

SECTION **HAC**

**HEATER & AIR CONDITIONING CONTROL SYSTEM**

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## PRECAUTION

### PRECAUTIONS

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

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

#### PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

**WARNING:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

#### Precaution for Work

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- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components.
  - Water soluble dirt: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the dirty area.  
Then rub with a soft and dry cloth.
  - Oily dirt: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the dirty area.  
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol, or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

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

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**WARNING:**

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to [HA-26. "Inspection"](#). To determine the purity

# PRECAUTIONS

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< PRECAUTION >

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

## CONTAMINATED REFRIGERANT

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

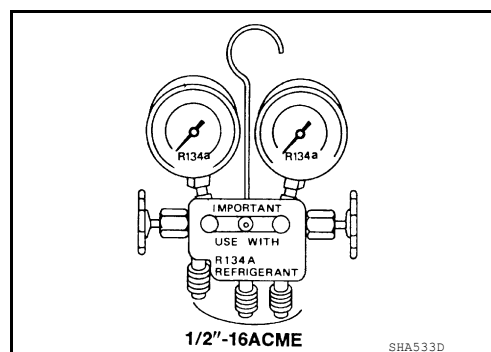
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

## Precaution for Service Equipment

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## MANIFOLD GAUGE SET

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



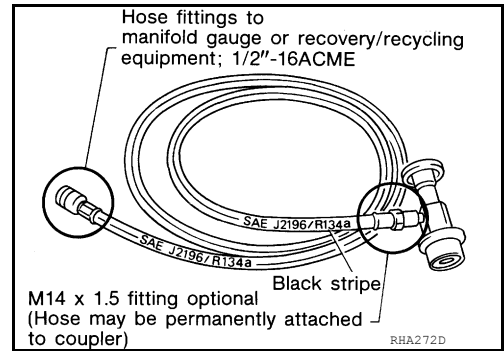
## SERVICE HOSES

# PRECAUTIONS

## < PRECAUTION >

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

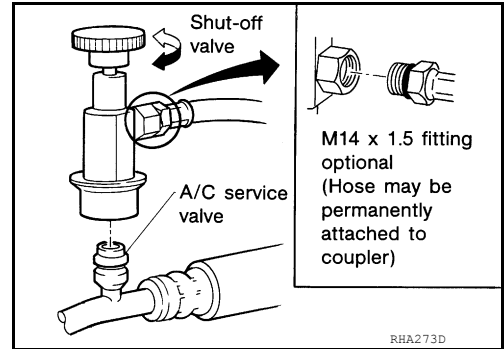
## [AUTOMATIC AIR CONDITIONER]



## SERVICE COUPLERS

Do not attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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





# PREPARATION

< PREPARATION >

[AUTOMATIC AIR CONDITIONER]

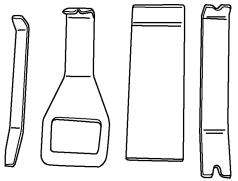
## PREPARATION

### PREPARATION

#### Special Service Tool

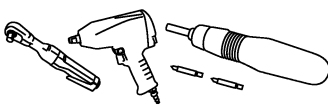
INFOID:000000007992798

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

Tool number (Kent-Moore No.) Tool name	Description
— (J-46534) Trim Tool Set <div style="text-align: center;">  <p>AWJIA0483ZZ</p> </div>	Removing trim components

#### Commercial Service Tool

INFOID:000000007992799

(Kent-Moore No.) Tool name	Description
( — ) Power tool <div style="text-align: center;">  <p>PIIB1407E</p> </div>	Loosening nuts, screws and bolts

A  
B  
C  
D  
E  
F  
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H  
J  
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M  
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O  
P

HAC

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

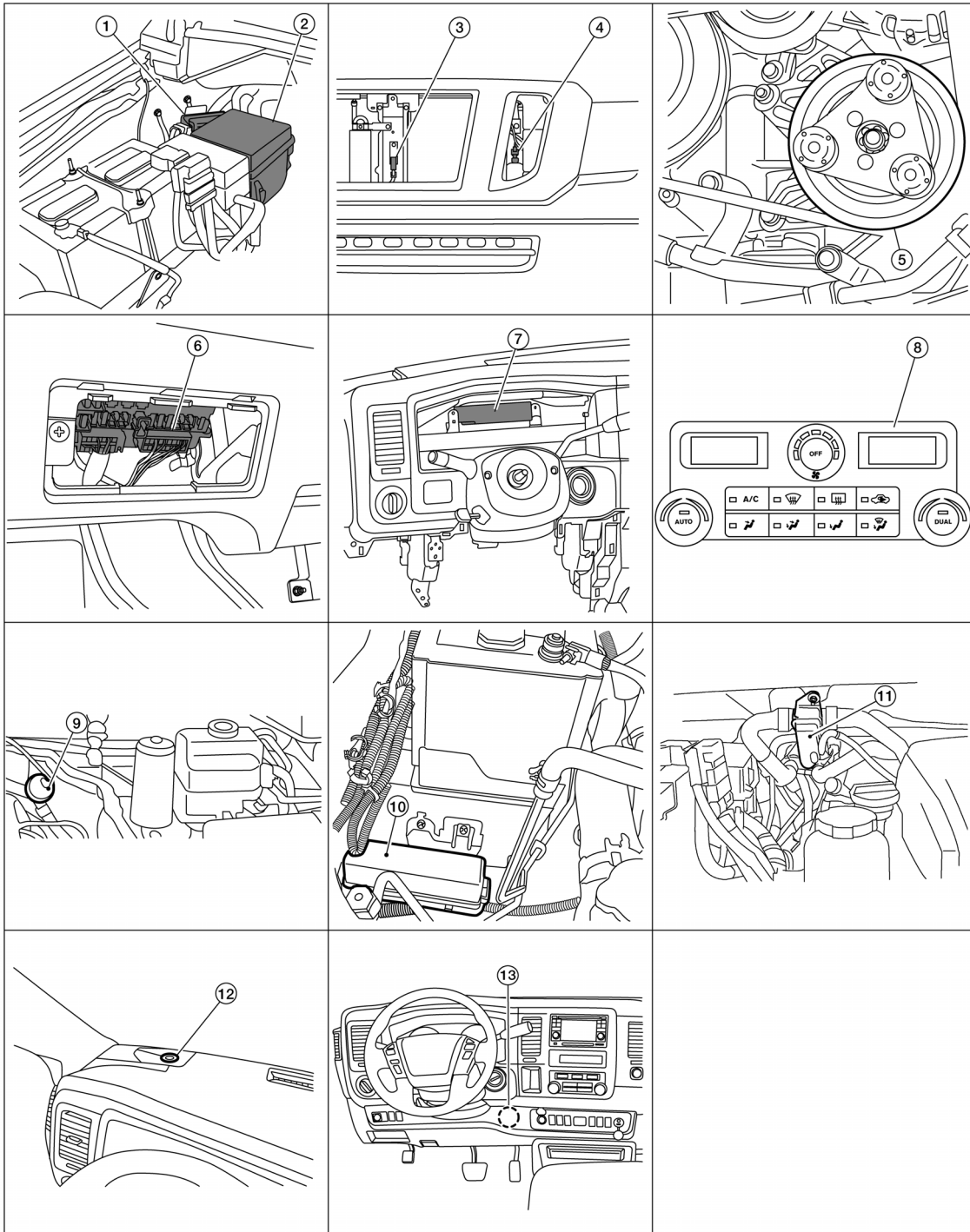
## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### FRONT AUTOMATIC AIR CONDITIONING SYSTEM

#### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Component Part Location

INFOID:000000007992800

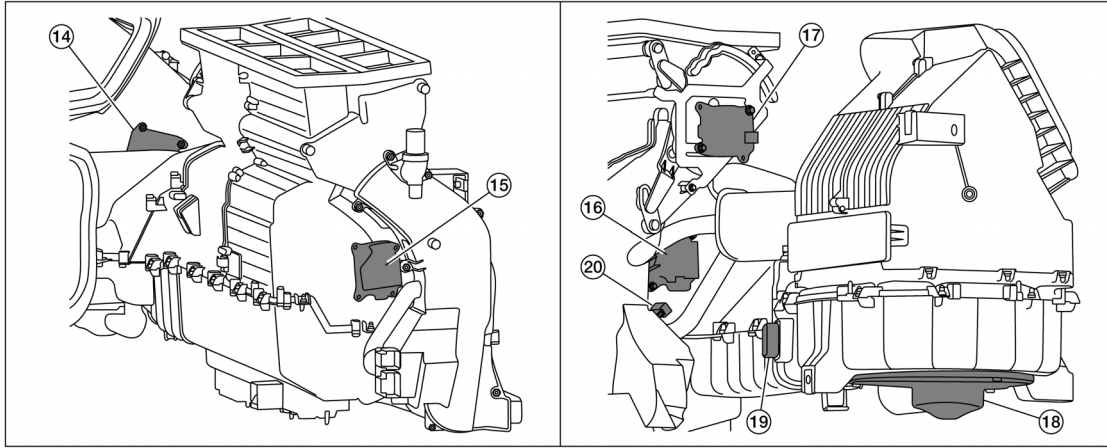


ALI1A05152Z

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



- |  |                           |  |
|--|---------------------------|--|
| 1. ECM                                   | 2. IPDM E/R               | 3. Ambient sensor (view with grille removed)   |
| 4. Refrigerant pressure sensor           | 5. A/C Compressor         | 6. Fuse Block (J/B), Front blower motor relay - 1, Front blower motor relay - 2 (taped to harness near Fuse Block [J/B]) |
| 7. BCM                                   | 8. Front air control      | 9. Heater pump (if equipped)   |
| 10. Heater pump relay (if equipped)      | 11. Water valve           | 12. Sunload sensor   |
| 13. In-vehicle sensor                    | 14. Intake door motor     | 15. Front air mix motor (driver)   |
| 16. Front air mix door motor (passenger) | 17. Front mode door motor | 18. Front blower motor   |
| 19. Power transistor                     | 20. Intake sensor         |  |

A  
B  
C  
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E

F  
G  
H

HAC

## FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Component Description

INFOID:000000007992801

Component	Description
A/C Compressor	Vaporized refrigerant is drawn into the A/C compressor from the evaporator, where it is compressed to a high pressure, high temperature vapor. The hot, compressed vapor is then discharged to the condenser.
Ambient sensor	The ambient sensor measures the temperature of the air surrounding the vehicle. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
BCM	The BCM receives the fan ON and A/C ON signals from the front air control and sends a compressor ON request to the ECM.
ECM	The ECM sends a compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the front air control via CAN communication line.
Fuse Block (J/B)	Located in the passenger compartment, behind the left lower IP, the Fuse Block (J/B) contains the front blower motor relay-1 and several fuses required for the air conditioner control system.
Front air control	The front air control controls the operation of the A/C and heating system based on inputs from the temperature control knob, the mode switches, the blower control dial, the ambient temperature sensor, the intake sensor, and inputs received from the ECM and combination meter across the CAN. Diagnosis of the front air control can be performed using the CONSULT. There is no self-diagnostic feature available.

J  
K  
L  
M  
N  
O  
P

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Component	Description
Front air mix door motor (driver)	The air mix door controls the mix of hot or cold air that enters the ventilation system. It is controlled by the front air control based on the position of the temperature dial. The front air mix door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. If the front air mix door moves to a position less than 5% or more than 95% of its expected or allowed positions, the front air control will set a DTC.
Front air mix door motor (passenger)	The air mix door controls the mix of hot or cold air that enters the ventilation system. It is controlled by the front air control based on the position of the temperature dial. The front air mix door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. If the front air mix door moves to a position less than 5% or more than 95% of its expected or allowed positions, the front air control will set a DTC.
Front blower motor	The front blower motor varies the speed at which the air flows through the ventilation system. The blower control dial has 26 detents allowing for 26 different fan speeds.
Front blower motor relay - 1	The front blower motor relay-1 controls the flow of current to fuse 10 in the Fuse Block (J/B). The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position.
Front blower motor relay - 2	The front blower motor relay-2 controls the flow of current to fuse 18 in the Fuse Block (J/B). The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position. This relay is necessary to provide additional current carrying capacity to the front blower motor.
Front mode door motor	The mode door controls the direction the conditioned air passes through the ventilation system. Through a series of levers and gears, the mode door controls the defrost door, the foot door, and the vent door. There are 5 preset positions: VENT, B/L, FOOT, D/F, and DEF. The FOOT position can be set to allow some airflow through to the defroster vent, or to completely block the defroster vent using the CONSULT. The mode door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. The mode door has 5 expected positions and, therefore, can set up to 5 DTCs if the expected position is not reported back to the front air control.
Heater pump (if equipped)	The heater pump improves heater performance specifically at idle conditions. It is designed to operate in either of the following 2 situations: Front blower motor set to maximum speed and temperature control dial set to full hot or Engine coolant temperature (signal via CAN communication) minus heater core outlet temperature (intake sensor input to front air control) is greater than 20°C (68°F). If the difference is less than 16°C (61°F), the heater pump will not operate unless the conditions in item No. 1 above are met.
Intake door motor	The intake door motor controls the position of the intake door. Fresh air is allowed to enter the cabin in one position, and recirculated inside air is allowed to enter in the other position. At times the front air control may command partial fresh or recirculation based on evaporator or coolant temperatures. The intake door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. If the recirculation door moves to a position less than 5% or more than 95% of its expected or allowed positions, the front air control will set a DTC.

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

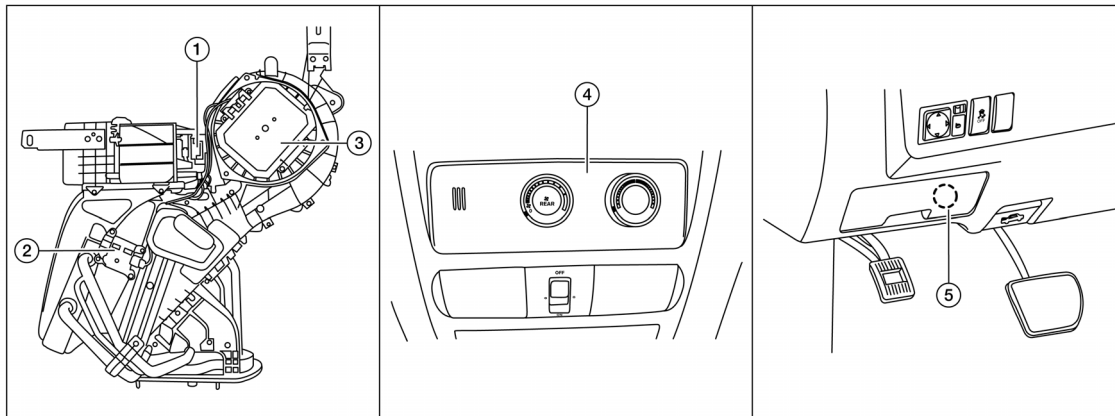
[AUTOMATIC AIR CONDITIONER]

Component	Description
Intake sensor	The intake sensor measures the temperature of the front evaporator fins. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
In-vehicle sensor	In-vehicle sensor measures temperature of intake air that flows through aspirator to passenger room. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
IPDM E/R	Refer to <a href="#">PCS-5, "RELAY CONTROL SYSTEM : System Description"</a> .
Power transistor	The power transistor controls the speed of the blower motor by controlling the ground circuit of the blower motor. The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. The power transistor is a metal-oxide semiconductor field effect transistor (MOSFET) that varies the ground side current of the front blower motor. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor.
Refrigerant pressure sensor	Refer to <a href="#">EC-430, "Component Function Check"</a> for VQ40DE and <a href="#">EC-872, "Component Function Check"</a> for VK56DE.
Sunload sensor	Sunload sensor measures sunload amount. This sensor is a dual system so that sunload for driver side and passenger side are measured separately. This sensor converts sunload amount to voltage signal by photodiode and transmits to A/C auto amp.
Water valve	The water valve cuts the flow of engine coolant to the front and rear heater cores to allow for maximum cooling during A/C operation. It is controlled by the front air control.

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Component Parts Location

INFOID:000000008067669



ALIIA0522Z

1. Rear mode door motor (view with rear air conditioning assembly removed from vehicle)
2. Rear air mix door motor
3. Rear blower motor
4. Rear air control
5. Rear blower motor relay

### REAR AIR CONDITIONING SYSTEM : Component Description

INFOID:000000008067670

Component	Description
Rear air control	The operation of the rear air control is communicated to the front air control.
Rear blower motor relay	The rear blower motor relay controls the flow of current to the rear blower motor. The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position.

## COMPONENT PARTS

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Component		Description
Rear A/C unit assembly	Rear air mix door motor	The LCU (Local Control Unit) is installed to rear air mix door motor so as to perform the multiplex communication control (LIN). Refer to <a href="#">HAC-136, "REAR AIR CONDITIONING SYSTEM : Door Control"</a> .
	Rear blower motor	The rear blower motor varies the speed at which the air flows through the ventilation system.
	Rear mode door motor	The LCU (Local Control Unit) is installed to rear mode door motor so as to perform the multiplex communication control (LIN). Refer to <a href="#">HAC-136, "REAR AIR CONDITIONING SYSTEM : Door Control"</a> .



# SYSTEM

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

- [HAC-17. "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control"](#)
- [HAC-17. "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"](#)
- [HAC-18. "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Door Control"](#)
- [HAC-21. "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control"](#)

Controlled by BCM:

- Air conditioning request signal.  
Refer to [BCS-6. "BODY CONTROL SYSTEM : System Description"](#).

Controlled by IPDM E/R:

- A/C Relay  
Refer to [PCS-5. "RELAY CONTROL SYSTEM : System Description"](#).

## FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Air Flow Control

INFOID:000000007992810

### DESCRIPTION

The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor. The front air control monitors the blower motor voltage and the blower motor ground circuits. The blower control dial has 26 detents, each detent outputting a different gate voltage to the power transistor, allowing for 26 different fan speeds.

In addition to manual control of the air flow, the front air control will modify the customer selection during certain conditions. During heater warm-up, the front air control will move the intake door from fresh to partial recirculation. The front air control will illuminate the fresh indicator. Also, if the intake temperature is too hot, the intake door will move to partial or full recirculation. The front air control will illuminate the fresh indicator.

When the blower control dial is turned off, the front air control will remember the customer selected intake air position (REC or FRE), the current mode, and the A/C state. Upon turning to any blower speed, the front air control will return to the previous mode and state, and if the previous state was MAX A/C, the front air control will illuminate the REC LED.

Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
OFF	0.00 volts	0.00 volts	0.00 volts	0.00 volts
1	3.25 volts	3.75 volts	3.75 volts	3.75 volts
2	3.50 volts	4.00 volts	4.00 volts	4.00 volts
3	3.75 volts	4.25 volts	4.25 volts	4.25 volts
4	4.00 volts	4.50 volts	4.50 volts	4.50 volts
5	4.50 volts	4.75 volts	4.75 volts	4.75 volts
6	4.75 volts	5.00 volts	5.00 volts	5.00 volts
7	5.00 volts	5.50 volts	5.50 volts	5.50 volts
8	5.25 volts	5.75 volts	5.75 volts	5.75 volts
9	5.50 volts	6.00 volts	6.00 volts	6.00 volts
10	5.75 volts	6.25 volts	6.25 volts	6.25 volts
11	6.25 volts	6.50 volts	6.50 volts	6.50 volts
12	6.50 volts	6.75 volts	6.75 volts	6.75 volts
13	6.75 volts	7.00 volts	7.00 volts	7.00 volts
14	7.00 volts	7.25 volts	7.25 volts	7.25 volts
15	7.50 volts	7.50 volts	7.50 volts	7.50 volts
16	7.75 volts	7.75 volts	7.75 volts	7.75 volts
17	8.00 volts	8.00 volts	8.25 volts	8.00 volts
18	8.25 volts	8.25 volts	8.50 volts	8.25 volts
19	8.50 volts	8.50 volts	8.75 volts	8.50 volts
20	8.75 volts	8.75 volts	9.00 volts	8.75 volts
21	9.00 volts	9.00 volts	9.25 volts	9.00 volts



# SYSTEM

## < SYSTEM DESCRIPTION >

## [AUTOMATIC AIR CONDITIONER]

Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
22	9.25 volts	9.25 volts	9.50 volts	9.25 volts
23	9.75 volts	9.75 volts	10.00 volts	9.50 volts
24	10.25 volts	10.25 volts	10.25 volts	10.75 volts
25	10.50 volts	10.50 volts	10.50 volts	10.00 volts
26	10.75 volts	10.75 volts	12.00 volts	10.25 volts

12 = Max blower voltage

### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Air Inlet Control

INFOID:000000007992811

The intake door position is automatically controlled in MAX A/C (REC) and DEF (FRE) modes. The intake door is controlled by customer input in the other modes, unless certain conditions apply. If heat has been selected, and the ambient temperature is low, the front air control will command the intake door to partial recirculation to speed up the heating of the heater core. If the evaporator fin temperature is too high, the front air control will command the intake door to partial or full recirculation, as needed, to help cool the evaporator.

### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control

INFOID:000000007992812

Initial setting of air outlet control (first time after battery disconnect) is as follows:

	Fan ON	Fan OFF
Mode	D/F1	D/F1
Intake	FRE	FRE
A/C	ON	OFF

Subsequently, air outlet control is controlled by customer input. When the A/C is turned off by turning the blower control dial fully counterclockwise, the front air control retains the current selections and returns to these selections the next time the blower control dial is turned to any fan position.

#### NOTE:

If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.

### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control

INFOID:000000007992813

#### DESCRIPTION

In order for the IPDM E/R to complete a compressor ON request, the following conditions must be met:

1. The BCM detects a Fan ON signal from the front air control. The front air control grounds the fan ON signal monitored by the BCM when the blower speed dial is in any of the fan speed positions.
2. The BCM detects an A/C ON signal from the front air control. The front air control grounds the A/C ON signal monitored by the BCM when:
  - The A/C switch is pressed. The A/C switch LED illuminates and the front air control grounds the A/C ON signal monitored by the BCM. Any mode control button except D/F may be selected.
  - The A/C switch is OFF, and the MAX A/C button is pressed. The A/C switch LED will automatically illuminate and the front air control grounds the A/C ON signal monitored by the BCM.
  - The A/C switch is OFF, and the mode button for either D/F or DEF is selected. The front air control grounds the A/C ON signal monitored by the BCM, but it does not illuminate the A/C switch LED
3. The intake temperature value must be within the specified range.

#### NOTE:

If the compressor was engaged by pressing the D/F or DEF mode buttons, and the time spent in either mode exceeds 1 minute, then the compressor stays requested, even when modes other than D/F or DEF are selected, until either:

1. The ignition switch is turned OFF.
2. The blower speed dial is turned completely counterclockwise to the OFF position.
3. The A/C switch is manually turned OFF.

In other words, the compressor ON request cannot be turned off in D/F or DEF modes.

< SYSTEM DESCRIPTION >

## REFRIGERANT PRESSURE PROTECTION

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank on the condenser. The refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. If the system pressure rises above or falls below the following values, the ECM requests the IPDM E/R to de-energize the A/C relay and disengage the compressor.

- 3.12 MPa (31.82 kg/cm<sup>2</sup>, 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm<sup>2</sup>, 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm<sup>2</sup>, 20.3 psi) or less

## PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/cm<sup>2</sup>, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

## COMPRESSOR OIL CIRCULATION CONTROL

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

## LOW TEMPERATURE PROTECTION CONTROL

- When the intake sensor detects that the front evaporator fin temperature is 1.5°C (35°F) or less, the front air control requests the BCM to turn the compressor OFF, and stops the compressor.
- When the front evaporator fin temperature returns to 5.0°C (41°F) or more, the compressor is activated.

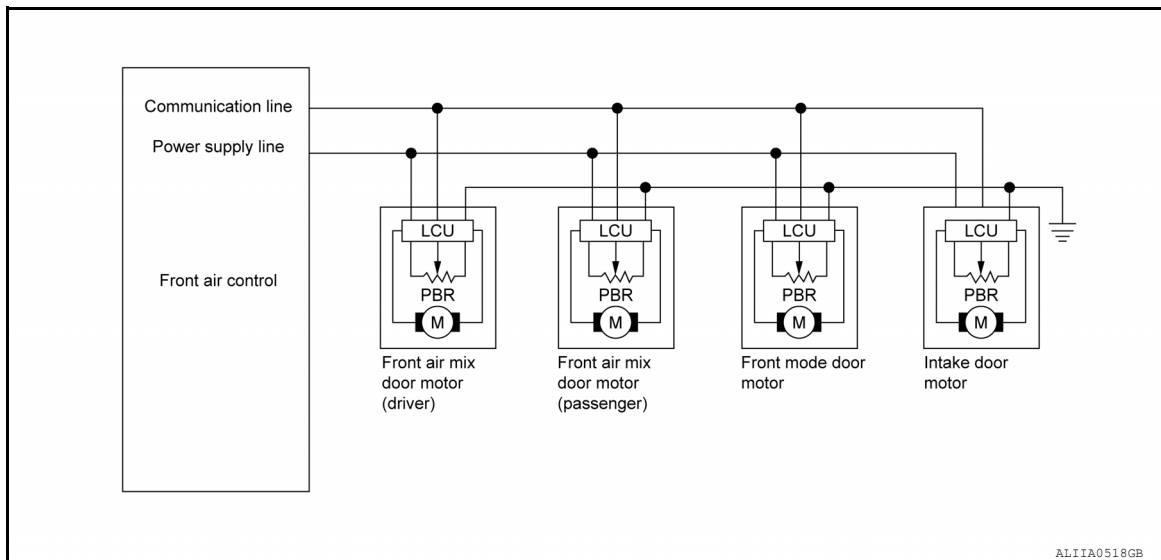
## OPERATING RATE CONTROL

When the set temperature is other than fully cold or the air outlet is “VENT”, “B/L” or “FOOT”, the front air control controls the compressor activation depending on ambient temperature.

## FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Door Control

INFOID:000000007992814

### DOOR MOTOR CONTROL



- A Local Control Unit (LCU) is built into each door motor and detects the door position by using a Position Balanced Resistor (PBR).
- Each door motor LCU has a unique address. The front air control communicates with the door motor LCUs by using each door’s unique communication address. The front air control sends requested door position commands to each door motor LCU via a Local Interconnect Network (LIN) communication line using a communication protocol called LIN 2.0. The LIN-Bus is a vehicle bus standard used within current automotive network architectures. The LIN specification is enforced by the LIN-consortium, with the first exploited version being 1.1, released in 1999. Since then the specification has evolved to version 2.1 to meet current networking needs. Each door motor’s LCU receives the command and sends back a door position feedback signal.

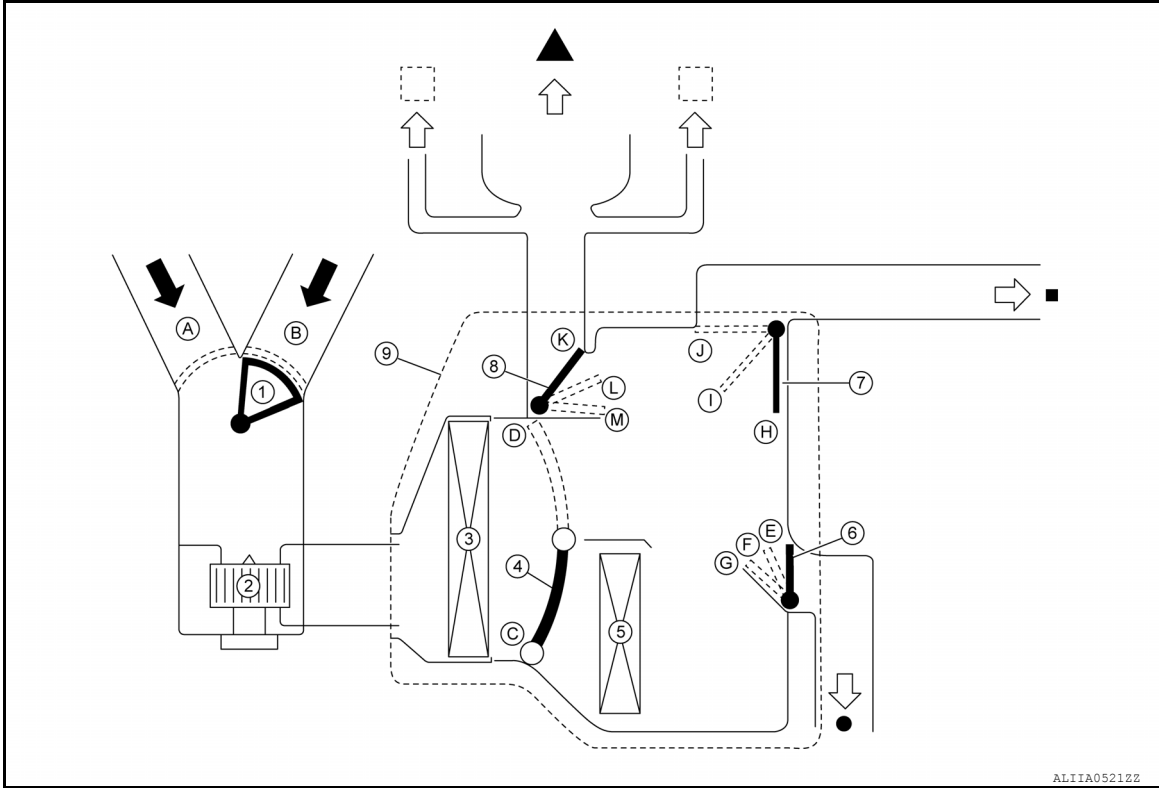
# SYSTEM

## [AUTOMATIC AIR CONDITIONER]

### < SYSTEM DESCRIPTION >

- Each LCU controls each door to the appropriate position depending on the control signal from the front air control. When the door movement is complete, the LCU transmits a signal to the front air control indicating that the door movement is complete.

### SWITCHES AND THEIR CONTROL FUNCTION



- |                    |                   |   |
|--------------------|-------------------|---|
| 1. Intake door     | 2. Blower motor   | 3. Evaporator   |
| 4. Air mix door    | 5. Heater core    | 6. Foot door  |
| 7. Ventilator door | 8. Defroster door | 9. The structure of the dotted area is independent in RH and LH sides. Driver side and passenger side are divided by a partition. |

- |                  |                   |
|------------------|-------------------|
| Fresh air intake | Recirculation air |
| Ventilator       | Side defroster    |
| Foot             | Defroster         |

Switch/Dial position			Door position				
			Ventilator door	Foot door	Defroster door	Intake door	Air mix door
MODE switch	VENT		H	E	K	—	
	B/L		I	F	K	—	
	FOOT		J	G	L	—	
	D/F		J	G	L	B	—
DEF switch			J	E	M	B	—
REC switch <sup>*1</sup>			—			B	—
FRE switch <sup>*2</sup>			—			A	—

# SYSTEM

< SYSTEM DESCRIPTION >

**[AUTOMATIC AIR CONDITIONER]**

Switch/Dial position		Door position				
		Ventilator door	Foot door	Defroster door	Intake door	Air mix door
Temperature control dial	Full Cold	—				C
	Full Cold ↔ Full Hot	—				AUTO
	Full Hot	—				D

\*1: Inlet status is displayed by indicator when activating Max A/C or D/F modes.

\*2: If equipped (without rear defogger).

## AIR DISTRIBUTION

VENT MODE (  )				
OUTLET	VENT			
	ASST	CTR		DR
		ASST	DR	
AIR FLOW DISTRIBUTION RATIO (%)	25	25	25	25

B/L MODE (  )								
OUTLET	VENT				FOOT			
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR
		ASST	DR					
AIR FLOW DISTRIBUTION RATIO (%)	15	15	15	15	13	13	7	7

FOOT MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	9	0	0	9	30	30	11	11	0


D/F1 MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	7	0	0	7	21	21	8	8	28

D/F2 MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	5	0	0	5	15	15	5	5	50

# SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

DEF MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	7	0	0	7	0	0	0	0	86

## FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control

INFOID:000000007992815

- When the ignition switch is in the ON position, the customer uses the front air control temperature control dial to set the desired temperature.
- The front air control calculates the target front air mix door opening angle depending on the selected temperature, intake temperature sensor, engine coolant temperature and rpm, and ambient temperature.
- Front air mix door is controlled depending on the comparison of current front air mix door opening angle and target front air mix door opening angle.
- Regardless of ambient temperature, the front air mix door is fixed at the fully cold position when the temperature control dial is set at the full cold position and fixed at the fully hot position when the temperature control dial is set at the full hot position.

## FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Fail-safe

INFOID:000000007992816

### FAIL-SAFE FUNCTION

- If a communication error exists between the front air control's Application Specific Integrated Circuit (ASIC) and Central Processing Unit (CPU), the air conditioning system is controlled under the following conditions:

**Compressor** : OFF  
**Air outlet** : Setting before communication error occurs  
**Air inlet** : Setting before communication error occurs  
**Blower fan speed** : HI  
**Set temperature** : Setting before communication error occurs

- If a communication error exists between the front air control's CPU and the ASIC, the air conditioning system is controlled under the following conditions:

**Compressor** : Control is normal operation  
**Air outlet** : Control is normal operation  
**Air inlet** : Control is normal operation  
**Blower fan speed** : Control is normal operation  
**Set temperature** : Control is normal operation  
**Indicator brightness** : Full brightness  
**Illumination brightness** : Full brightness

- If a communication error exists between the front air control's CPU and the EEPROM (Electrically Erasable Programmable Read-Only Memory), the air conditioning system is controlled using the CPU's default values and a DTC is set.
- If a button becomes stuck for 2 minutes, it will be disabled until the next ignition cycle.

## REAR AIR CONDITIONING SYSTEM

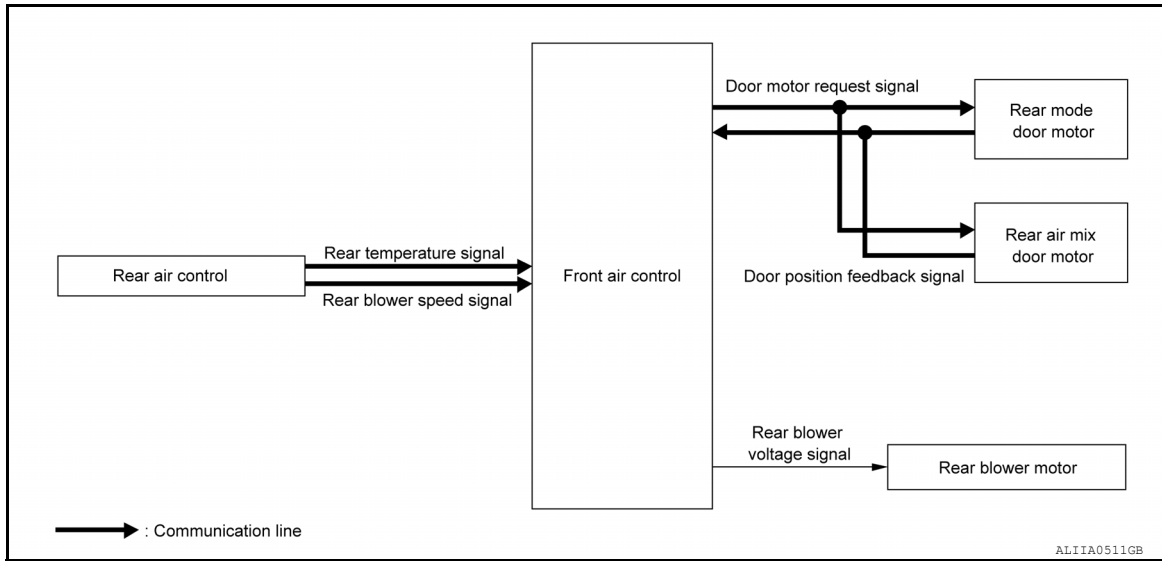
# SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## REAR AIR CONDITIONING SYSTEM : System Diagram

INFOID:000000008067636



## REAR AIR CONDITIONING SYSTEM : System Description

INFOID:000000008067633

### DESCRIPTION

- Rear manual air conditioning system is controlled by each function of rear air control.
- Each operation of rear air control is controlled by the front air A/C control.

### CONTROL BY FRONT AIR CONTROL

- [HAC-22. "REAR AIR CONDITIONING SYSTEM : Air Flow Control"](#)
- [HAC-23. "REAR AIR CONDITIONING SYSTEM : Door Control"](#)

## REAR AIR CONDITIONING SYSTEM : Air Flow Control

INFOID:000000008067634

### DESCRIPTION

- Front air control changes duty ratio of rear blower motor control signal to control air flow continuously. When air flow is increased, duty ratio of rear blower motor control signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control, air flow control is composed of fan speed control at door motor operation.

### FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When rear mode door motor is activated while air flow is more than the specified value, front air control temporarily reduces fan speed so that rear mode door moves smoothly.

# SYSTEM

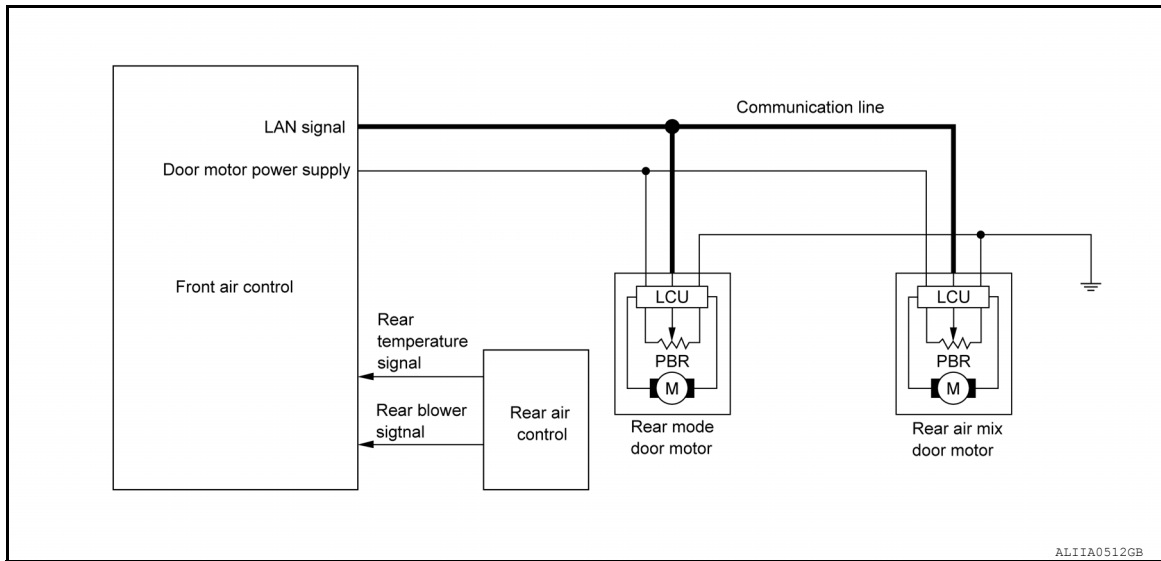
< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## REAR AIR CONDITIONING SYSTEM : Door Control

INFOID:000000008067635

### DOOR MOTOR CONTROL



- LCU (Local Control Unit) is built into each door motor. And detects door position by PBR (Potentiometer Balance Resistor).
- A/C amp. communicates with each LCU via communication line. And receives each door position feedback signal from each LCU.
- Each LCU controls each door to the appropriate position depending on the control signal from A/C amp.
- Each LCU transmits the signal of door movement completion to A/C amp., when the door movement is completed.

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## OPERATION

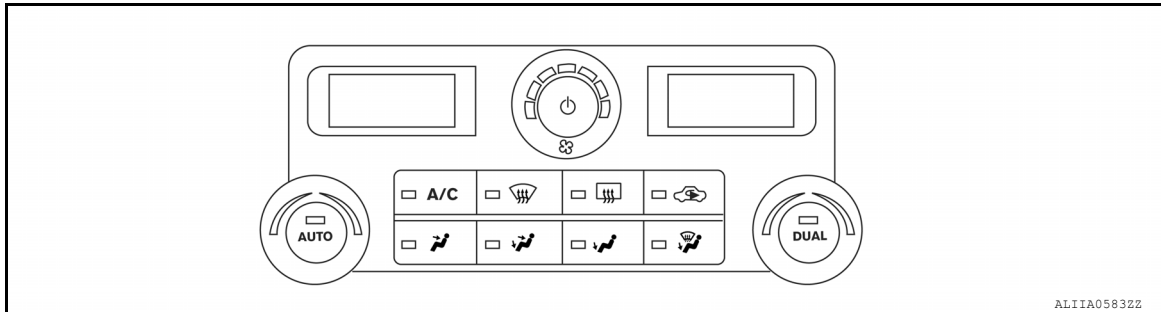
### FRONT AUTOMATIC AIR CONDITIONING SYSTEM

#### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Switch Name and Function

INFOID:000000008067657

#### CONTROL OPERATION

Front air control



#### AUTO SWITCH

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

#### TEMPERATURE CONTROL DIAL (DRIVER)

Increases or decreases the set temperature.

#### TEMPERATURE CONTROL DIAL (PASSENGER)

Increases or decreases the set temperature.

#### RECIRCULATION ( ) SWITCH

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

#### DEFROSTER ( ) SWITCH

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position, and turns A/C compressor ON.

#### REAR WINDOW DEFOGGER SWITCH

When switch is ON, rear window and door mirrors are defogged.

#### POWER BUTTON ( )

The compressor and blower are OFF, the intake doors are set to the outside air position, and the air outlet doors are set to the foot (75% foot and 25% defrost) position.

#### BLOWER CONTROL DIAL

The blower speed is manually controlled with this dial.

#### A/C SWITCH

The compressor is ON or OFF.

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

#### MODE SWITCHES

Controls the air discharge outlets.

#### DUAL SWITCH

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



# OPERATION

< SYSTEM DESCRIPTION >

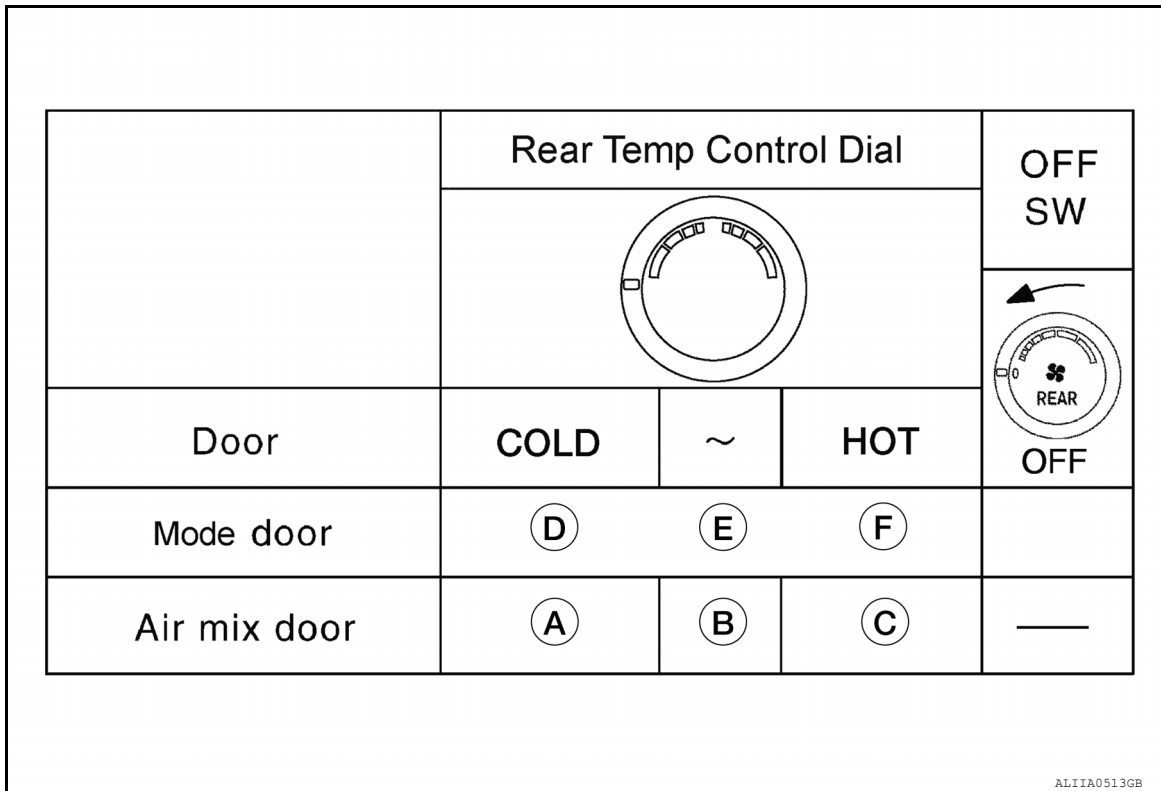
[AUTOMATIC AIR CONDITIONER]

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Switch Name and Function

INFOID:000000008067665

#### SWITCH NAME AND FUNCTION



Switch position	Door position		
		Rear mode door	Rear air mix door
Temperature control switch (rear air control)	Full cold	D	A
	Mix	E	B
	Full hot	F	C
ON-OFF switch (front air control)	OFF	F	—
OFF switch (rear air control)			

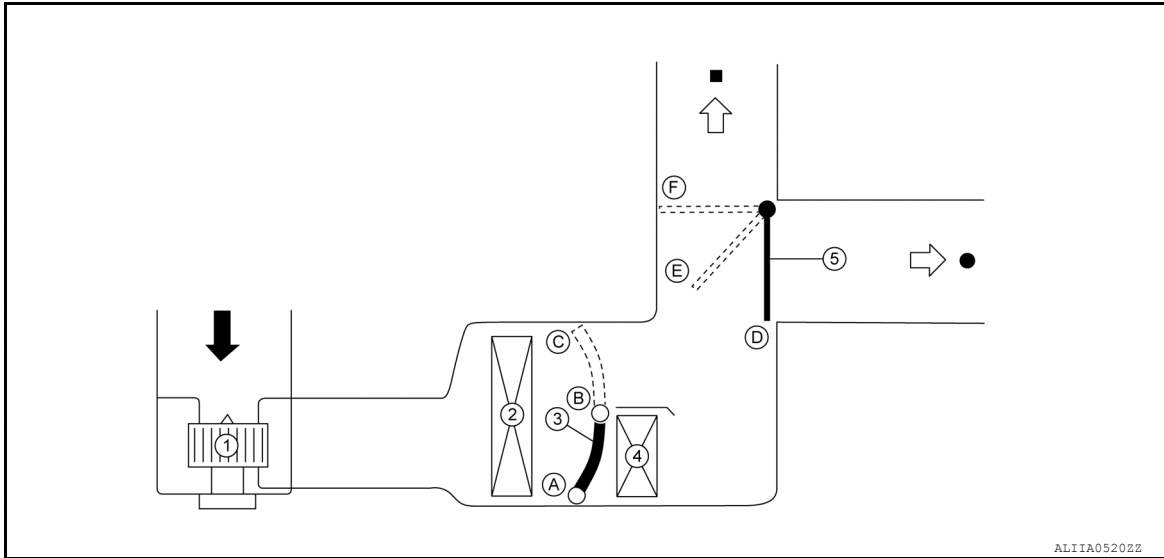
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# OPERATION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]



1. Rear blower motor

4. Rear heater core

← Recirculation air

■ Rear ventilator

2. Rear evaporator

5. Rear mode door

⇐ Discharge air

● Rear floor

3. Rear air mix door

# DIAGNOSIS SYSTEM (HVAC)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

## DIAGNOSIS SYSTEM (HVAC)

### CONSULT Function (HVAC)

INFOID:000000007992820

The CONSULT displays the following test modes:

Diagnostic mode	Description
Ecu Identification	Front air control part number can be read.
Self Diagnostic Result	Displays front air control self-diagnosis results.
Data Monitor	Displays front air control input/output data in real time.
Active Test	The signals used to activate each device are output from the front air control
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

### SELF-DIAGNOSIS

#### Display Item List

DTC	Description	Reference page
B2578	Indoor temperature sensor circuit short	<a href="#">HAC-171. "Diagnosis Procedure"</a>
B2579	Indoor temperature sensor circuit open	
B257B	Ambient sensor circuit short	<a href="#">HAC-171. "Diagnosis Procedure"</a>
B257C	Ambient sensor circuit open	
B2581	Intake sensor circuit short	<a href="#">HAC-174. "Diagnosis Procedure"</a>
B2582	Intake sensor circuit open	
B2630	Sun sensor circuit short	<a href="#">HAC-176. "Diagnosis Procedure"</a>
B2631	Sun sensor circuit open	
B2632	Front air mix door motor circuit short (driver)	<a href="#">HAC-176. "Diagnosis Procedure"</a>
B2633	Front air mix door motor circuit open (driver)	
B2634	Front air mix door motor circuit short (passenger)	<a href="#">HAC-176. "Diagnosis Procedure"</a>
B2635	Front air mix door motor circuit open (passenger)	
B2636	VENT door position error	<a href="#">HAC-179. "Diagnosis Procedure"</a>
B2637	B/L door position error	
B2638	D/F1 door position error	
B2639	DEF door position error	
B2654	D/F2 door position error	<a href="#">HAC-180. "Diagnosis Procedure"</a>
B263D	FRE door position error	
B263E	20% FRE (H/REC) door position error	
B263F	REC door position error	<a href="#">HAC-182. "Diagnosis Procedure"</a>
B27B0	EEPROM reading error	
U1000	CAN bus fault	<a href="#">HAC-168. "Diagnosis Procedure"</a>
U1010	Control unit (CAN)	<a href="#">HAC-169. "Diagnosis Procedure"</a>

If codes B2632, B2633, B2636, B2637, B2638, B2639, B2654, B263D, and B263F are displayed at the same time, refer to [HAC-183. "Description"](#).

