

D

Е

F

HEATER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

AUTOMATIC AIR CONDITIONER	System Description	
BASIC INSPECTION6	Mode Door Motor Component Function Check2 Mode Door Motor Diagnosis Procedure	
DIAGNOSIS AND REPAIR WORKFLOW 6	-	
How to Perform Trouble Diagnosis For Quick And	System Description	
Accurate Repair6		
·	Air Miy Door Motor (Driver) Diagnosis Procedure	
INSPECTION AND ADJUSTMENT7	Air Mix Door Motor (Passenger) Diagnosis Proce-	
Operational Check7	dure	
FUNCTION DIAGNOSIS9	INTAKE DOOR MOTOR	HAC
FUNCTION INFORMATION9	System Description	
	intake Door Motor Component Function Check	
Component Part Location9 Symptom Table11		39
	DEEDOSTED DOOD MOTOD CIDCUIT	41
REFRIGERATION SYSTEM12	System Description 2	41 K
Refrigerant Cycle12 Refrigerant System Protection12		
Tremgerant Gystem Floteotion12	••••	
AUTOMATIC AIR CONDITIONER SYSTEM13		42 _L
Control System Diagram13		46
Control System Description		46
Discharge Air Flow	1 fort blower wotor component i unction check	
Switches And Their Control Function16	From blower wotor Diagnosis Procedure	
CAN COMMUNICATION SYSTEM17	Front Blower Motor Component Inspection	51
System Description17	MAGNET CLUTCH	53 N
DIAGNOSIS SYSTEM (HVAC)18	O store Description	
CONSULT-III Function (HVAC)	Manual Olytah Canananat Function Obsal	
CONSOLT-III I diretion (TVAG)10	Magnet Clutch Diagnosis Procedure	
DIAGNOSIS SYSTEM (BCM)20		
CONSULT-III Function (BCM)20		-0
SELF-DIAGNOSIS FUNCTION21	Description	
Front Air Control Self-Diagnosis21		30
Front Air Control Self-Diagnosis Code Chart21	AMBIENT SENSOR	
_	Component Description6	
COMPONENT DIAGNOSIS22		
MODE DOOR MOTOR22	Ambient Sensor Component Inspection	61

IN-VEHICLE SENSOR	63	DIAGNOSIS AND REPAIR WORKFLOW	.100
Component Description	63	How to Perform Trouble Diagnosis For Quick And	
In-Vehicle Sensor Diagnosis Procedure		Accurate Repair	. 100
In-Vehicle Sensor Component Inspection	65	INSPECTION AND ADJUSTMENT	404
OPTICAL SENSOR		Operational Check	
Component Description	66	·	
Optical Sensor Diagnosis Procedure		FUNCTION DIAGNOSIS	. 103
INTAKE SENSOR	68	MANUAL A/C IDENTIFICATION TABLE	.103
System Description	68	Application Table	. 103
Intake Sensor Diagnosis Procedure	68	FUNCTION INFORMATION	404
Intake Sensor Component Inspection	69		
DOWED CLIDDLY AND CROUND CIRCUIT		Component Part Location Symptom Table	
POWER SUPPLY AND GROUND CIRCUIT	70	Symptom rable	. 100
FOR CONTROLLER		REFRIGERATION SYSTEM	.107
Component Description		Refrigerant Cycle	. 107
Front Air Control Component Function Check	70	Refrigerant System Protection	. 107
Front Air Control Power and Ground Diagnosis Procedure	71	MANUAL AIR CONDITIONER OVOTEM	
Procedure	/ 1	MANUAL AIR CONDITIONER SYSTEM	
ECU DIAGNOSIS	72	Control System Diagram	
		Control System Description	. 108
AIR CONDITIONER CONTROL		Discharge Air Flow	
Front Air Control Terminals Reference Values		Switches And Their Control Function	. 110
Wiring Diagram	74	CAN COMMUNICATION SYSTEM	.112
SYMPTOM DIAGNOSIS		System Description	
		DIACNOSIS SYSTEM (UVAC)	440
AIR CONDITIONER CONTROL	83	DIAGNOSIS SYSTEM (HVAC)	
Symptom Matrix Chart	83	CONSULT-III Function (HVAC)	. 113
INCUEFICIENT COOLING		DIAGNOSIS SYSTEM (BCM)	.114
INSUFFICIENT COOLING	04	CONSULT-III Function (BCM)	
Component Function Check		, ,	
Performance Test Diagnoses Performance Chart		SELF-DIAGNOSIS FUNCTION	
Test Reading		Front Air Control Self-Diagnosis	
Trouble Diagnoses for Unusual Pressure		Front Air Control Self-Diagnosis Code Chart	. 115
Trouble Diagnoses for Offusual Fressure		COMPONENT DIAGNOSIS	116
INSUFFICIENT HEATING	92	COMI CINENT DIAGRACIO	. 1 10
Component Function Check	92	MANUAL A/C IDENTIFICATION TABLE	.116
NOISE		Application Table	
NOISE			
Component Function Check	94	MODE DOOR MOTOR	
MEMORY FUNCTION DOES NOT OPERATE	96	System Description	
Memory Function Check		Mode Door Motor Component Function Check	
•		Mode Door Motor Diagnosis Procedure	. 118
PRECAUTION	97	AIR MIX DOOR MOTOR	.122
DDECAUTIONS		System Description	
PRECAUTIONS	97	Air Mix Door Motor Component Function Check	
Supplemental Restraint System (SRS) "AIR BAG"	07	Air Mix Door Motor Diagnosis Procedure	
and "SEAT BELT PRE-TENSIONER"	~7	•	
Working with HFC-134a (R-134a) Precaution for Service Equipment		INTAKE DOOR MOTOR	
	30	System Description	
MANUAL A/C (TYPE 1)		Intake Door Motor Component Function Check	
BASIC INSPECTION	99	Intake Door Motor Diagnosis Procedure	. 128
		DEFROSTER DOOR MOTOR CIRCUIT	.130
MANUAL A/C IDENTIFICATION TABLE	99	System Description	
Application Table	99	- , - ,	. 55

Defroster Door Motor Component Function Check	NOISE177
130	Component Function Check177
Defroster Door Motor Diagnosis Procedure 131	PRECAUTION179
BLOWER MOTOR CONTROL SYSTEM 135	
System Description135	PRECAUTIONS179
Front Blower Motor Component Function Check 135	Supplemental Restraint System (SRS) "AIR BAG"
Front Blower Motor Diagnosis Procedure 136	and "SEAT BELT PRE-TENSIONER"179
Front Blower Motor Component Inspection 139	Working with HFC-134a (R-134a)179
MACNET OLLITOLI	Precaution for Service Equipment180
MAGNET CLUTCH141	MANUAL A/C (TYPE 2)
System Description	DAGIO INORECTION
Magnet Clutch Component Function Check 141	BASIC INSPECTION181
Magnet Clutch Diagnosis Procedure142	MANUAL A/C IDENTIFICATION TABLE 181
WATER VALVE CIRCUIT146	Application Table181
Description146	Application rable
Water Valve Diagnosis Procedure146	DIAGNOSIS AND REPAIR WORKFLOW 182
	How to Perform Trouble Diagnosis For Quick And
AMBIENT SENSOR148	Accurate Repair182
Component Description148	INODEOTION AND AD HIGTMENT
Ambient Sensor Diagnosis Procedure148	INSPECTION AND ADJUSTMENT183
Ambient Sensor Component Inspection149	Operational Check183 G
INTAKE SENSOR151	FUNCTION DIAGNOSIS 185
System Description151	
Intake Sensor Diagnosis Procedure151	MANUAL A/C IDENTIFICATION TABLE 185
Intake Sensor Component Inspection152	Application Table185
· ·	FUNCTION INFORMATION
POWER SUPPLY AND GROUND CIRCUIT	FUNCTION INFORMATION186
FOR CONTROLLER153	Component Part Location186
Component Description 153	Symptom Table188
Front Air Control Component Function Check 153	REFRIGERATION SYSTEM189
Front Air Control Power and Ground Diagnosis	Refrigerant Cycle189
Procedure154	Refrigerant System Protection189
ECU DIAGNOSIS155	K
ECO DIAGNOSIS100	MANUAL AIR CONDITIONER SYSTEM 190
MANUAL A/C IDENTIFICATION TABLE 155	Control System Diagram190
Application Table155	Control System Description190
	Discharge Air Flow191
AIR CONDITIONER CONTROL156	Switches And Their Control Function192
Front Air Control Terminals Reference Values 156	CAN COMMUNICATION SYSTEM194
Wiring Diagram158	System Description194
SYMPTOM DIAGNOSIS165	
3 I WIF I OW DIAGNOSIS103	DIAGNOSIS SYSTEM (BCM)195
MANUAL A/C IDENTIFICATION TABLE 165	CONSULT-III Function (BCM)195
Application Table165	COMPONENT DIA ONOGIO
	COMPONENT DIAGNOSIS196
AIR CONDITIONER CONTROL166	MANUAL A/C IDENTIFICATION TABLE 196
Symptom Matrix Chart166	Application Table196
INSUFFICIENT COOLING167	Application rable190
Component Function Check	MODE DOOR MOTOR197
Performance Test Diagnoses	System Description197
Performance Chart	Mode Door Motor Component Function Check197
Test Reading171	Mode Door Motor Diagnosis Procedure198
Trouble Diagnoses for Unusual Pressure	•
Trouble Diagnoses for Offusual Fressule 1/2	AIR MIX DOOR MOTOR202
INSUFFICIENT HEATING175	System Description
Component Function Check175	Air Mix Door Motor Component Function Check202

Air Mix Door Motor Diagnosis Procedure203	Trouble Diagnoses for Unusual Pressure 249
INTAKE DOOR MOTOR207	INSUFFICIENT HEATING252
System Description207	Component Function Check252
Intake Door Motor Component Function Check207	NOISE254
Intake Door Motor Diagnosis Procedure208	Component Function Check
DEFROSTER DOOR MOTOR CIRCUIT 210	·
System Description210	PRECAUTION256
Defroster Door Motor Component Function Check	PRECAUTIONS256
210	Supplemental Restraint System (SRS) "AIR BAG"
Defroster Door Motor Diagnosis Procedure211	and "SEAT BELT PRE-TÉNSIONER" 256
BLOWER MOTOR CONTROL SYSTEM 215	Working with HFC-134a (R-134a)256
System Description215	Precaution for Service Equipment
Front Blower Motor Component Function Check215	MANUAL A/C (TYPE 3)
Front Blower Motor Diagnosis Procedure216 Front Blower Motor Component Inspection219	BASIC INSPECTION258
·	
MAGNET CLUTCH 221	MANUAL A/C IDENTIFICATION TABLE258
System Description	Application Table258
Magnet Clutch Component Function Check221 Magnet Clutch Diagnosis Procedure221	DIAGNOSIS AND REPAIR WORKFLOW259
Magnet Clutch Diagnosis Flocedure221	How to Perform Trouble Diagnosis For Quick And
WATER VALVE CIRCUIT 226	Accurate Repair259
Description	INSPECTION AND ADJUSTMENT260
Water Valve Diagnosis Procedure226	Operational Check260
INTAKE SENSOR 228	
System Description228	FUNCTION DIAGNOSIS262
Intake Sensor Diagnosis Procedure228	MANUAL A/C IDENTIFICATION TABLE262
Intake Sensor Component Inspection229	Application Table262
POWER SUPPLY AND GROUND CIRCUIT	FUNCTION INFORMATION263
FOR CONTROLLER 230	Component Part Location
Component Description230	Symptom Table
Front Air Control Component Function Check230	
Front Air Control Power and Ground Diagnosis Procedure	REFRIGERATION SYSTEM266
	Refrigerant Cycle
ECU DIAGNOSIS232	•
MANUAL A/C IDENTIFICATION TABLE 232	MANUAL AIR CONDITIONER SYSTEM267
Application Table232	Control System Diagram
• •	Control System Description
AIR CONDITIONER CONTROL233	Switches And Their Control Function
Front Air Control Terminals Reference Values233	
Wiring Diagram235	CAN COMMUNICATION SYSTEM271
SYMPTOM DIAGNOSIS242	System Description271
MANUAL A/C IDENTIFICATION TABLE 242	DIAGNOSIS SYSTEM (BCM)272
Application Table242	CONSULT-III Function (BCM)272
• •	COMPONENT DIAGNOSIS273
AIR CONDITIONER CONTROL243	COMI CIVELLY DIACHOOLO
Symptom Matrix Chart243	MANUAL A/C IDENTIFICATION TABLE273
INSUFFICIENT COOLING244	Application Table273
Component Function Check244	MODE DOOR MOTOR274
Performance Test Diagnoses245	System Description274
Performance Chart	Mode Door Motor Component Function Check 274
Test Reading248	Mode Door Motor Diagnosis Procedure275

AIR MIX DOOR MOTOR279	Front Air Control Power and Ground Diagnosis	
System Description	Procedure309	1
Air Mix Door Motor Component Function Check 279 Air Mix Door Motor Diagnosis Procedure	ECU DIAGNOSIS310	
INTAKE DOOR MOTOR284	MANUAL A/C IDENTIFICATION TABLE 310	3
System Description284	Application Table310	
Intake Door Motor Component Function Check 284	AIR CONDITIONER CONTROL311	
Intake Door Motor Diagnosis Procedure285	Front Air Control Terminals Reference Values311	j
DEFROSTER DOOR MOTOR CIRCUIT287	Wiring Diagram313	
System Description	SYMPTOM DIAGNOSIS321)
287	MANUAL A/C IDENTIFICATION TABLE 321	
Defroster Door Motor Diagnosis Procedure 288	Application Table321	=
BLOWER MOTOR CONTROL SYSTEM292	AIR CONDITIONER CONTROL322	
System Description	Symptom Matrix Chart322	
Front Blower Motor Component Function Check 292	INSUFFICIENT COOLING323	=
Front Blower Motor Diagnosis Procedure 293 Front Blower Motor Component Inspection 296	Component Function Check323	
·	Performance Test Diagnoses324	
MAGNET CLUTCH299	Performance Chart326	ì
System Description	Test Reading327	
Magnet Clutch Component Function Check 299 Magnet Clutch Diagnosis Procedure	Trouble Diagnoses for Unusual Pressure328	4
	INSUFFICIENT HEATING331	
WATER VALVE CIRCUIT 304 Description 304	Component Function Check331	
Water Valve Diagnosis Procedure304	NOISE333	4
	Component Function Check333	
INTAKE SENSOR306		
System Description	PRECAUTION335	J
Intake Sensor Component Inspection307	PRECAUTIONS335	
·	Supplemental Restraint System (SRS) "AIR BAG"	
POWER SUPPLY AND GROUND CIRCUIT	and "SEAT BELT PRE-TENSIONER"335	(
FOR CONTROLLER308	Working with HFC-134a (R-134a)335	
Component Description	Precaution for Service Equipment336	
Front Air Control Component Function Check 308	L	-

 \mathbb{N}

Ν

0

DIAGNOSIS AND REPAIR WORKFLOW

[AUTOMATIC AIR CONDITIONER]

BASIC INSPECTION

< BASIC INSPECTION >

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000001611774

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-7, "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-83, "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 <u>HAC-21</u>, "Front Air Control Self-Diagnosis Code Chart".
- >> Confirm the repair by performing operational check. Refer to HAC-7, "Operational Check".

INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION > INSPECTION AND ADJUSTMENT Α Operational Check INFOID:0000000001611775 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. D Turn ignition switch OFF. 4. Turn ignition switch ON. Е 5. Press the AUTO switch. Confirm that the set temperature remains at previous temperature. F Press the OFF switch. If NG, go to trouble diagnosis procedure for HAC-96, "Memory Function Check". If OK, continue with next check. CHECKING BLOWER Rotate the blower control dial clockwise once, blower should operate on low speed. Rotate the blower control dial again, and continue checking blower speed until all speeds are checked. Н Leave blower on maximum speed. If NG, go to trouble diagnosis procedure for HAC-48, "Front Blower Motor Diagnosis Procedure". If OK, continue with next check. CHECKING DISCHARGE AIR 1. Press each MODE switch and the DEF w switch. Each MODE position indicator should illuminate. 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-24, "Mode Door Motor Diagnosis Procedure". If OK, continue the check. L NOTE: Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at M

fresh when the DEF or D/F is selected.

CHECKING RECIRCULATION (♥, ♥ ONLY)

- 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-39, "Intake Door Motor Diagnosis Procedure". If OK, continue the check.

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.
- 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-84, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-29, "Air Mix Door Motor Component Function Check".

HAC

Ν

INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

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 <u>HAC-92</u>. "Component Function Check". If air mix door motor appears to be malfunctioning, go to <u>HAC-29</u>, "Air Mix Door <u>Motor Component Function Check"</u>.

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 <u>HAC-54</u>, "<u>Magnet Clutch Diagnosis Procedure</u>". 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 <u>HAC-71</u>, "Front Air Control Power and Ground <u>Diagnosis Procedure"</u>, then if necessary, trouble diagnosis procedure for <u>HAC-54</u>, "Magnet Clutch <u>Diagnosis Procedure"</u>.

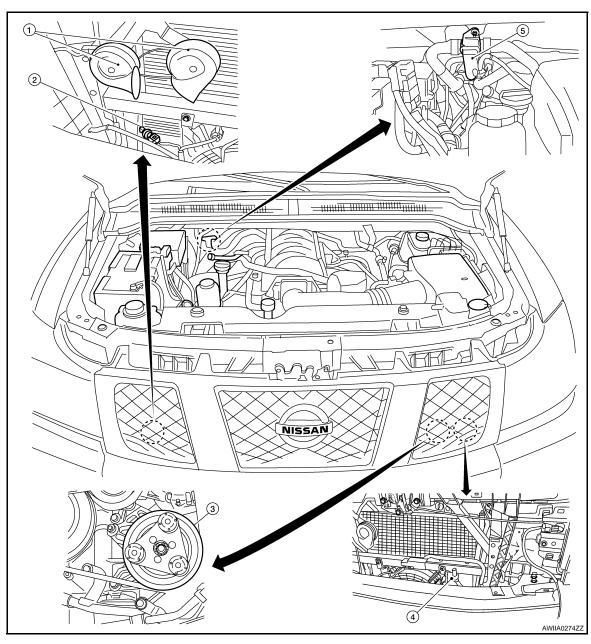
If all operational checks are OK (symptom cannot be duplicated), go to malfunction Simulation Tests in HAC-6. "How to Perform Trouble Diagnosis For Quick And Accurate Repair" and perform tests as outlined to simulate driving conditions environment. If symptom appears. Refer to HAC-83. "Symptom Matrix Chart", and perform applicable trouble diagnosis procedures.

FUNCTION DIAGNOSIS

FUNCTION INFORMATION

Component Part Location

ENGINE COMPARTMENT



- 1. Horn (view with grille removed)
- Ambient sensor E1 (view with grille removed)
- 2. Refrigerant pressure sensor E111
- Water valve F68
- 3. A/C Compressor F3

Α

С

В

INFOID:0000000001611777

D

Е

F

G

Н

HAC

J

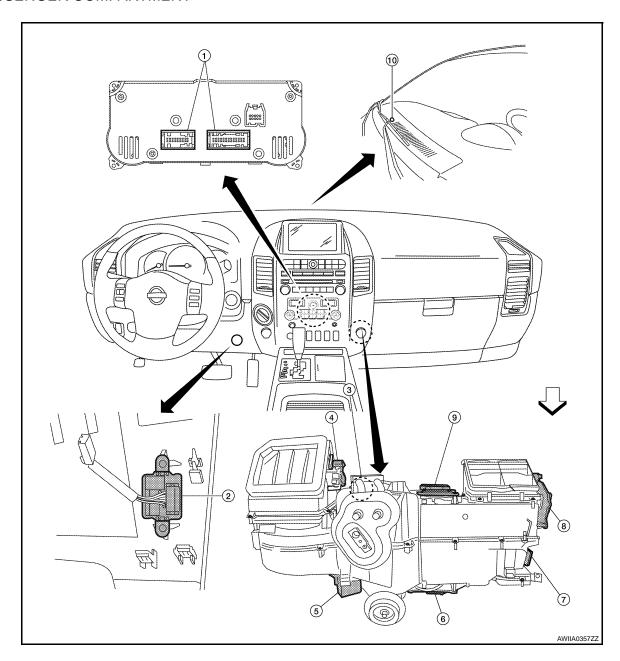
K

M

Ν

 \bigcirc

PASSENGER COMPARTMENT



- 1. Front air control M49, M50
- 4. Intake door motor M58
- 7. Mode door motor M142
- 10. Optical sensor M302
- 2. In-vehicle sensor M32
- Variable blower control (front) M122
- 8. Defroster door motor M144
- $\Leftarrow \quad : Front$

- 3. Intake sensor M146
- 6. Air mix door motor (Passenger) M143
- D. Air mix door motor (driver) M147

FUNCTION INFORMATION

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INFOID:0000000001611778

Α

В

D

Е

F

G

Н

Symptom Table

Symptom	Reference Page	_
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	<u>HAC-71</u>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	<u>HAC-21</u>
Air outlet does not change.	Co to Trouble Diagnosis Dropadure for Made Door Motor	1100.24
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-24</u>
Discharge air temperature does not change.	Co to Trouble Diagnosis Procedure for Air Mix Door Motor	HAC 20
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<u>HAC-29</u>
Intake door does not change.	Co to Trouble Diagnosis Broody ve for Intella Dear Mater	114 € 20
Intake door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<u>HAC-39</u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	<u>HAC-42</u>
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	<u>HAC-48</u>
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	<u>HAC-54</u>
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<u>HAC-84</u>
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	<u>HAC-92</u>
Noise	Go to Trouble Diagnosis Procedure for Noise.	<u>HAC-94</u>
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	<u>HAC-21</u>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-96

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

REFRIGERATION SYSTEM

Refrigerant Cycle

Refer to HAC-12, "Refrigerant Cycle".

Refrigerant System Protection

INFOID:0000000001611780

Refer to HAC-12, "Refrigerant System Protection".

AUTOMATIC AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000001611781

Α

В

D

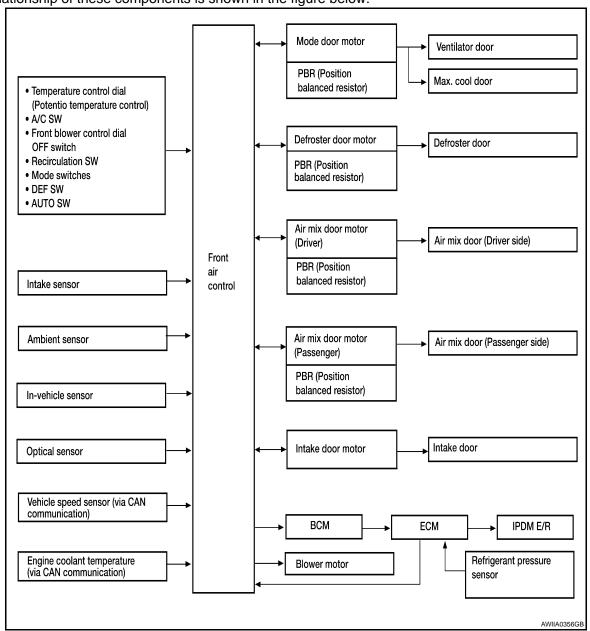
Е

Н

HAC

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:0000000001611782

CONTROL OPERATION

Р

Ν

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.)

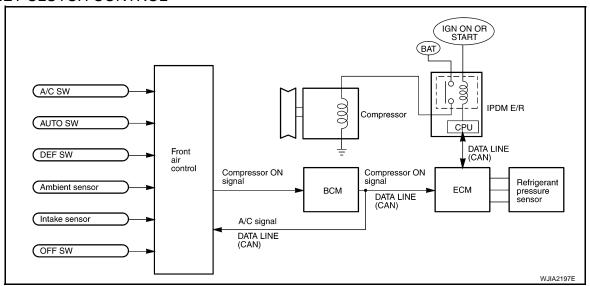
MODE SWITCHES

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

WJIA0540E

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
7,	95%	5%	_
**	60%	40%	_
ų,	_	70%	30%
357.3	_	60%	40%
(4)	_	10%	90%

HAC

INFOID:0000000001611783

Н

Α

В

D

Е

F

K

M

L

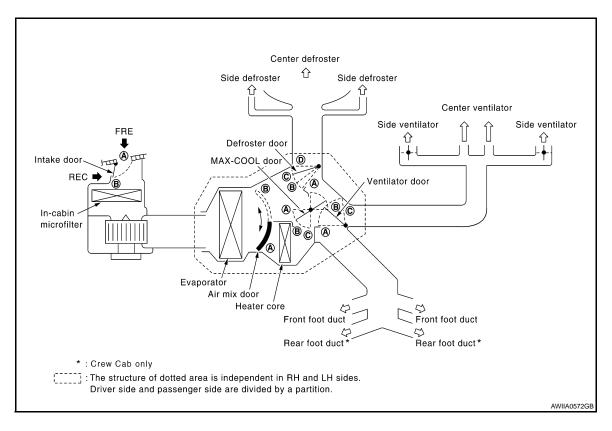
Ν

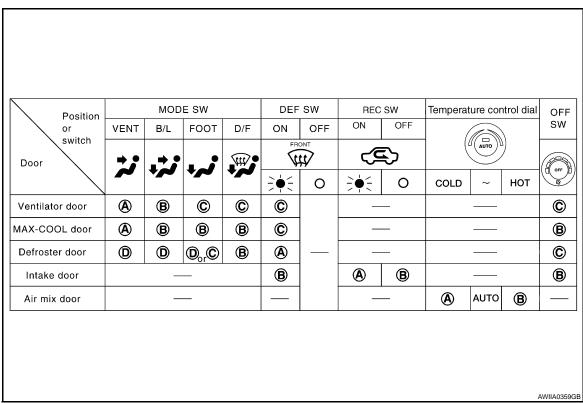
0

Ρ

Switches And Their Control Function

INFOID:0000000001611785





CAN COMMUNICATION SYSTEM

		11		-10	N I	\Box	^	NIC	\C	Ο.	
<	Fι	JI۱	1CT	TC)	IV	1) 1 /	Α(¬	INC.	והנ	7	>

[AUTOMATIC AIR CONDITIONER]

CAN COMMUNICATION SYSTEM

System Description

INFOID:0000000001611787

Refer to LAN-4, "System Description".

В

Α

С

D

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

DIAGNOSIS SYSTEM (HVAC)

CONSULT-III Function (HVAC)

INFOID:0000000001611788

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

Diagnostic mode	Description
SELF-DIAG RESULTS	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 PART NUMBER	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"	
B2578	In-vehicle sensor circuit out of range (low)	HAC-63, "In-Vehicle Sensor Diagnosis Procedure"	
B2579	In-vehicle sensor circuit out of range (high)	- MAC-03, III-Verilcie Serisor Diagnosis Procedure	
B257B	Ambient sensor circuit short	HAC-61, "Ambient Sensor Component Inspection"	
B257C	Ambient sensor circuit open	- Mac-ot, Ambient Sensor Component Inspection	
B257F	Optical sensor (Driver) circuit open or short	HAC-66, "Optical Sensor Diagnosis Procedure".	
B2580	Optical sensor (Passenger) circuit open or short	- MAC-00, Optical Serisor Diagnosis Procedure.	
B2581	Intake sensor circuit short	HAC-69, "Intake Sensor Component Inspection"	
B2582	Intake sensor circuit open	- Ind-03, intake Sensor Component inspection	
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.
A/C	"ON/OFF"	Displays A/C switch signal.

DIAGNOSIS SYSTEM (HVAC)

< FUNCTION DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Monitor item	Value	Contents	
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.	

D

Α

В

С

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

DIAGNOSIS SYSTEM (BCM)

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM)

INFOID:0000000001611789

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

BCM diagnostic test item	Diagnostic mode	Description
	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR	Displays BCM input/output data in real time.
Inspection by part	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
.,	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.
	CONFIGURATION	Performs BCM configuration read/write functions.

DATA MONITOR

Display Item List

Monitor item name "operation or unit"		Contents
IGN ON SW	"ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
COMP ON SIG	"ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.
FAN ON SIG	"ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower motor switch signal.

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:0000000001611790

Α

В

D

Е

A/C SYSTEM SELF-DIAGNOSIS FUNCTION

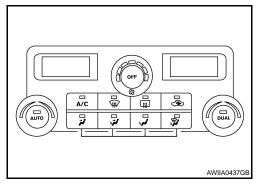
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

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.



INFOID:0000000001611792

Front Air Control Self-Diagnosis Code Chart

SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page		
03	Battery voltage out of range	CHG-4, "Work Flow"	
30	In-vehicle sensor circuit out of range (low)	HAC-63, "In-Vehicle Sensor Diagnosis Procedure"	
31	In-vehicle sensor circuit out of range (high)	MAC-03, III-Verlicie Serisor Diagnosis Procedure	
40	Ambient sensor circuit short	HAC 60 "Ambient Congr Diagnosis Procedure"	
41	Ambient sensor circuit open	HAC-60, "Ambient Sensor Diagnosis Procedure"	
50	Optical sensor (Driver) circuit open or short	HAC 66 "Optical Capaci Diagnosis Procedure"	
52	Optical sensor (Passenger) circuit open or short	HAC-66, "Optical Sensor Diagnosis Procedure"	
56	Intake sensor circuit short	HAC 69 "Intoko Songer Diagnosis Procedura"	
57	Intake sensor circuit open	HAC-68, "Intake Sensor Diagnosis Procedure"	
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"	
90	Stuck button	VTL-8, "Removal and Installation"	

HAC

K

L

M

Ν

Н

0

COMPONENT DIAGNOSIS

MODE DOOR MOTOR

System Description

INFOID:0000000001611793

SYSTEM DESCRIPTION

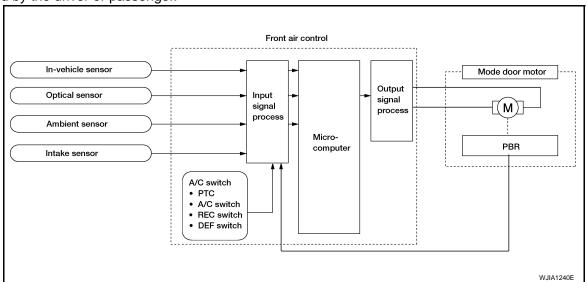
Component Parts

Mode door control system components are:

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

System Operation

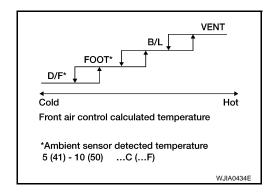
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the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



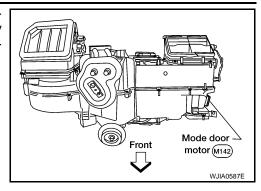
Mode Door Control Specification

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:0000000001611794

INSPECTION FLOW

${f 1}$.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

- 1. Press each mode switch and press the i (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.

Can a 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-7, "Operational Check"

Can a symptom be duplicated?

YES >> Refer to HAC-6, "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.CHECK MODE DOOR OPERATION

Check and verify mode door mechanism for smooth operation in each mode.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair as necessary.

${f 5}$ PERFORM FRONT AIR CONTROL 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 6.

O.CHECK THE MODE DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the mode door motor. Refer to HAC-23, "Mode Door Motor Component Function Check".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair PBR circuit or replace motor. Refer to HAC-24, "Mode Door Motor Diagnosis Procedure".

.RECHECK FOR CODES

HAC

Н

Α

В

D

Е

L

N

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Perform front air control self-diagnosis. Refer to HAC-21, "Front Air Control Self-Diagnosis".

Are any self-diagnostic codes present?

YES >> Refer to HAC-21, "Front Air Control Self-Diagnosis Code Chart".

NO >> GO TO 8.

8. RECHECK FOR SYMPTOMS

Perform a complete operational check and check for any symptoms. Refer to HAC-7, "Operational Check".

Does another symptom exist?

YES >> Repair as necessary.

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

Mode Door Motor Diagnosis Procedure

INFOID:0000000001611795

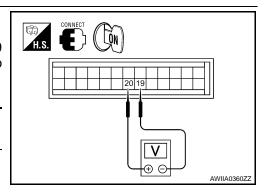
SYMPTOM:

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

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Press the B/L (*) mode switch.
- 3. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the floor (4) mode.

Connector	Te	erminals	Condition	Voltage
	(+)	(-)		(Approx.)
Front air control: M49	20	19	Press mode switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2. CHECK MODE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 19, 20 and ground.

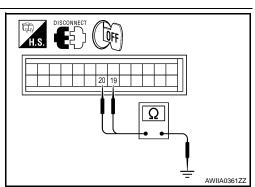
19 - Ground : Continuity should not exist.20 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

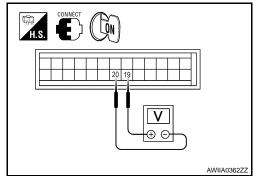
3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER



[AUTOMATIC AIR CONDITIONER]

- 1. Press the mode switch to the D/F () mode.
- Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the vent (*) mode.

Connector	Te	erminals	Condition	Voltage
	(+)	(-)		(Approx.)
Front air control: M49	19	20	Press mode switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

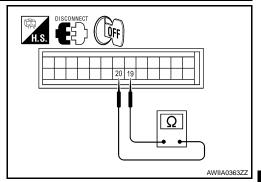
f 4.CHECK MODE DOOR MOTOR AND CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 19 and terminal 20.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5. CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN

- 1. Disconnect the mode door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 19, 20 and the mode door motor harness connector M142 (B) terminal 5, 6.

5 - 19 : Continuity should exist.

6 - 20 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

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

Connector	Terr	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49, M50	28	3	5V

Ω

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

HAC

Н

Α

В

D

Е

5 6

AWIIA036477

M

Ν

 \circ

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

H.S. PED OFF

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 (A) terminal 28 and M49 (B) terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

- 1. Disconnect the mode door motor harness connector.
- Check continuity between mode door motor harness connector M142 (B) terminal 3, 1 and front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28.

28 - 1 : Continuity should exist. 3 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

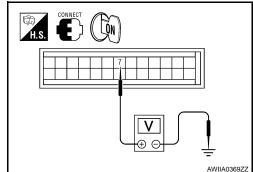
10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 7 and ground while cycling mode switch through all modes.

Voltage : Approx. 1V - 4.5V

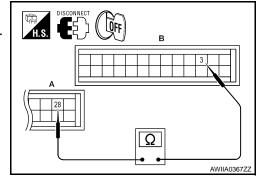
Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



Ω

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND



H.S. ES

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 7 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

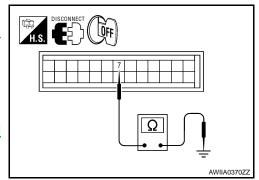
- 1. Turn ignition switch OFF.
- 2. Disconnect the mode door motor harness connector and front air control harness connector.
- Check continuity between mode door motor harness connector M142 terminal 2 and front air control harness connector M49 terminal 7.

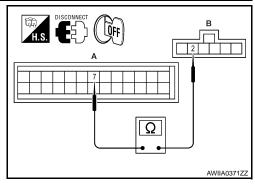
Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





HAC

Н

Α

В

D

Е

F

J

K

L

M

Ν

 \cap

System Description

INFOID:0000000001611796

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:

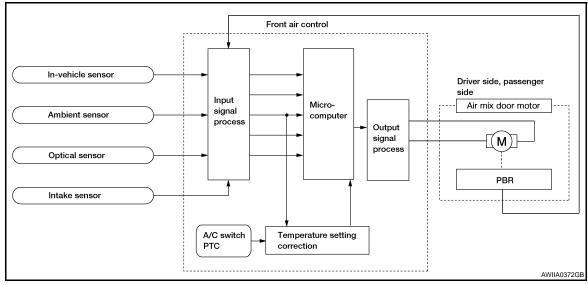
- · Front air control
- Air mix door motors (driver, passenger)
- PBR (built-into air mix door motors)
- · In-vehicle sensor
- · Ambient sensor
- · Optical sensor
- · Intake sensor

System Operation

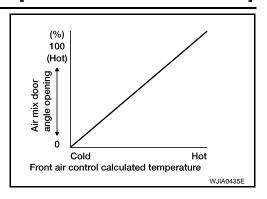
The front air control receives data from the temperature selected by the driver side, passenger side, and rear. The front air control then applies a voltage to one circuit of the appropriate air mix door motor, while ground is applied to the other circuit, causing the appropriate air mix door motor to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

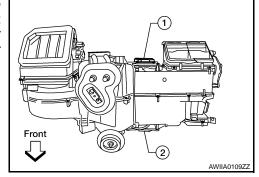


COMPONENT DESCRIPTION

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 Component Function Check



INFOID:0000000001611797

HAC

Н

Α

В

D

Е

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 >> GO TO 4.

NO >> GO TO 3.

3. PERFORM COMPLETE OPERATIONAL CHECK

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-7</u>, "<u>Operational Check</u>". <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> System OK.

4. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation from 18°C (60°F) to 32°C (90°F) in each mode.

K

M

Ν

< COMPONENT DIAGNOSIS >

<u>Is the inspection result normal?</u> YES >> GO TO 6.

NO >> Repair as necessary.

6.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 7.

7.CHECK THE AIR MIX DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the air mix door motors. Refer to <u>HAC-29</u>, "Air Mix Door Motor Component Function Check".

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair PBR circuit or replace air mix door motor. Refer to VTL-20, "Removal and Installation".

8. RECHECK FOR CODES

Perform self-diagnosis. Refer to HAC-21, "Front Air Control Self-Diagnosis".

Are any self-diagnostic codes present?

YES >> Refer to HAC-21, "Front Air Control Self-Diagnosis Code Chart".

NO >> GO TO 9.

9. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Air Mix Door Motor (Driver) Diagnosis Procedure

INFOID:0000000001611798

SYMPTOM:

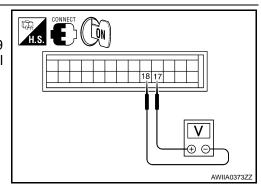
- Discharge air temperature does not change.
- Air mix door motor does not operate.

DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (DRIVER)

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial (driver) to 32°C (90°F).
- 3. 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).

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	17	18	Rotate temp control dial	Battery voltage



Is the inspection result normal?

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

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

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 17, 18 and ground.

17 - Ground : Continuity should not exist.18 - Ground : Continuity should not exist.

Is the inspection result normal?

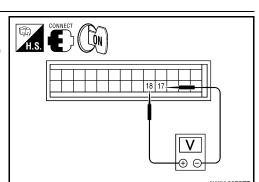
YES >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial (driver) to 32°C (90°F).
- 3. 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).

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	18	17	Rotate temp control dial	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

4. CHECK AIR MIX DOOR MOTOR (DRIVER) CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 17 and terminal 18.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

5. CHECK AIR MIX DOOR MOTOR (DRIVER) CIRCUITS FOR OPEN

- 1. Disconnect the air mix door motor (driver) harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 17, 18 and the air mix door motor (driver) harness connector M147 (B) terminal 1, 6.

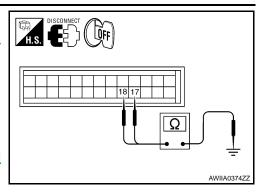
17 - 1 : Continuity should exist. 18 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor (driver). Refer to <u>VTL-20.</u> "Removal and Installation".

NO >> Repair or replace harness as necessary.

6.CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND



HAC

Н

Α

В

D

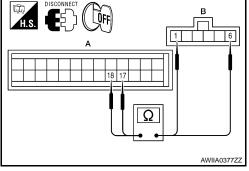
K

L

M

Ν

0

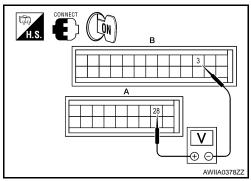


< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Connector	Teri	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M50, M49	28	3	5V



Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

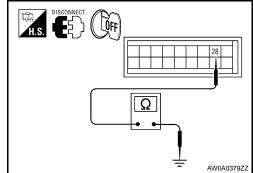
- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.



8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M50 (A)terminal 28 and M49 (B)terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

AWIIAO380ZZ

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

- 1. Disconnect the air mix door motor (driver) harness connector.
- 2. Check continuity between air mix door motor (driver) harness connector M147 (B) terminal 3, 2 and front air control harness connector M49 (C) terminal 3 and M50 (A) terminal 28.

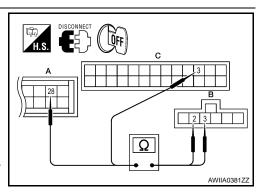
28 - 3 : Continuity should exist. 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor (driver). Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE



< COMPONENT DIAGNOSIS >

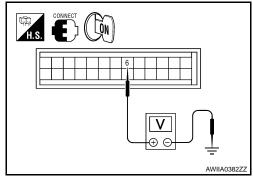
[AUTOMATIC AIR CONDITIONER]

- Reconnect the front air control harness connector.
- Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 6 and ground while rotating temperature control dial from 32°C (90°F) to 18°C (60°F).

Voltage : Approx. .5V - 4.5V

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 6 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the air mix door motor (driver) harness connector and front air control harness connector.
- 3. Check continuity between air mix door motor (driver) harness connector M147 (B) terminal 4 and front air control harness connector M49 (A) terminal 6.

Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor (driver). Refer to VTL-20, "Removal and Installation".

NO >> Repair or replace harness as necessary.

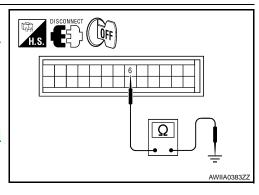
Air Mix Door Motor (Passenger) Diagnosis Procedure

SYMPTOM:

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

DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (PASSENGER)

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND



AWIIA0384ZZ

HAC

Н

Α

В

D

K

INFOID:0000000001611799

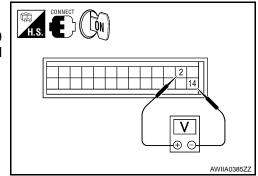
Ν

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial (passenger) to 32°C (90°F).
- 3. Check voltage between front air control harness connector M49 terminal 14 and terminal 2 while rotating temperature control dial (passenger) to 18° C (60° F).

