

# SECTION **ATC**

## AUTOMATIC AIR CONDITIONER

A  
B  
C

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# PRECAUTIONS

## PRECAUTIONS

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

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The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

#### **WARNING:**

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SRS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

EJS001H7

#### **WARNING:**

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer [ATC-4, "Contaminated Refrigerant"](#). To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment (ACR2000) (J-43600) and Refrigerant Identifier.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
  - Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove R-134a from the A/C system using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
  - Do not allow lubricant (NISSAN A/C System Oil Type DH-PS) to come in contact with styrofoam parts. Damage may result.

### Contaminated Refrigerant

EJS001H8

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

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility

# PRECAUTIONS

does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.

- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

## General Refrigerant Precautions

EJS001H9

### WARNING:

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

## Precautions for Leak Detection Dye

EJS001HA

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

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## A/C Identification Label

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

**NOTE:**

**Vehicles with factory installed fluorescent dye have a green label.**

AIR CONDITIONER		NISSAN
	REFRIGERANT	COMPRESSOR LUBRICANT
TYPE (PART NO.)	HFC134a (R134a)	Nissan Luminous Oil Type DH-PS [KLH00-PAGS0]
AMOUNT	0.55 ± .025 kg (1.21 ± 0.055lbs)	150ml (5.03 oz)
<b>CAUTION PRECAUTION</b>		
<ul style="list-style-type: none"> <li>• REFRIGERANT UNDER HIGH PRESSURE.</li> <li>• SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL.</li> <li>• IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY.</li> <li>• CONSULT SERVICE MANUAL.</li> <li>• THIS AIR CONDITIONER SYSTEM COMPLIES WITH SAE J-639.</li> </ul>		
Nissan Motor Corporation in USA, Carson, CA		
WJIA0292E		

## Precautions for Refrigerant Connection

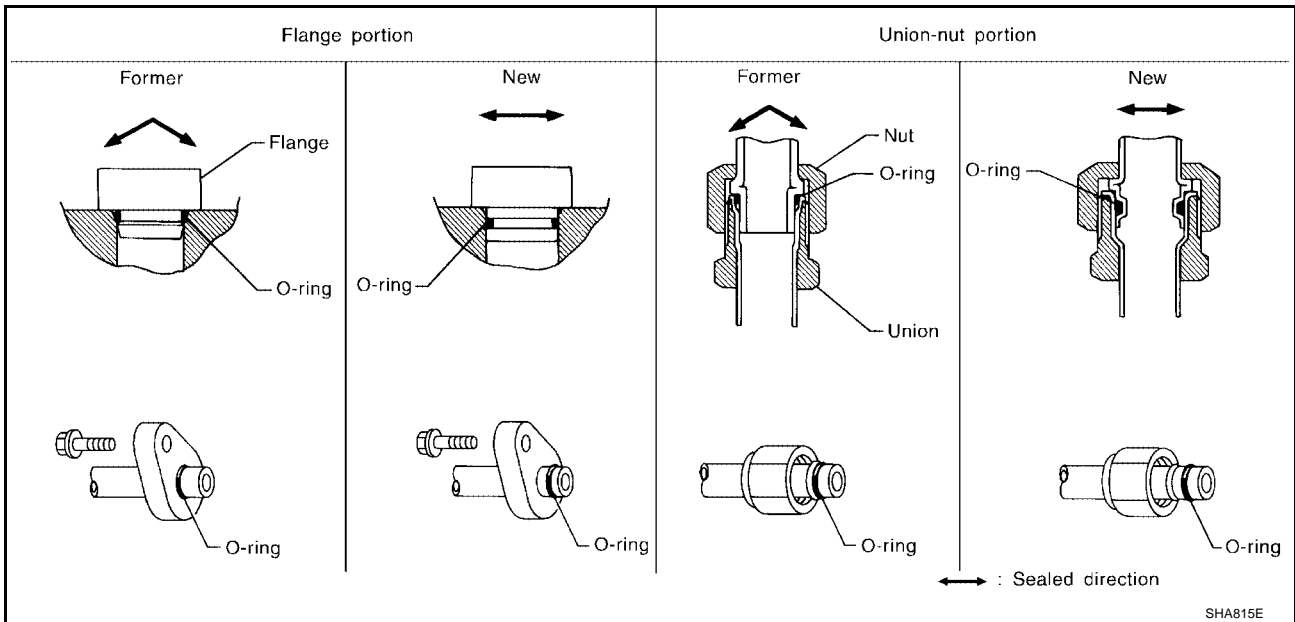
EJS001HC

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

### FEATURES OF NEW TYPE REFRIGERANT CONNECTION

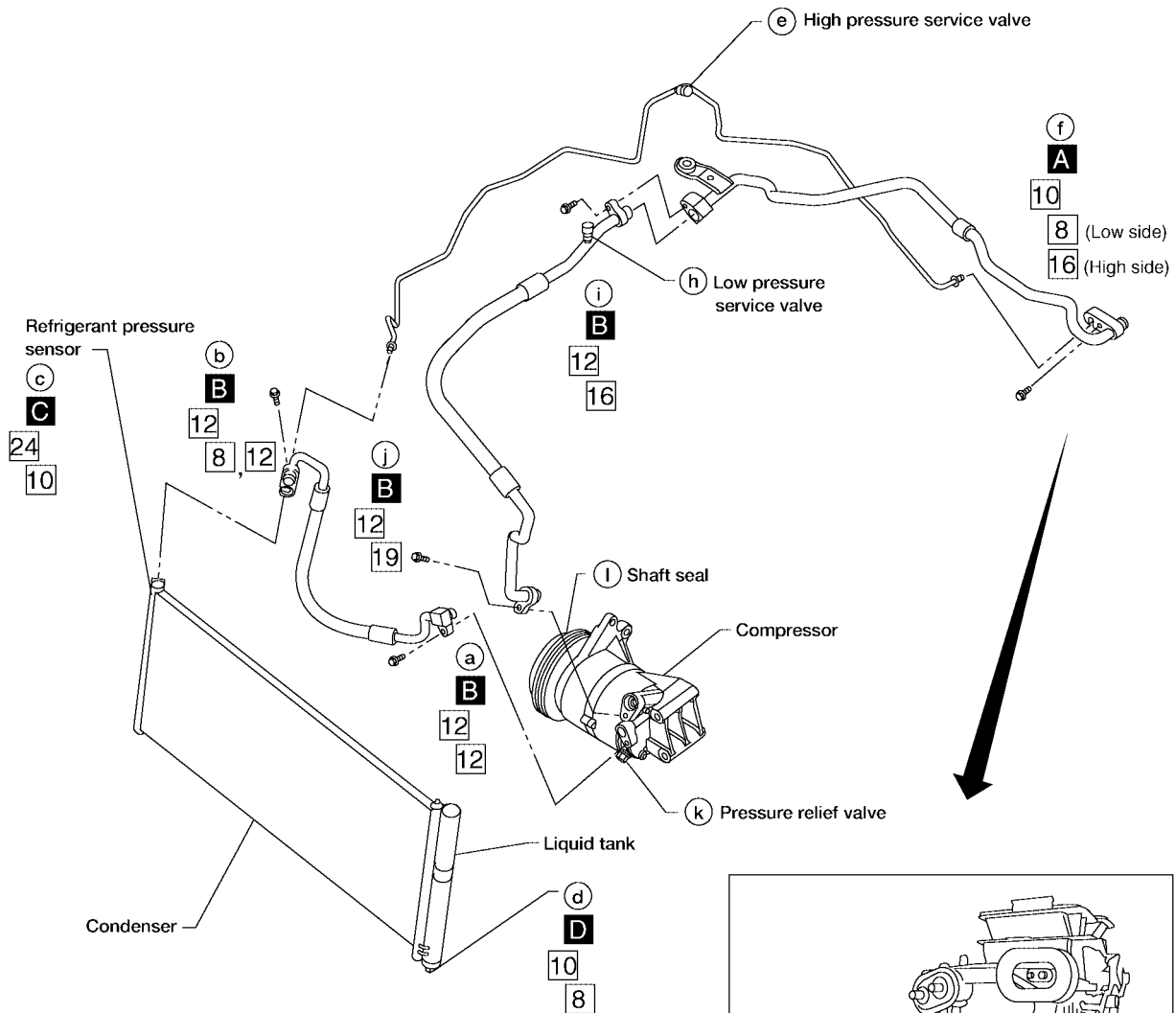
- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part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



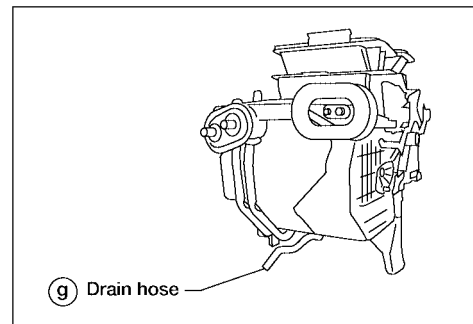
# PRECAUTIONS

## O-RING AND REFRIGERANT CONNECTION

SEC. 214 • 271 • 274 • 276



- : Refrigerant leak checking order
- : (Tightening torque)
- □ : (Wrench size)
- : (O-ring size)
- ⊗ : N·m (kg-m, in-lb)
- ⊕ : N·m (kg-m, ft-lb)
- A** ⊗ : 2.9 – 5.9 (0.29 – 0.60, 26 – 52)
- B** ⊗ : 7.8 – 19.6 (0.8 – 1.9, 69 – 173)
- C** ⊗ : 9.8 – 11.7 (1.0 – 1.1, 7.3 – 8.6)
- D** ⊗ : 5.0 – 6.47 (0.51 – 0.65, 45 – 57)



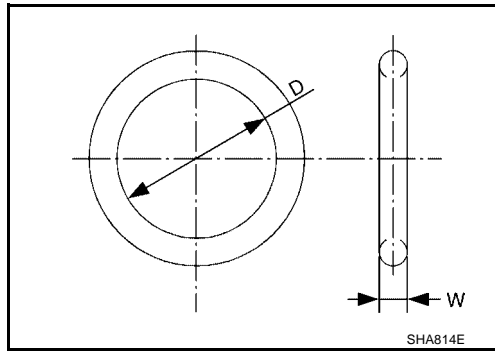
WJIA0982E

### 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



Conne- ction 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:

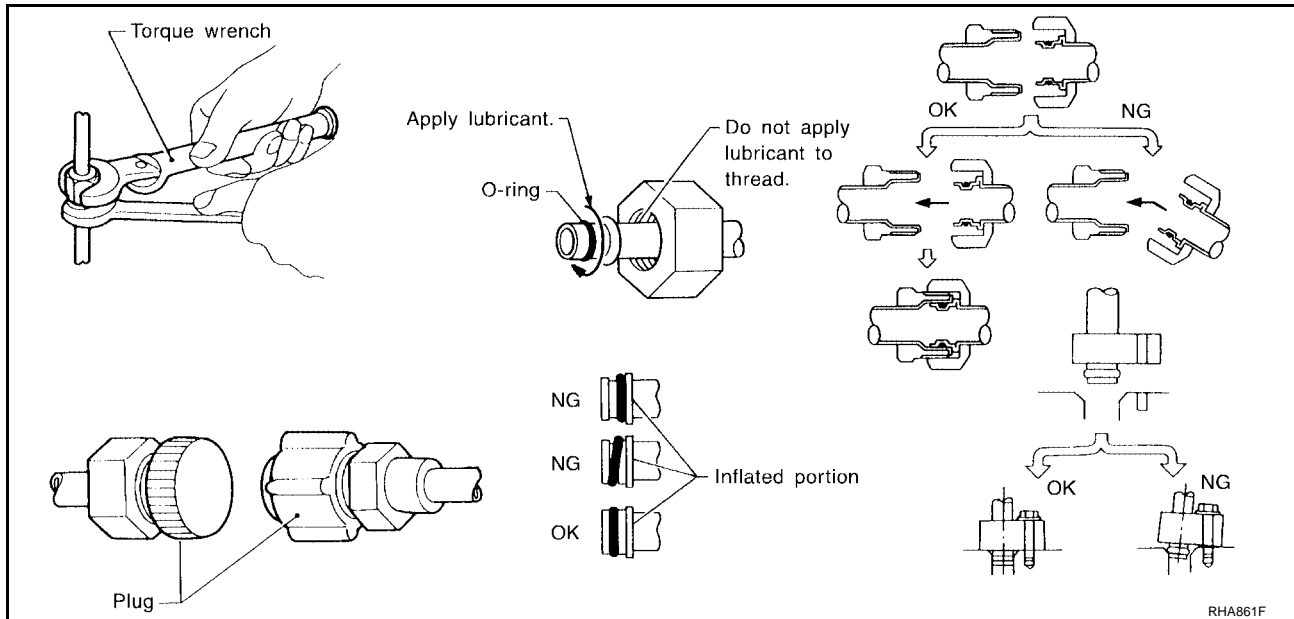
When replacing or cleaning refrigerant cycle components, observe the following.

- 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: NISSAN A/C System Oil Type DH-PS  
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

EJS001HD

- 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-18, "Maintenance of Lubricant Quantity in Compressor"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than 5 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 1 hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation. Refer to [ATC-120, "Removal and Installation for Compressor Clutch"](#)

## Precautions for Service Equipment RECOVERY/RECYCLING EQUIPMENT

EJS001HE

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

## ELECTRONIC LEAK DETECTOR

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

# PRECAUTIONS

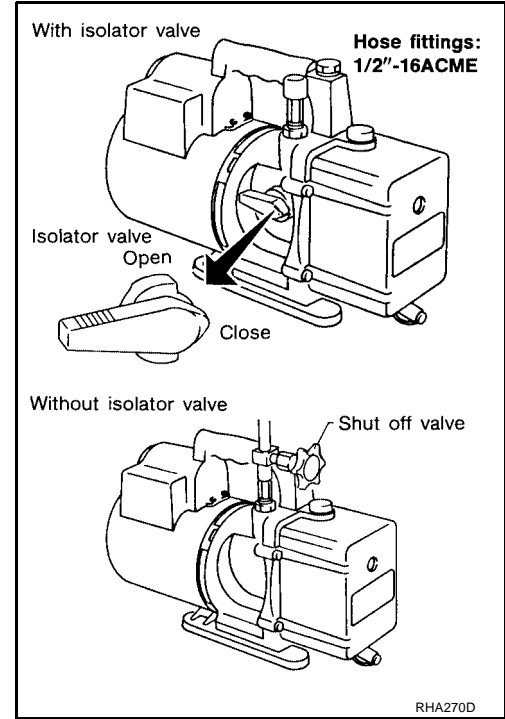
## VACUUM PUMP

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 situated near the hose-to-pump connection, as follows.

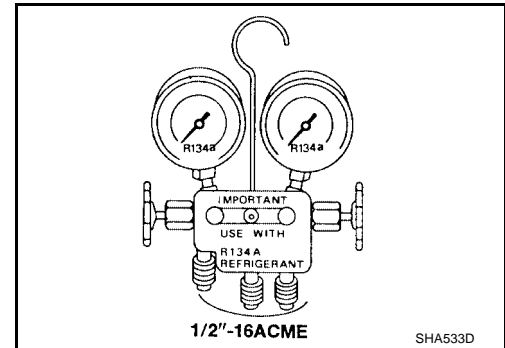
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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

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



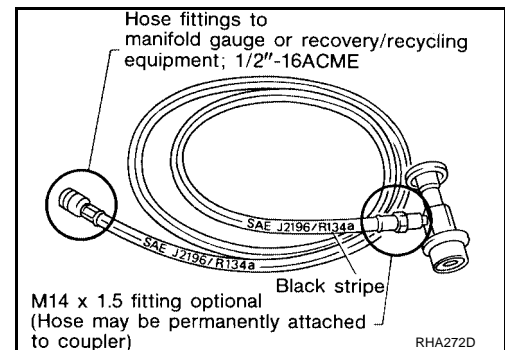
## MANIFOLD GAUGE SET

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



## SERVICE HOSES

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

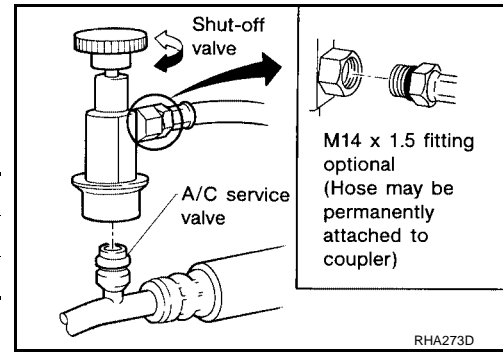


# PRECAUTIONS

## SERVICE COUPLERS

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

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



## 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.

## Wiring Diagrams and Trouble Diagnosis

EJS001HF

When you read wiring diagrams, refer to the following:

- [GI-12, "How to Read Wiring Diagrams"](#)
- [PG-3, "POWER SUPPLY ROUTING CIRCUIT"](#)

When you perform trouble diagnosis, refer to the following:

- [GI-9, "How to Follow Trouble Diagnoses"](#)
- [GI-25, "How to Perform Efficient Diagnosis for an Electrical Incident"](#)

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# PREPARATION

## PREPARATION

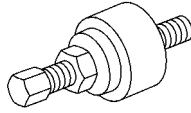
PFP:00002

### Special Service Tools

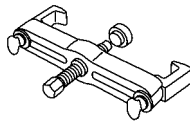
EJS001HG

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

Tool number (Kent-Moore No.) Tool name	Description
— (J-38873-A) Pulley installer	Installing pulley
KV99233130 (J-29884) Pulley puller	Removing pulley



LHA171



LHA172

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

EJS001HH

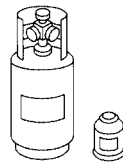
Never mix HFC-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

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

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

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

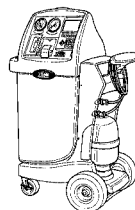
Tool number (Kent-Moore No.) Tool name	Description
HFC-134a (R-134a) refrigerant	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● large container 1/2"-16 ACME
KLH00-PAGS0 ( — ) NISSAN A/C System Oil Type DH-PS	Type: Poly alkylene glycol oil (PAG), type DH-PS Application: HFC-134a (R-134a) vane rotary compressors (NISSAN only) Lubricity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)
(J-43600) Recovery/Recycling Recharging equipment (ACR2000)	Function: Refrigerant Recovery and Recycling and Recharging



S-NT196

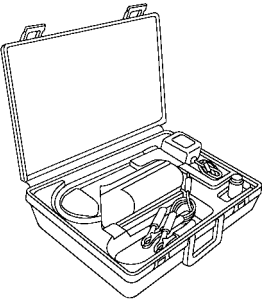
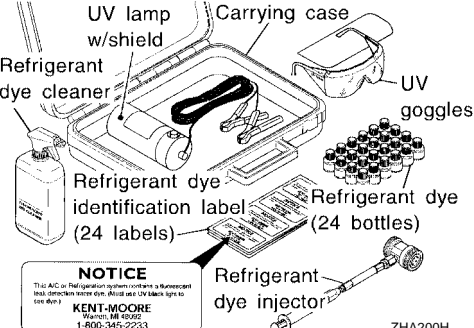
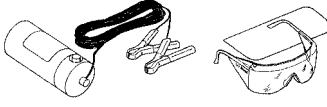

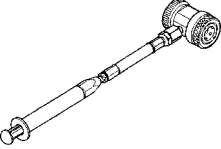



S-NT197

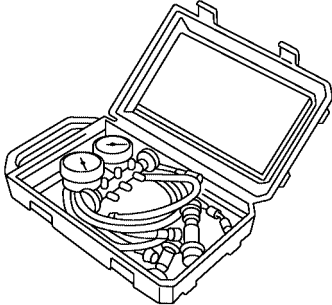
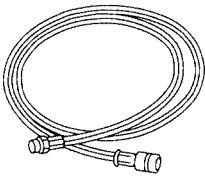
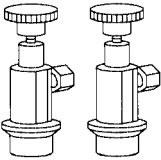
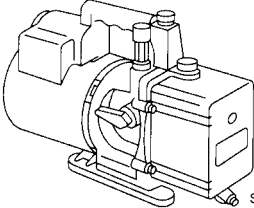


WJIA0293E

# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description	
<p>(J-41995) Electronic refrigerant leak detector</p>  <p style="text-align: right;">AHA281A</p>	<p>Power supply: ● DC 12V (Cigarette lighter)</p>	A B C D
<p>(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) qty. 24 HFC-134a (R-134a) refrigerant dye (J-43872) Refrigerant dye cleaner</p>  <p style="text-align: right;">ZHA200H</p>	<p>Power supply: DC 12V (Battery terminal)</p>	E F G H
<p>(J-42220) Fluorescent dye leak detector</p>  <p style="text-align: right;">SHA438F</p>	<p>Power supply: DC 12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system. Includes: UV lamp and UV safety goggles</p>	I <b>ATC</b>
<p>(J-41447) HFC-134a (R-134a) Fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)</p>  <p style="text-align: right;">SHA439F</p>	<p>Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)</p>	K L
<p>(J-41459) HFC-134a (R-134a) Dye injector Use with J-41447, 1/4 ounce bottle</p>  <p style="text-align: right;">SHA440F</p>	<p>For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.</p>	M
<p>(J-43872) Dye cleaner</p>  <p style="text-align: right;">SHA441F</p>	<p>For cleaning dye spills.</p>	

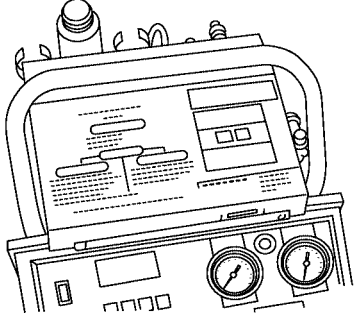
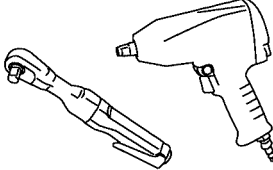

# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
<p>(J-39183-C) Manifold gauge set (with hoses and couplers)</p>  <p style="text-align: right; font-size: small;">RJIA0196E</p>	<p><b>Identification:</b></p> <ul style="list-style-type: none"> <li>● The gauge face indicates R-134a. Fitting size: Thread size</li> <li>● 1/2"-16 ACME</li> </ul>
<p><b>Service hoses</b></p> <ul style="list-style-type: none"> <li>● High side hose (J-39500-72B)</li> <li>● Low side hose (J-39500-72R)</li> <li>● Utility hose (J-39500-72Y)</li> </ul>  <p style="text-align: right; font-size: small;">S-NT201</p>	<p><b>Hose color:</b></p> <ul style="list-style-type: none"> <li>● Low side hose: Blue with black stripe</li> <li>● High side 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><b>Service couplers</b></p> <ul style="list-style-type: none"> <li>● High side coupler (J-39500-20A)</li> <li>● Low side coupler (J-39500-24A)</li> </ul>  <p style="text-align: right; font-size: small;">S-NT202</p>	<p><b>Hose fitting to service hose:</b></p> <ul style="list-style-type: none"> <li>● M14 x 1.5 fitting is optional or permanently attached.</li> </ul>
<p>(J-39649) Vacuum pump (Including the isolator valve)</p>  <p style="text-align: right; font-size: small;">S-NT203</p>	<p><b>Capacity:</b></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) Fitting size: Thread size</li> <li>● 1/2"-16 ACME</li> </ul>

# PREPARATION

## Commercial Service Tools

EJS001HI

Tool name	Description
<p>(J-41810-NI) Refrigerant identifier equipment- (R-134a)</p>  <p style="text-align: right; font-size: small;">RJIA0197E</p>	<p>For checking refrigerant purity and system contamination</p>
<p>Power tool</p>  <p style="text-align: right; font-size: small;">PBIC0190E</p>	<p>Loosening bolts and nuts</p>
<p>(J-44614) Clutch disc holding tool</p>  <p style="text-align: right; font-size: small;">WHA230</p>	<p>Clutch disc holding tool</p>

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**ATC**

# REFRIGERATION SYSTEM

PPF:KA990

## REFRIGERATION SYSTEM

### Refrigerant Cycle REFRIGERANT FLOW

EJS001HJ

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

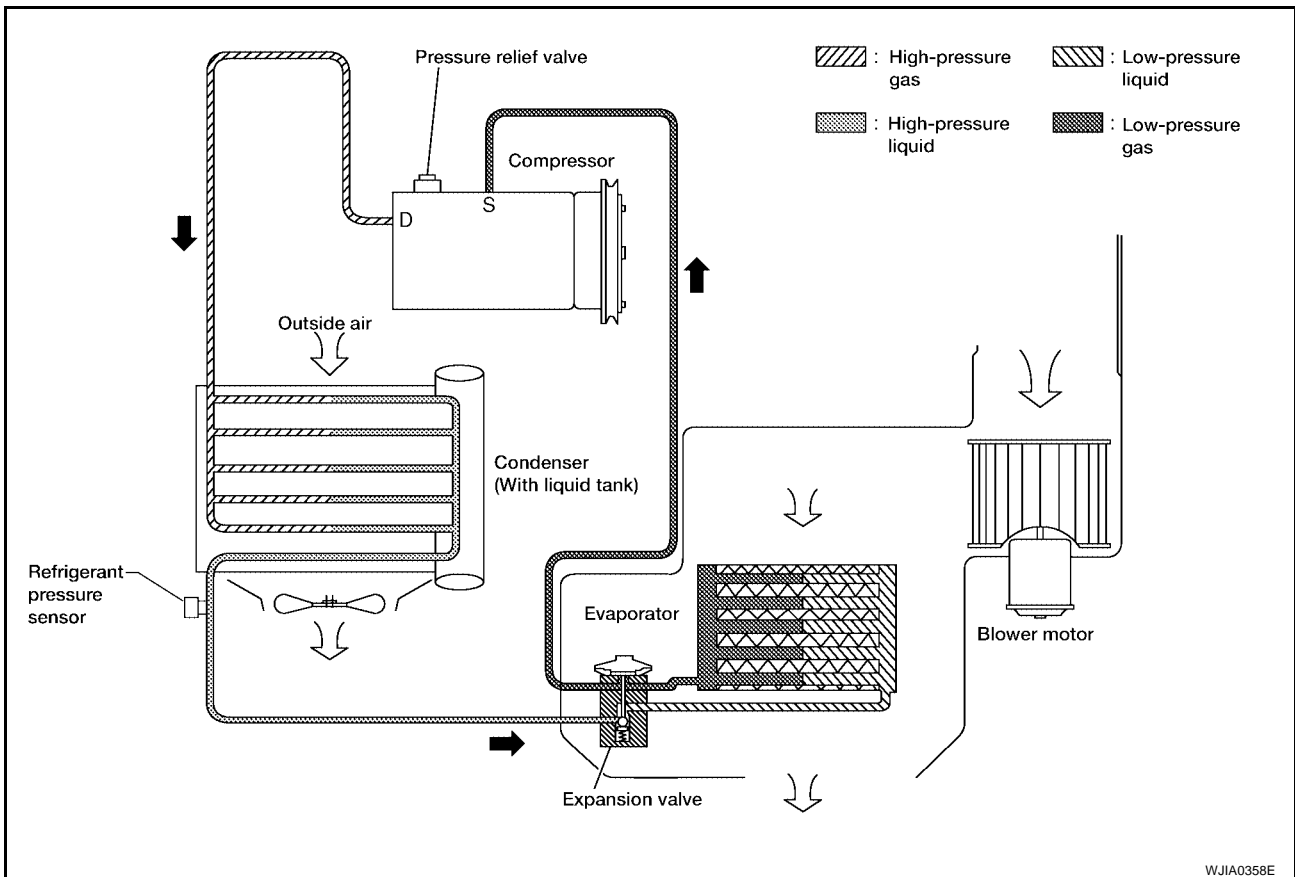
### Refrigerant System Protection REFRIGERANT PRESSURE SENSOR

EJS001HK

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm<sup>2</sup>, 398 psi), or below about 120 kPa (1.22 kg/cm<sup>2</sup>, 17.4 psi).

### PRESSURE RELIEF VALVE

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



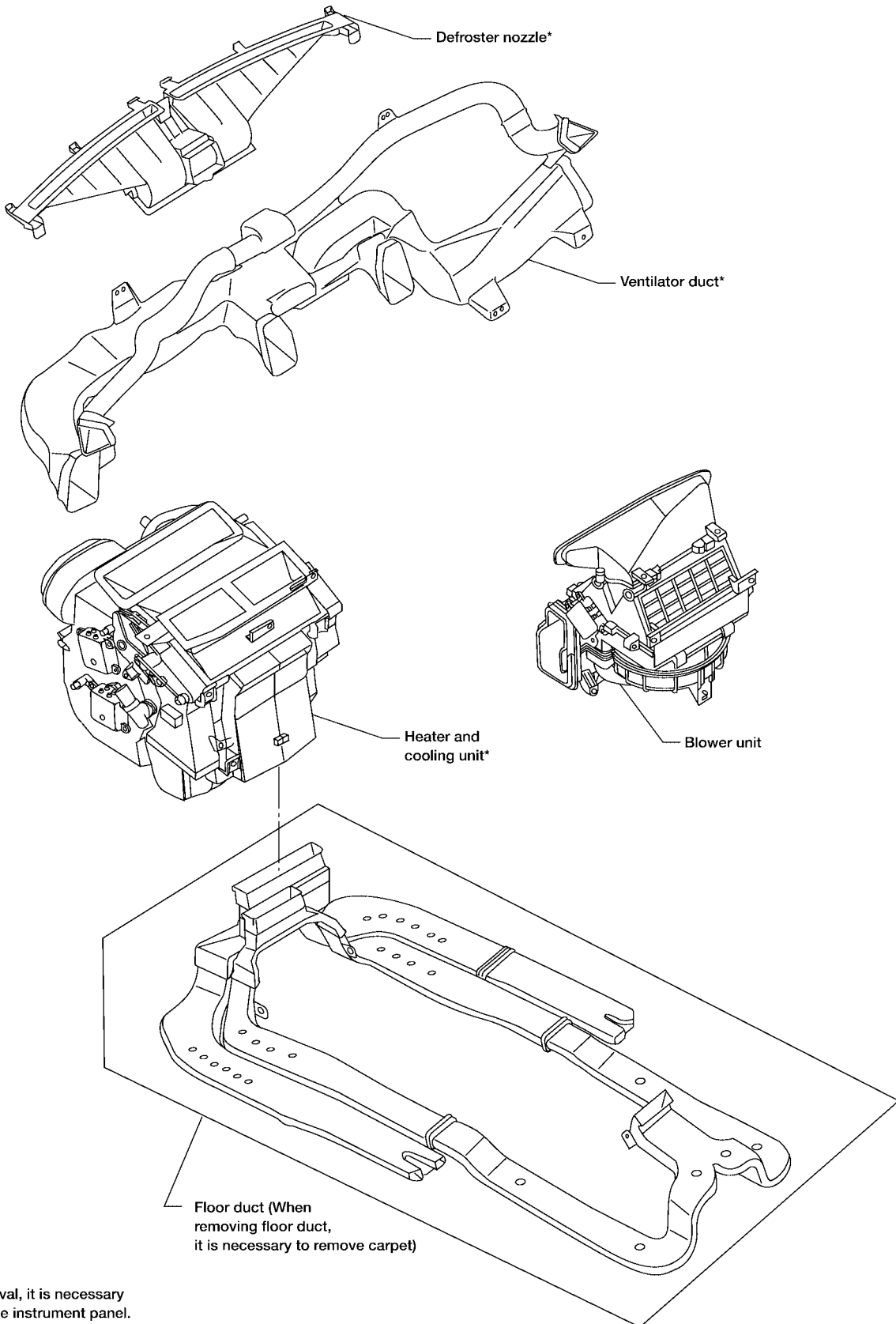


# REFRIGERATION SYSTEM

## Component Layout

EJS001HL

SEC. 270 • 271 • 272 • 273



\* For removal, it is necessary to remove instrument panel.

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WJIA0294E

# LUBRICANT

PPF:KLG00

## LUBRICANT

### Maintenance of Lubricant Quantity in Compressor

EJS001HM

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 Oil Type DH-PS**

**Part number: KLH00-PAGS0**

### CHECKING AND ADJUSTING

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

## 1. LUBRICANT RETURN OPERATION

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Can lubricant return operation be performed?

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

Yes or No

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

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

---

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

### **CAUTION:**

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

>> GO TO 3.

## 3. CHECK COMPRESSOR

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Should the compressor be replaced?

Yes or No

- Yes >> GO TO [ATC-19, "Lubricant Adjustment Procedure for Compressor Replacement"](#) .  
No >> GO TO 4.

## 4. CHECK ANY PART

---

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

Yes or No

- Yes >> GO TO [ATC-19, "Lubricant Adjusting Procedure for Components Replacement Except Compressor"](#) .  
No >> Carry out the A/C performance test.

# LUBRICANT

## Lubricant Adjusting Procedure for Components Replacement Except Compressor

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

### Amount of lubricant to be added

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced.
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *1

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

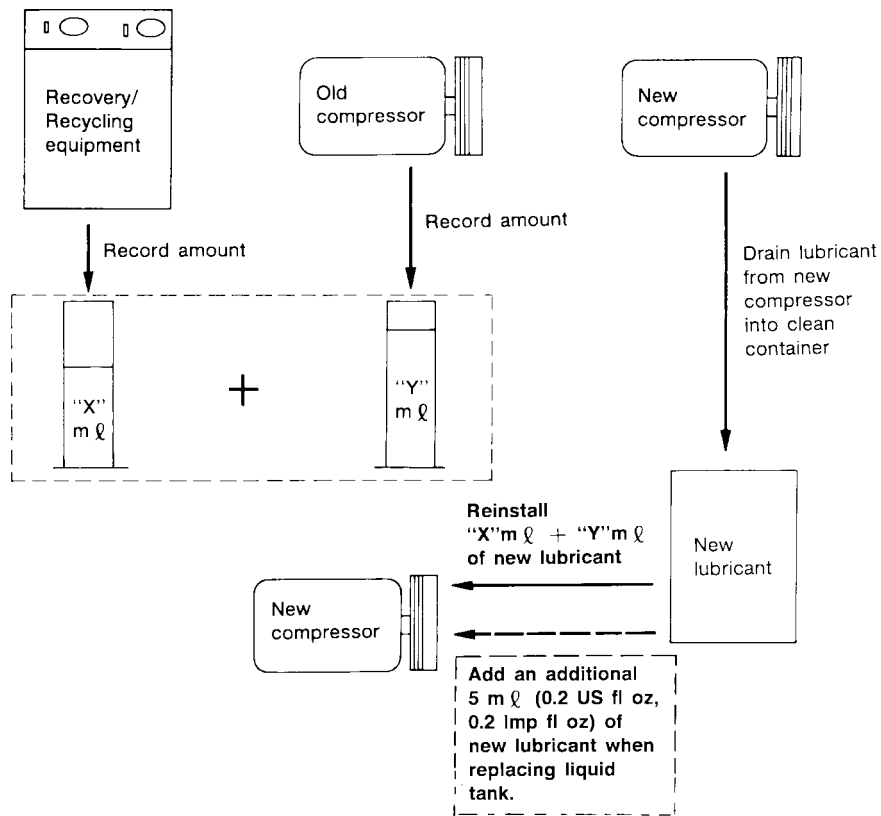
## Lubricant Adjustment Procedure for Compressor Replacement

1. Before connecting ACR2000 to vehicle, check ACR2000 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect ACR2000 to vehicle. Confirm refrigerant purity in supply tank using ACR2000 and refrigerant identifier. If NG, refer to [ATC-4, "Contaminated Refrigerant"](#).
3. Confirm refrigerant purity in vehicle A/C system using ACR2000 and refrigerant identifier. If NG, refer to [ATC-4, "Contaminated Refrigerant"](#).
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the "old" (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the "new" compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from "old" compressor. Add this lubricant to "new" compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to "new" compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add an additional 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.

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

# LUBRICANT

## Lubricant adjusting procedure for compressor replacement



RHA065DD

# AIR CONDITIONER CONTROL

## AIR CONDITIONER CONTROL

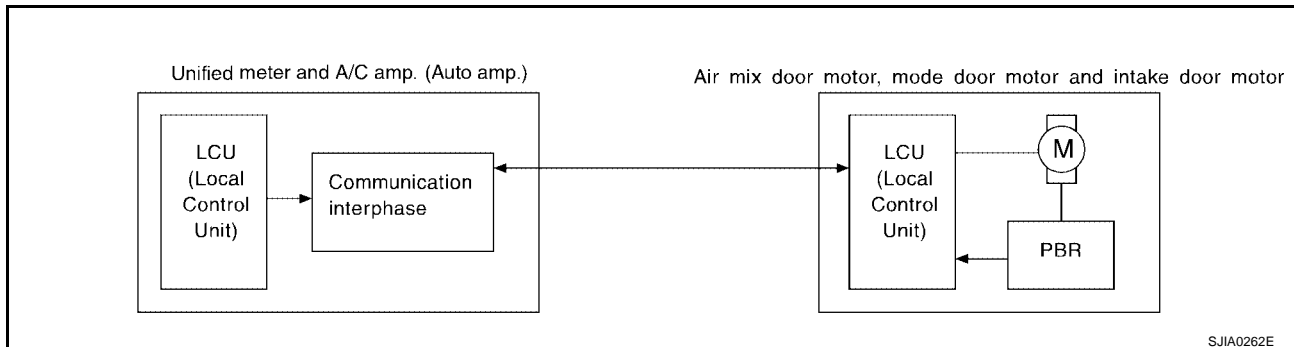
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### Description of Air Conditioner LAN Control System

EJS001MA

The LAN (Local Area Network) system consists of unified meter and A/C amp., mode door motor, air mix door motor and intake door motor.

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



### System Construction

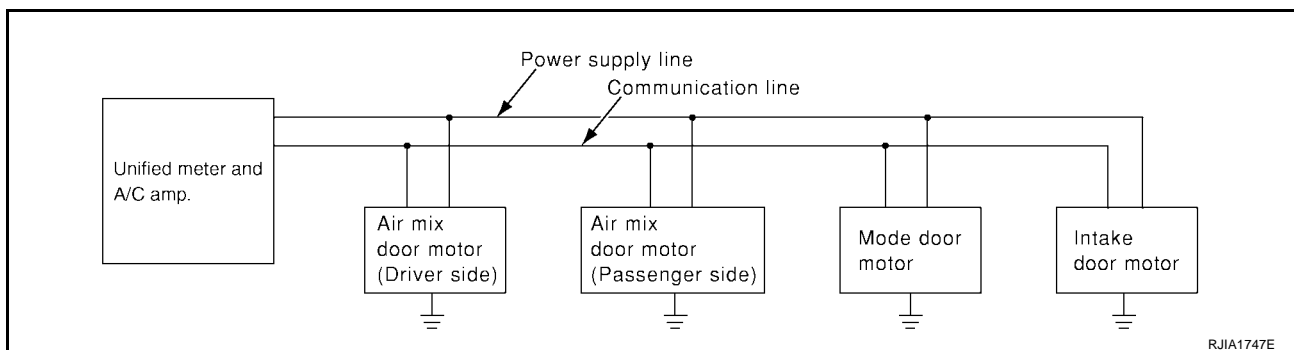
EJS001MB

A small network is constructed between the unified meter and A/C amp., air mix door motor, mode door motor and intake door motor. The unified meter and A/C amp. and motors are connected by data transmission lines and motor power supply lines. The LAN communication is achieved using the dedicated communication line and ground line between each door motor and the unified meter and A/C amp.

The unified meter and A/C amp. identifies each motor type by its unique Address. Serial communication includes positioning and error checking information.

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

- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor [Position balanced resistor (PBR) function]
- Comparison
- Decision (Unified meter and A/C amp. indicated value and motor opening angle comparison)



### OPERATION

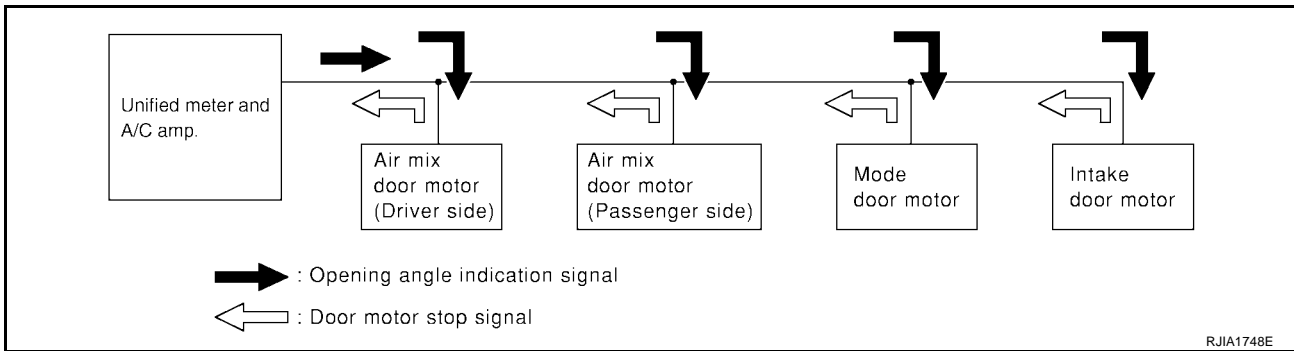
The unified meter and A/C amp. sends mode door, air mix door and intake door opening angle data to the mode door motor LCU, air mix door motor LCU and intake door motor LCU.

The mode door motor, air mix door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals are sent from the unified meter and A/C amp. to each of the motors and are compared by the LCUs in each motor with the existing position and opening angles. Subsequently, HOT/COLD, DEFROST/VENT or FRESH/RECIRCULATION operation is selected. When the selected angle position is reached a reply is sent from the motors back to the unified meter and A/C amp.

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# AIR CONDITIONER CONTROL



## TRANSMISSION DATA AND TRANSMISSION ORDER

Unified meter and A/C amp. data is transmitted consecutively to each of the door motors following the form shown in figure below.

**Start:** Initial compulsory signal sent to each of the door motors.

**Address:** Data sent from the unified meter and A/C amp. is selected according to data-based decisions made by the air mix door motor, mode door motor and intake door motor.

If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is usual, door control begins.