### DATA MONITOR

#### Display Item List

# DIAGNOSIS SYSTEM (HVAC)

[AUTOMATIC AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

Monitor item	Value	Contents
AMB TEMP SEN	"°C/°F"	Displays ambient sensor signal.
IN-VEH TEMP	"°C/°F"	Displays in-vehicle temperature sensor signal.
INT TEMP SEN	"°C/°F"	Displays intake sensor signal.
SUNLOAD SEN	[w/m <sup>2</sup> ]	Sunload sensor value converted from sunload sensor signal received from sunload sensor
AMB SEN CAL	"°C/°F"	Displays calculated ambient sensor signal.
IN-VEH CAL	"°C/°F"	Displays calculated in-vehicle sensor signal.
INT TEMP CAL	"°C/°F"	Displays calculated intake sensor signal.
SUNL SEN CAL	[w/m <sup>2</sup> ]	Sunload value calculated by front air control
COMP REQ SIG	"ON/OFF"	Displays compressor request signal.
FAN REQ SIG	"ON/OFF"	Displays fan request signal.
FAN DUTY	"%"	Displays duty cycle of blower motor.
XM	"units"	Displays calculated air mix value.
RR FAN REQ SIG	"ON/OFF"	Displays rear blower motor ON/OFF status transmitted to other units via CAN communication
RR FAN DUTY	"%"	Duty ratio of rear blower motor judged by front air control
C/BOX INTAKE SEN	"°C/°F"	Displays calculated intake sensor signal.
ENG COOL TEMP	"°C/°F"	Engine coolant temperature signal value received from ECM via CAN communication.
VEHICLE SPEED	[km/h (mph)]	Vehicle speed signal value received from combination meter via CAN communication.

## ACTIVE TEST

Test item	Description
HVAC TEST	The operation check of A/C system can be performed by selecting the mode. Refer to the following table for the conditions of each mode.
ALL SEG	All LED segments illuminate.

## HVAC TEST

	Test item						
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7
Front mode door motor position	VENT	VENT	B/L	B/L	FOOT	D/F	DEF
Intake door motor position	REC	REC	20% FRE	20% FRE	FRE	FRE	FRE
Front air mix door motor (driver side) position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Front air mix door motor (passenger side) position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Front blower motor control signal duty ratio	35%	35%	59%	59%	89%	89%	35%
Magnet clutch	ON	ON	ON	ON	OFF	OFF	ON
Rear mode door motor position	VENT	VENT	B/L	B/L	FOOT	FOOT	FOOT
Rear air mix door motor position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Rear blower motor control signal duty ratio	35%	35%	59%	59%	89%	89%	35%
Rear Blower relay	ON	ON	ON	ON	OFF	OFF	ON

# DIAGNOSIS SYSTEM (HVAC)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

## WORK SUPPORT

Work item	Description	Reference
TEMP SET CORRECT	Setting change of temperature setting trimmer (front) can be performed.	<a href="#">HAC-55. "Temperature Setting Trimmer (Front)"</a>
BLOW SET	Setting change of foot position setting trimmer can be performed.	<a href="#">HAC-55. "Foot Position Setting Trimmer"</a>
REC MEMORY SET	Setting change of inlet port memory function (REC) can be performed.	<a href="#">HAC-56. "Inlet Port Memory Function (REC)"</a>
FRE MEMORY SET	Setting change of inlet port memory function (FRE) can be performed.	<a href="#">HAC-55. "Inlet Port Memory Function (FRE)"</a>

### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of WORK SUPPORT may be cancelled.

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# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

## ECU DIAGNOSIS INFORMATION

### FRONT AIR CONTROL

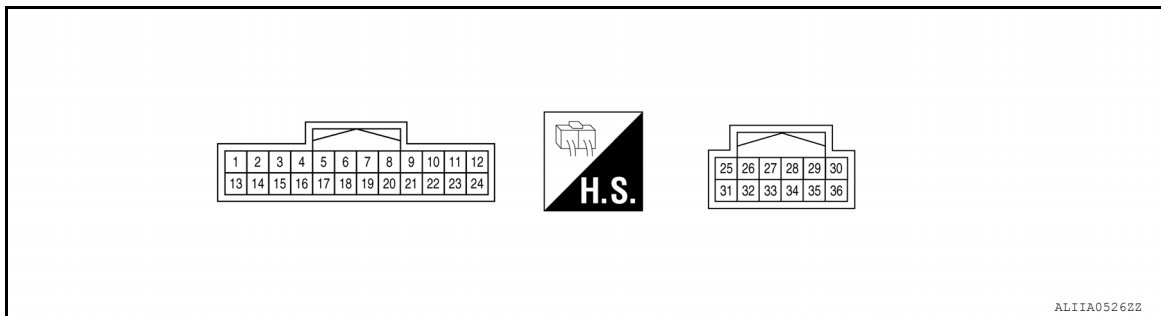
Reference Value

INFOID:000000007992830

#### CONSULT DATA MONITOR REFERENCE VALUES

Monitor item	Condition		Value/Status
FAN REQ SIG	Engine: Running at idle after warming up	Blower fan: ON	On
		Blower fan: OFF	Off
COMP REQ SIG	Blower control dial must be in any ON position	A/C switch: ON	On
		A/C switch: OFF	Off
IN-VEH TEMP	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
AMB TEMP SEN	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
INT TEMP SEN	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
SUNLOAD SEN	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
AMB SEN CAL	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
INT TEMP CAL	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
IN-VEH CAL	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
SUNL SEN CAL	Ignition switch ON	—	-22°F⇔131°F (-30°C⇔55°C)
FAN DUTY	Blower control dial must be in any ON position	Blower fan: detents 1 - 26	25% ⇔ 100%
		Blower fan: OFF	0%
XM	Ignition switch ON	—	37°F⇔149°F (2.5°C⇔65°C)
RRFAN REQ SIG	Engine: Running at idle after warming up	Blower fan: ON	On
		Blower fan: OFF	Off
RR FAN DUTY	Blower control dial must be in any ON position	Blower fan: detents 1 - 26	25% ⇔ 100%
		Blower fan: OFF	0%

#### TERMINAL LAYOUT



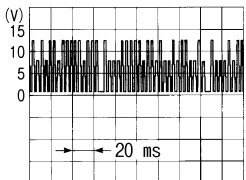
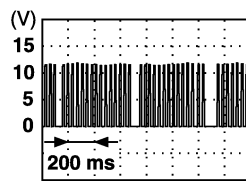
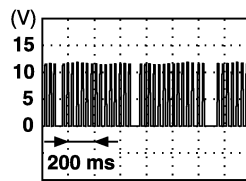
#### PHYSICAL VALUES

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	Y	Power supply for BAT	-	-	Battery voltage
2	R	Power supply for IGN	ON	-	Battery voltage
3	B	Ground	-	-	0V
4	B	Ground	-	-	0V
5	V	V ref ACTR	ON	-	5V

# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
6	LG	LAN signal	-	-	 <p style="text-align: right; font-size: small;">SJIA1453J</p>
8	LG	Water valve	ON	Water valve open	Battery voltage
			ON	Water valve closed	0V
9	Y	Water valve	ON	Water valve open	0V
			ON	Water valve closed	Battery voltage
10	W	Heater pump request	ON	Heater pump on	0V
			ON	Heater pump off	Battery voltage
11	GR	Intake sensor	ON	-	0 - 5V
12	G	Power supply from front blower motor relay	-	-	Battery voltage
13	L	Front blower motor feedback	ON	-	0 - 12V
14	LG	Variable blower control	ON	-	0 - 12V
15	O	Ambient sensor	ON	-	0 - 5V
16	SB	Sensor ground	ON	-	0V
18	BR	Rear Defrost ON signal *1	ON	DEF switch OFF	5V
			ON	DEF switch ON	0V
19	Y	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
20	GR	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
21	L	CAN-H	ON	-	0 - 5V
22	P	CAN-L	ON	-	0 - 5V
23	V	Illumination +	-	Park lamps ON	 <p style="text-align: right; font-size: small;">PIIA2344E</p>
24	BR	Illumination -	-	Park lamps ON	 <p style="text-align: right; font-size: small;">PIIA2344E</p>
29	G	Rear fan	ON	-	0 - 5V
30	SB	Rear temperature	ON	-	0 - 5V
31	P	5V supply	ON	-	0 - 5V
33	BR	Rear fan PW/M	ON	-	0 - 5V

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# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
35	O	Sunload sensor	ON	-	0 - 5V
36	LG	In-vehicle sensor	ON	-	0 - 5V

\*1: If equipped

## Fail-safe

INFOID:000000007992832

### FAIL-SAFE FUNCTION

- If a communication error exists between the front air control's Application Specific Integrated Circuit (ASIC) and Central Processing Unit (CPU), the air conditioning system is controlled under the following conditions:

**Compressor** : OFF  
**Air outlet** : Setting before communication error occurs  
**Air inlet** : Setting before communication error occurs  
**Blower fan speed** : HI  
**Set temperature** : Setting before communication error occurs

- If a communication error exists between the front air control's CPU and the ASIC, the air conditioning system is controlled under the following conditions:

**Compressor** : Control is normal operation  
**Air outlet** : Control is normal operation  
**Air inlet** : Control is normal operation  
**Blower fan speed** : Control is normal operation  
**Set temperature** : Control is normal operation  
**Indicator brightness** : Full brightness  
**Illumination brightness** : Full brightness

- If a communication error exists between the front air control's CPU and the EEPROM (Electrically Erasable Programmable Read-Only Memory), the air conditioning system is controlled using the CPU's default values and a DTC is set.
- If a button becomes stuck for 2 minutes, it will be disabled until the next ignition cycle.

## DTC Inspection Priority Chart

INFOID:000000007992833

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart:

Priority	Detected items (DTC)	Diagnostic procedure
1	U1000: CONTROL UNIT (CAN)	<a href="#">HAC-57, "Diagnosis Procedure"</a>
	U1010: CONTROL UNIT (CAN)	<a href="#">HAC-58, "Diagnosis Procedure"</a>
	B27B0: A/C AUTO AMP.	<a href="#">HAC-79, "Diagnosis Procedure"</a>



# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Priority	Detected items (DTC)	Diagnostic procedure
2	B257B: AMB TEMP SEN (SHORT)	<a href="#">HAC-63, "Diagnosis Procedure"</a>
	B257C: AMB TEMP SEN (OPEN)	<a href="#">HAC-63, "Diagnosis Procedure"</a>
	B2578: IN-VEH SEN (SHORT)	<a href="#">HAC-59, "Diagnosis Procedure"</a>
	B2579: IN-VEH SEN (OPEN)	<a href="#">HAC-59, "Diagnosis Procedure"</a>
	B2581: EVAP TEMP SEN (SHORT)	<a href="#">HAC-66, "Diagnosis Procedure"</a>
	B2582: EVAP TEMP SEN (OPEN)	<a href="#">HAC-66, "Diagnosis Procedure"</a>
	B2630: SUN SENSOR (SHORT)	<a href="#">HAC-68, "Diagnosis Procedure"</a>
	B2631: SUN SENSOR (OPEN)	<a href="#">HAC-68, "Diagnosis Procedure"</a>
	B2632: DR AIRMIX ACTR (SHORT)	<a href="#">HAC-71, "Diagnosis Procedure"</a>
	B2633: DR AIRMIX ACTR (OPEN)	<a href="#">HAC-71, "Diagnosis Procedure"</a>
	B2634: FAS AIRMIX ACTR (SHORT)	<a href="#">HAC-73, "Diagnosis Procedure"</a>
	B2635: FAS AIRMIX ACTR (OPEN)	<a href="#">HAC-73, "Diagnosis Procedure"</a>
	B2636: DR VENT DOOR FAIL	<a href="#">HAC-76, "Diagnosis Procedure"</a>
	B2637: DR B/L DOOR FAIL	<a href="#">HAC-76, "Diagnosis Procedure"</a>
	B2638: DR D/F1 DOOR FAIL	<a href="#">HAC-76, "Diagnosis Procedure"</a>
	B2639: DR DEF DOOR FAIL	<a href="#">HAC-76, "Diagnosis Procedure"</a>
	B263D: FRE DOOR FAIL	<a href="#">HAC-77, "Diagnosis Procedure"</a>
	B263E: 20% FRE DOOR POSITION ERROR	<a href="#">HAC-77, "Diagnosis Procedure"</a>
B263F: REC DOOR FAIL	<a href="#">HAC-77, "Diagnosis Procedure"</a>	
B2654: D/F2 DOOR FAIL	<a href="#">HAC-76, "Diagnosis Procedure"</a>	

## DTC Index

INFOID:000000007992834

DTC	Items (CONSULT screen terms)	Reference
U1000	CAN COMM CIRCUIT	<a href="#">HAC-57, "DTC Logic"</a>
U1010	CONTROL UNIT (CAN)	<a href="#">HAC-58, "DTC Logic"</a>
B2578	IN-VEHICLE SENSOR	<a href="#">HAC-59, "DTC Logic"</a>
B2579	IN-VEHICLE SENSOR	<a href="#">HAC-59, "DTC Logic"</a>
B257B	AMBIENT SENSOR	<a href="#">HAC-63, "DTC Logic"</a>
B257C	AMBIENT SENSOR	<a href="#">HAC-63, "DTC Logic"</a>
B2581	INTAKE SENSOR	<a href="#">HAC-66, "DTC Logic"</a>
B2582	INTAKE SENSOR	<a href="#">HAC-66, "DTC Logic"</a>
B2630	SUNLOAD SENSOR	<a href="#">HAC-68, "DTC Logic"</a>
B2631	SUNLOAD SENSOR	<a href="#">HAC-68, "DTC Logic"</a>
B2632	DR AIRMIX DOOR MOT	<a href="#">HAC-71, "DTC Logic"</a>
B2633	DR AIRMIX DOOR MOT	<a href="#">HAC-71, "DTC Logic"</a>
B2634	PASS AIR MIX DOOR MOT	<a href="#">HAC-73, "DTC Logic"</a>
B2635	PASS AIR MIX DOOR MOT	<a href="#">HAC-73, "DTC Logic"</a>
B2636	DR VENT DOOR FAIL	<a href="#">HAC-71, "DTC Logic"</a>
B2637	DR B/L DOOR FAIL	<a href="#">HAC-71, "DTC Logic"</a>
B2638	DR D/F1 DOOR FAIL	<a href="#">HAC-71, "DTC Logic"</a>
B2639	DR DEF DOOR FAIL	<a href="#">HAC-71, "DTC Logic"</a>
B263D	FRE DOOR FAIL	<a href="#">HAC-77, "DTC Logic"</a>
B263E	20P FRE DOOR FAIL	<a href="#">HAC-77, "DTC Logic"</a>

## FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

DTC	Items (CONSULT screen terms)	Reference
B263F	REC DOOR FAIL	<a href="#">HAC-77. "DTC Logic"</a>
B2654	D/F2 DOOR FAIL	<a href="#">HAC-71. "DTC Logic"</a>
B27B0	A/C AUTO AMP.	<a href="#">HAC-79. "DTC Logic"</a>

**NOTE:**

If all of door motor DTCs (B2632, B2633, B2636, B2637, B2638, B2639, B263D, B263F, AND B2654) are detected, check door motor communication circuit. Refer to [HAC-80. "Description"](#).

# ECM, IPDM E/R, BCM

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

## ECM, IPDM E/R, BCM

### List of ECU Reference

INFOID:000000007992835

ECU	Reference	
ECM	<a href="#">EC-76. "Reference Value"</a> (VQ40DE)	
	<a href="#">EC-513. "Reference Value"</a> (VK56DE)	
	<a href="#">EC-89. "Fail safe"</a> (VQ40DE)	
	<a href="#">EC-525. "Fail-safe"</a> (VK56DE)	
	<a href="#">EC-90. "DTC Inspection Priority Chart"</a> (VQ40DE)	
	<a href="#">EC-526. "DTC Inspection Priority Chart"</a> (VK56DE)	
BCM	<a href="#">BCS-25. "Reference Value"</a>	
	<a href="#">BCS-35. "Fail-safe"</a>	
	<a href="#">BCS-35. "DTC Inspection Priority Chart"</a>	
	<a href="#">BCS-35. "DTC Index"</a>	
	IPDM E/R	<a href="#">PCS-13. "Physical Values"</a>
		<a href="#">PCS-16. "Fail Safe"</a>
<a href="#">PCS-17. "DTC Index"</a>		

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# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

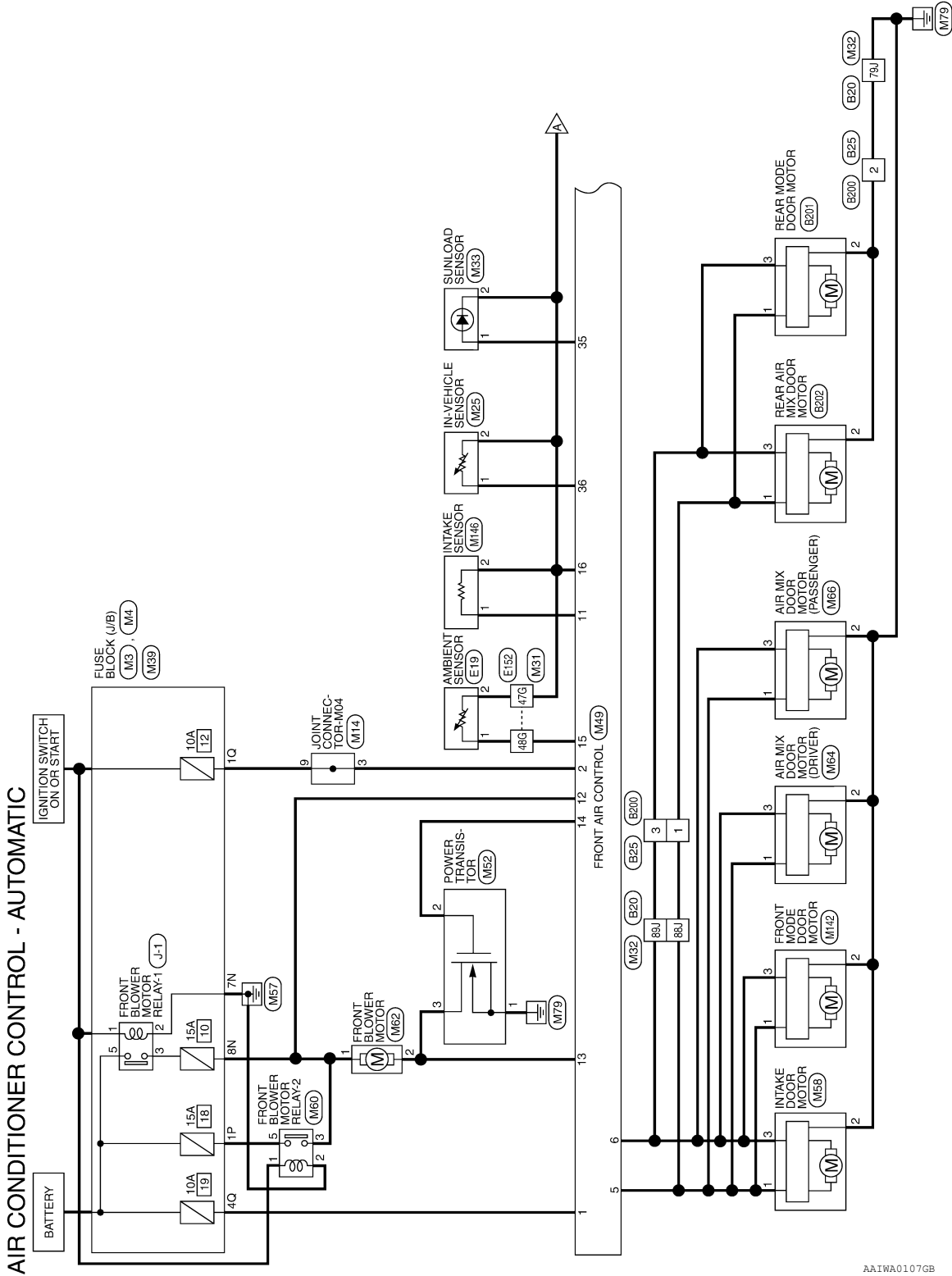
< WIRING DIAGRAM >

## WIRING DIAGRAM

### AIR CONDITIONER CONTROL

Wiring Diagram

INFOID:000000007992836



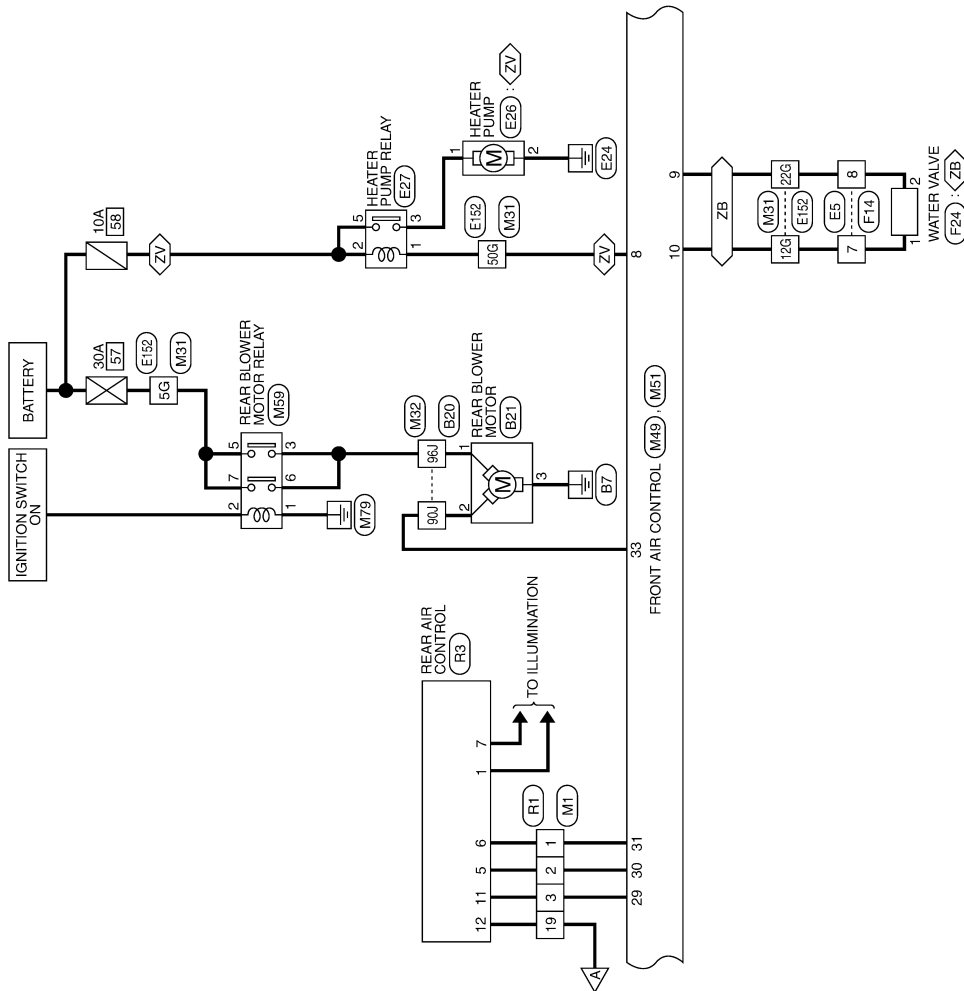
AAIWA0107GB

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

ZB : WITH VK56DE  
ZV : WITH VQ40DE



A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

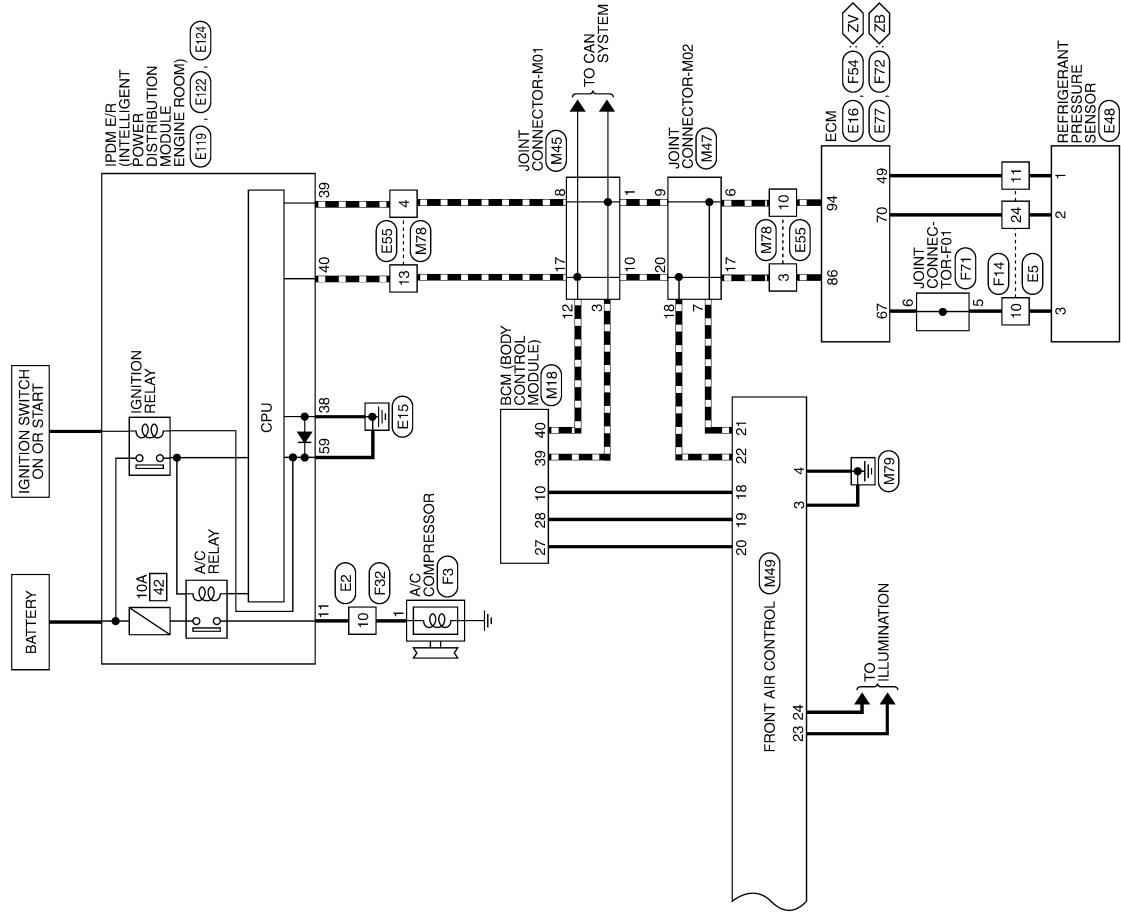
AAIWA0108GB

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

ZB : WITH VK56DE  
ZV : WITH VQ40DE



AAIWA0109GB

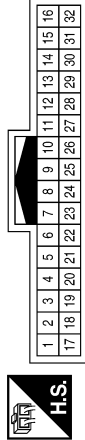
# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

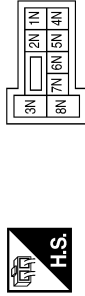
## AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	SB	-
3	G	-
19	B	-

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



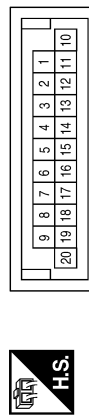
Terminal No.	Color of Wire	Signal Name
7N	B	-
8N	G	-

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



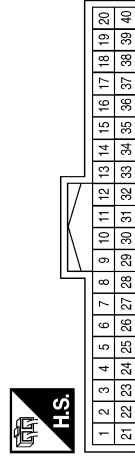
Terminal No.	Color of Wire	Signal Name
1P	L	-

Connector No.	M14
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
3	R	-
9	R	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	BR	REAR DEFOGGER SW
27	GR	AIR CON SW
28	Y	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M25
Connector Name	IN-VEHICLE SENSOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	SB	-

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A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

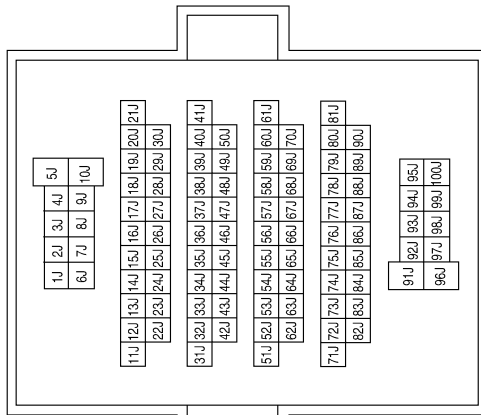
< WIRING DIAGRAM >

Connector No.	M33
Connector Name	SUNLOAD SENSOR
Connector Color	BLACK



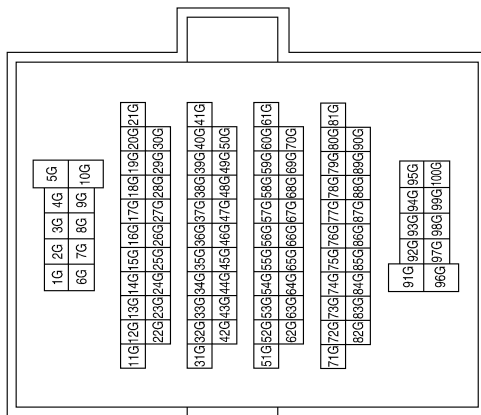
Terminal No.	Color of Wire	Signal Name
1	O	-
2	B	-

Connector No.	M32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
79J	B	-
88J	V	-
89J	LG	-
90J	BR	-
96J	W	-

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
5G	Y	-
12G	W	-
22G	Y	-
47G	SB	-
48G	O	-
50G	LG	-

AA1IA0166GB

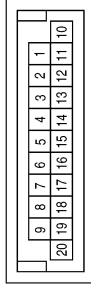


# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

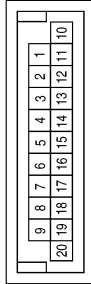
< WIRING DIAGRAM >

Connector No.	M47
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN



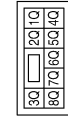
Terminal No.	Color of Wire	Signal Name
6	L	-
7	L	-
9	L	-
17	P	-
18	P	-
20	P	-

Connector No.	M45
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



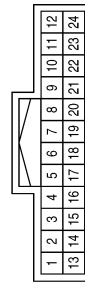
Terminal No.	Color of Wire	Signal Name
1	L	-
3	L	-
8	L	-
10	P	-
12	P	-
17	P	-

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1Q	R	-
4Q	Y	-

Connector No.	M49
Connector Name	FRONT AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	BAT
2	R	IGN
3	B	GND
4	B	POWER GND
5	V	VACTR
6	LG	LIN
7	-	-
8	LG	HEATER PUMP

Terminal No.	Color of Wire	Signal Name
9	Y	WATER VALVE OPEN (-)
10	W	WATER VALVE CLOSE (+)
11	GR	INT SENS
12	G	VIGN2
13	L	FAN F/B
14	LG	FAN GATE
15	O	AMB SENS
16	SB	SENS GND
17	-	-
18	BR	R. DEF ON
19	Y	FAN ON
20	GR	COMP ON
21	L	CAN-H
22	P	CAN-L
23	V	ILL+
24	BR	ILL-

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A  
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# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

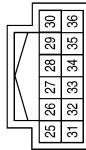
Connector No.	M52
Connector Name	POWER TRANSISTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	-
2	LG	-
3	L	-

Terminal No.	Color of Wire	Signal Name
31	P	SV SUPPLY
32	-	-
33	BR	RR FAN PW/M
34	-	-
35	O	SUN SENS
36	LG	INCAR SENS

Connector No.	M51
Connector Name	FRONT AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
25	-	-
26	-	-
27	-	-
28	-	-
29	G	RR FAN
30	SB	RR TEMP

Connector No.	M60
Connector Name	FRONT BLOWER MOTOR RELAY-2
Connector Color	BLUE



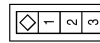
Terminal No.	Color of Wire	Signal Name
1	R	-
2	B	-
3	G	-
5	L	-

Connector No.	M59
Connector Name	REAR BLOWER MOTOR RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	B	-
2	R	-
3	W	-
5	Y	-
6	W	-
7	Y	-

Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

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# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

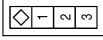
< WIRING DIAGRAM >

Connector No.	M66
Connector Name	AIR MIX DOOR MOTOR (PASSENGER)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	M64
Connector Name	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	M62
Connector Name	FRONT BLOWER MOTOR
Connector Color	WHITE



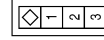
Terminal No.	Color of Wire	Signal Name
1	G	-
2	L	-

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	WHITE



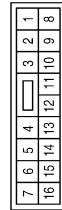
Terminal No.	Color of Wire	Signal Name
1	GR	-
2	SB	-

Connector No.	M142
Connector Name	FRONT MODE DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	M78
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
10	L	-
13	P	-

AA1IA0169GB

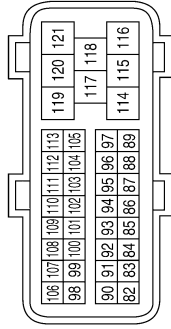
A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

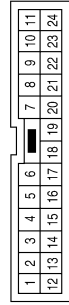
< WIRING DIAGRAM >

Connector No.	E16
Connector Name	ECM (WITH VQ40DE)
Connector Color	BLACK



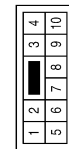
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
7	W	-
8	Y	-
10	B	-
11	O	-
24	GR	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	W	-

Connector No.	E27
Connector Name	HEATER PUMP RELAY
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	O	-
3	BR	-
5	O	-

Connector No.	E26
Connector Name	HEATER PUMP
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	B	-

Connector No.	E19
Connector Name	AMBIENT SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	O	-
2	SB	-

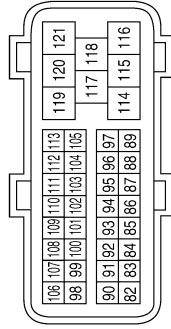
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# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

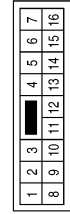
< WIRING DIAGRAM >

Connector No.	E77
Connector Name	ECM (WITH VQ56DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E55
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
10	L	-
13	P	-

Connector No.	E48
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Color	BLACK



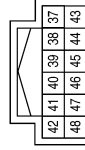
Terminal No.	Color of Wire	Signal Name
1	O	-
2	GR	-
3	B	-

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



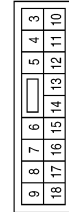
Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
11	W	A/C CLUTCH

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A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[AUTOMATIC AIR CONDITIONER]

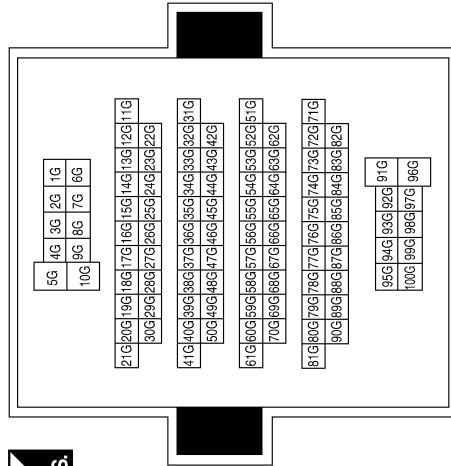
Connector No.	F3
Connector Name	A/C COMPRESSOR
Connector Color	BLACK



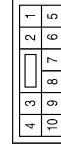
Terminal No.	Color of Wire	Signal Name
1	W	-

Terminal No.	Color of Wire	Signal Name
5G	Y	-
12G	W	-
22G	Y	-
47G	SB	-
48G	O	-
50G	LG	-

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	W	-

Connector No.	F24
Connector Name	WATER VALVE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
1	W	-
2	Y	-

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
7	W	-
8	Y	-
10	B	-
11	O	-
24	GR	-

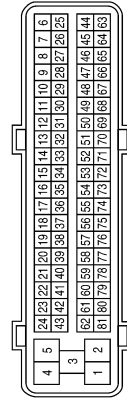
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# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

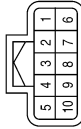
< WIRING DIAGRAM >

Connector No.	F54
Connector Name	ECM (WITH VQ40DE)
Connector Color	BLACK



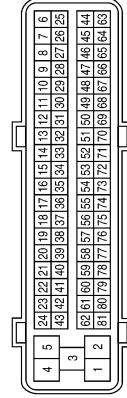
Terminal No.	Color of Wire	Signal Name
49	O	AVCC (PDPRES)
67	B	GND-A
70	GR	PDPRESS

Connector No.	F71
Connector Name	JOINT CONNECTOR-F01
Connector Color	GRAY



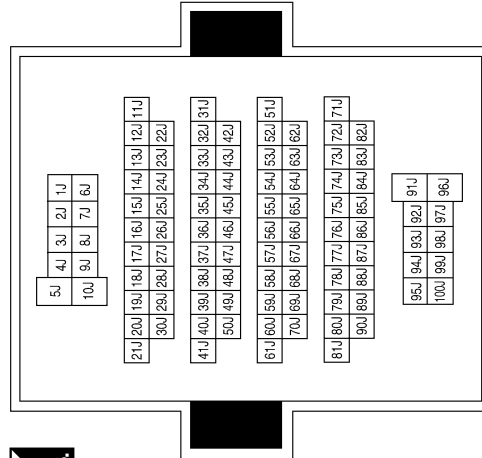
Terminal No.	Color of Wire	Signal Name
5	B	-
6	B	-

Connector No.	F72
Connector Name	ECM (WITH VQ56DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
49	O	AVCC (PDPRES)
67	B	GND-A
70	GR	PDPRESS

Connector No.	B20
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
79J	B	-
88J	V	-
89J	LG	-
90J	BR	-
96J	W	-

Connector No.	B21
Connector Name	REAR BLOWER MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W	-
2	BR	-
3	B	-

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A  
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C  
D  
E  
F  
G  
H  
HAC  
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L  
M  
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P

# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

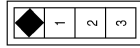
< WIRING DIAGRAM >

Connector No.	B201
Connector Name	REAR MODE DOOR MOTOR
Connector Color	WHITE



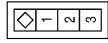
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

Connector No.	B200
Connector Name	WIRE TO WIRE
Connector Color	WHITE



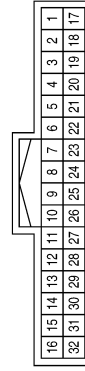
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

Connector No.	B25
Connector Name	WIRE TO WIRE
Connector Color	WHITE



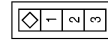
Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	R1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	SB	-
3	G	-
19	B	-

Connector No.	B202
Connector Name	REAR AIR MIX DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

AAIIA0174GB



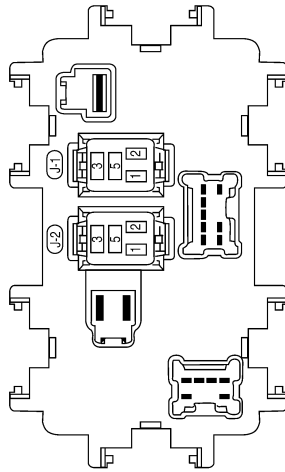
# AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

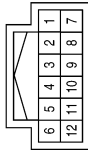
< WIRING DIAGRAM >

A  
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HAC  
J  
K  
L  
M  
N  
O  
P

Connector No.	J-1
Connector Name	FUSE BLOCK (J/B) (FRONT BLOWER MOTOR RELAY-1)
Connector Color	-



Connector No.	R3
Connector Name	REAR AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	ILL +
2	-	-
3	-	-
4	-	-
5	SB	RR TEMP SW
6	P	RR SW VCC
7	BR	ILL -
8	-	-
9	-	-
10	-	-
11	G	RR FAN SW
12	B	SENS GND

AA1IA0175GB

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

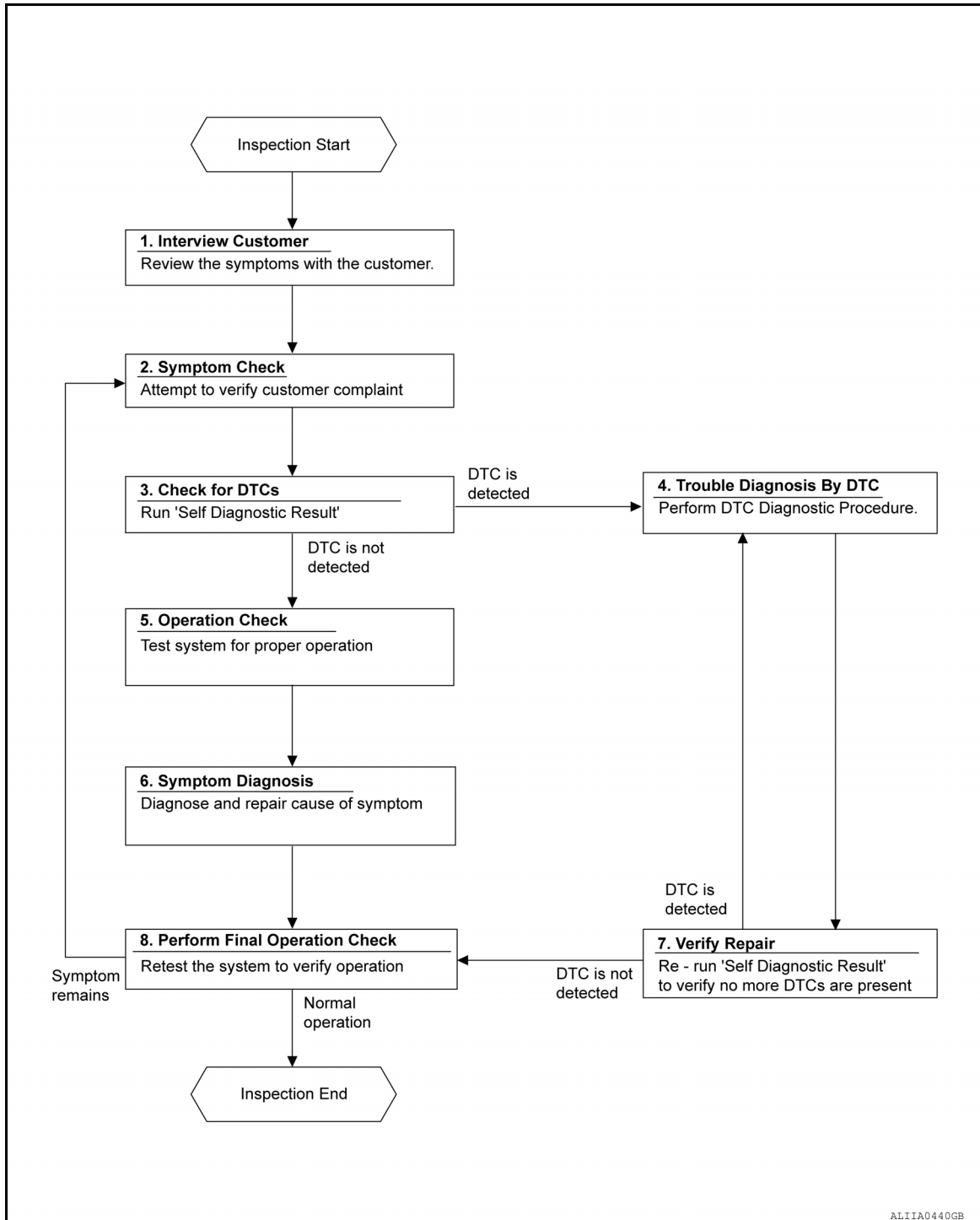
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:000000007992838

#### OVERALL SEQUENCE



#### DETAILED FLOW

##### 1. INTERVIEW CUSTOMER

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurred.

# DIAGNOSIS AND REPAIR WORKFLOW

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

>> GO TO 2.

## 2. SYMPTOM CHECK

Verify symptoms.

>> GO TO 3.

