

SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

MANUAL AIR CONDITIONING	COMMON ITEM15	
PRECAUTION 3	COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)15	
PRECAUTIONS 3	AIR CONDITIONER16	
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"3	AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER) 16	
Precaution for Procedure without Cowl Top Cover.....3	DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM) 17	
Precaution for Work3	COMMON ITEM17	
Working with HFC-134a (R-134a)4	COMMON ITEM : CONSULT Function (BCM - COMMON ITEM) 17	
Service Equipment4	AIR CONDITIONER18	
PREPARATION 7	AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER) 18	
PREPARATION 7	ECU DIAGNOSIS INFORMATION19	
Special Service Tool7	BCM, ECM, IPDM E/R19	
Commercial Service Tool7	List of ECU Reference19	
SYSTEM DESCRIPTION 8	WIRING DIAGRAM20	
COMPONENT PARTS 8	MANUAL AIR CONDITIONING SYSTEM20	
Component Parts Location8	Wiring Diagram20	
Component Description9	MANUAL HEATER SYSTEM26	
SYSTEM10	Wiring Diagram26	
MANUAL AIR CONDITIONING SYSTEM10	BASIC INSPECTION28	
MANUAL AIR CONDITIONING SYSTEM : System Diagram 10	DIAGNOSIS AND REPAIR WORKFLOW28	
MANUAL AIR CONDITIONING SYSTEM : System Description 10	Workflow28	
MANUAL AIR CONDITIONING SYSTEM : Compressor Control 10	OPERATION INSPECTION30	
MANUAL AIR CONDITIONING SYSTEM : Door Control 11	Work Procedure30	
OPERATION14	DTC/CIRCUIT DIAGNOSIS32	
Switch Name and Function 14	A/C ON SIGNAL32	
DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)15	Component Function Check32	

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

Diagnosis Procedure	32	COMPRESSOR DOES NOT OPERATE	47
Component Inspection	34	Description	47
BLOWER FAN ON SIGNAL	35	Diagnosis Procedure	47
Component Function Check	35	UNIT REMOVAL AND INSTALLATION	48
Diagnosis Procedure	35	FRONT AIR CONTROL	48
A/C INDICATOR	37	Exploded View	48
Diagnosis Procedure	37	Removal and Installation	48
FRONT BLOWER MOTOR	38	REFRIGERANT PRESSURE SENSOR	49
Description	38	Removal and Installation for Refrigerant Pressure	
Diagnosis Procedure	38	Sensor	49
Component Inspection (Front Blower Motor)	40	BLOWER FAN RESISTOR	50
Component Inspection (Blower Relay)	40	Exploded View	50
Component Inspection (Front Blower Motor Re-		Removal and Installation	50
sistor)	40	DOOR CABLE	51
Component Inspection (Fan Switch)	40	Exploded View	51
MAGNET CLUTCH	42	INTAKE DOOR CABLE	51
Description	42	INTAKE DOOR CABLE : Removal and Installation	
Component Function Check	42	51
Diagnosis Procedure	42	INTAKE DOOR CABLE : Adjustment	51
SYMPTOM DIAGNOSIS	44	MODE DOOR CABLE	52
MANUAL AIR CONDITIONING SYSTEM	44	MODE DOOR CABLE : Removal and Installation...	52
Symptom Table	44	MODE DOOR CABLE : Adjustment	52
INSUFFICIENT COOLING	45	AIR MIX DOOR CABLE	52
Description	45	AIR MIX DOOR CABLE : Removal and Installation	
Diagnosis Procedure	45	52
INSUFFICIENT HEATING	46	AIR MIX DOOR CABLE : Adjustment	53
Description	46		
Diagnosis Procedure	46		

PRECAUTION

PRECAUTIONS

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

INFOID:000000009269770

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

WARNING:

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

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

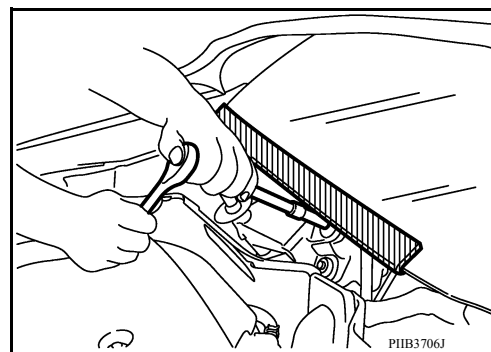
WARNING:

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

Precaution for Procedure without Cowl Top Cover

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When performing the procedure after removing cowl top cover, cover the lower end of windshield with urethane, etc to prevent damage to windshield.



Precaution for Work

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- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.
- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:
 - Water soluble dirt:

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PRECAUTIONS

[MANUAL AIR CONDITIONING]

< PRECAUTION >

- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.
- Oily dirt:
- Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
- Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

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

INFOID:000000009269773

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to [HA-3, "Precaution for Working with HFC-134a \(R-134a\)"](#). To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.**
- **Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.**
- **The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
 - **When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
 - **When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
 - **Only use the specified oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.**
 - **Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment]. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.**
- **Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.**

CONTAMINATED REFRIGERANT

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

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

Service Equipment

INFOID:000000009269774

RECOVERY/RECYCLING EQUIPMENT

Follow the manufacturer's instructions for machine operation and machine maintenance. Do not introduce any refrigerant other than that specified into the machine.

ELECTRONIC LEAK DETECTOR

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

VACUUM PUMP

PRECAUTIONS

< PRECAUTION >

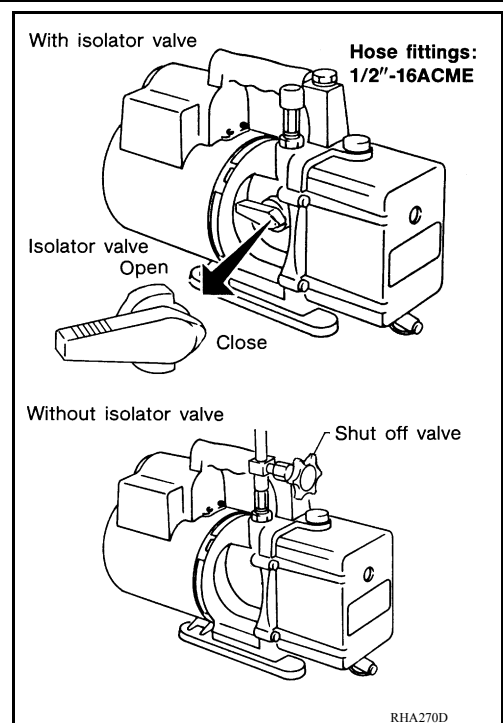
The oil contained inside the vacuum pump is not compatible with the specified oil for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure so the vacuum pump oil may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

To prevent this migration, use a manual valve situated near the hose-to-pump connection, as follows.

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

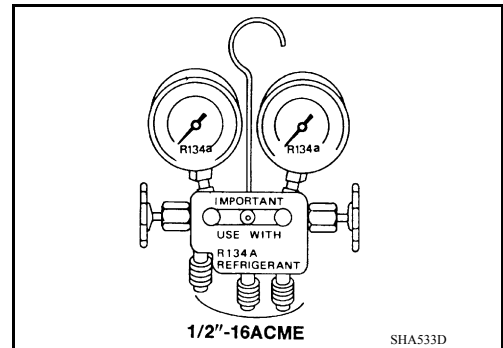
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

[MANUAL AIR CONDITIONING]



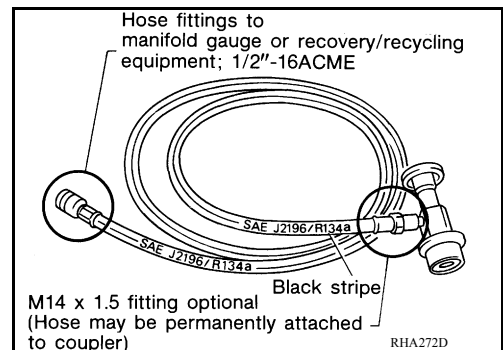
MANIFOLD GAUGE SET

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



SERVICE HOSES

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



SERVICE COUPLERS

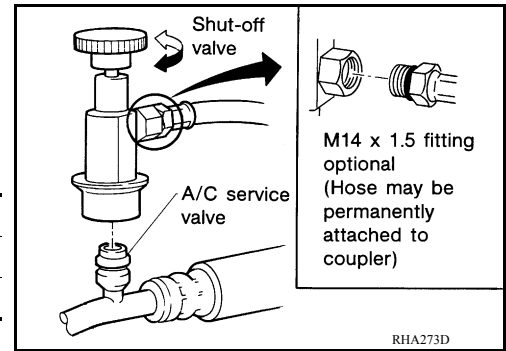
PRECAUTIONS

< PRECAUTION >

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

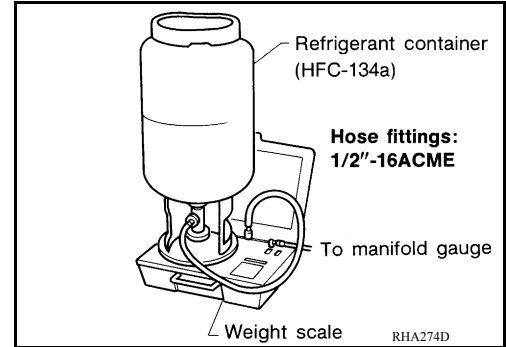
Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

[MANUAL AIR CONDITIONING]



WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified oils have been used with the weight scale. If the weight scale controls refrigerant flow electronically, the hose fitting must be 1/2"-16 ACME.



CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

PREPARATION

< PREPARATION >

[MANUAL AIR CONDITIONING]

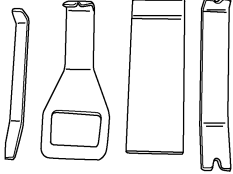
PREPARATION

PREPARATION

Special Service Tool


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

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

Commercial Service Tool

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Tool name	Description
Power tool <div style="text-align: center;">  <p>PIIB1407E</p> </div>	Loosening nuts, screws and bolts

