

SECTION HAC

HEATER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

AUTOMATIC AIR CONDITIONER		
BASIC INSPECTION	5	
DIAGNOSIS AND REPAIR WORKFLOW	5	
How to Perform Trouble Diagnosis For Quick And Accurate Repair	5	
INSPECTION AND ADJUSTMENT	6	
Operational Check	6	
SYSTEM DESCRIPTION	8	
FUNCTION INFORMATION	8	
Component Part Location	8	
Symptom Table	10	
REFRIGERATION SYSTEM	11	
Refrigerant Cycle	11	
Refrigerant System Protection	11	
AUTOMATIC AIR CONDITIONER SYSTEM	13	
Control System Diagram	13	
Control System Description	13	
Discharge Air Flow	15	
Switches And Their Control Function	16	
DIAGNOSIS SYSTEM (HVAC)	17	
CONSULT-III Function (HVAC)	17	
DIAGNOSIS SYSTEM (BCM)	19	
CONSULT-III Function (BCM - COMMON ITEM)....	19	
CONSULT-III Function (BCM - AIR CONDITIONER)	19	
SELF-DIAGNOSIS FUNCTION	21	
Front Air Control Self-Diagnosis	21	
Front Air Control Self-Diagnosis Code Chart	21	
DTC/CIRCUIT DIAGNOSIS	22	
MODE DOOR MOTOR	22	
System Description	22	
Mode Door Motor Component Function Check	23	
Mode Door Motor Diagnosis Procedure	23	
AIR MIX DOOR MOTOR	27	
System Description	27	
Air Mix Door Motor (Driver) Component Function Check	28	
Air Mix Door Motor (Driver) Diagnosis Procedure....	28	
Air Mix Door Motor (Passenger) Component Function Check	31	
Air Mix Door Motor (Passenger) Diagnosis Procedure	32	
INTAKE DOOR MOTOR	35	
System Description	35	
Intake Door Motor Component Function Check	36	
Intake Door Motor Diagnosis Procedure	36	
DEFROSTER DOOR MOTOR CIRCUIT	38	
System Description	38	
Defroster Door Motor Component Function Check	38	
Defroster Door Motor Diagnosis Procedure	39	
BLOWER MOTOR CONTROL SYSTEM	43	
System Description	43	
Front Blower Motor Component Function Check	44	
Front Blower Motor Diagnosis Procedure	44	
Front Blower Motor Component Inspection	48	
MAGNET CLUTCH	49	
System Description	49	
Magnet Clutch Component Function Check	49	
Magnet Clutch Diagnosis Procedure	49	
WATER VALVE CIRCUIT	54	
Description	54	
Water Valve Diagnosis Procedure	54	
AMBIENT SENSOR	56	
Component Description	56	
Ambient Sensor Diagnosis Procedure	56	

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

Ambient Sensor Component Inspection	57	BASIC INSPECTION	97
IN-VEHICLE SENSOR	59	MANUAL A/C IDENTIFICATION TABLE	97
Component Description	59	Application Table	97
In-Vehicle Sensor Diagnosis Procedure	59	DIAGNOSIS AND REPAIR WORKFLOW	98
In-Vehicle Sensor Component Inspection	61	How to Perform Trouble Diagnosis For Quick And Accurate Repair	98
OPTICAL SENSOR	62	INSPECTION AND ADJUSTMENT	99
Component Description	62	Operational Check	99
Optical Sensor Diagnosis Procedure	62	SYSTEM DESCRIPTION	101
INTAKE SENSOR	64	MANUAL A/C IDENTIFICATION TABLE	101
System Description	64	Application Table	101
Intake Sensor Diagnosis Procedure	64	FUNCTION INFORMATION	102
Intake Sensor Component Inspection	65	Component Part Location	102
POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER	67	Symptom Table	104
Component Description	67	REFRIGERATION SYSTEM	105
Front Air Control Component Function Check	67	Refrigerant Cycle	105
Front Air Control Power and Ground Diagnosis Procedure	67	Refrigerant System Protection	105
ECU DIAGNOSIS INFORMATION	69	MANUAL AIR CONDITIONER SYSTEM	107
AIR CONDITIONER CONTROL	69	Control System Diagram	107
Front Air Control Terminals Reference Values	69	Control System Description	107
WIRING DIAGRAM	71	Discharge Air Flow	109
AIR CONDITIONER CONTROL	71	Switches And Their Control Function	109
Wiring Diagram - Automatic Air Conditioner	71	DIAGNOSIS SYSTEM (HVAC)	111
SYMPTOM DIAGNOSIS	82	CONSULT-III Function (HVAC)	111
AIR CONDITIONER CONTROL	82	DIAGNOSIS SYSTEM (BCM)	112
Symptom Matrix Chart	82	CONSULT-III Function (BCM - COMMON ITEM)	112
INSUFFICIENT COOLING	83	CONSULT-III Function (BCM - AIR CONDITION- ER)	112
Component Function Check	83	SELF-DIAGNOSIS FUNCTION	114
Diagnostic Work Flow	84	Front Air Control Self-Diagnosis	114
Performance Chart	86	Front Air Control Self-Diagnosis Code Chart	114
Trouble Diagnoses for Abnormal Pressure	87	DTC/CIRCUIT DIAGNOSIS	115
INSUFFICIENT HEATING	91	MANUAL A/C IDENTIFICATION TABLE	115
Component Function Check	91	Application Table	115
NOISE	93	MODE DOOR MOTOR	116
Component Function Check	93	System Description	116
MEMORY FUNCTION DOES NOT OPERATE..	94	Mode Door Motor Component Function Check ...	116
Memory Function Check	94	Mode Door Motor Diagnosis Procedure	116
PRECAUTION	95	AIR MIX DOOR MOTOR	120
PRECAUTIONS	95	System Description	120
Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN- SIONER"	95	Air Mix Door Motor Component Function Check .	120
Working with HFC-134a (R-134a)	95	Air Mix Door Motor Diagnosis Procedure	121
Precaution for Service Equipment	96	INTAKE DOOR MOTOR	125
MANUAL A/C (TYPE 1)		System Description	125
		Intake Door Motor Component Function Check ...	125
		Intake Door Motor Diagnosis Procedure	126

DEFROSTER DOOR MOTOR CIRCUIT	127	Diagnostic Work Flow	168	A
System Description	127	Performance Chart	170	
Defroster Door Motor Component Function Check ..	127	Trouble Diagnoses for Abnormal Pressure	171	
Defroster Door Motor Diagnosis Procedure	127	INSUFFICIENT HEATING	175	B
BLOWER MOTOR CONTROL SYSTEM	131	Component Function Check	175	
System Description	131	NOISE	177	C
Front Blower Motor Component Function Check ..	131	Component Function Check	177	
Front Blower Motor Diagnosis Procedure	132	PRECAUTION	178	
Front Blower Motor Component Inspection	135	PRECAUTIONS	178	D
MAGNET CLUTCH	137	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"	178	E
System Description	137	Working with HFC-134a (R-134a)	178	
Magnet Clutch Component Function Check	137	Precaution for Service Equipment	179	
Magnet Clutch Diagnosis Procedure	137	MANUAL A/C (TYPE 2)		F
WATER VALVE CIRCUIT	142	BASIC INSPECTION	180	
Description	142	MANUAL A/C IDENTIFICATION TABLE	180	G
Water Valve Diagnosis Procedure	142	Application Table	180	
AMBIENT SENSOR	144	DIAGNOSIS AND REPAIR WORKFLOW	181	H
Component Description	144	How to Perform Trouble Diagnosis For Quick And Accurate Repair	181	
Ambient Sensor Diagnosis Procedure	144	INSPECTION AND ADJUSTMENT	182	HAC
Ambient Sensor Component Inspection	145	Operational Check	182	
INTAKE SENSOR	147	SYSTEM DESCRIPTION	184	J
System Description	147	MANUAL A/C IDENTIFICATION TABLE	184	
Intake Sensor Diagnosis Procedure	147	Application Table	184	K
Intake Sensor Component Inspection	148	FUNCTION INFORMATION	185	
POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER	150	Component Part Location	185	L
Component Description	150	Symptom Table	187	
Front Air Control Component Function Check	150	REFRIGERATION SYSTEM	188	M
Front Air Control Power and Ground Diagnosis Procedure	150	Refrigerant Cycle	188	
ECU DIAGNOSIS INFORMATION	152	Refrigerant System Protection	188	
MANUAL A/C IDENTIFICATION TABLE	152	MANUAL AIR CONDITIONER SYSTEM	190	N
Application Table	152	Control System Diagram	190	
AIR CONDITIONER CONTROL	153	Control System Description	190	
Front Air Control Terminals Reference Values	153	Discharge Air Flow	191	
WIRING DIAGRAM	155	Switches And Their Control Function	192	O
AIR CONDITIONER CONTROL	155	DIAGNOSIS SYSTEM (BCM)	194	
Wiring Diagram - Manual With 2 Control Dial System	155	CONSULT-III Function (BCM - COMMON ITEM)..	194	P
SYMPTOM DIAGNOSIS	165	CONSULT-III Function (BCM - AIR CONDITIONER)	194	
MANUAL A/C IDENTIFICATION TABLE	165	DTC/CIRCUIT DIAGNOSIS	196	
Application Table	165	MANUAL A/C IDENTIFICATION TABLE	196	
AIR CONDITIONER CONTROL	166	Application Table	196	
Symptom Matrix Chart	166	MODE DOOR MOTOR	197	
INSUFFICIENT COOLING	167			
Component Function Check	167			

System Description	197	Front Air Control Power and Ground Diagnosis Procedure	227
Mode Door Motor Component Function Check	197		
Mode Door Motor Diagnosis Procedure	197		
AIR MIX DOOR MOTOR	201	ECU DIAGNOSIS INFORMATION	229
System Description	201	MANUAL A/C IDENTIFICATION TABLE	229
Air Mix Door Motor Component Function Check ..	201	Application Table	229
Air Mix Door Motor Diagnosis Procedure	202	AIR CONDITIONER CONTROL	230
INTAKE DOOR MOTOR	205	Front Air Control Terminals Reference Values	230
System Description	205	WIRING DIAGRAM	232
Intake Door Motor Component Function Check	205	AIR CONDITIONER CONTROL	232
Intake Door Motor Diagnosis Procedure	206	Wiring Diagram - Manual With 3 Control Dial Sys- tem	232
DEFROSTER DOOR MOTOR CIRCUIT	207	SYMPTOM DIAGNOSIS	242
System Description	207	MANUAL A/C IDENTIFICATION TABLE	242
Defroster Door Motor Component Function Check	207	Application Table	242
Defroster Door Motor Diagnosis Procedure	207	AIR CONDITIONER CONTROL	243
BLOWER MOTOR CONTROL SYSTEM	211	Symptom Matrix Chart	243
System Description	211	INSUFFICIENT COOLING	244
Front Blower Motor Component Function Check ..	211	Component Function Check	244
Front Blower Motor Diagnosis Procedure	212	Diagnostic Work Flow	245
Front Blower Motor Component Inspection	215	Performance Chart	247
MAGNET CLUTCH	217	Trouble Diagnoses for Abnormal Pressure	248
System Description	217	INSUFFICIENT HEATING	252
Magnet Clutch Component Function Check	217	Component Function Check	252
Magnet Clutch Diagnosis Procedure	217	NOISE	254
WATER VALVE CIRCUIT	222	Component Function Check	254
Description	222	PRECAUTION	255
Water Valve Diagnosis Procedure	222	PRECAUTIONS	255
INTAKE SENSOR	224	Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN- SIONER"	255
System Description	224	Working with HFC-134a (R-134a)	255
Intake Sensor Diagnosis Procedure	224	Precaution for Service Equipment	256
Intake Sensor Component Inspection	225		
POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER	227		
Component Description	227		
Front Air Control Component Function Check	227		

BASIC INSPECTION

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:000000006164670

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

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

Can a symptom be duplicated?