If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

**Opening angle:**

Data that shows the indicated door opening angle of each door motor.

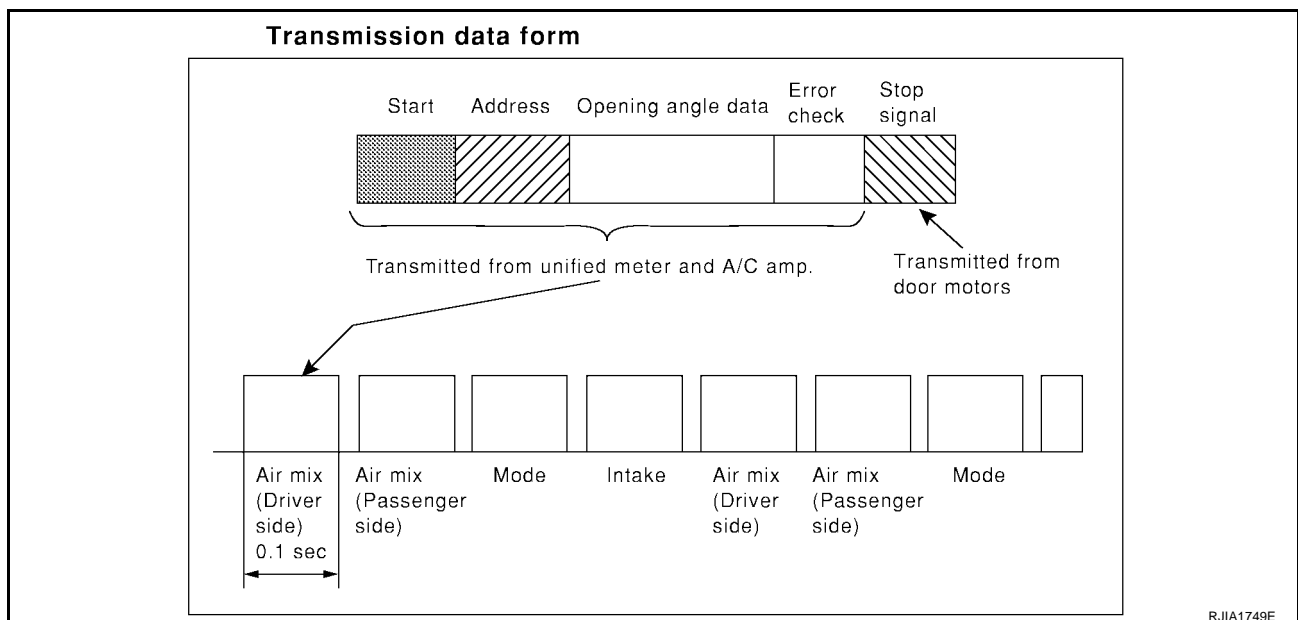
**Error check:**

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

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

**Stop signal:**

At the end of each transmission, a stop operation, in-operation, or internal error message is delivered to the unified meter and A/C amp. This completes one data transmission and control cycle.



# AIR CONDITIONER CONTROL

## AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

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

## FAN SPEED CONTROL

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

When pressing AUTO switch, the blower motor starts to gradually increase air flow volume.

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

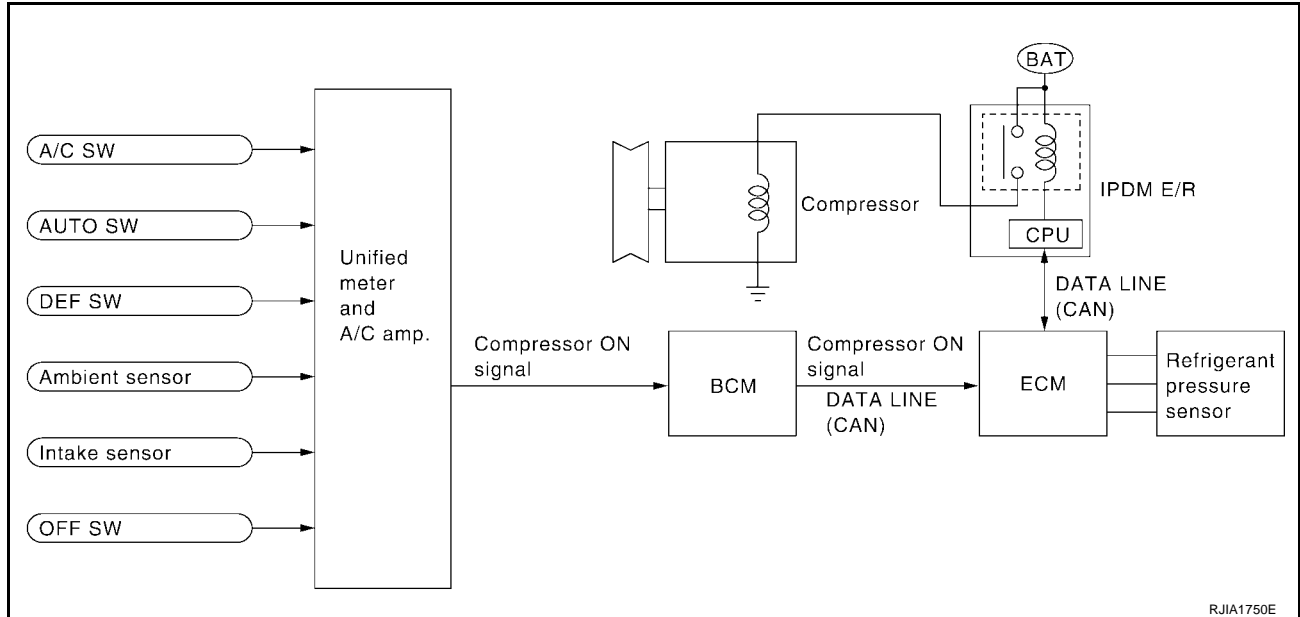
## INTAKE DOOR CONTROL

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

## OUTLET DOOR CONTROL

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

## MAGNET CLUTCH CONTROL



When A/C switch or DEF switch is pressed, unified meter and A/C amp. 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, 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 unified meter and A/C amp. to quickly locate the cause of symptoms.

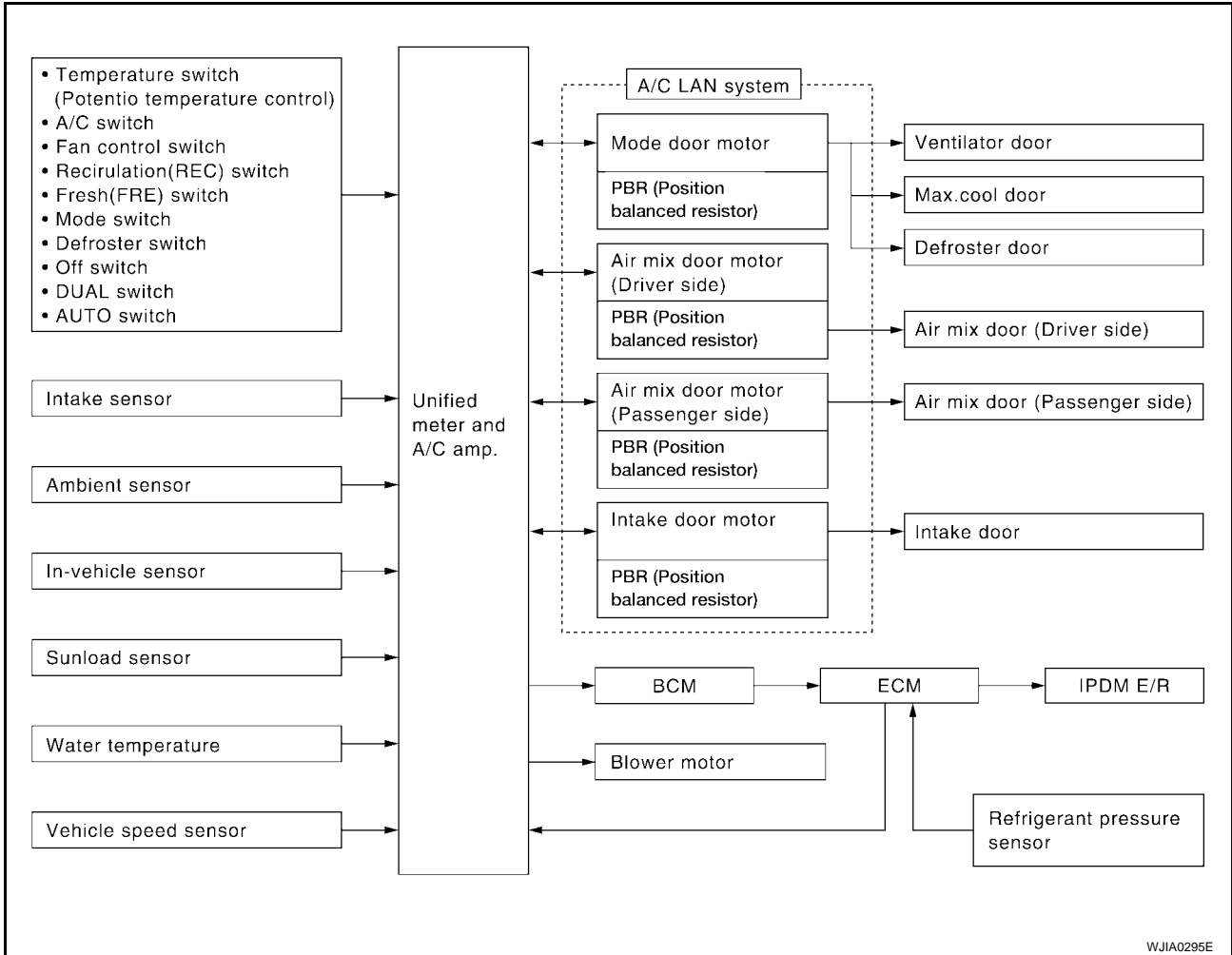
# AIR CONDITIONER CONTROL

EJS001MC

## Description of Control System

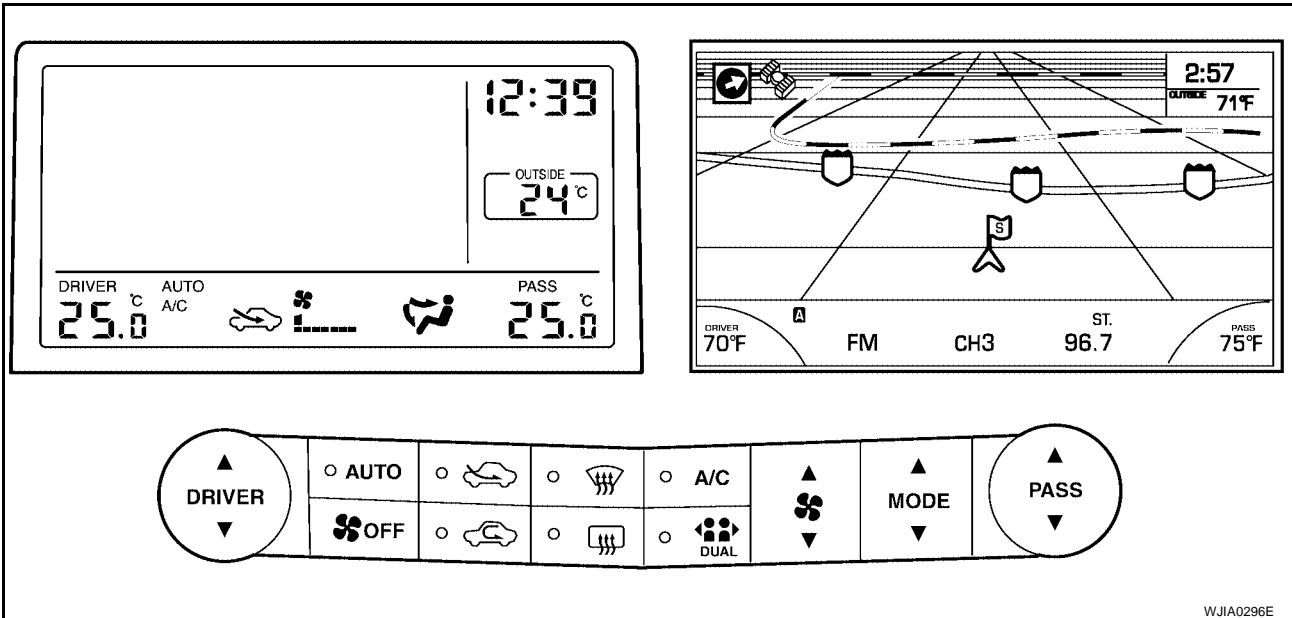
The control system consists of input sensors, switches, the unified meter and A/C amp. (microcomputer) and outputs.

The relationship of these components is shown in the figure below:



## Control Operation

EJS001MD





# AIR CONDITIONER CONTROL

---

## DISPLAY SCREEN

Displays the operational status of the system.

A

## AUTO SWITCH

- The compressor, intake doors, air mix doors, outlet doors and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.
- When pressing AUTO switch, air inlet, air outlet, fan speed, and discharge air temperature are automatically controlled.

B

C

## TEMPERATURE SWITCH (TEMPERATURE CONTROL) (DRIVER SIDE)

Increases or decreases the set temperature.

D

## TEMPERATURE SWITCH (TEMPERATURE CONTROL) (PASSENGER SIDE)

- Increases or decreases the set temperature.
- When the temperature switch is pressed, the dual switch indicator will automatically illuminate.

E

## RECIRCULATION (REC) SWITCH

- When REC switch is ON, REC switch indicator turns ON, and air inlet is set to REC.
- When REC switch is ON and is pressed for approximately 1.5 seconds or longer, REC and FRE switch indicators blink twice. Then, automatic control mode is entered. Inlet status is displayed even when in automatic mode.
- When FRE switch is turned ON, or when compressor is turned from ON to OFF, REC switch is automatically turned OFF (set to FRE mode). 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.

F

G

H

## FRESH (FRE) SWITCH

- When FRE switch is ON, FRE switch indicator turns ON, and air inlet is set to FRE.
- When FRE switch is ON and is pressed for approximately 1.5 seconds or longer, REC and FRE switch indicators blink twice. Then, automatic control mode is entered. Inlet status is displayed even during automatically controlled.
- When REC switch is turned ON, FRE switch is automatically turned OFF (set to REC mode). FRE mode can be re-entered by pressing FRE switch again.

I

ATC

## DEFROSTER (DEF) SWITCH

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position. The compressor remains ON until the ignition is turned OFF.

K

## REAR WINDOW DEFOGGER SWITCH

When illumination is ON, rear window is defogged.

L

## 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.

M

## 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.)

## MODE SWITCH

Controls the air discharge outlets.

## FAN CONTROL SWITCH

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

## DUAL SWITCH (WITH LEFT AND RIGHT VENTILATION TEMPERATURE SEPARATE CONTROL SYSTEM)

- When the DUAL switch indicator is not illuminated and the DUAL switch is pressed, the driver-side setting temperature and passenger-side setting temperature can each be set independently.

## AIR CONDITIONER CONTROL

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- When DUAL switch indicator is illuminated and the DUAL switch is pressed, the driver-side setting temperature is applied to both sides.

### Fail-safe Function

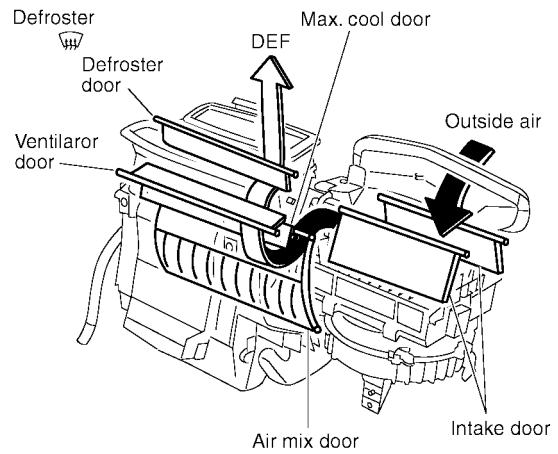
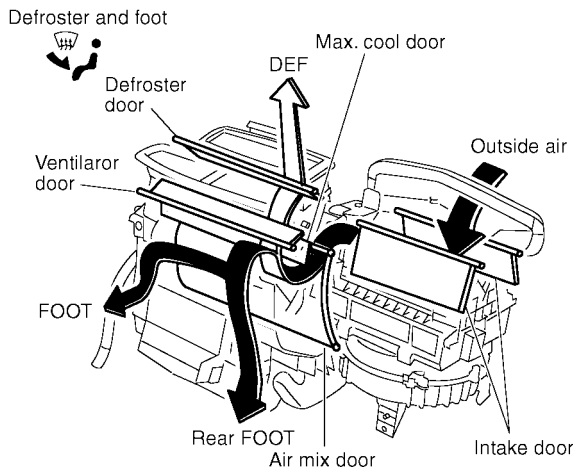
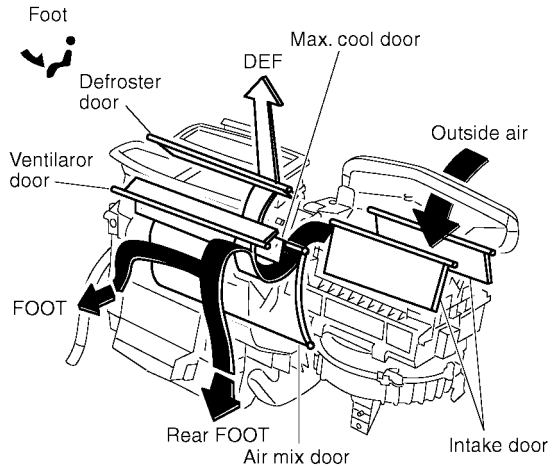
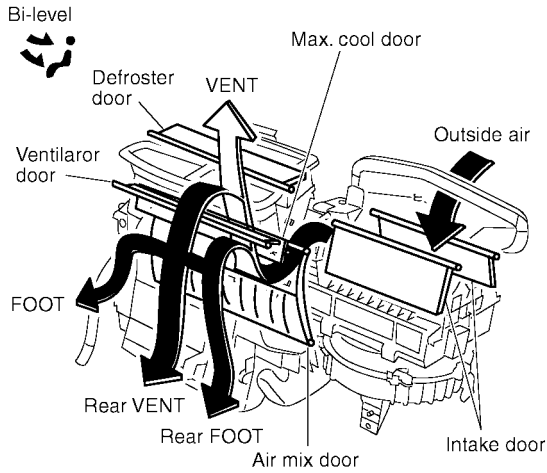
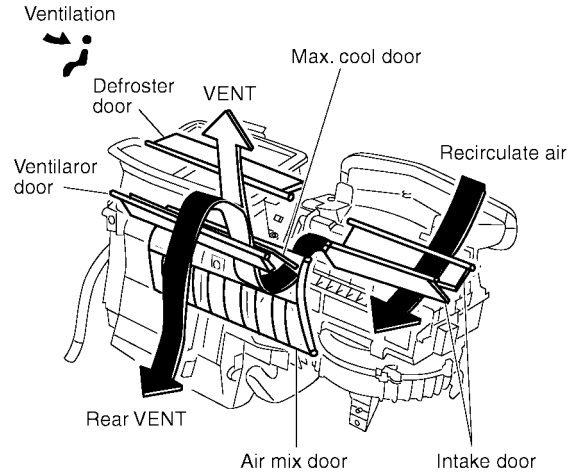
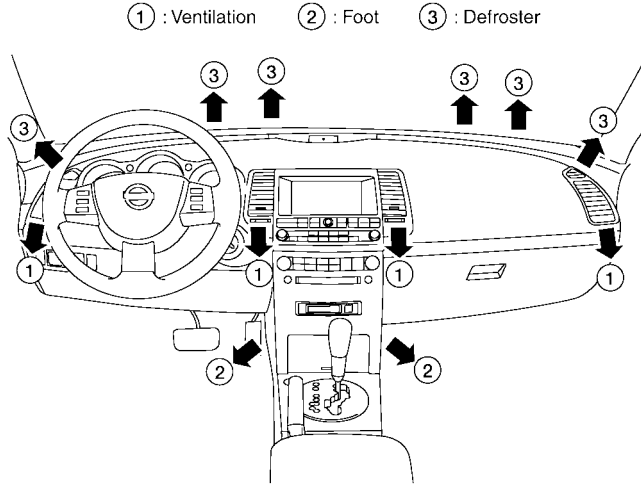
EJS001ME

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

# AIR CONDITIONER CONTROL

EJS001MF

## Discharge Air Flow



A  
B  
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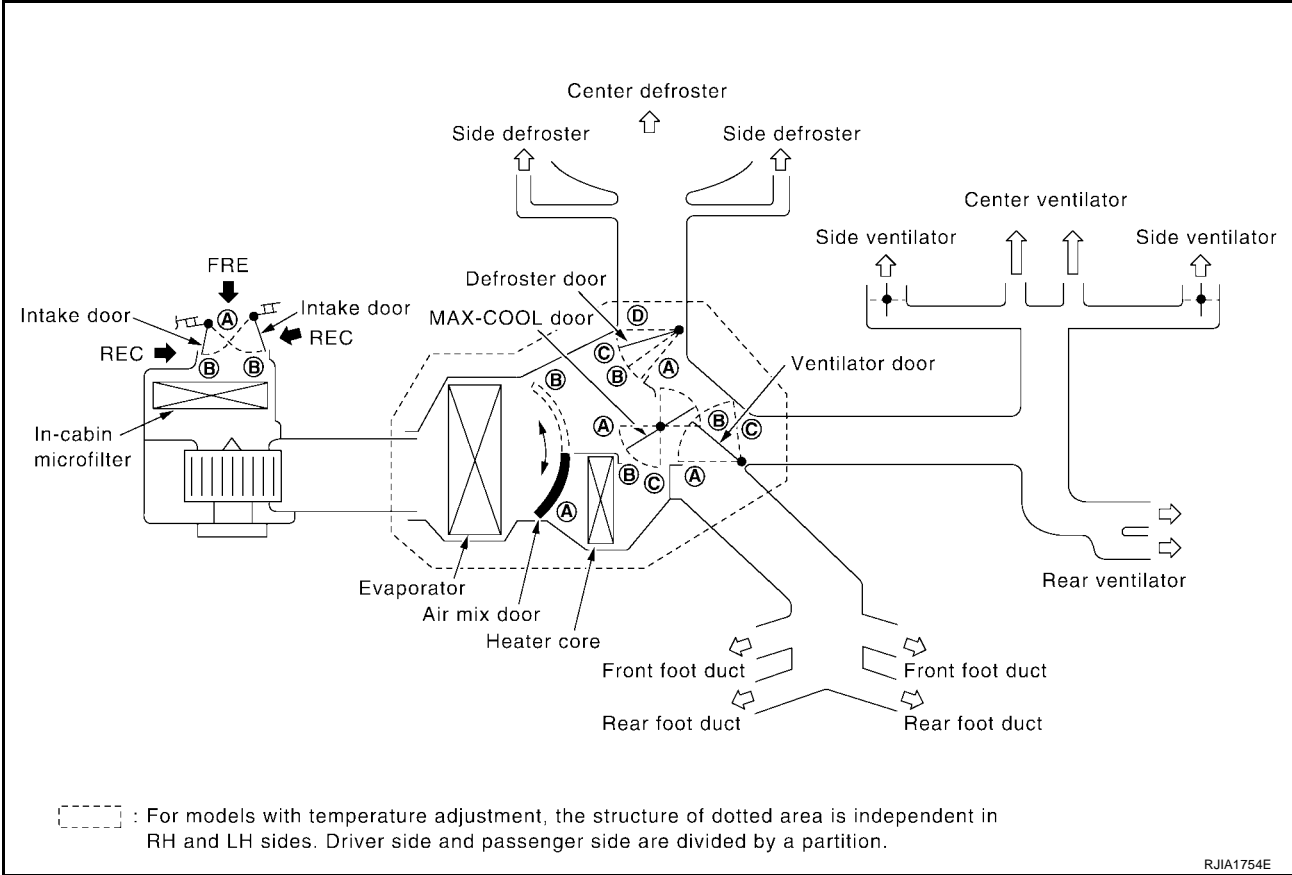
ATC

WJIA0297E

# AIR CONDITIONER CONTROL

## System Description SWITCHES AND THEIR CONTROL FUNCTION

EJS001MG



Position or switch	MODE SW				DEF SW		AUTO SW	REC SW	FRE SW	Temperature switch			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF				18°C (60°F)	~	32°C (90°F)	
Door													
Ventilator door	(A)	(B)	(C)	(C)	(C)	—	AUTO	—	—	—			(C)
MAX-COOL door	(A)	(B)	(B)	(B)	(C)	—	AUTO	—	—	—			(B)
Defroster door	(D)	(D)	(D) <sup>*1</sup> (C)	(B)	(A)	—	—	—	—	—			(C)
Intake door	—				(B)	—	—	(A) <sup>*2</sup>	(B) <sup>*2</sup>	—			(B)
Air mix door	—				—	—	AUTO	—	—	(A)	AUTO	(B)	—

\*1: This position is selected only when the mode door is automatically controlled.  
\*2: Inlet status is displayed even during automatic control.

WJIA0298E

# AIR CONDITIONER CONTROL

---

## CAN Communication System Description

EJS001MH

Refer to [LAN-8, "CAN COMMUNICATION"](#) .

A

B

C

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**ATC**

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L

M

# TROUBLE DIAGNOSIS

## TROUBLE DIAGNOSIS

PFP:00004

### CONSULT-II Function (METER A/C AMP)

EJS001LL

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

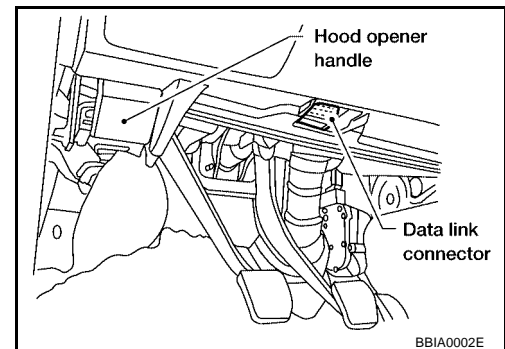
SELF-DIAG RESULTS	Displays unified meter and A/C amp. self-diagnosis results.
DATA MONITOR	Displays unified meter and A/C amp. input/output data in real time.
CAN DIAG SUP-PORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

### CONSULT-II BASIC OPERATION

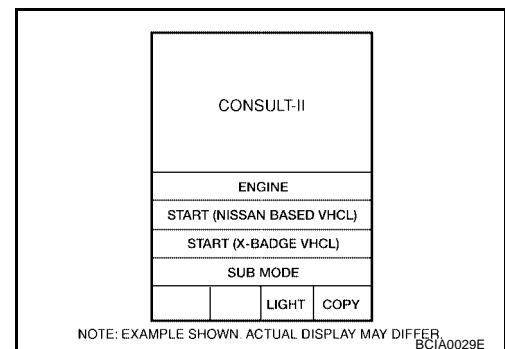
#### CAUTION:

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.

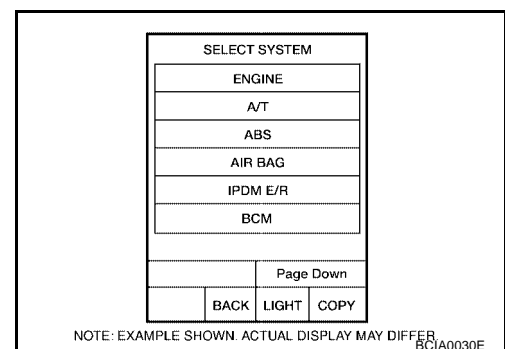
1. With the ignition switch OFF, connect CONSULT-II and "CONSULT-II converter" to the data link connector, and turn the ignition switch ON.



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



3. Touch "BCM" on "SELECT SYSTEM" screen. If "BCM" is not indicated, go to [GI-36, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).

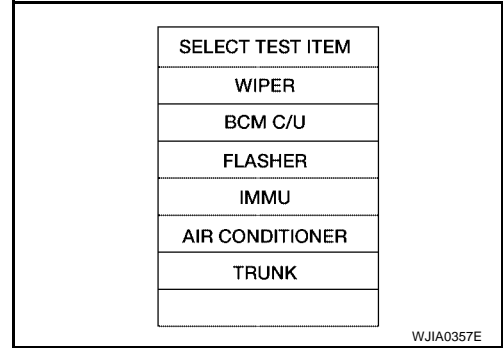


# TROUBLE DIAGNOSIS

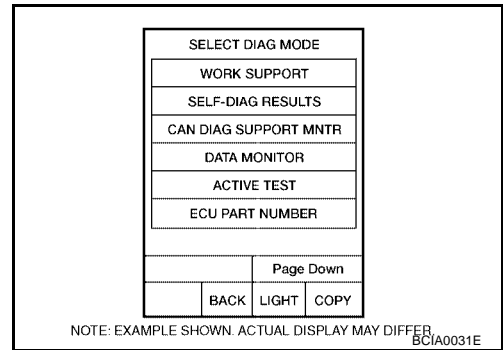
## DATA MONITOR

### Operation Procedure

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



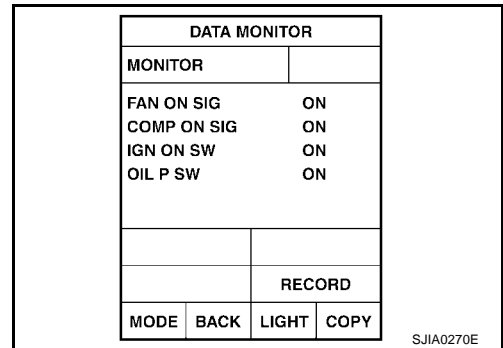
2. Touch "DATA MONITOR" on "SELECT DIAG MODE" screen.



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. Touch "START".
5. When "SELECTION FROM MENU" is selected, touch items to be monitored. When "ALL SIGNALS" is selected, all the items will be monitored.
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 fan motor switch signal.

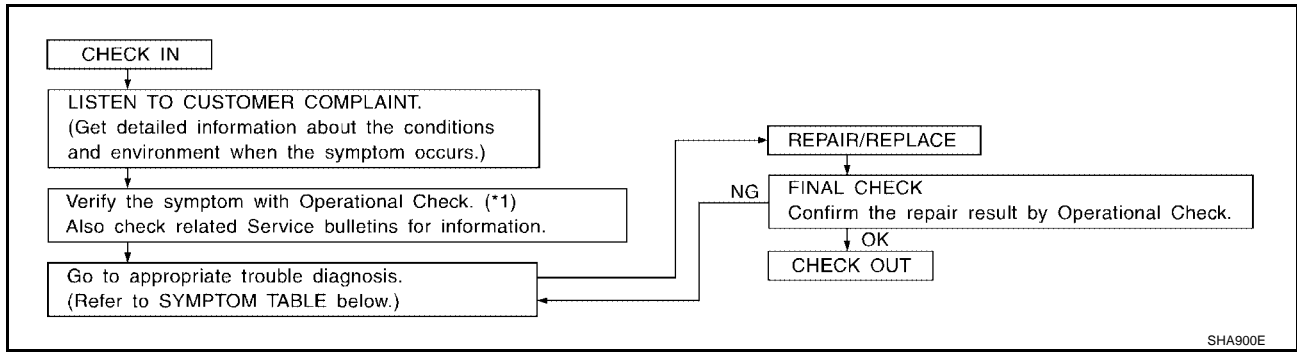
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ATC

# TROUBLE DIAGNOSIS

EJS001LM

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



SHA900E

\*1 [ATC-50. "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-52. "Power Supply and Ground Circuit for Auto Amp."</a>
A/C system cannot be controlled.	<ul style="list-style-type: none"> <li>Go to Integrated Display System.</li> <li>Go to Navigation System.</li> </ul> <a href="#">AV-67. "System Description"</a> (Without navigation system) or <a href="#">AV-179. "A/C Does Not Work"</a> (With navigation system)
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) <a href="#">ATC-58. "Mode Door Motor Circuit"</a>
Mode door motor does not operate normally.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) <a href="#">ATC-61. "Air Mix Door Motor Circuit"</a>
Air mix door motor does not operate normally.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. (LAN) <a href="#">ATC-64. "Intake Door Motor Circuit"</a>
Intake door motor does not operate normally.	
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor. <a href="#">ATC-67. "Blower Motor Circuit"</a>
Blower motor operation is malfunctioning under out of starting fan speed control.	
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. <a href="#">ATC-72. "Magnet Clutch Circuit"</a>
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. <a href="#">ATC-78. "Insufficient Cooling"</a>
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. <a href="#">ATC-85. "Insufficient Heating"</a>
Noise	Go to Trouble Diagnosis Procedure for Noise. <a href="#">ATC-86. "Noise"</a>
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis. <a href="#">ATC-87. "Self-diagnosis"</a>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function. <a href="#">ATC-88. "Memory Function"</a>

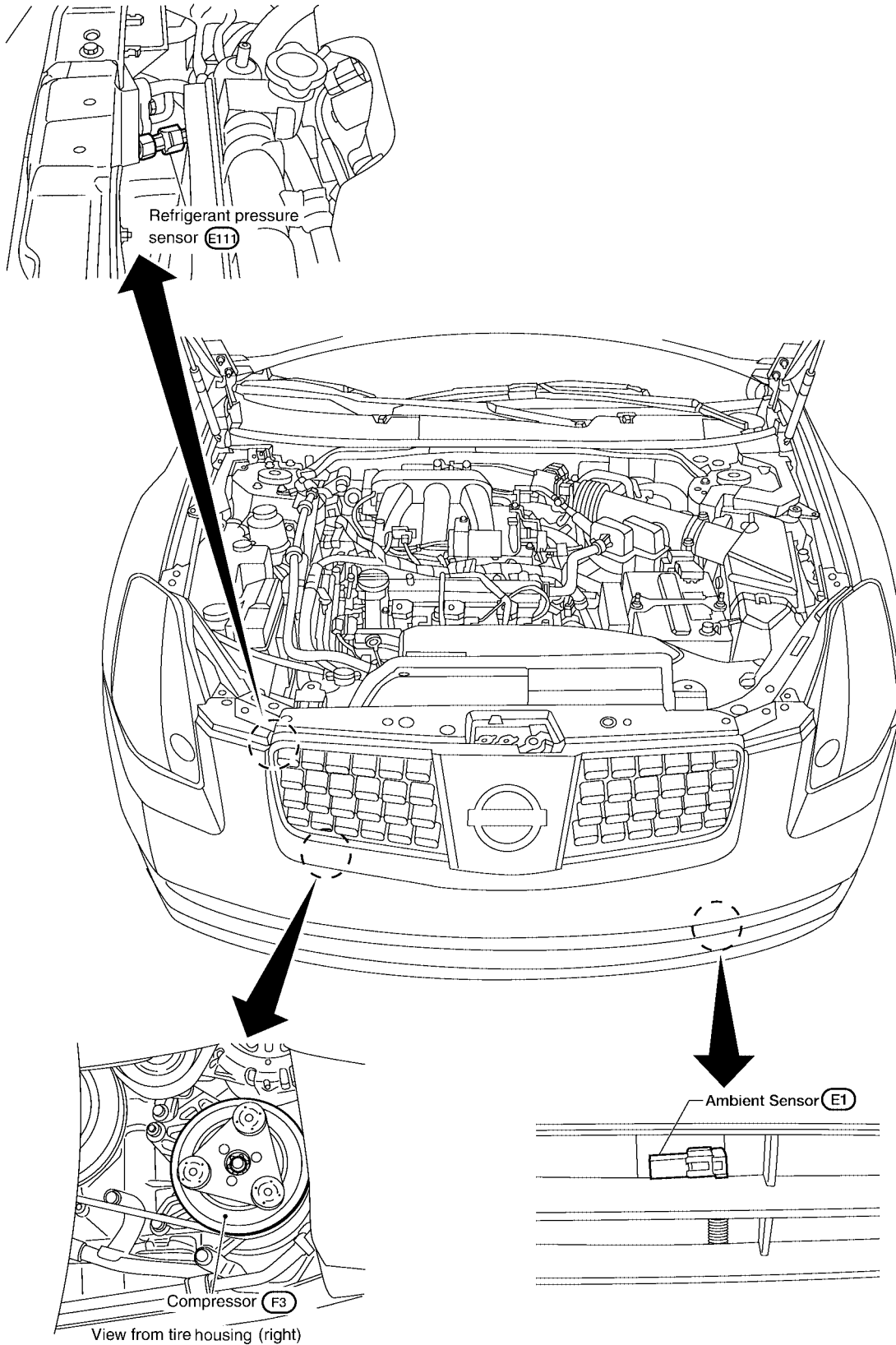


# TROUBLE DIAGNOSIS

## Component Parts and Harness Connector Location ENGINE COMPARTMENT

EJS001LN

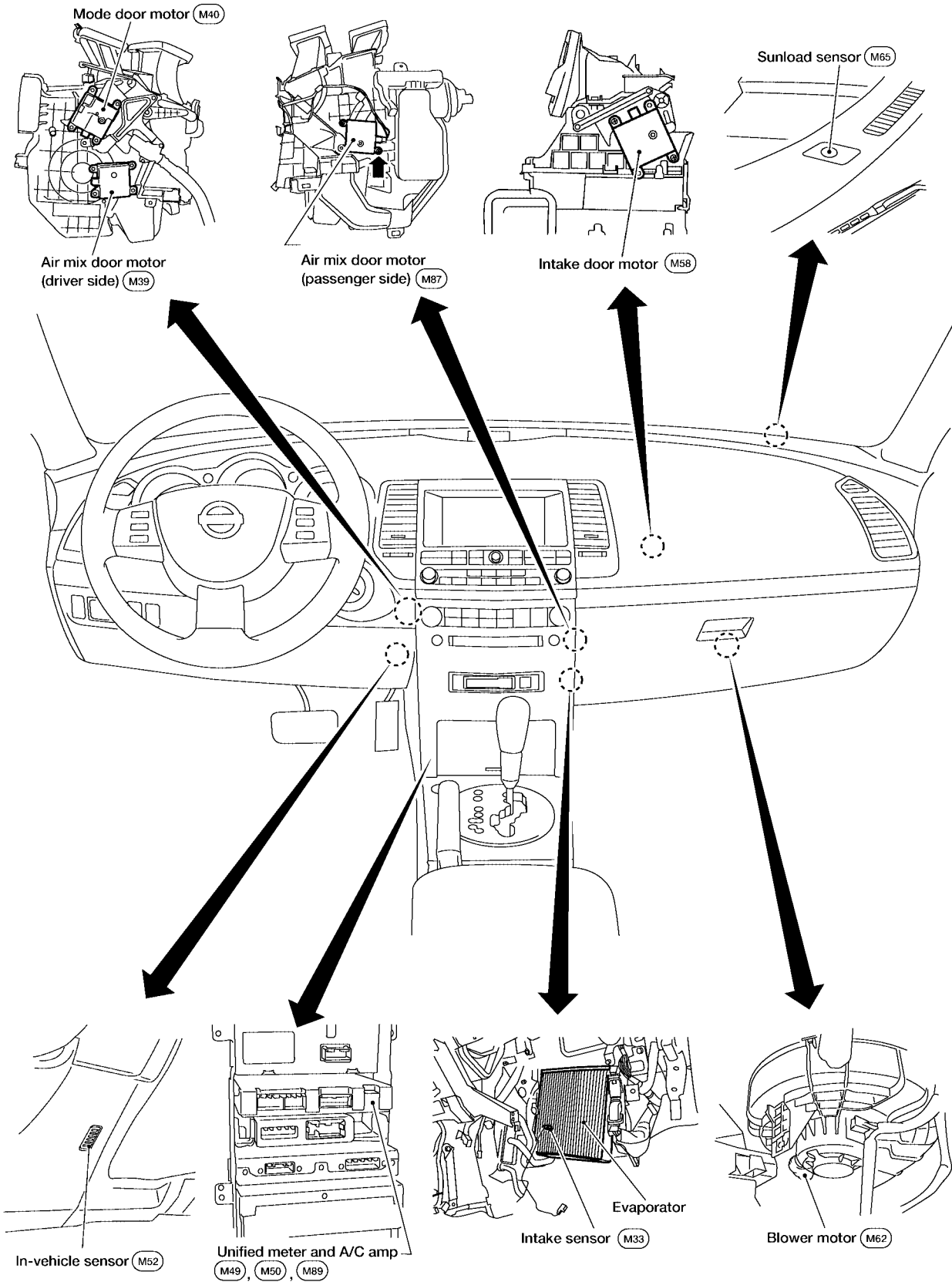
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WJIA0299E