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	2	14	Rotate temp control dial	Battery voltage



Is the inspection result normal?

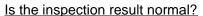
OK >> GO TO 4. NG >> GO TO 3.

$2. \mathsf{CHECK}$ AIR MIX DOOR MOTOR (PASSENGER) CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 14, 2 and ground.

14 - Ground : Continuity should not exist.2 - Ground : Continuity should not exist.



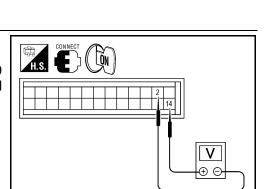
YES >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial (passenger) to 18°C (60°F).
- 3. Check voltage between front air control harness connector M49 terminal 14 and terminal 2 while rotating temperature control dial (passenger) to 32°C (90°F).

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	14	2	Rotate temp control dial	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

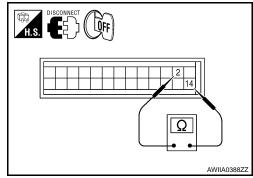
4. CHECK AIR MIX DOOR MOTOR (PASSENGER) CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 14 and terminal 2.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5. CHECK AIR MIX DOOR MOTOR (PASSENGER) CIRCUITS FOR OPEN

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- Disconnect the air mix door motor (passenger) harness connector
- Check continuity between front air control harness connector M49 terminal 14, 2 and the air mix door motor (passenger) harness connector M143 terminal 1, 6.

14 - 1 : Continuity should exist.2 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor (passenger). Refer to <u>VTL-</u>20, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6.CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

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

Connector	Terminals		Voltage (Ap-
	(+)	(-)	prox.)
Front air control: M49	28	3	5V

H.S. CONNECT B A A A AWIIA0390ZZ

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

7. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 29 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M50 (A) terminal 28 and M49 (B) terminal 3.

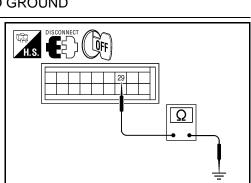
Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 10.

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN



Ω

_

K

Α

В

D

Е

F

Н

HAC

M

Ν

0

Р

AWIIA03927

HAC-35

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Disconnect the air mix door motor (passenger) harness connector

2. Check continuity between air mix door motor (passenger) harness connector M143 (B) terminal 3, 2 and front air control harness connector M49 (C) terminal 3 and M50 terminal 28.

28 - 3 : Continuity should exist. 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor (passenger). Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

- 1. Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M50 terminal 29 and ground while rotating temperature control dial (passenger) from 32°C (90° F) to 18° (60° F).



Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 29 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12. CHECK PBR FEEDBACK CIRCUIT FOR OPEN

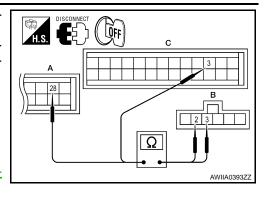
- Turn ignition switch OFF.
- 2. Disconnect the air mix door motor (passenger) harness connector and front air control harness connector.
- 3. Check continuity between air mix door motor (passenger) harness connector M143 terminal 4 and front air control harness connector M50 terminal 29.

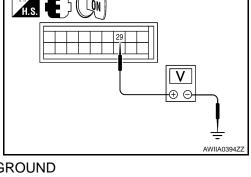
Continuity should exist.

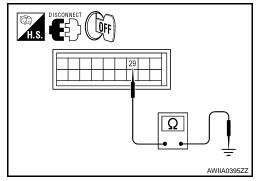
Is the inspection result normal?

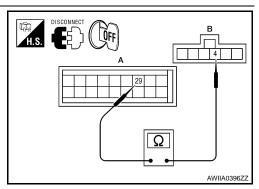
YES >> Replace air mix door motor (passenger). Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.









INTAKE DOOR MOTOR

System Description

INFOID:0000000001611800

Α

В

D

SYSTEM DESCRIPTION

SYMTOM:

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

SYSTEM DESCRIPTION

Component Parts

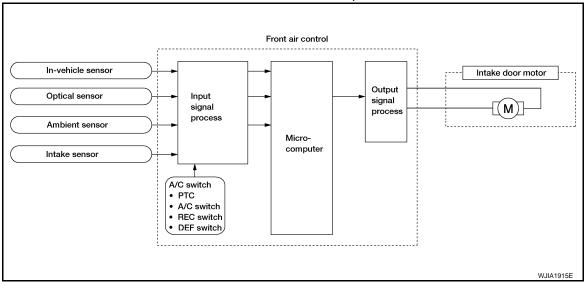
Intake door control system components are:

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

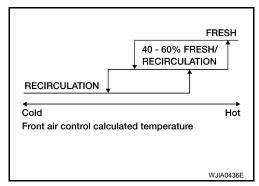
System Operation

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, FLOOR or OFF switches are pushed, the front air control sets the intake door at the fresh position.



Intake Door Control Specification



HAC

Н

K

L

M

Ν

Р

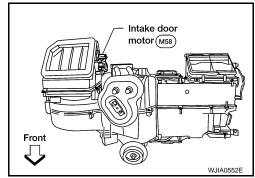
Ρ

COMPONENT DESCRIPTION

< COMPONENT DIAGNOSIS >

Intake door motor

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



Intake Door Motor Component Function Check

INFOID:0000000001611801

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).

Can a 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 <u>HAC-7</u>, "<u>Operational Check</u>". <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-6, "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. CHECK INTAKE DOOR OPERATION

Check and verify intake door mechanism for smooth operation.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair intake door mechanism.

5. 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 6.

6. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Intake Door Motor Diagnosis Procedure

INFOID:0000000001611802

Α

В

D

Е

F

SYMPTOM:

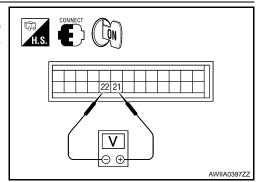
- · Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. 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
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	21	22	Self-diagnostic mode	Battery voltage



Is the inspection result normal?

OK >> GO TO 4.

NO >> GO TO 3.

2.CHECK INTAKE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 21, 22 and ground.

21 - Ground : Continuity should not exist. 22 - Ground : Continuity should not exist.

Is the inspection result normal?

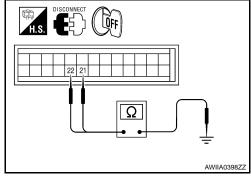
OK >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3. CHECK FRONT AIR CONTROL FOR GROUND AND POWER

- 1. Press the BACK button to back out of self-diagnostic mode.
- 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
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	22	21	Self-diagnostic mode	Battery voltage



H.S. CONNECT CON LOCAL CONNECT CON LOCAL CONTROL CON LOCAL CONTROL CON

Is the inspection result normal?

OK >> GO TO 5.

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

f 4.CHECK INTAKE DOOR MOTOR AND CIRCUITS FOR OPEN

HAC

Н

K

M

Ν

0

INTAKE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 21 and terminal 22.

Continuity should exist.

Is the inspection result normal?

OK >> Replace intake door motor. Refer to <u>VTL-18, "Removal and Installation"</u>.

NO >> GO TO 6.

5. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN

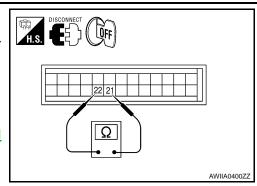
- 1. Disconnect the intake door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 21, 22 and the intake door motor harness connector M58 (B) terminal 1, 6.

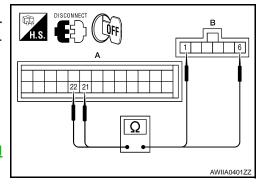
21 - 6 : Continuity should exist.22 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace intake door motor. Refer to <u>VTL-18. "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:0000000001611803

Α

В

D

Е

F

SYSTEM DESCRIPTION

Component Parts

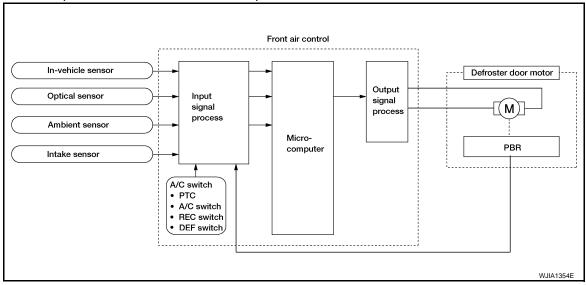
Defroster door control system components are:

- 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.

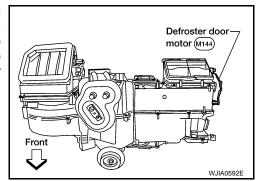
In the AUTO mode, the front air control determines defroster door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature.



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 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:0000000001611804

INSPECTION FLOW

HAC-41

HAC

Н

K

L

\ /I

Ν

0

DEFROSTER DOOR MOTOR CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

${\bf 1.} {\tt confirm \ symptom \ by \ performing \ operational \ check-defroster \ door}$

- 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).

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-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "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. CHECK DEFROSTER DOOR MOTOR

Perform diagnostic procedure for defroster door motor. Refer to <u>HAC-41</u>, "<u>Defroster Door Motor Component</u> Function Check".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair PBR circuit or replace defroster door motor. Refer to VTL-17, "Removal and Installation".

5. CHECK DEFROSTER DOOR OPERATION

Check and verify defroster door mechanism for smooth operation.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, "Removal and Installation".

NO >> Repair defroster door mechanism.

Defroster Door Motor Diagnosis Procedure

INFOID:0000000001611805

SYMPTOM:

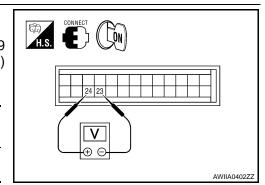
- Defroster door does not change.
- Defroster door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR DEFROSTER DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Press the defroster switch ().
- 3. Check voltage between front air control harness connector M49 terminal 24 and terminal 23 and press the defroster switch () again.

Connector	Terminals		Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	24	23	Press defroster switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

< COMPONENT DIAGNOSIS >

$\overline{2}$.check defroster door motor circuits for short to ground

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 23, 24 and ground.

23 - Ground : Continuity should not exist. 24 - Ground : Continuity should not exist.

Is the inspection result normal?

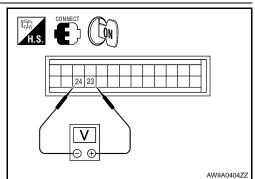
YES >> Replace front air control. Refer to VTL-8, "Removal and Installation"

NO >> Repair or replace harness as necessary.

3.check front air control for ground and power

- Press the defroster switch ().
- 2. Check voltage between front air control harness connector M49 terminal 23 and terminal 24 and press the defroster switch () again.

Connector	Te	erminals	Condition	Voltage
Connector	(+)	(-)		(Approx.)
Front air control: M49	23	24	Press de- froster switch	Battery voltage



H.S. ES OFF

Ω

Is the inspection result normal?

YES >> GO TO 5.

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

4.CHECK DEFROSTER DOOR MOTOR AND CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 23 and terminal 24.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.

5. CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN

- 1. Disconnect the defroster door motor harness connector.
- 2. Check continuity between front air control harness connector M49 terminal 23, 24 and the defroster door motor harness connector M144 terminal 1. 6.

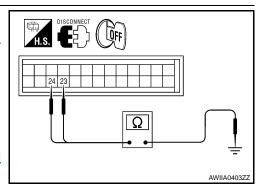
: Continuity should exist. 23 - 1 24 - 6 : Continuity should exist.

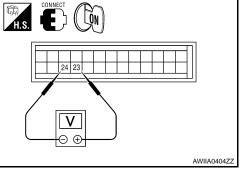
Is the inspection result normal?

YES >> Replace defroster door motor. Refer to VTL-17, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6.CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND





HAC

Н

Α

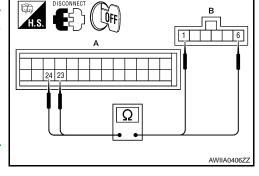
В

D

M

AWIIA0405ZZ

Ν



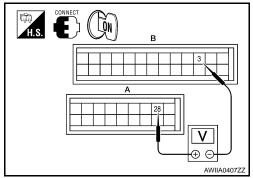
DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

Connector	Terminals		Voltage (Ap-	
Connector	(+)	(-)	prox.)	
Front air control: M50, M49	28	3	5V	



Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

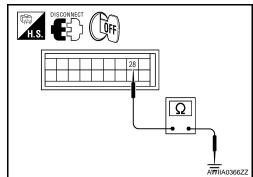
- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.



8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M50 terminal 28 (A) and M49 (B) terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

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

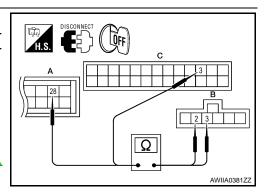
28 - 3 : Continuity should exist. 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10.CHECK PBR FEEDBACK VOLTAGE



DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

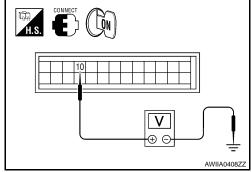
- 1. Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 10 and ground while cycling defroster switch on and off.

Voltage

: Approx. 1V - 4.5V

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 10 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

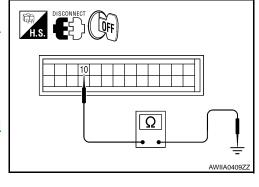
- Turn ignition switch OFF.
- 2. Disconnect the defroster door motor harness connector and front air control harness connector.
- Check continuity between defroster door motor harness connector tor M144 (B) terminal 4 and front air control harness connector M49 (A) terminal 10

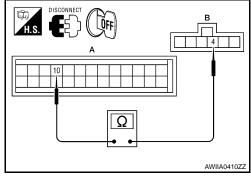
Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





HAC

Н

Α

В

D

Е

J

K

M

L

Ν

C

System Description

INFOID:0000000001611806

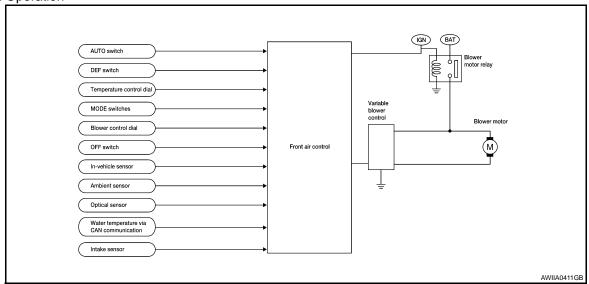
SYSTEM DESCRIPTION

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.

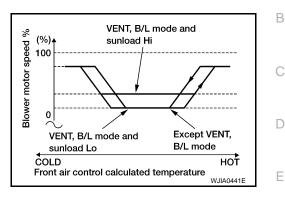
Start up from usual operating or hot soak condition (Automatic mode).

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.

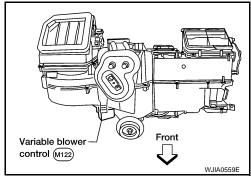
Blower Speed Control Specification



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.).



INFOID:0000000001611807

Front Blower Motor Component Function Check

INSPECTION FLOW

1.confirm symptom by performing operational check - front blower

Rotate the blower control dial clockwise once. Blower motor should operate in low speed.

Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

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-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "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.

f 4.PERFORM FRONT AIR CONTROL 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?

HAC

F

Н

K

M

Р

HAC-47

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

YES >> Refer to HAC-21, "Front Air Control Self-Diagnosis Code Chart".

NO >> GO TO 5.

5. CHECK BLOWER MOTOR OPERATION

Check and verify blower motor operates manually in all speeds.

Does blower motor operate in all speeds?

YES >> GO TO 6.

NO >> Refer to HAC-48, "Front Blower Motor Diagnosis Procedure".

6.CHECK ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT

Check engine coolant temperature sensor circuit. Refer to EC-125, "Diagnosis Procedure".

Is the inspection results normal?

YES >> GO TO 7.

NO >> Replace enging coolant temperature sensor.

7. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair" .

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

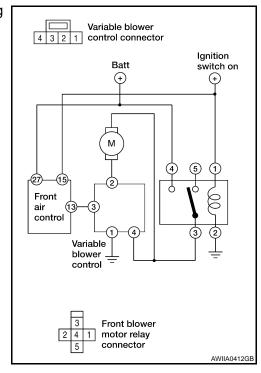
Front Blower Motor Diagnosis Procedure

INFOID:0000000001611808

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 <u>PG-67</u>, "Terminal Arrangement".

Fuses are good.

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 9.

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

$\overline{2}$.check front blower motor power supply circuit

- 1. Turn ignition switch OFF.
- Disconnect front blower motor connector. 2.
- Turn ignition switch ON.
- 4. Press the A/C switch.
- 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 10. NO >> GO TO 3.

3.check front blower motor relay (switch side) power supply circuit

- Turn ignition switch OFF.
- Disconnect front blower motor relay. 2.
- 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.

f 4.CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to HAC-51, "Front Blower Motor Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace front blower motor relay.

${f 5.}$ 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.

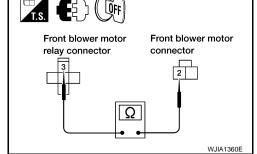
3 - 2

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

: Continuity should exist.



6.CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

Front blower motor connector WJIA1331E

> Front blower motor relay connector

Е

D

Α

В

F

Н

W.JIA1886E

HAC

K

M

N

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

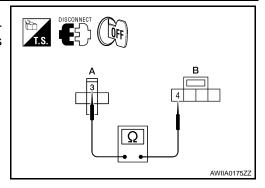
- 1. Disconnect variable blower control harness connector.
- Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 4.

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

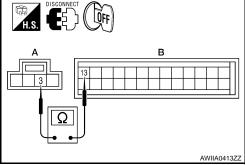
- 1. Disconnect front air control connector.
- 2. Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.



$8.\mathsf{CHECK}$ FRONT BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

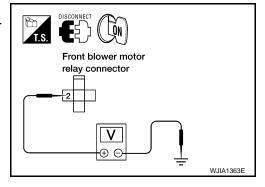
- 1. Turn ignition switch ON.
- Check voltage between front blower motor relay harness connector M107 terminal 2 and ground.

2 - 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.
- Check continuity between variable blower control harness connector M122 terminal 4 and ground.

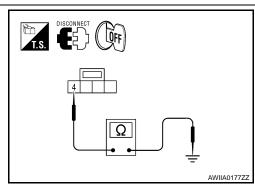
4 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT



: Continuity should exist.

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

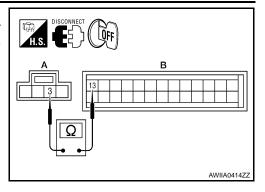
- 1. Disconnect front air control connector.
- Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3

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-51, "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

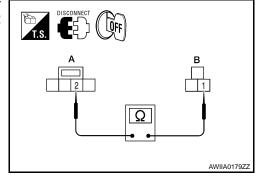
Check continuity between front blower motor harness connector M62 terminal 1 and variable blower control harness connector M122 terminal 2.

1 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.



HAC

J

K

M

Н

Α

В

D

Е

F

14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

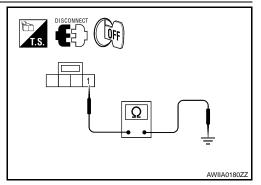
Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to <u>VTL-22</u>, <u>"Removal and Installation"</u>.

NO >> Repair harness or connector.



Front Blower Motor Component Inspection

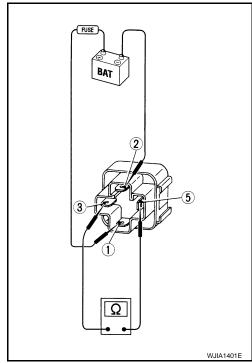
COMPONENT INSPECTION

INFOID:0000000001611809

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

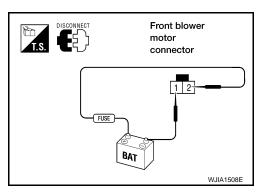
Check continuity between terminals 3, and 5 by supplying 12 volts and ground to coil side terminals 1 and 2 of relay.



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:0000000001611819

Α

В

D

Е

F

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

....

L

N

Р

INFOID:0000000001611820

Н

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

- 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.)

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-7, "Operational Check".

Does another symptom exist?

YES >> Refer to <u>HAC-6</u>. "How to <u>Perform Trouble Diagnosis For Quick And Accurate Repair"</u>.

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 AMBIENT SENSOR

HAC

HAC-53

Check and verify ambient sensor circuit. Refer to HAC-60, "Ambient Sensor Diagnosis Procedure".

>> GO TO 6.

6. CHECK INTAKE SENSOR

Check and verify intake sensor circuit. Refer to HAC-68, "Intake Sensor Diagnosis Procedure".

>> GO TO 7.

7. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to <u>HAC-7</u>, "<u>Operational Check</u>". <u>Does another symptom exist?</u>

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

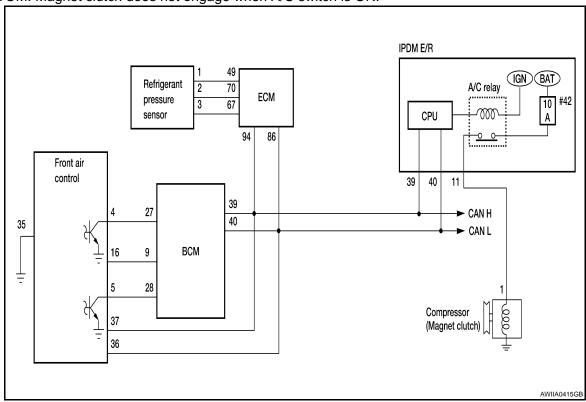
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

Magnet Clutch Diagnosis Procedure

INFOID:0000000001611821

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 <u>HAC-68</u>, "Intake Sensor Diagnosis Procedure".

• Malfunctioning ambient sensor. Refer to HAC-60, "Ambient Sensor Diagnosis Procedure".

2.PERFORM AUTO ACTIVE TEST

Refer to XX-XX, IN PG.

Does magnet clutch operate?

YES >> • • WITH CONSULT-III GO TO 5.

• **WITHOUT CONSULT-III**

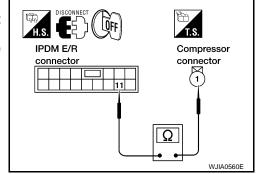
< COMPONENT DIAGNOSIS >

GO TO 6.

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

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

- Turn ignition switch OFF.
- 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



11 - 1

: Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

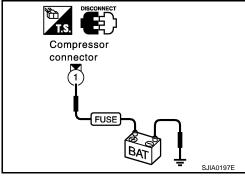
4. CHECK MAGNET CLUTCH CIRCUIT

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

Is the inspection result normal?

>> Replace IPDM E/R. Refer to PCS-30, "Removal and YES Installation of IPDM E/R".

NO >> Replace magnet clutch. Refer to HA-34, "Removal and Installation for Compressor Clutch".



 ${f 5.}$ CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to HAC-18, "CONSULT-III Function (HVAC)".

A/C SW ON : COMP ON SIG ON A/C SW OFF : COMP ON SIG OFF

Is the inspection result normal?

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

6.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- Turn ignition switch OFF.
- Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 27 and front air control harness connector M49 (B) terminal 4.



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)

H.S. CSCONNECT (QFF)

Ω

HAC

Н

Α

В

D

F

K

M

Ν

R

Р

AWIIA0416Z

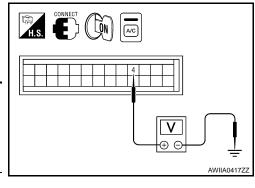
MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Reconnect BCM connector and front air control connector.
- Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 4 and ground.

Terminals				
(-	+)		0 1111	
Front air con- trol connec- tor	Terminal No.	(-)	Condition	Voltage
M49	4	Ground	A/C switch: ON	Approx. 0V
10143	4	Orbana	A/C switch: OFF	Approx. 5V



Is the inspection result normal?

YES >> GO TO 8.

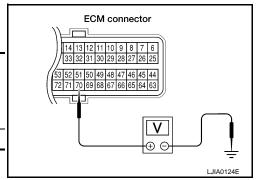
NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to <u>BCS-50, "Removal and Installation"</u>.

8. CHECK REFRIGERANT PRESSURE SENSOR

- 1. Start engine.
- 2. Check voltage between ECM harness connector F54 terminal 70 and ground.

	Terminals				
	(-	+)		Condition	Voltage
_	ECM con- nector	Terminal No.	(-)		, and the second
	F54	70	Ground	A/C switch: ON	Approx. 0.36 - 3.88V



Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-412, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to HAC-18, "CONSULT-III Function (HVAC)".

FRONT BLOWER CONTROL : FAN ON SIG ON

DIAL ON

FRONT BLOWER CONTROL : FAN ON SIG OFF

DIAL OFF

Is the inspection result normal?

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

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- 2. Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M49 terminal 5.

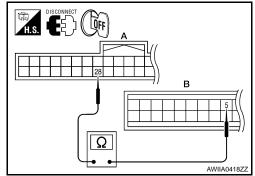
28 - 5

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11.

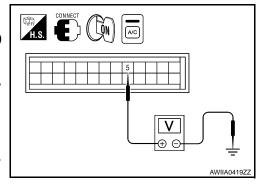
NO >> Repair harness or connector.



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

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

	Terminals				
-	(+)			Condition	Voltage
_	Front air control connector	Terminal No.	(-)		g -
	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 <u>VTL-8</u>, "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to <u>BCS-50</u>, "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 >> Inspection End.

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

HAC

Н

Α

В

D

Е

Κ

J

L

M

Ν

C

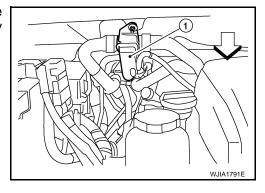
WATER VALVE CIRCUIT

Description INFOID:000000001611822

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

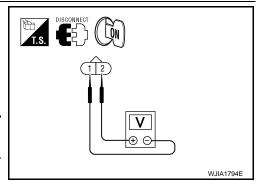
INFOID:0000000001611823

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 16°C (60°F).

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- 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.

AWIIA0420ZZ

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

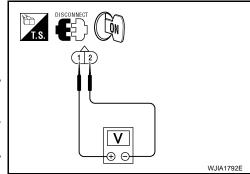
WATER VALVE CIRCUIT

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

- 1. Rotate temperature control dial (driver) to 16°C (60°F).
- 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
Connector	(+)	(-)	Condition	(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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- 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.

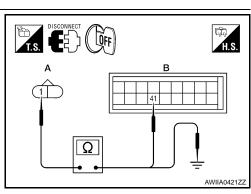
4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

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.



HAC

Н

Α

В

D

Е

F

J

Κ

L

M

Ν

AMBIENT SENSOR

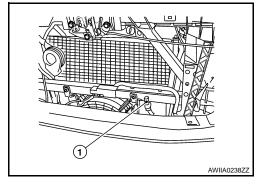
Component Description

INFOID:0000000001611824

COMPONENT DESCRIPTION

Ambient Sensor

The ambient sensor 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.

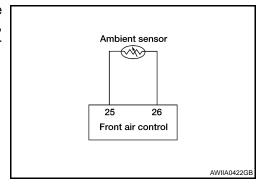
This prevents constant adjustments due to momentary conditions, such as stopping after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front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

Ambient Sensor Diagnosis Procedure

INFOID:0000000001611825

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. Using the Consult-III, DTC B257B or B257C is displayed. Without Consult-III, 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

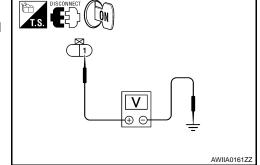
- Disconnect ambient sensor connector.
- 2. Turn ignition switch ON.
- Check voltage between ambient sensor harness connector E1 terminal 1 and ground.

1 - Ground

: Approx. 5V

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 5.



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

AMBIENT SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

inector. bient sensor harness connector control harness connector M49 : Continuity should exist. nector.

Is the inspection result normal?

YES >> GO TO 4.

1 - 25

NO >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Check the Ambient Sensor Circuit. Refer to <u>HAC-61</u>, "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.

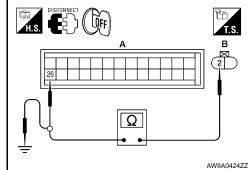
2. GO TO HAC-21, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector.
- Check continuity between ambient sensor harness connector E1 (B) terminal 2 and front air control harness connector M49 (A) terminal 26.



 Check continuity between ambient sensor harness connector E1 (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.

Ambient Sensor Component Inspection

COMPONENT INSPECTION

Ambient Sensor

Р

HAC-61

Α

В

С

Е

D

F

G

Н

HAC

K

INFOID:0000000001611826

Ν

M

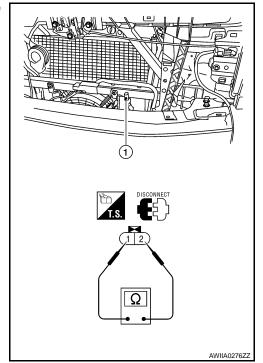
AMBIENT SENSOR

< COMPONENT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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 <u>HA-45, "Removal and Installation"</u>

IN-VEHICLE SENSOR

Component Description

INFOID:0000000001611827

Α

В

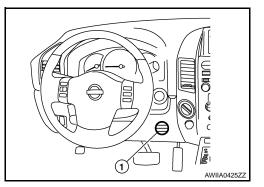
D

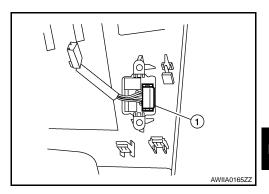
Е

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.





HAC

K

M

Ν

Р

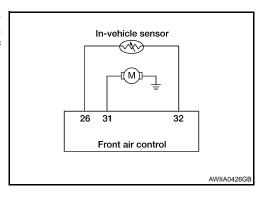
INFOID:0000000001611828

Н

In-Vehicle Sensor Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. Using the CONSULT-III, DTC B2578 or B2579 is displayed. Without a CONSULT-III, 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-III) or code 30, 31 (without CONSULT-III) present? <u>YES or NO Is the inspection result normal?</u>

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

2.CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

_

IN-VEHICLE SENSOR

< COMPONENT DIAGNOSIS >

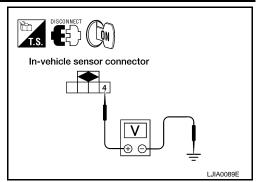
[AUTOMATIC AIR CONDITIONER]

- 1. Disconnect in-vehicle sensor connector.
- 2. Turn ignition switch ON.
- 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 4. NO >> GO TO 6.



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

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control connector M49.
- 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 5.

NO >> Repair harness or connector.

4. CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to HAC-65, "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 <u>VTL-9</u>, "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.
- 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.

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

4 - Ground Continuity should not exist.

AWIIA0428ZZ

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)

IN-VEHICLE SENSOR

< COMPONENT DIAGNOSIS >

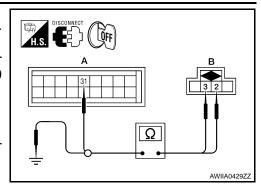
[AUTOMATIC AIR CONDITIONER]

- 1. Turn ignition switch OFF.
- Disconnect front air control connector and in-vehicle sensor connector
- 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:0000000001611829

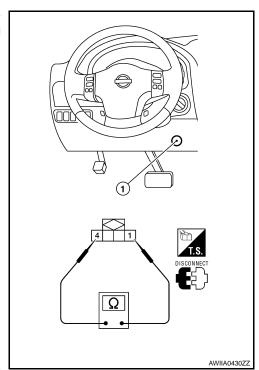
COMPONENT INSPECTION

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 k Ω		
-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 <a href="Installation"



Α

В

С

D

Е

F

Н

HAC

J

Κ

L

M

Ν

0

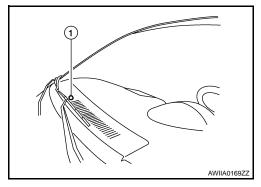
OPTICAL SENSOR

Component Description

INFOID:0000000001611830

COMPONENT DESCRIPTION

The optical sensor 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.

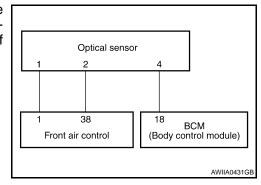
For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the optical sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the 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:0000000001611831

DIAGNOSTIC PROCEDURE FOR OPTICAL SENSOR

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

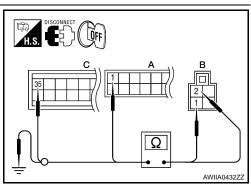


1. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND FRONT AIR CONTROL

- Turn ignition switch OFF.
- Disconnect front air control connector and optical sensor connector.
- Check continuity between optical sensor harness connector M302 (B) terminals 1 and 2 and front air control harness connector M50 (C) terminal 42 and M49 (A) terminal 1.

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

4. Check continuity between optical sensor harness connector M302 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.
- Check continuity between optical sensor harness connector M302 (B) terminal 4 and BCM harness connector M18 (A) terminal 18.

4 - 18 : Continuity should exist.

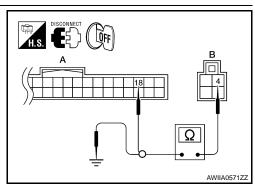
Check continuity between optical sensor harness connector M302 (A) terminal 4 and ground.

4 - 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.



HAC

Н

Α

В

C

D

Е

J

L

K

M

Ν

C

INTAKE SENSOR

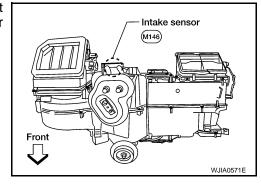
System Description

INFOID:0000000001611832

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.

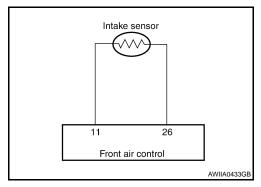


Intake Sensor Diagnosis Procedure

INFOID:0000000001611833

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

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



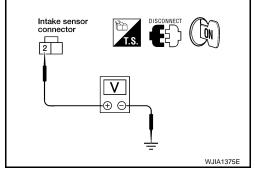
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

- 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 3. NO >> GO TO 4.



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

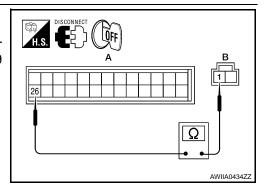
- 1. Turn ignition switch OFF.
- Disconnect front air control connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M49 (A) terminal 26.

1 - 26 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



3.check intake sensor

Check intake sensor. Refer to HAC-69, "Intake Sensor Component Inspection".

Is the inspection result normal?

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

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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector.
- 3. Check continuity between intake sensor harness connector M146 (B) terminal 6 and front air control harness connector M49 (A) terminal 21.

6 - 21: Continuity should exist.

4. Check continuity between intake sensor harness connector M146 terminal 6 and ground.

6 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:0000000001611834

AWIIA0435ZZ

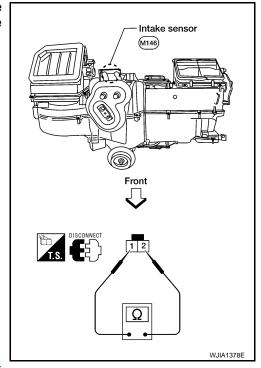
COMPONENT INSPECTION

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 46.7 37.3		
15 (59)			
20 (68)			
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".



HAC

M

N

Р

Н

Α

D

Е

INFOID:0000000001611835

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

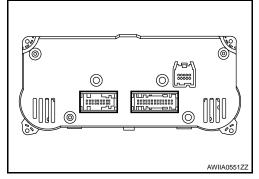
COMPONENT DESCRIPTION

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.

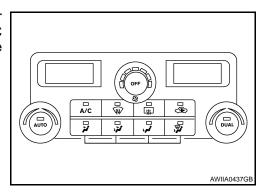
The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.

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.



INFOID:0000000001611836

Front Air Control Component Function Check

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.)

Can a 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 <u>HAC-7</u>, "<u>Operational Check</u>". <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-6, "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. CHECK POWER AND GROUND CIRCUIT

Check main power supply and ground circuit. Refer to <u>HAC-71</u>, "Front Air Control Power and Ground Diagnosis Procedure".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER [AUTOMATIC AIR CONDITIONER]

< COMPONENT DIAGNOSIS >

Is the inspection result normal? >> System OK.

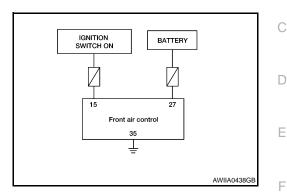
YES

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

Front Air Control Power and Ground Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

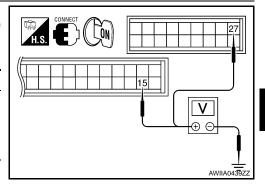
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- Disconnect front air control connectors.
- 2. Check voltage between front air control harness connector M49 (B) terminal 15 and M50 (A) terminal 27, and ground.

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



HAC

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to PG-67, "Terminal Arrangement".

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

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

- Turn ignition switch OFF.
- Check continuity between front air control harness connector M50 terminal 35 and ground.

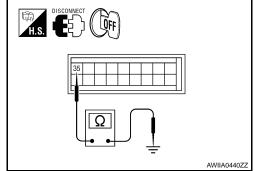
35 - Ground

: 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.



Н

Α

В

INFOID:0000000001611837

K

Ν

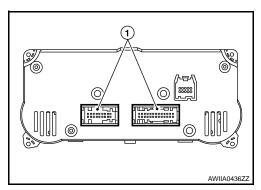
INFOID:0000000001611838

ECU DIAGNOSIS

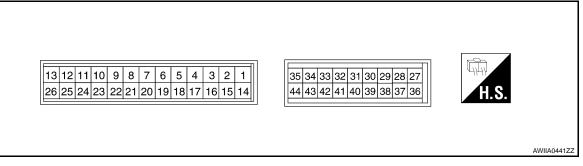
AIR CONDITIONER CONTROL

Front Air Control Terminals Reference Values

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 RERERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	ltem	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	Р	V ref ACTR (ground)	ON	DN - 5V	
4 W/F	\\//D	Compressor ON signal	ON	A/C switch OFF	5V
	VV/IX	Compressor ON signal	ON	A/C switch ON	0V
5 L	L/R	Fan ON signal	ON	Blower switch OFF	5V
	L/K	Fan ON signal	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	(V) 15 10 5 0 200 ms
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

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

L

M

Ν

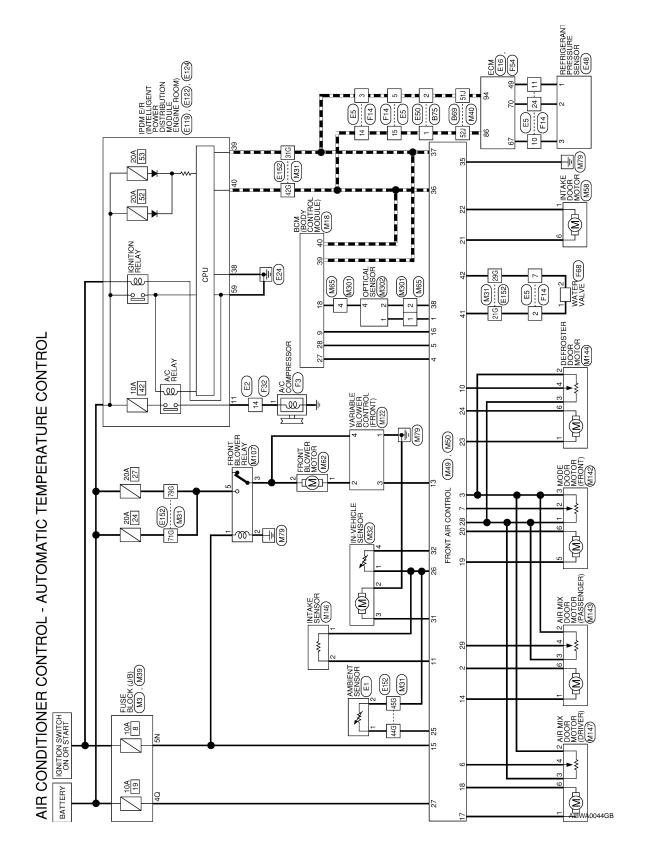
0

Ρ

			_			
Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)	1
15	Y/G	Power supply for IGN	ON	-	Battery voltage	
16	Y/B	Rear Defroster 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	0	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	Р	Ambient sensor	ON	-	0 - 5V	_
26	V/R	Sensor ground	ON	-	OV	_
27	Y/R	Power supply for BAT	-	-	Battery voltage	_
28	Υ	V ref ACTR (5V)	ON	-	0 - 5V	_
29	R/W	Air mix door motor (passenger) feedback	ON	-	0 - 5V	
31	BR/Y	In-vehicle sensor motor (+)	ON	-	Battery voltage	
32	LG/R	In-vehicle sensor signal	ON	-	0 - 5V	
35	В	Ground	-	-	0V	
36	Р	CAN-L	ON	-	0 - 5V	
37	L	CAN-H	ON	-	0 - 5V	
38	W/V	Optical sensor (passenger)	ON	-	0 - 5V	
	>//	Water	ON	Water valve open	Battery voltage	
41	Y/L	Water valve	ON	Water valve closed	0V	
40	14//0	W. C. C. C.	ON	Water valve open	0V	
42	W/G	Water valve	ON	Water valve closed	Battery voltage	

^{*1:} If equipped

Wiring Diagram

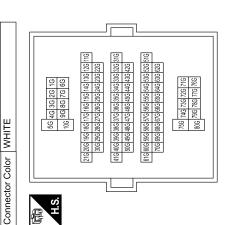


AIR CONDITIONER CONTROL - AUTOMATIC TEMPERATURE CONTROL CONNECTORS

M18 BCM (BODY CONTROL MODULE) WHITE		1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 12 2 2 3 24 2 5 26 27 2 8 2 9 3 3 1 3 2 3 3 3 4 5 5 5 5 7 3 8 3 9 40	f Signal Name	RR DEF SW	KEYLESS GND	AIR CON SW	BLR_FAN_SW	CAN-H	CAN-L
9 5		6 7 8	Color o Wire	Y/B	۵	W/R	L/R	_	۵
Connector No. Connector Name Connector Color	H.S.	1 2 3 4 5 21 22 23 24 25	Terminal No. Wire	6	18	27	28	39	40
Connector No. M3 Connector Name FUSE BLOCK (J/B) Connector Color WHITE	3N 3N 5N 4N H.S.		Terminal No. Wire Signal Name	5N Y/G -					

	ISOR			Name				
M32	Connector Name IN-VEHICLE SENSOR	VHITE	4 3 2 1	of Signal Name			\ \	~
	= e u	lor V		Color of Wire	N/R	O/B	BR/Y	LG/R
Connector No.	Connector Na	Connector Color WHITE	际场 H.S.	Terminal No.	_	2	3	4

Signal Name	ı	1	1	1	ı	ı	1	ı
Color of Wire	Y/L	M/G	_	Ь	Ь	N/R	Ь	Ь
Terminal No. Wire	21G	29G	31G	42G	44G	45G	716	56Z



ALIIA0176GB

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

Р

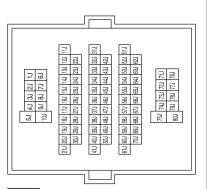
Connector Name WIRE TO WIRE

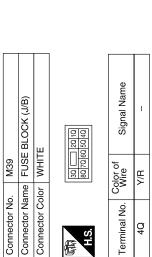
M31

Connector No.

ne		
Signal Name	I	1
Color of Wire	7	Ь
Terminal No.	51J	52J

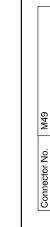




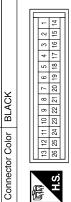


Terminal No. 40

Signal Name	PANEL DEFROST FEEDBACK	EVAP AIR TEMP SENS	UBL SIGNAL PWR	PASS BLEND DR A	NOI	RR DEF REQUEST	DR BLEND DOOR A	DR BLEND DOOR B	FLOOR A	FLOOR B	RECIRC DOOR A	RECIRC DOOR B	PANEL DEFROST A	PANEL DEFROST B	AMB TEMP SENS	SENS RETURN	
Color of Wire	LG/B	I/B	G/R	G/W	Y/G	Y/B	W/G	5	BR/W	P/L	G/B	0	ГG	P/B	۵	N/R	
Terminal No.	10	11	13	14	15	16	41	18	19	20	21	22	23	24	25	26	



Connector Name A/C AUTO AMP.



