SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

TYPE 1

TYPE 3

TYPE 5

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006561986

Check the vehicle type to use the service information in this section.

Destination	Service information
Automatic air conditioning (4WD models)	“TYPE 1”
Automatic air conditioning (2WD models)	“TYPE 2”
Manual air conditioning (4WD models)	“TYPE 3”
Manual air conditioning (2WD models)	“TYPE 4”
Manual heater	“TYPE 5”

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006626859

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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

WARNING:

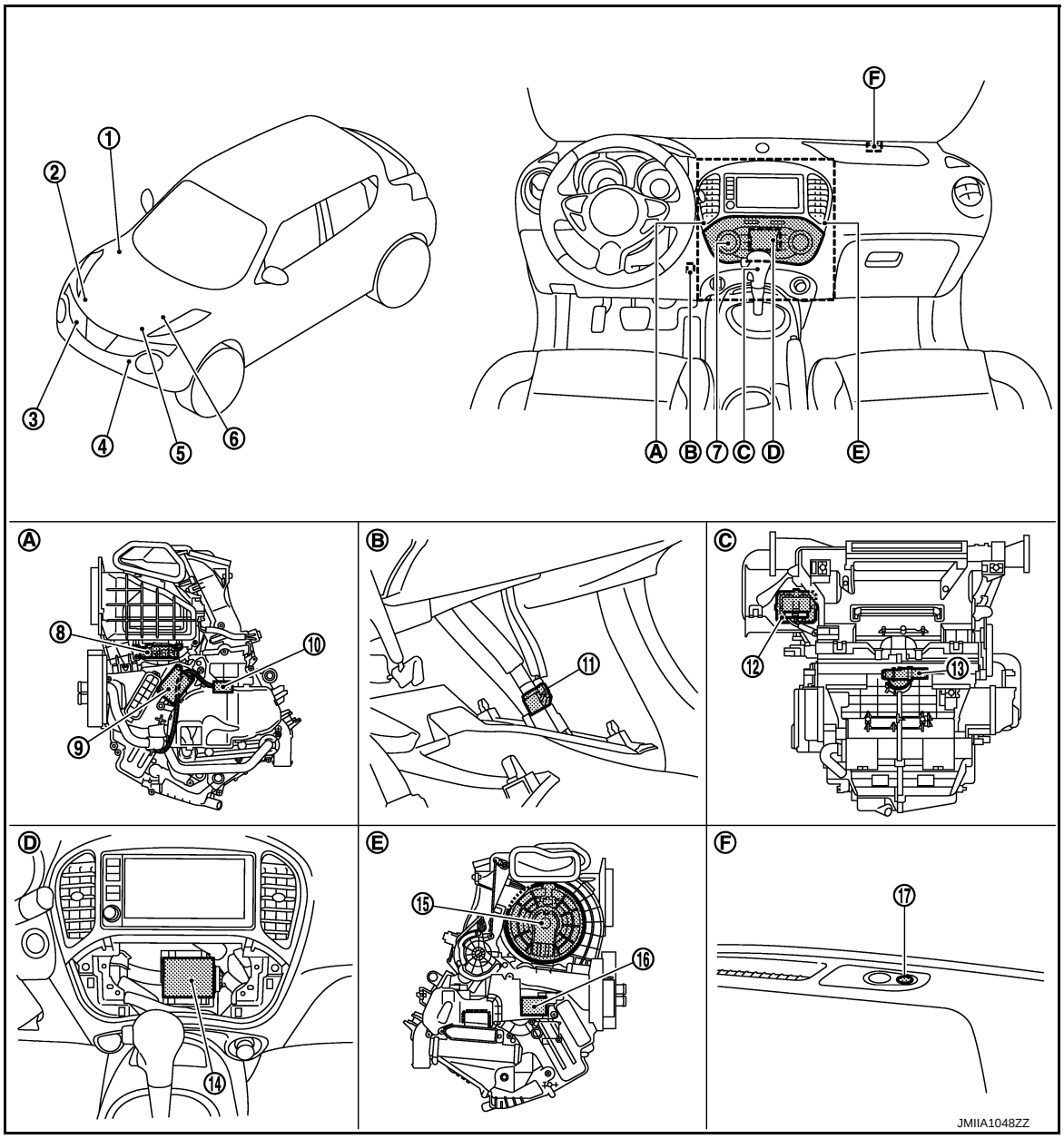
- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious 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.**

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

INFOID:0000000006545783



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-96, "BODY CONTROL SYSTEM : Component Parts Location".
2. Magnet clutch
3. Refrigerant pressure sensor
4. Ambient sensor
5. ECM
   Refer to EC-25, "ENGINE CONTROL SYSTEM : Component Parts Location".
6. IPDM E/R
   - With Intelligent Key: Refer to PCS-5, "Component Parts Location".
   - Without Intelligent Key: Refer to PCS-37, "Component Parts Location".
7. Multi display unit
8. Intake door motor
9. Air mix door motor
10. Intake sensor
11. In-vehicle sensor
12. Power transistor
13. Aspirator
14. A/C auto amp.
15. Blower motor
16. Mode door motor
17. Sunload sensor

A. Left side of A/C unit assembly
B. Instrument lower panel LH is removed
C. Back side of A/C unit assembly
D. Multi display unit is removed
E. Right side of A/C unit assembly
F. Right side of switch panel

Component Description

INFOID:0000000006545784

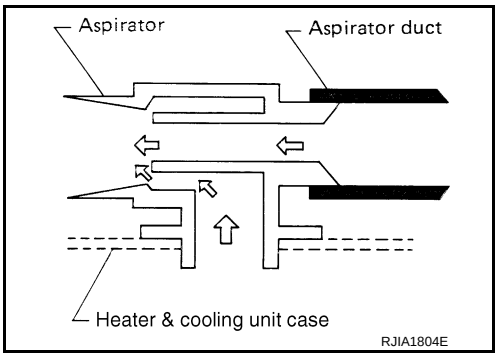
Component		Description
A/C unit assembly	Aspirator	HAC-14
	Intake sensor	HAC-14
	Air mix door motor	HAC-14
	Mode door motor	HAC-14
	Intake door motor	HAC-14
	Blower motor	HAC-14
	Power transistor	HAC-15
Multi display unit		HAC-15
A/C auto amp.		HAC-15
BCM		HAC-15
ECM		HAC-15
IPDM E/R		HAC-15
Ambient sensor		HAC-15
In-vehicle sensor		HAC-16
Sunload sensor		HAC-16
Refrigerant pressure sensor		HAC-16
Magnet clutch		HAC-16

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Aspirator

INFOID:0000000006545785

The aspirator generates the vacuum by the air blown from the A/C unit assembly and draws the air of the passenger room to the in-vehicle sensor area via the aspirator duct.



A/C UNIT ASSEMBLY : Intake Sensor

INFOID:0000000006545786

Intake sensor measures temperature of evaporator fin temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

A/C UNIT ASSEMBLY : Air Mix Door Motor

INFOID:0000000006545787

- The step motor system is adopted for air mix door motor.
- When a drive signal is input from A/C auto amp. to door motor, a step motor built into the door the door motor rotates according to the drive signal, and then stops at the position of target door. Refer to HAC-21, "Door Control".
- Rotation of motor is transmitted to air mix door (upper air mix door and lower air mix door) by lod and lever. Air flow temperature is switched.

A/C UNIT ASSEMBLY : Mode Door Motor

INFOID:0000000006545788

- The step motor system is adopted for mode door motor.
- When a drive signal is input from A/C auto amp. to door motor, a step motor built into the door the door motor rotates according to the drive signal, and then stops at the position of target door. Refer to HAC-21, "Door Control".
- Rotation of motor is transmitted to mode door (center ventilator and defroster door, sub defroster door, side ventilator door, and foot door) by link, lod, and lever. Air outlet is switched.

A/C UNIT ASSEMBLY : Intake Door Motor

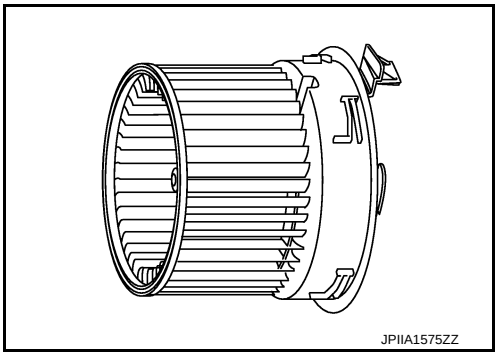
INFOID:0000000006545789

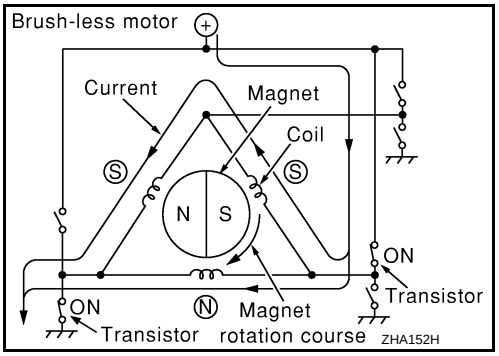
- Intake door motor consists of motor that drives door and PBR (Potentio Balance Register) that detects door position.
- Motor operates intake door according to control signal from A/C auto amp. Refer to HAC-21, "Door Control".
- Rotation of motor is transmitted to intake door by lever. Air inlet is switched.
- PBR (Potentio Balance Register) transmits PBR feedback signal to A/C auto amp. according to motor position.
- According to PBR feedback signal, A/C auto amp. monitors that motor is in an appropriate door position.

A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000006545790

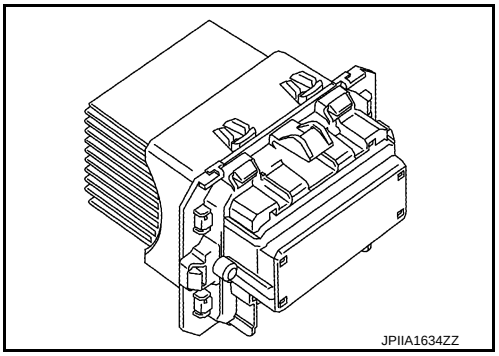
- The blower motor utilizes a brush-less motor with a rotating magnet.
- Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.





A/C UNIT ASSEMBLY : Power Transistor

INFOID:0000000006545791



- Power transistor, that uses MOS field effect transistor, is adopted for blower motor speed control.
  NOTE:
  MOS field effect transistor is a transistor for which the gate portion is composed of a metal electrode on an oxide layer of semiconductor. Field effect transistor is controlled by voltage, while ordinary transistor is controlled by current. Electrode of field effect transistor is called source, drain, or gate, while electrode of ordinary transistor is called emitter, collector, or base.
- Power transistor continuously controls voltage to blower motor, according to gate voltage from A/C auto amp.
- This power transistor does not require a HI relay even when the maximum voltage is applied to blower motor at HI status, because voltage drop is nominal.

Multi Display Unit

INFOID:0000000006626863

- Multi display unit integrates display and operation switches.
- Operation of each switch (A/C operation signal) and setting status (A/C ECO setting signal and ECO mode signal) are transmitted to A/C auto amp. via CAN communication.
- Operation status of air conditioning system is indicated in the display according to A/C display signal that is received from A/C auto amp.

A/C Auto Amp.

INFOID:0000000006545792

A/C auto amp. controls automatic air conditioning system by inputting and calculating signals from each sensor and each switch. A/C auto amp. has self-diagnosis function. Diagnosis of automatic air conditioning system can be performed quickly.

BCM

INFOID:0000000006545793

BCM transmits A/C ON signal and blower fan ON signal from A/C auto amp. to ECM via CAN communication line.

ECM

INFOID:0000000006545794

- ECM, when receiving A/C ON signal and blower fan ON signal from BCM, transmits A/C compressor request signal to IPDM E/R via CAN communication according to status of the engine and refrigerant pressure.
- ECM transmits engine coolant temperature signal to A/C auto amp. via CAN communication line.

IPDM E/R

INFOID:0000000006545795

A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line.

Ambient Sensor

INFOID:0000000006545797

Ambient sensor measures ambient air temperature. 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

INFOID:0000000006545798

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.

Sunload Sensor

INFOID:0000000006545799

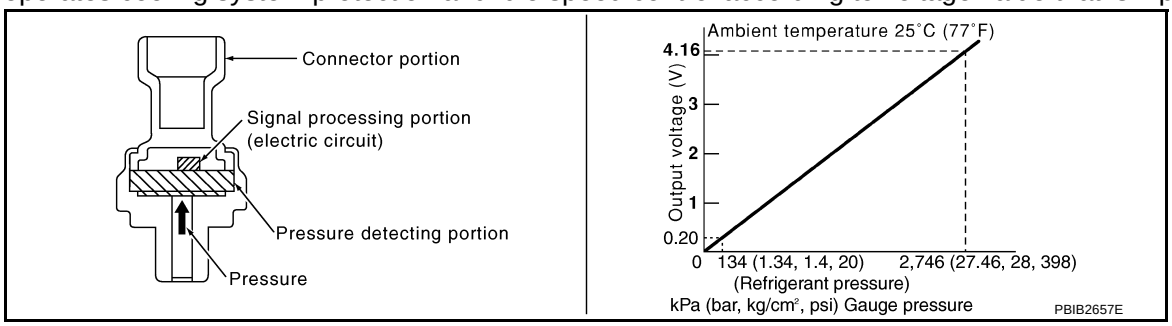
Sunload sensor measures sunload amount. This sensor converts sunload amount to voltage signal by photodiode and transmits to A/C auto amp.

Refrigerant Pressure Sensor

INFOID:0000000006545800

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection ares and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

Magnet Clutch

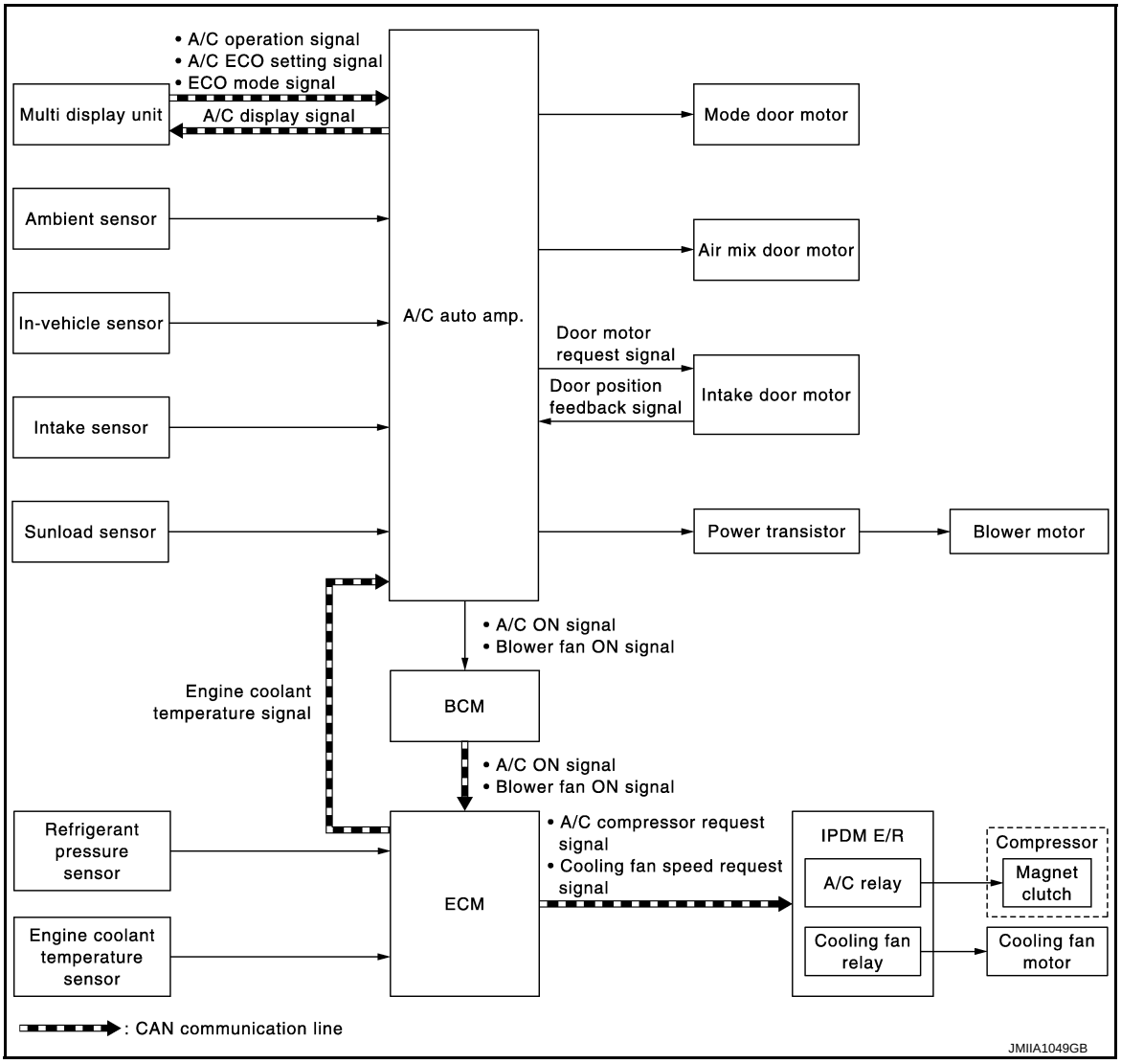
INFOID:0000000006545801

Compressor is driven by the magnet clutch which is magnetized by electric power supply.

SYSTEM

System Diagram

INFOID:0000000006545802



System Description

INFOID:0000000006545803

DESCRIPTION

- Automatic air conditioning system is controlled by each function of A/C auto amp., BCM, ECM and IPDM E/R.
- Each operation of air conditioning system is transmitted from multi display unit via CAN communication. A/C auto amp. transmits each type of indication information to multi display unit via CAN communication. Multi display unit displays each type of indication information that is received.

CONTROL BY A/C AUTO AMP.

- HAC-18, "Temperature Control"
- HAC-19, "Air Outlet Control"
- HAC-19, "Air Flow Control"
- HAC-20, "Air Inlet Control"
- HAC-20, "Compressor Control"
- HAC-21, "Door Control"
- HAC-24, "ECO Mode Control"
- Correction for input value

Ambient temperature correction

- The A/C auto amp. inputs the temperature detected with the ambient sensor as the ambient temperature.

- Perform the correction of the temperature detected with the ambient sensor for air conditioning control.
- Select and use the initial value of ambient temperature data depending on the engine coolant temperature when turning the ignition switch from OFF to ON. Use the detection temperature of the ambient sensor at low coolant temperature [less than approximately 56°C (133°F)]. Use the memory data (before the ignition switch is OFF) when the engine is warming up [approximately 56°C (133°F) or more].
- Do not perform the correction of the ambient temperature when the detection temperature of the ambient temperature is less than approximately –20°C (–4°F).

Passenger room temperature correction
- The A/C auto amp. inputs the temperature detected with the in-vehicle sensor as the passenger room temperature.
- Perform the correction of the temperature detected with the in-vehicle sensor for air conditioning control.
- The A/C auto amp. performs the correction so that the recognition passenger room temperature changes depending on the difference between the detected passenger room temperature and the recognition passenger room temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

Intake temperature correction
- The A/C auto amp. inputs the temperature detected with the intake sensor as the intake temperature.
- Perform the correction of the temperature detected with the intake sensor for air conditioning control.
- The A/C auto amp. performs the correction so that the recognition intake temperature changes depending on the difference between the detected intake temperature and the recognition intake temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

Sunload amount correction
- The A/C auto amp. inputs the sunload amount detected with the sunload sensor.
- Perform the correction of the sunload amount detected with the sunload sensor for air conditioning control.
- When the sunload amount suddenly changes, for example when entering a tunnel, perform the correction so that the recognition sunload amount of the A/C auto amp. changes slowly.

Set temperature correction
- A/C auto amp. controls The A/C auto amp. performs the correction to the target temperature set by the temperature control switch so as to match the temperature felt by the passengers depending on the ambient temperature detected with the ambient sensor and controls it so that the interior air temperature is always the most suitable.

CONTROL BY BCM
- HAC-20, "Compressor Control"

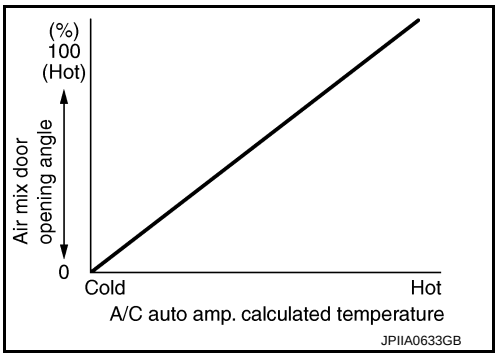
CONTROL BY ECM
- HAC-20, "Compressor Control"
- Cooling fan control. Refer to EC-61, "COOLING FAN CONTROL : System Description".

CONTROL BY IPDM E/R
- HAC-20, "Compressor Control"
- Cooling fan control. Refer to PCS-9, "POWER CONTROL SYSTEM : System Description" (with Intelligent Key) or PCS-41, "POWER CONTROL SYSTEM : System Description" (without Intelligent Key).

Temperature Control

INFOID:0000000006545804

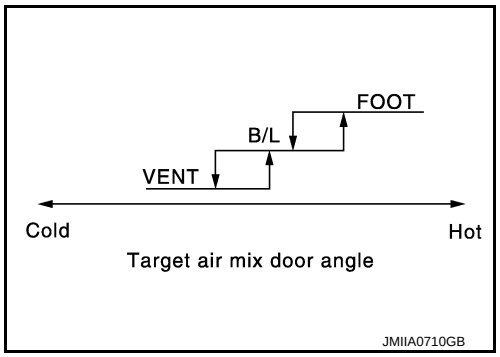
- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of air conditioner operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- Air mix door is controlled depending on the comparison of current air mix door opening angle and target air mix door opening angle.
- Regardless of in-vehicle temperature, ambient temperature, and sunload, air mix door is fixed at the fully cold position when set temperature is 18°C (60°F), and at the fully hot position when set temperature is 32°C (90°F).



Air Outlet Control

INFOID:0000000006545805

- While air outlet is in automatic control, A/C auto amp. selects the mode door position depending on a target air mix door angle and outlet air temperature calculated from sunload.
- If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.



Air Flow Control

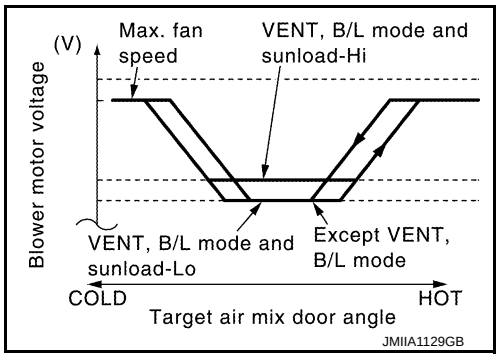
INFOID:0000000006545806

DESCRIPTION

- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously. When air flow is increased, duty ratio of blower motor drive signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control and automatic control, air flow control is compose of starting fan speed control, low coolant temperature starting control, high in-vehicle temperature starting control, and blower speed control at door motor operation.

AUTOMATIC AIR FLOW CONTROL

- A/C auto amp. decides target air flow depending on target air mix door opening angle.
- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously so that air flow matches to target air flow.
- When air outlet is VENT or B/L, the minimum air flow is changed depending on sunload.

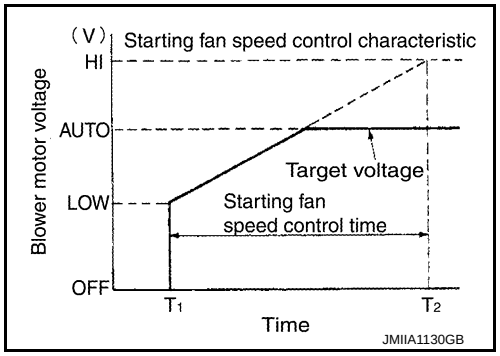


STARTING FAN SPEED CONTROL

When blower motor is activated, A/C auto amp. gradually increases duty ratio of blower fan drive signal to prevent a sudden increase in discharge air flow. (T_1 – T_2 = approximately 10 seconds)

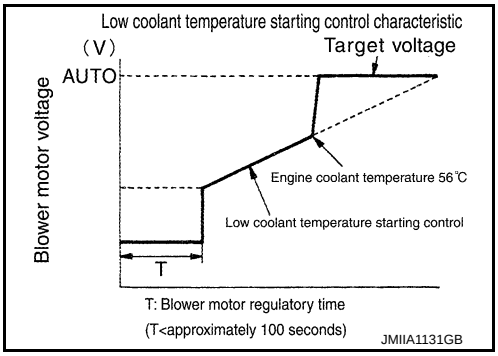
NOTE:

Do not perform the starting air flow control when the discharge outlet is set to DEF.



LOW COOLANT TEMPERATURE STARTING CONTROL

If the engine coolant temperature is 56°C (133°F) or less, to prevent a cold discharged air flow, A/C auto amp. suspends blower motor activation for the maximum 100 seconds depending on target air mix door opening angle. After this, blower fan drive signal is increased gradually, and blower motor is activated.



FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When mode door motor is activated while air flow is more than the specified value, A/C auto amp. reduces temporarily fan speed so that mode door moves smoothly.

HIGH IN- TEMPERATURE STARTING CONTROL

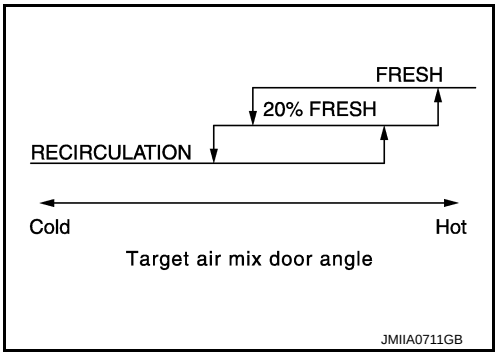
When evaporator temperature is high [intake air temperature sensor value is 35°C (95°F) or more], to prevent a hot discharged air flow, A/C auto amp. suspends blower motor activation for approximately 3 seconds so that evaporator is cooled by refrigerant.

Air Inlet Control

INFOID:0000000006545807

- While air inlet is in automatic control, A/C auto amp. selects air inlet (fresh air intake, 20% fresh air intake, or recirculation) depending on set temperature, in-vehicle temperature, and ambient temperature.
- Air inlet is fixed to 80% FRE, only when the conditions are satisfied as follows:

- Air inlet is FOOT or D/F
- Ambient temperature is 2°C (36°F) or less
- Maximum fan speed



Compressor Control

INFOID:0000000006545808

DESCRIPTION

- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to BCM.
- BCM transmits the A/C ON signal and blower fan ON signal to ECM via CAN communication line.

- With Intelligent Key system: Refer to BCS-13, "SIGNAL BUFFER SYSTEM : System Description".
- Without Intelligent Key system: Refer to BCS-103, "SIGNAL BUFFER SYSTEM : System Description".

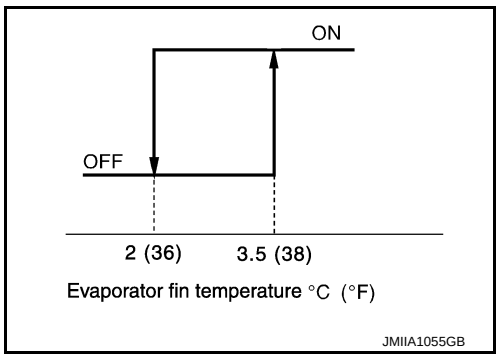
- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor request signal to IPDM E/R via CAN communication line.
- By receiving the A/C compressor request signal from ECM, IPDM E/R turns the A/C relay to ON, and activates the compressor.

- With Intelligent Key system: Refer to PCS-6, "RELAY CONTROL SYSTEM : System Description".
- Without Intelligent Key system: Refer to PCS-38, "RELAY CONTROL SYSTEM : System Description".

CONTROL BY A/C AUTO AMP.

Low Temperature Protection Control

When intake sensor detects that evaporator surface temperature is 2°C (36°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.
When the air temperature returns to 3.5°C (38°F) or more, the compressor is activated.



CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction

The high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn A/C relay OFF and stop the compressor.

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

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 oil once.

Air Conditioning Cut Control

When the engine condition is high load, ECM makes the A/C relay to OFF, and stops the compressor. Refer to EC-60, "AIR CONDITIONING CUT CONTROL : System Description".

Door Control

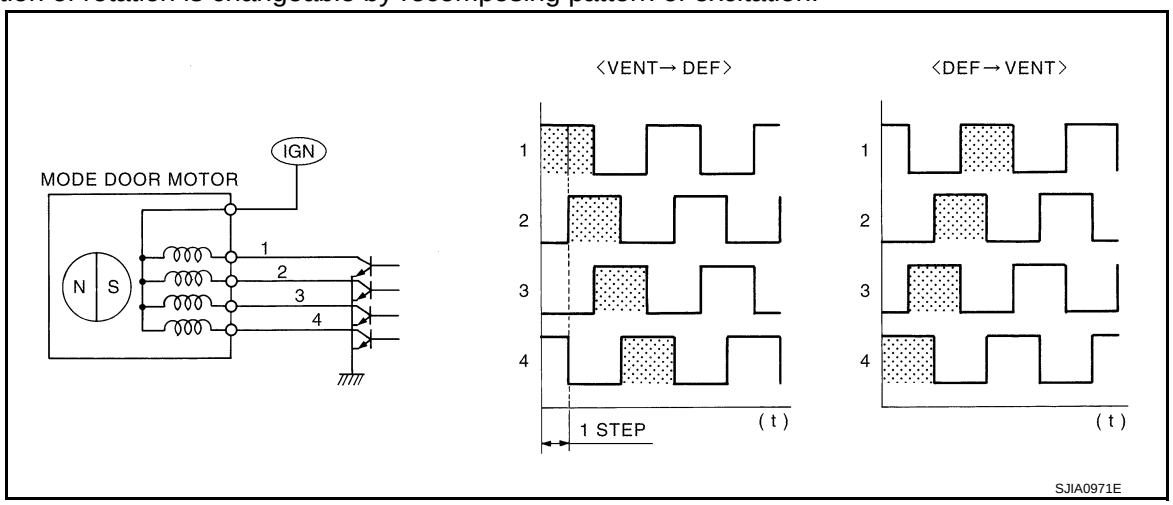
INFOID:0000000006545809

DOOR MOTOR CONTROL

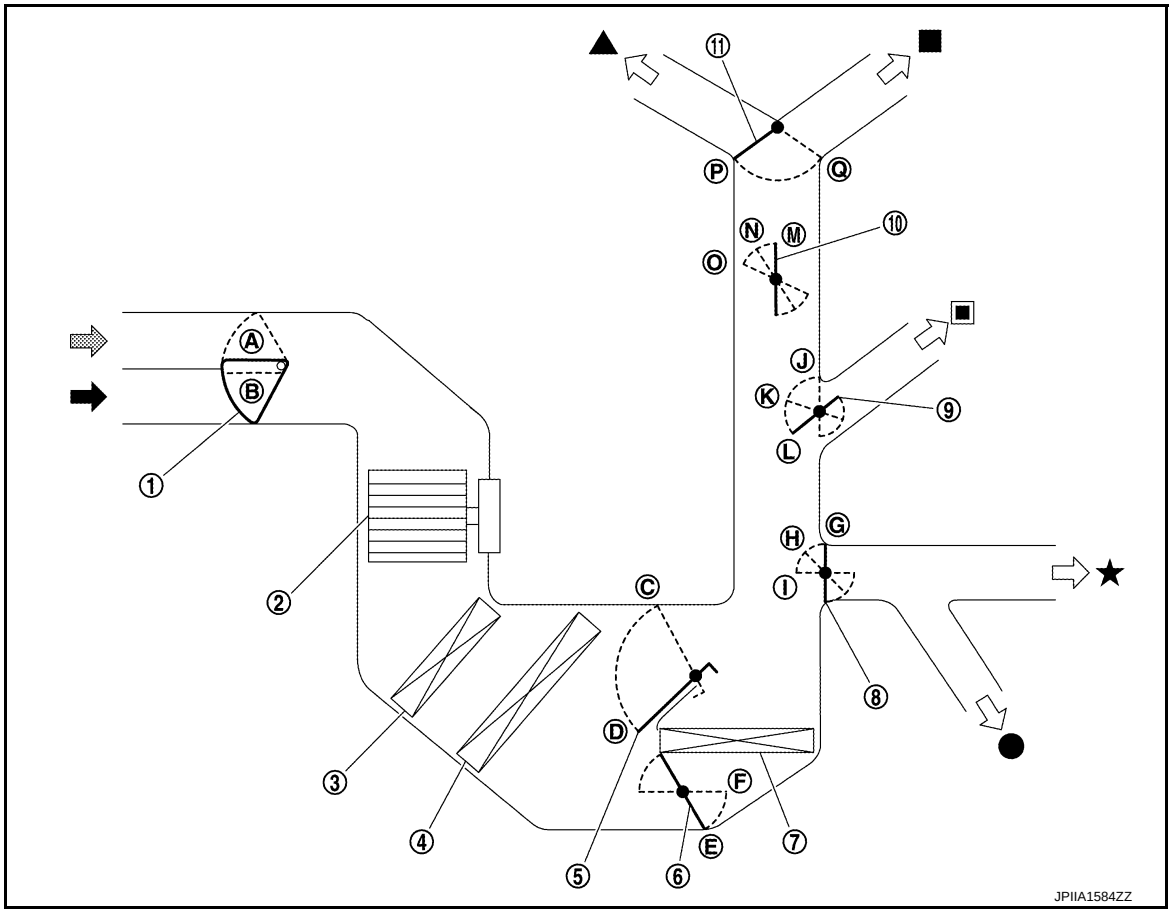
- A/C auto amp. receives the detection data from each sensor.
- Intake door motor, when receiving control signal from A/C auto amp. moves intake door to the appropriate position based on the door position detection signal of each PBR (Potentio Balance Resistor).
- Each motor of air mix and mode, when receiving drive signal from A/C auto amp., moves each door to the appropriate position according to drive signal.

DRIVE METHOD OF STEPPING MOTOR TYPE MOTOR

- Stepping motor type motor is driven by 4 pieces of drive coil that are sequentially excited.
- Direction of rotation is changeable by recomposing pattern of excitation.



SWITCH AND THEIR CONTROL FUNCTION



1. Intake door
2. Blower motor
3. Air conditioner filter
4. Evaporator
5. Upper air mix door
6. Lower air mix door
7. Heater core
8. Foot door
9. Side ventilator door
10. Sub defroster door
11. Center ventilator and defroster door

Fresh air intake | Recirculation air | Defroster
Center ventilator | Side ventilator | Foot
Rear foot*

*: With rear foot duct

Switch/dial position		Door position						
		Center ventilator and defroster door	Sub defroster door	Side ventilator door	Foot door	Intake door	Upper air mix door	Lower air mix door
AUTO switch	AUTO	AUTO						

Switch/dial position				Door position: Center ventilator and defroster door	Sub defroster door	Side ventilator door	Foot door	Intake door	Upper air mix door	Lower air mix door
MODE switch	VENT		☀	P	M	L	G	—	—	—
	B/L		☀		N	K	H			
	FOOT		☀	Q	O	J	I			
	D/F		☀		N					
DEF switch			☀		M		G			
Intake switch			☀	—	—	—	—	A	—	—
			☀					B		
Temperature control dial		Full cold (16°C)						—	D	E
		16.5°C – 29.5°C							AUTO	AUTO
		Full hot (30°C)							C	F
OFF switch				P or Q*	M – O*	J – L*	G – I*	B	—	—

*: Previous setting before turning air conditioning system OFF (FOOT when previous setting is automatic control).

AIR DISTRIBUTION

Without rear foot duct

MODE/DEF setting position	Discharge air flow: Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	52.6%	47.3%	—	—
	34.0%	27.7%	38.4%	—
	—	19.1%	57.9%	23.0%
	—	13.5%	42.4%	44.1%
	—	16.3%	—	83.8%

With rear foot duct

MODE/DEF setting position	Discharge air flow: Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	52.6%	47.3%	—	—	—
	28.2%	25.9%	29.6%	16.3%	—
	—	16.3%	43.0%	21.0%	19.7%

MODE/DEF setting position	Discharge air flow				
	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	—	12.2%	33.1%	16.3%	38.4%
	—	16.3%	—	—	83.8%

ECO Mode Control

INFOID:0000000006626864

DESCRIPTION

- A/C auto amp. receives operation status of each switch (A/C operation signal), D-MODE setting status (ECO mode signal), and “CLIMATE ECO” setting status (A/C ECO setting signal) from multi display unit via CAN communication.
- A/C auto amp. operates air conditioning system in ECO mode, when D-MODE on multi display unit is set to ECO mode while air conditioning system is in automatic control.

NOTE:

- For setting procedure of D-MODE, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".
- Activation or deactivation of ECO mode can be changed using multi display unit setting function (“CLIMATE ECO”). For setting procedure, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

CONTROL OUTLINE

During ECO mode operation, A/C auto amp. changes air flow and control characteristics of air inlet, within a range that may not spoil the comfort level, lowers operation ratio of compressor, and reduces the electrical load. This reduces engine load and improved fuel economy. Refer to the following items for details of each control.

Air Flow Control

- A/C auto amp. increases voltage to power transistor gate compared to ordinary operation and reduces voltage to blower motor. This reduces air flow.
- Since air flow is reduced, the amount of air that passes evaporator is reduced. Increase of evaporator temperature can be moderated. Evaporator temperature is easily shifted to temperature control range for low temperature protection control. Operation ratio of evaporator is reduced.
- Since air flow is reduced, the electrical load is reduced. Alternator power output can be moderated.

Air Inlet Control

- In the following conditions, A/C auto amp. controls air inlet and increases recirculation air mixing ratio compared to ordinary operation.

- Ambient temperature: 25°C (77°F) or more
- Temperature setting: Any temperature other than full cold (16°C) or full hot (30°C)
- Air outlet: In automatic control
- Air flow: In automatic control
- Air inlet: In automatic control or in fresh air intake mode by manual control
- A/C switch: ON

- By increasing recirculation air mixing ratio, cooled air in passenger room is circulated in larger amount than during ordinary operation. Air temperature blowing to evaporator is maintained at a low level. Evaporator temperature increase can be moderated. Evaporator temperature is easily shifted to temperature control range for low temperature protection control. Operation ratio of evaporator is reduced.

Fail-safe

INFOID:0000000006692466

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and multi display unit for 2 seconds or longer, air conditioning is controlled under the following conditions:

A/C display : OFF
Set temperature : Setting before communication error occurs
Air outlet : AUTO

Air flow	**: AUTO**
Air inlet	**: FRE (Fresh air intake)**
A/C switch	**: ON**

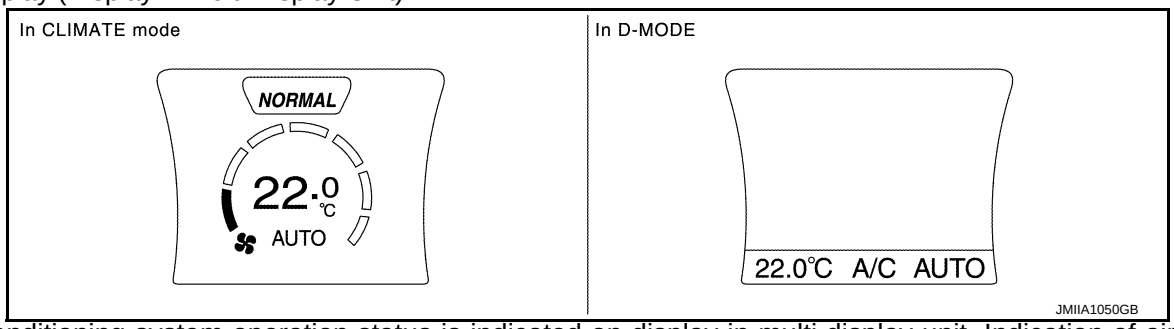
OPERATION

Switch Name and Function

INFOID:0000000006626865

OPERATION AND DISPLAY

A/C Display (Display in Multi Display Unit)



- Air conditioning system operation status is indicated on display in multi display unit. Indication of air conditioning system varies according to display mode of multi display unit. For changing procedure of display mode, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

- In CLIMATE mode: Operation status of air conditioning system (setting temperature, air flow, and “AUTO”*1) is indicated on display when air conditioning system is turned ON.
- In D-MODE: Operation status of air conditioning system (setting temperature, A/C switch, and “AUTO”*2) is indicated on lower portion of display when air conditioning system is turned ON.

NOTE:

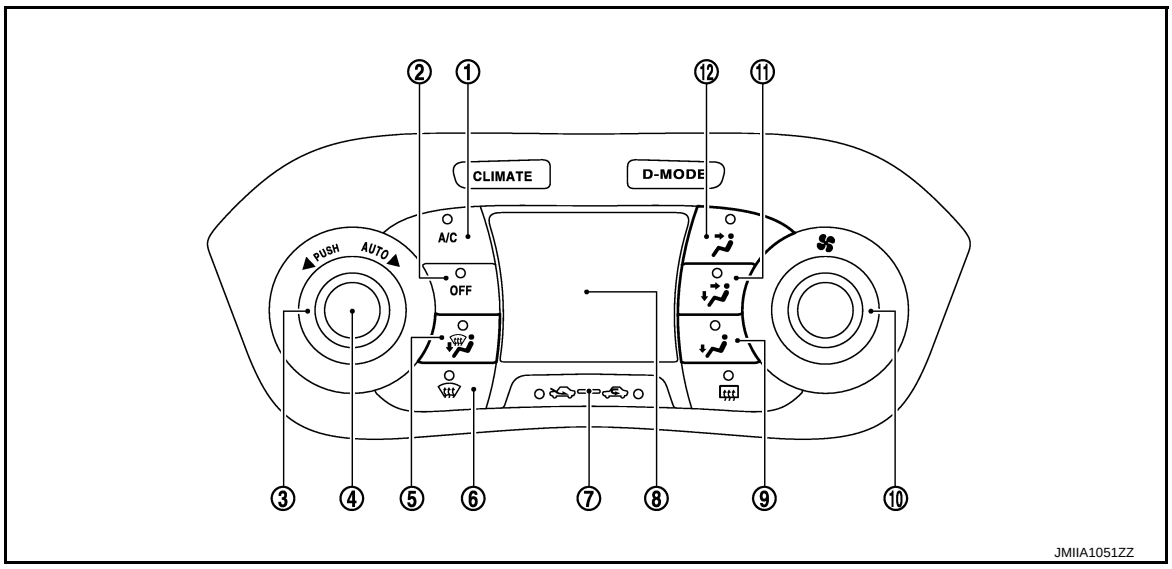
*1: AUTO is indicated when both air flow and air outlet are in automatic control.

*2: Air Flow is indicated when air flow or air outlet is in manual control.

A/C Controller (Multi Display Unit)

Operation procedure of air conditioning system varies depending on display mode of multi display unit. For changing procedure of display mode, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

- In CLIMATE mode: All operations of air conditioning system are possible.



1. A/C switch
2. OFF switch
3. Temperature control dial
4. AUTO switch
5. MODE switch (D/F)
6. DEF switch
7. Intake switch
8. Display
9. MODE switch (FOOT)
10. Fan control dial
11. MODE switch (B/L)
12. MODE switch (VENT)

A/C switch	• Compressor control (switch indicator) changes between ON ⇔ OFF each time when switch is pressed while air conditioning system is in the ON position. • Air conditioning system turns ON and operates according to the following setting when switch is pressed while air conditioning system is in the OFF position. - Air outlet: Previous setting before turning air conditioning system OFF. - Air flow: 1st speed (manual control) - Air inlet: Previous setting before turning air conditioning system OFF. - A/C switch: ON
OFF switch	Air conditioning system turns ON ⇔ OFF each time when switch is pressed. • When switch is pressed while air conditioning system is in the ON position - Air conditioning system turns OFF and changes to the following status when switch is pressed. • Air outlet: Previous setting before turning air conditioning system OFF (FOOT when previous setting is automatic control). • Air flow: OFF. • Air inlet: Fresh air intake (switch indicator turns OFF) • A/C switch: OFF • When switch is pressed while air conditioning system is in the OFF position (Previous setting before turning air conditioning system OFF is other than DEF mode). - Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when switch is pressed. • When switch is pressed while air conditioning system is in the OFF position (Previous setting before turning air conditioning system OFF is DEF mode). - Air conditioning system turns ON and operates according to the following setting when switch is pressed. • Air outlet: Automatic control • Air flow: Automatic control • Air inlet: Automatic control • A/C switch: ON
Temperature control dial	Setting temperature can be set within a range of 16°C – 30°C at a rate of 0.5°C per adjustment using this dial. • Clockwise rotation: Set temperature increases • Counterclockwise rotation: Set temperature decreases.
AUTO switch	“AUTO” is indicated on display and air conditioning system operates according to the following setting when switch is pressed. • Air outlet: Automatic control • Air flow: Automatic control • Air inlet: Automatic control • A/C switch: ON **NOTE:** When air outlet or air flow is manually operated while “AUTO” is indicated on display “AUTO” indication turns OFF. However, automatic control continues for other functions than air outlet or air flow.
MODE switch	• When each MODE switch is pressed, air outlet is switched and VENT, B/L, FOOT, or D/F* can be selected manually. (Switch indicator of operated switch turns ON.) • When each MODE switch is pressed twice continuously, air outlet is set to automatic control. (Switch indicator turns OFF while air outlet automatic control is operated.) • Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when each MODE switch is pressed while air conditioning system is OFF. (Air outlet is set according to the switch that is pressed) *: Air inlet is set to fresh air intake when D/F is selected. **NOTE:** Air outlet automatic control is released (“AUTO” turns OFF) when each MODE switch is pressed while “AUTO” is indicated on display.

DEF switch	DEF mode turns ON ⇔ OFF each time when switch is pressed. • When switch is pressed while air conditioning system is in the ON position. - Air conditioning system operates according to the following setting when DEF mode is turned ON • Air outlet: DEF • Air flow: Automatic control • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning system operates according to the previous setting before turning DEF mode ON when DEF mode is turned OFF. • When switch is pressed while air conditioning system is in the OFF position. - Air conditioning system turns ON and operates according to the following setting when DEF mode is turned ON. • Air outlet: DEF • Air flow: Automatic control • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning system operates according to the previous setting before turning air conditioning system OFF when DEF mode is turned OFF. **NOTE:** • System returns to the status that DEF mode is firstly turned ON when setting is changed during DEF mode using fan control dial, intake switch, or A/C switch and if DEF switch is pressed. • When DEF mode is turned ON while “AUTO” is indicated on display, “AUTO” indication turns OFF. However, air flow automatic control continues.
Intake switch	• Air inlet changes between recirculation (REC) ⇔ fresh air intake (FRE) each time this switch is pressed. -  switch indicator ON: Recirculation* -  switch indicator ON: Fresh air intake • Switch indicator blinks 2 times and air inlet is set to automatic control when switch is pressed and held for 2 seconds or more. • Air conditioning system turns ON and operates according to the following setting when switch is pressed while air conditioning system is in the OFF position. - Air outlet: Previous setting before turning air conditioning system OFF. - Air flow: Previous setting before turning air conditioning system OFF. - Air inlet: Recirculation - A/C switch: ON *: A/C switch turns ON when recirculation is selected.
Fan control dial	• Air flow can be manually set within a range of 1st – 7th speed using this dial. - Clockwise rotation: Air flow increases - Counterclockwise rotation: Air flow decreases • Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when this dial is operated while air conditioning system is OFF. [Air flow is set to 1st speed (manual control)] **NOTE:** Air flow automatic control is released (“AUTO” turns OFF) when this dial is operated while “AUTO” is indicated on display.

• In D-MODE: The following switches and dial cannot be operated.
- A/C switch
- OFF switch
- MODE switch
- Fan control dial

DIAGNOSIS SYSTEM (A/C AUTO AMP.)

Description

INFOID:0000000006626866

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
A/C auto amp.	HVAC	Self Diagnostic Result
		Data Monitor
		Active Test
		Work support
Multi display unit	MDU	Self Diagnostic Result
		Data Monitor
		Active Test
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

CONSULT-III Function

INFOID:0000000006626867

CONSULT-III performs the following functions via CAN communication with A/C auto amp.

Diagnostic mode	Description
Ecu Identification	Displays the part number of A/C auto amp.
Self Diagnostic Result	Displays the diagnosis results judged by A/C auto amp.
Data Monitor	Displays the input/output signal of A/C auto amp.
Active Test	The signals used to activate each device are forcibly supplied from A/C auto amp.
Work support	Changes the setting for each setting function and performs automatic adjustment of components.

NOTE:
Diagnosis should be performed with engine running. Door motor operation speeds become slower and NO results may be returned even for normal operation if battery voltage drops below 12 V during self-diagnosis.

ECU IDENTIFICATION

Part number of A/C auto amp. can be checked.

SELF-DIAGNOSIS RESULTS

Diagnosis result that is judged by A/C auto amp. can be checked. Refer to HAC-39, "DTC Index".

DATA MONITOR

Input/output signal of A/C auto amp. can be checked.

Display item list

Monitor item [Unit]		Description
AMB TEMP SEN	[°C (°F)]	Ambient temperature value converted from ambient sensor signal received from ambient sensor
IN-VEH TEMP	[°C (°F)]	In-vehicle temperature value converted from in-vehicle sensor signal received from in-vehicle sensor

Monitor item [Unit]		Description
INT TEMP SEN	[°C (°F)]	Evaporator fin temperature value converted from intake sensor signal received from intake sensor
SUNLOAD SEN	[w/m^2]	Sunload value converted from sunload sensor signal received from sunload sensor
AMB SEN CAL	[°C (°F)]	Ambient temperature value calculated by A/C auto amp.
IN-VEH CAL	[°C (°F)]	In-vehicle temperature value calculated by A/C auto amp.
INT TEMP CAL	[°C (°F)]	Evaporator fin temperature value calculated by A/C auto amp.
SUNL SEN CAL	[w/m^2]	Sunload value calculated by A/C auto amp.
COMP REQ SIG	[On/Off]	Displays A/C ON signal ON/OFF status transmitted to BCM.
FAN REQ SIG	[On/Off]	Displays blower fan ON signal ON/OFF status transmitted to BCM.
FAN DUTY*		Target value of voltage (applied voltage) applied to blower motor by A/C auto amp.
XM		Target discharge air temperature judged by A/C auto amp. depending on the temperature setting and the value from each sensor
ENG COOL TEMP	[°C (°F)]	Engine coolant temperature signal value received from ECM via CAN communication

*: “DUTY” is displayed, but voltage is indicated. Or unit is not displayed but unit is (V).

ACTIVE TEST

The signals used to activate each device forcibly supplied from A/C auto amp. operation check of air conditioning system can be performed.

Test item	Description
HVAC TEST	The operation check of air conditioning system can be performed by selecting the mode. Refer to the following table for the conditions of each mode.

Check each output device

	Test item						
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7
Mode door motor position	VENT	VENT	B/L	B/L	FOOT*	D/F	DEF
Intake door motor position	REC	REC	REC	20% FRE	80% FRE	FRE	FRE
Air mix door motor position	FULL COLD	FULL COLD	FULL COLD	MIDDLE	MIDDLE	FULL HOT	FULL HOT
Blower motor (Applied voltage)	5 V	8.5 V	10.5 V	8.5 V	8.5 V	8.5 V	13 V
Magnet clutch	ON	ON	ON	ON	OFF	OFF	ON
Blower motor (Blower fan ON signal transmitted to BCM)	ON	ON	ON	ON	OFF	OFF	ON

*: Position of mode door motor is set to the status of automatic control that is selected by foot position setting trimmer. Refer to HAC-49, "Foot Position Setting Trimmer".

NOTE:

Perform the inspection of each output device after starting the engine because the compressor is operated.

WORK SUPPORT

Setting change of each setting functions and automatic adjustment of components can be performed.

Work item	Description	Refer to
TEMP SET CORRECT	Setting change of temperature setting trimmer can be performed.	HAC-48, "Temperature Setting Trimmer"
REC MEMORY SET	Setting change of inlet port memory function (REC) can be performed.	HAC-48, "Inlet Port Memory Function (REC)"
FRE MEMORY SET	Setting change of inlet port memory function (FRE) can be performed.	HAC-49, "Inlet Port Memory Function (FRE)"

Work item	Description	Refer to
BLOWER SET	Setting change of foot position setting trimmer can be performed.	HAC-49, "Foot Position Setting Trimmer"
Door Motor Starting Position Reset	Starting position reset of air mix door motor and mode door motor can be performed.	HAC-50, "Work Procedure"

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

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)
COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706383

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
• Automatic A/C • Manual A/C	AIR CONDITONER		×	×*2
• Intelligent Key system • Engine start system	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
NVIS - NATS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Theft warning alarm	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

- *1: This item is displayed, but not used.
- *2: For models with automatic A/C, this diagnosis mode is not used.

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT-III.

CONSULT screen item	Indication/Unit	Description	
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected	
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected	
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected	While turning BCM status from low power consumption mode to normal mode (Power supply position is “LOCK”)
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is “OFF”.)
	LOCK>ACC		While turning power supply position from “LOCK” to “ACC”
	ACC>ON		While turning power supply position from “ACC” to “IGN”
	RUN>ACC		While turning power supply position from “RUN” to “ACC” (Vehicle is stopping and selector lever is except P position.)
	CRANK>RUN		While turning power supply position from “CRANKING” to “RUN” (From cranking up the engine to run it)
	RUN>URGENT		While turning power supply position from “RUN“ to “ACC” (Emergency stop operation)
	ACC>OFF		While turning power supply position from “ACC” to “OFF”
	OFF>LOCK		While turning power supply position from “OFF” to “LOCK”
	OFF>ACC		While turning power supply position from “OFF” to “ACC”
	ON>CRANK		While turning power supply position from “IGN” to “CRANKING”
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is “OFF”.) to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is “LOCK”.) to low power consumption mode
	LOCK		Power supply position is “LOCK” (Ignition switch OFF with steering is locked.)
	OFF		Power supply position is “OFF” (Ignition switch OFF with steering is unlocked.)
	ACC		Power supply position is “ACC” (Ignition switch ACC)
	ON		Power supply position is “IGN” (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is “RUN” (Ignition switch ON with engine running)
	CRANKING		Power supply position is “CRANKING” (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Automatic A/C 4WD Models)

INFOID:0000000006545813

DATA MONITOR

Display Item List

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays the blower fan status as jugged from the A/C auto amp.
AIR COND SW	[On/Off]	Displays [COMP (On)/COMP (Off)] status as judged from the A/C auto amp.

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706384

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×
• Automatic A/C • Manual A/C • Manual heater	AIR CONDITONER		×	×*2
Combination switch	COMB SW		×	
Body control system	BCM	×		
NATS	IMMU	×		×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	PANIC ALARM*1			×

- *1: This item is displayed, but is not used.
- *2: For models with automatic A/C, this mode is not used.

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Automatic A/C 4WD Models)

INFOID:0000000006545815

DATA MONITOR

Display Item List

Monitor Item [Unit]		Contents
IGN SW	[On/Off]	Displays ignition switch position status as judged from ignition switch signal.
FAN ON SIG	[On/Off]	Displays the blower fan status as jugged from the A/C auto amp.
AIR COND SW	[On/Off]	Displays [COMP (On)/COMP (Off)] status as judged from the A/C auto amp.

ECU DIAGNOSIS INFORMATION

A/C AUTO AMP.

Reference Value

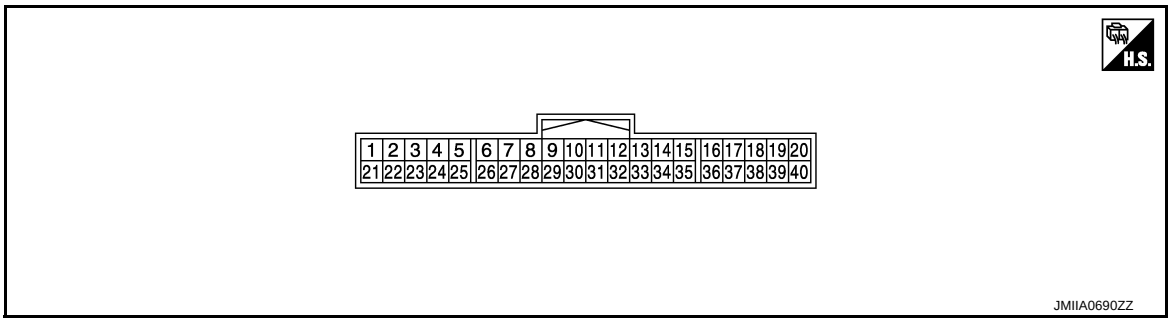
INFOID:0000000006626868

CONSULT-III DATA MONITOR REFERENCE VALUES

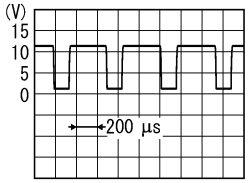
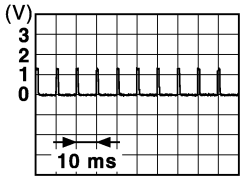
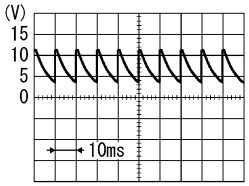
Monitor item	Condition		Value/Status
AMB TEMP SEN	Ignition switch ON		Equivalent to ambient temperature
IN-VEH TEMP	Ignition switch ON		Equivalent to in-vehicle temperature
INT TEMP SEN	Ignition switch ON		Equivalent to evaporator fin temperature
SUNLOAD SEN	Ignition switch ON		Equivalent to sunload amount
AMB SEN CAL	Ignition switch ON		Equivalent to ambient temperature
IN-VEH CAL	Ignition switch ON		Equivalent to in-vehicle temperature
INT TEMP CAL	Ignition switch ON		Equivalent to evaporator fin temperature
SUNL SEN CAL	Ignition switch ON		Equivalent to sunload amount
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	On
		A/C switch: OFF	Off
FAN REQ SIG	Engine: Run at idle after warming up	Blower motor: ON	On
		Blower motor: OFF	Off
FAN DUTY*	Engine: Run at idle after warming up	Blower motor: ON	4 – 13
		Blower motor: OFF	0
XM	Ignition switch ON		Value according to target air flow temperature
ENG COOL TEMP	Ignition switch ON		Equivalent to engine coolant temperature

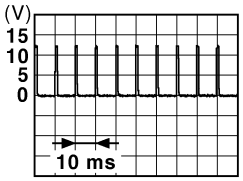
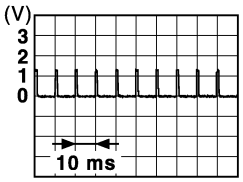
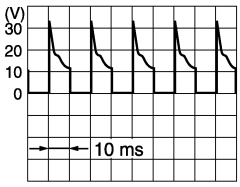
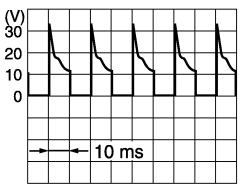
*: “DUTY” is displayed, but voltage is indicated. Or unit is not displayed but unit is (V).

