

SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000012564976

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. Get detailed information about the conditions and environment when the symptom occurs.

>> GO TO 2.

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-6, "Operational Check"](#).

Can a symptom be duplicated?

YES >> GO TO 4.

NO >> GO TO 5.

4. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HAC-72, "Symptom Matrix Chart"](#).

Can a symptom be duplicated?

>> GO TO 5.

5. PERFORM THE FRONT AIR CONTROL SELF-DIAGNOSIS

Perform front air control self-diagnosis. Refer to [HAC-20, "Front Air Control Self-Diagnosis"](#).

>> If any diagnostic trouble codes set. Refer to [HAC-20, "Front Air Control Self-Diagnosis Code Chart"](#).

>> Confirm the repair by performing operational check. Refer to [HAC-6, "Operational Check"](#).

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000012564977

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

Conditions : Engine running and at normal operating temperature

CHECKING MEMORY FUNCTION

1. Set the temperature to 32° (90°F).
2. Press the OFF switch.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.

7. Press the OFF switch.

If NG, go to trouble diagnosis procedure for [HAC-85. "Memory Function Check"](#).

If OK, continue with next check.


CHECKING BLOWER

1. Rotate the blower control dial clockwise once, blower should operate on low speed.
2. Rotate the blower control dial again, and continue checking blower speed until all speeds are checked.
3. Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for [HAC-37. "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR

1. Press each MODE switch and the DEF  switch.
2. Each MODE position indicator should illuminate.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-15. "Discharge Air Flow"](#).

Mode door position is checked in the next step.



If NG, go to trouble diagnosis procedure for [HAC-22. "Mode Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF or D/F is selected.





CHECKING RECIRCULATION (,  ONLY)

1. Press recirculation () switch one time. Recirculation indicator should illuminate.
2. Press recirculation () switch one more time. Recirculation indicator should go off.
3. Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for [HAC-34. "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF or D/F is selected. REC () is not allowed in DEF () D/F () or FOOT ()

CHECKING TEMPERATURE DECREASE

1. Rotate temperature control dial (driver or passenger) counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-73. "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-26. "Air Mix Door Motor \(Driver\) Component Function Check"](#).

INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise (drive or passenger) until 32°C (90°F) is displayed.
2. Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-81, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-26, "Air Mix Door Motor \(Driver\) Component Function Check"](#).

If OK, continue with next check.

CHECK A/C SWITCH

1. Press A/C switch when AUTO switch is ON, or in manual mode.
2. A/C switch indicator will turn ON.
 - Confirm that the compressor clutch engages (sound or visual inspection).

NOTE:

If current mode setting is DEF or D/F, compressor clutch will already be engaged and cannot be turned off.

If NG, go to trouble diagnosis procedure for [HAC-43, "Magnet Clutch Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING AUTO MODE

1. Press AUTO switch.
2. AUTO indicator should illuminate.
 - If ambient temperature is warm, and selected temperature is cool, confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

If NG, go to trouble diagnosis procedure for [HAC-59, "Front Air Control Power and Ground Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-43, "Magnet Clutch Diagnosis Procedure"](#).

If all operational checks are OK (symptom cannot be duplicated), go to malfunction Simulation Tests in [HAC-5, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#) and perform tests as outlined to simulate driving conditions environment. If symptom appears. Refer to [HAC-72, "Symptom Matrix Chart"](#), and perform applicable trouble diagnosis procedures.

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FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

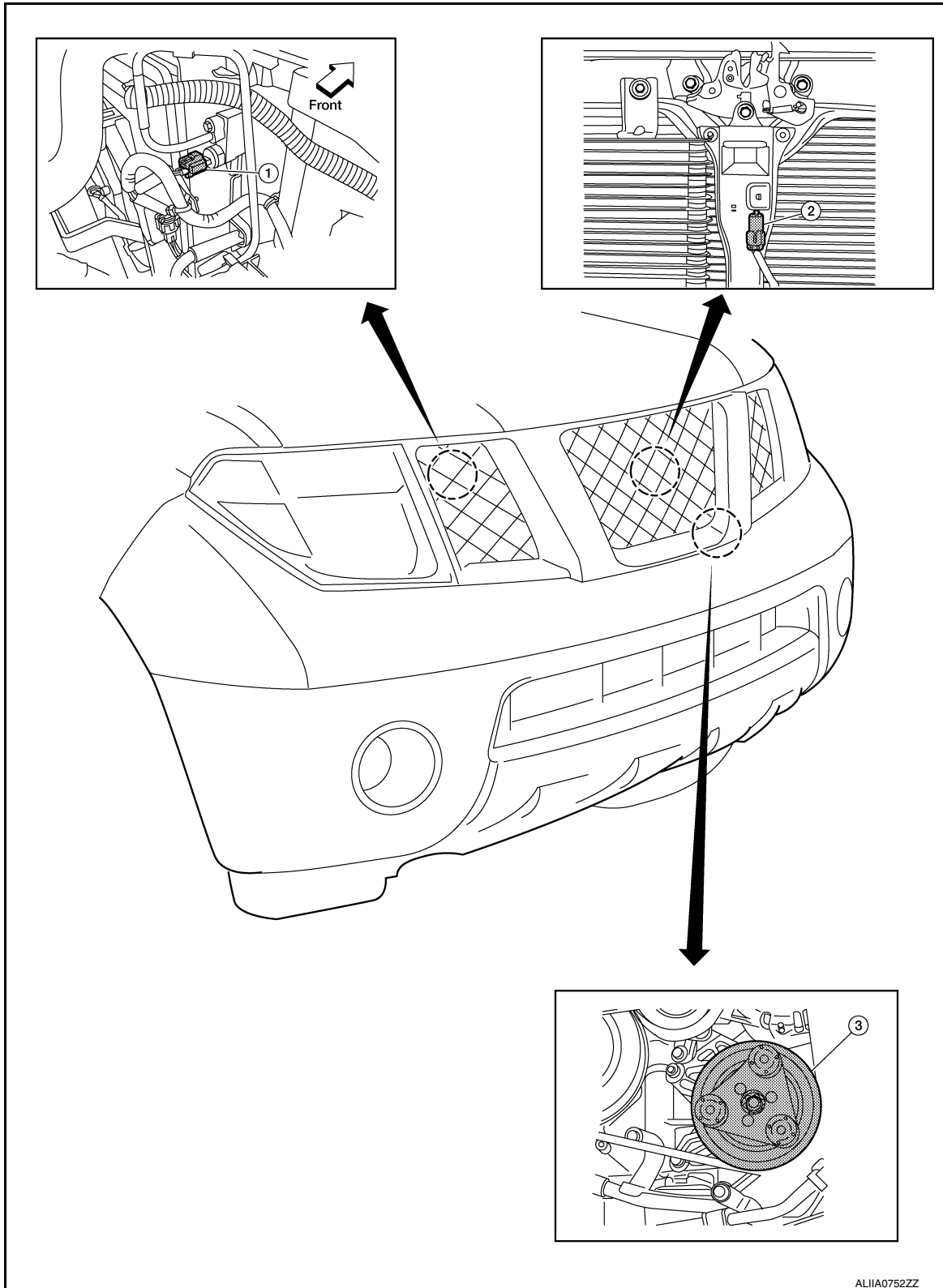
SYSTEM DESCRIPTION

FUNCTION INFORMATION

Component Part Location

INFOID:000000012564978

ENGINE COMPARTMENT



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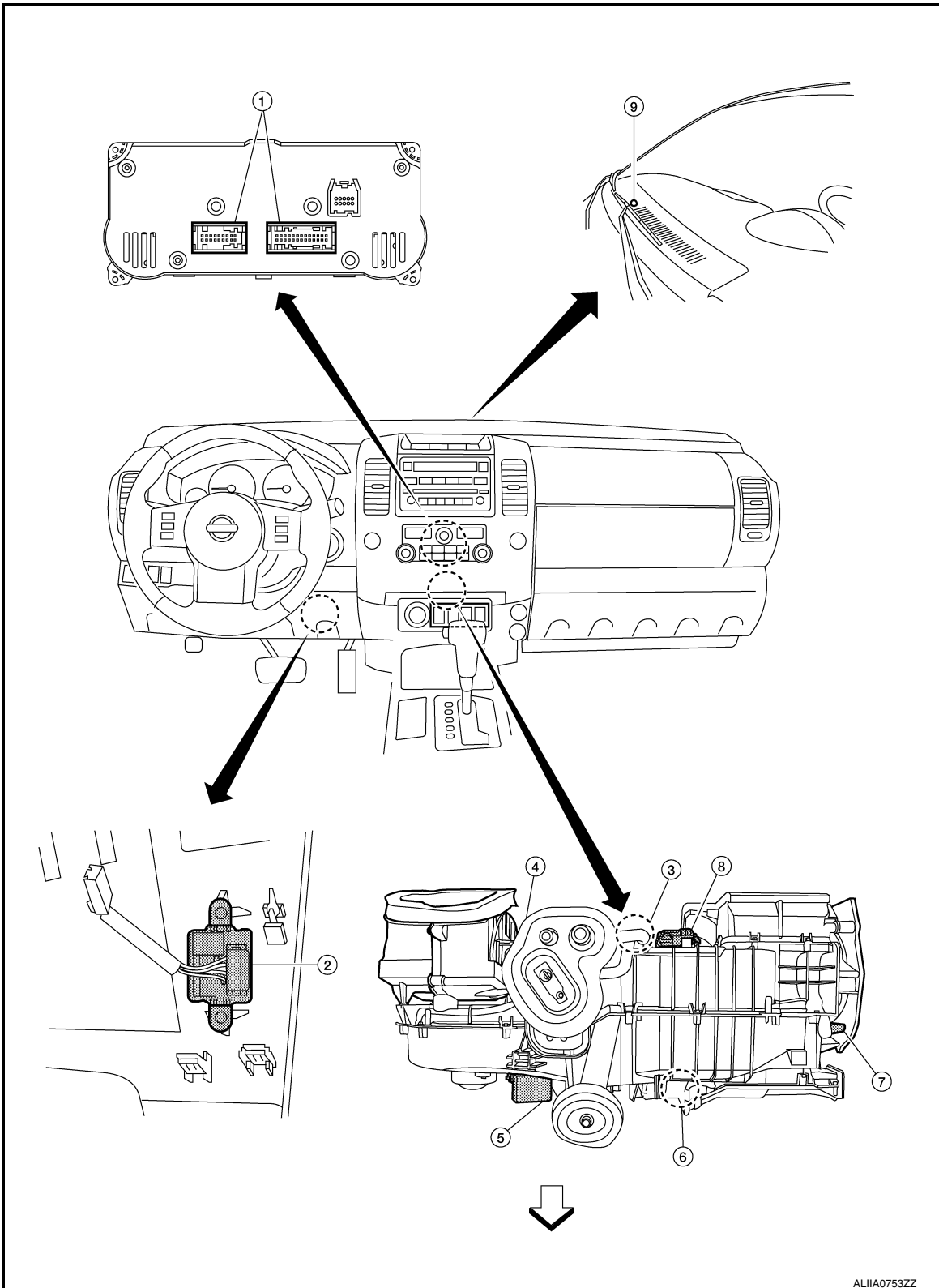
FUNCTION INFORMATION

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

1. Refrigerant pressure sensor E48 (view with battery removed)
2. Ambient sensor E28 (view with grille removed)
3. A/C compressor F3 removed

PASSENGER COMPARTMENT



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FUNCTION INFORMATION

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

- | | | |
|-------------------------------|---|--|
| 1. Front air control M52, M56 | 2. In-vehicle sensor M34 | 3. Intake sensor M146 |
| 4. Intake door motor M58 | 5. Variable blower control (front) M121 | 6. Air mix door motor (Passenger) M131 |
| 7. Mode door motor M142 | 8. Air mix door motor (driver) M148 | 9. Optical sensor M14 |
- ← :Front

Symptom Table

INFOID:000000012564979

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-59
A/C system cannot be controlled.	Go to Self-diagnosis Function. HAC-20
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. HAC-22
Mode door motor is malfunctioning.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. HAC-26
Air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-34
Intake door motor is malfunctioning.	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-37
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-43
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-73
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-81
Noise	Go to Trouble Diagnosis Procedure for Noise. HAC-83
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis. HAC-20
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function. HAC-85

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:0000000012564980

REFRIGERANT FLOW

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser with liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coils are controlled by externally equalized expansion valve, located inside the evaporator case.

Refrigerant System Protection

INFOID:0000000012564981

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. The ECM de-energizes the A/C relay to disengage the magnetic compressor clutch when pressure on the high pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm², 398 psi), or below about 120 kPa (1.22 kg/cm², 17.4 psi).

PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/

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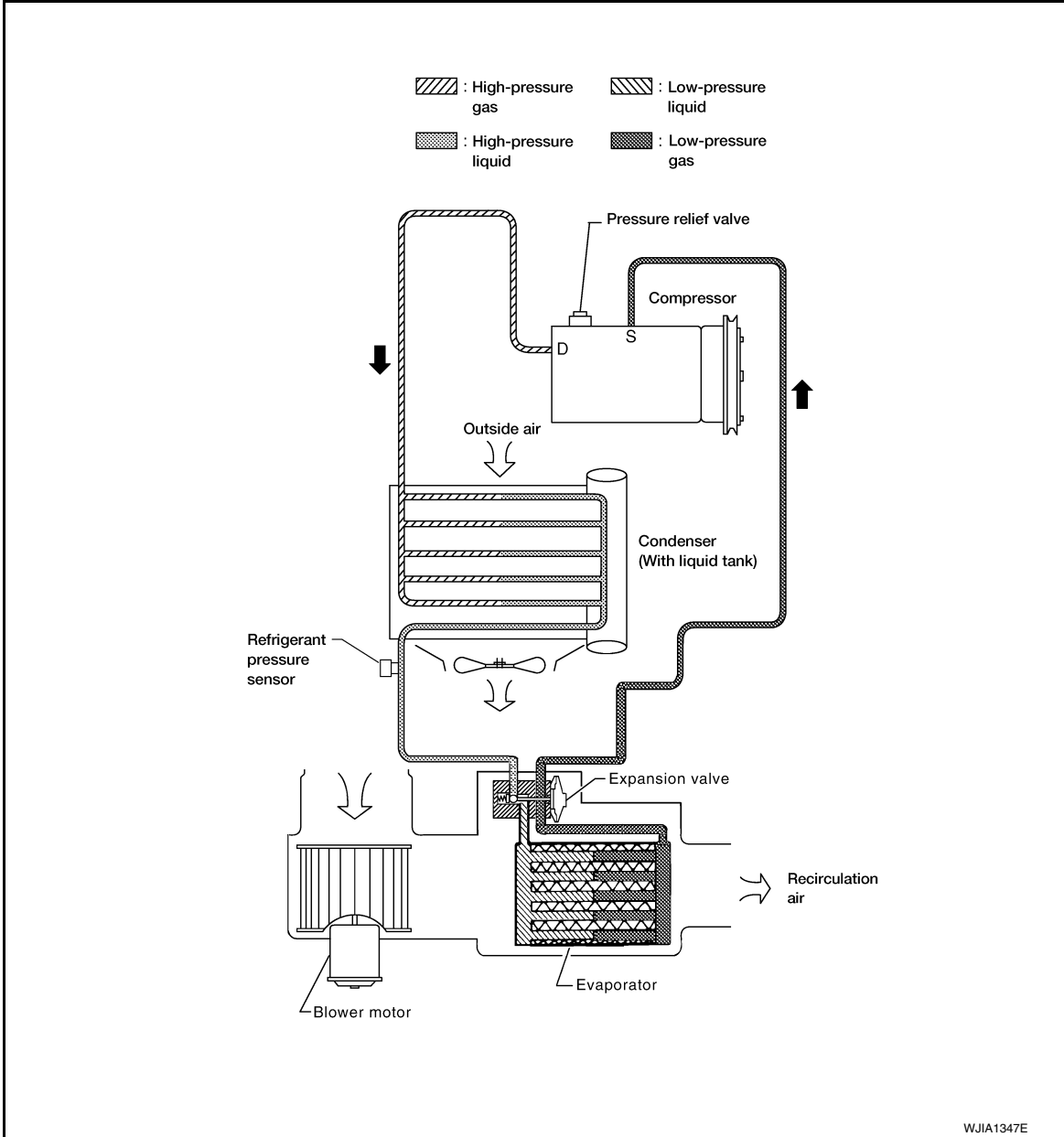
HAC

REFRIGERATION SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

cm², 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

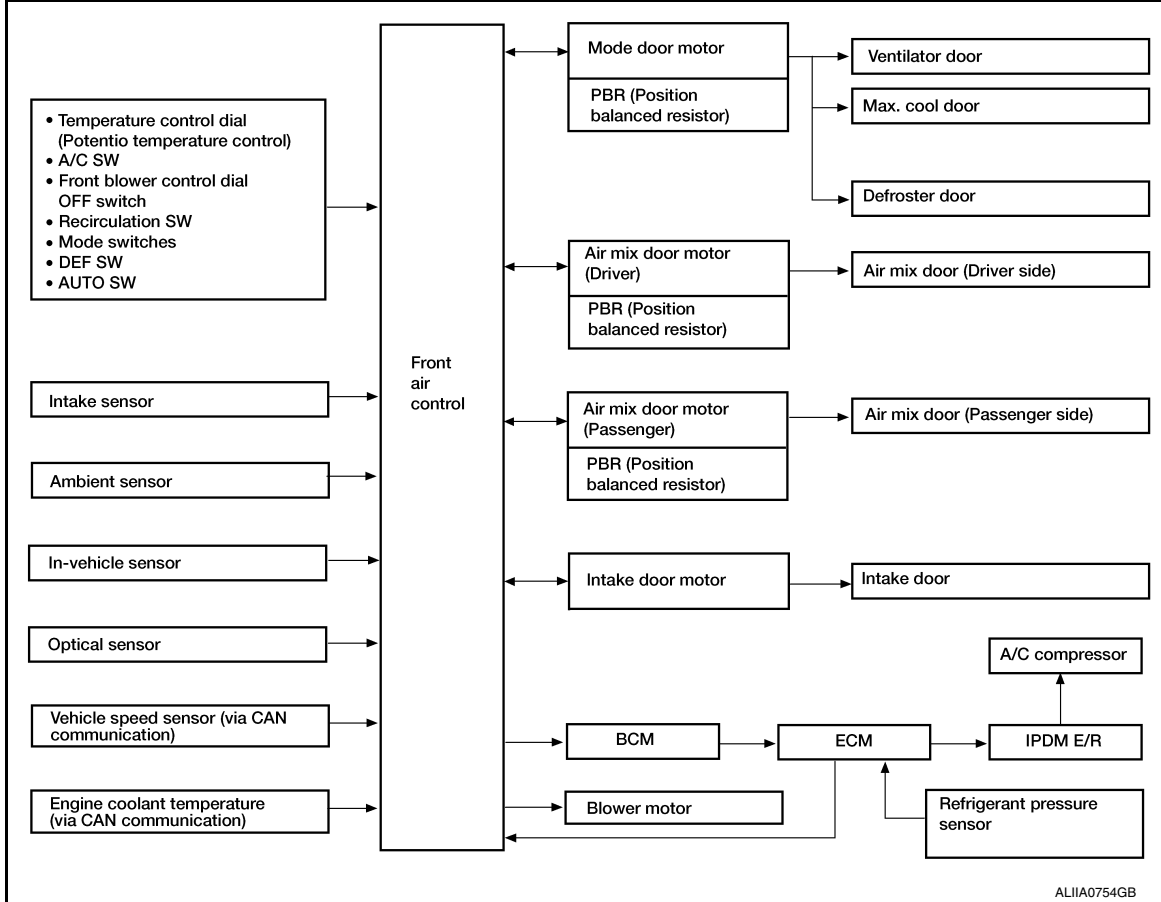
AUTOMATIC AIR CONDITIONER SYSTEM

Control System Diagram

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CONTROL SYSTEM

The control system consists of input sensors, switches, the front air control (microcomputer) and outputs. The relationship of these components is shown in the figure below:

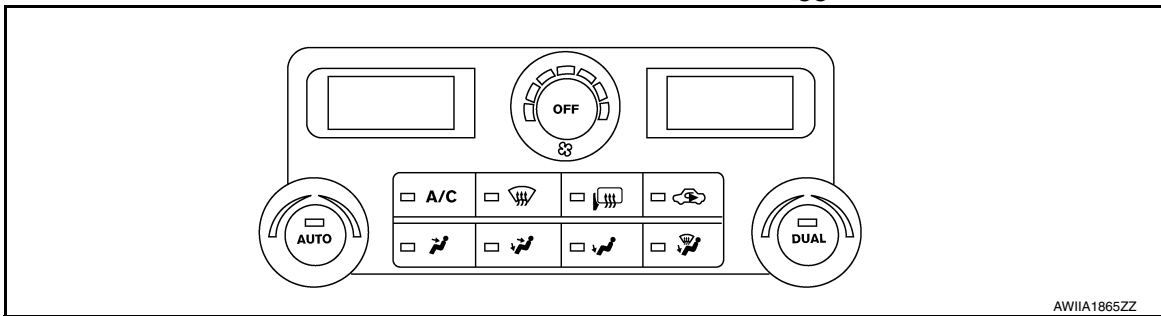


Control System Description

INFOID:000000012564983

CONTROL OPERATION

Front air control with door mirror defogger

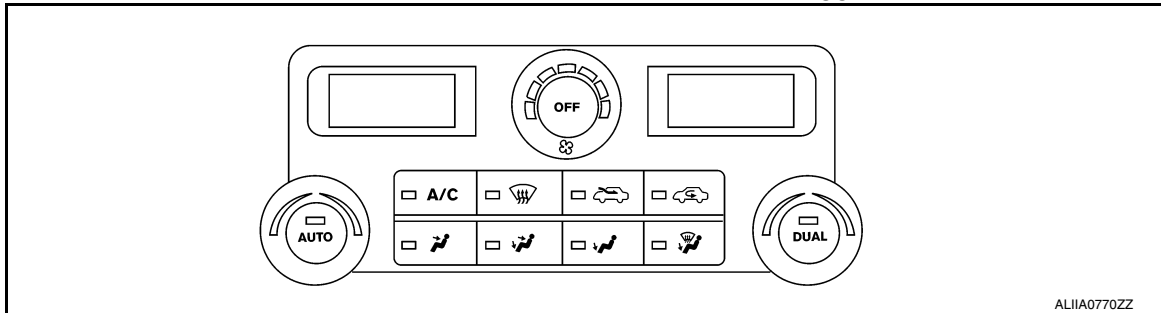


AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Front air control without door mirror defogger



AUTO SWITCH

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

TEMPERATURE CONTROL DIAL (DRIVER)

Increases or decreases the set temperature.

TEMPERATURE CONTROL DIAL (PASSENGER)

Increases or decreases the set temperature.

RECIRCULATION () SWITCH

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

DEFROSTER () SWITCH

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

DOOR MIRROR DEFOGGER SWITCH (IF EQUIPPED)

When switch is ON, door mirrors are defogged.

FRE () SWITCH (IF EQUIPPED)

When FRE switch is ON, FRE switch indicator turns ON, and air inlet is set to FRE.

OFF SWITCH

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

BLOWER CONTROL DIAL

The blower speed is manually controlled with this dial.

A/C SWITCH

The compressor is ON or OFF.

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

MODE SWITCHES

Controls the air discharge outlets.

DUAL SWITCH

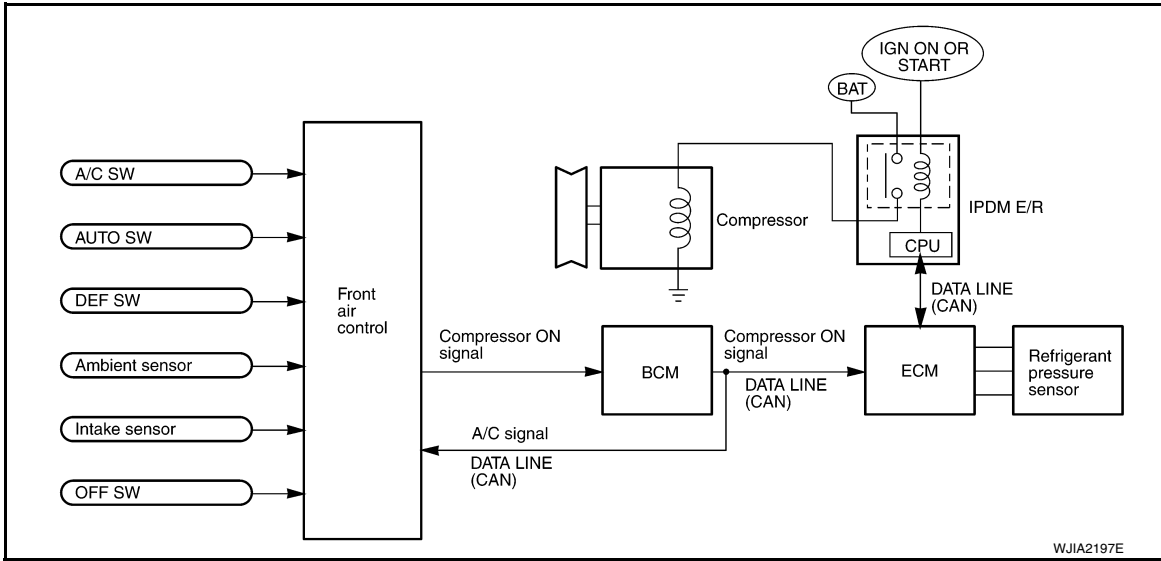
- When the DUAL switch indicator is illuminated, the driver and passenger temperature can each be set independently.
- When the DUAL switch indicator is not illuminated, the driver temperature setting is applied to both sides.

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH CONTROL

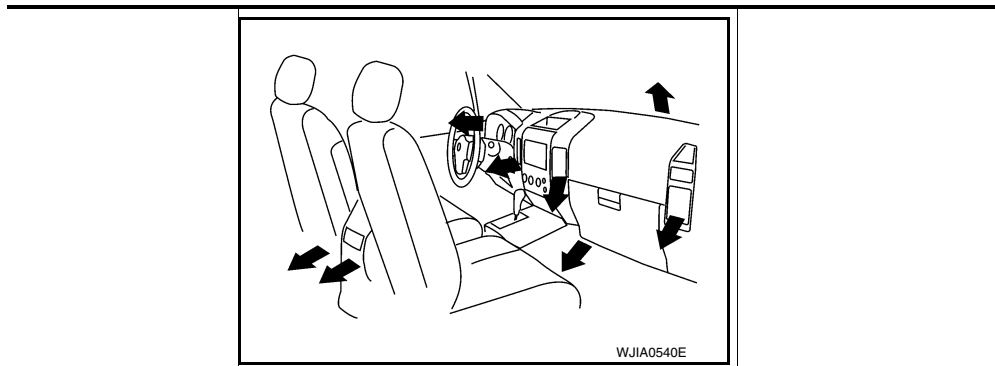


When A/C switch or DEF switch is pressed, front air control inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM and front air control, via CAN communication line. ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant pressure sensor signal, throttle angle sensor, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication line. Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

Discharge Air Flow

INFOID:000000012564984

HAC



Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	95%	5%	—
	60%	40%	—
	—	70%	30%
	—	60%	40%
	—	10%	90%

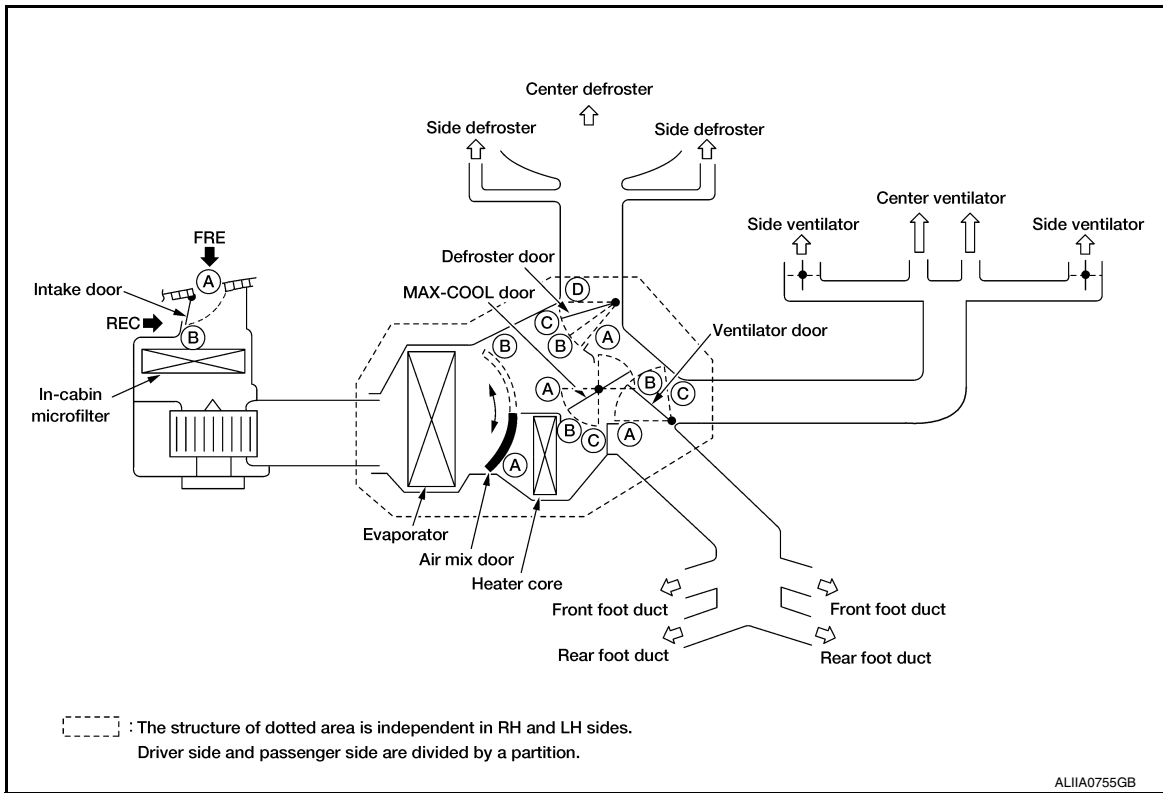
AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Switches And Their Control Function

INFOID:000000012564985



Switch/Dial position			Door position				
			Ventilator door	MAX-COOL door	Defroster door	Intake door	Air mix door
MODE switch	VENT		A	A	D	—	
	B/L		B	B	D	—	
	FOOT		C	B	D or C	—	
	D/F		C	B	B	—	
DEF switch			C	C	A	B	—
REC switch ^{*1}			—			A	—
FRE switch ^{*2}			—			B	—
Temperature control dial	Full Cold		—			A	
	Full Cold ↔ Full Hot		—			AUTO	
	Full Hot		—			B	

*1: Inlet status is displayed by indicator when activating D/F mode.

*2: If equipped (without door mirror defogger).

DIAGNOSIS SYSTEM (HVAC)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (HVAC)

CONSULT Function (HVAC)

INFOID:000000012564986

CONSULT can display each diagnostic item using the diagnostic test modes shown following.

Diagnostic mode	Description
Self Diagnostic Result	Displays Front air control self-diagnosis results.
Data Monitor	Displays Front air control input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ECU Identification	Front air control part number can be read.

SELF-DIAGNOSIS

Display Item List

DTC	Description	Reference page
B2573	Battery voltage out of range	PG-80, "Work Flow"
B2578	In-vehicle sensor circuit out of range (low)	HAC-51, "In-Vehicle Sensor Diagnosis Procedure"
B2579	In-vehicle sensor circuit out of range (high)	
B257B	Ambient sensor circuit short	HAC-49, "Ambient Sensor Component Inspection"
B257C	Ambient sensor circuit open	
B257F	Optical sensor (Driver) circuit open or short	HAC-54, "Optical Sensor Diagnosis Procedure"
B2580	Optical sensor (Passenger) circuit open or short	
B2581	Intake sensor circuit short	HAC-57, "Intake Sensor Component Inspection"
B2582	Intake sensor circuit open	
B2587	Stuck button	VTL-7, "Removal and Installation"
U1000	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"

DATA MONITOR

Display Item List

Monitor item	Value	Contents
BATT VIA CAN	"V"	Displays battery voltage signal.
IGN VIA CAN	"ON/OFF"	Displays ignition switch signal.
DVR SUNLD SEN	"w/m2"	Displays optical sensor (driver) signal.
PAS SUNLD SEN	"w/m2"	Displays optical sensor (passenger) signal.
AMB TEMP SEN	"°C"	Displays ambient sensor signal.
EVAP TEMP SEN	"°C"	Displays intake sensor signal.
INCAR TMP SEN	"°C"	Displays in-vehicle sensor signal.
RR TEMPSET FR	"V"	Displays air mix door (front) set point signal.
RR TEMPSET RR	"V"	Displays air mix door (rear) set point signal.
MODE FDBCK	"V"	Displays mode door motor feedback signal.
DVR MIX FDBCK	"V"	Displays air mix door motor (driver) feedback signal.
PAS MIX FDBCK	"V"	Displays air mix door motor (passenger) feedback signal.
RR FDBCK	"V"	Displays air mix door motor (rear) feedback signal.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000012564987

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			x	x	x		
Rear window defogger	REAR DEFOGGER			x	x			
Warning chime	BUZZER			x	x			
Interior room lamp timer	INT LAMP			x	x	x		
Remote keyless entry system	MULTI REMOTE ENT			x	x	x		
Exterior lamp	HEAD LAMP			x	x	x		
Wiper and washer	WIPER			x	x	x		
Turn signal and hazard warning lamps	FLASHER			x	x			
Air conditioner	AIR CONDITIONER			x				
Combination switch	COMB SW			x				
BCM	BCM	x	x			x	x	x
Immobilizer	IMMU		x	x	x			
Interior room lamp battery saver	BATTERY SAVER			x	x	x		
Vehicle security system	THEFT ALM			x	x	x		
RAP system	RETAINED PWR			x	x	x		
Signal buffer system	SIGNAL BUFFER			x	x			
TPMS	AIR PRESSURE MONITOR		x	x	x	x		
Panic alarm system	PANIC ALARM				x			

AIR CONDITIONER

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000012564988

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.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

SELF-DIAGNOSIS FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:000000012564989




A/C SYSTEM SELF-DIAGNOSIS FUNCTION

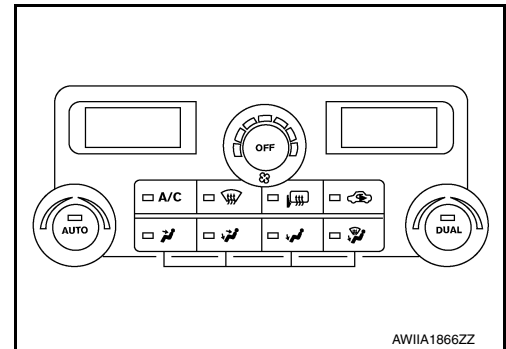
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

DESCRIPTION

The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on front air control. Refer to applicable sections (items) for details. Fault codes (if any are present) will be displayed in the ambient temperature display area. Refer to [HAC-20, "Front Air Control Self-Diagnosis Code Chart"](#).

SELF-DIAGNOSTIC MODE

1. Press the OFF switch.
2. Press the FLOOR/DEF () and DEF () mode switches together and release on the front air control.
3. Press the REC () to enter self diagnostic mode.
4. Turn ignition switch OFF to exit out of self-diagnostic mode.



Front Air Control Self-Diagnosis Code Chart

INFOID:000000012564990

SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page
03	Battery voltage out of range PG-80, "Work Flow"
30	In-vehicle sensor circuit out of range (low)
31	In-vehicle sensor circuit out of range (high)
40	Ambient sensor circuit short
41	Ambient sensor circuit open
50	Optical sensor (Driver) circuit open or short
52	Optical sensor (Passenger) circuit open or short
56	Intake sensor circuit short
57	Intake sensor circuit open
80	CAN bus fault LAN-14, "Trouble Diagnosis Flow Chart"
90	Stuck button VTL-7, "Removal and Installation"

DTC/CIRCUIT DIAGNOSIS

MODE DOOR MOTOR

System Description

INFOID:000000012564991

SYSTEM DESCRIPTION

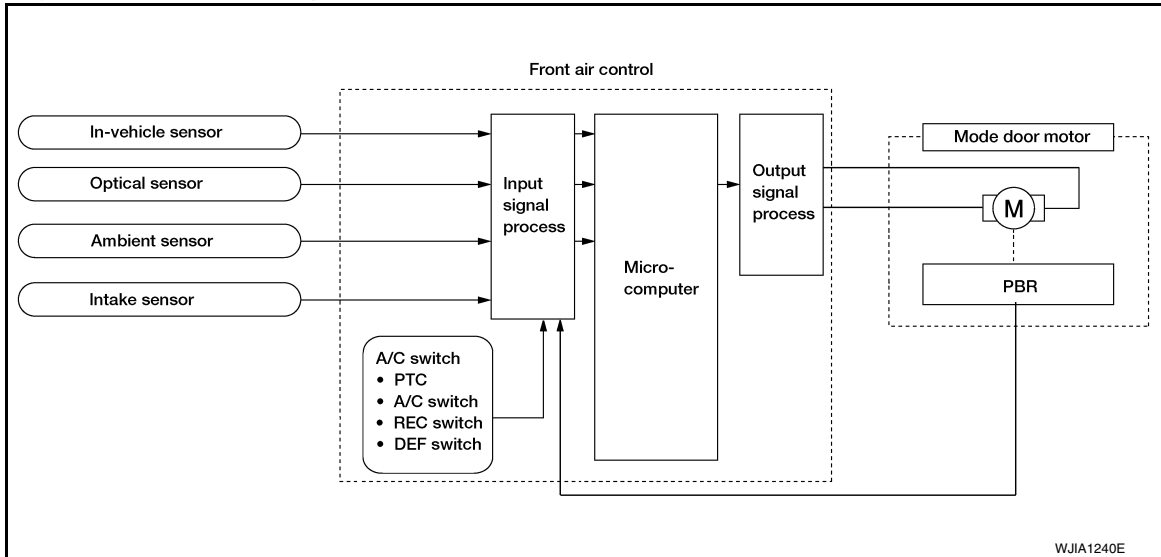
Component Parts

Mode door control system components are:

- Front air control
- Mode door motor
- PBR (built into mode door motor)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation

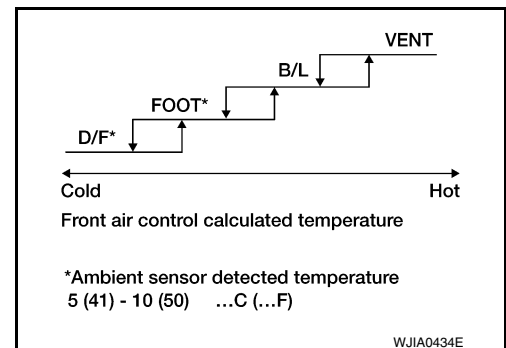
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the mode door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the mode door position by measuring the voltage signal on the PBR circuit. In AUTO mode the mode door position is set by the front air control which determines the proper position based on inputs from the in-vehicle sensor, ambient sensor, optical sensor, intake sensor, and the temperature selected by the driver or passenger.



Mode Door Control Specification

COMPONENT DESCRIPTION

Mode Door Motor

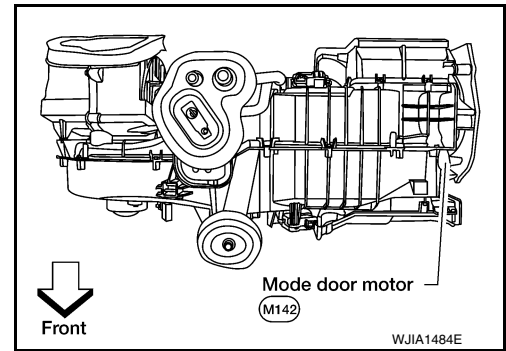


MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

The mode door motor is attached to the heater & cooling unit assembly. It rotates so that air is discharged from the outlet as indicated by the front air control. Motor rotation is conveyed to a link which activates the mode door.



Mode Door Motor Component Function Check

INFOID:000000012564992

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Press each mode switch and press the DEF (DEF) switch. Each position indicator should illuminate.
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-15, "Discharge Air Flow"](#).

NOTE:

Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when DEF (DEF) or D/F (D/F) is selected.

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Go to diagnosis procedure. Refer to [HAC-22, "Mode Door Motor Diagnosis Procedure"](#).

Mode Door Motor Diagnosis Procedure

INFOID:000000012564993

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

1. CHECK MODE DOOR MOTOR POSITION BALANCED RESISTOR (PBR) FEEDBACK VOLTAGE

1. Turn ignition switch ON.
2. Using CONSULT, check "MODE FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to [HAC-17, "CONSULT Function \(HVAC\)"](#).
3. Observe "MODE FDBCK" voltage while cycling front air control mode switch through all modes.

Monitor Item	Condition	Results
MODE FDBCK	Cycle mode switch through all modes, D/F (D/F), VENT (VENT), B/L (B/L), and FOOT (FOOT)	Voltage varies between D/F (D/F) and VENT (VENT), and between VENT (VENT) and B/L (B/L).

Is the inspection result normal?

- YES >> • Mode door motor is OK.
 • Inspect mode door for mechanical failure. Refer to [VTL-21, "Removal and Installation"](#).
 NO >> GO TO 2.

2. CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M52 and the mode door motor harness connector M142.
3. Check continuity between front air control harness connector M52 terminals 19, 20 and the mode door motor harness connector M142 terminals 6, 1.

MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

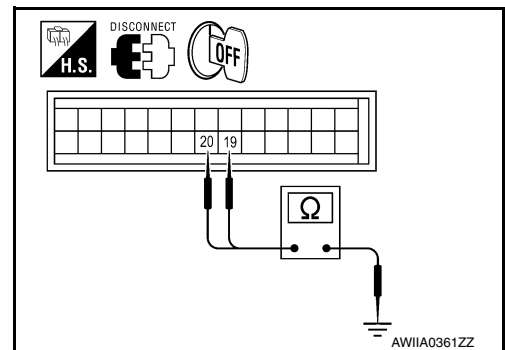
Connector	Terminal	Connector	Terminal	Continuity
M52	19	M142	6	Yes
	20		1	

4. Check continuity between front air control harness connector M52 terminals 19, 20 and ground.

Connector	Terminal	—	Continuity
M52	19	Ground	No
	20		

Is the inspection result normal?

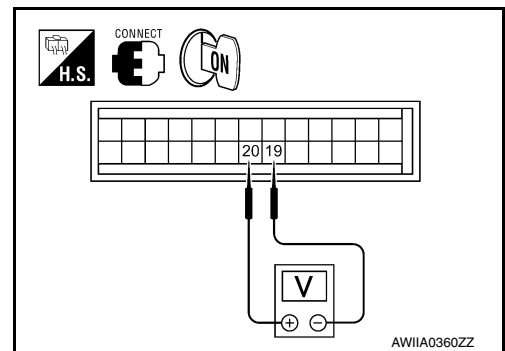
- YES >> GO TO 3.
NO >> Repair or replace harness as necessary.



3. CHECK FRONT AIR CONTROL FOR MODE DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the D/F (D/F) mode.
4. Check voltage between front air control harness connector M52 terminal 19 and terminal 20 while pressing the mode switch to the VENT (VENT) mode, and then the B/L (B/L) mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M52	19	20	D/F (D/F) mode to VENT (VENT) mode	Battery voltage
	20	19	VENT (VENT) mode to B/L (B/L) mode	Battery voltage



Is the inspection result normal?

- YES >> GO TO 4.
NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

4. CHECK MODE DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M52 terminal 3, and M56 terminal 28 and the mode door motor harness connector M142 terminals 2, 3.

Connector	Terminal	Connector	Terminal	Continuity
M52	3	M142	2	Yes
M56	28		3	

4. Check continuity between front air control harness connector M52 terminal 3, M56 terminal 28 and ground.

Connector	Terminal	—	Continuity
M52	3	Ground	No
M56	28		

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Repair or replace harness as necessary.

5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

1. Check continuity between front air control harness connector M52 terminal 7 and mode door motor harness connector M142 terminal 4.

Connector	Terminal	Connector	Terminal	Continuity
M52	7	M142	4	Yes

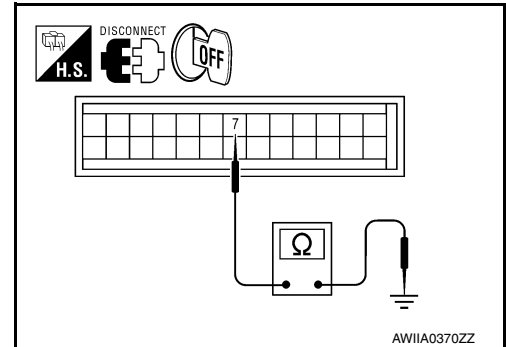
2. Check continuity between front air control harness connector M52 terminal 7 and ground.

Connector	Terminal	—	Continuity
M52	7	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

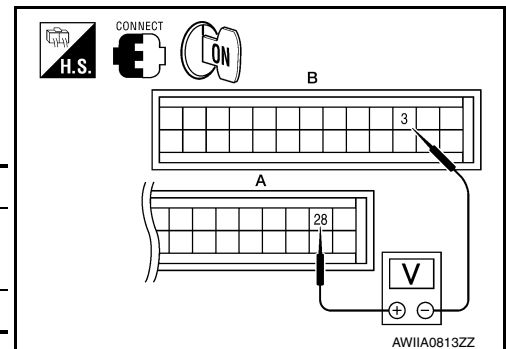
NO >> Repair or replace harness as necessary.



6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M52 (B) terminal 3, and M56 (A) terminal 28.

A		B		Voltage (Approx.)
Connector	Terminals (+)	Connector	Terminals (-)	
M56	28	M52	3	5 Volts



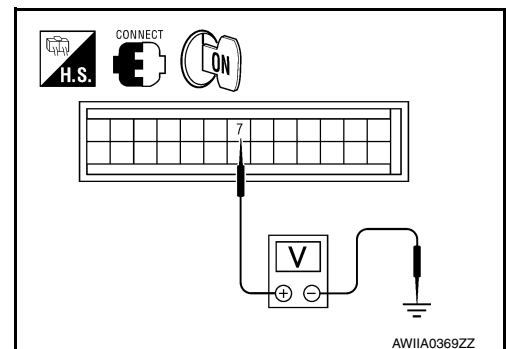
4. Check voltage between front air control harness connector M52 terminal 7 and ground.

Connector	Terminal	—	Voltage (Approx.)
M52	7	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

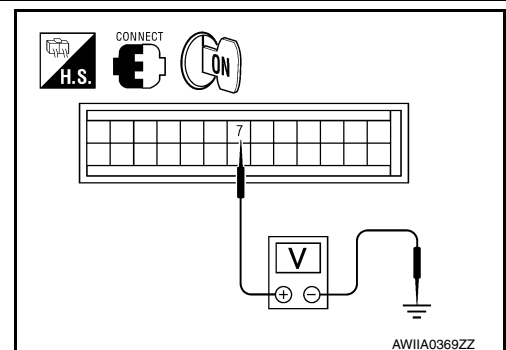
1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M52 terminal 7 and ground.

Connector	Terminal	—	Voltage (Approx.)
M52	7	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-21, "Removal and Installation"](#).



AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR MOTOR

System Description

INFOID:000000012564994

SYSTEM DESCRIPTION

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

SYSTEM DESCRIPTION

Component Parts

Air mix door control system components are:

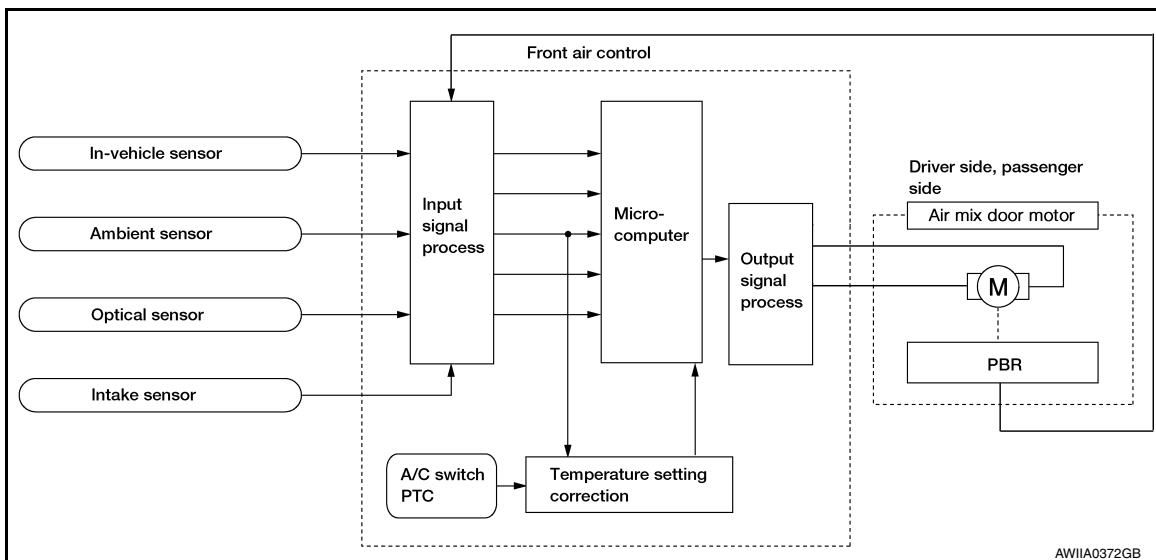
- Front air control
- Air mix door motors (driver, passenger)
- PBR (built-into air mix door motors)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation

The front air control receives data from the temperature selected by the driver side, passenger side, and rear. The front air control then applies a voltage to one circuit of the appropriate air mix door motor, while ground is applied to the other circuit, causing the appropriate air mix door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the air mix door positions by measuring the voltage signal on the PBR circuits of each door.

In AUTO mode the air mix, intake, mode door, and defrost door positions are set by the front air control which determines the proper position based on inputs from the in-vehicle sensor, ambient sensor, optical sensor, intake sensor, and the temperature selected by the driver and front and rear passengers.

Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new door position data is returned to the front air control

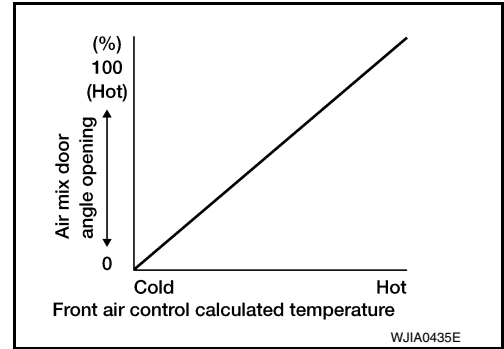


AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

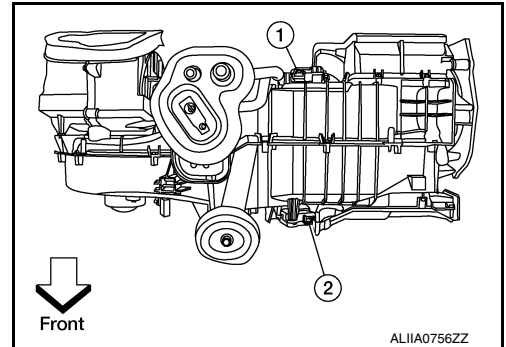
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motors

The driver (1) and passenger (2) air mix door motors are attached to the front heater & cooling unit assembly. These motors rotate so that the air mix door is opened or closed to a position set by the front air control. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the front air control by the PBR built into the air mix door motors.



Air Mix Door Motor (Driver) Component Function Check

INFOID:000000012564995

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the temperature control dial (driver) clockwise until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn the temperature control dial (driver) counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

Can a symptom be duplicated?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-26. "Air Mix Door Motor \(Driver\) Diagnosis Procedure"](#).

Air Mix Door Motor (Driver) Diagnosis Procedure

INFOID:000000012564996

Regarding Wiring Diagram information, refer to [HAC-63. "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

1. CHECK AIR MIX DOOR MOTOR (DRIVER) POSITION BALANCED RESISTOR (PBR) FEEDBACK VOLTAGE

1. Turn ignition switch ON.

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

2. Using CONSULT, check "DVR MIX FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to [HAC-17, "CONSULT Function \(HVAC\)"](#).
3. Observe "DVR MIX FDBACK" voltage while rotating temperature control dial (driver) between 32°C (90°F) and 18°C (60°F).

Monitor Item	Condition	Results
DVR MIX FDBCK	Rotate temperature control dial (driver) between 32°C (90°F) and 18°C (60°F)	Voltage varies with dial rotation between 0.2 and 4.8 volts.

Is the inspection result normal?

- YES >> • Air mix door motor (driver) is OK.
 • Inspect air mix door (driver) for mechanical failure and repair if necessary. If air mix door (driver) is OK, refer to [HAC-73, "Component Function Check"](#) for insufficient cooling or [HAC-81, "Component Function Check"](#) for insufficient heating.

NO >> GO TO 2.

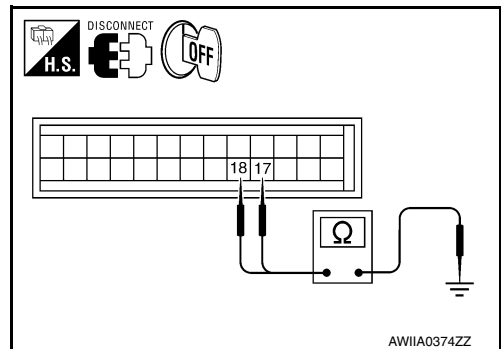
2. CHECK AIR MIX DOOR MOTOR (DRIVER) CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M52 and the air mix door motor (driver) harness connector M148.
3. Check continuity between front air control harness connector M52 terminals 17, 18 and the air mix door motor (driver) harness connector M148 terminals 6, 5.