Color of Wire
0/5
W/R
ĽR
SB
GR

ALIIA0177GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< ECU DIAGNOSIS >

	TOR			me		
	INTAKE DOOR MOTOR	×	3 4 5 6	Signal Name	ı	ı
. M58		lor BLACK	128	Color of Wire	0	G/B
Connector No.	Connector Name	Connector Color	南 H.S.	Terminal No.	-	9

Signal Name	В	V REF ACTR (5V)	PASS BLEND DR FEEDBACK	IN CAR MTR+	IN CAR TEMP SENS	GND	CAN-L	CAN-H	SUNLOAD SEN RIGHT (DR)	WATER VALVE CLOSE	WATER VALVE OPEN
Color of Wire	Y/R	>	W/A	BR/Y	LG/R	В	۵	٦	N/N	Y/L	M/G
Terminal No.	27	28	29	31	32	35	36	37	38	41	42

ctor No.		Σ	M50						
ctor Name	ne.	A/C AUTO AMP	ပြ	₹	lΕ	_	ĮŞ	La:	
ctor Color	'n	m	BLUE	ш					
	L								F
	32	35 34 33 32 31 30 29 28 27	33	32	31	33	29	28	27
	44	44 43 42 41 40 39 38 37 36	42	41	40	39	38	37	36
_		II	II	II	II	II	II	II	ī

Г	_	_	$\overline{}$
Ш	27	36	Ш
Ш	28	37	Ш
Ш	53	38	Ш
Ш	30	39	Ш
Ш	31	40	Ш
Ш	32	41	Ш
Ш	33	42	Ш
II	34	43	Ш
П	35	44	Ш



70	FRONT BLOWER RELAY	BLACK	2 4 9	Signal Name	ı	ı	ı	I
M107				Color of Wire	Y/G	В	M/L	GR
Connector No.	Connector Name	Connector Color	原动 H.S.	Terminal No.	-	2	ဇ	2

5	WIRE TO WIRE	WHITE	1 2 8	Signal Name	ı	-	I
. M65			74	Color of Wire	0/9	M/V	۵
Connector No.	Sonnector Name	Connector Color	语.S.	Color of Wire	-	2	4

	FRONT BLOWER MOTOR	×	رتا ا	Signal Name	1	1
M62		r BLACK		Color of Wire	ΓW	M/L
Connector No.	Connector Name	Connector Color	所 H.S.	Terminal No.	-	2

Α

В

С

D

Е

F

Н

HAC

K

L

M

Ν

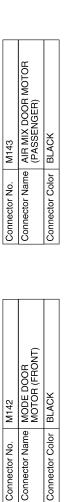
0

Ρ

ALIIA0178GB

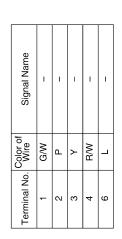
g

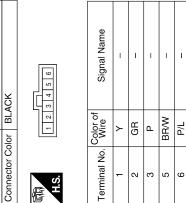
9

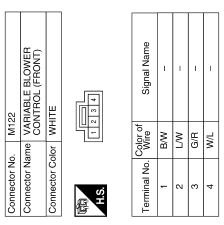


Connector No. M142

E







Connector No.	o. M147	2
Connector Name	ame AIR MO	AIR MIX DOOR MOTOR (DRIVER)
Connector Color	olor BLACK	ICK
原 H.S.	1 2 3	3 4 5 6
Terminal No. Wire	Color of Wire	Signal Name
-	W/G	ı
2	Ь	1
က	Υ	ı
4	SB	1

Connector No.	o. M146	
Connector Name	l	INTAKE SENSOR
Connector Color	olor GRAY	>
麻 H.S.		[]
Terminal No.	Color of Wire	Signal Name
1	N/R	I
2	L/B	1

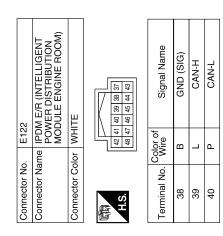
FROSTER OR MOTOR	ACK	3 4 5 6	Signal Name	1	1	I	-	1
	-	1 2	Color of Wire	ГG	۵	>	LG/B	P/B
Connector Na	Connector Co	崎島 H.S.	Terminal No.	-	2	က	4	9
	Connector Name DEFROSTER DOOR MOTOR			DEFROST DOOR MC BLACK	DEFROST DOOR MC BLACK	DEFROST DOOR MC BLACK 12 13 14 15 or of ire	DEFROST BLACK BLACK 12 13 14 15 gr of ire	DEFROST DOOR MC BLACK IZ 3 4 5 Or of or of

ALIIA0179GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

Connector Name OPTICAL SENSOR

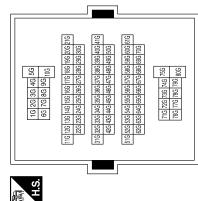


Signal Name	ı	ı	ı	I	I	I	_	I
Color of Wire	Y/L	M/G	٦	Ь	Ь	N/R	Ь	GR
Terminal No. Wire	21G	29G	31G	42G	44G	45G	71G	79G

Connector No.	E119
Connector Name	Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color WHITE	WHITE
6	9 8 7 6 6 5 4 3
18	18 17 16 15 14 13 12 11 10

Signal Name	AC_COMP	
Color of Wire	A//B	
Terminal No.	11	

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

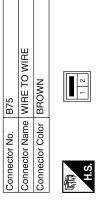


- ا

Connector No.	E124	4
Connector Name		IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	or BLACK	CK
瑜 H.S.	59	2 61 60
Terminal No.	Color of Wire	Signal Name
29	В	GND (PWR)

ALIIA0181GB

			А
E 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	Signal Name -	Signal Name	В
F32 WIRE TO WIRE WHITE 7 6 5 4 3 16 15 14 13 12 11 10			С
lame WIR	Color of Wire Y/B	Color of L	D
Connector No. F32 Connector Name WIRE TO WIRE Connector Color WHITE	Terminal No.	52.7 S2.9	Е
			F
E 8 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Signal Name	N 284 201 21 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	G
No. F14 Vame WIRE TO WIRE Color WHITE II 10 9 8 7 6 6 4 3 2 1 1 1 1 1 1 1 1 1		B69 WHRE TO WIRE TO	Н
Vo. F14 Vame WIRE T Color WHITE TI 10 9 8 7 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6 6	Color of Wire L L L L P P P P	10 10 10 10 10 10 10 10	HAC
Connector No. F14 Connector Name WIRE TO WIRE Connector Color WHITE	Terminal No. 2 3 3 5 7 7 7 15 15	Connector No. B69 Connector Name WIRE TO WIRE Connector Color WHITE 10 2.1 33, 44, 53, 66, 77, 81, 81, 91, 102, 103, 103, 103, 103, 103, 103, 103, 103	J
			K
SSOR	Signal Name	VALVE Signal Name	L
F3 A/C COMPRE BLACK		F68 WATER VALV GRAY or of Sign //- //- //- //- //- //- //- //- //- //	M
No. F3 Name A/C Color BL	o. Wire Y/B	No. F68 Color of Wife WAT	Ν
Connector No. F3 Connector Name A/C COMPRESSOR Connector Color BLACK	Terminal No.	Connector No. F68 Connector Name WATER VALVE Connector Color GRAY H.S. 2 W/G	0
		ALIIA0182GB	Р





ALIIA0183GB

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Symptom Matrix Chart

SYMPTOM TABLE

Symptom	Reference Page		
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-70	
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-21	
Air outlet does not change.	Co to Trouble Diagnosis Presedure for Made Door Mater	114.0.22	
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-23</u>	
Discharge air temperature does not change.	Co to Trouble Diagnosis Dresadure for Air Mir Door Mater	114.0.20	
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<u>HAC-29</u>	
Intake door does not change.	Co to Trouble Diagnosis Precedure for Intella Dear Mater	HAC-38	
Intake door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<u> </u>	
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-41	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-47	
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-53	
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-84	
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	<u>HAC-92</u>	
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-94	
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	<u>HAC-70</u>	
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-96	

В

INFOID:0000000001611840

D

Е

F

G

Н

HAC

0

K

L

M

Ν

0

INFOID:0000000001611841

INSUFFICIENT COOLING

Component Function Check

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 16° 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-7, "Operational Check".

Does another symptom exist?

YES >> Refer to <u>HAC-83</u>, "Symptom Matrix Chart".

NO >> System OK.

3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

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-12, "Checking Drive Belts".

Is the inspection result normal?

OK >> GO TO 6.

NG >> Adjust or replace compressor belt. Refer to EM-12, "Removal and Installation".

6.CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to <u>HAC-29</u>, "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 <u>HAC-30</u>, "Air Mix Door Motor (Driver) <u>Diagnosis Procedure"</u> or <u>HAC-33</u>, "Air Mix Door Motor (Passenger) <u>Diagnosis Procedure"</u>.

7.CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to EC-386, "Component Inspection".

Does cooling fan motor operate correctly?

YES >> GO TO 8.

NO >> Check cooling fan motor. Refer to <u>EC-386</u>, "<u>Diagnosis Procedure</u>".

8.CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to <u>HAC-58</u>, "Description".

Does water valve operate correctly?

YES >> GO TO 8.

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS > NO >> GO TO 9. 10. CHECK REFRIGERANT PURITY Is the inspection result normal? YES >> GO TO 10. NO

[AUTOMATIC AIR CONDITIONER]

>> Check water valve circuit. Refer to HAC-58, "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.

Connect recovery/recycling equipment to vehicle.

2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

>> Check contaminated refrigerant. Refer to HAC-97, "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-85, "Performance Test Diagnoses".

NO >> GO TO 11.

12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-88, "Test Reading".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-85, "Performance Test Diagnoses".

NO >> GO TO 12.

13. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

Performance Test Diagnoses

Α

В

D

Е

F

Н

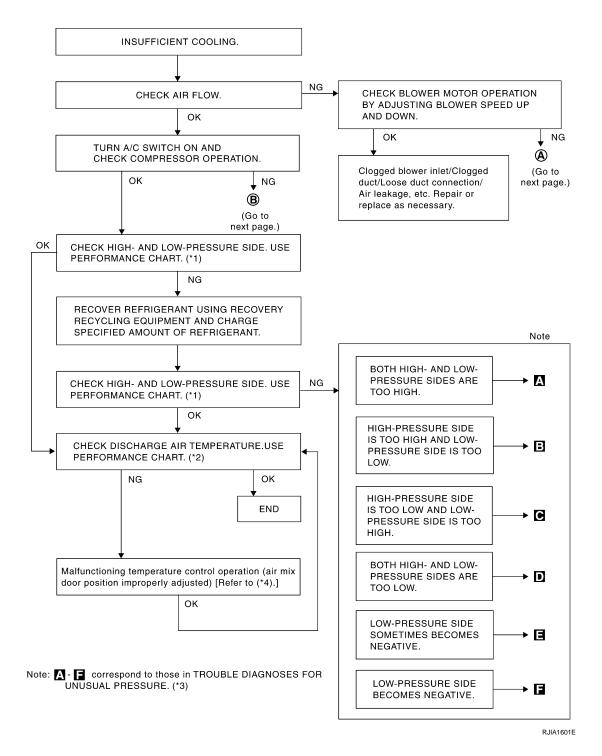
HAC

INFOID:0000000001611842

N

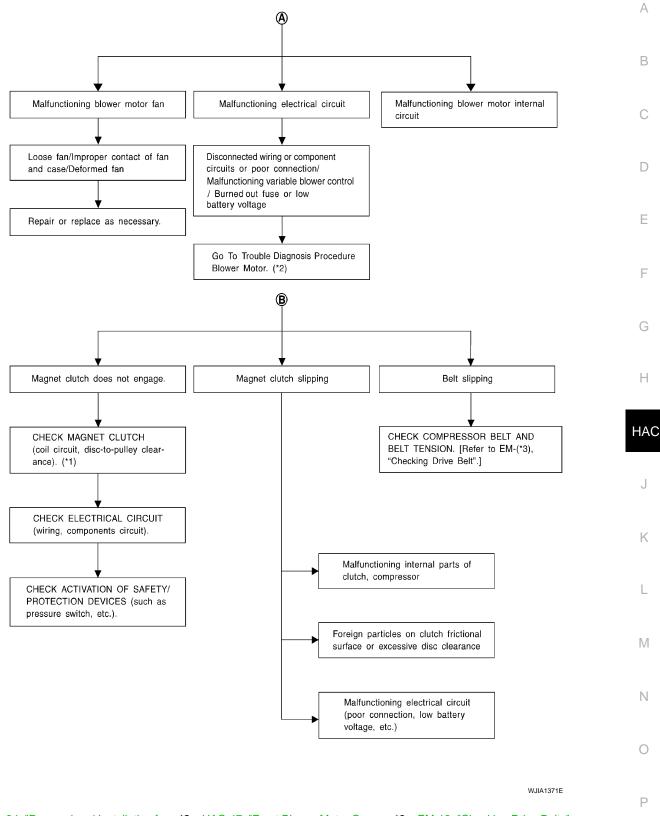
L

M



- *1 HAC-87, "Performance Chart"
- *2 HAC-88, "Test Reading"
- *3 HAC-89, "Trouble Diagnoses for Unusual Pressure"

*4 HAC-29, "Air Mix Door Motor Component Function Check"



^{*1} HA-34, "Removal and Installation for *2 HAC-47, "Front Blower Motor Com- *3 EM-12, "Checking Drive Belts"

Compressor Clutch" *3 EM-12, "Checking Drive Belts"

ponent Function Check"

Performance Chart

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	

Test Reading

Recirculating-to-discharge Air Temperature Table

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

Ambie	ent air	High-pressure (Discharge side)	Low-pressure (Suction side) kPa (kg/cm ² , psi)	
Relative humidity %	Air temperature °C (°F)	kPa (kg/cm ² , psi)		
	20 (68)	1020 - 1250 (10.4 - 12.7, 147.9 - 181.3)	160 - 190 (1.63 - 1.94, 23.2 - 27.6)	
50 - 70	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)	

[AUTOMATIC AIR CONDITIONER]

Trouble Diagnoses for Unusual Pressure

INFOID:0000000001611845

Α

В

C

N/I

Whenever system's high and/or low side pressure is unusual, 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 temperatureto-operating pressure table).

Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action	
	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until speci- fied pressure is obtained.	D
	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.	F
Both high- and low-pressure sides are too high.	Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) Air in refrigeration cycle	Evacuate and recharge system.	G H
A A A VC329V	Engine tends to overheat.	Engine cooling systems mal- function.	Check and repair engine cooling system.	1 1/-
	 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.	J K L

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action	
High-pressure side is too high and low-pressure side is too low.				1
	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts lo- cated between compressor and condenser are clogged or crushed.	Check and repair or replace malfunctioning parts. Check oil for contamination.	C
AC360A				F

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

[AUTOMATIC AIR CONDITIONER]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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. Understand the compressor packings.	Replace compressor.
LO HI AC356A	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. Understand the compressor packings.	Replace compressor.

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	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 highpressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	Check and repair malfunctioning parts. Check oil for contamination.
Both high- and low-pressure sides are too low.	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 <u>HA-23</u> , " <u>Checking of Refrigerant Leaks</u> ".
(O) (HI) AC353A	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-68, "Intake Sensor Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-47, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

INSUFFICIENT COOLING

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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
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.

HAC

Α

В

С

D

Е

F

G

Н

K

L

 \mathbb{N}

Ν

0

INFOID:0000000001611846

INSUFFICIENT HEATING

Component Function Check

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 <u>HAC-7</u>, "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

- Check for proper engine coolant level. Refer to <u>CO-10, "Inspection"</u>.
- 2. Check hoses for leaks or kinks.
- 3. Check radiator cap. Refer to CO-10, "Inspection".
- 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-29, "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.
- Touch both the inlet and outlet heater hoses.

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-126, "Component Inspection".

INSUFFICIENT HEATING
< SYMPTOM DIAGNOSIS > [AUTOMATIC AIR CONDITIONER]
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 <u>CO-11, "Changing Engine Coolant"</u> .
4. GO TO 10 to retest.
10.check heater hose temperatures
Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses.
Is the inspection result normal?
YES >> System OK. NO >> Replace heater core. Refer to <u>VTL-15, "Removal and Installation"</u> .
11. CHECK WATER VALVE
Check the operation of the water valve. Refer to HAC-58, "water valve Diagnosis Procedure".
Is the inspection result normal?
YES >> System OK. NO >> Replace water valve.

HAC

J

Κ

 \lfloor

M

Ν

 \circ

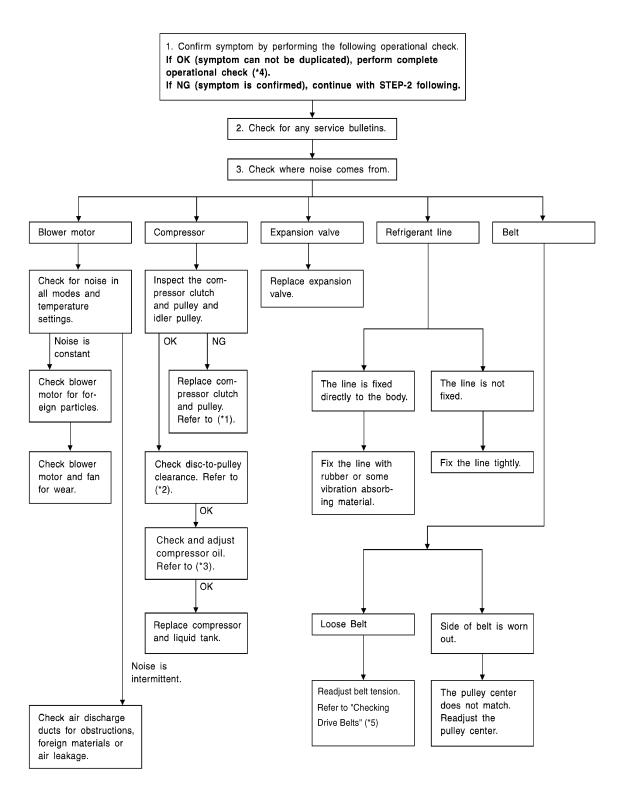
Ρ

NOISE

Component Function Check

INFOID:0000000001611847

SYMPTOM: Noise INSPECTION FLOW



WJIA1972E

NOISE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

*1 HA-34, "Removal and Installation for *2 HA-34, "Removal and Installation for *3 HA-20, "Maintenance of Oil Quantity Compressor Clutch"

Compressor Clutch"

*5 EM-12, "Checking Drive Belts"

in Compressor"

Α

В

*4 HAC-7, "Operational Check"

C

D

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INFOID:0000000001611848

MEMORY FUNCTION DOES NOT OPERATE

Memory Function Check

SYMPTOM: Memory function does not operate.

3 TWI TOW. Memory function does i

INSPECTION FLOW

${f 1.}$ 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-7, "Operational Check".

Can a symptom be duplicated?

YES >> Refer to HAC-6, "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 <u>HAC-70</u>, "Front Air Control Component Function Check".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace as necessary.

RECHECK FOR SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-7, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-6, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

PRECAUTION

PRECAUTIONS

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSION-

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.

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

INFOID:0000000001611850

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 <u>HA-4</u>, "<u>Contaminated Refrigerant</u>". 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

HAC

Α

D

Е

J

(

/

J

0

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.

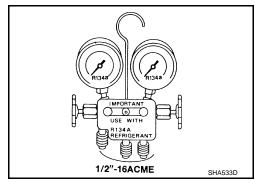
If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Service Equipment

INFOID:0000000001611851

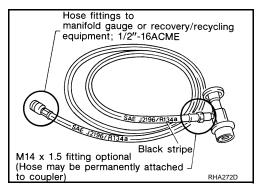
MANIFOLD GAUGE SET

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

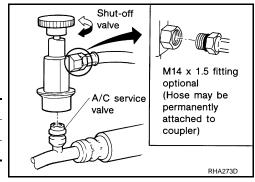
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shutoff devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



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



Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

Ρ

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA04782Z
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	A/C A/C AVIIA0479ZZ

HAC-99

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL A/C (TYPE 1)]

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000001669125

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-101, "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-21, "Front Air Control Self-Diagnosis".

- >> If any diagnostic trouble codes set. Refer to <u>HAC-21, "Front Air Control Self-Diagnosis Code Chart"</u>.
- >> Confirm the repair by performing operational check. Refer to HAC-7, "Operational Check".

6. REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 6

7. FINAL CHECK

Final check.

Is the inspection result normal?

YES >> CHECK OUT NO >> GO TO 4

[MANUAL A/C (TYPE 1)]

INSPECTION AND ADJUSTMENT

Operational Check

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 <u>HAC-136</u>, "Front Blower Motor Diagnosis Procedure". If OK, continue with next check.

CHECKING DISCHARGE AIR

- 1. Press each MODE switch and the DEF w switch.
- 2. Each MODE position indicator should illuminate.
- Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-110</u>, "<u>Discharge Air Flow</u>"

Mode door position is checked in the next step.

If NG, go to trouble diagnosis procedure for <u>HAC-118</u>, "<u>Mode Door Motor Diagnosis Procedure</u>". 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)

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

If NG, go to trouble diagnosis procedure for <u>HAC-128</u>, "Intake <u>Door Motor Diagnosis Procedure"</u>. 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 <u>HAC-167</u>, <u>"Component Function Check"</u>. If air mix door motor appears to be malfunctioning, go to <u>HAC-123</u>, "Air Mix <u>Door Motor Diagnosis Procedure"</u>.

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

- 1. Rotate temperature control dial clockwise until maximum hot.
- 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 <u>HAC-175</u>, <u>"Component Function Check"</u>. If air mix door motor appears to be malfunctioning, go to <u>HAC-122</u>, "Air Mix <u>Door Motor Component Function Check"</u>.

If OK, continue with next check.

CHECK A/C SWITCH

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

HAC

Н

Α

Е

F

.

K

L

M

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[MANUAL A/C (TYPE 1)]

• 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 <u>HAC-142</u>, "<u>Magnet Clutch Diagnosis Procedure</u>".

If all operational checks are OK (symptom cannot be duplicated), go to <u>HAC-100</u>, "How to <u>Perform Trouble Diagnosis For Quick And Accurate Repair"</u> and perform tests as outlined. If symptom appears, refer to <u>HAC-166</u>, "Symptom Matrix Chart" and perform applicable trouble diagnosis procedures.

[MANUAL A/C (TYPE 1)]

FUNCTION DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	○ ₩ ○ ₩ ○ Φ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIAO479ZZ

A

В

С

D

Е

F

G

Н

HAC

J

K

L

M

Ν

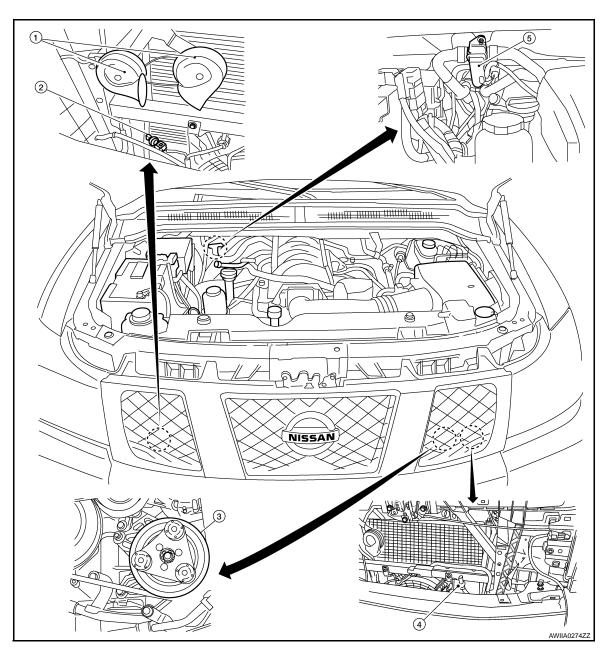
0

FUNCTION INFORMATION

Component Part Location

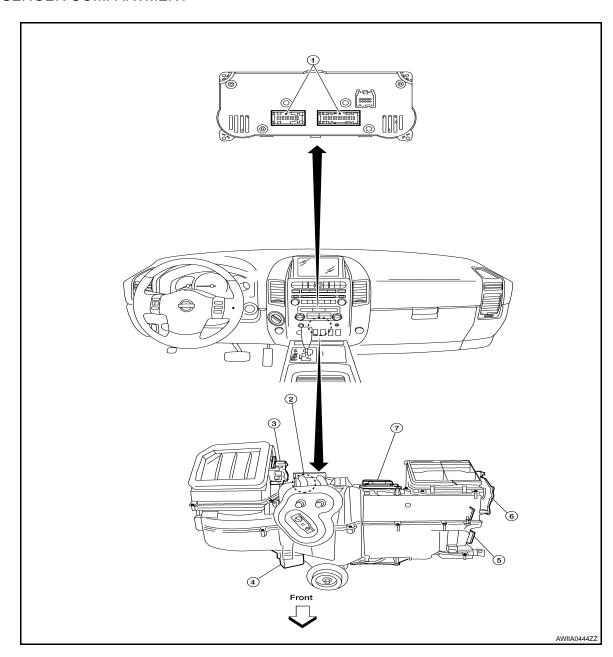
ENGINE COMPARTMENT

INFOID:0000000001669127



- Water valve F68
 Horn (view with grille removed)
- 4. Abient sensor E1 (view with grille re- 5. moved)
- Refrigerant pressure sensor E111 (view with grille removed)
- Water valve F68
- 3. A/C Compressor F3

PASSENGER COMPARTMENT



- 1. Front air control M49, M50
- 4. Variable blower control M122
- 7. Air mix door motor (front) M147
- 2. Intake sensor M146
- 5. Mode door motor M142
- 3. Intake door motor M58
- 6. Defroster door motor M144

Α

В

С

D

Е

F

G

Н

HAC

Κ

L

M

N

0

FUNCTION INFORMATION

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Symptom Table

INFOID:0000000001669128

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	<u>HAC-154</u>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-115
Air outlet does not change.	Co to Trouble Diagnosis Precedure for Mode Deer Motor	HAC-118
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	
Discharge air temperature does not change.	Co to Trouble Diagnosis Precedure for Air Mix Deer Motor	HAC-122
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-128
Intake door motor is malfunctioning.	Go to Houble Diagnosis Procedure for intake Door Motor.	
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-131
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-136
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-142
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-115

REFRIGERATION SYSTEM					
< FUNCTION DIAGNOSIS >	[MANUAL A/C (TYPE 1)]				
REFRIGERATION SYSTEM		А			
Refrigerant Cycle	INFOID:000000001669129	/ (
		В			
Refer to <u>HA-15, "Refrigerant Cycle"</u> .					
Refrigerant System Protection	INFOID:000000001669130	С			
Pefer to UA 15 "Pefrigarent System Protection"					
Refer to HA-15, "Refrigerant System Protection".		D			
		_			
		Е			
		F			
		G			
		Н			
		HAC			
		J			
		K			

L

 \mathbb{N}

Ν

0

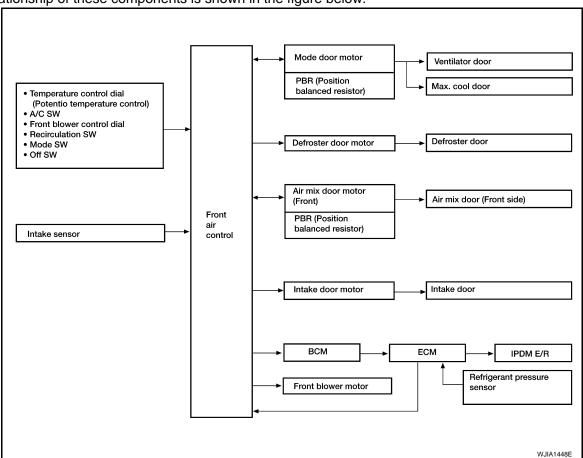
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000001669131

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:

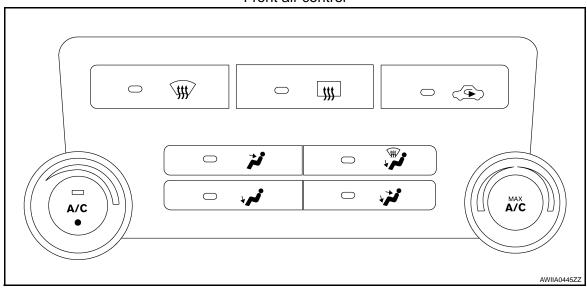


Control System Description

INFOID:0000000001669132

CONTROL OPERATION

Front air control



MANUAL AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

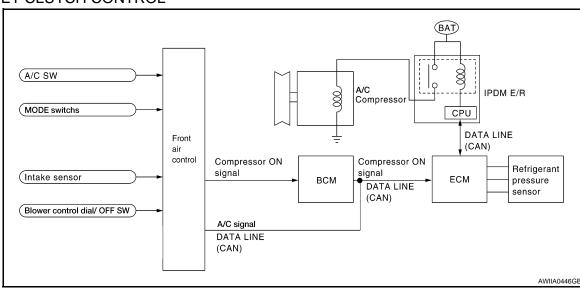
The compressor is ON or OFF.

(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.

HAC

Н

Α

D

Е

F

1/

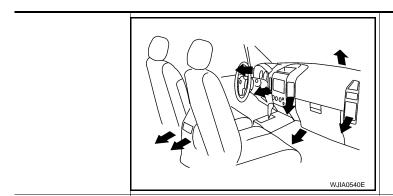
L

M

Ν

0

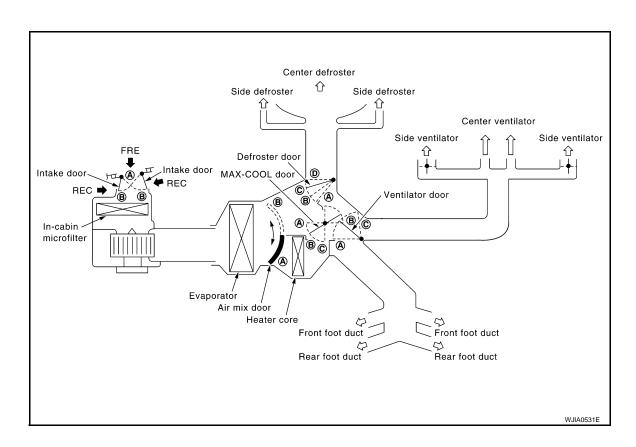
[MANUAL A/C (TYPE 1)]



Mode door position	Air outlet/distribution				
	Vent	Foot	Defroster		
*;	95%	5%	_		
*	60%	40%	_		
· i	_	70%	30%		
*	_	60%	40%		
(4)	_	10%	90%		

Switches And Their Control Function

INFOID:0000000001669134



MANUAL AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Position		MOD	E SW		DEF	SW	REC	SW	Tempe	rature	switch	OFF
or	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF	(/-		/	sw
switch	→ •	.**		W •	_	TAC	8	>		MAX A/C •		
		+ //-		4 /-	-> • =	0	\	0	COLD	~	нот	A/C
Ventilator door	(A)	B	©	©	©		_	_				©
MAX-COOL door	A	B	B	B	©		_	_				B
Defroster door	(D)	(D)	O _{or} ©	B	A		_	_				©
Intake door		_			B		(A)	B				₿
Air mix door		_	_				_	_	A		B	

HAC

Н

Α

В

С

D

Е

F

G

J

Κ

L

M

Ν

0

Ρ

CAN COMMUNICATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

INFOID:0000000001669135

CAN COMMUNICATION SYSTEM

System Description

Refer to LAN-4, "System Description".

[MANUAL A/C (TYPE 1)]

DIAGNOSIS SYSTEM (HVAC)

CONSULT-III Function (HVAC)

INFOID:0000000001683792

Α

В

C

D

Е

F

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

Diagnostic mode	Description
SELF-DIAG RESULTS	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 PART NUMBER	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"
B257B	Ambient sensor circuit short	HAC-148, "Ambient Sensor Diagnosis Procedure"
B257C *1	Ambient sensor circuit open	HAC-146, Ambient Sensor Diagnosis Procedure
B2581	Intake sensor circuit short	HAC-151, "Intake Sensor Diagnosis Procedure"
B2582	Intake sensor circuit open	TING-131, IIIIake Selisoi Diagliosis Plocedule
U1000	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"

^{*1:} On models with mid audio system but without outside temperature display in combination meter, DTC will always be present.

HAC

J

K

L

M

Ν

0

Р

Н

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.
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.
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.

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM)

INFOID:0000000001669137

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

BCM diagnostic test item	Diagnostic mode	Description
	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR	Displays BCM input/output data in real time.
Inspection by part	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
.,	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.
	CONFIGURATION	Performs BCM configuration read/write functions.

DATA MONITOR

Display Item List

Monitor item name "operation or unit"		Contents
IGN ON SW	"ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
COMP ON SIG	"ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.
FAN ON SIG	"ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower motor switch signal.

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:0000000001686382

Α

В

D

Е

A/C SYSTEM SELF-DIAGNOSIS FUNCTION

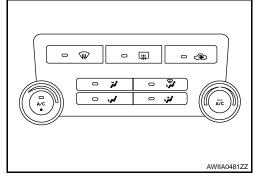
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

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-115, "Front Air Control Self-Diagnosis Code Chart".

SELF-DIAGNOSTIC MODE

- Rotate the blower contol dial counterclockwise to the OFF position.
- 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.



INFOID:0000000001686383

Front Air Control Self-Diagnosis Code Chart

SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page				
03	Battery voltage out of range	CHG-4, "Work Flow"			
40	Ambient sensor circuit short	LIAC CO. "Archient Concer Diagnosis Drocedure"			
41	Ambient sensor circuit open	HAC-60, "Ambient Sensor Diagnosis Procedure"			
56	Intake sensor circuit short	HAC-68, "Intake Sensor Diagnosis Procedure"			
57	Intake sensor circuit open	MAC-00, Intake Sensor Diagnosis Procedure			
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"			
90	Stuck button	VTL-8, "Removal and Installation"			

HAC

M

K

L

Ν

0

Р

COMPONENT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIAO481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower con- trol (VBC)]	AWIIA0479ZZ

MODE DOOR MOTOR

System Description

INFOID:0000000001669141

Α

В

D

Н

HAC

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

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

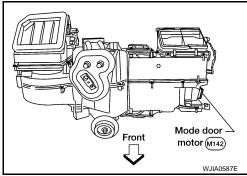
System Operation

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:0000000001669142

INSPECTION FLOW

${f 1}$.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

- Press each mode switch and press the 🗰 (DEF) switch. Each position indicator should illuminate.
- Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-110</u>, "<u>Discharge</u> 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.

Can a 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-101, "Operational Check". Can a symptom be duplicated?

>> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair". YES

NO >> System OK.

3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

L

Ν

>> GO TO 4.

4. CHECK MODE DOOR OPERATION

Check and verify mode door mechanism for smooth operation in each mode.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair as necessary.

5. CHECK THE MODE DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the mode door motor. Refer to <u>HAC-117</u>, "<u>Mode Door Motor Component Function Check</u>".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair PBR circuit or replace motor. Refer to <u>HAC-118</u>, "Mode Door Motor Diagnosis Procedure".

6. RECHECK FOR SYMPTOMS

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-101</u>, <u>"Operational Check"</u>. <u>Does another symptom exist?</u>

YES >> Repair as necessary.

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

Mode Door Motor Diagnosis Procedure

INFOID:0000000001669143

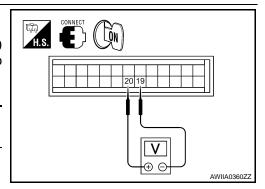
SYMPTOM:

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

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- Turn ignition switch ON.
- 2. Press the B/L (🕻) mode switch.
- 3. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the floor (4) mode.

Connector	Terminals		Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	20	19	Press mode switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2.check mode door motor circuits for short to ground

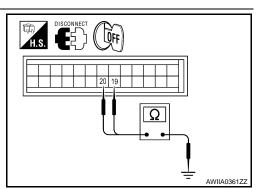
- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 19, 20 and ground.

19 - Ground : Continuity should not exist.20 - Ground : Continuity should not exist.

Is the inspection result normal?

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

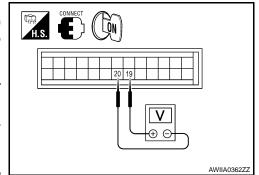
NO >> Repair or replace harness as necessary.



$\overline{\mathbf{3.}}$ CHECK FRONT AIR CONTROL FOR GROUND AND POWER

- 1. Press the mode switch to the D/F () mode.
- 2. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the vent (**) mode.

Connector	Te	erminals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition		
Front air control: M49	19	20	Press mode switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 5.

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

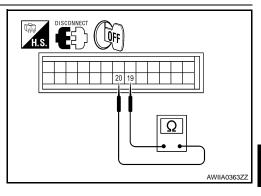
4. CHECK MODE DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 19 and terminal 20.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



HAC

K

M

Ν

Р

5 6

AWIIA0364ZZ

Н

Α

В

D

Е

5.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN

- Disconnect the mode door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 19, 20 and the mode door motor harness connector M142 (B) terminal 5, 6.

5 - 19 : Continuity should exist.6 - 20 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6.CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

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

Connector	Terr	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49, M50	28	3	5V

Ω

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

[MANUAL A/C (TYPE 1)]

< COMPONENT DIAGNOSIS >

- Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

H.S. ES Ω A₩IIA0366ZZ

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M50 (A) terminal 28 and M49 (B) terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. >> GO TO 10 NO

Ω AWIIA0367ZZ

H.S. ES

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

- Disconnect the mode door motor harness connector.
- Check continuity between mode door motor harness connector M142 (B) terminal 3, 1 and front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28.

28 - 1 : Continuity should exist. 3 - 3 : Continuity should exist.

Is the inspection result normal?

>> Replace mode door motor. Refer to VTL-19, "Removal YES and Installation".

NO >> Repair or replace harness as necessary.

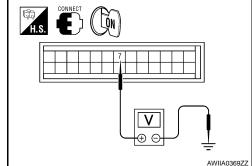
10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 7 and ground while cycling mode switch through all modes.

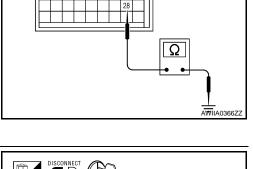
: Approx. 1V - 4.5V Voltage

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



Ω



11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 7 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

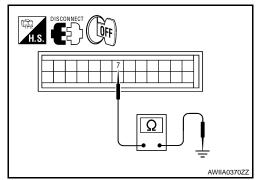
- 1. Turn ignition switch OFF.
- 2. Disconnect the mode door motor harness connector and front air control harness connector.
- Check continuity between mode door motor harness connector M142 terminal 2 and front air control harness connector M49 terminal 7.

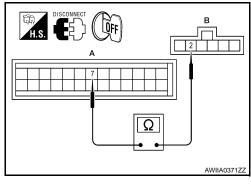


Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





HAC

Н

Α

В

D

Е

F

U

K

L

M

Ν

 \bigcirc

Р

AIR MIX DOOR MOTOR

System Description

INFOID:0000000001669144

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

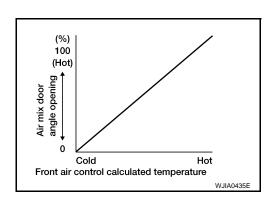
Air mix door control system components are:

- · 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.

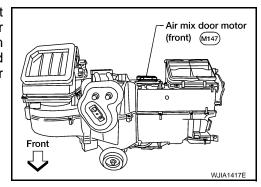
Air Mix Door Control Specification



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:0000000001669145

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.

