SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

MANUAL A/C (TYPE 1)

MANUAL A/C (TYPE 2)

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000011560754

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-82, "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-21, "Front Air Control Self-Diagnosis".

>> If any diagnostic trouble codes set. Refer to HAC-21, "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:0000000011560755

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-94, "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-44, "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-23, "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-36, "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 (drive 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-83, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-28, "Air Mix Door Motor (Driver) Component Function Check".

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-91, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-28, "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-49, "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-67, "Front Air Control Power and Ground Diagnosis Procedure", then if necessary, trouble diagnosis procedure for HAC-49, "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-82, "Symptom Matrix Chart", and perform applicable trouble diagnosis procedures.

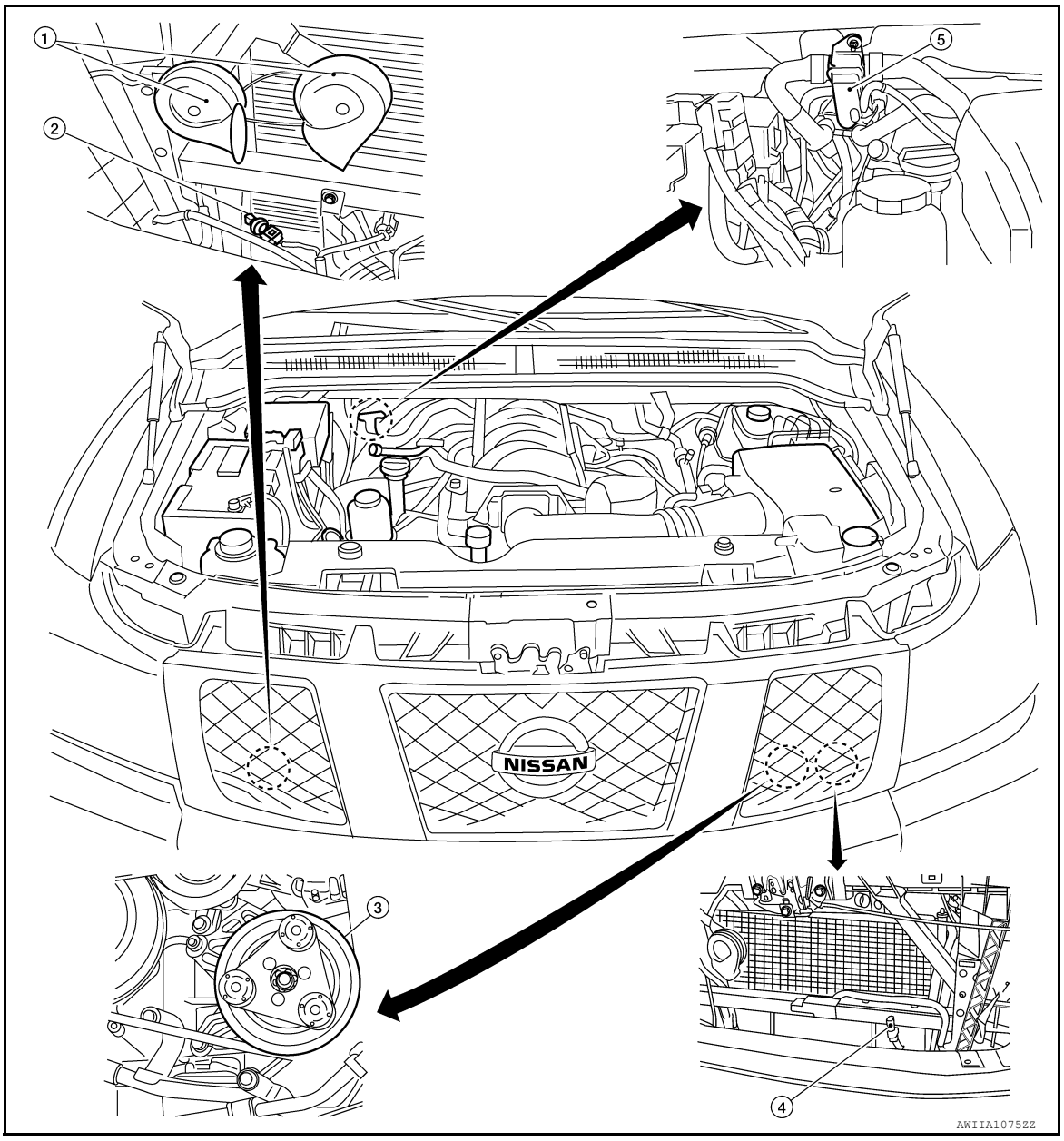
SYSTEM DESCRIPTION

FUNCTION INFORMATION

Component Part Location

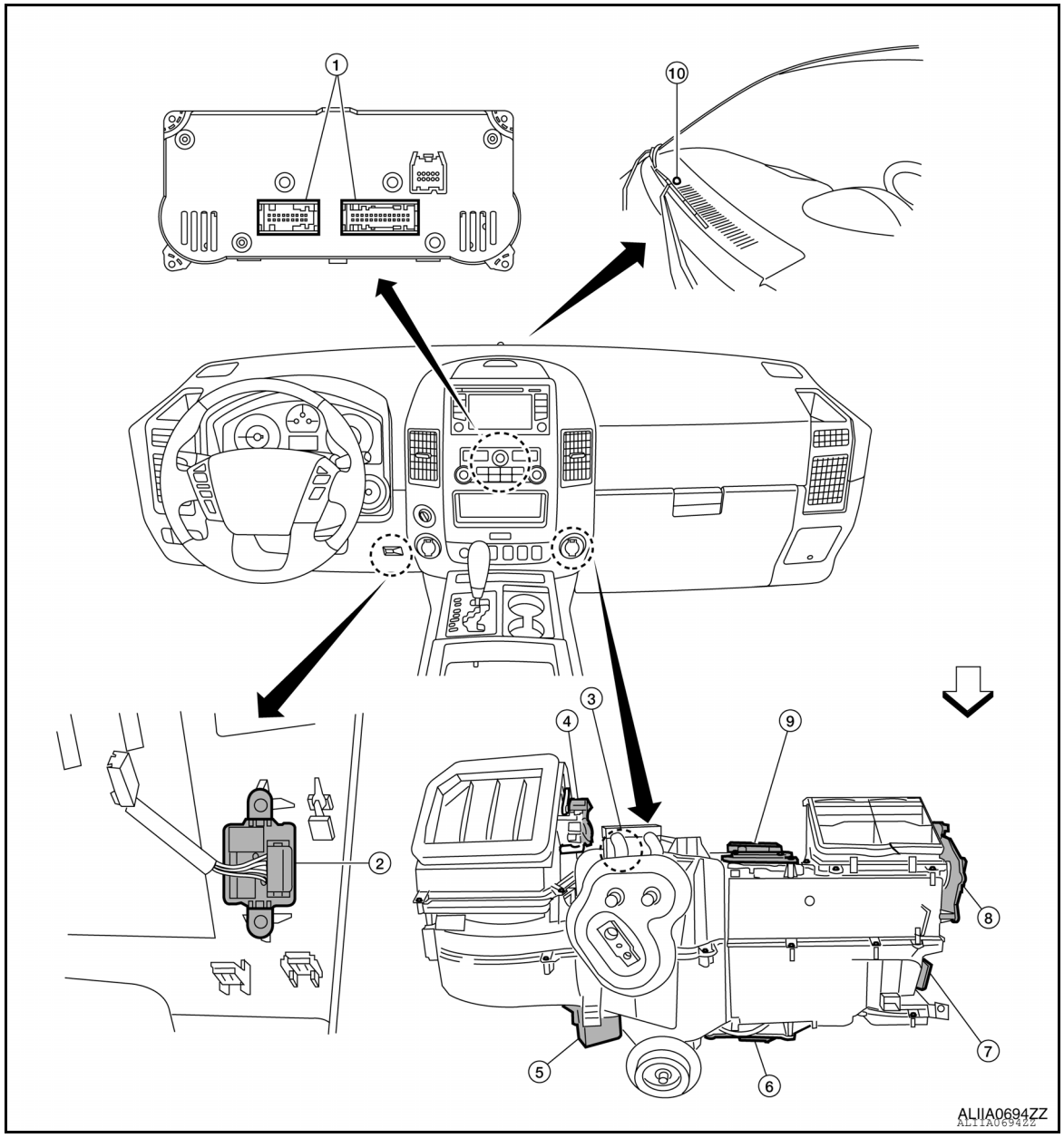
INFOID:0000000011560756

ENGINE COMPARTMENT



1. Horn (view with grille removed)
2. Refrigerant pressure sensor E48
3. A/C compressor F3
4. Ambient sensor E1 (view with grille removed)
5. Water valve F68

PASSENGER COMPARTMENT



1. Front air control M49, M50
2. In-vehicle sensor M32
3. Intake sensor M146
4. Intake door motor M58
5. Variable blower control M122
6. Air mix door motor (Passenger) M143
7. Mode door motor M142
8. Defroster door motor M144
9. Air mix door motor (driver) M147
10. Optical sensor M302

⇐ :Front

Symptom Table

INFOID:0000000011560757

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-67
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-21
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-23
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-28
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-36
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-39
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-44
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-49
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-83
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-91
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-93
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-21
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-94

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:0000000011560758

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:0000000011560759

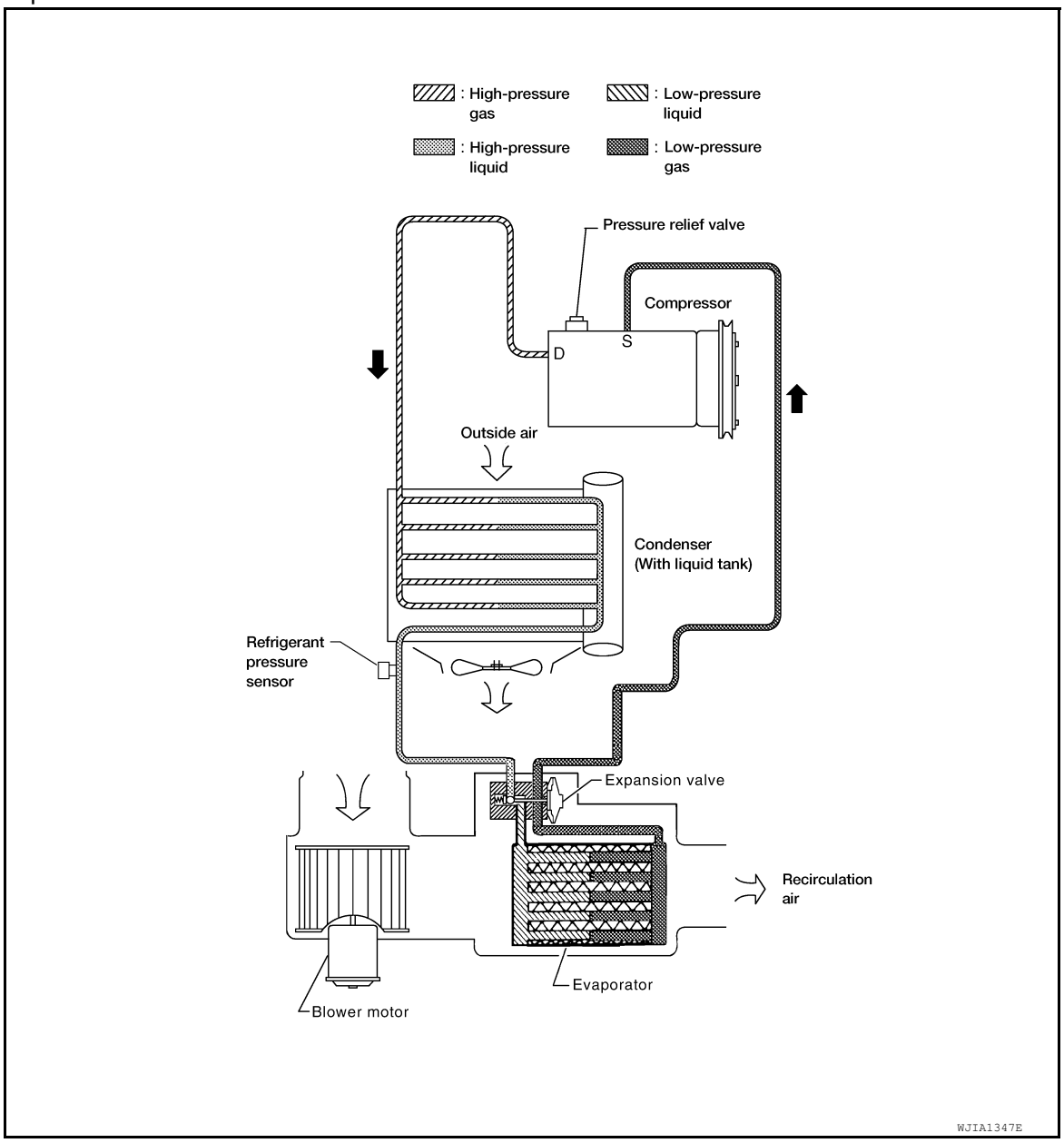
REFRIGERANT PRESSURE SENSOR

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/cm^2, 398 psi), or below about 120 kPa (1.22 kg/cm^2, 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/

cm^2, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



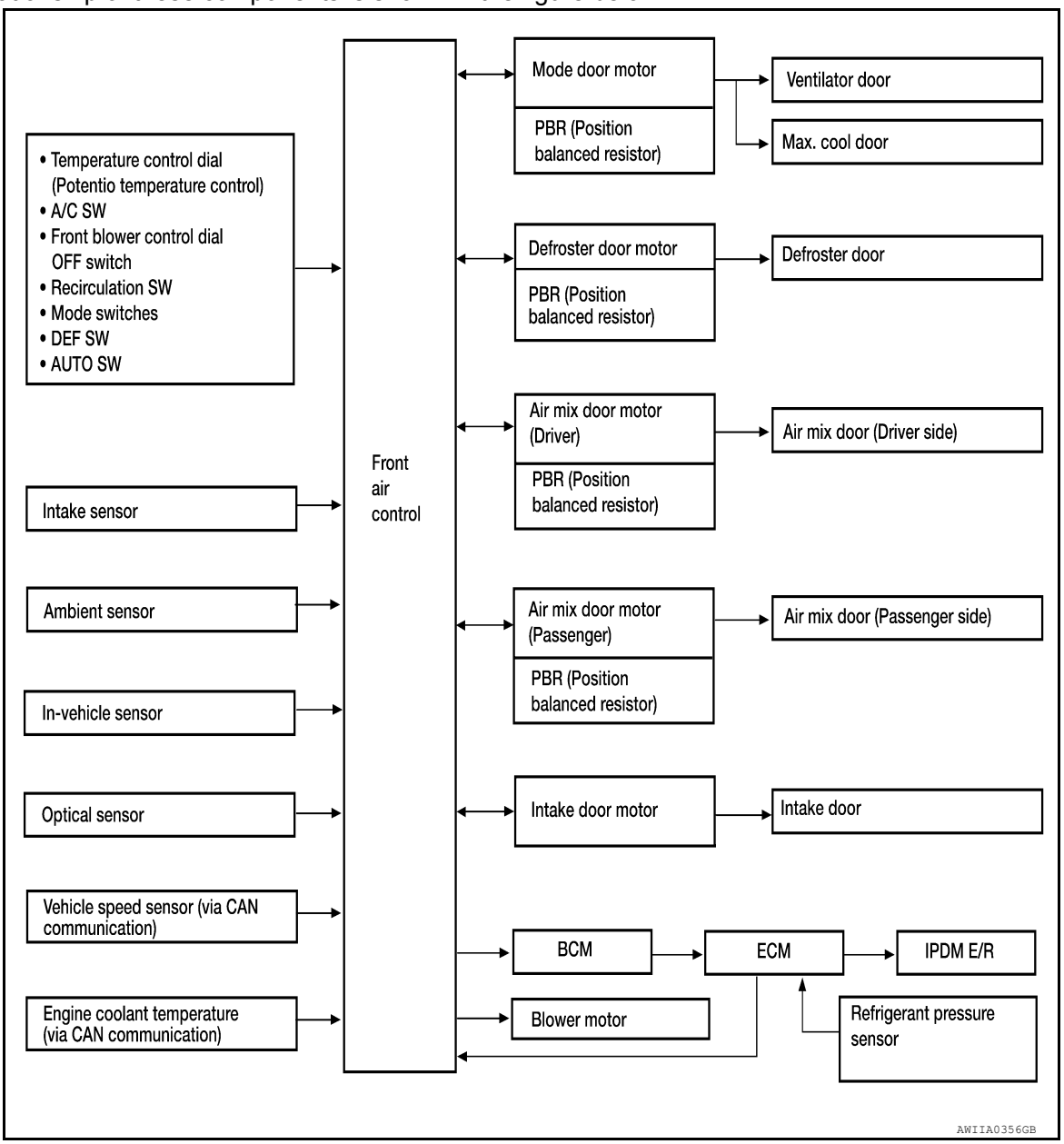
AUTOMATIC AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000011560760

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:

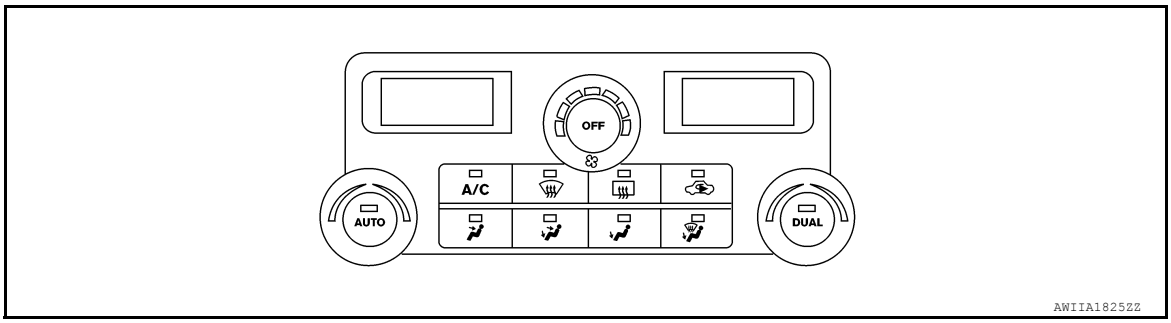


Control System Description

INFOID:0000000011560761

CONTROL OPERATION

Front air control



AUTO SWITCH

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

TEMPERATURE CONTROL DIAL (DRIVER)

Increases or decreases the set temperature.

TEMPERATURE CONTROL DIAL (PASSENGER)

Increases or decreases the set temperature.

RECIRCULATION ( ) SWITCH

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

DEFROSTER ( ) SWITCH

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

REAR WINDOW DEFOGGER SWITCH (CREW CAB)

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

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.)

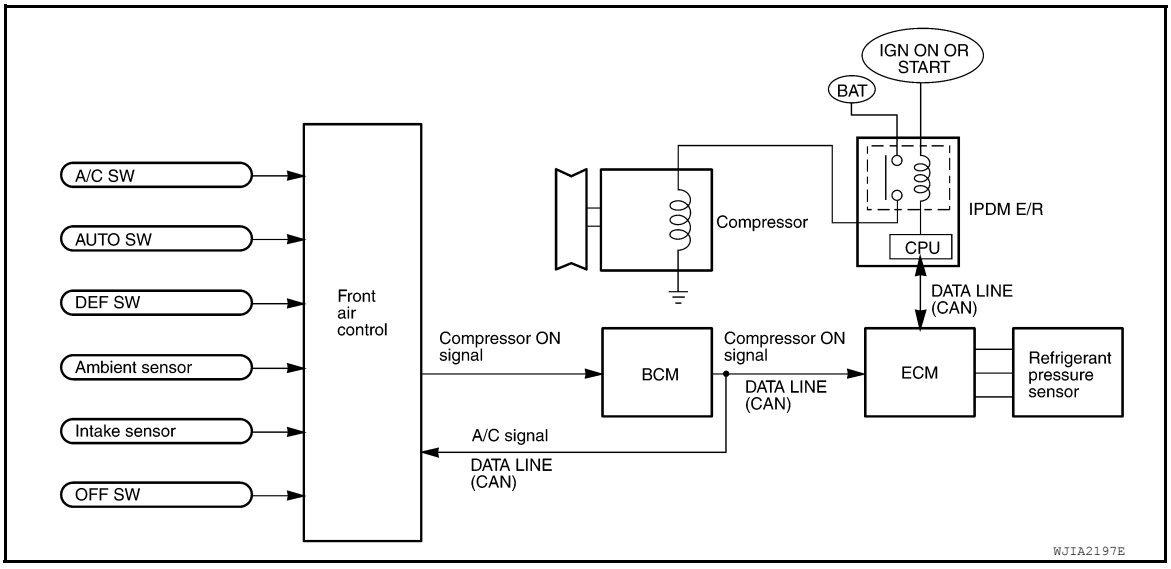
MODE SWITCHES

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.

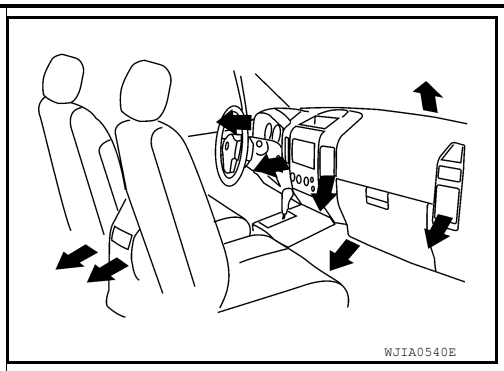
MAGNET CLUTCH CONTROL



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

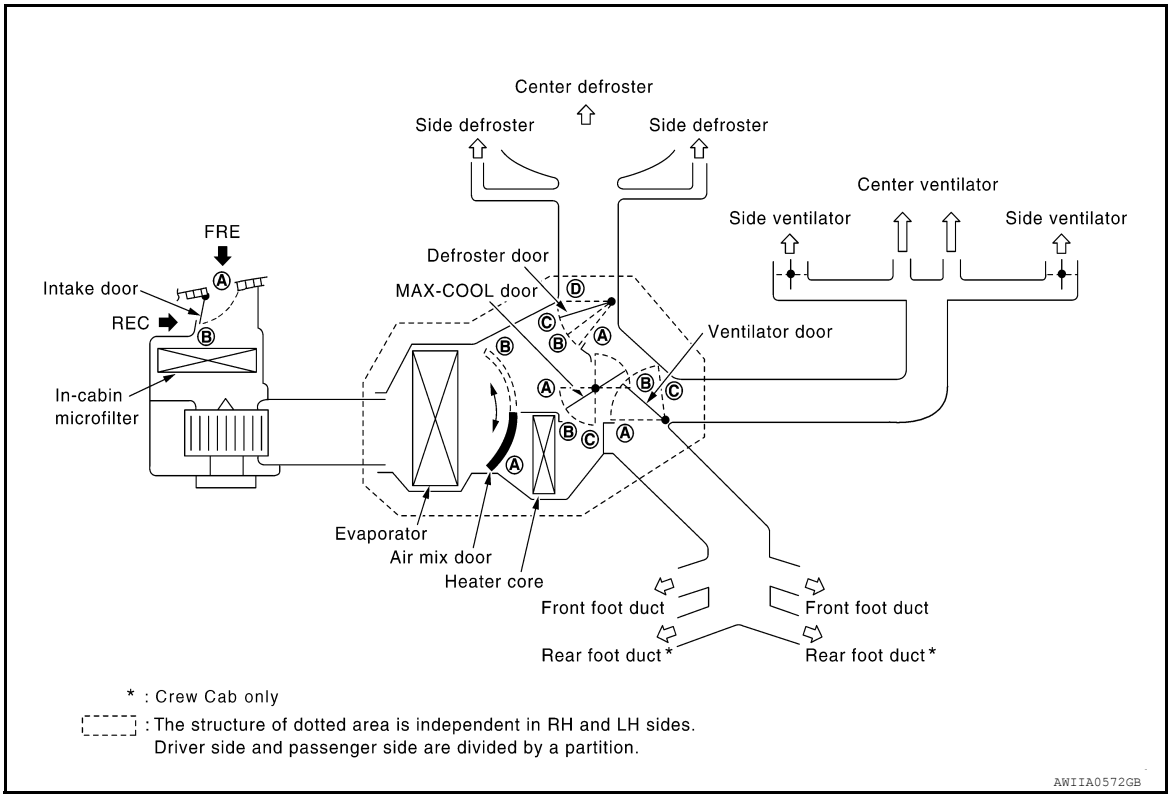
INFOID:0000000011560762



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

Switches And Their Control Function

INFOID:0000000011560763



Position or switch / Door	MODE SW				DEF SW		REC SW		Temperature control dial			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF				
					FRONT							
					☀	○	☀	○	COLD	~	HOT	OFF
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ		—		—			Ⓒ
MAX-COOL door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—			Ⓑ
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ	Ⓑ	Ⓐ	—	—		—			Ⓒ
Intake door	—				Ⓑ		Ⓐ	Ⓑ	—			Ⓑ
Air mix door	—				—		—		Ⓐ	AUTO	Ⓑ	—

AWIIA0359GB

DIAGNOSIS SYSTEM (HVAC)

CONSULT Function (HVAC)

INFOID:0000000011560764

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	CHG-4, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "Work Flow (Without EXP-800 NI or GR8-1200 NI)"
B2578	In-vehicle sensor circuit out of range (low)	HAC-59, "In-Vehicle Sensor Diagnosis Procedure"
B2579	In-vehicle sensor circuit out of range (high)	
B257B	Ambient sensor circuit short	HAC-57, "Ambient Sensor Component Inspection"
B257C	Ambient sensor circuit open	
B257F	Optical sensor (Driver) circuit open or short	HAC-62, "Optical Sensor Diagnosis Procedure".
B2580	Optical sensor (Passenger) circuit open or short	
B2581	Intake sensor circuit short	HAC-65, "Intake Sensor Component Inspection"
B2582	Intake sensor circuit open	
B2587	Stuck button	VTL-8, "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.
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.
DEF FDBCK	"V"	Displays defroster door motor feedback signal.
RECIRC	"ON/OFF"	Displays recirculation switch signal.
DEFROST	"ON/OFF"	Displays defroster switch signal.
AUTO	"ON/OFF"	Displays AUTO switch signal.

Monitor item	Value	Contents
A/C	"ON/OFF"	Displays A/C switch signal.
L TEMP UP	"ON/OFF"	Displays driver side temperature control dial (temp increase) signal.
L TEMP DOWN	"ON/OFF"	Displays driver side temperature control dial (temp decrease) signal.
R TEMP UP	"ON/OFF"	Displays passenger temperature control dial (temp increase) signal.
R TEMP DOWN	"ON/OFF"	Displays passenger temperature control dial (temp decrease) signal.
RR DEFOG	"ON/OFF"	Displays rear defroster request signal.
FAN UP	"ON/OFF"	Displays blower motor (blower speed increase) signal.
FAN DOWN	"ON/OFF"	Displays blower motor (blower speed decrease) signal.
MODE SELECT	"DTNT"	Displays selected mode position.
DUAL MODE	"ON/OFF"	Displays dual mode status.
MODE D STATUS	"V"	Displays mode d status signal.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000011875462

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	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing BCM.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION
BCM can perform the following functions:

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

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:0000000011875463

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

Front Air Control Self-Diagnosis

INFOID:0000000011560767

A/C SYSTEM SELF-DIAGNOSIS FUNCTION

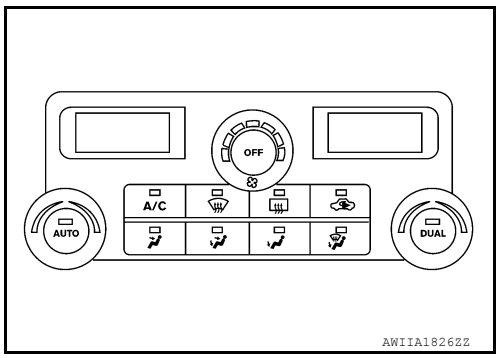
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

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-21, "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:0000000011560768

SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page	
03	Battery voltage out of range	CHG-4, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "Work Flow (Without EXP-800 NI or GR8-1200 NI)"
30	In-vehicle sensor circuit out of range (low)	HAC-59, "In-Vehicle Sensor Diagnosis Procedure"
31	In-vehicle sensor circuit out of range (high)	
40	Ambient sensor circuit short	HAC-56, "Ambient Sensor Diagnosis Procedure"
41	Ambient sensor circuit open	
50	Optical sensor (Driver) circuit open or short	HAC-62, "Optical Sensor Diagnosis Procedure"
52	Optical sensor (Passenger) circuit open or short	
56	Intake sensor circuit short	HAC-64, "Intake Sensor Diagnosis Procedure"
57	Intake sensor circuit open	
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"
90	Stuck button	VTL-8, "Removal and Installation"

DTC/CIRCUIT DIAGNOSIS

MODE DOOR MOTOR

System Description

INFOID:0000000011560769

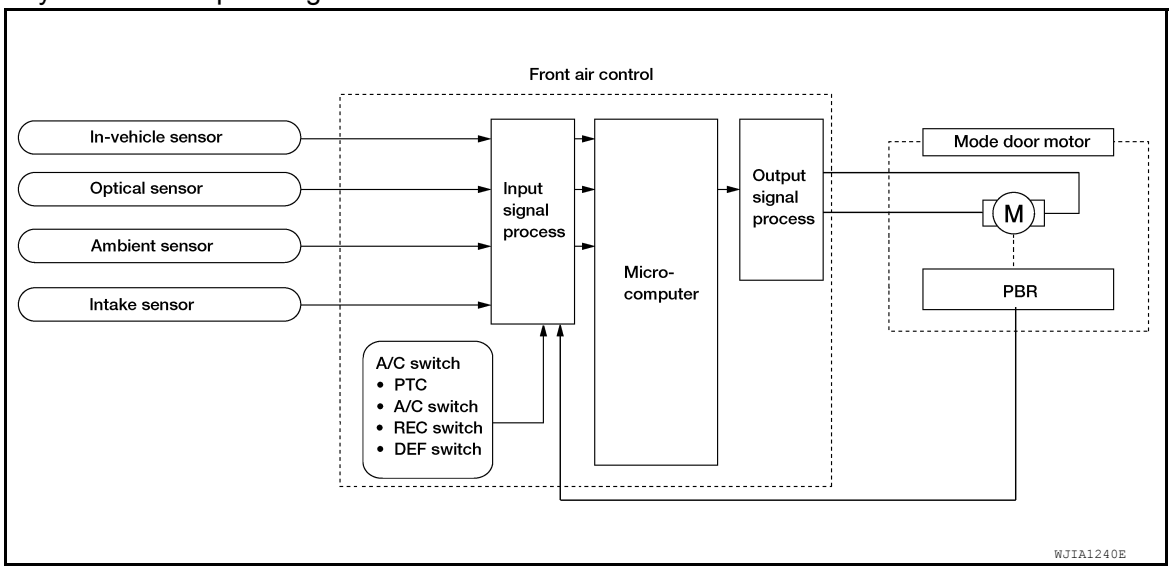
SYSTEM DESCRIPTION

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

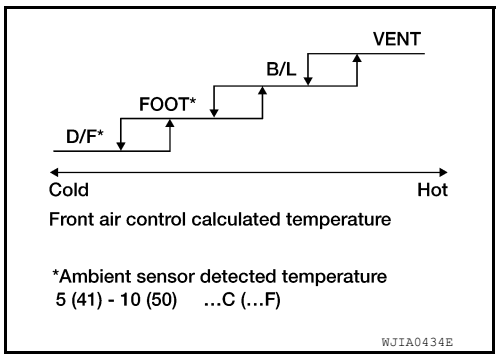
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the 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.



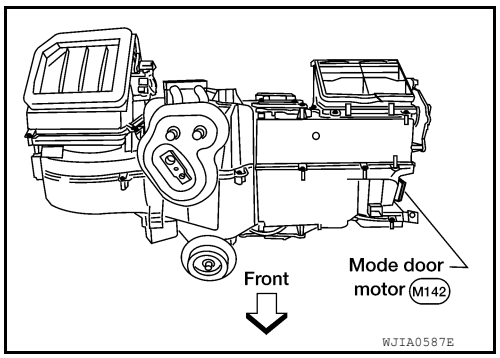
Mode Door Control Specification

COMPONENT DESCRIPTION

Mode Door Motor



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:0000000011560770

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Press each mode switch and press the (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 ( ) or D/F ( ) is selected.

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to HAC-23, "Mode Door Motor Diagnosis Procedure".

Mode Door Motor Diagnosis Procedure

INFOID:0000000011560771

Regarding Wiring Diagram information, refer to HAC-71, "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.

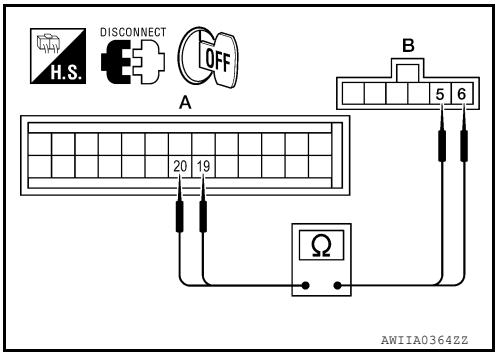
Monitor Item	Condition	Results
MODE FDBCK	Cycle mode switch through all modes, D/F ( ), VENT ( ), B/L ( ), and FOOT( )	Voltage varies between D/F ( ) and VENT ( ), and between VENT ( ) and B/L ( ).

Is the inspection result normal?

YES >> • Mode door motor is OK.
• Inspect mode door for mechanical failure. Refer to VTL-19, "Removal and Installation".
NO >> GO TO 2.

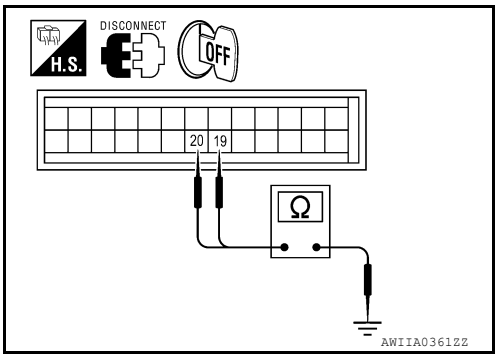
2.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the mode door motor harness connector M142 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 19, 20 and the mode door motor harness connector M142 (B) terminals 5, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	19	M142	5	Yes
	20		6	

4. Check continuity between front air control harness connector M49 terminals 19, 20 and ground.



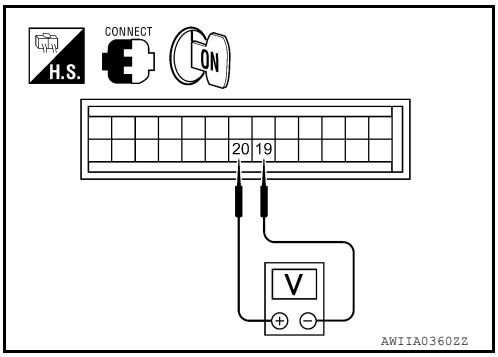
Connector	Terminal	—	Continuity
M49	19	Ground	No
	20		

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 ( ) mode.
4. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the VENT ( ), and then the B/L ( ) mode.



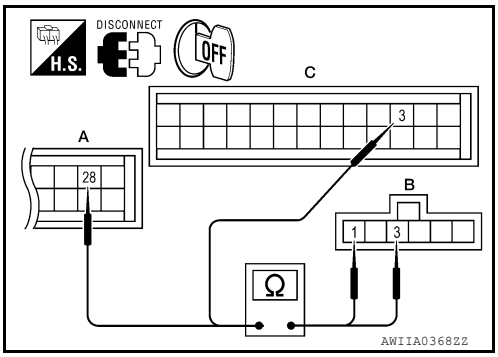
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	19	20	D/F ( ) mode to VENT ( ) mode	Battery voltage
	20	19	VENT ( ) mode to B/L ( ) mode	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "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 M49 (C) terminal 3, and M50 (A) terminal 28 and the mode door motor harness connector M142 (B) terminals 1, 3.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M49 (C)	3	M142	3	Yes
M50 (A)	28		1	

4. Check continuity between front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

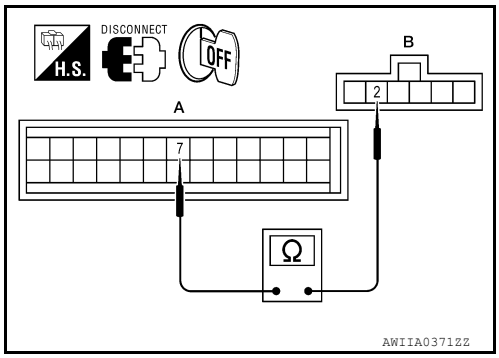
Connector	Terminal	—	Continuity
M49 (C)	3	Ground	No
M50 (A)	28		

Is the inspection result normal?

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

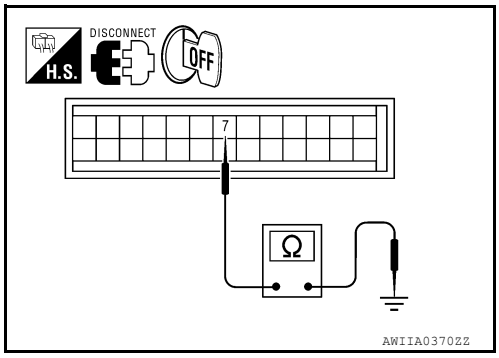
5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M49 (A) terminal 7 and mode door motor harness connector M142 (B) terminal 2.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	7	M142	2	Yes

2. Check continuity between front air control harness connector M49 terminal 7 and ground.



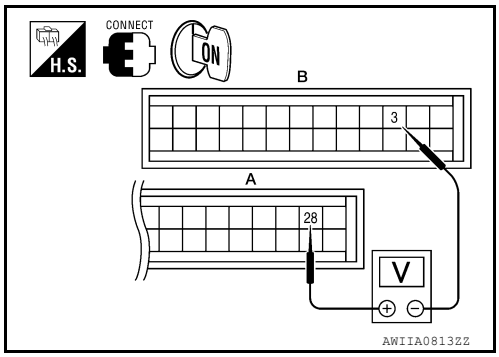
Connector	Terminal	—	Continuity
M49	7	Ground	No

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

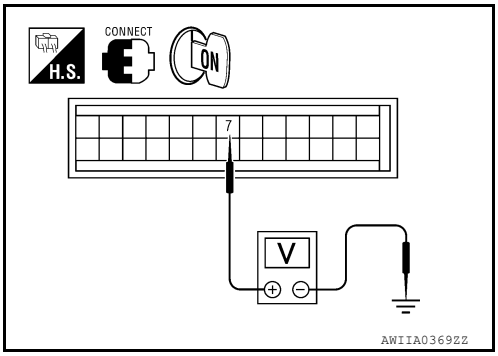
1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 (B) terminal 3, and M50 (A) terminal 28.



A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M50	28	M49	3	5 Volts

4. Check voltage between front air control harness connector M49 terminal 7 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	7	Ground	0 Volts

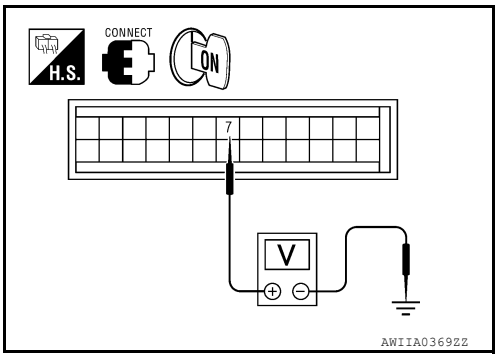


Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "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 M49 terminal 7 and ground.



Connector	Terminal	—	Voltage (Approx.)
M49	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-8, "Removal and Installation".
NO >> Replace the mode door motor. Refer to VTL-19, "Removal and Installation".

AIR MIX DOOR MOTOR

System Description

INFOID:0000000011560772

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

Component Parts

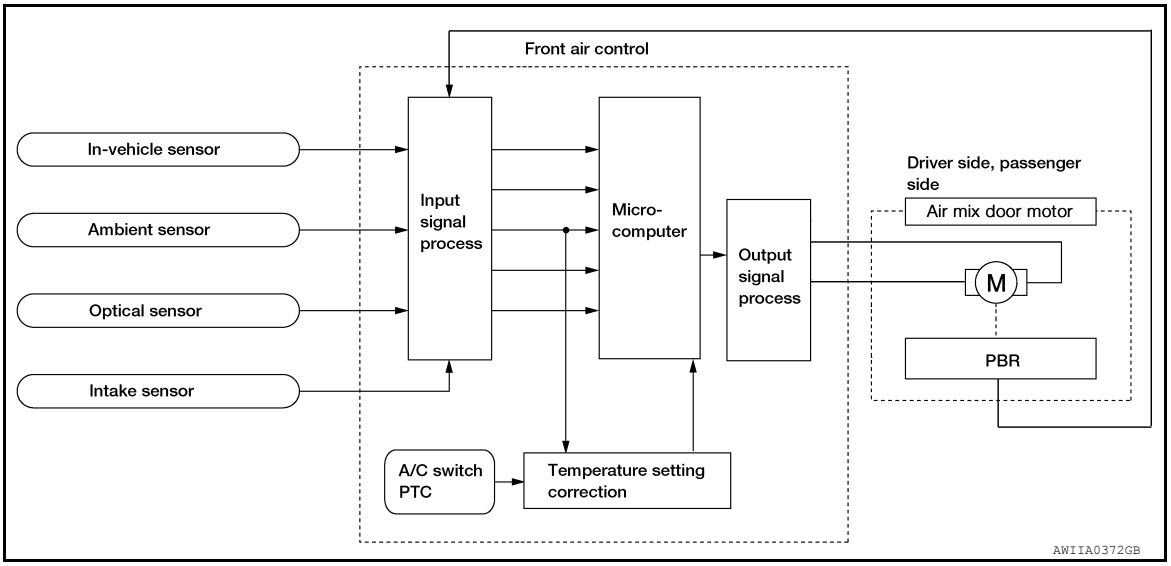
Air mix door control system components are:
- Front air control
- Air mix door motors (driver, passenger)
- PBR (built-into air mix door motors)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation

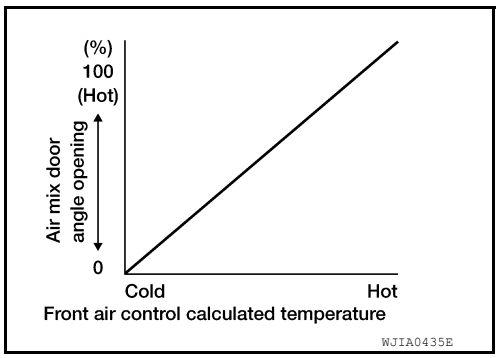
The front air control receives data from the temperature selected by the driver side, passenger side, and rear. The front air control then applies a voltage to one circuit of the appropriate air mix door motor, while ground is applied to the other circuit, causing the appropriate air mix door motor to 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



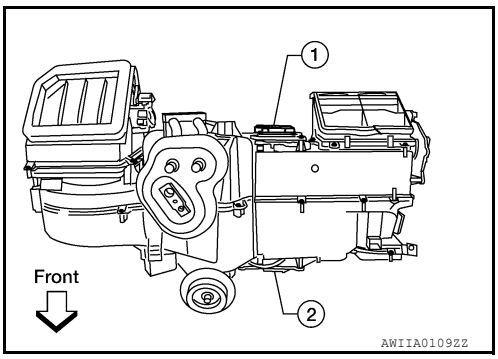
Air Mix Door Control Specification



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:0000000011560773

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-28, "Air Mix Door Motor (Driver) Diagnosis Procedure".

Air Mix Door Motor (Driver) Diagnosis Procedure

INFOID:0000000011560774

Regarding Wiring Diagram information, refer to HAC-71, "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.

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.

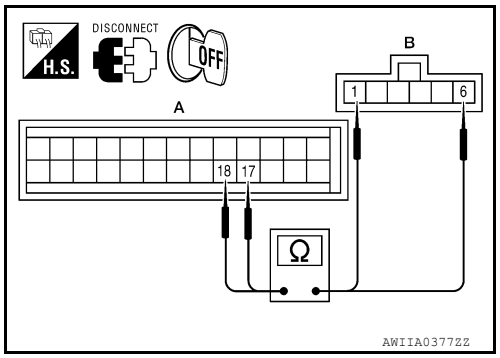
Is the inspection result normal?

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-83, "Component Function Check" for insufficient cooling or HAC-91, "Component Function Check" for insufficient heating.

NO >> GO TO 2.

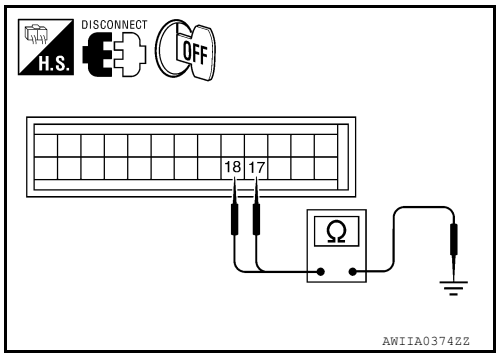
2. CHECK AIR MIX DOOR MOTOR (DRIVER) CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the air mix door motor (driver) harness connector M147 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 17, 18 and the air mix door motor (driver) harness connector M147 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	17	M147	1	Yes
	18		6	

4. Check continuity between front air control harness connector M49 terminals 17, 18 and ground.



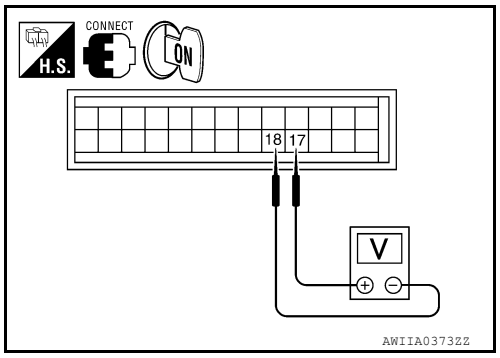
Connector	Terminal	—	Continuity
M49	17	Ground	No
	18		

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 M49 terminal 17 and terminal 18 while rotating temperature control dial (driver) to 18°C (60°F) and back to 32°C (90°F).



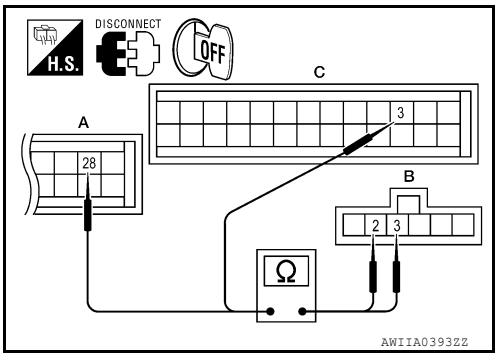
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	17	18	While rotating temperature control dial (driver) from 32°C (90°F) to 18°C (60°F)	Battery voltage
	18	17	While rotating temperature control dial (driver) from 18°C (60°F) to 32°C (90°F)	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

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 M49 (C) terminal 3, connector M50 (A) terminal 28 and air mix door motor (driver) harness connector M147 (B) terminals 3, 2.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M49 (C)	3	M147	2	Yes
M50 (A)	28		3	

4. Check continuity between front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

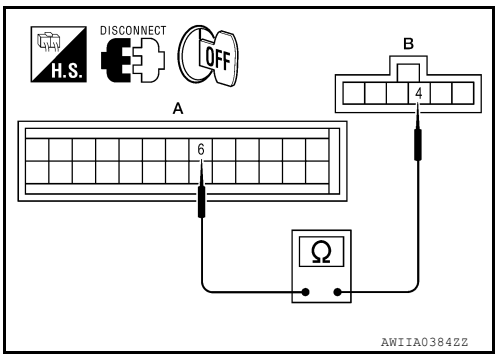
Connector	Terminal	—	Continuity
M49 (C)	3	Ground	No
M50 (A)	28		

Is the inspection result normal?

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

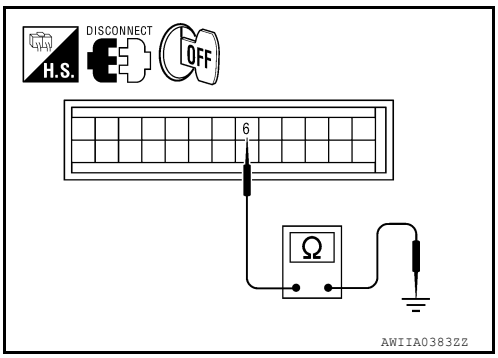
5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M49 (A) terminal 6 and air mix door motor (driver) harness connector M147 (B) terminal 4.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	6	M147	4	Yes

2. Check continuity between front air control harness connector M49 terminal 6 and ground.



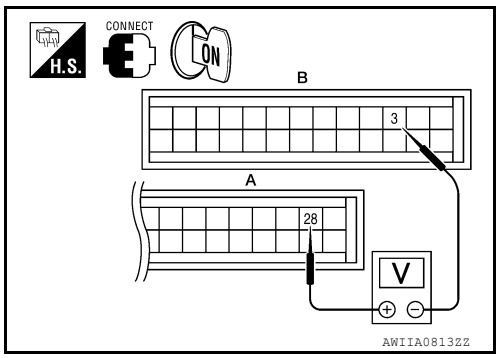
Connector	Terminal	—	Continuity
M49	6	Ground	No

Is the inspection result normal?

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

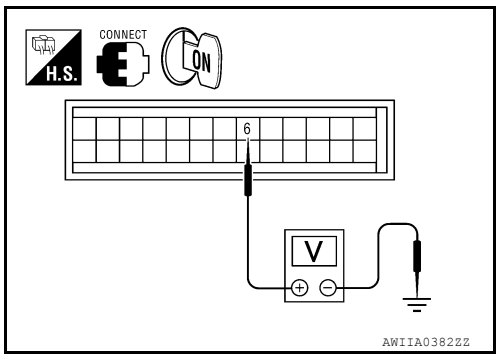
6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 (B) terminal 3, and M50 (A) terminal 28.



A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M50	28	M49	3	5 Volts

4. Check voltage between front air control harness connector M49 terminal 6 and ground.



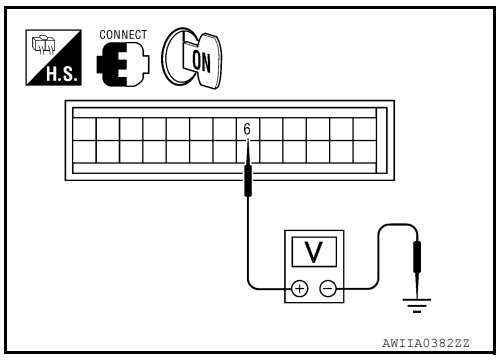
Connector	Terminal	—	Voltage (Approx.)
M49	6	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the air mix door motor (driver) harness connector M147.
2. Check voltage between front air control harness connector M49 terminal 6 and ground.



Connector	Terminal	—	Voltage (Approx.)
M49	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-8, "Removal and Installation".
NO >> Replace air mix door motor (driver). Refer to VTL-20, "Removal and Installation".

Air Mix Door Motor (Passenger) Component Function Check

INFOID:0000000011560775

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the temperature control dial (passenger) 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 (passenger) 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-32, "Air Mix Door Motor (Passenger) Diagnosis Procedure".

Air Mix Door Motor (Passenger) Diagnosis Procedure

INFOID:0000000011560776

Regarding Wiring Diagram information, refer to HAC-71, "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

1. Turn ignition switch ON.
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.

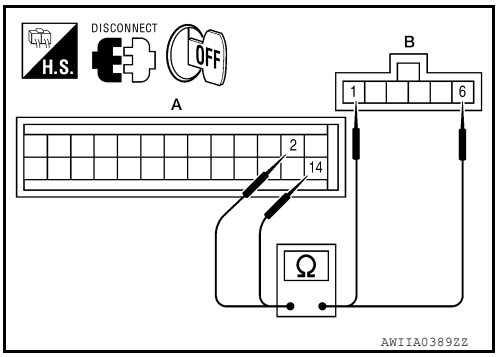
Is the inspection result normal?

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-83, "Component Function Check" for insufficient cooling or HAC-91, "Component Function Check" for insufficient heating.

NO >> GO TO 2.

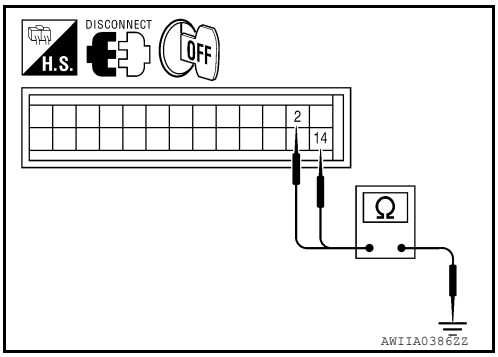
2. CHECK AIR MIX DOOR MOTOR (PASSENGER) CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the air mix door motor (passenger) harness connector M143 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 2, 14 and the air mix door motor (passenger) harness connector M143 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	14	M143	1	Yes
	2		6	

4. Check continuity between front air control harness connector M49 terminals 2, 14 and ground.



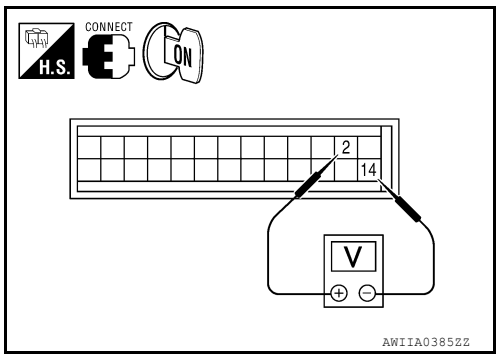
Connector	Terminal	—	Continuity
M49	14	Ground	No
	2		

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 M49 terminal 2 and terminal 14 while rotating temperature control dial (passenger) to 18°C (60°F) and back to 32°C (90°F).



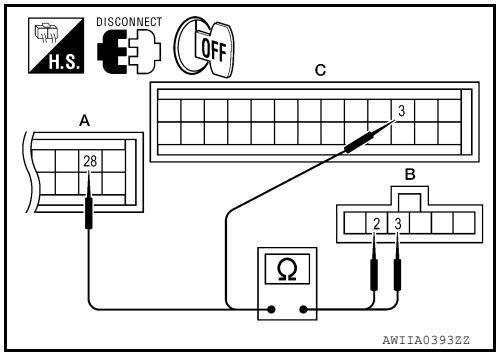
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	2	14	While rotating temperature control dial (passenger) from 32°C (90°F) to 18°C (60°F)	Battery voltage
	14	2	While rotating temperature control dial (passenger) from 18°C (60°F) to 32°C (90°F)	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control Refer to VTL-8, "Removal and Installation".

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 M49 (C) terminal 3 and M50 (A) terminal 28 and air mix door motor (passenger) harness connector M143 (B) terminals 2, 3.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M49 (C)	3	M143	2	Yes
M50 (A)	28		3	

4. Check continuity between front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

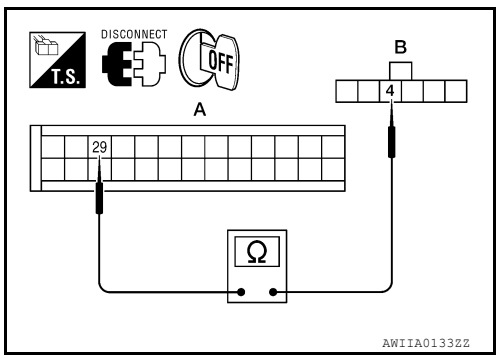
Connector	Terminal	—	Continuity
M49 (C)	3	Ground	No
M50 (A)	28		

Is the inspection result normal?