Connector	Terminal	Connector	Terminal	Continuity
M52	17	M148	6	Yes
	18		5	

4. Check continuity between front air control harness connector M52 terminals 17, 18 and ground.

Connector	Terminal	—	Continuity
M52	17	Ground	No
	18		



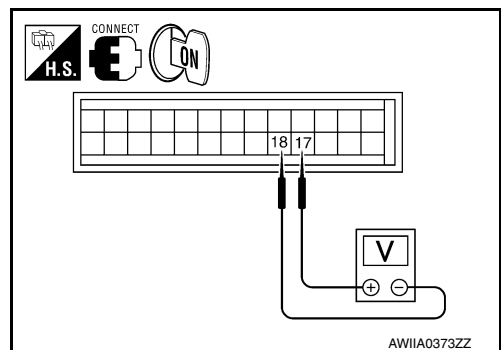
Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

3. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR (DRIVER) POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate temperature control dial (driver) to 32°C (90°F).
4. Check voltage between front air control harness connector M52 terminal 17 and terminal 18 while rotating temperature control dial (driver) to 18°C (60°F) and back to 32°C (90°F).

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M52	17	18	While rotating temperature control dial (driver) from 32°C (90°F) to 18°C (60°F)	Battery voltage
	18	17	While rotating temperature control dial (driver) from 18°C (60°F) to 32°C (90°F)	Battery voltage



Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

4. CHECK AIR MIX DOOR MOTOR (DRIVER) PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M52 terminal 3, connector M56 terminal 28 and air mix door motor (driver) harness connector M148 terminals 3, 1.

Connector	Terminal	Connector	Terminal	Continuity
M52	3	M148	3	Yes
M56	28		1	

4. Check continuity between front air control harness connector M52 terminal 3, M56 terminal 28 and ground.

Connector	Terminal	—	Continuity
M52	3	Ground	No
M56	28		

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair or replace harness as necessary.

5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M52 terminal 6 and air mix door motor (driver) harness connector M148 terminal 2.

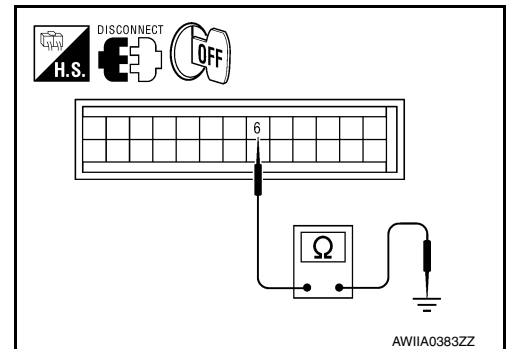
Connector	Terminal	Connector	Terminal	Continuity
M52	6	M148	2	Yes

2. Check continuity between front air control harness connector M52 terminal 6 and ground.

Connector	Terminal	—	Continuity
M52	6	Ground	No

Is the inspection result normal?

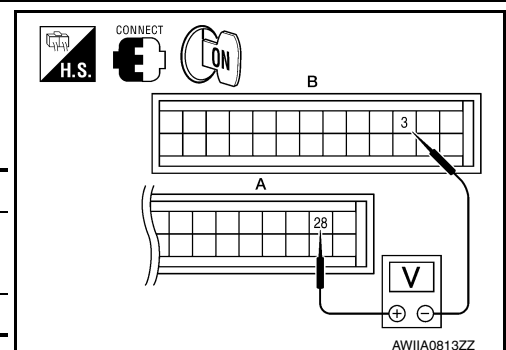
- YES >> GO TO 6.
 NO >> Repair or replace harness as necessary.



6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M52 (B) terminal 3, and M56 (A) terminal 28.

A		B		Voltage (Approx.)
Connector	Terminals (+)	Connector	Terminals (-)	
M56	28	M52	3	5 Volts



AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

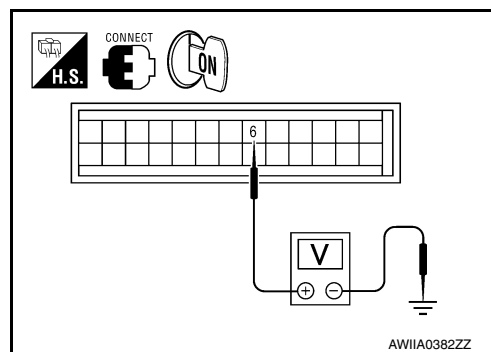
- Check voltage between front air control harness connector M52 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M52	6	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

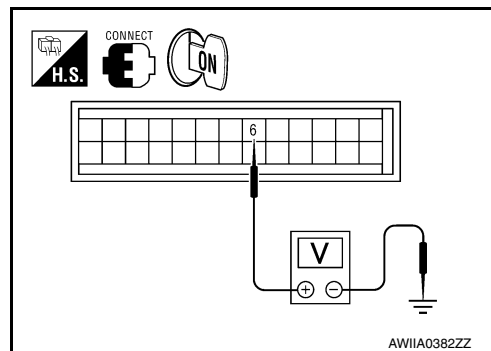
- Reconnect the air mix door motor (driver) harness connector M148.
- Check voltage between front air control harness connector M52 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M52	6	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect air mix door (driver) for binding or mechanical failure. If air mix door (driver) moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Replace air mix door motor (driver). Refer to [VTL-23, "Removal and Installation"](#).



Air Mix Door Motor (Passenger) Component Function Check

INFOID:000000012564997

HAC

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

- Turn the temperature control dial (passenger) clockwise until 32°C (90°F) is displayed.
- Check for hot air at discharge air outlets.

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

- Turn the temperature control dial (passenger) counterclockwise until 18°C (60°F) is displayed.
- Check for cold air at discharge air outlets.

Can a symptom be duplicated?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-29, "Air Mix Door Motor \(Passenger\) Diagnosis Procedure"](#).

Air Mix Door Motor (Passenger) Diagnosis Procedure

INFOID:000000012564998

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (PASSENGER)

1. CHECK AIR MIX DOOR MOTOR (PASSENGER) POSITION BALANCED RESISTOR (PBR) FEEDBACK VOLTAGE

- Turn ignition switch ON.

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

2. Using CONSULT, check "PAS MIX FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to [HAC-17, "CONSULT Function \(HVAC\)"](#).
3. Observe "PAS MIX FDBCK" voltage while rotating temperature control dial (passenger) between 32°C (90°F) and 18°C (60°F).

Monitor Item	Condition	Results
PAS MIX FDBCK	Rotate temperature control dial (passenger) between 32°C (90°F) and 18°C (60°F)	Voltage varies between 0.2 and 4.8 volts.

Is the inspection result normal?

- YES >> • Air mix door motor (passenger) is OK.
 • Inspect air mix door (passenger) for mechanical failure and repair if necessary. If air mix door (passenger) is OK, refer to [HAC-73, "Component Function Check"](#) for insufficient cooling or [HAC-81, "Component Function Check"](#) for insufficient heating.

NO >> GO TO 2.

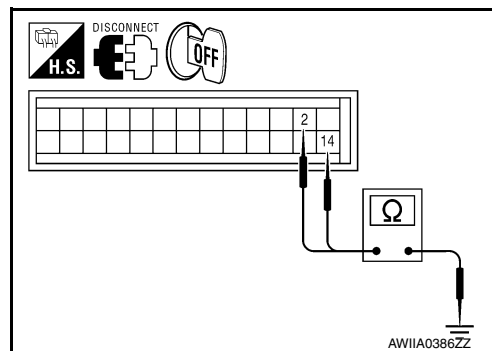
2. CHECK AIR MIX DOOR MOTOR (PASSENGER) CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M52 and the air mix door motor (passenger) harness connector M131.
3. Check continuity between front air control harness connector M52 terminals 2, 14 and the air mix door motor (passenger) harness connector M131 terminals 5, 6.

Connector	Terminal	Connector	Terminal	Continuity
M52	14	M131	6	Yes
	2		5	

4. Check continuity between front air control harness connector M52 terminals 2, 14 and ground.

Connector	Terminal	—	Continuity
M52	14	Ground	No
	2		



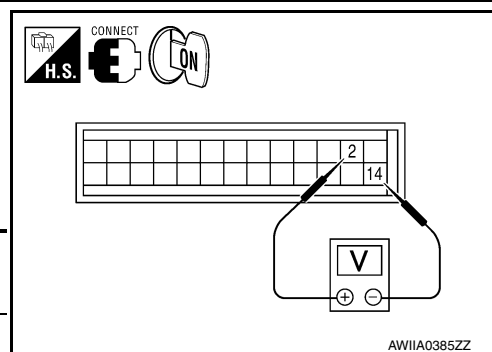
Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

3. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR (PASSENGER) POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate temperature control dial (passenger) to 32°C (90°F).
4. Check voltage between front air control harness connector M52 terminal 2 and terminal 14 while rotating temperature control dial (passenger) to 18°C (60°F) and back to 32°C (90°F).

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M52	2	14	While rotating temperature control dial (passenger) from 32°C (90°F) to 18°C (60°F)	Battery voltage
	14	2	While rotating temperature control dial (passenger) from 18°C (60°F) to 32°C (90°F)	Battery voltage



Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control Refer to [VTL-7, "Removal and Installation"](#).

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

4. CHECK AIR MIX DOOR MOTOR (PASSENGER) PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M52 terminal 3 and M56 terminal 28 and air mix door motor (passenger) harness connector M131 terminals 3, 1.

Connector	Terminal	Connector	Terminal	Continuity
M52	3	M131	3	Yes
M56	28		1	

4. Check continuity between front air control harness connector M52 terminal 3, M56 terminal 28 and ground.

Connector	Terminal	—	Continuity
M52	3	Ground	No
M56	28		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M56 terminal 29 and air mix door motor (passenger) harness connector M131 terminal 2.

Connector	Terminal	Connector	Terminal	Continuity
M56	29	M131	2	Yes

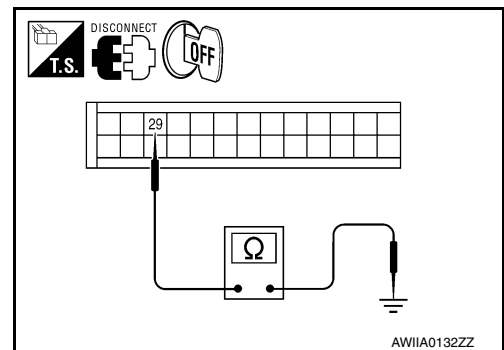
2. Check continuity between front air control harness connector M56 terminal 29 and ground.

Connector	Terminal	—	Continuity
M56	29	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

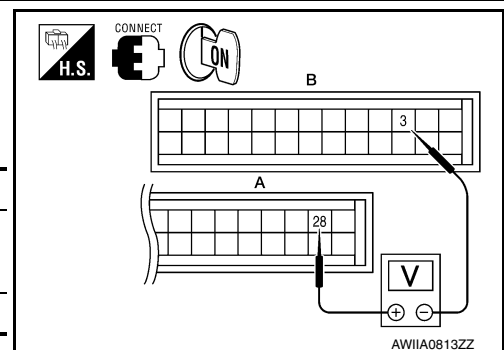
NO >> Repair or replace harness as necessary.



6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M52 (B) terminal 3, and M56 (A) terminal 28.

A		B		Voltage (Approx.)
Connector	Terminals (+)	Connector	Terminals (-)	
M56	28	M52	3	5 Volts



AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

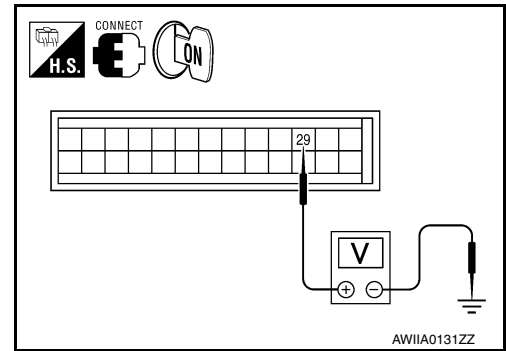
4. Check voltage between front air control harness connector M56 terminal 29 and ground.

Connector	Terminal	—	Voltage (Approx.)
M56	29	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

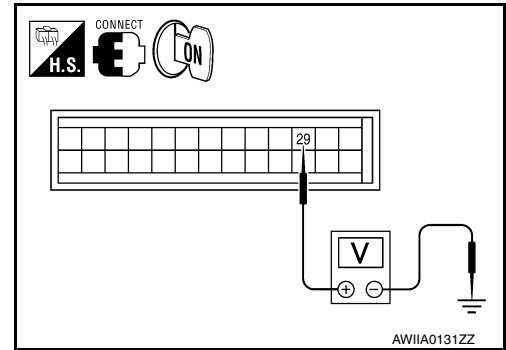
1. Reconnect the air mix door motor (passenger) harness connector M131.
2. Check voltage between front air control harness connector M56 terminal 29 and ground.

Connector	Terminal	—	Voltage (Approx.)
M56	29	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect air mix door (passenger) for binding or mechanical failure. If air mix door (passenger) moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Replace the air mix door motor (passenger). Refer to [VTL-23, "Removal and Installation"](#).



INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INTAKE DOOR MOTOR

System Description

INFOID:000000012564999

SYSTEM DESCRIPTION

SYMPTOM:

- Intake door motor does not operate normally.
- Intake door does not change.

SYSTEM DESCRIPTION

Component Parts

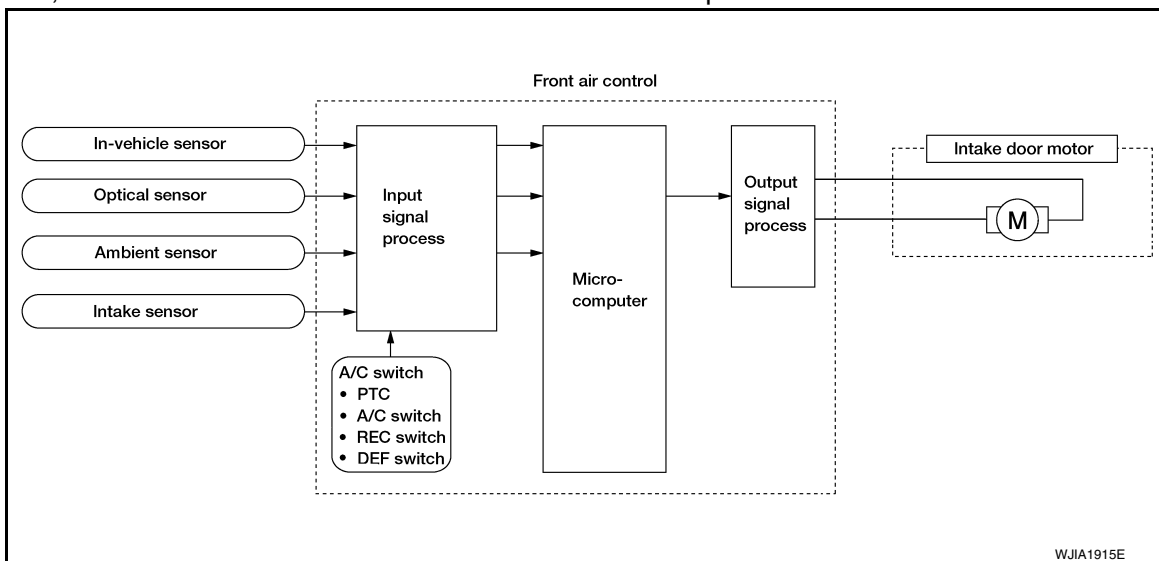
Intake door control system components are:

- Front air control
- Intake door motor (PRB built into the intake door motor)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

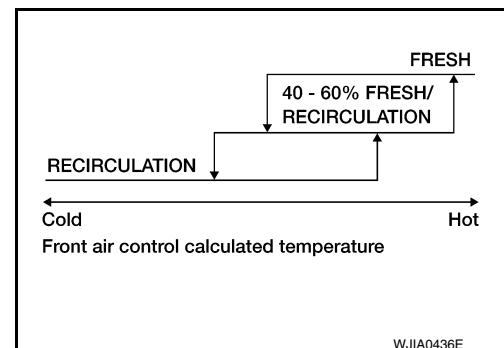
System Operation

The intake door control determines the intake door position based on the position of the recirculation switch. When the recirculation switch is depressed the intake door motor rotates closing off the fresh air inlet and recirculating the cabin air. If the recirculation switch is depressed again, the intake door motor rotates in the opposite direction, again allowing fresh air into the cabin.

In the AUTO mode, the front air control determines the intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the DEF, D/F, FOOT or OFF switches are pushed, the front air control sets the intake door at the fresh position.



Intake Door Control Specification



COMPONENT DESCRIPTION

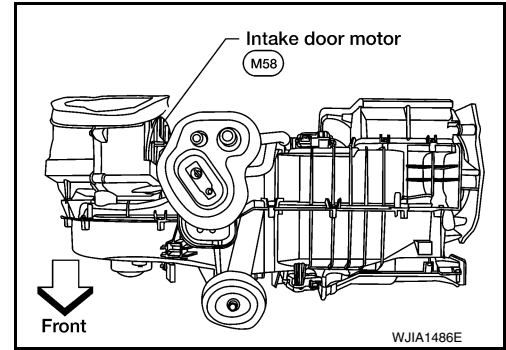
INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Intake door motor

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the front air control. Motor rotation is conveyed to a lever which activates the intake door.








INFOID:000000012565001

Intake Door Motor Component Function Check

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - REC ()

1. Press the mode switch to vent mode ().
2. Press REC () switch. The REC () indicator should illuminate.
3. Press REC () switch again. The REC () indicator should go out.
4. Listen for intake door position change (you should hear blower sound change slightly).

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-34, "Intake Door Motor Diagnosis Procedure"](#).

Intake Door Motor Diagnosis Procedure

INFOID:000000012565001

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

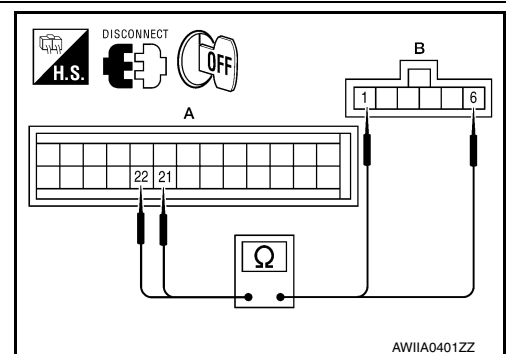
- Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M52 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M52 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M52	21	M58	6	Yes
	22		1	



INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

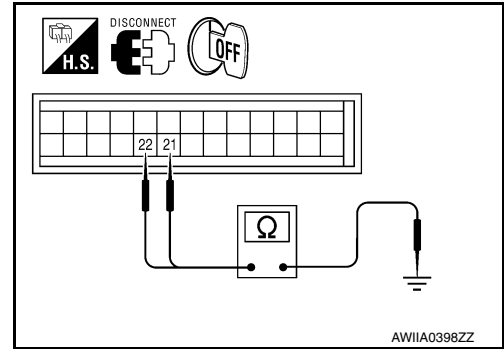
< DTC/CIRCUIT DIAGNOSIS >

- Check continuity between front air control harness connector M52 terminals 21, 22 and ground.

Connector	Terminal	—	Continuity
M52	21	Ground	No
	22		

Is the inspection result normal?

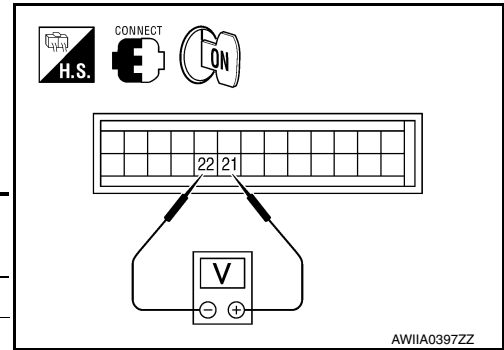
- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.



2. CHECK FRONT AIR CONTROL FOR INTAKE AIR DOOR MOTOR POWER AND GROUND

- Reconnect front air control harness connector.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M52 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M52	21	22	Self-diagnostic mode (opening)	Battery voltage
	22	21	Self-diagnostic mode (closing)	Battery voltage



Is the inspection result normal?

- YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-20. "Removal and Installation"](#).
 NO >> Replace front air control. Refer to [VTL-7. "Removal and Installation"](#).

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BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

BLOWER MOTOR CONTROL SYSTEM

System Description

INFOID:000000012565002

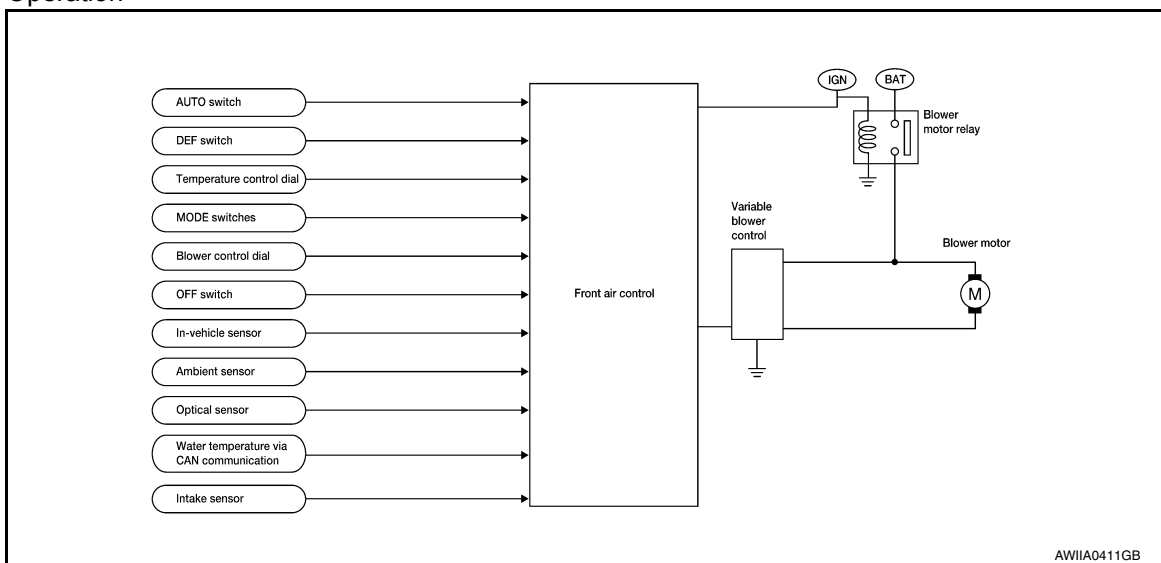
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

- Front air control
- Variable blower control
- Front blower motor relay
- Front blower motor
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the front air control and variable blower control based on input from the in-vehicle sensor, optical sensor, intake sensor and ambient sensor, and potentiometer temperature control (PTC).

When the air flow is increased, the blower motor speed is adjusted gradually to prevent a sudden increase in air flow.

In addition to manual air flow control and the usual automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

Starting Blower Speed Control

Start up from cold soak condition (Automatic mode).

In a cold start up condition where the engine coolant temperature is below 50°C (122°F), the blower will not operate at blower speed 1 for a short period of time (up to 210 seconds). The exact start delay time varies depending on the ambient and engine coolant temperatures.

In the most extreme case (very low ambient temperature) the blower starting delay will be 210 seconds as described above. After the coolant temperature reaches 50°C (122°F), or the 210 seconds has elapsed, the blower speed will increase to the objective blower speed.

Start up from usual operating or hot soak condition (Automatic mode).

The blower will begin operation momentarily after the AUTO switch is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

Blower Speed Compensation - Sunload

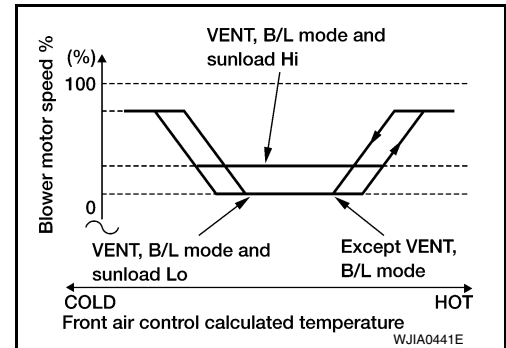
BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The speed will vary depending on the sunload. During conditions of low or no sunload, the blower operates at low speed. During high sunload conditions, the front air control causes the blower speed to increase.

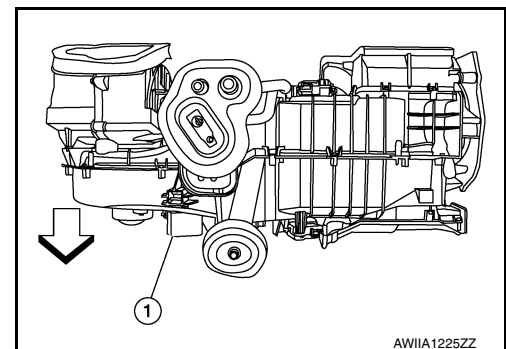
Blower Speed Control Specification



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control (1) is located on the cooling unit. The variable blower control receives a gate voltage from the front air control to steplessly maintain the blower motor voltage in the 0 to 5 volt range (approx.).



Front Blower Motor Component Function Check

INFOID:000000012565003

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

1. Rotate the blower control dial clockwise once. Blower motor should operate in low speed.
2. Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-37, "Front Blower Motor Diagnosis Procedure"](#).

Front Blower Motor Diagnosis Procedure

INFOID:000000012565004

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM: Blower motor operation is malfunctioning.

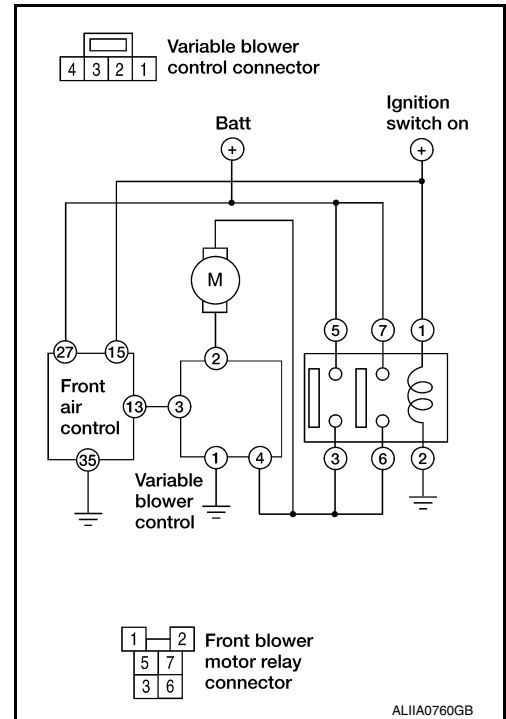
DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

SYMPTOM: Blower motor operation is malfunctioning under starting blower speed control.



1. CHECK FUSES

Check 15A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to [PG-77](#). "[Terminal Arrangement](#)".

Fuses are good.

Is the inspection result normal?

- YES >> GO TO 2.
- NO >> GO TO 9.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector.
3. Turn ignition switch ON.
4. Press the A/C switch.
5. Rotate blower control dial to maximum speed.
6. Check voltage between front blower motor harness connector M62 terminal 2 and ground.

2 - Ground : Battery voltage

Is the inspection result normal?

- YES >> GO TO 12.
- NO >> GO TO 3.

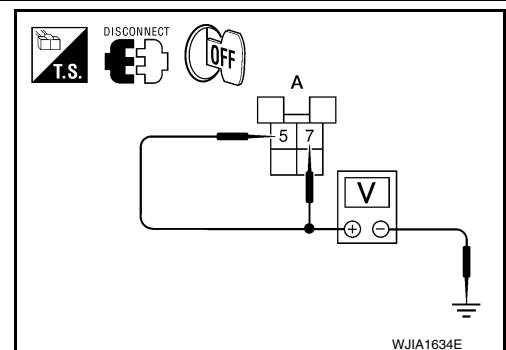
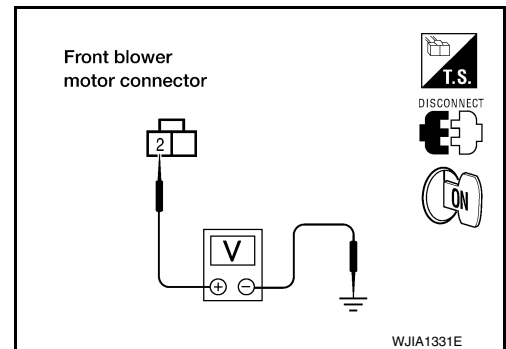
3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor relay.
3. Check voltage between front blower motor relay harness connector E54 terminals 5,7 and ground.

5, 7 - Ground : Battery voltage

Is the inspection result normal?

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



BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to [HAC-41, "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace front blower motor relay.

5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

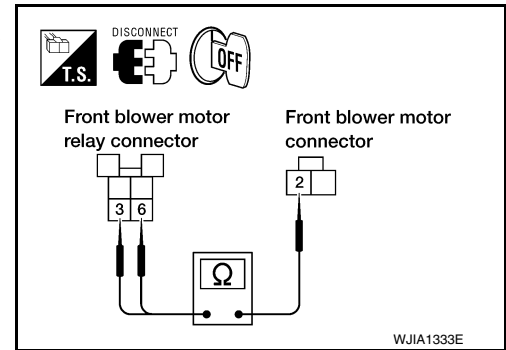
Check continuity between front blower motor relay harness connector E54 terminals 3, 6 and front blower motor harness connector M62 terminal 2.

3, 6 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.



6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

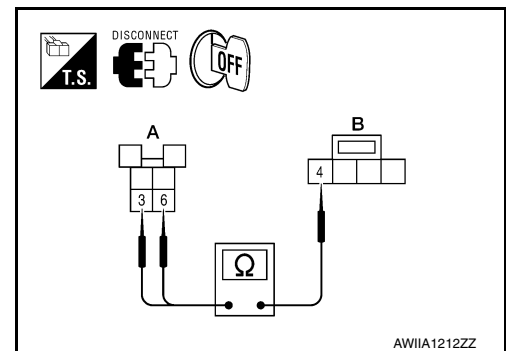
1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector E54 (A) terminals 3, 6 and variable blower control harness connector M121 (B) terminal 4.

3, 6 - 4 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.



7. CHECK FRONT BLOWER MOTOR RELAY (COIL SIDE) GROUND CIRCUIT

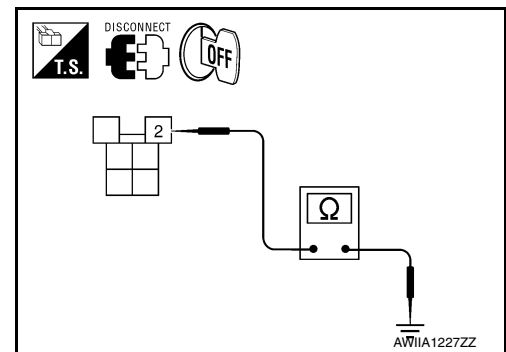
Check continuity between front blower motor relay harness connector E54 terminal 2 and ground.

2 - Ground : Continuity should exist

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.



8. CHECK FRONT BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

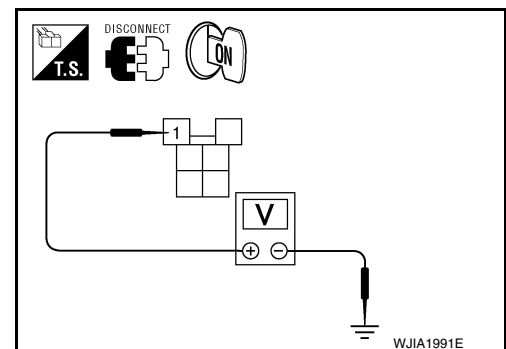
1. Turn ignition switch ON.
2. Check voltage between front blower motor relay harness connector E54 terminal 1 and ground.

1 - Ground : Battery voltage

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).

NO >> Repair front blower motor ground circuit or connector.



BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

9. REPLACE FUSES

Replace fuses.

Does the fuse blow?

- YES >> • If fuse blows without activating the front blower motor, repair short between fuse and front blower motor relay.
• If fuse blows activating the front blower motor, GO TO 10.

NO >> Inspection End.

10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

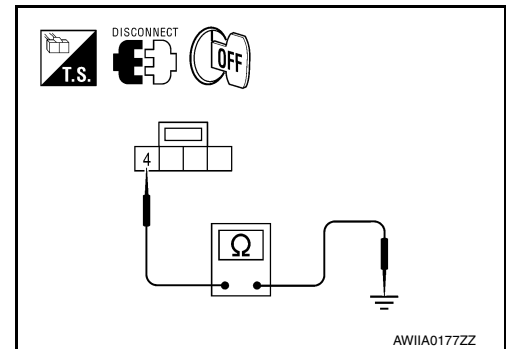
1. Turn ignition switch OFF.
2. Disconnect front blower motor connector and variable blower control connector.
3. Check continuity between variable blower control harness connector M121 terminal 4 and ground.

4 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.



11. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-41, "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).

NO >> Replace front blower motor. Refer to [VTL-11, "Removal and Installation"](#).

12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-41, "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace front blower motor. Refer to [VTL-11, "Removal and Installation"](#).

13. CHECK BLOWER MOTOR GROUND CIRCUIT

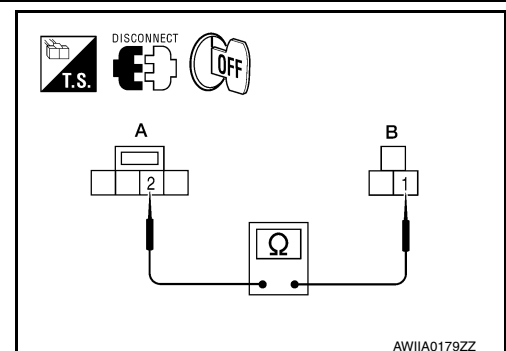
1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M121 (A) terminal 2.

1 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.



14. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

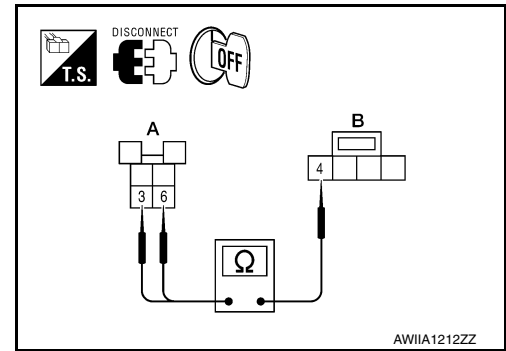
Check continuity between front blower motor relay harness connector E54 (A) terminals 3, 6 and variable blower control harness connector M121 (B) terminal 4.

3, 6 - 4 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair harness or connector.



15. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

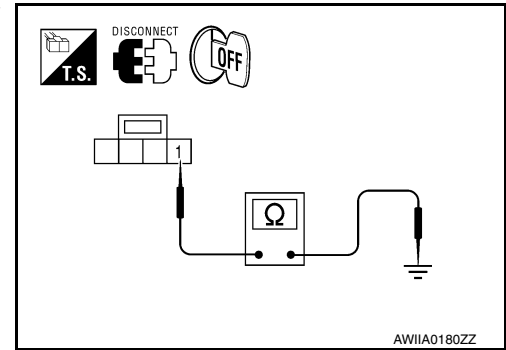
Check continuity between variable blower control harness connector M121 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 16.

NO >> Repair harness or connector.



16. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Reconnect all disconnected component connectors.
2. Disconnect front air control connector.
3. Turn ignition switch ON.
4. Turn blower control dial to maximum speed.
5. Check voltage between front air control harness connector M50 terminal 13 and ground.

13 - Ground Approx.: 4.5V

Is the inspection result normal?

YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> GO TO 17.

17. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

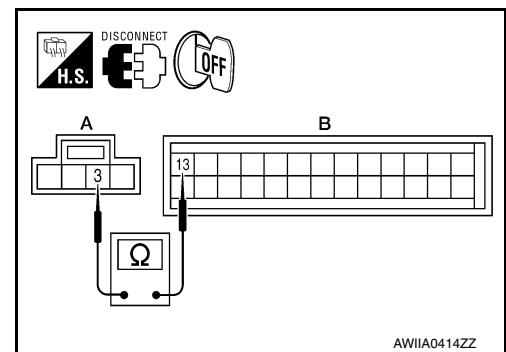
1. Turn ignition switch OFF.
2. Disconnect variable blower control.
3. Check continuity between front air control harness connector M50 (B) terminal 13 and variable blower control harness connector M121 (A) terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).

NO >> Repair harness or connector.



Front Blower Motor Component Inspection

INFOID:000000012565005

COMPONENT INSPECTION

Front Blower Motor Relay

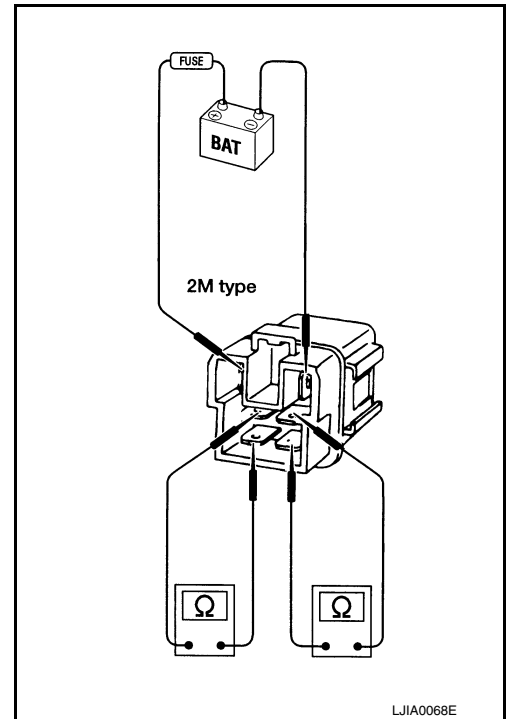
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BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Check continuity between terminals 3 and 5 and terminals 7 and 6 by supplying 12 volts and ground to coil side terminals 1 and 2 of the relay.



Front Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.
- Apply 12 volts to terminal 2 and ground to terminal 1 and verify that the motor operates freely and quietly.

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH

System Description

INFOID:0000000012565006

SYSTEM DESCRIPTION

The front air control controls compressor operation based on ambient and intake temperature and a signal from ECM.

Low Temperature Protection Control

The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor and the ambient sensor.

When intake air temperature is higher than the preset value, the compressor turns ON. The compressor turns OFF when intake air temperature is lower than the preset value. That preset value is dependent on the ambient temperature, refer to the following table.

Ambient temperature °C (°F)	Compressor ON intake temperature °C (°F)	Compressor OFF intake temperature °C (°F)
0 (32)	5.5 (42)	5.0 (41)
10 (50)	5.5 (42)	5.0 (41)
20 (68)	5.5 (42)	5.0 (41)
30 (86)	4.0 (39)	3.5 (38)
40 (104)	3.5 (38)	3.0 (37)
50 (122)	3.5 (38)	3.0 (37)

Magnet Clutch Component Function Check

INFOID:0000000012565007

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Turn ignition switch ON.
2. Press the A/C switch.
3. Press vent mode switch (↺).
4. Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-43, "Magnet Clutch Diagnosis Procedure"](#).

Magnet Clutch Diagnosis Procedure

INFOID:0000000012565008

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

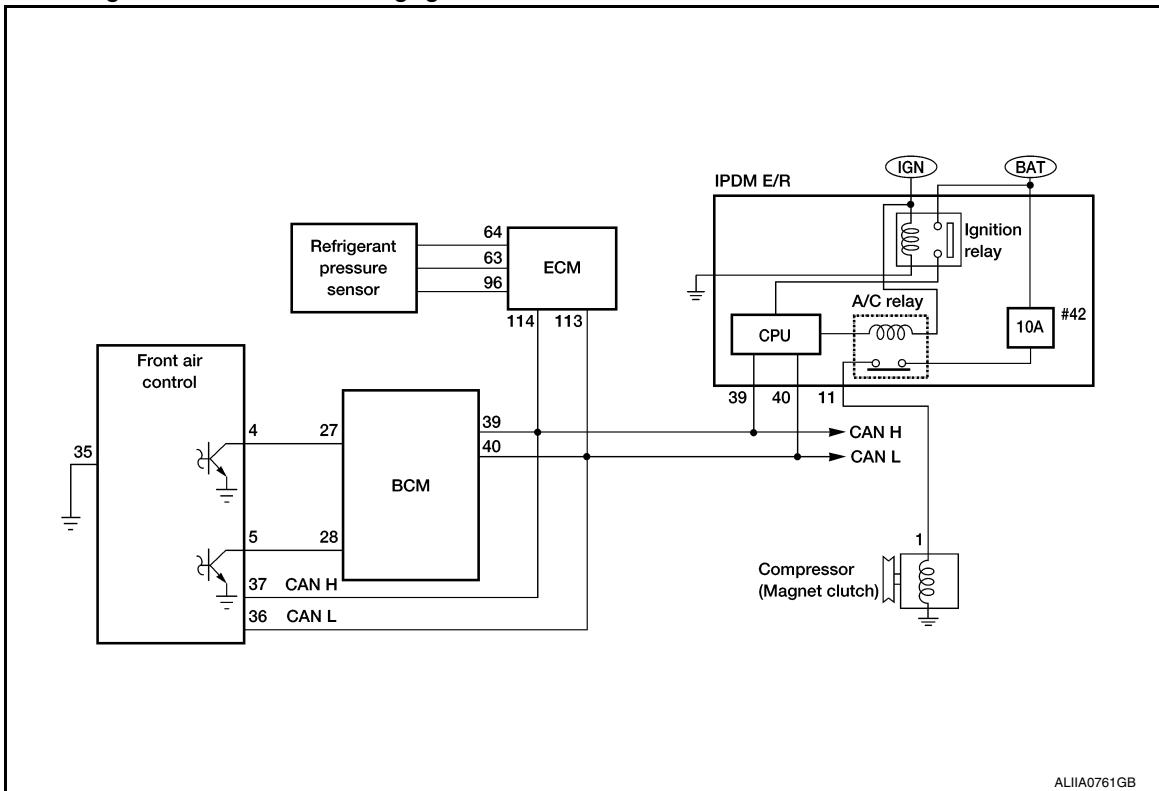
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MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK INTAKE AND AMBIENT SENSOR CIRCUITS

Check intake and ambient sensors. Refer to [HAC-20, "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

YES >> GO TO 2.

- NO >> • Malfunctioning intake sensor. Refer to [HAC-56, "Intake Sensor Diagnosis Procedure"](#).
 • Malfunctioning ambient sensor. Refer to [HAC-48, "Ambient Sensor Diagnosis Procedure"](#).

2. PERFORM AUTO ACTIVE TEST

Refer to [PCS-9, "Diagnosis Description"](#).

Does magnet clutch operate?

- YES >> • WITH CONSULT
 GO TO 5.
 • WITHOUT CONSULT
 GO TO 6.

NO >> Check 10A fuse (No. 42, located in IPDM E/R), and GO TO 3.

3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

- Turn ignition switch OFF.
- Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
- Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal 1.

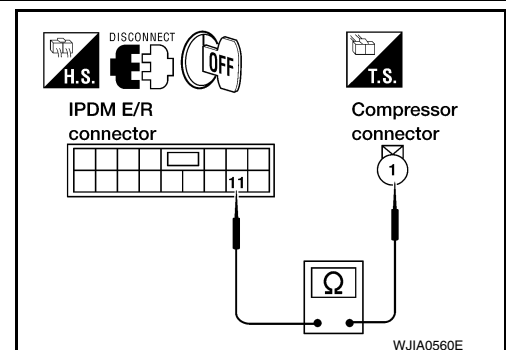
11 – 1 : Continuity should exist.

- Check continuity between IPDM E/R harness connector E119 terminal 11 and ground.

11 – ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 4.



MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair harness or connector.

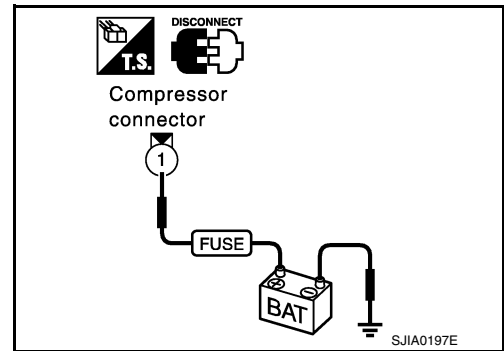
4. CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage direct current to terminal.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).

NO >> Replace magnet clutch. Refer to [HA-27, "Removal and Installation for Compressor Clutch"](#).



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to [HAC-19, "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

A/C SWITCH ON

:AIR COND SW ON

A/C SWITCH OFF

:AIR COND SW OFF

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

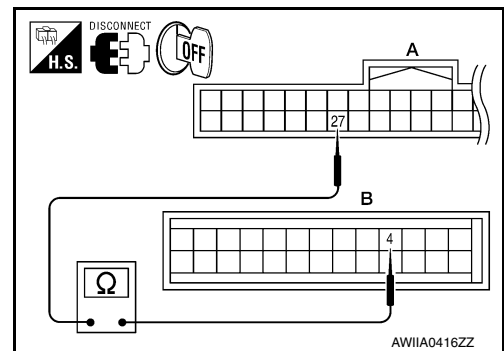
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 27 and front air control harness connector M52 (B) terminal 4.

27 - 4 Continuity should exist.

4. Check continuity between BCM harness connector M18 (A) terminal 27 and ground.

27 - ground Continuity should not exist.



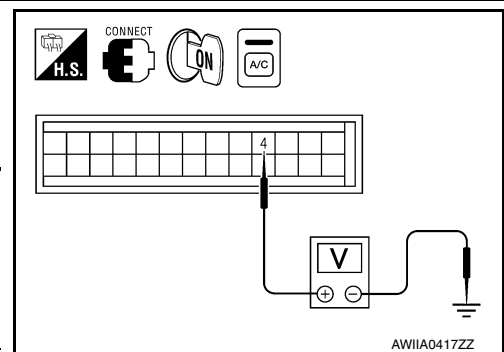
Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

7. CHECK VOLTAGE FOR FRONT AIR CONTROL (A/C COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M52 terminal 4 and ground.



Terminals		Condition	Voltage
(+)	(-)		
Front air control connector	Terminal No.		
M52	4	Ground	A/C switch: ON Approx. 0V
			A/C switch: OFF Approx. 5V

Is the inspection result normal?

YES >> GO TO 8.

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MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control Refer to [VTL-7. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-56. "Removal and Installation"](#).

8. CHECK REFRIGERANT PRESSURE SENSOR

1. Start engine.
2. Check voltage between ECM harness connector F57 terminal 63 and ground.

Terminals		Condition	Voltage
(+)	(-)		
ECM connector	Terminal No.		
F57	63	Ground	A/C switch: ON
			Approx. 0.36 - 3.88V

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Refer to [EC-969. "Diagnosis Procedure"](#).

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [HAC-19. "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

FRONT BLOWER CONTROL : FAN ON SIG ON
DIAL ON

FRONT BLOWER CONTROL : FAN ON SIG OFF
DIAL OFF

Is the inspection result normal?

- YES >> GO TO 12.
- NO >> GO TO 10.

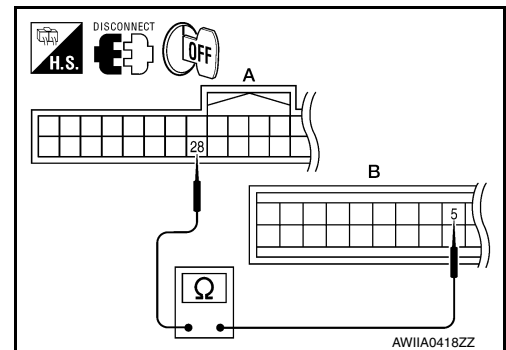
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M52 (B) terminal 5.

28 - 5 Continuity should exist.

4. Check continuity between BCM harness connector M18 (A) terminal 28 and ground.

28 - ground Continuity should not exist.



Is the inspection result normal?

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

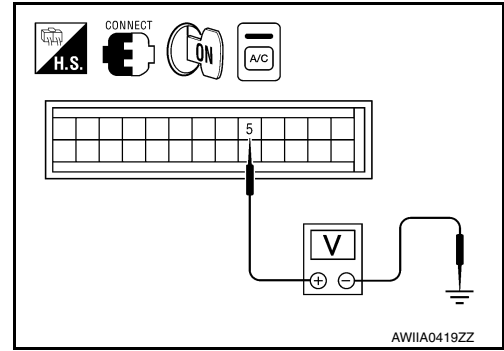
11. CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M52 terminal 5 and ground.



Terminals		Condition	Voltage
(+)	(-)		
Front air control connector	Terminal No.		
M52	5	A/C switch: ON Blower motor operates	Approx. 0V
		A/C switch: OFF	Approx. 5V

Is the inspection result normal?

YES >> GO TO 12.

NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-56, "Removal and Installation"](#).

12.CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-4, "System Description"](#).

- BCM – ECM
- ECM – IPDM E/R
- ECM – Front air control

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).

NO >> Repair or replace malfunctioning part(s).

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AMBIENT SENSOR

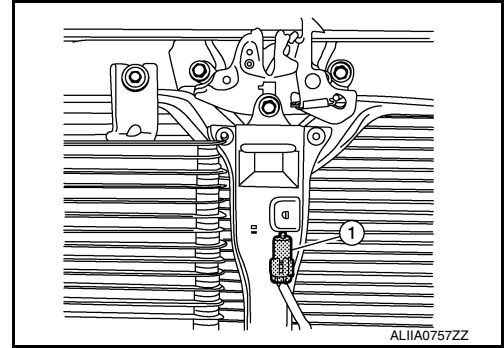
Component Description

INFOID:000000012565009

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor (1) is attached on the radiator core support (left side). It detects ambient temperature and converts it into a value which is then input into the front air control.



AMBIENT TEMPERATURE INPUT PROCESS

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

This prevents constant adjustments due to momentary conditions, such as stopping after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

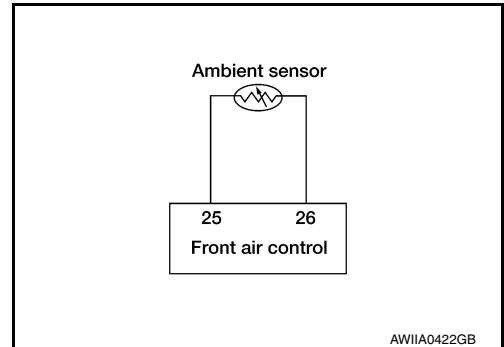
Ambient Sensor Diagnosis Procedure

INFOID:000000012565010

Regarding Wiring Diagram information, refer to [HAC-63. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. Using the CONSULT, DTC B257B or B257C is displayed. Without CONSULT, code 40 or 41 is indicated on front air control as a result of conducting the front air control self-diagnosis.



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

AMBIENT SENSOR

[AUTOMATIC AIR CONDITIONER]

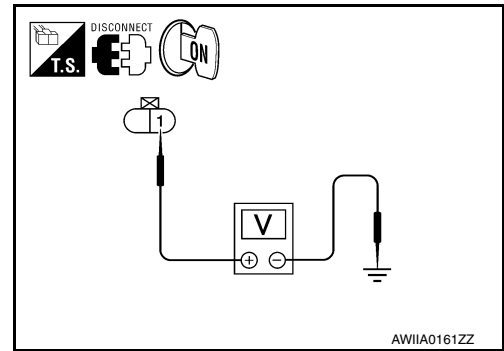
< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E28 terminal 1 and ground.

1 - Ground : Approx. 5V

Is the inspection result normal?

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



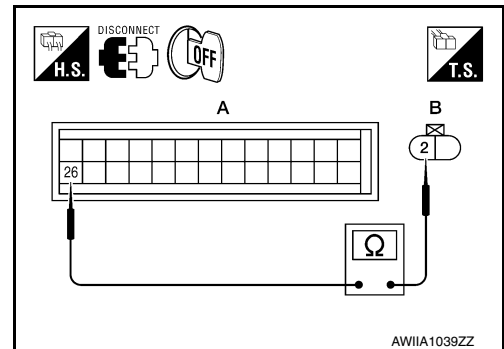
2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E28 (B) terminal 2 and front air control harness connector M52 (A) terminal 26.

2 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK AMBIENT SENSOR

Check the ambient sensor circuit. Refer to [HAC-49, "Ambient Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
2. GO TO [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
NO >> 1. Replace ambient sensor. Refer to [HA-35, "Removal and Installation"](#).
2. GO TO [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E28 (B) terminal 1 and front air control harness connector M52 (A) terminal 25.

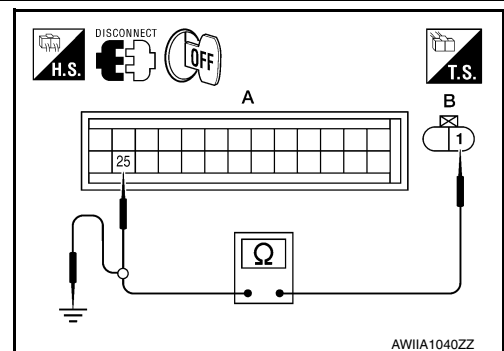
1 - 25 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E28 (B) terminal 2 and ground.

1 - Ground : Continuity should not exist.

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
2. GO TO [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
NO >> Repair harness or connector.



Ambient Sensor Component Inspection

INFOID:000000012565011

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor connector E28, measure resistance between terminals 1 and 2 at sensor component side, using the table below.

AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

If NG, replace ambient sensor. Refer to [HA-35, "Removal and Installation"](#).

IN-VEHICLE SENSOR

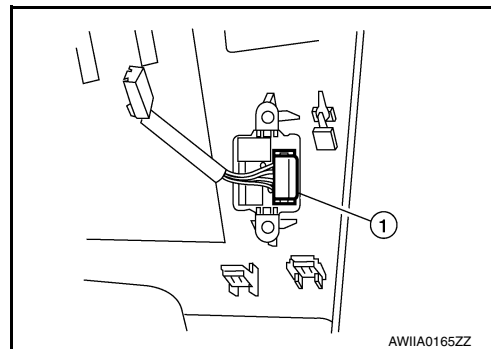
Component Description

INFOID:000000012565012

COMPONENT DESCRIPTION

In-vehicle Sensor

The in-vehicle sensor (1) is located on the lower instrument panel LH. It converts variations in temperature of passenger compartment air (drawn in through the integrated fan) into a resistance value. It is then input into the front air control.