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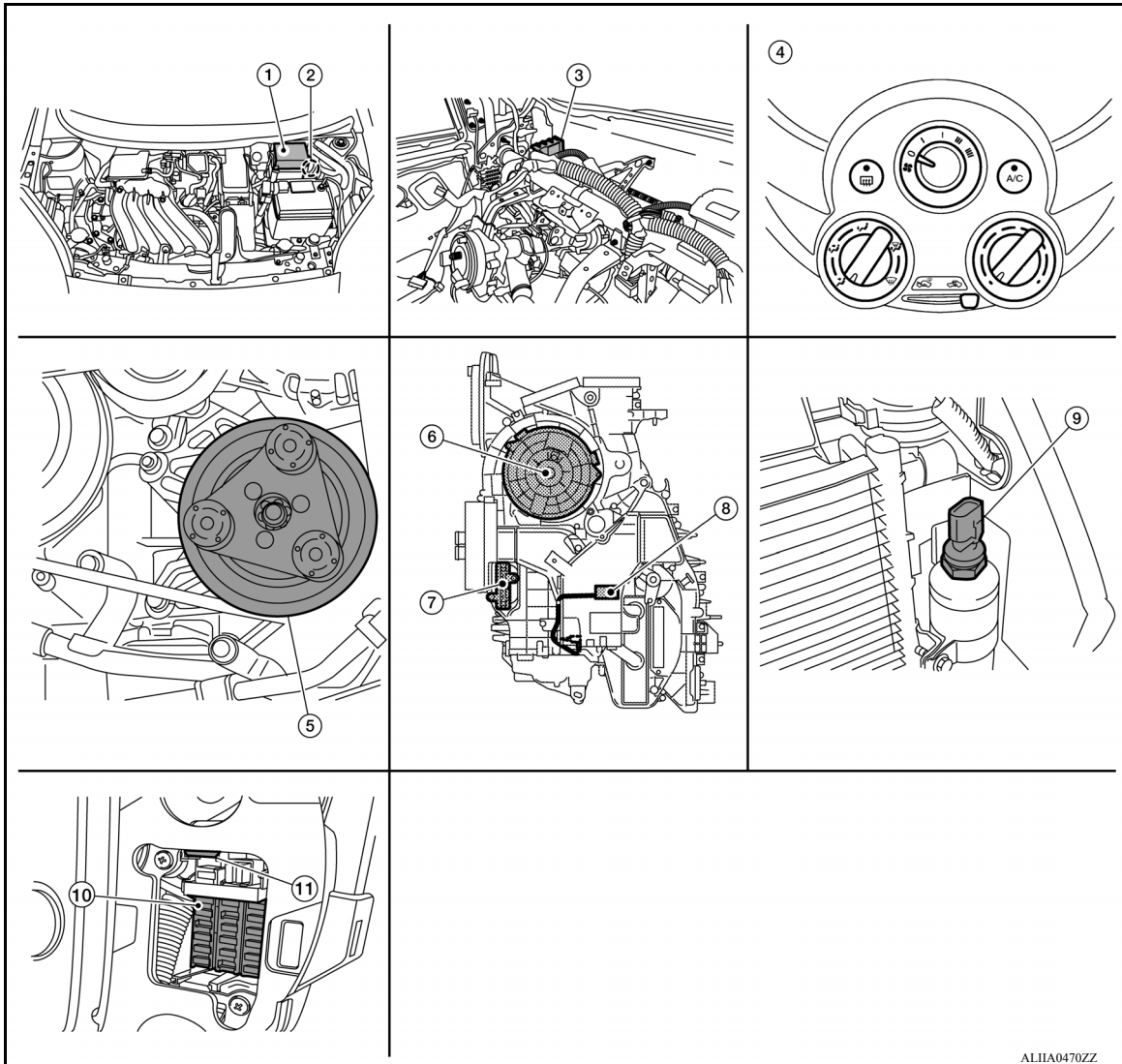
HAC

SYSTEM DESCRIPTION

COMPONENT PARTS

Component Parts Location

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AL11A0470ZZ

- | | | |
|--|--|---|
| 1. IPDM E/R | 2. ECM | 3. BCM (view with instrument panel removed) |
| 4. Front air control | 5. A/C compressor | 6. Front blower motor (view with A/C unit assembly removed) |
| 7. Front blower motor resistor (view with A/C unit assembly removed) | 8. Thermo control amp. (view with A/C unit assembly removed) | 9. Refrigerant pressure sensor |
| 10. Fuse block (J/B) | 11. Blower relay | |

COMPONENT PARTS

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

Component Description

INFOID:00000009269778

Component	Description
A/C compressor	Vaporized refrigerant is drawn into the A/C compressor from the evaporator, where it is compressed to a high pressure, high temperature vapor. The hot, compressed vapor is then discharged to the condenser.
BCM	The BCM receives the fan ON and A/C ON signals from the front air control and sends a compressor ON request to the ECM.
ECM	The ECM sends a compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the compressor ON request to the IPDM E/R.
Fuse Block (J/B)	Located in the passenger compartment, behind the left lower IP, the Fuse Block (J/B) contains the front blower motor relay and several fuses required for the air conditioner control system.
Front air control	The front air control controls the operation of the A/C and heating system.
Front blower motor	The front blower motor varies the speed at which the air flows through the ventilation system.
Front blower motor relay	The front blower motor relay controls the flow of current to fuse 20, 21 and 22 in the Fuse Block (J/B). The relay is connected directly to ground, and is energized when the ignition switch is in the ON or START position.
Front blower motor resistor	Ground for the blower is supplied through blower resistor and the blower speed switch. As the switch is moved from position 1 through 5, more current is allowed to flow through the motor, for a higher speed. This is because less resistors are in the path as the switch is moved to a higher position. When the switch is on the highest position, all resistors are bypassed.
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.
Refrigerant pressure sensor	Refer to EC-26. "Refrigerant Pressure Sensor" .
Thermo control amp.	Thermo control amp. is composed of thermistor and amplifier. When the A/C switch signal is received from the front air control, the thermo control amp. transmits the A/C ON signal to the BCM according to evaporator fin temperature. When the thermistor detecting temperature of the air that passes through evaporator is extremely low, the thermo control amp. sends the A/C OFF signal to BCM, and stops the compressor.

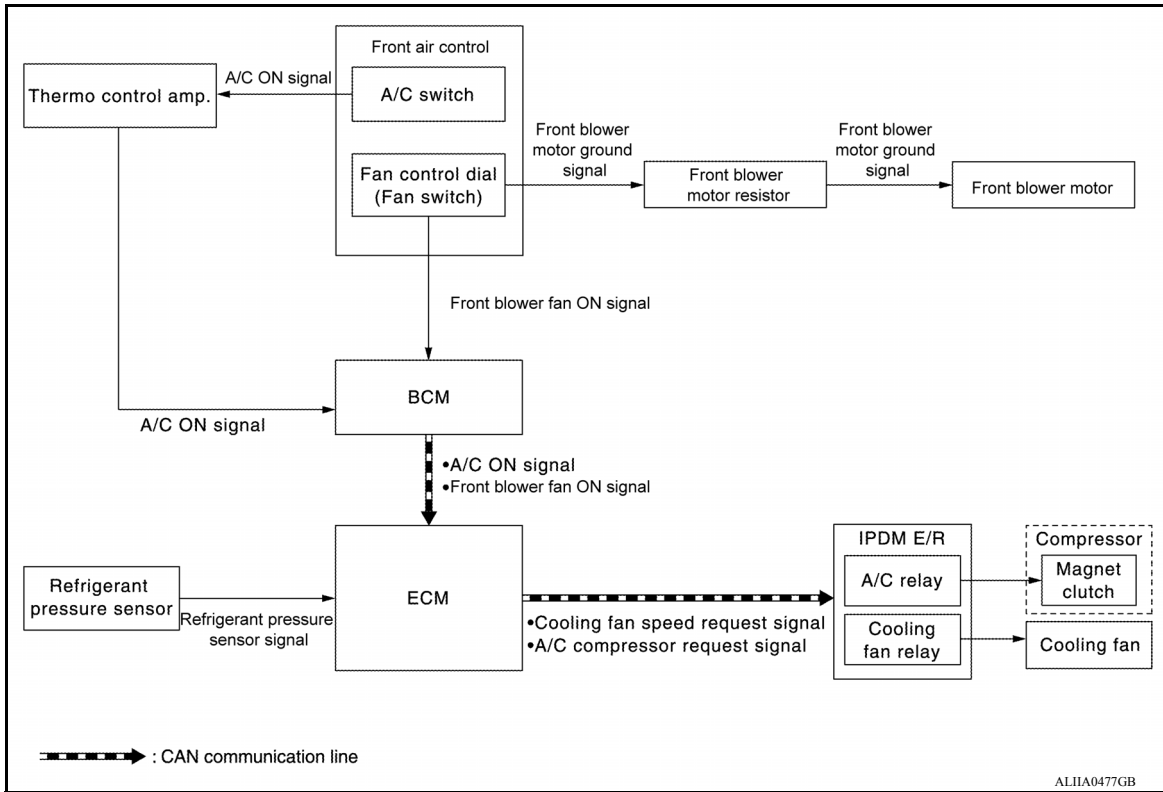
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SYSTEM

MANUAL AIR CONDITIONING SYSTEM

MANUAL AIR CONDITIONING SYSTEM : System Diagram

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MANUAL AIR CONDITIONING SYSTEM : System Description

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- The manual air conditioning system is controlled by a sequence of functions from the front air control, BCM, ECM, and IPDM E/R.
- The fan speed of the front blower motor is changed by the combination of the fan control dial (fan switch) operation and blower resistor control.

Module/Function	Door control	A/C request signal	Compressor control	Cooling fan control
Front air control	HAC-11		HAC-10	
BCM		BCS-8 or BCS-74		
ECM			HAC-10	EC-39
IPDM E/R			HAC-10	EC-39

MANUAL AIR CONDITIONING SYSTEM : Compressor Control

INFOID:000000009269781

DESCRIPTION

- When A/C switch signal is received from front air control, the thermo control amp. transmits A/C ON signal to the BCM according to evaporator fin temperature.
- When the front blower motor is operated, the front air control transmits blower fan ON signal to the BCM.
- BCM transmits the A/C ON signal and blower fan ON signal to ECM via CAN communication line. Refer to [EC-39. "CAN COMMUNICATION : System Description"](#)
- ECM judges the conditions of each sensor (Refrigerant pressure sensor signal, accelerator position signal, etc.), and transmits the A/C compressor request signal to IPDM E/R via CAN communication line.
- By receiving the A/C compressor request signal from ECM, IPDM E/R turns the A/C relay to ON, and activates the compressor. Refer to [PCS-7. "RELAY CONTROL SYSTEM : System Description"](#) or [PCS-34. "RELAY CONTROL SYSTEM : System Description"](#)

SYSTEM

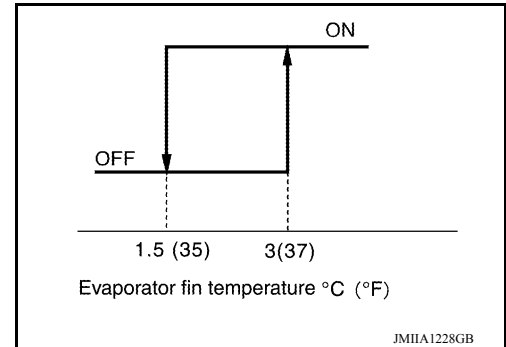
< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

CONTROL BY THERMO CONTROL AMP.

Low Temperature Protection Control

- When thermo control amp. detects that evaporator fin temperature is 1.5°C (35°F) or less, thermo control amp. switches A/C ON signal to OFF and stops the compressor.
When the evaporator fin temperature returns to 3°C (37°F) or more, the compressor is activated.



CONTROL BY ECM

Refrigerant Pressure Protection

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

- 3.12 MPa (31.82 kg/cm², 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm², 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm², 20.3 psi) or less

Compressor Oil Circulation Control

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

Air Conditioning Cut Control

When the engine is under a high load condition, the ECM transmits an A/C relay OFF request to IPDM E/R, and stops the compressor. Refer to [EC-38. "AIR CONDITIONING CUT CONTROL : System Description"](#).