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value
+	–	Signal name	Input/ Output		
2 (LG)	30 (B)	In-vehicle sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with in-vehicle temperature
3 (V)	30 (B)	Intake sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with evaporator fin temperature
4 (GR)	30 (B)	Ambient sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with ambient temperature
5 (P)	30 (B)	Sunload sensor signal	Input	Ignition switch ON	0 – 4.8 V Output voltage varies with sunload amount
6 (L)	—	CAN-H	Input/ Output	—	—
7 (P)	—	CAN-L	Input/ Output	—	—
8 (W)	30 (B)	Intake door motor PBR power supply	Output	Ignition switch ON	4.8 – 5.2 V
9 (P)	30 (B)	A/C auto amp. connection recognition signal	Output	Ignition switch ON	11 – 14 V
10 (R)	30 (B)	Sensor ground	—	Ignition switch ON	0 – 0.1 V
11 (SB)	30 (B)	Ignition power supply	Input	Ignition switch ON	11 – 14 V
12 (Y)	30 (B)	Battery power supply	Input	Ignition switch OFF	11 – 14 V
13 (GR)	30 (B)	Power transistor control signal	Output	• Ignition switch ON • Blower motor: 1st speed (manual)	 ZJIA0863J
14 (LG)	30 (B)	Blower fan ON signal	Output	• Ignition switch ON • Blower motor: OFF	 JMIIA0941GB
				• Ignition switch ON • Blower motor: ON	 PKIB4960J

Terminal No. (Wire color)		Description			Condition	Value
+	–	Signal name		Input/ Output		
15 (Y)	30 (B)	A/C ON signal		Output	• Ignition switch ON • A/C switch: OFF (A/C indicator: OFF)	 JPMIA0012GB
					• Ignition switch ON • A/C switch: ON (A/C indicator: ON)	 JMIIA0941GB
17 (BR)	30 (B)	A/MIX drive 4	Air mix door motor drive signal	Output	• Ignition switch ON • Right after the temperature control dial operation	 JPIIA1647GB
18 (GR)	30 (B)	A/MIX drive 3				
19 (W)	30 (B)	A/MIX drive 2				
20 (L)	30 (B)	A/MIX drive 1				
21 (G)	30 (B)	Ignition power supply		Input	Ignition switch ON	11 – 14 V
22 (SB)	30 (B)	Intake door motor PBR feedback signal		Input	• Ignition switch ON • Intake switch: REC	0.2 – 0.8 V
					• Ignition switch ON • Intake switch: FRE	4.2 – 4.8 V
30 (B)	Ground	Ground		—	Ignition switch ON	0 – 0.1 V
35 (G)	30 (B)	REC	Intake door motor drive signal	Output	• Ignition switch ON • Intake switch: FRE → REC	9.5 – 13.5 V
					• Ignition switch ON • Intake switch: REC → FRE	0 – 1 V
36 (V)	30 (B)	FRE			• Ignition switch ON • Intake switch: REC → FRE	9.5 – 13.5 V
					• Ignition switch ON • Intake switch: FRE → REC	0 – 1 V
37 (R)	30 (B)	MODE drive 4	Mode door motor drive signal	Output	• Ignition switch ON • Right after the MODE switch operation	 JPIIA1647GB
38 (P)	30 (B)	MODE drive 3				
39 (Y)	30 (B)	MODE drive 2				
40 (V)	30 (B)	MODE drive 1				

Fail-safe

INFOID:0000000006626869

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and multi display unit for 2 seconds or longer, air conditioning is controlled under the following conditions:

A/C display	**: OFF**
Set temperature	**: Setting before communication error occurs**
Air outlet	**: AUTO**
Air flow	**: AUTO**
Air inlet	**: FRE (Fresh air intake)**
A/C switch	**: ON**

DTC Index

INFOID:0000000006626870

DTC	Items (CONSULT-III screen terms)	Reference
U1000	CAN COMM CIRCUIT	HAC-51, "DTC Logic"
U1010	CONTROL UNIT (CAN)	HAC-52, "DTC Logic"
B2578	IN-VEHICLE SENSOR	HAC-53, "DTC Logic"
B2579	IN-VEHICLE SENSOR	HAC-53, "DTC Logic"
B257B	AMBIENT SENOR	HAC-56, "DTC Logic"
B257C	AMBIENT SENOR	HAC-56, "DTC Logic"
B2581	INTAKE SENSOR	HAC-59, "DTC Logic"
B2582	INTAKE SENSOR	HAC-59, "DTC Logic"
B2630*	SUNLOAD SENSOR	HAC-62, "DTC Logic"
B2631*	SUNLOAD SENSOR	HAC-62, "DTC Logic"
B27A0	INTAKE DOOR MOTOR	HAC-65, "DTC Logic"
B27A1	INTAKE DOOR MOTOR	HAC-65, "DTC Logic"
B27A2	DR AIR MIX DOOR MOT	HAC-69, "DTC Logic"
B27A3	DR AIR MIX DOOR MOT	HAC-69, "DTC Logic"
B27A4	DR AIR MIX DOOR MOT	HAC-69, "DTC Logic"
B27A5	DR AIR MIX DOOR MOT	HAC-69, "DTC Logic"
B27A6	MODE DOOR MOTOR	HAC-71, "DTC Logic"
B27A7	MODE DOOR MOTOR	HAC-71, "DTC Logic"
B27A8	MODE DOOR MOTOR	HAC-71, "DTC Logic"
B27A9	MODE DOOR MOTOR	HAC-71, "DTC Logic"

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

MULTI DISPLAY UNIT, BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000006545817

ECU		Reference
Multi display unit		AV-109, "Reference Value"
		AV-111, "DTC Inspection Priority Chart"
		AV-111, "DTC Index"
BCM	With Intelligent Key system	BCS-41, "Reference Value"
		BCS-64, "Fail-safe"
		BCS-66, "DTC Inspection Priority Chart"
		BCS-67, "DTC Index"
	Without Intelligent Key system	BCS-125, "Reference Value"
		BCS-140, "Fail-safe"
		BCS-140, "DTC Inspection Priority Chart"
		BCS-141, "DTC Index"
ECM		EC-90, "Reference Value"
		EC-104, "Fail Safe"
		EC-106, "DTC Inspection Priority Chart"
		EC-108, "DTC Index"
IPDM E/R	With Intelligent Key system	PCS-17, "Reference Value"
		PCS-24, "Fail-Safe"
		PCS-25, "DTC Index"
	Without Intelligent Key system	PCS-48, "Reference Value"
		PCS-54, "Fail-Safe"
		PCS-55, "DTC Index"

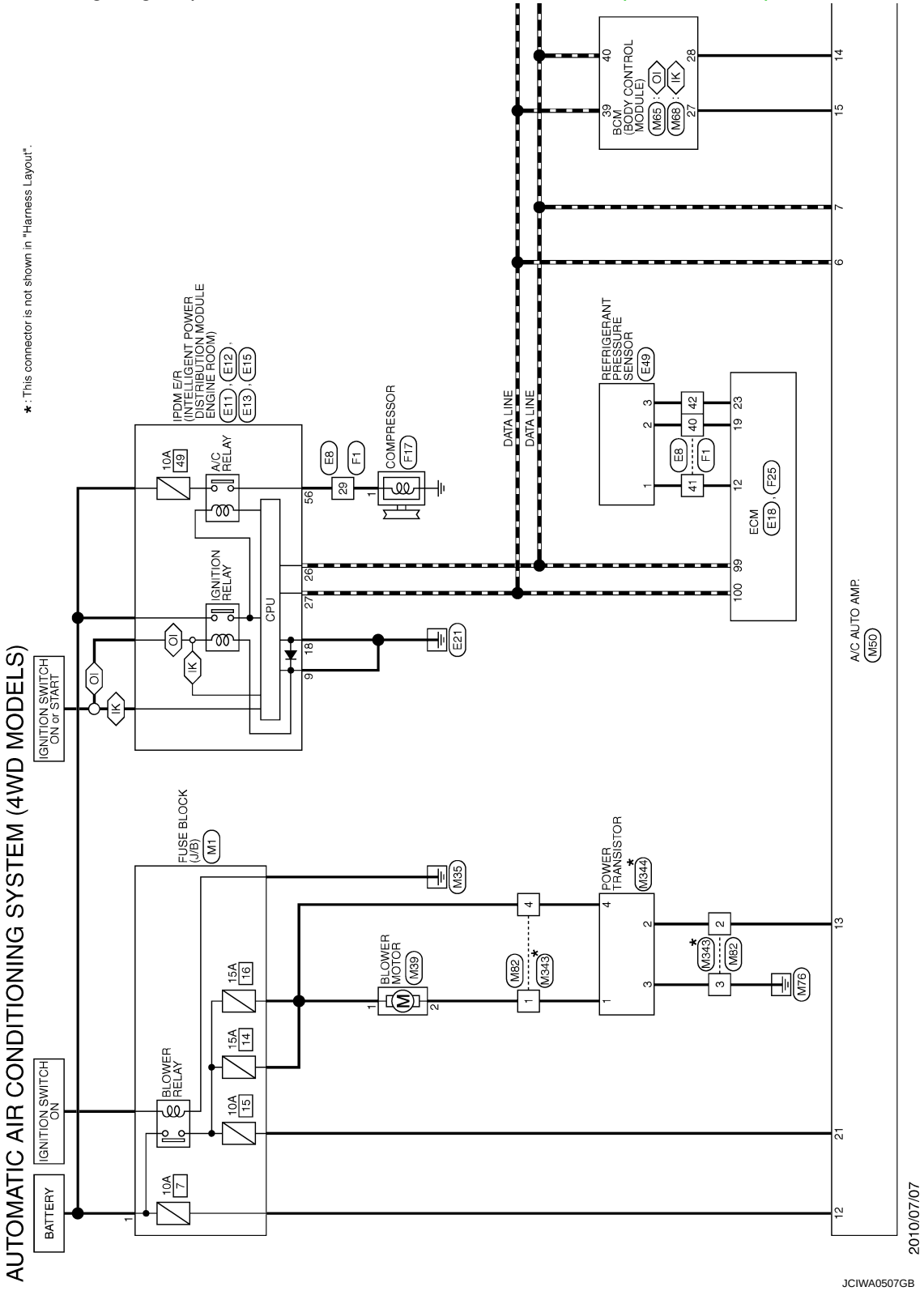
WIRING DIAGRAM

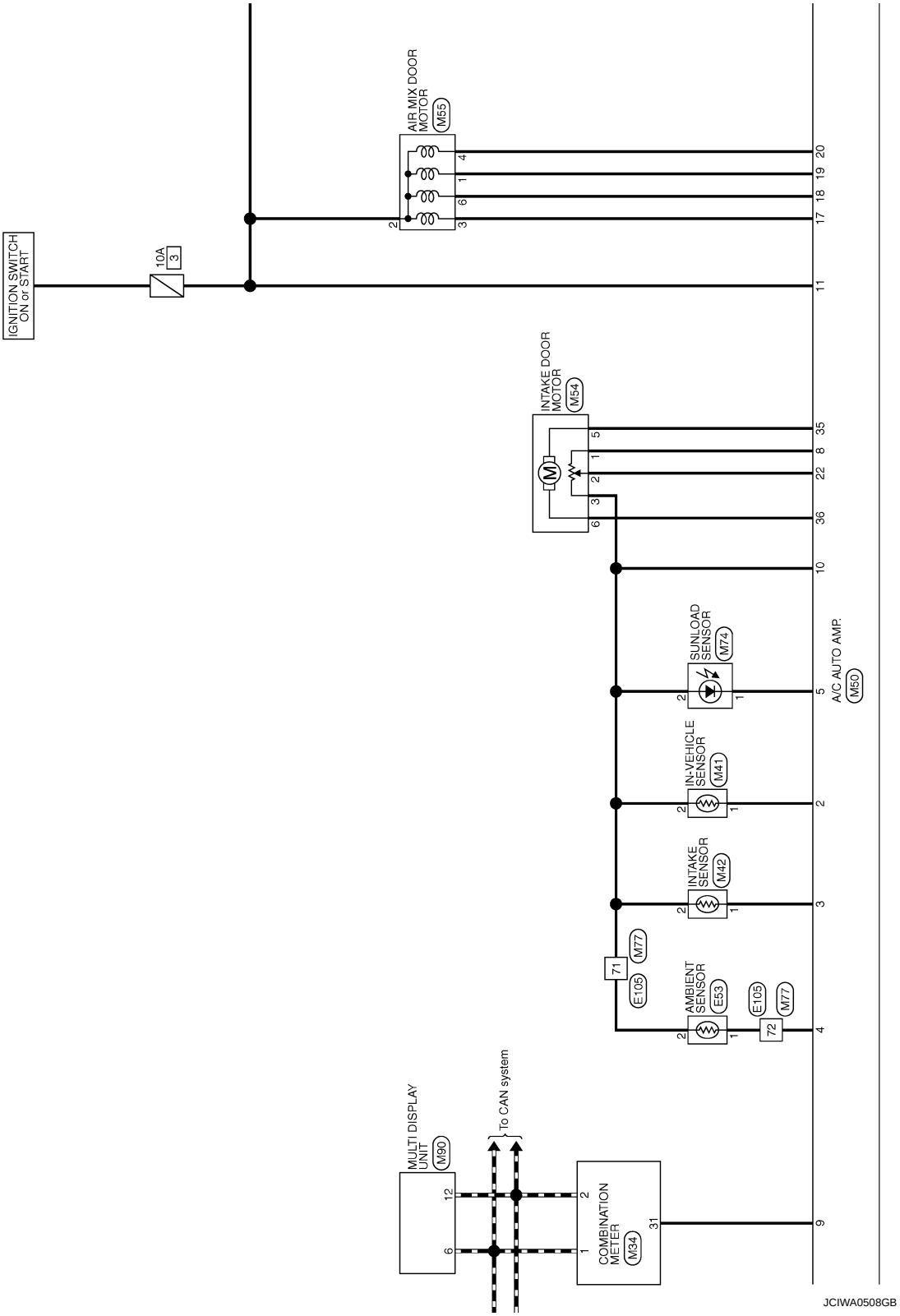
AUTOMATIC AIR CONDITIONING SYSTEM

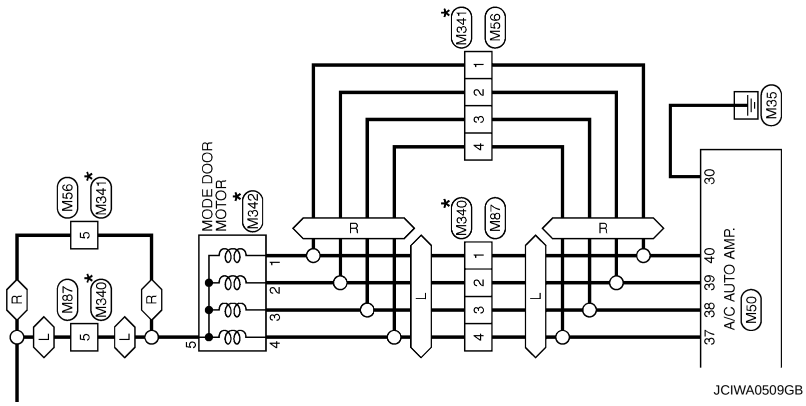
Wiring Diagram

INFOID:0000000006545818

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information/Explanation of Option Abbreviation".




IGNITION SWITCH ON or START
10A 3
AIR MIX DOOR MOTOR M55
INTAKE DOOR MOTOR M54
SUNLOAD SENSOR M74
IN-VEHICLE SENSOR M41
INTAKE SENSOR M42
AMBIENT SENSOR E53
71 M77 E105
72 E105 M77
A/C AUTO AMP. M50
MULTI DISPLAY UNIT M90
COMBINATION METER M34
To CAN system
JCIWA0508GB


M341
M56
M35
MODE DOOR MOTOR
M342
M340
M87
R
L
A/C AUTO AMP.
M50
JCIWA0509GB

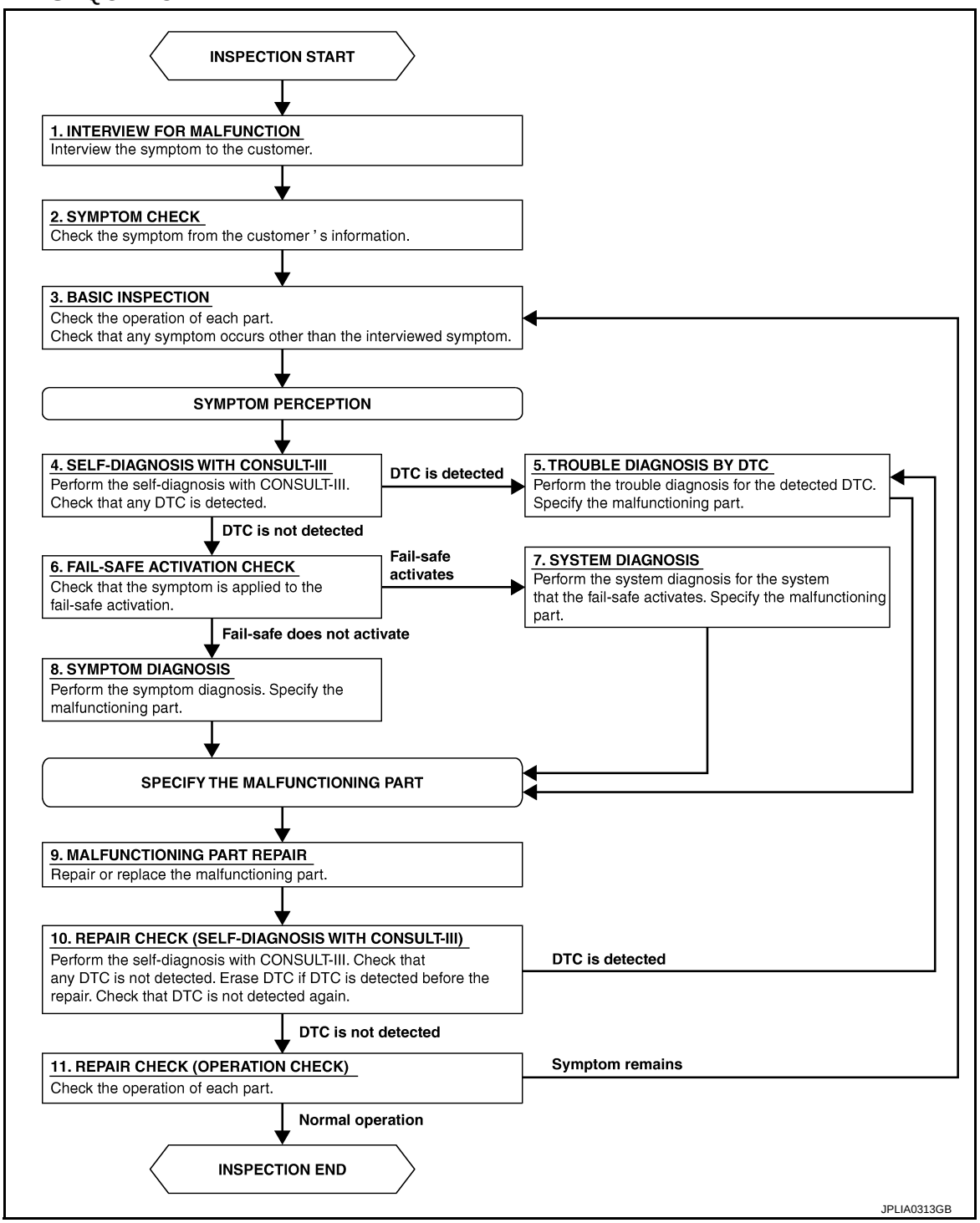
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006626873

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 9.

6.FAIL-SAFE ACTIVATION CHECK

Check that the symptom is applied to the fail-safe activation.

Does the fail-safe activate?

YES >> GO TO 7.
NO >> GO TO 8.

7.SYSTEM DIAGNOSIS

Perform the system diagnosis for the system that the fail-safe activates. Specify the malfunctioning part.

>> GO TO 9.

8.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 9.

9.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 10.

10.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnosis with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 11.

11.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

OPERATION INSPECTION

Work Procedure

INFOID:0000000006545820

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

Check condition : Engine running at normal operating temperature.

1.CHECK MEMORY FUNCTION

1. Set temperature to 30°C by operating the temperature control dial.
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 10.

2.CHECK AIR FLOW

1. Start engine.
2. Operate fan control dial.
3. Check that air flow changes. Check operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 10.

3.CHECK AIR OUTLET

1. Operate fan control dial 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 air outlets. Refer to VTL-5, "System Description".

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 10.

4.CHECK AIR INLET

1. Press intake switch to set the air inlet to recirculation. [Intake switch indicator (side) turns ON.]
2. Listen to intake sound and confirm air inlets change.
3. Press intake switch again to set the air inlet to fresh air intake. [Intake switch indicator (side) turns OFF and (side) turns ON.]
4. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 10.

5.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 6.
NO >> GO TO 10.

6.CHECK DISCHARGE AIR TEMPERATURE

1. Operate temperature control dial.
2. Check that discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 10.

7. CHECK TEMPERATURE DECREASE

1. Operate compressor.
2. Operate temperature control dial and lower the set temperature to 16°C.
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 10.

8. CHECK TEMPERATURE INCREASE

1. Operate temperature control dial and raise the set temperature to 30°C.
2. Check that warm air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 9.
NO >> GO TO 10.

9. CHECK AUTO MODE

1. Press AUTO switch to confirm that “AUTO” is indicated on the display.
2. Operate temperature control dial to check that air outlet or air flow changes (the air outlet or air flow varies depending on the ambient temperature, in-vehicle temperature, set temperature, and etc.).

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 10.

10. CHECK SELF-DIAGNOSIS WITH CONSULT-III

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

Is any DTC detected?

YES >> Refer to HAC-39, "DTC Index" and perform the appropriate diagnosis.
NO >> GO TO 11.

11. CHECK FAIL-SAFE ACTIVATION

Check that symptom is applied to the fail-safe activation. Refer to HAC-39, "Fail-safe".

>> Refer to HAC-84, "Symptom Table" and perform the appropriate diagnosis.

SYSTEM SETTING

Temperature Setting Trimmer

INFOID:0000000006626875

DESCRIPTION

If the temperature felt by the customer is different from the 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-III

Perform “TEMP SET CORRECT” of HVAC work support item.

Work support items	Display (°C)
TEMP SET CORRECT	3.0
	2.5
	2.0
	1.5
	1.0
	0.5
	0 (initial status)
	–0.5
	–1.0
	–1.5
	–2.0
	–2.5
	–3.0

NOTE:

- When –3.0°C is corrected on the temperature setting set as 25.0°C the temperature controlled by A/C auto amp. is 25.0°C –3.0°C = 22.0°C 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.

Inlet Port Memory Function (REC)

INFOID:0000000006626878

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-III

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.

Inlet Port Memory Function (FRE)

INFOID:0000000006626877

DESCRIPTION

- 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-III

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.

Foot Position Setting Trimmer

INFOID:0000000006626876

DESCRIPTION

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

HOW TO SET

With CONSULT-III

Perform the “BLOW SET” of HVAC work support item.

Work support items	Display	Defroster door position	
		Auto control	Manual control
BLOW SET	Mode1 (initial status)	OPEN	CLOSE
	Mode2	OPEN	OPEN
	Mode3	CLOSE	OPEN
	Mode4	CLOSE	CLOSE

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 discharge air mix ratio in FOOT mode may be cancelled.

DOOR MOTOR STARTING POSITION RESET

Description

INFOID:0000000006626879

- Reset signal is transmitted from A/C auto amp. to air mix door motor and mode door motor. Starting position reset can be performed.
  NOTE:
  During reset, DEF switch indicator blinks.
- When air mix door motor or mode door motor is removed and installed, always perform door motor starting position reset.

Work Procedure

INFOID:0000000006626880

1.PERFORM DOOR MOTOR STARTING POSITION RESET

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Door Motor Starting Position Reset” in “ACTIVE TEST” mode of “HVAC” using CONSULT-III.
3. Touch “Start” and wait a few seconds.
4. Make sure the “COMPLETED” is displayed on CONSULT-III screen.

>> INSPECTION END

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006627100

CAN (Controller Area Network) is a serial communication line for real time applications. It is an on-board multiplex communication line with high data communication speed and excellent error detection ability. A modern vehicle is equipped with many ECMs, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, 2 control units are connected with 2 communication lines (CAN-L line and CAN-H 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-31, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart" for details of the communication signal.

DTC Logic

INFOID:0000000006627101

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1000	CAN COMM CIRCUIT	When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds.	CAN communication system

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III
1. Turn ignition switch ON and wait at least 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-51, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-42, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000006627102

1. CHECK CAN COMMUNICATION SYSTEM

Check CAN communication system. Refer to LAN-17, "Trouble Diagnosis Flow Chart".

>> INSPECTION END

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000006627103

Initial diagnosis of A/C auto amp.

DTC Logic

INFOID:0000000006627104

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1010	CONTROL UNIT(CAN)	When detecting error during the initial diagnosis of CAN controller of A/C auto amp.	A/C auto amp.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-52, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006627105

1.REPLACE A/C AUTO AMP.

Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".

>> INSPECTION END

B2578, B2579 IN-VEHICLE SENSOR

DTC Logic

INFOID:0000000006627107

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B2578	IN-VEHICLE SENSOR	The in-vehicle sensor recognition temperature is too high [more than 100°C (212°F)].	• 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 [less than –42°C (–44°F)].	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-53, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545828

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.)
In-vehicle sensor			
Connector	Terminal		
M41	1	Ground	5 V

Is the inspection result normal?

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

2. CHECK IN-VEHICLE SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp harness connector.

In-vehicle sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M41	2	M50	10	Existed

Is the inspection result normal?

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

3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-57, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace in-vehicle sensor. Refer to HAC-93, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

In-vehicle sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M41	1	M50	2	Existed

Is the inspection result normal?

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

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

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

In-vehicle sensor		—	Continuity
Connector	Terminal		
M41	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006545829

1.CHECK IN-VEHICLE SENSOR

1. Remove in-vehicle sensor. Refer to HAC-93, "Removal and Installation".
2. Check resistance between in-vehicle sensor terminals. Refer to applicable table for the normal value.

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-93, "Removal and Installation".

B257B, B257C AMBIENT SENSOR

DTC Logic

INFOID:0000000006627108

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B257B	AMBIENT SENSOR	The ambient sensor recognition temperature is too high [more than 100°C (212°F)].	• Ambient sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B257C		The ambient sensor recognition temperature is too low [less than –42°C (–44°F)].	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-56, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545826

1.CHECK AMBIENT SENSOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Ambient sensor			
Connector	Terminal		
E53	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK AMBIENT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp harness connector.

Ambient sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
E53	2	M50	10	Existed

Is the inspection result normal?

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

3. CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-57, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace ambient sensor. Refer to HAC-92, "Removal and Installation".

4. CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

Ambient sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
E53	1	M50	4	Existed

Is the inspection result normal?

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

5. CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between ambient sensor harness connector and ground.

Ambient sensor		—	Continuity
Connector	Terminal		
E53	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006545827

1. CHECK AMBIENT SENSOR

1. Remove ambient sensor. Refer to HAC-92, "Removal and Installation".
2. Check resistance between ambient sensor terminals. Refer to applicable table for the normal value.

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-92, "Removal and Installation".

B2581, B2582 INTAKE SENSOR

DTC Logic

INFOID:0000000006627109

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B2581	INTAKE SENSOR	The intake sensor recognition temperature is too high [more than 100°C (212°F)].	• Intake sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B2582		The intake sensor recognition temperature is too low [less than –42°C (–44°F)].	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-59, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545830

1.CHECK INTAKE SENSOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Intake sensor			
Connector	Terminal		
M42	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK INTAKE SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp harness connector.

Intake sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M42	2	M50	10	Existed

Is the inspection result normal?

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

3.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-57, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace intake sensor. Refer to HAC-95, "Removal and Installation".

4.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

Intake sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M42	1	M50	3	Existed

Is the inspection result normal?

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

5.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between intake sensor harness connector and ground.

Intake sensor		—	Continuity
Connector	Terminal		
M42	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006545831

1.CHECK INTAKE SENSOR

1. Remove intake sensor. Refer to HAC-95, "Removal and Installation".
2. Check resistance between intake sensor terminals. Refer to applicable table for the normal value.

Terminal		Condition	Resistance: kΩ
		Temperature: °C (°F)	
1	2	–15 (5)	12.34
		–10 (14)	9.62
		–5 (23)	7.56
		0 (32)	6.00
		5 (41)	4.80
		10 (50)	3.87
		15 (59)	3.15
		20 (68)	2.57
		25 (77)	2.12
		30 (86)	1.76
		35 (95)	1.47
		40 (104)	1.23
		45 (113)	1.04

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake sensor. Refer to HAC-95, "Removal and Installation".

B2630, B2631 SUNLOAD SENSOR

DTC Logic

INFOID:0000000006627110

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "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-III screen terms)	DTC detection condition	Possible cause
B2630	SUNLOAD SENSOR	Detected calorie at sunload sensor 1677 W/m^2 (1442 kcal/m^2·h) or more.	• Sunload sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B2631		Detected calorie at sunload sensor 33 W/m^2 (28 kcal/m^2·h) or less.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-62, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545832

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		
M74	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK SUNLOAD SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp harness connector.

Sunload sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M74	2	M50	10	Existed

Is the inspection result normal?

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

3. CHECK SUNLOAD SENSOR

1. Disconnect A/C auto amp. connector.
2. Check sunload sensor. Refer to HAC-57, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace sunload sensor. Refer to HAC-94, "Removal and Installation".

4. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

Sunload sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M74	1	M50	5	Existed

Is the inspection result normal?

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

5. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between sunload sensor harness connector and ground.

Sunload sensor		—	Continuity
Connector	Terminal		
M74	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

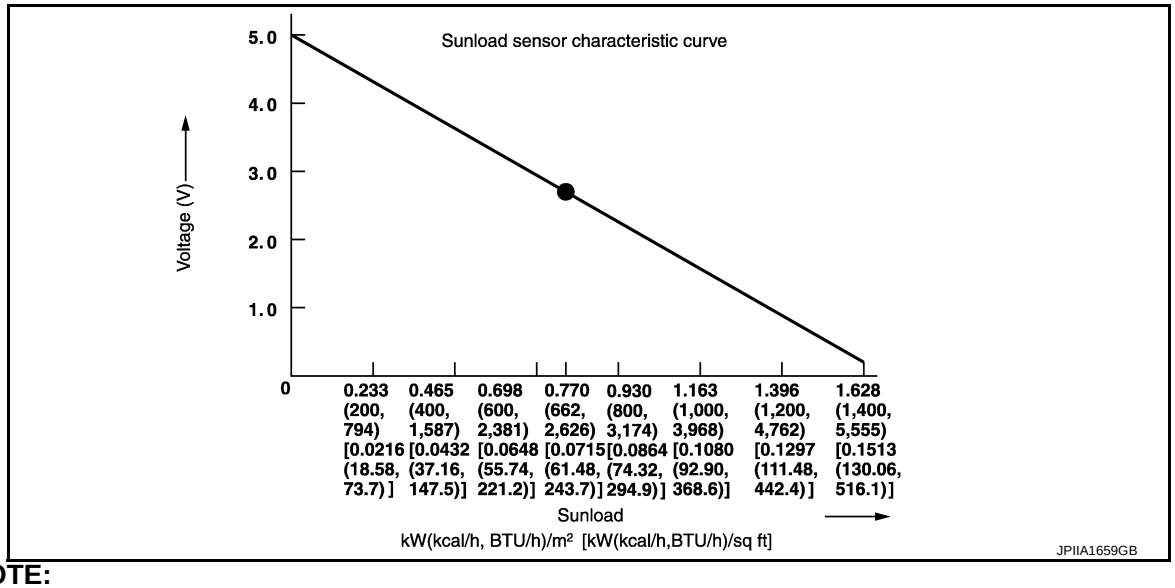
Component Inspection

INFOID:0000000006545833

1. CHECK SUNLOAD SENSOR

1. Turn ignition switch ON.
2. Check voltage between A/C auto amp. harness connector and ground. Refer to applicable table for the normal value.

A/C auto amp.		
Connector	+	–
	Terminal	Terminal
M50	5	30



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 0.77 kW/m^2 (662 $kcal/m^2 \cdot h$).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace sunload sensor. Refer to HAC-94, "Removal and Installation".

B27A0, B27A1 INTAKE DOOR MOTOR

DTC Logic

INFOID:0000000006626930

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition*	Possible cause
B27A0	INTAKE DOOR MOTOR	PBR opening angle of intake door motor is 50% or more. (PBR feedback signal voltage of intake door motor is 2.5 V or more)	• Intake door motor • Intake door motor system installation condition • A/C auto amp. • Harness or connectors (The motor circuit is open or shorted.)
B27A1		PBR opening angle of intake door motor is 30% or less. (PBR feedback signal voltage of intake door motor is 1.5 V or less)	

*: A/C auto amp. operates intake door motor according to target value of PBR opening angle at 40% when performing self-diagnosis.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Start engine.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-65, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006626931

1.CHECK INTAKE DOOR MOTOR OPERATION

1. Turn ignition switch ON.
2. Operate intake switch and check by operation sound that intake door motor operates.

Does the intake door motor operate?

YES >> GO TO 2.
NO >> GO TO 8.

2.CHECK INTAKE DOOR MOTOR PBR POWER SUPPLY

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

+		–	Voltage (Approx.)
Intake door motor			
Connector	Terminal		
M54	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 7.

3.CHECK INTAKE DOOR MOTOR PBR GROUND CIRCUIT FOR OPEN

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

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M54	3	M50	10	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK INTAKE DOOR MOTOR PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN

Check continuity between intake door motor harness connector and A/C auto amp. harness connector.

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M54	2	M50	22	Existed

Is the inspection result normal?

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

5. CHECK INTAKE DOOR MOTOR PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT

Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M54	2	Ground	Not existed

Is the inspection result normal?

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

6. CHECK INTAKE DOOR MOTOR PBR

Check intake door motor PBR. Refer to HAC-67, "Component Inspection (PBR)".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace intake door motor. Refer to HAC-99, "INTAKE DOOR MOTOR : Removal and Installation".

7. CHECK INTAKE DOOR MOTOR PBR POWER SUPPLY CIRCUIT FOR OPEN

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

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M54	1	M50	8	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

8. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector, and A/C auto amp. connector.

3. Check continuity between intake door motor harness connector and A/C auto amp. harness connector.

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M54	5	M50	35	Existed
	6		36	

Is the inspection result normal?

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

9. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M54	5	Ground	Not existed
	6		

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair harness or connector.

10. CHECK INTAKE DOOR MOTOR

1. Turn ignition switch OFF.
2. Check intake door motor. Refer to HAC-67, "Component Inspection (Motor)".

Is the inspection result normal?

YES >> GO TO 11.
NO >> Replace intake door motor. Refer to HAC-99, "INTAKE DOOR MOTOR : Removal and Installation".

11. CHECK INSTALLATION OF INTAKE DOOR MOTOR SYSTEM

Check intake door motor system is properly installed. Refer to HAC-98, "Exploded View".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

Component Inspection (PBR)

INFOID:0000000006626932

1. CHECK INTAKE DOOR MOTOR PBR

Check resistance between intake door motor terminals.

Terminal		Resistance (Ω)
1	2	Except 0 or ∞
	3	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace intake door motor. Refer to HAC-99, "INTAKE DOOR MOTOR : Removal and Installation".

Component Inspection (Motor)

INFOID:0000000006626933

1. CHECK INTAKE DOOR MOTOR

Supply intake door motor terminals with battery voltage and check by visually and operation sound that intake door motor operates.

Terminal		Operation direction
+	–	
5	6	REC
6	5	FRE

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake door motor. Refer to HAC-99, "INTAKE DOOR MOTOR : Removal and Installation".

B27A2, B27A3, B27A4, B27A5 AIR MIX DOOR MOTOR

DTC Logic

INFOID:0000000006627111

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".
- If air mix door motors DTC (B27A2 – B27A5) are detected, there is probably a disconnected connector or an open circuit in air mix door motor drive power supply harness.

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B27A2	DR AIR MIX DOOR MOT	Short or open circuit of air mix door motor drive signal terminal 1.	• Air mix door motor • A/C auto amp. • Harness or connectors (The motor circuit is open or shorted.)
B27A3		Short or open circuit of air mix door motor drive signal terminal 2.	
B27A4		Short or open circuit of air mix door motor drive signal terminal 3.	
B27A5		Short or open circuit of air mix door motor drive signal terminal 4.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-69, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545834

1.CHECK AIR MIX DOOR MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector.
3. Turn ignition switch ON.
4. Check voltage between air mix door motor harness connector and ground.

+		–	Voltage
Air mix door motor			
Connector	Terminal		
M55	2	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector between air mix door motor and fuse.

2.CHECK AIR MIX DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR OPEN

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

Air mix door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M55	3	M50	17	Existed
	6		18	
	1		19	
	4		20	

Is the inspection result normal?

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

3.CHECK AIR MIX DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

Check continuity between air mix door motor harness connector and A/C auto amp. harness connector.

Air mix door motor		—	Continuity
Connector	Terminal		
M55	3	Ground	Not existed
	6		
	1		
	4		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK AIR MIX DOOR MOTOR

Check air mix door motor. Refer to HAC-70, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace air mix door motor. Refer to HAC-100, "AIR MIX DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000006627112

1.CHECK AIR MIX DOOR MOTOR

1. Remove air mix door motor. Refer to HAC-100, "AIR MIX DOOR MOTOR : Removal and Installation".
2. Check resistance between air mix door motor terminals. Refer to applicable table for the normal value.

Terminal		Resistance (Ω) (Approx.)
2	1	90
	3	
	4	
	6	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace air mix door motor. Refer to HAC-100, "AIR MIX DOOR MOTOR : Removal and Installation".

B27A6, B27A7, B27A8, B27A9 MODE DOOR MOTOR

DTC Logic

INFOID:0000000006627113

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-51, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-52, "DTC Logic".
- If mode door motors DTC (B27A6 – B27A9) are detected, there is probably a disconnected connector or an open circuit in mode door motor drive power supply harness.

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B27A6	MODE DOOR MOTOR	Short or open circuit of mode door motor drive signal terminal 1.	• Mode door motor • A/C auto amp. • Harness or connectors (The motor circuit is open or shorted.)
B27A7		Short or open circuit of mode door motor drive signal terminal 2.	
B27A8		Short or open circuit of mode door motor drive signal terminal 3.	
B27A9		Short or open circuit of mode door motor drive signal terminal 4.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-71, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006545835

1.CHECK MODE DOOR MOTOR POWER SUPPLY

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

+		–	Voltage
Mode door motor			
Connector	Terminal		
M342	5	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.
NO >> Repair harness or connector between mode door motor and fuse.

2.CHECK MODE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR OPEN

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

Mode door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M342	4	M50	37	Existed
	3		38	
	2		39	
	1		40	

Is the inspection result normal?

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

3.CHECK MODE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

Check continuity between mode door motor harness connector and A/C auto amp. harness connector.

Mode door motor		—	Continuity
Connector	Terminal		
M342	4	Ground	Not existed
	3		
	2		
	1		

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK MODE DOOR MOTOR

Check mode door motor. Refer to HAC-72, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Replace mode door motor. Refer to HAC-100, "MODE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000006627114

1.CHECK MODE DOOR MOTOR

1. Remove mode door motor. Refer to HAC-100, "MODE DOOR MOTOR : Removal and Installation".
2. Check resistance between mode door motor terminals. Refer to applicable table for the normal value.

Terminal		Resistance (Ω) (Approx.)
5	1	90
	2	
	3	
	4	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace mode door motor. Refer to HAC-100, "MODE DOOR MOTOR : Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT
A/C AUTO AMP.

A/C AUTO AMP. : Diagnosis Procedure

INFOID:0000000006545823

1.CHECK SYMPTOM

Check symptom (A or B).

	Symptom
A	• Air conditioning system does not activate. • Air conditioning system does cannot be controlled. • Operation status of air conditioning system is not indicated on display. **NOTE:** Fail-safe does not activate.
B	• Memory function does not operate normally. • The setting is not maintained. (It returns to the initial condition)

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 5.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 3).
   NOTE:
   Refer to PG-23, "Fuse and Fusible Link Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK A/C AUTO AMP. IGNITION POWER SUPPLY

1. Disconnect A/C auto amp. connector.
2. Turn ignition switch ON.
3. Check voltage between A/C auto amp. harness connector and ground.

+		–	Voltage
A/C auto amp.			
Connector	Terminal		
M50	11	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector between A/C auto amp. and fuse.

4.CHECK A/C AUTO AMP. GROUND CIRCUIT FOR OPEN

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

A/C auto amp.		—	Continuity
Connector	Terminal		
M50	30	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

5.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No.7, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

6. CHECK A/C AUTO AMP. BATTERY POWER SUPPLY

1. Disconnect A/C auto amp. connector.
2. Check voltage between A/C auto amp. harness connector and ground.

+		–	Voltage
A/C auto amp.			
Connector	Terminal		
M50	12	Ground	Battery voltage

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector between A/C auto amp. and fuse.

A/C ON SIGNAL

Component Function Check

INFOID:0000000006545838

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Operate blower motor.
3. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
4. Select “AIR COND SW” in “DATA MONITOR” mode.
5. Check A/C ON signal when the A/C switch is operated.

Monitor item	Condition		Status
AIR COND SW	A/C switch	ON (A/C indicator: ON)	On
		OFF (A/C indicator: OFF)	Off

Is the inspection result normal?

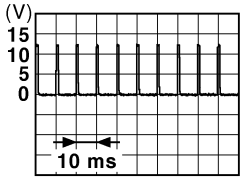
YES >> INSPECTION END
NO >> Refer to HAC-75, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006545839

1.CHECK A/C ON SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C auto amp. harness connector and ground with using oscilloscope.

+		–	Output waveform
A/C auto amp.			
Connector	Terminal		
M50	15	Ground	

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Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> GO TO 2.

2.CHECK A/C ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between A/C auto amp. harness connector and BCM harness connector.

A/C auto amp.		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M50	15	M65 (without Intelligent Key) M68 (with Intelligent Key)	27	Existed

Is the inspection result normal?

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

3. CHECK A/C ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M50	15	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

BLOWER FAN ON SIGNAL

Component Function Check

INFOID:0000000006545840

1.CHECK BLOWER FAN ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “FAN ON SIG” in “DATA MONITOR” mode.
4. Check blower fan ON signal when the fan control dial is operated.

Monitor item	Condition		Status
FAN ON SIG	Blower motor	ON	On
		OFF	OFF

Is the inspection result normal?

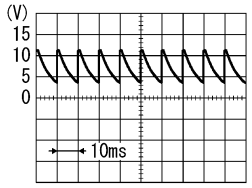
YES >> INSPECTION END
NO >> Refer to HAC-77, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006545841

1.CHECK BLOWER FAN ON SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. harness connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C auto amp. and ground with using oscilloscope.

+		–	Output waveform
A/C auto amp.			
Connector	Terminal		
M50	14	Ground	

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Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> GO TO 2.

2.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity A/C auto amp. harness connector and BCM harness connector.

A/C auto amp.		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M50	14	M65 (without Intelligent Key) M68 (with Intelligent Key)	28	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M50	14	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000006545842

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check following fuses.

- 10A fuse [No. 15, located in fuse block (J/B)]
- 15A fuses [Nos. 14 and 16, located in fuse block (J/B)]

NOTE:
Refer to PG-22, "Fuse, Connector and 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 BLOWER MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Blower motor			
Connector	Terminal		
M39	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 3.

3.CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Check blower relay. Refer to HAC-82, "Component Inspection (Blower Relay)".

Is the inspection result normal?

YES >> Repair harness or connector between blower motor and fuse.
NO >> Replace blower relay.

4.CHECK BLOWER MOTOR CONTROL CIRCUIT

1. Turn ignition switch OFF.
2. Connect blower motor connector.
3. Disconnect power transistor connector.
4. Turn ignition switch ON.
5. Check voltage between power transistor harness connector and ground.

+		–	Voltage (Approx.)
Power transistor			
Connector	Terminal		
M344	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 5.

5.CHECK BLOWER MOTOR CONTROL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect blower motor connector.
3. Check continuity between power transistor harness connector and blower motor harness connector.

Power transistor		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M344	1	M39	2	Existed

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
NO >> Repair harness or connector.

6. CHECK A/C AUTO AMP. IGNITION POWER SUPPLY

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

+		–	Voltage (Approx.)
A/C auto amp.			
Connector	Terminal		
M50	21	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair harness or connector between A/C auto amp. and fuse.

7. CHECK POWER TRANSISTOR IGNITION POWER SUPPLY

Check voltage between power transistor harness connector and ground.

+		–	Voltage (Approx.)
Power transistor			
Connector	Terminal		
M344	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector between power transistor and fuse.

8. CHECK POWER TRANSISTOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between power transistor harness connector and ground.

Power transistor		—	Continuity
Connector	Terminal		
M344	3	Ground	Existed

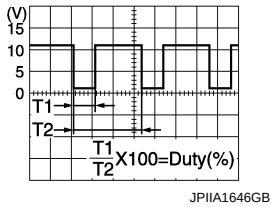
Is the inspection result normal?

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

9. CHECK POWER TRANSISTOR CONTROL SIGNAL

1. Connect blower motor connector and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Set air outlet to VENT.
4. Change fan speed from 1st – 7th, and check duty ratios between blower motor harness connector and ground by using an oscilloscope.
   NOTE:
   Calculate the drive signal duty ratio as shown in the figure.

T2 = Approx. 1.6 ms

+		–	Condition	Duty ratio (Approx.)	Output waveform
Power transistor					
Connector	Terminal		Fan speed (manual) Air outlet: VENT		
M344	2	Ground	1st	26%	
			2nd	34%	
			3rd	41%	
			4th	51%	
			5th	62%	
			6th	73%	
			7th	82%	

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Is the inspection result normal?

YES >> Replace power transistor. Refer to HAC-97, "Removal and Installation".
NO >> GO TO 10.

10.CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect power transistor connector and A/C auto amp. connector.
3. Check continuity between power transistor harness connector and A/C auto amp. harness connector.

Power transistor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M344	2	M50	13	Existed

Is the inspection result normal?

YES >> GO TO 11.
NO >> Repair harness or connector.

11.CHECK POWER TRANSISTOR CONTROL SIGNAL CIRCUIT FOR SHORT

Check continuity between power transistor harness connector and ground.

Power transistor		—	Continuity
Connector	Terminal		
M344	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection (Blower Motor)

INFOID:0000000006545843

1.CHECK BLOWER MOTOR

1. Remove blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
2. Check that there is not any mixing foreign object in the blower motor.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

3. CHECK BLOWER MOTOR

Check that blower motor turns smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

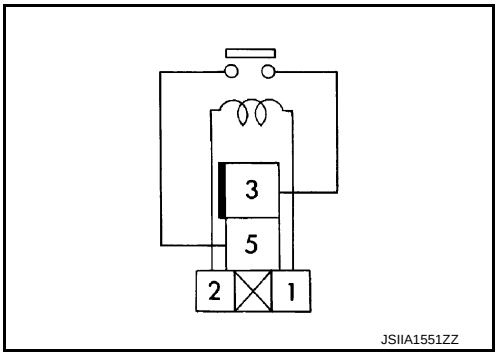
Component Inspection (Blower Relay)

INFOID:0000000006545844

1. CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-22, "Fuse, Connector and Terminal Arrangement".
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed



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Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower relay.

MAGNET CLUTCH

Component Function Check

INFOID:0000000006545846

1.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-12, "Diagnosis Description" (with Intelligent Key) or PCS-43, "Diagnosis Description" (without Intelligent Key).

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-83, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006545847

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 49, located in IPDM E/R).
   NOTE:
   Refer to PG-25, "Fuse, Connector and 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 MAGNET CLUTCH

1. Disconnect compressor connector.
2. Directly apply battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 3.
NO >> Replace magnet clutch. Refer to HA-88, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".

3.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

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

IPDM E/R		Compressor		Continuity
Connector	Terminal	Connector	Terminal	
E15	56	F17	1	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

SYMPTOM DIAGNOSIS

AUTOMATIC AIR CONDITIONER SYSTEM

Symptom Table

INFOID:0000000006545848

NOTE:
Perform self-diagnoses with CONSULT-III before performing the symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

Symptom		Corresponding malfunction part	Check item/Reference
• Air conditioning system does not activate. • Air conditioning system cannot be controlled. • Operation status of air conditioning system is not indicated on display.	Fail-safe activates	Multi display unit	AV-124, "Symptom Table"
	Fail-safe does not activate	• A/C auto amp. ignition power supply and ground circuit • A/C auto amp.	HAC-73, "A/C AUTO AMP. : Diagnosis Procedure"
Discharge air temperature does not change.		Air mix door motor system installation condition	Check air mix door motor system is properly installed. Refer to HAC-98, "Exploded View".
Air outlet does not change.		Mode door motor system installation condition	Check mode door motor system is properly installed. Refer to HAC-98, "Exploded View".
Air inlet does not change.		Intake door motor system installation condition	Check intake door motor system is properly installed. Refer to HAC-98, "Exploded View".
Blower motor does not operates or operation speed is not normal.		• Blower motor power supply circuit • Blower motor control circuit • A/C auto amp. ignition power supply circuit • Power transistor power supply and ground circuit • Power transistor control signal circuit • Blower motor • Power transistor • A/C auto amp.	HAC-79, "Diagnosis Procedure"
Compressor does not operate.		• Magnet clutch • The circuit between magnet clutch and IPDM E/R • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • A/C ON signal circuit • Blower fan ON signal circuit • A/C auto amp.	HAC-83, "Diagnosis Procedure"
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)		• Magnet clutch control system • Drive belt slipping • Cooler cycle • Air leakage from each duct • A/C auto amp. connection recognition signal circuit • Temperature setting trimmer	HAC-86, "Diagnosis Procedure"
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)		• Engine cooling system • Heater hose • Heater core • Air leakage from each duct • Temperature setting trimmer	HAC-88, "Diagnosis Procedure"

Symptom		Corresponding malfunction part	Check item/Reference
Noise is heard when the A/C system operates.	During compressor operation	Cooler cycle	HA-85, "Symptom Table"
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	HAC-81, "Component Inspection (Blower Motor)"
• Memory function dose not operate normally. • The setting is not maintained. (It returns to initial condition)		• A/C auto amp. battery power supply circuit • A/C auto amp.	HAC-73, "A/C AUTO AMP. : Diagnosis Procedure"

INSUFFICIENT COOLING

Description

INFOID:0000000006545849

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006545850

NOTE:
Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

1.CHECK MAGNET CLUTCH OPERATION

1. Turn ignition switch ON.
2. Operate fan control dial.
3. Press A/C switch.
4. Check that A/C indicator turns ON. Check visually and by sound that compressor operates.
5. Press A/C switch again.
6. Check that A/C indicator turns OFF. Check that compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform diagnosis of “COMPRESSOR DOSE NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-89, "Diagnosis Procedure".

2.CHECK DRIVE BELT

Check tension of drive belt. Refer to EM-20, "Checking".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

3.CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling recharging equipment to the vehicle and perform pressure inspection with gauge. Refer to HA-83, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioning system for leakage.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts depending on the inspection results.

5.CHECK AMBIENT TEMPERATURE DISPLAY

Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Perform diagnosis for the A/C auto amp. connection recognition signal circuit. Refer to MWI-62, "Diagnosis Procedure".

6.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

1. Check setting value of temperature setting trimmer. Refer to HAC-48, "Temperature Setting Trimmer".
2. Check that temperature setting trimmer is set to “+ direction”.
   NOTE:
   The control temperature can be set with the setting of the temperature setting trimmer.

3. Set difference between the set temperature and control temperature to “0”.

Is inspection result normal?

YES >> INSPECTION END
NO >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".

INSUFFICIENT HEATING

Description

INFOID:0000000006545851

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006545852

NOTE:
Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to CO-11, "Inspection".
2. Check radiator cap. Refer to CO-15, "RADIATOR CAP : Inspection".
3. Check water flow sounds of the engine coolant. Refer to CO-12, "Refilling".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill engine coolant and repair or replace the parts depending on the inspection results.

2.CHECK HEATER HOSE

Check installation of heater hose by visually or touching.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

3.CHECK HEATER CORE

1. Check temperature of inlet hose and outlet hose of heater core.
2. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.
   CAUTION:
   Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace heater core. Refer to HA-116, "HEATER CORE : Removal and Installation".

4.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioning system for air leakage.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts depending on the inspection results.

5.CHECK SETTING OF TEMPERATURE SETTING TRIMMER

1. Check setting value of temperature setting trimmer. Refer to HAC-48, "Temperature Setting Trimmer".
2. Check that temperature setting trimmer is set to “– direction”.
   NOTE:
   The control temperature can be set by the temperature setting trimmer.
3. Set difference between the set temperature and control temperature to “0”.

Are the symptoms solved?

YES >> INSPECTION END
NO >> Replace A/C auto amp. Refer to HAC-91, "Removal and Installation".

COMPRESSOR DOSE DOT OPERATE

Description

INFOID:0000000006545853

SYMPTOM

Compressor dose not operate.

Diagnosis Procedure

INFOID:0000000006545854

NOTE:

- Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.
- Check that refrigerant is enclosed in cooler cycle normally. If refrigerant amount is shortage from proper amount, perform the inspection of refrigerant leakage.

1.CHECK MAGNET CLUTCH OPERATION

Check magnet clutch. Refer to HAC-83, "Component Function Check".

Does it operate normally?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2.CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to EC-423, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK A/C ON SIGNAL

Check A/C ON signal. Refer to HAC-75, "Component Function Check".

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK BLOWER FAN ON SIGNAL

Check blower fan ON signal. Refer to HAC-77, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts

5.CHECK BCM OUTPUT SIGNAL

With CONSULT-III

1. Select “DATA MONITOR” mode of “ECM” using CONSULT-III.
2. Select “AIR COND SIG” and “HEATER FAN SW”, and check status under the following conditions.

Monitor item	Condition		Status
AIR COND SIG	A/C switch	OFF (A/C indicator: OFF)	Off
		ON (A/C indicator: ON)	On
HEATER FAN SW	Blower motor	OFF	Off
		ON	On

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

REMOVAL AND INSTALLATION

CONTROLLER

Removal and Installation

INFOID:0000000006678687

REMOVAL

Remove multi display unit. Refer to IP-13, "Removal and Installation".

INSTALLATION

Install in the reverse order of removal.

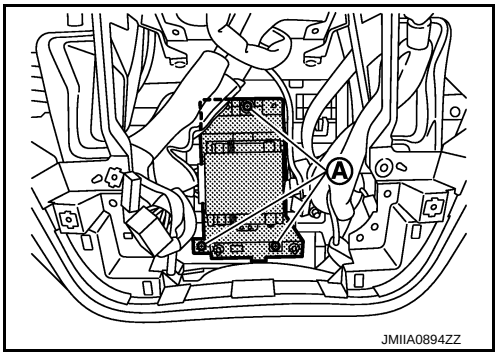
A/C AUTO AMP.

Removal and Installation

INFOID:0000000006545855

REMOVAL

1. Remove audio unit. Refer to AV-38, "Removal and Installation".
2. Remove inside key antenna (instrument center). Refer to DLK-188, "INSTRUMENT CENTER : Removal and Installation".
3. Remove fixing screws (A), and then remove A/C auto amp.



INSTALLATION

Install in the reverse order of removal.

AMBIENT SENSOR

Removal and Installation

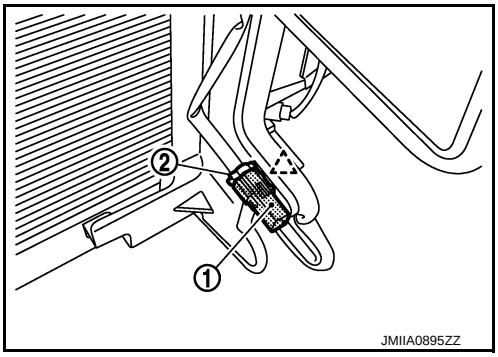
INFOID:0000000006545856

REMOVAL

1. Remove bumper fascia assembly. Refer to EXT-13, "Removal and Installation".
2. Disengage fixing pawl, and then remove ambient sensor (1) from air guide RH.

   : Pawl

3. Disconnect ambient sensor connector (2), and then remove ambient sensor.



INSTALLATION

Install in the reverse order of removal.

IN-VEHICLE SENSOR

Removal and Installation

INFOID:0000000006545857

REMOVAL

1. Remove instrument lower panel (LH/RH). Refer to IP-13, "Removal and Installation".
2. Remove fixing screw, and then remove in-vehicle sensor from instrument lower panel (LH/RH).

INSTALLATION

Install in the reverse order of removal.

SUNLOAD SENSOR

Removal and Installation

INFOID:0000000006545858

REMOVAL

1. Remove switch panel. Refer to IP-13, "Removal and Installation".
2. Disconnect sunload sensor connector, and then remove sunload sensor.

INSTALLATION

Install in the reverse order of removal.

INTAKE SENSOR

Exploded View

INFOID:0000000006545859

Refer to HA-97, "Exploded View (Automatic Air Conditioning)".

Removal and Installation

INFOID:0000000006545860

REMOVAL

1. Remove evaporator assembly. Refer to HA-115, "EVAPORATOR : Removal and Installation".
2. Remove intake sensor from evaporator.

INSTALLATION

Note the following items, and then install in the order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply the compressor oil to them when installing.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Never rotate the bracket insertion part when removing and installing the intake sensor.**
- **Check for leakages when recharging refrigerant. Refer to HA-74, "Leak Test".**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000006545861

Refer to HA-94, "Exploded View".

Removal and Installation

INFOID:0000000006545862

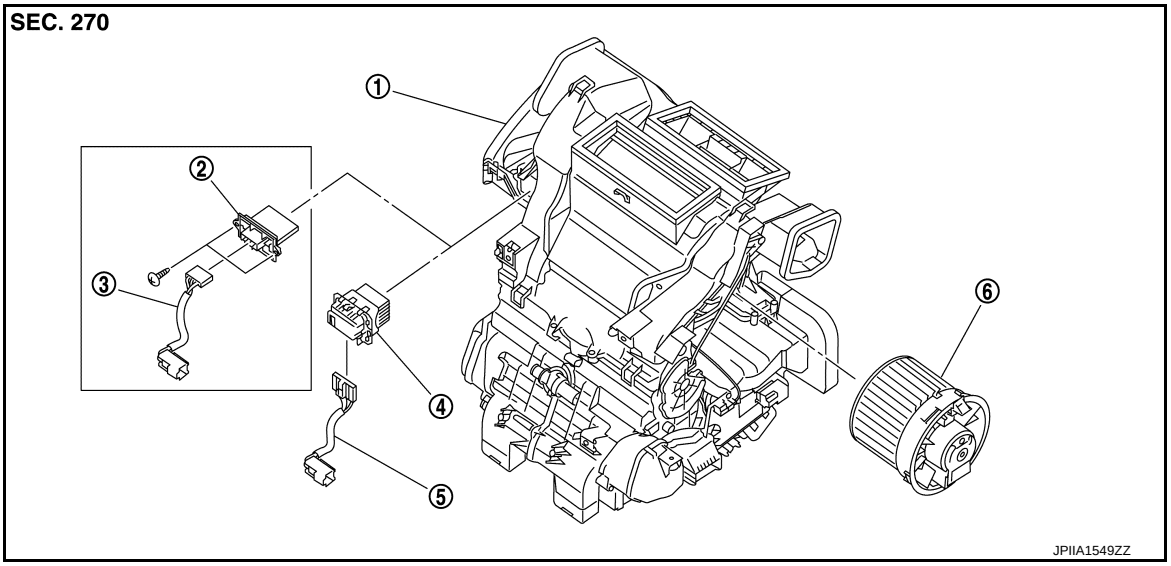
REMOVAL
Refer to HA-96, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".

INSTALLATION
Install in the reverse order of removal.

POWER TRANSISTOR

Exploded View

INFOID:0000000006545863



1. A/C unit assembly
2. Blower fan resistor*1
3. Sub harness*1
4. Power transistor*2
5. Sub harness*2
6. Blower motor

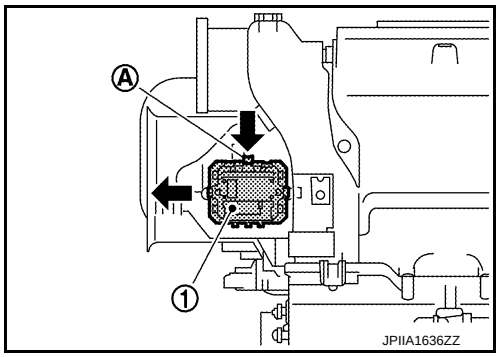
- *1: Manual air conditioner
- *2: Automatic air conditioner

Removal and Installation

INFOID:0000000006545864

REMOVAL

1. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect power transistor connector.
4. Slide power transistor (1) to the left while pressing lever (A), and then remove power transistor.



INSTALLATION

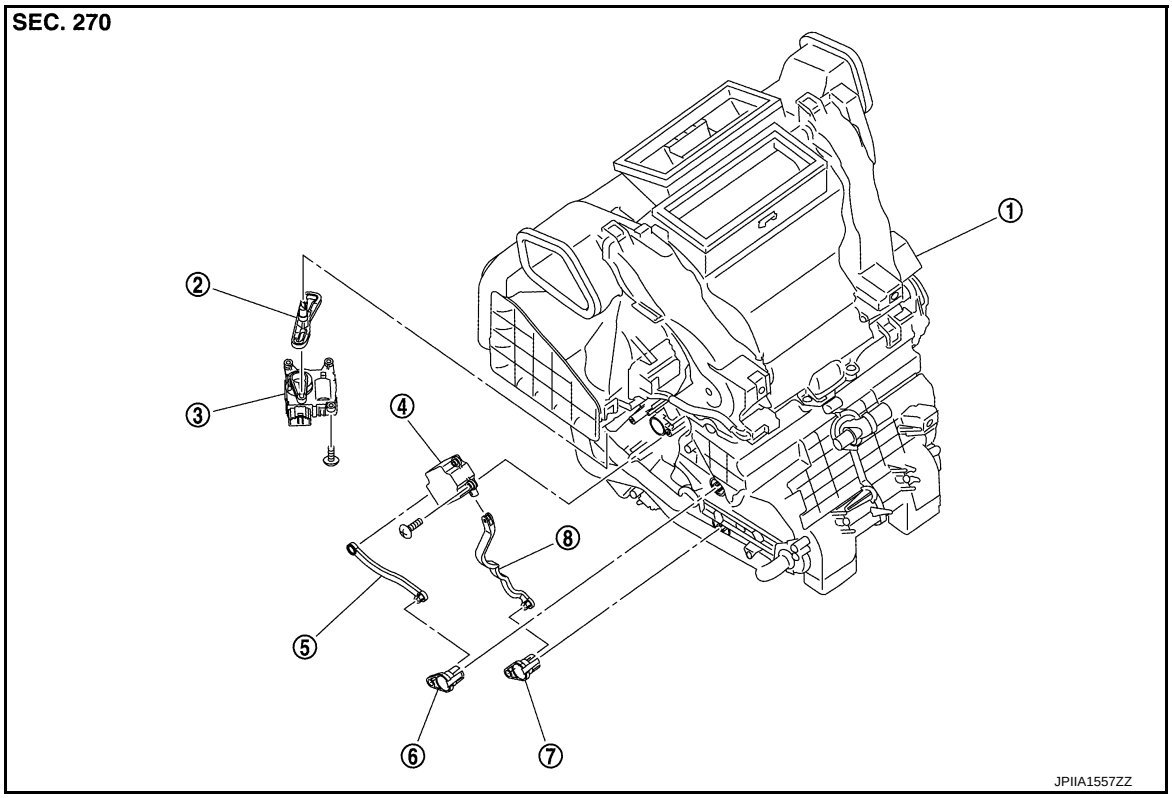
Install in the reverse order of removal.