## 3. CHECK FOR DTCS

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

## 4. PERFORM DTC DIAGNOSTIC PROCEDURE

Perform the diagnostic procedure for the detected DTC. Refer to [HAC-32, "DTC Inspection Priority Chart"](#).

>> GO TO 7.

## 5. OPERATION CHECK

Perform the operation check. Refer to [HAC-52, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Work Procedure"](#).

>> GO TO 6.

## 6. SYMPTOM DIAGNOSIS

Check the symptom diagnosis table. Refer to [HAC-104, "Symptom Table"](#).

>> GO TO 8.

## 7. VERIFY REPAIR.

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 8.

## 8. PERFORM FINAL OPERATION CHECK

Perform the operation check. Refer to [HAC-52, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Work Procedure"](#).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

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## OPERATION INSPECTION

### FRONT AUTOMATIC AIR CONDITIONING SYSTEM

#### FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Work Procedure

INFOID:000000008116316

#### DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

**Check condition : Engine running at normal operating temperature.**

#### OPERATION INSPECTION

##### 1.CHECK MEMORY FUNCTION

---

1. Set temperature control dial (driver side) to 32.0°C (90°F).
2. Press OFF switch.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press AUTO switch.
6. Check that set temperature is maintained.

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 11.

##### 2.CHECK FRONT BLOWER MOTOR

---

1. Start engine.
2. Operate fan switch.
3. Check that fan speed changes. Check operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 11.

##### 3.CHECK DISCHARGE AIR (MODE SWITCH AND DEF SWITCH)

---

1. Operate fan switch to set the fan speed to maximum speed.
2. Operate MODE switch and DEF switch.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to [HAC-15, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : System Description"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 11.

##### 4.CHECK DISCHARGE AIR (UPPER VENTILATOR SWITCH)

---

1. Press MODE switch to set the air outlet to other than D/F or DEF.
2. Press upper ventilator switch. The upper ventilator switch indicator is turns ON.
3. Check that air flow blows from upper ventilator.
4. Press upper ventilator switch again. The upper ventilator switch indicator is turns OFF.
5. Check that air flow from upper ventilator stops.

Is the inspection result normal?

YES >> GO TO 5.

NO >> GO TO 11.

##### 5.CHECK INTAKE AIR

---

1. Press REC switch to set the air inlet to recirculation. The REC switch indicator turns ON.
2. Listen to intake sound and confirm air inlets change.
3. Press FRE switch to set the air inlet to fresh air intake. The REC switch indicator turns OFF and FRE switch indicator turns ON.
4. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

# OPERATION INSPECTION

[AUTOMATIC AIR CONDITIONER]

## < BASIC INSPECTION >

- YES >> GO TO 6.  
NO >> GO TO 11.

### 6. CHECK COMPRESSOR

1. Press A/C switch. The A/C switch indicator is turns ON.
2. Check visually and by sound that the compressor operates.
3. Press A/C switch again. The A/C switch indicator is turns OFF.
4. Check that compressor stops.

Is the inspection result normal?

- YES >> GO TO 7.  
NO >> GO TO 11.

### 7. CHECK DISCHARGE AIR TEMPERATURE (LH/RH INDEPENDENT TEMPERATURE ADJUSTMENT FUNCTION)

1. Operate temperature control dial (driver side).
2. Check that discharge air temperature (driver side) changes.
3. Operate temperature control dial (passenger side). The DUAL switch indicator is turns ON.
4. Check that the discharge air temperature (passenger side) changes.
5. Press DUAL switch. The DUAL switch indicator is turns OFF.
6. Check that air temperature setting (LH/RH) is unified to the driver side temperature setting.

Is the inspection result normal?

- YES >> GO TO 8.  
NO >> GO TO 11.

### 8. CHECK WITH TEMPERATURE SETTING LOWERED

1. Operate compressor.
2. Operate temperature control dial (driver side) and lower the set temperature to 18°C (60°F).
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

- YES >> GO TO 9.  
NO >> GO TO 11.

### 9. CHECK TEMPERATURE INCREASE

1. Operate temperature control dial (driver side) and raise the set temperature to 32°C (90°F).
2. Check that warm air blows from the air outlets.

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> GO TO 11.

### 10. CHECK AUTO MODE

1. Press AUTO switch to confirm that "AUTO" is indicated on the display.
2. Operate temperature control dial (driver side) to check that fan speed or air outlet changes (the air outlet or fan speed varies depending on the ambient temperature, in-vehicle temperature (front side), set temperature, and etc.).

Is the inspection result normal?

- YES >> GO TO 11.  
NO >> GO TO 12.

### 11. CHECK SELF-DIAGNOSIS WITH CONSULT

1. Perform self-diagnosis with CONSULT.
2. Check that any DTC is detected.

Is any DTC detected?

- YES >> Refer to [HAC-33, "DTC Index"](#) and perform the appropriate diagnosis.  
NO >> GO TO 12.

### 12. CHECK FAIL-SAFE ACTIVATION

Check that symptom is applied to the fail-safe activation. Refer to [HAC-32, "Fail-safe"](#).

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HAC

# OPERATION INSPECTION

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

>> Refer to [HAC-104. "Symptom Table"](#) and perform the appropriate diagnosis.

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Work Procedure

INFOID:000000008067666

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

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

#### CHECKING REAR BLOWER MOTOR

1. Turn the ignition switch ON.
2. Rotate rear air control blower control dial to low speed.
3. Rotate the blower control dial clockwise and continue checking blower speed until all speeds are checked.
4. Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for [HAC-195. "Diagnosis Procedure"](#).

If OK, continue with next check.

#### CHECKING REAR TEMPERATURE DECREASE

1. Rotate the rear air control (rear) temperature control dial counterclockwise to maximum cold.
2. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-106. "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-83. "Diagnosis Procedure"](#).

If OK, continue with next check.

#### CHECKING REAR TEMPERATURE INCREASE

1. Rotate the rear air control temperature control dial clockwise to maximum heat.
2. Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-108. "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-83. "Diagnosis Procedure"](#).

If NG, go to trouble diagnosis procedure for [HAC-108. "Component Function Check"](#).

If all operational checks are OK (inspection results are normal), go to [HAC-50. "Workflow"](#) and perform tests as outlined. If symptom appears, refer to [HAC-104. "Symptom Table"](#) and perform applicable trouble diagnosis procedures.

# SYSTEM SETTING

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

## SYSTEM SETTING

### Temperature Setting Trimmer (Front)

INFOID:000000008116356

#### DESCRIPTION

If the temperature felt by the customer is different from the front air flow temperature controlled by the temperature setting, the A/C auto amp. control temperature can be adjusted to compensate for the temperature setting.

#### HOW TO SET

☑ With CONSULT

Perform "TEMP SET CORRECT" of HVAC work support item.

Work support items	Display (°C)	Display (°F)
TEMP SET CORRECT	3.0	6
	2.5	5
	2.0	4
	1.5	3
	1.0	2
	0.5	1
	0 (initial status)	0 (initial status)
	-0.5	-1
	-1.0	-2
	-1.5	-3
	-2.0	-4
	-2.5	-5
	-3.0	-6

#### NOTE:

- When  $-3.0^{\circ}\text{C}$  ( $-6^{\circ}\text{F}$ ) is corrected on the temperature setting set as  $25.0^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ ) the temperature controlled by A/C auto amp. is  $25.0^{\circ}\text{C}$  ( $77^{\circ}\text{F}$ )  $-3.0^{\circ}\text{C}$  ( $-6^{\circ}\text{F}$ ) =  $22.0^{\circ}\text{C}$  ( $72^{\circ}\text{F}$ ) and the temperature becomes lower than the temperature setting.
- When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the difference between the set temperature and control temperature may be cancelled.

### Foot Position Setting Trimmer

INFOID:000000007992844

#### Description

In the FOOT mode, the air blowing to the DEF can be turned ON/OFF.

#### How to set

Using CONSULT, perform "BLOW SET" in "WORK SUPPORT" of HVAC.

Work support items	Display	DEF door position
		Manual control
BLOW SET	Mode 1	CLOSE
	Mode 2 (initial status)	OPEN

#### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the discharge air mix ratio in FOOT mode may be cancelled.

### Inlet Port Memory Function (FRE)

INFOID:000000008116357

#### DESCRIPTION

# SYSTEM SETTING

## < BASIC INSPECTION >

## [AUTOMATIC AIR CONDITIONER]

- If the ignition switch is turned to the OFF position while the intake switch is set to OFF (fresh air intake), “Perform the memory” or “Do not perform the memory” of intake switch OFF (fresh air intake) condition can be selected.
- If “Perform the memory” was set, the intake switch will be OFF (fresh air intake) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

### HOW TO SET

Ⓟ With CONSULT

Perform the “FRE MEMORY SET” of HVAC work support item.

Work support items	Display	Setting
FRE MEMORY SET	WITHOUT	Perform the memory of manual FRE
	WITH (initial status)	Do not perform the memory of manual FRE (auto control)

#### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the FRE memory function may be cancelled.

### Inlet Port Memory Function (REC)

INFOID:000000008116358

#### DESCRIPTION

- If the ignition switch is turned to the OFF position while the intake switch is set to ON (recirculation), “Perform the memory” or “Do not perform the memory” of intake switch ON (recirculation) condition can be selected.
- If “Perform the memory” was set, the intake switch will be ON (recirculation) when turning the ignition switch to the ON position again.
- If “Do not perform the memory” was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

### HOW TO SET

Ⓟ With CONSULT

Perform the “REC MEMORY SET” of HVAC work support item.

Work support items	Display	Setting
REC MEMORY SET	WITHOUT (initial status)	Perform the memory of manual REC
	WITH	Do not perform the memory of manual REC (auto control)

#### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10 V or less, the setting of the REC memory function may be cancelled.



# U1000 CAN COMM CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## DTC/CIRCUIT DIAGNOSIS

### U1000 CAN COMM CIRCUIT

#### Description

INFOID:000000007992853

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to [LAN-14, "How to Use CAN Communication Signal Chart"](#).

#### DTC Logic

INFOID:000000007992854

#### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
U1000	CAN COMM CIRCUIT	When front air control is not transmitting or receiving CAN communication signal for 2 or more seconds	CAN communication system

#### Diagnosis Procedure

INFOID:000000007992855

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Turn ignition switch ON and wait for 2 or more seconds.
2. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is "CAN COMM CIRCUIT" displayed?

- YES >> Perform trouble diagnosis for the CAN communication system. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).
- NO >> Perform the intermittent malfunction diagnosis. Refer to [GI-39, "Intermittent Incident"](#).

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# U1010 CONTROL UNIT (CAN)

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## U1010 CONTROL UNIT (CAN)

### Description

INFOID:000000007992856

Initial diagnosis of front air control.

### DTC Logic

INFOID:000000007992857

### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of front air control	Front air control

### Diagnosis Procedure

INFOID:000000007992858

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is DTC No. "U1010" displayed?

- YES >> Replace front air control Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).
- NO >> Inspection End.

# B2578, B2579 IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2578, B2579 IN-VEHICLE SENSOR

### DTC Logic

INFOID:000000008080305

### DTC DETECTION LOGIC

#### NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to [HAC-57, "DTC Logic"](#).
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to [HAC-58, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B2578	IN-VEHICLE SENSOR	The in-vehicle sensor recognition temperature is too high.	• In-vehicle sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B2579		The in-vehicle sensor recognition temperature is too low.	

### DTC CONFIRMATION PROCEDURE

#### 1. PERFORM DTC CONFIRMATION PROCEDURE

##### Ⓜ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

##### Is DTC detected?

- YES >> Refer to [HAC-59, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000008080306

#### 1. CHECK IN-VEHICLE SENSOR POWER SUPPLY

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

+		-	Voltage (Approx.)
Connector	Terminal		
M26	1	Ground	5 V

##### Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

#### 2. CHECK IN-VEHICLE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between in-vehicle sensor harness connector and ground.

In-vehicle sensor		—	Continuity
Connector	Terminal		
M26	2	Ground	Yes

##### Is the inspection result normal?

- YES >> GO TO 3.

## B2578, B2579 IN-VEHICLE SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair harness or connector.

### 3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to [HAC-60, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).

NO >> Replace in-vehicle sensor. Refer to [HAC-113, "Removal and Installation"](#).

### 4.CHECK IN-VEHICLE SENSOR POWER SUPPLY CIRCUIT FOR OPEN

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

In-vehicle sensor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
M26	1	M49	36	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

### 5.CHECK IN-VEHICLE SENSOR POWER SUPPLY CIRCUIT FOR GROUND SHORT

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

In-vehicle sensor		—	Continuity
Connector	Terminal		
M26	1	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

### 6.CHECK IN-VEHICLE SENSOR POWER SUPPLY CIRCUIT FOR POWER SHORT

1. Turn ignition switch ON.
2. Check voltage between in-vehicle sensor harness connector and ground.

+		-	Voltage (Approx.)
In-vehicle sensor			
Connector	Terminal		
M26	1	Ground	0 V

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## Component Inspection

INFOID:000000008080307

### 1.CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector.
3. Check resistance between in-vehicle sensor terminals.

# B2578, B2579 IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Terminal		Condition	Resistance: kΩ
		Temperature: °C (°F)	
1	2	-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
		15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace in-vehicle sensor. Refer to [HAC-113. "Removal and Installation"](#).

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# B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B257B, B257C AMBIENT SENSOR

### Description

INFOID:000000007992859

#### Ambient Sensor

- The ambient sensor is installed behind the grill, in front of the radiator, on the center core support.
- The ambient sensor is a thermistor. The resistance of the sensor changes with temperature, and the front air control converts this analog data into a digital count, ranging from 10 to 95 AD (Analog to Digital) counts. Data is transmitted on the CAN in AD counts, but always reported in °C. A conversion algorithm is used to convert °C to °F. The range of the sensor is from -30°C (-22°F) to 55°C (131°F).

AD Counts (sent on CAN)	Deg °C	AD Counts (sent on CAN)	Deg °C
10	-30.00	53	13.00
11	-29.00	54	14.00
12	-28.00	55	15.00
13	-27.00	56	16.00
14	-26.00	57	17.00
15	-25.00	58	18.00
16	-24.00	59	19.00
17	-23.00	60	20.00
18	-22.00	61	21.00
19	-21.00	62	22.00
20	-20.00	63	23.00
21	-19.00	64	24.00
22	-18.00	65	25.00
23	-17.00	66	26.00
24	-16.00	67	27.00
25	-15.00	68	28.00
26	-14.00	69	29.00
27	-13.00	70	30.00
28	-12.00	71	31.00
29	-11.00	72	32.00
30	-10.00	73	33.00
31	-9.00	74	34.00
32	-8.00	75	35.00
33	-7.00	76	36.00
34	-6.00	77	37.00
35	-5.00	78	38.00
36	-4.00	79	39.00
37	-3.00	80	40.00
38	-2.00	81	41.00
39	-1.00	82	42.00
40	-0.00	83	43.00
41	1.00	84	44.00
42	2.00	85	45.00
43	3.00	86	46.00

## B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AD Counts (sent on CAN)	Deg °C	AD Counts (sent on CAN)	Deg °C
44	4.00	87	47.00
45	5.00	88	48.00
46	6.00	89	49.00
47	7.00	90	50.00
48	8.00	91	51.00
49	9.00	92	52.00
50	10.00	93	53.00
51	11.00	94	54.00
52	12.00	95	55.00

### Ambient temperature input process

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

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

### DTC Logic

INFOID:000000007992860

### DTC DETECTION LOGIC

#### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57. "DTC Logic"](#) or [HAC-58. "DTC Logic"](#).
- If there is an open circuit in the ambient sensor, the front air control registers extreme cold [-30°C (-22°F)] and adjusts the temperature control warmer.

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B257B	AMB TEMP SEN (SHORT)	Detected temperature at ambient sensor 55°C (131°F) or more	<ul style="list-style-type: none"> <li>• Ambient sensor</li> <li>• Front air control</li> <li>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit)</li> </ul>
B257C	AMB TEMP SEN (OPEN)	Detected temperature at ambient sensor -30°C (-22°F) or less	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

#### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57. "DTC Logic"](#) or [HAC-58. "DTC Logic"](#).
- If there is an open circuit in the ambient sensor, the front air control registers extreme cold [-30°C (-22°F)] and adjusts the temperature control warmer.

Is DTC No. "B257B" or "B257C" displayed?

- YES >> Perform trouble diagnosis for the ambient sensor. Refer to [HAC-63. "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000007992861

Regarding Wiring Diagram information, refer to [HAC-36. "Wiring Diagram"](#).

## B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

---

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E19 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

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

---

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E19 terminal 2 and front air control harness connector M49 terminal 16.

**2 - 16 : Continuity should exist.**

Is the inspection result normal?

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

### 3. CHECK AMBIENT SENSOR

---

Check ambient sensor. Refer to [HAC-64. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).  
NO >> Replace ambient sensor. Refer to [HAC-114. "Removal and Installation"](#).

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

---

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E19 terminal 1 and front air control harness connector M49 terminal 15.

**1 - 15 : Continuity should exist.**

4. Check continuity between ambient sensor harness connector E19 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> Replace front air control Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.

## Component Inspection

INFOID:000000007992862

### 1. CHECK AMBIENT SENSOR

---

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector.
3. Check resistance between ambient sensor terminals.



# B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	
1	2	-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
		15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace ambient sensor. Refer to [HAC-114. "Removal and Installation"](#).

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# B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2581, B2582 INTAKE SENSOR

### Description

INFOID:000000007992867

#### Intake Sensor

- The intake sensor is located on the evaporator.
- It converts air temperature after it passes through the evaporator into a resistance value which is then input to the front air control

### DTC Logic

INFOID:000000007992868

#### DTC DETECTION LOGIC

##### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57. "DTC Logic"](#) or [HAC-58. "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2581	EVAP TEMP SEN (SHORT)	Detected temperature at intake sensor 55°C (131°F) or more	• Intake sensor • Front air control • Harness and connector (Intake sensor circuit is open, or there is a short in the circuit)
B2582	EVAP TEMP SEN (OPEN)	Detected temperature at intake sensor -30°C (-22°F) or less	

#### DTC CONFIRMATION PROCEDURE

##### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

##### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57. "DTC Logic"](#) or [HAC-58. "DTC Logic"](#).

Is DTC No. "B2581" or "B2582" displayed?

- YES >> Perform trouble diagnosis for the intake sensor. Refer to [HAC-66. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000007992869

Regarding Wiring Diagram information, refer to [HAC-36. "Wiring Diagram"](#).

##### 1. CHECK INTAKE SENSOR POWER SUPPLY

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M146 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 2 and front air control harness connector M49 terminal 16.

# B2581, B2582 INTAKE SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

**2 - 16** : **Continuity should exist.**

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3.CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-67, "Component Inspection"](#).

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).

NO >> Replace intake sensor. Refer to [HAC-115, "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 1 and front air control harness connector M49 terminal 11.

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

4. Check continuity between intake sensor harness connector M146 terminal 1 and ground.

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

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## Component Inspection

INFOID:000000007992870

HAC

## 1.CHECK INTAKE SENSOR

1. Turn ignition switch OFF.
2. Disconnect intake sensor connector.
3. Check resistance between intake sensor terminals.

Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	
1	2	-15 (5)	18.63
		-10 (14)	14.15
		-5 (23)	10.86
		0 (32)	8.41
		5 (41)	6.58
		10 (50)	5.19
		15 (59)	4.12
		20 (68)	3.30
		25 (77)	2.67
		30 (86)	2.17
		35 (95)	1.78
		40 (104)	1.46
45 (113)	1.21		

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace intake sensor. Refer to [HAC-115, "Removal and Installation"](#).

# B2630, B2631 SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2630, B2631 SUNLOAD SENSOR

### DTC Logic

INFOID:000000008080308

#### DTC DETECTION LOGIC

##### NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to [HAC-57, "DTC Logic"](#).
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. [HAC-58, "DTC Logic"](#).
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, use a lamp (60 W or more) that is pointed at the sunload sensor.

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B2630	SUNLOAD SENSOR	Detected calorie at sunload sensor (driver side) 2832 W/m <sup>2</sup> (2436 kcal/m <sup>2</sup> ·h) or more.	• Sunload sensor • A/C auto amp. • Harness or connectors [The sensor circuit (driver side) is open or shorted.]
B2631		Detected calorie at sunload sensor (driver side) 64.7 W/m <sup>2</sup> (55.6 kcal/m <sup>2</sup> ·h) or less.	

#### DTC CONFIRMATION PROCEDURE

##### 1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓟ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is DTC detected?

- YES >> Refer to [HAC-68, "Diagnosis Procedure"](#).  
NO >> Inspection End.

#### Diagnosis Procedure

INFOID:000000008080309

##### 1. CHECK SUNLOAD SENSOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect sunload sensor connector.
3. Turn ignition switch ON.
4. Check voltage between sunload sensor harness connector and ground.

+		-	Voltage (Approx.)
Sunload sensor			
Connector	Terminal		
M33	1	Ground	5 V

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

##### 2. CHECK SUNLOAD SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between sunload sensor harness connector and ground.

Sunload sensor		—	Continuity
Connector	Terminal		
M33	1	Ground	Yes

Is the inspection result normal?

# B2630, B2631 SUNLOAD SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

## 3.CHECK SUNLOAD SENSOR

Check sunload sensor. Refer to [HAC-69. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).  
NO >> Replace sunload sensor. Refer to [HAC-112. "Removal and Installation"](#).

## 4.CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR OPEN

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

Sunload sensor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
M33	1	M49	35	Yes

Is the inspection result normal?

- YES >> GO TO 5.  
NO >> Repair harness or connector.

## 5.CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR GROUND SHORT

Check continuity between sunload sensor harness connector and ground.

Sunload sensor		—	Continuity
Connector	Terminal		
M33	1	Ground	No

Is the inspection result normal?

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

## 6.CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR POWER SHORT

1. Turn ignition switch ON.
2. Check voltage between sunload sensor harness connector and ground.

+		-	Voltage (Approx.)
Sunload sensor			
Connector	Terminal		
M33	1	Ground	0 V

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.

## Component Inspection

INFOID:000000008080310

## 1.CHECK SUNLOAD SENSOR

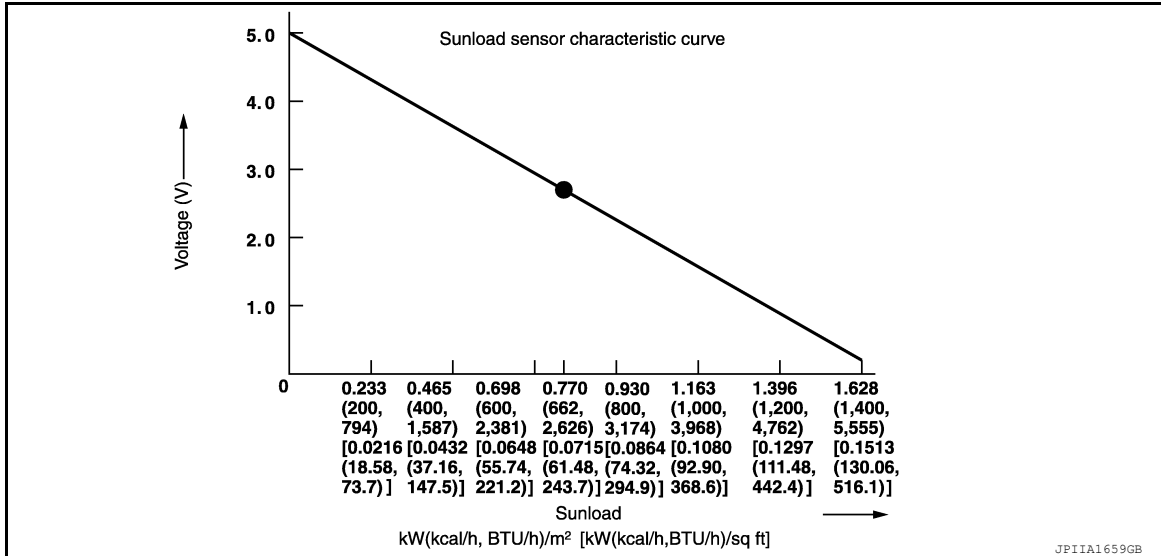
1. Turn ignition switch OFF.
2. Reconnect sunload sensor connector.
3. Turn ignition switch ON.
4. Check input voltage from sunload sensor between front air control harness connector and ground. Refer to applicable table for normal value.

# B2630, B2631 SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

+		-
A/C auto amp.		
Connector	Terminal	
M49	35	Ground



**NOTE:**

- When checking indoors, use a lamp of approximately 60 W. Move the lamp towards and away from the sensor to check.
- The sunload amount produced by direct sunshine in fair weather is equivalent to approximately 0.770 kW/m<sup>2</sup> (662 kcal/m<sup>2</sup>·h).

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace sunload sensor. Refer to [HAC-112. "Removal and Installation"](#).

# B2632, B2633 FRONT AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2632, B2633 FRONT AIR MIX DOOR MOTOR (DRIVER SIDE)

### Description

INFOID:000000007992875

### COMPONENT DESCRIPTION

Front Air Mix Door Motor (Driver Side)

- The front air mix door motor (driver side) is attached to the heater & cooling unit assembly.
- The front air mix door motor (driver side) consists of a motor, gears, shaft, a Position Balanced Resistor (PBR), and a Local Control Unit (LCU).
- The motor rotates so that the air mix door is opened or closed to a position set by the front air control.
- The LCU determines the air mix door position via feedback from the PBR and sends the position information to the front air control.

### DTC Logic

INFOID:000000007992876

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57, "DTC Logic"](#) or [HAC-58, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2632	DR AIRMIX ACTR (SHORT)	Air mix door PBR position 5% or less	<ul style="list-style-type: none"><li>• Front air mix door motor (driver side)</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li><li>• (Front air mix door motor (driver side) is open or shorted)</li></ul>
B2633	DR AIRMIX ACTR (OPEN)	Air mix door PBR position 95% or more	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57, "DTC Logic"](#) or [HAC-58, "DTC Logic"](#).

Is DTC No. "B2632" or "B2633" displayed?

YES >> Perform trouble diagnosis for the front air mix door motor (driver side). Refer to [HAC-71, "Diagnosis Procedure"](#).

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Make sure the engine is running and is at normal operating temperature.
2. Turn the temperature control dial to the full hot position.
3. Check for warm air at discharge air outlets.
4. Operate the A/C compressor.
5. Turn the temperature control dial to the full cool position.
6. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> Inspection End.

NO >> Check front air mix door motor (driver side) installation, and repair or replace the malfunctioning parts.

### Diagnosis Procedure

INFOID:000000007992877

# B2632, B2633 FRONT AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Regarding Wiring Diagram information, refer to [HAC-36. "Wiring Diagram"](#).

## 1. CHECK FRONT AIR MIX DOOR MOTOR (DRIVER SIDE) POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between front air mix door motor (driver side) harness connector M64 terminal 1 and ground.

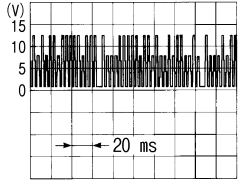
**1 - Ground : Battery Voltage**

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Repair the harnesses or connectors.

## 2. CHECK SIGNAL FOR FRONT AIR MIX DOOR MOTOR (DRIVER SIDE)

Check the output waveform (LAN signal) between front air mix door motor driver side) harness connector M147 terminal 3 and ground using an oscilloscope.

(+)		(-)	Voltage
Front air mix door motor (driver side)		—	
Connector	Terminal		
M64	3	Ground	 SJIA1453J

Is the inspection result normal?

- YES >> GO TO 3.  
NO >> Repair the harnesses or connectors.

## 3. CHECK FRONT AIR MIX DOOR MOTOR (DRIVER SIDE) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air mix door motor (driver side) connector.
3. Check continuity between front air mix door (driver side) motor harness connector M64 terminal 2 and ground.

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

Is the inspection result normal?

- YES >> Replace front air mix door motor (driver side). Refer to [HAC-118. "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).  
NO >> Repair harness or connector.



# B2634, B2635 FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2634, B2635 FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE)

### DTC Logic

INFOID:000000008080311

### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B2634	PASS AIR MIX DOOR MOT	Front air mix door motor (passenger side) PBR position 95% or more	<ul style="list-style-type: none"> <li>Front air mix door motor (passenger side) (PBR internal circuit is open or shorted)</li> <li>Front air mix door motor (passenger side) installation condition</li> <li>A/C auto amp.</li> <li>Harness and connector (LIN communication line is open or shorted)</li> </ul>
B2635		Front air mix door motor (passenger side) PBR position 5% or less	

### DTC CONFIRMATION PROCEDURE

#### 1. PERFORM DTC CONFIRMATION PROCEDURE

Ⓜ With CONSULT

- Turn ignition switch ON.
- Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
- Check DTC.

Is DTC detected?

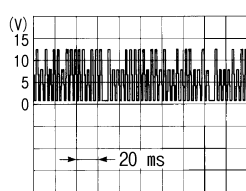
- YES >> Refer to [HAC-73. "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000008080312

#### 1. CHECK FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE) COMMUNICATION SIGNAL

- Turn ignition switch ON.
- Check output waveform between front air mix door motor RH harness connector and ground with the oscilloscope.

+		-	Output waveform
Front air mix door motor RH Connector	Terminal		
M66	3	Ground	 <p style="text-align: right; font-size: small;">SJIA1453J</p>

Is the inspection result normal?

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

#### 2. CHECK INSTALLATION OF FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE)

Check front air mix door motor (passenger side) is properly installed.

Is the inspection result normal?

- YES >> Replace front air mix door motor (passenger side). Refer to [HAC-118. "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).

## B2634, B2635 FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE)

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

### 3. CHECK FRONT AIR MIX DOOR MOTOR (PASSENGER SIDE) COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air mix door motor RH and front air control connector.
3. Check continuity between front air mix door motor RH harness connector and front air control harness connector.

Front air mix door motor RH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M66	3	M49	6	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

# B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

### Description

INFOID:000000007992881

### COMPONENT DESCRIPTION

#### Front Mode Door Motor

- The front mode door motor is attached to the heater & cooling unit assembly.
- The front mode door motor consists of a motor, gears, shaft, a Position Balanced Resistor (PBR), and a Local Control Unit (LCU).
- Motor rotation is conveyed to a set of links which activate the defroster, vent, and floor mode doors. It rotates so that air is discharged from the outlet set by the front air control.
- The LCU determines the front mode door position via feedback from the PBR and sends the position information to the front air control.

### DTC Logic

INFOID:000000007992882

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57, "DTC Logic"](#) or [HAC-58, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2636	DR VENT DOOR FAIL	When the malfunctioning door position is detected at VENT position	• Front mode door motor • Front air control • Harness and connector (LIN communication line is open or shorted) (Front mode door motor is open or shorted)
B2637	DR B/L DOOR FAIL	When the malfunctioning door position is detected at B/L position	
B2638	DR D/F1 DOOR FAIL	When the malfunctioning door position is detected at FOOT position	
B2639	DR DEF DOOR FAIL	When the malfunctioning door position is detected at DEF position	
B2654	D/F2 DOOR FAIL	When the malfunctioning door position is detected at D/F position	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57, "DTC Logic"](#) or [HAC-58, "DTC Logic"](#).

Is DTC No. "B2636", "B2637", "B2638", "B2639", "B2654" or "B2655" displayed?

YES >> Perform trouble diagnosis for the front mode door motor. Refer to [HAC-76, "Diagnosis Procedure"](#).

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press each mode switch and the DEF switch.
2. Confirm that air discharge comes out according to the door control table. Refer to [HAC-18, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Door Control"](#).

Does it operate normally?

YES >> Inspection End.

NO >> Check front mode door motor installation, and repair or replace the malfunctioning parts. Refer to [HAC-118, "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).

# B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## Diagnosis Procedure

INFOID:000000007992883

Regarding Wiring Diagram information, refer to [HAC-36. "Wiring Diagram"](#).

### 1. CHECK FRONT MODE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between front mode door motor harness connector M142 terminal 1 and ground.

**1 - Ground : Battery Voltage**

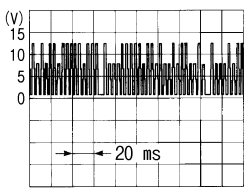
Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

### 2. CHECK SIGNAL FOR FRONT MODE DOOR MOTOR

Check the output waveform (LAN signal) between the front mode door motor harness connector M142 terminal 3 and ground using an oscilloscope.

(+)		(-)	Voltage
Connector	Terminal	—	
M142	3	Ground	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

### 3. CHECK FRONT MODE DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front mode door motor connector.
3. Check continuity between front mode door motor harness connector M142 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace front mode door motor. Refer to [HAC-118. "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).

NO >> Repair harness or connector.

# B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B263D, B263E, B263F INTAKE DOOR MOTOR

### DTC Logic

INFOID:000000008080313

### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B263D	FRE DOOR FAIL	When the malfunctioning intake door position is detected at FRE position	<ul style="list-style-type: none"> <li>Intake door motor (PBR internal circuit is open or shorted)</li> <li>Intake door motor control linkage installation condition</li> <li>A/C auto amp.</li> <li>Harness and connector (LIN communication line is open or shorted)</li> </ul>
B263E	20P FRE DOOR FAIL	When the malfunctioning intake door position is detected at 20% FRE position	
B263F	REC DOOR FAIL	When the malfunctioning intake door position is detected at REC position	

### DTC CONFIRMATION PROCEDURE

#### 1. PERFORM DTC CONFIRMATION PROCEDURE

☑ With CONSULT

- Turn ignition switch ON.
- Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
- Check DTC.

Is DTC detected?

- YES >> Refer to [HAC-77, "Diagnosis Procedure"](#).  
 NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000008080314

#### 1. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL

- Turn ignition switch ON.
- Check output waveform between intake door motor harness connector and ground with the oscilloscope.

+		-	Output waveform
Intake door motor			
Connector	Terminal		
M58	3	Ground	<p style="text-align: right;">SJIA1453J</p>

Is the inspection result normal?

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

#### 2. CHECK INSTALLATION OF INTAKE DOOR MOTOR CONTROL LINKAGE

Check intake door motor control linkage is properly installed.

Is the inspection result normal?

- YES >> Replace intake door motor. Refer to [HAC-118, "INTAKE DOOR MOTOR : Removal and Installation"](#).  
 NO >> Repair or replace malfunctioning part.

## B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

### 3. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect intake door motor and front air control connector.
3. Check continuity between intake door motor harness connector and front air control harness connector.

Intake door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
M58	3	M49	6	Yes

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.

# B27B0 FRONT AIR CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## B27B0 FRONT AIR CONTROL

### DTC Logic

INFOID:000000007992927

### DTC DETECTION LOGIC

#### NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to [HAC-57, "DTC Logic"](#).
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. [HAC-58, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B27B0	FRONT AIR CONTROL	Front air control EEPROM system is malfunctioning.	Front air control

### DTC CONFIRMATION PROCEDURE

#### 1. PERFORM DTC CONFIRMATION PROCEDURE

##### With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

##### Is DTC detected?

- YES >> Refer to [HAC-79, "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000007992928

HAC

#### 1. PERFORM SELF DIAGNOSTIC

##### With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Touch "ERASE".
4. Turn ignition switch OFF.
5. Turn ignition switch ON.
6. Perform "DTC CONFIRMATION PROCEDURE". Refer to [HAC-79, "DTC Logic"](#).

##### Is DTC detected again?

- YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).  
NO >> Inspection End.

# DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## DOOR MOTOR COMMUNICATION CIRCUIT

### Description

INFOID:000000007992931

The mode door motor, air mix door motor, and intake door motor receive position commands from the front air control and report actual door position back via an LCU (Local Control Unit) installed inside each motor. Each door motor LCU has a unique address. The front air control communicates with the door motor LCUs by using each door's unique communication address. The front air control sends requested door position commands to each door motor LCU via a Local Interconnect Network (LIN) communication line using a communication protocol called LIN 2.0. The LIN-Bus is a vehicle bus standard used within current automotive network architectures. The LIN specification is enforced by the LIN-consortium, with the first exploited version being 1.1, released in 1999. Since then the specification has evolved to version 2.1 to meet current networking needs. The LCUs read the door positions from Position Balanced Resistors (PBR), also part of the motor, and returns that information to the front air control. The LCUs switch the polarity of the circuits connected to the DC motors to drive the motor forward or backward as requested by the front air control. The mode door has 5 expected positions and, therefore, can set up to 5 DTCs if the expected position is not reported back to the front air control. The air mix door motor and the intake door motor both have 2 DTCs related to being out of range. The front air control provides a voltage signal and receives a signal return from the LIN. The 3 motors share a common ground which completes the LIN infrastructure. If the signal return line shorts to ground or has an open before reaching any of the LCUs, the front air control will trigger DTCs for all the motors. Loss of the supplied voltage and common ground will also trigger all the motor DTCs.

### DTC Logic

INFOID:000000007992932

#### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57, "DTC Logic"](#) or [HAC-58, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2632	DR AIRMIX ACTR (SHORT)	Air mix door PBR position 5% or less	<ul style="list-style-type: none"><li>• Air mix door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted) (Air mix door motor is open or shorted)</li></ul>
B2633	DR AIRMIX ACTR (OPEN)	Air mix door PBR position 95% or more	
B2634	PASS AIRMIX ACTR (SHORT)	Air mix door PBR position 5% or less	<ul style="list-style-type: none"><li>• Air mix door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted) (Air mix door motor is open or shorted)</li></ul>
B2635	PASS AIRMIX ACTR (OPEN)	Air mix door PBR position 95% or more	
B2636	DR VENT DOOR FAIL	When the malfunctioning door position is detected at VENT position	<ul style="list-style-type: none"><li>• Mode door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted) (Mode door motor is open or shorted)</li></ul>
B2637	DR B/L DOOR FAIL	When the malfunctioning door position is detected at B/L position	
B2638	DR D/F1 DOOR FAIL	When the malfunctioning door position is detected at FOOT position	
B2639	DR DEF DOOR FAIL	When the malfunctioning door position is detected at DEF position	
B2654	D/F2 DOOR FAIL	When the malfunctioning door position is detected at D/F position	



# DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B263D	FRE DOOR FAIL	When the malfunctioning intake door position is detected at FRE position	<ul style="list-style-type: none"> <li>• Intake door motor</li> <li>• Front air control</li> <li>• Harness and connector (LIN communication line is open or shorted)</li> <li>(Intake door motor is open or shorted)</li> </ul>
B263E	20% FRE DOOR FAIL	When the malfunctioning intake door position is detected at REC position	
B263F	REC DOOR FAIL	When the malfunctioning intake door position is detected at REC position	

## DTC CONFIRMATION PROCEDURE

### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-57. "DTC Logic"](#) or [HAC-58. "DTC Logic"](#).

Are DTCs No. "B2632", "B2633", "B2634", "B2635", "B2636", "B2637", "B2638", "B2639", "B2654", "B263D", "B263E", and "B263F" displayed?

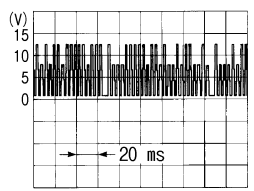
- YES >> Perform trouble diagnosis for the door motor communications. Refer to [HAC-71. "Diagnosis Procedure"](#).
- NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000007992933

### 1. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL

1. Turn ignition switch ON.
2. Check output waveform between front air control harness connector and ground with the oscilloscope.

+		-	Output waveform
Front air control			
Connector	Terminal		
M49	6	Ground	 <p style="text-align: right; font-size: x-small;">SJIA1453J</p>

Is the inspection result normal?

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

### 2. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect front air control connector and intake door motor connector.
3. Check continuity between front air control harness connector and intake door motor harness connector.

Front air control		Intake door motor		Continuity
Connector	Terminal	Connector	Terminal	
M49	6	M58	3	YES

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Repair harness or connector.

# DOOR MOTOR COMMUNICATION CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## 3. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT FOR SHORT

1. Disconnect front air control connector.
2. Disconnect following connectors.
  - Air mix door motor
  - Mode door motor
  - Intake door motor
3. Check continuity between front air control harness connector and ground.

Front air control		—	Continuity
Connector	Terminal		
M49	6	Ground	NO

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

## 4. CHECK EACH DOOR MOTOR POWER SUPPLY

1. Connect front air control connector.
2. Turn ignition switch ON.
3. Check voltage between each motor connector and ground.

Motor	Connector	Terminal	—	Voltage
Air mix door	M147	1	Ground	Battery voltage
Mode door	M142	1		
Intake door	M58	1		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## 5. CHECK EACH DOOR MOTOR GROUND

1. Turn ignition switch OFF.
2. Check continuity between each motor connector and ground.

Motor	Connector	Terminal	—	Continuity
Air mix door	M147	3	Ground	YES
Mode door	M142	3		
Intake door	M58	3		

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

# REAR AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## REAR AIR MIX DOOR MOTOR

### Diagnosis Procedure

INFOID:000000008067641

#### 1. CHECK REAR AIR MIX DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between rear air mix door motor harness connector and ground.

+		-	Voltage
Rear air mix door motor			
Connector	Terminal	Ground	9.5 – 13.5 V
B202	1		

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 5.

#### 2. CHECK REAR AIR MIX DOOR MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and front air control connector.
3. Check continuity between rear air mix door motor harness connector and ground.

Rear air mix door motor		—	Continuity
Connector	Terminal		
B202	2	Ground	Yes

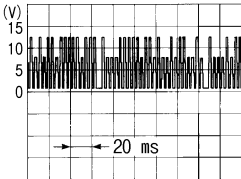
Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

#### 3. CHECK REAR AIR MIX DOOR MOTOR LAN SIGNAL

1. Connect rear air mix door motor and front air control connector.
2. Turn ignition switch ON.
3. Confirm output waveform between rear air mix door motor harness connector and ground using oscilloscope.

+		-	Output waveform
Rear air mix door motor			
Connector	Terminal	Ground	
B202	3		

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 6.

#### 4. CHECK INSTALLATION OF REAR AIR MIX DOOR MOTOR

Check rear air mix door motor is properly installed.

Is the inspection result normal?

YES >> Replace rear air mix door motor. Refer to [HAC-219, "AIR MIX DOOR MOTOR : Removal and Installation - Rear Air Mix Door Motor \(If Equipped\)"](#).

## REAR AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

### 5. CHECK REAR AIR MIX DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and A/C amp. connector.
3. Check continuity between rear air mix door motor harness connector and front air control connector.

Rear air mix door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B202	1	M49	5	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

### 6. CHECK REAR AIR MIX DOOR MOTOR LAN SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and A/C amp. connector.
3. Check continuity between rear air mix door motor harness connector and A/C amp. harness connector.

Rear air mix door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B202	3	M49	6	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

# REAR MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## REAR MODE DOOR MOTOR

### Diagnosis Procedure

INFOID:000000008067642

#### 1. CHECK REAR MODE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between rear mode door motor harness connector and ground.

+		-	Voltage
Rear mode door motor			
Connector	Terminal		
B201	1	Ground	9.5 – 13.5 V

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 5.

#### 2. CHECK REAR MODE DOOR MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and front air control connector.
3. Check continuity between rear mode door motor harness connector and ground.

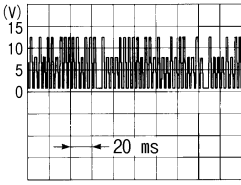
Rear mode door motor		—	Continuity
Connector	Terminal		
B201	2	Ground	Yes

Is the inspection result normal?

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

#### 3. CHECK REAR MODE DOOR MOTOR SIGNAL

1. Connect rear mode door motor and front air control connector.
2. Turn ignition switch ON.
3. Confirm output waveform between rear mode door motor harness connector and ground using oscilloscope.

+		-	Output waveform
Rear mode door motor			
Connector	Terminal		
B201	3	Ground	 SJI1A1453J

Is the inspection result normal?

- YES >> GO TO 4.  
NO >> GO TO 6.

#### 4. CHECK INSTALLATION OF REAR MODE DOOR MOTOR

Check rear mode door motor is properly installed.

Is the inspection result normal?

- YES >> Replace rear mode door motor. Refer to [HAC-218, "MODE DOOR MOTOR : Removal and Installation - Rear Mode Door Motor \(If Equipped\)"](#).

## REAR MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

### 5. CHECK REAR MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and front air control connector.
3. Check continuity between rear mode door motor harness connector and front air control connector.

Rear mode door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B201	1	M49	5	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

### 6. CHECK REAR MODE DOOR MOTOR LAN SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and A/C amp. connector.
3. Check continuity between rear mode door motor harness connector and front air control connector.

Rear mode door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B201	3	M49	6	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## FRONT BLOWER MOTOR

### Description

INFOID:000000007992934

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

Battery voltage is supplied to the front blower motor from 2 15-amp fuses located in the fuse block (J/B). The voltage is controlled through two relays which are energized whenever the ignition switch is in the ON or START position.

Fan speed is modified by controlling the ground circuit. A power transistor is integrated into the ground side of the front blower fan circuit. The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor. The front air control monitors the blower motor ground circuit. This allows the front air control to minutely adjust the voltage supplied to the gate to smooth out any power surges. The blower control dial has 26 detents, each detent outputting a different gate voltage to the power transistor, allowing for 26 different fan speeds. The mode selection also affects fan speed. Refer to [HAC-16, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Air Flow Control"](#).

### Component Function Check

INFOID:000000007992935

#### 1.CHECK OPERATION

1. Turn ignition switch ON.
2. Starting from the OFF position, rotate the blower control dial clockwise through each detent.
3. Check that the fan speed increases with each detent.

#### Does it operate normally?

- YES >> Inspection End.  
NO >> Perform trouble diagnosis for the blower motor. Refer to [HAC-87, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000007992936

#### 1.CHECK FUSES

1. Turn ignition switch OFF.
2. Check 15A fuses [Nos. 10 and 18, located in fuse block (J/B)].

#### NOTE:

Refer to [PG-85, "Terminal Arrangement"](#).

#### Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Replace the blown fuse after repairing the affected circuit.

#### 2.CHECK FRONT BLOWER MOTOR POWER SUPPLY

1. Disconnect front blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between front blower motor harness connector and ground.

+		-	Voltage
Front blower motor			
Connector	Terminal		
M62	1	Ground	Battery voltage

#### Is the inspection result normal?

- YES >> GO TO 3.  
NO >> GO TO 8.

#### 3.CHECK FRONT BLOWER MOTOR GROUND CIRCUIT

1. Turn blower control dial fully counterclockwise to the OFF position
2. While turning the blower control dial clockwise, through each detent, check the resistance between front blower motor harness connector and ground.

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Front blower motor		—	Continuity
Connector	Terminal		
M62	2	Ground	Decreases as dial approaches full speed

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 4

## 4. CHECK FRONT BLOWER MOTOR GROUND CIRCUIT CONTINUITY

1. Disconnect power transistor connector.
2. Check continuity between front blower motor harness connector and power transistor.