# TROUBLE DIAGNOSIS

## PASSENGER COMPARTMENT



WJIA0300E

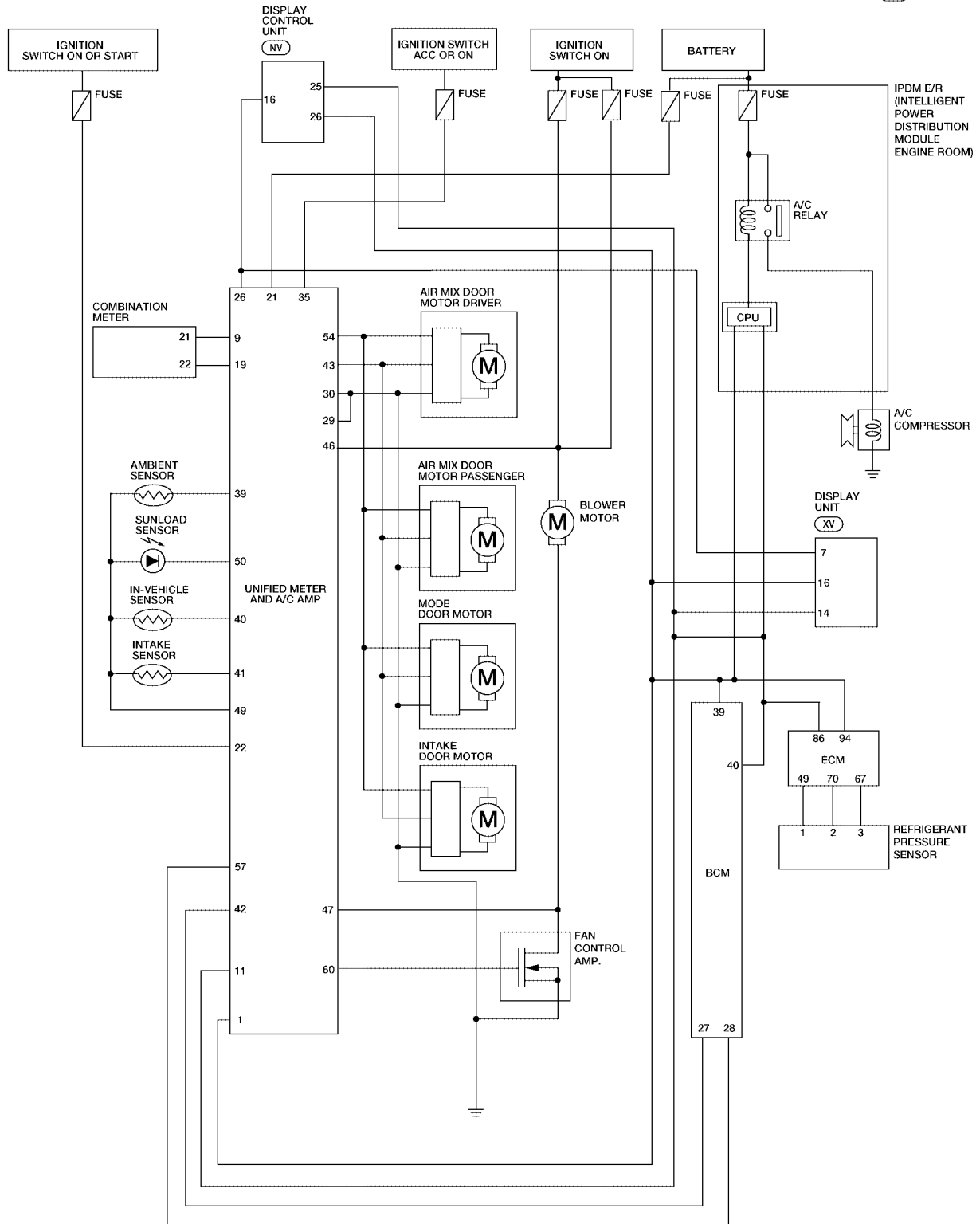
# TROUBLE DIAGNOSIS

## Schematic

EJS001LO

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**ATC**  
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(NV) : With NAVI  
(XV) : Without NAVI



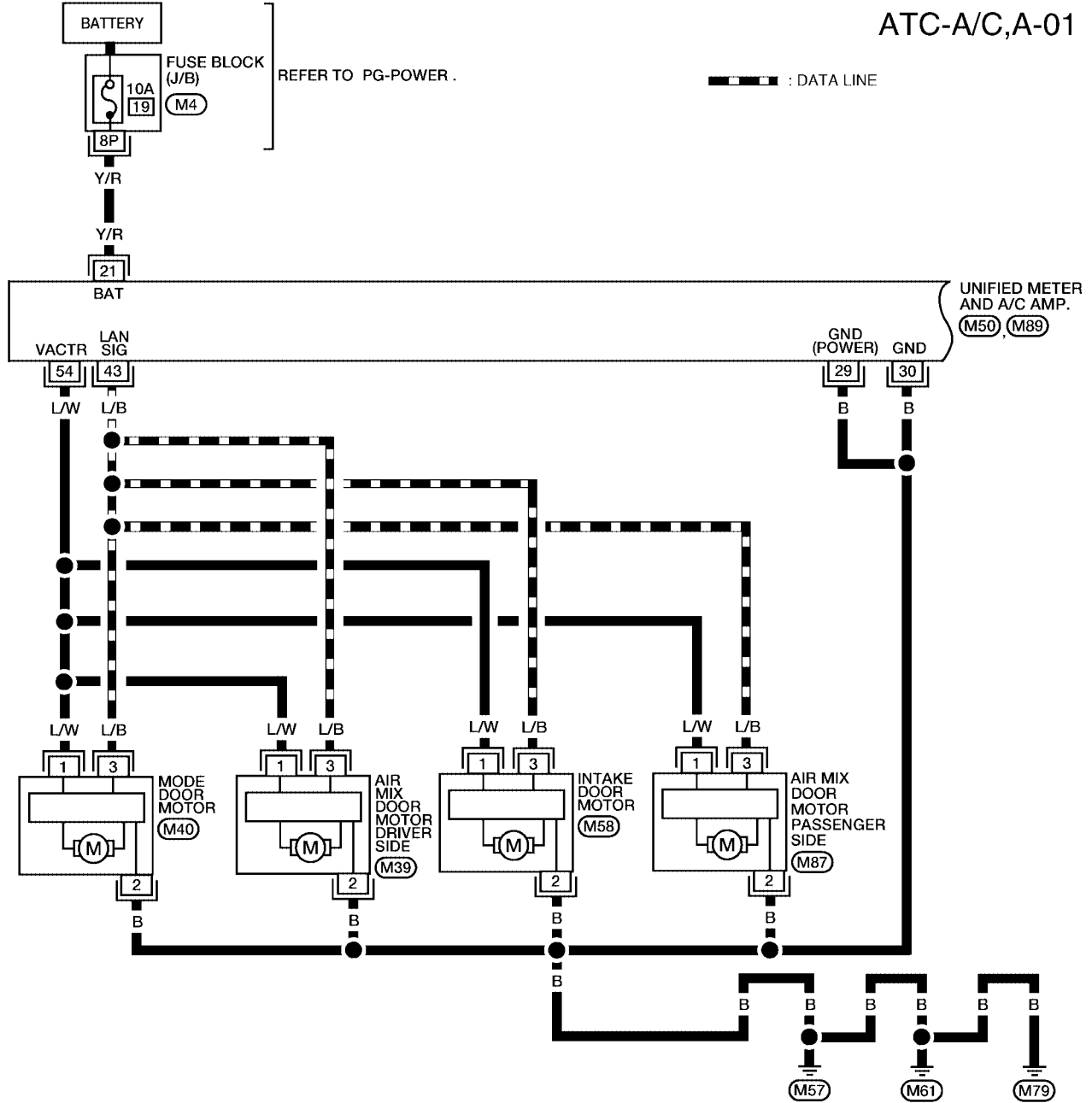
WJWA0043E

# TROUBLE DIAGNOSIS

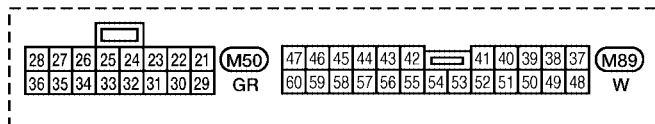
EJS001LP

## Wiring Diagram —A/C—

ATC-A/C,A-01



1	M39	M40	M58	M87
2	W	W	W	W
3				

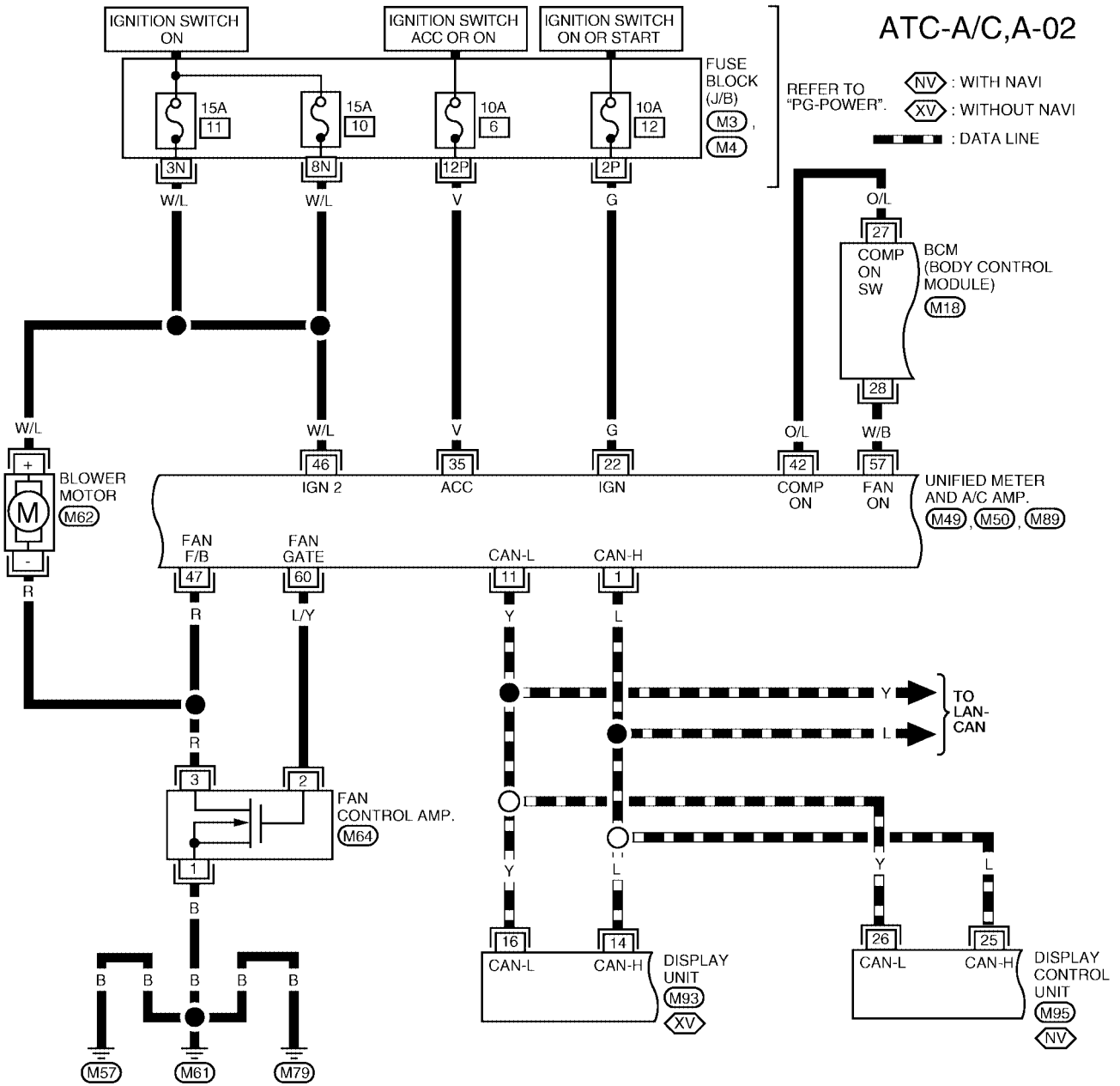


REFER TO THE FOLLOWING.

- (M4) - FUSE BLOCK
- JUNCTION BOX (J/B)

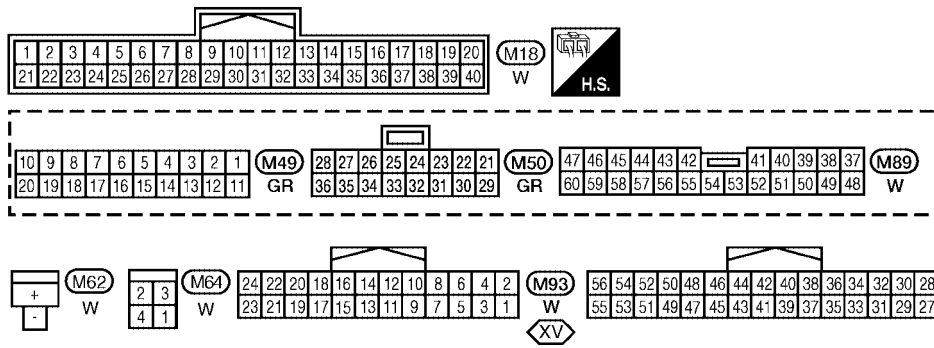
WJWA0044E

# TROUBLE DIAGNOSIS



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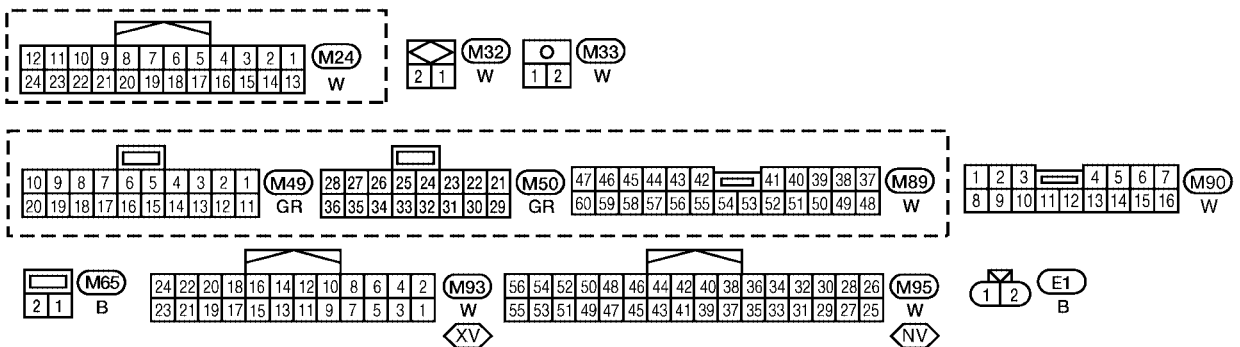
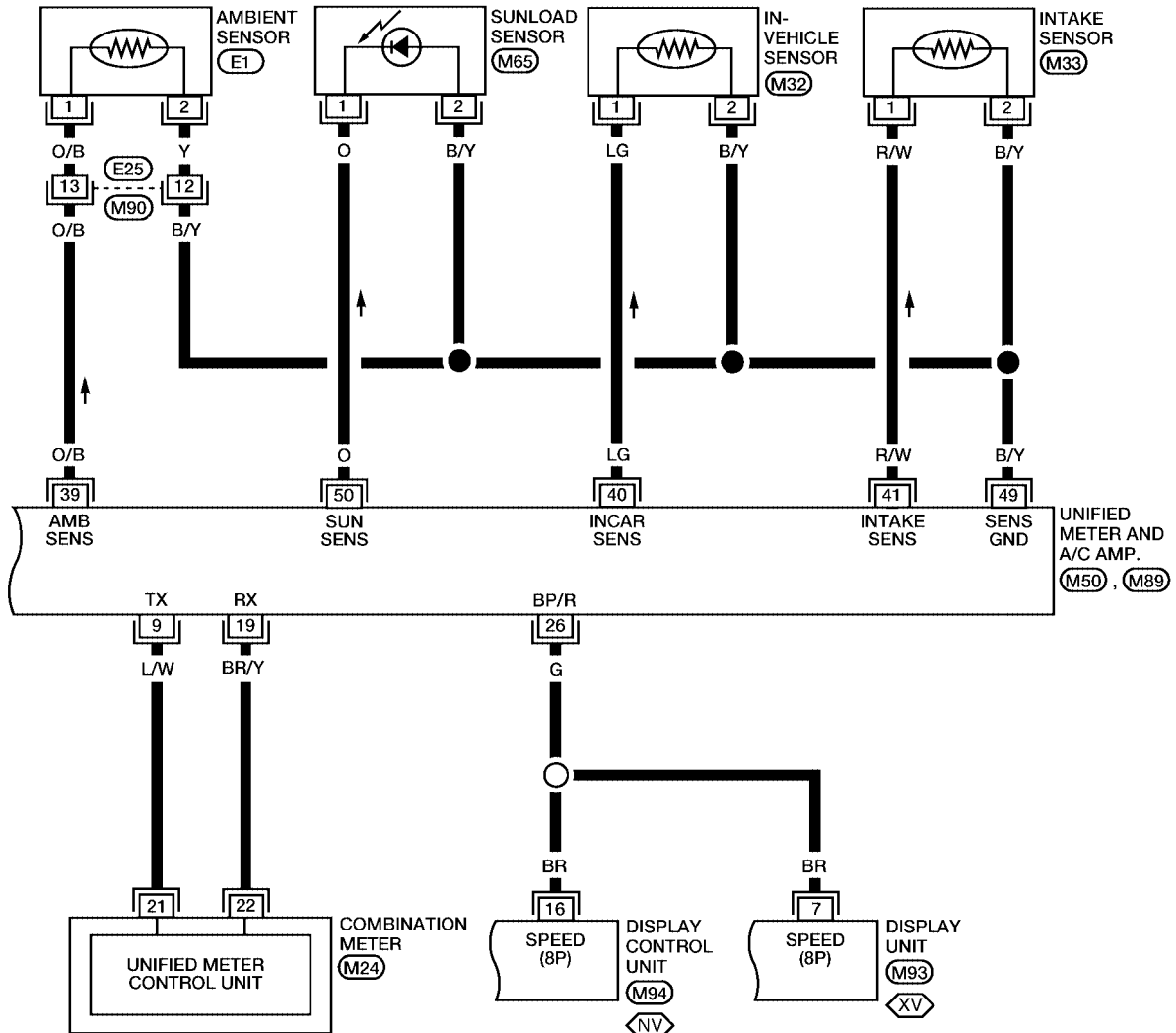


REFER TO THE FOLLOWING.  
 (M3), (M4) - FUSE BLOCK  
 - JUNCTION BOX (J/B)

WJWA0045E

# TROUBLE DIAGNOSIS

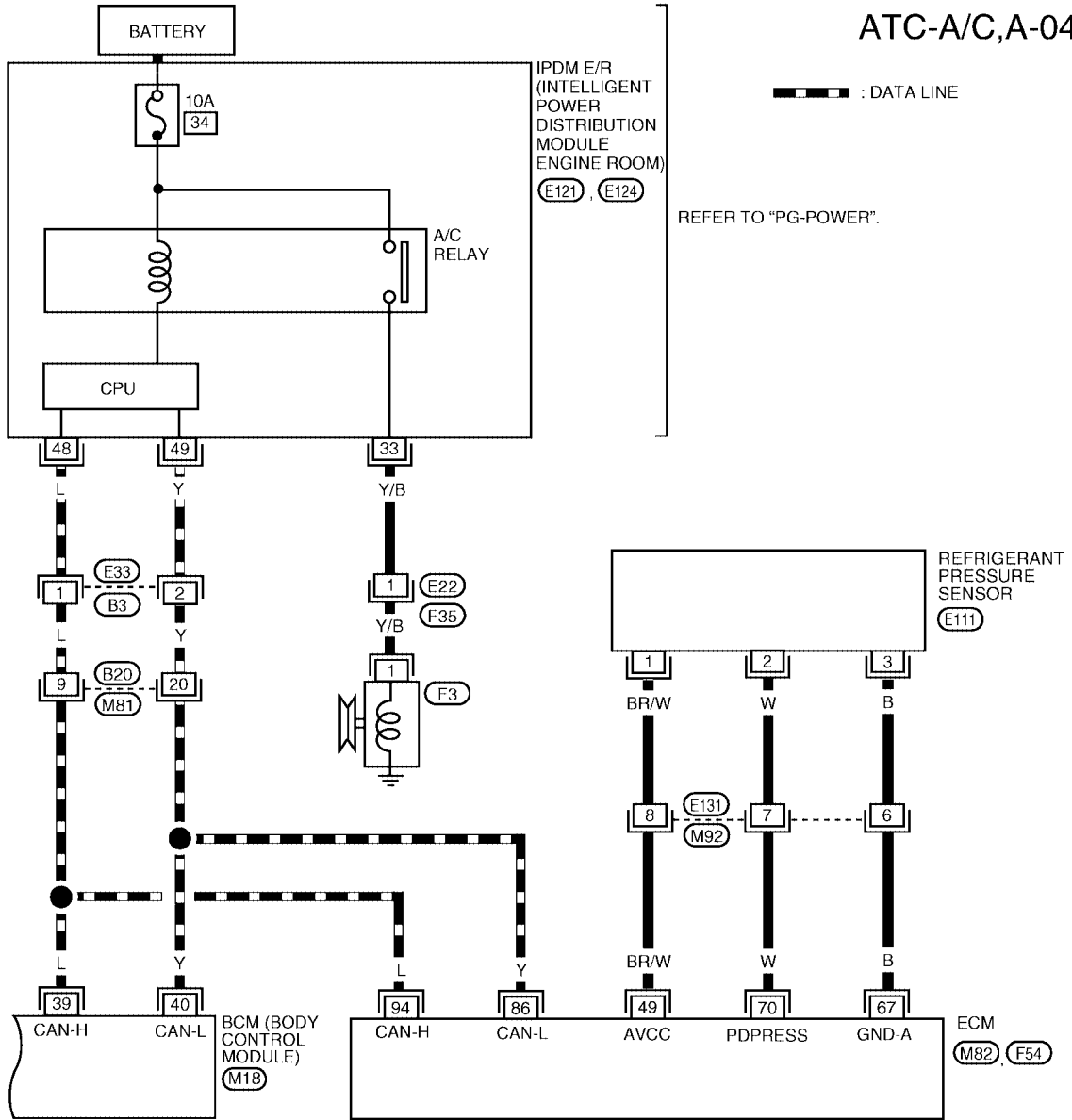
ATC-A/C,A-03



WJWA0046E

# TROUBLE DIAGNOSIS

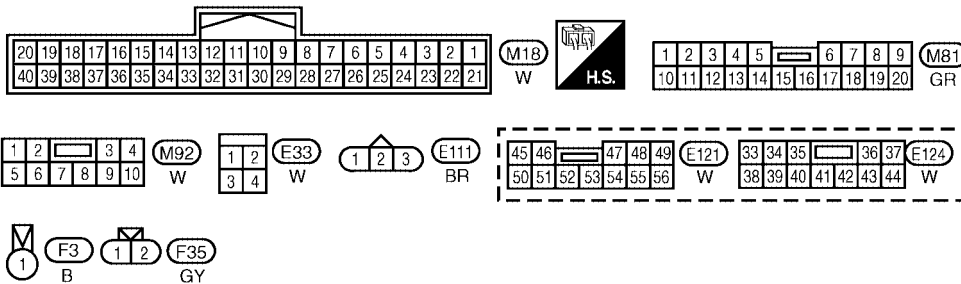
## ATC-A/C,A-04



REFER TO "PG-POWER".

REFER TO THE FOLLOWING.

M82, F54 - ELECTRICAL UNITS



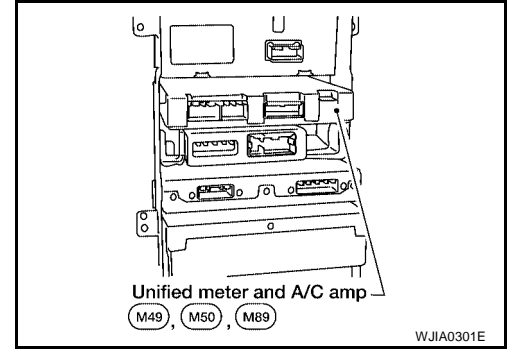
WJWA0047E

# TROUBLE DIAGNOSIS

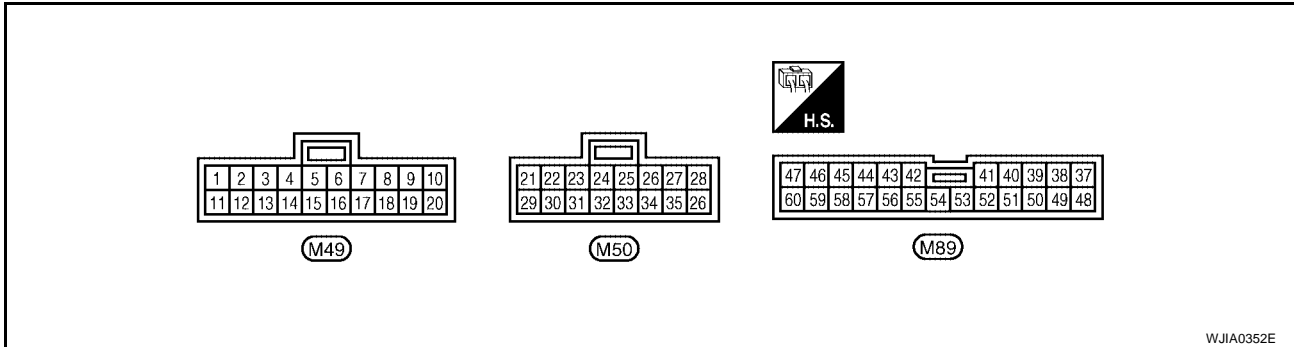
EJS001LQ

## Auto Amp. Terminals and Reference Value

Measure voltage between each terminal and ground by following Terminals and Reference Value for unified meter and A/C amp.



### PIN CONNECTOR TERMINAL LAYOUT



### TERMINALS AND REFERENCE VALUE FOR UNIFIED METER AND A/C AMP.

TERMI- NAL NO.	WIRE COLOR	ITEM	Ignition Switch	CONDITION	Voltage (V)
1	L	CAN H	-	-	-
9	L/W	Data	-	-	-
11	Y	CAN L	-	-	-
19	BR/Y	Data	-	-	-
21	Y/R	Power supply for BAT	OFF	-	Battery voltage
22	G	Power supply for IGN	ON	-	Battery voltage
26	GL	Vehicle speed	ON	Speedometer operated [When vehicle speed is approx. 20 km/h (12 MPH)]	Approx. 240 Hz
29	B	Ground (Power)	ON	-	Approx. 0
30	B	Ground	ON	-	Approx. 0
35	V	Power supply for ACC	ACC	-	Battery voltage
39	O/B	Ambient sensor	-	-	-
40	LG	In-vehicle sensor	-	-	-
41	R/W	Intake sensor	-	-	-
42	O/L	Compressor ON signal	ON	A/C switch: ON	Approx. 0
				A/C switch: OFF	Approx. 10
43	L/B	A/C LAN signal	ON	-	
46	W/L	Power supply for IGN2	ON	-	Battery voltage

HAK0652D



# TROUBLE DIAGNOSIS

TERMI- NAL NO.	WIRE COLOR	ITEM	Ignition Switch	CONDITION		Voltage (V)
47	L/R	Blower motor feed back	ON	Fan speed: Low		7 - 10
49	B/Y	Sensor ground	ON	-		Approx. 0
50	O	Sunload sensor	-	-		-
54	L/W	Power supply for each door motor	ON	-		Battery voltage
57	W/B	Blower motor ON signal	ON	-		Battery voltage
60	L/Y	Fan control AMP. control signal	ON	Fan speed	Low, middle low, or middle high	2.5 - 3.0
					High	9 - 10


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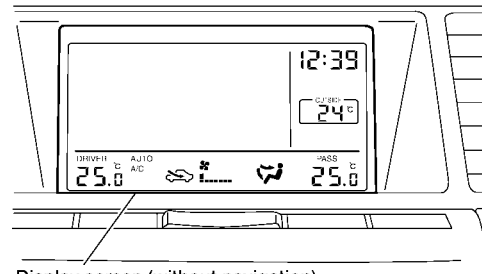
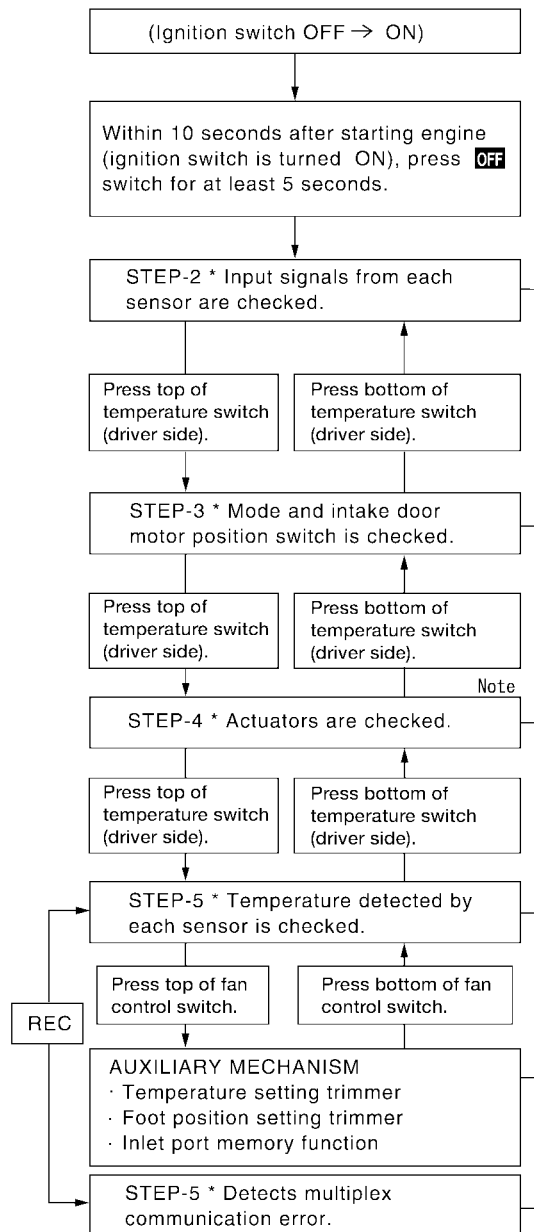
**ATC**

# TROUBLE DIAGNOSIS

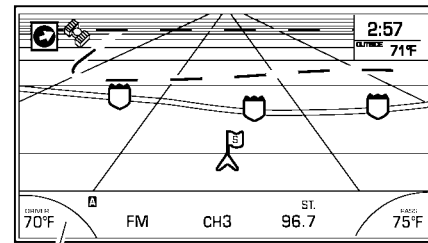
EJS001LR

## A/C System Self-diagnosis Function DESCRIPTION

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

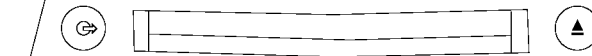
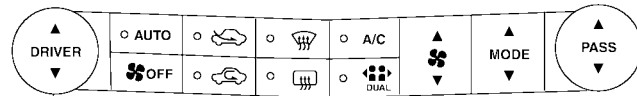


Display screen (without navigation)



Display screen

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



Temperature switch (driver side)

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

\* : Former STEP-1 (LEDs and display screen are checked) does not exist in this self-diagnosis function.

WJIA0302E

# TROUBLE DIAGNOSIS

---

## FUNCTION CONFIRMATION PROCEDURE

### 1. ENTER SELF-DIAGNOSTIC MODE

---

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

**CAUTION:**

- If battery voltage drops below 12V during diagnosis STEP 3, actuator speed becomes slower and as a result, the system may generate an error even when operation is usual. To avoid this, start engine before performing this diagnosis.
- Former STEP 1 (LEDs and display screen are checked) no longer exist in this self-diagnosis function.

>> GO TO 2.

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

---

Does code No. 20 appear on the display 25 seconds after "2" is illuminated?

YES or NO

- YES >> GO TO 3.  
NO >> GO TO 13.

### 3. CHECK OPERATION OF TEMPERATURE SWITCH

---

1. Press top of temperature switch (driver side).
2. Does the temperature switch advance to self-diagnosis STEP 3?

YES or NO

- YES >> GO TO 4.  
NO >> Malfunctioning temperature switch.  
>> Replace A/C switch.

### 4. CHECK TO RETURN SELF-DIAGNOSIS STEP 2

---

1. Press bottom of temperature switch (driver side).
2. Does the temperature switch return to self-diagnosis STEP 2?

YES or NO

- YES >> GO TO 5.  
NO >> Malfunctioning temperature switch.  
>> Replace A/C switch.

### 5. SELF-DIAGNOSIS STEP 3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

---

1. Press top of temperature switch (driver side).
2. Does code No. 30 appear on the display 50 seconds after "3" is illuminated?

YES or NO

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

### 6. STEP 4: CHECK OPERATION OF EACH ACTUATOR

---

1. Press top of temperature switch (driver side).
2. Press DEF switch. Code No. (a "4" followed by a 1, 2, 3, etc., through 6) of each actuator test is indicated on the display.

>> GO TO 7.

A  
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ATC

# TROUBLE DIAGNOSIS

## 7. CHECK ACTUATORS

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

Discharge air flow			
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	75%(100%)	25% (—)
	—	60%	40%
	—	—	100%

( ) : Manually control RJIA1761E

	41	42	43	44	45	46
Mode door position	VENT	B/L 1	B/L 2	FOOT*1	D/F	DEF
Intake door position	REC	REC	20%FRE	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor voltage (approx.)	5.25V	12.70V	8.75V	8.75V	8.75V	12.70V
Compressor	ON	ON	OFF	OFF	ON	ON

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

\*1: FOOT position during automatic control. Refer to [ATC-49, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER"](#) .

### OK or NG

- OK >> GO TO 8.  
 NG >> ● Air outlet does not change.  
     Go to Mode Door Motor Circuit [ATC-58, "Mode Door Motor Circuit"](#) .  
 ● Intake door does not change.  
     Go to Intake Door Motor Circuit [ATC-64, "Intake Door Motor Circuit"](#) .  
 ● Blower motor operation is malfunctioning.  
     Go to Blower Motor Circuit [ATC-67, "Blower Motor Circuit"](#) .  
 ● Magnet clutch does not engage.  
     Go to Magnet Clutch Circuit [ATC-72, "Magnet Clutch Circuit"](#) .  
 ● Discharge air temperature does not change.  
     Go to Air Mix Door Motor Circuit [ATC-61, "Air Mix Door Motor Circuit"](#) .

## 8. SELF-DIAGNOSIS STEP 5: TEMPERATURE OF EACH SENSOR IS CHECKED

1. Press top of the temperature switch (driver side).
2. Code No. 51 appears on the display.

>> GO TO 9.

## 9. CHECK AMBIENT SENSOR

Press (DEF) switch one time. Temperature detected by ambient sensor is indicated on the display (°F for U.S.A. model, °C for Canada model).

### NOTE:


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

### OK or NG

- OK >> GO TO 10.  
 NG >> Go to Ambient Sensor Circuit [ATC-89, "Ambient Sensor Circuit"](#) .

# TROUBLE DIAGNOSIS

## 10. CHECK IN-VEHICLE SENSOR

Press  (DEF) switch a second time. Temperature detected by in-vehicle sensor is indicated on the display (°F for U.S.A. model, °C for Canada model).

### NOTE:


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

### OK or NG

OK >> GO TO 11.

NG >> Go to In-vehicle Sensor Circuit [ATC-92, "In-vehicle Sensor Circuit"](#) .

## 11. CHECK INTAKE SENSOR

Press  (DEF) switch a third time. Temperature detected by intake sensor is indicated on the display (°F for U.S.A. model, °C for Canada model).

### NOTE:


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

### OK or NG

OK >> GO TO 12.

NG >> Go to Intake Sensor Circuit [ATC-98, "Intake Sensor Circuit"](#) .

## 12. CHECK CAN COMMUNICATION ERROR




1. Press  (REC) switch.
2. CAN communication error between unified meter and A/C amp. and DISPLAY UNIT or DISPLAY CONTROL UNIT is detected.

### OK or NG

OK >> 1. Turn ignition switch OFF or AUTO switch ON.  
2. END

NG >> Go to CAN communication. Refer to [DI-31, "CAN Communication System Description"](#) .

- Unified meter and A/C amp. - DISPLAY UNIT
- Unified meter and A/C amp. - DISPLAY CONTROL UNIT

Display	CAN communication error
	In good order
	Display unit or Display control unit ⇨ Unified meter and A/C amp.
	Unified meter and A/C amp. ⇨ Display unit or Display control unit

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# TROUBLE DIAGNOSIS

## 13. CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.

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

\*1: Conduct self-diagnosis STEP-2 under sunshine.

When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise Code No. 25 will indicate despite that sunload sensor is functioning properly.

Code No.	Malfunctioning sensor (Including circuits)	Reference page
21 / -21	Ambient sensor	*2
22 / -22	In-vehicle sensor	*3
24 / -24	Intake sensor	*4
25 / -25	Sunload sensor *1	*5
26 / -26	Air mix door motor PBR (Driver side)	*6
27 / -27	Air mix door motor PBR (Passenger side)	

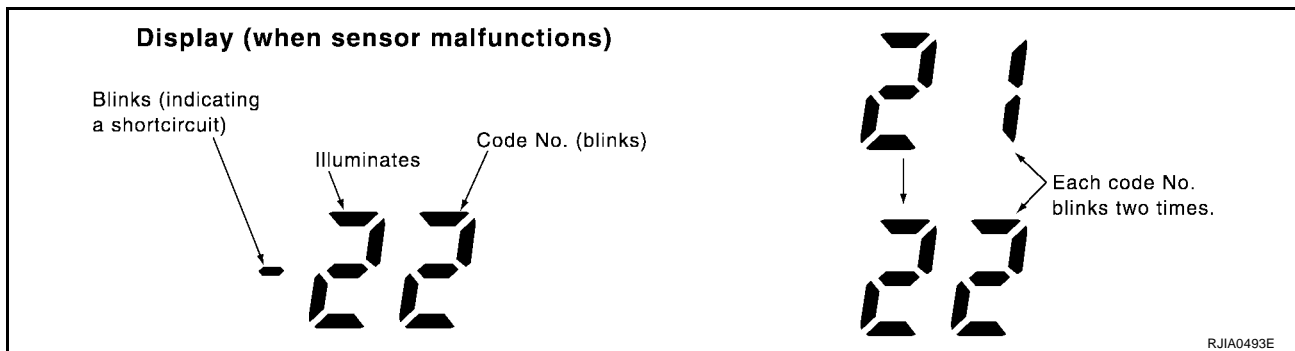
\*2: [ATC-89, "DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR"](#) .

\*3: [ATC-93, "DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR"](#) .

\*4: [ATC-98, "DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR"](#) .

\*5: [ATC-95, "DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR"](#) .

\*6: [ATC-55, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .



>> INSPECTION END

# TROUBLE DIAGNOSIS

## 14. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

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

Code No. *1 *2	Mode or intake door position	Reference page
31	VENT	*4
32	B/L 1	
33	B/L 2	
34	FOOT*3	
35	D/F	
36	DEF	
37	FRE	*5
38	20% FRE	
39	REC	

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

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

31→32→33→34→35→36→Return to 31

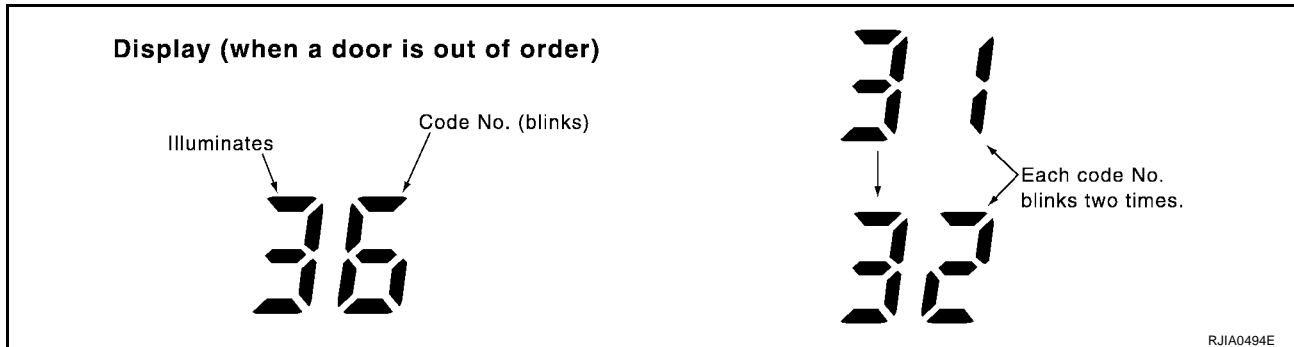
\*2: If intake door motor harness connector is disconnected, the following display pattern will appear.

37→38→39→Return to 37

\*3: FOOT position during automatic control. Refer to [ATC-49, "AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER"](#).

\*4: [ATC-58, "Mode Door Motor Circuit"](#).

\*5: [ATC-64, "Intake Door Motor Circuit"](#).



>> INSPECTION END

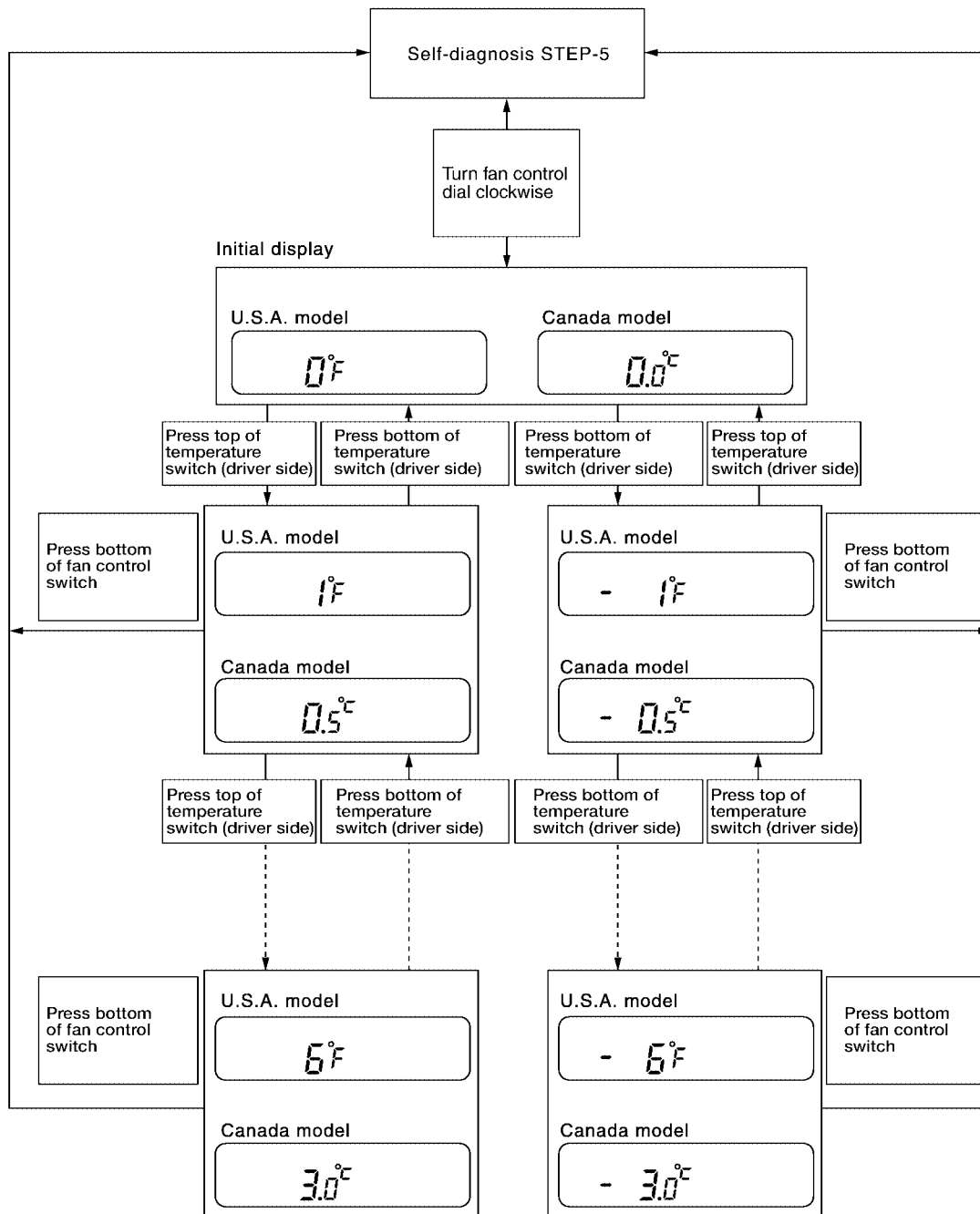
# TROUBLE DIAGNOSIS

## AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

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

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode. Refer to [ATC-42, "A/C System Self-diagnosis Function"](#).
- Press top of fan control switch to set system in auxiliary mode.
- Display shows 61 in auxiliary mechanism. It takes approximately 3 seconds.
- Press top of temperature switch (driver side) as desired. Temperature will change at a rate of  $0.5^{\circ}\text{C}$  ( $1.0^{\circ}\text{F}$ ) each time the switch is pressed.