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

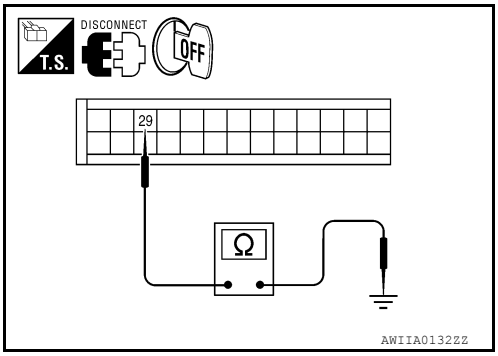
5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M50 (A) terminal 29 and air mix door motor (passenger) harness connector M143 (B) terminal 4.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M50	29	M143	4	Yes

2. Check continuity between front air control harness connector M50 terminal 29 and ground.



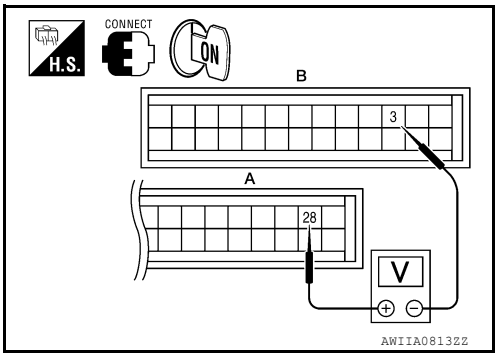
Connector	Terminal	—	Continuity
M50	29	Ground	No

Is the inspection result normal?

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

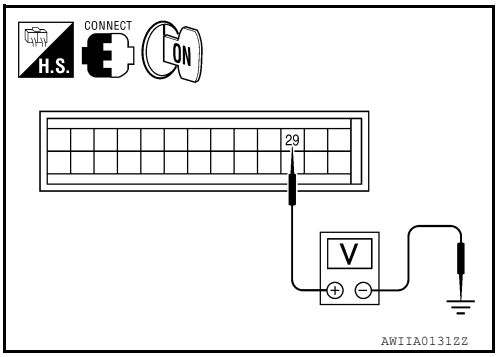
6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 (B) terminal 3, and M50 (A) terminal 28.



A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M50	28	M49	3	5 Volts

4. Check voltage between front air control harness connector M50 terminal 29 and ground.



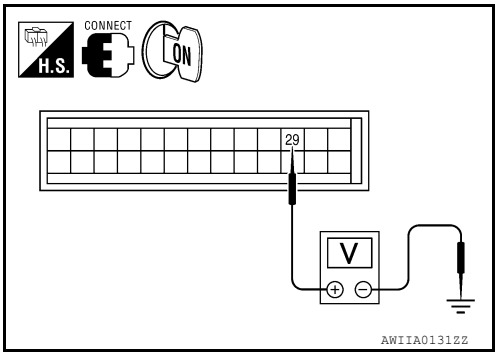
Connector	Terminal	—	Voltage (Approx.)
M50	29	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the air mix door motor (passenger) harness connector M143.
2. Check voltage between front air control harness connector M50 terminal 29 and ground.



Connector	Terminal	—	Voltage (Approx.)
M50	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-8, "Removal and Installation".
NO >> Replace the air mix door motor (passenger). Refer to VTL-20, "Removal and Installation".

INTAKE DOOR MOTOR

System Description

INFOID:0000000011560777

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

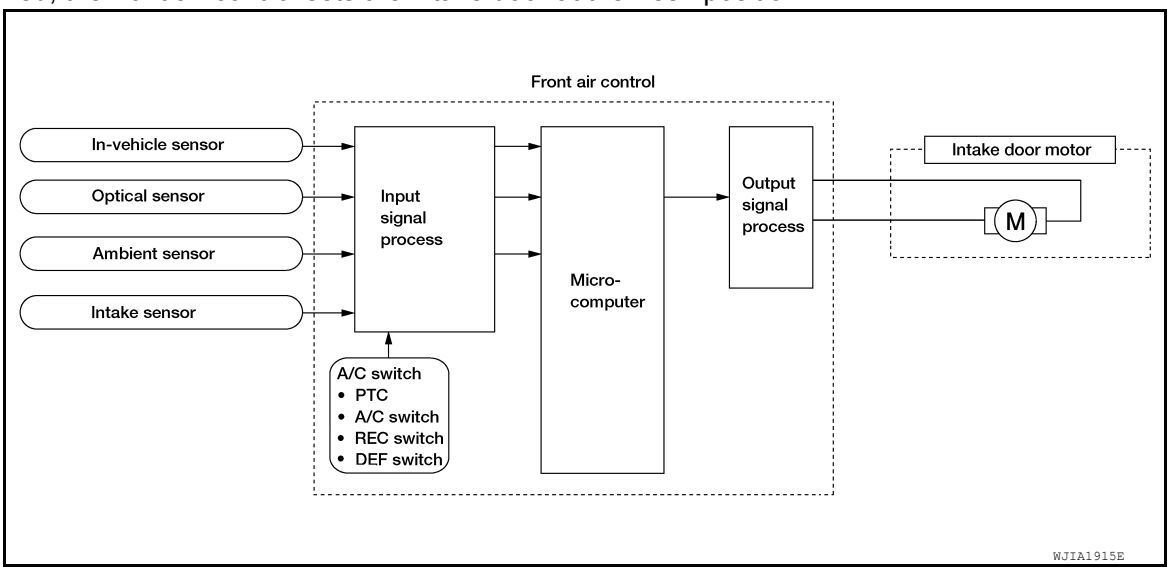
Component Parts

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

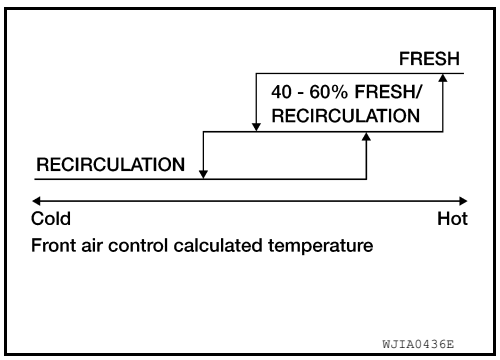
System Operation

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.



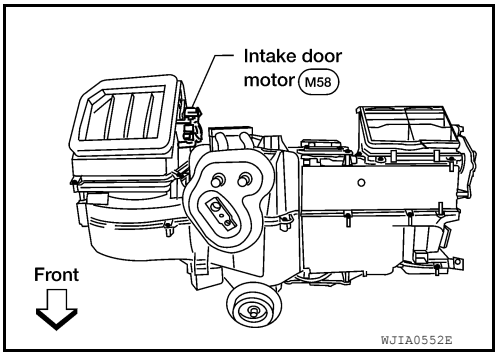
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake door motor

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:0000000011560778

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-36, "Intake Door Motor Diagnosis Procedure".

Intake Door Motor Diagnosis Procedure

INFOID:0000000011560779

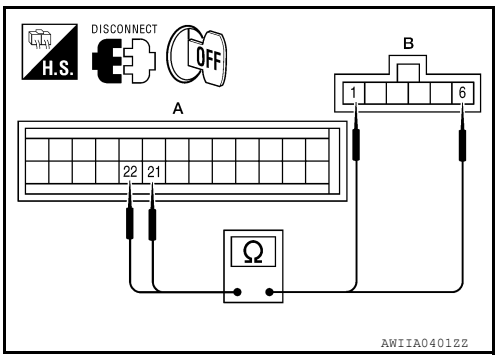
Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

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

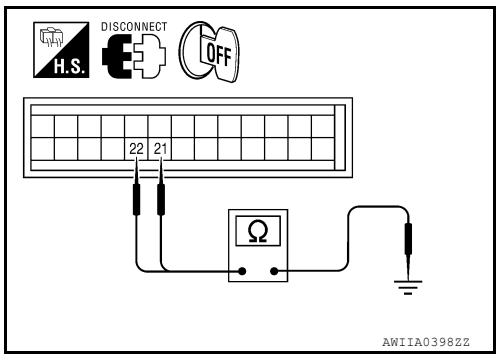
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	21	M58	6	Yes
	22		1	

4. Check continuity between front air control harness connector M49 terminals 21, 22 and ground.

Connector	Terminal	—	Continuity
M49	21	Ground	No
	22		



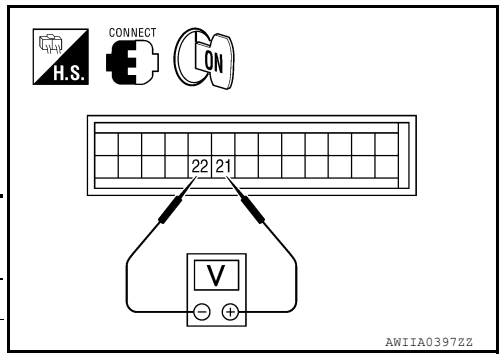
Is the inspection result normal?

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 M49 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	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-18, "Removal and Installation".
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:0000000011560780

SYSTEM DESCRIPTION

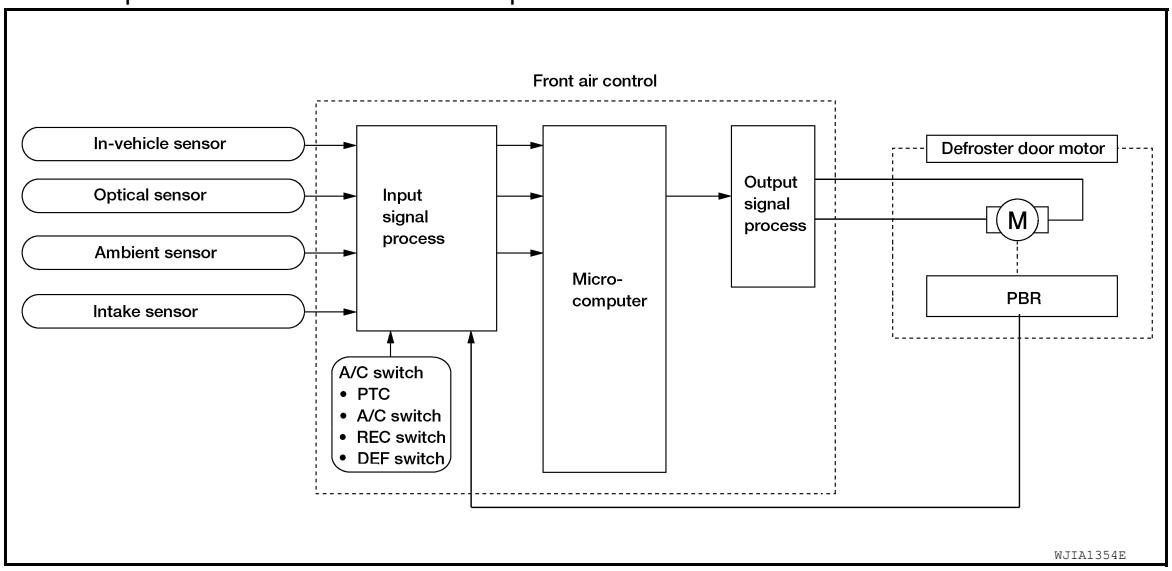
Component Parts

Defroster door control system components are:
- Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation

The front air control determines defroster door position based on the position of the defroster switch. When the defroster switch is depressed, the defroster door motor rotates directing air to the defroster ducts. When any mode other than defroster is selected, the defroster motor rotates in the opposite direction closing off air flow to the defroster ducts.

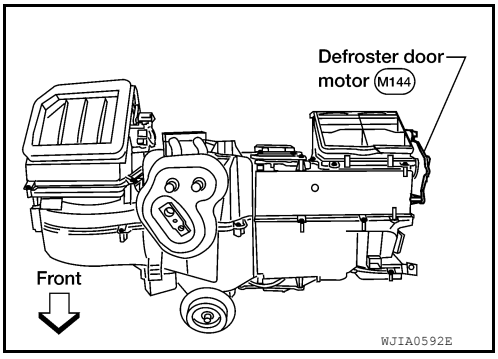
In the AUTO mode, the front air control determines defroster door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature.



COMPONENT DESCRIPTION

Defroster door motor

The defroster door motor is attached to the front heater & cooling unit assembly. The front air control sends a voltage to rotate to the defroster door directing the air flow either to the defroster ducts, or to the foot ducts, depending on which way the voltage and ground are applied to the motor leads. Motor rotation is conveyed to a lever which activates the defroster door.



Defroster Door Motor Component Function Check

INFOID:0000000011560781

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

1. Select vent ( ) mode.
2. Press the defrost switch ( ). Defroster indicator should illuminate.
3. Listen for defroster door position change (blower sound should change slightly).

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to HAC-39, "Defroster Door Motor Diagnosis Procedure".

Defroster Door Motor Diagnosis Procedure

INFOID:0000000011560782

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

SYMPTOM:
- Defroster door does not change.
- Defroster door motor does not operate normally.

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

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

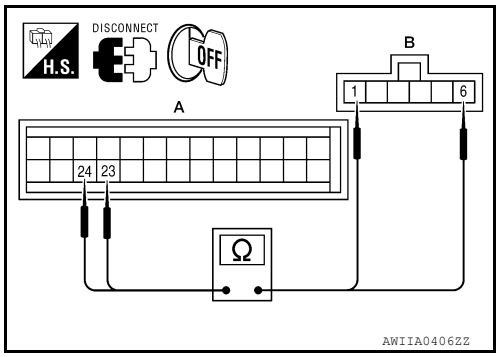
Monitor Item	Condition	Results
DEF FDBCK	Cycle mode switch through all modes, D/F ( ), VENT ( ), B/L ( ), FOOT( ), and press DEF ( )	Voltage varies between 0.2 and 4.8 volts.

Is the inspection result normal?

YES >> • Defroster door motor is OK.
• Inspect defroster door for mechanical failure. Refer to VTL-17, "Removal and Installation".
NO >> GO TO 2.

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

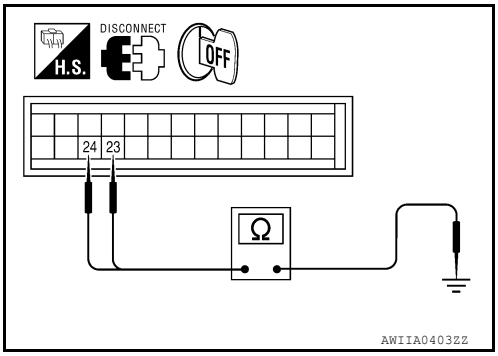
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the defroster door motor harness connector M144 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 23, 24 and the defroster door motor harness connector M144 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	23	M144	1	Yes
	24		6	

4. Check continuity between front air control harness connector M49 terminals 23, 24 and ground.

Connector	Terminal	—	Continuity
M49	23	Ground	No
	24		

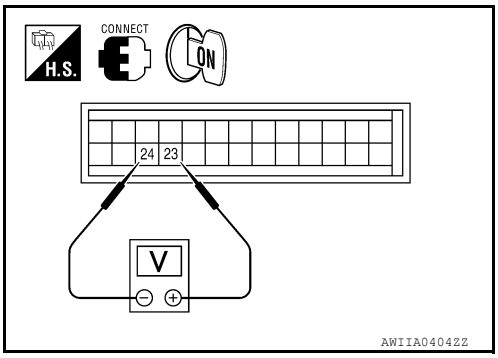


Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the VENT ( ) mode.
4. Check voltage between front air control harness connector M49 terminal 23 and terminal 24 while pressing the defroster switch ( ).



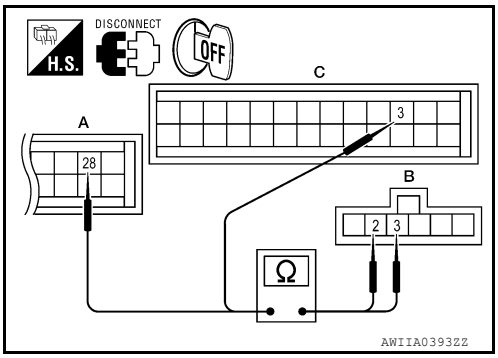
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	23	24	Following defroster switch ( ) on	Battery voltage
	24	23	Following defroster switch ( ) off	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors M49 (C) and M50 (A).
3. Check continuity between front air control harness connector M49 (C) terminal 3, and M50 (A) terminal 28 and the defroster door motor harness connector M144 (B) terminals 2, 3.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M49 (C)	3	M144	2	Yes
M50 (A)	28		3	

4. Check continuity between front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

Connector	Terminal	—	Continuity
M49 (C)	3	Ground	No
M50 (A)	28		

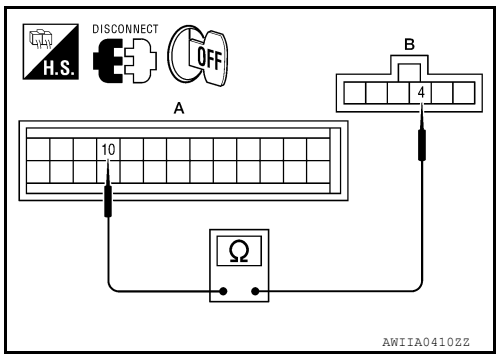
Is the inspection result normal?

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

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

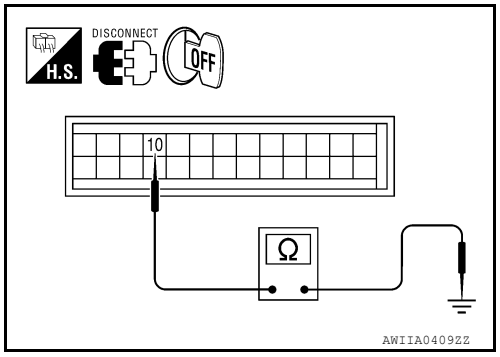
1. Check continuity between front air control harness connector M49 (A) terminal 10 and defroster door motor harness connector M144 (B) terminal 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M49	10	M144	4	Yes



2. Check continuity between front air control harness connector M49 terminal 10 and ground.

Connector	Terminal	—	Continuity
M49	10	Ground	No



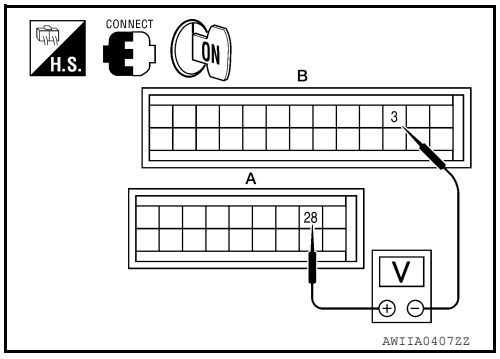
Is the inspection result normal?

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

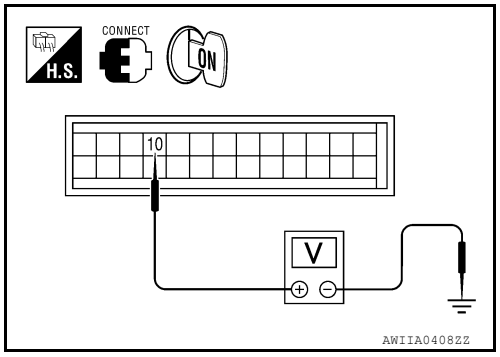
1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M50	28	M49	3	5 Volts



4. Check voltage between front air control harness connector M49 terminal 10 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	10	Ground	0 Volts

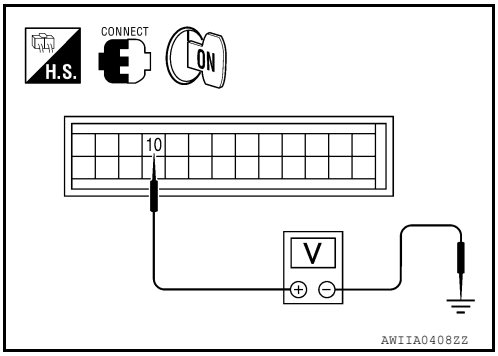


Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the defroster door motor harness connector M144.
2. Check voltage between front air control harness connector M49 terminal 10 and ground.



Connector	Terminal	—	Voltage (Approx.)
M49	10	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect defroster door for binding or mechanical failure. If defroster door moves freely, replace front air control. Refer to VTL-8, "Removal and Installation".

NO >> Replace the defroster door motor. Refer to VTL-17, "Removal and Installation".

BLOWER MOTOR CONTROL SYSTEM

System Description

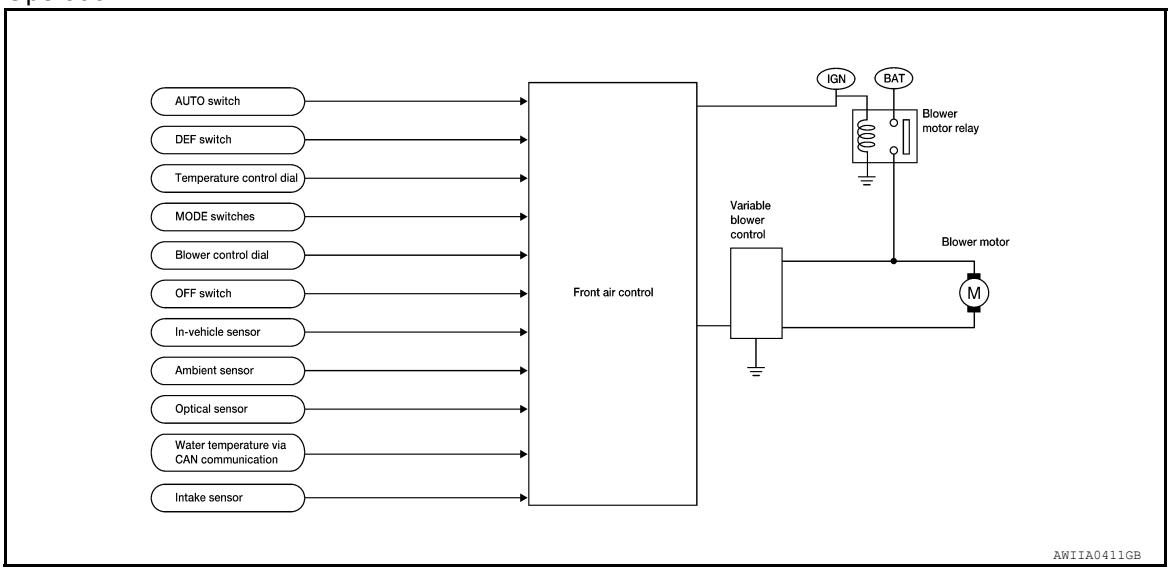
INFOID:0000000011560783

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 potentio 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.

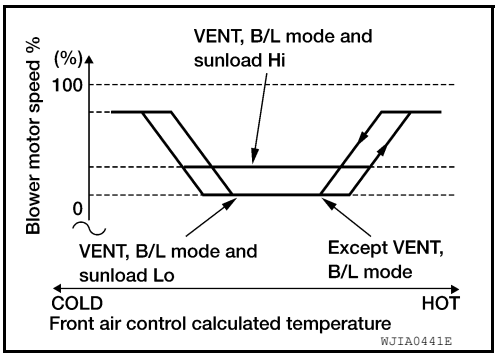
Start up from usual operating or hot soak condition (Automatic mode).

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

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.

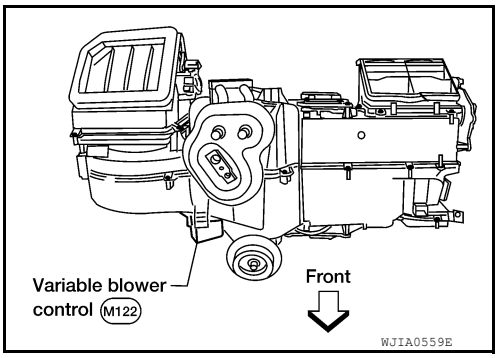
Blower Speed Control Specification



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control 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:0000000011560784

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-44, "Front Blower Motor Diagnosis Procedure".

Front Blower Motor Diagnosis Procedure

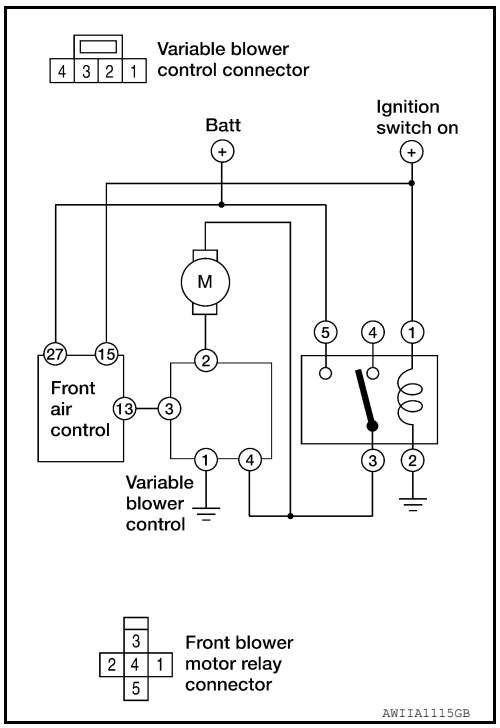
INFOID:0000000011560785

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

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 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to HAC-69, "Front Air Control Terminals Reference Values".

Fuses are good.

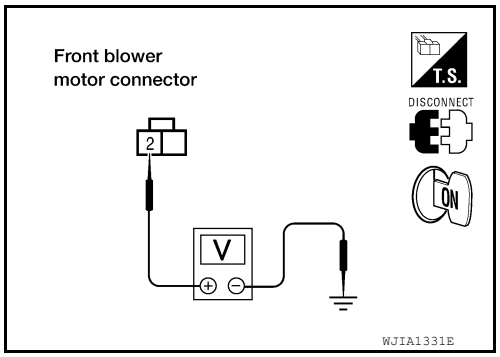
Is the inspection result normal?

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



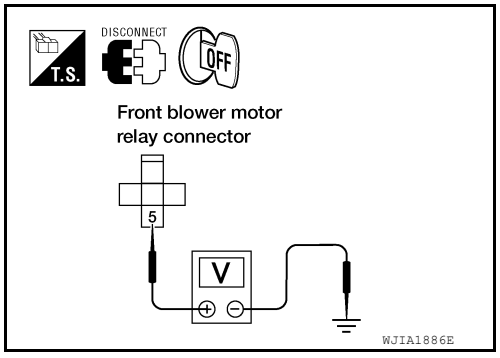
Is the inspection result normal?

YES >> GO TO 11.
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 M107 terminal 5 and ground.

5 - 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-48, "Front Blower Motor Component Inspection".

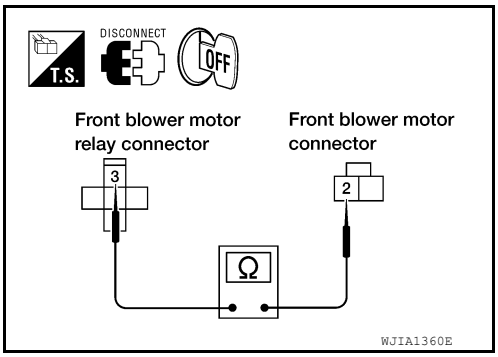
Is the inspection result normal?

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 M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.



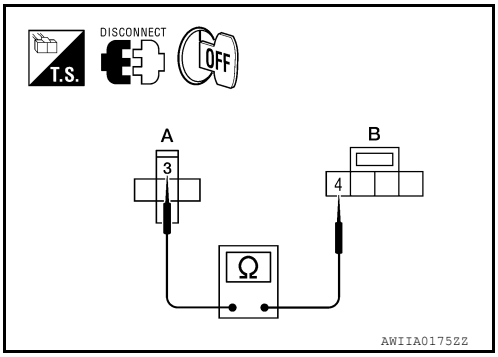
Is the inspection result normal?

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 M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 4.

3 - 4 : Continuity should exist.



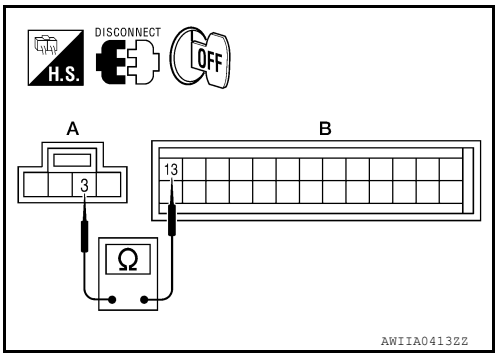
Is the inspection result normal?

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

7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.



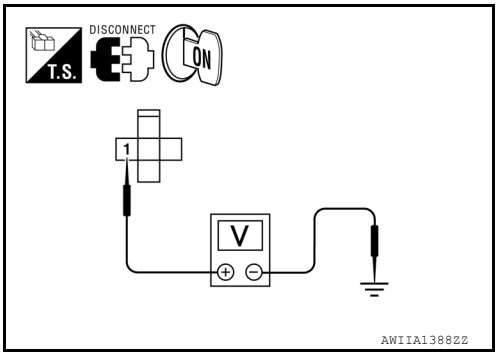
Is the inspection result normal?

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 M107 terminal 1 and ground.

1 - Ground : Battery voltage



Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair front blower motor ground circuit or connector.

9.REPLACE FUSES

1. Replace fuses.
2. Activate the front blower motor.

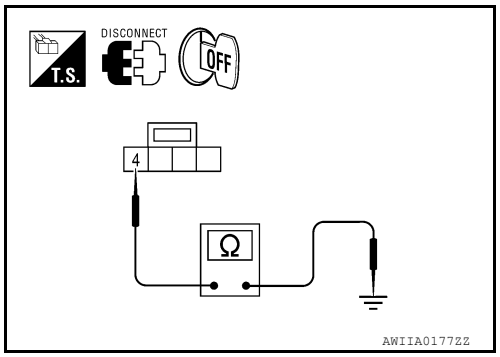
Does the fuse blow?

YES >> 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 M122 terminal 4 and ground.

4 - Ground : Continuity should not exist.



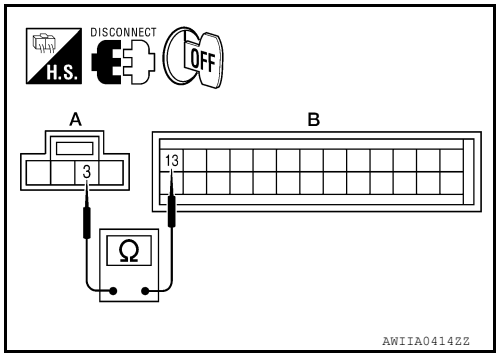
Is the inspection result normal?

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

11.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.



Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair harness or connector.

12.CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to HAC-48, "Front Blower Motor Component Inspection".

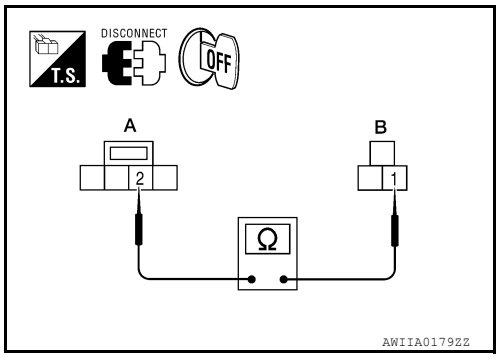
Is the inspection result normal?

YES >> GO TO 13.
NO >> Replace front blower motor. Refer to VTL-12, "Removal and Installation".

13.CHECK BLOWER MOTOR GROUND CIRCUIT

Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M122 (A) terminal 2.

1 - 2 : Continuity should exist.



Is the inspection result normal?

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

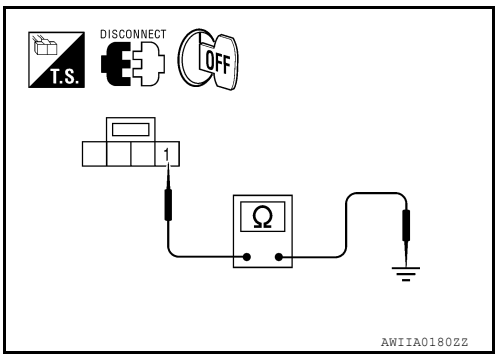
14.CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to VTL-22, "Removal and Installation".
NO >> Repair harness or connector.

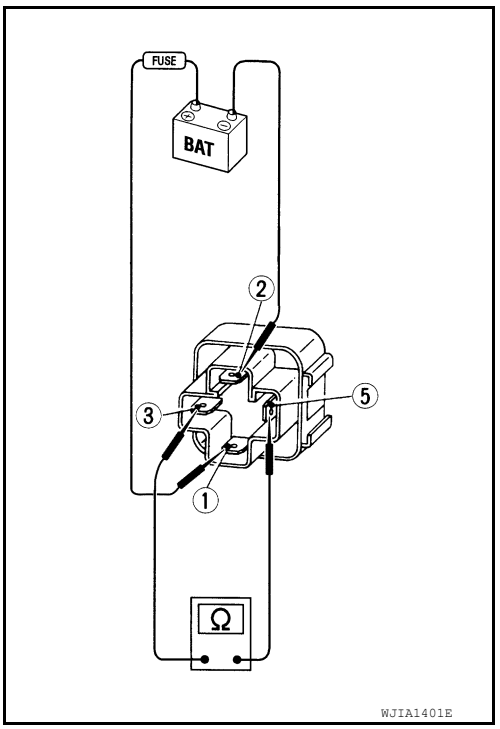


Front Blower Motor Component Inspection

INFOID:0000000011560786

COMPONENT INSPECTION

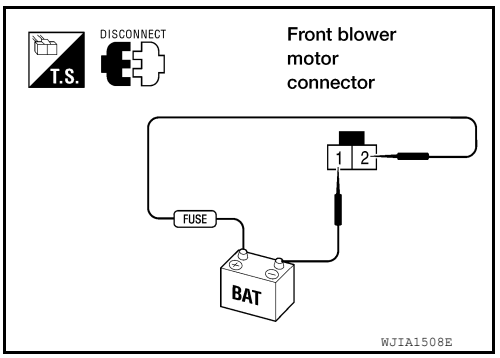
Check continuity between terminals 3, and 5 by supplying 12 volts and ground to coil side terminals 1 and 2 of relay.



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:0000000011560787

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:0000000011560788

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-49, "Magnet Clutch Diagnosis Procedure".

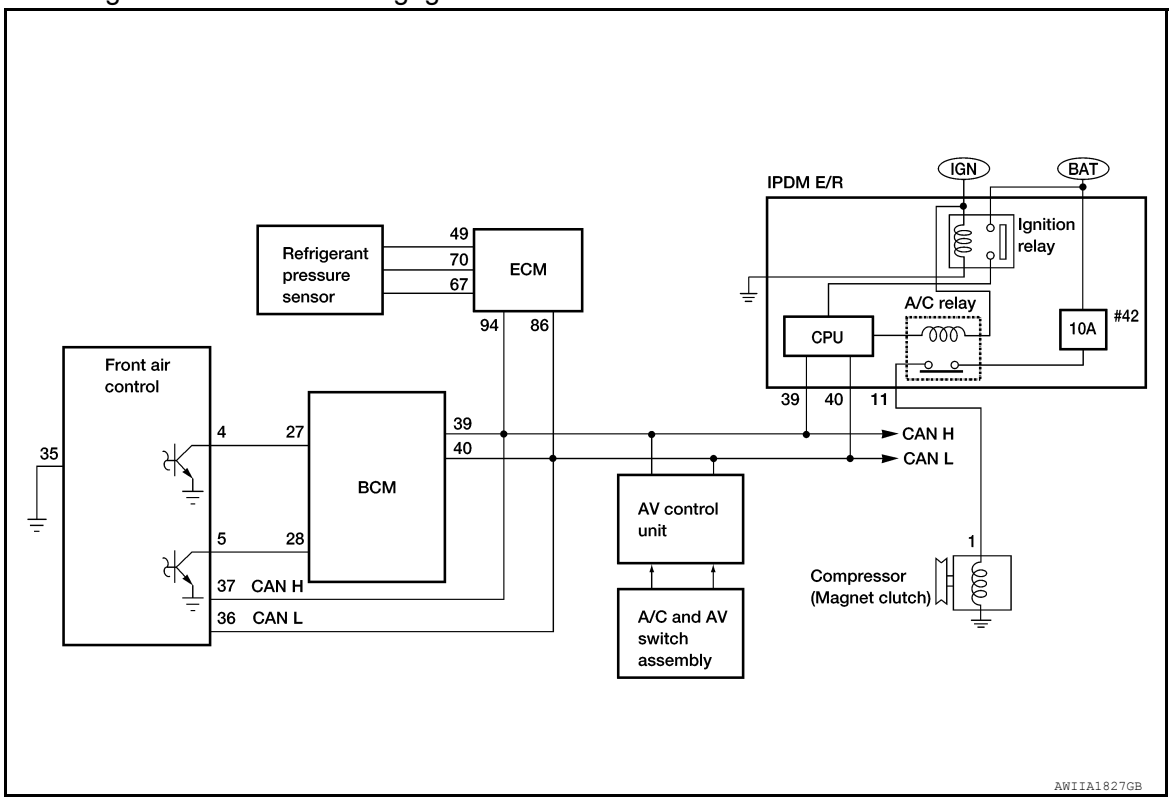
Magnet Clutch Diagnosis Procedure

INFOID:0000000011560789

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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-21, "Front Air Control Self-Diagnosis".

Is the inspection result normal?

YES >> GO TO 2.

NO >> • Malfunctioning intake sensor. Refer to HAC-64, "Intake Sensor Diagnosis Procedure".
• Malfunctioning ambient sensor. Refer to HAC-56, "Ambient Sensor Diagnosis Procedure".

2. PERFORM AUTO ACTIVE TEST

Refer to PCS-11, "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.

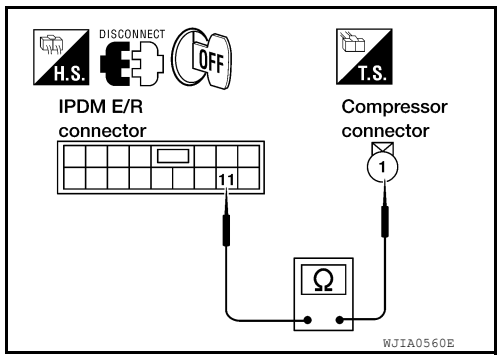
3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
3. 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.

4. 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.

NO >> Repair harness or connector.

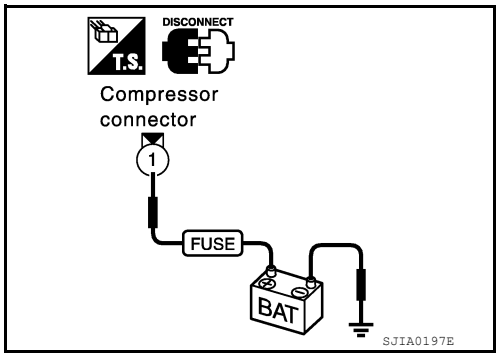
4. CHECK MAGNET CLUTCH CIRCUIT

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-33, "Removal and Installation".



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to BCS-24, "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.

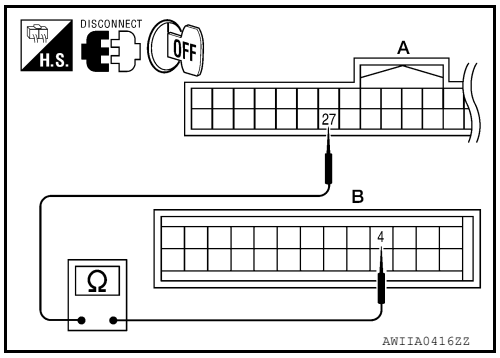
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M49 (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?

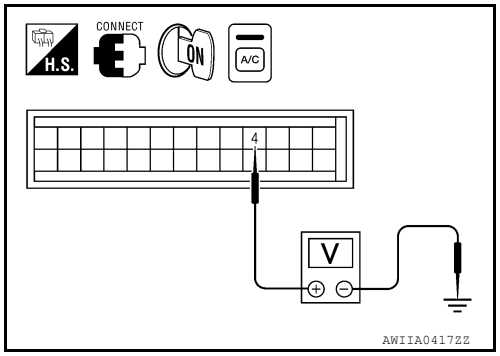
YES >> GO TO 7.

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 M49 terminal 4 and ground.

Terminals			Condition	Voltage
(+)		(-)		
Front air control connector	Terminal No.			
M49	4	Ground	A/C switch: ON	Approx. 0V
			A/C switch: OFF	Approx. 5V



Is the inspection result normal?

YES >> GO TO 8.

NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control Refer to VTL-8, "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 F54 terminal 70 and ground.

Terminals			Condition	Voltage
(+)		(-)		
ECM connector	Terminal No.			
F54	70	Ground	A/C switch: ON	Approx. 1.0 - 4.0V

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-488, "Diagnosis Procedure".

9.CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to BCS-24, "AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)".

FRONT BLOWER CONTROL DIAL ON : FAN ON SIG ON

FRONT BLOWER CONTROL DIAL OFF : FAN ON SIG OFF

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 10.

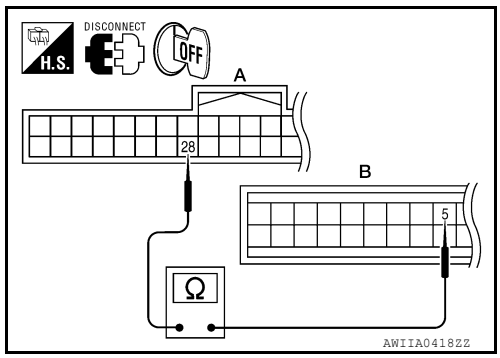
10.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M49 (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.



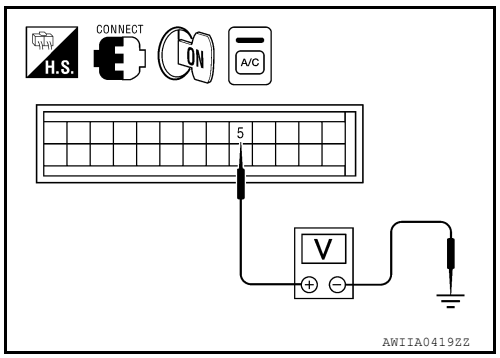
Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

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

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M49 terminal 5 and ground.



Terminals			Condition	Voltage
(+)		(-)		
Front air control connector	Terminal No.			
M49	5	Ground	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-8, "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).

WATER VALVE CIRCUIT

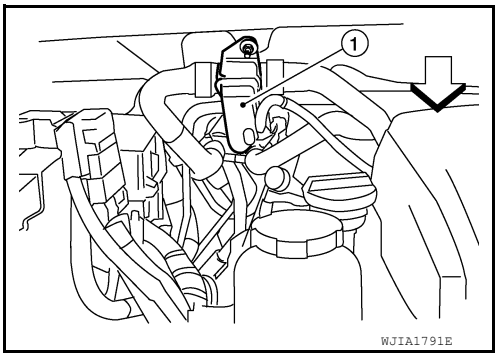
Description

INFOID:0000000011560790

COMPONENT DESCRIPTION

Water Valve

The water valve (1) cuts the flow of engine coolant to the heater core to allow for maximum cooling during A/C operation. It is controlled by the front air control.



Water Valve Diagnosis Procedure

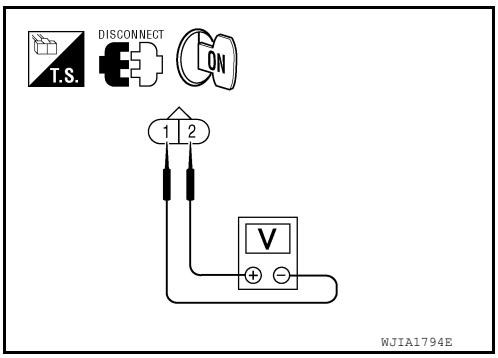
INFOID:0000000011560791

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F68.
2. Turn ignition switch ON.
3. Rotate temperature control dial (driver) to 32°C (90°F).
4. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial (driver) to 18°C (60°F).



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	2	1	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

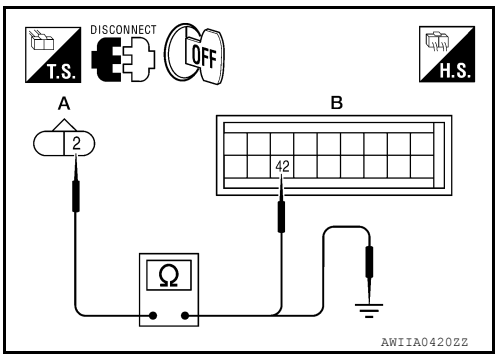
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M50.
3. Check continuity between water valve harness connector F68 (A) terminal 2 and front air control harness connector M50 (B) terminal 42.

2 - 42 : Continuity should exist.

4. Check continuity between water valve harness connector F68 terminal 2 and ground.

2 - Ground : Continuity should not exist.

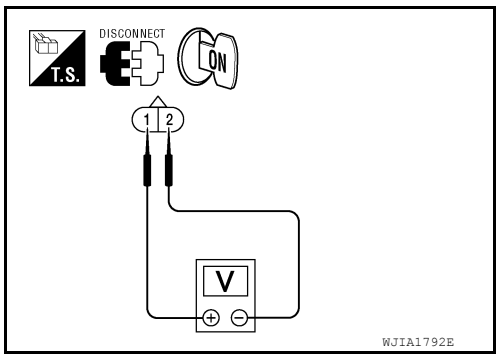


Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Repair harness or connector.

3.CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial (driver) to 18°C (60°F).
2. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial (driver) to 32°C (90°F).



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	1	2	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

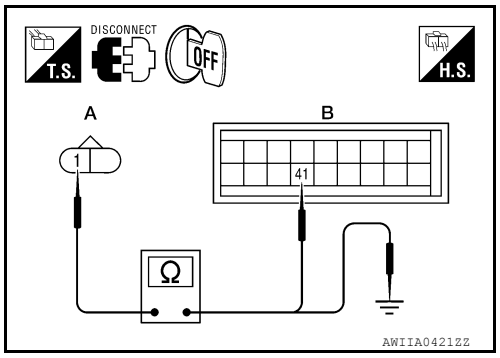
4.CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M50.
3. Check continuity between water valve harness connector F68 (A) terminal 1 and front air control harness connector M50 (B) terminal 41.

1 - 41 : Continuity should exist.

4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

1 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Repair harness or connector.

AMBIENT SENSOR

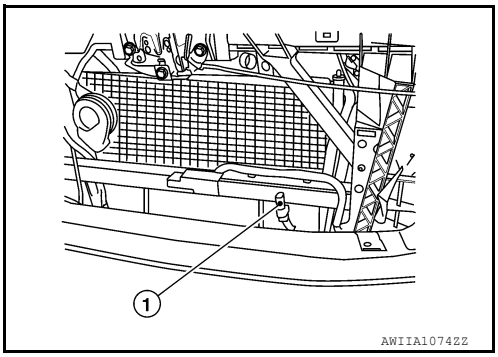
Component Description

INFOID:0000000011560792

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.

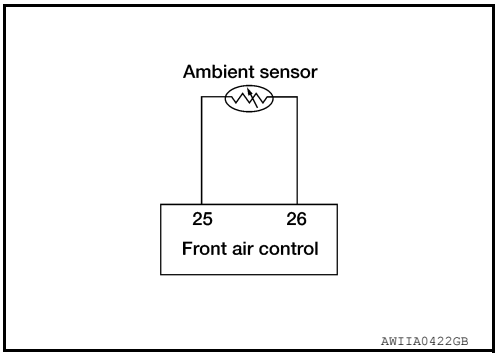
Ambient Sensor Diagnosis Procedure

INFOID:0000000011560793

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

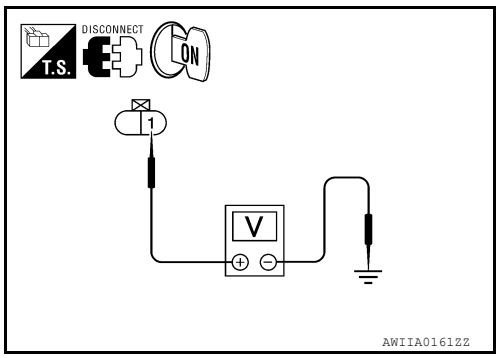
SYMPTOM: Ambient sensor circuit is open or shorted. Using the CONSULT, DTC B257B or B257C is displayed. Without CONSULT, code 40 or 41 is indicated on front air control as a result of conducting the front air control self-diagnosis.



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E1 terminal 1 and ground.

1 - Ground : Approx. 5V



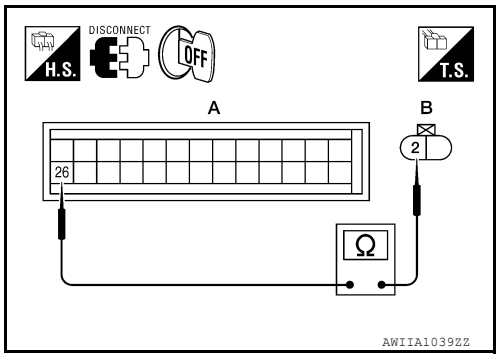
Is the inspection result normal?

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 E1 (B) terminal 2 and front air control harness connector M49 (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-57, "Ambient Sensor Component Inspection".

Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. GO TO HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> 1. Replace ambient sensor. Refer to HA-45, "Removal and Installation".
2. GO TO HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

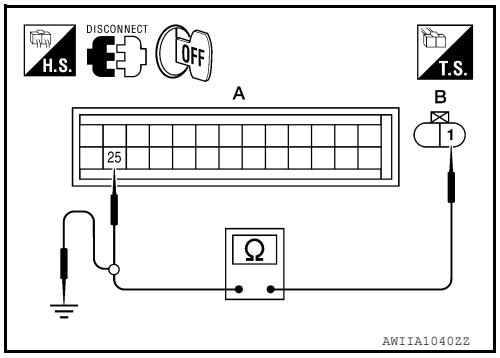
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E1 (B) terminal 1 and front air control harness connector M49 (A) terminal 25.

1 - 25 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E1 (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-8, "Removal and Installation".
2. GO TO HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> Repair harness or connector.

Ambient Sensor Component Inspection

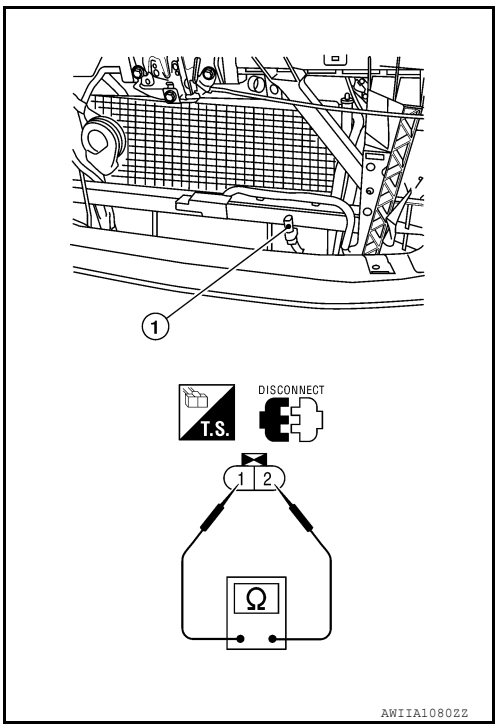
INFOID:0000000011560794

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor (1) connector E1, measure resistance between terminals 1 and 2 at sensor component side, using the table below.

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-45, "Removal and Installation".

IN-VEHICLE SENSOR

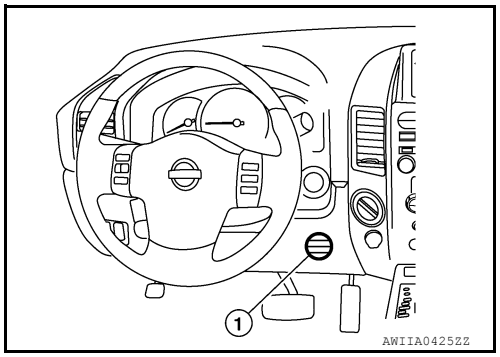
Component Description

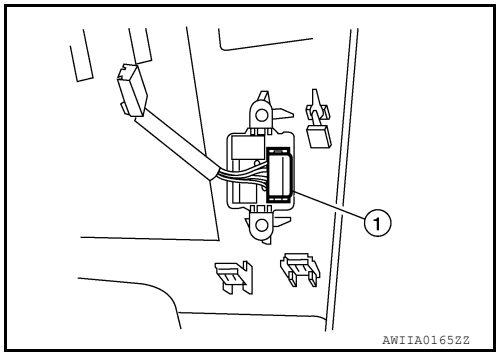
INFOID:0000000011560795

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.





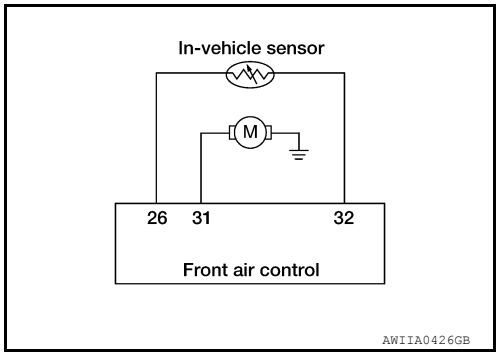
In-Vehicle Sensor Diagnosis Procedure

INFOID:0000000011560796

Regarding Wiring Diagram information, refer to HAC-71, "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

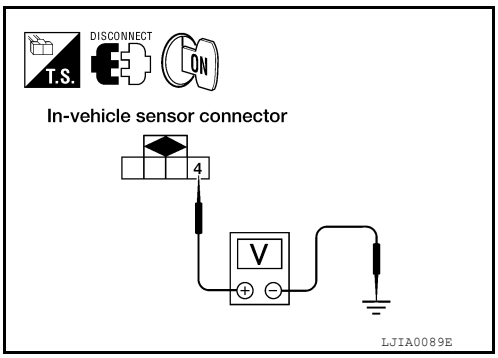
Is self-diagnosis DTC B2578 or B2579 (with CONSULT) or code 30, 31 (without CONSULT) present?

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 M32 terminal 4 and ground.



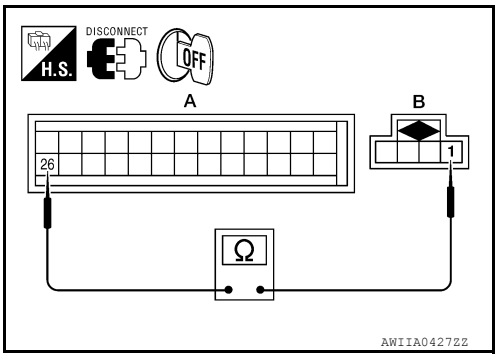
4 - Ground : Approx. 5V.

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 M49.
3. Check continuity between in-vehicle sensor harness connector M32 (B) terminal 1 and front air control harness connector M49 (A) terminal 26.



1 - 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-61, "In-Vehicle Sensor Component Inspection".

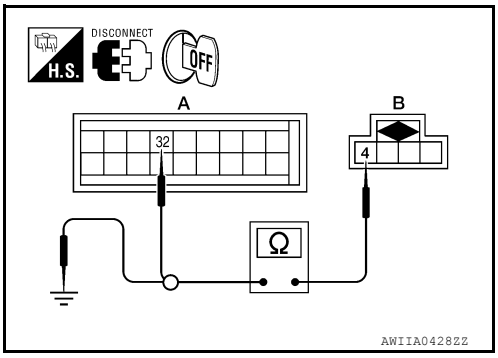
Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. Go to HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

NO >> 1. Replace in-vehicle sensor. Refer to VTL-9, "Removal and Installation".
2. Go to HAC-21, "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 M32 (B) terminal 4 and front air control harness connector M50 (A) terminal 32.



4 - 32 : Continuity should exist.

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

4 - Ground Continuity should not exist.

Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. Go to HAC-21, "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

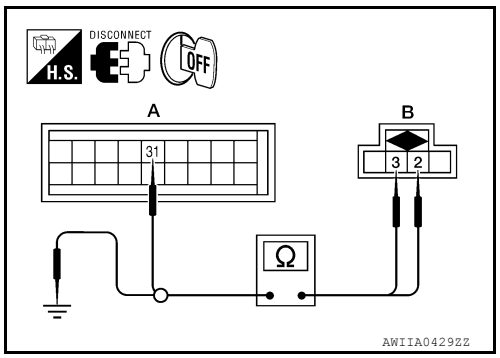
(SELF-DIAGNOSIS CODES 30, 31, 44, 46 OR DTC B2578, B2579)

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 M32 (B) terminal 3 and front air control harness connector M50 (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-8, "Removal and Installation".
2. Go to HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

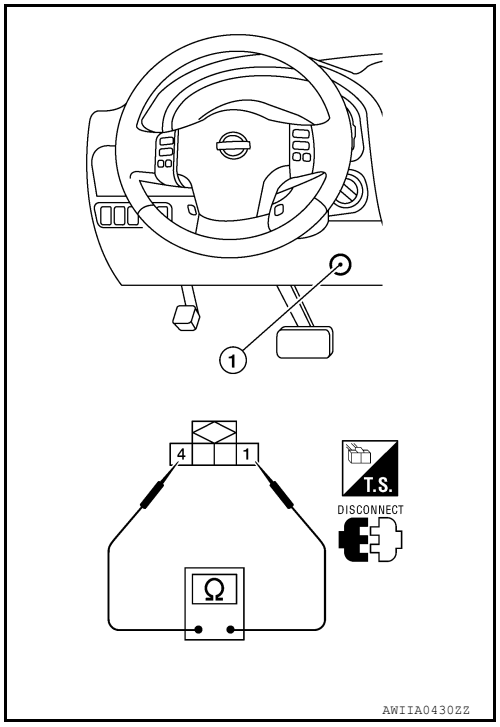
In-Vehicle Sensor Component Inspection

INFOID:0000000011560797

COMPONENT INSPECTION

In-vehicle Sensor

After disconnecting in-vehicle sensor connector M32, measure resistance between terminals 1 and 4 at sensor component side, using the table below.



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-9, "Removal and Installation".

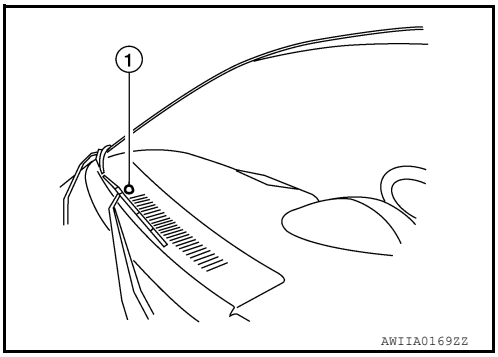
OPTICAL SENSOR

Component Description

INFOID:0000000011560798

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.

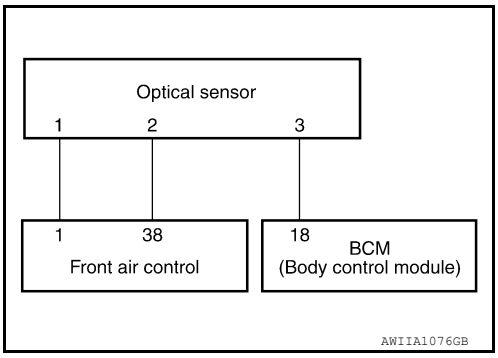
Optical Sensor Diagnosis Procedure

INFOID:0000000011560799

Regarding Wiring Diagram information, refer to HAC-71, "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.



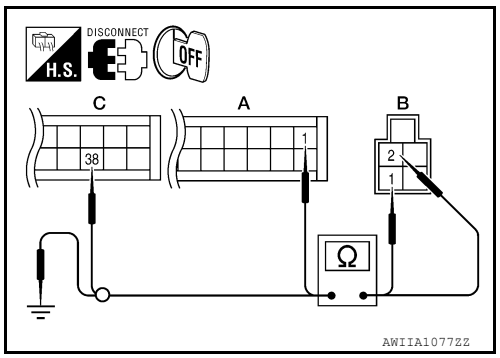
1. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector and optical sensor connector.
3. Check continuity between optical sensor harness connector M302 (B) terminals 1 and 2 and front air control harness connector M50 (C) terminal 38 and M49 (A) terminal 1.

1 - 1 : Continuity should exist.
2 - 38 : Continuity should exist.

4. Check continuity between optical sensor harness connector M302 (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.

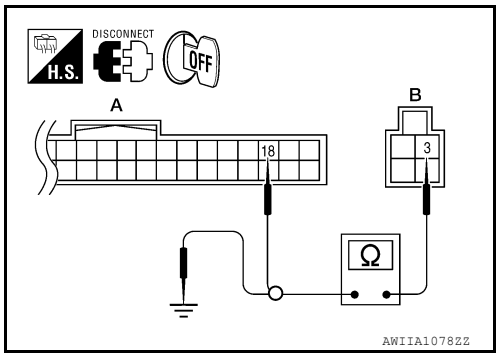
2. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND BCM

1. Disconnect BCM connector.
2. Check continuity between optical sensor harness connector M302 (B) terminal 3 and BCM harness connector M18 (A) terminal 18.

3 - 18 : Continuity should exist.

3. Check continuity between optical sensor harness connector M302 (B) terminal 4 and ground.

3 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace optical sensor. Refer to VTL-10, "Removal and Installation".
NO >> Repair harness or connector.

INTAKE SENSOR

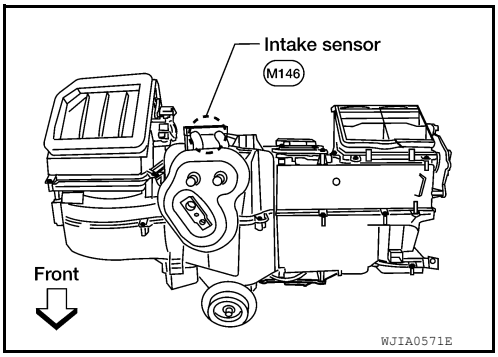
System Description

INFOID:0000000011560800

COMPONENT DESCRIPTION

Intake Sensor

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



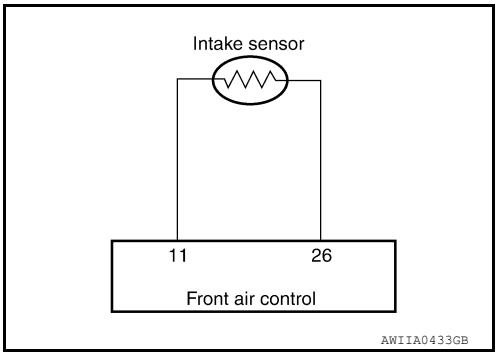
Intake Sensor Diagnosis Procedure

INFOID:0000000011560801

Regarding Wiring Diagram information, refer to HAC-71, "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.



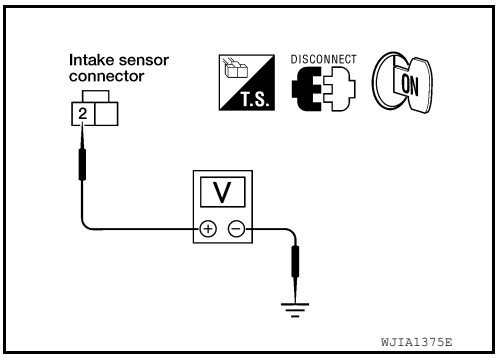
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

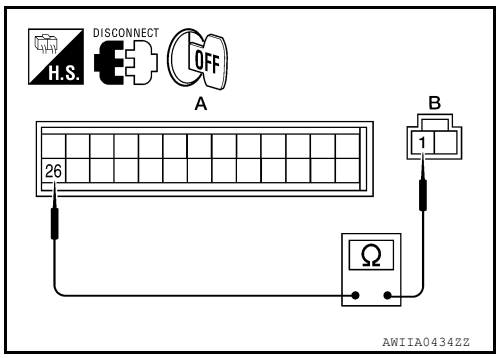
Is the inspection result normal?

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



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

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 M49 (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

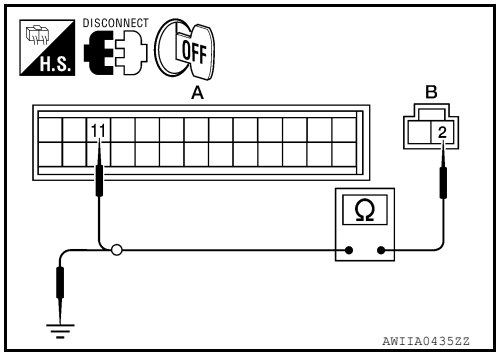
Check intake sensor. Refer to HAC-65, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. Go to HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> 1. Replace intake sensor. Refer to VTL-11, "Removal and Installation".
2. Go to HAC-21, "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 M49 (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-8, "Removal and Installation".
2. Go to HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> Repair harness or connector.

Intake Sensor Component Inspection

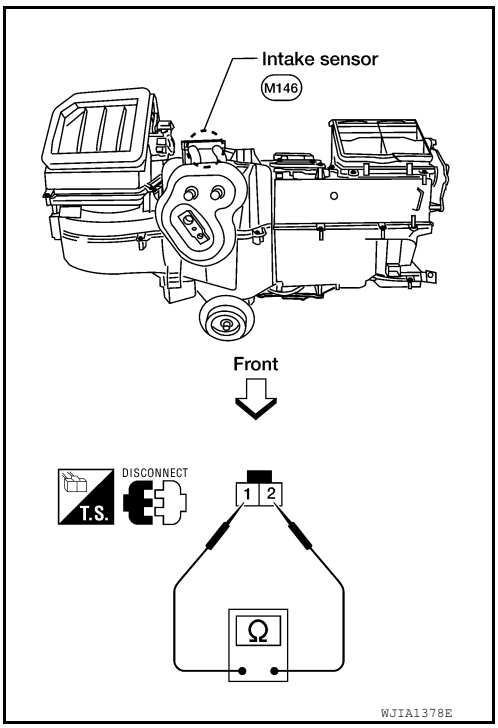
INFOID:0000000011560802

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
40 (104)	16.1
45 (113)	13.2



If NG, replace intake sensor. Refer to VTL-11, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

INFOID:0000000011560803

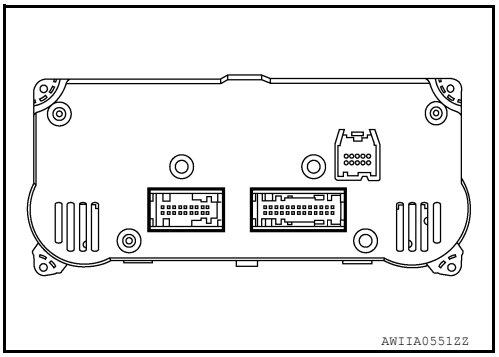
COMPONENT DESCRIPTION

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, defroster door motor, blower motor and compressor are then controlled.

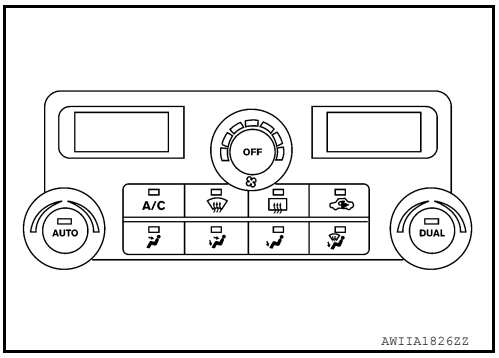
The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.

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



Potentio 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:0000000011560804

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-67, "Front Air Control Power and Ground Diagnosis Procedure".

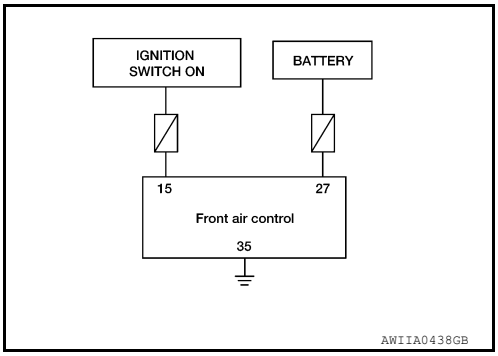
Front Air Control Power and Ground Diagnosis Procedure

INFOID:0000000011560805

Regarding Wiring Diagram information, refer to HAC-71, "Wiring Diagram - Automatic Air Conditioner".

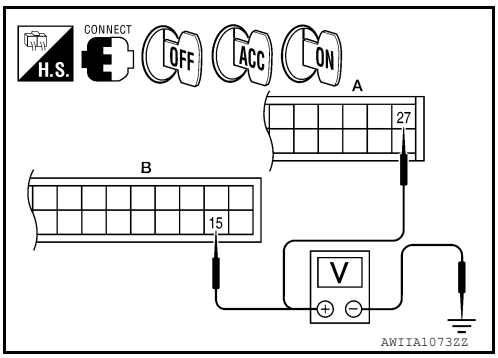
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

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 M49 (B) terminal 15 and M50 (A) terminal 27, and ground.



Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
front air control connector	Terminal No.				
M49	15	Ground	Approx. 0V	Approx. 0V	Battery voltage
M50	27		Battery voltage	Battery voltage	Battery voltage

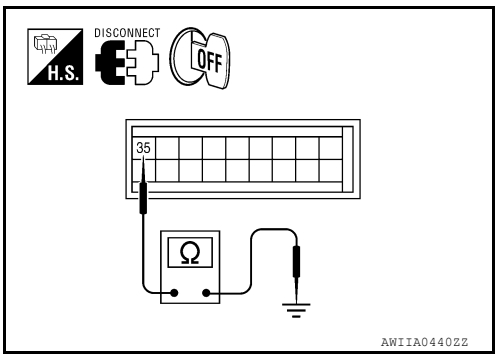
Is the inspection result normal?

YES >> GO TO 2.
NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to HAC-69, "Front Air Control Terminals Reference Values".
- 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 M50 terminal 35 and ground.

35 - Ground : Continuity should exist.



Is the inspection result normal?

OK >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NG >> Repair harness or connector.

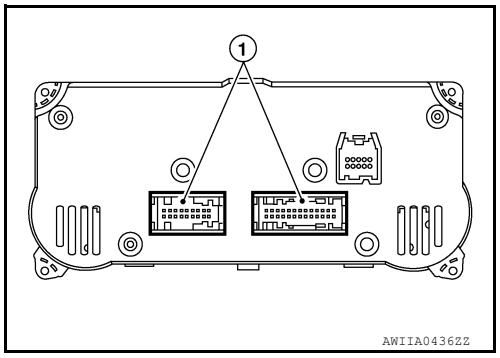
ECU DIAGNOSIS INFORMATION

AIR CONDITIONER CONTROL

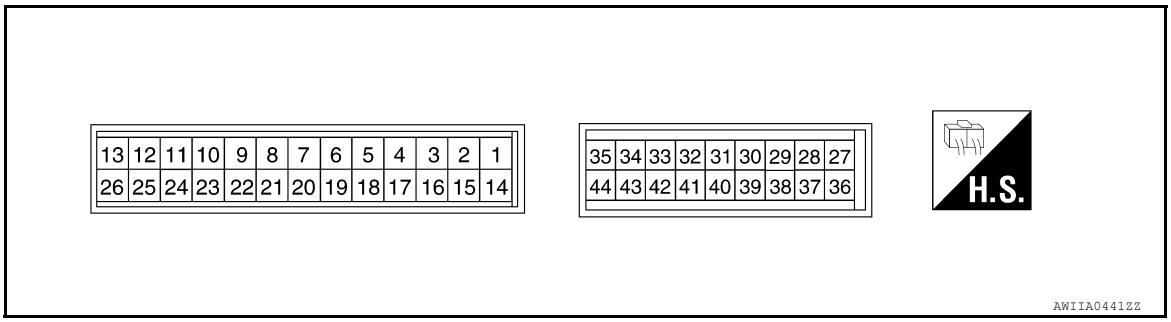
Front Air Control Terminals Reference Values

INFOID:0000000011560806

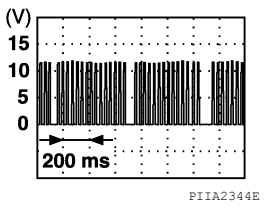
Measure voltage between each terminal and ground by following Terminals and Reference Value for front air control (1).



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/O	Optical sensor (driver)	ON	-	0 - 5V
2	L	Air mix door motor (passenger) CCW	ON	-	Battery voltage
3	P	V ref ACTR (ground)	ON	-	5V
4	W/R	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
5	L/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	GR	Mode door motor feedback	ON	-	0 - 5V
8	R/L	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	
10	LG/B	Defroster door motor feedback	ON	-	0 - 5V
11	L/B	Intake sensor	ON	-	0 - 5V
13	G/R	Variable blower control	ON	-	0 - 5V
14	G/W	Air mix door motor (passenger) CW	ON	Clockwise rotation	Battery voltage

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
15	Y/G	Power supply for IGN	ON	-	Battery voltage
16	Y/B	Rear Defogger request *1	ON		Battery voltage
17	W/G	Air mix door motor (driver) CW	ON	Clockwise rotation	Battery voltage
18	G	Air mix door motor (driver) CCW	ON	Counterclockwise rotation	Battery voltage
19	BR/W	Mode door motor CW	ON	Clockwise rotation	Battery voltage
20	P/L	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	G/B	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
22	O	Intake door motor CW	ON	Clockwise rotation	Battery voltage
23	LG	Defroster door motor CW	ON	Clockwise rotation	Battery voltage
24	P/B	Defroster door motor CCW	ON	Counterclockwise rotation	Battery voltage
25	P	Ambient sensor	ON	-	0 - 5V
26	V/R	Sensor ground	ON	-	0V
27	Y/R	Power supply for BAT	-	-	Battery voltage
28	Y	V ref ACTR (5V)	ON	-	0 - 5V
29	R/W	Air mix door motor (passenger) feed-back	ON	-	0 - 5V
31	BR/Y	In-vehicle sensor motor (+)	ON	-	Battery voltage
32	LG/R	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	W/V	Optical sensor (passenger)	ON	-	0 - 5V
41	Y/L	Water valve	ON	Water valve open	Battery voltage
				Water valve closed	0V
42	W/G	Water valve	ON	Water valve open	0V
				Water valve closed	Battery voltage

*1: If equipped

WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - Automatic Air Conditioner

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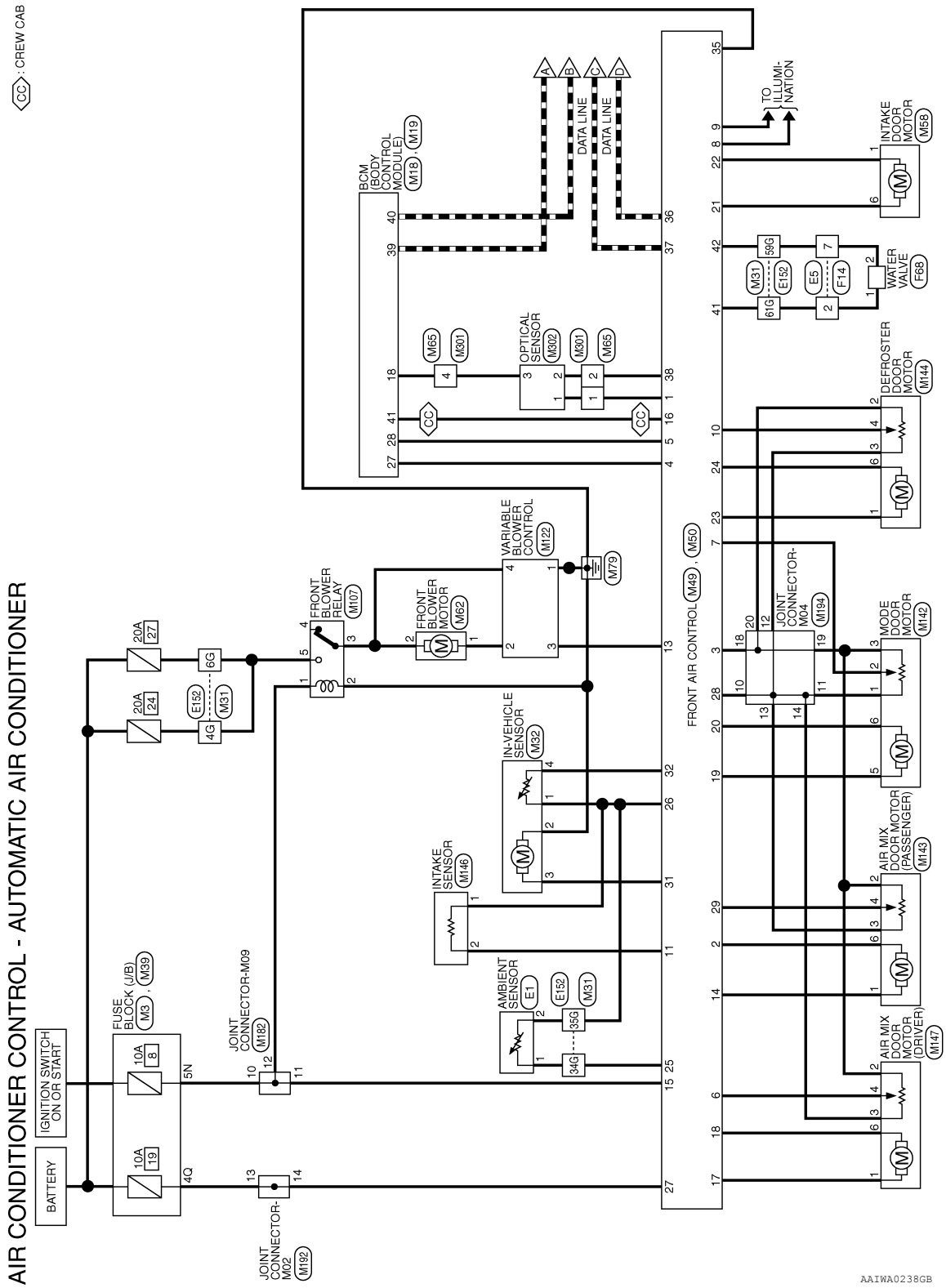
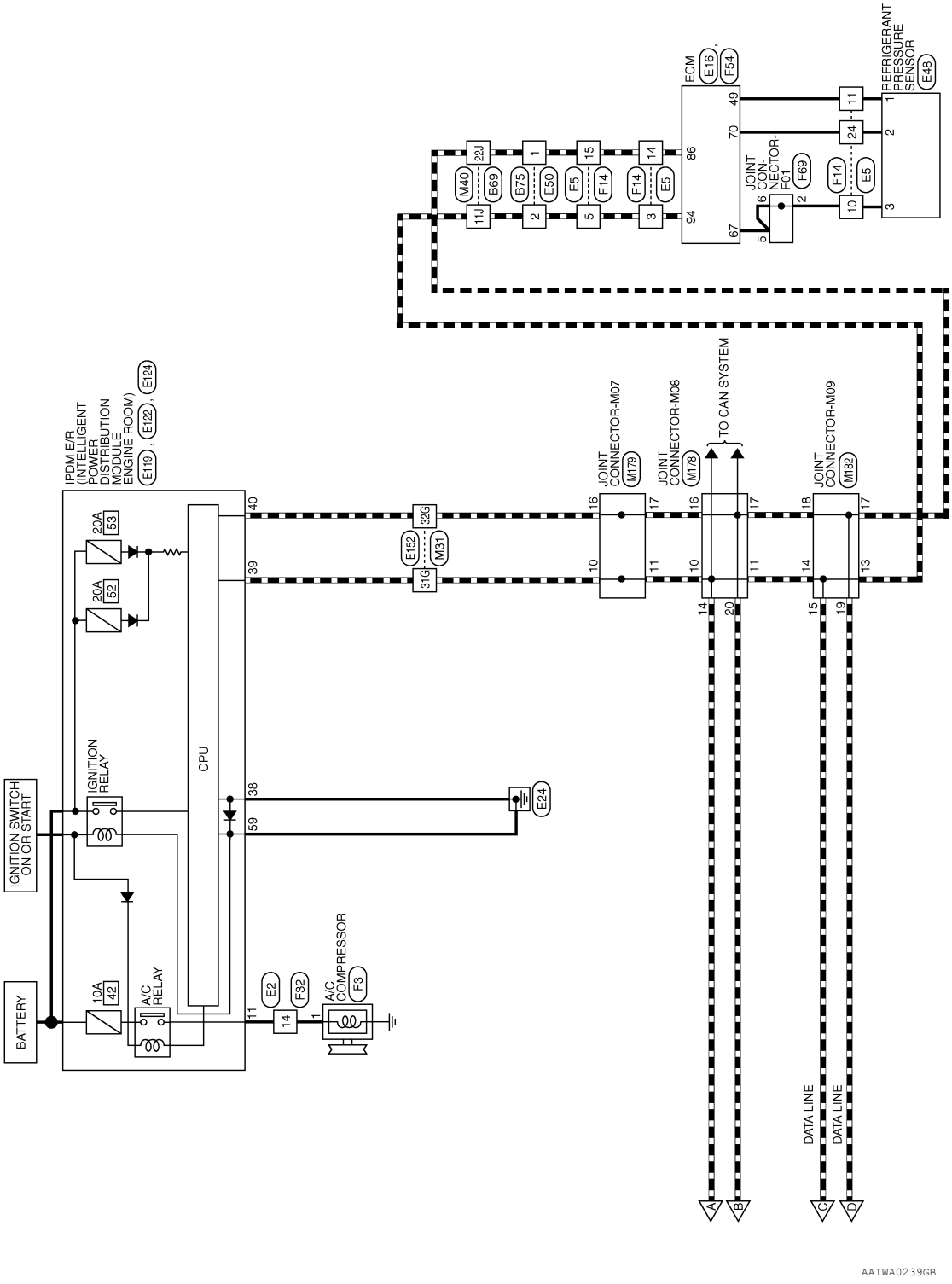
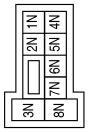



ECM
E16, F54
REFRIGERANT PRESSURE SENSOR
E48
JOINT CON-NECTOR-F01
F69
M40
22J
B69
B75
1
E50
15
E5
F14
14
11J
2
5
3
86
94
70
67
49
24
10
6
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E119, E122, E124
20A 53
20A 52
IGNITION RELAY
CPU
IGNITION SWITCH ON OR START
BATTERY
10A 42
A/C RELAY
E2
F32
A/C COMPRESSOR
F3
E24
E152
32G
31G
M31
JOINT CONNECTOR-M07
M179
JOINT CONNECTOR-M08
M178
TO CAN SYSTEM
JOINT CONNECTOR-M09
M182
DATA LINE
DATA LINE
AAIWA0239GB

AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC AIR CONDITIONER

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

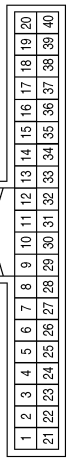
H.S.



Terminal No.	Color of Wire	Signal Name
5N	Y/G	–

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

H.S.



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

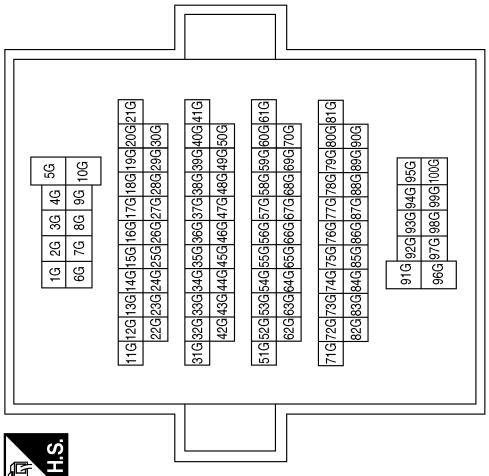
Connector No.	M19
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE

H.S.

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

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

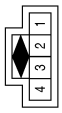
H.S.



Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
34G	P	–
35G	V/R	–
59G	W/G	–
61G	Y/L	–

Connector No.	M32
Connector Name	IN-VEHICLE SENSOR
Connector Color	WHITE

H.S.



Terminal No.	Color of Wire	Signal Name
1	V/R	–
2	O/B	–
3	BR/Y	–
4	LG/R	–

AAIIA0617GB

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

H.S.

3Q 2Q 1Q
8Q 7Q 6Q 5Q 4Q

Terminal No.	Color of Wire	Signal Name
4Q	Y/R	–

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

				5J
1J	2J	3J	4J	
6J	7J	8J	9J	10J

11J	12J	13J	14J	15J	16J	17J	18J	19J	20J	21J
	22J	23J	24J	25J	26J	27J	28J	29J	30J	
31J	32J	33J	34J	35J	36J	37J	38J	39J	40J	41J
	42J	43J	44J	45J	46J	47J	48J	49J	50J	
51J	52J	53J	54J	55J	56J	57J	58J	59J	60J	61J
	62J	63J	64J	65J	66J	67J	68J	69J	70J	
71J	72J	73J	74J	75J	76J	77J	78J	79J	80J	81J
	82J	83J	84J	85J	86J	87J	88J	89J	90J	
91J	92J	93J	94J	95J						
96J	97J	98J	99J	100J						

Terminal No.	Color of Wire	Signal Name
11J	L	–
22J	P	–

Terminal No.	Color of Wire	Signal Name
17	W/G	DRVR BLND DR A
18	G	DRVR BLND DR B
19	BR/W	PNL/FLR DR A
20	P/L	PNL/FLR DR B
21	G/B	RECIRC DR1 A
22	O	RECIRC DR1 B
23	LG	DEFROST DR A
24	P/B	DEFROST DR B
25	P	AMBIENT TEMP SEN
26	V/R	SENSOR RETURN

Terminal No.	Color of Wire	Signal Name
7	GR	PNL/FLR DR FB
8	R/L	ILLUM +
9	BR	ILLUM -
10	LG/B	DEFROST FEEDBACK
11	L/B	EVAP TEMP SENSOR
12	–	–
13	G/R	FRONT BLWR SPEED
14	G/W	PASS BLND DR A
15	Y/G	IGN
16	Y/B	REAR DEF REQ

Connector No.	M49
Connector Name	FRONT AIR CONTROL (WITH AUTO A/C)
Connector Color	BLACK

H.S.

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	G/O	SUN LD SEN LFT
2	L	PASS BLND DR B
3	P	V REF RET
4	W/R	AC REQ
5	L/R	FAN ON
6	SB	DRVR BLND DR FF

ABIIA1425GB

Connector No.	M50
Connector Name	FRONT AIR CONTROL (WITH AUTO A/C)
Connector Color	WHITE

H.S.

35	34	33	32	31	30	29	28	27
44	43	42	41	40	39	38	37	36

Terminal No.	Color of Wire	Signal Name
27	Y/R	V BAT
28	Y	5V REF VOLTAGE
29	R/W	PASS BLND DR FB
30	–	–
31	BR/Y	IN-CAR TMP MTR+

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

H.S.

1	2	3	4	5	6

Terminal No.	Color of Wire	Signal Name
1	O	–
6	G/B	–

Terminal No.	Color of Wire	Signal Name
32	LG/R	IN-CAR TEMP SEN
33	–	–
34	–	–
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	W/V	SUN LD SEN RGHT
39	–	–
40	–	–
41	Y/L	WATER VALVE A
42	W/G	WATER VALVE B
43	–	–
44	–	–

Connector No.	M65
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

4	3	2	1

Terminal No.	Color of Wire	Signal Name
1	G/O	–
2	W/V	–
4	P	–

Connector No.	M107
Connector Name	FRONT BLOWER RELAY
Connector Color	BLACK

H.S.

3		
2	4	1
	5	

Terminal No.	Color of Wire	Signal Name
1	Y/G	–
2	B	– (2 CONTROL DIAL SYSTEM OR AUTO A/C)
3	W/L	–
4	–	–
5	GR	–

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

H.S.

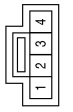
1	2

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

ABIIA1411GB

Connector No.	M122
Connector Name	VARIABLE BLOWER CONTROL (2 CONTROL DIAL SYSTEM OR AUTO A/C)
Connector Color	WHITE

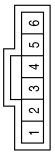
H.S.



Terminal No.	Color of Wire	Signal Name
1	B/W	–
2	L/W	–
3	G/R	–
4	W/L	–

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

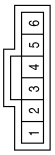
H.S.



Terminal No.	Color of Wire	Signal Name
1	Y	–
2	GR	–
3	P	–
5	BR/W	–
6	P/L	–

Connector No.	M143
Connector Name	AIR MIX DOOR MOTOR (PASSENGER)
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
1	G/W	–
2	P	–
3	Y	–
4	R/W	–
6	L	–

Connector No.	M144
Connector Name	DEFROSTER DOOR MOTOR
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	P	–
3	Y	–
4	LG/B	–
6	P/B	–

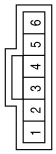
Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	V/R	–
2	L/B	–

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	BLACK

H.S.



Terminal No.	Color of Wire	Signal Name
1	W/G	–
2	P	–
3	Y	–
4	SB	–
6	G	–

ABIIA1412GB

Connector No.	M178
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
14	L	–
16	P	–
17	P	–
20	P	–

Connector No.	M179
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
16	P	–
17	P	–

Connector No.	M182
Connector Name	JOINT CONNECTOR-M09
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y/G	–
11	Y/G	–
12	Y/G	–
13	L	–
14	L	–
15	L	–
17	P	–
18	P	–
19	P	–

Connector No.	M192
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
13	Y/R	–
14	Y/R	–

Connector No.	M194
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y	–
11	Y	–
12	Y	–
13	Y	–
14	Y	–
18	P	–
19	P	–
20	P	–

Connector No.	M301
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

1	2	3	4

Terminal No.	Color of Wire	Signal Name
1	G/O	–
2	W/V	–
4	P	–

AAIIA0618GB

Connector No.	M302
Connector Name	OPTICAL SENSOR
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	G/O	–
2	W/V	–
3	P	–

Connector No.	E1
Connector Name	AMBIENT SENSOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	V/R	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
14	Y/B	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R/Y	–
2	B/W	–
3	B	–

ABIIA1414GB

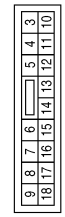
Connector No.	E50
Connector Name	WIRE TO WIRE
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	L	–

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

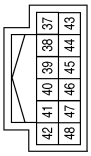
H.S.



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

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

H.S.



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

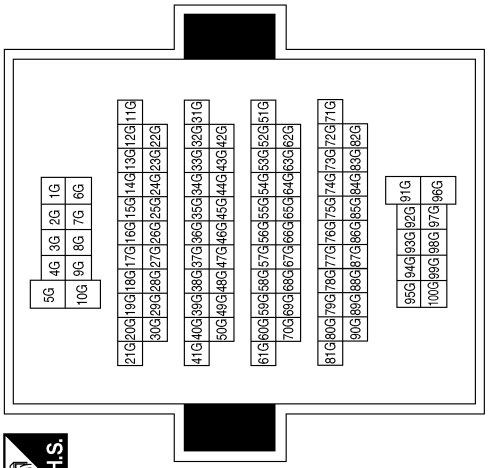
Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK

H.S.

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

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

H.S.



Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
34G	P	–
35G	V/R	–
59G	W/G	–
61G	Y/L	–

ABIIA1426GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/B	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
14	Y/B	–

Connector No.	F54
Connector Name	ECM
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
49	R/Y	AVCC (PDPRES)
67	B	GND-A
70	B/W	PD PRESS

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY

H.S.

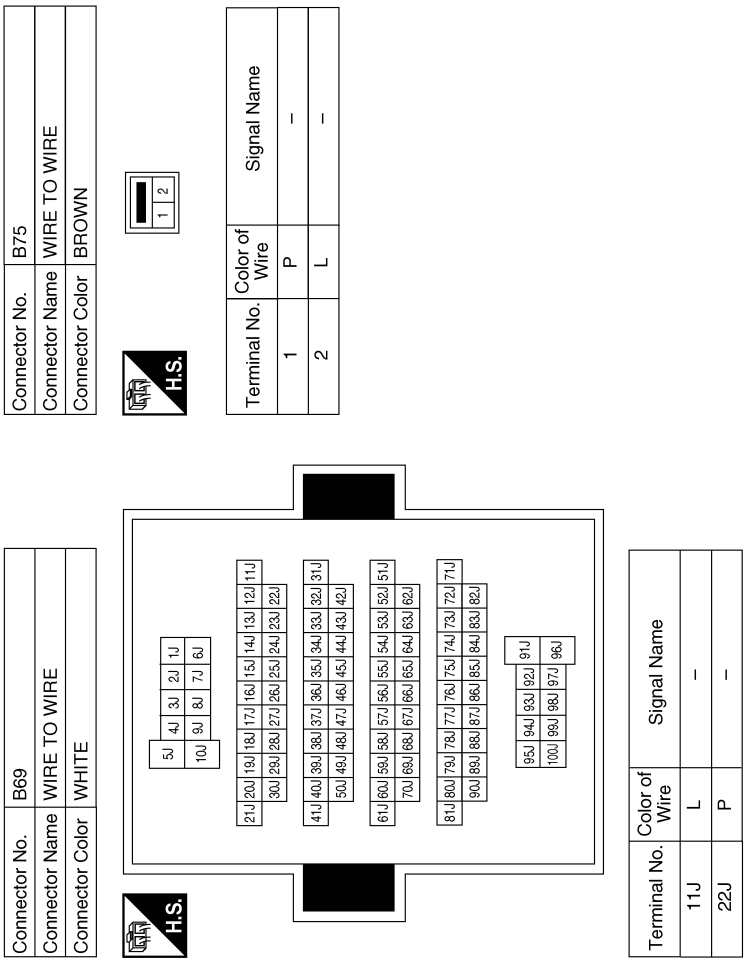
Terminal No.	Color of Wire	Signal Name
1	Y/L	–
2	W/G	–

Connector No.	F69
Connector Name	JOINT CONNECTOR-F01
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	B	–
5	B	–
6	B	–

ABIIA1415GB



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SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Symptom Matrix Chart

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SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-67
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-21
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-23
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-28
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-36
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-39
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-44
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-49
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-83
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-91
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-93
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-21
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-94

INSUFFICIENT COOLING

Component Function Check

INFOID:0000000011560809

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-82, "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-21, "Front Air Control Self-Diagnosis".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Refer to HAC-21, "Front Air Control Self-Diagnosis Code Chart".

5.CHECK DRIVE BELTS

Check compressor belt tension. Refer to EM-13, "Checking Drive Belts".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Adjust or replace compressor belt. Refer to EM-13, "Removal and Installation".

6.CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to HAC-28, "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-28, "Air Mix Door Motor (Driver) Diagnosis Procedure" or HAC-32, "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-380, "Overall Function Check".

Does cooling fan motor operate correctly?

YES >> GO TO 8.
NO >> Check cooling fan motor. Refer to EC-381, "Diagnosis Procedure".

8.CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to HAC-54, "Description".

Does water valve operate correctly?

YES >> GO TO 9.

NO >> Check water valve circuit. Refer to HAC-54, "Water Valve Diagnosis Procedure".

9. 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 10.

10. 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 11.
NO >> Check contaminated refrigerant. Refer to HAC-95, "Working with HFC-134a (R-134a)".

11. 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-84, "Diagnostic Work Flow".
NO >> GO TO 12.

12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-86, "Performance Chart".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-84, "Diagnostic Work Flow".
NO >> GO TO 13.

13. 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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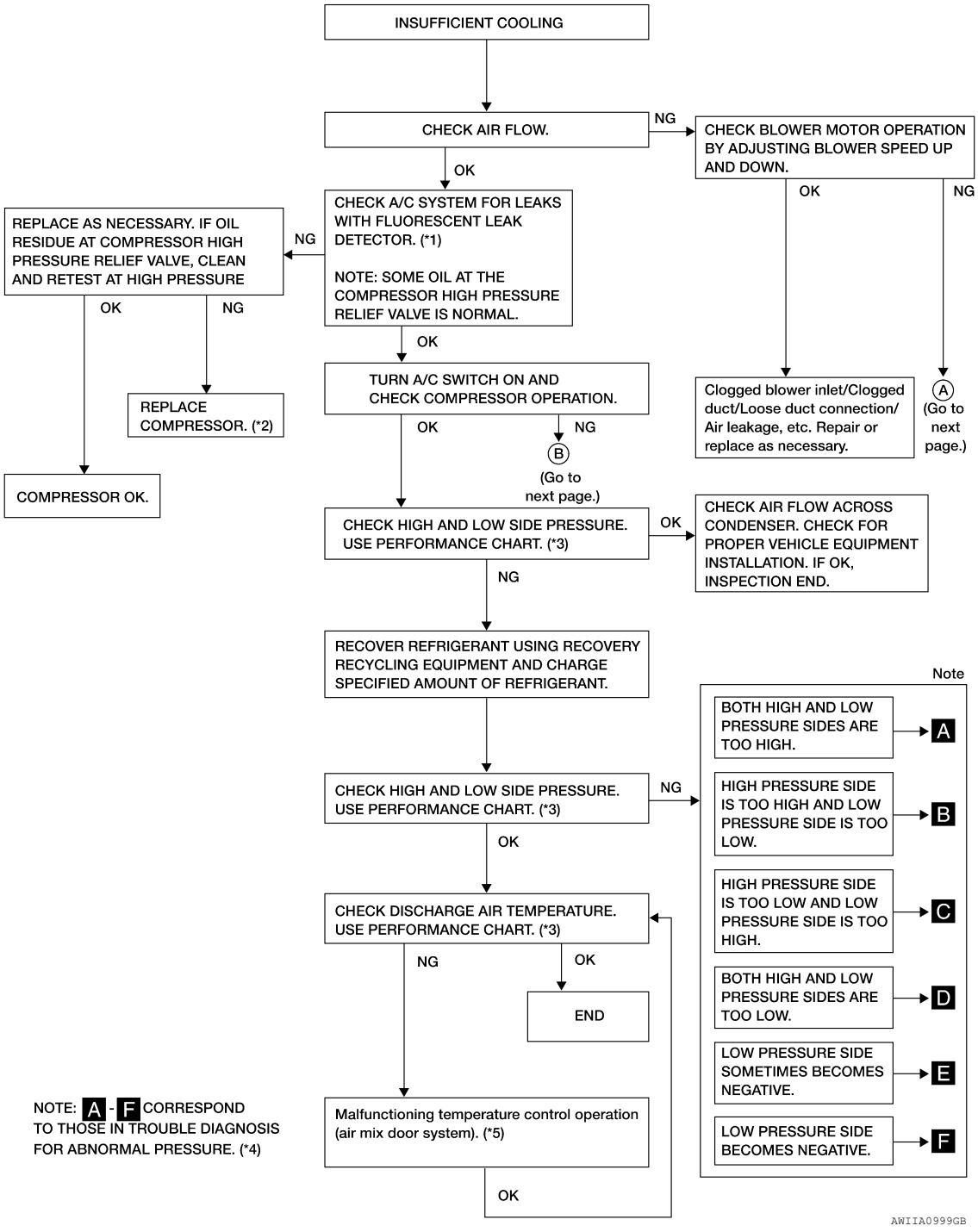
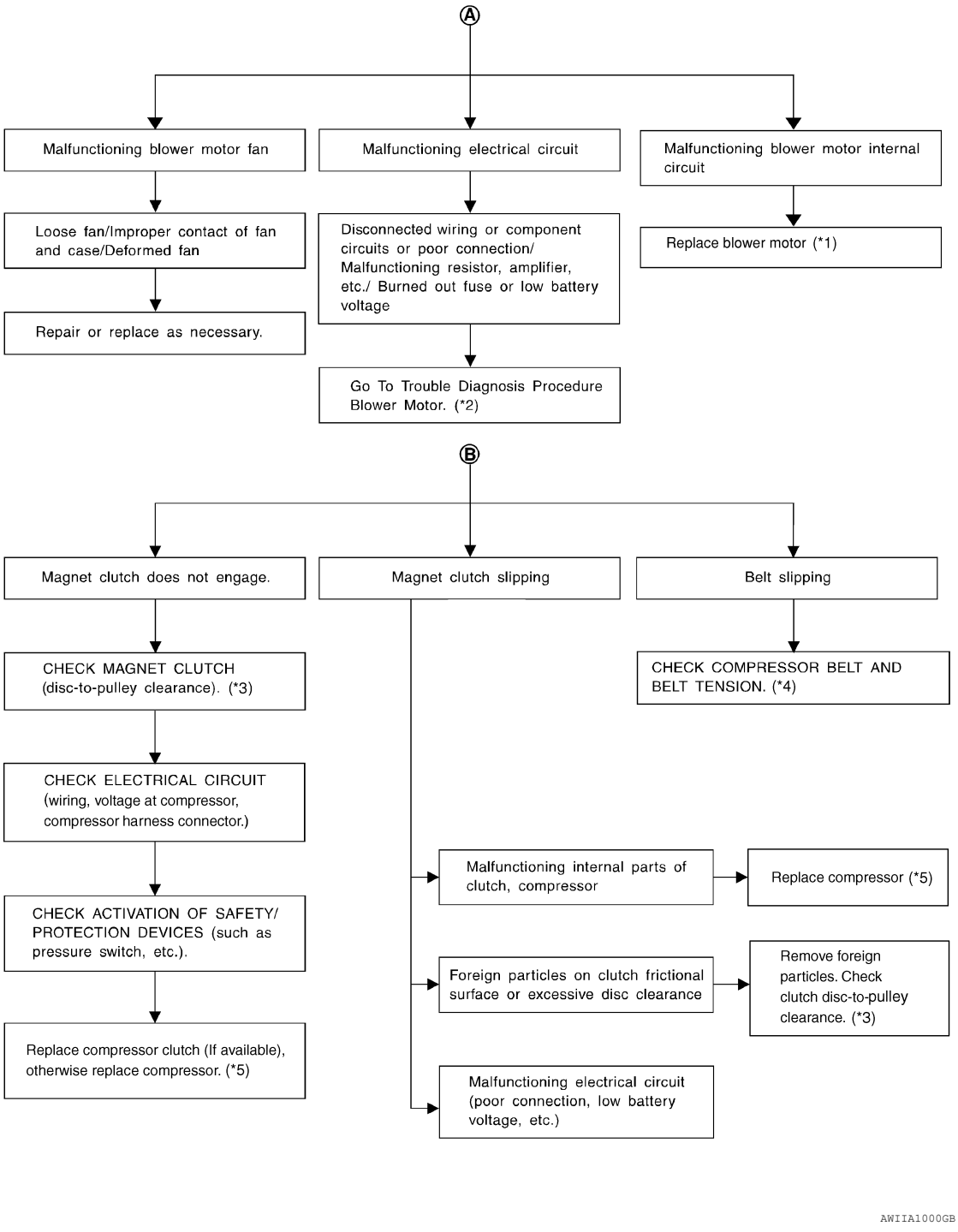


*1 HA-24, "Checking System for Leaks Using the Fluorescent Dye Leak Detector"
*2 HA-33, "Removal and Installation"
*3 HAC-86, "Performance Chart"
*4 HAC-87, "Trouble Diagnoses for Abnormal Pressure"
*5 HAC-28, "Air Mix Door Motor (Driver) Component Function Check"



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*1 HA-33, "Removal and Installation" *2 HAC-44, "Front Blower Motor Component Function Check" *3 HA-33, "Removal and Installation"

*4 EM-13, "Checking Drive Belts" *5 HA-31, "Removal and Installation"

Performance Chart

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TEST CONDITION

Testing must be performed as follows:

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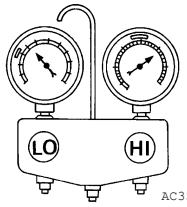
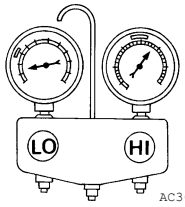
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient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

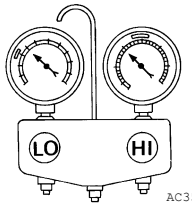
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
A Both high- and low-pressure sides are too high.  AC359A	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	• Clean condenser. • Check and repair cooling fan if necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 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.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• 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.

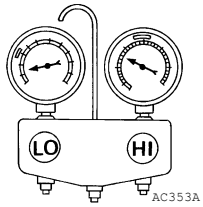
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
B High-pressure side is too high and low-pressure side is too low.  AC360A	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.	• Check and repair or replace malfunctioning parts. • Check oil for contamination.

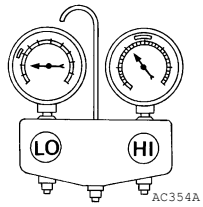
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
C High-pressure side is too low and low-pressure side is too high.  AC356A	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.

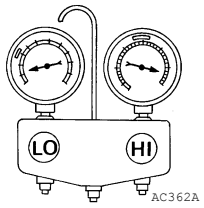
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
D Both high- and low-pressure sides are too low.  	• 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.	• Replace liquid tank. • Check oil for contamination.
	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	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-24, "Checking of Refrigerant Leaks" or HA-26, "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.	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	• Check intake sensor circuit. Refer to HAC-64, "Intake Sensor Diagnosis Procedure". • Repair evaporator fins. • Replace evaporator. • Refer to HAC-44, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
E Low-pressure side sometimes becomes negative.  	• 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.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
F Low-pressure side becomes negative. 	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	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. • 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:0000000011560813

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-21, "Front Air Control Self-Diagnosis".

Is the inspection results normal?

YES >> GO TO 4.
NO >> Refer to HAC-21, "Front Air Control Self-Diagnosis Code Chart".

4.CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to CO-10, "Inspection".
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to CO-10, "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-28, "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 11.
- Both hoses warm: GO TO 9.

8.CHECK ENGINE COOLANT SYSTEM

Check engine coolant temperature sensor. Refer to EC-192, "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-11, "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-15, "Removal and Installation".

11. CHECK WATER VALVE

Check the operation of the water valve. Refer to HAC-54, "Water Valve Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.
NO >> Replace water valve.

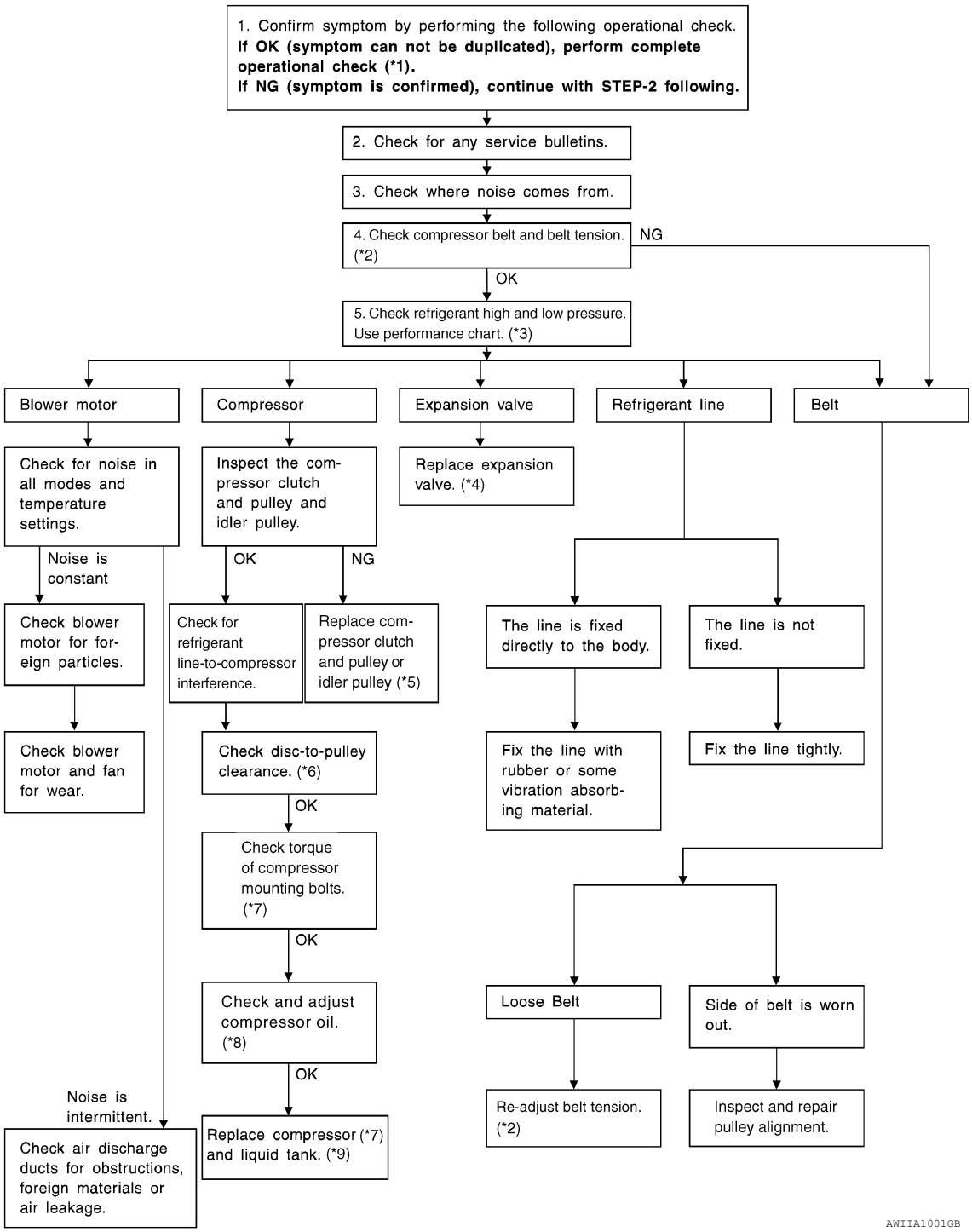
NOISE

Component Function Check

INFOID:0000000011560814

SYMPTOM: Noise

INSPECTION FLOW



*1 HAC-6, "Operational Check"
*2 EM-13, "Checking Drive Belts"
*3 HAC-86, "Performance Chart"
*4 HA-43, "Removal and Installation"
*5 HA-33, "Removal and Installation"
*6 HA-33, "Removal and Installation"
*7 HA-31, "Removal and Installation"
*8 HA-31, "Removal and Installation"
*9 HA-41, "Removal and Installation"

MEMORY FUNCTION DOES NOT OPERATE

Memory Function Check

INFOID:0000000011560815

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-21, "Front Air Control Self-Diagnosis".

Are any self-diagnosis codes present?

YES >> Refer to HAC-21, "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-67, "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-8, "Removal and Installation".

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011560816

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:0000000011560817

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-4, "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

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

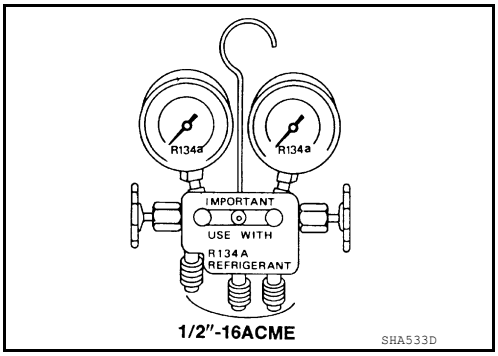
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location 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:0000000011560818

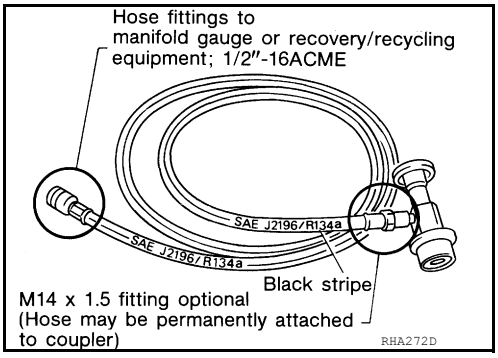
MANIFOLD GAUGE SET

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

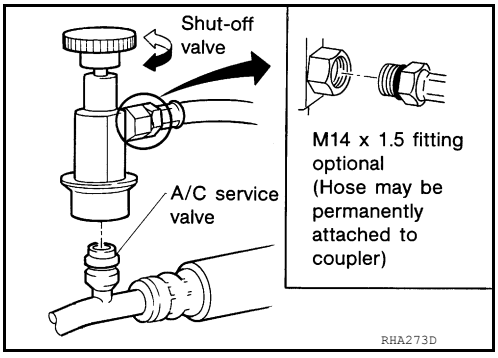
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



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

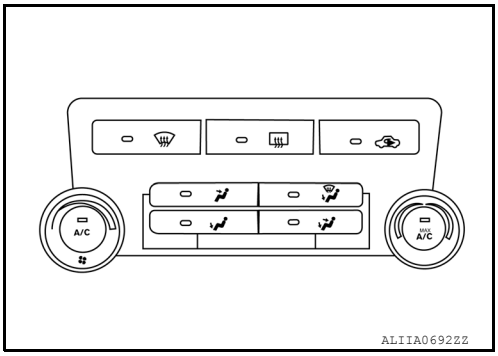
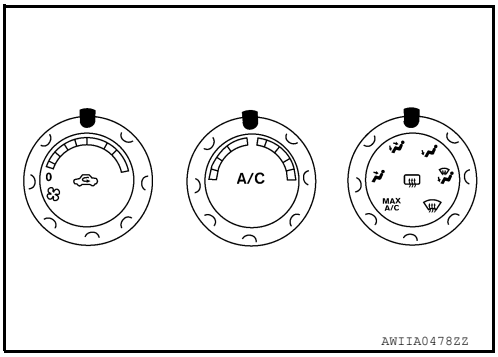


BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560819

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000011560820

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-99, "Operational Check".

