SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

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PRECAUTION

PRECAUTIONS

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

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

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.**

Precautions for Removing Battery Terminal

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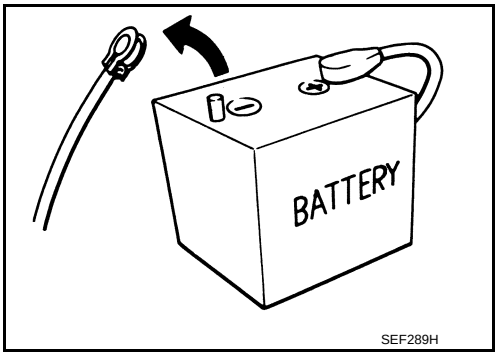
- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.

2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes
K9K engine	: 4 minutes
M9R engine	: 4 minutes
R9M engine	: 4 minutes
V9X engine	: 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

1. Unlock the door with intelligent key or remote keyless entry.
NOTE:
At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
6. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

SYSTEM DESCRIPTION

COMPONENT PARTS

AUTOMATIC AIR CONDITIONING SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM : Component Parts Location

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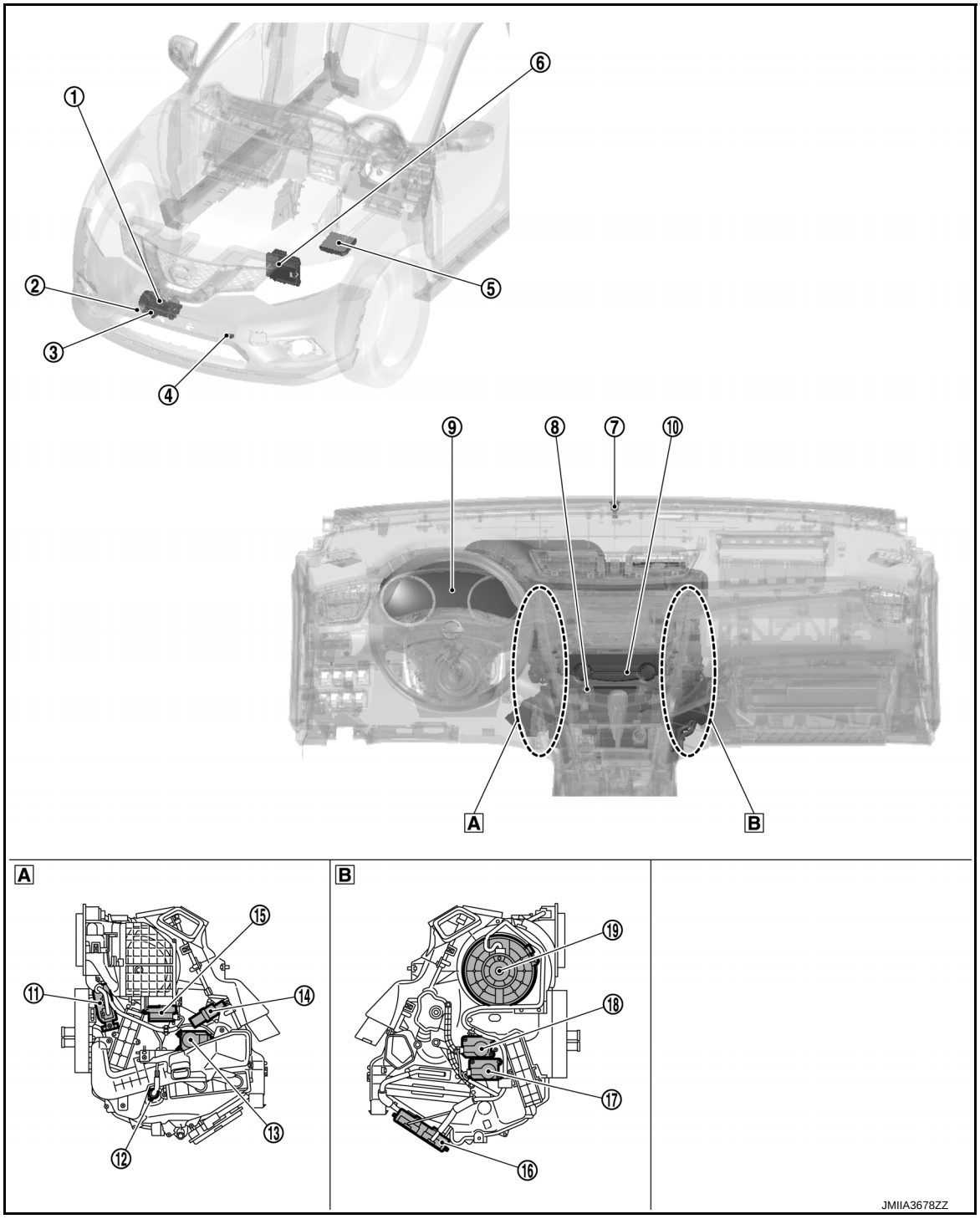

A Left side of A/C unit assembly

B Right side of A/C unit assembly

No.	Component		Function
①	Compressor	Magnet clutch	HAC-17, "COMPRESSOR : Magnet Clutch"
		ECV (electrical control valve)	HAC-18, "COMPRESSOR : ECV (Electrical Control Valve)"
②	Refrigerant pressure sensor (MR20DD engine models and QR25 DE engine models)		HAC-19, "Refrigerant Pressure Sensor"
③	Refrigerant pressure sensor (R9M engine models)		HAC-19, "Refrigerant Pressure Sensor"
④	Ambient sensor		HAC-19, "Ambient Sensor"
⑤	IPDM E/R		A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when receiving A/C compressor request signal from ECM via CAN communication line. Refer to PCS-5, "Component Parts Location" for detailed installation location.
⑥	ECM		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 combination meter via CAN communication line. Refer to EC-28, "ENGINE CONTROL SYSTEM : Component Parts Location" (MR20DD engine models), EC-440, "Component Parts Location" (QR25DE engine models) or EC-812, "Component Parts Location" (R9M engine models) for detailed installation location.
⑦	Sunload sensor		HAC-19, "Sunload Sensor"
⑧	In-vehicle sensor		HAC-19, "In-vehicle Sensor"
⑨	Combination meter		Combination meter transmits ambient temperature signal and vehicle speed signal to A/C auto amp. via CAN communication line.
⑩	A/C control		HAC-18, "A/C Control"
⑪	Power transistor		HAC-17, "A/C UNIT ASSEMBLY : Power Transistor"
⑫	Intake sensor		HAC-14, "A/C UNIT ASSEMBLY : Intake Sensor"
⑬	Air mix door motor (Driver side)		HAC-14, "A/C UNIT ASSEMBLY : Air Mix Door Motor (Driver Side)"
⑭	Aspirator		HAC-14, "A/C UNIT ASSEMBLY : Aspirator"
⑮	Intake door motor		HAC-16, "A/C UNIT ASSEMBLY : Intake Door Motor"
⑯	A/C auto amp.		HAC-18, "A/C Auto Amp."
⑰	Air mix door motor (Passenger side)		HAC-15, "A/C UNIT ASSEMBLY : Air Mix Door Motor (Passenger Side)"
⑱	Mode door motor		HAC-15, "A/C UNIT ASSEMBLY : Mode Door Motor"
⑲	Blower motor		HAC-16, "A/C UNIT ASSEMBLY : Blower Motor"

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : Component Parts Location

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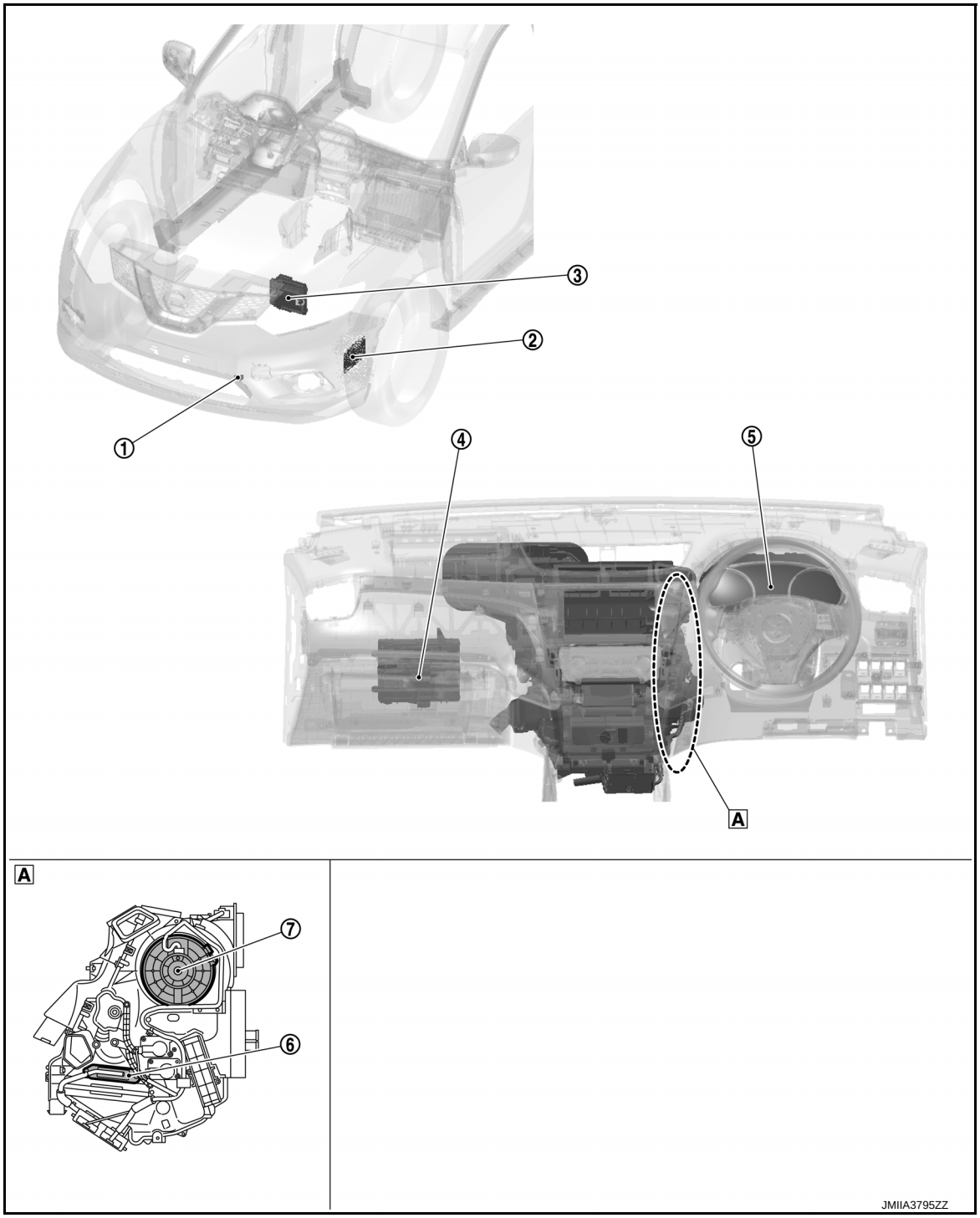
RHD MODELS

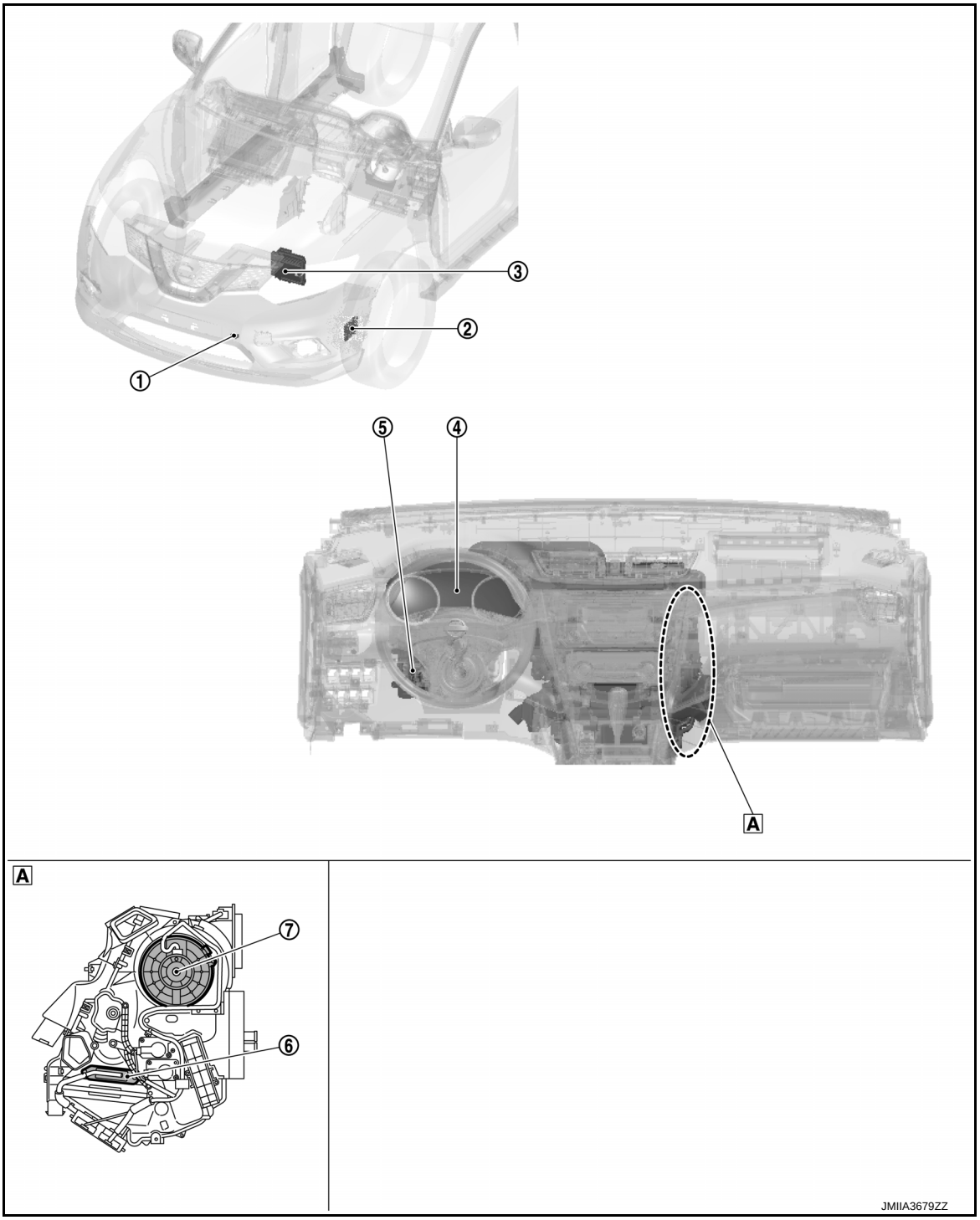


A Right side of A/C unit assembly

No.	Component	Function
①	Ambient sensor	HAC-19, "Ambient Sensor"
②	PTC relay-1/2/3	PTC relay is controlled by BCM, and supplies power supply to PTC heater.
③	ECM	ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to BCM via CAN communication line. Refer to EC-812, "Component Parts Location" for detailed installation location.

No.	Component	Function
④	BCM	BCM receives each signals, and controls PTC relay. BCM transmits idle up signal to ECM according to electrical load condition. Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑤	Combination meter	Combination meter transmits ambient temperature signal to BCM via CAN communication line.
⑥	PTC heater	HAC-17, "A/C UNIT ASSEMBLY : PTC Heater"
⑦	Blower motor	HAC-16, "A/C UNIT ASSEMBLY : Blower Motor"

LHD MODELS



A Right side of A/C unit assembly

No.	Component	Function
①	Ambient sensor	HAC-19, "Ambient Sensor"
②	PTC relay-1/2/3	PTC relay is controlled by BCM, and supplies power supply to PTC heater.
③	ECM	ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to BCM via CAN communication line. Refer to EC-812, "Component Parts Location" for detailed installation location.
④	Combination meter	Combination meter transmits ambient temperature signal to BCM via CAN communication line.
⑤	BCM	BCM receives each signals, and controls PTC relay. BCM transmits idle up signal to ECM according to electrical load condition. Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑥	PTC heater	HAC-17, "A/C UNIT ASSEMBLY : PTC Heater"
⑦	Blower motor	HAC-16, "A/C UNIT ASSEMBLY : Blower Motor"

STOP/START SYSTEM

STOP/START SYSTEM : Component Parts Location

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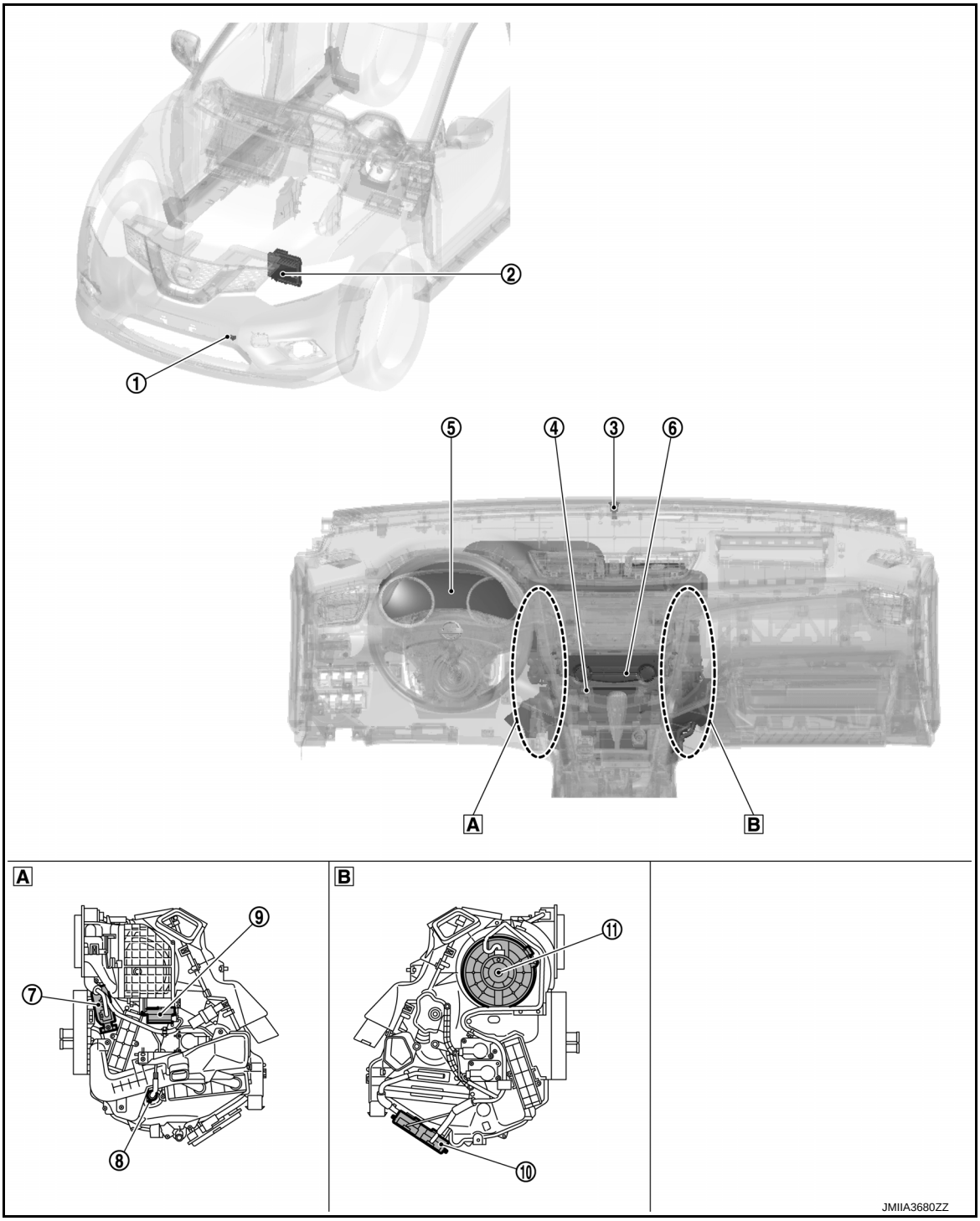

A Left side of A/C unit assembly

B Right side of A/C unit assembly

No.	Component	Function
①	Ambient sensor	Refer to HAC-19, "Ambient Sensor".
②	ECM	ECM transmits engine coolant temperature signal and stop/start status signal to A/C auto amp. via CAN communication line. ECM receives stop/start permit signal from A/C auto amp. via CAN communication line. Refer to EC-812, "Component Parts Location" for detailed installation location.
③	Sunload sensor	HAC-19, "Sunload Sensor"
④	In-vehicle sensor	HAC-19, "In-vehicle Sensor"
⑤	Combination meter	Combination meter transmits ambient temperature signal to A/C auto amp. via CAN communication line.
⑥	A/C control	HAC-18, "A/C Control"
⑦	Power transistor	HAC-17, "A/C UNIT ASSEMBLY : Power Transistor"
⑧	Intake sensor	HAC-14, "A/C UNIT ASSEMBLY : Intake Sensor"
⑨	Intake door motor	HAC-16, "A/C UNIT ASSEMBLY : Intake Door Motor"
⑩	A/C auto amp.	HAC-18, "A/C Auto Amp."
⑪	Blower motor	HAC-16, "A/C UNIT ASSEMBLY : Blower Motor"

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Aspirator

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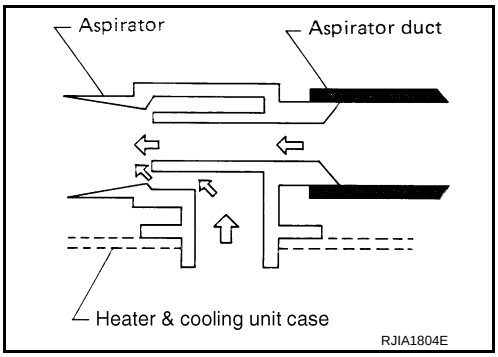
The aspirator generates the vacuum by the air blown from the A/C unit assembly and draws the air of the passenger room to the in-vehicle sensor area via the aspirator duct.



A/C UNIT ASSEMBLY : Intake Sensor

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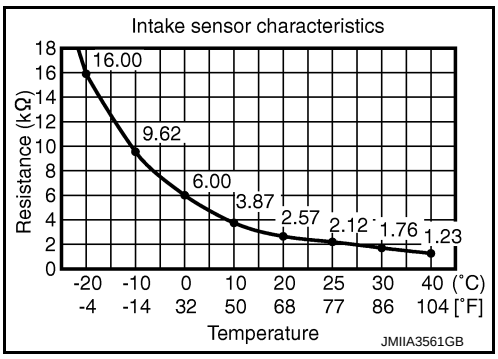
Intake sensor measures evaporator temperature (through air temperature). The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



A/C UNIT ASSEMBLY : Air Mix Door Motor (Driver Side)

INFOID:0000000010939685

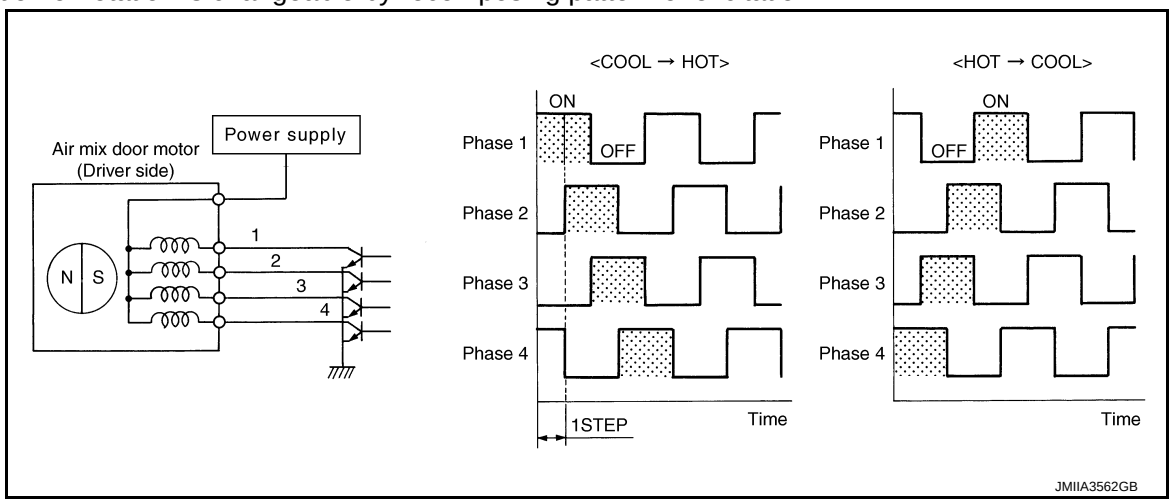
DESCRIPTION

- The step motor system is adopted for air mix door motor (driver side).
- When a drive signal is input from A/C auto amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.

- Rotation of motor is transmitted to air mix door (driver side) by link and lever, then air flow temperature (driver side) is switched.

AIR MIX DOOR MOTOR (DRIVER SIDE) DRIVE METHOD

- The 4 drive coils are excited in sequence in order to drive the motor.
- Direction of rotation is changeable by recomposing pattern of excitation.



A/C UNIT ASSEMBLY : Air Mix Door Motor (Passenger Side)

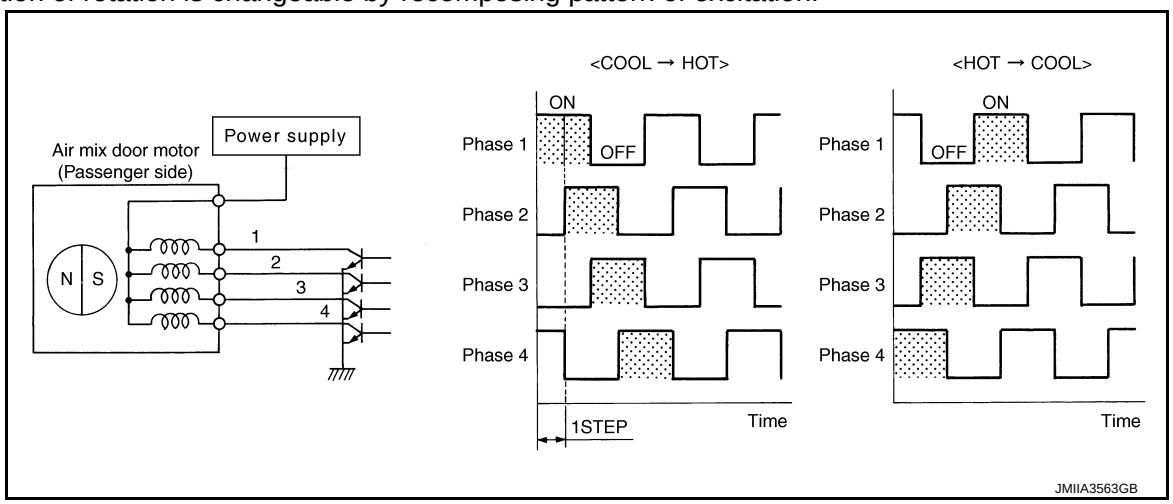
INFOID:0000000010939686

DESCRIPTION

- The step motor system is adopted for air mix door motor (passenger side).
- When a drive signal is input from A/C auto amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.
- Rotation of motor is transmitted to air mix door (passenger side) by link and lever, then air flow temperature (passenger side) is switched.

AIR MIX DOOR MOTOR (PASSENGER SIDE) DRIVE METHOD

- The 4 drive coils are excited in sequence in order to drive the motor.
- Direction of rotation is changeable by recomposing pattern of excitation.



A/C UNIT ASSEMBLY : Mode Door Motor

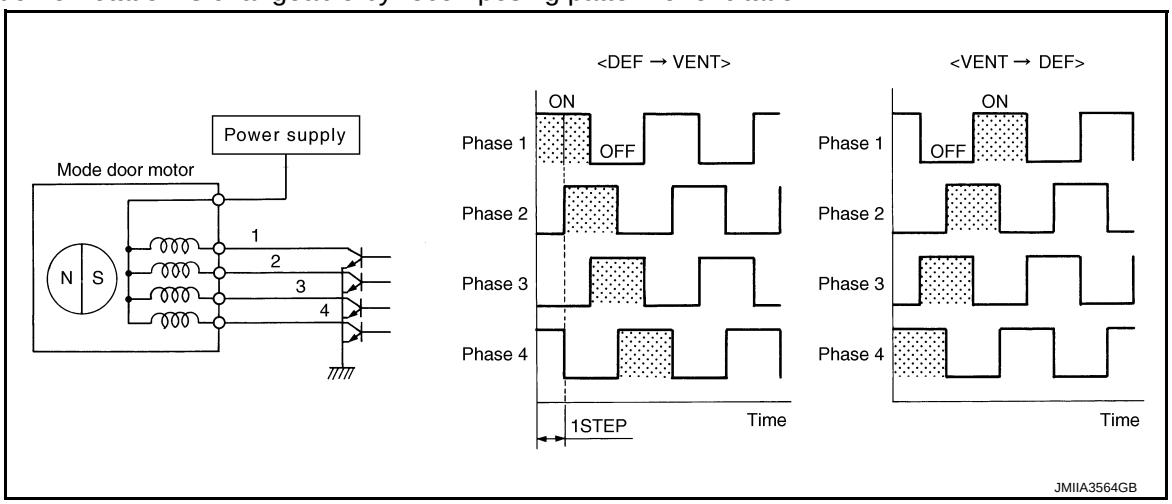
INFOID:0000000010939687

DESCRIPTION

- 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 motor rotates according to the drive signal, and then stops at the target door position.
- Rotation of motor is transmitted to mode door (center ventilator and defroster door, sub defroster door, side ventilator door, and foot door) by link, rod, and lever, then air outlet is switched.

MODE DOOR MOTOR DRIVE METHOD

- The 4 drive coils are excited in sequence in order to drive the motor.
- Direction of rotation is changeable by recomposing pattern of excitation.



A/C UNIT ASSEMBLY : Intake Door Motor

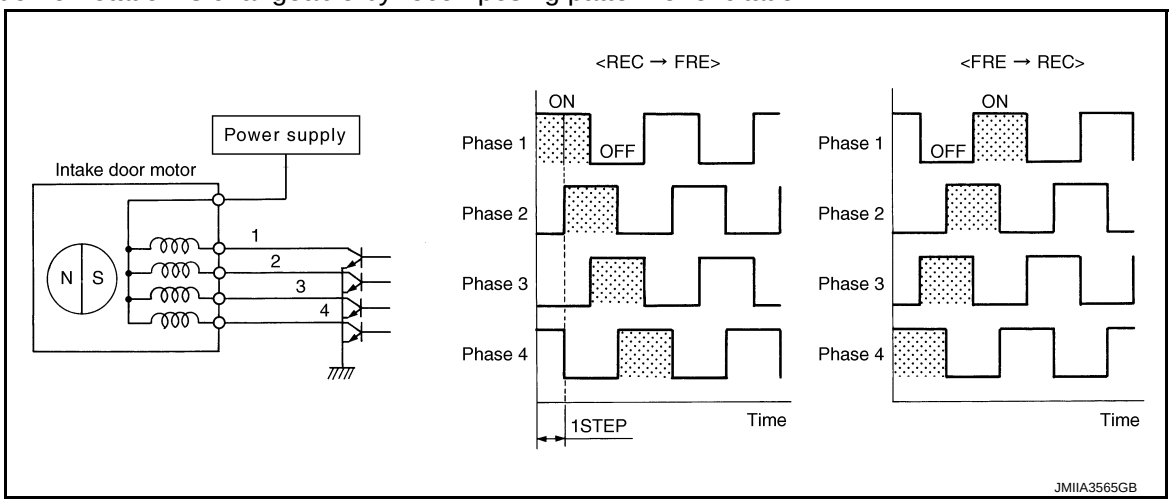
INFOID:0000000010939688

DESCRIPTION

- The step motor system is adopted for intake door motor.
- When a drive signal is input from A/C auto amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.
- Rotation of motor is transmitted to intake door by lever, then air inlet is switched.

INTAKE DOOR MOTOR DRIVE METHOD

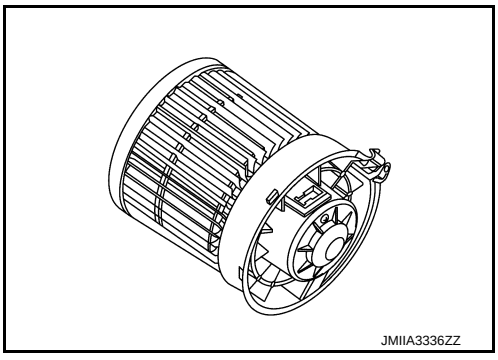
- The 4 drive coils are excited in sequence in order to drive the motor.
- Direction of rotation is changeable by recomposing pattern of excitation.

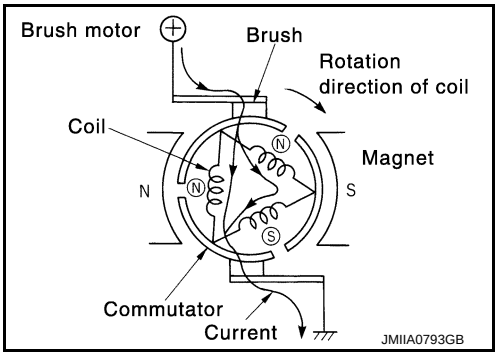


A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000010939689

- Brush motor, that rotates coil while brush functions as contact points, is adopted for blower motor.
- Rotation speed changes according to voltage from power transistor.

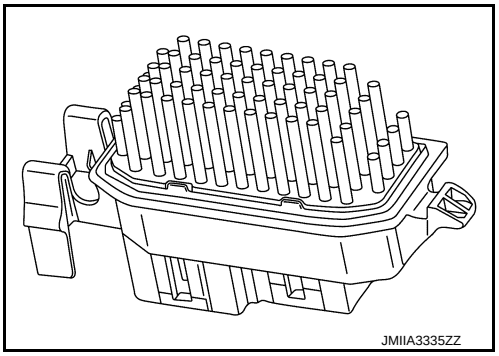




A/C UNIT ASSEMBLY : Power Transistor

INFOID:0000000010939690

- 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.

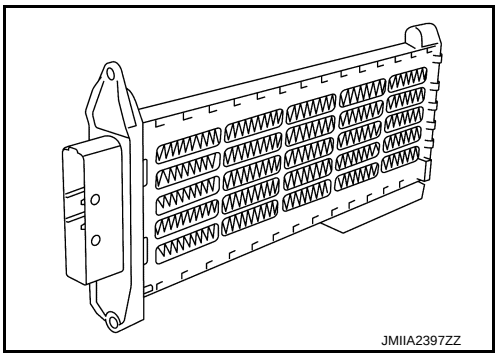


- Power transistor continuously controls voltage to blower motor, according to gate voltage from A/C auto amp.
- This power transistor does not require a HI relay even when the maximum voltage is applied to blower motor at HI status, because voltage drop is nominal.

A/C UNIT ASSEMBLY : PTC Heater

INFOID:0000000010939691

- PTC heater is installed on right lower side of A/C unit assembly.
- Heat element is heated and air flow temperature is increased by power supply from PTC relay.



COMPRESSOR

COMPRESSOR : Magnet Clutch

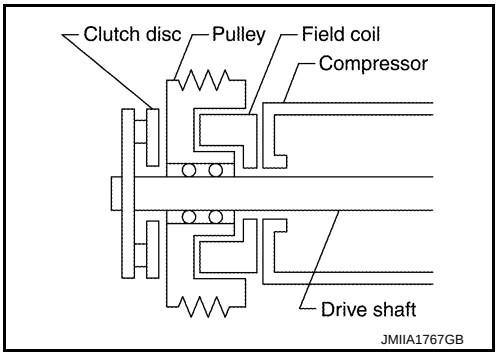
INFOID:0000000010939692

DESCRIPTION

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

STRUCTURE AND OPERATION

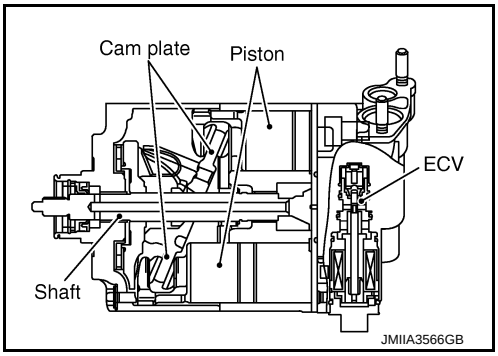
- Magnet clutch consists of pulley, clutch disc, and field coil.
- Pulley is connected with crankshaft pulley of engine via drive belt and is always rotated while engine is running.
- Clutch disc is connected with drive shaft of compressor.
- Field coil, which becomes a strong electric magnet when electricity is supplied, strongly pulls clutch disc and presses it to pulley.
- When A/C relay integrated in IPDM E/R turns ON, electricity is supplied to field coil, clutch disc is presses to pulley, and engine rotational movement is transmitted from crankshaft pulley ⇒ drive belt ⇒ pulley ⇒ clutch disc ⇒ drive shaft. Compressor is operated. When A/C relay turns OFF, electricity is not supplied to field coil, and clutch disc is released from pulley. Compressor is not operated.



COMPRESSOR : ECV (Electrical Control Valve)

INFOID:0000000010939693

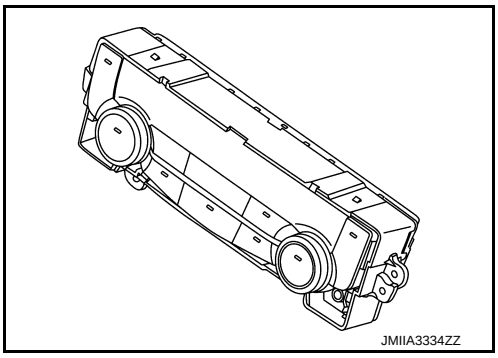
- ECV (Electrical Control Valve) is integrated in the compressor. IPDM E/R receives the ECV control signal from A/C auto amp. via CAN communication, and ECV is controlled according to the control signal transmitted from IPDM E/R.
- ECV is controlled according to the control signal transmitted from IPDM E/R.
  The control signal transmitted by IPDM E/R is controlled according to the ECV control signal transmitted from A/C auto amp. via CAN communication.
- ECV varies the air pressure balance in the left and right air spaces that are divided by the cam plate in order to change the angle of the cam plate inside the compressor.
  By changing the cam plate angle, it changes the piston stroke and controls the refrigerant discharge amount.



A/C Control

INFOID:0000000010939694

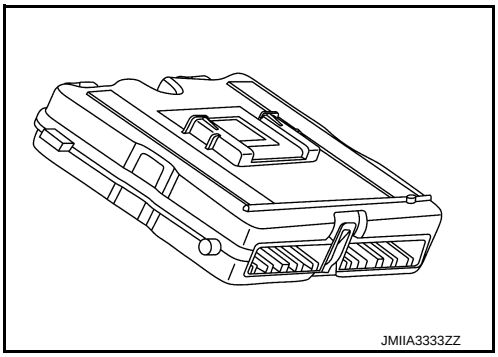
A/C control has switches and display that can set and indicate the operation of automatic air conditioning system. A/C control transmits setting status to A/C auto amp. via LIN communication line. A/C auto amp. controls automatic air conditioning system.



A/C Auto Amp.

INFOID:0000000010939695

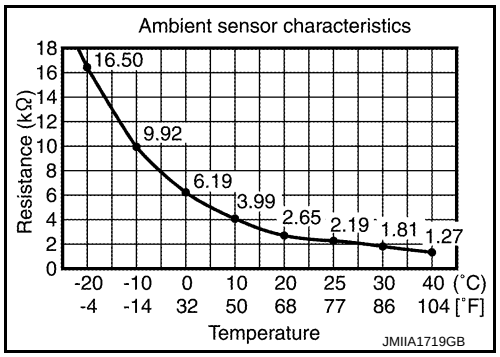
A/C auto amp. controls automatic air conditioning system by inputting and calculating signals from each sensor and each switch. A/C auto amp. has self-diagnosis function. Diagnosis of automatic air conditioning system can be performed quickly.



Ambient Sensor

INFOID:0000000010939696

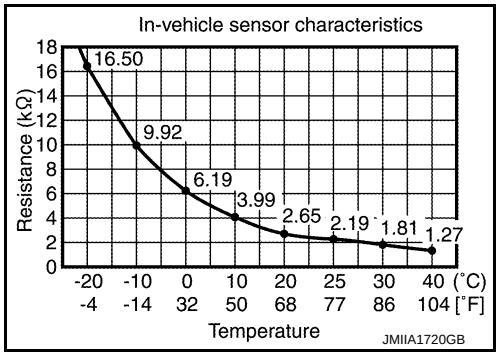
Ambient sensor measures ambient air temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



In-vehicle Sensor

INFOID:0000000010939697

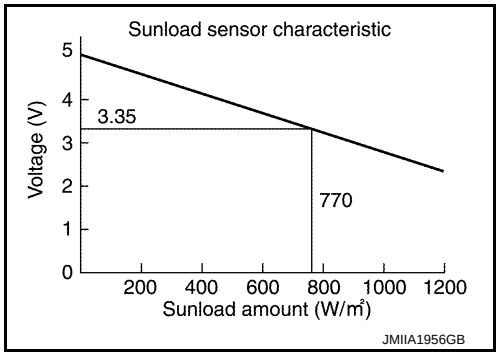
In-vehicle sensor measures temperature of intake air that flows through aspirator to passenger room. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



Sunload Sensor

INFOID:0000000010939698

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

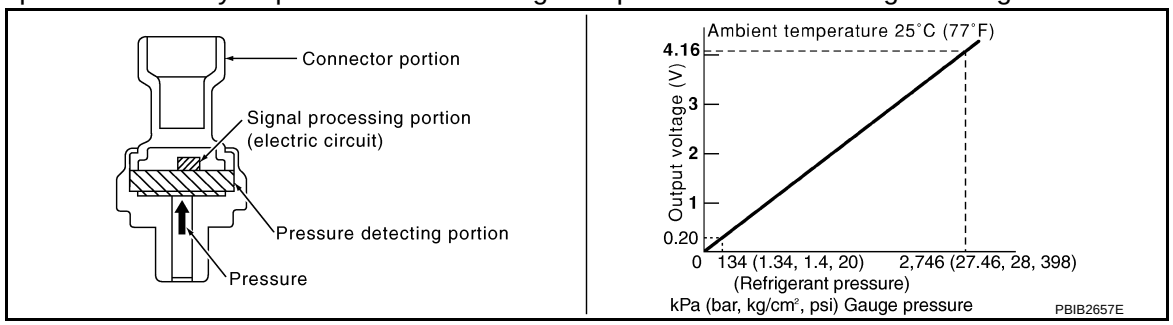


Refrigerant Pressure Sensor

INFOID:0000000010939699

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooler cycle protection and cooling fan 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 area 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.

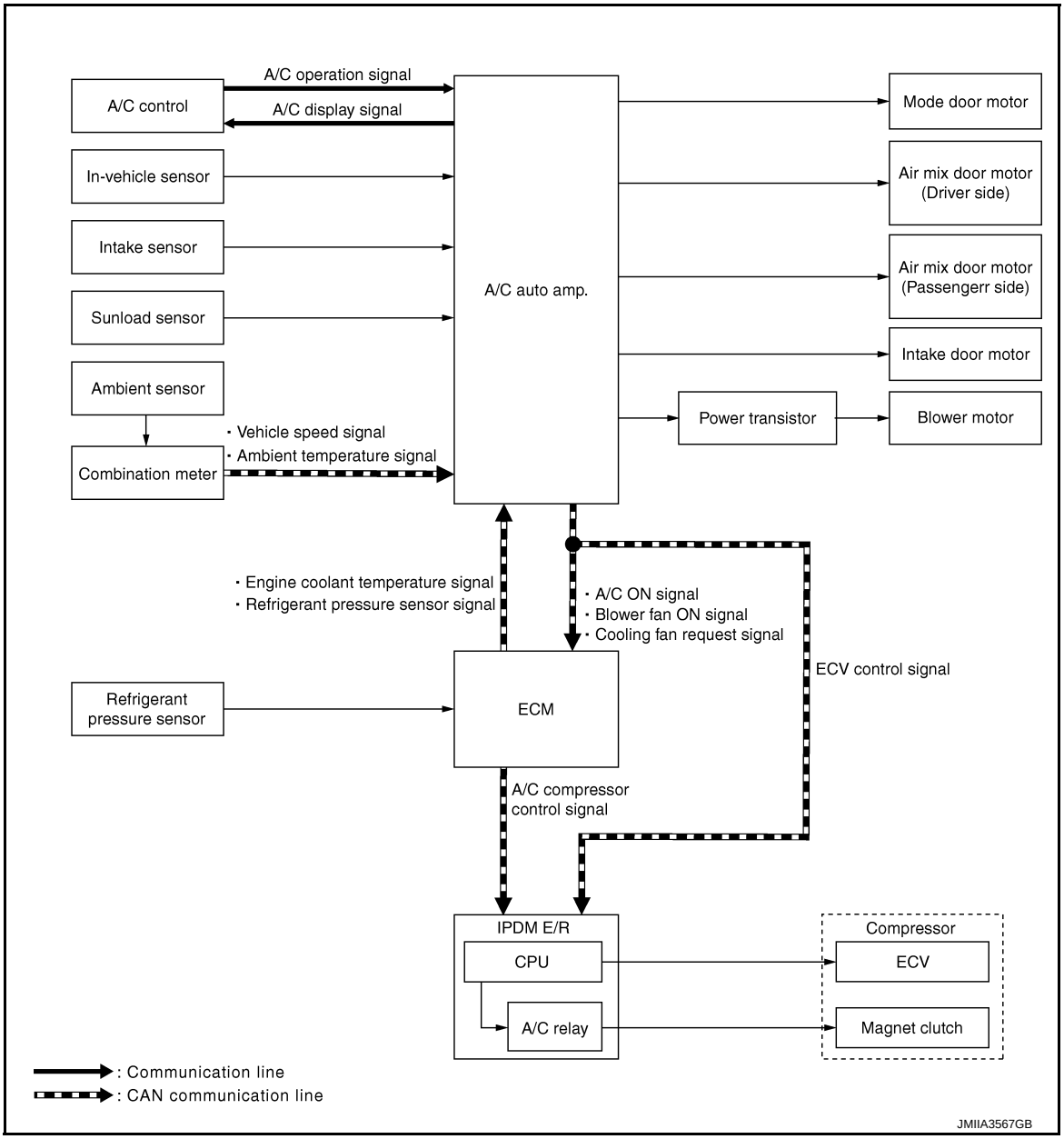
SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM

AUTOMATIC AIR CONDITIONING SYSTEM : System Description

INFOID:0000000010939700

SYSTEM DIAGRAM



DESCRIPTION

- Automatic air conditioning system is controlled by each function of A/C auto amp., ECM and IPDM E/R.
- Each operation of air conditioning system can be controlled by A/C control.

CONTROL BY A/C AUTO AMP.

- HAC-22, "AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control"
- HAC-23, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control"
- HAC-23, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Flow Control"
- HAC-24, "AUTOMATIC AIR CONDITIONING SYSTEM : Air Inlet Control"
- HAC-24, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"
- HAC-25, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Control"
- HAC-28, "AUTOMATIC AIR CONDITIONING SYSTEM : Cooling Fan Control"
- HAC-29, "AUTOMATIC AIR CONDITIONING SYSTEM : Door Motor Starting Position Reset Control"

- Correction for input value

Ambient temperature correction
- A/C auto amp. inputs the temperature detected by ambient sensor as the ambient temperature.
- A/C auto amp. performs the correction of the temperature detected by ambient sensor for air conditioning control.
- A/C auto amp. selects and uses the initial value of ambient temperature data depending on the engine coolant temperature when turning the ignition switch from OFF to ON. The detection temperature of the ambient sensor is used when engine coolant temperature is low [less than approximately 56°C (133°F)]. The memory data (before the ignition switch is OFF) when the engine is warmed up [approximately 56°C (133°F) or more].
- The correction of the ambient temperature is not performed when the detection temperature of the ambient temperature is less than approximately −20°C (−4°F).

In-vehicle temperature correction
- A/C auto amp. inputs the temperature detected by in-vehicle sensor as the in-vehicle temperature.
- A/C auto amp. performs the correction of the temperature detected by in-vehicle sensor for air conditioning control.
- 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
- A/C auto amp. inputs the temperature detected by intake sensor as the intake temperature (evaporator temperature).
- A/C auto amp. performs the correction of the temperature detected by intake sensor for air conditioning control.
- 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
- A/C auto amp. inputs the sunload amount detected by sunload sensor.
- A/C auto amp. performs the correction of the sunload amount detected by 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. 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 by ambient sensor and controls it so that the in-vehicle temperature is always the most suitable.

CONTROL BY ECM

HAC-24, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"

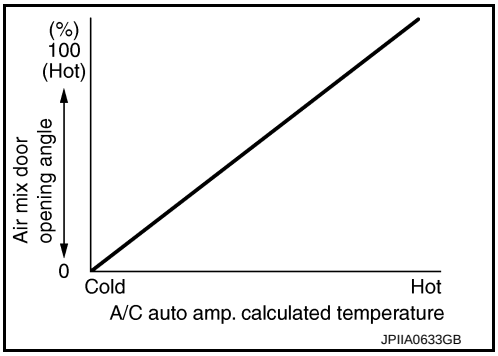
CONTROL BY IPDM E/R

HAC-24, "AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control"

AUTOMATIC AIR CONDITIONING SYSTEM : Temperature Control

INFOID:0000000010939701

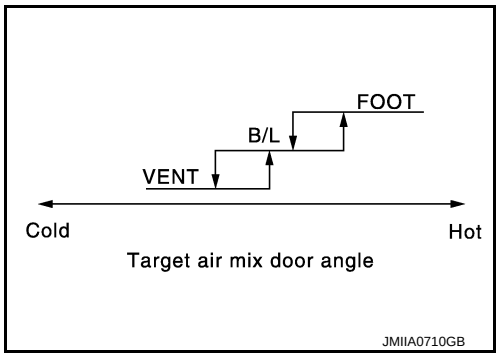
- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of air conditioner operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- 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 16.0°C, and at the fully hot position when set temperature is 30.0°C.



AUTOMATIC AIR CONDITIONING SYSTEM : Air Outlet Control

INFOID:0000000010939702

- 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

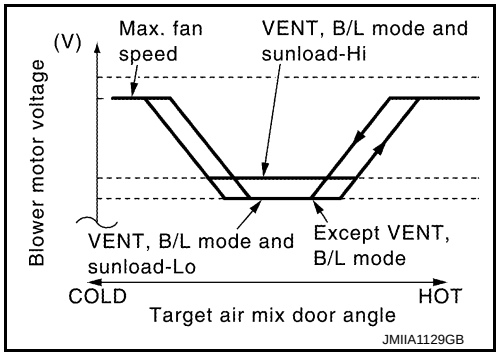
INFOID:0000000010939703

DESCRIPTION

- A/C auto amp. changes gate voltage of power transistor and controls air flow continuously. When air flow is increased, voltage of blower motor 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 voltage of blower motor 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.