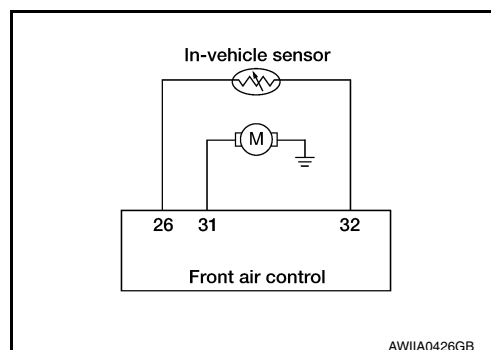
In-Vehicle Sensor Diagnosis Procedure

INFOID:000000012565013

Regarding Wiring Diagram information, refer to [HAC-63. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. Using the CONSULT, DTC B2578 or B2579 is displayed. Without a CONSULT, code 30, 31 is indicated on front air control as a result of conducting self-diagnosis.



1. CHECK IN-VEHICLE SENSOR CIRCUIT

Is self-diagnosis DTC B2578 or B2579 (with CONSULT) or code 30, 31 (without CONSULT) present?

YES or NO?

YES >> GO TO 6.

NO >> GO TO 2.

2. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M34 terminal 1 and ground.

1 - Ground : Approx. 5V.

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 5.

3. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector M52.
3. Check continuity between in-vehicle sensor harness connector M34 terminal 4 and front air control harness connector M52 terminal 26.

IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

4 - 26 : Continuity should exist.

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-52, "In-Vehicle Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
- 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
- NO >> 1. Replace in-vehicle sensor. Refer to [VTL-8, "Removal and Installation"](#).
- 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.

5. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between in-vehicle sensor harness connector M34 terminal 1 and front air control harness connector M56 terminal 32.

1 - 32 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M34 terminal 1 and ground.

1 - Ground Continuity should not exist.

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
- 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
- NO >> Repair harness or connector.

6. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR MOTOR AND FRONT AIR CONTROL (SELF-DIAGNOSIS CODES 30, 31 OR DTC B2578, B2579)

1. Turn ignition switch OFF.
2. Disconnect front air control connector and in-vehicle sensor connector.
3. Check continuity between in-vehicle sensor harness connector M34 (B) terminal 3 and front air control harness connector M56 (A) terminal 31.

3 - 31 : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M32 (B) terminal 3 and ground.

2 - Ground : Continuity should exist.

3 - Ground : Continuity should not exist.

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
- 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
- NO >> Repair harness or connector.

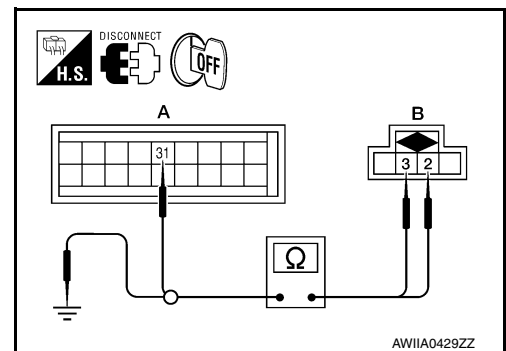
In-Vehicle Sensor Component Inspection

INFOID:000000012565014

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M34, measure resistance between terminals 1 and 4 at sensor component side, using the table below.



IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Temperature °C (°F)	Resistance kΩ
-15 (5)	21.40
-10 (14)	16.15
-5 (23)	12.29
0 (32)	9.41
5 (41)	7.27
10 (50)	5.66
15 (59)	4.45
20 (68)	3.51
25 (77)	2.79
30 (86)	2.24
35 (95)	1.80
40 (104)	1.45
45 (113)	1.18

If NG, replace in-vehicle sensor. Refer to [VTL-8, "Removal and Installation"](#).

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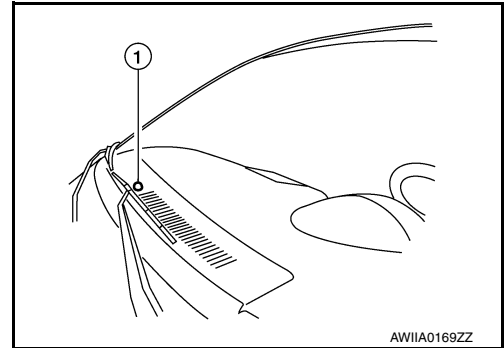
OPTICAL SENSOR

Component Description

INFOID:000000012565015

COMPONENT DESCRIPTION

The optical sensor (1) is located in the center of the defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the front air control.



OPTICAL INPUT PROCESS

The front air control includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents adjustments in the ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the optical sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

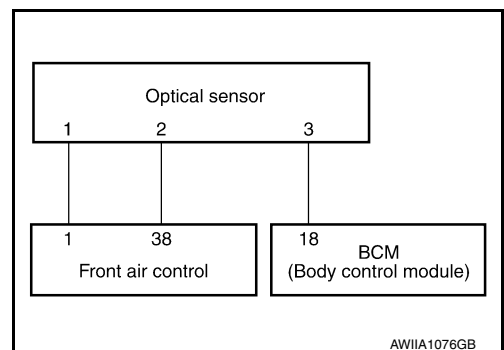
Optical Sensor Diagnosis Procedure

INFOID:000000012565016

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR OPTICAL SENSOR

SYMPTOM: Optical sensor circuit is open or shorted. Using the CONSULT, DTC B257F or B2580 is displayed. Without a CONSULT, code 50 or 52 is indicated on front air control as a result of conducting self-diagnosis.



1. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND FRONT AIR CONTROL

OPTICAL SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

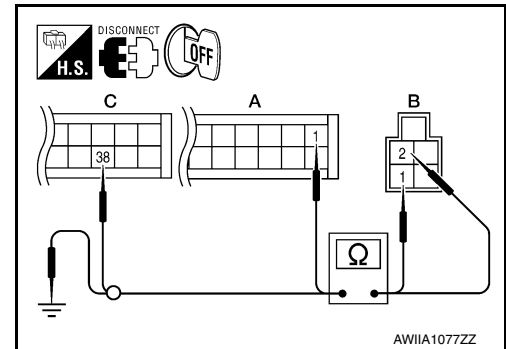
1. Turn ignition switch OFF.
2. Disconnect front air control connector and optical sensor connector.
3. Check continuity between optical sensor harness connector M14 (B) terminals 1 and 2 and front air control harness connector M56 (C) terminal 38 and M52 (A) terminal 1.

1 - 1 : Continuity should exist.

2 - 38 : Continuity should exist.

4. Check continuity between optical sensor harness connector M14 (B) terminal 1 and 2 and ground.

1, 2 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

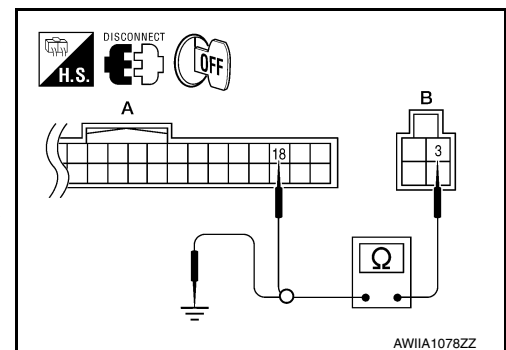
2. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND BCM

1. Disconnect BCM connector.
2. Check continuity between optical sensor harness connector M14 (B) terminal 3 and BCM harness connector M18 (A) terminal 18.

3 - 18 : Continuity should exist.

3. Check continuity between optical sensor harness connector M14 (B) terminal 4 and ground.

3 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace optical sensor. Refer to [VTL-9, "Removal and Installation"](#).

NO >> Repair harness or connector.

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INTAKE SENSOR

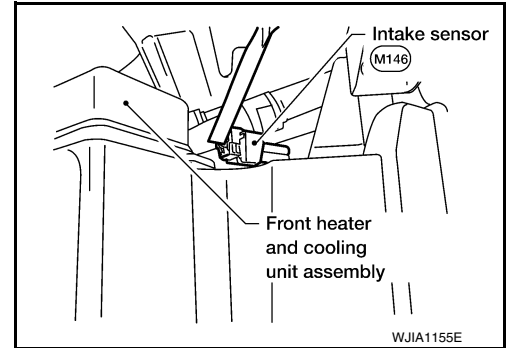
System Description

INFOID:000000012565017

COMPONENT DESCRIPTION

Intake Sensor

The intake sensor is located on the heater & cooling unit assembly. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the front air control.



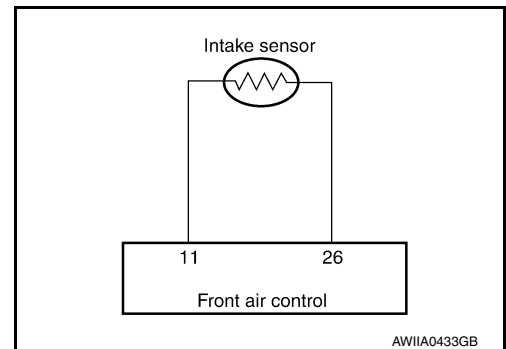
Intake Sensor Diagnosis Procedure

INFOID:000000012565018

Regarding Wiring Diagram information, refer to [HAC-63. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. Using the CONSULT, DTC B2581 or B2582 is displayed. Without a CONSULT, code 56 or 57 is indicated on front air control as a result of conducting self-diagnosis.



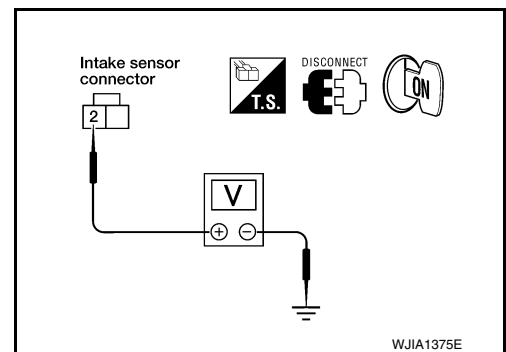
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

2 - Ground : Approx. 5V

Is the inspection result normal?

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



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

INTAKE SENSOR

[AUTOMATIC AIR CONDITIONER]

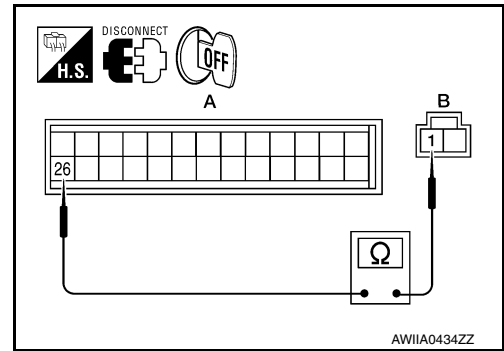
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M52 (A) terminal 26.

1 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-57, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
 NO >> 1. Replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).
 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.

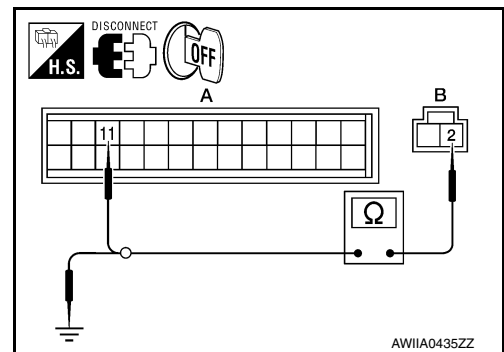
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M52 (A) terminal 11.

2 - 11 : Continuity should exist.

4. Check continuity between intake sensor harness connector M146 (B) terminal 2 and ground.

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
 2. Go to [HAC-20, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
 NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:000000012565019

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Temperature °C (°F)	Resistance kΩ
30 (86)	24.2
35 (95)	19.7
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-10. "Removal and Installation"](#).

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

INFOID:000000012565020

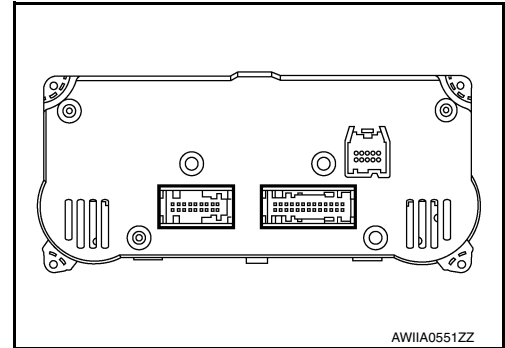
COMPONENT DESCRIPTION

Front Air Control

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

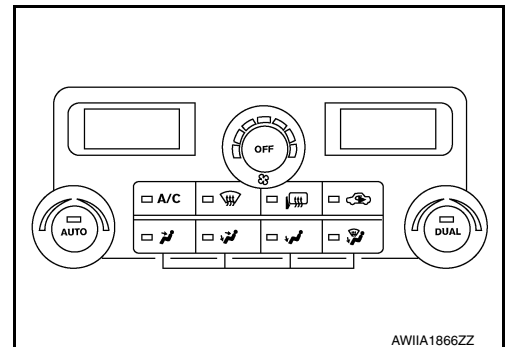
The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.

Self-diagnostic functions are also built into the front air control to provide quick check of malfunctions in the auto air conditioner system.



Potential Temperature Control (PTC)

There are two PTCs (driver and passenger) built into the front air control. They can be set at an interval of 0.5°C (1.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by rotating the temperature dial. The set temperature is displayed.



Front Air Control Component Function Check

INFOID:000000012565021

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - AUTO MODE

1. Press AUTO switch.
2. Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

Is the inspection result normal?

- YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to [HAC-59, "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000012565022

Regarding Wiring Diagram information, refer to [HAC-63, "Wiring Diagram - Automatic Air Conditioner"](#).

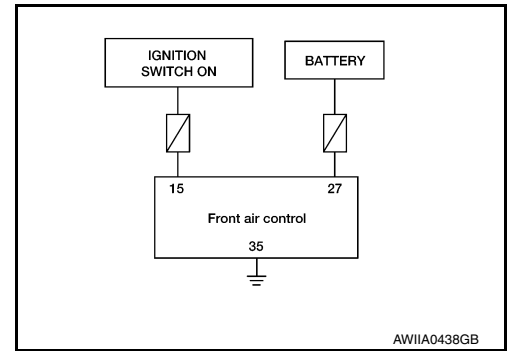
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

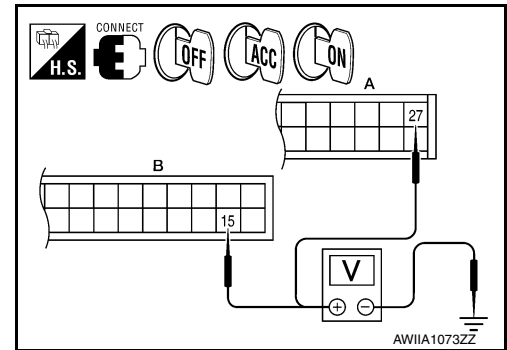
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

1. Turn ignition switch ON.
2. Check voltage between front air control harness connector M52 (B) terminal 15 and M56 (A) terminal 27, and ground.

Terminals		Ignition switch position			
(+)		(-)	OFF	ACC	ON
Front air control connector	Terminal No.				
M52	15	Ground	Approx. 0V	Approx. 0V	Battery voltage
M56	27		Battery voltage	Battery voltage	Battery voltage



Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-76, "Terminal Arrangement"](#).

- If fuses are OK, check harness for open circuit. Repair or replace as necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace as necessary.

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

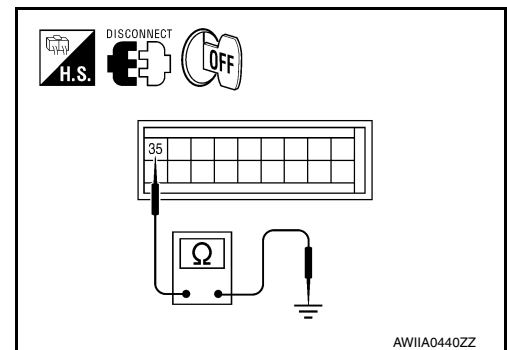
1. Turn ignition switch OFF.
2. Disconnect front air control connectors.
3. Check continuity between front air control harness connector M56 terminal 35 and ground.

35 - Ground : Continuity should exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NG >> Repair harness or connector.



AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

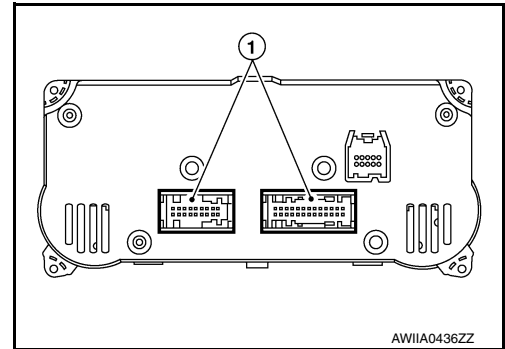
ECU DIAGNOSIS INFORMATION

AIR CONDITIONER CONTROL

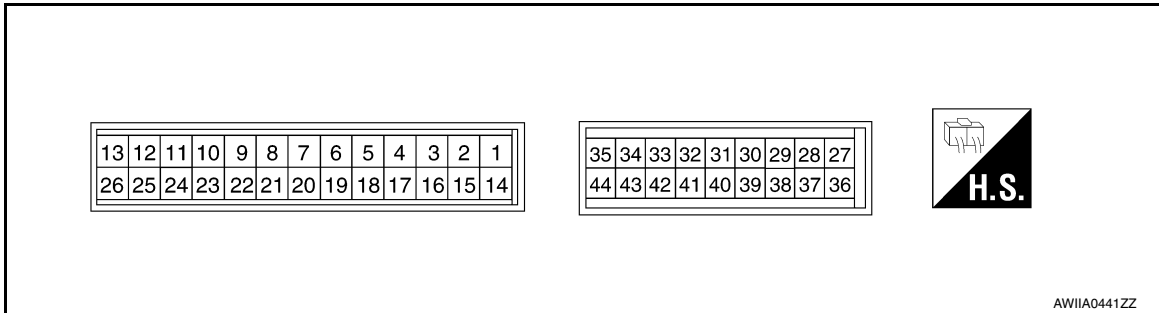
Front Air Control Terminals Reference Values

INFOID:000000012565023

Measure voltage between each terminal and ground by following Terminals and Reference Value for front air control (1).



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	G	Optical sensor (driver)	ON	-	0 - 5V
2	L	Air mix door motor (passenger) CCW	ON	-	Battery voltage
3	P	V ref ACTR (ground)	ON	-	0V
4	W	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
5	R	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
6	SB	Air mix door motor (driver) feedback	ON	-	0 - 5V
7	V	Mode door motor feedback	ON	-	0 - 5V
8	G	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	 PIIA2344E
11	L	Intake sensor	ON	-	0 - 5V
13	R	Variable blower control	ON	-	0 - 5V
14	LG	Air mix door motor (passenger) CW	ON	Clockwise rotation	Battery voltage
15	W/G	Power supply for IGN	ON	-	Battery voltage

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
16	Y	Rear defogger request *1	ON		Battery voltage
17	GR	Air mix door motor (driver) CW	ON	Clockwise rotation	Battery voltage
18	BR	Air mix door motor (driver) CCW	ON	Counterclockwise rotation	Battery voltage
19	L	Mode door motor CW	ON	Clockwise rotation	Battery voltage
20	BR	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	BG	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
22	Y	Intake door motor CW	ON	Clockwise rotation	Battery voltage
25	W	Ambient sensor	ON	-	0 - 5V
26	V	Sensor ground	ON	-	0V
27	R/Y	Power supply for BAT	-	-	Battery voltage
28	Y	V ref ACTR (5V)	ON	-	0 - 5V
29	SB	Air mix door motor (passenger) feed-back	ON	-	0 - 5V
31	BR	In-vehicle sensor motor (+)	ON	-	Battery voltage
32	LG	In-vehicle sensor signal	ON	-	0 - 5V
35	B	Ground	-	-	0V
36	P	CAN-L	ON	-	0 - 5V
37	L	CAN-H	ON	-	0 - 5V
38	GR	Optical sensor (passenger)	ON	-	0 - 5V

*1: If equipped

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

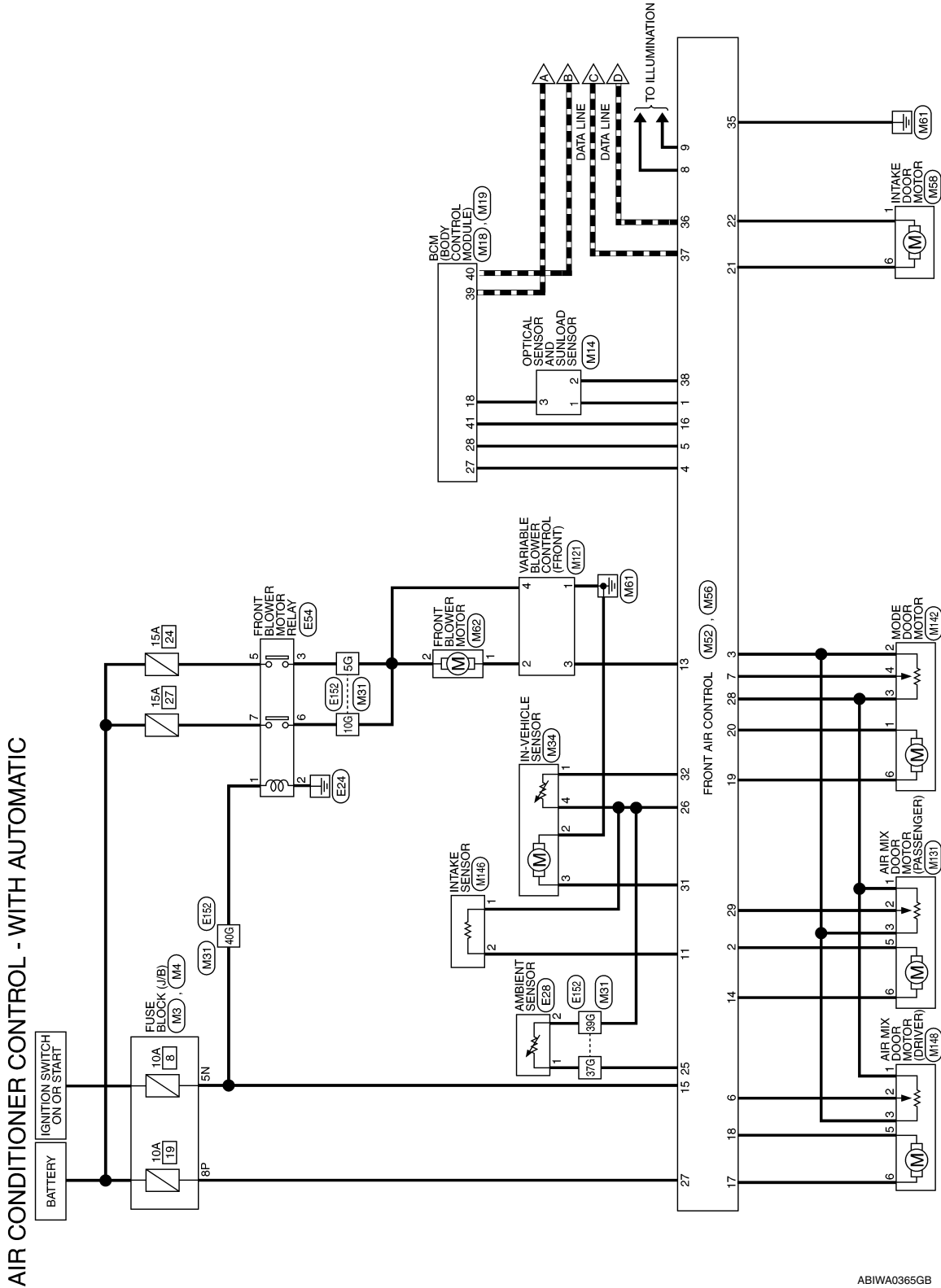
< WIRING DIAGRAM >

WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - Automatic Air Conditioner

INFOID:000000012565024



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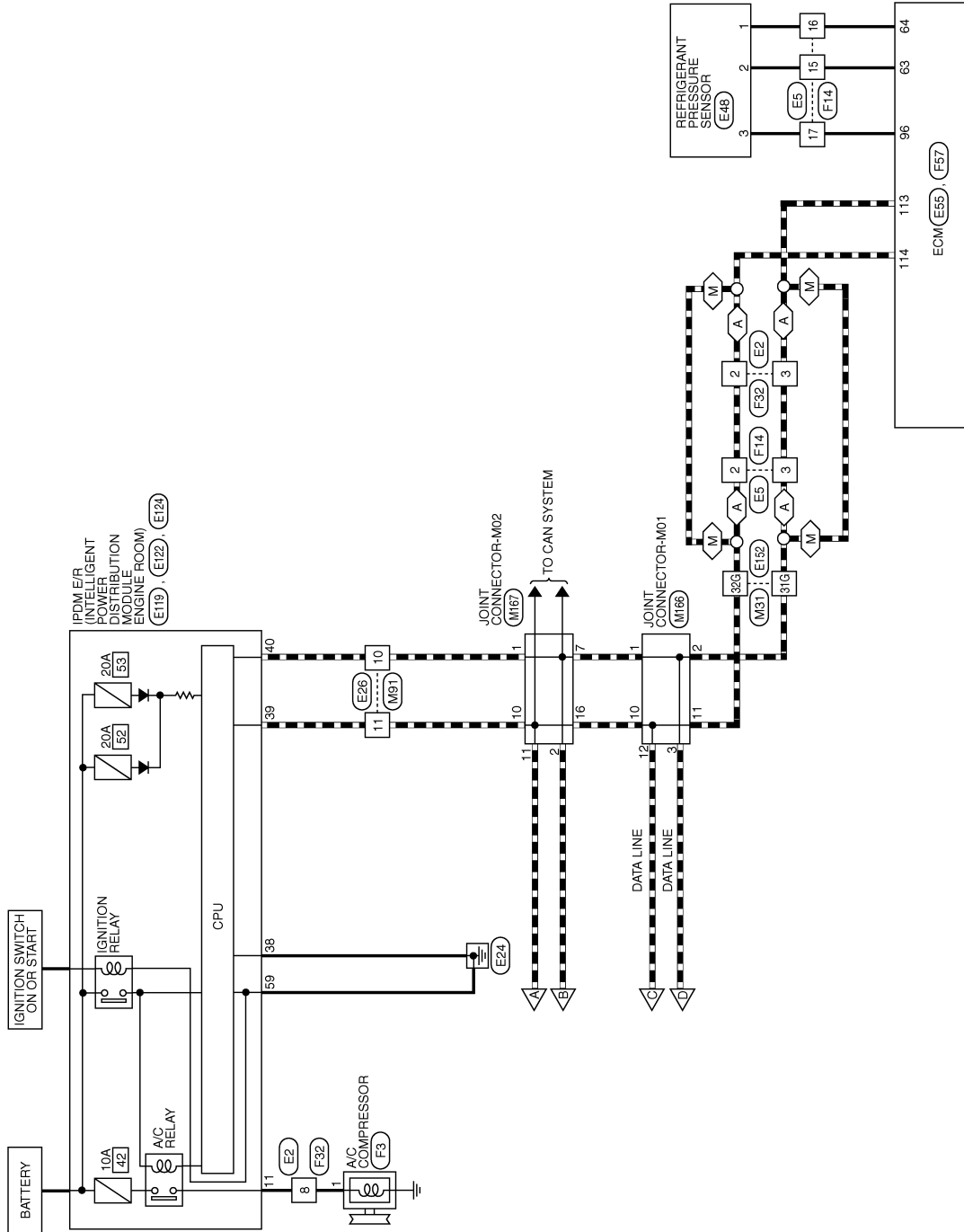
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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

A : WITH AVT
M : WITH MT



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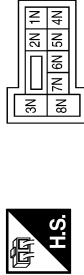
AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

AIR CONDITIONER CONTROL CONNECTORS - WITH AUTOMATIC

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



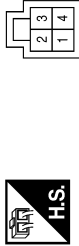
Terminal No.	5N	Color of Wire	W/G	Signal Name	-
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Connector No.	M4
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



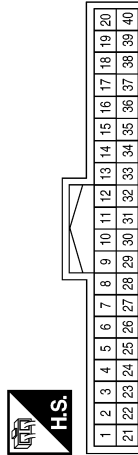
Terminal No.	8P	Color of Wire	R/Y	Signal Name	-
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Connector No.	M14
Connector Name	OPTICAL SENSOR AND SUNLOAD SENSOR
Connector Color	BLACK



Terminal No.	1	Color of Wire	G	Signal Name	-
2	GR	-	-	-	
3	P	-	-	-	

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



Terminal No.	18	Color of Wire	BR	Signal Name	KEYLESS & AUTO LIGHT SENSOR GND
27	W	AIRCON SW			
28	R	BLOWER FAN SW			
39	L	CAN-H			
40	P	CAN-L			

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	41	Color of Wire	Y	Signal Name	REAR DEFOGGER SW
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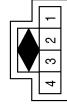
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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

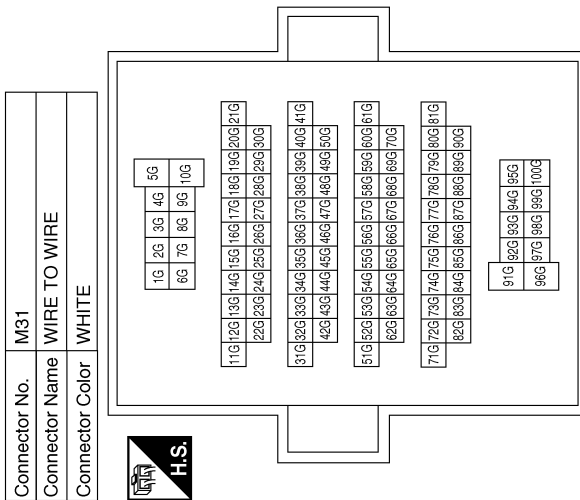
< WIRING DIAGRAM >

Connector No.	M34
Connector Name	IN-VEHICLE SENSOR
Connector Color	WHITE



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

Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
37G	W	-
39G	V	-
40G	W/G	-



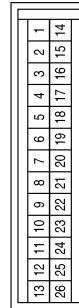
Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
15	W/G	IGN
16	Y	REAR DEFROST REQUEST
17	GR	DR BLEND DOOR A
18	BR	DR BLEND DOOR B
19	L	MODE A
20	BR	MODE B
21	BG	INTAKE A
22	Y	INTAKE B
23	-	-
24	-	-
25	W	AMB TEMP SENS
26	V	SENSOR RETURN

Terminal No.	Color of Wire	Signal Name
4	W	A/C REQUEST
5	R	FAN ON
6	SB	DR BLEND DOOR FEED BACK
7	V	MODE FEED BACK
8	G	ILLUM+
9	BR	ILLUM-
10	-	-
11	L	DISCHARGE AIR TEMP SENS
12	-	-
13	R	FRONT BLOWER VBC
14	LG	PASS BLEND DR A

Connector No.	M52
Connector Name	FRONT AIR CONTROL (WITH AUTO A/C)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	G	SUNLOAD SEN LEFT (DR)
2	L	PASS BLEND DR B
3	P	V REF RETURN (GND)

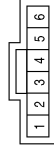
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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

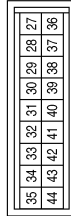
Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
6	BG	-

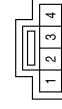
Terminal No.	Color of Wire	Signal Name
32	LG	IN CAR TEMP SEN
33	-	-
34	-	-
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	GR	SUNLOAD SEN RIGHT (PASS)
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	-	-

Connector No.	M56
Connector Name	FRONT AIR CONTROL (WITH AUTO A/C)
Connector Color	WHITE



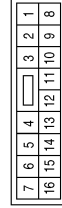
Terminal No.	Color of Wire	Signal Name
27	R/Y	B
28	Y	V REF. ACTR (5V)
29	SB	PASS BLEND DR FEED BACK
30	-	-
31	BR	IN CAR MTR+

Connector No.	M121
Connector Name	VARIABLE BLOWER CONTROL (FRONT)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	B	-
2	L	-
3	R	-(WITH AUTO A/C)
4	W/G	-

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

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



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

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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

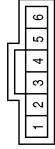
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Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



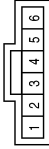
Terminal No.	Color of Wire	Signal Name
1	V	-
2	L	-

Connector No.	M142
Connector Name	MODE DOOR MOTOR
Connector Color	BLACK



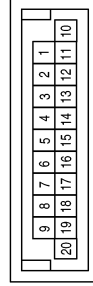
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	P	-
3	G	-
4	V	-
6	L	-(WITH AUTO A/C)

Connector No.	M131
Connector Name	AIR MIX DOOR MOTOR (PASSENGER)
Connector Color	BLACK



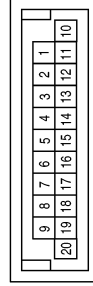
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-
3	R	-
5	L	-
6	LG	-

Connector No.	M167
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
7	P	-
10	L	-
11	L	-
16	L	-

Connector No.	M166
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
3	P	-
10	L	-
11	L	-
12	L	-

Connector No.	M148
Connector Name	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-
3	P	-
5	BR	-
6	GR	-

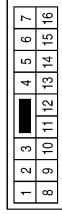
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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

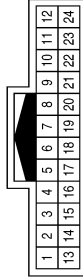
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Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Color	WHITE



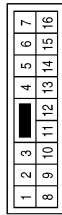
Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

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



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	LG	-(EXCEPT FOR MEXICO)
17	P	-

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



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

Connector No.	E54
Connector Name	FRONT BLOWER MOTOR RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	B	-
3	W/G	-
5	L	-
6	W/G	-
7	GR	-

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



Terminal No.	Color of Wire	Signal Name
1	LG	-(EXCEPT FOR MEXICO)
2	BR	-
3	P	-

Connector No.	E28
Connector Name	AMBIENT SENSOR
Connector Color	BLACK



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

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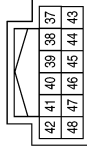
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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

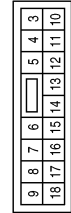
< WIRING DIAGRAM >

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



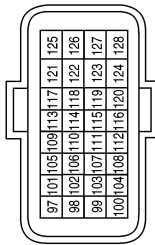
Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

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



Terminal No.	Color of Wire	Signal Name
11	Y	A/C COMPRESSOR

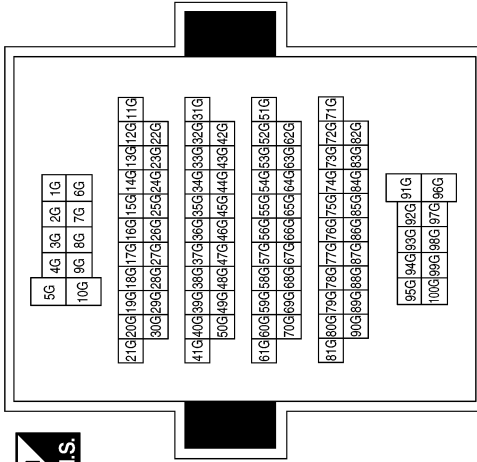
Connector No.	E55
Connector Name	ECM (WITH VQ40DE EXCEPT FOR MEXICO)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
113	P	CAN-L
114	L	CAN-H

Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
37G	W	-
39G	V	-
40G	W/G	-

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



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



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

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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

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



7	6	5	4	3	2	1		
16	15	14	13	12	11	10	9	8

Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

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



12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	LG	-(EXCEPT FOR MEXICO)
17	P	-

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



Terminal No.	Color of Wire	Signal Name
1	Y	-

Connector No.	F57
Connector Name	ECM (WITH VQ40DE EXCEPT FOR MEXICO)
Connector Color	BROWN



96	92	88	84	80	76	72	68	64	60	56	52
95	91	87	83	79	75	71	67	63	59	55	51
94	90	86	82	78	74	70	66	62	58	54	50
93	89	85	81	77	73	69	65	61	57	53	49

Terminal No.	Color of Wire	Signal Name
63	BR	PDPRES
64	LG	GMDA-PDPRES
96	P	AVCC (PDPRES)

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AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000012565025

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-59
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-20
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-22
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-26
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-34
Intake door motor is malfunctioning.		
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-37
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-43
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-73
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-81
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-83
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-20
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-85

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

INSUFFICIENT COOLING

Component Function Check

INFOID:0000000012565026

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Press the AUTO switch.
2. Turn temperature control dial (driver) counterclockwise until 18°C (60°F) is displayed.
3. Check for cold air at discharge air outlets.

Can the symptom be duplicated?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-6. "Operational Check"](#).

Does another symptom exist?

YES >> Refer to [HAC-72. "Symptom Matrix Chart"](#).

NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis Refer to [HAC-20. "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Refer to [HAC-20. "Front Air Control Self-Diagnosis Code Chart"](#).

5. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-130. "Checking Drive Belts"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust or replace compressor belt. Refer to [EM-130. "Removal and Installation"](#).

6. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to [HAC-26. "Air Mix Door Motor \(Driver\) Component Function Check"](#).

Does air mix door operate correctly?

YES >> GO TO 7.

NO >> Check air mix door motor circuit. Refer to [HAC-26. "Air Mix Door Motor \(Driver\) Diagnosis Procedure"](#) or [HAC-29. "Air Mix Door Motor \(Passenger\) Diagnosis Procedure"](#).

7. CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to [EC-856. "Overall Function Check"](#).

Does cooling fan motor operate correctly?

YES >> GO TO 8.

NO >> Check cooling fan motor. Refer to [EC-857. "Diagnosis Procedure"](#).

8. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

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INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

>> GO TO 9.

9. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.
2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check contaminated refrigerant. Refer to [HAC-86, "Working with HFC-134a \(R-134a\)"](#).

10. CHECK FOR EVAPORATOR FREEZE UP

Start engine and run A/C. Check for evaporator freeze up.

Does evaporator freeze up?

YES >> Perform performance test diagnoses. Refer to [HAC-74, "Diagnostic Work Flow"](#).

NO >> GO TO 11.

11. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-76, "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to [HAC-74, "Diagnostic Work Flow"](#).

NO >> GO TO 12.

12. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

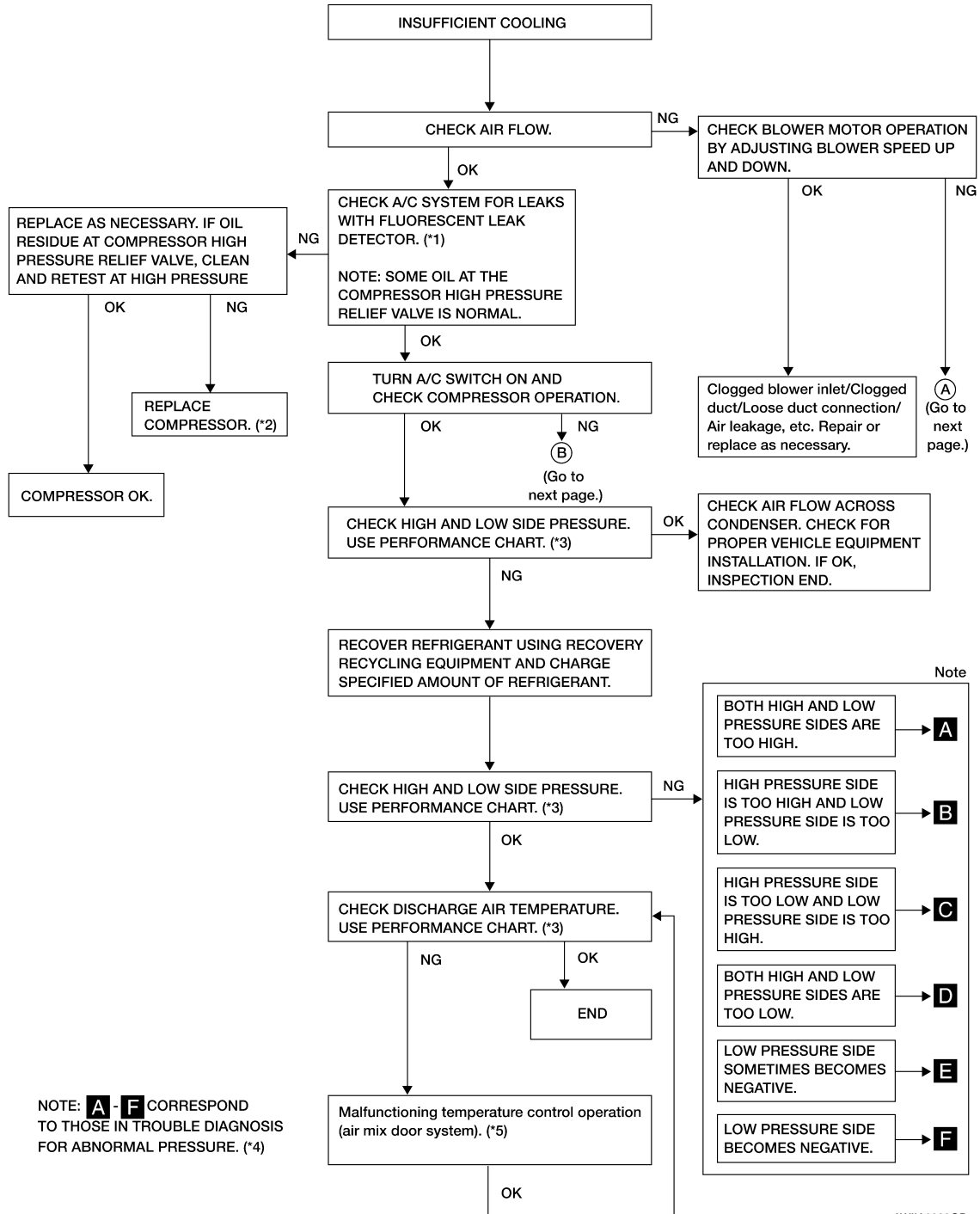
Diagnostic Work Flow

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INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >



*1 [HA-18. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-25. "Removal and Installation for Compressor"](#)

*3 [HAC-76. "Performance Chart"](#)

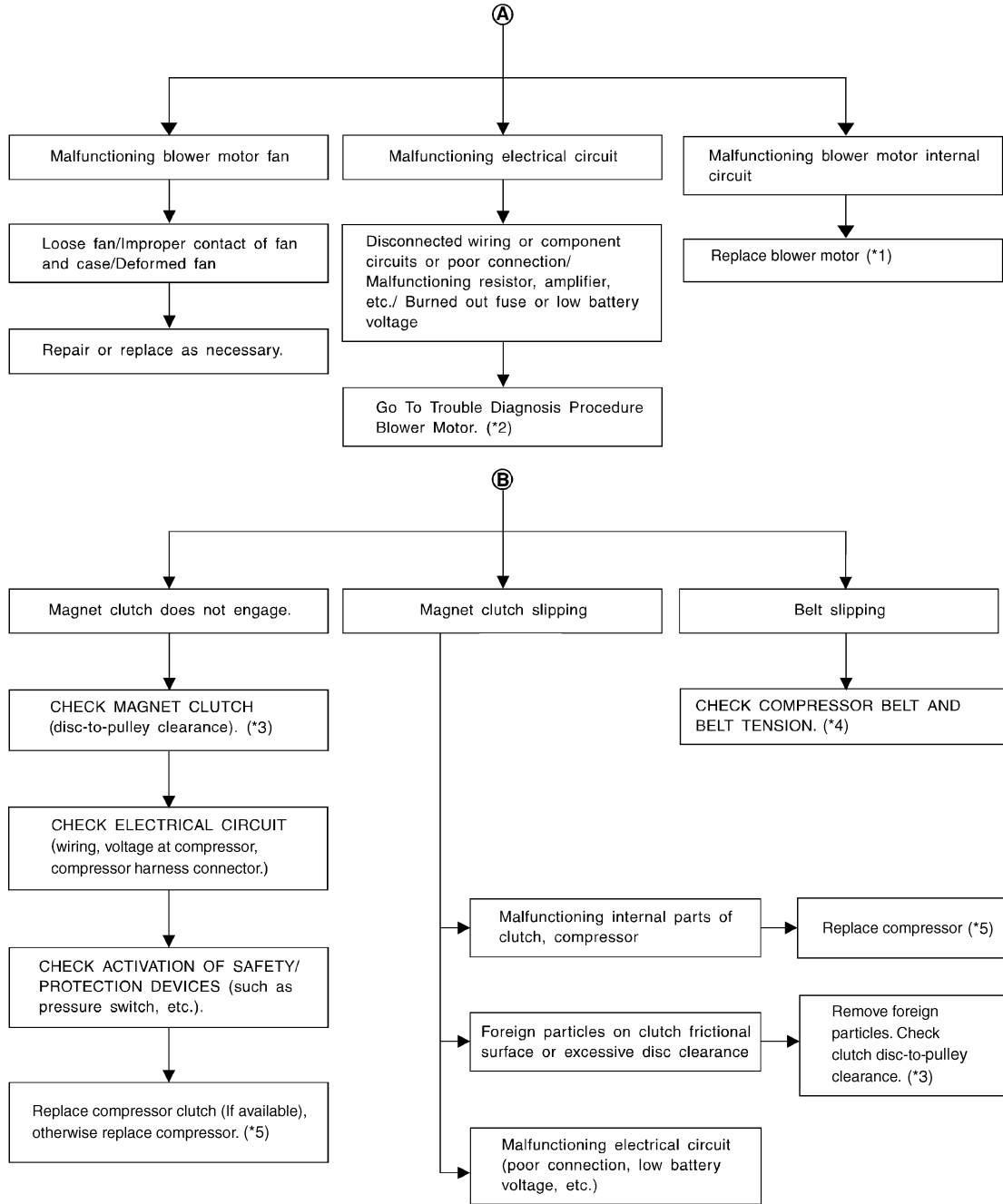
*4 [HAC-77. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-26. "Air Mix Door Motor \(Driver\) Component Function Check"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



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*1 [VTL-11, "Removal and Installation"](#)

*2 [HAC-37, "Front Blower Motor Component Function Check"](#)

*3 [HA-27, "Removal and Installation for Compressor Clutch"](#)

*4 [EM-130, "Checking Drive Belts"](#)

*5 [HA-25, "Removal and Installation for Compressor"](#)

Performance Chart

INFOID:000000012565028

TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Recirculation (REC) switch	(Recirculation) set
Blower speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	9.9 - 13.9 (50 - 57)
	25 (77)	14.6 - 18.6 (58 - 65)
	30 (86)	16.8 - 21.8 (62 - 71)
	35 (95)	21.1 - 27.1 (70 - 81)
	40 (104)	25.3 - 31.5 (78 - 89)
60 - 70	20 (68)	11.4 - 15.2 (53 - 59)
	25 (77)	15.5 - 20.0 (60 - 68)
	30 (86)	19.9 - 25.0 (68 - 77)
	35 (95)	24.5 - 29.6 (76 - 85)
	40 (104)	28.7 - 34.9 (84 - 95)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	1020 - 1250 (10.4 - 12.7, 147.9 - 181.3)	160 - 190 (1.63 - 1.94, 23.2 - 27.6)
	25 (77)	1236 - 1510 (12.6 - 15.4, 179.2 - 219)	206 - 245 (2.1 - 2.5, 29.9 - 35.6)
	30 (86)	1569 - 1,922 (16.0 - 19.6, 227.6 - 278.8)	265 - 324 (2.7 - 3.3, 38.4 - 46.9)
	35 (95)	1,697 - 2079 (17.3 - 21.2, 246.1 - 301.5)	304 - 363 (3.1 - 3.7, 44.1 - 52.6)
	40 (104)	1971 - 2403 (20.1 - 24.5, 285.9 - 348.5)	373 - 451 (3.8 - 4.6, 54.0 - 65.4)

Trouble Diagnoses for Abnormal Pressure

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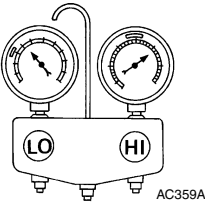
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

INSUFFICIENT COOLING

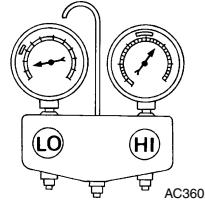
< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

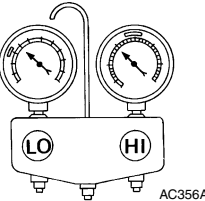
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p> 	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p> 	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check oil for contamination.

High-pressure Side is Too Low and Low-pressure Side is Too High

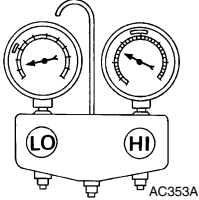
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p> 	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

INSUFFICIENT COOLING

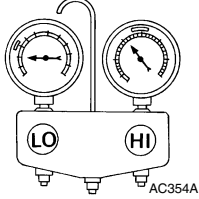
[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
<p>D Both high- and low-pressure sides are too low.</p> 	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-18, "Checking of Refrigerant Leaks" or HA-20, "Checking of Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-56, "Intake Sensor Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-37, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

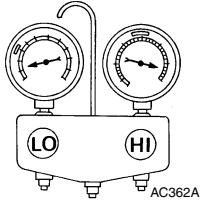
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> Air conditioning system does not function and does not cyclically cool the compartment air. The system constantly functions for a certain period of time after compressor is stopped and restarted. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> Drain water from refrigerant or replace refrigerant. Replace liquid tank.

Low-pressure Side Becomes Negative

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</p> 	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check oil for contamination.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INSUFFICIENT HEATING

Component Function Check

INFOID:000000012565030

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Press the AUTO switch.
2. Turn the temperature control dial (driver) clockwise until 32°C (90°F) is displayed.
3. Check for hot air at discharge air outlets.

Can this symptom be duplicated?

YES >> GO TO 2.

NO >> Perform complete system operational check. Refer to [HAC-6, "Operational Check"](#).

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [HAC-20, "Front Air Control Self-Diagnosis"](#).

Is the inspection results normal?

YES >> GO TO 4.

NO >> Refer to [HAC-20, "Front Air Control Self-Diagnosis Code Chart"](#).

4. CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to [CO-39, "System Inspection"](#).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-39, "System Inspection"](#).
4. Check for air in cooling system.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check the air mix door motor circuit. Refer to [HAC-26, "Air Mix Door Motor \(Driver\) Component Function Check"](#).

6. CHECK AIR DUCTS

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair all disconnected or leaking air ducts.

7. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 8.

NO >> • Inlet hose cold: GO TO 9.
• Both hoses warm: GO TO 9.

8. CHECK ENGINE COOLANT SYSTEM

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INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Check engine coolant temperature sensor. Refer to [EC-671, "Component Inspection"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

9.CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-40, "Changing Engine Coolant"](#).

4. GO TO 10 to retest.

10.CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.

2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [VTL-19, "Removal and Installation"](#).

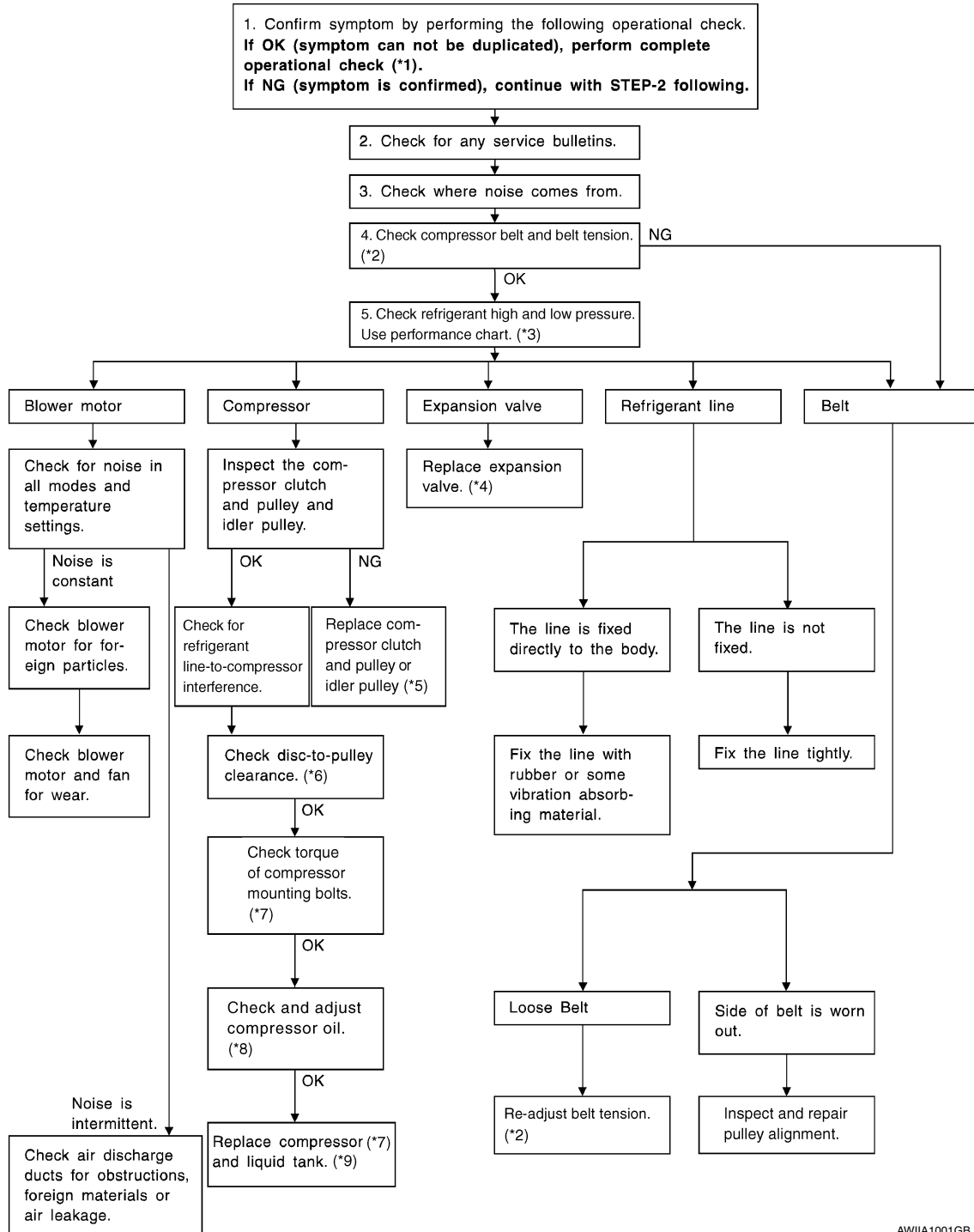
NOISE

Component Function Check

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SYMPTOM: Noise

INSPECTION FLOW



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*1 [HAC-6, "Operational Check"](#)

*2 [EM-14, "Checking Drive Belts" \(QR25DE\)](#) or [EM-130, "Checking Drive Belts" \(VQ40DE\)](#)

*3 [HAC-76, "Performance Chart"](#)

NOISE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

*4	HA-37. "Removal and Installation"	*5	HA-27. "Removal and Installation for Compressor Clutch"	*6	HA-27. "Removal and Installation for Compressor Clutch"
*7	HA-25. "Removal and Installation for Compressor"	*8	HA-25. "Removal and Installation for Compressor"	*9	HA-34. "Removal and Installation"

MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MEMORY FUNCTION DOES NOT OPERATE

Memory Function Check

INFOID:000000012565032

SYMPTOM: Memory function does not operate.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MEMORY FUNCTION

1. Set the temperature to 32°C (90°F).
2. Rotate the front blower control dial (driver) to turn system OFF.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press the OFF switch.