MANUAL AIR CONDITIONING SYSTEM : Door Control

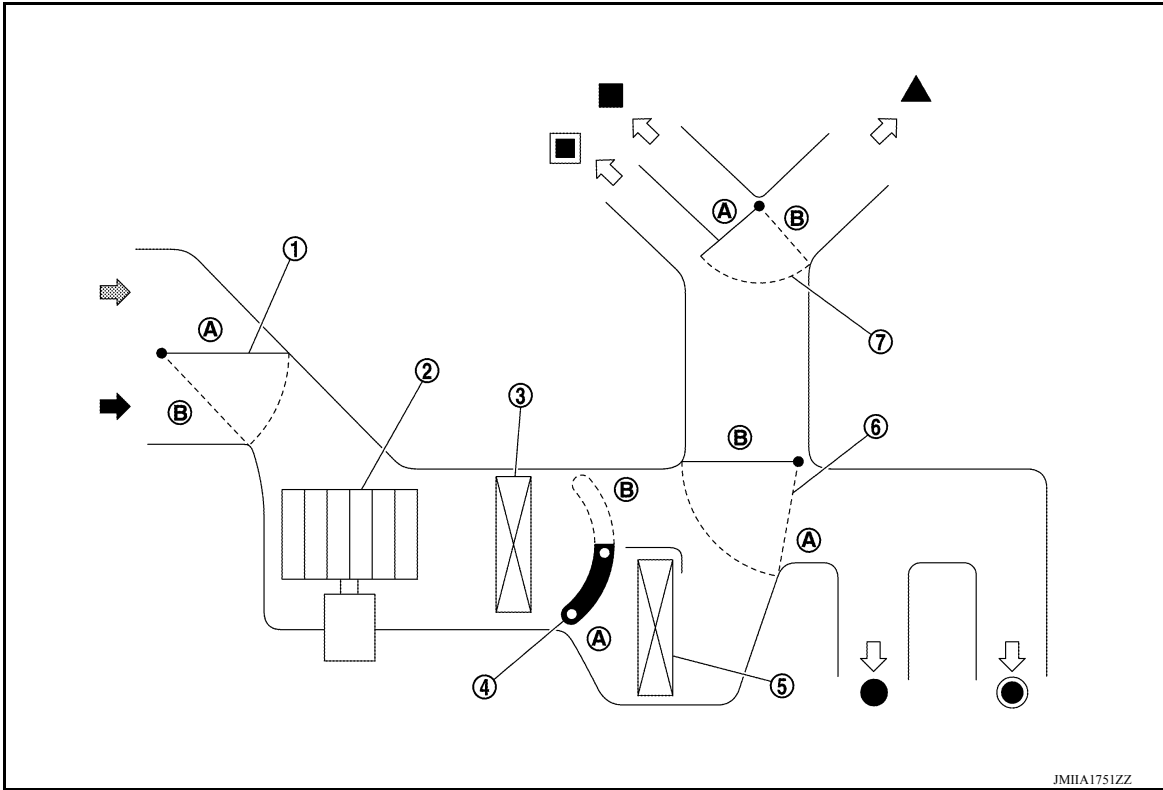
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SWITCHES AND THEIR CONTROL FUNCTIONS

SYSTEM

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[MANUAL AIR CONDITIONING]



- 1. Intake door
- 2. Blower motor
- 3. Evaporator
- 4. Air mix door
- 5. Heater core
- 6. Foot door
- 7. Ventilator and defroster door
- ◀ Fresh air intake
- ◀ Recirculation air
- ▲ Defroster
- Center ventilator
- Side ventilator
- Foot
- Rear foot*

*: With rear foot duct

Switch/Dial position		Door position			
		Ventilator and defroster door	Foot door	Intake door	Air mix door
MODE dial		B	A	—	—
			A – B		
		A	A – B		
			A – B		
			A		
Air intake lever		—	—	A	—
				B	
Temperature control dial	Full cold	—	—	—	A
	Full hot				B






AIR DISTRIBUTION

With rear foot duct






SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

Discharge air flow					
Mode position indication	Air outlet/distribution				
	Ventilator		Foot		Defroster
	Center	Side	Front	Rear	
	50%	50%	—	—	—
	29%	25%	28%	18%	—
	—	14%	47%	22%	17%
	—	14%	36%	20%	30%
	—	22%	—	—	78%

Without rear foot duct

Discharge air flow				
Mode position indication	Air outlet/distribution			
	Ventilator		Foot	Defroster
	Center	Side		
	50%	50%	—	—
	30%	30%	40%	—
	—	14%	66%	20%
	—	14%	51%	35%
	—	22%	—	78%

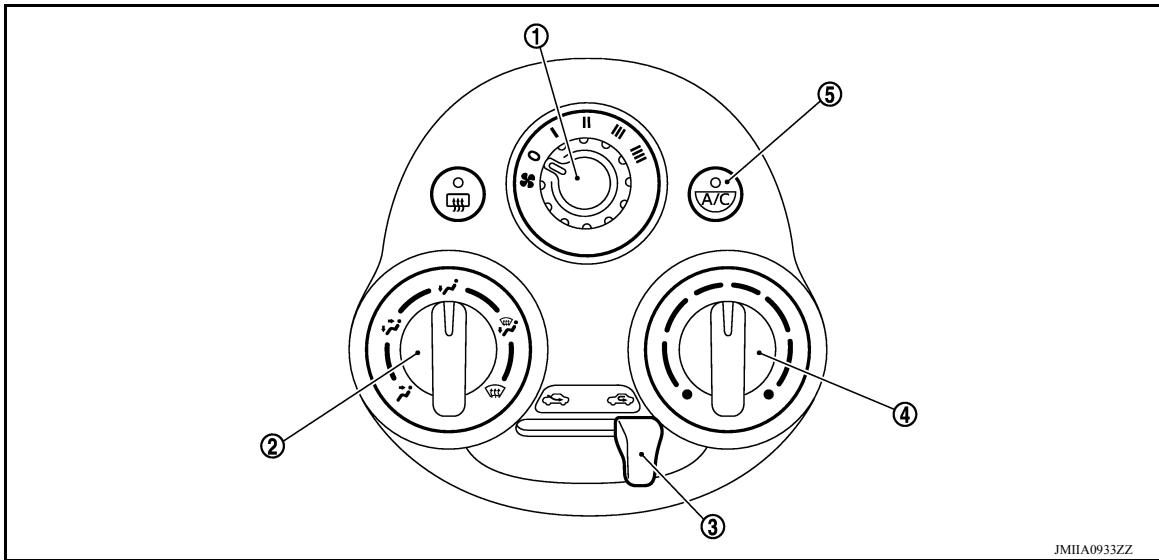
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OPERATION

Switch Name and Function

INFOID:000000009269783

CONTROLLER



- | | | |
|----------------------------------|---------------|-----------------|
| 1. Fan control dial (fan switch) | 2. MODE dial | 3. Intake lever |
| 4. Temperature control dial | 5. A/C switch | |

SWITCH OPERATION

Fan control dial (fan switch)	Fan speed can be adjusted within a range from 1st to 4th.
MODE dial	Mode position is selected to an optimal position by operating this dial.
Intake lever	The air inlet changes REC ⇔ FRE each time by operation this lever.
Temperature control dial	The setting temperature can be selected to an optimum temperature by operating this dial.
A/C switch	The compressor control (switch indicator) is turned ON ⇔ OFF each time by pressing this switch while the blower motor is activated.

DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

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

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000009543340

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

Direct Diagnostic Mode	Description
ECU identification	The BCM part number is displayed.
Self Diagnostic Result	The BCM self diagnostic results are displayed.
Data Monitor	The BCM input/output data is displayed in real time.
Active Test	The BCM activates outputs to test components.
Work support	The settings for BCM functions can be changed.
Configuration	<ul style="list-style-type: none"> The vehicle specification can be read and saved. The vehicle specification can be written when replacing BCM.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION

BCM can perform the following functions.

System	Sub System	Direct Diagnostic Mode						
		ECU identification	Self Diagnostic Result	Data Monitor	Active Test	Work support	Configuration	CAN DIAG SUPPORT MNTR
Door lock	DOOR LOCK		×	×	×	×		
Rear window defogger	REAR DEFOGGER			×	×			
Warning chime	BUZZER			×	×			
Interior room lamp timer	INT LAMP			×	×	×		
Exterior lamp	HEAD LAMP			×	×	×		
Wiper and washer	WIPER			×	×	×		
Turn signal and hazard warning lamps	FLASHER			×	×			
Air conditioner	AIR CONDITIONER			×				
Intelligent Key system	INTELLIGENT KEY		×	×	×	×		
Combination switch	COMB SW			×				
BCM	BCM	×	×			×	×	×
Immobilizer	IMMU		×		×	×		
Interior room lamp battery saver	BATTERY SAVER			×	×	×		
Trunk open	TRUNK			×				
Vehicle security system	THEFT ALM			×	×	×		
RAP system	RETAINED PWR			×		×		
Signal buffer system	SIGNAL BUFFER			×				
TPMS	AIR PRESSURE MONITOR		×	×	×	×		
Panic alarm system	PANIC ALARM				×			

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DIAGNOSIS SYSTEM (BCM) (WITH INTELLIGENT KEY SYSTEM)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000009543341

DATA MONITOR

Monitor Item [Unit]	Description
FAN ON SIG [On/Off]	Indicates condition of fan switch.
AIR COND SW [On/Off]	Indicates condition of A/C switch.

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM) COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000009543342

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

Direct Diagnostic Mode	Description
ECU identification	The BCM part number is displayed.
Self Diagnostic Result	The BCM self diagnostic results are displayed.
Data Monitor	The BCM input/output data is displayed in real time.
Active Test	The BCM activates outputs to test components.
Work support	The settings for BCM functions can be changed.
Configuration	<ul style="list-style-type: none"> The vehicle specification can be read and saved. The vehicle specification can be written when replacing BCM.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION

BCM can perform the following functions.

System	Sub System	Direct Diagnostic Mode						
		ECU identification	Self Diagnostic Result	Data Monitor	Active Test	Work support	Configuration	CAN DIAG SUPPORT MNTR
Door lock	DOOR LOCK		×	×	×	×		
Rear window defogger	REAR DEFOGGER			×	×			
Warning chime	BUZZER			×	×			
Interior room lamp timer	INT LAMP			×	×	×		
Remote keyless entry system	MULTI REMOTE ENT			×	×	×		
Exterior lamp	HEAD LAMP			×	×	×		
Wiper and washer	WIPER			×	×	×		
Turn signal and hazard warning lamps	FLASHER			×	×			
Air conditioner	AIR CONDITIONER			×				
Combination switch	COMB SW			×				
BCM	BCM	×	×			×	×	×
Immobilizer	IMMU		×		×	×		
Interior room lamp battery saver	BATTERY SAVER			×	×	×		
Trunk open	TRUNK			×				
Vehicle security system	THEFT ALM			×	×	×		
Signal buffer system	SIGNAL BUFFER			×	×			
TPMS	AIR PRESSURE MONITOR		×	×	×	×		
Panic alarm system	PANIC ALARM				×			

DIAGNOSIS SYSTEM (BCM) (WITHOUT INTELLIGENT KEY SYSTEM)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONING]

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000009543419

DATA MONITOR

Monitor Item [Unit]	Description
IGN ON SW [On/Off]	Indicates condition of ignition switch ON position.
FAN ON SIG [On/Off]	Indicates condition of fan switch.
AIR COND SW [On/Off]	Indicates condition of A/C switch.
THERMO AMP [On/Off]	Indicates condition of thermo amp.
FR DEF SW [On/Off]	Indicates condition of front defrost switch.