YES >> GO TO 4

NO >> GO TO 5

4. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HAC-82, "Symptom Matrix Chart"](#).

Can a symptom be duplicated?

>> GO TO 5.

5. PERFORM THE FRONT AIR CONTROL SELF-DIAGNOSIS

Perform front air control self-diagnosis. Refer to [HAC-21, "Front Air Control Self-Diagnosis"](#).

>> If any diagnostic trouble codes set. Refer to [HAC-21, "Front Air Control Self-Diagnosis Code Chart"](#).

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

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000006164671

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

Conditions : Engine running and at normal operating temperature

CHECKING MEMORY FUNCTION

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

7. Press the OFF switch.

If NG, go to trouble diagnosis procedure for [HAC-94, "Memory Function Check"](#).

If OK, continue with next check.


CHECKING BLOWER

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

If NG, go to trouble diagnosis procedure for [HAC-44, "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR

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

Mode door position is checked in the next step.



If NG, go to trouble diagnosis procedure for [HAC-23, "Mode Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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





CHECKING RECIRCULATION (, ONLY)

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

If NG, go to trouble diagnosis procedure for [HAC-36, "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

CHECKING TEMPERATURE DECREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-83, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-28, "Air Mix Door Motor \(Driver\) Component Function Check"](#).

INSPECTION AND ADJUSTMENT

[AUTOMATIC AIR CONDITIONER]

< BASIC INSPECTION >

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-91, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-28, "Air Mix Door Motor \(Driver\) Component Function Check"](#).

If OK, continue with next check.

CHECK A/C SWITCH

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

NOTE:

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

If NG, go to trouble diagnosis procedure for [HAC-49, "Magnet Clutch Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING AUTO MODE

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

If NG, go to trouble diagnosis procedure for [HAC-67, "Front Air Control Power and Ground Diagnosis Procedure"](#), then if necessary, trouble diagnosis procedure for [HAC-49, "Magnet Clutch Diagnosis Procedure"](#).

If all operational checks are OK (symptom cannot be duplicated), go to malfunction Simulation Tests in [HAC-5, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#) and perform tests as outlined to simulate driving conditions environment. If symptom appears. Refer to [HAC-82, "Symptom Matrix Chart"](#), and perform applicable trouble diagnosis procedures.

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

HAC

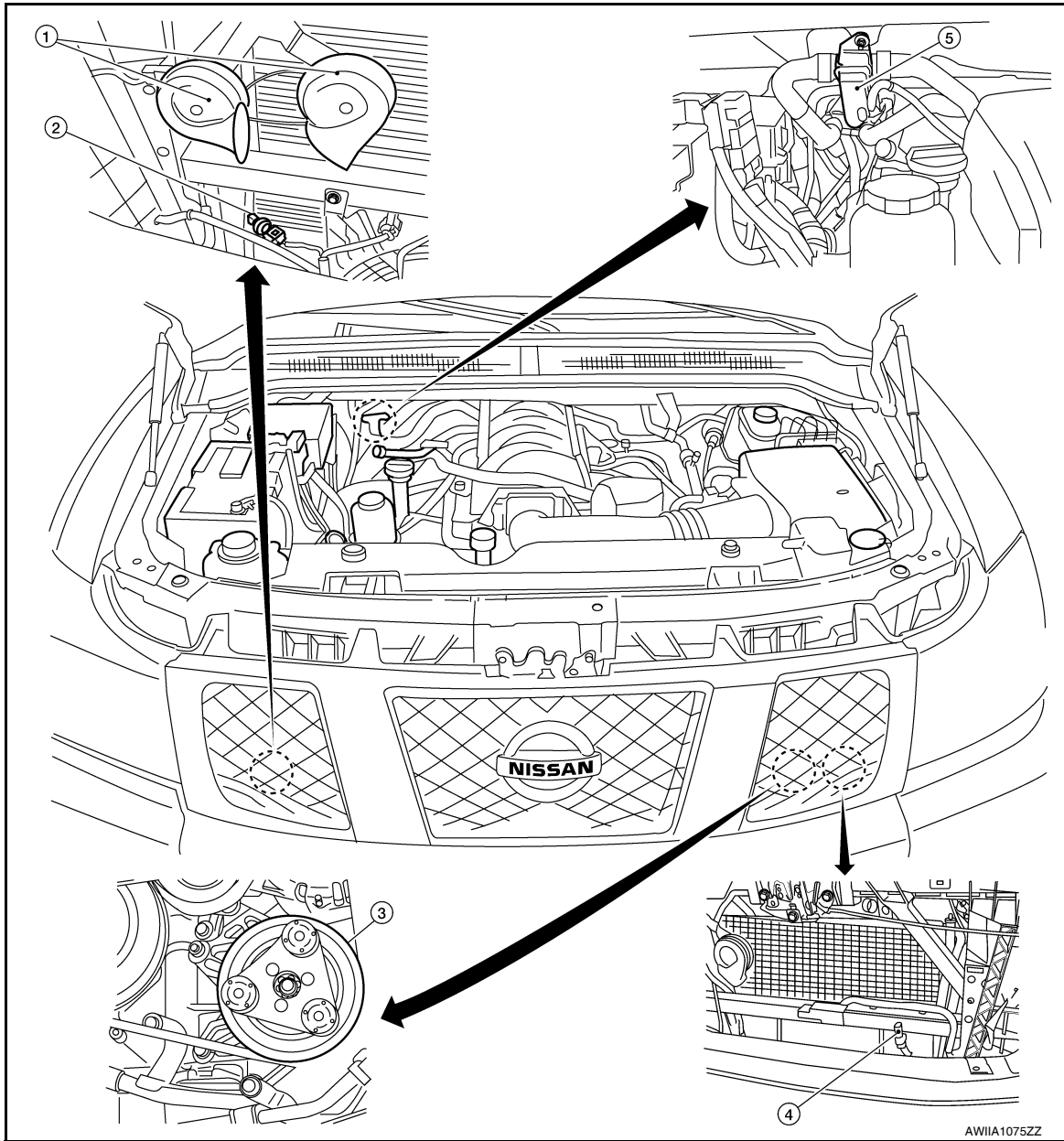
SYSTEM DESCRIPTION

FUNCTION INFORMATION

Component Part Location

INFOID:000000006164672

ENGINE COMPARTMENT



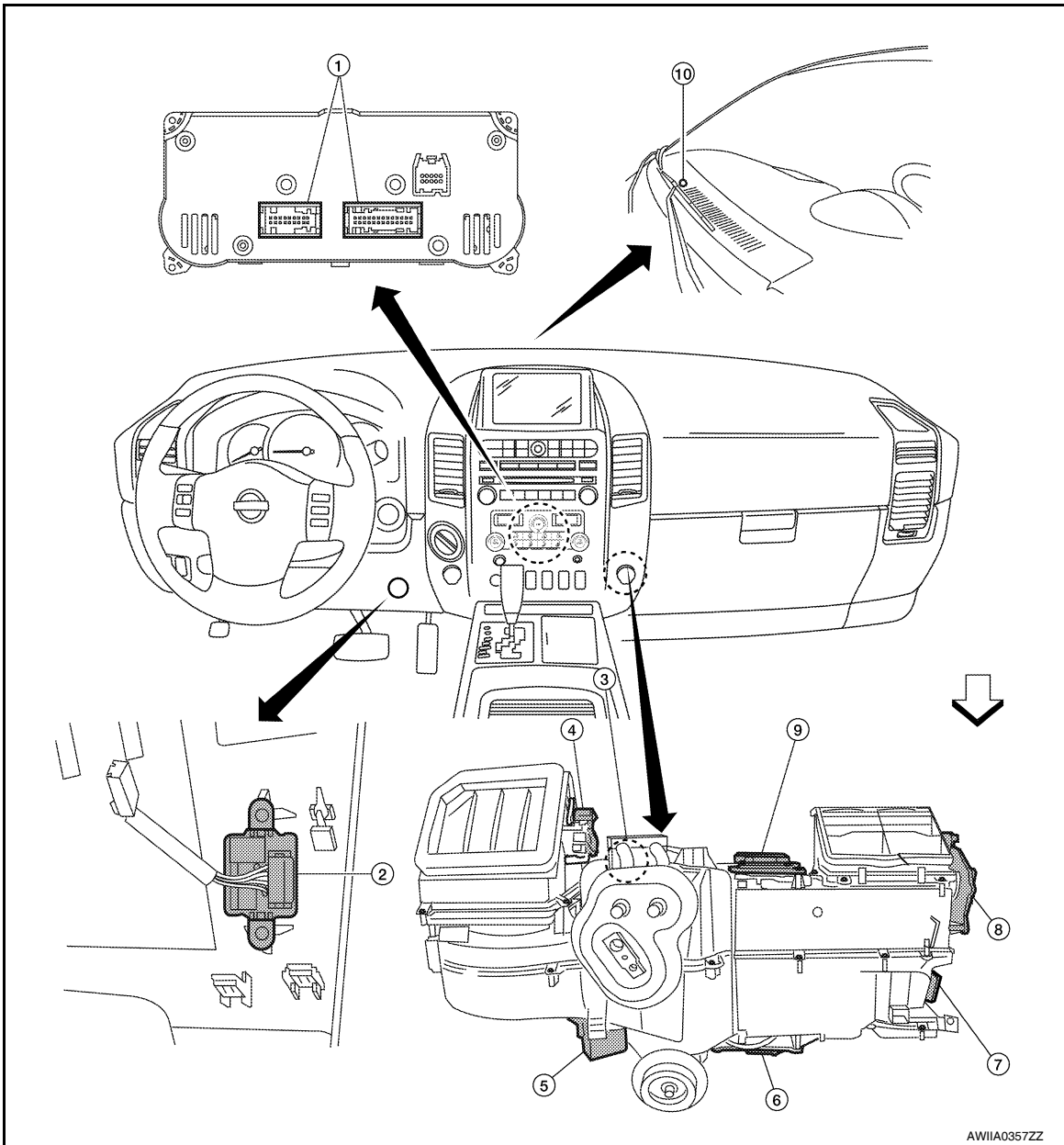
- | | | |
|---|------------------------------------|----------------------|
| 1. Horn (view with grille removed) | 2. Refrigerant pressure sensor E48 | 3. A/C compressor F3 |
| 4. Ambient sensor E1 (view with grille removed) | 5. Water valve F68 | |

FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

PASSENGER COMPARTMENT



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

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

FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Symptom Table

INFOID:000000006164673

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

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:000000006164674

REFRIGERANT FLOW

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

Refrigerant System Protection

INFOID:000000006164675

REFRIGERANT PRESSURE SENSOR

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

PRESSURE RELIEF VALVE

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

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

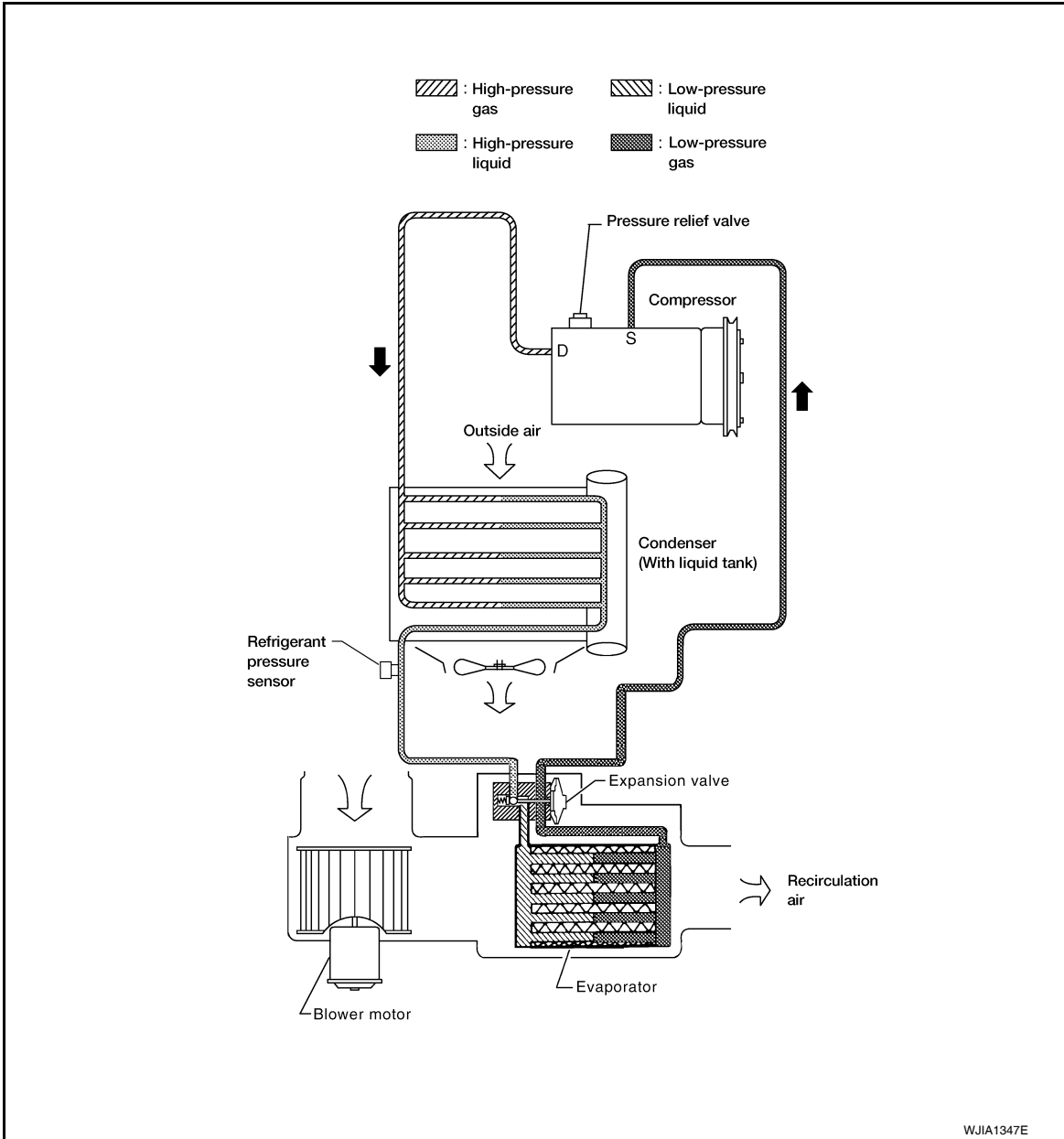
HAC

REFRIGERATION SYSTEM

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

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



AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

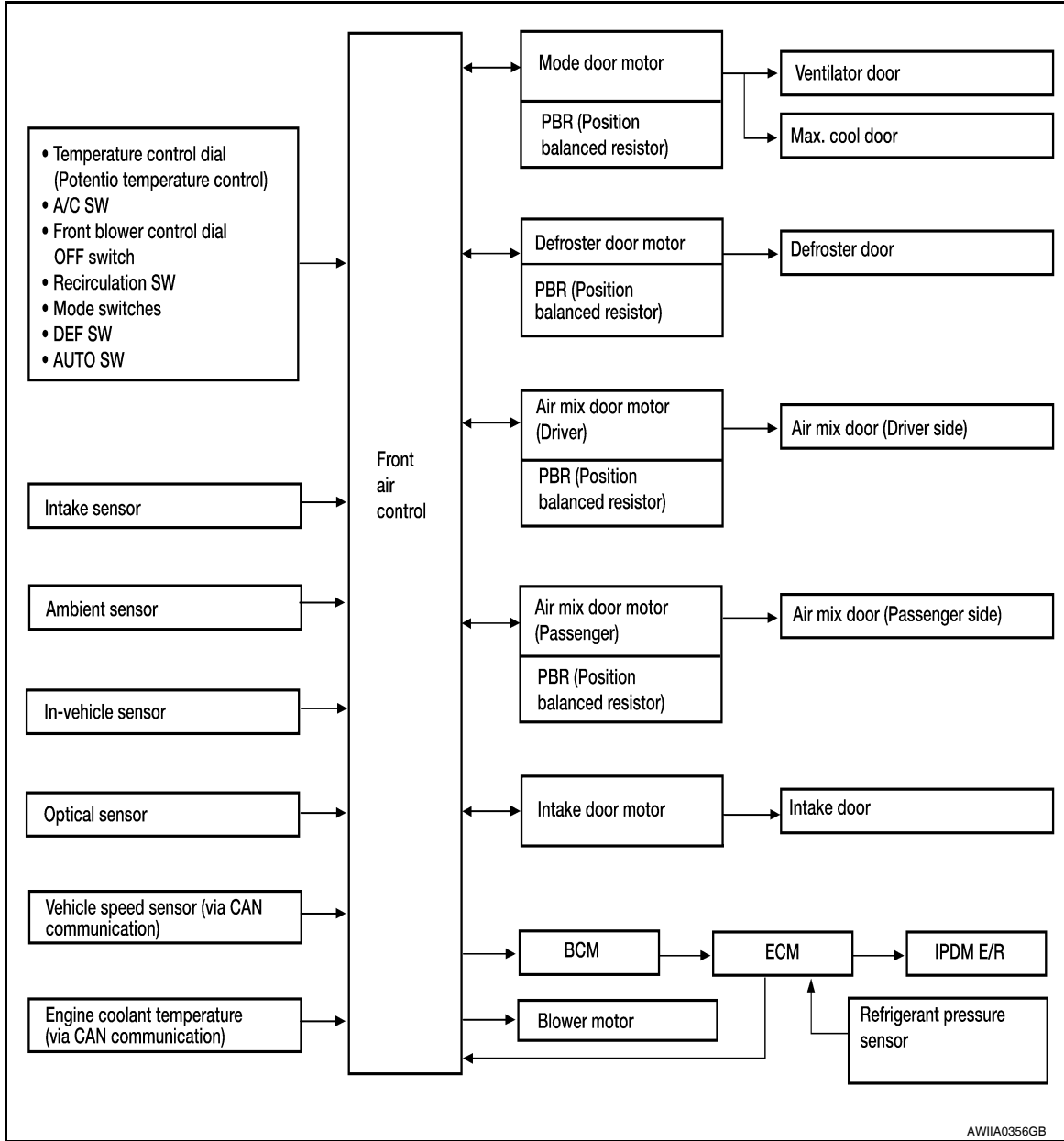
AUTOMATIC AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:000000006164676