Can the symptom be duplicated?

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

2. PERFORM COMPLETE OPERATIONAL CHECK

Perform a complete operational check and check for any symptoms. Refer to [HAC-6, "Operational Check"](#).

Can a symptom be duplicated?

- YES >> Refer to [HAC-5, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#).
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis to check for any codes. Refer to [HAC-20, "Front Air Control Self-Diagnosis"](#).

Are any self-diagnosis codes present?

- YES >> Refer to [HAC-20, "Front Air Control Self-Diagnosis Code Chart"](#).
NO >> GO TO 5.

5. CHECK POWER AND GROUND CIRCUIT

Check main power supply and ground circuit. Refer to [HAC-59, "Front Air Control Component Function Check"](#).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair or replace as necessary.

6. RECHECK FOR SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-6, "Operational Check"](#).

Does another symptom exist?

- YES >> Refer to [HAC-5, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#).
NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

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PRECAUTION

PRECAUTIONS

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

INFOID:000000012565033

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 three minutes before performing any service.

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

INFOID:000000012565034

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, "Contaminated Refrigerant"](#). 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

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER]

< PRECAUTION >

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

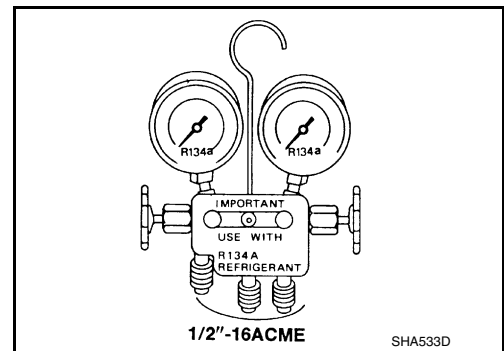
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

Precaution for Service Equipment

INFOID:000000012565035

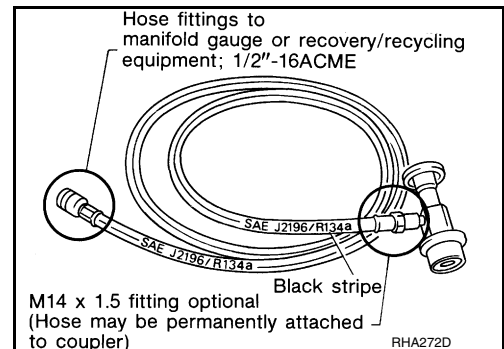
MANIFOLD GAUGE SET

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

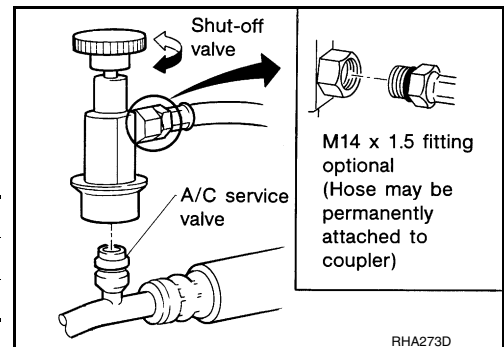
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

Never 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 A/C IDENTIFICATION TABLE

< BASIC INSPECTION >

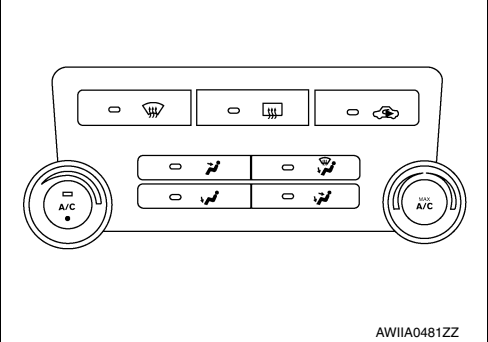
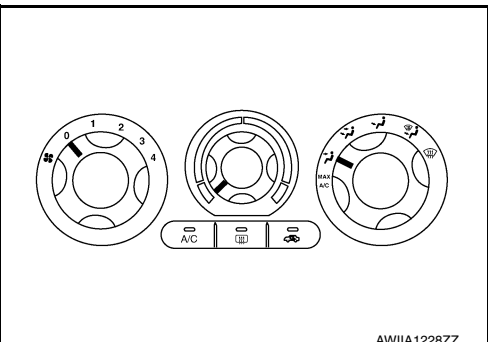
[MANUAL A/C (TYPE 1)]

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000012565036

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:000000012565037

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. Get detailed information about the conditions and environment when the symptom occurs.

>> GO TO 2.

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-90, "Operational Check"](#).

Can a symptom be duplicated?

YES >> Go to trouble diagnosis. Refer to [HAC-142, "Symptom Matrix Chart"](#).

NO >> GO TO 4.

4. PERFORM THE FRONT AIR CONTROL SELF-DIAGNOSIS

Perform front air control self-diagnosis. Refer to [HAC-101, "Front Air Control Self-Diagnosis"](#).

>> If any diagnostic trouble codes set. Refer to [HAC-101, "Front Air Control Self-Diagnosis Chart"](#).

>> Confirm the repair by performing operational check. Refer to [HAC-90, "Operational Check"](#).

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HAC

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000012565038

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

Conditions : Engine running and at normal operating temperature

CHECKING BLOWER

1. Turn blower control dial clockwise. Blower should operate on low speed.
2. Turn the blower control dial again, and continue checking each blower speed until all speeds are checked.
3. Leave blower on HI speed.

If NG, go to trouble diagnosis procedure for [HAC-116. "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR



Press each mode switch and confirm that discharge air comes out according to the air distribution table. Refer to [HAC-97. "Discharge Air Flow"](#).

Mode door position is checked in the next step.



If NG, go to trouble diagnosis procedure for [HAC-104. "Mode Door Motor Diagnosis Procedure"](#).

If OK, continue with next check.

NOTE:

Confirm that the A/C compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF () or D/F () is selected.

CHECKING RECIRCULATION

1. Press recirculation () switch one time. Recirculation indicator should illuminate.
2. Press recirculation () switch one more time. Recirculation indicator should go off.
3. Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for [HAC-113. "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue with next check.

NOTE:

Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF or D/F is selected.

CHECKING TEMPERATURE DECREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-143. "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-108. "Air Mix Door Motor Component Function Check"](#).

If OK, continue with next check.

CHECKING TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise.
2. Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-151. "Component Function Check"](#). If air mix door motor (front) appears to be malfunctioning, go to [HAC-108. "Air Mix Door Motor Component Function Check"](#).

If OK, continue with next check.

CHECK A/C SWITCH

1. Press A/C switch with the blower switch ON.
2. A/C switch indicator will turn ON.
 - Confirm that the compressor clutch engages (sound or visual inspection).

If NG, go to trouble diagnosis procedure for [HAC-121. "Magnet Clutch Diagnosis Procedure"](#).

If OK, continue with next check.

MANUAL A/C IDENTIFICATION TABLE

< SYSTEM DESCRIPTION >

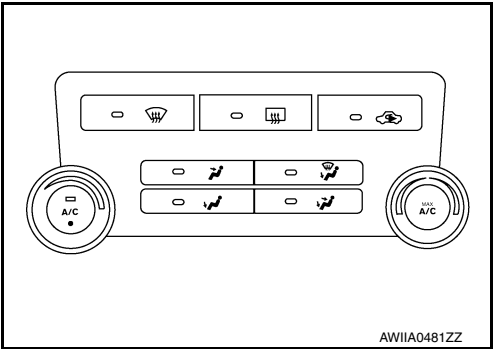
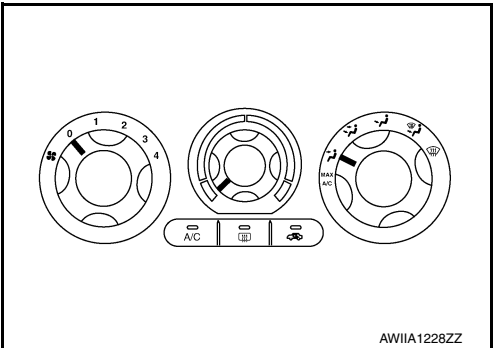
[MANUAL A/C (TYPE 1)]

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000012565039

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

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FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

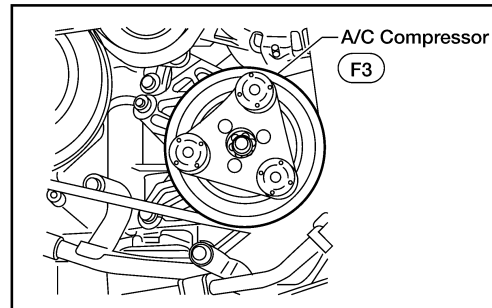
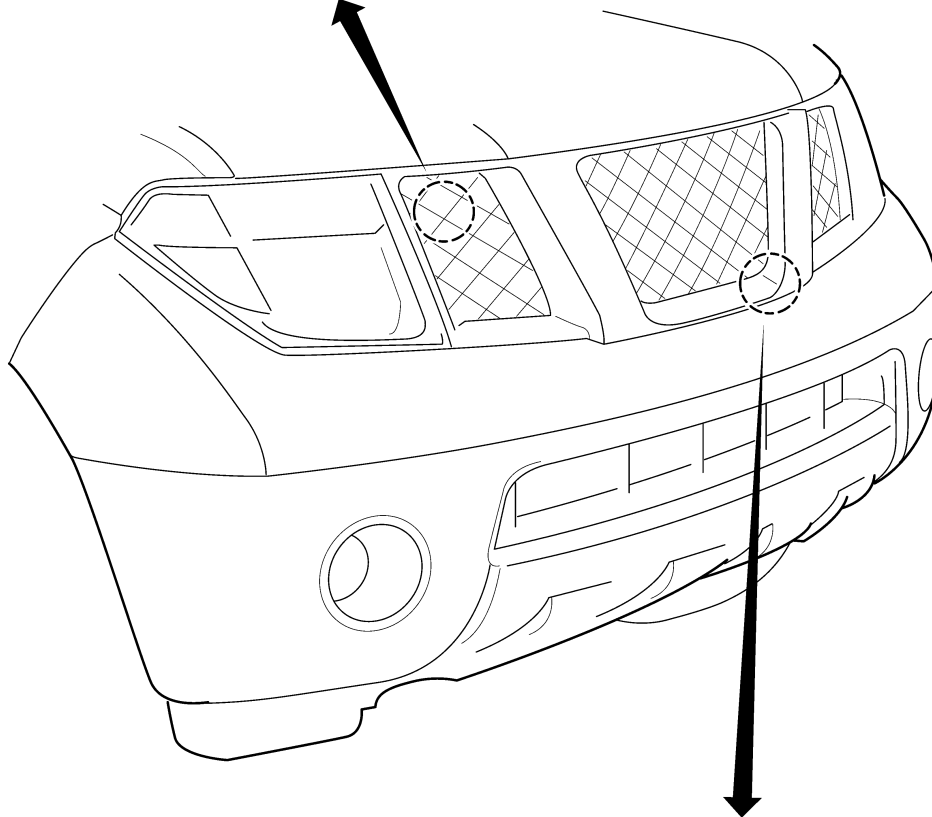
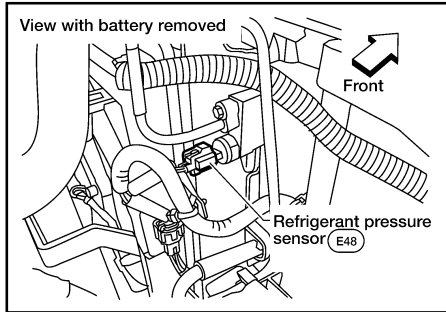
[MANUAL A/C (TYPE 1)]

FUNCTION INFORMATION

Component Part Location

INFOID:000000012565040

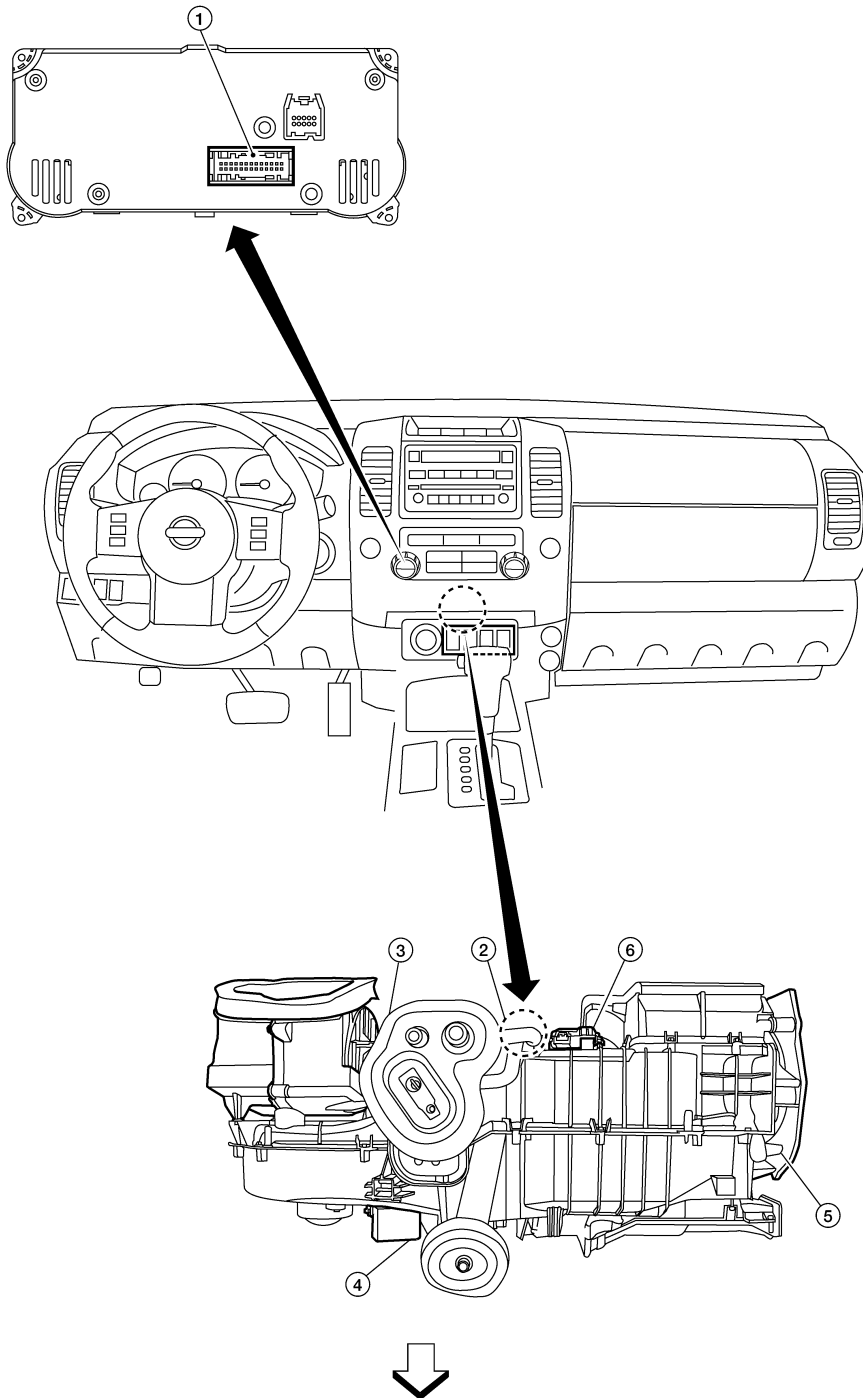
ENGINE COMPARTMENT



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PASSENGER COMPARTMENT

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⇒ :Front

- 3. Intake door motor M58
- 6. Air mix door motor M147

- 1. Front air control M50, M59
- 4. Variable blower control M121

- 2. Intake sensor M146
- 5. Mode door motor M142

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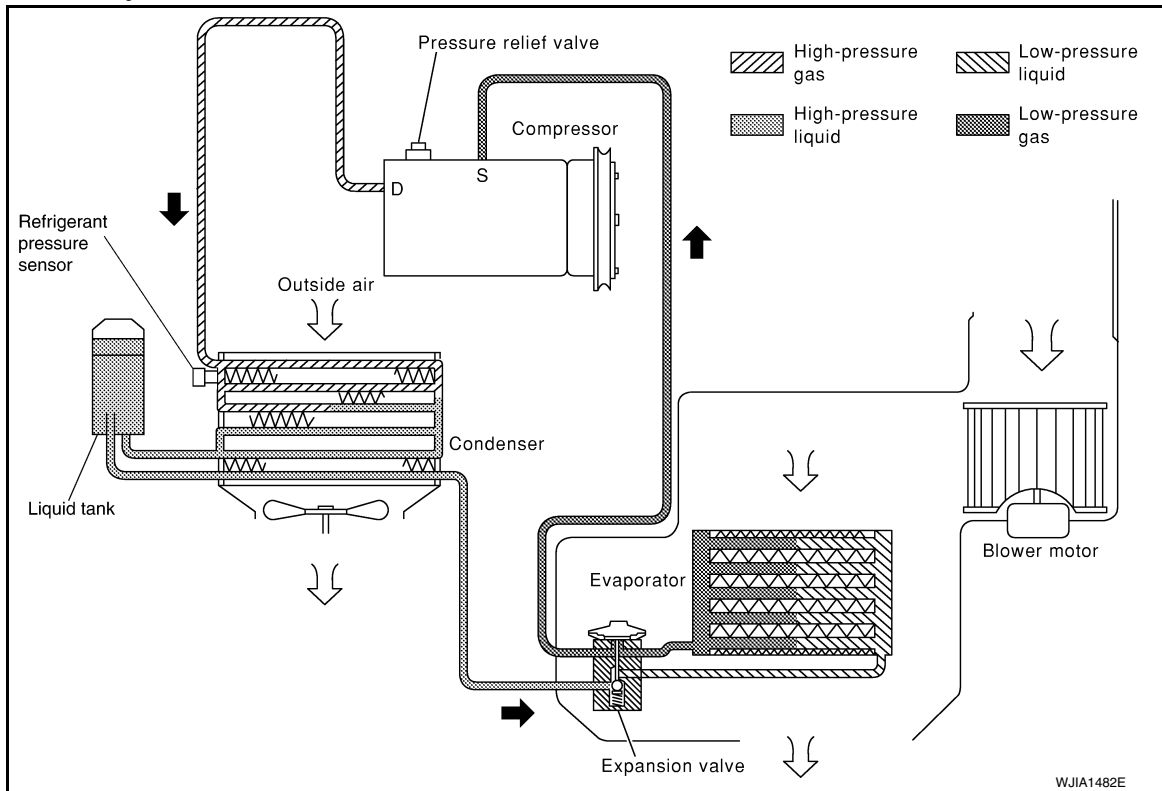
REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

REFRIGERATION SYSTEM

Refrigerant Cycle



REFRIGERANT FLOW

The refrigerant flows in the standard pattern. Refrigerant flows through the compressor, condenser, liquid tank, expansion valve, evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

The compressor cycles on and off to maintain the evaporator temperature within a specified range. When the evaporator coil temperature falls below a specified point, the intake sensor interrupts the compressor operation. When the evaporator coil temperature rises above the specification, the intake sensor allows compressor operation.

Refrigerant System Protection

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. The ECM de-energizes the A/C relay to disengage the magnetic compressor clutch when pressure on the high pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm², 398 psi), or below about 120 kPa (1.22 kg/cm², 17.4 psi).

PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/cm², 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

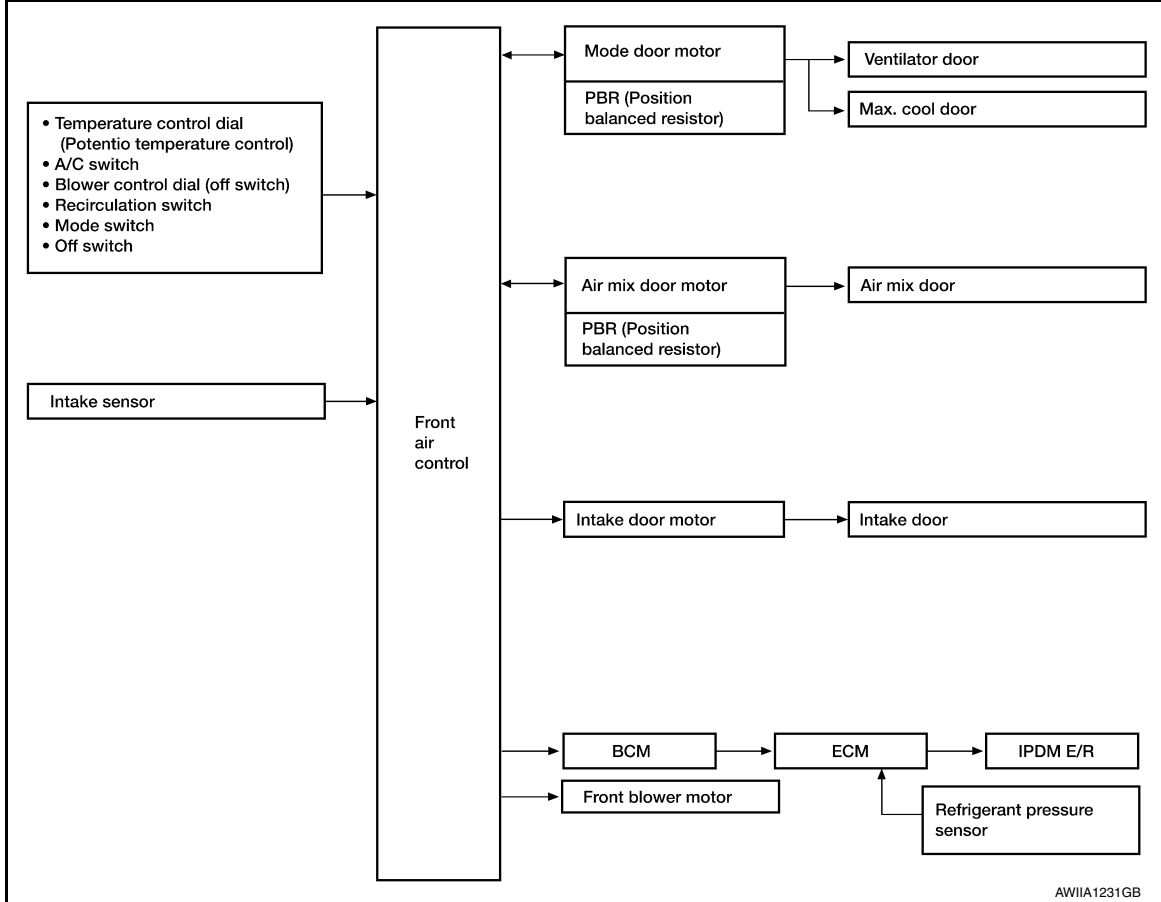
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:000000012565043

CONTROL SYSTEM

The control system consists of input sensors, switches, the front air control (microcomputer) and outputs. The relationship of these components is shown in the figure below:

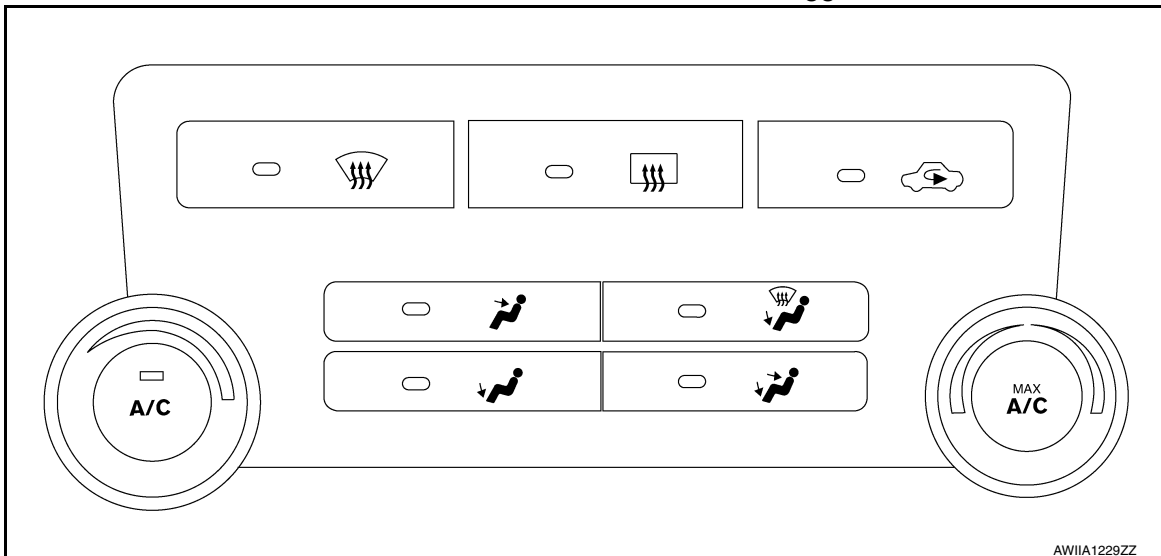


Control System Description

INFOID:000000012565044

CONTROL OPERATION

Front air control with rear window defogger

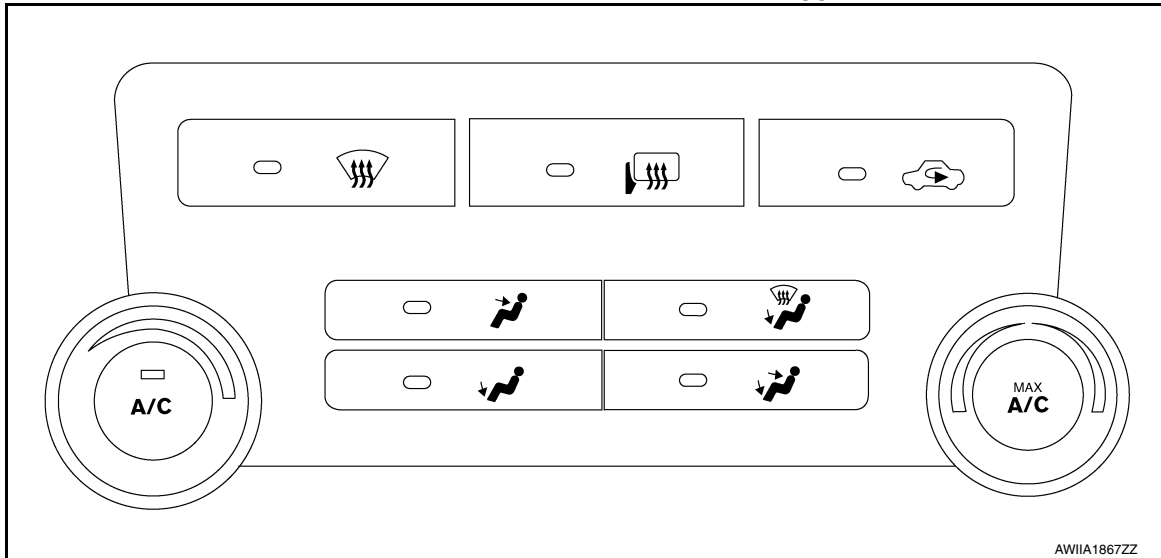


MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

Front air control with door mirror defogger



TEMPERATURE CONTROL DIAL (TEMPERATURE CONTROL)

Increases or decreases the set temperature.

RECIRCULATION () SWITCH

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

DEFROSTER () SWITCH

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position.

REAR WINDOW DEFOGGER SWITCH (IF EQUIPPED)

When switch is ON, rear window is defogged.

DOOR MIRROR DEFOGGER SWITCH (IF EQUIPPED)

When switch is ON, door mirror is defogged.

OFF SWITCH (BLOWER SPEED DIAL)

The compressor and blower are OFF.

A/C SWITCH

The compressor is ON or OFF.

(Pressing the A/C switch will turn off the A/C switch and compressor.)

MODE SWITCHES

Controls the air discharge outlets.

FRONT BLOWER CONTROL DIAL

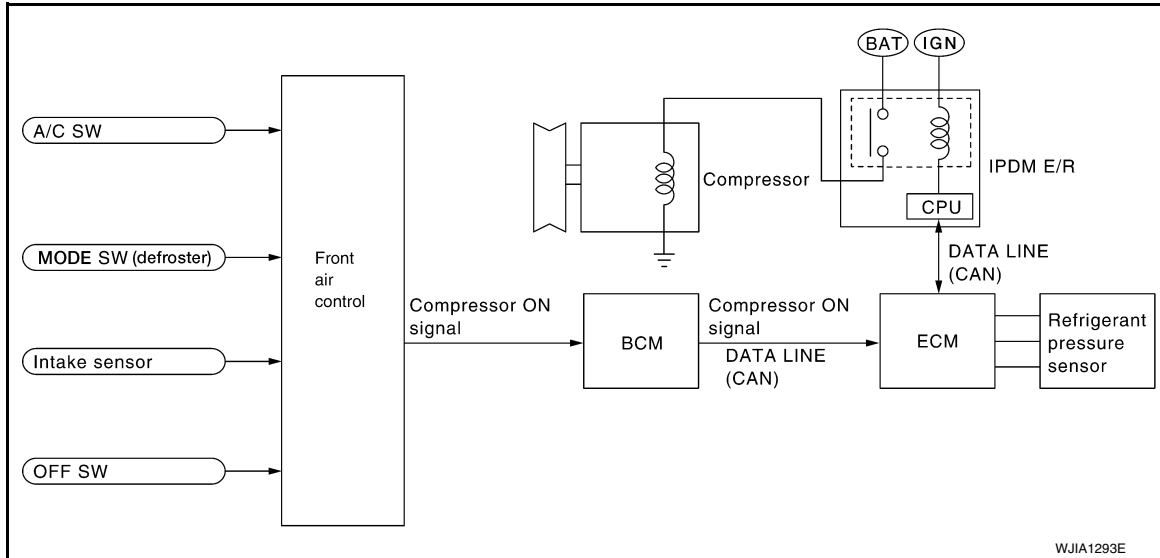
Manually controls the blower speed.

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

MAGNET CLUTCH CONTROL



When the A/C switch is pressed, or the mode switch is pressed to the DEF or D/F position, the front air control outputs a compressor ON signal to BCM.

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

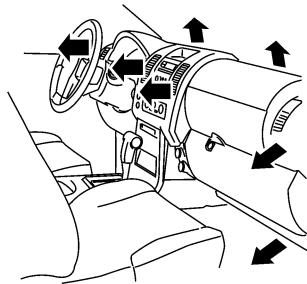
ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant pressure sensor signal, throttle angle sensor, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication line.

Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

Discharge Air Flow

INFOID:000000012565045

HAC



Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	95%	5%	—
	60%	40%	—
	20%	55%	25%
	15%	50%	35%
	7%	15%	78%

Airflow always present at driver and passenger side demisters

MANUAL AIR CONDITIONER SYSTEM

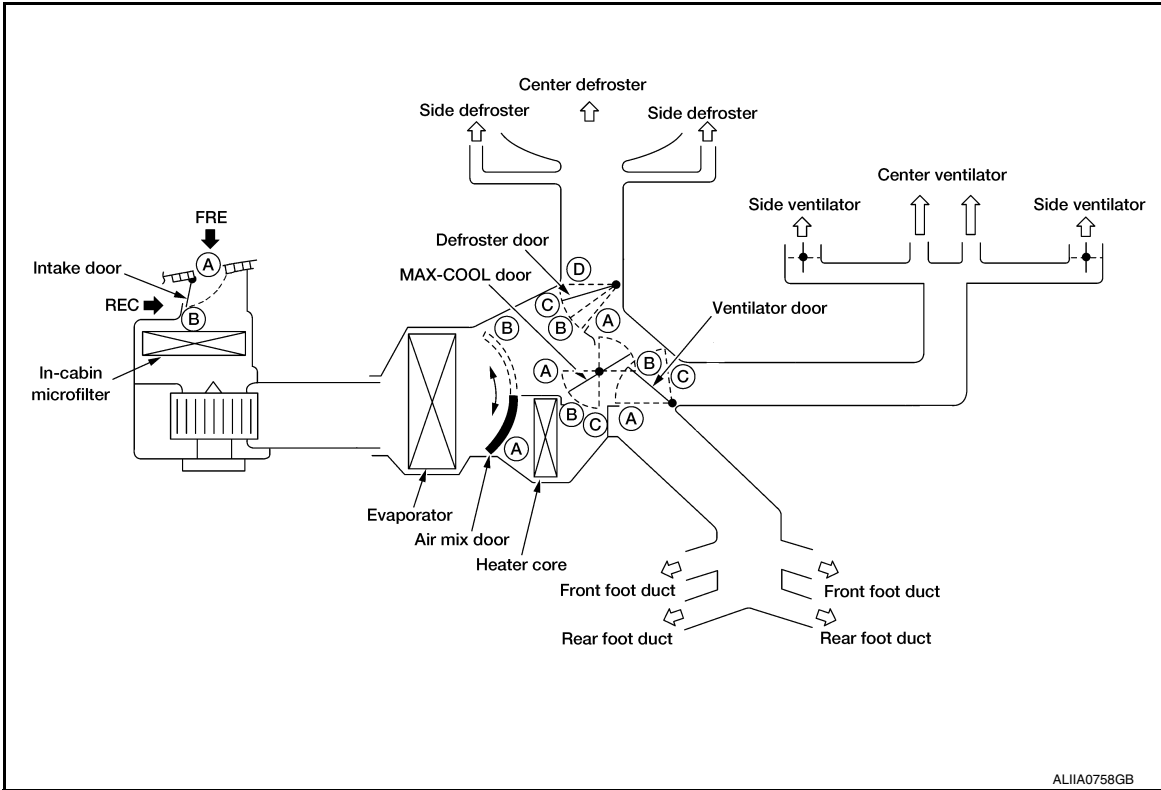
< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

Switches And Their Control Function

INFOID:000000012565046

SWITCHES AND THEIR CONTROL FUNCTION



ALIA0758GB

Position or switch	MODE SW				DEF SW		REC SW		Temperature dial			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF				
Door					FRONT 							
Ventilatator door	(A)	(B)	(C)	(C)	(C)	—	—	—	—			(C)
MAX-COOL door	(A)	(B)	(B)	(B)	(C)	—	—	—	—			(B)
Defroster door	(D)	(D)	(D _{or} C)	(B)	(A)	—	—	—	—			(C)
Intake door	—				(B)	—	(A)	(B)	—			(B)
Air mix door	—				—	—	(A)			(B)	—	

AWIIA1393GB

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000012565047

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			x	x	x		
Rear window defogger	REAR DEFOGGER			x	x			
Warning chime	BUZZER			x	x			
Interior room lamp timer	INT LAMP			x	x	x		
Remote keyless entry system	MULTI REMOTE ENT			x	x	x		
Exterior lamp	HEAD LAMP			x	x	x		
Wiper and washer	WIPER			x	x	x		
Turn signal and hazard warning lamps	FLASHER			x	x			
Air conditioner	AIR CONDITIONER			x				
Combination switch	COMB SW			x				
BCM	BCM	x	x			x	x	x
Immobilizer	IMMU		x	x	x			
Interior room lamp battery saver	BATTERY SAVER			x	x	x		
Vehicle security system	THEFT ALM			x	x	x		
RAP system	RETAINED PWR			x	x	x		
Signal buffer system	SIGNAL BUFFER			x	x			
TPMS	AIR PRESSURE MONITOR		x	x	x	x		
Panic alarm system	PANIC ALARM				x			

AIR CONDITIONER

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000012565048

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.

SELF-DIAGNOSIS FUNCTION

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:000000012565049

A/C SYSTEM SELF-DIAGNOSIS FUNCTION

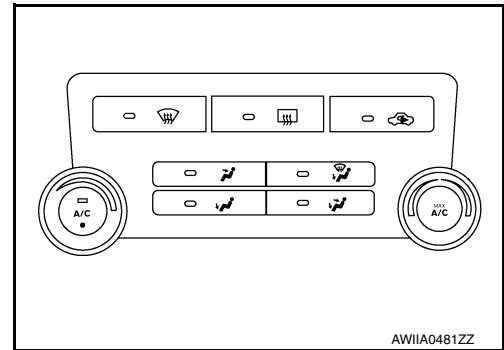
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

DESCRIPTION

The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on front air control. Refer to applicable sections (items) for details. Malfunctions (if any are present) will be displayed in the form of turning ON the A/C, MAX A/C, DEF and Intake button LED's. Refer to [HAC-101, "Front Air Control Self-Diagnosis Chart"](#).

SELF-DIAGNOSTIC MODE

1. Turn ignition switch ON.
2. Press the FLOOR/DEF (🌀) and DEF (🌀) mode switches at the same time and release on the front air control.
3. Press the FLOOR (🌀) and intake (🌀) buttons within two seconds to enter self diagnostic mode.
4. The mode (VENT, FLOOR/DEF, FLOOR and VENT/FLOOR) LED's start flashing in a clockwise sequence indicating that Self test is in progress. This takes about 17 seconds to complete.
5. All mode LED's stay ON once self test completes.
6. Malfunctions (if any) will be displayed in the form of turning ON the A/C, MAX A/C, DEF and Intake button LED's. Refer to [HAC-101, "Front Air Control Self-Diagnosis Chart"](#).
7. To exit diagnostic mode, press any button on the front air control.



Front Air Control Self-Diagnosis Chart

INFOID:000000012565050

SELF-DIAGNOSTIC CHART

Button LED	Description
A/C	Evap sensor open
MAX A/C	Evap sensor short
DEFROST	Air mix door motor circuit malfunctioning
INTAKE	Mode door motor circuit malfunctioning

MANUAL A/C IDENTIFICATION TABLE

< DTC/CIRCUIT DIAGNOSIS >

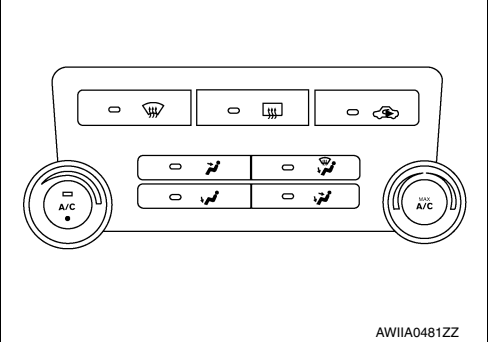
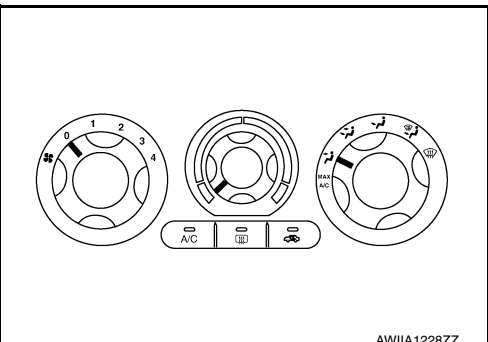
[MANUAL A/C (TYPE 1)]

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000012565051

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

MODE DOOR MOTOR

System Description

INFOID:000000012565052

SYSTEM DESCRIPTION

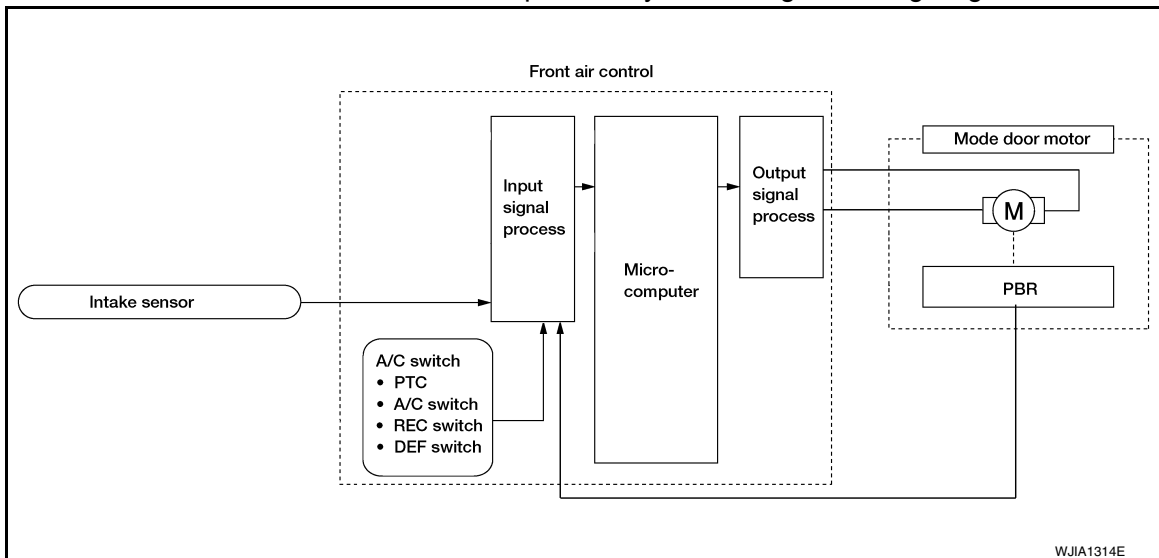
Component Parts

Mode door control system components are:

- Front air control
- Mode door motor
- Position Balanced Resistor (PBR) (built into mode door motor)
- Intake sensor

System Operation

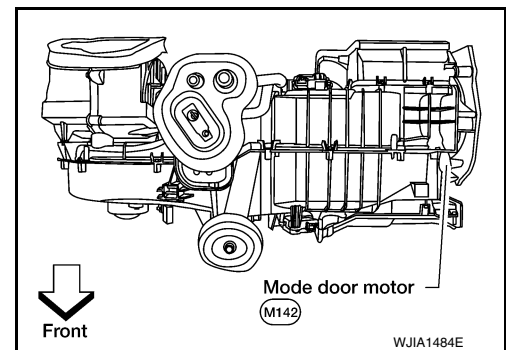
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the mode door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the mode door position by measuring the voltage signal on the PBR circuit.



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the heater and cooling unit assembly. It rotates so that air is discharged from the outlet as indicated by the front air control. Motor rotation is conveyed to a link which activates the mode door.



Mode Door Motor Component Function Check

INFOID:000000012565053

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

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MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Turn blower control dial to HI speed.
2. Press each mode switch and check all positions.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-97. "Discharge Air Flow"](#).

NOTE:

Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when DEF (☂) or D/F (☂) is selected.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-104. "Mode Door Motor Diagnosis Procedure"](#).

Mode Door Motor Diagnosis Procedure

INFOID:000000012565054

Regarding Wiring Diagram information, refer to [HAC-133. "Wiring Diagram - With Type 1"](#).

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

1. CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M50 and the mode door motor harness connector M142.
3. Check continuity between front air control harness connector M50 terminals 23, 24 and the mode door motor harness connector M142 terminals 1, 6.

Connector	Terminal	Connector	Terminal	Continuity
M50	24	M142	1	Yes
	23		6	

4. Check continuity between front air control harness connector M50 terminals 23, 24 and ground.

Connector	Terminal	—	Continuity
M50	24	Ground	No
	23		

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness as necessary.





2. CHECK FRONT AIR CONTROL FOR MODE DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch D/F (☂) mode.
4. Check voltage between front air control harness connector M50 terminal 23 and terminal 24 while pressing the VENT (☂) mode, and then the B/L (☂) mode.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M50	24	23	While pressing the mode control from D/F () mode to VENT () mode	Battery voltage
	23	24	While pressing the mode control from VENT () mode to B/L () mode	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

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

3. CHECK MODE DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

- Turn ignition switch OFF.
- Disconnect the front air control harness connector M50 and M59.
- Check continuity between front air control harness connector M50 terminal 3 and connector M59 terminal 28, and the mode door motor harness connector M142 terminals 2 and 3.

Connector	Terminal	Connector	Terminal	Continuity
M50	3	M142	2	Yes
M59	28		3	

- Check continuity between front air control harness connector M50 terminal 3 and M59 terminal 28, and ground.

Connector	Terminal	—	Continuity
M50	3	Ground	No
M59	28		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

- Check continuity between front air control harness connector M50 terminal 10 and mode door motor harness connector M142 terminal 4.

Connector	Terminal	Connector	Terminal	Continuity
M50	10	M142	4	Yes

- Check continuity between front air control harness connector M50 terminal 10 and ground.

Connector	Terminal	—	Continuity
M50	10	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.

5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- Reconnect front air control harness connectors.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M50 terminal 3 and M59 terminal 28.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Connector	Terminals	Connector	Terminals	Voltage (Approx.)
	(+)		(-)	
M59	28	M50	3	5 Volts

4. Check voltage between front air control harness connector M50 terminal 10 and ground.

Connector	Terminal	—	Voltage (Approx.)
M50	10	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M50 terminal 10 and ground.

Connector	Terminal	—	Voltage (Approx.)
M50	10	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-21, "Removal and Installation"](#).

AIR MIX DOOR MOTOR

System Description

INFOID:000000012565055

SYSTEM DESCRIPTION

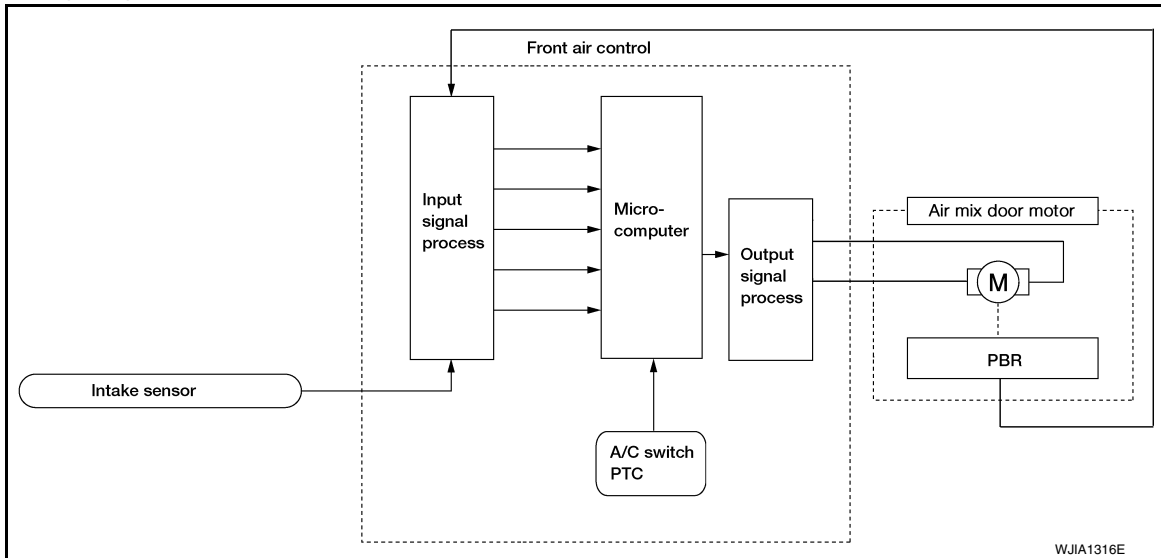
Component Parts

Air mix door control system components are:

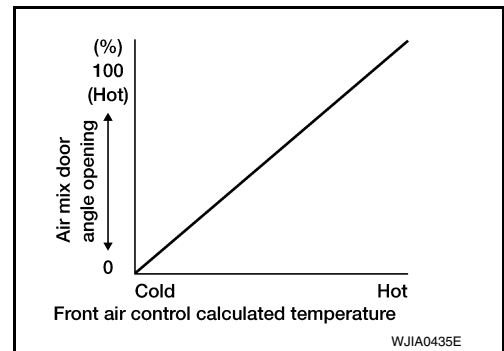
- Front air control
- Air mix door motor
- Position Balanced Resistor (PBR) (built into air mix door motor)
- Intake sensor

System Operation

The front air control receives data from the temperature selected by the driver. The front air control then applies a voltage to one circuit of the air mix door motor, while ground is applied to the other circuit, causing the air mix door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the air mix door positions by measuring the voltage signal on the PBR circuits of each door.



Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motor

A
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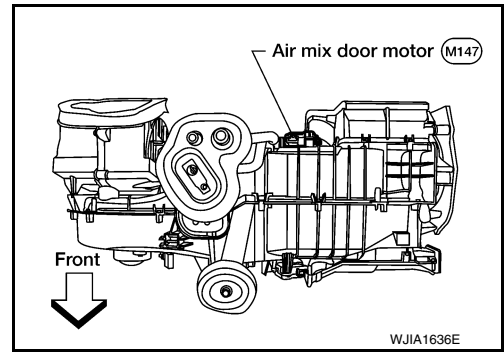
HAC

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

The air mix door motor is attached to the heater and cooling unit assembly. This motor rotates so that the air mix door is opened or closed to a position set by the front air control. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the front air control by the PBR built into the air mix door motor.



Air Mix Door Motor Component Function Check

INFOID:000000012565056

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Blower must be ON.
2. Turn the temperature control dial clockwise to maximum heat.
3. Check for hot air at discharge air outlets.

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn the temperature control dial counterclockwise to maximum cold.
2. Check for cold air at discharge air outlets.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-108. "Air Mix Door Motor Diagnosis Procedure"](#).

Air Mix Door Motor Diagnosis Procedure

INFOID:000000012565057

Regarding Wiring Diagram information, refer to [HAC-133. "Wiring Diagram - With Type 1"](#).

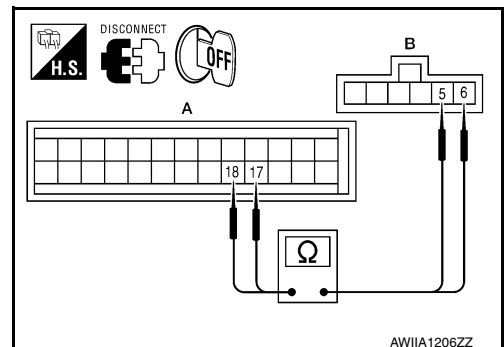
SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate normally.

1. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M50 (A) and the air mix door motor harness connector M147 (B).
3. Check continuity between front air control harness connector M50 (A) terminals 17, 18 and the air mix door motor harness connector M147 (B) terminals 5, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M50	18	M147	6	Yes
	17		5	



AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

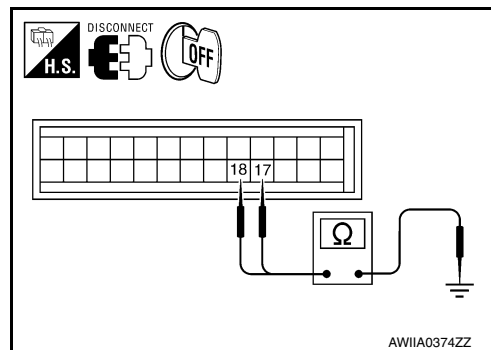
[MANUAL A/C (TYPE 1)]

4. Check continuity between front air control harness connector M50 terminals 17, 18 and ground.

Connector	Terminal	—	Continuity
M50	17	Ground	No
	18		

Is the inspection result normal?

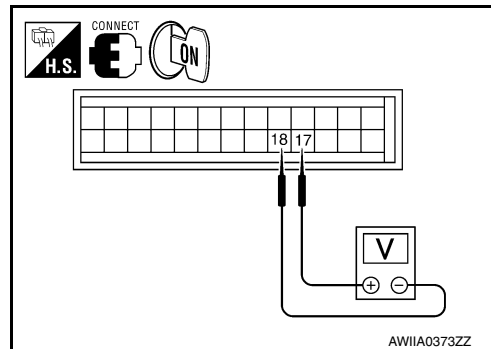
- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.



2. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch D/F (D/F mode).
4. Check voltage between front air control harness connector M50 terminal 17 and terminal 18 while pressing the mode switch to VENT (VENT mode), and then to B/L (B/L mode).

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M50	18	17	Pressing the mode switch from D/F (D/F mode) to VENT (VENT mode)	Battery voltage
	17	18	Pressing the mode switch from VENT (VENT mode) to B/L (B/L mode)	Battery voltage



Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

3. CHECK AIR MIX DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M50.
3. Check continuity between front air control harness connector M50 terminal 3 and M59 terminal 28, and the air mix door motor harness connector M147 terminals 1, 3.

Connector	Terminal	Connector	Terminal	Continuity
M50	3	M147	3	Yes
M59	28		1	

4. Check continuity between front air control harness connector M50 terminal 3 and M59 terminal 28, and ground.

Connector	Terminal	—	Continuity
M50	3	Ground	No
M59	28		

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair or replace harness as necessary.