ECU DIAGNOSIS INFORMATION

BCM, ECM, IPDM E/R

List of ECU Reference

INFOID:000000009269788

ECU	Reference
BCM (with Intelligent Key system)	BCS-28. "Reference Value"
	BCS-45. "Fail-safe"
	BCS-47. "DTC Inspection Priority Chart"
	BCS-48. "DTC Index"
BCM (without Intelligent Key system)	BCS-93. "Reference Value"
	BCS-104. "Fail-safe"
	BCS-104. "DTC Inspection Priority Chart"
	BCS-105. "DTC Index"
ECM	EC-70. "Reference Value"
	EC-82. "Fail Safe"
	EC-84. "DTC Inspection Priority Chart"
	EC-85. "DTC Index"
IPDM E/R (with Intelligent Key system)	PCS-13. "Reference Value"
	PCS-18. "Fail-safe"
	PCS-19. "DTC Index"
IPDM E/R (without Intelligent Key system)	PCS-40. "Reference Value"
	PCS-44. "Fail-Safe"
	PCS-46. "DTC Index"

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MANUAL AIR CONDITIONING SYSTEM

[MANUAL AIR CONDITIONING]

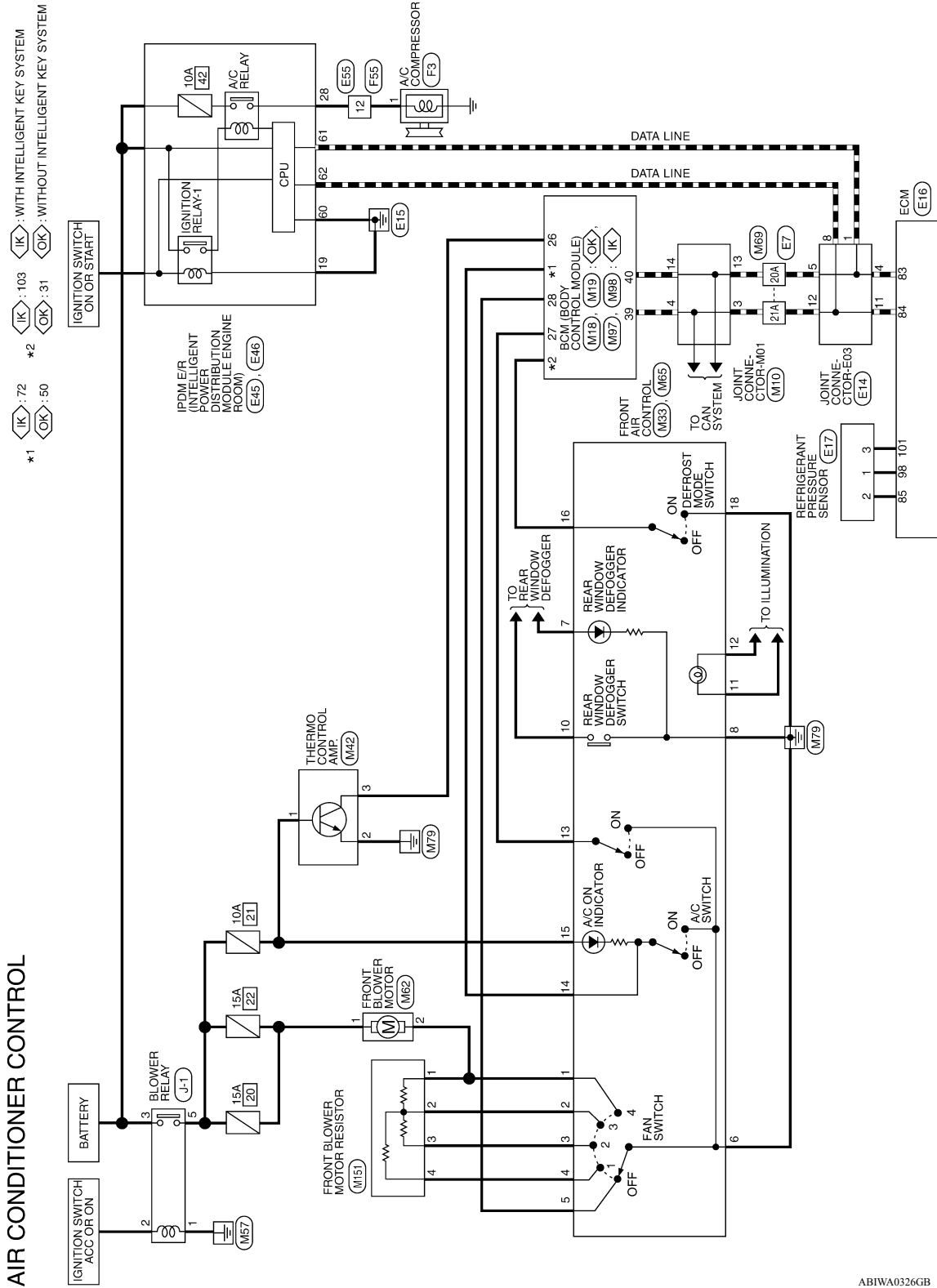
< WIRING DIAGRAM >

WIRING DIAGRAM

MANUAL AIR CONDITIONING SYSTEM

Wiring Diagram

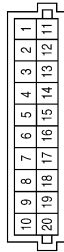
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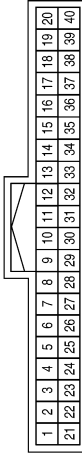
AIR CONDITIONER CONTROL CONNECTORS

Connector No.	M10
Connector Name	JOINT CONNECTOR-M01
Connector Color	GRAY



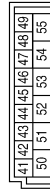
Terminal No.	Color of Wire	Signal Name
3	L	-
4	L	-
13	P	-
14	P	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE) (WITHOUT INTELLIGENT KEY SYSTEM)
Connector Color	WHITE



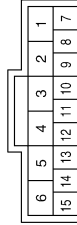
Terminal No.	Color of Wire	Signal Name
26	O	THERMO AMP
27	V	AIR CON SW
28	SB	BLOWER FAN SW
31	LG	FRONT DEF SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE) (WITHOUT INTELLIGENT KEY SYSTEM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
50	L	AIRCON INDICATOR OUTPUT

Connector No.	M33
Connector Name	FRONT AIR CONTROL
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
8	B	GND
9	-	-
10	G	R/DEF SWITCH
11	W	ILL+
12	B	ILL-
13	V	A/C AND FAN ON
14	L	A/C IND
15	Y	IGN

Terminal No.	Color of Wire	Signal Name
1	L	FAN 4 SPEED
2	Y	FAN 3 SPEED
3	P	FAN 2 SPEED
4	W	FAN 1 SPEED
5	SB	FAN OFF
6	B	GND
7	R	R/DEF LED

MANUAL AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

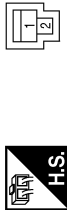
[MANUAL AIR CONDITIONING]

Connector No.	M42
Connector Name	THERMO CONTROL AMP.
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	B	-
3	O	-
4	-	-

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



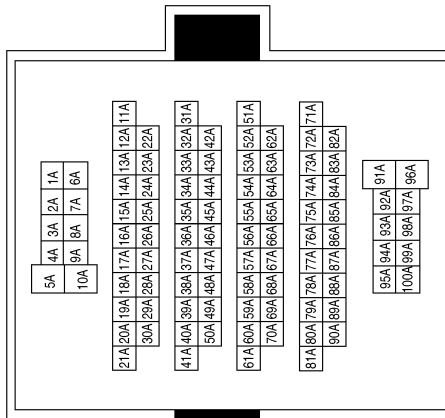
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	L	-

Connector No.	M65
Connector Name	FRONT AIR CONTROL
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
16	LG	-
17	-	-
18	B	-
19	-	-

Connector No.	M69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20A	P	-
21A	L	-

Connector No.	M97
Connector Name	BCM (BODY CONTROL MODULE) (WITH INTELLIGENT KEY SYSTEM)
Connector Color	BLACK



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
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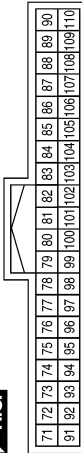
Terminal No.	Color of Wire	Signal Name
26	O	THERMO AMP
27	W	AIR CON SW
28	SB	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

MANUAL AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONING]

Connector No.	M98
Connector Name	BCM (BODY CONTROL MODULE) (WITH INTELLIGENT KEY SYSTEM)
Connector Color	WHITE



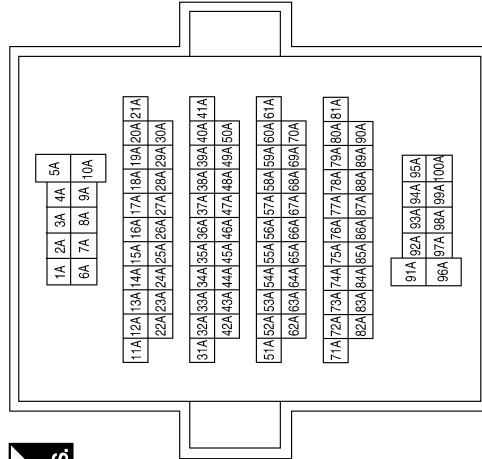
Terminal No.	Color of Wire	Signal Name
72	L	AIRCON INDICATOR OUTPUT
103	LG	FR DEF SW

Connector No.	M151
Connector Name	FRONT BLOWER MOTOR RESISTOR
Connector Color	BROWN



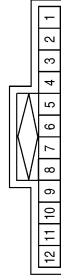
Terminal No.	Color of Wire	Signal Name
1	L	-
2	Y	-
3	P	-
4	W	-

Connector No.	E7
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
20A	P	-
21A	L	-

Connector No.	E14
Connector Name	JOINT CONNECTOR-E03
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
4	P	-
5	P	-
8	L	-
11	L	-
12	L	-

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MANUAL AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONING]

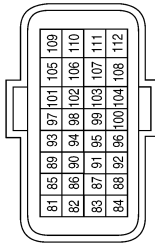
Connector No.	E17
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Color	BLACK



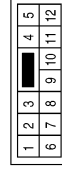
Terminal No.	Color of Wire	Signal Name
1	LG	-
2	V	-
3	W	-

Terminal No.	Color of Wire	Signal Name
83	P	CAN-L
84	L	CAN-H
85	V	REFRIGERANT PRESSURE SENSOR
98	LG	SENSOR GROUND (REFRIGERANT PRESSURE SENSOR)
101	W	SENSOR POWER SUPPLY (REFRIGERANT PRESSURE SENSOR)

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK

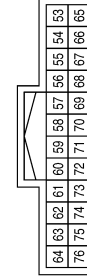


Connector No.	E55
Connector Name	WIRE TO WIRE
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
12	V	-

Connector No.	E46
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
60	B	GND (SIGNAL)
61	P	CAN-L
62	L	CAN-H

Connector No.	E45
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BROWN



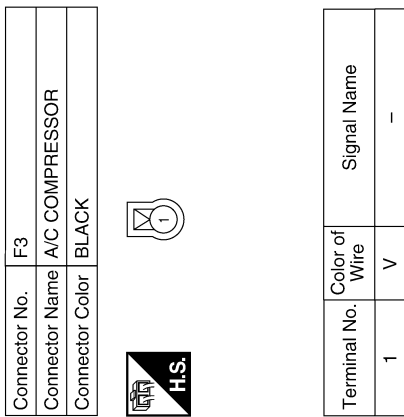
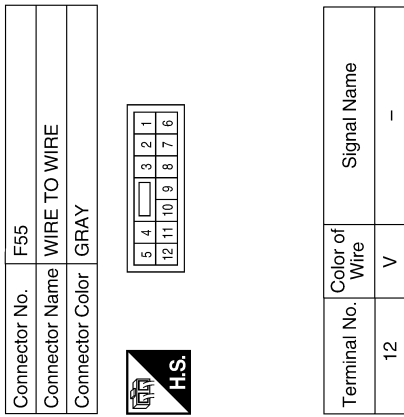
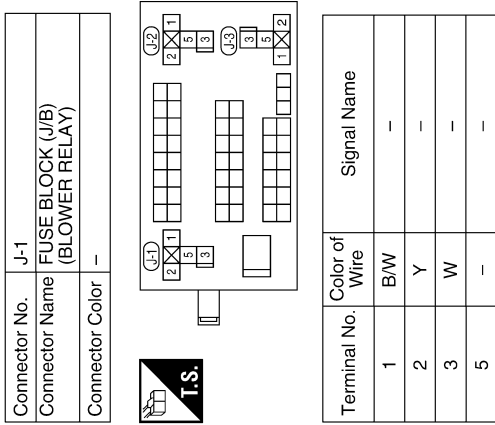
Terminal No.	Color of Wire	Signal Name
19	B	GND (POWER)
28	V	AC-COMP