>> GO TO 4.

4.GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to HAC-166, "Symptom Matrix Chart".

>> If equipped with NAVI, GO TO 5.
>> If equipped without NAVI, GO TO 6.

5.PERFORM THE FRONT AIR CONTROL SELF-DIAGNOSIS

Perform front air control self-diagnosis. Refer to HAC-114, "Front Air Control Self-Diagnosis".

>> If any diagnostic trouble codes set. Refer to HAC-114, "Front Air Control Self-Diagnosis Code Chart".
>> Confirm the repair by performing operational check. Refer to HAC-99, "Operational Check".

6.REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 7.

7.FINAL CHECK

Final check.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:0000000011560821

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. 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-132, "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-109, "Discharge Air Flow".
   Mode door position is checked in the next step.
   If NG, go to trouble diagnosis procedure for HAC-116, "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-126, "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 counterclockwise until maximum cold.
2. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for HAC-167, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-121, "Air Mix Door Motor Diagnosis Procedure".
If OK, continue the check.

CHECKING TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise until maximum hot.
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-175, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-120, "Air Mix Door Motor Component Function Check".
If OK, continue with next check.

CHECK A/C SWITCH

1. Press A/C switch.
2. A/C switch indicator will turn ON.

- Confirm that the compressor clutch engages (sound or visual inspection).

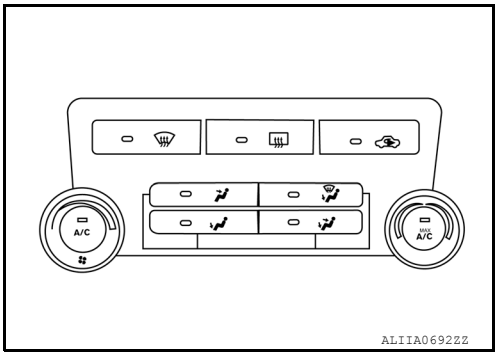
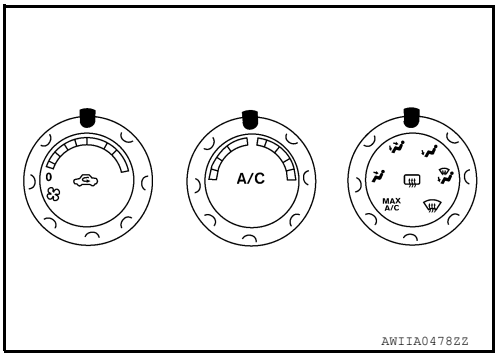
NOTE:
If current mode setting is DEF or D/F, compressor clutch will already be engaged and cannot be turned off.
If NG, go to trouble diagnosis procedure for HAC-137, "Magnet Clutch Diagnosis Procedure".
If all operational checks are OK (symptom cannot be duplicated), go to HAC-98, "How to Perform Trouble Diagnosis For Quick And Accurate Repair" and perform tests as outlined. If symptom appears, refer to HAC-166, "Symptom Matrix Chart" and perform applicable trouble diagnosis procedures.

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560822

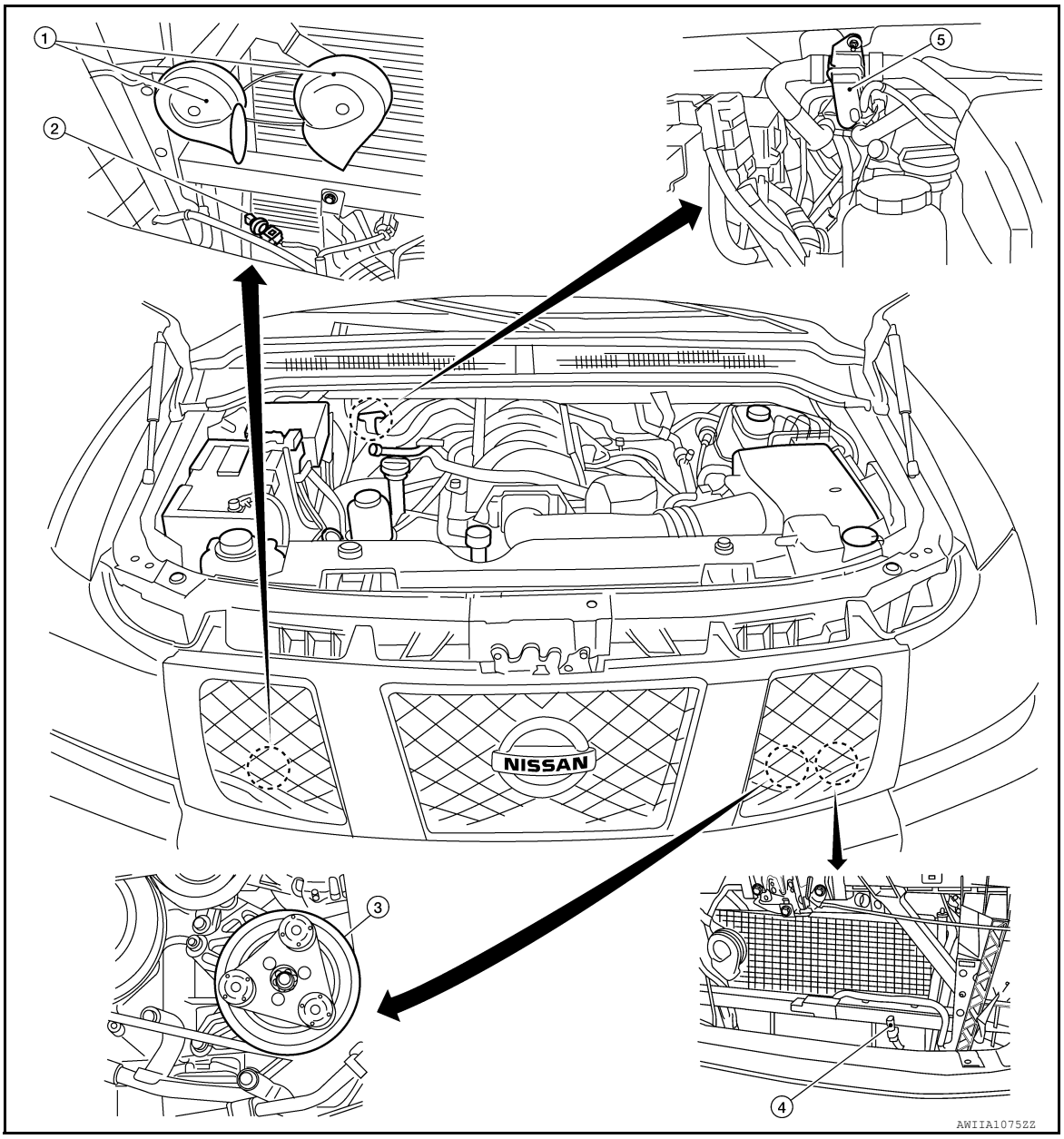
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

FUNCTION INFORMATION

Component Part Location

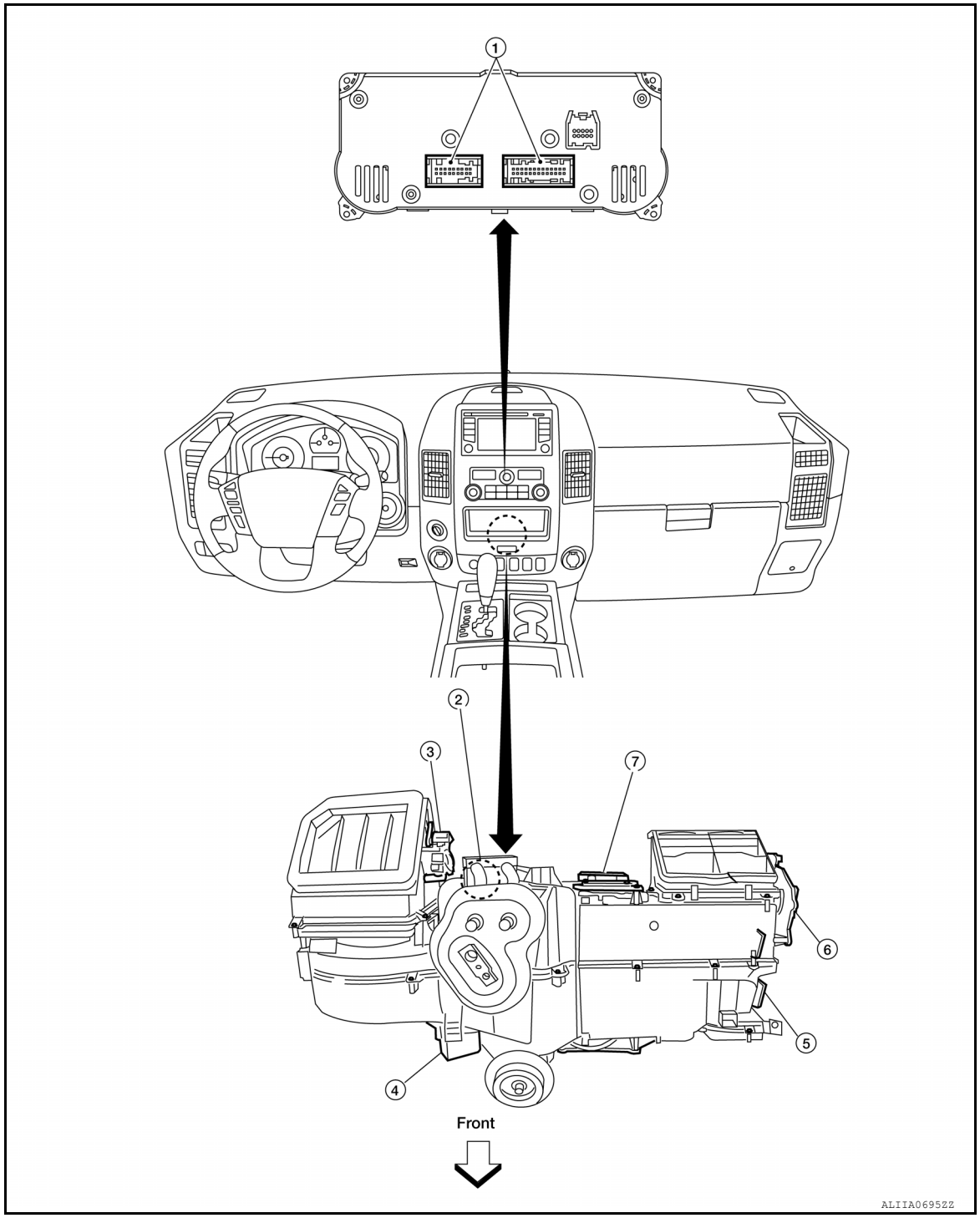
INFOID:0000000011560823

ENGINE COMPARTMENT



1. Horn (view with grille removed)
2. Refrigerant pressure sensor E48 (view with grille removed)
3. A/C compressor F3
4. Ambient sensor E1 (view with grille removed)
5. Water valve F68

PASSENGER COMPARTMENT



1. Front air control M180, M181
2. Intake sensor M146
3. Intake door motor M58
4. Variable blower control M122
5. Mode door motor M142
6. Defroster door motor M144
7. Air mix door motor M147

Symptom Table

INFOID:0000000011560824

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-150
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-114
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-116
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-120
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-126
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-127
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-132
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-137
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-167
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-175
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-177
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-114

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:0000000011560825

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:0000000011560826

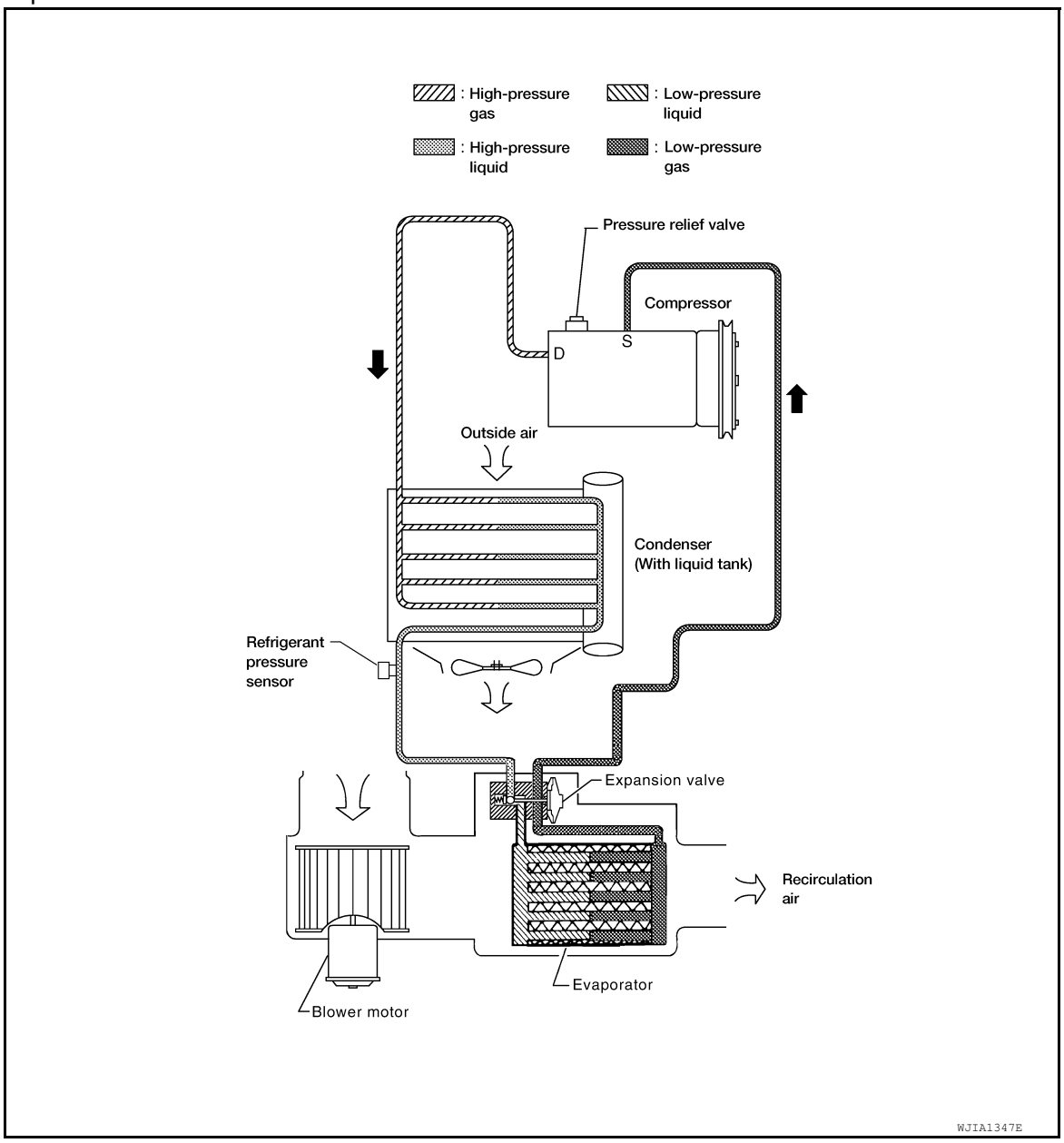
REFRIGERANT PRESSURE SENSOR

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/cm^2, 398 psi), or below about 120 kPa (1.22 kg/cm^2, 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/

cm^2, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



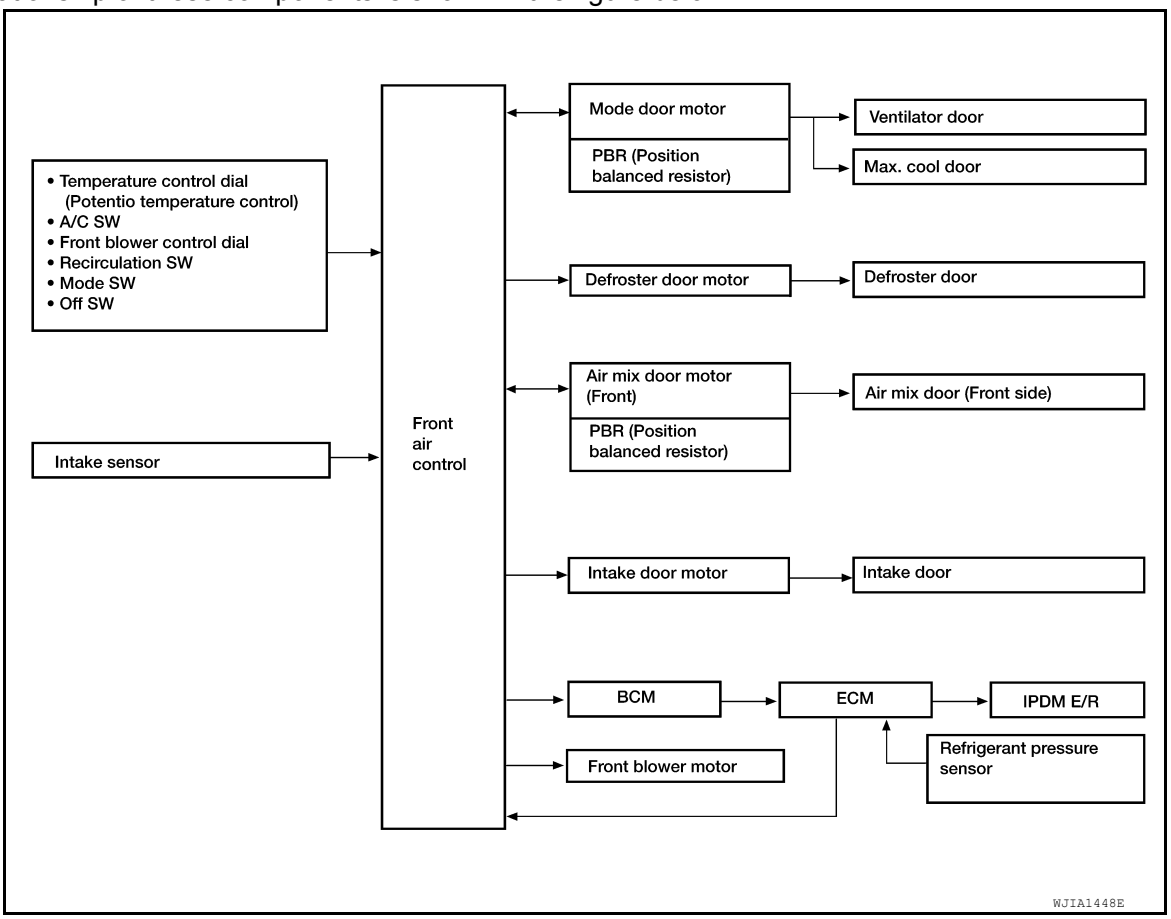
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000011560827

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:

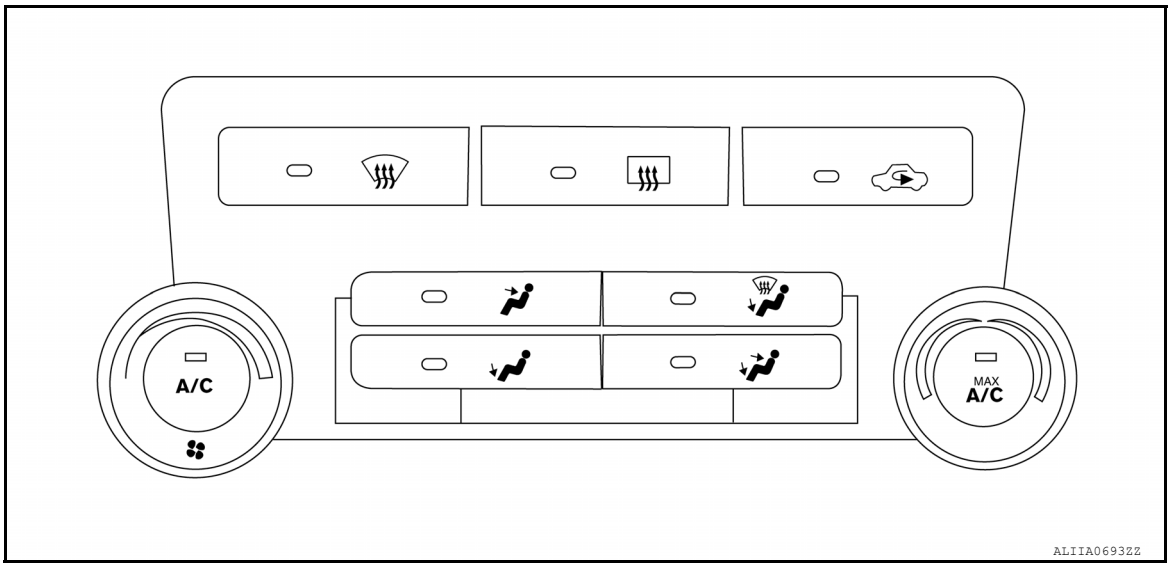


Control System Description

INFOID:0000000011560828

CONTROL OPERATION

Front air control



TEMPERATURE CONTROL DIAL

Increases or decreases the set temperature.

RECIRCULATION ( ) SWITCH

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

DEFROSTER ( ) SWITCH

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

REAR WINDOW DEFOGGER SWITCH (IF EQUIPPED)

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

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/OFF SWITCH

- The blower speed is manually controlled with this dial.
- 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 position.

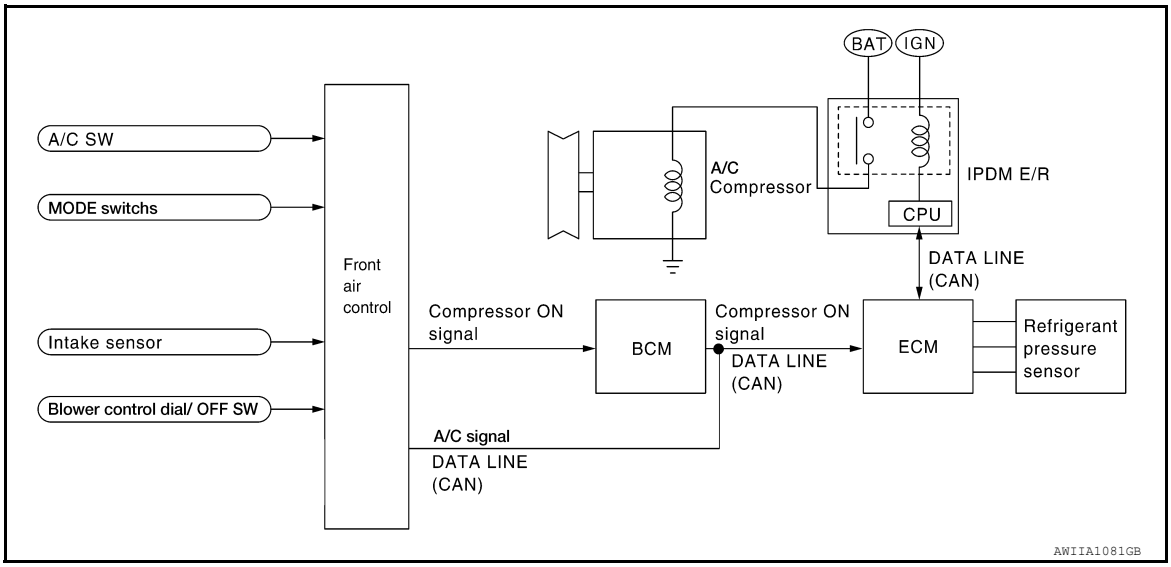
A/C SWITCH

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.

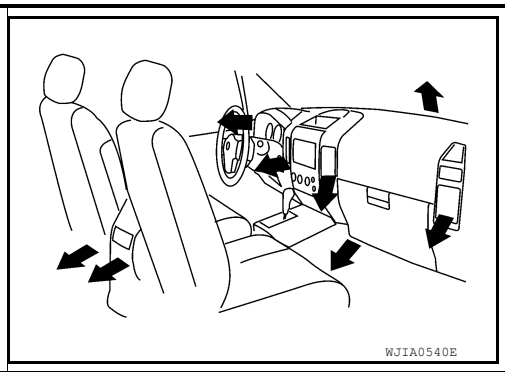
MAGNET CLUTCH CONTROL



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

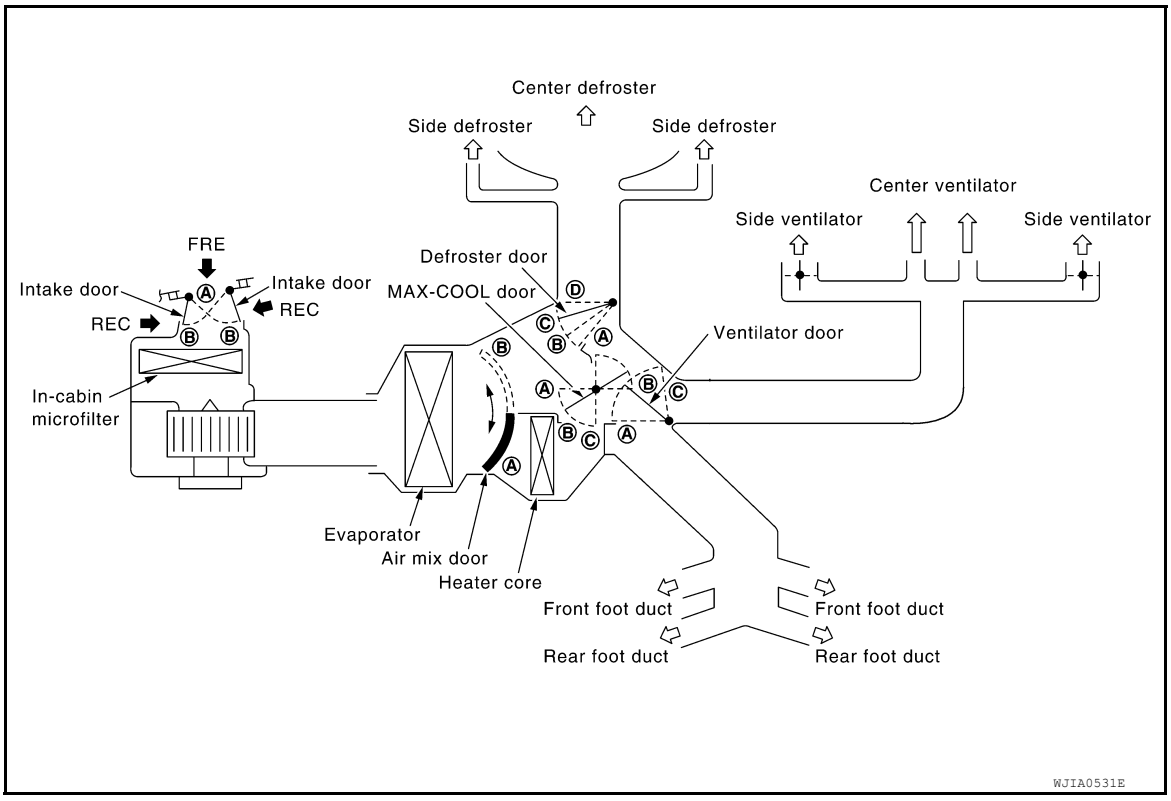
INFOID:0000000011560829

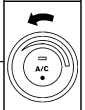


Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	95%	5%	—
	60%	40%	—
	—	70%	30%
	—	60%	40%
	—	10%	90%

Switches And Their Control Function

INFOID:0000000011560830



Position or switch / Door	MODE SW				DEF SW		REC SW		Temperature switch			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF				
					FRONT 							
					○			○	COLD	～	HOT	
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ		—		—			Ⓒ
MAX-COOL door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—			Ⓑ
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ	Ⓑ	Ⓐ	—	—		—			Ⓒ
Intake door	—				Ⓑ		Ⓐ	Ⓑ	—			Ⓑ
Air mix door	—				—		—		Ⓐ		Ⓑ	—

AWIIA0447GB

DIAGNOSIS SYSTEM (HVAC)

CONSULT Function (HVAC)

INFOID:0000000011560831

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	CHG-4, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "Work Flow (Without EXP-800 NI or GR8-1200 NI)"
B257B	Ambient sensor circuit short	HAC-144, "Ambient Sensor Diagnosis Procedure"
B257C	Ambient sensor circuit open	
B2581	Intake sensor circuit short	HAC-147, "Intake Sensor Diagnosis Procedure"
B2582	Intake sensor circuit open	
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.
AMB TEMP SEN	"°C"	Displays ambient sensor signal.
EVAP TEMP SEN	"°C"	Displays intake sensor signal.
MODE FDBCK	"V"	Displays mode door motor feedback signal.
DVR MIX FDBCK	"V"	Displays air mix door motor feedback signal.
DEF FDBCK	"V"	Displays defroster door motor feedback signal.
RECIRC	"ON/OFF"	Displays recirculation switch signal.
DEFROST	"ON/OFF"	Displays defroster switch signal.
A/C	"ON/OFF"	Displays A/C switch signal.
RR DEFOG	"ON/OFF"	Displays rear defroster request signal.
MODE SELECT	"DTNT"	Displays blower motor (blower speed decrease) signal.

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000011875474

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	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing BCM.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION
BCM can perform the following functions:

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

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:0000000011875475

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

Front Air Control Self-Diagnosis

INFOID:0000000011560834

A/C SYSTEM SELF-DIAGNOSIS FUNCTION

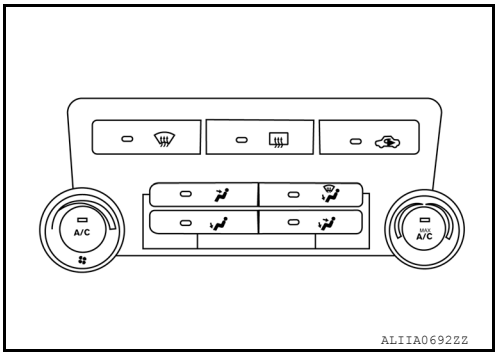
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

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 (if equipped). Refer to HAC-114, "Front Air Control Self-Diagnosis Code Chart".

SELF-DIAGNOSTIC MODE

1. Rotate the blower control dial counterclockwise to the OFF position.
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:0000000011560835

SELF-DIAGNOSTIC CODE CHART

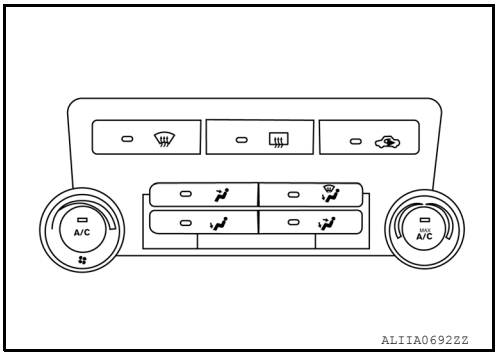
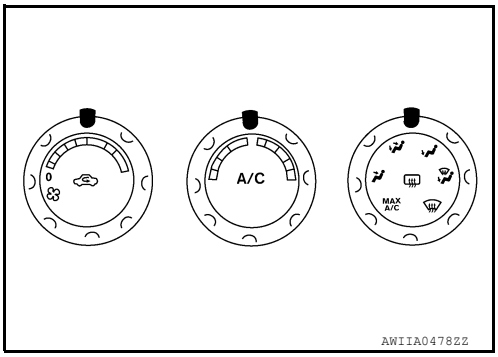
Code No.	Reference page	
03	Battery voltage out of range	CHG-4, "Work Flow (With EXP-800 NI or GR8-1200 NI)" or CHG-7, "Work Flow (Without EXP-800 NI or GR8-1200 NI)"
40	Ambient sensor circuit short	HAC-144, "Ambient Sensor Diagnosis Procedure"
41	Ambient sensor circuit open	
56	Intake sensor circuit short	HAC-147, "Intake Sensor Diagnosis Procedure"
57	Intake sensor circuit open	
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"
90	Stuck button	VTL-8, "Removal and Installation"

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560836

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

MODE DOOR MOTOR

System Description

INFOID:0000000011560837

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

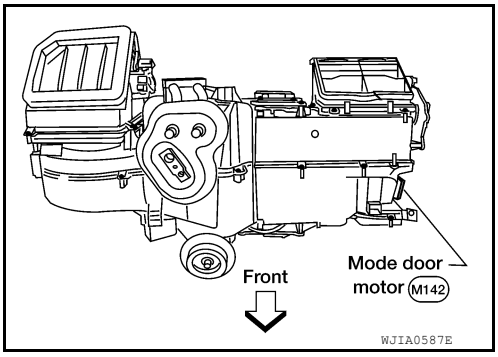
System Operation

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 & 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:0000000011560838

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Press each mode switch and press the (DEF) switch. Each position indicator should illuminate.
2. Confirm that discharge air comes out according to the air distribution table. Refer to HAC-109, "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-116, "Mode Door Motor Diagnosis Procedure".

Mode Door Motor Diagnosis Procedure

INFOID:0000000011560839

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

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-111, "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 ( ), VENT ( ), B/L ( ), and FOOT( )	Voltage varies between D/F ( ) and VENT ( ), and between VENT ( ) and B/L ( ).

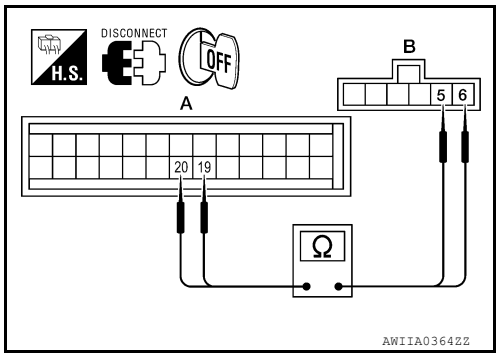
Is the inspection result normal?

YES >> • Mode door motor is OK.
• Inspect mode door for mechanical failure. Refer to VTL-19, "Removal and Installation".

NO >> GO TO 2.

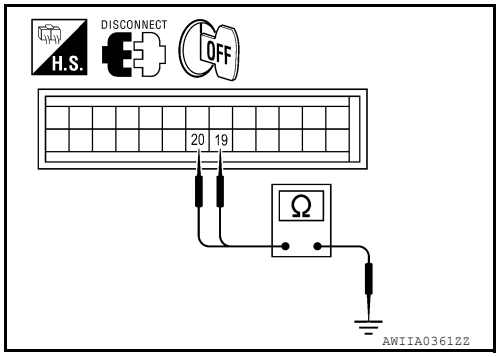
2.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the mode door motor harness connector M142 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 19, 20 and the mode door motor harness connector M142 (B) terminals 5, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	19	M142	5	Yes
	20		6	

4. Check continuity between front air control harness connector M180 terminals 19, 20 and ground.



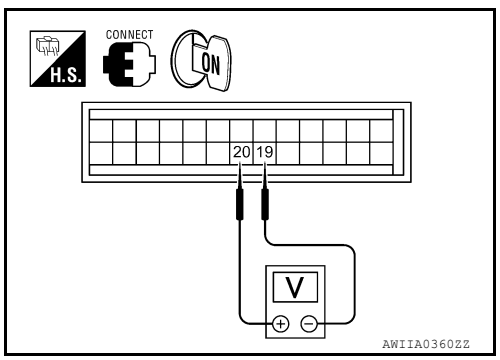
Connector	Terminal	—	Continuity
M180	19	Ground	No
	20		

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 ( ) mode.
4. Check voltage between front air control harness connector M180 terminal 19 and terminal 20 while pressing the mode switch to the VENT ( ), and then the B/L ( ) mode.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M180	19	20	D/F ( ) mode to VENT ( ) mode	Battery voltage
	20	19	VENT ( ) mode to B/L ( ) mode	Battery voltage

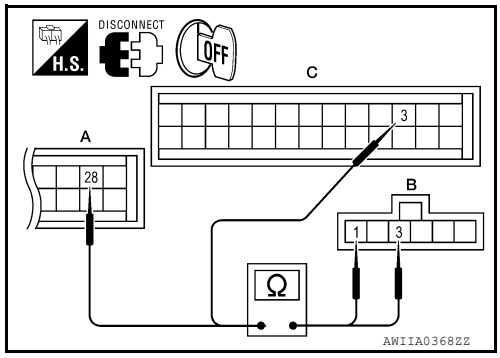
Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace front air control. Refer to VTL-8, "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 M180 (C) terminal 3, and M181 (A) terminal 28 and the mode door motor harness connector M142 (B) terminals 1, 3.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M180 (C)	3	M142	3	Yes
M181 (A)	28		1	

4. Check continuity between front air control harness connector M180 (C) terminal 3, M181 (A) terminal 28 and ground.

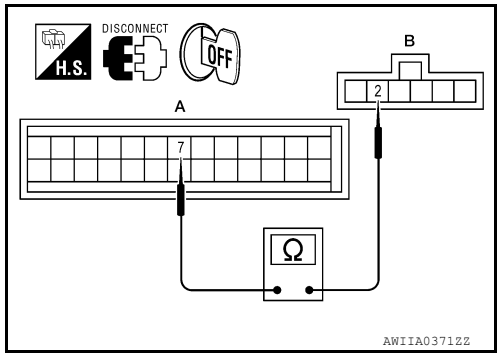
Connector	Terminal	—	Continuity
M180 (C)	3	Ground	No
M181 (A)	28		

Is the inspection result normal?

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

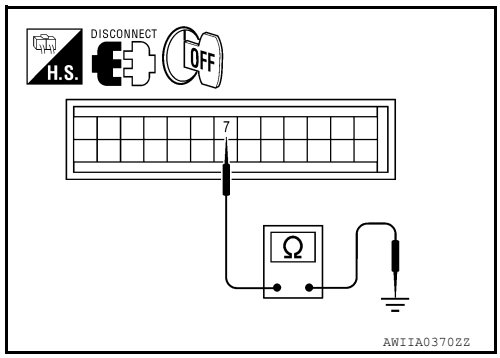
5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M180 (A) terminal 7 and mode door motor harness connector M142 (B) terminal 2.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	7	M142	2	Yes

2. Check continuity between front air control harness connector M180 terminal 7 and ground.



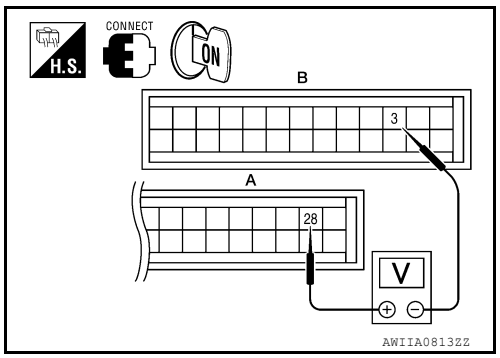
Connector	Terminal	—	Continuity
M180	7	Ground	No

Is the inspection result normal?

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

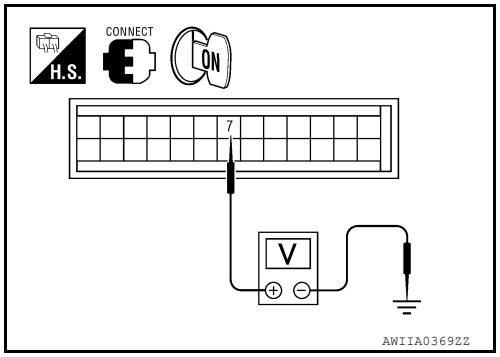
6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 (B) terminal 3, and M181 (A) terminal 28.



A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M181	28	M180	3	5 Volts

4. Check voltage between front air control harness connector M180 terminal 7 and ground.



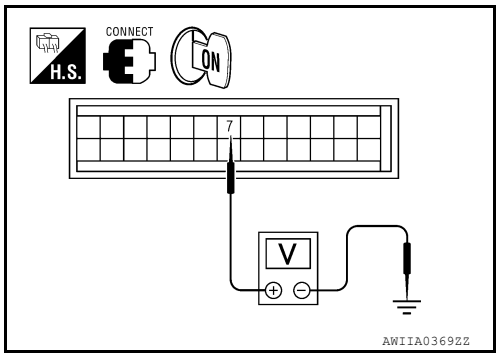
Connector	Terminal	—	Voltage (Approx.)
M180	7	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "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 M180 terminal 7 and ground.



Connector	Terminal	—	Voltage (Approx.)
M180	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-8, "Removal and Installation".
NO >> Replace the mode door motor. Refer to VTL-19, "Removal and Installation".

AIR MIX DOOR MOTOR

System Description

INFOID:0000000011560840

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

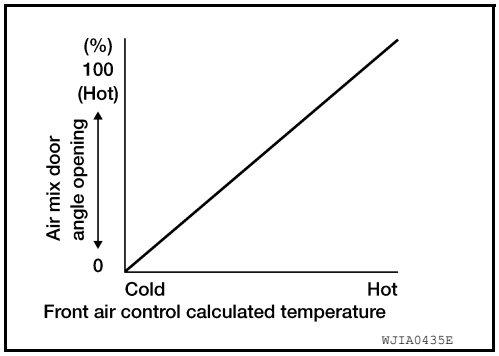
Component Parts

Air mix door control system components are:
- Front air control
- Air mix door motor
- Position balanced resistor (PBR) (built-into air mix door motors)
- 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.

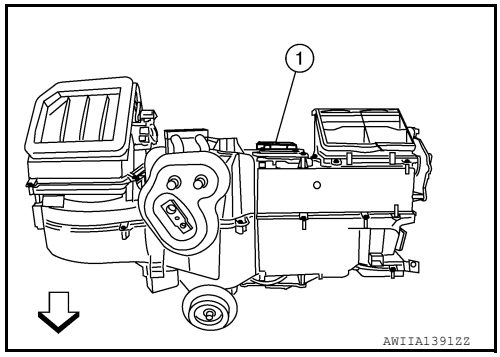
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motors

The air mix door motor (1) is attached to the front heater & cooling unit assembly. The 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:0000000011560841

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the temperature control dial clockwise to maximum hot.
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 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-121, "Air Mix Door Motor Diagnosis Procedure".

Air Mix Door Motor Diagnosis Procedure

INFOID:0000000011560842

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

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

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

1. Turn ignition switch ON.
2. Using CONSULT, check "DVR MIX FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to HAC-111, "CONSULT Function (HVAC)".
3. Observe "DVR MIX FDBACK" voltage while rotating temperature control dial between 32°C (90°F) and 18°C (60°F).

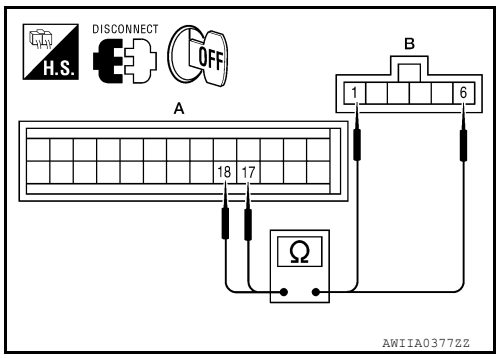
Monitor Item	Condition	Results
DVR MIX FDBCK	Rotate temperature control dial between 32°C (90°F) and 18°C (60°F)	Voltage varies with dial rotation between 0.2 and 4.8 volts.

Is the inspection result normal?

YES >> • Air mix door motor is OK.
• Inspect air mix door for mechanical failure and repair if necessary. If air mix door is OK, refer to HAC-167, "Component Function Check" for insufficient cooling or HAC-175, "Component Function Check" for insufficient heating.
NO >> GO TO 2.

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

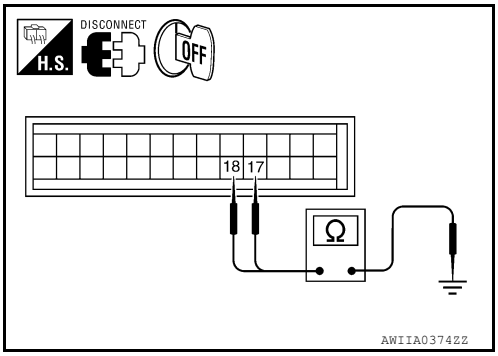
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the air mix door motor harness connector M147 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 17, 18 and the air mix door motor harness connector M147 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	17	M147	1	Yes
	18		6	

4. Check continuity between front air control harness connector M180 terminals 17, 18 and ground.

Connector	Terminal	—	Continuity
M180	17	Ground	No
	18		

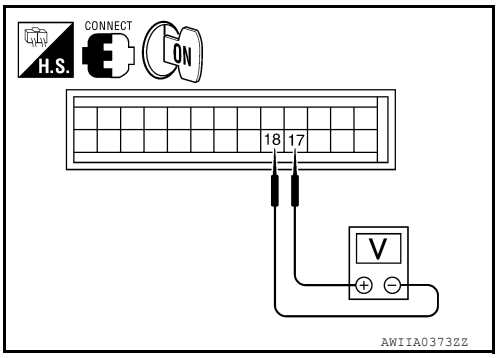


Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate temperature control dial to 32°C (90°F).
4. Check voltage between front air control harness connector M180 terminal 17 and terminal 18 while rotating temperature control dial to 18°C (60°F) and back to 32°C (90°F).



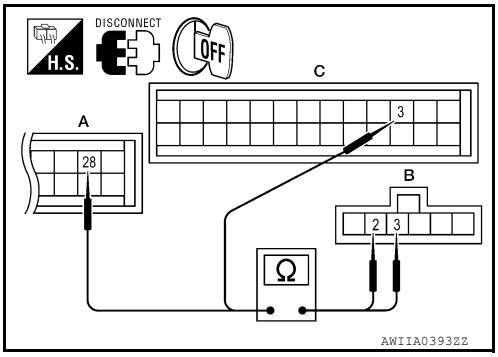
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M180	17	18	While rotating temperature control dial from 32°C (90°F) to 18°C (60°F)	Battery voltage
	18	17	While rotating temperature control dial from 18°C (60°F) to 32°C (90°F)	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

4. 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 connectors.
3. Check continuity between front air control harness connector M180 (C) terminal 3, connector M181 (A) terminal 28 and air mix door motor harness connector M147 (B) terminals 3, 2.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M180 (C)	3	M147	2	Yes
M181 (A)	28		3	

4. Check continuity between front air control harness connector M180 (C) terminal 3, M181 (A) terminal 28 and ground.

Connector	Terminal	—	Continuity
M180 (C)	3	Ground	No
M181 (A)	28		

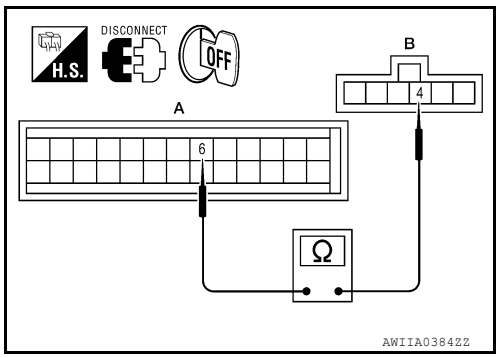
Is the inspection result normal?

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

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

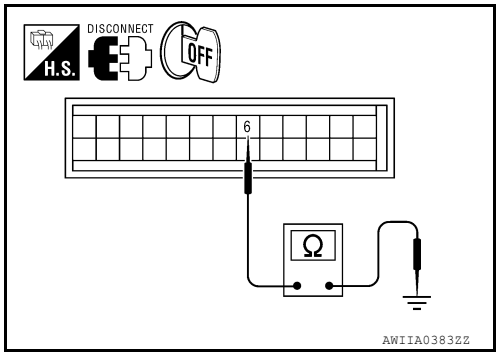
1. Check continuity between front air control harness connector M180 (A) terminal 6 and air mix door motor harness connector M147 (B) terminal 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	6	M147	4	Yes



2. Check continuity between front air control harness connector M180 terminal 6 and ground.

Connector	Terminal	—	Continuity
M180	6	Ground	No



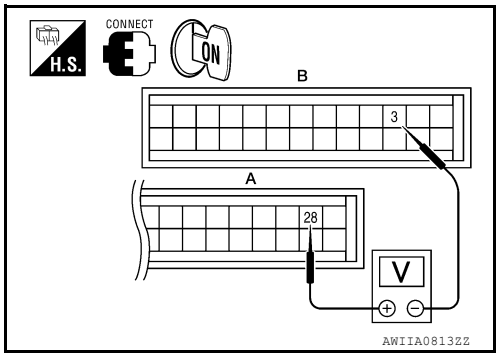
Is the inspection result normal?

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

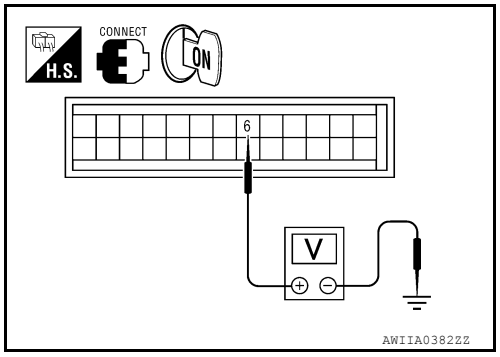
1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 (B) terminal 3, and M181 (A) terminal 28.

A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M181	28	M180	3	5 Volts



4. Check voltage between front air control harness connector M180 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M180	6	Ground	0 Volts

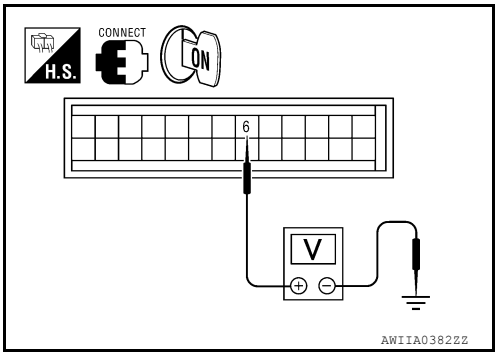


Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

7. 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 M180 terminal 6 and ground.



Connector	Terminal	—	Voltage (Approx.)
M180	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-8, "Removal and Installation".

NO >> Replace air mix door motor. Refer to VTL-20, "Removal and Installation".

INTAKE DOOR MOTOR

System Description

INFOID:0000000011560843

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

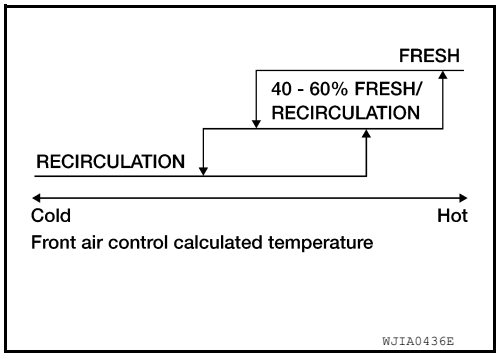
Component Parts

Intake door control system components are:
- Front air control
- Intake door motor (PRB built into the intake door motor)
- Ambient 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.

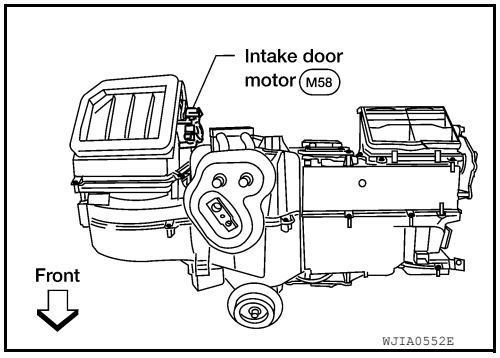
Intake Door Control Specification



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:0000000011560844

INSPECTION FLOW

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

1. Press the vent mode switch ( ).
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-126, "Intake Door Motor Diagnosis Procedure".

Intake Door Motor Diagnosis Procedure

INFOID:0000000011560845

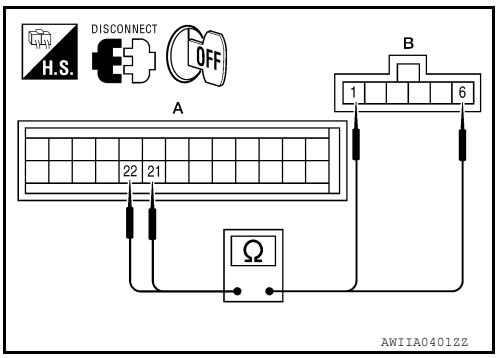
Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

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

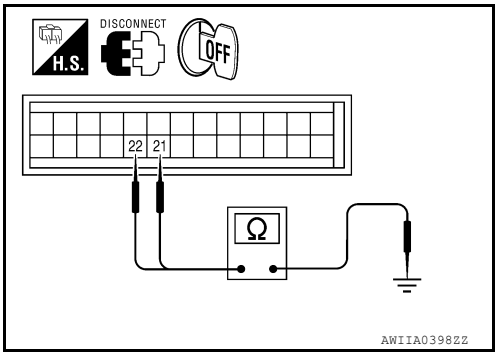
1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	21	M58	6	Yes
	22		1	

4. Check continuity between front air control harness connector M180 terminals 21, 22 and ground.



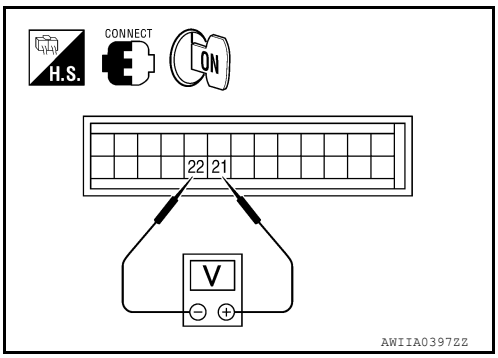
Connector	Terminal	—	Continuity
M180	21	Ground	No
	22		

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 M180 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M180	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-18, "Removal and Installation".
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:0000000011560846

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:
- Front air control
- Defroster door motor
- Position balanced resistor (PBR) (Built into defroster door motor)
- Ambient sensor
- Intake sensor

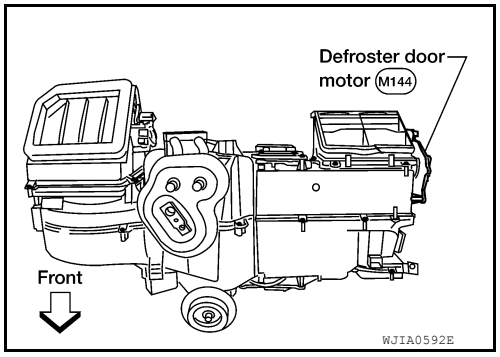
System Operation

The front air control determines defroster door position based on the position of the defroster switch. When the defroster switch is depressed, the defroster door motor rotates directing air to the defroster ducts. When any mode other than defroster is selected, the defroster motor rotates in the opposite direction closing off air flow to the defroster ducts.