4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

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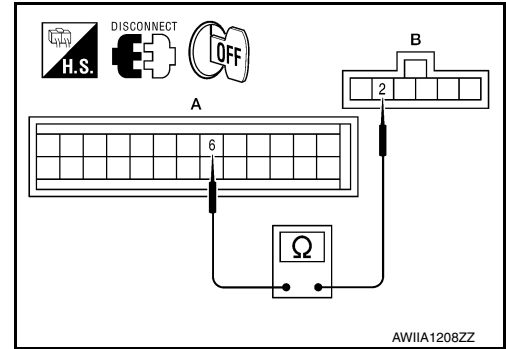
AIR MIX DOOR MOTOR

[MANUAL A/C (TYPE 1)]

< DTC/CIRCUIT DIAGNOSIS >

1. Check continuity between front air control harness connector M50 (A) terminal 6 and air mix door motor harness connector M147 (B) terminal 2.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M50	6	M147	2	Yes

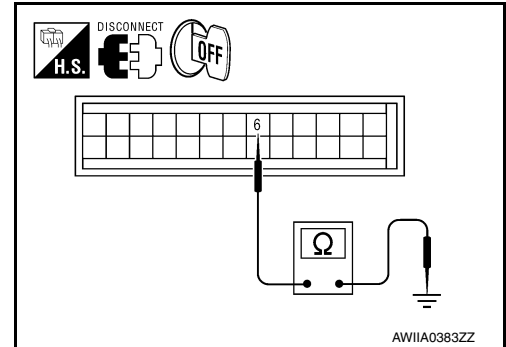


2. Check continuity between front air control harness connector M50 terminal 6 and ground.

Connector	Terminal	—	Continuity
M50	6	Ground	No

Is the inspection result normal?

- YES >> GO TO 6.
 NO >> Repair or replace harness as necessary.



5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M50 terminal 3 and M59 terminal 28.

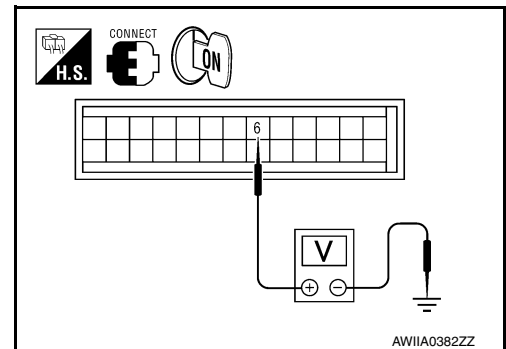
Connector	Terminals		Connector	Terminals		Voltage (Approx.)
	(+)	(-)		(-)	(+)	
M59	28		M50	3		5 Volts

4. Check voltage between front air control harness connector M50 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M50	6	Ground	0 Volts

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



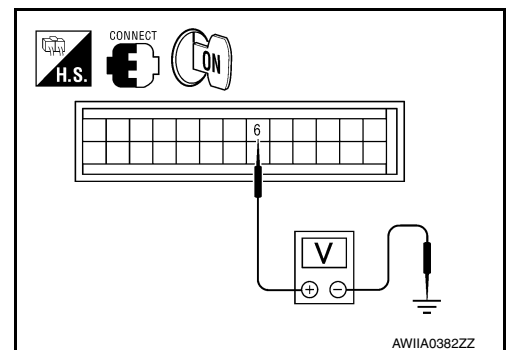
6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the air mix door motor harness connector M147.
2. Check voltage between front air control harness connector M50 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M50	6	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect air mix door for binding or mechanical failure. If air mix door moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Replace the air mix door motor. Refer to [VTL-23. "Removal and Installation"](#).

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INTAKE DOOR MOTOR

System Description

INFOID:000000012565058

SYSTEM DESCRIPTION

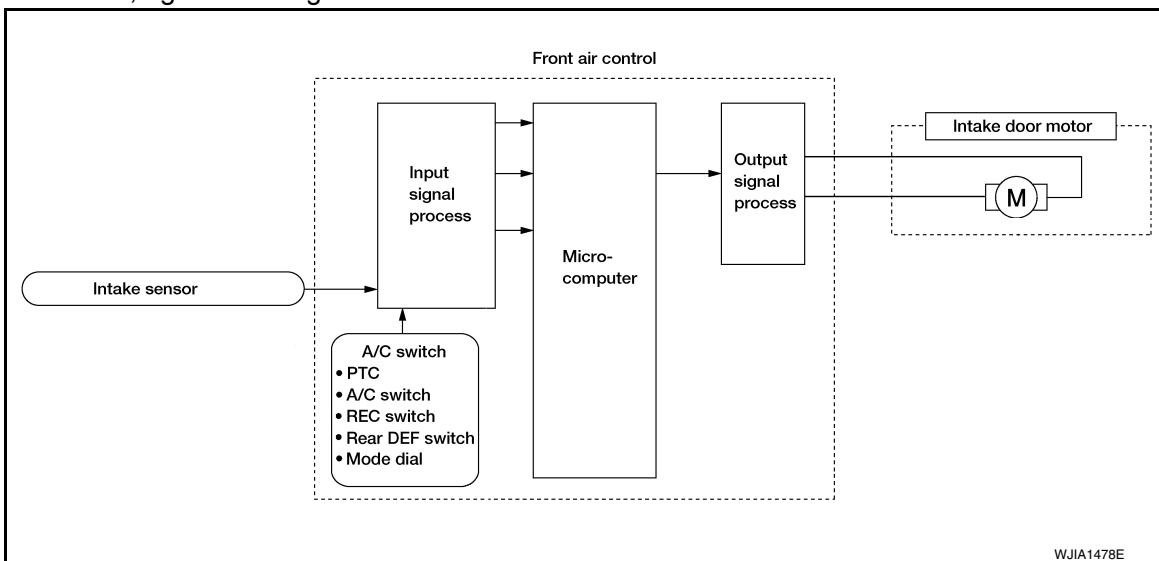
Component Parts

Intake door control system components are:

- Front air control
- Intake door motor
- Intake sensor

System Operation

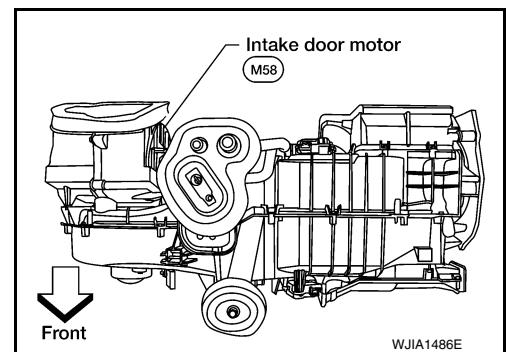
The intake door control determines the intake door position based on the position of the recirculation switch. When the recirculation switch is depressed the intake door motor rotates closing off the fresh air inlet and recirculating the cabin air. If the recirculation switch is depressed again, the intake door motor rotates in the opposite direction, again allowing fresh air into the cabin.



COMPONENT DESCRIPTION

Intake door motor

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the front air control. Motor rotation is conveyed to a lever which activates the intake door.



Intake Door Motor Component Function Check

INFOID:000000012565059

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW




1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - REC (🔧)

1. Turn blower control dial to any speed.

INTAKE DOOR MOTOR

[MANUAL A/C (TYPE 1)]

< DTC/CIRCUIT DIAGNOSIS >

2. Press vent mode () switch.
3. Press REC () switch.
4. Press REC () switch again.
5. Listen for intake door position change (you should hear blower sound change slightly).

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Go to diagnosis procedure. Refer to [HAC-113. "Intake Door Motor Diagnosis Procedure"](#).

Intake Door Motor Diagnosis Procedure

INFOID:000000012565060

Regarding Wiring Diagram information, refer to [HAC-133. "Wiring Diagram - With Type 1"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

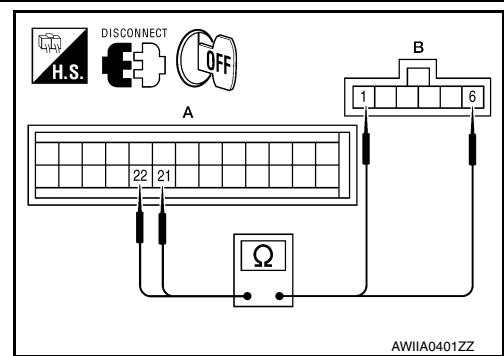
SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

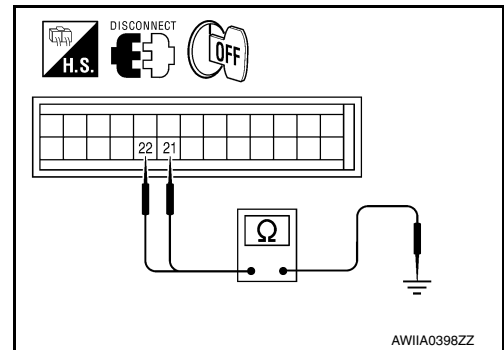
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M50 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M50 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M50	21	M58	6	Yes
	22		1	



4. Check continuity between front air control harness connector M50 terminals 8, 7 and ground.

Connector	Terminal	—	Continuity
M50	21	Ground	No
	22		



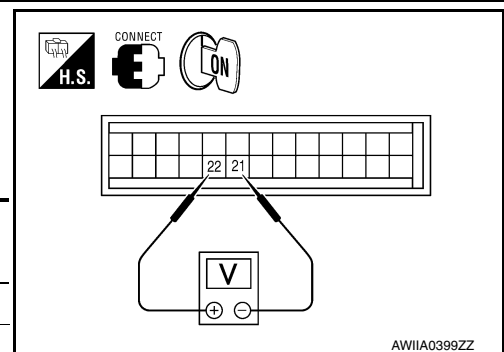
Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR INTAKE AIR DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M50 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M50	22	21	Self-diagnostic mode (opening)	Battery voltage
	21	22	Self-diagnostic mode (closing)	Battery voltage



INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Is the inspection result normal?

- YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-20. "Removal and Installation"](#).
- NO >> Replace front air control. Refer to [VTL-7. "Removal and Installation"](#).

BLOWER MOTOR

System Description

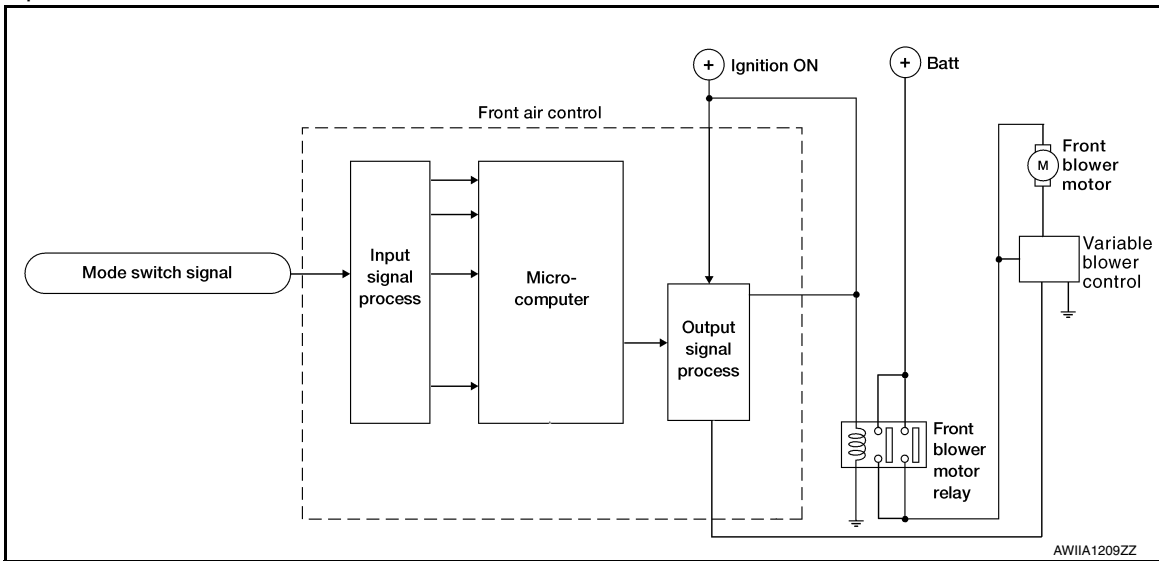
INFOID:000000012565061

Component Parts

Blower speed control system components are:

- Front air control
- Variable blower control
- Front blower motor
- Front blower motor relay

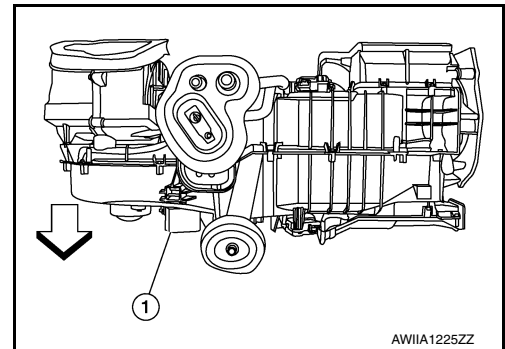
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control (1) is located on the heater and cooling unit assembly. The variable blower control receives a gate voltage from the front air control to steplessly maintain the blower motor voltage in the 0 to 5 volt range (approx.) ⇒ ↓:front.



Front Blower Motor Component Function Check

INFOID:000000012565062

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

1. Rotate the blower control dial clockwise. Blower should operate.
2. Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-116. "Front Blower Motor Diagnosis Procedure"](#).

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Front Blower Motor Diagnosis Procedure

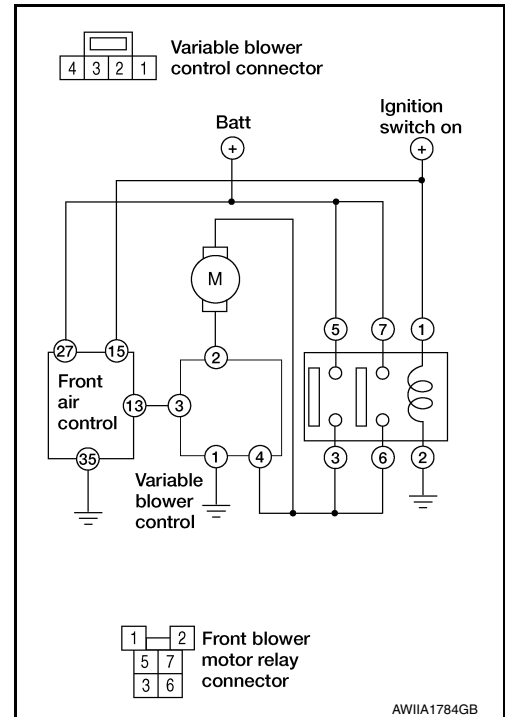
INFOID:000000012565063

Regarding Wiring Diagram information, refer to [HAC-133. "Wiring Diagram - With Type 1"](#).

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

SYMPTOM: Blower motor operation is malfunctioning under starting blower speed control.



1. CHECK FUSES

Check 15A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to [PG-77. "Terminal Arrangement"](#).

Fuses are good.

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 9.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector.
3. Turn ignition switch ON.
4. Press the A/C switch.
5. Rotate blower control dial to maximum speed.
6. Check voltage between front blower motor harness connector M62 terminal 2 and ground.

2 - Ground

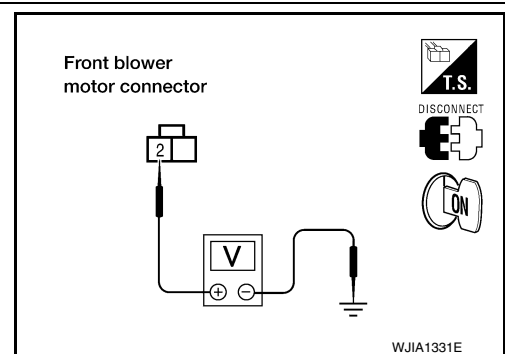
: Battery voltage

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 3.

3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT



BLOWER MOTOR

[MANUAL A/C (TYPE 1)]

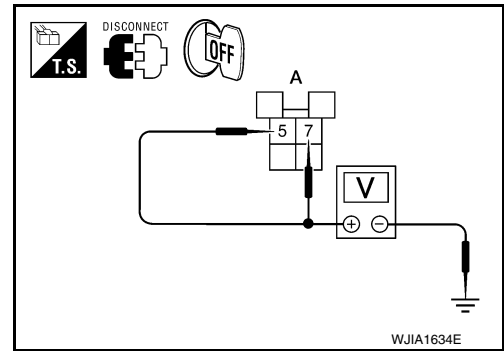
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front blower motor relay.
3. Check voltage between front blower motor relay harness connector E54 terminals 5,7 and ground.

5, 7 - Ground : Battery voltage

Is the inspection result normal?

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



4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to [HAC-119. "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace front blower motor relay.

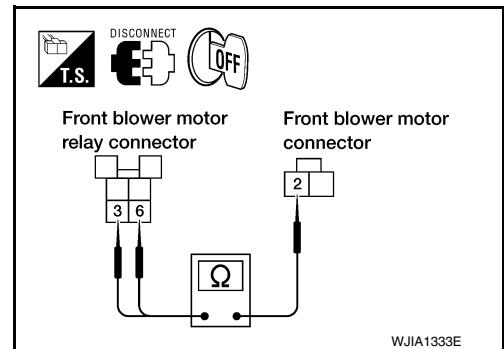
5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

Check continuity between front blower motor relay harness connector E54 terminals 3, 6 and front blower motor harness connector M62 terminal 2.

3, 6 - 2 : Continuity should exist.

Is the inspection result normal?

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



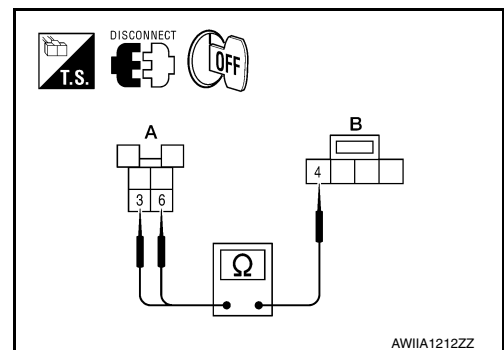
6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector E54 (A) terminals 3, 6 and variable blower control harness connector M121 (B) terminal 4.

3, 6 - 4 : Continuity should exist.

Is the inspection result normal?

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



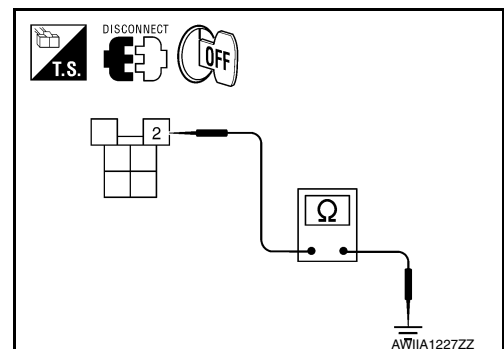
7. CHECK FRONT BLOWER MOTOR RELAY (COIL SIDE) GROUND CIRCUIT

Check continuity between front blower motor relay harness connector E54 terminal 2 and ground.

2 - Ground : Continuity should exist

Is the inspection result normal?

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



8. CHECK FRONT BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

BLOWER MOTOR

[MANUAL A/C (TYPE 1)]

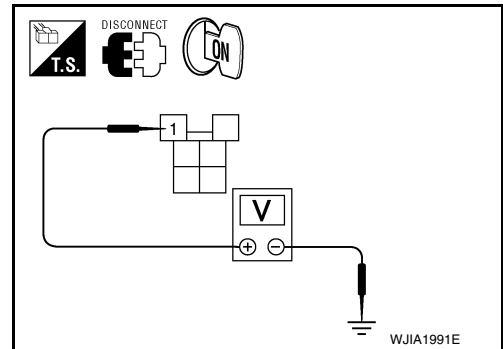
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.
2. Check voltage between front blower motor relay harness connector E54 terminal 1 and ground.

1 - Ground : Battery voltage

Is the inspection result normal?

- YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).
- NO >> Repair front blower motor ground circuit or connector.



9. REPLACE FUSES

Replace fuses.

Does the fuse blow?

- YES >> • If fuse blows without activating the front blower motor, repair short between fuse and front blower motor relay.
• If fuse blows activating the front blower motor, GO TO 10.
- NO >> Inspection End.

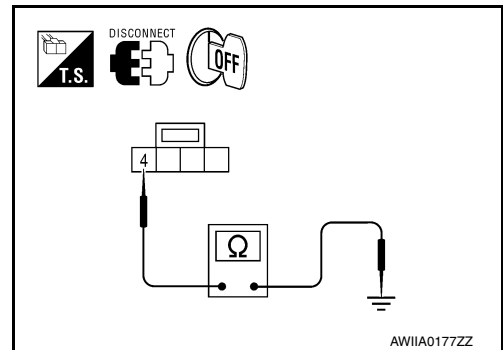
10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector and variable blower control connector.
3. Check continuity between variable blower control harness connector M121 terminal 4 and ground.

4 - Ground : Continuity should not exist.

Is the inspection result normal?

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



11. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-119, "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).
- NO >> Replace front blower motor. Refer to [VTL-11, "Removal and Installation"](#).

12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-115, "Front Blower Motor Component Function Check"](#).

Is the inspection result normal?

- YES >> GO TO 13.
- NO >> Replace front blower motor. Refer to [HAC-119, "Front Blower Motor Component Inspection"](#).

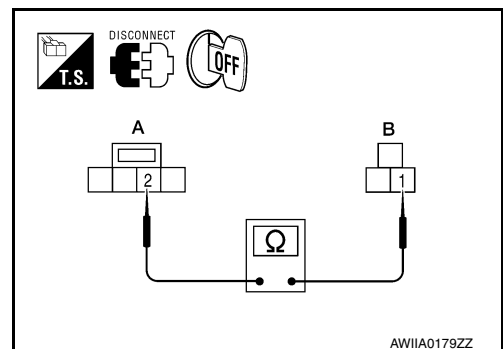
13. CHECK BLOWER MOTOR GROUND CIRCUIT

1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M121 (A) terminal 2.

1 - 2 : Continuity should exist.

Is the inspection result normal?

- YES >> GO TO 14.
- NO >> Repair harness or connector.



14. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

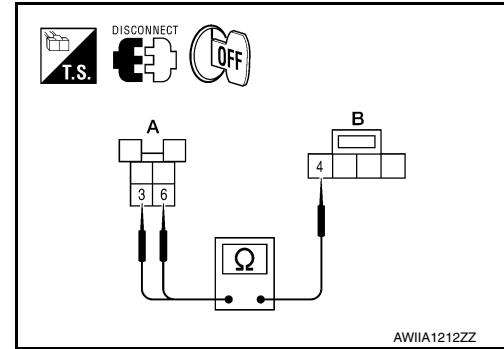
Check continuity between front blower motor relay harness connector E54 (A) terminals 3, 6 and variable blower control harness connector M121 (B) terminal 4.

3, 6 - 4 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 15.

NO >> Repair harness or connector.



15. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

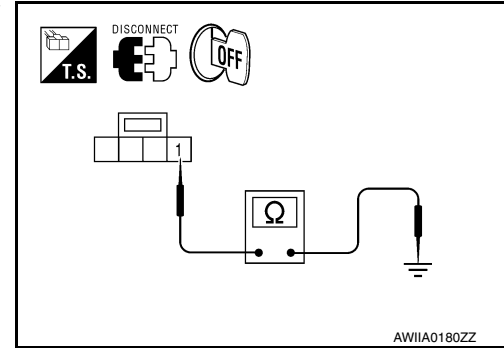
Check continuity between variable blower control harness connector M121 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 16.

NO >> Repair harness or connector.



16. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Reconnect all disconnected component connectors.
2. Disconnect front air control connector.
3. Turn ignition switch ON.
4. Turn blower control dial to maximum speed.
5. Check voltage between front air control harness connector M50 terminal 13 and ground.

13 - Ground Approx.: 4.5V

Is the inspection result normal?

YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> GO TO 17.

17. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect variable blower control.
3. Check continuity between front air control harness connector M50 terminal 13 and variable blower control harness connector M121 terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-12, "Removal and Installation"](#).

NO >> Repair harness or connector.

Front Blower Motor Component Inspection

INFOID:000000012565064

COMPONENT INSPECTION

Front Blower Motor Relay

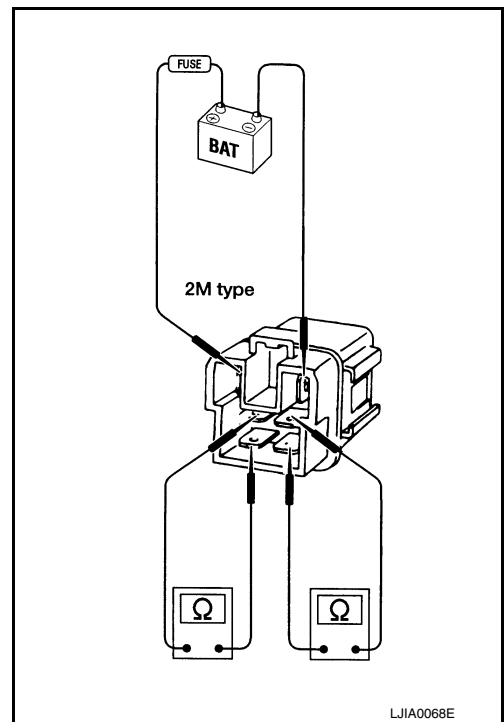
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BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Check continuity between terminals 3 and 5 and terminals 7 and 6 by supplying 12 volts and ground to coil side terminals 1 and 2 of the relay.



Front Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.
- Apply 12 volts to terminal 2 and ground to terminal 1 and verify that the motor operates freely and quietly.

MAGNET CLUTCH

System Description

INFOID:000000012565065

SYSTEM DESCRIPTION

The front air control controls compressor operation based on intake temperature and a signal from ECM.

Low Temperature Protection Control

The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor.

When intake air temperature is higher than 3.5°C (38.3°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than 2.5°C (36.5°F).

Magnet Clutch Component Function Check

INFOID:000000012565066

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Rotate blower control dial clockwise.
2. Press the vent () mode switch.
3. Press A/C switch. Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-121, "Magnet Clutch Diagnosis Procedure"](#).

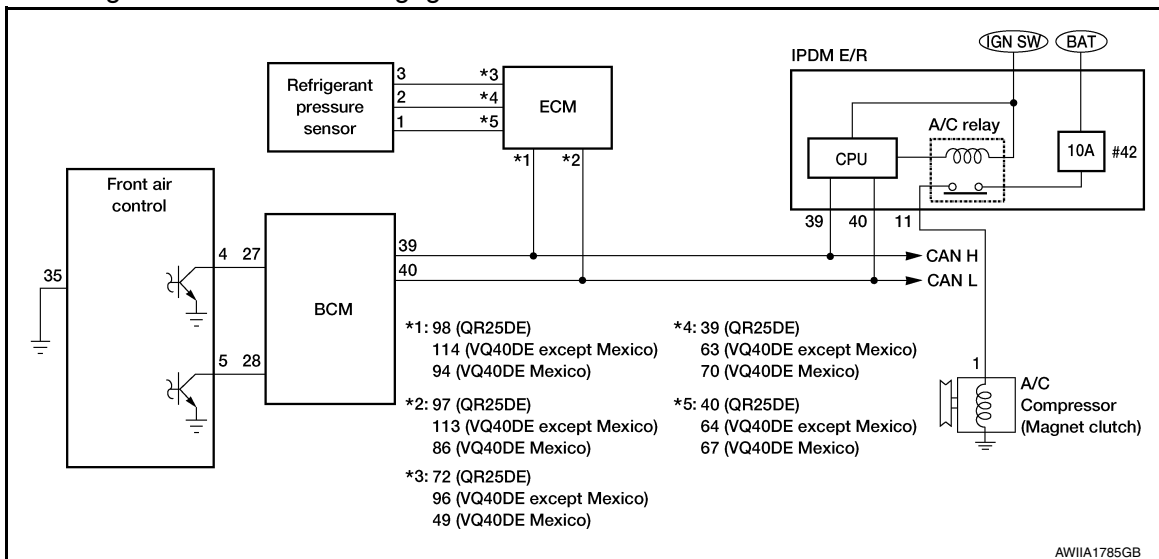
Magnet Clutch Diagnosis Procedure

INFOID:000000012565067

Regarding Wiring Diagram information, refer to [HAC-133, "Wiring Diagram - With Type 1"](#).

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. PERFORM IPDM E/R AUTO ACTIVE TEST

Perform IPDM E/R auto active test. Refer to [PCS-9, "Diagnosis Description"](#).

Does magnet clutch operate?

- YES >>
- WITH CONSULT GO TO 2.
 - WITHOUT CONSULT

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

GO TO 8.

NO >> Check 10A fuse (No. 42, located in IPDM E/R), and GO TO 12.

2.CHECK BCM INPUT (A/C COMPRESSOR ON) SIGNAL

Check A/C compressor ON/OFF signal. Refer to [HAC-100. "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

A/C SW ON : AIR COND SW ON
A/C SW OFF : AIR COND SW OFF

Is the inspection result normal?

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

3.CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to [EC-468. "Diagnosis Procedure"](#) (QR25DE), [EC-969. "Diagnosis Procedure"](#) (VQ40DE for USA and Canada) or [EC-1390. "Diagnosis Procedure"](#) (VQ40DE for Mexico).

Is the inspection result normal?

YES >> GO TO 4.
 NO >> Replace refrigerant pressure sensor. Refer to [HA-36. "Removal and Installation"](#).

4.CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [HAC-100. "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

BLOWER CONTROL DIAL ON : FAN ON SIG ON
BLOWER CONTROL DIAL OFF : FAN ON SIG OFF

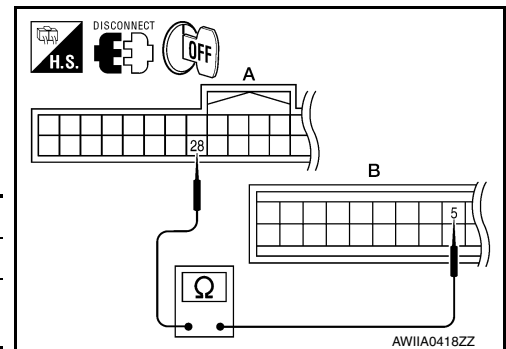
Is the inspection result normal?

YES >> GO TO 7.
 NO >> GO TO 5.

5.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M50 (B) terminal 5.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
BCM: M18	28	Front air control: M50	5	Yes



4. Check continuity between BCM harness connector M18 (A) terminal 28 and ground.

Connector	Terminal	Ground	Continuity
BCM: M18	28		No

Is the inspection result normal?

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

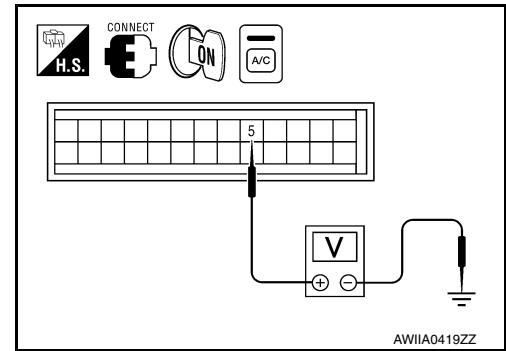
6.CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Turn A/C switch ON.
4. Check voltage between front air control harness connector M50 terminal 5 and ground.



Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Front air control connector	Terminal No.		
M50	5	A/C switch: ON Blower motor operates	0V
		A/C switch: OFF	Battery voltage

Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-56. "Removal and Installation"](#).
- NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-7. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-56. "Removal and Installation"](#).

7. CHECK CAN COMMUNICATION

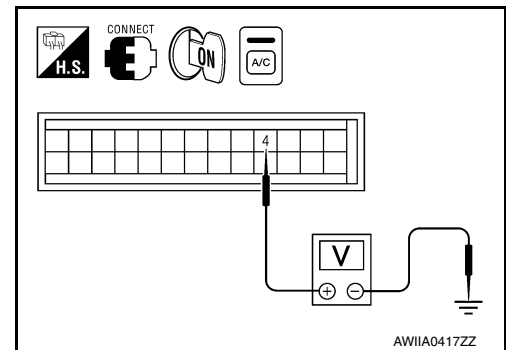
Check CAN communication. Refer to [LAN-14. "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Repair or replace malfunctioning part(s).

8. CHECK VOLTAGE FOR FRONT AIR CONTROL (A/C COMPRESSOR ON SIGNAL)

1. Turn ignition switch ON.
2. Check voltage between front air control harness connector M50 terminal 4 and ground.



Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Front air control connector	Terminal No.		
M50	4	A/C switch: ON	0V
		A/C switch: OFF	Battery voltage

Is the inspection result normal?

- YES >> GO TO 9.
- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to [VTL-7. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-56. "Removal and Installation"](#).

9. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 terminal 27 and front air control harness connector M50 terminal 4.

27 - 4 : Continuity should exist.

4. Check continuity between BCM harness connector M18 terminal 27 and ground.

27 - ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.

10. CHECK INTAKE SENSOR CIRCUITS

Check intake sensor. Refer to [HAC-126, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

11. CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-14, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

YES >> Replace BCM. Refer to [BCS-56, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning part(s).

12. CHECK MAGNET CLUTCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/C compressor connector.
3. Check for operation sound when applying battery voltage to A/C compressor terminal 1.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace magnet clutch. Refer to [HA-27, "Removal and Installation for Compressor Clutch"](#).

13. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND A/C COMPRESSOR

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal 1.

11 - 1 : Continuity should exist.

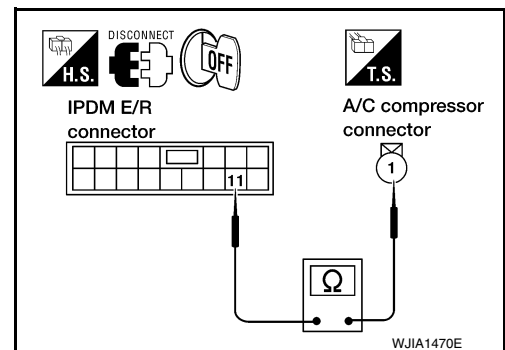
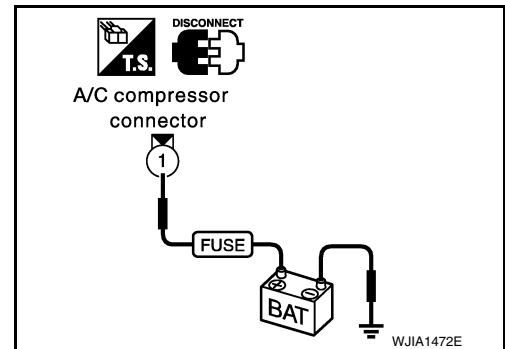
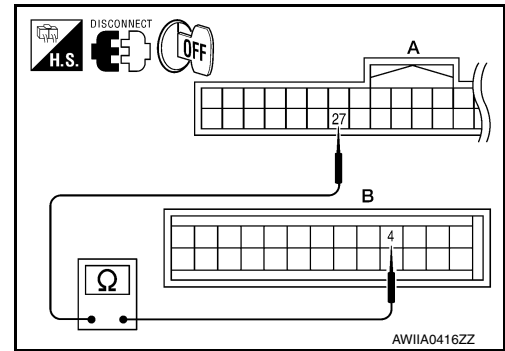
3. Check continuity between IPDM E/R harness connector E119 terminal 11 and ground.

11 - ground : Continuity should not exist.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).

NO >> Repair harness or connector.



INTAKE SENSOR

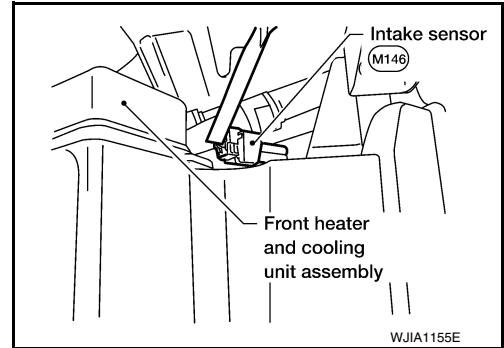
System Description

INFOID:000000012565068

COMPONENT DESCRIPTION

Intake Sensor

The intake sensor is located on top of the heater and cooling unit assembly next to the A/C evaporator cover. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the front air control.



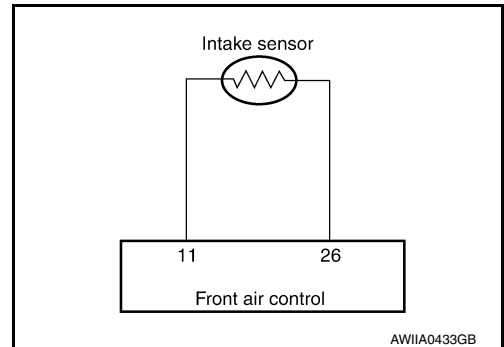
Intake Sensor Diagnosis Procedure

INFOID:000000012565069

Regarding Wiring Diagram information, refer to [HAC-133, "Wiring Diagram - With Type 1"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



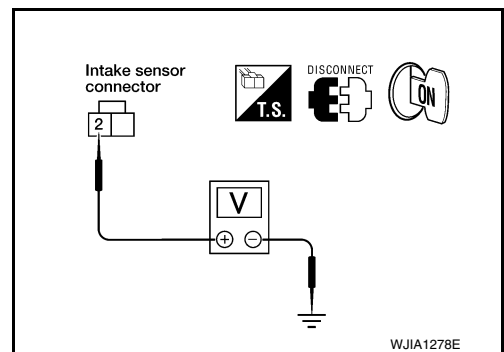
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

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

Is the inspection result normal?

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



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

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INTAKE SENSOR

[MANUAL A/C (TYPE 1)]

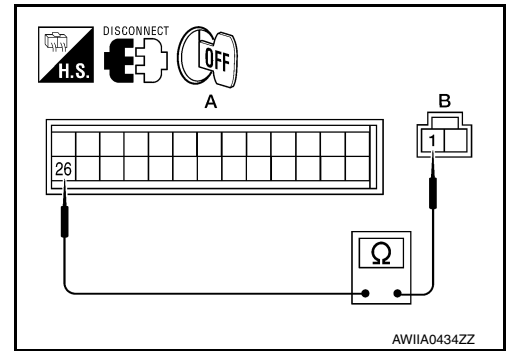
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M50 (A) terminal 26.

1 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK INTAKE SENSOR

Refer to [HAC-126, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
NO >> Replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

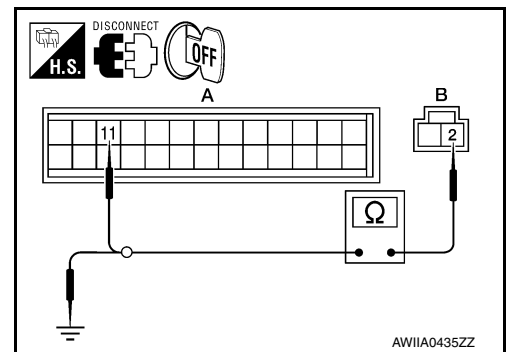
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M50 (A) terminal 11.

2 - 11 : Continuity should exist.

4. Check continuity between intake sensor harness connector M146 (B) terminal 2 and ground.

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:000000012565070

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Temperature °C (°F)	Resistance kΩ
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

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POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

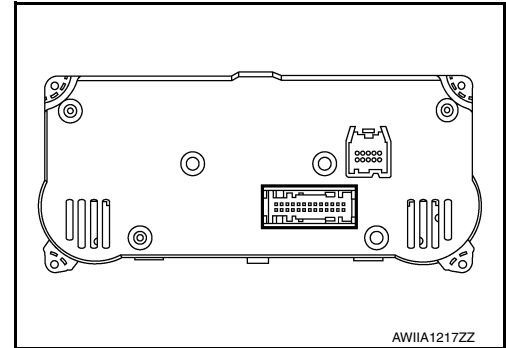
INFOID:000000012565071

COMPONENT DESCRIPTION

Front Air Control

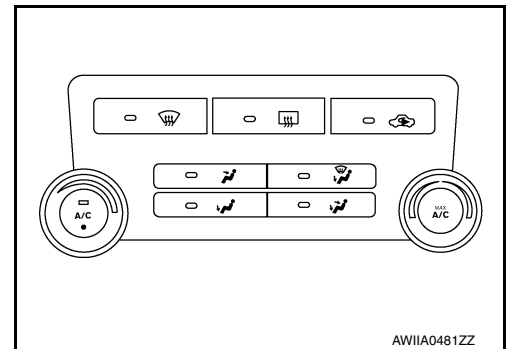
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.

The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.



Potential Temperature Control (PTC)

The PTC is built into the front air control. It can be set from cold to hot or any intermediate position by rotating the temperature dial.



Front Air Control Component Function Check

INFOID:000000012565072

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK

1. Turn blower motor ON, then press A/C switch.
2. Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

- YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to [HAC-128, "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000012565073

Regarding Wiring Diagram information, refer to [HAC-133, "Wiring Diagram - With Type 1"](#).

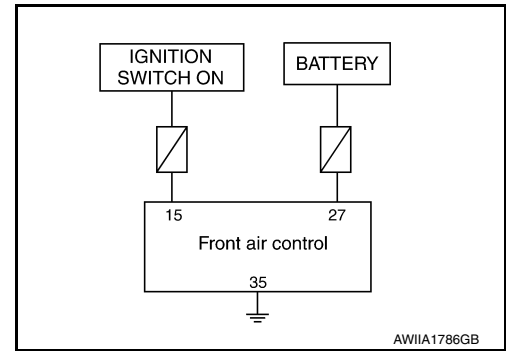
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M59 terminal 27 and M50 terminal 15, and ground.

Terminals		(-)	Ignition switch position		
Front air control connector	Terminal No.		OFF	ACC	ON
M50	15	Ground	Approx. 0V	Approx. 0V	Battery voltage
M59	27		Battery voltage	Battery voltage	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-76. "Terminal Arrangement"](#).

- If fuses are OK, check harness for open circuit. Repair or replace as necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace as necessary.

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M59 terminal 35 and ground.

35 - Ground : Continuity should exist.

Is the inspection result normal?

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

NO >> Repair harness or connector.

MANUAL A/C IDENTIFICATION TABLE

< ECU DIAGNOSIS INFORMATION >

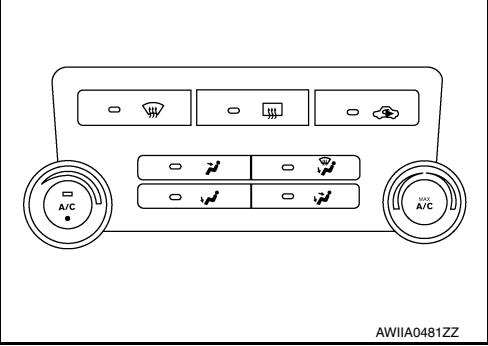
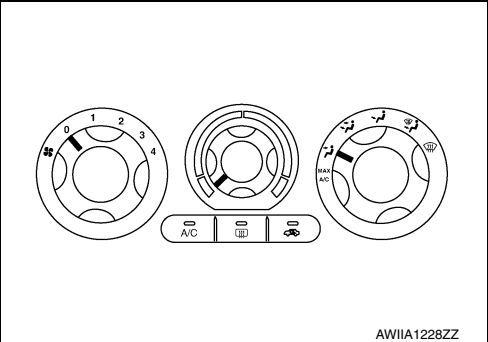
[MANUAL A/C (TYPE 1)]

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000012565074

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

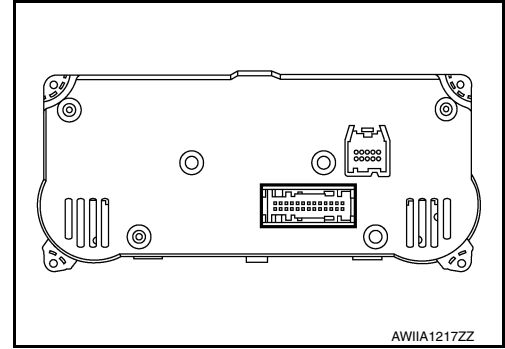
[MANUAL A/C (TYPE 1)]

AIR CONDITIONER CONTROL

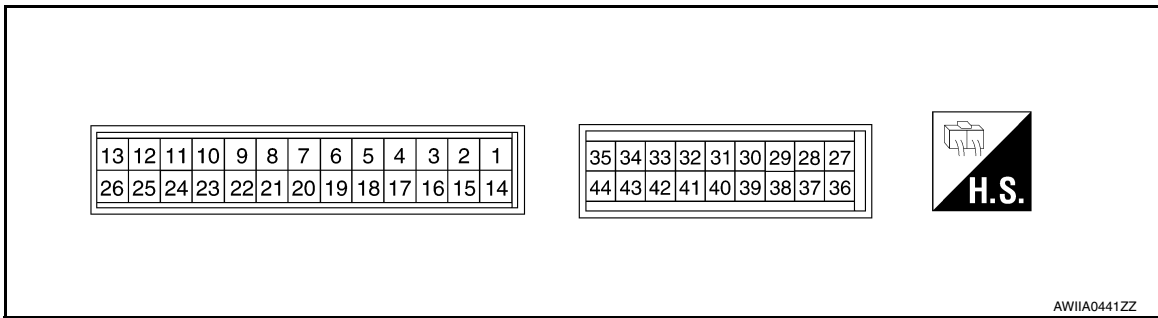
Front Air Control Terminals Reference Values

INFOID:000000012565075

Measure voltage between each terminal and ground by following Terminals and Reference Values for front air control.



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
3	P	Ground for mode door motor and air mix door motor PBR	ON	-	0V
4	W	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
5	R	Front blower monitor	ON	Front blower motor OFF	Battery voltage
				Front blower motor ON	0V
6	SB	Air mix door motor feedback	ON	-	0 - 5V
8	G	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	
10	V	Mode door motor feedback	ON	-	0 - 5V
11	L	Intake sensor	ON	-	0 - 5V
13	LG	Variable blower control	ON	-	0 - 5V
15	W/G	Power supply for IGN	ON	-	Battery voltage
16	Y	Rear defogger request *1	ON	-	Battery voltage
17	GR	Air mix door motor CCW	ON	Counterclockwise rotation	Battery voltage
18	BG	Air mix door motor CW	ON	Clockwise rotation	Battery voltage

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL A/C (TYPE 1)]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
21	BG	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
22	Y	Intake door motor CW	ON	Clockwise rotation	Battery voltage
23	R	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
24	BR	Mode door motor CW	ON	Clockwise rotation	Battery voltage
26	V	Sensor ground	ON	-	0V
27	R/Y	Power supply for BAT	-	-	Battery voltage
28	G	V ref ACTR (5V)	ON	-	0 - 5V
35	B	Ground	-	-	0V
36	P	CAN-L	ON	-	0 - 5V
37	L	CAN-H	ON	-	0 - 5V

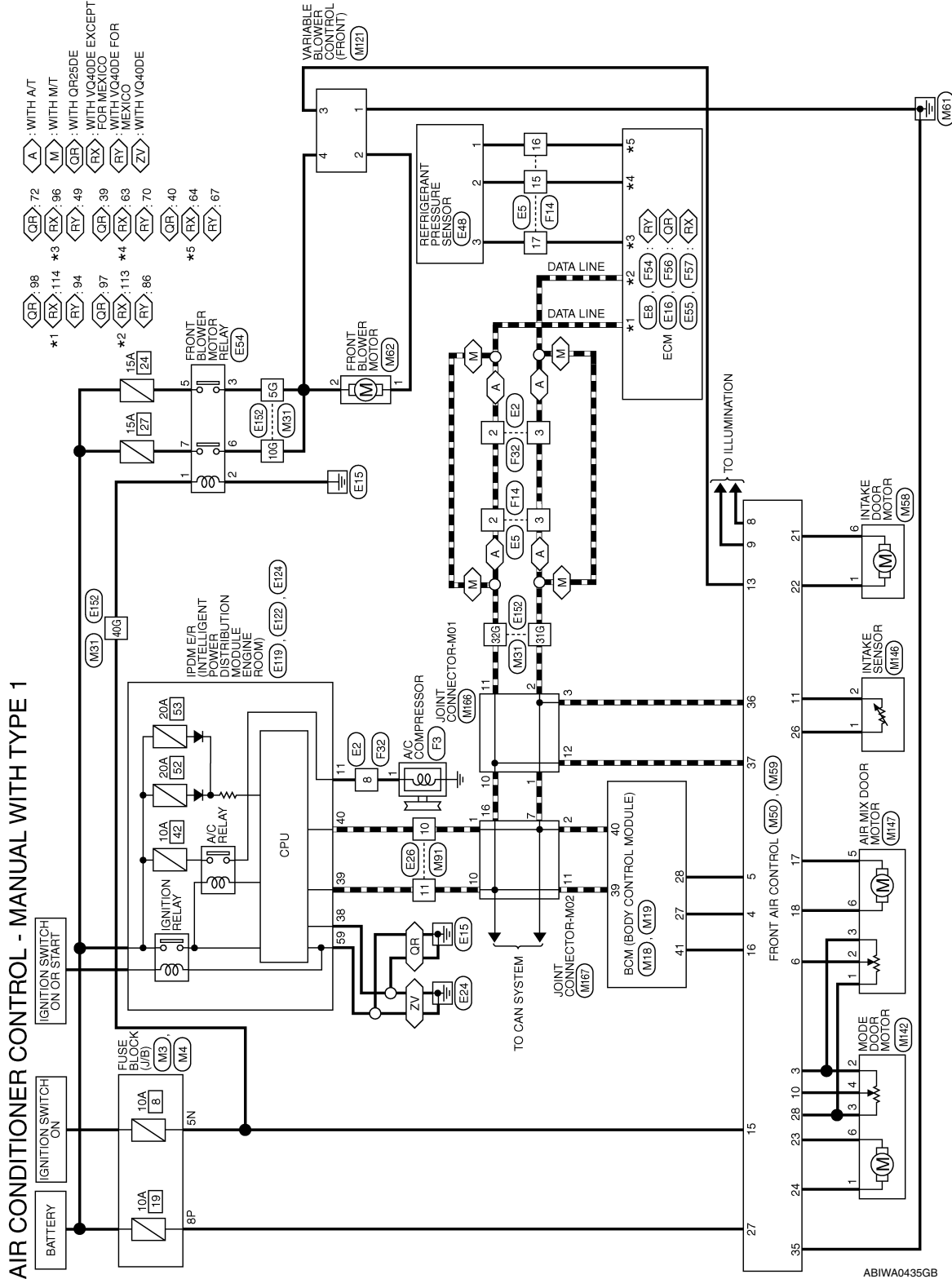
*1: If equipped

WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - With Type 1

INFOID:000000012565076



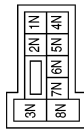
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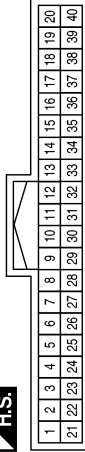
AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH TYPE 1

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



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

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

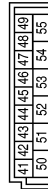


Terminal No.	Color of Wire	Signal Name
5N	W/G	-

Terminal No.	Color of Wire	Signal Name
8P	R/Y	-

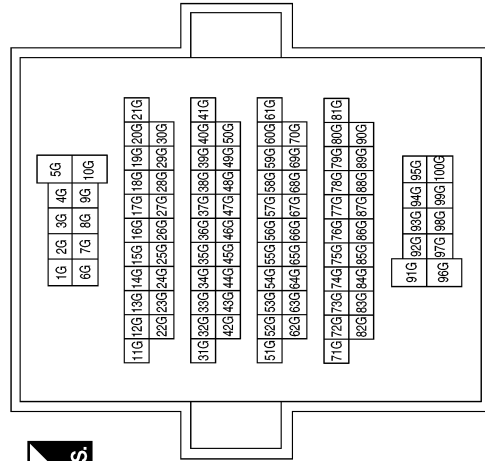
Terminal No.	Color of Wire	Signal Name
27	W	AIRCON SW
28	R	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
41	Y	REAR DEFOGGER SW

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



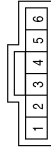
Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
40G	W/G	-

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

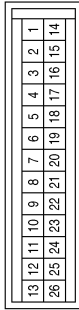
Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
6	BG	-

Terminal No.	Color of Wire	Signal Name
12	-	-
13	LG	FRONT BLWR SPEED
14	-	-
15	W/G	VIGN
16	Y	REAR DEF REQ
17	GR	SZ BLND DR A
18	BG	SZ BLND DR B
19	-	-
20	-	-
21	BG	INTAKE DR1 A
22	Y	INTAKE DR1 B
23	R	MODE DR A
24	BR	MODE DR B
25	-	-
26	V	SENSOR RETURN

Connector No.	M50
Connector Name	FRONT AIR CONTROL (MANUAL WITH TYPE 1)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	P	VREF RET
4	W	AC REQ
5	R	FAN ON
6	SB	SZ BLND DR FB
7	-	-
8	G	ILLUM+
9	BR	ILLUM-
10	V	MODE FEEDBACK
11	L	EVAP TEMP SENSOR

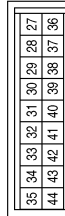
Connector No.	M62
Connector Name	FRONT BLOWER MOTOR
Connector Color	BLACK



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

Terminal No.	Color of Wire	Signal Name
33	-	-
34	-	-
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	-	-
39	-	-
40	-	-
41	-	-
42	-	-
43	-	-
44	-	-

Connector No.	M59
Connector Name	FRONT AIR CONTROL (MANUAL WITH TYPE 1)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
27	R/Y	VBAT
28	G	5V REF VOLTAGE
29	-	-
30	-	-
31	-	-
32	-	-

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AIR CONDITIONER CONTROL

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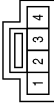
[MANUAL A/C (TYPE 1)]

Connector No.	M142
Connector Name	MODE DOOR MOTOR
Connector Color	BLACK



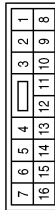
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	P	-
3	G	-
4	V	-
6	R	-(WITHOUT AUTO A/C)

Connector No.	M121
Connector Name	VARIABLE BLOWER CONTROL (FRONT)
Connector Color	WHITE



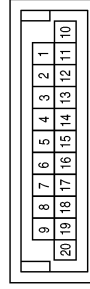
Terminal No.	Color of Wire	Signal Name
1	B	-
2	L	-
3	LG	-(WITHOUT AUTO A/C)
4	W/G	-

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Color	WHITE



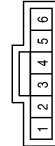
Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

Connector No.	M166
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
3	P	-
10	L	-
11	L	-
12	L	-

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-
3	P	-
5	GR	-
6	BG	-(MANUAL WITH TYPE 1)

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



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

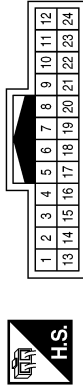
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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

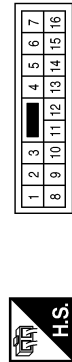
[MANUAL A/C (TYPE 1)]

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



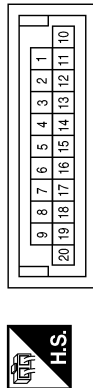
Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	B	-(FOR MEXICO)
16	LG	-(EXCEPT FOR MEXICO)
17	P	-

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



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

Connector No.	M167
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE



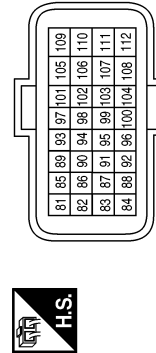
Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
7	P	-
10	L	-
11	L	-
16	L	-

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Color	WHITE



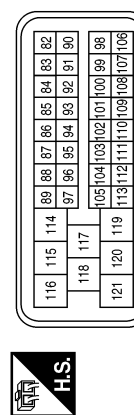
Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

Connector No.	E16
Connector Name	ECM (WITH QR25DE)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
97	P	CAN-L
98	L	CAN-H

Connector No.	E8
Connector Name	ECM (WITH VQ40DE FOR MEXICO)
Connector Color	BLACK



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

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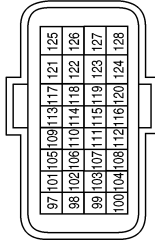
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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

Connector No.	E55
Connector Name	ECM (WITH VQ40DE EXCEPT FOR MEXICO)
Connector Color	GRAY



Terminal No.	Color of Wire	Signal Name
113	P	CAN-L
114	L	CAN-H

Connector No.	E54
Connector Name	FRONT BLOWER MOTOR RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	B	-
3	W/G	-
5	L	-
6	W/G	-
7	GR	-

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



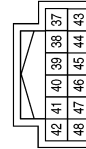
Terminal No.	Color of Wire	Signal Name
1	B	- (FOR MEXICO)
1	LG	- (EXCEPT FOR MEXICO)
2	BR	-
3	P	-

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



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

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



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

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



Terminal No.	Color of Wire	Signal Name
11	Y	A/C COMPRESSOR

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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

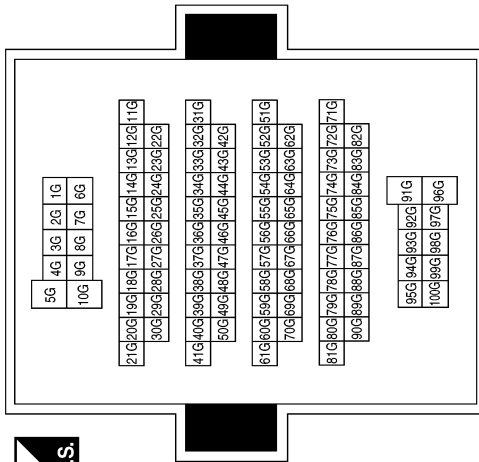
Connector No.	F3
Connector Name	A/C COMPRESSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-

Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
40G	W/G	-

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

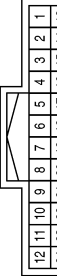


Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

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



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	B	-(FOR MEXICO)
16	LG	-(EXCEPT FOR MEXICO)
17	P	-

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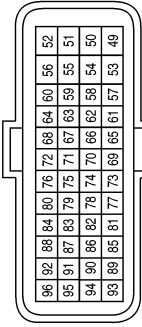
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AIR CONDITIONER CONTROL

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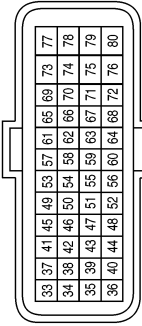
[MANUAL A/C (TYPE 1)]

Connector No.	F57
Connector Name	ECM (WITH VQ40DE EXCEPT FOR MEXICO)
Connector Color	BROWN



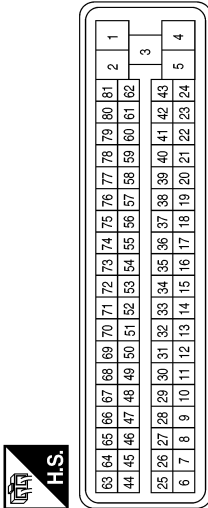
Terminal No.	Color of Wire	Signal Name
63	BR	PDPRESS
64	LG	GND-A-PDPRES
96	P	AVCC (PDPRES)

Connector No.	F56
Connector Name	ECM (WITH QR25DE)
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
39	BR	PDPRESS
40	LG	GND-A-PDPRES
72	P	AVCC (PDPRES)

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



Terminal No.	Color of Wire	Signal Name
49	P	AVCC (PDPRES)
67	V	GND-A
70	BR	PDPRESS

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MANUAL A/C IDENTIFICATION TABLE

< SYMPTOM DIAGNOSIS >

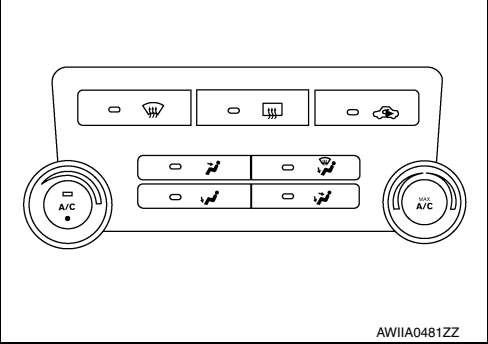
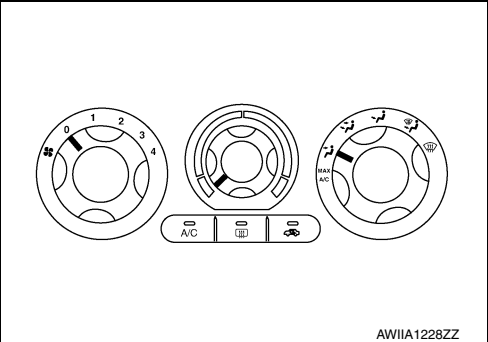
[MANUAL A/C (TYPE 1)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000012565077

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	 <p style="text-align: right;">AWIA0481ZZ</p>
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	 <p style="text-align: right;">AWIA1228ZZ</p>

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AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:000000012565078

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-128
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. HAC-103
Mode door motor is malfunctioning.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. HAC-108
Air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-112
Intake door motor is malfunctioning.	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-115
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-121
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-143
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-151
Noise	Go to Trouble Diagnosis Procedure for Noise. HAC-153
Self-Diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-Diagnosis. HAC-101

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

INSUFFICIENT COOLING

Component Function Check

INFOID:000000012565079

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn temperature control dial counterclockwise to maximum cold.
2. Check for cold air at discharge air outlets.