Front blower motor		Power transistor		Continuity
Connector	Terminal	Connector	Terminal	
M62	2	M52	3	YES

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the harness or connector.

## 5. CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT

1. Turn blower control dial fully counterclockwise to the OFF position
2. While turning the blower control dial clockwise, through each detent, check voltage between power transistor and ground.



# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Power transistor			Condition				
Connector	Terminal		Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
Voltage							
M52	2	Ground	OFF	0.00 volts	0.00 volts	0.00 volts	0.00 volts
			1	3.25 volts	3.75 volts	3.75 volts	3.75 volts
			2	3.50 volts	4.00 volts	4.00 volts	4.00 volts
			3	3.75 volts	4.25 volts	4.25 volts	4.25 volts
			4	4.00 volts	4.50 volts	4.50 volts	4.50 volts
			5	4.50 volts	4.75 volts	4.75 volts	4.75 volts
			6	4.75 volts	5.00 volts	5.00 volts	5.00 volts
			7	5.00 volts	5.50 volts	5.50 volts	5.50 volts
			8	5.25 volts	5.75 volts	5.75 volts	5.75 volts
			9	5.50 volts	6.00 volts	6.00 volts	6.00 volts
			10	5.75 volts	6.25 volts	6.25 volts	6.25 volts
			11	6.25 volts	6.50 volts	6.50 volts	6.50 volts
			12	6.50 volts	6.75 volts	6.75 volts	6.75 volts
			13	6.75 volts	7.00 volts	7.00 volts	7.00 volts
			14	7.00 volts	7.25 volts	7.25 volts	7.25 volts
			15	7.50 volts	7.50 volts	7.50 volts	7.50 volts
			16	7.75 volts	7.75 volts	7.75 volts	7.75 volts
			17	8.00 volts	8.00 volts	8.25 volts	8.00 volts
			18	8.25 volts	8.25 volts	8.50 volts	8.25 volts
			19	8.50 volts	8.50 volts	8.75 volts	8.50 volts
			20	8.75 volts	8.75 volts	9.00 volts	8.75 volts
			21	9.00 volts	9.00 volts	9.25 volts	9.00 volts
			22	9.25 volts	9.25 volts	9.50 volts	9.25 volts
			23	9.75 volts	9.75 volts	10.00 volts	9.50 volts
			24	10.25 volts	10.25 volts	10.25 volts	10.75 volts
			25	10.50 volts	10.50 volts	10.50 volts	10.00 volts
26	10.75 volts	10.75 volts	12.00 volts	10.25 volts			
			12 = Max blower voltage				

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> GO TO 7.

## 6. CHECK POWER TRANSISTOR GROUND CIRCUIT

Check continuity between power transistor connector and ground.

Power transistor		—	Continuity
Connector	Terminal		
M52	1	Ground	YES

Is the inspection result normal?

- YES >> Replace power transistor. Refer to [VTL-16, "Removal and Installation"](#).
- NO >> Repair harness or connector.

## 7. CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT CONTINUITY

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

1. Disconnect front air control connector.
2. Check continuity between power transistor connector and front air control connector.

Power transistor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
M52	2	M49	14	YES

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-110, "Removal and Installation - Front Air Control"](#).  
NO >> Repair the harness or connector.

## 8. CHECK FRONT BLOWER MOTOR RELAY-2 GROUND CIRCUIT

Check continuity between fuse block (J/B) harness connector and front blower motor relay-2 connector and ground.

Component		—	Continuity
Connector	Terminal		
Fuse block (J/B) M3	7N	Ground	YES
Front blower motor relay-2 M60	2		

Is the inspection result normal?

- YES >> GO TO 9.  
NO >> Repair harness or connector.

## 9. CHECK FRONT BLOWER MOTOR RELAYS

Check front blower motor relay-1 and front blower motor relay-2. Refer to [HAC-91, "Component Inspection \(Front Blower Motor Relay\)"](#).

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> Replace inoperative front blower motor relay.

## 10. CHECK FUSE BOX (J/B)

Check voltage between fuse block (J/B) connector and ground.

Fuse block (J/B)		Ground	Voltage
Connector	Terminal		
M3	8N	Ground	Battery voltage
M4	1P		

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse block (J/B).  
NO >> Replace fuse block (J/B).

## 11. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-90, "Component Inspection \(Front Blower Motor\)"](#).

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse block (J/B).  
NO >> Replace front blower motor.

## Component Inspection (Front Blower Motor)

INFOID:000000007992937

### 1. CHECK FRONT BLOWER MOTOR

1. Connect battery voltage to terminal 1 of front blower motor.
2. Connect ground to terminal 2 of front blower motor.

# FRONT BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Does the front blower fan operate?

YES >> Intermittent incident. Refer to [GI-39. "Intermittent Incident"](#).

NO >> Replace front blower motor. Refer to [VTL-14. "Removal and Installation - Front Blower Motor"](#).

Component Inspection (Front Blower Motor Relay)

INFOID:000000007992938

## 1. CHECK FRONT BLOWER MOTOR RELAY-1 OR 2

1. Turn ignition switch OFF.
2. Remove suspect front blower motor relay.
3. Check continuity between suspect front blower motor relay terminals 3 and 5 when voltage is supplied between terminals 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	YES
		OFF	NO

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace suspect front blower motor relay.

A  
B  
C  
D  
E  
F  
G  
H  
J  
K  
L  
M  
N  
O  
P

HAC

# REAR BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## REAR BLOWER MOTOR

### Diagnosis Procedure

INFOID:000000008067643

#### 1. CHECK FUSE

1. Turn ignition switch OFF.
2. Check 30A fuse (No. 57).

**NOTE:**

Refer to [PG-86, "Terminal Arrangement"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

#### 2. CHECK REAR BLOWER MOTOR POWER SUPPLY

1. Disconnect rear blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between rear blower motor harness connector and ground.

+		-	Voltage
Rear blower motor			
Connector	Terminal		
B21	1	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 6.

#### 3. CHECK REAR BLOWER MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between rear blower motor harness connector and ground.

Rear blower motor		—	Continuity
Connector	Terminal		
B21	3	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

#### 4. CHECK REAR BLOWER MOTOR CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect front air control connector.
2. Check continuity between rear blower motor harness connector and front air control connector.

Rear blower motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B21	2	M51	33	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

#### 5. CHECK REAR BLOWER MOTOR CONTROL SIGNAL

1. Reconnect rear blower motor connector and front air control connector.
2. Turn ignition switch ON.
3. Change rear fan speed from Lo to Hi, and check duty ratios between rear blower motor harness connector and ground by using an oscilloscope.

**NOTE:**

# REAR BLOWER MOTOR

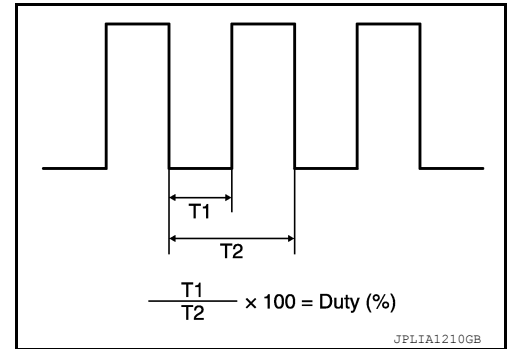
[AUTOMATIC AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

Calculate drive signal duty ratio as shown in the figure.

T2 = Approx. 1.6 ms

Rear blower motor		Condition	Duty ratio (Approx.)
Connector	Terminal	Fan speed	
B21	2	1st	25 %
		2nd	33 %
		3rd	41 %
		4th	51 %
		5th	61 %
		6th	69 %
		7th	81 %



Is the inspection result normal?

YES >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

NO >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).

### 6. CHECK REAR BLOWER MOTOR POWER SUPPLY CIRCUIT FOR OPEN

- Turn ignition switch OFF.
- Disconnect rear blower relay connector.
- Check continuity between rear blower relay harness connector and rear blower motor harness connector.

Rear blower relay		Rear blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M59	3	B403	3	Yes
	6			

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

### 7. CHECK REAR BLOWER RELAY GROUND CIRCUIT FOR OPEN

Check continuity between rear blower relay harness connector and ground.

Rear blower relay		—	Continuity
Connector	Terminal		
M59	1	Ground	Yes

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.

### 8. CHECK REAR BLOWER RELAY

Check rear blower relay. Refer to [HAC-196, "Component Inspection \(Rear Blower Motor\)"](#).

Is the inspection result normal?

YES >> Check rear blower relay power supply circuit. Refer to [PG-8, "Wiring Diagram — Battery Power Supply —"](#) and [PG-20, "Wiring Diagram — Ignition Power Supply —"](#).

NO >> Replace rear blower relay.

## Component Inspection (Rear Blower Motor)

INFOID:000000008067644

### 1. CHECK REAR BLOWER MOTOR-I

- Remove rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

# REAR BLOWER MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

2. Check that there is not any mixing foreign object in the rear blower motor.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

## 2.CHECK REAR BLOWER MOTOR-II

Check that there is not breakage or damage in the rear blower motor.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

## 3.CHECK REAR BLOWER MOTOR-III

Check that rear blower motor turns smoothly.

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

## Component Inspection (Rear Blower Relay)

INFOID:000000008067645

### 1.CHECK REAR BLOWER RELAY

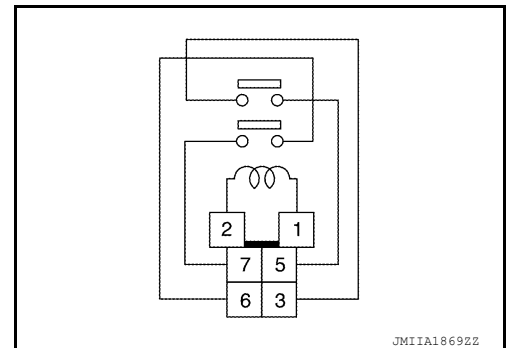
1. Remove rear blower relay. Refer to [PG-86, "Terminal Arrangement"](#).
2. Check continuity between rear blower relay terminal 3 and 5, then 6 and 7 when voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Yes
		OFF	No
6	7	ON	Yes
		OFF	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace rear blower relay.



# WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## WATER VALVE CIRCUIT

### System Description

INFOID:000000008067646

### COMPONENT DESCRIPTION

#### Water Valve

The water valve cuts the flow of engine coolant to the front and rear heater cores to allow for maximum cooling during A/C operation. It is controlled by the A/C auto amp.

### Diagnosis Procedure

INFOID:000000008067647

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

### DIAGNOSTIC PROCEDURE FOR WATER VALVE

#### 1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F24.
2. Turn ignition switch ON.
3. Rotate temperature control dial to full warm.
4. Check voltage between water valve harness connector F24 terminal 1 and terminal 2 while rotating temperature control dial to full cool.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F24	2	1	Rotate temperature control dial	Battery voltage

#### Is the inspection result normal?

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

#### 2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M49.
3. Check continuity between water valve harness connector F24 terminal 2 and front air control harness connector M49 terminal 9.

**2 - 9 : Continuity should exist.**

4. Check continuity between water valve harness connector F24 terminal 2 and ground.

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

#### Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.

#### 3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial full cool.
2. Check voltage between water valve harness connector F24 terminal 1 and terminal 2 while rotating temperature control dial to full warm.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F24	1	2	Rotate temperature control dial	Battery voltage

#### Is the inspection result normal?

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## WATER VALVE CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace the water valve.  
NO >> GO TO 4.

### 4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M49.
3. Check continuity between water valve harness connector F24 terminal 1 and front air control harness connector M49 terminal 10.

**1 - 10 : Continuity should exist.**

4. Check continuity between water valve harness connector F24 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.



## HEATER PUMP

### System Description

INFOID:000000008067648

### SYSTEM DESCRIPTION

#### Component Parts

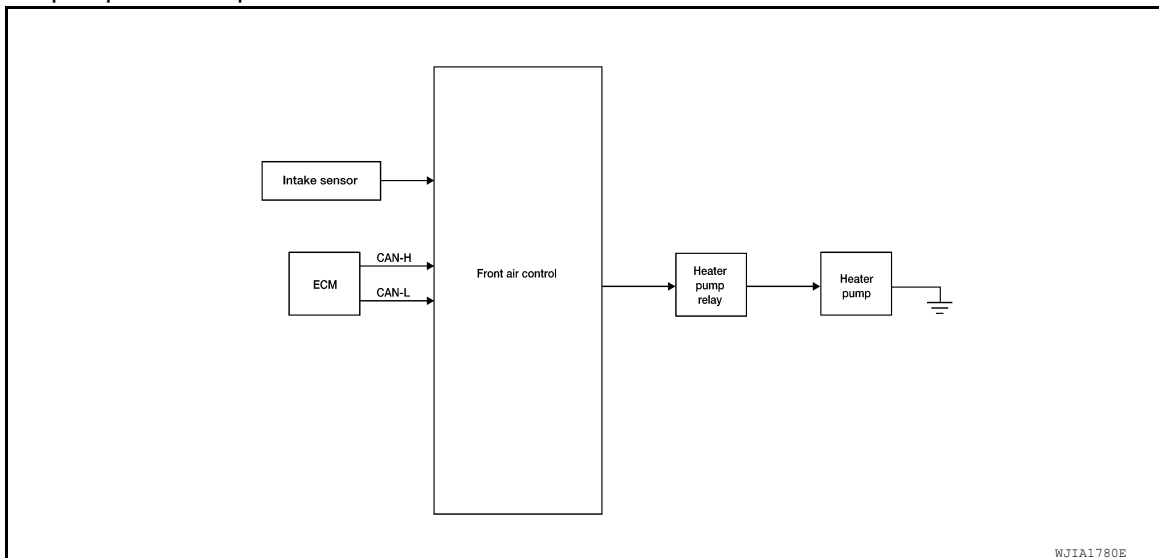
Heater pump control system components are:

- Front air control
- Heater pump relay
- Heater pump
- Intake sensor

#### System Operation

The heater pump improves heater performance specifically at idle conditions. It is designed to operate in either of the following 2 situations:

1. Front blower motor set to maximum speed and temperature control dial set to full hot or
2. Engine coolant temperature (signal via CAN communication) minus heater core outlet temperature (intake sensor input to front air control) is greater than 20°C (68°F). If the difference is less than 16°C (61°F), the heater pump will not operate unless the conditions in item No. 1 above are met.



### Diagnosis Procedure

INFOID:000000008067649

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

### DIAGNOSTIC PROCEDURE FOR HEATER PUMP CIRCUIT

#### 1. CHECK POWER SUPPLY TO HEATER PUMP

1. Disconnect heater pump connector.
2. Turn ignition switch ON.
3. Set front blower motor to maximum speed.
4. Turn temperature control dial to full hot.
5. Check voltage between heater pump harness connector E26 terminal 1 and ground.

**1 - Ground : Battery voltage**

Is the inspection result normal?

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

#### 2. CHECK HEATER PUMP GROUND

1. Turn ignition switch OFF.

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# HEATER PUMP

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

2. Check continuity between heater pump harness connector E26 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace heater pump. Refer to [HA-68, "Removal and Installation"](#).

NO >> Repair harness or connector.

## 3. CHECK HEATER PUMP RELAY

1. Turn ignition switch OFF.
2. Check heater pump relay. Refer to [HAC-201, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace heater pump relay.

## 4. CHECK RELAY POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between heater pump relay harness connector E27 terminals 2, 5 and ground.

**2 - Ground : Battery voltage**

**5 - Ground : Battery voltage**

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## 5. CHECK HEATER PUMP MOTOR POWER CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between heater pump relay harness connector E27 terminal 3 and heater pump harness connector E26 terminal 1.

**3 - 1 : Continuity should exist.**

3. Check continuity between heater pump relay harness connector E27 terminal 3 and ground.

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

## 6. CHECK CIRCUIT BETWEEN HEATER PUMP RELAY AND A/C AUTO AMP.

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M49 terminal 8 and heater pump relay harness connector E27 terminal 1.

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

3. Check continuity between heater pump relay harness connector E27 terminal 1 and ground.

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

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## Component Inspection

INFOID:000000008067650

## COMPONENT INSPECTION

Heater Pump Relay

# HEATER PUMP

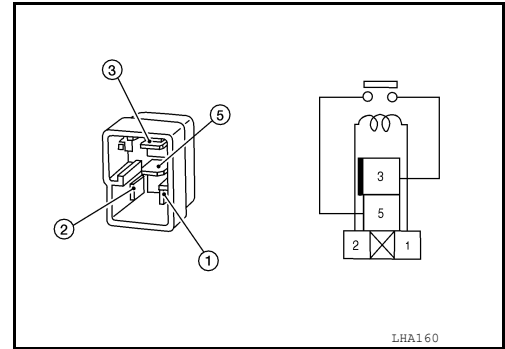
## < DTC/CIRCUIT DIAGNOSIS >

## [AUTOMATIC AIR CONDITIONER]

Check continuity between terminals 3 and 5.

Conditions	Continuity
12V direct current supply between terminals 1 and 2	Yes
No current supply	No

If NG, replace relay.



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## MAGNET CLUTCH

### Description

INFOID:000000007992941

The IPDM E/R provides a ground to energize the A/C relay. When the A/C relay is energized, voltage is supplied to the A/C compressor magnet clutch. The magnet clutch is permanently grounded.

In order for the IPDM E/R to complete a compressor ON request, the following conditions must be met:

1. The BCM detects a Fan ON signal from the front air control. The front air control grounds the fan ON signal monitored by the BCM when the blower speed dial is in any of the fan speed positions.
2. The BCM detects an A/C ON signal from the front air control. The front air control grounds the A/C ON signal monitored by the BCM when:
  - The A/C switch is pressed. The A/C switch LED illuminates and the front air control grounds the A/C ON signal monitored by the BCM. Any mode control button except D/F may be selected.
  - The A/C switch is OFF, and the MAX A/C button is pressed. The A/C switch LED will automatically illuminate and the front air control grounds the A/C ON signal monitored by the BCM.
  - The A/C switch is OFF, and the mode button for either D/F or DEF is selected. The front air control grounds the A/C ON signal monitored by the BCM, but it does not illuminate the A/C switch LED
3. The intake temperature value must be within the specified range.

**NOTE:**

If the compressor was engaged by pressing the D/F or DEF mode buttons, and the time spent in either mode exceeds 1 minute, then the compressor stays requested, even when modes other than D/F or DEF are selected, until either:

1. The ignition switch is turned OFF.
2. The blower speed dial is turned completely counterclockwise to the OFF position.
3. The A/C switch is manually turned OFF.

In other words, the compressor ON request cannot be turned off in D/F or DEF modes.

### Component Function Check

INFOID:000000007992942

#### 1. CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to [PCS-8, "Diagnosis Description"](#).

Does it operate normally?

- YES >> Inspection End.  
 NO >> Refer to [HAC-100, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000007992943

#### 1. CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 42, located in IPDM E/R).

**NOTE:**

Refer to [PG-89, "IPDM E/R Terminal Arrangement"](#).

Is the inspection result normal?

- YES >> GO TO 2.  
 NO >> Replace the blown fuse after repairing the affected circuit.

#### 2. CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT

1. Disconnect compressor connector and IPDM E/R connector.
2. Check continuity between compressor harness connector and IPDM E/R harness connector.

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F3	1	E119	11	YES

Is the inspection result normal?

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

# MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## 3.CHECK MAGNET CLUTCH

Directly apply battery voltage to the magnet clutch. Check operation visually and by sound.

Does it operate normally?

YES >> Replace IPDM E/R. Refer to [PCS-24, "Removal and Installation"](#).

NO >> Replace magnet clutch. Refer to [HA-51, "Removal and Installation for Compressor Clutch - VQ40DE"](#) or [HA-56, "Removal and Installation for Compressor Clutch - VK56DE"](#).

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# POWER SUPPLY AND GROUND CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## POWER SUPPLY AND GROUND CIRCUIT

### FRONT A/C CONTROL

#### FRONT A/C CONTROL : Description

INFOID:000000007992956

#### COMPONENT DESCRIPTION

Front air control.

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

#### FRONT A/C CONTROL : Component Function Check

INFOID:000000007992958

#### 1. CHECK OPERATION

1. Turn the blower motor dial clockwise and verify the blower speed increases and that one of the LEDs illuminates on the mode switch.
2. Press the mode switches and verify that the modes change, the LEDs illuminate, and that air flows from the various vents.
3. Turn the temperature control dial and verify the temperature changes at the selected vents.
4. Press the DEF, REC, and FRE (if equipped) buttons and verify air flow changes.

#### Does it operate normally?

YES >> Inspection End.

NO >> Perform trouble diagnosis for the front air control system. Refer to [HAC-102. "FRONT A/C CONTROL : Diagnosis Procedure"](#).

#### FRONT A/C CONTROL : Diagnosis Procedure

INFOID:000000007992960

Regarding Wiring Diagram information, refer to [HAC-36. "Wiring Diagram"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M49 terminals 1, 2 and ground.

(+)		(-)	Voltage		
Front air control		—	Ignition switch position		
Connector	Terminal		OFF	ACC	ON
M49	1	Ground	Battery voltage	Battery voltage	Battery voltage
	2		Approx. 0V	Approx. 0V	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

#### 2. CHECK FUSE

Check 10A fuses [Nos. 12 and 19, located in the fuse block (J/B)].

#### **NOTE:**

Refer to [PG-86. "Terminal Arrangement"](#).

#### Is the inspection result normal?

YES >> Check harness for open circuit. Repair or replace if necessary.

NO >> Check harness for short circuit. Repair or replace if necessary.

# POWER SUPPLY AND GROUND CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

## 3. CHECK FRONT AIR CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M49 terminals 3, 4 and ground.

**3, 4 - Ground : Continuity should exist.**

Is the inspection result normal?

- YES >> Replace the front air control. Refer to [HAC-110. "Removal and Installation - Front Air Control"](#).  
NO >> Repair the harnesses or connectors.

## REAR A/C CONTROL

### REAR A/C CONTROL : Diagnosis Procedure

INFOID:000000008117185

## 1. CHECK REAR AIR CONTROL POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect rear A/C control connector.
3. Turn ignition switch ON.
4. Check voltage between rear A/C control harness connector and ground.

+		-	Voltage
Rear air control			
Connector	Terminal		
R3	6	Ground	5V

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Repair harness or connector between rear A/C control and fuse block (J/B).

## 2. CHECK REAR AIR CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between rear A/C control harness connector and ground.

Rear air control		—	Continuity
Connector	Terminal		
R3	12	Ground	Yes

Is the inspection result normal?

- YES >> Replace rear air control. Refer to [HAC-212. "Removal and Installation - Rear Air Control \(If Equipped\)"](#).  
NO >> Repair harness or connector.

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# HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## SYMPTOM DIAGNOSIS

### HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

#### Symptom Table

INFOID:000000007992976

#### SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	<a href="#">HA-20</a>
Front air outlet does not change.	Go to Trouble Diagnosis Procedure for Front Mode Door Motor.	<a href="#">HAC-76</a>
Front mode door motor is malfunctioning.		
Rear air outlet does not change.	Go to Trouble Diagnosis Procedure for Rear Mode Door Motor.	<a href="#">HAC-85</a>
Rear mode door motor is malfunctioning.		
Front driver discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Front Air Mix Door Motor (Driver Side).	<a href="#">HAC-71</a>
Front air mix door motor (driver side) is malfunctioning.		
Front passenger discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Front Air Mix Door Motor (Passenger Side).	<a href="#">HAC-73</a>
Front air mix door motor (passenger side) is malfunctioning.		
Rear discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Rear Air Mix Door Motor.	<a href="#">HAC-83</a>
Rear air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<a href="#">HAC-77</a>
Intake door motor is malfunctioning.		
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	<a href="#">HAC-87</a>
Rear blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Rear Blower Motor.	<a href="#">HAC-92</a>
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	<a href="#">HAC-100</a>
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<a href="#">HAC-106</a>
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating.	<a href="#">HAC-108</a>
Noise.	Go to Trouble Diagnosis Procedure for Noise.	<a href="#">HA-38</a>
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
Front air control mode button LED(s) does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
REC button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
REC or FRE button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
All LEDs and illumination lamps are at full brightness.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
Front blower motor runs at full speed only and A/C compressor will not engage.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-102</a>
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-32</a>
High-pressure side is too high and low-pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-33</a>
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-34</a>



# HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Symptom	Reference Page	
Both high- and low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-35</a>
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-36</a>
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-37</a>

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# INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## INSUFFICIENT COOLING

### Component Function Check

INFOID:000000007992978

SYMPTOM: Insufficient cooling

#### DESCRIPTION

The purpose of the component function check is to check that the individual system operates normally.

**Check condition : Engine running at normal operating temperature.**

**Check condition : Blower control dial in OFF position.**

**Check condition : REC off (LED extinguished).**

**Check condition : FRE on (LED illuminated). (if equipped)**

**Check condition : VENT selected (LED illuminated).**

**Check condition : DEF off (LED extinguished).**

#### INSPECTION FLOW

### 1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Rotate the blower control dial to the low speed.
2. Turn temperature control dial counterclockwise to maximum cold.
3. Check for cold air at discharge air outlets.

#### Can the symptom be duplicated?

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

### 2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-52, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Work Procedure"](#).

#### Does another symptom exist?

- YES >> Refer to [HAC-104, "Symptom Table"](#).  
NO >> System OK.

### 3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

#### Are there any pertinent service bulletins?

- YES >> Perform service bulletin actions.  
NO >> GO TO 4.

### 4. CHECK FOR DTCS

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

#### Is any DTC detected?

- YES >> [HAC-32, "DTC Inspection Priority Chart"](#).  
NO >> GO TO 5.

### 5. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-13, "Checking Drive Belts"](#) (VQ40DE) or [EM-152, "Checking Drive Belts"](#) (VK56DE).

#### Is the inspection result normal?

- YES >> GO TO 6.  
NO >> Adjust or replace compressor belt. Refer to [EM-13, "Removal and Installation"](#) (VQ40DE) or [EM-152, "Removal and Installation"](#) (VK56DE).

### 6. CHECK A/C SYSTEM FOR LEAKS

# INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Check A/C system for leaks with fluorescent leak detector. Refer to [HA-45. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#).

## NOTE:

Some oil at the compressor high pressure relief valve is normal

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace as necessary. If oil residue is at compressor high pressure relief valve, clean and retest at high pressure.

## 7. CHECK LOW AND HIGH SIDE PRESSURE

Check A/C high and low side pressure. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> Check air flow across condenser; check for vehicle equipment installation. If OK, Inspection End.

NO >> GO TO 8.

## 8. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

Check recovery/recycling equipment before connecting to vehicle. Verify there is no pressure in the recovery/recycling equipment by checking the gauges. If pressure exists, recover refrigerant from equipment lines.

>> GO TO 9.

## 9. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.

2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check contaminated refrigerant. Refer to [HAC-6. "Working with HFC-134a \(R-134a\)"](#).

## 10. RECHARGE SYSTEM AND CHECK REFRIGERANT PRESSURE

1. Recharge system.

2. Check A/C high and low side pressure. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Diagnose symptom. Refer to [HAC-104. "Symptom Table"](#).

## 11. CHECK DISCHARGE AIR TEMPERATURE

Check discharge air temperature. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 12

## 12. CHECK AIR MIX DOOR OPERATION - TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise until maximum hot.

2. Check for hot air at appropriate discharge air outlets.

Is the test result normal?

YES >> GO TO 13.

NO >> Check air mix door for mechanical failure. Refer to [HAC-119. "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor \(Driver\)"](#) or [HAC-119. "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor \(Passenger\)"](#).

## 13. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks. Refer to [VTL-5. "Exploded View"](#).

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# INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

## INSUFFICIENT HEATING

### Component Function Check

INFOID:000000007992981

SYMPTOM: Insufficient heating

#### DESCRIPTION

The purpose of the component check is to check that the individual system operates normally.

- Check condition** : Engine running at normal operating temperature.
- Check condition** : Blower control dial in OFF position.
- Check condition** : REC off (LED extinguished).
- Check condition** : FRE on (LED illuminated). (if equipped)
- Check condition** : VENT selected (LED illuminated).
- Check condition** : DEF off (LED extinguished).

#### INSPECTION FLOW

### 1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

---

1. Rotate the blower control dial to the low speed.
2. Turn temperature control dial clockwise to maximum heat.
3. Check for hot air at discharge air outlets.

#### Can the symptom be duplicated?

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

### 2. CHECK FOR ANY SYMPTOMS

---

Perform a complete operational check for any symptoms. Refer to [HAC-52, "FRONT AUTOMATIC AIR CONDITIONING SYSTEM : Work Procedure"](#).

#### Does another symptom exist?

- YES >> Refer to [HAC-104, "Symptom Table"](#).
- NO >> System OK.

### 3. CHECK FOR SERVICE BULLETINS

---

Check for any service bulletins.

#### Are there any pertinent service bulletins?

- YES >> Perform service bulletin actions.
- NO >> GO TO 4.

### 4. CHECK FOR DTCS

---

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

#### Is any DTC detected?

- YES >> [HAC-32, "DTC Inspection Priority Chart"](#).
- NO >> GO TO 5.

### 5. CHECK ENGINE COOLING SYSTEM

---

1. Check for proper engine coolant level. Refer to [CO-11, "System Inspection"](#) (VQ40DE) or [CO-43, "Inspection"](#) (VK56DE).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-11, "System Inspection"](#) (VQ40DE) or [CO-43, "Inspection"](#) (VK56DE).
4. Check for air in cooling system.

>> GO TO 6.

### 6. CHECK AIR MIX DOOR OPERATION - TEMPERATURE DECREASE

---

# INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

## < SYMPTOM DIAGNOSIS >

1. Rotate temperature control dial counterclockwise until maximum cold.
2. Check for cold air at appropriate discharge air outlets.

Is the test result normal?

YES >> GO TO 7.

NO >> Check air mix door for mechanical failure. Refer to [HAC-119, "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor \(Driver\)"](#) or [HAC-119, "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor \(Passenger\)"](#).

## 7.CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair air leaks. Refer to [VTL-5, "Exploded View"](#).

## 8.CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 9.

NO >> GO TO 10.

## 9.CHECK ENGINE COOLANT SYSTEM

Check engine control temperature sensor. Refer to [EC-28, "Engine Coolant Temperature Sensor"](#) (VQ40DE) or [EC-467, "Engine Coolant Temperature Sensor"](#) (VQ56DE).

Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

## 10.CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-12, "Changing Engine Coolant"](#) (VQ40DE) or [CO-44, "Changing Engine Coolant"](#) (VQ56DE)

4. GO TO 11 to retest.

## 11.CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [HA-77, "Removal and Installation - Front Heater Core"](#).

# CONTROL UNIT

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## UNIT REMOVAL AND INSTALLATION

### CONTROL UNIT

#### Removal and Installation - Front Air Control

INFOID:000000007992983

#### REMOVAL

1. Remove cluster lid C. Refer to [JP-22, "Removal and Installation"](#).

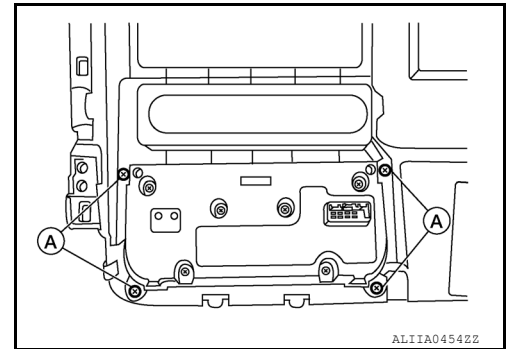
**CAUTION:**

The AV control unit and the front air control use the same 24-pin connector. Caution must be used to prevent misconnection. Colored tape has been added to the wiring harness to identify the connectors:

**White = AV control unit**

**Green = Front air control**

2. Remove the four screws (A) that retain the front air control to cluster lid C.



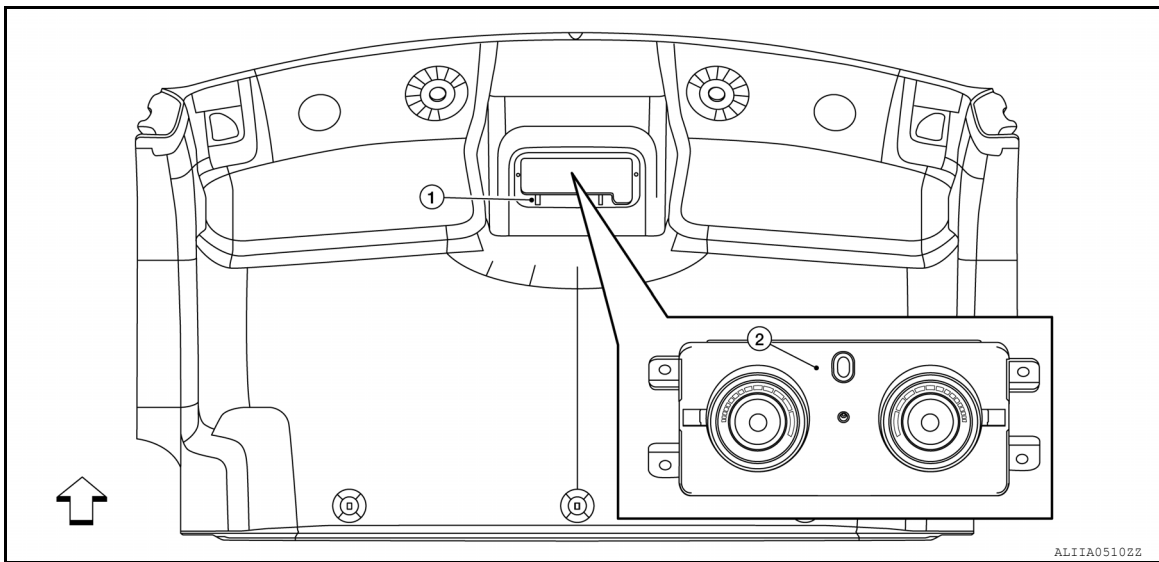
3. Remove front air control.

#### INSTALLATION

Installation is in the reverse order of removal.

#### Removal and Installation - Rear Air Control

INFOID:000000008440847



1. Overhead roof console

2. Rear air control

← Front

#### REMOVAL

1. Remove the overhead roof console. Refer to [INT-54, "Front Headlining"](#).
2. Remove the rear air control screws.
3. Disconnect the harness connector from the rear air control.

# CONTROL UNIT

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

---

4. Remove rear air control.

## INSTALLATION

Installation is in the reverse order of removal.

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# SUNLOAD SENSOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## SUNLOAD SENSOR

### Removal and Installation

INFOID:000000008440849

#### REMOVAL

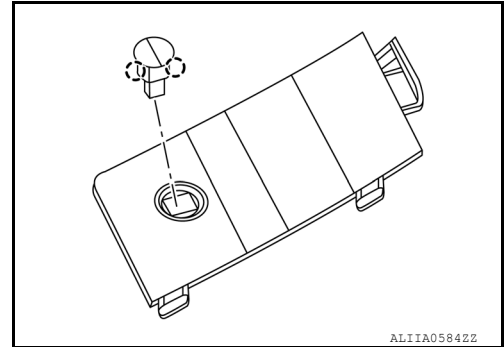
1. Remove the tweeter grille LH using a suitable tool. Refer to [IP-14. "Exploded View"](#).

**CAUTION:**

**Use a plastic or taped suitable tool to prevent damage to the tweeter grill and the instrument panel.**

2. Disconnect the harness connector from the sunload sensor.
3. Release the sunload sensor pawls using a suitable tool, then remove the sunload sensor.

⊖: Pawl



ALI1A05842Z

#### INSTALLATION

Installation is in the reverse order of removal.



# IN-VEHICLE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

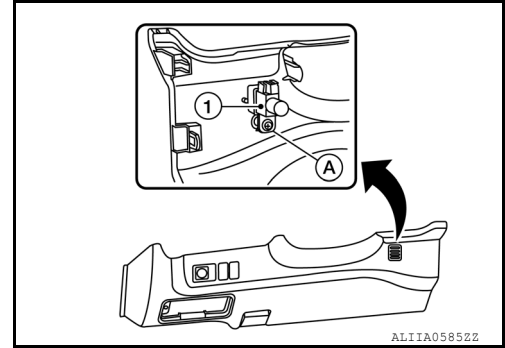
## IN-VEHICLE SENSOR

### Removal and Installation

INFOID:000000008440850

#### REMOVAL

1. Remove the instrument lower panel LH. Refer to [IP-18. "Removal and Installation"](#).
2. Remove the in-vehicle sensor screw (A), then remove the in-vehicle sensor (1).



#### INSTALLATION

Installation is in the reverse order of removal.

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# AMBIENT SENSOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## AMBIENT SENSOR

### Removal and Installation

INFOID:000000007992984

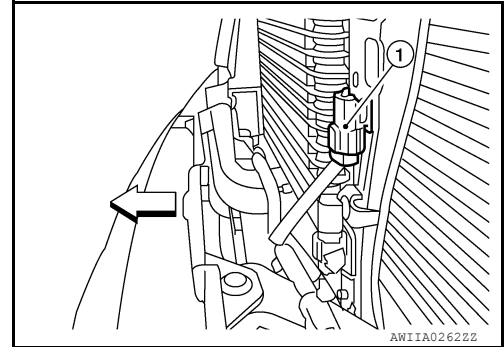
#### REMOVAL

##### NOTE:

The ambient sensor is located behind the front grille, below the hood lock assembly.

1. Remove the front grille. Refer to [EXT-28. "Removal and Installation"](#).
2. Disconnect the harness connector from the ambient sensor (1) and remove.

↶: Front



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

#### INSTALLATION

Installation is in the reverse order of removal.

# INTAKE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

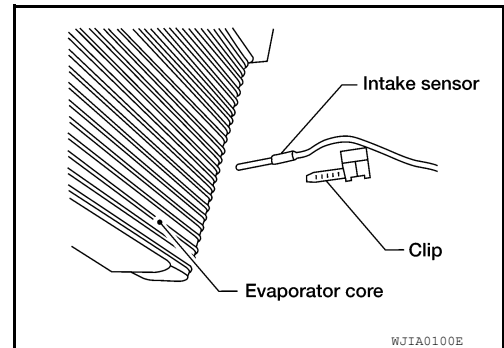
## INTAKE SENSOR

### Removal and Installation

INFOID:000000007992986

#### REMOVAL

1. Remove the front evaporator. Refer to [HA-73. "Removal and Installation - Front Evaporator"](#).
2. Release the intake sensor clip, then remove the intake sensor.  
**CAUTION:**
  - Mark the mounting position of the intake sensor.
  - Do not damage the evaporator core.



#### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

Mount the intake sensor in the same position as the original intake sensor on the front evaporator.

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# REFRIGERANT PRESSURE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## REFRIGERANT PRESSURE SENSOR

### Removal and Installation

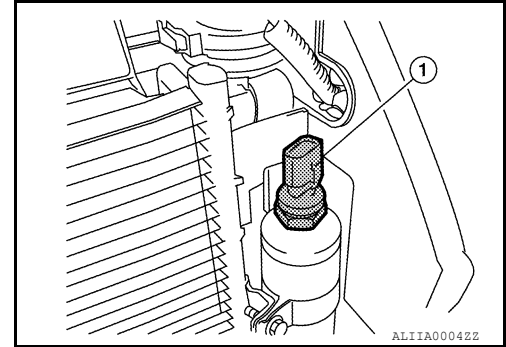
INFOID:000000007992987

#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the front grille. Refer to [EXT-28, "Removal and Installation"](#).
3. Disconnect the harness connector from the refrigerant pressure sensor.
4. Remove the refrigerant pressure sensor (1) from the liquid tank on the condenser.

**CAUTION:**

**Do not damage the condenser fins.**



#### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

- Do not reuse the O-rings.
- Apply compressor oil to the new O-rings for installation.

# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

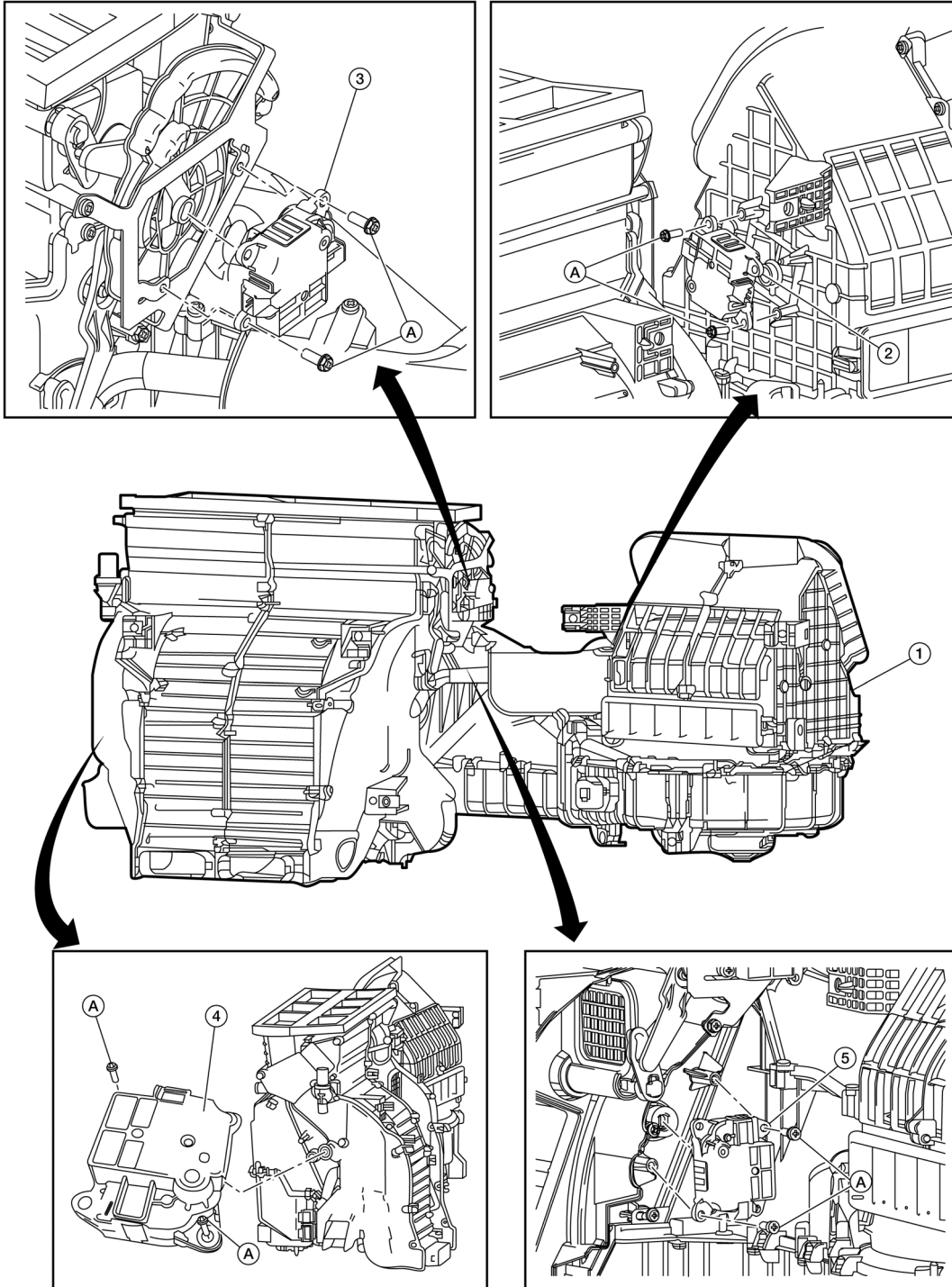
## DOOR MOTOR

### Components

INFOID:000000007994550

### Front Heating and Cooling Unit Assembly

SEC. 270



- 1. Front heating and cooling assembly
- 2. Intake door motor
- 3. Front mode door motor
- 4. Front air mix door motor (driver)
- 5. Front air mix door motor (passenger)
- A. Bolts

AWI1A15812Z

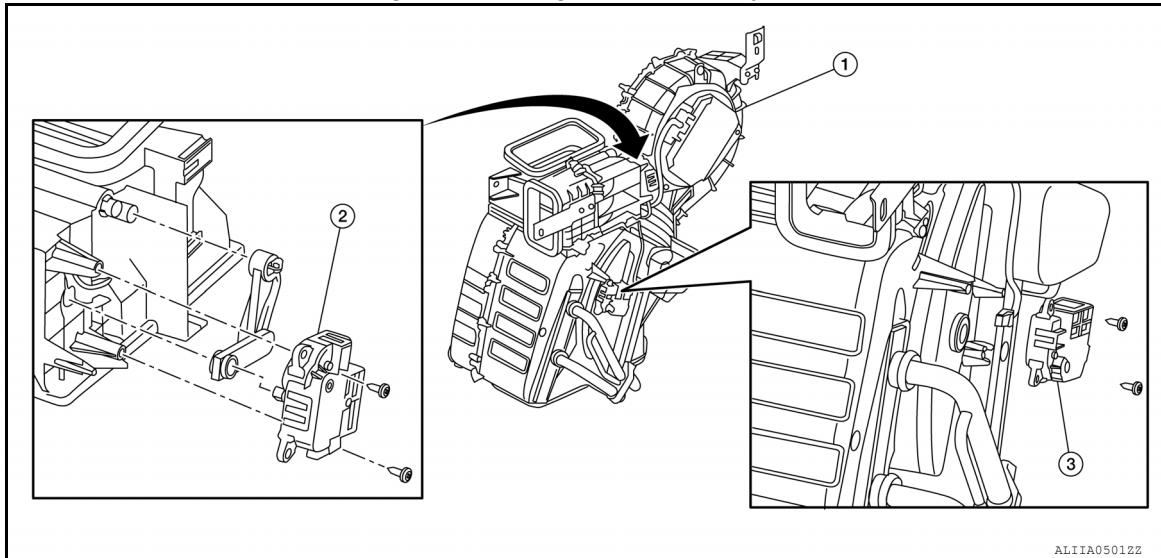
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# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

Rear Heating and Cooling Unit Assembly (If Equipped)



1. Rear heating and cooling unit assembly    2. Rear mode door motor    3. Rear air mix door motor

## INTAKE DOOR MOTOR

### INTAKE DOOR MOTOR : Removal and Installation

INFOID:000000007994551

#### REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [IP-24, "Removal and Installation"](#).
2. Disconnect the harness connector from the intake door motor.
3. Remove the intake door motor screws.
4. Remove the intake door motor from the blower unit.

#### INSTALLATION

Installation is in the reverse order of removal.

## MODE DOOR MOTOR

### MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor

INFOID:000000007994554

#### REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [IP-24, "Removal and Installation"](#).
2. Remove the front mode door motor screws.
3. Disconnect the harness connector from the front mode door motor.
4. Remove the front mode door motor.