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:000000006164677

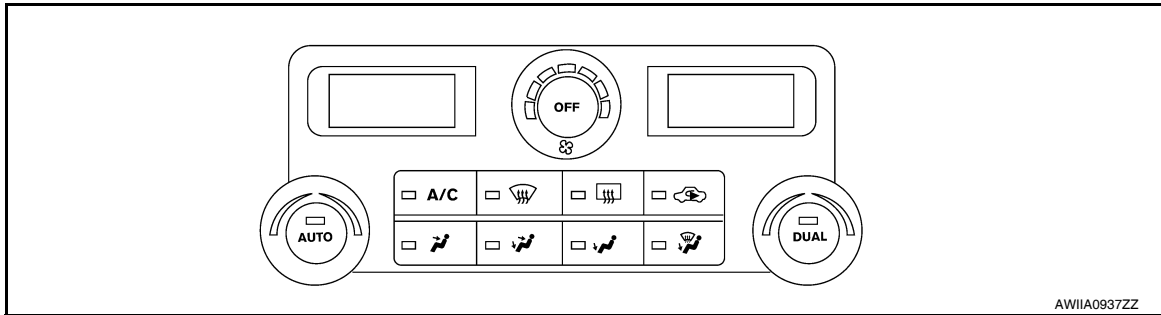
CONTROL OPERATION

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

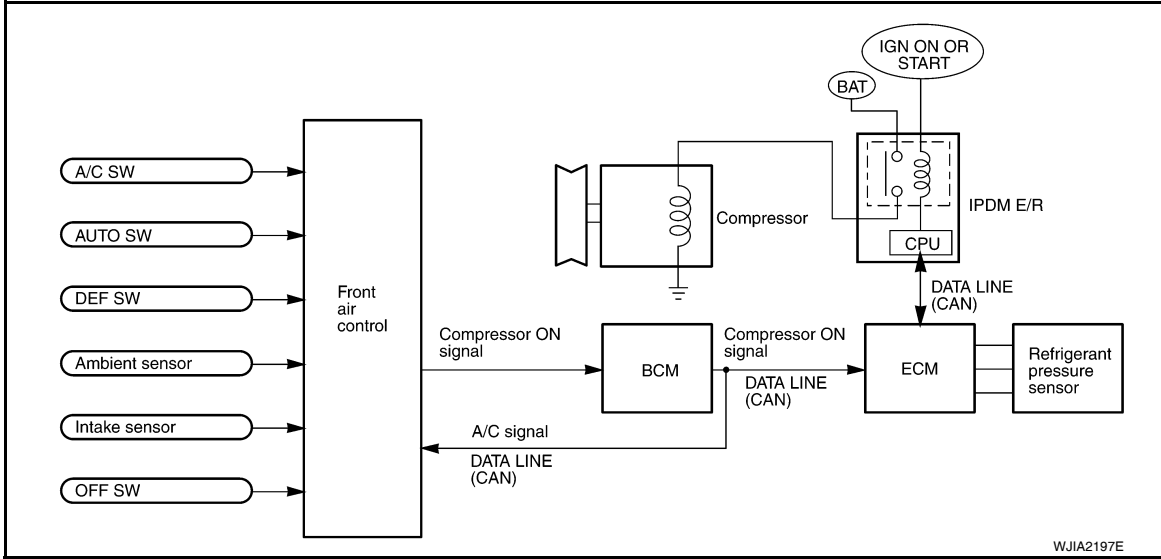
- When the DUAL switch indicator is illuminated, the driver and passenger temperature can each be set independently.
- When the DUAL switch indicator is not illuminated, the driver temperature setting is applied to both sides.

AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH CONTROL

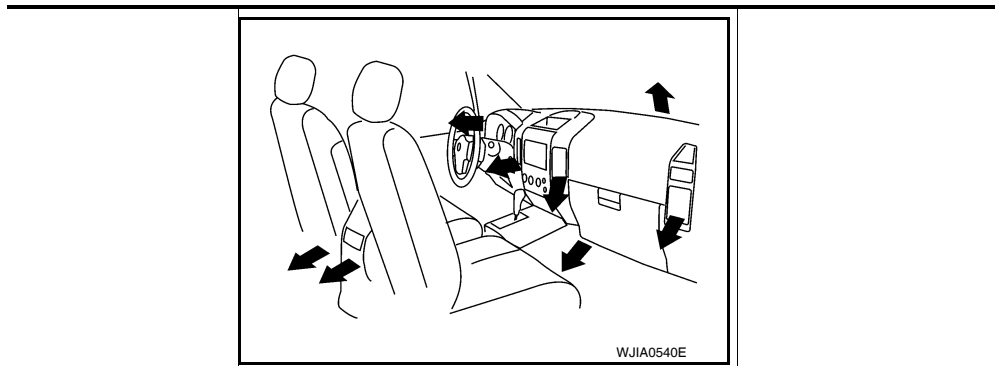


When A/C switch or DEF switch is pressed, front air control inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM and front air control, via CAN communication line. ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant pressure sensor signal, throttle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

Discharge Air Flow

INFOID:000000006164678

HAC



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

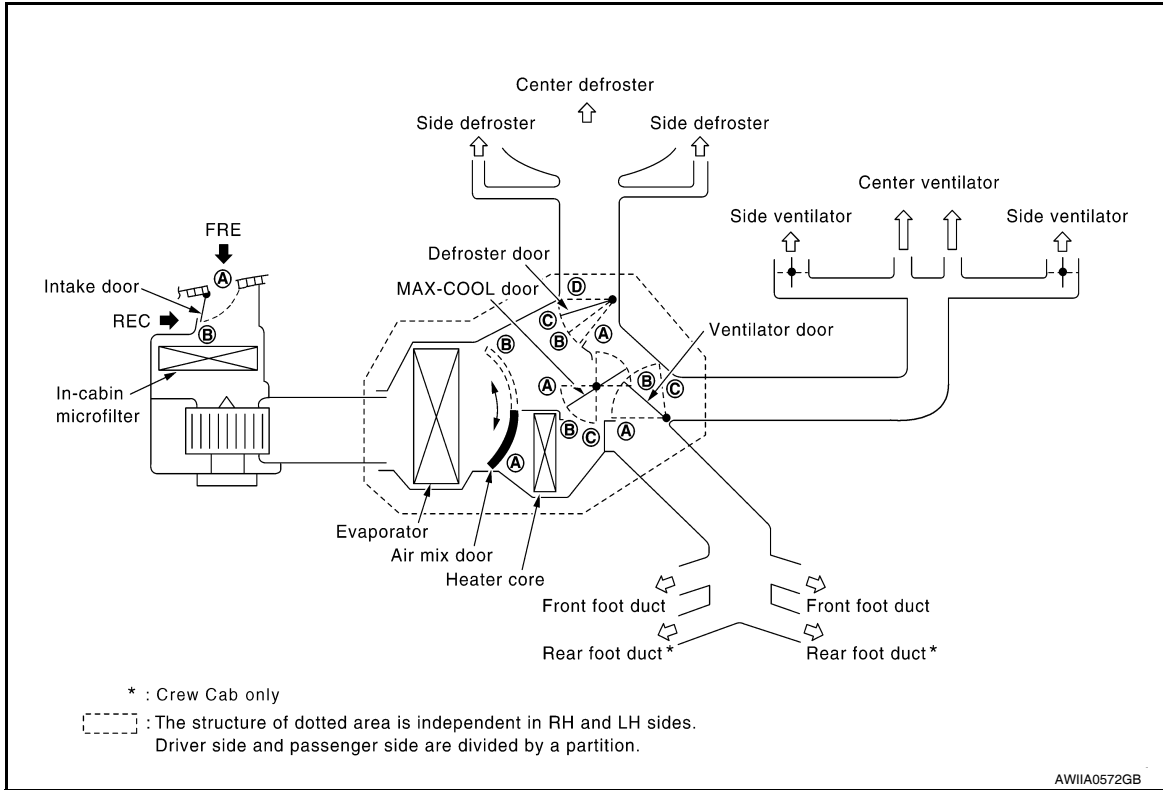
AUTOMATIC AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

Switches And Their Control Function

INFOID:000000006164679



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

AWIIA0359GB

DIAGNOSIS SYSTEM (HVAC)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (HVAC)

CONSULT-III Function (HVAC)

INFOID:000000006164680

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

Diagnostic mode	Description
SELF DIAGNOSTIC RESULT	Displays Front air control self-diagnosis results.
DATA MONITOR	Displays Front air control input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ECU IDENTIFICATION	Front air control part number can be read.

SELF-DIAGNOSIS

Display Item List

DTC	Description	Reference page
B2573	Battery voltage out of range	CHG-4, "Work Flow"
B2578	In-vehicle sensor circuit out of range (low)	HAC-59, "In-Vehicle Sensor Diagnosis Procedure"
B2579	In-vehicle sensor circuit out of range (high)	
B257B	Ambient sensor circuit short	HAC-57, "Ambient Sensor Component Inspection"
B257C	Ambient sensor circuit open	
B257F	Optical sensor (Driver) circuit open or short	HAC-62, "Optical Sensor Diagnosis Procedure"
B2580	Optical sensor (Passenger) circuit open or short	
B2581	Intake sensor circuit short	HAC-65, "Intake Sensor Component Inspection"
B2582	Intake sensor circuit open	
B2587	Stuck button	VTL-8, "Removal and Installation"
U1000	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"

DATA MONITOR

Display Item List

Monitor item	Value	Contents
BATT VIA CAN	"V"	Displays battery voltage signal.
IGN VIA CAN	"ON/OFF"	Displays ignition switch signal.
DVR SUNLD SEN	"w/m2"	Displays optical sensor (driver) signal.
PAS SUNLD SEN	"w/m2"	Displays optical sensor (passenger) signal.
AMB TEMP SEN	"°C"	Displays ambient sensor signal.
EVAP TEMP SEN	"°C"	Displays intake sensor signal.
INCAR TMP SEN	"°C"	Displays in-vehicle sensor signal.
MODE FDBCK	"V"	Displays mode door motor feedback signal.
DVR MIX FDBCK	"V"	Displays air mix door motor (driver) feedback signal.
PAS MIX FDBCK	"V"	Displays air mix door motor (passenger) feedback signal.
DEF FDBCK	"V"	Displays defroster door motor feedback signal.
RECIRC	"ON/OFF"	Displays recirculation switch signal.
DEFROST	"ON/OFF"	Displays defroster switch signal.
AUTO	"ON/OFF"	Displays AUTO switch signal.
A/C	"ON/OFF"	Displays A/C switch signal.

DIAGNOSIS SYSTEM (HVAC)

[AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

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.
MODE SELECT	"DTNT"	Displays selected mode position.
DUAL MODE	"ON/OFF"	Displays dual mode status.
MODE D STATUS	"V"	Displays mode d status signal.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM - COMMON ITEM)

INFOID:000000006625981

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

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

SYSTEM APPLICATION

BCM can perform the following functions.