COMPONENT DESCRIPTION

Defroster door motor

The defroster door motor is attached to the front heater & cooling unit assembly. The front air control sends a voltage to rotate to the defroster door directing the air flow either to the defroster ducts, or to the floor ducts, depending on which way the voltage and ground are applied to the motor leads. Motor rotation is conveyed to a lever which activates the defroster door.



Defroster Door Motor Component Function Check

INFOID:0000000011560847

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

1. Select vent ( ) mode.
2. Press the defrost switch ( ). Defroster indicator should illuminate.
3. Listen for defroster door position change (blower sound should change slightly).

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to HAC-127, "Defroster Door Motor Diagnosis Procedure"

Defroster Door Motor Diagnosis Procedure

INFOID:0000000011560848

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

SYMPTOM:
- Defroster door does not change.
- Defroster door motor does not operate normally.

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

1. Turn ignition switch ON.
2. Using CONSULT, check "DEF FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to HAC-111, "CONSULT Function (HVAC)".
3. Observe "DEF FDBCK" voltage while cycling front air control mode switch through all modes and pressing DEF switch.

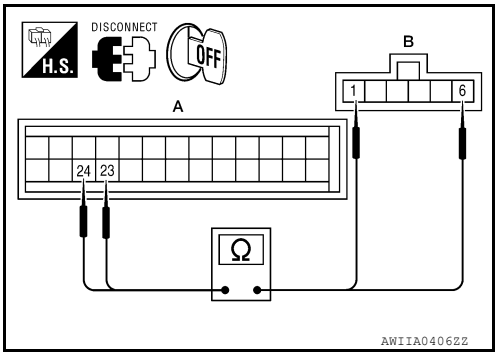
Monitor Item	Condition	Results
DEF FDBCK	Cycle mode switch through all modes, D/F ( ), VENT ( ), B/L ( ), FOOT( ), and press DEF ( )	Voltage varies between 0.2 and 4.8 volts.

Is the inspection result normal?

YES >> • Defroster door motor is OK.
• Inspect defroster door for mechanical failure. Refer to VTL-17, "Removal and Installation".
NO >> GO TO 2.

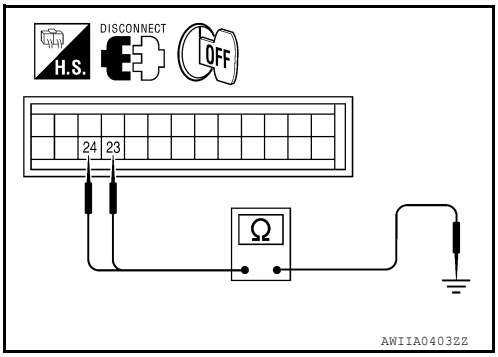
2. CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the defroster door motor harness connector M144 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 23, 24 and the defroster door motor harness connector M144 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	23	M144	1	Yes
	24		6	

4. Check continuity between front air control harness connector M180 terminals 23, 24 and ground.



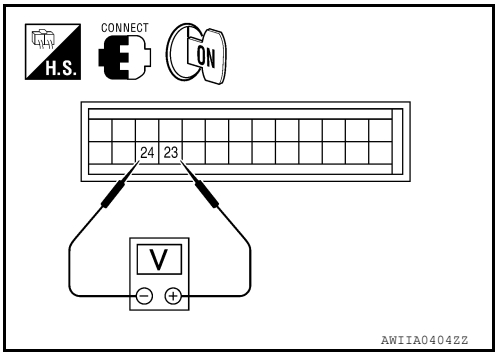
Connector	Terminal	—	Continuity
M180	23	Ground	No
	24		

Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the VENT ( ) mode.
4. Check voltage between front air control harness connector M180 terminal 23 and terminal 24 while pressing the defroster switch ( ).



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M180	23	24	Following defroster switch ( ) on	Battery voltage
	24	23	Following defroster switch ( ) off	Battery voltage

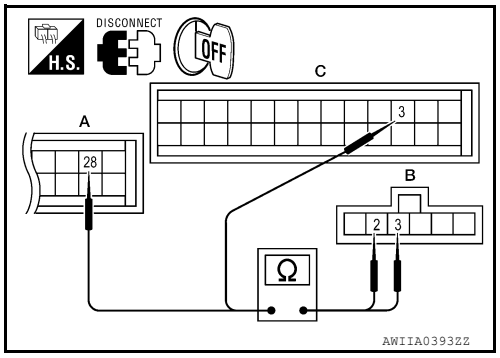
Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors M180 (C) and M181 (A).
3. Check continuity between front air control harness connector M180 (C) terminal 3, and M181 (A) terminal 28 and the defroster door motor harness connector M144 (B) terminals 2, 3.



A and C		B		Continuity
Connector	Terminal	Connector	Terminal	
M180 (C)	3	M144	2	Yes
M181 (A)	28		3	

4. Check continuity between front air control harness connector M180 (C) terminal 3, M181 (A) terminal 28 and ground.

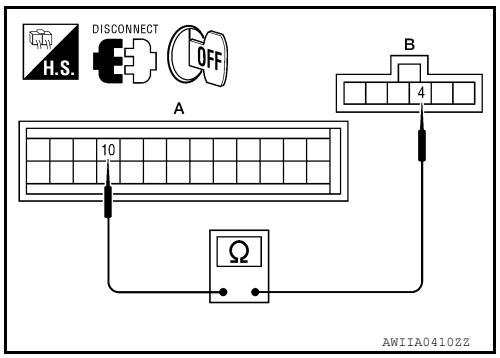
Connector	Terminal	—	Continuity
M180 (C)	3	Ground	No
M181 (A)	28		

Is the inspection result normal?

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

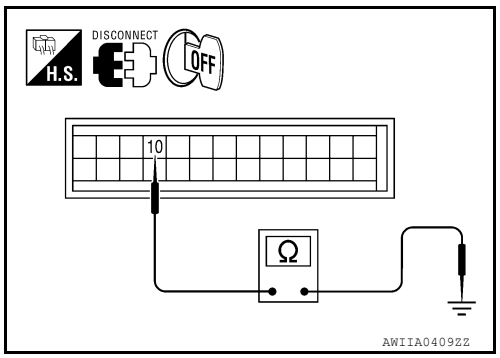
5. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M180 (A) terminal 10 and defroster door motor harness connector M144 (B) terminal 4.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M180	10	M144	4	Yes

2. Check continuity between front air control harness connector M180 terminal 10 and ground.



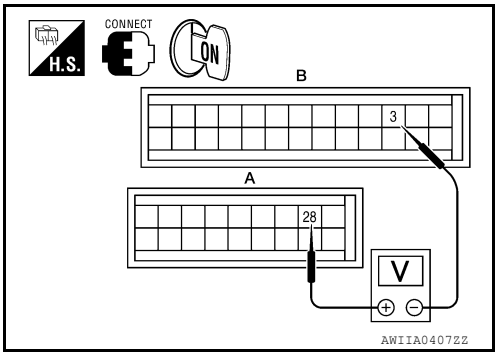
Connector	Terminal	—	Continuity
M180	10	Ground	No

Is the inspection result normal?

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

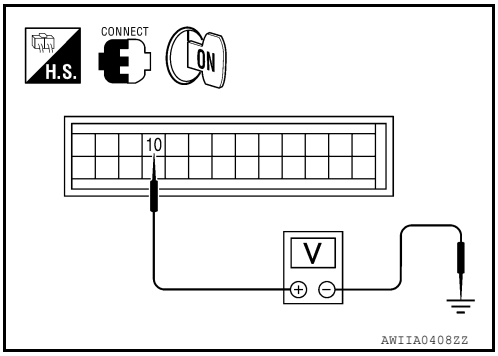
6. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 (B) terminal 3, and M181 (A) terminal 28.



A		B		
Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M181	28	M180	3	5 Volts

4. Check voltage between front air control harness connector M180 terminal 10 and ground.



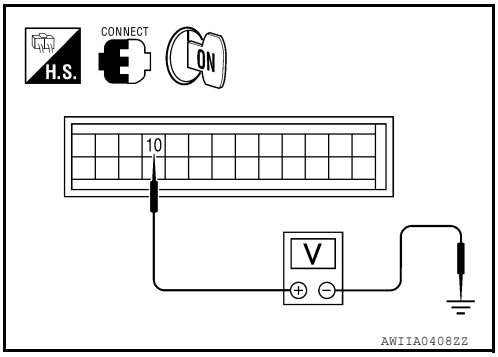
Connector	Terminal	—	Voltage (Approx.)
M180	10	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the defroster door motor harness connector M144.
2. Check voltage between front air control harness connector M180 terminal 10 and ground.



Connector	Terminal	—	Voltage (Approx.)
M180	10	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect defroster door for binding or mechanical failure. If defroster door moves freely, replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Replace the defroster door motor. Refer to VTL-17, "Removal and Installation".

BLOWER MOTOR CONTROL SYSTEM

System Description

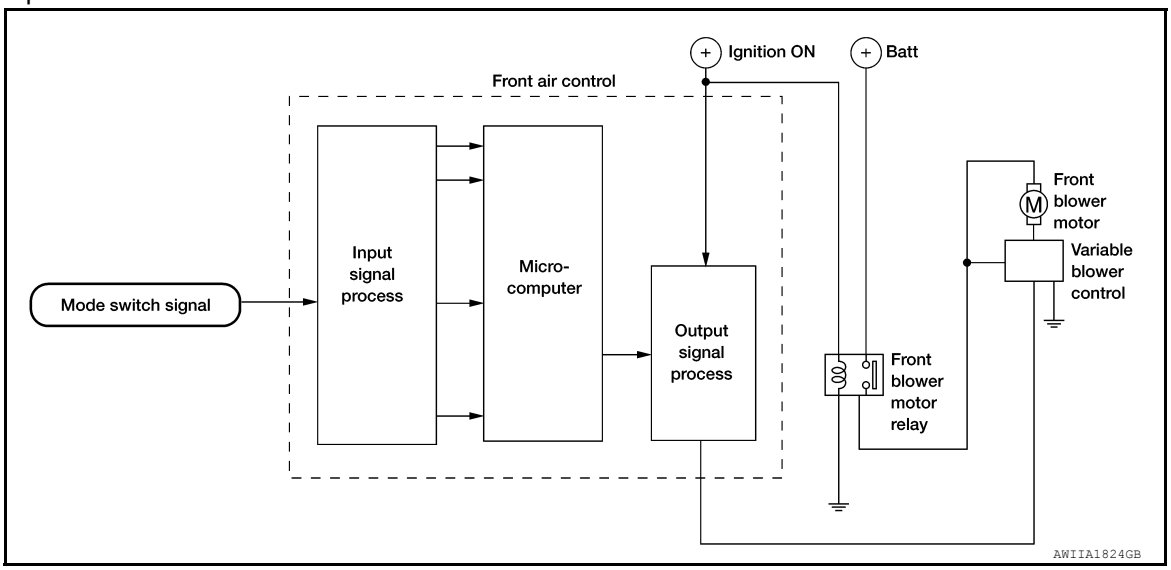
INFOID:0000000011560849

SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:
- Front air control
- Variable blower control
- Front blower motor relay
- Front blower motor
- Ambient sensor
- Intake sensor

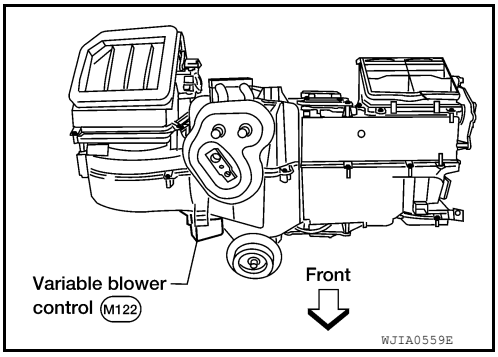
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control 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:0000000011560850

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-132, "Front Blower Motor Diagnosis Procedure".

Front Blower Motor Diagnosis Procedure

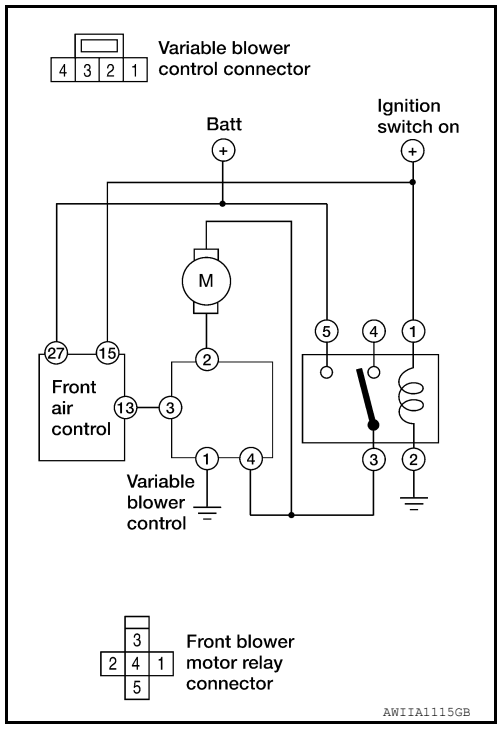
INFOID:0000000011560851

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

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 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to HAC-153, "Front Air Control Terminals Reference Values".

Fuses are good.

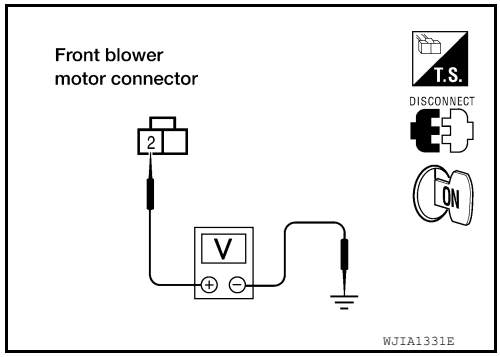
Is the inspection result normal?

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 11.
NO >> GO TO 3.

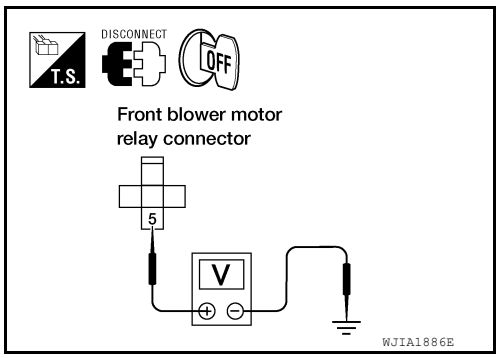
3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor relay.
3. Check voltage between front blower motor relay harness connector M107 terminal 5 and ground.

5 - 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-135, "Front Blower Motor Component Inspection".

Is the inspection result normal?

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

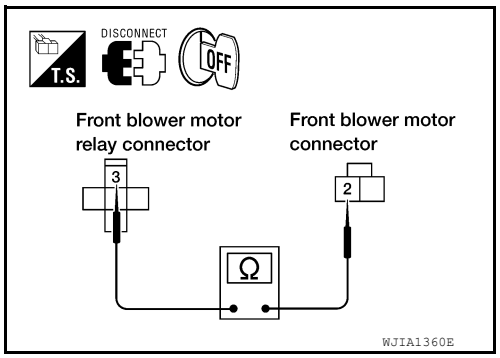
5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.

Is the inspection result normal?

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



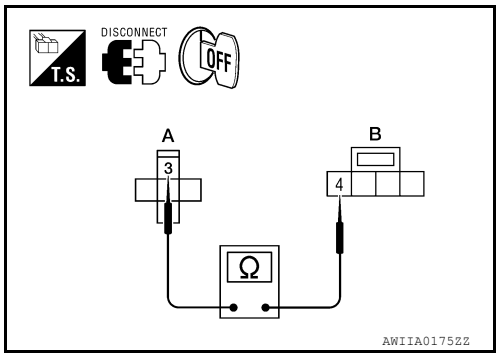
6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 4.

3 - 4 : Continuity should exist.

Is the inspection result normal?

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



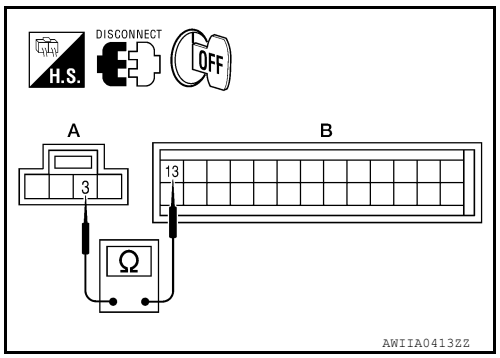
7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M180 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

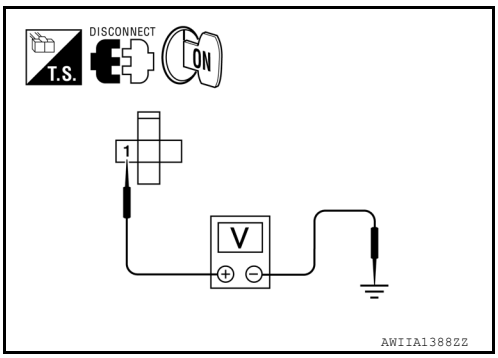
YES >> GO TO 8.
NO >> Repair harness or connector.



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 M107 terminal 1 and ground.

1 - Ground : Battery voltage



Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair front blower motor ground circuit or connector.

9. REPLACE FUSES

1. Replace fuses.
2. Activate the front blower motor.

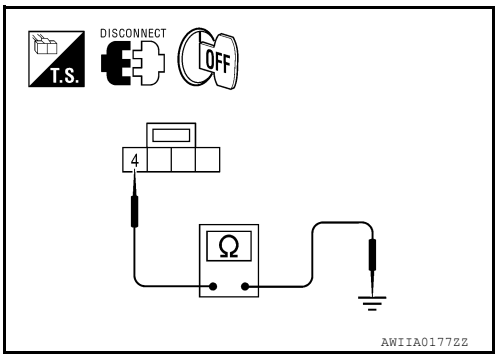
Does the fuse blow?

YES >> 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 M122 terminal 4 and ground.

4 - Ground : Continuity should not exist.



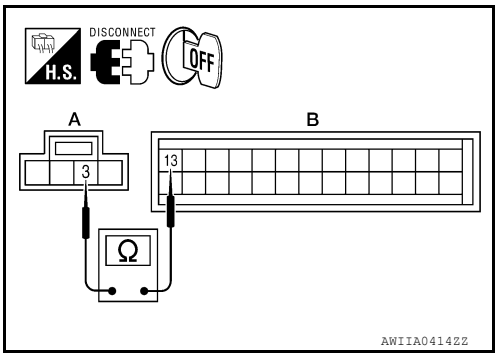
Is the inspection result normal?

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

11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M180 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.



Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair harness or connector.

12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to HAC-131, "Front Blower Motor Component Function Check".

Is the inspection result normal?

YES >> GO TO 13.
NO >> Replace front blower motor. Refer to VTL-12, "Removal and Installation".

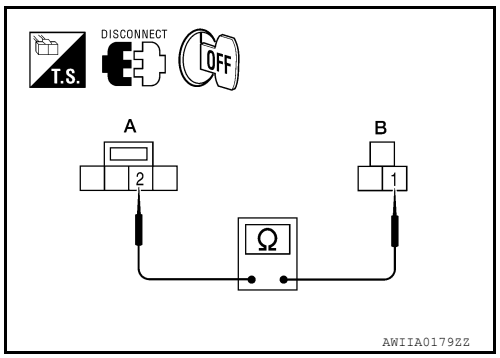
13. CHECK BLOWER MOTOR GROUND CIRCUIT

Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M122 (A) terminal 2.

1 - 2 : Continuity should exist.

Is the inspection result normal?

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



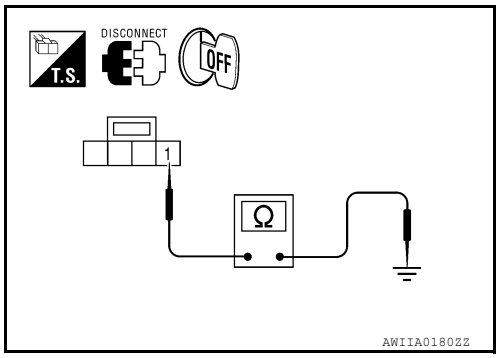
14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to VTL-22, "Removal and Installation".
NO >> Repair harness or connector.

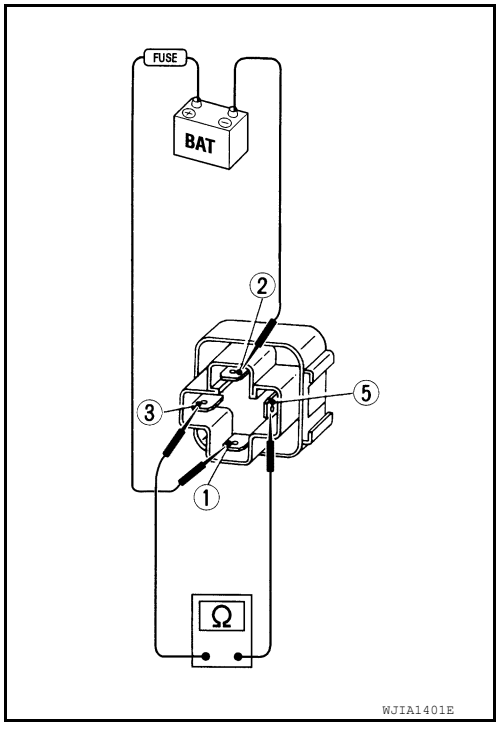


Front Blower Motor Component Inspection

INFOID:0000000011560852

COMPONENT INSPECTION

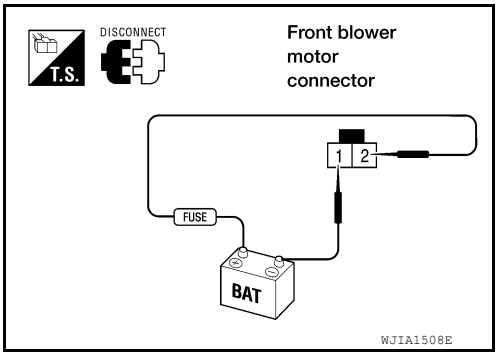
Check continuity between terminals 3 and 5 by supplying 12 volts and ground to coil side terminals 1 and 2 of the relay.



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:0000000011560853

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:0000000011560854

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Turn ignition switch ON.
2. Turn the blower control dial to low speed and 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-137, "Magnet Clutch Diagnosis Procedure".

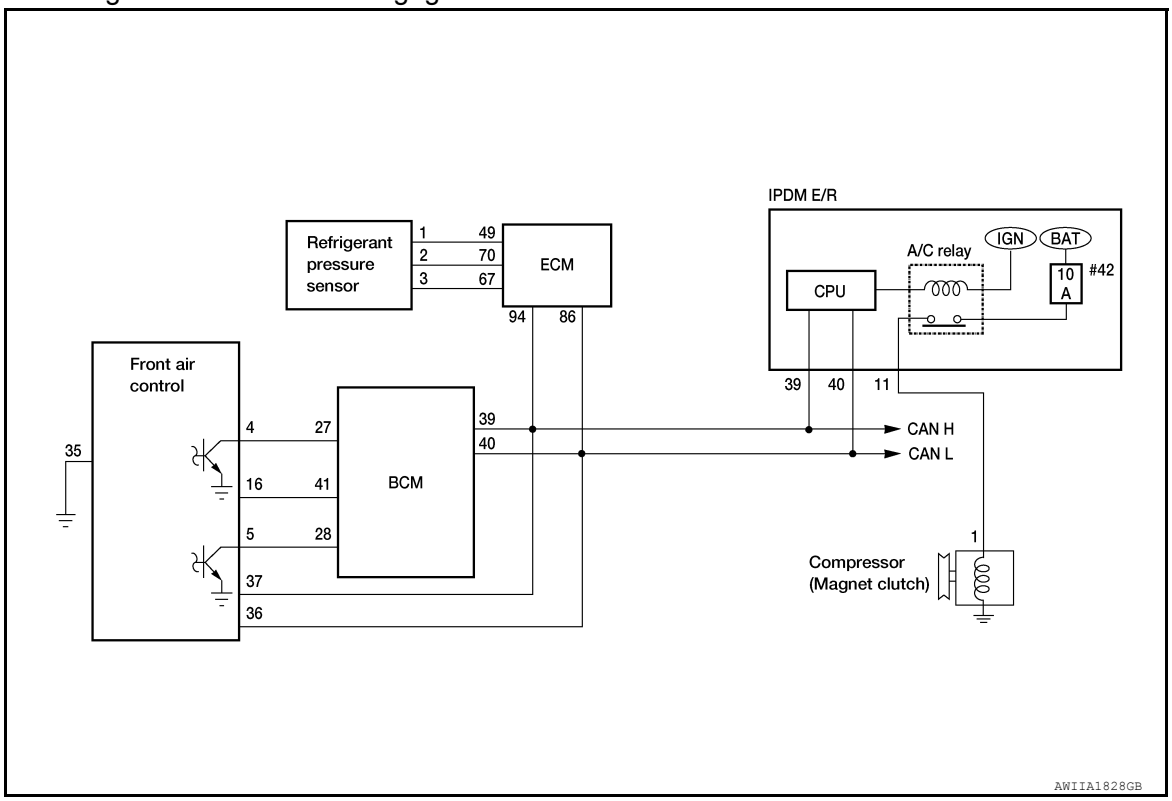
Magnet Clutch Diagnosis Procedure

INFOID:0000000011560855

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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-114, "Front Air Control Self-Diagnosis".

Is the inspection result normal?

YES >> GO TO 2.

NO >> • Malfunctioning intake sensor. Refer to HAC-147, "Intake Sensor Diagnosis Procedure".
• Malfunctioning ambient sensor. Refer to HAC-144, "Ambient Sensor Diagnosis Procedure".

2. PERFORM AUTO ACTIVE TEST

Refer to PCS-11, "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.

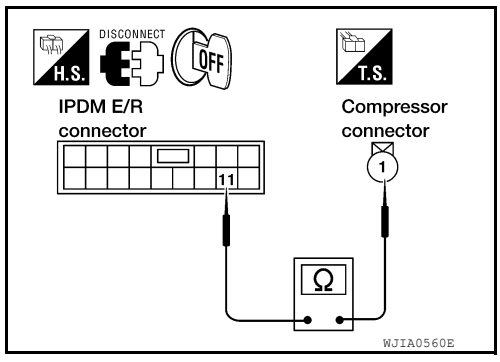
3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
3. 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.

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

11 – ground : Continuity should not exist.



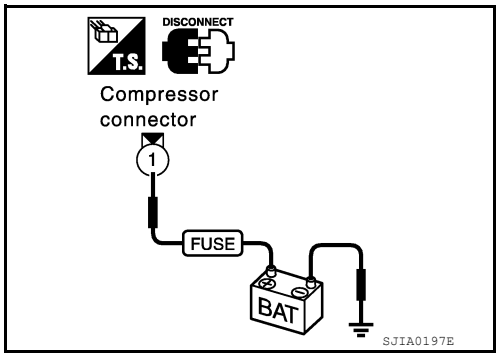
Is the inspection result normal?

YES >> GO TO 4.

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-33, "Removal and Installation".

5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to BCS-24, "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 8.
NO >> GO TO 6.

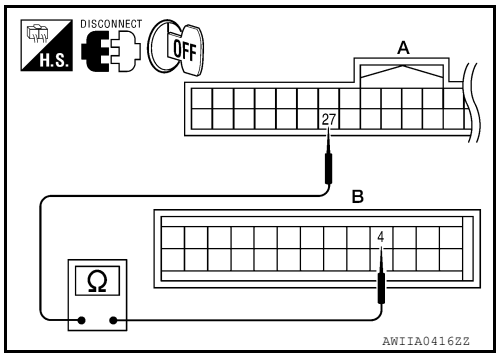
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M180 (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.

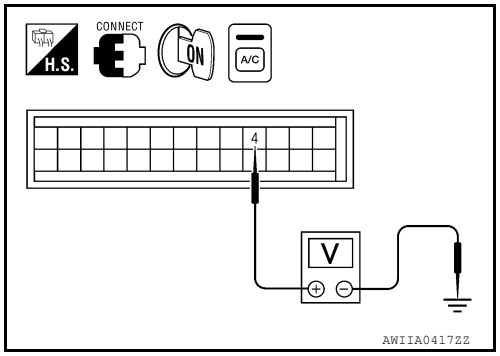


Is the inspection result normal?

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 M180 terminal 4 and ground.



Terminals			Condition	Voltage
(+)		(-)		
front air control connector	Terminal No.			
M180	4	Ground	A/C switch: ON	Approx. 0V
			A/C switch: OFF	Approx. 5V

Is the inspection result normal?

YES >> GO TO 8.

NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to VTL-8, "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 F54 terminal 70 and ground.

Terminals			Condition	Voltage
(+)		(-)		
ECM connector	Terminal No.			
F54	70	Ground	A/C switch: ON	Approx. 1.0 - 4.0V

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-488, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to BCS-24, "AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)".

FRONT BLOWER CONTROL DIAL ON : FAN ON SIG ON

FRONT BLOWER CONTROL DIAL OFF : FAN ON SIG OFF

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 10.

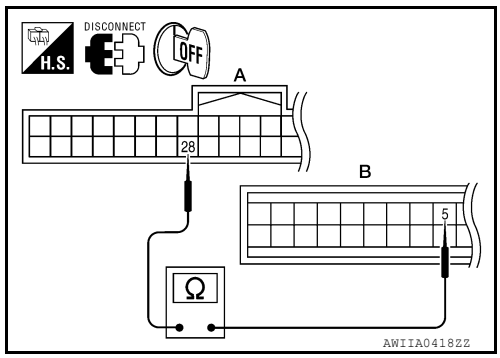
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M180 (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.



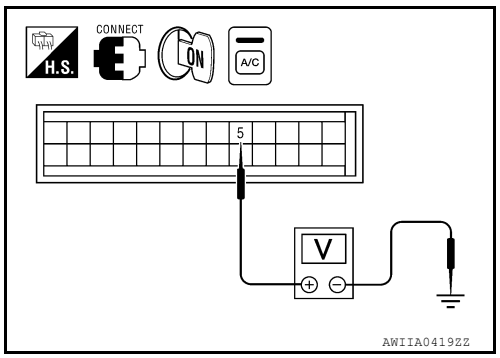
Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

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

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 terminal 5 and ground.



Terminals			Condition	Voltage
(+)		(-)		
front air control connector	Terminal No.			
M180	5	Ground	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-8, "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).

WATER VALVE CIRCUIT

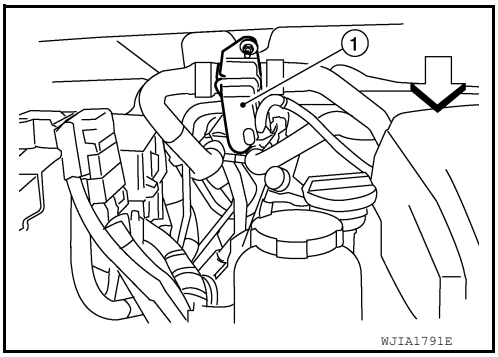
Description

INFOID:0000000011560856

COMPONENT DESCRIPTION

Water Valve

The water valve (1) cuts the flow of engine coolant to the heater core to allow for maximum cooling during A/C operation. It is controlled by the front air control.



Water Valve Diagnosis Procedure

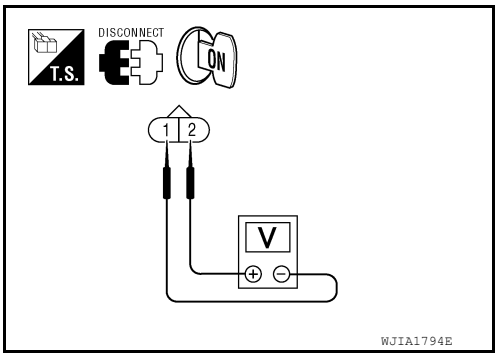
INFOID:0000000011560857

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F68.
2. Turn ignition switch ON.
3. Rotate temperature control dial to maximum heat.
4. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum cold.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	2	1	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

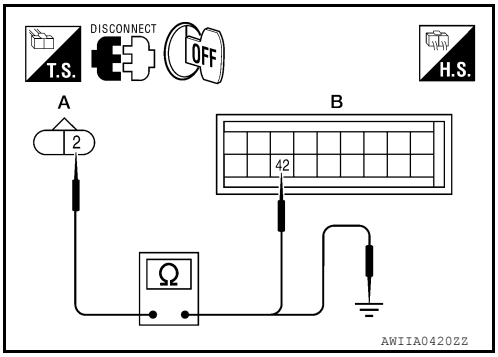
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M181.
3. Check continuity between water valve harness connector F68 (A) terminal 2 and front air control harness connector M181 (B) terminal 42.

2 - 42 : Continuity should exist.

4. Check continuity between water valve harness connector F68 (A) terminal 2 and ground.

2 - Ground : Continuity should not exist.



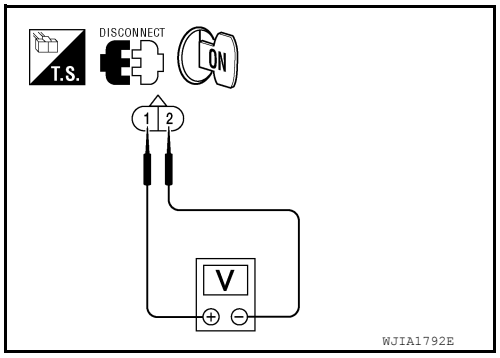
Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".

NO >> Repair harness or connector.

3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial to maximum cold.
2. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum heat.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	1	2	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

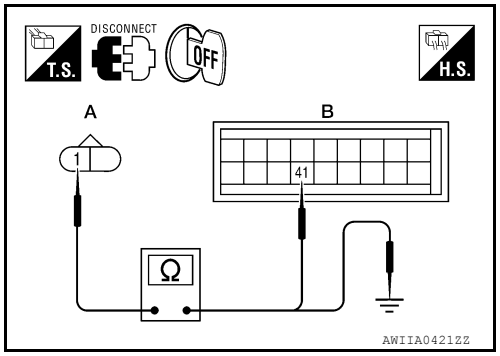
4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M181.
3. Check continuity between water valve harness connector F68 (A) terminal 1 and front air control harness connector M181 (B) terminal 41.

1 - 41 : Continuity should exist.

4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

1 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Repair harness or connector.

AMBIENT SENSOR

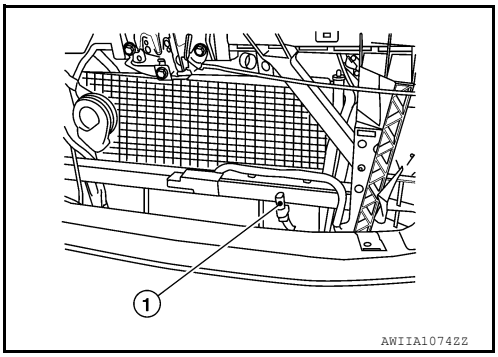
Component Description

INFOID:0000000011560858

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.

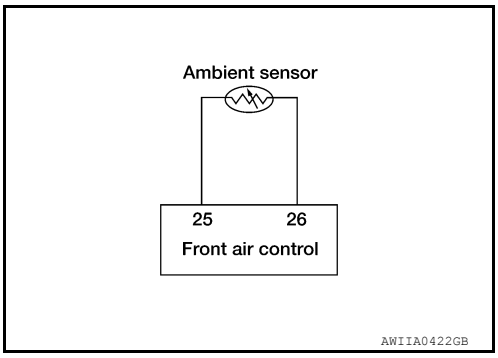
Ambient Sensor Diagnosis Procedure

INFOID:0000000011560859

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

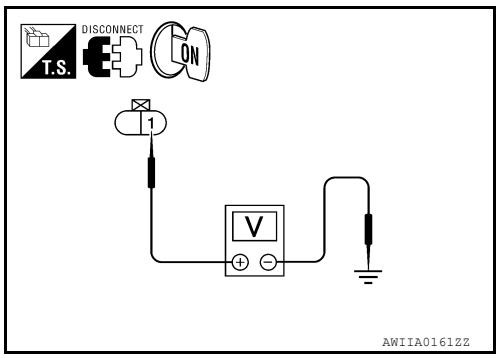
SYMPTOM: Ambient sensor circuit is open or shorted.



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E1 terminal 1 and ground.

1 - Ground : Approx. 5V



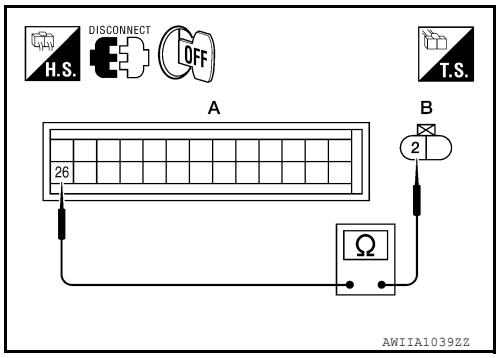
Is the inspection result normal?

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 E1 (B) terminal 2 and front air control harness connector M180 (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-144, "Ambient Sensor Diagnosis Procedure".

Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. GO TO HAC-114, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> 1. Replace ambient sensor. Refer to HA-45, "Removal and Installation".
2. GO TO HAC-114, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

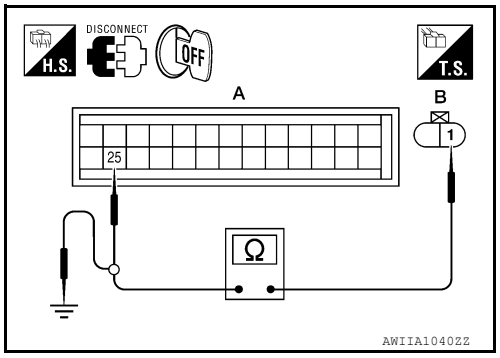
4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E1 (B) terminal 1 and front air control harness connector M180 (A) terminal 25.

1 - 25 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E1 (B) terminal 1 and ground.

1 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. GO TO HAC-114, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> Repair harness or connector.

Ambient Sensor Component Inspection

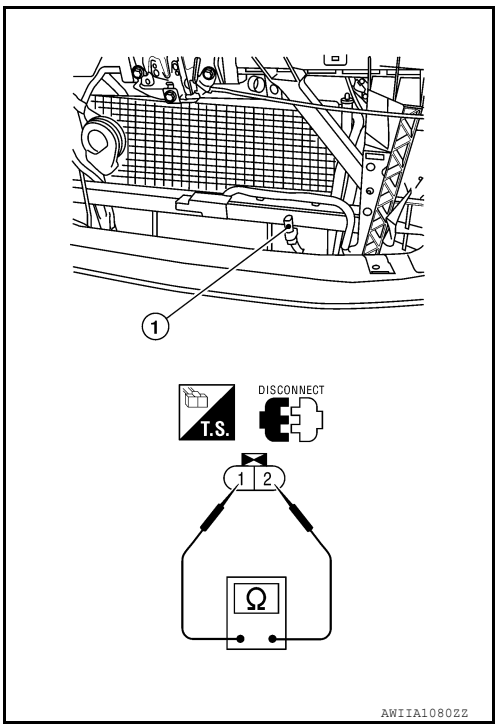
INFOID:0000000011560860

COMPONENT INSPECTION

Ambient Sensor

After disconnecting ambient sensor (1) connector E1, measure resistance between terminals 1 and 2 at sensor component side, using the table below.

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-45, "Removal and Installation".

INTAKE SENSOR

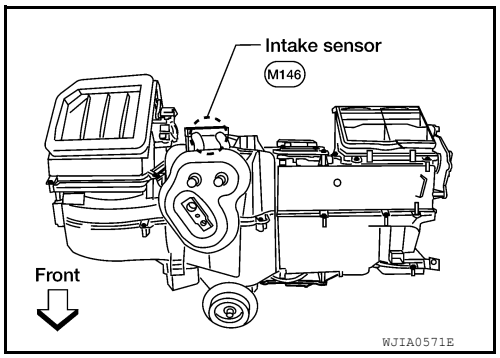
System Description

INFOID:0000000011560861

COMPONENT DESCRIPTION

Intake Sensor

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



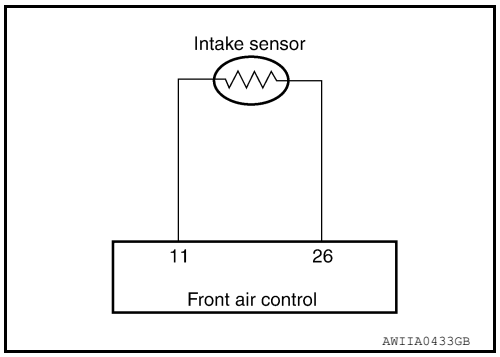
Intake Sensor Diagnosis Procedure

INFOID:0000000011560862

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



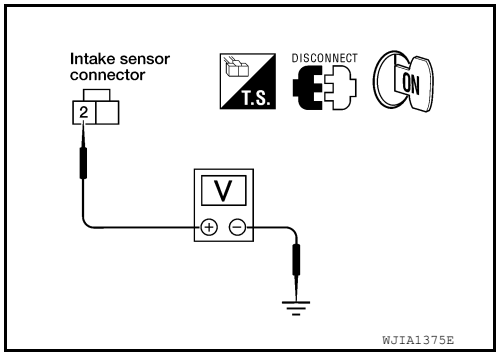
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

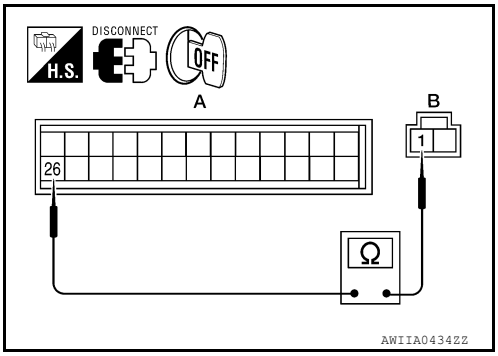
Is the inspection result normal?

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



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

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 M180 (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

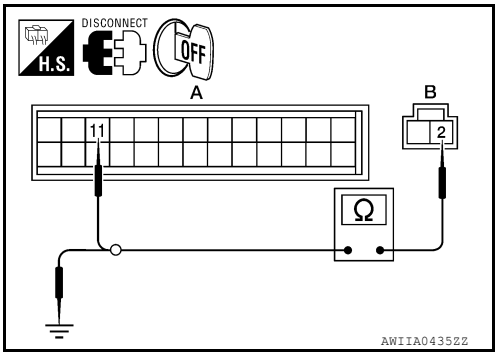
Check intake sensor. Refer to HAC-148, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> 1. Replace front air control. Refer to VTL-8, "Removal and Installation".
2. Go to HAC-114, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> 1. Replace intake sensor. Refer to VTL-11, "Removal and Installation".
2. Go to HAC-114, "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 M180 (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-8, "Removal and Installation".
2. Go to HAC-114, "Front Air Control Self-Diagnosis" and perform self-diagnosis.
NO >> Repair harness or connector.

Intake Sensor Component Inspection

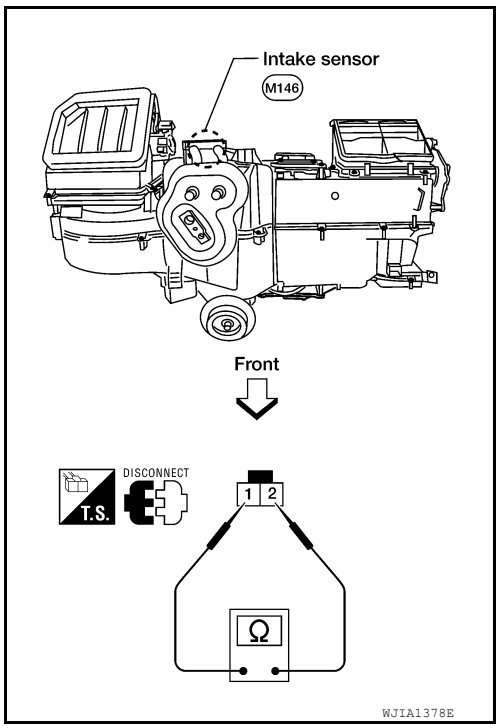
INFOID:0000000011560863

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
40 (104)	16.1
45 (113)	13.2



If NG, replace intake sensor. Refer to VTL-11, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

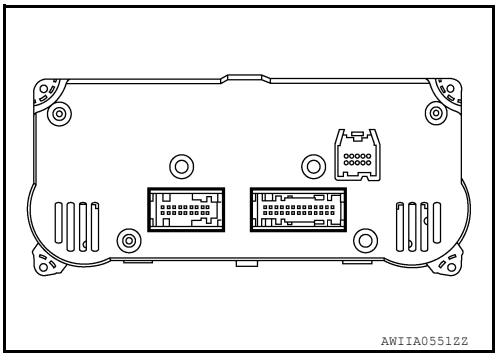
INFOID:0000000011560864

COMPONENT DESCRIPTION

Front Air Control

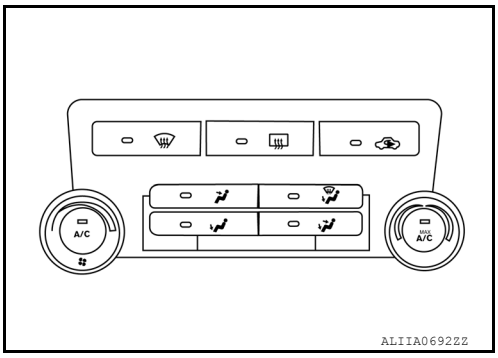
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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.



Potentio 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 control dial.



Front Air Control Component Function Check

INFOID:0000000011560865

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - AUTO MODE

1. Turn the blower control dial clockwise to low speed.
2. Press the A/C Turn the blower control dial clockwise to low speed.
3. 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-150, "Front Air Control Power and Ground Diagnosis Procedure".

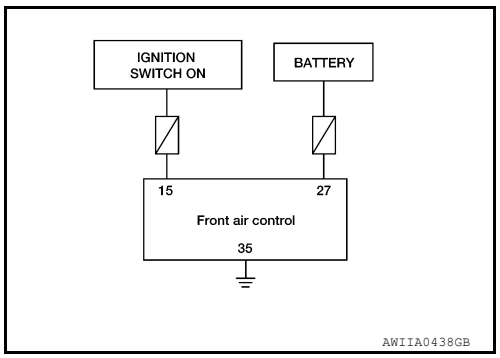
Front Air Control Power and Ground Diagnosis Procedure

INFOID:0000000011560866

Regarding Wiring Diagram information, refer to HAC-155, "Wiring Diagram - Manual With 2 Control Dial System".

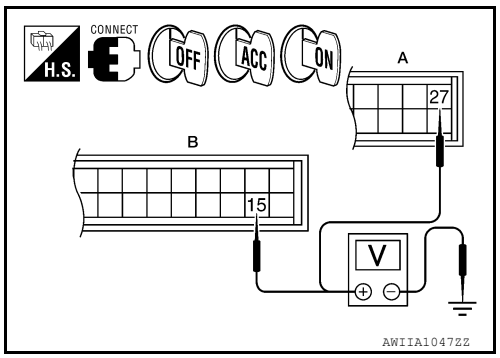
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

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 M180 (B) terminal 15 and M181 (A) terminal 27, and ground.



Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
Front air control connector	Terminal No.				
M180	15	Ground	Approx. 0V	Approx. 0V	Battery voltage
M181	27		Battery voltage	Battery voltage	Battery voltage

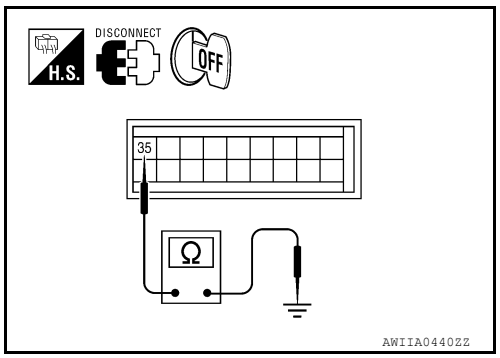
Is the inspection result normal?

YES >> GO TO 2.
NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to HAC-153, "Front Air Control Terminals Reference Values".
- 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 M181 terminal 35 and ground.

35 - Ground : Continuity should exist.



Is the inspection result normal?

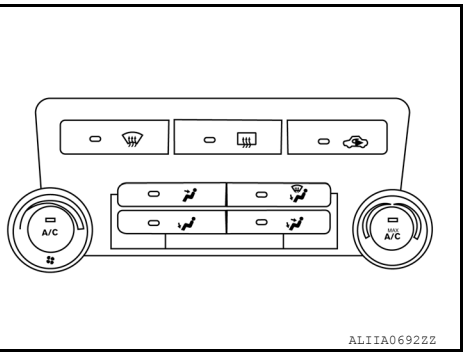
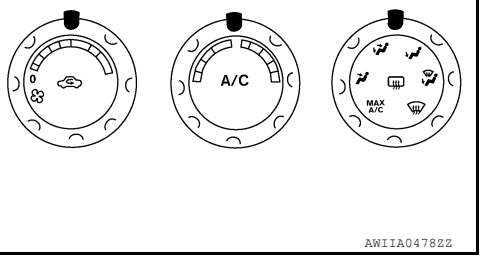
OK >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NG >> Repair harness or connector.

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560867

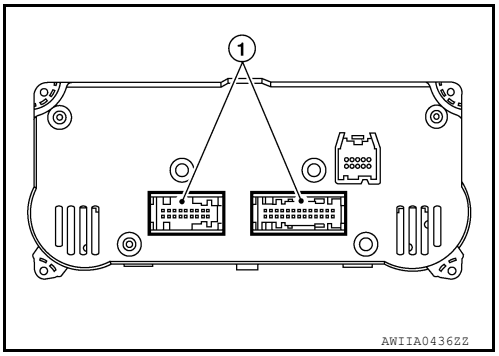
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

AIR CONDITIONER CONTROL

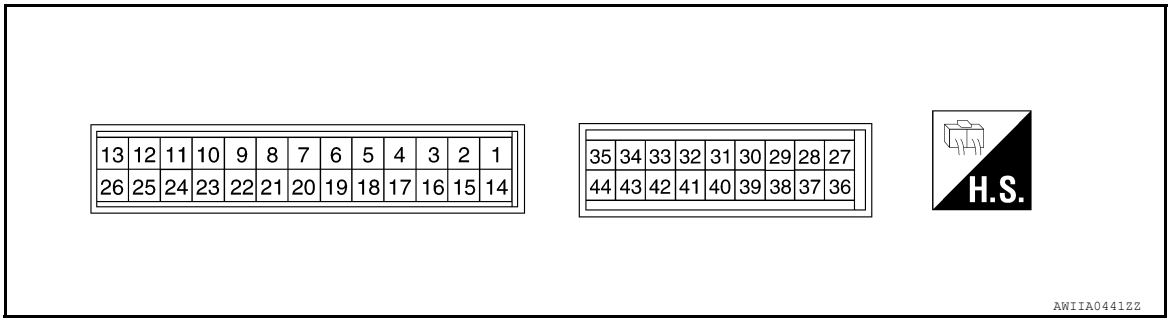
Front Air Control Terminals Reference Values

INFOID:0000000011560868

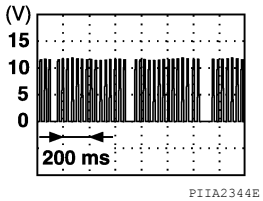
Measure voltage between each terminal and ground by following Terminals and Reference Value for front air control (1).