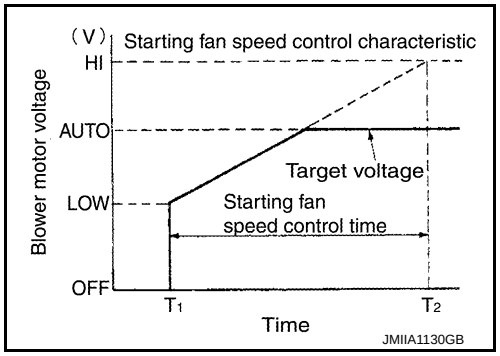


STARTING FAN SPEED CONTROL

When blower motor is activated, A/C auto amp. gradually increases voltage of blower motor to prevent a sudden increase in discharge air flow. (T_1 – T_2 = approximately 5 seconds)

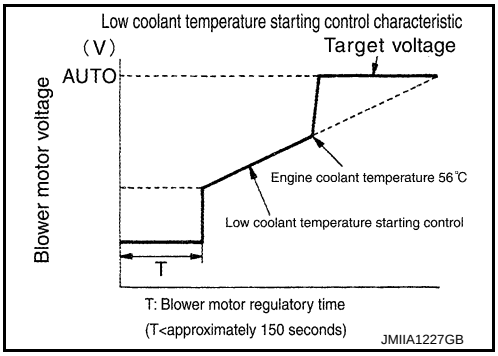
NOTE:

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 150 seconds depending on target air mix door opening angle. After this, voltage of blower motor is increased gradually, and blower motor is activated.



HIGH IN-VEHICLE TEMPERATURE STARTING CONTROL

When evaporator temperature is high [intake 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.

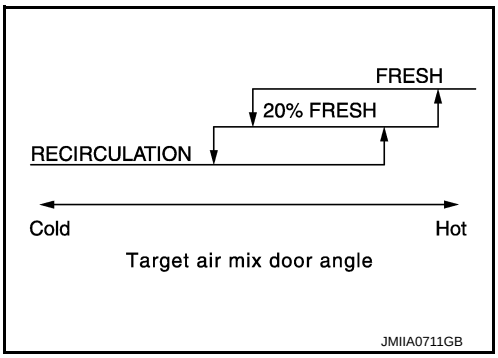
FAN SPEED CONTROL AT DOOR MOTOR OPERATION

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.

AUTOMATIC AIR CONDITIONING SYSTEM : Air Inlet Control

INFOID:0000000010939704

- A/C auto amp. controls intake door motor, and change air inlet.
- 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.



AUTOMATIC AIR CONDITIONING SYSTEM : Compressor Control

INFOID:0000000010939705

DESCRIPTION

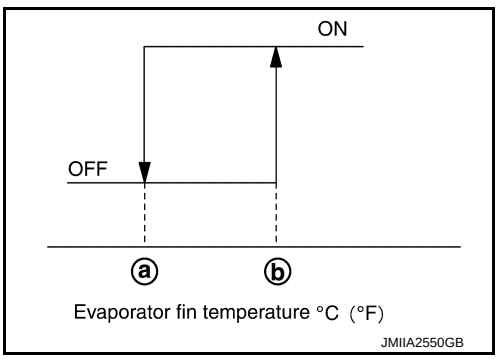
- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to ECM.
- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor 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-7, "RELAY CONTROL SYSTEM : System Description".

CONTROL BY A/C AUTO AMP.

Low Temperature Protection Control

When intake sensor detects that evaporator fin temperature is ⓐ [–5.0°C (23.0°F)] or less, A/C auto amp. requests ECM to turn the compressor OFF, and stops the compressor.

When the air temperature returns to ⓑ [1.0°C (33.8°F)] or more, the compressor is activated.



Refrigerant Discharge Amount Control

- A/C auto amp. transmits the ECV control signal via CAN communication. IPDM E/R transmits the control signal to ECV according to the received ECV control signal.
- ECV is controlled according to change in the duty ratio of the transmitted control signal.
- Except when temperature setting is full cold or outlet is DEF, A/C auto amp. controls the refrigerant discharge amount according to the required cooling capacity.
- A/C auto amp. increases the refrigerant discharge amount when evaporator temperature is higher than the target temperature upper limit, and reduces the refrigerant discharge amount when evaporator temperature is at or below the target temperature upper limit.

NOTE:
Target temperature upper limit value of evaporator can be changed using “TARGET EVAPORATOR TEMP UPPER LIMIT SETTING” in “WORK SUPPORT” mode of CONSULT. Refer to HAC-75, "Setting of Target Evaporator Temperature Upper Limit Value".

Compressor Oil Circulation Control
When the engine starts, A/C auto amp. activates the compressor for a few seconds and circulates the compressor oil once.

CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction
When 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 stops the compressor.

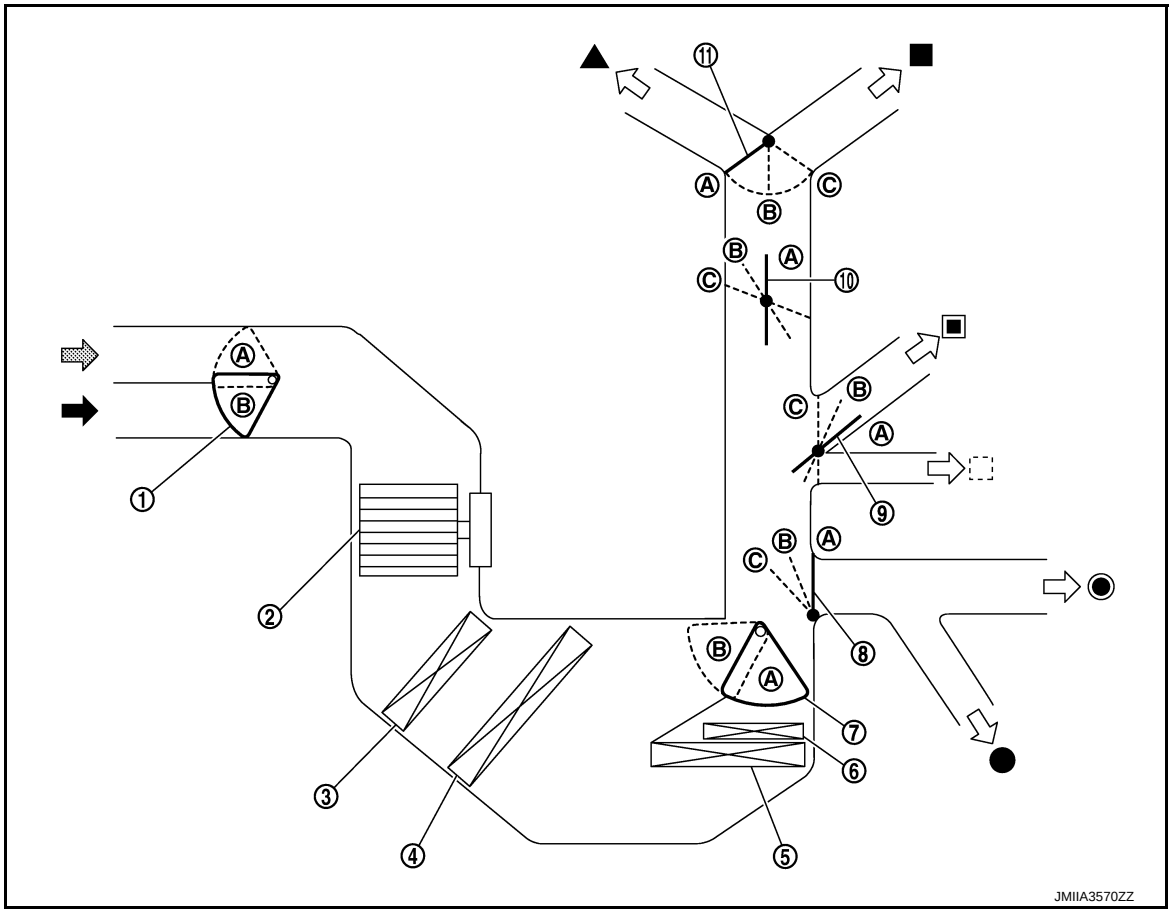
- 3.12 MPa (31.82 kg/cm^2, 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm^2, 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm^2, 20.3 psi) or less

Air Conditioning Cut Control
When the engine condition is high load, ECM transmit A/C relay OFF request to IPDM E/R, and stops the compressor.

AUTOMATIC AIR CONDITIONING SYSTEM : Door Control

INFOID:0000000010939706

SWITCH AND THEIR CONTROL FUNCTION



① Intake door	② Blower motor	③ Air conditioner filter
④ Evaporator	⑤ Heater core	⑥ PTC heater*
⑦ Air mix door (driver side/passenger side)	⑧ Foot door	⑨ Side ventilator door
⑩ Sub defroster door	⑪ Center ventilator and defroster door	
Fresh air	Recirculation air	Discharge air
Defroster	Center ventilator	Side ventilator
Rear ventilator	Front foot	Rear foot

*: R9M engine models

NOTE:

The sub-defroster and side ventilator door include a permanent opening and does not fully close.

Switch/dial position			Door position						
			Mode door					Air mix door	
			Center ventilator and defroster door	Sub defroster door	Side ventilator door	Foot door	Intake door	Driver side	Passenger side
AUTO switch			AUTO				—	—	—
• MODE VENT switch • MODE FOOT switch • MODE DEF switch • MAX DEF switch	MODE position	VENT/DEF (V/D)	Ⓑ	Ⓐ	Ⓐ	Ⓐ			
		VENT	Ⓐ	Ⓐ	Ⓐ	Ⓐ			
		Bi-level (B/L)	Ⓐ	Ⓑ	Ⓑ	Ⓑ			
		ALL	Ⓑ	Ⓑ	Ⓑ	Ⓑ			
		FOOT	Ⓒ	Ⓒ	Ⓒ	Ⓒ			
		DEF/FOOT (D/F)	Ⓒ	Ⓑ	Ⓒ	Ⓒ			
		DEF	Ⓒ	Ⓐ	Ⓒ	Ⓐ			
INTAKE switch*	REC		—	—	—	—	Ⓐ		
	FRE						Ⓑ		
Temperature control dial (Driver side)	DUAL switch: OFF	Full cold Lo					—	Ⓐ	
		16.0°C – 30.0°C						AUTO	
		Full hot HI						Ⓑ	
Temperature control dial (Driver side)	DUAL switch: ON	Full cold Lo						Ⓐ	—
		16.0°C – 30.0°C						AUTO	
		Full hot HI						Ⓑ	
Temperature control dial (Passenger side)		Full cold Lo						—	Ⓐ
		16.0°C – 30.0°C							AUTO
		Full hot HI							Ⓑ
ON·OFF switch		OFF	Ⓒ	Ⓒ	Ⓒ	Ⓒ			—

*: Air inlet status is displayed by indicator during activating automatic control

AIR DISTRIBUTION

MODE position	Discharge air flow					
	Air outlet/distribution					
	Ventilator			Foot		Defroster
	Front		Rear	Front	Rear	
	Center	Side				
V/D	39%	27%	11%	—	—	23%
VENT	47%	38%	15%	—	—	—
B/L	25%	34%	13%	18%	10%	—
ALL	21%	27%	11%	20%	10%	11%
FOOT	—	7%	4%	38%	24%	27%
D/F	—	6%	2%	30%	17%	45%
DEF	—	8%	2%	—	—	90%

AUTOMATIC AIR CONDITIONING SYSTEM : Cooling Fan Control

INFOID:0000000010939707

DESCRIPTION

A/C auto amp. controls the cooling fan operation request according to the refrigerant pressure status and vehicle speed status.

NOTE:

For an overview of the cooling fan and information about control, refer to EC-57, "COOLING FAN CONTROL : System Description" (MR20DD engine models), EC-472, "COOLING FAN CONTROL : System Description" (QR25DE engine models) or EC-843, "COOLING FAN CONTROL : System Description" (R9M engine models).

CONTROL OUTLINE

- A/C auto amp. receives the refrigerant pressure sensor signal from ECM via CAN communication, and the vehicle speed signal from the combination meter via CAN communication.
- A/C auto amp. sets one of the optionally determined stages according to the received refrigerant pressure sensor signal and vehicle speed signal.

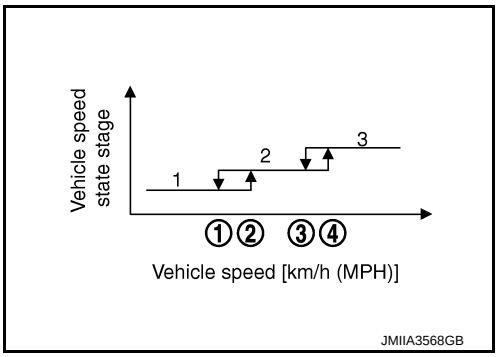
  NOTE:

  For the rules that prescribe the predetermined stages, refer to the following figures.

  - Vehicle speed stages

    Vehicle speed [Km/h (MPH)]

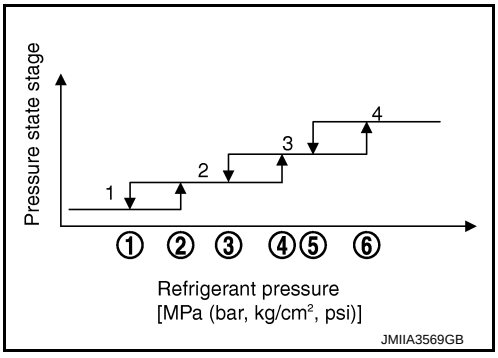
    - ①: 12 (7.5)
    - ②: 20 (12)
    - ③: 72 (45)
    - ④: 80 (50)



  - Refrigerant pressure stages

    Refrigerant pressure [MPa (bar, kg/cm^2, psi)]

    - ①: 0.7 (7, 7.14, 102)
    - ②: 1.0 (10, 10.2, 145)
    - ③: 1.28 (12.8, 13.1, 186)
    - ④: 1.58 (15.8, 16.1, 229)
    - ⑤: 1.88 (18.8, 19.2, 273)
    - ⑥: 2.08 (20.8, 21.2, 302)



- The requested cooling fan operation strength (0%, 40%, 100%) is determined as shown in the following table according to the combination of these two stages, and the request signal is transmitted to ECM via CAN communication.

Cooling fan operation strength

Unit: %

—		Refrigerant pressure stages			
		1	2	3	4
Vehicle speed stages	1	40	40	100	100
	2	40	40	100	100
	3	0	0	0	100

AUTOMATIC AIR CONDITIONING SYSTEM : Door Motor Starting Position Reset Control

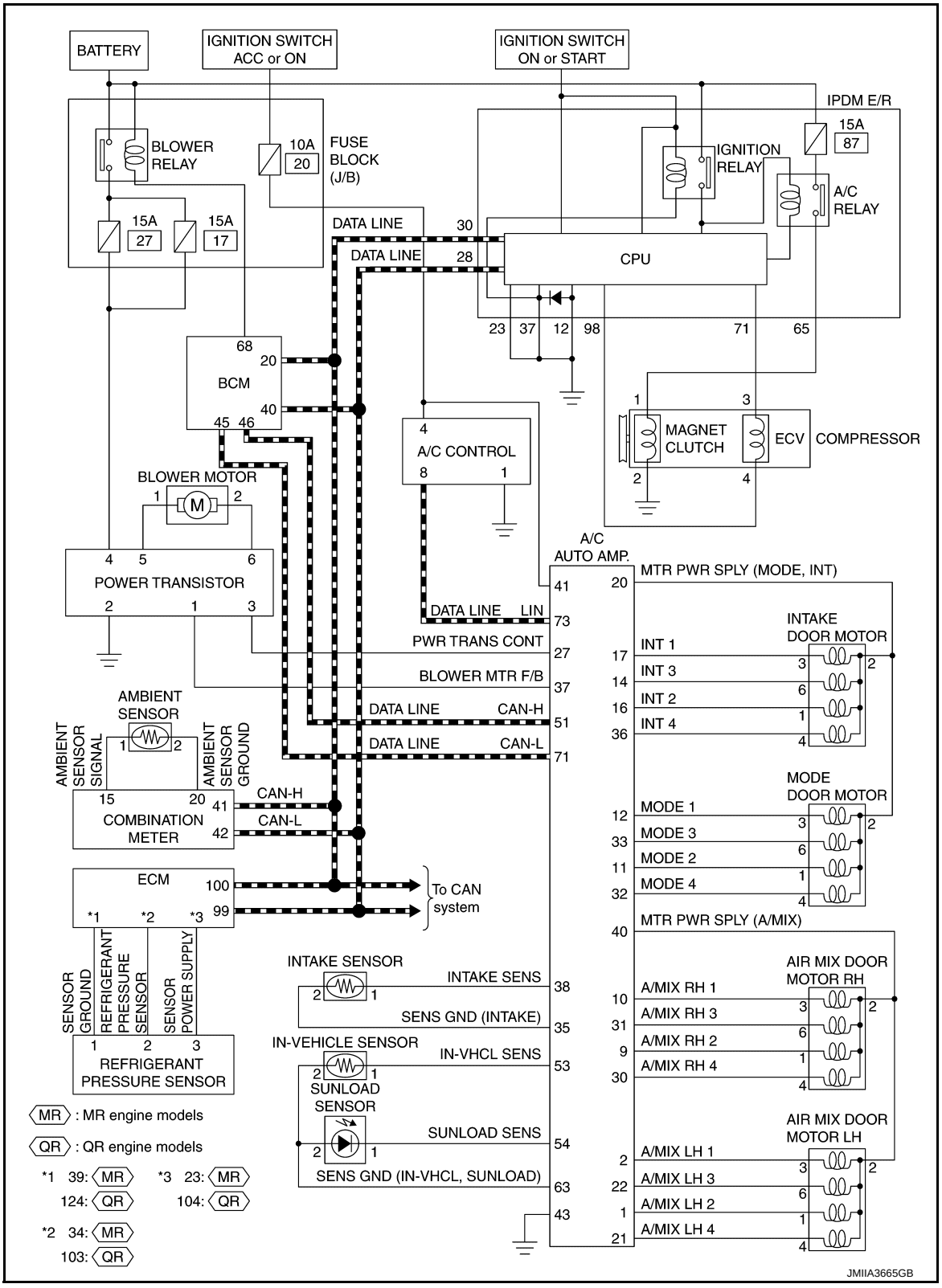
INFOID:0000000010939708

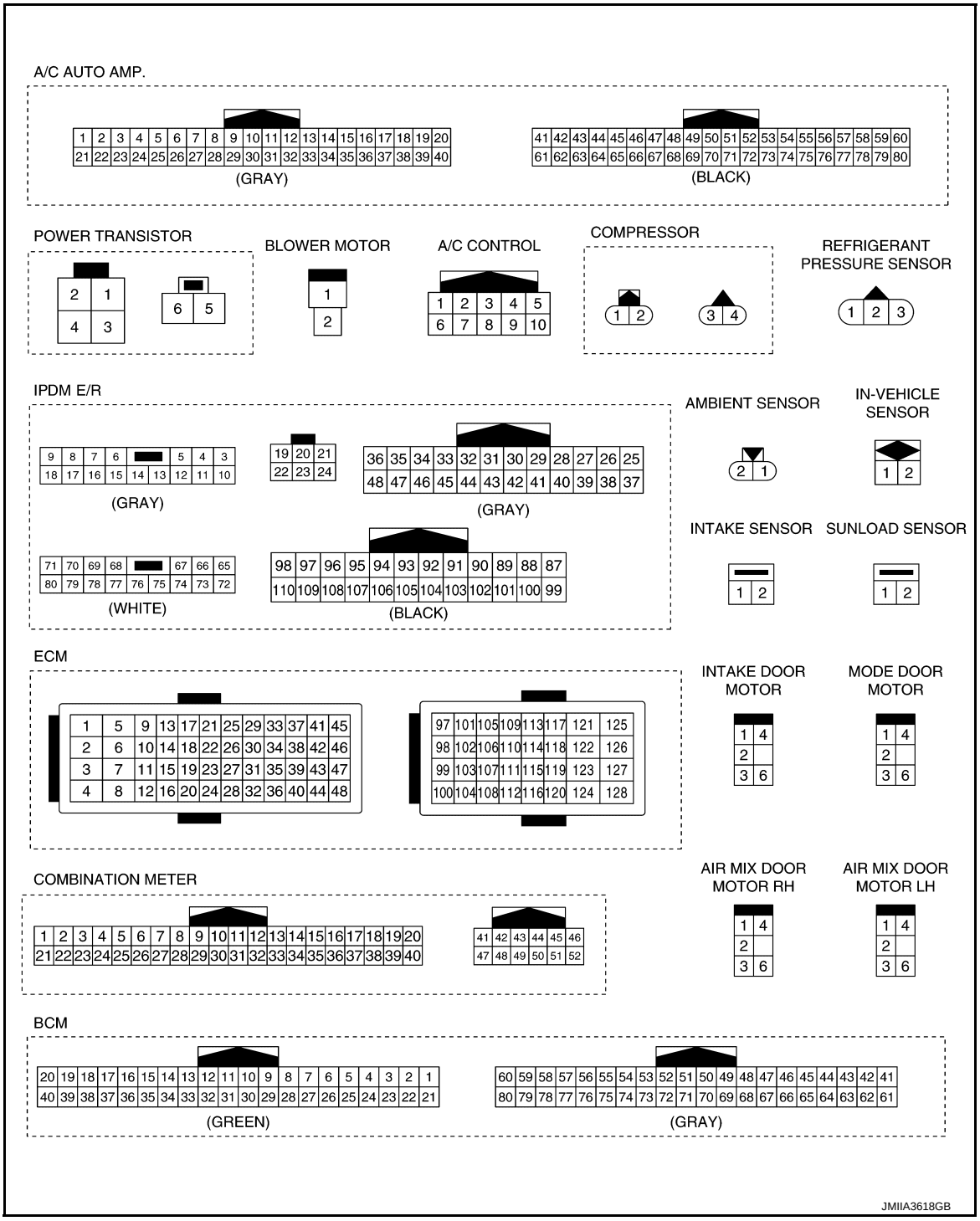
- Step motors are used for the mode door motor air mix door motor (driver side/passenger side), and intake door motor.
- Because the step motors do not have position detection mechanisms, there may be a deviation between the door position recognized by A/C auto amp. and the actual door position.
  Therefore, A/C auto amp. performs motor zero position reset for aligning its recognized door position with the actual door position.
- The reset signal is transmitted from A/C auto amp. to the air mix door motor (driver side/passenger side), mode door motor, and intake door motor, which then perform zero position reset.
- After any of the following conditions is met, A/C auto amp. performs motor zero position reset when the ignition switch is next turned ON.
- The battery terminal is disconnected and then reconnected.
- The travel distance reaches 3,000 km (1846 miles). [Performed every 3,000 km (1846 miles).]
- If A/C auto amp., air mix door motor (driver side, passenger side), mode door motor, or intake door motor is removed, it is necessary to perform motor zero position reset using CONSULT.

AUTOMATIC AIR CONDITIONING SYSTEM : Circuit Diagram

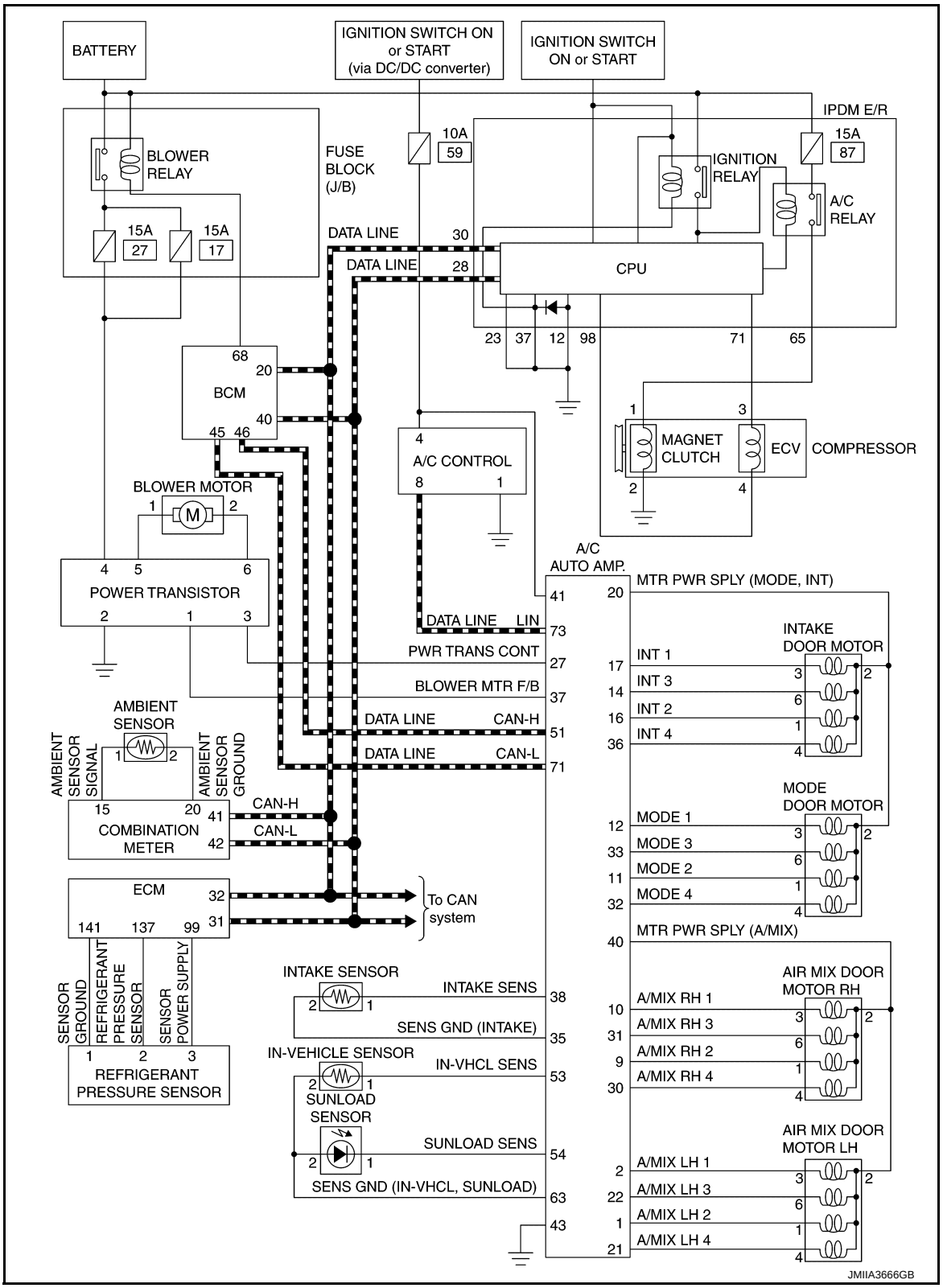
INFOID:0000000010941032

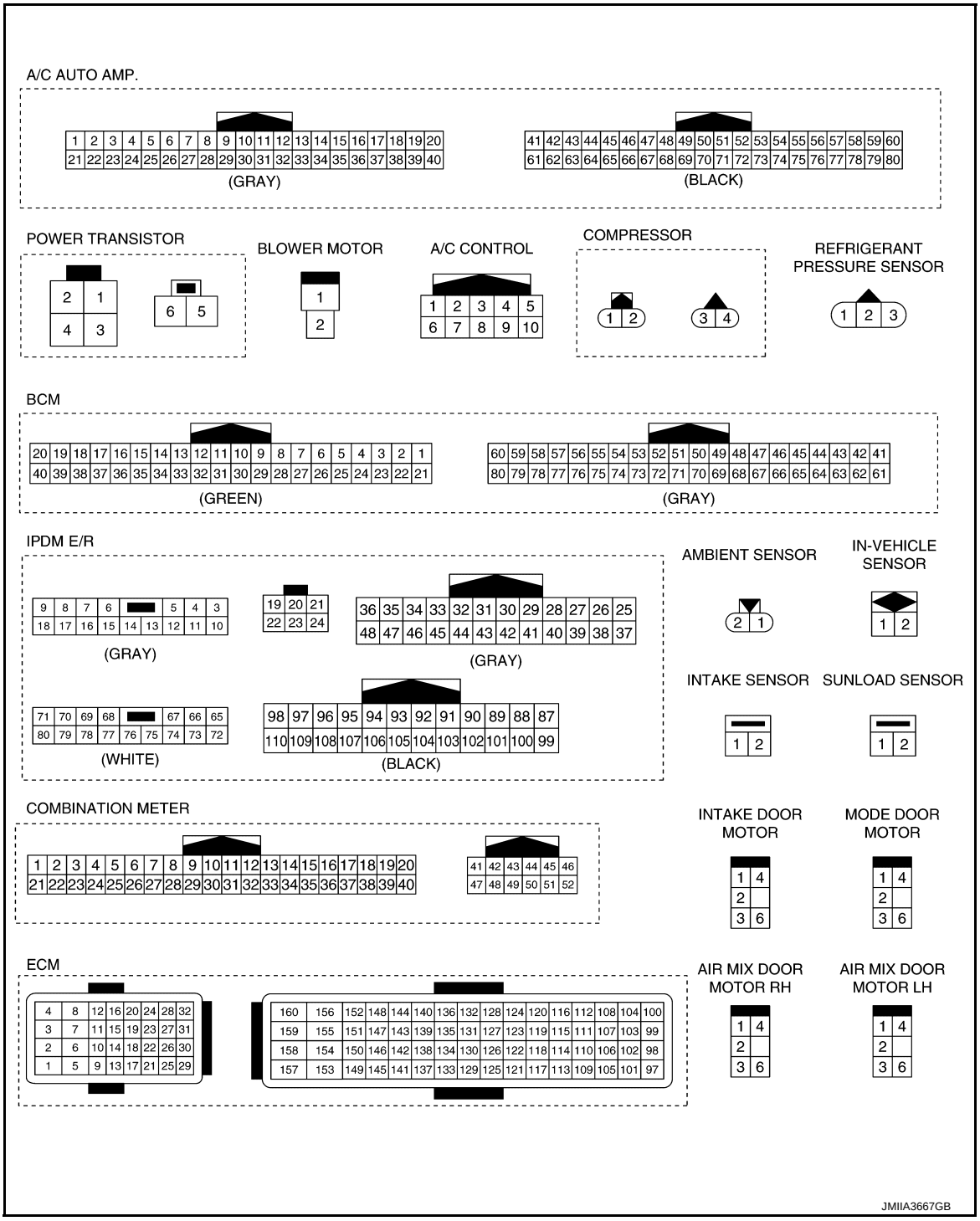
MR20DD AND QR25DE ENGINE MODELS




A/C AUTO AMP.
(GRAY)
(BLACK)
POWER TRANSISTOR
BLOWER MOTOR
A/C CONTROL
COMPRESSOR
REFRIGERANT PRESSURE SENSOR
IPDM E/R
(GRAY)
(GRAY)
(WHITE)
(BLACK)
AMBIENT SENSOR
IN-VEHICLE SENSOR
INTAKE SENSOR
SUNLOAD SENSOR
ECM
INTAKE DOOR MOTOR
MODE DOOR MOTOR
COMBINATION METER
AIR MIX DOOR MOTOR RH
AIR MIX DOOR MOTOR LH
BCM
(GREEN)
(GRAY)
JMIIA3618GB

R9M ENGINE MODELS





AUTOMATIC AIR CONDITIONING SYSTEM : Fail-safe

INFOID:0000000010940905

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and A/C control for 30 seconds or longer, air conditioning is controlled under the following conditions: A/C auto amp. is controlled in the setting state before the communication error occurs for following setting.

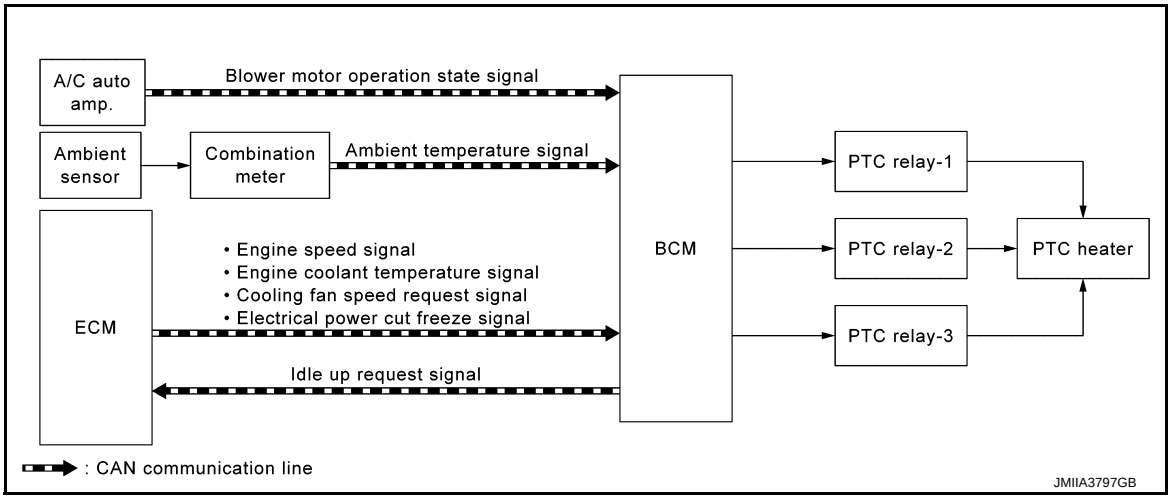
- Set temperature
- Air outlet
- Blower fan speed
- Air inlet
- A/C switch

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : System Description

INFOID:0000000010939710

SYSTEM DIAGRAM



DESCRIPTION

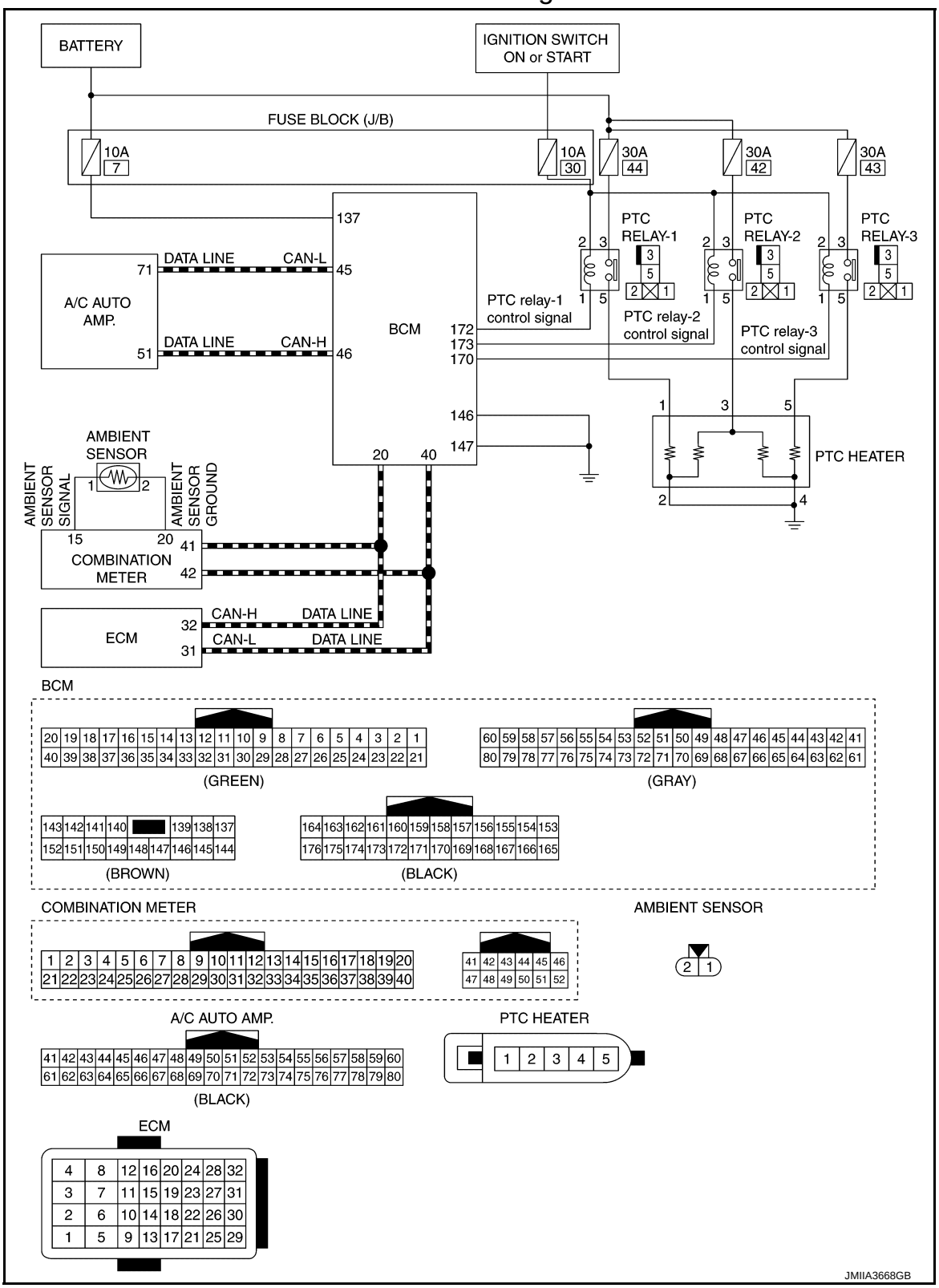
- BCM performs PTC relay ON/OFF control based on engine speed, engine coolant temperature, electrical power cut freeze signal (permission signal, retention signal, stop signal), blower motor operation state signal, front window defogger state signal, ambient temperature signal, battery voltage, and electrical load state (high beam request, low beam request, 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 BCM 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 (53.6°F) 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.

PTC HEATER CONTROL SYSTEM : Circuit Diagram

INFOID:0000000010941033

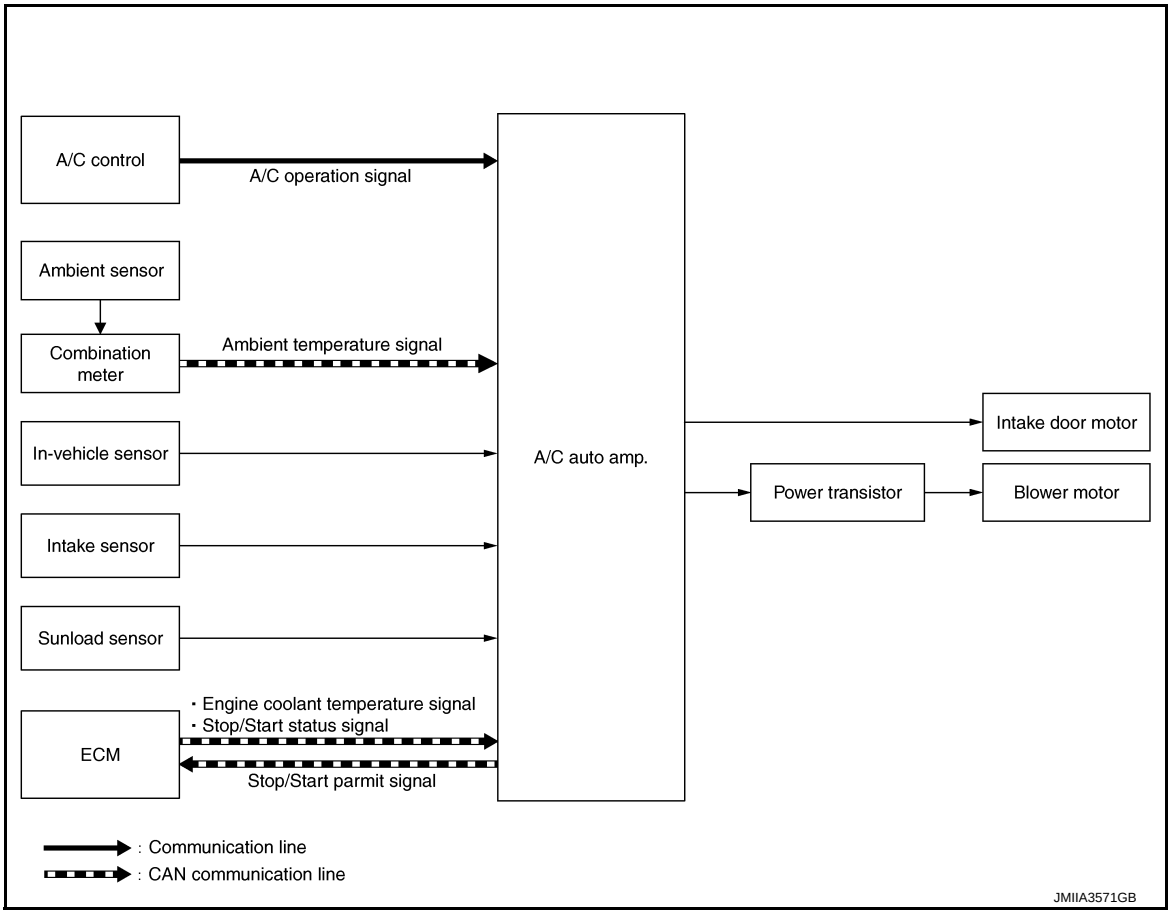


STOP/START SYSTEM

STOP/START SYSTEM : System Description

INFOID:0000000010939711

SYSTEM DIAGRAM



DESCRIPTION

- In the stop/start system, ECM performs integrated control based on the information from control units, sensors and switches. For details, refer to EC-848, "STOP/START SYSTEM : System Description (M/T models)" (R9M M/T models) or EC-856, "STOP/START SYSTEM : System Description (CVT models)" (R9M CVT models).
- A/C auto amp. transmits stop/start permit signal (permit) to ECM via CAN communication if it judges that the comfort level in the passenger room can be maintained, even when engine stops while idling, based on each sensor and the set temperature.
- A/C auto amp. receives operation status of stop/start system (stop/start status signal) from ECM via CAN communication. When A/C auto amp. recognizes that stop/start system is operating based on the signal, it changes control characteristics of air flow and inlet.
- When A/C auto amp. judges that the comfort level in the passenger room cannot be maintained while stop/start function operates, it cancels stop/start permit signal (permit) and requests ECM to restart engine. Also, when switch operation of A/C control (DEF switch) occurs, it also requests engine restart to ECM as well.

Stop/start Permission Condition Evaluated By A/C Auto Amp. (Before Stop/start Operation)

Before stop/start operation, when the following conditions are met, A/C auto amp. judges that stop/start system operation is available and transmits stop/start permit signal to ECM via CAN communication.

- Outlet: Other than DEF (Enabled only when the ambient temperature is 25°C or less. When ambient temperature is higher than 25°C (77°F), the outlet condition is not included in the conditions for judging that stop/start is possible.)
- Air flow: Other than for maximum position
- Passenger room temperature: Becomes approx. 20°C (68°F) or more (when A/C switch is ON/OFF) or approx. 30°C (86°F) or less (only when A/C switch is ON).

- When A/C switch is ON: 20°C (68°F) or more, and 30°C (86°F) or less.
- When A/C switch is OFF: 20°C (68°F) or more

NOTE:

When air conditioning system is OFF, it judges stop/start function is available at all times.

Stop/start Prohibition Condition Evaluated By A/C Auto Amp. (During Stop/start Operation)

During stop/start operation, when any of the following conditions is met, A/C auto amp. judges that stop/start system operation is prohibited, cancels stop/start permit signal (inhibit), and requests ECM to restart engine.

- AUTO switch: Pressed
- A/C switch: Pressed.
- MAX DEF switch: Pressed [only when ambient temperature is 25°C (77°F) or less]
- Passenger room temperature: Becomes 20°C (68°F) or less (when A/C switch is ON/OFF) or 30°C (86°F) or more (only when A/C switch is ON)
- Evaporator temperature: Becomes 16°C (60.8°F) or more (only when A/C switch is ON)

A/C CONTROL DURING STOP/START OPERATION

During stop/start operation, A/C auto amp. changes air flow and control characteristics of air inlet within a range that does not adversely affect the comfort level, prolongs stop/start operation time and reduces power consumption for improving fuel economy. Refer to the following items for details of each control.

Air Flow Control

Air flow reduction control during stop/start operation

- A/C auto amp increases voltage to power transistor gate compared to ordinary operation and reduces voltage to blower motor. This reduces air flow.
- Due to reduced airflow, the amount of air that passes evaporator is reduced. Increase of evaporator temperature can be moderated. This helps prevent a rise in evaporator temperature from meeting the stop/start prohibition condition, prolonging stop/start operation time.
- Also, by decreasing the voltage applied to blower motor, power consumption is reduced. This moderates alternator power output after engine is restarted.

NOTE:

When the fan switch is operated while stop/start is operating, the air flow changes to the setting from before stop/start is activated. (The air flow indicator also changes in the same way.)

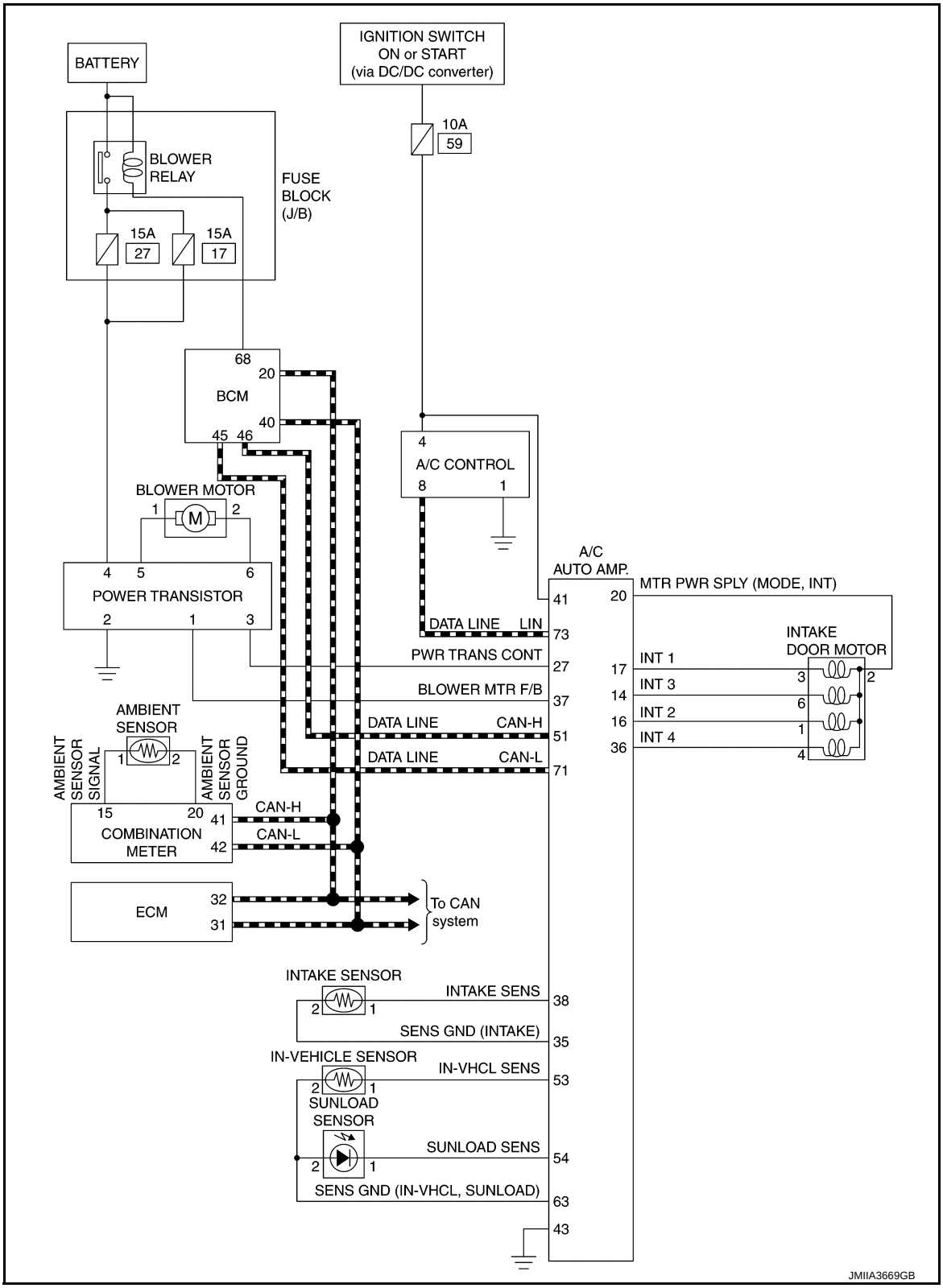
Air Inlet Control

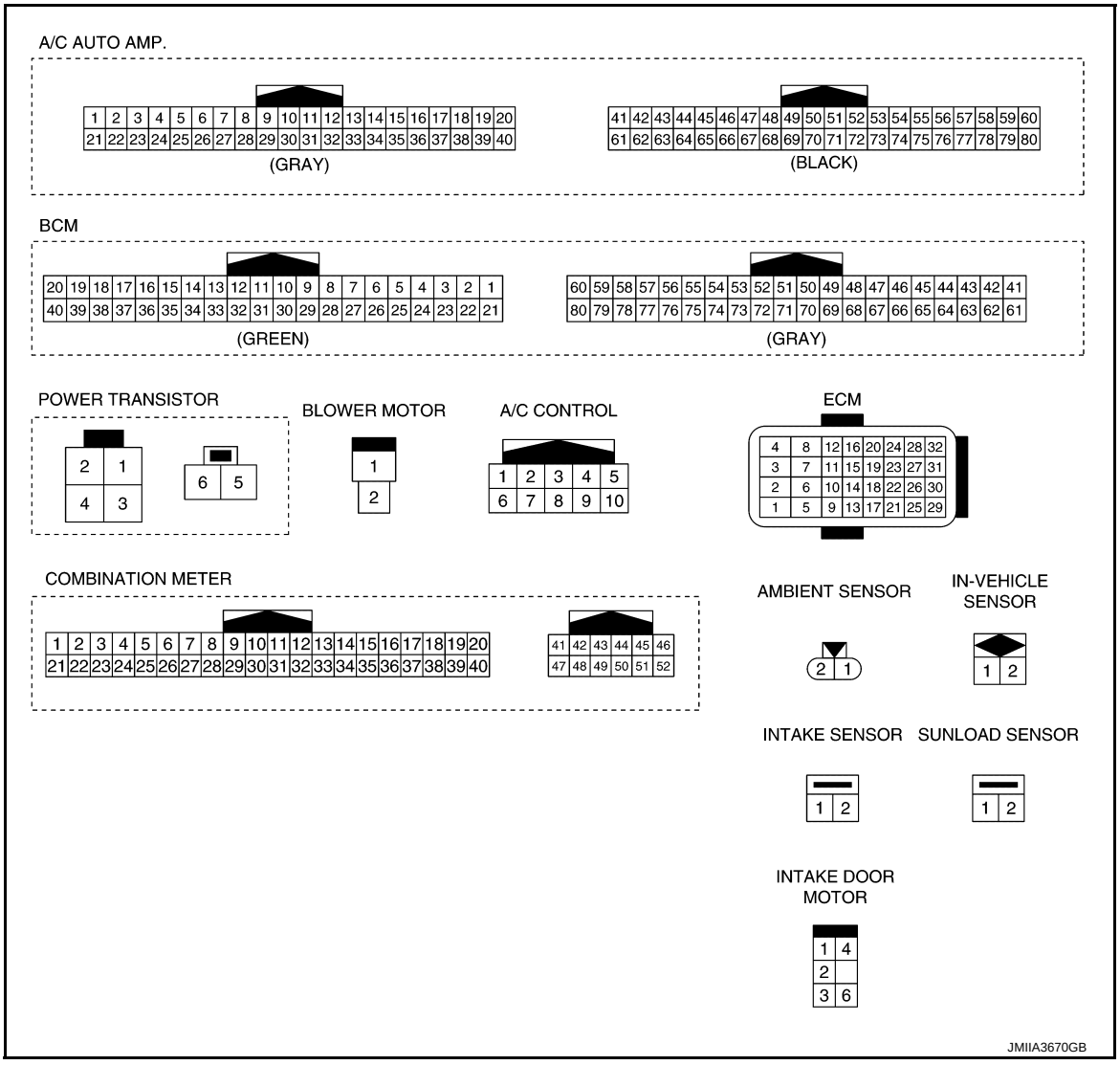
Air inlet change control during stop/start operation

- A/C auto amp. increases recirculation air mixing ratio compared to ordinary operation.
- By increasing recirculation air mixing ratio, cooled air in passenger room is circulated in larger amount than during ordinary operation and increase of evaporator temperature can be moderated. This helps prevent stop/start prohibition condition (evaporator temperature) from being met and prolongs stop/start operation time.