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

CONSULT-III Function (BCM - AIR CONDITIONER)

INFOID:000000006625982

DATA MONITOR

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

HAC

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

SELF-DIAGNOSIS FUNCTION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:000000006164683




A/C SYSTEM SELF-DIAGNOSIS FUNCTION

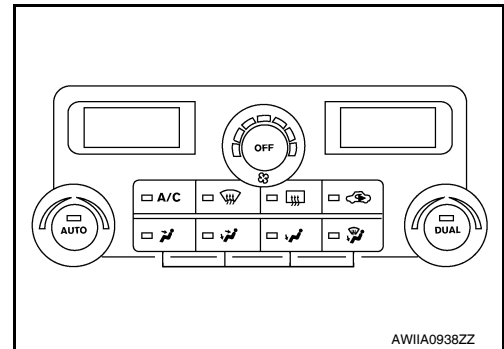
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

DESCRIPTION

The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on front air control. Refer to applicable sections (items) for details. Fault codes (if any are present) will be displayed in the ambient temperature display area. Refer to [HAC-21, "Front Air Control Self-Diagnosis Code Chart"](#).

SELF-DIAGNOSTIC MODE

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



Front Air Control Self-Diagnosis Code Chart

INFOID:000000006164684

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-59, "In-Vehicle Sensor Diagnosis Procedure"
31	In-vehicle sensor circuit out of range (high) HAC-56, "Ambient Sensor Diagnosis Procedure"
40	Ambient sensor circuit short
41	Ambient sensor circuit open
50	Optical sensor (Driver) circuit open or short HAC-62, "Optical Sensor Diagnosis Procedure"
52	Optical sensor (Passenger) circuit open or short
56	Intake sensor circuit short HAC-64, "Intake Sensor Diagnosis Procedure"
57	Intake sensor circuit open
80	CAN bus fault LAN-14, "Trouble Diagnosis Flow Chart"
90	Stuck button VTL-8, "Removal and Installation"

DTC/CIRCUIT DIAGNOSIS

MODE DOOR MOTOR

System Description

INFOID:000000006164685

SYSTEM DESCRIPTION

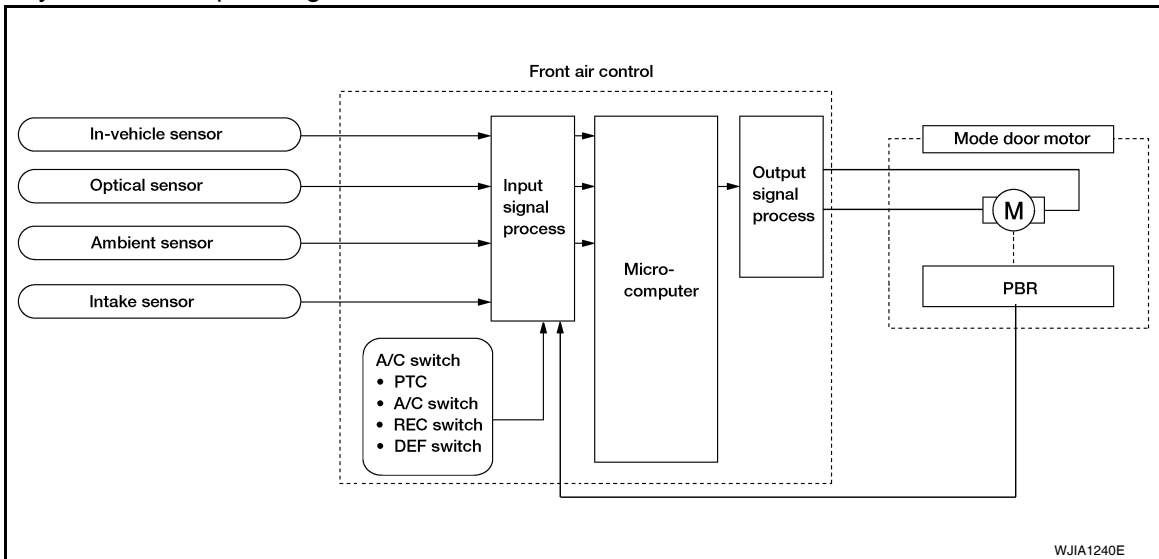
Component Parts

Mode door control system components are:

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

System Operation

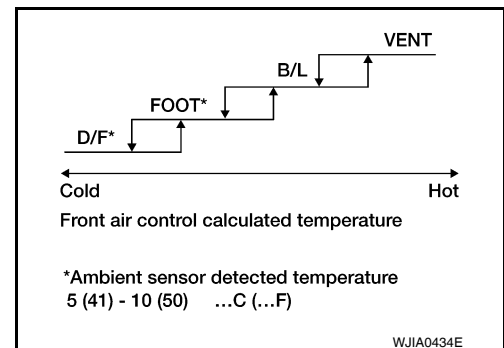
The mode door position (vent, B/L, foot, D/F, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the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



Mode Door Control Specification

COMPONENT DESCRIPTION

Mode Door Motor

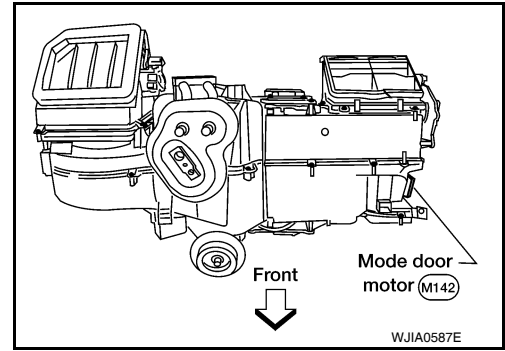


MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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



Mode Door Motor Component Function Check

INFOID:000000006164686

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

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

NOTE:

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-23, "Mode Door Motor Diagnosis Procedure"](#).

Mode Door Motor Diagnosis Procedure

INFOID:000000006708574

HAC

Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

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

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

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

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

Is the inspection result normal?

YES >> • Mode door motor is OK.

• Inspect mode door for mechanical failure. Refer to [VTL-19, "Removal and Installation"](#).

NO >> GO TO 2.

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

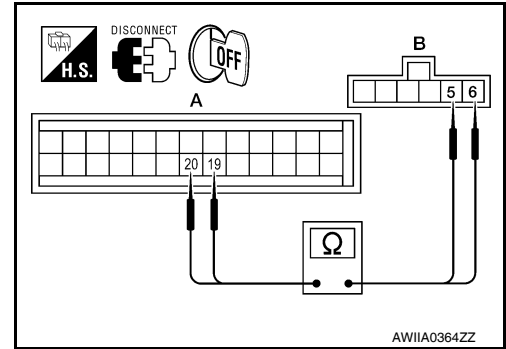
MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

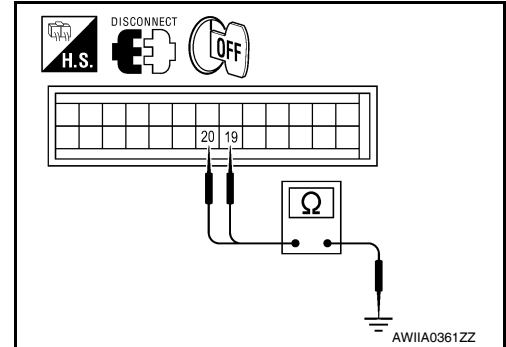
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the mode door motor harness connector M142 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 19, 20 and the mode door motor harness connector M142 (B) terminals 5, 6.

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



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

Connector	Terminal	—	Continuity
M49	19	Ground	No
	20		



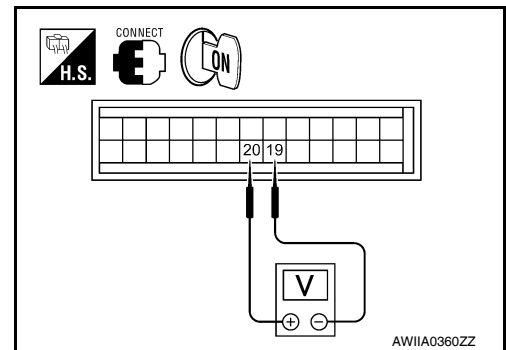
Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the D/F () mode.
4. Check voltage between front air control harness connector M49 terminal 19 and terminal 20 while pressing the mode switch to the VENT (), and then the B/L () mode.

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



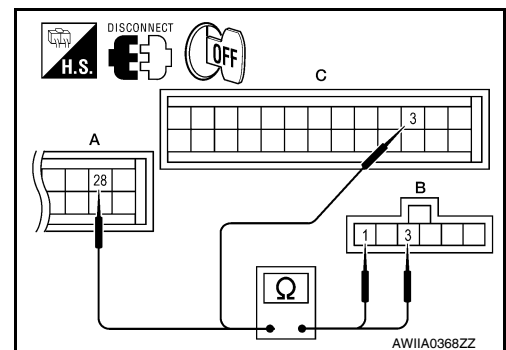
Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M49 (C) terminal 3, and M50 (A) terminal 28 and the mode door motor harness connector M142 (B) terminals 1, 3.

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



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

MODE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

Is the inspection result normal?

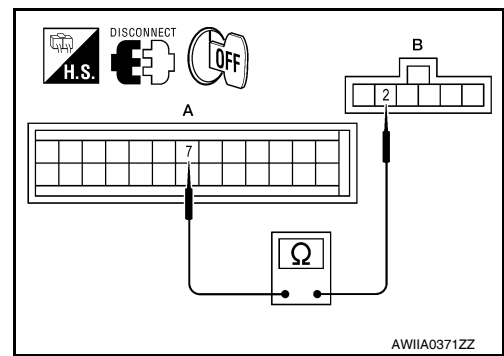
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

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

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



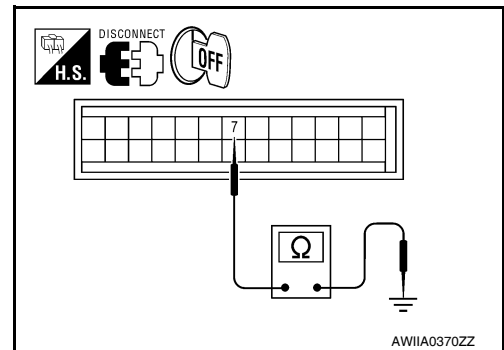
2. Check continuity between front air control harness connector M49 terminal 7 and ground.

Connector	Terminal	—	Continuity
M49	7	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

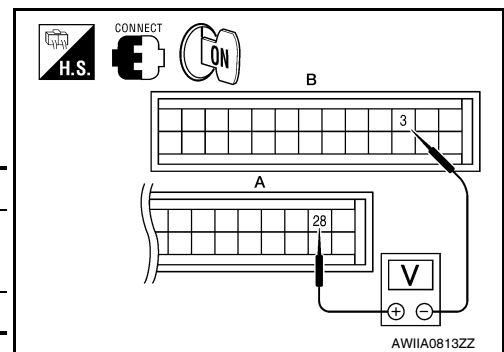
NO >> Repair or replace harness as necessary.