#### INSTALLATION

Installation is in the reverse order of removal.

### MODE DOOR MOTOR : Removal and Installation - Rear Mode Door Motor

INFOID:000000007994553

#### REMOVAL

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Remove the two rear mode door motor screws.
3. Disconnect the harness connector from the rear mode door motor.
4. Remove the rear mode door motor.

# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[AUTOMATIC AIR CONDITIONER]

## INSTALLATION

Installation is in the reverse order of removal.

### AIR MIX DOOR MOTOR

#### AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor (Driver)

INFOID:000000008047667

## REMOVAL

1. Remove the front air mix door motor (driver) screws.
2. Disconnect the harness connector from the front air mix door motor (driver).
3. Remove the front air mix door motor (driver).

## INSTALLATION

Installation is in the reverse order of removal.

#### AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor (Passenger)

INFOID:000000007994552

## REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [IP-24, "Removal and Installation"](#).
2. Remove the front air mix door motor (passenger) screws.
3. Disconnect the harness connector from the front air mix door motor (passenger).
4. Remove the front air mix door motor (passenger).

## INSTALLATION

Installation is in the reverse order of removal.

#### AIR MIX DOOR MOTOR : Removal and Installation - Rear Air Mix Door Motor

INFOID:000000007994555

## REMOVAL

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Remove the two rear air mix door motor screws.
3. Disconnect the harness connector from the rear air mix door motor.
4. Remove the rear air mix door motor.

## INSTALLATION

Installation is in the reverse order of removal.

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## PRECAUTION

### PRECAUTIONS

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

INFOID:000000006889274

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

#### PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

**WARNING:**

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

#### Precaution for Work

INFOID:000000007042495

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components.
  - Water soluble dirt: Dip a soft cloth into lukewarm water, and wring the water out of the cloth to wipe the dirty area.  
Then rub with a soft and dry cloth.
  - Oily dirt: Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%), and wipe the dirty area.  
Then dip a cloth into fresh water, and wring the water out of the cloth to wipe the detergent off. Then rub with a soft and dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol, or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

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

INFOID:000000006889275

**WARNING:**

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to [HA-26. "Inspection"](#). To determine the purity



# PRECAUTIONS

[MANUAL AIR CONDITIONER]

< PRECAUTION >

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

## CONTAMINATED REFRIGERANT

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

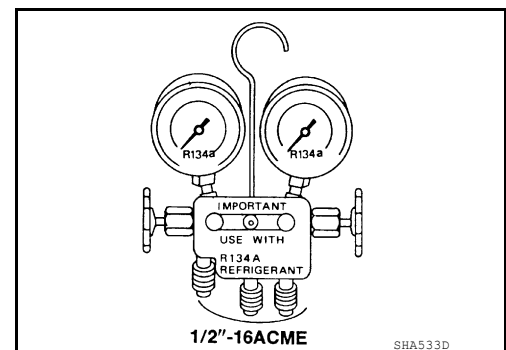
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

## Precaution for Service Equipment

INFOID:000000006889276

## MANIFOLD GAUGE SET

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



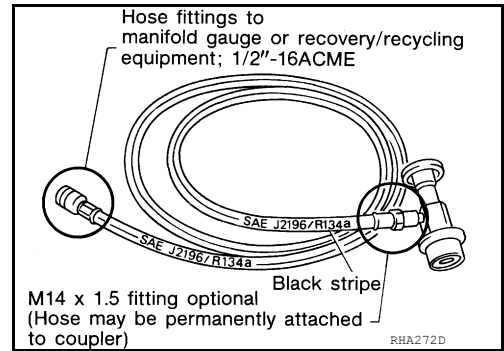
## SERVICE HOSES

# PRECAUTIONS

## < PRECAUTION >

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

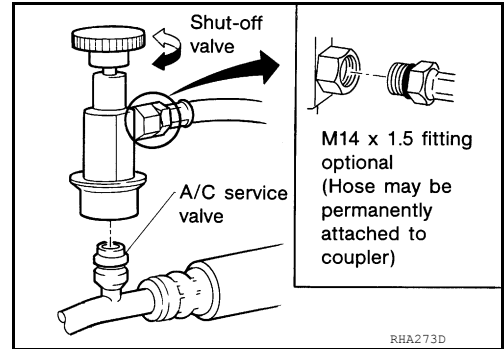
## [MANUAL AIR CONDITIONER]



## SERVICE COUPLERS

Do not attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



# PREPARATION

< PREPARATION >

[MANUAL AIR CONDITIONER]

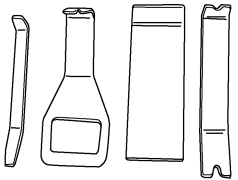
## PREPARATION

### PREPARATION

#### Special Service Tool


INFOID:000000007042496

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

Tool number (Kent-Moore No.) Tool name	Description
— (J-46534) Trim Tool Set <div style="text-align: center;">  <p>AWJIA0463ZZ</p> </div>	Removing trim components

#### Commercial Service Tool

INFOID:000000007042497

(Kent-Moore No.) Tool name	Description
( — ) Power tool <div style="text-align: center;">  <p>PIIB1407E</p> </div>	Loosening nuts, screws and bolts

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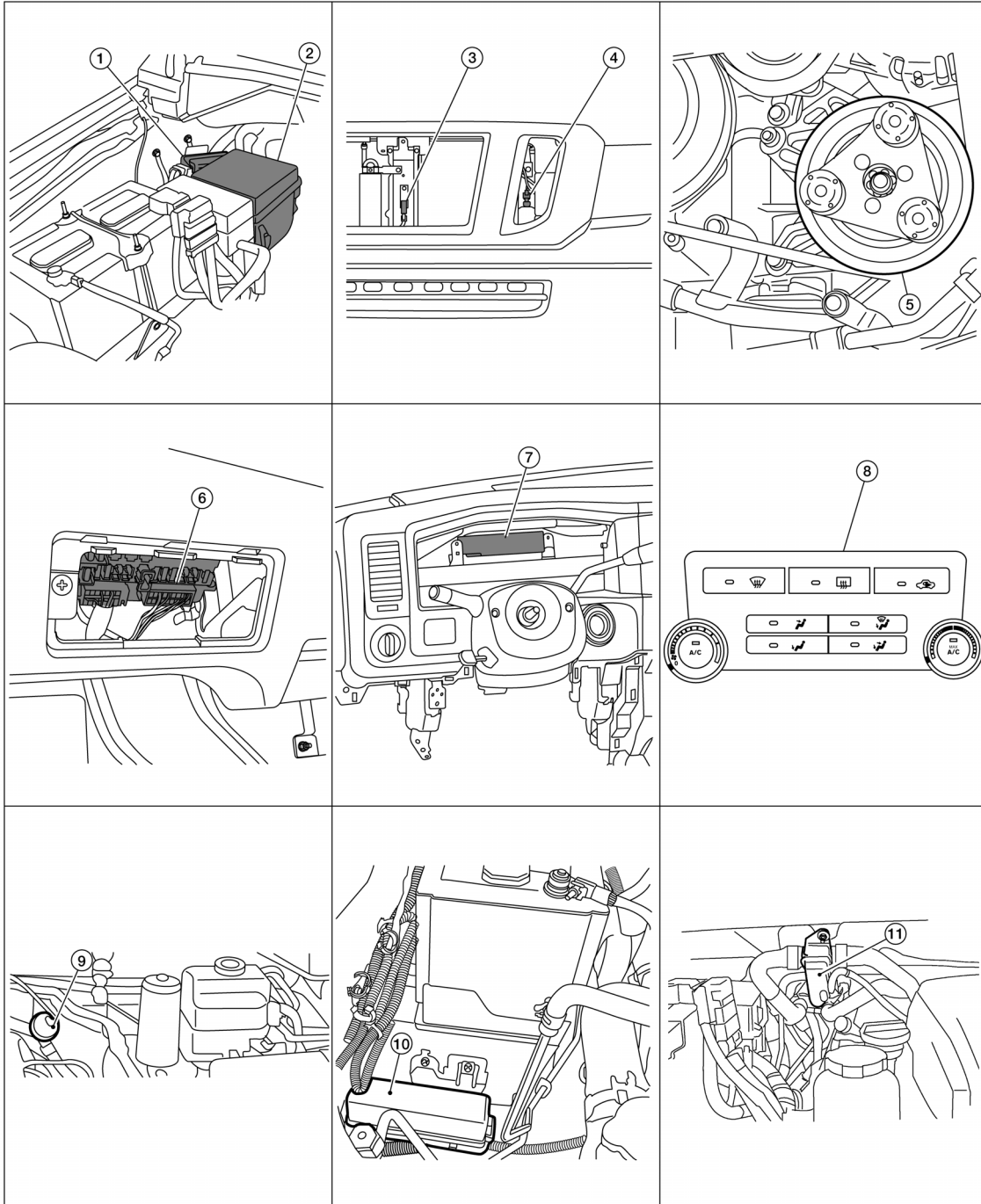
## SYSTEM DESCRIPTION

### COMPONENT PARTS

#### FRONT MANUAL AIR CONDITIONING SYSTEM

#### FRONT MANUAL AIR CONDITIONING SYSTEM : Component Part Location

INFOID:000000006889219

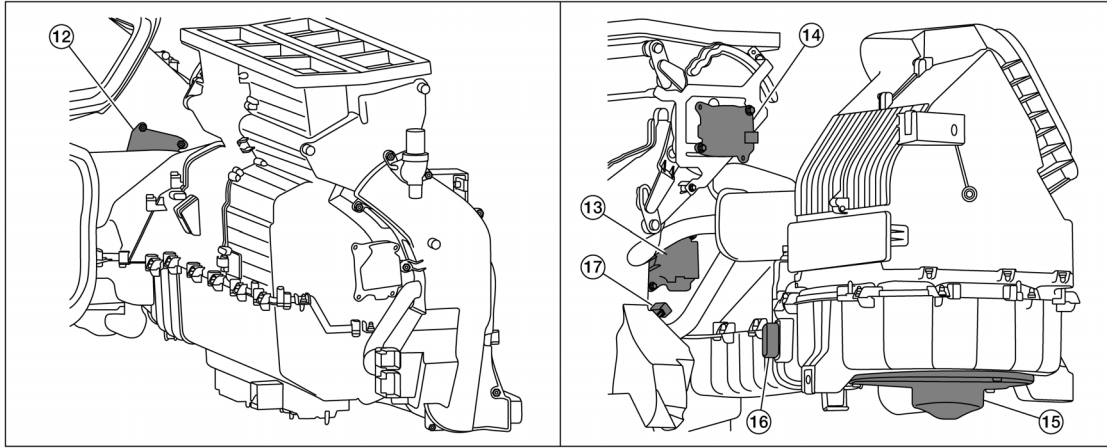


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# COMPONENT PARTS

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]



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- |   |  |  |
|---|--|--|
| 1. ECM  | 2. IPDM E/R  | 3. Ambient sensor (view with grille removed)   |
| 4. Refrigerant pressure sensor (view with grille removed) | 5. A/C Compressor  | 6. Fuse Block (J/B), Front blower motor relay - 1, Front blower motor relay - 2 (taped to harness near Fuse Block [J/B]) |
| 7. BCM (view with instrument panel removed)               | 8. Front air control (shown with optional FRE button. Some models may have REC button instead) | 9. Heater pump (if equipped)   |
| 10. Relay box (heater pump relay, if equipped)            | 11. Water valve (if equipped)  | 12. Intake door motor (view with front air conditioning assembly removed from vehicle)                                   |
| 13. Front air mix door motor                              | 14. Front mode door motor  | 15. Front blower motor   |
| 16. Power transistor                                      | 17. Intake sensor  |  |

## FRONT MANUAL AIR CONDITIONING SYSTEM : Component Description

INFOID:000000006918513

Component	Description
A/C Compressor	Vaporized refrigerant is drawn into the A/C compressor from the evaporator, where it is compressed to a high pressure, high temperature vapor. The hot, compressed vapor is then discharged to the condenser.
Ambient sensor	The ambient sensor measures the temperature of the air surrounding the vehicle. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
BCM	The BCM receives the fan ON and A/C ON signals from the front air control and sends a compressor ON request to the ECM.
ECM	The ECM sends a compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the front air control via CAN communication line.
Fuse Block (J/B)	Located in the passenger compartment, behind the left lower IP, the Fuse Block (J/B) contains the front blower motor relay-1 and several fuses required for the air conditioner control system.
Front air control	The front air control controls the operation of the A/C and heating system based on inputs from the temperature control knob, the mode switches, the blower control dial, the ambient temperature sensor, the intake sensor, and inputs received from the ECM and combination meter across the CAN. Diagnosis of the front air control can be performed using the CONSULT. There is no self-diagnostic feature available.

## COMPONENT PARTS

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

Component	Description
Front air mix door motor	The air mix door controls the mix of hot or cold air that enters the ventilation system. It is controlled by the front air control based on the position of the temperature dial. The air mix door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. If the air mix door moves to a position less than 5% or more than 95% of its expected or allowed positions, the front air control will set a DTC.
Front blower motor	The front blower motor varies the speed at which the air flows through the ventilation system. The blower control dial has 26 detents allowing for 26 different fan speeds.
Front blower motor relay - 1	The front blower motor relay-1 controls the flow of current to fuse 10 in the Fuse Block (J/B). The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position.
Front blower motor relay - 2	The front blower motor relay-2 controls the flow of current to fuse 18 in the Fuse Block (J/B). The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position. This relay is necessary to provide additional current carrying capacity to the front blower motor.
Front mode door motor	The mode door controls the direction the conditioned air passes through the ventilation system. Through a series of levers and gears, the mode door controls the defrost door, the foot door, and the vent door. There are 5 preset positions: VENT, B/L, FOOT, D/F, and DEF. The FOOT position can be set to allow some airflow through to the defroster vent, or to completely block the defroster vent using the CONSULT. The mode door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. The mode door has 5 expected positions and, therefore, can set up to 5 DTCs if the expected position is not reported back to the front air control.
Heater pump (if equipped)	The heater pump improves heater performance specifically at idle conditions. It is designed to operate in either of the following 2 situations: Front blower motor set to maximum speed and temperature control dial set to full hot or Engine coolant temperature (signal via CAN communication) minus heater core outlet temperature (intake sensor input to front air control) is greater than 20°C (68°F). If the difference is less than 16°C (61°F), the heater pump will not operate unless the conditions in item No. 1 above are met.
Heater pump relay (if equipped)	The heater pump relay controls the flow of current to the heater pump. The relay is controlled by the front air control.
Intake door motor	The intake door motor controls the position of the intake door. Fresh air is allowed to enter the cabin in one position, and recirculated inside air is allowed to enter in the other position. At times the front air control may command partial fresh or recirculation based on evaporator or coolant temperatures. The intake door motor receives position commands from the front air control and reports actual door position back via an LCU (Local Control Unit) installed inside the motor. Commands and responses are sent across the LIN (Local Interconnect Network) to each motor simultaneously, with each motor having its own unique address, thereby only responding to requests sent to its specific address. The LCU reads the door position from a Position Balanced Resistor (PBR), also part of the motor, and returns that information to the front air control. The LCU switches the polarity of the circuits connected to the DC motor to drive the motor forward or backward as requested by the front air control. If the recirculation door moves to a position less than 5% or more than 95% of its expected or allowed positions, the front air control will set a DTC.
Intake sensor	The intake sensor measures the temperature of the front evaporator fins. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.
IPDM E/R	Refer to <a href="#">PCS-5, "RELAY CONTROL SYSTEM : System Description"</a> .

# COMPONENT PARTS

< SYSTEM DESCRIPTION >

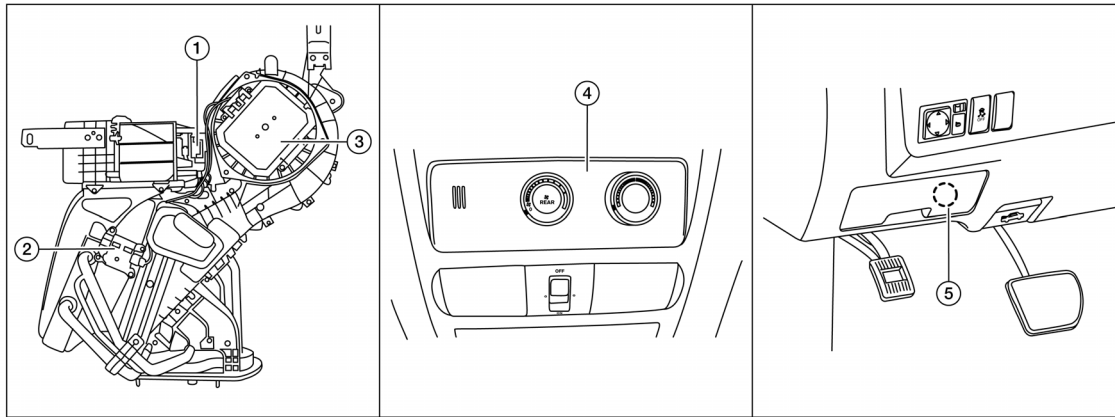
[MANUAL AIR CONDITIONER]

Component	Description
Power transistor	The power transistor controls the speed of the blower motor by controlling the ground circuit of the blower motor. The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. The power transistor is a metal-oxide semiconductor field effect transistor (MOSFET) that varies the ground side current of the front blower motor. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor.
Refrigerant pressure sensor	Refer to <a href="#">EC-430, "Component Function Check"</a> for VQ40DE and <a href="#">EC-872, "Component Function Check"</a> for VK56DE.
Water valve (if equipped)	The water valve cuts the flow of engine coolant to the front and rear heater cores to allow for maximum cooling during A/C operation. It is controlled by the front air control.

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Component Parts Location

INFOID:000000008067667



ALIIA05222Z

1. Rear mode door motor (view with rear air conditioning assembly removed from vehicle)
2. Rear air mix door motor
3. Rear blower motor
4. Rear air control
5. Rear blower motor relay

### REAR AIR CONDITIONING SYSTEM : Component Description

INFOID:000000008067668

Component	Description	
Rear air control	The operation of the rear air control is communicated to the front air control.	
Rear blower motor relay	The rear blower motor relay controls the flow of current to the rear blower motor. The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position.	
Rear A/C unit assembly	Rear air mix door motor	The LCU (Local Control Unit) is installed to rear air mix door motor so as to perform the multiplex communication control (LIN). Refer to <a href="#">HAC-136, "REAR AIR CONDITIONING SYSTEM : Door Control"</a> .
	Rear blower motor	The rear blower motor varies the speed at which the air flows through the ventilation system.
	Rear mode door motor	The LCU (Local Control Unit) is installed to rear mode door motor so as to perform the multiplex communication control (LIN). Refer to <a href="#">HAC-136, "REAR AIR CONDITIONING SYSTEM : Door Control"</a> .

# SYSTEM

< SYSTEM DESCRIPTION >

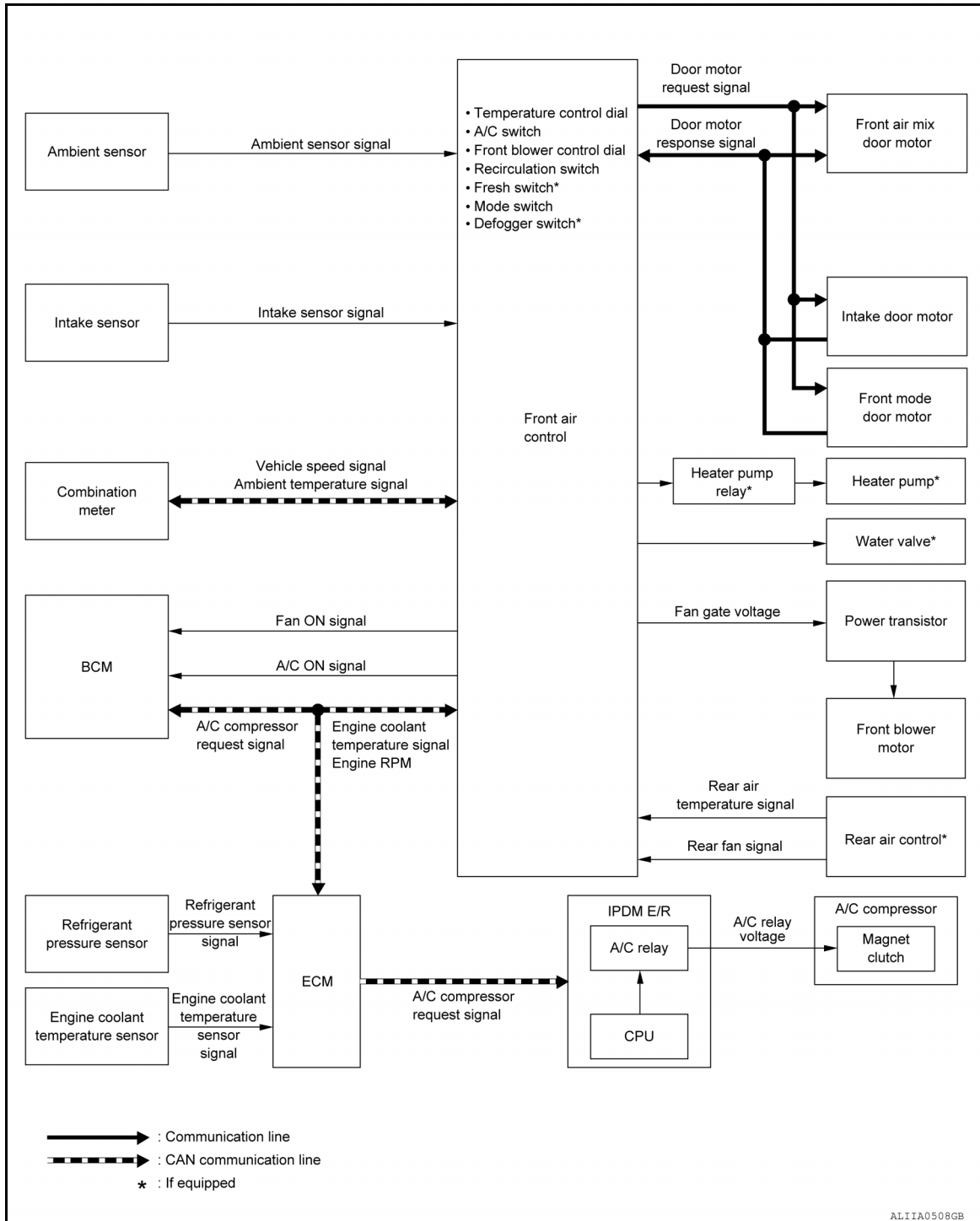
[MANUAL AIR CONDITIONER]

## SYSTEM

### FRONT MANUAL AIR CONDITIONING SYSTEM

#### FRONT MANUAL AIR CONDITIONING SYSTEM : System Diagram

INFOID:000000006928510



#### FRONT MANUAL AIR CONDITIONING SYSTEM : System Description

INFOID:000000006928511

- The manual air conditioning system is controlled by a sequence of functions from the front air control, BCM, ECM, and IPDM E/R.

Controlled by front air control:

- [HAC-129, "FRONT MANUAL AIR CONDITIONING SYSTEM : Air Flow Control"](#)
- [HAC-130, "FRONT MANUAL AIR CONDITIONING SYSTEM : Air Inlet Control"](#)



# SYSTEM

[MANUAL AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

- [HAC-130. "FRONT MANUAL AIR CONDITIONING SYSTEM : Air Outlet Control"](#)
- [HAC-130. "FRONT MANUAL AIR CONDITIONING SYSTEM : Compressor Control"](#)
- [HAC-131. "FRONT MANUAL AIR CONDITIONING SYSTEM : Door Control"](#)
- [HAC-134. "FRONT MANUAL AIR CONDITIONING SYSTEM : Temperature Control"](#)

Controlled by BCM:

- Air conditioning request signal.  
Refer to [BCS-6. "BODY CONTROL SYSTEM : System Description"](#).

Controlled by IPDM E/R:

- A/C Relay  
Refer to [PCS-5. "RELAY CONTROL SYSTEM : System Description"](#).

## FRONT MANUAL AIR CONDITIONING SYSTEM : Air Flow Control

INFOID:000000006928512

### DESCRIPTION

The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor. The front air control monitors the blower motor voltage and the blower motor ground circuits. The blower control dial has 26 detents, each detent outputting a different gate voltage to the power transistor, allowing for 26 different fan speeds.

In addition to manual control of the air flow, the front air control will modify the customer selection during certain conditions. During heater warm-up, the front air control will move the intake door from fresh to partial recirculation. The front air control will illuminate the fresh indicator. Also, if the intake temperature is too hot, the intake door will move to partial or full recirculation. The front air control will illuminate the fresh indicator.

When the blower control dial is turned off, the front air control will remember the customer selected intake air position (REC or FRE), the current mode, and the A/C state. Upon turning to any blower speed, the front air control will return to the previous mode and state, and if the previous state was MAX A/C, the front air control will illuminate the REC LED.

Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
OFF	0.00 volts	0.00 volts	0.00 volts	0.00 volts
1	3.25 volts	3.75 volts	3.75 volts	3.75 volts
2	3.50 volts	4.00 volts	4.00 volts	4.00 volts
3	3.75 volts	4.25 volts	4.25 volts	4.25 volts
4	4.00 volts	4.50 volts	4.50 volts	4.50 volts
5	4.50 volts	4.75 volts	4.75 volts	4.75 volts
6	4.75 volts	5.00 volts	5.00 volts	5.00 volts
7	5.00 volts	5.50 volts	5.50 volts	5.50 volts
8	5.25 volts	5.75 volts	5.75 volts	5.75 volts
9	5.50 volts	6.00 volts	6.00 volts	6.00 volts
10	5.75 volts	6.25 volts	6.25 volts	6.25 volts
11	6.25 volts	6.50 volts	6.50 volts	6.50 volts
12	6.50 volts	6.75 volts	6.75 volts	6.75 volts
13	6.75 volts	7.00 volts	7.00 volts	7.00 volts
14	7.00 volts	7.25 volts	7.25 volts	7.25 volts
15	7.50 volts	7.50 volts	7.50 volts	7.50 volts
16	7.75 volts	7.75 volts	7.75 volts	7.75 volts
17	8.00 volts	8.00 volts	8.25 volts	8.00 volts
18	8.25 volts	8.25 volts	8.50 volts	8.25 volts
19	8.50 volts	8.50 volts	8.75 volts	8.50 volts
20	8.75 volts	8.75 volts	9.00 volts	8.75 volts
21	9.00 volts	9.00 volts	9.25 volts	9.00 volts

# SYSTEM

## < SYSTEM DESCRIPTION >

## [MANUAL AIR CONDITIONER]

Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
22	9.25 volts	9.25 volts	9.50 volts	9.25 volts
23	9.75 volts	9.75 volts	10.00 volts	9.50 volts
24	10.25 volts	10.25 volts	10.25 volts	10.75 volts
25	10.50 volts	10.50 volts	10.50 volts	10.00 volts
26	10.75 volts	10.75 volts	12.00 volts	10.25 volts

12 = Max blower voltage

### FRONT MANUAL AIR CONDITIONING SYSTEM : Air Inlet Control

INFOID:000000006928513

The intake door position is automatically controlled in MAX A/C (REC) and DEF (FRE) modes. The intake door is controlled by customer input in the other modes, unless certain conditions apply. If heat has been selected, and the ambient temperature is low, the front air control will command the intake door to partial recirculation to speed up the heating of the heater core. If the evaporator fin temperature is too high, the front air control will command the intake door to partial or full recirculation, as needed, to help cool the evaporator.

### FRONT MANUAL AIR CONDITIONING SYSTEM : Air Outlet Control

INFOID:000000006928514

Initial setting of air outlet control (first time after battery disconnect) is as follows:

	Fan ON	Fan OFF
Mode	D/F1	D/F1
Intake	FRE	FRE
A/C	ON	OFF

Subsequently, air outlet control is controlled by customer input. When the A/C is turned off by turning the blower control dial fully counterclockwise, the front air control retains the current selections and returns to these selections the next time the blower control dial is turned to any fan position.

#### NOTE:

If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.

### FRONT MANUAL AIR CONDITIONING SYSTEM : Compressor Control

INFOID:000000006928515

#### DESCRIPTION

In order for the IPDM E/R to complete a compressor ON request, the following conditions must be met:

1. The BCM detects a Fan ON signal from the front air control. The front air control grounds the fan ON signal monitored by the BCM when the blower speed dial is in any of the fan speed positions.
2. The BCM detects an A/C ON signal from the front air control. The front air control grounds the A/C ON signal monitored by the BCM when:
  - The A/C switch is pressed. The A/C switch LED illuminates and the front air control grounds the A/C ON signal monitored by the BCM. Any mode control button except D/F may be selected.
  - The A/C switch is OFF, and the MAX A/C button is pressed. The A/C switch LED will automatically illuminate and the front air control grounds the A/C ON signal monitored by the BCM.
  - The A/C switch is OFF, and the mode button for either D/F or DEF is selected. The front air control grounds the A/C ON signal monitored by the BCM, but it does not illuminate the A/C switch LED
3. The intake temperature value must be within the specified range.

#### NOTE:

If the compressor was engaged by pressing the D/F or DEF mode buttons, and the time spent in either mode exceeds 1 minute, then the compressor stays requested, even when modes other than D/F or DEF are selected, until either:

1. The ignition switch is turned OFF.
2. The blower speed dial is turned completely counterclockwise to the OFF position.
3. The A/C switch is manually turned OFF.

In other words, the compressor ON request cannot be turned off in D/F or DEF modes.

#### REFRIGERANT PRESSURE PROTECTION

# SYSTEM

## < SYSTEM DESCRIPTION >

## [MANUAL AIR CONDITIONER]

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank on the condenser. The refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. If the system pressure rises above or falls below the following values, the ECM requests the IPDM E/R to de-energize the A/C relay and disengage the compressor.

- 3.12 MPa (31.82 kg/cm<sup>2</sup>, 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm<sup>2</sup>, 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm<sup>2</sup>, 20.3 psi) or less

### PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/cm<sup>2</sup>, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

### COMPRESSOR OIL CIRCULATION CONTROL

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

### LOW TEMPERATURE PROTECTION CONTROL

- When the intake sensor detects that the front evaporator fin temperature is 1.5°C (35°F) or less, the front air control requests the BCM to turn the compressor OFF, and stops the compressor.
- When the front evaporator fin temperature returns to 5.0°C (41°F) or more, the compressor is activated.

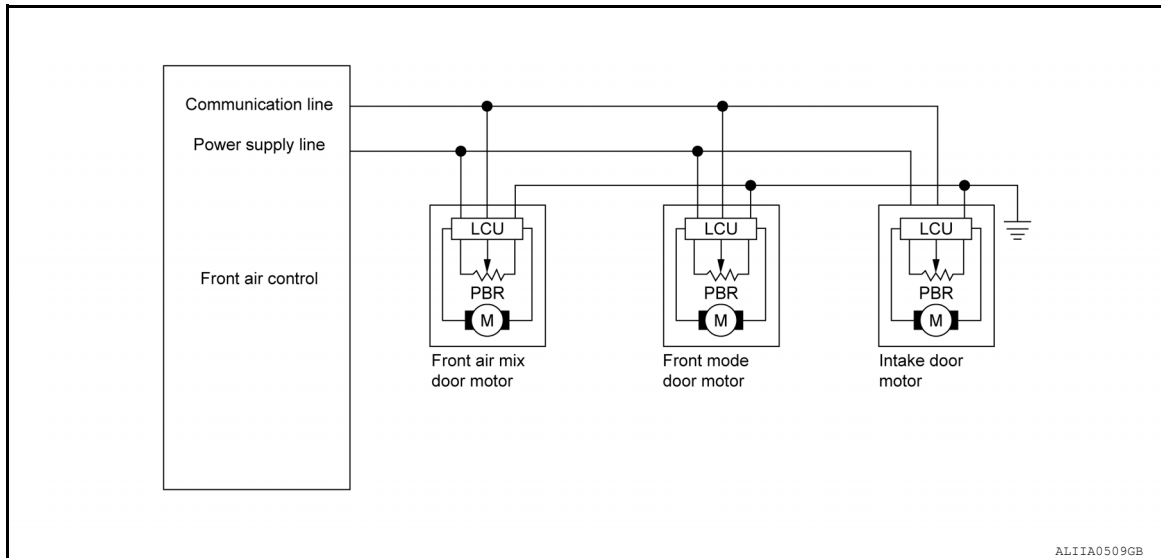
### OPERATING RATE CONTROL

When the set temperature is other than fully cold or the air outlet is "VENT", "B/L" or "FOOT", the front air control controls the compressor activation depending on ambient temperature.

## FRONT MANUAL AIR CONDITIONING SYSTEM : Door Control

INFOID:000000006928516

### DOOR MOTOR CONTROL



- A Local Control Unit (LCU) is built into each door motor and detects the door position by using a Position Balanced Resistor (PBR).
- Each door motor LCU has a unique address. The front air control communicates with the door motor LCUs by using each door's unique communication address. The front air control sends requested door position commands to each door motor LCU via a Local Interconnect Network (LIN) communication line using a communication protocol called LIN 2.0. The LIN-Bus is a vehicle bus standard used within current automotive network architectures. The LIN specification is enforced by the LIN-consortium, with the first exploited version being 1.1, released in 1999. Since then the specification has evolved to version 2.1 to meet current networking needs. Each door motor's LCU receives the command and sends back a door position feedback signal.

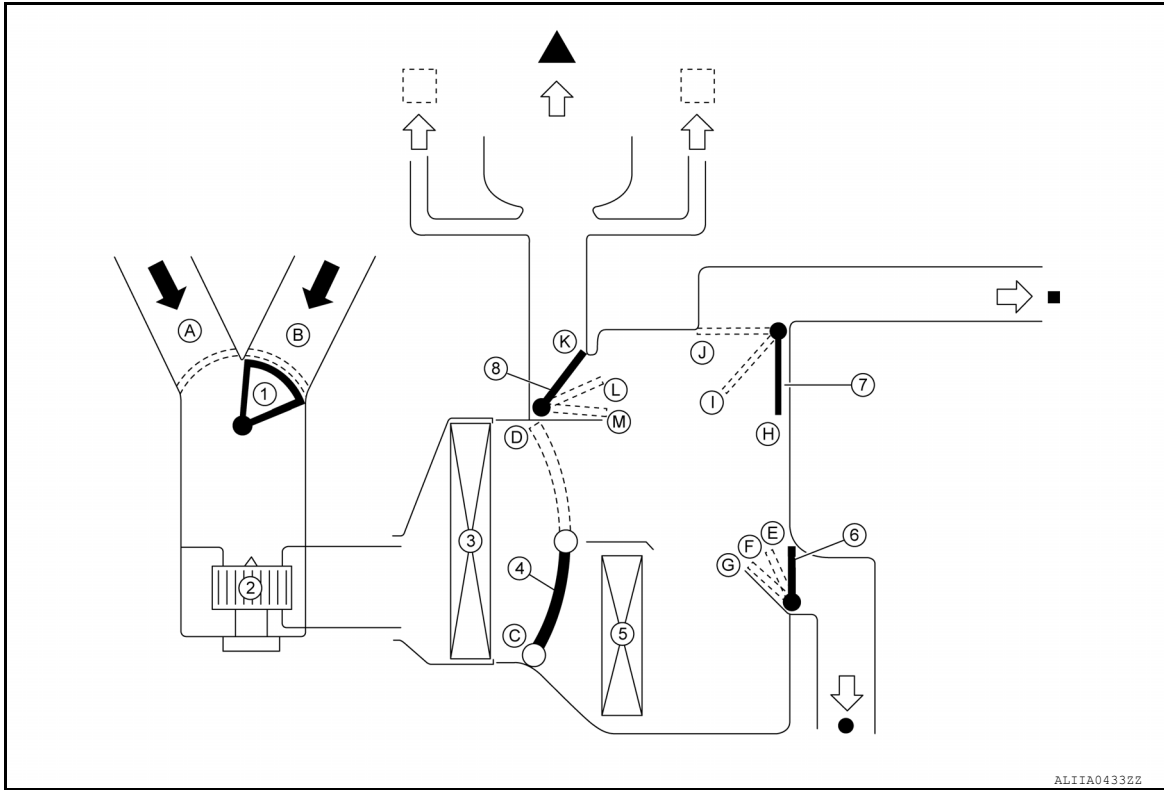
# SYSTEM

[MANUAL AIR CONDITIONER]

## < SYSTEM DESCRIPTION >

- Each LCU controls each door to the appropriate position depending on the control signal from the front air control. When the door movement is complete, the LCU transmits a signal to the front air control indicating that the door movement is complete.

## SWITCHES AND THEIR CONTROL FUNCTION



- |                    |                   |               |
|--------------------|-------------------|---------------|
| 1. Intake door     | 2. Blower motor   | 3. Evaporator |
| 4. Air mix door    | 5. Heater core    | 6. Foot door  |
| 7. Ventilator door | 8. Defroster door |               |
| Fresh air intake   | Recirculation air |               |
| Ventilator         | Side defroster    | Defroster     |
| Foot               |                   |               |

Switch/Dial position			Door position				
			Ventilator door	Foot door	Defroster door	Intake door	Air mix door
MODE switch	VENT		H	E	K	—	
	B/L		I	F	K	—	
	FOOT		J	G	L	—	
	D/F		J	G	L	B	—
DEF switch			J	E	M	B	—
REC switch <sup>*1</sup>			—			B	—
FRE switch <sup>*2</sup>			—			A	—

# SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

Switch/Dial position		Door position				
		Ventilator door	Foot door	Defroster door	Intake door	Air mix door
Temperature control dial	Full Cold	—				C
	Full Cold ↔ Full Hot	—				AUTO
	Full Hot	—				D

\*1: Inlet status is displayed by indicator when activating Max A/C or D/F modes.

\*2: If equipped (without rear defogger).

## AIR DISTRIBUTION

VENT MODE (  )				
OUTLET	VENT			
	ASST	CTR		DR
		ASST	DR	
AIR FLOW DISTRIBUTION RATIO (%)	25	25	25	25

B/L MODE (  )								
OUTLET	VENT				FOOT			
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR
		ASST	DR					
AIR FLOW DISTRIBUTION RATIO (%)	15	15	15	15	13	13	7	7

FOOT MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	9	0	0	9	30	30	11	11	0


D/F1 MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	7	0	0	7	21	21	8	8	28

D/F2 MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	5	0	0	5	15	15	5	5	50

# SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

DEF MODE (  )									
OUTLET	VENT				FOOT				DEF
	ASST	CTR		DR	Fr ASST	Fr DR	Rr ASST	Rr DR	
		ASST	DR						
AIR FLOW DISTRIBUTION RATIO (%)	7	0	0	7	0	0	0	0	86

## FRONT MANUAL AIR CONDITIONING SYSTEM : Temperature Control

INFOID:000000006928517

- When the ignition switch is in the ON position, the customer uses the front air control temperature control dial to set the desired temperature.
- The front air control calculates the target front air mix door opening angle depending on the selected temperature, intake temperature sensor, engine coolant temperature and rpm, and ambient temperature.
- Front air mix door is controlled depending on the comparison of current front air mix door opening angle and target front air mix door opening angle.
- Regardless of ambient temperature, the front air mix door is fixed at the fully cold position when the temperature control dial is set at the full cold position and fixed at the fully hot position when the temperature control dial is set at the full hot position.

## FRONT MANUAL AIR CONDITIONING SYSTEM : Fail-safe

INFOID:000000006928518

### FAIL-SAFE FUNCTION

- If a communication error exists between the front air control's Application Specific Integrated Circuit (ASIC) and Central Processing Unit (CPU), the air conditioning system is controlled under the following conditions:

**Compressor** : OFF  
**Air outlet** : Setting before communication error occurs  
**Air inlet** : Setting before communication error occurs  
**Blower fan speed** : HI  
**Set temperature** : Setting before communication error occurs

- If a communication error exists between the front air control's CPU and the ASIC, the air conditioning system is controlled under the following conditions:

**Compressor** : Control is normal operation  
**Air outlet** : Control is normal operation  
**Air inlet** : Control is normal operation  
**Blower fan speed** : Control is normal operation  
**Set temperature** : Control is normal operation  
**Indicator brightness** : Full brightness  
**Illumination brightness** : Full brightness

- If a communication error exists between the front air control's CPU and the EEPROM (Electrically Erasable Programmable Read-Only Memory), the air conditioning system is controlled using the CPU's default values and a DTC is set.
- If a button becomes stuck for 2 minutes, it will be disabled until the next ignition cycle.

## REAR AIR CONDITIONING SYSTEM

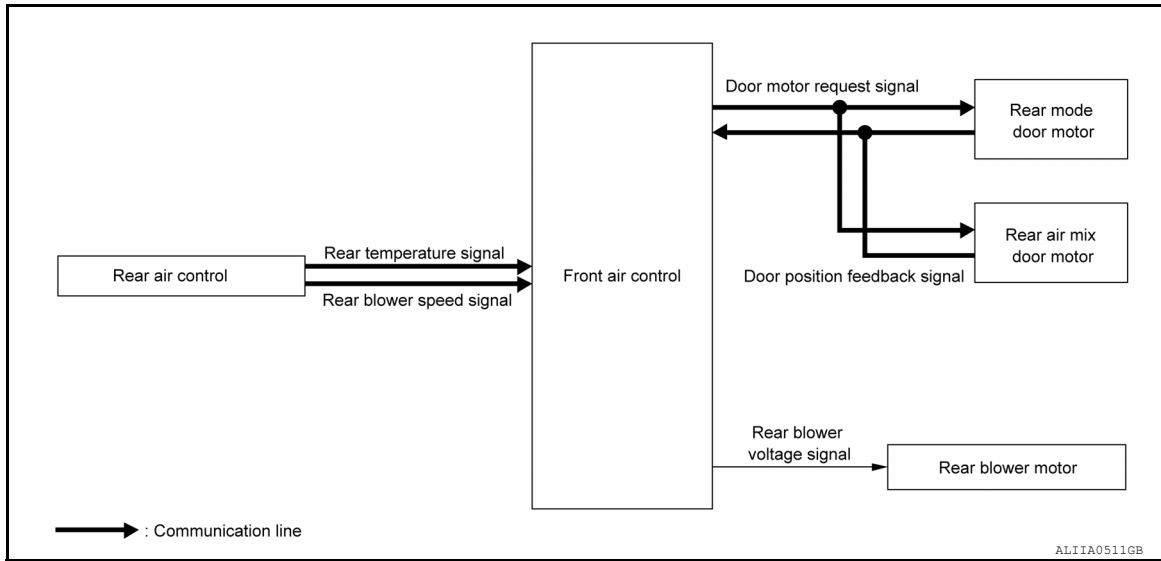
# SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

## REAR AIR CONDITIONING SYSTEM : System Diagram

INFOID:000000008059006



## REAR AIR CONDITIONING SYSTEM : System Description

INFOID:000000008059003

### DESCRIPTION

- Rear manual air conditioning system is controlled by each function of rear air control.
- Each operation of rear air control is controlled by the front air A/C control.

### CONTROL BY FRONT AIR CONTROL

- [HAC-135. "REAR AIR CONDITIONING SYSTEM : Air Flow Control"](#)
- [HAC-136. "REAR AIR CONDITIONING SYSTEM : Door Control"](#)

## REAR AIR CONDITIONING SYSTEM : Air Flow Control

INFOID:000000008059004

### DESCRIPTION

- Front air control changes duty ratio of rear blower motor control signal to control air flow continuously. When air flow is increased, duty ratio of rear blower motor control signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control, air flow control is composed of fan speed control at door motor operation.

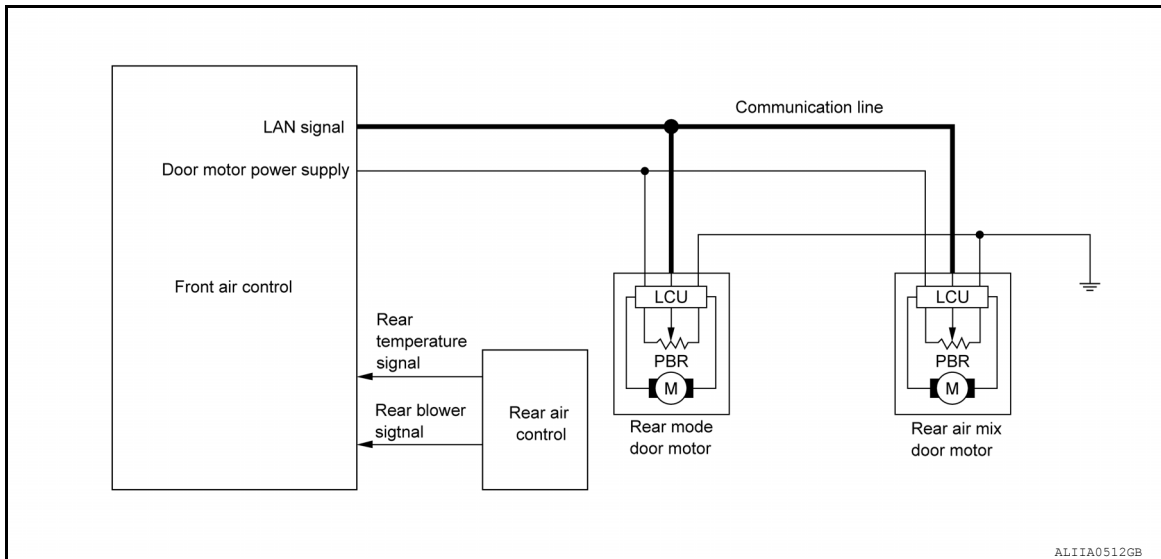
### FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When rear mode door motor is activated while air flow is more than the specified value, front air control temporarily reduces fan speed so that rear mode door moves smoothly.

## REAR AIR CONDITIONING SYSTEM : Door Control

INFOID:000000008059005

### DOOR MOTOR CONTROL



- LCU (Local Control Unit) is built into each door motor. And detects door position by PBR (Potentiometer Balance Resistor).
- A/C amp. communicates with each LCU via communication line. And receives each door position feedback signal from each LCU.
- Each LCU controls each door to the appropriate position depending on the control signal from A/C amp.
- Each LCU transmits the signal of door movement completion to A/C amp., when the door movement is completed.



