

# ATC

## SECTION ATC

### AUTOMATIC AIR CONDITIONER

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# PRECAUTIONS

## PRECAUTIONS

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

EJS002JP

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. Information necessary to service the system safely is included in the SRS and SB section of this Service Manual.

#### **WARNING:**

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

### Refrigerant Gas HFC134a Handling Instructions

EJS002HR

- Only use HFC134a for refrigerant gas. If CFC12 is accidentally charged, compressor will be damaged due to insufficient lubrication.
- Observe the precautions written on the service can. Incorrect handling could result in the service can rupturing, frostbite, loss of sight, or other injuries.
- Do not inhale the refrigerant gas. Inhaling the gas could result in injury to the eyes, nose, or throat.
- If HFC134a comes into contact with a high-temperature area, such as an open flame, poisonous gas could be generated, so keep it away from flame. In addition, keep the working area well ventilated.

### Compressor Lubricant Precautions

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- Synthetic oil that matches the characteristics of the refrigerant is used. In addition, two types of compressor lubricant (synthetic oil) that match the compressor type are set, so be sure to use the compressor lubricant specified below.

#### **Specified oil : DH-PR (for rotary type compressor)**

- Using compressor lubricant for swash plates (DH-PS) will reduce the durability of the compressor. In addition, using compressor lubricant for CFC12 (mineral oil) could damage the pump due to poor lubrication.
- Compressor lubricant for HFC134a rapidly absorbs moisture, so observe the following precautions when handling it.
  - When removing air conditioning cycle parts, use a cap, plastic tape, etc., to cover the opening to seal out the air.
  - When installing air conditioning cycle parts, do not remove the cap, etc., being used to seal the openings until just before installation.
  - After using the compressor lubricant container, immediately close the lid to avoid exposing the lubricant to the atmosphere.
- Do not breath in the compressor lubricant mist. Doing so could injure the eyes, nose, or throat.
- Because the compressor lubricant for HFC134a melts Styrofoam parts or exfoliates painted surfaces (except for baked finishes), keep the lubricant away from those parts.

### Precautions for Pipe Connection Type

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Except for the following areas, new pipe couplings (shaft seal type) must be used for all air conditioning cycle connections.

- Between the expansion valve and the evaporator.
- Refrigerant pressure sensor

# PRECAUTIONS

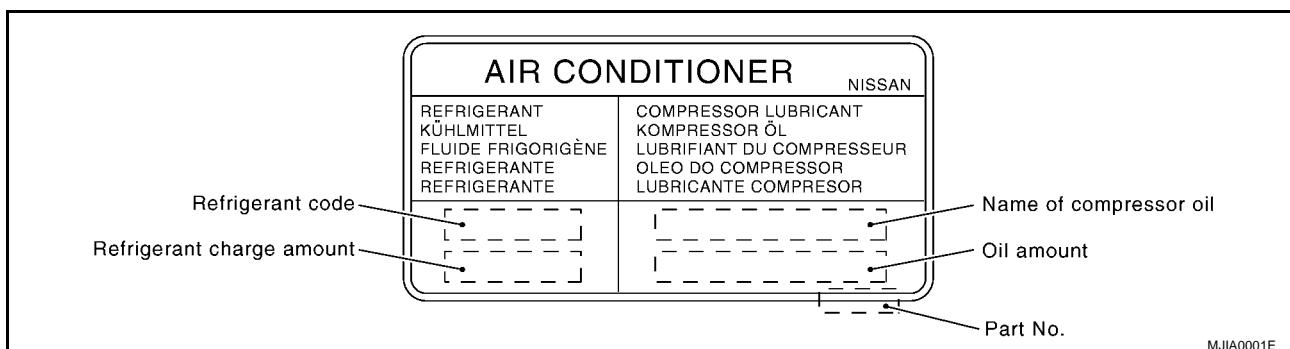
## O-RING PART NUMBER TABLE

Connection type	Location	Part No.	Nominal size
Axe seal-type	Air conditioner unit	Inlet	92471N8210
		Outlet	92743N8210
	Condenser	Inlet	92472N8210
		Outlet	92471N8210
	Compressor	Inlet	92474N8210
		Outlet	92472N8210
Conventional	Liquid tank	Inlet	92471N8210
		Outlet	8 dia.
Conventional	Refrigerant pressure sensor	J247689956	10 dia.
	Expansion valve	Inlet	92477AX000
		Outlet	92477AX005
			16 dia.

## Air Conditioning Cycle Servicing Precautions

EJS002HU

- When servicing the air conditioning cycle, strictly observe the following items and the caution label instructions.



Contained refrigerant (HFC134a) amount	MT: 500 g AT: 450 g
Lubricant amount contained in compressor (DH-PR)	80 cm <sup>3</sup>

- After removing the piping, use a cap, plastic tape, etc., to keep dust and water vapor from getting in.
- When installing the piping, be sure to use a torque wrench or backup wrench.
- When installing the air conditioner in the vehicle, installing the piping is the last part of the installation work. In addition, when installing the piping or other parts, do not remove the caps, etc., used to seal the pipes until just before installation.
- When parts are stored in a cool location, warm them up to the temperature of the work area before removing the caps, etc., used to seal the pipes. This is to prevent condensation from forming inside the parts.
- Before adding refrigerant, remove the moisture from the air conditioning cycle.
- Be sure to use new O-rings for the parts removed from the air conditioning cycle.
- When installing the piping, apply compressor lubricant to the O-rings. Be careful, however, not to get the compressor lubricant on the screw threads.

### Specified oil : DH-PR (for rotary type compressor)

- Properly insert the O-ring into the piping groove.
- When installing the O-ring, be careful not to damage the O-ring or the piping.
- When installing the piping, make sure you can hear the click sound when making the connection, and then tighten the nuts and bolts by hand until they begin to engage. Also, make sure the O-ring is properly inserted in the piping.

# PRECAUTIONS

- After installing the piping, perform a refrigerant leak test to confirm that there are no leaks from the connections. If a leak is discovered, disconnect the piping, and replace the O-ring. Then tighten the connection to the specified torque.

## Compressor Servicing Precautions

EJS002HV

- Seal all openings to keep out dust and moisture.
- When removing the compressor, to prevent the lubricant from getting into the low-pressure side chamber, set it in the same orientation as when it is installed in the vehicle.
- When replacing the compressor, adjust the amount of compressor lubricant. Refer to [ATC-8, "Adjustment of Compressor Lubricant Amount"](#) .
- Kept the clutch and pulley friction surfaces clean. If lubricant gets on the surface, wipe it off with a clean damp cloth.
- After completing compressor servicing, rotate the compressor shaft by hand at least 5 times in both directions. This is to evenly distribute the lubricant on the inside. After installing the compressor, operate the compressor for 1 hour with the engine idling.

## Serving Equipment Connection Precautions

EJS002HW

### REFRIGERANT RECOVERY UNIT

For information regarding unit connection and maintenance, follow the instructions from the manufacturer. In addition, do not add more than the specified amount of refrigerant to the unit.

### ELECTRIC LEAK TESTER

For tester connection and maintenance, follow the instructions from the manufacturer.

## Precautions Concerning Fluorescent Indicator for Detecting Coolant Leakage

EJS002HX

- When handling fluorescent indicator, wear fluorescence detector goggles (Calsonic Kansei product) or safety glasses to prevent indicator from splashing and entering eyes. If indicator enters eyes, it will cause inflammation.
- When removing air conditioner system parts, first wrap joint part with shop cloth before disconnecting piping. This will prevent residual pressure in air conditioning cycle from spraying indicator out. Also be sure to use a fender cover and seat covers.
- If fluorescent indicator contacts vehicle paint surface and is left, it may cause staining or harden on the surface. Immediately wipe it off with shop cloth or clean with surface-active cleaner (maintenance cleaner: KA306-48090).
- Use a rag to wipe off fluorescent that gets on parts in the engine room or on tools, then clean with brake cleaner.
- If fluorescent cannot be completely removed with a shop cloth, apply surface-active cleaner to it and leave for one minute, then wipe it off with a clean shop cloth and rinse with water.
- After inspection, use a UV lamp to make sure the fluorescent is completely removed, especially at the piping joints.

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# PREPARATION

## PREPARATION

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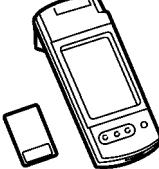
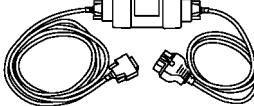
### Lubricant, Refrigerant

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Description	Application	Remarks
Refrigerant container (HFC134a)	Charging refrigerant	—
Compressor lubricant DH-PR 569900-1900 (40 cm <sup>3</sup> )	Refilling compressor lubricant	Handled by Zexel
Compressor lubricant DH-PR 596160-2500 (250 cm <sup>3</sup> )	Refilling compressor lubricant	Handled by Zexel
Compressor lubricant spray 597096-0020 (135 cm <sup>3</sup> )	Applied to pipe connections	Handled by Zexel

### Special Service Tools

EJS002HZ

Description	Application
CONSULT-II unit, and Program card AED02E	 PBIA3527J System inspection and diagnosis
CONSULT-II CONVERTER	 PBIA3526J

## REFRIGERATION SYSTEM

PFP:KA990

### Refrigerant Cycle

EJS00210

### REFRIGERANT FLOW

Refrigerant basically circulates through compressor, condenser, liquid tank and evaporator and returns to compressor. Vaporization of refrigerant is controlled by expansion valve.

### Refrigerant System Protection

EJS00211

#### REFRIGERANT-PRESSURE SENSOR

- Refrigerant system is protected from significant high-pressure or low-pressure by refrigerant pressure sensor attached to condenser.
- If unexpected pressures are detected in the cooler system (approx. 2.74 MPa (approx. 27.9 kg/cm<sup>2</sup> ) or more or 0.14 MPa (approx. 1.4 kg/cm<sup>2</sup> ) or less), the compressor is stopped by the refrigerant pressure sensor.

Note: Values in the ( ) indicate gauge pressure.

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## LUBRICANT

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### Adjustment of Compressor Lubricant Amount

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Compressor lubricant circulates through the system with refrigerant. When air conditioner system component is replaced or after the large refrigerant leak, lubricant needs to be added to compressor. Also it is important to maintain lubricant level properly. If lubricant level is not proper, following might happen.

- Insufficient lubricant: Compressor adherence
- Lubricant overfill: Insufficient cooling (insufficient heat exchange)

**Specified oil : DH-PR (for rotary type compressor)**

### PROCEDURES FOR LUBRICANT RETURN OPERATION

Follow the steps below to adjust the lubricant level.

#### 1. CHECK A/C SYSTEM

1. Make sure A/C system operates normally.
2. Make sure a large amount of refrigerant or lubricant does not leak.

OK or NG

OK >> GO TO 2.

NG >> GO TO 3.

#### 2. LUBRICANT RETURN OPERATION

1. Start the engine. Put it in the following state.
  - Engine speed: Idling - 1,200 rpm
  - A/C or AUTO switch: ON
  - Fan speed: HI
  - Air inlet: Recirculation
  - Set temperature: FULL HOT
2. Keep running for approximately 10 minutes.
3. Stop the engine.

#### CAUTION:

**When a large leak of refrigerant or lubricant is found, do not perform lubricant return operation.**

>> GO TO 3.

#### 3. CHECK COMPRESSOR

Is compressor replaced?

YES >> GO TO [ATC-9, "LUBRICANT LEVEL ADJUSTMENT WHEN REPLACING COMPRESSOR"](#) .  
NO >> GO TO 4.

#### 4. CHECK OTHER COMPONENTS

Is any other component to be replaced? (evaporator, condenser, liquid tank, large leak of refrigerant or lubricant)

YES >> GO TO [ATC-9, "LUBRICANT LEVEL ADJUSTMENT WHEN REPLACING COMPONENTS OTHER THAN COMPRESSOR"](#) .  
NO >> GO TO [ATC-42, "CHECK FUNCTION"](#) .

# LUBRICANT

## LUBRICANT LEVEL ADJUSTMENT WHEN REPLACING COMPONENTS OTHER THAN COMPRESSOR

Add compressor lubricant from the high-pressure port of the compressor according to the table below.  $\alpha$  indicates lubricant amount that spouts with refrigerant when refrigerant is discharged.

Components to be replaced	Lubricant amount to be added
Evaporator	$35+\alpha$ cm <sup>3</sup>
Condenser	$15+\alpha$ cm <sup>3</sup>
Liquid tank	$5+\alpha$ cm <sup>3</sup>

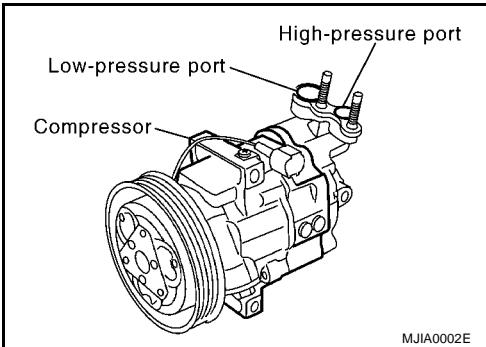
### CAUTION:

When replacing 2 or more parts, do not sum up  $\alpha$ .

Ex. Lubricant amount to be added to evaporator and liquid tank (cm<sup>3</sup>) =  $35 + 5 + \alpha$

## LUBRICANT LEVEL ADJUSTMENT WHEN REPLACING COMPRESSOR

1. Drain the compressor lubricant from the removed compressor's high and low-pressure ports and measure the amount of lubricant.
2. Drain the compressor lubricant from a new compressor according to the formula below.  $\alpha$  indicates lubricant amount that spouts with refrigerant when refrigerant is discharged.  
Lubricant amount drained from new compressor (cm<sup>3</sup>)  
= Lubricant amount contained in the new compressor (80) - Lubricant amount discharged from the removed compressor - Lubricant amount that adheres to inside of compressor (20) -  $\alpha$   
= 60 - Lubricant amount discharged from the removed compressor -  $\alpha$
3. When adding lubricant, add the appropriate amount of compressor lubricant from the compressor's high-pressure port.



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# AUTO AIR CONDITIONER SYSTEM

## AUTO AIR CONDITIONER SYSTEM

PFP:27500

### Description

EJS002I3

- The auto air conditioner detects the vehicle cabin temperature, outside air temperature, intake air temperature, and amount of malfunction sunlight using an interior air sensor, ambient air sensor, intake temperature sensor, and sunload sensor. A comparison of the detected values and temperature set by the temperature setting switch is made by the A/C auto amp (internal controller) and then the blown air temperature, vent blown air volume, vents, and air intake are adjusted to maintain the temperature set for the cabin.

# TROUBLE DIAGNOSIS

## TROUBLE DIAGNOSIS

PFP:00004

### CONSULT-II Functions

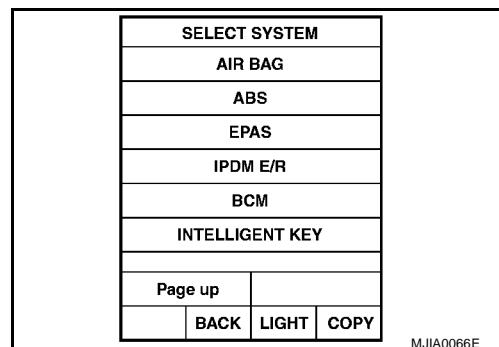
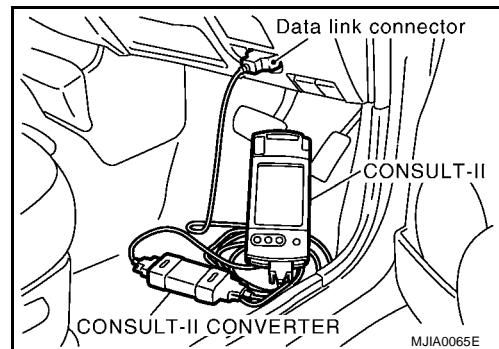
EJS00214

The CONSULT-II has display functions for work support, self-diagnosis, data monitor, and active tests for each part by combining data reception and command transmission via communication lines from the BCM.

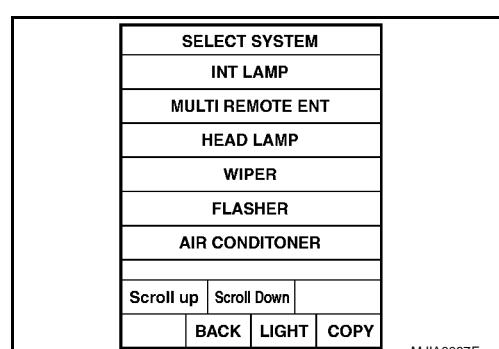
BCM trouble diagnosis item	Inspection Item, Diagnosis Mode	Description
Air conditioner system	Data monitor	Displays BCM input data in real time.

### CONSULT-II BASIC OPERATION

1. Turn ignition switch OFF.
2. Connect the CONSULT-II to data link connector via the CONSULT-II CONVERTER.  
For details, refer to the supplied CONSULT-II Operation Manual (Supplement-III) and CONSULT-II CONVERTER Operation Manual.
3. Turn ignition switch ON.
4. Touch "START (NISSAN BASED VHCL)".
5. Touch "BCM" on the "SELECT SYSTEM" screen.
  - If "BCM" is not displayed, print the "SELECT SYSTEM" screen, and then refer to [LAN-3, "PRECAUTIONS"](#).



6. Touch "AIR CONDITIONER" on the "SELECT TEST ITEM" screen.
7. Touch "DATA MONITOR" on the "SELECT DIAG MODE" screen.  
For details, refer to separate volume "CONSULT-II Operation Manual (Common) (Supplement-I) (Supplement-II) (Supplement-III)".



# TROUBLE DIAGNOSIS

## DATA MONITOR

### Operation Procedure

1. Touch "AIR CONDITIONER" on the "SELECT TEST ITEM" screen.
2. Touch "DATA MONITOR" on the "SELET DIAG MODE" screen.  
For details, refer to separate volume "CONSULT-II Operation Manual (Common) (Supplement-I) (Supplement-II) (Supplement-III)".
3. Touch "ALL SIGNALS" on the "DATA MONITOR" screen.
4. Touch "START".
5. Touch "RECORD" while monitoring to record the status of the item being monitored. To stop recording, touch "STOP".

DATA MONITOR	
MONITOR	
IGN ON SW	OFF
FAN ON SIG	OFF
AIR COND SW	OFF
RECORD	
MODE	BACK
LIGHT	COPY

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### Monitored Item

Monitor item [UNIT]	Contents
FAN ON SIG [ON/OFF]	Displays status "Blower fan on (ON)/blower fan off (OFF)" as judged by the BCM from the input from the A/C auto amp.
AIR COND SW [ON/OFF]	Displays status "Compressor on (ON)/compressor off (OFF)" as judged by the BCM from the input from the A/C auto amp.
IGN ON SW [ON/OFF]	Displays the "ON/OFF, ACC (OFF)" status determined from the ignition switch signal.

# TROUBLE DIAGNOSIS

## Diagnosis Chart by Symptom

EJS00215

Symptom	Operation inspection	Suspect systems	Possible causes
No air comes out. Airflow volume does not change.	Check blower motor operation.	Blower motor circuit	Refer to <a href="#">ATC-32, "Blower Motor System"</a> and <a href="#">ATC-31, "Coolant Temperature Signal System"</a> .
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction
Common items (Check these items for any of the three malfunctions listed below.)	Check installation condition of air mix door motor.	Air mix door circuit	<ul style="list-style-type: none"> <li>● Improper installation of air mix door rod or air mix door lever.</li> <li>● Malfunction of air mix door system (damage, locking, etc.)</li> </ul>
	Set temperature to 18°C and 32°C. Make sure air mix door operates for its full stroke.	Air mix door motor circuit	Refer to <a href="#">ATC-38, "Air Mix Door Motor System"</a> .
	Malfunction indicated in Self-Diagnosis Step 2.	Sensor circuit	<ul style="list-style-type: none"> <li>● Sensor Malfunction; Refer to <a href="#">ATC-29, "Intake Sensor System"</a>, <a href="#">ATC-28, "Sunload Sensor System"</a>, <a href="#">ATC-27, "In-Vehicle Sensor System"</a>, <a href="#">ATC-25, "Ambient Sensor System"</a>.</li> <li>● Sensor harness malfunction</li> </ul>
	After normal indication in Self-Diagnosis Step 3, reset the actuator to zero position.	Air mix door circuit	Misreading of the door position of the A/C auto amp. <a href="#">ATC-18, "Self-Diagnosis Function"</a>
	Malfunction indicated in Self-Diagnosis Step 3.	Air mix door motor circuit	Refer to <a href="#">ATC-38, "Air Mix Door Motor System"</a> .
	With A/C switch ON, check operation of magnetic clutch.	Magnetic clutch circuit	Refer to <a href="#">ATC-39, "Magnetic Clutch System"</a> , <a href="#">ATC-42, "Check Fan ON Signal"</a> .
No cold air comes out. (Normal airflow amount)	● Check refrigerant level. ● Performance check	Air conditioner system	Refer to <a href="#">ATC-42, "CHECK FUNCTION" in "Cooling Malfunction"</a> .
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction
No warm air comes out. (Airflow volume is normal.)	After warming up engine, heater core inlet and outlet sides of the heater hose do not become warm.	Coolant circuit	<ul style="list-style-type: none"> <li>● Poor engine coolant</li> <li>● Blockage of heater hose or heater core</li> </ul>
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction
Large difference between set temperature and interior air temperature	Blower motor speed does not change when switching fan switch.	Blower motor circuit	Refer to <a href="#">ATC-32, "Blower Motor System"</a> .
	The inlet of the interior sensor does not draw in smoke when the fan switch is set to speed 4.	Aspirator circuit	<ul style="list-style-type: none"> <li>● Aspirator malfunction</li> <li>● Aspirator duct is loose or crushed.</li> </ul>
	Check the difference between set temperature and control temperature.	—	Improperly set temperature difference <a href="#">ATC-23, "Difference Between Set Temperature and Control Temperature"</a>
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction

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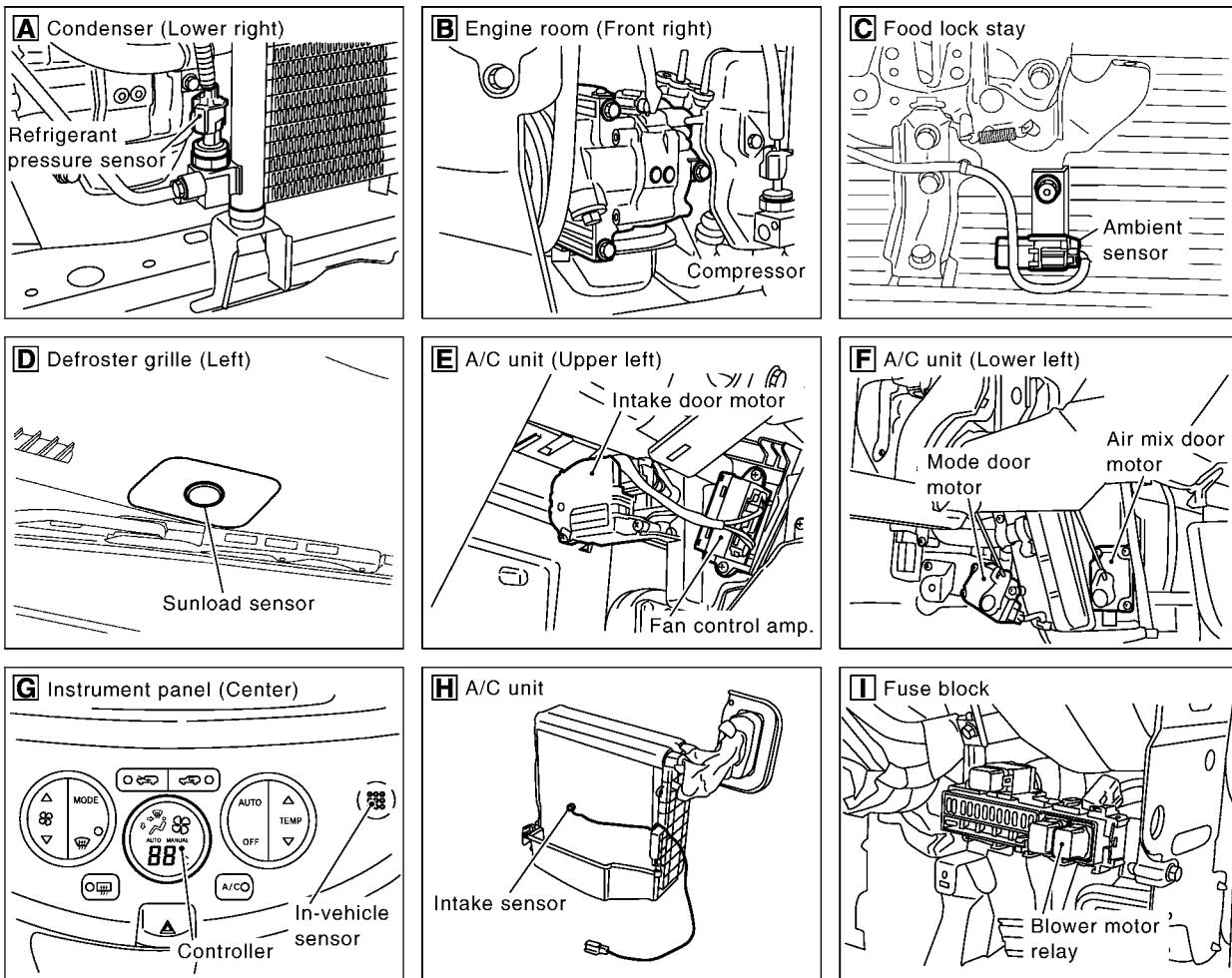
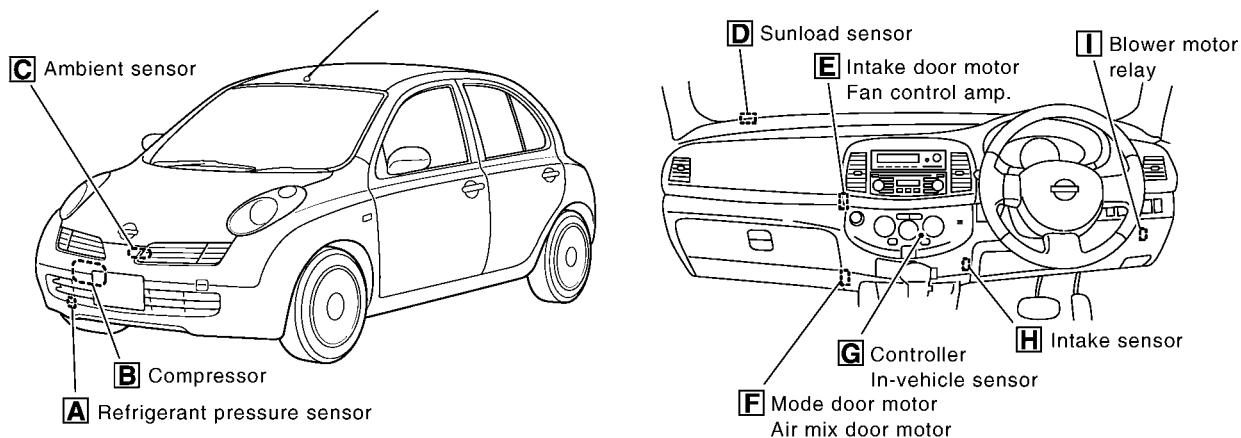
## TROUBLE DIAGNOSIS