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

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

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



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

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

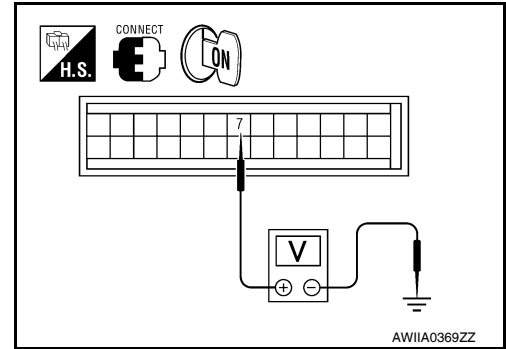
[AUTOMATIC AIR CONDITIONER]

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

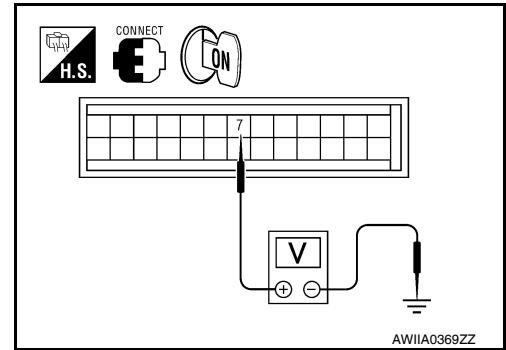
1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M49 terminal 7 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	7	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-19, "Removal and Installation"](#).



AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

AIR MIX DOOR MOTOR

System Description

INFOID:000000006164688

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

Air mix door control system components are:

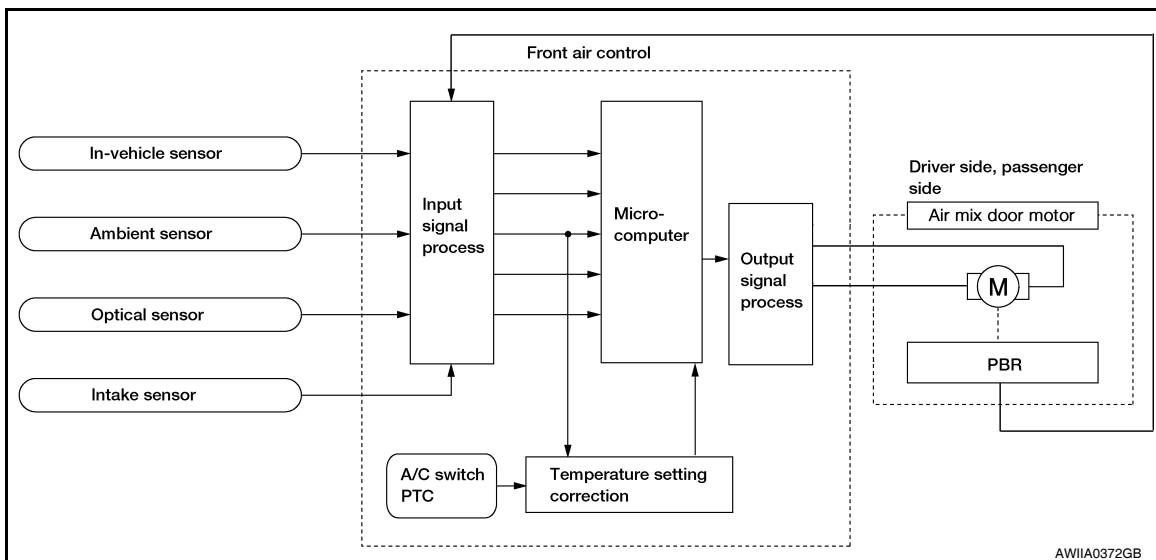
- Front air control
- Air mix door motors (driver, passenger)
- PBR (built-into air mix door motors)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

System Operation

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

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

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

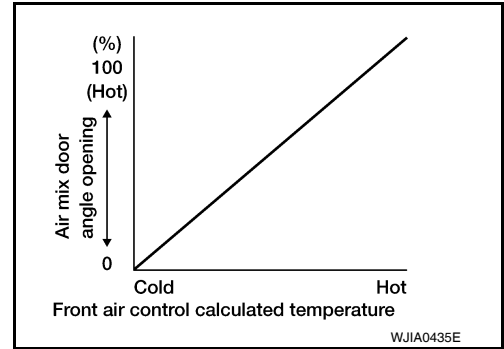


AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

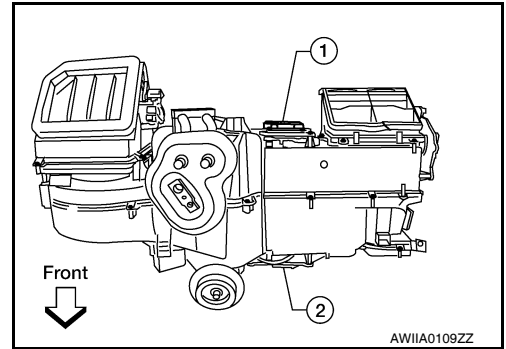
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motors

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



Air Mix Door Motor (Driver) Component Function Check

INFOID:000000006164689

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

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

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can a symptom be duplicated?

- YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to [HAC-28. "Air Mix Door Motor \(Driver\) Diagnosis Procedure"](#).

Air Mix Door Motor (Driver) Diagnosis Procedure

INFOID:000000006708575

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

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

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

1. Turn ignition switch ON.

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

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

Is the inspection result normal?

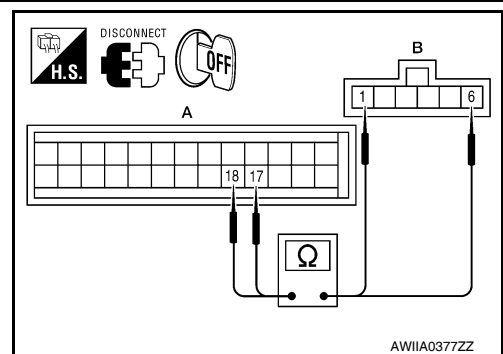
- YES >> • Air mix door motor (driver) is OK.
 • Inspect air mix door (driver) for mechanical failure and repair if necessary. If air mix door (driver) is OK, refer to [HAC-83, "Component Function Check"](#) for insufficient cooling or [HAC-91, "Component Function Check"](#) for insufficient heating.

NO >> GO TO 2.

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

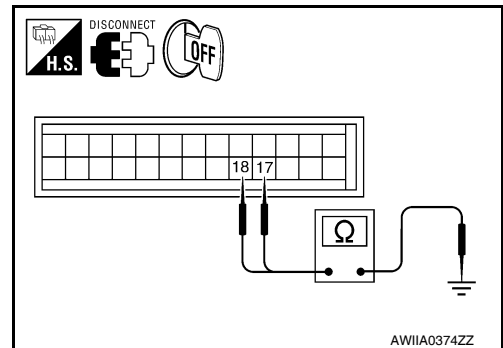
- Turn ignition switch OFF.
- Disconnect the front air control harness connector M49 (A) and the air mix door motor (driver) harness connector M147 (B).
- Check continuity between front air control harness connector M49 (A) terminals 17, 18 and the air mix door motor (driver) harness connector M147 (B)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

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



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

Connector	Terminal	—	Continuity
M49	17	Ground	No
	18		



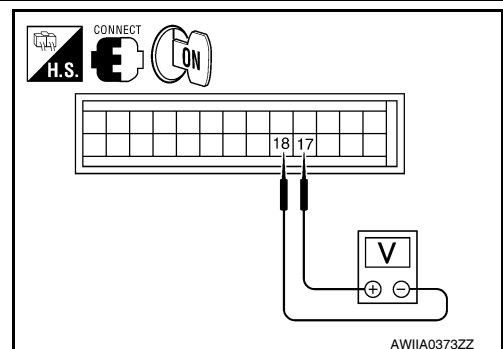
Is the inspection result normal?

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

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

- Reconnect front air control harness connector.
- Turn ignition switch ON.
- Rotate temperature control dial (driver) to 32°C (90°F).
- Check voltage between front air control harness connector M49 terminal 17 and terminal 18 while rotating temperature control dial (driver) to 18°C (60°F) and back to 32°C (90°F).

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



Is the inspection result normal?

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

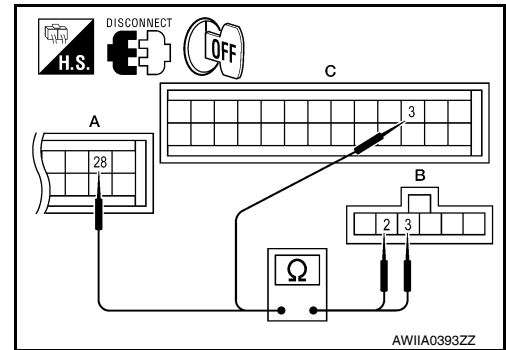
< DTC/CIRCUIT DIAGNOSIS >

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

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

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

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



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

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

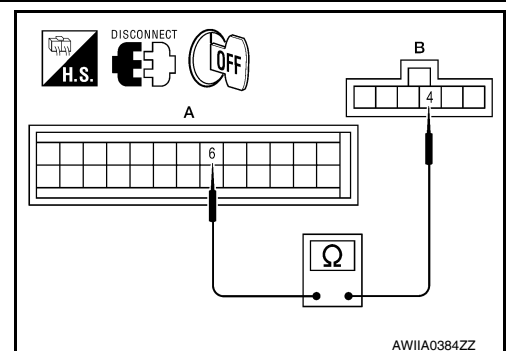
Is the inspection result normal?

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

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

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

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

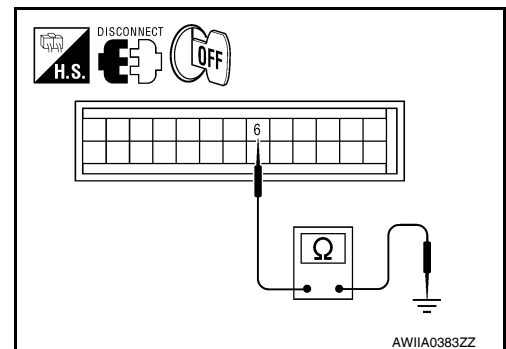


2. Check continuity between front air control harness connector M49 terminal 6 and ground.

Connector	Terminal	—	Continuity
M49	6	Ground	No

Is the inspection result normal?