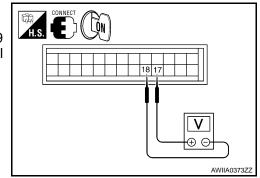
>> GO TO 2.	А
2.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE	
 Turn the temperature control dial counterclockwise to maximum cold. Check for cold air at discharge air outlets. 	В
Can a symptom be duplicated?	
YES >> GO TO 4.	С
NO >> GO TO 3.	
3.PERFORM COMPLETE OPERATIONAL CHECK	
Perform a complete operational check and check for any symptoms. Refer to <u>HAC-101</u> , "Operational Check".	D
Can a symptom be duplicated? YES >> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".	
NO >> System OK.	Е
4.CHECK FOR SERVICE BULLETINS	
Check for any service bulletins.	F
00.70.5	
>> GO TO 5. 5. CHECK AIR MIX DOOR OPERATION	G
Check and verify air mix door mechanism for smooth operation from maximum cold °to maximum hot in each mode.	Н
Is the inspection result normal?	П
YES >> GO TO 6. NO >> Repair as necessary.	
NO >> Repair as necessary. 6. CHECK THE AIR MIX DOOR MOTOR PBR CIRCUIT	HAC
Perform diagnostic procedure for the air mix door motor. Refer to HAC-122, "Air Mix Door Motor Component	
Function Check".	J
Is the inspection result normal?	
YES >> GO TO 7. NO >> Repair PBR circuit or replace air mix door motor. Refer to <u>VTL-20, "Removal and Installation"</u> .	K
7. RECHECK FOR ANY SYMPTOMS	
Perform a complete operational check for any symptoms. Refer to HAC-101, "Operational Check".	
Does another symptom exist?	L
YES >> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".	
NO >> Replace front air control Refer to VTL-8, "Removal and Installation".	M
Air Mix Door Motor Diagnosis Procedure	
	Ν
SYMPTOM: • Discharge air temperature does not change.	
Air mix door motor does not operate.	0
DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR	
1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND	
- I STILON I NOW AIR CONTROL I ON I OWEN AND GROUND	Р

[MANUAL A/C (TYPE 1)]

< COMPONENT DIAGNOSIS > 1. Turn ignition switch ON.

- 2. Rotate temperature control dial to maximum hot.
- 3. Check voltage between front air control harness connector M49 terminal 17 and terminal 18 while rotating temperature control dial to maximum cold.

Connector	Te	erminals	Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	17	18	Rotate temp control dial	Battery voltage



Is the inspection result normal?

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

$2. \mathsf{CHECK}$ AIR MIX DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

2. Disconnect the front air control harness connector.

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

17 - Ground : Continuity should not exist.18 - Ground : Continuity should not exist.

Is the inspection result normal?

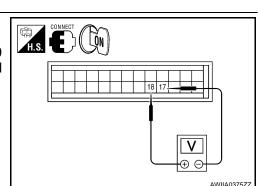
YES >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- Turn ignition switch ON.
- 2. Rotate temperature control dial to maximum hot.
- Check voltage between front air control harness connector M49 terminal 17 and terminal 18 while rotating temperature control dial to maximum cold.

Connector	Te	erminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	18	17	Rotate temp control dial	Battery voltage	



Is the inspection result normal?

YES >> GO TO 5.

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

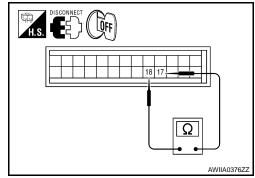
4. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 17 and terminal 18.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

HAC-124

AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

DISCONNECT

1. Disconnect the air mix door motor harness connector.

 Check continuity between front air control harness connector M49 (A) terminal 17, 18 and the air mix door motor harness connector M147 (B) terminal 1, 6.

> 17 - 1 : Continuity should exist. 18 - 6 : Continuity should exist.

Is the inspection result normal?

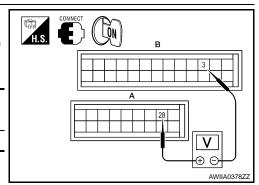
YES >> Replace air mix door motor. Refer to <u>VTL-20, "Removal</u> and Installation".

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

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

Connector	Teri	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M50, M49	28	3	5V



Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

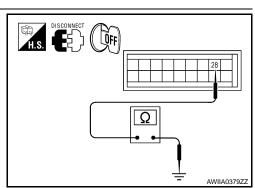
- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 (A) terminal 28 and M49 (B) terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

9.check pbr reference voltage circuit for open



HAC

Н

Α

В

D

Е

F

J

K

L

M

Ν

0

Р

[MANUAL A/C (TYPE 1)]

2 3

< COMPONENT DIAGNOSIS >

- 1. Disconnect the air mix door motor harness connector.
- Check continuity between air mix door motor harness connector M147 (B) terminal 3, 2 and front air control harness connector M49 (C) terminal 3 and M50 (A) terminal 28.

28 - 3 : Continuity should exist. 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 6 and ground while rotating temperature control dial from maximum hot to maximum cold.



Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

CONNECT CON GOVERNMENT OF THE PROPERTY OF THE

Ω

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 6 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12. CHECK PBR FEEDBACK CIRCUIT FOR OPEN

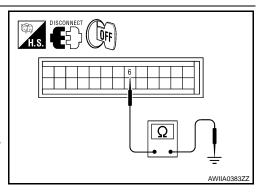
- Turn ignition switch OFF.
- Disconnect the air mix door motor harness connector and front air control harness connector.
- Check continuity between air mix door motor harness connector M147 (B) terminal 4 and front air control harness connector M49 (A) terminal 6.

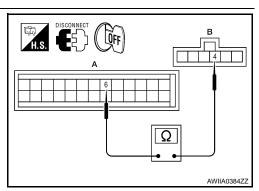
Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to VTL-20, "Removal and Installation".

NO >> Repair or replace harness as necessary.





[MANUAL A/C (TYPE 1)]

INTAKE DOOR MOTOR

System Description

SYSTEM DESCRIPTION

SYMTOM:

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

SYSTEM DESCRIPTION

Component Parts

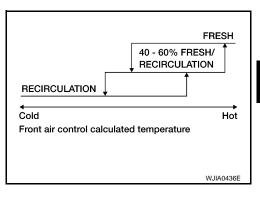
Intake door control system components are:

- 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.

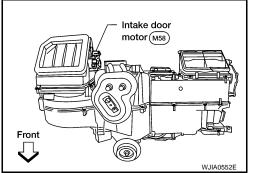
Intake Door Control Specification



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

INSPECTION FLOW

1.confirm symptom by performing operational check - rec (igsims)

- Press the vent mode switch (**).
- Press REC () switch. The REC () indicator should illuminate.
- Press REC () switch again. The REC () indicator should go out.
- Listen for intake door position change (you should hear blower sound change slightly).

INFOID:0000000001669148

HAC

Н

Α

В

D

K

M

N

INFOID:0000000001669149

< COMPONENT DIAGNOSIS >

Can a 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 <u>HAC-101</u>, "<u>Operational Check</u>". Can a symptom be duplicated?

YES >> Refer to HAC-100, "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. CHECK INTAKE DOOR OPERATION

Check and verify intake door mechanism for smooth operation.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair intake door mechanism.

5. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to <u>HAC-101, "Operational Check"</u>.

Does another symptom exist?

YES >> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Intake Door Motor Diagnosis Procedure

INFOID:0000000001669150

SYMPTOM:

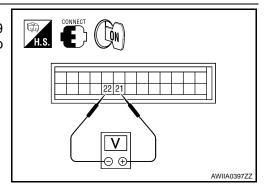
- · Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Te	erminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
front air control: M49	21	22	Self-diagnostic mode	Battery volt- age	



Is the inspection result normal?

OK >> GO TO 4. NO >> GO TO 3.

2.CHECK INTAKE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

INTAKE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

H.S. CONNECT

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 21, 22 and ground.

21 - Ground : Continuity should not exist. 22 - Ground : Continuity should not exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

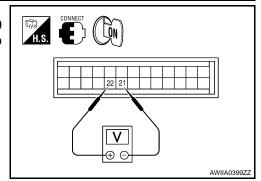
NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER

1. Press the BACK button to back out of self-diagnostic mode.

Check voltage between front air control harness connector M49 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Te	erminals	Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
front air control: M49	22	21	Self-diagnostic mode	Battery voltage



Is the inspection result normal?

OK >> GO TO 5.

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

4. CHECK INTAKE DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 21 and terminal 22.

Continuity should exist.

Is the inspection result normal?

OK >> Replace intake door motor. Refer to <u>VTL-11</u>, "Removal and Installation".

NO >> GO TO 6.

5. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN

1. Disconnect the intake door motor harness connector.

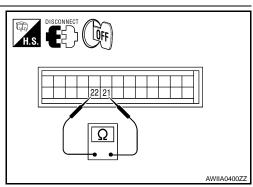
 Check continuity between front air control harness connector M49 (A) terminal 21, 22 and the intake door motor harness connector M58 (B) terminal 1, 6.

21 - 6 : Continuity should exist.22 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace intake door motor. Refer to <u>VTL-11, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.



H.S. CE DISCONNECT OFF

HAC

Н

Α

В

D

Е

ı

K

M

L

Ν

0

AWIIA0401ZZ

INFOID:000000001669151

DEFROSTER DOOR MOTOR CIRCUIT

System Description

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:

- Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- Ambient sensor
- · Intake sensor

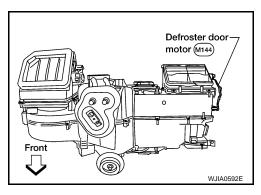
System Operation

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.



INFOID:0000000001669152

Defroster Door Motor Component Function Check

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

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

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 <u>HAC-101</u>, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-100, "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. CHECK DEFROSTER DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Perform diagnostic procedure for defroster door motor. Refer to <u>HAC-130</u>, "<u>Defroster Door Motor Component</u> Function Check".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair PBR circuit or replace defroster door motor. Refer to VTL-17, "Removal and Installation".

 ${f 5.}$ CHECK DEFROSTER DOOR OPERATION

Check and verify defroster door mechanism for smooth operation.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to VTL-17, "Removal and Installation".

NO >> Repair defroster door mechanism.

Defroster Door Motor Diagnosis Procedure

INFOID:0000000001669153

SYMPTOM:

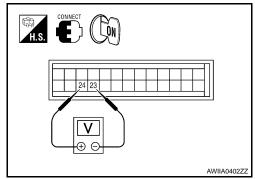
- Defroster door does not change.
- Defroster door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR DEFROSTER DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Press the defroster switch ().
- Check voltage between front air control harness connector M49 terminal 24 and terminal 23 and then press the defroster switch (\(\varphi\)) again.

Connector	Terr	ninals	Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	24	23	Press defroster switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2.CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 23, 24 and ground.

23 - Ground : Continuity should not exist.24 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER

AWIIA0403ZZ

HAC

Н

Α

В

D

Е

F

K

M

N

0

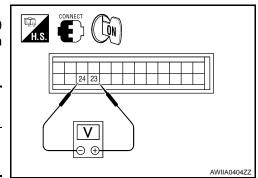
Р

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- Press the defroster switch ().
- 2. Check voltage between front air control harness connector M49 terminal 23 and terminal 24 and the press the defroster switch (₩) again.

Connector	To	erminals	Condition	Voltage (Approx.)
Connector	(+)	(-)		
Front air control: M49	23	24	Press de- froster switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

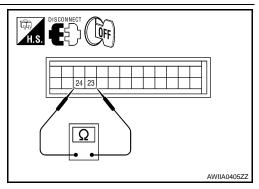
4. CHECK DEFROSTER DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 23 and terminal 24.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5.CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN

- 1. Disconnect the defroster door motor harness connector.
- Check continuity between front air control harness connector M49 terminal 23, 24 and the defroster door motor harness connector M144 terminal 1, 6.

23 - 1 : Continuity should exist.

24 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

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

Connector	Terminals		Voltage (Ap-	
Connector	(+)	(-)	prox.)	
Front air control: M50, M49	28	3	5V	

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

Ω ΑΨΙΙΑ0366ZZ

H.S. CONNEC

8.CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M50 terminal 28 (A) and M49 (B) terminal 3.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

H.S. B

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

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

28 - 3 : Continuity should exist. 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

- 1. Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 10 and ground while cycling defroster switch on and off.

Voltage : Approx. 1V - 4.5V

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12. H.S. CONNECT CON

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

HAC

Н

Α

В

D

J

2 3

AWIIA0381ZZ

Ω

K

L

M

N

0

Р

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 10 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

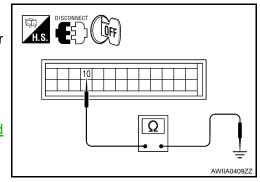
- 1. Turn ignition switch OFF.
- 2. Disconnect the defroster door motor harness connector and front air control harness connector.
- Check continuity between defroster door motor harness connector tor M144 (B) terminal 4 and front air control harness connector M49 (A) terminal 10

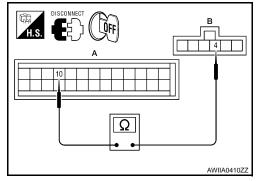
Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





INFOID:0000000001669154

BLOWER MOTOR CONTROL SYSTEM

System Description

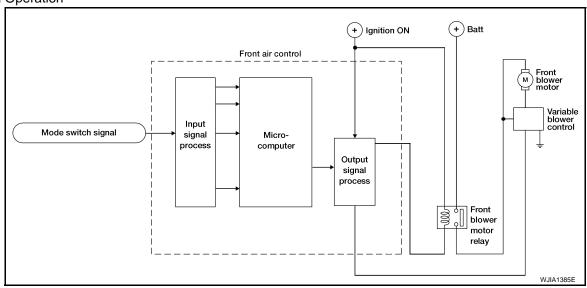
SYSTEM DESCRIPTION

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

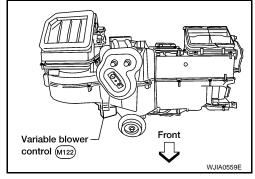
System Operation



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

Tork Blower Motor Component Function Check

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.

Can the symptom be duplicated?

YES >> GO TO 3.

Н

HAC

Α

В

D

Е

F

K

L

M

Ν

0

Р

INFOID:0000000001669155

HAC-135

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> GO TO 2.

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-101, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-100, "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. CHECK BLOWER MOTOR OPERATION

Check and verify blower motor operates manually in all speeds.

Does blower motor operate in all speeds?

YES >> GO TO 5.

NO >> Refer to <u>HAC-136</u>, "Front Blower Motor Diagnosis Procedure".

${f 5.}$ CHECK ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT

Check engine coolant temperature sensor circuit. Refer to EC-125, "Diagnosis Procedure".

Is the inspection results normal?

YES >> GO TO 6.

NO >> Replace enging coolant temperature sensor.

6. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-101. "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

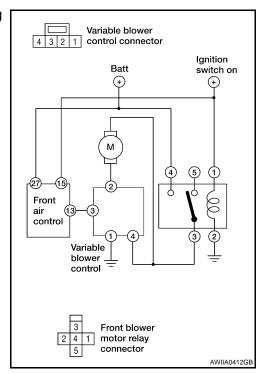
Front Blower Motor Diagnosis Procedure

INFOID:0000000001669156

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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



< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

1. CHECK FUSES

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to PG-66, "Terminal Arrangement".

Fuses are good.

Is the inspection result normal?

YES >> GO TO 3. 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.
- 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 10.

NO >> GO TO 3.

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

- 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-139, "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

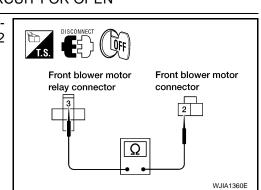
Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.



Front blower motor connector

DISCONNECT

WANTED

WANT

Front blower motor relay connector

٧

 $\Theta \subset$

HAC

Н

Α

В

D

Е

J

K

WJIA1886E

В. Л

Ν

0

Ρ

6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

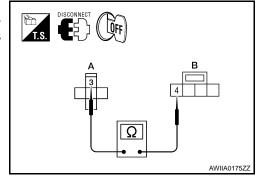
- 1. Disconnect variable blower control harness connector.
- Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 4.

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

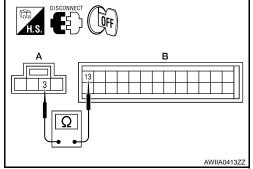
- 1. Disconnect front air control connector.
- 2. Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.



$8.\mathsf{CHECK}$ FRONT BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

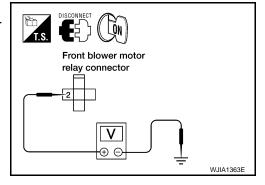
- Turn ignition switch ON.
- Check voltage between front blower motor relay harness connector M107 terminal 2 and ground.

2 - 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.

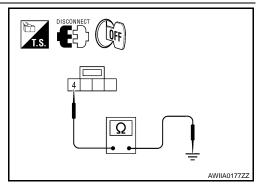
4 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT



: Continuity should exist.

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

13 - 3

Is the inspection result normal?

YES >> GO TO 12.

NO >> Repair harness or connector.

AWIIA0414ZZ

12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to <u>HAC-135</u>, "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

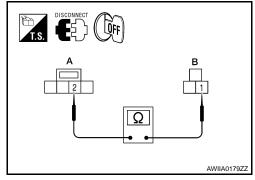
Check continuity between front blower motor harness connector M62 terminal 1 and variable blower control harness connector M122 terminal 2.

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

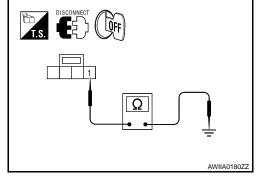
Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to <u>VTL-22</u>, <u>"Removal and Installation"</u>.

NO >> Repair harness or connector.



Front Blower Motor Component Inspection

COMPONENT INSPECTION

INFOID:0000000001669157

Α

В

С

Е

D

F

Н

HAC

K

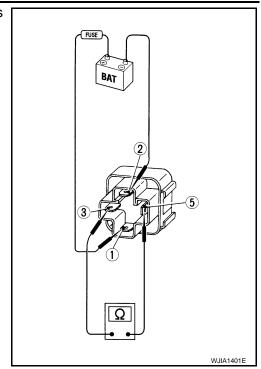
M

Р

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

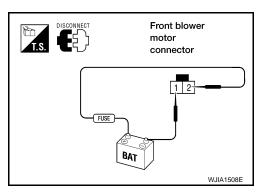
Check continuity between terminals 3 and 5 by supplying 12 volts and ground to coil side terminals 1 and 2 of the relay.



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:0000000001669158

Α

В

D

Е

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

HAC

L

N

Р

Н

INFOID:0000000001669159

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

- 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.)

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-101, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-100, "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. CHECK AMBIENT SENSOR

Check and verify ambient sensor circuit. Refer to HAC-148, "Ambient Sensor Diagnosis Procedure".

>> GO TO 5.

5. CHECK INTAKE SENSOR

Check and verify intake sensor circuit. Refer to HAC-151, "Intake Sensor Diagnosis Procedure".

>> GO TO 6.

6. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-101, "Operational Check" . Does another symptom exist?

YES >> Refer to HAC-100, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

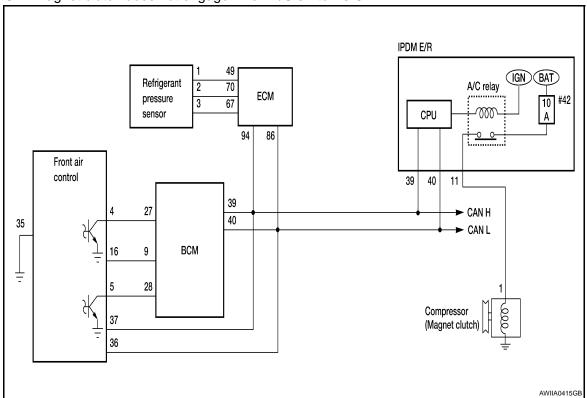
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

Magnet Clutch Diagnosis Procedure

INFOID:0000000001669160

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 <u>HAC-115</u>, "Front Air Control Self-Diagnosis". Is the inspection result normal?

YES >> GO TO 2.

NO >> • Malfunctioning intake sensor. Refer to <u>HAC-151</u>, "Intake Sensor Diagnosis Procedure".

Malfunctioning ambient sensor. Refer to HAC-148, "Ambient Sensor Diagnosis Procedure".

2. PERFORM AUTO ACTIVE TEST

Refer to XX-XX. IN PG.

Does magnet clutch operate?

YES >> • @WITH CONSULT-III GO TO 5.

• WITHOUT CONSULT-III GO TO 6.

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

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

MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- Turn ignition switch OFF.
- 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

11 - 1: Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

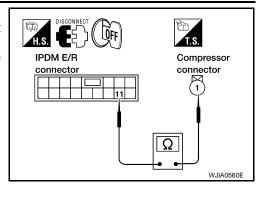
4. CHECK MAGNET CLUTCH CIRCUIT

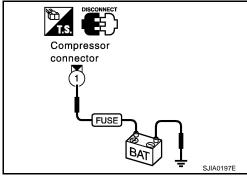
Check for operation sound when applying battery voltage direct current to terminal.

Is the inspection result normal?

>> Replace IPDM E/R. Refer to PCS-30, "Removal and YES Installation of IPDM E/R".

NO >> Replace magnet clutch. Refer to HA-34, "Removal and Installation for Compressor Clutch".





${f 5.}$ CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to HAC-113, "CONSULT-III Function (HVAC)".

A/C SW ON : COMP ON SIG ON A/C SW OFF : COMP ON SIG OFF

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

$\mathsf{G}.\mathsf{CHECK}$ CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- 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.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

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

H.S. CONNECT OFF

HAC

Н

Α

В

D

Е

F

K

L

M

Ν

AWIIA041677

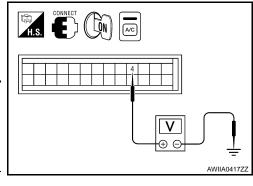
Р

HAC-143

< COMPONENT DIAGNOSIS >

- 1. Reconnect BCM connector and front air control connector.
- Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 4 and ground.

Terminals					
(-	(+)				
front air con- trol connec- tor	Terminal No.	(-)	Condition	Voltage	
M49	4	Ground	A/C switch: ON	Approx. 0V	
10143	4	Giouna	A/C switch: OFF	Approx. 5V	



Is the inspection result normal?

YES >> GO TO 8.

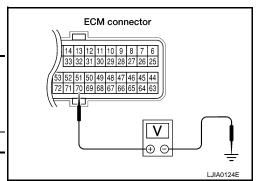
NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to <u>VTL-8</u>. "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to <u>BCS-50, "Removal and Installation"</u>.

8. CHECK REFRIGERANT PRESSURE SENSOR

- Start engine.
- 2. Check voltage between ECM harness connector F54 terminal 70 and ground.

	Terminals				
	(-	+)		Condition	Voltage
_	ECM con- nector	Terminal No.	(-)		S
	F54	70	Ground	A/C switch: ON	Approx. 0.36 - 3.88V



Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-412, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to HAC-113, "CONSULT-III Function (HVAC)".

FRONT BLOWER CONTROL : FAN ON SIG ON

DIAL ON

FRONT BLOWER CONTROL : FAN ON SIG OFF

DIAL OFF

Is the inspection result normal?

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

10. Check circuit continuity between BCM and front air control

- 1. Turn ignition switch OFF.
- 2. Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M49 terminal 5.

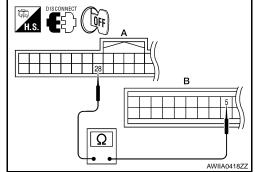
28 - 5

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11.

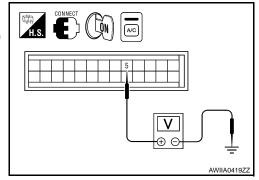
NO >> Repair harness or connector.



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 <u>VTL-8</u>, <u>"Removal and Installation"</u>.

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to <u>BCS-50</u>, "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 >> Inspection End.

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

HAC

Н

Α

В

D

Е

F

K

J

L

M

Ν

0

Р

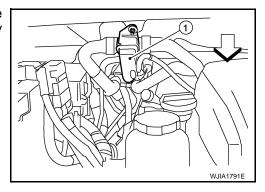
WATER VALVE CIRCUIT

Description INFOID:000000001669161

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

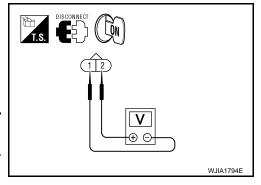
INFOID:0000000001669162

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

Connector	Te	erminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- 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.

T.S. CEP OFF H.S. AWIIA0420ZZ

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

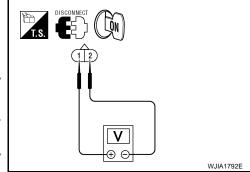
WATER VALVE CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

Connector	Te	rminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(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.
- 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.

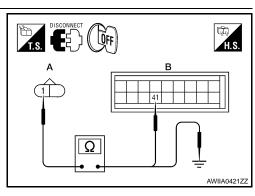
4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

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.



HAC

Н

Α

В

D

Е

F

J

Κ

L

M

Ν

C

Р

AMBIENT SENSOR

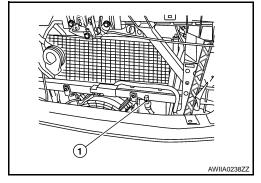
Component Description

INFOID:0000000001669163

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

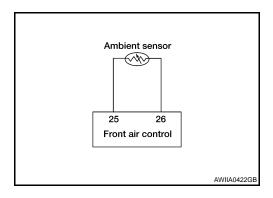
The front air control includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the front air control function. It only allows the front air control to recognize an ambient temperature increase 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:0000000001669164

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR SYMPTOM: Ambient sensor circuit is open or shorted.



1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

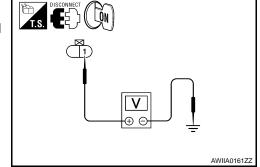
- Disconnect ambient sensor connector.
- 2. Turn ignition switch ON.
- Check voltage between ambient sensor harness connector E1 terminal 1 and ground.

1 - Ground

: Approx. 5V

Is the inspection result normal?

YES >> GO TO 3. NO >> GO TO 5.



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

AMBIENT SENSOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- 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.

<u>Is the inspection result normal?</u>

YES >> GO TO 4.

NO >> Repair harness or connector.

3. CHECK AMBIENT SENSOR

Check the Ambient Sensor Circuit. Refer to <u>HAC-148</u>, "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-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

NO >> 1. Replace ambient sensor.

2. GO TO HAC-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector.
- 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.

4. Check continuity between ambient sensor harness connector E1 (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"

GO TO HAC-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

Ambient Sensor Component Inspection

COMPONENT INSPECTION

Ambient Sensor

AWIIA0424Z

A B B DISCONNECT OFF

С

D

Α

В

Е

F

G

Н

HAC

J

K

M

N

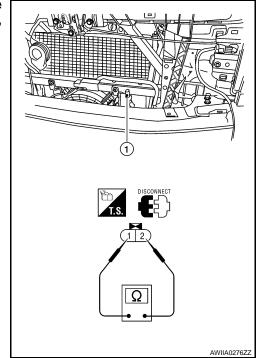
Р

INFOID:0000000001669165

< COMPONENT DIAGNOSIS >

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 <u>HA-45</u>, "Removal and Installation"

INTAKE SENSOR

System Description

INFOID:000000001669171

INFOID:0000000001669172

Α

В

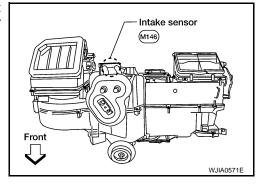
D

Е

COMPONENT DESCRIPTION

Intake Sensor

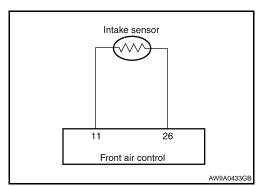
The intake sensor is located on the heater & cooling unit assembly. It converts temperature of air after if passes through the evaporator into a resistance value which is then input to the front air control.



Intake Sensor Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



T.S. CONNECT

1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

2 - Ground : Approx. 5V

Is the inspection result normal?

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



Intake sensor connector

2

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

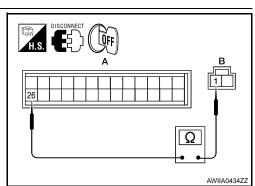
- Turn ignition switch OFF.
- Disconnect front air control connector.
- 3. Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M49 (A) terminal 26.

: Continuity should exist. 1 - 26

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



⊕ ⊝

Н

HAC

K

M

Ν

Р

W.IIA1375E

3.CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-152, "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-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

>> 1. Replace intake sensor. Refer to VTL-11, "Removal and Installation".

2. Go to HAC-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

${f 4.}$ CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

Turn ignition switch OFF.

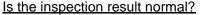
NO

- Disconnect front air control connector.
- 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 terminal 6 and ground.

2 - Ground : Continuity should not exist.



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

2. Go to HAC-115, "Front Air Control Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:0000000001669173

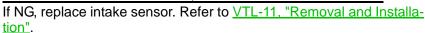
AWIIA0435ZZ

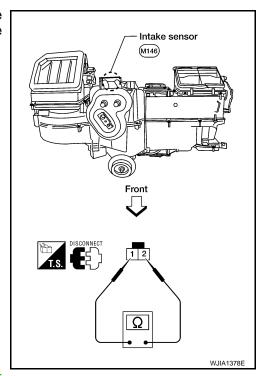
COMPONENT INSPECTION

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 $k\Omega$
-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





POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

INFOID:0000000001669174

Α

В

D

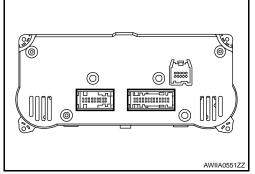
Е

COMPONENT DESCRIPTION

Front Air Control

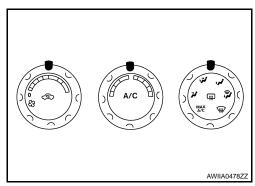
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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 postion by rotating the temperature control dial.



HAC

K

M

N

Р

INFOID:0000000001669175

Front Air Control Component Function Check

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.
- 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.)

Can a 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 <u>HAC-101</u>, <u>"Operational Check"</u>. <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-100, "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. CHECK POWER AND GROUND CIRCUIT

HAC-153

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Check main power supply and ground circuit. Refer to <u>HAC-154</u>, "Front Air Control Power and Ground Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.

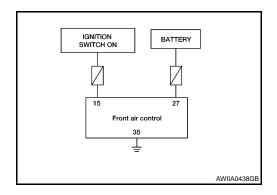
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

Front Air Control Power and Ground Diagnosis Procedure

INFOID:0000000001669176

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

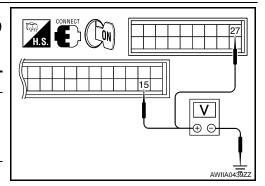
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- Disconnect front air control connectors.
- Check voltage between front air control harness connector M49
 (B) terminal 15 and M50 (A) terminal 27, and ground.

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



Is the inspection result normal?

YES >> GO TO 3.

NO

>> Check 10A fuses [Nos. 18 and 19, located in the fuse block (J/B)]. Refer to PG-66, "Terminal Arrangement".

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

2. Check ground circuit for front air control

- 1. Turn ignition switch OFF.
- 2. Check continuity between front air control harness connector M50 terminal 35 and ground.

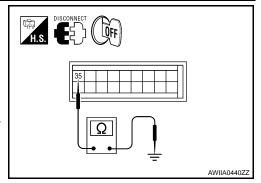
35 - Ground

: Continuity should exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to <u>VTL-8</u>, "<u>Removal and Installation"</u>.

NG >> Repair harness or connector.



[MANUAL A/C (TYPE 1)]

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

ECU DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

Ν

M

0

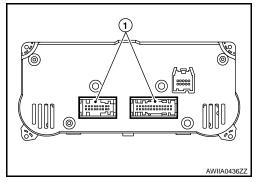
Ρ

AIR CONDITIONER CONTROL

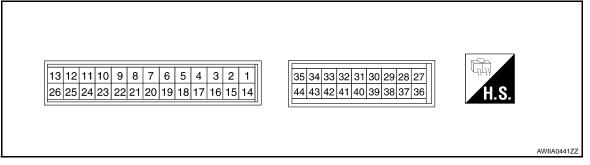
Front Air Control Terminals Reference Values

INFOID:0000000001669178

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 RERERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
3	Р	V ref ACTR (ground)	ON	-	5V
4	W/R	Compressor ON signal	ON	A/C switch OFF	5V
4	VV/K	Compressor ON signal	ON	A/C switch ON	0V
5	L/R	Fan ON signal	ON	Blower switch OFF	5V
5	L/K	Fan ON signal	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	(V) 15 10 5 0 200 ms
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
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
19	BR/W	Mode door motor CW	ON	Clockwise rotation	Battery voltage

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)	
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	0	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	Р	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	В	Ground	-	-	0V	
36	Р	CAN-L	ON	-	0 - 5V	
37	L	CAN-H	ON	-	0 - 5V	
41	Y/L	Water valve	ON	Water valve open	Battery voltage	
41	1/L	water valve	ON	Water valve closed	0V	
42	W/C	VO Metarrialia		Water valve open	0V	
42	W/G	Water valve	ON	Water valve closed	Battery voltage	

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

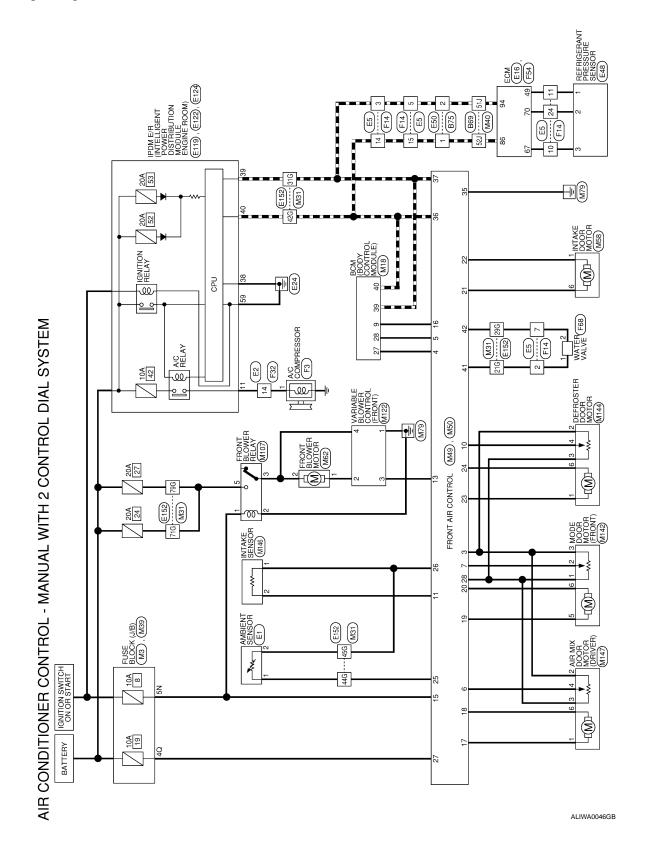
M

Ν

0

Р

Wiring Diagram



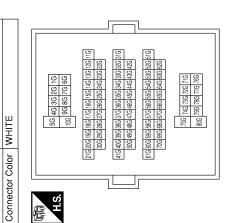
CONNECTORS										_							
IR CONDITIONER CONTROL - MANUAL WITH 2 CONTROL DIAL SYSTEM CONNECTORS	M18	BCM (BODY CONTROL	MODULE)	WHITE				/	8 9 10 11 12 13 14 15 16 17 18 19 20 28 29 30 31 32 33 34 35 36 37 38 39 40		of Signal Name	RR_DEF_SW	NO AIR_CON_SW	BLR_FAN_SW	CAN-H	CAN-L	
VITH 2 CON	Connector No.	Connector Name	N	Connector Color WHITE		厝	H.S.		1 2 3 4 5 6 7 8 21 22 23 24 25 26 27 28		Color of Terminal No. Wire	9 Y/B	27 W/R	28 L/R	39 L	40 P	
JL - MANUAL V						<u> </u>				-	· ·			I		ı	J
R CONTRO		SE BLOCK (J/B)	里			8N 7N 6N 5N 4N					Signal Name	ı					
IONE	Jo. M3	lame FU	olor WF		<u>ا</u>	<u>, I ∞</u>					Color of Wire	Y/G					
R CONDIT	Connector No.	Connector Name FUS	Connector Color WHI			H.S.					Terminal No. Wire	2N					

]						
	BLOCK (J/B)	Ш		0102	80 70 60 50 40]	;	Signal Name	ı
M39	me FUSE	or WHIT		ွ	80 70 60		Color of	Wire	Y/R
Connector No.	Connector Name FUSE BLOCK (J/B)	Connector Color WHITE		E	ВН	5	Color of	l erminal No.	40
			_			_			
		T	T						

Signal Name	ı	I	ı	-	_	1
Color of Wire	Y/L	M/G	_	Ь	Ь	Ь
Terminal No.	21G	567	31G	42G	517	562

Connector Name WIRE TO WIRE

Connector No. M31



ALIIA0198GB

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

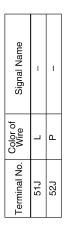
M

Ν

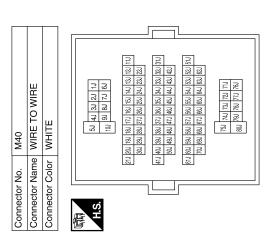
0

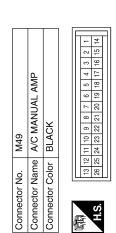
Ρ

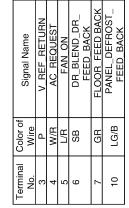
	M50	A/C MANUAL AMP	BLUE	33 32 31 30 29 28 27	42 41 40 39 38 37 36	Signal Name	Olginal Ivaline	В	V_REF ACTR (5V)	GND	CAN L	CAN_H	WATER_VALVE_	CLOSE	WATER_VALVE_	OPEN
ŀ				35 34 3	44 43 4	Color of	Wire	Y/R	Υ	В	Ь	Τ	J//		M/G	
	Connector No.	Connector Name	Connector Color	優	H.S.	Terminal	No.	27	28	35	36	37	41		42	



	_	_	_	_	_	_	_	_	_	_	_	_	_	_
Signal Name	EVAP AIR TEMP SENS	AWA SIG DAV	NSI	RR DEF REQUEST	DR BLEND DOOR A	8 HOOD DOOK B	FLOOR A	FLOOR B	A RECIRC DOOR A	B HOOD DHIDEH	PANEL DEFROST A	PANEL DEFROST B	AMB TEMP SENS	SENS_RETURN
Color of Wire	L/B	G/R	Y/G	A//B	M/G	В	BR/W	P/L	G/B	0	LG	P/B	Ь	V/R
Terminal No.	11	13	15	16	17	18	19	20	21	22	23	24	25	26







ALIIA0199GB

<u> </u>	M58	Connector No.	S :	M62	Connector No.	M107	
ii en	Connector Name INTAKE DOOR MOTOR	Connector	Name F	Connector Name FRONT BLOWER MOTOR	Connector Nam	Connector Name FRONT BLOWER RELAY	ELAY
Connector Color B	BLACK	Connector Color BLACK	Color B	LACK	Connector Color	BLACK	
	2 3 4 5 6	画 H.S.			H.S.	E 4 0	
Color of	0	F	Color of				
X	e Signal Name	leriiinal No.	o. WIĘ	Signal Name	_ Color of		
0	ı	-	Γ/M	ı	Terminal No.	Wire Signal Name	ше
G/B	- 8	2	M/L	1	·	- J/K	
]			2	В	
					က	- M/L	
					ıc	GR -	

Connector No.		M144
Connector Name		DEFROSTER DOOR MOTOR
Connector Color		BLACK
说. H.S.		2 3 4 5 6
Terminal No. Wire	Color	of Signal Name
-	LG LG	ı
2	۵	ı
ო	>	ı
4	LG/B	1
9	P/B	ı

Connector No.	. M142	21
lά	Connector Name MO	MODE DOOR MOTOR (FRONT)
1,9	Connector Color BLA	BLACK
	-	3 4 5 6
	Terminal No. Wire	Signal Name
 	۵	ı
	GR	ı
	>	ı
	BR/W	ı
	P/L	ı

M122	VARIABLE BLOWER CONTROL (FRONT)	WHITE	2 3 4	Signal Name	1	1	ı	ı
		_		Color of Wire	M/L	G/R	N/	B/W
Connector No.	Connector Name	Connector Color	所 H.S.	Terminal No.	-	2	က	4

ALIIA0200GB

Α

В

С

D

Е

F

G

Н

HAC

J

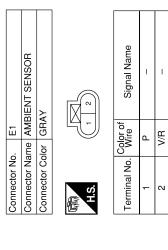
Κ

L

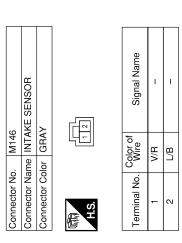
Ν

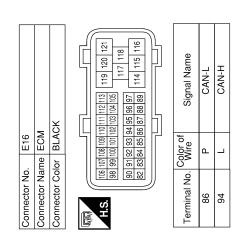
0

Ρ

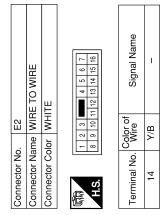


:		
Connector No.	M147	_
r Name	MOT	Connector Name AIR MIX DOOR MOTOR (DRIVER)
Connector Color	BLACK	OK
	2 3	9 2 9
Terminal No. Wire	lor of Vire	Signal Name
	M/G	ı
	۵	1
	>	ı
	SB	ı
	G	ı





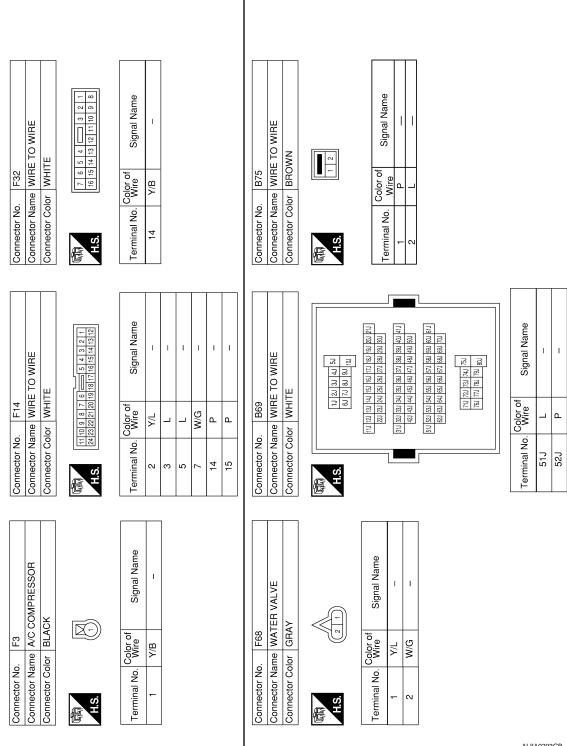
			Ī							
	WIRE TO WIRE	ITE	1 2 3 4 5 6	Signal Name	ı	1	-	ı	ı	1
. E5	me WIF	lor WHITE	2 3 4 5 13 14 15 1	Color of Wire	X/L	_	_	W/G	۵	۵
Connector No.	Connector Name	Connector Color	用。 H.S.	Terminal No.	2	က	5	7	14	15



ALIIA0201GB

		А
E122 POWER DISTRIBUTION MODULE ENGINE ROOM) WHITE A2 41 40 33 38 37 42 41 40 33 38 37 42 41 40 33 38 37 42 41 40 33 48 37 42 41 40 31 40 40 42 41 40 31 40 40 42 41 40 31 40 40 42 41 40 31 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 42 41 40 40 40 40 40 42 41 40 40	Signal Name	В
	Color of W/G W/G P P P P GR	C
Connector No. Connector Color Terminal No. Www. 38 1 39 1 40 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Terminal No. 21G 29G 31G 42G 71G 79G	E
		F
Signal Name	2805 400 410 410 51805 400 410 51805 400 610	G
0 0 0 0 0 0 0 0 0 0	TO WIRE TO WIRE WIRE TO WIRE 11G 2G 3G 4G 5G 11G 2G 3G 4G 11G 2G 3G 11G 2G 11G 2G 3G 11G 2G 11G	Н
nector No. nector Color ninal No. Color	nector No.	HAC
Con Con Terr		J
	SENT TION AOOM)	K
PRE TO WIRE COWN 2 1 1	E124 IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) BLACK Signal Name re Signal Name re Signal Name re GND (PWR)	M
Note of P		N
Connector No Connector Name Connector Color H.S.	Connector No. Connector Color Terminal No. S9	0
'	ALIIA0202GB	

HAC-163



ALIIA0203GB

[MANUAL A/C (TYPE 1)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	0 1 2 3 A/C A/C WANT AWIIA0479ZZ

HAC

Α

В

С

D

Е

F

G

Н

J

Κ

L

M

Ν

0

Р

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000001669180

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-153
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-115
Air outlet does not change.	Co to Trouble Diagnosis Precedure for Made Dear Motor	HAC 117
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-117</u>
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-122
Air mix door motor is malfunctioning.	Go to Houble Diagnosis Procedure for All Mix Door Motor.	<u> </u>
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-127
Intake door motor is malfunctioning.	Go to Houble Diagnosis Procedure for intake Door Motor.	<u> </u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-130
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-135
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-141
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	<u>HAC-167</u>
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.	XXXX <u>HAC-70</u>

YES >> GO TO 9.