STOP/START SYSTEM : Circuit Diagram

INFOID:0000000010941034




A/C AUTO AMP.
(GRAY)
(BLACK)
BCM
(GREEN)
(GRAY)
POWER TRANSISTOR
BLOWER MOTOR
A/C CONTROL
ECM
COMBINATION METER
AMBIENT SENSOR
IN-VEHICLE SENSOR
INTAKE SENSOR
SUNLOAD SENSOR
INTAKE DOOR MOTOR
JMIIA3670GB

OPERATION

Switch Name and Function

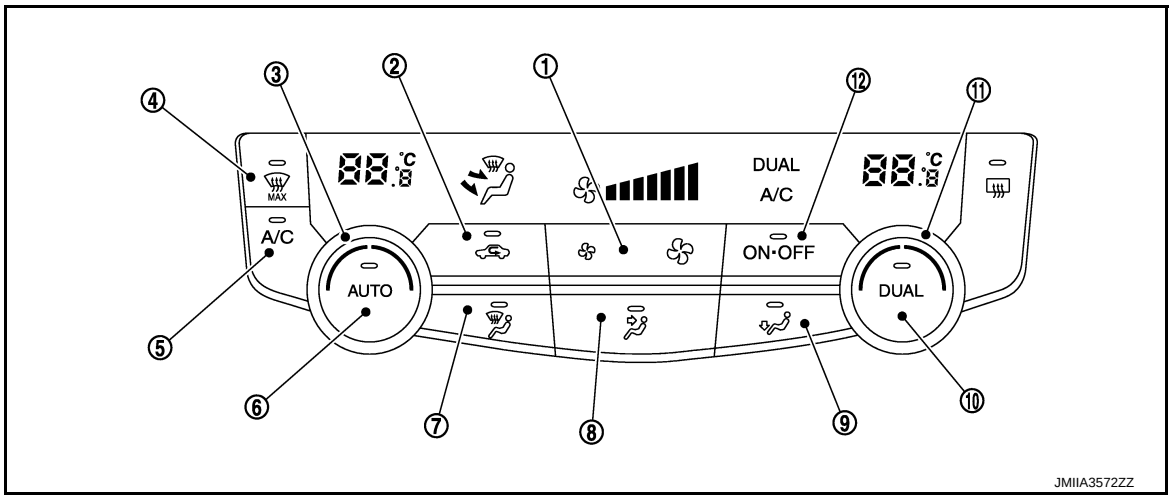
INFOID:0000000010939712

OPERATION AND DISPLAY OF AUTOMATIC AIR CONDITIONING SYSTEM

Display: Display in A/C control

- Air conditioning operation status is indicated on display in A/C control.
- Air conditioning status display screen is indicated when MODE VENT, MODE FOOT or MODE DEF switches is pressed while air conditioning is OFF.

Operation: A/C control



① Fan switch
② INTAKE switch
③ Temperature control dial [passenger side (RHD models)/driver side (LHD models)]
④ MAX DEF switch
⑤ A/C switch
⑥ AUTO switch
⑦ MODE DEF switch
⑧ MODE VENT switch
⑨ MODE FOOT switch
⑩ DUAL switch
⑪ Temperature control dial [driver side (RHD models)/passenger side (LHD models)]
⑫ ON·OFF switch

Switch name	Function
Fan switch	• Air flow can be set within a range between 1st – 7th speed according to switch operation. - Press (large): Air flow increases - Press (small): Air flow decreases • Air conditioning turns ON and operates according to the following status, when this switch is pressed while air conditioning is OFF. - Air outlet: Automatic control - Air flow: 1st speed - Air inlet: Settings set before this switch is pressed - A/C switch: Settings set before air conditioning is turned OFF **NOTE:** Automatic air flow control is cancelled (AUTO switch indicator turns OFF), when fan switch is pressed while AUTO switch indicator is ON.
INTAKE switch	Air inlet changes between recirculation (REC) ⇔ fresh air intake (FRE) each time this switch is pressed. • Switch indicator lamp ON: Recirculation • Switch indicator lamp OFF: Fresh air intake **NOTE:** Air inlet can be changed when front air conditioning is in OFF status.

Switch name	Function
Temperature control dial (driver side)	• Setting temperature can be set according to dial operation within a range between 16.0°C – 30.0°C at a rate of 0.5°C per adjustment. - Clockwise: Setting temperature increases - Counterclockwise: Setting temperature decreases • If temperature control dial (driver side) is counterclockwise turned when temperature setting is 16.0°C, temperature setting indicates “Lo”. And air conditioning system operates following status. - Air mix: Full cold - Air outlet: Settings set before temperature setting is “Lo” - Air flow: 7th speed - Air inlet: REC - A/C switch: ON • If temperature control dial (driver side) is clockwise turned when temperature setting is 30.0°C, temperature setting indicates “HI”. And air conditioning system operates following status. - Air mix: Full hot - Air outlet: Settings set before temperature setting is “HI” - Air flow: 7th speed - Air inlet: FRE - A/C switch: Settings set before temperature setting is “HI” **NOTE:** When air conditioning is OFF, setting temperature can be set only while air conditioning status screen (only when MODE VENT, MODE FOOT or MODE DEF switches is pressed) is indicated.
Temperature control dial (passenger side)	• Left and right ventilation temperature separately control (DUAL switch indicator) turns ON according to dial operation. Air flow temperature of passenger side can be changed without changing air flow temperature of driver side. • Setting temperature can be set according to dial operation within a range between 16.0°C – 30.0°C at a rate of 0.5°C per adjustment. - Clockwise: Setting temperature increases - Counterclockwise: Setting temperature decreases • If temperature control dial (passenger side) is counterclockwise turned when temperature setting is 16.0°C, temperature setting indicates “Lo”. And air mix setting is set to full cold. • If temperature control dial (passenger side) is clockwise turned when temperature setting is 30.0°C, temperature setting indicates “HI”. And air mix setting is set to full hot. **NOTE:** When air conditioning is OFF, setting temperature can be set only while air conditioning status screen (only when MODE VENT, MODE FOOT or MODE DEF switches is pressed) is indicated.
MAX DEF switch	MAX DEF mode (switch indicator) changes between ON ⇔ OFF each time switch is pressed. • When this switch is pressed while air conditioning is ON - Air conditioning becomes the following status when DEF mode is turned ON. • Air outlet: DEF • Air flow: Maximum setting • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning becomes the following status when DEF mode is turned OFF. • Air outlet: Settings set before DEF mode is turned ON • Air flow: Settings set before DEF mode is turned ON • Air inlet: Settings set before DEF mode is turned ON • A/C switch: Settings set before DEF mode is turned ON • When this switch is pressed while air conditioning is OFF - Air conditioning turns ON and operates in the following status, when DEF mode is turned ON. • Air outlet: DEF • Air flow: Maximum setting • Air inlet: Fresh air intake • A/C switch: ON - Air conditioning becomes the following status when DEF mode is turned OFF. • Air outlet: Automatic control • Air flow: Automatic control • Air inlet: Automatic control • A/C switch: Settings set before DEF mode is turned OFF **NOTE:** When DEF mode is turned ON while AUTO switch indicator is turned ON, AUTO switch indicator turns OFF. However, automatic air flow control continues.

Switch name	Function
A/C switch	Compressor control (switch indicator) changes between ON ⇔ OFF each time this switch is pressed while blower motor is operated. **NOTE:** A/C switch cannot be turned ON when blower motor is OFF.
AUTO switch	• AUTO switch indicator turns ON and air conditioning becomes the following status, when this switch is pressed while air conditioning is ON. - Air outlet: Automatic control - Air flow: Automatic control - Air inlet: Automatic control - A/C switch: Settings set before this switch is pressed • Air conditioning turns ON and operates according to the following status, when this switch is pressed while air conditioning is OFF. (AUTO switch indicator turns ON) - Air outlet: Automatic control - Air flow: Automatic control - Air inlet: Automatic control - A/C switch: Settings set before this switch is pressed **NOTE:** When air outlet or air flow is manually operated while AUTO switch indicator is ON, AUTO switch indicator turns OFF. However, automatic control continues for other functions than air outlet or air flow.
MODE DEF switch	• Air outlet changes to DEF when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ VENT - VENT ⇒ V/D - B/L ⇒ ALL - ALL ⇒ B/L - FOOT ⇒ D/F - D/F ⇒ FOOT - DEF ⇒ Automatic control - Automatic control (MODE DEF/VENT/FOOT switch indicator is not illuminated) ⇒ DEF • When this switch is pressed while air conditioning is ON and MODE DEF is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: DEF - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: DEF - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** • Automatic air outlet control is cancelled (AUTO switch indicator turns OFF), when MODE DEF switch is pressed while AUTO switch indicator is ON. • *: When MAX DEF is turned ON from air conditioning OFF status, each settings are set before air conditioning is turned OFF.

Switch name	Function
MODE VENT switch	• Air outlet changes to VENT when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ DEF - VENT ⇒ Automatic control - B/L ⇒ FOOT - ALL ⇒ D/F - FOOT ⇒ B/L - D/F ⇒ ALL - DEF ⇒ V/D - Automatic control (MODE DEF/VENT/FOOR switch indicator is not illuminated) ⇒ VENT • When this switch is pressed while air conditioning is ON and MODE VENT is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: VENT - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: VENT - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** • Automatic air outlet control is cancelled (AUTO switch indicator turns OFF), when MODE VENT switch is pressed while AUTO switch indicator is ON. • *: When MAX DEF is turned ON from air conditioning OFF status, each settings are set before air conditioning is turned OFF.
MODE FOOT switch	• Air outlet changes to FOOT when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ ALL - VENT ⇒ B/L - B/L ⇒ VENT - ALL ⇒ V/D - FOOT ⇒ Automatic control - D/F ⇒ DEF - DEF ⇒D/F - Automatic control (MODE DEF/VENT/FOOR switch indicator is not illuminated) ⇒ FOOT • When this switch is pressed while air conditioning is ON and MODE FOOT is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: FOOT - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: FOOT - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** • Automatic air outlet control is cancelled (AUTO switch indicator turns OFF), when MODE FOOT switch is pressed while AUTO switch indicator is ON. • *: When MAX DEF is turned ON from air conditioning OFF status, each settings are set before air conditioning is turned OFF.

Switch name	Function
DUAL switch	Left and right ventilation temperature separately control (switch indicator) changes between ON ⇔ OFF each time this switch is pressed while blower motor is operated. **NOTE:** • Setting temperature for passenger side is the same as that for driver side when left and right ventilation temperature separately control is OFF. • DUAL switch operation is not accepted when DEF mode is ON.
ON·OFF switch	Air conditioning turns ON ⇔ OFF each time this switch is pressed. • When this switch is pressed while air conditioning is ON - Air conditioning turns OFF and becomes the following status, when this switch is pressed. • Air outlet: FOOT • Air flow: OFF • Air inlet: FRE • A/C switch: OFF • When this switch is pressed while air conditioning is OFF - Air conditioning turns ON and operates according to the settings set before air conditioning is turned OFF, when this switch is pressed.

DIAGNOSIS SYSTEM (A/C AUTO AMP.)

Description

INFOID:0000000010939713

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

ECU	Diagnostic item (CONSULT)	
A/C auto amp.	HVAC	Self Diagnostic Result
		Data Monitor
		Active Test
		Work support
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 Function

INFOID:0000000010939714

CONSULT 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-56, "DTC Index".

DATA MONITOR

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

NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Display item list

Monitor item [Unit]		Description
AMB TEMP SEN	[°C (°F)]	Ambient temperature value converted from ambient temperature signal received from combination meter via CAN communication.
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 ECM.
COMP ECV DUTY	[%]	Duty ratio of ECV (electrical control valve) judged by A/C auto amp.
FAN REQ SIG	[On/Off]	Displays blower fan ON signal ON/OFF status transmitted to ECM.
FAN DUTY*		Target duty ratio of voltage (applied voltage) applied to blower motor by A/C auto amp.
XM		Target discharge air temperature (driver side) 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.

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	20% FRE	20% FRE	FRE	FRE	FRE
Air mix door motor (driver side) position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Air mix door motor (passenger side) position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor (Duty ratio)	35%	35%	60%	60%	90%	90%	35%
Magnet clutch	ON	ON	ON	ON	OFF	OFF	ON
ECV duty ratio	80%	80%	40%	40%	0%	0%	70%

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-74, "Temperature Setting Trimmer"
REC MEMORY SET	Setting change of inlet port memory function (REC) can be performed.	HAC-74, "Inlet Port Memory Function (REC)"
FRE MEMORY SET	Setting change of inlet port memory function (FRE) can be performed.	HAC-75, "Inlet Port Memory Function (FRE)"

Work item	Description	Refer to
BLOW SET	**NOTE:** This item is indicated, but not used.	
TARGET EVAPORATOR TEMP UPPER LIMIT SETTING	Setting change of evaporator target temperature upper limit value can be performed.	HAC-75, "Setting of Target Evaporator Temperature Upper Limit Value"
Door Motor Starting Position Reset	Zero position reset of air mix door motor and mode door motor can be performed.	HAC-77, "Description"

DIAGNOSIS SYSTEM (A/C CONTROL)

Diagnosis Description

INFOID:0000000010939715

DESCRIPTION

On board diagnosis of A/C control can be used to perform an operation check of the segment display and indicator lamps.

STARTING PROCEDURE

Starting Self-diagnosis Mode

1. Ignition switch turns OFF, and stand by 3 minutes after the driver side door is opened.
   NOTE:
   Accessory power supply may be supplied if vehicle is operated during standby.
2. The self-diagnosis function starts when the ON·OFF switch is pressed for 5 seconds or more within 10 seconds after the ignition switch turns ON.

Ending Self-diagnosis Mode

Turn ignition switch OFF and accessory power supply OFF by AUTO ACC function, or press AUTO switch.

NOTE:

For details of AUTO ACC function, refer to PCS-68, "AUTO ACC FUNCTION : System Description".

DIAGNOSIS DESCRIPTION

Check indicators of all A/C control switches and check all liquid crystal display segments.

When normal: All display parts and indicator lamps on A/C controller turn ON.

Malfunction: The malfunctioning part does not turn ON, or does not display. (A/C controller malfunction)

NOTE:

If on board diagnosis does not start, check A/C control power supply and the ground circuit. Refer to HAC-105, "A/C CONTROL : Diagnosis Procedure". If the result of the check is normal, replace A/C control. Refer to HAC-125, "Removal and Installation".

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000011028575

APPLICATION ITEM

CONSULT 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.
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		×	×
Exterior lamp	HEAD LAMP	×	×	×
Interior room lamp control	INT LAMP		×	
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	
—	AIR CONDITONER*		×	×
Intelligent Key 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		×	
Vehicle security	THEFT ALM	×	×	
RAP	RETAINED PWR		×	
Remote keyless entry system	MULTI REMOTE ENT	×	×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

*: This item is displayed, but 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.

CONSULT screen item	Indication/Unit	Description
BATTERY VOLTAGE	V	Battery voltage of the moment a particular DTC is detected.
VEHICLE SPEED	km/h	Vehicle speed of the moment a particular DTC is detected.
EXTERNAL TEMP	°C	External temperature of the moment a particular DTC is detected
VEHICLE COND	—	**NOTE:** This item is displayed, but cannot be use this item.
DOOR LOCK STATUS	—	**NOTE:** This item is displayed, but cannot be use this item.
POWER SUPPLY COUNTER	min	Displays the cumulative time from the time that the battery terminal is connected.

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:0000000010939717

ACTIVE TEST

Test item	Operation	Description
PTC RELAY-1	Off/On	PTC RELAY-1 is turned OFF/ON.
PTC RELAY-2	Off/On	PTC RELAY-2 is turned OFF/ON.
PTC RELAY-3	Off/On	PTC RELAY-3 is turned OFF/ON.

ECU DIAGNOSIS INFORMATION

A/C AUTO AMP.

Reference Value

INFOID:0000000010939718

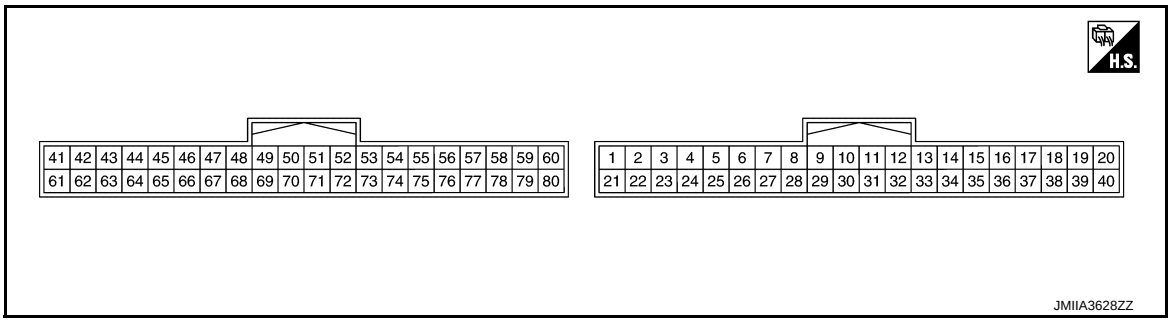
CONSULT DATA MONITOR REFERENCE VALUES

NOTE:

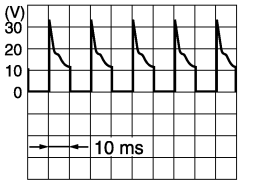
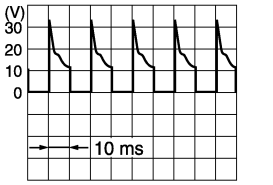
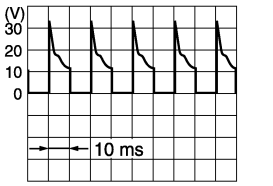
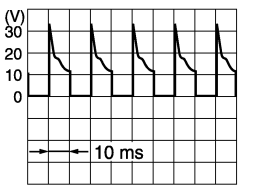
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

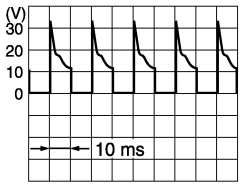
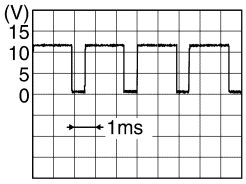
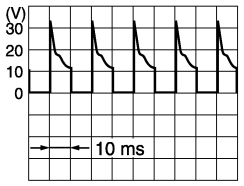
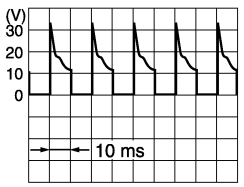
Monitor item	Condition		Value/Status
AMB TEMP SEN	Ignition switch ON		Equivalent to ambient temperature
IN-VEH TEMP	Ignition switch ON		Equivalent to in-vehicle temperature
INT TEMP SEN	Ignition switch ON		Values depending on evaporator fin temperature
SUNLOAD SEN	Ignition switch ON		Values depending on 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		Values depending on evaporator fin temperature
SUNL SEN CAL	Ignition switch ON		Values depending on 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
COMP ECV DUTY	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	1 - 100%
		A/C switch: OFF	0%
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	1 – 100
		Blower motor: OFF	0
XM	Ignition switch ON		Value depending on target air flow temperature (driver side)
ENG COOL TEMP	Ignition switch ON		Values depending on engine coolant temperature
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Equivalent to speedometer reading

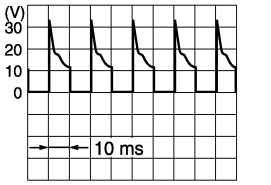
TERMINAL LAYOUT

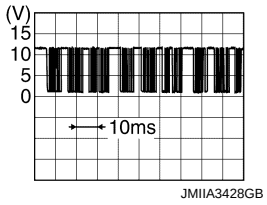


PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition	Value (Approx.)
+	–	Signal name	Input/ Output		
1 (BR)	Ground	• Air mix door motor (passenger side) drive 2 (RHD models) • Air mix door motor (driver side) drive 2 (LHD models)	Output	• Ignition switch ON • Immediately after the temperature control dial (passenger side) is operated [when the air mix door motor (passenger side) operates] (RHD models) • Immediately after the temperature control dial (driver side) is operated [when the air mix door motor (driver side) operates] (LHD models)	 JPIIA1647GB
2 (L)	Ground	• Air mix door motor (passenger side) drive 1 (RHD models) • Air mix door motor (driver side) drive 1 (LHD models)			
9 (W)	Ground	• Air mix door motor (driver side) drive 2 (RHD models) • Air mix door motor (passenger side) drive 2 (LHD models)	Output	• Ignition switch ON • Immediately after the temperature control dial (driver side) is operated [when the air mix door motor (driver side) operates] (RHD models) • Immediately after the temperature control dial (passenger side) is operated [when the air mix door motor (passenger side) operates] (LHD models)	 JPIIA1647GB
10 (L)	Ground	• Air mix door motor (driver side) drive 1 (RHD models) • Air mix door motor (passenger side) drive 1 (LHD models)			
11 (BR)	Ground	Mode door motor drive 2	Output	• Ignition switch ON • Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)	 JPIIA1647GB
12 (L)	Ground	Mode door motor drive 1			
14 (BR)	Ground	Intake door motor drive 3	Output	• Ignition switch ON • Immediately after the INTAKE switch is operated (when intake door motor operates)	 JPIIA1647GB
16 (R)	Ground	Intake door motor drive 2			
17 (L)	Ground	Intake door motor drive 1			

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
20 (W)	Ground	Door motor power supply (mode, intake)	Output	• Ignition switch ON • Each following condition - Immediately after the INTAKE switch is operated (when intake door motor operates) - Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)		11 – 14 V
21 (G)	Ground	• Air mix door motor (passenger side) drive 4 (RHD models) • Air mix door motor (driver side) drive 4 (LHD models)	Output	• Ignition switch ON • Immediately after the temperature control dial (passenger side) is operated [when the air mix door motor (passenger side) operates] (RHD models) • Immediately after the temperature control dial (driver side) is operated [when the air mix door motor (driver side) operates] (LHD models)		 JPIIA1647GB
22 (R)	Ground	• Air mix door motor (passenger side) drive 3 (RHD models) • Air mix door motor (driver side) drive 3 (LHD models)				
27 (G)	Ground	Power transistor control signal	Output	Ignition switch ON	Blower motor: OFF	11 – 14 V
					Blower motor: 1st speed (manual)	 JMIIA3426GB
30 (BR)	Ground	• Air mix door motor (driver side) drive 4 (RHD models) • Air mix door motor (passenger side) drive 4 (LHD models)	Output	• Ignition switch ON • Immediately after the temperature control dial (driver side) is operated [when the air mix door motor (driver side) operates] (RHD models) • Immediately after the temperature control dial (passenger side) is operated [when the air mix door motor (passenger side) operates] (LHD models)		 JPIIA1647GB
31 (R)	Ground	• Air mix door motor (driver side) drive 3 (RHD models) • Air mix door motor (passenger side) drive 3 (LHD models)				
32 (G)	Ground	Mode door motor drive 4	Output	• Ignition switch ON • Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)		 JPIIA1647GB
33 (R)	Ground	Mode door motor drive 3				
35 (BR)	Ground	Sensor ground (intake)	—	Ignition switch ON		0 – 0.1 V

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
36 (W)	Ground	Intake door motor drive 4	Output	• Ignition switch ON • Immediately after the INTAKE switch is operated (when intake door motor operates)		 JPIIA1647GB
37 (R)	Ground	Power transistor control	Output	Ignition switch ON	Blower motor: OFF	11 – 14 V
					Blower motor: 1st speed (manual)	8.5 V
					Blower motor: 7th speed (manual)	1.5 V
38 (BG)	Ground	Intake sensor	Input	Air temperature after passing through evaporator (Ignition switch ON)	–20°C (–4°F)	3.62 V
					–10°C (14°F)	3.05 V
					0°C (32°F)	2.46 V
					10°C (50°F)	1.92 V
					20°C (68°F)	1.46 V
					25°C (77°F)	1.26 V
					30°C (86°F)	1.09 V
					40°C (104°F)	0.82 V
40 (G)	Ground	Door motor power supply (air mix)	Output	• Ignition switch ON • Following condition - Immediately after the temperature control dial is operated		11 – 14 V
41 (BG)	Ground	Accessory power supply	—	Ignition switch ON		11 – 14 V
43 (R)	Ground	Ground	—	Ignition switch ON		0 – 0.1 V
51 (L)	—	CAN-H	Input/ Output	—		—

Terminal No. (Wire color)		Description		Condition		Value (Approx.)
+	–	Signal name	Input/ Output			
53 (P)	Ground	In-vehicle sensor	Input	Passenger room temperature (Ignition switch ON)	–20°C (–4°F)	3.09 V
					–10°C (14°F)	2.46 V
					0°C (32°F)	1.89 V
					10°C (50°F)	1.41 V
					20°C (68°F)	1.03 V
					25°C (77°F)	0.88 V
					30°C (86°F)	0.75 V
					40°C (104°F)	0.55 V
54 (V)	Ground	Sunload sensor signal	Input	Sunload amount (Ignition switch ON)	0 W/m^2	5.00 V
					200 W/m^2	4.46 V
					400 W/m^2	3.92 V
					600 W/m^2	3.39 V
					800 W/m^2	2.85 V
					1000 W/m^2	2.25 V
63 (G)	Ground	Sensor ground (in-vehicle, sunload)	—	Ignition switch ON		0 – 0.1 V
71 (W)	—	CAN-L	Input/ Output	—		—
73 (Y)	Ground	LIN	Input/ Output	Ignition switch ON		

JMIIA3428GB

Fail-safe

INFOID:0000000010939719

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and A/C control for 30 seconds or longer, air conditioning is controlled under the following conditions: A/C auto amp. is controlled in the setting state before the communication error occurs for following setting.

- Set temperature
- Air outlet
- Blower fan speed
- Air inlet
- A/C switch

DTC Index

INFOID:0000000010939720

x: Applied

DTC	Items (CONSULT screen terms)		Fail-safe	Reference
U1000	CAN COMM CIRCUIT		—	HAC-78, "DTC Description"
B24A0	A/C AUTO AMP.	[INTERNAL ELECTRONIC ERROR]	—	HAC-79, "DTC Description"
B24A1	A/C AUTO AMP. POWER SUPPLY	[CIRC VOLT BELOW THRESHOLD]	—	HAC-80, "DTC Description"
B24A4	INTAKE SENSOR	[CIRCUIT SHORT TO GROUND]	—	HAC-81, "DTC Description"
		[CIRC SHORT TO BATT OR OPEN]	—	
B24A6	IN-VEHICLE SENSOR	[CIRCUIT SHORT TO GROUND]	—	HAC-84, "DTC Description"
		[CIRC SHORT TO BATT OR OPEN]	—	
B24A9*	SUNLOAD SENSOR	[CIRCUIT SHORT TO GROUND]	—	HAC-87, "DTC Description"
		[CIRC SHORT TO BATT OR OPEN]	—	
B24B4	A/C CONTROL	[GENERAL ELEC MALFUNCTN]	—	HAC-90, "DTC Description"
B24B7	INTAKE DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	—	HAC-91, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	—	
B24B9	MODE DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	—	HAC-94, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	—	
B24BB	LEFT AIR MIX DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	—	HAC-97, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	—	
B24BD	RIGHT AIR MIX DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	—	HAC-100, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	—	
B24D4	A/C CONTROL COMM	[BUS SIGNAL/MESSAGE ERROR]	x	HAC-103, "DTC Description"

*: 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.

BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000010939721

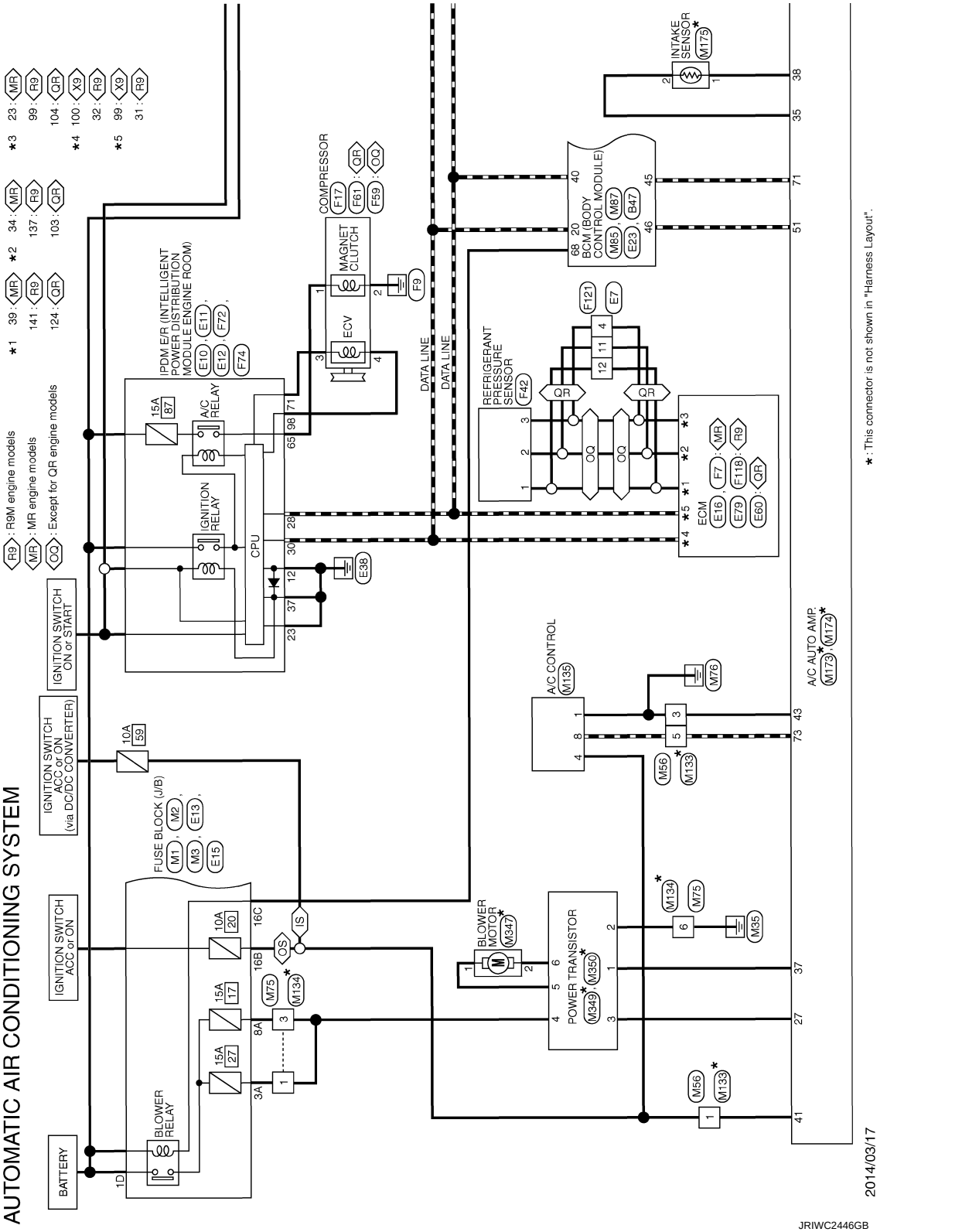
ECU		Reference
BCM		BCS-53, "Reference Value"
		BCS-76, "Fail-safe"
		BCS-77, "DTC Inspection Priority Chart"
		BCS-78, "DTC Index"
ECM	MR20DD engine models	EC-89, "Reference Value"
		EC-103, "Fail-safe"
		EC-107, "DTC Inspection Priority Chart"
		EC-109, "DTC Index"
	QR25DE engine models	EC-501, "Reference Value"
		EC-513, "Fail Safe"
		EC-515, "DTC Inspection Priority Chart"
		EC-517, "DTC Index"
	R9M engine models	EC-889, "Reference Value"
		EC-901, "Fail-safe"
		EC-907, "DTC Inspection Priority Chart"
		EC-908, "DTC Index"
IPDM E/R		PCS-22, "Reference Value"
		PCS-34, "Fail-safe"
		PCS-37, "DTC Inspection Priority Chart"
		PCS-38, "DTC Index"

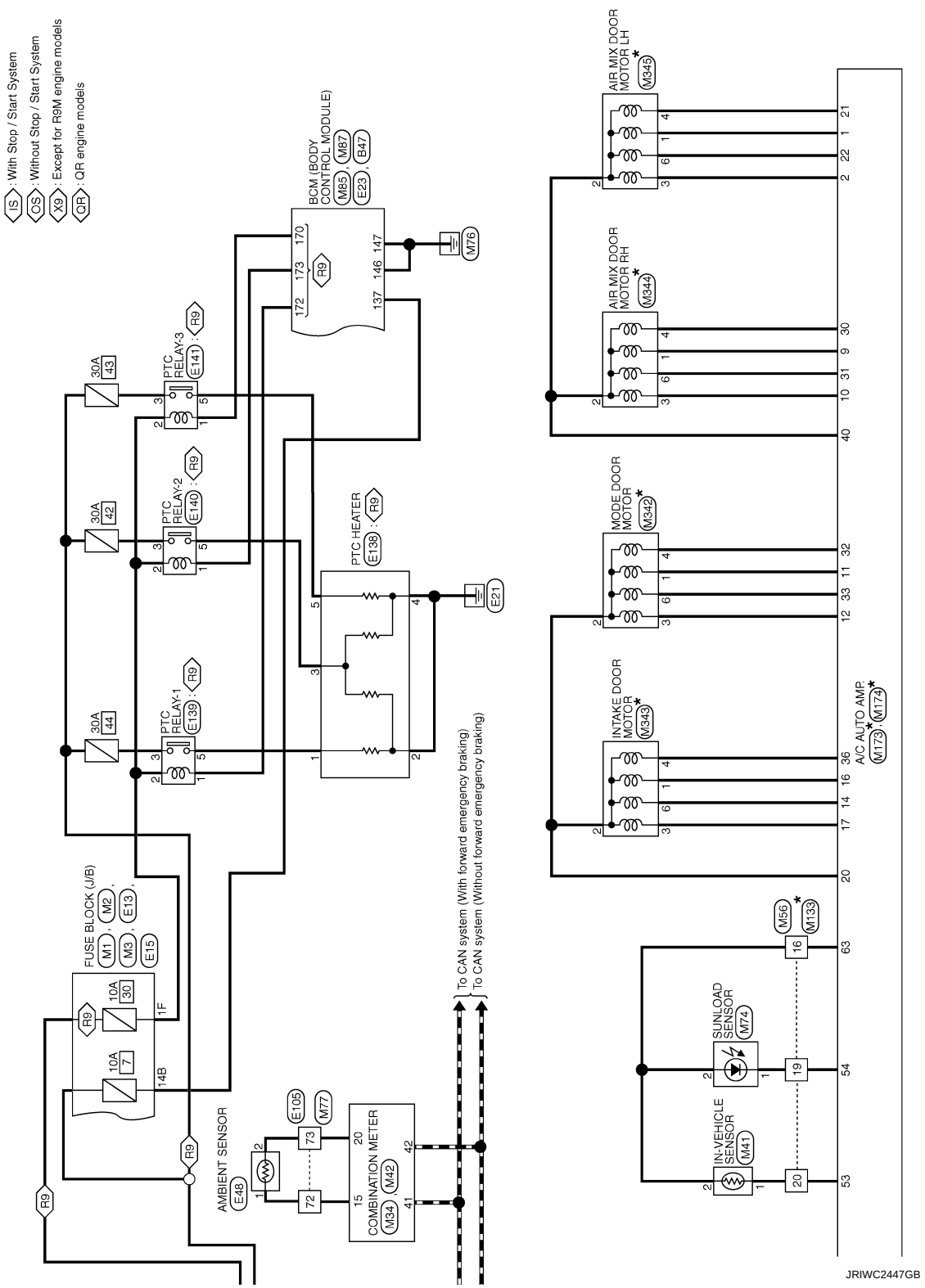
WIRING DIAGRAM

AUTOMATIC AIR CONDITIONING SYSTEM

Wiring Diagram

INFOID:0000000010939722




IS : With Stop / Start System
OS : Without Stop / Start System
X9 : Except for R9M engine models
QR : QR engine models
BCM (BODY CONTROL MODULE)
M85, M87, E23, B47
M76
PTC RELAY-3 E141 : R9
PTC RELAY-2 E140 : R9
PTC RELAY-1 E139 : R9
PTC HEATER E138 : R9
E21
30A 43
30A 42
30A 44
FUSE BLOCK (J/B) M1, M2, E13, M3, E15
10A 30
10A 7
1F
14B
AMBIENT SENSOR E48
E105 M77
COMBINATION METER M34, M42
To CAN system (With forward emergency braking)
To CAN system (Without forward emergency braking)
AIR MIX DOOR MOTOR LH * M345
AIR MIX DOOR MOTOR RH * M344
MODE DOOR MOTOR * M342
INTAKE DOOR MOTOR * M343
A/C AUTO AMP. * M173, M174
M56 * M133
SUNLOAD SENSOR M74
IN-VEHICLE SENSOR M41
JRIWC2447GB

AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	B47
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
6	R	BACK DOOR OPENER REQUEST SW
9	G	HANDS FREE SENSOR
10	W	REAR RH DOOR SW
11	LG	BACK DOOR SW
12	R	REAR LH DOOR SW
13	SB	PASSENGER DOOR SW
15	LA/G	REAR WIPER AUTO STOP
16	Y	BACK DOOR OPENER SW
17	SB	DRIVER DOOR SW
20	L	CAN-H
21	BR	BUMPER ANTENNA(-)
22	Y	REAR ANTENNA(-)
23	L	REAR ANTENNA(+)
24	G	BUMPER ANTENNA(+)
38	V	SIREN
39	LA/W	HIGH-MOUNTED STOP LAMP
40	P	CAN-L

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Type	NS16MBR-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	- [With MR20 or QR25 engine]
1	SB	- [With R9M engine]
2	BR	- [With MR20 or QR25 engine]
2	GR	- [With R9M engine]
3	G	-
4	R	-
5	B	- [With MR20 engine]
5	L	- [With R9M engine]
5	LG	- [With QR25 engine]
6	BG	-
7	G	-
8	V	- [With MR20 engine or R9M engine]
8	W	- [With QR25 engine]
9	BG	- [With R9M engine]
9	BR	- [With MR20 engine]
10	BR	-
11	Y	-
12	L	- [With R9M Engine]
12	LG	- [With QR25 engine]
13	BR	- [With MR20 or QR25 engine]
13	R	- [With R9M engine]
15	L	-
16	SB	-

Connector No.	E10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FGY-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
3	P	-
4	Y	-
7	L	-
8	BG	-
9	L	-
12	B	-
16	G	-
17	W	-

Connector No.	E11
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	renault_243405408R

Terminal No.	Color Of Wire	Signal Name [Specification]
19	V	-
20	R	-
21	LG	-
22	Y	-
23	B	-
24	W	-

Connector No.	E12
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FGY-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
25	LG	-
26	W	-
27	SB	-
28	P	-
30	L	-
31	G	-
32	B	-
33	BG	-
34	LG	-
35	V	-
36	Y	-
37	B	-
38	GR	-

39	BR	-
45	L	-
46	P	-
47	W	-
48	R	-

Connector No.	E13
Connector Name	FUSE BLOCK (J/B)
Connector Type	L01FW-MC

Terminal No.	Color Of Wire	Signal Name [Specification]
1D	G	-

Connector No.	E15
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
10F	L	-
1F	W	-
5F	V	-
6F	Y	-

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AUTOMATIC AIR CONDITIONING SYSTEM

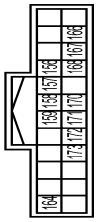
Connector No.	E16
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
97	W	BAROMETRIC PRESSURE SENSOR
99	P	CAN-L
100	L	CAN-H
101	Y	SENSOR POWER SUPPLY
108	R	CLUTCH PEDAL POSITION SWITCH
109	LG	IGNITION SWITCH
110	G	ASCD STEERING SWITCH
111	BR	SENSOR GROUND
115	V	STOP LAMP SWITCH
116	GR	BRAKE PEDAL POSITION SWITCH
118	SB	SENSOR POWER SUPPLY
119	Y	ACCELERATOR PEDAL POSITION SENSOR 2
120	LG	SENSOR GROUND
121	BR	POWER SUPPLY FOR ECM
122	V	SENSOR POWER SUPPLY
123	B	ECM GROUND
124	R	SENSOR GROUND
125	B	ECM GROUND
126	GR	ACCELERATOR PEDAL POSITION SENSOR 1
127	R	SENSOR GROUND
128	B	ECM GROUND

Connector No.	E23
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH24FB-NH

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
156	V	CLUTCH INTERLOCK SW
157	LG	STOP LAMP SW 2
158	W	STOP LAMP SW 1
159	R	ASCD CLUTCH SWITCH
164	Y	INTELLIGENT KEY WARNING BUZZER
166	P	STEERING LOCK UNIT POWER SUPPLY
167	BR	TURN SIG LH (FRONT)
168	GR	TURN SIG RH (FRONT)
170	L	PTC RELAY-3 CONTROL
171	G	STARTER RELAY CONT
172	V	PTC RELAY-1 CONTROL
173	BG	PTC RELAY-2 CONTROL

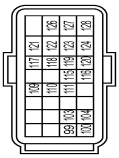
Connector No.	E48
Connector Name	AMBIENT SENSOR
Connector Type	RS02FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	R	-

Connector No.	E60
Connector Name	ECM
Connector Type	RH24FB-RZ8-L-LH

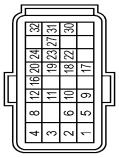
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
99	P	CAN COMMUNICATION LINE (CAN-L)
100	L	CAN COMMUNICATION LINE (CAN-H)
103	Y	REFRIGERANT PRESSURE SENSOR
104	R	SENSOR POWER SUPPLY
109	LG	IGNITION SWITCH
110	G	ASCD STEERING SWITCH
111	BR	SENSOR GROUND
115	V	STOP LAMP SWITCH
116	GR	BRAKE PEDAL POSITION SWITCH
117	W	PNP SIGNAL
118	SB	SENSOR POWER SUPPLY
119	Y	ACCELERATOR PEDAL POSITION SENSOR 2
120	LG	SENSOR GROUND
121	BR	POWER SUPPLY FOR ECM
122	V	SENSOR POWER SUPPLY
123	BR	ECM GROUND
124	W	SENSOR GROUND
126	GR	ACCELERATOR PEDAL POSITION SENSOR 1
127	R	SENSOR GROUND
128	BR	ECM GROUND

Connector No.	E79
Connector Name	ECM
Connector Type	RH24FB-RZ8-R-RH

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	ECM GROUND
2	W	ACCELERATOR PEDAL POSITION SENSOR 1
3	Y	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
4	B	ECM GROUND
5	L	POWER SUPPLY FOR ECM
6	G	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
8	B	ECM GROUND
9	L	FUEL HEATER AND WATER IN FUEL LEVEL SENSOR
10	L	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
11	V	ACCELERATOR PEDAL POSITION SENSOR 2
12	P	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
16	BG	STOP LAMP SWITCH [With M/T]
16	R	BRAKE PEDAL POSITION SWITCH [With CVT]
17	LG	IGNITION SWITCH
18	G	ASCD STEERING SWITCH
19	BR	SENSOR GROUND (ASCD STEERING SWITCH)
20	BR	FUEL PUMP CONTROL MODULE (COMMAND)
22	G	FUEL PUMP CONTROL MODULE (DIAGNOSIS)
23	V	SPEED LIMITER MAIN SWITCH
24	R	CLUTCH PEDAL POSITION SWITCH
27	V	CLUTCH INTERLOCK SWITCH
30	BR	ASCD MAIN SWITCH
31	P	CAN-L
32	L	CAN-H

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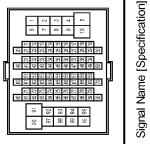
Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

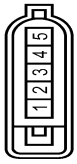
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
2	W	-
5	V	- [Without ISS]
5	W	- [With ISS]
8	L	-
9	LG	-
10	W	-
20	W	-
21	B	-
22	SHIELD	-
31	Y	-
32	W	-
33	SB	-
34	LG	-
35	BG	-
36	LG	-
37	V	-
38	G	-
39	BR	-
40	L	-
41	P	-
47	GR	-
48	SB	-
51	P	-
52	L	-
53	W	-
54	Y	-
55	BR	-
56	P	-
57	B	-
58	L	-
59	W	-
60	G	-
61	BR	-
62	V	-
63	BR	-
64	GR	-
65	LG	-
66	BG	-
67	L	-
68	R	-
71	V	-
72	L	-
73	R	-
76	L	-
77	V	-
78	LG	-
79	SHIELD	-
80	GR	-
82	Y	-
83	SB	-
84	L	-
85	G	-
86	Y	-
87	B	-
88	B	-
91	R	-
92	BR	-
93	W	-
96	GR	-
97	R	-
98	V	-
99	Y	-

Connector No.	E138
Connector Name	PTC HEATER
Connector Type	ALA05FB-R-RH

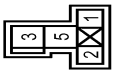
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	L	-
3	GR	-
4	G	-
5	Y	-

Connector No.	E139
Connector Name	PTC RELAY-1
Connector Type	MS02FL-M2-LC

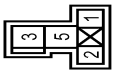
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	LG	-
3	GR	-
5	L	-

Connector No.	E140
Connector Name	PTC RELAY-2
Connector Type	MS02FL-M2-LC

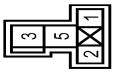
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BG	-
2	SB	-
3	P	-
5	G	-

Connector No.	E141
Connector Name	PTC RELAY-3
Connector Type	MS02FL-M2-LC

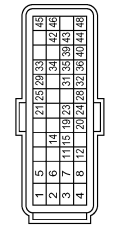
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	W	-
3	BG	-
5	Y	-

Connector No.	F7
Connector Name	ECM
Connector Type	RH40FB-RZ9-R-LH

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	FUEL INJECTOR NO.1(HI)
2	W	FUEL INJECTOR NO.2(HI)
3	W	FUEL INJECTOR NO.3(HI)
4	W	FUEL INJECTOR NO.4(HI)
5	B	FUEL INJECTOR NO.1(LO)
6	B	FUEL INJECTOR NO.2(LO)
7	B	FUEL INJECTOR NO.3(LO)
8	B	FUEL INJECTOR NO.4(LO)
11	B	ECM GROUND
12	BR	SHIELD
14	W	PARK/NEUTRAL POSITION SIGNAL
15	R	GNDA-PHASE
19	W	CAMSHAFT POSITION SENSOR
20	L	SENSOR GROUND
21	L	SENSOR POWER SUPPLY
23	Y	SENSOR POWER SUPPLY

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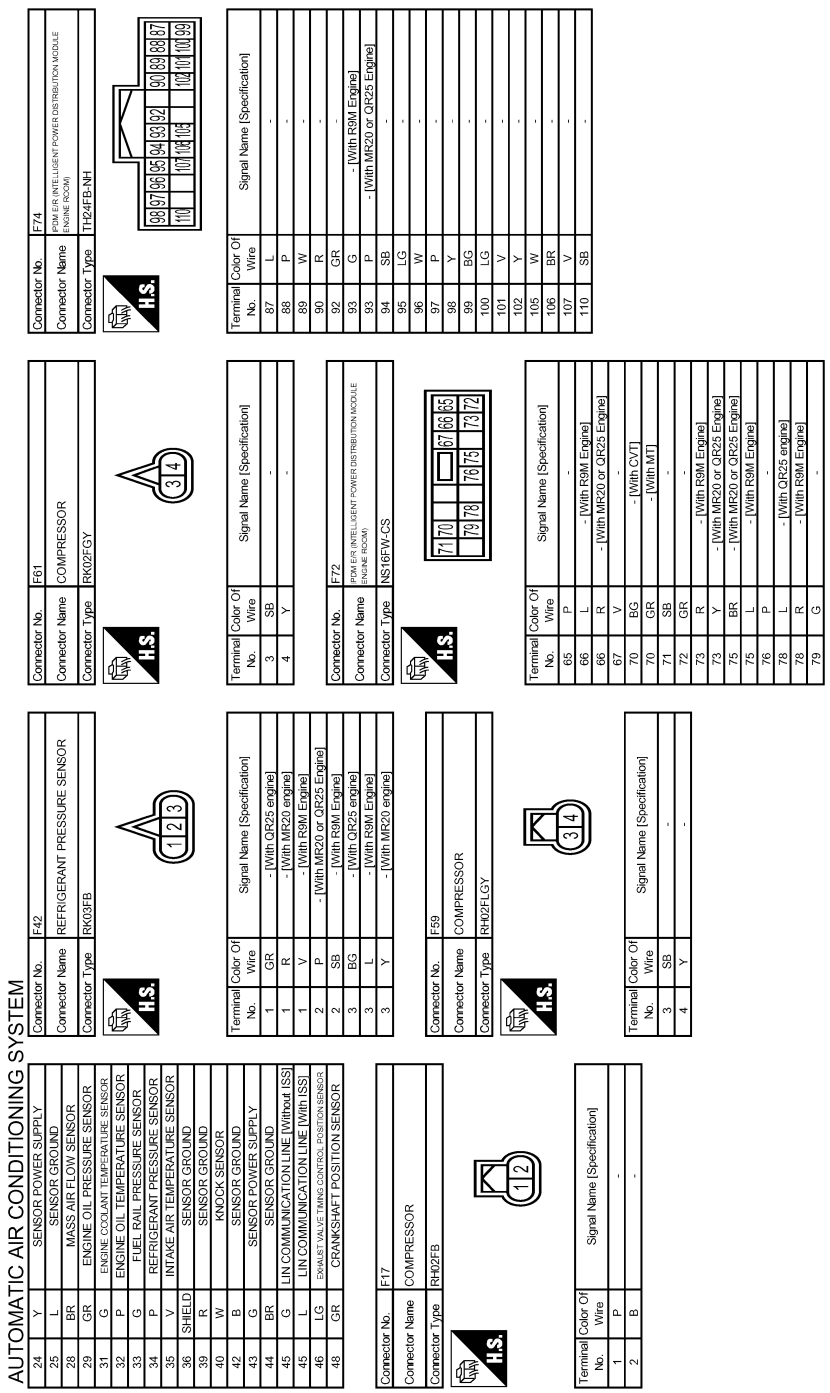

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AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	F118
Connector Name	ECM
Connector Type	RH56FGY-RZ8-R-LH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
98	P	FUEL TEMPERATURE SENSOR
99	L	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)
100	R	SENSOR POWER SUPPLY (DPF DIFFERENTIAL PRESSURE SENSOR)
102	G	SENSOR GROUND (FUEL TEMPERATURE SENSOR)
103	GR	SENSOR GROUND (THROTTLE POSITION SENSOR)
104	LG	SENSOR POWER SUPPLY (EXHAUST THROTTLE POSITION SENSOR)
105	LG	EXHAUST GAS TEMPERATURE SENSOR 2
106	BG	HIGH PRESSURE EGR VOLUME CONTROL VALVE POSITION SENSOR
107	Y	THROTTLE POSITION SENSOR
108	R	SENSOR GROUND (HIGH PRESSURE EGR VOLUME CONTROL VALVE POSITION SENSOR)
109	V	SENSOR GROUND (EXHAUST GAS TEMPERATURE SENSOR 2)
110	L	SENSOR POWER SUPPLY (HIGH PRESSURE EGR VOLUME CONTROL VALVE POSITION SENSOR)
112	LG	SENSOR GROUND (INTAKE MANIFOLD RUNNER CONTROL VALVE POSITION SENSOR)
113	R	EXHAUST THROTTLE POSITION SENSOR
115	B	A/F SENSOR VOLTAGE NERNST 1
116	W	SENSOR GROUND (A/F FUEL RATIO (A/F) SENSOR 1)
117	Y	SENSOR GROUND (EXHAUST THROTTLE POSITION SENSOR)
119	BG	A/F SENSOR CURRENT PUMP 1
121	L	INTAKE MANIFOLD RUNNER CONTROL VALVE POSITION SENSOR
122	Y	DPF DIFFERENTIAL PRESSURE SENSOR
125	W	SENSOR GROUND (EXHAUST GAS PRESSURE SENSOR)
126	W	SENSOR GROUND (EXHAUST GAS PRESSURE SENSOR)
129	P	ENGINE COOLANT TEMPERATURE SENSOR
132	BR	EXHAUST ELECTRIC THROTTLE CONTROL MOTOR (+)
133	B	SENSOR POWER SUPPLY (ENGINE COOLANT TEMPERATURE SENSOR)
134	R	SENSOR GROUND (EXHAUST GAS TEMPERATURE SENSOR 1)
136	W	LOW PRESSURE EGR VOLUME CONTROL VALVE MOTOR (-)
137	SB	REFRIGERANT PRESSURE SENSOR
138	L	EXHAUST GAS PRESSURE SENSOR
140	W	ELECTRIC THROTTLE CONTROL MOTOR (-)
141	V	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
142	G	SENSOR GROUND (LOW PRESSURE EGR TEMPERATURE SENSOR)
143	B	LOW PRESSURE EGR VOLUME CONTROL VALVE MOTOR (+)
144	B	HIGH PRESSURE EGR VOLUME CONTROL VALVE MOTOR (+)
146	BR	LOW PRESSURE EGR TEMPERATURE SENSOR
147	GR	EXHAUST ELECTRIC THROTTLE CONTROL MOTOR (-)
148	W	HIGH PRESSURE EGR VOLUME CONTROL VALVE MOTOR (-)
149	R	TURBOCHARGER BOOST CONTROL ACTUATOR
150	Y	EXHAUST GAS TEMPERATURE SENSOR 1
151	G	ENGINE RESTART BYPASS CONTROL RELAY
152	SB	ELECTRIC THROTTLE CONTROL MOTOR (+)
153	V	FUEL INJECTOR No. 4 (HI)
154	BG	FUEL INJECTOR No. 2 (HI)
155	G	FUEL INJECTOR No. 3 (LO)
156	L	FUEL INJECTOR No. 4 (LO)
157	R	FUEL INJECTOR No. 3 (HI)
158	P	FUEL INJECTOR No. 1 (HI)
159	W	FUEL INJECTOR No. 2 (LO)
160	L	FUEL INJECTOR No. 1 (LO)

Connector No.	F121
Connector Name	WIRE TO WIRE
Connector Type	NS16FBR-CS

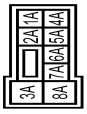
H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	- [With MR20 or QR25 engine]
1	P	- [With R9M engine]
2	BR	- [With QR25 engine]
2	GR	- [With MR20 engine]
2	Y	- [With R9M engine]
3	G	-
4	BG	-
5	B	- [With MR20 engine]
5	L	- [With R9M engine]
5	LG	- [With QR25 engine]
6	V	-
7	G	-
8	V	- [With MR20 engine or R9M engine]
8	W	- [With QR25 engine]
9	B	- [With MR20 engine]
9	W	- [With R9M engine]
10	BR	-
11	P	- [Without ISS]
11	R	- [With ISS]
12	G	- [With QR25 engine]
12	L	- [With R9M Engine]

13	R	- [With R9M engine]
13	Y	- [With MR20 or QR25 engine]
15	L	-
16	LG	-

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS06FW-M2

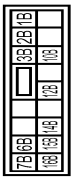
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1A	L	-
2A	LG	-
3A	Y	-
4A	LG	-
5A	R	-
6A	BG	-
7A	BR	-
8A	SB	-

Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS

H.S.