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.)
3	P	V ref ACTR (ground)	ON	-	5V
4	W/R	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
5	L/R	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
6	SB	Air mix door motor feedback	ON	-	0 - 5V
7	GR	Mode door motor feedback	ON	-	0 - 5V
8	R/L	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	
10	LG/B	Defroster door motor feedback	ON	-	0 - 5V
11	L/B	Intake sensor	ON	-	0 - 5V
13	G/R	Variable blower control	ON	-	0 - 5V
15	Y/G	Power supply for IGN	ON	-	Battery voltage
16	Y/B	Rear defogger request *1	ON	-	Battery voltage
17	W/G	Air mix door motor CW	ON	Clockwise rotation	Battery voltage
18	G	Air mix door motor CCW	ON	Counterclockwise rotation	Battery voltage

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
19	BR/W	Mode door motor CW	ON	Clockwise rotation	Battery voltage
20	P/L	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	G/B	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
22	O	Intake door motor CW	ON	Clockwise rotation	Battery voltage
23	LG	Defroster door motor CW	ON	Clockwise rotation	Battery voltage
24	P/B	Defroster door motor CCW	ON	Counterclockwise rotation	Battery voltage
25	P	Ambient sensor	ON	-	0 - 5V
26	V/R	Sensor ground	ON	-	0V
27	Y/R	Power supply for BAT	-	-	Battery voltage
28	Y	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
41	Y/L	Water valve	ON	Water valve open	Battery voltage
				Water valve closed	0V
42	W/G	Water valve	ON	Water valve open	0V
				Water valve closed	Battery voltage

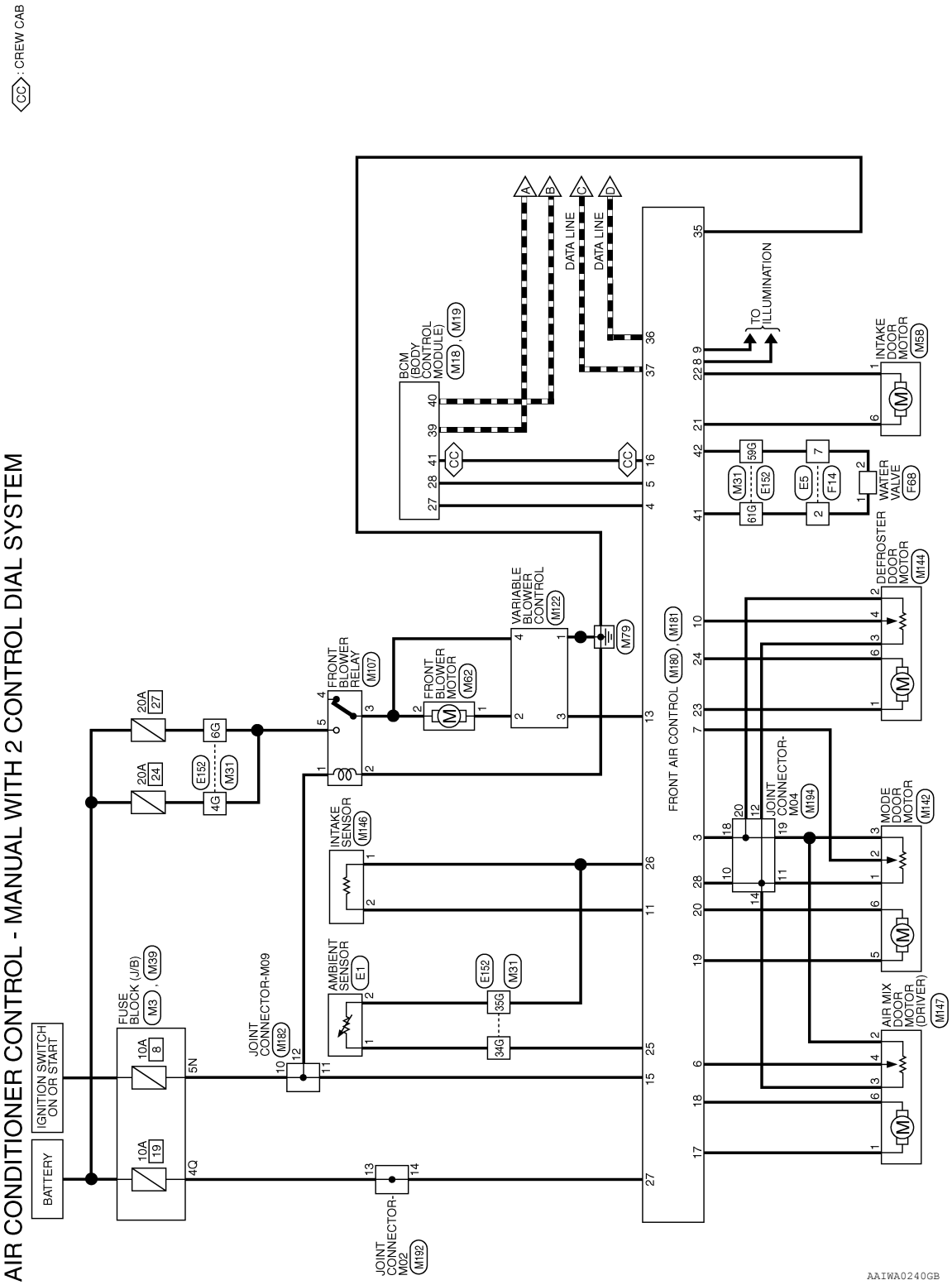
*1: If equipped

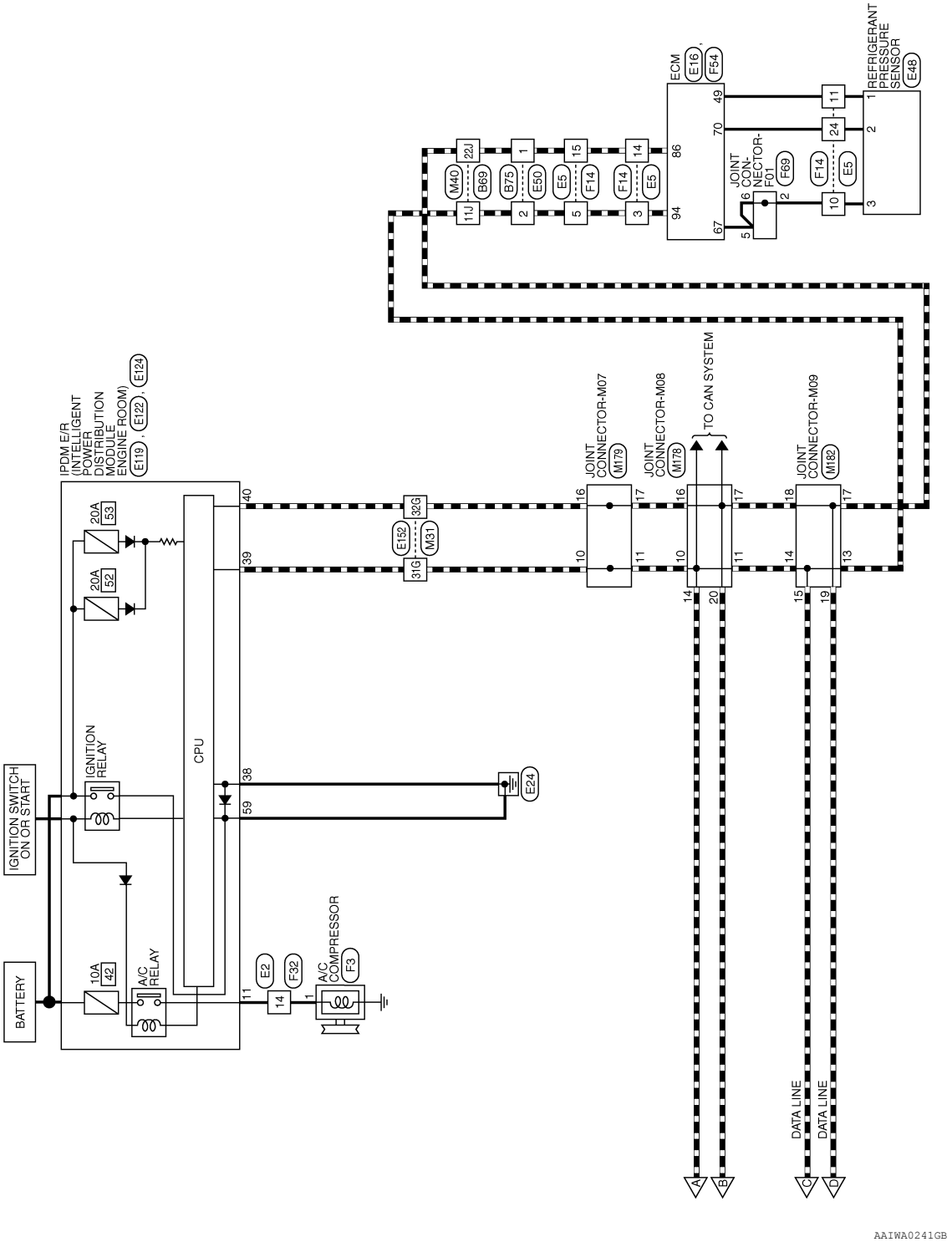
WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - Manual With 2 Control Dial System

INFOID:0000000011560869





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AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH 2 CONTROL DIAL SYSTEM

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

H.S.

3N 1N 2N 4N 5N 6N 7N 8N

Terminal No.	Color of Wire	Signal Name
5N	Y/G	–

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

H.S.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

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

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

H.S.

41	42	43	44	45	46	47	48	49
50	51	52	53	54	55			

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

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

H.S.

1G 2G 3G 4G 5G
6G 7G 8G 9G 10G
11G 12G 13G 14G 15G 16G 17G 18G 19G 20G 21G
22G 23G 24G 25G 26G 27G 28G 29G 30G
31G 32G 33G 34G 35G 36G 37G 38G 39G 40G 41G
42G 43G 44G 45G 46G 47G 48G 49G 50G
51G 52G 53G 54G 55G 56G 57G 58G 59G 60G 61G
62G 63G 64G 65G 66G 67G 68G 69G 70G
71G 72G 73G 74G 75G 76G 77G 78G 79G 80G 81G
82G 83G 84G 85G 86G 87G 88G 89G 90G
91G 92G 93G 94G 95G
96G 97G 98G 99G 100G

Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
34G	P	–
35G	V/R	–
59G	W/G	–
61G	Y/L	–

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

H.S.

3Q 2Q 1Q
8Q 7Q 6Q 5Q 4Q

Terminal No.	Color of Wire	Signal Name
4Q	Y/R	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	O	–
6	G/B	–

Connector No.	M122
Connector Name	VARIABLE BLOWER CONTROL (2 CONTROL DIAL SYSTEM OR AUTO A/C)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	B/W	–
2	L/W	–
3	G/R	–
4	W/L	–

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
11J	L	–
22J	P	–

Connector No.	M107
Connector Name	FRONT BLOWER RELAY
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/G	–
2	B	– (2 CONTROL DIAL SYSTEM OR AUTO A/C)
3	W/L	–
4	–	–
5	GR	–

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

H.S.

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

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Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
1	V/R	–
2	L/B	–

Connector No.	M144
Connector Name	DEFROSTER DOOR MOTOR
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	P	–
3	Y	–
4	LG/B	–
6	P/B	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y	–
2	GR	–
3	P	–
5	BR/W	–
6	P/L	–

Connector No.	M179
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
16	P	–
17	P	–

Connector No.	M178
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
14	L	–
16	P	–
17	P	–
20	P	–

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	W/G	–
2	P	–
3	Y	–
4	SB	–
6	G	–

ABIIA1417GB

Connector No.	M180
Connector Name	FRONT AIR CONTROL (WITH MANUAL 2 CONTROL DIAL SYSTEM)
Connector Color	BLACK

H.S.

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	–	–
2	–	–
3	P	V REF RET
4	W/R	AC REQ
5	L/R	FAN ON
6	SB	DRVR BLND DR FB
7	GR	PNL/FLR DR FB
8	R/L	ILLUM +
9	BR	ILLUM -

Terminal No.	Color of Wire	Signal Name
10	LG/B	DEFROST FEEDBACK
11	L/B	EVAP TEMP SENSOR
12	–	–
13	G/R	FRONT BLWR SPEED
14	–	–
15	Y/G	V IGN
16	Y/B	REAR DEF REQUEST
17	W/G	DRVR BLND DR A
18	G	DRVR BLND DR B
19	BR/W	PNL/FLR DR A
20	P/L	PNL/FLR DR B
21	G/B	RECIRC DRI A
22	O	RECIRC DRI B
23	LG	DEFROST DR A
24	P/B	DEFROST DR B
25	P	AMB TEMP SEN
26	V/R	SENS RETURN

Connector No.	M181
Connector Name	FRONT AIR CONTROL (WITH MANUAL 2 CONTROL DIAL SYSTEM)
Connector Color	WHITE

H.S.

35	34	33	32	31	30	29	28	27
44	43	42	41	40	39	38	37	36

Terminal No.	Color of Wire	Signal Name
27	Y/R	V BAT
28	Y	5V REF VOLTAGE
29	–	–
30	–	–
31	–	–
32	–	–
33	–	–
34	–	–
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	–	–
39	–	–
40	–	–
41	Y/L	WATER VALVE A
42	W/G	WATER VALVE B
43	–	–
44	–	–

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Connector No.	M182
Connector Name	JOINT CONNECTOR-M09
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y/G	–
11	Y/G	–
12	Y/G	–
13	L	–
14	L	–
15	L	–
17	P	–
18	P	–
19	P	–

Connector No.	M192
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
13	Y/R	–
14	Y/R	–

Connector No.	M194
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y	–
11	Y	–
12	Y	–
14	Y	–
18	P	–
19	P	–
20	P	–

Connector No.	E1
Connector Name	AMBIENT SENSOR
Connector Color	GRAY

H.S.

1	2

Terminal No.	Color of Wire	Signal Name
1	P	–
2	V/R	–

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
14	Y/B	–

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

ABIIA1430GB

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	R/Y	–
2	B/W	–
3	B	–

Connector No.	E50
Connector Name	WIRE TO WIRE
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	L	–

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

H.S.

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

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

H.S.

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

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

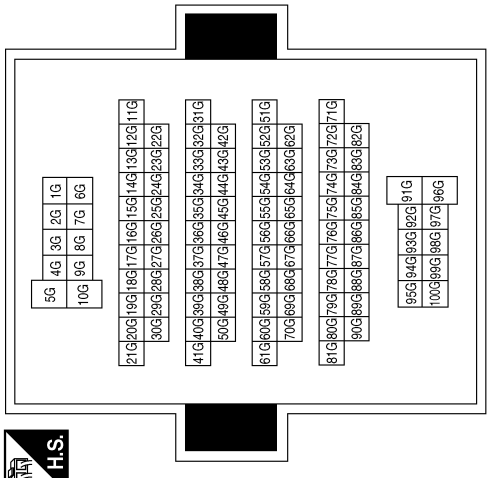
H.S.

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

ABIIA1418GB

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

H.S.



Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
34G	P	–
35G	V/R	–
59G	W/G	–
61G	Y/L	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/B	–

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

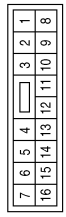
H.S.

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–

Terminal No.	Color of Wire	Signal Name
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

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

H.S.



Terminal No.	Color of Wire	Signal Name
14	Y/B	–

ABIIA1431GB

Connector No.	F54
Connector Name	ECM
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
49	R/Y	AVCC (PDPRES)
67	B	GND-A
70	B/W	PD PRESS

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY

H.S.

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

Connector No.	F69
Connector Name	JOINT CONNECTOR-F01
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	B	–
5	B	–
6	B	–

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
11J	L	–
22J	P	–

Connector No.	B75
Connector Name	WIRE TO WIRE
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	L	–

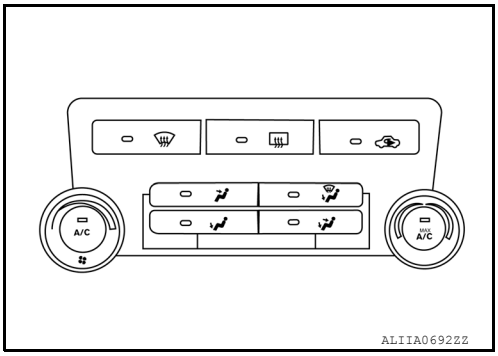
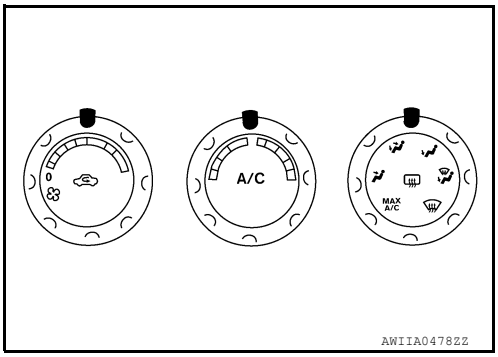
ABIIA1419GB

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560870

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000011560871

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-150
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-114
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-116
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-120
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-125
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-127
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-131
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-137
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-167
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-175
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-177
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-114

INSUFFICIENT COOLING

Component Function Check

INFOID:0000000011560872

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can the symptom be duplicated?

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

2.CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-99, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-166, "Symptom Matrix Chart".
NO >> System OK.

3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> If equipped with NAVI, GO TO 4.
>> If not equipped with NAVI, GO TO 5.

4.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis Refer to HAC-114, "Front Air Control Self-Diagnosis".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Refer to HAC-166, "Symptom Matrix Chart".

5.CHECK DRIVE BELTS

Check compressor belt tension. Refer to EM-13, "Checking Drive Belts".

Is the inspection result normal?

YES >> GO TO 6.
NO >> Adjust or replace compressor belt. Refer to EM-13, "Removal and Installation".

6.CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to HAC-120, "Air Mix Door Motor Component Function Check".

Does air mix door operate correctly?

YES >> GO TO 7.
NO >> Check air mix door motor circuit. Refer to HAC-121, "Air Mix Door Motor Diagnosis Procedure".

7.CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to EC-380, "Overall Function Check".

Does cooling fan motor operate correctly?

YES >> GO TO 8.
NO >> Check cooling fan motor. Refer to EC-381, "Diagnosis Procedure".

8.CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to HAC-142, "Description".

Does water valve operate correctly?

YES >> GO TO 9.

NO >> Check water valve circuit. Refer to HAC-142, "Water Valve Diagnosis Procedure".

9. 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 10.

10. 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 11.
NO >> Check contaminated refrigerant. Refer to HAC-178, "Working with HFC-134a (R-134a)".

11. 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-168, "Diagnostic Work Flow".
NO >> GO TO 12.

12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-170, "Performance Chart".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-168, "Diagnostic Work Flow".
NO >> GO TO 13.

13. 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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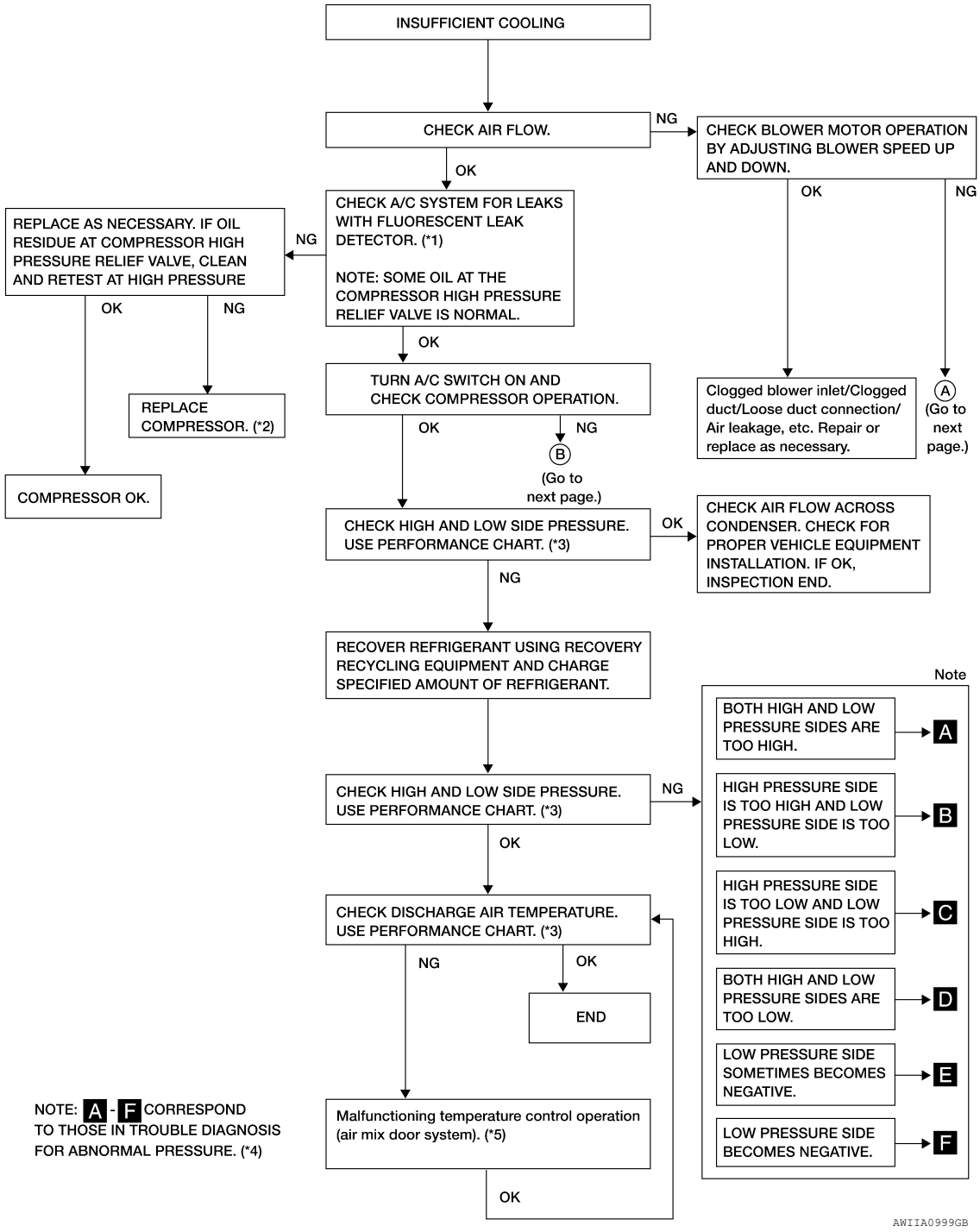
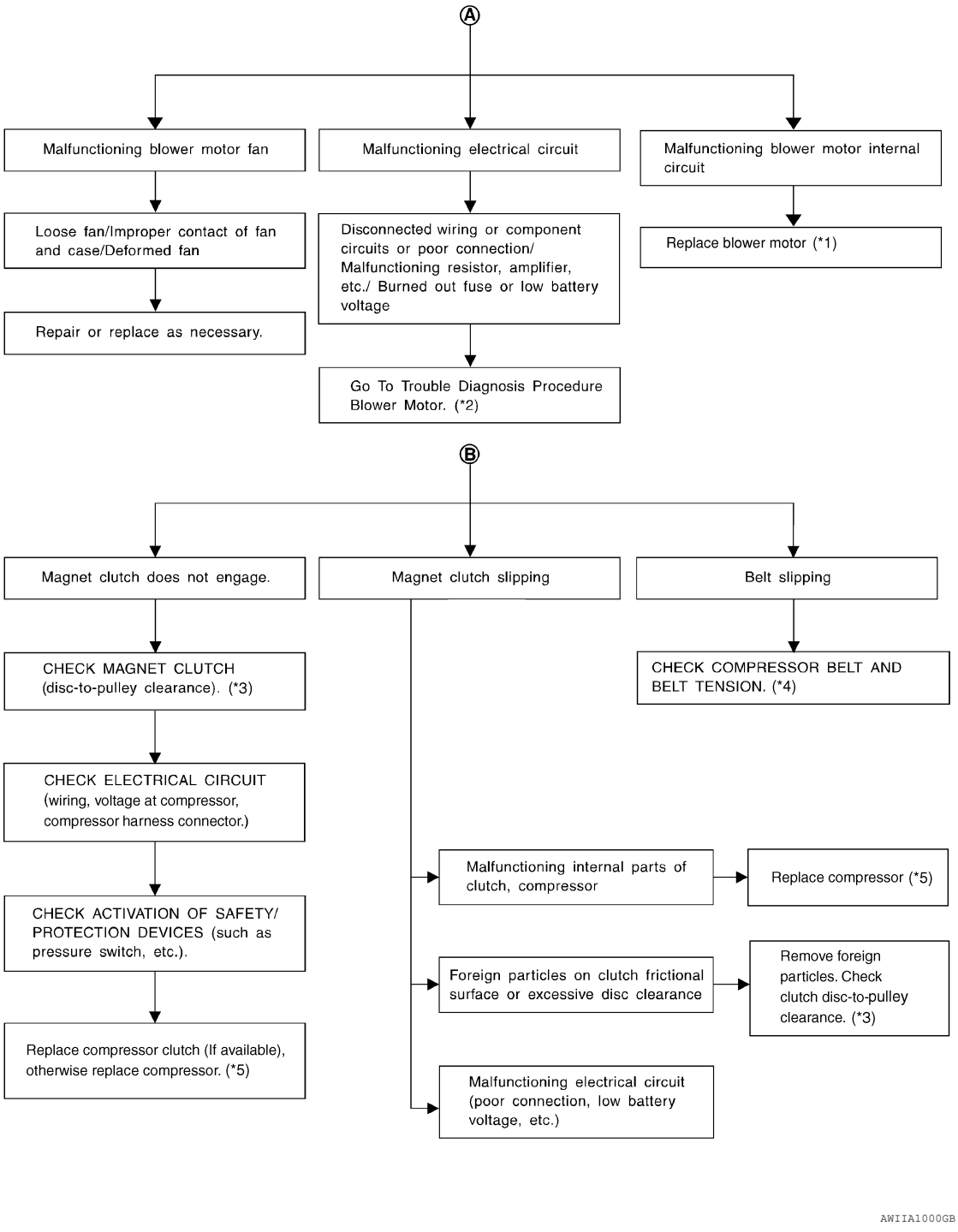


*1 HA-24, "Checking System for Leaks Using the Fluorescent Dye Leak Detector"
*2 HA-33, "Removal and Installation"
*3 HAC-170, "Performance Chart"
*4 HAC-171, "Trouble Diagnoses for Abnormal Pressure"
*5 HAC-120, "Air Mix Door Motor Component Function Check"



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*1 VTL-12, "Removal and Installation" *2 HAC-131, "Front Blower Motor Component Function Check" *3 HA-33, "Removal and Installation"

*4 EM-13, "Checking Drive Belts" *5 HA-33, "Removal and Installation"

Performance Chart

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TEST CONDITION

Testing must be performed as follows:

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)	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)

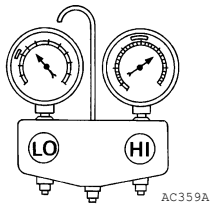
Trouble Diagnoses for Abnormal Pressure

INFOID:0000000011560875

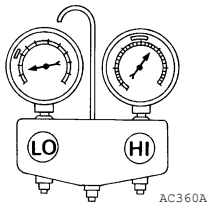
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the stan-

dard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table):

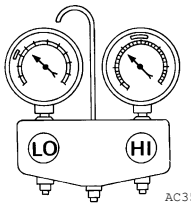
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
A Both high- and low-pressure sides are too high.  	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	• Clean condenser. • Check and repair cooling fan if necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 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.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• 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.

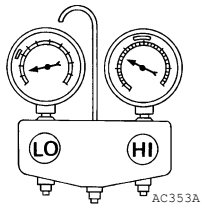
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
B High-pressure side is too high and low-pressure side is too low.  	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.	• Check and repair or replace malfunctioning parts. • Check oil for contamination.

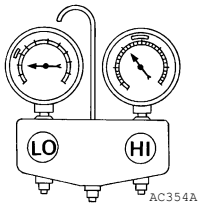
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
C High-pressure side is too low and low-pressure side is too high.  	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.

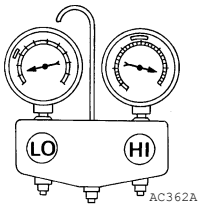
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
D Both high- and low-pressure sides are too low.  	• 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.	• Replace liquid tank. • Check oil for contamination.
	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	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-24, "Checking of Refrigerant Leaks" or HA-26, "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.	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	• Check intake sensor circuit. Refer to HAC-147, "Intake Sensor Diagnosis Procedure". • Repair evaporator fins. • Replace evaporator. • Refer to HAC-131, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
E Low-pressure side sometimes becomes negative. 	• 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.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
F Low-pressure side becomes negative. 	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	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. • 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:0000000011560876

SYMPTOM: Insufficient heating

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the blower control dial to low speed.
2. Turn the temperature control dial clockwise to maximum heat
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-99, "Operational Check".

2.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> If equipped with NAVI, GO TO 3.
>> If not equipped with NAVI, GO TO 4.

3.PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to HAC-114, "Front Air Control Self-Diagnosis".

Is the inspection results normal?

YES >> GO TO 4.
NO >> Refer to HAC-166, "Symptom Matrix Chart".

4.CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to CO-10, "Inspection".
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to CO-10, "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-120, "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 >> • Inlet hose cold: GO TO 11.
• Both hoses warm: GO TO 9.

8. CHECK ENGINE COOLANT SYSTEM

Check engine control temperature sensor. Refer to EC-192, "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-11, "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-15, "Removal and Installation".

11. CHECK WATER VALVE

Check the operation of the water valve. Refer to HAC-142, "Water Valve Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.
NO >> Replace water valve.

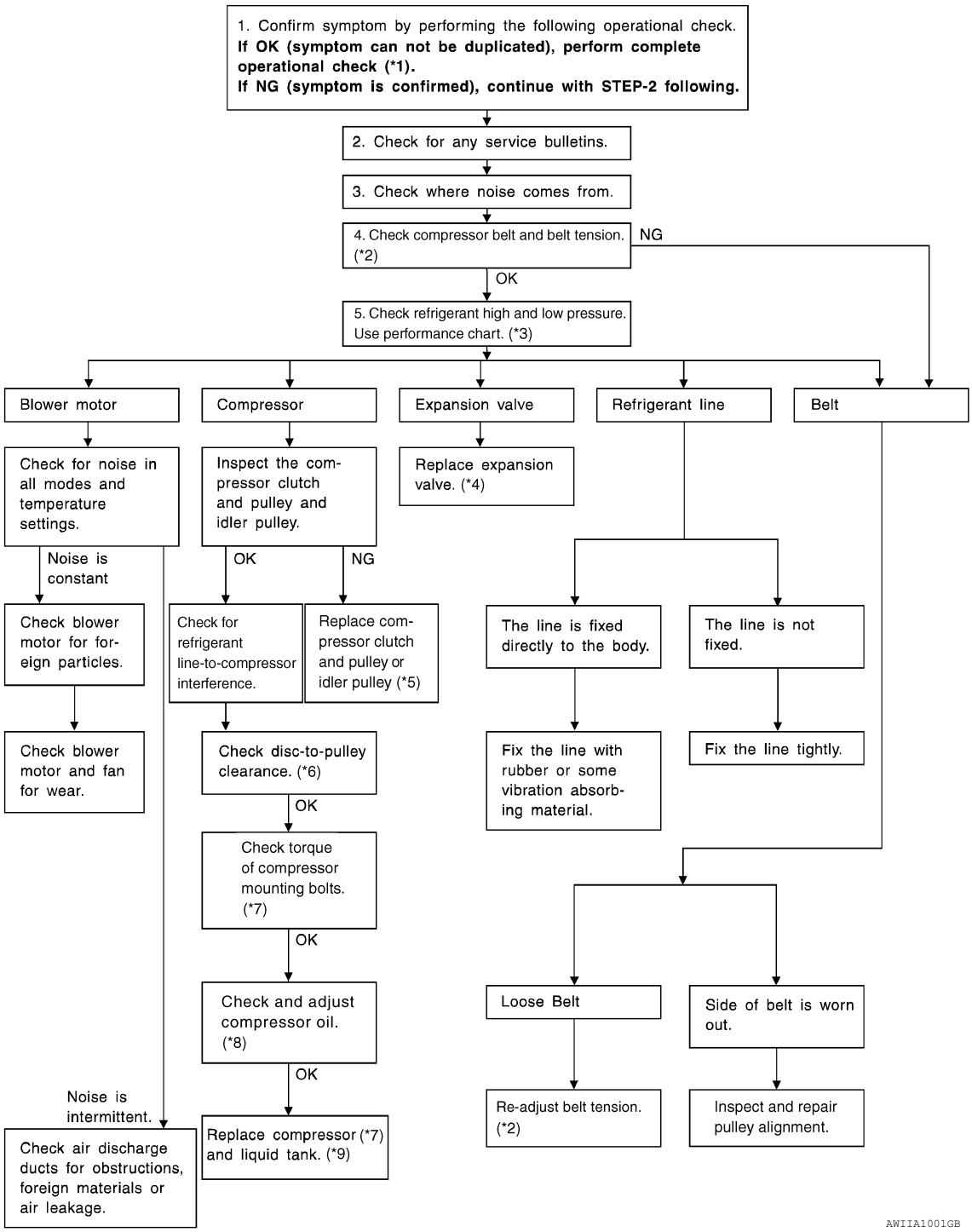
NOISE

Component Function Check

INFOID:0000000011560877

SYMPTOM: Noise

INSPECTION FLOW



*1 HAC-99, "Operational Check" *2 EM-13, "Checking Drive Belts" *3 EM-13, "Checking Drive Belts"
*4 HA-43, "Removal and Installation" *5 HA-33, "Removal and Installation" *6 HA-33, "Removal and Installation"
*7 HA-31, "Removal and Installation" *8 HA-31, "Removal and Installation" *9 HA-41, "Removal and Installation"

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011560878

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:0000000011560879

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-4, "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

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

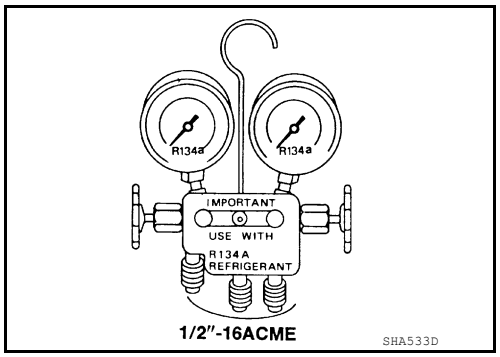
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location 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:0000000011560880

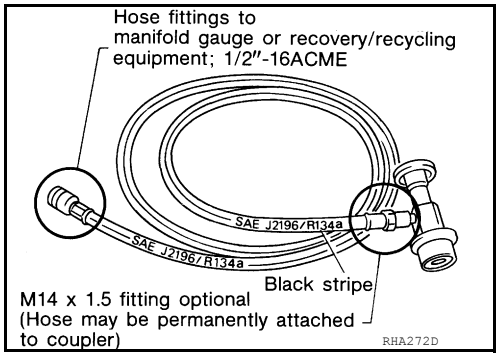
MANIFOLD GAUGE SET

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

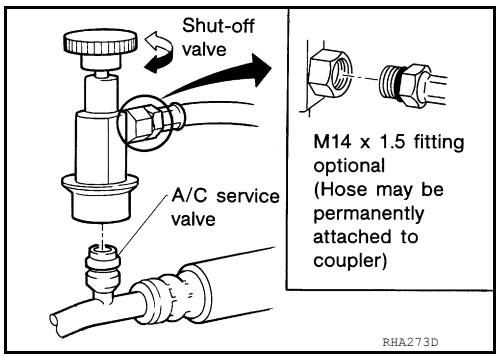
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



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



BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

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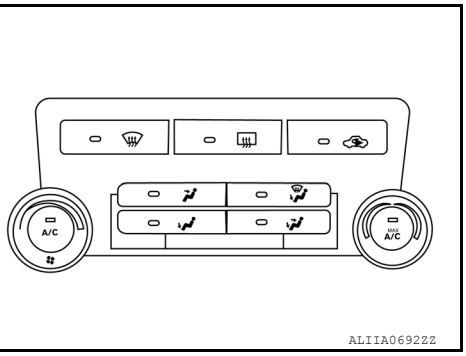
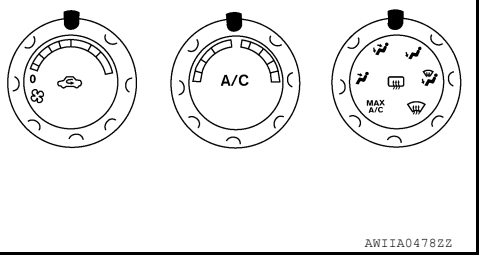
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000011560882

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-182, "Operational Check".

>> GO TO 4.

4.GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to HAC-243, "Symptom Matrix Chart".

>> GO TO 5.

5.REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 7.

6.FINAL CHECK

Final check.

Is the inspection result normal?

YES >> Inspection End.
NO >> GO TO 4.

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:0000000011560883

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. 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-212, "Front Blower Motor Diagnosis Procedure".
If OK, continue with next check.

CHECKING DISCHARGE AIR

1. Rotate MODE control dial to each position and the DEF mode.
2. Confirm that discharge air comes out according to the air distribution table. Refer to HAC-191, "Discharge Air Flow".
   Mode door position is checked in the next step.
   If NG, go to trouble diagnosis procedure for HAC-197, "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-206, "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 counterclockwise until maximum cold.
2. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for HAC-244, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-202, "Air Mix Door Motor Diagnosis Procedure".
If OK, continue the check.

CHECKING TEMPERATURE INCREASE

1. Rotate temperature control dial clockwise until maximum hot.
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-252, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-202, "Air Mix Door Motor Diagnosis Procedure".
If OK, continue with next check.

CHECK A/C SWITCH

1. Press A/C switch.

- 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.

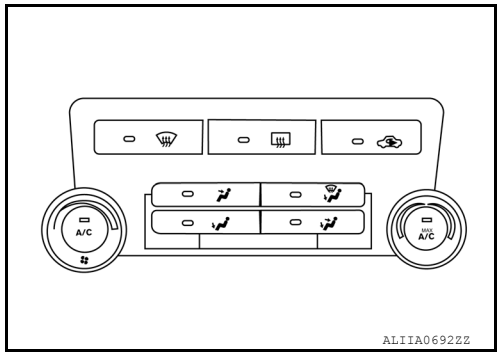
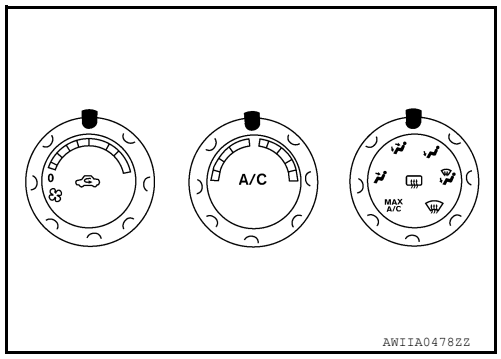
If NG, go to trouble diagnosis procedure for HAC-217, "Magnet Clutch Diagnosis Procedure".
If all operational checks are OK (symptom cannot be duplicated), go to HAC-181, "How to Perform Trouble Diagnosis For Quick And Accurate Repair" and perform tests as outlined. If symptom appears, refer to HAC-243, "Symptom Matrix Chart" and perform applicable trouble diagnosis procedures.

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560884

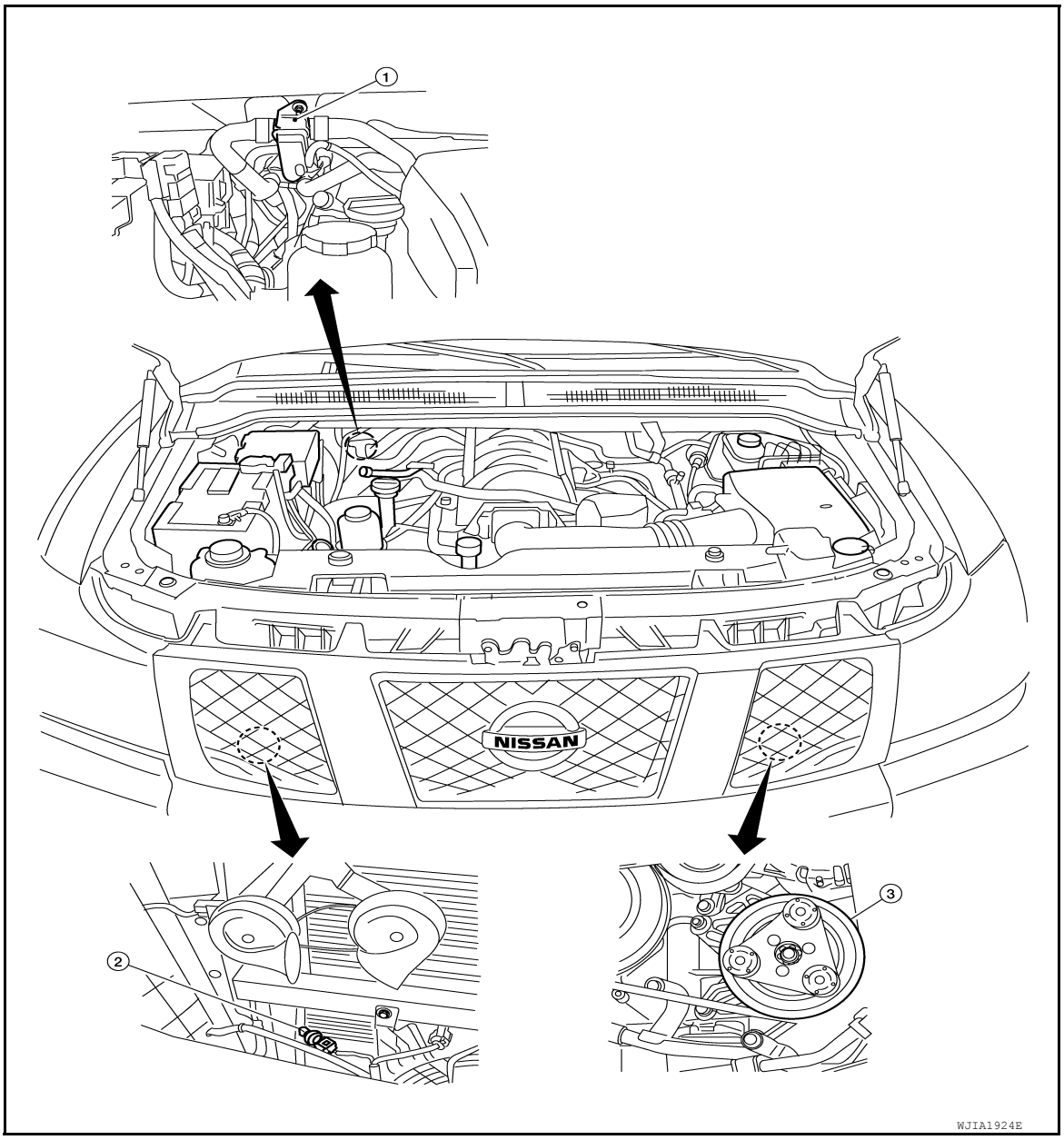
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

FUNCTION INFORMATION

Component Part Location

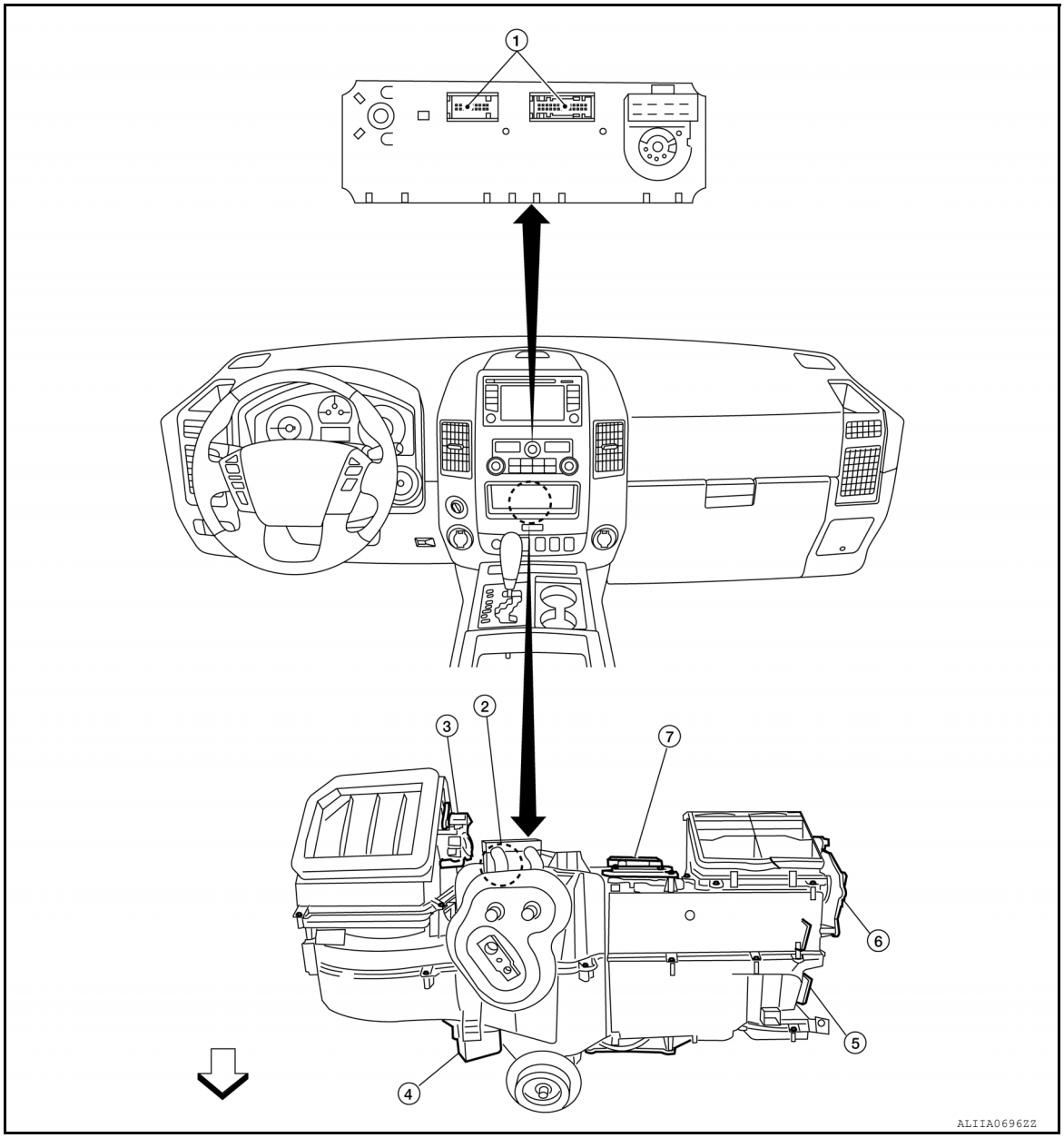
INFOID:0000000011560885

ENGINE COMPARTMENT



1. Water valve F68
2. Refrigerant pressure sensor E48 (view with grille removed)
3. A/C compressor F3

PASSENGER COMPARTMENT



1. Front air control M176, M177
2. Intake sensor M146
3. Intake door motor M58
4. Variable blower control M121
5. Mode door motor M142
6. Defroster door motor M144
7. Air mix door motor M147

Symptom Table

INFOID:0000000011560886

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-227
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-197
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-201
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-205
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-207
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-211
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-217
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-244
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-252
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-254

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:0000000011560887

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:0000000011560888

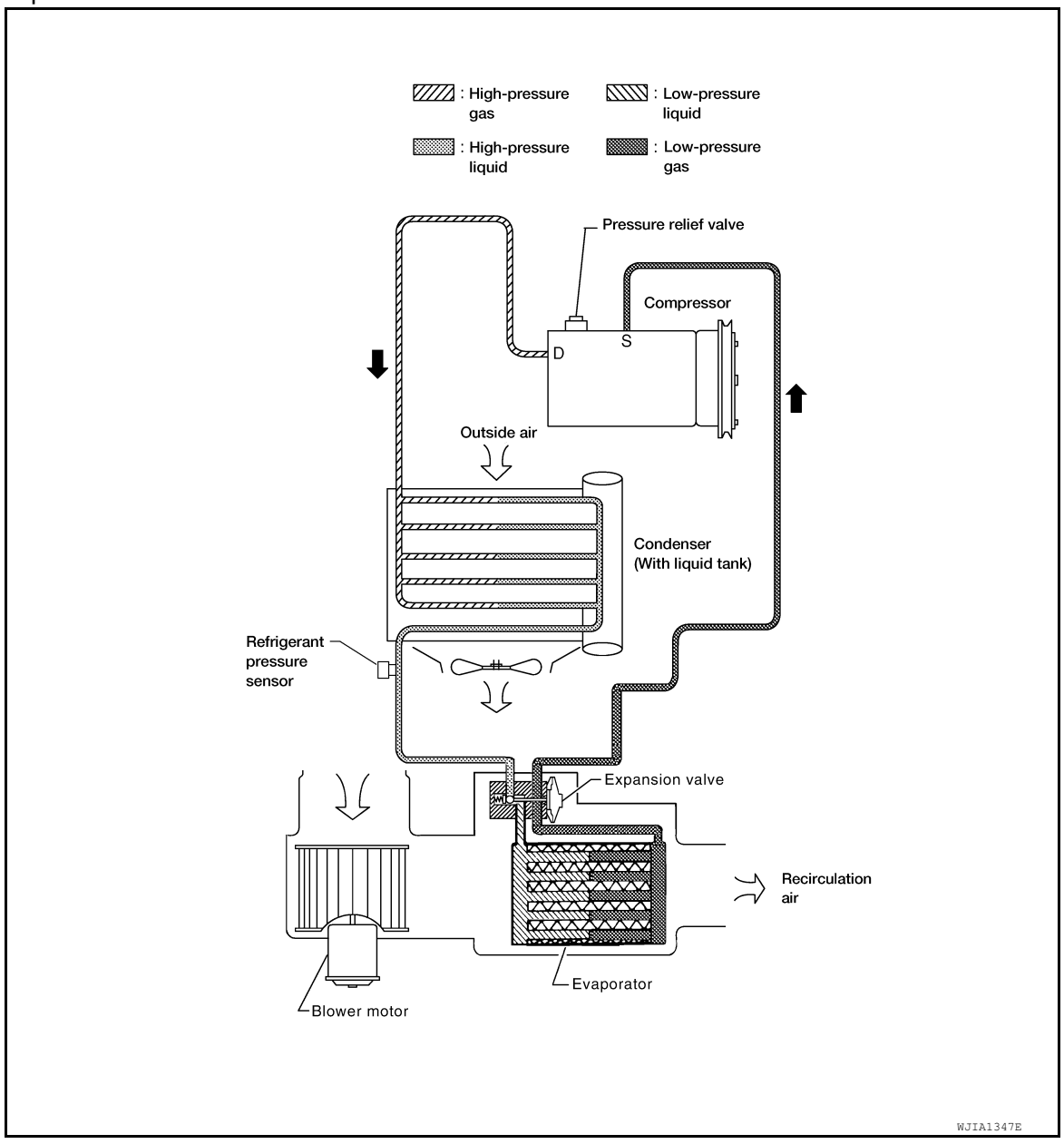
REFRIGERANT PRESSURE SENSOR

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/cm^2, 398 psi), or below about 120 kPa (1.22 kg/cm^2, 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/

cm^2, 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



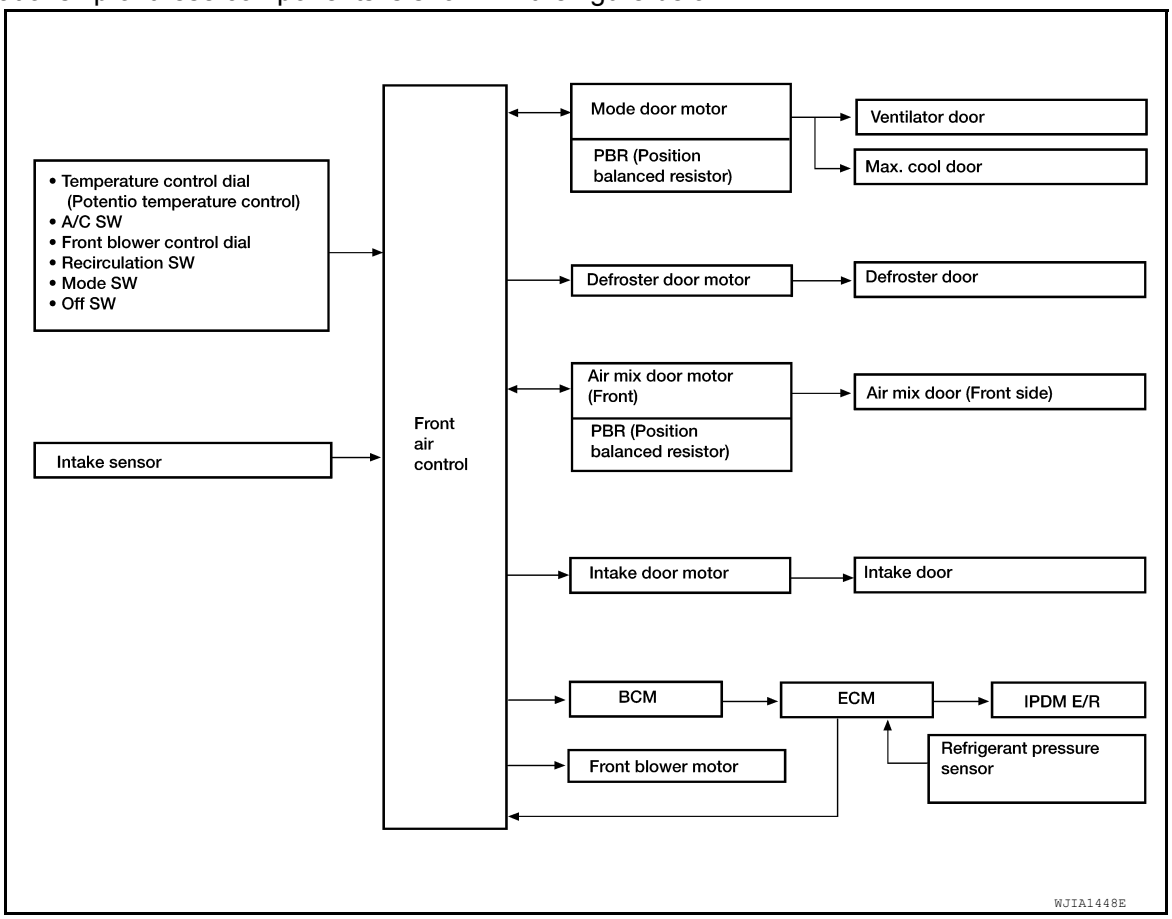
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000011560889

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:

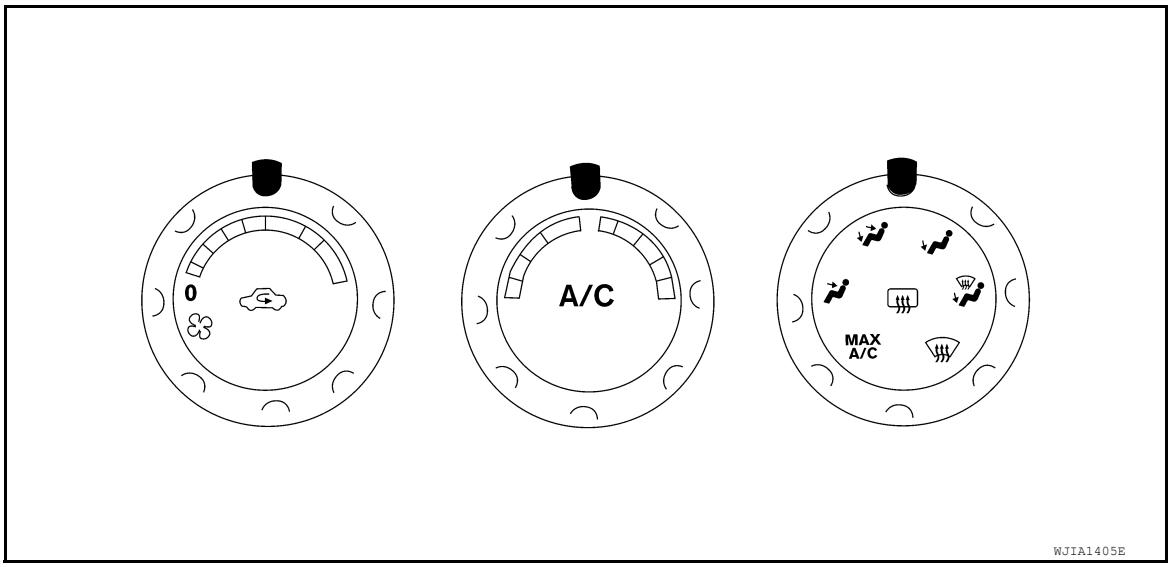


Control System Description

INFOID:0000000011560890

CONTROL OPERATION

Front air control



TEMPERATURE CONTROL DIAL

Increases or decreases the set temperature.

RECIRCULATION ( ) SWITCH

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

DEFROSTER ( ) SWITCH

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

REAR WINDOW DEFOGGER SWITCH (IF EQUIPPED)

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

BLOWER CONTROL DIAL/OFF SWITCH

- The blower speed is manually controlled with this dial.
- 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 position.

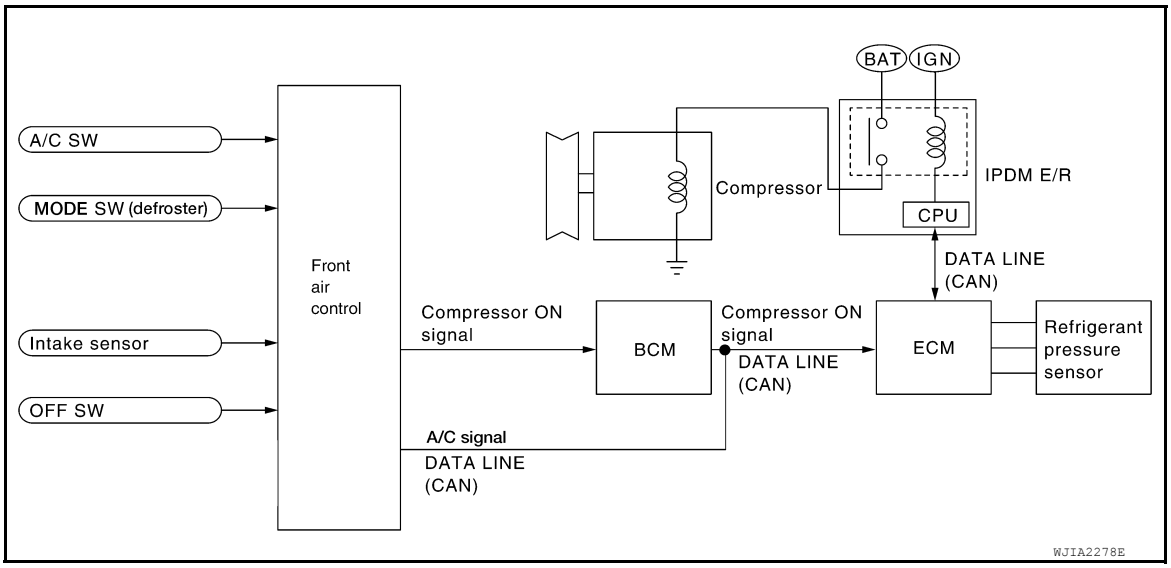
A/C SWITCH

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 CONTROL DIAL

Controls the air discharge outlets.