Can the symptom be duplicated?

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

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-90, "Operational Check"](#).

Does another symptom exist?

- YES >> Refer to [HAC-142, "Symptom Matrix Chart"](#).
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [HAC-101, "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Check symptom chart. Refer to [HAC-142, "Symptom Matrix Chart"](#).

5. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-14, "Checking Drive Belts"](#) (QR25DE) or [EM-130, "Checking Drive Belts"](#) (VQ40DE).

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Adjust or replace compressor belt. Refer to [EM-14, "Adjustment"](#) (QR25DE) or [EM-130, "Adjustment"](#) (VQ40DE).

6. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation.

Does air mix door operate correctly?

- YES (QR25DE) >> GO TO 8.
YES (VQ40DE) >> GO TO 7.
NO >> Repair or replace air mix door control linkage.

7. CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to [EC-947, "Component Inspection"](#) (for USA and Canada) or [EC-1367, "Component Inspection"](#) (for Mexico).

Does cooling fan motor operate correctly?

- YES >> GO TO 8.
NO >> Check cooling fan motor. Refer to [EC-946, "Diagnosis Procedure"](#) (for USA and Canada) or [EC-1366, "Diagnosis Procedure"](#) (for Mexico).

8. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

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INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

>> GO TO 9.

9. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.
2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check contaminated refrigerant. Refer to [HA-3. "Contaminated Refrigerant"](#).

10. CHECK FOR EVAPORATOR FREEZE UP

Start engine and run A/C. Check for evaporator freeze up.

Does evaporator freeze up?

YES >> Perform diagnostic work flow. Refer to [HAC-144. "Diagnostic Work Flow"](#).

NO >> GO TO 11.

11. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-146. "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform diagnostic work flow. Refer to [HAC-144. "Diagnostic Work Flow"](#).

NO >> GO TO 12.

12. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

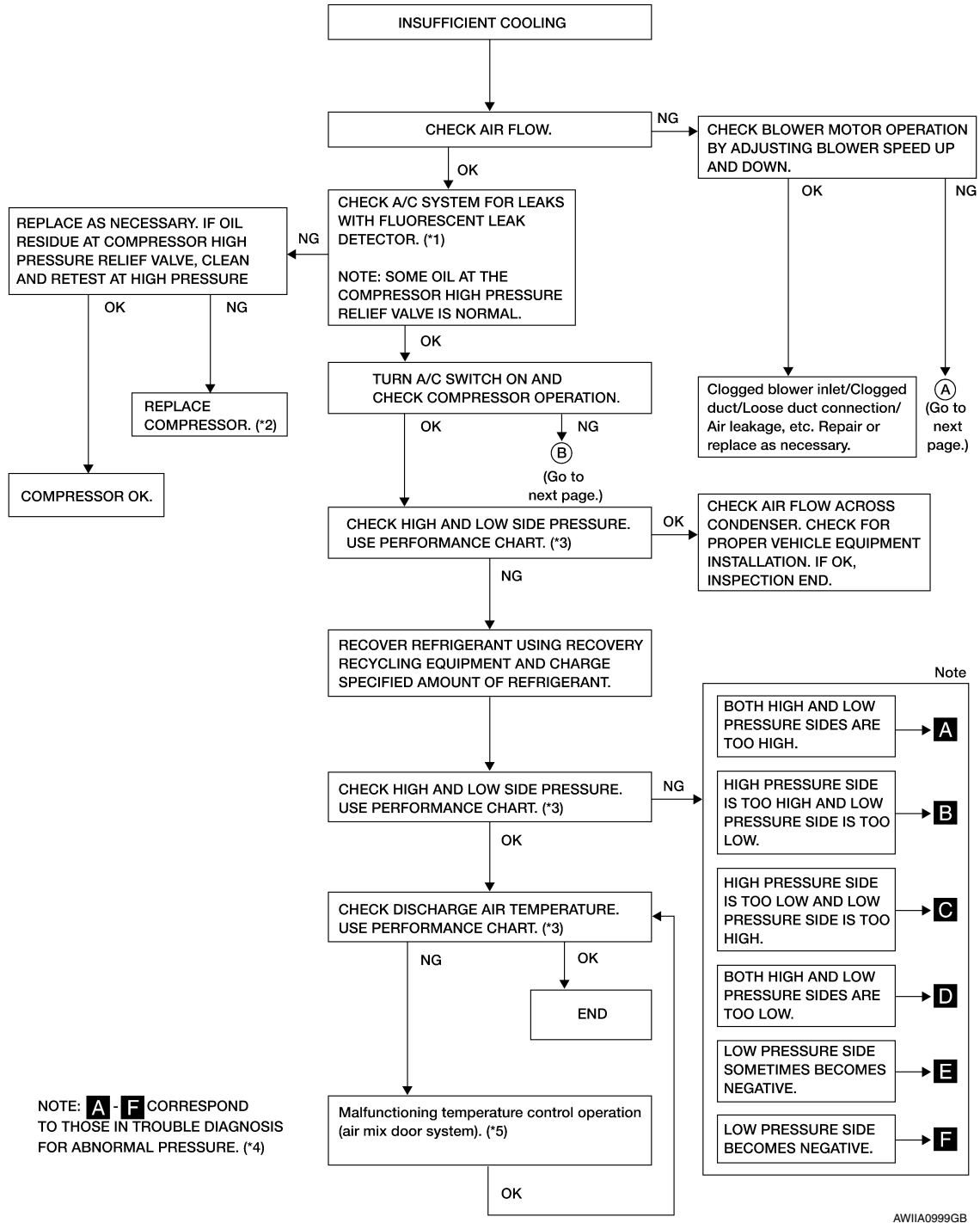
Diagnostic Work Flow

INFOID:000000012565080

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]



*1 [HA-18. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-25. "Removal and Installation for Compressor"](#)

*3 [HAC-146. "Performance Chart"](#)

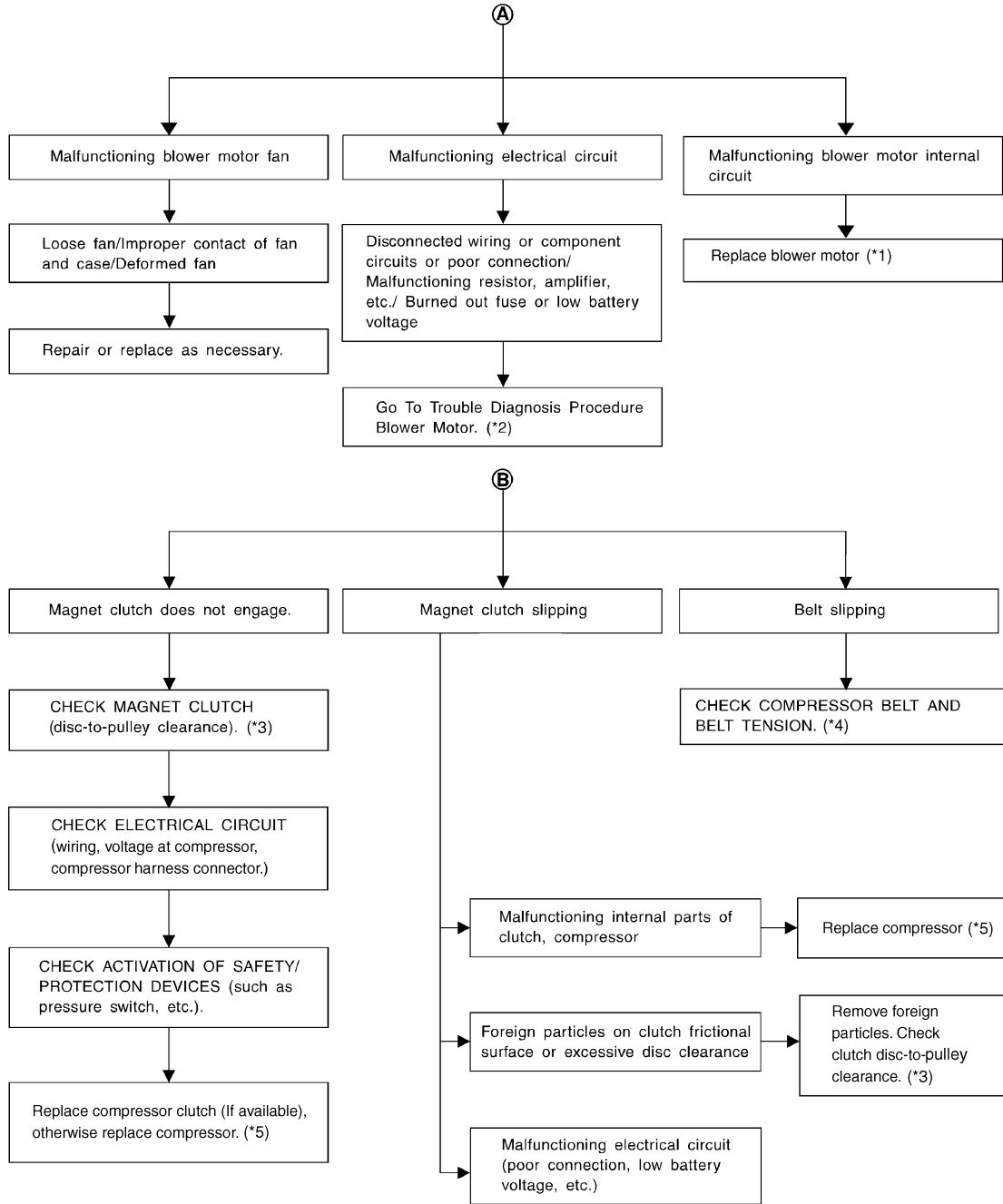
*4 [HAC-147. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-108. "Air Mix Door Motor Diagnosis Procedure"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]



AWIA1000GB

*1 [VTL-11, "Removal and Installation"](#)

*2 [HAC-116, "Front Blower Motor Diagnosis Procedure"](#)

*3 [HA-27, "Removal and Installation for Compressor Clutch"](#)

*4 [EM-14, "Checking Drive Belts" \(QR25DE\)](#) or [EM-130, "Checking Drive Belts" \(VQ40DE\)](#)

*5 [HA-25, "Removal and Installation for Compressor"](#)

Performance Chart

INFOID:000000012565081

TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Recirculation (REC) switch	(Recirculation) set
Blower speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	5.3 - 6.5 (42 - 44)
	25 (77)	9.7 - 11.5 (49 - 53)
	30 (86)	13.8 - 16.3 (57 - 61)
	35 (95)	18.0 - 21.2 (64 - 70)
	40 (104)	22.2 - 25.7 (72 - 78)
60 - 70	20 (68)	6.5 - 7.7 (44 - 46)
	25 (77)	11.5 - 13.3 (53 - 56)
	30 (86)	16.3 - 18.8 (61 - 66)
	35 (95)	21.2 - 24.0 (70 - 75)
	40 (104)	25.7 - 29.2 (78 - 85)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	680 - 840 (6.94 - 8.57, 98.6 - 121.8)	160 - 198 (1.63 - 2.02, 23.2 - 28.7)
	25 (77)	800 - 985 (8.16 - 10.05, 116.0 - 142.8)	198 - 245 (2.02 - 2.50, 28.7 - 35.5)
	30 (86)	940 - 1,150 (9.59 - 11.73, 136.3 - 166.8)	225 - 278 (2.30 - 2.84, 32.6 - 40.3)
	35 (95)	1,160 - 1,410 (11.83 - 14.38, 168.2 - 204.5)	273 - 335 (2.78 - 3.42, 39.6 - 48.6)
	40 (104)	1,325 - 1,620 (13.52 - 16.52, 192.1 - 234.9)	325 - 398 (3.32 - 4.06, 47.1 - 57.7)

Trouble Diagnoses for Abnormal Pressure

INFOID:000000012565082

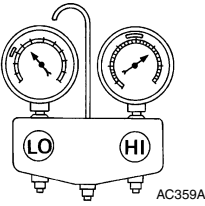
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

INSUFFICIENT COOLING

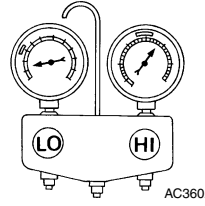
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

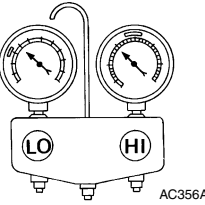
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p>  <p style="text-align: right; font-size: small;">AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check oil for contamination.

High-pressure Side is Too Low and Low-pressure Side is Too High

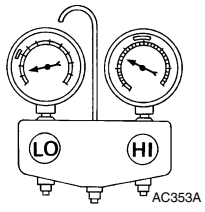
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p>  <p style="text-align: right; font-size: small;">AC356A</p>	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

INSUFFICIENT COOLING

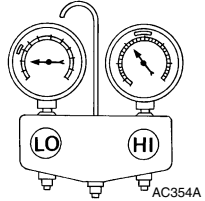
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
<p>D Both high- and low-pressure sides are too low.</p> 	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-20. "Checking of Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-125. "Intake Sensor Diagnosis Procedure". Replace compressor. Repair evaporator fins. Replace evaporator. Refer to HAC-115. "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

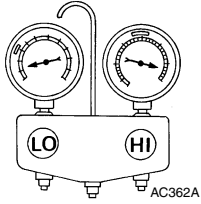
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> Air conditioning system does not function and does not cyclically cool the compartment air. The system constantly functions for a certain period of time after compressor is stopped and restarted. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> Drain water from refrigerant or replace refrigerant. Replace liquid tank.

Low-pressure Side Becomes Negative

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</p> 	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check oil for contamination.

INSUFFICIENT HEATING**Component Function Check**

INFOID:000000012565083

SYMPTOM: Insufficient heating

INSPECTION FLOW**1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE**

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

Can the symptom be duplicated?

YES >> GO TO 2.

NO >> Perform complete operational check. Refer to [HAC-90, "Operational Check"](#).**2. CHECK FOR SERVICE BULLETINS**

Check for any service bulletins.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSISPerform self-diagnosis. Refer to [HAC-101, "Front Air Control Self-Diagnosis"](#).Is the inspection results normal?

YES >> GO TO 4.

NO >> Refer to [HAC-142, "Symptom Matrix Chart"](#).**4. CHECK ENGINE COOLING SYSTEM**

1. Check for proper engine coolant level. Refer to [CO-11, "System Inspection"](#) (QR25DE) or [CO-39, "System Inspection"](#) (VQ40DE).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-11, "System Inspection"](#) (QR25DE) or [CO-39, "System Inspection"](#) (VQ40DE).
4. Check for air in cooling system.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check the air mix door motor circuit. Refer to [HAC-108, "Air Mix Door Motor Component Function Check"](#).**6. CHECK AIR DUCTS**

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair all disconnected or leaking air ducts.

7. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 8.

NO >> Both hoses warm: GO TO 9.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

8. CHECK ENGINE COOLANT SYSTEM

Check engine coolant temperature sensor. Refer to [EC-187, "Component Inspection"](#) (QR25DE), [EC-665, "Component Inspection"](#) (VQ40DE for USA and Canada) or [EC-1143, "Component Inspection"](#) (VQ40DE for Mexico).

Is the inspection result normal?

- YES >> System OK.
NO >> Repair or replace as necessary. Retest.

9. CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

- YES >> System OK.
NO >> 1. Back flush heater core.
2. Drain the water from the system.
3. Refill system with new engine coolant. Refer to [CO-12, "Changing Engine Coolant"](#) (QR25DE) or [CO-40, "Changing Engine Coolant"](#) (VQ40DE).
4. GO TO 10 to retest.

10. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

- YES >> System OK.
NO >> Replace heater core. Refer to [VTL-19, "Removal and Installation"](#).

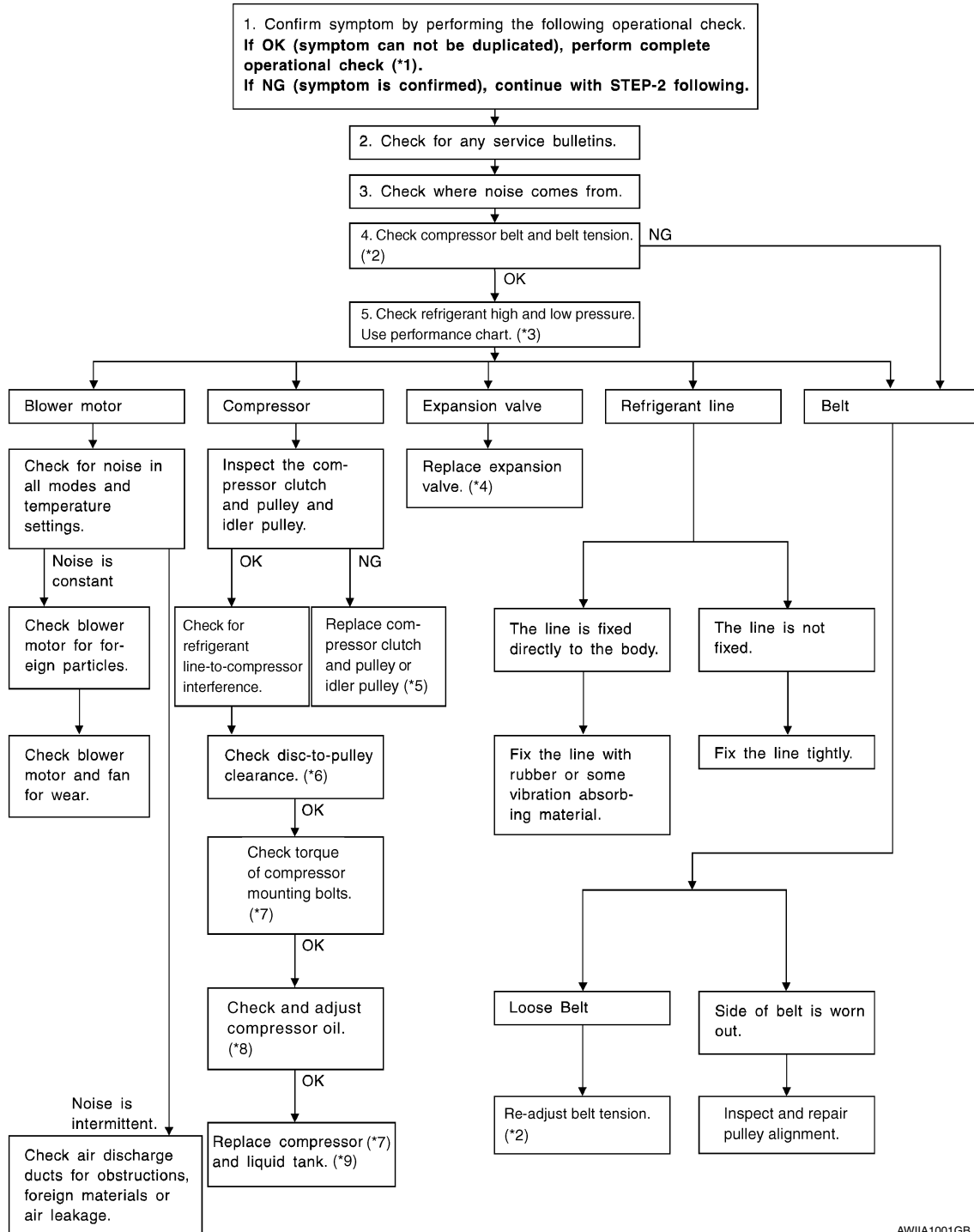
NOISE

Component Function Check

INFOID:000000012565084

SYMPTOM: Noise

INSPECTION FLOW



AWI1A1001GB

NOISE

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- | | | |
|---|--|--|
| *1 HAC-90. "Operational Check" | *2 EM-14. "Checking Drive Belts" (QR25DE) or EM-130. "Checking Drive Belts" (VQ40DE) | *3 HAC-146. "Performance Chart" |
| *4 HA-37. "Removal and Installation" | *5 HA-27. "Removal and Installation for Compressor Clutch" | *6 HA-27. "Removal and Installation for Compressor Clutch" |
| *7 HA-25. "Removal and Installation for Compressor" | *8 HA-16. "Maintenance of Oil Quantity in Compressor" | *9 HA-34. "Removal and Installation" |

PRECAUTION

PRECAUTIONS

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

INFOID:000000012565085

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 three minutes before performing any service.

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

INFOID:000000012565086

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, "Contaminated Refrigerant"](#). 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

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PRECAUTIONS

< PRECAUTION >

[MANUAL A/C (TYPE 1)]

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

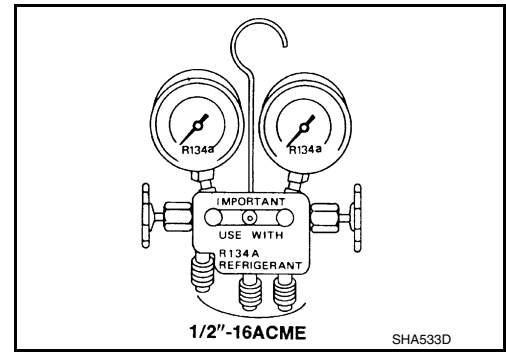
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

Precaution for Service Equipment

INFOID:000000012565087

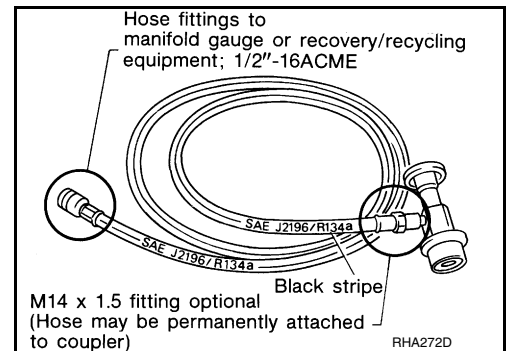
MANIFOLD GAUGE SET

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

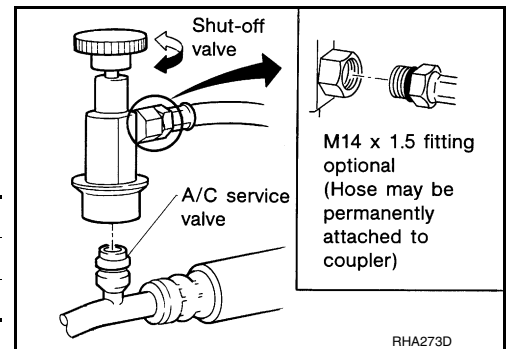
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

Never 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 A/C IDENTIFICATION TABLE

< BASIC INSPECTION >

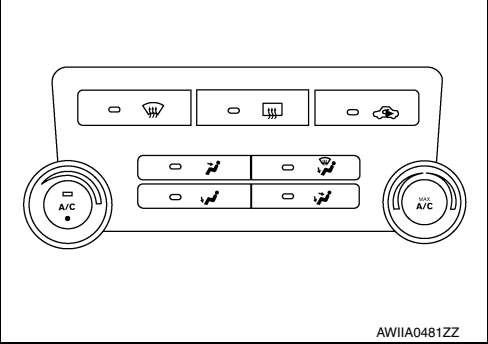
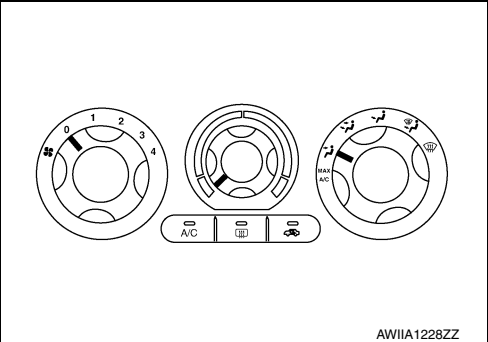
[MANUAL A/C (TYPE 2)]

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000012565088

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	 <p style="text-align: right;">AWIA0481ZZ</p>
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	 <p style="text-align: right;">AWIA1228ZZ</p>

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DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL A/C (TYPE 2)]

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:000000012565089

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

Listen to customer complaint. Get detailed information about the conditions and environment when the symptom occurs.

>> GO TO 2.

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-159, "Operational Check"](#).

Can a symptom be duplicated?

YES >> Go to trouble diagnosis. Refer to [HAC-212, "Symptom Matrix Chart"](#).

NO >> System OK.

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000012565090

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

Conditions : Engine running and at normal operating temperature

CHECKING BLOWER

1. Turn blower control dial clockwise. Blower should operate on low speed.
2. Turn the blower control dial again, and continue checking each blower speed until all speeds are checked.
3. Leave blower on speed 4.

If NG, go to trouble diagnosis procedure for [HAC-183, "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR



1. Turn the mode switch to each position.
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-166, "Discharge Air Flow"](#).

Mode door position is checked in the next step.



If NG, go to trouble diagnosis procedure for [HAC-173, "Mode Door Motor Diagnosis Procedure"](#).

If OK, continue with next check.

NOTE:

Confirm that the A/C compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF () or D/F () is selected.

CHECKING RECIRCULATION

1. Press recirculation () switch one time. Recirculation indicator should illuminate.
2. Press recirculation () switch one more time. Recirculation indicator should go off.
3. Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for [HAC-181, "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue with next check.

NOTE:

Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at fresh when the DEF or D/F is selected.

CHECKING TEMPERATURE DECREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-213, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-177, "Air Mix Door Motor Component Function Check"](#).

If OK, continue with next check.

CHECKING TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise.
2. Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-221, "Component Function Check"](#). If air mix door motor (front) appears to be malfunctioning, go to [HAC-177, "Air Mix Door Motor Component Function Check"](#).

If OK, continue with next check.

CHECK A/C SWITCH (IF EQUIPPED)

1. Press A/C switch with the blower switch ON.
2. A/C switch indicator will turn ON.
 - Confirm that the compressor clutch engages (sound or visual inspection).

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[MANUAL A/C (TYPE 2)]

If NG, go to trouble diagnosis procedure for [HAC-188. "Magnet Clutch Diagnosis Procedure"](#).

If OK, continue with next check.

MANUAL A/C IDENTIFICATION TABLE

< SYSTEM DESCRIPTION >

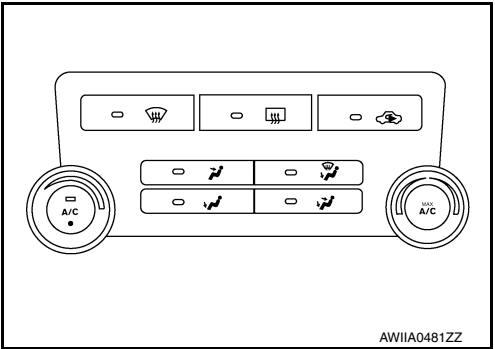
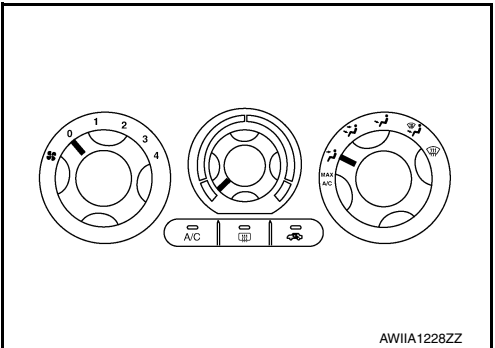
[MANUAL A/C (TYPE 2)]

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000012565091

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

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FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

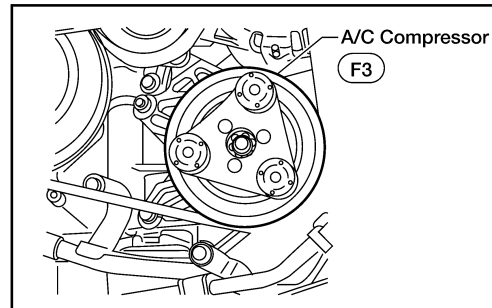
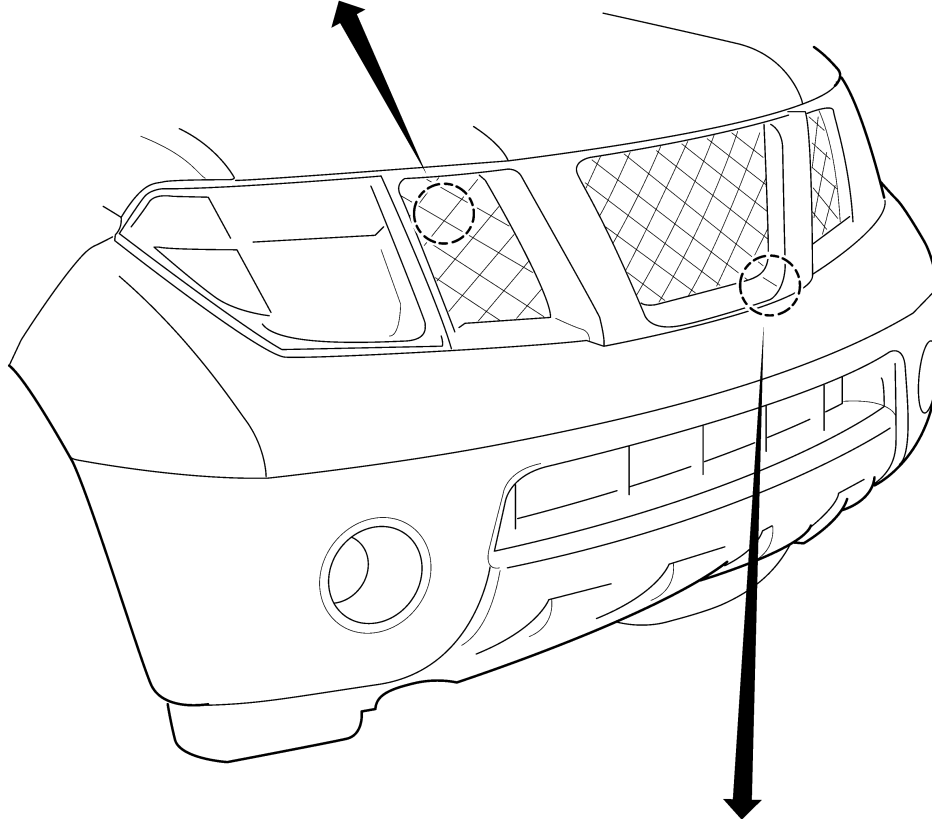
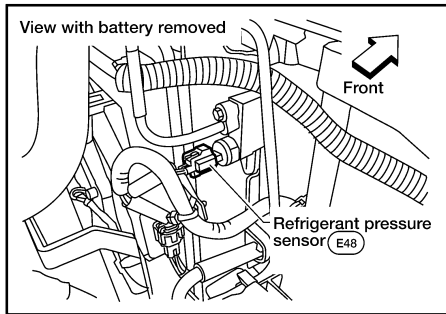
[MANUAL A/C (TYPE 2)]

FUNCTION INFORMATION

Component Part Location

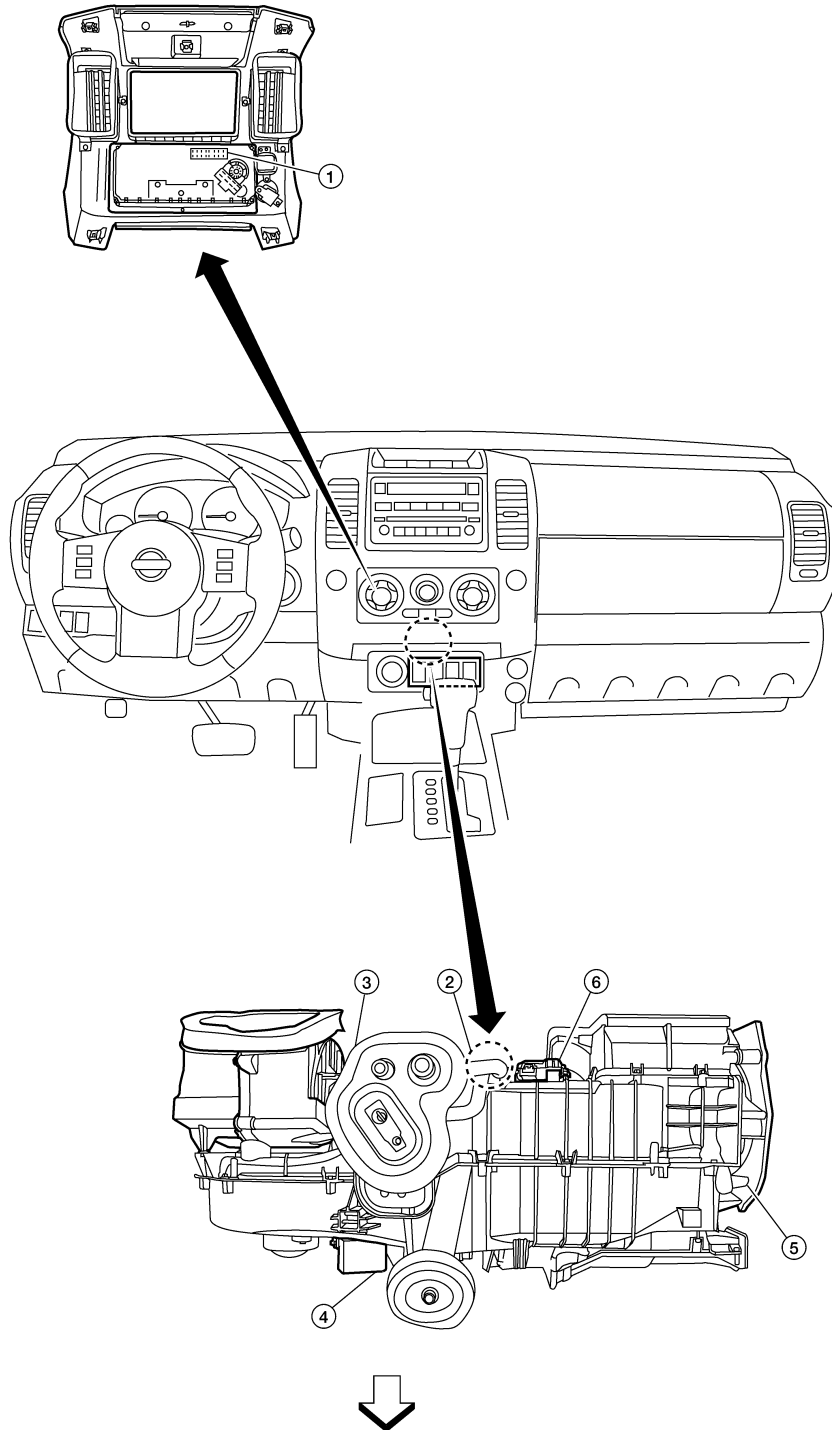
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ENGINE COMPARTMENT



WJIA1489E

PASSENGER COMPARTMENT



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⇒ :Front

- 3. Intake door motor M58
- 6. Air mix door motor M147

1. Front air control M49

4. Front blower motor resistor M122

2. Intake sensor M146

5. Mode door motor M142

AW11A0724ZZ

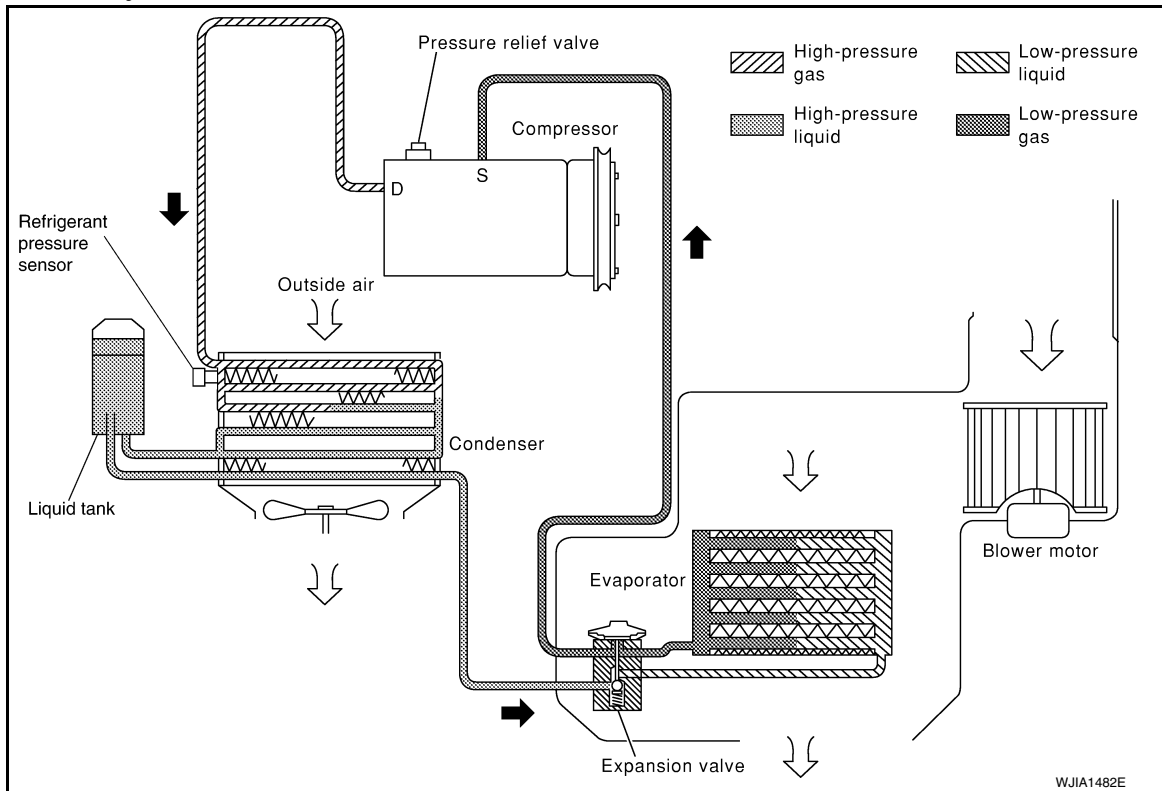
REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

REFRIGERATION SYSTEM

Refrigerant Cycle



REFRIGERANT FLOW

The refrigerant flows in the standard pattern. Refrigerant flows through the compressor, condenser, liquid tank, expansion valve, evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

FREEZE PROTECTION

The compressor cycles on and off to maintain the evaporator temperature within a specified range. When the evaporator coil temperature falls below a specified point, the intake sensor interrupts the compressor operation. When the evaporator coil temperature rises above the specification, the intake sensor allows compressor operation.

Refrigerant System Protection

INFOID:000000012565094

REFRIGERANT PRESSURE SENSOR

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. The ECM de-energizes the A/C relay to disengage the magnetic compressor clutch when pressure on the high pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm², 398 psi), or below about 120 kPa (1.22 kg/cm², 17.4 psi).

PRESSURE RELIEF VALVE

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/cm², 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

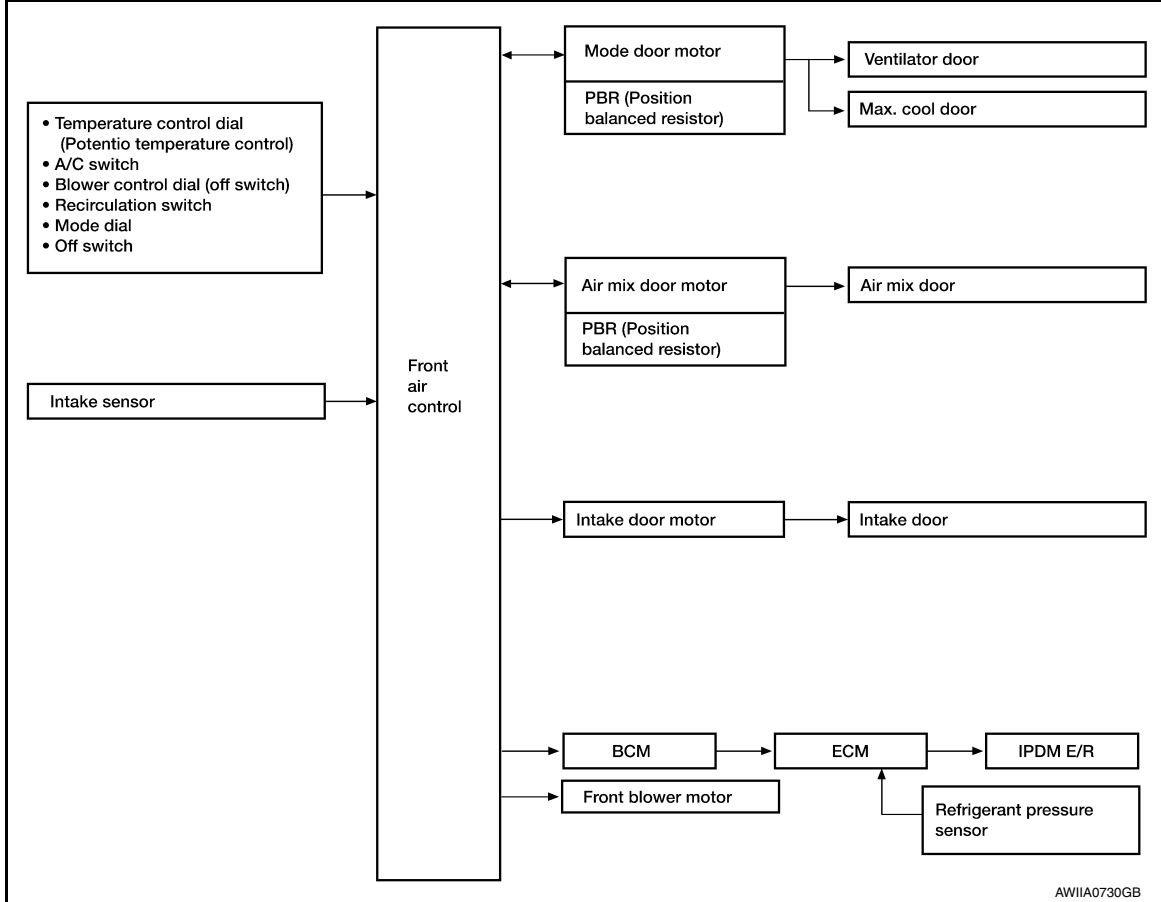
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:000000012565095

CONTROL SYSTEM

The control system consists of input sensors, switches, the front air control (microcomputer) and outputs. The relationship of these components is shown in the figure below:



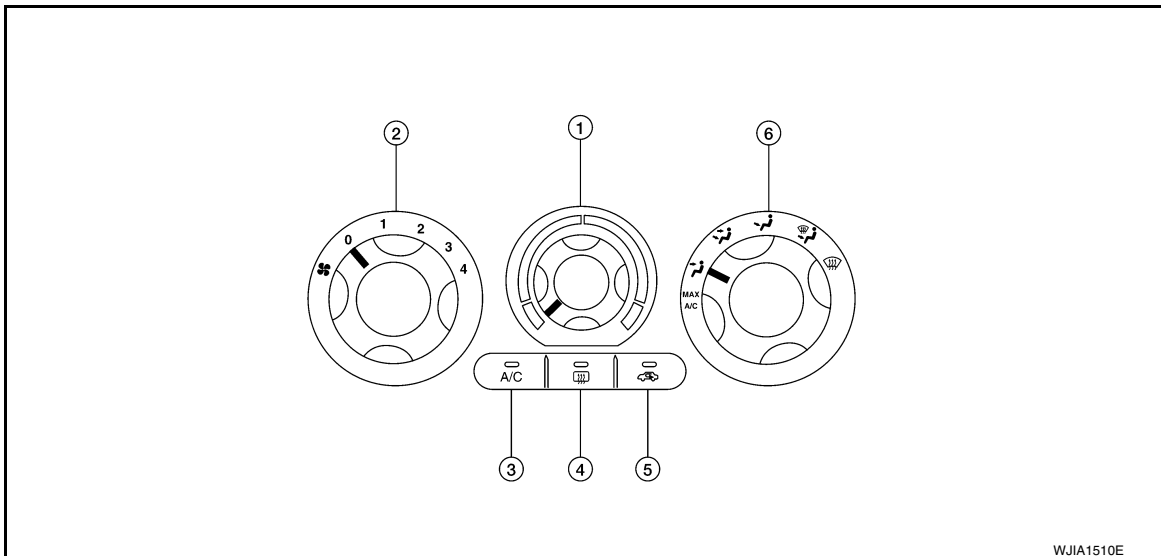
AW11A0730GB

Control System Description

INFOID:000000012565096

CONTROL OPERATION

Front air control



WJIA1510E

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

1. Temperature control dial
2. Blower control dial
3. A/C switch (if equipped)
4. Rear window defogger switch (if equipped)
5. Recirculation switch
6. Mode dial

TEMPERATURE CONTROL DIAL (TEMPERATURE CONTROL)

Increases or decreases the set temperature.

RECIRCULATION () SWITCH

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

REAR WINDOW DEFOGGER SWITCH (IF EQUIPPED)

When switch is ON, rear window is defogged.

OFF SWITCH (BLOWER SPEED SET TO 0)

The compressor and blower are OFF.

A/C SWITCH (IF EQUIPPED)

The compressor is ON or OFF.

(Pressing the A/C switch will turn off the A/C switch and compressor.)

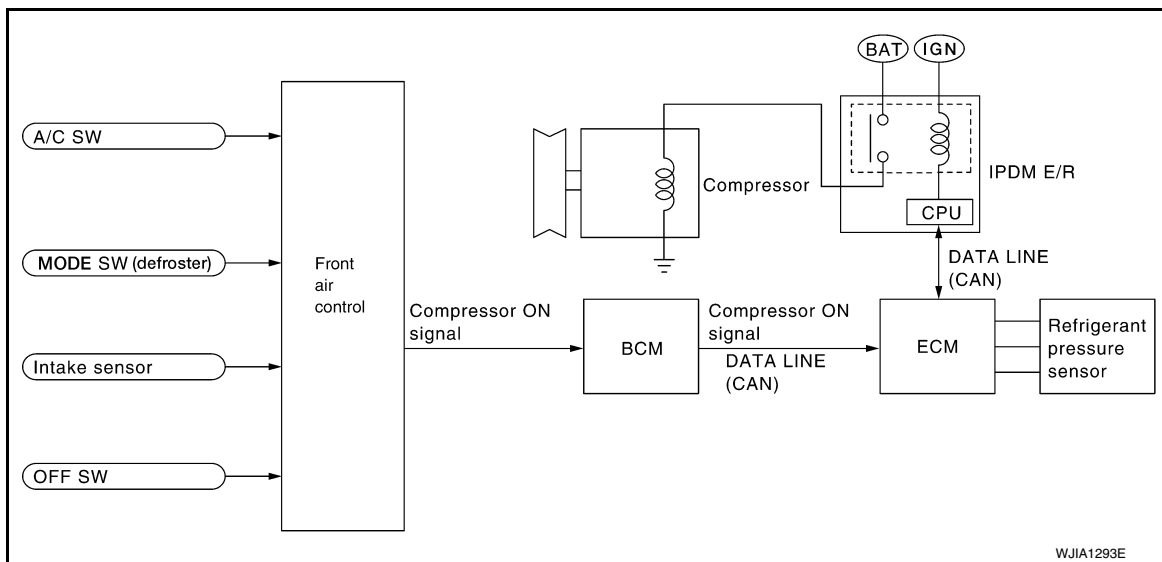
MODE DIAL

Controls the air discharge outlets.

FRONT BLOWER CONTROL DIAL

Manually controls the four blower speeds.

MAGNET CLUTCH CONTROL



When the A/C switch is pressed, or the mode dial is turned to the DEF or D/F position, the front air control outputs a compressor ON signal to BCM.