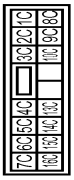


Terminal No.	Color Of Wire	Signal Name [Specification]
10B	GR	- [With MR20 engine or R9M engine]
10B	LA/GR	- [With QR25 Engine]
12B	BR	-
14B	W	-
15B	W	-
16B	GR	-

1B	G	-
2B	R	-
3B	V	-
6B	LA/L	-
7B	LA/V	-

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
10C	LG	-
13C	LA/G	-
14C	R	-
15C	L	-
16C	LA/W	-
1C	R	-
2C	G	-
3C	Y	-
4C	LG	-
5C	GR	-
6C	LA/R	-
7C	Y	-
8C	BR	- [With ISS]
8C	LA/BR	- [Without ISS]
9C	L	-

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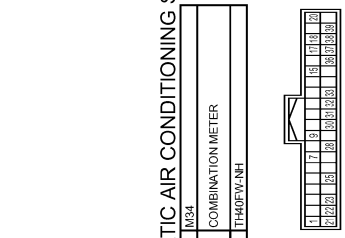
AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH

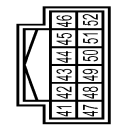


Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
7	BG	SECURITY SIGNAL
9	GR	ECO MODE SWITCH SIGNAL
15	L	AMBIENT SENSOR SIGNAL
17	BG	METER CONTROL SWITCH GROUND
18	SB	TRIP RESET SWITCH SIGNAL
20	Y	AMBIENT SENSOR GROUND
21	L	STEERING SWITCH GROUND
22	Y	STEERING SWITCH SIGNAL A
23	GR	STEERING SWITCH SIGNAL B
25	V	BRAKE FLUID LEVEL SWITCH SIGNAL
28	Y	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
30	LG	MANUAL MODE SIGNAL
31	SB	NON-MANUAL MODE SIGNAL
32	BG	MANUAL MODE SHIFT UP SIGNAL
33	BR	MANUAL MODE SHIFT DOWN SIGNAL
36	GR	ILLUMINATION CONTROL SWITCH SIGNAL (+)
37	V	ILLUMINATION CONTROL SWITCH SIGNAL (-)
38	G	VEHICLE SPEED SIGNAL (8-PULSE)
39	W	VEHICLE SPEED SIGNAL (2-PULSE)

Connector No.	M41
Connector Name	IN-VEHICLE SENSOR
Connector Type	A02FW

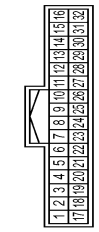
Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
2	P	-

Connector No.	M42
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	W	ILLUMINATION CONTROL SIGNAL
44	LA/B	FUEL LEVEL SENSOR GROUND
45	LA/G	BATTERY POWER SUPPLY
46	LA/BR	IGNITION SIGNAL [Without ISS]
46	V	IGNITION SIGNAL [With ISS]
47	SB	AV COMMUNICATION SIGNAL (H)
48	LG	AV COMMUNICATION SIGNAL (L)
49	Y	OIL LEVEL SENSOR SIGNAL
50	BG	OIL LEVEL SENSOR GROUND
51	LA/L	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

Connector No.	M66
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
1	SB	-
3	B	-
5	LG	-
7	L	-
8	W	-
9	BG	-
10	Y	-
11	V	-
12	GR	-
13	LG	-
14	SB	-
16	BR	-
18	BR	-
19	G	-
20	Y	-
21	BG	-
23	R	-
24	SB	-
25	GR	-
26	BR	-
27	LG	-
28	W	-
29	BG	-
30	G	-

Connector No.	M74
Connector Name	SUNLOAD SENSOR
Connector Type	K02FB

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	-
2	BR	-

Connector No.	M75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC

Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	SB	-
4	V	-
5	W	-
6	B	-

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AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
2	LA/R	-
5	V	- [Without ISS]
5	W	- [With ISS]
8	G	-
9	Y	-
10	R	-
20	W	-
21	B	-
22	SHIELD	-
31	V	-
32	GR	-
33	G	-
34	LG	-
35	BG	-
36	LG	-
37	V	-
38	G	-
39	BR	-
40	L	-
41	P	-
47	Y	-
48	BG	-
51	GR	-
52	SB	-
53	R	-
54	LA/L	-
55	BR	-
56	P	-
57	B	-
58	L	-
59	W	-
60	LA/R	-
61	P	-
62	V	-
63	LA/BR	-
64	Y	-
65	GR	-
66	BG	-
67	L	-
68	R	-
71	V	-
72	L	-
73	Y	-
76	L	-
77	V	-
78	LG	-
79	SHIELD	-
80	L	- [With ISS]
80	LA/L	- [Without ISS]
82	GR	-
83	LG	-
84	SB	-
85	G	-
86	G	-
87	B	-
88	B	-
91	L	-
92	W	-
93	W	-
96	LG	-
97	BR	-
98	V	-
99	R	-

Connector No.	M85
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	NS16FBR-CS

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
137	W	BAT POWER SUPPLY (FUSE)
138	SB	INT ROOM LAMP CONT
139	L	PASSENGER DOOR UNLOCK OUTPUT
141	V	FRONT DOOR LOCK OUTPUT
143	LA/V	POWER SUPPLY (FR DOOR LK ACT)
144	BG	POWER SUPPLY (TURN SIGNAL)
145	GR	POWER SUPPLY (STOP LAMP)
146	B	GROUND
147	B	GROUND
148	G	DRIVER DOOR UNLOCK OUTPUT
149	W	FRONT DOOR SUPERLOCK OUTPUT
151	R	POWER SUPPLY (REAR DOOR LK ACT)
152	LG	POWER SUPPLY (REAR WIPER)

Connector No.	M87
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FGY-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
41	V	STEERING LOCK UNIT POWER SUPPLY
42	LA/G	TURN SIG LH (SIDE)
43	LA/Y	TURN SIG RH (SIDE)
44	P	INTERIOR ROOM LAMP RELAY CONT
45	R	CAN-L
46	L	CAN-H
47	G	LIGHT & RAIN SENSOR
48	L	CAN-H
49	R	CAN-L
50	BG	DOOR LOCK SW
51	Y	HAZARD SW
56	P	DONGLE
57	L	CVT SHIFT SELECT (DETENT SW) PWR
60	R	HEADLAMP WASHER SW
63	G	POWER WINDOW RELAY CON
64	LA/R	REAR WINDOW DEFOGGER RELAY CONT
65	BR	ACC RELAY CONT
67	Y	IGN RELAY (F/B) CONT OUTPUT
68	LA/W	BLOWER RELAY CONT
73	LG	COMBI SW INPUT 5
74	Y	COMBI SW OUTPUT 5
75	BG	SECURITY IND LAMP CONT
76	G	COMBI SW INPUT 3
77	GR	COMBI SW INPUT 4
78	V	COMBI SW INPUT 1
79	W	COMBI SW INPUT 2
80	SB	DOOR UNLOCK SW

Connector No.	M133
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
3	-	-
5	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
16	-	-
18	-	-
19	-	-
20	-	-
21	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-

JRIWC2454GB

AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M134
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-

Connector No.	M135
Connector Name	A/C CONTROL
Connector Type	TH10FB-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GND
4	GR	ACC PWR SPLY
8	LG	LIN

Connector No.	M173
Connector Name	A/C AUTO AMP.
Connector Type	TH40FGY-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	BR	A/MIX LH 2
2	L	A/MIX LH 1
9	W	A/MIX RH 2
10	L	A/MIX RH 1
11	BR	MODE 2
12	L	MODE 1
14	BR	INT 3
16	R	INT 2
17	L	INT 1
20	W	MTR PWR SPLY (MODE, INT)
21	G	A/MIX LH 4
22	R	A/MIX LH 3
27	G	PWR TRANS CONT
30	BR	A/MIX RH 4
31	R	A/MIX RH 3
32	G	MODE 4
33	R	MODE 3
35	BR	SENS GND (INTAKE)
36	W	INT 4
37	R	BLOWER MTR F/B
38	BG	INTAKE SENS
40	G	MTR PWR SPLY (A/MIX)

Connector No.	M174
Connector Name	A/C AUTO AMP.
Connector Type	TH40FB-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
41	BG	ACC PWR SPLY
43	R	GND
51	L	CAN-H
53	P	IN-VHCL SENS
54	V	SUNLOAD SENS
63	G	SENS GND (IN-VHCL, SUNLOAD)
71	W	CAN-L
73	Y	LIN

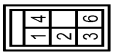
Connector No.	M175
Connector Name	INTAKE SENSOR
Connector Type	TK02FBR

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-

Connector No.	M342
Connector Name	MODE DOOR MOTOR
Connector Type	98192-1001

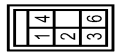
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	MODE DRIVE SIGNAL 2
2	-	MODE DOOR DRIVE POWER SUPPLY
3	-	MODE DRIVE SIGNAL 4
4	-	MODE DRIVE SIGNAL 1
6	-	MODE DRIVE SIGNAL 3

Connector No.	M343
Connector Name	INTAKE DOOR MOTOR
Connector Type	MAA06FB

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	A/MIX DRIVE SIGNAL 2
2	-	AIR MIX DOOR DRIVE POWER SUPPLY
3	-	A/MIX DRIVE SIGNAL 4
4	-	A/MIX DRIVE SIGNAL 1
6	-	A/MIX DRIVE SIGNAL 3

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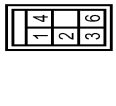
AUTOMATIC AIR CONDITIONING SYSTEM

Connector No.	M344
Connector Name	AIR MIX DOOR MOTOR RH
Connector Type	MAA06FB

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	
2	-	
3	-	
4	-	
6	-	

Connector No.	M345
Connector Name	AIR MIX DOOR MOTOR LH
Connector Type	MAA06FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	A/MIX DRIVE SIGNAL 2
2	-	AIR MIX DOOR DRIVE POWER SUPPLY
3	-	A/MIX DRIVE SIGNAL 4
4	-	A/MIX DRIVE SIGNAL 1
6	-	A/MIX DRIVE SIGNAL 3

Connector No.	M347
Connector Name	BLOWER MOTOR
Connector Type	M02FW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	
2	-	

Connector No.	M349
Connector Name	POWER TRANSISTOR
Connector Type	YAZAKI 7283-6469-40

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	
2	-	
3	-	
4	-	

Connector No.	M350
Connector Name	POWER TRANSISTOR
Connector Type	YAZAKI 7283-6458-40

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
5	-	
6	-	

JRIWC2456GB

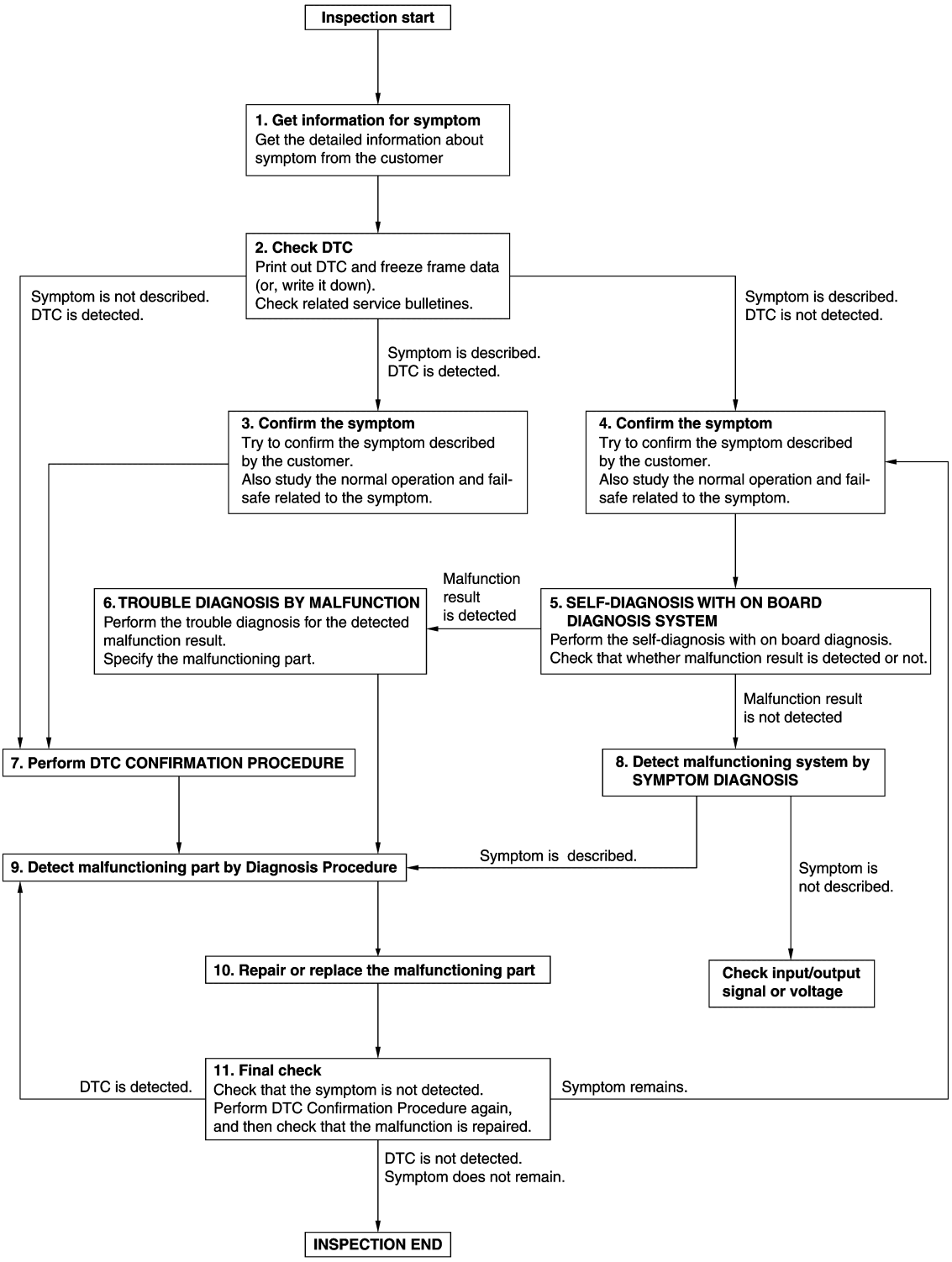
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000010939723

OVERALL SEQUENCE



JMIIA2097GB

DETAILED FLOW

1.GET INFORMATION FOR SYMPTOM

1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is detected.

- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.

3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.
Symptom is described, DTC is not detected>>GO TO 4.
Symptom is not described, DTC is detected>>GO TO 7.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 7.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

5.SELF-DIAGNOSIS WITH ON BOARD DIAGNOSIS SYSTEM

Perform the self-diagnosis with on board diagnosis. Check that whether malfunction result is detected or not.

Is malfunction result detected?

YES >> GO TO 6.
NO >> GO TO 8.

6.TROUBLE DIAGNOSIS BY MALFUNCTION

Perform the trouble diagnosis for the detected malfunction result. Specify the malfunctioning part.

>> GO TO 9.

7.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.
If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
  If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

YES >> GO TO 9.
NO >> Check according to GI-44, "Intermittent Incident".

8. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

YES >> GO TO 9.
NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

9. DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 10.
NO >> Check according to GI-44, "Intermittent Incident".

10. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is detected, erase it.

>> GO TO 11.

11. FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.
When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 9.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

OPERATION INSPECTION

Work Procedure

INFOID:0000000010939724

DESCRIPTION

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

Check condition : Engine running at normal operating temperature.

OPERATION INSPECTION

1. CHECK MEMORY FUNCTION

1. Press AUTO switch to activate air conditioning.
2. Set temperature to 30.0°C by operating temperature control dial (driver side).
3. Press ON·OFF switch.
4. Turn ignition switch OFF.
5. Turn ignition switch ON.
6. Press AUTO switch.
7. Check that the set temperature (30.0°C) is maintained.

Is the inspection result normal?

YES >> GO TO 2.
NO >> GO TO 10.

2. CHECK FAN SPEED

1. Start engine.
2. Operate fan switch and check that fan speed changes.
3. 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 switch to set the fan speed to maximum speed.
2. Operate MODE VENT/FOOT/DEF switch and MAX DEF switch.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the outlets.

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. The INTAKE switch indicator 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. The INTAKE switch indicator turns OFF.
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 turns ON.
2. Check visually and by sound that the compressor operates.
3. Press A/C switch again. The A/C switch indicator 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 (driver side).
2. Check that discharge air temperature (driver side) changes.
3. Operate temperature control dial (passenger side). DUAL switch indicator turns ON.
4. Check that discharge air temperature (passenger side) changes.
5. Press DUAL switch. DUAL switch indicator turns OFF.
6. Check that air temperature setting (LH/RH) is unified to the driver side temperature setting.

Is the inspection result normal?

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

7. CHECK WITH TEMPERATURE SETTING LOWERED

1. Operate compressor.
2. Operate temperature control dial (driver side) to lower the set temperature to 16.0°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. Warm up engine to the normal operating temperature.
2. Operate temperature control dial (driver side) to raise the set temperature to 30.0°C.
3. 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 and check that AUTO indicator turns ON.
2. Operate temperature control dial (driver side) to check that fan speed or air outlet changes (the air outlet or fan speed varies depending on the ambient temperature, in-vehicle temperature, set temperature, and etc.).

Is the inspection result normal?

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

10. CHECK SELF-DIAGNOSIS WITH ON BOARD DIAGNOSIS SYSTEM

1. Perform self-diagnosis with on board diagnosis.
2. Check that any whether malfunction result is detected.

Is any malfunction result detected?

YES >> Refer to HAC-48, "Diagnosis Description" and perform the appropriate diagnosis.
NO >> GO TO 11.

11. CHECK SELF-DIAGNOSIS WITH CONSULT

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

Is any DTC detected?

YES >> Refer to HAC-56, "DTC Index", and perform the appropriate diagnosis.
NO >> GO TO 12.

12. CHECK FAIL-SAFE ACTIVATION

Check that symptom is applied to the fail-safe activation. Refer to HAC-55, "Fail-safe".

>> Refer to HAC-118, "Symptom Table", and perform the appropriate diagnosis.

SYSTEM SETTING

Temperature Setting Trimmer

INFOID:0000000010939725

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

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.
- A/C auto amp. stores the setting at the time 1 minute after the ignition switch turns OFF.
- When the battery cable is disconnected from the negative terminal or when the battery voltage is 10 V or less, the setting for the difference between the set temperature and control temperature is set to the value stored 1 minute after most recent ignition switch OFF status.

Inlet Port Memory Function (REC)

INFOID:0000000010939726

DESCRIPTION

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

HOW TO SET

With CONSULT

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

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

NOTE:

- A/C auto amp. stores the setting at the time 1 minute after the ignition switch turns OFF.

- When the battery cable is disconnected from the negative terminal or when the battery voltage is 10 V or less, the setting for the difference between the set temperature and control temperature is set to the value stored 1 minute after most recent ignition switch OFF status.

Inlet Port Memory Function (FRE)

INFOID:0000000010939727

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

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

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

NOTE:

- A/C auto amp. stores the setting at the time 1 minute after the ignition switch turns OFF.
- When the battery cable is disconnected from the negative terminal or when the battery voltage is 10 V or less, the setting for the difference between the set temperature and control temperature is set to the value stored 1 minute after most recent ignition switch OFF status.

Setting of Target Evaporator Temperature Upper Limit Value

INFOID:0000000010939728

DESCRIPTION

Setting of upper limit value of target evaporator temperature can be changed. Control characteristic of compressor control (refrigerant discharge amount control) changes according to change of the setting, and then operation ratio of compressor and refrigerant discharge amount are changed. According to change of the setting, control characteristic focusing on the fuel consumption can be adjusted to control characteristic focusing on the cooling capacity.

HOW TO SET

With CONSULT

Perform “TARGET EVAPORATOR TEMP UPPER LIMIT SETTING” in “WORK SUPPORT” mode of “HVAC” using CONSULT.

Work support items	Display	Setting
TARGET EVAPORATOR TEMP UPPER LIMIT SETTING	Initial setting	Initial setting
	High	Setting 1
	Middle	Setting 2
	Low	Setting 3

Setting	Target evaporator temperature upper limit value	Evaporator freezing protection control	Refrigerant discharge amount control
Initial setting	12°C (54°F)	Initial setting	Initial setting
Setting 1	7°C (45°F)	Operation ratio of compressor increases from initial setting.	Refrigerant discharge amount increases from initial setting.

Setting	Target evaporator temperature upper limit value	Evaporator freezing protection control	Refrigerant discharge amount control
Setting 2	5°C (41°F)	Operation ratio of compressor increases from initial setting 1.	Refrigerant discharge amount increases from initial setting 1.
Setting 3	3°C (37°F)	Operation ratio of compressor increases from setting 2.	Refrigerant discharge amount increases from setting 2.

NOTE:
- A/C auto amp. stores the setting at the time 1 minute after the ignition switch turns OFF.
- When the battery cable is disconnected from the negative terminal or when the battery voltage is 10 V or less, the setting for the difference between the set temperature and control temperature is set to the value stored 1 minute after most recent ignition switch OFF status.

DOOR MOTOR STARTING POSITION RESET

Description

INFOID:0000000010939729

- Step motors are used for the mode door motor air mix door motor (driver side/passenger side), and intake door motor.
- Because the step motors do not have position detection mechanisms, there may be a deviation between the door position recognized by A/C auto amp. and the actual door position.
  Therefore, A/C auto amp. performs motor zero position reset for aligning its recognized door position with the actual door position.
- The reset signal is transmitted from A/C auto amp. to the air mix door motor (driver side/passenger side), mode door motor, and intake door motor, which then perform zero position reset.
- After any of the following conditions is met, A/C auto amp. performs motor zero position reset when the ignition switch is next turned ON.
- The battery terminal is disconnected and then reconnected.
- The travel distance reaches 3,000 km (1864 miles). [Performed every 3,000 km (1864 miles).]
- If A/C auto amp., air mix door motor (driver side, passenger side), mode door motor, or intake door motor is removed, it is necessary to perform motor zero position reset using CONSULT.

Work Procedure

INFOID:0000000010939730

1. PERFORM DOOR MOTOR STARTING POSITION RESET

With CONSULT
1. Turn ignition switch ON.
2. Select “Door Motor Starting Position Reset” in “WORK SUPPORT” mode of “HVAC” using CONSULT.
3. Touch “Start” and wait 10 seconds.
4. Make sure the “COMPLETED” is displayed on CONSULT screen.

>> INSPECTION END

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000010939732

DESCRIPTION

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-41, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart" for details of the communication signal.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition
U1000	CAN COMM CIRCUIT (CAN COMM CIRCUIT)	When A/C auto amp. is not transmitting or receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

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

Is DTC detected?

YES >> Refer to HAC-78, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939733

1.CHECK CAN COMMUNICATION SYSTEM

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

>> INSPECTION END

B24A0 A/C AUTO AMP.

DTC Description

INFOID:0000000010939734

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A0	A/C AUTO AMP. (Air conditioning automatic amplifier)	[INTERNAL ELECTRONIC ERROR]	A malfunction is detected in A/C auto amp. internal EEPROM memory functions.

POSSIBLE CAUSE

A/C auto amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC detected?

YES >> Refer to HAC-79, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939735

1.REPLACE A/C AUTO AMP.

Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".

>> INSPECTION END

B24A1 A/C AUTO AMP. POWER SUPPLY

DTC Description

INFOID:0000000010939736

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A1	A/C AUTO AMP. POWER SUPPLY (Air conditioning automatic amplifier power supply)	[CIRC VOLT BELOW THRESHOLD]	The accessory power voltage that is transmitted to A/C auto amp. is 10.5 V or less for 30 seconds or more.

POSSIBLE CAUSE

- A/C auto amp.
- Harness or connector (Accessory power supply circuits is open or shorted.)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

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

Is DTC detected?

YES >> Refer to HAC-80, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939737

1.CHECK A/C AUTO AMP. POWER SUPPLY AND GROUND CIRCUITS

Check A/C auto amp. power supply and ground circuits. Refer to HAC-105, "A/C AUTO AMP. : Diagnosis Procedure".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
YES >> Repair or replace malfunctioning parts.

B24A4 INTAKE SENSOR

DTC Description

INFOID:0000000010939738

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A4	INTAKE SENSOR (Intake sensor)	[CIRCUIT SHORT TO GROUND]	The intake sensor recognition temperature is too low [less than –44°C (–47°F)].
		[CIRC SHORT TO BATT OR OPEN]	The intake sensor recognition temperature is too high [more than 100°C (212°F)].

POSSIBLE CAUSE

[CIRCUIT SHORT TO GROUND]
- Intake sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is shorted to ground.)

[CIRC SHORT TO BATT OR OPEN]
- Intake sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted to battery.)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-81, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939739

NOTE:
The intake sensor cannot be reused. If the intake sensor harness connector is disconnected, sensor must be replaced.

1.CHECK INTAKE SENSOR SIGNAL

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

+		–	Condition		Voltage
A/C auto amp.					
Connector	Terminal				
M173	38	Ground	Sensor detection temperature	–20°C (–4°F)	3.62 V
				–10°C (14°F)	3.05 V
				0°C (32°F)	2.46 V
				10°C (50°F)	1.92 V
				20°C (68°F)	1.46 V
				25°C (77°F)	1.26 V
				30°C (86°F)	1.09 V
				40°C (104°F)	0.82 V

Is the inspection result normal?

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

2.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	
M175	1	M173	38	Existed

Is the inspection result normal?

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

3.CHECK INTAKE SENSOR GROUND CIRCUIT FOR OPEN

1. 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	
M175	2	M173	35	Existed

Is the inspection result normal?

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

4.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR SHORT

1. Check continuity between intake sensor harness connector and ground.

Intake sensor		—	Continuity
Connector	Terminal		
M175	1	Ground	Not existed

2. Check voltage between intake harness connector and ground

+		–	Voltage
Intake sensor			
Connector	Terminal		
M175	1	Ground	0 V

Is the inspection result normal?

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

5. CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-83, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace intake sensor. Refer to HAC-130, "Removal and Installation".

6. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-44, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

Component Inspection

INFOID:0000000010939740

NOTE:
The intake sensor cannot be reused. If the intake sensor harness connector is disconnected, sensor must be replaced.

1. CHECK INTAKE SENSOR

1. Remove intake sensor from A/C unit assembly without disconnecting intake sensor connector. Refer to HAC-130, "Removal and Installation".
2. Check resistance between intake sensor harness connector terminals. Refer to applicable table for the normal value.

Intake sensor			Condition	Resistance: kΩ
Connector	Terminal		Temperature: °C (°F)	
M175	1	2	–20 (–4)	16.00
			–10 (14)	9.62
			0 (32)	6.00
			10 (50)	3.87
			20 (68)	2.57
			25 (77)	2.12
			30 (86)	1.76
			40 (104)	1.23

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace intake sensor. Refer to HAC-130, "Removal and Installation".

B24A6 IN-VEHICLE SENSOR

DTC Description

INFOID:0000000010939741

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A6	IN-VEHICLE SENSOR (In-vehicle sensor)	[CIRCUIT SHORT TO GROUND]	The in-vehicle sensor recognition temperature is too low [less than –44°C (–47°F)].
		[CIRC SHORT TO BATT OR OPEN]	The in-vehicle sensor recognition temperature is too high [more than 100°C (212°F)].

POSSIBLE CAUSE

[CIRCUIT SHORT TO GROUND]
- In-vehicle sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is shorted to ground.)

[CIRC SHORT TO BATT OR OPEN]
- In-vehicle sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted to battery.)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-84, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939742

1.CHECK IN-VEHICLE SENSOR SIGNAL

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

+		–	Condition		Voltage
A/C auto amp.					
Connector	Terminal				
M174	53	Ground	Sensor detection temperature	–20°C (–4°F)	3.09 V
				–10°C (14°F)	2.46 V
				0°C (32°F)	1.89 V
				10°C (50°F)	1.41 V
				20°C (68°F)	1.03 V
				25°C (77°F)	0.88 V
				30°C (86°F)	0.75 V
				40°C (104°F)	0.55 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 2.

2.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 3.
NO >> GO TO 5.

3.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	M174	63	Existed

Is the inspection result normal?

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

4.CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-86, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace in-vehicle sensor. Refer to HAC-128, "Removal and Installation".

5.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	M174	53	Existed

Is the inspection result normal?

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

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

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

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

2. Check voltage between in-vehicle harness connector and ground

+		–	Voltage
In-vehicle sensor			
Connector	Terminal		
M41	1	Ground	0 V

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

7. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-44, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

Component Inspection

INFOID:0000000010939743

1. CHECK IN-VEHICLE SENSOR

1. Remove in-vehicle sensor. Refer to HAC-128, "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	–20 (–4)	16.50
		–10 (14)	9.92
		0 (32)	6.19
		10 (50)	3.99
		20 (68)	2.65
		25 (77)	2.19
		30 (86)	1.81
		40 (104)	1.27

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace in-vehicle sensor. Refer to HAC-128, "Removal and Installation".

B24A9 SUNLOAD SENSOR

DTC Description

INFOID:0000000010939744

DTC DETECTION LOGIC

NOTE:
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 No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A9	SUNLOAD SENSOR (Sunload sensor)	[CIRCUIT SHORT TO GROUND]	Detected calorie at sunload sensor 950 W/m^2 (817 kcal/m^2·h) or more.
		[CIRC SHORT TO BATT OR OPEN]	Detected calorie at sunload sensor 50 W/m^2 (43 kcal/m^2·h) or less.

POSSIBLE CAUSE

[CIRCUIT SHORT TO GROUND]
- Sunload sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is shorted to ground.)

[CIRC SHORT TO BATT OR OPEN]
- Sunload sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted to battery.)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-87, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939745

1.CHECK SUNLOAD SENSOR SIGNAL

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

+		–	Condition		Voltage
A/C auto amp.					
Connector	Terminal				
M174	54	Ground	Sensor detection sunload amount	0 W/m^2	5.00 V
				200 W/m^2	4.46 V
				400 W/m^2	3.92 V
				600 W/m^2	3.39 V
				800 W/m^2	2.85 V
				1000 W/m^2	2.25 V

Is the inspection result normal?

YES >> GO TO 7.
NO >> GO TO 2.

2.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 3.
NO >> GO TO 5.

3.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	M174	63	Existed

Is the inspection result normal?

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

4.REPLACE SUNLOAD SENSOR

1. Replace sunload sensor. Refer to HAC-129, "Removal and Installation".
2. Perform DTC confirmation procedure. Refer to HAC-56, "DTC Index".
3. Check DTC.

Is DTC detected?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> INSPECTION END

5.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	M174	54	Existed

Is the inspection result normal?

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

6. CHECK SUNLOAD SENSOR POWER SUPPLY CIRCUIT FOR SHORT

1. Check continuity between sunload sensor harness connector and ground.

Sunload sensor		—	Continuity
Connector	Terminal		
M74	1	Ground	Not existed

2. Check voltage between in-vehicle harness connector and ground

+		–	Voltage
Sunload sensor			
Connector	Terminal		
M74	1	Ground	0 V

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

7. CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-44, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

B24B4 A/C CONTROL

DTC Description

INFOID:0000000010939746

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24B4	A/C CONTROL (Air conditioning control)	[GENERAL ELEC MALFUNCTN]	An internal circuit error message is received from A/C control via LIN communication for 30 seconds or more.

POSSIBLE CAUSE

A/C control (Internal circuit malfunction)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC detected?

YES >> Refer to HAC-90, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939747

1.REPLACE A/C CONTROL

Replace A/C control. Refer to HAC-125, "Removal and Installation".

>> INSPECTION END

B24B7 INTAKE DOOR MOTOR

DTC Description

INFOID:0000000010939748

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24B7	INTAKE DOOR MOTOR (Intake door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of intake door motor circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of intake door motor circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector (Intake door motor circuit is shorted to battery)
- Intake door motor
- A/C auto amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector (Intake door motor circuit is open or shorted to ground)
- Intake door motor
- A/C auto amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-91, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939749

1.CHECK INTAKE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Turn ignition switch ON.
4. Check voltage between intake door motor harness connector and ground for several seconds after pressing the INTAKE switch.

+		–	Voltage
Intake door motor			
Connector	Terminal		
M343	2	Ground	11 - 14 V

Is the inspection result normal?

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

2.CHECK INTAKE DOOR MOTOR 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	
M343	2	M173	20	Existed

Is the inspection result normal?

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

3. CHECK INTAKE DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M343	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

4. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL 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	
M343	6	M173	14	Existed
	1		16	
	3		17	
	4		36	

Is the inspection result normal?

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

5. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M343	6	Ground	Not existed
	1		
	3		
	4		

2. Check voltage between intake door motor harness connector and ground.

+		–	Voltage
Intake door motor			
Connector	Terminal		
M343	6	Ground	0 V
	1		
	3		
	4		

Is the inspection result normal?

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

6. CHECK INTAKE DOOR MOTOR

Check intake door motor. Refer to HAC-93, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace intake door motor. Refer to HAC-136, "INTAKE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939750

1. CHECK INTAKE DOOR MOTOR

1. Remove intake door motor. Refer to HAC-136, "INTAKE DOOR MOTOR : Removal and Installation".
2. Check resistance between intake 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 intake door motor. Refer to HAC-136, "INTAKE DOOR MOTOR : Removal and Installation".

B24B9 MODE DOOR MOTOR

DTC Description

INFOID:0000000010939751

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24B9	MODE DOOR MOTOR (Mode door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of mode door motor circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of mode door motor circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector (Mode door motor circuit is shorted to battery)
- Mode door motor
- A/C auto amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector (Mode door motor circuit is open or shorted to ground)
- Mode door motor
- A/C auto amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-94, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939752

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 for several seconds after pressing the MODE VENT/FOOT/DEF switch.

+		–	Voltage
Mode door motor			
Connector	Terminal		
M342	2	Ground	11 - 14 V

Is the inspection result normal?

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

2.CHECK MODE DOOR MOTOR POWER SUPPLY 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	2	M173	20	Existed

Is the inspection result normal?

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

3. CHECK MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between mode door motor harness connector and ground.

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

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

4. 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	1	M173	11	Existed
	3		12	
	4		32	
	6		33	

Is the inspection result normal?

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

5. CHECK MODE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between mode door motor harness connector and ground.

Mode door motor		—	Continuity
Connector	Terminal		
M342	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between mode door motor harness connector and ground.

+		–	Voltage
Mode door motor			
Connector	Terminal		
M342	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6.CHECK MODE DOOR MOTOR

Check mode door motor. Refer to HAC-96, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace mode door motor. Refer to HAC-137, "MODE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939753

1.CHECK MODE DOOR MOTOR

1. Remove mode door motor. Refer to HAC-137, "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.)
2	1	90
	3	
	4	
	6	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace mode door motor. Refer to HAC-137, "MODE DOOR MOTOR : Removal and Installation".

B24BB LEFT AIR MIX DOOR MOTOR

DTC Description

INFOID:0000000010939754

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24BB	LEFT AIR MIX DOOR MOTOR (Left side air mix door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of air mix door motor [driver side (LHD models), passenger side (RHD models)] circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of air mix door motor [driver side (LHD models), passenger side (RHD models)] circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector [Air mix door motor (driver side) circuit is shorted to battery] (LHD models)
- Harness and connector [Air mix door motor (passenger side) circuit is shorted to battery] (RHD models)
- Air Mix door motor
- A/C auto amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector [Air mix door motor (driver side) circuit is open or shorted to ground] (LHD models)
- Harness and connector [Air mix door motor (passenger side) circuit is open or shorted to ground] (RHD models)
- Air mix door motor
- A/C auto amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-97, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939755

1.CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)] POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect air mix door motor LH connector.
3. Turn ignition switch ON.
4. Check voltage between air mix door motor LH harness connector and ground for several seconds after operating the temperature control dial (driver side) while DUAL switch is OFF.

+		–	Voltage
Air mix door motor LH			
Connector	Terminal		
M345	2	Ground	11 - 14 V

Is the inspection result normal?

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

2.CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)] POWER SUPPLY CIRCUIT FOR OPEN

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

Air mix door motor LH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M345	2	M173	40	Existed

Is the inspection result normal?

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

3.CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)] POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between air mix door motor LH harness connector and ground.

Air mix door motor LH		—	Continuity
Connector	Terminal		
M345	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

4.CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)] 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 LH harness connector and A/C auto amp. harness connector.

Air mix door motor LH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M345	1	M173	1	Existed
	3		2	
	4		21	
	6		22	

Is the inspection result normal?

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

5.CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)] DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between air mix door motor LH harness connector and ground.

Air mix door motor LH		—	Continuity
Connector	Terminal		
M345	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between air mix door motor LH harness connector and ground.

+		–	Voltage
Air mix door motor LH			
Connector	Terminal		
M345	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6. CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)]

Check air mix door motor [driver side (LHD models), passenger side (RHD models)]. Refer to HAC-99, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace air mix door motor [driver side (LHD models), passenger side (RHD models)]. Refer to HAC-135, "AIR MIX DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939756

1. CHECK AIR MIX DOOR MOTOR [DRIVER SIDE (LHD MODELS), PASSENGER SIDE (RHD MODELS)]

1. Remove air mix door motor [driver side (LHD models), passenger side (RHD models)]. Refer to HAC-135, "AIR MIX DOOR MOTOR : Removal and Installation".
2. Check resistance between air mix door motor [driver side (LHD models), passenger side (RHD models)] 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 [driver side (LHD models), passenger side (RHD models)]. Refer to HAC-135, "AIR MIX DOOR MOTOR : Removal and Installation".

B24BD RIGHT AIR MIX DOOR MOTOR

DTC Description

INFOID:0000000010939757

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24BD	RIGHT AIR MIX DOOR MOTOR (Right side air mix door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of air mix door motor [passenger side (LHD models), driver side (RHD models)] circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of air mix door motor [passenger side (LHD models), driver side (RHD models)] circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector [Air mix door motor (passenger side) circuit is shorted to battery] (LHD models)
- Harness and connector [Air mix door motor (driver side) circuit is shorted to battery] (RHD models)
- Air Mix door motor
- A/C auto amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector [Air mix door motor (passenger side) circuit is open or shorted to ground] (LHD models)
- Harness and connector [Air mix door motor (driver side) circuit is open or shorted to ground] (RHD models)
- Air mix door motor
- A/C auto amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1. PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-100, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939758

1. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)] POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect air mix door motor RH connector.
3. Turn ignition switch ON.
4. Check voltage between air mix door motor RH harness connector and ground for several seconds after operating the temperature control dial (driver side) while DUAL switch is OFF.

+		–	Voltage
Air mix door motor RH			
Connector	Terminal		
M344	2	Ground	11 - 14 V

Is the inspection result normal?

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

2. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)] POWER SUPPLY CIRCUIT FOR OPEN

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

Air mix door motor RH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M344	2	M173	40	Existed

Is the inspection result normal?

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

3. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)] POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between air mix door motor RH harness connector and ground.

Air mix door motor RH		—	Continuity
Connector	Terminal		
M344	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

4. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)] 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 RH harness connector and A/C auto amp. harness connector.

Air mix door motor RH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M344	1	M173	9	Existed
	3		10	
	4		30	
	6		31	

Is the inspection result normal?

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

5. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)] DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between air mix door motor RH harness connector and ground.

Air mix door motor RH		—	Continuity
Connector	Terminal		
M344	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between air mix door motor RH harness connector and ground.

+		–	Voltage
Air mix door motor RH			
Connector	Terminal		
M344	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)]

Check air mix door motor [passenger side (LHD models), driver side (RHD models)]. Refer to HAC-102, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Replace air mix door motor [passenger side (LHD models), driver side (RHD models)]. Refer to HAC-137, "MODE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939759

1. CHECK AIR MIX DOOR MOTOR [PASSENGER SIDE (LHD MODELS), DRIVER SIDE (RHD MODELS)]

1. Remove air mix door motor [passenger side (LHD models), driver side (RHD models)]. Refer to HAC-135, "AIR MIX DOOR MOTOR : Removal and Installation".
2. Check resistance between air mix door motor [passenger side (LHD models), driver side (RHD models)] 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 [passenger side (LHD models), driver side (RHD models)]. Refer to HAC-135, "AIR MIX DOOR MOTOR : Removal and Installation".

B24D4 A/C CONTROL COMMUNICATION

DTC Description

INFOID:0000000010939760

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24D4	A/C CONTROL COMM (Air conditioning control communication)	[BUS SIGNAL/MESSAGE ERROR]	A malfunction is detected in the signal that is sent from A/C control.

POSSIBLE CAUSE

- Harness and connector (A/C control circuit is open or shorted)
- A/C control
- A/C auto amp.

FAIL-SAFE

If a communication error exists between the A/C auto amp. and A/C control for 30 seconds or longer, air conditioning is controlled under the following conditions: A/C auto amp. is controlled in the setting state before the communication error occurs for following setting.

- Set temperature
- Air outlet
- Blower fan speed
- Air inlet
- A/C switch

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

With CONSULT

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

Is DTC detected?

YES >> Refer to HAC-103, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939761

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10 A fuse [No. 14 (without stop/start system), located in fuse block (J/B)], [No. 76 (with stop/start system)].
   NOTE:
   Refer to PG-84, "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 A/C CONTROL POWER SUPPLY

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

+		–	Voltage (Approx.)
A/C control			
Connector	Terminal		
M135	4	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between A/C control and fuse.

3.CHECK A/C CONTROL GROUND CIRCUIT FOR OPEN

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

A/C control		—	Continuity
Connector	Terminal		
M135	1	Ground	Existed

Is the inspection result normal?

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

4.CHECK LIN COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Disconnect A/C auto amp. connector.
2. Check continuity between A/C control harness connector and A/C auto amp. harness connector.

A/C control		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
M135	8	M174	73	Existed

Is the inspection result normal?

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

5.CHECK LIN COMMUNICATION SIGNAL CIRCUIT FOR SHORT

Check continuity between A/C control harness connector and ground.

A/C control		—	Continuity
Connector	Terminal		
M135	8	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-125, "Removal and Installation".
NO >> Repair harness or connector.

POWER SUPPLY AND GROUND CIRCUIT

A/C AUTO AMP.

A/C AUTO AMP. : Diagnosis Procedure

INFOID:0000000010939762

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10 A fuse [No. 20 (without stop/start system), located in fuse block (J/B)], [No. 59 (with stop/start system)].
   NOTE:
   Refer to PG-84, "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 A/C AUTO AMP. ACCESSORY 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		
M174	41	Ground	11 - 14 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between A/C auto amp. and fuse.

3.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		
M174	43	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

A/C CONTROL

A/C CONTROL : Diagnosis Procedure

INFOID:0000000010939763

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10 A fuse [No. 20 (without stop/start system), located in fuse block (J/B)], [No. 59 (with stop/start system)].
   NOTE:
   Refer to PG-84, "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 A/C CONTROL POWER SUPPLY

1. Turn ignition switch OFF.

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

+		–	Voltage
A/C control			
Connector	Terminal		
M135	4	Ground	11 - 14 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between A/C control and fuse block (J/B).

3.CHECK A/C CONTROL GROUND CIRCUIT

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

A/C control		—	Continuity
Connector	Terminal		
M135	1	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C control. Refer to HAC-125, "Removal and Installation".
NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000010939764

1.CHECK FUSE

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

- 15 A fuse [Nos. 17 and 27, located in fuse block (J/B)]

NOTE:
Refer to PG-84, "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.CHECKPOWER TRANSISTOR POWER SUPPLY

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

+		–	Voltage
Power transistor			
Connector	Terminal		
M349	4	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-110, "Component Inspection (Blower Relay)".

Is the inspection result normal?

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

4.CHECK BLOWER MOTOR CONTROL CIRCUIT

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

+		–	Voltage
Blower motor			
Connector	Terminal		
M347	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 power transistor connector.
3. Check continuity between power transistor harness connector and blower motor harness connector.

Power transistor		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M350	5	M347	1	Existed

Is the inspection result normal?

YES >> Replace power transistor. Refer to HAC-133, "Removal and Installation".
NO >> Repair harness or connector.

6. CHECK BLOWER MOTOR GROUND CIRCUIT

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

Power transistor		Blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M350	6	M347	2	Existed

Is the inspection result normal?

YES >> GO TO 7.
NO >> Repair harness or connector.

7. CHECK POWER TRANSISTOR GROUND CIRCUIT

Check continuity between power transistor harness connector and ground.

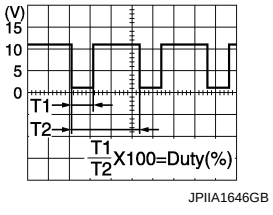
Power transistor		—	Continuity
Connector	Terminal		
M349	2	Ground	Existed

Is the inspection result normal?

YES >> GO TO 8.
NO >> Repair harness or connector.

8. CHECK POWER TRANSISTOR CONTROL SIGNAL

1. Connect power transistor 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 power transistor harness connector and ground by using an oscilloscope.
   NOTE:
   Calculate the drive signal duty ratio as shown in the figure.
   T2 = Approx. 2.5 ms

+ Power transistor		–	Condition	Duty ratio (Approx.)	Voltage
Connector	Terminal		Fan speed (manual) Air outlet: VENT		
M349	1	Ground	1st	21%	
			2nd	24%	
			3rd	31%	
			4th	40%	
			5th	54%	
			6th	70%	
			7th	100%	

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Is the inspection result normal?

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

9. 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	
M349	3	M173	27	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

10. CHECK BLOWER MOTOR FEEDBACK SIGNAL

When fan speed is set to OFF, and check voltage between power transistor harness connector and ground.

+		–	Voltage
Power transistor			
Connector	Terminal		
M349	1	Ground	11 - 14 V

Is the inspection result normal?

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

11. CHECK BLOWER MOTOR FEEDBACK 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	
M349	1	M173	37	Existed

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".
NO >> Repair harness or connector.

12. REPLACE POWER TRANSISTOR

1. Turn ignition switch OFF.
2. Replace power transistor. Refer to HAC-133, "Removal and Installation".
3. Turn ignition switch ON.
4. Change fan speed from 1st – 7th, and check that blower motor operates normally.

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation".

Component Inspection (Blower Motor)

INFOID:0000000010939765

1. CHECK BLOWER MOTOR-I

1. Remove blower motor. Refer to VTL-15, "Removal and Installation".
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".

2.CHECK BLOWER MOTOR-II

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".

3.CHECK BLOWER MOTOR-III

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".

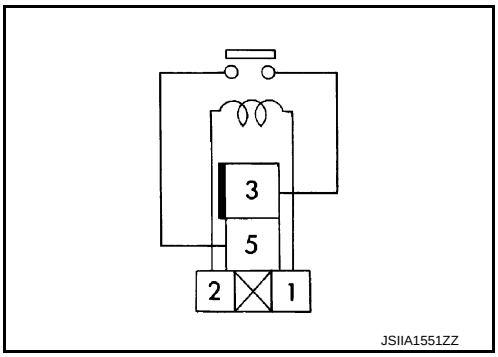
Component Inspection (Blower Relay)

INFOID:0000000010939766

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-84, "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.

MAGNET CLUTCH

Component Function Check

INFOID:0000000010939767

1.CHECK MAGNET CLUTCH OPERATION

CONSULT ACTIVE TEST
1. Select “COMPRESSOR” of IPDM E/R active test item.
2. With operating the test item, check magnet clutch operation by listening and viewing.

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-111, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010939768

1.CHECK MAGNET CLUTCH

CONSULT
1. Turn ignition switch OFF
2. Disconnect compressor connector.
3. Select “COMPRESSOR” of IPDM E/R active test item.
4. With operating the test item, check voltage between compressor harness connector and ground.

+		–	Condition		Voltage
Compressor					
Connector	Terminal				
F17	1	Ground	Active test: COMPRESSOR	Off	0 - 1 V
				On	9 - 16 V

Does it operate normally?

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

2.CHECK FUSE

1. Turn ignition switch OFF
2. Check 15 A fuse (No. 87, located in IPDM E/R).

NOTE:
Refer to PG-86, "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 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	
F72	65	F17	1	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation".
NO >> Repair harness or connector.

4.CHECK MAGNET CLUTCH GROUND CIRCUIT FOR OPEN

Check continuity between compressor harness connector and ground.