## OPERATION

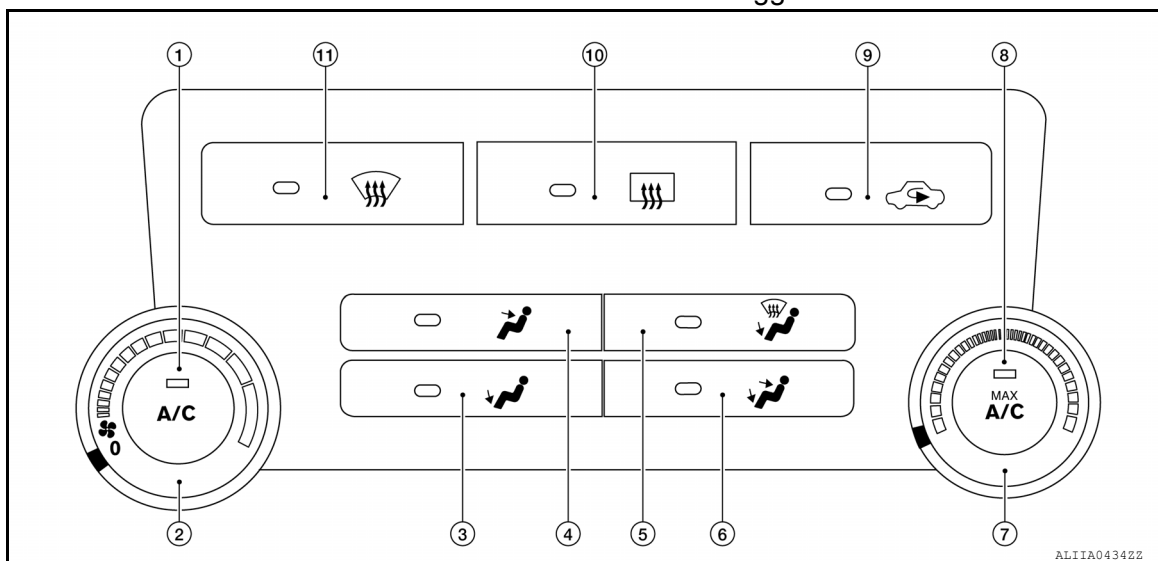
### FRONT MANUAL AIR CONDITIONING SYSTEM

### FRONT MANUAL AIR CONDITIONING SYSTEM : Switch Name and Function

INFOID:000000006928519

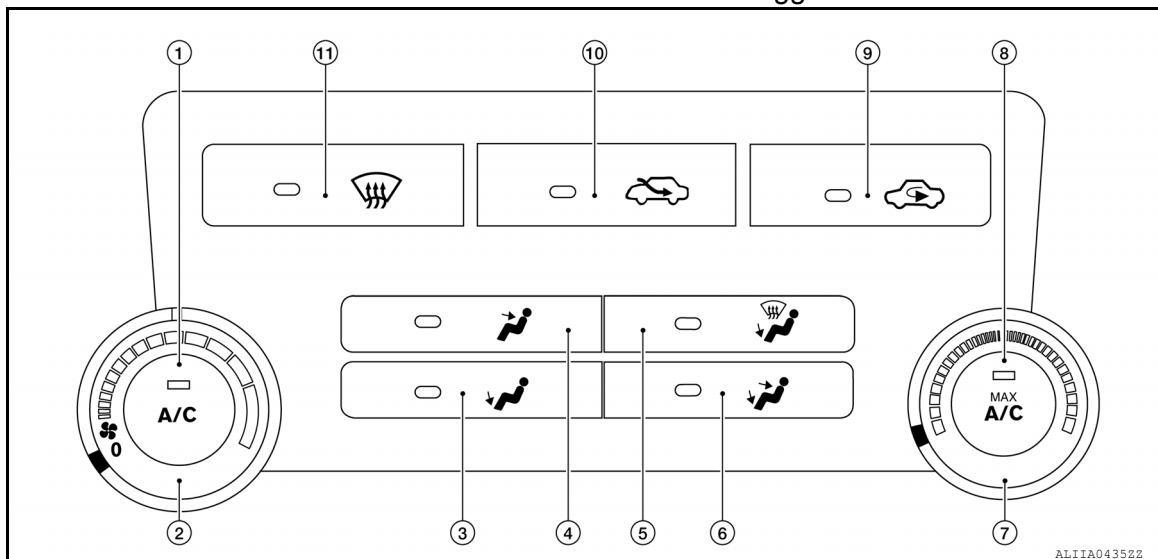
#### Front Air Control

Front air control with rear defogger



- |                             |  |                |
|-----------------------------|--|----------------|
| 1. A/C switch               | 2. Blower control dial (with OFF switch) | 3. FOOT switch |
| 4. VENT switch              | 5. D/F switch                            | 6. B/L switch  |
| 7. Temperature control dial | 8. MAX A/C switch                        | 9. REC switch  |
| 10. Rear DEF switch         | 11. DEF switch                           |                |

Front air control without rear defogger



- |                             |  |                |
|-----------------------------|--|----------------|
| 1. A/C switch               | 2. Blower control dial (with OFF switch) | 3. FOOT switch |
| 4. VENT switch              | 5. D/F switch                            | 6. B/L switch  |
| 7. Temperature control dial | 8. MAX A/C switch                        | 9. REC switch  |
| 10. FRE switch              | 11. DEF switch                           |                |

A  
B  
C  
D  
E  
F  
G  
H  
HAC  
J  
K  
L  
M  
N  
O  
P

# OPERATION

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

## Switch Operation

A/C switch	<p>Switches the compressor control switch indicator between ON ⇔ OFF with each press while front blower fan is activated. The circuit used by the BCM to detect an A/C ON request is grounded.</p> <p><b>NOTE:</b> When front blower fan is OFF, the compressor control cannot be activated.</p>
Blower control dial (with OFF switch)	<ul style="list-style-type: none"> <li>• Blower fan speed is manually controlled with the dial. 26 detents are available for varying blower speed. When ON, the circuit used by the BCM to detect a fan ON request is grounded.</li> <li>• Turns air conditioning system OFF.</li> </ul> <p><b>NOTE:</b> When blower control dial is turned to any ON position the air conditioning system is activated. (Compressor control state returns to the previous state before air conditioning system was turned OFF.)</p>
DEF switch (if equipped)	<p>Switches DEF mode (switch indicator) between ON ⇔ OFF with each press.</p> <ul style="list-style-type: none"> <li>• When DEF mode is turned ON, the air conditioning system changes to the following state.               <ul style="list-style-type: none"> <li>- Air inlet: Fresh air intake</li> <li>- Air outlet: DEF</li> <li>- Blower fan: Manual setting.</li> <li>- Compressor: ON</li> </ul> </li> <li>• When DEF mode is turned OFF, the air conditioning system state returns to the previous state before DEF mode was selected, but the following state is continued:               <ul style="list-style-type: none"> <li>- Air inlet: Fresh air intake</li> <li>- Compressor: ON</li> </ul> </li> </ul> <p><b>NOTE:</b> When front blower fan is OFF, DEF cannot be activated.</p>
FRE switch (if equipped)	<ul style="list-style-type: none"> <li>• Air inlet is selected to fresh air intake (FRE) by pressing this switch.</li> <li>- FRE indicator: ON</li> <li>- REC indicator: OFF</li> </ul> <p><b>NOTE:</b> When air conditioning system is OFF, air inlet can be selected.</p>
MAX A/C switch	<p>Switches the MAX A/C and compressor control switch indicators between ON ⇔ OFF with each press while front blower fan is activated.</p> <ul style="list-style-type: none"> <li>• When MAX A/C mode is turned ON, the air conditioning system changes to the following state.               <ul style="list-style-type: none"> <li>- Air inlet: Recirculation air intake</li> <li>- Air outlet: Manual setting</li> <li>- Blower fan: Manual setting.</li> <li>- Compressor: ON</li> </ul> </li> <li>• When MAX A/C mode is turned OFF, the air conditioning system state returns to the previous state before MAX A/C mode is selected. But, the following state is changed:               <ul style="list-style-type: none"> <li>- Air inlet: Fresh air intake</li> <li>- Compressor: ON</li> </ul> </li> </ul> <p><b>NOTE:</b> When front blower fan is OFF, the compressor control cannot be activated.</p>
MODE switches	<p>Selects air outlet from VENT, B/L, FOOT, and D/F.</p> <p><b>NOTE:</b> When the air conditioning system is OFF, the air outlet can still be selected.</p>
REC switch	<ul style="list-style-type: none"> <li>• Air inlet is selected to fresh air intake (REC) by pressing this switch.</li> <li>- REC indicator: ON</li> <li>- FRE indicator: OFF (if equipped)</li> </ul> <p><b>NOTE:</b></p> <ul style="list-style-type: none"> <li>• When the air conditioning system is OFF, the air inlet can still be selected.</li> <li>• When D/F mode or DEF is selected, the REC button is disabled.</li> </ul>
Temperature control dial	<ul style="list-style-type: none"> <li>• Selects desired temperature between full cold and full hot.</li> <li>- Clockwise rotation: Temperature increases.</li> <li>- Counterclockwise rotation: Temperature decreases.</li> </ul>

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Switch Name and Function

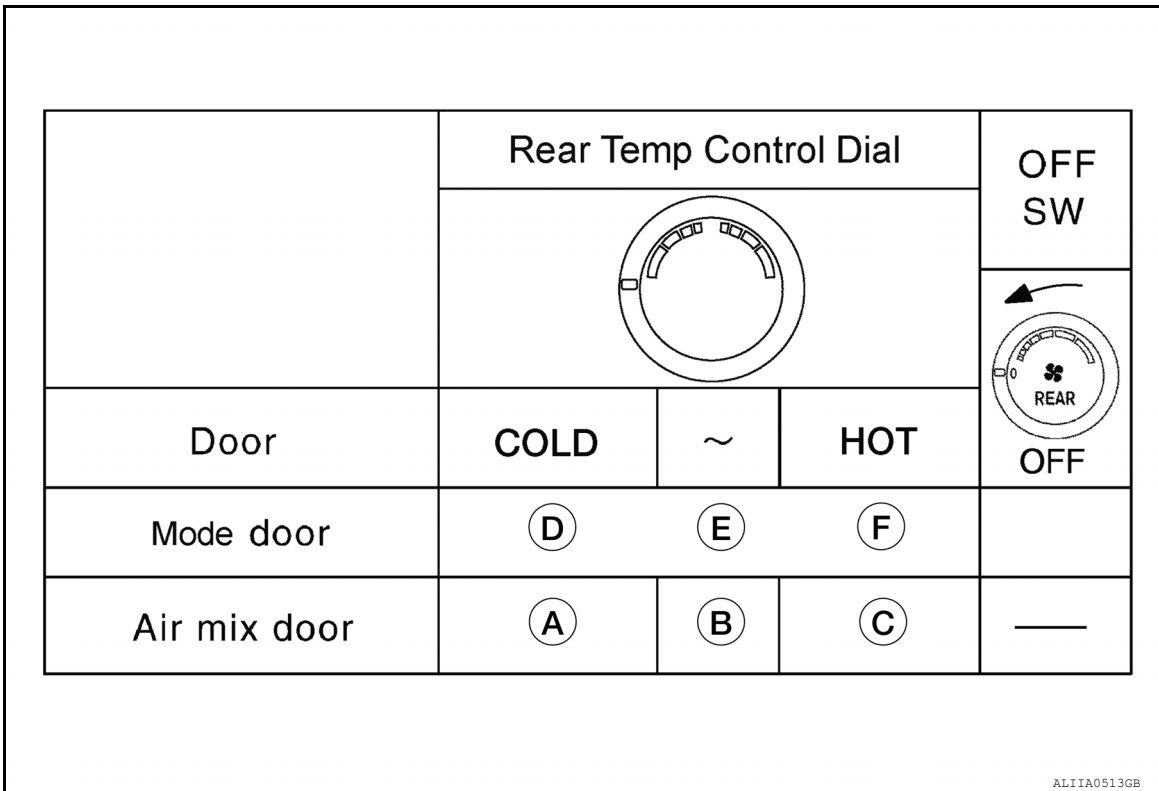
INFOID:000000008067664

#### SWITCH NAME AND FUNCTION

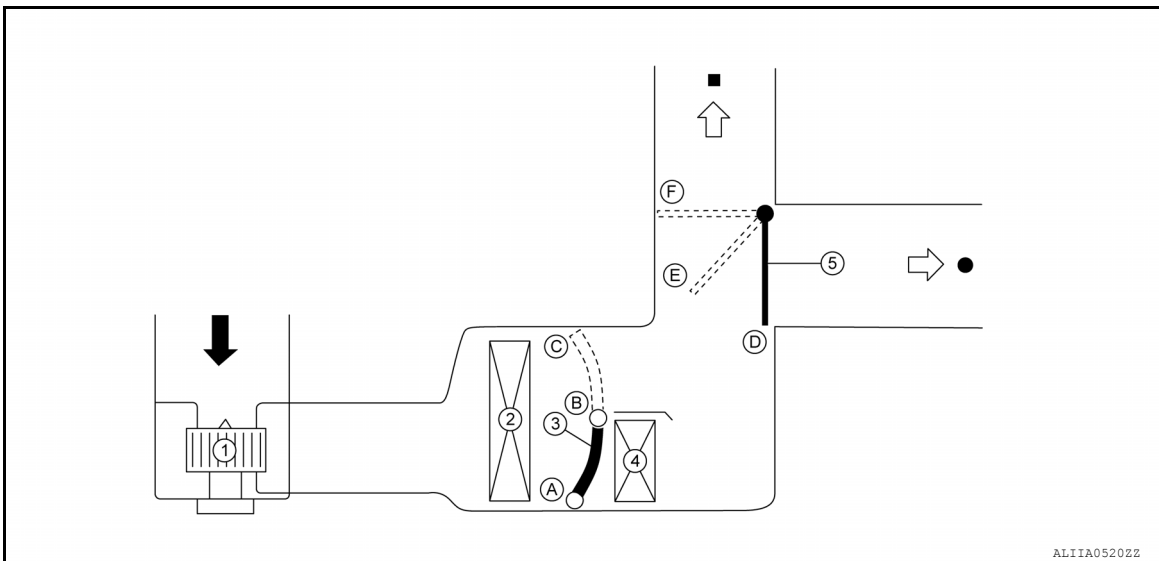
# OPERATION

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]



Switch position	Door position	
	Rear mode door	Rear air mix door
Temperature control switch (rear air control)	Full cold	D
	Mix	E
	Full hot	F
ON·OFF switch (front air control)	F	—
OFF switch (rear air control)	OFF	—



- |                      |                    |                      |
|----------------------|--------------------|----------------------|
| 1. Rear blower motor | 2. Rear evaporator | 3. Rear air mix door |
| 4. Rear heater core  | 5. Rear mode door  |                      |

# OPERATION

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

---

← Recirculation air

⇐ Discharge air

■ Rear ventilator

● Rear floor

# DIAGNOSIS SYSTEM (HVAC)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

## DIAGNOSIS SYSTEM (HVAC)

### CONSULT Function (HVAC)

INFOID:000000006934942

The CONSULT displays the following test modes:

Diagnostic mode	Description
Self Diagnostic Result	Displays front air control self-diagnosis results.
Data Monitor	Displays front air control input/output data in real time.
Work Support	The settings for the front air control can be changed.
Active Test	The signals used to activate each device are output from the front air control
Ecu Identification	Front air control part number can be read.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.

### SELF-DIAGNOSIS

#### Display Item List

DTC	Description	Reference page
B257B	Ambient sensor circuit short	<a href="#">HAC-63, "Diagnosis Procedure"</a>
B257C	Ambient sensor circuit open	
B2581	Intake sensor circuit short	<a href="#">HAC-66, "Diagnosis Procedure"</a>
B2582	Intake sensor circuit open	
B2632	Air mix door motor circuit short	<a href="#">HAC-71, "Diagnosis Procedure"</a>
B2633	Air mix door motor circuit open	
B2636	VENT door position error	<a href="#">HAC-76, "Diagnosis Procedure"</a>
B2637	B/L door position error	
B2638	D/F1 door position error	
B2639	DEF door position error	
B2654	D/F2 door position error	
B263D	FRE door position error	
B263F	REC door position error	<a href="#">HAC-180, "Diagnosis Procedure"</a>
B27B0	EEPROM reading error	<a href="#">HAC-79, "Diagnosis Procedure"</a>
U1000	CAN bus fault	<a href="#">HAC-57, "Diagnosis Procedure"</a>
U1010	Control unit (CAN)	<a href="#">HAC-58, "Diagnosis Procedure"</a>

If codes B2632, B2633, B2636, B2637, B2638, B2639, B2654, B263D, and B263F are displayed at the same time, refer to [HAC-80, "Description"](#).

### DATA MONITOR

#### Display Item List

Monitor item	Value	Contents
AMB TEMP SEN	"°C/°F"	Displays ambient sensor signal.
INT TEMP SEN	"°C/°F"	Displays intake sensor signal.
AMB SEN CAL	"°C/°F"	Displays calculated ambient sensor signal.
INT TEMP CAL	"°C/°F"	Displays calculated intake sensor signal.
COMP REQ SIG	"ON/OFF"	Displays compressor request signal.
FAN REQ SIG	"ON/OFF"	Displays fan request signal.

# DIAGNOSIS SYSTEM (HVAC)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

Monitor item	Value	Contents
FAN DUTY	"%"	Displays duty cycle of blower motor.
XM	"units"	Displays calculated air mix value.
REAR FAN REQUEST SIG	"ON/OFF"	Displays rear fan request signal.
REAR FAN DUTY	"units"	Displays duty cycle of rear blower motor.

## ACTIVE TEST

Test item	Description
HVAC TEST	The operation check of A/C system can be performed by selecting the mode. Refer to the following table for the conditions of each mode.
ALL SEG	All LED segments illuminate.

## HVAC TEST

	Test item				
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5
Front mode door position	VENT1	B/L1	FOOT	D/F	DEF
Intake door position	REC	REC	FRE	FRE	FRE
Front air mix door position	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT
Blower motor gate voltage	4 volts	12 volts	8 volts	8 volts	12 volts
A/C compressor (Magnet clutch)	ON	ON	OFF	ON	ON

### NOTE:

Test these items after starting the engine, and with the A/C compressor operating.

## WORK SUPPORT

Work item	Description	Reference
BLOW SET (Blow setting to DEF in FOOT mode)	The FOOT door can be set to allow some air to flow to the defrost position, or to blow completely out the FOOT vent only.	<a href="#">HAC-167, "Foot Position Setting Trimmer"</a>

### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of WORK SUPPORT may be cancelled.

# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

## ECU DIAGNOSIS INFORMATION

### FRONT AIR CONTROL

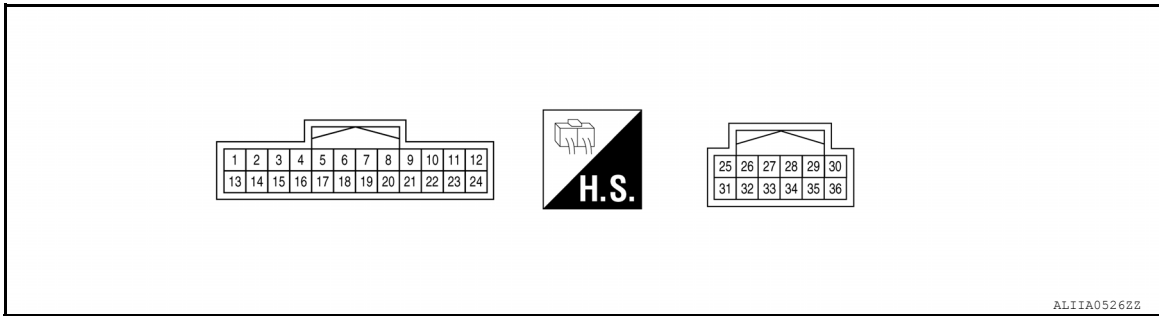
Reference Value

INFOID:000000006889264

#### CONSULT DATA MONITOR REFERENCE VALUES

Monitor item	Condition		Value/Status
FAN REQ SIG	Engine: Running at idle after warming up	Blower fan: ON	On
		Blower fan: OFF	Off
COMP REQ SIG	Blower control dial must be in any ON position	A/C switch: ON	On
		A/C switch: OFF	Off
AMB TEMP SEN	Ignition switch ON	—	-22°F↔131°F (-30°C↔55°C)
INT TEMP SEN	Ignition switch ON	—	-22°F↔131°F (-30°C↔55°C)
AMB SEN CAL	Ignition switch ON	—	-22°F↔131°F (-30°C↔55°C)
INT TEMP CAL	Ignition switch ON	—	-22°F↔131°F (-30°C↔55°C)
FAN DUTY	Blower control dial must be in any ON position	Blower fan: detents 1 - 26	25% ↔ 100%
		Blower fan: OFF	0%
XM	Ignition switch ON	—	37°F↔149°F (2.5°C↔65°C)
RRFAN REQ SIG	Engine: Running at idle after warming up	Blower fan: ON	On
		Blower fan: OFF	Off
RR FAN DUTY	Blower control dial must be in any ON position	Blower fan: detents 1 - 26	25% ↔ 100%
		Blower fan: OFF	0%

#### TERMINAL LAYOUT



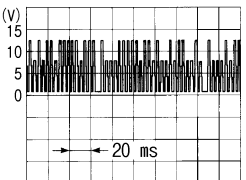
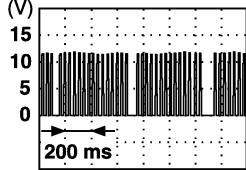
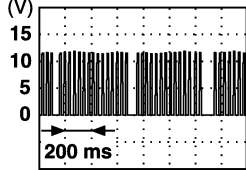
#### PHYSICAL VALUES

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	Y	Power supply for BAT	-	-	Battery voltage
2	R	Power supply for IGN	ON	-	Battery voltage
3	B	Ground	-	-	0V
4	B	Ground	-	-	0V
5	V	V ref ACTR	ON	-	5V

# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
6	LG	LAN signal	-	-	 <p style="text-align: right; font-size: small;">SJIA1453J</p>
8	LG	Water valve *1	ON	Water valve open	Battery voltage
			ON	Water valve closed	0V
9	Y	Water valve *1	ON	Water valve open	0V
			ON	Water valve closed	Battery voltage
10	W	Heater pump request *1	ON	Heater pump on	0V
			ON	Heater pump off	Battery voltage
11	GR	Intake sensor	ON	-	0 - 5V
12	G	Power supply from front blower motor relay	-	-	Battery voltage
13	L	Front blower motor feedback	ON	-	0 - 12V
14	LG	Variable blower control	ON	-	0 - 12V
15	O	Ambient sensor	ON	-	0 - 5V
16	SB	Sensor ground	ON	-	0V
18	BR	Rear Defrost ON signal *1	ON	DEF switch OFF	5V
			ON	DEF switch ON	0V
19	Y	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
20	GR	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
21	L	CAN-H	ON	-	0 - 5V
22	P	CAN-L	ON	-	0 - 5V
23	V	Illumination +	-	Park lamps ON	 <p style="text-align: right; font-size: small;">PIIA2344E</p>
24	BR	Illumination -	-	Park lamps ON	 <p style="text-align: right; font-size: small;">PIIA2344E</p>
29	G	Rear fan *1	ON	-	0 - 5V
30	SB	Rear temperature *1	ON	-	0 - 5V
31	P	5V supply *1	ON	-	0 - 5V
33	BR	Rear fan PW/M *1	ON	-	0 - 5V

\*1: If equipped



# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

## Fail-safe

INFOID:000000006934955

### FAIL-SAFE FUNCTION

- If a communication error exists between the front air control's Application Specific Integrated Circuit (ASIC) and Central Processing Unit (CPU), the air conditioning system is controlled under the following conditions:

**Compressor** : OFF  
**Air outlet** : Setting before communication error occurs  
**Air inlet** : Setting before communication error occurs  
**Blower fan speed** : HI  
**Set temperature** : Setting before communication error occurs

- If a communication error exists between the front air control's CPU and the ASIC, the air conditioning system is controlled under the following conditions:

**Compressor** : Control is normal operation  
**Air outlet** : Control is normal operation  
**Air inlet** : Control is normal operation  
**Blower fan speed** : Control is normal operation  
**Set temperature** : Control is normal operation  
**Indicator brightness** : Full brightness  
**Illumination brightness** : Full brightness

- If a communication error exists between the front air control's CPU and the EEPROM (Electrically Erasable Programmable Read-Only Memory), the air conditioning system is controlled using the CPU's default values and a DTC is set.
- If a button becomes stuck for 2 minutes, it will be disabled until the next ignition cycle.

### DTC Inspection Priority Chart

INFOID:000000006934957

If some DTCs are displayed at the same time, perform inspections one by one based on the following priority chart:

Priority	Detected items (DTC)	Diagnostic procedure
1	U1000: CONTROL UNIT (CAN)	<a href="#">HAC-168. "Diagnosis Procedure"</a>
	U1010: CONTROL UNIT (CAN)	<a href="#">HAC-169. "Diagnosis Procedure"</a>
	B27B0: A/C AUTO AMP.	<a href="#">HAC-182. "Diagnosis Procedure"</a>
2	B257B: AMB TEMP SEN (SHORT)	<a href="#">HAC-171. "Diagnosis Procedure"</a>
	B257C: AMB TEMP SEN (OPEN)	<a href="#">HAC-171. "Diagnosis Procedure"</a>
	B2581: EVAP TEMP SEN (SHORT)	<a href="#">HAC-174. "Diagnosis Procedure"</a>
	B2582: EVAP TEMP SEN (OPEN)	<a href="#">HAC-174. "Diagnosis Procedure"</a>
	B2632: DR AIRMIX ACTR (SHORT)	<a href="#">HAC-176. "Diagnosis Procedure"</a>
	B2633: DR AIRMIX ACTR (OPEN)	<a href="#">HAC-176. "Diagnosis Procedure"</a>
	B2636: DR VENT DOOR FAIL	<a href="#">HAC-179. "Diagnosis Procedure"</a>
	B2637: DR B/L DOOR FAIL	<a href="#">HAC-179. "Diagnosis Procedure"</a>
	B2638: DR D/F1 DOOR FAIL	<a href="#">HAC-179. "Diagnosis Procedure"</a>
	B2639: DR DEF DOOR FAIL	<a href="#">HAC-179. "Diagnosis Procedure"</a>
	B263D: FRE DOOR FAIL	<a href="#">HAC-180. "Diagnosis Procedure"</a>
	B263F: REC DOOR FAIL	<a href="#">HAC-180. "Diagnosis Procedure"</a>
B2654: D/F2 DOOR FAIL	<a href="#">HAC-179. "Diagnosis Procedure"</a>	

# FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

## DTC Index

INFOID:000000006934956

DTC	Items (CONSULT screen terms)	Reference
U1000	CAN COMM CIRCUIT	<a href="#">HAC-168, "DTC Logic"</a>
U1010	CONTROL UNIT (CAN)	<a href="#">HAC-169, "DTC Logic"</a>
B257B	AMBIENT SENSOR	<a href="#">HAC-171, "DTC Logic"</a>
B257C	AMBIENT SENSOR	<a href="#">HAC-171, "DTC Logic"</a>
B2581	INTAKE SENSOR	<a href="#">HAC-174, "DTC Logic"</a>
B2582	INTAKE SENSOR	<a href="#">HAC-174, "DTC Logic"</a>
B2632	DR AIRMIX DOOR MOT	<a href="#">HAC-176, "DTC Logic"</a>
B2633	DR AIRMIX DOOR MOT	<a href="#">HAC-176, "DTC Logic"</a>
B2636	DR VENT DOOR FAIL	<a href="#">HAC-176, "DTC Logic"</a>
B2637	DR B/L DOOR FAIL	<a href="#">HAC-176, "DTC Logic"</a>
B2638	DR D/F1 DOOR FAIL	<a href="#">HAC-176, "DTC Logic"</a>
B2639	DR DEF DOOR FAIL	<a href="#">HAC-176, "DTC Logic"</a>
B263D	FRE DOOR FAIL	<a href="#">HAC-180, "DTC Logic"</a>
B263F	REC DOOR FAIL	<a href="#">HAC-180, "DTC Logic"</a>
B2654	D/F2 DOOR FAIL	<a href="#">HAC-176, "DTC Logic"</a>
B27B0	A/C AUTO AMP.	<a href="#">HAC-182, "DTC Logic"</a>

### NOTE:

If all of door motor DTCs (B2632, B2633, B2636, B2637, B2638, B2639, B263D, B263F, AND B2654) are detected, check door motor communication circuit. Refer to [HAC-183, "Description"](#).

# ECM, IPDM E/R, BCM

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

## ECM, IPDM E/R, BCM

### List of ECU Reference

INFOID:000000006934954

ECU	Reference	
ECM	<a href="#">EC-76. "Reference Value"</a> (VQ40DE)	
	<a href="#">EC-513. "Reference Value"</a> (VK56DE)	
	<a href="#">EC-89. "Fail safe"</a> (VQ40DE)	
	<a href="#">EC-525. "Fail-safe"</a> (VK56DE)	
	<a href="#">EC-90. "DTC Inspection Priority Chart"</a> (VQ40DE)	
	<a href="#">EC-526. "DTC Inspection Priority Chart"</a> (VK56DE)	
BCM	<a href="#">BCS-25. "Reference Value"</a>	
	<a href="#">BCS-35. "Fail-safe"</a>	
	<a href="#">BCS-35. "DTC Inspection Priority Chart"</a>	
	<a href="#">BCS-35. "DTC Index"</a>	
	IPDM E/R	<a href="#">PCS-13. "Physical Values"</a>
		<a href="#">PCS-16. "Fail Safe"</a>
<a href="#">PCS-17. "DTC Index"</a>		

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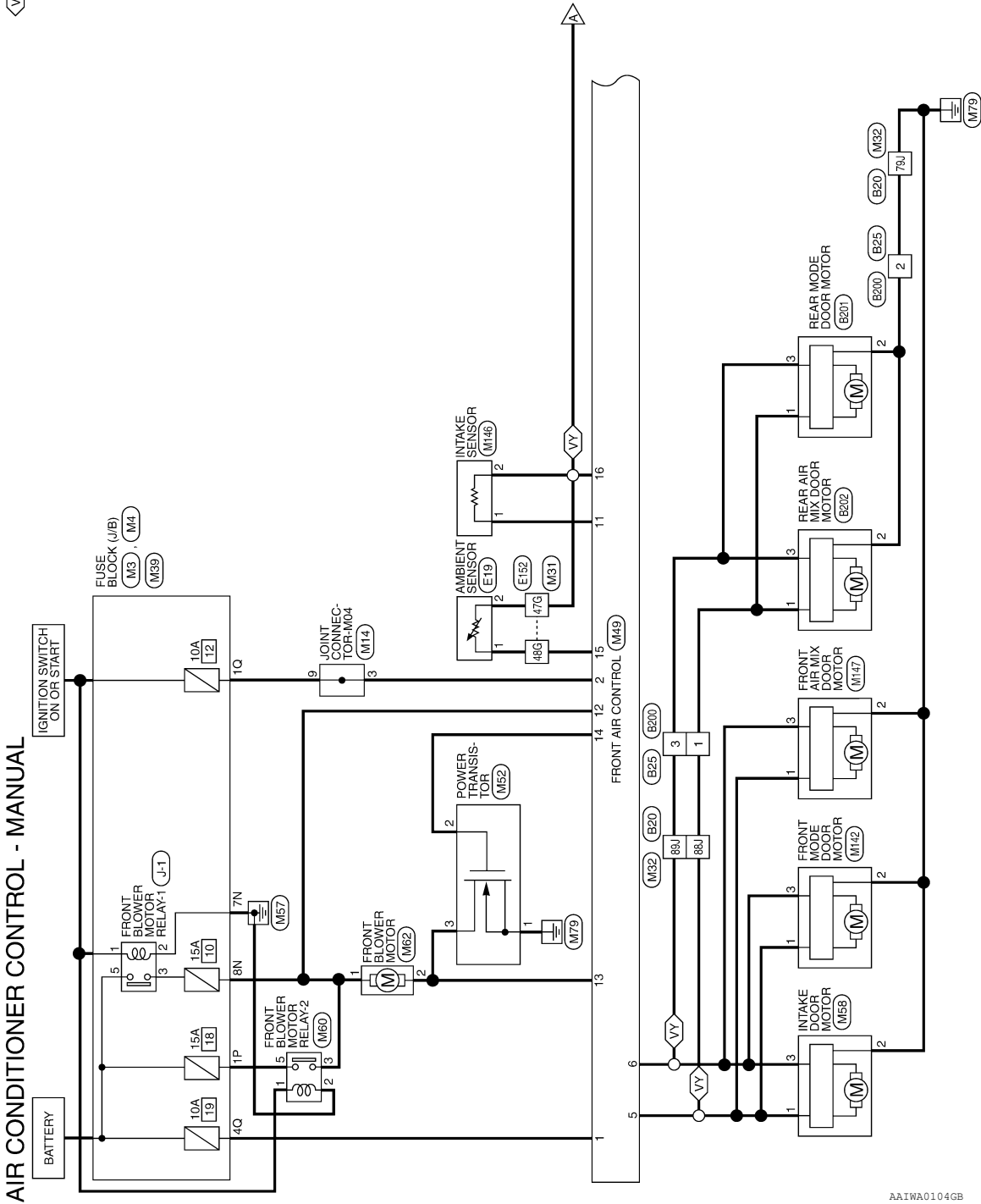
# WIRING DIAGRAM

## AIR CONDITIONER CONTROL

### Wiring Diagram

INFOID:000000006889265

⊞ VY ⊞ : PASSENGER VAN



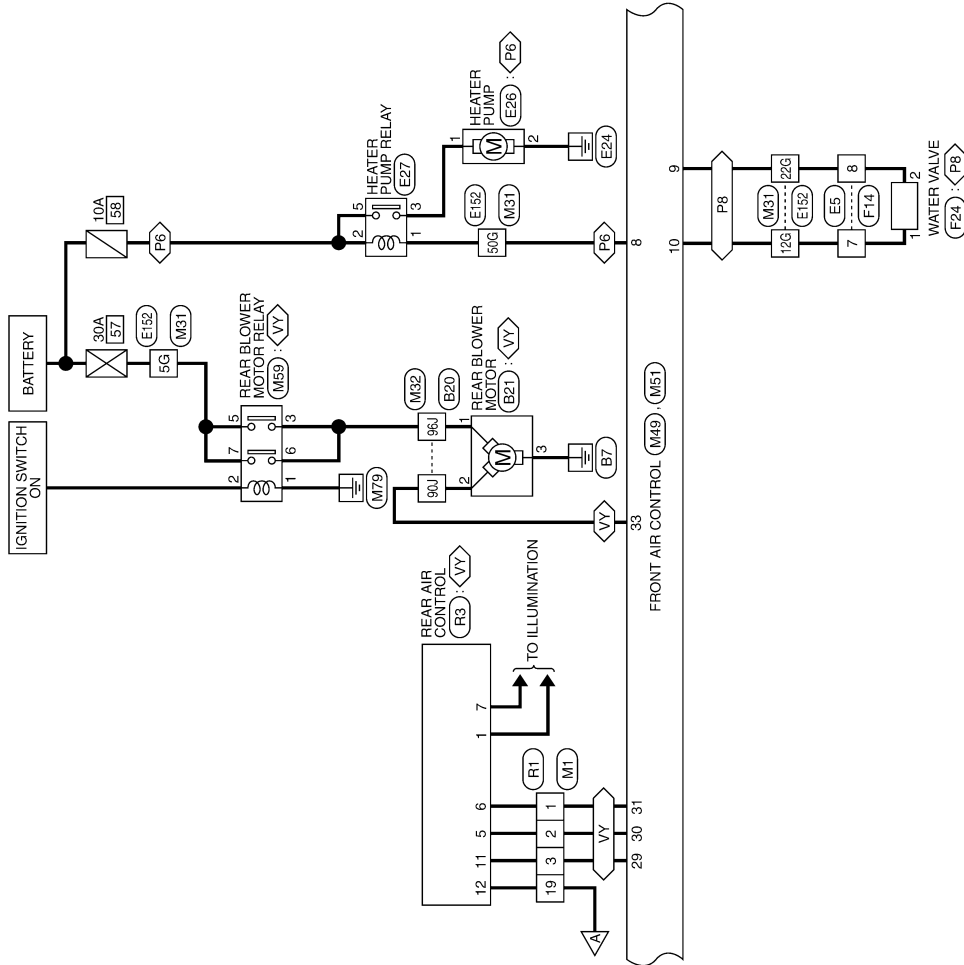
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# AIR CONDITIONER CONTROL

[MANUAL AIR CONDITIONER]

< WIRING DIAGRAM >

P6 : PASSENGER VAN WITH VQ40DE  
 P8 : PASSENGER VAN WITH VK56DE  
 VY : PASSENGER VAN



A  
B  
C  
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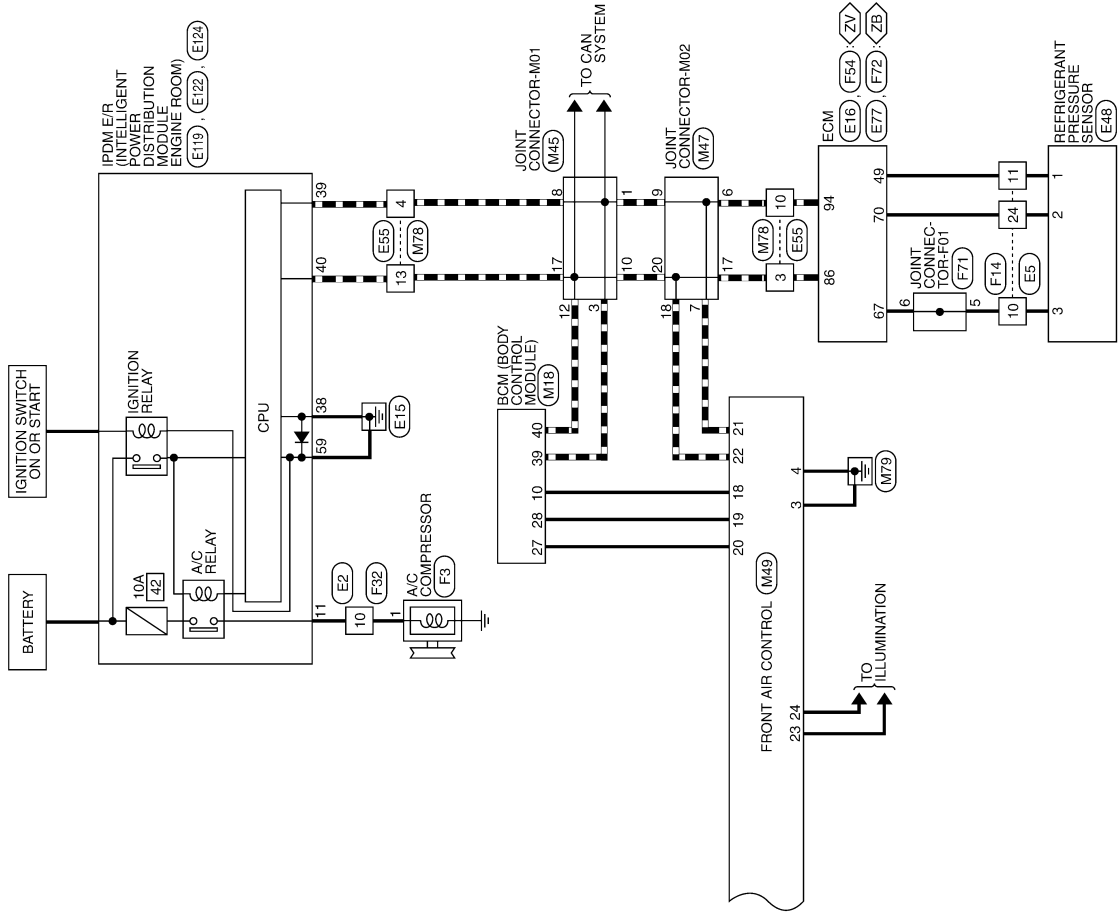
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# AIR CONDITIONER CONTROL

[MANUAL AIR CONDITIONER]

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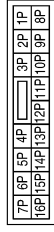
ZB : WITH VK56DE  
ZV : WITH VQ40DE



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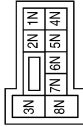
### AIR CONDITIONER CONTROL CONNECTORS - MANUAL

Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



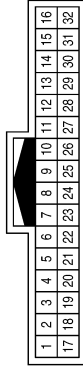
Terminal No.	Color of Wire	Signal Name
1P	L	-

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



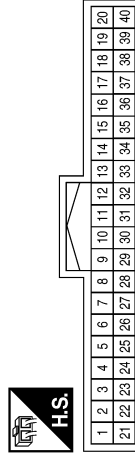
Terminal No.	Color of Wire	Signal Name
7N	B	-
8N	G	-

Connector No.	M1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



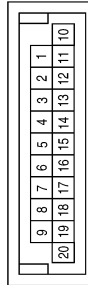
Terminal No.	Color of Wire	Signal Name
1	P	-
2	SB	-
3	G	-
19	B	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	BR	REAR DEFOGGER SW
27	GR	AIR CON SW
28	Y	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M14
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
3	R	-
9	R	-

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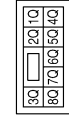
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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

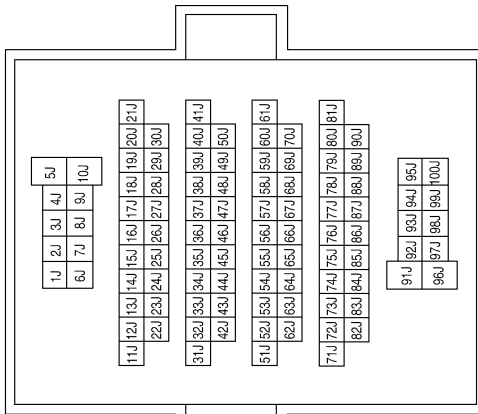
[MANUAL AIR CONDITIONER]

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



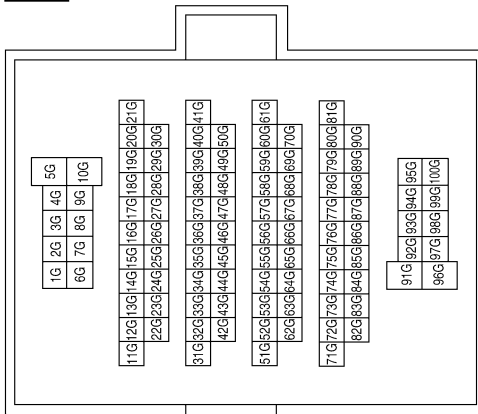
Terminal No.	Color of Wire	Signal Name
1Q	R	-
4Q	Y	-

Connector No.	M32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
79J	B	-
88J	V	-
89J	LG	-
90J	BR	-
96J	W	-

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
5G	Y	-
12G	W	-
22G	Y	-
47G	SB	-
48G	O	-
50G	LG	-

AA1IA0155GB

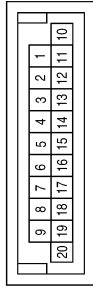


# AIR CONDITIONER CONTROL

[MANUAL AIR CONDITIONER]

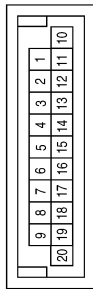
< WIRING DIAGRAM >

Connector No.	M47
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN



Terminal No.	Color of Wire	Signal Name
6	L	-
7	L	-
9	L	-
17	P	-
18	P	-
20	P	-

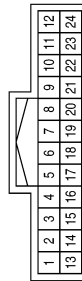
Connector No.	M45
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
3	L	-
8	L	-
10	P	-
12	P	-
17	P	-

Terminal No.	Color of Wire	Signal Name
9	Y	WATER VALVE OPEN (-)
10	W	WATER VALVE CLOSE (+)
11	GR	INT SENS
12	G	VIGN2
13	L	FAN F/B
14	LG	FAN GATE
15	O	AMB SENS
16	SB	SENS GND
17	-	-
18	BR	R. DEF ON
19	Y	FAN ON
20	GR	COMP ON
21	L	CAN-H
22	P	CAN-L
23	V	ILL+
24	BR	ILL-

Connector No.	M49
Connector Name	FRONT AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	Y	BAT
2	R	IGN
3	B	GND
4	B	POWER GND
5	V	VACTR
6	LG	LIN
7	-	-
8	LG	HEATER PUMP

AA11A0156GB

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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

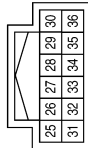
Connector No.	M52
Connector Name	POWER TRANSISTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	-
2	LG	-
3	L	-

Terminal No.	Color of Wire	Signal Name
30	SB	RR TEMP
31	P	SV SUPPLY
32	-	-
33	BR	RR FAN PW/M
34	-	-
35	-	-
36	-	-

Connector No.	M51
Connector Name	FRONT AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
25	-	-
26	-	-
27	-	-
28	-	-
29	G	RR FAN

Connector No.	M60
Connector Name	FRONT BLOWER MOTOR RELAY-2
Connector Color	BLUE



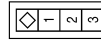
Terminal No.	Color of Wire	Signal Name
1	R	-
2	B	-
3	G	-
5	L	-

Connector No.	M59
Connector Name	REAR BLOWER MOTOR RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	B	-
2	R	-
3	W	-
5	Y	-
6	W	-
7	Y	-

Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

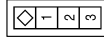
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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

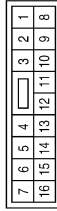
[MANUAL AIR CONDITIONER]

Connector No.	M142
Connector Name	FRONT MODE DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	M78
Connector Name	WIRE TO WIRE
Connector Color	WHITE



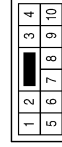
Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
10	L	-
13	P	-

Connector No.	M62
Connector Name	FRONT BLOWER MOTOR
Connector Color	WHITE



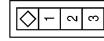
Terminal No.	Color of Wire	Signal Name
1	G	-
2	L	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	W	-

Connector No.	M147
Connector Name	FRONT AIR MIX DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	GR	-
2	SB	-

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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

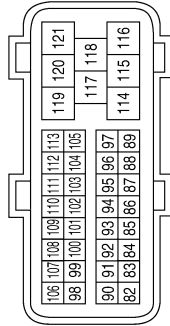
[MANUAL AIR CONDITIONER]

Connector No.	E19
Connector Name	AMBIENT SENSOR
Connector Color	BLACK



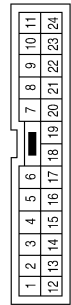
Terminal No.	Color of Wire	Signal Name
1	O	-
2	SB	-

Connector No.	E16
Connector Name	ECM (WITH VQ40DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
7	W	-
8	Y	-
10	B	-
11	O	-
24	GR	-

Connector No.	E48
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	O	-
2	GR	-
3	B	-

Connector No.	E27
Connector Name	HEATER PUMP RELAY
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	O	-
3	BR	-
5	O	-

Connector No.	E26
Connector Name	HEATER PUMP
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	B	-

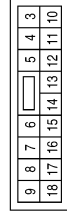
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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

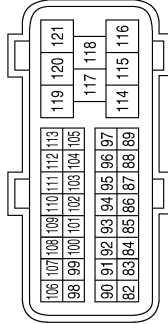
[MANUAL AIR CONDITIONER]