WJIA0353E

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



# TROUBLE DIAGNOSIS

## AUXILIARY MECHANISM: FOOT POSITION SETTING TRIMMER

Air distribution ratio in FOOT mode can be set.

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode. Refer to [ATC-42, "A/C System Self-diagnosis Function"](#) .
- Press top of fan control switch to set system in auxiliary mode.
- Display shows 61 in auxiliary mechanism. It takes approximately 3 seconds.
- Press the mode switch as desired.

Display	Discharge air flow			
	Automatically controls the mode door		Manually controls the mode door	
	FOOT	DEF	FOOT	DEF
	75%	25%	100%	—
	75%	25%	75%	25%
	100%	—	75%	25%
	100%	—	100%	—

RJIA1764E

## AUXILIARY MECHANISM: INLET PORT MEMORY FUNCTION

When ignition key is turned from OFF to ON, inlet port can be set to AUTO or manual.

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode. Refer to [ATC-42, "A/C System Self-diagnosis Function"](#) .
- Press top of fan control switch to set system in auxiliary mode.
- Display shows 61 in auxiliary mechanism. It takes approximately 3 seconds.
- Press the recirculation (REC) and fresh (FRE) switch as desired.

Switch	LED status of REC/FRE switch	Setting status	Setting changeover method
REC	ON	Manual REC status is memorized. (Initial setting)	REC SW: ON
	OFF	AUTO control	
FRE	ON	Manual FRE status is memorized.	FRE SW: ON
	OFF	AUTO control (Initial setting)	

# TROUBLE DIAGNOSIS

EJS001LS

## Operational Check

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

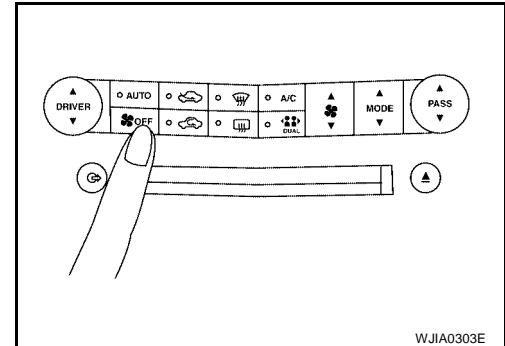
**Conditions : Engine running and at usual operating temperature**

### CHECKING MEMORY FUNCTION

1. Set the temperature to 90°F or 32°C.
2. Press OFF switch.
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. Press OFF switch.

If NG, go to trouble diagnosis procedure for [ATC-88, "Memory Function"](#).

If OK, continue with next check.

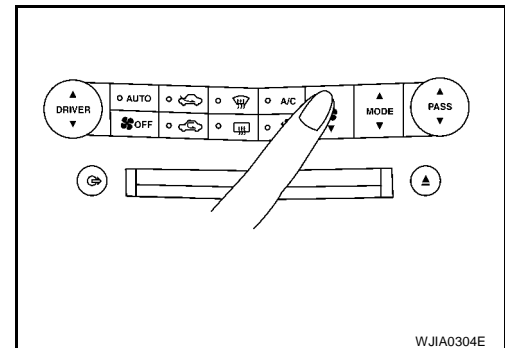


### CHECKING BLOWER

1. Press top of fan control switch. Blower should operate on low speed. The fan symbol should have one blade lit.
2. Press top of fan control switch again, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on MAX speed.

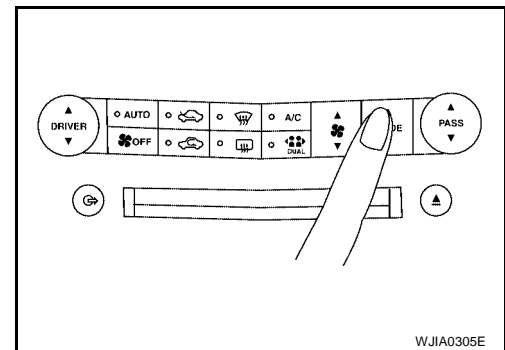
If NG, go to trouble diagnosis procedure for [ATC-69, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR"](#)

If OK, continue with next check.



### CHECKING DISCHARGE AIR

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



3. Confirm that discharge air comes out according to the air distribution table. Refer to [ATC-27, "Discharge Air Flow"](#).

Mode door position is checked in the next step.

If NG, go to trouble diagnosis procedure for [ATC-58, "Mode Door Motor Circuit"](#).

If OK, continue with 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.

Discharge air flow			
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	75%(100%)	25% (—)
	—	60%	40%
	—	—	100%

( ): Manually control

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# TROUBLE DIAGNOSIS

## CHECKING RECIRCULATION

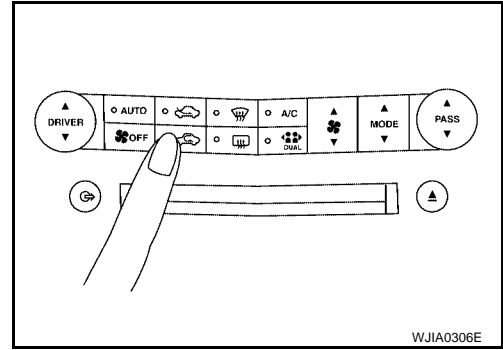
1. Press recirculation (REC) switch one time. Recirculation indicator should illuminate.
2. Press fresh (FRE) switch one time. Fresh indicator should illuminate.
3. Listen for intake door position change (you should hear blower sound change slightly).

If NG, go to trouble diagnosis procedure for [ATC-64, "Intake Door Motor Circuit"](#) .

If OK, continue with 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.

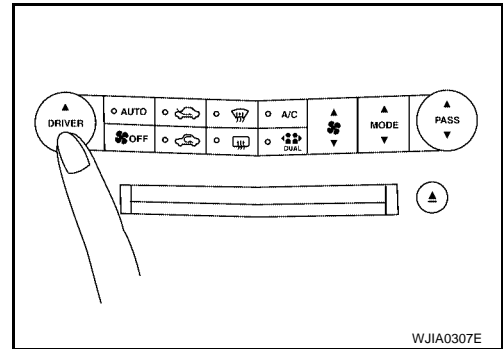


## CHECKING TEMPERATURE DECREASE

1. Press bottom of temperature switch (driver side) until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [ATC-78, "Insufficient Cooling"](#) .

If OK, continue with next check.

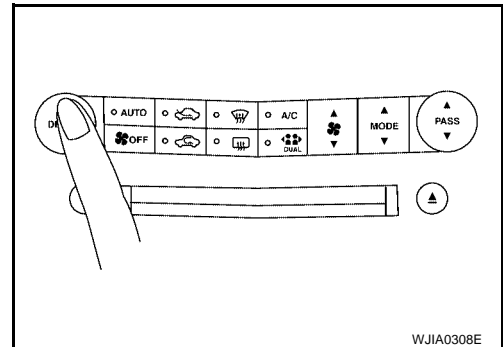


## CHECKING TEMPERATURE INCREASE

1. Press top of temperature switch (driver side) until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for [ATC-85, "Insufficient Heating"](#) .

If OK, continue with next check.

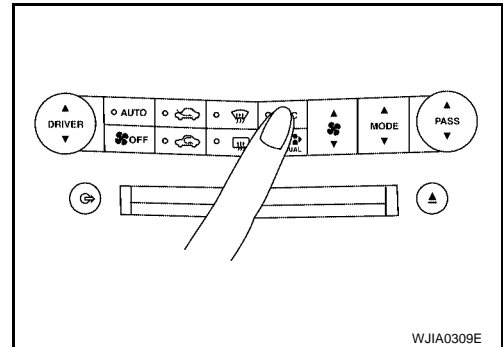


## CHECK A/C SWITCH

1. Press A/C switch when AUTO switch is ON.
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-72, "Magnet Clutch Circuit"](#) .

If OK, continue with next check.



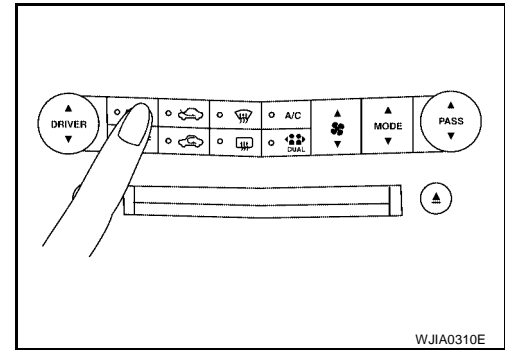
# TROUBLE DIAGNOSIS

## CHECKING AUTO MODE

1. Press AUTO switch.
2. Display should indicate AUTO.
  - 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-52, "Power Supply and Ground Circuit for Auto Amp."](#) , then if necessary, trouble diagnosis procedure for [ATC-72, "Magnet Clutch Circuit"](#) .

If all operational checks are OK (symptom cannot be duplicated), go to malfunction Simulation Tests in [ATC-32, "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-32, "How to Perform Trouble Diagnosis for Quick and Accurate Repair"](#) , [ATC-32, "SYMPTOM TABLE"](#) and perform applicable trouble diagnosis procedures.



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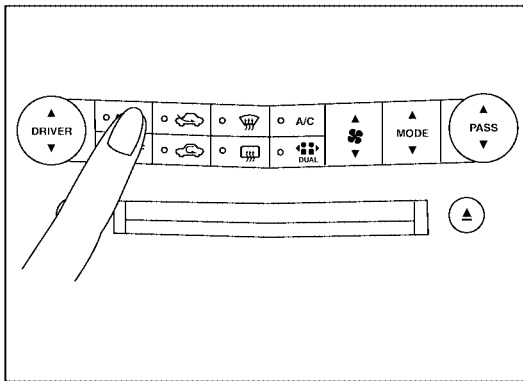
## Power Supply and Ground Circuit for Auto Amp.

EJS001LT

SYMPTOM: A/C system does not come on.

## INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



### OPERATIONAL CHECK – AUTO mode

- a. Press AUTO. switch.
  - b. Display should indicate AUTO.
- 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 OK (symptom cannot be duplicated), perform complete operational check (\*2).  
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

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

4. Check Integrated Display System (\*3) or Navigation System (\*4).

OK

5. Replace unified meter and A/C amp.

WJIA0311E

\*1 [ATC-52, "Power Supply and Ground Circuit for Auto Amp."](#)

\*2 [ATC-50, "Operational Check"](#).

\*3 [AV-86, "Trouble Diagnosis Chart by Symptom"](#).

\*4 [AV-179, "A/C Does Not Work"](#).

# TROUBLE DIAGNOSIS

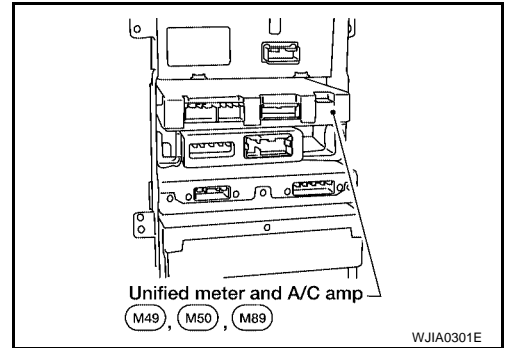
## COMPONENT DESCRIPTION

### Unified meter and A/C amp. (Automatic Amplifier)

The unified meter and A/C amp. 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, blower motor and compressor are then controlled.

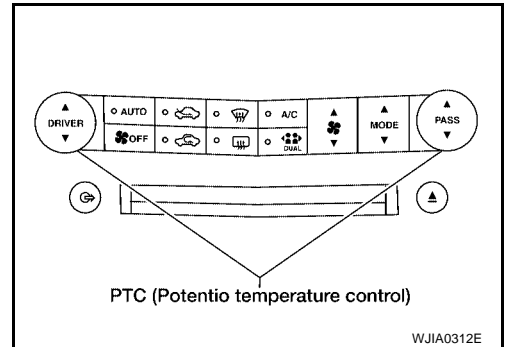
The unified meter and A/C amp. is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the unified meter and A/C amp. from the BCM using CAN communication.

Self-diagnostic functions are also built into unified meter and A/C amp. to provide quick check of malfunctions in the auto air conditioner system.



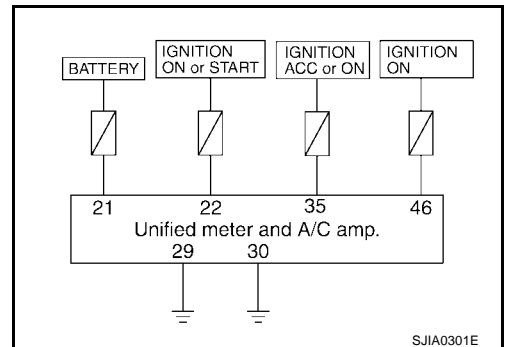
### Potential Temperature Control (PTC)

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



## DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.

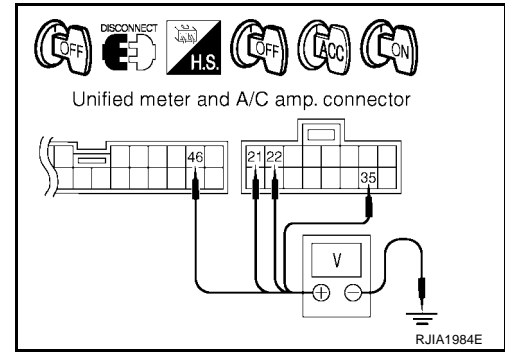


# TROUBLE DIAGNOSIS

## 1. CHECK POWER SUPPLY CIRCUIT FOR UNIFIED METER AND A/C AMP.

1. Disconnect unified meter and A/C amp. connector.
2. Check voltage between unified meter and A/C amp. harness connector M50 terminals 21 (Y/R), 22 (G) and 35 (V), unified meter and A/C amp. harness connector M89 terminal 46 (W/L) and ground.

Terminals		(-)	Ignition switch position		
(+)	Auto amp. connector		Terminal No. (Wire color)	OFF	ACC
M50	21 (Y/R)	Ground	Battery voltage	Battery voltage	Battery voltage
M50	22 (G)		Approx. 0V	Approx. 0V	Battery voltage
M50	35 (V)		Approx. 0V	Battery voltage	Battery voltage
M89	46 (W/L)		Approx. 0V	Approx. 0V	Battery voltage



### OK or NG

OK >> GO TO 2.

NG >> Check 10A and 15A fuses [Nos. 6, 10, 12 and 19, located in the fuse block (J/B)]. Refer to [PG-67](#).

- 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 UNIFIED METER AND A/C AMP.

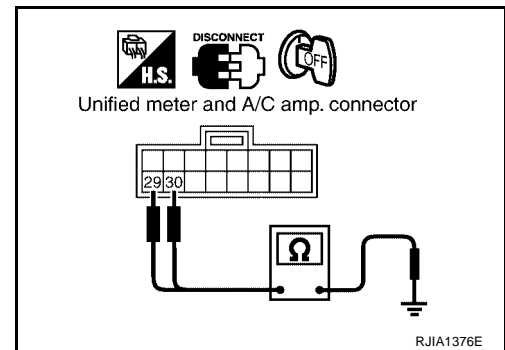
1. Turn ignition switch OFF.
2. Check continuity between unified meter and A/C amp. harness connector M50 terminal 29 (B), 30 (B) and ground.

**29, 30 – Ground : Continuity should exist.**

### OK or NG

OK >> Replace unified meter and A/C amp.

NG >> Repair harness or connector.

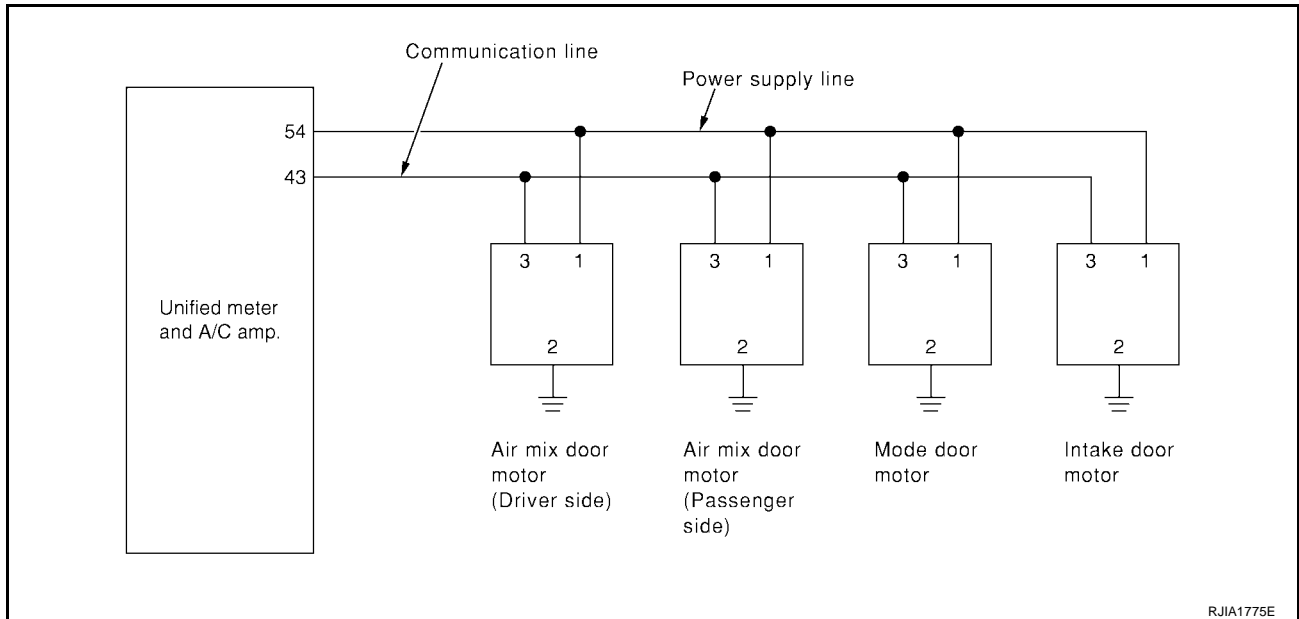


# TROUBLE DIAGNOSIS

EJS001LU

## LAN System Circuit

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



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### DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT

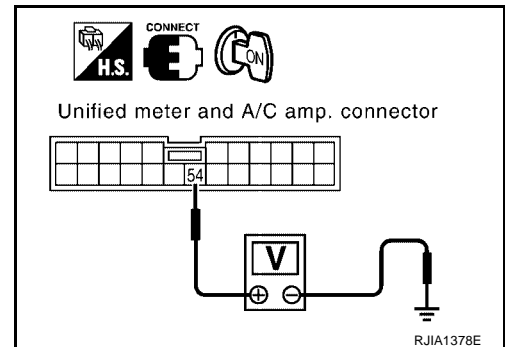
#### 1. CHECK POWER SUPPLY FOR UNIFIED METER AND A/C AMP. SIDE

- Turn ignition switch ON.
- Check voltage between unified meter and A/C amp. harness connector M89 terminal 54 (L/W) and ground.

**54 – Ground : Battery voltage**

OK or NG

- OK >> GO TO 2.  
 NG >> Replace unified meter and A/C amp.



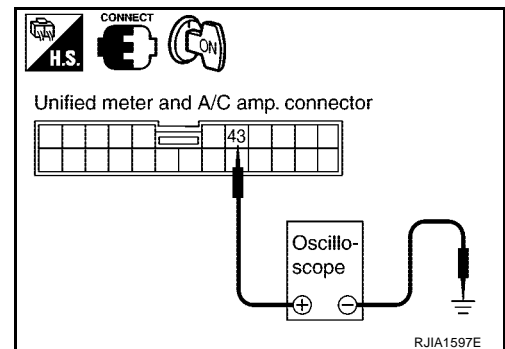
RJIA1378E

#### 2. CHECK SIGNAL FOR UNIFIED METER AND A/C AMP. SIDE

Confirm A/C LAN signal between unified meter and A/C amp. harness connector M89 terminal 43 (L/B) and ground using an oscilloscope.

Terminals		(-)	Voltage
(+)	Terminal No. (Wire color)		
Auto amp. connector			
M89	43 (L/B)	Ground	

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OK or NG

- OK >> GO TO 3.  
 NG >> Replace unified meter and A/C amp.

# TROUBLE DIAGNOSIS

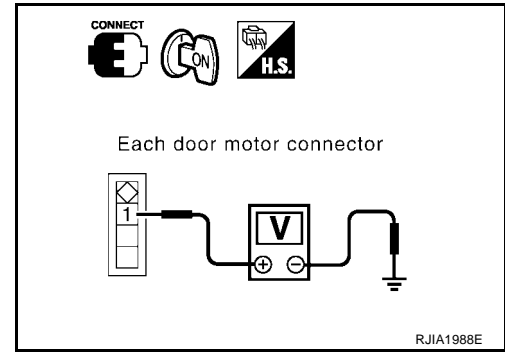
## 3. CHECK POWER SUPPLY FOR MOTOR SIDE

Check voltage between mode door motor harness connector M40 terminal 1 (L/W), driver side air mix door motor harness connector M39 terminal 1 (L/W), passenger side air mix door motor harness connector M87 terminal 1 (L/W), intake door motor harness connector M58 terminal 1 (L/W) and ground.

**1 – Ground** : **Battery voltage**

OK or NG

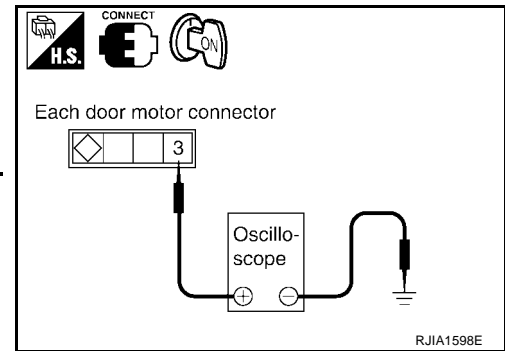
- OK >> GO TO 4.
- NG >> Repair harness or connector.



## 4. CHECK SIGNAL FOR MOTOR SIDE

Confirm A/C LAN signal between mode door motor harness connector M40 terminal 3 (L/B), driver side air mix door motor harness connector M39 terminal 3 (L/B), passenger side air mix door motor harness connector M87 terminal 3 (L/B), intake door motor harness connector M58 terminal 3 (L/B) and ground using an oscilloscope.

Door motor	Terminals		Voltage
	(+)		
	Con- nector	Terminal No. (Wire color)	
		(-)	
Mode	M40	3 (L/B)	Ground
Air mix (Driver side)	M39	3 (L/B)	
Air mix (Passen- ger side)	M87	3 (L/B)	
Intake	M58	3 (L/B)	



OK or NG

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

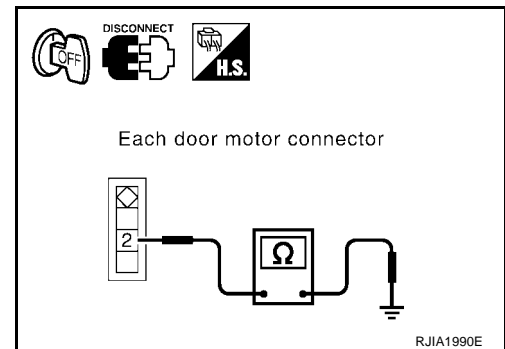
## 5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door motor connector.
3. Check continuity between mode door motor harness connector M40 terminal 2 (B), driver side air mix door motor harness connector M39 terminal 2 (B), passenger side air mix door motor harness connector M87 terminal 2 (B), intake door motor harness connector M58 terminal 2 (B) and ground.

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

OK or NG

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





# TROUBLE DIAGNOSIS

---

## 6. CHECK MOTOR OPERATION

---

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

### OK or NG

- OK >> (Operates normally.)
- Poor contact in motor connector.
- NG >> (Does not operate normally.)
- GO TO 7.

---

## 7. CHECK MODE DOOR MOTOR OPERATION

---

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

### OK or NG

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

---

## 8. CHECK AIR MIX DOOR MOTOR OPERATION

---

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

### OK or NG

- OK >> (Air mix door motor operates normally.)
- GO TO 9.
- NG >> (Air mix door motor does not operate normally.)
- GO TO 10.

---

## 9. CHECK INTAKE DOOR MOTOR OPERATION

---

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

### OK or NG

- OK >> (Intake door motor operates normally.)
- Repair unified meter and A/C amp.
- NG >> (Intake door motor does not operate normally.)
- Repair intake door motor.

---

## 10. CHECK AIR MIX DOOR MOTOR OPERATION

---

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

### OK or NG

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

# TROUBLE DIAGNOSIS

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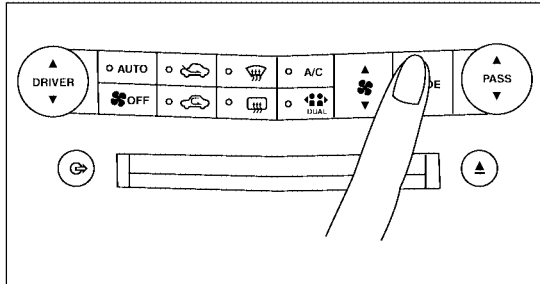
## Mode Door Motor Circuit

### 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.

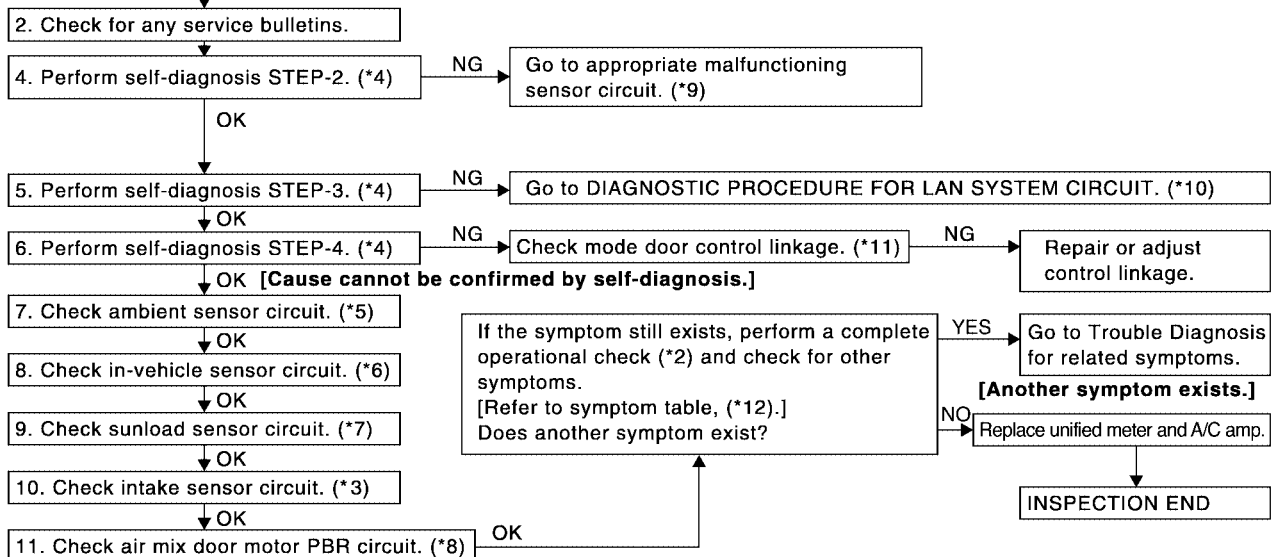
#### Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	75%(100%)	25%(–)
	–	60%	40%
	–	–	100%

- 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.



WJIA0314E

\*1 [ATC-27. "Discharge Air Flow".](#)

\*2 [ATC-50. "Operational Check".](#)

\*3 [ATC-98. "Intake Sensor Circuit"](#)

\*4 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*5 [ATC-89. "Ambient Sensor Circuit".](#)

\*6 [ATC-92. "In-vehicle Sensor Circuit".](#)

\*7 [ATC-95. "Sunload Sensor Circuit".](#)

\*8 [ATC-61. "Air Mix Door Motor Circuit".](#)

\*9 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*10 [ATC-55. "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT".](#)

\*11 [ATC-111. "MODE DOOR MOTOR".](#)

\*12 [ATC-32. "SYMPTOM TABLE".](#)

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

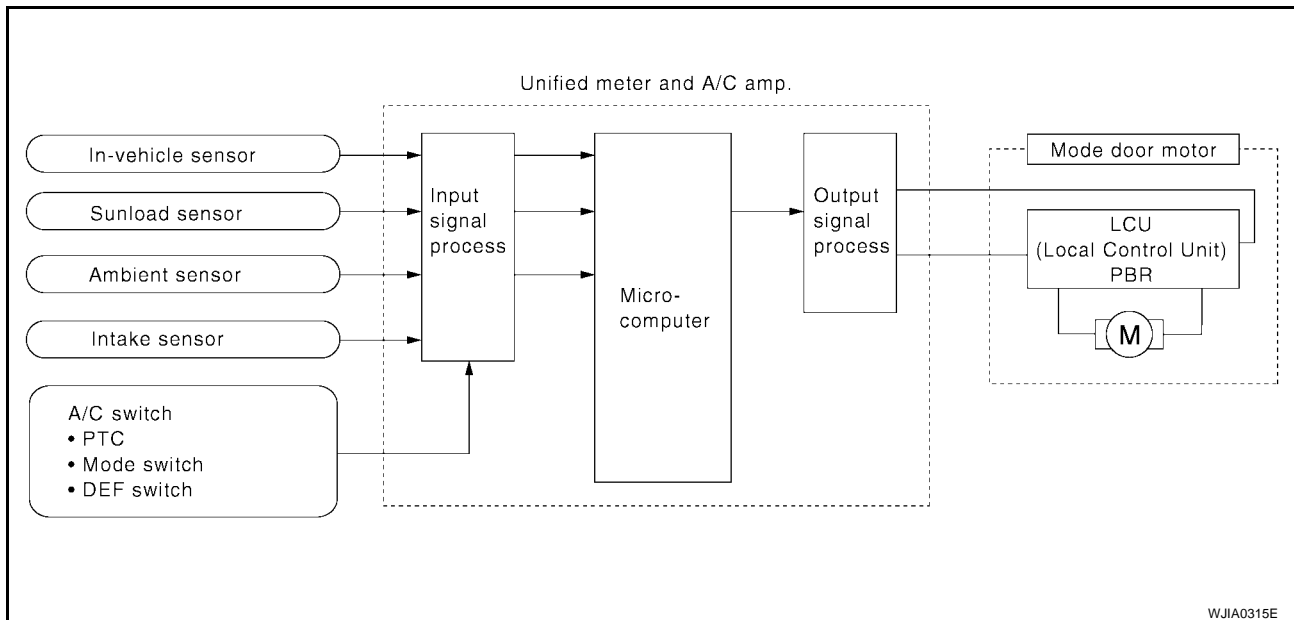
Mode door control system components are:

- Unified meter and A/C amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-into mode motor and air mix motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

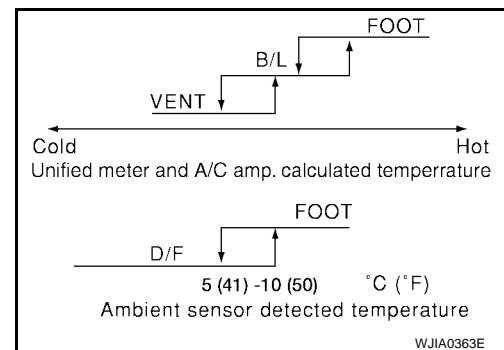
### System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

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



### Mode Door Control Specification

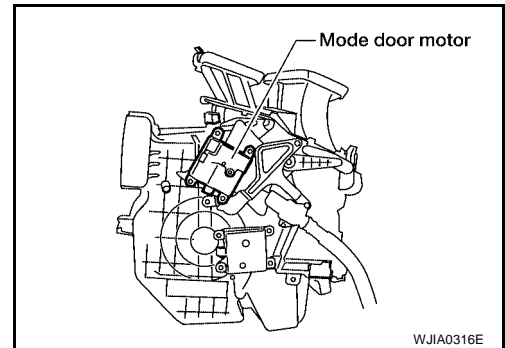


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Mode Door Motor

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



## DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.

Perform diagnostic procedure for LAN circuit. Refer to [ATC-55, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .

# TROUBLE DIAGNOSIS

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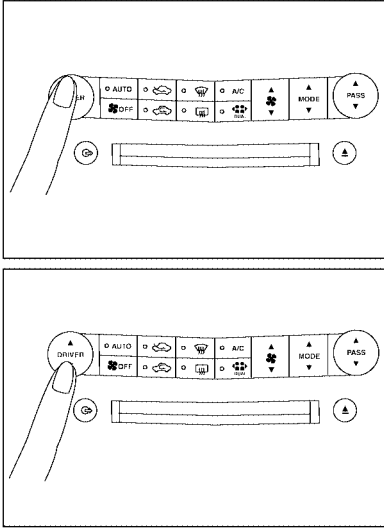
## Air Mix Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



**OPERATIONAL CHECK**

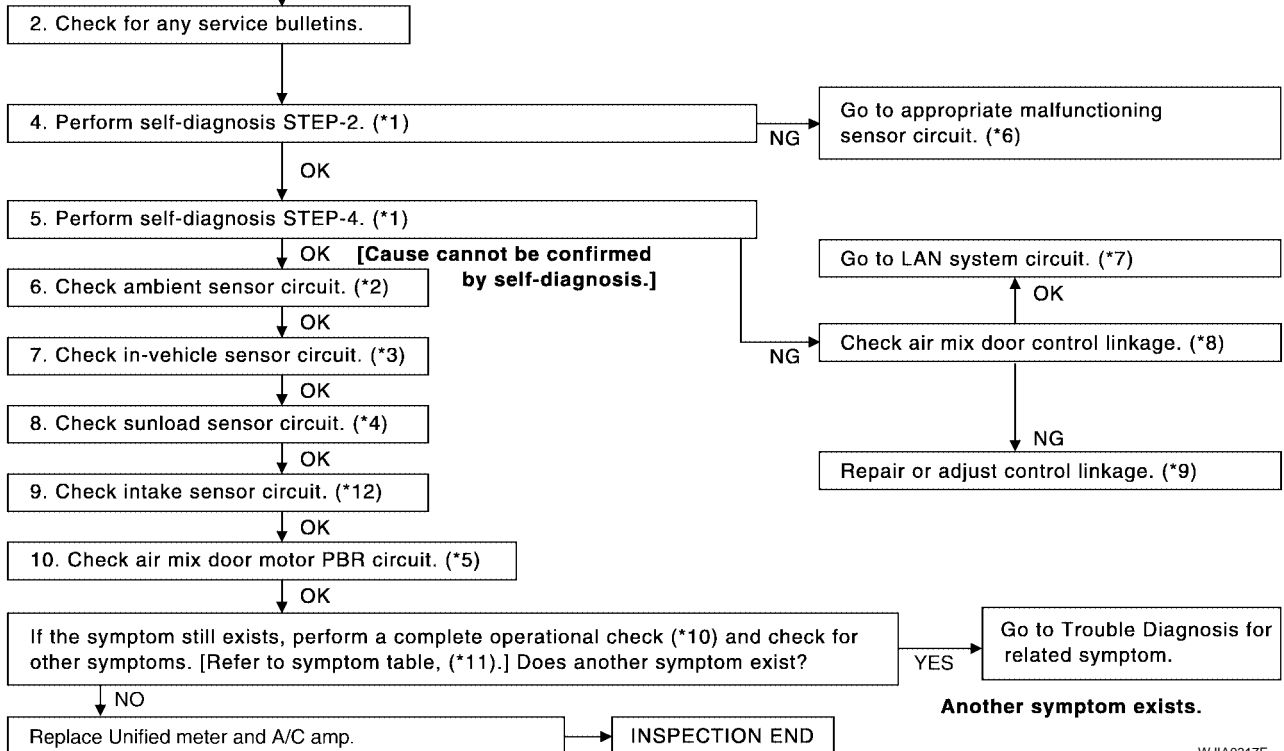
**Temperature increase**

- Press the top of the temperature switch until 32°C (90°F) is displayed.
- Check for hot air at discharge air outlets.

**Temperature decrease**

- Press the bottom of the temperature switch until 18°C (60°F) is displayed.
- Check for cold air at discharge air outlets.

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



- |   |  |   |
|---|--|---|
| *1 <a href="#">ATC-43. "FUNCTION CONFIRMATION PROCEDURE".</a> | *2 <a href="#">ATC-89. "Ambient Sensor Circuit".</a>         | *3 <a href="#">ATC-92. "In-vehicle Sensor Circuit".</a>       |
| *4 <a href="#">ATC-95. "Sunload Sensor Circuit".</a>          | *5 <a href="#">ATC-63. "Air Mix Door Motor PBR Circuit".</a> | *6 <a href="#">ATC-43. "FUNCTION CONFIRMATION PROCEDURE".</a> |
| *7 <a href="#">ATC-55. "LAN System Circuit".</a>              | *8 <a href="#">ATC-112. "AIR MIX DOOR MOTOR".</a>            | *9 <a href="#">ATC-112. "AIR MIX DOOR MOTOR".</a>             |
| *10 <a href="#">ATC-50. "Operational Check".</a>              | *11 <a href="#">ATC-32. "SYMPTOM TABLE".</a>                 | *12 <a href="#">ATC-98. "Intake Sensor Circuit".</a>          |

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# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

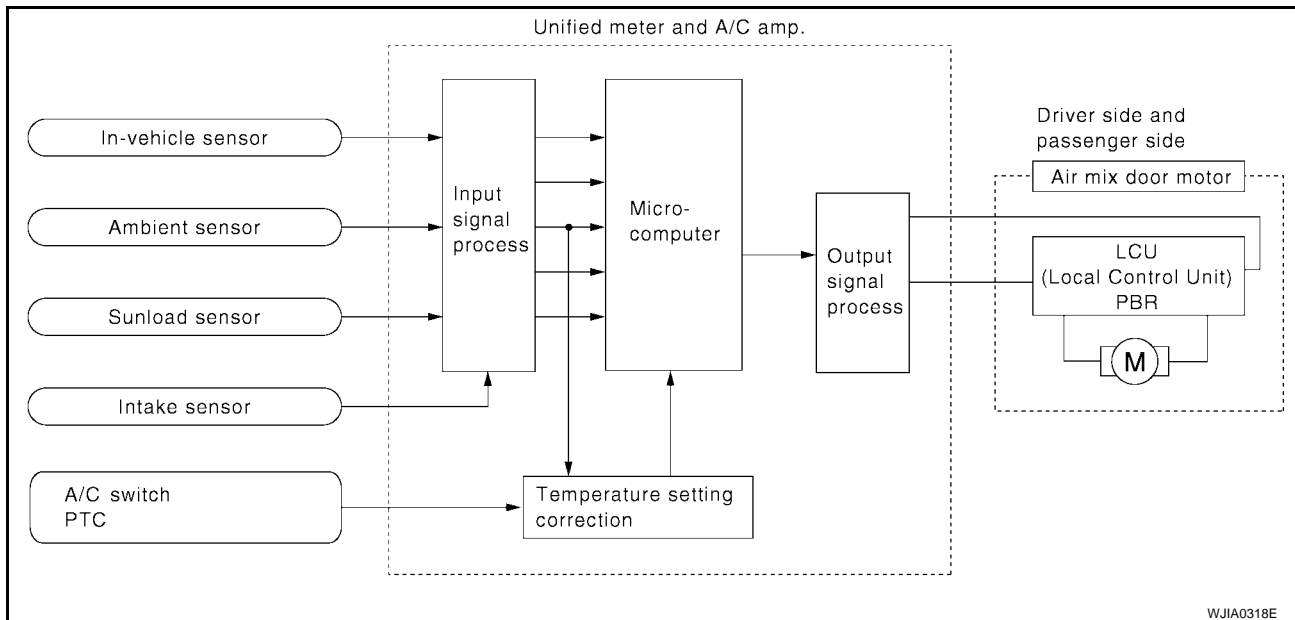
Air mix door control system components are:

- Unified meter and A/C amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-into mode motor and air mix motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

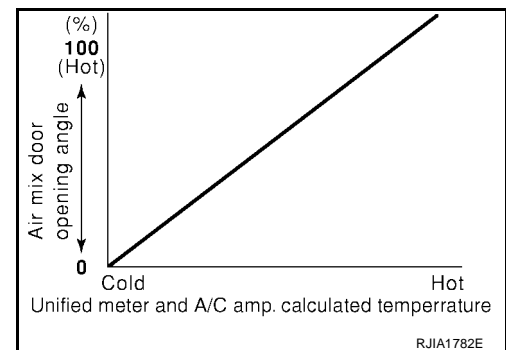
### System Operation

The unified meter and A/C amp. receives data from each of the sensors. The unified meter and A/C amp. sends air mix door, mode door and intake door motor opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

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



### Air Mix Door Control Specification

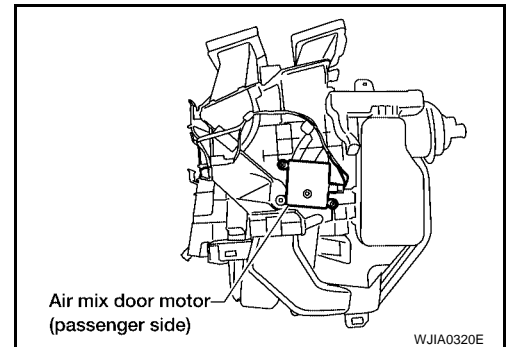
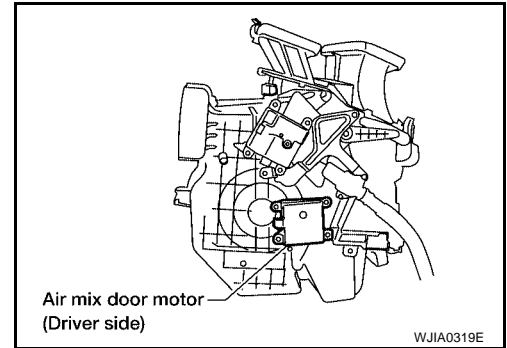


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Air Mix Door Motor

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



### DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR

Perform diagnostic procedure for LAN circuit. Refer to [ATC-55, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#).