Compressor		—	Continuity
Connector	Terminal		
F17	2	Ground	Existed

Is the inspection result normal?

YES >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia), HA-76, "Removal and Installation". (MR20DD engine models), HA-121, "Removal and Installation" (QR25DE engine models) or HA-167, "Removal and Installation" (R9M engine models for Russia).

NO >> Repair harness or connector.

ECV (ELECTRICAL CONTROL VALVE)

Diagnosis Procedure

INFOID:0000000010939769

1.CHECK ECV POWER SUPPLY CIRCUIT

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

Except QR25DE engine models

+		–	Voltage
Compressor			
Connector	Terminal		
F59	3	Ground	6 - 16 V

QR25DE engine models

+		–	Voltage
Compressor			
Connector	Terminal		
F61	3	Ground	6 - 16 V

Is the inspection result normal?

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

2.CHECK ECV POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between compressor harness connector and IPDM E/R harness connector.

Except QR25DE engine models

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	3	F72	71	Existed

QR25DE engine models

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F61	3	F72	71	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation".
NO >> Repair harness or connector.

3.CHECK ECV CONTROL SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between compressor harness connector and IPDM E/R harness connector.

Except QR engine models

Compressor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
F59	4	F74	98	Existed

QR engine models

Compressor		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	
F61	4	F74	98	Existed

Is the inspection result normal?

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

4. CHECK ECV

Check ECV. Refer to HAC-114, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation"
NO >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia), HA-76, "Removal and Installation". (MR20DD engine models), HA-121, "Removal and Installation" (QR25DE engine models) or HA-167, "Removal and Installation" (R9M engine models for Russia).

Component Inspection

INFOID:0000000010939770

1. CHECK ECV

Check continuity between compressor terminals.

Terminal		Continuity
3	4	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia), HA-76, "Removal and Installation". (MR20DD engine models), HA-121, "Removal and Installation" (QR25DE engine models) or HA-167, "Removal and Installation" (R9M engine models for Russia).

PTC HEATER

Component Function Check

INFOID:0000000010939771

1.CHECK PTC HEATER OPERATION

1. Start the engine.
2. Operate blower motor.
3. Operate temperature control switch 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-115, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010939772

1.CHECK FUSE AND FUSIBLE LINK

1. Turn ignition switch OFF.
2. Check 30 A fuses (Nos. 42, 43 and 44) and 10 A fuse [No. 30, located in fuse block (J/B)].

NOTE:
Refer to PG-84, "Fuse, Connector and Terminal 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 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	E139	2	Ground	Battery voltage
		3		
2	E140	2		
		3		
3	E141	2		
		3		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between PTC relay and fuse.

3.CHECK PTC RELAY CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect BCM connector.
2. Check continuity between PTC relay harness connector and BCM harness connector.

PTC relay			BCM		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E139	1	E23	172	Existed
2	E140			173	
3	E141			170	

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	E139	5	E138	1	Existed
2	E140			3	
3	E141			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		
E138	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-116, "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-117, "Component Inspection (PTC Heater)".

Is the inspection result normal?

YES >> Replace BCM. Refer to BCS-121, "Removal and Installation".
NO >> Replace PTC heater. Refer to HAC-132, "Removal and Installation".

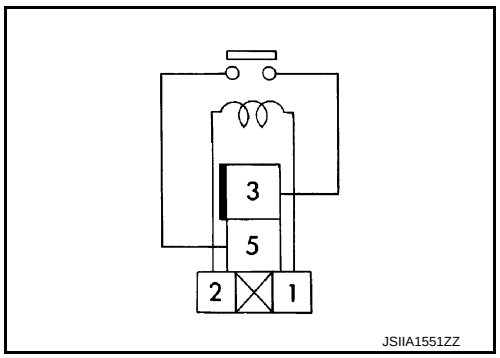
Component Inspection (PTC Relay)

INFOID:0000000010939773

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:0000000010939774

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. Refer to HAC-132, "Removal and Installation".

SYMPTOM DIAGNOSIS

AUTOMATIC AIR CONDITIONER SYSTEM

Symptom Table

INFOID:0000000010939775

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

Symptom		Corresponding malfunction part	Check item/Reference
Air conditioning cannot be controlled.	All control	• A/C control power supply or ground circuit • A/C auto amp.	Check A/C control power supply and ground circuits. Refer to HAC-105, "A/C CONTROL : Diagnosis Procedure".
	A part of control	A/C control	Replace A/C control. Refer to HAC-125, "Removal and Installation".
A/C control display or switch indicator lamp does not display correctly. **NOTE:** The results of A/C control on board diagnosis are normal.		A/C auto amp.	Replace A/C auto amp. Refer to HAC-105, "A/C AUTO AMP. : Diagnosis Procedure".
Discharge air temperature (driver side) does not change.		Air mix door motor (driver side) system installation condition	Check air mix door motor (driver side) system is properly installed. Refer to HAC-134, "Exploded View".
Discharge air temperature (passenger side) does not change.		Air mix door motor (passenger side) system installation condition	Check air mix door motor (passenger side) system is properly installed. Refer to HAC-134, "Exploded View".
Air outlet does not change.		Mode door motor system installation condition	Check mode door motor system is properly installed. Refer to HAC-134, "Exploded View".
Air inlet does not change.		Intake door motor system installation condition	Check intake door motor system is properly installed. Refer to HAC-134, "Exploded View".
Blower motor does not operates or operation speed is not normal.		• Blower motor • Power transistor • Power transistor power supply or ground circuits • Blower motor control or ground circuits • Power transistor control signal circuits • Blower motor feedback signal circuits • A/C auto amp.	Check blower motor circuits. HAC-107, "Diagnosis Procedure"
Compressor does not operate.		• Magnet clutch • Magnet clutch power supply circuits • Magnet clutch ground circuits • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • ECM • A/C auto amp.	Check magnet clutch circuits. HAC-111, "Component Function Check"

Symptom		Corresponding malfunction part	Check item/Reference
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)		• Magnet clutch control system • Drive belt slipping • Cooler cycle • ECV (Electrical control valve) • Air leakage from each duct • Temperature setting trimmer	HAC-120, "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 • PTC heater system (with PTC heater) • Temperature setting trimmer	HAC-122, "Diagnosis Procedure"
Noise is heard when the air conditioning operates.	During compressor operation	Cooler cycle	Symptom table for noise • HA-29, "Symptom Table" (R9M engine models except for Russia) • HA-75, "Symptom Table" (MR20DD engine models) • HA-120, "Symptom Table" (QR25DE engine models) • HA-166, "Symptom Table" (R9M engine models for Russia)
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	Check blower motor. HAC-109, "Component Inspection (Blower Motor)"

INSUFFICIENT COOLING

Description

INFOID:0000000010939776

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

Diagnosis Procedure

INFOID:0000000010939777

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

1.CHECK MAGNET CLUTCH OPERATION

1. Turn ignition switch ON.
2. Push fan switch and operate blower fan.
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 DOES NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-124, "Diagnosis Procedure".

2.CHECK DRIVE BELT

Check tension of drive belt. Refer to EM-23, "Inspection" (MR20DD engine models), EM-167, "Inspection" (QR25DE engine models) or EM-301, "Inspection" (R9M engine models).

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-27, "Symptom Table" (M9R engine models except for Russia), HA-73, "Symptom Table" (MR20DD engine models), HA-118, "Symptom Table" (QR25DE engine models) or HA-164, "Symptom Table" (R9M engine models for Russia).

Is the inspection result normal?

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

4.CHECK ECV

Perform ECV circuit diagnosis. Refer to HAC-113, "Diagnosis Procedure".

Is the inspection result normal?

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

5.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 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-74, "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-126, "Removal and Installation".

INSUFFICIENT HEATING

Description

INFOID:0000000010939778

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

Diagnosis Procedure

INFOID:0000000010939779

NOTE:
Perform self-diagnoses with CONSULT 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-13, "Inspection" (MR20DD engine models), CO-39, "Inspection" (QR25DE engine models) or CO-64, "Inspection" (R9M engine models).
2. Check radiator cap or reservoir tank cap. Refer to CO-16, "RADIATOR CAP : Inspection" (MR20DD engine models), CO-42, "RADIATOR CAP : Inspection" (QR25DE engine models) or CO-68, "Inspection" (R9M engine models).
3. Check water flow sounds of the engine coolant. Refer to CO-14, "Refilling" (MR20DD engine models), CO-40, "Refilling" (QR25DE engine models) or CO-65, "Refilling" (R9M engine models).

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-46, "HEATER CORE : Removal and Installation" (R9M engine models except for Russia), HA-91, "HEATER CORE : Removal and Installation" (MR20DD engine models), HA-136, "HEATER CORE : Removal and Installation" (QR25DE engine models) or HA-182, "HEATER CORE : Removal and Installation" (R9M engine models for Russia).

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-1 >> With PTC heater: GO TO 5.
YES-2 >> Without PTC heater: GO TO 6.
NO >> Repair or replace parts depending on the inspection results.

5.CHECK PTC HEATER

Perform PTC heater diagnosis. Refer to HAC-115, "Diagnosis Procedure".

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-74, "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-126, "Removal and Installation".

COMPRESSOR DOES NOT OPERATE

Description

INFOID:0000000010939780

SYMPTOM
Compressor does not operate.

Diagnosis Procedure

INFOID:0000000010939781

NOTE:
- Perform self-diagnoses with CONSULT 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-111, "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-407, "Diagnosis Procedure" (MR20DD engine models), EC-792, "Diagnosis Procedure" (QR25DE engine models) or EC-1056, "Diagnosis Procedure" (R9M engine models).

Is the inspection result normal?

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

3.CHECK BCM OUTPUT SIGNAL

With CONSULT-
1. Select “DATA MONITOR” mode of “ENGINE” using CONSULT.
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-60, "Removal and Installation".
NO >> Replace A/C auto amp. Refer to HAC-126, "Removal and Installation".

REMOVAL AND INSTALLATION

A/C CONTROL

Exploded View

INFOID:0000000010939782

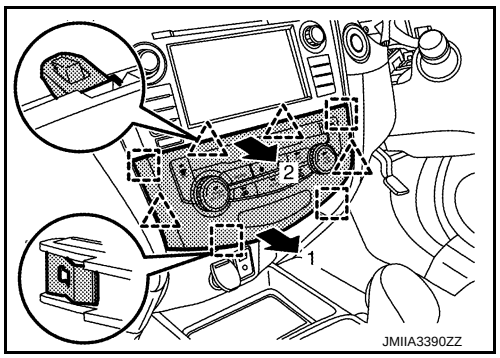
Refer to IP-13, "Exploded View".

Removal and Installation

INFOID:0000000010939783

REMOVAL

1. Disengage fixing metal clips and pawls, and then remove A/C control from instrument panel assembly according to numerical order 1→2 indicated by arrows as shown in the figure.



: Pawl

: Metal clip

2. Disconnect harness connectors.

INSTALLATION

Install in the reverse order of removal.

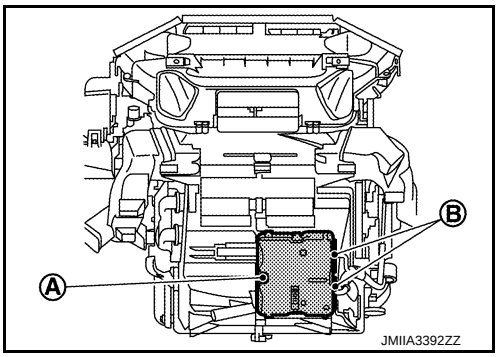
A/C AUTO AMP.

Removal and Installation

INFOID:0000000010939784

REMOVAL

1. Remove instrument lower cover. Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove fixing screw Ⓐ and disconnect harness connectors Ⓑ.



3. Remove A/C auto amp. from A/C unit assembly.

INSTALLATION

Install in the reverse order of removal.

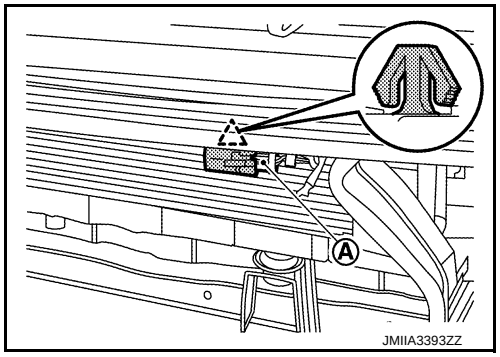
AMBIENT SENSOR

Removal and Installation

INFOID:0000000010939785

REMOVAL

1. Remove front bumper fascia assembly. Refer to EXT-15, "Removal and Installation".
2. Disconnect harness connector Ⓐ.



: Pawl

3. Disengage fixing pawl, and then remove ambient sensor.

INSTALLATION

Install in the reverse order of removal.

IN-VEHICLE SENSOR

Removal and Installation

INFOID:0000000010939786

REMOVAL

1. Remove instrument lower panel center. Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove fixing screw, and then remove in-vehicle sensor.

INSTALLATION

Install in the reverse order of removal.

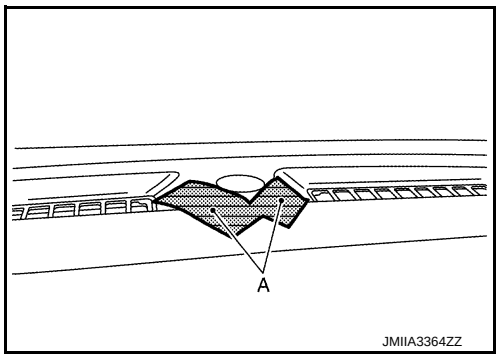
SUNLOAD SENSOR

Removal and Installation

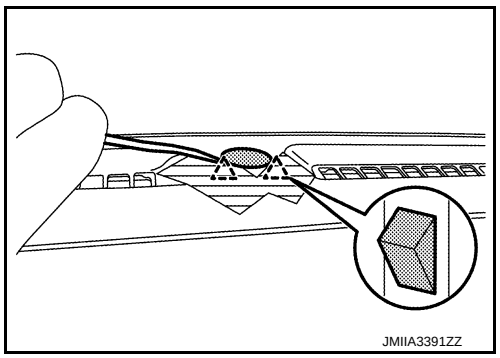
INFOID:0000000010939787

REMOVAL

1. Apply protective tape (A) on instrument panel assembly to protect from damage.



2. Disengage fixing pawls using a remover tool, and then pull up sunload sensor.



: Pawl

CAUTION:
Using a remover tool wrapped in tape.

3. Disconnect harness connector, and then remove sunload sensor.

INSTALLATION

Install in the reverse order of removal.

INTAKE SENSOR

Exploded View

INFOID:0000000010939788

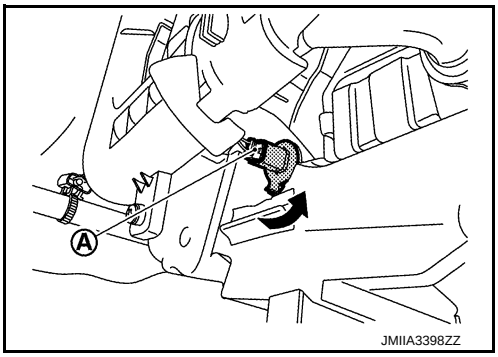
Refer to following items.
- R9M (EXCETP FOR RUSSIA) : Refer to HA-40, "Exploded View".
- MR20DD : Refer to HA-86, "Exploded View".
- QR25DE : Refer to HA-131, "Exploded View".
- R9M (FOR RUSSIA) : Refer to HA-177, "Exploded View".

Removal and Installation

INFOID:0000000010939789

REMOVAL

1. Remove instrument lower cover LH. Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove intake sensor from A/C unit assembly.
3. Disconnect harness connector Ⓐ from intake sensor.
   CAUTION:
   If disconnect harness connector from intake sensor, replace intake sensor with new one.



INSTALLATION

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

CAUTION:

If disconnect harness connector from intake sensor, replace intake sensor with new one.

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000010939790

Refer to following items.
- R9M (EXCETP FOR RUSSIA) : Refer to HA-32, "Exploded View".
- MR20DD : Refer to HA-82, "Exploded View".
- QR25DE : Refer to HA-127, "Exploded View".
- R9M (FOR RUSSIA) : Refer to HA-169, "Exploded View".

Removal and Installation

INFOID:0000000010939791

REMOVAL

Refer to following items.
- R9M (EXCETP FOR RUSSIA) : Refer to HA-36, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- MR20DD : Refer to HA-84, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- QR25DE : Refer to HA-129, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- R9M (FOR RUSSIA) : Refer to HA-174, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".

INSTALLATION

Install in the reverse order of removal.

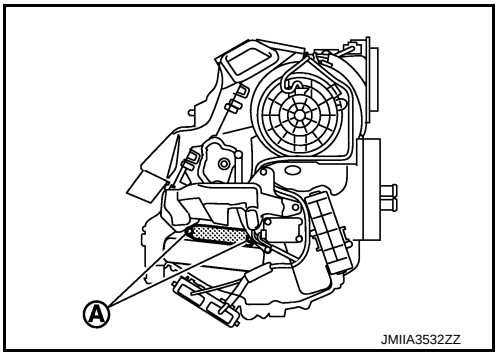
PTC HEATER

Removal and Installation

INFOID:0000000010939792

REMOVAL

1. Remove glove box cover (LHD models) or instrument lower cover RH (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Disconnect PTC heater connector.
3. Remove fixing screws Ⓐ, and then remove PTC heater from A/C unit assembly.



INSTALLATION

Install in the reverse order of removal.

POWER TRANSISTOR

Exploded View

INFOID:0000000010939793

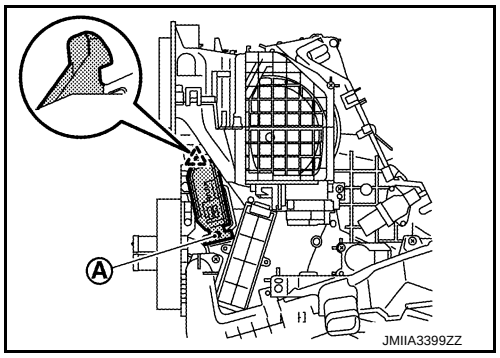
Refer to following items.
- R9M (EXCETP FOR RUSSIA) : Refer to HA-40, "Exploded View".
- MR20DD : Refer to HA-86, "Exploded View".
- QR25DE : Refer to HA-131, "Exploded View".
- R9M (FOR RUSSIA) : Refer to HA-177, "Exploded View".

Removal and Installation

INFOID:0000000010939794

REMOVAL

1. Disconnect power transistor harness connector.
2. Remove fixing screw Ⓐ and disengage pawl.



: Pawl

3. Remove power transistor from A/C unit assembly.

INSTALLATION

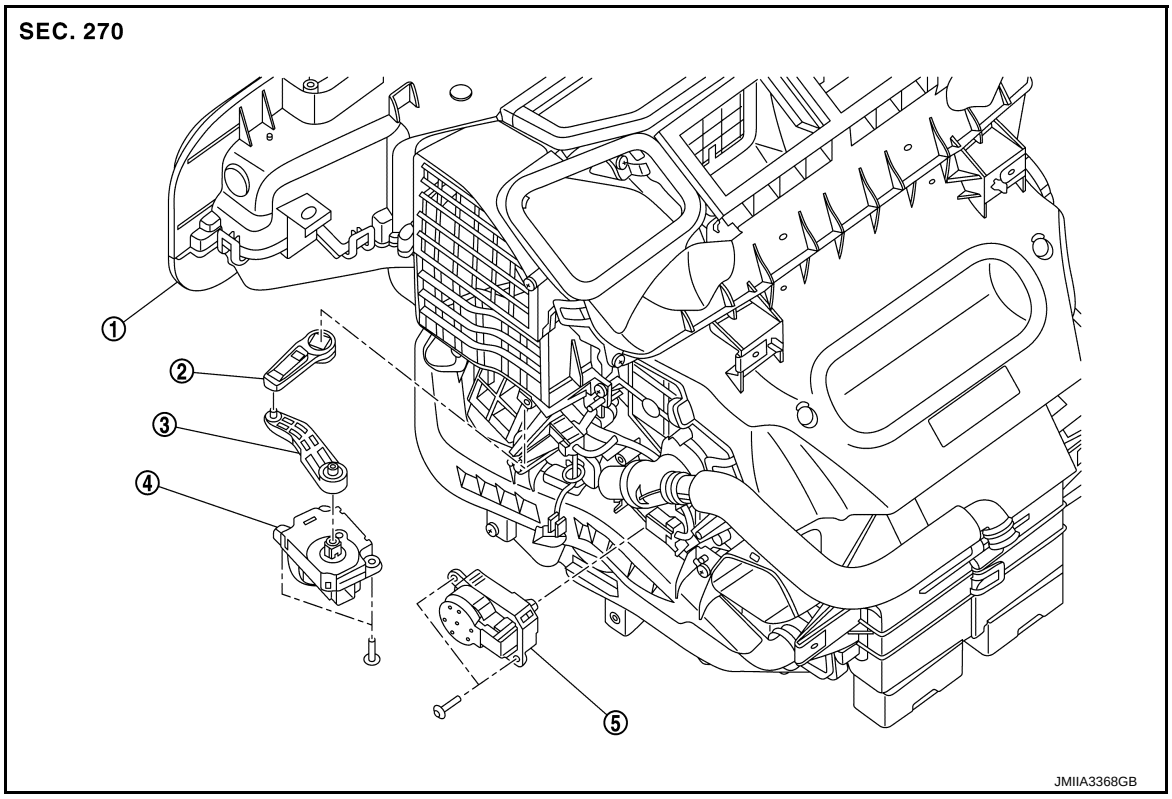
Install in the reverse order of removal.

DOOR MOTOR

Exploded View

INFOID:0000000010939795

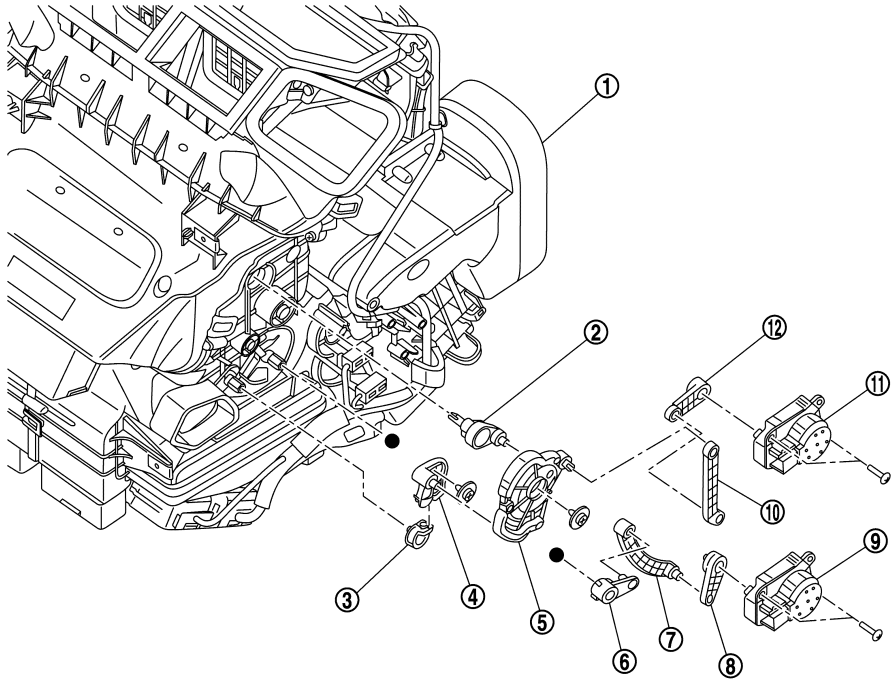
LEFT SIDE



① A/C unit assembly
② Intake door lever
③ Intake door link
④ Intake door motor
⑤ Air mix door motor LH

RIGHT SIDE

SEC. 270



① A/C unit assembly	② Side ventilator door lever	③ Foot door link
④ Foot door link	⑤ Main link	⑥ Air mix door lever
⑦ Air mix door rod	⑧ Air mix door motor lever	⑨ Air mix door motor RH
⑩ Mode door link	⑪ Mode door motor	⑫ Mode door lever

● : Indicates that the part is connected at pints with same symbol in actual vehicle.

AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR : Removal and Installation

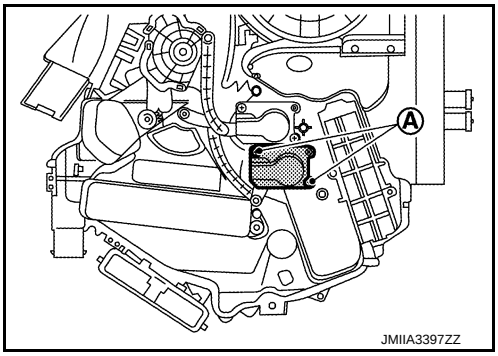
INFOID:0000000010939796

REMOVAL

Air Mix Door Motor RH

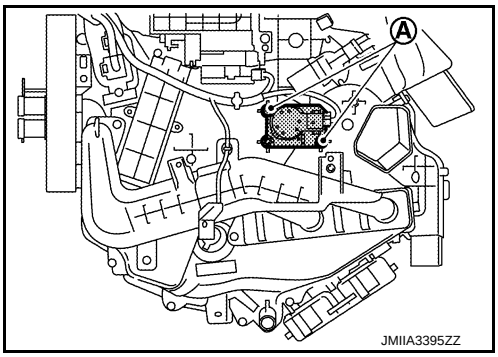
1. Set the temperature at 32°C (90°F).
   CAUTION:
   Always perform the above procedure when removing air mix door motor. Otherwise, air mix door may interfere in A/C unit assembly may be damaged.
2. Remove glove box cover (LHD models) or instrument lower panel RH (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
3. Remove foot duct RH. Refer to VTL-12, "FOOT DUCT : Removal and Installation".
4. Disconnect air mix door motor harness connector.

5. Remove fixing screws Ⓐ, and then remove air mix door motor RH.



Air Mix Door Motor LH

1. Set the temperature at 18°C (64°F).
   CAUTION:
   Always perform the above procedure when removing air mix door motor. Otherwise, air mix door may interfere in A/C unit assembly may be damaged.
2. Remove instrument lower panel LH (LHD models) or glove box cover (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
3. Remove front foot duct LH. Refer to VTL-12, "FOOT DUCT : Removal and Installation".
4. Disconnect air mix door motor harness connector.
5. Remove fixing screws Ⓐ, and then remove air mix door motor LH.



INSTALLATION

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

CAUTION:

After installing door motor, perform door motor starting position. Refer to HAC-77, "Work Procedure".

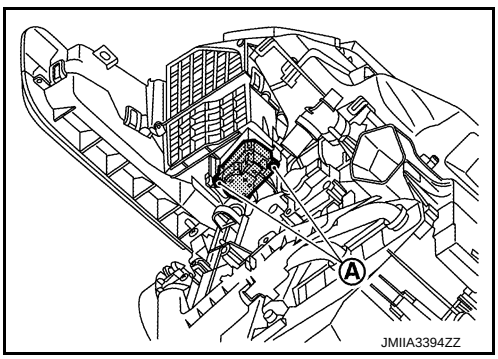
INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000010939797

REMOVAL

1. Remove instrument lower panel LH (LHD models) or glove box cover (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Disconnect intake door motor harness connector.
3. Remove fixing screws Ⓐ, and then remove intake door motor.



INSTALLATION
Install in the reverse order of removal.

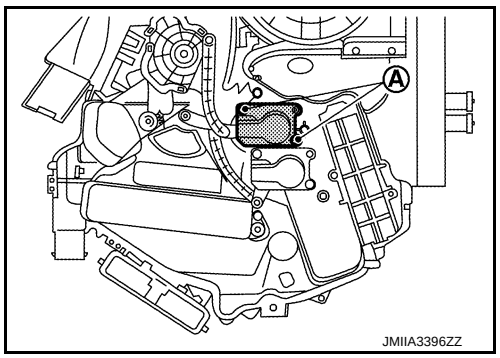
MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:0000000010939798

REMOVAL

1. Remove glove box cover (LHD models) or instrument lower panel RH (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove foot duct RH. Refer to VTL-12, "FOOT DUCT : Removal and Installation".
3. Disconnect mode door motor harness connector.
4. Remove fixing screws Ⓐ, mode door motor.



INSTALLATION
Note the following item, and then install in the reverse order of removal.
CAUTION:
After installing door motor, perform door motor starting position. Refer to HAC-77, "Work Procedure".

PRECAUTION

PRECAUTIONS

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

INFOID:0000000010940093

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.

WARNING:

Always observe the following items for preventing accidental activation.

- **To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision that 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 “SRS AIR BAG”.**
- **Never use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.**

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

WARNING:

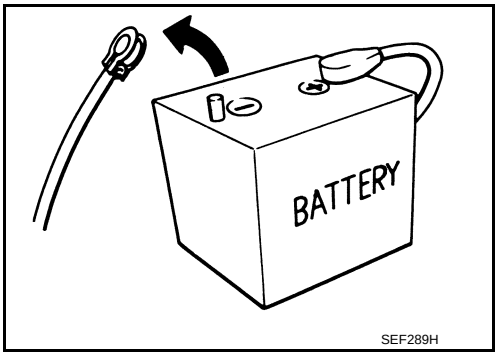
Always observe the following items for preventing accidental activation.

- **When working near the Air Bag Diagnosis Sensor Unit or other Air Bag System sensors with the ignition ON or engine running, never 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.**

Precautions for Removing Battery Terminal

INFOID:0000000010940288

- With the adoption of Auto ACC function, ACC power is automatically supplied by operating the intelligent key or remote keyless entry or by opening/closing the driver side door. In addition, ACC power is supplied even after the ignition switch is turned to the OFF position, i.e. ACC power is supplied for a certain fixed time.
- When disconnecting the 12V battery terminal, turn off the ACC power before disconnecting the 12V battery terminal, observing “How to disconnect 12V battery terminal” described below.
  NOTE:
  Some ECUs operate for a certain fixed time even after ignition switch is turned OFF and ignition power supply is stopped. If the battery terminal is disconnected before ECU stops, accidental DTC detection or ECU data damage may occur.
- For vehicles with the 2-batteries, be sure to connect the main battery and the sub battery before turning ON the ignition switch.
  NOTE:
  If the ignition switch is turned ON with any one of the terminals of main battery and sub battery disconnected, then DTC may be detected.
- After installing the 12V battery, always check "Self Diagnosis Result" of all ECUs and erase DTC.
  NOTE:
  The removal of 12V battery may cause a DTC detection error.



SEF289H

HOW TO DISCONNECT 12V BATTERY TERMINAL

Disconnect 12V battery terminal according to Instruction 1 or Instruction 2 described below.
For vehicles parked by ignition switch OFF, refer to Instruction 2.

INSTRUCTION 1

1. Open the hood.

2. Turn key switch to the OFF position with the driver side door opened.
3. Get out of the vehicle and close the driver side door.
4. Wait at least 3 minutes. For vehicle with the engine listed below, remove the battery terminal after a lapse of the specified time.

D4D engine	: 20 minutes
HRA2DDT	: 12 minutes
K9K engine	: 4 minutes
M9R engine	: 4 minutes
R9M engine	: 4 minutes
V9X engine	: 4 minutes

CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.

5. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

INSTRUCTION 2 (FOR VEHICLES PARKED BY IGNITION SWITCH OFF)

1. Unlock the door with intelligent key or remote keyless entry.
NOTE:
At this moment, ACC power is supplied.
2. Open the driver side door.
3. Open the hood.
4. Close the driver side door.
5. Wait at least 3 minutes.
CAUTION:
While waiting, never operate the vehicle such as locking, opening, and closing doors. Violation of this caution results in the activation of ACC power supply according to the Auto ACC function.
6. Remove 12V battery terminal.
CAUTION:
After installing 12V battery, always check self-diagnosis results of all ECUs and erase DTC.

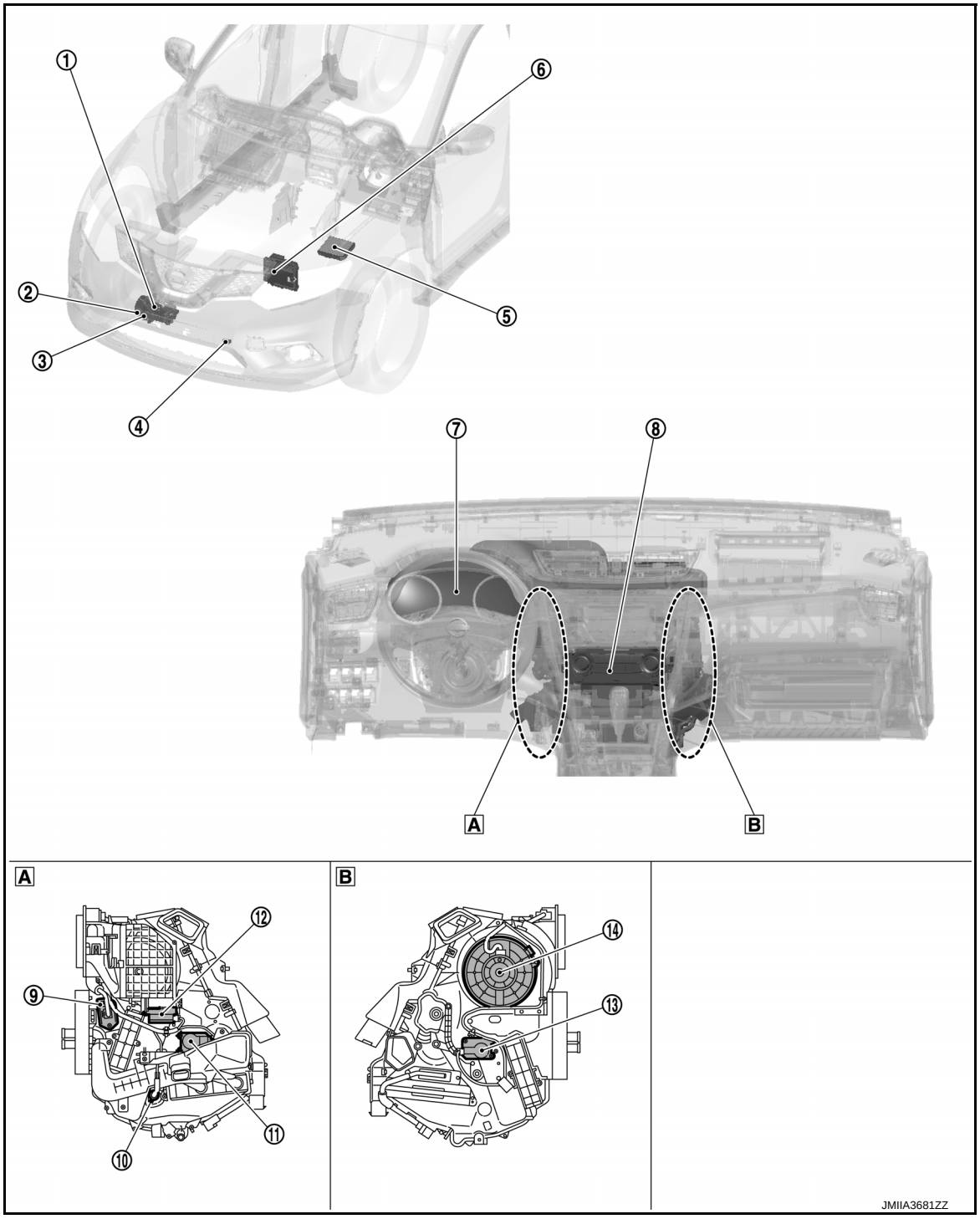
SYSTEM DESCRIPTION

COMPONENT PARTS

MANUAL AIR CONDITIONING SYSTEM

MANUAL AIR CONDITIONING SYSTEM : Component Parts Location

INFOID:0000000010939801



A Left side of A/C unit assembly

B Right side of A/C unit assembly

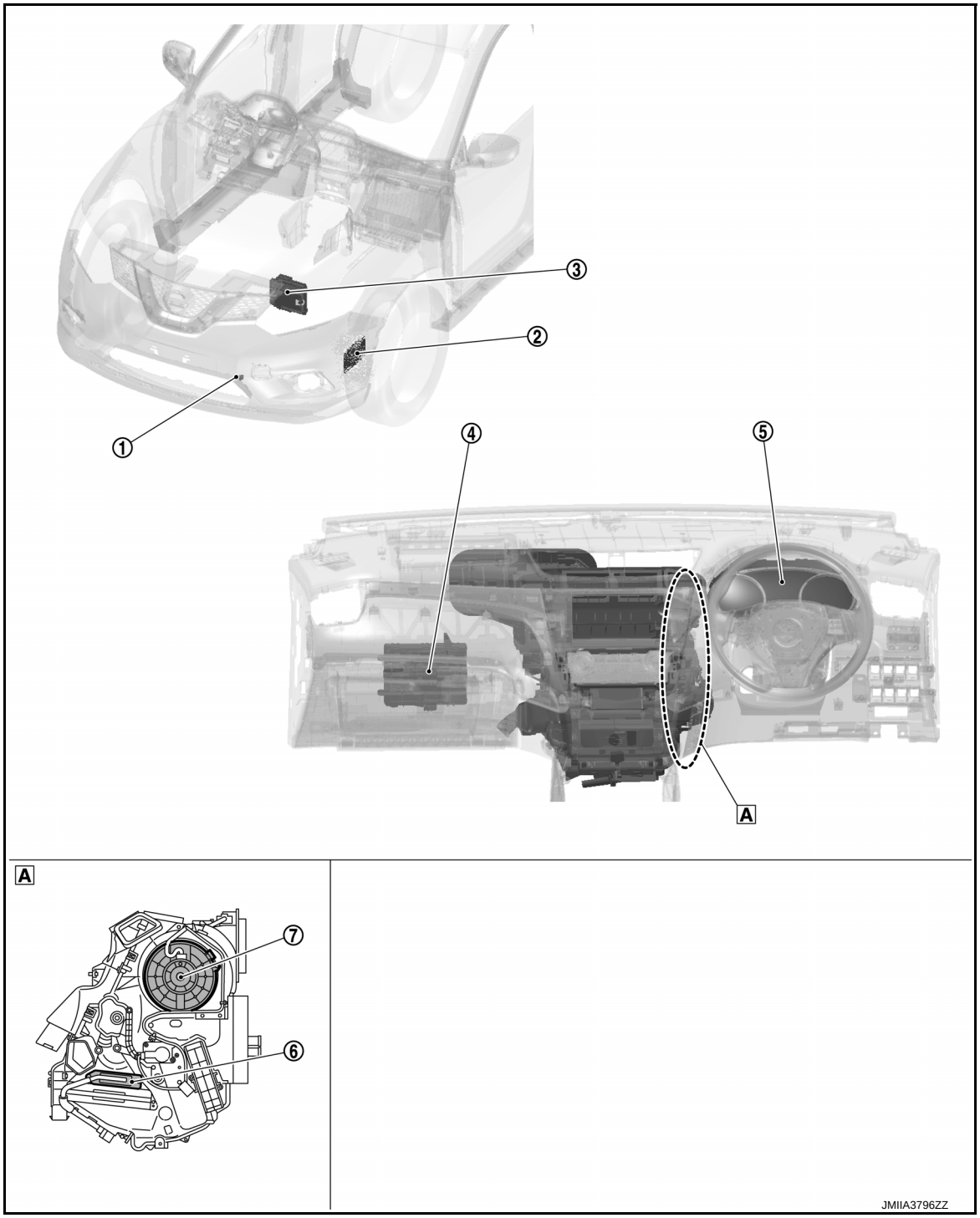
No.	Component		Function
①	Compressor	Magnet clutch	HAC-147, "COMPRESSOR : Magnet Clutch"
		ECV (Electrical Control Valve)	HAC-147, "COMPRESSOR : ECV (Electrical Control Valve)"
②	Refrigerant pressure sensor (MR20DD engine models)		HAC-148, "Refrigerant Pressure Sensor"
③	Refrigerant pressure sensor (R9M engine models)		HAC-148, "Refrigerant Pressure Sensor"
④	Ambient sensor		HAC-148, "Ambient Sensor"
⑤	IPDM E/R		A/C relay is integrated in IPDM E/R. IPDM E/R operates A/C relay when receiving A/C compressor request signal from ECM via CAN communication line. IPDM E/R controls ECV compressor when receiving ECV control signal from A/C amp. via CAN communication line. Refer to PCS-5, "Component Parts Location" for detailed installation location.
⑥	ECM		ECM, when receiving A/C ON signal and blower fan ON signal from A/C amp., transmits A/C compressor request signal to IPDM E/R via CAN communication according to status of the engine and refrigerant pressure. ECM receives cooling fan request signal from A/C amp. ECM transmits engine coolant temperature signal and refrigerant pressure sensor signal to A/C amp. via CAN communication line. Refer to EC-28, "ENGINE CONTROL SYSTEM : Component Parts Location" (MR20DD engine models) or EC-812, "Component Parts Location" (R9M engine models) for detailed installation location.
⑦	Combination meter		Combination meter transmits ambient temperature signal and vehicle speed signal to A/C amp. via CAN communication line.
⑧	A/C control (A/C amp.)		HAC-148, "A/C Control (A/C Amp.)"
⑨	Fan control amp.		HAC-146, "A/C UNIT ASSEMBLY : Fan Control Amp."
⑩	Intake sensor		HAC-144, "A/C UNIT ASSEMBLY : Intake Sensor"
⑪	Air mix door motor		HAC-144, "A/C UNIT ASSEMBLY : Air Mix Door Motor"
⑫	Intake door motor		HAC-145, "A/C UNIT ASSEMBLY : Intake Door Motor"
⑬	Mode door motor		HAC-145, "A/C UNIT ASSEMBLY : Mode Door Motor"
⑭	Blower motor		HAC-146, "A/C UNIT ASSEMBLY : Blower Motor"

PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : Component Parts Location

INFOID:0000000010939802

RHD MODELS

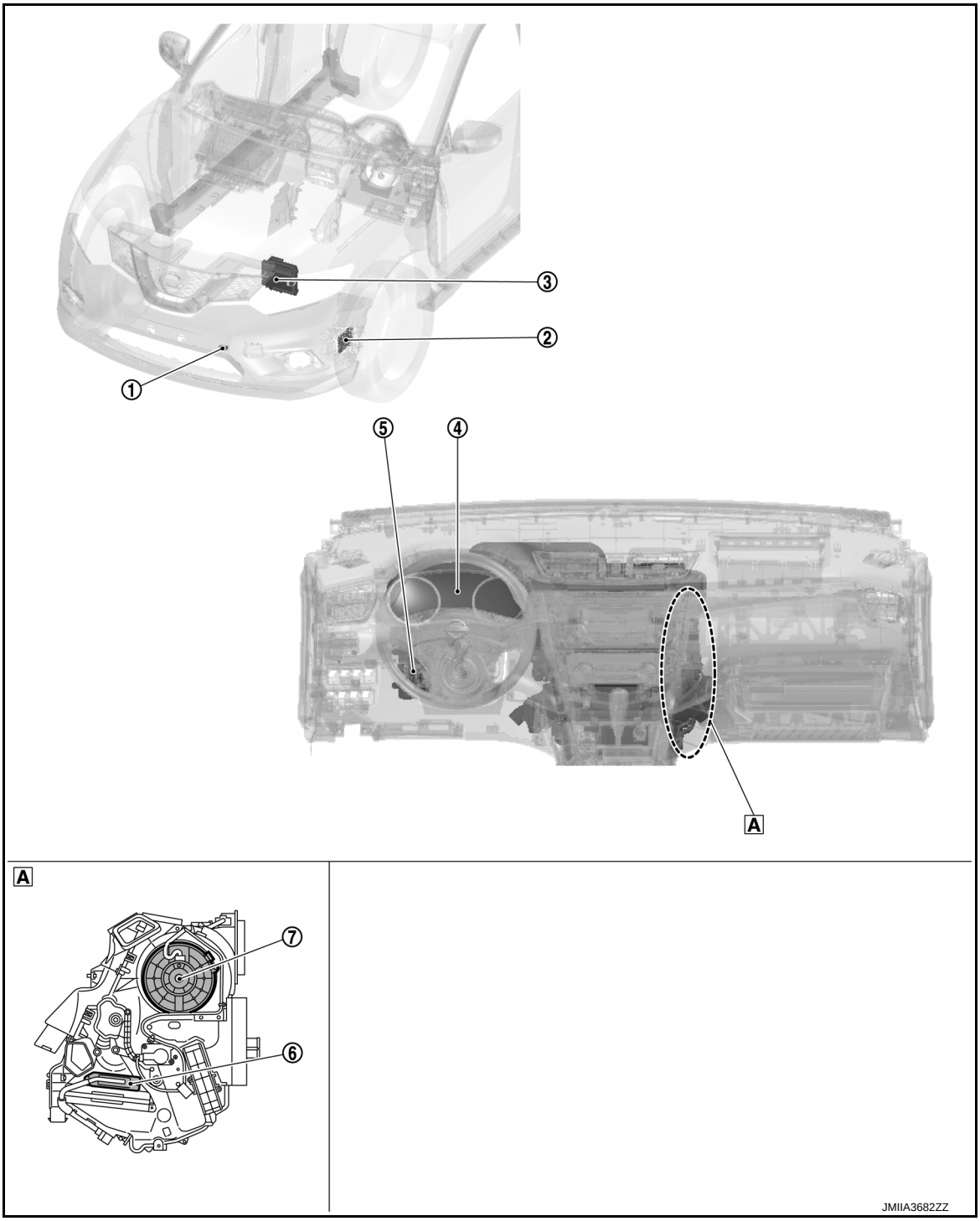


A Right side of A/C unit assembly

No.	Component	Function
①	Ambient sensor	HAC-148, "Ambient Sensor"
②	PTC relay-1/2/3	PTC relay is controlled by BCM, and supplies power supply to PTC heater.
③	ECM	ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to BCM via CAN communication line. Refer to EC-812, "Component Parts Location" for detailed installation location.

No.	Component	Function
④	BCM	BCM receives each signals, and controls PTC relay. BCM transmits idle up signal to ECM according to electrical load condition. Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑤	Combination meter	Combination meter transmits ambient temperature signal to BCM via CAN communication line.
⑥	PTC heater	HAC-147, "A/C UNIT ASSEMBLY : PTC Heater"
⑦	Blower motor	HAC-146, "A/C UNIT ASSEMBLY : Blower Motor"

LHD MODELS



A Right side of A/C unit assembly

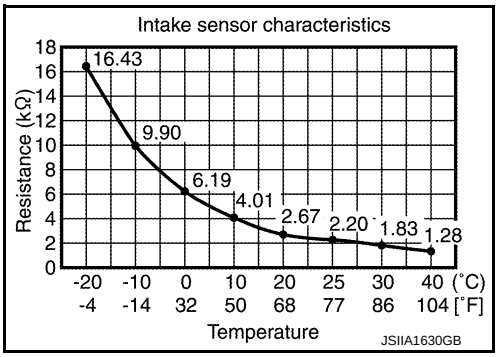
No.	Component	Function
①	Ambient sensor	HAC-148, "Ambient Sensor"
②	PTC relay-1/2/3	PTC relay is controlled by BCM, and supplies power supply to PTC heater.
③	ECM	ECM transmits engine speed signal, engine coolant temperature signal, cooling fan speed request signal, and electrical power cut freeze signal to BCM via CAN communication line. Refer to EC-812, "Component Parts Location" for detailed installation location.
④	Combination meter	Combination meter transmits ambient temperature signal to BCM via CAN communication line.
⑤	BCM	BCM receives each signals, and controls PTC relay. BCM transmits idle up signal to ECM according to electrical load condition. Refer to BCS-6, "BODY CONTROL SYSTEM : Component Parts Location" for detailed installation location.
⑥	PTC heater	HAC-147, "A/C UNIT ASSEMBLY : PTC Heater"
⑦	Blower motor	HAC-146, "A/C UNIT ASSEMBLY : Blower Motor"

A/C UNIT ASSEMBLY

A/C UNIT ASSEMBLY : Intake Sensor

INFOID:0000000010939803

Intake sensor measures 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:0000000010939804

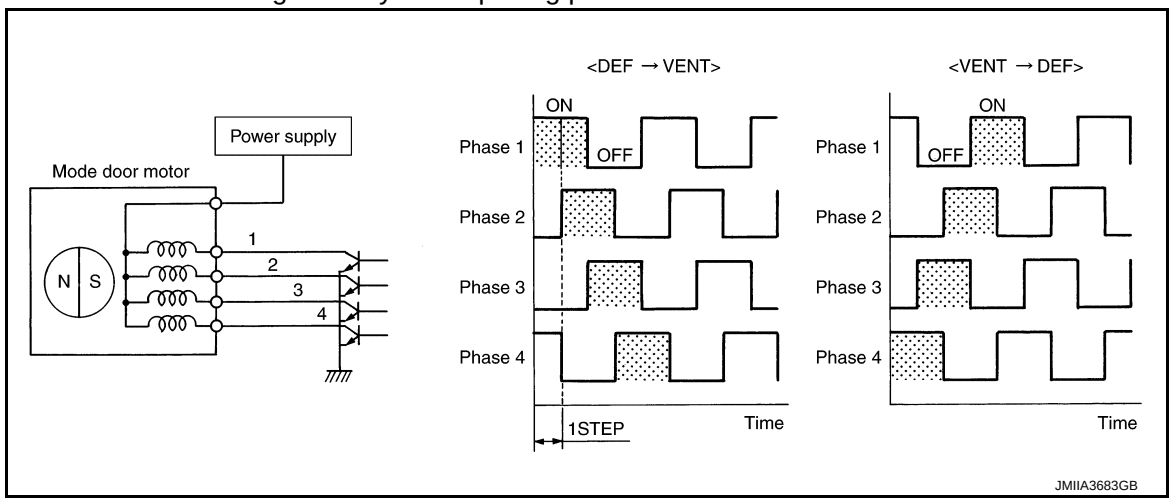
DESCRIPTION

- The step motor system is adopted for air mix door motor.
- When a drive signal is input from A/C amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.
- Rotation of motor is transmitted to air mix door by link and lever, then air flow temperature is switched.

AIR MIX DOOR MOTOR DRIVE METHOD

- The 4 drive coils are excited in sequence in order to drive the motor.

• Direction of rotation is changeable by recomposing pattern of excitation.



A/C UNIT ASSEMBLY : Mode Door Motor

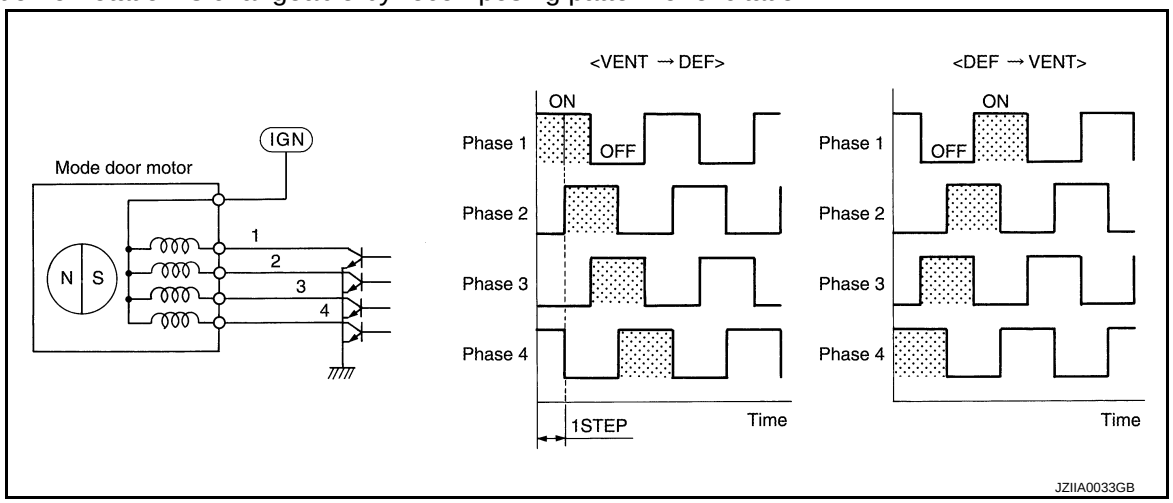
INFOID:0000000010939805

DESCRIPTION

• The step motor system is adopted for mode door motor.
• When a drive signal is input from A/C amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.
• Rotation of motor is transmitted to mode door (center ventilator and defroster door, sub defroster door, side ventilator door, and foot door) by link, rod, and lever, then air outlet is switched.