Symptom	Operation inspection	Suspect systems	Possible causes
Unable to switch air outlets to others.	Mode door operation check (manual operation)	Mode door circuit	<ul style="list-style-type: none"> <li>● Improper installation of mode door rod, mode door link and mode door lever</li> <li>● Mode door system malfunction (damage, locking, etc.)</li> </ul>
	After normal indication in Self-Diagnosis Step 3, reset the actuator to zero position.	Mode door circuit	Misreading of the door position of the A/C auto amp. <a href="#">ATC-18, "Self-Diagnosis Function"</a>
	Malfunction indicated in Self-Diagnosis Step 3.	Mode door motor circuit	Refer to <a href="#">ATC-36, "Mode Door Motor System"</a> .
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction
Unable to switch intake inlets to others.	Intake door operation check (manual operation)	Intake door circuit	<ul style="list-style-type: none"> <li>● Improper installation of intake door lever</li> <li>● Intake door system malfunction (damage, locking, etc.)</li> </ul>
	Malfunction indicated in Self-Diagnosis Step 3.	Intake door motor circuit	Refer to <a href="#">ATC-36, "Intake Door Motor System"</a> .
	The circuit above is normal.	A/C auto amp. circuit	A/C auto amp. malfunction

# TROUBLE DIAGNOSIS

## Component Parts Location

EJS00216



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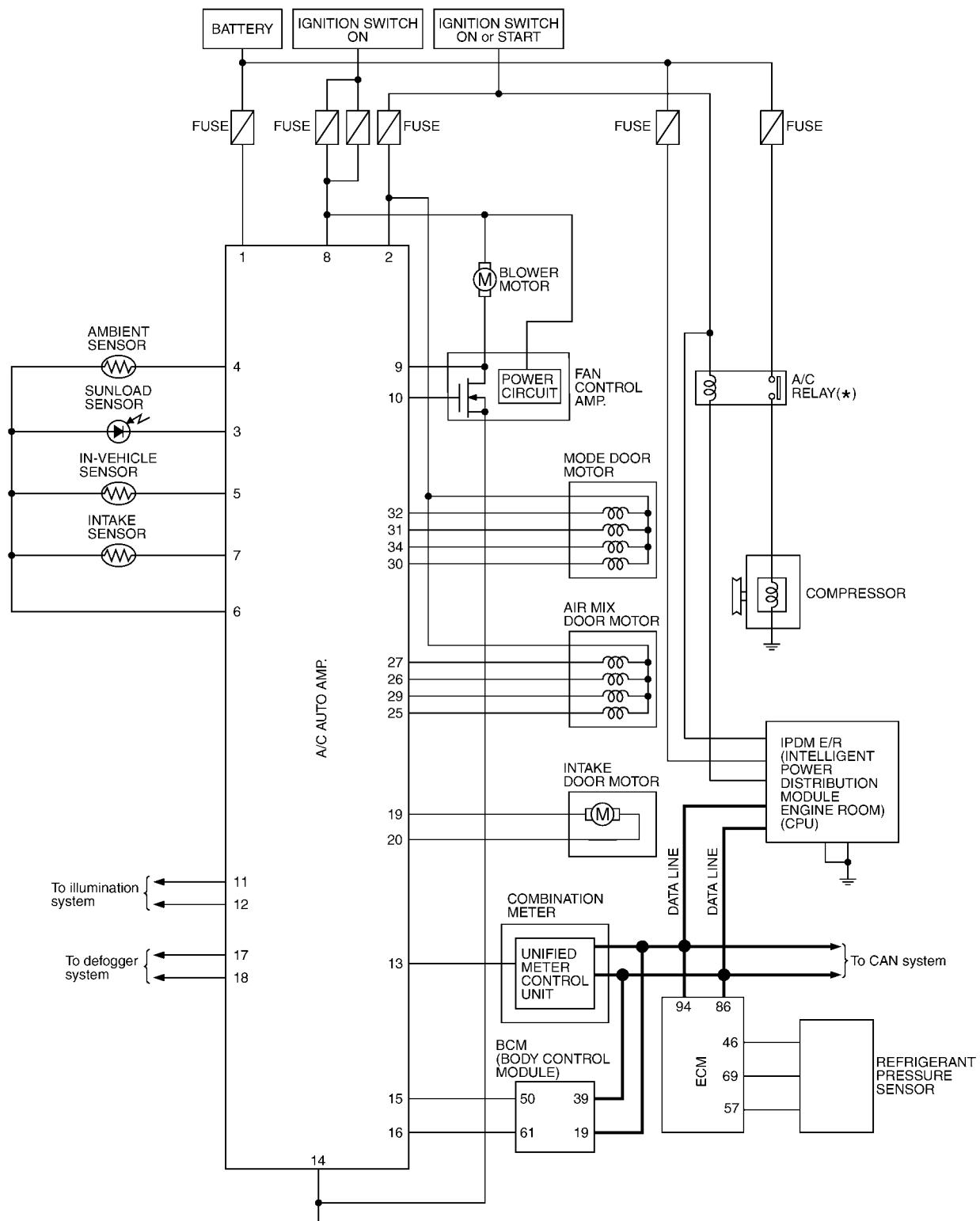
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# TROUBLE DIAGNOSIS

## Circuit Diagram

EJS00217



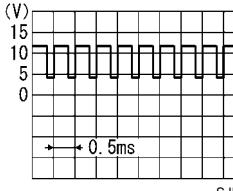
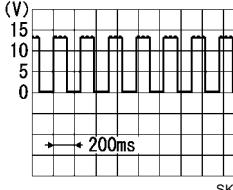
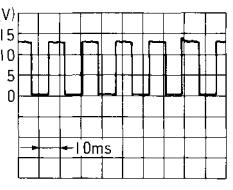
\* : This relay is built into the IPDM E/R (Intelligent power distribution module engine room).

MJWA0012E

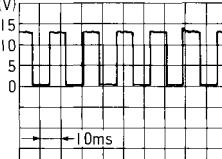
# TROUBLE DIAGNOSIS

## A/C Auto Amp. Input/Output Signal Standard

EJS00218

Ter- minal No.	Signal Designation	Measuring condition		Standard
		Ignition switch	Operation (status)	
1	Battery power supply	OFF	—	Approx. 12V
2	Ignition power supply	ON	—	Approx. 12V
3	Sunload sensor signal	—	—	Note 4
4	Ambient sensor signal	—	—	Note 3
5	In-vehicle sensor signal	—	—	Note 1:
6	Sensor ground	ON	—	Approx. 0V
7	Intake sensor signal	—	—	Note 2:
8	Fan control amp. signal	ON	Fan speed: Manual speed 1	
9	Blower fan feedback signal	ON	Fan speed: Manual speed 1	Approx. 8V
10	Fan ON signal	ON	Blower fan: ON	Approx. 12V
			Blower fan: OFF	Approx. 1V
11	Illumination power supply	ON	Lighting switch: 1st	Approx. 12V
12	Illumination ground	ON	—	Approx. 0V
13	Engine coolant temperature signal	ON	At idle (after warming up, approx. 80°C)  <b>CAUTION:</b> <b>The waveforms vary depending on the coolant temperature.</b>	
14	Ground	ON	—	Approx. 0V
15	Ignition feedback (blower motor) signal	ON	—	Approx. 12V
16	Compressor ON signal	ON	Compressor ON	Approx. 1V
			Compressor OFF	Approx. 5V
17	rear window defogger switch signal	ON	Rear window defogger: ON	Approx. 1V
			Rear window defogger: OFF	Approx. 12V
18	rear window defogger feedback signal	ON	Rear window defogger: ON	Approx. 12V
			Rear window defogger: OFF	Approx. 0V
19	Intake door motor drive signal	ON	REC→FRE	Approx. 12V
			FRE→REC	Approx. 0V
20	Intake door motor drive signal	ON	REC or FRE switch	Approx. 0V
			FRE→REC	Approx. 12V
25	Air mix door motor drive signal	ON	Immediately after temperature adjustment switch operation	
26				
27				
29				

# TROUBLE DIAGNOSIS

Ter- minal No.	Signal Designation	Measuring condition		Standard
		Ignition switch	Operation (status)	
30	Mode door motor drive signal	ON	Immediately after mode switch operation	 HAK0627D
31				
32				
34				

Note 1: Refer to [ATC-27, "In-Vehicle Sensor System"](#) .

Note 2: Refer to [ATC-29, "Intake Sensor System"](#) .

Note 3: Refer to [ATC-25, "Ambient Sensor System"](#) .

Note 4: Refer to [ATC-28, "Sunload Sensor System"](#) .

## Self-Diagnosis Function

### DESCRIPTION

EJS00219

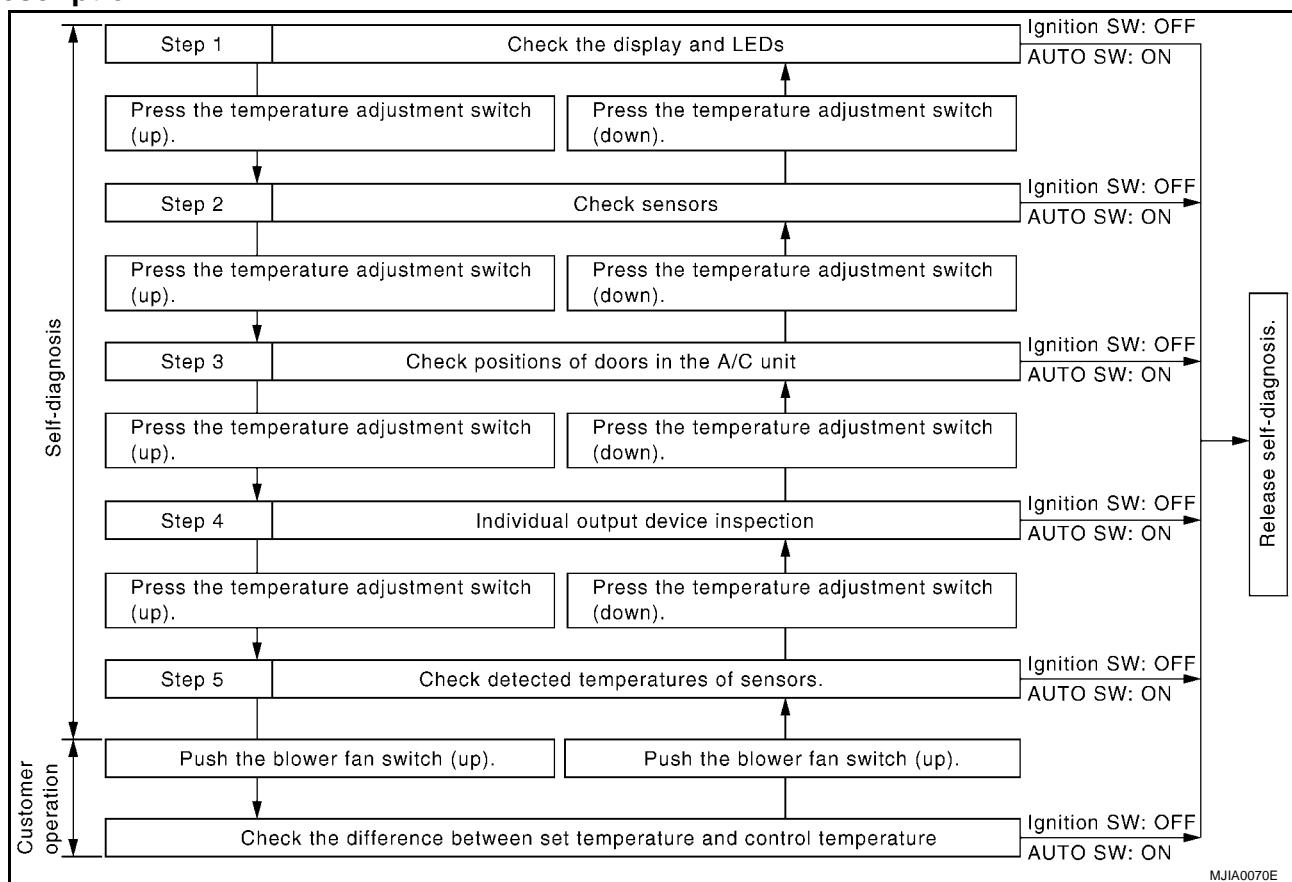
- The self-diagnosis system consists of steps 1 to 5, and diagnosis sensor operations by checking for failures of each sensor and outputting control signals predetermined for each output device.

	Step 1	Step 2	Step 3	Step 4	Step 5
Description	Check the display and LEDs	Check sensors	Check positions of doors in the A/C unit	Individual output device inspection	<ul style="list-style-type: none"> <li>Check detected temperatures of sensors</li> </ul>
Part to be diagnosed	<ul style="list-style-type: none"> <li>Display</li> <li>LED</li> </ul>	<ul style="list-style-type: none"> <li>Ambient sensor</li> <li>In-vehicle sensor</li> <li>Intake sensor</li> <li>Sunload sensor</li> </ul>	<ul style="list-style-type: none"> <li>Mode door motor</li> <li>Intake door motor</li> <li>Air mix door motor</li> <li>Air mix door motor</li> </ul>	<ul style="list-style-type: none"> <li>Mode door motor</li> <li>Intake door motor</li> <li>Air mix door motor</li> <li>Blower motor</li> <li>Compressor</li> <li>Fan ON signal</li> </ul>	<ul style="list-style-type: none"> <li>The following sensor</li> <li>Ambient sensor</li> <li>In-vehicle sensor</li> <li>Intake sensor</li> </ul>

# TROUBLE DIAGNOSIS

## OPERATION PROCEDURE

### Description



### Switching to Self-Diagnosis Mode

- Turn ignition switch OFF, then turn it to start engine. Within 10 seconds after starting the engine, press and hold the OFF switch for at least 5 seconds. Self-diagnosis (step1) should start.

#### CAUTION:

Diagnosis should be carried out with the engine running. If the battery voltage drops below 12V during step 3 trouble diagnosis, the actuator speeds become slower and NO results may be returned even for normal operation.

### Finishing Self-Diagnosis Mode

- Turn ignition switch OFF or press AUTO switch.

### Shifting the Steps

- Use the temperature adjustment switch to switch between steps 1 through 5.

### Procedure

#### 1. START SELF-DIAGNOSIS

- Turn ignition switch from OFF position to engine start. Within 10 seconds of engine start, press and hold OFF switch for approximately 5 seconds or longer.

#### Is self-diagnosis mode activated?

YES >> GO TO 2.

NO >> Replace A/C auto amp.

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# TROUBLE DIAGNOSIS

## 2. STEP 1 - CHECK DISPLAY AND LEDS

Check LEDs of all controller switches. Check all liquid crystal display segments.

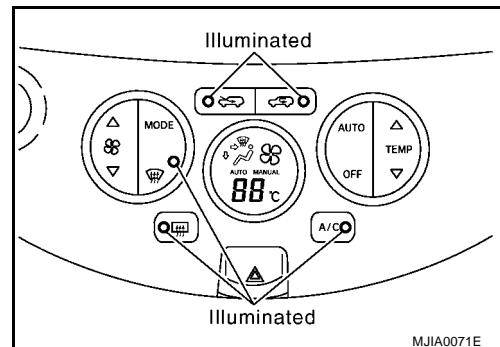
Normal: All segments and LEDs are illuminated.

Error: LEDs and sections of malfunctioning locations are not illuminated.

Are LEDs and display normal?

OK >> GO TO 3.

NG >> Replace A/C auto amp.



MJIA0071E

## 3. STEP 2 - CHECK ALL SENSORS

1. Press temperature adjustment switch (Up:▲) to change to step 2.

2. A "2" is displayed, followed by display of check results.

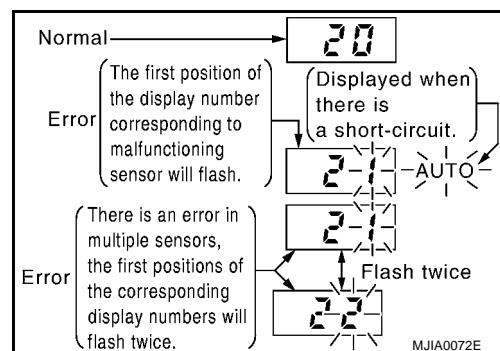
Normal: "20" is displayed.

Error: The first position of the display number corresponding to malfunctioning sensor will flash. "AUTO" is shown on the display when there is a short-circuit.

OK or NG

OK >> GO TO 5.

NG >> GO TO 4.



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## 4. CHECK SENSOR MALFUNCTION

When an error occurs, the first position of the display number corresponding to this sensor will flash. If it is determined at this time that there is a short in the sensor circuit, "AUTO" will flash. Further, if there is an error in multiple sensors, the first positions of the corresponding display numbers will flash twice.

Displayed No.	Corresponding sensor	Error return condition		Reference page
		OPEN	SHORT	
21	Ambient sensor	Approx. -42°C or less	Approx. 100°C or more	<a href="#">ATC-25, "Ambient Sensor System"</a>
22	In-vehicle sensor	Approx. -42°C or less	Approx. 100°C or more	<a href="#">ATC-27, "In-Vehicle Sensor System"</a>
24	Intake sensor	Approx. -42°C or less	Approx. 100°C or more	<a href="#">ATC-29, "Intake Sensor System"</a>
25	Sunload sensor	33 W/m <sup>2</sup> (28.4 Kcal/m <sup>2</sup> · h) or less	1677 W/m <sup>2</sup> (1422 Kcal/m <sup>2</sup> · h) or more	<a href="#">ATC-28, "Sunload Sensor System"</a>

Example: If there is an open circuit in the ambient sensor, the A/C auto amp. registers extreme cold (-42°C or less) and adjusts the temperature control warmer.

### CAUTION:

**Sunload sensor may register malfunction when indoors, at dusk, or at other times when light is insufficient.**

OK or NG

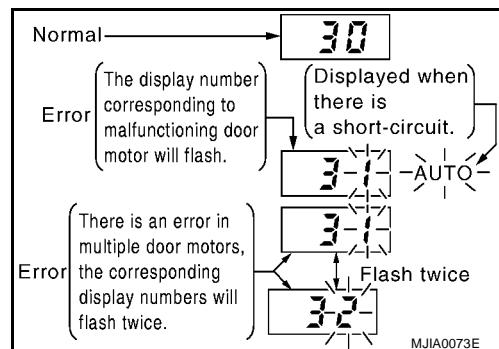
OK >> End of self-diagnosis

NG >> Malfunction in corresponding sensor system

# TROUBLE DIAGNOSIS

## 5. STEP 3 - CHECK AIR MIX DOOR AND MODE DOOR MOTOR

1. Press temperature adjustment switch (Up: ▲) to change to step 3.
2. A "3" is displayed, followed by a display of check results. Send output signals to the air mix door motor and mode door motor and inspect both motors.  
Normal: "30" is displayed.  
Error: The indicator lamp for the door position where the error occurred flashes. At this time, if it is judged that there is a short in the door motor circuit, "AUTO" will be displayed. If there is an error in multiple door motors, the corresponding display numbers will flash in ascending order.



door motors corresponding to the DTC

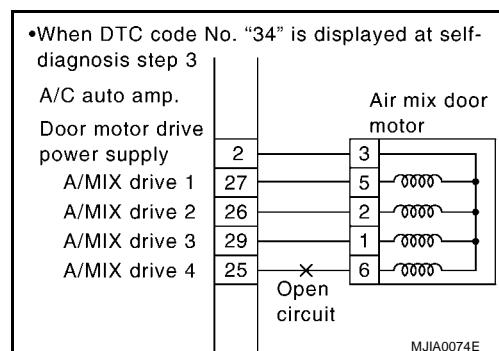
Displayed No.	31, 32, 33, 34				35, 36, 37, 38			
Corresponding door motor	Air mix door				Mode door			

DTC for an inoperative harness

Corresponding door motor	Air mix door motor				Mode door motor			
Corresponding terminal (Door motor side)	5	2	1	6	5	2	1	6
Corresponding terminal (A/C auto amp. side)	27	26	29	25	32	31	34	30
Displayed number for short circuit	AUTO <sub>31</sub>	AUTO <sub>32</sub>	AUTO <sub>33</sub>	AUTO <sub>34</sub>	AUTO <sub>35</sub>	AUTO <sub>36</sub>	AUTO <sub>37</sub>	AUTO <sub>38</sub>
Displayed number for open circuit	31	32	33	34	35	36	37	38

### NOTE:

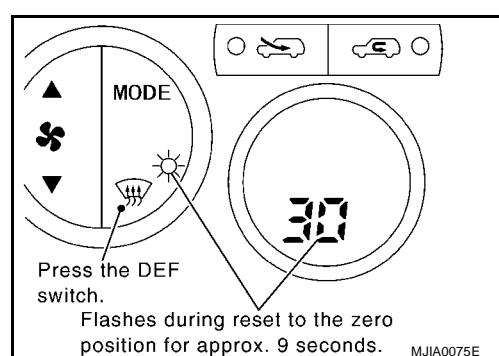
- If all four terminals of each door motor show a DTC for an open circuit, there is probably a disconnected connector or an open circuit in the door motor drive power supply harness.
- If a short circuit occurs in the harness between terminals for each door motor and drive signal, although it cannot be detected by self-diagnosis, the door motor will vibrate when it operates.



### Door Motor Zero Position Reset

- Pressing the DEF switch during step 3 will send a reset signal to air mix door and mode door motor to reset them to the zero position.

During reset: The 30 and DEF switch indicator lamps will flash. (For approx. 9 seconds)



# TROUBLE DIAGNOSIS

## OK or NG

OK >> GO TO 6.

NG >> Refer to [ATC-36, "Mode Door Motor System"](#) or [ATC-38, "Air Mix Door Motor System"](#) .

## 6. STEP 4 - CHECK EACH OUTPUT DEVICE

1. Press temperature adjustment switch (Up: ▲) to change to step 4.
2. Each time the DEF switch is pressed, the display will change to 41→42→43→44→45→46→41.
3. Follow table below and check outlet, inlet, airflow temperature, blower motor applied voltage, magnetic clutch operation, and air mix ratio. Each operating condition should be checked visually, by listening for noise, by touching air outlets with your hand, and so on.

Displayed No.	41	42	43	44	45	46
Mode door	VENT	B/L	B/L	FOOT	D/F	DEF
Intake door	Recirculation	Recirculation	Fresh air	Fresh air	Fresh air	Fresh air
Air mix door position	Full Cold	Full Cold	Halfway (50%)	Halfway (50%)	FULL HOT	FULL HOT
Blower motor Applied voltage	5V	10.5V	8.5V	8.5V	8.5V	Battery voltage
Magnetic clutch	ON	ON	ON	OFF	OFF	ON
Fan ON signal	12V	12V	12V	1V	1V	12V

## OK or NG

OK >> GO TO 7.