### Air Mix Door Motor PBR Circuit

EJS001LX

SYMPTOM:

- Discharge air temperature does not change.
- PBR circuit is open or shorted.

### DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR PBR

Perform diagnostic procedure for LAN circuit. Refer to [ATC-55, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#).

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# TROUBLE DIAGNOSIS

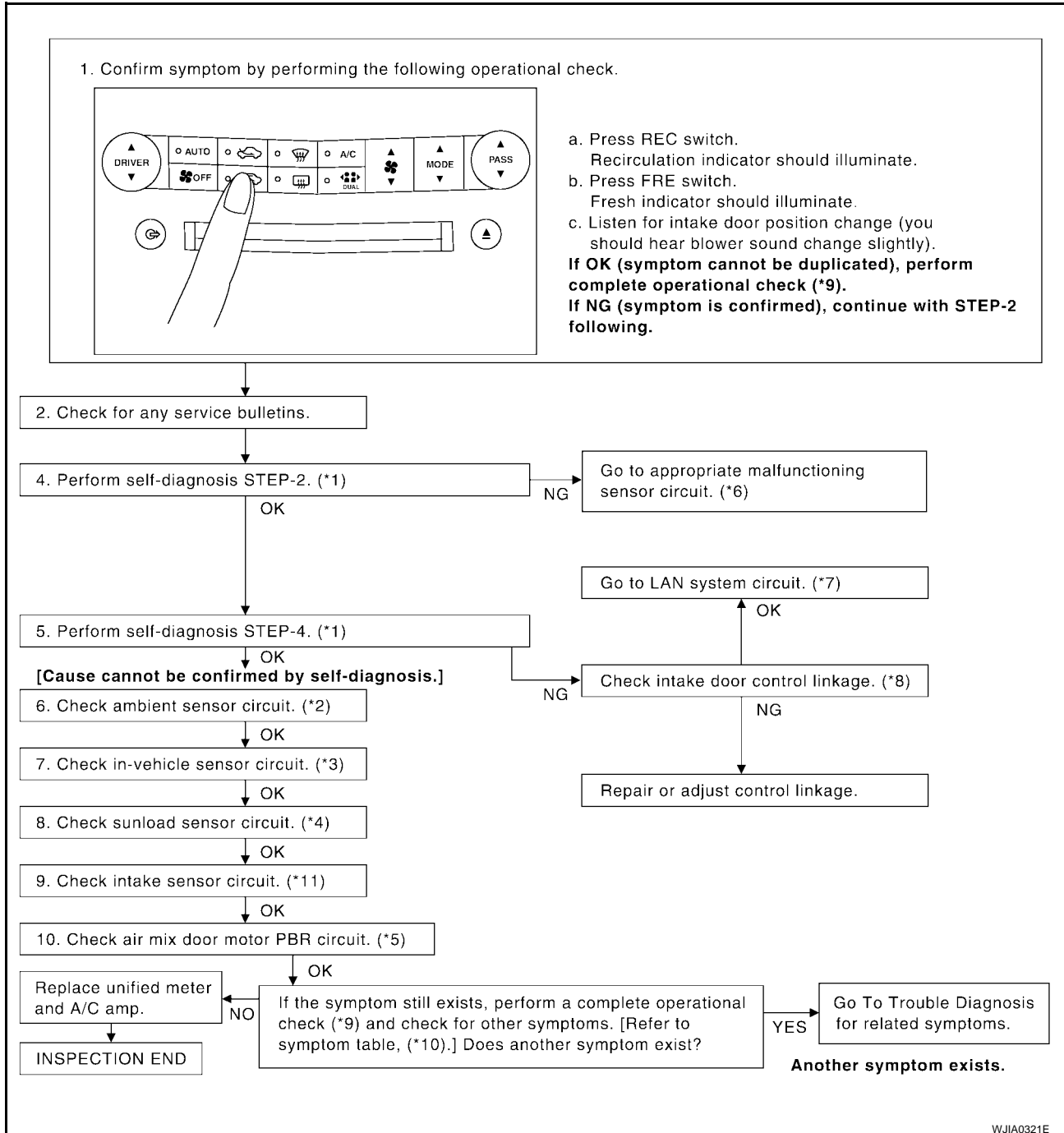
EJS001LY

## Intake Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



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- |   |  |   |
|---|--|---|
| *1 <a href="#">ATC-43. "FUNCTION CONFIRMATION PROCEDURE".</a> | *2 <a href="#">ATC-89. "Ambient Sensor Circuit".</a>         | *3 <a href="#">ATC-92. "In-vehicle Sensor Circuit".</a>       |
| *4 <a href="#">ATC-95. "Sunload Sensor Circuit".</a>          | *5 <a href="#">ATC-63. "Air Mix Door Motor PBR Circuit".</a> | *6 <a href="#">ATC-43. "FUNCTION CONFIRMATION PROCEDURE".</a> |
| *7 <a href="#">ATC-55. "LAN System Circuit".</a>              | *8 <a href="#">ATC-107. "INTAKE DOOR MOTOR".</a>             | *9 <a href="#">ATC-50. "Operational Check".</a>               |
| *10 <a href="#">ATC-32. "SYMPTOM TABLE".</a>                  | *11 <a href="#">ATC-98. "Intake Sensor Circuit".</a>         |   |



# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

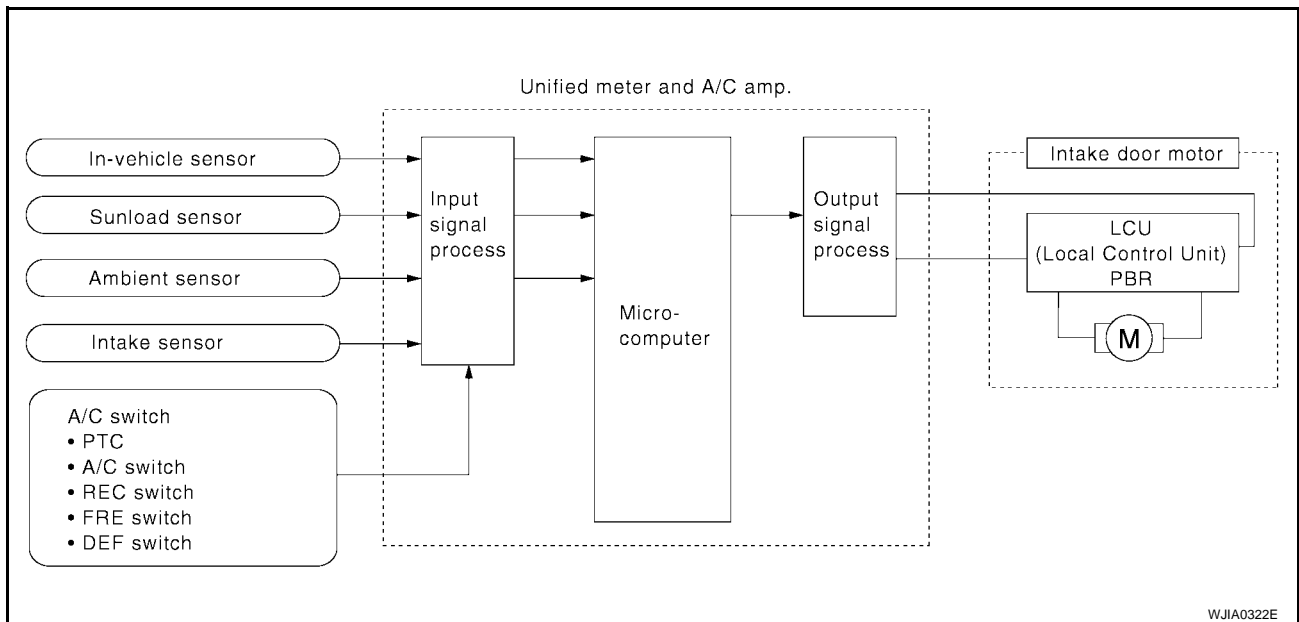
### Component Parts

Intake door control system components are:

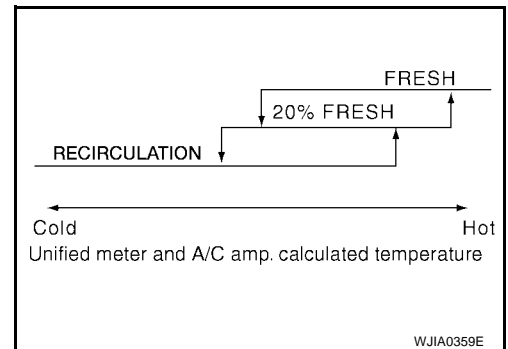
- Unified meter and A/C amp.
- Intake door motor
- A/C LAN system (PBR built-in mode motor and air mix door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

### System Operation

The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the DEFROST, or OFF switches are pushed or A/C switch is OFF, the unified meter and A/C amp. sets the intake door at the FRESH position.



### Intake Door Control Specification

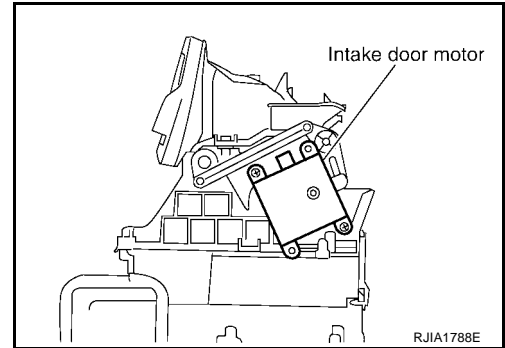


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Intake door motor

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



## DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

SYMPTOM: Intake door motor does not operate normally.

Perform diagnostic procedure for LAN system circuit. Refer to [ATC-55, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .

# TROUBLE DIAGNOSIS

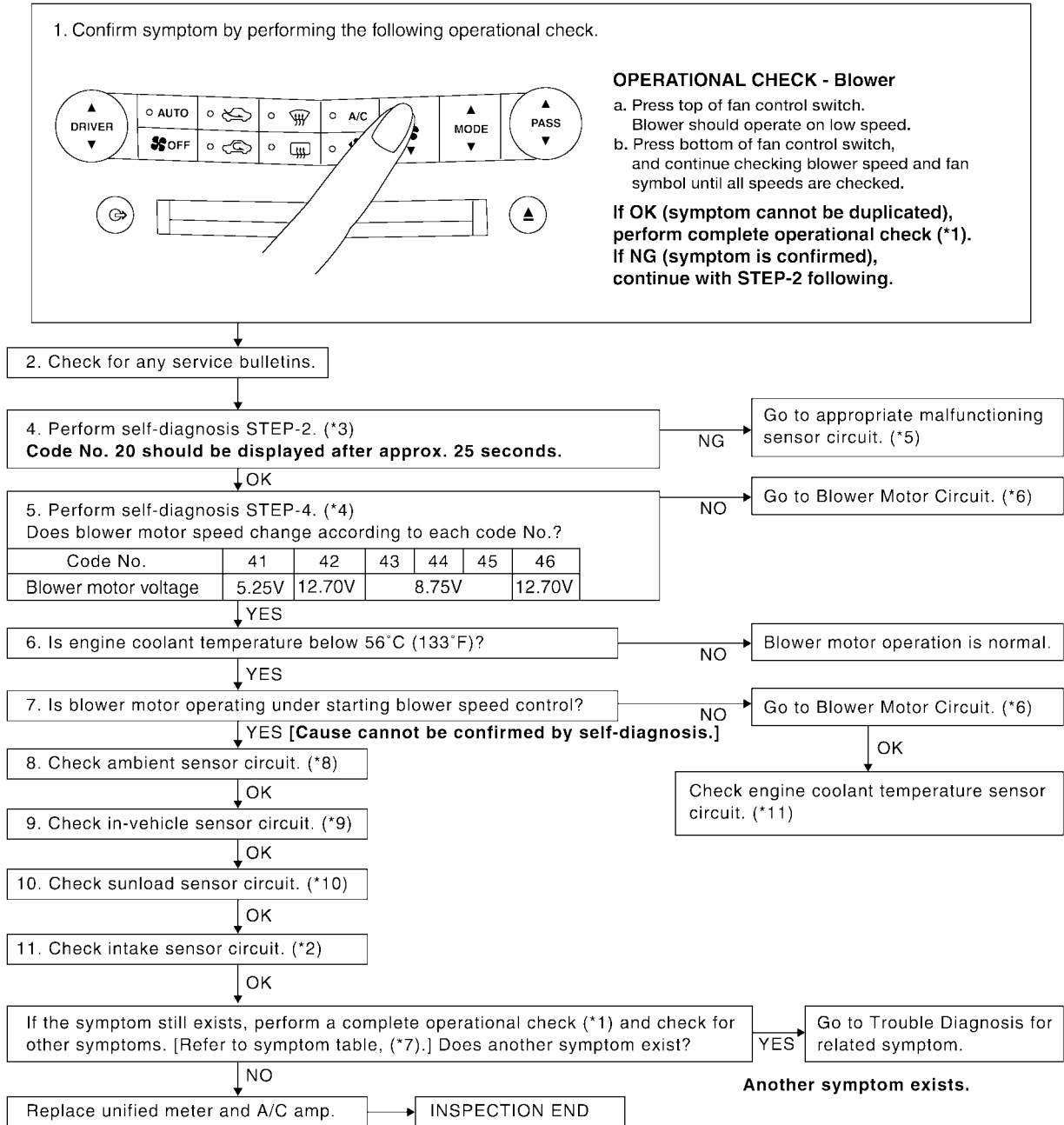
EJS001LZ

## Blower Motor Circuit

SYMPTOM:

- Blower motor operation is malfunctioning.

### INSPECTION FLOW



\*1 [ATC-50. "Operational Check".](#)

\*2 [ATC-98. "Intake Sensor Circuit".](#)

\*3 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*4 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*5 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*6 [ATC-69. "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR".](#)

\*7 [ATC-32. "SYMPTOM TABLE".](#)

\*8 [ATC-89. "Ambient Sensor Circuit".](#)

\*9 [ATC-92. "In-vehicle Sensor Circuit".](#)

\*10 [ATC-95. "Sunload Sensor Circuit".](#)

\*11 [EC-183. "DTC P0117, P0118 ECT SENSOR".](#)

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# TROUBLE DIAGNOSIS

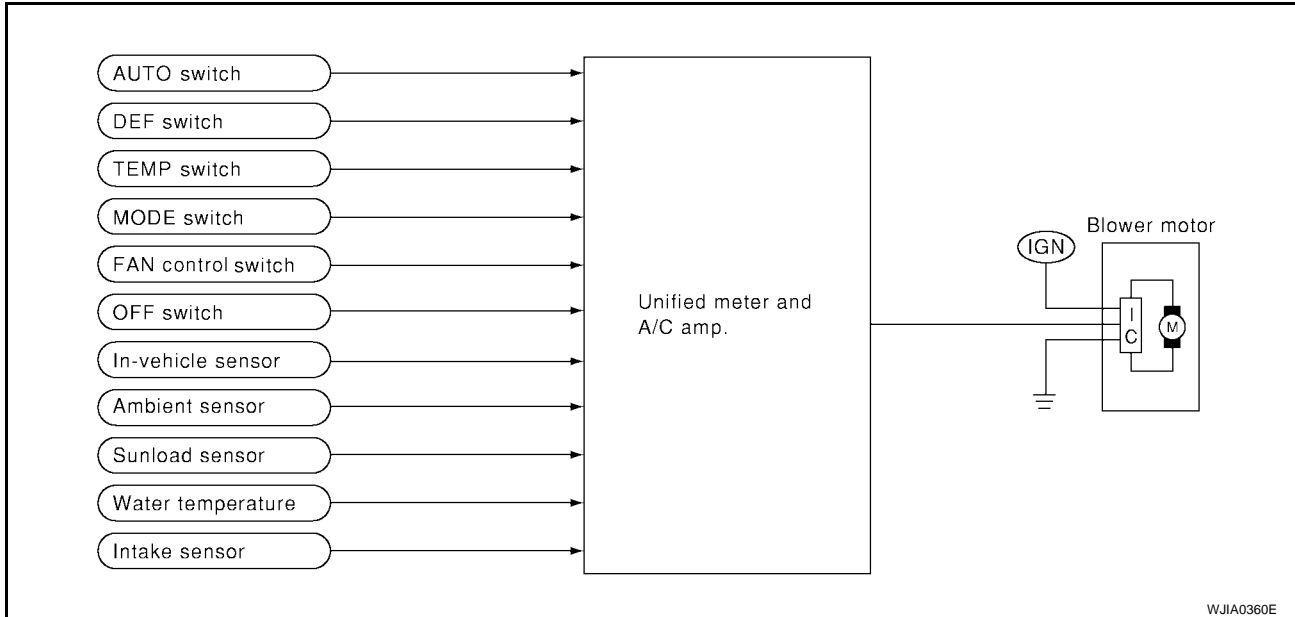
## SYSTEM DESCRIPTION

### Component Parts

Fan speed control system components are:

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

### System Operation



### Automatic Mode

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

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

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

### Starting Fan Speed Control

#### Start Up From COLD SOAK Condition (Automatic mode)

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

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

#### Start Up From Usual or HOT SOAK Condition (Automatic mode)

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

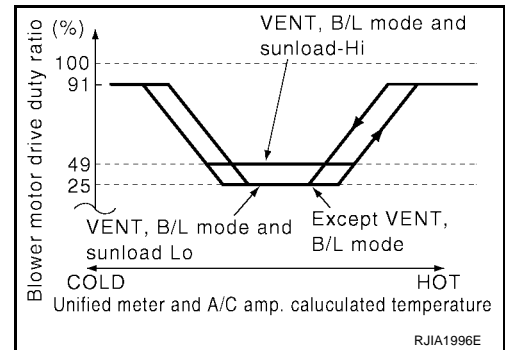
# TROUBLE DIAGNOSIS

## Blower Speed Compensation

### Sunload

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of low or no sunload, the blower low speed is usual low speed (duty ratio 25%). During high sunload conditions, the display and A/C auto amp. causes the blower speed to increase (duty ratio 49%).

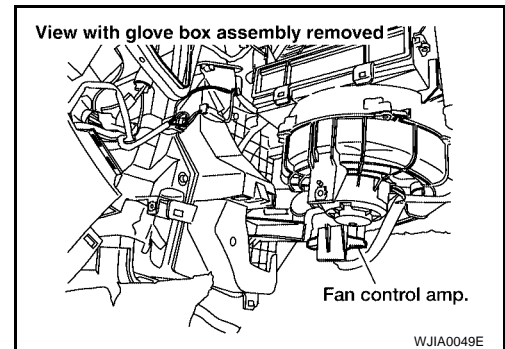
## Fan Speed Control Specification



## COMPONENT DESCRIPTION

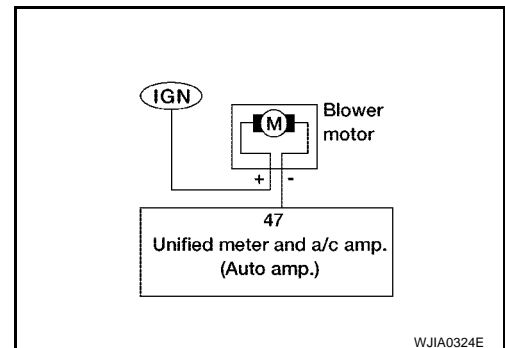
### Fan Control Amp

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



## DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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



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# TROUBLE DIAGNOSIS

## 1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M62 terminal + (W/L) and ground.

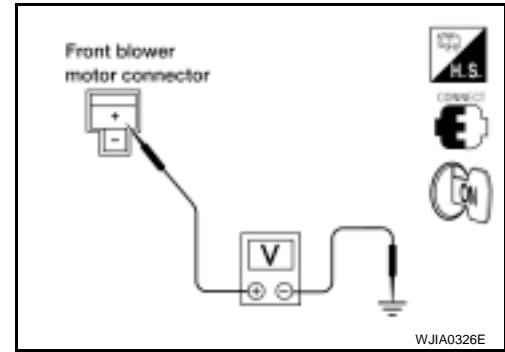
**+ – Ground : Battery voltage**

OK or NG

OK >> GO TO 2.

NG >> Check power supply circuit and 15A fuse [No. 11, located in the fuse block (J/B)]. Refer to [PG-67, "FUSE BLOCK-JUNCTION BOX\(J/B\)"](#).

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



## 2. CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND UNIFIED METER AND A/C AMP.

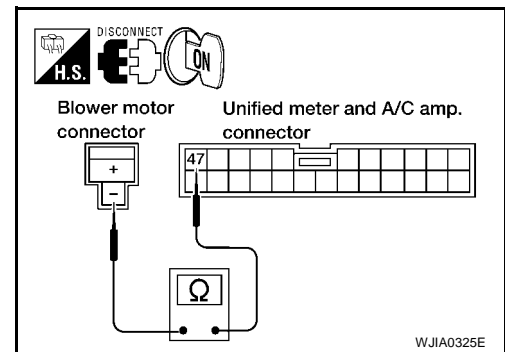
1. Disconnect unified meter and A/C amp. connector.
2. Check continuity between blower motor harness connector M62 terminal - (L/R) and unified meter and A/C amp. harness connector M89 terminal 47 (L/R).

**-- 53 : Continuity should exist.**

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



## 3. CHECK UNIFIED METER AND A/C AMP. FOR OUTPUT

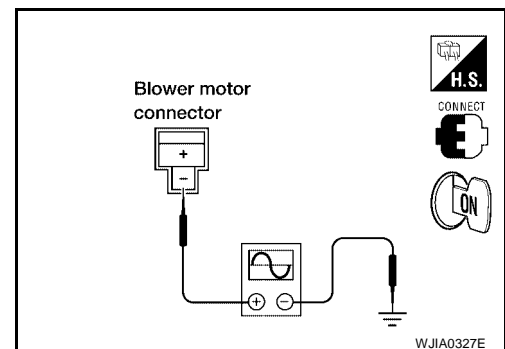
1. Reconnect blower motor connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Vary the fan speed between Lo and Hi and confirm the voltage between blower motor harness connector M62 terminal - (L/R) and ground.

Fan Speed:	Voltage (approx.)
1	: 4.25V
2	: 5.50V
3	: 6.50V
4	: 8.25V
5	: 10.0V
6	: 11.5V
7	: 12.7V

OK or NG

OK >> Replace blower motor.

NG >> Replace unified meter and A/C amp.



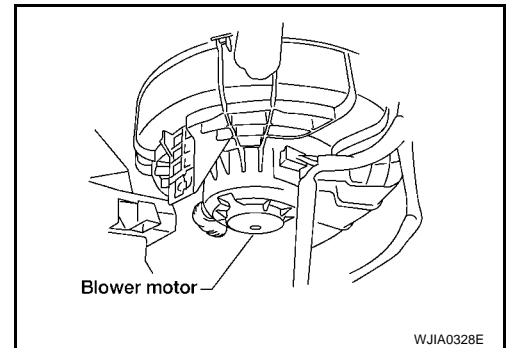
# TROUBLE DIAGNOSIS

## COMPONENT INSPECTION

### Blower Motor

Confirm smooth rotation of the blower motor.

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



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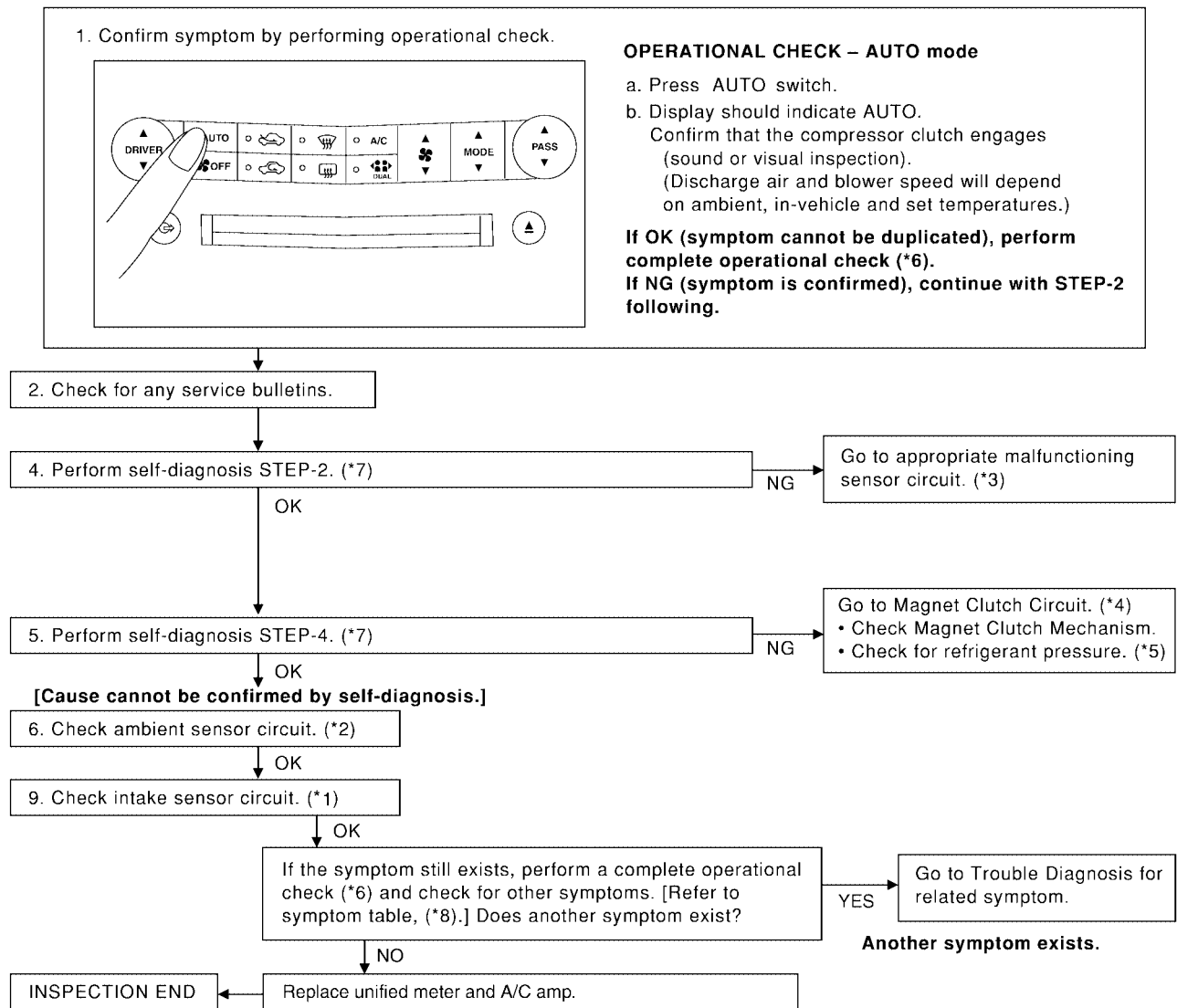
# TROUBLE DIAGNOSIS

EJS001M0

## Magnet Clutch Circuit

SYMPTOM: Magnet clutch does not engage.

### INSPECTION FLOW



\*1 [ATC-98. "Intake Sensor Circuit".](#)

\*2 [ATC-89. "Ambient Sensor Circuit".](#)

\*3 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*4 [ATC-73. "DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH".](#)

\*5 [ATC-82. "Trouble Diagnoses for Unusual Pressure".](#)

\*6 [ATC-50. "Operational Check".](#)

\*7 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE".](#)

\*8 [ATC-32. "SYMPTOM TABLE".](#)

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# TROUBLE DIAGNOSIS

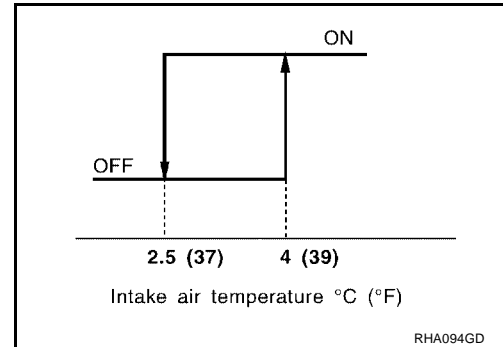
## SYSTEM DESCRIPTION

Unified meter and A/C amp. controls compressor operation by ambient temperature and signal from ECM.

### Low Temperature Protection Control

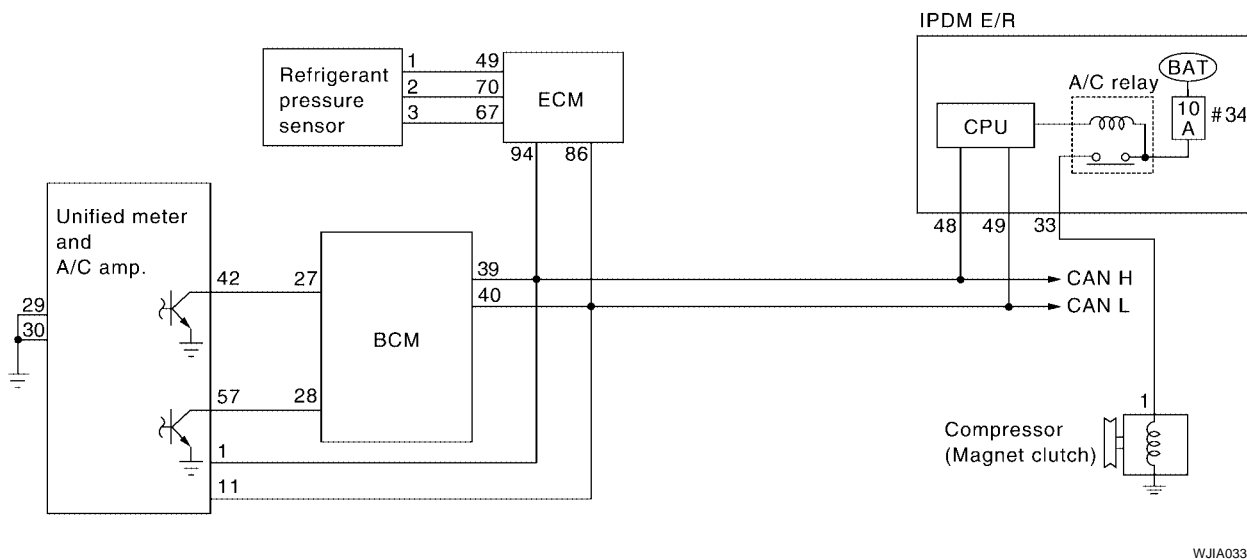
Unified meter and A/C amp. will turn the compressor ON or OFF as determined by a signal detected by intake sensor.

When intake air temperature is higher than 4°C (39°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than 2.5°C (37°F).



## DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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



### 1. CHECK INTAKE SENSOR CIRCUIT

Check intake sensor. Refer to [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#).

OK or NG

OK >> GO TO 2.

NG >> Malfunctioning intake sensor: Refer to [ATC-98, "Intake Sensor Circuit"](#).

### 2. PERFORM AUTO ACTIVE TEST

Refer to [PG-20, "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. 34, located in IPDM E/R), and GO TO 3.

# TROUBLE DIAGNOSIS

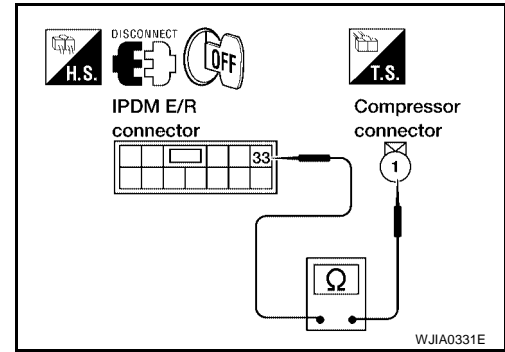
## 3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
3. Check continuity between IPDM E/R harness connector E124 terminal 33 (Y/B) and compressor harness connector F3 terminal 1 (Y/B).

**33 – 1 : Continuity should exist.**

OK or NG

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

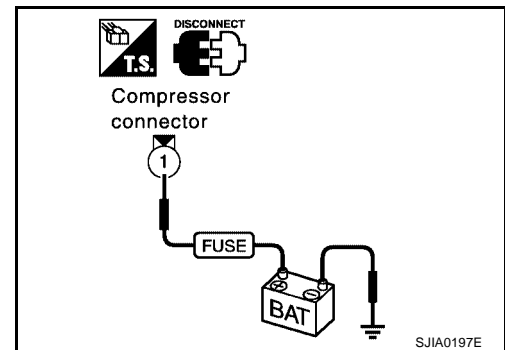


## 4. CHECK MAGNET CLUTCH CIRCUIT

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

OK or NG

- OK >> Replace IPDM E/R.
- NG >> Replace magnet clutch. Refer to [ATC-120, "Removal and Installation for Compressor Clutch"](#).



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

Check compressor ON/OFF signal. Refer to [ATC-30, "CONSULT-II Function \(METER A/C AMP\)"](#).

**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	
OIL P SW		ON	
RECORD			
MODE	BACK	LIGHT	COPY

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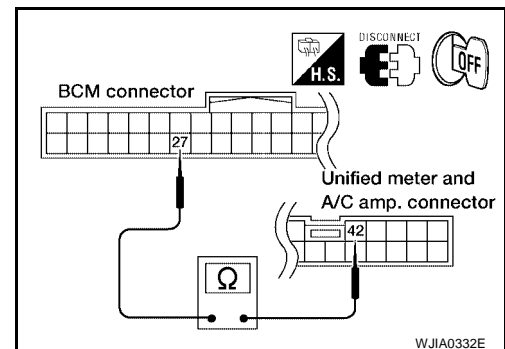
## 6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M18 terminal 27 (O/L) and unified meter and A/C amp. harness connector M89 terminal 42 (O/L).

**27 – 42 : Continuity should exist.**

OK or NG

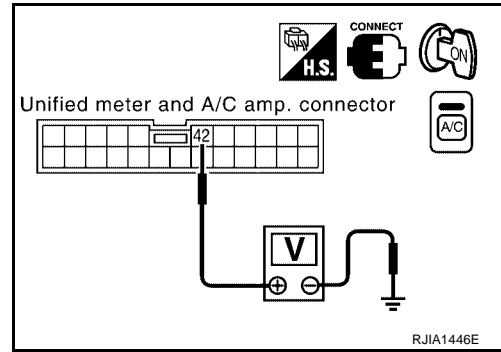
- OK >> GO TO 7.
- NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## 7. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M89 terminal 42 (O/L) and ground.



Terminals		(-)	Condition	Voltage (Approx.)
(+) (+)				
Auto amp. connector	Terminal No. (Wire color)			
M89	42 (O/L)	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 unified meter and A/C amp.

NG-2 >> If the voltage is approx. 0V when A/C switch is OFF: Replace BCM.

## 8. CHECK REFRIGERANT PRESSURE SENSOR

WITH CONSULT-II

1. Start engine.
2. Check voltage of refrigerant pressure sensor. Refer to [ATC-30, "CONSULT-II Function \(METER A/C AMP\)"](#).

WITHOUT CONSULT-II

1. Start engine.
2. Check voltage between ECM harness connector F54 terminal 70 (W) and ground.

Terminals		(-)	Condition	Voltage (Approx.)
(+) (+)				
ECM connector	Terminal No. (Wire color)			
F54	70 (W)	Ground	A/C switch: ON	03.6 - 3.88VV

**OK or NG**

OK >> ●  WITH CONSULT-II  
GO TO 9.

- WITHOUT CONSULT-II  
GO TO 10.

NG >> Refer to [EC-666, "REFRIGERANT PRESSURE SENSOR"](#).

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

Check FAN ON/OFF signal. Refer to [ATC-30, "CONSULT-II Function \(METER A/C AMP\)"](#).

**FAN CONTROL SWITCH ON : FAN ON SIG ON**

**FAN CONTROL SWITCH OFF : FAN ON SIG OFF**

**OK or NG**

OK >> GO TO 12.

NG >> GO TO 10.

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

SJIA0270E

# TROUBLE DIAGNOSIS

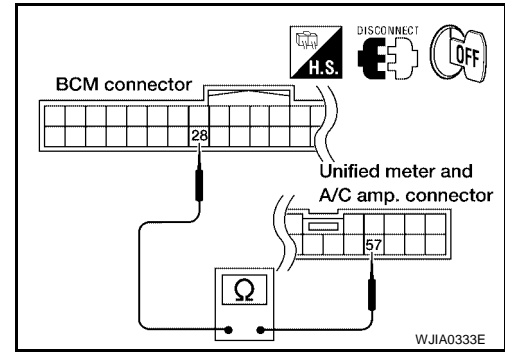
## 10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect BCM connector and unified meter and A/C amp. connector.
3. Check continuity between BCM harness connector M18 terminal 28 (W/B) and unified meter and A/C amp. harness connector M89 terminal 57 (W/B).

**28 – 57 : Continuity should exist.**

OK or NG

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



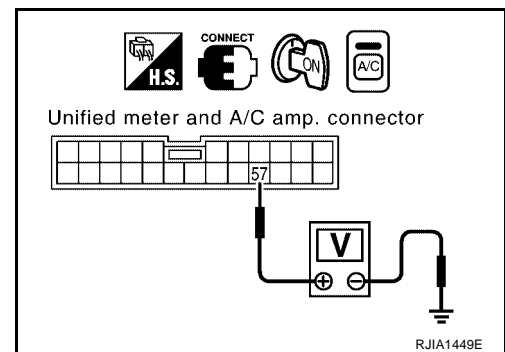
## 11. CHECK VOLTAGE FOR UNIFIED METER AND A/C AMP. (FAN ON SIGNAL)

1. Reconnect BCM connector and unified meter and A/C amp. connector.
2. Turn ignition switch ON.
3. Check voltage between unified meter and A/C amp. harness connector M89 terminal 57 (W/B) and ground.

Terminals		(-)	Condition	Voltage (Approx.)
(+)	Auto amp. connector			
M89	57 (W/B)	Ground	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 unified meter and A/C amp.  
 NG-2 >> If the voltage is approx. 0V when blower motor is OFF: Replace BCM. Refer to [BCS-19, "Removal and Installation of BCM"](#).



## 12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to [ATC-29, "CAN Communication System Description"](#).

- BCM – ECM
- ECM – IPDM E/R
- ECM – Unified meter and A/C amp.

OK or NG

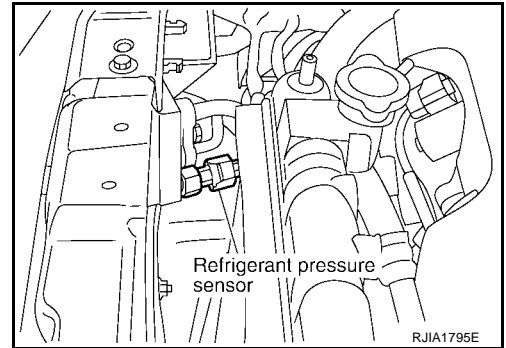
- OK >> INSPECTION END  
 NG >> Repair or replace malfunctioning part(s).

# TROUBLE DIAGNOSIS

## COMPONENT INSPECTION

### Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the condenser.