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MANUAL AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONING]



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MANUAL HEATER SYSTEM

< WIRING DIAGRAM >

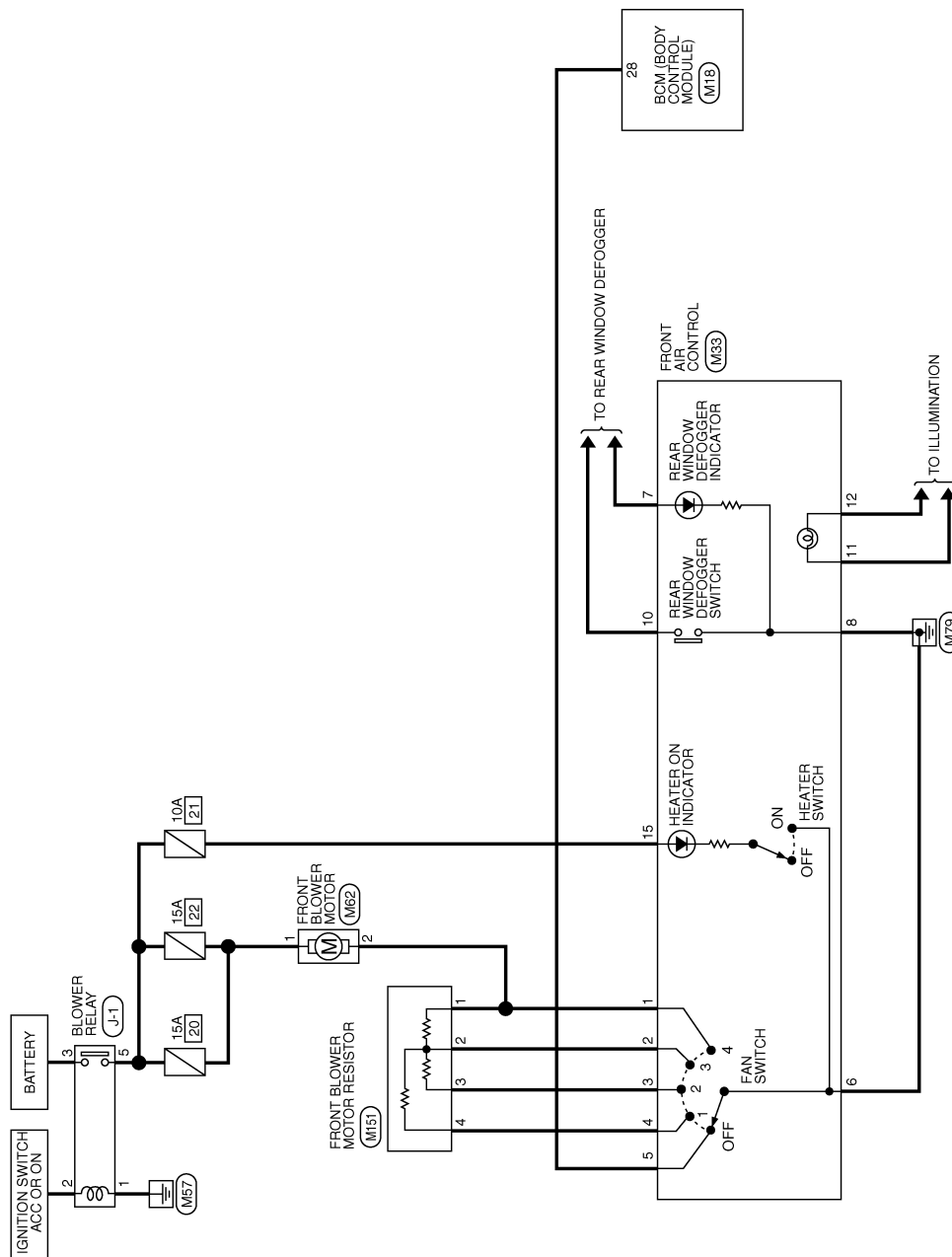
[MANUAL AIR CONDITIONING]

MANUAL HEATER SYSTEM

Wiring Diagram

INFOID:000000009269790

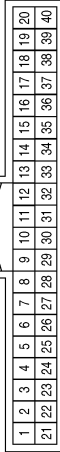
HEATER CONTROL



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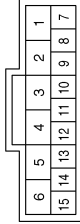
HEATER CONTROL CONNECTORS

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE) (WITHOUT INTELLIGENT KEY SYSTEM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
28	SB	BLOWER FAN SW

Connector No.	M33
Connector Name	FRONT AIR CONTROL
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	L	FAN 4 SPEED
2	Y	FAN 3 SPEED
3	P	FAN 2 SPEED
4	W	FAN 1 SPEED

Terminal No.	Color of Wire	Signal Name
5	SB	FAN OFF
6	B	GND
7	R	R/DEF LED
8	B	GND
9	-	-
10	G	R/DEF SWITCH
11	W	ILL+
12	B	ILL-
13	-	-
14	-	-
15	Y	IGN

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



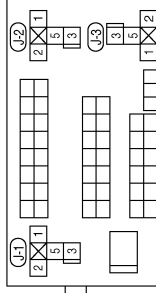
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	L	-

Connector No.	M151
Connector Name	FRONT BLOWER MOTOR RESISTOR
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	L	-
2	Y	-
3	P	-
4	W	-

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



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

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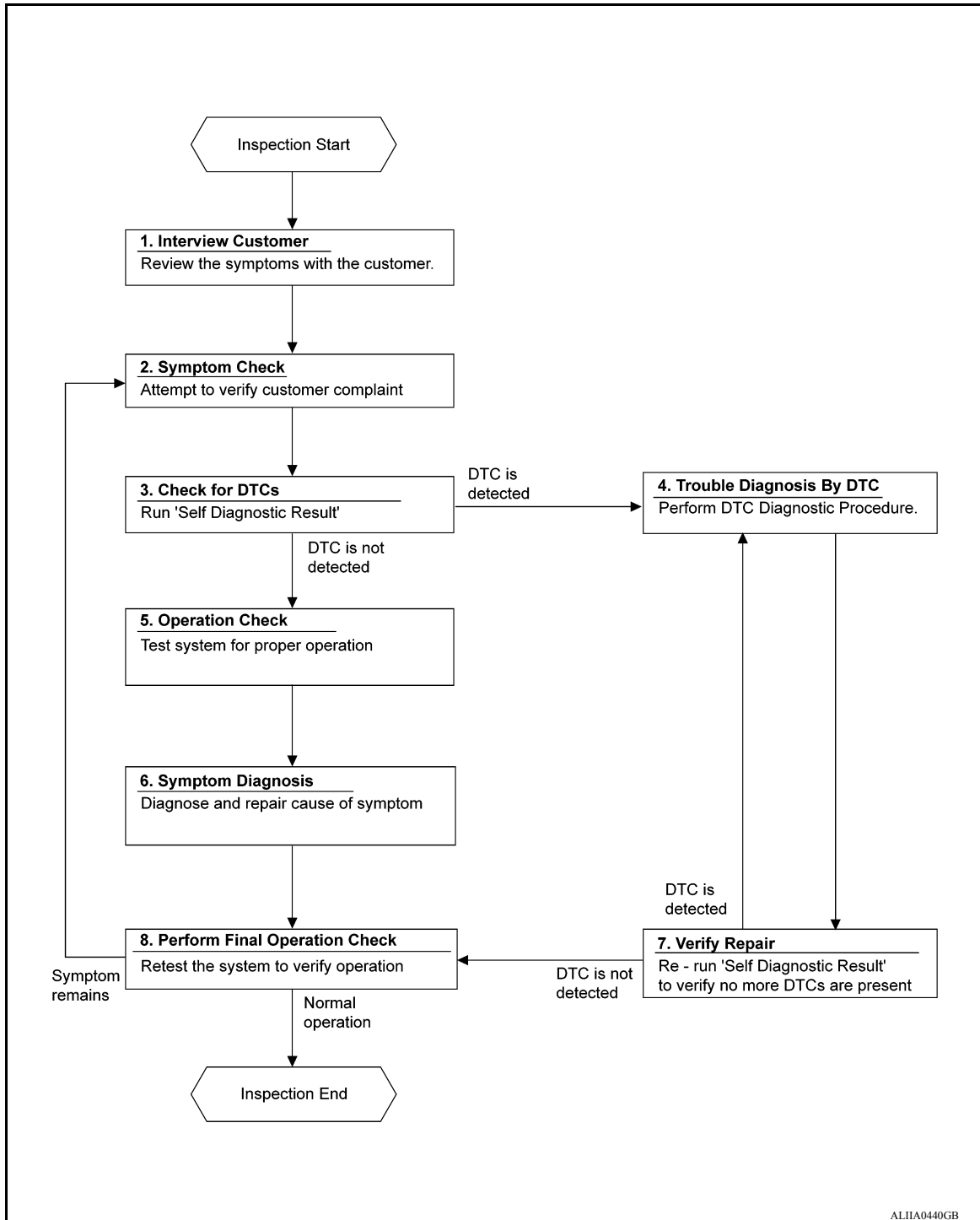
BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

Workflow

INFOID:000000009269791

OVERALL SEQUENCE



DETAILED FLOW

1. INTERVIEW CUSTOMER

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

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL AIR CONDITIONING]

>> GO TO 2.

2. SYMPTOM CHECK

Verify symptoms.

>> GO TO 3.

3. CHECK FOR DTCS

④ With CONSULT

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

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 5.

4. PERFORM DTC DIAGNOSTIC PROCEDURE

Perform the diagnostic procedure for the detected DTC. Refer to [BCS-47, "DTC Inspection Priority Chart"](#) or [BCS-104, "DTC Inspection Priority Chart"](#).

>> GO TO 7.

5. OPERATION CHECK

Perform the operation check. Refer to [HAC-30, "Work Procedure"](#).

>> GO TO 6.

6. SYMPTOM DIAGNOSIS

Check the symptom diagnosis table. Refer to [HAC-44, "Symptom Table"](#).

>> GO TO 8.

7. VERIFY REPAIR.

④ With CONSULT

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

Is any DTC detected?

YES >> GO TO 4.

NO >> GO TO 8.

8. PERFORM FINAL OPERATION CHECK

Perform the operation check. Refer to [HAC-30, "Work Procedure"](#).

Does it operate normally?

YES >> Inspection End.

NO >> GO TO 2.

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OPERATION INSPECTION

Work Procedure

INFOID:000000009269792

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

Check condition : Engine running at normal operating temperature.

1. CHECK FRONT BLOWER MOTOR

1. Operate fan control dial.
2. Check that fan speed changes. Check operation for all fan speeds.

Is the inspection result normal?

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

2. CHECK DISCHARGE AIR

1. Operate fan control dial to set the fan speed to maximum speed.
2. Operate MODE dial to each position.
3. Check that air outlets change according to each indicated air outlet by placing a hand in front of the air outlets. Refer to [VTL-4, "VENTILATION SYSTEM \(FRONT AIR CONDITIONING\) : System Description"](#).

Is the inspection result normal?

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

3. CHECK INTAKE AIR

1. Operate intake lever to each position.
2. Listen to intake sound and confirm air inlets change.

Is the inspection result normal?

- YES >> GO TO 4.
NO >> GO TO 8.

4. CHECK COMPRESSOR

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

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 8.