NG >> ● Outlet does not change: Refer to [ATC-36, "Mode Door Motor System"](#) .

● Inlet does not change: Refer to [ATC-29, "Intake Sensor System"](#) .

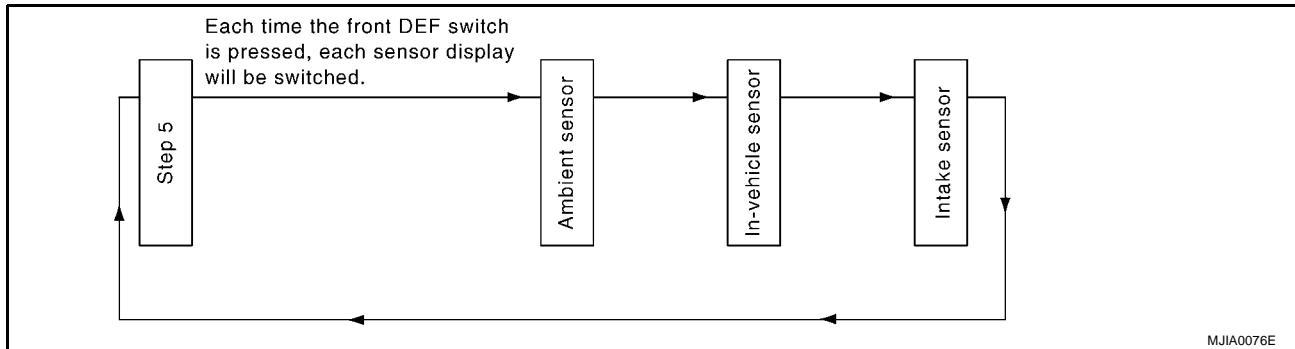
● Airflow temperature does not change: Refer to [ATC-38, "Air Mix Door Motor System"](#) .

● Blower motor malfunction: Refer to [ATC-32, "Blower Motor System"](#) .

● Magnetic clutch does not engage or operate: Refer to [ATC-39, "Magnetic Clutch System"](#) .

## 7. STEP 5 - DISPLAY OF TEMPERATURE DETECTED AT EACH SENSOR

1. Press temperature adjustment switch (Up: ▲) to change to step 5.
2. Pressing DEF switch once cycles from 5→detected temperature at ambient sensor → detected temperature at in-vehicle sensor → detected temperature at intake sensor →5.



## OK or NG

OK >> End of self-diagnosis

NG >> ● Ambient sensor malfunction: Refer to [ATC-25, "Ambient Sensor System"](#) .

● Inside air temperature malfunction: Refer to [ATC-27, "In-Vehicle Sensor System"](#) .

● Intake sensor malfunction: Refer to [ATC-29, "Intake Sensor System"](#) .

## Difference Between Set Temperature and Control Temperature

EJS002IA

### DESCRIPTION

- If the temperature felt by the customer is different than the airflow temperature controlled by the set temperature, A/C auto amp. control temperature can be adjusted to compensate for the set temperature (displayed temperature).

### HOW TO SET

1. Change to self-diagnosis mode. Refer to [ATC-19, "Switching to Self-Diagnosis Mode"](#) .
2. In self-diagnosis step 5, press the fan switch (Up: ▲).
3. A "0" is shown in the display.
4. Pressing the temperature adjustment switch increases or decreases the display temperature throughout a range of +3°C through -3°C (in increments of 1°C). At this time, if the setting difference is negative, "AUTO" is displayed.

### NOTE:

When the set temperature (display temperature) is set to 25°C and -3°C, the temperature controlled by A/C auto amp. is 25°C - 3°C = 22°C and the temperature becomes lower than set temperature.

### CAUTION:

**When the battery is disconnected or the battery voltage becomes 9V or less, the difference between the set temperature (display) and control temperature is cancelled.**

## Function Inspection

EJS002IB

### 1. CHECK FAN SPEED

Operate fan switch to make sure fan speed changes. Confirm operation for all fan speeds.

#### OK or NG

OK      >> Switch fan speed to "4" and GO TO 2.  
NG      >> Blower motor system malfunction: Refer to [ATC-32, "Blower Motor System"](#) .

### 2. CHECK AIR OUTLET

1. Operate mode switch and DEF switch.
2. Confirm air outlets change according to each indicated air outlet.

#### OK or NG

OK      >> GO TO 3.  
NG      >> Mode door system malfunction: Refer to [ATC-36, "Mode Door Motor System"](#) .

### 3. CHECK AIR INLET

1. Press REC switch to change recirculation.
2. Listen to intake sound and confirm air inlets change.
3. Press FRE switch to change to fresh air intake.
4. Listen to intake sound and confirm air inlets change.

#### OK or NG

OK      >> GO TO 4.  
NG      >> Intake door system malfunction: Refer to [ATC-36, "Intake Door Motor System"](#) .

### 4. CHECK WITH TEMPERATURE SETTING LOWERED

1. Turn compressor ON.
2. Press temperature adjustment switch (Down: ▼) and lower temperature setting to 18°C.
3. Confirm cool air blows from outlets.

#### OK or NG

OK      >> GO TO 5.  
NG      >> Air mix door system malfunction: Refer to [ATC-38, "Air Mix Door Motor System"](#) .

# TROUBLE DIAGNOSIS

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## 5. CHECK WITH TEMPERATURE SETTING RAISED

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1. Warm up the engine.
2. Press temperature adjustment switch (Up: ▲) and raise temperature setting to 32°C.
3. Confirm warm air blows from outlets.

OK or NG

OK     >> GO TO 6.

NG     >> Air mix door system malfunction: Refer to [ATC-38, "Air Mix Door Motor System"](#) .

## 6. CHECK AUTO MODE

---

1. Press AUTO switch and confirm that "AUTO" is displayed.
2. Make sure display and indicator lamp turns on by pressing A/C switch. Listen to make sure compressor is operating. (Temperature of air blowing from outlets and fan speed vary depending on ambient temperature.)

OK or NG

OK     >> GO TO 7.

NG     >> Refer to [ATC-13, "Diagnosis Chart by Symptom"](#) .

## 7. CHECK A/C SWITCH

---

1. Press A/C switch and make sure compressor turns off.
2. Press A/C switch again and make sure compressor turns on.

OK or NG

OK     >> If all function checks are normal (no phenomena reoccurrence), refer to [ATC-13, "Diagnosis Chart by Symptom"](#) .

NG     >> Refer to [ATC-13, "Diagnosis Chart by Symptom"](#) .

# TROUBLE DIAGNOSIS

## Air Conditioning System

EJS002IC

Symptom: Air conditioner does not operate.

### 1. CHECK POWER SUPPLY CIRCUIT OF A/C AUTO AMP.

Disconnect the A/C auto amp. connector (AAB18 black) and check voltage between the ground and terminals 1, 2 and 8.

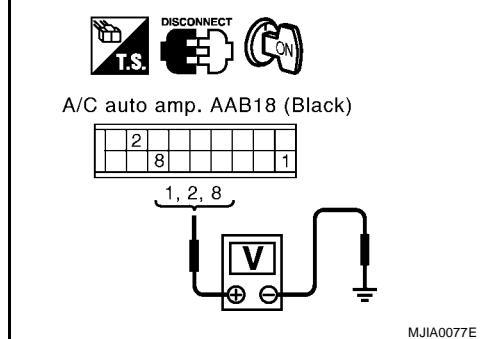
Connector terminal	Ignition switch	Voltage
A/C auto amp.	Ground	
1		OFF
2		ON
8		ON

OK or NG

OK >> GO TO 2.

NG >> Check fuse. For the Fuse Block Layout, Refer to [PG-4, "POWER SUPPLY ROUTING"](#).

- If fuse is OK, check for open circuit in harness.
- If a fuse is NG, determine the possible cause, repair circuit and replace blown fuse.



### 2. CHECK GROUND CIRCUIT OF A/C AUTO AMP.

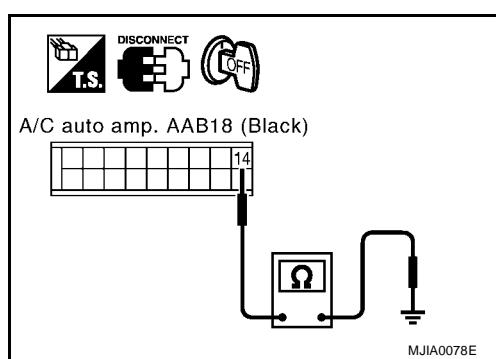
Check continuity between A/C auto amp. terminal 14 and ground.

Connector terminal	Continuity
A/C auto amp.	Ground
14	Yes

Does continuity exist?

YES >> Replace A/C auto amp.

NO >> Repair harness or connector.



## Ambient Sensor System

EJS002ID

### 1. CHECK POWER SUPPLY CIRCUIT

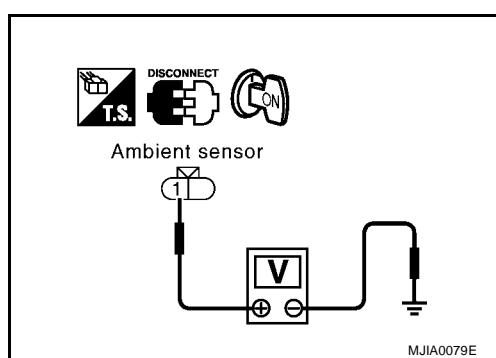
Disconnect ambient sensor connector, turn ignition switch ON, and check voltage between the terminal No. 1 and ground.

Connector terminal	Voltage
Ambient sensor	Ground
1	Approx. 5V

OK or NG

OK >> GO TO 2.

NG >> GO TO 4.



# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY

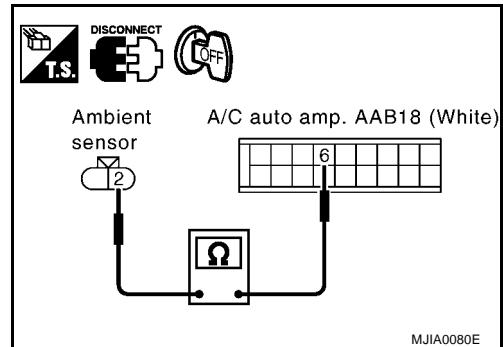
1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between ambient sensor terminal 1 and A/C auto amp. terminal 6.

Connector terminal	Continuity
Ambient sensor	A/C auto amp.
2	6

Does continuity exist?

YES >> GO TO 3.

NO >> Repair harness or connector.



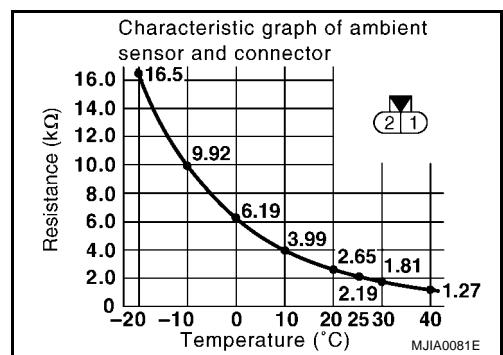
## 3. CHECK AMBIENT SENSOR

Check resistance between terminals 1 and 2 on ambient sensor.

OK or NG

OK >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).

NG >> 1. Replace ambient sensor.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).



## 4. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between ambient sensor terminal 1 and A/C auto amp. terminal 4.

Connector terminal	Continuity
Ambient sensor	A/C auto amp.
1	4

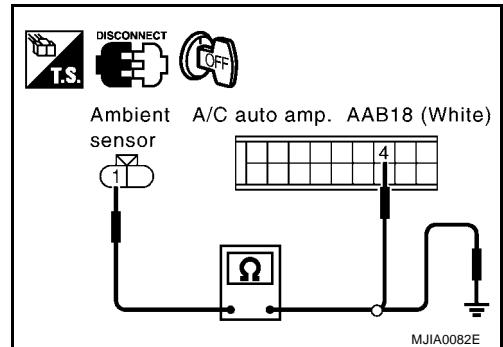
3. Check continuity between ambient sensor terminal 1 and ground.

Connector terminal	Continuity
Ambient sensor	Ground
1	None

OK or NG

OK >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).

NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## In-Vehicle Sensor System

EJS002IE

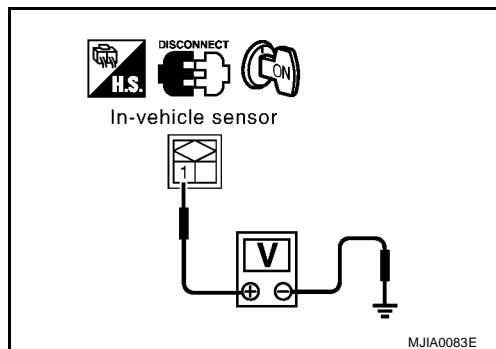
### 1. CHECK POWER SUPPLY CIRCUIT

Disconnect in-vehicle sensor connector, turn ignition switch ON, and check voltage between terminal 1 and ground.

Connector terminal	Voltage	
In-vehicle sensor		
1	Ground	Approx. 5V

OK or NG

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



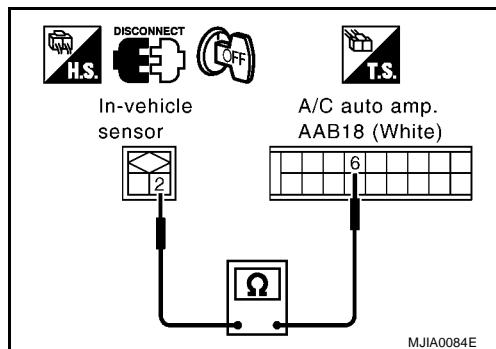
### 2. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between in-vehicle sensor terminal 2 and A/C auto amp. terminal 6.

Connector terminal	Continuity	
In-vehicle sensor		
2	6	Yes

Does continuity exist?

YES >> GO TO 3.  
NO >> Repair harness or connector.



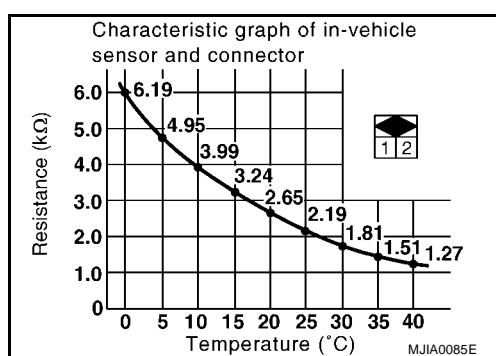
### 3. CHECK IN-VEHICLE SENSOR

Check the resistance between in-vehicle sensor terminals 1 and 2.

OK or NG

OK >> 1. Replace A/C auto amp.  
2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#) .

NG >> 1. Replace in-vehicle sensor.  
2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#) .



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# TROUBLE DIAGNOSIS

## 4. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between in-vehicle sensor terminal 1 and A/C auto amp. terminal 5.

Connector terminal	Continuity
In-vehicle sensor	A/C auto amp.
1	5

3. Check continuity between in-vehicle sensor terminal 1 and ground.

Connector terminal	Continuity
In-vehicle sensor	Ground
1	None

OK or NG

OK >> 1. Replace A/C auto amp.

2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).

NG >> Repair harness or connector.

## Sunload Sensor System

EJS002IF

### 1. CHECK POWER SUPPLY CIRCUIT

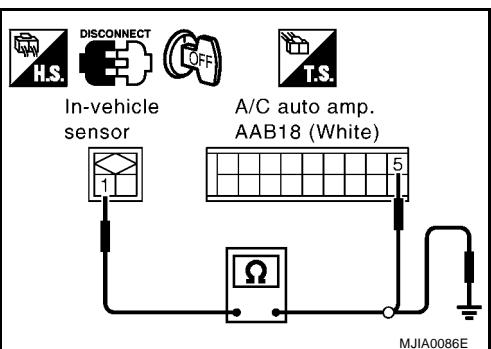
Disconnect sunload sensor connector, turn ignition switch ON, and check voltage between terminal 2 and ground.

Connector terminal	Voltage
Sunload sensor	Ground
1	Approx. 5V

OK or NG

OK >> GO TO 2.

NG >> GO TO 4.



### 2. CHECK CIRCUIT CONTINUITY

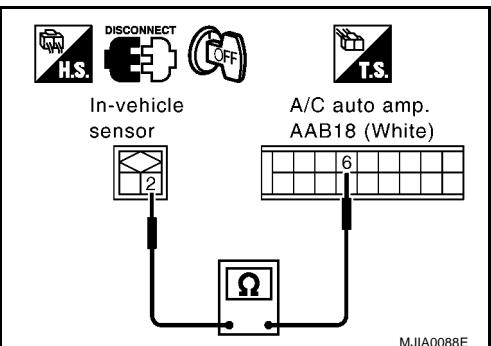
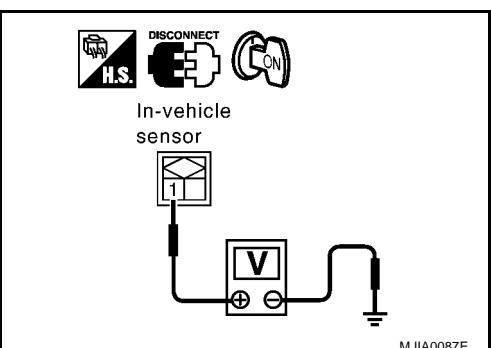
1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between sunload sensor terminal 2 and A/C auto amp. terminal 6.

Connector terminal	Continuity
Sunload sensor	A/C auto amp.
2	6

Does continuity exist?

YES >> GO TO 3.

NO >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## 3. CHECK SUNLOAD SENSOR

1. Connect the sunload sensor and A/C auto amp. connectors.
2. Check voltage between sunload sensor terminal 1 and ground.

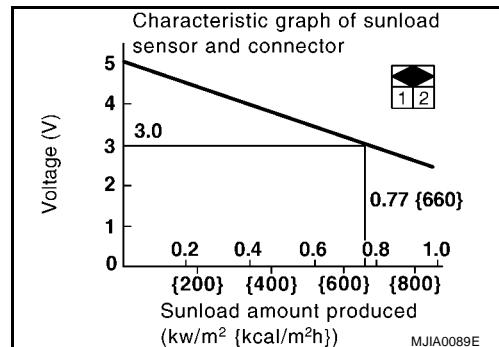
**NOTE:**

- When checking indoors, use a lamp of approximately 60W. Move the lamp towards and away from the sensor to check.
- Sunload amount produced by direct sunshine in fair weather is equivalent to approximately  $0.77 \text{ W/m}^2$  (660 kcal/m<sup>2</sup> ·h).

OK or NG

OK    >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).

NG    >> 1. Replace sunload sensor.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).



## 4. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between sunload sensor terminal 1 and A/C auto amp. terminal 3.

Connector terminal	Continuity
Sunload sensor	
1	3

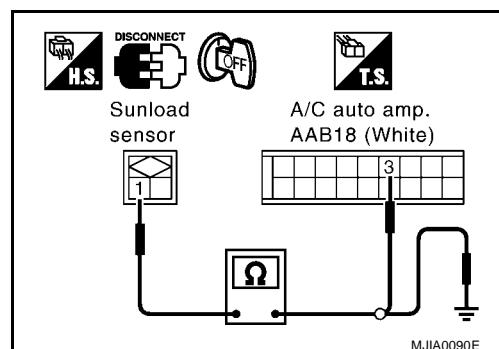
3. Check continuity between sunload sensor terminal 1 and ground.

Connector terminal	Continuity
Sunload sensor	
1	Ground

OK or NG

OK    >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#).

NG    >> Repair harness or connector.



## Intake Sensor System

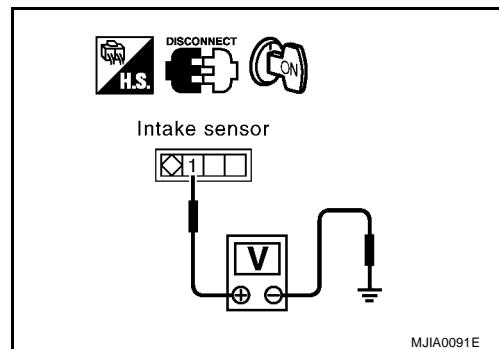
### 1. CHECK POWER SUPPLY CIRCUIT

Disconnect intake sensor connector, turn ignition switch ON, and check voltage between terminal 1 and ground.

Connector terminal	Voltage
Intake sensor	
1	Ground

OK or NG

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



# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY

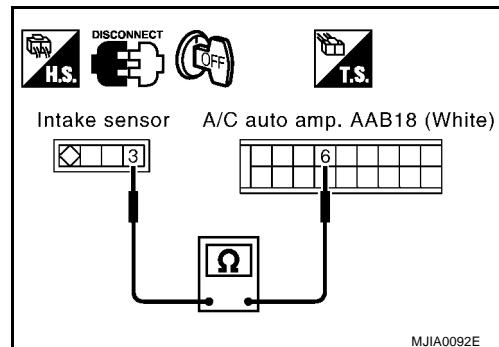
1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between intake sensor terminal 3 and A/C auto amp. terminal 6.

Connector terminal	Continuity
Intake sensor	A/C auto amp.
3	6

Does continuity exist?

YES >> GO TO 3.

NO >> Repair harness or connector.



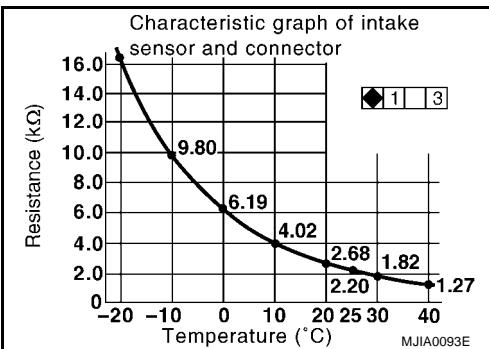
## 3. CHECK INTAKE SENSOR

Disconnect intake sensor connector and check the resistance between terminals 1 to 3.

OK or NG

OK >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#) .

NG >> 1. Replace the intake sensor.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#) .



## 4. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between intake sensor terminal 1 and A/C auto amp. terminal 7.

Connector terminal	Continuity
Intake sensor	A/C auto amp.
1	7

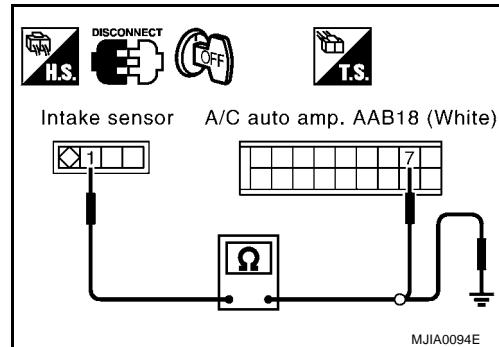
3. Check continuity between intake sensor terminal 1 and ground.

Connector terminal	Continuity
Intake sensor	Ground
1	None

OK or NG

OK >> 1. Replace A/C auto amp.  
           2. Perform self-diagnosis step 2. Make sure result is normal. Refer to [ATC-18, "Self-Diagnosis Function"](#) .

NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## Coolant Temperature Signal System

EJS002IH

Phenomenon: The low coolant temperature startup airflow volume control does not cancel or the lower coolant temperature startup airflow volume is not controlled.

### Inspection Procedure

#### 1. CHECK FUNCTION OF COMBINATION METER

Does the engine coolant temperature gauge operate normally?

OK or NG

OK >> GO TO 2.

NG >> GO TO [DI-25, "Inspection/Water Temperature Warning/Indicator Lamp" in Combination Meter.](#)

#### 2. CHECK HARNESS

1. Disconnect the A/C auto amp. connector (AAB18 black) and the combination meter connector (TH40).
2. Check continuity between A/C auto amp. terminal 13 and combination meter terminal 35.

Connector terminal		Continuity
A/C auto amp.	Combination meter	
13	35	Yes

3. Check continuity between A/C auto amp. terminal 13 and ground.

Connector terminal		Continuity
A/C auto amp.	Ground	
13		None

OK or NG

OK >> GO TO 3.

NG >> Repair the harness and connector.

#### 3. CHECK 1: ENGINE COOLANT SIGNAL

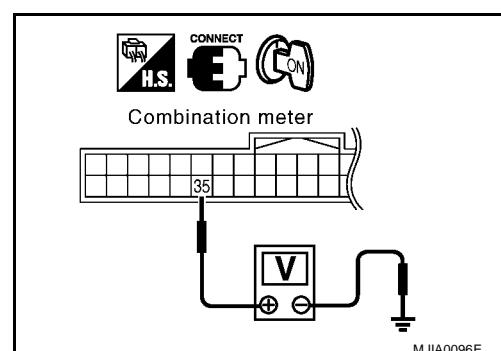
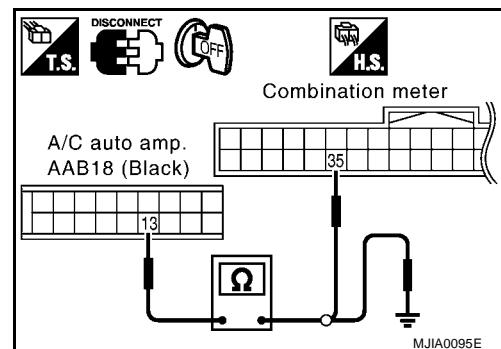
1. Connect the A/C auto amp. connector (AAB18 black) and the combination meter connector (TH40).
2. Turn ignition switch ON, and check voltage between combination meter terminal 35 and ground.