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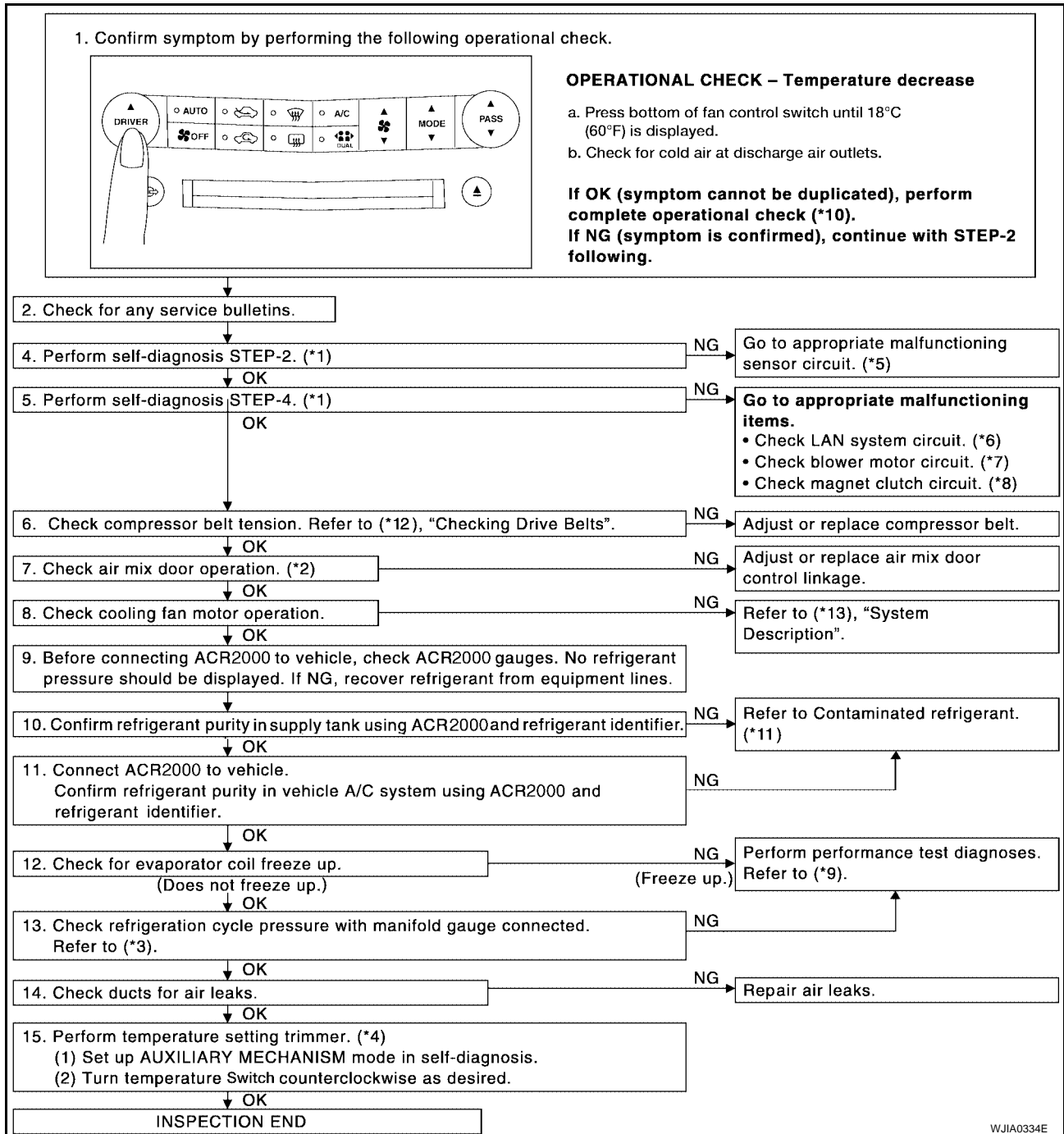
# TROUBLE DIAGNOSIS

EJS001M1

## Insufficient Cooling

SYMPTOM: Insufficient cooling

### INSPECTION FLOW

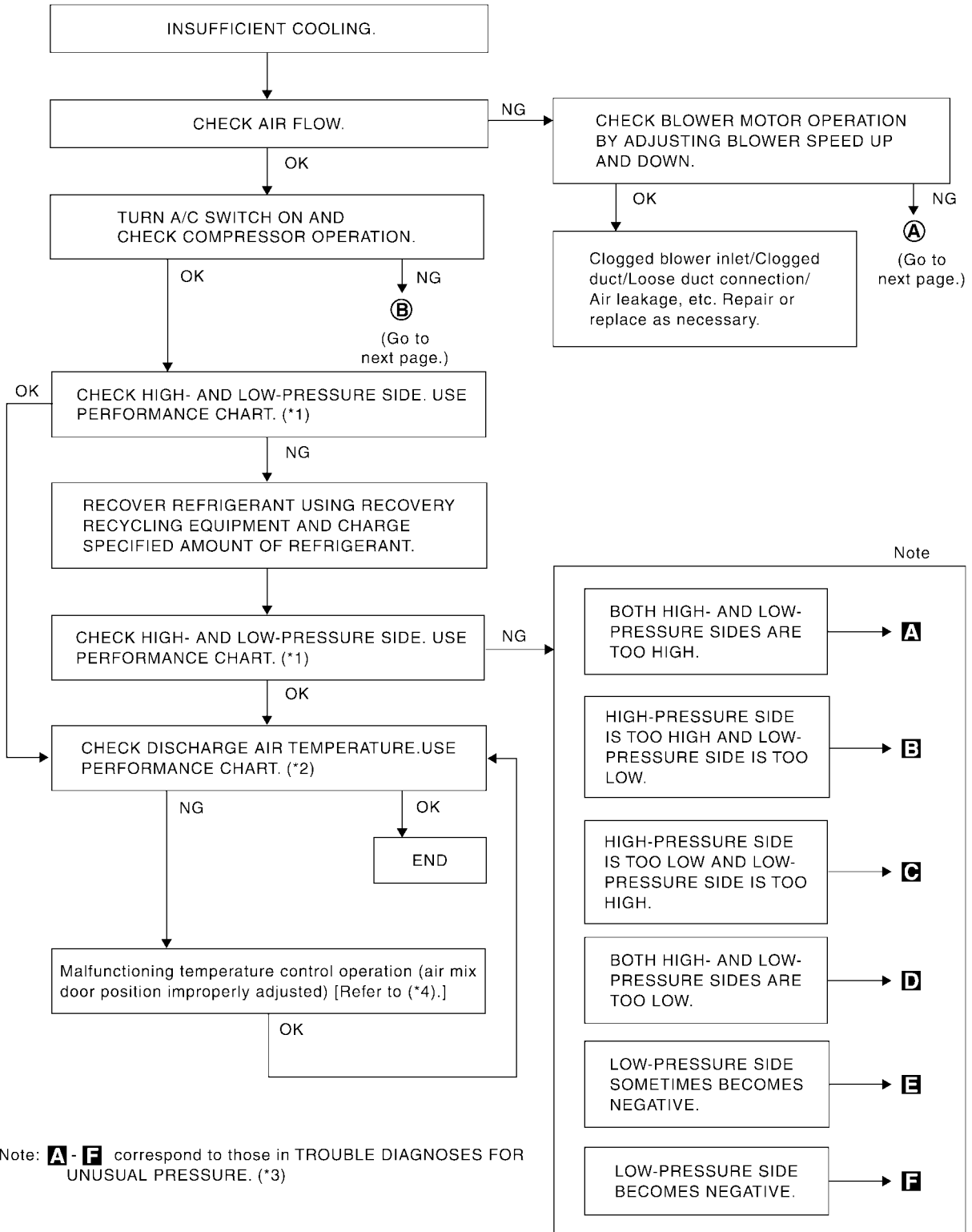


WJIA0334E

- \*1 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE"](#), see No.4 to 6.
- \*2 [ATC-61. "Air Mix Door Motor Circuit"](#).
- \*3 [ATC-81. "Test Reading"](#).
- \*4 [ATC-48. "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"](#).
- \*5 [ATC-43. "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 13.
- \*6 [ATC-55. "LAN System Circuit"](#).
- \*7 [ATC-67. "Blower Motor Circuit"](#).
- \*8 [ATC-72. "Magnet Clutch Circuit"](#).
- \*9 [ATC-79. "PERFORMANCE TEST DIAGNOSES"](#).
- \*10 [ATC-50. "Operational Check"](#).
- \*11 [ATC-4. "Contaminated Refrigerant"](#).
- \*12 [EM-12. "Checking Drive Belts"](#).
- \*13 [EC-462. "DTC P1217 ENGINE OVER TEMPERATURE"](#).

# TROUBLE DIAGNOSIS

## PERFORMANCE TEST DIAGNOSES



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

\*1 [ATC-81. "PERFORMANCE CHART"](#).

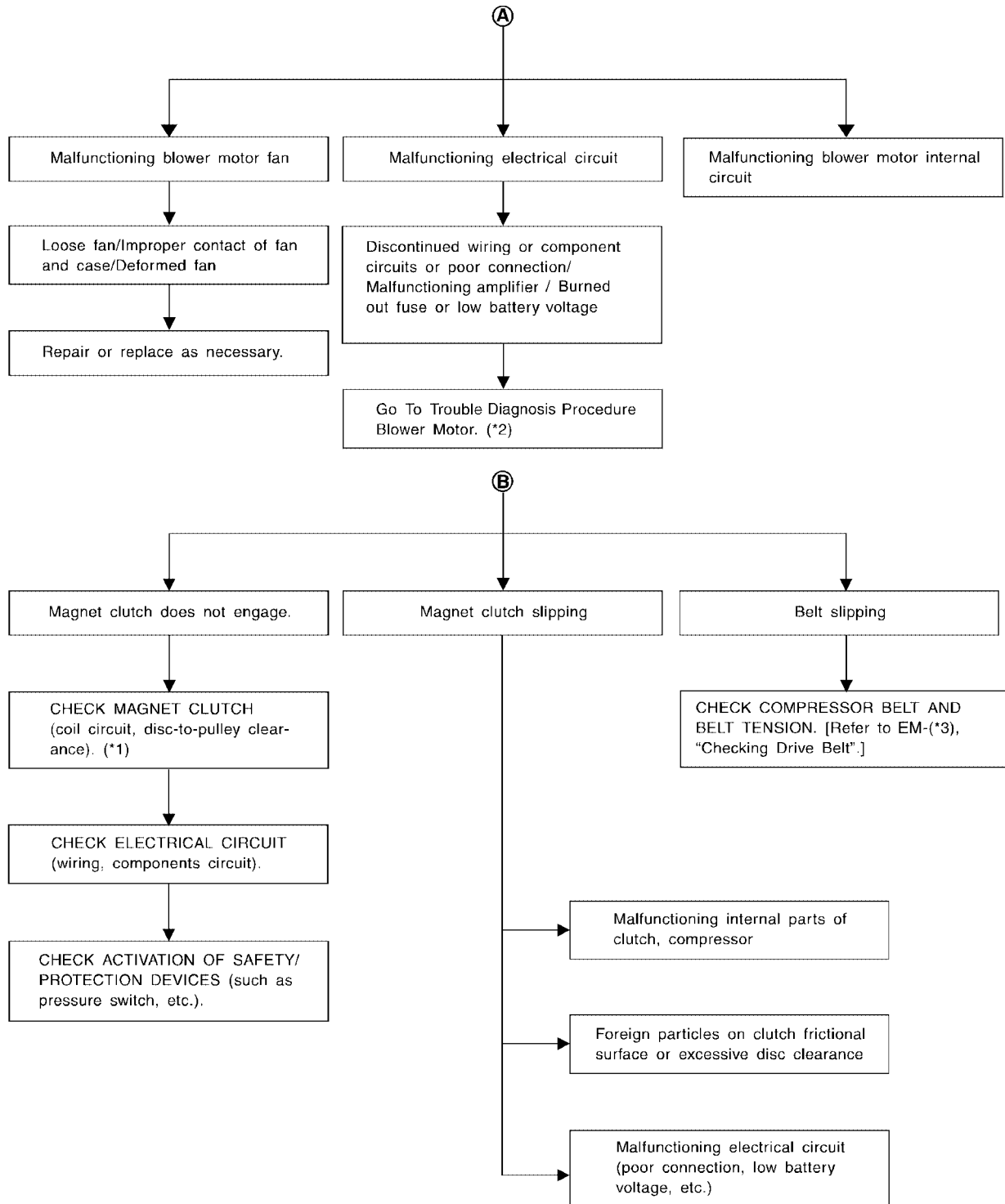
\*2 [ATC-81. "PERFORMANCE CHART"](#).

\*3 [ATC-82. "Trouble Diagnoses for Unusual Pressure"](#).

\*4 [ATC-61. "Air Mix Door Motor Circuit"](#).

RJIA1601E

# TROUBLE DIAGNOSIS



WJIA0361E

\*1 [ATC-120, "Removal and Installation for Compressor Clutch"](#).

\*2 [ATC-67, "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
 Fan (blower) speed	Max. speed set
Engine speed	Idle speed

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

### Test Reading

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

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	5.3 - 6.5 (42 - 44)
	25 (77)	9.7 - 11.5 (49 - 53)
	30 (86)	13.8 - 16.3 (57 - 61)
	35 (95)	18.0 - 21.2 (64 - 70)
	40 (104)	22.2 - 25.7 (72 - 78)
60 - 70	20 (68)	6.5 - 7.7 (44 - 46)
	25 (77)	11.5 - 13.3 (53 - 56)
	30 (86)	16.3 - 18.8 (61 - 66)
	35 (95)	21.2 - 24.0 (70 - 75)
	40 (104)	25.7 - 29.2 (78 - 85)

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

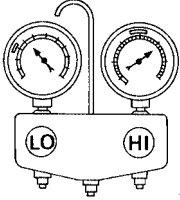
Ambient air		High-pressure (Discharge side) kPa (kg/cm <sup>2</sup> , psi)	Low-pressure (Suction side) kPa (kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	680 - 840 (6.94 - 8.57, 98.6 - 121.8)	160 - 198 (1.63 - 2.02, 23.2 - 28.7)
	25 (77)	800 - 985 (8.16 - 10.05, 116.0 - 142.8)	198 - 245 (2.02 - 2.50, 28.7 - 35.5)
	30 (86)	940 - 1,150 (9.59 - 11.73, 136.3 - 166.8)	225 - 278 (2.30 - 2.84, 32.6 - 40.3)
	35 (95)	1,160 - 1,410 (11.83 - 14.38, 168.2 - 204.5)	273 - 335 (2.78 - 3.42, 39.6 - 48.6)
	40 (104)	1,325 - 1,620 (13.52 - 16.52, 192.1 - 234.9)	325 - 398 (3.32 - 4.06, 47.1 - 57.7)

# TROUBLE DIAGNOSIS

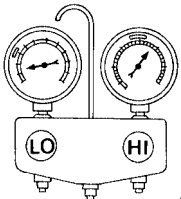
## TROUBLE DIAGNOSES FOR UNUSUAL PRESSURE

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

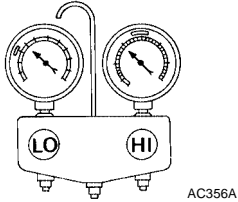
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> <li>● Clean condenser.</li> <li>● Check and repair cooling fan as necessary.</li> </ul>
	<ul style="list-style-type: none"> <li>● Low-pressure pipe is not cold.</li> <li>● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm<sup>2</sup>, 28 psi). It then decreases gradually thereafter.</li> </ul>	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair 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 style="text-align: right; font-size: small;">AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> <li>● Check and repair or replace malfunctioning parts.</li> <li>● Check lubricant for contamination.</li> </ul>

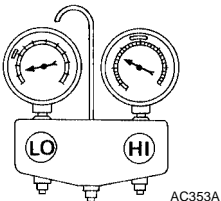
# TROUBLE DIAGNOSIS

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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.

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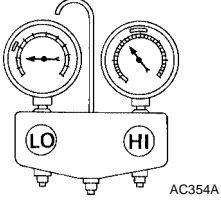
## Both High- and Low-pressure Sides are Too Low

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 receiver drier outlet and inlet. Outlet temperature is extremely low.</li> <li>Liquid tank inlet and expansion valve are frosted.</li> </ul>	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> <li>Replace 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 receiver drier and expansion valve is clogged.	<ul style="list-style-type: none"> <li>Check and repair malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge ↓ Leaking fittings or components	Check refrigerant for leaks. Refer to <a href="#">ATC-126. "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 not enough or is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> <li>Check intake sensor circuit. Refer to <a href="#">ATC-98. "Intake Sensor Circuit"</a> .</li> <li>Replace compressor.</li> </ul>

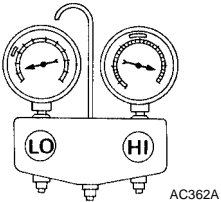
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M

# 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>

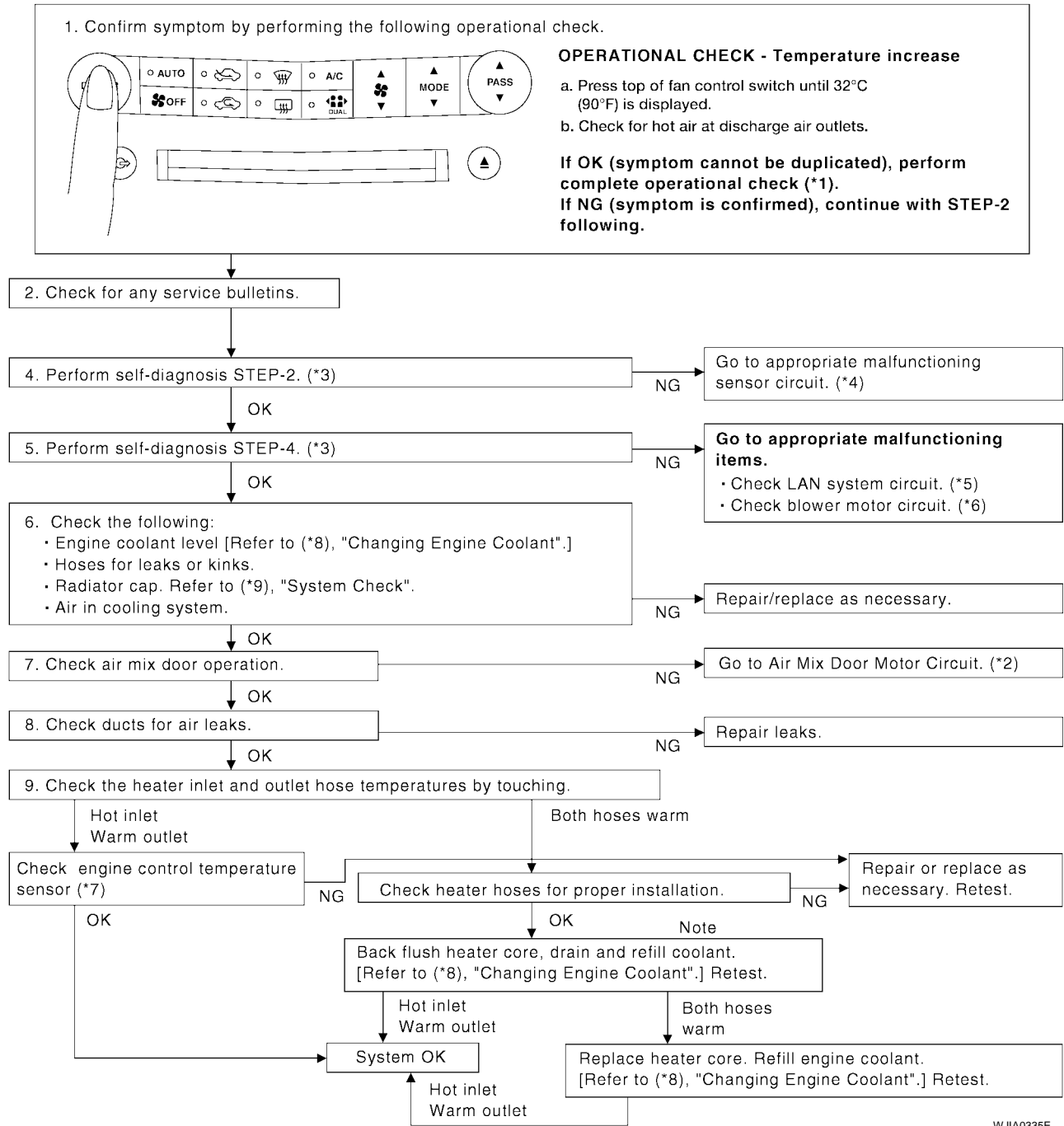
# TROUBLE DIAGNOSIS

EJS001M2

## Insufficient Heating

SYMPTOM: Insufficient heating

### INSPECTION FLOW



\*1 [ATC-50, "Operational Check"](#).

\*2 [ATC-61, "Air Mix Door Motor Circuit"](#).

\*3 [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#).

\*4 [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#).

\*5 [ATC-55, "LAN System Circuit"](#).

\*6 [ATC-67, "Blower Motor Circuit"](#).

\*7 [EC-183, "DTC P0117, P0118 ECT SENSOR"](#).

\*8 [MA-14, "Changing Engine Coolant"](#).

\*9 [CO-10, "CHECKING RADIATOR CAP"](#).

WJIA0335E

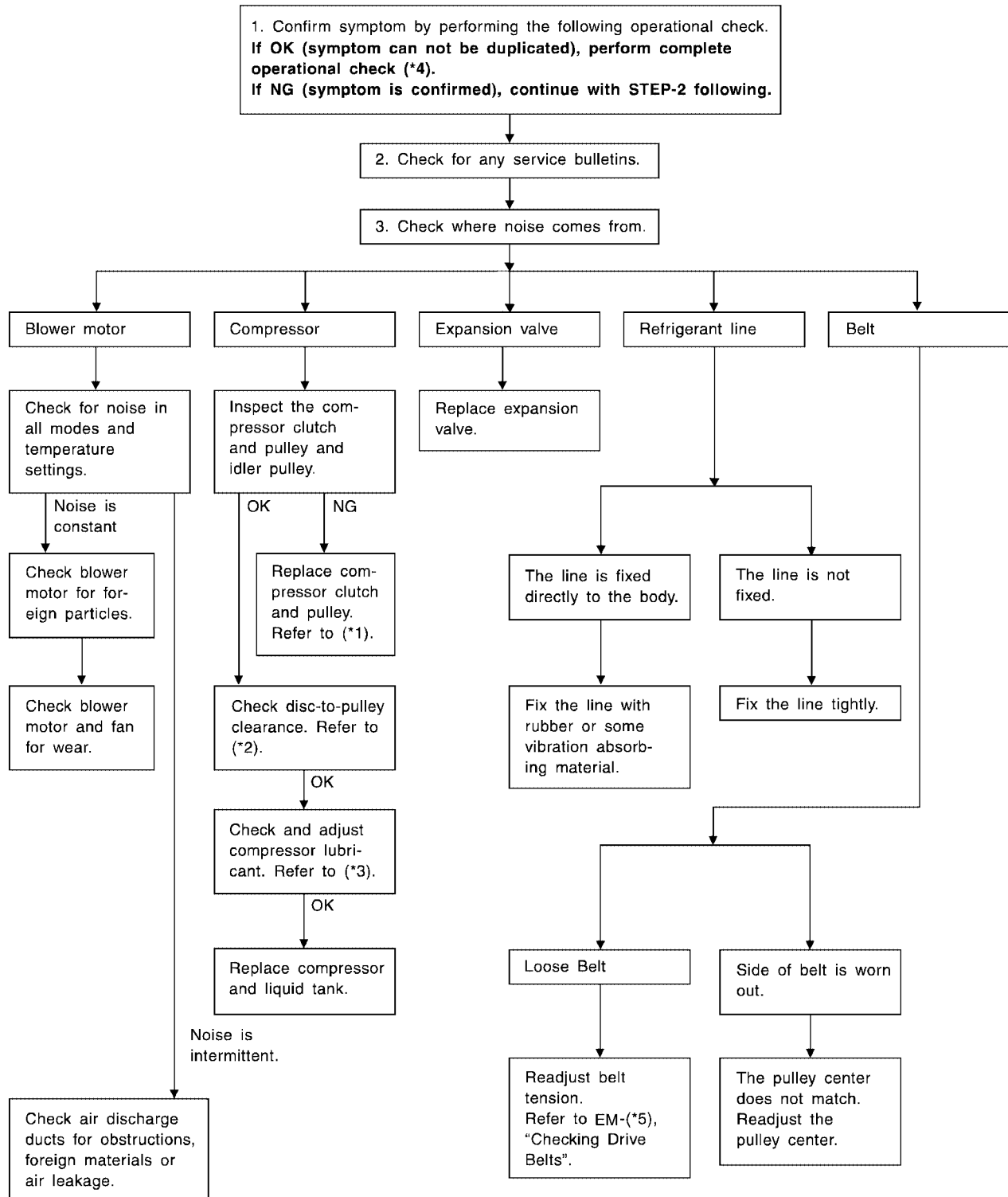
# TROUBLE DIAGNOSIS

EJS001M3

## Noise

SYMPTOM: Noise

### INSPECTION FLOW



\*1 [ATC-120, "REMOVAL"](#).

\*2 [ATC-121, "INSTALLATION"](#).

\*3 [ATC-18, "Maintenance of Lubricant Quantity in Compressor"](#).

\*4 [ATC-50, "Operational Check"](#).

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

RJIA1596E

# TROUBLE DIAGNOSIS

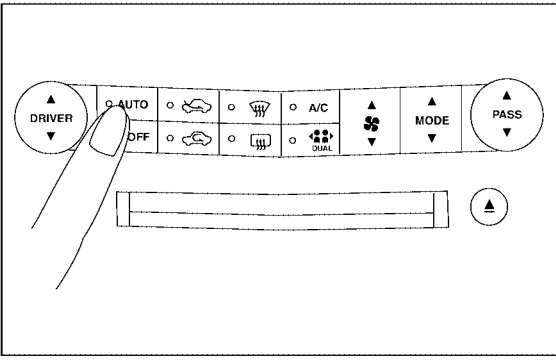
EJS001M4

## Self-diagnosis

SYMPTOM: Self-diagnosis cannot be performed.

### INSPECTION FLOW

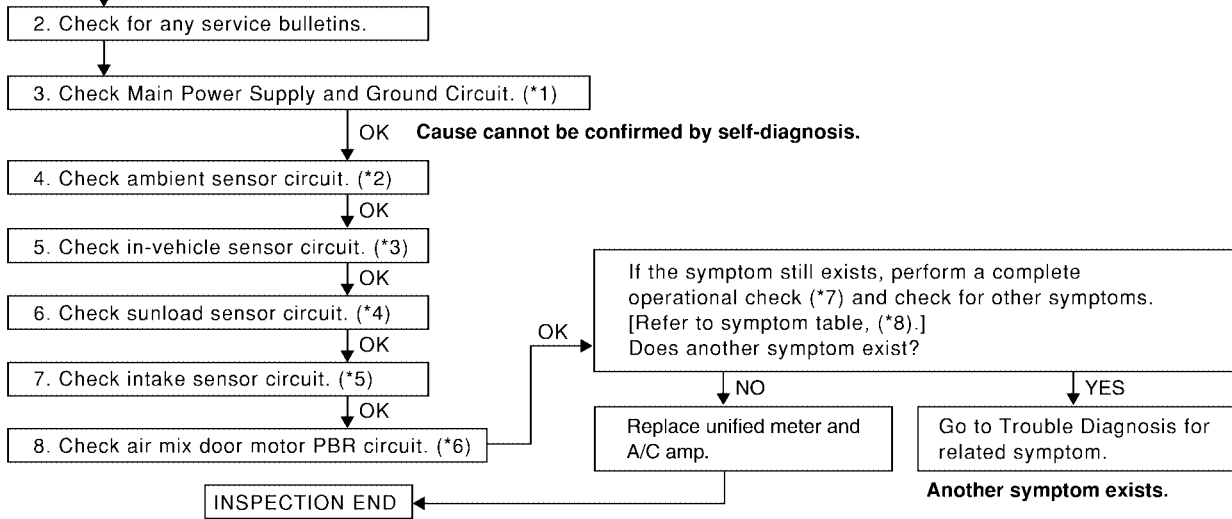
1. Confirm symptom by performing operational check.



**OPERATIONAL CHECK – AUTO mode**

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

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



\*1 [ATC-52, "Power Supply and Ground Circuit for Auto Amp."](#)

\*2 [ATC-89, "Ambient Sensor Circuit"](#).

\*3 [ATC-92, "In-vehicle Sensor Circuit"](#).

\*4 [ATC-95, "Sunload Sensor Circuit"](#).

\*5 [ATC-98, "Intake Sensor Circuit"](#).

\*6 [ATC-63, "Air Mix Door Motor PBR Circuit"](#).

\*7 [ATC-50, "Operational Check"](#).

\*8 [ATC-32, "SYMPTOM TABLE"](#).

WJIA0336E

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ATC

# TROUBLE DIAGNOSIS

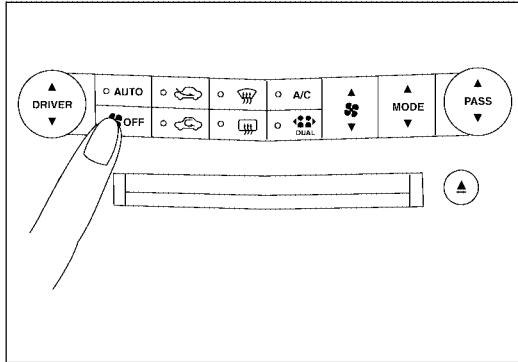
EJS001M5

## Memory Function

SYMPTOM: Memory function does not operate.

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK – Memory function

- Set the temperature 90°F or 32°C.
- Press OFF switch.
- Turn the ignition off.
- Turn the ignition on.
- Press the AUTO switch.
- Confirm that the set temperature remains at previous temperature.
- Press OFF switch.

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

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

2. Check for any service bulletins.

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

OK

4. Replace Unified meter and A/C amp.

#### 5. FINAL CHECK

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

\*1 [ATC-52, "Power Supply and Ground Circuit for Auto Amp."](#) \*2 [ATC-50, "Operational Check"](#).

\*3 [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#).

WJIA0337E



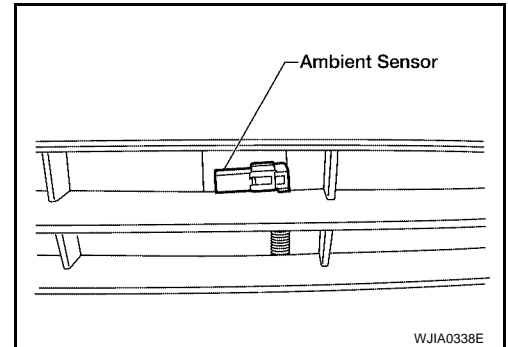
# TROUBLE DIAGNOSIS

EJS001M6

## Ambient Sensor Circuit COMPONENT DESCRIPTION

### Ambient Sensor

The ambient sensor is attached on the radiator core support (left side). It detects ambient temperature and converts it into a resistance value which is then input into the unified meter and A/C amp.



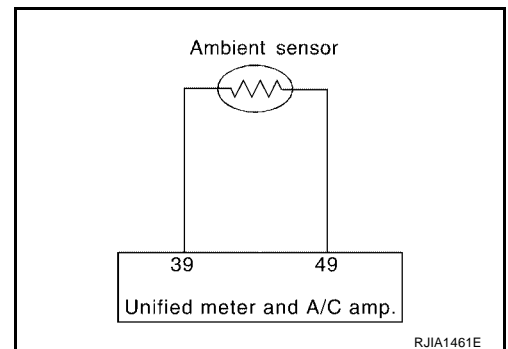
### AMBIENT TEMPERATURE INPUT PROCESS

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

As an example, consider stopping for a cup of coffee after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

### DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

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



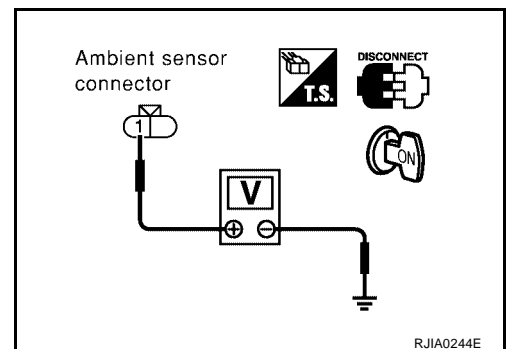
## 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E1 terminal 1 (O/B) and ground.

**1 – Ground : Approx. 5V**

OK or NG

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



# TROUBLE DIAGNOSIS

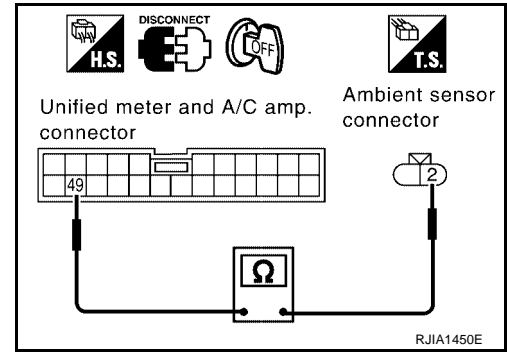
## 2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E1 terminal 2 (B/Y) and unified meter and A/C amp. harness connector M89 terminal 49 (B/Y).

**2 – 49 : Continuity should exist.**

OK or NG

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



## 3. CHECK AMBIENT SENSOR

Refer to [ATC-91, "Ambient Sensor"](#) .

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace ambient sensor.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between ambient sensor harness connector E1 terminal 1 (O/B) and unified meter and A/C amp. harness connector M89 terminal 39 (O/B).

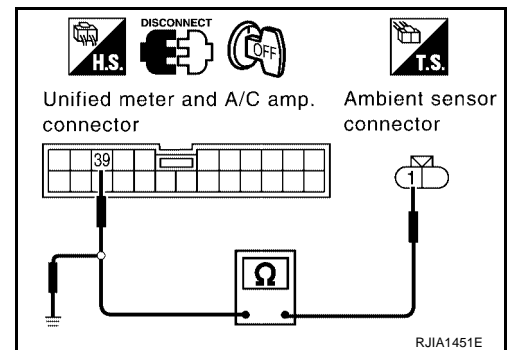
**1 – 39 : Continuity should exist.**

4. Check continuity between ambient sensor harness connector E1 terminal 1 (O/B) and ground.

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

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP -2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

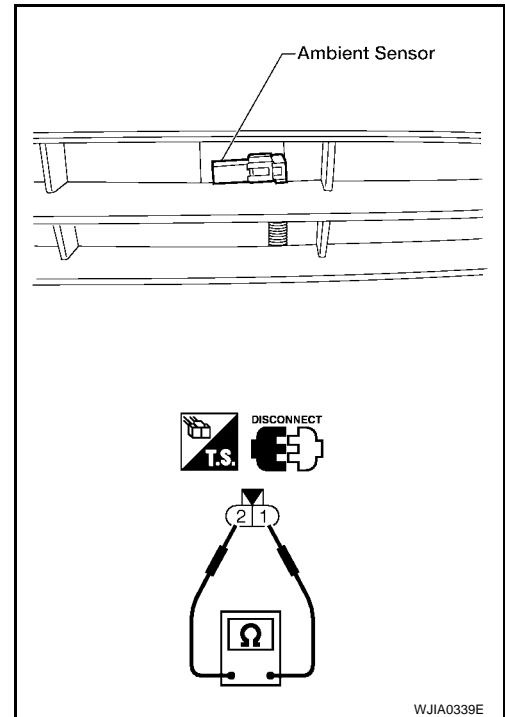
## COMPONENT INSPECTION

### Ambient Sensor

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

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

If NG, replace ambient sensor.



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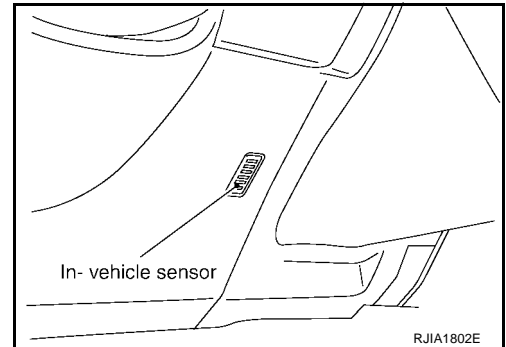
# TROUBLE DIAGNOSIS

EJS001M7

## In-vehicle Sensor Circuit COMPONENT DESCRIPTION

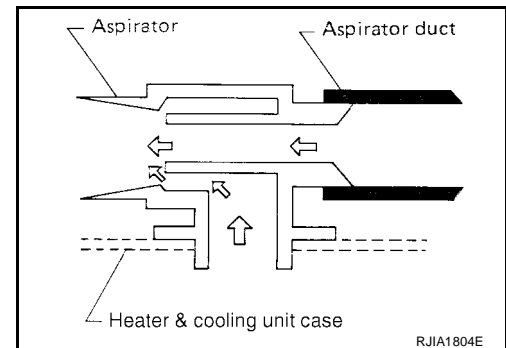
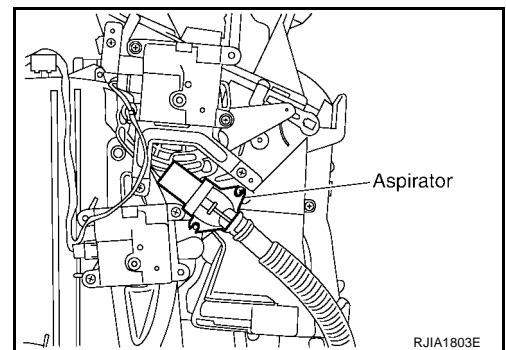
### In-vehicle Sensor

The in-vehicle sensor is located on instrument lower driver panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the unified meter and A/C amp.



### Aspirator

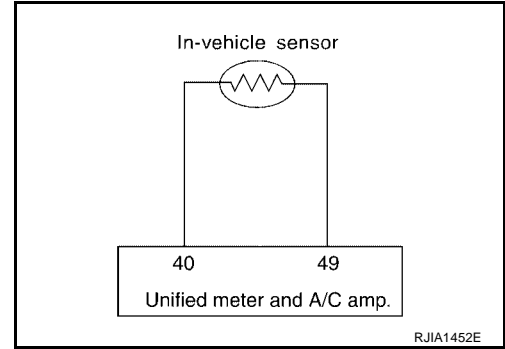
The aspirator is located on driver's side of heater & cooling unit. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.



# TROUBLE DIAGNOSIS

## DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

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



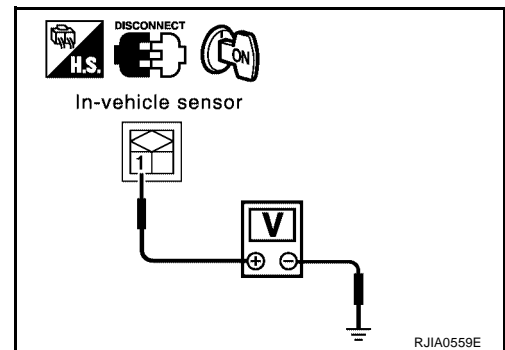
### 1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M32 terminal 1 (LG) and ground.

**1 – Ground : Approx. 5V**

OK or NG

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



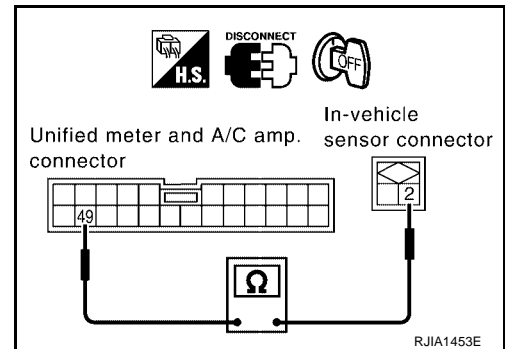
### 2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M32 terminal 2 (B/Y) and unified meter and A/C amp. harness connector M89 terminal 49 (B/Y).

**2 – 49 : Continuity should exist.**

OK or NG

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



### 3. CHECK IN-VEHICLE SENSOR

Refer to [ATC-94, "In-vehicle Sensor"](#) .

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace in-vehicle sensor.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.

# TROUBLE DIAGNOSIS

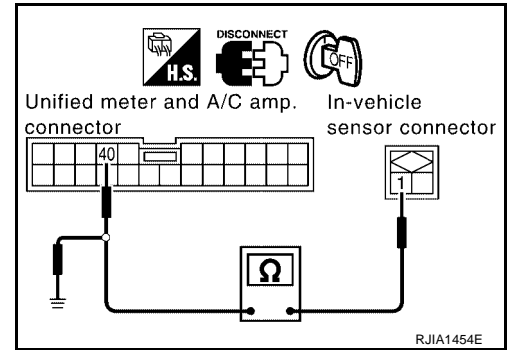
## 4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between in-vehicle sensor harness connector M32 terminal 1 (LG) and unified meter and A/C amp. harness connector M89 terminal 40 (LG).

**1 – 40 : Continuity should exist.**

4. Check continuity between in-vehicle sensor harness connector M32 terminal 1 (LG) and ground.

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



OK or NG

OK >> 1. Replace unified meter and A/C amp.

2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.

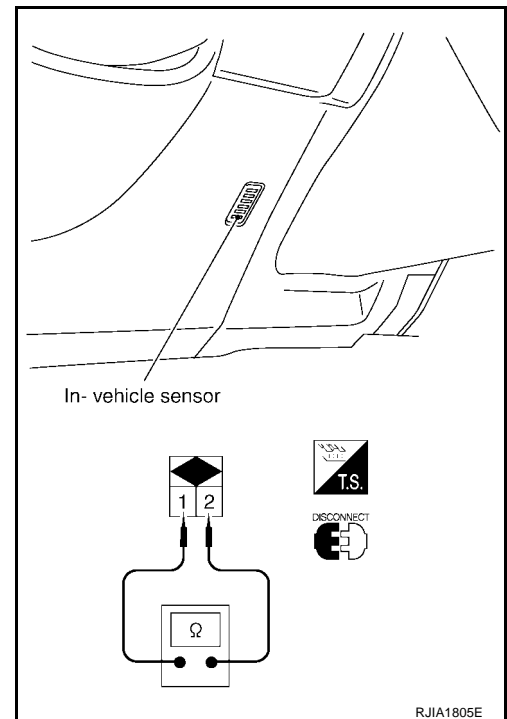
## COMPONENT INSPECTION

### In-vehicle Sensor

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

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

If NG, replace in-vehicle sensor.



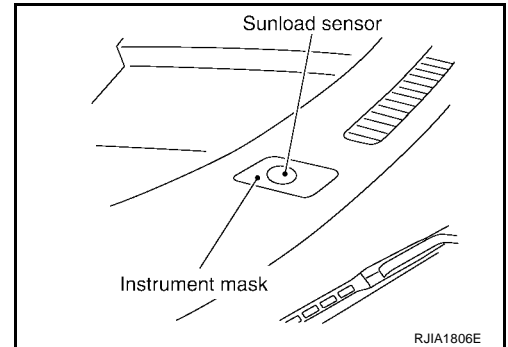
# TROUBLE DIAGNOSIS

EJS001M8

## Sunload Sensor Circuit COMPONENT DESCRIPTION

### Sunload Sensor

The sunload sensor is located on the passenger side 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 unified meter and A/C amp.