DOOR MOTOR

Exploded View

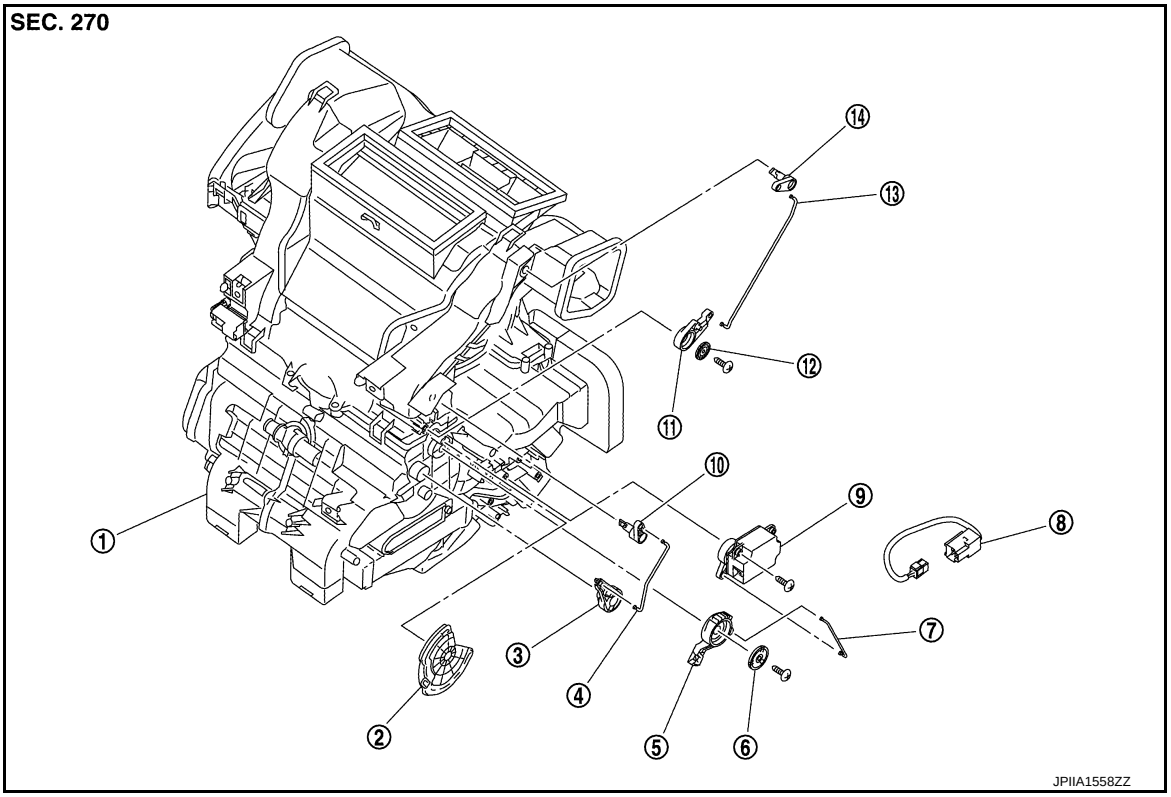
INFOID:0000000006545865

LEFT SIDE



1. A/C unit assembly
2. Intake door lever
3. Intake door motor
4. Air mix door motor
5. Upper air mix door rod
6. Upper air mix door lever
7. Lower air mix door lever
8. Lower air mix door rod

RIGHT SIDE



1. A/C unit assembly
2. Main link
3. Sub defroster door link
4. Sub defroster door rod
5. Mode link
6. Plate
7. Mode link rod
8. Sub harness
9. Mode door motor
10. Sub defroster door lever
11. Center ventilator and defroster door link
12. Plate
13. Center ventilator and defroster door rod
14. Center ventilator and defroster door lever

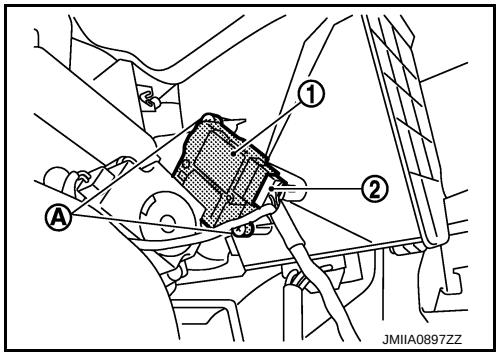
INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000006545866

REMOVAL

1. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Remove fixing screws (A), and then remove intake door motor (1) from A/C unit assembly.
4. Disconnect intake door motor connector (2).



INSTALLATION

Install in the reverse order of removal.

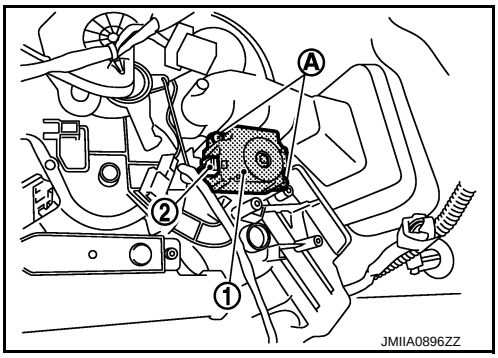
MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:0000000006545867

REMOVAL

1. Remove glove box assembly Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove instrument lower panel RH. Refer to IP-13, "Removal and Installation". (RHD models)
3. Remove foot duct RH. Refer to VTL-14, "FOOT DUCT : Removal and Installation".
4. Disconnect mode link rod from mode door motor.
5. Remove fixing screws (A), and then remove mode door motor (1).
6. Disconnect mode door motor connector (2).



INSTALLATION

Install in the reverse order of removal.

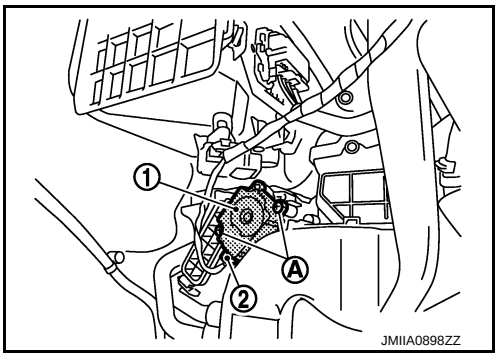
AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000006545868

REMOVAL

1. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Remove fixing screws (A), and then remove air mix door motor (1) from A/C unit assembly.
4. Disconnect air mix door motor connector (2).



INSTALLATION

Install in the reverse order of removal.

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006626855

Check the vehicle type to use the service information in this section.

Destination	Service information
Automatic air conditioning (4WD models)	“TYPE 1”
Automatic air conditioning (2WD models)	“TYPE 2”
Manual air conditioning (4WD models)	“TYPE 3”
Manual air conditioning (2WD models)	“TYPE 4”
Manual heater	“TYPE 5”

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006626860

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag 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.**

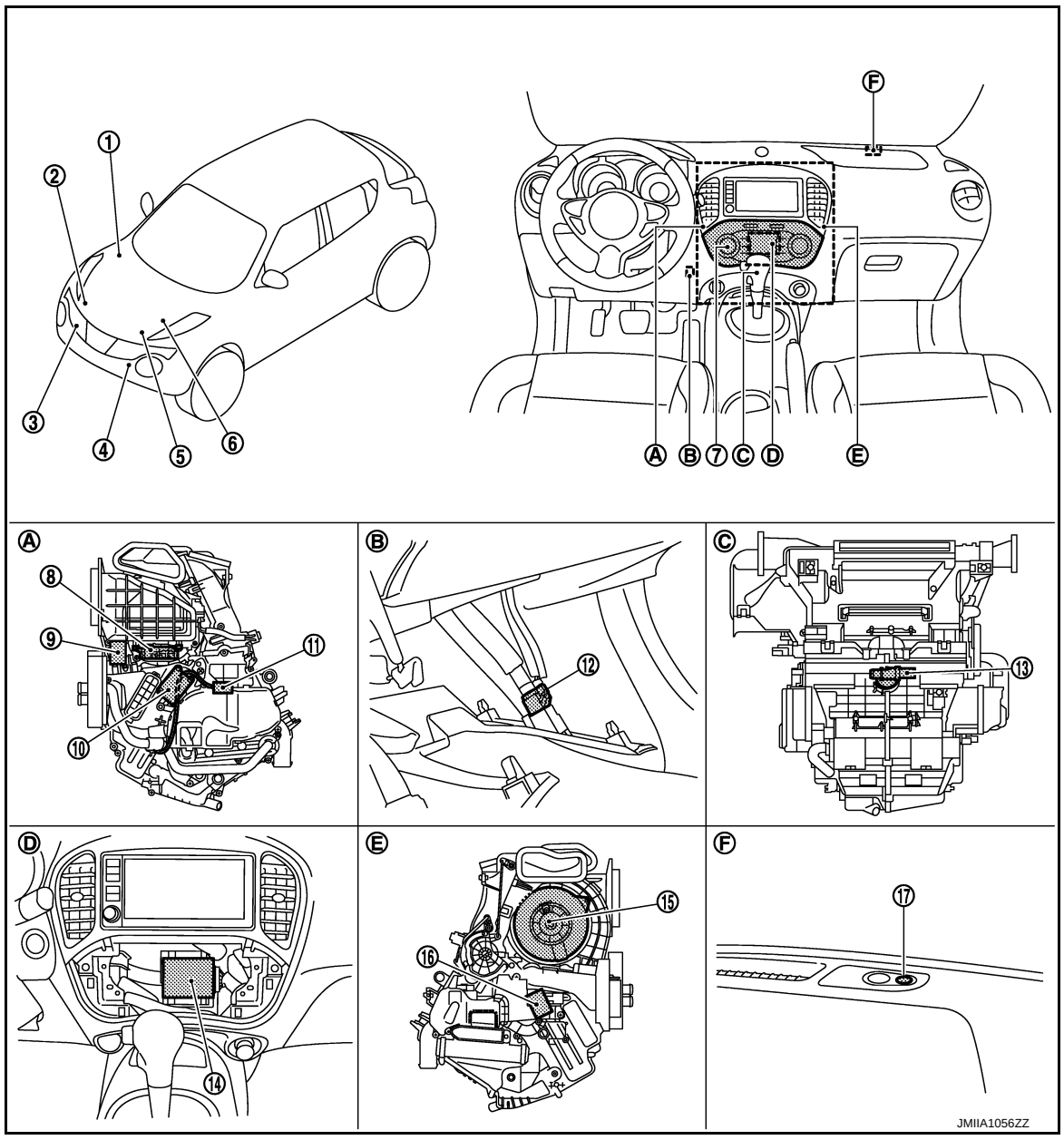
SYSTEM DESCRIPTION

COMPONENT PARTS

AUTOMATIC AIR CONDITIONING SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM : Component Parts Location

INFOID:0000000006546650



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-96, "BODY CONTROL SYSTEM : Component Parts Location".
2. Magnet clutch
3. Refrigerant pressure sensor
4. Ambient sensor
5. ECM
   - HR16DE: Refer to EC-455, "ENGINE CONTROL SYSTEM : Component Parts Location".
   - MR16DDT: Refer to EC-25, "ENGINE CONTROL SYSTEM : Component Parts Location".
   - K9K: Refer to EC-813, "Component Parts Location".
6. IPDM E/R
   - With Intelligent Key: Refer to PCS-5, "Component Parts Location".
   - Without Intelligent Key: Refer to PCS-37, "Component Parts Location".
7. Multi display unit
8. Intake door motor
9. Fan control amp.
10. Air mix door motor
11. Intake sensor
12. In-vehicle sensor
13. Aspirator
14. A/C auto amp.
15. Blower motor
16. Mode door motor
17. Sunload sensor

A. Left side of A/C unit assembly
B. Instrument lower panel LH is removed
C. Back side of A/C unit assembly
D. Multi display unit is removed
E. Right side of A/C unit assembly
C. Right side of switch panel

AUTOMATIC AIR CONDITIONING SYSTEM : Component Description

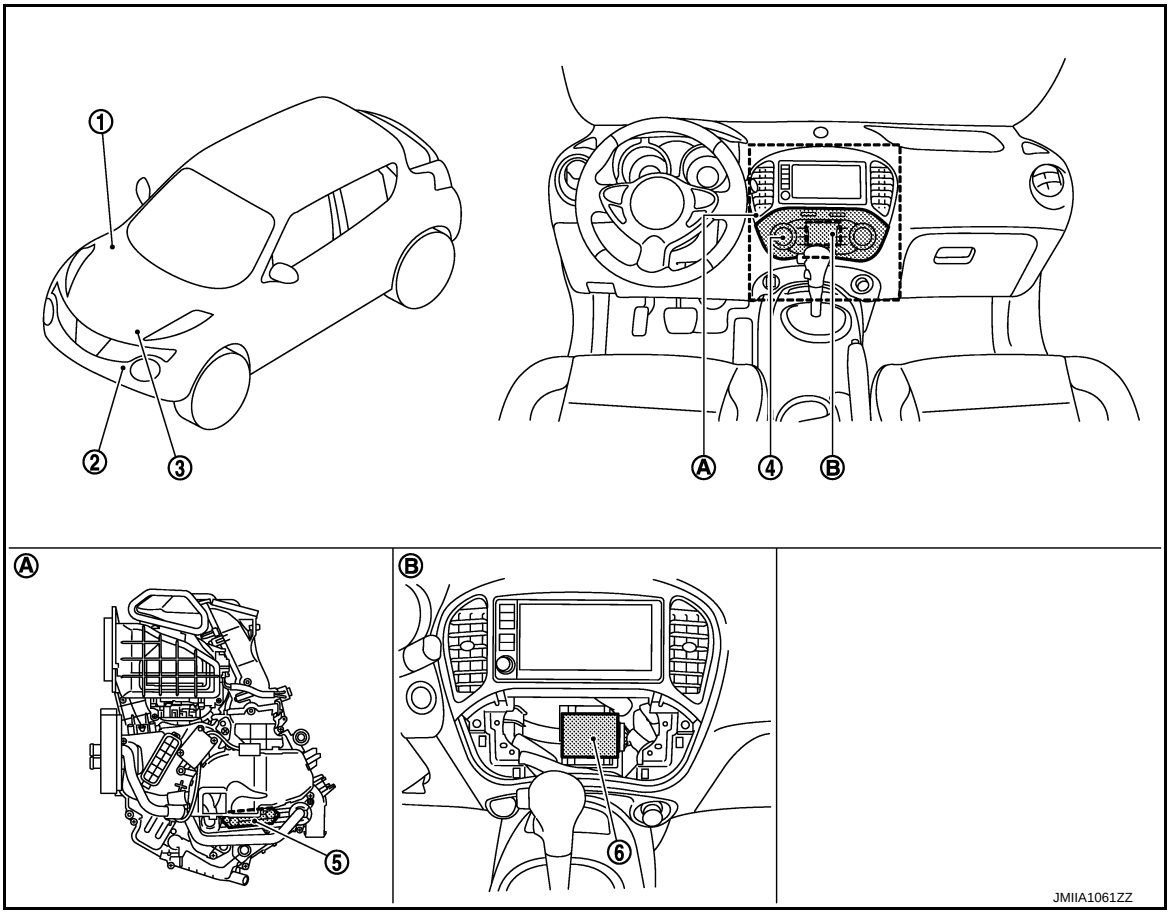
INFOID:0000000006546651

Component		Description
A/C unit assembly	Aspirator	HAC-106
	Intake sensor	HAC-106
	Air mix door motor	HAC-106
	Mode door motor	HAC-106
	Intake door motor	HAC-106
	Blower motor	HAC-106
	Fan control amp.	HAC-107
Multi display unit		HAC-107
A/C auto amp.		HAC-107
BCM		HAC-107
ECM		HAC-107
IPDM E/R		HAC-107
Ambient sensor		HAC-108
In-vehicle sensor		HAC-108
Sunload sensor		HAC-108
Refrigerant pressure sensor		HAC-108
Magnet clutch		HAC-108

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : Component Parts Location

INFOID:0000000006659829



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-96, "BODY CONTROL SYSTEM : Component Parts Location".
2. Ambient sensor
3. ECM
   Refer to EC-813.
4. Multi display unit
5. PTC heater
6. A/C auto amp.

A. Left side of A/C unit assembly
B. Multi display unit is removed

PTC HEATER CONTROL SYSTEM : Component Description

INFOID:0000000006659830

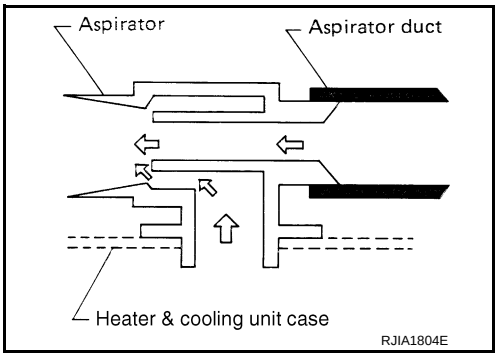
Component parts		Description
A/C unit assembly	PTC heater	HAC-107
Ambient sensor		HAC-108
Multi display unit		HAC-107
A/C auto amp.		A/C auto amp. controls PTC heater control system by inputting and calculating signals from each sensor and fan control dial.
BCM		BCM transmits electrical load signal (high beam request signal, low beam request signal, rear window defogger ON signal, and others) to A/C auto amp. via CAN communication line.
ECM		ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to A/C auto amp. via CAN communication line.

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Aspirator

INFOID:0000000006546652

The aspirator generates the vacuum by the air blown from the A/C unit assembly and draws the air of the passenger room to the in-vehicle sensor area via the aspirator duct.



A/C UNIT ASSEMBLY : Intake Sensor

INFOID:0000000006546653

Intake sensor measures temperature of evaporator fin temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

A/C UNIT ASSEMBLY : Air Mix Door Motor

INFOID:0000000006546654

- Air mix door motor consists of motor that drives door, PBR (Potentio Balance Register) that detects door position and LCU (Local Control Unit) that perform multiplex communication control (LIN) with A/C auto amp. Refer to HAC-114, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Control".
- Rotation of motor is transmitted to air mix door (upper air mix door, lower air mix door, max. cool door) by link, rod, and lever. Air flow temperature is switched.

A/C UNIT ASSEMBLY : Mode Door Motor

INFOID:0000000006546655

- Mode door motor consists of motor that drives door, PBR (Potentio Balance Register) that detects door position and LCU (Local Control Unit) that perform multiplex communication control (LIN) with A/C auto amp. Refer to HAC-114, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Control".
- Rotation of motor is transmitted to mode door (center ventilator door, side ventilator door, foot door, and defroster door) by link, rod, and lever. Air outlet is switched.

A/C UNIT ASSEMBLY : Intake Door Motor

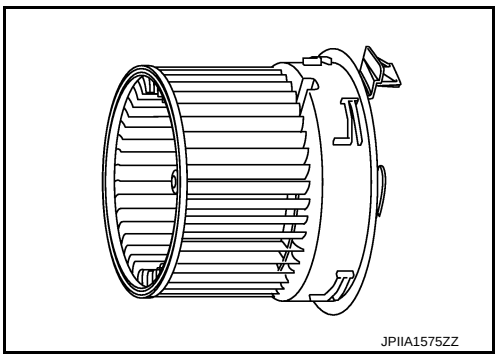
INFOID:0000000006546656

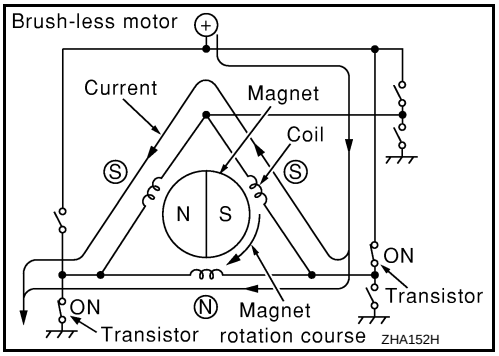
- Intake door motor consists of motor that drives door, PBR (Potentio Balance Register) that detects door position and LCU (Local Control Unit) that perform multiplex communication control (LIN) with A/C auto amp. Refer to HAC-114, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Control".
- Rotation of motor is transmitted to intake door by link and lever. Air inlet is switched.

A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000006546657

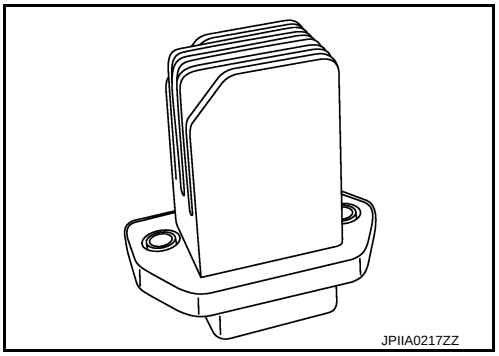
- The blower motor utilizes a brush-less motor with a rotating magnet.
- Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.





A/C UNIT ASSEMBLY : Fan Control Amp.

INFOID:0000000006546658



- Fan control amp., that uses MOS field effect transistor, is adopted for blower motor speed control.
  NOTE:
  MOS field effect transistor is a transistor for which the gate portion is composed of a metal electrode on an oxide layer of semiconductor. Field effect transistor is controlled by voltage, while ordinary transistor is controlled by current. Electrode of field effect transistor is called source, drain, or gate, while electrode of ordinary transistor is called emitter, collector, or base.
- Fan control amp. continuously controls voltage to blower motor, according to gate voltage from A/C auto amp.
- This power transistor does not require a HI relay even when the maximum voltage is applied to blower motor at HI status, because voltage drop is nominal.

A/C UNIT ASSEMBLY : PTC Heater

INFOID:0000000006659833

Heat element is heated and air flow temperature is increased by power supply from PTC relay.

Multi Display Unit

INFOID:0000000006696889

- Multi display unit integrates display and operation switches.
- Operation of each switch (A/C operation signal) and setting status (A/C ECO setting signal and ECO mode signal) are transmitted to A/C auto amp. via CAN communication.
- Operation status of air conditioning system is indicated in the display according to A/C display signal that is received from A/C auto amp.

A/C Auto Amp.

INFOID:0000000006546659

A/C auto amp. controls automatic air conditioning system by inputting and calculating signals from each sensor and each switch. A/C auto amp. has self-diagnosis function. Diagnosis of automatic air conditioning system can be performed quickly.

BCM

INFOID:0000000006546660

BCM transmits A/C ON signal and blower fan ON signal from A/C auto amp. to ECM via CAN communication line.

ECM

INFOID:0000000006546661

- ECM, when receiving A/C ON signal and blower fan ON signal from BCM, transmits A/C compressor request signal to IPDM E/R via CAN communication according to status of the engine and refrigerant pressure.
- ECM transmits engine coolant temperature signal to A/C auto amp. via CAN communication line.

IPDM E/R

INFOID:0000000006546662

A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line.

Ambient Sensor

INFOID:0000000006546664

Ambient sensor measures ambient air temperature. 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

INFOID:0000000006546665

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.

Sunload Sensor

INFOID:0000000006546666

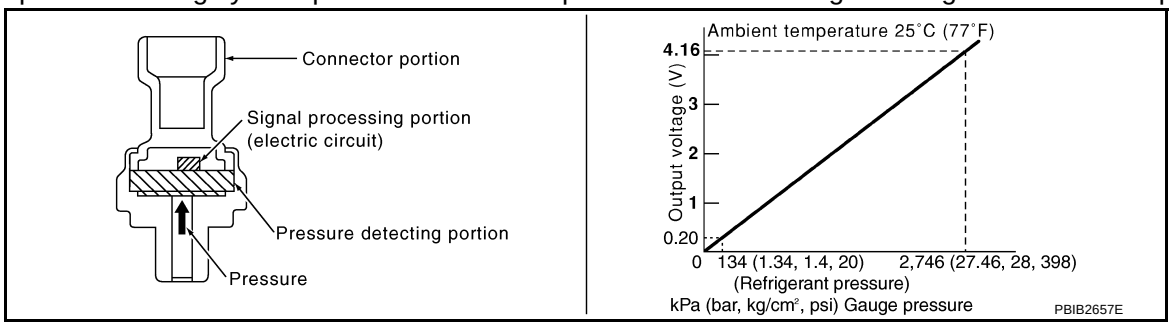
Sunload sensor measures sunload amount. This sensor converts sunload amount to voltage signal by photodiode and transmits to A/C auto amp.

Refrigerant Pressure Sensor

INFOID:0000000006546667

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection ares and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

Magnet Clutch

INFOID:0000000006546668

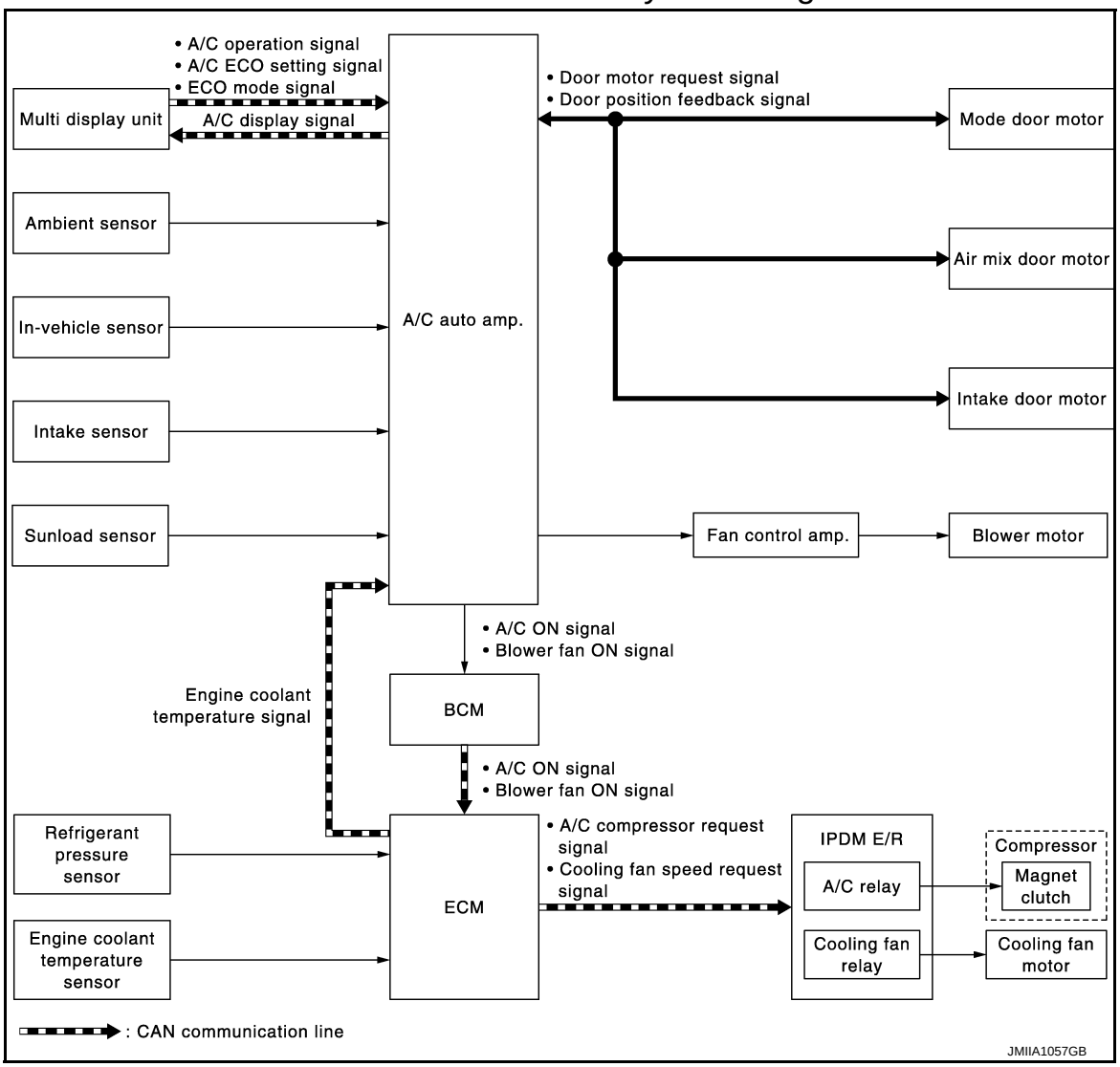
Compressor is driven by the magnet clutch which is magnetized by electric power supply.

SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM : System Diagram

INFOID:0000000006546669



AUTOMATIC AIR CONDITIONING SYSTEM : System Description

INFOID:0000000006546670

DESCRIPTION

- Automatic air conditioning system is controlled by each function of A/C auto amp., BCM, ECM and IPDM E/R.
- Each operation of air conditioning system is transmitted from multi display unit via CAN communication. A/C auto amp. transmits each type of indication information (A/C display signal) to multi display unit via CAN communication. Multi display unit displays each type of indication information (A/C display signal) that is received.

CONTROL BY A/C AUTO AMP.

- HAC-111, "AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control"
- HAC-111, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control"
- HAC-111, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Flow Control"
- HAC-112, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Inlet Control"
- HAC-112, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"
- HAC-114, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Control"
- HAC-116, "AUTOMATIC AIR CONDITIONING SYSTEM : ECO Mode Control"
- Correction for input value

Ambient temperature correction
- The A/C auto amp. inputs the temperature detected with the ambient sensor as the ambient temperature.
- Perform the correction of the temperature detected with the ambient sensor for air conditioning control.
- Select and use the initial value of ambient temperature data depending on the engine coolant temperature when turning the ignition switch from OFF to ON. Use the detection temperature of the ambient sensor at low coolant temperature [less than approximately 56°C (133°F)]. Use the memory data (before the ignition switch is OFF) when the engine is warming up [approximately 56°C (133°F) or more].
- Do not perform the correction of the ambient temperature when the detection temperature of the ambient temperature is less than approximately –20°C (–4°F).

Passenger room temperature correction
- The A/C auto amp. inputs the temperature detected with the in-vehicle sensor as the passenger room temperature.
- Perform the correction of the temperature detected with the in-vehicle sensor for air conditioning control.
- The A/C auto amp. performs the correction so that the recognition passenger room temperature changes depending on the difference between the detected passenger room temperature and the recognition passenger room temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

Intake temperature correction
- The A/C auto amp. inputs the temperature detected with the intake sensor as the intake temperature.
- Perform the correction of the temperature detected with the intake sensor for air conditioning control.
- The A/C auto amp. performs the correction so that the recognition intake temperature changes depending on the difference between the detected intake temperature and the recognition intake temperature. If the difference is large, the changing is early. The changing becomes slow as the difference becomes small.

Sunload amount correction
- The A/C auto amp. inputs the sunload amount detected with the sunload sensor.
- Perform the correction of the sunload amount detected with the sunload sensor for air conditioning control.
- When the sunload amount suddenly changes, for example when entering a tunnel, perform the correction so that the recognition sunload amount of the A/C auto amp. changes slowly.

Set temperature correction
- A/C auto amp. controls The A/C auto amp. performs the correction to the target temperature set by the temperature control switch so as to match the temperature felt by the passengers depending on the ambient temperature detected with the ambient sensor and controls it so that the interior air temperature is always the most suitable.

CONTROL BY BCM
- HAC-112, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"

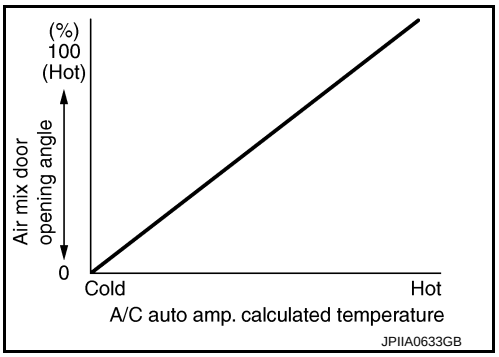
CONTROL BY ECM
- HAC-112, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"
- Cooling fan control
  - HR16DE: Refer to EC-479, "COOLING FAN CONTROL : System Description".
  - MR16DDT: Refer to EC-61, "COOLING FAN CONTROL : System Description".
  - K9K: Refer to EC-827, "COOLING FAN CONTROL : System Description".

CONTROL BY IPDM E/R
- HAC-112, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"
- Cooling fan control. Refer to PCS-9, "POWER CONTROL SYSTEM : System Description" (with Intelligent Key) or PCS-41, "POWER CONTROL SYSTEM : System Description" (without Intelligent Key).

AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control

INFOID:0000000006546671

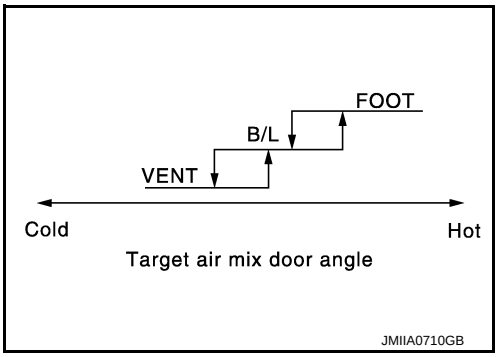
- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of air conditioner operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- Air mix door is controlled depending on the comparison of current air mix door opening angle and target air mix door opening angle.
- Regardless of in-vehicle temperature, ambient temperature, and sunload, air mix door is fixed at the fully cold position when set temperature is 16°C, and at the fully hot position when set temperature is 30°C.



AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control

INFOID:0000000006546672

- While air outlet is in automatic control, A/C auto amp. selects the mode door position depending on a target air mix door angle and outlet air temperature calculated from sunload.
- If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.



AUTOMATIC AIR CONDITIONING SYSTEM : Air Flow Control

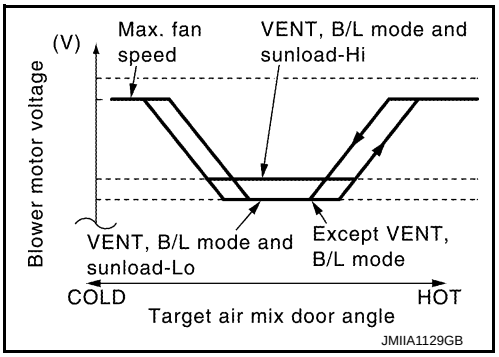
INFOID:0000000006546673

DESCRIPTION

- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously. When air flow is increased, duty ratio of blower motor drive signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control and automatic control, air flow control is compose of starting fan speed control, low coolant temperature starting control, high in-vehicle temperature starting control, and blower speed control at door motor operation.

AUTOMATIC AIR FLOW CONTROL

- A/C auto amp. decides target air flow depending on target air mix door opening angle.
- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously so that air flow matches to target air flow.
- When air outlet is VENT or B/L, the minimum air flow is changed depending on sunload.

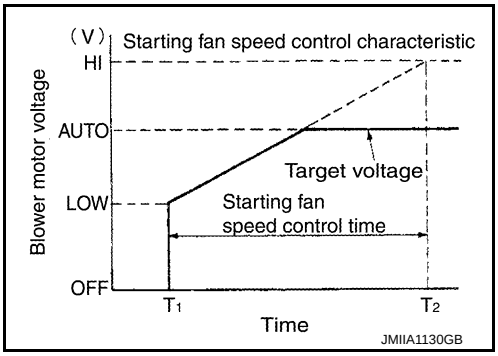


STARTING FAN SPEED CONTROL

When blower motor is activated, A/C auto amp. gradually increases duty ratio of blower fan drive signal to prevent a sudden increase in discharge air flow. ($T_1 - T_2$ = approximately 10 seconds)

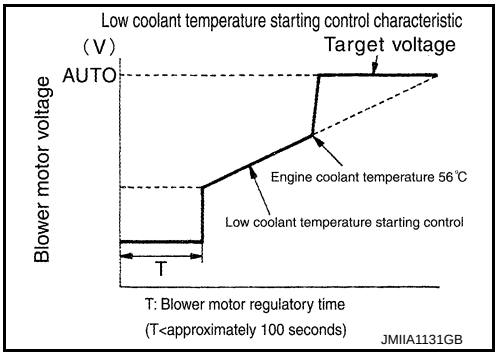
NOTE:

Do not perform the starting air flow control when the discharge outlet is set to DEF.



LOW COOLANT TEMPERATURE STARTING CONTROL

If the engine coolant temperature is 56°C (133°F) or less, to prevent a cold discharged air flow, A/C auto amp. suspends blower motor activation for the maximum 100 seconds depending on target air mix door opening angle. After this, blower fan drive signal is increased gradually, and blower motor is activated.



FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When mode door motor is activated while air flow is more than the specified value, A/C auto amp. reduces temporarily fan speed so that mode door moves smoothly.

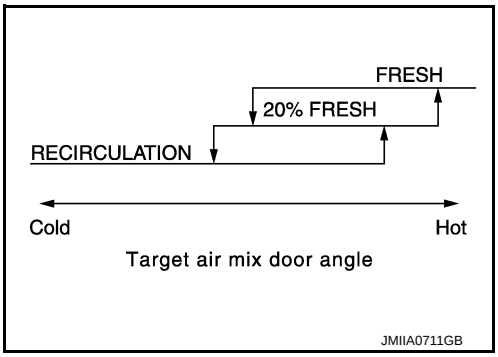
HIGH IN- TEMPERATURE STARTING CONTROL

When evaporator temperature is high [intake air temperature sensor value is 35°C (95°F) or more], to prevent a hot discharged air flow, A/C auto amp. suspends blower motor activation for approximately 3 seconds so that evaporator is cooled by refrigerant.

AUTOMATIC AIR CONDITIONING SYSTEM : Air Inlet Control

INFOID:0000000006546674

- While air inlet is in automatic control, A/C auto amp. selects air inlet (fresh air intake, 20% fresh air intake, or recirculation) depending on set temperature, in-vehicle temperature, and ambient temperature.
- Air inlet is fixed to 80% FRE, only when the conditions are satisfied as follows:
- Air inlet is FOOT
- Ambient temperature is 8°C (46°F) or less
- Blower motor (applied voltage) is 10 V or more



AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control

INFOID:0000000006546675

DESCRIPTION

- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to BCM.
- BCM transmits the A/C ON signal and blower fan ON signal to ECM via CAN communication line.
- With Intelligent Key system: Refer to BCS-13, "SIGNAL BUFFER SYSTEM : System Description".
- Without Intelligent Key system: Refer to BCS-103, "SIGNAL BUFFER SYSTEM : System Description".
- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor request signal to IPDM E/R via CAN communication line.
- By receiving the A/C compressor request signal from ECM, IPDM E/R turns the A/C relay to ON, and activates the compressor.
- With Intelligent Key system: Refer to PCS-6, "RELAY CONTROL SYSTEM : System Description".

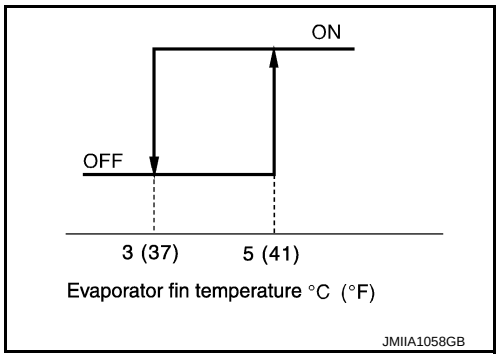
- Without Intelligent Key system: Refer to PCS-38, "RELAY CONTROL SYSTEM : System Description".

CONTROL BY A/C AUTO AMP.

Low Temperature Protection Control

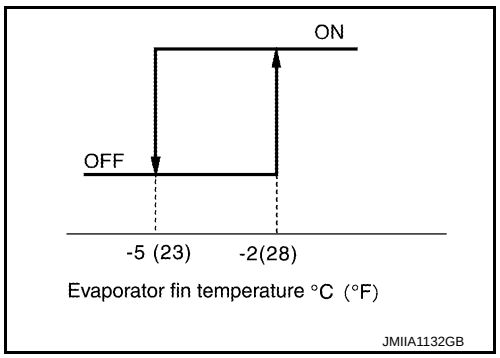
With HR16DE and MR16DDT

- When intake sensor detects that evaporator surface temperature is 3°C (37°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.
  When the air temperature returns to 5°C (41°F) or more, the compressor is activated.



With K9K

- When intake sensor detects that evaporator surface temperature is –5°C (23°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.
  When the air temperature returns to –2°C (28°F) or more, the compressor is activated.



CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction

The high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn A/C relay OFF and stop the compressor.

With HR16DE and MR16DDT

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

With K9K

- 2.8 MPa (28.56 kg/cm^2, 406 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.8 MPa (28.56 kg/cm^2, 406 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.12 MPa (1.22 kg/cm^2, 17.4 psi) or less

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 oil once.

Air Conditioning Cut Control

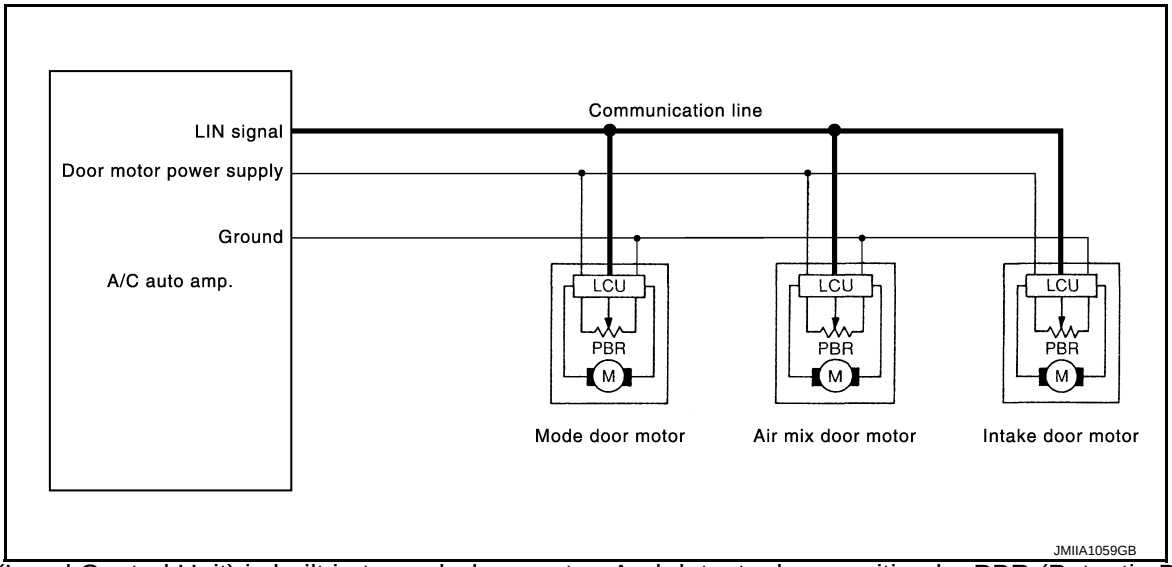
When the engine condition is high load, ECM makes the A/C relay to OFF, and stops the compressor. Refer to following.

- HR16DE: EC-476, "AIR CONDITIONING CUT CONTROL : System Description"
- MR16DDT: EC-60, "AIR CONDITIONING CUT CONTROL : System Description"

AUTOMATIC AIR CONDITIONING SYSTEM : Door Control

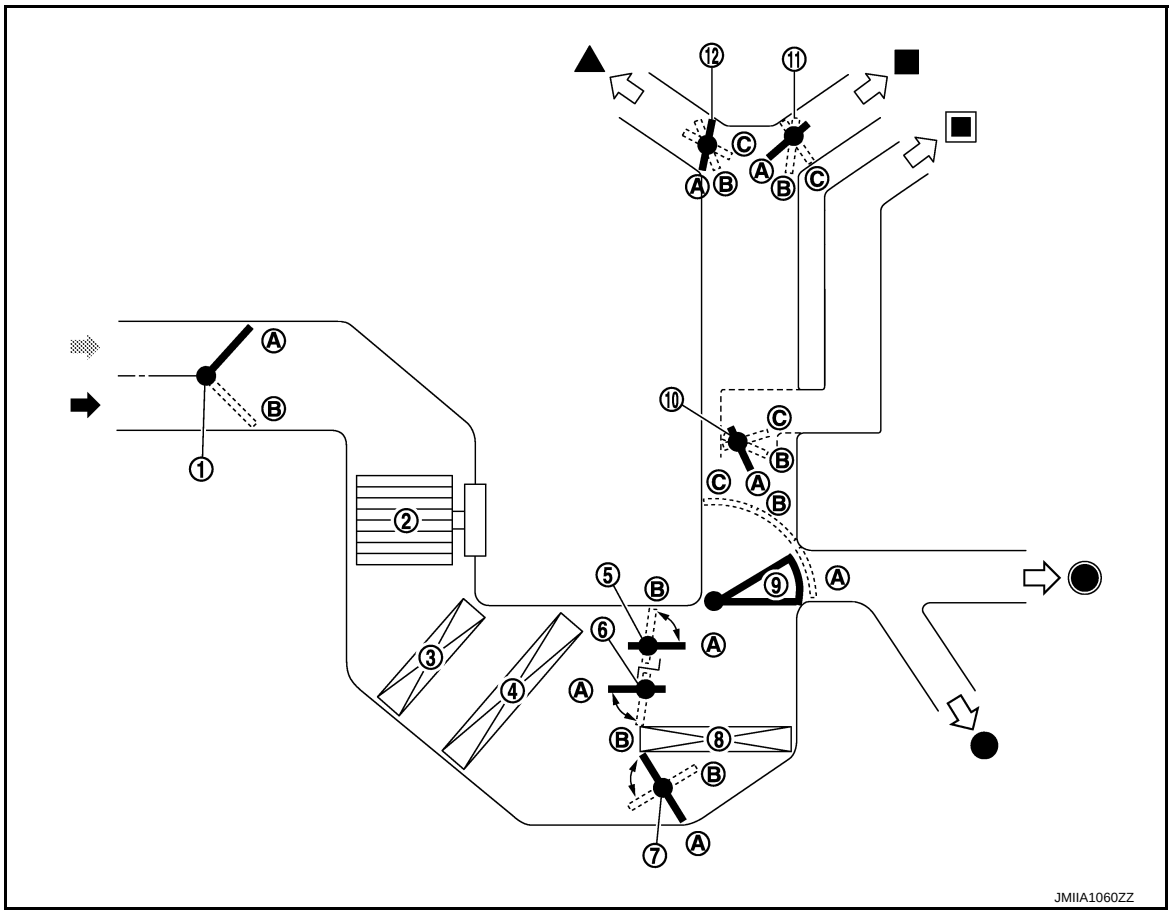
INFOID:0000000006546676

DOOR MOTOR CONTROL



- LCU (Local Control Unit) is built in to each door motor. And detects door position by PBR (Potentio Balance Resistor).
- A/C auto 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 auto amp. when the door movement is complete, transmits the signal of door movement completion to A/C auto amp.

SWITCH AND THEIR CONTROL FUNCTION



1. Intake door
2. Blower motor
3. Air conditioner filter
4. Evaporator
5. Max. cool door
6. Upper air mix door
7. Lower air mix door
8. Heater core
9. Foot door
10. Side ventilator door
11. Center ventilator door
12. Defroster door

Fresh air intake | Recirculation air | Defroster

Center ventilator | Side ventilator | Foot

Rear foot*

*: With rear foot duct

Switch/dial position				Door position							
				Center ventilator door	Side ventilator door	Foot door	Defroster door	Intake door	Max. cool door	Upper air mix door	Lower air mix door
AUTO switch		AUTO		AUTO							
MODE switch	VENT		☀	A	A	A	A	—	—	—	—
	B/L		☀	B	B	B	A				
	FOOT		☀	C	C	C	B				
	D/F		☀								
DEF switch			☀			A	C				
Intake switch			☀	—	—	—	—	A			
			☀					B			
Temperature control dial		Full cold (16°C)						—	A	A	A
		16.5°C – 29.5°C							AUTO	AUTO	AUTO
		Full hot (30°C)							B	B	B
OFF switch				C	C	C	B	B	—	—	—

AIR DISTRIBUTION

Without rear foot duct

MODE/DEF setting position	Discharge air flow			
	Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	52.6%	47.3%	—	—
	34.0%	27.7%	38.4%	—
	—	19.1%	57.9%	23.0%
	—	13.5%	42.4%	44.1%
	—	16.3%	—	83.8%

With rear foot duct

MODE/DEF setting position	Discharge air flow				
	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	52.6%	47.3%	—	—	—
	28.2%	25.9%	29.6%	16.3%	—
	—	16.3%	43.0%	21.0%	19.7%
	—	12.2%	33.1%	16.3%	38.4%
	—	16.3%	—	—	83.8%

AUTOMATIC AIR CONDITIONING SYSTEM : ECO Mode Control

INFOID:0000000006659840

DESCRIPTION

- A/C auto amp. receives operation status of each switch (A/C operation signal), D-MODE setting status (ECO mode signal), and “CLIMATE ECO” setting status (A/C ECO setting signal) from multi display unit via CAN communication.
- A/C auto amp. operates air conditioning system in ECO mode, when D-MODE on multi display unit is set to ECO mode while air conditioning system is in automatic control.

NOTE:

- For setting procedure of D-MODE, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".
- Activation or deactivation of ECO mode can be changed using multi display unit setting function (“CLIMATE ECO”). For setting procedure, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

CONTROL OUTLINE

During ECO mode operation, A/C auto amp. changes air flow and control characteristics of air inlet, within a range that may not spoil the comfort level, lowers operation ratio of compressor, and reduces the electrical load. This reduces engine load and improved fuel economy. Refer to the following items for details of each control.

Air Flow Control

- A/C auto amp. increases voltage to power transistor gate compared to ordinary operation and reduces voltage to blower motor. This reduces air flow.
- Since air flow is reduced, the amount of air that passes evaporator is reduced. Increase of evaporator temperature can be moderated. Evaporator temperature is easily shifted to temperature control range for low temperature protection control. Operation ratio of evaporator is reduced.
- Since air flow is reduced, the electrical load is reduced. Alternator power output can be moderated.

Air Inlet Control

- In the following conditions, A/C auto amp. controls air inlet and increases recirculation air mixing ratio compared to ordinary operation.

- Ambient temperature: 25°C (77°F) or more
- Temperature setting: Any temperature other than full cold (16°C) or full hot (30°C)
- Air outlet: In automatic control
- Air flow: In automatic control
- Air inlet: In automatic control or in fresh air intake mode by manual control
- A/C switch: ON

- By increasing recirculation air mixing ratio, cooled air in passenger room is circulated in larger amount than during ordinary operation. Air temperature blowing to evaporator is maintained at a low level. Evaporator temperature increase can be moderated. Evaporator temperature is easily shifted to temperature control range for low temperature protection control. Operation ratio of evaporator is reduced.

AUTOMATIC AIR CONDITIONING SYSTEM : Fail-safe

INFOID:0000000006696751

FAIL-SAFE FUNCTION

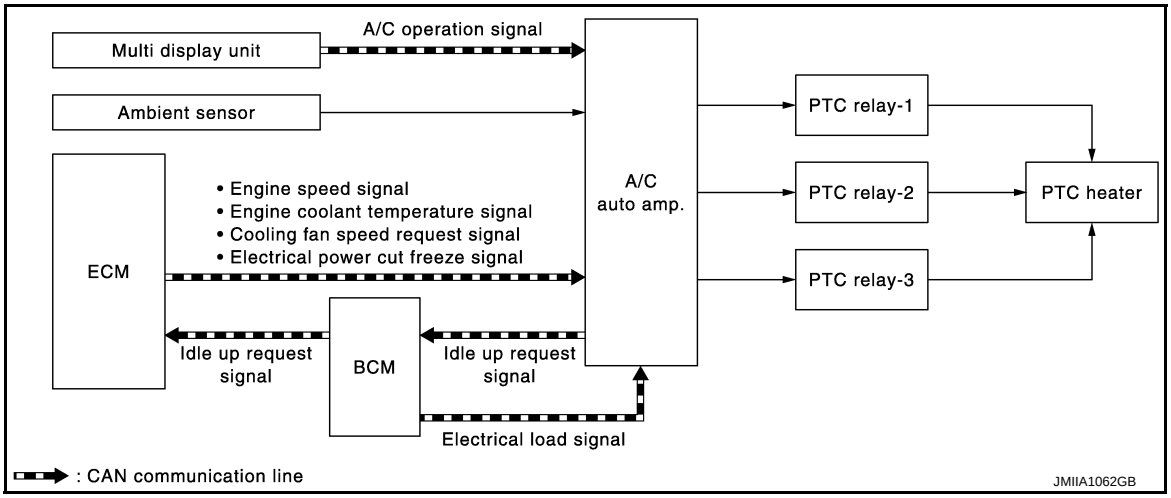
If a communication error exists between the A/C auto amp. and multi display unit for 2 seconds or longer, air conditioning is controlled under the following conditions:

A/C display	**: OFF**
Set temperature	**: Setting before communication error occurs**
Air outlet	**: AUTO**
Air flow	**: AUTO**
Air inlet	**: FRE (Fresh air intake)**
A/C switch	**: ON**

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : System Diagram

INFOID:0000000006659834



PTC HEATER CONTROL SYSTEM : System Description

INFOID:0000000006659835

- A/C auto amp. performs PTC relay ON/OFF control based on engine speed, engine coolant temperature, electrical power cut freeze signal (permission signal, retention signal, stop signal), fan speed, ambient temperature, battery voltage, and electrical load signal (high beam request signal, low beam request signal, rear window defogger ON signal, and others).
- When PTC relay turns ON, power supply is supplied to PTC heater. Heating element is heated and air flow temperature is increased. Heating is available for a period of time until engine coolant temperature is increased when engine starts cold in cold climate.
- Idle up request signal is transmitted from A/C auto amp. to ECM while PTC heater operates. Idle speed is increased, warming-up is facilitated, and battery electric power is obtained.
- Electric power supplied to PTC heating element is subject to PTC relay control conditions.

PTC heater	Operation	PTC relay-1	PTC relay-2	PTC relay-3	Electric power (W)
OFF	OFF	OFF	OFF	OFF	Approx. 0
PTC heater-1	LOW	ON	OFF	OFF	Approx. 333
PTC heater-2	MID	ON	ON	OFF	Approx. 666
PTC heater-3	HI	ON	ON	ON	Approx. 999

NOTE:
PTC heater operation depends on ambient temperature and battery voltage. PTC heater is ON when ambient temperature is 8°C or less. PTC heater is OFF when ambient temperature is 12°C or more. PTC heater is ON when battery voltage is 11.5 V or more. PTC heater is OFF when battery voltage is 11 V or less.

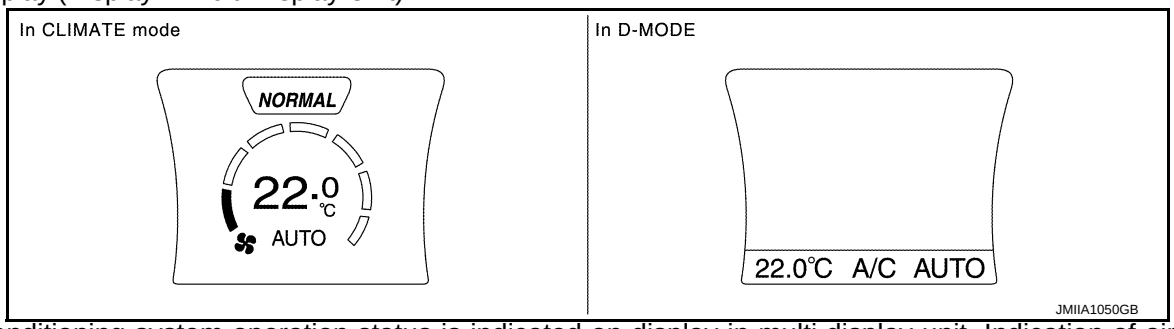
OPERATION

Switch Name and Function

INFOID:0000000006659841

OPERATION AND DISPLAY

A/C Display (Display in Multi Display Unit)



- Air conditioning system operation status is indicated on display in multi display unit. Indication of air conditioning system varies according to display mode of multi display unit. For changing procedure of display mode, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

- In CLIMATE mode: Operation status of air conditioning system (setting temperature, air flow, and “AUTO”*1) is indicated on display when air conditioning system is turned ON.
- In D-MODE: Operation status of air conditioning system (setting temperature, A/C switch, and “AUTO”*2) is indicated on lower portion of display when air conditioning system is turned ON.

NOTE:

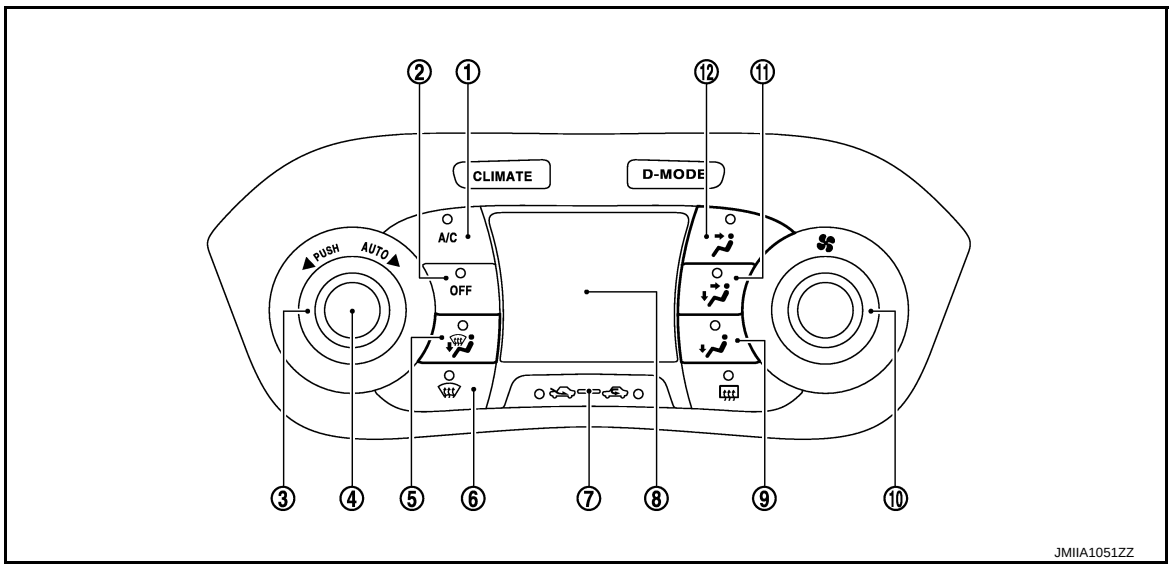
*1: AUTO is indicated when both air flow and air outlet are in automatic control.

*2: Air Flow is indicated when air flow or air outlet is in manual control.

A/C Controller (Multi Display Unit)

Operation procedure of air conditioning system varies depending on display mode of multi display unit. For changing procedure of display mode, refer to AV-99, "NISSAN DYNAMIC CONTROL SYSTEM : System Description".

- In CLIMATE mode: All operations of air conditioning system are possible.



1. A/C switch
2. OFF switch
3. Temperature control dial
4. AUTO switch
5. MODE switch (D/F)
6. DEF switch
7. Intake switch
8. Display
9. MODE switch (FOOT)
10. Fan control dial
11. MODE switch (B/L)
12. MODE switch (VENT)

A/C switch	• Compressor control (switch indicator) changes between ON ⇔ OFF each time when switch is pressed while air conditioning system is in the ON position. • Air conditioning system turns ON and operates according to the following setting when switch is pressed while air conditioning system is in the OFF position. - Air outlet: Previous setting before turning air conditioning system OFF. - Air flow: 1st speed (manual control) - Air inlet: Previous setting before turning air conditioning system OFF. - A/C switch: ON
OFF switch	Air conditioning system turns ON ⇔ OFF each time when switch is pressed. • When switch is pressed while air conditioning system is in the ON position - Air conditioning system turns OFF and changes to the following status when switch is pressed. • Air outlet: FOOT • Air flow: OFF. • Air inlet: Fresh air intake (switch indicator turns OFF) • A/C switch: OFF • When switch is pressed while air conditioning system is in the OFF position - Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when switch is pressed.
Temperature control dial	Setting temperature can be set within a range of 16°C – 30°C at a rate of 0.5°C per adjustment using this dial. • Clockwise rotation: Set temperature increases • Counterclockwise rotation: Set temperature decreases.
AUTO switch	“AUTO” is indicated on display and air conditioning system operates according to the following setting when switch is pressed. • Air outlet: Automatic control • Air flow: Automatic control • Air inlet: Automatic control • A/C switch: ON **NOTE:** When air outlet or air flow is manually operated while “AUTO” is indicated on display “AUTO” indication turns OFF. However, automatic control continues for other functions than air outlet or air flow.
MODE switch	• When each MODE switch is pressed, air outlet is switched and VENT, B/L, FOOT, or D/F* can be selected manually. (Switch indicator of operated switch turns ON.) • When each MODE switch is pressed twice continuously, air outlet is set to automatic control. (Switch indicator turns OFF while air outlet automatic control is operated.) • Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when each MODE switch is pressed while air conditioning system is OFF. (Air outlet is set according to the switch that is pressed) *: Air inlet is set to fresh air intake when D/F is selected. **NOTE:** Air outlet automatic control is released (“AUTO” turns OFF) when each MODE switch is pressed while “AUTO” is indicated on display.
DEF switch	DEF mode turns ON ⇔ OFF each time when switch is pressed. • When switch is pressed while air conditioning system is in the ON position. - Air conditioning system operates according to the following setting when DEF mode is turned ON • Air outlet: DEF • Air flow: Previous setting before turning DEF mode ON. • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning system operates according to the previous setting before turning DEF mode ON when DEF mode is turned OFF. • When switch is pressed while air conditioning system is in the OFF position. - Air conditioning system turns ON and operates according to the following setting when DEF mode is turned ON. • Air outlet: DEF • Air flow: Automatic control • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning system operates according to the previous setting before turning air conditioning system OFF when DEF mode is turned OFF. **NOTE:** When DEF mode is turned ON while “AUTO” is indicated on display, “AUTO” indication turns OFF. However, air flow automatic control continues.