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

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

Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

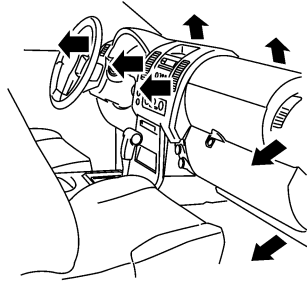
Discharge Air Flow

INFOID:000000012565097

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]



WJIA1296E

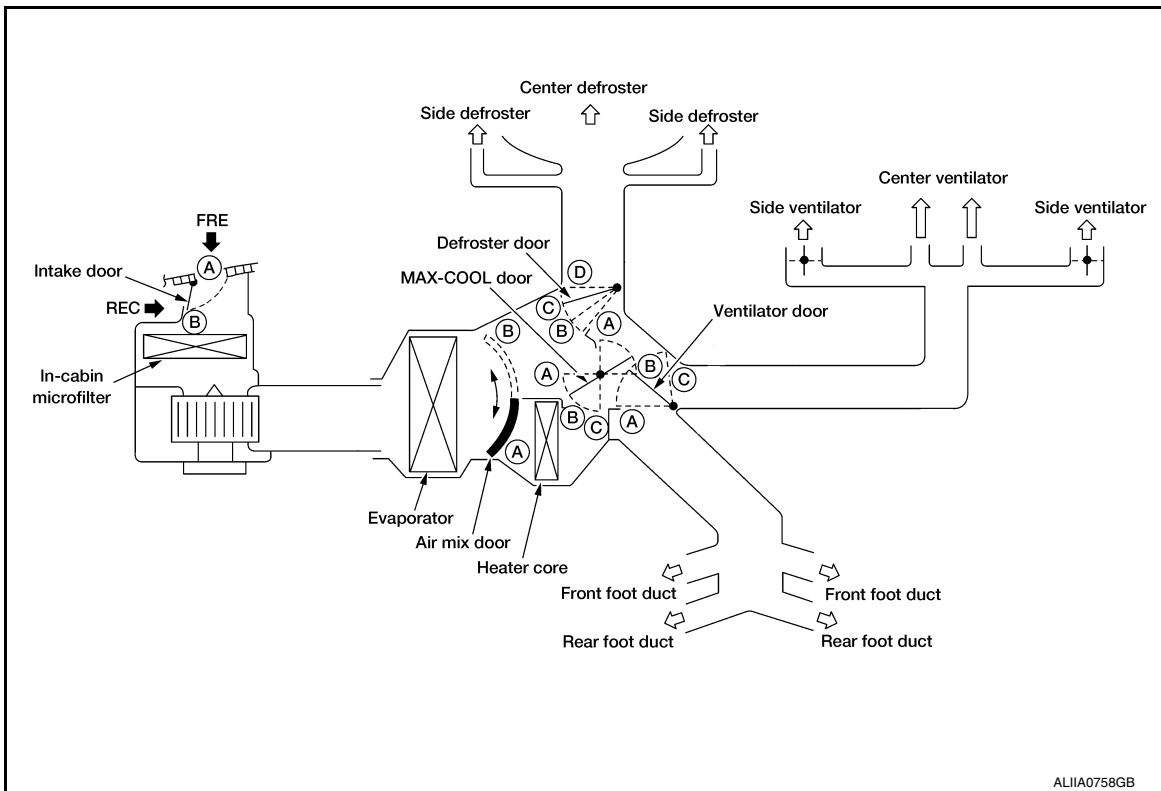
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	95%	5%	—
	60%	40%	—
	20%	55%	25%
	15%	50%	35%
	7%	15%	78%

Airflow always present at driver and passenger side demisters

Switches And Their Control Function

INFOID:0000000012565098

SWITCHES AND THEIR CONTROL FUNCTION



ALIIA0758GB

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

Door Position or switch	MODE SW				DEF SW		REC SW		Temperature dial			OFF SW	
	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF					
									COLD	~	HOT	OFF	
Ventilator door	(A)	(B)	(C)	(C)	(C)	—	—	—	—	—	—	(C)	
MAX-COOL door	(A)	(B)	(B)	(B)	(C)	—	—	—	—	—	—	(B)	
Defroster door	(D)	(D)	(D _{or} C)	(B)	(A)	—	—	—	—	—	—	(C)	
Intake door	—				(B)	—	(A)	(B)	—			(B)	
Air mix door	—				—	—	—		(A)			(B)	—

WJIA1497E

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

DIAGNOSIS SYSTEM (BCM)

COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000012565099

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			x	x	x		
Rear window defogger	REAR DEFOGGER			x	x			
Warning chime	BUZZER			x	x			
Interior room lamp timer	INT LAMP			x	x	x		
Remote keyless entry system	MULTI REMOTE ENT			x	x	x		
Exterior lamp	HEAD LAMP			x	x	x		
Wiper and washer	WIPER			x	x	x		
Turn signal and hazard warning lamps	FLASHER			x	x			
Air conditioner	AIR CONDITIONER			x				
Combination switch	COMB SW			x				
BCM	BCM	x	x			x	x	x
Immobilizer	IMMU		x	x	x			
Interior room lamp battery saver	BATTERY SAVER			x	x	x		
Vehicle security system	THEFT ALM			x	x	x		
RAP system	RETAINED PWR			x	x	x		
Signal buffer system	SIGNAL BUFFER			x	x			
TPMS	AIR PRESSURE MONITOR		x	x	x	x		
Panic alarm system	PANIC ALARM				x			

AIR CONDITIONER

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000012565100

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.

MANUAL A/C IDENTIFICATION TABLE

< DTC/CIRCUIT DIAGNOSIS >

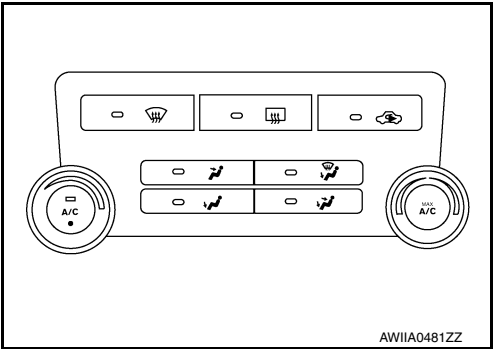
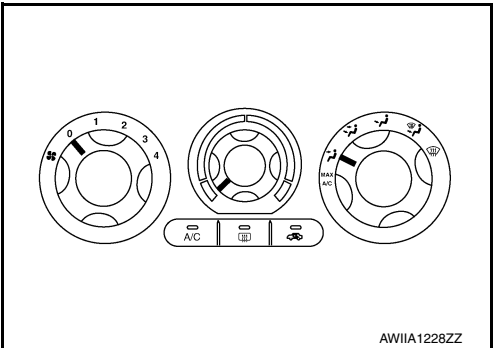
[MANUAL A/C (TYPE 2)]

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000012565101

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

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MODE DOOR MOTOR

System Description

INFOID:000000012565102

SYSTEM DESCRIPTION

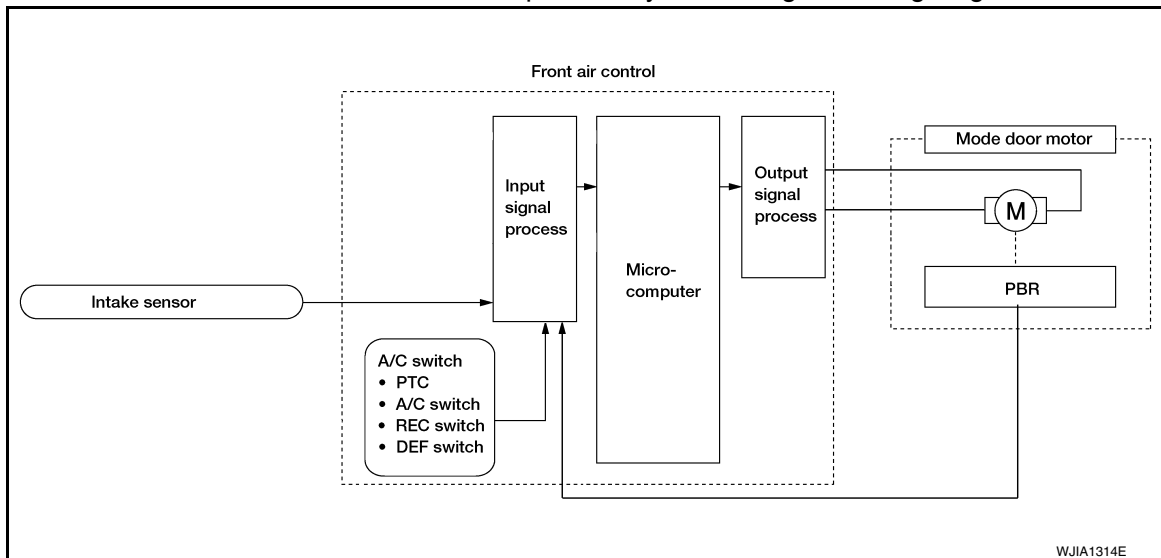
Component Parts

Mode door control system components are:

- Front air control
- Mode door motor
- Position Balanced Resistor (PBR) (built into mode door motor)
- Intake sensor

System Operation

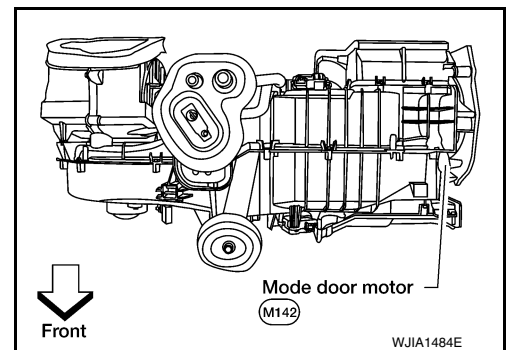
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the mode door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the mode door position by measuring the voltage signal on the PBR circuit.



COMPONENT DESCRIPTION

Mode Door Motor

The mode door motor is attached to the heater and cooling unit assembly. It rotates so that air is discharged from the outlet as indicated by the front air control. Motor rotation is conveyed to a link which activates the mode door.



Mode Door Motor Component Function Check

INFOID:000000012565103

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

INSPECTION FLOW

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Turn blower control dial to 4.
2. Turn the mode dial and check all positions.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-166. "Discharge Air Flow"](#).

NOTE:

Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when DEF (☰) or D/F (☱) is selected.

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Go to the diagnosis procedure. Refer to [HAC-173. "Mode Door Motor Diagnosis Procedure"](#).

Mode Door Motor Diagnosis Procedure

INFOID:000000012565104

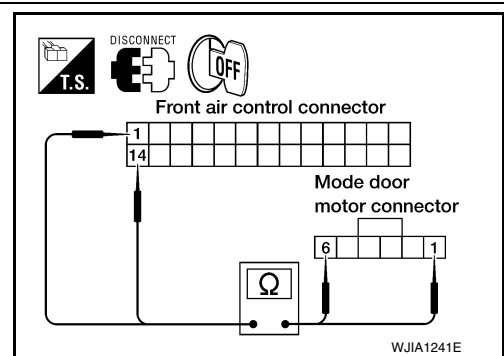
Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#) or [HAC-207. "Wiring Diagram - Heater Control"](#).

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

1. CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 and the mode door motor harness connector M142.
3. Check continuity between front air control harness connector M49 terminals 1, 14 and the mode door motor harness connector M142 terminals 1, 6.



Connector	Terminal	Connector	Terminal	Continuity
M49	1	M142	1	Yes
	14		6	

4. Check continuity between front air control harness connector M49 terminals 1, 14 and ground.

Connector	Terminal	—	Continuity
M49	1	Ground	No
	14		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.





2. CHECK FRONT AIR CONTROL FOR MODE DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate the mode switch to the D/F (☱) mode.
4. Check voltage between front air control harness connector M49 terminal 1 and terminal 14 while rotating the mode control dial to the VENT (☷), and then the B/L (☶) mode.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	1	14	Rotating the mode control dial from D/F () mode to VENT () mode	Battery voltage
	14	1	Rotating the mode control dial from VENT () mode to B/L () mode	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

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

3. CHECK MODE DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

- Turn ignition switch OFF.
- Disconnect the front air control harness connector M49.
- Check continuity between front air control harness connector M49 terminals 23, 26 and the mode door motor harness connector M142 terminals 1, 3.

Connector	Terminal	Connector	Terminal	Continuity
M49	23	M142	3	Yes
	26		2	

- Check continuity between front air control harness connector M49 terminals 23, 26 and ground.

Connector	Terminal	—	Continuity
M49	23	Ground	No
	26		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

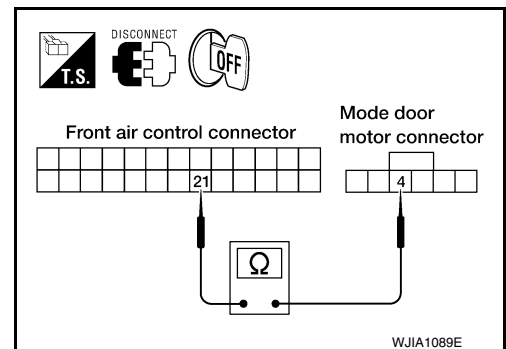
4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

- Check continuity between front air control harness connector M49 terminal 21 and mode door motor harness connector M142 terminal 4.

Connector	Terminal	Connector	Terminal	Continuity
M49	21	M142	4	Yes

- Check continuity between front air control harness connector M49 terminal 16 and ground.

Connector	Terminal	—	Continuity
M49	21	Ground	No



Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.

5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- Reconnect front air control harness connectors.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 23 and terminal 26.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Connector	Terminals	Connector	Terminals	Voltage (Approx.)
	(+)		(-)	
M49	23	M49	26	5 Volts

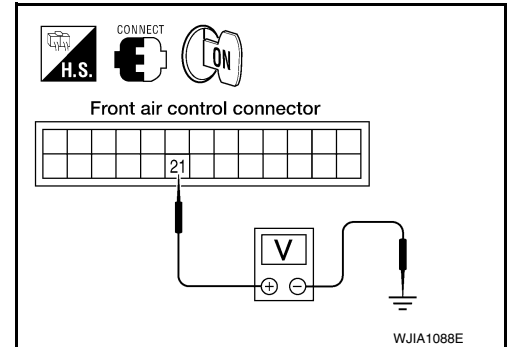
4. Check voltage between front air control harness connector M49 terminal 21 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	21	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).



6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

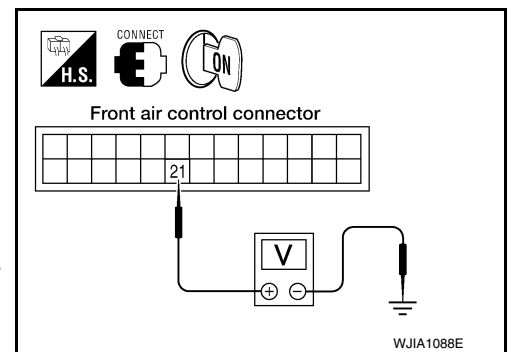
1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M49 terminal 21 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	21	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-21, "Removal and Installation"](#).



AIR MIX DOOR MOTOR

System Description

INFOID:000000012565105

SYSTEM DESCRIPTION

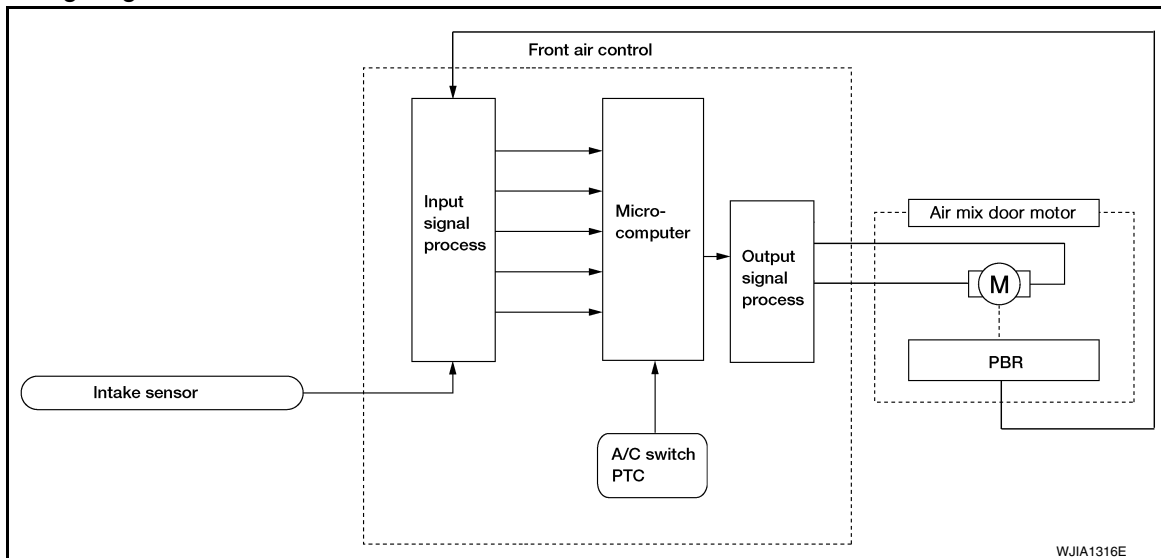
Component Parts

Air mix door control system components are:

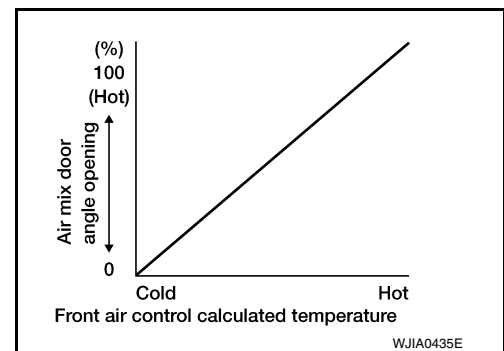
- Front air control
- Air mix door motor
- Position Balanced Resistor (PBR) (built into air mix door motor)
- Intake sensor

System Operation

The front air control receives data from the temperature selected by the driver. The front air control then applies a voltage to one circuit of the air mix door motor, while ground is applied to the other circuit, causing the air mix door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the air mix door positions by measuring the voltage signal on the PBR circuits of each door.



Air Mix Door Control Specification



COMPONENT DESCRIPTION

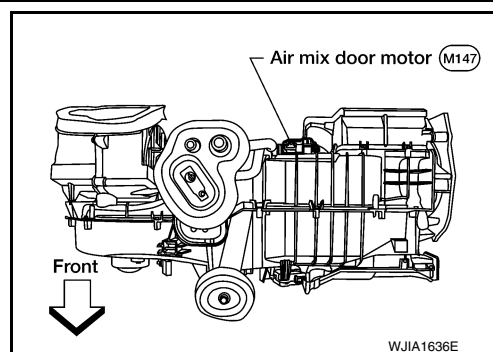
Air Mix Door Motor

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

The air mix door motor is attached to the heater and cooling unit assembly. This motor rotates so that the air mix door is opened or closed to a position set by the front air control. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the front air control by the PBR built into the air mix door motor.



Air Mix Door Motor Component Function Check

INFOID:000000012565106

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Blower must be on (1, 2, 3, 4).
2. Turn the temperature control dial clockwise to maximum heat.
3. Check for hot air at discharge air outlets.

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn the temperature control dial counterclockwise to maximum cold.
2. Check for cold air at discharge air outlets.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-177. "Air Mix Door Motor Diagnosis Procedure"](#).

Air Mix Door Motor Diagnosis Procedure

INFOID:000000012565107

Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#) or [HAC-200. "Wiring Diagram - With Type 2"](#).

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate normally.

1. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 and the air mix door motor harness connector M147.
3. Check continuity between front air control harness connector M49 terminals 3, 2 and the air mix door motor harness connector M147 terminals 5, 6.

Connector	Terminal	Connector	Terminal	Continuity
M49	2	M147	6	Yes
	3		5	

4. Check continuity between front air control harness connector M49 terminals 3, 2 and ground.

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Connector	Terminal	—	Continuity
M49	3	Ground	No
	2		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate the mode switch to the D/F (☼) mode.
4. Check voltage between front air control harness connector M49 terminal 3 and terminal 2 while rotating the mode control dial to the VENT (☼), and then the B/L (☼) mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	2	3	Rotating the mode control dial from D/F (☼) mode to VENT (☼) mode	Battery voltage
	3	2	Rotating the mode control dial from VENT (☼) mode to B/L (☼) mode	Battery voltage

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

3. CHECK AIR MIX DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49.
3. Check continuity between front air control harness connector M49 terminals 23, 26 and the air mix door motor harness connector M147 terminals 1, 3.

Connector	Terminal	Connector	Terminal	Continuity
M49	26	M147	3	Yes
	23		1	

4. Check continuity between front air control harness connector M49 terminals 23, 26 and ground.

Connector	Terminal	—	Continuity
M49	23	Ground	No
	26		

Is the inspection result normal?

- YES >> GO TO 5.
 NO >> Repair or replace harness as necessary.

4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M49 terminal 22 and air mix door motor harness connector M147 terminal 2.

Connector	Terminal	Connector	Terminal	Continuity
M49	22	M147	2	Yes

2. Check continuity between front air control harness connector M49 terminal 22 and ground.

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Connector	Terminal	—	Continuity
M49	22	Ground	No

Is the inspection result normal?

- YES >> GO TO 6.
- NO >> Repair or replace harness as necessary.

5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 terminal 23 and terminal 26.

Connector	Terminals	Connector	Terminals	Voltage (Approx.)
	(+)		(-)	
M49	23	M49	26	5 Volts

4. Check voltage between front air control harness connector M49 terminal 22 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	22	Ground	0 Volts

Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the air mix door motor harness connector M147.
2. Check voltage between front air control harness connector M49 terminal 22 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	22	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect air mix door for binding or mechanical failure. If air mix door moves freely, replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
- NO >> Replace the air mix door motor. Refer to [VTL-23, "Removal and Installation"](#).

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INTAKE DOOR MOTOR

System Description

INFOID:000000012565108

SYSTEM DESCRIPTION

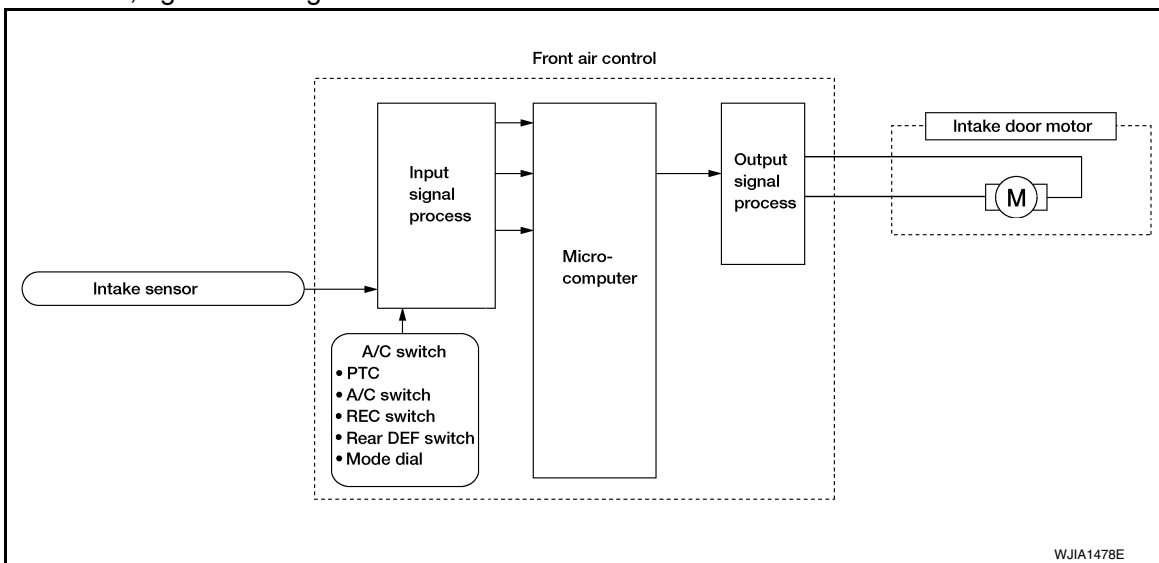
Component Parts

Intake door control system components are:

- Front air control
- Intake door motor
- Intake sensor

System Operation

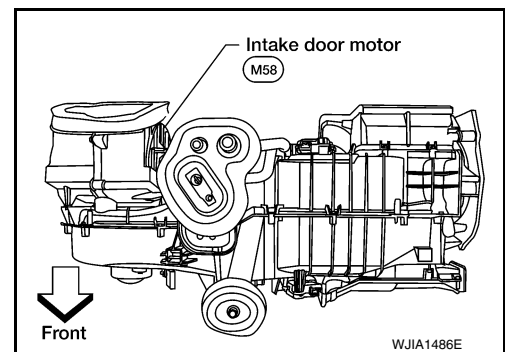
The intake door control determines the intake door position based on the position of the recirculation switch. When the recirculation switch is depressed the intake door motor rotates closing off the fresh air inlet and recirculating the cabin air. If the recirculation switch is depressed again, the intake door motor rotates in the opposite direction, again allowing fresh air into the cabin.



COMPONENT DESCRIPTION

Intake door motor

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the front air control. Motor rotation is conveyed to a lever which activates the intake door.



Intake Door Motor Component Function Check

INFOID:000000012565109

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

INSPECTION FLOW




1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - REC (🔧)

1. Turn blower control dial to 4.

INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

2. Turn mode dial to vent mode ().
3. Press REC () switch.
4. Press REC () switch again.
5. Listen for intake door position change (you should hear blower sound change slightly).

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Go to diagnosis procedure. Refer to [HAC-181, "Intake Door Motor Diagnosis Procedure"](#).

Intake Door Motor Diagnosis Procedure

INFOID:0000000012565110

Regarding Wiring Diagram information, refer to [HAC-200, "Wiring Diagram - With Type 2"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 and the intake door motor harness connector M58.
3. Check continuity between front air control harness connector M49 terminals 4, 5 and the intake door motor harness connector M58 terminals 1, 6.

Connector	Terminal	Connector	Terminal	Continuity
M49	4	M58	1	Yes
	5		6	

4. Check continuity between front air control harness connector M49 terminals 4, 5 and ground.

Connector	Terminal	—	Continuity
M49	4	Ground	No
	5		

Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR INTAKE AIR DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 terminal 4 and terminal 5 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	5	4	Self-diagnostic mode (opening)	Battery voltage
	4	5	Self-diagnostic mode (closing)	Battery voltage

Is the inspection result normal?

- YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-20, "Removal and Installation"](#).
 NO >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

BLOWER MOTOR

System Description

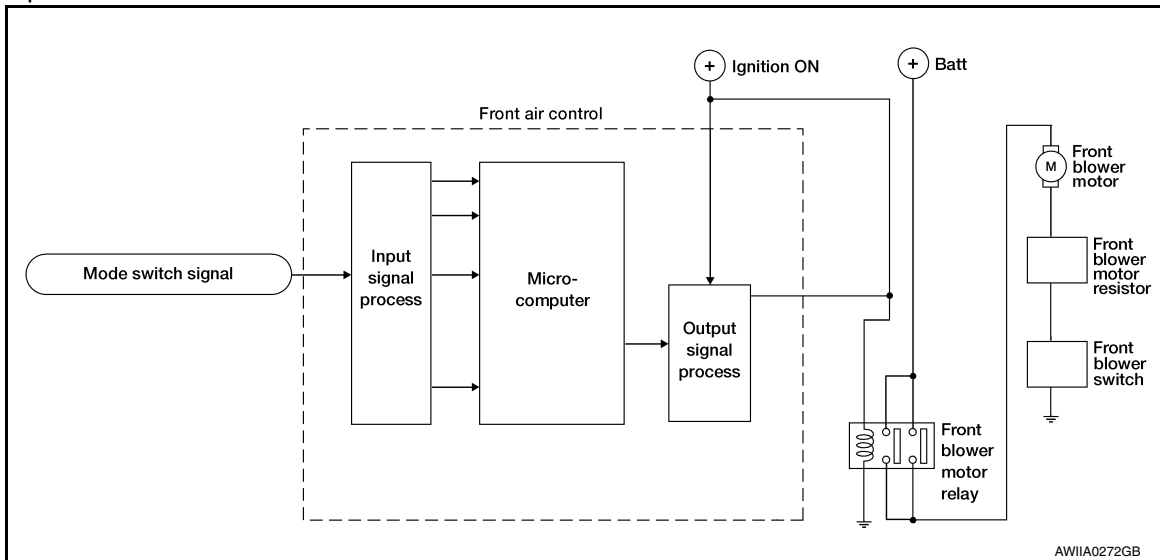
INFOID:000000012565111

Component Parts

Blower speed control system components are:

- Front air control
- Front blower motor resistor
- Front blower motor
- Front blower relay
- Front blower switch

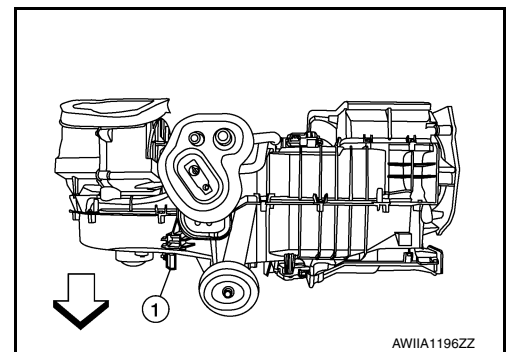
System Operation



COMPONENT DESCRIPTION

Blower Motor Resistor

The front blower motor resistor (1) is located on the heater and cooling unit assembly. The front blower motor resistor grounds the front blower motor through a series of 1, 2, or 3 resistors, depending upon speed selected. For high speed operation the front blower motor resistor is circumvented and the front blower motor grounds directly.



Front Blower Motor Component Function Check

INFOID:000000012565112

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

1. Rotate the blower control dial clockwise. Blower should operate.
2. Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-183. "Front Blower Motor Diagnosis Procedure"](#).

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

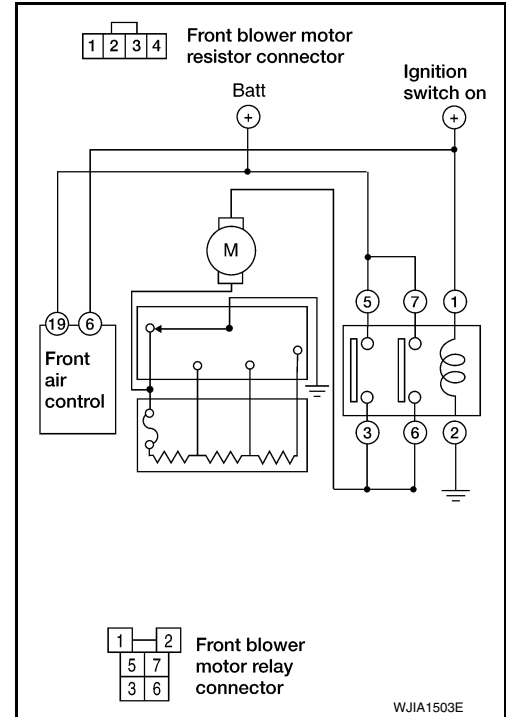
[MANUAL A/C (TYPE 2)]

Front Blower Motor Diagnosis Procedure

INFOID:0000000012565113

Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#) or [HAC-207. "Wiring Diagram - Heater Control"](#).

SYMPTOM: Blower motor operation is malfunctioning under starting blower speed control.



1. DIAGNOSTIC PROCEDURE

1. Turn ignition switch ON.
2. Turn the front blower switch to each of its four speeds.
Does blower motor rotate normally at each speed?

YES or NO

- YES >> Inspection End.
- NO >> 1. Does not rotate at any speed, GO TO 2.
2. Does not rotate at 1 - 3 speed, GO TO 13.
3. Does not rotate at 4 speed, GO TO 16.

2. CHECK FUSES

1. Check 15A fuses (Nos. 24 and 27, located in the fuse and fusible link box). Refer to [PG-77. "Terminal Arrangement"](#).
2. Check 10A fuse [No. 8, located in the fuse block (J/B)]. Refer to [PG-76. "Terminal Arrangement"](#).

Is inspection result normal?

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

3. CHECK FRONT BLOWER MOTOR POWER SUPPLY

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

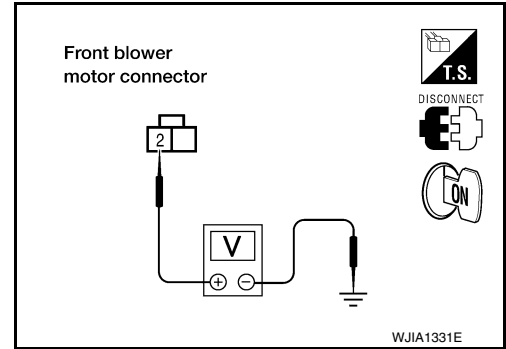
[MANUAL A/C (TYPE 2)]

1. Turn ignition switch OFF.
2. Disconnect front blower motor harness connector.
3. Turn ignition switch ON.
4. Select any front blower speed except OFF.
5. Check voltage between front blower motor harness connector M62 terminal 2 and ground.

2 - Ground : Battery voltage

Is inspection result normal?

- YES >> GO TO 12.
NO >> GO TO 4.



4.CHECK FRONT BLOWER MOTOR RELAY

1. Turn Ignition switch OFF.
2. Check front blower motor relay. Refer to [HAC-186. "Front Blower Motor Component Inspection"](#).

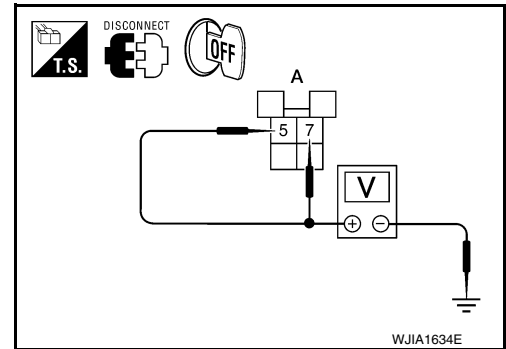
Is inspection result normal?

- YES >> GO TO 5.
NO >> Replace front blower motor relay.

5.CHECK FRONT BLOWER MOTOR RELAY POWER SUPPLY (SWITCH SIDE)

Check voltage between front blower motor relay harness connector E54 terminals 7 and 5 and ground.

A		(-)	Condition	Voltage (Approx.)
(+) Front blower motor relay connector				
Front blower motor relay connector	Terminal			
E54	5	Ground	Blower motor relay power supply	Battery voltage
	7	Ground	Blower motor relay power supply	Battery voltage



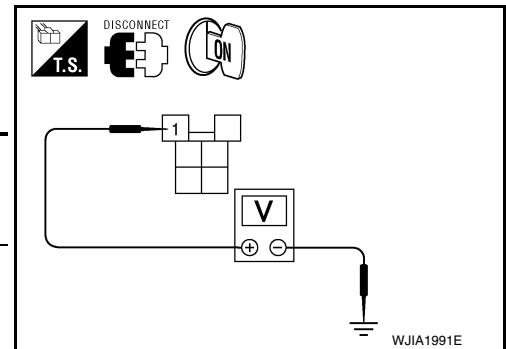
Is inspection result normal?

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

6.CHECK FRONT BLOWER MOTOR RELAY POWER SUPPLY (COIL SIDE)

1. Turn ignition switch ON.
2. Check voltage between front blower motor relay harness connector E54 terminal 1 and ground.

A		(-)	Condition	Voltage (Approx.)
(+) Front blower motor relay connector				
Front blower motor relay connector	Terminal			
E54	1	Ground	Blower motor relay power supply (coil side)	Battery voltage



Is inspection result normal?

- YES >> GO TO 7.
NO >> Repair or replace harness as necessary.

7.CHECK FRONT BLOWER MOTOR POWER FROM RELAY TO FRONT BLOWER MOTOR

BLOWER MOTOR

[MANUAL A/C (TYPE 2)]

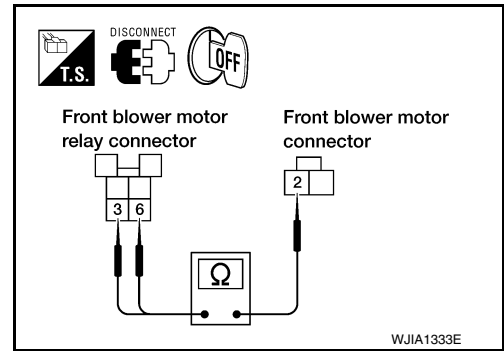
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Check continuity between front blower motor relay harness connector E54 terminals 6 and 3 and front blower motor harness connector M62 terminal 2.

3, 6 - 2 : Continuity should exist.

Is inspection result normal?

- YES >> Repair the blower motor ground circuit as necessary.
NO >> Repair harness or connector between the front blower motor relay and the front blower motor.



8. REPLACE FUSE

Refer to [PG-77, "Terminal Arrangement"](#).

Does fuse No. 24 or 27 open when the front blower motor is turned on?

YES or NO

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

9. REPLACE FUSE

Refer to [PG-76, "Terminal Arrangement"](#).

Does fuse No. 8 open when the ignition switch is turned ON?

YES or NO

- YES >> Repair or replace harness as necessary.
NO >> Inspection End.

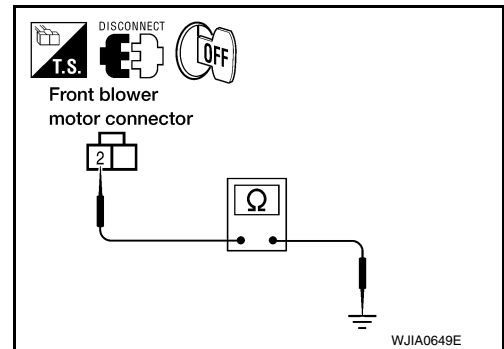
10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector.
3. Check continuity between front blower motor harness connector M62 terminal 2 and ground.

2 - Ground : Continuity should not exist.

Is inspection result normal?

- YES >> GO TO 11.
NO >> Repair or replace harness as necessary.



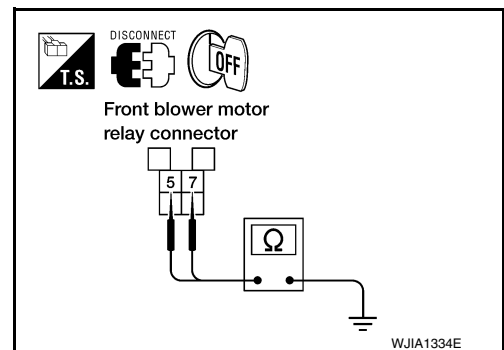
11. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT FOR SHORT

1. Disconnect front blower motor relay connector.
2. Check continuity between the front blower motor relay harness connector E54 terminal 7 and terminal 5 and ground.

7, 5 - Ground : Continuity should not exist.

Is inspection result normal?

- YES >> Check front blower motor. Refer to [HAC-186, "Front Blower Motor Component Inspection"](#).
NO >> Repair harness or connector.



12. CHECK FRONT BLOWER MOTOR

1. Turn ignition switch OFF.
2. Check front blower motor. Refer to [HAC-186, "Front Blower Motor Component Inspection"](#).

Is inspection result normal?

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

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

YES >> GO TO 13.

NO >> Replace front blower motor. Refer to [VTL-11, "Removal and Installation"](#).

13.CHECK FRONT BLOWER MOTOR RESISTOR

Check front blower motor resistor. Refer to [HAC-186, "Front Blower Motor Component Inspection"](#).

Is inspection result normal?

YES >> GO TO 14.

NO >> Replace front blower motor resistor. Refer to [VTL-13, "Removal and Installation"](#).

14.CHECK FRONT BLOWER SWITCH

Check front blower switch. Refer to [HAC-186, "Front Blower Motor Component Inspection"](#).

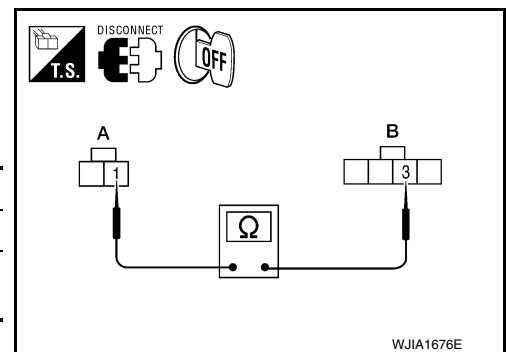
Is inspection result normal?

YES >> GO TO 15.

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

15.CHECK FRONT BLOWER MOTOR GROUND CIRCUIT TO FRONT BLOWER MOTOR RESISTOR

1. Disconnect front blower motor resistor harness connector.
2. Check continuity between front blower motor connector M62 (A) terminal 1 and front blower motor resistor harness connector M122 (B) terminal 3.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
Front blower motor: M62	1	Front blower motor resistor: M122	3	Yes

Is inspection result normal?

YES >> Repair harness or connector between front blower switch connector M51 terminal 8 and ground.

NO >> Repair harness or connector between front blower motor resistor and front blower motor.

16.CHECK FRONT BLOWER SWITCH

Check front blower switch. Refer to [HAC-186, "Front Blower Motor Component Inspection"](#).

Is inspection result normal?

YES >> Repair harness or connector between front blower motor switch connector M51 terminal 8 and front blower motor resistor connector M122 terminal 3.

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

SYMPTOM: Blower motor operation is malfunctioning.

Front Blower Motor Component Inspection

INFOID:000000012565114

COMPONENT INSPECTION

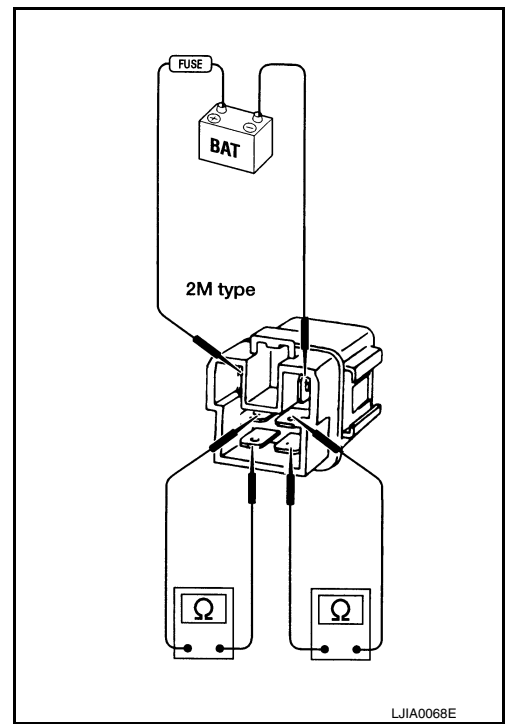
Front Blower Motor Relay

BLOWER MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



A
B
C
D
E
F
G

Front Blower Motor

Confirm smooth rotation of the blower motor.

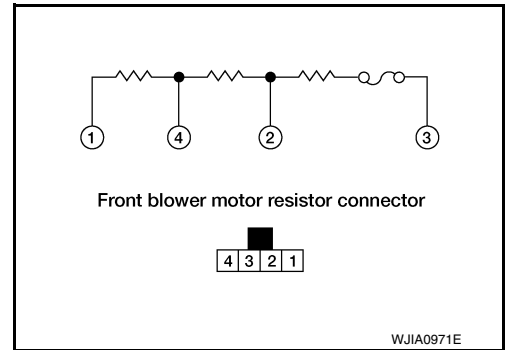
- Ensure that there are no foreign particles inside the blower unit.
- Apply 12 volts to terminal 2 and ground to terminal 1 and verify that the motor operates freely and quietly.

Front Blower Switch

Check continuity between terminals at each front blower speed position.

Front Blower Motor Resistor

Check continuity between terminals. There will be resistance, but there should not be an open or short between any two terminals.



H
HAC

J
K
L
M
N
O
P

MAGNET CLUTCH

System Description

INFOID:000000012565115

SYSTEM DESCRIPTION

The front air control controls compressor operation based on intake temperature and a signal from ECM.

Low Temperature Protection Control

The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor.

When intake air temperature is higher than 3.5°C (38.3°F), the compressor turns ON. The compressor turns OFF when intake air temperature is lower than 2.5°C (36.5°F).

Magnet Clutch Component Function Check

INFOID:000000012565116

SYMPTOM: Magnet clutch does not engage.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Rotate blower control dial clockwise.
2. Rotate mode dial to vent () position.
3. Press A/C switch. Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-188. "Magnet Clutch Diagnosis Procedure"](#).

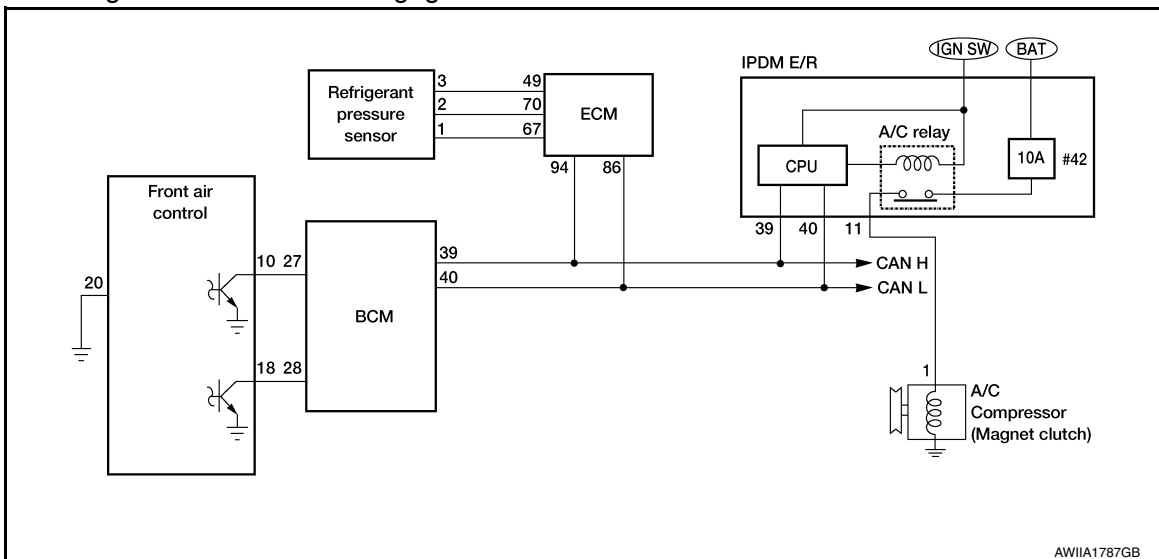
Magnet Clutch Diagnosis Procedure

INFOID:000000012565117

Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#).

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. PERFORM IPDM E/R AUTO ACTIVE TEST

Refer to [PCS-9. "Diagnosis Description"](#).

Does magnet clutch operate?

- YES >>
- WITH CONSULT GO TO 2.
 - WITHOUT CONSULT

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

GO TO 8.

NO >> Check 10A fuse (No. 42, located in IPDM E/R), and GO TO 12.

2.CHECK BCM INPUT (A/C COMPRESSOR ON) SIGNAL

Check A/C compressor ON/OFF signal. Refer to [HAC-170. "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

A/C SW ON : AIR COND SW ON
A/C SW OFF : AIR COND SW OFF

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 8.

3.CHECK REFRIGERANT PRESSURE SENSOR

Check refrigerant pressure sensor. Refer to [EC-468. "Diagnosis Procedure"](#) (QR25DE) or [EC-1390. "Diagnosis Procedure"](#) (VQ40DE).

Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace refrigerant pressure sensor. Refer to [HA-36. "Removal and Installation"](#).

4.CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [HAC-170. "AIR CONDITIONER : CONSULT Function \(BCM - AIR CONDITIONER\)"](#).

BLOWER CONTROL DIAL ON : FAN ON SIG ON
BLOWER CONTROL DIAL OFF : FAN ON SIG OFF

Is the inspection result normal?

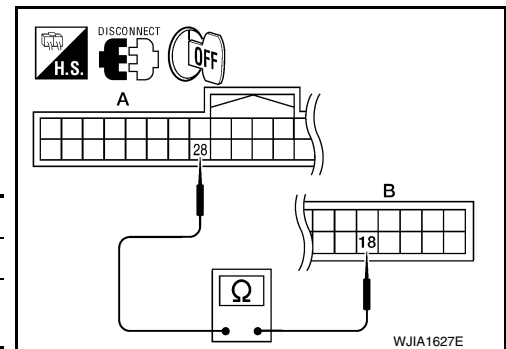
YES >> GO TO 7.

NO >> GO TO 5.

5.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M49 (B) terminal 18.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
BCM: M18	28	Front air control: M49	18	Yes



4. Check continuity between BCM harness connector M18 (A) terminal 28 and ground.

Connector	Terminal	Ground	Continuity
BCM: M18	28		No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

6.CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

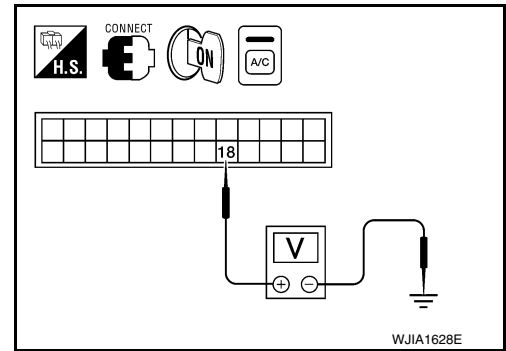
MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Turn A/C switch ON.
4. Check voltage between front air control harness connector M49 terminal 18 and ground.

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Front air control connector	Terminal No.		
M49	18	A/C switch: ON Blower motor operates	0V
		A/C switch: OFF	Battery voltage



Is the inspection result normal?

- YES >> Replace BCM. Refer to [BCS-56. "Removal and Installation"](#).
- NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-7. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-56. "Removal and Installation"](#).

7. CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-14. "Trouble Diagnosis Flow Chart"](#).

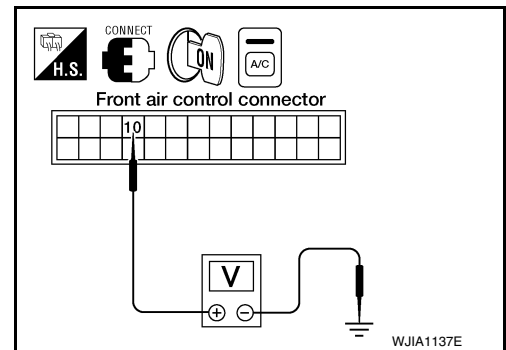
Is the inspection result normal?

- YES >> Inspection End.
- NO >> Repair or replace malfunctioning part(s).

8. CHECK VOLTAGE FOR FRONT AIR CONTROL (A/C COMPRESSOR ON SIGNAL)

1. Turn ignition switch ON.
2. Check voltage between front air control harness connector M49 terminal 10 and ground.

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Front air control connector	Terminal No.		
M49	10	A/C switch: ON	0V
		A/C switch: OFF	Battery voltage



Is the inspection result normal?

- YES >> GO TO 9.
- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to [VTL-7. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-56. "Removal and Installation"](#).

9. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

MAGNET CLUTCH

[MANUAL A/C (TYPE 2)]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 terminal 27 and front air control harness connector M49 terminal 10.

27 - 10 : Continuity should exist.

4. Check continuity between BCM harness connector M18 terminal 27 and ground.

27 - ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.

10. CHECK INTAKE SENSOR CIRCUITS

Check intake sensor. Refer to [HAC-193, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

11. CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-14, "Trouble Diagnosis Flow Chart"](#).

Is the inspection result normal?

YES >> Replace BCM. Refer to [BCS-56, "Removal and Installation"](#).

NO >> Repair or replace malfunctioning part(s).

12. CHECK MAGNET CLUTCH CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect A/C compressor connector.
3. Check for operation sound when applying battery voltage to A/C compressor terminal 1.

Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace magnet clutch. Refer to [HA-27, "Removal and Installation for Compressor Clutch"](#).

13. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND A/C COMPRESSOR

1. Disconnect IPDM E/R connector.
2. Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal 1.

11 - 1 : Continuity should exist.

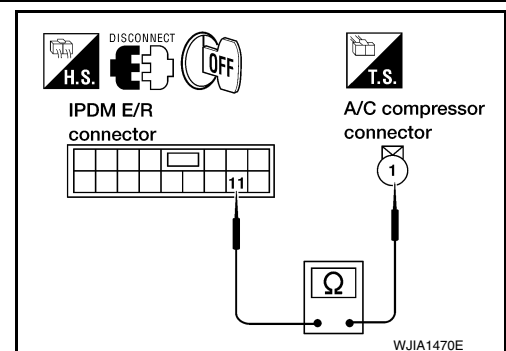
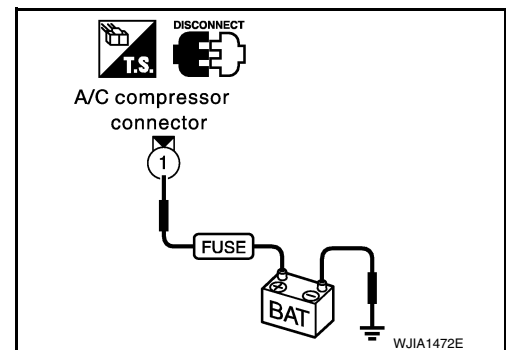
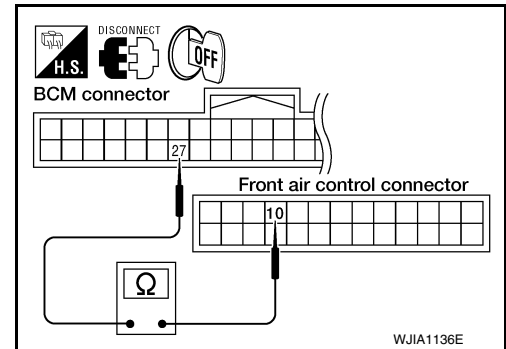
3. Check continuity between IPDM E/R harness connector E119 terminal 11 and ground.

11 - ground : Continuity should not exist.

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).

NO >> Repair harness or connector.