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
11	W	A/C CLUTCH

Connector No.	E77
Connector Name	ECM (WITH VQ56DE)
Connector Color	BLACK



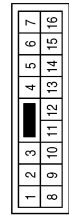
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

Connector No.	E55
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
3	P	-
4	L	-
10	L	-
13	P	-

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

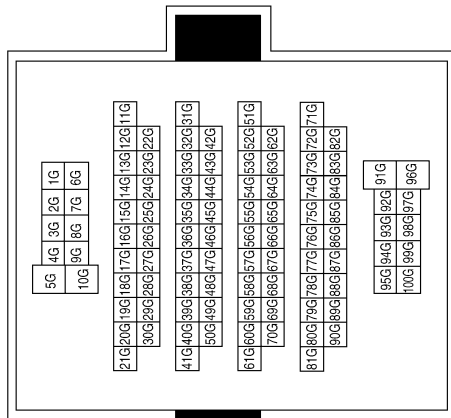
Connector No.	F3
Connector Name	A/C COMPRESSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	W	-

Terminal No.	Color of Wire	Signal Name
5G	Y	-
12G	W	-
22G	Y	-
47G	SB	-
48G	O	-
50G	LG	-

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



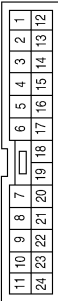
Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	F24
Connector Name	WATER VALVE
Connector Color	GRAY



Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	10	Color of Wire	W	Signal Name	-
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Terminal No.	Color of Wire	Signal Name
1	W	-
2	Y	-

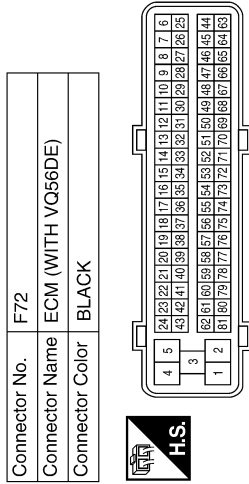
Terminal No.	Color of Wire	Signal Name
7	W	-
8	Y	-
10	B	-
11	O	-
24	GR	-

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# AIR CONDITIONER CONTROL

[MANUAL AIR CONDITIONER]

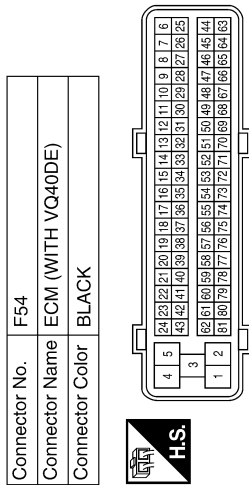
< WIRING DIAGRAM >



Terminal No.	Color of Wire	Signal Name
49	O	AVCC (PDPRES)
67	B	GND-A
70	GR	PDPRES



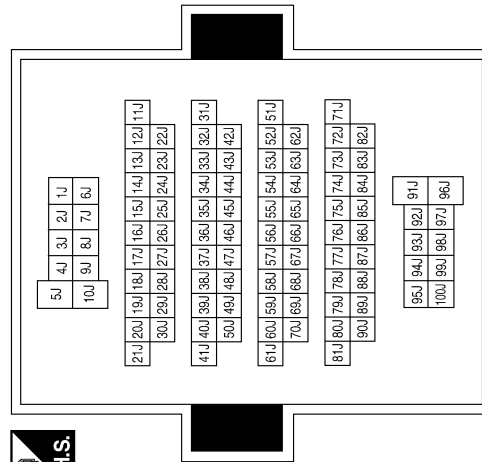
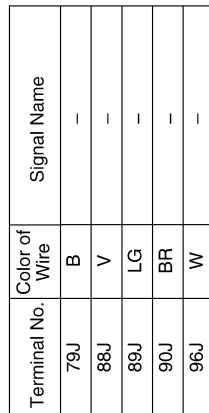
Terminal No.	Color of Wire	Signal Name
5	B	-
6	B	-



Terminal No.	Color of Wire	Signal Name
49	O	AVCC (PDPRES)
67	B	GND-A
70	GR	PDPRES



Terminal No.	Color of Wire	Signal Name
1	W	-
2	BR	-
3	B	-



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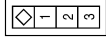
A  
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# AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

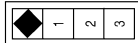
[MANUAL AIR CONDITIONER]

Connector No.	B201
Connector Name	REAR MODE DOOR MOTOR
Connector Color	WHITE



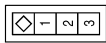
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

Connector No.	B200
Connector Name	WIRE TO WIRE
Connector Color	WHITE



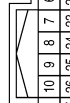
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

Connector No.	B25
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	-
2	B	-
3	LG	-

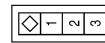
Connector No.	R1
Connector Name	WIRE TO WIRE
Connector Color	WHITE



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

Terminal No.	Color of Wire	Signal Name
1	P	-
2	SB	-
3	G	-
19	B	-

Connector No.	B202
Connector Name	REAR AIR MIX DOOR MOTOR
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	G	-
3	W	-

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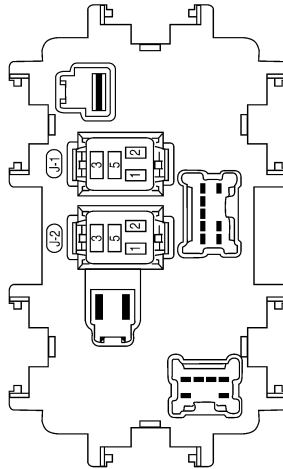
# AIR CONDITIONER CONTROL

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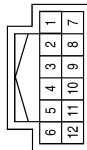
[MANUAL AIR CONDITIONER]

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Connector No.	J-1
Connector Name	FUSE BLOCK (J/B) (FRONT BLOWER MOTOR RELAY-1)
Connector Color	-



Connector No.	R3
Connector Name	REAR AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	V	ILL+
2	-	-
3	-	-
4	-	-
5	SB	RR TEMP SW
6	P	RR SW VCC
7	BR	ILL-
8	-	-
9	-	-
10	-	-
11	G	RR FAN SW
12	B	SENS GND

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# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL AIR CONDITIONER]

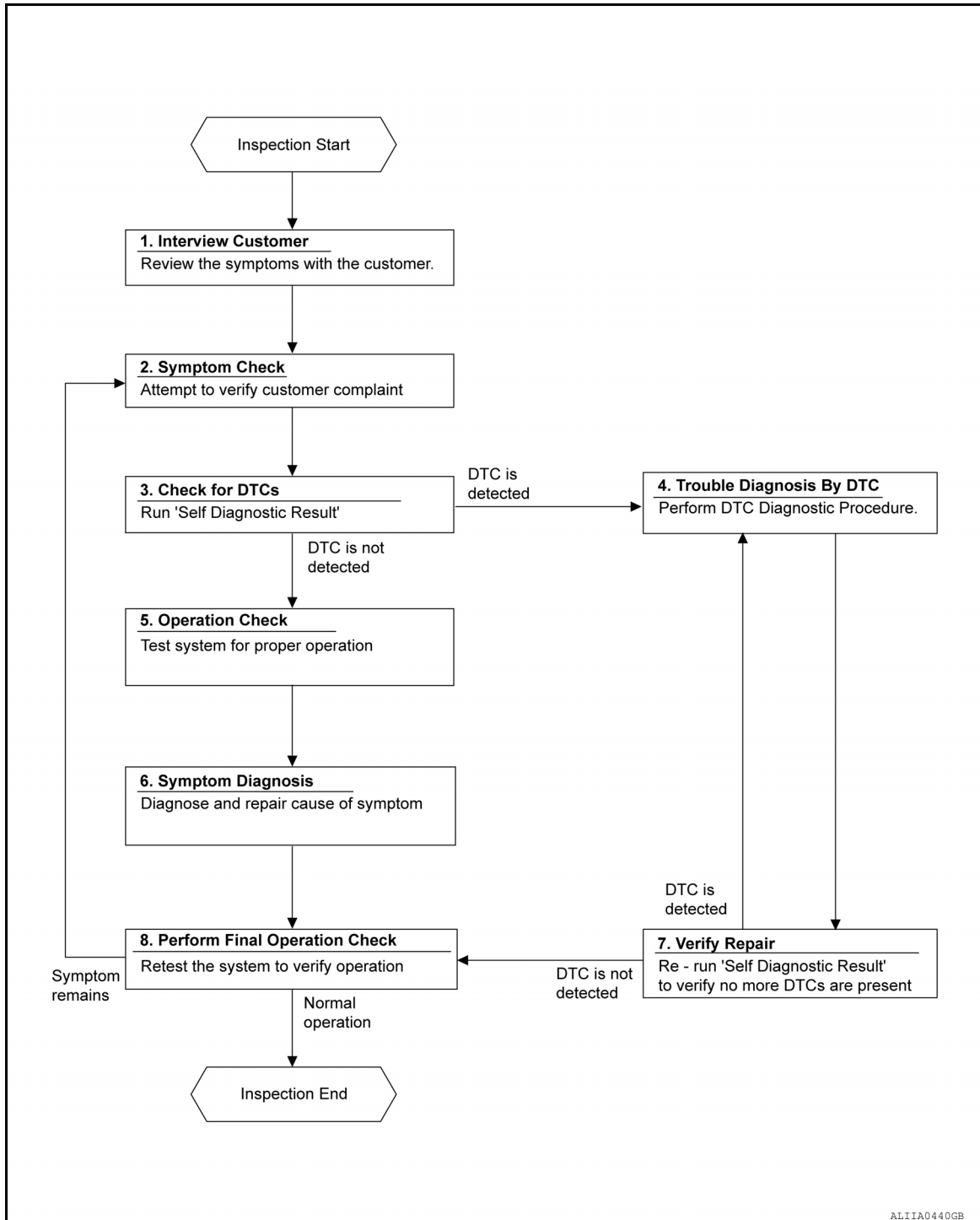
## BASIC INSPECTION

### DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:000000006942722

#### OVERALL SEQUENCE



#### DETAILED FLOW

##### 1. INTERVIEW CUSTOMER

Interview the customer to obtain as much information as possible about the conditions and environment under which the malfunction occurred.

# DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL AIR CONDITIONER]

>> GO TO 2.

## 2. SYMPTOM CHECK

Verify symptoms.

>> GO TO 3.

## 3. CHECK FOR DTCS

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

## 4. PERFORM DTC DIAGNOSTIC PROCEDURE

Perform the diagnostic procedure for the detected DTC. Refer to [HAC-145, "DTC Inspection Priority Chart"](#).

>> GO TO 7.

## 5. OPERATION CHECK

Perform the operation check. Refer to [HAC-164, "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

>> GO TO 6.

## 6. SYMPTOM DIAGNOSIS

Check the symptom diagnosis table. Refer to [HAC-207, "Symptom Table"](#).

>> GO TO 8.

## 7. VERIFY REPAIR.

④ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 8.

## 8. PERFORM FINAL OPERATION CHECK

Perform the operation check. Refer to [HAC-164, "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

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## OPERATION INSPECTION

### FRONT MANUAL AIR CONDITIONING SYSTEM

#### FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure

INFOID:000000006942723

#### DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

**Check condition** : Engine running at normal operating temperature.

**Check condition** : Blower control dial in OFF position.

**Check condition** : REC off (LED extinguished).

**Check condition** : FRE on (LED illuminated). (if equipped)

**Check condition** : VENT selected (LED illuminated).

**Check condition** : DEF off (LED extinguished).

#### OPERATION INSPECTION

##### 1. CHECK BLOWER

1. Rotate the blower control dial clockwise one detent. Blower should operate on low speed.
2. Rotate the blower control dial one detent at a time, and continue checking blower speed until all speeds are checked.
3. Leave blower on maximum speed.

Is the test result normal?

YES >> GO TO 2.

NO >> Refer to [HAC-190. "Diagnosis Procedure"](#).

##### 2. CHECK A/C SWITCH LED

1. Press A/C switch.
2. A/C switch indicator should turn ON.

Is the test result normal?

YES >> GO TO 3.

NO >> Refer to [HAC-205. "FRONT A/C CONTROL : Diagnosis Procedure"](#).

##### 3. CHECK A/C SWITCH

Confirm that the compressor clutch engages (sound or visual inspection).

Is the test result normal?

YES >> GO TO 4.

NO >> Refer to [HAC-203. "Diagnosis Procedure"](#).

##### 4. CHECK FRONT AIR CONTROL MODE LEDS

1. Press D/F (☀), FOOT (⬇), B/L (↺), and VENT (↻), MAX A/C, and DEF (☑).
2. Each button indicator should illuminate.

Is the test result normal?

YES >> GO TO 5.

NO >> Refer to [HAC-205. "FRONT A/C CONTROL : Diagnosis Procedure"](#).

##### 5. CHECK DISCHARGE AIR

1. Press D/F (☀), FOOT (⬇), B/L (↺), and VENT (↻) and DEF (☑).
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-131. "FRONT MANUAL AIR CONDITIONING SYSTEM : Door Control"](#).

Is the test result normal?

YES >> With rear defroster, GO TO 6.

>> Without rear defroster, GO TO 8.






NO >> Refer to [HAC-207. "Symptom Table"](#).

##### 6. CHECK REC LED

# OPERATION INSPECTION

[MANUAL AIR CONDITIONER]

## < BASIC INSPECTION >



1. Press DEF (  ) and make sure LED is off.
2. Make sure VENT (  ) or B/L (  ) is selected.
3. Press REC (  ) switch one time. REC indicator should illuminate.
4. Press REC (  ) switch one more time. REC indicator should go off.

Is the test result normal?

YES >> GO TO 7.

NO >> Refer to [HAC-205, "FRONT A/C CONTROL : Diagnosis Procedure"](#).

## 7. CHECK INTAKE DOOR OPERATION






1. Press REC (  ) switch one time. REC indicator should illuminate.
2. Listen to the sound of the air coming out of the vent.
3. Press REC (  ) switch one more time. REC indicator should go off.
4. There should be an audible change to the sound of the air flowing out of the vent.

Is the test result normal?

YES >> GO TO 10.

NO >> Refer to [HAC-180, "Diagnosis Procedure"](#).

## 8. CHECK REC AND FRE LEDS



1. Press DEF (  ) and make sure LED is off.
2. Make sure VENT (  ) or B/L (  ) is selected.
3. Press REC (  ) switch one time. REC indicator should illuminate and FRE indicator should go off.
4. Press FRE (  ) switch one time. FRE indicator should illuminate and REC indicator should go off.

Is the test result normal?

YES >> GO TO 9.

NO >> Refer to [HAC-205, "FRONT A/C CONTROL : Diagnosis Procedure"](#).

## 9. CHECK INTAKE DOOR OPERATION

1. Press REC (  ) switch one time.
2. Listen to the sound of the air coming out of the vent.
3. Press FRE (  ) switch one time.
4. There should be an audible change to the sound of the air flowing out of the vent.

Is the test result normal?

YES >> GO TO 10.

NO >> Refer to [HAC-180, "Diagnosis Procedure"](#).

## 10. CHECK TEMPERATURE DECREASE

1. Press A/C switch.
2. Rotate temperature control dial counterclockwise until maximum cold.
3. Check for cold air at selected discharge air outlets.

Is the test result normal?

YES >> GO TO 11.

NO >> Refer to [HAC-208, "Component Function Check"](#).

## 11. CHECK TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise until maximum hot.
2. Check for hot air at appropriate discharge air outlets.

Is the test result normal?

YES >> Inspection End.

NO >> Refer to [HAC-210, "Component Function Check"](#).

## REAR AIR CONDITIONING SYSTEM

### REAR AIR CONDITIONING SYSTEM : Work Procedure

INFOID:000000008067663

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

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

# OPERATION INSPECTION

< BASIC INSPECTION >

[MANUAL AIR CONDITIONER]

## CHECKING REAR BLOWER MOTOR

1. Turn the ignition switch ON.
2. Rotate rear air control blower control dial to low speed.
3. Rotate the blower control dial clockwise and continue checking blower speed until all speeds are checked.
4. Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for [HAC-195, "Diagnosis Procedure"](#).

If OK, continue with next check.

## CHECKING REAR TEMPERATURE DECREASE

1. Rotate the rear air control (rear) temperature control dial counterclockwise to maximum cold.
2. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-106, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-83, "Diagnosis Procedure"](#).

If OK, continue with next check.

## CHECKING REAR TEMPERATURE INCREASE

1. Rotate the rear air control temperature control dial clockwise to maximum heat.
2. Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-108, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-83, "Diagnosis Procedure"](#).

If NG, go to trouble diagnosis procedure for [HAC-108, "Component Function Check"](#).

If all operational checks are OK (inspection results are normal), go to [HAC-50, "Workflow"](#) and perform tests as outlined. If symptom appears, refer to [HAC-104, "Symptom Table"](#) and perform applicable trouble diagnosis procedures.

# SYSTEM SETTING

< BASIC INSPECTION >

[MANUAL AIR CONDITIONER]

## SYSTEM SETTING

### Foot Position Setting Trimmer

INFOID:000000006934951

#### Description

In the FOOT mode, the air blowing to the DEF can be turned ON/OFF.

#### How to set

Using CONSULT, perform "BLOW SET" in "WORK SUPPORT" of HVAC.

Work support items	Display	DEF door position
		Manual control
BLOW SET	Mode 1	CLOSE
	Mode 2 (initial status)	OPEN

#### NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the discharge air mix ratio in FOOT mode may be cancelled.

A  
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O  
P

HAC

## DTC/CIRCUIT DIAGNOSIS

### U1000 CAN COMM CIRCUIT

#### Description

INFOID:000000006948893

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to [LAN-14, "How to Use CAN Communication Signal Chart"](#).

#### DTC Logic

INFOID:000000006948894

#### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
U1000	CAN COMM CIRCUIT	When front air control is not transmitting or receiving CAN communication signal for 2 or more seconds	CAN communication system

#### Diagnosis Procedure

INFOID:000000006948895

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Turn ignition switch ON and wait for 2 or more seconds.
2. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is "CAN COMM CIRCUIT" displayed?

- YES >> Perform trouble diagnosis for the CAN communication system. Refer to [LAN-15, "Trouble Diagnosis Flow Chart"](#).
- NO >> Perform the intermittent malfunction diagnosis. Refer to [GI-39, "Intermittent Incident"](#).



# U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## U1010 CONTROL UNIT (CAN)

### Description

INFOID:000000006948896

Initial diagnosis of front air control.

### DTC Logic

INFOID:000000006948897

### DTC DETECTION LOGIC

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of front air control	Front air control

### Diagnosis Procedure

INFOID:000000006948898

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.

Is DTC No. "U1010" displayed?

- YES >> Replace front air control Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).
- NO >> Inspection End.

A  
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P

HAC

# B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B257B, B257C AMBIENT SENSOR

### Description

INFOID:000000006948899

#### Ambient Sensor

- The ambient sensor is installed behind the grill, in front of the radiator, on the center core support.
- The ambient sensor is a thermistor. The resistance of the sensor changes with temperature, and the front air control converts this analog data into a digital count, ranging from 10 to 95 AD (Analog to Digital) counts. Data is transmitted on the CAN in AD counts, but always reported in °C. A conversion algorithm is used to convert °C to °F. The range of the sensor is from -30°C (-22°F) to 55°C (131°F).

AD Counts (sent on CAN)	Deg °C	AD Counts (sent on CAN)	Deg °C
10	-30.00	53	13.00
11	-29.00	54	14.00
12	-28.00	55	15.00
13	-27.00	56	16.00
14	-26.00	57	17.00
15	-25.00	58	18.00
16	-24.00	59	19.00
17	-23.00	60	20.00
18	-22.00	61	21.00
19	-21.00	62	22.00
20	-20.00	63	23.00
21	-19.00	64	24.00
22	-18.00	65	25.00
23	-17.00	66	26.00
24	-16.00	67	27.00
25	-15.00	68	28.00
26	-14.00	69	29.00
27	-13.00	70	30.00
28	-12.00	71	31.00
29	-11.00	72	32.00
30	-10.00	73	33.00
31	-9.00	74	34.00
32	-8.00	75	35.00
33	-7.00	76	36.00
34	-6.00	77	37.00
35	-5.00	78	38.00
36	-4.00	79	39.00
37	-3.00	80	40.00
38	-2.00	81	41.00
39	-1.00	82	42.00
40	-0.00	83	43.00
41	1.00	84	44.00
42	2.00	85	45.00
43	3.00	86	46.00

# B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

AD Counts (sent on CAN)	Deg °C	AD Counts (sent on CAN)	Deg °C
44	4.00	87	47.00
45	5.00	88	48.00
46	6.00	89	49.00
47	7.00	90	50.00
48	8.00	91	51.00
49	9.00	92	52.00
50	10.00	93	53.00
51	11.00	94	54.00
52	12.00	95	55.00

## Ambient temperature input process

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

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

## DTC Logic

INFOID:000000006948900

## DTC DETECTION LOGIC

### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).
- If there is an open circuit in the ambient sensor, the front air control registers extreme cold [-30°C (-22°F)] and adjusts the temperature control warmer.

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B257B	AMB TEMP SEN (SHORT)	Detected temperature at ambient sensor 55°C (131°F) or more	<ul style="list-style-type: none"> <li>• Ambient sensor</li> <li>• Front air control</li> <li>• Harness and connector (Ambient sensor circuit is open, or there is a short in the circuit)</li> </ul>
B257C	AMB TEMP SEN (OPEN)	Detected temperature at ambient sensor -30°C (-22°F) or less	

## DTC CONFIRMATION PROCEDURE

### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

### NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).
- If there is an open circuit in the ambient sensor, the front air control registers extreme cold [-30°C (-22°F)] and adjusts the temperature control warmer.

Is DTC No. "B257B" or "B257C" displayed?

- YES >> Perform trouble diagnosis for the ambient sensor. Refer to [HAC-171, "Diagnosis Procedure"](#).  
 NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000006948901

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

## B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

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

---

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E19 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

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

---

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E19 terminal 2 and front air control harness connector M49 terminal 16.

**2 - 16 : Continuity should exist.**

Is the inspection result normal?

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

### 3. CHECK AMBIENT SENSOR

---

Check ambient sensor. Refer to [HAC-172. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).  
NO >> Replace ambient sensor. Refer to [HAC-214. "Removal and Installation"](#).

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

---

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E19 terminal 1 and front air control harness connector M49 terminal 15.

**1 - 15 : Continuity should exist.**

4. Check continuity between ambient sensor harness connector E19 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> Replace front air control Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).  
NO >> Repair harness or connector.

## Component Inspection

INFOID:000000006948902

### 1. CHECK AMBIENT SENSOR

---

1. Turn ignition switch OFF.
2. Disconnect ambient sensor connector.
3. Check resistance between ambient sensor terminals.

# B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	
1	2	-15 (5)	12.73
		-10 (14)	9.92
		-5 (23)	7.80
		0 (32)	6.19
		5 (41)	4.95
		10 (50)	3.99
		15 (59)	3.24
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		35 (95)	1.51
		40 (104)	1.27
		45 (113)	1.07

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace ambient sensor. Refer to [HAC-214. "Removal and Installation"](#).

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HAC

# B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B2581, B2582 INTAKE SENSOR

### Description

INFOID:000000006948907

#### Intake Sensor

- The intake sensor is located on the evaporator.
- It converts air temperature after it passes through the evaporator into a resistance value which is then input to the front air control

### DTC Logic

INFOID:000000006948908

#### DTC DETECTION LOGIC

##### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168. "DTC Logic"](#) or [HAC-169. "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2581	EVAP TEMP SEN (SHORT)	Detected temperature at intake sensor 55°C (131°F) or more	• Intake sensor • Front air control • Harness and connector (Intake sensor circuit is open, or there is a short in the circuit)
B2582	EVAP TEMP SEN (OPEN)	Detected temperature at intake sensor -30°C (-22°F) or less	

#### DTC CONFIRMATION PROCEDURE

##### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

##### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168. "DTC Logic"](#) or [HAC-169. "DTC Logic"](#).

##### Is DTC No. "B2581" or "B2582" displayed?

- YES >> Perform trouble diagnosis for the intake sensor. Refer to [HAC-174. "Diagnosis Procedure"](#).  
NO >> Inspection End.

### Diagnosis Procedure

INFOID:000000006948909

Regarding Wiring Diagram information, refer to [HAC-148. "Wiring Diagram"](#).

##### 1. CHECK INTAKE SENSOR POWER SUPPLY

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M146 terminal 1 and ground.

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

##### Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 4.

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 2 and front air control harness connector M49 terminal 16.

# B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

**2 - 16** : **Continuity should exist.**

Is the inspection result normal?

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

## 3.CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-175. "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).
- NO >> Replace intake sensor. Refer to [HAC-215. "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 1 and front air control harness connector M49 terminal 11.

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

4. Check continuity between intake sensor harness connector M146 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).
- NO >> Repair harness or connector.

## Component Inspection

INFOID:000000006948910

HAC

## 1.CHECK INTAKE SENSOR

1. Turn ignition switch OFF.
2. Disconnect intake sensor connector.
3. Check resistance between intake sensor terminals.

Terminal		Condition	Resistance kΩ
		Temperature °C (°F)	
1	2	-15 (5)	18.63
		-10 (14)	14.15
		-5 (23)	10.86
		0 (32)	8.41
		5 (41)	6.58
		10 (50)	5.19
		15 (59)	4.12
		20 (68)	3.30
		25 (77)	2.67
		30 (86)	2.17
		35 (95)	1.78
		40 (104)	1.46
45 (113)	1.21		

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Replace intake sensor. Refer to [HAC-215. "Removal and Installation"](#).

# B2632, B2633 FRONT AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B2632, B2633 FRONT AIR MIX DOOR MOTOR

### Description

INFOID:000000006948915

### COMPONENT DESCRIPTION

Front Air Mix Door Motor

- The front air mix door motor is attached to the heater & cooling unit assembly.
- The front air mix door motor consists of a motor, gears, shaft, a Position Balanced Resistor (PBR), and a Local Control Unit (LCU).
- The motor rotates so that the front air mix door is opened or closed to a position set by the front air control.
- The LCU determines the front air mix door position via feedback from the PBR and sends the position information to the front air control.

### DTC Logic

INFOID:000000006948916

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2632	DR AIRMIX ACTR (SHORT)	Air mix door PBR position 5% or less	<ul style="list-style-type: none"><li>• Front air mix door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted) (Front air mix door motor is open or shorted)</li></ul>
B2633	DR AIRMIX ACTR (OPEN)	Air mix door PBR position 95% or more	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

Is DTC No. "B2632" or "B2633" displayed?

YES >> Perform trouble diagnosis for the front air mix door motor. Refer to [HAC-176, "Diagnosis Procedure"](#).

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Make sure the engine is running and is at normal operating temperature.
2. Turn the temperature control dial to the full hot position.
3. Check for warm air at discharge air outlets.
4. Operate the A/C compressor.
5. Turn the temperature control dial to the full cool position.
6. Check for cool air at air discharge outlets.

Does it operate normally?

YES >> Inspection End.

NO >> Check front air mix door motor installation, and repair or replace the malfunctioning parts.

### Diagnosis Procedure

INFOID:000000006948917

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).



# B2632, B2633 FRONT AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## 1. CHECK FRONT AIR MIX DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between air mix door motor harness connector M147 terminal 1 and ground.

**1 - Ground : Battery Voltage**

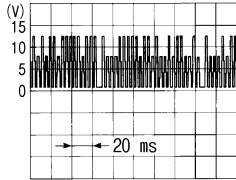
Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair the harnesses or connectors.

## 2. CHECK SIGNAL FOR FRONT AIR MIX DOOR MOTOR

Check the output waveform (LAN signal) between front air mix door motor harness connector M147 terminal 3 and ground using an oscilloscope.

(+)		(-)	Voltage
Connector	Terminal	—	
M147	3	Ground	 SJIA1453J

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair the harnesses or connectors.

## 3. CHECK FRONT AIR MIX DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air mix door motor connector.
3. Check continuity between front air mix door motor harness connector M147 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace front air mix door motor. Refer to [HAC-219, "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor"](#).

NO >> Repair harness or connector.

# B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

### Description

INFOID:000000006948921

### COMPONENT DESCRIPTION

#### Front Mode Door Motor

- The front mode door motor is attached to the heater & cooling unit assembly.
- The front mode door motor consists of a motor, gears, shaft, a Position Balanced Resistor (PBR), and a Local Control Unit (LCU).
- Motor rotation is conveyed to a set of links which activate the defroster, vent, and floor mode doors. It rotates so that air is discharged from the outlet set by the front air control.
- The LCU determines the front mode door position via feedback from the PBR and sends the position information to the front air control.

### DTC Logic

INFOID:000000006948922

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2636	DR VENT DOOR FAIL	When the malfunctioning door position is detected at VENT position	<ul style="list-style-type: none"><li>• Front mode door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li></ul> (Front mode door motor is open or shorted)
B2637	DR B/L DOOR FAIL	When the malfunctioning door position is detected at B/L position	
B2638	DR D/F1 DOOR FAIL	When the malfunctioning door position is detected at FOOT position	
B2639	DR DEF DOOR FAIL	When the malfunctioning door position is detected at DEF position	
B2654	D/F2 DOOR FAIL	When the malfunctioning door position is detected at D/F position	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

Is DTC No. "B2636", "B2637", "B2638", "B2639", "B2654" or "B2655" displayed?

YES >> Perform trouble diagnosis for the front mode door motor. Refer to [HAC-179, "Diagnosis Procedure"](#).

NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Press each mode switch and the DEF switch.
2. Confirm that air discharge comes out according to the door control table. Refer to [HAC-131, "FRONT MANUAL AIR CONDITIONING SYSTEM : Door Control"](#).

Does it operate normally?

YES >> Inspection End.

NO >> Check front mode door motor installation, and repair or replace the malfunctioning parts. Refer to [HAC-218, "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).

# B2636, B2637, B2638, B2639, B2654, B2655 FRONT MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## Diagnosis Procedure

INFOID:00000006948923

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

### 1. CHECK FRONT MODE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between front mode door motor harness connector M142 terminal 1 and ground.

**1 - Ground : Battery Voltage**

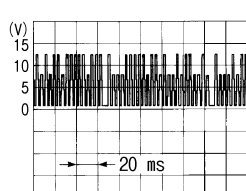
Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

### 2. CHECK SIGNAL FOR FRONT MODE DOOR MOTOR

Check the output waveform (LAN signal) between the front mode door motor harness connector M142 terminal 3 and ground using an oscilloscope.

(+)		(-)	Voltage
Connector	Terminal	—	
M142	3	Ground	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

### 3. CHECK FRONT MODE DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front mode door motor connector.
3. Check continuity between front mode door motor harness connector M142 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace front mode door motor. Refer to [HAC-218, "MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor"](#).

NO >> Repair harness or connector.

# B263D, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B263D, B263F INTAKE DOOR MOTOR

### Description

INFOID:000000006948924

### COMPONENT DESCRIPTION

#### Intake Door Motor

- The intake door motor is attached to the blower unit.
- The intake door motor consists of a motor, gears, shaft, a Position Balanced Resistor (PBR), and a Local Control Unit (LCU).
- Motor rotation is conveyed to a lever which activates the intake door. It rotates so that air is drawn from inlets set by the front air control
- The LCU determines the intake door position via feedback from the PBR and sends the position information to the front air control.

### DTC Logic

INFOID:000000006948925

### DTC DETECTION LOGIC

#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B263D	FRE DOOR FAIL	When the malfunctioning intake door position is detected at FRE position	<ul style="list-style-type: none"><li>• Intake door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li><li>(Intake door motor is open or shorted)</li></ul>
B263F	REC DOOR FAIL	When the malfunctioning intake door position is detected at REC position	

### DTC CONFIRMATION PROCEDURE

#### 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.




#### NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

Is DTC No. "B263D", "B263E", or "B263F" displayed?

- YES >> Perform trouble diagnosis for the intake door motor. Refer to [HAC-180, "Diagnosis Procedure"](#).  
NO >> GO TO 2.

#### 2. FUNCTION INSPECTION

1. Turn the blower control dial to the highest speed.
2. Press the REC (  ) switch.
3. Listen for intake door position change (slight change of blower sound can be heard).
4. Press the FRE (  ) switch (if equipped); otherwise, press the REC (  ) switch again.
5. Listen for intake door position change (slight change of blower sound can be heard).

Does it operate normally?

- YES >> Inspection End.  
NO >> Check intake door motor installation and repair or replace the malfunctioning parts. Refer to [HAC-218, "INTAKE DOOR MOTOR : Removal and Installation"](#).

### Diagnosis Procedure

INFOID:000000006948926

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

# B263D, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## 1. CHECK INTAKE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between intake door motor harness connector M58 terminal 1 and ground.

**1 - Ground : Battery Voltage**

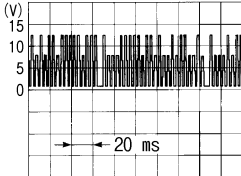
Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

## 2. CHECK SIGNAL FOR INTAKE DOOR MOTOR

Check the output waveform (LAN signal) between the intake door motor harness connector M58 terminal 3 and ground using an oscilloscope.

(+)		(-)	Voltage
Connector	Terminal	—	
M58	3	Ground	 SJIA1453J

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

## 3. CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Check continuity between intake door motor harness connector M58 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace intake door motor. Refer to [HAC-218, "INTAKE DOOR MOTOR : Removal and Installation"](#).

NO >> Repair harness or connector.

# B27B0 FRONT AIR CONTROL

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## B27B0 FRONT AIR CONTROL

### DTC Logic

INFOID:000000006920791

#### DTC DETECTION LOGIC

##### NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to [HAC-168, "DTC Logic"](#).
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. [HAC-169, "DTC Logic"](#).

DTC	Items (CONSULT screen terms)	DTC detection condition	Possible cause
B27B0	FRONT AIR CONTROL	Front air control EEPROM system is malfunctioning.	Front air control

#### DTC CONFIRMATION PROCEDURE

##### 1. PERFORM DTC CONFIRMATION PROCEDURE

###### Ⓟ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

###### Is DTC detected?

- YES >> Refer to [HAC-182, "Diagnosis Procedure"](#).  
NO >> Inspection End.

#### Diagnosis Procedure

INFOID:000000006920792

##### 1. PERFORM SELF DIAGNOSTIC

###### Ⓟ With CONSULT

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Touch "ERASE".
4. Turn ignition switch OFF.
5. Turn ignition switch ON.
6. Perform "DTC CONFIRMATION PROCEDURE". Refer to [HAC-182, "DTC Logic"](#).

###### Is DTC detected again?

- YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).  
NO >> Inspection End.

# DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## DOOR MOTOR COMMUNICATION CIRCUIT

### Description

INFOID:000000006956110

The mode door motor, air mix door motor, and intake door motor receive position commands from the front air control and report actual door position back via an LCU (Local Control Unit) installed inside each motor. Each door motor LCU has a unique address. The front air control communicates with the door motor LCUs by using each door's unique communication address. The front air control sends requested door position commands to each door motor LCU via a Local Interconnect Network (LIN) communication line using a communication protocol called LIN 2.0. The LIN-Bus is a vehicle bus standard used within current automotive network architectures. The LIN specification is enforced by the LIN-consortium, with the first exploited version being 1.1, released in 1999. Since then the specification has evolved to version 2.1 to meet current networking needs. The LCUs read the door positions from Position Balanced Resistors (PBR), also part of the motor, and returns that information to the front air control. The LCUs switch the polarity of the circuits connected to the DC motors to drive the motor forward or backward as requested by the front air control. The mode door has 5 expected positions and, therefore, can set up to 5 DTCs if the expected position is not reported back to the front air control. The air mix door motor and the intake door motor both have 2 DTCs related to being out of range. The front air control provides a voltage signal and receives a signal return from the LIN. The 3 motors share a common ground which completes the LIN infrastructure. If the signal return line shorts to ground or has an open before reaching any of the LCUs, the front air control will trigger DTCs for all the motors. Loss of the supplied voltage and common ground will also trigger all the motor DTCs.

### DTC Logic

INFOID:000000006956111

#### DTC DETECTION LOGIC

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168. "DTC Logic"](#) or [HAC-169. "DTC Logic"](#).

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DTC	Items (CONSULT screen terms)	Diagnostic item is detected when...	Possible cause
B2632	DR AIRMIX ACTR (SHORT)	Air mix door PBR position 5% or less	<ul style="list-style-type: none"><li>• Air mix door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li><li>(Air mix door motor is open or shorted)</li></ul>
B2633	DR AIRMIX ACTR (OPEN)	Air mix door PBR position 95% or more	
B2636	DR VENT DOOR FAIL	When the malfunctioning door position is detected at VENT position	<ul style="list-style-type: none"><li>• Mode door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li><li>(Mode door motor is open or shorted)</li></ul>
B2637	DR B/L DOOR FAIL	When the malfunctioning door position is detected at B/L position	
B2638	DR D/F1 DOOR FAIL	When the malfunctioning door position is detected at FOOT position	
B2639	DR DEF DOOR FAIL	When the malfunctioning door position is detected at DEF position	
B2654	D/F2 DOOR FAIL	When the malfunctioning door position is detected at D/F position	
B263D	FRE DOOR FAIL	When the malfunctioning intake door position is detected at FRE position	<ul style="list-style-type: none"><li>• Intake door motor</li><li>• Front air control</li><li>• Harness and connector (LIN communication line is open or shorted)</li><li>(Intake door motor is open or shorted)</li></ul>
B263F	REC DOOR FAIL	When the malfunctioning intake door position is detected at REC position	

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#### DTC CONFIRMATION PROCEDURE

# DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## 1. CHECK WITH SELF-DIAGNOSIS FUNCTION OF CONSULT

1. Using CONSULT, perform "SELF-DIAGNOSIS RESULTS" of HVAC.
2. Check if any DTC No. is displayed in the self-diagnosis results.

**NOTE:**

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to [HAC-168, "DTC Logic"](#) or [HAC-169, "DTC Logic"](#).

Are DTCs No. "B2632", "B2633", "B2636", "B2637", "B2638", "B2639", "B2654", "B263D", and "B263F" displayed?

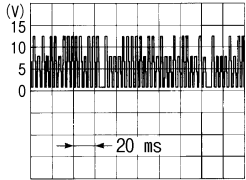
- YES >> Perform trouble diagnosis for the door motor communications. Refer to [HAC-176, "Diagnosis Procedure"](#).
- NO >> Inspection End.

## Diagnosis Procedure

INFOID:000000006956109

## 1. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL

1. Turn ignition switch ON.
2. Check output waveform between front air control harness connector and ground with the oscilloscope.

+		-	Output waveform
Front air control			
Connector	Terminal		
M49	6	Ground	 <p style="text-align: right; font-size: small;">SJIA1453J</p>

Is the inspection result normal?

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

## 2. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect front air control connector and intake door motor connector.
3. Check continuity between front air control harness connector and intake door motor harness connector.

Front air control		Intake door motor		Continuity
Connector	Terminal	Connector	Terminal	
M49	6	M58	3	YES

Is the inspection result normal?

- YES >> Inspection End.  
 NO >> Repair harness or connector.

## 3. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT FOR SHORT

1. Disconnect front air control connector.
2. Disconnect following connectors.
  - Air mix door motor
  - Mode door motor
  - Intake door motor
3. Check continuity between front air control harness connector and ground.



# DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Front air control		—	Continuity
Connector	Terminal		
M49	6	Ground	NO

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

## 4. CHECK EACH DOOR MOTOR POWER SUPPLY

1. Connect front air control connector.
2. Turn ignition switch ON.
3. Check voltage between each motor connector and ground.

Motor	Connector	Terminal	—	Voltage
Air mix door	M147	1	Ground	Battery voltage
Mode door	M142	1		
Intake door	M58	1		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## 5. CHECK EACH DOOR MOTOR GROUND

1. Turn ignition switch OFF.
2. Check continuity between each motor connector and ground.

Motor	Connector	Terminal	—	Continuity
Air mix door	M147	3	Ground	YES
Mode door	M142	3		
Intake door	M58	3		

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

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# REAR AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## REAR AIR MIX DOOR MOTOR

### Diagnosis Procedure

INFOID:000000008059022

#### 1. CHECK REAR AIR MIX DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between rear air mix door motor harness connector and ground.

+		-	Voltage
Rear air mix door motor			
Connector	Terminal	Ground	9.5 – 13.5 V
B202	1		

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 5.

#### 2. CHECK REAR AIR MIX DOOR MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and front air control connector.
3. Check continuity between rear air mix door motor harness connector and ground.

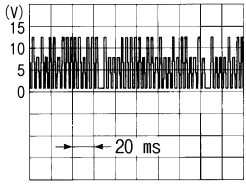
Rear air mix door motor		—	Continuity
Connector	Terminal		
B202	2	Ground	Yes

Is the inspection result normal?

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

#### 3. CHECK REAR AIR MIX DOOR MOTOR LAN SIGNAL

1. Connect rear air mix door motor and front air control connector.
2. Turn ignition switch ON.
3. Confirm output waveform between rear air mix door motor harness connector and ground using oscilloscope.

+		-	Output waveform
Rear air mix door motor			
Connector	Terminal	Ground	
B202	3		

Is the inspection result normal?

- YES >> GO TO 4.  
NO >> GO TO 6.

#### 4. CHECK INSTALLATION OF REAR AIR MIX DOOR MOTOR

Check rear air mix door motor is properly installed.

Is the inspection result normal?

- YES >> Replace rear air mix door motor. Refer to [HAC-219, "AIR MIX DOOR MOTOR : Removal and Installation - Rear Air Mix Door Motor \(If Equipped\)"](#).

# REAR AIR MIX DOOR MOTOR

[MANUAL AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

## 5. CHECK REAR AIR MIX DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and A/C amp. connector.
3. Check continuity between rear air mix door motor harness connector and front air control connector.

Rear air mix door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B202	1	M49	5	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## 6. CHECK REAR AIR MIX DOOR MOTOR LAN SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear air mix door motor and A/C amp. connector.
3. Check continuity between rear air mix door motor harness connector and A/C amp. harness connector.

Rear air mix door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B202	3	M49	6	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

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# REAR MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## REAR MODE DOOR MOTOR

### Diagnosis Procedure

INFOID:000000008059023

#### 1. CHECK REAR MODE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between rear mode door motor harness connector and ground.

+		-	Voltage
Rear mode door motor			
Connector	Terminal		
B201	1	Ground	9.5 – 13.5 V

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> GO TO 5.

#### 2. CHECK REAR MODE DOOR MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and front air control connector.
3. Check continuity between rear mode door motor harness connector and ground.

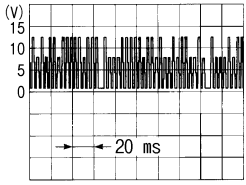
Rear mode door motor		—	Continuity
Connector	Terminal		
B201	2	Ground	Yes

Is the inspection result normal?

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

#### 3. CHECK REAR MODE DOOR MOTOR SIGNAL

1. Connect rear mode door motor and front air control connector.
2. Turn ignition switch ON.
3. Confirm output waveform between rear mode door motor harness connector and ground using oscilloscope.

+		-	Output waveform
Rear mode door motor			
Connector	Terminal		
B201	3	Ground	 SJIA1453J

Is the inspection result normal?

- YES >> GO TO 4.  
NO >> GO TO 6.

#### 4. CHECK INSTALLATION OF REAR MODE DOOR MOTOR

Check rear mode door motor is properly installed.

Is the inspection result normal?

- YES >> Replace rear mode door motor. Refer to [HAC-218, "MODE DOOR MOTOR : Removal and Installation - Rear Mode Door Motor \(If Equipped\)"](#).

# REAR MODE DOOR MOTOR

[MANUAL AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair or replace malfunctioning part.

## 5. CHECK REAR MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and front air control connector.
3. Check continuity between rear mode door motor harness connector and front air control connector.

Rear mode door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B201	1	M49	5	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## 6. CHECK REAR MODE DOOR MOTOR LAN SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear mode door motor and A/C amp. connector.
3. Check continuity between rear mode door motor harness connector and front air control connector.

Rear mode door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B201	3	M49	6	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

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# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## FRONT BLOWER MOTOR

### Description

INFOID:000000006953178

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

Battery voltage is supplied to the front blower motor from 2 15-amp fuses located in the fuse block (J/B). The voltage is controlled through two relays which are energized whenever the ignition switch is in the ON or START position.

Fan speed is modified by controlling the ground circuit. A power transistor is integrated into the ground side of the front blower fan circuit. The front air control provides voltage to the gate of the power transistor based on the position of the blower control dial. By applying a variable voltage to the gate, the power transistor controls the current flow to ground, thereby controlling the speed of the blower motor. The front air control monitors the blower motor ground circuit. This allows the front air control to minutely adjust the voltage supplied to the gate to smooth out any power surges. The blower control dial has 26 detents, each detent outputting a different gate voltage to the power transistor, allowing for 26 different fan speeds. The mode selection also affects fan speed. Refer to [HAC-129, "FRONT MANUAL AIR CONDITIONING SYSTEM : Air Flow Control"](#).

### Component Function Check

INFOID:000000006953179

#### 1. CHECK OPERATION

1. Turn ignition switch ON.
2. Starting from the OFF position, rotate the blower control dial clockwise through each detent.
3. Check that the fan speed increases with each detent.

Does it operate normally?

YES >> Inspection End.

NO >> Perform trouble diagnosis for the blower motor. Refer to [HAC-190, "Diagnosis Procedure"](#).

### Diagnosis Procedure

INFOID:000000006920804

#### 1. CHECK FUSES

1. Turn ignition switch OFF.
2. Check 15A fuses [Nos. 10 and 18, located in fuse block (J/B)].

**NOTE:**

Refer to [PG-85, "Terminal Arrangement"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

#### 2. CHECK FRONT BLOWER MOTOR POWER SUPPLY

1. Disconnect front blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between front blower motor harness connector and ground.

+		-	Voltage
Front blower motor			
Connector	Terminal		
M62	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 8.

#### 3. CHECK FRONT BLOWER MOTOR GROUND CIRCUIT

1. Turn blower control dial fully counterclockwise to the OFF position
2. While turning the blower control dial clockwise, through each detent, check the resistance between front blower motor harness connector and ground.

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Front blower motor		—	Continuity
Connector	Terminal		
M62	2	Ground	Decreases as dial approaches full speed

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 4

## 4. CHECK FRONT BLOWER MOTOR GROUND CIRCUIT CONTINUITY

1. Disconnect power transistor connector.
2. Check continuity between front blower motor harness connector and power transistor.

Front blower motor		Power transistor		Continuity
Connector	Terminal	Connector	Terminal	
M62	2	M52	3	YES

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair the harness or connector.

## 5. CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT

1. Turn blower control dial fully counterclockwise to the OFF position
2. While turning the blower control dial clockwise, through each detent, check voltage between power transistor and ground.