Connector terminal		Standard voltage
Combination meter	Ground	
35		Approx. 12V

OK or NG

OK >> GO TO 4.

NG >> Replace A/C auto amp.



# TROUBLE DIAGNOSIS

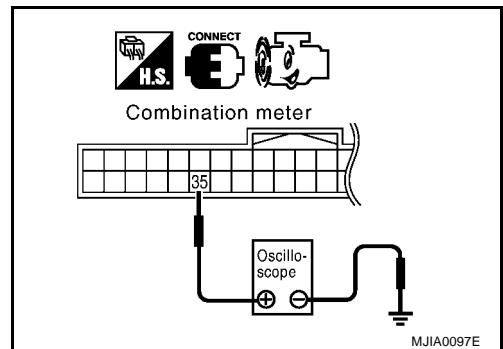
## 4. CHECK 2: ENGINE COOLANT TEMPERATURE

After the engine warms up, check voltage waveform between combination meter terminal 35 and ground.

**Between terminal 35 and ground** : Refer to [ATC-17, "A/C Auto Amp. Input/Output Signal Standard"](#) .

OK or NG

OK >> Replace A/C auto amp.  
NG >> Replace the combination meter.



EJS002II

## Blower Motor System

Symptom: Operation malfunction of blower motor

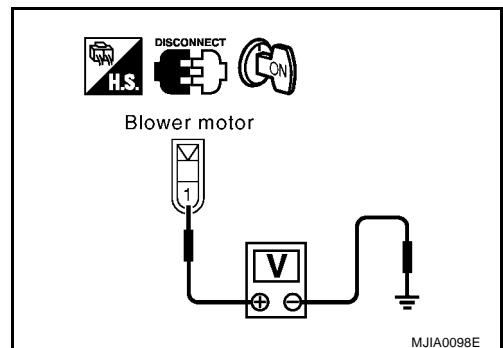
### 1. CHECK POWER SUPPLY CIRCUIT (BLOWER MOTOR)

Turn ignition switch ON, and check voltage between blower motor terminal 1 and ground.

Connector terminal	Voltage
Blower motor	Ground
1	Battery voltage

OK or NG

OK >> GO TO 2.  
NG >> Check fuse. For the Fuse Block Layout, Refer to [PG-4, "POWER SUPPLY ROUTING"](#) .  
● If any non-standard conditions are found with fuse, make sure blower motor is normal before replacing the fuse.  
● If the fuse is normal, check the blower motor relay.



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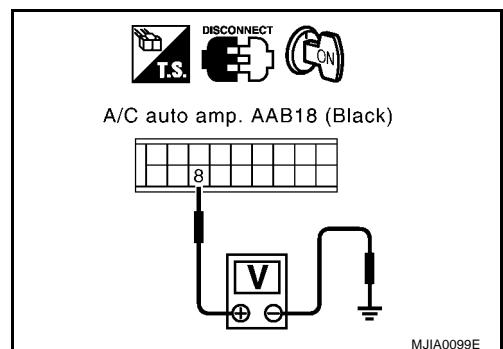
### 2. CHECK POWER SUPPLY CIRCUIT (A/C AUTO AMP.)

1. Disconnect A/C auto amp. connector (AAB18 black).
2. Turn ignition switch ON, and check voltage between A/C auto amp. terminal 8 and ground.

Connector terminal	Voltage
A/C auto amp.	Ground
8	Battery voltage

OK or NG

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



MJIA0099E

# TROUBLE DIAGNOSIS

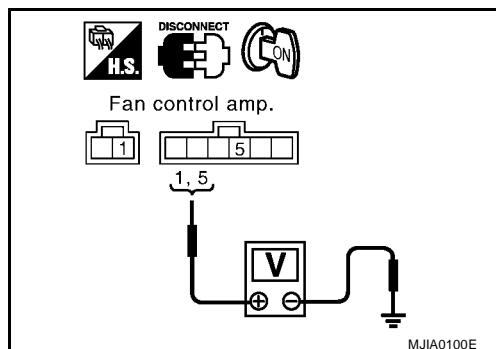
## 3. CHECK POWER SUPPLY CIRCUIT (FUN CONTROL ANP.)

1. Disconnect the fun control amp. connector.
2. Turn ignition switch ON, and check voltage between fan control amp. terminal 1, 5 and ground.

Connector terminal		Voltage
Fan control amp.	Ground	
1		
5		Battery voltage

### OK or NG

OK >> GO TO 4.  
 NG >> ● Between terminal 1 and ground: Repair the harness or connector.  
 ● Between terminal 5 and ground: GO TO 7.



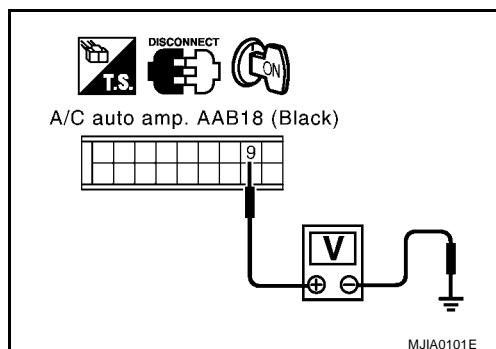
## 4. CHECK BLOWER MOTOR FEEDBACK SIGNAL

Turn ignition switch ON, and check voltage between A/C auto amp. terminal 9 and ground.

Connector terminal		Voltage
A/C auto amp.	Ground	Approx. 12V
9		

### OK or NG

OK >> GO TO 5.  
 NG >> GO TO 9.



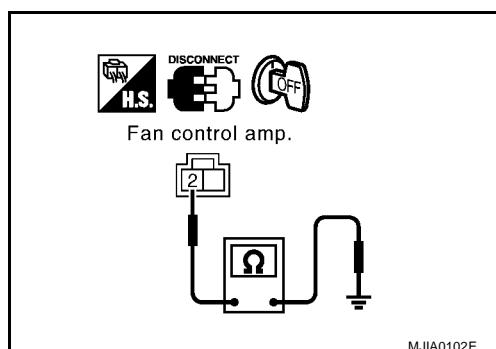
## 5. CHECK GROUND CIRCUIT

Check continuity between fan control amp. connector terminal 2 and ground.

Connector terminal		Continuity
Fan control amp.	Ground	Yes
2		

### Does continuity exist?

YES >> GO TO 6.  
 NO >> Repair harness or connector.



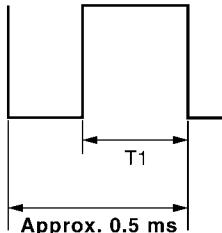
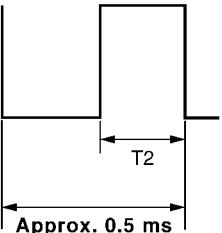
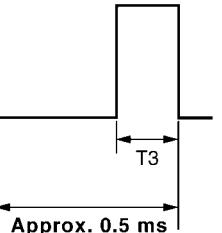
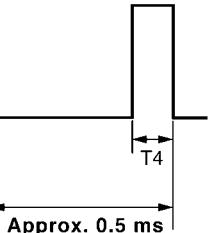
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ATC

# TROUBLE DIAGNOSIS

## 6. CHECK 1: FAN CONTROL AMP. CONTROL SIGNAL

Check waveform between fan control amp. terminal 3 and ground.

Fan speed	First	Second	Third	Fourth
Terminal 3 (Oscilloscope)	 T1: Approx. 0.37 ms Duty ratio: Approx. 27%	 T2: Approx. 0.29 ms Duty ratio: Approx. 42%	 T3: Approx. 0.19 ms Duty ratio: Approx. 62%	 T4: Approx. 0.04 ms Duty ratio: Approx. 92%

$$\text{NOTE: Duty ratio} = \frac{\text{Approx. 0.5 ms} - T_x}{\text{Approx. 0.5 ms}} \times 100 (\%)$$

MJIA0103E

### OK or NG

OK >> Replace the fan control amp.  
 NG 

- Fan speed is stuck at speed 4: GO TO 11.
- Fan speed is stuck at speed 1: GO TO 12.

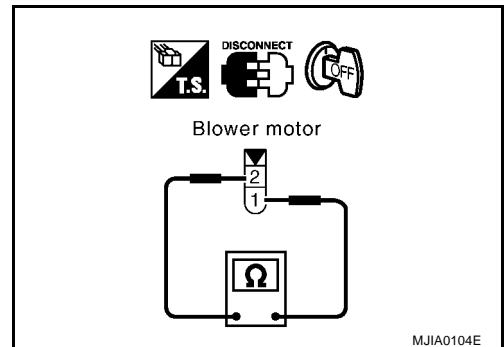
## 7. CHECK BLOWER MOTOR

1. Remove the blower motor.
2. Check continuity between blower motor terminal 1 and terminal 2.

Connector terminal	Continuity
Blower motor	Yes
1	

Does continuity exist?

YES >> GO TO 8.  
 NO >> Replace the blower motor.



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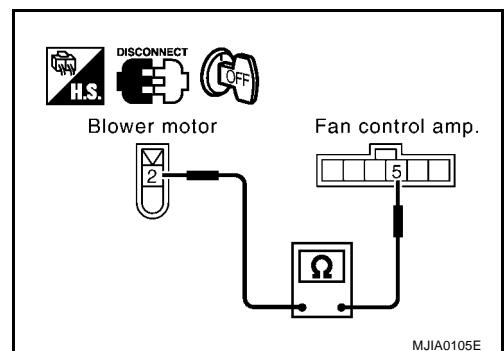
## 8. CHECK CIRCUIT CONTINUITY

1. Disconnect the blower motor and fan control amp. connectors.
2. Check continuity between the blower motor terminal 2 and fan control amp. terminal 5.

Connector terminal	Continuity
Blower motor	Yes
2	

Does continuity exist?

YES >> End of trouble diagnosis  
 NO >> Repair harness or connector.



MJIA0105E

# TROUBLE DIAGNOSIS

## 9. CHECK CIRCUIT CONTINUITY

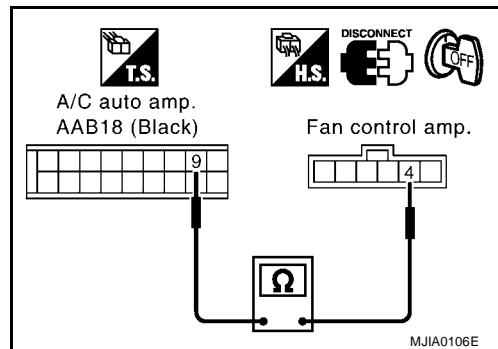
1. Disconnect the fan control amp. and A/C auto amp. (AAB18 black) connectors.
2. Check continuity between fan control amp. terminal 4 and A/C auto amp. terminal 9.

Connector terminal		Continuity
fan control amp.	A/C auto amp.	
4	9	Yes

Does continuity exist?

YES >> GO TO 10.

NO >> Repair harness or connector.



## 10. CHECK FAN CONTROL AMP.

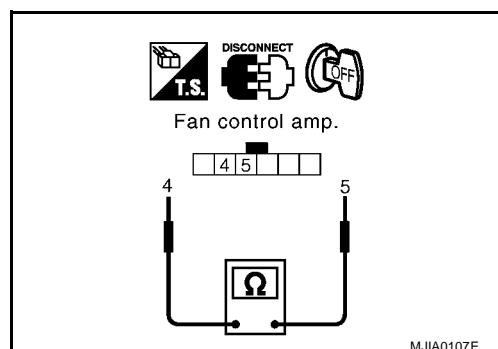
Check continuity between fan control amp. terminals 4 and 5.

Connector terminal		Continuity
Fan control amp.		
4	5	Yes

Does continuity exist?

YES >> End of trouble diagnosis

NO >> Replace the fan control amp.



## 11. CHECK CIRCUIT CONTINUITY

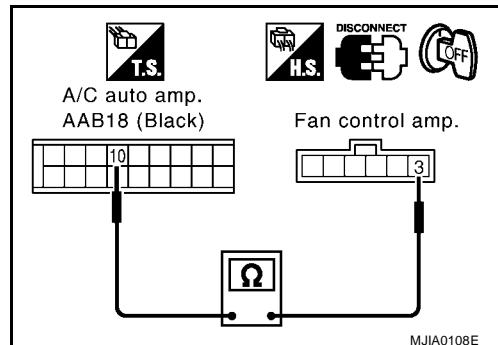
1. Disconnect the fan control amp. and A/C auto amp. (AAB18 black) connectors.
2. Check continuity between fan control amp. terminal 3 and A/C auto amp. terminal 10.

Connector terminal		Continuity
Fan control amp.	A/C auto amp.	
3	10	Yes

Does continuity exist?

YES >> Replace the fan control amp.

NO >> Repair harness or connector.



## 12. CHECK 2: FAN CONTROL AMP. CONTROL SIGNAL

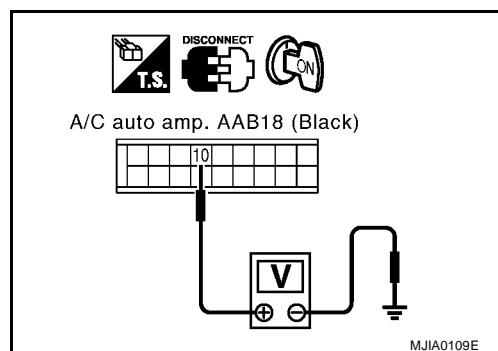
1. Disconnect the A/C auto amp. (AAB18 black) connector.
2. Turn ignition switch ON, and check voltage between A/C auto amp. terminal 10 and ground.

Connector terminal	Condition	Voltage
A/C auto amp.	Ground	Fan speed : Speed 1 through Speed 3
10		
		Battery voltage

OK or NG

OK >> Replace A/C auto amp.

NG >> Replace the fan control amp.



# TROUBLE DIAGNOSIS

## Intake Door Motor System

EJS002IJ

### Symptom

- Unable to change the intake door.
- Intake door motor does not operate normally.

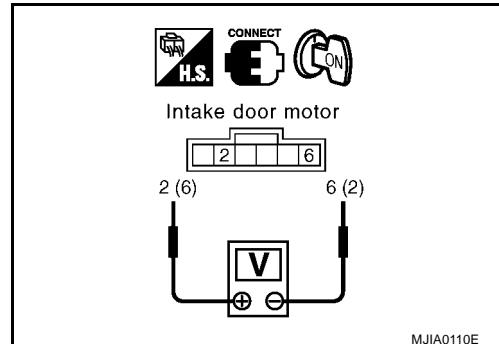
### 1. CHECK INTAKE DOOR MOTOR DRIVE POWER

Turn ignition switch ON, and check voltage between intake door motor terminals 2 and 6.

Connector terminal		Condition	Voltage
Intake door motor			
2(+)	6(-)	FRE→REC	Approx. 12V
6(+)	2(-)	REC→FRE	Approx. 12V

OK or NG

OK >> Replace intake door motor.  
NG >> GO TO 2.



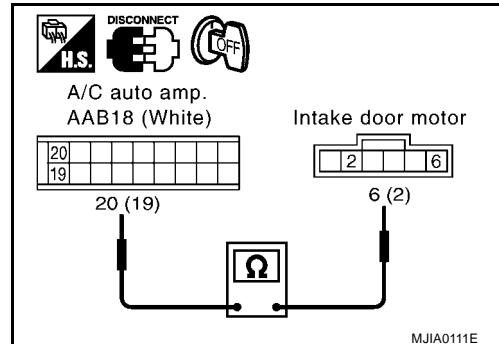
### 2. CHECK CIRCUIT CONTINUITY

Check continuity between A/C auto amp. terminal 19 and 20, and intake door motor terminals 6 and 2.

Connector terminal		Continuity
A/C auto amp.	Intake door motor	
20	6	Yes
19	2	

Does continuity exist?

YES >> Replace A/C auto amp.  
NO >> Repair the harness or connector.



## Mode Door Motor System

EJS002IK

### Symptom

- Unable to change air outlets to others.
- Mode door motor does not operate normally.

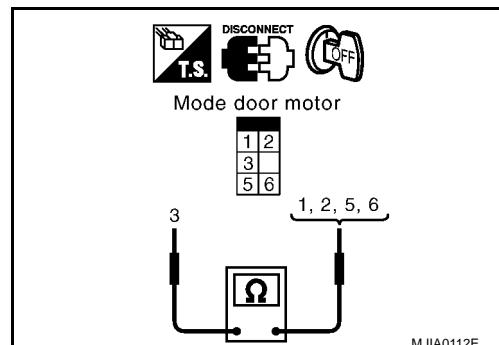
### 1. CHECK MODE DOOR MOTOR

1. Disconnect the mode door motor connector.
2. Check continuity between mode door motor terminals 3 and 1, 2, 5, 6.

Connector terminal		Continuity
Mode door motor		
3	1	Yes
	2	
	5	
	6	

Does continuity exist?

YES >> GO TO 2.  
NO >> Replace the mode door motor.

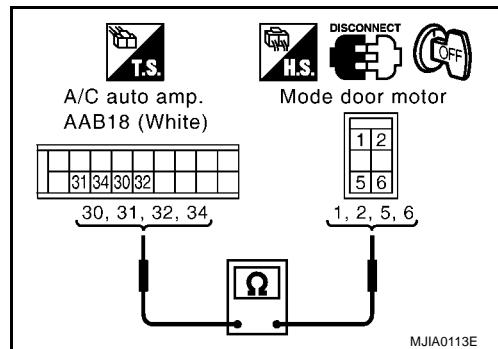


# TROUBLE DIAGNOSIS

## 2. CHECK 1: CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity among the A/C auto amp. terminals 30, 31, 32, 34 and the mode door motor terminals 1, 2, 5, and 6.

Connector terminal		Continuity
A/C auto amp.	Mode door door	
30	6	Yes
31	2	
32	5	
34	1	



Does continuity exist?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3. CHECK 2: CIRCUIT CONTINUITY

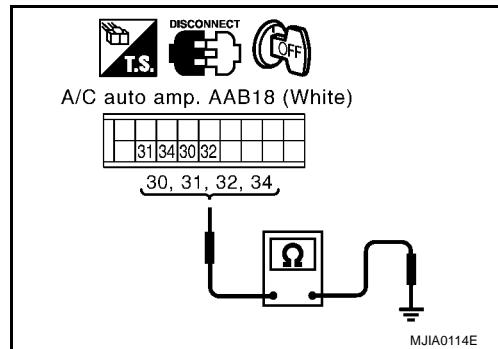
Check continuity between the ground and A/C auto amp. terminals 30, 31, 32, and 34.

Connector terminal		Continuity
A/C auto amp.		
30	Ground	None
31		
32		
34		

OK or NG

OK >> Replace A/C auto amp.

NG >> Repair the harness and connector.



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# TROUBLE DIAGNOSIS

## Air Mix Door Motor System

EJS002IL

Symptom:

- Temperature of blowing air does not change.
- Air mix door motor does not operate.

### 1. CHECK AIR MIX DOOR MOTOR

1. Disconnect the air mix door motor connector.
2. Check continuity between the air mix door motor terminals 3 and 1, 2, 5, 6.

Connector terminal		Continuity
Air mix door motor		
3	1	Yes
	2	
	5	
	6	

Does continuity exist?

YES >> GO TO 2.

NO >> Replace the air mix door motor.

### 2. CHECK 1: CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. connector (AAB18 white).
2. Check continuity between A/C auto amp. terminals 25, 26, 27, 29, and air mix door motor terminals 1, 2, 5, 6.

Connector terminal		Continuity
A/C auto amp.	Air mix door motor	
25	6	Yes
	2	
	5	
	1	

Does continuity exist?

YES >> GO TO 3.

NO >> Repair harness or connector.

### 3. CHECK 2: CIRCUIT CONTINUITY

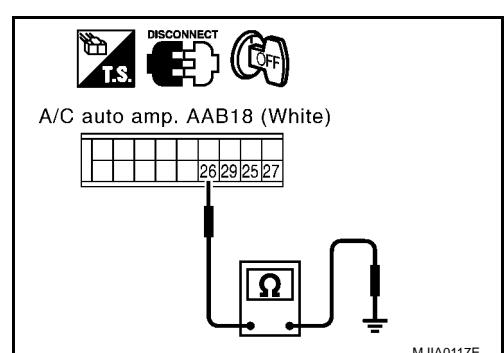
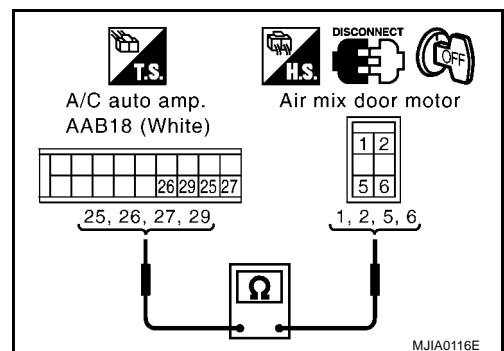
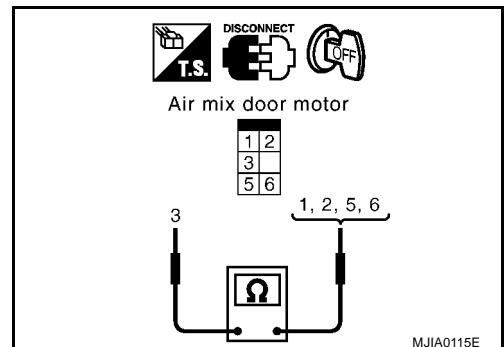
Check continuity between the ground and A/C auto amp. terminals 25, 26, 27, 29.

Connector terminal		Continuity
A/C auto amp.	Ground	
25		
26		
27		
29		

OK or NG

OK >> Replace A/C auto amp.

NG >> Repair the harness and connector.



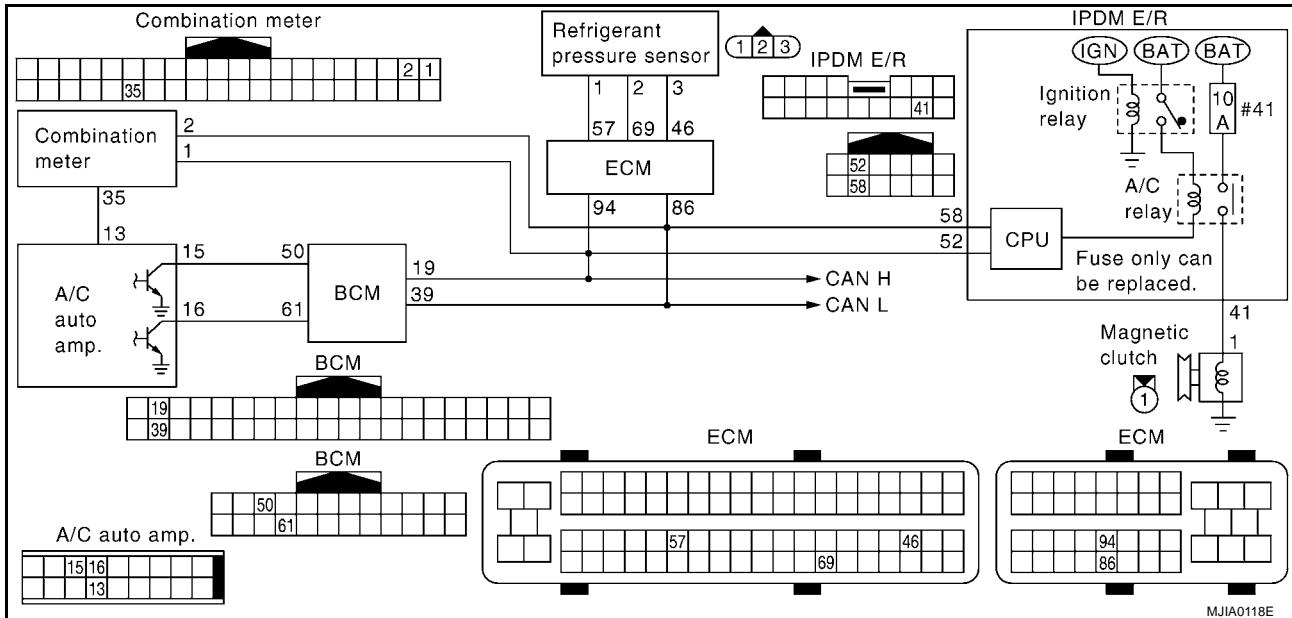
## Magnetic Clutch System

EJS002IM

Symptom:

- The magnetic clutch does not operate when the A/C switch is turned to ON when the blower motor is operating.
- The magnetic clutch does not stop. Refer to [PG-39, "Diagnosis of IPDM E/R Integrated Relay"](#).