5. CHECK DISCHARGE AIR TEMPERATURE

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

Is the inspection result normal?

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

6. CHECK TEMPERATURE DECREASE

1. Operate compressor.
2. Turn temperature control dial to full cold position.
3. Check that cool air blows from the air outlets.

Is the inspection result normal?

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

7. CHECK TEMPERATURE INCREASE

OPERATION INSPECTION

[MANUAL AIR CONDITIONING]

< BASIC INSPECTION >

1. Turn temperature control dial to full hot position.
2. Check that warm air blows from air outlets.

Is the inspection result normal?

YES >> INSPECTION END

NO >> GO TO 8.

8.CHECK SELF-DIAGNOSIS WITH CONSULT

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

Is any DTC detected?

YES >> Perform trouble diagnosis for the detected DTC.

NO >> Refer to [HAC-44. "Symptom Table"](#) and perform the appropriate diagnosis.

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DTC/CIRCUIT DIAGNOSIS

A/C ON SIGNAL

Component Function Check

INFOID:000000009269793

1. CHECK A/C ON SIGNAL

Ⓟ With CONSULT

1. Turn ignition switch ON.
2. Operate front blower motor.
3. Select "AIR CONDITIONER" of "BCM" using CONSULT.
4. Select "AIR COND SW" in "DATA MONITOR" mode, and check status under the following condition.

Monitor item	Condition		Status
AIR COND SW	A/C switch	ON	On
		OFF	Off

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Refer to [HAC-32, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009269794

Regarding Wiring Diagram information, refer to [HAC-20, "Wiring Diagram"](#).

1. CHECK FUSE

1. Turn ignition switch OFF.
2. Check 10A fuse (No. 21, located in fuse block (J/B)).

NOTE:

Refer to [PG-60, "Terminal Arrangement"](#).

Is the inspection result normal?

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

2. CHECK THERMO CONTROL AMP. POWER SUPPLY

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

+		-	Voltage (V) (Approx.)
Thermo control amp.			
Connector	Terminal		
M42	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair harness or connector between thermo control amp. and fuse.

3. CHECK THERMO CONTROL AMP. GROUND CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Check continuity between thermo control amp. harness connector and ground.

A/C ON SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONING]

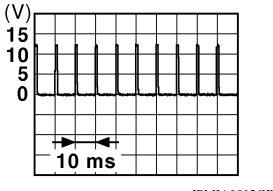
Thermo control amp.		-	Continuity
Connector	Terminal		
M42	2	Ground	Yes

Is the inspection result normal?

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

4. CHECK A/C ON SIGNAL

1. Turn ignition switch ON.
2. Check output waveform between thermo control amp. harness connector and ground with using oscilloscope.

+		-	Output waveform
Thermo control amp.			
Connector	Terminal		
M42	3	Ground	

Is the inspection result normal?

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

5. CHECK FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Check front air control. Refer to [HAC-34, "Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace thermo control amp. Refer to [HAC-50, "Removal and Installation"](#).
- NO >> Replace front air control. Refer to [HAC-48, "Removal and Installation"](#).

6. CHECK A/C ON SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect BCM and front air control connector.
3. Check continuity between thermo control amp. harness connector and BCM harness connector.

Thermo control amp.		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M42	3	M18 (without Intelligent Key system) M97 (with Intelligent Key system)	26	Yes

4. Check continuity between front air control harness connector and BCM harness connector.

Front air control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M33	13	M18 (without Intelligent Key system) M97 (with Intelligent Key system)	27	Yes

Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-69, "Removal and Installation"](#) or [BCS-122, "Removal and Installation"](#).

A/C ON SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONING]

NO >> Repair harness or connector.

Component Inspection

INFOID:000000009269795

1. CHECK A/C CONTROL

Check continuity front air control terminals.

Terminal		Condition	Continuity
13	6	A/C switch: ON Fan control dial: Except OFF position	Yes

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace front air control. Refer to [HAC-48. "Removal and Installation"](#).

BLOWER FAN ON SIGNAL

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONING]

BLOWER FAN ON SIGNAL

Component Function Check

INFOID:000000009269796

1. CHECK BLOWER FAN ON SIGNAL

④ With CONSULT

1. Turn ignition switch ON.
2. Select "AIR CONDITIONER" of "BCM" using CONSULT.
3. Select "FAN ON SIG" in "DATA MONITOR" mode, and check status under the following condition.

Monitor item	Condition		Status
FAN ON SIG	Fan control dial	Except OFF position	On
		OFF position	Off

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Refer to [HAC-35, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009269797

Regarding Wiring Diagram information, refer to [HAC-20, "Wiring Diagram"](#) or [HAC-26, "Wiring Diagram"](#).

1. CHECK BLOWER FAN ON SIGNAL

1. Turn ignition switch OFF.
2. Disconnect front air control harness connector.
3. Turn ignition switch ON.
4. Check output waveform between front air control and ground with using oscilloscope.

+		-	Output waveform
Front air control			
Connector	Terminal		
M33	5	Ground	

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-48, "Removal and Installation"](#).
 NO >> GO TO 2.

2. CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR OPEN

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

Front air control		BCM		Continuity
Connector	Terminal	Connector	Terminal	
M33	5	M18 (without Intelligent Key system)	28	Yes
		M97 (with Intelligent Key system)		

BLOWER FAN ON SIGNAL

[MANUAL AIR CONDITIONING]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK BLOWER FAN ON SIGNAL CIRCUIT FOR SHORT

Check continuity between front air control harness connector and ground.

Front air control		—	Continuity
Connector	Terminal		
M33	5	Ground	No

Is the inspection result normal?

YES >> Replace BCM. Refer to [BCS-69. "Removal and Installation"](#) or [BCS-122. "Removal and Installation"](#).

NO >> Repair harness or connector.

A/C INDICATOR

Diagnosis Procedure

INFOID:000000009269798

Regarding Wiring Diagram information, refer to [HAC-20. "Wiring Diagram"](#) or [HAC-26. "Wiring Diagram"](#).

1.CHECK A/C INDICATOR POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between front air control harness connector and ground.

+		-	Voltage (V) (Approx.)
Front air control			
Connector	Terminal		
M33	15	Ground	Battery voltage

Is the inspection result normal?

- YES >> Replace front air control. Refer to [HAC-48. "Removal and Installation"](#).
 NO >> Repair harness or connector between front air control and fuse.

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HAC

FRONT BLOWER MOTOR

Description

INFOID:000000009269799

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

Diagnosis Procedure

INFOID:000000009269800

Regarding Wiring Diagram information, refer to [HAC-20, "Wiring Diagram"](#) or [HAC-26, "Wiring Diagram"](#).

1.CHECK SYMPTOM

Check symptom (A or B).

Symptom	
A	Front blower motor does not operate at any dial position
B	Front blower motor does not operate at any dial position other than 4th, or operation speed is not normal.

Which symptom is detected?

- A >> GO TO 2.
B >> GO TO 7.

2.CHECK FUSE

- Turn ignition switch OFF.
- Check 15A fuses (Nos. 20 and 22, located in fuse block (J/B)).

NOTE:

Refer to [PG-60, "Terminal Arrangement"](#).

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Replace the blown fuse after repairing the affected circuit.

3.CHECK FRONT BLOWER MOTOR POWER SUPPLY

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

+		-	Voltage (V) (Approx.)
Front blower motor			
Connector	Terminal		
M62	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 5.
NO >> GO TO 4.

4.CHECK BLOWER RELAY

- Turn ignition switch OFF.
- Check blower relay. Refer to [HAC-40, "Component Inspection \(Blower Relay\)"](#).

Is the inspection result normal?

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

5.CHECK FAN SWITCH GROUND CIRCUIT FOR OPEN

- Turn ignition switch OFF.

FRONT BLOWER MOTOR

[MANUAL AIR CONDITIONING]

< DTC/CIRCUIT DIAGNOSIS >

2. Disconnect front air control connector.
3. Check continuity between front air control harness connector and ground.

Front air control		—	Continuity
Connector	Terminal		
M33	6	Ground	Yes

Is the inspection result normal?

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

6.CHECK FAN SWITCH 4TH POSITION CIRCUIT FOR OPEN

Check continuity between front air control harness connector and front blower motor harness connector.

Front air control		Front blower motor		Continuity
Connector	Terminal	Connector	Terminal	
M33	1	M62	2	Yes

Is the inspection result normal?

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

7.CHECK FRONT BLOWER MOTOR RESISTOR POWER SUPPLY

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

+		—	Voltage (V) (Approx.)
Front blower motor resistor			
Connector	Terminal		
M151	1	Ground	Battery voltage

Is the inspection result normal?

- YES >> GO TO 8.
 NO >> Repair harness or connector between front blower motor resistor and front blower motor.

8.CHECK FAN SWITCH 1ST, 2ND, AND 3RD POSITION CIRCUIT FOR OPEN

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

Front air control		Front blower motor resistor		Continuity
Connector	Terminal	Connector	Terminal	
M33	2	M151	2	Yes
	3		3	
	4		4	

Is the inspection result normal?

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

9.CHECK FRONT BLOWER MOTOR RESISTOR

Check front blower motor resistor. Refer to [HAC-40, "Component Inspection \(Front Blower Motor Resistor\)"](#).

Is the inspection result normal?

- YES >> GO TO 10.

FRONT BLOWER MOTOR

[MANUAL AIR CONDITIONING]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace front blower motor resistor. Refer to [HAC-50. "Removal and Installation"](#).

10.CHECK FAN SWITCH

Check fan switch. Refer to [HAC-40. "Component Inspection \(Fan Switch\)"](#).

Is the inspection result normal?

YES >> Replace front blower motor. Refer to [VTL-7. "Removal and Installation"](#).

NO >> Replace front air control. Refer to [HAC-48. "Removal and Installation"](#).

Component Inspection (Front Blower Motor)

INFOID:000000009269801

1.CHECK FRONT BLOWER MOTOR

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

Does the front blower motor operate?

YES >> Intermittent incident. Refer to [GI-45. "Intermittent Incident"](#).

NO >> Replace front blower motor. Refer to [VTL-7. "Removal and Installation"](#).

Component Inspection (Blower Relay)

INFOID:000000009269802

1.CHECK BLOWER RELAY

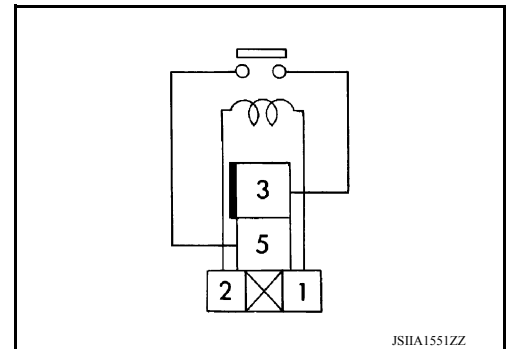
1. Remove blower relay. Refer to [PG-60. "Terminal Arrangement"](#).
2. Check continuity between blower relay terminal 3 and 5 when the voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity
3	5	ON	Yes
		OFF	No

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace blower relay.



JSIIA1551ZZ

Component Inspection (Front Blower Motor Resistor)

INFOID:000000009269803

1.CHECK FRONT BLOWER MOTOR RESISTOR

1. Disconnect front blower motor resistor connector.
2. Check resistance between front blower motor resistor terminals. Refer to applicable table for the normal value.

Terminal		Resistance: Ω (Approx.)
1	2	0.54
	3	1.56
	4	3.07

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace front blower motor resistor. Refer to [HAC-50. "Removal and Installation"](#).