INSUFFICIENT COOLING	
Component Function Check	0000001669181
SYMPTOM: Insufficient cooling	
INSPECTION FLOW	
${f 1}$.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE	
Rotate the blower control dial to the low speed.	
 Turn temperature control dial counterclockwise to maximum cold. 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 <u>HAC-101, "Operational Check"</u> .	
Does another symptom exist?	
YES >> Refer to <u>HAC-166, "Symptom Matrix Chart"</u> .	
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	ŀ
Perform self-diagnosis Refer to HAC-115, "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-12, "Checking Drive Belts".	
Is the inspection result normal?	
OK >> GO TO 6. NG >> Adjust or replace compressor belt. Refer to EM-12, "Removal and Installation".	
6.CHECK AIR MIX DOOR OPERATION	
OTOTILE ON THE WILL BOOK OF ENVIRON	or Com-
Check and verify air mix door mechanism for smooth operation. Refer to HAC-122. "Air Mix Door Moto	<u> </u>
Check and verify air mix door mechanism for smooth operation. Refer to <u>HAC-122, "Air Mix Door Motoponent Function Check"</u>	
ponent Function Check" Does air mix door operate correctly?	
ponent Function Check" Does air mix door operate correctly? YES >> GO TO 7.	dure"
ponent Function Check" Does air mix door operate correctly? YES >> GO TO 7. NO >> Check air mix door motor circuit. Refer to HAC-123, "Air Mix Door Motor Diagnosis Proced	<u>dure"</u> .
ponent Function Check" Does air mix door operate correctly? YES >> GO TO 7. NO >> Check air mix door motor circuit. Refer to HAC-123, "Air Mix Door Motor Diagnosis Proced CHECK COOLING FAN MOTOR OPERATION	dure".
ponent Function Check" Does air mix door operate correctly? YES >> GO TO 7. NO >> Check air mix door motor circuit. Refer to HAC-123, "Air Mix Door Motor Diagnosis Proced	dure".
Does air mix door operate correctly? YES >> GO TO 7. NO >> Check air mix door motor circuit. Refer to HAC-123, "Air Mix Door Motor Diagnosis Proced." CHECK COOLING FAN MOTOR OPERATION Check and verify cooling fan motor for smooth operation. Refer to EC-305, "Overall Function Check". Does cooling fan motor operate correctly? YES >> GO TO 8.	dure".
Does air mix door operate correctly? YES >> GO TO 7. NO >> Check air mix door motor circuit. Refer to HAC-123, "Air Mix Door Motor Diagnosis Proced." CHECK COOLING FAN MOTOR OPERATION Check and verify cooling fan motor for smooth operation. Refer to EC-305, "Overall Function Check". Does cooling fan motor operate correctly?	dure".

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Check water valve circuit. Refer to <u>HAC-146</u>, "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-179, "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 <u>HAC-168</u>, "Performance Test Diagnoses".

NO >> GO TO 12.

12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-171, "Test Reading".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-168, "Performance Test Diagnoses".

NO >> GO TO 13.

13. CHECK AIR DUCTS

Check ducts for air leaks.

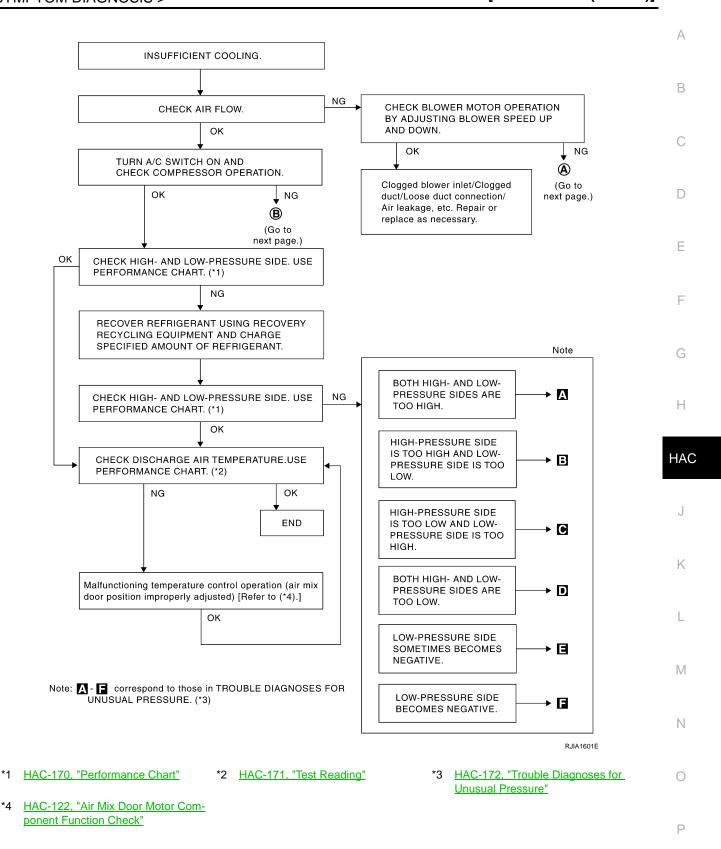
Is the inspection result normal?

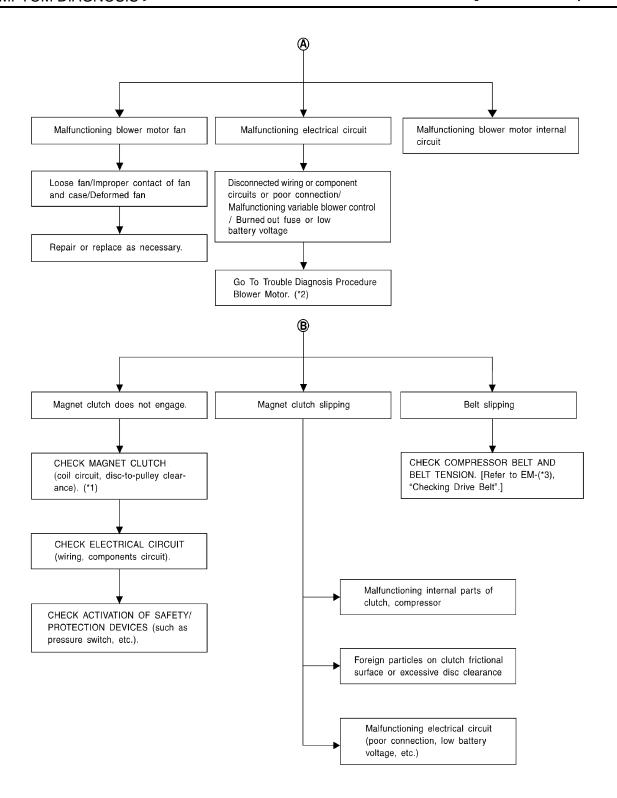
YES >> System OK.

NO >> Repair air leaks.

Performance Test Diagnoses

INFOID:0000000001669182





WJIA1371E

Performance Chart

^{*1} HA-34, "Removal and Installation for Compressor Clutch"

*2 HAC-135, "Front Blower Motor Component Function Check"

*3 EM-12, "Checking Drive Belts" ponent Function Check"

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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	n for 10 minutes before taking measurements.

Test Reading

Recirculating-to-discharge Air Temperature Table

nside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator
Relative humidity %	Air temperature °C (°F)	°C (°F)
	20 (68)	9.9 - 13.9 (50 - 57)
	25 (77)	14.6 - 18.6 (58 - 65)
50 - 60	30 (86)	16.8 - 21.8 (62 - 71)
	35 (95)	21.1 - 27.1 (70 - 81)
	40 (104)	25.3 - 31.5 (78 - 89)
	20 (68)	11.4 - 15.2 (53 - 59)
	25 (77)	15.5 - 20.0 (60 - 68)
60 - 70	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)	Low-pressure (Suction side)	
Relative humidity %	Air temperature °C (°F)	kPa (kg/cm ² , psi)	kPa (kg/cm ² , psi)	
	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)	
50 - 70	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)	

HAC

Α

В

D

Е

F

G

Н

K

L

M

Ν

0

Ρ

Trouble Diagnoses for Unusual Pressure

INFOID:0000000001669185

Whenever system's high and/or low side pressure is unusual, 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
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 speci- fied 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/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) Air in refrigeration cycle	Evacuate and recharge system.
Ф Б Ф AC359A	Engine tends to overheat.	Engine cooling systems mal- function.	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
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 lo- cated 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

Probable cause

Refrigerant cycle

Gauge indication

Corrective action

dure".

• Repair evaporator fins.

Replace evaporator.
 Refer to <u>HAC-135</u>, "Front <u>Blower Motor Component Function Check"</u>.

Α

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. Understand the proper operation is improper. Damaged inside compressor packings.	Replace compressor.
LO HI AC356A	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. Understand the proper of the proper operation is improper. Damaged inside compressor packings.	Replace compressor.
oth High- and Low-pressure	Sides are Too Low		
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	 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 highpressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	 Check and repair malfunctioning parts. Check oil for contamination.
Both high- and low-pressure sides are too low.	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-23, "Checking of Refrigerant Leaks".
(IO) (HI) AC353A	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.
			Check intake sensor circuit. Refer to HAC-151, "Intake Sensor Diagnosis Procedure"

Low-pressure Side Sometimes Becomes Negative

Evaporator is frozen.

Air flow volume is too low.

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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
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.

INSUFFICIENT HEATING	, ,,
Component Function Check	INFOID:000000001669186
SYMPTOM: Insufficient heating	
INSPECTION FLOW	
1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERAT	URE INCREASE
 Turn the blower control dial to low speed. Turn the temperature control dial clockwise to maximum heat Check for hot air at discharge air outlets. 	
Can this symptom be duplicated?	
YES >> GO TO 2.	Cara at Oh a at ill
NO >> Perform complete system operational check. Refer to HAC-101 , "Operate 2. CHECK FOR SERVICE BULLETINS	llonai Check".
Check for any 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 <u>HAC-115</u> , "Front Air Control Self-Diagnosis". <u>Is the inspection results normal?</u>	
YES >> GO TO 4.	
NO >> Refer to <u>HAC-166, "Symptom Matrix Chart"</u> .	
4.CHECK ENGINE COOLING SYSTEM	
 Check for proper engine coolant level. Refer to <u>CO-10, "Inspection"</u>. Check hoses for leaks or kinks. Check radiator cap. Refer to <u>CO-10, "Inspection"</u>. 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-122, "Air Mix Door Motor Check".	otor Component Function
6.CHECK AIR DUCTS	
Check for disconnected or leaking air ducts.	_
Is the inspection result normal? YES >> GO TO 7.	
YES >> GO TO 7. NO >> Repair all disconnected or leaking air ducts.	
7. CHECK HEATER HOSE TEMPERATURES	
 Start engine and warm it up to normal operating temperature. Touch both the inlet and outlet heater hoses. 	
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	

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Check engine control temperature sensor. Refer to EC-126, "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

- >> 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 11 to retest.

10. CHECK HEATER HOSE TEMPERATURES

- 1. Start engine and warm it up to normal operating temperature.
- Touch both the inlet and outlet heater hoses.

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-146, "Water Valve Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

INFOID:0000000001669187

Α

В

NOISE

Component Function Check

SYMPTOM: Noise

INSPECTION FLOW



WJIA1972E

- Compressor Clutch"
- *4 HAC-101, "Operational Check"
- *1 HA-34, "Removal and Installation for *2 HA-34, "Removal and Installation for *3 HA-20, "Maintenance of Oil Quantity Compressor Clutch"
 - *5 EM-12, "Checking Drive Belts"
- in Compressor"

PRECAUTION

PRECAUTIONS

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSION-FR"

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.

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

INFOID:0000000001669190

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
- 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

HAC

Α

D

Е

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.

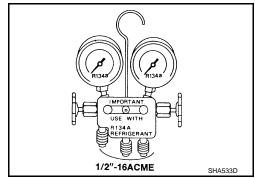
If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Service Equipment

INFOID:0000000001669191

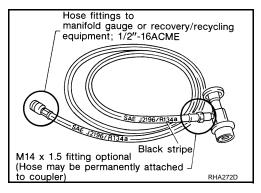
MANIFOLD GAUGE SET

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

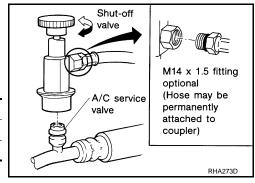
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shutoff devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



[MANUAL A/C (TYPE 2)]

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩ ○ ₩
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

HAC

Α

В

С

D

Е

F

G

Н

J

K

L

M

Ν

0

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >

[MANUAL A/C (TYPE 2)]

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:0000000001678297

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-183. "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 6

6. FINAL CHECK

Final check.

Is the inspection result normal?

YES >> CHECK OUT

NO >> GO TO 4

[MANUAL A/C (TYPE 2)]

INSPECTION AND ADJUSTMENT

Operational Check INFOID:0000000001678298

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.
- Rotate the blower control dial again, and continue checking blower speed until all speeds are checked.
- Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for HAC-216, "Front Blower Motor Diagnosis Procedure". If OK, continue with next check.

CHECKING DISCHARGE AIR

- Rotate MODE control dial to each position and the DEF m mode.
- 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 <u>HAC-198</u>, "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.
- Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for HAC-208, "Intake Door Motor Diagnosis Procedure". If OK, continue the check.

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

- Rotate temperature control dial counterclockwise until maximum cold.
- 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-203, "Air Mix Door Motor Diagnosis Procedure".

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

- 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-203, "Air Mix Door Motor Diagnosis Procedure".

If OK, continue with next check.

CHECK A/C SWITCH

- 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.

HAC

Н

Α

В

Е

L

M

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[MANUAL A/C (TYPE 2)]

If NG, go to trouble diagnosis procedure for <u>HAC-221, "Magnet Clutch Diagnosis Procedure"</u>. If all operational checks are OK (symptom cannot be duplicated), go to <u>HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"</u> and perform tests as outlined. If symptom appears, refer to <u>HAC-243, "Symptom Matrix Chart"</u> and perform applicable trouble diagnosis procedures.

[MANUAL A/C (TYPE 2)]

FUNCTION DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

HAC

Α

В

С

D

Е

F

G

Н

J

K

L

M

Ν

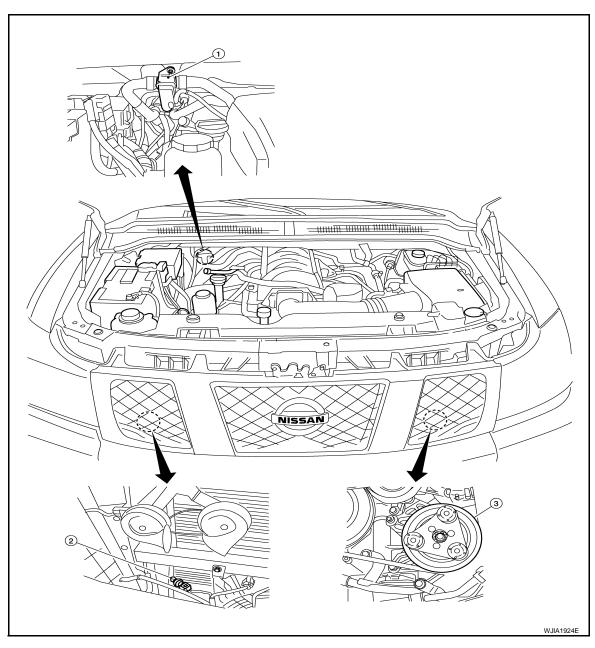
0

FUNCTION INFORMATION

Component Part Location

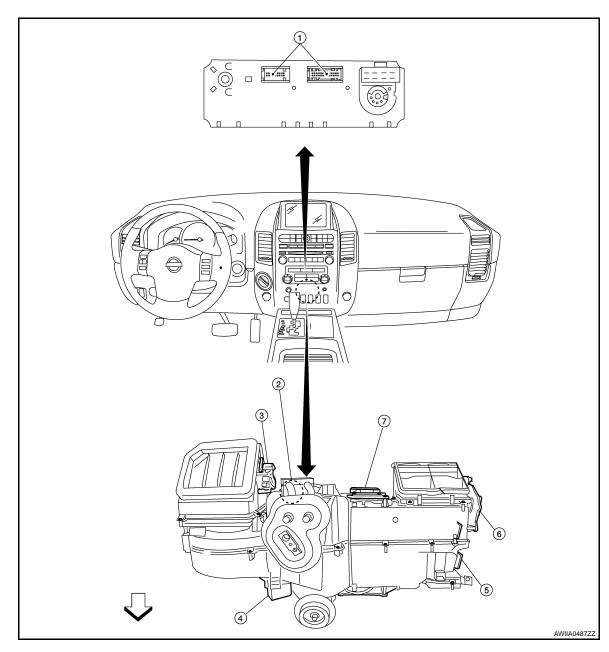
ENGINE COMPARTMENT

INFOID:0000000001678300



1. Water valve F68

- 2. Refrigerant pressure sensor E48 (view with grille removed)
- 3. A/C Compressor F3



- 1. Front air control M49, M50
- 4. Variable blower control M122
- 7. Air mix door motor (front) M147
- 2. Intake sensor M146
- 5. Mode door motor M142
- 3. Intake door motor M58
- 6. Defroster door motor M144

Α

В

С

D

Е

F

G

Н

HAC

K

L

M

Ν

0

FUNCTION INFORMATION

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Symptom Table

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-231
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-197
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u> HAC-197</u>
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-202
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<u>HAC-202</u>
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-207
Intake door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	<u>11AC-207</u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-210
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-215
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-221
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		
< FUNCTION DIAGNOSIS >	[MANUAL A/C (TYPE 2)]	
REFRIGERATION SYSTEM		А
Refrigerant Cycle	INFOID:000000001678302	
		В
Refer to HAC-189, "Refrigerant Cycle".		
Refrigerant System Protection	INFOID:000000001678303	С
Refer to HA-15, "Refrigerant System Protection".		D
		Е
		F
		G
		Н
		HAC
		J
		K
		L

 \mathbb{N}

Ν

0

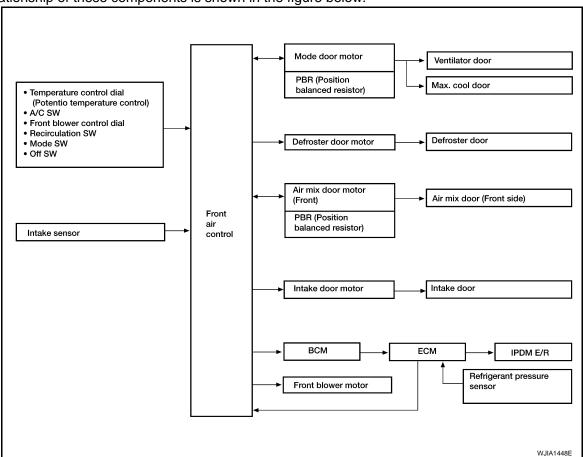
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000001678304

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:0000000001678305

CONTROL OPERATION

Front air control A/C MAX A/C WJJA1405E

MANUAL AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

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

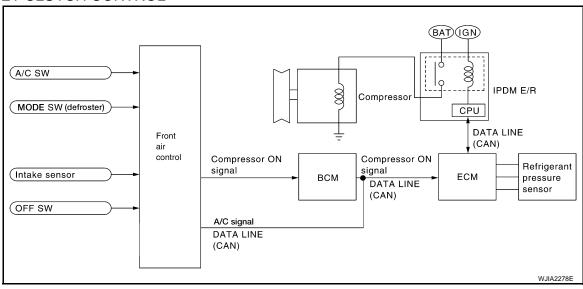
The compressor is ON or OFF.

(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:0000000001678306

HAC

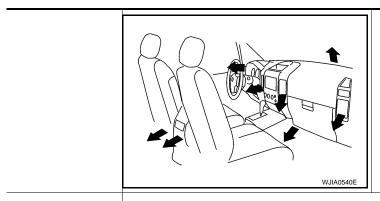
Н

Α

D

Е

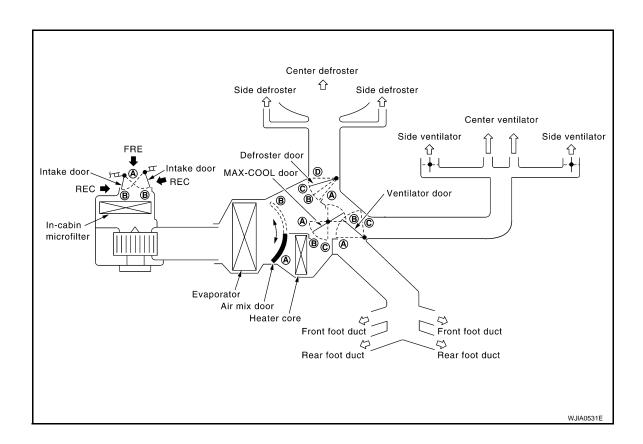
F



Mode door position	Air outlet/distribution				
	Vent	Foot	Defroster		
~;	95%	5%	_		
**	60%	40%	_		
·,i	_	70%	30%		
#	_	60%	40%		
\PP	_	10%	90%		

Switches And Their Control Function

INFOID:0000000001678307



MANUAL AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Position		MOD	E SW		DEF	SW	REC	SW	Tempe	rature	switch	OFF
Position or	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF	/-		\	SW
switch	→ •	. > .*		(W)	FR	CONT CONT	₹	>	(>(A/C	(1)	
	~	+2	*	+~	-> • =	0	÷ • :	0	COLD	~	нот	
Ventilator door	(A)	B	©	©	©		_	_		_		©
MAX-COOL door	A	B	B	B	©		_	_				B
Defroster door	(D)	(D)	O or ©	B	(A)		_	_		_		©
Intake door		_	_		B		(A)	B				B
Air mix door		_	_				_	_	(A)		B	

HAC

Α

В

С

D

Е

F

G

Н

J

Κ

L

M

Ν

0

Ρ

CAN COMMUNICATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

CAN COMMUNICATION SYSTEM

System Description

INFOID:0000000001678308

Refer to LAN-4, "System Description".

DIAGNOSIS SYSTEM (BCM)

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM)

INFOID:0000000001678309

Α

В

С

D

Е

F

G

Н

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

BCM diagnostic test item	Diagnostic mode	Description
	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR	Displays BCM input/output data in real time.
Inspection by part	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.
	CONFIGURATION	Performs BCM configuration read/write functions.

DATA MONITOR

Display Item List

Monitor item name "operation or unit"		Contents
IGN ON SW	"ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
COMP ON SIG	"ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.
FAN ON SIG	"ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower motor switch signal.

HAC

Κ

L

M

Ν

0

COMPONENT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	○ ★ ○ ★ ○ ★ ○ ★ ○ ★ ○ ★ ○ ★ ○ ★ ○ ★ ○ ★
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [(without variable blower control (VBC)]	AWIIA0479ZZ

MODE DOOR MOTOR

System Description

INFOID:0000000001678311

Α

В

D

Н

HAC

L

Ν

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

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

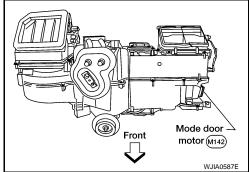
System Operation

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:0000000001678312

INSPECTION FLOW

${f 1}$.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

- Rotate the mode control dial and check each position and press the (DEF) mode.
- Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-191, "Discharge</u> 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.

Can a 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-183, "Operational Check". Can a symptom be duplicated?

>> Refer to HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair". YES

NO >> System OK.

3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. CHECK MODE DOOR OPERATION

Check and verify mode door mechanism for smooth operation in each mode.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair as necessary.

5. CHECK THE MODE DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the mode door motor. Refer to <u>HAC-197</u>, "Mode <u>Door Motor Component Function Check"</u>.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair PBR circuit or replace motor. Refer to <u>HAC-198</u>, "Mode Door Motor Diagnosis Procedure".

6. RECHECK FOR SYMPTOMS

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-183</u>, <u>"Operational Check"</u>. <u>Does another symptom exist?</u>

YES >> Repair as necessary.

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

Mode Door Motor Diagnosis Procedure

INFOID:0000000001678313

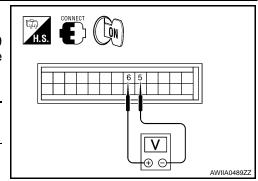
SYMPTOM:

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

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Press the B/L (🗘) mode switch.
- Check voltage between front air control harness connector M49 terminal 5 and terminal 6 while pressing the mode switch to the floor () mode.

Connector	Te	erminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	6	5	Press mode switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2. CHECK MODE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

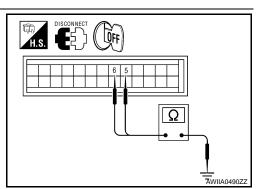
- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 5, 6 and ground.

5 - Ground : Continuity should not exist.6 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.



Α

В

D

Е

Н

HAC

K

M

Ν

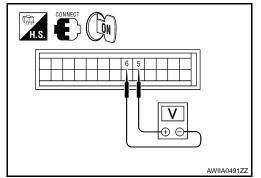
Р

AWIIA0493ZZ

$\overline{3.}$ CHECK FRONT AIR CONTROL FOR GROUND AND POWER

- 1. Press the mode switch to the D/F () mode.
- 2. Check voltage between front air control harness connector M49 terminal 5 and terminal 6 while pressing the mode switch to the vent (*) mode.

Connector	Te	erminals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition	(Approx.)	
Front air control: M49	5	6	Press mode switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 5.

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

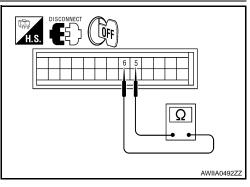
f 4.CHECK MODE DOOR MOTOR AND CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 5 and terminal 6.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN

- Disconnect the mode door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 5, 6 and the mode door motor harness connector M142 (B) terminal 5, 6.

: Continuity should exist. 5 - 5

6 - 6 : Continuity should exist.

Is the inspection result normal?

>> Replace mode door motor. Refer to VTL-19, "Removal YES and Installation".

NO >> Repair or replace harness as necessary.

$\mathsf{G}.\mathsf{CHECK}$ FRONT AIR CONTROL FOR PBR POWER AND GROUND

- 1. Reconnect front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 2 and 15.

Connector	Terr	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49, M50	2	15	5V

AWIIA0495ZZ

Is the inspection result normal?

YES >> GO TO 9. >> GO TO 8. NO

.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

[MANUAL A/C (TYPE 2)]

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

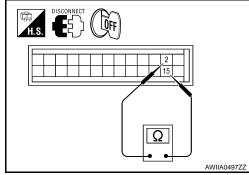
8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and terminal 15.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10



9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

- 1. Disconnect the mode door motor harness connector.
- Check continuity between mode door motor harness connector M142 (B) terminal 3, 1 and front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28.

2 - 3 : Continuity should exist. 15 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

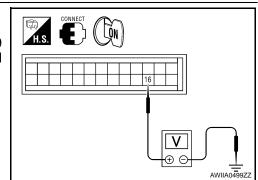
10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 16 and ground while cycling mode switch through all modes.

Voltage : Approx. 1V - 4.5V

Is the inspection result normal?

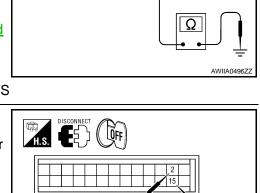
YES >> GO TO 13. NO >> GO TO 12.



Ω

1 3

AWIIA0498Z



11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 16 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

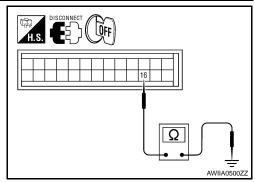
- 1. Turn ignition switch OFF.
- 2. Disconnect the mode door motor harness connector and front air control harness connector.
- Check continuity between mode door motor harness connector M142 terminal 2 and front air control harness connector M49 terminal 16.

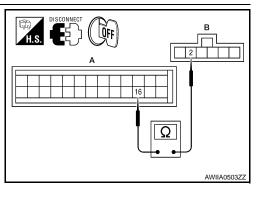
Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





HAC

Н

Α

В

D

Е

F

. I

K

L

M

Ν

0

AIR MIX DOOR MOTOR

System Description

INFOID:0000000001678314

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

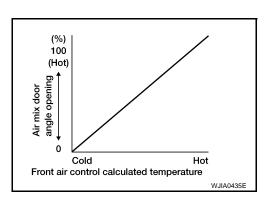
Air mix door control system components are:

- 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.

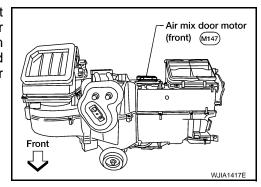
Air Mix Door Control Specification



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:0000000001678315

INSPECTION FLOW

1.confirm symptom by performing operational check - temperature increase

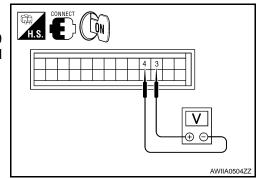
- 1. Turn the temperature control dial clockwise to maximum hot.
- 2. Check for hot air at discharge air outlets.

>> GO TO 2.	А
2.confirm symptom by performing operational check - temperature decrease	
 Turn the temperature control dial counterclockwise to maximum cold. Check for cold air at discharge air outlets. 	В
Can a symptom be duplicated?	
YES >> GO TO 4.	С
NO >> GO TO 3.	
3.PERFORM COMPLETE OPERATIONAL CHECK	
Perform a complete operational check and check for any symptoms. Refer to <u>HAC-183, "Operational Check"</u> .	D
Can a symptom be duplicated? YES >> Refer to HAC-182. "How to Perform Trouble Diagnosis For Quick And Accurate Repair".	
YES >> Refer to <u>HAC-182</u> , " <u>How to Perform Trouble Diagnosis For Quick And Accurate Repair</u> ". NO >> System OK.	Е
4.CHECK FOR SERVICE BULLETINS	
Check for any service bulletins.	F
>> GO TO 5.	
5. CHECK AIR MIX DOOR OPERATION	G
Check and verify air mix door mechanism for smooth operation from maximum cold °to maximum hot in each	
mode. <u>Is the inspection result normal?</u>	Н
YES >> GO TO 6.	
NO >> Repair as necessary.	НА
6.CHECK THE AIR MIX DOOR MOTOR PBR CIRCUIT	
Perform diagnostic procedure for the air mix door motor. Refer to <u>HAC-202</u> , "Air Mix Door Motor Component Function Check".	J
Is the inspection result normal?	
YES >> GO TO 7. NO >> Repair PBR circuit or replace air mix door motor. Refer to VTL-20, "Removal and Installation".	K
7. RECHECK FOR ANY SYMPTOMS	
Perform a complete operational check for any symptoms. Refer to <u>HAC-183, "Operational Check"</u> .	
Does another symptom exist?	L
YES >> Refer to HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair". NO >> Replace front air control Refer to VTL-8, "Removal and Installation".	M
Air Mix Door Motor Diagnosis Procedure	
	Ν
SYMPTOM:	1 4
Discharge air temperature does not change.Air mix door motor does not operate.	
	0
DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR	
1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND	Р

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial to maximum hot.
- Check voltage between front air control harness connector M49 terminal 3 and terminal 4 while rotating temperature control dial to maximum cold.

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	3	4	Rotate temp control dial	Battery voltage



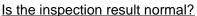
Is the inspection result normal?

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

$2. \mathsf{CHECK}$ AIR MIX DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 3, 4 and ground.

3 - Ground : Continuity should not exist.4 - Ground : Continuity should not exist.



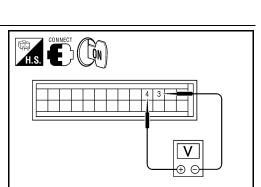
YES >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial to maximum hot.
- 3. Check voltage between front air control harness connector M49 terminal 3 and terminal 4 while rotating temperature control dial to maximum cold.

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	4	3	Rotate temp control dial	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

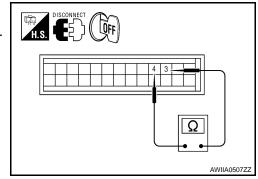
4. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 3 and terminal 4.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Ω

1. Disconnect the air mix door motor harness connector.

 Check continuity between front air control harness connector M49 (A) terminal 3, 4 and the air mix door motor harness connector M147 (B) terminal 1, 6.

3 - 1 : Continuity should exist.4 - 6 : Continuity should exist.

Is the inspection result normal?

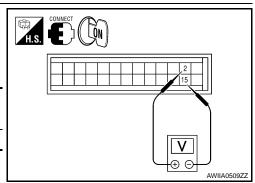
YES >> Replace air mix door motor. Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

- 1. Reconnect front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 2 and 15

Connector	Terr	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49	2	15	5V



Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

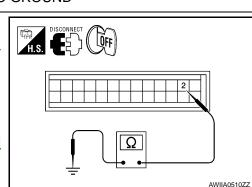
- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and 15.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN



HAC

Α

В

D

Е

AWIIA0508ZZ

M

Ν

0

Р

AWIIA0511ZZ

[MANUAL A/C (TYPE 2)]

AWIIA0512ZZ

< COMPONENT DIAGNOSIS >

- 1. Disconnect the air mix door motor harness connector.
- Check continuity between air mix door motor harness connector M147 (B) terminal 3, 2 and front air control harness connector M49 (A) terminal 2 and 15.

2 - 3 : Continuity should exist. 15 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

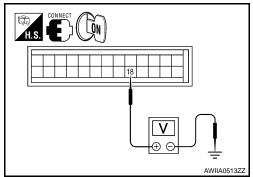
10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 18 and ground while rotating temperature control dial from maximum hot to maximum cold.



Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 18 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12. CHECK PBR FEEDBACK CIRCUIT FOR OPEN

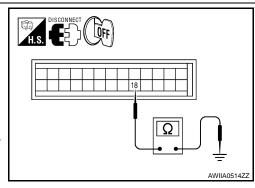
- Turn ignition switch OFF.
- Disconnect the air mix door motor harness connector and front air control harness connector.
- Check continuity between air mix door motor harness connector M147 (B) terminal 4 and front air control harness connector M49 (A) terminal 18.

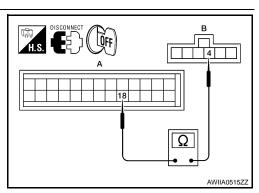
Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to <u>VTL-20, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





INTAKE DOOR MOTOR

System Description

INFOID:0000000001678317

SYSTEM DESCRIPTION

SYMTOM:

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

SYSTEM DESCRIPTION

Component Parts

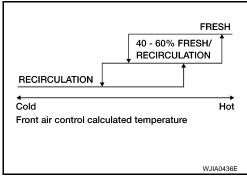
Intake door control system components are:

- 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.

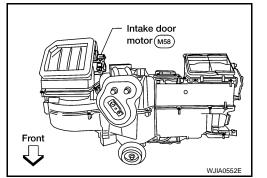
Intake Door Control Specification



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

INSPECTION FLOW

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

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

HAC

Н

Α

В

D

Е

K

M

Ν

Р

INFOID:0000000001678318

< COMPONENT DIAGNOSIS >

Can a 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 <u>HAC-183</u>, <u>"Operational Check"</u>. <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-182, "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. CHECK INTAKE DOOR OPERATION

Check and verify intake door mechanism for smooth operation.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair intake door mechanism.

5. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to <u>HAC-183, "Operational Check"</u>.

Does another symptom exist?

YES >> Refer to HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Intake Door Motor Diagnosis Procedure

INFOID:0000000001678319

SYMPTOM:

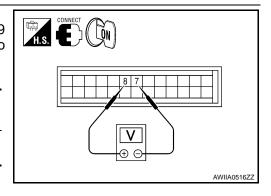
- · Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.

Connector	Te	erminals	Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
front air control: M49	8	7	Self-diagnostic mode	Battery voltage



Is the inspection result normal?

OK >> GO TO 4. NO >> GO TO 3.

2.CHECK INTAKE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

INTAKE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Ω

- 1. Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 8, 7 and ground.

8 - Ground : Continuity should not exist.7 - Ground : Continuity should not exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

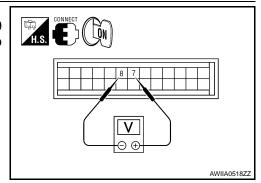
NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER

1. Press the BACK button to back out of self-diagnostic mode.

 Check voltage between front air control harness connector M49 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
front air control: M49	7	8	Self-diagnostic mode	Battery voltage



Is the inspection result normal?

OK >> GO TO 5.

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

4. CHECK INTAKE DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 8 and terminal 7.

Continuity should exist.

Is the inspection result normal?

OK >> Replace intake door motor. Refer to <u>VTL-18</u>, "Removal and Installation".

NO >> GO TO 6.

5. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN

Disconnect the intake door motor harness connector.

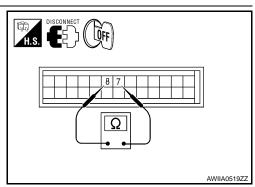
 Check continuity between front air control harness connector M49 (A) terminal 7, 8 and the intake door motor harness connector M58 (B) terminal 1, 6.

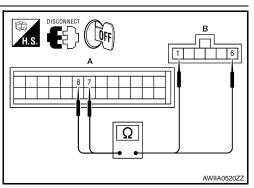
8 - 6 : Continuity should exist.7 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace intake door motor. Refer to VTL-18, "Removal and Installation".

NO >> Repair or replace harness as necessary.





Н

HAC

Α

В

D

Е

AWIIA0517ZZ

K

L

M

Ν

0

System Description

Cystem Description

INFOID:0000000001678320

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:

- · Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- Intake sensor

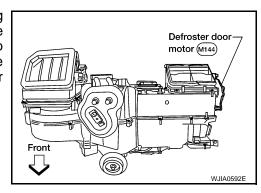
System Operation

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:0000000001678321

INSPECTION FLOW

1.confirm symptom by performing operational check - defroster door

- 1. Select vent (*) mode.
- 2. Rotate mode control dial todefrost mode ().
- Listen for defroster door position change (blower sound should change slightly).

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-183, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-182, "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. CHECK DEFROSTER DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Perform diagnostic procedure for defroster door motor. Refer to <u>HAC-210</u>, "<u>Defroster Door Motor Component</u> Function Check".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair PBR circuit or replace defroster door motor. Refer to VTL-17, "Removal and Installation".