## CIRCUIT DIAGRAM



### 1. CHECK INTAKE AIR TEMPERATURE SENSOR

Inspect the intake sensor using a self-diagnosis. Refer to [ATC-18, "Self-Diagnosis Function"](#).

OK or NG

OK >> GO TO 2.

NG >> Repair or replace parts according to the inspection results.

ATC

### 2. CHECK WITH AUTO ACTIVE TEST MODE

Perform auto active test to make sure magnetic clutch operates. Refer to [PG-29, "Auto Active Test"](#).

OK or NG

OK >> GO TO 6.

NG >> GO TO 3.

K

L

M

### 3. CHECK MAGNETIC CLUTCH VOLTAGE

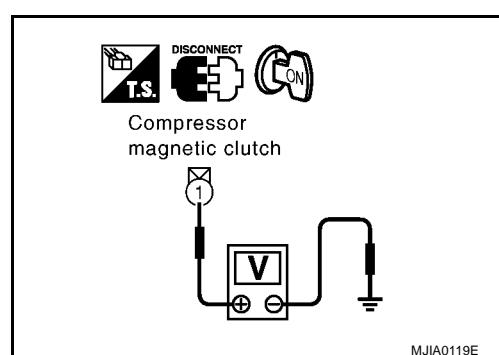
Disconnect compressor connector, turn ignition switch ON, and check voltage between compressor terminal 1 and ground.

OK or NG

OK >> GO TO 5.

NG >> After Inspecting the Fuse (#41), GO TO 4. For Information Regarding the Fuse Block Layout, Refer to [PG-4, "POWER SUPPLY ROUTING"](#).

- If fuse is OK, check for open circuit in harness.
- If a fuse is NG, determine the possible cause, repair circuit and replace blown fuse.



# TROUBLE DIAGNOSIS

## 4. CHECK CIRCUIT CONTINUITY

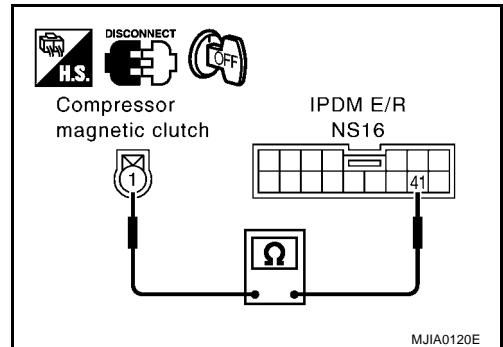
1. Disconnect the IPDM E/R and compressor connectors.
2. Check continuity between IPDM E/R terminal 41 and compressor terminal 1.

Connector terminal		Continuity
IPDM E/R	Compressor	
41	1	Yes

Does continuity exist?

YES >> GO TO 5.

NO >> Repair harness or connector.



## 5. CHECK MAGNETIC CLUTCH

Disconnect compressor connector, and check continuity between terminal 1 and ground.

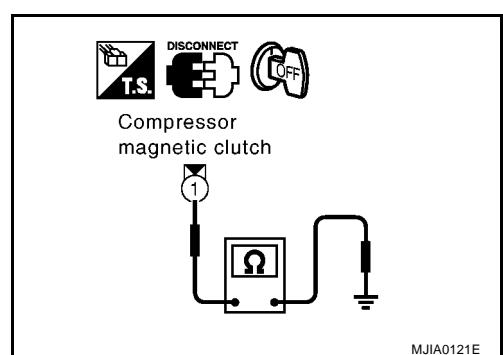
Connector terminal		Continuity
Compressor	Ground	
1		Yes

Does continuity exist?

YES >> Apply battery voltage to magnetic clutch directly and check operation sound.

1. If inspection results are NG, replace magnetic clutch.
2. If magnetic clutch is normal, replace IPDM E/R.

NO >> Replace magnetic clutch.



## 6. CHECK BCM INPUT SIGNAL

### With CONSULT-II

- Touch "BCM" → "AIR CONDITIONER" → "DATA MONITOR" → "ALL SIGNALS" and then check ON and OFF operation of compressor. Refer to [PG-25](#).

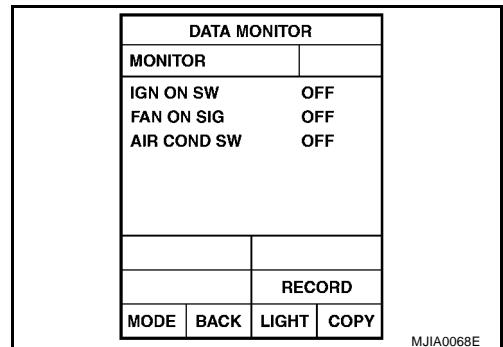
### Without CONSULT-II

- GO TO 7.

OK or NG

OK >> GO TO 10.

NG >> GO TO 7.



# TROUBLE DIAGNOSIS

## 7. CHECK CIRCUIT CONTINUITY

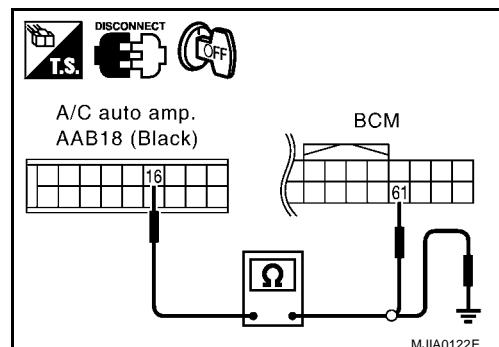
1. Disconnect the A/C auto amp. and BCM connectors.
2. Check continuity between A/C auto amp. terminal 16 and BCM terminal 61, and between A/C auto amp. terminal 16 and ground.

Connector terminal		Continuity
A/C auto amp.	BCM	
16	61	Yes
	Ground	None

OK or NG

OK >> GO TO 8.

NG >> Repair harness or connector.



## 8. CHECK COMPRESSOR ON SIGNAL

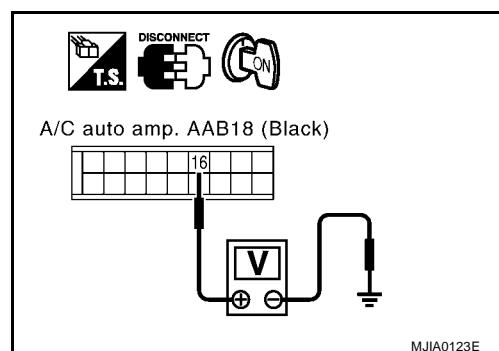
1. Connect BCM connector.
2. Turn ignition switch ON, and check voltage between A/C auto amp. terminal 16 and ground.

Connector terminal		Voltage
A/C auto amp.	Ground	
16		Approx. 5V

OK or NG

OK >> GO TO 9.

NG >> Replace BCM.



## 9. CHECK REFRIGERANT PRESSURE SENSOR SIGNAL

### With CONSULT-II

- Check refrigerant pressure sensor (touch "ENGINE" → "DATA MONITOR" → "SELECTION FROM MENU" → "AC PRESS SEN") input voltage with data monitor. Refer to [PG-25](#).

AC PRESS SEN : Approx. 0.36 - 3.88V

### Without CONSULT-II

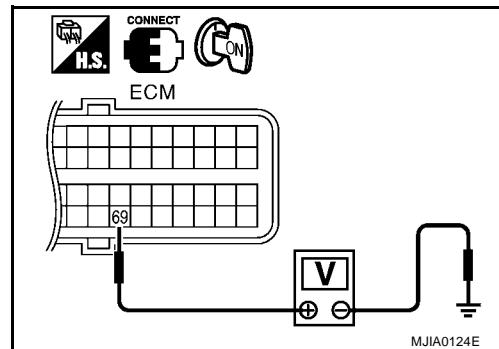
- Check voltage between ECM terminal 69 and ground.

Connector terminal		Voltage
ECM	Ground	
69		Approx. 0.36 - 3.88V

OK or NG

OK >> GO TO 10.

NG >> GO TO [EC-396, "REFRIGERANT PRESSURE SENSOR"](#).



## 10. CHECK CAN COMMUNICATION CIRCUIT

Check the CAN communication between the BCM and ECM, and ECM and IPDM E/R. Refer to [BCS-16](#), ["CAN Communication Inspection With CONSULT-II \(Self-Diagnosis\)"](#), [LAN-5, "CAN COMMUNICATION"](#).

OK or NG

OK >> Replace ECM.

NG >> Repair or replace parts based on the diagnosis results.

# TROUBLE DIAGNOSIS

## Check Fan ON Signal

EJS002IN

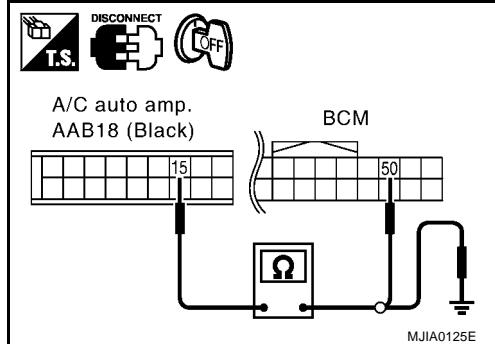
### 1. CHECK CIRCUIT CONTINUITY

1. Disconnect the A/C auto amp. and BCM connectors.
2. Check continuity between A/C auto amp. terminal 15 and BCM terminal 50, and between A/C auto amp. terminal 15 and ground.

Connector terminal		Continuity
A/C auto amp.	BCM	
15	50	Yes
	Ground	None

OK or NG

OK >> GO TO 2.  
NG >> Repair harness or connector.



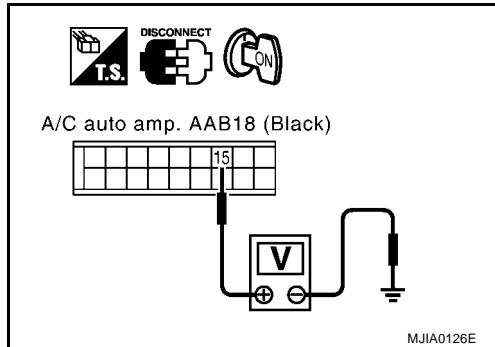
### 2. CHECK FAN ON SIGNAL

1. Disconnect BCM connector.
2. Turn ignition switch ON, and check voltage between A/C auto amp. terminal 15 and ground.

Connector terminal		Voltage
A/C auto amp.	Ground	
15		Approx. 12V

OK or NG

OK >> Replace A/C auto amp.  
NG >> Replace BCM.



## Insufficient Cooling

### CHECK FUNCTION

#### Inspection Procedure

1. Connect manifold gauge to service valve of air conditioner system.
2. Attach a psychrometer to blower unit air inlet (under glove box). Attach a dry-bulb thermometer to right-center of ventilator grille.
3. Start and warm up the engine.
4. After warming-up engine, make sure engine speed is the specified idle speed.
5. Operate compressor. Adjust controller to match conditions below.

<b>Fan speed</b>	<b>: HI</b>
<b>Air inlet</b>	<b>: Recirculation</b>
<b>Air outlet</b>	<b>: Ventilator (VENT)</b>
<b>Predetermined temperature</b>	<b>: FULL COLD</b>

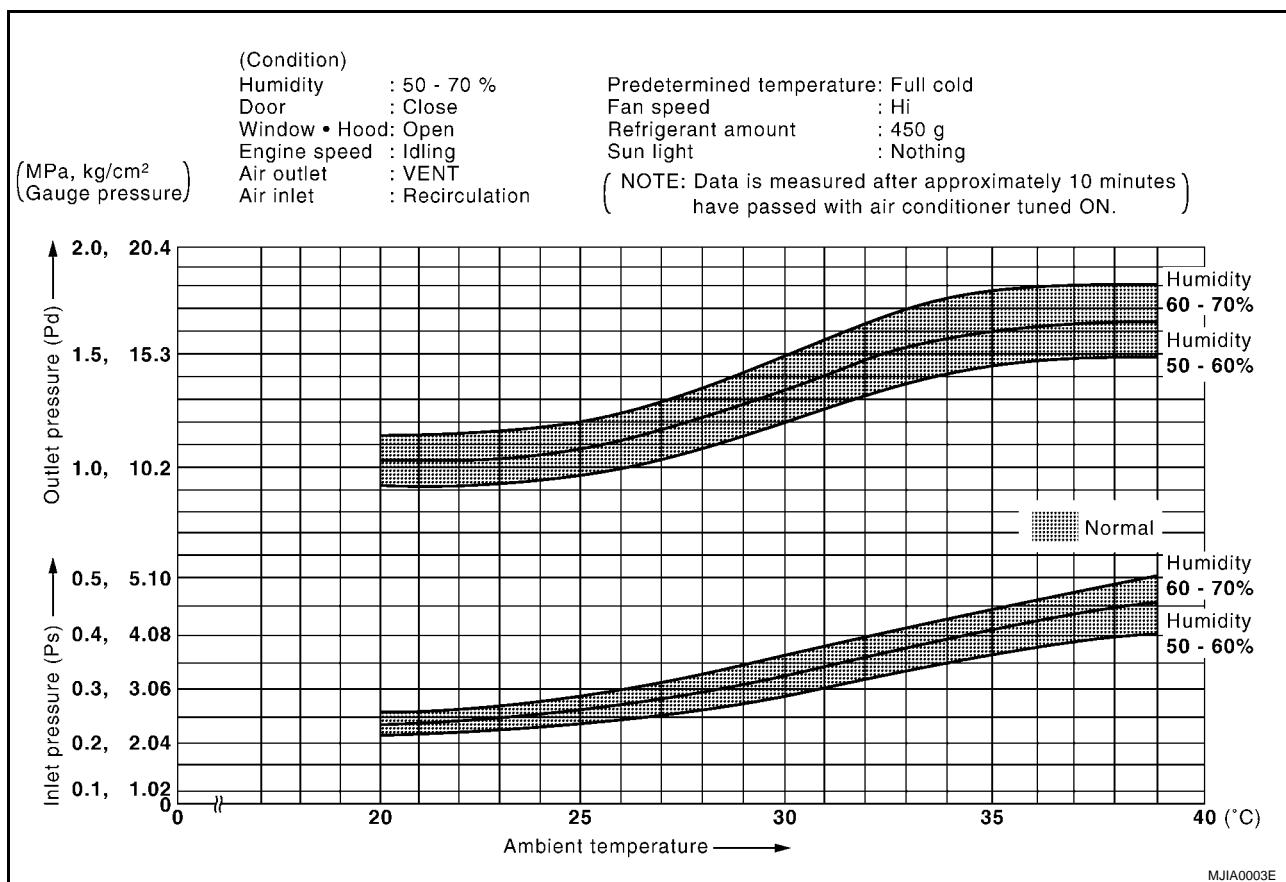
6. Fully open the hood and door windows, and close all the doors.
7. Keep this state until the air conditioner system becomes stable (after approximately 10 minutes).
8. Keep the engine speed at idle.
9. Measure the temperature and humidity at the air inlets, temperature at the air outlets, and the high-pressure and low-pressure of the air conditioner system, and compare them to "Ambient temperature - Pressure characteristic", "Intake air temperature - Discharge air temperature characteristic" for estimating.

EJS002IO

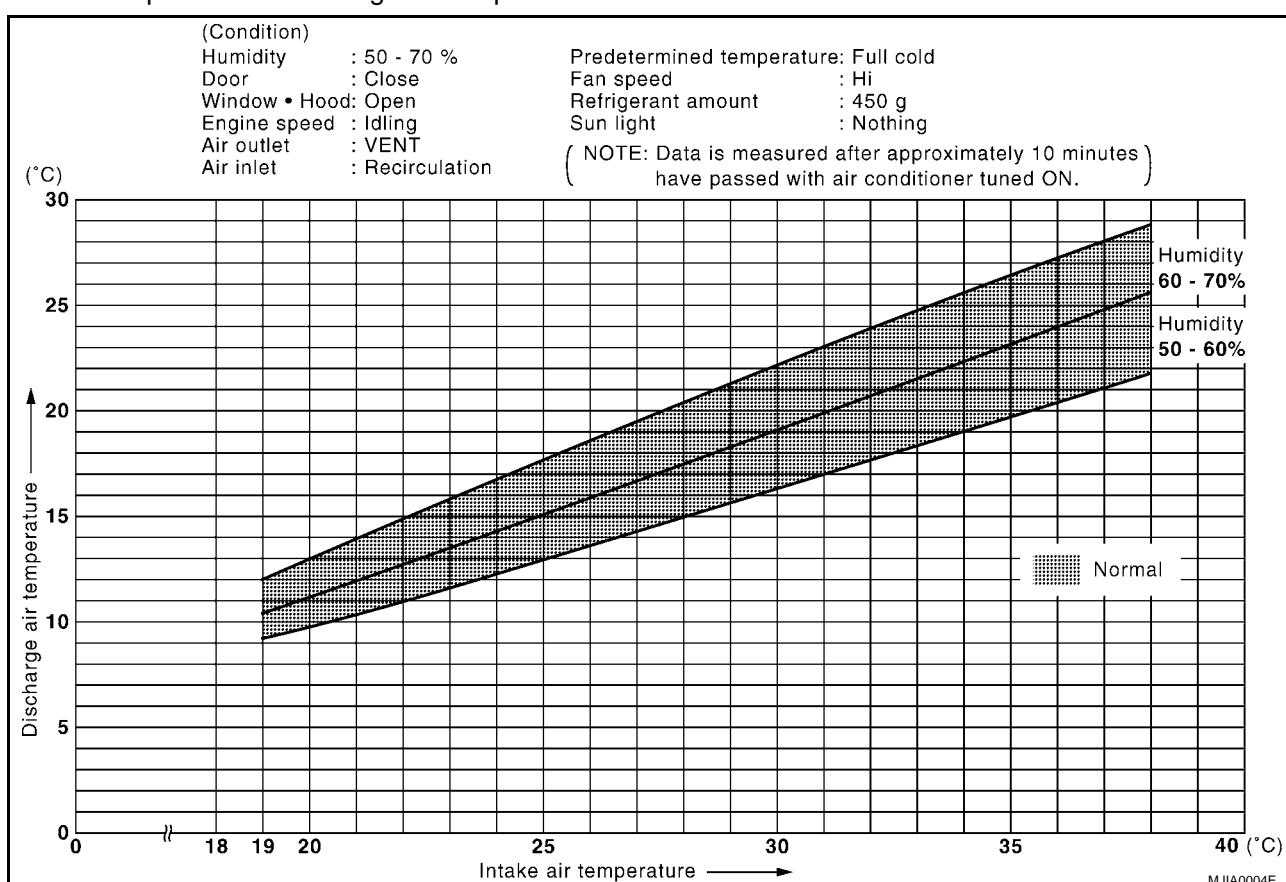
# TROUBLE DIAGNOSIS

## Performance Curve

Ambient temperature - Pressure characteristic



Intake air temperature - Discharge air temperature characteristics



# TROUBLE DIAGNOSIS

## DIAGNOSIS BY PRESSURE GAUGE

Connect a manifold gauge to service valve of air conditioner system, and determine faulty parts and possible causes by pressure in the air conditioning cycle, then troubleshoot.

Symptom	Cycle status	Possible causes	Action
High-pressure and low-pressure are both high.	They return to normal when condenser is cooled with water.	<ul style="list-style-type: none"> <li>Insufficient cooling of condenser</li> <li>Operation malfunction of radiator and condenser fan</li> <li>Improper installation of air guide</li> <li>Clogged condenser or dirty fins</li> </ul>	<ul style="list-style-type: none"> <li>Repair or replace as necessary</li> <li>Clean and repair condenser fins.</li> </ul>
	When the compressor has been stopped, pressure drops quickly by approximately $2 \text{ kg/cm}^2$ , and then decreases gradually.	Excessively charged refrigerant	Discharge refrigerant completely, evacuate again, and recharge with proper amount of refrigerant.
	Temperature at low-pressure pipe is lower than that at evaporator outlet, or low-pressure pipe becomes frosted.	Mixed air in the air conditioner system	Discharge refrigerant completely, evacuate again, and recharge with proper amount of refrigerant.
High-pressure is extremely high.	Temperature differences occur at points where high-pressure pipe is crushed or clogged.	Expansion valve opened too far (excessive refrigerant flow).	Replace expansion valve.
High-pressure and low-pressure are both low (low-pressure occasionally becomes minus).	Evaporator outlet is not cold. Frost forms on evaporator inlet.	<ul style="list-style-type: none"> <li>Expansion valve is blocked.</li> <li>Gas leakage around sensor unit.</li> <li>Clogged by foreign material</li> </ul>	Remove foreign materials from expansion valve or replace expansion valve.
	Temperature differences occur at the top/bottom outlet and inlet of the liquid tank or the liquid tank becomes frosted.	Liquid tank inner malfunction	Replace liquid tank
	Evaporator becomes frosted.	Evaporator fins are clogged or crushed.	Repair or replace.
		Insufficient airflow	<a href="#">ATC-32, "Blower Motor System"</a>
Occasionally high-pressure becomes low, and low-pressure becomes minus.	Some temperature difference occurs between high-pressure and low-pressure pipes of the compressor.	Insufficient refrigerant amount	<ul style="list-style-type: none"> <li>Check for refrigerant leaks.</li> <li>Discharge refrigerant completely, evacuate again, and recharge with proper amount of refrigerant.</li> </ul>
High-pressure is low, and low-pressure is high.	Sometimes the evaporator outlet side does not become cold. Sometimes frost forms at the evaporator inlet.	<ul style="list-style-type: none"> <li>Water mixed in cooler system. (Blockage caused by moisture freezing at the expansion valve.)</li> </ul>	Discharge refrigerant completely, evacuate again to remove all moisture, and recharge with proper amount of refrigerant. Be certain to replace liquid tank.
	The pressure equalizes soon after the compressor is stopped. There is no temperature difference between the compressor high-pressure piping and low-pressure piping.	<ul style="list-style-type: none"> <li>Compressor malfunction (improper compression)</li> <li>Damage or breakage of valve</li> <li>Gasket worn or damaged</li> </ul>	Replace compressor.

# TROUBLE DIAGNOSIS

## DIAGNOSIS OF COMPRESSOR

If there is a compressor unit malfunction (internal noise, insufficient cooling), follow table below and perform trouble diagnosis.

Symptom	Inspection Method	Checklist	Result	Action	
Noise from compressor unit when A/C is ON. (rattling or rolling sound)	Air conditioner system internal pressure	Check with a manifold gauge.	Both high- and low-pressure sides are high. (Refer to Note 2)	Recharge with proper amount of refrigerant.	
			High/low-pressure hunt. (Refer to Note 2)	Replace compressor only.	
Insufficient cooling (Refer to Note 1)	Check compressor oil condition.	Sample compressor oil and judge.	Refer to the criteria shown in compressor lubricant.	Diagnostic result 1: Replace compressor only. Judgement results 2: Compressor and liquid tank replacement	
	Compressor body	Check rotation of compressor. If seized or stuck, sample compressor oil and judge.			
Outlet air temperature rises temporarily while driving. (Refer to Note 2)	Air conditioner system internal pressure	Check with a manifold gauge. If the difference between high-pressure and low-pressure is small or if they are almost the same, sample compressor oil and judge.			
		Replace compressor only.			

Note 1: First conduct inspection according to trouble diagnosis for each malfunction. Refer to [ATC-13, "Diagnosis Chart by Symptom"](#).

Note 2: Applicable to variable capacity compressor only.