Intake switch	• Air inlet changes between recirculation (REC) ⇔ fresh air intake (FRE) each time this switch is pressed. -  switch indicator ON: Recirculation* -  switch indicator ON: Fresh air intake • Switch indicator blinks 2 times and air inlet is set to automatic control when switch is pressed and held for 2 seconds or more. • Air conditioning system operates according to the previous setting when switch is pressed while air conditioning system is in the OFF position. - Air outlet: Previous setting before turning air conditioning system OFF. - Air flow: Previous setting before turning air conditioning system OFF. - Air inlet: Previous setting before turning air conditioning system OFF. - A/C switch: ON *: A/C switch turns ON when recirculation is selected.
Fan control dial	• Air flow can be manually set within a range of 1st – 7th speed using this dial. - Clockwise rotation: Air flow increases - Counterclockwise rotation: Air flow decreases • Air conditioning system turns ON and operates according to the previous setting before turning air conditioning system OFF when this dial is operated while air conditioning system is OFF. [Air flow is set to 1st speed (manual control)] **NOTE:** Air flow automatic control is released (“AUTO” turns OFF) when this dial is operated while “AUTO” is indicated on display.

• In D-MODE: The following switches and dial cannot be operated.
- A/C switch
- OFF switch
- MODE switch
- Fan control dial

DIAGNOSIS SYSTEM (A/C AUTO AMP.)

Description

INFOID:0000000006659842

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
A/C auto amp.	HVAC	Self Diagnostic Result
		Data Monitor
		Active Test
		Work support
Multi display unit	MDU	Self Diagnostic Result
		Data Monitor
		Active Test
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

CONSULT-III Function

INFOID:0000000006659843

CONSULT-III performs the following functions via CAN communication with A/C auto amp.

Diagnostic mode	Description
Ecu Identification	Displays the part number of A/C auto amp.
Self Diagnostic Result	Displays the diagnosis results judged by A/C auto amp.
Data Monitor	Displays the input/output signal of A/C auto amp.
Active Test	The signals used to activate each device are forcibly supplied from A/C auto amp.
Work support	Changes the setting for each setting function.

NOTE:
Diagnosis should be performed with engine running. Door motor operation speeds become slower and NO results may be returned even for normal operation if battery voltage drops below 12 V during self-diagnosis.

ECU IDENTIFICATION

Part number of A/C auto amp. can be checked.

SELF-DIAGNOSIS RESULTS

Diagnosis result that is judged by A/C auto amp. can be checked. Refer to HAC-130, "DTC Index".

DATA MONITOR

Input/output signal of A/C auto amp. can be checked.

Display item list

Monitor item [Unit]		Description
AMB TEMP SEN	[°C (°F)]	Ambient temperature value converted from ambient sensor signal received from ambient sensor
IN-VEH TEMP	[°C (°F)]	In-vehicle temperature value converted from in-vehicle sensor signal received from in-vehicle sensor

Monitor item [Unit]		Description
INT TEMP SEN	[°C (°F)]	Evaporator fin temperature value converted from intake sensor signal received from intake sensor
SUNLOAD SEN	[w/m^2]	Sunload value converted from sunload sensor signal received from sunload sensor
AMB SEN CAL	[°C (°F)]	Ambient temperature value calculated by A/C auto amp.
IN-VEH CAL	[°C (°F)]	In-vehicle temperature value calculated by A/C auto amp.
INT TEMP CAL	[°C (°F)]	Evaporator fin temperature value calculated by A/C auto amp.
SUNL SEN CAL	[w/m^2]	Sunload value calculated by A/C auto amp.
COMP REQ SIG	[On/Off]	Displays A/C ON signal ON/OFF status transmitted to BCM.
FAN REQ SIG	[On/Off]	Displays blower fan ON signal ON/OFF status transmitted to BCM.
FAN DUTY*		Target value of voltage (applied voltage) applied to blower motor by A/C auto amp.
XM		Target discharge air temperature judged by A/C auto amp. depending on the temperature setting and the value from each sensor
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

*: “DUTY” is displayed, but voltage is indicated. Or unit is not displayed but unit is (V).

ACTIVE TEST

The signals used to activate each device forcibly supplied from A/C auto amp. operation check of air conditioning system can be performed.

Test item	Description
HVAC TEST	The operation check of air conditioning system can be performed by selecting the mode. Refer to the following table for the conditions of each mode.

Check each output device

	Test item						
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7
Mode door motor position	VENT	VENT	B/L	B/L	FOOT*	D/F	DEF
Intake door motor position	REC	REC	REC	20% FRE	80% FRE	FRE	FRE
Air mix door motor position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor (Applied voltage)	4.75 V	4.75 V	7.75 V	7.75 V	11.5 V	11.5 V	4.75 V
Magnet clutch	ON	ON	ON	ON	OFF	OFF	ON

NOTE:
Perform the inspection of each output device after starting the engine because the compressor is operated.

WORK SUPPORT

Setting change of each setting functions can be performed.

Work item	Description	Refer to
TEMP SET CORRECT	Setting change of temperature setting trimmer can be performed.	HAC-139, "Temperature Setting Trimmer"
REC MEMORY SET	Setting change of inlet port memory function (REC) can be performed.	HAC-139, "Inlet Port Memory Function (REC)"
FRE MEMORY SET	Setting change of inlet port memory function (FRE) can be performed.	HAC-140, "Inlet Port Memory Function (FRE)"

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

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)
COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706385

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
• Automatic A/C • Manual A/C	AIR CONDITONER		×	×*2
• Intelligent Key system • Engine start system	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
NVIS - NATS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Theft warning alarm	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

- *1: This item is displayed, but not used.
- *2: For models with automatic A/C, this diagnosis mode is not used.

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT-III.

CONSULT screen item	Indication/Unit	Description	
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected	
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected	
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected	While turning BCM status from low power consumption mode to normal mode (Power supply position is “LOCK”)
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is “OFF”.)
	LOCK>ACC		While turning power supply position from “LOCK” to “ACC”
	ACC>ON		While turning power supply position from “ACC” to “IGN”
	RUN>ACC		While turning power supply position from “RUN” to “ACC” (Vehicle is stopping and selector lever is except P position.)
	CRANK>RUN		While turning power supply position from “CRANKING” to “RUN” (From cranking up the engine to run it)
	RUN>URGENT		While turning power supply position from “RUN“ to “ACC” (Emergency stop operation)
	ACC>OFF		While turning power supply position from “ACC” to “OFF”
	OFF>LOCK		While turning power supply position from “OFF” to “LOCK”
	OFF>ACC		While turning power supply position from “OFF” to “ACC”
	ON>CRANK		While turning power supply position from “IGN” to “CRANKING”
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is “OFF”.) to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is “LOCK”.) to low power consumption mode
	LOCK		Power supply position is “LOCK” (Ignition switch OFF with steering is locked.)
	OFF		Power supply position is “OFF” (Ignition switch OFF with steering is unlocked.)
	ACC		Power supply position is “ACC” (Ignition switch ACC)
	ON		Power supply position is “IGN” (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is “RUN” (Ignition switch ON with engine running)
	CRANKING		Power supply position is “CRANKING” (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Automatic A/C 2WD Models)

INFOID:0000000006546680

DATA MONITOR

Display Item List

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays the blower fan status as jugged from the A/C auto amp.
AIR COND SW	[On/Off]	Displays [COMP (On)/COMP (Off)] status as judged from the A/C auto amp.

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706386

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×
• Automatic A/C • Manual A/C • Manual heater	AIR CONDITONER		×	×*2
Combination switch	COMB SW		×	
Body control system	BCM	×		
NATS	IMMU	×		×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	PANIC ALARM*1			×

- *1: This item is displayed, but is not used.
- *2: For models with automatic A/C, this mode is not used.

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Automatic A/C 2WD Models)

INFOID:0000000006546682

DATA MONITOR

Display Item List

Monitor Item [Unit]		Contents
IGN SW	[On/Off]	Displays ignition switch position status as judged from ignition switch signal.
FAN ON SIG	[On/Off]	Displays the blower fan status as jugged from the A/C auto amp.
AIR COND SW	[On/Off]	Displays [COMP (On)/COMP (Off)] status as judged from the A/C auto amp.

ECU DIAGNOSIS INFORMATION

A/C AUTO AMP.

Reference Value

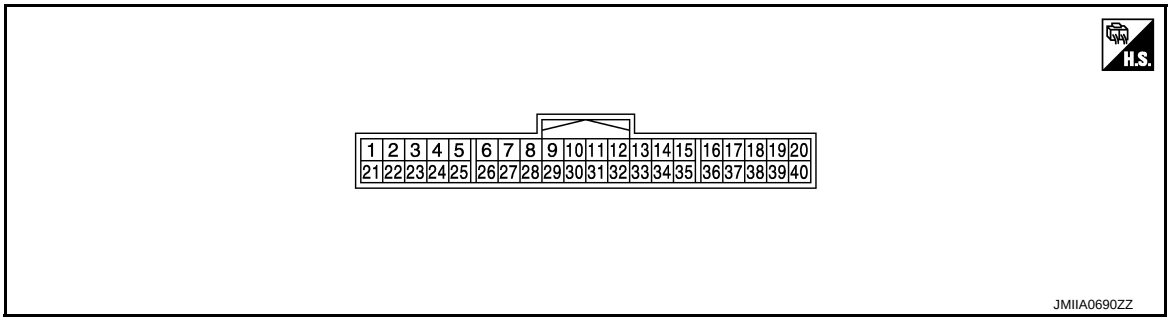
INFOID:0000000006659844

CONSULT-III DATA MONITOR REFERENCE VALUES

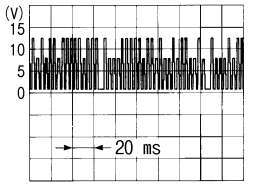
Monitor item	Condition		Value/Status
AMB TEMP SEN	Ignition switch ON		Equivalent to ambient temperature
IN-VEH TEMP	Ignition switch ON		Equivalent to in-vehicle temperature
INT TEMP SEN	Ignition switch ON		Equivalent to evaporator fin temperature
SUNLOAD SEN	Ignition switch ON		Equivalent to sunload amount
AMB SEN CAL	Ignition switch ON		Equivalent to ambient temperature
IN-VEH CAL	Ignition switch ON		Equivalent to in-vehicle temperature
INT TEMP CAL	Ignition switch ON		Equivalent to evaporator fin temperature
SUNL SEN CAL	Ignition switch ON		Equivalent to sunload amount
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	On
		A/C switch: OFF	Off
FAN REQ SIG	Engine: Run at idle after warming up	Blower motor: ON	On
		Blower motor: OFF	Off
FAN DUTY*	Engine: Run at idle after warming up	Blower motor: ON	4 – 13
		Blower motor: OFF	0
XM	Ignition switch ON		Value according to target air flow temperature
ENG COOL TEMP	Ignition switch ON		Equivalent to engine coolant temperature
VEHICLE SPEED	Turn drive wheels and compare CONSULT-III value with the speedometer indication.		Equivalent to speedometer reading

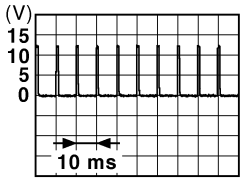
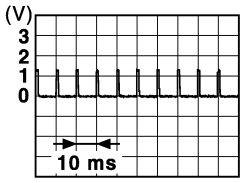
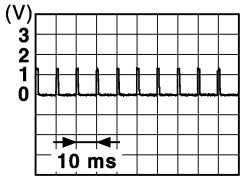
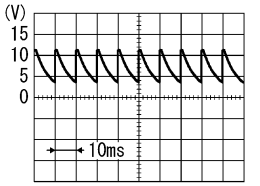
*: “DUTY” is displayed, but voltage is indicated. Or unit is not displayed but unit is (V).

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
1 (L)	—	CAN-H	Input/ Output	—		—
2 (B)	Ground	Ground	—	Ignition switch ON		0 – 0.1 V
3 (Y)	Ground	Battery power supply	Input	Ignition switch OFF		11 – 14 V
6 (P)	Ground	A/C auto amp. connection recognition signal	Output	Ignition switch ON		11 – 14 V
7 (GR)	Ground	Ambient sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with ambient temperature
9 (P)	Ground	Sunload sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with sunload amount
13 (G)	Ground	Ignition power supply feedback signal	Input	Ignition switch ON		11 – 14 V
14 (L)	Ground	Fan control amp. control signal	Output	• Ignition switch ON • Blower motor: 1st – 6th speed (manual)		2.0 – 3.0 V
				• Ignition switch ON • Blower motor: 7ht speed (manual)		8.5 – 9.5 V
16 (V)	Ground	Door motor LIN signal	Input/ Output	Ignition switch ON		 SJIA1453J
17 (W)	Ground	Door motor power supply	Output	Ignition switch ON		11 – 14 V
19* (Y)	Ground	PTC relay-1 control signal	Output	PTC heater	OFF	11 – 14 V
					LOW, MID, or HIGH operation	0 – 0.1 V
20* (P)	Ground	PTC relay-3 control signal	Output	PTC heater	OFF	11 – 14 V
					HIGH operation	0 – 0.1 V
21 (P)	—	CAN-L	Input/ Output	—		—
22 (B)	Ground	Ground	—	Ignition switch ON		0 – 0.1 V
23 (SB)	Ground	Ignition power supply	Input	Ignition switch ON		11 – 14 V
26 (R)	Ground	Sensor ground	—	Ignition switch ON		0 – 0.1 V
27 (LG)	Ground	In-vehicle sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with in-vehicle temperature

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
28 (V)	Ground	Intake sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with evaporator fin temperature
33 (Y)	Ground	A/C ON signal	Output	• Ignition switch ON • A/C switch: OFF (A/C indicator: OFF)		 JPMIA0012GB
				• Ignition switch ON • A/C switch: ON (A/C indicator: ON)		 JMIIA0941GB
34 (R)	Ground	Blower motor feedback signal	Input	• Ignition switch ON • Fan speed: 1st speed (manual)		9.5 – 10.5 V
37 (B)	Ground	Door motor ground	—	Ignition switch ON		0 – 0.1 V
38 (LG)	Ground	Blower fan ON signal	Output	• Ignition switch ON • Blower motor: OFF		 JMIIA0941GB
				• Ignition switch ON • Blower motor: ON		 PKIB4960J
39* (Y)	Ground	PTC relay-2 control signal	Output	PTC heater	OFF	11 – 14 V
					MID, or HIGH operation	0 – 0.1 V

*: With K9K

Fail-safe

INFOID:0000000006659845

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and multi display unit for 2 seconds or longer, air conditioning is controlled under the following conditions:

A/C display : OFF

Set temperature : Setting before communication error occurs

Air outlet : AUTO
Air flow : AUTO
Air inlet : FRE (Fresh air intake)
A/C switch : ON

DTC Index

INFOID:0000000006659846

DTC	Items (CONSULT-III screen terms)	Reference
U1000	CAN COMM CIRCUIT	HAC-141, "DTC Logic"
U1010	CONTROL UNIT (CAN)	HAC-142, "DTC Logic"
B2578	IN-VEHICLE SENSOR	HAC-143, "DTC Logic"
B2579	IN-VEHICLE SENSOR	HAC-143, "DTC Logic"
B257B	AMBIENT SENOR	HAC-146, "DTC Logic"
B257C	AMBIENT SENOR	HAC-146, "DTC Logic"
B2581	INTAKE SENSOR	HAC-149, "DTC Logic"
B2582	INTAKE SENSOR	HAC-149, "DTC Logic"
B2630*	SUNLOAD SENSOR	HAC-152, "DTC Logic"
B2631*	SUNLOAD SENSOR	HAC-152, "DTC Logic"
B2632	DR AIR MIX DOOR MOT	HAC-155, "DTC Logic"
B2633	DR AIR MIX DOOR MOT	HAC-155, "DTC Logic"
B2636	DR VENT DOOR FAIL	HAC-157, "DTC Logic"
B2637	DR B/L DOOR FAIL	HAC-157, "DTC Logic"
B2638	DR D/F1 DOOR FAIL	HAC-157, "DTC Logic"
B2639	DR DEF DOOR FAIL	HAC-157, "DTC Logic"
B263D	FRE DOOR FAIL	HAC-159, "DTC Logic"
B263E	20P FRE DOOR FAIL	HAC-159, "DTC Logic"
B263F	REC DOOR FAIL	HAC-159, "DTC Logic"
B2654	D/F2 DOOR FAIL	HAC-157, "DTC Logic"
B2655	B/L2 DOOR FAIL	HAC-157, "DTC Logic"
B27B0	A/C AUTO AMP.	HAC-161, "DTC Logic"

*: Perform self-diagnosis under sunshine. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise self-diagnosis indicates even though the sunload sensor is functioning normally.

MULTI DISPLAY UNIT, BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000006659847

ECU		Reference
Multi display unit		AV-109, "Reference Value"
		AV-111, "DTC Inspection Priority Chart"
		AV-111, "DTC Index"
BCM	With Intelligent Key system	BCS-41, "Reference Value"
		BCS-64, "Fail-safe"
		BCS-66, "DTC Inspection Priority Chart"
		BCS-67, "DTC Index"
	Without Intelligent Key system	BCS-125, "Reference Value"
		BCS-140, "Fail-safe"
		BCS-140, "DTC Inspection Priority Chart"
		BCS-141, "DTC Index"
ECM	HR16DE	EC-508, "Reference Value"
		EC-519, "Fail Safe"
		EC-521, "DTC Inspection Priority Chart"
		EC-522, "DTC Index"
	MR16DDT	EC-90, "Reference Value"
		EC-104, "Fail Safe"
		EC-106, "DTC Inspection Priority Chart"
		EC-108, "DTC Index"
	K9K	EC-846, "Reference Value"
		EC-855, "DTC Index"
IPDM E/R	With Intelligent Key system	PCS-17, "Reference Value"
		PCS-24, "Fail-Safe"
		PCS-25, "DTC Index"
	Without Intelligent Key system	PCS-48, "Reference Value"
		PCS-54, "Fail-Safe"
		PCS-55, "DTC Index"

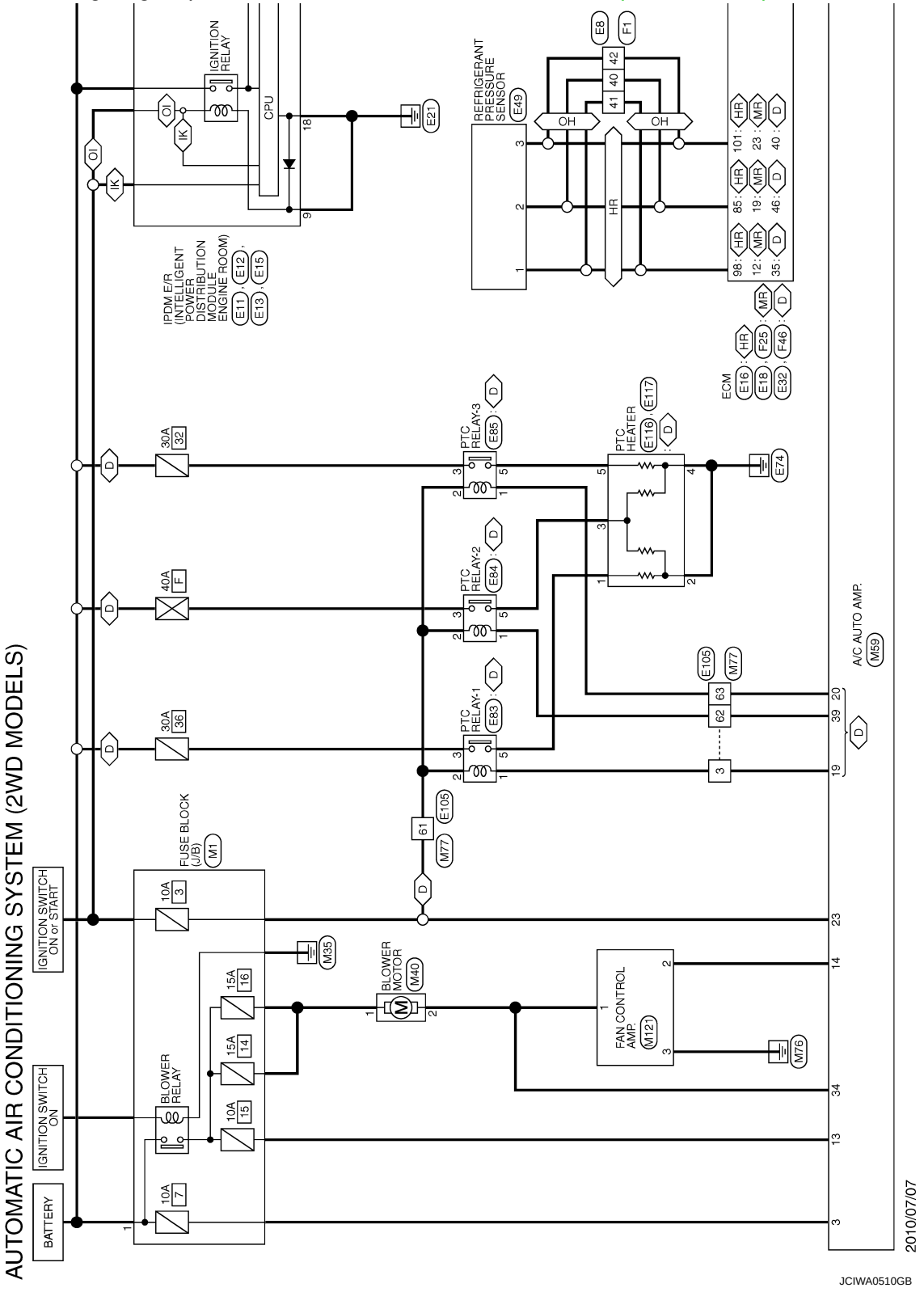
WIRING DIAGRAM

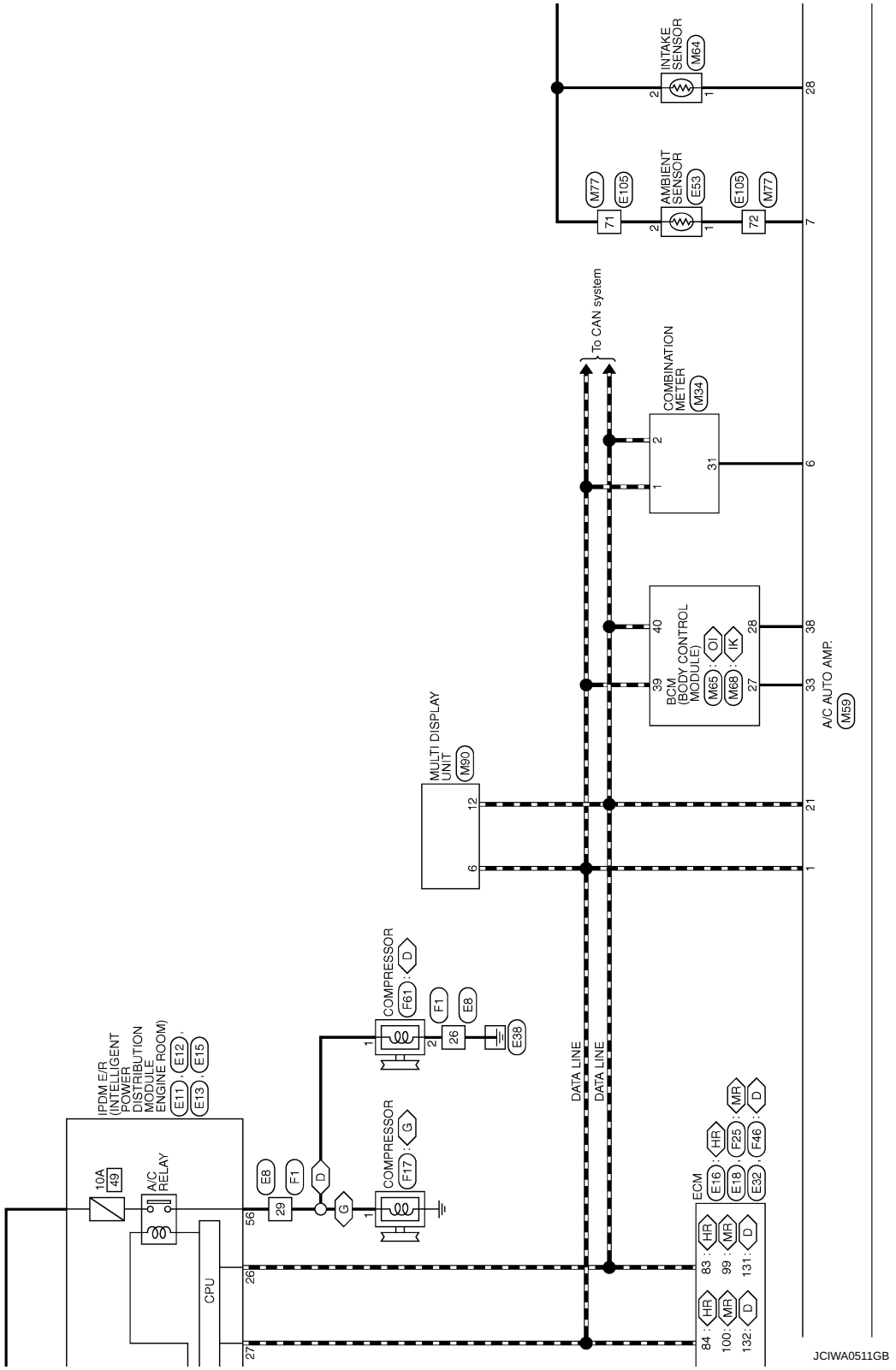
AUTOMATIC AIR CONDITIONING SYSTEM

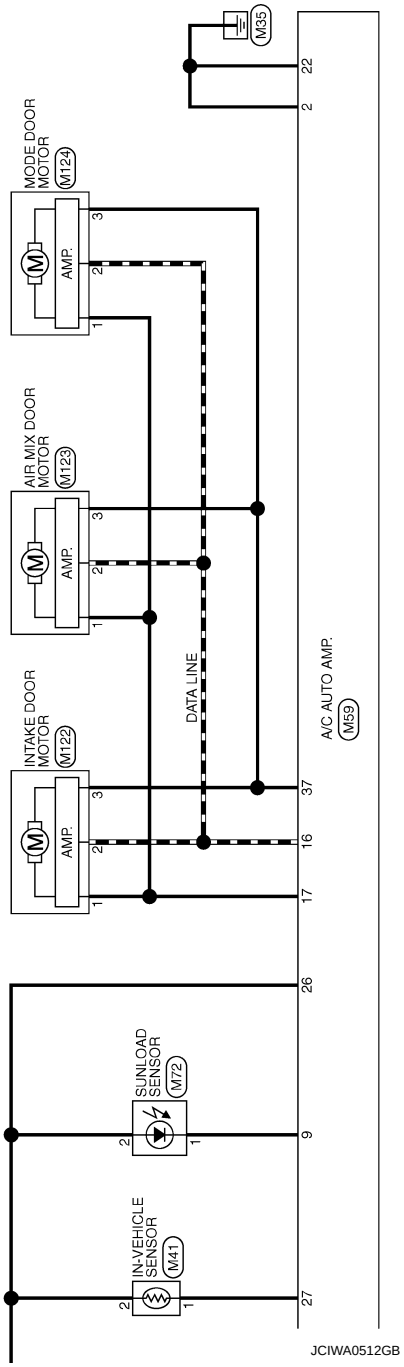
Wiring Diagram

INFOID:0000000006546685

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information/Explanation of Option Abbreviation".




INTAKE SENSOR M64
AMBIENT SENSOR E53
M77 E105 71
E105 M77 72
To CAN system
COMBINATION METER M34
BCM (BODY CONTROL MODULE) M65 : OI M68 : IK
A/C AUTO AMP. M59
MULTI DISPLAY UNIT M90
COMPRESSOR F61 : D
COMPRESSOR F17 : G
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) E11 E12 E13 E15
10A 49
A/C RELAY
CPU
DATA LINE
DATA LINE
ECM E16 : HR E18 : MR E32 : D
F25 : HR F46 : MR
JCIWA0511GB


M35
22
2
MODE DOOR MOTOR
M124
AMP.
3
2
1
AIR MIX DOOR MOTOR
M123
AMP.
3
2
1
INTAKE DOOR MOTOR
M122
AMP.
3
2
1
DATA LINE
A/C AUTO AMP.
M59
37
16
17
26
SUNLOAD SENSOR
M72
2
1
9
IN-VEHICLE SENSOR
M41
2
1
27
JCIWA0512GB

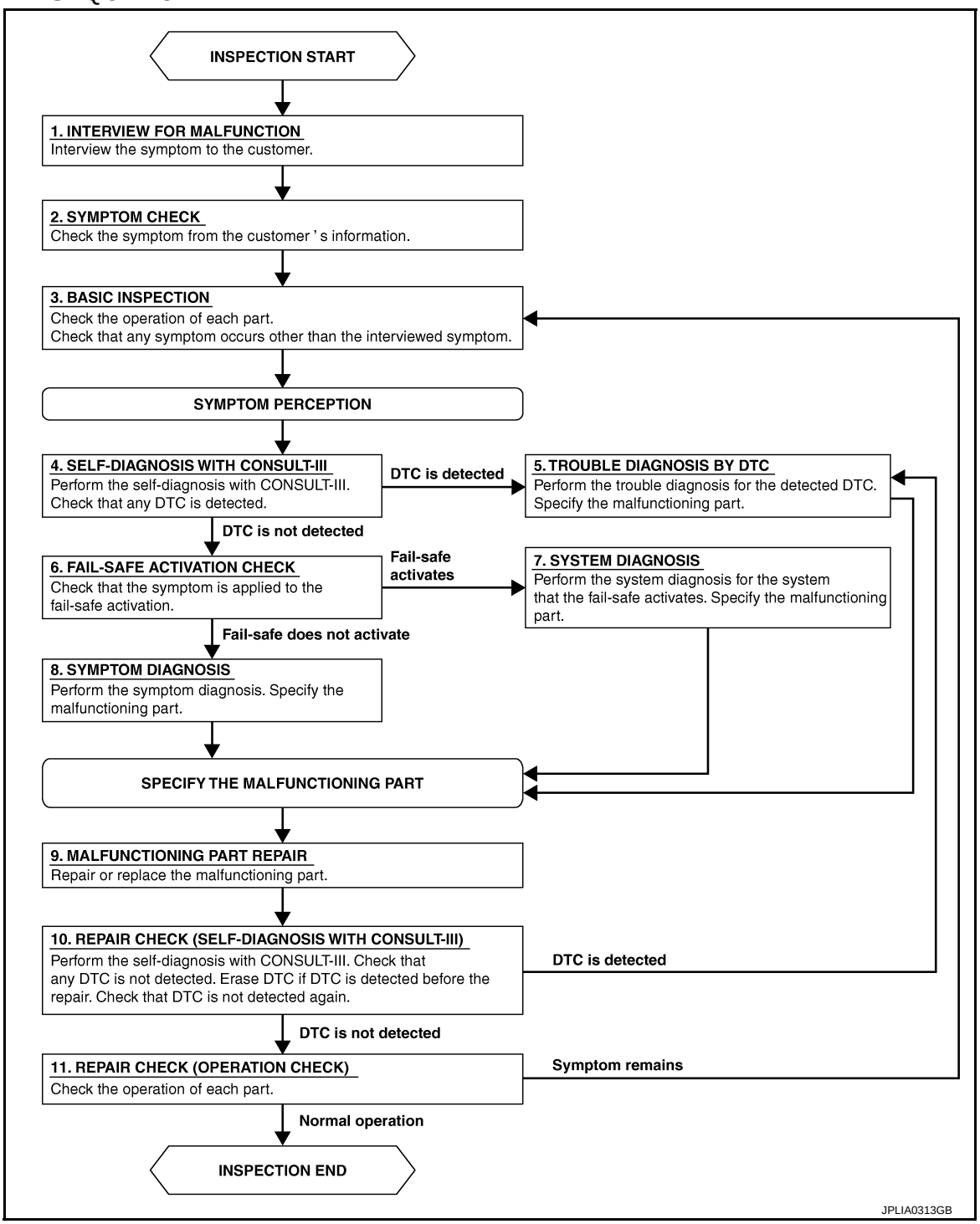
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000006659848

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 9.

6.FAIL-SAFE ACTIVATION CHECK

Check that the symptom is applied to the fail-safe activation.

Does the fail-safe activate?

YES >> GO TO 7.
NO >> GO TO 8.

7.SYSTEM DIAGNOSIS

Perform the system diagnosis for the system that the fail-safe activates. Specify the malfunctioning part.

>> GO TO 9.

8.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 9.

9.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 10.

10.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnosis with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 11.

11.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

OPERATION INSPECTION

Work Procedure

INFOID:0000000006659849

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

Check condition : Engine running at normal operating temperature.

1.CHECK MEMORY FUNCTION

1. Set temperature to 30°C by operating the temperature control dial.
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 10.

2.CHECK AIR FLOW

1. Start engine.
2. Operate fan control dial.
3. Check that air flow changes. Check operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 10.

3.CHECK AIR OUTLET

1. Operate fan control dial 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 air outlets. Refer to VTL-5, "System Description".

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 10.

4.CHECK AIR INLET

1. Press intake switch to set the air inlet to recirculation. [Intake switch indicator (side) turns ON.]
2. Listen to intake sound and confirm air inlets change.
3. Press intake switch again to set the air inlet to fresh air intake. [Intake switch indicator (side) turns OFF and (side) turns ON.]
4. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 10.

5.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 6.
NO >> GO TO 10.

6.CHECK DISCHARGE AIR TEMPERATURE

1. Operate temperature control dial.
2. Check that discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 10.

7. CHECK TEMPERATURE DECREASE

1. Operate compressor.
2. Operate temperature control dial and lower the set temperature to 16°C.
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 8.
NO >> GO TO 10.

8. CHECK TEMPERATURE INCREASE

1. Operate temperature control dial and raise the set temperature to 30°C.
2. Check that warm air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 9.
NO >> GO TO 10.

9. CHECK AUTO MODE

1. Press AUTO switch to confirm that “AUTO” is indicated on the display.
2. Operate temperature control dial to check that air outlet or air flow changes (the air outlet or air flow varies depending on the ambient temperature, in-vehicle temperature, set temperature, and etc.).

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 10.

10. CHECK SELF-DIAGNOSIS WITH CONSULT-III

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

Is any DTC detected?

YES >> Refer to HAC-130, "DTC Index" and perform the appropriate diagnosis.
NO >> GO TO 11.

11. CHECK FAIL-SAFE ACTIVATION

Check that symptom is applied to the fail-safe activation. Refer to HAC-39, "Fail-safe".

>> Refer to HAC-84, "Symptom Table" and perform the appropriate diagnosis.

SYSTEM SETTING

Temperature Setting Trimmer

INFOID:0000000006659850

DESCRIPTION

If the temperature felt by the customer is different from the 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-III

Perform “TEMP SET CORRECT” of HVAC work support item.

Work support items	Display (°C)
TEMP SET CORRECT	3.0
	2.5
	2.0
	1.5
	1.0
	0.5
	0 (initial status)
	–0.5
	–1.0
	–1.5
	–2.0
	–2.5
	–3.0

NOTE:

- When –3.0°C is corrected on the temperature setting set as 25.0°C the temperature controlled by A/C auto amp. is 25.0°C –3.0°C = 22.0°C 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.

Inlet Port Memory Function (REC)

INFOID:0000000006659852

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-III

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.

Inlet Port Memory Function (FRE)

INFOID:0000000006659851

DESCRIPTION

- 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-III

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.

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006548580

CAN (Controller Area Network) is a serial communication system for real time application. It is an on-vehicle multiplex communication system with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto vehicles, 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.
CAN Communication Signal Chart. Refer to LAN-31, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC Logic

INFOID:0000000006548581

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1000	CAN COMM CIRCUIT	When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 or more seconds.	CAN communication system

DTC CONFIRMATION PROCEDURE

1. PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn ignition switch ON and wait for 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-.III
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-141, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-42, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000006548582

1. CHECK CAN COMMUNICATION SYSTEM

Check CAN communication system. Refer to LAN-17, "Trouble Diagnosis Flow Chart".

>> INSPECTION END

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000006548583

Initial diagnosis of A/C auto amp.

DTC Logic

INFOID:0000000006548584

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of A/C auto amp.	A/C auto amp.

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-.III
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-142, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006548585

1.REPLACE A/C AUTO AMP.

Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".

>> INSPECTION END

B2578, B2579 IN-VEHICLE SENSOR

DTC Logic

INFOID:0000000006548586

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-141, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to HAC-142, "DTC Logic".

DTC	Items (CONSULT-III 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-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-143, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546695

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.)
In-vehicle sensor			
Connector	Terminal		
M41	1	Ground	5 V

Is the inspection result normal?

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

2. CHECK IN-VEHICLE SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp harness connector.

In-vehicle sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M41	2	M59	26	Existed

Is the inspection result normal?

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

3.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-147, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace in-vehicle sensor. Refer to HAC-190, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector and A/C auto amp. harness connector.

In-vehicle sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M41	1	M59	27	Existed

Is the inspection result normal?

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

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

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

In-vehicle sensor		—	Continuity
Connector	Terminal		
M41	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006546696

1.CHECK IN-VEHICLE SENSOR

1. Remove in-vehicle sensor. Refer to HAC-190, "Removal and Installation".
2. Check resistance between in-vehicle sensor terminals. Refer to applicable table for the normal value.

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-190, "Removal and Installation".

B257B, B257C AMBIENT SENSOR

DTC Logic

INFOID:0000000006548587

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-141, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-142, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B257B	AMBIENT SENSOR	The ambient sensor recognition temperature is too high.	• Ambient sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B257C		The ambient sensor recognition temperature is too low.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-146, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546693

1.CHECK AMBIENT SENSOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Ambient sensor			
Connector	Terminal		
E53	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK AMBIENT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp harness connector.

Ambient sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
E53	2	M59	26	Existed

Is the inspection result normal?

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

3. CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-147, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace ambient sensor. Refer to HAC-189, "Removal and Installation".

4. CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

Ambient sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
E53	1	M59	7	Existed

Is the inspection result normal?

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

5. CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between ambient sensor harness connector and ground.

Ambient sensor		—	Continuity
Connector	Terminal		
E53	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006546694

1. CHECK AMBIENT SENSOR

1. Remove ambient sensor. Refer to HAC-189, "Removal and Installation".
2. Check resistance between ambient sensor terminals. Refer to applicable table for the normal value.

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-189, "Removal and Installation".

B2581, B2582 INTAKE SENSOR

DTC Logic

INFOID:0000000006548588

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-141, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-142, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B2581	INTAKE SENSOR	The intake sensor recognition temperature is too high.	• Intake sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B2582		The intake sensor recognition temperature is too low.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-149, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546697

1.CHECK INTAKE SENSOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Intake sensor			
Connector	Terminal		
M64	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK INTAKE SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp harness connector.

Intake sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M64	2	M59	26	Existed

Is the inspection result normal?

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

3.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-147, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace intake sensor. Refer to HAC-192, "Removal and Installation".

4.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between intake sensor harness connector and A/C auto amp. harness connector.

Intake sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M64	1	M59	28	Existed

Is the inspection result normal?

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

5.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between intake sensor harness connector and ground.

Intake sensor		—	Continuity
Connector	Terminal		
M64	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006546698

1.CHECK INTAKE SENSOR

1. Remove intake sensor. Refer to HAC-192, "Removal and Installation".
2. Check resistance between intake sensor terminals. Refer to applicable table for the normal value.

Terminal		Condition	Resistance: kΩ
		Temperature: °C (°F)	
1	2	–15 (5)	12.34
		–10 (14)	9.62
		–5 (23)	7.56
		0 (32)	6.00
		5 (41)	4.80
		10 (50)	3.87
		15 (59)	3.15
		20 (68)	2.57
		25 (77)	2.12
		30 (86)	1.76
		35 (95)	1.47
		40 (104)	1.23
		45 (113)	1.04

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace intake sensor. Refer to HAC-192, "Removal and Installation".

B2630, B2631 SUNLOAD SENSOR

DTC Logic

INFOID:0000000006548589

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-141, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-142, "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-III screen terms)	DTC detection condition	Possible cause
B2630	SUNLOAD SENSOR	Detected calorie at sunload sensor 1677 W/m^2 (1442 kcal/m^2·h) or more.	• Sunload sensor • A/C auto amp. • Harness or connectors (The sensor circuit is open or shorted.)
B2631		Detected calorie at sunload sensor 33 W/m^2 (28 kcal/m^2·h) or less.	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-152, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546699

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		
M72	1	Ground	5 V

Is the inspection result normal?

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

2.CHECK SUNLOAD SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp harness connector.

Sunload sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M72	2	M59	26	Existed

Is the inspection result normal?

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

3. CHECK SUNLOAD SENSOR

1. Disconnect A/C auto amp. connector.
2. Check sunload sensor. Refer to HAC-147, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace sunload sensor. Refer to HAC-191, "Removal and Installation".

4. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

Sunload sensor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M72	1	M59	9	Existed

Is the inspection result normal?

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

5. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between sunload sensor harness connector and ground.

Sunload sensor		—	Continuity
Connector	Terminal		
M72	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

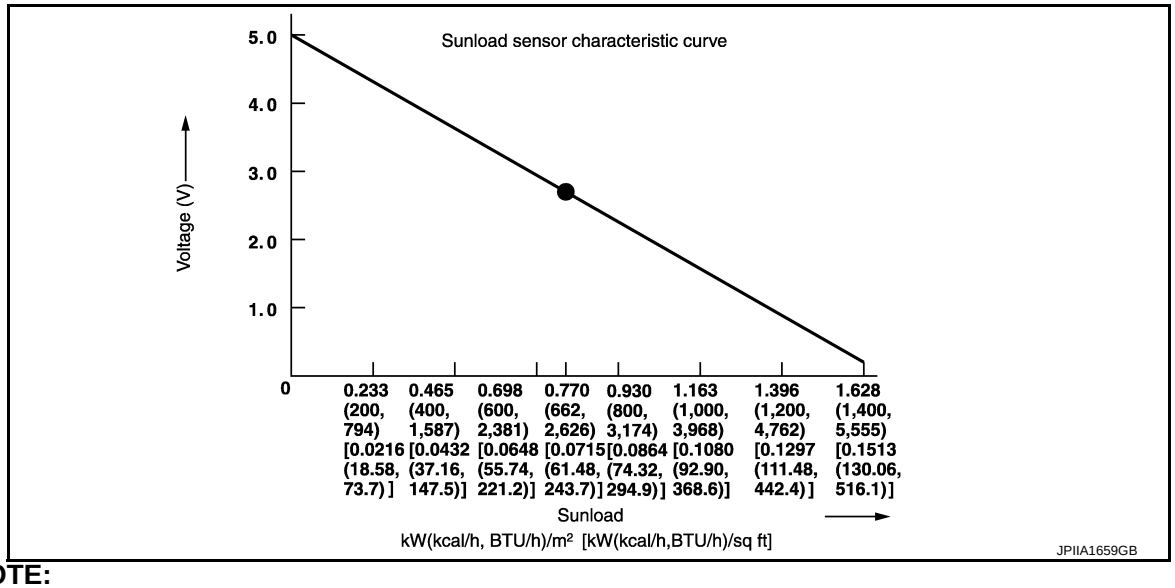
Component Inspection

INFOID:0000000006546700

1. CHECK SUNLOAD SENSOR

1. Turn ignition switch ON.
2. Check voltage between A/C auto amp. harness connector and ground. Refer to applicable table for the normal value.

+		–
A/C auto amp.		
Connector	Terminal	
M59	18	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 0.77 kW/m^2 (662 $kcal/m^2 \cdot h$).

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace sunload sensor. Refer to HAC-191, "Removal and Installation".

B2632, B2633 AIR MIX DOOR MOTOR PBR

DTC Logic

INFOID:0000000006548590

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B2632	DR AIR MIX DOOR MOT	Air mix door motor PBR position 95% or more	• Air mix door motor (PBR internal circuit is open or shorted) • Air mix door motor installation condition • A/C auto amp. • Harness and connector (LIN communication line is open or shorted)
B2633		Air mix door motor PBR position 5% or less	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-155, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546701

1.CHECK AIR MIX DOOR MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Air mix door motor			
Connector	Terminal		
M123	1	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK AIR MIX DOOR MOTOR GROUND CIRCUIT FOR OPEN

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

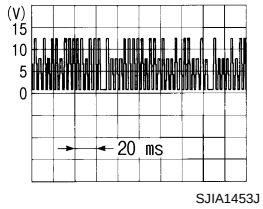
Air mix door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M123	3	M59	37	Existed

Is the inspection result normal?

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

3.CHECK AIR MIX DOOR MOTOR LIN SIGNAL

1. Connect air mix door motor and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Confirm output waveform between air mix door motor harness connector and ground using oscilloscope.

+		–	Output waveform
Air mix door motor			
Connector	Terminal		
M123	2	Ground	 SJIA1453J

Is the inspection result normal?

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

4. CHECK INSTALLATION OF AIR MIX DOOR MOTOR

Check air mix door motor is properly installed. Refer to HAC-195, "Exploded View".

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to HAC-197, "AIR MIX DOOR MOTOR : Removal and Installation".
NO >> Repair or replace malfunctioning part.

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

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

Air mix door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M123	1	M59	17	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

6. CHECK AIR MIX DOOR MOTOR LIN SIGNAL CIRCUIT FOR OPEN

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

Air mix door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M123	2	M59	16	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

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

DTC Logic

INFOID:0000000006548591

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B2636	DR VENT DOOR FAIL	When the malfunctioning door position is detected at VENT position	• Mode door motor (PBR internal circuit is open or shorted) • Mode door motor control linkage installation condition • A/C auto amp. • Harness and connector (LIN communication line 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 VENT DOOR FAIL	When the malfunctioning door position is detected at D/F position	
B2655	B/L DOOR FAIL	When the malfunctioning door position is detected at B/L position	

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-157, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546702

1.CHECK MODE DOOR MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Mode door motor			
Connector	Terminal		
M124	1	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK MODE DOOR MOTOR GROUND CIRCUIT FOR OPEN

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

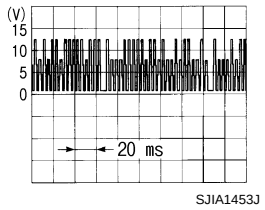
Mode door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M124	3	M59	37	Existed

Is the inspection result normal?

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

3.CHECK MODE DOOR MOTOR LIN SIGNAL

1. Connect mode door motor and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Confirm output waveform between mode door motor harness connector and ground using oscilloscope.

+		–	Output waveform
Mode door motor			
Connector	Terminal		
M124	2	Ground	

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Is the inspection result normal?

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

4.CHECK INSTALLATION OF MODE DOOR MOTOR

Check mode door motor is properly installed. Refer to HAC-195, "Exploded View".

Is the inspection result normal?

YES >> Replace mode door motor. Refer to HAC-197, "MODE DOOR MOTOR : Removal and Installation".
NO >> Repair or replace malfunctioning part.

5.CHECK MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

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

Mode door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M124	1	M59	17	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

6.CHECK MODE DOOR MOTOR LIN SIGNAL CIRCUIT FOR OPEN

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

Mode door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M124	2	M59	16	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

B263D, B263E, B263F INTAKE DOOR MOTOR

DTC Logic

INFOID:0000000006548592

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B263D	FRE DOOR FAIL	When the malfunctioning intake door position is detected at FRE position	• Intake door motor (PBR internal circuit is open or shorted) • Intake door motor control linkage installation condition • A/C auto amp. • Harness and connector (LIN communication line is open or shorted)
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-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-159, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006546703

1.CHECK INTAKE DOOR MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Intake door motor			
Connector	Terminal		
M122	1	Ground	11 – 14 V

Is the inspection result normal?

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

2.CHECK INTAKE DOOR MOTOR GROUND CIRCUIT FOR OPEN

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

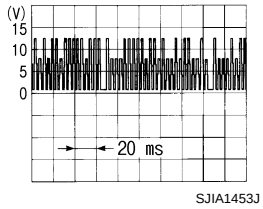
Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M122	3	M59	37	Existed

Is the inspection result normal?

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

3.CHECK INTAKE DOOR MOTOR LIN SIGNAL

1. Connect intake door motor and A/C auto amp. connector.
2. Turn ignition switch ON.
3. Confirm output waveform between intake door motor harness connector and ground using oscilloscope.

+		–	Output waveform
Intake door motor			
Connector	Terminal		
M122	2	Ground	

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Is the inspection result normal?

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

4. CHECK INSTALLATION OF INTAKE DOOR MOTOR

Check intake door motor is properly installed. Refer to HAC-195, "Exploded View".

Is the inspection result normal?

YES >> Replace intake door motor. Refer to HAC-196, "INTAKE DOOR MOTOR : Removal and Installation".
NO >> Repair or replace malfunctioning part.

5. CHECK INTAKE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

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

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M122	1	M59	17	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

6. CHECK INTAKE DOOR MOTOR LIN SIGNAL CIRCUIT FOR OPEN

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

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M122	2	M59	16	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

B27B0 A/C AUTO AMP.

DTC Logic

INFOID:0000000006548594

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-141, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-142, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B27B0	A/C AUTO AMP.	A/C auto amp. EEPROM system is malfunctioning.	A/C auto amp.

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-161, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006548595

1.PERFORM SELF DIAGNOSTIC

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “HVAC” using CONSULT-III.
3. Touch “ERASE”.
4. Turn ignition switch OFF.
5. Turn ignition switch ON.
6. Perform “DTC CONFIRMATION PROCEDURE”. Refer to HAC-161, "DTC Logic".

Is DTC detected again?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> INSPECTION END

POWER SUPPLY AND GROUND CIRCUIT
A/C AUTO AMP.

A/C AUTO AMP. : Diagnosis Procedure

INFOID:0000000006546690

1.CHECK SYMPTOM

Check symptom (A or B).

	Symptom
A	• Air conditioning system does not activate. • Air conditioning system does cannot be controlled. • Operation status of air conditioning system is not indicated on display.
B	• Memory function does not operate normally. • The setting is not maintained. (It returns to the initial condition)

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 5.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 3, located in fuse block (J/B)].

NOTE:
Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK A/C AUTO AMP. IGNITION POWER SUPPLY

1. Disconnect A/C auto amp. connector.
2. Turn ignition switch ON.
3. Check voltage between A/C auto amp. harness connector and ground.

+		–	Voltage
A/C auto amp.			
Connector	Terminal		
M59	23	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector between A/C auto amp. and fuse.

4.CHECK A/C AUTO AMP. GROUND CIRCUIT FOR OPEN

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

A/C auto amp.		—	Continuity
Connector	Terminal		
M59	2	Ground	Existed
	22		

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

5.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No.7, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

6. CHECK A/C AUTO AMP. BATTERY POWER SUPPLY

1. Disconnect A/C auto amp. connector.
2. Check voltage between A/C auto amp. harness connector and ground.

+		–	Voltage
A/C auto amp.			
Connector	Terminal		
M59	3	Ground	11 – 14 V

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector between A/C auto amp. and fuse.

DOOR MOTOR

Diagnosis Procedure

INFOID:0000000006546704

NOTE:
If all of door motor DTCs are detected, check this circuit.

1.CHECK DOOR MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Intake door motor			
Connector	Terminal		
M122	1	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 7.

2.CHECK DOOR MOTOR GROUND CIRCUIT FOR OPEN

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

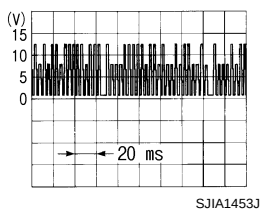
Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M122	3	M59	37	Existed

Is the inspection result normal?

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

3.CHECK DOOR MOTOR LIN SIGNAL

1. Connect A/C auto amp. and intake door motor connector.
2. Turn ignition switch ON.
3. Confirm output waveform between A/C auto amp. harness connector and ground using oscilloscope.

+		–	Output waveform
A/C auto amp.			
Connector	Terminal		
M59	16	Ground	

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Is the inspection result normal?

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

4.CHECK DOOR MOTOR LIN SIGNAL CIRCUIT FOR OPEN

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

A/C auto amp.		Intake door motor		Continuity
Connector	Terminal	Connector	Terminal	
M59	16	M122	2	Existed

Is the inspection result normal?

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

5. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-42, "Intermittent Incident".

>> INSPECTION END

6. CHECK DOOR MOTOR LIN SIGNAL CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect following connectors.
- A/C auto amp.
- Air mix door motor
- Mode door motor
- Intake door motor
3. Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M59	16	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

7. CHECK DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

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

Intake door motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M122	1	M59	17	Existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector.

8. CHECK DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Disconnect following connectors.
- Air mix door motor
- Mode door motor
2. Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M59	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

A/C ON SIGNAL

Component Function Check

INFOID:0000000006546705

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Operate blower motor.
3. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
4. Select “AIR COND SW” in “DATA MONITOR” mode.
5. Check A/C ON signal when the A/C switch is operated.

Monitor item	Condition		Status
AIR COND SW	A/C switch	ON (A/C indicator: ON)	On
		OFF (A/C indicator: OFF)	Off

Is the inspection result normal?

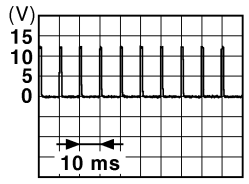
YES >> INSPECTION END
NO >> Refer to HAC-166, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006546706

1.CHECK A/C ON SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C auto amp. harness connector and ground with using oscilloscope.

+		–	Output waveform
A/C auto amp.			
Connector	Terminal		
M59	33	Ground	

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Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> GO TO 2.

2.CHECK A/C ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between A/C auto amp. harness connector and BCM harness connector.

A/C auto amp.		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M59	33	M65 (without Intelligent Key) M68 (with Intelligent Key)	27	Existed

Is the inspection result normal?

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

3. CHECK A/C ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M59	33	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

BLOWER FAN ON SIGNAL

Component Function Check

INFOID:0000000006546707

1.CHECK BLOWER FAN ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “FAN ON SIG” in “DATA MONITOR” mode.
4. Check blower fan ON signal when the fan switch is operated.

Monitor item	Condition		Status
FAN ON SIG	Fan switch	OFF position	Off
		Except OFF position	On

Is the inspection result normal?

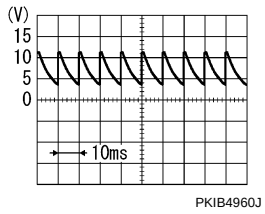
YES >> INSPECTION END
NO >> Refer to HAC-168, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006546708

1.CHECK BLOWER FAN ON SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C auto amp. harness connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C auto amp. and ground with using oscilloscope.

+		–	Output waveform
A/C auto amp.			
Connector	Terminal		
M59	38	Ground	

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Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> GO TO 2.

2.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity A/C auto amp. harness connector and BCM harness connector.

A/C auto amp.		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M59	38	M65 (without Intelligent Key) M68 (with Intelligent Key)	28	Existed

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C auto amp. harness connector and ground.

A/C auto amp.		—	Continuity
Connector	Terminal		
M59	38	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000006546709

1.CHECK SYMPTOM

Check symptom (A, B or C).

Symptom		
A	Blower motor does not operate.	
B	Blower motor operates at the maximum fan speed and fan speed cannot be selected.	Blower motor can be switched to OFF.
C		Blower motor cannot be switched to OFF.

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 11.
C >> GO TO 13.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check following fuses.

- 10A fuse [No. 15, located in fuse block (J/B)]
- 15A fuses [Nos. 14 and 16, located in the fuse block (J/B)]

NOTE:
Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK BLOWER MOTOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Blower motor			
Connector	Terminal		
M40	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Check blower relay. Refer to HAC-173, "Component Inspection (Blower Relay)".

Is the inspection result normal?

YES >> Repair harness or connector between blower motor and fuse.
NO >> Replace blower relay.

5.CHECK FAN CONTROL AMP. POWER SUPPLY (SOURCE) CIRCUIT

1. Turn ignition switch OFF.
2. Connect blower motor connector.
3. Disconnect fan control amp. connector.
4. Turn ignition switch ON.
5. Check voltage between fan control amp. harness connector and ground.

+		−	Voltage (Approx.)
Fan control amp.			
Connector	Terminal		
M121	1	Ground	Battery voltage

Is the inspection result normal?

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

6. CHECK FAN CONTROL AMP. POWER SUPPLY (SOURCE) CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect blower motor connector.
3. Check continuity between fan control amp. harness connector and blower motor harness connector.

Fan control amp.		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M121	1	M40	2	Existed

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
NO >> Repair harness or connector.

7. CHECK FAN CONTROL AMP. GROUND (DRAIN) CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between fan control amp. harness connector and ground.

Fan control amp.		—	Continuity
Connector	Terminal		
M121	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector.

8. CHECK FAN CONTROL AMP. CONTROL SIGNAL (GATE) CIRCUIT FOR OPEN

1. Disconnect A/C auto amp. connector.
2. Check continuity between fan control amp. harness connector and A/C auto amp. harness connector.

Fan control amp.		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M121	2	M59	14	Existed

Is the inspection result normal?

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

9. CHECK FAN CONTROL AMP. CONTROL SIGNAL (GATE) CIRCUIT FOR SHORT

Check continuity between fan control amp. harness connector and ground.

Fan control amp.		—	Continuity
Connector	Terminal		
M121	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.

10. CHECK FAN CONTROL AMP.

Check fan control amp. Refer to HAC-173, "Component Inspection (Fan Control Amp.)".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace fan control amp. Refer to HAC-194, "Removal and Installation".

11. CHECK A/C AUTO AMP. IGNITION POWER SUPPLY FEEDBACK SIGNAL

1. Turn ignition switch ON.
2. Check voltage between A/C auto amp. harness connector and ground.

+		–	Voltage (Approx.)
A/C auto amp.			
Connector	Terminal		
M59	13	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair harness or connector between A/C auto amp. and fuse.

12. CHECK BLOWER MOTOR FEEDBACK SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect blower motor connector and A/C auto amp. connector.
3. Check continuity between blower motor harness connector and A/C auto amp. harness connector.

Blower motor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M40	2	M59	34	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Repair harness or connector.

13. CHECK BLOWER MOTOR FEEDBACK SIGNAL CIRCUIT AND FAN CONTROL AMP. POWER SUPPLY (SOURCE) CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect following connectors.
- Blower fan motor
- Fan control amp.
- A/C auto amp.
3. Check continuity between blower motor harness connector and ground.

Blower motor		—	Continuity
Connector	Terminal		
M40	2	Ground	Not existed

Is the inspection result normal?

YES >> GO TO 14.
NO >> Repair harness or connector.

14. CHECK FAN CONTROL AMP. CONTROL SIGNAL (GATE) CIRCUIT FOR SHORT TO POWER SUPPLY

Check harness between fan control amp. harness connector and A/C auto amp. harness connector for short to power supply.

Fan control amp.		A/C auto amp.	
Connector	Terminal	Connector	Terminal
M121	2	M59	14

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair harness or connector.

Component Inspection (Blower Motor)

INFOID:0000000006546710

1.CHECK BLOWER MOTOR

1. Remove blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
2. Check that there is not any mixing foreign object in the blower motor.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

3.CHECK BLOWER MOTOR

Check that blower motor turns smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

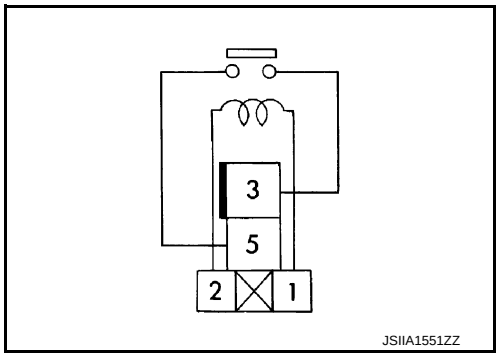
Component Inspection (Blower Relay)

INFOID:0000000006546711

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-22, "Fuse, Connector and Terminal Arrangement".
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed



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Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower relay.

Component Inspection (Fan Control Amp.)

INFOID:0000000006546712

1.CHECK FAN CONTROL AMP.

1. Remove fan control amp. Refer to HAC-194, "Removal and Installation".
2. Check continuity between fan control amp. terminals.

+	–	Continuity
Terminal	Terminal	
3	1	Existed
1	3	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace fan control amp. Refer to HAC-194, "Removal and Installation".

MAGNET CLUTCH

Component Function Check

INFOID:0000000006546713

1.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-12, "Diagnosis Description" (with Intelligent Key) or PCS-43, "Diagnosis Description" (without Intelligent Key).

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-175, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006546714

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 49, located in IPDM E/R).
   NOTE:
   Refer to PG-25, "Fuse, Connector and 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 MAGNET CLUTCH

1. Disconnect compressor connector.
2. Directly apply battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 3.
NO-1 >> HR16DE: Replace magnet clutch. Refer to HA-32, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".
NO-2 >> MR16DDT: Replace magnet clutch. Refer to HA-88, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".
NO-3 >> K9K: Replace magnet clutch.

3.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

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

IPDM E/R		Compressor		Continuity
Connector	Terminal	Connector	Terminal	
E14	64	F17 (with gasoline engine models)	1	Existed
		F61 (with diesel engine models)		

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

PTC HEATER

Component Function Check

INFOID:0000000006659836

1.CHECK PTC HEATER OPERATION

1. Start the engine.
2. Operate fan control dial.
3. Operate temperature control dial to full hot position.
4. Check for warm air at discharge air outlet.