5.CHECK DEFROSTER DOOR OPERATION

Check and verify defroster door mechanism for smooth operation.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to VTL-17, "Removal and Installation".

NO >> Repair defroster door mechanism.

Defroster Door Motor Diagnosis Procedure

INFOID:0000000001678322

SYMPTOM:

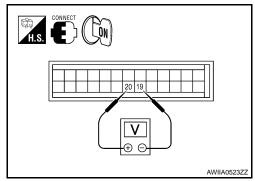
- Defroster door does not change.
- Defroster door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR DEFROSTER DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- Rotate the mode control dial to defrost mode ().
- Check voltage between front air control harness connector M49 terminal 20 and terminal 19 and then press the defroster switch () again.

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	20	19	Press defroster switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2.CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 19, 20 and ground.

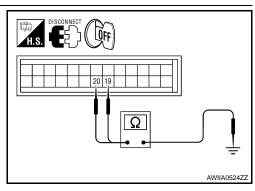
19 - Ground : Continuity should not exist.20 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

3. CHECK FRONT AIR CONTROL FOR GROUND AND POWER



HAC

Н

Α

В

D

Е

F

K

L

M

Ν

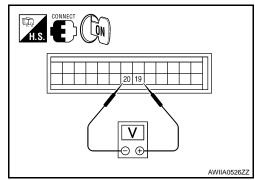
0

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

- Press the defroster switch ().
- 2. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 and the press the defroster switch (♠) again.

Connector	Terminals		Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	19	20	Press de- froster switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

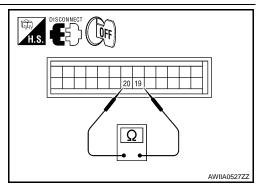
4. CHECK DEFROSTER DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 19 and terminal 20.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



$5. \mathsf{CHECK}$ DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN

- 1. Disconnect the defroster door motor harness connector.
- Check continuity between front air control harness connector M49 terminal 19, 20 and the defroster door motor harness connector M144 terminal 1, 6.

19 - 1 : Continuity should exist.20 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR 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 2 and 15.

Connector	Ter	Voltage (Ap-		
Connector	(+)	(-)	prox.)	
Front air control: M50, M49	2	15	5V	

CONNECT CON LANGUAGE AWIIA0494ZZ

Ω

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

and \Q

8.CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and 15.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

AWIIA0497ZZ

2 3

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

1. Disconnect the defroster door motor harness connector.

Check continuity between defroster door motor harness connector M144 (B) terminal 3, 2 and front air control harness connector M49 (A) terminal 2, and 15.

2 - 3 : Continuity should exist. 15 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

- 1. Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 25 and ground while cycling defroster switch on and off.

Voltage : Approx. 1V - 4.5V

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12. V ⊕ ⊙ = AWIIA053:

Ω

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

H | |

HAC

Α

В

D

J

K

AWIIA0531ZZ

M

L

Ν

0

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

- Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 25 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

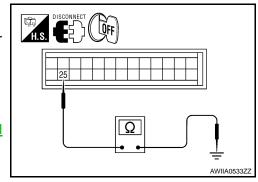
- 1. Turn ignition switch OFF.
- 2. Disconnect the defroster door motor harness connector and front air control harness connector.
- Check continuity between defroster door motor harness connector tor M144 (B) terminal 4 and front air control harness connector M49 (A) terminal 25

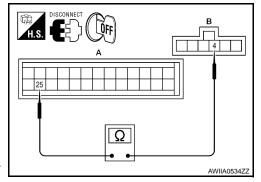
Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





BLOWER MOTOR CONTROL SYSTEM

System Description

INFOID:0000000001678323

Α

В

D

Е

F

Н

HAC

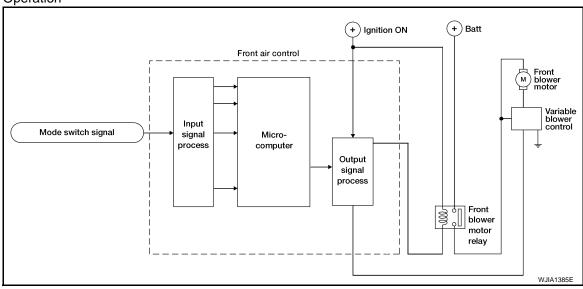
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

- Front air control
- Variable blower control
- Front blower motor relav
- Front blower motor
- · Intake sensor

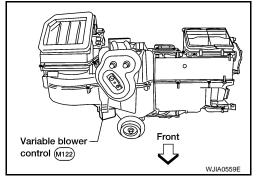
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control is located on the cooling unit. The variable blower control 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:0000000001678324

INSPECTION FLOW

1.CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

- 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.

Can the symptom be duplicated?

>> GO TO 3. YES

NO >> GO TO 2.

HAC-215

K

M

Ν

BLOWER MOTOR CONTROL SYSTEM

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-183, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-182, "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. CHECK BLOWER MOTOR OPERATION

Check and verify blower motor operates manually in all speeds.

Does blower motor operate in all speeds?

YES >> GO TO 5.

NO >> Refer to HAC-216, "Front Blower Motor Diagnosis Procedure".

5. CHECK ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT

Check engine coolant temperature sensor circuit. Refer to EC-125, "Diagnosis Procedure".

Is the inspection results normal?

YES >> GO TO 6.

NO >> Replace engine coolant temperature sensor.

6. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-183, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

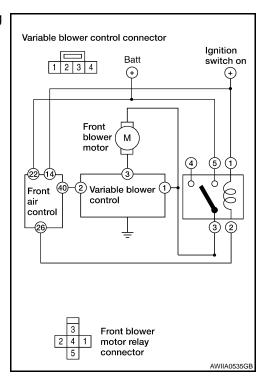
Front Blower Motor Diagnosis Procedure

INFOID:0000000001678325

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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



< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

1. CHECK FUSES

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to <u>PG-66, "Terminal Arrangement"</u>.

Fuses are good.

Is the inspection result normal?

YES >> GO TO 3. 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.
- 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 10.

NO >> GO TO 3.

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

- Turn ignition switch OFF.
- 2. Disconnect front blower motor relay.
- 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 <u>HAC-219</u>, "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

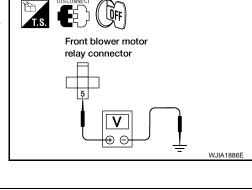
Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.



Front blower motor connector

2

WJIA1331E

HAC

Н

Α

В

D

Е

J

K

N/I

Ν

0

Р

Front blower motor relay connector connector

6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

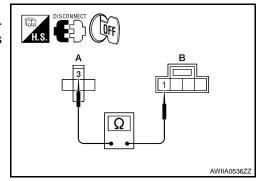
- 1. Disconnect variable blower control harness connector.
- Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 1.

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

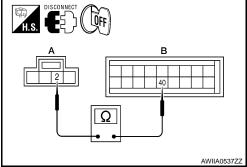
- 1. Disconnect front air control connector.
- 2. Check continuity between front air control harness connector M49 (B) terminal 40 and variable blower control harness connector M122 (A) terminal 2.

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

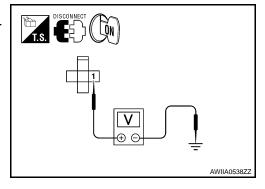
- Turn ignition switch ON.
- Check voltage between front blower motor relay harness connector M107 terminal 1 and ground.

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 1 and ground.

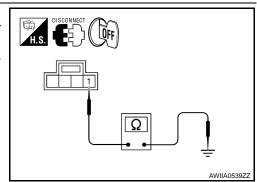
1 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT



< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

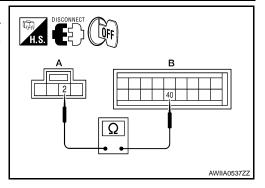
- 1. Disconnect front air control connector.
- Check continuity between front air control harness connector M49 (B) terminal 40 and variable blower control harness connector M122 (A) terminal 2.

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 <u>HAC-215</u>, "Front Blower Motor Component Function Check". <u>Is the inspection result normal?</u>

YES >> GO TO 13.

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

13. CHECK BLOWER MOTOR GROUND CIRCUIT

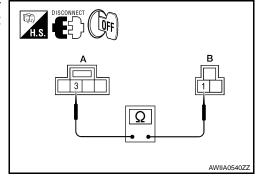
Check continuity between front blower motor harness connector M62 terminal 1 and variable blower control harness connector M122 terminal 3.

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

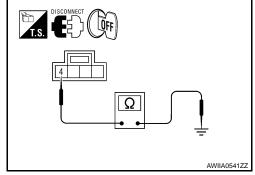
Check continuity between variable blower control harness connector M122 terminal 4 and ground.

4 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to <u>VTL-22</u>, <u>"Removal and Installation"</u>.

NO >> Repair harness or connector.



Front Blower Motor Component Inspection

COMPONENT INSPECTION

INFOID:0000000001678326

Α

В

С

D

Е

F

G

Н

HAC

K

L

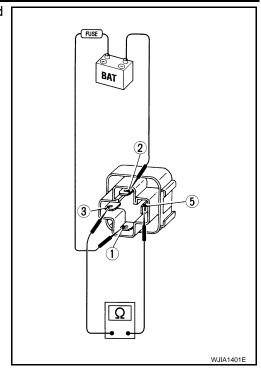
M

Р

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

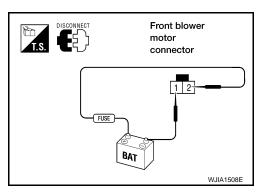
Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



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.



>> GO TO 4.

4. CHECK INTAKE SENSOR

Check and verify intake sensor circuit. Refer to HAC-228, "Intake Sensor Diagnosis Procedure".

M

Ν

INFOID:0000000001678329

>> GO TO 5.

5. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-183, "Operational Check".

Does another symptom exist?

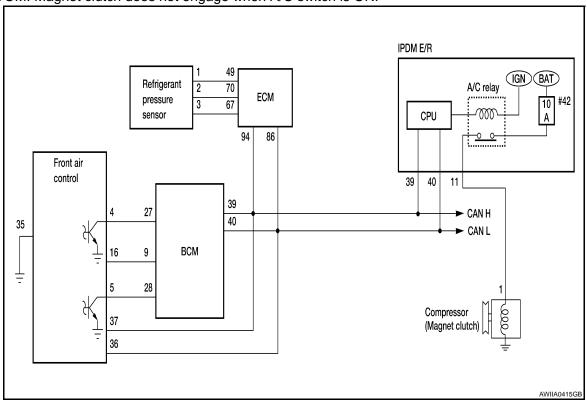
YES >> Refer to HAC-182, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Magnet Clutch Diagnosis Procedure

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-229, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check malfunctioning intake sensor. Refer to HAC-228, "Intake Sensor Diagnosis Procedure".

2. PERFORM AUTO ACTIVE TEST

Refer to PCS-10, "Diagnosis Description".

Does magnet clutch operate?

YES >> • @WITH CONSULT-III

ĞO TO 5.

• WITHOUT CONSULT-III GO TO 6.

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

$3. {\sf CHECK\ CIRCUIT\ CONTINUITY\ BETWEEN\ IPDM\ E/R\ AND\ COMPRESSOR}$

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

11 – 1

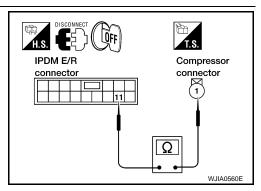
: Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK MAGNET CLUTCH CIRCUIT



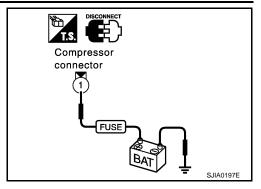
< COMPONENT DIAGNOSIS >

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

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-30</u>, "Removal and <u>Installation of IPDM E/R"</u>.

NO >> Replace magnet clutch. Refer to <u>HA-34, "Removal and</u> Installation for Compressor Clutch".



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to HAC-195, "CONSULT-III Function (BCM)".

A/C SW ON : COMP ON SIG ON A/C SW OFF : COMP ON SIG OFF

Is the inspection result normal?

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

6.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- Turn ignition switch OFF.
- 2. Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 27 and front air control harness connector M49 (B) terminal 12.

27 - 12 Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7.

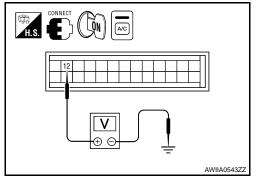
NO >> Repair harness or connector.

AWIIA0542ZZ

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.
- Check voltage between front air control harness connector M49 terminal 12 and ground.

	Terminals			
(+)				
front air con- trol connec- tor	Terminal No.	(-)	Condition	Voltage
M49	12	Ground	A/C switch: ON	Approx. 0V
10149	12	Giodila	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 <u>VTL-8</u>. "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to <u>BCS-50, "Removal and Installation"</u>.

8. CHECK REFRIGERANT PRESSURE SENSOR

1. Start engine.

Α

В

C

D

Е

F

Н

HAC

J

K

M

Ν

< COMPONENT DIAGNOSIS >

Check voltage between ECM harness connector F54 terminal 70 and ground.

Terminals				
((+)		Condition	Voltage
ECM con- nector	Terminal No.	(-)		3.0
F54	70	Ground	A/C switch: ON	Approx. 0.36 - 3.88V

Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-412, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to HAC-195, "CONSULT-III Function (BCM)".

FRONT BLOWER CONTROL : FAN ON SIG ON

DIAL ON

FRONT BLOWER CONTROL : FAN ON SIG OFF

DIAL OFF

Is the inspection result normal?

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

10.check circuit continuity between BCM and front air control

- 1. Turn ignition switch OFF.
- 2. Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M50 terminal 36.

28 - 36

Continuity should exist.

Is the inspection result normal?

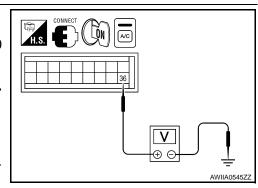
YES >> GO TO 11.

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.
- Check voltage between front air control harness connector M50 terminal 36 and ground.

	Terminals				
(+)			Condition	Voltage	
front air con- trol connector	Ierminal No			vellage	
M50	36 Ground		A/C switch: ON Blower motor operates	Approx. 0V	
			A/C switch: OFF	Approx. 5V	



AWIIA0544ZZ

Ω

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".

MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to <u>BCS-50, "Removal and Installation"</u>.

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 >> Inspection End.

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

Н

G

Α

В

C

D

Е

F

HAC

K

J

L

M

Ν

0

Р

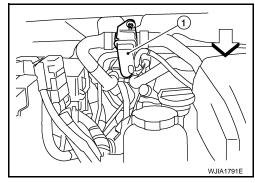
WATER VALVE CIRCUIT

Description INFOID.000000001678330

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.



INFOID:0000000001678331

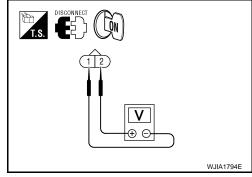
Water Valve Diagnosis Procedure

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	Te	erminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- Check continuity between water valve harness connector F68

 (A) terminal 2 and front air control harness connector M50 (B) terminal 30.

2 - 30 : Continuity should exist.

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

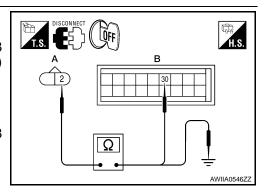
2 - Ground : Continuity should not exist.

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



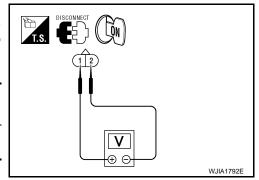
WATER VALVE CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

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

Connector	Te	rminals	Condition	Voltage	
Connector	(+)	(-)	Condition	(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.
- Check continuity between water valve harness connector F68

 (A) terminal 1 and front air control harness connector M50 (B) terminal 29.

1 - 29 : Continuity should exist.

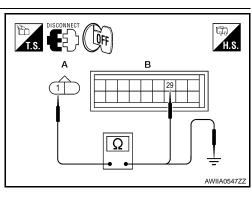
4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

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.



HAC

Н

Α

В

D

Е

F

J

Κ

L

M

Ν

C

Р

INTAKE SENSOR

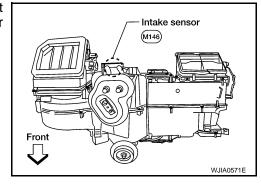
System Description

INFOID:0000000001678335

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.

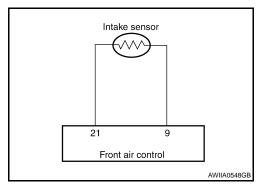


Intake Sensor Diagnosis Procedure

INFOID:0000000001678336

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



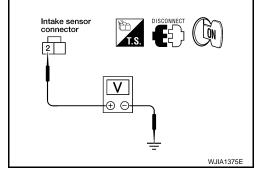
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

- 1. Disconnect intake sensor connector.
- 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 3. NO >> GO TO 4.



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

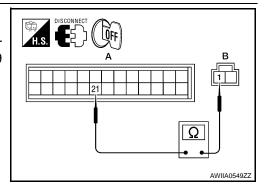
- 1. Turn ignition switch OFF.
- 2. Disconnect front air control connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M49 (A) terminal 21.

1 - 21 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-229, "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.
- Disconnect front air control connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M49 (A) terminal 9.

2 - 9 : Continuity should exist.

 Check continuity between intake sensor harness connector M146 terminal 6 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:0000000001678337

AWIIA0550Z

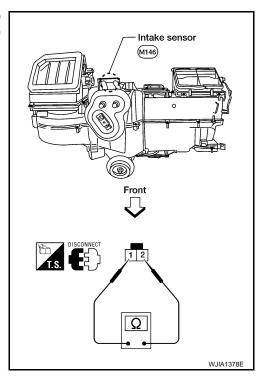
COMPONENT INSPECTION

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 $k\Omega$
-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 <u>VTL-11</u>, "Removal and Installation".



HAC

В

D

Е

K

M

Ν

0

Р

[MANUAL A/C (TYPE 2)]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

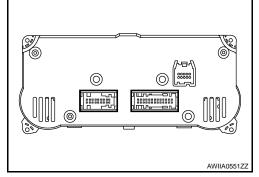
INFOID:0000000001678338

COMPONENT DESCRIPTION

Front Air Control

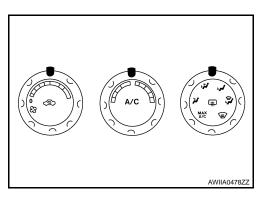
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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 postion by rotating the temperature control dial.



INFOID:0000000001678339

Front Air Control Component Function Check

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

Can a 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 <u>HAC-183, "Operational Check"</u>. <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-182, "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. CHECK POWER AND GROUND CIRCUIT

Check main power supply and ground circuit. Refer to <u>HAC-231</u>, "Front Air Control Power and Ground Diagnosis Procedure".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER [MANUAL A/C (TYPE 2)]

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

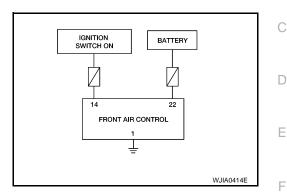
YES >> System OK.

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

Front Air Control Power and Ground Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

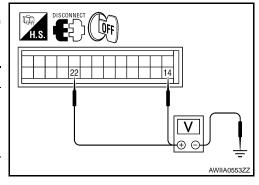
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- Disconnect front air control connectors.
- 2. Check voltage between front air control harness connector M49 terminals 14, 22, and ground.

Terminals			Ignition switch position		
(+)					
front air control connector	Terminal No.	(-)	OFF	ACC	ON
M49	14	Ground	Approx. 0V	Approx. 0V	Battery voltage
M49	22	Ground	Battery voltage	Battery voltage	Battery voltage



HAC

Н

Α

В

INFOID:0000000001678340

K

Ν

Is the inspection result normal?

YES >> GO TO 3.

- NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to PG-66, "Terminal Arrangement".
 - If fuses are OK, check harness for open circuit, Repair or replace as necessary.
 - If fuses are NG, replace fuse and check harness for short circuit. Repair or replace as necessary.

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

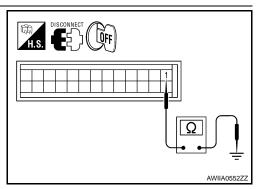
- Turn ignition switch OFF.
- Check continuity between front air control harness connector M49 terminal 1 and ground.

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.



HAC-231

ECU DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

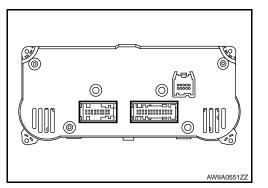
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

INFOID:0000000001678344

AIR CONDITIONER CONTROL

Front Air Control Terminals Reference Values

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



AWIIA0441ZZ

FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT

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 H.S.

TERMINALS AND RERERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	ltem	Ignition switch	Condition	Voltage (V) (Approx.)
1	В	Ground	-	-	0V
2	Υ	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	0	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 defrost request	ON	-	Battery voltage
12	W/R	Compressor ON signal	ON	A/C switch OFF	5V
12	v v / 「N	Compressor ON signal	ON	A/C switch ON	0V
14	Y/G	Power supply for IGN	ON	-	Battery voltage
15	Р	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

HAC

Н

Α

В

D

Е

F

J

K

M

Ν

0

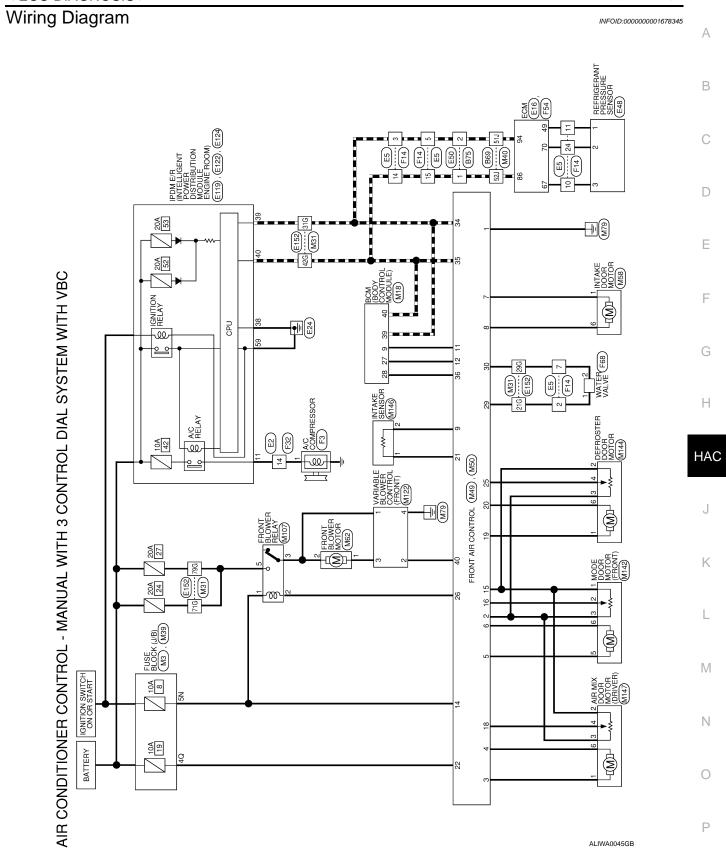
Р

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Terminal No.	Wire color	ltem	Ignition switch	Condition	Voltage (V) (Approx.)
24	BR	Illumination -	-	Park lamps ON	(V) 15 10 5 0 200 ms
25	LG/B	Defroster door motor feedback	ON	-	0 - 5V
26	R/B	Front blower request	ON	Front blower motor OFF	Battery voltage
20	N/D	Front blower request	ON	Front blower motor ON	0V
29	Y/L	Water valve	ON	Water valve open	Battery voltage
29	1/L	vvater varve	ON	Water valve closed	0V
30	W/G	Water valve	ON	Water valve open	0V
30	W/G	vvater varve	ON	Water valve closed	Battery voltage
34	L	CAN-H	ON	-	0 - 5V
35	Р	CAN-L	ON	-	0 - 5V
26	I /D	For ON signal	ON	Blower switch OFF	5V
36 L/R	L/K	L/R Fan ON signal	ON	Blower switch ON	0V
40	G/R	Variable blower control	ON	-	0 - 5V



WITH VBC CONNECTORS

AIR	CONDITION	AIR CONDITIONER CONTROL - MANUAL WITH 3 CONTROL DIAL SYSTEM W	NUAL WITH 3 CO	NTROL DIAL SYSTE	E W E
	Connector No.	M3	Connector No.	M18	
	Connector Name	Connector Name FUSE BLOCK (J/B)	Connector Name	connector Name BCM (BODY CONTROL	

o. M18	Connector Name BCM (BODY CONTRO MODULE)	Connector Color WHITE
Connector No.	Connector N	Connector C
		7

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



Connector Color WHITE

_			_			
	8	4				
	6	39	١.			_
	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				
	17	37				
	9	38		Φ	≥	
	15	32		аш	S	١.
	7	34		Z	H	6
	13	33		Signal Name	RR_DEF_SW	
	42	32		Sig	Ä.	9
	Ξ	31		0,	ш	ľ
	유	30				
	6	53				L
ī	ω	28		Color of Wire	ω	١
	7	27		흥분	Y/B	(
	9	26		Ö_		Ľ
	ro	22		<u>0</u>		
	4	24		<u> </u>		
	က	೫		in 3	6	1
	2	22		Ē		
	_	2		Terminal No.		
				Signal Name	ı	
						ı

Signal Name	I	
Color of Wire	Y/G	
Terminal No.	NS	

AIR_CON_SW BLR_FAN_SW

W/R Y/B

27

2

83 89 4

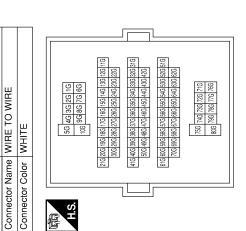
CAN-H CAN-L

_₽

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

J	70 60 50 40	Signal Name	1
5	30 08	Color of Wire	Y/R
	赋 H.S.	Terminal No.	4Q
			•

Signal Name	_	I	ı	_	I	I	
Color of Wire	J//	M/G	_	Ь	Ь	Ь	
Terminal No.	21G	29G	31G	42G	71G	79G	



ALIIA0192GB

M31

Connector No.

M50	A/C MANUAL AMP	BLUE	34 33 32 31 30 29 28 27 43 42 41 40 39 38 37 36			Signal Name	Olginal Ivaline	WATER VALVE CLOSE	WATER VALVE OPEN	CAN-H	CAN-L	PAN ON	MWG THATHO DAV
	Name	_	35			Color of	Wire	Y/L	M/G	٦	Д	L/R	G/B
Connector No.	Connector Name	Connector Color	僵	Ŋ.		Terminal	No.	59	30	34	32	98	40

Signal Name	-	_	
Color of Wire	Γ	Ь	
Terminal No.	51J	52J	

Terminal Color of	Color of	O S C N
No.	Wire	Sigrial Name
6	R/T	EVAP AIR TEMP SENS
11	Y/B	RR_DEF_REQUEST
12	W/R	AC_REQUEST
14	Y/G	IGN
15	Ь	V REF RETURN
16	GR	PANEL/FLOOR_FEED_
		BACK
18	SB	DR_BLEAD_DR_FEED_
		BACK
19	LG	DEFROST_CW
20	P/B	DEFROST CCW
21	N/R	SENS_RETURN
22	Y/R	VB
25	LG/B	DEFROST FEED BACK
26	B/B	FR BLOWER REQUEST

M40	WIRE TO WIRE	WHITE	5.4 4.3 5.1 7.1 6.1 6.1 4.3 5.1 1.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6.1 6
Connector No.	Connector Name	Connector Color	S.H.

M49	A/C MANUAL AMP	BLACK		0 9 8 7 6 5 4 3 2 1	24 23 22 21 20 19 18 17 16 15 14		Signal Name	Olgilal Ivalile	GND	V_REF ACTR (5V)	DR_BLEND_DR_CW	DR_BLEND_DR_CCW	PANEL/FLOOR_CW	PANEL/FLOOR_CCW	RECIRC_DOOR_CW	RECIRC_DOOR CCW	
				13 12 11 10	26 25 24 2		Color of	Wire	В	Υ	M/G	g	BR/W	P/L	0	G/B	
Connector No.	Connector Name	Connector Color		F	H.S.	J	Terminal Color of	No.	1	7	8	4	9	9	2	8	
			_														

ALIIA0193GB

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

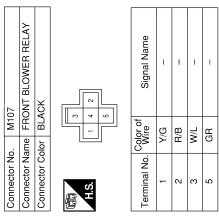
L

M

Ν

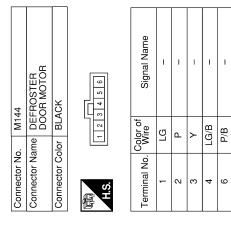
0

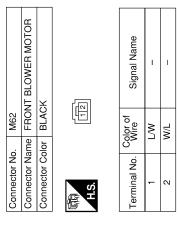
Ρ



	Signal Name	ı	ı	I	1
	Color of Wire	Y/G	B/B	M/L	GR
南 H.S.	Terminal No. Wire	-	2	3	5



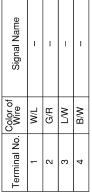




42	MODE DOOR MOTOR (FRONT)	BLACK	3 4 5 6	Signal Name	ı	ı	ı	ı	ı
. M142			- 2	Color of Wire	۵	GR	>	BR/W	P/L
Connector No.	Connector Name	Connector Color	原 H.S.	Terminal No.	-	2	ဗ	2	9

Connector No.). M58		
Connector Name	ame INTA	INTAKE DOOR MOTOR	
Connector Color	olor BLACK	X	
画 H.S.	1 2 3	9 8	
Terminal No.	Color of Wire	Signal Name	
-	0	I	
9	G/B	1	

Connector No.	M122
Connector Name	VARIABLE BLOWER CONTROL (FRONT)
Connector Color WHITE	WHITE
赋 H.S.	1 2 3 4



ALIIA0194GB

	WIRE			5 6 7		Signal Name	1					
E2	WIRE TO \	WHITE		9 10 11 12 13 14	jo so		Y/B	ĵ				
Connector No.	Connector Name WIRE TO WIRE	Connector Color WHITE		H.S.	2	Terminal No. Wire	14					
		_									I	<u> </u>
	AIX DOOR	(השאותם) הס	X	4 5 6		Signal Name		1	1	1	ı	ı
M147	ne AIR I		or BLAC	1 2 3		Color of	2	M/G	۵	>	SB	g
Connector No. M147	Connector Name AIR MIX DOOR		Connector Color BLACK	是 H.S.		Terminal No. Wire		1	2	က	4	9
	INTAKE SENSOR			450		Signal Name		1	1			
M146	ne INTAK	Connector Color GRAY		1-		Color of	2	N/R	L/B			
Connector No.	Connector Name	ector Colc		H.S.		Terminal No.		-	2			

E50	HE WIRE TO WIRE	or BROWN	2 1	Color of Signal Name Wire		
Connector No.	Connector Name	Connector Color BROWN	(和)	Terminal No.	- 0	7
			120 121 7 118 115 116	Φ		
	∑	ACK	119	Signal Name	CAN-L	CAN-H
E16	Connector Name ECM	Connector Color BLACK	106 107 108 109 110 111 112 113	Terminal No. Wire Signal Nam	CAN-L	1460

	WIRE TO WIRE	ITE	1 2 3 4 5 6	Signal Name	ı	ı	ı	I	ı	I
E2		lor WHITE	2 3 4 5	Color of Wire	X/L	_	_	W/G	۵	۵
Connector No.	Connector Name	Connector Color	E ST	Terminal No.	2	က	ည	7	14	15

ALIIA0195GB

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

 \mathbb{N}

Ν

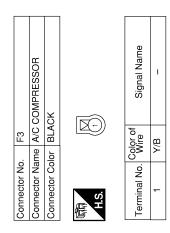
0

Ρ

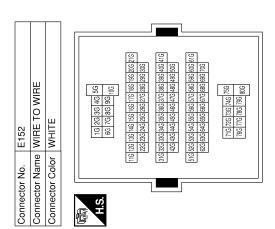
Connector No.	E124	4
Connector Na	me IPDI POV	Connector Name IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color BLACK	lor BLA	CK CK
画 H.S.		29 58 57 22 61 60
Terminal No. Wire	Color of Wire	Signal Name
59	В	GND (PWR)

2	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	ITE	41 40 39 38 37 47 46 45 44 43	Signal Name	GND (SIG)	CAN-H	CAN-L
. E122		lor WHITE	42 41	Color of Wire	В	_	۵
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	38	39	40

Connector Name IPDM E POWEL MODING CONNECTOR WHITE IS 17 16 18 17 16 15 15 15 15 15 15 15 15 15 15 15 15 15	
tor Color WHITE	9:
8 7 17 16 17 00 of of	2
al No. Wire	0 14 13 12 11 10
	Signal Name
1 Y/B	AC_COMP



Signal Name	ı	I	I	1	1	-
Color of Wire	Y/L	M/G	_	۵	Д	GR
Terminal No.	21G	29G	31G	42G	71G	79G



ALIIA0196GB

			A B
			С
R VALVE	1 1	Signal Name	D
Connector No. F68 Connector Name WATER VALVE Connector Color GRAY H.S. Terminal No. Color of Signal	A//L W/G	Connector No. B75 Connector Name WIRE TO WIRE Connector Color BROWN H.S. Terminal No. Wire 1 P 2 L	Е
Connector No. Connector Color Connector Color H.S.	- a	Connector No. Connector Color Connector Color H.S.	F
			G
F32 WIRE TO WIRE WHITE 7 6 5 4	1	Signal Name	Н
		Color of Leading Mire	HAC
or No	4	51J S2J	J
			K
WIRE	1 1 1 1 1 1	### ### ### ### ### ### ### ### ### ##	L
1 TE TO 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		Connector No. B69 Connector Name WIRE TO WIRE Connector Color WHITE 1.0 [2] 30 44 [3] 1.1 [2] 31 [4] [5] [13 [4] [5] 1.1 [2] [2] [4] [4] [5] [6] [6] [6] [6] [6] [6] [6] 1.1 [2] [2] [2] [2] [2] [2] [2] [2] [2] [2]	M
or No. F14 or Color WHI or Color WHI or Color WHI or Color of Color of Wire		7 No. B69 7 Name WIR 7 No. Color WHI 13 13 13 13 13 13 13 13 13 13 13 13 13 1	Ν
Connector No. Connector Color Connector Color H.S. Terminal No.	2 8 3 3 4 4 1 1 2 1	Connector No. Connector Name Connector Color H.S.	0
	I	ALIIA0197GB	P

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower con- trol (VBC)]	AWIIA0479ZZ

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000001678347

Α

В

С

D

Е

F

G

Н

SYMPTOM TABLE

Symptom	Reference Page		
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.		
Air outlet does not change.	Co to Trouble Diagnosis Presedure for Mode Deer Motor	HAC 107	
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-197</u>	
Discharge air temperature does not change.	Co to Trouble Diagnosis Presedure for Air Mix Deer Mater	1140 000	
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-202	
Intake door does not change.	Co to Trouble Diagnosis Presedure for Inteles Deer Motor	HAC 207	
Intake door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-207	
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-210	
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-215	
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-221	
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	

HAC

J

Κ

L

M

Ν

0

Ρ

INFOID:000000001678348

INSUFFICIENT COOLING

Component Function Check

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-183, "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 3.

4. CHECK DRIVE BELTS

Check compressor belt tension. Refer to EM-12, "Checking Drive Belts".

Is the inspection result normal?

OK >> GO TO 5.

NG >> Adjust or replace compressor belt. Refer to EM-12, "Removal and Installation".

5.CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to <u>HAC-202</u>, "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-203, "Air Mix Door Motor Diagnosis Procedure".

6.CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to EC-386, "Component Inspection".

Does cooling fan motor operate correctly?

YES >> GO TO 7.

NO >> Check cooling fan motor. Refer to EC-386, "Diagnosis Procedure".

7. CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to HAC-226, "Description".

Does water valve operate correctly?

YES >> GO TO 8.

NO >> Check water valve circuit. Refer to HAC-226, "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.

INSUFFICIENT COOLING	
< SYMPTOM DIAGNOSIS > [MANUAL A/C (TYPE 2)]	
9. CHECK REFRIGERANT PURITY	А
 Connect recovery/recycling equipment to vehicle. 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-256, "Working with HFC-134a (R-134a)".	В
10.check for evaporator freeze up	С
Start engine and run A/C. Check for evaporator freeze up.	
Does evaporator freeze up?	D
YES >> Perform performance test diagnoses. Refer to <u>HAC-245, "Performance Test Diagnoses"</u> . NO >> GO TO 11.	
11. CHECK REFRIGERANT PRESSURE	Е
Check refrigerant pressure with manifold gauge connected. Refer to <u>HAC-248</u> , "Test Reading". <u>Is the inspection result normal?</u>	
YES >> Perform performance test diagnoses. Refer to <u>HAC-245, "Performance Test Diagnoses"</u> . NO >> GO TO 12.	F
12.check air ducts	0
Check ducts for air leaks.	G
Is the inspection result normal?	

Performance Test Diagnoses

>> System OK. >> Repair air leaks.

YES

NO

INFOID:0000000001678349

HAC

Н

K

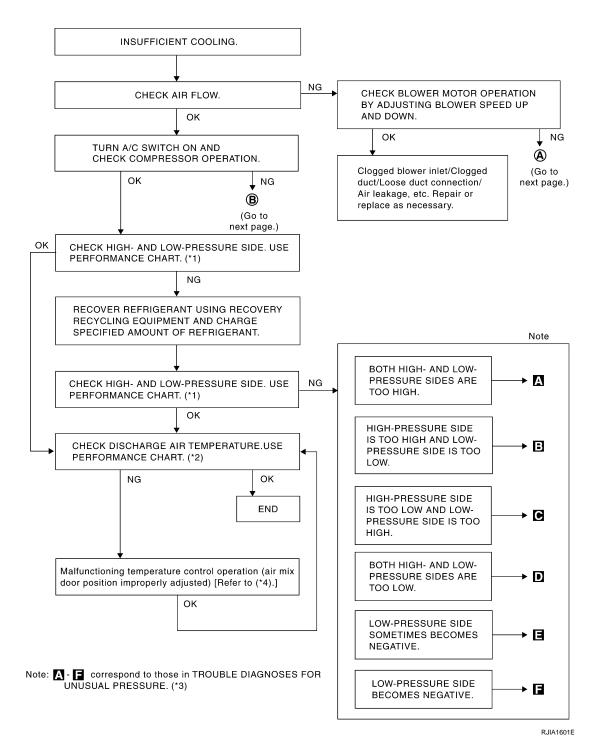
L

 \mathbb{N}

Ν

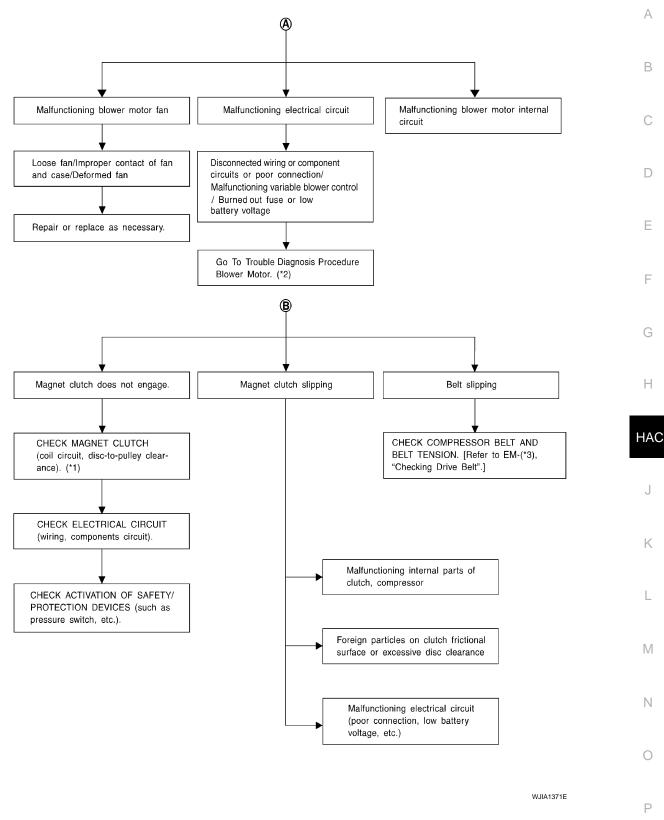
0

Р



- *1 HAC-247, "Performance Chart"
- *2 HAC-248, "Test Reading"
- *3 HAC-249, "Trouble Diagnoses for Unusual Pressure"

*4 HAC-202, "Air Mix Door Motor Component Function Check"



^{*1} HA-34, "Removal and Installation for *2 HAC-215, "Front Blower Motor Com- *3 EM-12, "Checking Drive Belts" compressor Clutch" ponent Function Check"

Performance Chart

Testing must be performed as follows:

Vehicle location	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	

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator	
Relative humidity %	Air temperature °C (°F)	°C (°F)	
	20 (68)	9.9 - 13.9 (50 - 57)	
	25 (77)	14.6 - 18.6 (58 - 65)	
50 - 60	30 (86)	16.8 - 21.8 (62 - 71)	
	35 (95)	21.1 - 27.1 (70 - 81)	
	40 (104)	25.3 - 31.5 (78 - 89)	
	20 (68)	11.4 - 15.2 (53 - 59)	
	25 (77)	15.5 - 20.0 (60 - 68)	
60 - 70	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)	Low-pressure (Suction side)	
Relative humidity %	Air temperature °C (°F)	kPa (kg/cm ² , psi)	kPa (kg/cm ² , psi)	
	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)	
50 - 70	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 Unusual Pressure

INFOID:0000000001678352

Α

В

C

Whenever system's high and/or low side pressure is unusual, 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	
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 speci- fied pressure is obtained.	D
	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.	F
	Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) Air in refrigeration cycle	Evacuate and recharge system.	G H
Ф ₩ Ф АСЗ59А	Engine tends to overheat.	Engine cooling systems mal- function.	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. 	Replace expansion valve.	J
		Improper expansion valve adjustment		L

 $\label{pressure Side} \mbox{High-pressure Side is Too High and Low-pressure Side is Too Low}$

Gauge indication	Refrigerant cycle	Probable cause	Corrective action	
High-pressure side is too high and low-pressure side is too low.				Ν
	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts lo- cated between compressor and condenser are clogged or crushed.	Check and repair or replace malfunctioning parts. Check oil for contamination.	0
AC360A				Р

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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. Understand the compressor packings.	Replace compressor.
LO (HI) AC356A	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
	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 highpressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	Check and repair malfunctioning parts. Check oil for contamination.
Both high- and low-pressure sides are too low.	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 <u>HA-23</u> , " <u>Checking of Refrigerant Leaks</u> ".
LO HI) AC353A	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-228, "Intake Sensor Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-215, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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
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.