Component Inspection (Fan Switch)

INFOID:000000009269804

1.CHECK FAN SWITCH

1. Remove front air control. Refer to [HAC-48. "Removal and Installation"](#).
2. Check continuity between front air control terminals.

FRONT BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONING]

Terminal		Condition	Continuity
		Fan control dial (fan switch) position	
6	4	1st	Yes
	3	2nd	
	2	3rd	
	1	4th	

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace front air control. Refer to [HAC-48, "Removal and Installation"](#).

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HAC

MAGNET CLUTCH

Description

INFOID:000000009269805

SYSTEM DESCRIPTION

When the blower speed dial is in one of the fan speed positions, the front air control outputs a fan ON signal to the BCM. When the A/C switch is pressed, the A/C switch LED illuminates and the front air control outputs a compressor ON signal to the BCM. Any mode control button can be selected. As long as the BCM receives a compressor ON signal and a fan ON signal from the front air control, the conditions required for the BCM to transmit a compressor ON request to the ECM have been met.

The BCM sends a compressor ON signal to ECM, via CAN communication line.

The ECM judges whether the compressor can be turned ON, based on each sensor status (refrigerant pressure sensor signal, throttle angle sensor, etc.). If it judges the compressor can be turned ON, it sends a compressor ON signal to IPDM E/R, via CAN communication line.

Upon receipt of a compressor ON signal from ECM, IPDM E/R turns the A/C relay ON to operate the compressor.

Component Function Check

INFOID:000000009269806

1. CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to [PCS-10, "CONSULT Function \(IPDM E/R\)"](#) or [PCS-37, "CONSULT Function \(IPDM E/R\)"](#).

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Refer to [HAC-42, "Diagnosis Procedure"](#).

Diagnosis Procedure

INFOID:000000009269807

Regarding Wiring Diagram information, refer to [HAC-20, "Wiring Diagram"](#).

1. CHECK FUSE

Check 10A fuse (No. 42, located in IPDM E/R).

NOTE:

Refer to [PG-62, "IPDM E/R Terminal Arrangement"](#).

Is the inspection result normal?

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

2. CHECK MAGNET CLUTCH

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

Does it operate normally?

- YES >> GO TO 3.
- NO >> Replace magnet clutch. Refer to [HA-29, "Removal and Installation"](#).

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.

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONING]

IPDM E/R		Compressor		Continuity
Connector	Terminal	Connector	Terminal	
E45	28	F3	1	Yes

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-56. "Removal and Installation"](#).

NO >> Repair harness or connector.

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MANUAL AIR CONDITIONING SYSTEM

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONING]

SYMPTOM DIAGNOSIS

MANUAL AIR CONDITIONING SYSTEM

Symptom Table

INFOID:000000009269808

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-30
A/C system cannot be controlled.	Go to Self-diagnosis Function. HA-15
Air outlet does not change.	Go to Adjustment Procedure for Mode Door. HAC-52
Discharge air temperature does not change.	Go to Adjustment Procedure for Air Mix Door. HAC-53
Intake door does not change.	Go to Adjustment Procedure for Intake Door. HAC-51
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-38
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-42
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-45
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-46
Noise.	Go to Trouble Diagnosis Procedure for Noise. HA-28
A/C switch LED does not illuminate.	Go to Trouble Diagnosis Procedure for A/C System. HAC-37
Both high- and low-pressure sides are too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26
High-pressure side is too high and low pressure side is too low.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26
High-pressure side is too low and low-pressure side is too high.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26
Both high- and low-pressure side sometimes become negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26
Low-pressure side sometimes becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26
Low-pressure side becomes negative.	Go to Trouble Diagnosis Procedure for Abnormal Pressure. HA-26

INSUFFICIENT COOLING

Description

INFOID:000000009269809

Symptom

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

Diagnosis Procedure

INFOID:000000009269810

NOTE:

Perform self-diagnosis with CONSULT before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1.CHECK MAGNET CLUTCH OPERATION

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

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check compressor operation. Refer to [HAC-47, "Diagnosis Procedure"](#).**2.CHECK DRIVE BELT**

Check tension of drive belt. Refer to [EM-17, "Inspection"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Adjust or replace drive belt depending on the inspection results.

3.CHECK REFRIGERANT CYCLE PRESSURE

Connect the recovery/recycling recharging equipment to the vehicle and perform the pressure inspection using gauge. Refer to [HA-26, "Symptom Table"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace parts depending on the inspection results.

4.CHECK AIR LEAKAGE FROM EACH DUCT

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

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.

NO >> Repair or replace parts depending on the inspection results.

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INSUFFICIENT HEATING

Description

INFOID:000000009269811

Symptom

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

Diagnosis Procedure

INFOID:000000009269812

NOTE:

Perform self-diagnosis with CONSULT before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.

1.CHECK COOLING SYSTEM

1. Check engine coolant level and check for leakage. Refer to [CO-8, "Inspection"](#).
2. Check radiator cap. Refer to [CO-12, "RADIATOR CAP : Inspection"](#).
3. Check water flow sounds of the engine coolant. Refer to [CO-9, "Refilling Engine Coolant"](#).

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-39, "Removal and Installation"](#).**4**.CHECK AIR LEAKAGE FROM EACH DUCT

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

Is the inspection result normal?

YES >> Check air mix door cable installation and air mix door operation.

NO >> Repair or replace parts depending on the inspection results.

COMPRESSOR DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONING]

COMPRESSOR DOES NOT OPERATE

Description

INFOID:000000009269813

SYMPTOM

Compressor does not operate.

Diagnosis Procedure

INFOID:000000009269814

NOTE:

- Perform self-diagnosis with CONSULT before performing symptom diagnosis. If any malfunction result or DTC is detected, perform the corresponding diagnosis.
- Check that refrigerant system is fully charged. If the refrigerant charge is low, perform the inspection for refrigerant leakage

1. CHECK MAGNET CLUTCH OPERATION

Check magnet clutch. Refer to [HAC-42, "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-448, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace malfunctioning parts.

3. CHECK A/C ON SIGNAL

Check A/C ON signal. Refer to [HAC-32, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair or replace malfunctioning parts.

4. CHECK BLOWER FAN ON SIGNAL

Check blower fan ON signal. Refer to [HAC-35, "Component Function Check"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace malfunctioning parts

5. CHECK BCM OUTPUT SIGNAL

Ⓜ With CONSULT

1. Select "DATA MONITOR" mode of "ECM" 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-56, "Removal and Installation"](#).

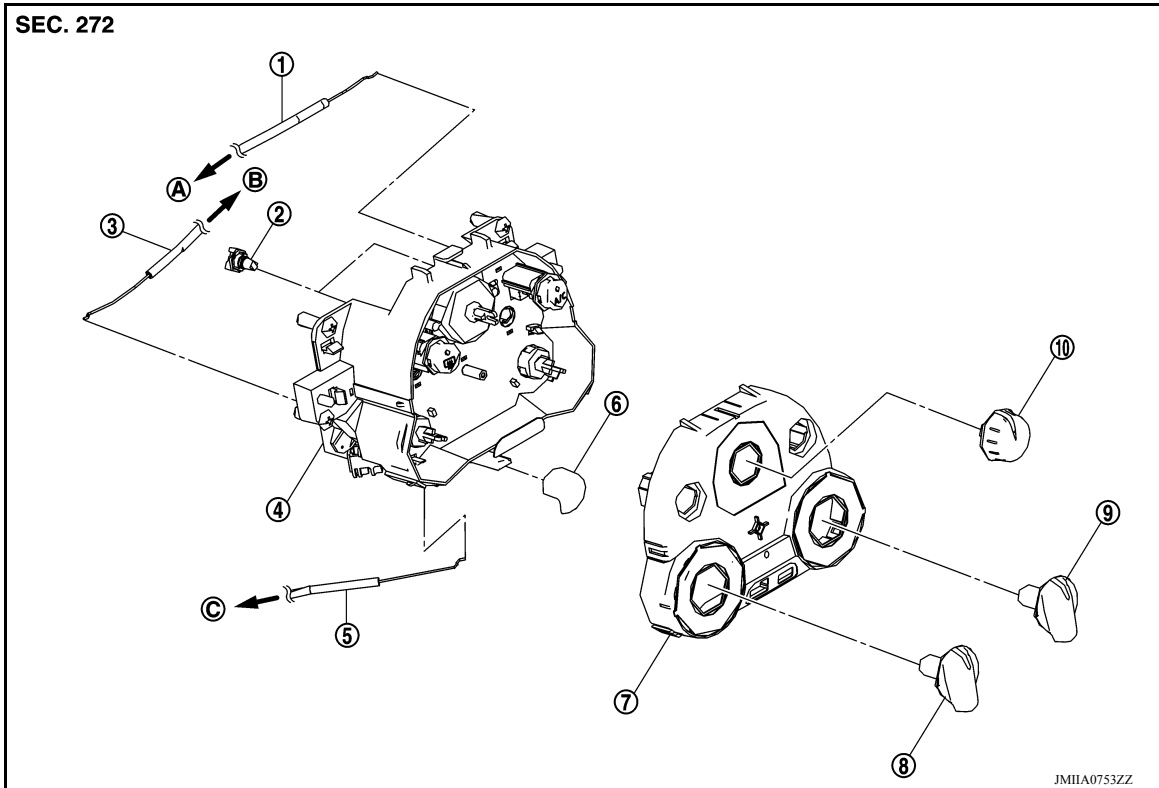
NO >> Replace BCM. Refer to [BCS-69, "Removal and Installation"](#) or [BCS-122, "Removal and Installation"](#).

UNIT REMOVAL AND INSTALLATION

FRONT AIR CONTROL

Exploded View

INFOID:000000009269815



- | | | |
|------------------------|----------------------|---------------------------|
| 1. Mode door cable | 2. Illumination bulb | 3. Air mix door cable |
| 4. Front air control | 5. Intake door cable | 6. Intake door lever knob |
| 7. Control panel bezel | 8. Mode dial | 9. Temperature dial |
| 10. Fan control dial | A. To mode door link | B. To air mix door link |
| C. To intake door link | | |

Removal and Installation

INFOID:000000009269816

REMOVAL

1. Remove A/C finisher. Refer to [IP-21, "Removal and Installation"](#).
2. Remove the air mix door cable from the A/C unit assembly. Refer to [HAC-52, "AIR MIX DOOR CABLE : Removal and Installation"](#).
3. Remove the mode door cable from the A/C unit assembly. Refer to [HAC-52, "MODE DOOR CABLE : Removal and Installation"](#).
4. Remove the intake door cable from the A/C unit assembly. Refer to [HAC-51, "INTAKE DOOR CABLE : Removal and Installation"](#).
5. Remove the front air control screws.
6. Remove the front air control.

INSTALLATION

Installation is in the reverse order of removal.

REFRIGERANT PRESSURE SENSOR

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONING]

REFRIGERANT PRESSURE SENSOR

Removal and Installation for Refrigerant Pressure Sensor

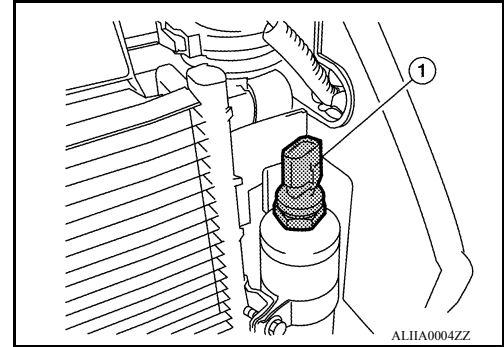
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REMOVAL

CAUTION:

- Do not damage the condenser fins.
- Perform lubricant return operation before each refrigeration system disassembly. However, if a large amount of refrigerant or lubricant is detected, do not perform lubricant return operation. Refer to [HA-21, "Perform Oil Return Operation"](#).