NOTE:
- Engine must be cold.
- Battery must be charged.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-176, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006659837

1.CHECK FUSE AND FUSIBLE LINK

1. Turn ignition switch OFF.
2. Check 30A fuses (Nos. 32 and 36) and 40A fusible link (letter F).

NOTE:
Refer to PG-23, "Fuse and Fusible Link Arrangement".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown fuse or fusible link after repairing the affected circuit if a fuse or fusible link is blown.

2.CHECK PTC RELAY POWER SUPPLY

1. Disconnect PTC relay connector.
2. Turn ignition switch ON.
3. Check voltage between PTC relay harness connector and ground.

Relay	+		–	Voltage
	PTC relay			
	Connector	Terminal		
1	E83	2	Ground	Battery voltage
		3		
2	E84	2		
		3		
3	E85	2		
		3		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between PTC relay and fuse or fusible link.

3.CHECK PTC RELAY CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect A/C auto amp. connector.
2. Check continuity between PTC relay harness connector and A/C auto amp. harness connector.

PTC relay			A/C auto amp.		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E83	1	M59	19	Existed
2	E84			39	
3	E85			20	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK PTC HEATER POWER SUPPLY CIRCUIT FOR OPEN

Check continuity between PTC relay harness connector and PTC heater harness connector.

PTC relay			PTC heater		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E83	5	E116	1	Existed
2	E84			3	
3	E85			5	

Is the inspection result normal?

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

5.CHECK PTC HEATER GROUND CIRCUIT FOR OPEN

Check continuity between PTC heater harness connector and ground.

PTC heater		—	Continuity
Connector	Terminal		
E117	2	Ground	Existed
	4		

Is the inspection result normal?

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

6.CHECK PTC RELAY

Check PTC relay. Refer to HAC-177, "Component Inspection (PTC Relay)".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace malfunctioning PTC relay.

7.CHECK PTC HEATER

Check PTC heater. Refer to HAC-178, "Component Inspection (PTC Heater)".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".
NO >> Replace PTC heater.

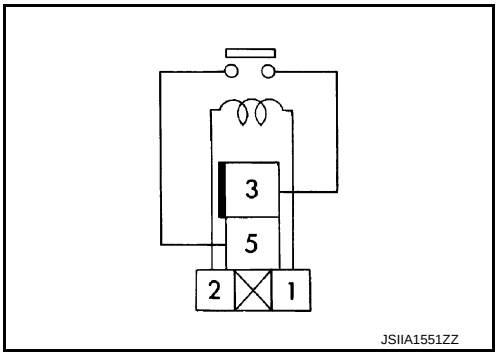
Component Inspection (PTC Relay)

INFOID:0000000006659838

1.CHECK PTC RELAY

1. Remove PTC relay.

2. Check continuity between PTC relay terminals 3 and 5 when the voltage is supplied between terminals 1 and 2.



Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace malfunctioning PTC relay.

Component Inspection (PTC Heater)

INFOID:0000000006659839

1.CHECK PTC HEATER

Check resistance between PTC heater terminals.

Terminal		Resistance (Ω)
1	2	Except 0 or ∞
3	2 and 4	
5	4	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace PTC heater.

SYMPTOM DIAGNOSIS

AUTOMATIC AIR CONDITIONER SYSTEM

Symptom Table

INFOID:0000000006546715

NOTE:
Perform self-diagnoses with CONSULT-III before performing the symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

Symptom		Corresponding malfunction part	Check item/Reference
• Air conditioning system does not activate. • Air conditioning system cannot be controlled. • Operation status of air conditioning system is not indicated on display.	Fail-safe activates	Multi display unit	AV-124, "Symptom Table"
	Fail-safe does not activates	• A/C auto amp. ignition power supply and ground circuit • A/C auto amp.	HAC-162, "A/C AUTO AMP. : Diagnosis Procedure"
Discharge air temperature does not change.		Air mix door motor system installation condition	Check air mix door motor system is properly installed. Refer to HAC-195, "Exploded View".
Air outlet does not change.		Mode door motor system installation condition	Check mode door motor system is properly installed. Refer to HAC-195, "Exploded View".
Air inlet does not change.		Intake door motor system installation condition	Check intake door motor system is properly installed. Refer to HAC-195, "Exploded View".
Blower motor does not operate.		• Blower motor power supply circuit. • A/C auto amp. ignition power supply feedback signal circuit • Fan control amp. power supply (source) circuit • Fan control amp. ground (drain) circuit • Fan control amp. control signal (gate) circuit • Blower motor • Fan control amp. • A/C auto amp.	HAC-170, "Diagnosis Procedure"
Blower motor operates at the maximum fan speed and fan speed cannot be selected.	Blower motor can be switched to OFF.	• A/C auto amp. ignition power supply feedback signal circuit • Blower motor feedback signal circuit • A/C auto amp.	
	Blower motor cannot be switched to OFF.	• Blower motor feedback signal circuit • A/C auto amp. ignition power supply circuit • Fan control amp. power supply (source) circuit • Fan control amp. control signal (gate) circuit • Fan control amp. • A/C auto amp.	

Symptom		Corresponding malfunction part	Check item/Reference
Compressor does not operate.		• Magnet clutch • The circuit between magnet clutch and IPDM E/R • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • CAN communication line • A/C ON signal circuit • Blower fan ON signal circuit • A/C auto amp.	HAC-175, "Diagnosis Procedure"
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)		• Magnet clutch control system • Drive belt slipping • Cooler cycle • Air leakage from each duct • A/C auto amp. connection recognition signal circuit • Temperature setting trimmer	HAC-181, "Diagnosis Procedure"
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)		• Engine cooling system • Heater hose • Heater core • Air leakage from each duct • Temperature setting trimmer • Power supply system of PTC heater* • The circuit between A/C auto amp. and blower motor* • PTC heater* • A/C auto amp.*	HAC-183, "Diagnosis Procedure"
Noise is heard when the A/C system operates.	During compressor operation	Cooler cycle	• HR16DE: HA-30, "Symptom Table" • MR16DDT: HA-30, "Symptom Table"
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	HAC-173, "Component Inspection (Blower Motor)"
• Memory function dose not operate normally. • The setting is not maintained. (It returns to initial condition)		• A/C auto amp. battery power supply circuit • A/C auto amp.	HAC-162, "A/C AUTO AMP. : Diagnosis Procedure"

*: With K9K engine models

INSUFFICIENT COOLING

Description

INFOID:0000000006546716

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006546717

NOTE:
Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

1.CHECK MAGNET CLUTCH OPERATION

1. Turn ignition switch ON.
2. Operate fan control dial.
3. Press A/C switch.
4. Check that A/C indicator turns ON. Check visually and by sound that compressor operates.
5. Press A/C switch again.
6. Check that A/C indicator turns OFF. Check that compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform diagnosis of “COMPRESSOR DOSE NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-185, "Diagnosis Procedure".

2.CHECK DRIVE BELT

Check tension of drive belt. Refer to the following.
- HR16DE: Refer to EM-154, "Checking".
- MR16DDT: Refer to EM-20, "Checking".
- K9K: Refer to EM-276, "Checking Drive Belts".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

3.CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling recharging equipment to the vehicle and perform pressure inspection with gauge. Refer to the following.
- HR16DE: Refer to HA-28, "Symptom Table".
- MR16DDT: Refer to HA-83, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioning system for leakage.

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace parts depending on the inspection results.

5.CHECK AMBIENT TEMPERATURE DISPLAY

Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Perform diagnosis for the A/C auto amp. connection recognition signal circuit. Refer to MWI-62, "Diagnosis Procedure".

6. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

1. Check setting value of temperature setting trimmer. Refer to HAC-139, "Temperature Setting Trimmer".
2. Check that temperature setting trimmer is set to “+ direction”.
   NOTE:
   The control temperature can be set with the setting of the temperature setting trimmer.
3. Set difference between the set temperature and control temperature to “0”.

Is inspection result normal?

YES >> INSPECTION END
NO >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".

INSUFFICIENT HEATING

Description

INFOID:0000000006546718

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006546719

NOTE:
Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to the following.
- HR16DE: Refer to CO-37, "Inspection".
- MR16DDT: Refer to CO-11, "Inspection".
- K9K: Refer to CO-62, "Inspection".
2. Check radiator cap (HR16DE and MR16DDT) or reservoir tank cap (K9K). Refer to the following.
- HR16DE: Refer to CO-40, "RADIATOR CAP : Inspection".
- MR16DDT: Refer to CO-15, "RADIATOR CAP : Inspection".
- K9K: Refer to CO-65, "Inspection".
3. Check water flow sounds of the engine coolant. Refer to the following.
- HR16DE: Refer to CO-38, "Refilling".
- MR16DDT: Refer to CO-12, "Refilling".
- K9K: Refer to CO-63, "Refilling".

Is the inspection result normal?

YES-1 >> HR16DE and MR16DDT: GO TO 3.
YES-2 >> K9K: GO TO 2.
NO >> Refill engine coolant and repair or replace the parts depending on the inspection results.

2.CHECK PTC HEATER OPERATION

Check PTC heater operation. Refer to HAC-294, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

3.CHECK HEATER HOSE

Check installation of heater hose by visually or touching.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4.CHECK HEATER CORE

1. Check temperature of inlet hose and outlet hose of heater core.
2. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.

CAUTION:
Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.

Is the inspection result normal?

YES >> GO TO 5.
NO-1 >> HR16DE: Replace heater core. Refer to HA-56, "HEATER CORE : Removal and Installation".
NO-2 >> MR16DDT: Replace heater core. Refer to HA-116, "HEATER CORE : Removal and Installation".
NO-3 >> K9K: Replace heater core.

5.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioning system for air leakage.

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace parts depending on the inspection results.

6. CHECK SETTING OF TEMPERATURE SETTING TRIMMER

1. Check setting value of temperature setting trimmer. Refer to HAC-139, "Temperature Setting Trimmer".
2. Check that temperature setting trimmer is set to “– direction”.
   NOTE:
   The control temperature can be set by the temperature setting trimmer.
3. Set difference between the set temperature and control temperature to “0”.

Are the symptoms solved?

YES >> INSPECTION END
NO >> Replace A/C auto amp. Refer to HAC-188, "Removal and Installation".

COMPRESSOR DOSE DOT OPERATE

Description

INFOID:0000000006546720

SYMPTOM

Compressor dose not operate.

Diagnosis Procedure

INFOID:0000000006546721

NOTE:

- Perform self-diagnoses with CONSULT-III before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis.
- Check that refrigerant is enclosed in cooler cycle normally. If refrigerant amount is shortage from proper amount, perform the inspection of refrigerant leakage.

1. CHECK MAGNET CLUTCH OPERATION

Check magnet clutch. Refer to HAC-175, "Component Function Check".

Does it operate normally?

YES >> GO TO 2.
NO >> Repair or replace malfunctioning parts.

2. CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to the following.

- HR16DE: Refer to EC-790, "Component Function Check".
- MR16DDT: Refer to EC-423, "Component Function Check".
- K9K: Refer to EC-960, "DTC Logic".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3. CHECK A/C ON SIGNAL

Check A/C ON signal. Refer to HAC-166, "Component Function Check".

Is inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4. CHECK BLOWER FAN ON SIGNAL

Check blower fan ON signal. Refer to HAC-168, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Repair or replace malfunctioning parts

5. CHECK BCM OUTPUT SIGNAL

With CONSULT-III

1. Select “DATA MONITOR” mode of “ECM” using CONSULT-III.
2. Select “AIR COND SIG” and “HEATER FAN SW”, and check status under the following conditions.

Monitor item	Condition		Status
AIR COND SIG	A/C switch	OFF (A/C indicator: OFF)	Off
		ON (A/C indicator: ON)	On
HEATER FAN SW	Blower motor	OFF	Off
		ON	On

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).

NO >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

REMOVAL AND INSTALLATION

CONTROLLER

Removal and Installation

INFOID:0000000006695890

REMOVAL

Remove multi display unit. Refer to IP-13, "Removal and Installation".

INSTALLATION

Install in the reverse order of removal.

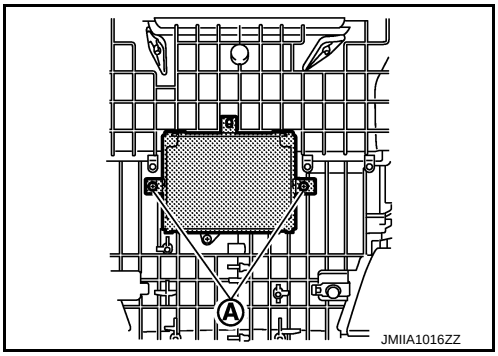
A/C AUTO AMP.

Removal and Installation

INFOID:0000000006695891

REMOVAL

1. Remove audio unit. Refer to AV-38, "Removal and Installation".
2. Remove inside key antenna (instrument center). Refer to DLK-188, "INSTRUMENT CENTER : Removal and Installation".
3. Remove fixing screws (A), and then remove A/C auto amp.



INSTALLATION

Install in the reverse order of removal.

AMBIENT SENSOR

Removal and Installation

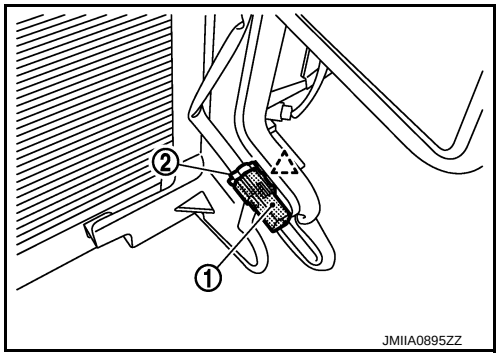
INFOID:0000000006695892

REMOVAL

1. Remove bumper fascia assembly. Refer to EXT-13, "Removal and Installation".
2. Disengage fixing pawl, and then remove ambient sensor (1) from air guide RH.

: Pawl

3. Disconnect ambient sensor connector (2), and then remove ambient sensor.



INSTALLATION

Install in the reverse order of removal.

IN-VEHICLE SENSOR

Removal and Installation

INFOID:0000000006695893

REMOVAL

1. Remove instrument lower panel (LH/RH). Refer to IP-13, "Removal and Installation".
2. Remove fixing screw, and then remove in-vehicle sensor from instrument lower panel (LH/RH).

INSTALLATION

Install in the reverse order of removal.

SUNLOAD SENSOR

Removal and Installation

INFOID:0000000006695894

REMOVAL

1. Remove switch panel. Refer to IP-13, "Removal and Installation".
2. Disconnect sunload sensor connector, and then remove sunload sensor.

INSTALLATION

Install in the reverse order of removal.

INTAKE SENSOR

Exploded View

INFOID:0000000006695895

Refer to HA-43, "Exploded View (Automatic Air Conditioning)". (HR16DE)
Refer to HA-97, "Exploded View (Automatic Air Conditioning)". (MR16DDT)

Removal and Installation

INFOID:0000000006695896

REMOVAL

1. Remove evaporator.
   - Refer to HA-55, "EVAPORATOR : Removal and Installation". (HR16DE)
   - Refer to HA-115, "EVAPORATOR : Removal and Installation". (MR16DDT)
2. Remove intake sensor from evaporator.

INSTALLATION

Note the following items, and then install in the order of removal.

CAUTION:

- **Replace O-rings with new ones. Then apply the compressor oil to them when installing.**
- **Mark the mounting position of intake sensor bracket prior to removal so that the reinstalled sensor can be located in the same position.**
- **Never rotate the bracket insertion part when removing and installing the intake sensor.**
- **Check for leakages when recharging refrigerant. Refer to HA-19, "Leak Test". (HR16DE) or HA-74, "Leak Test". (MR16DDT)**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000006695897

Refer to HA-39, "Exploded View". (HR16DE)
Refer to HA-94, "Exploded View". (MR16DDT)

Removal and Installation

INFOID:0000000006695898

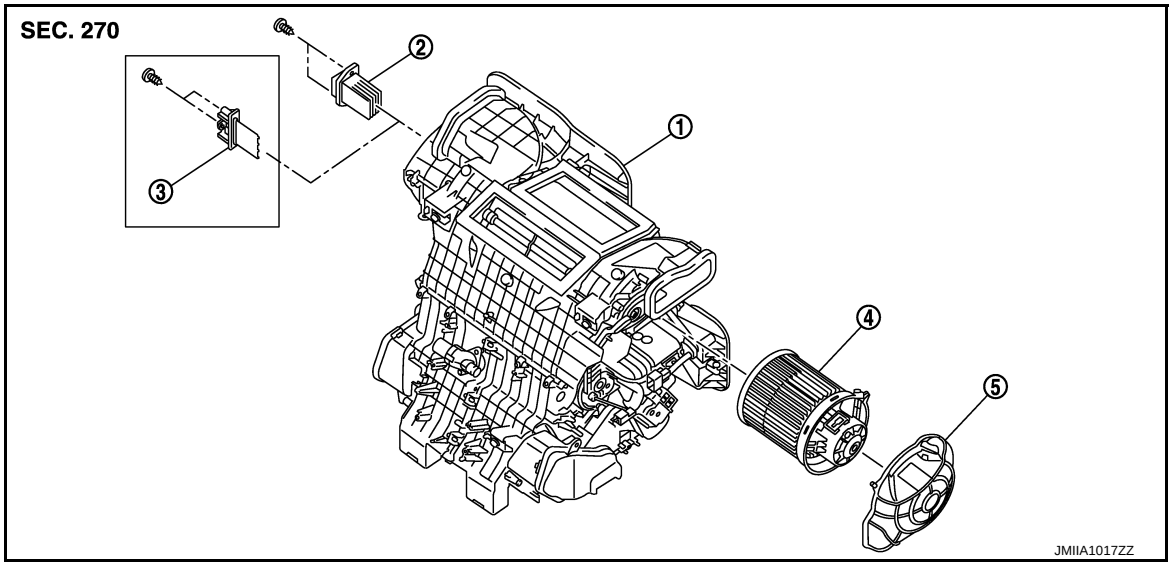
REMOVAL
Refer to HA-42, "REFRIGERANT PRESSURE SENSOR : Removal and Installation". (HR16DE)
Refer to HA-96, "REFRIGERANT PRESSURE SENSOR : Removal and Installation". (MR16DDT)

INSTALLATION
Install in the reverse order of removal.

FAN CONTROL AMPLIFIER

Exploded View

INFOID:0000000006695899



1. A/C unit assembly
2. Fan control amp.*1
3. Blower fan resistor*2
4. Blower motor
5. Blower motor cover

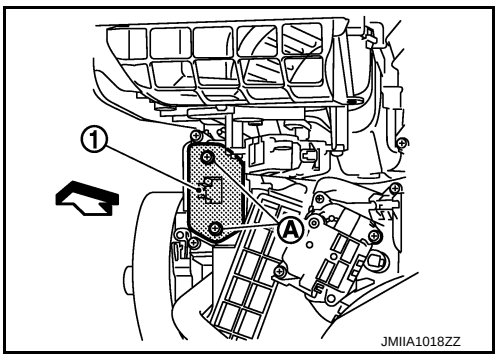
- *1: Automatic air conditioner
- *2: Manual air conditioner

Removal and Installation

INFOID:0000000006695900

REMOVAL

1. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect fan control amp. connector.
4. Remove fixing screws (A), and then remove fan control amp. (1).



INSTALLATION

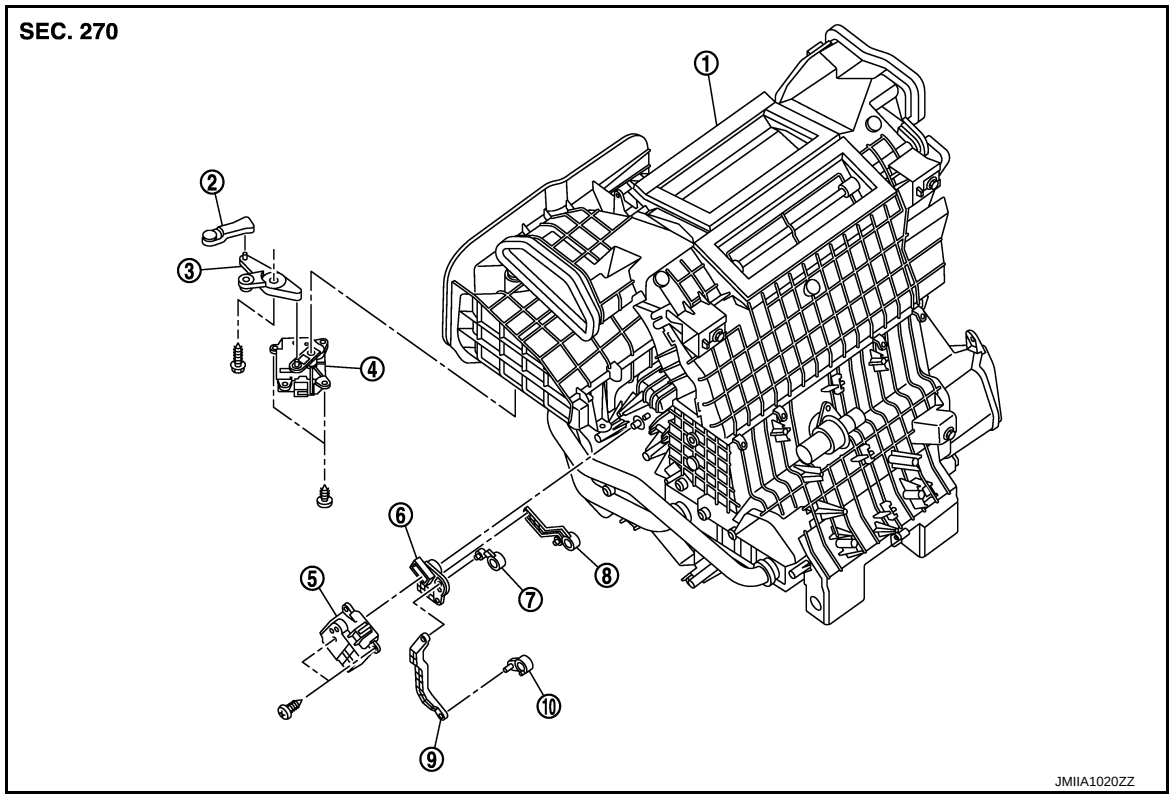
Install in the reverse order of removal.

DOOR MOTOR

Exploded View

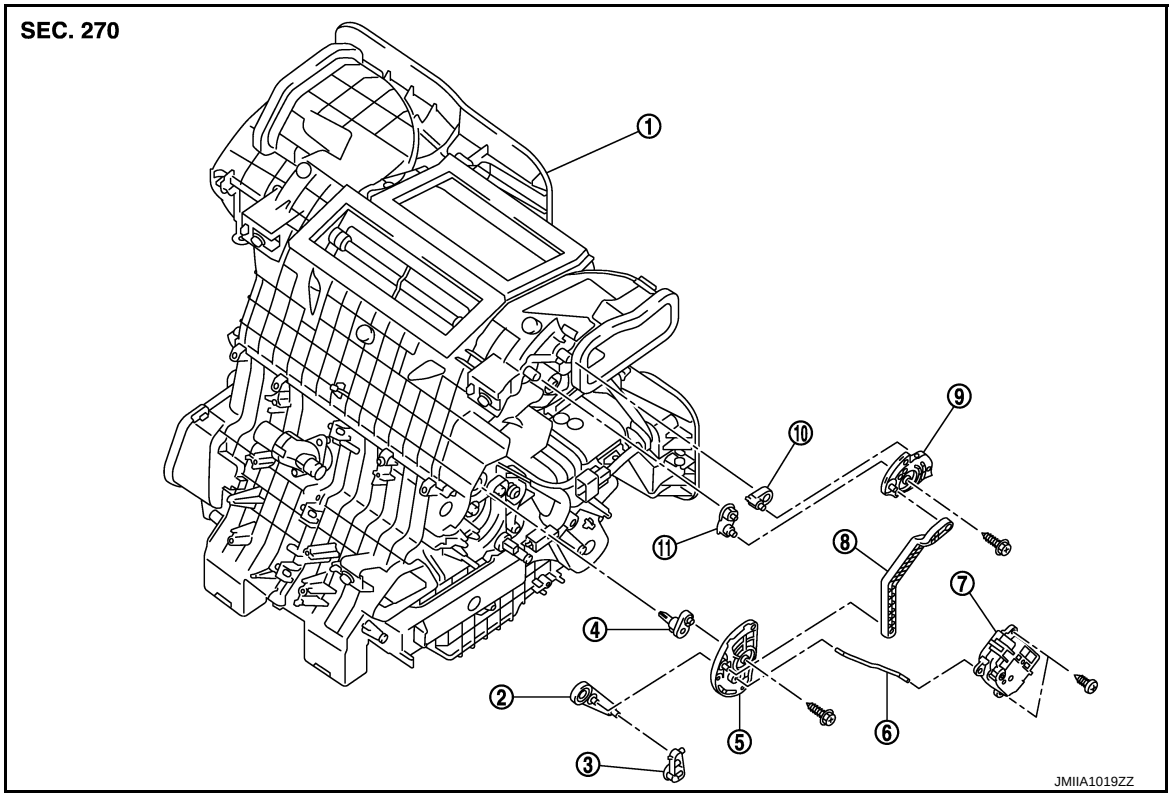
INFOID:0000000006695901

LEFT SIDE



1. A/C unit assembly
2. Intake door lever
3. Intake door link
4. Intake door motor
5. Air mix door motor
6. Air mix door link
7. Max. cool door
8. Upper air mix door lever
9. Air mix door rod
10. Lower air mix door lever

RIGHT SIDE



1. A/C unit assembly
2. Foot door link
3. Foot door lever
4. Side ventilator door lever
5. Mode door main link
6. Mode door link rod
7. Mode door motor
8. Mode door main link adapter rod
9. Mode door main link adapter
10. Defroster door lever
11. Center ventilator door lever

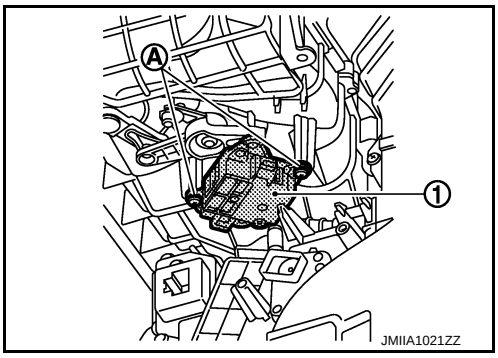
INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000006695902

REMOVAL

1. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect intake door motor connector.
4. Remove fixing screws (A), and then remove intake door motor (1) from A/C unit assembly.



INSTALLATION

Install in the reverse order of removal.

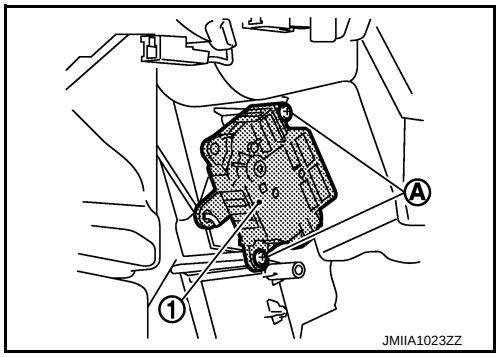
MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:0000000006695903

REMOVAL

1. Remove glove box assembly Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove instrument lower panel RH. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect mode door motor connector.
4. Disconnect mode door link rod from mode door motor (1).
5. Remove fixing screws (A), and then remove mode door motor from A/C unit assembly.



INSTALLATION

Install in the reverse order of removal.

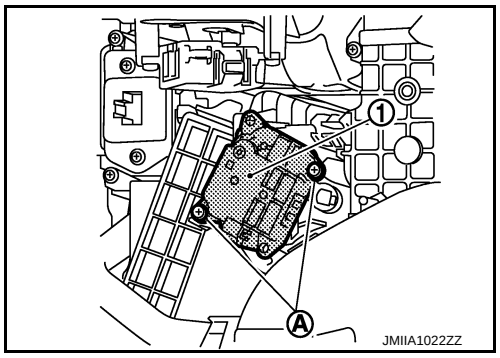
AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000006695904

REMOVAL

1. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect air mix door motor harness connector.
4. Remove fixing screws (A), and then remove air mix door motor (1) from A/C unit assembly.



INSTALLATION

Install in the reverse order of removal.

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006626856

Check the vehicle type to use the service information in this section.

Destination	Service information
Automatic air conditioning (4WD models)	“TYPE 1”
Automatic air conditioning (2WD models)	“TYPE 2”
Manual air conditioning (4WD models)	“TYPE 3”
Manual air conditioning (2WD models)	“TYPE 4”
Manual heater	“TYPE 5”

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006626861

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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

WARNING:

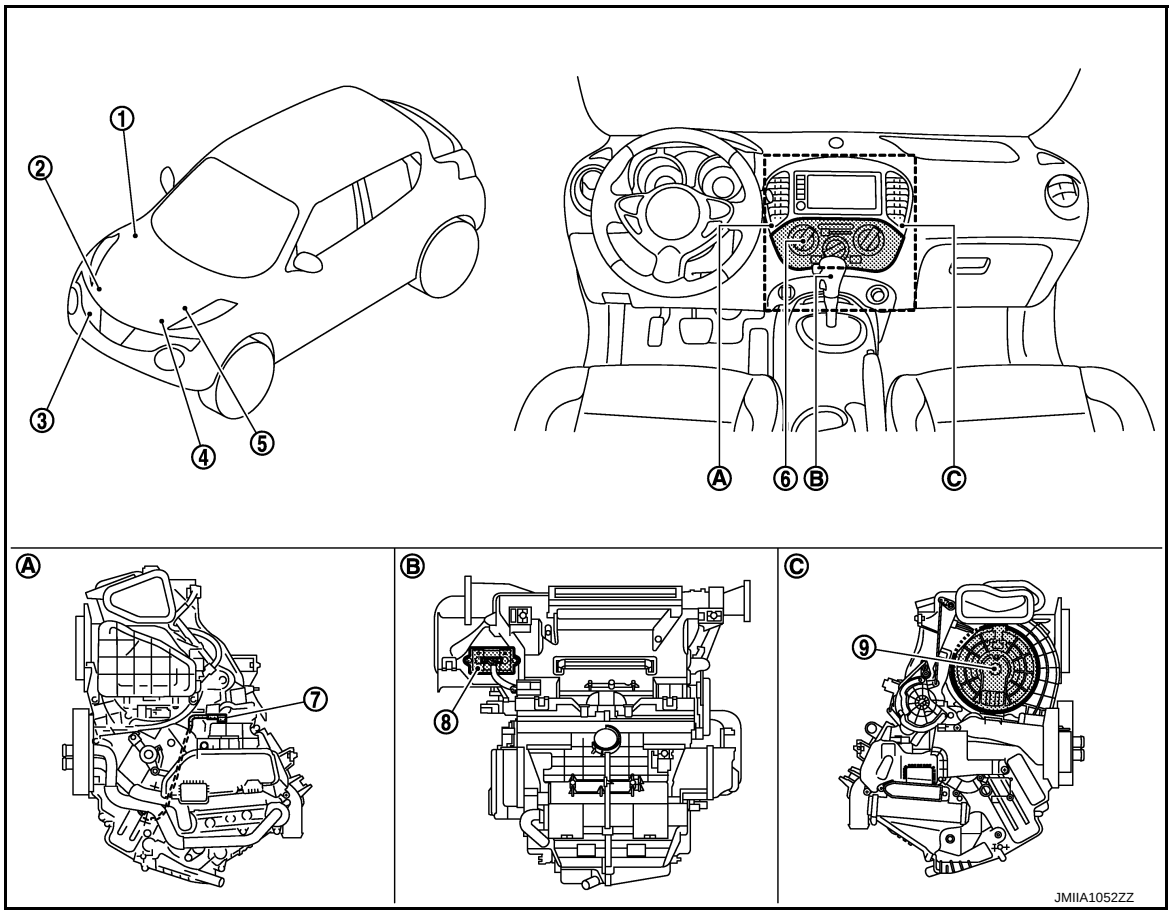
- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious 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.**

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Part Location

INFOID:0000000006547913



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-96, "BODY CONTROL SYSTEM : Component Parts Location".
2. Magnet clutch
3. Refrigerant pressure sensor
4. ECM
   Refer to EC-25, "ENGINE CONTROL SYSTEM : Component Parts Location".
5. IPDM E/R
   - With Intelligent Key: Refer to PCS-5, "Component Parts Location".
   - Without Intelligent Key: Refer to PCS-37, "Component Parts Location".
6. A/C control
7. Thermo control amp.
8. Blower fan resistor
9. Blower motor

A. Left side of A/C unit assembly
B. Back side of A/C unit assembly
C. Right side of A/C unit assembly

Component Description

INFOID:0000000006547914

Component		Description
A/C unit assembly	Thermo control amp.	HAC-201
	Blower motor	HAC-201
	Blower fan resistor	HAC-202
A/C control		HAC-202
BCM		HAC-202
ECM		HAC-202
IPDM E/R		HAC-202
Refrigerant pressure sensor		HAC-202
Magnet clutch		HAC-202

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Thermo Control Amp.

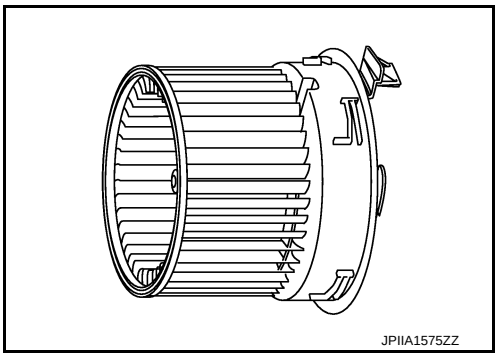
INFOID:0000000006547915

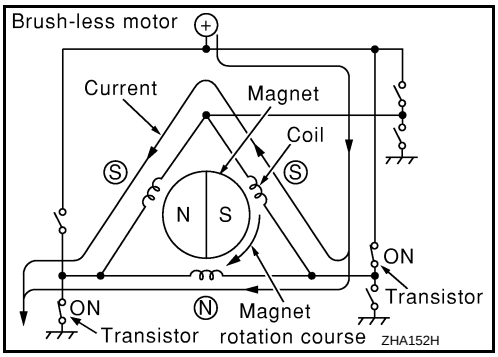
- Thermo control amp. is composed of thermistor and amplifier. Thermistor is installed on evaporator, and amplifier is attached to foot duct.
- When the thermistor detecting temperature of the evaporator fin is extremely low, thermo control amp. sends the thermo control amp. OFF signal to BCM, and stops the compressor.

A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000006547916

- 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.

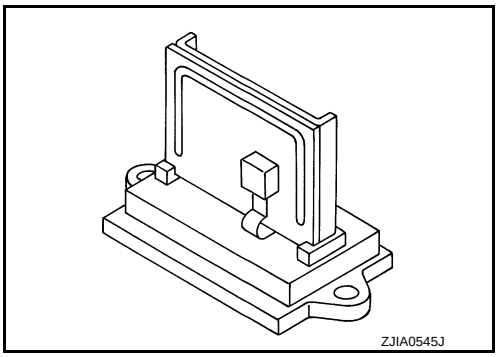




A/C UNIT ASSEMBLY : Blower Fan Resistor

INFOID:0000000006547917

- Compact and lightweight resistor is adopted with outstanding ventilation.
- Temperature fuse is installed to protects the blower motor circuit.



A/C Control

INFOID:0000000006547918

Controls the air conditioning function.

BCM

INFOID:0000000006547919

BCM transmits A/C ON signal and blower fan ON signal to ECM via CAN communication, according to A/C switch signal and blower fan ON signal that are received from A/C control and thermo control amp. signal that is received from thermo control amp. and A/C indicator is turned ON.

ECM

INFOID:0000000006547920

ECM, when receiving A/C ON signal and blower fan ON signal from BCM, transmits A/C compressor request signal to IPDM E/R via CAN communication according to status of the engine and refrigerant pressure.

IPDM E/R

INFOID:0000000006547921

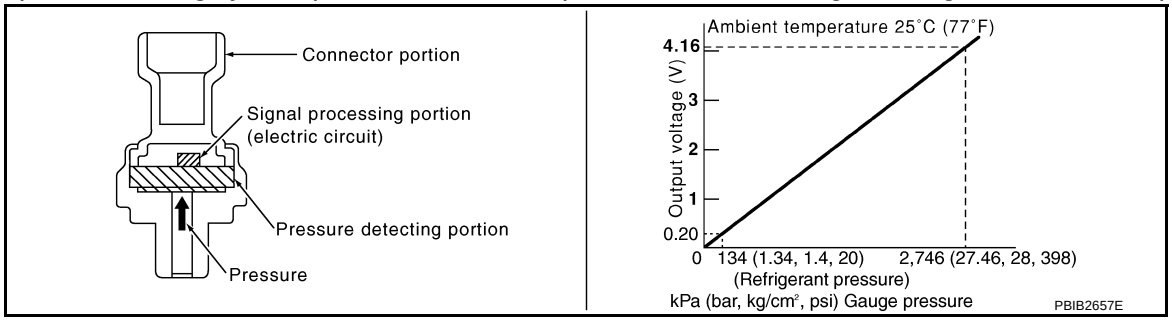
A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line.

Refrigerant Pressure Sensor

INFOID:0000000006547922

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection ares and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

Magnet Clutch

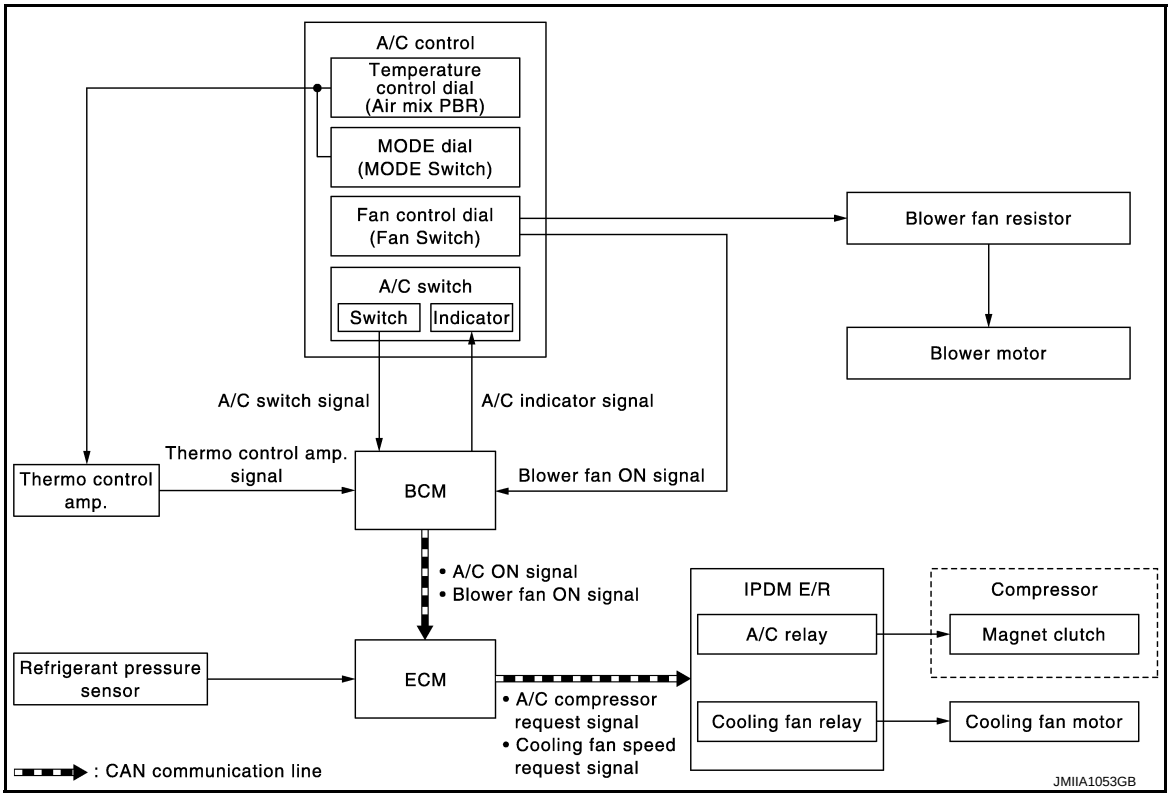
INFOID:0000000006547923

Compressor is driven by the magnet clutch which is magnetized by electric power supply.

SYSTEM

System Diagram

INFOID:0000000006547924



System Description

INFOID:0000000006547925

DESCRIPTION

- Manual air conditioning system is controlled by each function of thermo control amp., BCM, ECM and IPDM E/R.
- Fan speed of blower motor is changed by the combination of fan control dial operation and blower fan resistor control.

CONTROL BY THERMO CONTROL AMP.

HAC-203, "Compressor Control"

CONTROL BY BCM

HAC-203, "Compressor Control"

CONTROL BY ECM

- HAC-203, "Compressor Control"
- Cooling fan control: Refer to EC-61, "COOLING FAN CONTROL : System Description".

CONTROL BY IPDM E/R

- HAC-203, "Compressor Control"
- Cooling fan control
  - With Intelligent Key system: Refer to PCS-9, "POWER CONTROL SYSTEM : System Description".
  - Without Intelligent Key system: Refer to PCS-41, "POWER CONTROL SYSTEM : System Description".

Compressor Control

INFOID:0000000006547926

DESCRIPTION

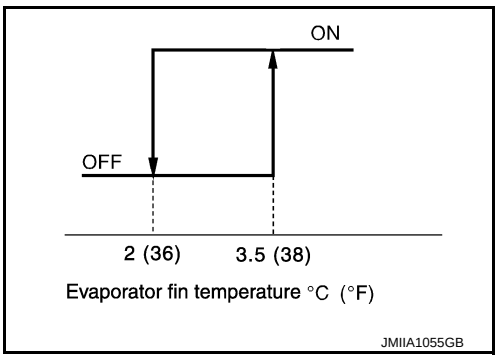
- BCM transmits the A/C ON signal and blower fan ON signal to ECM via CAN communication line only when the compressor operational condition is satisfied, and A/C indicator is turned ON.
  Refer to BCS-13, "SIGNAL BUFFER SYSTEM : System Description" (with Intelligent Key system) or BCS-103, "SIGNAL BUFFER SYSTEM : System Description" (without Intelligent Key system).

NOTE:
Compressor operational condition
- A/C switch signal: ON
- Blower fan ON signal: ON
- Thermo control amp. signal: ON

- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor request signal to IPDM E/R via CAN communication line.
- By receiving the A/C compressor request signal from ECM, IPDM E/R turns the A/C relay to ON, and activates the compressor.
  Refer to PCS-6, "RELAY CONTROL SYSTEM : System Description" (with Intelligent Key system) or PCS-38, "RELAY CONTROL SYSTEM : System Description" (without Intelligent Key system).

CONTROL BY THERMO CONTROL AMP.

Low Temperature Protection Control
- When the thermo control amp. detects that evaporator fin temperature is 2°C (36°F) or less, thermo control amp. signal becomes OFF, and stops the compressor.
- When the air temperature returns to 3.5°C (38°F) or more, the compressor is activated.



CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction
The high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn A/C relay OFF and stop the compressor.
- 3.12 MPa (31.82 kg/cm^2, 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm^2, 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm^2, 20.3 psi) or less

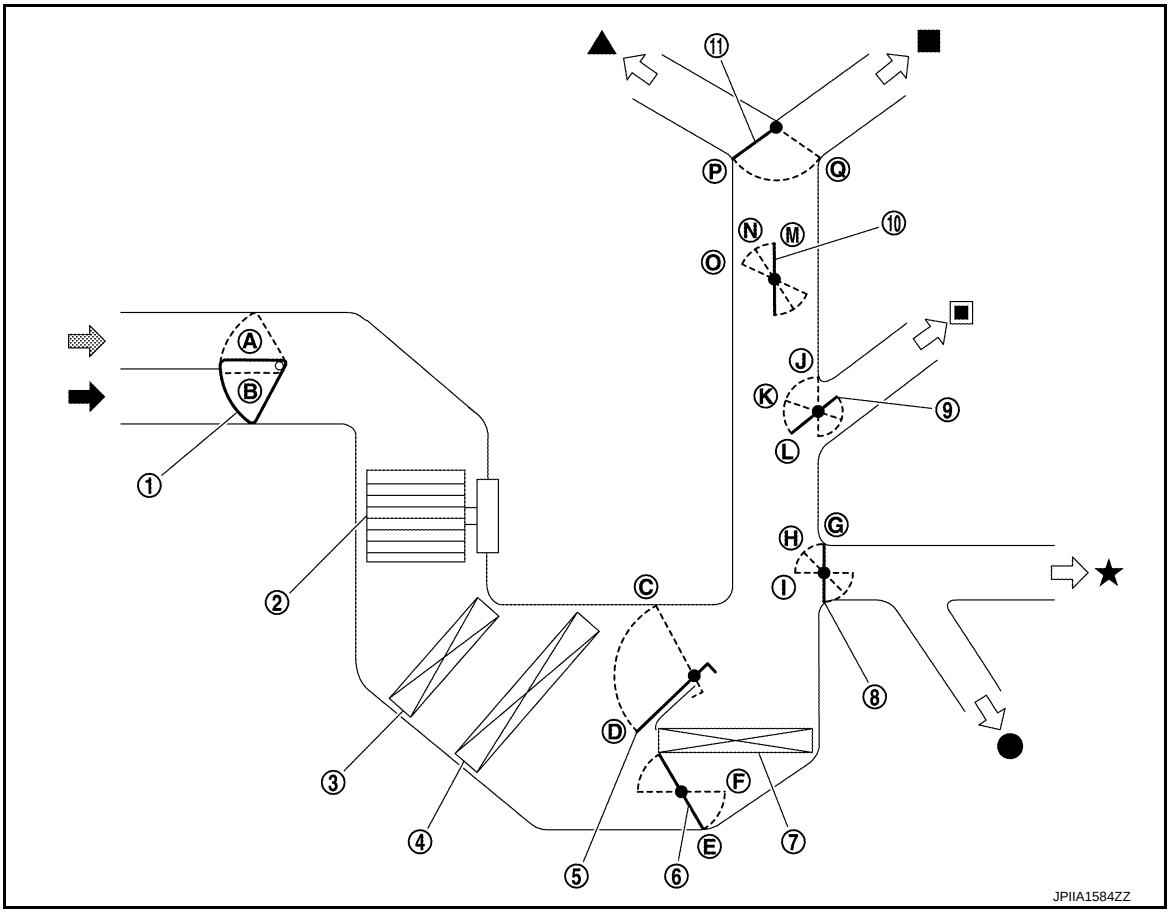
Compressor Oil Circulation Control
When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor oil once.

Air Conditioning Cut Control
When the engine condition is high load, ECM makes the A/C relay to OFF, and stops the compressor.
Refer to EC-60, "AIR CONDITIONING CUT CONTROL : System Description".

Door Control

INFOID:0000000006547927

SWITCHES AND THEIR CONTROL FUNCTIONS



1. Intake door
2. Blower motor
3. Air conditioner filter
4. Evaporator
5. Upper air mix door
6. Lower air mix door
7. Heater core
8. Foot door
9. Side ventilator door
10. Sub defroster door
11. Center ventilator and defroster door

Fresh air intake
Recirculation air
Defroster
Center ventilator
Side ventilator
Foot
Rear foot*

*: With rear foot duct

Switch/dial position		Door position						
		Center ventilator and defroster door	Sub defroster door	Side ventilator door	Foot door	Intake door	Upper air mix door	Lower air mix door
MODE dial		P	M	L	G	—	—	—
			N	K	H			
		Q	O	J	I			
			N					
			M		G			
Intake lever		—	—	—	—	A		
						B		
Temperature control dial	Full cold					—	D	E
	Full hot						C	F

AIR DISTRIBUTION

Without rear foot duct

MODE dial position	Discharge air flow			
	Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	52.6%	47.3%	—	—
	34.0%	27.7%	38.4%	—
	—	19.1%	57.9%	23.0%
	—	13.5%	42.4%	44.1%
	—	16.3%	—	83.8%

With rear foot duct

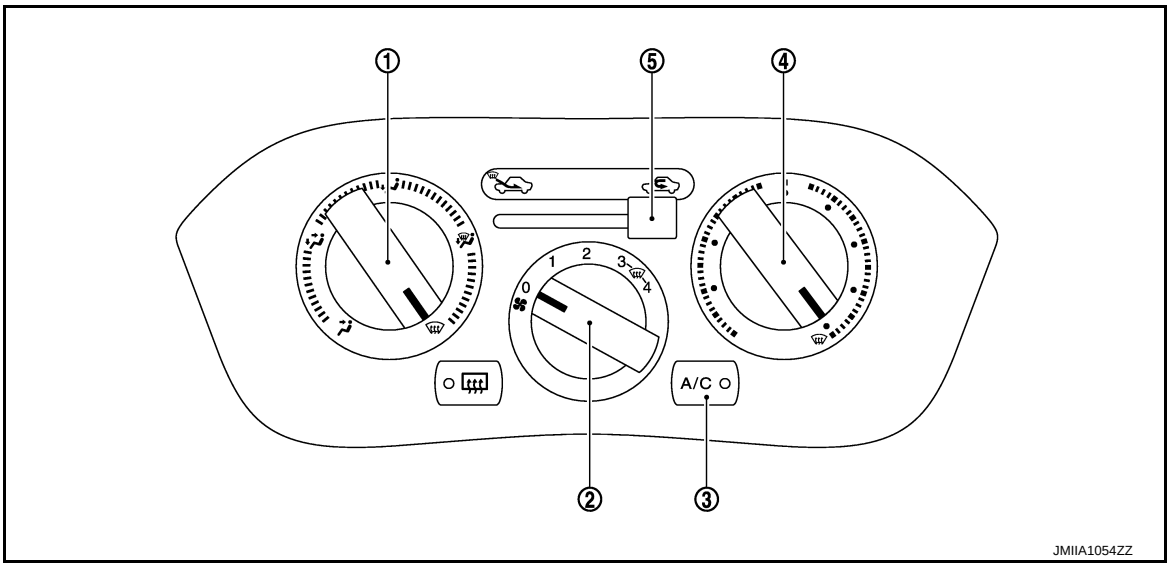
MODE dial position	Discharge air flow				
	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	52.6%	47.3%	—	—	—
	28.2%	25.9%	29.6%	16.3%	—
	—	16.3%	43.0%	21.0%	19.7%
	—	12.2%	33.1%	16.3%	38.4%
	—	16.3%	—	—	83.8%

OPERATION

Switch Name and Function

INFOID:0000000006547928

A/C CONTROLLER (A/C CONTROL)



1. MODE dial
2. Fan control dial
3. A/C switch
4. Temperature control dial
5. Intake lever

MODE dial	Mode position is selected to an optimal position by operating this dial.
Fan control dial	Fan speed can be adjusted within a range from 1st to 4th.
A/C switch	The compressor control (switch indicator) is turned ON ⇔ OFF each time by pressing this switch while the blower motor is activated.
Temperature control dial	The setting temperature can be selected to an optimum temperature by operating this dial. • Clockwise rotation: Discharge air flow temperature increases • Counterclockwise rotation: Discharge air flow temperature decreases.
Intake lever	The air inlet changes REC ⇔ FRE each time by operation this lever.

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)

Description

INFOID:0000000006705741

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
		Active Test
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706387

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
• Automatic A/C • Manual A/C	AIR CONDITONER		×	×*2

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
• Intelligent Key system • Engine start system	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
NVIS - NATS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Theft warning alarm	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

- *1: This item is displayed, but not used.
- *2: For models with automatic A/C, this diagnosis mode is not used.

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT-III.

CONSULT screen item	Indication/Unit	Description
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected

CONSULT screen item	Indication/Unit	Description	
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected	While turning BCM status from low power consumption mode to normal mode (Power supply position is “LOCK”)
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is “OFF”.)
	LOCK>ACC		While turning power supply position from “LOCK” to “ACC”
	ACC>ON		While turning power supply position from “ACC” to “IGN”
	RUN>ACC		While turning power supply position from “RUN” to “ACC” (Vehicle is stopping and selector lever is except P position.)
	CRANK>RUN		While turning power supply position from “CRANKING” to “RUN” (From cranking up the engine to run it)
	RUN>URGENT		While turning power supply position from “RUN“ to “ACC” (Emergency stop operation)
	ACC>OFF		While turning power supply position from “ACC” to “OFF”
	OFF>LOCK		While turning power supply position from “OFF” to “LOCK”
	OFF>ACC		While turning power supply position from “OFF” to “ACC”
	ON>CRANK		While turning power supply position from “IGN” to “CRANKING”
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is “OFF”.) to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is “LOCK”.) to low power consumption mode
	LOCK		Power supply position is “LOCK” (Ignition switch OFF with steering is locked.)
	OFF		Power supply position is “OFF” (Ignition switch OFF with steering is unlocked.)
	ACC		Power supply position is “ACC” (Ignition switch ACC)
	ON		Power supply position is “IGN” (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is “RUN” (Ignition switch ON with engine running)
	CRANKING		Power supply position is “CRANKING” (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Manual A/C 4WD Models)

INFOID:0000000006547930

DATA MONITOR

Display item list

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays blower motor status as judged from blower fan ON signal.
AIR COND SW	[On/Off]	Displays A/C switch status as judged from A/C switch signal.
THERMO AMP	[On/Off]	Displays thermo control amp. status as judged from thermo control amp. signal.
IGN SW	[On/Off]	Displays ignition switch position status as judged form ignition switch signal.

ACTIVE TEST

Test item	Operation	Description
A/C INDICATOR	On	A/C indicator is turned ON.
	Off	A/C indicator is turned OFF.

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

Description

INFOID:0000000006706007

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
		Active Test
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706388

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
• Automatic A/C • Manual A/C • Manual heater	AIR CONDITONER		×	×*2
Combination switch	COMB SW		×	
Body control system	BCM	×		
NATS	IMMU	×		×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	PANIC ALARM*1			×

• *1: This item is displayed, but is not used.
• *2: For models with automatic A/C, this mode is not used.

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Manual A/C 4WD Models)

INFOID:0000000006547932

DATA MONITOR

Display item list

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays blower motor status as judged from blower fan ON signal.
AIR COND SW	[On/Off]	Displays A/C switch status as judged from A/C switch signal.
THERMO AMP	[On/Off]	Displays thermo control amp. status as judged from thermo control amp. signal.
IGN SW	[On/Off]	Displays ignition switch position status as judged form ignition switch signal.

ACTIVE TEST

Test item	Operation	Description
A/C INDICATOR	On	A/C indicator is turned ON.
	Off	A/C indicator is turned OFF.

ECU DIAGNOSIS INFORMATION

BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000006547933

ECU		Reference
BCM	With Intelligent Key system	BCS-41, "Reference Value"
		BCS-64, "Fail-safe"
		BCS-66, "DTC Inspection Priority Chart"
		BCS-67, "DTC Index"
	Without Intelligent Key system	BCS-125, "Reference Value"
		BCS-140, "Fail-safe"
		BCS-140, "DTC Inspection Priority Chart"
		BCS-141, "DTC Index"
ECM		EC-90, "Reference Value"
		EC-104, "Fail Safe"
		EC-106, "DTC Inspection Priority Chart"
		EC-108, "DTC Index"
IPDM E/R	With Intelligent Key system	PCS-17, "Reference Value"
		PCS-24, "Fail-Safe"
		PCS-25, "DTC Index"
	Without Intelligent Key system	PCS-48, "Reference Value"
		PCS-54, "Fail-Safe"
		PCS-55, "DTC Index"

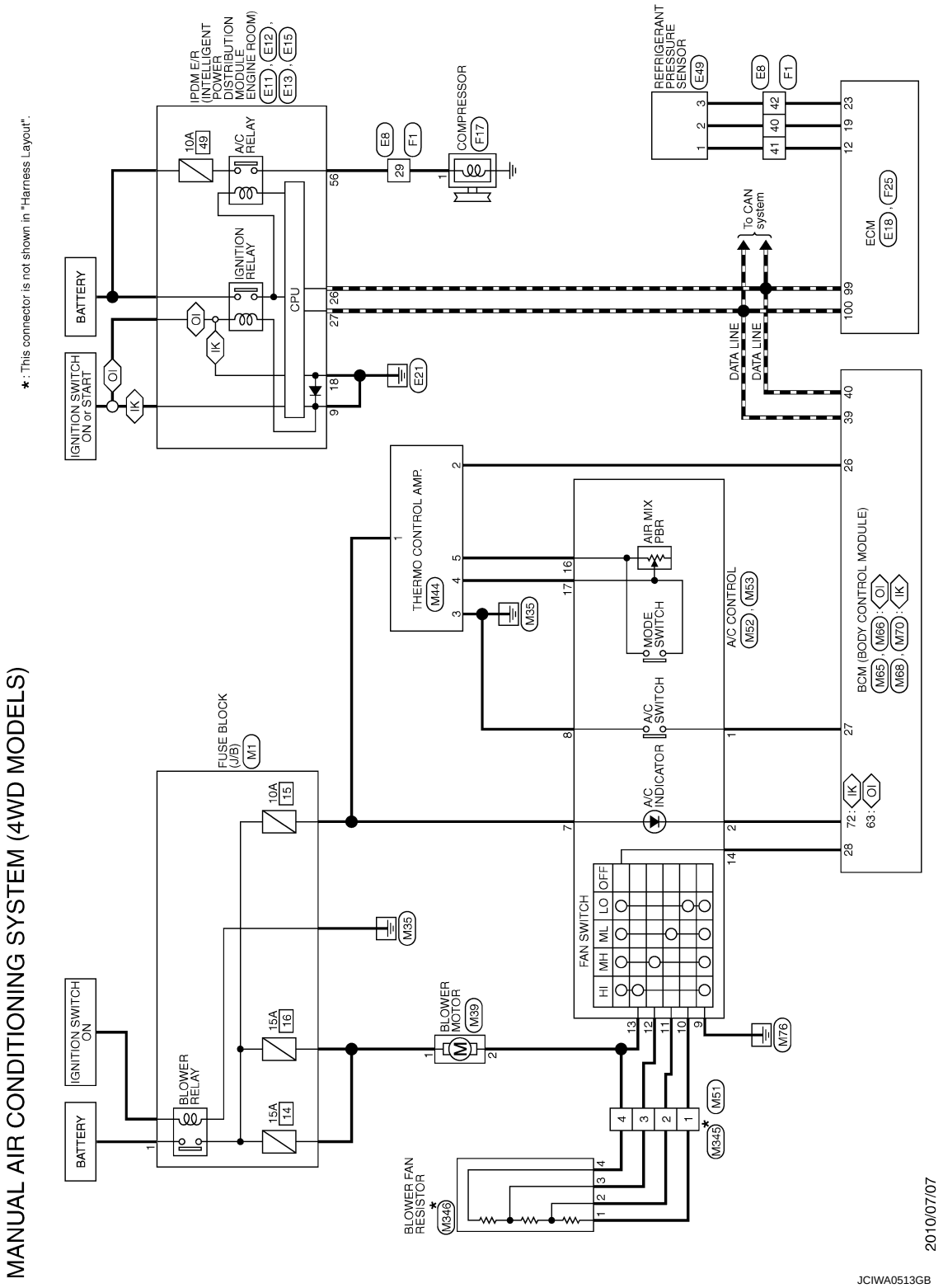
WIRING DIAGRAM

MANUAL AIR CONDITIONING SYSTEM

Wiring Diagram

INFOID:0000000006547934

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information/Explanation of Option Abbreviation".



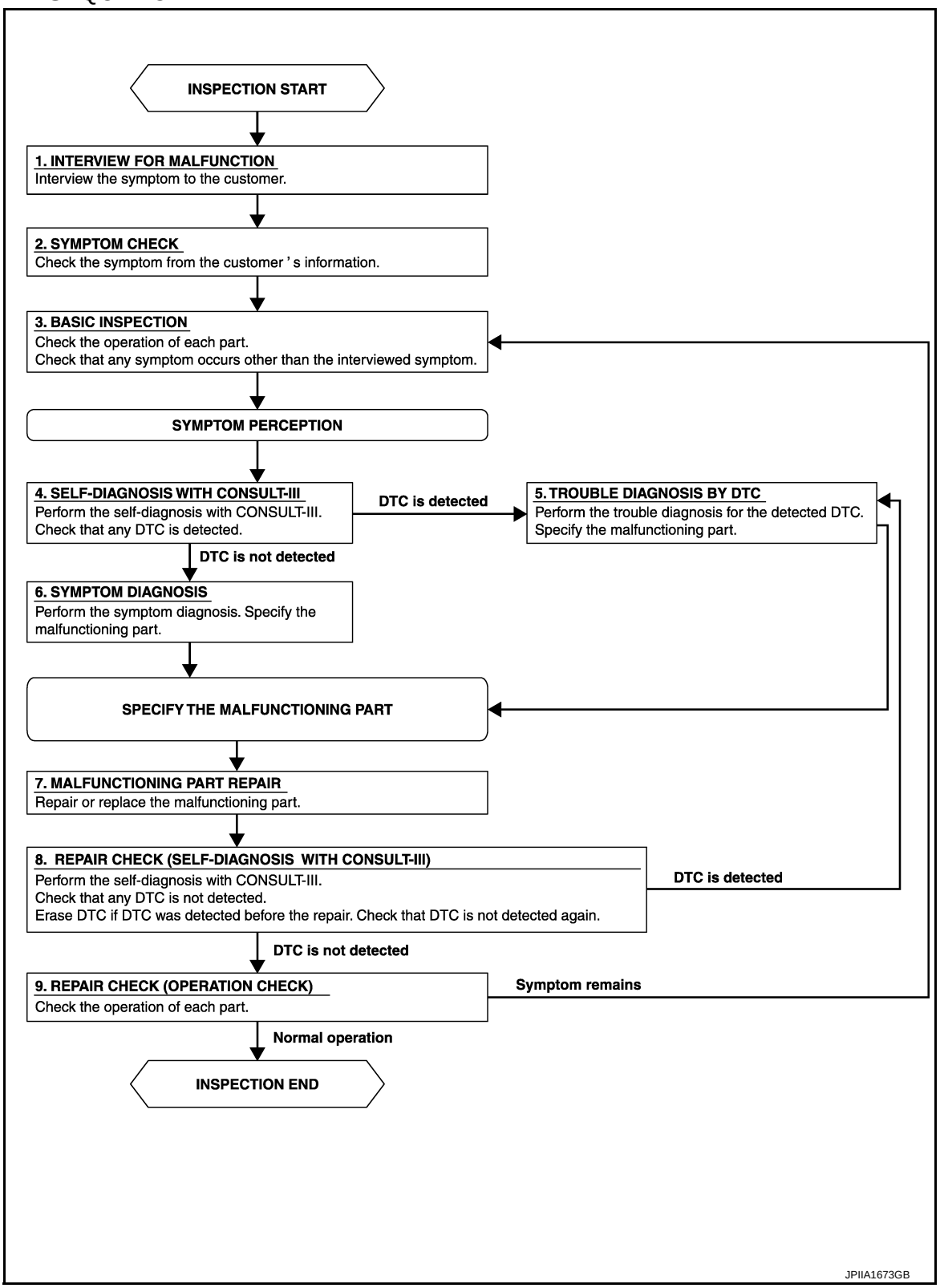
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006547935

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 6.