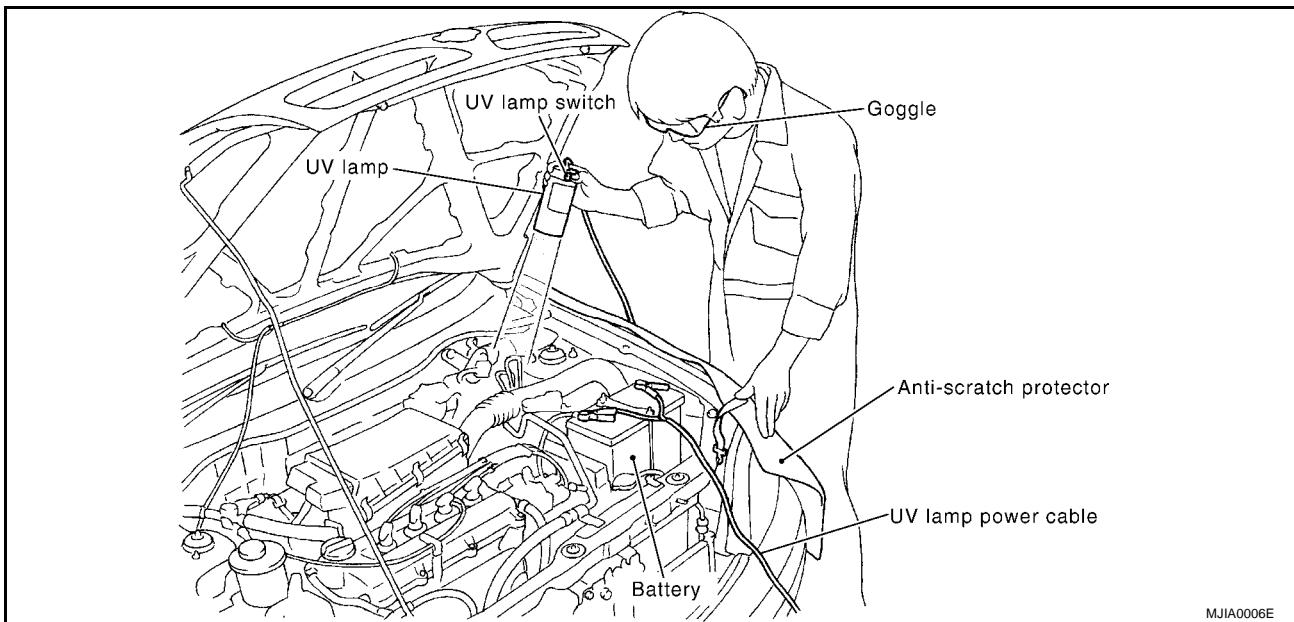
Compressor oil judgement figure				
Almost clear, no foreign material	Grayish clear, no foreign material	Light gray, no foreign material	Gray, foreign material	Black, foreign material
Judgement result 1			Judgement result 2	

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# TROUBLE DIAGNOSIS

## Detecting Leaks With Fluorescent Indicator METHOD FOR DETECTING REFRIGERANT LEAKAGE.

EJS002IP



1. Wear goggles provided with the fluorescent detector.
2. Connect the UV lamp power cable to the negative battery terminal.
3. Press UV lamp switch. Check for air conditioner system leaks. (Light green fluorescent will appear at the leak.)
4. Repair or replace parts with refrigerant leaks and wipe off the fluorescent indicator.

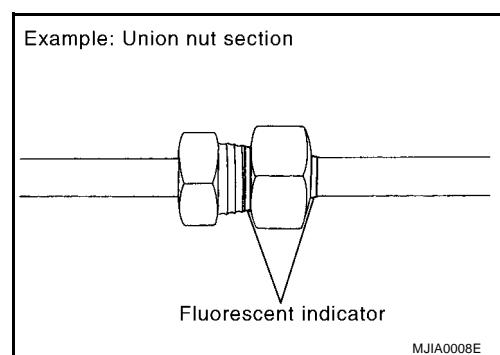
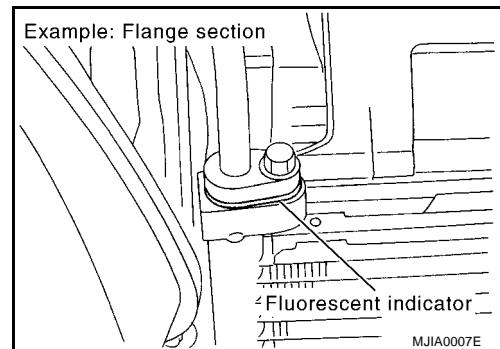
**CAUTION:**

Completely wipe off all fluorescent indicators. Use a cotton swab or something similar to remove indicator from gaps between parts, screw threads, and similar places.

5. After finishing work, use a UV lamp to make sure no fluorescent indicator remains.

**CAUTION:**

- Do not look directly into the UV lamp light source.
- For continuous operating time of UV lamp and other details, follow the Operation Manual when performing the operation.
- Dust, dirt, and adhesive of packing materials used in condenser, evaporator, and other locations may fluoresce. Be careful to avoid misidentifying leaks.



### Inspection Procedure

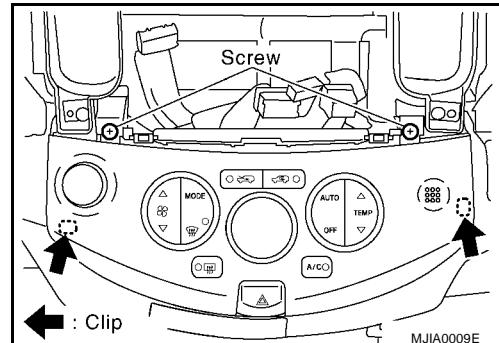
- Shine UV lamp on pipe joints from different angles to make sure there are no leaks.
- Use a cotton swab or something similar to wipe water off of drain hoses. By shining UV lamp, a check can also be made to detect leaks from evaporator.
- Use a mirror to check for refrigerant leaks in difficult to see areas.

## CONTROLLER

PFP:27500

## Removal and Installation

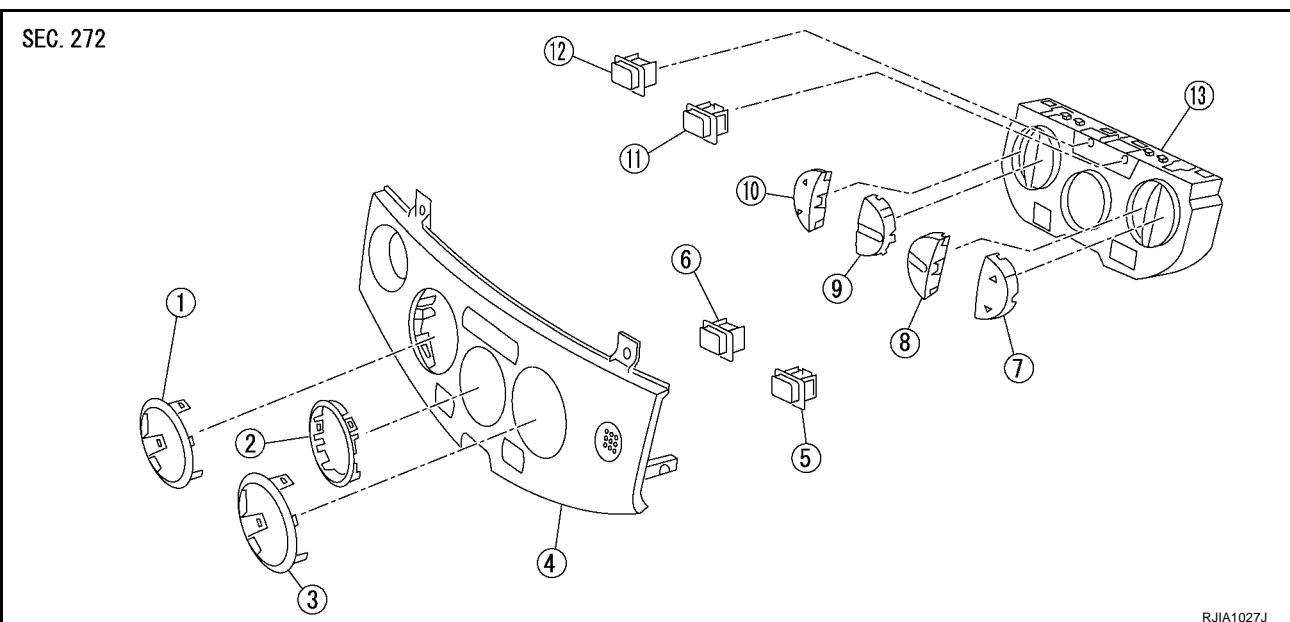
1. Remove cluster lid "C". Refer to [IP-7, "K. Cluster Lid C"](#) .
2. Remove two screws and two clip, then remove controller.



EJS002IQ

## Disassembly and Assembly

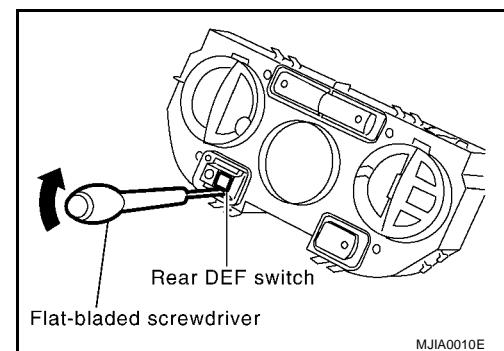
EJS002IR



1. MODE ring	2. LCD ring	3. TEMP ring
4. Air conditioner finisher	5. A/C switch	6. Rear DEF switch
7. TEMP switch	8. AUTO switch	9. MODE switch
10. FAN switch	11. REC switch	12. FRE switch
13. Controller assembly		

## NOTE:

After removing the rear DEF switch, use a flat bladed screwdriver to push the hooks in the arrow direction, and then remove the rear DEF switch.



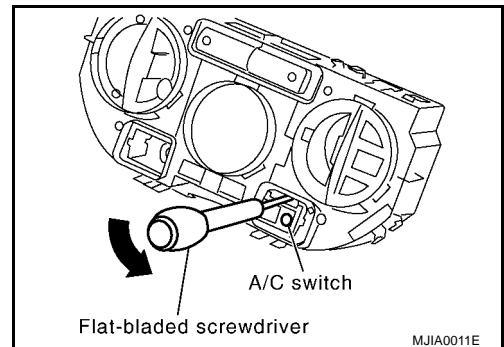
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## CONTROLLER

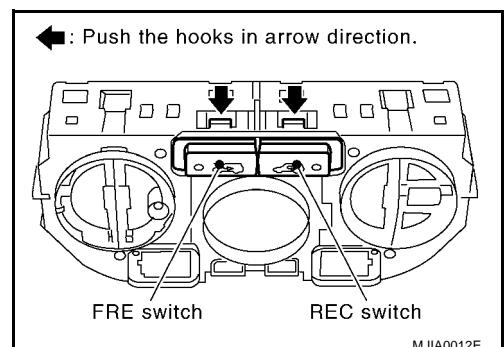
### NOTE:

After removing the A/C switch, use a flat bladed screwdriver to push the hooks in the arrow direction, and then remove the A/C switch.



### NOTE:

Use a flat bladed screwdriver to push the hooks in the arrow direction, and then remove the FRE and REC switch.



# AMBIENT SENSOR

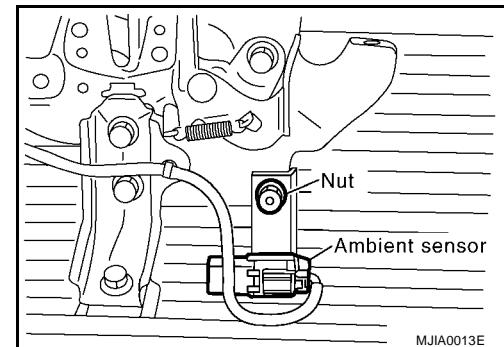
## AMBIENT SENSOR

PFP:27722

### Removal and Installation

EJS002IS

1. Remove the front grille (LH). Refer to [EI-9, "FRONT GRILLE"](#) .
2. Remove the nut and then remove the ambient sensor.



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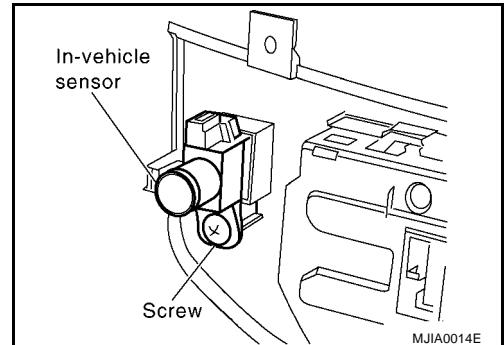
## IN-VEHICLE SENSOR

PFP:27720

### Removal and Installation

EJS002IT

1. Remove the controller. Refer to [ATC-47, "CONTROLLER"](#).
2. Remove the screw and the remove the in-vehicle sensor.



# SUNLOAD SENSOR

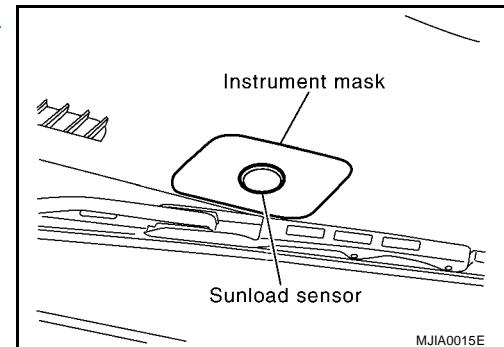
## SUNLOAD SENSOR

PFP:27721

### Removal and Installation

EJS002IU

1. Remove the instrument mask. Refer to [IP-4, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove the sunload sensor.



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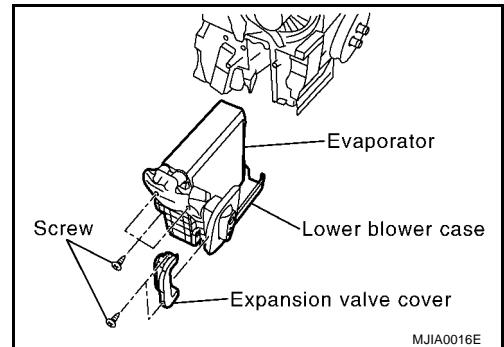
## INTAKE SENSOR

PFP:27723

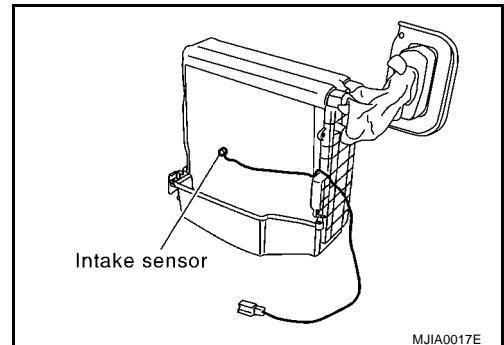
## Removal

EJS002IV

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the A/C unit. Refer to [ATC-53, "A/C UNIT ASSEMBLY"](#) .
3. Remove the clean filter, mode door actuator, and foot duct (RH). Refer to [ATC-59, "CLEAN FILTER"](#) , [ATC-61, "MODE DOOR MOTOR"](#) , [ATC-67, "FOOT DUCT"](#) .
4. Remove the lower blower case and expansion valve cover.



5. Slide the evaporator and door blower case downward, and remove the intake sensor.



## Installation

EJS002IW

**CAUTION:**

- Replace the low-pressure and high-pressure flexible hoses and high-pressure pipe O-rings with new ones. Apply compressor lubricant to them during installation.
- When replacing the intake air temperature sensor, install the intake sensor thermistor in the same position as the removed intake sensor.
- When removing and installing the intake sensor, do not rotate the thermistor insertion part.
- After charging with refrigerant, check for refrigerant leaks.
- After installing actuator, reset zero position by following Self-Diagnosis Step 3. Refer to [ATC-18, "Self-Diagnosis Function"](#) .

**Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.**

**Tightening torque    2.9 - 5.9 N·m (0.3 - 0.6 kg·m)**

## A/C UNIT ASSEMBLY

PFP:27210

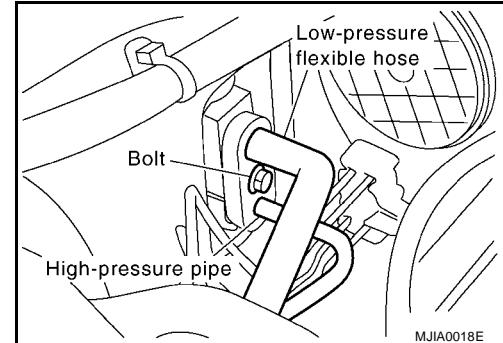
### Removal and Installation

#### REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Drain engine coolant.
3. Disconnect the low-pressure flexible hose and high-pressure pipe from the evaporator.

#### CAUTION:

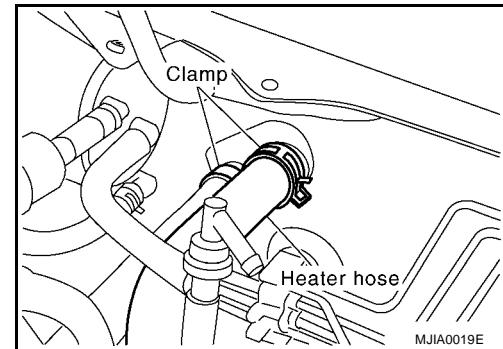
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



4. Pull out the heater hose from the heater core.

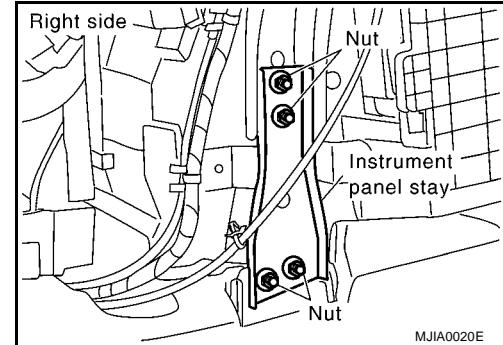
#### CAUTION:

- Some coolant may spill when heater hoses are disconnected.
- Close off the coolant inlet and outlet on the heater core (2 locations) with shop cloths.



5. Remove instrument panel. Refer to [IP-4, "INSTRUMENT PANEL ASSEMBLY"](#) .

6. Remove the vehicle harness clips and then remove the instrument panel stay.



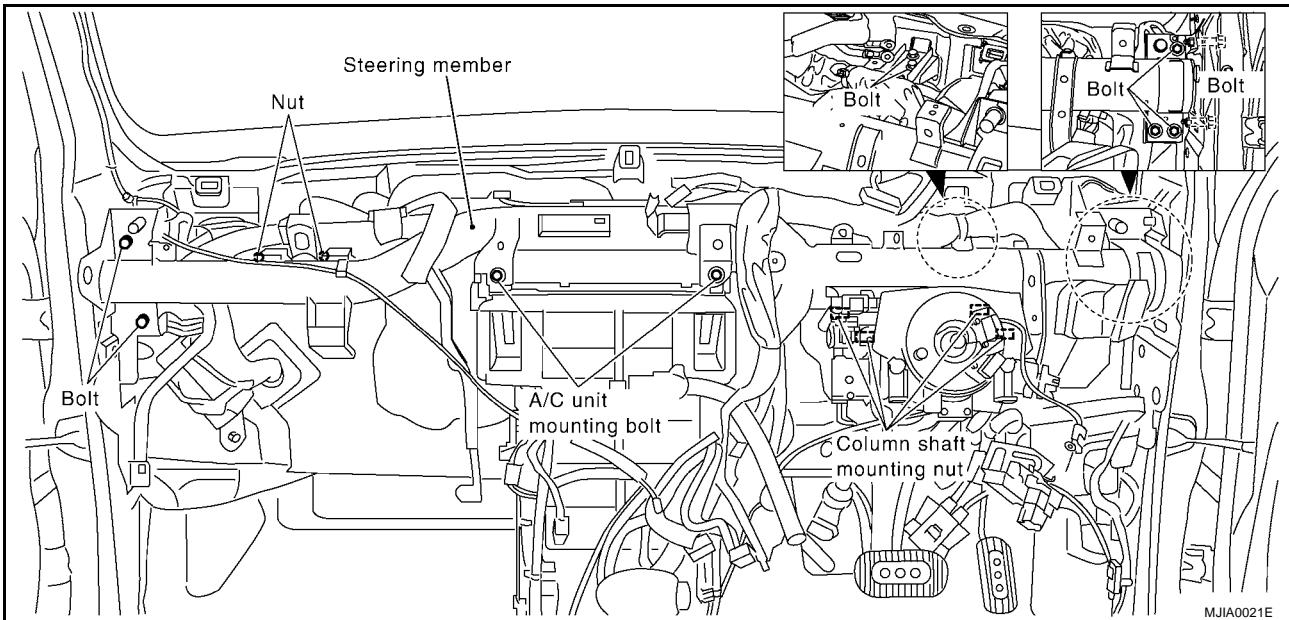
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# A/C UNIT ASSEMBLY

## NOTE:

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



7. Remove the ventilator duct mounting screws and clips.
8. Remove the two A/C unit mounting bolts, nine steering member mounting bolts, four column shaft mounting bolts, and the harness clips.
9. Remove the BCM. Refer to [BCS-3, "BCM \(BODY CONTROL MODULE\)"](#) .
10. Remove the steering member, and then remove the A/C unit.

## INSTALLATION

### CAUTION:

- Replace all O-rings on the pipes with new ones. Apply a coat of compressor lubricant prior to installation.
- After charging with refrigerant, check for refrigerant leaks.

1. Install the A/C unit.

### CAUTION:

Confirm that the A/C unit drain and drain hose positions match up.

#### A/C unit mounting bolt.

**Tightening torque : 5.98 - 7.65 N·m (0.61 - 0.78 kg·m)**

2. Perform removal steps 3 through 10 in reverse order.

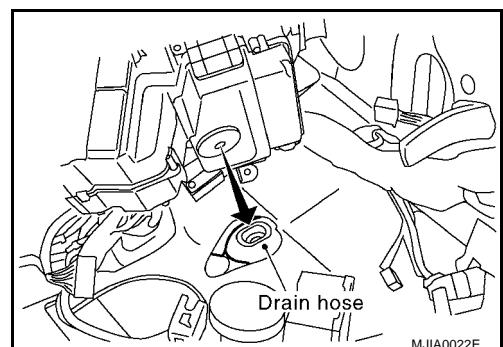
#### Steering member mounting nut and bolt

**Tightening torque : 11 - 13 N·m (1.1 - 1.4 kg·m)**

#### Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.

**Tightening torque 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)**

3. Fill engine coolant.
4. Charge refrigerant using refrigerant recovery unit (for HFC134a).



# A/C UNIT ASSEMBLY

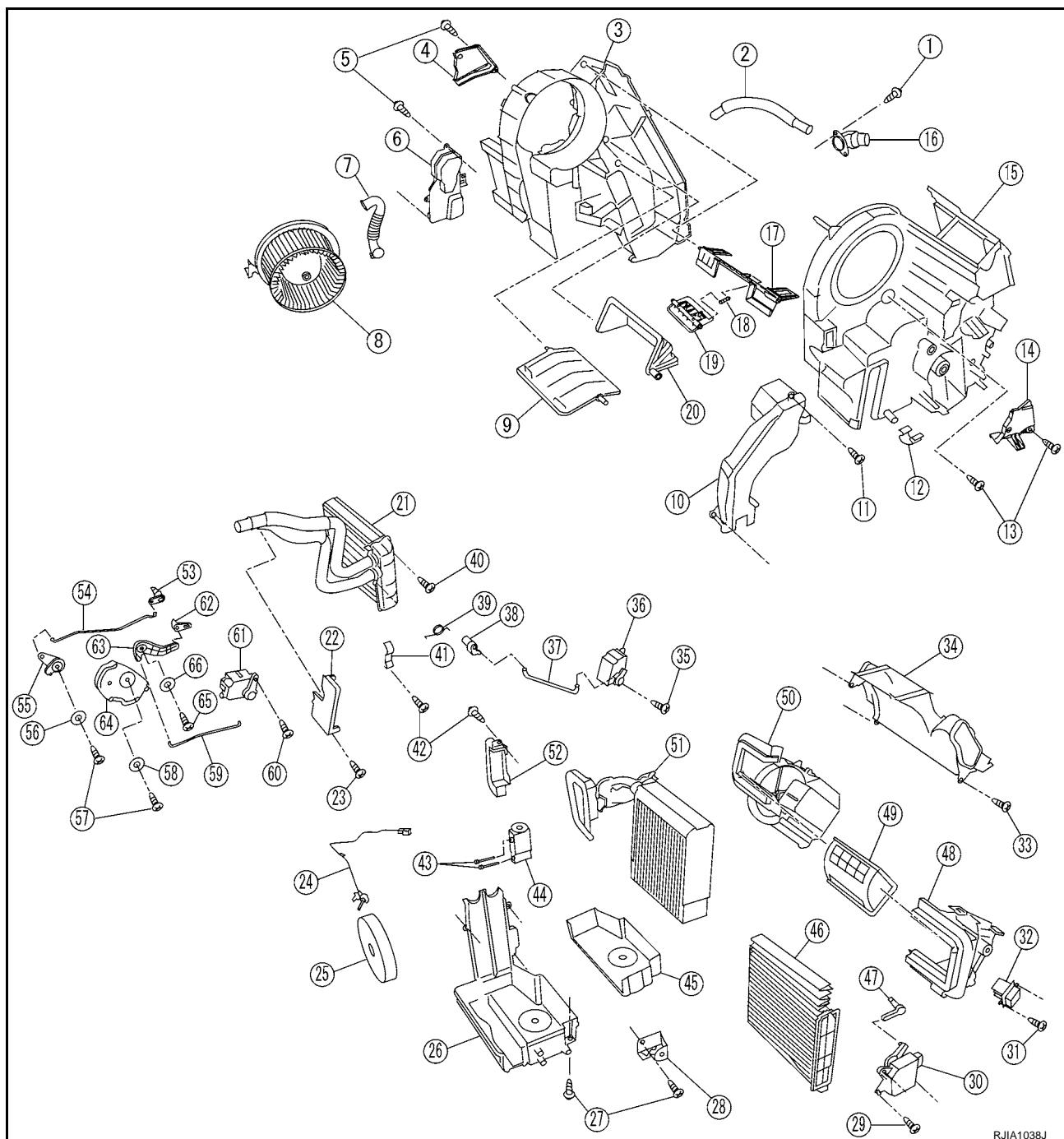
## Disassembly and Assembly

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1. Screw	2. Aspirator duct	3. Blower case (RH)
4. Cover (RH)	5. Screw	6. Foot duct (RH)
7. Coolant hose	8. Blower motor	9. Air mix door
10. Foot duct (LH)	11. Screw	12. Clips
13. Screw	14. Cover (LH)	15. Blower case (LH)
16. Aspirator	17. Vent door	18. DEF rod
19. DEF door	20. Foot door	21. Heater core
22. Heater pipe cover	23. Screw	24. Intake sensor
25. Heater pipe packing	26. Lower blower case	27. Screw
28. Bracket	29. Screw	30. Intake door motor
31. Screw	32. Fan control amp.	33. Screw
34. Attachment case	35. Screw	36. Air mix door motor

## A/C UNIT ASSEMBLY

---

37. Air mix door rod	38. Air mix door lever	39. Spring
40. Screw	41. Heater pipe clip	42. Screw
43. Bolt	44. Expansion valve	45. Insulator
46. Clean filter	47. Intake link	48. Intake case (LH)
49. Intake door	50. Intake case (RH)	51. Evaporator
52. Expansion valve cover	53. Vent DEF lever	54. Vent DEF rod
55. Vent DEF link	56. Washer	57. Screw
58. Washer	59. Mode door rod	60. Screw
61. Mode door motor	62. Foot lever	63. Foot link
64. Main link	65. Screw	66. Washer

**CAUTION:**

After installing actuator, reset zero position by following Self-Diagnosis Step 3. Refer to [ATC-18, "Self-Diagnosis Function"](#) .