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HAC

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Power transistor			Condition				
Connector	Terminal		Blower control dial detents	MAX A/C, VENT, and B/L	FOOT, D/F0	D/F1, DEF	P/REC Mode
Voltage							
M52	2	Ground	OFF	0.00 volts	0.00 volts	0.00 volts	0.00 volts
			1	3.25 volts	3.75 volts	3.75 volts	3.75 volts
			2	3.50 volts	4.00 volts	4.00 volts	4.00 volts
			3	3.75 volts	4.25 volts	4.25 volts	4.25 volts
			4	4.00 volts	4.50 volts	4.50 volts	4.50 volts
			5	4.50 volts	4.75 volts	4.75 volts	4.75 volts
			6	4.75 volts	5.00 volts	5.00 volts	5.00 volts
			7	5.00 volts	5.50 volts	5.50 volts	5.50 volts
			8	5.25 volts	5.75 volts	5.75 volts	5.75 volts
			9	5.50 volts	6.00 volts	6.00 volts	6.00 volts
			10	5.75 volts	6.25 volts	6.25 volts	6.25 volts
			11	6.25 volts	6.50 volts	6.50 volts	6.50 volts
			12	6.50 volts	6.75 volts	6.75 volts	6.75 volts
			13	6.75 volts	7.00 volts	7.00 volts	7.00 volts
			14	7.00 volts	7.25 volts	7.25 volts	7.25 volts
			15	7.50 volts	7.50 volts	7.50 volts	7.50 volts
			16	7.75 volts	7.75 volts	7.75 volts	7.75 volts
			17	8.00 volts	8.00 volts	8.25 volts	8.00 volts
			18	8.25 volts	8.25 volts	8.50 volts	8.25 volts
			19	8.50 volts	8.50 volts	8.75 volts	8.50 volts
			20	8.75 volts	8.75 volts	9.00 volts	8.75 volts
			21	9.00 volts	9.00 volts	9.25 volts	9.00 volts
			22	9.25 volts	9.25 volts	9.50 volts	9.25 volts
			23	9.75 volts	9.75 volts	10.00 volts	9.50 volts
			24	10.25 volts	10.25 volts	10.25 volts	10.75 volts
			25	10.50 volts	10.50 volts	10.50 volts	10.00 volts
26	10.75 volts	10.75 volts	12.00 volts	10.25 volts			
			12 = Max blower voltage				

**Is the inspection result normal?**

- YES >> GO TO 6.
- NO >> GO TO 7.

## 6. CHECK POWER TRANSISTOR GROUND CIRCUIT

Check continuity between power transistor connector and ground.

Power transistor		—	Continuity
Connector	Terminal		
M52	1	Ground	YES

**Is the inspection result normal?**

- YES >> Replace power transistor. Refer to [VTL-16, "Removal and Installation"](#).
- NO >> Repair harness or connector.

## 7. CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT CONTINUITY



# FRONT BLOWER MOTOR

[MANUAL AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

1. Disconnect front air control connector.
2. Check continuity between power transistor connector and front air control connector.

Power transistor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
M52	2	M49	14	YES

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).  
NO >> Repair the harness or connector.

## 8. CHECK FRONT BLOWER MOTOR RELAY-2 GROUND CIRCUIT

Check continuity between fuse block (J/B) harness connector and front blower motor relay-2 connector and ground.

Component		—	Continuity
Connector	Terminal		
Fuse block (J/B) M3	7N	Ground	YES
Front blower motor relay-2 M60	2		

Is the inspection result normal?

- YES >> GO TO 9.  
NO >> Repair harness or connector.

## 9. CHECK FRONT BLOWER MOTOR RELAYS

Check front blower motor relay-1 and front blower motor relay-2. Refer to [HAC-194. "Component Inspection \(Front Blower Motor Relay\)"](#).

Is the inspection result normal?

- YES >> GO TO 10.  
NO >> Replace inoperative front blower motor relay.

## 10. CHECK FUSE BOX (J/B)

Check voltage between fuse block (J/B) connector and ground.

Fuse block (J/B)		Ground	Voltage
Connector	Terminal		
M3	8N	Ground	Battery voltage
M4	1P		

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse block (J/B).  
NO >> Replace fuse block (J/B).

## 11. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-193. "Component Inspection \(Front Blower Motor\)"](#).

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse block (J/B).  
NO >> Replace front blower motor.

## Component Inspection (Front Blower Motor)

INFOID:000000006920805

### 1. CHECK FRONT BLOWER MOTOR

1. Connect battery voltage to terminal 1 of front blower motor.
2. Connect ground to terminal 2 of front blower motor.

# FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Does the front blower fan operate?

YES >> Intermittent incident. Refer to [GI-39, "Intermittent Incident"](#).

NO >> Replace front blower motor. Refer to [VTL-14, "Removal and Installation - Front Blower Motor"](#).

Component Inspection (Front Blower Motor Relay)

INFOID:000000006920806

## 1. CHECK FRONT BLOWER MOTOR RELAY-1 OR 2

1. Turn ignition switch OFF.
2. Remove suspect front blower motor relay.
3. Check continuity between suspect front blower motor relay terminals 3 and 5 when voltage is supplied between terminals 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	YES
		OFF	NO

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace suspect front blower motor relay.

# REAR BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## REAR BLOWER MOTOR

### Diagnosis Procedure

INFOID:000000008059024

#### 1. CHECK FUSE

1. Turn ignition switch OFF.
2. Check 30A fuse (No. 57).

**NOTE:**

Refer to [PG-86, "Terminal Arrangement"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

#### 2. CHECK REAR BLOWER MOTOR POWER SUPPLY

1. Disconnect rear blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between rear blower motor harness connector and ground.

+		-	Voltage
Rear blower motor			
Connector	Terminal		
B21	1	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 6.

#### 3. CHECK REAR BLOWER MOTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between rear blower motor harness connector and ground.

Rear blower motor		—	Continuity
Connector	Terminal		
B21	3	Ground	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

#### 4. CHECK REAR BLOWER MOTOR CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect front air control connector.
2. Check continuity between rear blower motor harness connector and front air control connector.

Rear blower motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	
B21	2	M51	33	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

#### 5. CHECK REAR BLOWER MOTOR CONTROL SIGNAL

1. Reconnect rear blower motor connector and front air control connector.
2. Turn ignition switch ON.
3. Change rear fan speed from Lo to Hi, and check duty ratios between rear blower motor harness connector and ground by using an oscilloscope.

**NOTE:**

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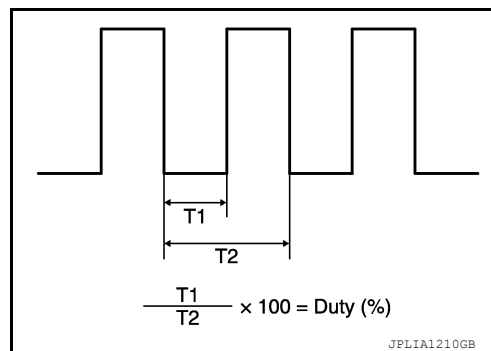
# REAR BLOWER MOTOR

[MANUAL AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

Calculate drive signal duty ratio as shown in the figure.  
T2 = Approx. 1.6 ms

Rear blower motor		Condition	Duty ratio (Approx.)
Connector	Terminal	Fan speed	
B21	2	1st	25 %
		2nd	33 %
		3rd	41 %
		4th	51 %
		5th	61 %
		6th	69 %
		7th	81 %



### Is the inspection result normal?

YES >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

NO >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).

## 6. CHECK REAR BLOWER MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect rear blower relay connector.
3. Check continuity between rear blower relay harness connector and rear blower motor harness connector.

Rear blower relay		Rear blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M59	3	B403	3	Yes
	6			

### Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

## 7. CHECK REAR BLOWER RELAY GROUND CIRCUIT FOR OPEN

Check continuity between rear blower relay harness connector and ground.

Rear blower relay		—	Continuity
Connector	Terminal		
M59	1	Ground	Yes

### Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.

## 8. CHECK REAR BLOWER RELAY

Check rear blower relay. Refer to [HAC-196, "Component Inspection \(Rear Blower Motor\)"](#).

### Is the inspection result normal?

YES >> Check rear blower relay power supply circuit. Refer to [PG-8, "Wiring Diagram — Battery Power Supply —"](#) and [PG-20, "Wiring Diagram — Ignition Power Supply —"](#).

NO >> Replace rear blower relay.

## Component Inspection (Rear Blower Motor)

INFOID:000000008059025

## 1. CHECK REAR BLOWER MOTOR-I

1. Remove rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

# REAR BLOWER MOTOR

[MANUAL AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

2. Check that there is not any mixing foreign object in the rear blower motor.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

## 2.CHECK REAR BLOWER MOTOR-II

Check that there is not breakage or damage in the rear blower motor.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

## 3.CHECK REAR BLOWER MOTOR-III

Check that rear blower motor turns smoothly.

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace rear blower motor. Refer to [VTL-15, "Removal and Installation - Rear Blower Motor \(If Equipped\)"](#).

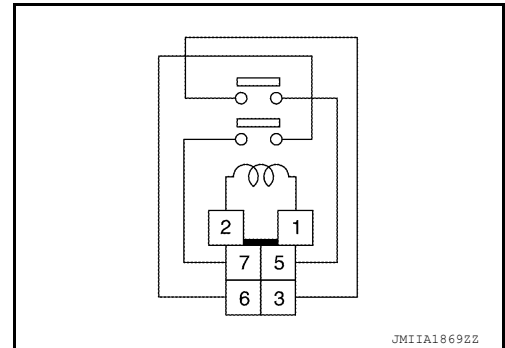
## Component Inspection (Rear Blower Relay)

INFOID:000000008059026

## 1.CHECK REAR BLOWER RELAY

1. Remove rear blower relay. Refer to [PG-86, "Terminal Arrangement"](#).
2. Check continuity between rear blower relay terminal 3 and 5, then 6 and 7 when voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Yes
		OFF	No
6	7	ON	Yes
		OFF	No



Is the inspection result normal?

YES >> Inspection End.

NO >> Replace rear blower relay.

## WATER VALVE CIRCUIT

### System Description

INFOID:000000008059027

### COMPONENT DESCRIPTION

#### Water Valve

The water valve cuts the flow of engine coolant to the front and rear heater cores to allow for maximum cooling during A/C operation. It is controlled by the A/C auto amp.

### Diagnosis Procedure

INFOID:000000008059028

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

### DIAGNOSTIC PROCEDURE FOR WATER VALVE

#### 1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F24.
2. Turn ignition switch ON.
3. Rotate temperature control dial to full warm.
4. Check voltage between water valve harness connector F24 terminal 1 and terminal 2 while rotating temperature control dial to full cool.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F24	2	1	Rotate temperature control dial	Battery voltage

#### Is the inspection result normal?

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

#### 2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M49.
3. Check continuity between water valve harness connector F24 terminal 2 and front air control harness connector M49 terminal 9.

**2 - 9 : Continuity should exist.**

4. Check continuity between water valve harness connector F24 terminal 2 and ground.

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

#### Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).  
 NO >> Repair harness or connector.

#### 3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial full cool.
2. Check voltage between water valve harness connector F24 terminal 1 and terminal 2 while rotating temperature control dial to full warm.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F24	1	2	Rotate temperature control dial	Battery voltage

#### Is the inspection result normal?

# WATER VALVE CIRCUIT

[MANUAL AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

- YES >> Replace the water valve.
- NO >> GO TO 4.

## 4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M49.
3. Check continuity between water valve harness connector F24 terminal 1 and front air control harness connector M49 terminal 10.

**1 - 10 : Continuity should exist.**

4. Check continuity between water valve harness connector F24 terminal 1 and ground.

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

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).
- NO >> Repair harness or connector.

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## HEATER PUMP

### System Description

INFOID:000000008059029

### SYSTEM DESCRIPTION

#### Component Parts

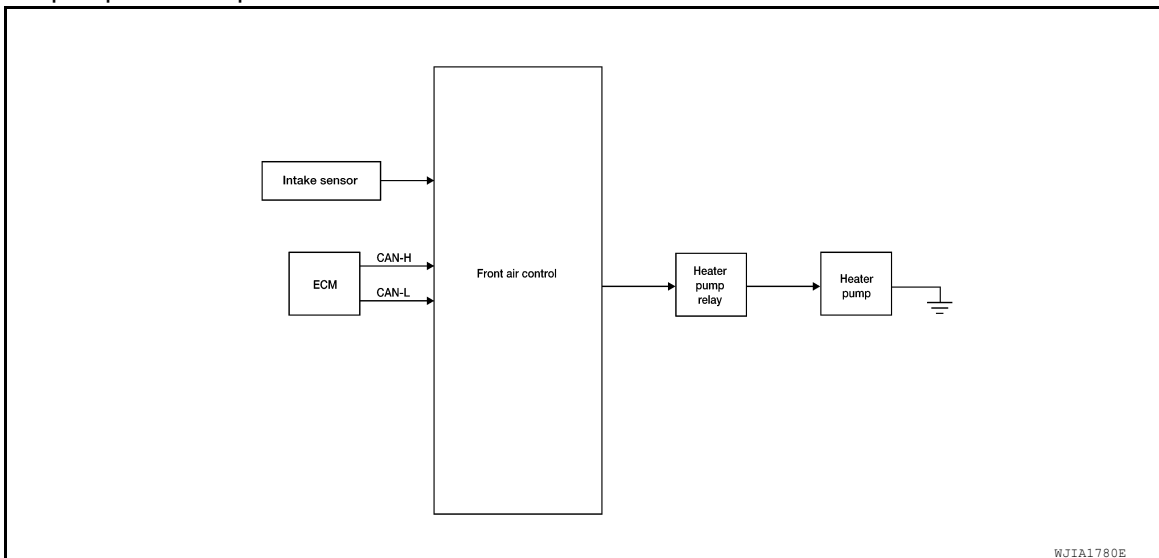
Heater pump control system components are:

- Front air control
- Heater pump relay
- Heater pump
- Intake sensor

#### System Operation

The heater pump improves heater performance specifically at idle conditions. It is designed to operate in either of the following 2 situations:

1. Front blower motor set to maximum speed and temperature control dial set to full hot or
2. Engine coolant temperature (signal via CAN communication) minus heater core outlet temperature (intake sensor input to front air control) is greater than 20°C (68°F). If the difference is less than 16°C (61°F), the heater pump will not operate unless the conditions in item No. 1 above are met.



WJIA1780E

### Diagnosis Procedure

INFOID:000000008059030

Regarding Wiring Diagram information, refer to [HAC-148, "Wiring Diagram"](#).

### DIAGNOSTIC PROCEDURE FOR HEATER PUMP CIRCUIT

#### 1. CHECK POWER SUPPLY TO HEATER PUMP

1. Disconnect heater pump connector.
2. Turn ignition switch ON.
3. Set front blower motor to maximum speed.
4. Turn temperature control dial to full hot.
5. Check voltage between heater pump harness connector E26 terminal 1 and ground.

**1 - Ground**

**: Battery voltage**

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

#### 2. CHECK HEATER PUMP GROUND

1. Turn ignition switch OFF.



# HEATER PUMP

[MANUAL AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

2. Check continuity between heater pump harness connector E26 terminal 2 and ground.

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

Is the inspection result normal?

YES >> Replace heater pump. Refer to [HA-68, "Removal and Installation"](#).

NO >> Repair harness or connector.

## 3. CHECK HEATER PUMP RELAY

1. Turn ignition switch OFF.
2. Check heater pump relay. Refer to [HAC-201, "Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace heater pump relay.

## 4. CHECK RELAY POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between heater pump relay harness connector E27 terminals 2, 5 and ground.

**2 - Ground : Battery voltage**

**5 - Ground : Battery voltage**

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

## 5. CHECK HEATER PUMP MOTOR POWER CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between heater pump relay harness connector E27 terminal 3 and heater pump harness connector E26 terminal 1.

**3 - 1 : Continuity should exist.**

3. Check continuity between heater pump relay harness connector E27 terminal 3 and ground.

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

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

## 6. CHECK CIRCUIT BETWEEN HEATER PUMP RELAY AND A/C AUTO AMP.

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M49 terminal 8 and heater pump relay harness connector E27 terminal 1.

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

3. Check continuity between heater pump relay harness connector E27 terminal 1 and ground.

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

Is the inspection result normal?

YES >> Replace front air control. Refer to [HAC-212, "Removal and Installation - Front Air Control"](#).

NO >> Repair harness or connector.

## Component Inspection

INFOID:000000008059031

## COMPONENT INSPECTION

Heater Pump Relay

# HEATER PUMP

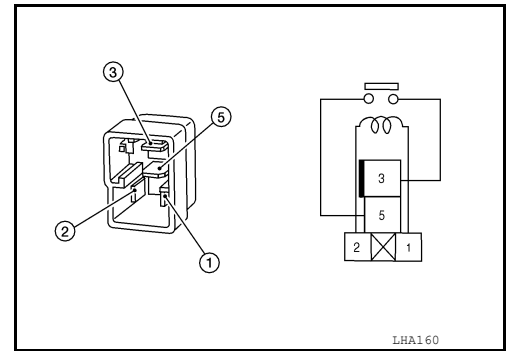
[MANUAL AIR CONDITIONER]

## < DTC/CIRCUIT DIAGNOSIS >

Check continuity between terminals 3 and 5.

Conditions	Continuity
12V direct current supply between terminals 1 and 2	Yes
No current supply	No

If NG, replace relay.



MAGNET CLUTCH

Description

INFOID:000000006953180

The IPDM E/R provides a ground to energize the A/C relay. When the A/C relay is energized, voltage is supplied to the A/C compressor magnet clutch. The magnet clutch is permanently grounded.

In order for the IPDM E/R to complete a compressor ON request, the following conditions must be met:

1. The BCM detects a Fan ON signal from the front air control. The front air control grounds the fan ON signal monitored by the BCM when the blower speed dial is in any of the fan speed positions.
2. The BCM detects an A/C ON signal from the front air control. The front air control grounds the A/C ON signal monitored by the BCM when:
  - The A/C switch is pressed. The A/C switch LED illuminates and the front air control grounds the A/C ON signal monitored by the BCM. Any mode control button except D/F may be selected.
  - The A/C switch is OFF, and the MAX A/C button is pressed. The A/C switch LED will automatically illuminate and the front air control grounds the A/C ON signal monitored by the BCM.
  - The A/C switch is OFF, and the mode button for either D/F or DEF is selected. The front air control grounds the A/C ON signal monitored by the BCM, but it does not illuminate the A/C switch LED
3. The intake temperature value must be within the specified range.

**NOTE:**

If the compressor was engaged by pressing the D/F or DEF mode buttons, and the time spent in either mode exceeds 1 minute, then the compressor stays requested, even when modes other than D/F or DEF are selected, until either:

1. The ignition switch is turned OFF.
2. The blower speed dial is turned completely counterclockwise to the OFF position.
3. The A/C switch is manually turned OFF.

In other words, the compressor ON request cannot be turned off in D/F or DEF modes.

Component Function Check

INFOID:000000006920809

HAC

1.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to [PCS-8, "Diagnosis Description"](#).

Does it operate normally?

- YES >> Inspection End.
- NO >> Refer to [HAC-203, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000006920810

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 42, located in IPDM E/R).

**NOTE:**

Refer to [PG-89, "IPDM E/R Terminal Arrangement"](#).

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> Replace the blown fuse after repairing the affected circuit.

2.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT

1. Disconnect compressor connector and IPDM E/R connector.
2. Check continuity between compressor harness connector and IPDM E/R harness connector.

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F3	1	E119	11	YES

Is the inspection result normal?

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

## MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

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### 3. CHECK MAGNET CLUTCH

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Directly apply battery voltage to the magnet clutch. Check operation visually and by sound.

Does it operate normally?

- YES >> Replace IPDM E/R. Refer to [PCS-24, "Removal and Installation"](#).
- NO >> Replace magnet clutch. Refer to [HA-51, "Removal and Installation for Compressor Clutch - VQ40DE"](#) or [HA-56, "Removal and Installation for Compressor Clutch - VK56DE"](#).

# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## POWER SUPPLY AND GROUND CIRCUIT

### FRONT A/C CONTROL

#### FRONT A/C CONTROL : Description

INFOID:000000006953175

#### COMPONENT DESCRIPTION

Front air control.

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

#### FRONT A/C CONTROL : Component Function Check

INFOID:000000006953176

#### 1. CHECK OPERATION

1. Turn the blower motor dial clockwise and verify the blower speed increases and that one of the LEDs illuminates on the mode switch.
2. Press the mode switches and verify that the modes change, the LEDs illuminate, and that air flows from the various vents.
3. Turn the temperature control dial and verify the temperature changes at the selected vents.
4. Press the DEF, REC, and FRE (if equipped) buttons and verify air flow changes.

#### Does it operate normally?

YES >> Inspection End.

NO >> Perform trouble diagnosis for the front air control system. Refer to [HAC-205. "FRONT A/C CONTROL : Diagnosis Procedure"](#).

#### FRONT A/C CONTROL : Diagnosis Procedure

INFOID:000000006953177

Regarding Wiring Diagram information, refer to [HAC-148. "Wiring Diagram"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M49 terminals 1, 2 and ground.

(+) Front air control		(-) —	Voltage		
Connector Terminal		Ground	Ignition switch position		
			OFF	ACC	ON
M49	1	Ground	Battery voltage	Battery voltage	Battery voltage
	2		Approx. 0V	Approx. 0V	Battery voltage

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

#### 2. CHECK FUSE

Check 10A fuses [Nos. 12 and 19, located in the fuse block (J/B)].

#### **NOTE:**

Refer to [PG-86. "Terminal Arrangement"](#).

#### Is the inspection result normal?

YES >> Check harness for open circuit. Repair or replace if necessary.

NO >> Check harness for short circuit. Repair or replace if necessary.

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# POWER SUPPLY AND GROUND CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## 3. CHECK FRONT AIR CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M49 terminals 3, 4 and ground.

**3, 4 - Ground : Continuity should exist.**

Is the inspection result normal?

- YES >> Replace the front air control. Refer to [HAC-212. "Removal and Installation - Front Air Control"](#).  
NO >> Repair the harnesses or connectors.

## REAR A/C CONTROL

### REAR A/C CONTROL : Diagnosis Procedure

INFOID:000000008117184

## 1. CHECK REAR AIR CONTROL POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect rear A/C control connector.
3. Turn ignition switch ON.
4. Check voltage between rear A/C control harness connector and ground.

+		-	Voltage
Rear air control			
Connector	Terminal		
R3	6	Ground	5V

Is the inspection result normal?

- YES >> GO TO 2.  
NO >> Repair harness or connector between rear A/C control and fuse block (J/B).

## 2. CHECK REAR AIR CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between rear A/C control harness connector and ground.

Rear air control		—	Continuity
Connector	Terminal		
R3	12	Ground	Yes

Is the inspection result normal?

- YES >> Replace rear air control. Refer to [HAC-212. "Removal and Installation - Rear Air Control \(If Equipped\)"](#).  
NO >> Repair harness or connector.

# HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER]

## SYMPTOM DIAGNOSIS

### HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

#### Symptom Table

INFOID:000000006889267

#### SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	<a href="#">HAC-162</a>
Front air outlet does not change.	Go to Trouble Diagnosis Procedure for Front Mode Door Motor.	<a href="#">HAC-179</a>
Front mode door motor is malfunctioning.		
Rear air outlet does not change.	Go to Trouble Diagnosis Procedure for Rear Mode Door Motor.	<a href="#">HAC-179</a>
Rear mode door motor is malfunctioning.		
Front discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Front Air Mix Door Motor.	<a href="#">HAC-176</a>
Front air mix door motor is malfunctioning.		
Rear discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Rear Air Mix Door Motor.	<a href="#">HAC-176</a>
Rear air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<a href="#">HAC-180</a>
Intake door motor is malfunctioning.		
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	<a href="#">HAC-190</a>
Rear blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Rear Blower Motor.	<a href="#">HAC-190</a>
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	<a href="#">HAC-203</a>
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<a href="#">HAC-208</a>
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating.	<a href="#">HAC-210</a>
Noise.	Go to Trouble Diagnosis Procedure for Noise.	<a href="#">HA-38</a>
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
Front air control mode button LED(s) does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
REC button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
REC or FRE button LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
All LEDs and illumination lamps are at full brightness.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
Front blower motor runs at full speed only and A/C compressor will not engage.	Go to Trouble Diagnosis Procedure for A/C System.	<a href="#">HAC-205</a>
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-32</a>
High-pressure side is too high and low-pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-33</a>
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-34</a>
Both high- and low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-35</a>
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-36</a>
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure.	<a href="#">HA-37</a>

**INSUFFICIENT COOLING****Component Function Check**

INFOID:000000006889268

SYMPTOM: Insufficient cooling

**DESCRIPTION**

The purpose of the component function check is to check that the individual system operates normally.

**Check condition : Engine running at normal operating temperature.**

**Check condition : Blower control dial in OFF position.**

**Check condition : REC off (LED extinguished).**

**Check condition : FRE on (LED illuminated). (if equipped)**

**Check condition : VENT selected (LED illuminated).**

**Check condition : DEF off (LED extinguished).**

**INSPECTION FLOW****1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE**

1. Rotate the blower control dial to the low speed.
2. Turn temperature control dial counterclockwise to maximum cold.
3. Check for cold air at discharge air outlets.

Can the symptom be duplicated?

YES >> GO TO 3.

NO >> GO TO 2.

**2. CHECK FOR ANY SYMPTOMS**

Perform a complete operational check for any symptoms. Refer to [HAC-164, "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

Does another symptom exist?

YES >> Refer to [HAC-207, "Symptom Table"](#).

NO >> System OK.

**3. CHECK FOR SERVICE BULLETINS**

Check for any service bulletins.

Are there any pertinent service bulletins?

YES >> Perform service bulletin actions.

NO >> GO TO 4.

**4. CHECK FOR DTCS**

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

YES >> [HAC-145, "DTC Inspection Priority Chart"](#).

NO >> GO TO 5.

**5. CHECK DRIVE BELTS**

Check compressor belt tension. Refer to [EM-13, "Checking Drive Belts"](#) (VQ40DE) or [EM-152, "Checking Drive Belts"](#) (VK56DE).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust or replace compressor belt. Refer to [EM-13, "Removal and Installation"](#) (VQ40DE) or [EM-152, "Removal and Installation"](#) (VK56DE).

**6. CHECK A/C SYSTEM FOR LEAKS**



# INSUFFICIENT COOLING

[MANUAL AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Check A/C system for leaks with fluorescent leak detector. Refer to [HA-45. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#).

## NOTE:

Some oil at the compressor high pressure relief valve is normal

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace as necessary. If oil residue is at compressor high pressure relief valve, clean and retest at high pressure.

## 7. CHECK LOW AND HIGH SIDE PRESSURE

Check A/C high and low side pressure. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> Check air flow across condenser; check for vehicle equipment installation. If OK, Inspection End.

NO >> GO TO 8.

## 8. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

Check recovery/recycling equipment before connecting to vehicle. Verify there is no pressure in the recovery/recycling equipment by checking the gauges. If pressure exists, recover refrigerant from equipment lines.

>> GO TO 9.

## 9. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.

2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check contaminated refrigerant. Refer to [HAC-120. "Working with HFC-134a \(R-134a\)"](#).

## 10. RECHARGE SYSTEM AND CHECK REFRIGERANT PRESSURE

1. Recharge system.

2. Check A/C high and low side pressure. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Diagnose symptom. Refer to [HAC-207. "Symptom Table"](#).

## 11. CHECK DISCHARGE AIR TEMPERATURE

Check discharge air temperature. Refer to [HA-28. "Inspection"](#).

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 12

## 12. CHECK AIR MIX DOOR OPERATION - TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise until maximum hot.

2. Check for hot air at appropriate discharge air outlets.

Is the test result normal?

YES >> GO TO 13.

NO >> Check air mix door for mechanical failure. Refer to [HAC-219. "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor"](#).

## 13. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks. Refer to [VTL-5. "Exploded View"](#).

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**INSUFFICIENT HEATING****Component Function Check**

INFOID:00000006889272

SYMPTOM: Insufficient heating

**DESCRIPTION**

The purpose of the component check is to check that the individual system operates normally.

- Check condition : Engine running at normal operating temperature.**
- Check condition : Blower control dial in OFF position.**
- Check condition : REC off (LED extinguished).**
- Check condition : FRE on (LED illuminated). (if equipped)**
- Check condition : VENT selected (LED illuminated).**
- Check condition : DEF off (LED extinguished).**

**INSPECTION FLOW****1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE**

1. Rotate the blower control dial to the low speed.
2. Turn temperature control dial clockwise to maximum heat.
3. Check for hot air at discharge air outlets.

Can the symptom be duplicated?

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

**2. CHECK FOR ANY SYMPTOMS**

Perform a complete operational check for any symptoms. Refer to [HAC-164, "FRONT MANUAL AIR CONDITIONING SYSTEM : Work Procedure"](#).

Does another symptom exist?

- YES >> Refer to [HAC-207, "Symptom Table"](#).
- NO >> System OK.

**3. CHECK FOR SERVICE BULLETINS**

Check for any service bulletins.

Are there any pertinent service bulletins?

- YES >> Perform service bulletin actions.
- NO >> GO TO 4.

**4. CHECK FOR DTCS**

1. Turn ignition switch ON.
2. Select "Self Diagnostic Result" mode of "HVAC" using CONSULT.
3. Check DTC.

Is any DTC detected?

- YES >> [HAC-145, "DTC Inspection Priority Chart"](#).
- NO >> GO TO 5.

**5. CHECK ENGINE COOLING SYSTEM**

1. Check for proper engine coolant level. Refer to [CO-11, "System Inspection"](#) (VQ40DE) or [CO-43, "Inspection"](#) (VK56DE).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-11, "System Inspection"](#) (VQ40DE) or [CO-43, "Inspection"](#) (VK56DE).
4. Check for air in cooling system.

>> GO TO 6.

**6. CHECK AIR MIX DOOR OPERATION - TEMPERATURE DECREASE**

# INSUFFICIENT HEATING

[MANUAL AIR CONDITIONER]

## < SYMPTOM DIAGNOSIS >

1. Rotate temperature control dial counterclockwise until maximum cold.
2. Check for cold air at appropriate discharge air outlets.

Is the test result normal?

YES >> GO TO 7.

NO >> Check air mix door for mechanical failure. Refer to [HAC-219, "AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor"](#).

## 7.CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair air leaks. Refer to [VTL-5, "Exploded View"](#).

## 8.CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 9.

NO >> GO TO 10.

## 9.CHECK ENGINE COOLANT SYSTEM

Check engine control temperature sensor. Refer to [EC-28, "Engine Coolant Temperature Sensor"](#) (VQ40DE) or [EC-467, "Engine Coolant Temperature Sensor"](#) (VQ56DE).

Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

## 10.CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-12, "Changing Engine Coolant"](#) (VQ40DE) or [CO-44, "Changing Engine Coolant"](#) (VQ56DE)

4. GO TO 11 to retest.

## 11.CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [HA-77, "Removal and Installation - Front Heater Core"](#).

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# CONTROL UNIT

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

## UNIT REMOVAL AND INSTALLATION

### CONTROL UNIT

#### Removal and Installation - Front Air Control

INFOID:000000007042499

#### REMOVAL

1. Remove cluster lid C. Refer to [JP-22, "Removal and Installation"](#).

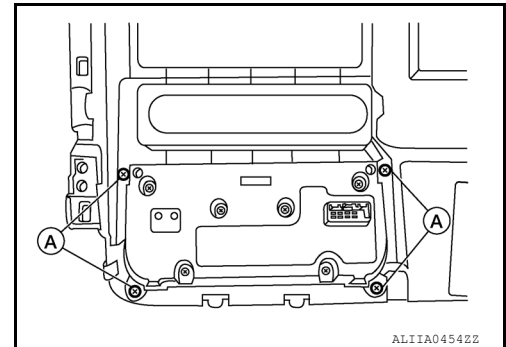
**CAUTION:**

The AV control unit and the front air control use the same 24-pin connector. Caution must be used to prevent misconnection. Colored tape has been added to the wiring harness to identify the connectors:

**White = AV control unit**

**Green = Front air control**

2. Remove the four screws (A) that retain the front air control to cluster lid C.



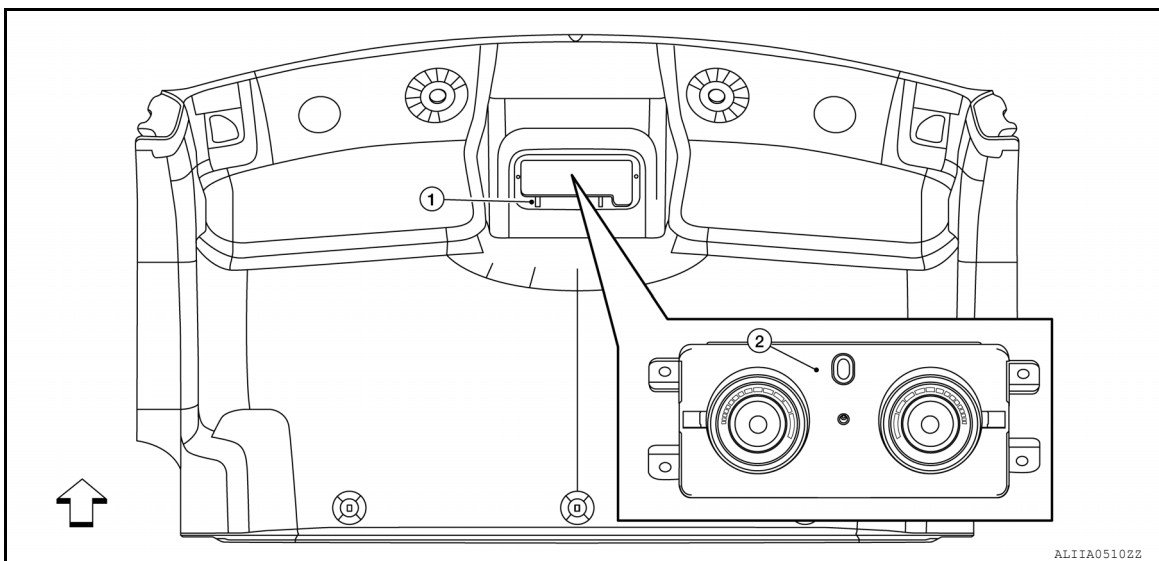
3. Remove front air control.

#### INSTALLATION

Installation is in the reverse order of removal.

#### Removal and Installation - Rear Air Control (If Equipped)

INFOID:000000008440848



1. Overhead roof console

2. Rear air control

← Front

#### REMOVAL

1. Remove the overhead roof console. Refer to [INT-56, "Rear Headlining"](#).
2. Remove the rear air control screws.
3. Disconnect the harness connector from the rear air control.

# CONTROL UNIT

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

4. Remove rear air control.

## INSTALLATION

Installation is in the reverse order of removal.

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# AMBIENT SENSOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

## AMBIENT SENSOR

### Removal and Installation

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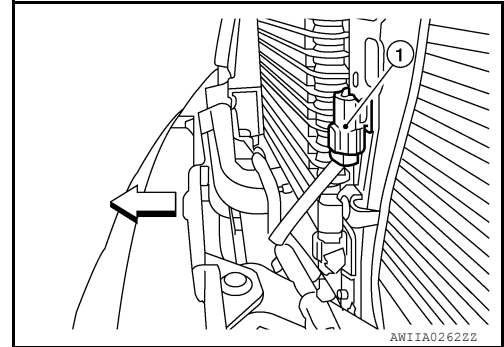
#### REMOVAL

##### NOTE:

The ambient sensor is located behind the front grille, below the hood lock assembly.

1. Remove the front grille. Refer to [EXT-28. "Removal and Installation"](#).
2. Disconnect the harness connector from the ambient sensor (1) and remove.

↶: Front



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

#### INSTALLATION

Installation is in the reverse order of removal.

# INTAKE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

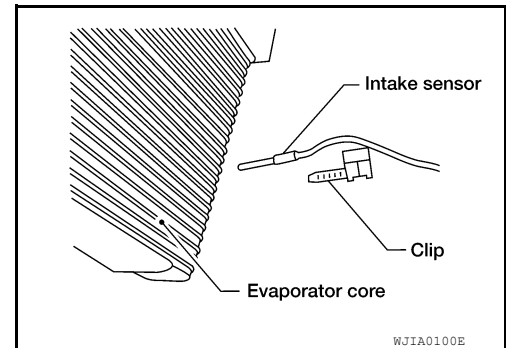
## INTAKE SENSOR

### Removal and Installation

INFOID:000000007236372

#### REMOVAL

1. Remove the front evaporator. Refer to [HA-73. "Removal and Installation - Front Evaporator"](#).
2. Release the intake sensor clip, then remove the intake sensor.  
**CAUTION:**
  - Mark the mounting position of the intake sensor.
  - Do not damage the evaporator core.



#### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

Mount the intake sensor in the same position as the original intake sensor on the front evaporator.

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# REFRIGERANT PRESSURE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

## REFRIGERANT PRESSURE SENSOR

### Removal and Installation

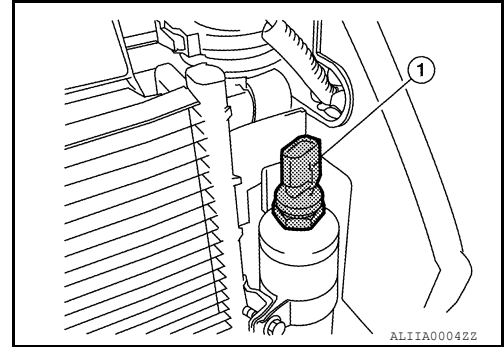
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#### REMOVAL

1. Discharge the refrigerant. Refer to [HA-40, "HFC-134a \(R-134a\) Service Procedure"](#).
2. Remove the front grille. Refer to [EXT-28, "Removal and Installation"](#).
3. Disconnect the harness connector from the refrigerant pressure sensor.
4. Remove the refrigerant pressure sensor (1) from the liquid tank on the condenser.

**CAUTION:**

**Do not damage the condenser fins.**



#### INSTALLATION

Installation is in the reverse order of removal.

**CAUTION:**

- Do not reuse the O-rings.
- Apply compressor oil to the new O-rings for installation.



# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

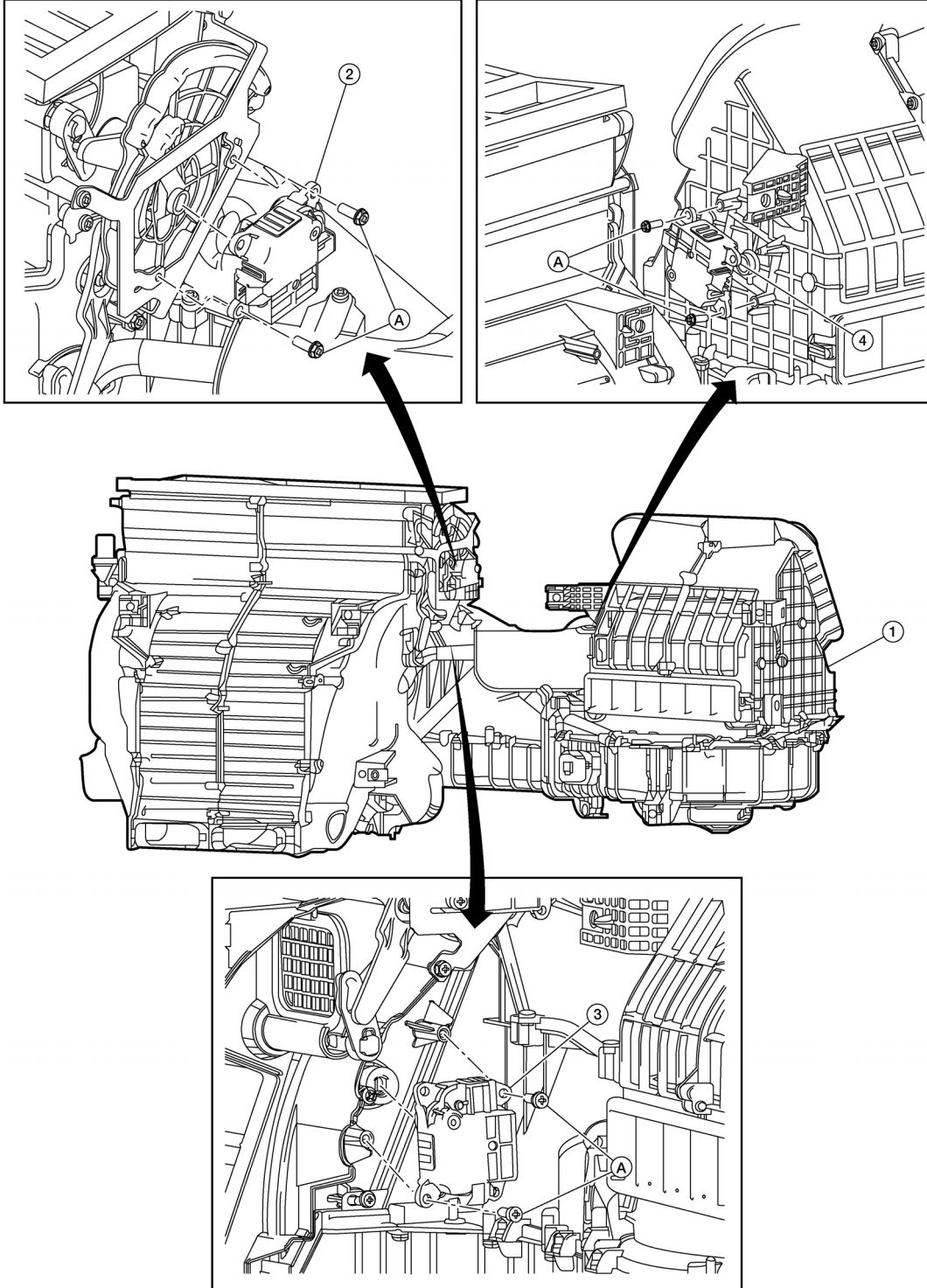
## DOOR MOTOR

### Components

INFOID:000000007236373

#### Front Heating and Cooling Unit Assembly

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- 1. Front heating and cooling assembly
- 2. Front mode door motor
- 3. Front air mix door motor
- 4. Intake door motor
- A. Bolts

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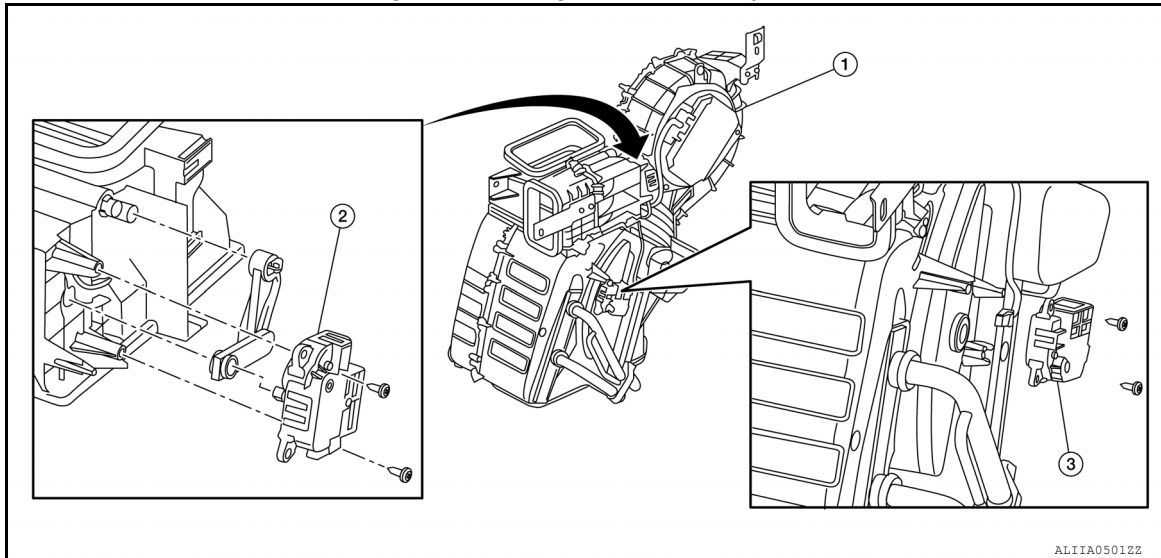
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# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

Rear Heating and Cooling Unit Assembly (If Equipped)



1. Rear heating and cooling unit assembly    2. Rear mode door motor    3. Rear air mix door motor

## INTAKE DOOR MOTOR

### INTAKE DOOR MOTOR : Removal and Installation

INFOID:000000007236368

#### REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [IP-24, "Removal and Installation"](#).
2. Remove the intake door motor screws.
3. Disconnect the harness connector from the intake door motor.
4. Remove the intake door motor from the blower unit.

#### INSTALLATION

Installation is in the reverse order of removal.

## MODE DOOR MOTOR

### MODE DOOR MOTOR : Removal and Installation - Front Mode Door Motor

INFOID:000000007236369

#### REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [IP-24, "Removal and Installation"](#).
2. Remove the mode door motor screws.
3. Disconnect the harness connector from the mode door motor.
4. Remove the mode door motor.

#### INSTALLATION

Installation is in the reverse order of removal.

### MODE DOOR MOTOR : Removal and Installation - Rear Mode Door Motor (If Equipped)

INFOID:000000007992993

#### REMOVAL

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Remove the two rear mode door motor screws.
3. Disconnect the harness connector from the rear mode door motor.
4. Remove the rear mode door motor.

# DOOR MOTOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONER]

## INSTALLATION

Installation is in the reverse order of removal.

### AIR MIX DOOR MOTOR

#### AIR MIX DOOR MOTOR : Removal and Installation - Front Air Mix Door Motor

INFOID:000000007236370

## REMOVAL

1. Remove the instrument lower panel RH and glove box. Refer to [JP-24, "Removal and Installation"](#).
2. Remove the air mix door motor screws.
3. Disconnect the harness connector from the air mix door motor.
4. Remove the air mix door motor.

## INSTALLATION

Installation is in the reverse order of removal.

#### AIR MIX DOOR MOTOR : Removal and Installation - Rear Air Mix Door Motor (If Equipped)

INFOID:000000007992994

## REMOVAL

1. Remove the rear heating and cooling unit assembly. Refer to [HA-80, "HEATER & COOLING UNIT ASSEMBLY : Removal and Installation - Rear Heating and Cooling Unit"](#).
2. Remove the two rear air mix door motor screws.
3. Disconnect the harness connector from the rear air mix door motor.
4. Remove the rear air mix door motor.

## INSTALLATION

Installation is in the reverse order of removal.

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