HAC

Α

В

С

D

Е

F

G

Н

K

L

M

Ν

0

Ρ

INSUFFICIENT HEATING

Component Function Check

INFOID:0000000001678353

SYMPTOM: Insufficient heating

INSPECTION FLOW

${f 1.}$ CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

- 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-183, "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".
- 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-202, "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.

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 control temperature sensor. Refer to EC-126, "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.

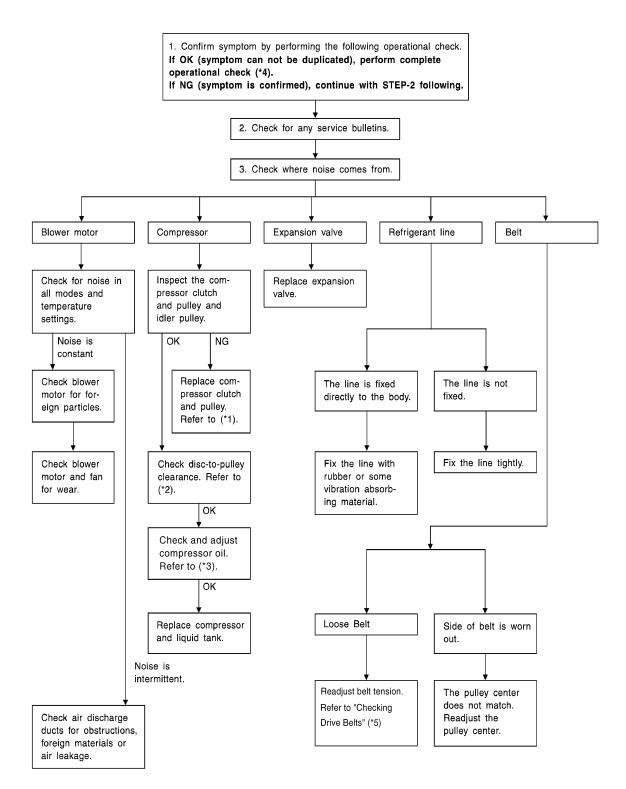
INSUFFICIENT HEATING	
< SYMPTOM DIAGNOSIS > [MANUAL A/C (TYPE 2)]
Is the inspection result normal?	_
YES >> System OK. NO >> 1. Back flush heater core.	Α
2. Drain the water from the system.	
 Refill system with new engine coolant. Refer to <u>CO-11, "Changing Engine Coolant"</u>. GO TO 10 to retest. 	В
9. CHECK HEATER HOSE TEMPERATURES	
 Start engine and warm it up to normal operating temperature. Touch both the inlet and outlet heater hoses. 	С
Is the inspection result normal?	
YES >> System OK.	D
NO >> Replace heater core. Refer to <u>VTL-15, "Removal and Installation"</u> .	
10.check water valve	Е
Check the operation of the water valve. Refer to <u>HAC-226, "Water Valve Diagnosis Procedure"</u> .	
Is the inspection result normal? YES >> System OK.	_
YES >> System OK. NO >> Replace water valve.	F
·	
	G
	Н
	HA
	J
	K
	1
	L
	M
	p. *
	Ν
	0

NOISE

Component Function Check

INFOID:0000000001678354

SYMPTOM: Noise INSPECTION FLOW



- *1 HA-34, "Removal and Installation for *2 HA-34, "Removal and Installation for *3 HA-20, "Maintenance of Oil Quantity Compressor Clutch"
- *4 HAC-183, "Operational Check"
- Compressor Clutch"

*5 EM-12, "Checking Drive Belts"

in Compressor"

Α

В

С

D

Е

F

G

Н

HAC

J

K

L

M

Ν

0

PRECAUTION

PRECAUTIONS

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSION-FR"

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.

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

INFOID:0000000001678357

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.

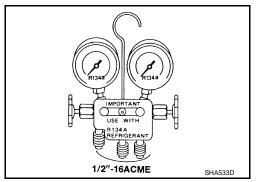
If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Service Equipment

INFOID:0000000001678358

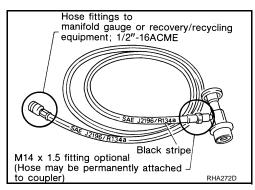
MANIFOLD GAUGE SET

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

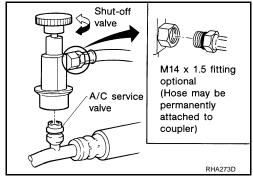
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shutoff devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



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



C

В

D

Е

F

G

HAC

Н

K

M

Ν

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

DIAGNOSIS AND REPAIR WORKFLOW

[MANUAL A/C (TYPE 3)] < BASIC INSPECTION > DIAGNOSIS AND REPAIR WORKFLOW Α How to Perform Trouble Diagnosis For Quick And Accurate Repair INFOID:0000000001680512 **WORK FLOW** В 1.LISTEN TO CUSTOMER COMPLAINT Listen to customer complaint. Get detailed information about the conditions and environment when the symptom occurs. >> GO TO 2 D 2.CHECK FOR SERVICE BULLETINS Check for any service bulletins. Е >> GO TO 3. 3.VERIFY THE SYMPTOM WITH OPERATIONAL CHECK F Verify the symptom with operational check. Refer to HAC-183, "Operational Check". >> GO TO 4 4.GO TO APPROPRIATE TROUBLE DIAGNOSIS Go to appropriate trouble diagnosis. Refer to HAC-322, "Symptom Matrix Chart". Н >> If equipped with NAVI, GO TO 5. >> If equipped without NAVI, GO TO 6. HAC ${f 5}$ 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". K >> Confirm the repair by performing operational check. Refer to HAC-7, "Operational Check". 6.repair or replace Repair or replace the specific parts. L >> GO TO 6 M /.FINAL CHECK Final check. Is the inspection result normal? N YES >> CHECK OUT NO >> GO TO 4 Р

[MANUAL A/C (TYPE 3)]

< BASIC INSPECTION >

INSPECTION AND ADJUSTMENT

Operational Check INFOID:0000000001680513

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

Conditions : Engine running and at normal operating temperature

CHECKING BLOWER

- Rotate the blower control dial clockwise once, blower should operate on low speed.
- 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-293, "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 m mode.
- Confirm that discharge air comes out according to the air distribution table. Refer to HAC-268, "Discharge Air Flow"

Mode door position is checked in the next step.

If NG, go to trouble diagnosis procedure for <u>HAC-275</u>. "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.
- Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for HAC-285, "Intake Door Motor Diagnosis Procedure". If OK, continue the check.

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

- Rotate temperature control dial counterclockwise until maximum cold.
- 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-323, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-279, "Air Mix Door Motor Component Function Check".

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

- 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-331, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-279, "Air Mix **Door Motor Component Function Check**".

If OK, continue with next check.

CHECK A/C SWITCH

- 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.

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[MANUAL A/C (TYPE 3)]

If NG, go to trouble diagnosis procedure for <u>HAC-299</u>, "<u>Magnet Clutch Diagnosis Procedure</u>". If all operational checks are OK (symptom cannot be duplicated), go to <u>HAC-259</u>, "<u>How to Perform Trouble Diagnosis For Quick And Accurate Repair</u>" and perform tests as outlined. If symptom appears, refer to <u>HAC-322</u>, "<u>Symptom Matrix Chart</u>" and perform applicable trouble diagnosis procedures.

В

Α

С

D

Е

F

G

Н

HAC

J

K

L

M

Ν

0

FUNCTION DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

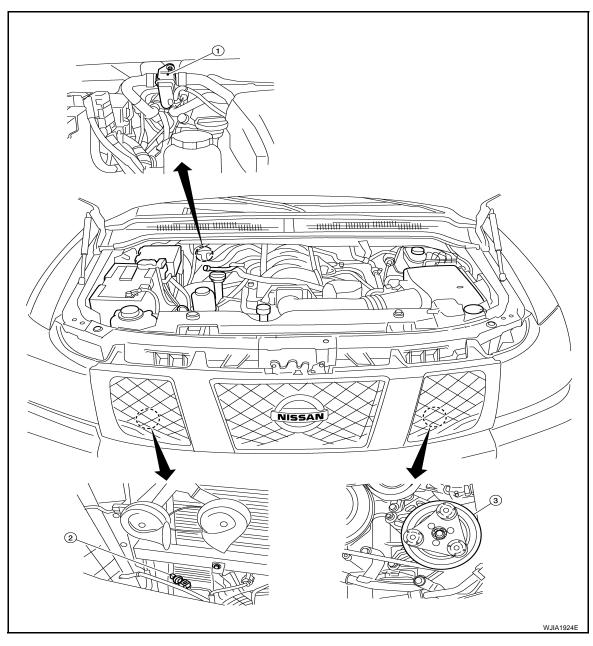
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIAO481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower con- trol (VBC)]	AWIIA0479ZZ

INFOID:0000000001680515

FUNCTION INFORMATION

Component Part Location

ENGINE COMPARTMENT



1. Water valve F68

- Refrigerant pressure sensor E48 (view with grille removed)
- 3. A/C Compressor F3

Α

В

C

D

Е

F

G

Н

HAC

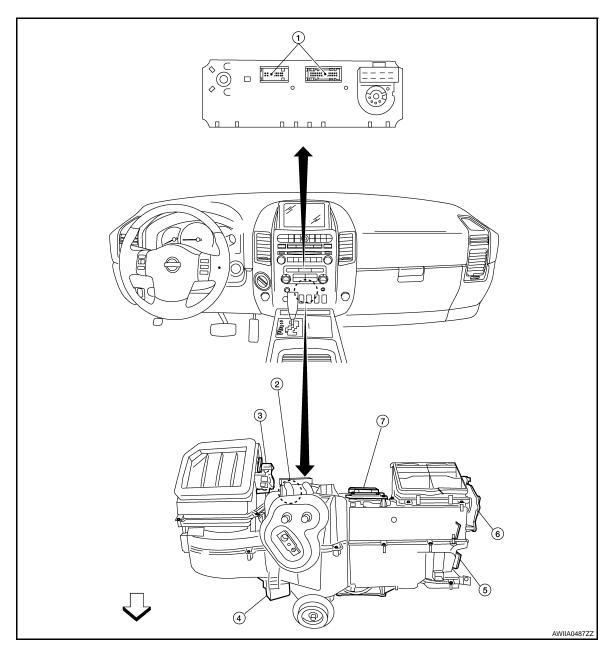
J

K

M

Ν

0



- 1. Front air control M49, M50
- 4. Front blower motor resistor M163
- 7. Air mix door motor (front) M147
- 2. Intake sensor M146
- 5. Mode door motor M142
- 3. Intake door motor M58
- 6. Defroster door motor M144

FUNCTION INFORMATION

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Symptom Table

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-309
Air outlet does not change.	Co to Trouble Diagnosis Procedure for Mode Deer Motor	HAC-274
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-274</u>
Discharge air temperature does not change.	Co to Trouble Diagnosis Procedure for Air Mix Door Motor	HAC-279
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<u>HAC-279</u>
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-284
Intake door motor is malfunctioning.	Go to Housie Diagnosis Procedure for intake Door Motor.	<u>11AO-204</u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-287
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-292
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-299
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-323
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-331
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-333

Α

В

С

D

Е

F

G

Н

HAC

K

J

L

M

Ν

0

Ρ

REFRIGERATION SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

REFRIGERATION SYSTEM

Refrigerant Cycle

Refer to HA-15, "Refrigerant Cycle".

Refrigerant System Protection

INFOID:0000000001680518

Refer to HA-15, "Refrigerant System Protection".

MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:0000000001680519

Α

В

D

Е

Н

HAC

K

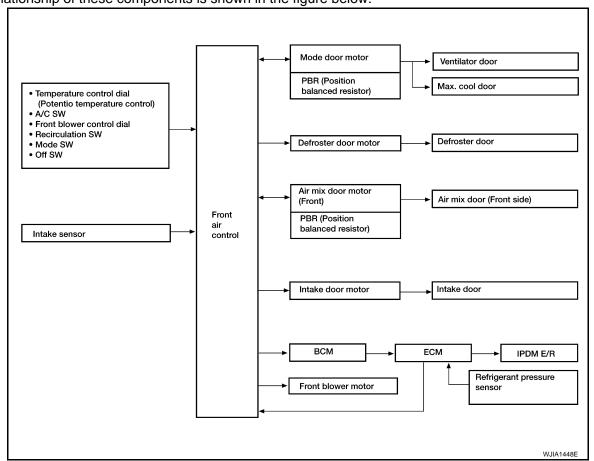
M

Ν

Р

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:0000000001680520

CONTROL OPERATION

Front air control

TEMPERATURE CONTROL DIAL

Increases or decreases the set temperature.

MANUAL AIR CONDITIONER SYSTEM

< FUNCTION DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

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.

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

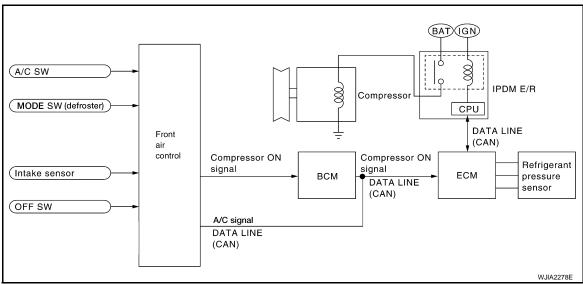
The compressor is ON or OFF.

(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



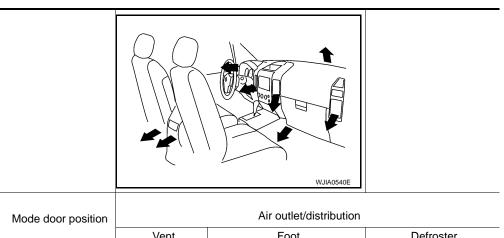
When A/C switch is pressed or DEF position is selected, front air control inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM and front air control, via CAN communication line.

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:0000000001680521



Mode door position	Air outlet/distribution				
	Vent	Foot	Defroster		
*;	95%	5%	_		
Ÿ	60%	40%	_		
~i	_	70%	30%		
SHO.	_	60%	40%		
(III)	_	10%	90%		

Switches And Their Control Function

INFOID:0000000001680522

K

Α

В

D

Е

F

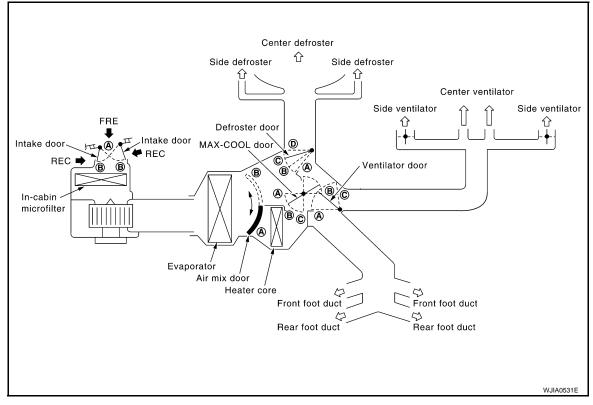
G

HAC

M

Ν

0



					T		REC	SW	T				
Position		MOD	E SW		DEF	SW			rempe	rature	switch	٠ ا	
or	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF			3 [SW	
switch	•	*		₩•	_	TAC TAC	< €	₹ >	(>(A/C)()	55	
	_	-	7,5	7,0	-> ∳ <	0	<u>-></u> • -	0	COLD	~	нот	OFF	
Ventilator door	(A)	B	©	©	©		_	_				©	
MAX-COOL door	(A)	B	B	B	©		_				₿		
Defroster door	0	(D)	O or ©	B	(A)		_	_		_		©	
Intake door		_			B		(A)	B				₿	
Air mix door		_					_	_	(A)		B		
												WJIA053	32E

CAN COMMUNICATION SYSTEM

_	FI	INC	CIT:	ИD	IAG	NOS	:15 -	

[MANUAL A/C (TYPE 3)]

CAN COMMUNICATION SYSTEM

System Description

INFOID:0000000001680523

Refer to LAN-4. "System Description".

С

В

Α

D

Е

F

G

Н

HAC

J

K

L

M

Ν

0

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM)

INFOID:0000000001680524

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

BCM diagnostic test item	Diagnostic mode Description				
	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.			
	DATA MONITOR	Displays BCM input/output data in real time.			
Inspection by part	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.			
.,	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.			
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.			
	ECU PART NUMBER	BCM part number can be read.			
	CONFIGURATION	Performs BCM configuration read/write functions.			

DATA MONITOR

Display Item List

Monitor item name "operation or unit"		Contents
IGN ON SW	"ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
COMP ON SIG	"ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.
FAN ON SIG	"ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower motor switch signal.

Α

В

С

D

Е

F

G

Н

HAC

J

Κ

L

M

Ν

0

Р

COMPONENT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [(without variable blower control (VBC)]	A/C A/C AVIIA0479ZZ

HAC-273

MODE DOOR MOTOR

System Description

INFOID:0000000001680526

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

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

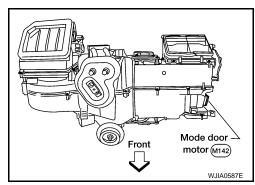
System Operation

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:0000000001680527

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.
- Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-268</u>, "<u>Discharge Air Flow</u>".

NOTE:

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

Can a 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 <u>HAC-260</u>, "Operational Check". Can a symptom be duplicated?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> System OK.

3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

[MANUAL A/C (TYPE 3)]

< COMPONENT DIAGNOSIS >

>> GO TO 4.

4. CHECK MODE DOOR OPERATION

Check and verify mode door mechanism for smooth operation in each mode.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair as necessary.

5. CHECK THE MODE DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the mode door motor. Refer to <u>HAC-274</u>, "<u>Mode Door Motor Component Function Check</u>".

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair PBR circuit or replace motor. Refer to <u>HAC-275</u>, "Mode <u>Door Motor Diagnosis Procedure"</u>.

6. RECHECK FOR SYMPTOMS

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-260, "Operational Check"</u>. <u>Does another symptom exist?</u>

YES >> Repair as necessary.

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

Mode Door Motor Diagnosis Procedure

SYMPTOM:

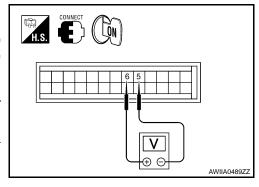
Air outlet does not change.

Mode door motor does not operate normally.

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Press the B/L (🗘) mode switch.
- Check voltage between front air control harness connector M49 terminal 5 and terminal 6 while pressing the mode switch to the floor () mode.

Connector	To	erminals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition		
Front air control: M49	6	5	Press mode switch	Battery voltage	



Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

2.CHECK MODE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

Turn ignition switch OFF.

2. Disconnect the front air control harness connector.

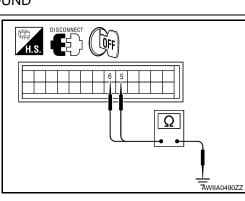
3. Check continuity between front air control harness connector M49 terminal 5, 6 and ground.

5 - Ground : Continuity should not exist.6 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.



HAC

Н

Α

В

D

Е

F

INFOID:0000000001680528

J

K

L

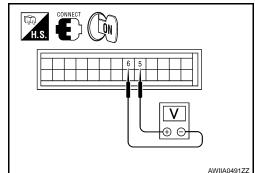
M

Ν

3.check front air control for ground and power

- Press the mode switch to the D/F () mode.
- Check voltage between front air control harness connector M49 terminal 5 and terminal 6 while pressing the mode switch to the vent (*) mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)	Condition	(Approx.)
Front air control: M49	5	6	Press mode switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

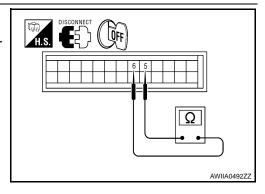
4. CHECK MODE DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 5 and terminal 6.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5.CHECK MODE DOOR MOTOR CIRCUITS FOR OPEN

- Disconnect the mode door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 5, 6 and the mode door motor harness connector tor M142 (B) terminal 5, 6.

5 - 5 : Continuity should exist.

6 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

- 1. Reconnect front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 2 and 15.

Connector	Ter	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49, M50	2	15	5V

AWIIA0495ZZ

AWIIA0493ZZ

Is the inspection result normal?

YES >> GO TO 9.

NO >> GO TO 8.

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and terminal 15.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

1. Disconnect the mode door motor harness connector.

 Check continuity between mode door motor harness connector M142 (B) terminal 3, 1 and front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28.

2 - 3 : Continuity should exist.15 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace mode door motor. Refer to <u>VTL-19, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

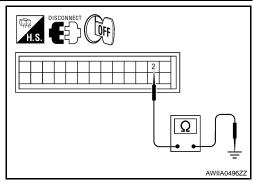
- 1. Reconnect the front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 16 and ground while cycling mode switch through all modes.

Voltage : Approx. 1V - 4.5V

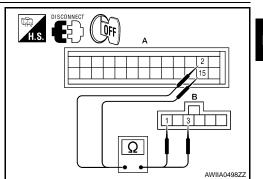
Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND



DISCONNECT OFF



HAC

Н

Α

В

D

J

K

. .

L

M

Ν

0

MODE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 16 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

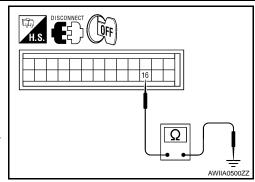
- 1. Turn ignition switch OFF.
- 2. Disconnect the mode door motor harness connector and front air control harness connector.
- Check continuity between mode door motor harness connector M142 terminal 2 and front air control harness connector M49 terminal 16.

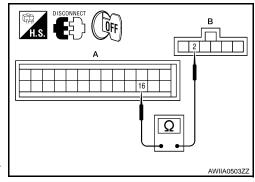


Is the inspection result normal?

YES >> Replace mode door motor. Refer to VTL-19, "Removal and Installation".

NO >> Repair or replace harness as necessary.





[MANUAL A/C (TYPE 3)]

AIR MIX DOOR MOTOR

System Description

INFOID:0000000001680529

Α

В

D

F

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

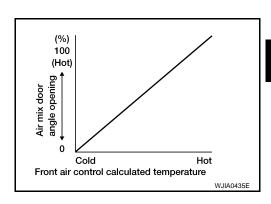
Air mix door control system components are:

- 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.

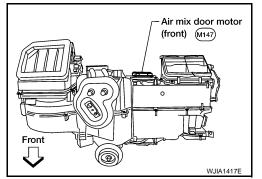
Air Mix Door Control Specification



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:0000000001680530

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.

HAC

Н

K

M

Ν

0

>> GO TO 2.

2.confirm symptom by performing operational check - temperature decrease

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

Can a symptom be duplicated?

YES >> GO TO 4.

NO >> GO TO 3.

3. PERFORM COMPLETE OPERATIONAL CHECK

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-260, "Operational Check"</u>. Can a symptom be duplicated?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> System OK.

4. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation from maximum cold °to maximum hot in each mode.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair as necessary.

6.CHECK THE AIR MIX DOOR MOTOR PBR CIRCUIT

Perform diagnostic procedure for the air mix door motor. Refer to <u>HAC-279</u>, "Air Mix Door Motor Component Function Check".

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair PBR circuit or replace air mix door motor. Refer to VTL-20. "Removal and Installation".

7. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Air Mix Door Motor Diagnosis Procedure

INFOID:0000000001680531

SYMPTOM:

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

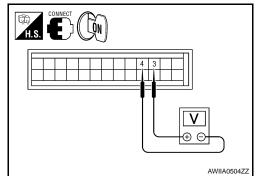
DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

< COMPONENT DIAGNOSIS >

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial to maximum hot.
- 3. Check voltage between front air control harness connector M49 terminal 3 and terminal 4 while rotating temperature control dial to maximum cold.

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	3	4	Rotate temp control dial	Battery voltage



Is the inspection result normal?

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

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

Turn ignition switch OFF.

2. Disconnect the front air control harness connector.

3. Check continuity between front air control harness connector M49 terminal 3, 4 and ground.

3 - Ground : Continuity should not exist.4 - Ground : Continuity should not exist.

Is the inspection result normal?

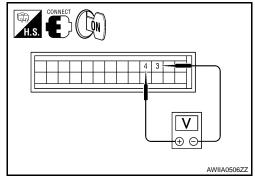
YES >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate temperature control dial to maximum hot.
- Check voltage between front air control harness connector M49 terminal 3 and terminal 4 while rotating temperature control dial to maximum cold.

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	4	3	Rotate temp control dial	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

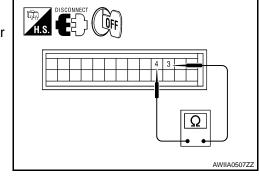
4. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 3 and terminal 4.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5.CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN

HAC

M

Ν

Р

Н

Α

В

D

Е

HAC-281

AWIIA0508ZZ

< COMPONENT DIAGNOSIS >

- 1. Disconnect the air mix door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 3, 4 and the air mix door motor harness connector M147 (B) terminal 1, 6.

3 - 1 : Continuity should exist. 4 - 6 : Continuity should exist.

Is the inspection result normal?

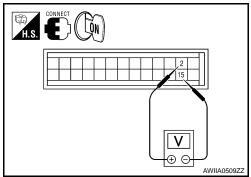
YES >> Replace air mix door motor. Refer to <u>VTL-20</u>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

6.CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

- Reconnect front air control harness connector.
- 2. Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 2 and 15

Connector	Teri	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M49	2	15	5V



Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

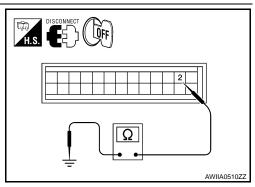
- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 2 and 15.

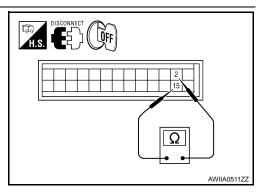
Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. NO >> GO TO 10.

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN





AIR MIX DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

1. Disconnect the air mix door motor harness connector.

 Check continuity between air mix door motor harness connector M147 (B) terminal 3, 2 and front air control harness connector M49 (A) terminal 2 and 15.

> 2 - 3 : Continuity should exist. 15 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to <u>VTL-20, "Removal</u> and Installation".

NO >> Repair or replace harness as necessary.

10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- Turn ignition switch ON.
- 3. Check voltage between front air control harness connector M49 terminal 18 and ground while rotating temperature control dial from maximum hot to maximum cold.

Voltage : Approx. .5V - 4.5V

Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 18 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12. CHECK PBR FEEDBACK CIRCUIT FOR OPEN

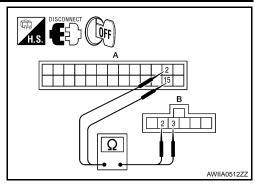
- 1. Turn ignition switch OFF.
- 2. Disconnect the air mix door motor harness connector and front air control harness connector.
- Check continuity between air mix door motor harness connector M147 (B) terminal 4 and front air control harness connector M49 (A) terminal 18.

Continuity should exist.

Is the inspection result normal?

YES >> Replace air mix door motor. Refer to VTL-20, "Removal and Installation".

NO >> Repair or replace harness as necessary.



CONNECT CONNEC

HAC

Н

Α

В

D

J

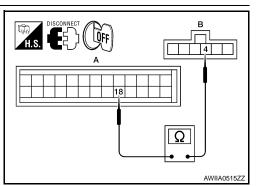
K

AWIIA051477

M

N

0



INTAKE DOOR MOTOR

System Description

INFOID:000000001680532

SYSTEM DESCRIPTION

SYMTOM:

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

SYSTEM DESCRIPTION

Component Parts

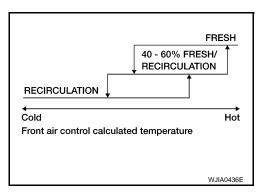
Intake door control system components are:

- 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.

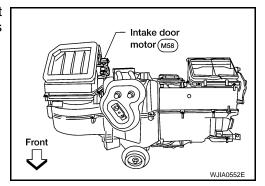
Intake Door Control Specification



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:0000000001680533

INSPECTION FLOW

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

- 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).

INTAKE DOOR MOTOR

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Can a 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 <u>HAC-260</u>, "Operational Check". Can a symptom be duplicated?

YES >> Refer to HAC-259, "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. CHECK INTAKE DOOR OPERATION

Check and verify intake door mechanism for smooth operation.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair intake door mechanism.

5. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Intake Door Motor Diagnosis Procedure

SYMPTOM:

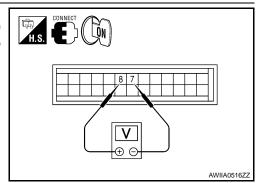
- Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
front air control: M49	8	7	Self-diagnostic mode	Battery volt- age



Is the inspection result normal?

OK >> GO TO 4.

NO >> GO TO 3.

2.CHECK INTAKE DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

HAC

K

L

M

Ν

INFOID:0000000001680534

Н

Α

В

D

Е

F

[MANUAL A/C (TYPE 3)]

Ω

< COMPONENT DIAGNOSIS >

- Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 8, 7 and ground.

8 - Ground : Continuity should not exist.7 - Ground : Continuity should not exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to <u>VTL-8</u>, "Removal and Installation".

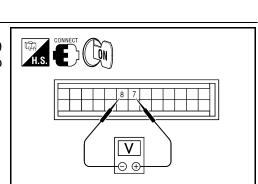
NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER

1. Press the BACK button to back out of self-diagnostic mode.

 Check voltage between front air control harness connector M49 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
front air control: M49	7	8	Self-diagnostic mode	Battery voltage



AWIIA0518ZZ

Is the inspection result normal?

OK >> GO TO 5.

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

4. CHECK INTAKE DOOR MOTOR AND CIRCUITS FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 8 and terminal 7.

Continuity should exist.

Is the inspection result normal?

OK >> Replace intake door motor. Refer to <u>VTL-11, "Removal and Installation"</u>.

NO >> GO TO 6.

5. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN

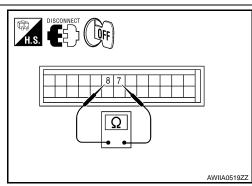
- 1. Disconnect the intake door motor harness connector.
- Check continuity between front air control harness connector M49 (A) terminal 7, 8 and the intake door motor harness connector M58 (B) terminal 1, 6.

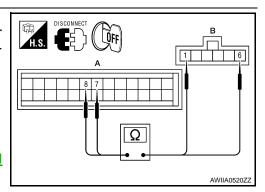
8 - 6 : Continuity should exist.7 - 1 : Continuity should exist.

Is the inspection result normal?

YES >> Replace intake door motor. Refer to <u>VTL-11, "Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:0000000001680535

Α

В

D

F

Н

HAC

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:

- Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- · Intake sensor

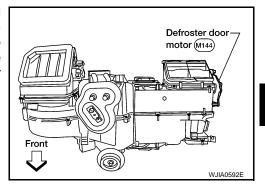
System Operation

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:0000000001680536

INSPECTION FLOW

1.confirm symptom by performing operational check - defroster door

- Select vent (*) mode.
- 2. Rotate mode control dial todefrost mode ().
- 3. Listen for defroster door position change (blower sound should change slightly).

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-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259, "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. CHECK DEFROSTER DOOR MOTOR

Р

N

DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Perform diagnostic procedure for defroster door motor. Refer to <u>HAC-287</u>, "<u>Defroster Door Motor Component</u> Function Check".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair PBR circuit or replace defroster door motor. Refer to VTL-17, "Removal and Installation".

5.CHECK DEFROSTER DOOR OPERATION

Check and verify defroster door mechanism for smooth operation.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, "Removal and Installation".

NO >> Repair defroster door mechanism.

Defroster Door Motor Diagnosis Procedure

INFOID:0000000001680537

SYMPTOM:

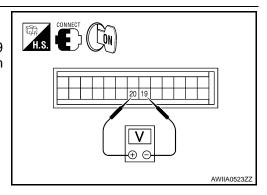
- Defroster door does not change.
- Defroster door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR DEFROSTER DOOR MOTOR

1. CHECK FRONT AIR CONTROL FOR POWER AND GROUND

- 1. Turn ignition switch ON.
- 2. Rotate the mode control dial to defrost mode ().
- 3. Check voltage between front air control harness connector M49 terminal 20 and terminal 19 and then press the defroster switch (♠) again.

Connector	Terminals		Condition	Voltage
	(+)	(-)	Condition	(Approx.)
Front air control: M49	20	19	Press defroster switch	Battery voltage



Is the inspection result normal?

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

2.CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 19, 20 and ground.

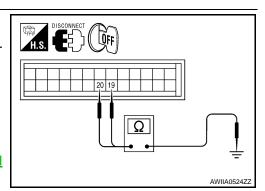
19 - Ground : Continuity should not exist.20 - Ground : Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

3.CHECK FRONT AIR CONTROL FOR GROUND AND POWER



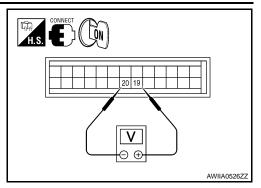
DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- 1. Press the defroster switch ().
- Check voltage between front air control harness connector M49 terminal 19 and terminal 20 and the press the defroster switch () again.

Connector	Te	erminals	Condition	Voltage
Connector	(+)	(-)	Condition	(Approx.)
Front air control: M49	19	20	Press de- froster switch	Battery voltage



Is the inspection result normal?

YES >> GO TO 5.

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

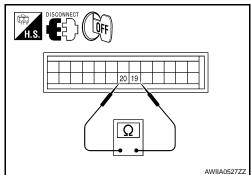
4. CHECK DEFROSTER DOOR MOTOR AND CIRCUITS FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 19 and terminal 20.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7. NO >> GO TO 6.



5. CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN

- Disconnect the defroster door motor harness connector.
- Check continuity between front air control harness connector M49 terminal 19, 20 and the defroster door motor harness connector M144 terminal 1, 6.

19 - 1 : Continuity should exist.

20 - 6 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.

6. CHECK FRONT AIR CONTROL FOR PBR POWER AND GROUND

- 1. Reconnect front air control harness connector.
- 2. Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 2 and 15.

Connector	Teri	Voltage (Ap-	
Connector	(+)	(-)	prox.)
Front air control: M50, M49	2	15	5V

Ω

Is the inspection result normal?

YES >> GO TO 9. NO >> GO TO 8.

7

7.CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR SHORT TO GROUND

HAC

Н

Α

В

D

Е

J

1 6

AWIIA052877

K

L

M

Ν

С

DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 2 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

8. CHECK PBR REFERENCE VOLTAGE AND GROUND CIRCUITS

- 1. Turn ignition switch OFF.
- Disconnect the front air control harness connector.
- Check continuity between front air control harness connector M49 terminal 2 and 15.

Continuity should exist.

Is the inspection result normal?

YES >> GO TO 11. >> GO TO 10. NO

Ω AWIIA0497ZZ

9. CHECK PBR REFERENCE VOLTAGE CIRCUIT FOR OPEN

- Disconnect the defroster door motor harness connector.
- Check continuity between defroster door motor harness connector M144 (B) terminal 3, 2 and front air control harness connector M49 (A) terminal 2, and 15.

2 - 3 : Continuity should exist. 15 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to VTL-17. "Removal and Installation".

NO >> Repair or replace harness as necessary.

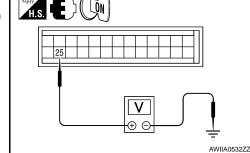
10. CHECK PBR FEEDBACK VOLTAGE

- Reconnect the front air control harness connector.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M49 terminal 25 and ground while cycling defroster switch on and off.

: Approx. 1V - 4.5V Voltage

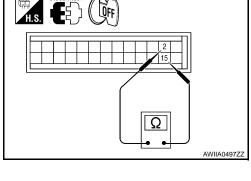
Is the inspection result normal?

YES >> GO TO 13. NO >> GO TO 12.



Ω

11. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR SHORT TO GROUND



2 3

AWIIA0531ZZ

DEFROSTER DOOR MOTOR CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- 1. Turn ignition switch OFF.
- 2. Disconnect front air control harness connector.
- 3. Check continuity between front air control harness connector M49 terminal 25 and ground.

Continuity should not exist.

Is the inspection result normal?

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

NO >> Repair or replace harness as necessary.

12.CHECK PBR FEEDBACK CIRCUIT FOR OPEN

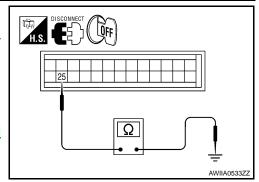
- 1. Turn ignition switch OFF.
- 2. Disconnect the defroster door motor harness connector and front air control harness connector.
- Check continuity between defroster door motor harness connector tor M144 (B) terminal 4 and front air control harness connector M49 (A) terminal 25

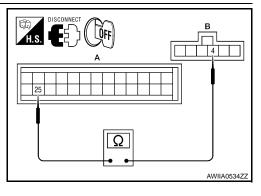
Continuity should exist.

Is the inspection result normal?

YES >> Replace defroster door motor. Refer to <u>VTL-17</u>, <u>"Removal and Installation"</u>.

NO >> Repair or replace harness as necessary.





HAC

Н

Α

В

D

Е

F

.1

Κ

L

M

Ν

 \cap

System Description

INFOID:0000000001680538

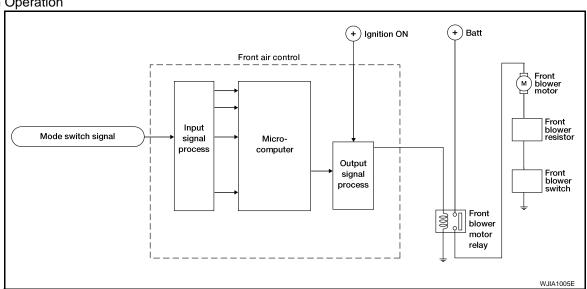
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

- Front air control
- Front blower motor resistor
- · Front blower motor relav
- · Front blower motor
- · Intake sensor

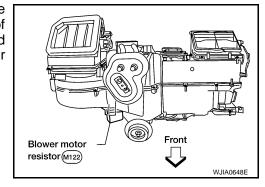
System Operation



COMPONENT DESCRIPTION

Front Blower Motor Resistor

The front blower motor resistor is located on the cooling unit. The blower motor resistor grounds the blower motor through a series of 1, 2 or 3 resistors, depending upon speed selected. For high speed operation, the blower motor resistor is circumbented and the blower motor grounds directly.



Front Blower Motor Component Function Check

INFOID:0000000001680539

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.
- Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

Can the symptom be duplicated?

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

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> System OK.

CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. CHECK BLOWER MOTOR OPERATION

Check and verify blower motor operates manually in all speeds.

Does blower motor operate in all speeds?

YES >> GO TO 5.

NO >> Refer to HAC-293, "Front Blower Motor Diagnosis Procedure".

${f 5.}$ CHECK ENGINE COOLANT TEMPERATURE SENSOR CIRCUIT

Check engine coolant temperature sensor circuit. Refer to EC-125, "Diagnosis Procedure".

Is the inspection results normal?

YES >> GO TO 6.

NO >> Replace enging coolant temperature sensor.

6. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259. "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

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

Front Blower Motor Diagnosis Procedure

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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

Front blower resistor connector

INFOID:0000000001680540

Ignition Batt switch on (+)(+)М Front Motor blower switch 1 (22)-(14) Front control (T Front blower motor resistor

3 Front blower 2 4 1 motor relay

connector

5

HAC

M

N

Р

Н

Α

В

D

Е

F

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

1. CHECK FRONT BLOWER MOTOR OPERATION

- 1. Turn ignition switch ON.
- 2. Turn blower control dial to each of the four speeds.

Does the blower motor operate normally at each speed?

YES >> Inspection End..

>> 1. Blower motor does not operate at any speed, GO TO 2.

- 2. Blower motor does not operate at 1 3 speeds, GO TO 11.
- 3. Blower motor does not operate at 4 speed, GO TO 12.

2.CHECK FUSES

NO

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to <u>PG-66</u>, <u>"Terminal Arrangement"</u>.

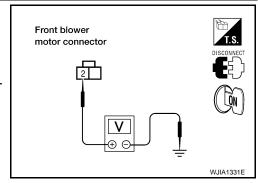
Fuses are good.

Is the inspection result normal?

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

3.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.
- 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 4.

4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to HAC-296, "Front Blower Motor Component Inspection".

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace front blower motor relay.

${f 5.}$ CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

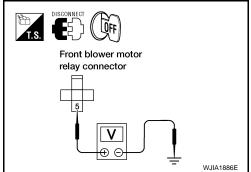
- 1. Turn ignition switch OFF.
- Check voltage between front blower motor relay harness connector M107 terminal 5 and ground.

5 - Ground : Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.



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

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

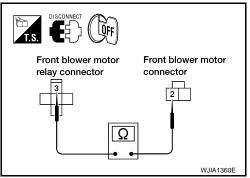
Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

> 3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.



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

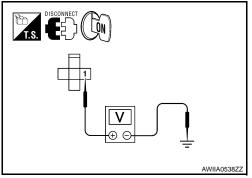
- Turn ignition switch ON.
- 2. Check voltage between front blower motor relay harness connector M107 terminal 1 and ground.

1 - Ground : Battery voltage

Is the inspection result normal?

YES >> Repair front blower motor ground circuit or connector.