INTAKE SENSOR

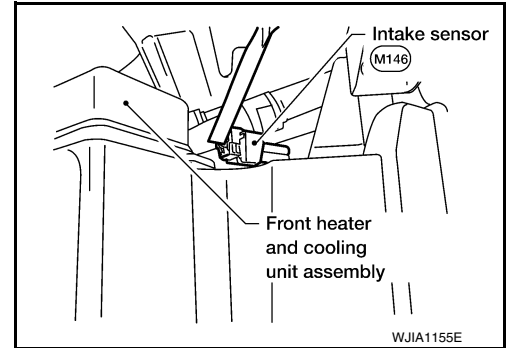
System Description

INFOID:000000012565118

COMPONENT DESCRIPTION

Intake Sensor

The intake sensor is located on top of the heater and cooling unit assembly next to the A/C evaporator cover. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the front air control.



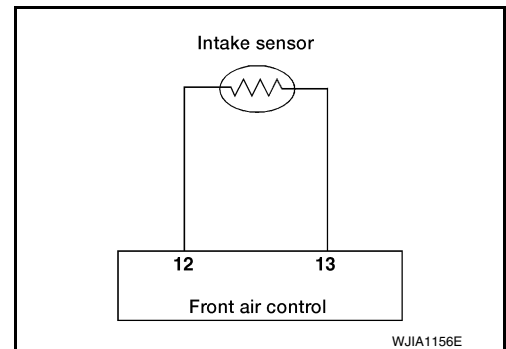
Intake Sensor Diagnosis Procedure

INFOID:000000012565119

Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



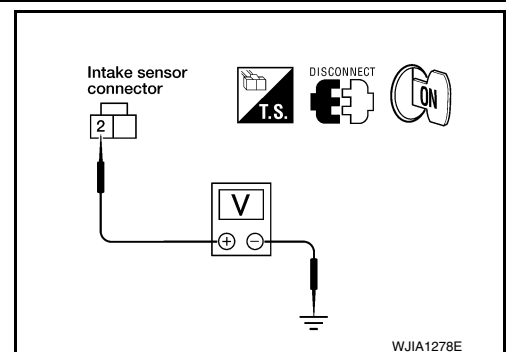
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

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

Is the inspection result normal?

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



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

INTAKE SENSOR

[MANUAL A/C (TYPE 2)]

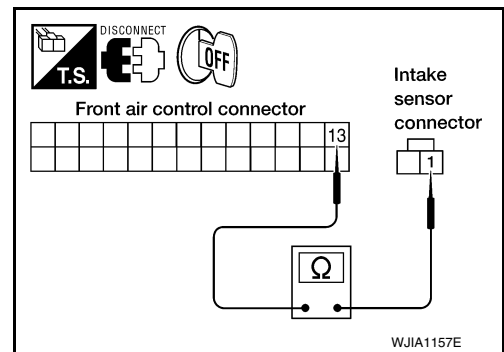
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 1 and front air control harness connector M49 terminal 13.

1 - 13 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK INTAKE SENSOR

Refer to [HAC-193, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
NO >> Replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

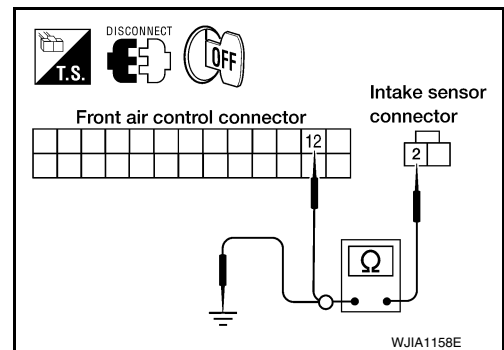
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 terminal 2 and front air control harness connector M49 terminal 12.

2 - 12 : Continuity should exist.

4. Check continuity between intake sensor harness connector M146 terminal 2 and ground.

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).
NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:000000012565120

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Temperature °C (°F)	Resistance kΩ
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-10, "Removal and Installation"](#).

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

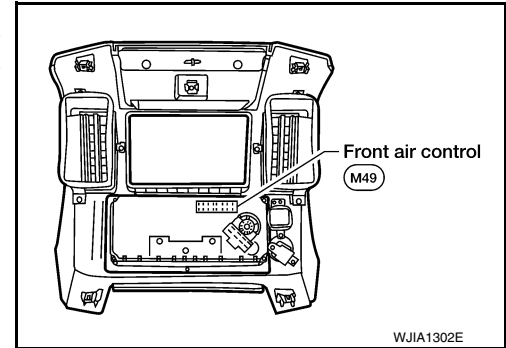
INFOID:000000012565121

COMPONENT DESCRIPTION

Front Air Control

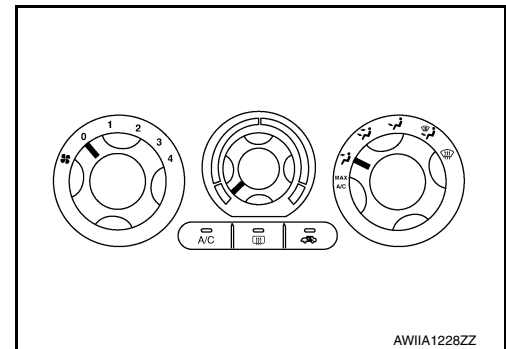
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, blower motor and compressor are then controlled.

The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.



Potential Temperature Control (PTC)

The PTC is built into the front air control. It can be set from cold to hot or any intermediate position by rotating the temperature dial.



Front Air Control Component Function Check

INFOID:000000012565122

SYMPTOM: A/C system does not come on (if equipped).

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK

1. Turn blower control dial to position 1-4, then press A/C switch.
2. Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Go to diagnosis procedure. Refer to [HAC-195. "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000012565123

Regarding Wiring Diagram information, refer to [HAC-200. "Wiring Diagram - With Type 2"](#) or [HAC-207. "Wiring Diagram - Heater Control"](#).

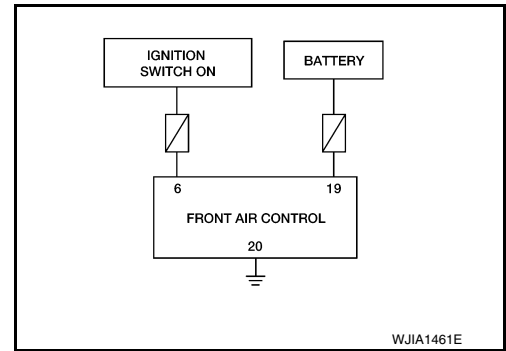
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

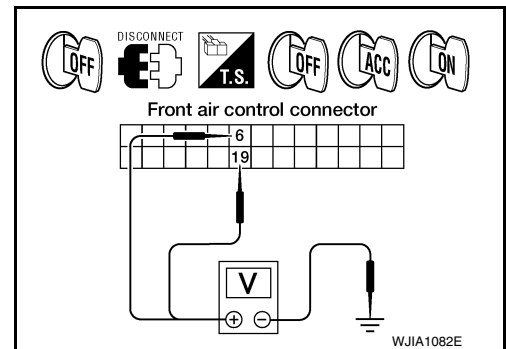
SYMPTOM: A/C system does not come on (if equipped).



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M49 terminals 6 and 19, and ground.

Terminals		Ignition switch position			
(+)		(-)	OFF	ACC	ON
Front air control connector	Terminal No.				
M49	6	Ground	Approx. 0V	Approx. 0V	Battery voltage
	19		Battery voltage	Battery voltage	Battery voltage



Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-76, "Terminal Arrangement"](#).

- If fuses are OK, check harness for open circuit. Repair or replace as necessary.
- If fuses are NG, replace fuse and check harness for short circuit. Repair or replace as necessary.

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

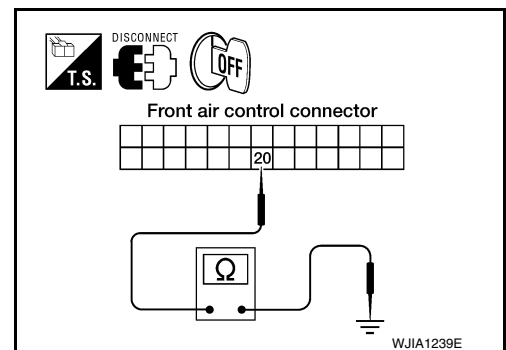
1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M49 terminal 20 and ground.

20 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace front air control. Refer to [VTL-7, "Removal and Installation"](#).

NO >> Repair harness or connector.



MANUAL A/C IDENTIFICATION TABLE

< ECU DIAGNOSIS INFORMATION >

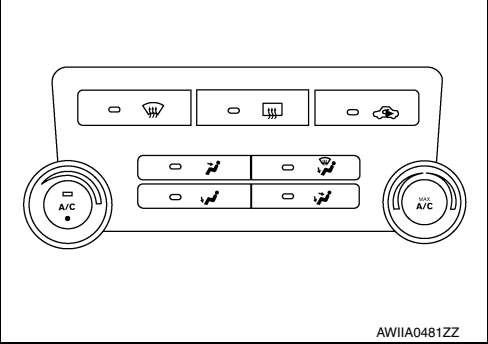
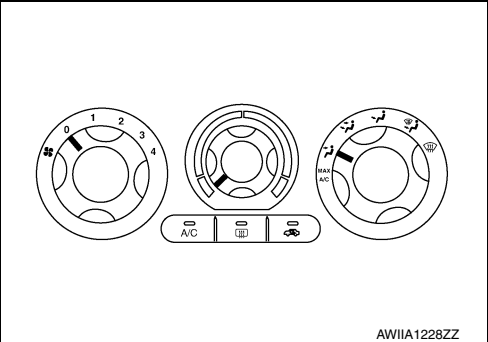
[MANUAL A/C (TYPE 2)]

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000012565124

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	 <p style="text-align: right;">AWIA0481ZZ</p>
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	 <p style="text-align: right;">AWIA1228ZZ</p>

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AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

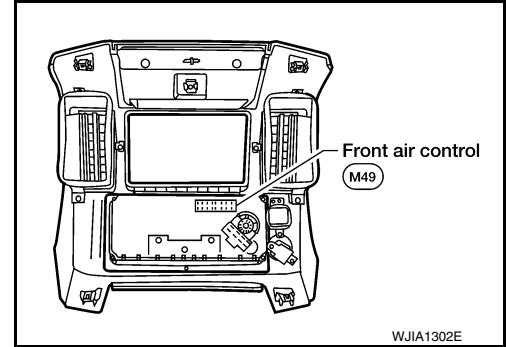
[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL

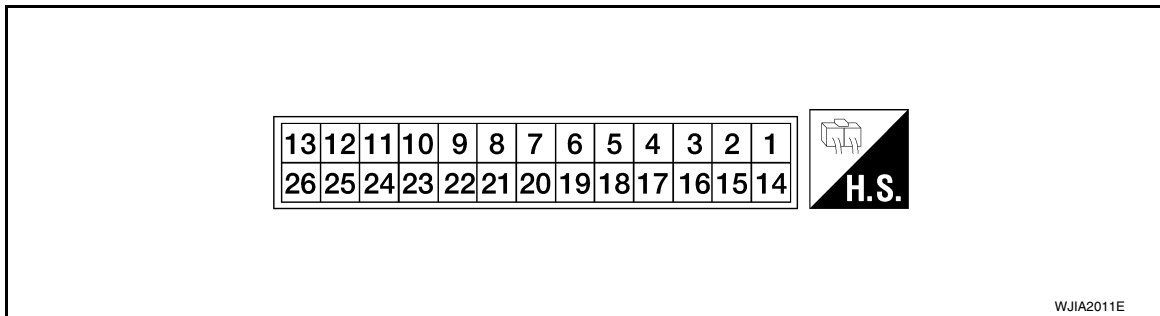
Front Air Control Terminals Reference Values

INFOID:000000012565125

Measure voltage between each terminal and ground by following Terminals and Reference Values for front air control.



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	BR	Mode door motor CW	ON	Clockwise rotation	Battery voltage
2	W	Air mix door motor CW	ON	Clockwise rotation	Battery voltage
3	GR	Air mix door motor CCW	ON	Counterclockwise rotation	Battery voltage
4	Y	Intake door motor CW	ON	Clockwise rotation	Battery voltage
5	BG	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
6	W/G	Power supply for IGN	ON	-	Battery voltage
8	G	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	<p style="text-align: right;">PIIA2344E</p>
10	W	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
11	Y	Rear defrost request	ON	-	Battery voltage
12	L	Intake sensor	ON	-	0 - 5V
13	V	Sensor ground	ON	-	0 - 5V
14	R	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
18	BR	Front blower monitor	ON	Front blower motor OFF	Battery voltage
				Front blower motor ON	0V

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL A/C (TYPE 2)]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
19	R/Y	Power supply for BAT	-	-	Battery voltage
20	B	Ground	-	-	0V
21	V	Mode door motor feedback	ON	-	0 - 5V
22	SB	Air mix door motor feedback	ON	-	0 - 5V
23	G	Power supply for mode door motor and air mix door motor PBR	ON	-	5V
25	R	Rear defogger request *1	ON	-	Battery voltage
26	P	Ground for mode door motor and air mix door motor PBR	ON	-	0V

*1: If equipped

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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

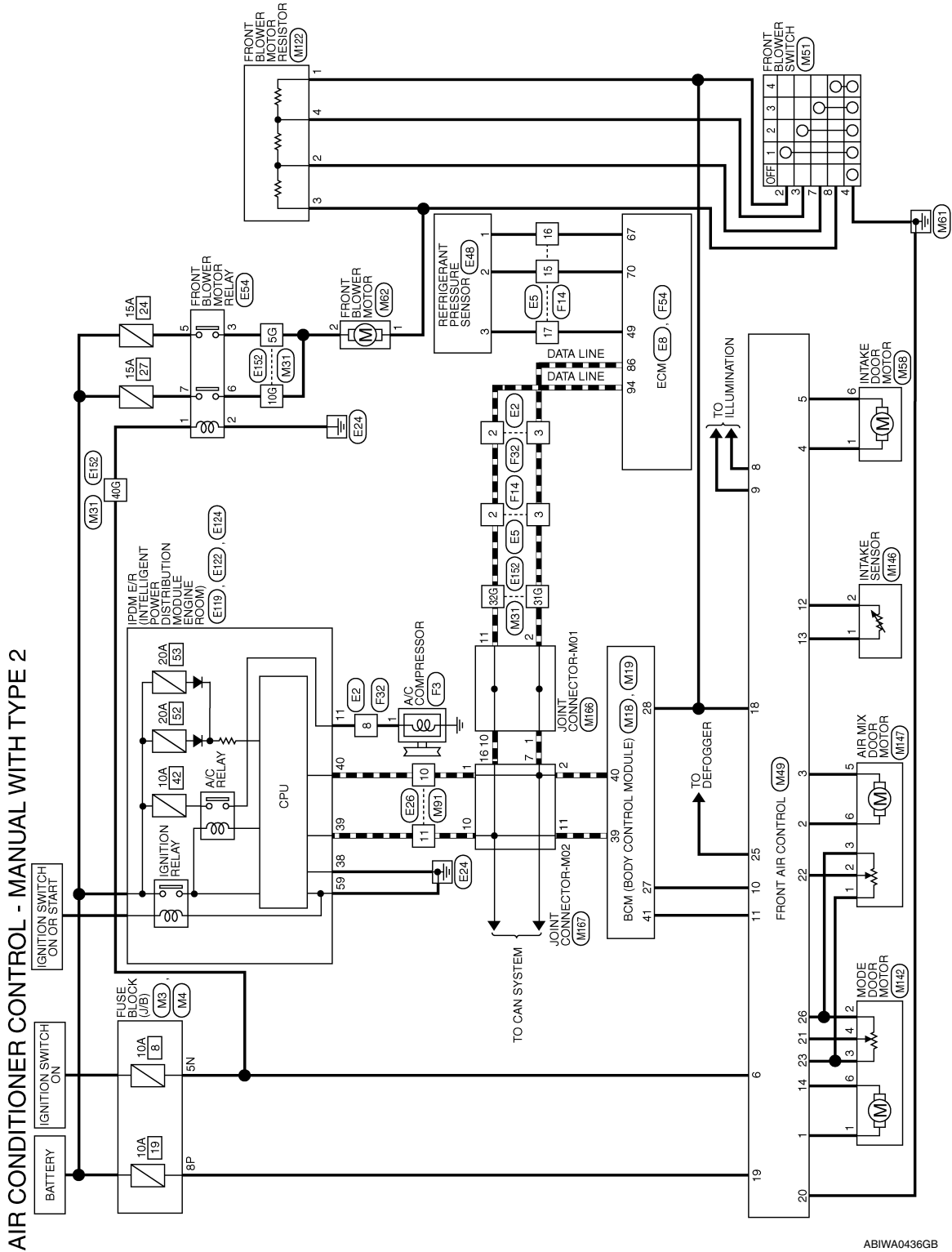
[MANUAL A/C (TYPE 2)]

WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - With Type 2

INFOID:000000012565126



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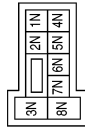
AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH TYPE 2

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



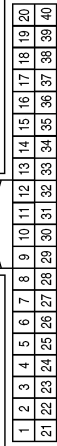
Terminal No.	Color of Wire	Signal Name
5N	W/G	-

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



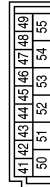
Terminal No.	Color of Wire	Signal Name
8P	R/Y	-

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



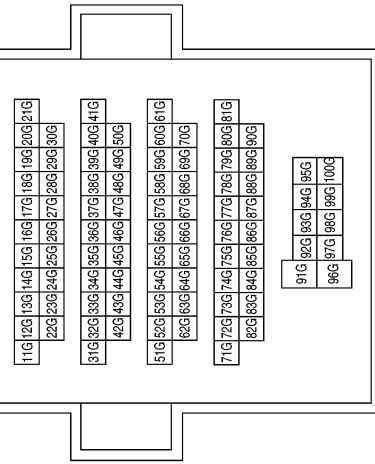
Terminal No.	Color of Wire	Signal Name
27	W	AIRCON SW
28	R	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
41	Y	REAR DEFOGGER SW

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



Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
40G	W/G	-

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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Connector No.	M49
Connector Name	FRONT AIR CONTROL (MANUAL WITH TYPE 2)
Connector Color	BLACK

13	12	11	10	9	8	7	6	5	4	3	2	1
26	25	24	23	22	21	20	19	18	17	16	15	14



Terminal No.	Color of Wire	Signal Name
1	BR	MODE CW
2	W	BLEND DR CW
3	GR	BLEND DR CCW
4	Y	RECIRC DOOR CW
5	BG	RECIRC DOOR CCW

Connector No.	M51
Connector Name	FRONT BLOWER SWITCH
Connector Color	WHITE

4	3	2	1
8	7	6	5



Terminal No.	Color of Wire	Signal Name
2	BR	-
3	SB	-
4	B	-
7	Y	-
8	W	-

Terminal No.	Color of Wire	Signal Name
6	W/G	IGN
7	-	-
8	G	ILLUM+
9	BR	ILLUM-
10	W	A/C REQUEST
11	Y	REAR DEFOGGER REQUEST
12	L	INTAKE SENSOR
13	V	SENS RETURN
14	R	MODE CCW
15	-	-
16	-	-
17	-	-

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

1	2	3	4	5	6
---	---	---	---	---	---



Terminal No.	Color of Wire	Signal Name
1	Y	-
6	BG	-

Terminal No.	Color of Wire	Signal Name
18	BR	FR BLOWER MONITOR
19	R/Y	BATT
20	B	GND
21	V	MODE FEED BACK
22	SB	BLEND FEED BACK
23	G	V REF ACTR (5V)
24	-	-
25	R	RR DEF STATUS
26	P	MODE (GND)

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

1	2
---	---



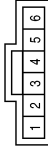
Terminal No.	Color of Wire	Signal Name
1	L	-
2	W/G	-

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

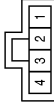
[MANUAL A/C (TYPE 2)]

Connector No.	M142
Connector Name	MODE DOOR MOTOR
Connector Color	BLACK



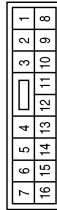
Terminal No.	Color of Wire	Signal Name
1	BR	-
2	P	-
3	G	-
4	V	-
6	R	-(WITHOUT AUTO A/C)

Connector No.	M122
Connector Name	FRONT BLOWER MOTOR RESISTOR
Connector Color	WHITE



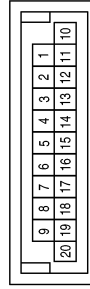
Terminal No.	Color of Wire	Signal Name
1	R	-
2	Y	-
3	L	-
4	SB	-

Connector No.	M91
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

Connector No.	M166
Connector Name	JOINT CONNECTOR-M01
Connector Color	BLUE



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

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-
3	P	-
5	GR	-
6	W	-(MANUAL WITH TYPE 2)

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



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

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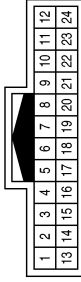
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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

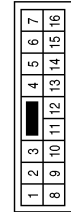
[MANUAL A/C (TYPE 2)]

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



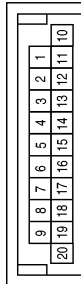
Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	B	-(FOR MEXICO)
17	P	-

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



Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

Connector No.	M167
Connector Name	JOINT CONNECTOR-M02
Connector Color	BLUE



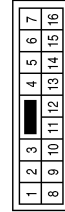
Terminal No.	Color of Wire	Signal Name
1	P	-
2	P	-
7	P	-
10	L	-
11	L	-
16	L	-

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



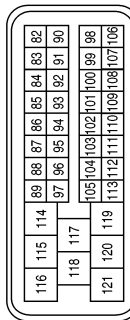
Terminal No.	Color of Wire	Signal Name
1	B	-(FOR MEXICO)
2	BR	-
3	P	-

Connector No.	E26
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
10	P	-
11	L	-

Connector No.	E8
Connector Name	ECM (WITH VQ40DE FOR MEXICO)
Connector Color	BLACK



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

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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Connector No.	E54
Connector Name	FRONT BLOWER MOTOR RELAY
Connector Color	BROWN



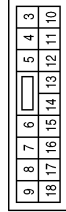
Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	B	-
3	W/G	-
5	L	-
6	W/G	-
7	GR	-

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



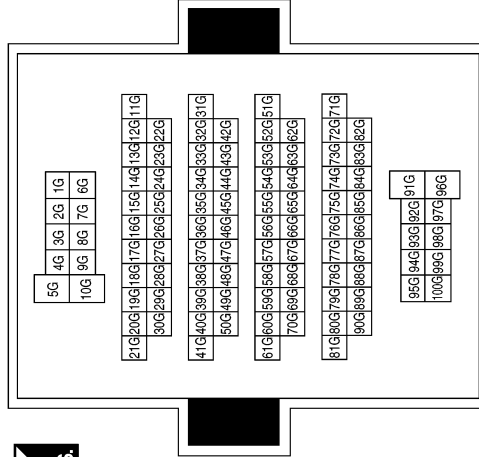
Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

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

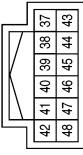


Terminal No.	Color of Wire	Signal Name
11	Y	A/C COMPRESSOR

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



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



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

Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
31G	P	-
32G	L	-
40G	W/G	-

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

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

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



Terminal No.	Color of Wire	Signal Name
1	Y	-

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



12	11	10	9	8	7	6	5	4	3	2	1
24	23	22	21	20	19	18	17	16	15	14	13

Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
15	BR	-
16	B	-(FOR MEXICO)
17	P	-

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



7	6	5	4	3	2	1		
16	15	14	13	12	11	10	9	8

Terminal No.	Color of Wire	Signal Name
2	L	-
3	P	-
8	Y	-

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



63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	2	1
44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	3	
25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43		
6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	5	4

Terminal No.	Color of Wire	Signal Name
49	P	AVCC (PDPRES)
67	V	GND-A
70	BR	PDPRES

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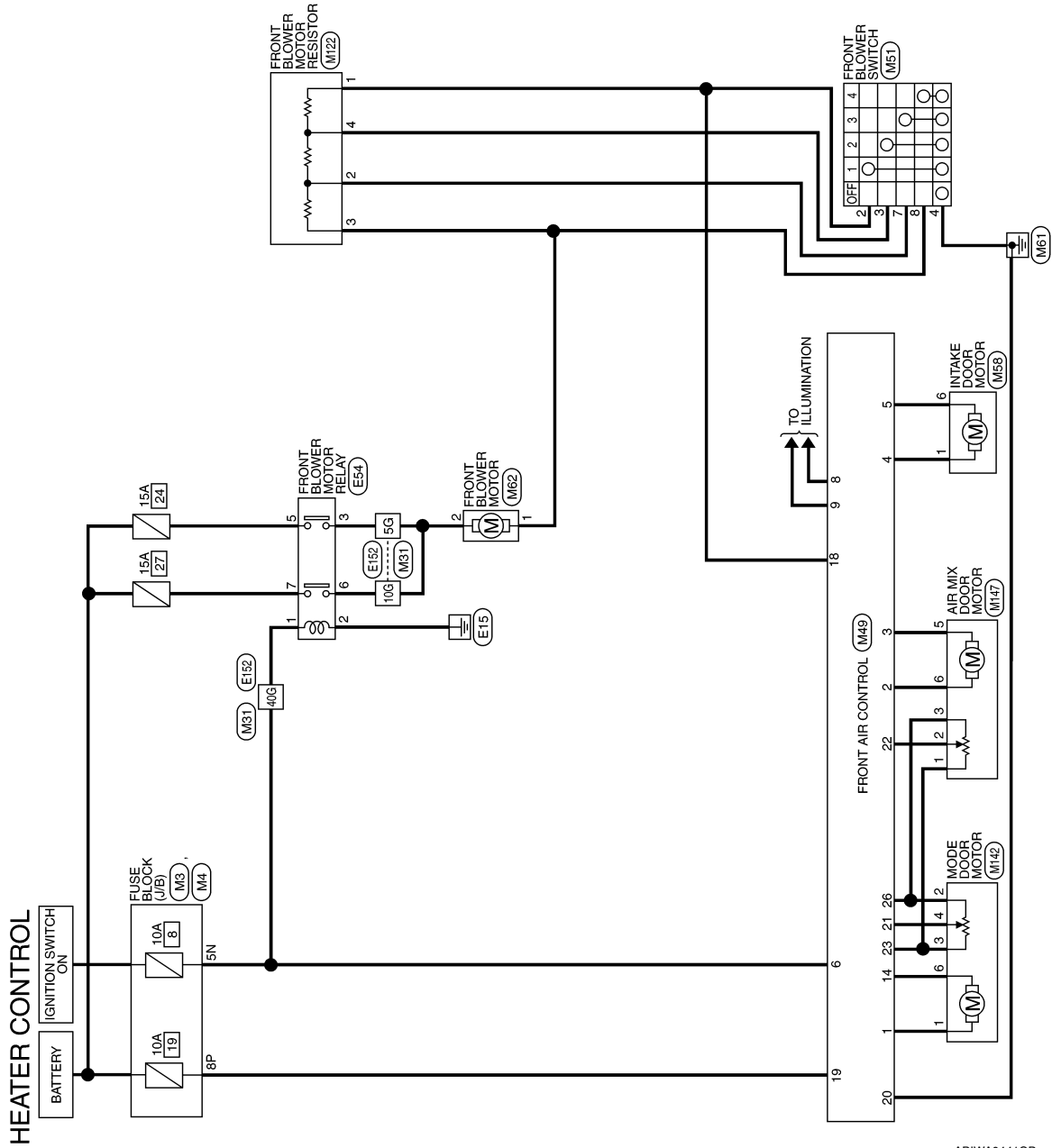
AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Wiring Diagram - Heater Control

INFOID:000000012565127



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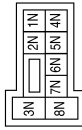
AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

HEATER CONTROL CONNECTORS

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



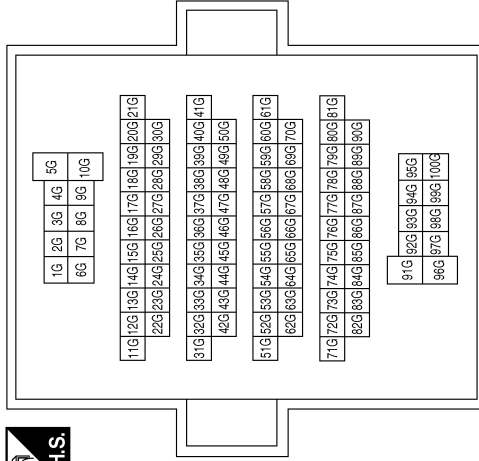
Terminal No.	Color of Wire	Signal Name
5N	W/G	-

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



Terminal No.	Color of Wire	Signal Name
8P	R/Y	-

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



Terminal No.	Color of Wire	Signal Name
5G	W/G	-
10G	W/G	-
40G	W/G	-

AIR CONDITIONER CONTROL

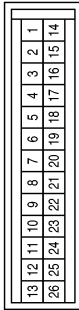
< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Terminal No.	Color of Wire	Signal Name
18	BR	FR BLOWER MONITOR
19	R/Y	BATT
20	B	GND
21	V	MODE FEED BACK
22	SB	BLEND FEED BACK
23	G	V REF ACTR (5V)
24	-	-
25	-	-
26	P	MODE (GND)

Terminal No.	Color of Wire	Signal Name
6	W/G	IGN
7	-	-
8	G	ILLUM+
9	BR	ILLUM-
10	-	-
11	-	-
12	-	-
13	-	-
14	R	MODE CCW
15	-	-
16	-	-
17	-	-

Connector No.	M49
Connector Name	FRONT AIR CONTROL (MANUAL WITH TYPE 2)
Connector Color	BLACK



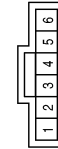
Terminal No.	Color of Wire	Signal Name
1	BR	MODE CW
2	W	BLEND DR CW
3	GR	BLEND DR CCW
4	Y	RECIRC DOOR CW
5	BG	RECIRC DOOR CCW

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



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

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



Terminal No.	Color of Wire	Signal Name
1	Y	-
6	BG	-

Connector No.	M51
Connector Name	FRONT BLOWER SWITCH
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
2	BR	-
3	SB	-
4	B	-
7	Y	-
8	W	-

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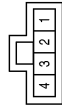
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AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

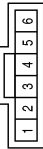
[MANUAL A/C (TYPE 2)]

Connector No.	M122
Connector Name	FRONT BLOWER MOTOR RESISTOR
Connector Color	WHITE



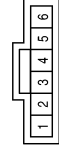
Terminal No.	Color of Wire	Signal Name
1	R	-
2	Y	-
3	L	-
4	SB	-

Connector No.	M142
Connector Name	MODE DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	BR	-
2	P	-
3	G	-
4	V	-
6	R	- (WITHOUT AUTO A/C)

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR
Connector Color	BLACK



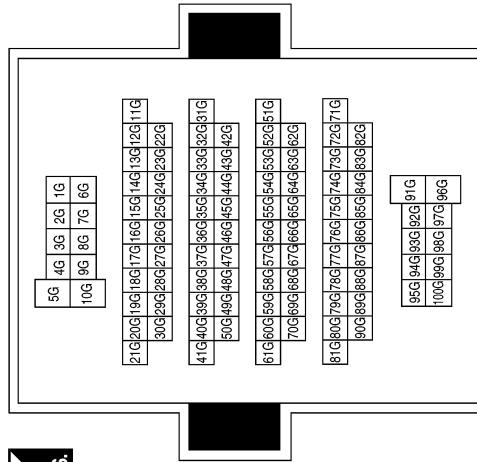
Terminal No.	Color of Wire	Signal Name
1	Y	-
2	SB	-
3	P	-
5	GR	-
6	W	- (MANUAL WITH TYPE 2)

Connector No.	E54
Connector Name	FRONT BLOWER MOTOR RELAY
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	B	-
3	W/G	-
5	L	-
6	W/G	-
7	GR	-

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



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MANUAL A/C IDENTIFICATION TABLE

< SYMPTOM DIAGNOSIS >

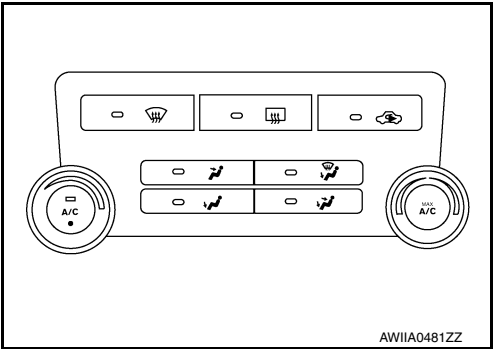
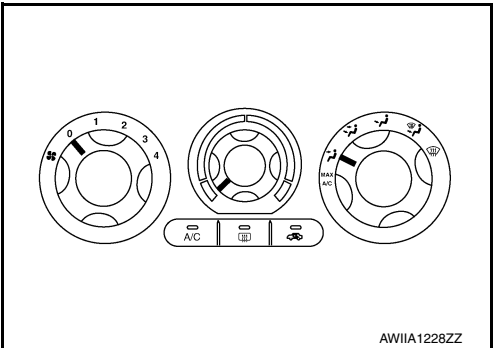
[MANUAL A/C (TYPE 2)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000012565128

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System [with variable blower control (VBC)]	
Manual A/C (Type 2)	Three Control Dial System [without variable blower control (VBC)]	

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AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:000000012565129

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-195
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. HAC-172
Mode door motor is malfunctioning.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. HAC-177
Air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-180
Intake door motor is malfunctioning.	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-182
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-188
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-213
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-221
Noise	Go to Trouble Diagnosis Procedure for Noise. HAC-223

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

INSUFFICIENT COOLING

Component Function Check

INFOID:000000012565130

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn temperature control dial counterclockwise to maximum cold.
2. Check for cold air at discharge air outlets.

Can the symptom be duplicated?

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

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-159, "Operational Check"](#).

Does another symptom exist?

- YES >> Refer to [HAC-212, "Symptom Matrix Chart"](#).
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-130, "Checking Drive Belts"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Adjust or replace compressor belt. Refer to [EM-130, "Adjustment"](#).

5. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation.

Does air mix door operate correctly?

- YES >> GO TO 6.
NO >> Repair or replace air mix door control linkage.

6. CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to [EC-947, "Component Inspection"](#).

Does cooling fan motor operate correctly?

- YES >> GO TO 7.
NO >> Check cooling fan motor. Refer to [EC-946, "Diagnosis Procedure"](#).

7. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

>> GO TO 8.

8. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.
2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Check contaminated refrigerant. Refer to [HA-3, "Contaminated Refrigerant"](#).

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INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

9. CHECK FOR EVAPORATOR FREEZE UP

Start engine and run A/C. Check for evaporator freeze up.

Does evaporator freeze up?

YES >> Perform diagnostic work flow. Refer to [HAC-214. "Diagnostic Work Flow"](#).

NO >> GO TO 10.

10. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-216. "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform diagnostic work flow. Refer to [HAC-214. "Diagnostic Work Flow"](#).

NO >> GO TO 11.

11. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

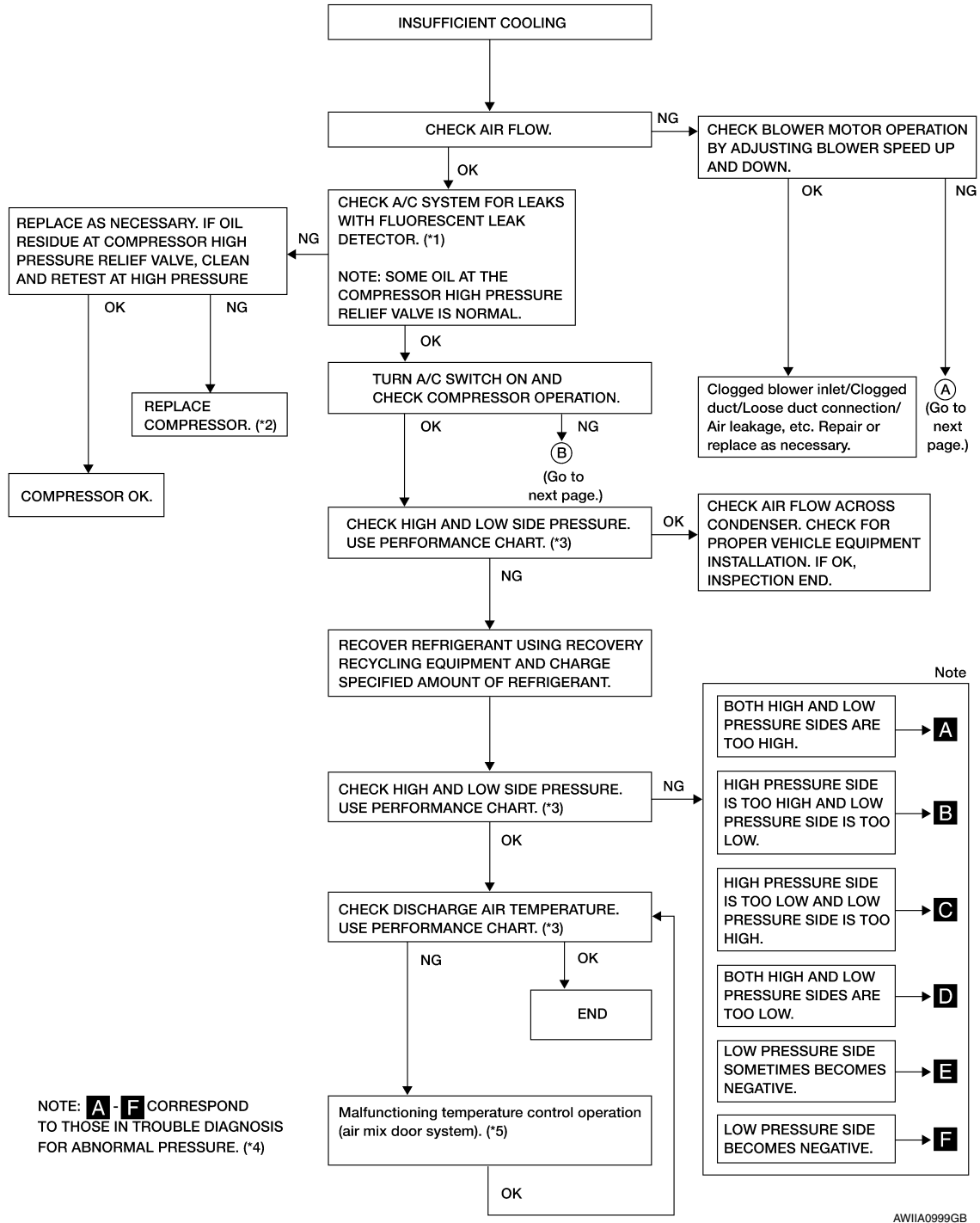
Diagnostic Work Flow

INFOID:000000012565131

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]



*1 [HA-18. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-25. "Removal and Installation for Compressor"](#)

*3 [HAC-216. "Performance Chart"](#)

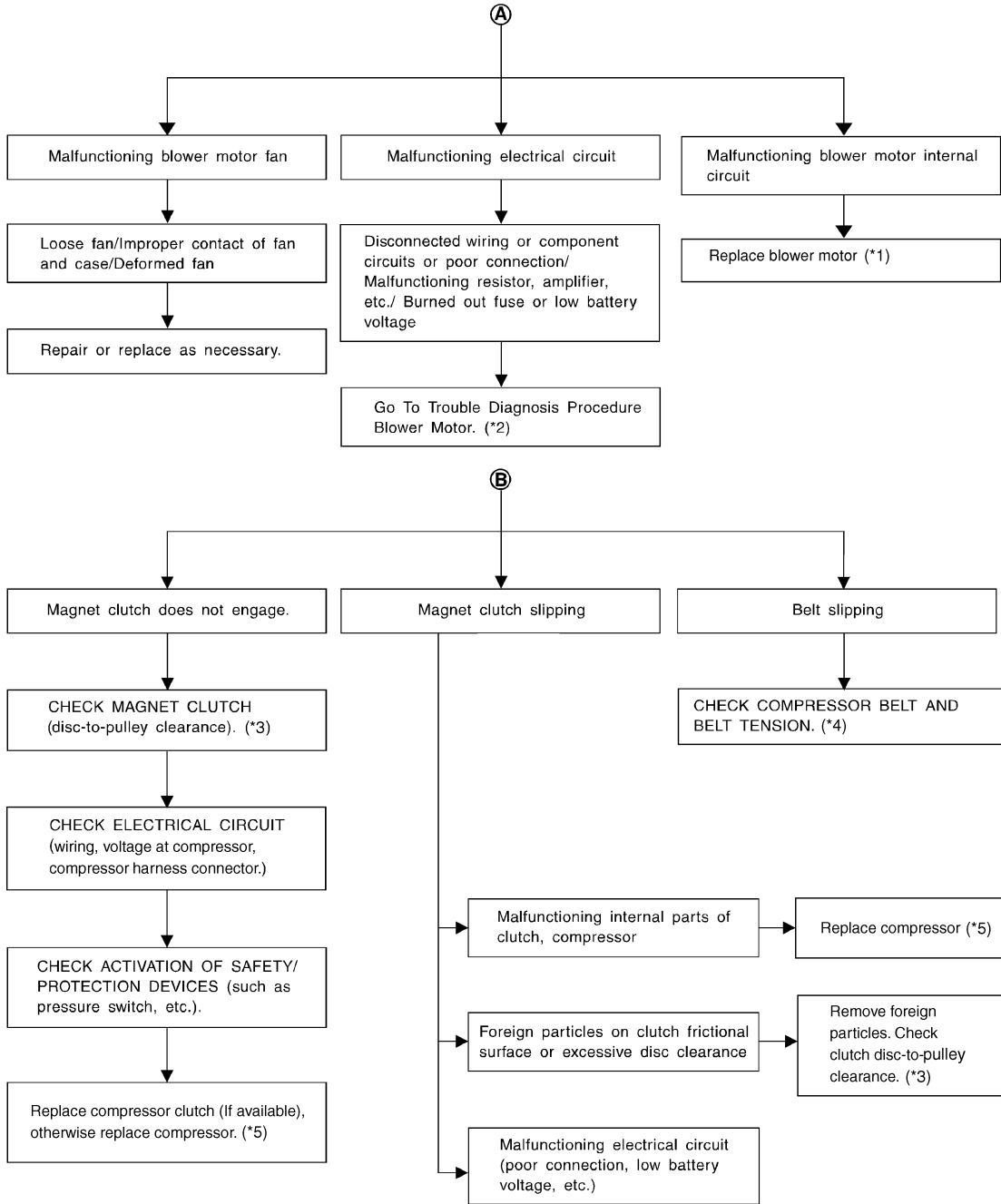
*4 [HAC-217. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-177. "Air Mix Door Motor Diagnosis Procedure"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]



AWI1000GB

*1 [VTL-11, "Removal and Installation"](#)

*2 [HAC-116, "Front Blower Motor Diagnosis Procedure"](#)

*3 [HA-27, "Removal and Installation for Compressor Clutch"](#)

*4 [EM-14, "Checking Drive Belts" \(QR25DE\)](#) or [EM-130, "Checking Drive Belts" \(VQ40DE\)](#)

*5 [HA-25, "Removal and Installation for Compressor"](#)

Performance Chart

INFOID:000000012565132

TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	(Ventilation) set
Recirculation (REC) switch	(Recirculation) set
Blower speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	5.3 - 6.5 (42 - 44)
	25 (77)	9.7 - 11.5 (49 - 53)
	30 (86)	13.8 - 16.3 (57 - 61)
	35 (95)	18.0 - 21.2 (64 - 70)
	40 (104)	22.2 - 25.7 (72 - 78)
60 - 70	20 (68)	6.5 - 7.7 (44 - 46)
	25 (77)	11.5 - 13.3 (53 - 56)
	30 (86)	16.3 - 18.8 (61 - 66)
	35 (95)	21.2 - 24.0 (70 - 75)
	40 (104)	25.7 - 29.2 (78 - 85)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	680 - 840 (6.94 - 8.57, 98.6 - 121.8)	160 - 198 (1.63 - 2.02, 23.2 - 28.7)
	25 (77)	800 - 985 (8.16 - 10.05, 116.0 - 142.8)	198 - 245 (2.02 - 2.50, 28.7 - 35.5)
	30 (86)	940 - 1,150 (9.59 - 11.73, 136.3 - 166.8)	225 - 278 (2.30 - 2.84, 32.6 - 40.3)
	35 (95)	1,160 - 1,410 (11.83 - 14.38, 168.2 - 204.5)	273 - 335 (2.78 - 3.42, 39.6 - 48.6)
	40 (104)	1,325 - 1,620 (13.52 - 16.52, 192.1 - 234.9)	325 - 398 (3.32 - 4.06, 47.1 - 57.7)

Trouble Diagnoses for Abnormal Pressure

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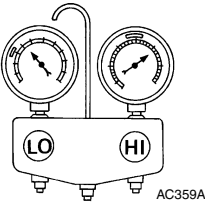
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table).

INSUFFICIENT COOLING

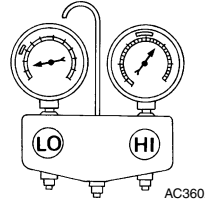
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

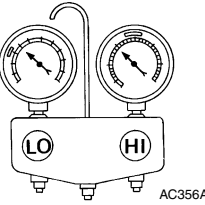
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p>  <p style="text-align: right; font-size: small;">AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check oil for contamination.

High-pressure Side is Too Low and Low-pressure Side is Too High

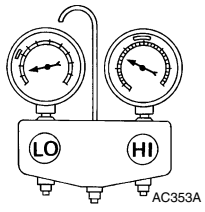
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p>  <p style="text-align: right; font-size: small;">AC356A</p>	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

INSUFFICIENT COOLING

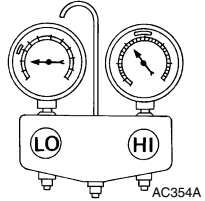
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
<p>D Both high- and low-pressure sides are too low.</p> 	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-20. "Checking of Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-125. "Intake Sensor Diagnosis Procedure". Replace compressor. Repair evaporator fins. Replace evaporator. Refer to HAC-115. "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

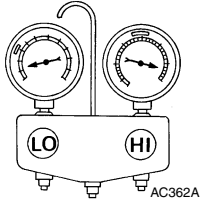
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> Air conditioning system does not function and does not cyclically cool the compartment air. The system constantly functions for a certain period of time after compressor is stopped and restarted. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> Drain water from refrigerant or replace refrigerant. Replace liquid tank.

Low-pressure Side Becomes Negative

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</p> 	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check oil for contamination.

INSUFFICIENT HEATING

Component Function Check

INFOID:000000012565134

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

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

Can the symptom be duplicated?

YES >> GO TO 2.

NO >> Perform complete operational check. Refer to [HAC-159, "Operational Check"](#).**2.** CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to [CO-11, "System Inspection"](#) (QR25DE) or [CO-39, "System Inspection"](#) (VQ40DE).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-11, "System Inspection"](#) (QR25DE) or [CO-39, "System Inspection"](#) (VQ40DE).
4. Check for air in cooling system.

>> GO TO 4.

4. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Check the air mix door motor circuit. Refer to [HAC-177, "Air Mix Door Motor Component Function Check"](#).**5.** CHECK AIR DUCTS

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair all disconnected or leaking air ducts.

6. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 7.

NO >> Both hoses warm: GO TO 8.

7. CHECK ENGINE COOLANT SYSTEMCheck engine coolant temperature sensor. Refer to [EC-187, "Component Inspection"](#) (QR25DE) or [EC-1143, "Component Inspection"](#) (VQ40DE).Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

8. CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

- NO >> 1. Back flush heater core.
2. Drain the water from the system.
3. Refill system with new engine coolant. Refer to [CO-12. "Changing Engine Coolant"](#) (QR25DE) or [CO-40. "Changing Engine Coolant"](#) (VQ40DE).
4. GO TO 9 to retest.

9. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

YES >> System OK.

- NO >> Replace heater core. Refer to [VTL-19. "Removal and Installation"](#).

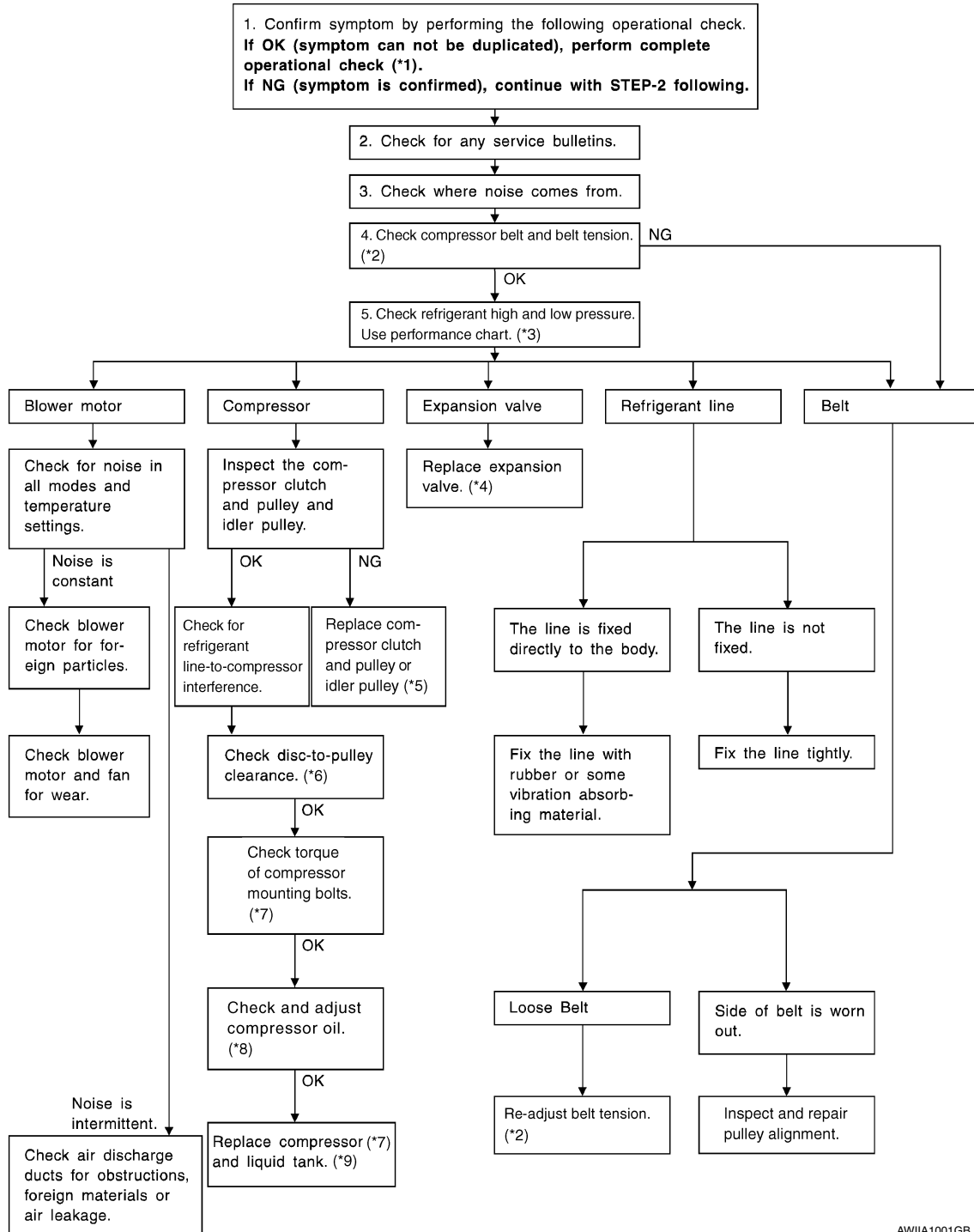
NOISE

Component Function Check

INFOID:000000012565135

SYMPTOM: Noise

INSPECTION FLOW



AWI1A1001GB

NOISE

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

- | | | |
|---|--|--|
| *1 HAC-90. "Operational Check" | *2 EM-14. "Checking Drive Belts" (QR25DE) or EM-130. "Checking Drive Belts" (VQ40DE) | *3 HAC-216. "Performance Chart" |
| *4 HA-37. "Removal and Installation" | *5 HA-27. "Removal and Installation for Compressor Clutch" | *6 HA-27. "Removal and Installation for Compressor Clutch" |
| *7 HA-25. "Removal and Installation for Compressor" | *8 HA-16. "Maintenance of Oil Quantity in Compressor" | *9 HA-34. "Removal and Installation" |

PRECAUTION

PRECAUTIONS

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

INFOID:000000012565136

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 three minutes before performing any service.

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

INFOID:000000012565137

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, "Contaminated Refrigerant"](#). 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

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

PRECAUTIONS

< PRECAUTION >

[MANUAL A/C (TYPE 2)]

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

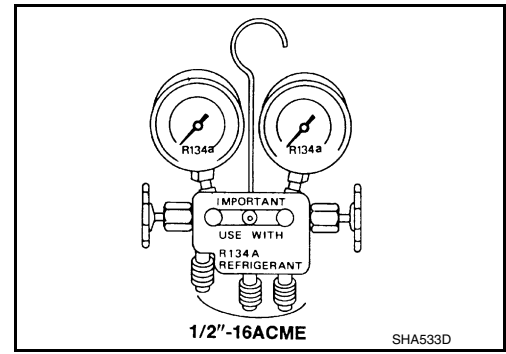
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

Precaution for Service Equipment

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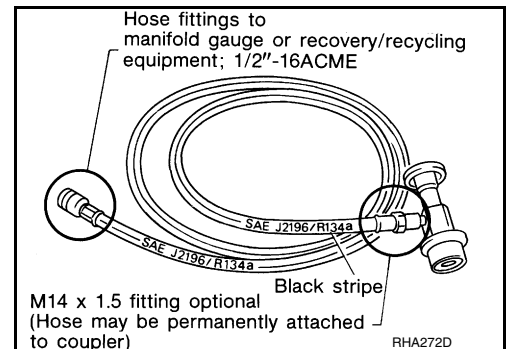
MANIFOLD GAUGE SET

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



SERVICE HOSES

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

Never 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