6.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnoses with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any or malfunction result or DTC detected?

YES >> If DTC is detected, GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

OPERATION INSPECTION

Work Procedure

INFOID:0000000006547936

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

Check condition : Engine running at normal operating temperature.

1.CHECK BLOWER MOTOR

1. Operate fan control dial.
2. Check that fan speed changes. Check operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 8.

2.CHECK DISCHARGE AIR

1. Operate fan control dial to set the fan speed to maximum speed.
2. Operate MODE dial to each position.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the air outlets. Refer to VTL-5, "System Description".

Is the inspection result normal?

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

3.CHECK INTAKE AIR

1. Operate intake lever to each position.
2. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 8.

4.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 5.
NO >> GO TO 8.

5.CHECK DISCHARGE AIR TEMPERATURE

1. Operate temperature control dial.
2. Check that discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 8.

6.CHECK TEMPERATURE DECREASE

1. Operate compressor.
2. Turn temperature control dial to full cold position.
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 8.

7.CHECK TEMPERATURE INCREASE

1. Turn temperature control dial to full hot position.

2. Check that warm air blows from air outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 8.

8. CHECK SELF-DIAGNOSIS WITH CONSULT-III

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

Is any DTC detected?

YES >> Perform trouble diagnosis for the detected DTC.
NO >> Refer to HAC-233, "Symptom Table" and perform the appropriate diagnosis.

DTC/CIRCUIT DIAGNOSIS

A/C SWITCH

Component Function Check

INFOID:0000000006547937

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “AIR COND SW” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
AIR COND SW	A/C switch	While pushing	On
		While not pushing	Off

Is the inspection result normal?

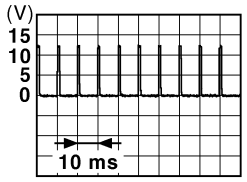
YES >> INSPECTION END
NO >> Refer to HAC-220, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006547938

1.CHECK A/C SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect A/C control connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C control harness connector and ground with using oscilloscope.

+		–	Output waveform
A/C control			
Connector	Terminal		
M53	1	Ground	 JPMIA0012GB

Is the inspection result normal?

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

2.CHECK A/C SWITCH GROUND CIRCUIT FOR OPEN

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

A/C control		—	Continuity
Connector	Terminal		
M53	8	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-239, "Removal and Installation".
NO >> Repair harness or connector.

3.CHECK A/C SWITCH POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	1	M65 (without Intelligent Key) M68 (with Intelligent Key)	27	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK A/C SWITCH POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between A/C control harness connector and ground.

A/C control		—	Continuity
Connector	Terminal		
M53	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

BLOWER FAN ON SIGNAL

Component Function Check

INFOID:0000000006547940

1.CHECK BLOWER FAN ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “FAN ON SIG” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
FAN ON SIG	Fan control dial	Except OFF position	On
		OFF position	Off

Is the inspection result normal?

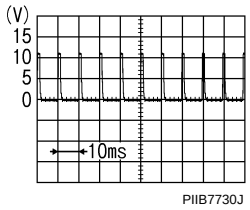
YES >> INSPECTION END
NO >> Refer to HAC-222, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006547941

1.CHECK FAN SWITCH POWER SUPPLY SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C control harness connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C control and ground with using oscilloscope.

+		–	Output waveform
A/C control			
Connector	Terminal		
M53	14	Ground	

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Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-239, "Removal and Installation".
NO >> GO TO 2.

2.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	14	M65 (without Intelligent Key) M68 (with Intelligent Key)	28	Existed

Is the inspection result normal?

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

3.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C control harness connector and ground.

A/C control		—	Continuity
Connector	Terminal		
M53	14	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

THERMO CONTROL AMPLIFIER

Component Function Check

INFOID:0000000006660870

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “THERMO AMP” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
THERMO AMP	Ignition switch	ON	On
		OFF	Off

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-224, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660871

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 15, located in fuse block (J/B)].

NOTE:
Refer to PG-22, "Fuse, Connector and 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 THERMO CONTROL AMP. POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect thermo control amp. connector.
3. Turn ignition switch ON.
4. Check voltage between thermo control amp. harness connector and ground.

+		–	Voltage
Thermo control amp.			
Connector	Terminal		
M44	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between thermo control amp. and fuse.

3.CHECK THERMO CONTROL AMP. GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between thermo control amp. harness connector and ground.

Thermo control amp.		—	Continuity
Connector	Terminal		
M44	3	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK THERMO CONTROL AMP. SIGNAL

1. Turn ignition switch ON.
2. Check voltage between thermo control amp. harness connector and ground.

+		–	Voltage (Approx.)
Thermo control amp.			
Connector	Terminal		
M44	2	Ground	12 V

Is the inspection result normal?

YES >> Replace thermo control amp. Refer to HAC-240, "Removal and Installation".
NO >> GO TO 5.

5. CHECK THERMO CONTROL AMP. SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between thermo control amp. harness connector and BCM harness connector.

Thermo control amp.		A/C control		Continuity
Connector	Terminal	Connector	Terminal	
M44	2	M65 (with Intelligent Key) M68 (without Intelligent Key)	26	Existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

A/C INDICATOR

Diagnosis Procedure

INFOID:0000000006547942

1.CHECK SYMPTOM

Check symptom.

A/C indicator dose not turn ON>>GO TO 2.
A/C indicator dose not turn OFF>>GO TO 6.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 15, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK A/C INDICATOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between A/C control harness connector and ground.

+		–	Voltage
A/C control			
Connector	Terminal		
M53	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector between A/C control and fuse.

4.CHECK A/C INDICATOR CIRCUIT

Check voltage between A/C control harness connector and ground.

+		–	Voltage (Approx.)
A/C control			
Connector	Terminal		
M53	2	Ground	12 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace A/C control. Refer to HAC-239, "Removal and Installation".

5.CHECK A/C INDICATOR CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C control connector and BCM connector.
3. Check continuity between A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	2	M66 (without Intelligent Key)	63	Existed
		M69 (with Intelligent Key)	72	Existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

6. CHECK A/C INDICATOR CIRCUIT FOR SHORT

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

A/C control		—	Continuity
Connector	Terminal		
M53	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000006547943

1.CHECK SYMPTOM

Check symptom (A or B).

	Symptom
A	Blower motor does not operate at any dial position
B	Blower motor does not operate at any dial position other than 4, or operation speed is not normal.

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 7.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 15A fuses (Nos. 14 and 16, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK BLOWER MOTOR POWER SUPPLY

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

+		–	Voltage
Blower motor			
Connector	Terminal		
M39	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Check blower relay. Refer to HAC-230, "Component Inspection (Blower Relay)".

Is the inspection result normal?

YES >> Repair harness or connector between blower motor and fuse.
NO >> Replace blower relay.

5.CHECK FAN SWITCH GROUND CIRCUIT FOR OPEN

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

A/C control		—	Continuity
Connector	Terminal		
M53	9	Ground	Existed

Is the inspection result normal?

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

6.CHECK FAN SWITCH 4 POSITION CIRCUIT FOR OPEN

Check continuity between A/C control harness connector and blower motor harness connector.

A/C control		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M53	13	M39	2	Existed

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair the harness or connector.

7.CHECK BLOWER FAN RESISTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect blower fan resistor connector.
3. Turn ignition switch ON.
4. Check voltage between blower fan resistor harness connector and ground.

+		–	Voltage
Blower fan resistor			
Connector	Terminal		
M346	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector between blower fan resistor and blower motor.

8.CHECK BLOWER FAN RESISTOR

1. Turn the ignition switch OFF.
2. Check blower fan resistor. Refer to HAC-230, "Component Inspection (Blower Fan Resistor)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace blower fan resistor. Refer to HAC-242, "Removal and Installation".

9.CHECK FAN SWITCH 1, 2, 3 POSITION CIRCUIT FOR OPEN

Check continuity between A/C control harness connector and blower fan resistor.

A/C control		Blower fan resistor		Continuity
Connector	Terminal	Connector	Terminal	
M53	10	M346	1	Existed
	11		2	
	12		3	

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair harness or connector.

10.CHECK FAN SWITCH

Check fan switch. Refer to HAC-231, "Component Inspection (Fan Switch)".

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
NO >> Replace A/C control. Refer to HAC-239, "Removal and Installation".

Component Inspection (Blower Motor)

INFOID:0000000006547944

1.CHECK BLOWER MOTOR

1. Remove blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
2. Check that there is not any mixing foreign object in the blower motor.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

3.CHECK BLOWER MOTOR

Check that blower motor turns smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

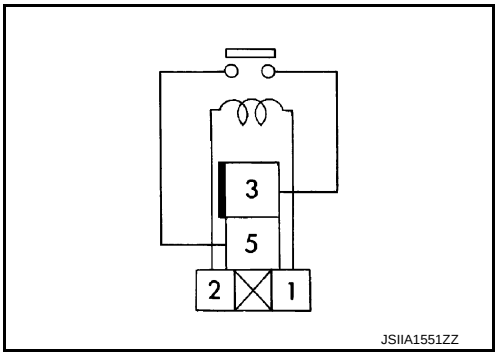
Component Inspection (Blower Relay)

INFOID:0000000006547945

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-22, "Fuse, Connector and Terminal Arrangement".
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed



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Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower relay.

Component Inspection (Blower Fan Resistor)

INFOID:0000000006547946

1.CHECK BLOWER FAN RESISTOR

1. Disconnect blower fan resistor connector.
2. Check resistance between blower fan resistor terminals. Refer to applicable table for the normal value.

Terminal		Resistance: Ω (Approx.)
4	3	0.43
	2	1.03
	1	3

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower fan resistor. Refer to HAC-242, "Removal and Installation".

Component Inspection (Fan Switch)

INFOID:0000000006547947

1. CHECK FAN SWITCH

Check continuity between A/C control terminals.

Terminal		Condition	Continuity
		Fan control dial position	
9	10	1st	Existed
	11	2nd	
	12	3rd	
	13	4th	

Is the inspection result normal?

YES >> INSPECTION END

NO >> Replace A/C control. Refer to HAC-239, "Removal and Installation".

MAGNET CLUTCH

Component Function Check

INFOID:0000000006547948

1.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-12, "Diagnosis Description" (with Intelligent Key) or PCS-43, "Diagnosis Description" (without Intelligent Key).

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-232, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006547949

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 49, located in IPDM E/R).
   NOTE:
   Refer to PG-25, "Fuse, Connector and 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 MAGNET CLUTCH

1. Disconnect compressor connector.
2. Directly apply battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 3.
NO >> Replace magnet clutch. Refer to HA-88, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".

3.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

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

IPDM E/R		Compressor		Continuity
Connector	Terminal	Connector	Terminal	
E15	56	F17	1	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

SYMPTOM DIAGNOSIS

MANUAL AIR CONDITIONING SYSTEM

Symptom Table

INFOID:0000000006547950

NOTE:
Perform self-diagnosis with CONSULT-III before performing the symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

Symptom		Corresponding malfunction part	Check item/Reference
• Blower motor does not operate at any dial position. • Blower motor does not operate at any dial position other than 4, or operation speed is not normal.		• Blower motor • Blower motor power supply circuit • The circuit between blower motor and fan switch • The circuit between blower motor and blower fan resistor • The circuit between blower fan resistor and fan switch (A/C control) • Blower fan resistor • Fan switch (A/C control)	HAC-228, "Diagnosis Procedure"
• A/C indicator dose not turn ON. (Compressor operates) • A/C indicator dose not turn OFF. (Compressor stops)		• A/C indicator (A/C control) power supply circuit • The circuit between A/C indicator (A/C control) and BCM • A/C indicator (A/C control) • BCM	HAC-226, "Diagnosis Procedure"
Compressor does not operate. (Blower motor operates)		• Magnet clutch • The circuit between magnet clutch and IPDM E/R • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • A/C ON signal circuit • Blower fan ON signal circuit • CAN communication line • A/C control • Thermo control amp. • BCM	HAC-237, "Diagnosis Procedure"
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)		• Magnet clutch control system • Drive belt slipping • Cooler cycle • Air leakage from each duct	HAC-235, "Diagnosis Procedure"
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)		• Engine cooling system • Heater hose • Heater core • Air leakage from each duct	HAC-236, "Diagnosis Procedure"
Noise is heard when the A/C system operates.	During compressor operation	Cooler cycle	HA-85, "Symptom Table"
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	HAC-230, "Component Inspection (Blower Motor)"
Discharge air temperature dose not change.		• A/C control • Air mix door cable • Air mix door	Check the air mix door installation and door operation

Symptom	Corresponding malfunction part	Check item/Reference
Air outlet dose not change.	• A/C control • Mode door cable • Mode door	Check the mode door installation and door operation
Air inlet dose not change.	• A/C control • Intake door cable • Intake door	Check the intake door installation and door operation

INSUFFICIENT COOLING

Description

INFOID:0000000006547951

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006547952

NOTE:
Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1. CHECK MAGNET CLUTCH OPERATION

1. Turn ignition switch ON.
2. Turn fan control dial ON.
3. Press A/C switch.
4. Check that A/C indicator turns ON. Check visually and by sound that compressor operates.
5. Press A/C switch again.
6. Check that A/C indicator turns OFF. Check that compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the diagnosis of “COMPRESSOR DOSE NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-237, "Diagnosis Procedure".

2. CHECK DRIVE BELT

Check tension of the drive belt. Refer to EM-20, "Checking".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

3. CHECK REFRIGERANT CYCLE PRESSURE

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection with the gauge. Refer to HA-83, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4. CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioner system for leakage.

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.
NO >> Repair or replace parts depending on the inspection results.

INSUFFICIENT HEATING

Description

INFOID:0000000006547953

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006547954

NOTE:
Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to CO-11, "Inspection".
2. Check radiator cap. Refer to CO-15, "RADIATOR CAP : Inspection".
3. Check water flow sounds of the engine coolant. Refer to CO-12, "Refilling".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill engine coolant and repair or replace parts depending on the inspection results.

2.CHECK HEATER HOSE

Check installation of heater hose by visually or touching.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

3.CHECK HEATER CORE

1. Check temperature of inlet hose and outlet hose of heater core.
2. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.
   CAUTION:
   Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace heater core. Refer to HA-116, "HEATER CORE : Removal and Installation".

4.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of air conditioning system for air leakage.

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.
NO >> Repair or replace parts depending on the inspection results.

COMPRESSOR DOSE DOT OPERATE

Description

INFOID:0000000006547955

SYMPTOM

Compressor dose not operate.

Diagnosis Procedure

INFOID:0000000006547956

NOTE:

- Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.
- Check that refrigerant is enclosed in cooler cycle normally. If the refrigerant amount is shortage from proper amount, perform the inspection of refrigerant leakage

1.CHECK A/C INDICATOR

1. Turn ignition switch ON.
2. Operate blower motor.
3. Check that A/C indicator is turned ON/OFF when operating A/C switch.

Is the inspection result normal?

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

2.CHECK MAGNET CLUTCH OPERATION

Check magnet clutch. Refer to HAC-232, "Component Function Check".

Does it operate normally?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to EC-423, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK BCM OUTPUT SIGNAL

With CONSULT-III

1. Select “DATA MONITOR” mode of “ECM” using CONSULT-III.
2. Select “AIR COND SIG” and “HEATER FAN SW”, and check status under the following conditions.

Monitor item	Condition		Status
AIR COND SIG	A/C switch	OFF (A/C indicator: OFF)	Off
		ON (A/C indicator: ON)	On
HEATER FAN SW	Blower motor	OFF	Off
		ON	On

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

5.CHECK A/C SWITCH

Check A/C switch. Refer to HAC-220, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace the malfunctioning parts.

6.CHECK BLOWER FAN ON SIGNAL

Check blower fan ON signal. Refer to HAC-222, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace the malfunctioning parts

7.CHECK THERMO CONTROL AMP.

Check thermo control amp. Refer to HAC-224, "Component Function Check".

Is the inspection result normal?

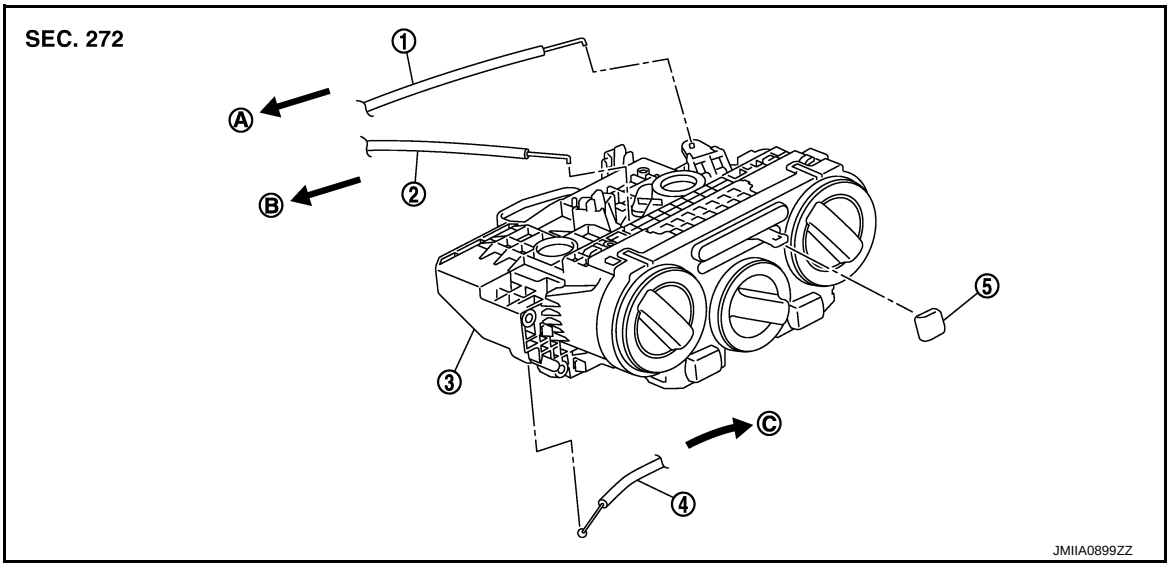
YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair or replace the malfunctioning parts

REMOVAL AND INSTALLATION

A/C CONTROL

Exploded View

INFOID:0000000006547957



1. Intake door cable
2. Mode door cable
3. A/C control
4. Air mix door cable
5. Intake door lever knob
A. To mode door link
B. To intake door link
C. To air mix door link

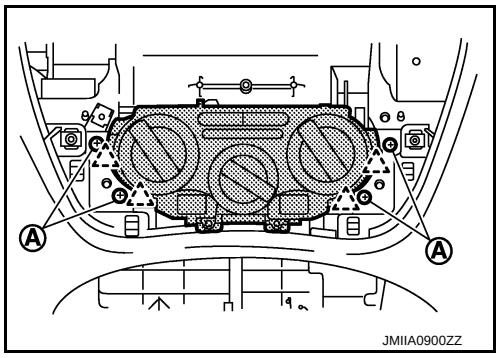
Removal and Installation

INFOID:0000000006547958

REMOVAL

1. Remove A/C finisher. Refer to IP-13, "Removal and Installation".
2. Remove A/C control fixing screws (A) and fixing pawls, and then remove A/C control.

: Pawl



3. Disconnect door cable and harness connector from A/C control.

INSTALLATION

Install in the reverse order of removal.

THERMO CONTROL AMPLIFIER

Removal and Installation

INFOID:0000000006547960

REMOVAL

1. Remove evaporator. Refer to HA-115, "EVAPORATOR : Removal and Installation".
2. Remove thermo control amp. from evaporator.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-ring with new one. Then apply compressor oil to them when installing.**
- **When install the thermo control amp., set the same position before replacement.**
- **When remove the thermo control amp., never turn the bracket which is equipped the top of the thermo control amp.**
- **Check for the leakages when recharging refrigerant. Refer to HA-74, "Leak Test".**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000006547961

Refer to HA-94, "Exploded View".

Removal and Installation

INFOID:0000000006547962

REMOVAL

Refer to HA-96, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".

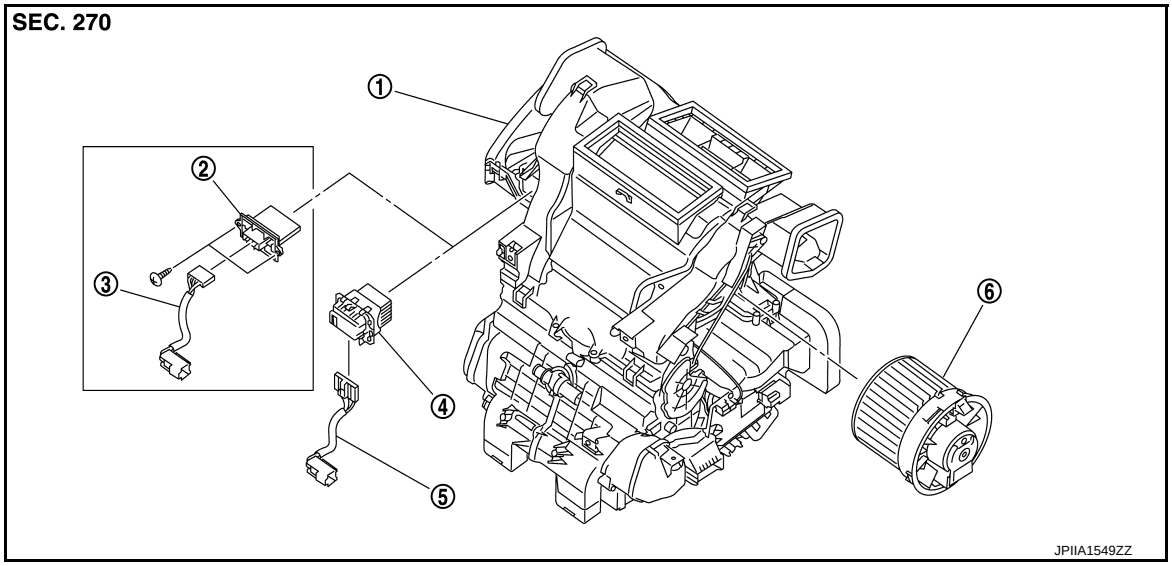
INSTALLATION

Install in the reverse order of removal.

BLOWER FAN RESISTOR

Exploded View

INFOID:0000000006547963



1. A/C unit assembly
2. Blower fan resistor*1
3. Sub harness*1
4. Power transistor*2
5. Sub harness*2
6. Blower motor

- *1: Manual air conditioner
- *2: Automatic air conditioner

Removal and Installation

INFOID:0000000006547964

REMOVAL

1. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation". (LHD models)
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
3. Disconnect blower fan resistor harness connector.
4. Remove fixing screws, and then remove blower fan resistor from A/C unit assembly.

INSTALLATION

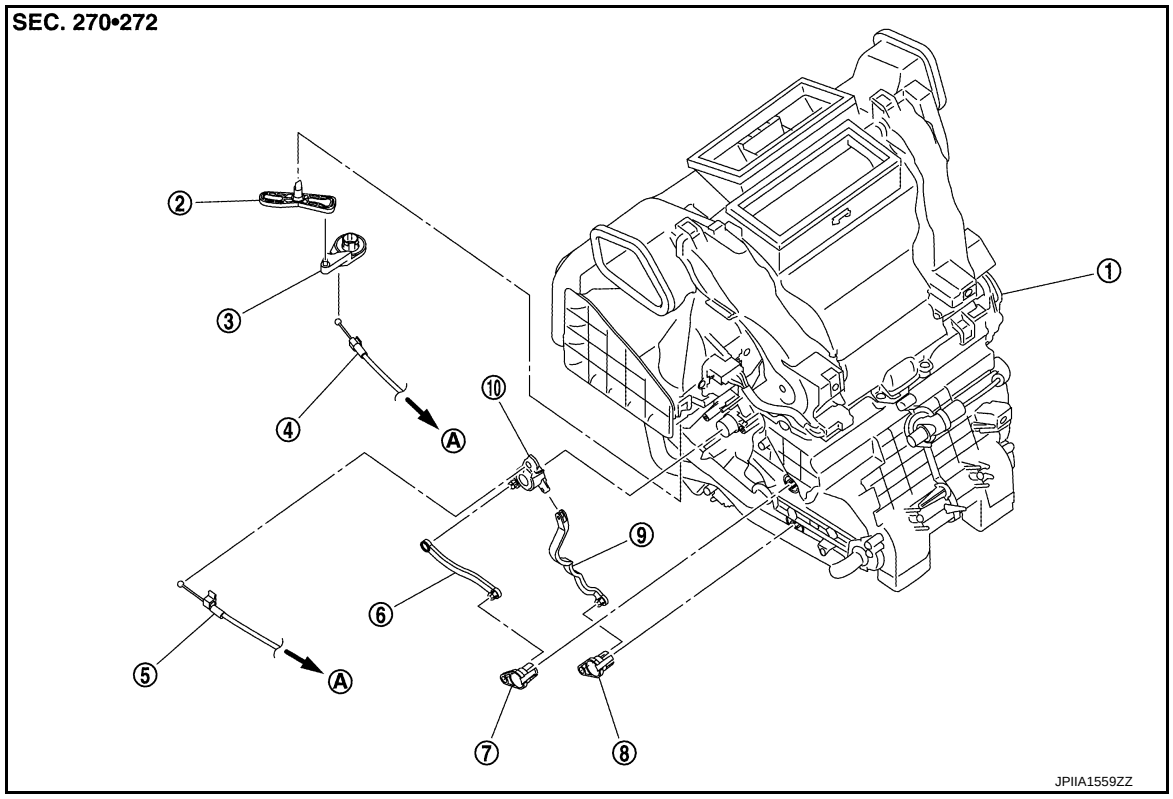
Install in the reverse order of removal.

DOOR CABLE

Exploded View

INFOID:0000000006547965

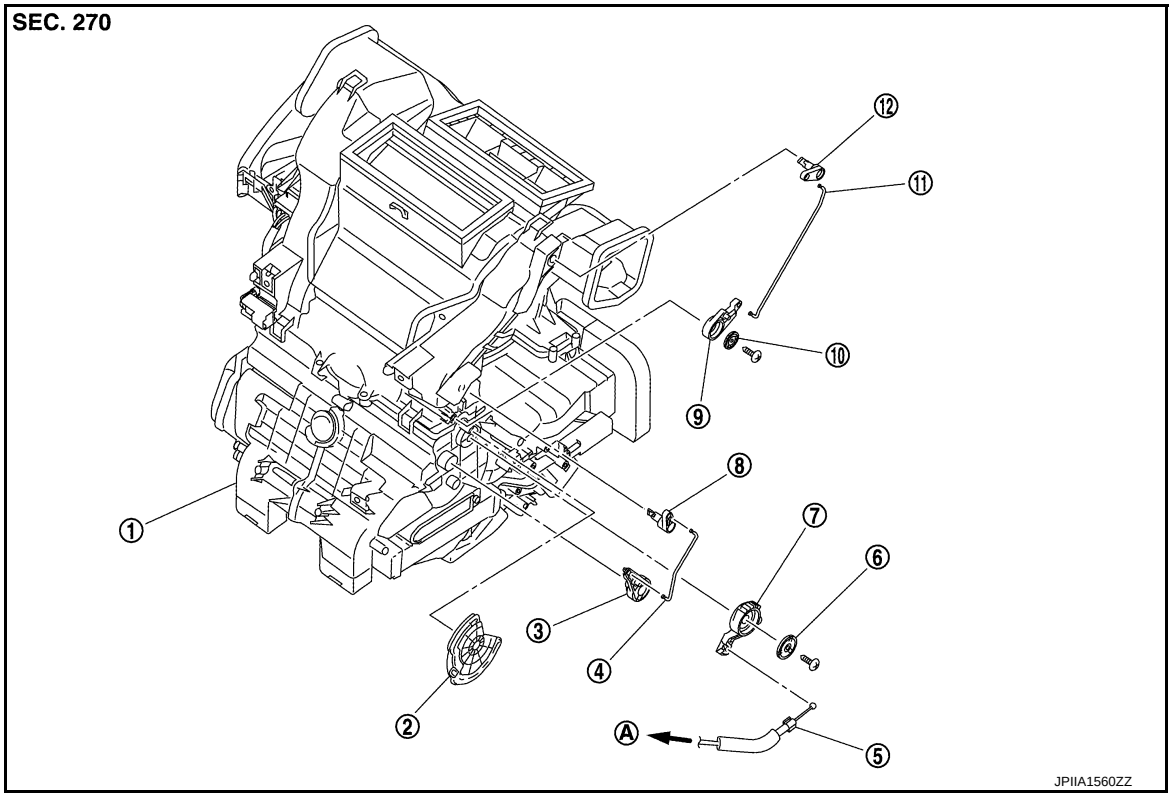
LEFT SIDE



1. A/C unit assembly
2. Intake door lever
3. Intake door link
4. Intake door cable
5. Air mix door cable
6. Upper air mix door rod
7. Upper air mix door lever
8. Lower air mix door lever
9. Lower air mix door rod
10. Air mix door link

A. To A/C control

RIGHT SIDE



1. A/C unit assembly
2. Main link
3. Sub defroster door link
4. Sub defroster door rod
5. Mode door cable
6. Plate
7. Mode link
8. Sub defroster door lever
9. Center ventilator and defroster door link
10. Plate
11. Center ventilator and defroster door rod
12. Center ventilator and defroster door lever
A. To A/C control

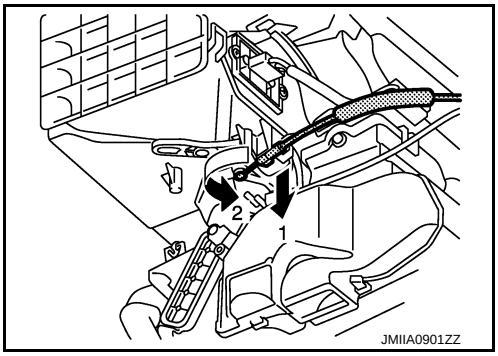
INTAKE DOOR CABLE

INTAKE DOOR CABLE : Removal and Installation

INFOID:0000000006547966

REMOVAL

1. Disconnect intake door cable from A/C control. Refer to HAC-239, "Exploded View".
2. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect intake door cable from A/C unit assembly as shown by the arrow in the figure, and then remove intake door cable.



INSTALLATION

Install in the reverse order of removal.

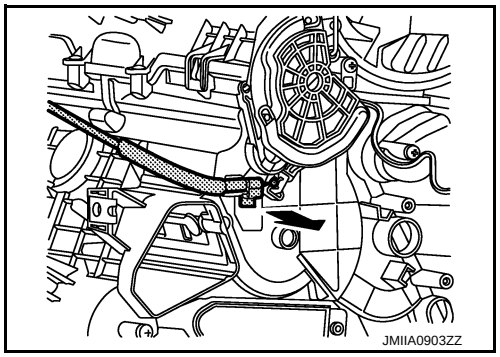
MODE DOOR CABLE

MODE DOOR CABLE : Removal and Installation

INFOID:0000000006547968

REMOVAL

1. Disconnect mode door cable from A/C control. Refer to HAC-239, "Exploded View".
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove instrument panel RH. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect mode door cable from A/C unit assembly as shown by the arrow in the figure, and then remove mode door cable.



INSTALLATION

Install in the reverse order of removal.

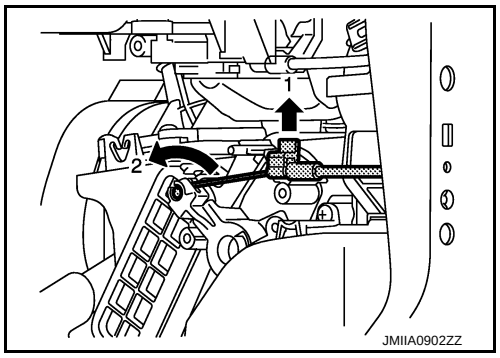
AIR MIX DOOR CABLE

AIR MIX DOOR CABLE : Removal and Installation

INFOID:0000000006547970

REMOVAL

1. Disconnect air mix door cable from A/C control. Refer to HAC-239, "Exploded View".
2. Remove instrument panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect air mix door cable from A/C unit assembly as shown by the arrow in the figure, and then remove air mix door cable.



INSTALLATION

Install in the reverse order of removal.

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006626857

Check the vehicle type to use the service information in this section.

Destination	Service information
Automatic air conditioning (4WD models)	“TYPE 1”
Automatic air conditioning (2WD models)	“TYPE 2”
Manual air conditioning (4WD models)	“TYPE 3”
Manual air conditioning (2WD models)	“TYPE 4”
Manual heater	“TYPE 5”

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006626862

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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

WARNING:

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag 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.**

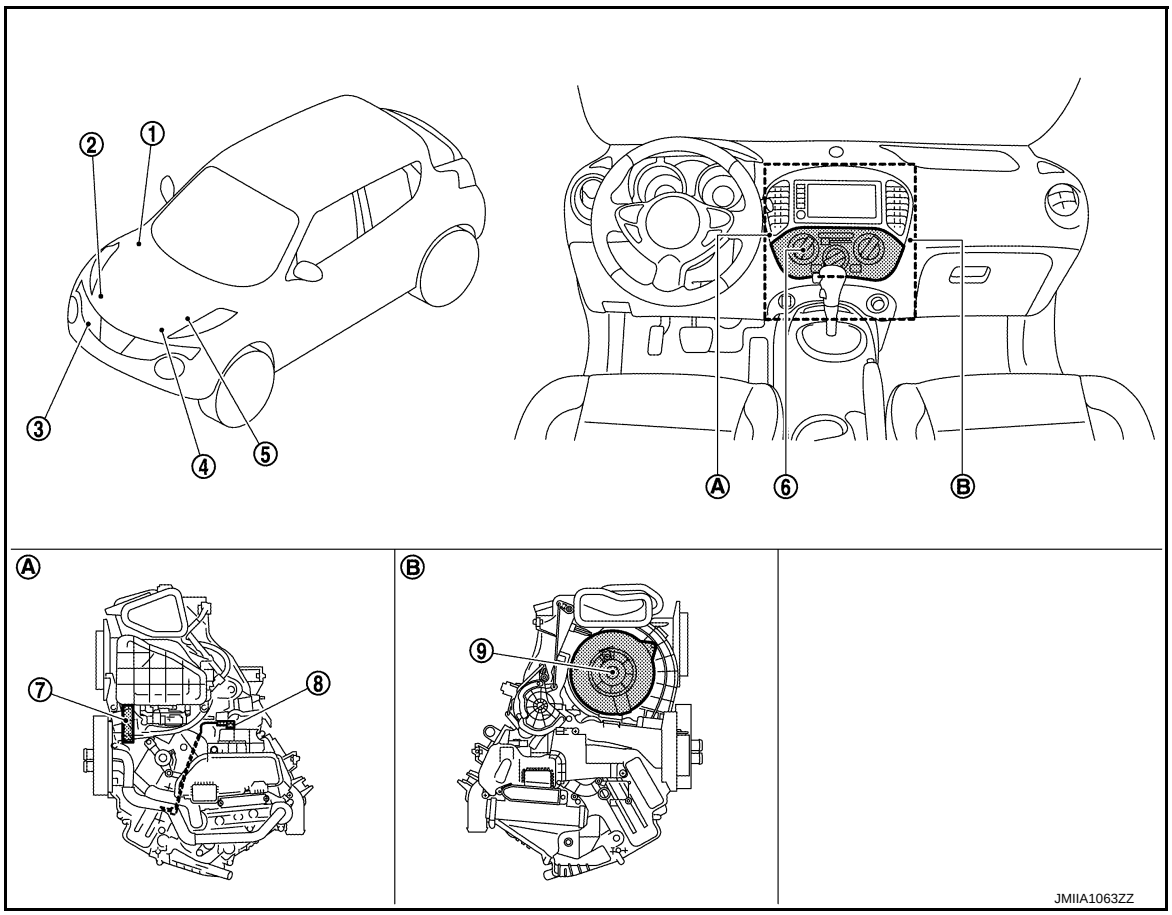
SYSTEM DESCRIPTION

COMPONENT PARTS

MANUAL AIR CONDITIONING SYSTEM

MANUAL AIR CONDITIONING SYSTEM : Component Part Location

INFOID:0000000006553380



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-161, "Removal and Installation".
2. Magnet clutch
3. Refrigerant pressure sensor
4. ECM
   - HR16DE: Refer to EC-455, "ENGINE CONTROL SYSTEM : Component Parts Location".
   - MR16DDT: Refer to EC-25, "ENGINE CONTROL SYSTEM : Component Parts Location".
   - K9K: Refer to EC-813, "Component Parts Location".
5. IPDM E/R
   - With Intelligent Key: Refer to PCS-5, "Component Parts Location".
   - Without Intelligent Key: Refer to PCS-37, "Component Parts Location".
6. A/C control
7. Blower fan resistor
8. Thermo control amp.
9. Blower motor

A. Left side of A/C unit assembly
B. Right side of A/C unit assembly

MANUAL AIR CONDITIONING SYSTEM : Component Description

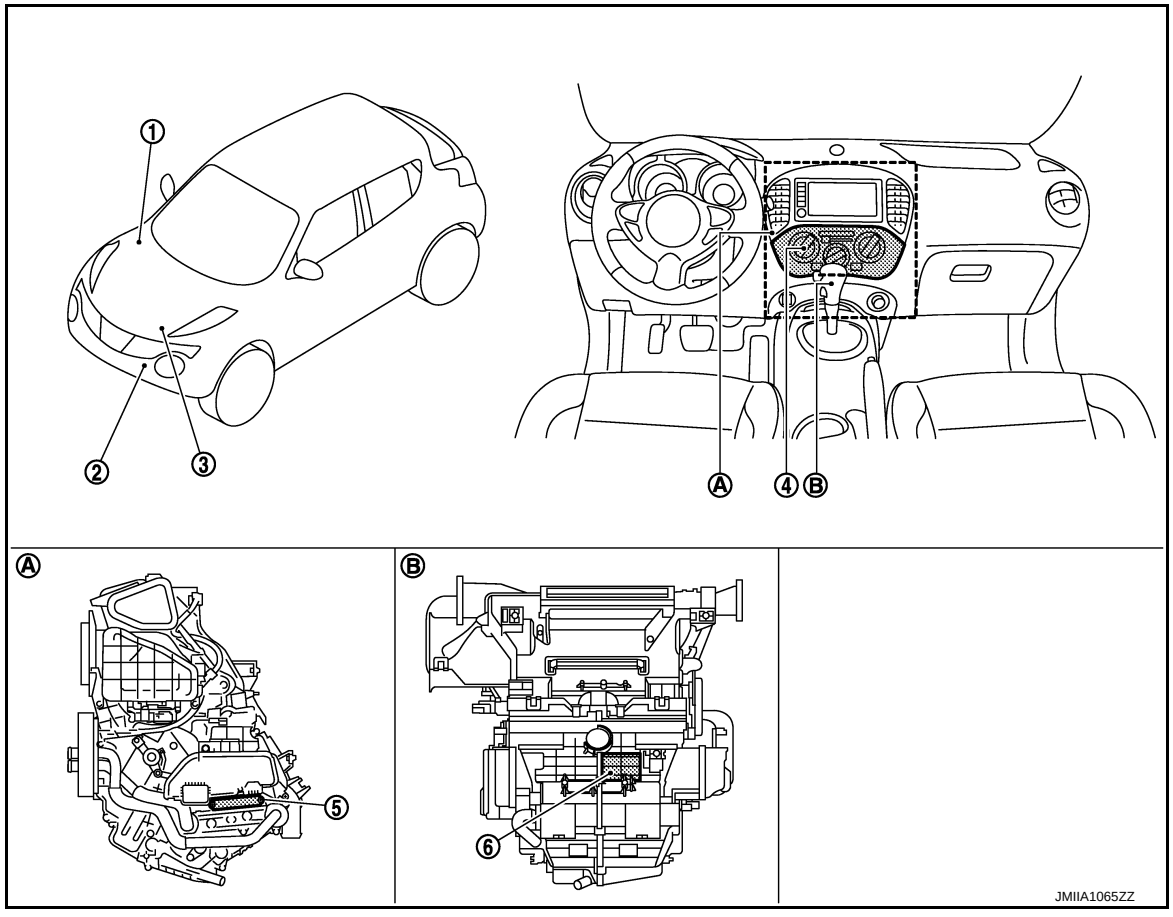
INFOID:0000000006553381

Component		Description
A/C unit assembly	Thermo control amp.	HAC-250
	Blower motor	HAC-250
	Blower fan resistor	HAC-251
A/C control		HAC-251
BCM		HAC-251
ECM		HAC-251
IPDM E/R		HAC-251
Refrigerant pressure sensor		HAC-251
Magnet clutch		HAC-252

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : Component Parts Location

INFOID:0000000006660948



1. BCM
   - With Intelligent Key: Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location".
   - Without Intelligent Key: Refer to BCS-161, "Removal and Installation".
2. Ambient sensor
3. ECM
   Refer to EC-813.
4. A/C control
5. PTC heater
6. PTC heater control unit

A. Left side of A/C unit assembly
B. Back side of A/C unit assembly

PTC HEATER CONTROL SYSTEM : Component Description

INFOID:0000000006660949

Component parts		Description
A/C unit assembly	PTC heater control unit	HAC-251
	PTC heater	HAC-251
A/C control		HAC-251
BCM		BCM transmits electrical load signal (high beam request signal, low beam request signal, rear window defogger ON signal, and others) to PTC heater control unit via CAN communication line.
ECM		ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to PTC heater control unit via CAN communication line.
Ambient sensor		HAC-251

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Thermo Control Amp.

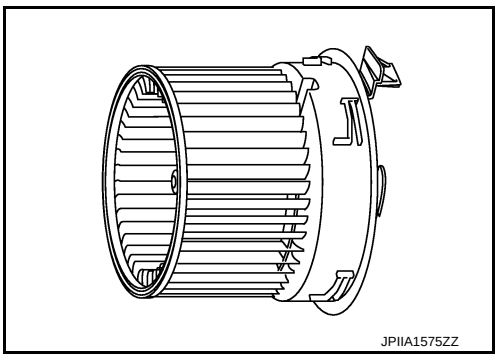
INFOID:0000000006553382

- Thermo control amp. is composed of thermistor and amplifier. Thermistor is installed on evaporator, and amplifier is attached to foot duct.
- When the thermistor detecting temperature of the evaporator fin is extremely low, thermo control amp. sends the thermo control amp. OFF signal to BCM, and stops the compressor.

A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000006553383

- 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.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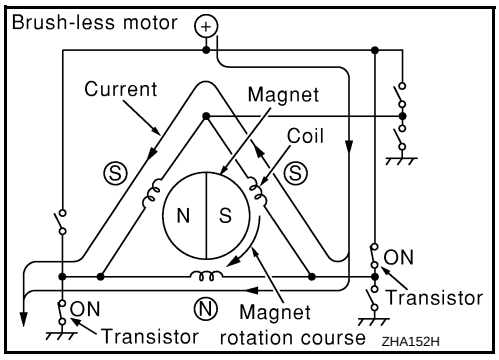
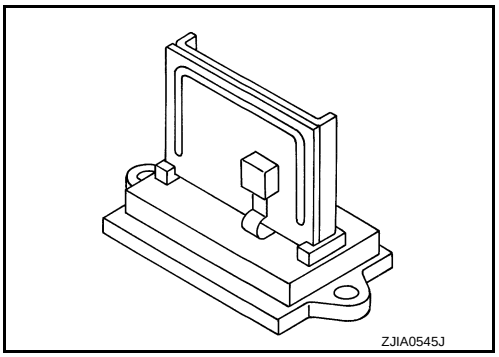


A/C UNIT ASSEMBLY : Blower Fan Resistor

INFOID:0000000006553384

- Compact and lightweight resistor is adopted with outstanding ventilation.
- Temperature fuse is installed to protects the blower motor circuit.



A/C UNIT ASSEMBLY : PTC Heater Control Unit

INFOID:0000000006660982

- The PTC heater control unit consists of a microcomputer and connectors for signal input and output and for power supply. The PTC heater control unit controls PTC heater system.
- Self-diagnosis functions are also built into PTC heater control unit to provide quick check of malfunctions in the PTC heater control system.

A/C UNIT ASSEMBLY : PTC Heater

INFOID:0000000006660950

Heat element is heated and air flow temperature is increased by power supply from PTC relay.

A/C Control

INFOID:0000000006553385

Controls the air conditioning function.

BCM

INFOID:0000000006553386

BCM transmits A/C ON signal and blower fan ON signal to ECM via CAN communication, according to A/C switch signal and blower fan ON signal that are received from A/C control and thermo control amp. signal that is received from thermo control amp. and A/C indicator is turned ON.

ECM

INFOID:0000000006553387

ECM, when receiving A/C ON signal and blower fan ON signal from BCM, transmits A/C compressor request signal to IPDM E/R via CAN communication according to status of the engine and refrigerant pressure.

IPDM E/R

INFOID:0000000006553388

A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line.

Ambient Sensor

INFOID:0000000006660957

Ambient sensor measures ambient air temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

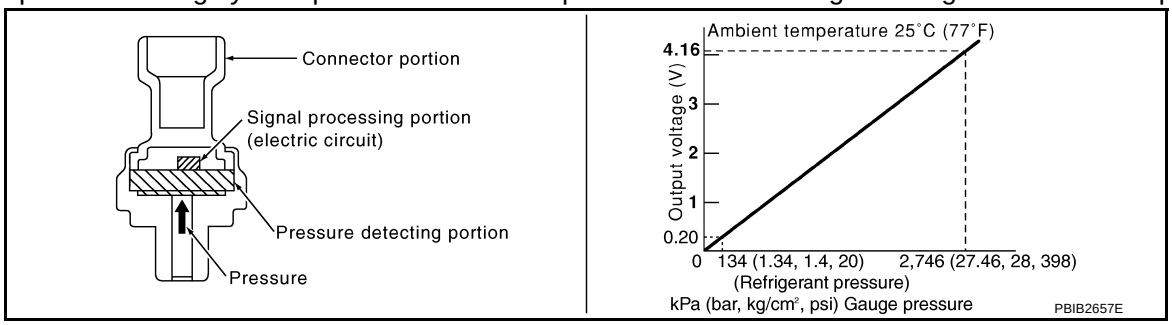
Refrigerant Pressure Sensor

INFOID:0000000006553389

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.

- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection ares and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

Magnet Clutch

INFOID:0000000006553390

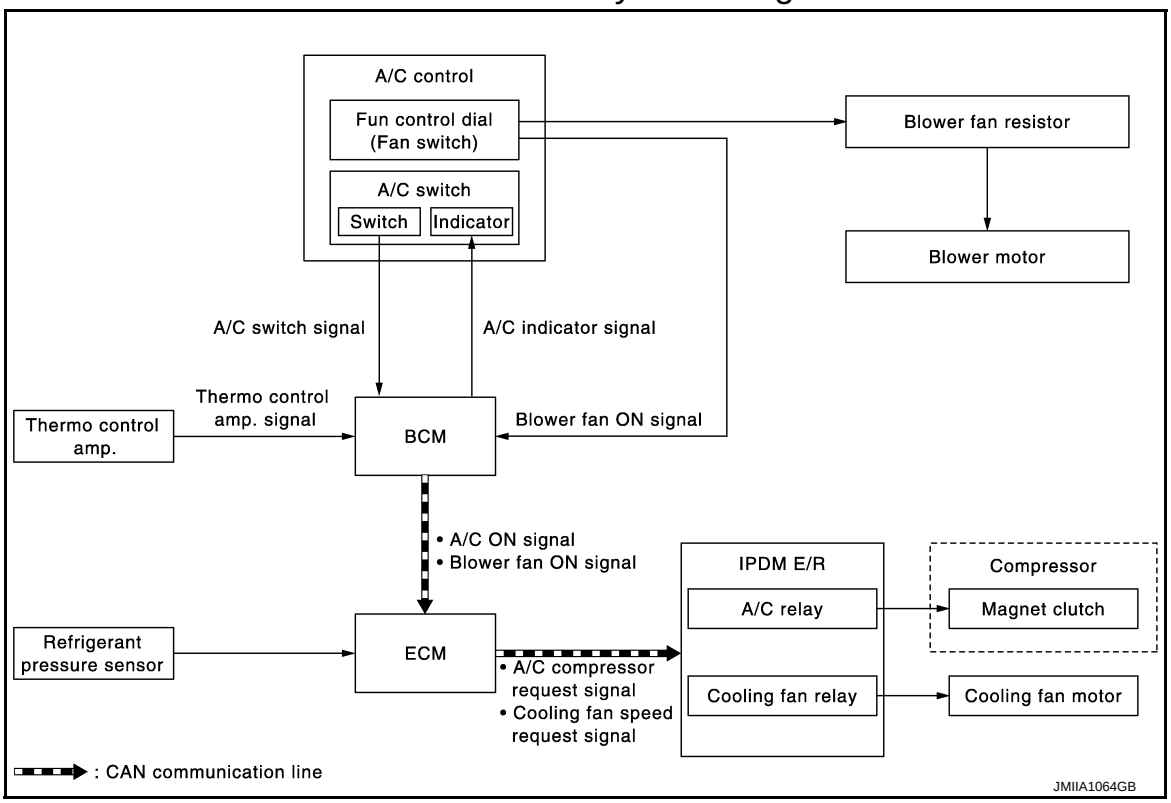
Compressor is driven by the magnet clutch which is magnetized by electric power supply.

SYSTEM

MANUAL AIR CONDITIONING SYSTEM

MANUAL AIR CONDITIONING SYSTEM : System Diagram

INFOID:0000000006553391



MANUAL AIR CONDITIONING SYSTEM : System Description

INFOID:0000000006553392

DESCRIPTION

- Manual air conditioning system is controlled by each function of thermo control amp., BCM, ECM and IPDM E/R.
- Fan speed of blower motor is changed by the combination of fan control dial operation and blower fan resistor control.

CONTROL BY THERMO CONTROL AMP.

- HAC-253, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"

CONTROL BY BCM

- HAC-253, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"

CONTROL BY ECM

- HAC-253, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"
- Cooling fan control
  - HR16DE: Refer to EC-479, "COOLING FAN CONTROL : System Description".
  - MR16DDT: Refer to EC-61, "COOLING FAN CONTROL : System Description".
  - K9K: Refer to EC-827, "COOLING FAN CONTROL : System Description".

CONTROL BY IPDM E/R

- HAC-253, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"
- Cooling fan control. Refer to PCS-9, "POWER CONTROL SYSTEM : System Description" (with Intelligent Key) or PCS-41, "POWER CONTROL SYSTEM : System Description" (without Intelligent Key).

MANUAL AIR CONDITIONING SYSTEM : Compressor Control

INFOID:0000000006553393

DESCRIPTION

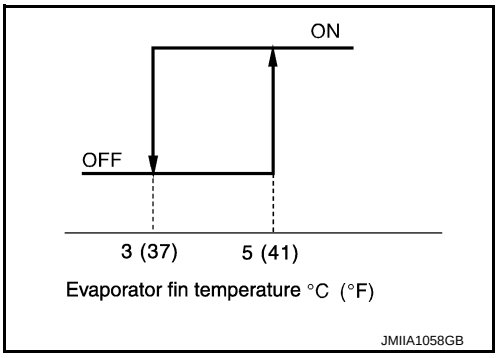
- BCM transmits the A/C ON signal and blower fan ON signal to ECM via CAN communication line only when the compressor operational condition is satisfied, and A/C indicator is turned ON.
  Refer to BCS-13, "SIGNAL BUFFER SYSTEM : System Description" (with Intelligent Key system) or BCS-103, "SIGNAL BUFFER SYSTEM : System Description" (without Intelligent Key system).
  NOTE:
  Compressor operational condition
  - A/C switch signal: ON
  - Blower fan ON signal: ON
  - Thermo control amp. signal: ON
- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor request signal to IPDM E/R via CAN communication line.
- By receiving the A/C compressor request signal from ECM, IPDM E/R turns the A/C relay to ON, and activates the compressor.
  Refer to PCS-6, "RELAY CONTROL SYSTEM : System Description" (with Intelligent Key system) or PCS-38, "RELAY CONTROL SYSTEM : System Description" (without Intelligent Key system).

CONTROL BY THERMO CONTROL AMP.

Low Temperature Protection Control

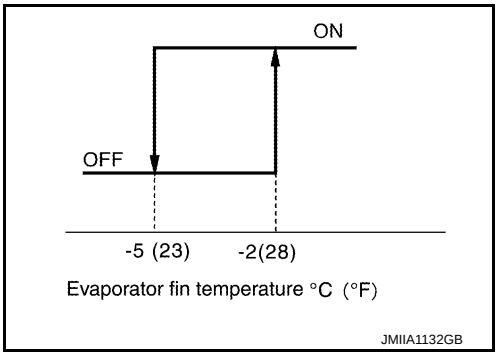
With HR16DE and MR16DDT

- When intake sensor detects that evaporator surface temperature is 3°C (37°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.
  When the air temperature returns to 5°C (41°F) or more, the compressor is activated.



With K9K

- When intake sensor detects that evaporator surface temperature is –5°C (23°F) or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.
  When the air temperature returns to –2°C (28°F) or more, the compressor is activated.



CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction

The high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, ECM requests IPDM E/R to turn A/C relay OFF and stop the compressor.

With HR16DE and MR16DDT

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

With K9K

- 2.8 MPa (28.56 kg/cm^2, 406 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.8 MPa (28.56 kg/cm^2, 406 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.12 MPa (1.22 kg/cm^2, 17.4 psi) or less

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 oil once.

Air Conditioning Cut Control

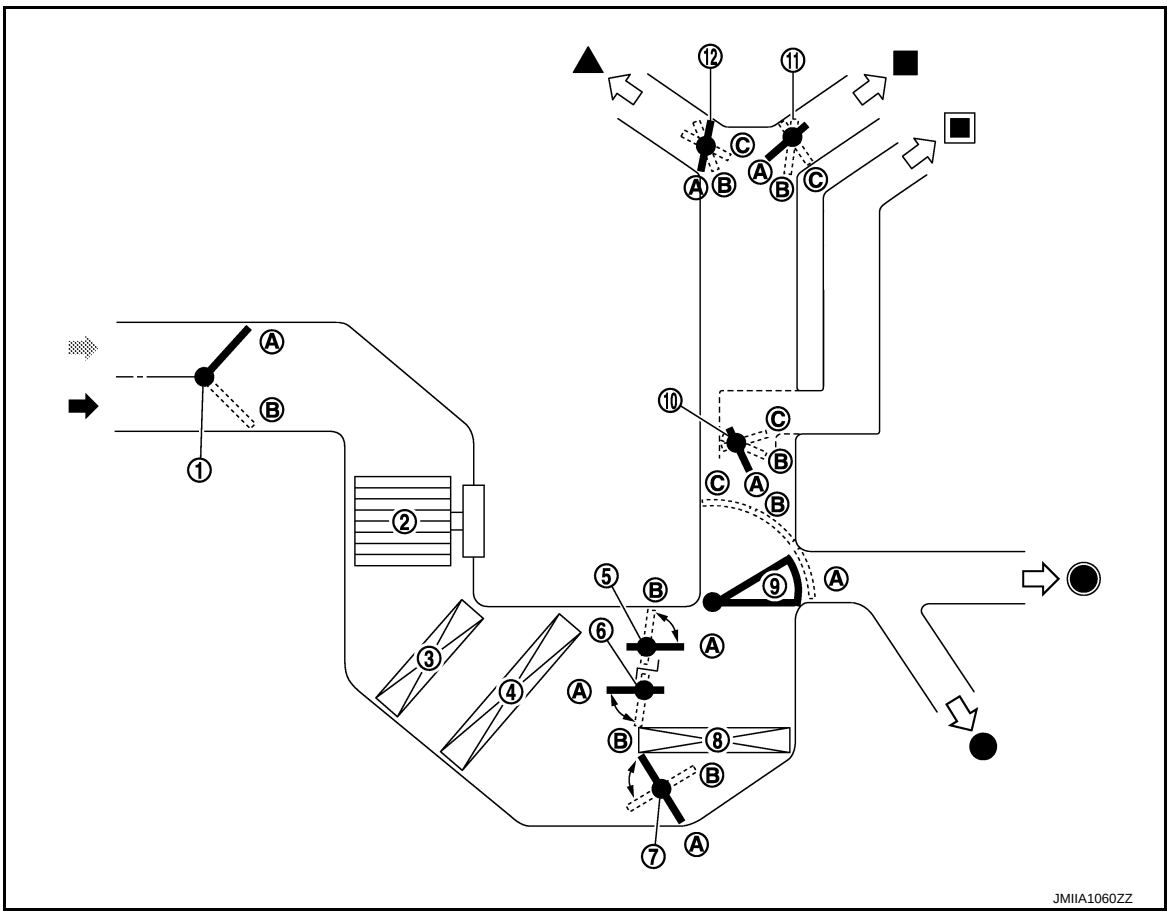
When the engine condition is high load, ECM makes the A/C relay to OFF, and stops the compressor. Refer to following.

- HR16DE: EC-476, "AIR CONDITIONING CUT CONTROL : System Description"
- MR16DDT: EC-60, "AIR CONDITIONING CUT CONTROL : System Description"

MANUAL AIR CONDITIONING SYSTEM : Door Control

INFOID:0000000006553394

SWITCHES AND THEIR CONTROL FUNCTIONS



1. Intake door	2. Blower motor	3. Air conditioner filter
4. Evaporator	5. Max. cool door	6. Upper air mix door
7. Lower air mix door	8. Heater core	9. Foot door
10. Side ventilator door	11. Center ventilator door	12. Defroster door
Fresh air intake	Recirculation air	Defroster
Center ventilator	Side ventilator	Foot
Rear foot*		

*: With rear foot duct

Switch/dial position		Door position							
		Center ventilator door	Side ventilator door	Foot door	Defroster door	Intake door	Max. cool door	Upper air mix door	Lower air mix door
MODE dial		A	A	A	A	—	—	—	—
		B	B	B	A				
		C	C	C	B				
				A	C				
Air intake lever		—	—	—	—	A			
						B			
Temperature control dial	Full cold					—	A	A	A
	Full hot						B	B	B

AIR DISTRIBUTION

Without rear foot duct

MODE/DEF setting position	Discharge air flow			
	Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	52.6%	47.3%	—	—
	34.0%	27.7%	38.4%	—
	—	19.1%	57.9%	23.0%
	—	13.5%	42.4%	44.1%
	—	16.3%	—	83.8%

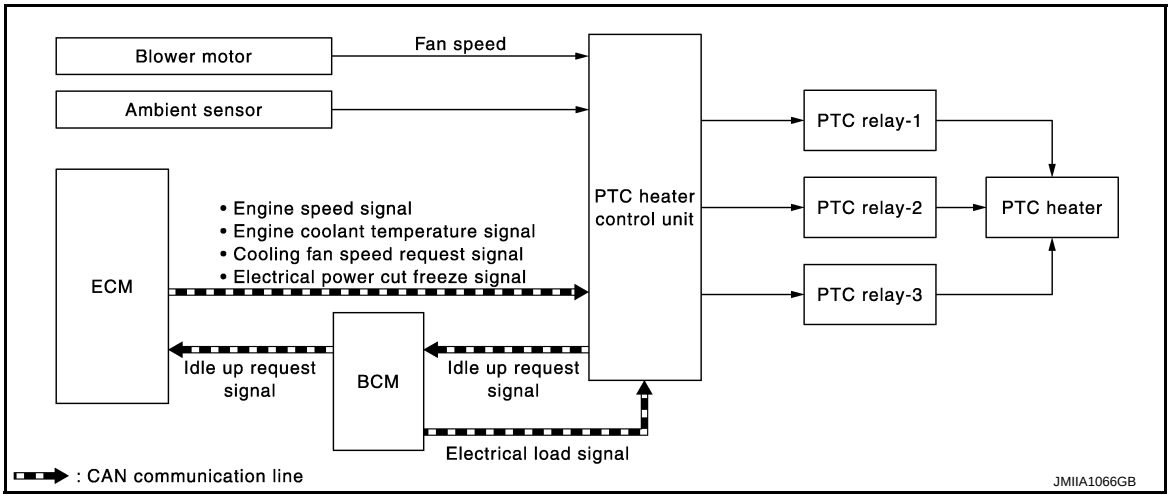
With rear foot duct

MODE/DEF setting position	Discharge air flow				
	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	52.6%	47.3%	—	—	—
	28.2%	25.9%	29.6%	16.3%	—
	—	16.3%	43.0%	21.0%	19.7%
	—	12.2%	33.1%	16.3%	38.4%
	—	16.3%	—	—	83.8%

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : System Diagram

INFOID:0000000006660955



PTC HEATER CONTROL SYSTEM : System Description

INFOID:0000000006660956

- PTC heater control unit performs PTC relay ON/OFF control based on engine speed, engine coolant temperature, electrical power cut freeze signal (permission signal, retention signal, stop signal), fan speed, ambient temperature, battery voltage, and electrical load signal (high beam request signal, low beam request signal, rear window defogger ON signal, and others).
- When PTC relay turns ON, power supply is supplied to PTC heater. Heating element is heated and air flow temperature is increased. Heating is available for a period of time until engine coolant temperature is increased when engine starts cold in cold climate.
- Idle up request signal is transmitted from PTC heater control unit to ECM while PTC heater operates. Idle speed is increased, warming-up is facilitated, and battery electric power is obtained.
- Electric power supplied to PTC heating element is subject to PTC relay control conditions.