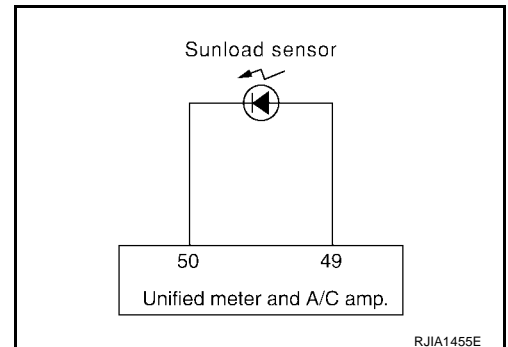
### SUNLOAD INPUT PROCESS

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

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

### DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR

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



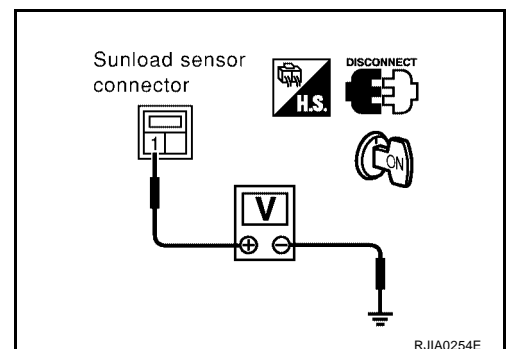
## 1. CHECK VOLTAGE BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M65 terminal 1 (O) and ground.

**1 – Ground : Approx. 5V**

OK or NG

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



# TROUBLE DIAGNOSIS

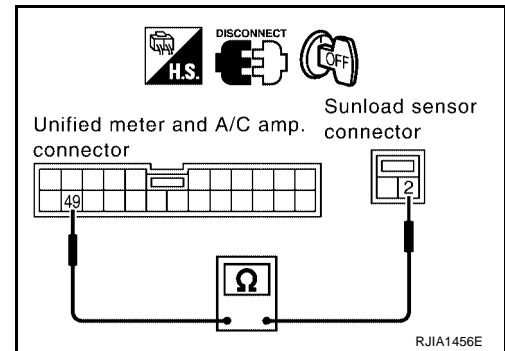
## 2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M65 terminal 2 (B/Y) and unified meter and A/C amp. harness connector M89 terminal 49 (B/Y).

**2 – 49 : Continuity should exist.**

OK or NG

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



## 3. CHECK SUNLOAD SENSOR

Refer to [ATC-97, "Sunload Sensor"](#) .

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace sunload sensor.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between sunload sensor harness connector M65 terminal 1 (O) and display and A/C auto amp. harness connector M89 terminal 50 (O).

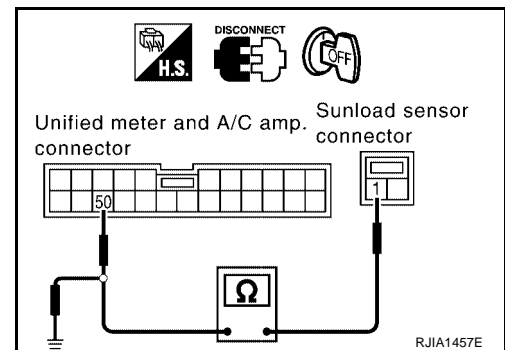
**1 – 50 : Continuity should exist.**

4. Check continuity between sunload sensor harness connector M65 terminal 1 (O) and ground.

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

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.



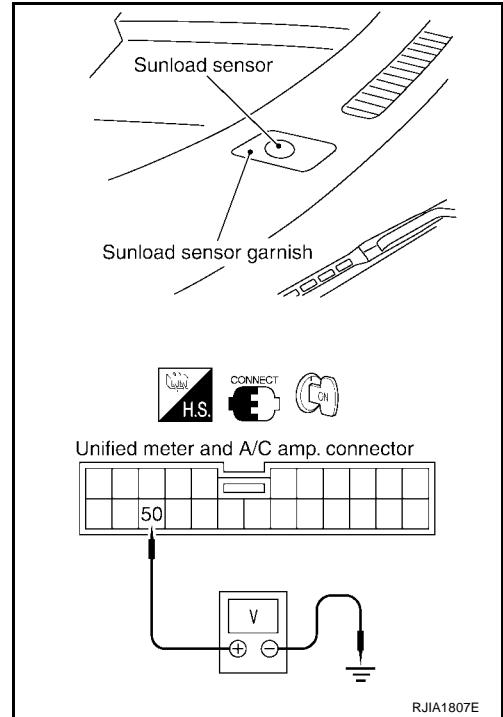


# TROUBLE DIAGNOSIS

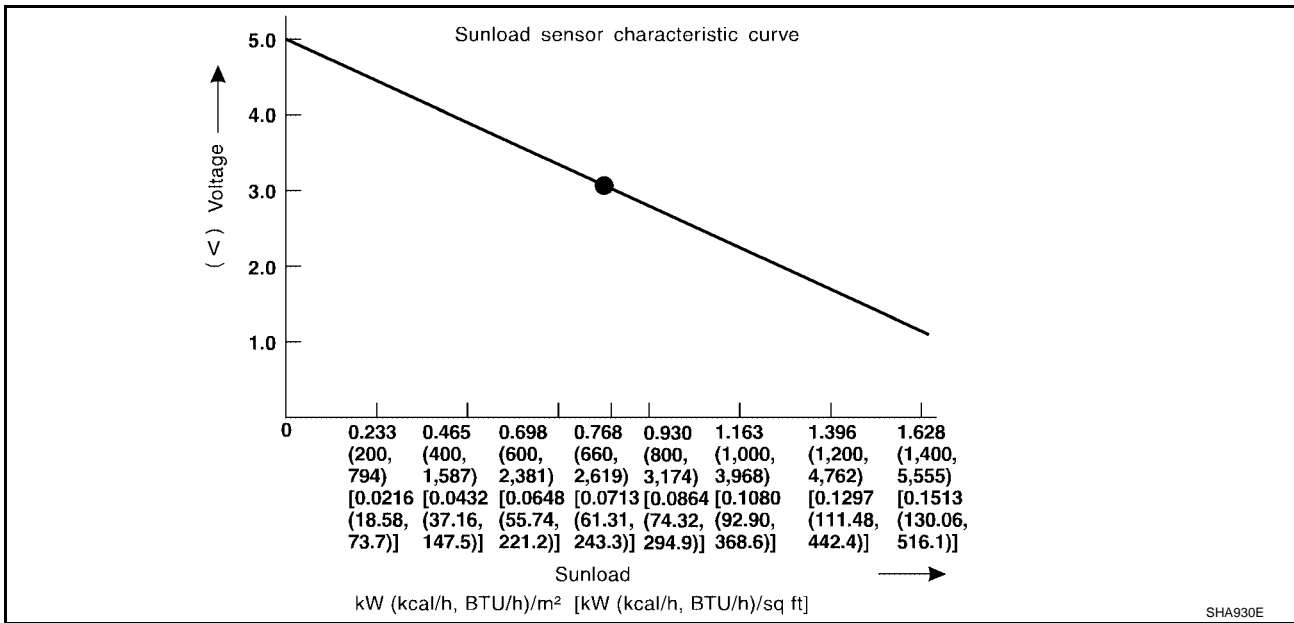
## COMPONENT INSPECTION

### Sunload Sensor

Measure voltage between unified meter and A/C amp. harness connector M89 terminal 50 (O) and ground.  
If NG, replace unified meter and A/C amp.



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



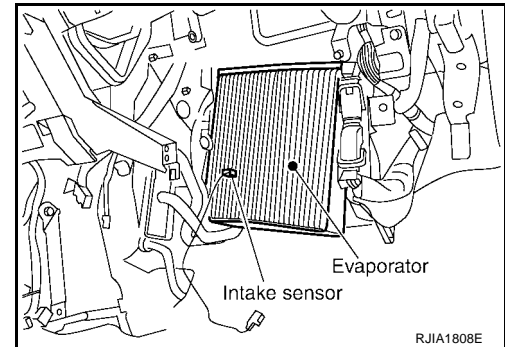
# TROUBLE DIAGNOSIS

EJS001M9

## Intake Sensor Circuit COMPONENT DESCRIPTION

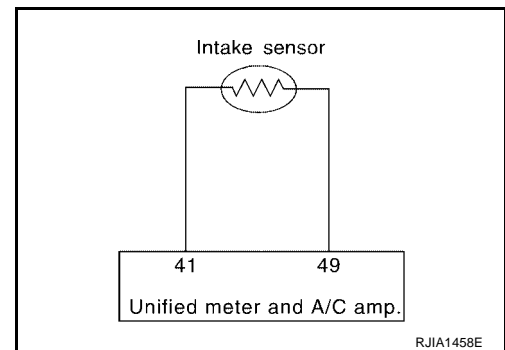
### Intake Sensor

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 unified meter and A/C amp.



### DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (24 or -24 is indicated on unified meter and A/C amp. as a result of conducting Self-diagnosis STEP 2.)



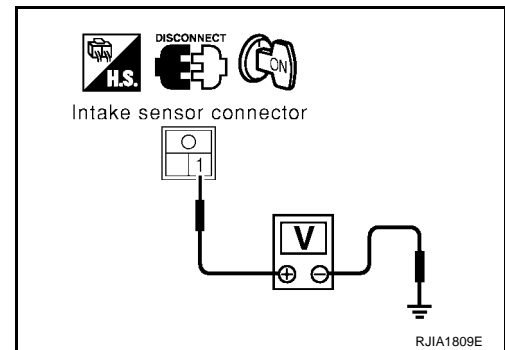
### 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M33 terminal 1 (R/W) and ground.

**1 – Ground : Approx. 5V**

OK or NG

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



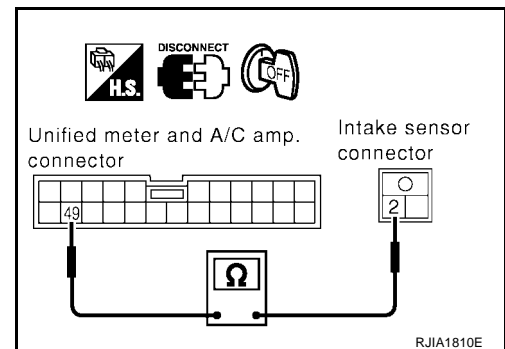
### 2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

1. Turn ignition switch OFF.
2. Disconnect unified meter and A/C amp. connector.
3. Check continuity between intake sensor harness connector M33 terminal 2 (B/Y) and unified meter and A/C amp. harness connector M89 terminal 49 (B/Y).

**2 – 49 : Continuity should exist.**

OK or NG

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



# TROUBLE DIAGNOSIS

## 3. CHECK INTAKE SENSOR

Refer to [ATC-99, "Intake Sensor"](#) .

OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
 2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace intake sensor.  
 2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.

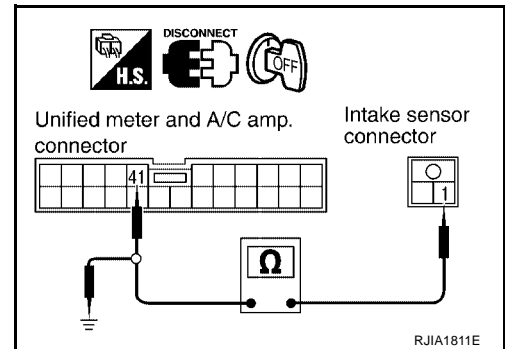
## 4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND UNIFIED METER AND A/C AMP.

- Turn ignition switch OFF.
- Disconnect unified meter and A/C amp. connector.
- Check continuity between intake sensor harness connector M33 terminal 1 (R/W) and unified meter and A/C amp. harness connector M89 terminal 41 (R/W).

**1 – 41 : Continuity should exist.**

- Check continuity between intake sensor harness connector M33 terminal 1 (R/W) and ground.

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



OK or NG

- OK >> 1. Replace unified meter and A/C amp.  
 2. Go to self-diagnosis [ATC-43, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP 2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.

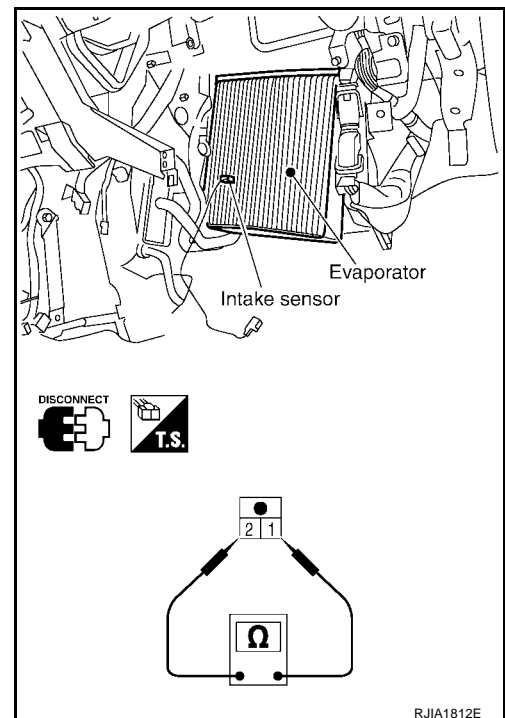
## COMPONENT INSPECTION

### Intake Sensor

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	18.63
-10 (14)	14.14
-5 (23)	10.85
0 (32)	8.40
5 (41)	6.57
10 (50)	5.18
15 (59)	4.12
20 (68)	3.30
25 (77)	2.66
30 (86)	2.16
35 (95)	1.77
40 (104)	1.46
45 (113)	1.21

If NG, replace intake sensor.



# AUTO AMP

PFP:27760

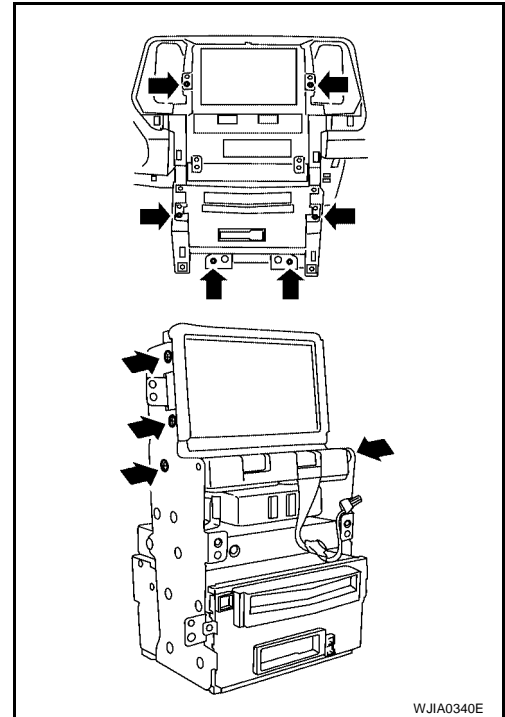
EJS001II

## AUTO AMP

### Removal and Installation

#### REMOVAL

1. Remove shift knob.
2. Remove shift bezel.
3. Remove cluster lid C. Refer to [IP-12, "Cluster Lid C"](#) .
4. Remove cluster lid D. Refer to [IP-12, "Cluster Lid D"](#) .
5. Remove the center stack.
6. Remove fasteners securing rear of unified meter and A/C auto amp.
7. Remove fasteners on either side of display screen.
8. Gently spread top of bracket and remove unified meter and A/C auto amp.



#### INSTALLATION

Installation is the reverse order of removal.

# AMBIENT SENSOR

## AMBIENT SENSOR

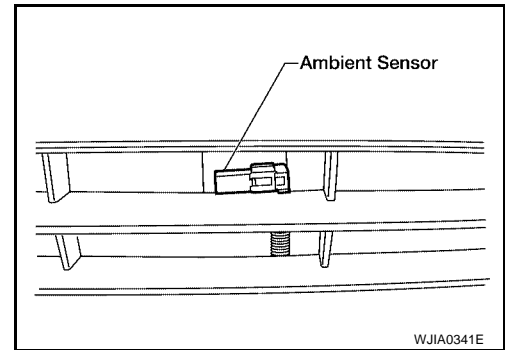
PFP:27722

### Removal and Installation

EJS001U

#### REMOVAL

1. Disconnect ambient sensor connector.
2. Release the ambient sensor clip and then remove it.



#### INSTALLATION

Installation is the reverse order of removal.

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# IN-VEHICLE SENSOR

## IN-VEHICLE SENSOR

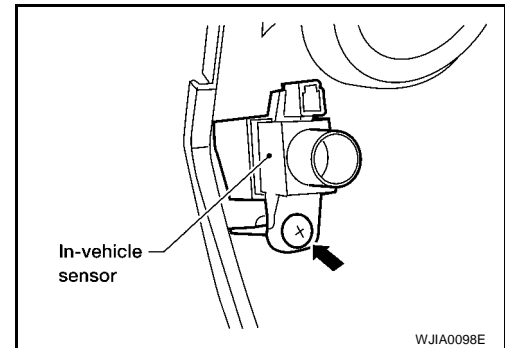
PF2:27720

### Removal and Installation

EJS001K

#### REMOVAL

1. Remove lower driver instrument panel assembly. Refer to [IP-14, "Lower Driver Instrument Panel"](#).
2. Remove the in-vehicle sensor retaining screw and then remove the in-vehicle sensor.



#### INSTALLATION

Installation is the reverse order of removal.

# SUNLOAD SENSOR

## SUNLOAD SENSOR

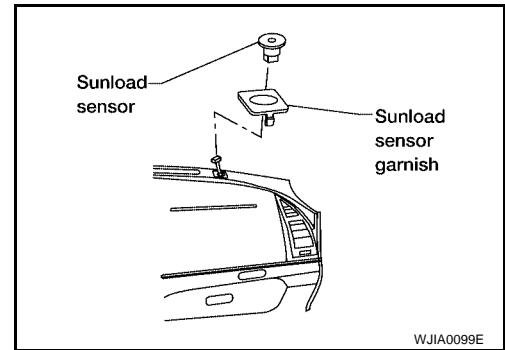
PFP:27721

### Removal and Installation

EJS001L

#### REMOVAL

1. Remove the sunload sensor garnish.
2. Disconnect the connector.
3. Release the sunload sensor tabs and then remove it from the garnish.



#### INSTALLATION

Installation is the reverse order of removal.

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ATC

# INTAKE SENSOR

PFP:27723

EJS001M

## INTAKE SENSOR

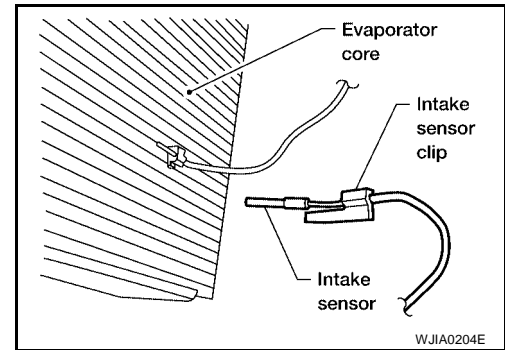
### Removal and Installation

#### REMOVAL

1. Remove the evaporator. Refer to [ATC-124, "Removal and Installation for Evaporator"](#) .
2. Remove the intake sensor clip and then the sensor.

**CAUTION:**

**Be careful not to damage the core surface.**



#### INSTALLATION

Installation is the reverse order of removal.



# BLOWER UNIT

## BLOWER UNIT

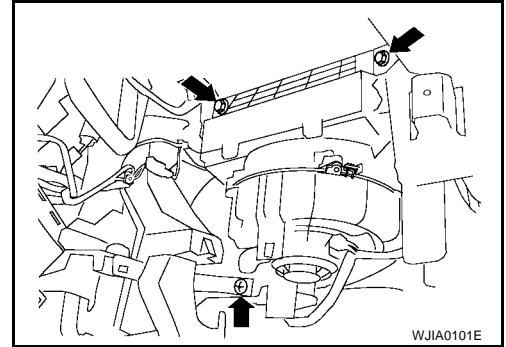
PFP:27200

### Removal and Installation

EJS0010

#### REMOVAL

1. Remove the glove box assembly. Refer to [IP-16, "Instrument Lower Cover RH and Glove Box"](#).
2. Remove console side cover. Refer to [IP-17, "Center Console"](#).
3. Remove the ECM.
4. Disconnect the blower motor, intake door motor and fan control amp. connector
5. Disconnect the main harness from the top of the blower unit.
6. Remove the 2 bolts and 1 screw from the blower unit, then remove it.



#### INSTALLATION

Installation is the reverse order of removal.

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ATC

# BLOWER MOTOR

## BLOWER MOTOR

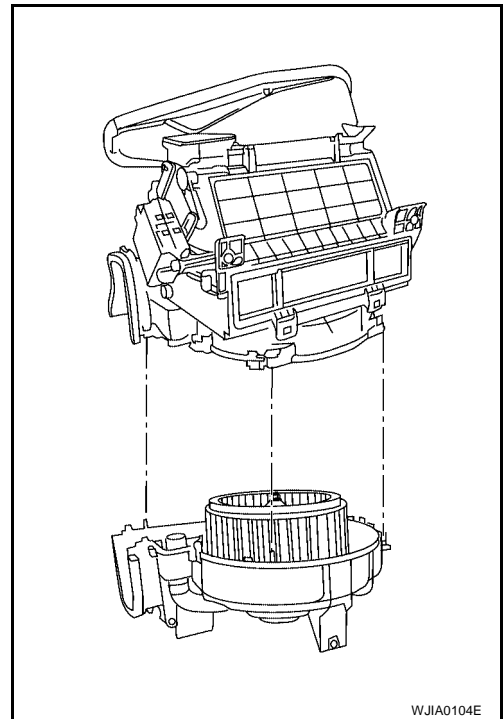
PFP:27226

### Removal and Installation

EJS001P

#### REMOVAL

1. Remove the blower unit. Refer to [ATC-105, "Removal and Installation"](#) .
2. Release the 8 tabs attaching blower motor to blower unit case and then remove it.



#### INSTALLATION

Installation is the reverse order of removal.

# INTAKE DOOR MOTOR

## INTAKE DOOR MOTOR

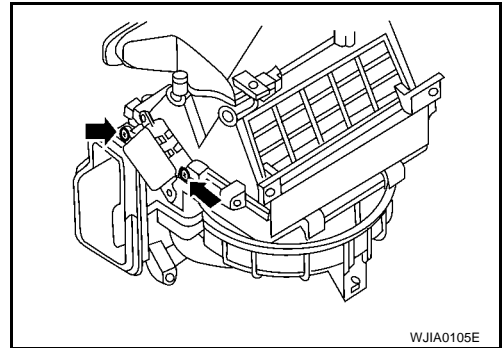
PFP:27730

### Removal and Installation

EJS001Q

#### REMOVAL

1. Remove the blower unit. Refer to [ATC-105, "Removal and Installation"](#) .
2. Remove the screws and then the intake door motor from the blower unit.



#### INSTALLATION

Installation is the reverse order of removal.

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# IN-CABIN MICROFILTER

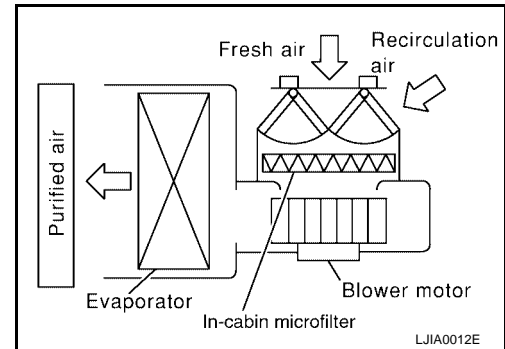
## IN-CABIN MICROFILTER

PF2:27277

### Removal and Installation FUNCTION

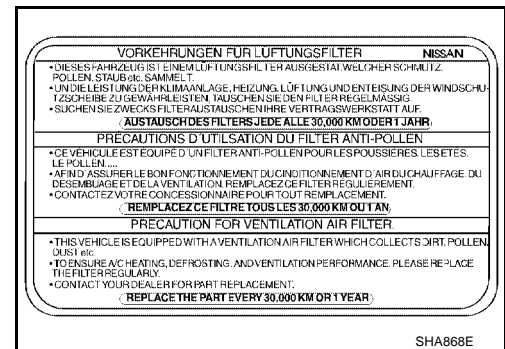
EJS0011R

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



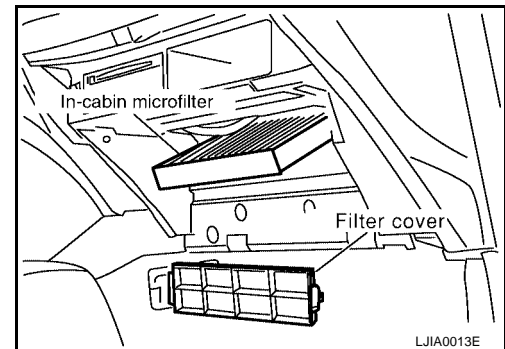
### REPLACEMENT TIMING

Replace in-cabin microfilter.  
Refer to [MA-6, "Schedule 1"](#) and [MA-8, "Schedule 2"](#).  
Caution label is affixed inside the glove box.



### REPLACEMENT PROCEDURES

1. Remove glove box assembly. Refer to [IP-16, "Instrument Lower Cover RH and Glove Box"](#).
2. Remove in-cabin microfilter cover.
3. Remove the in-cabin microfilter from blower unit.
4. Replace with new in-cabin microfilter and reinstall cover on blower unit.
5. Reinstall glove box assembly.



# HEATER & COOLING UNIT ASSEMBLY

PF27110

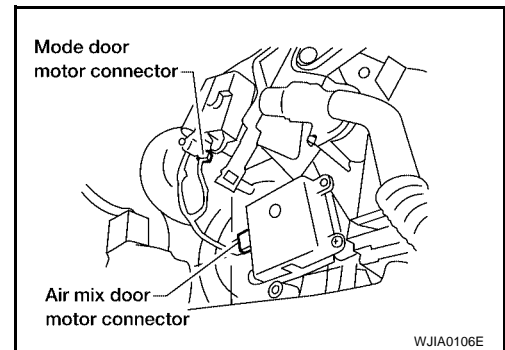
## HEATER & COOLING UNIT ASSEMBLY

EJS001S

### Removal and Installation

#### REMOVAL

1. Discharge refrigerant from A/C system. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#)
2. Drain coolant from cooling system. Refer to [MA-14, "Changing Engine Coolant"](#) .
3. Disconnect heater hoses from heater core pipes.
4. Disconnect refrigerant lines from evaporator.
5. Remove the instrument panel. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#) .
6. Remove the blower unit. Refer to [ATC-105, "BLOWER UNIT"](#) .
7. Disconnect mode door motor and air mix door motor connectors.
8. Remove the heater and cooling unit.



#### INSTALLATION

Installation is the reverse order of removal.

#### NOTE:

When filling radiator with coolant, refer to [MA-14, "REFILLING ENGINE COOLANT"](#) . Recharge the A/C system. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#) .

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# HEATER CORE

PFP:27140

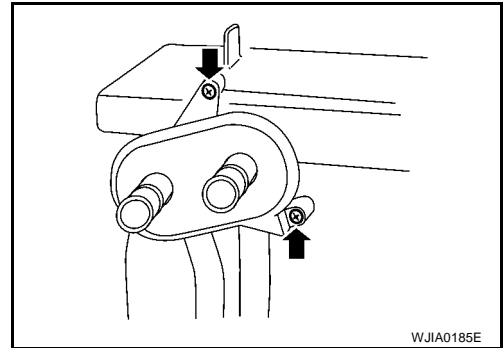
EJS0011T

## HEATER CORE

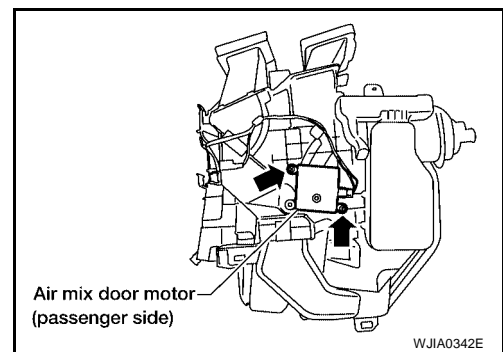
### Removal and Installation

#### REMOVAL

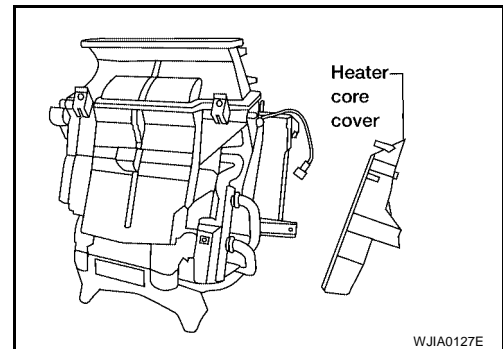
1. Remove heater and cooling unit. Refer to [ATC-109, "HEATER & COOLING UNIT ASSEMBLY"](#).
2. Remove heater core pipe support screws and then remove heater core pipe support.



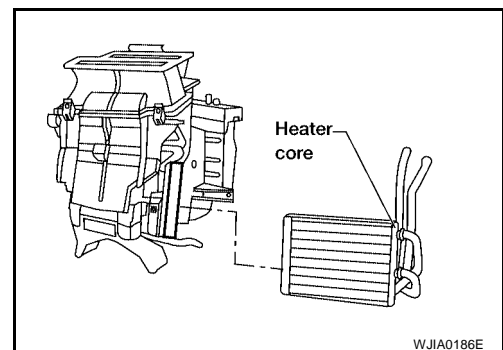
3. Remove the air mix door motor (passenger side).



4. Remove heater core cover screws and then remove heater core cover.



5. Remove heater core.



#### INSTALLATION

Installation is the reverse order of removal.

# MODE DOOR MOTOR

## MODE DOOR MOTOR

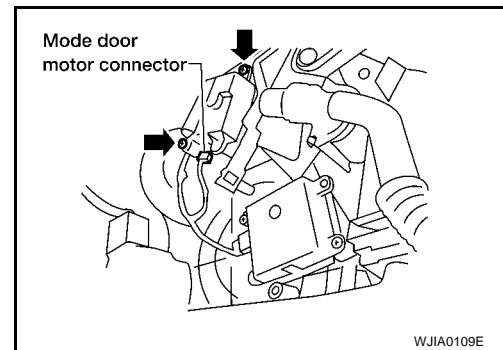
PFP:27731

### Removal and Installation

EJS001IU

#### REMOVAL

1. Remove the driver lower instrument panel assembly. Refer to [IP-14, "Lower Driver Instrument Panel"](#).
2. Disconnect the mode door motor connector.
3. Remove the mode door motor screws and then remove mode door motor.



#### INSTALLATION

Installation is the reverse order of removal.

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# AIR MIX DOOR MOTOR

## AIR MIX DOOR MOTOR

PF2:27732

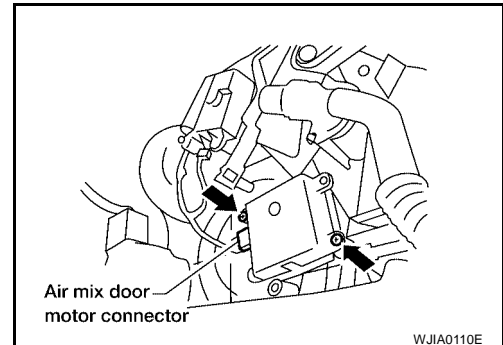
### Removal and Installation

EJS0011V

#### REMOVAL

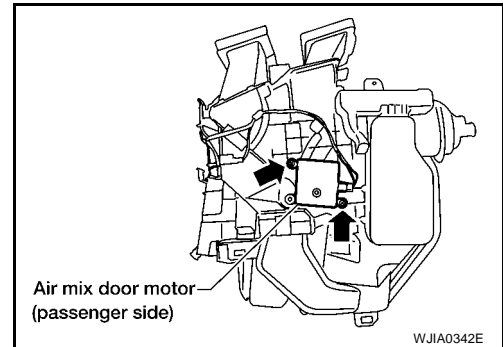
##### Driver Side Air Mix Door Motor

1. Remove the driver lower instrument panel assembly. Refer to [IP-14, "Lower Driver Instrument Panel"](#).
2. Disconnect the driver side air mix door motor connector.
3. Remove the driver side air mix door motor screws and then remove driver side air mix door motor.



##### Passenger Side Air Mix Door Motor

1. Remove the instrument passenger lower panel. Refer to [IP-16, "Instrument Lower Cover RH and Glove Box"](#).
2. Disconnect the passenger side air mix door motor connector.
3. Remove the passenger side air mix door motor screws and then remove passenger side air mix door motor.



### INSTALLATION

Installation is the reverse order of removal.



# FAN CONTROL AMPLIFIER

## FAN CONTROL AMPLIFIER

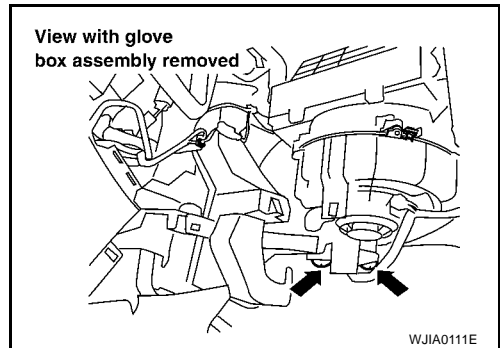
PF2:27761

### Removal and Installation

EJS001W

#### REMOVAL

1. Disconnect fan control amp. connector.
2. Remove screws from the fan control amp. and then remove fan control amp.



#### INSTALLATION

Installation is the reverse order of removal.

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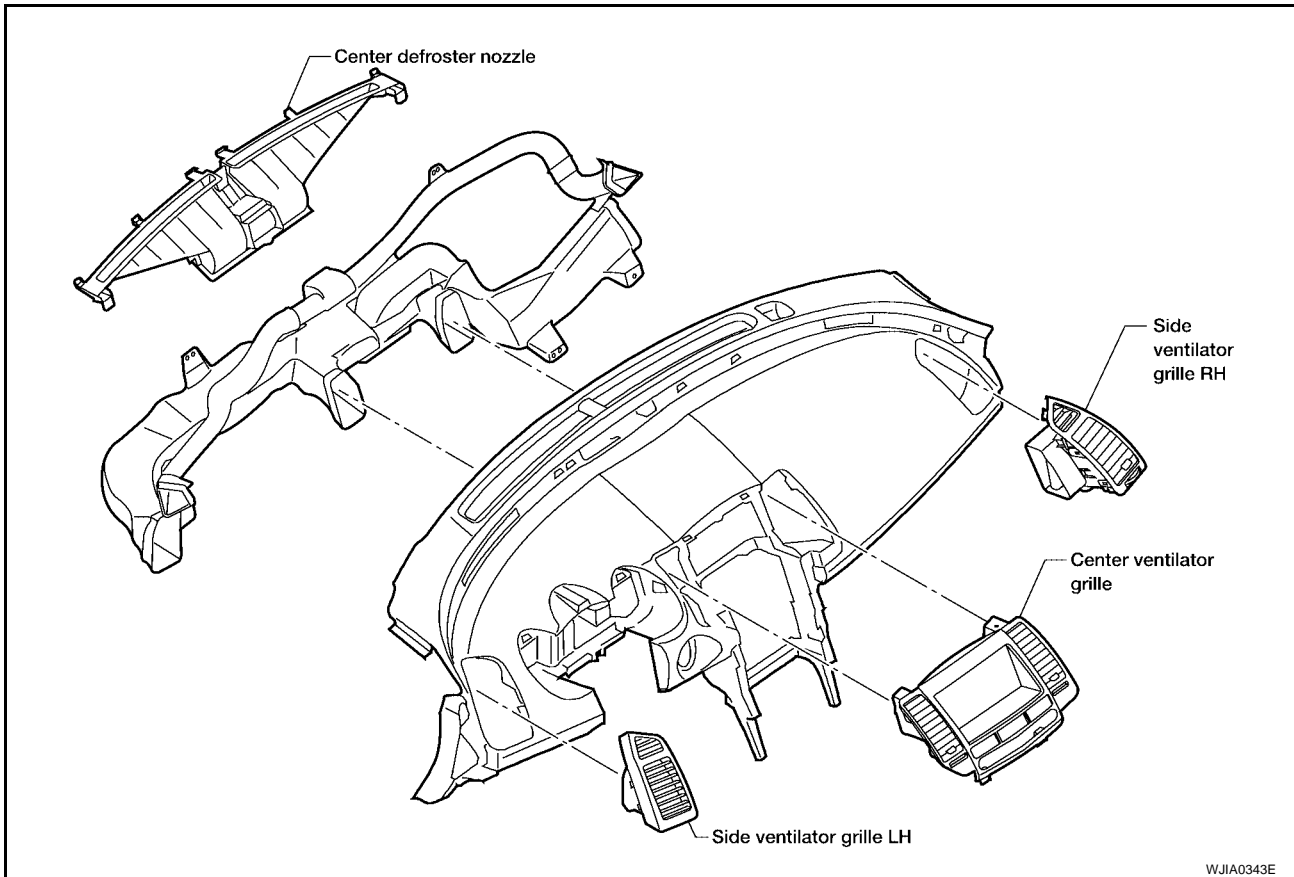
## DUCTS AND GRILLES

PFP:27860

### Removal and Installation REMOVAL

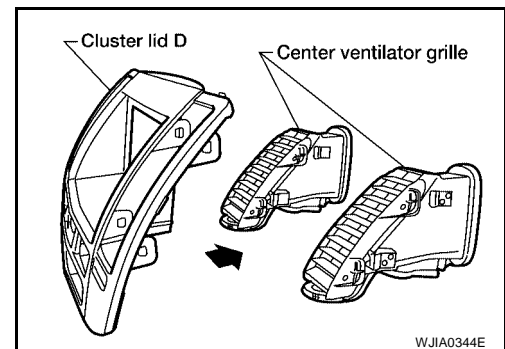
EJS001IX

#### Ventilator Duct, Defroster Nozzle and Defroster Ducts



#### Center Ventilator Grille

1. Remove shift knob.
2. Remove shift bezel.
3. Remove cluster lid C, refer to [IP-12, "Cluster Lid C"](#).
4. Remove cluster lid D, refer to [IP-12, "Cluster Lid D"](#).
5. Release the tabs to remove each of the two center ventilator grilles.

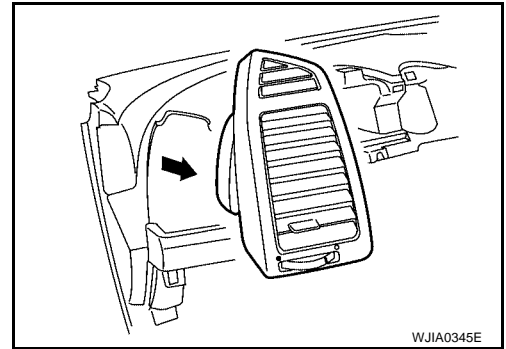


#### Side Ventilator Grille LH

1. Remove the instrument panel, refer to [IP-10, "Removal and Installation"](#).

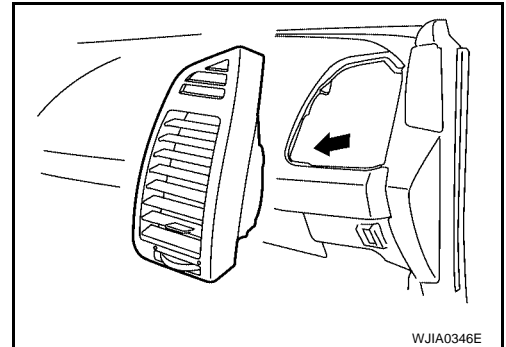
# DUCTS AND GRILLES

2. Release the tabs to remove side ventilator grille LH.



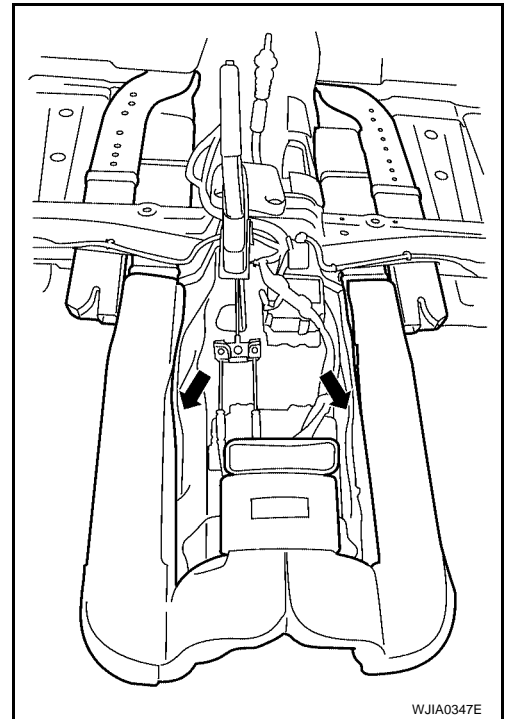
## Side Ventilator Grille RH

1. Remove the instrument panel, refer to [IP-10, "Removal and Installation"](#).
2. Release the tabs to remove side ventilator grille RH.



## Floor duct

1. Remove the carpet. Refer to [EI-40, "FLOOR TRIM"](#).



## INSTALLATION

Installation is the reverse order of removal.