1. Move air guide aside.
2. Disconnect the harness connector from the refrigerant pressure sensor.
3. Remove the refrigerant pressure sensor (1) from the liquid tank on the condenser.



INSTALLATION

Installation is in the reverse order of removal.

CAUTION:

- Replace O-ring with new one. Then apply compressor oil to them when installing.
- Check for leakages when recharging refrigerant. Refer to [HA-17, "Leak Test"](#).

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BLOWER FAN RESISTOR

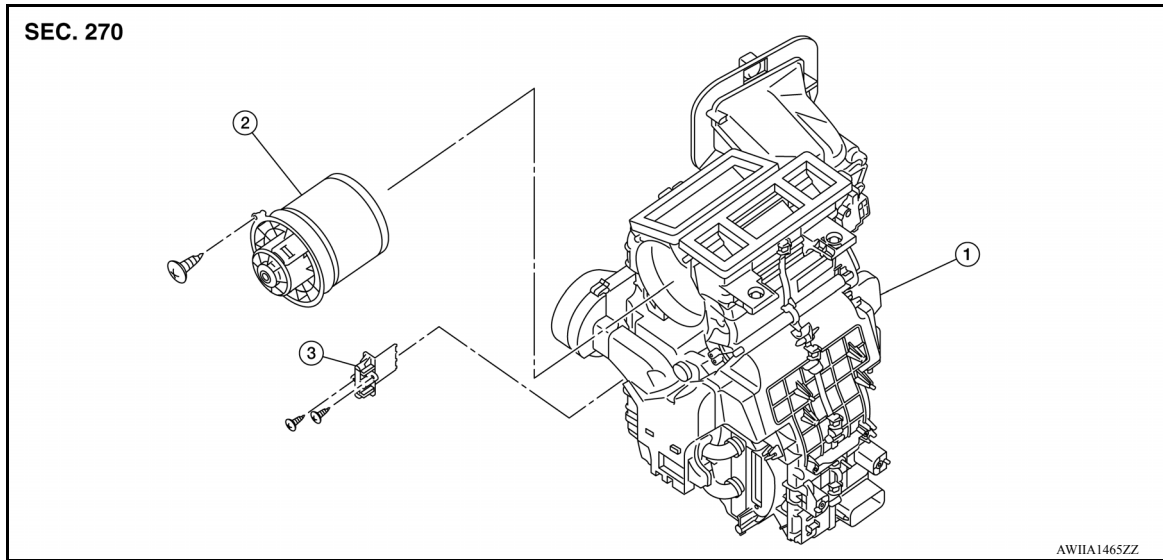
< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONING]

BLOWER FAN RESISTOR

Exploded View

INFOID:000000009269818



1. A/C unit assembly

2. Blower motor

3. Blower fan resistor

Removal and Installation

INFOID:000000009269819

REMOVAL

1. Remove instrument panel assembly. Refer to [IP-15. "Removal and Installation"](#).
2. Disconnect harness connector from the blower fan resistor.
3. Remove screws and blower fan resistor.

INSTALLATION

Installation is in the reverse order of removal.

DOOR CABLE

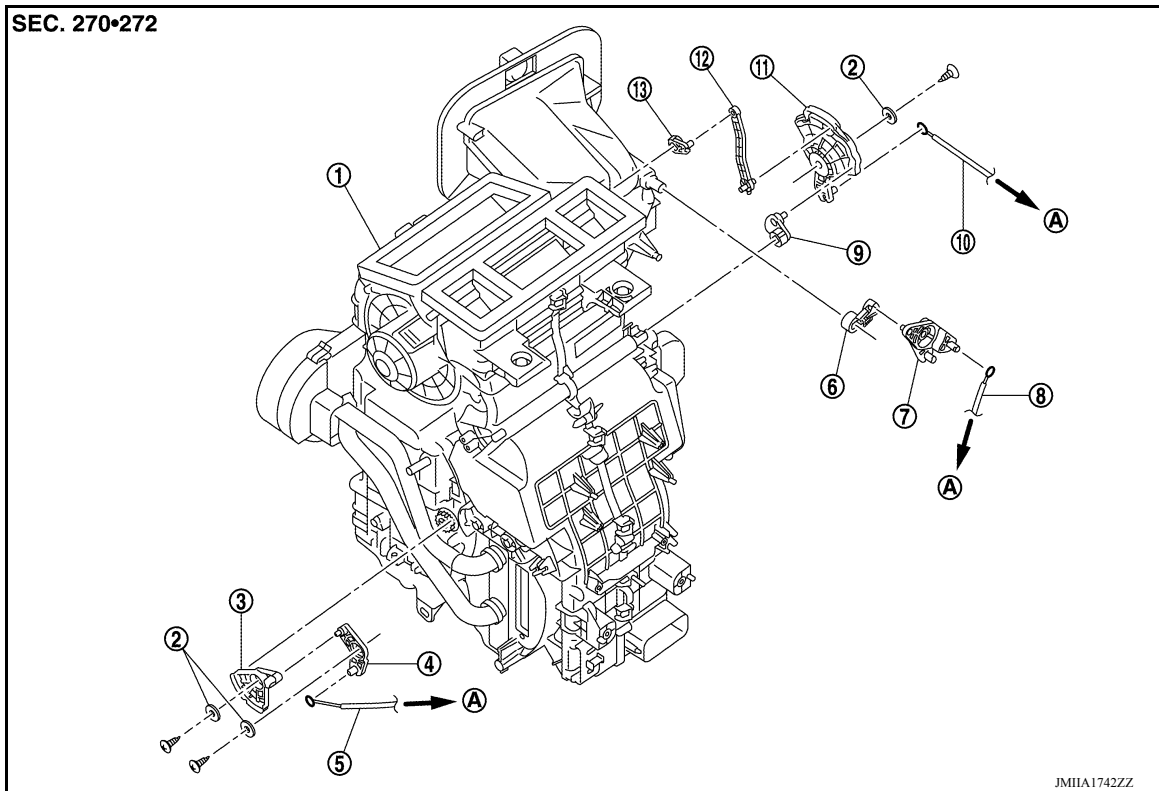
< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONING]

DOOR CABLE

Exploded View

INFOID:000000009269820



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| 1. A/C unit assembly | 2. Plate | 3. Air mix door link 2 |
| 4. Air mix door link 1 | 5. Air mix door cable | 6. Intake door lever |
| 7. Intake door link | 8. Intake door cable | 9. Foot door lever |
| 10. Mode door cable | 11. Main link | 12. Ventilator door rod |
| 13. Ventilator door lever | A. To A/C control | |

INTAKE DOOR CABLE

INTAKE DOOR CABLE : Removal and Installation

INFOID:000000009269821

REMOVAL

1. Remove instrument panel assembly. Refer to [IP-15. "Removal and Installation"](#).
2. Disconnect intake door cable from A/C control.
3. Disconnect intake door cable from A/C unit assembly and remove.

INSTALLATION

Installation is in the reverse order of removal.

INTAKE DOOR CABLE : Adjustment

INFOID:000000009269822

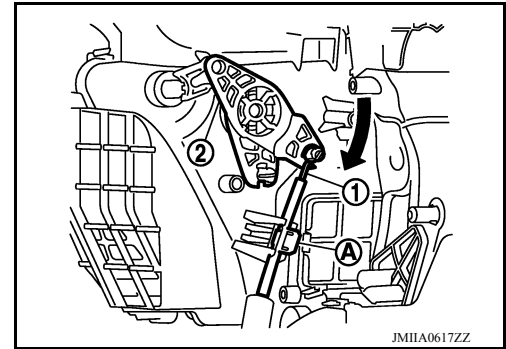
1. Remove instrument panel assembly. Refer to [IP-15. "Removal and Installation"](#).

DOOR CABLE

< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONING]

2. Disconnect intake door cable (1) from clamp (A).
3. Set intake door lever to REC position.
4. Push intake door link (2) in the direction as shown, and then carefully pulling outer cable to A/C control side, and connect clamp.



5. Operate intake door lever to insure that inner cable moves smoothly.

CAUTION:

When clamping the outer cable, do not move the inner cable.

MODE DOOR CABLE

MODE DOOR CABLE : Removal and Installation

INFOID:000000009269823

REMOVAL

1. Remove A/C unit assembly. Refer to [HA-40. "Removal and Installation"](#).
2. Disconnect mode door cable from A/C control.
3. Disconnect mode door cable from A/C unit assembly, and then remove mode door cable.

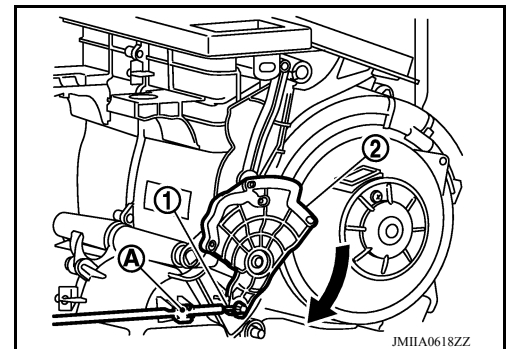
INSTALLATION

Installation is in the reverse order of removal.

MODE DOOR CABLE : Adjustment

INFOID:000000009269824

1. Remove A/C unit assembly. Refer to [HA-40. "Removal and Installation"](#).
2. Disconnect mode door cable (1) from clamp (A).
3. Set mode dial to VENT position.
4. Push main link (2) in the direction as shown, and then carefully pulling outer cable to A/C control side, and connect clamp.



5. Operate mode dial to insure that inner cable moves smoothly.

CAUTION:

When clamping the outer cable, do not move the inner cable.

AIR MIX DOOR CABLE

AIR MIX DOOR CABLE : Removal and Installation

INFOID:000000009269825

REMOVAL

1. Remove foot duct (LH). Refer to [VTL-6. "FOOT DUCT : Removal and Installation"](#).
2. Disconnect air mix door cable from A/C control.
3. Disconnect air mix door cable from A/C unit assembly, and then remove air mix door cable.

INSTALLATION

Installation is in the reverse order of removal.

DOOR CABLE

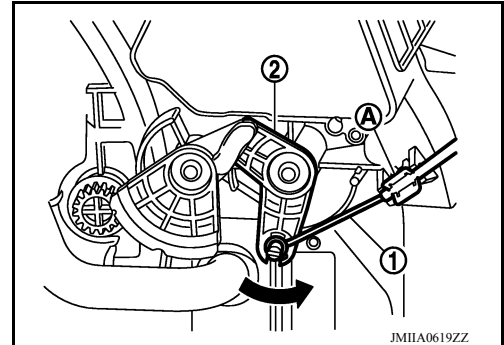
< UNIT REMOVAL AND INSTALLATION >

[MANUAL AIR CONDITIONING]

AIR MIX DOOR CABLE : Adjustment

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1. Remove cluster lid C. Refer to [IP-21, "Removal and Installation"](#).
2. Remove instrument lower panel LH. Refer to [IP-15, "Removal and Installation"](#).
3. Remove glove box. Refer to [IP-22, "Removal and Installation"](#).
4. Disconnect air mix door cable (1) from clamp (A).
5. Set temperature control dial to full cold position.
6. Push air mix door link (2) in the direction as shown, and then carefully pulling outer cable to A/C control side, and connect clamp.



7. Operate temperature control dial to insure that inner cable moves smoothly.

CAUTION:

When clamping the outer cable, do not move the inner cable.

A
B
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