PTC heater	Operation	PTC relay-1	PTC relay-2	PTC relay-3	Electric power (W)
OFF	OFF	OFF	OFF	OFF	Approx. 0
PTC heater-1	LOW	ON	OFF	OFF	Approx. 333
PTC heater-2	MID	ON	ON	OFF	Approx. 666
PTC heater-3	HI	ON	ON	ON	Approx. 999

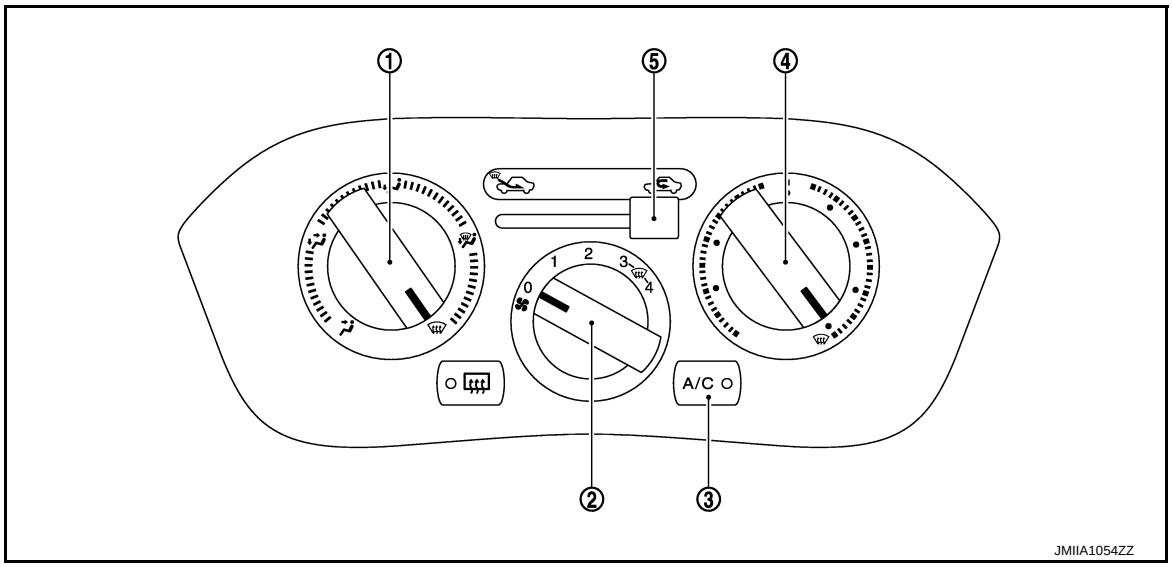
NOTE:
PTC heater operation depends on ambient temperature and battery voltage. PTC heater is ON when ambient temperature is 8°C or less. PTC heater is OFF when ambient temperature is 12°C or more. PTC heater is ON when battery voltage is 11.5 V or more. PTC heater is OFF when battery voltage is 11 V or less.

OPERATION

Switch Name and Function

INFOID:0000000006553395

A/C CONTROLLER (A/C CONTROL)



1. MODE dial
2. Fan control dial
3. A/C switch
4. Temperature control dial
5. Intake lever

MODE dial	Mode position is selected to an optimal position by operating this dial.
Fan control dial	Fan speed can be adjusted within a range from 1st to 4th.
A/C switch	The compressor control (switch indicator) is turned ON ⇔ OFF each time by pressing this switch while the blower motor is activated.
Temperature control dial	The setting temperature can be selected to an optimum temperature by operating this dial. • Clockwise rotation: Discharge air flow temperature increases • Counterclockwise rotation: Discharge air flow temperature decreases.
Intake lever	The air inlet changes REC ⇔ FRE each time by operation this lever.

DIAGNOSIS SYSTEM (PTC HEATER CONTROL UNIT)

CONSULT-III Function

INFOID:0000000006660973

CONSULT-III performs the following functions via CAN communication with PTC heater control unit.

Diagnostic mode	Description
Ecu Identification	Displays the part number of PTC heater control unit.
Self Diagnostic Result	Displays the diagnosis results judged by PTC heater control unit.
Data Monitor	Displays the input/output signal of PTC heater control unit.

ECU IDENTIFICATION

Part number of PTC heater control unit can be checked.

SELF-DIAGNOSTIC RESULT

Diagnosis result that is judged by PTC heater control unit. can be checked. Refer to HAC-267, "DTC Index".

DATA MONITOR

Input/output signal of PTC heater control unit can be checked.

Display item list

Monitor item [Unit]		Description
AMB TEMP SEN	[°C or °F]	Ambient sensor value converted from ambient sensor signal received from ambient sensor.
AMB SEN CAL	[°C or °F]	Ambient sensor value calculated by PTC heater control unit.
ENG COOL TEMP	[°C or °F]	Water temperature signal value received from ECM via CAN communication.

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)

Description

INFOID:0000000006706008

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
		Active Test
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706389

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp timer	INT LAMP	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	×
• Automatic A/C • Manual A/C	AIR CONDITONER		×	×*2

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
• Intelligent Key system • Engine start system	INTELLIGENT KEY	×	×	×
Combination switch	COMB SW		×	
Body control system	BCM	×		
NVIS - NATS	IMMU	×	×	×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Theft warning alarm	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

- *1: This item is displayed, but not used.
- *2: For models with automatic A/C, this diagnosis mode is not used.

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays on CONSULT-III.

CONSULT screen item	Indication/Unit	Description
Vehicle Speed	km/h	Vehicle speed of the moment a particular DTC is detected
Odo/Trip Meter	km	Total mileage (Odometer value) of the moment a particular DTC is detected

CONSULT screen item	Indication/Unit	Description	
Vehicle Condition	SLEEP>LOCK	Power position status of the moment a particular DTC is detected	While turning BCM status from low power consumption mode to normal mode (Power supply position is “LOCK”)
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is “OFF”.)
	LOCK>ACC		While turning power supply position from “LOCK” to “ACC”
	ACC>ON		While turning power supply position from “ACC” to “IGN”
	RUN>ACC		While turning power supply position from “RUN” to “ACC” (Vehicle is stopping and selector lever is except P position.)
	CRANK>RUN		While turning power supply position from “CRANKING” to “RUN” (From cranking up the engine to run it)
	RUN>URGENT		While turning power supply position from “RUN“ to “ACC” (Emergency stop operation)
	ACC>OFF		While turning power supply position from “ACC” to “OFF”
	OFF>LOCK		While turning power supply position from “OFF” to “LOCK”
	OFF>ACC		While turning power supply position from “OFF” to “ACC”
	ON>CRANK		While turning power supply position from “IGN” to “CRANKING”
	OFF>SLEEP		While turning BCM status from normal mode (Power supply position is “OFF”.) to low power consumption mode
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply position is “LOCK”.) to low power consumption mode
	LOCK		Power supply position is “LOCK” (Ignition switch OFF with steering is locked.)
	OFF		Power supply position is “OFF” (Ignition switch OFF with steering is unlocked.)
	ACC		Power supply position is “ACC” (Ignition switch ACC)
	ON		Power supply position is “IGN” (Ignition switch ON with engine stopped)
	ENGINE RUN		Power supply position is “RUN” (Ignition switch ON with engine running)
	CRANKING		Power supply position is “CRANKING” (At engine cranking)
IGN Counter	0 - 39	The number of times that ignition switch is turned ON after DTC is detected • The number is 0 when a malfunction is detected now. • The number increases like 1 → 2 → 3...38 → 39 after returning to the normal condition whenever ignition switch OFF → ON. • The number is fixed to 39 until the self-diagnosis results are erased if it is over 39.	

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Manual A/C 2WD Models)

INFOID:0000000006553397

DATA MONITOR

Display item list

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays blower motor status as judged from blower fan ON signal.
AIR COND SW	[On/Off]	Displays A/C switch status as judged from A/C switch signal.
THERMO AMP	[On/Off]	Displays thermo control amp. status as judged from thermo control amp. signal.
IGN SW	[On/Off]	Displays ignition switch position status as judged form ignition switch signal.

ACTIVE TEST

Test item	Operation	Description
A/C INDICATOR	On	A/C indicator is turned ON.
	Off	A/C indicator is turned OFF.

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

Description

INFOID:0000000006706010

Air conditioning system performs self-diagnosis, operation check, function diagnosis, and various settings using diagnosis function of each control unit.

ECU	Diagnostic item (CONSULT-III)	
BCM	BCM-AIR CONDITIONER	Self Diagnostic Result
		Data Monitor
		Active Test
ECM	ENGINE	Self Diagnostic Result
		Data Monitor
IPDM E/R	IPDM E/R	Self Diagnostic Result
		Data Monitor
	Auto active test	

COMMON ITEM

COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706390

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION

BCM can perform the following functions for each system.

NOTE:

It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
• Automatic A/C • Manual A/C • Manual heater	AIR CONDITONER		×	×*2
Combination switch	COMB SW		×	
Body control system	BCM	×		
NATS	IMMU	×		×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	PANIC ALARM*1			×

• *1: This item is displayed, but is not used.
• *2: For models with automatic A/C, this mode is not used.

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Manual A/C 2WD Models)

INFOID:0000000006553399

DATA MONITOR

Display item list

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays blower motor status as judged from blower fan ON signal.
AIR COND SW	[On/Off]	Displays A/C switch status as judged from A/C switch signal.
THERMO AMP	[On/Off]	Displays thermo control amp. status as judged from thermo control amp. signal.
IGN SW	[On/Off]	Displays ignition switch position status as judged form ignition switch signal.

ACTIVE TEST

Test item	Operation	Description
A/C INDICATOR	On	A/C indicator is turned ON.
	Off	A/C indicator is turned OFF.

ECU DIAGNOSIS INFORMATION

PTC HEATER CONTROL UNIT

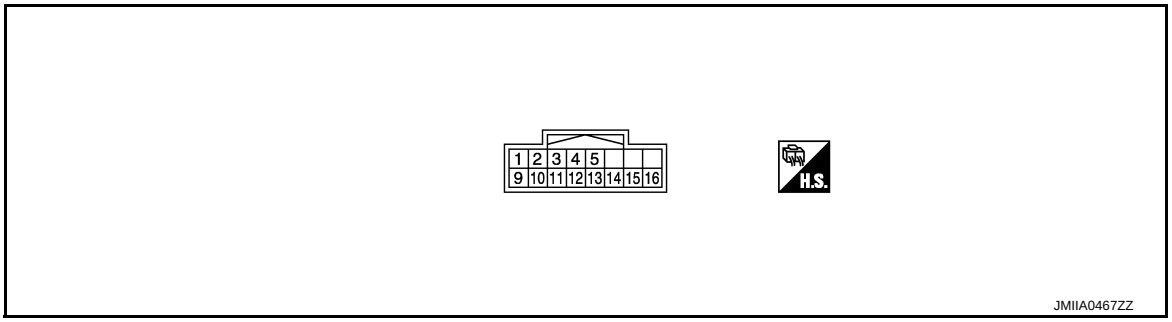
Reference Value

INFOID:0000000006660977

CONSULT-III DATA MONITOR REFERENCE VALUES

Monitor item	Condition	Value
AMB TEMP SEN	Ignition switch ON	Equivalent to ambient temperature
AMB SEN CAL	Ignition switch ON	Equivalent to ambient temperature
ENG COOL TEMP	Ignition switch ON	Values depending on engine coolant temperature

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
1 (L)	—	CAN-H	Input/ Output	—		—
2 (B)	Ground	Ground	—	Ignition switch ON		0 – 0.1 V
3 (SB)	Ground	Ignition power supply	Input	Ignition switch ON		11 – 14 V
4 (P)	Ground	PTC heater control unit connection recognition signal	Output	Ignition switch ON		4.8 – 5.2 V
5 (R)	Ground	Ambient sensor ground	—	Ignition switch ON		0 – 0.1 V
9 (P)	—	CAN-L	—	—		—
10 (Y)	Ground	Battery power supply	Input	Ignition switch OFF		11 – 14 V
12 (GR)	Ground	Ambient sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with ambient temperature
13 (L)	Ground	Blower motor feedback signal	Input	• Ignition switch ON • Fan speed: 1st speed (manual)		9.5 – 10.5 V
14 (Y)	Ground	PTC relay-1 control signal	Output	PTC heater	OFF	11 – 14 V
					“LOW”, “MID” or “HIGH” operation	0 – 0.1 V

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
15 (LG)	Ground	PTC relay-2 control signal	Output	PTC heater	“MID” or “HIGH” operation	11 – 14 V
					Except above	0 – 0.1 V
16 (P)	Ground	PTC relay-3 control signal	Output	PTC heater	“HIGH” operation	11 – 14 V
					Except above	0 – 0.1 V

DTC Index

INFOID:0000000006660979

DTC	Items (CONSULT-III screen terms)	Reference
U1000	CAN COMM CIRCUIT	HAC-275, "DTC Logic"
U1010	CONTROL UNIT(CAN)	HAC-276, "DTC Logic"
B257B	AMBIENT SENSOR	HAC-277, "DTC Logic"
B257C	AMBIENT SENSOR	HAC-277, "DTC Logic"

BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000006553400

ECU		Reference
BCM	With Intelligent Key system	BCS-41, "Reference Value"
		BCS-64, "Fail-safe"
		BCS-66, "DTC Inspection Priority Chart"
		BCS-67, "DTC Index"
	Without Intelligent Key system	BCS-125, "Reference Value"
		BCS-140, "Fail-safe"
		BCS-140, "DTC Inspection Priority Chart"
		BCS-141, "DTC Index"
ECM	HR16DE	EC-508, "Reference Value"
		EC-519, "Fail Safe"
		EC-521, "DTC Inspection Priority Chart"
		EC-522, "DTC Index"
	MR16DDT	EC-90, "Reference Value"
		EC-104, "Fail Safe"
		EC-106, "DTC Inspection Priority Chart"
		EC-108, "DTC Index"
	K9K	EC-846, "Reference Value"
		EC-855, "DTC Index"
IPDM E/R	With Intelligent Key system	PCS-17, "Reference Value"
		PCS-24, "Fail-Safe"
		PCS-25, "DTC Index"
	Without Intelligent Key system	PCS-48, "Reference Value"
		PCS-54, "Fail-Safe"
		PCS-55, "DTC Index"

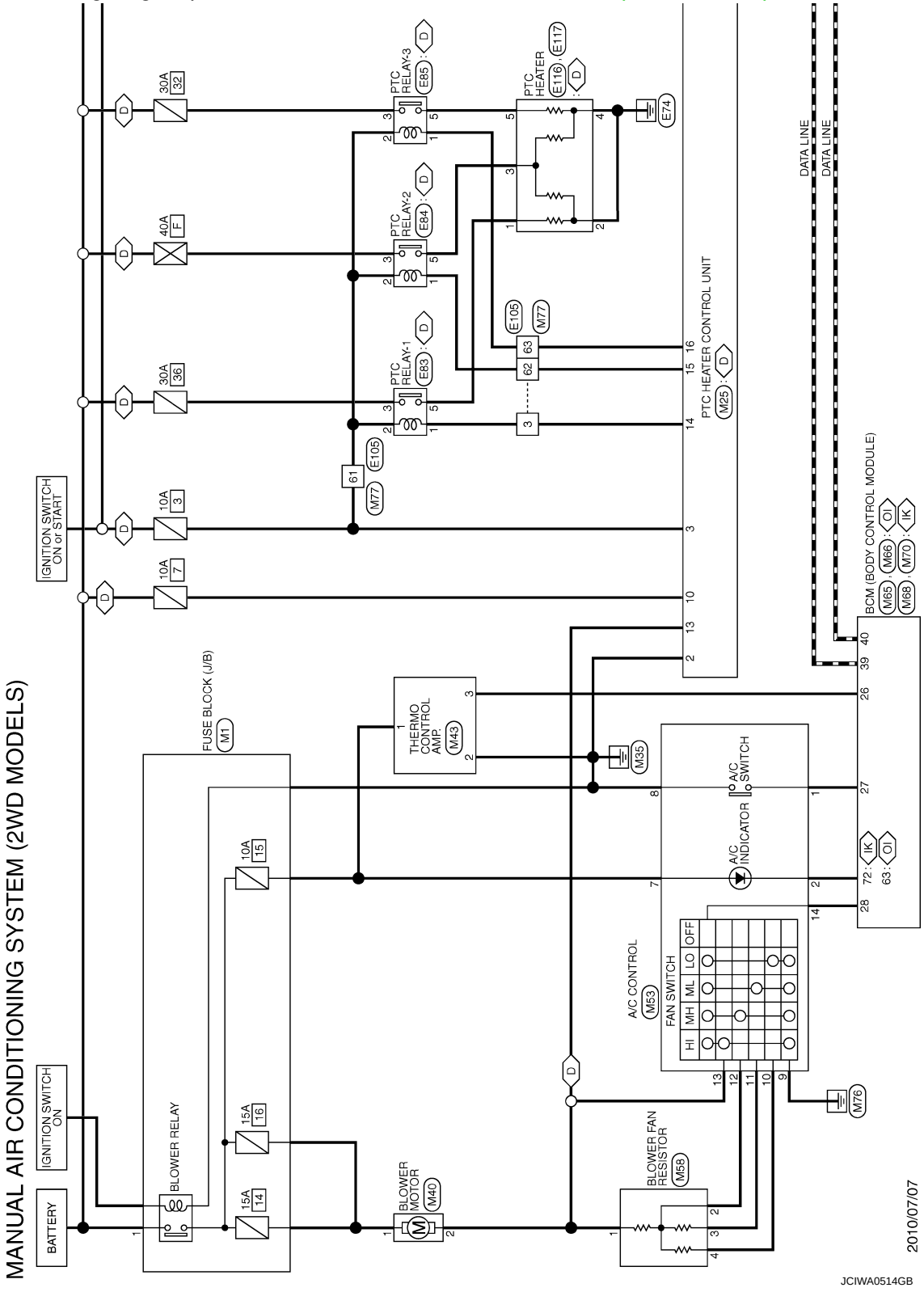
WIRING DIAGRAM

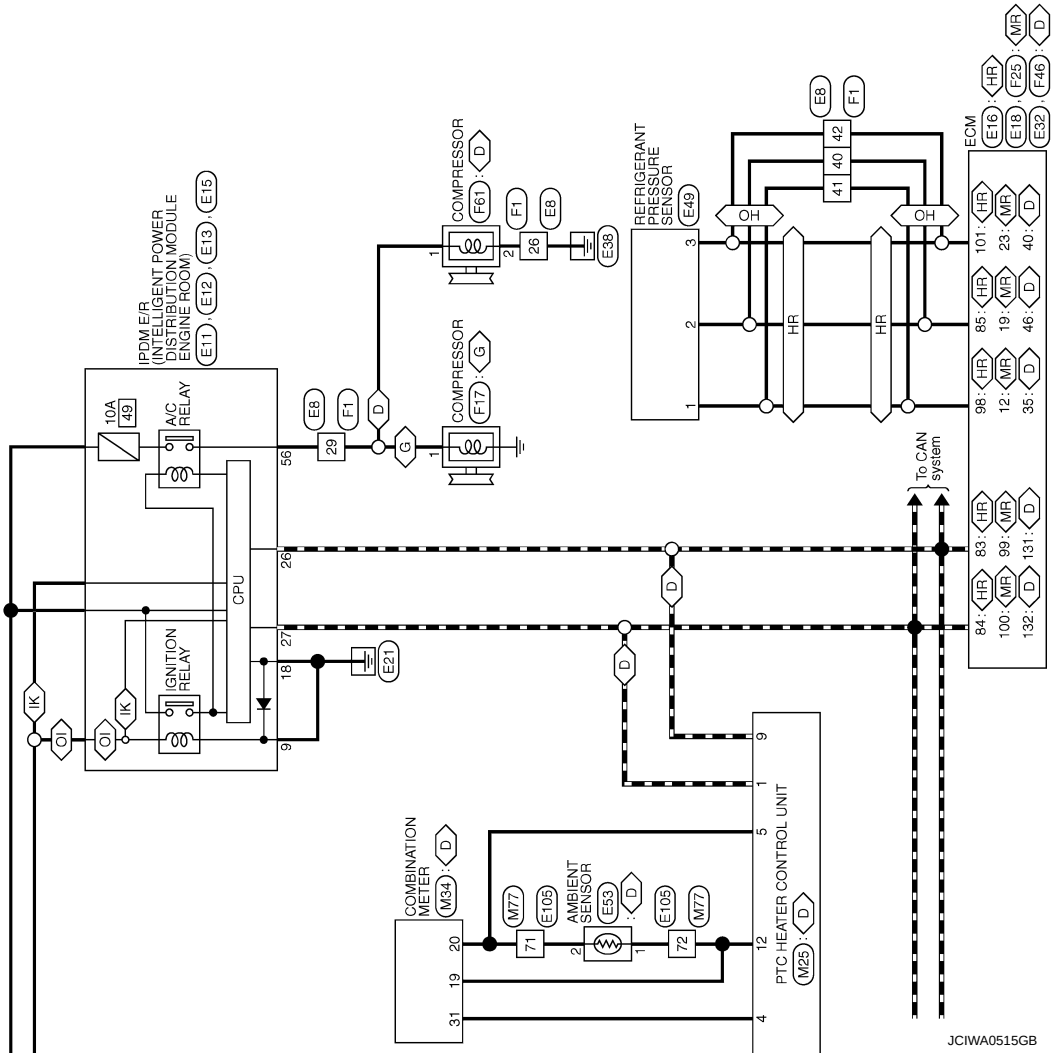
MANUAL AIR CONDITIONING SYSTEM

Wiring Diagram

INFOID:0000000006553401

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information/Explanation of Option Abbreviation".




IPDM E/R
(INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E11, E12, E13, E15
10A 49
A/C RELAY
IGNITION RELAY
CPU
IK
OI
56
29
26
27
18
9
E8
F1
D
G
COMPRESSOR
F61 : D
COMPRESSOR
F17 : G
1
2
26
E38
E21
REFRIGERANT PRESSURE SENSOR
E49
3
2
1
OH
HR
E8
F1
42
40
41
ECM
E16, E18, E32
HR : F25 : F46 : MR : D
101 : HR
23 : MR
40 : D
85 : HR
19 : MR
46 : D
98 : HR
12 : MR
35 : D
83 : HR
99 : MR
131 : D
84 : HR
100 : MR
132 : D
To CAN system
COMBINATION METER
M34 : D
20
19
31
M77
E105
71
AMBIENT SENSOR
E53 : D
2
1
E105
M77
72
PTC HEATER CONTROL UNIT
M25 : D
5
12
4
9
1
JCIWA0515GB

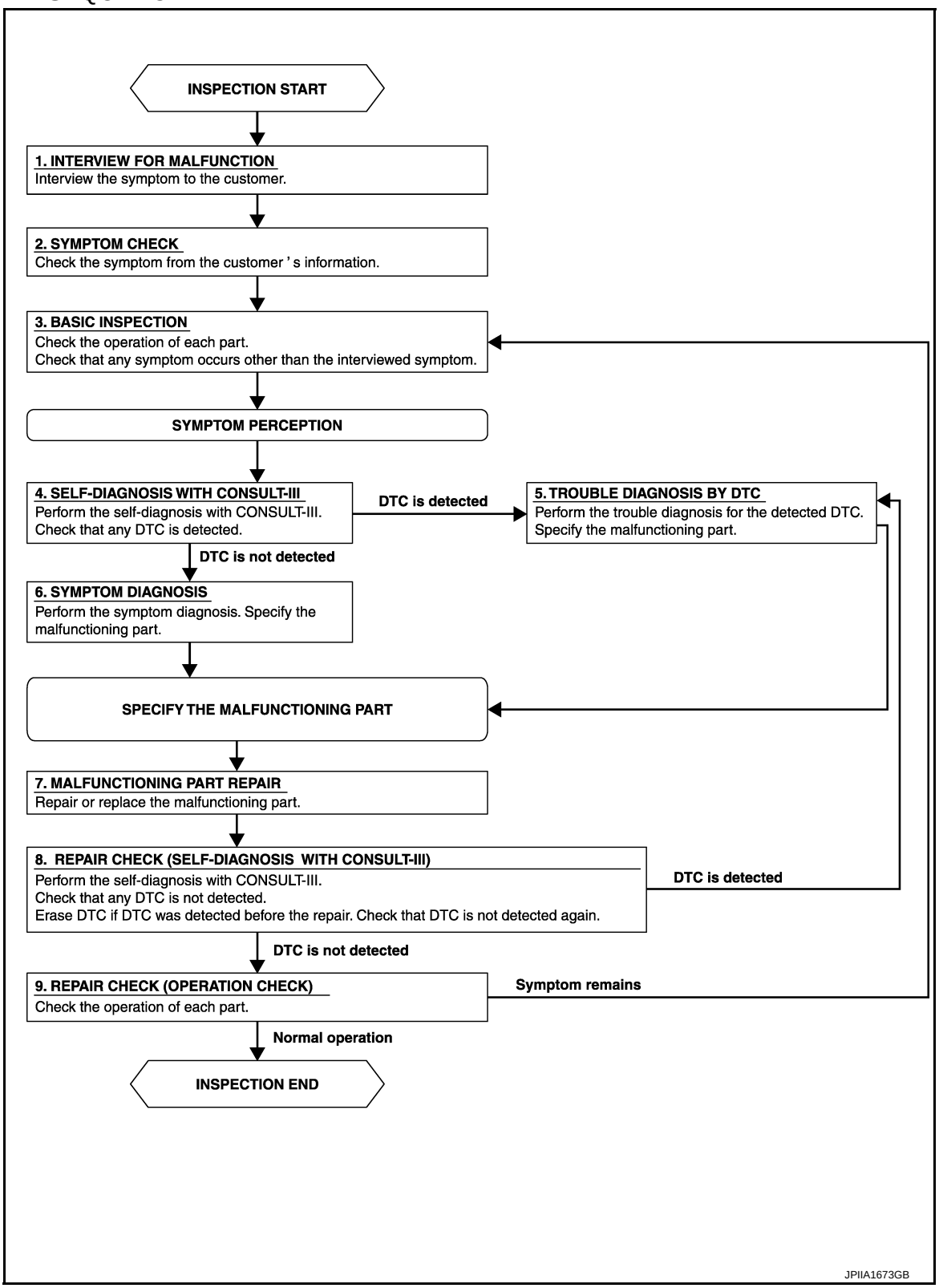
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006553402

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 6.

6.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnoses with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any or malfunction result or DTC detected?

YES >> If DTC is detected, GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

OPERATION INSPECTION

Work Procedure

INFOID:0000000006553403

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

Check condition : Engine running at normal operating temperature.

1.CHECK BLOWER MOTOR

1. Operate fan control dial.
2. Check that fan speed changes. Check operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 8.

2.CHECK DISCHARGE AIR

1. Operate fan control dial to set the fan speed to maximum speed.
2. Operate MODE dial to each position.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the air outlets. Refer to VTL-5, "System Description".

Is the inspection result normal?

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

3.CHECK INTAKE AIR

1. Operate intake lever to each position.
2. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

YES >> GO TO 4.
NO >> GO TO 8.

4.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 5.
NO >> GO TO 8.

5.CHECK DISCHARGE AIR TEMPERATURE

1. Operate temperature control dial.
2. Check that discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 6.
NO >> GO TO 8.

6.CHECK TEMPERATURE DECREASE

1. Operate compressor.
2. Turn temperature control dial to full cold position.
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 8.

7.CHECK TEMPERATURE INCREASE

1. Turn temperature control dial to full hot position.

2. Check that warm air blows from air outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 8.

8. CHECK SELF-DIAGNOSIS WITH CONSULT-III

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

Is any DTC detected?

YES >> Perform trouble diagnosis for the detected DTC.
NO >> Refer to HAC-297, "Symptom Table" and perform the appropriate diagnosis.

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

Description

INFOID:0000000006660958

CAN (Controller Area Network) is a serial communication system for real time application. It is an on-vehicle multiplex communication system with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto vehicles, 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.
CAN Communication Signal Chart. Refer to LAN-31, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC Logic

INFOID:0000000006660959

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1000	CAN COMM CIRCUIT	When PTC heater control unit is not transmitting or receiving CAN communication signal for 2 or more seconds.	CAN communication system

DTC CONFIRMATION PROCEDURE

1. PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn ignition switch ON and wait for 2 seconds or more.
2. Select “Self Diagnostic Result” mode of “PTC HEATER” using CONSULT-.III
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-275, "Diagnosis Procedure".
NO >> Check intermittent incident. Refer to GI-42, "Intermittent Incident".

Diagnosis Procedure

INFOID:0000000006660960

1. CHECK CAN COMMUNICATION SYSTEM

Check CAN communication system. Refer to LAN-17, "Trouble Diagnosis Flow Chart".

>> INSPECTION END

U1010 CONTROL UNIT (CAN)

Description

INFOID:0000000006660961

Initial diagnosis of A/C auto amp.

DTC Logic

INFOID:0000000006660962

DTC DETECTION LOGIC

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
U1010	CONTROL UNIT (CAN)	When detecting error during the initial diagnosis of CAN controller of PTC heater control unit	PTC heater control unit

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

With CONSULT-III
1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “PTC HEATER” using CONSULT-.III
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-276, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006660963

1.REPLACE PTC HEATER CONTROL UNIT

Replace PTC heater control unit.

>> INSPECTION END

B257B, B257C AMBIENT SENSOR

DTC Logic

INFOID:0000000006660964

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to HAC-275, "DTC Logic".
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. HAC-276, "DTC Logic".

DTC	Items (CONSULT-III screen terms)	DTC detection condition	Possible cause
B257B	AMBIENT SENSOR	The ambient sensor recognition temperature is too high.	• Ambient sensor • PTC heater control unit • Harness or connectors (The sensor circuit is open or shorted.)
B257C		The ambient sensor recognition temperature is too low.	

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT-III

1. Turn ignition switch ON.
2. Select “Self Diagnostic Result” mode of “PTC HEATER” using CONSULT-III.
3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-277, "Diagnosis Procedure".
NO >> INSPECTION END

Diagnosis Procedure

INFOID:0000000006660965

1. CHECK AMBIENT SENSOR POWER SUPPLY

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

+		–	Voltage (Approx.)
Ambient sensor			
Connector	Terminal		
E53	1	Ground	5 V

Is the inspection result normal?

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

2. CHECK AMBIENT SENSOR GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect PTC heater control unit connector.
3. Check continuity between ambient sensor harness connector and A/C auto amp harness connector.

Ambient sensor		PTC heater control unit		Continuity
Connector	Terminal	Connector	Terminal	
E53	2	M25	5	Existed

Is the inspection result normal?

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

3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-278, "Component Inspection".

Is the inspection result normal?

YES >> Replace PTC heater control unit.
NO >> Replace ambient sensor.

4.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect PTC heater control unit connector.
3. Check continuity between ambient sensor harness connector and PTC heater control unit harness connector.

Ambient sensor		PTC heater control unit		Continuity
Connector	Terminal	Connector	Terminal	
E53	1	M25	12	Existed

Is the inspection result normal?

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

5.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between ambient sensor harness connector and ground.

Ambient sensor		—	Continuity
Connector	Terminal		
E53	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace PTC heater control unit.
NO >> Repair harness or connector.

Component Inspection

INFOID:0000000006660966

1.CHECK AMBIENT SENSOR

1. Remove ambient sensor.
2. Check resistance between ambient sensor terminals. Refer to applicable table for the normal value.

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.

POWER SUPPLY AND GROUND CIRCUIT
PTC HEATER CONTROL UNIT

PTC HEATER CONTROL UNIT : Diagnosis Procedure

INFOID:0000000006660993

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuses (No. 3 and 7).
   NOTE:
   Refer to PG-23, "Fuse and Fusible Link 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 PTC HEATER CONTROL UNIT POWER SUPPLY

1. Disconnect PTC heater control unit connector.
2. Check voltage between PTC heater control unit harness connector and ground.

+		−	Voltage (Approx.)		
PTC heater control unit			Ignition switch position		
Connector	Terminal		OFF	ACC	ON voltage
M25	3	Ground	0 V	0 V	Battery voltage
	10		Battery voltage	Battery voltage	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between PTC heater control unit and fuse.

3.CHECK PTC HEATER CONTROL UNIT GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between PTC heater control unit harness connector and ground.

PTC heater control unit		—	Continuity
Connector	Terminal		
M25	2	Ground	Existed

Is the inspection result normal?

YES >> Replace PTC heater control unit.
NO >> Repair harness or connector.

A/C SWITCH

Component Function Check

INFOID:0000000006660873

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “AIR COND SW” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
AIR COND SW	A/C switch	While pushing	On
		While not pushing	Off

Is the inspection result normal?

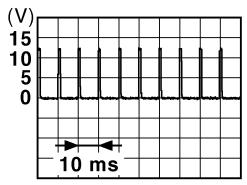
YES >> INSPECTION END
NO >> Refer to HAC-281, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660874

1.CHECK A/C SWITCH POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect A/C control connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C control harness connector and ground with using oscilloscope.

+		–	Output waveform
A/C control			
Connector	Terminal		
M53	1	Ground	 JPMIA0012GB

Is the inspection result normal?

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

2.CHECK A/C SWITCH GROUND CIRCUIT FOR OPEN

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

A/C control		—	Continuity
Connector	Terminal		
M53	8	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-239, "Removal and Installation".
NO >> Repair harness or connector.

3.CHECK A/C SWITCH POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect BCM connector.
3. Check continuity between A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	1	M65 (without Intelligent Key) M68 (with Intelligent Key)	27	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK A/C SWITCH POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between A/C control harness connector and ground.

A/C control		—	Continuity
Connector	Terminal		
M53	1	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

BLOWER FAN ON SIGNAL

Component Function Check

INFOID:0000000006660875

1.CHECK BLOWER FAN ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “FAN ON SIG” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
FAN ON SIG	Fan control dial	Except OFF position	On
		OFF position	Off

Is the inspection result normal?

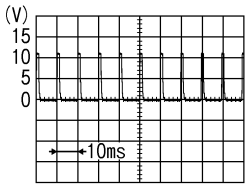
YES >> INSPECTION END
NO >> Refer to HAC-283, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660876

1.CHECK FAN SWITCH POWER SUPPLY SIGNAL

1. Turn ignition switch OFF.
2. Disconnect A/C control harness connector.
3. Turn ignition switch ON.
4. Check output waveform between A/C control and ground with using oscilloscope.

+		–	Output waveform
A/C control			
Connector	Terminal		
M53	14	Ground	

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Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-304, "Removal and Installation".
NO >> GO TO 2.

2.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	14	M65 (without Intelligent Key) M68 (with Intelligent Key)	28	Existed

Is the inspection result normal?

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

3.CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C control harness connector and ground.

A/C control		—	Continuity
Connector	Terminal		
M53	14	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

THERMO CONTROL AMPLIFIER

Component Function Check

INFOID:0000000006660877

1.CHECK A/C ON SIGNAL

With CONSULT-III
1. Turn ignition switch ON.
2. Select “AIR CONDITIONER” of “BCM” using CONSULT-III.
3. Select “THERMO AMP” in “DATA MONITOR” mode, and check status under the following condition.

Monitor item	Condition		Status
THERMO AMP	Ignition switch	ON	On
		OFF	Off

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-285, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660878

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 15, located in fuse block (J/B)].

NOTE:
Refer to PG-22, "Fuse, Connector and 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 THERMO CONTROL AMP. POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect thermo control amp. connector.
3. Turn ignition switch ON.
4. Check voltage between thermo control amp. harness connector and ground.

+		–	Voltage
Thermo control amp.			
Connector	Terminal		
M43	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between thermo control amp. and fuse.

3.CHECK THERMO CONTROL AMP. GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between thermo control amp. harness connector and ground.

Thermo control amp.		—	Continuity
Connector	Terminal		
M43	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4. CHECK THERMO CONTROL AMP. SIGNAL

1. Turn ignition switch ON.
2. Check voltage between thermo control amp. harness connector and ground.

+		–	Voltage (Approx.)
Thermo control amp.			
Connector	Terminal		
M43	3	Ground	12 V

Is the inspection result normal?

YES >> Replace thermo control amp. Refer to HAC-305, "Removal and Installation".
NO >> GO TO 5.

5. CHECK THERMO CONTROL AMP. SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM connector.
3. Check continuity between thermo control amp. harness connector and BCM harness connector.

Thermo control amp.		A/C control		Continuity
Connector	Terminal	Connector	Terminal	
M43	3	M65 (with Intelligent Key) M68 (without Intelligent Key)	26	Existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

A/C INDICATOR

Diagnosis Procedure

INFOID:0000000006660879

1.CHECK SYMPTOM

Check symptom.

A/C indicator dose not turn ON>>GO TO 2.
A/C indicator dose not turn OFF>>GO TO 6.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 15, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK A/C INDICATOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between A/C control harness connector and ground.

+		–	Voltage
A/C control			
Connector	Terminal		
M53	7	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector between A/C control and fuse.

4.CHECK A/C INDICATOR CIRCUIT

Check voltage between A/C control harness connector and ground.

+		–	Voltage (Approx.)
A/C control			
Connector	Terminal		
M53	2	Ground	12 V

Is the inspection result normal?

YES >> GO TO 5.
NO >> Replace A/C control. Refer to HAC-304, "Removal and Installation".

5.CHECK A/C INDICATOR CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect A/C control connector and BCM connector.
3. Check continuity between A/C control harness connector and BCM harness connector.

A/C control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M53	2	M66 (without Intelligent Key)	63	Existed
		M69 (with Intelligent Key)	72	Existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

6. CHECK A/C INDICATOR CIRCUIT FOR SHORT

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

A/C control		—	Continuity
Connector	Terminal		
M53	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000006660880

1.CHECK SYMPTOM

Check symptom (A or B).

	Symptom
A	Blower motor does not operate at any dial position
B	Blower motor does not operate at any dial position other than 4, or operation speed is not normal.

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 7.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 15A fuses (Nos. 14 and 16, located in fuse block (J/B)].

NOTE:
Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK BLOWER MOTOR POWER SUPPLY

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

+		–	Voltage
Blower motor			
Connector	Terminal		
M40	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Check blower relay. Refer to HAC-291, "Component Inspection (Blower Relay)".

Is the inspection result normal?

YES >> Repair harness or connector between blower motor and fuse.
NO >> Replace blower relay.

5.CHECK FAN SWITCH GROUND CIRCUIT FOR OPEN

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

A/C control		—	Continuity
Connector	Terminal		
M53	9	Ground	Existed

Is the inspection result normal?

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

6. CHECK FAN SWITCH 4 POSITION CIRCUIT FOR OPEN

Check continuity between A/C control harness connector and blower motor harness connector.

A/C control		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M53	13	M40	2	Existed

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair the harness or connector.

7. CHECK BLOWER FAN RESISTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect blower fan resistor connector.
3. Turn ignition switch ON.
4. Check voltage between blower fan resistor harness connector and ground.

+		–	Voltage
Blower fan resistor			
Connector	Terminal		
M58	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector between blower fan resistor and blower motor.

8. CHECK BLOWER FAN RESISTOR

1. Turn the ignition switch OFF.
2. Check blower fan resistor. Refer to HAC-291, "Component Inspection (Blower Fan Resistor)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace blower fan resistor. Refer to HAC-307, "Removal and Installation".

9. CHECK FAN SWITCH 1, 2, 3 POSITION CIRCUIT FOR OPEN

Check continuity between A/C control harness connector and blower fan resistor.

A/C control		Blower fan resistor		Continuity
Connector	Terminal	Connector	Terminal	
M53	12	M58	2	Existed
	11		3	
	10		4	

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair harness or connector.

10. CHECK FAN SWITCH

Check fan switch. Refer to HAC-292, "Component Inspection (Fan Switch)".

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
NO >> Replace A/C control. Refer to HAC-304, "Removal and Installation".

Component Inspection (Blower Motor)

INFOID:0000000006660881

1.CHECK BLOWER MOTOR

1. Remove blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
2. Check that there is not any mixing foreign object in the blower motor.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

3.CHECK BLOWER MOTOR

Check that blower motor turns smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

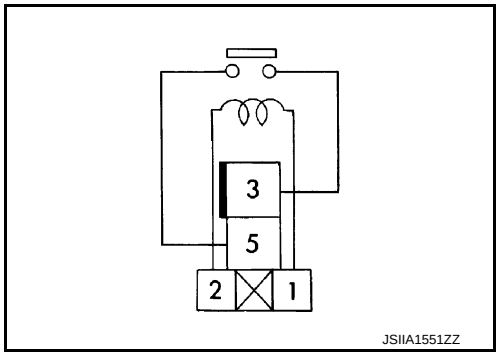
Component Inspection (Blower Relay)

INFOID:0000000006660882

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-22, "Fuse, Connector and Terminal Arrangement".
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed



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Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower relay.

Component Inspection (Blower Fan Resistor)

INFOID:0000000006660883

1.CHECK BLOWER FAN RESISTOR

1. Disconnect blower fan resistor connector.
2. Check resistance between blower fan resistor terminals. Refer to applicable table for the normal value.

Terminal		Resistance: Ω (Approx.)
1	2	0.43
	3	1.03
	4	3

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower fan resistor. Refer to HAC-307, "Removal and Installation".

Component Inspection (Fan Switch)

INFOID:0000000006660884

1.CHECK FAN SWITCH

Check continuity between A/C control terminals.

Terminal		Condition	Continuity
		Fan control dial position	
9	10	1st	Existed
	11	2nd	
	12	3rd	
	13	4th	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace A/C control. Refer to HAC-304, "Removal and Installation".

MAGNET CLUTCH

Component Function Check

INFOID:0000000006660885

1.CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-12, "Diagnosis Description" (with Intelligent Key) or PCS-43, "Diagnosis Description" (without Intelligent Key).

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-293, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660886

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 49, located in IPDM E/R).
   NOTE:
   Refer to PG-25, "Fuse, Connector and 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 MAGNET CLUTCH

1. Disconnect compressor connector.
2. Directly apply battery voltage to the magnet clutch. Check for operation visually and by sound.

Does it operate normally?

YES >> GO TO 3.
NO-1 >> HR16DE: Replace magnet clutch. Refer to HA-32, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".
NO-2 >> MR16DDT: Replace magnet clutch. Refer to HA-88, "MAGNET CLUTCH : Removal and Installation of Compressor Clutch".

3.CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT FOR OPEN

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

IPDM E/R		Compressor		Continuity
Connector	Terminal	Connector	Terminal	
E15	56	F17 (HR16DE and MR16DDT)	1	Existed
		F61 (K9K)		

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Repair harness or connector.

PTC HEATER

Component Function Check

INFOID:0000000006660989

1.CHECK PTC HEATER OPERATION

1. Start the engine.
2. Operate fan control dial.
3. Operate temperature control dial to full hot position.
4. Check for warm air at discharge air outlet.

NOTE:
- Engine must be cold.
- Battery must be charged.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Refer to HAC-294, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000006660990

1.CHECK FUSE AND FUSIBLE LINK

1. Turn ignition switch OFF.
2. Check 30A fuses (Nos. 32 and 36) and 40A fusible link (letter F).

NOTE:
Refer to PG-23, "Fuse and Fusible Link Arrangement".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace the blown fuse or fusible link after repairing the affected circuit if a fuse or fusible link is blown.

2.CHECK PTC RELAY POWER SUPPLY

1. Disconnect PTC relay connector.
2. Turn ignition switch ON.
3. Check voltage between PTC relay harness connector and ground.

Relay	+		–	Voltage
	PTC relay			
	Connector	Terminal		
1	E83	2	Ground	Battery voltage
		3		
2	E84	2		
		3		
3	E85	2		
		3		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between PTC relay and fuse or fusible link.

3.CHECK PTC RELAY CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect PTC heater control unit connector.
2. Check continuity between PTC relay harness connector and PTC heater control unit harness connector.

PTC relay			PTC heater control unit		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E83	1	M25	14	Existed
2	E84			15	
3	E85			16	

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair harness or connector.

4.CHECK PTC HEATER POWER SUPPLY CIRCUIT FOR OPEN

Check continuity between PTC relay harness connector and PTC heater harness connector.

PTC relay			PTC heater		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E83	5	E116	1	Existed
2	E84			3	
3	E85			5	

Is the inspection result normal?

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

5.CHECK PTC HEATER GROUND CIRCUIT FOR OPEN

Check continuity between PTC heater harness connector and ground.

PTC heater		—	Continuity
Connector	Terminal		
E117	2	Ground	Existed
	4		

Is the inspection result normal?

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

6.CHECK PTC RELAY

Check PTC relay. Refer to HAC-295, "Component Inspection (PTC Relay)".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace malfunctioning PTC relay.

7.CHECK PTC HEATER

Check PTC heater. Refer to HAC-296, "Component Inspection (PTC Heater)".

Is the inspection result normal?

YES >> Replace PTC heater control unit.
NO >> Replace PTC heater.

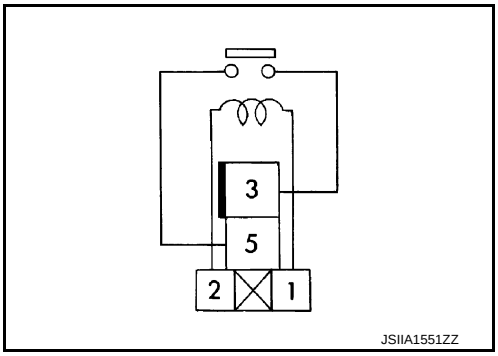
Component Inspection (PTC Relay)

INFOID:0000000006660991

1.CHECK PTC RELAY

1. Remove PTC relay.

2. Check continuity between PTC relay terminals 3 and 5 when the voltage is supplied between terminals 1 and 2.



Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace malfunctioning PTC relay.

Component Inspection (PTC Heater)

INFOID:0000000006660992

1.CHECK PTC HEATER

Check resistance between PTC heater terminals.

Terminal		Resistance (Ω)
1	2	Except 0 or ∞
3	2 and 4	
5	4	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace PTC heater.

SYMPTOM DIAGNOSIS

MANUAL AIR CONDITIONER SYSTEM

Symptom Table

INFOID:0000000006553417

NOTE:
Perform self-diagnosis with CONSULT-III before performing the symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

Symptom	Corresponding malfunction part	Check item/Reference
• Blower motor does not operate at any dial position. • Blower motor does not operate at any dial position other than 4, or operation speed is not normal.	• Blower motor • Blower motor power supply circuit • The circuit between blower motor and fan switch • The circuit between blower motor and blower fan resistor • The circuit between blower fan resistor and fan switch (A/C control) • Blower fan resistor • Fan switch (A/C control)	HAC-289, "Diagnosis Procedure"
• A/C indicator dose not turn ON. (Compressor operates) • A/C indicator dose not turn OFF. (Compressor stops)	• A/C indicator (A/C control) power supply circuit • The circuit between A/C indicator (A/C control) and BCM • A/C indicator (A/C control) • BCM	HAC-287, "Diagnosis Procedure"
Compressor does not operate. (Blower motor operates)	• Magnet clutch • The circuit between magnet clutch and IPDM E/R • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • A/C ON signal circuit • Blower fan ON signal circuit • CAN communication line • A/C control • Thermo control amp. • BCM	HAC-302, "Diagnosis Procedure"
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)	• Magnet clutch control system • Drive belt slipping • Cooler cycle • Air leakage from each duct	HAC-299, "Diagnosis Procedure"
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)	• Engine cooling system • Heater hose • Heater core • Air leakage from each duct • Power supply system of PTC heater* • The circuit between PTC heater control unit and blower motor* • PTC heater* • PTC heater control unit*	HAC-300, "Diagnosis Procedure"

Symptom		Corresponding malfunction part	Check item/Reference
Noise is heard when the A/C system operates.	During compressor operation	Cooler cycle	• HR16DE: HA-30, "Symptom Table" • MR16DDT: HA-30, "Symptom Table"
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	HAC-291, "Component Inspection (Blower Motor)"
Discharge air temperature dose not change.		• A/C control • Air mix door cable • Air mix door	Check the air mix door installation and door operation
Air outlet dose not change.		• A/C control • Mode door cable • Mode door	Check the mode door installation and door operation
Air inlet dose not change.		• A/C control • Intake door cable • Intake door	Check the intake door installation and door operation

*: With K9K engine models

INSUFFICIENT COOLING

Description

INFOID:0000000006553418

Symptom
- Insufficient cooling
- No cool air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006553419

NOTE:
Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1. CHECK MAGNET CLUTCH OPERATION

1. Turn ignition switch ON.
2. Turn fan control dial ON.
3. Press A/C switch.
4. Check that A/C indicator turns ON. Check visually and by sound that compressor operates.
5. Press A/C switch again.
6. Check that A/C indicator turns OFF. Check that compressor stops.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Perform the diagnosis of “COMPRESSOR DOSE NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-302, "Diagnosis Procedure".

2. CHECK DRIVE BELT

Check tension of drive belt. Refer to the following.
- HR16DE: Refer to EM-154, "Checking".
- MR16DDT: Refer to EM-20, "Checking".
- K9K: Refer to EM-276, "Checking Drive Belts".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Adjust or replace drive belt depending on the inspection results.

3. CHECK REFRIGERANT CYCLE PRESSURE

Connect recovery/recycling recharging equipment to the vehicle and perform pressure inspection with gauge. Refer to the following.
- HR16DE: Refer to HA-28, "Symptom Table".
- MR16DDT: Refer to HA-83, "Symptom Table".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4. CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of the air conditioning system for leakage.

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.
NO >> Repair or replace parts depending on the inspection results.

INSUFFICIENT HEATING

Description

INFOID:0000000006553420

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006553421

NOTE:
Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to the following.
- HR16DE: Refer to CO-37, "Inspection".
- MR16DDT: Refer to CO-11, "Inspection".
- K9K: Refer to CO-62, "Inspection".
2. Check radiator cap (HR16DE and MR16DDT) or reservoir tank cap (K9K). Refer to the following.
- HR16DE: Refer to CO-40, "RADIATOR CAP : Inspection".
- MR16DDT: Refer to CO-15, "RADIATOR CAP : Inspection".
- K9K: Refer to CO-65, "Inspection".
3. Check water flow sounds of the engine coolant. Refer to the following.
- HR16DE: Refer to CO-38, "Refilling".
- MR16DDT: Refer to CO-12, "Refilling".
- K9K: Refer to CO-63, "Refilling".

Is the inspection result normal?

YES-1 >> HR16DE and MR16DDT: GO TO 3.
YES-2 >> K9K: GO TO 2.
NO >> Refill engine coolant and repair or replace the parts depending on the inspection results.

2.CHECK PTC HEATER OPERATION

Check PTC heater operation. Refer to HAC-294, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

3.CHECK HEATER HOSE

Check installation of heater hose by visually or touching.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace parts depending on the inspection results.

4.CHECK HEATER CORE

1. Check temperature of inlet hose and outlet hose of heater core.
2. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.

CAUTION:
Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.

Is the inspection result normal?

YES >> GO TO 5.
NO-1 >> HR16DE: Replace heater core. Refer to HA-56, "HEATER CORE : Removal and Installation".
NO-2 >> MR16DDT: Replace heater core. Refer to HA-116, "HEATER CORE : Removal and Installation".
NO-3 >> K9K: Replace heater core.

5.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of air conditioning system for air leakage.

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.
NO >> Repair or replace parts depending on the inspection results.

COMPRESSOR DOSE DOT OPERATE

Description

INFOID:0000000006553422

SYMPTOM
Compressor dose not operate.

Diagnosis Procedure

INFOID:0000000006553423

NOTE:
- Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.
- Check that refrigerant is enclosed in cooler cycle normally. If the refrigerant amount is shortage from proper amount, perform the inspection of refrigerant leakage

1.CHECK A/C INDICATOR

1. Turn ignition switch ON.
2. Operate blower motor.
3. Check that A/C indicator is turned ON/OFF when operating A/C switch.

Is the inspection result normal?

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

2.CHECK MAGNET CLUTCH OPERATION

Check magnet clutch. Refer to HAC-293, "Component Function Check".

Does it operate normally?

YES >> GO TO 3.
NO >> Repair or replace malfunctioning parts.

3.CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to the following.
- HR16DE: Refer to EC-790, "Component Function Check".
- MR16DDT: Refer to EC-423, "Component Function Check".
- K9K: Refer to EC-960, "DTC Logic".

Is the inspection result normal?

YES >> GO TO 4.
NO >> Repair or replace malfunctioning parts.

4.CHECK BCM OUTPUT SIGNAL

With CONSULT-III
1. Select “DATA MONITOR” mode of “ECM” using CONSULT-III.
2. Select “AIR COND SIG” and “HEATER FAN SW”, and check status under the following conditions.

Monitor item	Condition		Status
AIR COND SIG	A/C switch	OFF (A/C indicator: OFF)	Off
		ON (A/C indicator: ON)	On
HEATER FAN SW	Blower motor	OFF	Off
		ON	On

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-34, "Removal and Installation" (with Intelligent Key) or PCS-63, "Removal and Installation" (without Intelligent Key).
NO >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).

5.CHECK A/C SWITCH

Check A/C switch. Refer to HAC-281, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Repair or replace the malfunctioning parts.

6. CHECK BLOWER FAN ON SIGNAL

Check blower fan ON signal. Refer to HAC-283, "Component Function Check".

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair or replace the malfunctioning parts

7. CHECK THERMO CONTROL AMP.

Check thermo control amp. Refer to HAC-285, "Component Function Check".

Is the inspection result normal?

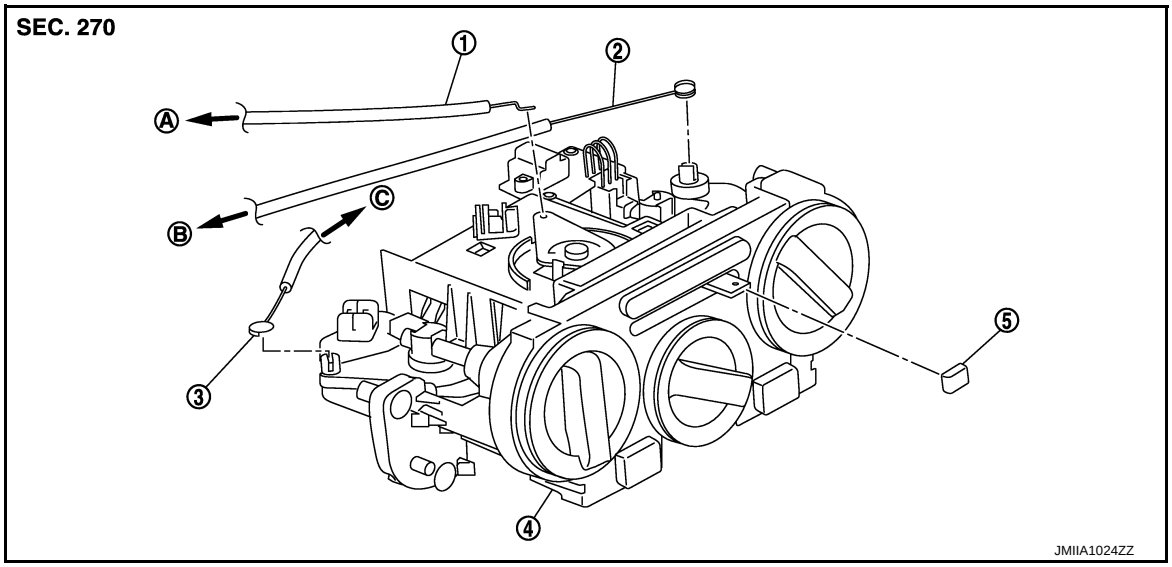
YES >> Replace BCM. Refer to BCS-93, "Removal and Installation" (with Intelligent Key) or BCS-161, "Removal and Installation" (without Intelligent Key).
NO >> Repair or replace the malfunctioning parts

REMOVAL AND INSTALLATION

A/C CONTROL

Exploded View

INFOID:0000000006553424



1. Intake door cable
2. Air mix door cable
3. Mode door cable
4. A/C control
5. Intake door lever knob
A. To intake door link
B. To air mix door link
C. To mode door link

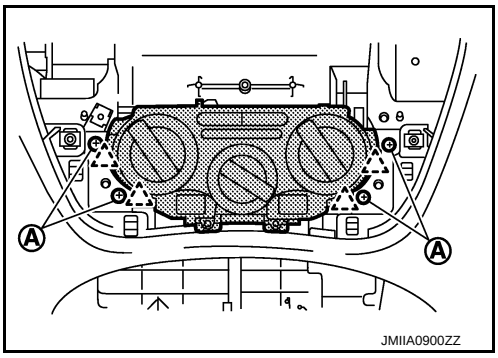
Removal and Installation

INFOID:0000000006553425

REMOVAL

1. Remove A/C finisher. Refer to IP-13, "Removal and Installation".
2. Remove A/C control fixing screws (A) and fixing pawls, and then remove A/C control.

: Pawl



3. Disconnect door cable and harness connector from A/C control.

INSTALLATION

Install in the reverse order of removal.

THERMO CONTROL AMPLIFIER

Removal and Installation

INFOID:0000000006553427

REMOVAL

1. Remove evaporator.
   - Refer to HA-55, "EVAPORATOR : Removal and Installation". (HR16DE)
   - Refer to HA-115, "EVAPORATOR : Removal and Installation". (MR16DDT)
2. Remove the thermo control amp. from evaporator.

INSTALLATION

Note the following items, and then install in the reverse order of removal.

CAUTION:

- **Replace O-ring with new one. Then apply compressor oil to them when installing.**
- **When install the thermo control amp., set the same position before replacement.**
- **When remove the thermo control amp., never turn the bracket which is equipped the top of the thermo control amp.**
- **Check for the leakages when recharging refrigerant. Refer to HA-19, "Leak Test". (HR16DE) or HA-74, "Leak Test". (MR16DDT)**

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000006553428

Refer to HA-39, "Exploded View". (HR16DE)
Refer to HA-94, "Exploded View". (MR16DDT)

Removal and Installation

INFOID:0000000006553429

REMOVAL

Remove refrigerant pressure sensor.
Refer to HA-42, "REFRIGERANT PRESSURE SENSOR : Removal and Installation". (HR16DE)
Refer to HA-96, "REFRIGERANT PRESSURE SENSOR : Removal and Installation". (MR16DDT)

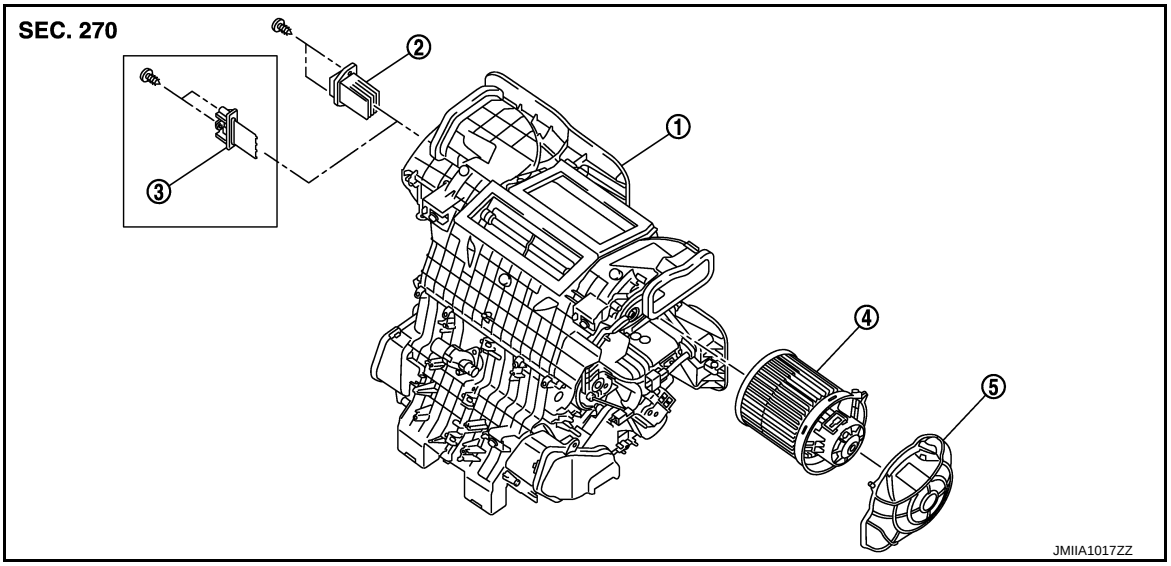
INSTALLATION

Install in the reverse order of removal.