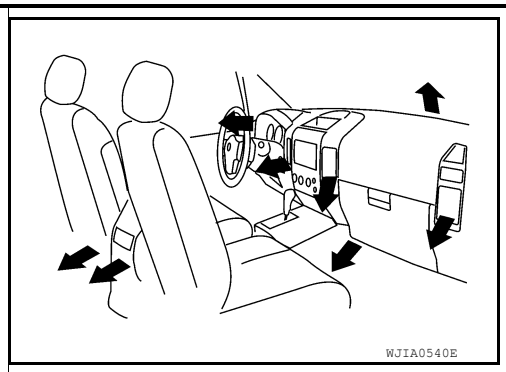
MAGNET CLUTCH CONTROL



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

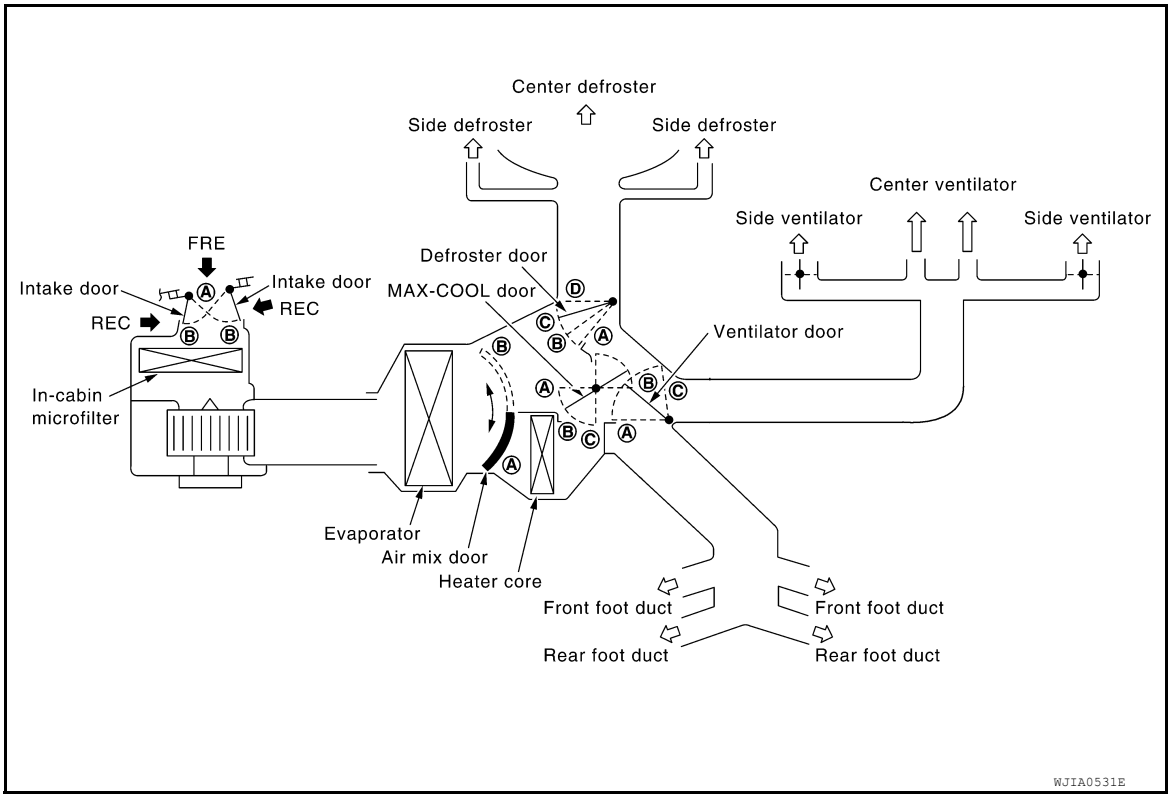
INFOID:0000000011560891



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

Switches And Their Control Function

INFOID:0000000011560892



Position or switch / Door	MODE SW				DEF SW		REC SW		Temperature switch			OFF SW
	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF				
					FRONT							
					☀	○	☀	○	COLD	~	HOT	
Ventilator door	Ⓐ	Ⓑ	Ⓒ	Ⓒ	Ⓒ		—		—			Ⓒ
MAX-COOL door	Ⓐ	Ⓑ	Ⓑ	Ⓑ	Ⓒ		—		—			Ⓑ
Defroster door	Ⓓ	Ⓓ	Ⓓ or Ⓒ	Ⓑ	Ⓐ	—	—		—			Ⓒ
Intake door	—				Ⓑ		Ⓐ	Ⓑ	—			Ⓑ
Air mix door	—				—		—		Ⓐ		Ⓑ	—

WJIA1406E

DIAGNOSIS SYSTEM (BCM)
COMMON ITEM
COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:0000000011875476

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	• The vehicle specification can be read and saved. • The vehicle specification can be written when replacing BCM.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION
BCM can perform the following functions:

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

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:0000000011875477

DATA MONITOR

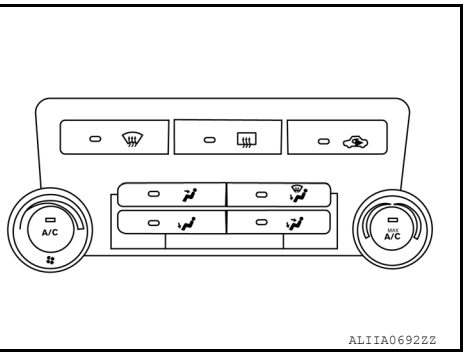
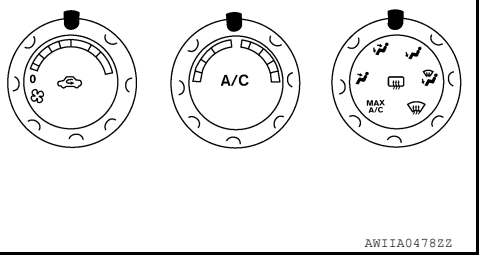
Monitor Item [Unit]	Description
IGN ON SW [On/Off]	Indicates condition of ignition switch ON position.
FAN ON SIG [On/Off]	Indicates condition of fan switch.
AIR COND SW [On/Off]	Indicates condition of A/C switch.

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560895

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

MODE DOOR MOTOR

System Description

INFOID:0000000011560896

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:
- Front air control
- Mode door motor
- PBR (built into mode door motor)
- Intake sensor

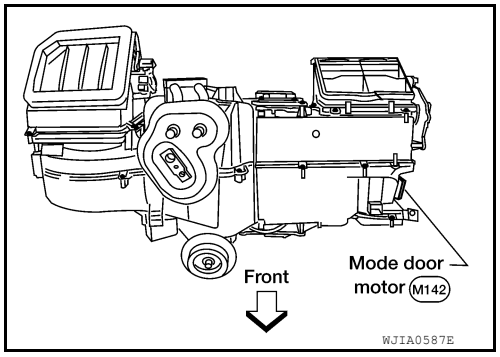
System Operation

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 & 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:0000000011560897

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Rotate the mode control dial and check each position and press the (DEF) mode.
2. Confirm that discharge air comes out according to the air distribution table. Refer to HAC-191, "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-197, "Mode Door Motor Diagnosis Procedure".

Mode Door Motor Diagnosis Procedure

INFOID:0000000011560898

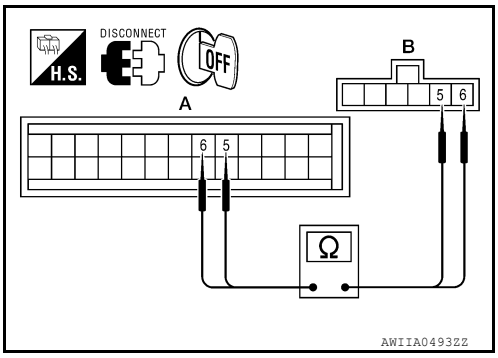
Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

SYMPTOM:
- Air outlet does not change.

• Mode door motor does not operate normally.

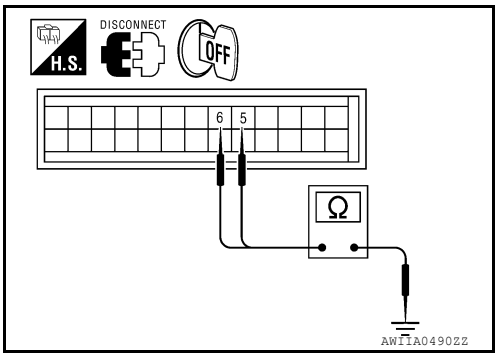
1.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the mode door motor harness connector M142 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 5, 6 and the mode door motor harness connector M142 (B) terminals 5, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	5	M142	5	Yes
	6		6	

4. Check continuity between front air control harness connector M176 terminals 5, 6 and ground.



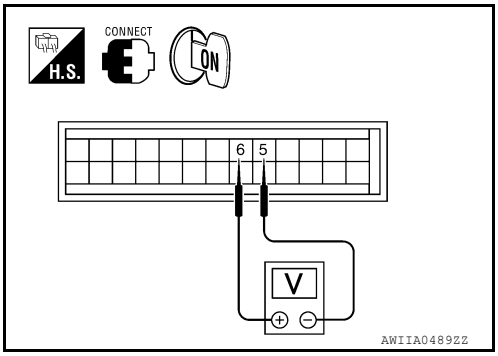
Connector	Terminal	—	Continuity
M176	5	Ground	No
	6		

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 M176 terminal 5 and terminal 6 while rotating the mode control dial to the VENT ( ), and then the B/L ( ) mode.



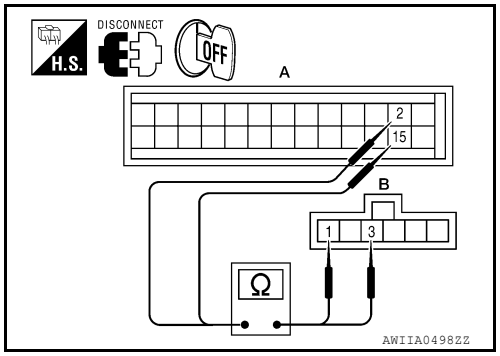
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	5	6	Rotating the mode control dial from D/F ( ) mode to VENT ( ) mode	Battery voltage
	6	5	Rotating the mode control dial from VENT ( ) mode to B/L ( ) mode	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A).
3. Check continuity between front air control harness connector M176 (A) terminals 2, 15 and the mode door motor harness connector M142 (B) terminals 1, 3.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	2	M142	1	Yes
	15		3	

4. Check continuity between front air control harness connector M176 terminals 2, 15 and ground.

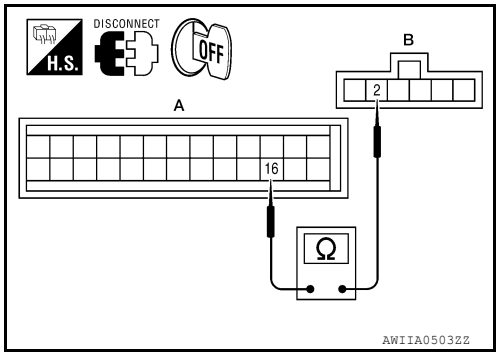
Connector	Terminal	—	Continuity
M176	2	Ground	No
	15		

Is the inspection result normal?

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

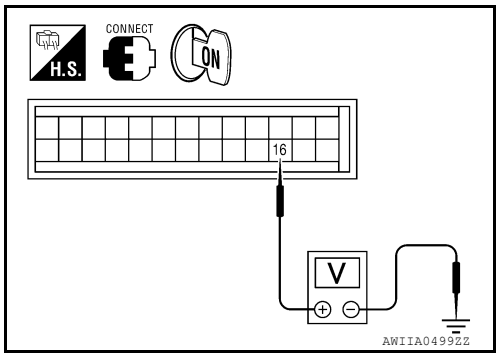
4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M176 (A) terminal 16 and mode door motor harness connector M142 (B) terminal 2.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	16	M142	2	Yes

2. Check continuity between front air control harness connector M176 terminal 16 and ground.



Connector	Terminal	—	Continuity
M176	16	Ground	No

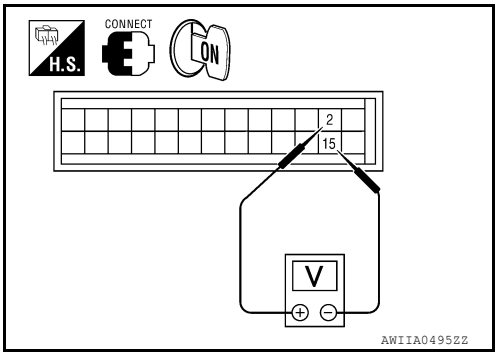
Is the inspection result normal?

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

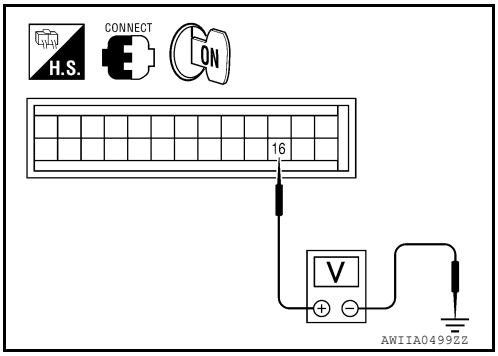
1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminal 2 and terminal 15.

Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M176	2	M176	15	5 Volts



4. Check voltage between front air control harness connector M176 terminal 16 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	16	Ground	0 Volts



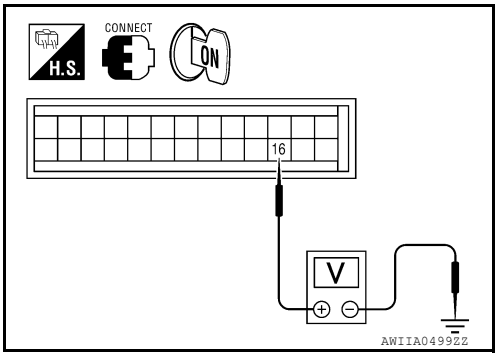
Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "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 M176 terminal 16 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	16	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-8, "Removal and Installation".
NO >> Replace the mode door motor. Refer to VTL-19, "Removal and Installation".

AIR MIX DOOR MOTOR

System Description

INFOID:0000000011560899

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

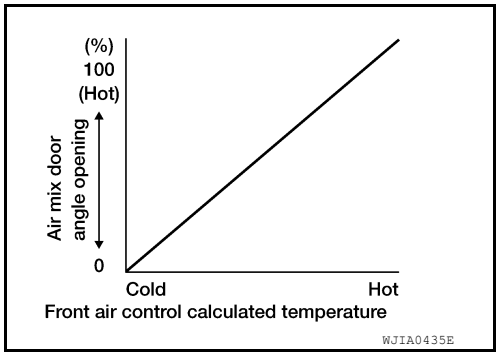
Component Parts

Air mix door control system components are:
- Front air control
- Air mix door motor
- PBR (built-into air mix door motors)
- 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.

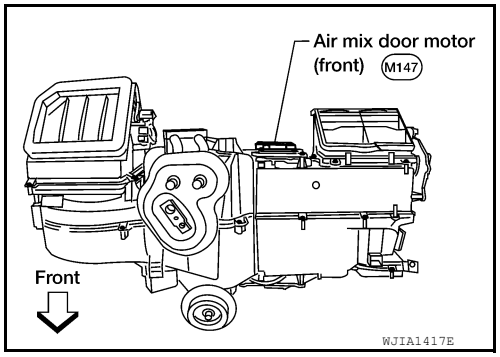
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motors

The air mix door motor is attached to the front heater & cooling unit assembly. The 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:0000000011560900

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the temperature control dial clockwise to maximum hot.
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 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-202, "Air Mix Door Motor Diagnosis Procedure".

Air Mix Door Motor Diagnosis Procedure

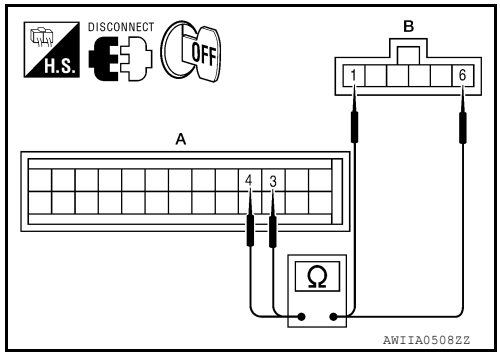
INFOID:0000000011560901

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

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

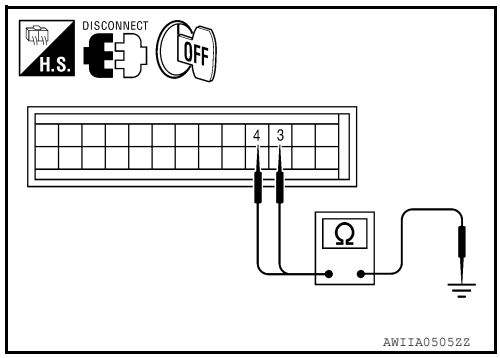
1. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the air mix door motor harness connector M147 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 3, 4 and the air mix door motor harness connector M147 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	3	M147	1	Yes
	4		6	

4. Check continuity between front air control harness connector M176 terminals 3, 4 and ground.



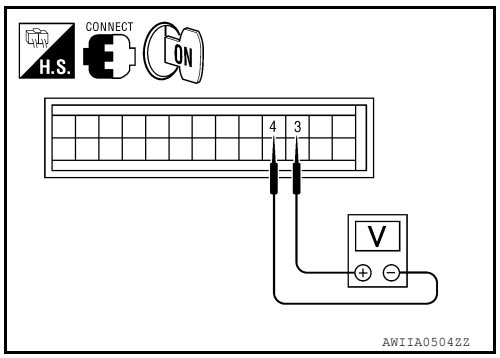
Connector	Terminal	—	Continuity
M176	3	Ground	No
	4		

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 temperature control dial to 32°C (90°F).
4. Check voltage between front air control harness connector M176 terminal 3 and terminal 4 while rotating temperature control dial to 18°C (60°F) and back to 32°C (90°F).



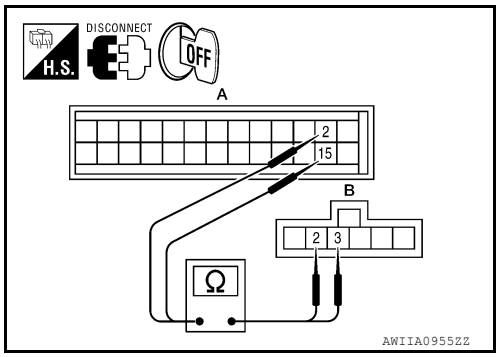
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	3	4	While rotating temperature control dial from 32°C (90°F) to 18°C (60°F)	Battery voltage
	4	3	While rotating temperature control dial from 18°C (60°F) to 32°C (90°F)	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "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 M176 (A).
3. Check continuity between front air control harness connector M176 (A) terminals 2, 15 and air mix door motor harness connector M147 (B) terminals 2, 3.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	15	M147	2	Yes
	2		3	

4. Check continuity between front air control harness connector M176 terminals 2, 15 and ground.

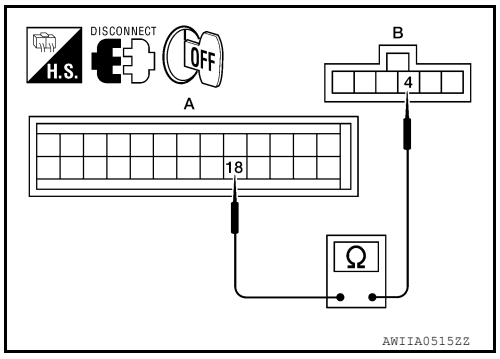
Connector	Terminal	—	Continuity
M176	15	Ground	No
	2		

Is the inspection result normal?

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

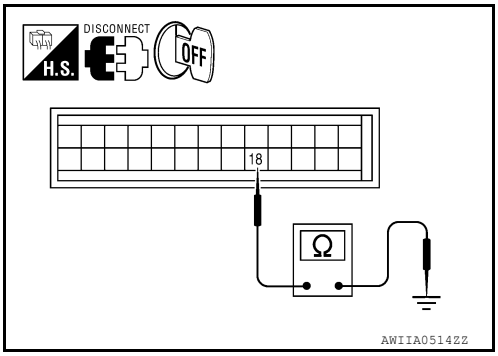
4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M176 (A) terminal 18 and air mix door motor harness connector M147 (B) terminal 4.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	18	M147	4	Yes

2. Check continuity between front air control harness connector M176 terminal 18 and ground.



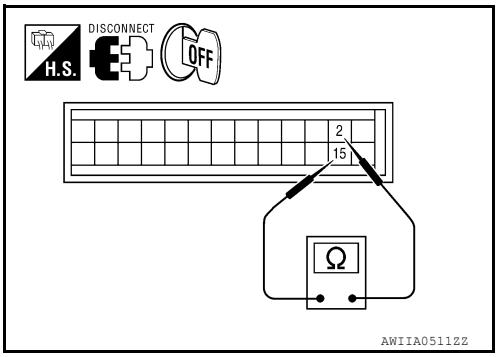
Connector	Terminal	—	Continuity
M176	18	Ground	No

Is the inspection result normal?

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

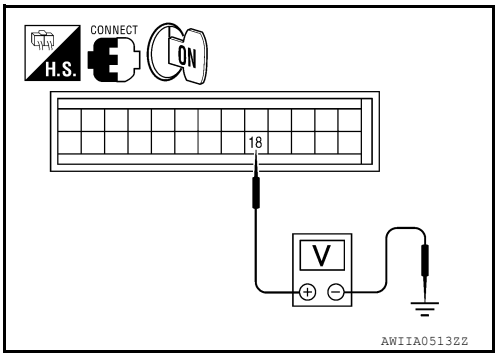
5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminal 2 and terminal 15.



Connector	Terminal (+)	Connector	Terminal (-)	Voltage (Approx.)
M176	2	M176	15	5 Volts

4. Check voltage between front air control harness connector M176 terminal 18 and ground.



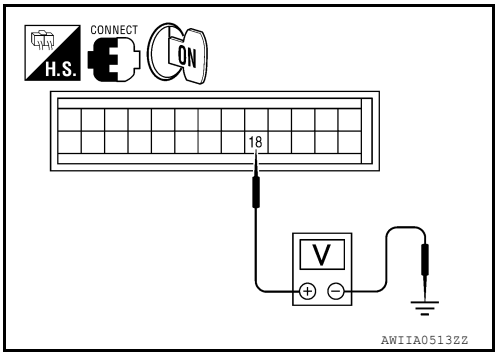
Connector	Terminal	—	Voltage (Approx.)
M176	18	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "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 M176 terminal 18 and ground.



Connector	Terminal	—	Voltage (Approx.)
M176	18	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-8, "Removal and Installation".
NO >> Replace air mix door motor. Refer to VTL-20, "Removal and Installation".

INTAKE DOOR MOTOR

System Description

INFOID:0000000011560902

SYSTEM DESCRIPTION

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

SYSTEM DESCRIPTION

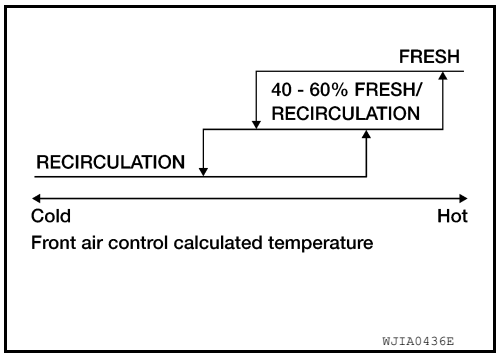
Component Parts

Intake door control system components are:
- Front air control
- Intake door motor (PBR built into the 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.

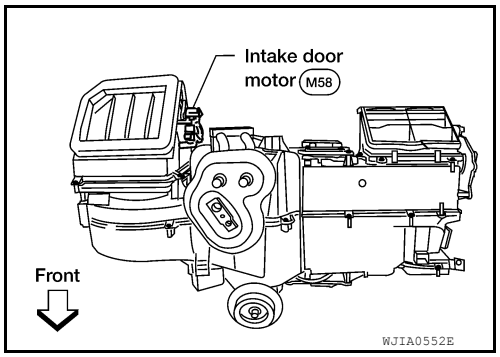
Intake Door Control Specification



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:0000000011560903

INSPECTION FLOW

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

1. Press the vent mode switch ( ).
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-206, "Intake Door Motor Diagnosis Procedure"

Intake Door Motor Diagnosis Procedure

INFOID:0000000011560904

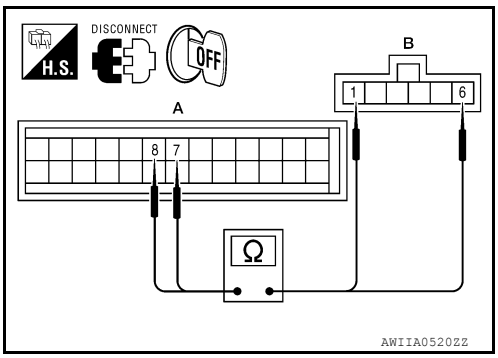
Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

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

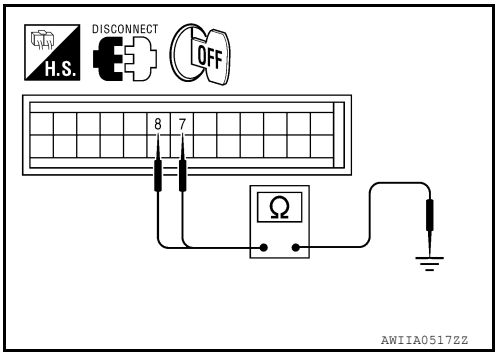
1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 8, 7 and the intake door motor harness connector M58 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	8	M58	6	Yes
	7		1	

4. Check continuity between front air control harness connector M176 terminals 8, 7 and ground.



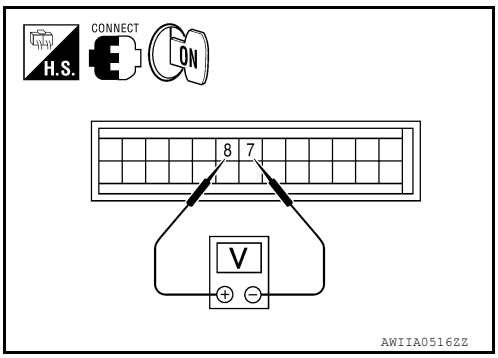
Connector	Terminal	—	Continuity
M176	8	Ground	No
	7		

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 M176 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	8	7	Self-diagnostic mode (opening)	Battery voltage
	7	8	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-18, "Removal and Installation".
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:0000000011560905

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:
- Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- Intake sensor

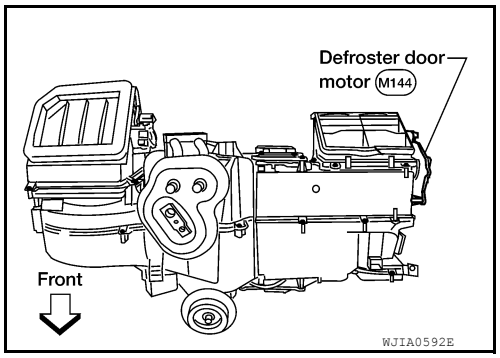
System Operation

The front air control determines defroster door position based on the position of the defroster switch. When the defroster switch is depressed, the defroster door motor rotates directing air to the defroster ducts. When any mode other than defroster is selected, the defroster motor rotates in the opposite direction closing off air flow to the defroster ducts.

COMPONENT DESCRIPTION

Defroster door motor

The defroster door motor is attached to the front heater & cooling unit assembly. The front air control sends a voltage to rotate to the defroster door directing the air flow either to the defroster ducts, or to the floor ducts, depending on which way the voltage and ground are applied to the motor leads. Motor rotation is conveyed to a lever which activates the defroster door.



Defroster Door Motor Component Function Check

INFOID:0000000011560906

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

1. Select vent ( ) mode.
2. Rotate mode control dial to defrost mode ( ).
3. Listen for defroster door position change (blower sound should change slightly).

Is the inspection result normal?

YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to HAC-207, "Defroster Door Motor Diagnosis Procedure".

Defroster Door Motor Diagnosis Procedure

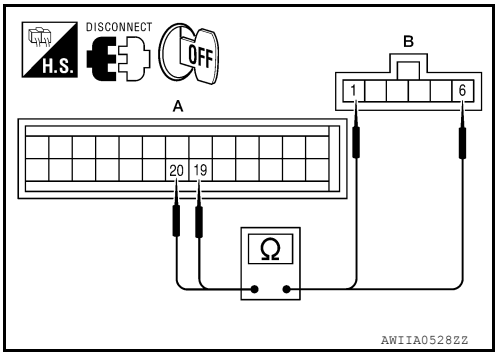
INFOID:0000000011560907

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

SYMPTOM:
- Defroster door does not change.
- Defroster door motor does not operate normally.

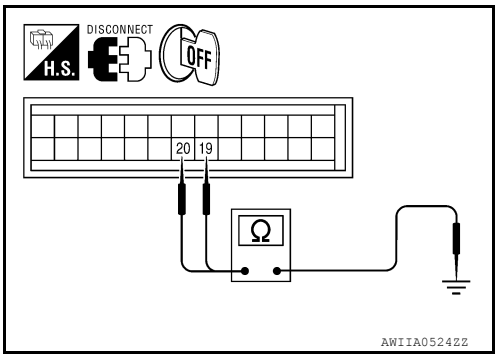
1. CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the defroster door motor harness connector M144 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 19, 20 and the defroster door motor harness connector M144 (B) terminals 1, 6.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	19	M144	1	Yes
	20		6	

4. Check continuity between front air control harness connector M176 terminals 19, 20 and ground.



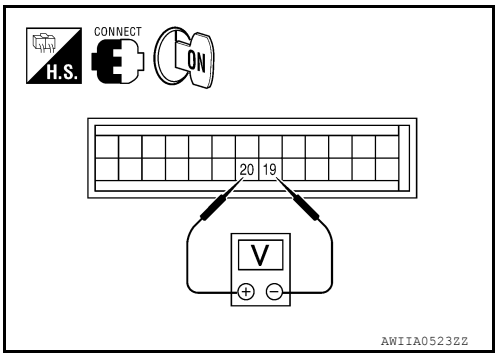
Connector	Terminal	—	Continuity
M176	19	Ground	No
	20		

Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the VENT ( ) mode.
4. Check voltage between front air control harness connector M176 terminal 19 and terminal 20 while pressing the defroster switch ( ).



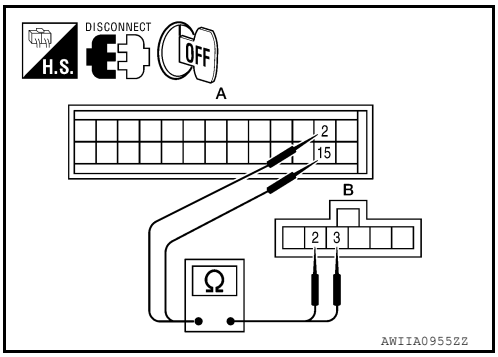
Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	19	20	Following defroster switch ( ) on	Battery voltage
	20	19	Following defroster switch ( ) off	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A).
3. Check continuity between front air control harness connector M176 (A) terminals 15, 2 and the defroster door motor harness connector M144 (B) terminals 2, 3.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	2	M144	3	Yes
	15		2	

4. Check continuity between front air control harness connector M176 terminal 2, 15 and ground.

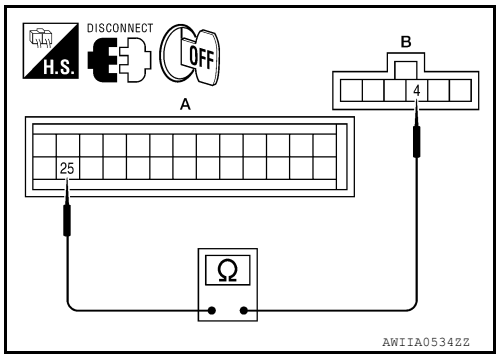
Connector	Terminal	—	Continuity
M176	2	Ground	No
	15		

Is the inspection result normal?

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

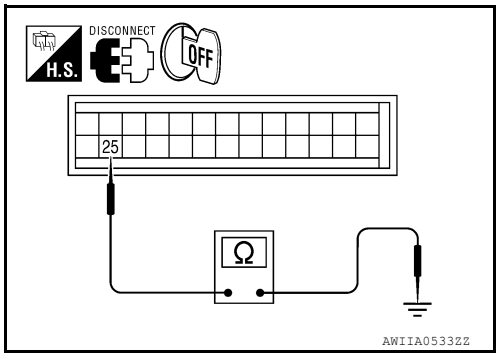
4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M176 (A) terminal 25 and defroster door motor harness connector M144 (B) terminal 4.



A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	25	M144	4	Yes

2. Check continuity between front air control harness connector M176 terminal 25 and ground.



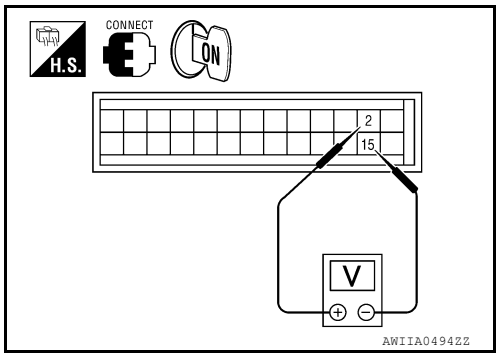
Connector	Terminal	—	Continuity
M176	25	Ground	No

Is the inspection result normal?

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

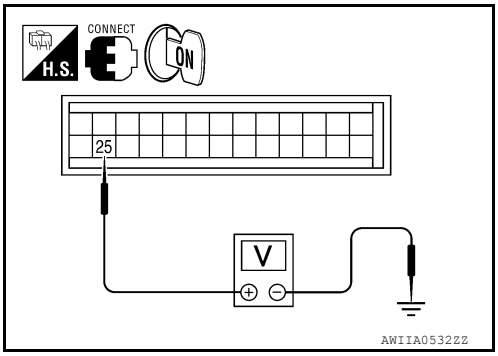
5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminals 2, 15.



Connector	Terminals (+)	Connector	Terminals (-)	Voltage (Approx.)
M176	2	M176	15	5 Volts

4. Check voltage between front air control harness connector M176 terminal 25 and ground.



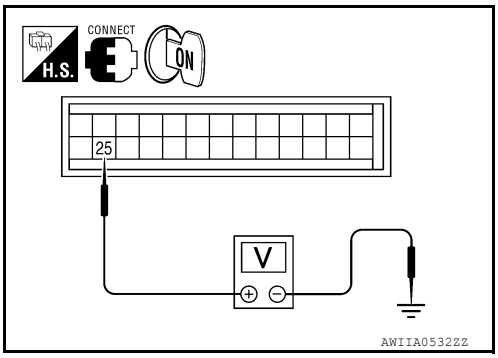
Connector	Terminal	—	Voltage (Approx.)
M176	25	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the defroster door motor harness connector M144.
2. Check voltage between front air control harness connector M176 terminal 25 and ground.



Connector	Terminal	—	Voltage (Approx.)
M176	25	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect defroster door for binding or mechanical failure. If defroster door moves freely, replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Replace the defroster door motor. Refer to VTL-17, "Removal and Installation".

BLOWER MOTOR CONTROL SYSTEM

System Description

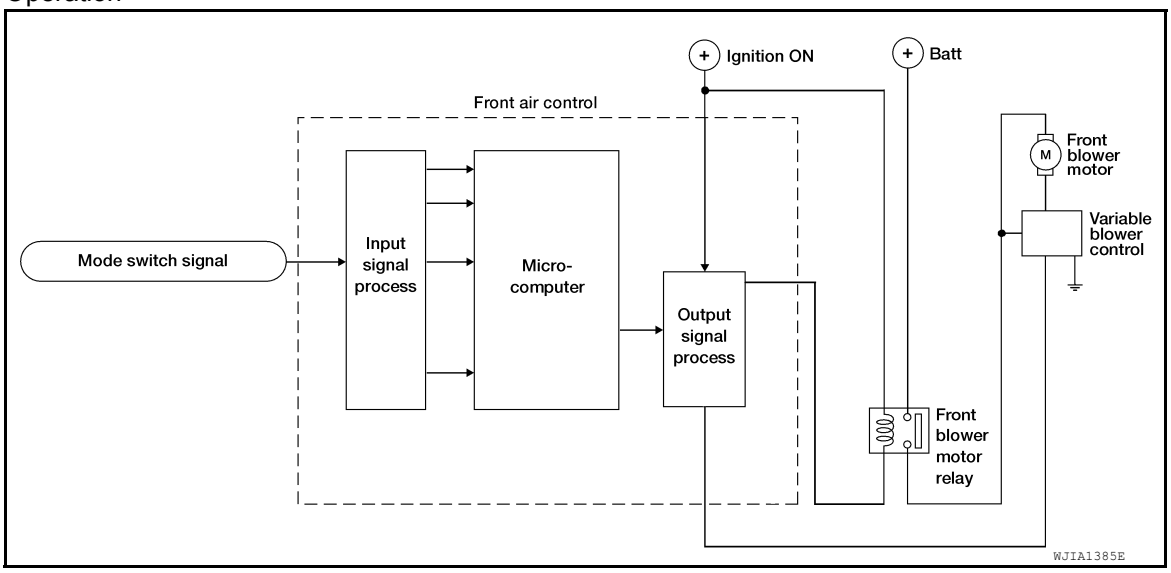
INFOID:0000000011560908

SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:
- Front air control
- Variable blower control
- Front blower motor relay
- Front blower motor
- Intake sensor

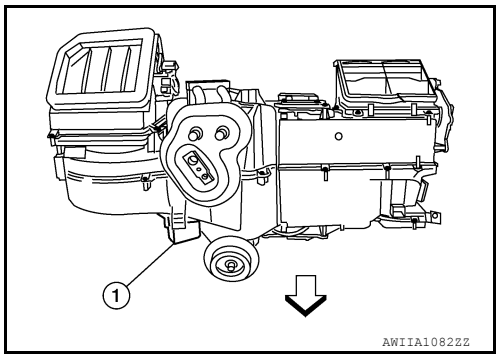
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control is located on the cooling unit. The variable blower control (1) 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:0000000011560909

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-212, "Front Blower Motor Diagnosis Procedure"

Front Blower Motor Diagnosis Procedure

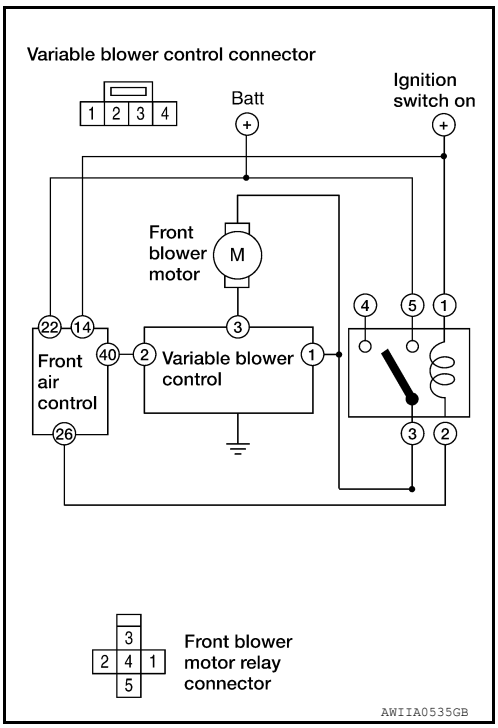
INFOID:0000000011560910

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

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 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to HAC-230, "Front Air Control Terminals Reference Values".

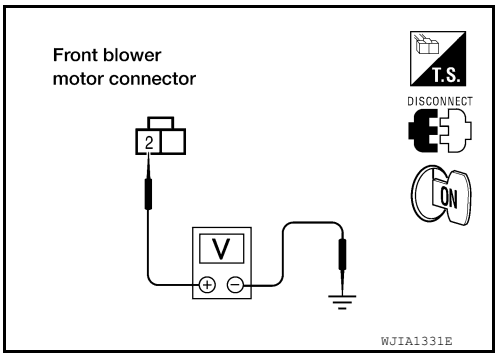
Fuses are good.

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 11.
NO >> GO TO 3.

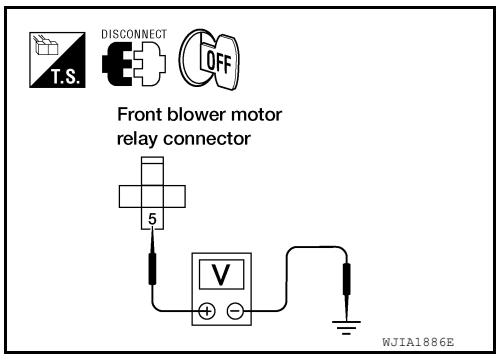
3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor relay.
3. Check voltage between front blower motor relay harness connector M107 terminal 5 and ground.

5 - 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-215, "Front Blower Motor Component Inspection".

Is the inspection result normal?

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

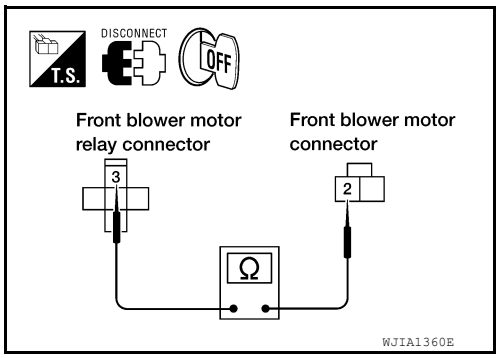
5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.

Is the inspection result normal?

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



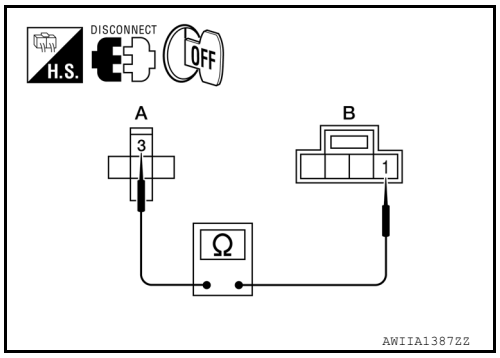
6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M121 (B) terminal 1.

3 - 1 : Continuity should exist.

Is the inspection result normal?

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



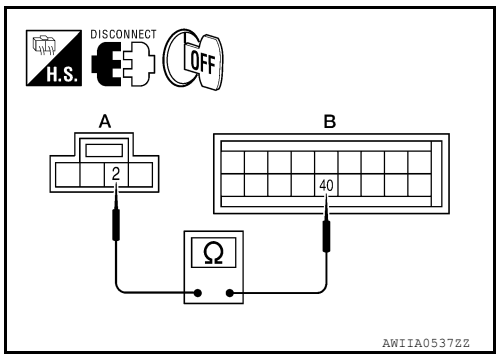
7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M177 (B) terminal 40 and variable blower control harness connector M121 (A) terminal 2.

40 - 2 : Continuity should exist.

Is the inspection result normal?

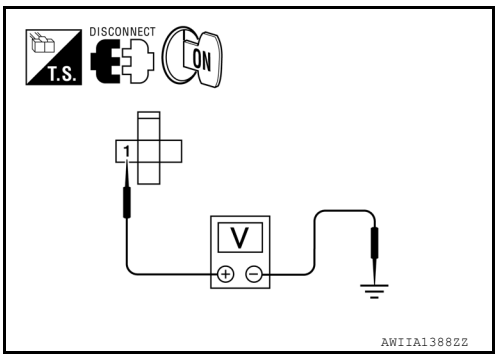
YES >> GO TO 8.
NO >> Repair harness or connector.



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 M107 terminal 1 and ground.

1 - Ground : Battery voltage



Is the inspection result normal?

YES >> GO TO 9.
NO >> Repair front blower motor ground circuit or connector.

9.REPLACE FUSES

1. Replace fuses.
2. Activate the front blower motor.

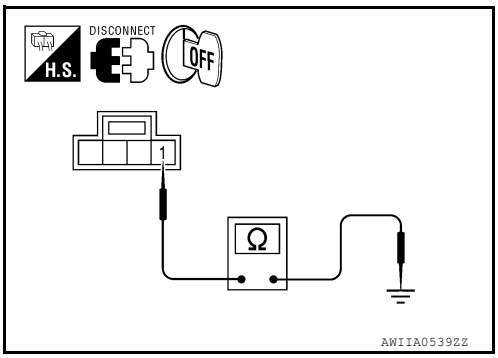
Does the fuse blow?

YES >> 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 1 and ground.

1 - Ground : Continuity should not exist.



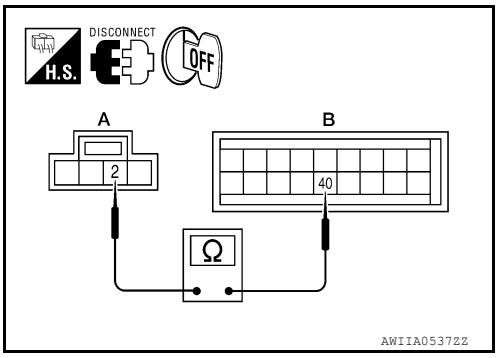
Is the inspection result normal?

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

11.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M177 (B) terminal 40 and variable blower control harness connector M121 (A) terminal 2.

40 - 2 : Continuity should exist.



Is the inspection result normal?

YES >> GO TO 12.
NO >> Repair harness or connector.

12.CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to HAC-211, "Front Blower Motor Component Function Check".

Is the inspection result normal?

YES >> GO TO 13.
NO >> Replace front blower motor. Refer to VTL-12, "Removal and Installation".

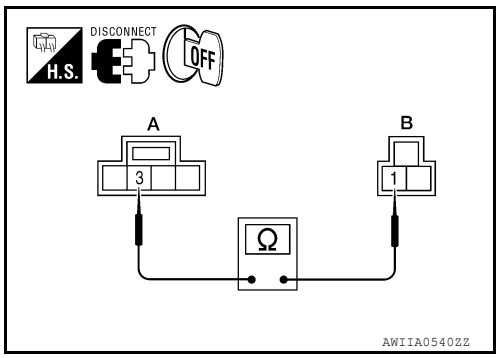
13.CHECK BLOWER MOTOR GROUND CIRCUIT

Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M121 (A) terminal 3.

1 - 3 : Continuity should exist.

Is the inspection result normal?

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



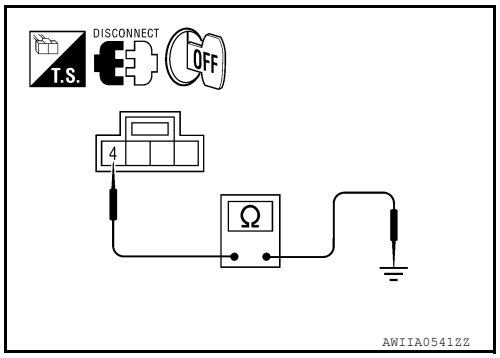
14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

Check continuity between variable blower control harness connector M121 terminal 4 and ground.

4 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to VTL-22, "Removal and Installation".
NO >> Repair harness or connector.

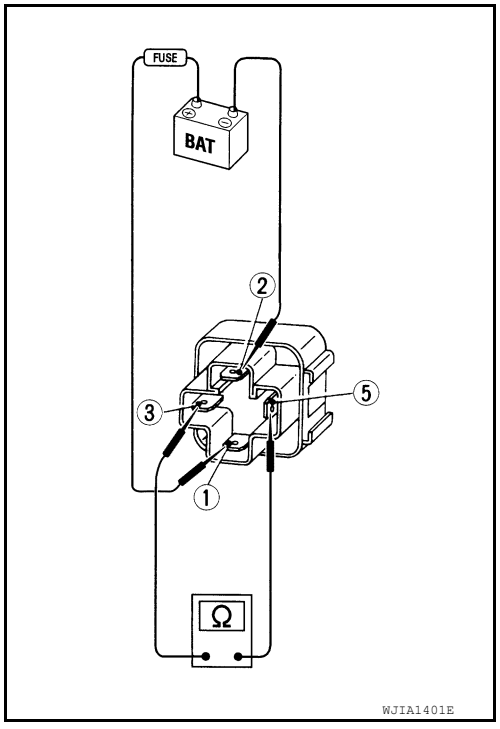


Front Blower Motor Component Inspection

INFOID:0000000011560911

COMPONENT INSPECTION

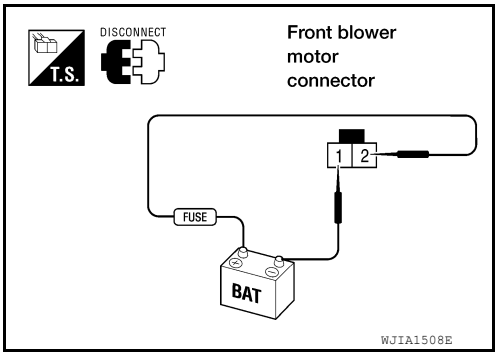
Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



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:0000000011560912

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.

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.

Magnet Clutch Component Function Check

INFOID:0000000011560913

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Turn ignition switch ON.
2. Turn the blower control dial to low speed and press the A/C switch.
3. Rotate mode control dial to vent mode ( ).
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-217, "Magnet Clutch Diagnosis Procedure".

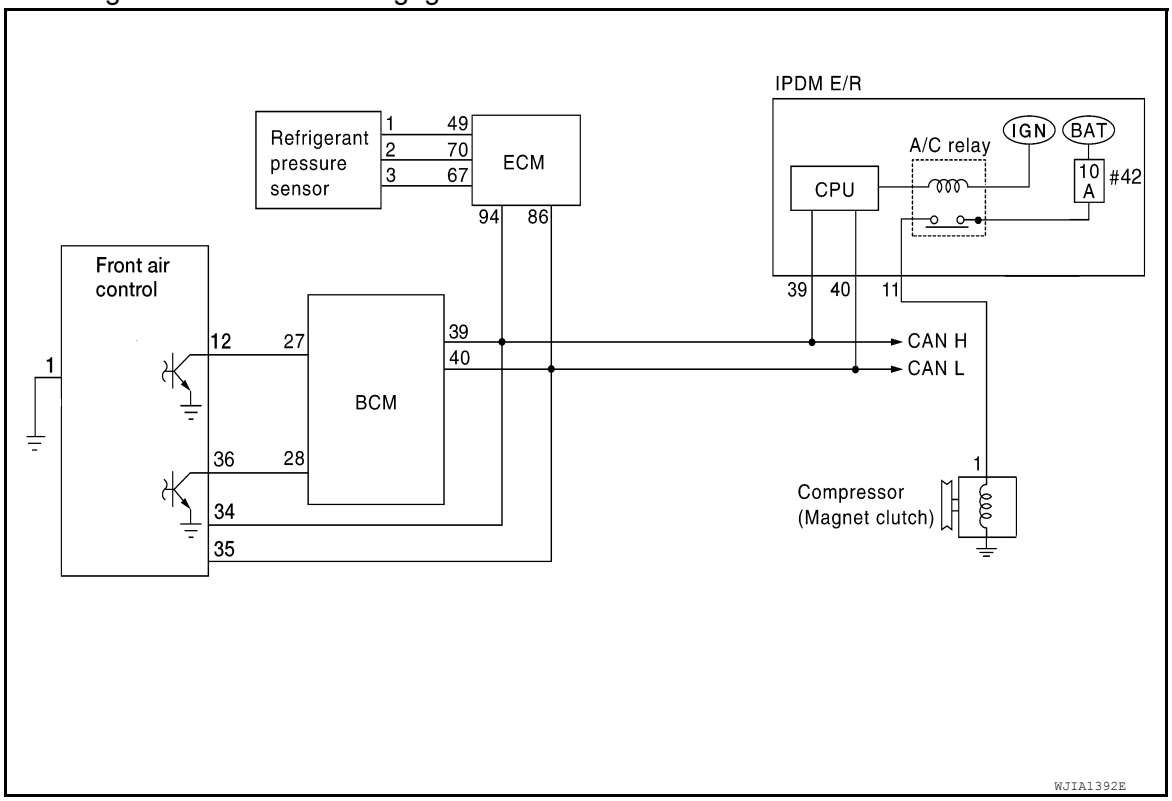
Magnet Clutch Diagnosis Procedure

INFOID:0000000011560914

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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



1.CHECK INTAKE SENSOR CIRCUIT

Check intake sensors. Refer to HAC-225, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.
NO >> Check malfunctioning intake sensor. Refer to HAC-224, "Intake Sensor Diagnosis Procedure".

2.PERFORM AUTO ACTIVE TEST

Refer to PCS-11, "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.

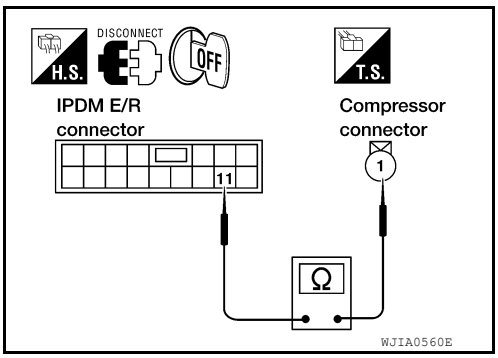
3.CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
3. 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.

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

11 – ground : Continuity should not exist.



Is the inspection result normal?

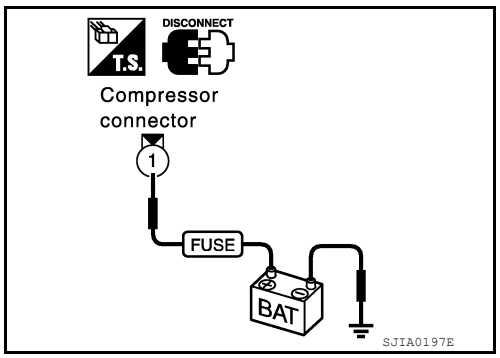
YES >> GO TO 4.
NO >> Repair harness or connector.

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-33, "Removal and Installation".



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to BCS-24, "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 8.
NO >> GO TO 6.

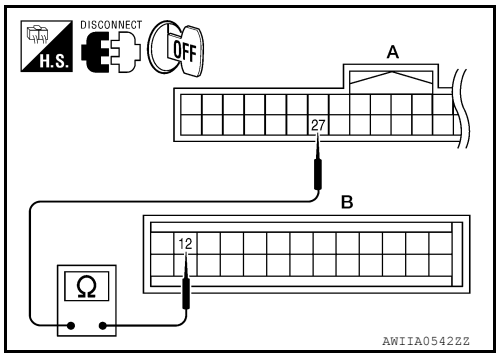
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M176 (B) terminal 12.

27 - 12 Continuity should exist.

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

27 - ground Continuity should not exist.



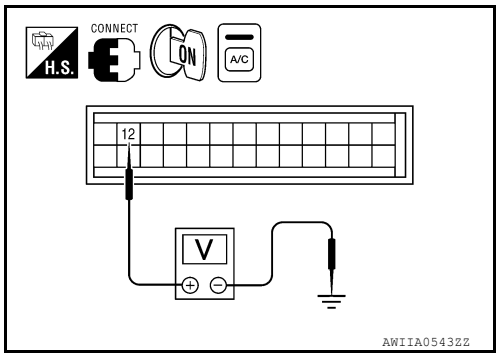
Is the inspection result normal?

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 M176 terminal 12 and ground.

Terminals			Condition	Voltage
(+)		(-)		
front air control connector	Terminal No.			
M176	12	Ground	A/C switch: ON	Approx. 0V
			A/C switch: OFF	Approx. 5V



Is the inspection result normal?

YES >> GO TO 8.

NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to VTL-8, "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 F54 terminal 70 and ground.

Terminals			Condition	Voltage
(+)		(-)		
ECM connector	Terminal No.			
F54	70	Ground	A/C switch: ON	Approx. 1.0 - 4.0V

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-488, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to BCS-24, "AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)".

FRONT BLOWER CONTROL DIAL ON : FAN ON SIG ON

FRONT BLOWER CONTROL DIAL OFF : FAN ON SIG OFF

Is the inspection result normal?

YES >> GO TO 12.

NO >> GO TO 10.