## HEATER CORE

PFP:27140

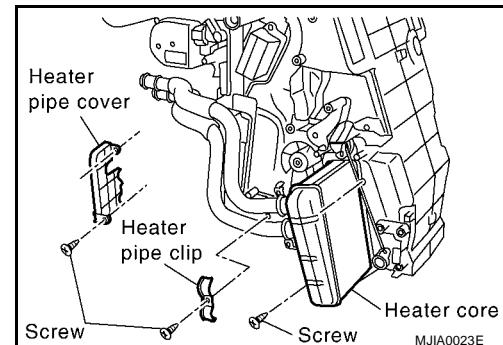
### Removal and Installation

EJS002IZ

1. Remove the A/C unit. Refer to [ATC-53, "A/C UNIT ASSEMBLY"](#)
2. Remove the foot duct (LH), two screws, and heater pipe cover.
3. Remove the mode door actuator, main link, and vent DEF link.
4. Remove the heater pipe clip, and then pull out heater core from the A/C unit.

**CAUTION:**

After installing actuator, reset zero position by following Self-Diagnosis Step 3. Refer to [ATC-18, "Self-Diagnosis Function"](#).



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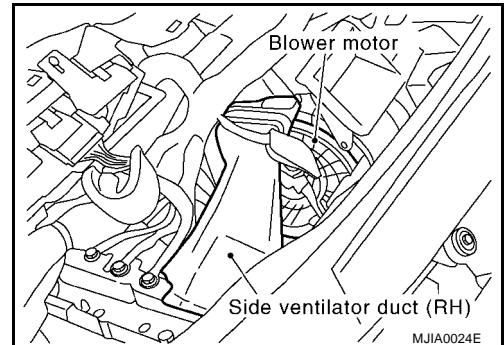
# BLOWER MOTOR

## BLOWER MOTOR

PFP:27226

### Removal

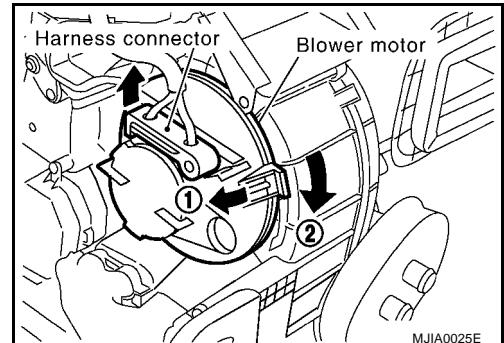
1. Remove instrument panel. Refer to [IP-4, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove the side ventilator duct (RH). Refer to [ATC-66, "SIDE VENTILATOR DUCT"](#).



3. Disconnect the harness connector, and remove the blower motor.

**CAUTION:**

When the blower fan and blower motor are assembled, the balance is adjusted, so do not replace the individual parts.



### Installation

EJS002J1

**CAUTION:**

Correctly install the blower motor flange holding hooks in the A/C unit.

## CLEAN FILTER

PFP:27277

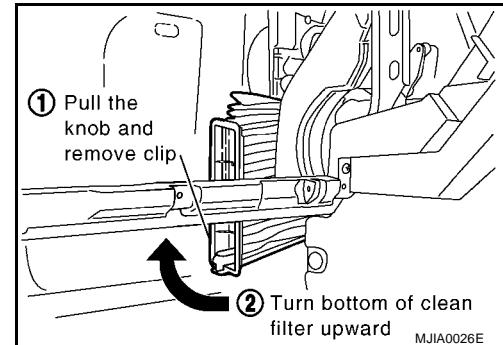
### Removal and Installation

EJS002J2

#### NOTE:

Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

1. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#) .
2. Compress the clean filter downward while sliding it to the outside of the vehicle.
3. Turn the bottom of the clean filter upward, and then remove it.



### Replacement

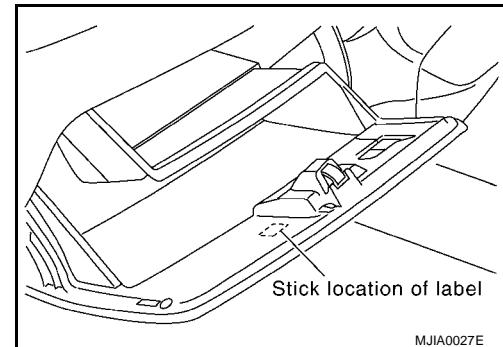
EJS002J3

#### NOTE:

Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

**Clean filter  
Replacement  
interval** : Once a year or every  
12,000 km

Fill in the necessary information on the label, and stick it on the inside of the glove box as shown in the figure.



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# INTAKE DOOR MOTOR

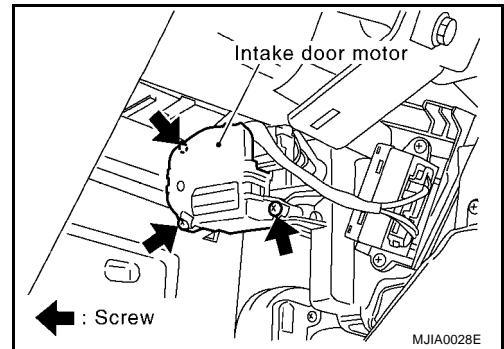
## INTAKE DOOR MOTOR

PFP:27730

### Removal and Installation

EJS002J4

1. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#) .
2. Remove the three screws and then remove the intake door motor.



## MODE DOOR MOTOR

PFP:27731

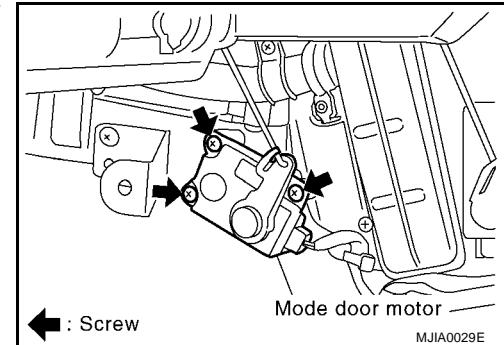
### Removal and Installation

EJS002J5

1. Remove the instrument panel stay cover. Refer to [IP-8, "M. Instrument Panel Stay Cover"](#) .
2. Remove the three screws and then remove the mode door motor.

#### CAUTION:

After installing actuator, reset zero position by following Self-Diagnosis Step 3. Refer to [ATC-18, "Self-Diagnosis Function"](#) .



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## AIR MIX DOOR MOTOR

PFP:27732

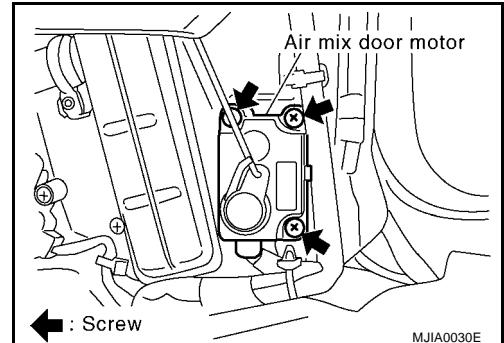
### Removal and Installation

EJS002J6

1. Remove the instrument panel stay cover. Refer to [IP-8, "M. Instrument Panel Stay Cover"](#) .
2. Remove the three screws and then remove the air mix door actuator.

#### CAUTION:

After installing actuator, reset zero position by following Self-Diagnosis Step 3. Refer to [ATC-18, "Self-Diagnosis Function"](#) .



# FAN CONTROL AMPLIFIER

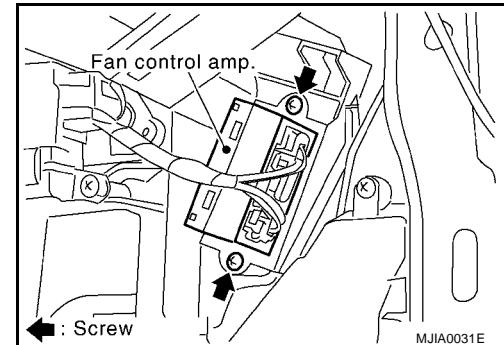
## FAN CONTROL AMPLIFIER

PFP:27761

### Removal and Installation

EJS002J7

1. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#).
2. Remove the two screws and then remove the fan control amp.



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# DUCTS AND GRILLES

## DUCTS AND GRILLES

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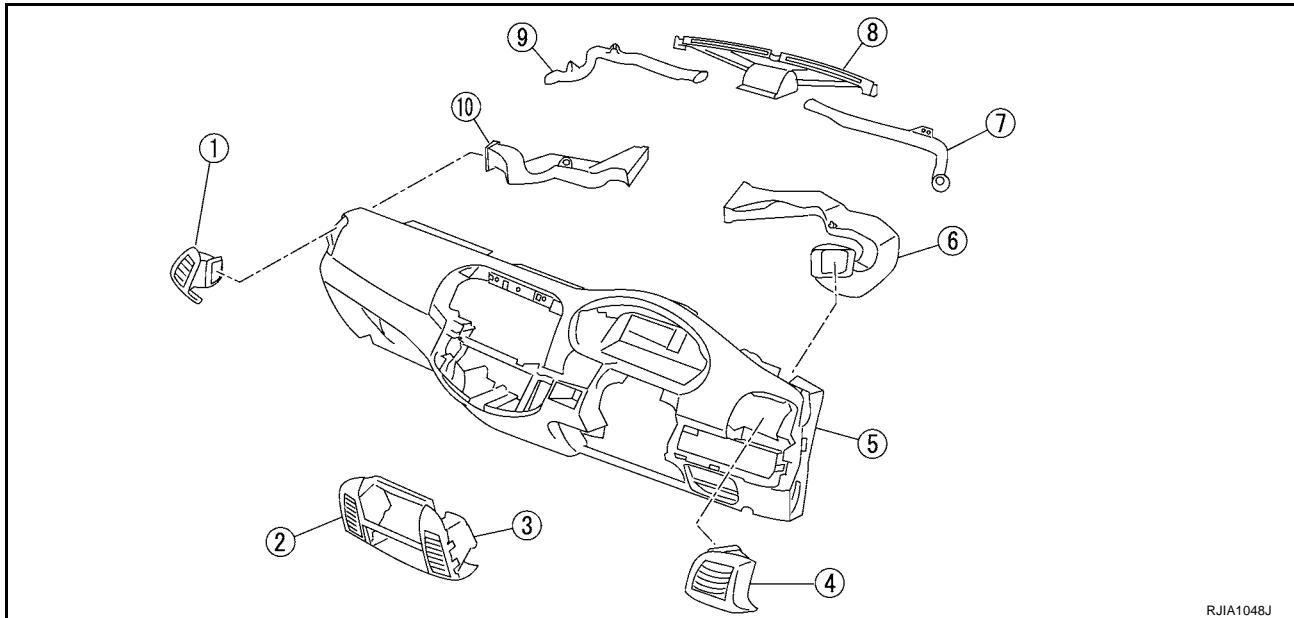
### Removal and Installation

#### COMPONENT PARTS LOCATION

EJS002J8

##### NOTE:

Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

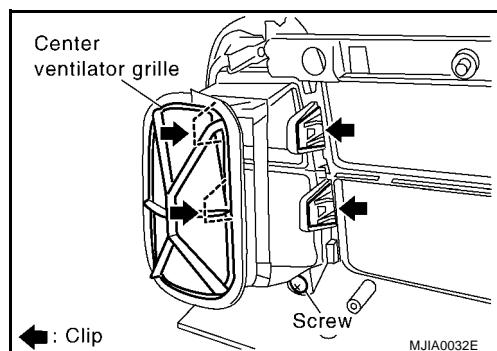


RJIA1048J

1. Side ventilator grille (passenger side)
2. Central ventilator grille (passenger side)
3. Central ventilator grille (driver side)
4. Side ventilator grille (driver side)
5. Instrument panel
6. Side ventilator duct (driver side)
7. Side defroster duct (driver side)
8. Defroster nozzle
9. Side defroster duct (passenger side)
10. Side ventilator duct (passenger side)

### CENTRAL VENTILATOR GRILLE

1. Remove cluster lid "C". Refer to [IP-7, "K. Cluster Lid C"](#) .
2. Remove the audio. Refer to [AV-3, "AUDIO"](#) , [AV-15, "NAVIGATION SYSTEM"](#) .
3. Remove the center ventilator grille.

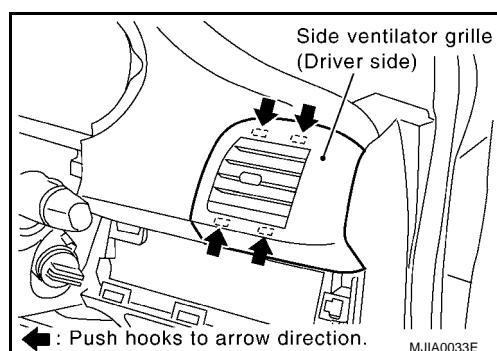


### SIDE VENTILATOR GRILLE

##### NOTE:

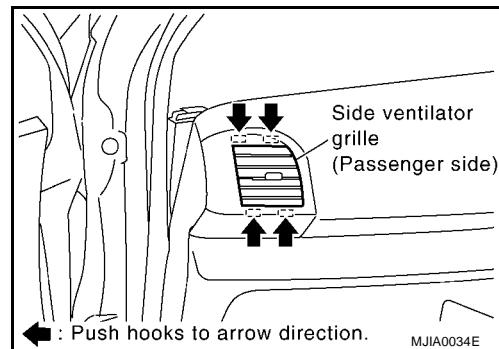
Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

1. Remove the upper instrument panel. Refer to [IP-6, "B. Upper Instrument Panel"](#) .
2. Remove the switch panel finisher. Refer to [IP-6, "E. Switch Panel Finisher"](#) .
3. Remove the side ventilator grille (driver side) hooks from the back side of the instrument panel, and then remove the side ventilator grille (driver side).
4. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#) .



## DUCTS AND GRILLES

5. Remove the side ventilator grille (passenger side) hooks from the back side of the instrument panel, and then remove the side ventilator grille (passenger side).

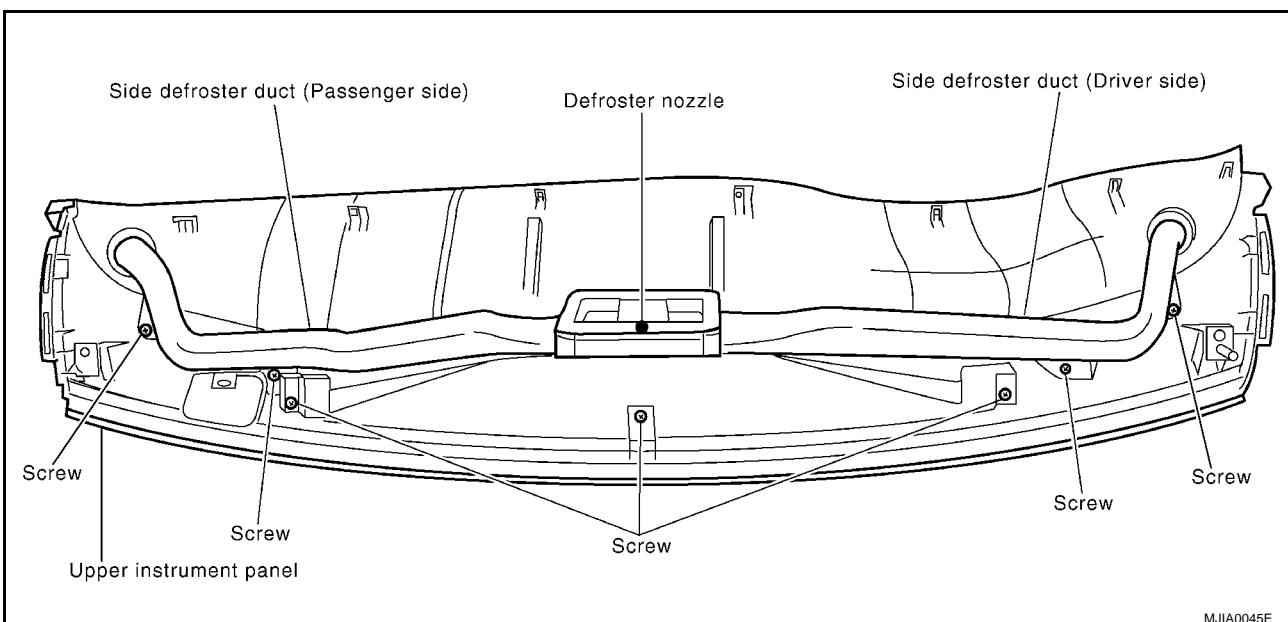


## DEFROSTER NOZZLE AND DUCT

### NOTE:

Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

1. Remove the upper instrument panel. Refer to [IP-6, "B. Upper Instrument Panel"](#) .



2. Remove the side defroster ducts and defroster nozzles from the upper instrument panel.

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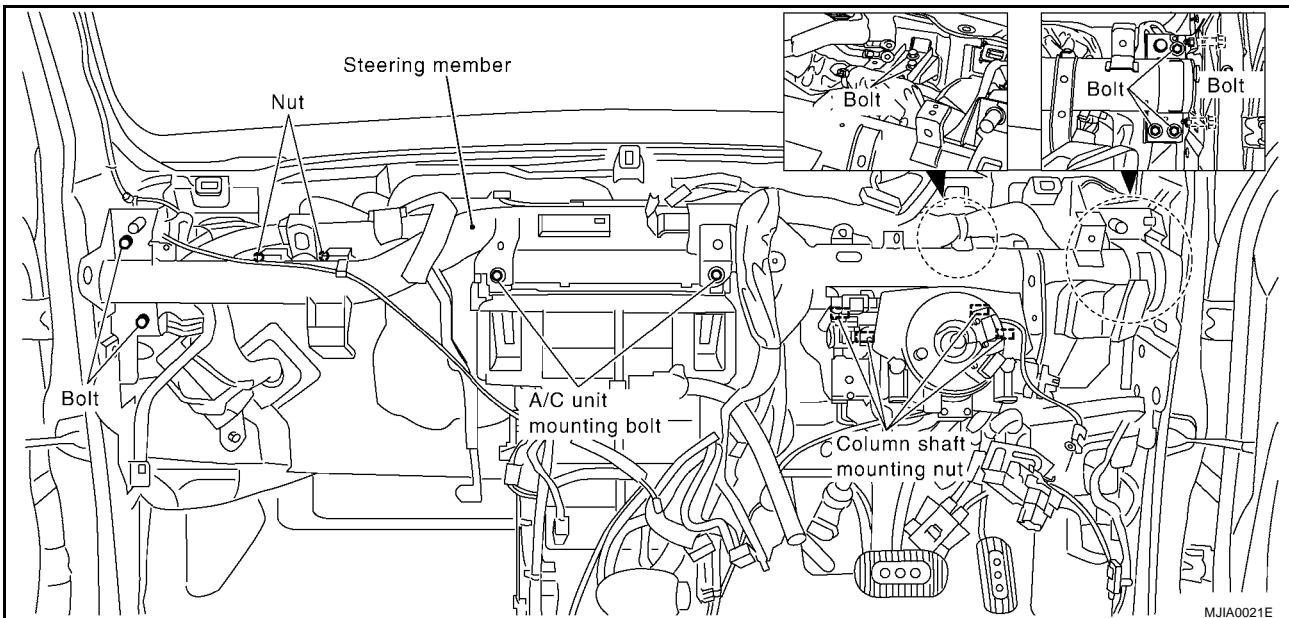
# DUCTS AND GRILLES

## SIDE VENTILATOR DUCT

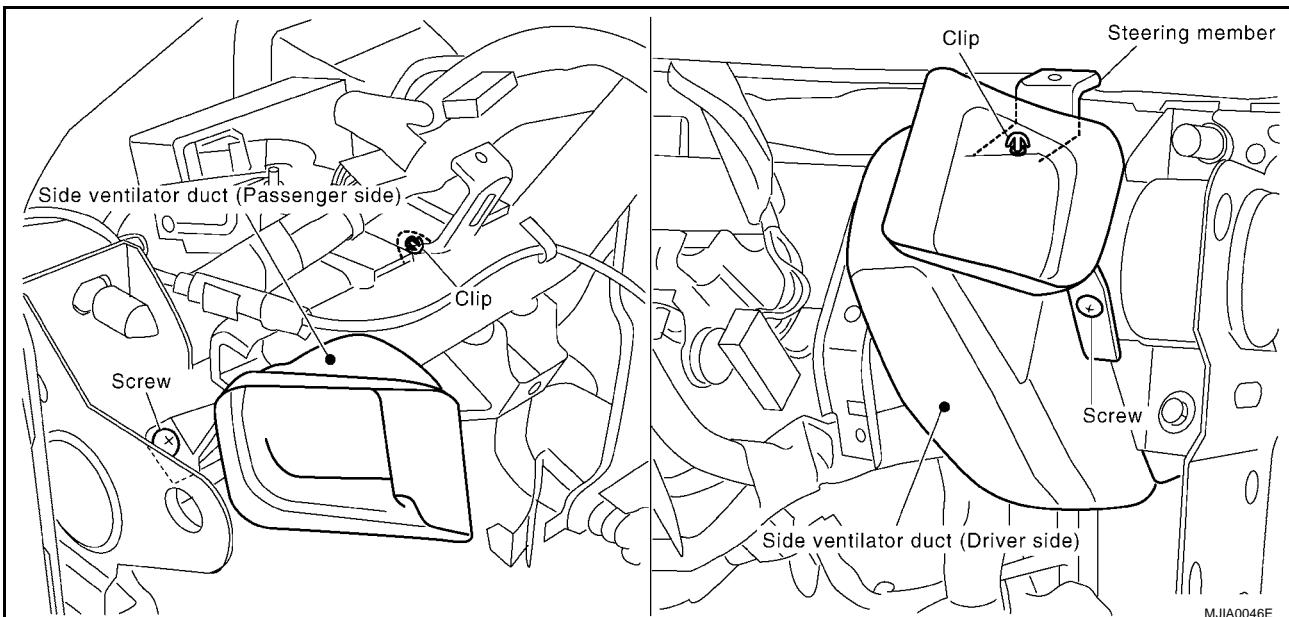
### NOTE:

Following illustration is for RHD model. The layout for LHD model is symmetrically opposite.

1. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#) .
2. Remove the side ventilator duct (passenger side).
3. Remove instrument panel. Refer to [IP-4, "INSTRUMENT PANEL ASSEMBLY"](#) .
4. Remove the BCM. Refer to [BCS-3, "BCM \(BODY CONTROL MODULE\)"](#) .
5. Remove the two A/C unit mounting bolts, nine steering member mounting bolts, four column shaft mounting bolts, and the harness clips.