BLOWER FAN RESISTOR

Exploded View

INFOID:0000000006553430



1. A/C unit assembly
2. Fan control amp.*1
3. Blower fan resistor*2
4. Blower motor
5. Blower motor cover
6.

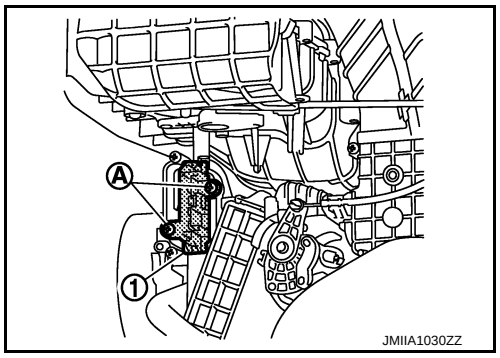
- *1: Automatic air conditioner
- *2: Manual air conditioner

Removal and Installation

INFOID:0000000006553431

REMOVAL

1. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation".
2. Disconnect blower fan resistor connector.
3. Remove fixing screws (A), and then remove blower fan resistor (1).



INSTALLATION

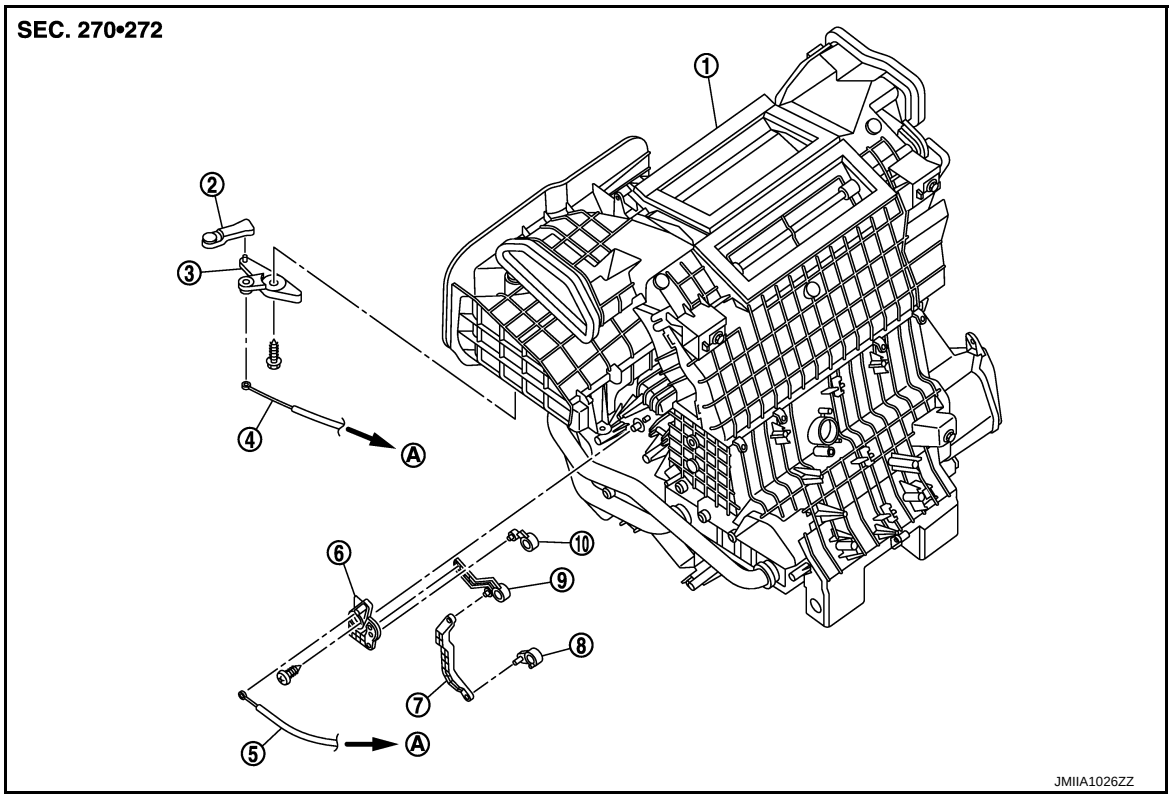
Install in the reverse order of removal.

DOOR CABLE

Exploded View

INFOID:0000000006553432

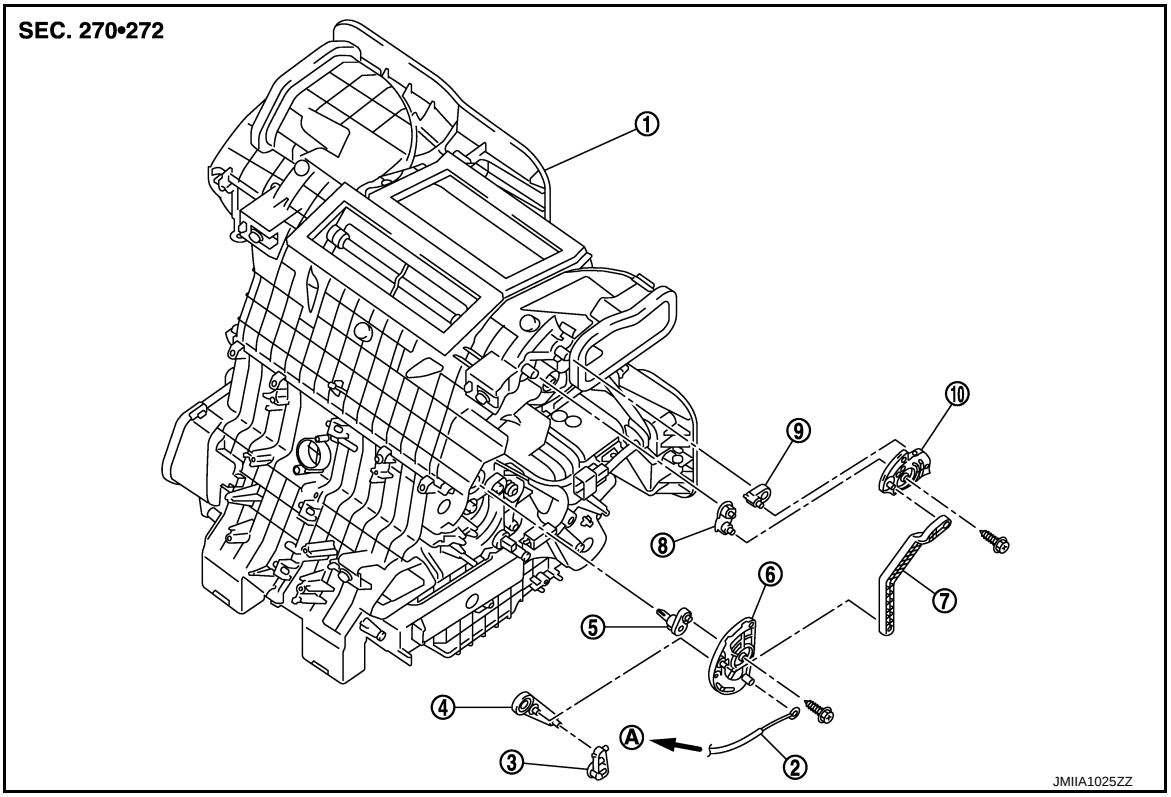
LEFT SIDE



1. A/C unit assembly
2. Intake door lever
3. Intake door link
4. Intake door cable
5. Air mix door cable
6. Air mix door link
7. Air mix door rod
8. Lower air mix door lever
9. Upper air mix door lever
10. Max. cool door

A. To A/C control

RIGHT SIDE



1. A/C unit assembly
2. Mode door cable
3. Foot door lever
4. Foot door link
5. Side ventilator door lever
6. Mode door main link
7. Mode door main link adapter rod
8. Center ventilator door lever
9. Defroster door lever
10. Mode door main link adapter
A. To A/C control

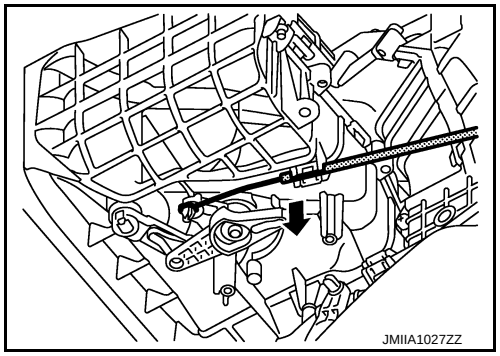
INTAKE DOOR CABLE

INTAKE DOOR CABLE : Removal and Installation

INFOID:0000000006553433

REMOVAL

1. Disconnect intake door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect intake door cable from A/C unit assembly as shown by the arrow in the figure, and then remove intake door cable.



INSTALLATION

Install in the reverse order of removal.

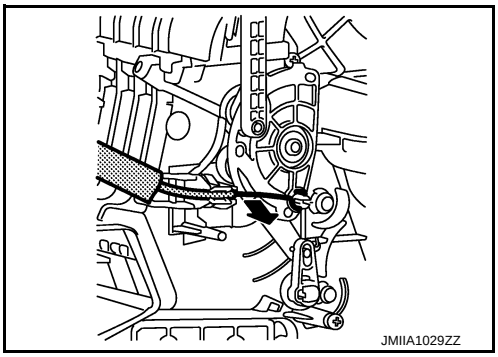
MODE DOOR CABLE

MODE DOOR CABLE : Removal and Installation

INFOID:0000000006553435

REMOVAL

1. Disconnect mode door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove instrument panel RH. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect mode door cable from A/C unit assembly as shown by the arrow in the figure, and then remove mode door cable.



INSTALLATION

Install in the reverse order of removal.

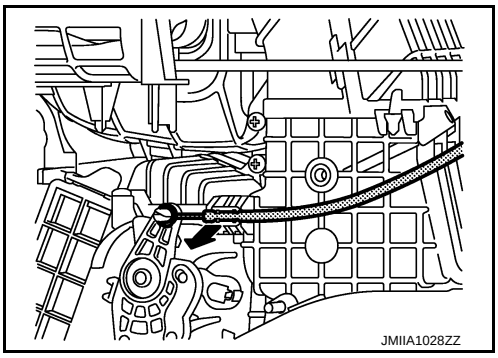
AIR MIX DOOR CABLE

AIR MIX DOOR CABLE : Removal and Installation

INFOID:0000000006553437

REMOVAL

1. Disconnect air mix door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove instrument panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect air mix door cable from A/C unit assembly as shown by the arrow in the figure, and then remove air mix door cable.



INSTALLATION

Install in the reverse order of removal.

HOW TO USE THIS MANUAL

APPLICATION NOTICE

Information

INFOID:0000000006626858

Check the vehicle type to use the service information in this section.

Destination	Service information
Automatic air conditioning (4WD models)	“TYPE 1”
Automatic air conditioning (2WD models)	“TYPE 2”
Manual air conditioning (4WD models)	“TYPE 3”
Manual air conditioning (2WD models)	“TYPE 4”
Manual heater	“TYPE 5”

PRECAUTION

PRECAUTIONS

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

INFOID:0000000006748427

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

The vehicle may be equipped with a passenger air bag deactivation switch. Because no rear seat exists where a rear-facing child restraint can be placed, the switch is designed to turn off the passenger air bag so that a rear-facing child restraint can be used in the front passenger seat. The switch is located in the center of the instrument panel, near the ashtray. When the switch is turned to the ON position, the passenger air bag is enabled and could inflate for certain types of collision. When the switch is turned to the OFF position, the passenger air bag is disabled and will not inflate. A passenger air bag OFF indicator on the instrument panel lights up when the passenger air bag is switched OFF. The driver air bag always remains enabled and is not affected by the passenger air bag deactivation switch.

WARNING:

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the “SRS AIR BAG”.**
- **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.**
- **The vehicle may be equipped with a passenger air bag deactivation switch which can be operated by the customer. When the passenger air bag is switched OFF, the passenger air bag is disabled and will not inflate. When the passenger air bag is switched ON, the passenger air bag is enabled and could inflate for certain types of collision. After SRS maintenance or repair, make sure the passenger air bag deactivation switch is in the same position (ON or OFF) as when the vehicle arrived for service.**

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

WARNING:

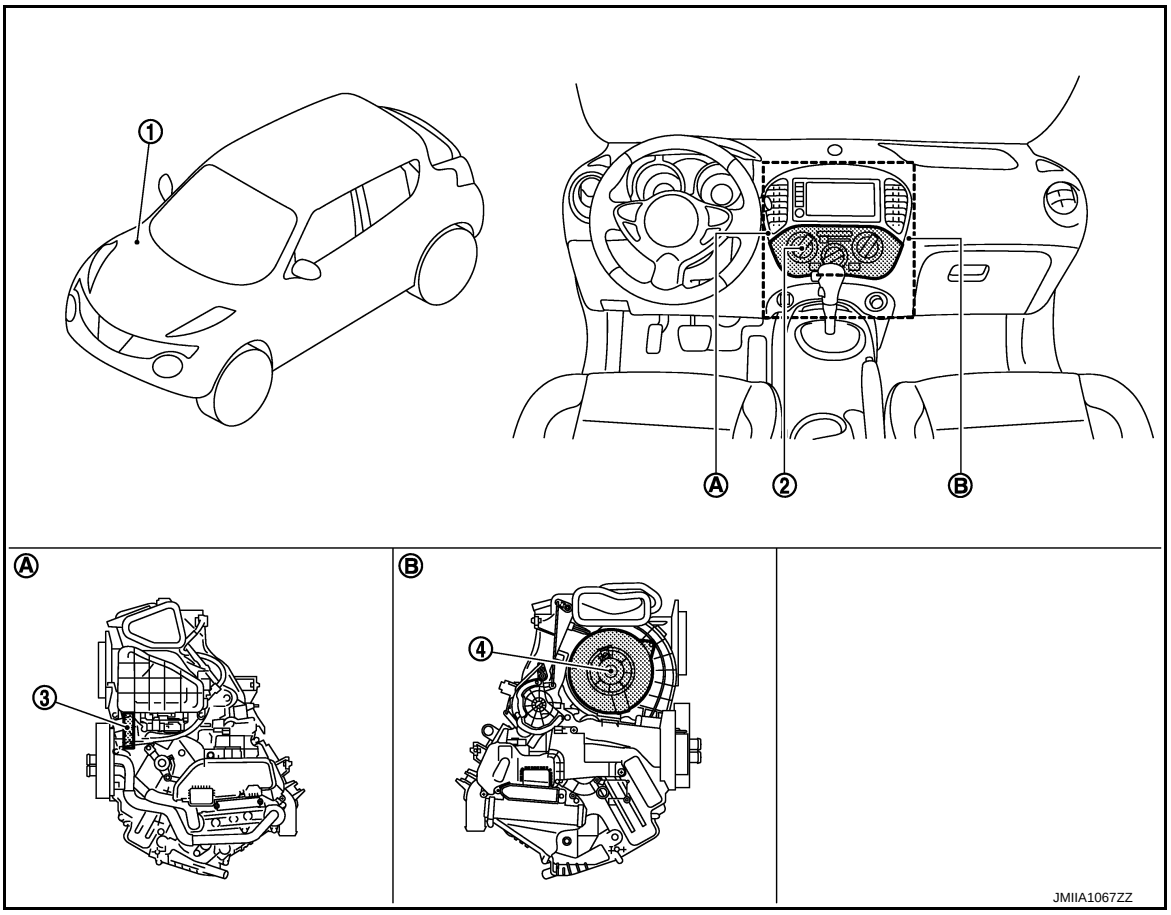
- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious 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.**

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Part Location

INFOID:0000000006557732



1. BCM
   Refer to BCS-161, "Removal and Installation".
2. Heater control
3. Blower fan resistor
4. Blower motor

A. Left side of heater unit assembly
B. Right side of heater unit assembly

Component Description

INFOID:0000000006557733

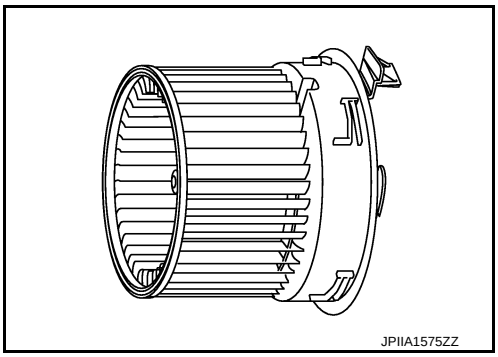
Component		Description
Heater and ventilation unit assembly	Blower motor	HAC-314
	Blower fan resistor	HAC-314
Heater control		HAC-314
BCM		Blower motor status can be checked using CONSULT-III. **NOTE:** BCM is not for controlling the manual heater system

HEATER AND VENTILATION UNIT ASSEMBLY

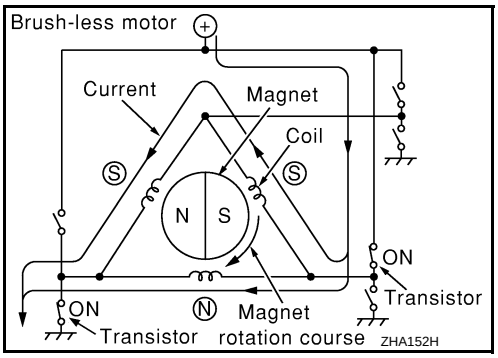
HEATER AND VENTILATION UNIT ASSEMBLY : Blower Motor

INFOID:0000000006557734

- The blower motor utilizes a brush-less motor with a rotating magnet.



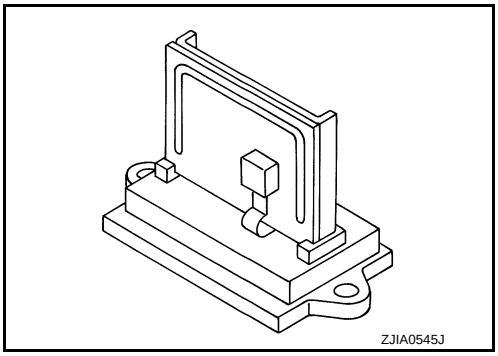
- Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



HEATER AND VENTILATION UNIT ASSEMBLY : Blower Fan Resistor

INFOID:0000000006557735

- Compact and lightweight resistor is adopted with outstanding ventilation.
- Temperature fuse is installed to protects the blower motor circuit.



Heater Control

INFOID:0000000006557736

Controls the heater control function.

SYSTEM

System Description

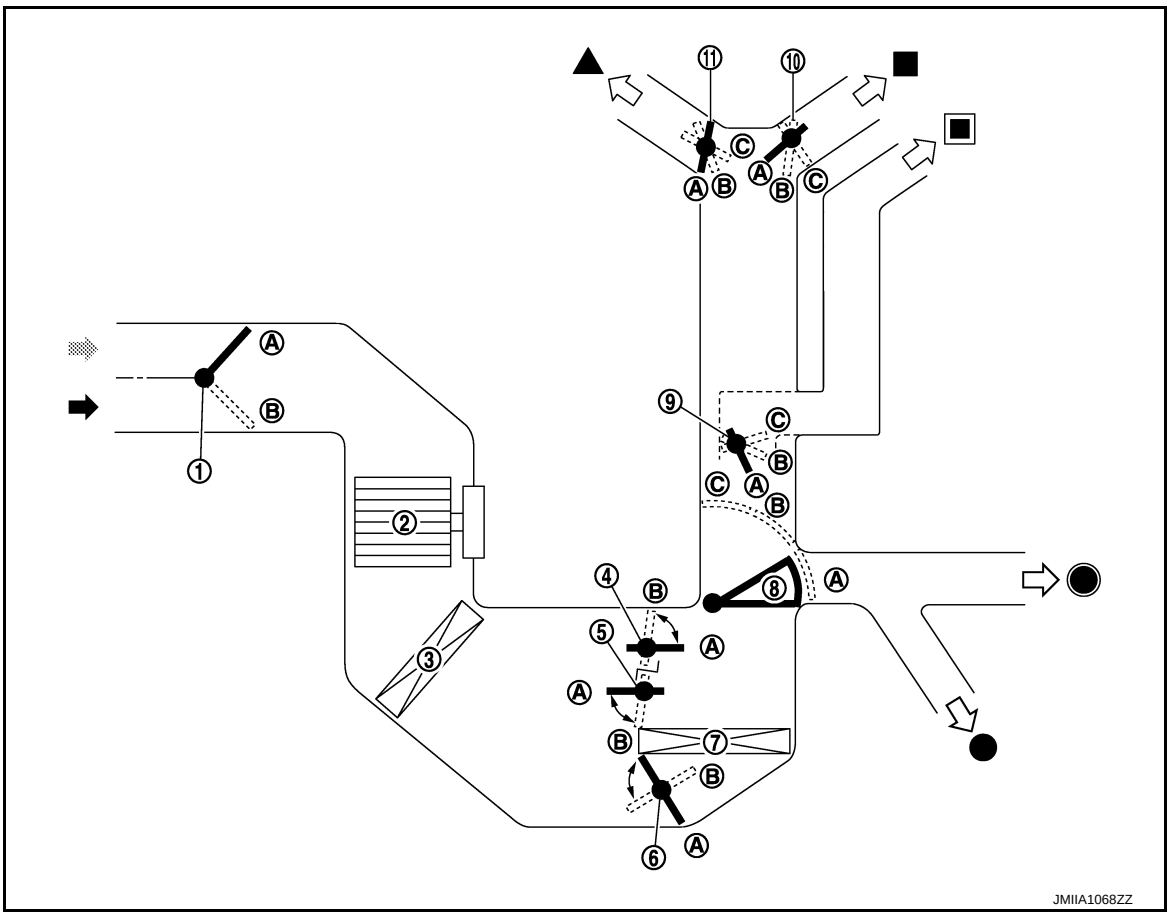
INFOID:0000000006557737

Fan speed of blower motor is changed by the combination of fan control dial (fan switch) operation and blower fan resistor control.

Door Control

INFOID:0000000006557738

SWITCHES AND THEIR CONTROL FUNCTIONS



1. Intake door
2. Blower motor
3. Air conditioner filter
4. Max. cool door
5. Upper air mix door
6. Lower air mix door
7. Heater core
8. Foot door
9. Side ventilator door
10. Center ventilator door
11. Defroster door

Fresh air intake
Recirculation air
Defroster
Center ventilator
Side ventilator
Foot
Rear foot*

*: With rear foot duct

Switch/dial position		Door position							
		Center ventilator door	Side ventilator door	Foot door	Defroster door	Intake door	Max. cool door	Upper air mix door	Lower air mix door
MODE dial		A	A	A	A	—	—	—	—
		B	B	B	A				
		C	C	C	B				
				A	C				
Air intake lever		—	—	—	—	A			
						B			
Temperature control dial	Full cold					—	A	A	A
	Full hot						B	B	B

AIR DISTRIBUTION

Without rear foot duct

MODE/DEF setting position	Discharge air flow			
	Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	52.6%	47.3%	—	—
	34.0%	27.7%	38.4%	—
	—	19.1%	57.9%	23.0%
	—	13.5%	42.4%	44.1%
	—	16.3%	—	83.8%

With rear foot duct

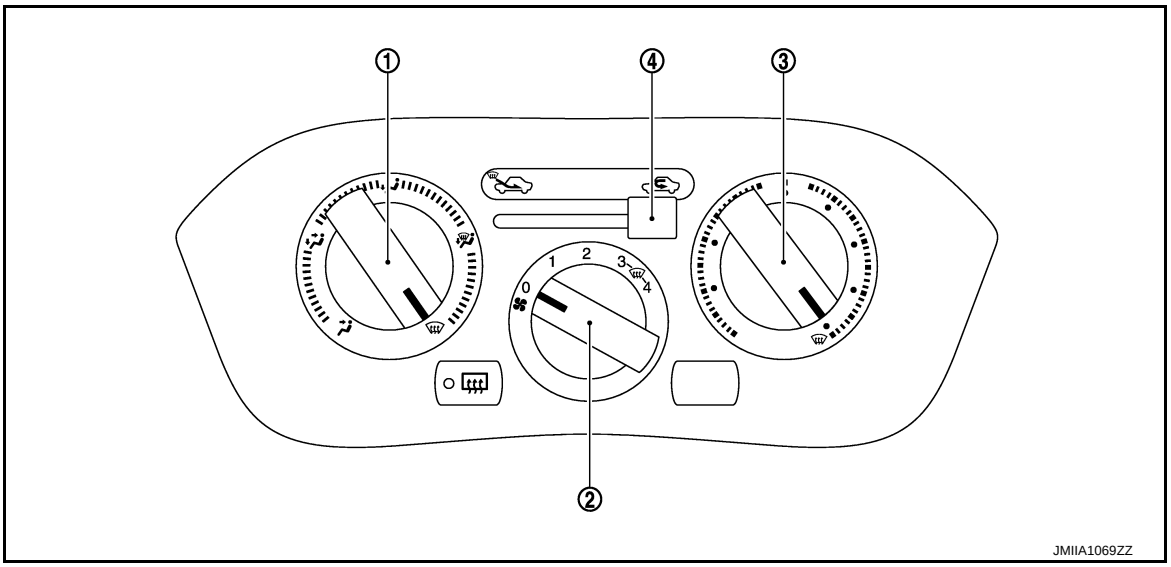
MODE/DEF setting position	Discharge air flow				
	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	52.6%	47.3%	—	—	—
	28.2%	25.9%	29.6%	16.3%	—
	—	16.3%	43.0%	21.0%	19.7%
	—	12.2%	33.1%	16.3%	38.4%
	—	16.3%	—	—	83.8%

OPERATION

Switch Name and Function

INFOID:0000000006557739

HEATER CONTROLLER (HEATER CONTROL)



1. MODE dial
2. Fan control dial
3. Temperature control dial
4. Intake lever

MODE dial	Mode position is selected to an optimal position by operating this dial.
Fan control dial	Fan speed can be adjusted within a range from 1st to 4th.
Temperature control dial	The setting temperature can be selected to an optimum temperature by operating this dial. • Clockwise rotation: Discharge air flow temperature increases • Counterclockwise rotation: Discharge air flow temperature decreases.
Intake lever	The air inlet changes REC ⇔ FRE each time by operation this lever.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006706391

APPLICATION ITEM
CONSULT-III performs the following functions via CAN communication with BCM.

Diagnosis mode	Function Description
Work Support	Changes the setting for each system function.
Self Diagnostic Result	Displays the diagnosis results judged by BCM.
CAN Diag Support Monitor	Monitors the reception status of CAN communication viewed from BCM. Refer to CONSULT-III operation manual.
Data Monitor	The BCM input/output signals are displayed.
Active Test	The signals used to activate each device are forcibly supplied from BCM.
Ecu Identification	The BCM part number is displayed.
Configuration	• Read and save the vehicle specification. • Write the vehicle specification when replacing BCM.

SYSTEM APPLICATION
BCM can perform the following functions for each system.
NOTE:
It can perform the diagnosis modes except the following for all sub system selection items.

×: Applicable item

System	Sub system selection item	Diagnosis mode		
		Work Support	Data Monitor	Active Test
Door lock	DOOR LOCK	×	×	×
Rear window defogger	REAR DEFOGGER		×	×
Warning chime	BUZZER		×	×
Interior room lamp control	INT LAMP	×	×	×
Remote keyless entry system	MULTI REMOTE ENT	×	×	×
Exterior lamp	HEAD LAMP	×	×	×
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER		×	×
• Automatic A/C • Manual A/C • Manual heater	AIR CONDITONER		×	×*2
Combination switch	COMB SW		×	
Body control system	BCM	×		
NATS	IMMU	×		×
Interior room lamp battery saver	BATTERY SAVER	×	×	×
Back door open	TRUNK		×	
Vehicle security system	THEFT ALM	×	×	×
—	RETAINED PWR*1		×	×
Signal buffer system	SIGNAL BUFFER		×	×
—	PANIC ALARM*1			×

- *1: This item is displayed, but is not used.
- *2: For models with automatic A/C, this mode is not used.

AIR CONDITIONER

AIR CONDITIONER : CONSULT-III Function (BCM - AIR CONDITIONER) (Heater and Ventilation)

INFOID:0000000006557741

DATA MONITOR

Display item list

Monitor Item [Unit]		Contents
FAN ON SIG	[On/Off]	Displays blower motor status as judged from blower fan ON signal.
IGN SW	[On/Off]	Displays ignition switch position status as judged form ignition switch signal.

ECU DIAGNOSIS INFORMATION

BCM

List of ECU Reference

INFOID:0000000006557742

ECU	Reference
BCM	BCS-125, "Reference Value"
	BCS-140, "Fail-safe"
	BCS-140, "DTC Inspection Priority Chart"
	BCS-141, "DTC Index"

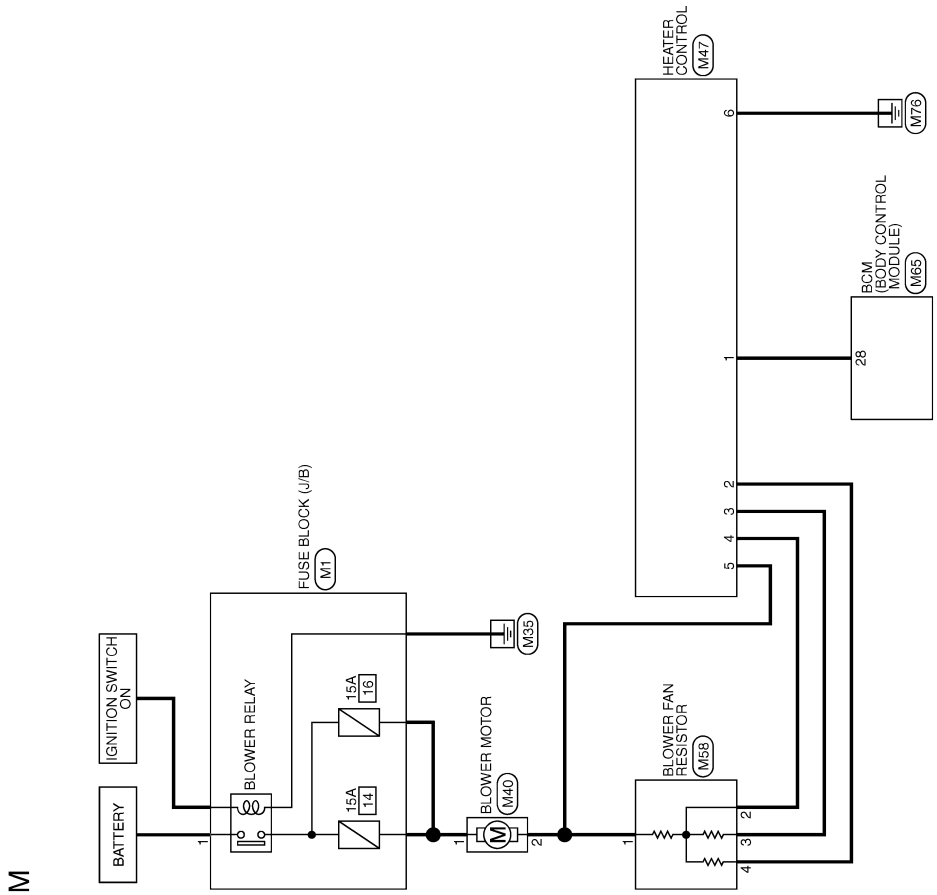
WIRING DIAGRAM

MANUAL HEATER SYSTEM

Wiring Diagram

INFOID:0000000006557743

For connector terminal arrangements, harness layouts, and alphabets in a ⬡ (option abbreviation; if not described in wiring diagram), refer to GI-12, "Connector Information/Explanation of Option Abbreviation".



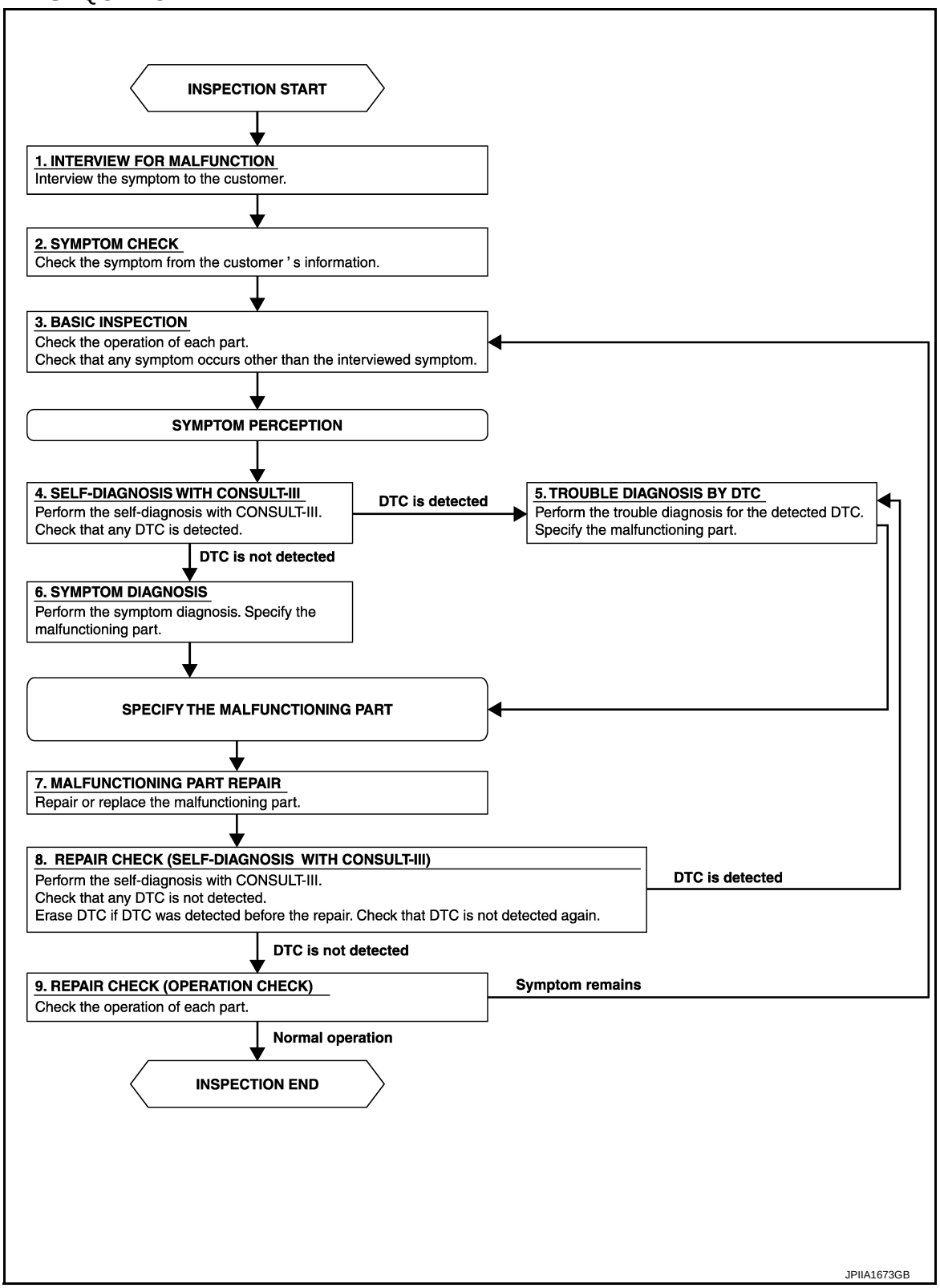
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:0000000006557744

OVERALL SEQUENCE



DETAILED FLOW

1.INTERVIEW FOR MALFUNCTION

Interview the symptom to the customer.

>> GO TO 2.

2.SYMPTOM CHECK

Check the symptom from the customer's information.

>> GO TO 3.

3.BASIC INSPECTION

Check the operation of each part. Check that any symptom occurs other than the interviewed symptom.

>> GO TO 4.

4.SELF-DIAGNOSIS WITH CONSULT-III

Perform the self-diagnosis with CONSULT-III. Check that any DTC is detected.

Is any DTC detected?

YES >> GO TO 5.
NO >> GO TO 6.

5.TROUBLE DIAGNOSIS BY DTC

Perform the trouble diagnosis for the detected DTC. Specify the malfunctioning part.

>> GO TO 6.

6.SYMPTOM DIAGNOSIS

Perform the symptom diagnosis. Specify the malfunctioning part.

>> GO TO 7.

7.MALFUNCTION PART REPAIR

Repair or replace the malfunctioning part.

>> GO TO 8.

8.REPAIR CHECK (SELF-DIAGNOSIS WITH CONSULT-III)

Perform the self-diagnoses with CONSULT-III. Check that any DTC is not detected. Erase DTC if DTC is detected before the repair. Check that DTC is not detected again.

Is any or malfunction result or DTC detected?

YES >> If DTC is detected, GO TO 5.
NO >> GO TO 9.

9.REPAIR CHECK (OPERATION CHECK)

Check the operation of each part.

Does it operate normally?

YES >> INSPECTION END
NO >> GO TO 3.

OPERATION INSPECTION

Work Procedure

INFOID:0000000006557745

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

Check condition : Engine running at normal operating temperature.

1.CHECK BLOWER MOTOR

1. Operate fan control dial.
2. Check that fan speed changes. Check operation for all fan speeds.

Is the inspection result normal?

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

2.CHECK DISCHARGE AIR

1. Operate fan control dial to set the fan speed to maximum speed.
2. Operate MODE dial to each position.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the air outlets. Refer to VTL-5, "System Description".

Is the inspection result normal?

YES >> GO TO 3.
NO >> GO TO 6.

3.CHECK INTAKE AIR

1. Operate intake lever to each position.
2. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

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

4.CHECK DISCHARGE AIR TEMPERATURE

1. Operate temperature control dial.
2. Check that discharge air temperature changes.

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 6.

5.CHECK TEMPERATURE INCREASE

1. Turn temperature control dial to full hot position.
2. Check that warm air blows from air outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 6.

6.CHECK SELF-DIAGNOSIS WITH CONSULT-III

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

Is any DTC detected?

YES >> Perform trouble diagnosis for the detected DTC.
NO >> Refer to HAC-329, "Symptom Table" and perform the appropriate diagnosis.

DTC/CIRCUIT DIAGNOSIS

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000006706105

1.CHECK SYMPTOM

Check symptom (A or B).

	Symptom
A	Blower motor does not operate at any dial position
B	Blower motor does not operate at any dial position other than 4, or operation speed is not normal.

Which symptom is detected?

A >> GO TO 2.
B >> GO TO 7.

2.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 15A fuses (Nos. 14 and 16, located in fuse block (J/B)].
   NOTE:
   Refer to PG-22, "Fuse, Connector and Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit if a fuse is blown.

3.CHECK BLOWER MOTOR POWER SUPPLY

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

+		–	Voltage
Blower motor			
Connector	Terminal		
M40	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BLOWER RELAY

1. Turn ignition switch OFF.
2. Check blower relay. Refer to HAC-327, "Component Inspection (Blower Relay)".

Is the inspection result normal?

YES >> Repair harness or connector between blower motor and fuse.
NO >> Replace blower relay.

5.CHECK FAN SWITCH GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect heater control connector.
3. Check continuity between heater control harness connector and ground.

Heater control		—	Continuity
Connector	Terminal		
M47	6	Ground	Existed

Is the inspection result normal?

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

6. CHECK FAN SWITCH 4 POSITION CIRCUIT FOR OPEN

Check continuity between heater control harness connector and blower motor harness connector.

Heater control		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M47	5	M40	2	Existed

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair the harness or connector.

7. CHECK BLOWER FAN RESISTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect blower fan resistor connector.
3. Turn ignition switch ON.
4. Check voltage between blower fan resistor harness connector and ground.

+		–	Voltage
Blower fan resistor			
Connector	Terminal		
M58	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector between blower fan resistor and blower motor.

8. CHECK BLOWER FAN RESISTOR

1. Turn the ignition switch OFF.
2. Check blower fan resistor. Refer to HAC-327, "Component Inspection (Blower Fan Resistor)".

Is the inspection result normal?

YES >> GO TO 9.
NO >> Replace blower fan resistor. Refer to HAC-332, "Removal and Installation".

9. CHECK FAN SWITCH 1, 2, 3 POSITION CIRCUIT FOR OPEN

Check continuity between heater control harness connector and blower fan resistor.

Heater control		Blower fan resistor		Continuity
Connector	Terminal	Connector	Terminal	
M47	2	M58	4	Existed
	3		3	
	4		2	

Is the inspection result normal?

YES >> GO TO 10.
NO >> Repair harness or connector.

10. CHECK FAN SWITCH

Check fan switch. Refer to HAC-328, "Component Inspection (Fan Switch)".

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
NO >> Replace heater control. Refer to HAC-331, "Removal and Installation".

Component Inspection (Blower Motor)

INFOID:0000000006706106

1.CHECK BLOWER MOTOR

1. Remove blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".
2. Check that there is not any mixing foreign object in the blower motor.

Is the inspection result normal?

YES >> GO TO 2.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

2.CHECK BLOWER MOTOR

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

Is the inspection result normal?

YES >> GO TO 3.
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

3.CHECK BLOWER MOTOR

Check that blower motor turns smoothly.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation (LHD models)" or VTL-16, "Removal and Installation (RHD models)".

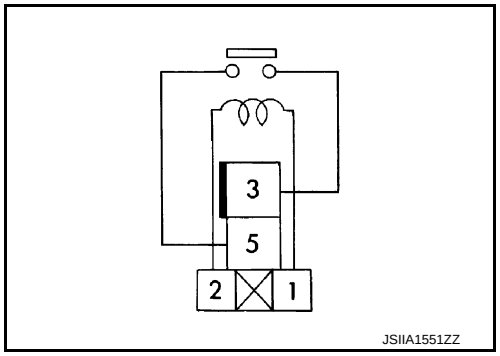
Component Inspection (Blower Relay)

INFOID:0000000006706107

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-22, "Fuse, Connector and Terminal Arrangement".
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Existed
		OFF	Not existed



Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower relay.

Component Inspection (Blower Fan Resistor)

INFOID:0000000006706108

1.CHECK BLOWER FAN RESISTOR

1. Disconnect blower fan resistor connector.
2. Check resistance between blower fan resistor terminals. Refer to applicable table for the normal value.

Terminal		Resistance: Ω (Approx.)
1	2	0.43
	3	1.03
	4	3

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower fan resistor. Refer to HAC-332, "Removal and Installation".

Component Inspection (Fan Switch)

INFOID:0000000006706109

1. CHECK FAN SWITCH

Check continuity between heater control terminals.

Terminal		Condition	Continuity
		Fan control dial position	
6	2	1st	Existed
	3	2nd	
	4	3rd	
	5	4th	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace heater control. Refer to HAC-331, "Removal and Installation".

SYMPTOM DIAGNOSIS

MANUAL HEATER SYSTEM

Symptom Table

INFOID:0000000006557751

NOTE:
Perform self-diagnosis with CONSULT-III before performing the symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

Symptom	Corresponding malfunction part	Check item/Reference
• Blower motor does not operate at any dial position. • Blower motor does not operate at any dial position other than 4, or operation speed is not normal.	• Blower motor • Blower motor power supply circuit • The circuit between blower motor and fan switch • The circuit between blower motor and blower fan resistor • The circuit between blower fan resistor and fan switch (heater control) • Blower fan resistor • Fan switch (heater control)	HAC-325, "Diagnosis Procedure"
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)	• Engine cooling system • Heater hose • Heater core • Air leakage from each duct	HAC-330, "Diagnosis Procedure"
Noise is heard when the heater and ventilation control system operates.	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	HAC-327, "Component Inspection (Blower Motor)"
Discharge air temperature dose not change.	• Heater control • Air mix door cable • Air mix door	Check the air mix door installation and door operation
Air outlet dose not change.	• Heater control • Mode door cable • Mode door	Check the mode door installation and door operation
Air inlet dose not change.	• Heater control • Intake door cable • Intake door	Check the intake door installation and door operation

INSUFFICIENT HEATING

Description

INFOID:0000000006557752

Symptom
- Insufficient heating
- No warm air comes out. (Air flow volume is normal.)

Diagnosis Procedure

INFOID:0000000006557753

NOTE:
Perform self-diagnosis with CONSULT-III before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to CO-37, "Inspection".
2. Check radiator cap. Refer to CO-40, "RADIATOR CAP : Inspection".
3. Check water flow sounds of the engine coolant. Refer to CO-38, "Refilling".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Refill engine coolant and repair or replace parts depending on the inspection results.

2.CHECK HEATER HOSE

Check installation of heater hose by visually or touching.

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair or replace parts depending on the inspection results.

3.CHECK HEATER CORE

1. Check temperature of inlet hose and outlet hose of heater core.
2. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side.
   CAUTION:
   Always perform the temperature inspection in a short period of time because the engine coolant temperature is very hot.

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace heater core. Refer to HA-56, "HEATER CORE : Removal and Installation".

4.CHECK AIR LEAKAGE FROM EACH DUCT

Check duct and nozzle, etc. of air conditioning system for air leakage.

Is the inspection result normal?

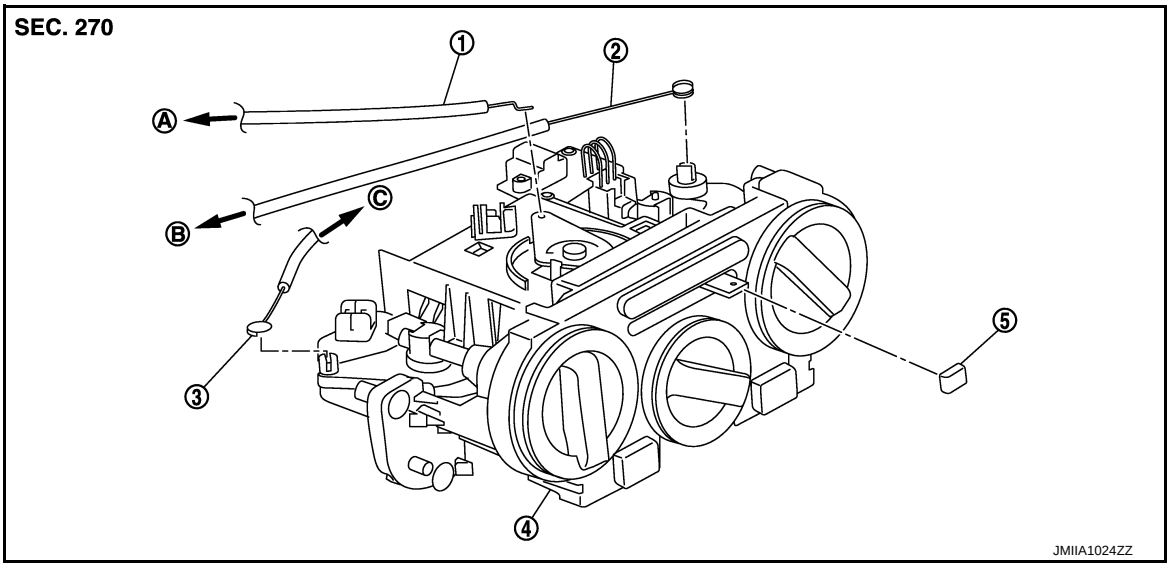
YES >> Check air mix door cable installation and air mix door operation.
NO >> Repair or replace parts depending on the inspection results.

REMOVAL AND INSTALLATION

HEATER CONTROL

Exploded View

INFOID:0000000006706114



1. Intake door cable
2. Air mix door cable
3. Mode door cable
4. Heater control
5. Intake door lever knob
A. To intake door link
B. To air mix door link
C. To mode door link

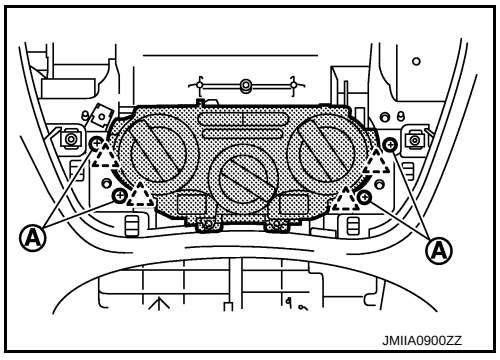
Removal and Installation

INFOID:0000000006706115

REMOVAL

1. Remove A/C finisher. Refer to IP-13, "Removal and Installation".
2. Remove heater control fixing screws (A) and fixing pawls, and then remove heater control.

: Pawl



3. Disconnect door cable and harness connector from heater control.

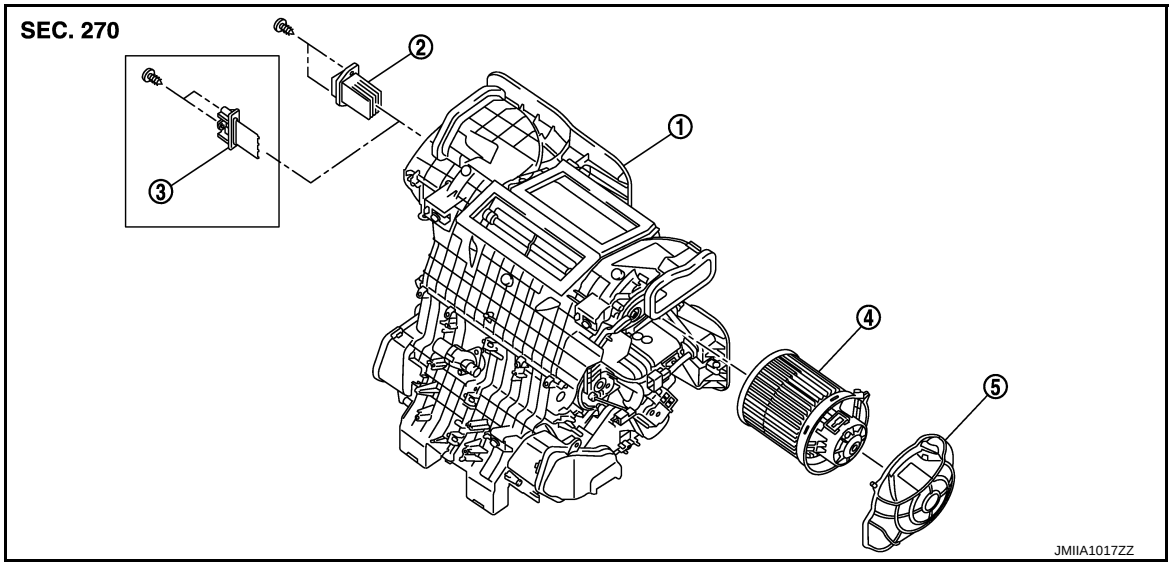
INSTALLATION

Install in the reverse order of removal.

BLOWER FAN RESISTOR

Exploded View

INFOID:0000000006706116



1. Heater unit assembly
2. Fan control amp.*1
3. Blower fan resistor*2
4. Blower motor
5. Blower motor cover
6.

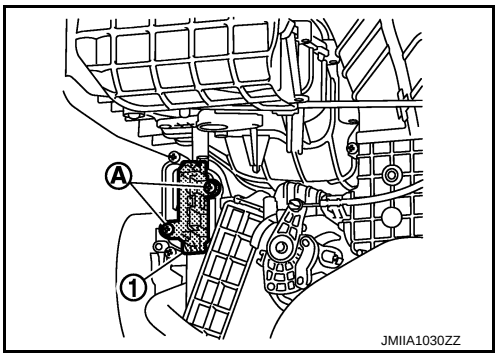
- *1: Automatic air conditioner
- *2: Manual air conditioner or Manual heater

Removal and Installation

INFOID:0000000006706117

REMOVAL

1. Remove instrument panel assembly. Refer to IP-13, "Removal and Installation".
2. Disconnect blower fan resistor connector.
3. Remove fixing screws (A), and then remove blower fan resistor (1).



INSTALLATION

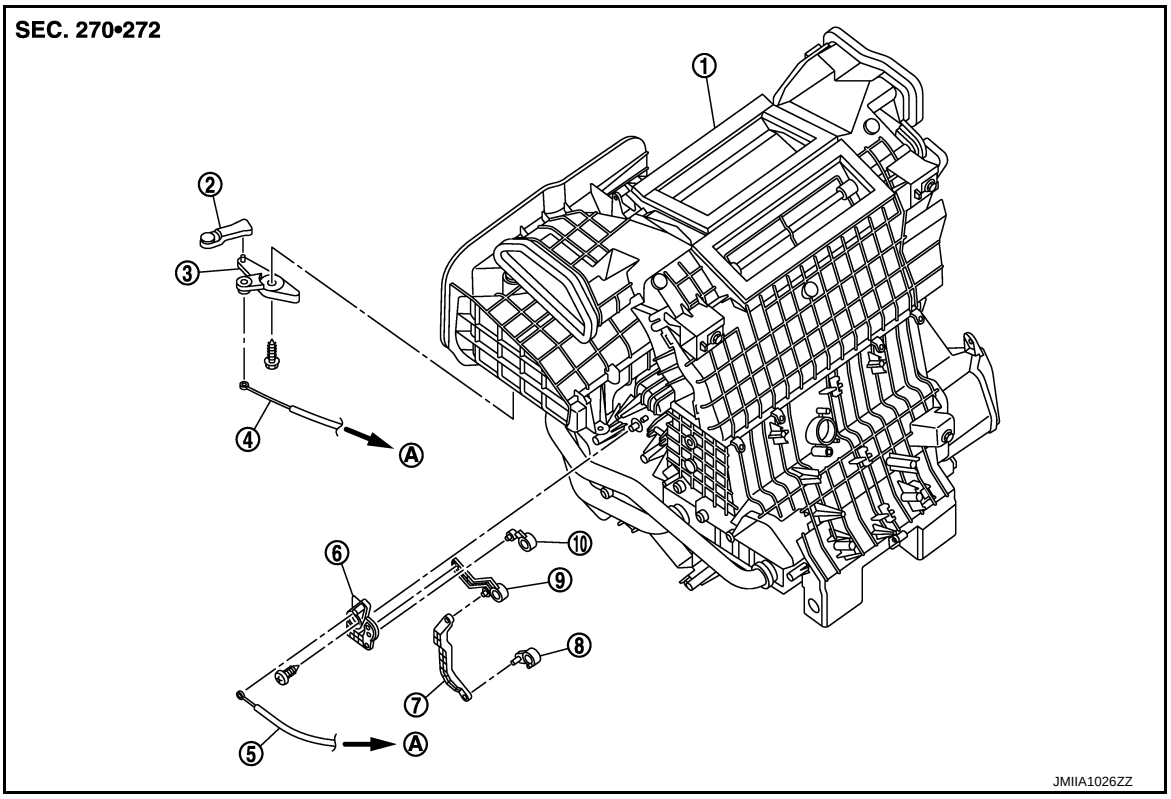
Install in the reverse order of removal.

DOOR CABLE

Exploded View

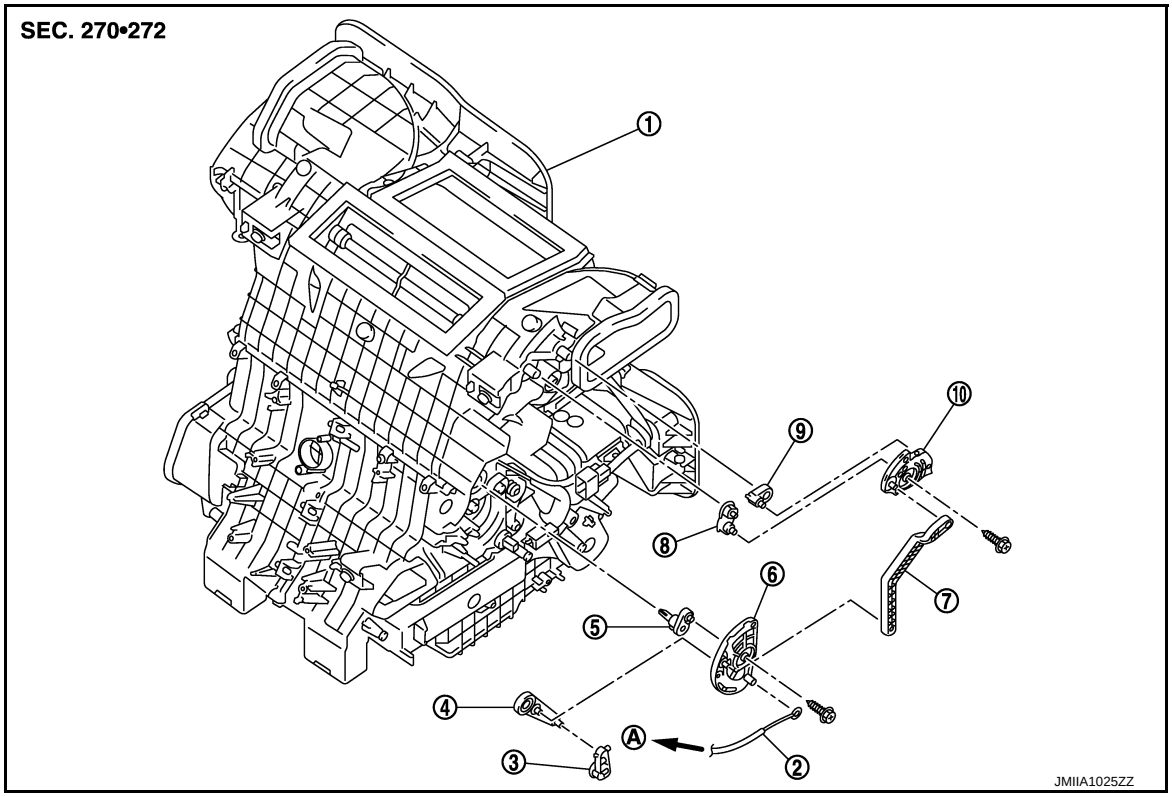
INFOID:0000000006706118

LEFT SIDE



1. Heater unit assembly
2. Intake door lever
3. Intake door link
4. Intake door cable
5. Air mix door cable
6. Air mix door link
7. Air mix door rod
8. Lower air mix door lever
9. Upper air mix door lever
10. Max. cool door
A. To A/C control

RIGHT SIDE



1. Heater unit assembly
2. Mode door cable
3. Foot door lever
4. Foot door link
5. Side ventilator door lever
6. Mode door main link
7. Mode door main link adapter rod
8. Center ventilator door lever
9. Defroster door lever
10. Mode door main link adapter
A. To A/C control

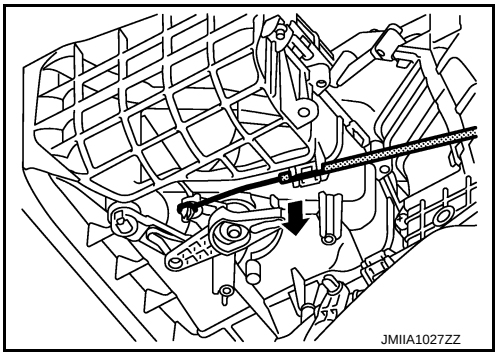
INTAKE DOOR CABLE

INTAKE DOOR CABLE : Removal and Installation

INFOID:0000000006706119

REMOVAL

1. Disconnect intake door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove instrument lower panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect intake door cable from heater unit assembly as shown by the arrow in the figure, and then remove intake door cable.



INSTALLATION

Install in the reverse order of removal.

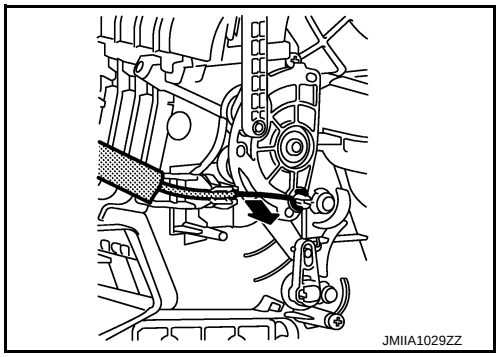
MODE DOOR CABLE

MODE DOOR CABLE : Removal and Installation

INFOID:0000000006706121

REMOVAL

1. Disconnect mode door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove instrument panel RH. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect mode door cable from heater unit assembly as shown by the arrow in the figure, and then remove mode door cable.



INSTALLATION

Install in the reverse order of removal.

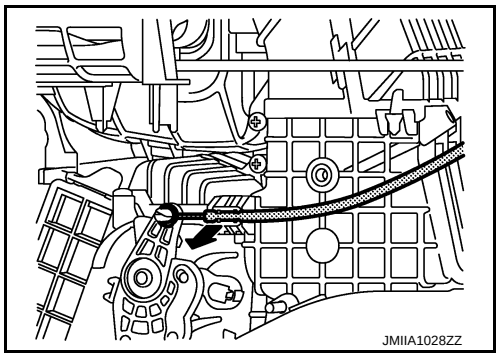
AIR MIX DOOR CABLE

AIR MIX DOOR CABLE : Removal and Installation

INFOID:0000000006706123

REMOVAL

1. Disconnect air mix door cable from A/C control. Refer to HAC-308, "Exploded View".
2. Remove instrument panel LH. Refer to IP-13, "Removal and Installation". (LHD models)
3. Remove glove box assembly. Refer to IP-13, "Removal and Installation". (RHD models)
4. Disconnect air mix door cable from heater unit assembly as shown by the arrow in the figure, and then remove air mix door cable.



INSTALLATION

Install in the reverse order of removal.