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# REFRIGERANT LINES

PFP:92600

EJS001J3

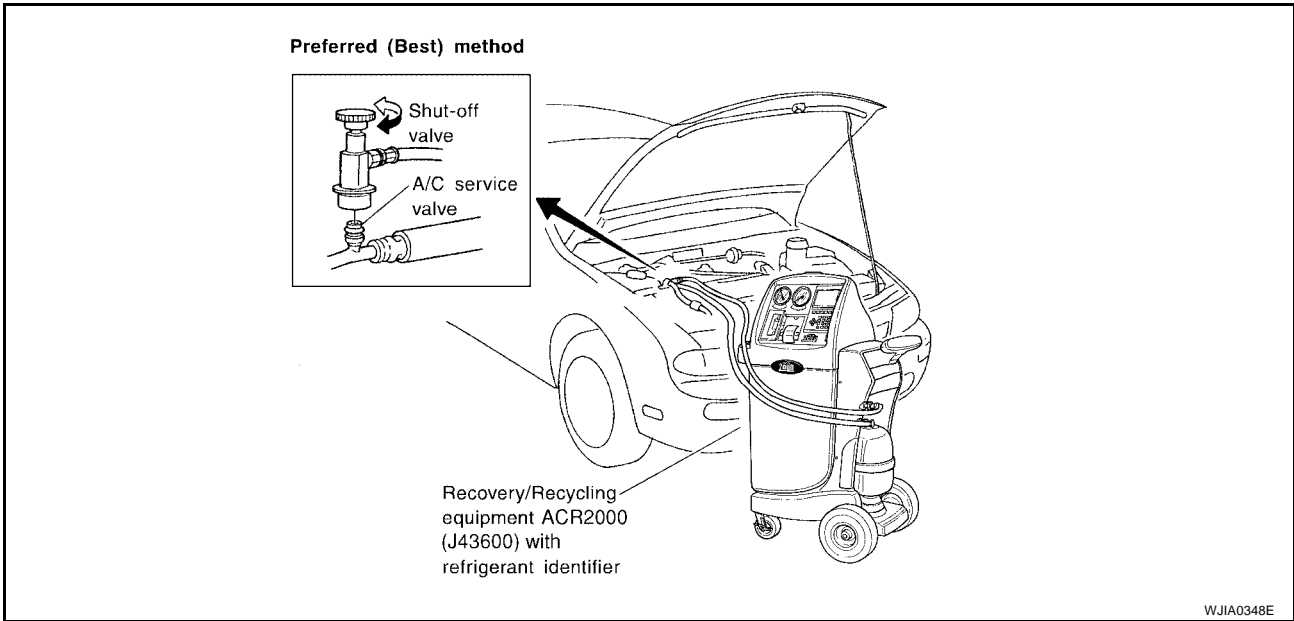
## REFRIGERANT LINES

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

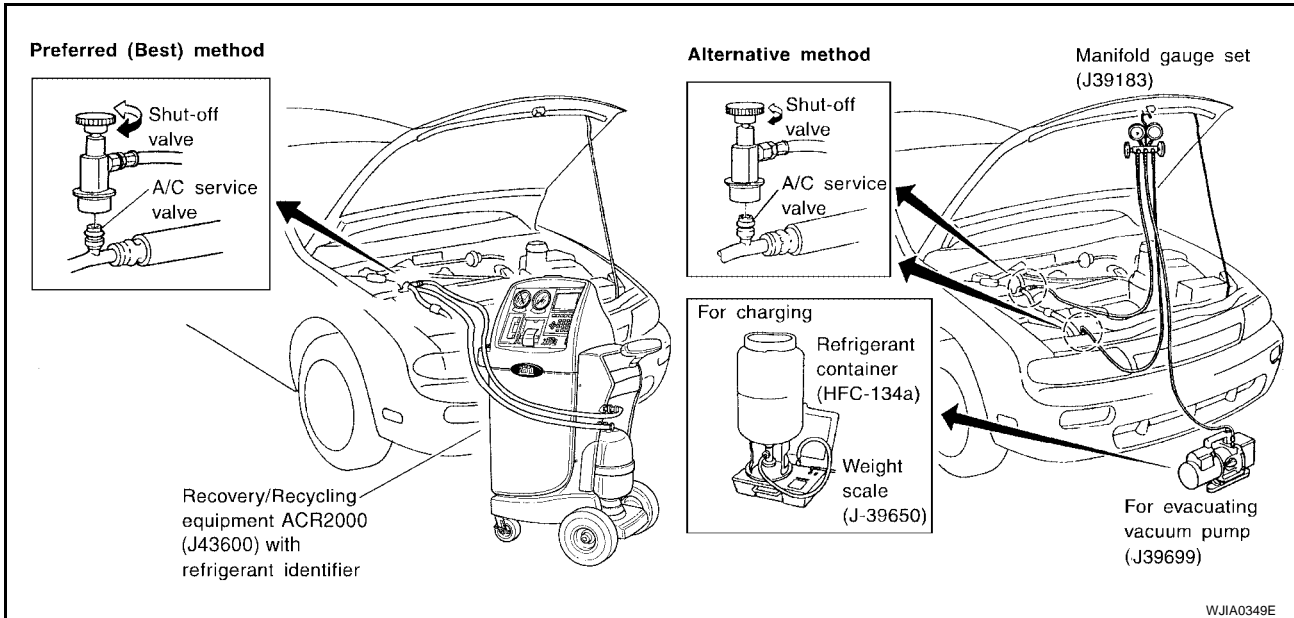
#### Discharging Refrigerant

**WARNING:**

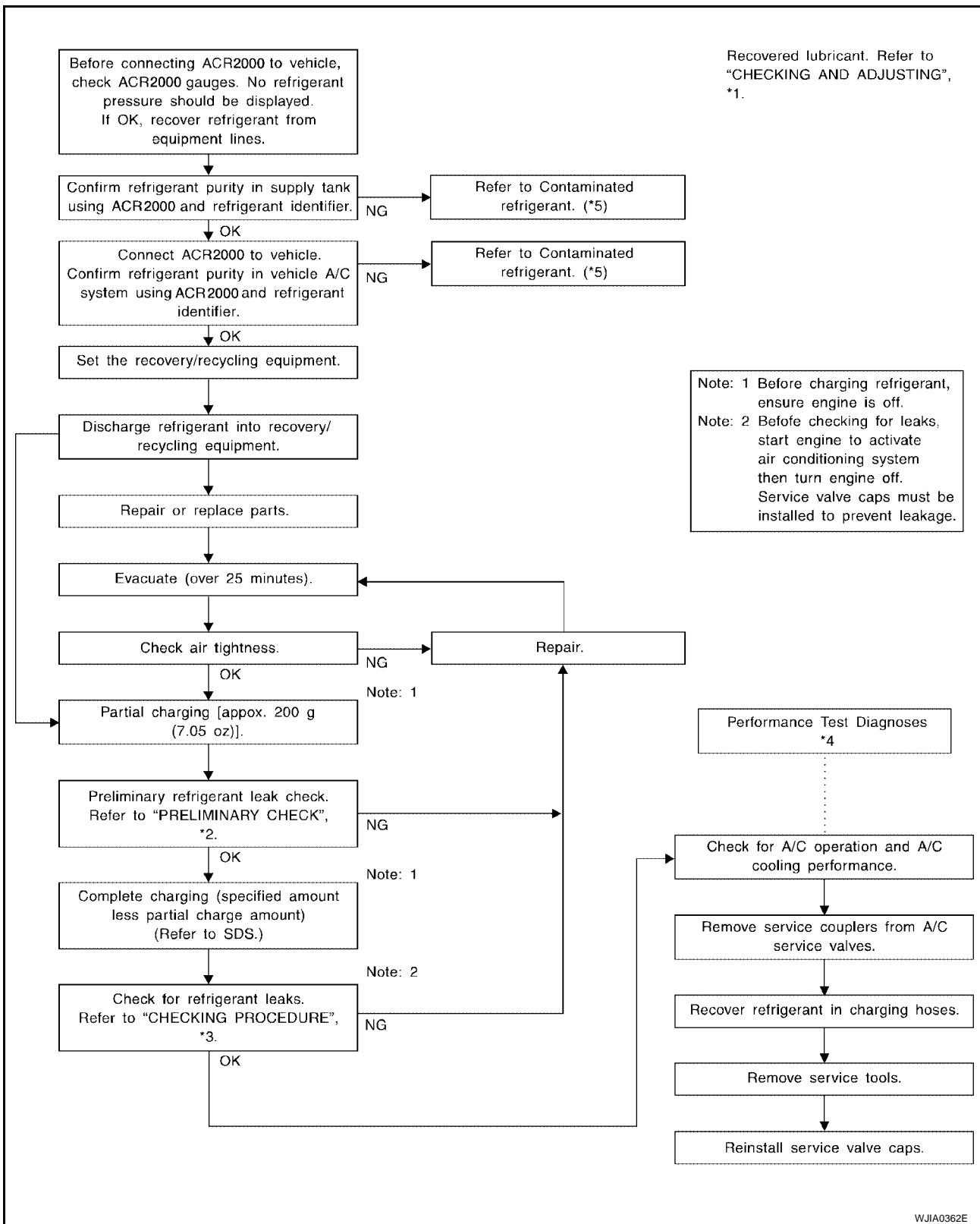
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment) or J2201 (R-134a recovery equipment). If accidental system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



#### Evacuating System and Charging Refrigerant



# REFRIGERANT LINES



\*1 [ATC-18, "CHECKING AND ADJUSTING"](#).

\*2 [ATC-126, "Checking for Refrigerant Leaks"](#).

\*3 [ATC-126, "Checking for Refrigerant Leaks"](#).

\*4 [ATC-79, "PERFORMANCE TEST DIAGNOSES"](#).

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

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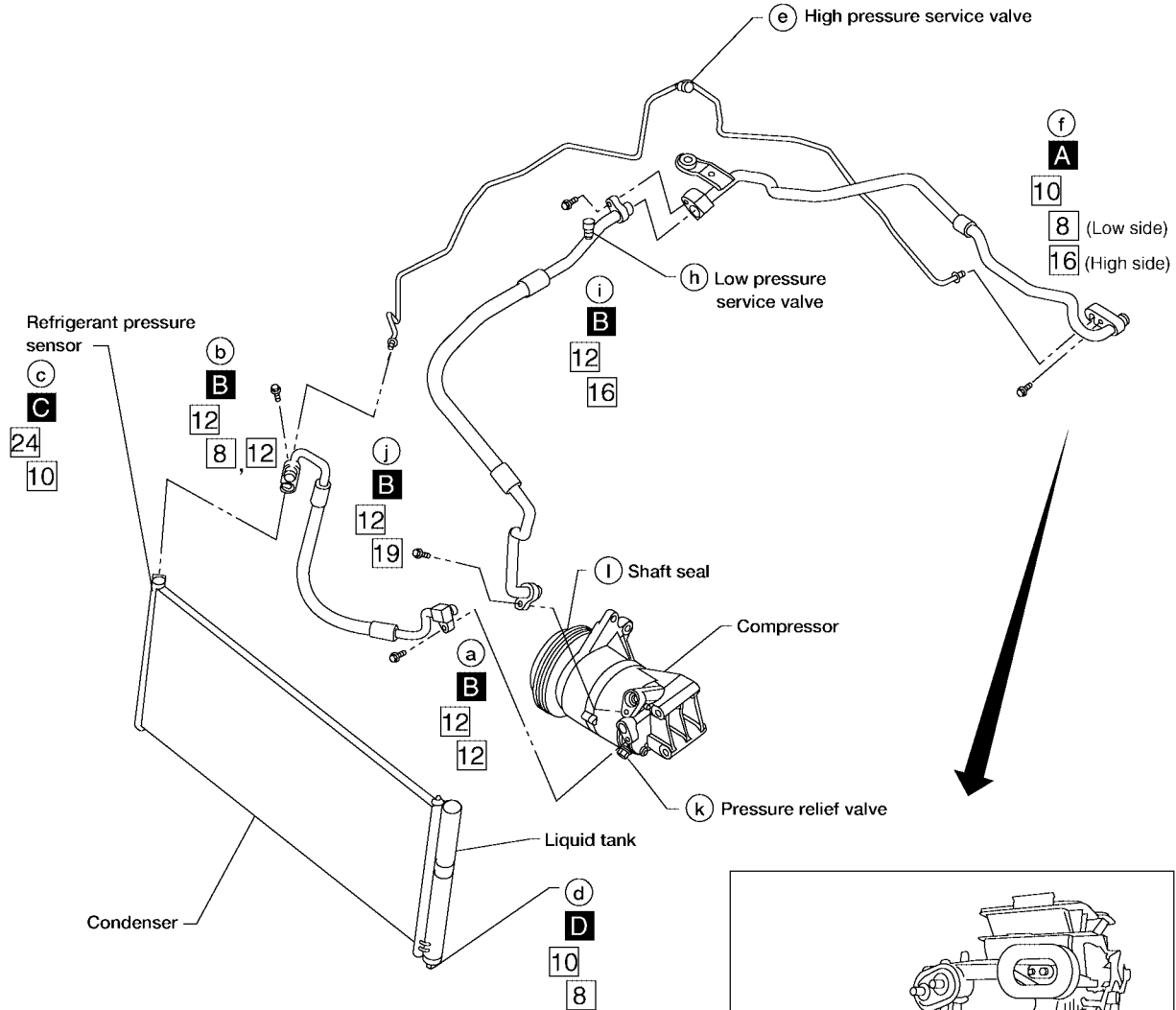
# REFRIGERANT LINES

EJS001J4

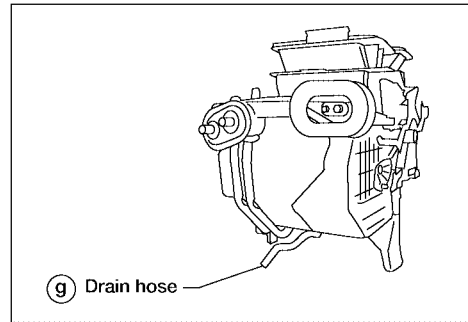
## Components

Refer to [ATC-6, "Precautions for Refrigerant Connection"](#).

SEC. 214 • 271 • 274 • 276



- : Refrigerant leak checking order
- : (Tightening torque)
- ▭ : (Wrench size)
- ▭ : (O-ring size)
- ⊗ : N·m (kg-m, in-lb)
- ⊙ : N·m (kg-m, ft-lb)
- A** ⊗ : 2.9 – 5.9 (0.29 – 0.60, 26 – 52)
- B** ⊗ : 7.8 – 19.6 (0.8 – 1.9, 69 – 173)
- C** ⊙ : 9.8 – 11.7 (1.0 – 1.1, 7.3 – 8.6)
- D** ⊗ : 5.0 – 6.47 (0.51 – 0.65, 45 – 57)

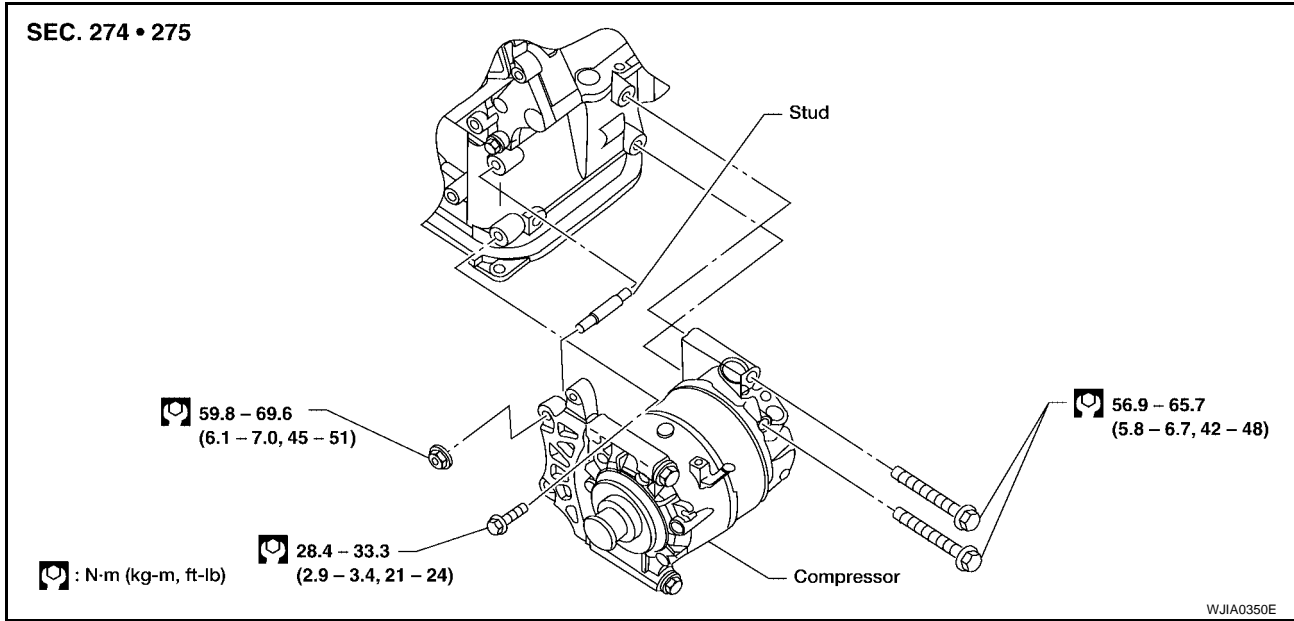


WJIA0982E

# REFRIGERANT LINES

## Removal and Installation for Compressor

EJS001J5



### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the drive belt.  
Refer to [MA-12, "Drive Belts"](#).
3. Remove the coolant pipe bracket bolt.
4. Remove compressor mounting stud.
5. Disconnect the compressor connector.
6. Remove the high-pressure flexible hose and low-pressure flexible hose.

#### CAUTION:

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

7. Remove the mounting bolts and nut from compressor using power tools.

### INSTALLATION

#### CAUTION:

- Replace the O-ring of the low-pressure flexible hose and high-pressure flexible hose with a new one, then apply compressor oil to it when installing it.
- When charging refrigerant, check for leaks.

#### Compressor mounting bolts (rear side)

Tightening torque : 56.9 - 65.7 N-m (5.8 - 6.7 kg-m, 42 - 48 ft-lb)

#### Bolt mounting the compressor (front side)

Tightening torque : 28.4 - 33.3 N-m (2.9 - 3.4 kg-m, 21 - 24 ft-lb)

#### Nut mounting the compressor (front side)

Tightening torque : 59.8 - 69.6 N-m (6.1 - 7.0 kg-m, 45 - 51 ft-lb)

#### Bolt mounting the high- and low-pressure flexible hoses

Tightening torque : 7.8 - 19.6 N-m (0.8 - 1.9 kg-m, 69 - 173 in-lb)

# REFRIGERANT LINES

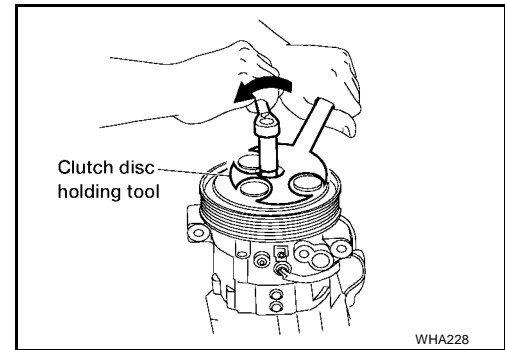
EJS001J6

## Removal and Installation for Compressor Clutch REMOVAL

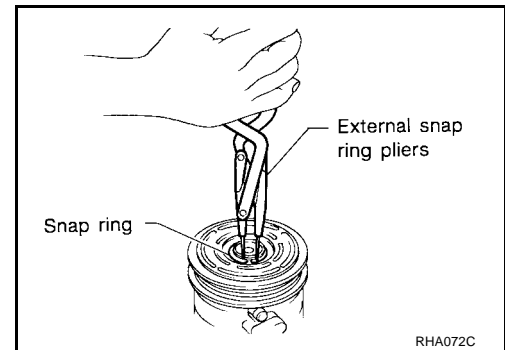
- When removing center bolt, hold clutch disc with tool.

**Commercial service tool : J-44614**

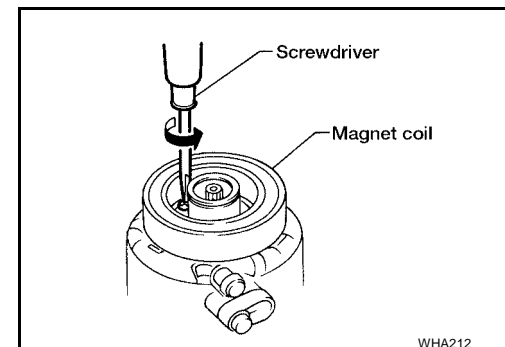
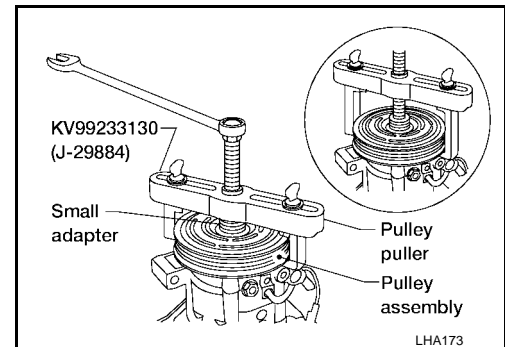
- Remove the clutch disc.



- Remove the snap ring using external snap ring pliers.



- Pulley removal:



Use a pulley puller with small adapter. Position the small adapter on the end of the drive shaft and the center of the puller on the small adapter. Remove the pulley assembly with the puller.

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

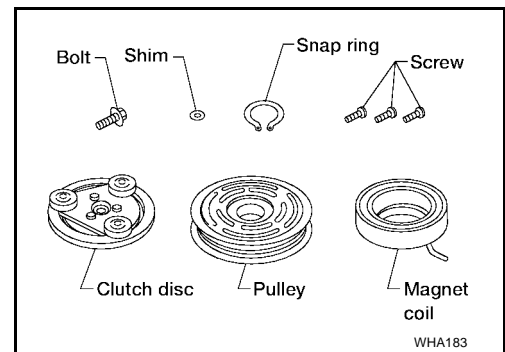
- Remove the snap ring using external snap ring pliers.
- Remove the magnet coil harness clip using a screwdriver, remove the three magnet coil fixing screws and remove the magnet coil.



# REFRIGERANT LINES

## INSPECTION

### Clutch Disc



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

### Pulley

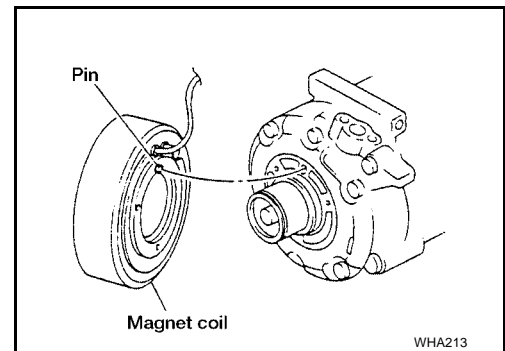
Check the appearance of the pulley assembly. If contact surface of pulley shows signs of excessive grooving, replace clutch disc and pulley. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

### Coil

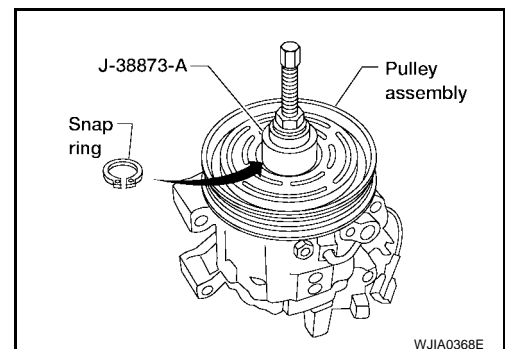
Check magnet coil for loose connection or cracked insulation.

## INSTALLATION

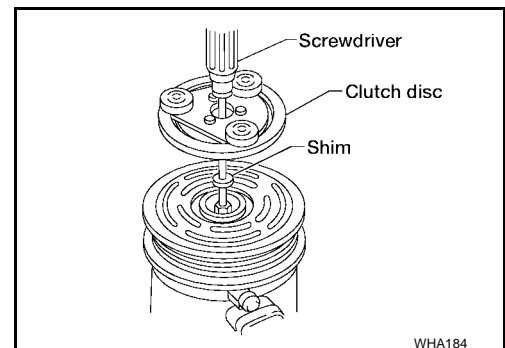
- Install the magnet coil.  
**Be sure to align the magnet coil pin with the hole in the compressor front head.**
- Install the magnet coil harness clip using a screwdriver.



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



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

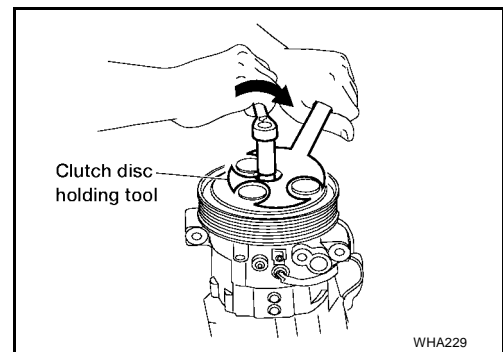


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## REFRIGERANT LINES

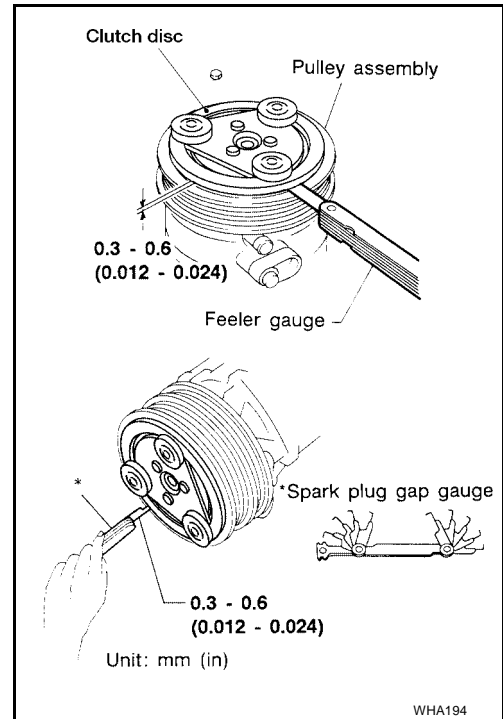
- Using the clutch disc tool to prevent clutch disc rotation, tighten the bolt to 12 N·m (1.2 kg·m, 9 ft·lb).
- After tightening the bolt, check that the pulley rotates smoothly.



- Check clearance all the way around the clutch disc.

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

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



### BREAK-IN OPERATION

When replacing compressor clutch assembly, always 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 Low-pressure Flexible Hose

EJS001J7

#### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-116, "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.

2. Remove the low-pressure flexible hose. Refer to [ATC-118, "Components"](#).

#### INSTALLATION

#### CAUTION:

- Replace the O-ring of the low-pressure flexible hose with a new one, then apply compressor oil to it when installing it.
- When charging refrigerant, check for leaks.

**Low-pressure flexible hose (evaporator side) mounting bolt**

**Tightening torque : 2.9 - 5.9 N·m (0.29 - 0.60 kg·m, 26 - 52 in·lb)**

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

**Tightening torque : 7.8 - 19.6 N·m (0.8 - 1.9 kg·m, 69 - 173 in·lb)**

# REFRIGERANT LINES

Low-pressure flexible hose in-line connection mounting bolt

Tightening torque : 7.8 - 19.6 N·m (0.8 - 1.9 kg·m, 69 - 173 in·lb)

## Removal and Installation for High-pressure Flexible Hose

EJS001J8

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the high-pressure flexible hose. Refer to [ATC-118, "Components"](#) .

### CAUTION:

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

### INSTALLATION

### CAUTION:

- Replace the O-ring of the high-pressure flexible hose with a new one, then apply compressor oil to it when installing it.
- When charging refrigerant, check for leaks.

High-pressure flexible hose mounting bolt

Tightening torque : 7.8 - 19.6 N·m (0.8 - 1.9 kg·m, 69 - 173 in·lb)

## Removal and Installation for High-pressure Pipe

EJS001J9

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the high-pressure pipe. Refer to [ATC-118, "Components"](#) .

### CAUTION:

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

### INSTALLATION

### CAUTION:

- Replace the O-ring of the high-pressure pipe with a new one, then apply compressor oil to it when installing it.
- When charging refrigerant, check for leaks.

High-pressure pipe (evaporator side) mounting bolt

Tightening torque : 2.9 - 5.9 N·m (0.29 - 0.60 kg·m, 26 - 52 in·lb)

Bolt mounting the high-pressure pipe (condenser side)

Tightening torque : 7.8 - 19.6 N·m (0.8 - 1.9 kg·m, 69 - 173 in·lb)

## Removal and Installation for Refrigerant Pressure Sensor

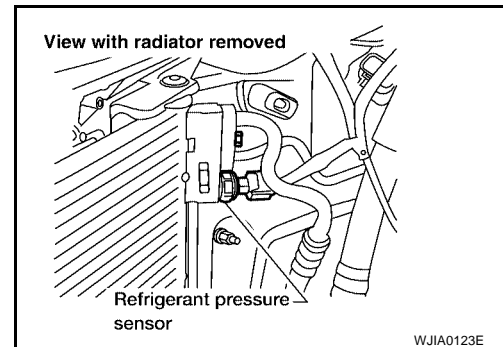
EJS001JA

1. Discharge the refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Disconnect the refrigerant pressure sensor connector and remove the refrigerant pressure sensor from condenser.

### CAUTION:

- Please be careful not to damage the condenser fins.
- Apply compressor oil to the O-ring of the refrigerant pressure sensor when installing it.

Tightening torque : 9.8 - 11.7 N·m (1.0 - 1.2 kg·m,  
7.3 - 8.6 ft·lb)



## Removal and Installation for Condenser

EJS001JB

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the radiator. Refer to [CO-12, "RADIATOR"](#) .

### CAUTION:

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

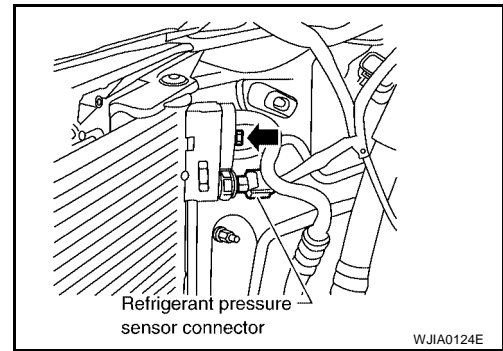
## REFRIGERANT LINES

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

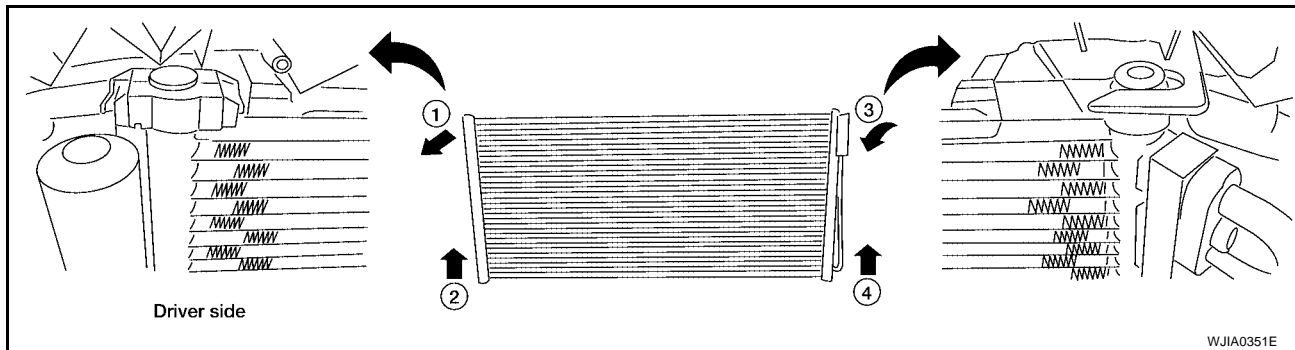
**CAUTION:**

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

4. Disconnect the refrigerant pressure sensor connector.



5. Carefully release retaining clips located on top driver side of condenser and rotate the condenser out of its mounts as shown.



### INSTALLATION

**CAUTION:**

- Replace the O-rings of the high-pressure pipe and the high-pressure flexible hose with new ones, then apply compressor oil to them after installing them.
- When charging refrigerant, check for leaks.

**High-pressure flexible hose and pipe mounting bolt**

Tightening torque : 7.8 - 19.6 N·m (0.8 - 1.9 kg·m, 69 - 173 in·lb)

**Condenser mounting nuts**

Tightening torque : 5.0 - 6.79 N·m (0.51 - 0.69 kg·m, 45 - 60 in·lb)

### Removal and Installation for Evaporator

EJS0031D

#### REMOVAL

1. Evacuate and recover the A/C system refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Disconnect the battery negative terminal.
3. Disconnect the air cleaner to electronic throttle control actuator tube. Refer to [EM-15, "AIR CLEANER AND AIR DUCT"](#).

**NOTE:**

The tube is located between the air cleaner assembly and the intake manifold and is removed to access the expansion valve.

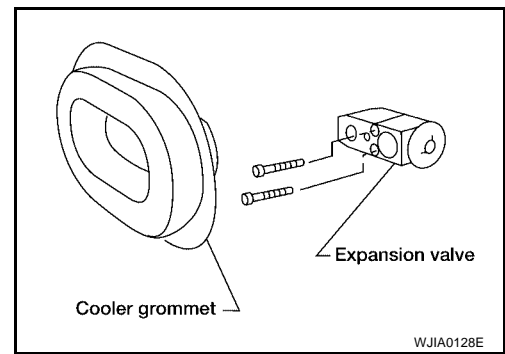
4. Disconnect the A/C pipe from the expansion valve.

**CAUTION:**

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

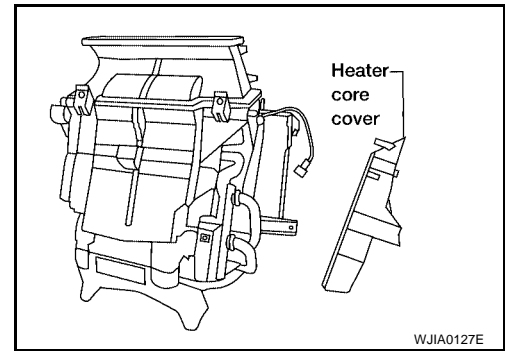
# REFRIGERANT LINES

5. Remove the expansion valve.
6. Remove the center console side finisher RH. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
7. Remove the instrument lower panel cover RH and glove box. Refer to [IP-16, "Instrument Lower Cover RH and Glove Box"](#).
8. Remove the ECM.
  - Disconnect the ECM connector.
  - Remove the wire harness from the ECM mounting bracket.
  - Remove the two ECM mounting bracket nuts and disconnect the ground wire.
9. Remove the blower unit. Refer to [ATC-105, "BLOWER UNIT"](#).
10. Remove the heater core cover.



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11. Remove the evaporator cover.

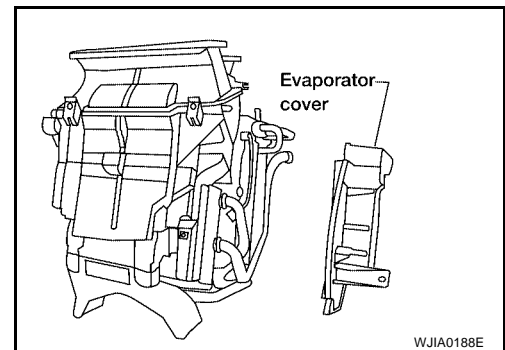


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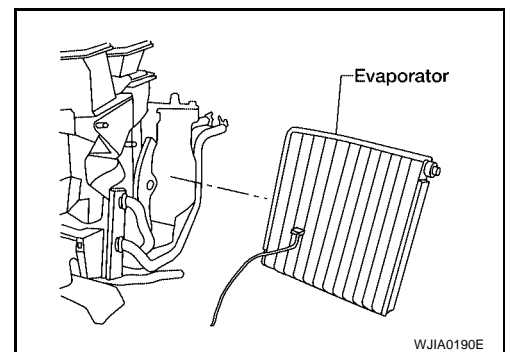
12. Remove the evaporator.
  - Remove the thermo control amplifier.
  - Remove the intake sensor.

**CAUTION:**

  - **Mark the mounting position of the intake sensor and thermo control amplifier.**



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## INSTALLATION

Installation is in the reverse order of removal.

**Expansion valve mounting bolts : 2.9 - 5.0 N·m (0.29 - 0.51 kg·m, 26 - 44 in·lb)**

### CAUTION:

- Replace the O-rings with new ones, then apply compressor oil to them when installing them.

## Removal and Installation for Expansion Valve

### REMOVAL

1. Evacuate and recover the A/C system refrigerant. Refer to [ATC-116, "HFC-134a \(R-134a\) Service Procedure"](#).

EJS0031E

# REFRIGERANT LINES

2. Disconnect the air cleaner to electronic throttle control actuator tube. Refer to [EM-15, "AIR CLEANER AND AIR DUCT"](#).

**NOTE:**

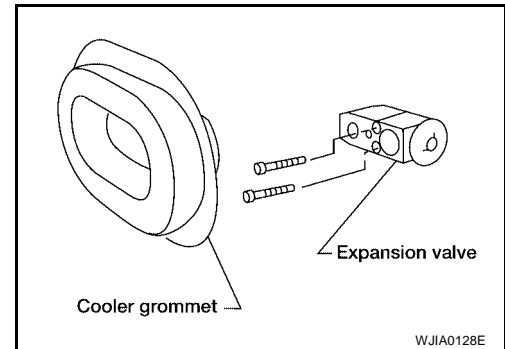
The tube is located between the air cleaner assembly and the intake manifold and is removed to access the expansion valve.

3. Disconnect the A/C pipe from the expansion valve.

**CAUTION:**

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

4. Remove the expansion valve.



## INSTALLATION

Installation is in the reverse order of removal.

**Expansion valve mounting bolts : 2.9 - 5.0 N-m (0.29 - 0.51 kg-m, 26 - 44 in-lb)**

**CAUTION:**

- Replace the O-rings with new ones, then apply compressor oil to them when installing them.

## Checking for Refrigerant Leaks

EJS001JE

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 25 - 50 mm (1 - 2 in) per second and no further than 6 mm (1/4 in) 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

EJS001JF

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

**NOTE:**

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

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

# REFRIGERANT LINES

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

## Dye Injection

EJS001JG

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

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm<sup>2</sup> , 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (J-41459).
3. Connect the injector tool to the A/C LOW PRESSURE side service fitting.
4. Start engine and 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:

**If repairing 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.

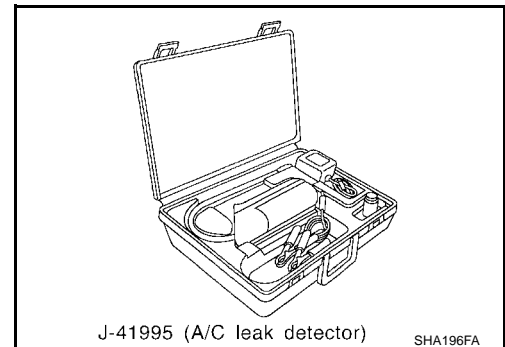
## Electronic Refrigerant Leak Detector

EJS001JH

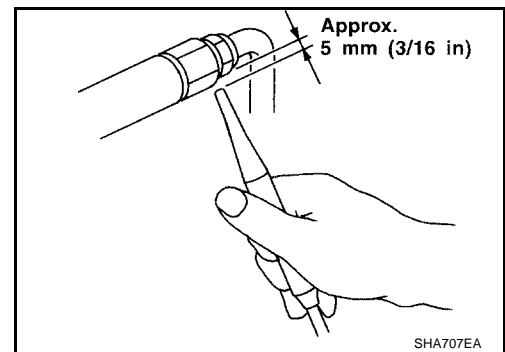
### PRECAUTIONS FOR HANDLING LEAK DETECTOR

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

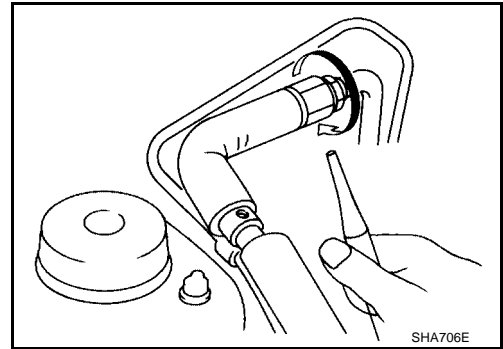


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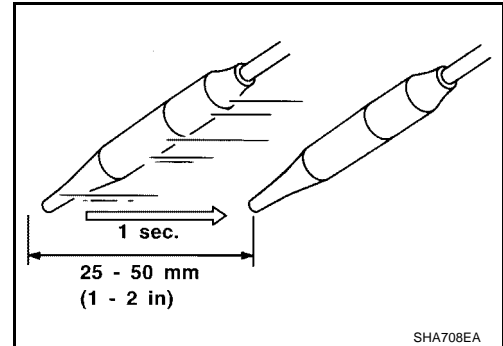
ATC

## REFRIGERANT LINES

- When testing, circle each fitting completely with probe.



- 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.

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

#### NOTE:

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

- Conduct the leak test from the high side (compressor discharge a to evaporator inlet f) to the low side (evaporator drain hose g to shaft seal l). Refer to [ATC-118](#). 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 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.

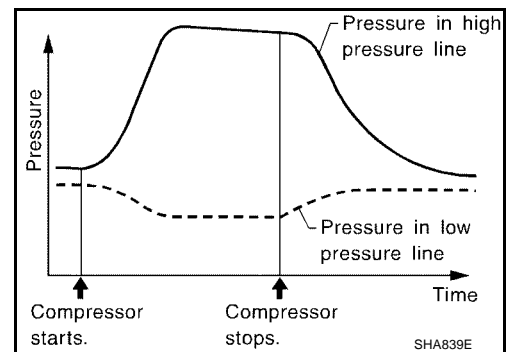
Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.



## REFRIGERANT LINES

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. Face mode
  - c. Intake position: Recirculation
  - d. Max cold temperature
  - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.

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



11. Before connecting ACR2000 to vehicle, check ACR2000 gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using ACR2000 and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using ACR2000 and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component as necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
16. Conduct A/C performance test to ensure system works properly.

# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

### Service Data and Specifications (SDS) COMPRESSOR

EJS001JI

Make	ZEXEL VALEO CLIMATE CONTROL
Model	DKS-17D
Type	Swash plate
Displacement cm <sup>3</sup> (cu in)/rev	175.5 (10.7)/rev
Cylinder bore × stroke mm (in)	30.5 (1.201) x 24.0 (0.94)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

### LUBRICANT

Make	ZEXEL VALEO CLIMATE CONTROL	
Model	DKS-17D	
Name	Nissan A/C System Oil Type DH-PS	
Part number	KLH00-PAGS0	
Capacity m <sup>l</sup> (US fl oz, Imp fl oz)	Total in system	150 (5.03, 5.3)
	Compressor (Service part) charging amount	150 (5.03, 5.3)

### REFRIGERANT

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.525 - 0.575 (1.155 - 1.265)

### ENGINE IDLING SPEED

Refer to [EC-35, "Idle Speed and Ignition Timing Check"](#) .

### BELT TENSION

Refer to [MA-12, "Tension Adjustment"](#) .