MODE DOOR MOTOR DRIVE METHOD

• The 4 drive coils are excited in sequence in order to drive the motor.
• Direction of rotation is changeable by recomposing pattern of excitation.



A/C UNIT ASSEMBLY : Intake Door Motor

INFOID:0000000010939806

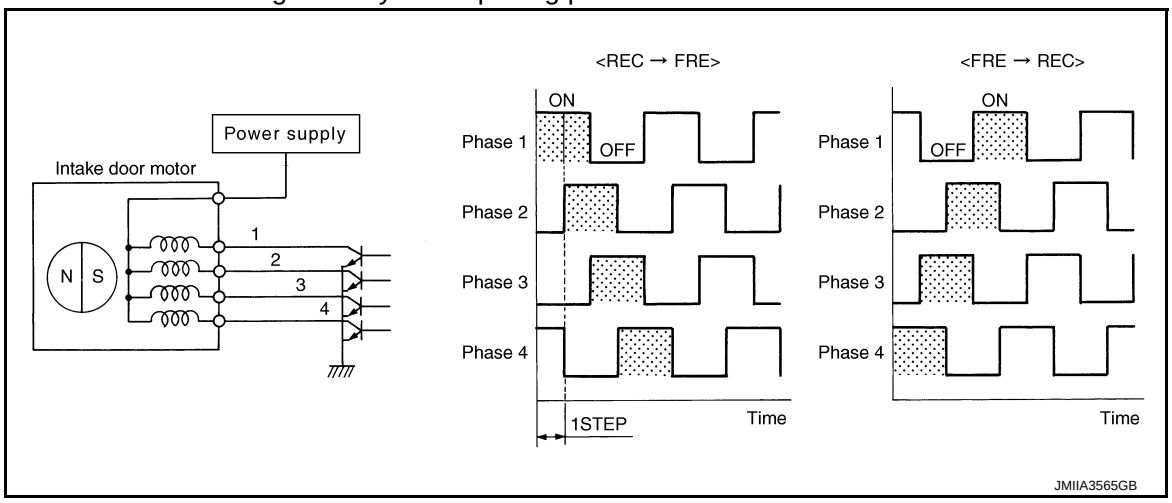
DESCRIPTION

• The step motor system is adopted for intake door motor.
• When a drive signal is input from A/C amp. to door motor, a step motor built into the door motor rotates according to the drive signal, and then stops at the target door position.
• Rotation of motor is transmitted to intake door by lever, then air inlet is switched.

INTAKE DOOR MOTOR DRIVE METHOD

• The 4 drive coils are excited in sequence in order to drive the motor.

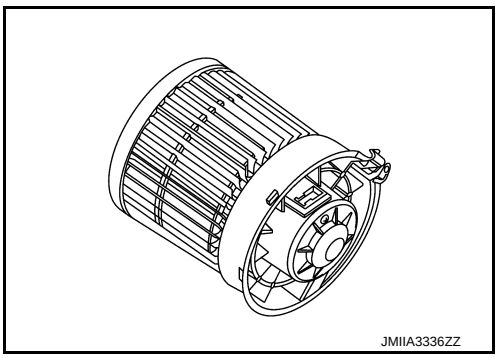
- Direction of rotation is changeable by recomposing pattern of excitation.

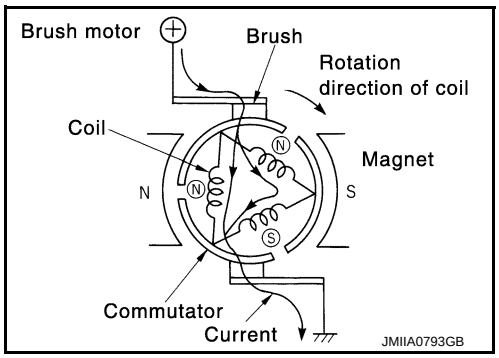


A/C UNIT ASSEMBLY : Blower Motor

INFOID:0000000010939807

- Brush motor, that rotates coil while brush functions as contact points, is adopted for blower motor.
- Rotation speed changes according to voltage from power transistor.

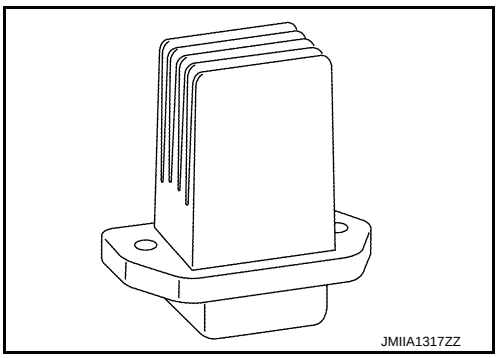




A/C UNIT ASSEMBLY : Fan Control Amp.

INFOID:0000000010939808

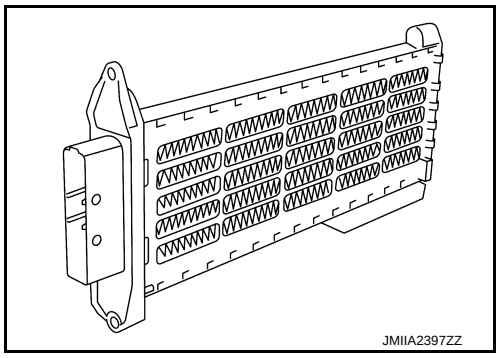
- Fan control amp., that uses MOS field effect transistor, is adopted for blower motor speed control.
  NOTE:
  MOS field effect transistor is a transistor for which the gate portion is composed of a metal electrode on an oxide layer of semiconductor. Field effect transistor is controlled by voltage, 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 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:0000000010939809

- PTC heater is installed on passenger lower side of A/C unit assembly.
- Heat element is heated and air flow temperature is increased by power supply from PTC relay.



COMPRESSOR

COMPRESSOR : Magnet Clutch

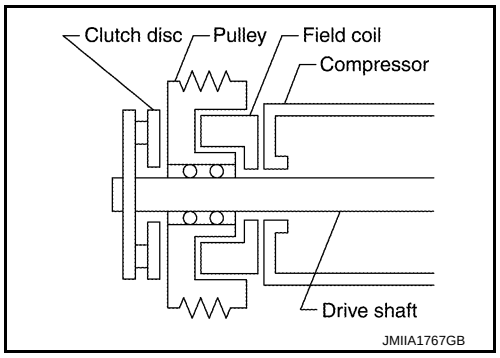
INFOID:0000000010939810

DESCRIPTION

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

STRUCTURE AND OPERATION

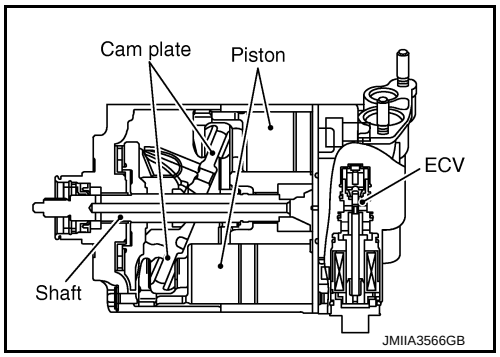
- Magnet clutch consists of pulley, clutch disc, and field coil.
  - Pulley is connected with crankshaft pulley of engine via drive belt and is always rotated while engine is running.
  - Clutch disc is connected with drive shaft of compressor.
  - Field coil, which becomes a strong electric magnet when electricity is supplied, strongly pulls clutch disc and presses it to pulley.
- When A/C relay integrated in IPDM E/R turns ON, electricity is supplied to field coil, clutch disc is presses to pulley, and engine rotational movement is transmitted from crankshaft pulley ⇒ drive belt ⇒ pulley ⇒ clutch disc ⇒ drive shaft. Compressor is operated. When A/C relay turns OFF, electricity is not supplied to field coil, and clutch disc is released from pulley. Compressor is not operated.



COMPRESSOR : ECV (Electrical Control Valve)

INFOID:0000000010939811

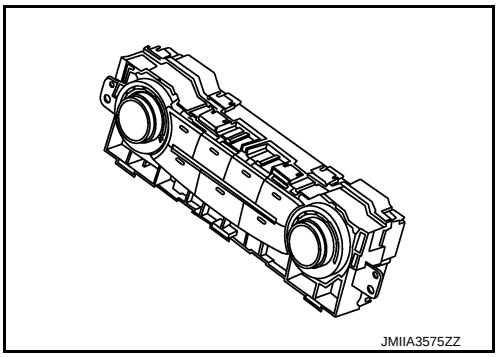
- ECV (Electrical Control Valve) is integrated in the compressor. IPDM E/R receives the ECV control signal from A/C amp. via CAN communication, and ECV is controlled according to the control signal transmitted from IPDM E/R.
- ECV is controlled according to the control signal transmitted from IPDM E/R.
  The control signal transmitted by IPDM E/R is controlled according to the ECV control signal transmitted from A/C amp. via CAN communication.
- ECV varies the air pressure balance in the left and right air spaces that are divided by the swash plate in order to change the angle of the swash plate inside the compressor.
  By changing the swash plate angle, it changes the piston stroke and controls the refrigerant discharge amount.



A/C Control (A/C Amp.)

INFOID:0000000010939812

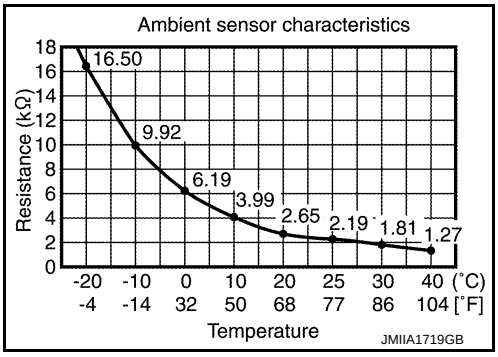
A/C control (A/C amp.) controls A/C by calculations based on signals transmitted from each sensor and switch.
A/C control (A/C amp.) includes a self-diagnosis function. Diagnosis of the manual air conditioning system can be performed quickly.



Ambient Sensor

INFOID:0000000010939813

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.

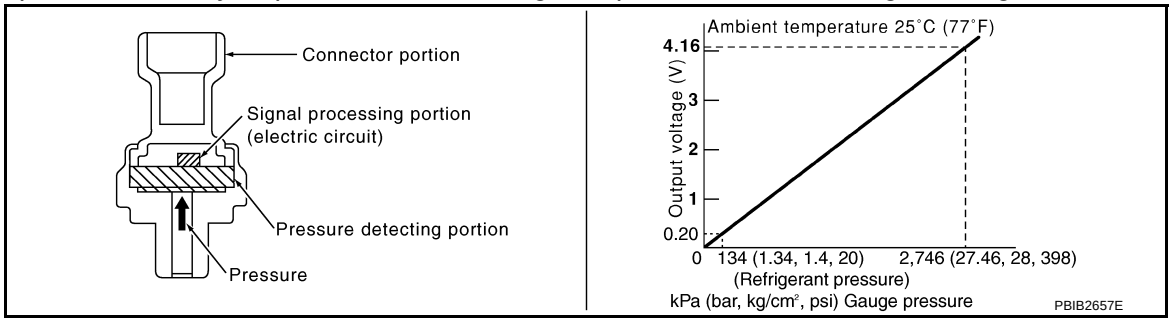


Refrigerant Pressure Sensor

INFOID:0000000010939814

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooler cycle protection and cooling fan 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 area 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.

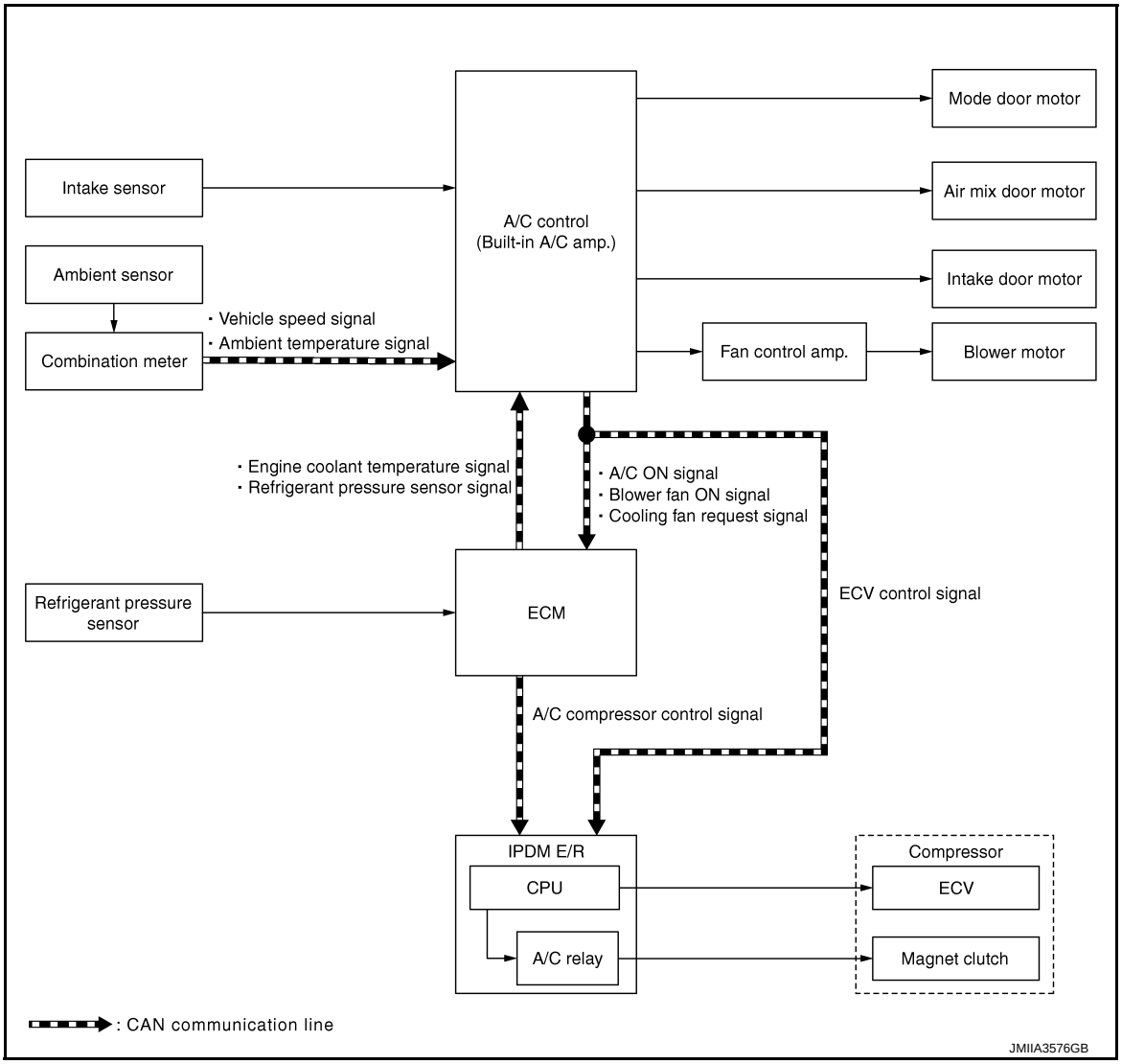
SYSTEM

MANUAL AIR CONDITIONING SYSTEM

MANUAL AIR CONDITIONING SYSTEM : System Description

INFOID:0000000010939815

SYSTEM DIAGRAM



DESCRIPTION

- Automatic air conditioning system is controlled by each function of A/C amp.,ECM and IPDM E/R.
- Each operation of air conditioning system can be controlled by A/C control (built-in A/C amp.).
- A/C control switch indicator is turned ON/OFF by air conditioning system operation condition.

CONTROL BY A/C AMP.

- HAC-150, "MANUAL AIR CONDITIONING SYSTEM : Air Inlet Control"
- HAC-150, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"
- HAC-151, "MANUAL AIR CONDITIONING SYSTEM : Door Control"
- HAC-153, "MANUAL AIR CONDITIONING SYSTEM : Cooling Fan Control"
- HAC-154, "MANUAL AIR CONDITIONING SYSTEM : Door Motor Starting Position Reset Control"
- Correction for input value

Ambient temperature correction

- A/C amp. inputs the temperature detected by ambient sensor as the ambient temperature.
- A/C amp. performs the correction of the temperature detected by ambient sensor for air conditioning control.
- A/C amp. selects and uses the initial value of ambient temperature data depending on the engine coolant temperature when turning the ignition switch from OFF to ON. The detection temperature of the ambient

sensor is used when engine coolant temperature is low [less than approximately 56°C (133°F)]. The memory data (before the ignition switch is OFF) when the engine is warmed up [approximately 56°C (133°F) or more].
- The correction of the ambient temperature is not performed when the detection temperature of the ambient temperature is less than approximately –20°C (–4°F).

Intake temperature correction
- A/C amp. inputs the temperature detected by intake sensor as the intake temperature (evaporator temperature).
- A/C amp. performs the correction of the temperature detected by intake sensor for air conditioning control.
- A/C 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.

CONTROL BY ECM
HAC-150, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"

CONTROL BY IPDM E/R
HAC-150, "MANUAL AIR CONDITIONING SYSTEM : Compressor Control"

MANUAL AIR CONDITIONING SYSTEM : Air Inlet Control
INFOID:0000000010939816

DESCRIPTION
- A/C amp. controls the intake door motor and switches the air inlets.
- A/C amp. controls the air inlets so that they are set to fresh air intake, when compressor is stopped by low temperature protection control.
- When the following conditions are met, A/C amp. controls the air inlets to 20% recirculation. (However, this does not occur when high water temperature control is in effect.)
  At this time, the intake switch indicator lamp turns OFF.
- Fan control dial: 21st - 24th
- Temperature control dial: Full hot
- Air outlet mode: DF ON or DEF ON

HIGH ENGINE COOLANT TEMPERATURE CONTROL
When either of the following conditions is met, A/C amp. changes the air inlets to recirculation.

Condition 1
- Air outlet: Other than D/F or DEF
- A/C switch: ON
- Ambient temperature: More than 25°C (77°F)
- Vehicle speed: 30 km/h or more
- Engine coolant temperature: 105°C (221°F) or more

Condition 2
- Air outlet: D/F or DEF
- Air inlet: Fresh air intake
- A/C switch: ON
- Ambient temperature: More than 25°C (77°F)
- Vehicle speed: 30 km/h or more
- Engine coolant temperature: 105°C (221°F) or more

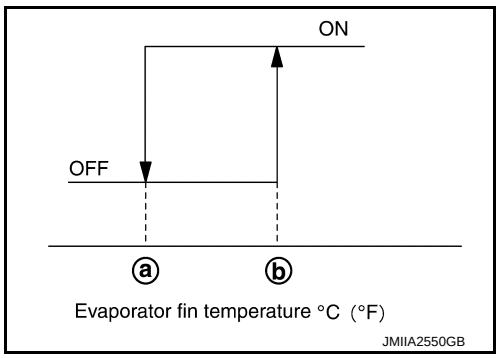
MANUAL AIR CONDITIONING SYSTEM : Compressor Control
INFOID:0000000010939817

DESCRIPTION
- When the compressor activation condition is satisfied while blower motor is activated, A/C amp. transmits A/C ON signal and blower fan ON signal to ECM.
- 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-7, "RELAY CONTROL SYSTEM : System Description".

CONTROL BY A/C AMP.

Low Temperature Protection Control

When intake sensor detects that evaporator fin temperature is ⓐ [–5.0°C (23.0°F)] or less, A/C amp. requests ECM to turn the compressor OFF, and stops the compressor.
When the air temperature returns to ⓑ [1.0°C (33.8°F)] or more, the compressor is activated.



Refrigerant Discharge Amount Control

- A/C amp. transmits the ECV control signal via CAN communication. IPDM E/R transmits the control signal to ECV according to the received ECV control signal.
- ECV is controlled according to change in the duty ratio of the transmitted control signal.
- Except when temperature setting is full cold or outlet is DEF, A/C amp. controls the refrigerant discharge amount according to the required cooling capacity.
- A/C amp. increases the refrigerant discharge amount when evaporator temperature is higher than the target temperature upper limit, and reduces the refrigerant discharge amount when evaporator temperature is at or below the target temperature upper limit.

NOTE:
Target temperature upper limit value of evaporator can be changed using “TARGET EVAPORATOR TEMP UPPER LIMIT SETTING” in “WORK SUPPORT” mode of CONSULT. Refer to HAC-188, "Setting of Target Evaporator Temperature Upper Limit Value".

Compressor Oil Circulation Control

When the engine starts, A/C amp. activates the compressor for a few seconds and circulates the compressor oil once.

CONTROL BY ECM

Compressor Protection Control at Pressure Malfunction

When 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 stops 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

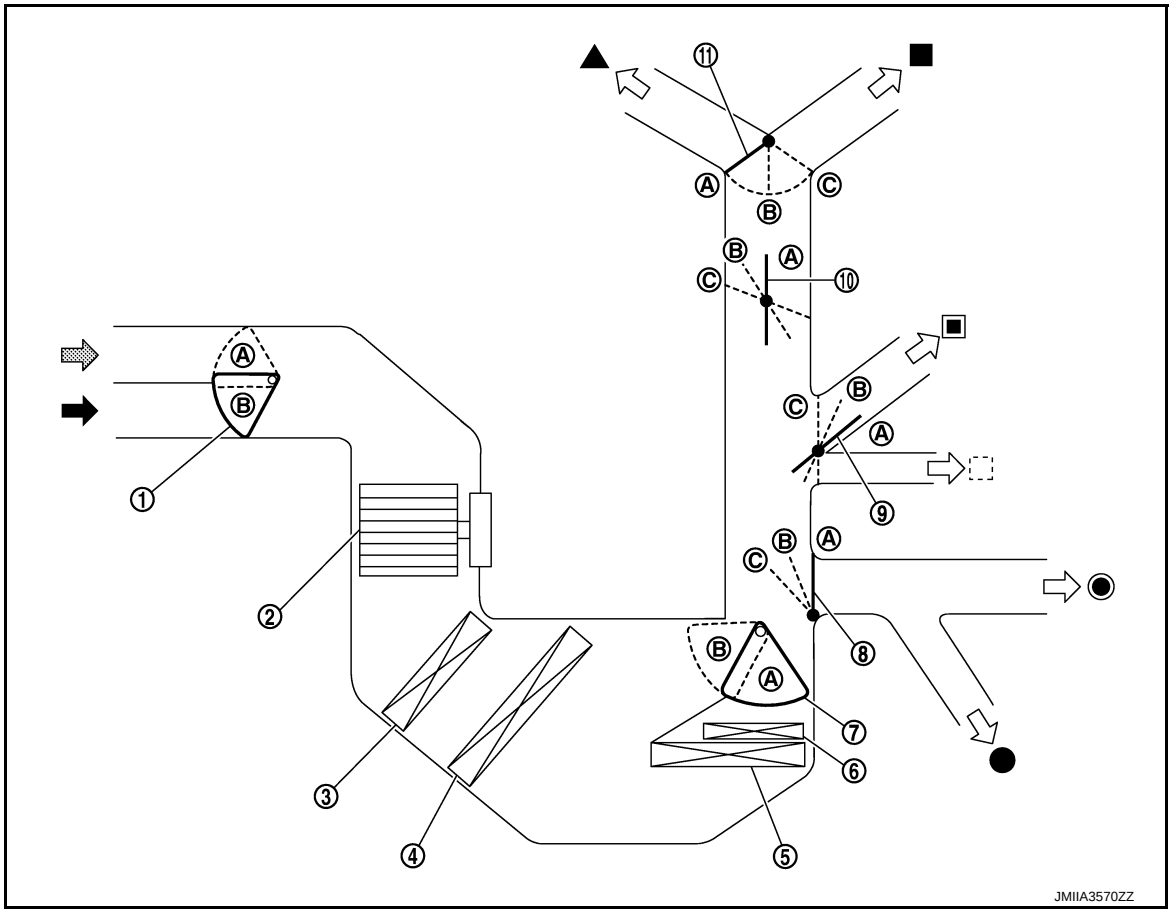
Air Conditioning Cut Control

When the engine condition is high load, ECM transmit A/C relay OFF request to IPDM E/R, and stops the compressor.

MANUAL AIR CONDITIONING SYSTEM : Door Control

INFOID:0000000010939818

SWITCH AND THEIR CONTROL FUNCTION



① Intake door	② Blower motor	③ Air conditioner filter
④ Evaporator	⑤ Heater core	⑥ PTC heater*
⑦ Air mix door	⑧ Foot door	⑨ Side ventilator door
⑩ Sub defroster door	⑪ Center ventilator and defroster door	
Fresh air	Recirculation air	Discharge air
Defroster	Center ventilator	Side ventilator
Rear ventilator	Front foot	Rear foot

*: R9M engine models

NOTE:

The sub-defroster and side ventilator door include a permanent opening and does not fully close.

Switch/dial position			Door position					
			Mode door					
			Center ventilator and defroster door	Sub defroster door	Side ventilator door	Foot door	Intake door	Air mix door
• MODE VENT switch • MODE FOOT switch • MODE DEF switch • MAX DEF switch	MODE position	VENT/DEF (V/D)	Ⓑ	Ⓐ	Ⓐ	Ⓐ	—	—
		VENT	Ⓐ	Ⓐ	Ⓐ	Ⓐ		
		Bi-level (B/L)	Ⓐ	Ⓑ	Ⓑ	Ⓑ		
		ALL	Ⓑ	Ⓑ	Ⓑ	Ⓑ		
		FOOT	Ⓒ	Ⓒ	Ⓒ	Ⓒ		
		DEF/FOOT (D/F)	Ⓒ	Ⓑ	Ⓒ	Ⓒ		
		DEF	Ⓒ	Ⓐ	Ⓒ	Ⓐ		
INTAKE switch	REC		—	—	—	—	Ⓐ	
	FRE						Ⓑ	
Temperature control dial		Full cold					—	Ⓐ
		Full cold – Full hot						Ⓐ - Ⓑ
		Full hot						Ⓑ

AIR DISTRIBUTION

With rear ventilator, with rear foot

MODE position	Discharge air flow					
	Air outlet/distribution					
	Ventilator			Foot		Defroster
	Front		Rear	Front	Rear	
	Center	Side				
V/D	39%	27%	11%	—	—	23%
VENT	47%	38%	15%	—	—	—
B/L	25%	34%	13%	18%	10%	—
ALL	21%	27%	11%	20%	10%	11%
FOOT	—	7%	4%	38%	24%	27%
D/F	—	6%	2%	30%	17%	45%
DEF	—	8%	2%	—	—	90%

MANUAL AIR CONDITIONING SYSTEM : Cooling Fan Control

INFOID:0000000010939819

DESCRIPTION

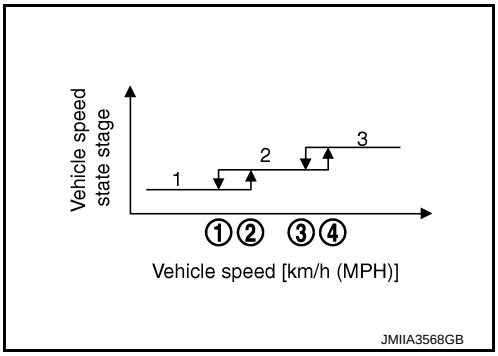
A/C amp. controls the cooling fan operation request according to the refrigerant pressure status and vehicle speed status.

NOTE:

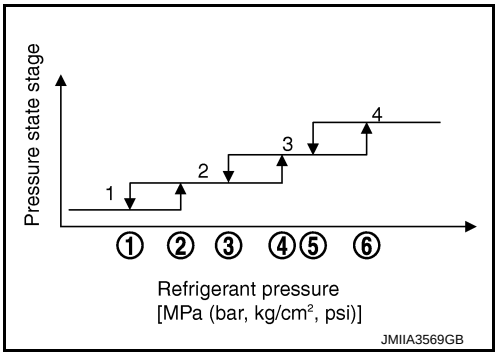
For an overview of the cooling fan and information about control, refer to EC-57, "COOLING FAN CONTROL : System Description" (MR20DD engine models) or EC-843, "COOLING FAN CONTROL : System Description" (R9M engine models).

CONTROL OUTLINE

- A/C amp. receives the refrigerant pressure sensor signal from ECM via CAN communication, and the vehicle speed signal from the combination meter via CAN communication.
- A/C amp. sets one of the optionally determined stages according to the received refrigerant pressure sensor signal and vehicle speed signal.
  NOTE:
  For the rules that prescribe the predetermined stages, refer to the following figures.
  - Vehicle speed stages
    Vehicle speed [Km/h (MPH)]
    - ①: 12 (7.5)
    - ②: 20 (12)
    - ③: 72 (45)
    - ④: 80 (50)



  - Refrigerant pressure stages
    Refrigerant pressure [MPa (bar, kg/cm^2, psi)]
    - ①: 0.7 (7, 7.14, 102)
    - ②: 1.0 (10, 10.2, 145)
    - ③: 1.28 (12.8, 13.1, 186)
    - ④: 1.58 (15.8, 16.1, 229)
    - ⑤: 1.88 (18.8, 19.2, 273)
    - ⑥: 2.08 (20.8, 21.2, 302)



- The requested cooling fan operation strength (0%, 40%, 100%) is determined as shown in the following table according to the combination of these two stages, and the request signal is transmitted to ECM via CAN communication.

Cooling fan operation strength

Unit: %

—		Refrigerant pressure stages			
		1	2	3	4
Vehicle speed stages	1	40	40	100	100
	2	40	40	100	100
	3	0	0	0	100

MANUAL AIR CONDITIONING SYSTEM : Door Motor Starting Position Reset Control

INFOID:0000000010939820

- Step motors are used for the mode door motor air mix door motor, and intake door motor.
- Because the step motors do not have position detection mechanisms, there may be a deviation between the door position recognized by A/C amp. and the actual door position.
  Therefore, A/C amp. performs motor zero position reset for aligning its recognized door position with the actual door position.
- The reset signal is transmitted from A/C amp. to the air mix door motor, mode door motor, and intake door motor, which then perform zero position reset.
- After any of the following conditions is met, A/C amp. performs motor zero position reset when the ignition switch is next turned ON.

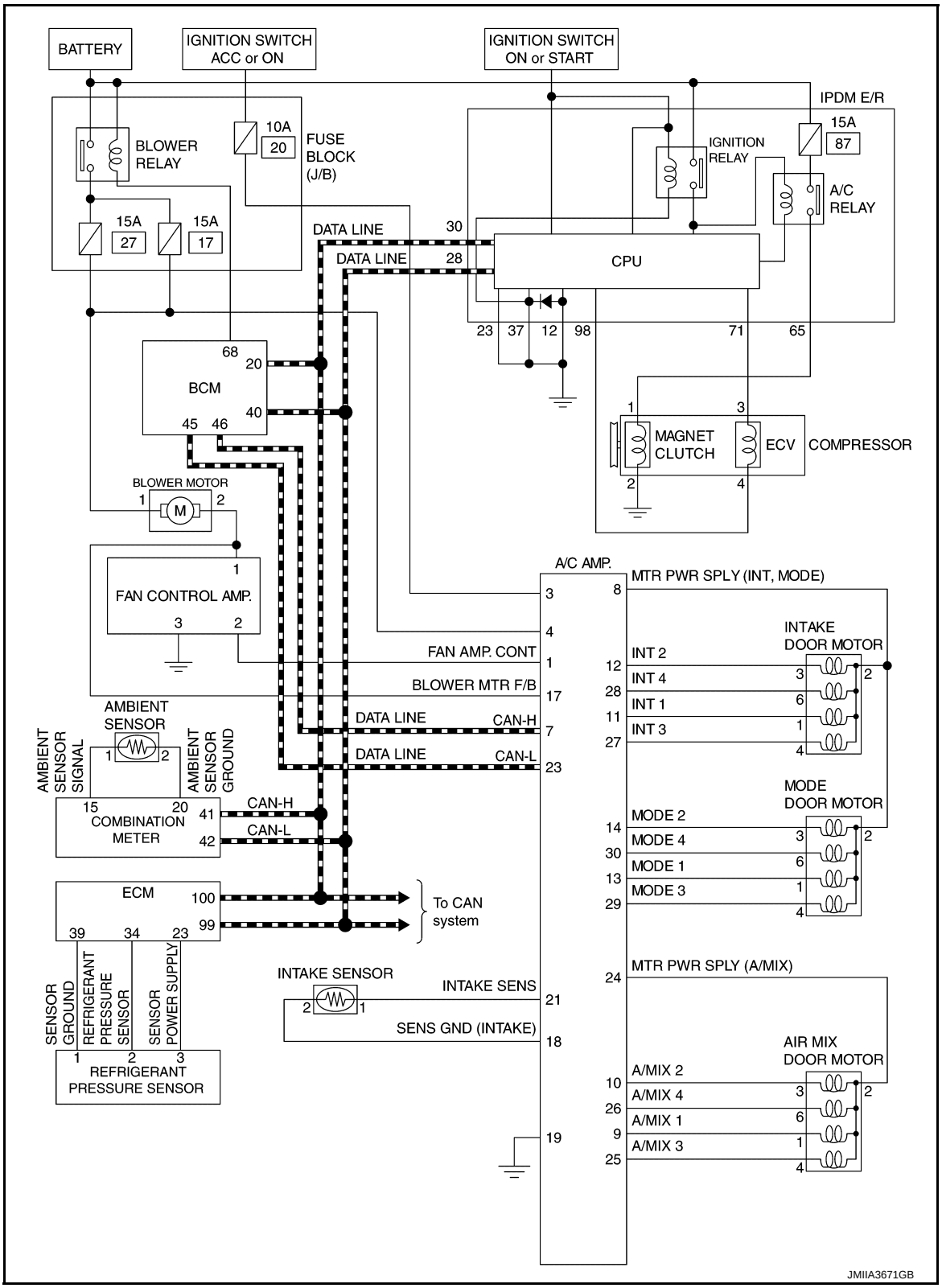
- The ignition switch is turned from ON to OFF a total of 360 times.
- The ignition switch turns OFF while the mode door motor, air mix door motor, or intake door motor is operating.

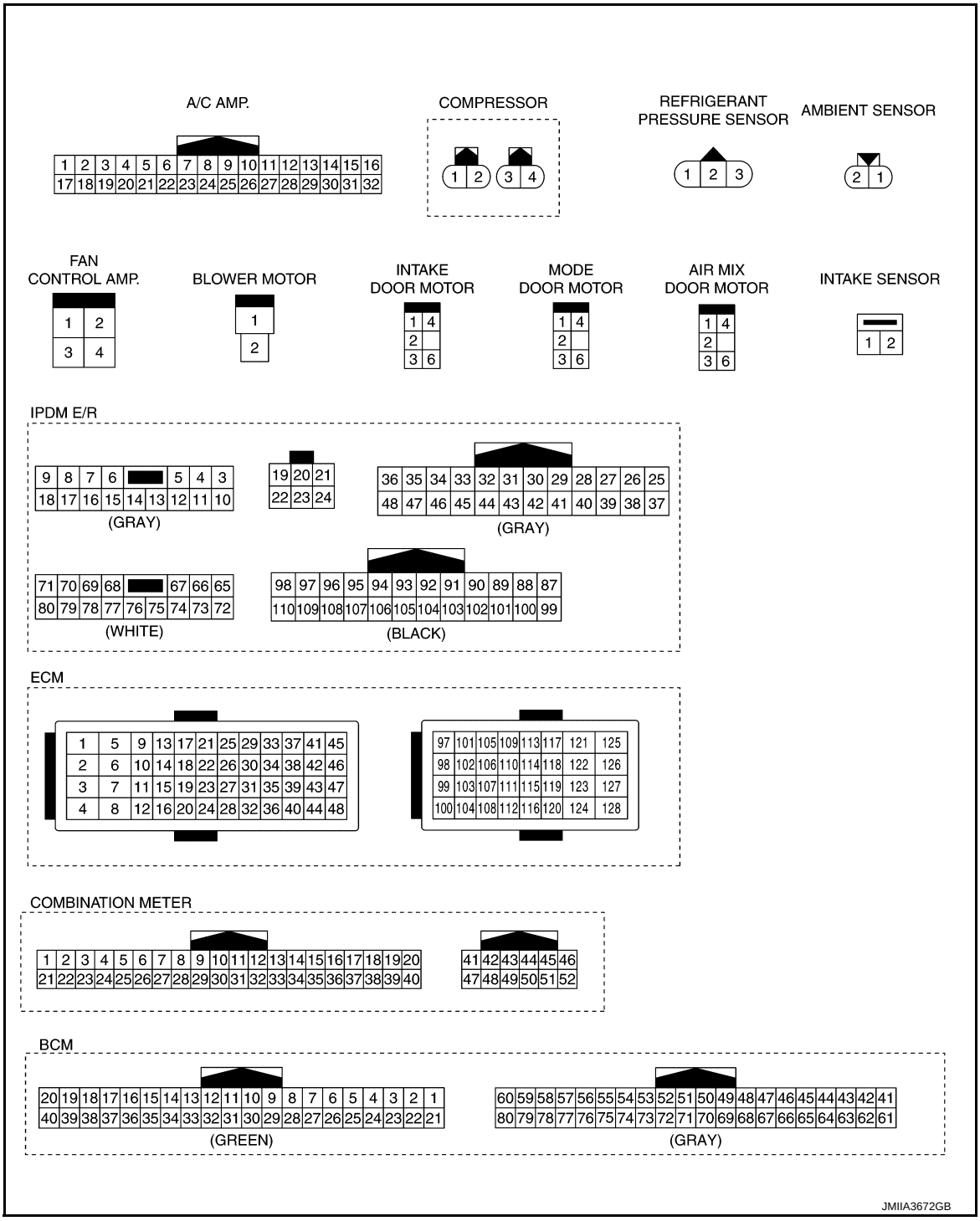
• If A/C amp., air mix door motor, mode door motor, or intake door motor is removed, it is necessary to perform motor zero position reset using CONSULT.

MANUAL AIR CONDITIONING SYSTEM : Circuit Diagram

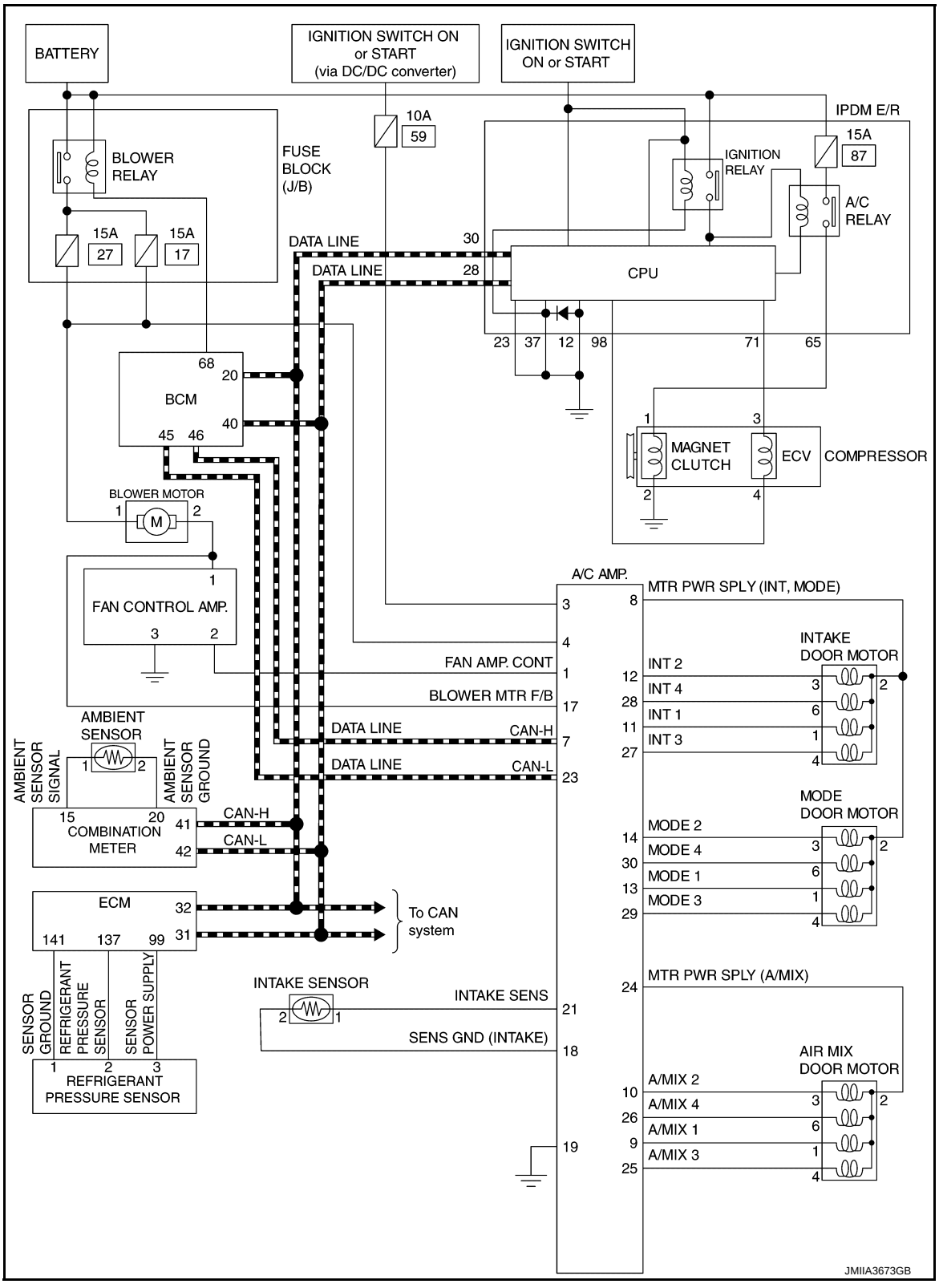
INFOID:0000000010941038

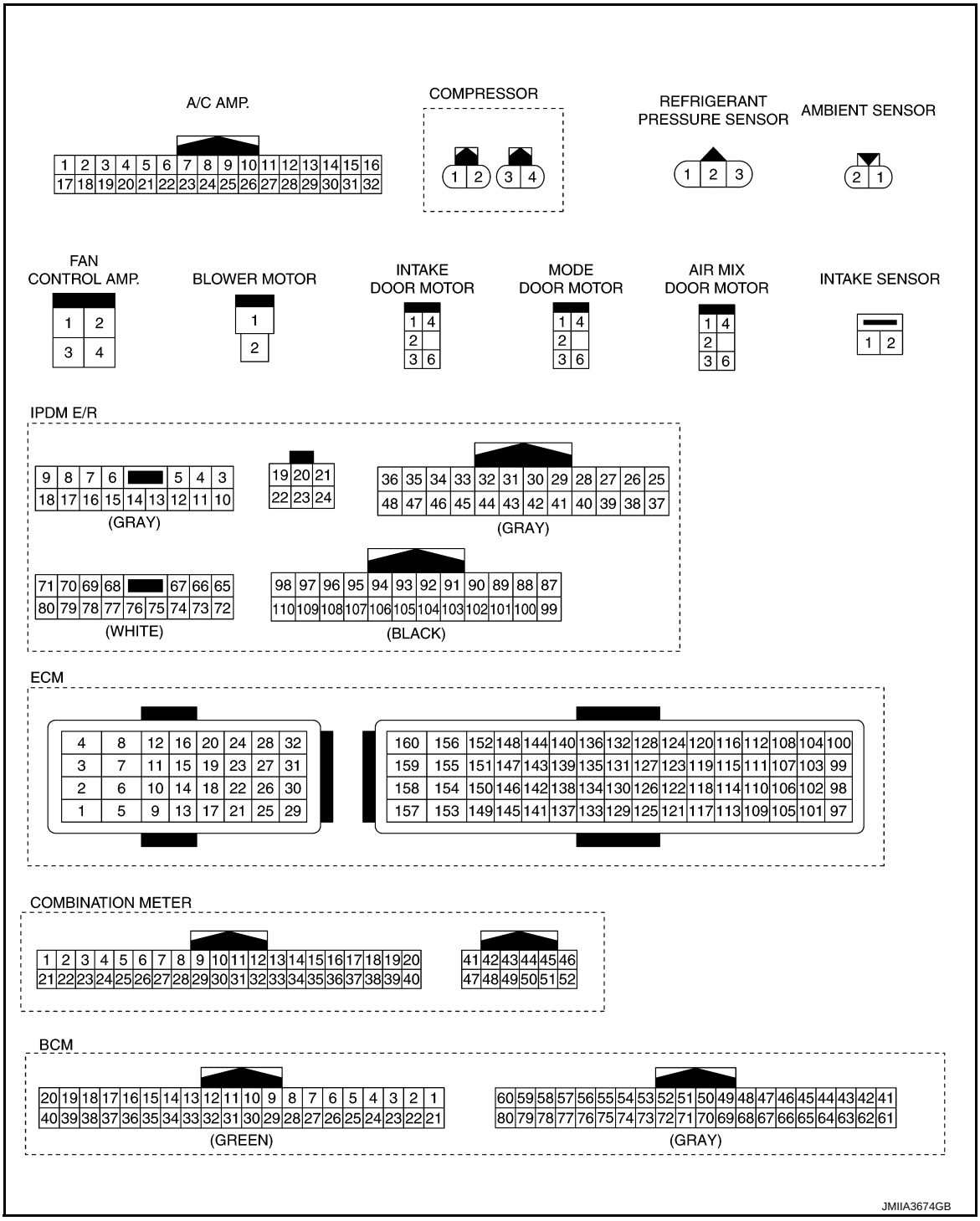
MR20DD ENGINE MODELS




A/C AMP.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32
COMPRESSOR
1 2 3 4
REFRIGERANT PRESSURE SENSOR
1 2 3
AMBIENT SENSOR
2 1
FAN CONTROL AMP.
1 2
3 4
BLOWER MOTOR
1
2
INTAKE DOOR MOTOR
1 4
2
3 6
MODE DOOR MOTOR
1 4
2
3 6
AIR MIX DOOR MOTOR
1 4
2
3 6
INTAKE SENSOR
1 2
IPDM E/R
9 8 7 6 5 4 3
18 17 16 15 14 13 12 11 10
(GRAY)
19 20 21
22 23 24
36 35 34 33 32 31 30 29 28 27 26 25
48 47 46 45 44 43 42 41 40 39 38 37
(GRAY)
71 70 69 68 67 66 65
80 79 78 77 76 75 74 73 72
(WHITE)
98 97 96 95 94 93 92 91 90 89 88 87
110 109 108 107 106 105 104 103 102 101 100 99
(BLACK)
ECM
1 5 9 13 17 21 25 29 33 37 41 45
2 6 10 14 18 22 26 30 34 38 42 46
3 7 11 15 19 23 27 31 35 39 43 47
4 8 12 16 20 24 28 32 36 40 44 48
97 101 105 109 113 117 121 125
98 102 106 110 114 118 122 126
99 103 107 111 115 119 123 127
100 104 108 112 116 120 124 128
COMBINATION METER
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20
21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
41 42 43 44 45 46
47 48 49 50 51 52
BCM
20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1
40 39 38 37 36 35 34 33 32 31 30 29 28 27 26 25 24 23 22 21
(GREEN)
60 59 58 57 56 55 54 53 52 51 50 49 48 47 46 45 44 43 42 41
80 79 78 77 76 75 74 73 72 71 70 69 68 67 66 65 64 63 62 61
(GRAY)
JMIIA3672GB

R9M ENGINE MODELS



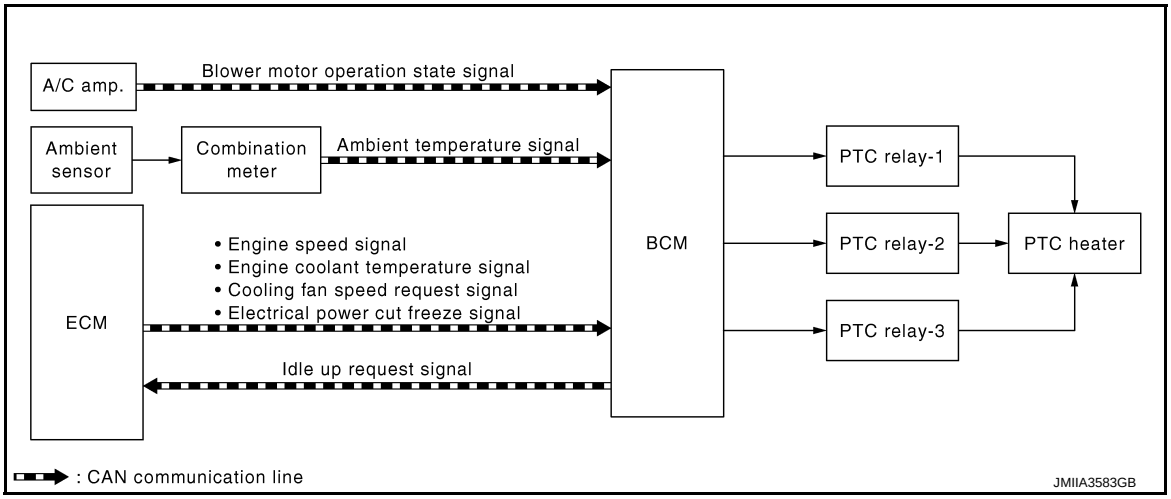


PTC HEATER CONTROL SYSTEM

PTC HEATER CONTROL SYSTEM : System Description

INFOID:0000000010939821

SYSTEM DIAGRAM



DESCRIPTION

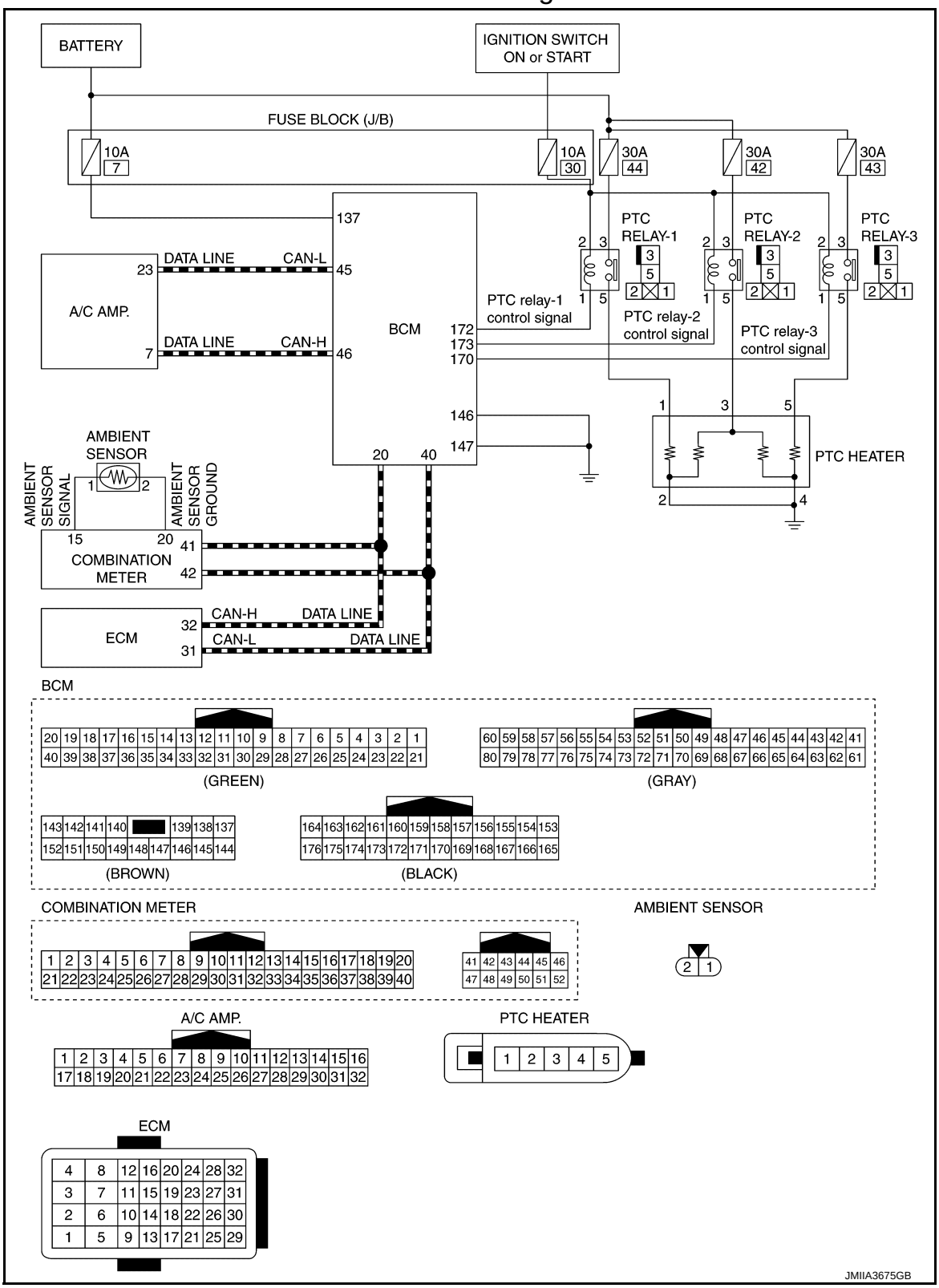
- BCM performs PTC relay ON/OFF control based on engine speed, engine coolant temperature, electrical power cut freeze signal (permission signal, retention signal, stop signal), blower motor operation state signal, front window defogger state signal, ambient temperature signal, battery voltage, and electrical load state (high beam request, low beam request, 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 BCM 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 (53.6°F) 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.