6. Remove the steering member, and then remove the side ventilator duct (driver side).



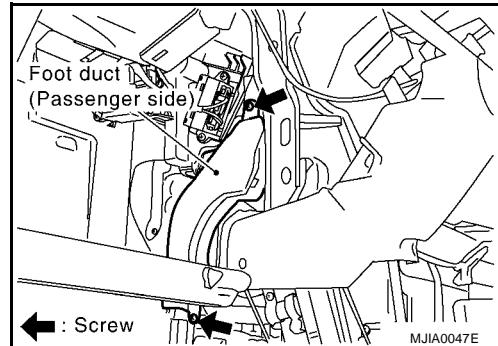
**Steering member mounting nut and bolt**

**Tightening torque :11 - 13 N·m (1.1 - 1.4 kg-m)**

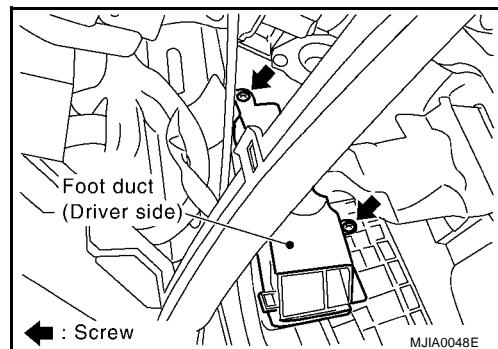
## DUCTS AND GRILLES

### FOOT DUCT

1. Remove the glove box cover assembly. Refer to [IP-8, "O. Glove Box Cover Assembly"](#).
2. Remove the two screws and then remove the foot duct (passenger side).



3. Remove the instrument under tray. Refer to [IP-6, "D. Instrument Panel Under Tray"](#).
4. Remove the two screws and intake sensor connector, and then remove the foot duct (driver side).



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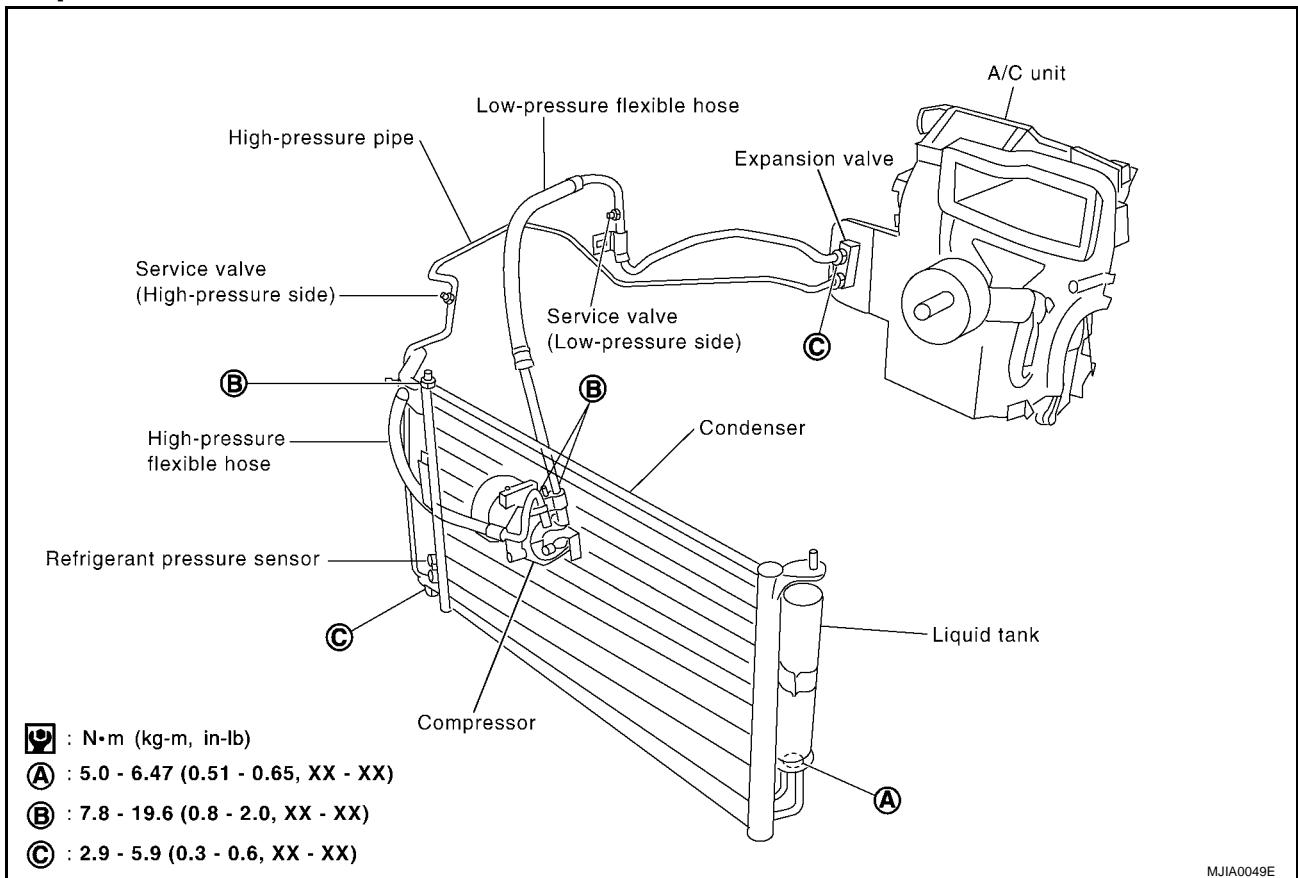
# REFRIGERANT LINES

## REFRIGERANT LINES

PFP:92600

### Component Parts Location

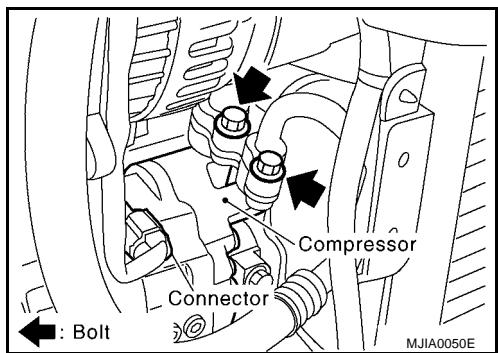
EJS002J9



### Compressor REMOVAL

EJS002JA

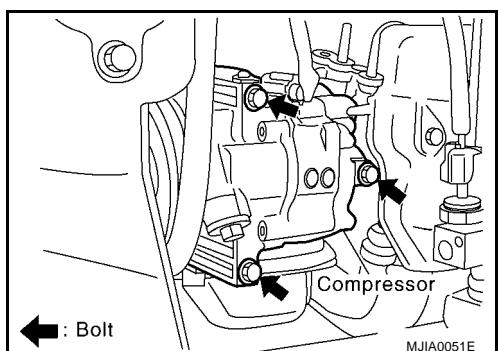
1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove air duct (fresh air intake side). Refer to [EM-14, "AIR CLEANER AND AIR DUCT"](#).
3. Disconnect compressor connector.
4. Remove the high-pressure and low-pressure flexible hose mounting bolts, and then disconnect the high-pressure and low-pressure flexible hose from the compressor.



#### CAUTION:

- Cover the compressor high and low-pressure ports with caps to keep the lubricant from spilling.
- Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

5. Remove the air conditioner compressor belt and alternator belt. Refer to [EM-10, "DRIVE BELTS"](#).
6. Remove compressor mounting bolts.
7. Remove the compressor from under the vehicle.



## INSTALLATION

## CAUTION:

- Replace O-rings on high-pressure and low-pressure flexible hoses with new ones. Apply compressor oil when installing new O-rings.
- After installing the air conditioner compressor and alternator belt, adjust the belt tension. Refer to [EM-10, "DRIVE BELTS"](#).
- When charging refrigerant, check for refrigerant leaks.

## Compressor mounting bolt

Tightening torque : 16.6 - 23.5 N·m (1.7 - 2.4 kg·m)

## High-pressure flexible hose mounting bolt

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

## Low-pressure flexible hose mounting bolt

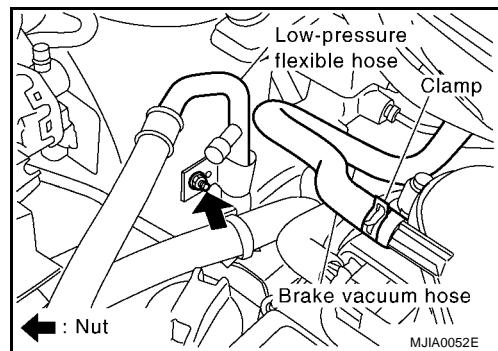
Tightening torque : 7.8 - 19.6 N·m (0.8 - 2.0 kg·m)

## Low-Pressure Flexible Hose

EJS002JB

## REMOVAL

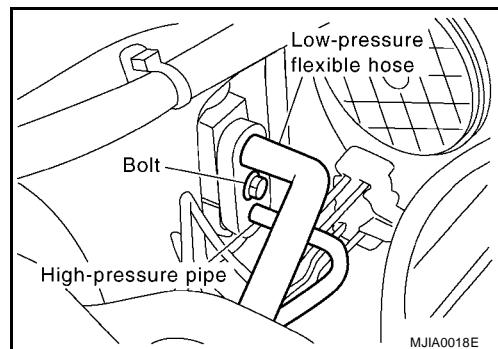
- Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
- Remove air duct (fresh air intake side). Refer to [EM-14, "AIR CLEANER AND AIR DUCT"](#).
- Remove the low-pressure flexible hose bracket mounting nut.
- Remove the brake vacuum hose from the air cleaner case.



- Remove the low-pressure flexible hose mounting bolt (air conditioner unit side).

## CAUTION:

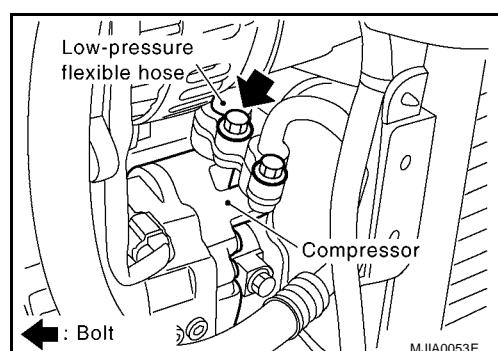
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



- Remove the low-pressure flexible hose mounting bolt (compressor side) and then remove the low-pressure flexible hose.

## CAUTION:

Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



## INSTALLATION

### CAUTION:

- Replace the low-pressure flexible hose O-ring with a new one. Apply a coat of compressor lubricant to the O-ring prior to installation.
- When charging refrigerant, check for refrigerant leaks.

Low-pressure flexible hose mounting bolt (compressor side)

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

Low-pressure flexible hose mounting bolt (evaporator side)

Tightening torque : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)

Low-pressure flexible hose bracket mounting nut

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

## High-Pressure Flexible Hose

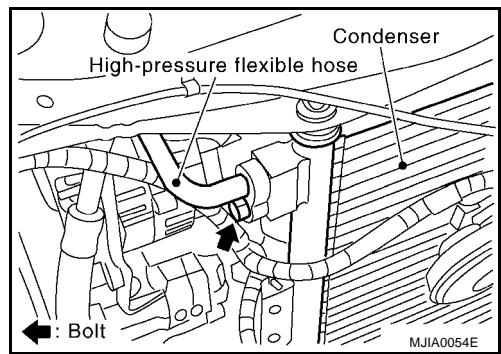
EJS002JC

### REMOVAL

- Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
- Remove air duct (fresh air intake side). Refer to [EM-14, "AIR CLEANER AND AIR DUCT"](#).
- Remove the front grille (RH). Refer to [EI-9, "FRONT GRILLE"](#).
- Remove the high-pressure flexible hose mounting bolt (condenser side).

### CAUTION:

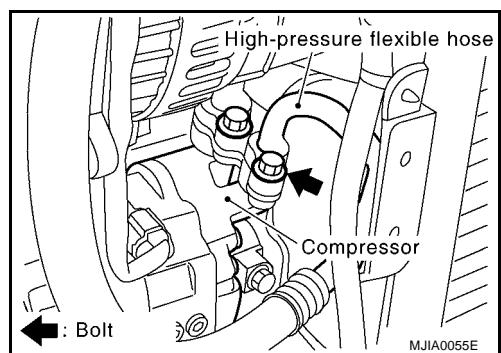
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



- Remove the high-pressure flexible hose mounting bolt (compressor side), and then remove the high-pressure flexible hose.

### CAUTION:

Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



## INSTALLATION

### CAUTION:

- Replace O-ring on high-pressure flexible hose with a new one. Apply compressor oil when installing new O-rings.
- When charging refrigerant, check for refrigerant leaks.

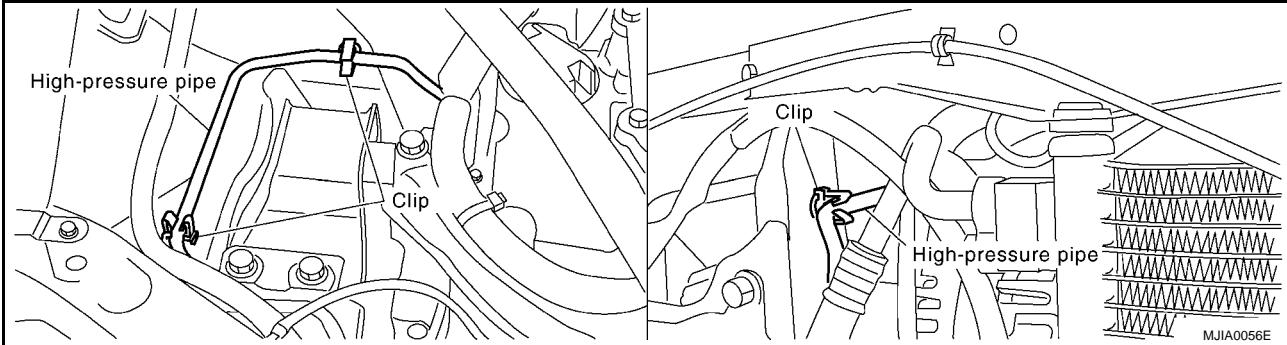
High-pressure flexible hose mounting bolt

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

## High-Pressure Pipe REMOVAL

EJS002JD

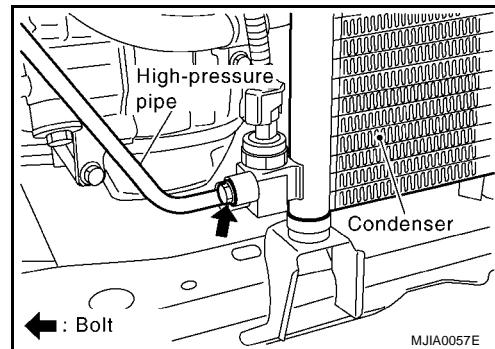
1. Remove the cowl top and headlamp (RH). Refer to [EI-11, "COWL TOP"](#) and halogen headlamp model [LT-5, "HEADLAMP -CONVENTIONAL TYPE"-](#) .
2. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
3. Remove the front bumper and air guide (RH). Refer to [EI-4, "FRONT BUMPER"](#) and [BL-11, "RADIATOR CORE SUPPORT"](#) .
4. Remove the low-pressure flexible hose. Refer to [ATC-69, "Low-Pressure Flexible Hose"](#) .
5. Remove the high-pressure pipe from clips.



6. Remove the high-pressure pipe mounting bolt, and then remove the high-pressure pipe.

**CAUTION:**

Seal the pipe connection openings with caps, plastic tape, or something similar to prevent them from being exposed to the atmosphere.



## INSTALLATION

**CAUTION:**

- Replace the O-ring on the high-pressure pipe with new one, and apply compressor lubricant to it before installing.
- When charging refrigerant, check for refrigerant leaks.

**High-pressure pipe mounting bolt**

**Tightening torque** : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)

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

**Tightening torque** : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)

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

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

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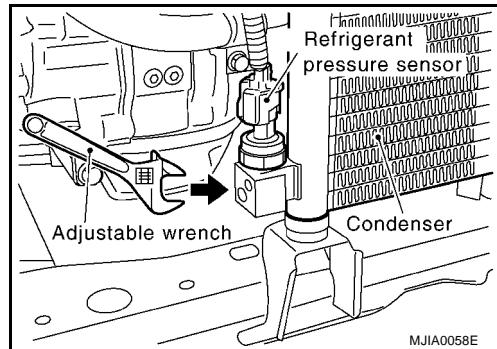
## Refrigerant Pressure Sensor REMOVAL AND INSTALLATION

EJS002JE

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the front bumper and air guide (RH). Refer to [EI-4, "FRONT BUMPER"](#) and [BL-11, "RADIATOR CORE SUPPORT"](#).
3. Use a adjustable wrench or other tool to hold the refrigerant pressure sensor mounting block, and then remove the refrigerant pressure sensor from the condenser.

**CAUTION:**

- Be careful when working so as not to damage the condenser core.
- When installing refrigerant pressure sensor, apply compressor lubricant to the O-rings.



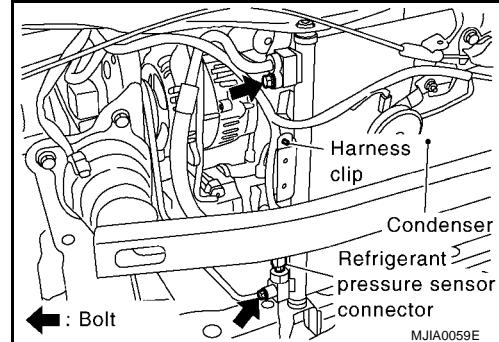
**Refrigerant pressure sensor**

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

## Condenser REMOVAL

EJS002JF

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the front bumper and air guide (RH). Refer to [EI-4, "FRONT BUMPER"](#) and [BL-11, "RADIATOR CORE SUPPORT"](#).
3. Disconnect the high-pressure flexible hose and high-pressure pipe from the condenser.
- CAUTION:**  
**Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.**
4. Disconnect the refrigerant pressure sensor connector, and then remove the harness clip.



5. Use cord, etc., to hold the condenser and radiator to each radiator core support upper.

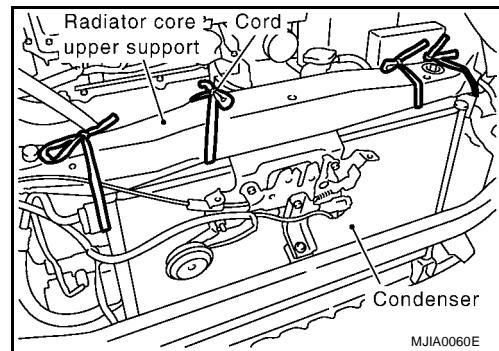
### NOTE:

To prevent the compressor and radiator from being dropped when the radiator core lower support is removed.

6. Remove the mounting bolts, and then remove the radiator core lower support.
7. Remove the condenser from underneath the vehicle.

### CAUTION:

**Do not damage the condenser core.**



## INSTALLATION

### CAUTION:

- Replace O-rings on the high-pressure pipe and high-pressure flexible hose with new ones. Apply compressor lubricant to O-rings when installing them.
- When charging refrigerant, check for refrigerant leaks.

ATC

#### High-pressure flexible hose bolt

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

#### High-pressure pipe mounting bolt

**Tightening torque : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)**

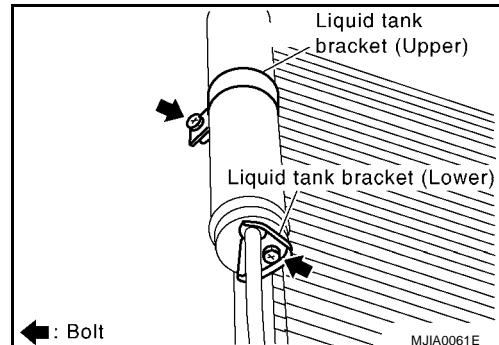
#### Radiator core lower support mounting bolts.

**Tightening torque : 43.4 - 58.7 N·m (4.4 - 6.0 kg·m)**

## Liquid Tank REMOVAL

EJS002JG

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove condenser. Refer to [ATC-73, "Condenser"](#).
3. Clean around the liquid tank to remove foreign material and corrosion.
4. Remove the liquid tank bracket (upper/lower) mounting bolts.

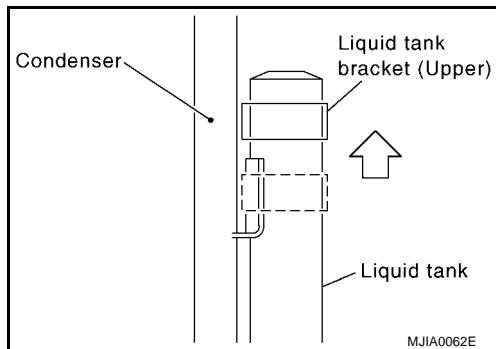


# REFRIGERANT LINES

5. Lift up the liquid tank bracket, and remove it from the condenser protruding area.
6. Lift up the liquid tank and remove it.

**CAUTION:**

Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.



## INSTALLATION

Install the liquid tank, and then install liquid tank bracket to the condenser.

**CAUTION:**

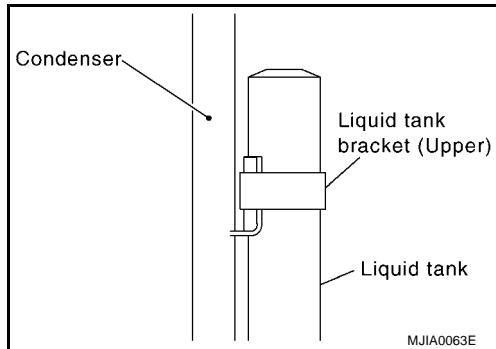
- Make sure the liquid tank bracket is correctly inserted into the condenser's protruding area (the liquid tank bracket does not move below the center of the liquid tank).
- Replace the condenser pipe O-rings with new ones. Apply a coat of compressor lubricant to the O-rings prior to installation.

**Liquid tank bracket (upper) mounting bolt**

Tightening torque : 2.94 - 3.82 N·m (0.30 - 0.38 kg·m)

**Liquid tank bracket (lower) mounting bolt**

Tightening torque : 5.0 - 6.47 N·m (0.51 - 0.65 kg·m)



## Evaporator REMOVAL

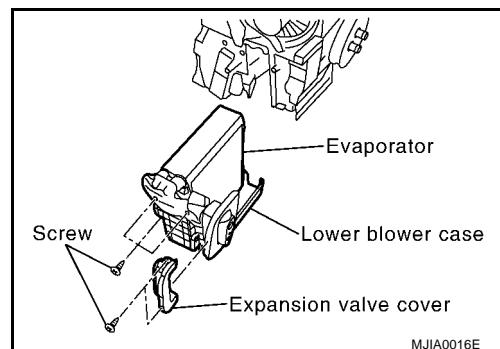
EJS002JH

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove the A/C unit. Refer to [ATC-53, "A/C UNIT ASSEMBLY"](#).

**CAUTION:**

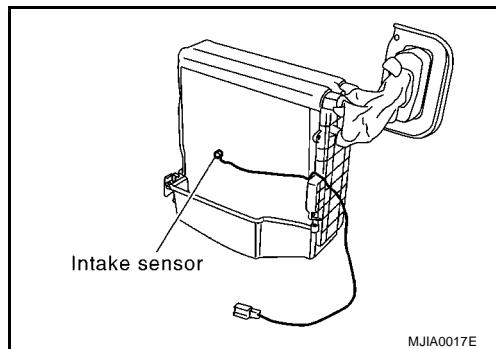
Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

3. Remove the clean filter, mode door motor, and foot duct (RH). Refer to [ATC-59, "CLEAN FILTER"](#) , [ATC-61, "MODE DOOR MOTOR"](#) and [ATC-67, "FOOT DUCT"](#) .
4. Remove the lower blower case and expansion valve cover.



# REFRIGERANT LINES

5. Slide the evaporator and lower blower case downward, and remove the intake sensor.
6. Remove the evaporator from the lower blower case.



## INSTALLATION

### CAUTION:

- Replace low-pressure flexible hose and high-pressure pipe O-rings with new ones. Apply a coat of compressor lubricant prior to installation.
- When installing a new evaporator, install the thermistor of intake air temperature in the same position as the removed intake sensor.
- When removing and installing the intake sensor, do not rotate the thermistor insertion part.

Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.

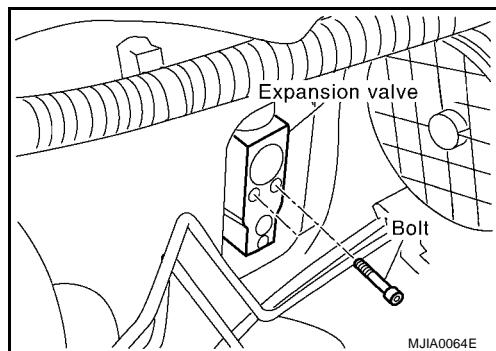
Tightening torque : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)

## Expansion Valve

EJS002JI

### REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Disconnect the low-pressure flexible hose and high-pressure pipe from the evaporator.



### CAUTION:

Seal the connecting points of the pipes with caps and vinyl tape, etc. to prevent them from being exposed to the atmosphere.

3. Remove the two bolts from the expansion valve, and then remove the expansion valve.

## INSTALLATION

### CAUTION:

Replace the removed O-rings with new ones. Apply a coat of compressor lubricant to the O-rings prior to installation.

Expansion valve mounting bolts

Tightening torque : 2.9 - 5.0 N·m (0.3 - 0.5 kg·m)

Mounting bolts for the low-pressure flexible hoses and high-pressure pipes.

Tightening torque : 2.9 - 5.9 N·m (0.3 - 0.6 kg·m)

## REFRIGERANT LINES

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