NO >> Repair harness or connector.



8. REPLACE FUSES

- Replace fuses.
- Activate the front blower motor.

Does the fuse blow?

YES >> GO TO 9.

NO >> Inspection End.

9.CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

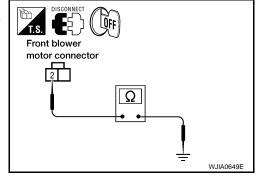
- Turn ignition switch OFF.
- Check continuity between variable blower control harness connector M62 terminal 2 and ground.

2 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Repair harness or connector.



10. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to HAC-296, "Front Blower Motor Component Inspection".

Is the inspection result normal?

YES >> Repair front blower motor relay (switch side) circuit for short.

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

11. CHECK BLOWER MOTOR RESISTOR

Check blower motor resistor, Refer to HAC-296, "Front Blower Motor Component Inspection",

Is the inspection result normal?

YES

>> Replace blower motor resistor. Refer to VTL-23, "Removal and Installation" NO

12.check front blower motor switch

HAC

Н

Α

В

M

N

Р

HAC-295

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Check front blower motor switch. Refer to <u>HAC-296</u>, "Front Blower Motor Component Inspection". Is the inspection result normal?

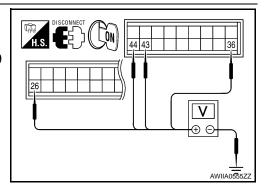
YES >> GO TO 13.

NO >> Replace blower motor motor switch. Refer to <u>VTL-8</u>, "Removal and Installation".

13. CHECK FRONT BLOWER MOTOR SWITCH CIRCUITS

- Reconnect blower motor resistor.
- 2. Disconnect front air control connector.
- Turn ignition switch ON.
- 4. Check voltage between front air control harness connector M49 (A) terminal 26, M50 (B) terminals 36, 43, and 44 and ground.

26 - Ground: Battery voltage36 - Ground: Battery voltage43 - Ground: Battery voltage44 - Ground: Battery voltage



Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.

14. CHECK BLOWER MOTOR GROUND CIRCUIT

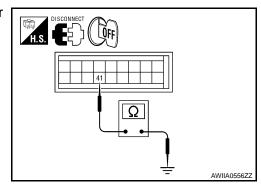
- 1. Turn ignition switch OFF.
- 2. Turn blower control dial OFF.
- 3. Check continuity between front air control harness connector M50 terminal 41 and ground.

41 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace front air control.

NO >> Repair harness or connector.



INFOID:0000000001680541

Front Blower Motor Component Inspection

COMPONENT INSPECTION

Front Blower Motor Relay

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Α

В

D

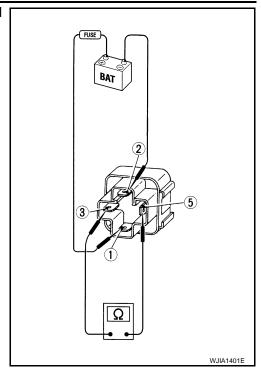
Е

Н

HAC

K

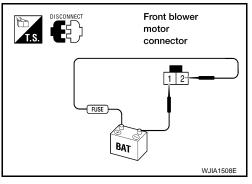
Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



Front Blower Motor

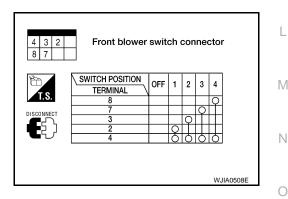
Confirm smooth rotation of the blower motor.

- 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.



Front Blower Motor Switch

Check continuity between terminals at each switch position.



Front Blower Motor Resistor

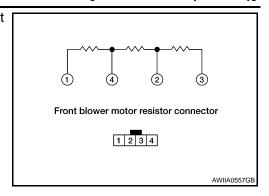
Р

HAC-297

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Check continuity between terminals. There will be resistance, but there should not be an open or short between any two terminals.



Does another symptom exist?

YES >> Refer to HAC-259, "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. CHECK INTAKE SENSOR

Check and verify intake sensor circuit. Refer to HAC-306, "Intake Sensor Diagnosis Procedure".

M

Ν

INFOID:0000000001680544

>> GO TO 5.

RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check".

Does another symptom exist?

YES >> Refer to HAC-259, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

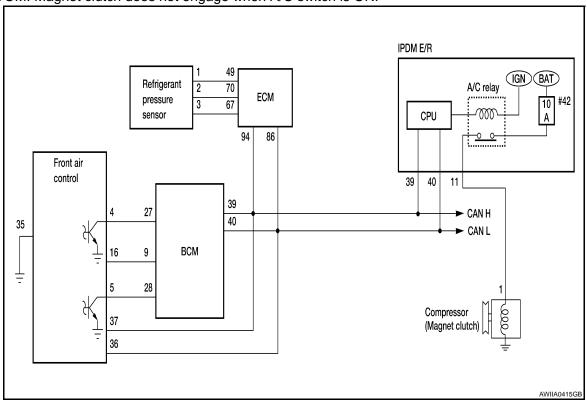
NO >> Replace front air control. Refer to VTL-8, "Removal and Installation".

Magnet Clutch Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

HAC-299

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



1. CHECK INTAKE SENSOR CIRCUIT

Check intake sensors. Refer to HAC-307, "Intake Sensor Component Inspection".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check malfunctioning intake sensor. Refer to HAC-306, "Intake Sensor Diagnosis Procedure".

2. PERFORM AUTO ACTIVE TEST

Refer to PCS-10, "Diagnosis Description".

Does magnet clutch operate?

YES >> • • WITH CONSULT-III GO TO 5.

• WWITHOUT CONSULT-III 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.
- Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
- Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal
 1.

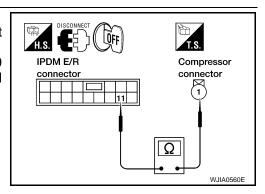
11 – 1 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK MAGNET CLUTCH CIRCUIT



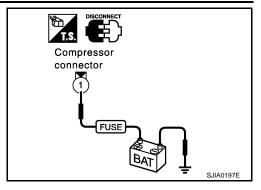
< COMPONENT DIAGNOSIS >

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

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-30</u>, "Removal and <u>Installation of IPDM E/R"</u>.

NO >> Replace magnet clutch. Refer to <u>HA-34, "Removal and</u> Installation for Compressor Clutch".



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to HAC-272, "CONSULT-III Function (BCM)".

A/C SW ON : COMP ON SIG ON A/C SW OFF : COMP ON SIG 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.
- Check continuity between BCM harness connector M18 (A) terminal 27 and front air control harness connector M49 (B) terminal 12.

27 - 12 Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7.

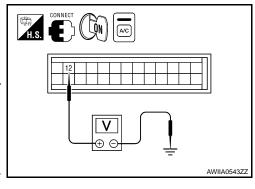
NO >> Repair harness or connector.

AWIIA0542ZZ

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.
- Check voltage between front air control harness connector M49 terminal 12 and ground.

1	Terminals			
(+)			0 11	
front air con- trol connec- tor	Terminal No.	(-)	Condition	Voltage
M49	12	Ground	A/C switch: ON	Approx. 0V
14149	10149 12		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 <u>VTL-8</u>. "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to <u>BCS-50, "Removal and Installation"</u>.

8. CHECK REFRIGERANT PRESSURE SENSOR

1. Start engine.

Α

В

С

D

Е

F

_

HAC

Н

K

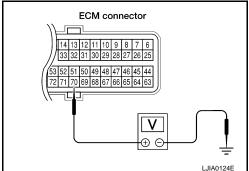
M

Ν

< COMPONENT DIAGNOSIS >

2. Check voltage between ECM harness connector F54 terminal 70 and ground.

Terminals				
((+)		Condition	Voltage
ECM con- nector	Terminal No.	(-)		3.0
F54	70	Ground	A/C switch: ON	Approx. 0.36 - 3.88V



Is the inspection result normal?

YES >> GO TO 9.

NO >> Refer to EC-412, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to HAC-272, "CONSULT-III Function (BCM)".

FRONT BLOWER CONTROL : FAN ON SIG ON

DIAL ON

FRONT BLOWER CONTROL : FAN ON SIG OFF

DIAL OFF

Is the inspection result normal?

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

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- 1. Turn ignition switch OFF.
- 2. Disconnect BCM connector and front air control connector.
- Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M50 terminal 36.

28 - 36

Continuity should exist.

Is the inspection result normal?

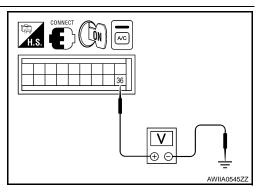
YES >> GO TO 11.

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.
- Check voltage between front air control harness connector M50 terminal 36 and ground.

	Terminals				
(+)			Condition	Voltage	
front air con- trol connector	Terminal No.	(-)			
M50	36	Ground	A/C switch: ON Blower motor operates	Approx. 0V	
			A/C switch: OFF	Approx. 5V	



AWIIA0544ZZ

Ω

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 <u>VTL-8</u>, "Removal and Installation".

MAGNET CLUTCH

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to <u>BCS-50</u>, "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 >> Inspection End.

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

Н

Α

В

C

D

Е

F

G

HAC

K

J

L

M

Ν

0

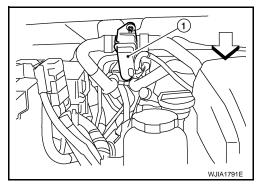
WATER VALVE CIRCUIT

Description INFOID:000000001680545

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

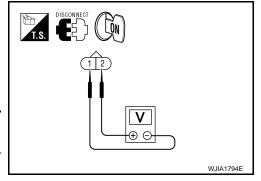
INFOID:0000000001680546

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

- Disconnect water valve connector F68. 1.
- 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	
Connector	(+)	(-)	Condition	(Approx.)	
Water valve: F68	er valve: F68 2 1		Rotate temperature control dial	Battery voltage	



Is the inspection result normal?

YFS >> GO TO 3.

>> GO TO 2. NO

2.check water valve control output circuit

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- Check continuity between water valve harness connector F68 (A) terminal 2 and front air control harness connector M50 (B) terminal 30.

2 - 30 : Continuity should exist.

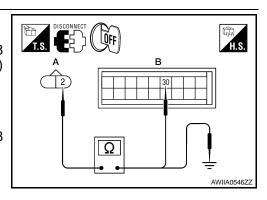
- 4. Check continuity between water valve harness connector F68 terminal 2 and ground.
 - 2 Ground : Continuity should not exist.

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



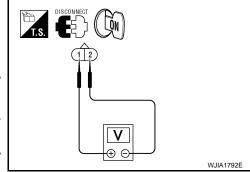
WATER VALVE CIRCUIT

< COMPONENT DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

- 1. Rotate temperature control dial to maximum cold.
- 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	
Connector	(+)	(-)	Condition	(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

- Turn ignition switch OFF.
- 2. Disconnect front air control connector M50.
- Check continuity between water valve harness connector F68

 (A) terminal 1 and front air control harness connector M50 (B) terminal 29.

1 - 29 : Continuity should exist.

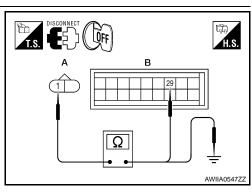
4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

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.



HAC

Н

Α

В

D

Е

F

J

Κ

L

M

Ν

C

INTAKE SENSOR

System Description

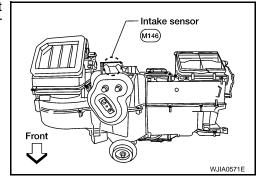
INFOID:0000000001680550

INFOID:0000000001680551

COMPONENT DESCRIPTION

Intake Sensor

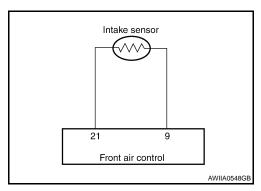
The intake sensor is located on the heater & cooling unit assembly. It converts temperature of air after if passes through the evaporator into a resistance value which is then input to the front air control.



Intake Sensor Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



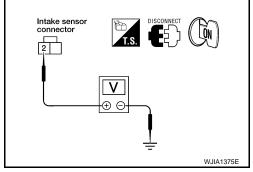
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

- 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 3. NO >> GO TO 4.



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

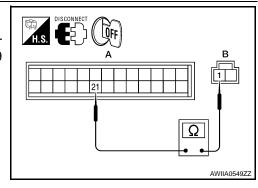
- 1. Turn ignition switch OFF.
- 2. Disconnect front air control connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M49 (A) terminal 21.

1 - 21 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-307, "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".

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

- Turn ignition switch OFF.
- Disconnect front air control connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M49 (A) terminal 9.

2 - 9 : Continuity should exist.

Check continuity between intake sensor harness connector M146 terminal 6 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:0000000001680552

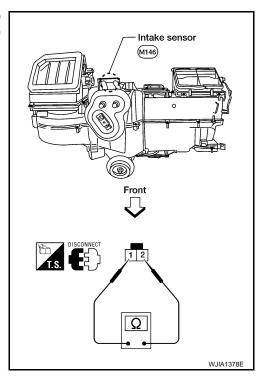
COMPONENT INSPECTION

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 $k\Omega$
-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".



HAC

В

D

Е

AWIIA0550Z

M

Ν

[MANUAL A/C (TYPE 3)]

INFOID:0000000001680553

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

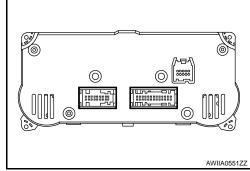
Component Description

COMPONENT DESCRIPTION

Front Air Control

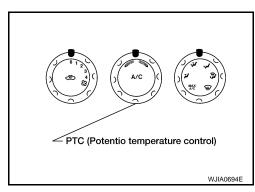
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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 postion by rotating the temperature control dial.



Front Air Control Component Function Check

INFOID:0000000001680554

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).

Can a 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 <u>HAC-260, "Operational Check"</u>. <u>Can a symptom be duplicated?</u>

YES >> Refer to HAC-259, "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. CHECK POWER AND GROUND CIRCUIT

Check main power supply and ground circuit. Refer to <u>HAC-309</u>, "Front Air Control Power and Ground Diagnosis Procedure".

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< COMPONENT DIAGNOSIS >

Is the inspection result normal?

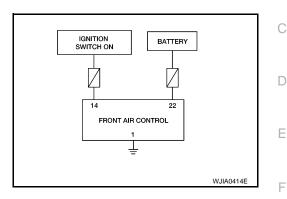
YES >> System OK.

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

Front Air Control Power and Ground Diagnosis Procedure

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



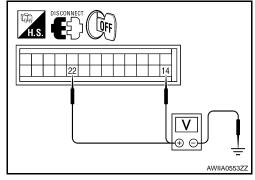
[MANUAL A/C (TYPE 3)]

INFOID:0000000001680555

1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- 1. Disconnect front air control connectors.
- 2. Check voltage between front air control harness connector M49 terminals 14, 22 and ground.

Terminals			Ignition switch position		
(+)					
Front air control connector	Terminal No.	(-)	OFF	ACC	ON
M49	14	Ground	Approx. 0V	Approx. 0V	Battery voltage
M49	22	Giodila	Battery voltage	Battery voltage	Battery voltage



HAC

J

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to PG-66, "Terminal Arrangement".

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

2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

- 1. Turn ignition switch OFF.
- 2. Check continuity between front air control harness connector M49 terminal 1 and ground.

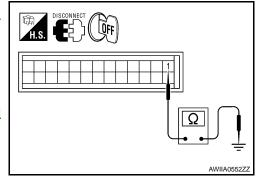
1 - Ground

: 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.



Н

Α

В

K

Ν

0

ECU DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

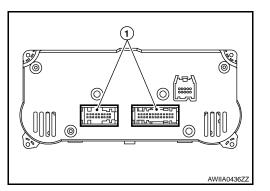
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

INFOID:0000000001680588

AIR CONDITIONER CONTROL

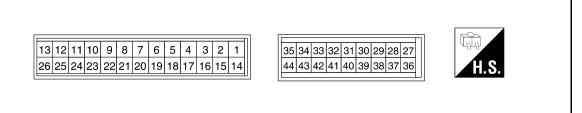
Front Air Control Terminals Reference Values

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



AWIIA0441ZZ

FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND RERERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	ltem	Ignition switch	Condition	Voltage (V) (Approx.)
1	В	Ground	-	-	0V
2	Υ	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	0	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 defrost request	ON	-	Battery voltage
12	W/R	Compressor ON signal	ON	A/C switch OFF	5V
12	v v / 「N	Compressor ON signal	ON	A/C switch ON	0V
14	Y/G	Power supply for IGN	ON	-	Battery voltage
15	Р	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	-	OV
22	Y/R	Power supply for BAT	-	-	Battery voltage
23	R/L	Illumination +	ON	Park lamps ON	Battery voltage

HAC

Н

Α

В

D

Е

F

J

K

M

0

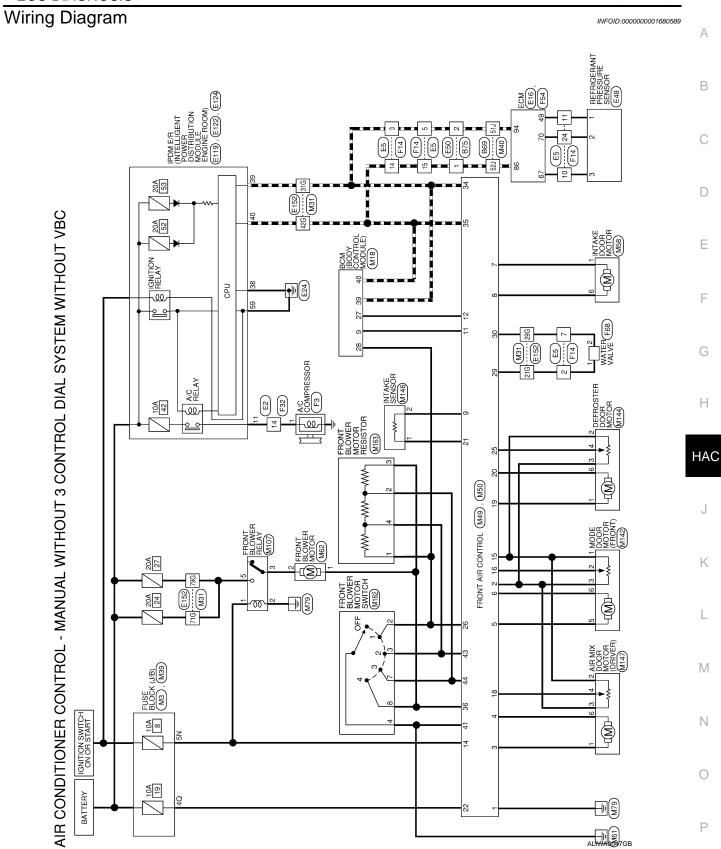
Ν

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
24	BR	Illumination -	-	Park lamps ON	(V) 15 10 5 0 200 ms
25	LG/B	Defroster door motor feedback	ON	-	0 - 5V
26	R/B	Front blower request	ON	Front blower motor OFF	Battery voltage
20	IV/D		1 Tont blower request	Tiont blower request Oil	Front blower motor ON
29	9 Y/L	Water valve	ON	Water valve open	Battery voltage
	172		0.1	Water valve closed	0V
30	W/G	Water valve	ON	Water valve open	0V
30	VV/C	vvater varve	OIV	Water valve closed	Battery voltage
34	L	CAN-H	ON	-	0 - 5V
35	Р	CAN-L	ON	-	0 - 5V
36	L/W	Blower speed input	ON	Front blower motor OFF	Battery voltage
30	L/ V V	Blower speed input	ON	Front blower motor ON	0V
41	B/W	Blower ground	ON	Front blower motor OFF	Battery voltage
41	41 D/VV	Blower ground	ON	Front blower motor ON	0V
43	L/R	Blower speed 2	ON	Front blower motor OFF	Battery voltage
70	L/IX	Blower speed 2	ON	Front blower motor ON	0V
44	L/Y	Blower speed 3	ON	Front blower motor OFF	Battery voltage
	L/ I	Y Blower speed 3	ON	Front blower motor ON	0V



ONNECTORS

AIR CONDITIONER CONTROL - MANUAL WITHOUT 3 CONTROL DIAL SYSTEM, WITHOUT VBC CC Connector No. M3 Connector Name M18 Connector Name EQM (BODY CONTROL	TEM, WITHOUT VBC CC		
AIR CONDITIONER CONTROL - MANUAL WITHOUT 3 (Connector No. M3 Connector Name FUSE BLOCK (J/B) Connector Name	CONTROL DIAL SYS	M18	BCM (BODY CONTROL
AIR CONDITIONER CONTROL - MA Connector No. M3 Connector Name FUSE BLOCK (J/B)	NUAL WITHOUT 3 (Connector No.	Connector Name
AIR CONDITION Connector No. Connector Name	VER CONTROL - MA	M3	2
	AIR CONDITION	Connector No.	Connector Name

M3	Connector No. M18	M18
FUSE BLOCK (J/B)	Connector Name	Connector Name BCM (BODY CONTROL
WHITE		MODULE)
	Connector Color WHITE	WHITE
3N	信	
]]	Ö.	

Connector Color

			-						
	20	9							
	19	33				_	_	_	_
	18	88							
	17	36 37							
	16			<u>e</u>	≥		Š		
	15	35		Signal Name	RR DEF SW	≥	BLR_FAN_SW	I	ب[
	13 14	32 33 34		Z	出	AC_SW	[₹	CAN-H	CAN-L
	13	33		l a		2		S	ပြ
- 117	12	32		Sign	뜐	`	5		
IV.	10 11	30 31		"			m		
- 11	9	30							
	6	28 29		_					
	8	28		Terminal No. Wire	m	œ	m		
	7	26 27		응불	Y/B	W/R	R/B	-	₾
	9	56		ŏ_					
	2	52		ġ					
	4	24		=					
ιń	က	22 23 24 25		i.	6	27	28	39	9
H.S.	2	22		E					
Ī	Ŀ	21		 					
_			-						

Signal Name

Terminal No. Wire

Y/G

SN 5N

AC_5W	BLR_FAN_SW	CAN-H	CAN-L	
רי/א	B/B	٦	Ь	
77	28	39	40	

Signal Name	_	I	I	-	_	_	
Color of Wire	J//L	M/G	_	Ь	Ь	Ь	
Terminal No. Wire	21G	29G	31G	42G	71G	56Z	

Connector Name FUSE BLOCK (J/B)

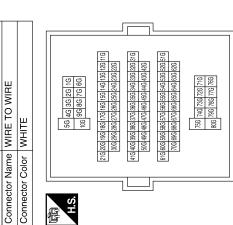
Connector No. M39

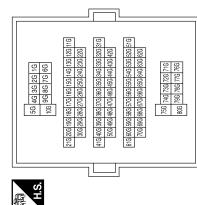
Connector Color WHITE

Signal Name

Color of Wire Υ/R

Terminal No. å





ALIIA0208GB

M31

Connector No.

_													
	A/C AUTO AMP.	Е	32 31	41 40 39 38 37 36	Signal Name	WATER VALVE CLOSE	WATER VALVE OPEN	CAN-H	CAN-L	BLOWER SPEED INPUT	BLOWER GND	BLOWER SPEED 2	BI OWEB SPEED 3
M50		or BLUE	35 34 33	44 43 42	Color of Wire	Y/L	M/G	_	۵	Γ/M	B/W	L/R	>
Connector No.	Connector Name	Connector Color	管	H.S.	Terminal No.	59	30	34	35	36	41	43	44

M50	Connector Name A/C AUTO AMP.	BLUE	
Connector No.	Connector Name	Connector Color	



Signal Name	RR DEF REQUEST	AC REQUEST	NSI	V REF RETURN	PANEL FLOOR FEEDBACK	DR BLEND DR FEEDBACK	DEFROST CW	DEFROST CCW	SENS RETURN	VB	DEFROST FEEDBACK	FR BLOWER MONITOR
Color of Wire	Y/B	W/R	Y/G	۵	GR	SB	ГG	P/B	N/R	Y/R	LG/B	B/B
Terminal No.	Ξ	12	14	15	16	18	19	20	21	22	25	26

	0
Connector Name WIRE TO WIRE	RE TO WIRE
Connector Color WHITE	븰

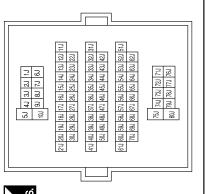
Signal Name

Color of Wire

Terminal No.

그 | 곱

51J 52J



	т —	_	1							_	_	_	_	
	A/C AUTO AMP.	¥		8 7 6 5 4 3 2 1 21 20 19 18 17 16 15 14	Signal Name	GND	V REF ACTR (5V)	DR BLEND DR CW	DR BLEND DR CCW	PANEL FLOOR CW	PANEL FLOOR CCW	RECIRC DOOR CCW	RECIRC DOOR CW	EVAP AIR TEMP SENS
M49		r BLACK		25 24 23 22 2	Color of Wire	В	>	M/G	ŋ	BR/W	P/L	0	G/B	L/B
Connector No.	Connector Name	Connector Color		H.S. 26 25	Terminal No.	-	2	က	4	2	9	2	8	6

ALIIA0185GB

Α

В

С

D

Е

F

G

Н

HAC

J

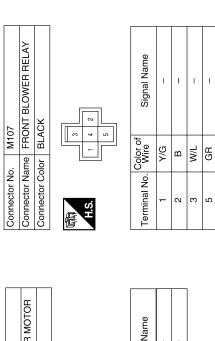
Κ

L

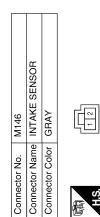
 \mathbb{N}

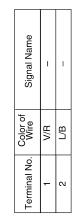
Ν

0



l
l





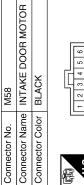


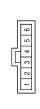


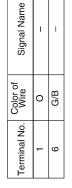
Terminal No.

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

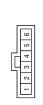
Signal Name	-	1	1	1	_
Color of Wire	ГG	Д	>	LG/B	B/B
Terminal No.	-	2	က	4	9







M142	Connector Name MODE DOOR MOTOR (FRONT)	BLACK	
Connector No.	Connector Name	Connector Color BLACK	ą.

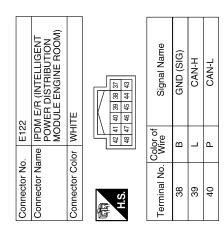




Signal Name	1	-	1	1	ı
Color of Wire	Ь	GR	\	BR/W	P/L
Ferminal No.	-	2	3	5	9

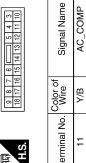
ALIIA0186GB

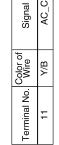
Connector No. E5 Connector Color WHITE

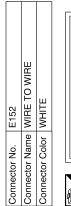


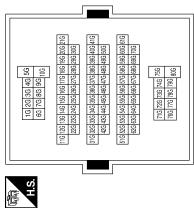
Signal Name	ı	I	I	1	I	_
Color of Wire	Y/L	M/G		Ь	۵	GR
Terminal No. Wire	21G	29G	31G	42G	71G	79G

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









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



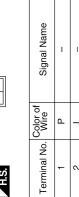
Signal Name	_	_
Color of Wire	Ь	7
Terminal No.	-	2

4	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	, CK	29 58 57 62 61 80	Signal Name	GND (PWR)
. E124		lor BLACK		Color of Wire	В
Connector No.	Connector Name	Connector Color	南 H.S.	Terminal No.	29

ALIIA0188GB

			А
10 3 9 8 1	Signal Name	Signal Name	В
F32 WIRE TO WIRE WHITE 7 6 5 4	Signal	Signal	С
Vo. F32 Vame WIR Color WHI	o. Color of Y/B	O Color of Wire of P	D
Connector No. F32	Terminal No.	Terminal No. 51J 52J	Е
			F
3 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 2 1 1 2 1	Signal Name	RE (N)	G
F14 Connector No. F14 Connector Name WIRE TO WIRE Connector Color WHITE Connector Color WHITE Connector Color WHITE Connector Color WHITE Connector Color Connect		TE TO WI	Н
No. F14 Vame WIRE T Color WHITE TI100 9 8 7 16 E Z423221201911	o. Color of V/L Y/L L L L L P P P P P P P P P P P P P P P	No. B69 Name WIRE T Color WHITE (1) [2] [3] [4] [4] [4] [5] [4] [4] [5] [4] [4] [5] [4] [4] [6] [6] [6] [6] [6] [6] [6] [6] [6] [6	HAG
Connector Name Connector Color	Terminal No. 2 2 3 3 5 7 7 7 15 15	Connector No. Connector Name Connector Color H.S.	J
			K
SSOR	Signal Name	VALVE Signal Name	L
F3 A/C COMPRE BLACK		F68 WATER VALV GRAY or of signs // // // // // // // // // // // // /	M
	No. Color of Wire Y/B		N
Connector No. Connector Name Connector Color	Terminal No.	Connector No. Connector Name Connector Color H.S. Terminal No. Co	0
		ALIIA0189GB	_
			Р





2

ALIIA0190GB

[MANUAL A/C (TYPE 3)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	AWIIA0481ZZ
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	AWIIA0478ZZ
Manual A/C (Type 3)	Three Control Dial System [without variable blower control (VBC)]	AWIIA0479ZZ

HAC

Α

В

С

D

Е

F

G

Н

J

K

L

M

Ν

0

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:0000000001680591

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-309
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-274
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-279
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-284
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-287
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-292
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-299
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-323
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-331
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-333

INSUFFICIENT COOLING Α Component Function Check INFOID:0000000001680592 SYMPTOM: Insufficient cooling INSPECTION FLOW 1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE Rotate the blower control dial to the low speed. Turn temperature control dial counterclockwise to maximum cold. Check for cold air at discharge air outlets. D Can the symptom be duplicated? YES >> GO TO 3. NO >> GO TO 2. Е $\mathbf{2}.$ CHECK FOR ANY SYMPTOMS Perform a complete operational check for any symptoms. Refer to HAC-260, "Operational Check". F Does another symptom exist? YES >> Refer to HAC-322, "Symptom Matrix Chart". NO >> System OK. 3.CHECK FOR SERVICE BULLETINS Check for any service bulletins. Н >> GO TO 3. 4. CHECK DRIVE BELTS HAC Check compressor belt tension. Refer to EM-12. "Checking Drive Belts". Is the inspection result normal? OK >> GO TO 5. NG >> Adjust or replace compressor belt. Refer to EM-12, "Removal and Installation". **5.**CHECK AIR MIX DOOR OPERATION Check and verify air mix door mechanism for smooth operation. Refer to HAC-279, "Air Mix Door Motor Component Function Check" Does air mix door operate correctly? L YES >> GO TO 6. >> Check air mix door motor circuit. Refer to HAC-280, "Air Mix Door Motor Diagnosis Procedure". NO O.CHECK COOLING FAN MOTOR OPERATION Check and verify cooling fan motor for smooth operation. Refer to EC-386, "Component Inspection". Does cooling fan motor operate correctly? YES >> GO TO 7. N NO >> Check cooling fan motor. Refer to EC-386, "Diagnosis Procedure". 7. CHECK WATER VALVE OPERATION Check and verify water valve for smooth operation. Refer to HAC-304, "Description". Does water valve operate correctly? YFS >> GO TO 8. Р NO >> Check water valve circuit. Refer to HAC-304, "Water Valve Diagnosis Procedure". $oldsymbol{\delta}.$ 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

- Connect recovery/recycling equipment to vehicle.
- 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-335, "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?

>> Perform performance test diagnoses. Refer to HAC-324, "Performance Test Diagnoses".

NO >> GO TO 11.

11. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HAC-327, "Test Reading".

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to HAC-324, "Performance Test Diagnoses".

NO >> GO TO 12.

12. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

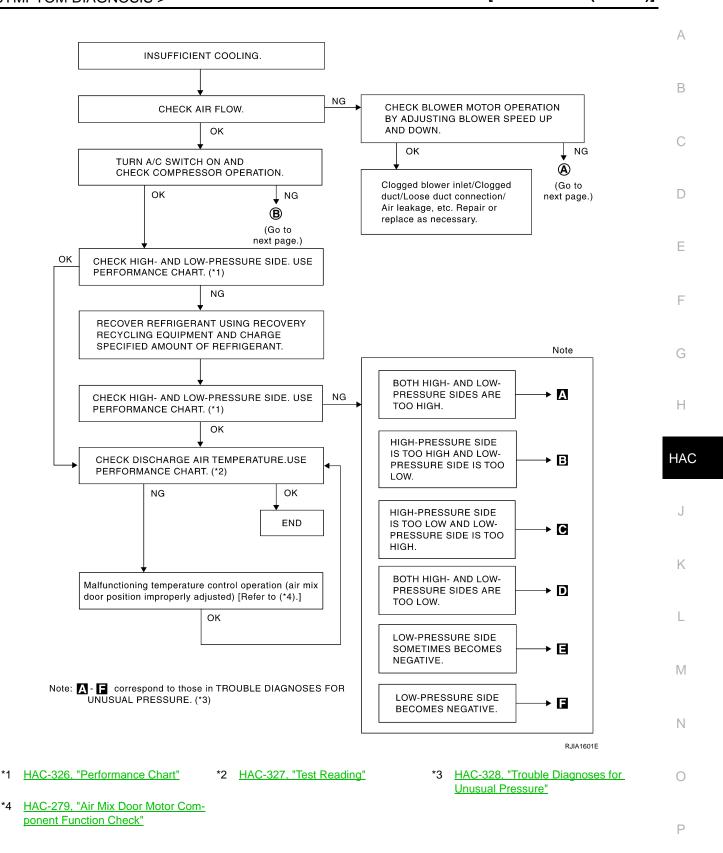
YES >> System OK.

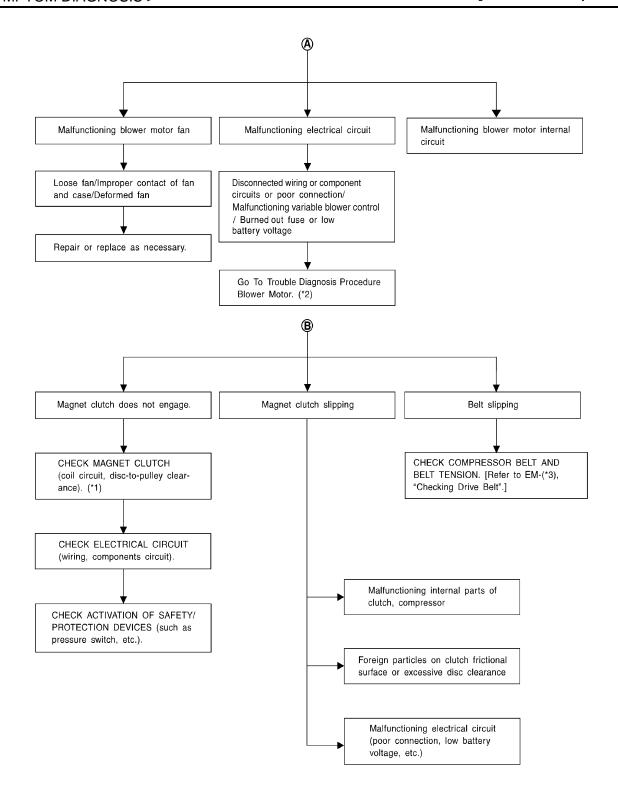
>> Repair air leaks. NO

Performance Test Diagnoses

INFOID:0000000001680593

[MANUAL A/C (TYPE 3)]





WJIA1371E

Performance Chart

^{*1} HA-34, "Removal and Installation for Compressor Clutch"

*2 HAC-292, "Front Blower Motor Compressor Clutch"

*3 EM-12, "Checking Drive Belts" ponent Function Check"

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

Testing must be performed as follows:

osed pen pen ax. COLD
pen
ax COLD
ax. COLD
(Ventilation) set
(Recirculation) set
ax. speed set
le speed
6

Test Reading

Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator	
Relative humidity %	Air temperature °C (°F)	°C (°F)	
	20 (68)	9.9 - 13.9 (50 - 57)	
	25 (77)	14.6 - 18.6 (58 - 65)	
50 - 60	30 (86)	16.8 - 21.8 (62 - 71)	
	35 (95)	21.1 - 27.1 (70 - 81)	
	40 (104)	25.3 - 31.5 (78 - 89)	
	20 (68)	11.4 - 15.2 (53 - 59)	
	25 (77)	15.5 - 20.0 (60 - 68)	
60 - 70	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)	Low-pressure (Suction side)
Relative humidity %	Air temperature °C (°F)	kPa (kg/cm ² , psi)	kPa (kg/cm ² , psi)
	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)
50 - 70	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)

HAC

Α

В

D

Е

F

G

Н

K

L

M

Ν

0

Ρ

Trouble Diagnoses for Unusual Pressure

INFOID:0000000001680596

Whenever system's high and/or low side pressure is unusual, 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
	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until speci- fied 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.
Both high- and low-pressure sides are too high.	Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) Air in refrigeration cycle	Evacuate and recharge system.
Ф Б Ф AC359A	Engine tends to overheat.	Engine cooling systems mal- function.	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.

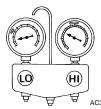
High-pressure Side is Too High and Low-pressure Side is Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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 lo- cated 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
ligh-pressure side is too low and ow-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. Understand the compressor packings.	Replace compressor.
High- and Low-pressure S	Sides are Too Low		
High- and Low-pressure S Gauge indication	Sides are Too Low Refrigerant cycle	Probable cause	Corrective action
·		Probable cause Liquid tank inside is slightly clogged.	Corrective action Replace liquid tank. Check oil for contamination.

Both high- and low-pressure sides are too low.



Expansion valve and liquid tank are warm or only cool when touched.

There is a big temperature dif-

valve inlet and outlet while the

ference between expansion

An area of the low-pressure

Air flow volume is too low.

pipe is colder than areas near

valve itself is frosted.

the evaporator outlet.

· Temperature difference oc-

curs somewhere in high-

be frosted.

pressure side.

Leaking fittings or compo-

Low refrigerant charge.

sion valve is clogged.

Expansion valve closes a little compared with the specification.

Improper expansion 1. valve adjustment. **Malfunctioning expansion**

Outlet and inlet may be clogged. Low-pressure pipe is clogged or crushed.

Evaporator is frozen.

· Remove foreign particles by using compressed air.

• Check oil for contamination.

Check refrigerant system for

ing of Refrigerant Leaks".

leaks. Refer to HA-23, "Check-

HAC

K

M

Ν

· Check oil for contamination.

· Check and repair malfunctioning parts. • Check oil for contamination.

• Check intake sensor circuit. Refer to HAC-306, "Intake Sensor Diagnosis Procedure". · Repair evaporator fins.

Replace evaporator.

• Refer to HAC-292, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
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
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 heater hoses for proper installation.

>> Repair or replace as necessary. Retest.

>> System OK.

8.CHECK HEATER HOSES

YES

NO

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 3)]

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.

$9.\mathsf{CHECK}$ HEATER HOSE TEMPERATURES

- 1. Start engine and warm it up to normal operating temperature.
- 2. Touch both the inlet and outlet heater hoses.

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-304, "Water Valve Diagnosis Procedure".

Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

INFOID:0000000001680598

Α

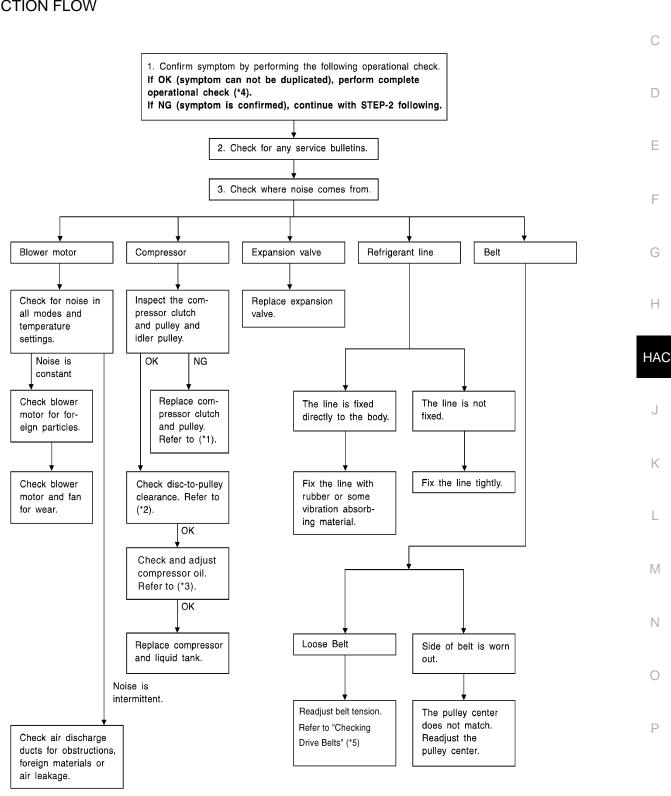
В

NOISE

Component Function Check

SYMPTOM: Noise

INSPECTION FLOW



WJIA1972E

- Compressor Clutch"
- *4 HAC-260, "Operational Check"
- Compressor Clutch"
- *5 EM-12, "Checking Drive Belts"
- *1 HA-34, "Removal and Installation for *2 HA-34, "Removal and Installation for *3 HA-20, "Maintenance of Oil Quantity in Compressor"

PRECAUTION

PRECAUTIONS

Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSION-FR"

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.

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

INFOID:0000000001680600

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
- 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

HAC

Α

D

Е

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.

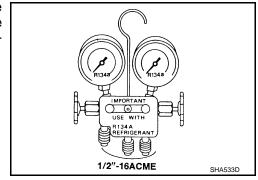
If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Service Equipment

INFOID:0000000001680601

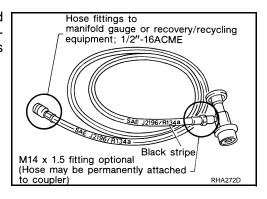
MANIFOLD GAUGE SET

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 shutoff 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