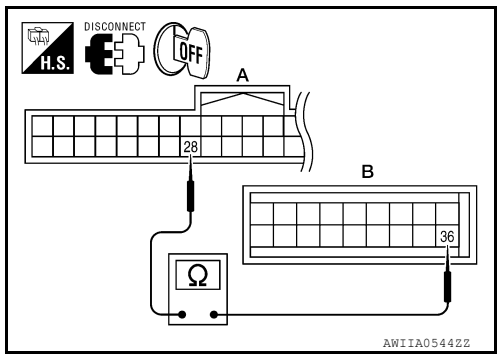
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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 M177 (B) terminal 36.

28 - 36 Continuity should exist.

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

28 - ground Continuity should not exist.



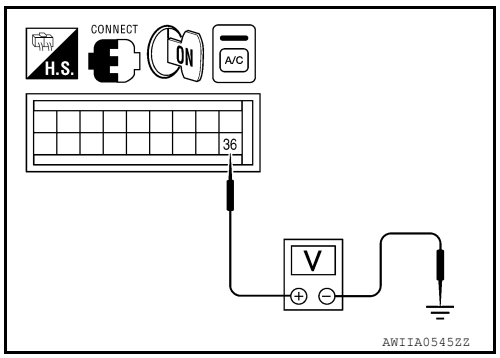
Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

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

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M177 terminal 36 and ground.



Terminals			Condition	Voltage
(+)		(-)		
front air control connector	Terminal No.			
M177	36	Ground	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-8, "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).

WATER VALVE CIRCUIT

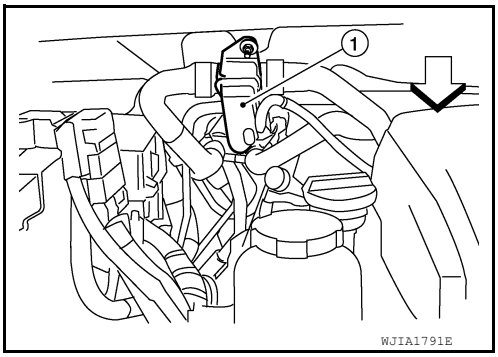
Description

INFOID:0000000011560915

COMPONENT DESCRIPTION

Water Valve

The water valve (1) cuts the flow of engine coolant to the heater core to allow for maximum cooling during A/C operation. It is controlled by the front air control.



Water Valve Diagnosis Procedure

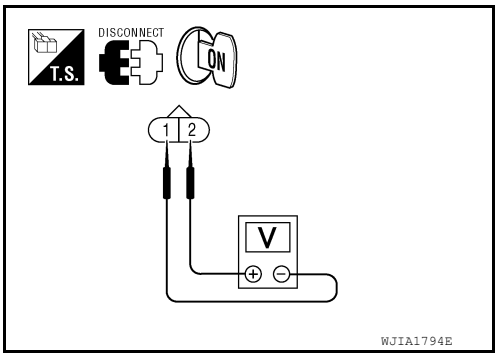
INFOID:0000000011560916

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F68.
2. Turn ignition switch ON.
3. Rotate temperature control dial to maximum heat.
4. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum cold.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	2	1	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

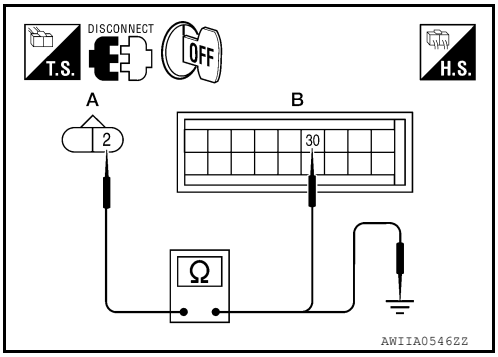
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M177.
3. Check continuity between water valve harness connector F68 (A) terminal 2 and front air control harness connector M177 (B) terminal 30.

2 - 30 : Continuity should exist.

4. Check continuity between water valve harness connector F68 terminal 2 and ground.

2 - Ground : Continuity should not exist.



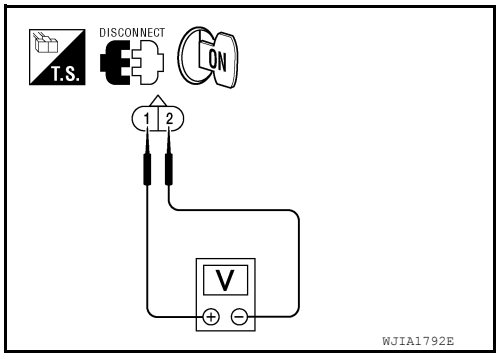
Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".

NO >> Repair harness or connector.

3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial to maximum cold.
2. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum heat.



Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	1	2	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

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

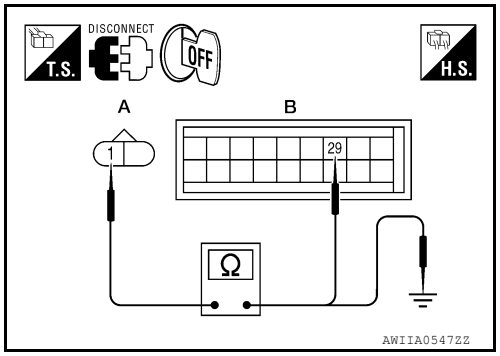
4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M177.
3. Check continuity between water valve harness connector F68 (A) terminal 1 and front air control harness connector M177 (B) terminal 29.

1 - 29 : Continuity should exist.

4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

1 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Repair harness or connector.

INTAKE SENSOR

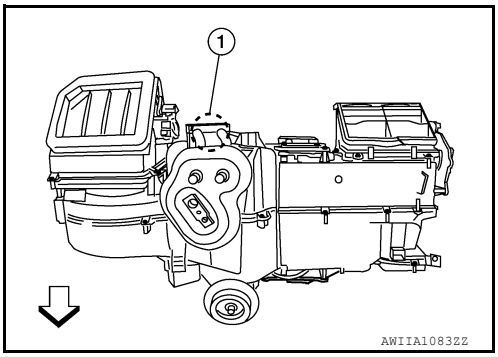
System Description

INFOID:0000000011560917

COMPONENT DESCRIPTION

Intake Sensor

The intake sensor (1) is located on the heater & cooling unit assembly. It converts temperature of air after if passes through the evaporator into a resistance value which is then input to the front air control.



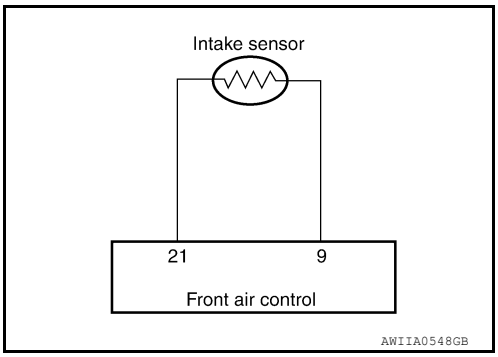
Intake Sensor Diagnosis Procedure

INFOID:0000000011560918

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



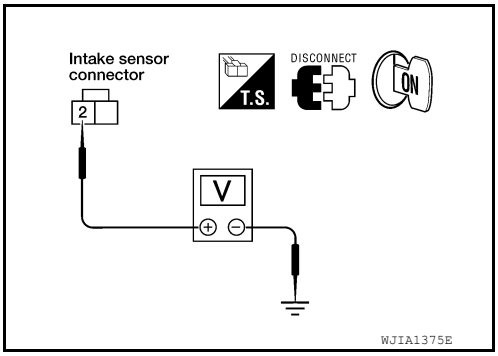
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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?

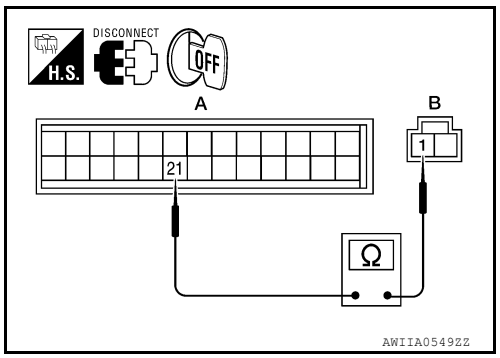
YES >> GO TO 2.
NO >> GO TO 4.



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

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 M176 (A) terminal 21.

1 - 21 : 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-225, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> Replace front air control. Refer to VTL-8, "Removal and Installation".
NO >> Replace intake sensor. Refer to VTL-11, "Removal and Installation".

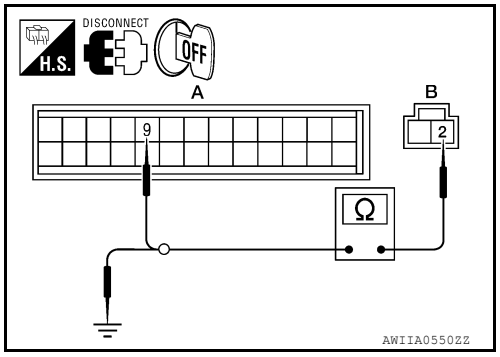
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

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 M176 (A) terminal 9.

2 - 9 : 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-8, "Removal and Installation".
NO >> Repair harness or connector.

Intake Sensor Component Inspection

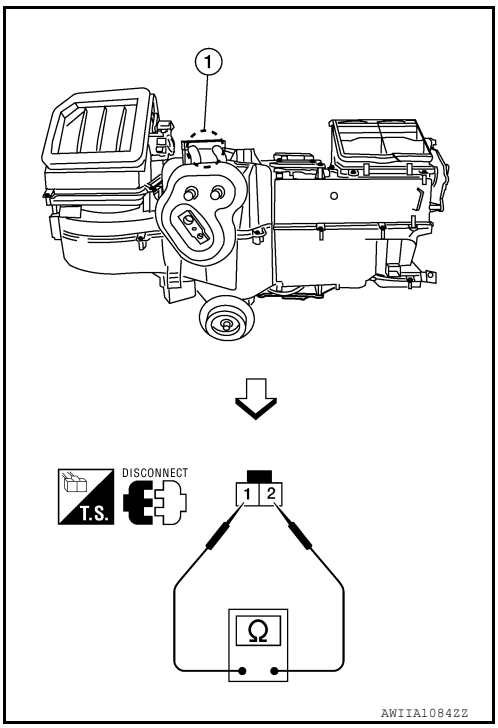
INFOID:0000000011560919

COMPONENT INSPECTION

Intake Sensor

After disconnecting intake sensor (1) 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
40 (104)	16.1
45 (113)	13.2



If NG, replace intake sensor. Refer to VTL-11, "Removal and Installation".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

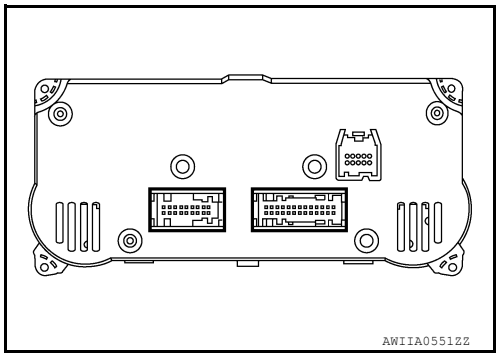
INFOID:0000000011560920

COMPONENT DESCRIPTION

Front Air Control

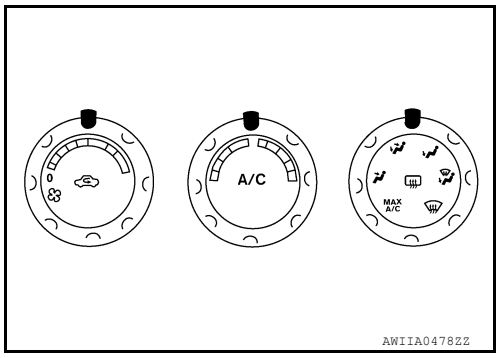
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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.



Potentio 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 control dial.



Front Air Control Component Function Check

INFOID:0000000011560921

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK

1. Turn the blower control dial clockwise to low speed.
2. Press the A/C switch.
3. 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-227, "Front Air Control Power and Ground Diagnosis Procedure".

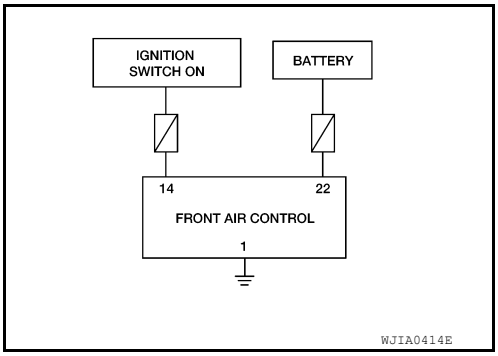
Front Air Control Power and Ground Diagnosis Procedure

INFOID:0000000011560922

Regarding Wiring Diagram information, refer to HAC-232, "Wiring Diagram - Manual With 3 Control Dial System".

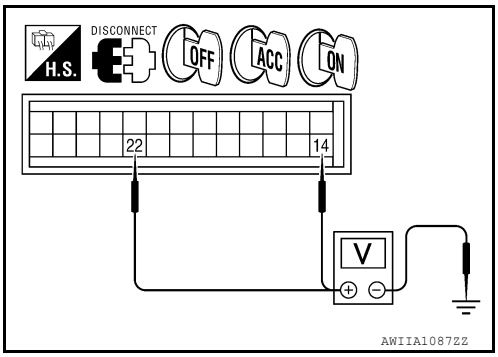
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

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 connectors.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M176 terminals 14, 22, and ground.



Terminals			Ignition switch position		
(+)		(-)	OFF	ACC	ON
front air control connector	Terminal No.				
M176	14	Ground	Approx. 0V	Approx. 0V	Battery voltage
	22		Battery voltage	Battery voltage	Battery voltage

Is the inspection result normal?

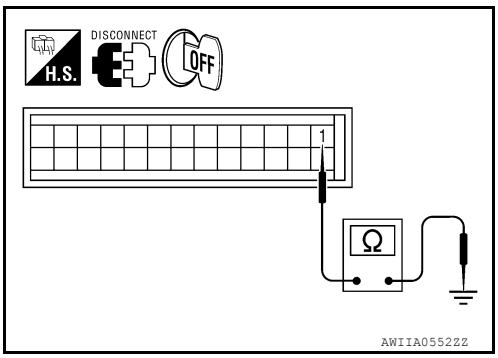
YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to HAC-230, "Front Air Control Terminals Reference Values".
- 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 M176 terminal 1 and ground.

1 - Ground : Continuity should exist.



Is the inspection result normal?

OK >> Replace front air control. Refer to VTL-8, "Removal and Installation".

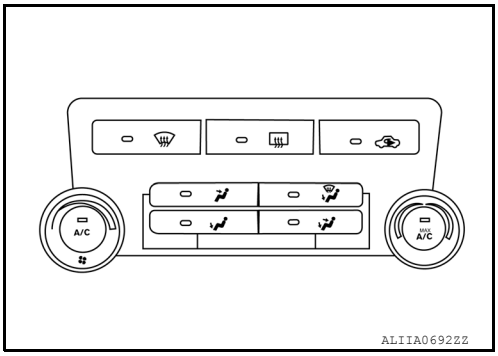
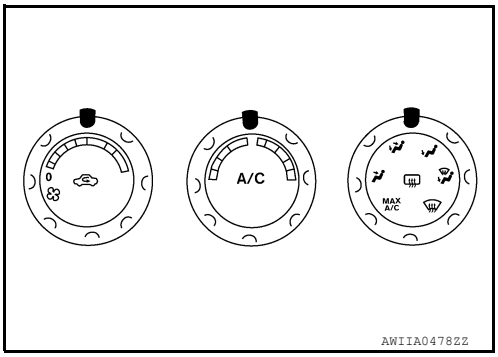
NG >> Repair harness or connector.

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:0000000011560923

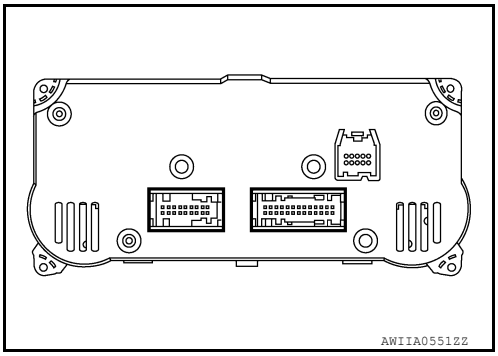
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

AIR CONDITIONER CONTROL

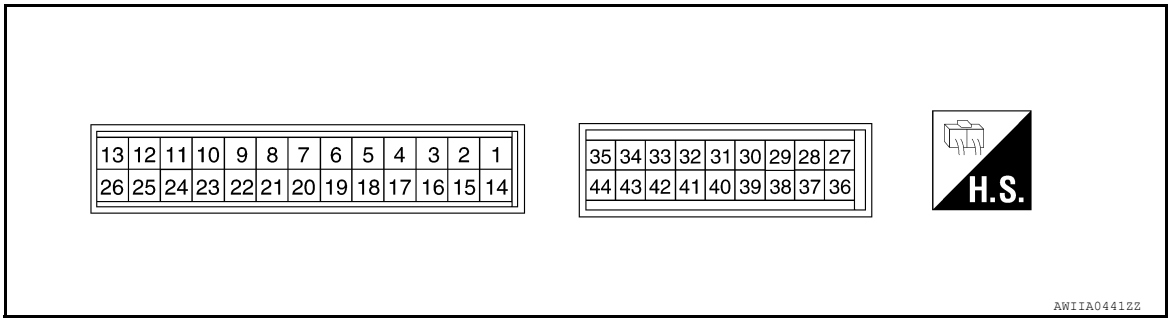
Front Air Control Terminals Reference Values

INFOID:0000000011560924

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

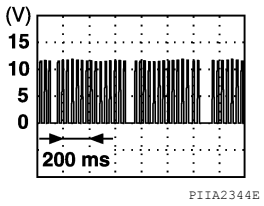


FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	B	Ground	-	-	0V
2	Y	V ref ACTR (5V)	ON	-	0 - 5V
3	W/G	Air mix door motor CW	ON	Clockwise rotation	Battery voltage
4	G	Air mix door motor CCW	ON	Counterclockwise rotation	Battery voltage
5	BR/W	Mode door motor CW	ON	Clockwise rotation	Battery voltage
6	P/L	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
7	O	Intake door motor CW	ON	Clockwise rotation	Battery voltage
8	G/B	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
9	L/B	Intake sensor	ON	-	0 - 5V
11	Y/B	Rear defogger request *1	ON	-	Battery voltage
12	W/R	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
14	Y/G	Power supply for IGN	ON	-	Battery voltage
15	P	V ref ACTR (ground)	ON	-	5V
16	GR	Mode door motor feedback	ON	-	0 - 5V
18	SB	Air mix door motor feedback	ON	-	0 - 5V
19	LG	Defroster door motor CW	ON	Clockwise rotation	Battery voltage
20	P/B	Defroster door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	V/R	Sensor ground	ON	-	0V
22	Y/R	Power supply for BAT	-	-	Battery voltage
23	R/L	Illumination +	ON	Park lamps ON	Battery voltage

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
24	BR	Illumination -	-	Park lamps ON	
25	LG/B	Defroster door motor feedback	ON	-	0 - 5V
26	R/B	Front blower request	ON	Front blower motor OFF	Battery voltage
				Front blower motor ON	0V
29	Y/L	Water valve	ON	Water valve open	Battery voltage
				Water valve closed	0V
30	W/G	Water valve	ON	Water valve open	0V
				Water valve closed	Battery voltage
34	L	CAN-H	ON	-	0 - 5V
35	P	CAN-L	ON	-	0 - 5V
36	L/R	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
40	G/R	Variable blower control	ON	-	0 - 5V

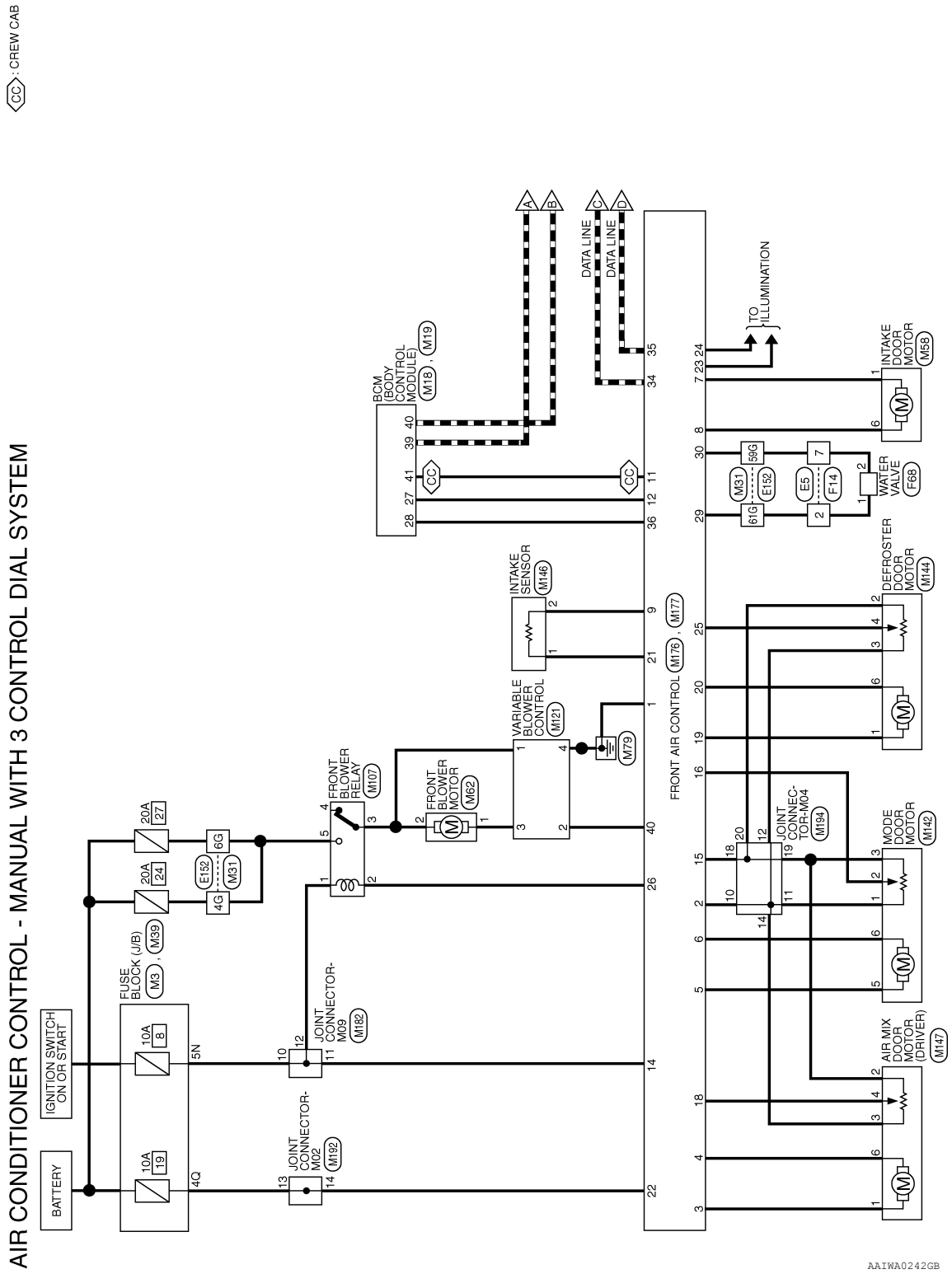
*1: If equipped

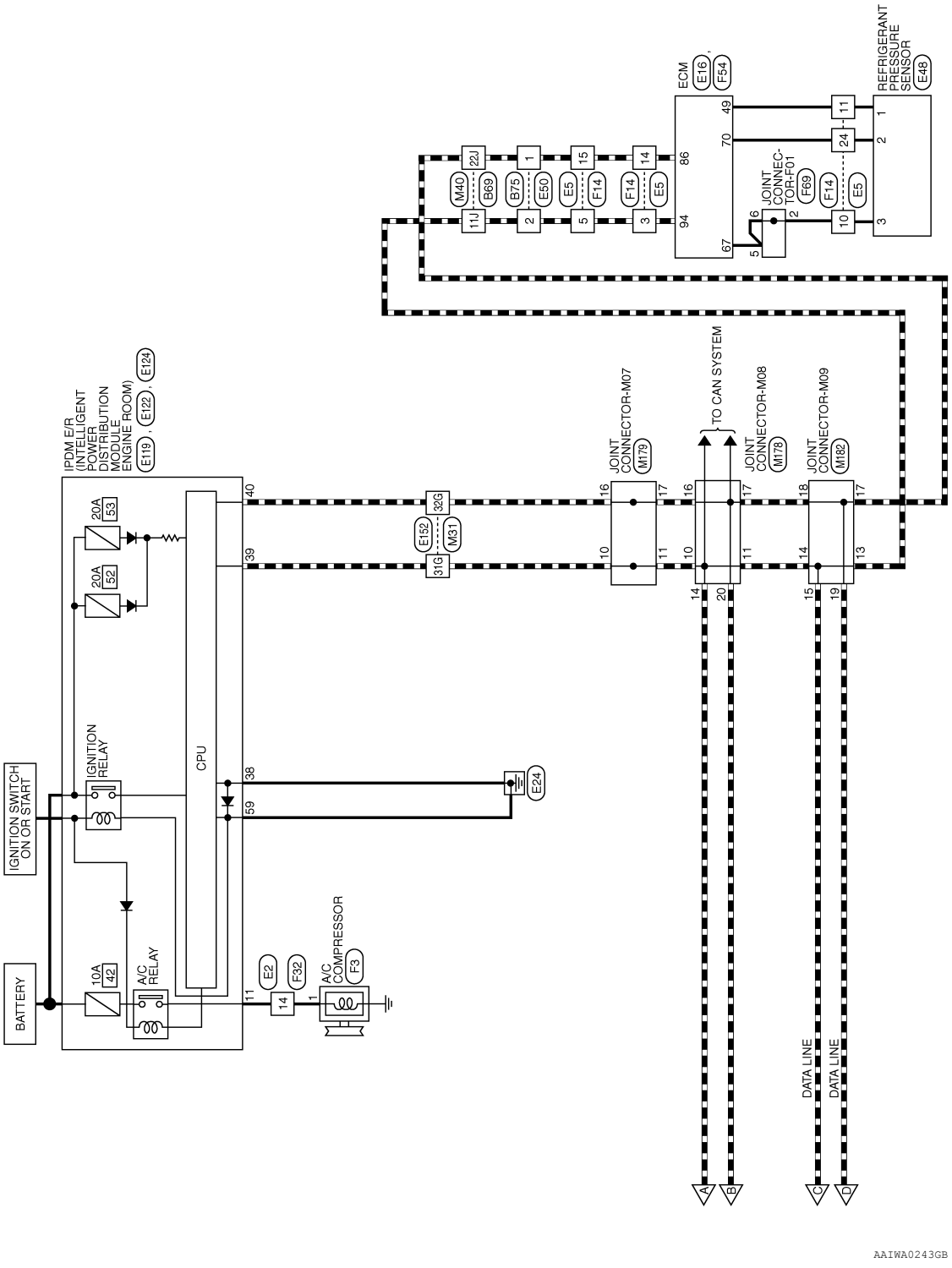
WIRING DIAGRAM

AIR CONDITIONER CONTROL

Wiring Diagram - Manual With 3 Control Dial System

INFOID:0000000011560925

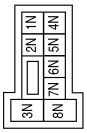



ECM
E16
F54
REFRIGERANT PRESSURE SENSOR
E48
JOINT CONNEC-TOR-F01
F69
F14
E5
IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
E119
E122
E124
JOINT CONNECTOR-M07
M179
TO CAN SYSTEM
JOINT CONNECTOR-M08
M178
JOINT CONNECTOR-M09
M182
E152
M31
20A 53
20A 52
10A 42
IGNITION RELAY
A/C RELAY
CPU
IGNITION SWITCH ON OR START
BATTERY
A/C COMPRESSOR
F3
E2
F32
E24
DATA LINE
DATA LINE
AAIWA0243GB

AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH 3 CONTROL DIAL SYSTEM

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

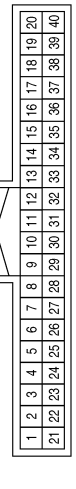
H.S.



Terminal No.	Color of Wire	Signal Name
5N	Y/G	–

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

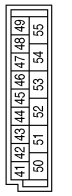
H.S.



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

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

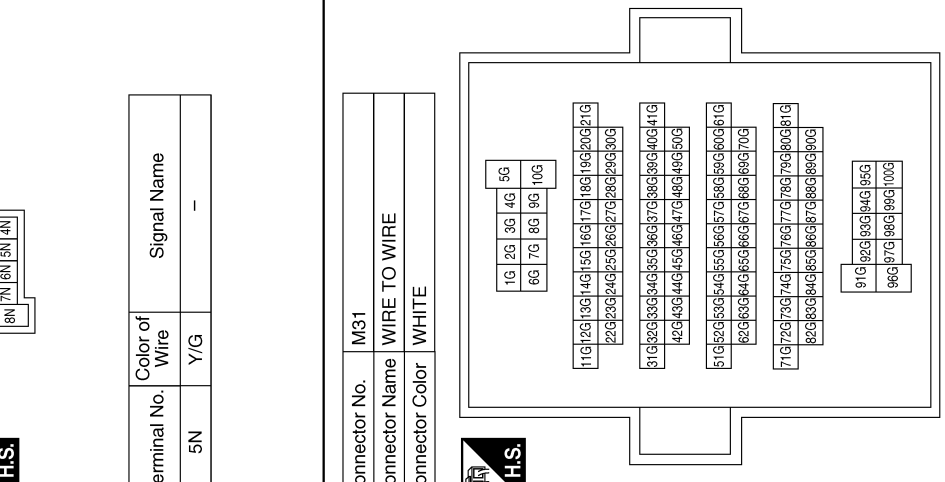
H.S.



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

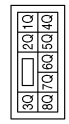
Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



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

H.S.



Terminal No.	Color of Wire	Signal Name
4Q	Y/R	–

Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
59G	W/G	–
61G	Y/L	–

AAIIA0620GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	O	–
6	G/B	–

Connector No.	M121
Connector Name	VARIABLE BLOWER CONTROL (3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
Connector Color	WHITE

H.S.

Terminal No.	Color of Wire	Signal Name
1	W/L	–
2	G/R	–
3	L/W	–
4	B/W	–

Terminal No.	Signal Name
11J	–
22J	–

Connector No.	M107
Connector Name	FRONT BLOWER RELAY
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/G	–
2	R/B	– (3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
3	W/L	–
4	–	–
5	GR	–

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.

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

H.S.

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

ABIIA1420GB

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

H.S.

1 2 3 4 5 6

Terminal No.	Color of Wire	Signal Name
1	Y	–
2	GR	–
3	P	–
5	BR/W	–
6	P/L	–

Connector No.	M144
Connector Name	DEFROSTER DOOR MOTOR
Connector Color	BLACK

H.S.

1 2 3 4 5 6

Terminal No.	Color of Wire	Signal Name
1	LG	–
2	P	–
3	Y	–
4	LG/B	–
6	P/B	–

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY

H.S.

1 2

Terminal No.	Color of Wire	Signal Name
1	V/R	–
2	L/B	–

Connector No.	M147
Connector Name	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	BLACK

H.S.

1 2 3 4 5 6

Terminal No.	Color of Wire	Signal Name
1	W/G	–
2	P	–
3	Y	–
4	SB	–
6	G	–

Connector No.	M176
Connector Name	FRONT AIR CONTROL (WITH MANUAL 3 CONTROL DIAL SYSTEM)
Connector Color	BLACK

H.S.

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	B	GND
2	Y	V REF ACTUATOR 5
3	W/G	DRIVER BLEND CW
4	G	DRIVER BLEND WCW
5	BR/W	PANEL/FLOOR CW
6	P/L	PANEL/FLOOR CCW
7	O	RECIRC 1 CW
8	G/B	RECIRC 1 CCW
9	L/B	EVAP TEMP SENS
10	–	–
11	Y/B	HB REQUEST
12	W/R	AC REQUEST
13	–	–
14	Y/G	V IGN
15	P	V REF RETURN
16	GR	PANEL/FLOOR FEEDBACK
17	–	–
18	SB	DRIVER BLEND FEEDBACK
19	LG	DEFROST CW
20	P/B	DEFROST CCW
21	V/R	SENSOR RETURN
22	Y/R	V BAT
23	R/L	ILLUM +
24	BR	ILLUM -
25	LG/B	DEFROST FEEDBACK
26	R/B	FRONT BLOWER REQUEST

ABIIA1421GB

Connector No.	M177
Connector Name	FRONT AIR CONTROL (WITH MANUAL 3 CONTROL DIAL SYSTEM)
Connector Color	GREEN

H.S.

35	34	33	32	31	30	29	28	27
44	43	42	41	40	39	38	37	36

Terminal No.	Color of Wire	Signal Name
27	–	–
28	–	–
29	Y/L	WATER VALVE OPEN +

Terminal No.	Color of Wire	Signal Name
30	W/G	WATER VALVE CLOSE -
31	–	–
32	–	–
33	–	–
34	L	CAN-H
35	P	CAN-L
36	L/R	FAN ON
37	–	–
38	–	–
39	–	–
40	G/R	VBC OUTPUT

Terminal No.	Color of Wire	Signal Name
41	–	–
42	–	–
43	–	–
44	–	–

Connector No.	M178
Connector Name	JOINT CONNECTOR-M08
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
14	L	–
16	P	–
17	P	–
20	P	–

Connector No.	M179
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	L	–
11	L	–
16	P	–
17	P	–

Connector No.	M182
Connector Name	JOINT CONNECTOR-M09
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y/G	–
11	Y/G	–
12	Y/G	–
13	L	–
14	L	–
15	L	–
17	P	–
18	P	–
19	P	–

ABIIA1433GB

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
14	Y/B	–

Connector No.	M194
Connector Name	JOINT CONNECTOR-M04
Connector Color	BLUE

H.S.

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

Terminal No.	Color of Wire	Signal Name
10	Y	–
11	Y	–
12	Y	–
14	Y	–
18	P	–
19	P	–
20	P	–

Connector No.	M192
Connector Name	JOINT CONNECTOR-M02
Connector Color	GREEN

H.S.

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

Terminal No.	Color of Wire	Signal Name
13	Y/R	–
14	Y/R	–

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

H.S.

3	2	1

Terminal No.	Color of Wire	Signal Name
1	R/Y	–
2	B/W	–
3	B	–

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK

H.S.

116	115		114		89	88	87	86	85	84	83	82
					97	96	95	94	93	92	91	90
		118	117									
					105	104	103	102	101	100	99	98
121		120		119	113	112	111	110	109	108	107	106

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

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

H.S.

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

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

ABIIA1422GB

Connector No.	E50
Connector Name	WIRE TO WIRE
Connector Color	BROWN

H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	L	–

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

H.S.

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

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

H.S.

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

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

H.S.

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

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

H.S.

Terminal No.	Color of Wire	Signal Name
4G	P	–
6G	GR	–
31G	L	–
32G	P	–
59G	W/G	–
61G	Y/L	–

ABIIA1434GB

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

H.S.

Terminal No.	Color of Wire	Signal Name
1	Y/B	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
2	Y/L	–
3	L	–
5	L	–
7	W/G	–
10	B	–
11	R/Y	–
14	P	–
15	P	–
24	B/W	–

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

H.S.

Terminal No.	Color of Wire	Signal Name
14	Y/B	–

Connector No.	F69
Connector Name	JOINT CONNECTOR-F01
Connector Color	GRAY

H.S.

Terminal No.	Color of Wire	Signal Name
2	B	–
5	B	–
6	B	–

Connector No.	F54
Connector Name	ECM
Connector Color	BLACK

H.S.

Terminal No.	Color of Wire	Signal Name
49	R/Y	AVCC (PDPRES)
67	B	GND-A
70	B/W	PD PRESS

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY

H.S.

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

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Connector No.	B75
Connector Name	WIRE TO WIRE
Connector Color	BROWN

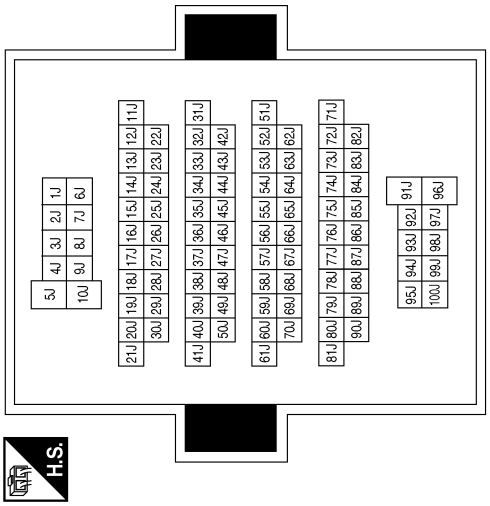
H.S.

Terminal No.	Color of Wire	Signal Name
1	P	–
2	L	–

Terminal No.	Color of Wire	Signal Name
11J	L	–
22J	P	–

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE

H.S.



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SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

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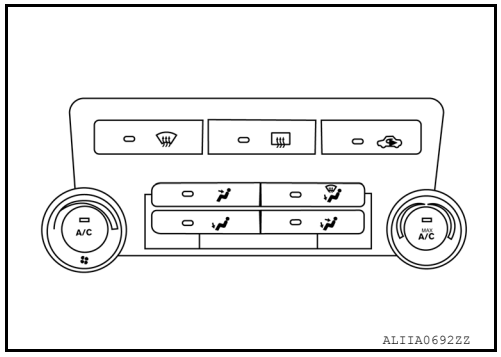
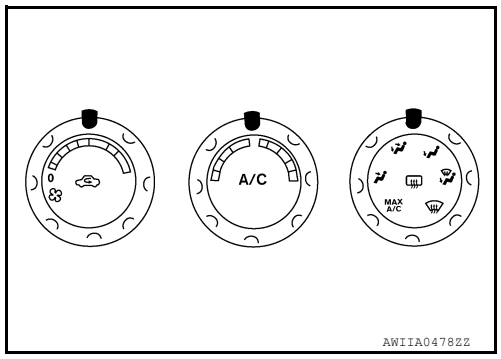
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 ALIIA0692ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 AWIIA0478ZZ

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000011560927

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-227
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-197
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-201
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-205
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-207
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-211
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-217
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-244
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-252
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-254

INSUFFICIENT COOLING

Component Function Check

INFOID:0000000011560928

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can the symptom be duplicated?

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

2.CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-182, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-243, "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-13, "Checking Drive Belts".

Is the inspection result normal?

YES >> GO TO 5.
NO >> Adjust or replace compressor belt. Refer to EM-13, "Removal and Installation".

5.CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to HAC-201, "Air Mix Door Motor Component Function Check".

Does air mix door operate correctly?

YES >> GO TO 6.
NO >> Check air mix door motor circuit. Refer to HAC-202, "Air Mix Door Motor Diagnosis Procedure".

6.CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to EC-380, "Overall Function Check".

Does cooling fan motor operate correctly?

YES >> GO TO 7.
NO >> Check cooling fan motor. Refer to EC-381, "Diagnosis Procedure".

7.CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to HAC-222, "Description".

Does water valve operate correctly?

YES >> GO TO 8.
NO >> Check water valve circuit. Refer to HAC-222, "Water Valve 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.

>> 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-255, "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-245, "Diagnostic Work Flow".
NO >> GO TO 11.

11.CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-247, "Performance Chart".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-245, "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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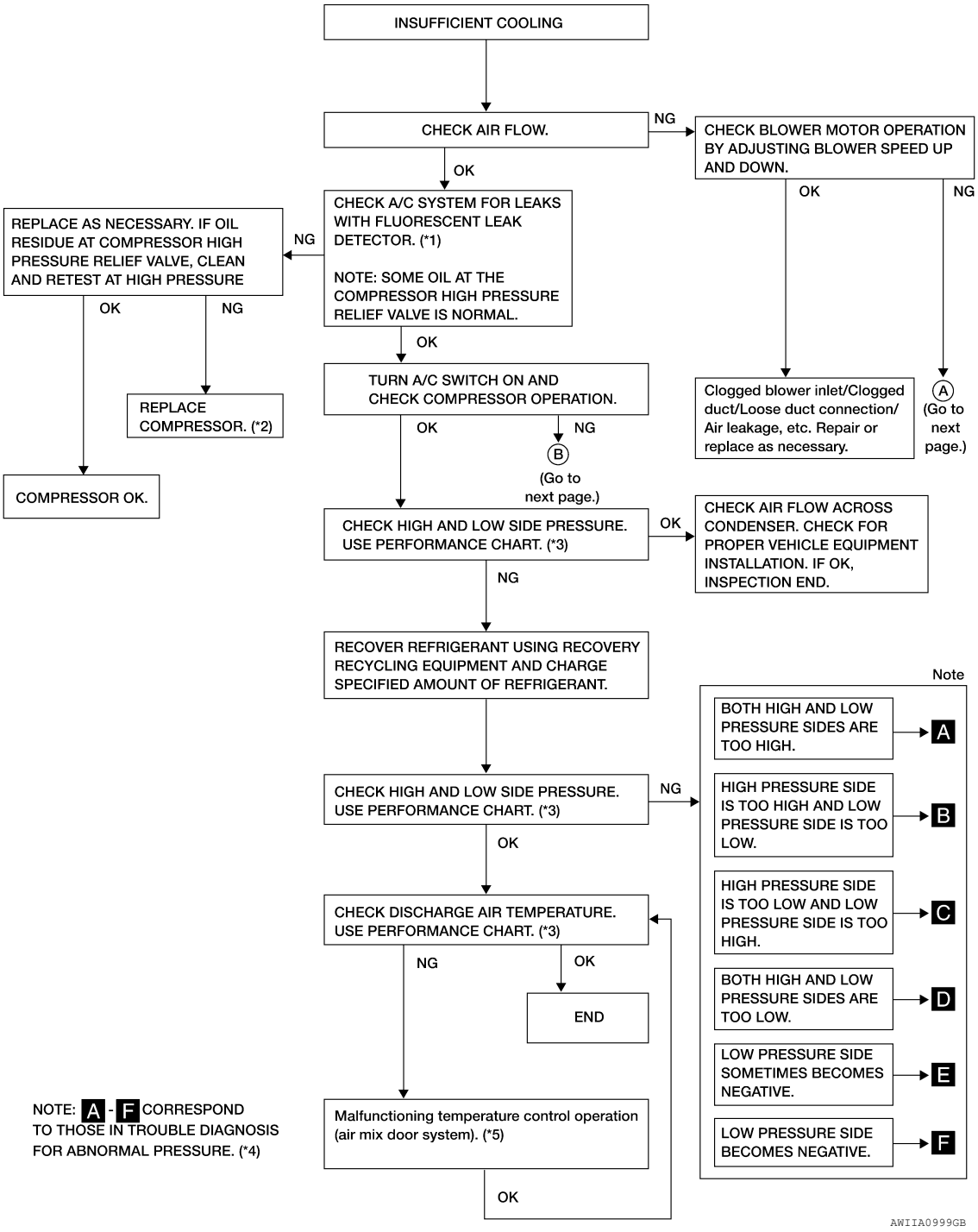
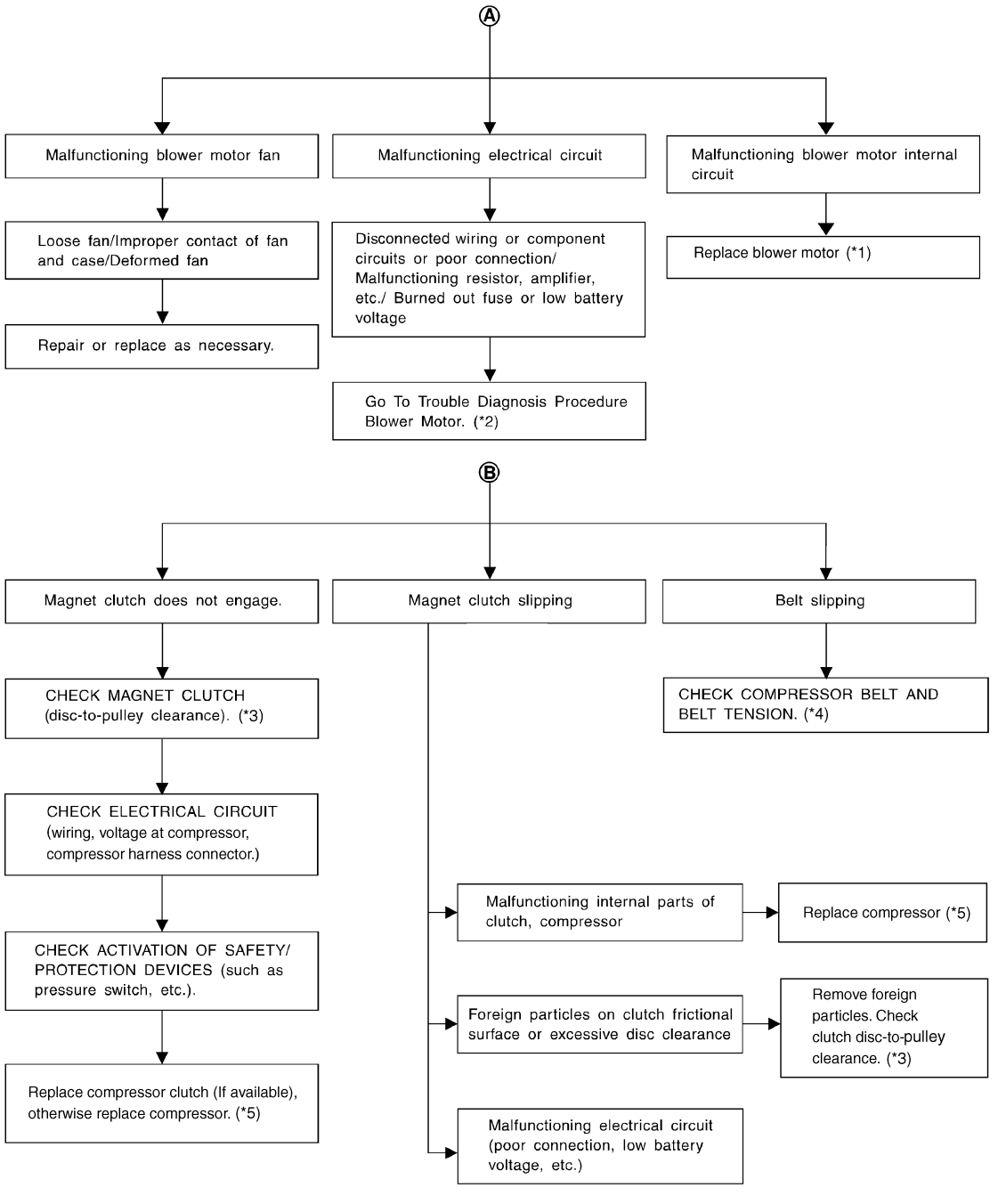


*1 HA-24, "Checking System for Leaks Using the Fluorescent Dye Leak Detector"
*2 HA-33, "Removal and Installation"
*3 HAC-247, "Performance Chart"
*4 HAC-248, "Trouble Diagnoses for Abnormal Pressure"
*5 HAC-201, "Air Mix Door Motor Component Function Check"



*1 VTL-12, "Removal and Installation" *2 HAC-211, "Front Blower Motor Component Function Check" *3 HA-33, "Removal and Installation"

*4 EM-13, "Checking Drive Belts" *5 HA-31, "Removal and Installation"

Performance Chart

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TEST CONDITION

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode control dial	(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

Recirculation-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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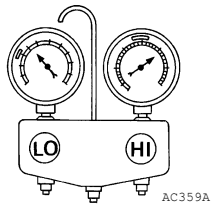
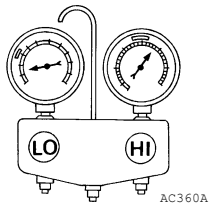
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the stan-

dard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient air temperature-to-operating pressure table):

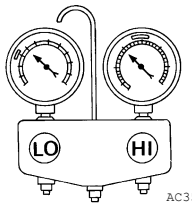
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
A Both high- and low-pressure sides are too high.  AC359A	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	• Clean condenser. • Check and repair cooling fan if necessary.
	• Low-pressure pipe is not cold. • When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm^2, 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.
	• An area of the low-pressure pipe is colder than areas near the evaporator outlet. • Plates are sometimes covered with frost.	• 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.

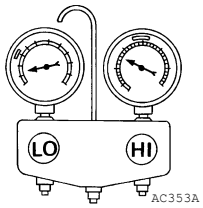
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
B High-pressure side is too high and low-pressure side is too low.  AC360A	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.	• Check and repair or replace malfunctioning parts. • Check oil for contamination.

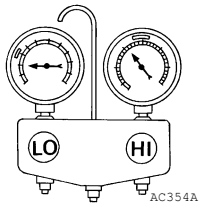
High-pressure Side is Too Low and Low-pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
C High-pressure side is too low and low-pressure side is too high. 	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.

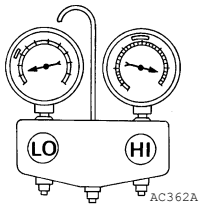
Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
D Both high- and low-pressure sides are too low. 	• 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.	• Replace liquid tank. • Check oil for contamination.
	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	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-24, "Checking of Refrigerant Leaks" or HA-26, "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.	• 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.	• Check and repair malfunctioning parts. • Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	• Check intake sensor circuit. Refer to HAC-224, "Intake Sensor Diagnosis Procedure". • Repair evaporator fins. • Replace evaporator. • Refer to HAC-211, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
E Low-pressure side sometimes becomes negative. 	• 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.	• Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
F Low-pressure side becomes negative. 	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	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. • 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:0000000011560932

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

1. Turn the blower control dial to low speed.
2. Turn the temperature control dial clockwise to maximum heat
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-182, "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-10, "Inspection".
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to CO-10, "Inspection".
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-201, "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 >>
- Inlet hose cold: GO TO 10.
- Both hoses warm: GO TO 8.

7. CHECK ENGINE COOLANT SYSTEM

Check engine coolant temperature sensor. Refer to EC-192, "Component Inspection".

Is the inspection result normal?

YES >> System OK.
NO >> Repair or replace as necessary. Retest.

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-11, "Changing Engine Coolant".
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-15, "Removal and Installation".

10. CHECK WATER VALVE

Check the operation of the water valve. Refer to HAC-222, "Water Valve Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.
NO >> Replace water valve.

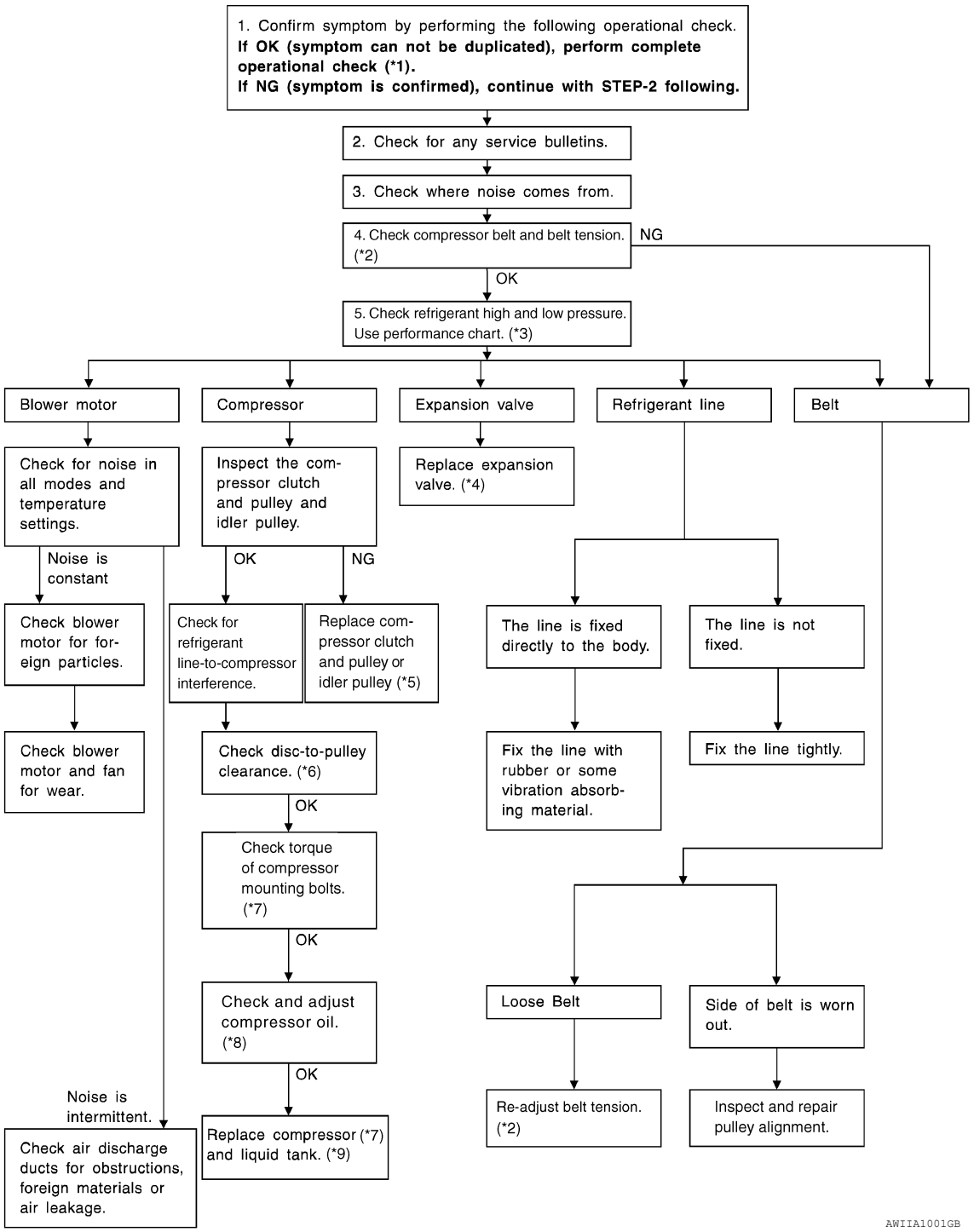
NOISE

Component Function Check

INFOID:0000000011560933

SYMPTOM: Noise

INSPECTION FLOW



*1 HAC-182, "Operational Check"
*2 EM-13, "Checking Drive Belts"
*3 HAC-247, "Performance Chart"
*4 HA-43, "Removal and Installation"
*5 HA-33, "Removal and Installation"
*6 HA-33, "Removal and Installation"
*7 HA-31, "Removal and Installation"
*8 HA-22, "Maintenance of Oil Quantity in Compressor"
*9 HA-41, "Removal and Installation"

PRECAUTION

PRECAUTIONS

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

INFOID:0000000011560934

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:0000000011560935

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-4, "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

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

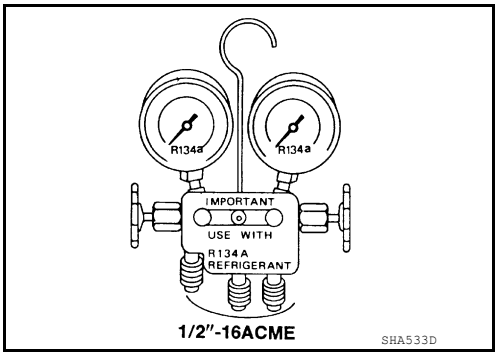
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location 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:0000000011560936

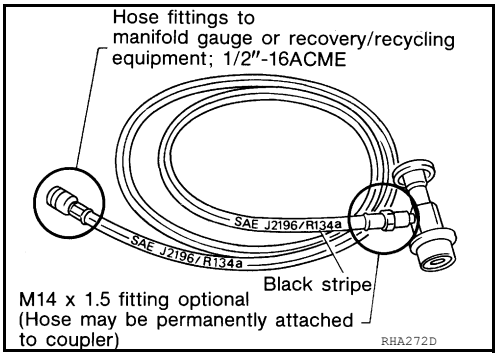
MANIFOLD GAUGE SET

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