PTC HEATER CONTROL SYSTEM : Circuit Diagram

INFOID:0000000010941039



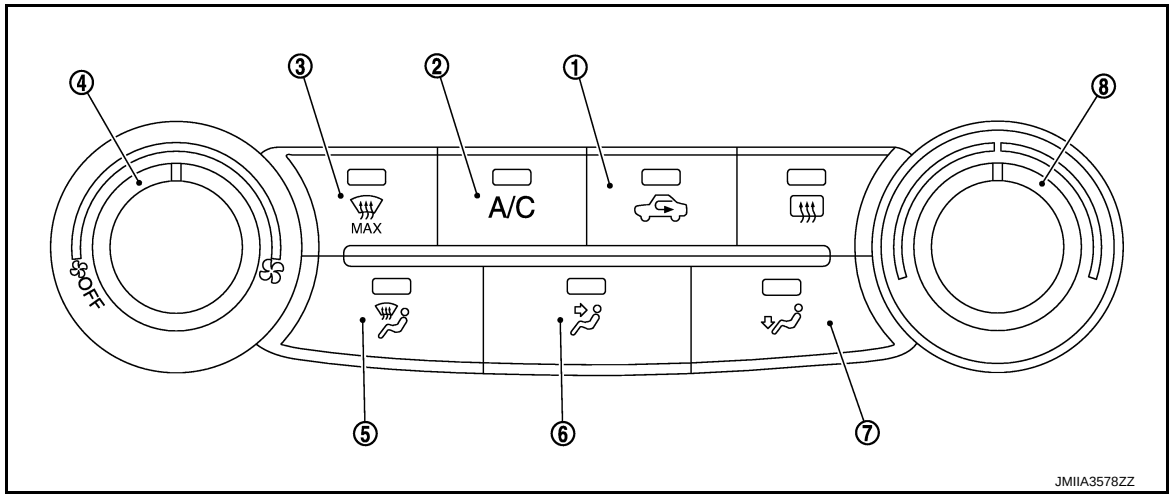
OPERATION

Switch Name and Function

INFOID:0000000010939822

OPERATION AND DISPLAY OF AUTOMATIC AIR CONDITIONING SYSTEM

Operation: A/C control



① INTAKE switch
② A/C switch
③ MAX DEF switch
④ Fan control dial
⑤ MODE DEF switch
⑥ MODE VENT switch
⑦ MODE FOOT switch
⑧ Temperature control dial

Switch name	Function
INTAKE switch	Air inlet changes between recirculation (REC) ⇔ fresh air intake (FRE) each time this switch is pressed. • Switch indicator lamp ON: Recirculation • Switch indicator lamp OFF: Fresh air intake
A/C switch	Compressor control (switch indicator) changes between ON ⇔ OFF each time this switch is pressed while blower motor is operated. **NOTE:** A/C switch cannot be turned ON when blower motor is OFF.
MAX DEF switch	MAX DEF mode (switch indicator) changes between ON ⇔ OFF each time switch is pressed. • Air conditioning becomes the following status when MAX DEF mode is turned ON. - Air outlet: DEF - Air flow: ON - Air inlet: Fresh air intake - A/C switch: ON • Air conditioning becomes the following status when MAX DEF mode is turned OFF. - Air outlet: Settings set before DEF mode is turned ON - Air flow: Settings set before DEF mode is turned ON - Air inlet: Settings set before DEF mode is turned ON - A/C switch: Settings set before DEF mode is turned ON
Fan control dial	The air flow can be manually set within the range of speeds 1st - 24th by operating the dial.

Switch name	Function
MODE DEF switch	• Air outlet changes to DEF when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ VENT - VENT ⇒ V/D - B/L ⇒ ALL - ALL ⇒ B/L - FOOT ⇒ D/F - D/F ⇒ FOOT - DEF ⇒ DEF • When this switch is pressed while air conditioning is ON and MODE DEF is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: DEF - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: DEF - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** *: When MAX DEF is turned ON from air conditioning OFF status, each settings set before air conditioning is turned OFF.
MODE VENT switch	• Air outlet changes to VENT when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ DEF - VENT ⇒ VENT - B/L ⇒ FOOT - ALL ⇒ D/F - FOOT ⇒ B/L - D/F ⇒ ALL - DEF ⇒ V/D • When this switch is pressed while air conditioning is ON and MODE VENT is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: VENT - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: VENT - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** *: When MAX DEF is turned ON from air conditioning OFF status, each settings set before air conditioning is turned OFF.

Switch name	Function
MODE FOOT switch	• Air outlet changes to FOOT when this switch is pressed while air conditioning is ON and air outlet condition is automatic control. • Air outlet changes as following when this switch is pressed while air conditioning is ON and air outlet condition is manual control. - V/D ⇒ ALL - VENT ⇒ B/L - B/L ⇒ VENT - ALL ⇒ V/D - FOOT ⇒ FOOT - D/F ⇒ DEF - DEF ⇒D/F • When this switch is pressed while air conditioning is ON and MODE FOOT is ON, air outlet control is changed to automatic control. • When this switch is pressed while air conditioning is OFF, air conditioning becomes the following status - Air outlet: FOOT - Air flow: Minimum setting - Air inlet: Settings set before air conditioning is turned OFF - A/C switch: Settings set before air conditioning is turned OFF • When this switch is pressed while MAX DEF is ON, air conditioning becomes the following status - Air outlet: FOOT - Air flow: Settings set before MAX DEF is turned ON* - Air inlet: Settings set before MAX DEF is turned ON* - A/C switch: Settings set before MAX DEF is turned ON* **NOTE:** *: When MAX DEF is turned ON from air conditioning OFF status, each settings set before air conditioning is turned OFF.
Temperature control dial	The air flow temperature can be adjusted by operating the dial. • Clockwise: Raise the air flow temperature. • Counterclockwise: Lower the air flow temperature.

DIAGNOSIS SYSTEM (A/C AMP.)

Description

INFOID:0000000010939823

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

ECU	Diagnostic item (CONSULT)	
A/C amp.	HVAC	Self Diagnostic Result
		Data Monitor
		Active Test
		Work support
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 Function

INFOID:0000000010939824

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

Diagnostic mode	Description
Ecu Identification	Displays the part number of A/C amp.
Self Diagnostic Result	Displays the diagnosis results judged by A/C amp.
Data Monitor	Displays the input/output signal of A/C amp.
Active Test	The signals used to activate each device are forcibly supplied from A/C 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 amp. can be checked.

SELF-DIAGNOSIS RESULTS

Diagnosis result that is judged by A/C amp. can be checked. Refer to HAC-171, "DTC Index".

DATA MONITOR

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

NOTE:
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

Display item list

Monitor item [Unit]		Description
AMB TEMP SEN	[°C (°F)]	Ambient temperature value converted from ambient temperature signal received from combination meter via CAN communication.
INT TEMP SEN	[°C (°F)]	Evaporator fin temperature value converted from intake sensor signal received from intake sensor.
AMB SEN CAL	[°C (°F)]	Ambient temperature value calculated by A/C amp.

Monitor item [Unit]		Description
INT TEMP CAL	[°C (°F)]	Evaporator fin temperature value calculated by A/C amp.
COMP REQ SIG	[On/Off]	Displays A/C ON signal ON/OFF status transmitted to BCM.
COMP ECV DUTY	[%]	Duty ratio of ECV (electrical control valve) judged by A/C amp.
FAN REQ SIG	[On/Off]	Displays blower fan ON signal ON/OFF status transmitted to ECM.
FAN DUTY		Target duty ratio of voltage (applied voltage) applied to blower motor by A/C amp.
VEHICLE SPEED	[km/h (mph)]	Vehicle speed signal value received from combination meter via CAN communication.

ACTIVE TEST

The signals used to activate each device forcibly supplied from A/C 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	20% FRE	20% FRE	FRE	FRE	FRE
Air mix door motor position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor (duty ratio)	35%	35%	60%	60%	90%	90%	35%
Magnet clutch	ON	ON	ON	ON	OFF	OFF	ON
ECV duty ratio	80%	80%	40%	40%	0%	0%	90%

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
TARGET EVAPORATOR TEMP UPPER LIMIT SETTING	Setting change of evaporator target temperature upper limit value can be performed.	HAC-188, "Setting of Target Evaporator Temperature Upper Limit Value"
Door Motor Starting Position Reset	Starting position reset of air mix door motor and mode door motor can be performed.	HAC-189, "Work Procedure"

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000011028977

APPLICATION ITEM

CONSULT 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.
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		×	×
Exterior lamp	HEAD LAMP	×	×	×
Interior room lamp control	INT LAMP		×	
Wiper and washer	WIPER	×	×	×
Turn signal and hazard warning lamps	FLASHER	×	×	
—	AIR CONDITONER*		×	×
Intelligent Key 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		×	
Vehicle security	THEFT ALM	×	×	
RAP	RETAINED PWR		×	
Remote keyless entry system	MULTI REMOTE ENT	×	×	
Signal buffer system	SIGNAL BUFFER		×	×

NOTE:

*: This item is displayed, but 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.

CONSULT screen item	Indication/Unit	Description
BATTERY VOLTAGE	V	Battery voltage of the moment a particular DTC is detected.
VEHICLE SPEED	km/h	Vehicle speed of the moment a particular DTC is detected.
EXTERNAL TEMP	°C	External temperature of the moment a particular DTC is detected
VEHICLE COND	—	**NOTE:** This item is displayed, but cannot be use this item.
DOOR LOCK STATUS	—	**NOTE:** This item is displayed, but cannot be use this item.
POWER SUPPLY COUNTER	min	Displays the cumulative time from the time that the battery terminal is connected.

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:0000000010939826

ACTIVE TEST

Test item	Operation	Description
PTC RELAY-1	Off/On	PTC RELAY-1 is turned OFF/ON.
PTC RELAY-2	Off/On	PTC RELAY-2 is turned OFF/ON.
PTC RELAY-3	Off/On	PTC RELAY-3 is turned OFF/ON.

ECU DIAGNOSIS INFORMATION

A/C AMP.

Reference Value

INFOID:0000000010939827

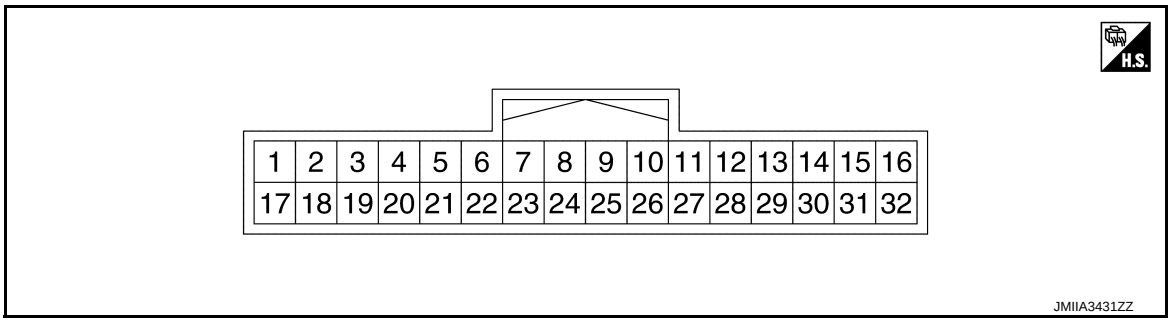
CONSULT DATA MONITOR REFERENCE VALUES

NOTE:

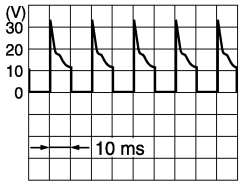
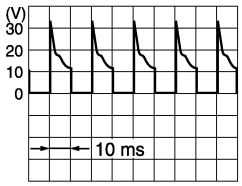
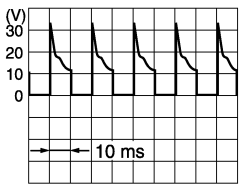
The following table includes information (items) inapplicable to this vehicle. For information (items) applicable to this vehicle, refer to CONSULT display items.

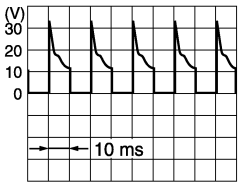
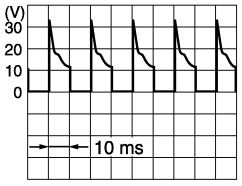
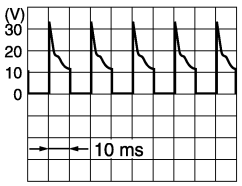
Monitor item	Condition		Value/Status
AMB TEMP SEN	Ignition switch ON		Equivalent to ambient temperature
INT TEMP SEN	Ignition switch ON		Values depending on evaporator fin temperature
AMB SEN CAL	Ignition switch ON		Equivalent to ambient temperature
INT TEMP CAL	Ignition switch ON		Values depending on evaporator fin temperature
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	On
		A/C switch: OFF	Off
COMP ECV DUTY	Engine: Run at idle after warming up	A/C switch: ON (Compressor operation status)	1 - 100%
		A/C switch: OFF	0%
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	1 – 100
		Blower motor: OFF	0
VEHICLE SPEED	Turn drive wheels and compare CONSULT value with the speedometer indication.		Equivalent to speedometer reading

TERMINAL LAYOUT



PHYSICAL VALUES

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
1 (G)	Ground	Fan control amp. control	Output	Ignition switch ON	Blower motor: 1st - 23rd speed (manual)	2.5 – 3.5 V
					Blower motor: 24th speed (manual)	10 – 11 V
3 (SB)	Ground	Accessory power supply	Input	Ignition switch ON		11 – 14 V
4 (V)	Ground	Ignition power supply	Input	Ignition switch ON		11 – 14 V
7 (L)	—	CAN-H	Input/ Output	—		—
8 (W)	Ground	Door motor power supply (mode, intake)	Output	• Ignition switch ON • Each following condition - Immediately after the INTAKE switch is operated (when intake door motor operates) - Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)		11 – 14 V
9 (BG)	Ground	Air mix door motor drive 1	Output	• Ignition switch ON • Immediately after the temperature control dial is operated (when the air mix door motor operates)		 JPIIA1647GB
10 (Y)	Ground	Air mix door motor drive 2				
11 (V)	Ground	Intake door motor drive 1	Output	• Ignition switch ON • Immediately after the INTAKE switch is operated (when intake door motor operates)		 JPIIA1647GB
12 (GR)	Ground	Intake door motor drive 2				
13 (LG)	Ground	Mode door motor drive 1	Output	• Ignition switch ON • Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)		 JPIIA1647GB
14 (SB)	Ground	Mode door motor drive 2				
17 (W)	Ground	Blower motor feedback	Output	Ignition switch ON	Blower motor: 1st speed (manual)	9.0 – 10.5 V

Terminal No. (Wire color)		Description		Condition		Value
+	–	Signal name	Input/ Output			
18 (BR)	Ground	Sensor ground (intake)	—	Ignition switch ON		0 – 0.1 V
19 (B)	Ground	Ground	—	Ignition switch ON		0 – 0.1 V
21 (BG)	Ground	Intake sensor	Input	Air temperature after passing through evaporator (Ignition switch ON)	–20°C (–4°F)	4.41 V
					–10°C (14°F)	4.09 V
					0°C (32°F)	3.68 V
					10°C (50°F)	3.21 V
					20°C (68°F)	2.71 V
					25°C (77°F)	2.47 V
					30°C (86°F)	2.23 V
					40°C (104°F)	1.80 V
23 (R)	—	CAN-L	Input/ Output	—		—
24 (SB)	Ground	Door motor power supply (air mix)	Output	• Ignition switch ON • Following condition - Immediately after the temperature control dial is operated		11 – 14 V
25 (GR)	Ground	Air mix door motor drive 3	Output	• Ignition switch ON • Immediately after the temperature control dial is operated (when the air mix door motor operates)		 JPIIA1647GB
26 (BR)	Ground	Air mix door motor drive 4				
27 (LG)	Ground	Intake door motor drive 3	Output	• Ignition switch ON • Immediately after the INTAKE switch is operated (when intake door motor operates)		 JPIIA1647GB
28 (W)	Ground	Intake door motor drive 4				
29 (BG)	Ground	Mode door motor drive 3	Output	• Ignition switch ON • Immediately after the MODE VENT/FOOT/DEF switch is operated (when mode door motor operates)		 JPIIA1647GB
30 (G)	Ground	Mode door motor drive 4				

DTC Index

INFOID:0000000010939828

DTC	Items (CONSULT screen terms)		Reference
U1000	CAN COMM CIRCUIT		HAC-190, "DTC Description"
U1010	CONTROL UNIT (CAN)		HAC-191, "DTC Description"
B24A4	INTAKE SENSOR	[CIRCUIT SHORT TO GROUND]	HAC-192, "DTC Description"
		[CIRC SHORT TO BATT OR OPEN]	
B24B7	INTAKE DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	HAC-195, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	
B24B9	MODE DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	HAC-198, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	
B24BB	LEFT AIR MIX DOOR MOTOR	[CIRCUIT SHORT TO BATTERY]	HAC-201, "DTC Description"
		[CIRC SHORT TO GRND OR OPEN]	

BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:0000000010939829

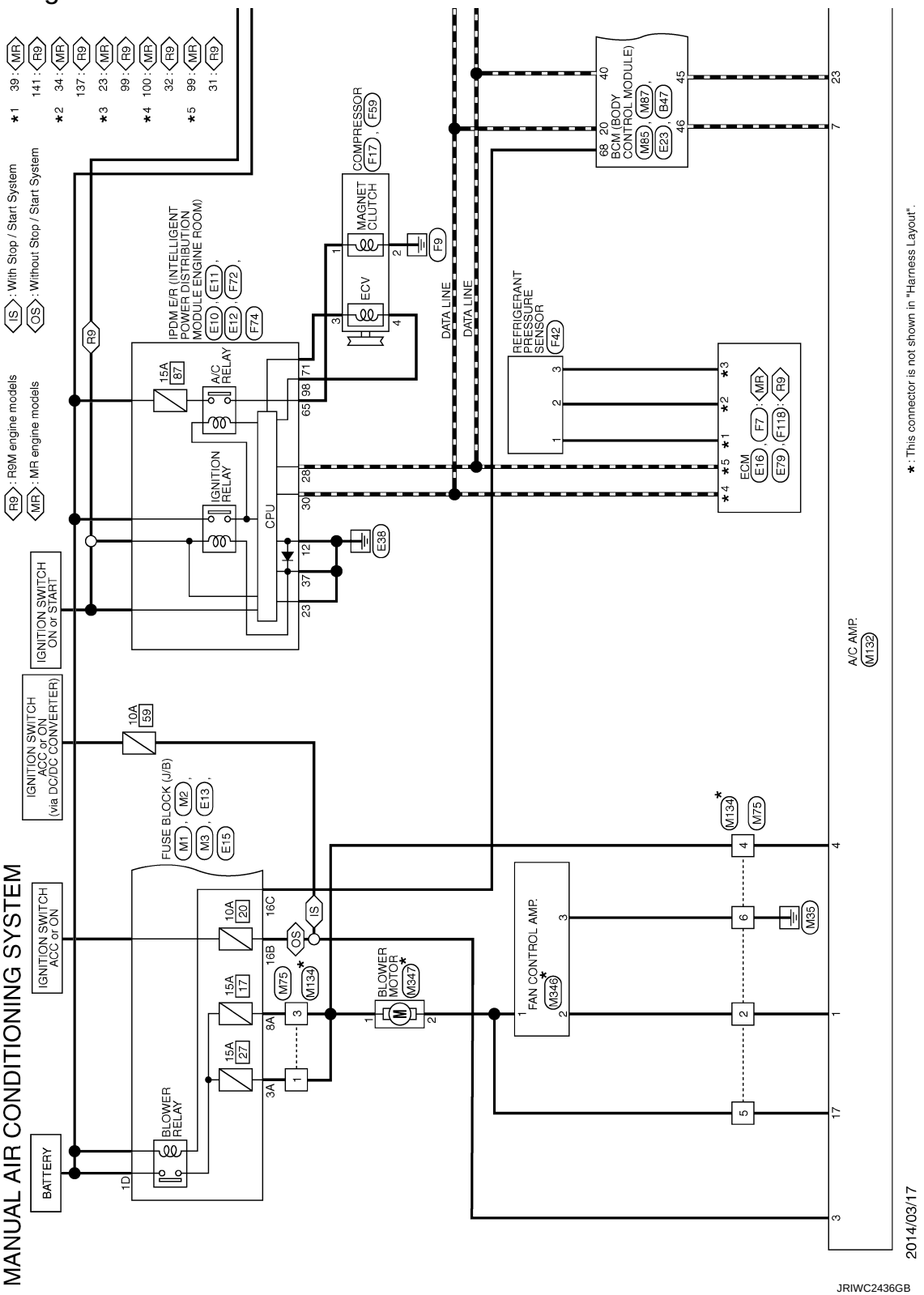
ECU		Reference
BCM		BCS-53, "Reference Value"
		BCS-76, "Fail-safe"
		BCS-77, "DTC Inspection Priority Chart"
		BCS-78, "DTC Index"
ECM	MR20DD engine models	EC-89, "Reference Value"
		EC-103, "Fail-safe"
		EC-107, "DTC Inspection Priority Chart"
		EC-109, "DTC Index"
	R9M engine models	EC-889, "Reference Value"
		EC-901, "Fail-safe"
		EC-907, "DTC Inspection Priority Chart"
		EC-908, "DTC Index"
IPDM E/R		PCS-22, "Reference Value"
		PCS-34, "Fail-safe"
		PCS-37, "DTC Inspection Priority Chart"
		PCS-38, "DTC Index"

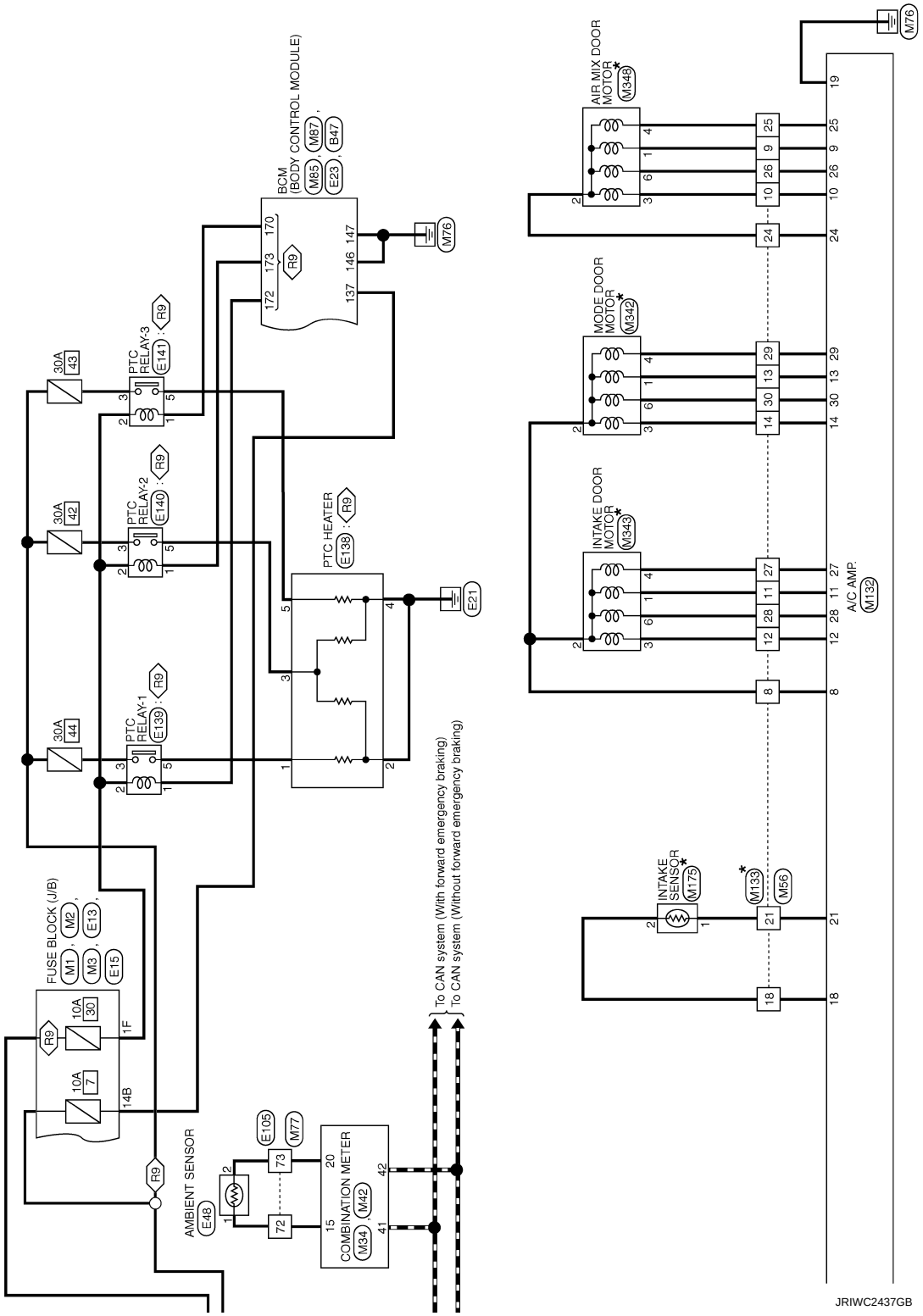
WIRING DIAGRAM

MANUAL AIR CONDITIONING SYSTEM

Wiring Diagram

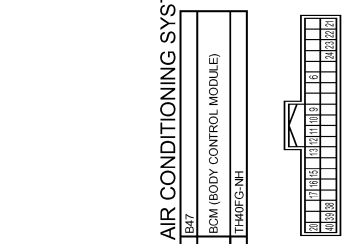
INFOID:0000000010939830




BCM (BODY CONTROL MODULE) M85, M87, E23, B47
M76
PTC RELAY-3 E141
PTC RELAY-2 E140
PTC RELAY-1 E139
PTC HEATER E138
E21
30A 43
30A 42
30A 44
FUSE BLOCK (J/B) M1, M2, E13, M3, E15
10A 30
10A 7
1F
14B
R9
AMBIENT SENSOR E48
E105
M77
COMBINATION METER M34, M42
To CAN system (With forward emergency braking)
To CAN system (Without forward emergency braking)
AIR MIX DOOR MOTOR* M348
MODE DOOR MOTOR* M342
INTAKE DOOR MOTOR* M343
INTAKE SENSOR* M176
M133*
M56
A/C AMP. M132
JRIWC2437GB

MANUAL AIR CONDITIONING SYSTEM

Connector No.	B47
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FG-NH



Terminal No.	Color Of Wire	Signal Name [Specification]
6	R	BACK DOOR OPENER REQUEST SW
9	G	HANDS FREE SENSOR
10	W	REAR RH DOOR SW
11	LG	BACK DOOR SW
12	R	REAR LH DOOR SW
13	SB	PASSENGER DOOR SW
15	LA/G	REAR WIPER AUTO STOP
16	Y	BACK DOOR OPENER SW
17	SB	DRIVER DOOR SW
20	L	CAN-H
21	BR	BUMPER ANTENNA(-)
22	Y	REAR ANTENNA(-)
23	L	REAR ANTENNA(+)
24	G	BUMPER ANTENNA(+)
38	V	SIREN
39	LA/W	HIGH-MOUNTED STOP LAMP
40	P	CAN-L

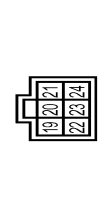
Connector No.	E10
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FGY-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
3	P	-
4	Y	-
7	L	-
8	BG	-
9	L	-
12	B	-
16	G	-
17	W	-

Connector No.	E11
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	Renault: 243405408R

Terminal No.	Color Of Wire	Signal Name [Specification]
19	V	-
20	R	-
21	LG	-
22	Y	-
23	B	-
24	W	-

Connector No.	E12
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FGY-NH

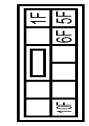


Terminal No.	Color Of Wire	Signal Name [Specification]
25	LG	-
26	W	-
27	SB	-
28	P	-
30	L	-
31	G	-
32	B	-
33	BG	-
34	LG	-
35	V	-
36	Y	-
37	B	-
38	GR	-
39	BR	-
45	L	-
46	P	-
47	W	-
48	R	-

Connector No.	E13
Connector Name	FUSE BLOCK (J/B)
Connector Type	L01FW-MC

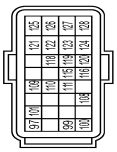
Terminal No.	Color Of Wire	Signal Name [Specification]
1D	G	-

Connector No.	E15
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS10FW-CS



Terminal No.	Color Of Wire	Signal Name [Specification]
10F	L	-
1F	W	-
5F	V	-
6F	Y	-

Connector No.	E16
Connector Name	ECM
Connector Type	RH24FB-RZ9-LLH



Terminal No.	Color Of Wire	Signal Name [Specification]
97	W	BAROMETRIC PRESSURE SENSOR
99	P	CAN-L
100	L	CAN-H
101	Y	SENSOR POWER SUPPLY
108	R	CLUTCH PEDAL POSITION SWITCH
109	LG	IGNITION SWITCH
110	G	ASCD STEERING SWITCH
111	BR	SENSOR GROUND
115	V	STOP LAMP SWITCH
116	GR	BRAKE PEDAL POSITION SWITCH
118	SB	SENSOR POWER SUPPLY
119	Y	ACCELERATOR PEDAL POSITION SENSOR 2
120	LG	SENSOR GROUND
121	BR	POWER SUPPLY FOR ECM
122	V	SENSOR POWER SUPPLY

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MANUAL AIR CONDITIONING SYSTEM

123	B	ECM GROUND
124	R	SENSOR GROUND
125	B	ECM GROUND
126	GR	ACCELERATOR PEDAL POSITION SENSOR 1
127	R	SENSOR GROUND
128	B	ECM GROUND

Connector No.	E48
Connector Name	AMBIENT SENSOR
Connector Type	RS02FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	R	-

Connector No.	E23
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH24FB-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
156	V	CLUTCH INTERLOCK SW
157	LG	STOP LAMP SW 2
158	W	STOP LAMP SW 1
159	R	ASCD CLUTCH SWITCH
164	Y	INTELLIGENT KEY WARNING BUZZER
166	P	STEERING LOCK UNIT POWER SUPPLY
167	BR	TURN SIG LH (FRONT)
168	GR	TURN SIG RH (FRONT)
170	L	PTC RELAY-3 CONTROL
171	G	STARTER RELAY CONT
172	V	PTC RELAY-1 CONTROL
173	BG	PTC RELAY-2 CONTROL

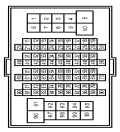
Connector No.	E79
Connector Name	ECM
Connector Type	RH24FB-RZ8-R-RH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	ECM GROUND
2	W	ACCELERATOR PEDAL POSITION SENSOR 1
3	Y	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 1)
4	B	ECM GROUND
5	L	POWER SUPPLY FOR ECM
6	G	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 1)
8	B	ECM GROUND
9	L	FUEL HEATER AND WATER IN FUEL LEVEL SENSOR
10	L	SENSOR POWER SUPPLY (ACCELERATOR PEDAL POSITION SENSOR 2)
11	V	ACCELERATOR PEDAL POSITION SENSOR 2
12	P	SENSOR GROUND (ACCELERATOR PEDAL POSITION SENSOR 2)
16	BG	STOP LAMP SWITCH [With M/T]
16	R	BRAKE PEDAL POSITION SWITCH [With CVT]
17	LG	IGNITION SWITCH
18	G	ASCD STEERING SWITCH
19	BR	SENSOR GROUND (ASCD STEERING SWITCH)
20	BR	FUEL PUMP CONTROL MODULE (COMMAND)
22	G	FUEL PUMP CONTROL MODULE (DIAGNOSIS)
23	V	SPEED LIMITER MAIN SWITCH
24	R	CLUTCH PEDAL POSITION SWITCH
27	V	CLUTCH INTERLOCK SWITCH
30	BR	ASCD MAIN SWITCH
31	P	CAN-L
32	L	CAN-H

Connector No.	E105
Connector Name	WIRE TO WIRE
Connector Type	TH80FW-CS16-TM4

H.S.



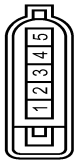
Terminal No.	Color Of Wire	Signal Name [Specification]
2	W	-
5	V	- [Without ISS]
5	W	- [With ISS]
8	L	-
9	LG	-
10	W	-
20	W	-
21	B	-
22	SHIELD	-
31	Y	-
32	W	-
33	SB	-
34	LG	-
35	BG	-
36	LG	-
37	V	-
38	G	-
39	BR	-
40	L	-
41	P	-
47	GR	-
48	SB	-
51	P	-
52	L	-
53	W	-
54	Y	-
55	BR	-
56	P	-
57	B	-
58	L	-
59	W	-
60	G	-
61	BR	-
62	V	-
63	BR	-
64	GR	-
65	LG	-
66	BG	-
67	L	-
68	R	-
71	V	-
72	L	-
73	R	-
76	L	-
77	V	-
78	LG	-
79	SHIELD	-
80	GR	-
82	Y	-
83	SB	-
84	L	-
85	G	-
86	Y	-
87	B	-
88	B	-
91	R	-
92	BR	-
93	W	-
96	GR	-
97	R	-
98	V	-
99	Y	-

JRIWC2439GB

MANUAL AIR CONDITIONING SYSTEM

Connector No.	E138
Connector Name	PTC HEATER
Connector Type	ALA05FB-R-RH

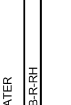
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	GR	-
3	G	-
4	GR	-
5	Y	-

Connector No.	E139
Connector Name	PTC RELAY-1
Connector Type	MS02FL-M2-LC

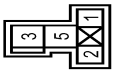
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	V	-
2	LG	-
3	GR	-
5	L	-

Connector No.	E140
Connector Name	PTC RELAY-2
Connector Type	MS02FL-M2-LC

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	BG	-
2	SB	-
3	P	-
5	G	-

Connector No.	E141
Connector Name	PTC RELAY-3
Connector Type	MS02FL-M2-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	L	-
2	W	-
3	BG	-
5	Y	-

Connector No.	F7
Connector Name	ECM
Connector Type	RH40FB-RZ8-R-LH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	W	FUEL INJECTOR NO.1(HI)
2	W	FUEL INJECTOR NO.2(HI)
3	W	FUEL INJECTOR NO.3(HI)
4	W	FUEL INJECTOR NO.4(HI)
5	B	FUEL INJECTOR NO.1(LO)
6	B	FUEL INJECTOR NO.2(LO)
7	B	FUEL INJECTOR NO.3(LO)
8	B	FUEL INJECTOR NO.4(LO)
11	B	ECM GROUND
12	BR	SHIELD
14	W	PARK/NEUTRAL POSITION SIGNAL
15	R	GND(CPHASE
19	W	CAMSHAFT POSITION SENSOR
20	L	SENSOR GROUND
21	L	SENSOR POWER SUPPLY
23	Y	SENSOR POWER SUPPLY
24	Y	SENSOR POWER SUPPLY
25	L	SENSOR GROUND
28	BR	MASS AIR FLOW SENSOR
29	GR	ENGINE OIL PRESSURE SENSOR
31	G	ENGINE COOLANT TEMPERATURE SENSOR
32	P	ENGINE OIL TEMPERATURE SENSOR
33	G	FUEL RAIL PRESSURE SENSOR
34	P	REFRIGERANT PRESSURE SENSOR
35	V	INTAKE AIR TEMPERATURE SENSOR
36	SHIELD	SENSOR GROUND
39	R	SENSOR GROUND
40	W	KNOCK SENSOR
42	B	SENSOR GROUND
43	G	SENSOR POWER SUPPLY
44	BR	SENSOR GROUND
45	G	LIN COMMUNICATION LINE [Without ISS]
45	L	LIN COMMUNICATION LINE [With ISS]
46	LG	EXHAUST VALVE TIMING CONTROL POSITION SENSOR
48	GR	CRANKSHAFT POSITION SENSOR

Connector No.	F17
Connector Name	COMPRESSOR
Connector Type	RH02FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	P	-
2	B	-

Connector No.	F42
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Type	RK03FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	GR	- [With QR25 engine]
1	R	- [With MR20 engine]
1	V	- [With R9M Engine]
2	P	- [With MR20 or QR25 Engine]
2	SB	- [With R9M Engine]
3	BG	- [With QR25 engine]
3	L	- [With R9M Engine]
3	Y	- [With MR20 engine]

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MANUAL AIR CONDITIONING SYSTEM

Connector No.	F59
Connector Name	COMPRESSOR
Connector Type	RHN2FLGY

Terminal No.	Color Of Wire	Signal Name [Specification]
3	SB	-
4	Y	-

Connector No.	F72
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	NS16FW-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
65	P	-
66	L	- [With R9M Engine]
66	R	- [With MR20 or QR25 Engine]
67	V	-
70	BG	- [With CVT]
70	GR	- [With MT]
71	SB	-
72	GR	-
73	R	- [With R9M Engine]
73	Y	- [With MR20 or QR25 Engine]
75	BR	- [With MR20 or QR25 Engine]
75	L	- [With R9M Engine]
76	P	-
78	L	- [With QR25 engine]
78	R	- [With R9M Engine]
79	G	-

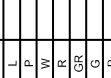
Connector No.	F74
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	TH24FB-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
87	L	-
88	P	-
89	W	-
90	R	-
92	GR	-
93	G	- [With R9M Engine]
93	P	- [With MR20 or QR25 Engine]
94	SB	-
95	LG	-
96	W	-
97	P	-
98	Y	-
99	BG	-
100	LG	-
101	V	-
102	Y	-
105	W	-
106	BR	-
107	V	-
110	SB	-

Connector No.	F118
Connector Name	ECM
Connector Type	RH56FGY-RZ8-R-LH

Terminal No.	Color Of Wire	Signal Name [Specification]
98	P	FUEL TEMPERATURE SENSOR
99	L	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)
100	R	SENSOR POWER SUPPLY (DPF DIFFERENTIAL PRESSURE SENSOR)
102	G	SENSOR GROUND (FUEL TEMPERATURE SENSOR)
103	GR	SENSOR GROUND (THROTTLE POSITION SENSOR)
104	LG	SENSOR POWER SUPPLY (EXHAUST THROTTLE POSITION SENSOR)
105	LG	EXHAUST GAS TEMPERATURE SENSOR 2
106	BG	HIGH PRESSURE EGR VOLUME CONTROL VALVE POSITION SENSOR
107	Y	THROTTLE POSITION SENSOR
108	R	SENSOR POWER SUPPLY (EXHAUST GAS TEMPERATURE SENSOR 2)
109	V	SENSOR GROUND (EXHAUST GAS TEMPERATURE SENSOR 2)
110	L	SENSOR GROUND (ENGINE COOLANT TEMPERATURE SENSOR)
112	LG	EXHAUST THROTTLE POSITION SENSOR
113	R	A/F SENSOR VOLTAGE NERNST 1
115	B	SENSOR GROUND (A/F) (FUEL RATIO (A/F) SENSOR 1)
116	W	SENSOR GROUND (EXHAUST THROTTLE POSITION SENSOR)
117	Y	A/F SENSOR CURRENT PUMP 1
119	BG	INTAKE MANIFOLD RUNNER CONTROL VALVE POSITION SENSOR
121	L	DPF DIFFERENTIAL PRESSURE SENSOR
122	Y	SENSOR GROUND (EXHAUST GAS PRESSURE SENSOR)
125	W	SENSOR GROUND (EXHAUST GAS PRESSURE SENSOR)
126	W	ENGINE COOLANT TEMPERATURE SENSOR
129	P	EXHAUST ELECTRIC THROTTLE CONTROL MOTOR (+)
132	BR	SENSOR POWER SUPPLY (ENGINE COOLANT TEMPERATURE SENSOR)
133	B	SENSOR GROUND (EXHAUST GAS TEMPERATURE SENSOR 1)
134	R	LOW PRESSURE EGR VOLUME CONTROL VALVE MOTOR (-)
136	W	REFRIGERANT PRESSURE SENSOR
137	SB	EXHAUST GAS PRESSURE SENSOR
138	L	ELECTRIC THROTTLE CONTROL MOTOR (-)
140	W	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
141	V	SENSOR GROUND (LOW PRESSURE EGR TEMPERATURE SENSOR)
142	G	LOW PRESSURE EGR VOLUME CONTROL VALVE MOTOR (+)
143	B	HIGH PRESSURE EGR VOLUME CONTROL VALVE MOTOR (+)
144	B	LOW PRESSURE EGR TEMPERATURE SENSOR
146	BR	EXHAUST ELECTRIC THROTTLE CONTROL MOTOR (-)
147	GR	TURBOCHARGER BOOST CONTROL ACTUATOR
148	W	EXHAUST GAS TEMPERATURE SENSOR 1
149	R	ENGINE RESTART BYPASS CONTROL RELAY
150	Y	ELECTRIC THROTTLE CONTROL MOTOR (+)
151	G	FUEL INJECTOR No. 4 (HI)
152	SB	FUEL INJECTOR No. 2 (HI)
153	V	FUEL INJECTOR No. 3 (LO)
154	BG	FUEL INJECTOR No. 4 (LO)
155	G	FUEL INJECTOR No. 3 (HI)
156	L	FUEL INJECTOR No. 1 (HI)
157	R	FUEL INJECTOR No. 2 (LO)
158	P	FUEL INJECTOR No. 1 (LO)
159	W	HIGH PRESSURE EGR VOLUME CONTROL VALVE MOTOR (-)
160	L	LOW PRESSURE EGR VOLUME CONTROL VALVE MOTOR (-)

Connector No.	M1
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS08FW-M2



Terminal No.	Color Of Wire	Signal Name [Specification]
1A	L	-
2A	LG	-
3A	Y	-
4A	LG	-
5A	R	-
6A	BG	-
7A	BR	-
8A	SB	-

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MANUAL AIR CONDITIONING SYSTEM

Connector No.	M2
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FBR-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
10B	GR	- [With MR20 engine or R9M engine]
10B	LA/GR	- [With QR25 Engine]
12B	BR	-
14B	W	-
15B	W	-
16B	GR	-
1B	G	-
2B	R	-
3B	V	-
6B	LA/L	-
7B	LA/V	-

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Type	NS16FW-CS

Terminal No.	Color Of Wire	Signal Name [Specification]
10C	LG	-
13C	LA/G	-
14C	R	-
15C	L	-
16C	LA/W	-
1C	R	-
2C	G	-
3C	Y	-
4C	LG	-

5C	GR	-
6C	LA/R	-
7C	Y	-
8C	BR	- [With ISS]
8C	LA/BR	- [Without ISS]
9C	L	-

Connector No.	M34
Connector Name	COMBINATION METER
Connector Type	TH40FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	B	GROUND
7	BG	SECURITY SIGNAL
9	GR	ECO MODE SWITCH SIGNAL
15	L	AMBIENT SENSOR SIGNAL
17	BG	METER CONTROL SWITCH GROUND
18	SB	TRIP RESET SWITCH SIGNAL
20	Y	AMBIENT SENSOR GROUND
21	L	STEERING SWITCH GROUND
22	Y	STEERING SWITCH SIGNAL A
23	GR	STEERING SWITCH SIGNAL B
25	V	BRAKE FLUID LEVEL SWITCH SIGNAL
28	Y	SEAT BELT BUCKLE SWITCH SIGNAL (DRIVER SIDE)
30	LG	MANUAL MODE SIGNAL
31	SB	NON-MANUAL MODE SIGNAL
32	BG	MANUAL MODE SHIFT UP SIGNAL
33	BR	MANUAL MODE SHIFT DOWN SIGNAL
36	GR	ILLUMINATION CONTROL SWITCH SIGNAL (+)
37	V	ILLUMINATION CONTROL SWITCH SIGNAL (-)
38	G	VEHICLE SPEED SIGNAL (8-PULSE)
39	W	VEHICLE SPEED SIGNAL (2-PULSE)

Connector No.	M42
Connector Name	COMBINATION METER
Connector Type	TH12FW-NH

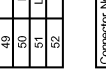
Terminal No.	Color Of Wire	Signal Name [Specification]
41	L	CAN-H
42	P	CAN-L
43	W	ILLUMINATION CONTROL SIGNAL
44	LA/B	FUEL LEVEL SENSOR GROUND
45	LA/G	BATTERY POWER SUPPLY
46	LA/BR	IGNITION SIGNAL [Without ISS]
46	V	IGNITION SIGNAL [With ISS]
47	SB	AV COMMUNICATION SIGNAL (H)
48	LG	AV COMMUNICATION SIGNAL (L)
49	Y	OIL LEVEL SENSOR SIGNAL
50	BG	OIL LEVEL SENSOR GROUND
51	LA/L	FUEL LEVEL SENSOR SIGNAL
52	B	GROUND

Connector No.	M56
Connector Name	WIRE TO WIRE
Connector Type	TH32FW-NH

Terminal No.	Color Of Wire	Signal Name [Specification]
1	SB	-
3	B	-
5	LG	-
7	L	-
8	W	-
9	BG	-
10	Y	-

11	V	-
12	GR	-
13	LG	-
14	SB	-
16	BR	-
18	BR	-
19	G	-
20	Y	-
21	BG	-
23	R	-
24	SB	-
25	GR	-
26	BR	-
27	LG	-
28	W	-
29	BG	-
30	G	-

Connector No.	M75
Connector Name	WIRE TO WIRE
Connector Type	M06FW-LC



Terminal No.	Color Of Wire	Signal Name [Specification]
1	Y	-
2	G	-
3	SB	-
4	V	-
5	W	-
6	B	-

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MANUAL AIR CONDITIONING SYSTEM

Connector No.	M77
Connector Name	WIRE TO WIRE
Connector Type	TH80MW-CS16-TM4

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
2	LA/R	-
5	V	- [Without ISS]
5	W	- [With ISS]
8	G	-
9	Y	-
10	R	-
20	W	-
21	B	-
22	SHIELD	-
31	V	-
32	GR	-
33	G	-
34	LG	-
35	BG	-
36	LG	-
37	V	-
38	G	-
39	BR	-
40	L	-
41	P	-
47	Y	-
48	BG	-
51	GR	-
52	SB	-
53	R	-
54	LA/L	-
55	BR	-
56	P	-
57	B	-
58	L	-
59	W	-
60	LA/R	-
61	P	-
62	V	-
63	LA/BR	-
64	Y	-
65	GR	-
66	BG	-
67	L	-
68	R	-
71	V	-
72	L	-
73	Y	-
76	L	-
77	V	-
78	LG	-
79	SHIELD	-
80	L	- [With ISS]
80	LA/L	- [Without ISS]
82	GR	-
83	LG	-
84	SB	-
85	G	-
86	G	-
87	B	-
88	B	-
91	L	-
92	W	-
93	W	-
96	LG	-
97	BR	-
98	V	-
99	R	-

Connector No.	M85
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	NS16FBR-CS

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
137	W	BAT POWER SUPPLY (FUSE)
138	SB	INT ROOM LAMP CONT
139	L	PASSENGER DOOR UNLOCK OUTPUT
141	V	FRONT DOOR LOCK OUTPUT
143	LA/V	POWER SUPPLY (FR DOOR LK ACT)
144	BG	POWER SUPPLY (TURN SIGNAL)
145	GR	POWER SUPPLY (STOP LAMP)
146	B	GROUND
147	B	GROUND
148	G	DRIVER DOOR UNLOCK OUTPUT
149	W	FRONT DOOR SUPERLOCK OUTPUT
151	R	POWER SUPPLY (REAR DOOR LK ACT)
152	LG	POWER SUPPLY (REAR WIPER)

Connector No.	M87
Connector Name	BCM (BODY CONTROL MODULE)
Connector Type	TH40FGY-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
41	V	STEERING LOCK UNIT POWER SUPPLY
42	LA/G	TURN SIG LH (SIDE)
43	LA/Y	TURN SIG RH (SIDE)
44	P	INTERIOR ROOM LAMP RELAY CONT
45	R	CAN-L
46	L	CAN-H
47	G	LIGHT & RAIN SENSOR
48	L	CAN-H
49	R	CAN-L
50	BG	DOOR LOCK SW
51	Y	HAZARD SW
56	P	DONGLE
57	L	CVT SHIFT SELECT (DETENT SW) PWR
60	R	HEADLAMP WASHER SW
63	G	POWER WINDOW RELAY CON
64	LA/R	REAR WINDOW DEFOGGER RELAY CONT
65	BR	ACC RELAY CONT
67	Y	IGN RELAY (F/B) CONT OUTPUT
68	LA/W	BLOWER RELAY CONT
73	LG	COMBI SW INPUT 5
74	Y	COMBI SW OUTPUT 5
75	BG	SECURITY IND LAMP CONT
76	G	COMBI SW INPUT 3
77	GR	COMBI SW INPUT 4
78	V	COMBI SW INPUT 1
79	W	COMBI SW INPUT 2
80	SB	DOOR UNLOCK SW

Connector No.	M132
Connector Name	A/C AMP.
Connector Type	TH32FW-NH

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	G	FAN AMP. CONT
3	SB	ACC PWR SPLY
4	V	IGN ON
7	L	CAN-H
8	W	MTR PWR SPLY (INT, MODE)
9	B/G	A/MIX 1
10	Y	A/MIX 2
11	V	INT 1
12	GR	INT 2
13	LG	MODE 1
14	SB	MODE 2
17	W	BLOWER MTR F/B
18	BR	SENS GND (INTAKE)
19	B	GND
21	BG	INTAKE SENS
23	R	CAN-L
24	SB	MTR PWR SPLY (A/MIX)
25	GR	A/MIX 3
26	BR	A/MIX 4
27	LG	INT 3
28	W	INT 4
29	B/G	MODE 3
30	G	MODE 4

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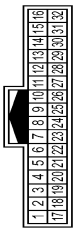
MANUAL AIR CONDITIONING SYSTEM

Connector No.	M133
Connector Name	WIRE TO WIRE
Connector Type	TH32MW-NH

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
3	-	-
5	-	-
7	-	-
8	-	-
9	-	-
10	-	-
11	-	-
12	-	-
13	-	-
14	-	-
16	-	-
18	-	-
19	-	-
20	-	-
21	-	-
23	-	-
24	-	-
25	-	-
26	-	-
27	-	-
28	-	-
29	-	-
30	-	-

Connector No.	M134
Connector Name	WIRE TO WIRE
Connector Type	M06MW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-
3	-	-
4	-	-
5	-	-
6	-	-

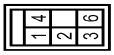
Connector No.	M175
Connector Name	INTAKE SENSOR
Connector Type	TK02FBR

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-

Connector No.	M342
Connector Name	MODE DOOR MOTOR
Connector Type	98192-1001

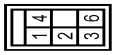
H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	MODE DRIVE SIGNAL 2
2	-	MODE DOOR DRIVE POWER SUPPLY
3	-	MODE DRIVE SIGNAL 4
4	-	MODE DRIVE SIGNAL 1
6	-	MODE DRIVE SIGNAL 3

Connector No.	M343
Connector Name	INTAKE DOOR MOTOR
Connector Type	MAA06FB

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	A/MIX DRIVE SIGNAL 2
2	-	AIR MIX DOOR DRIVE POWER SUPPLY
3	-	A/MIX DRIVE SIGNAL 4
4	-	A/MIX DRIVE SIGNAL 1
6	-	A/MIX DRIVE SIGNAL 3

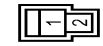
Connector No.	M346
Connector Name	FAN CONTROL AMP.
Connector Type	M04FW-LC

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-
3	-	-

Connector No.	M347
Connector Name	BLOWER MOTOR
Connector Type	M02FW-LC

H.S.



Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-

JRIWC2444GB

MANUAL AIR CONDITIONING SYSTEM

Connector No.	M348
Connector Name	AIR MIX DOOR MOTOR
Connector Type	MAA06FB

H.S.

Terminal No.	Color Of Wire	Signal Name [Specification]
1	-	-
2	-	-
3	-	-
4	-	-
6	-	-

JRIWC2445GB

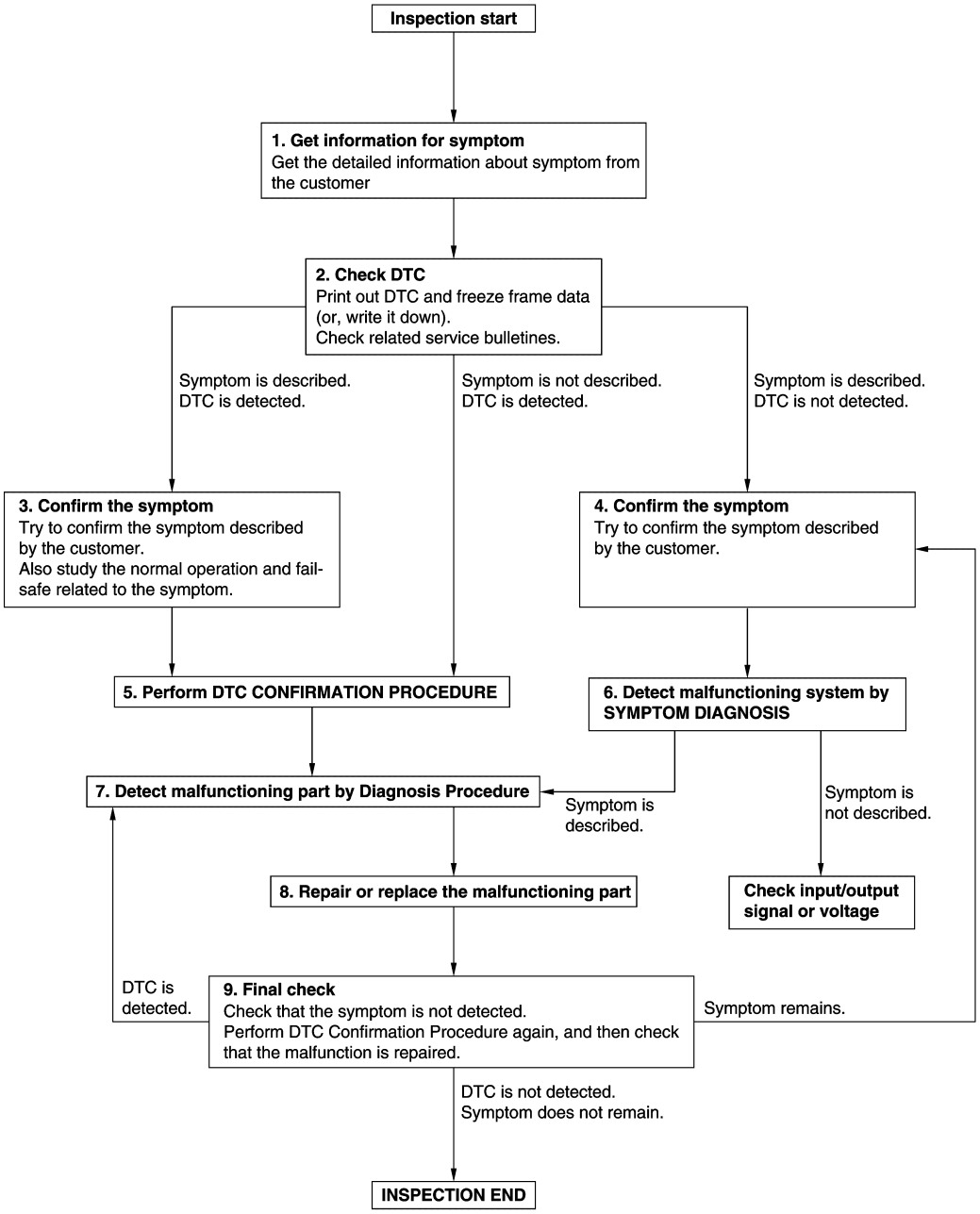
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORK FLOW

Work Flow

INFOID:0000000010939831

OVERALL SEQUENCE



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DETAILED FLOW

1.GET INFORMATION FOR SYMPTOM

1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

2.CHECK DTC

1. Check DTC.
2. Perform the following procedure if DTC is detected.

- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.

3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3.
Symptom is described, DTC is not detected>>GO TO 4.
Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Also study the normal operation and fail-safe related to the symptom.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer.
Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC, and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time.
If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included on Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.
  If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIRMATION PROCEDURE.

Is DTC detected?

YES >> GO TO 7.
NO >> Check according to GI-44, "Intermittent Incident".

6.DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

YES >> GO TO 7.
NO >> Monitor input data from related sensors or check voltage of related module terminals using CONSULT.

7.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

Inspect according to Diagnosis Procedure of the system.

Is malfunctioning part detected?

YES >> GO TO 8.
NO >> Check according to GI-44, "Intermittent Incident".

8. REPAIR OR REPLACE THE MALFUNCTIONING PART

1. Repair or replace the malfunctioning part.
2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement.
3. Check DTC. If DTC is detected, erase it.

>> GO TO 9.

9. FINAL CHECK

When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, and then check that the malfunction is repaired securely.
When symptom is described by the customer, refer to confirmed symptom in step 3 or 4, and check that the symptom is not detected.

Is DTC detected and does symptom remain?

YES-1 >> DTC is detected: GO TO 7.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

OPERATION INSPECTION

Work Procedure

INFOID:0000000010939832

DESCRIPTION

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

Check condition : Engine running at normal operating temperature.

OPERATION INSPECTION

1.CHECK FAN SPEED

1. Start engine.
2. Operate fan control dial and check that fan speed changes.
3. Check operation for all fan speeds.

Is the inspection result normal?

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

2.CHECK AIR OUTLET

1. Operate fan control dial to set the fan speed to maximum speed.
2. Operate MODE VENT/FOOT/DEF switch and MAX DEF switch.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the outlets.

Is the inspection result normal?

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

3.CHECK AIR INLET

1. Press INTAKE switch to set the air inlet to recirculation. The INTAKE switch indicator 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. The INTAKE switch indicator turns OFF.
4. 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 turns ON.
2. Check visually and by sound that the compressor operates.
3. Press A/C switch again. The A/C switch indicator 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 WITH TEMPERATURE SETTING LOWERED

1. Operate compressor.
2. Operate temperature control dial to lower the set to full cold.
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. Warm up engine to the normal operating temperature.
2. Operate temperature control dial to raise the set to full hot.
3. Check that warm air blows from the air outlets.

Is the inspection result normal?

YES >> INSPECTION END
NO >> GO TO 8.

8. CHECK SELF-DIAGNOSIS WITH CONSULT

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

Is any DTC detected?

YES >> Refer to HAC-171, "DTC Index", and perform the appropriate diagnosis.
NO >> Refer to HAC-217, "Symptom Table", and perform the appropriate diagnosis.

SYSTEM SETTING

Setting of Target Evaporator Temperature Upper Limit Value

INFOID:0000000010939833

DESCRIPTION

Setting of upper limit value of target evaporator temperature can be changed. Control characteristic of compressor control (refrigerant discharge amount control) changes according to change of the setting, and then operation ratio of compressor and refrigerant discharge amount are changed. According to change of the setting, control characteristic focusing on the fuel consumption can be adjusted to control characteristic focusing on the cooling capacity.

HOW TO SET

With CONSULT

Perform “TARGET EVAPORATOR TEMP UPPER LIMIT SETTING” in “WORK SUPPORT” mode of “HVAC” using CONSULT.

Work support items	Display	Setting
TARGET EVAPORATOR TEMP UPPER LIMIT SETTING	Initial setting	Initial setting
	High	Setting 1
	Middle	Setting 2
	Low	Setting 3

Setting	Target evaporator temperature upper limit value	Evaporator freezing protection control	Refrigerant discharge amount control
Initial setting	12°C (54°F)	Initial setting	Initial setting
Setting 1	7°C (45°F)	Operation ratio of compressor increases from initial setting.	Refrigerant discharge amount increases from initial setting.
Setting 2	5°C (41°F)	Operation ratio of compressor increases from initial setting 1.	Refrigerant discharge amount increases from initial setting 1.
Setting 3	3°C (37°F)	Operation ratio of compressor increases from setting 2.	Refrigerant discharge amount increases from setting 2.

NOTE:

- A/C amp. stores the setting at the time 1 minute after the ignition switch turns OFF.
- When the battery cable is disconnected from the negative terminal or when the battery voltage is 10 V or less, the setting for the difference between the set temperature and control temperature is set to the value stored 1 minute after most recent ignition switch OFF status.

DOOR MOTOR STARTING POSITION RESET

Description

INFOID:0000000010939834

- Step motors are used for the mode door motor air mix door motor, and intake door motor.
- Because the step motors do not have position detection mechanisms, there may be a deviation between the door position recognized by A/C amp. and the actual door position.
  Therefore, A/C amp. performs motor zero position reset for aligning its recognized door position with the actual door position.
- The reset signal is transmitted from A/C amp. to the air mix door motor, mode door motor, and intake door motor, which then perform zero position reset.
- After any of the following conditions is met, A/C amp. performs motor zero position reset when the ignition switch is next turned ON.
- The ignition switch is turned from ON to OFF a total of 360 times.
- The ignition switch turns OFF while the mode door motor, air mix door motor, or intake door motor is operating.
- If A/C amp., air mix door motor, mode door motor, or intake door motor is removed, it is necessary to perform motor zero position reset using CONSULT.

Work Procedure

INFOID:0000000010939835

1. PERFORM DOOR MOTOR STARTING POSITION RESET

With CONSULT
1. Turn ignition switch ON.
2. Select “Door Motor Starting Position Reset” in “WORK SUPPORT” mode of “HVAC” using CONSULT.
3. Touch “Start” and wait 10 seconds.
4. Make sure the “COMPLETED” is displayed on CONSULT screen.

>> INSPECTION END

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:0000000010939837

DESCRIPTION

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-41, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart" for details of the communication signal.

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition
U1000	CAN COMM CIRCUIT (CAN COMM CIRCUIT)	When A/C amp. is not transmitting or receiving CAN communication signal for 2 seconds or more.

POSSIBLE CAUSE

CAN communication system

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

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

Is DTC detected?

YES >> Refer to HAC-190, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939838

1.CHECK CAN COMMUNICATION SYSTEM

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

>> INSPECTION END

U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:0000000010939840

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition
U1010	CONTROL UNIT(CAN) [CONTROL UNIT(CAN)]	When detecting error during the initial diagnosis of CAN controller of A/C amp.

POSSIBLE CAUSE

A/C amp. (CAN communication function malfunction)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

With CONSULT

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

Is DTC detected?

YES >> Refer to HAC-191, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939841

1.REPLACE A/C AMP.

Replace A/C amp. Refer to HAC-222, "Removal and Installation".

>> INSPECTION END

B24A4 INTAKE SENSOR

DTC Description

INFOID:0000000010939842

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24A4	INTAKE SENSOR (Intake sensor)	[CIRCUIT SHORT TO GROUND]	The intake sensor recognition temperature is too low [less than –44°C (–47°F)].
		[CIRC SHORT TO BATT OR OPEN]	The intake sensor recognition temperature is too high [more than 100°C (212°F)].

POSSIBLE CAUSE

[CIRCUIT SHORT TO GROUND]
- Intake sensor
- A/C amp.
- Harness or connectors (The sensor circuit is shorted to ground.)

[CIRC SHORT TO BATT OR OPEN]
- Intake sensor
- A/C amp.
- Harness or connectors (The sensor circuit is open or shorted to battery.)

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-192, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939843

NOTE:
The intake sensor cannot be reused. If the intake sensor harness connector is disconnected, sensor must be replaced.

1.CHECK INTAKE SENSOR SIGNAL

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

+		–	Condition		Voltage
A/C amp.					
Connector	Terminal				
M132	21	Ground	Sensor detection temperature	–20°C (–4°F)	4.41 V
				–10°C (14°F)	4.09 V
				0°C (32°F)	3.68 V
				10°C (50°F)	3.21 V
				20°C (68°F)	2.71 V
				25°C (77°F)	2.47 V
				30°C (86°F)	2.23 V
				40°C (104°F)	1.80 V

Is the inspection result normal?

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

2.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR OPEN

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

Intake sensor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M175	1	M132	21	Existed

Is the inspection result normal?

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

3.CHECK INTAKE SENSOR GROUND CIRCUIT FOR OPEN

1. Check continuity between intake sensor harness connector and A/C amp harness connector.

Intake sensor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M175	2	M132	18	Existed

Is the inspection result normal?

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

4.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR SHORT

1. Check continuity between intake sensor harness connector and ground.

Intake sensor		—	Continuity
Connector	Terminal		
M175	1	Ground	Not existed

2. Check voltage between intake harness connector and ground

+		–	Voltage
Intake sensor			
Connector	Terminal		
M175	1	Ground	0 V

Is the inspection result normal?

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

5.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-194, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Replace intake sensor. Refer to HAC-224, "Removal and Installation".

6.CHECK INTERMITTENT INCIDENT

Check intermittent incident. Refer to GI-44, "Intermittent Incident".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair or replace malfunctioning parts.

Component Inspection

INFOID:0000000010939844

NOTE:
The intake sensor cannot be reused. If the intake sensor harness connector is disconnected, sensor must be replaced.

1.CHECK INTAKE SENSOR

1. Remove intake sensor. Refer to HAC-224, "Removal and Installation".
2. Check resistance between intake sensor harness connector terminals. Refer to applicable table for the normal value.

Intake sensor			Condition	Resistance: kΩ
Con-nector	Terminal		Temperature: °C (°F)	
M175	1	2	–20 (–4)	16.00
			–10 (14)	9.62
			0 (32)	6.00
			10 (50)	3.87
			20 (68)	2.57
			25 (77)	2.12
			30 (86)	1.76
			40 (104)	1.23

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace intake sensor. Refer to HAC-224, "Removal and Installation".

B24B7 INTAKE DOOR MOTOR

DTC Description

INFOID:0000000010939845

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24B7	INTAKE DOOR MOTOR (Intake door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of intake door motor circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of intake door motor circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector (Intake door motor circuit is shorted to battery)
- Intake door motor
- A/C amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector (Intake door motor circuit is open or shorted to ground)
- Intake door motor
- A/C amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-195, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939846

1.CHECK INTAKE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Turn ignition switch ON.
4. Check voltage between intake door motor harness connector and ground for several seconds after pressing the INTAKE switch.

+		–	Voltage
Intake door motor			
Connector	Terminal		
M343	2	Ground	11 - 14 V

Is the inspection result normal?

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

2.CHECK INTAKE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

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

Intake door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M343	2	M132	8	Existed

Is the inspection result normal?

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

3. CHECK INTAKE DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M343	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair harness or connector.

4. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR OPEN

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

Intake door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M343	1	M132	11	Existed
	3		12	
	4		27	
	6		28	

Is the inspection result normal?

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

5. CHECK INTAKE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between intake door motor harness connector and ground.

Intake door motor		—	Continuity
Connector	Terminal		
M343	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between intake door motor harness connector and ground.

+		–	Voltage
Intake door motor			
Connector	Terminal		
M343	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6. CHECK INTAKE DOOR MOTOR

Check intake door motor. Refer to HAC-197, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Replace intake door motor. Refer to HAC-230, "INTAKE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939847

1. CHECK INTAKE DOOR MOTOR

1. Remove intake door motor. Refer to HAC-230, "INTAKE DOOR MOTOR : Removal and Installation".
2. Check resistance between intake 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 intake door motor. Refer to HAC-230, "INTAKE DOOR MOTOR : Removal and Installation".

B24B9 MODE DOOR MOTOR

DTC Description

INFOID:0000000010939848

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24B9	MODE DOOR MOTOR (Mode door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of mode door motor circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of mode door motor circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector (Mode door motor circuit is shorted to battery)
- Mode door motor
- A/C amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector (Mode door motor circuit is open or shorted to ground)
- Mode door motor
- A/C amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-198, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939849

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 for several seconds after pressing the MODE VENT/FOOT/DEF switch.

+		–	Voltage
Mode door motor			
Connector	Terminal		
M342	2	Ground	11 - 14 V

Is the inspection result normal?

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

2.CHECK MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

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

Mode door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M342	2	M132	8	Existed

Is the inspection result normal?

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

3. CHECK MODE DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between mode door motor harness connector and ground.

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

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair harness or connector.

4. CHECK MODE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR OPEN

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

Mode door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M342	1	M132	13	Existed
	3		14	
	4		29	
	6		30	

Is the inspection result normal?

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

5. CHECK MODE DOOR MOTOR DRIVE SIGNAL CIRCUIT FOR SHORT

1. Check continuity between mode door motor harness connector and ground.

Mode door motor		—	Continuity
Connector	Terminal		
M342	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between mode door motor harness connector and ground.

+		–	Voltage
Mode door motor			
Connector	Terminal		
M342	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6.CHECK MODE DOOR MOTOR

Check mode door motor. Refer to HAC-200, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Replace mode door motor. Refer to HAC-230, "MODE DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939850

1.CHECK MODE DOOR MOTOR

1. Remove mode door motor. Refer to HAC-230, "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.)
2	1	90
	3	
	4	
	6	

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace mode door motor. Refer to HAC-230, "MODE DOOR MOTOR : Removal and Installation".

B24BB LEFT AIR MIX DOOR MOTOR

DTC Description

INFOID:0000000010939851

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition
B24BB	LEFT AIR MIX DOOR MOTOR (Left side air mix door motor)	[CIRCUIT SHORT TO BATTERY]	Detect short to battery circuit of air mix door motor circuits.
		[CIRC SHORT TO GRND OR OPEN]	Detect open or short to ground circuit of air mix door motor circuits.

POSSIBLE CAUSE

[CIRCUIT SHORT TO BATTERY]
- Harness and connector (Air mix door motor circuit is shorted to battery)
- Air Mix door motor
- A/C amp.

[CIRC SHORT TO GRND OR OPEN]
- Harness and connector (Air mix door motor circuit is open or shorted to ground])
- Air mix door motor
- A/C amp.

FAIL-SAFE

—

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

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

Is DTC detected?

YES >> Refer to HAC-201, "Diagnosis Procedure".
NO-1 >> To check malfunction symptom before repair: Refer to GI-44, "Intermittent Incident".
NO-2 >> Confirmation after repair: INSPECTION END

Diagnosis Procedure

INFOID:0000000010939852

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 for several seconds after operating the temperature control dial.

+		–	Voltage
Air mix door motor			
Connector	Terminal		
M348	2	Ground	11 - 14 V

Is the inspection result normal?

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

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

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

Air mix door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M348	2	M132	24	Existed

Is the inspection result normal?

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

3. CHECK AIR MIX DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

Check continuity between air mix door motor harness connector and ground.

Air mix door motor		—	Continuity
Connector	Terminal		
M348	2	Ground	Not existed

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair harness or connector.

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

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

Air mix door motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M348	1	M132	9	Existed
	3		10	
	4		25	
	6		26	

Is the inspection result normal?

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

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

1. Check continuity between air mix door motor harness connector and ground.

Air mix door motor		—	Continuity
Connector	Terminal		
M348	1	Ground	Not existed
	3		
	4		
	6		

2. Check voltage between air mix door motor harness connector and ground.

+		–	Voltage
Air mix door motor			
Connector	Terminal		
M348	1	Ground	0 V
	3		
	4		
	6		

Is the inspection result normal?

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

6. CHECK AIR MIX DOOR MOTOR

Check air mix door motor. Refer to HAC-203, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Replace air mix door motor. Refer to HAC-229, "AIR MIX DOOR MOTOR : Removal and Installation".

Component Inspection

INFOID:0000000010939853

1. CHECK AIR MIX DOOR MOTOR

1. Remove air mix door motor. Refer to HAC-229, "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-229, "AIR MIX DOOR MOTOR : Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT

A/C AMP.

A/C AMP. : Diagnosis Procedure

INFOID:0000000010939854

1.CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10 A fuse [No. 20 (without stop/start system), located in fuse block (J/B)], [No. 59 (with stop/start system)].
   NOTE:
   Refer to PG-84, "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 A/C AMP. ACCESSORY POWER SUPPLY

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

+		–	Voltage
A/C amp.			
Connector	Terminal		
M132	3	Ground	11 - 14 V

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between A/C amp. and fuse.

3.CHECK A/C AMP. GROUND CIRCUIT FOR OPEN

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

A/C amp.		—	Continuity
Connector	Terminal		
M132	19	Ground	Existed

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair harness or connector.

BLOWER MOTOR

Diagnosis Procedure

INFOID:0000000010939855

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.

- 20 A fuses [Nos. 7 and 17, located in the fuse block (J/B)]

NOTE:
Refer to PG-84, "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		
M347	1	Ground	11 – 14 V

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-208, "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
Fan control amp.			
Connector	Terminal		
M346	1	Ground	11 – 14 V

Is the inspection result normal?

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

6.CHECK FAN CONTROL AMP. POWER SUPPLY 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	
M346	1	M347	2	Existed

Is the inspection result normal?

YES >> Replace blower motor. Refer to VTL-15, "Removal and Installation".
NO >> Repair harness or connector.

7.CHECK FAN CONTROL AMP. GROUND 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		
M346	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

Check continuity between fan control amp. harness connector and A/C amp. harness connector.

Fan control amp.		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M346	2	M132	1	Existed

Is the inspection result normal?

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

9.CHECK FAN CONTROL AMP. CONTROL SIGNAL CIRCUIT FOR SHORT

Check continuity between fan control amp. harness connector and ground.

Fan control amp.		—	Continuity
Connector	Terminal		
M346	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-208, "Component Inspection (Fan Control Amp.)".

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Replace fan control amp. Refer to HAC-227, "Removal and Installation".

11. CHECK A/C AMP. IGNITION POWER SUPPLY FEEDBACK SIGNAL

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

+		–	Voltage
A/C amp.			
Connector	Terminal		
M132	4	Ground	11 – 14 V

Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair harness or connector between A/C 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 amp. connector.
3. Check continuity between blower motor harness connector and A/C amp. harness connector.

Blower motor		A/C amp.		Continuity
Connector	Terminal	Connector	Terminal	
M347	2	M132	17	Existed

Is the inspection result normal?

YES >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".
NO >> Repair harness or connector.

13. CHECK BLOWER MOTOR FEEDBACK SIGNAL CIRCUIT AND FAN CONTROL AMP. POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect following connectors.
- Blower fan motor
- Fan control amp.
- A/C amp.
3. Check continuity between blower motor harness connector and ground.

Blower motor		—	Continuity
Connector	Terminal		
M347	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 CIRCUIT FOR SHORT TO POWER SUPPLY

Check harness between fan control amp. harness connector and A/C amp. harness connector for short to power supply.

Fan control amp.		—	Voltage
Connector	Terminal		
M346	2	Ground	0 V

Is the inspection result normal?

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

Component Inspection (Blower Motor)

INFOID:0000000010939856

1.CHECK BLOWER MOTOR-I

1. Remove blower motor. Refer to VTL-15, "Removal and Installation".
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".

2.CHECK BLOWER MOTOR-II

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".

3.CHECK BLOWER MOTOR-III

Check that blower motor turns smoothly.

Is the inspection result normal?

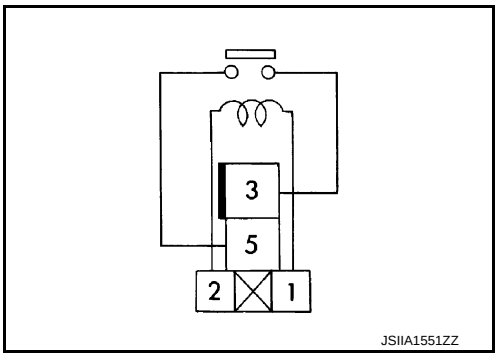
YES >> INSPECTION END
NO >> Replace blower motor. Refer to VTL-15, "Removal and Installation".

Component Inspection (Blower Relay)

INFOID:0000000010939857

1.CHECK BLOWER RELAY

1. Remove blower relay. Refer to PG-84, "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 (Fan Control Amp.)

INFOID:0000000010939858

1.CHECK FAN CONTROL AMP.

1. Remove fan control amp. Refer to HAC-227, "Removal and Installation".
2. Check continuity between fan control amp. terminals.

+	–	Continuity
Terminal	Terminal	
1	3	Existed
3	1	Not existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace fan control amp. Refer to HAC-227, "Removal and Installation".

MAGNET CLUTCH

Component Function Check

INFOID:0000000010939859

1.CHECK MAGNET CLUTCH OPERATION

CONSULT ACTIVE TEST
1. Select “COMPRESSOR” of IPDM E/R active test item.
2. With operating the test item, check magnet clutch operation by listening and viewing.

Does it operate normally?

YES >> INSPECTION END
NO >> Refer to HAC-210, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010939860

1.CHECK MAGNET CLUTCH

CONSULT
1. Turn ignition switch OFF
2. Disconnect compressor connector.
3. Select “COMPRESSOR” of IPDM E/R active test item.
4. With operating the test item, check voltage between compressor harness connector and ground.

+		–	Condition		Voltage
Compressor					
Connector	Terminal				
F17	1	Ground	Active test: COMPRESSOR	Off	0 - 1 V
				On	9 - 16 V

Does it operate normally?

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

2.CHECK FUSE

1. Turn ignition switch OFF
2. Check 15 A fuse (No. 87, located in IPDM E/R).
   NOTE:
   Refer to PG-89, "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 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	
F72	65	F17	1	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation".
NO >> Repair harness or connector.

4.CHECK MAGNET CLUTCH GROUND CIRCUIT FOR OPEN

Check continuity between compressor harness connector and ground.

Compressor		—	Continuity
Connector	Terminal		
F17	2	Ground	Existed

Is the inspection result normal?

YES >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia) or HA-76, "Removal and Installation" (MR20DD engine models).

NO >> Repair harness or connector.

ECV (ELECTRICAL CONTROL VALVE)

Diagnosis Procedure

INFOID:0000000010939861

1.CHECK ECV POWER SUPPLY CIRCUIT

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

+		–	Voltage
Compressor			
Connector	Terminal		
F59	3	Ground	6 - 16 V

Is the inspection result normal?

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

2.CHECK ECV POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between compressor harness connector and IPDM E/R harness connector.

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	3	F72	71	Existed

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation".
NO >> Repair harness or connector.

3.CHECK ECV CONTROL SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector.
3. Check continuity between compressor harness connector and IPDM E/R harness connector.

Compressor		IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	
F59	4	F74	98	Existed

Is the inspection result normal?

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

4.CHECK ECV

Check ECV. Refer to HAC-212, "Component Inspection".

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-60, "Removal and Installation"
NO >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia) or HA-76, "Removal and Installation" (MR20DD engine models).

Component Inspection

INFOID:0000000010939862

1.CHECK ECV

Check continuity between compressor terminals.

Terminal		Continuity
3	4	Existed

Is the inspection result normal?

YES >> INSPECTION END
NO >> Replace compressor. Refer to HA-30, "Removal and Installation" (R9M engine models except for Russia) or HA-76, "Removal and Installation" (MR20DD engine models).

PTC HEATER

Component Function Check

INFOID:0000000010939863

1.CHECK PTC HEATER OPERATION

1. Start the engine.
2. Operate blower motor.
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-214, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:0000000010939864

1.CHECK FUSE AND FUSIBLE LINK

1. Turn ignition switch OFF.
2. Check 30 A fuses (Nos. 42, 43 and 44) and 10 A fuse [No. 30, located in fuse block (J/B)].

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 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	E139	2	Ground	Battery voltage
		3		
2	E140	2		
		3		
3	E141	2		
		3		

Is the inspection result normal?

YES >> GO TO 3.
NO >> Repair harness or connector between PTC relay and fuse.

3.CHECK PTC RELAY CONTROL SIGNAL CIRCUIT FOR OPEN

1. Disconnect BCM connector.
2. Check continuity between PTC relay harness connector and BCM harness connector.

PTC relay			BCM		Continuity
Relay	Connector	Terminal	Connector	Terminal	
1	E139	1	E23	172	Existed
2	E140			173	
3	E141			170	

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	E139	5	E138	1	Existed
2	E140			3	
3	E141			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		
E138	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-215, "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-216, "Component Inspection (PTC Heater)".

Is the inspection result normal?

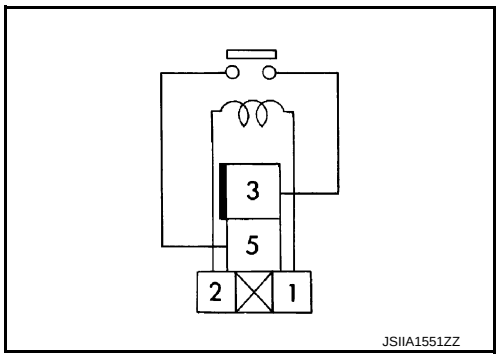
YES >> Replace BCM. Refer to BCS-121, "Removal and Installation".
NO >> Replace PTC heater. Refer to HAC-226, "Removal and Installation".

Component Inspection (PTC Relay)

INFOID:0000000010939865

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:0000000010939866

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. Refer to HAC-226, "Removal and Installation".

SYMPTOM DIAGNOSIS

MANUAL AIR CONDITIONING SYSTEM

Symptom Table

INFOID:0000000010939867

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

Symptom		Corresponding malfunction part	Check item/Reference
Air conditioning cannot be controlled.		• A/C amp. power supply or ground circuit • A/C amp.	Check A/C amp. power supply and ground circuits. HAC-204, "A/C 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-228, "Exploded View".
Air outlet does not change.		Mode door motor system installation condition	Check mode door motor system is properly installed. Refer to HAC-228, "Exploded View".
Air inlet does not change.		Intake door motor system installation condition	Check intake door motor system is properly installed. Refer to HAC-228, "Exploded View".
Blower motor does not operates or operation speed is not normal.		• Blower motor power supply circuit. • A/C amp. ignition power supply signal circuit • Fan control amp. power supply circuit • Fan control amp. ground circuit • Fan control amp. control signal circuit • Blower motor • Fan control amp. • A/C amp.	Check blower motor circuits. HAC-205, "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 amp. ignition power supply signal circuit • Blower motor feedback signal circuit • A/C amp.	
	Blower motor cannot be switched to OFF.	• Blower motor feedback signal circuit • A/C amp. power supply circuit • Fan control amp. power supply circuit • Fan control amp. control signal circuit • Fan control amp. • A/C amp.	
Compressor does not operate.		• Magnet clutch • Magnet clutch power supply circuit • Magnet clutch ground circuit • IPDM E/R (A/C relay) • The circuit between ECM and refrigerant pressure sensor • Refrigerant pressure sensor • ECM • A/C amp.	Check magnet clutch circuits. HAC-210, "Component Function Check"
• Insufficient cooling • No cool air comes out. (Air flow volume is normal.)		• Magnet clutch control system • Drive belt slipping • Cooler cycle • ECV (Electrical control valve) • Air leakage from each duct	HAC-219, "Diagnosis Procedure"

Symptom		Corresponding malfunction part	Check item/Reference
• Insufficient heating • No warm air comes out. (Air flow volume is normal.)		• Engine cooling system • Heater hose • Heater core • Air leakage from each duct • PTC heater system (with PTC heater)	HAC-220, "Diagnosis Procedure"
Noise is heard when the air conditioning operates.	During compressor operation	Cooler cycle	Symptom table for noise • HA-29, "Symptom Table" (R9M engine models except for Russia) • HA-75, "Symptom Table" (MR20DD engine models)
	During blower motor operation	• Mixing any foreign object in blower motor • Blower motor fan breakage • Blower motor rotation inferiority	Check blower motor. HAC-208, "Component Inspection (Blower Motor)"

INSUFFICIENT COOLING

Description

INFOID:0000000010939868

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

Diagnosis Procedure

INFOID:0000000010939869

NOTE:
Perform self-diagnoses with CONSULT 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 and operate blower fan.
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 DOES NOT OPERATE” in “SYMPTOM DIAGNOSIS”. Refer to HAC-221, "Diagnosis Procedure".

2.CHECK DRIVE BELT

Check tension of drive belt. Refer to EM-23, "Inspection" (MR20DD engine models) EM-301, "Inspection" (R9M engine models).

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-27, "Symptom Table" (R9M engine models except for Russia) or HA-73, "Symptom Table" (MR20DD engine models).

Is the inspection result normal?

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

4.CHECK ECV

Perform ECV circuit diagnosis. Refer to HAC-212, "Diagnosis Procedure".

Is the inspection result normal?

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

5.CHECK AIR LEAKAGE FROM EACH DUCT

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

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace parts depending on the inspection results.

INSUFFICIENT HEATING

Description

INFOID:0000000010939870

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

Diagnosis Procedure

INFOID:0000000010939871

NOTE:
Perform self-diagnoses with CONSULT 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-13, "Inspection" (MR20DD engine models) or CO-64, "Inspection" (R9M engine models).
2. Check radiator cap or reservoir tank cap. Refer to CO-16, "RADIATOR CAP : Inspection" (MR20DD engine models) or CO-68, "Inspection" (R9M engine models).
3. Check water flow sounds of the engine coolant. Refer to CO-14, "Refilling" (MR20DD engine models) or CO-65, "Refilling" (R9M engine models).

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-46, "HEATER CORE : Removal and Installation" (R9M engine models except for Europe) or HA-91, "HEATER CORE : Removal and Installation" (MR20DD engine models).

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-1 >> With PTC heater: GO TO 5.
YES-2 >> Without PTC heater: INSPECTION END
NO >> Repair or replace parts depending on the inspection results.

5.CHECK PTC HEATER

Perform PTC heater diagnosis. Refer to HAC-115, "Diagnosis Procedure".

Is the inspection result normal?

YES >> INSPECTION END
NO >> Repair or replace parts depending on the inspection results.

COMPRESSOR DOES NOT OPERATE

Description

INFOID:0000000010939872

SYMPTOM

Compressor does not operate.

Diagnosis Procedure

INFOID:0000000010939873

NOTE:

- Perform self-diagnoses with CONSULT 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-210, "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-407, "Diagnosis Procedure" (MR20DD engine models) or EC-1056, "Diagnosis Procedure" (R9M engine models).

Is the inspection result normal?

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

3. CHECK BCM OUTPUT SIGNAL

With CONSULT-

1. Select “DATA MONITOR” mode of “ENGINE” using CONSULT.
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-60, "Removal and Installation".
NO >> Replace A/C amp. Refer to HAC-222, "Removal and Installation".

REMOVAL AND INSTALLATION

A/C CONTROL (A/C AUTO AMP.)

Exploded View

INFOID:0000000010939874

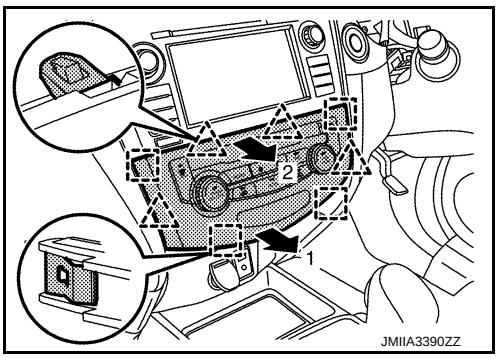
Refer to IP-13, "Exploded View".

Removal and Installation

INFOID:0000000010939875

REMOVAL

1. Disengage fixing metal clips and pawls, and then remove A/C control from instrument panel assembly according to numerical order 1→2 indicated by arrows as shown in the figure.



: Pawl

: Metal clip

2. Disconnect harness connectors.

INSTALLATION

Install in the reverse order of removal.

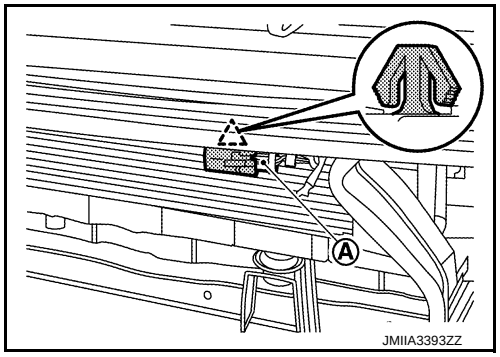
AMBIENT SENSOR

Removal and Installation

INFOID:0000000010939876

REMOVAL

1. Remove front bumper fascia assembly. Refer to EXT-15, "Removal and Installation".
2. Disconnect harness connector Ⓐ.



: Pawl

3. Disengage fixing pawl, and then remove ambient sensor.

INSTALLATION

Install in the reverse order of removal.

INTAKE SENSOR

Exploded View

INFOID:0000000010939877

Refer to HA-40, "Exploded View".

Removal and Installation

INFOID:0000000010939878

REMOVAL

1. Remove instrument lower cover LH. Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove intake sensor from A/C unit assembly.
3. Disconnect harness connector from intake sensor.
   CAUTION:
   If disconnect harness connector from intake sensor, replace intake sensor with new one.

INSTALLATION

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

CAUTION:

If disconnect harness connector from intake sensor, replace intake sensor with new one.

REFRIGERANT PRESSURE SENSOR

Exploded View

INFOID:0000000010939879

Refer to following items..
- R9M (EXCEPT FOR RUSSIA) : Refer to HA-32, "Exploded View".
- MR20DD : Refer to HA-82, "Exploded View".
- QR25DE : Refer to HA-127, "Exploded View".
- R9M (FOR RUSSIA) : Refer to HA-169, "Exploded View".

Removal and Installation

INFOID:0000000010939880

REMOVAL

Refer to following items.
- R9M (EXCEPT FOR RUSSIA) : Refer to HA-36, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- MR20DD : Refer to HA-84, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- QR25DE : Refer to HA-129, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".
- R9M (FOR RUSSIA) : Refer to HA-174, "REFRIGERANT PRESSURE SENSOR : Removal and Installation".

INSTALLATION

Install in the reverse order of removal.

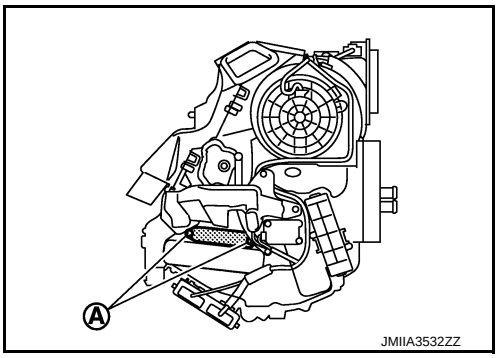
PTC HEATER

Removal and Installation

INFOID:0000000010939881

REMOVAL

1. Remove glove box coverinstrument lower cover RH (LHD models) or instrument lower cover RH (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Disconnect PTC heater connector.
3. Remove fixing screws Ⓐ, and then remove PTC heater from A/C unit assembly.



INSTALLATION

Install in the reverse order of removal.

FAN CONTROL AMPLIFIER

Exploded View

INFOID:0000000010939882

Refer to following items..
- R9M (EXCEPT FOR RUSSIA) : Refer to HA-40, "Exploded View".
- MR20DD : Refer to HA-86, "Exploded View".
- QR25DE : Refer to HA-131, "Exploded View".
- R9M (FOR RUSSIA) : Refer to HA-177, "Exploded View".

Removal and Installation

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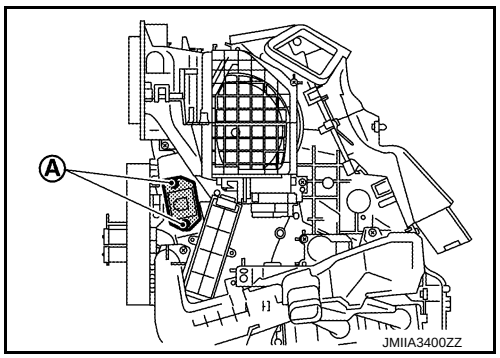
REMOVAL

1. Remove instrument lower panel LH (LHD models) or glove box cover (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Disconnect power transistor harness connector.
3. Remove fixing screws Ⓐ, and then remove fan control amplifier.



INSTALLATION

Install in the reverse order of removal.

DOOR MOTOR

Exploded View

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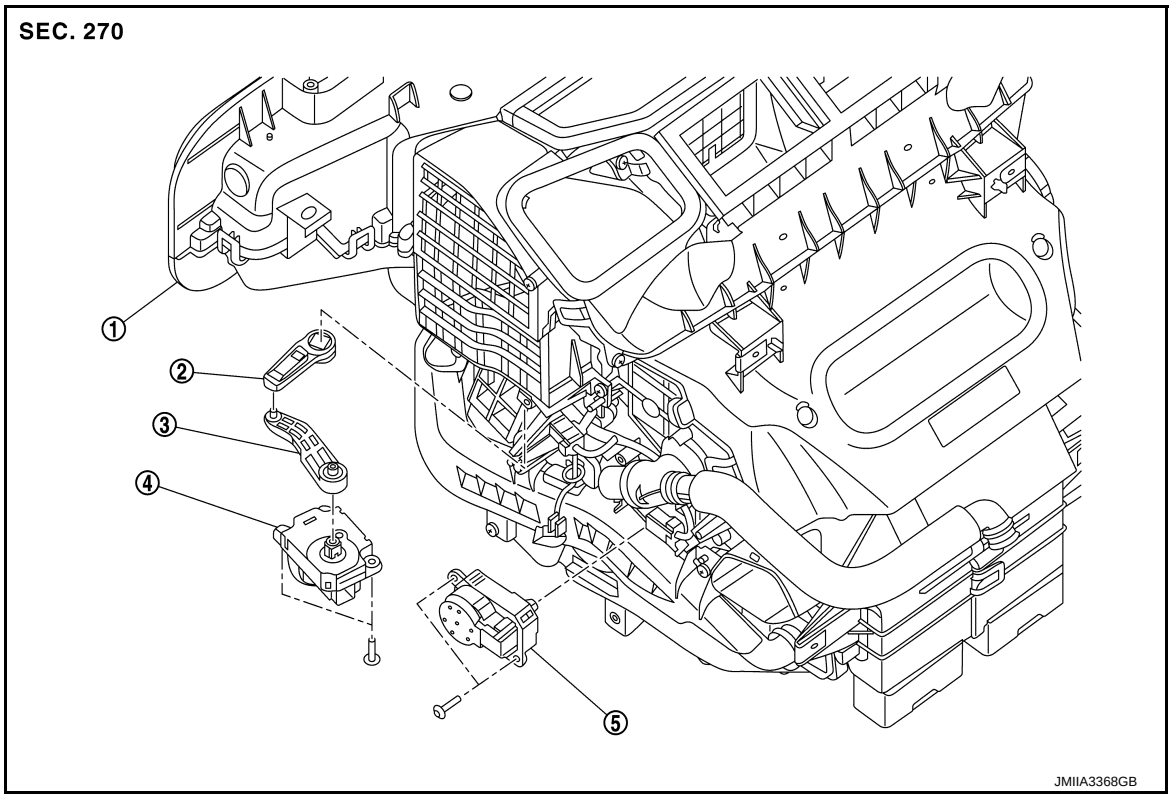
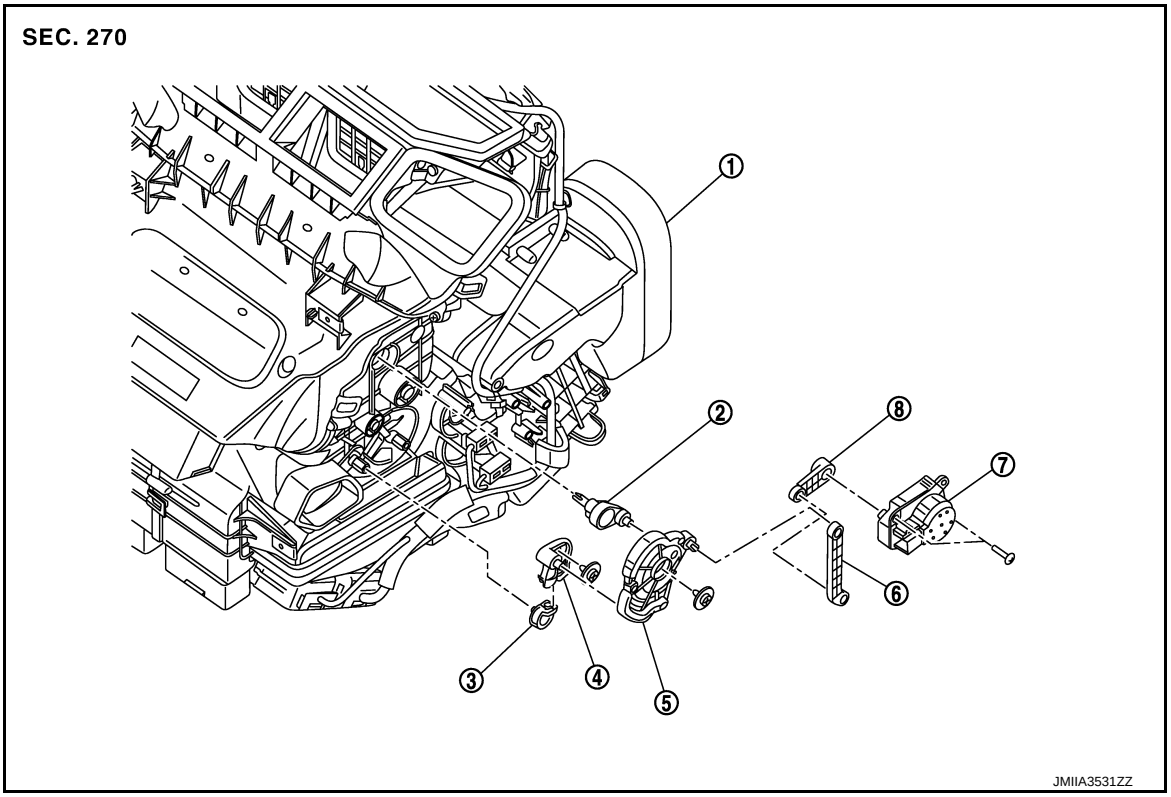
LEFT SIDE



① A/C unit assembly
② Intake door lever
③ Intake door link
④ Intake door motor
⑤ Air mix door motor LH

RIGHT SIDE



① A/C unit assembly
② Side ventilator door lever
③ Foot door link
④ Foot door link
⑤ Main link
⑥ Mode door link
⑦ Mode door motor

AIR MIX DOOR MOTOR

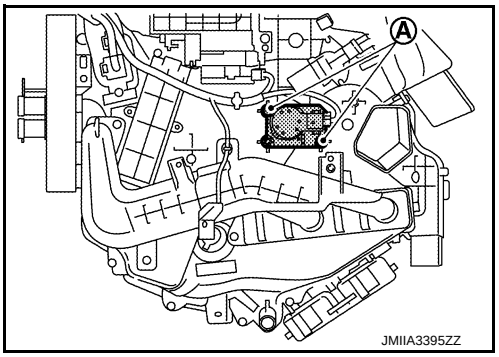
AIR MIX DOOR MOTOR : Removal and Installation

INFOID:0000000010939885

REMOVAL

Air Mix Door Motor LH

1. Set the temperature at 18°C (64°F).
   CAUTION:
   Always perform the above procedure when removing air mix door motor. Otherwise, air mix door may interfere in A/C unit assembly may be damaged.
2. Remove instrument lower panel LH (LHD models) or glove box cover (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
3. Remove foot duct LH. Refer to VTL-12, "FOOT DUCT : Removal and Installation".
4. Disconnect air mix door motor harness connector.
5. Remove fixing screws Ⓐ, and then remove air mix door motor LH.



INSTALLATION

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

CAUTION:

After installing door motor, perform door motor starting position. Refer to HAC-189, "Work Procedure".

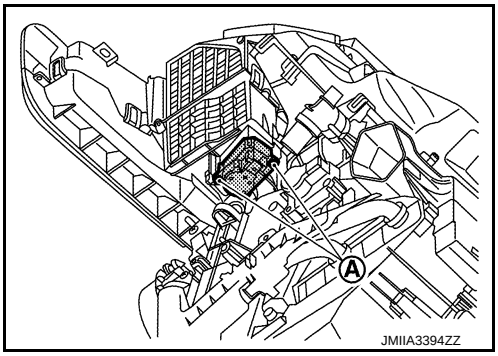
INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

INFOID:0000000010939886

REMOVAL

1. Remove instrument lower panel LH (LHD models) or glove box cover (RHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Disconnect intake door motor harness connector.
3. Remove fixing screws Ⓐ, and then remove intake door motor.



INSTALLATION

Install in the reverse order of removal.

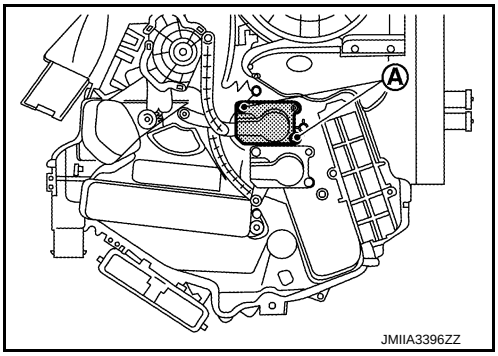
MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:0000000010939887

REMOVAL

1. Remove instrument lower panel RH (RHD models) or glove box cover (LHD models). Refer to IP-14, "Removal and Installation" (LHD models) or IP-41, "Removal and Installation" (RHD models).
2. Remove foot duct RH. Refer to VTL-12, "FOOT DUCT : Removal and Installation".
3. Disconnect mode door motor harness connector.
4. Remove fixing screws Ⓐ, mode door motor.



INSTALLATION

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

CAUTION:

After installing door motor, perform door motor starting position. Refer to HAC-189, "Work Procedure".