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



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

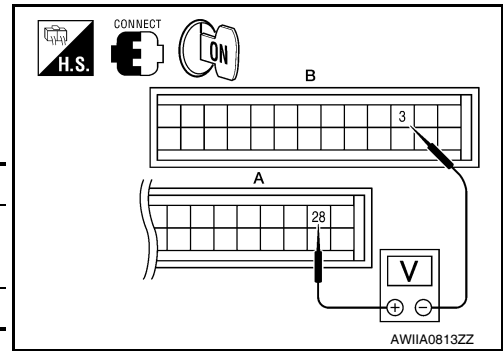
AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

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



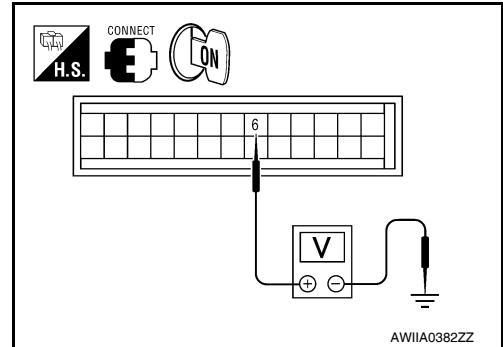
4. Check voltage between front air control harness connector M49 terminal 6 and ground.

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

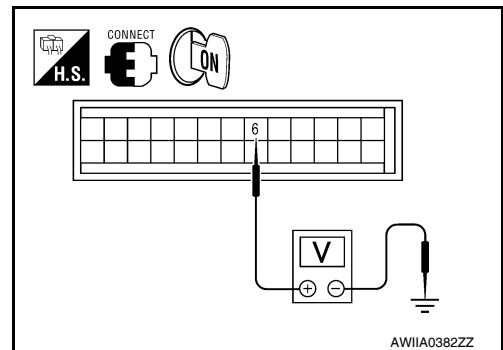
1. Reconnect the air mix door motor (driver) harness connector M147.
2. Check voltage between front air control harness connector M49 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M49	6	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect air mix door (driver) for binding or mechanical failure. If air mix door (driver) moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

NO >> Replace air mix door motor (driver). Refer to [VTL-20. "Removal and Installation"](#).



Air Mix Door Motor (Passenger) Component Function Check

INFOID:000000006164691

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

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

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can a symptom be duplicated?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-32. "Air Mix Door Motor \(Passenger\) Diagnosis Procedure"](#).

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Air Mix Door Motor (Passenger) Diagnosis Procedure

INFOID:000000006708576

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

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

DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (PASSENGER)

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

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

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

Is the inspection result normal?

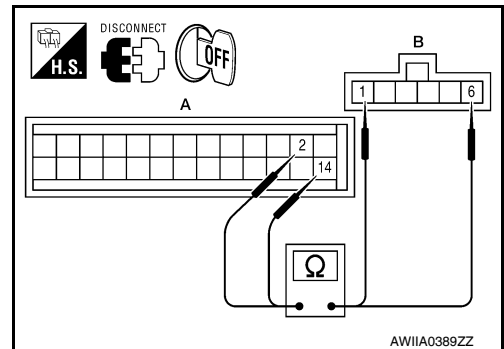
- YES >> • Air mix door motor (passenger) is OK.
 • Inspect air mix door (passenger) for mechanical failure and repair if necessary. If air mix door (passenger) is OK, refer to [HAC-83. "Component Function Check"](#) for insufficient cooling or [HAC-91. "Component Function Check"](#) for insufficient heating.

NO >> GO TO 2.

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

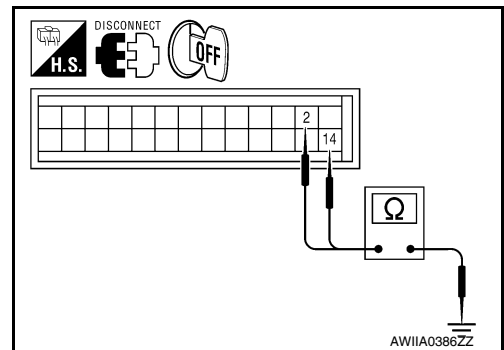
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M49 (A) and the air mix door motor (passenger) harness connector M143 (B).
3. Check continuity between front air control harness connector M49 (A) terminals 2, 14 and the air mix door motor (passenger) harness connector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

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



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

Connector	Terminal	—	Continuity
M49	14	Ground	No
	2		



Is the inspection result normal?

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

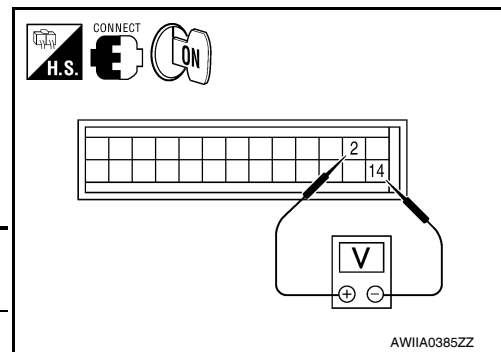
3. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR (PASSENGER) POWER AND GROUND

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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



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

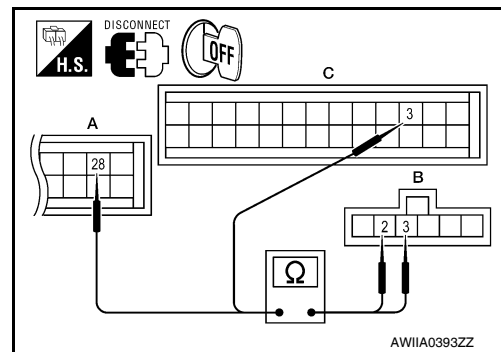
Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace front air control Refer to [VTL-8. "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M49 (C) terminal 3 and M50 (A) terminal 28 and air mix door motor (passenger) harness connector M143 (B) terminals 2, 3.



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

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

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

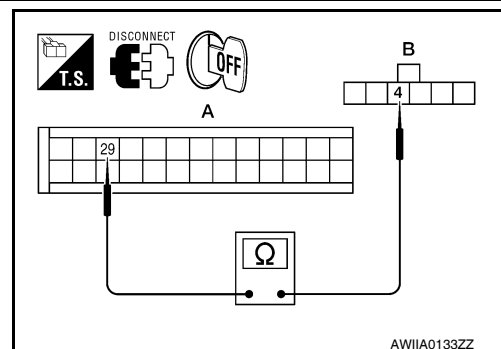
Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

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



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

AIR MIX DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

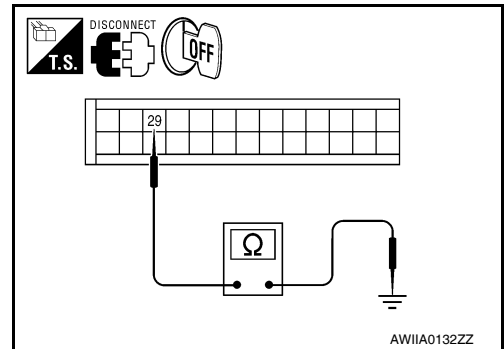
< DTC/CIRCUIT DIAGNOSIS >

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

Connector	Terminal	—	Continuity
M50	29	Ground	No

Is the inspection result normal?

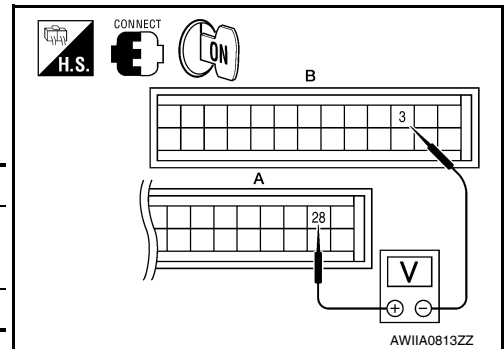
- YES >> GO TO 6.
 NO >> Repair or replace harness as necessary.



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

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

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

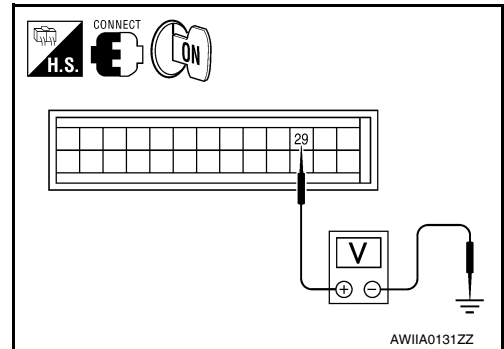


- Check voltage between front air control harness connector M50 terminal 29 and ground.

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

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



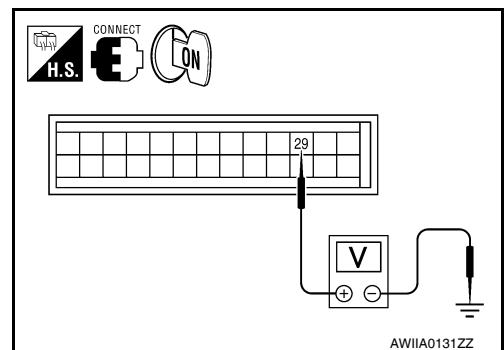
7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

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

Connector	Terminal	—	Voltage (Approx.)
M50	29	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect air mix door (passenger) for binding or mechanical failure. If air mix door (passenger) moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
 NO >> Replace the air mix door motor (passenger). Refer to [VTL-20. "Removal and Installation"](#).



INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

INTAKE DOOR MOTOR

System Description

INFOID:000000006164693

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

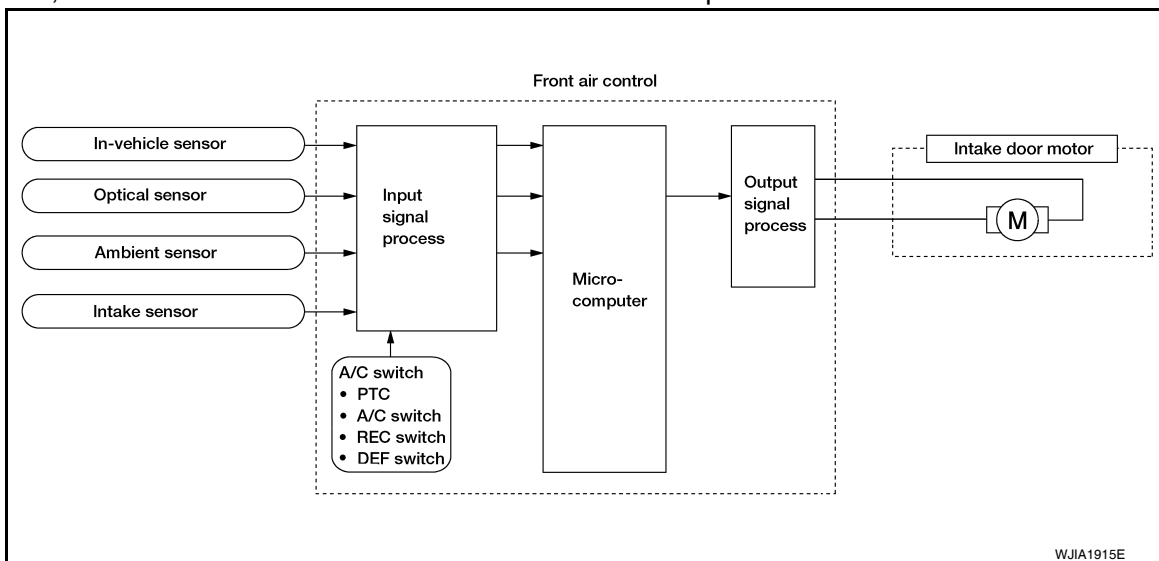
Intake door control system components are:

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

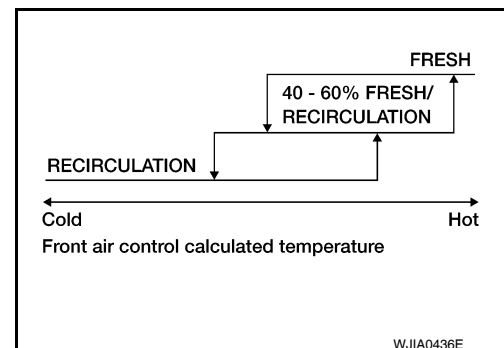
System Operation

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

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



Intake Door Control Specification



COMPONENT DESCRIPTION

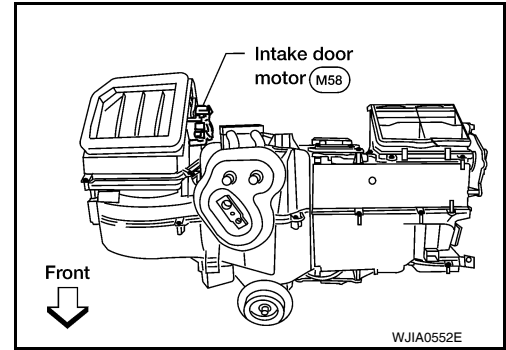
INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Intake door motor

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








INFOID:000000006164694

Intake Door Motor Component Function Check

INSPECTION FLOW

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

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-36. "Intake Door Motor Diagnosis Procedure"](#).

Intake Door Motor Diagnosis Procedure

INFOID:000000006708577

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

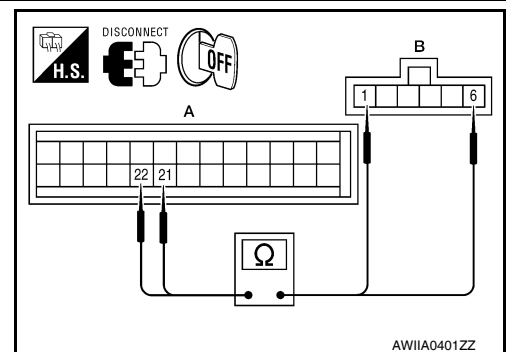
- Intake door does not change.
- Intake door motor does not operate normally.

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

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

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

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



INTAKE DOOR MOTOR

[AUTOMATIC AIR CONDITIONER]

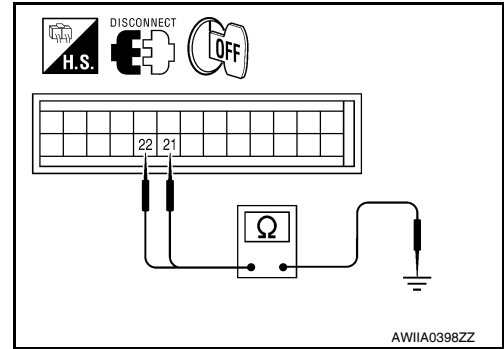
< DTC/CIRCUIT DIAGNOSIS >

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

Connector	Terminal	—	Continuity
M49	21	Ground	No
	22		

Is the inspection result normal?

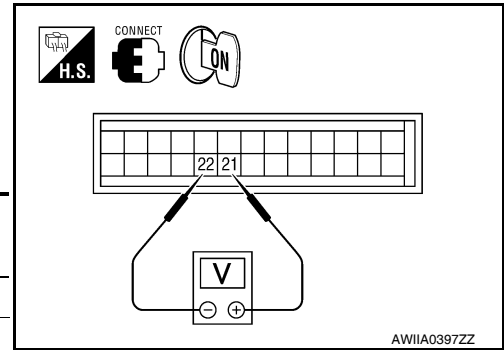
- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.



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

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

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M49	21	22	Self-diagnostic mode (opening)	Battery voltage
	22	21	Self-diagnostic mode (closing)	Battery voltage



Is the inspection result normal?

- YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-18. "Removal and Installation"](#).
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

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

HAC

DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:000000006164696

SYSTEM DESCRIPTION

Component Parts

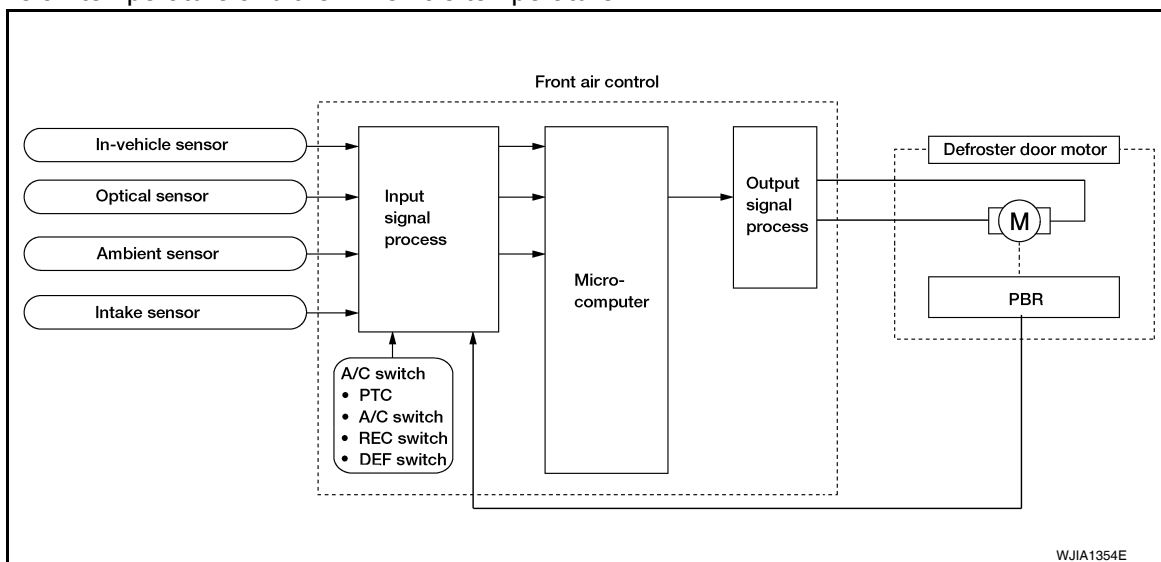
Defroster door control system components are:

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

System Operation

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

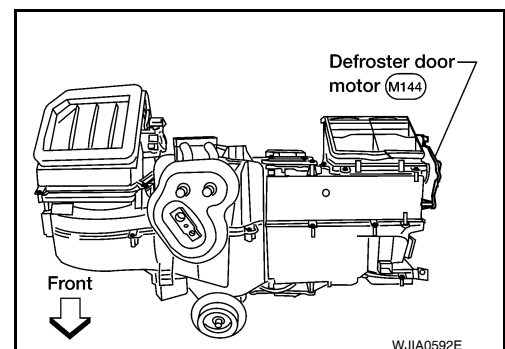
In the AUTO mode, the front air control determines defroster door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature.



COMPONENT DESCRIPTION

Defroster door motor

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



Defroster Door Motor Component Function Check

INFOID:000000006164697



INSPECTION FLOW

DEFROSTER DOOR MOTOR CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-39. "Defroster Door Motor Diagnosis Procedure"](#).

Defroster Door Motor Diagnosis Procedure

INFOID:000000006708578






Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM:

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

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

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

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

Is the inspection result normal?

YES >> • Defroster door motor is OK.

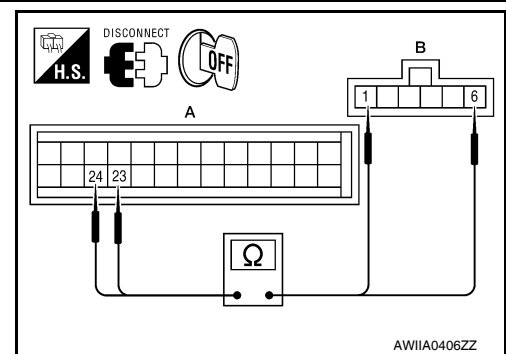
• Inspect defroster door for mechanical failure. Refer to [VTL-17. "Removal and Installation"](#).

NO >> GO TO 2.

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

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

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



DEFROSTER DOOR MOTOR CIRCUIT

[AUTOMATIC AIR CONDITIONER]

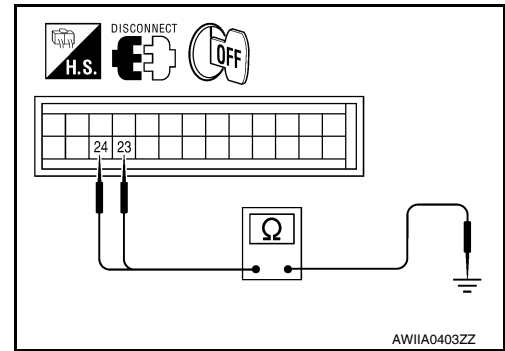
< DTC/CIRCUIT DIAGNOSIS >

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

Connector	Terminal	—	Continuity
M49	23	Ground	No
	24		

Is the inspection result normal?

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



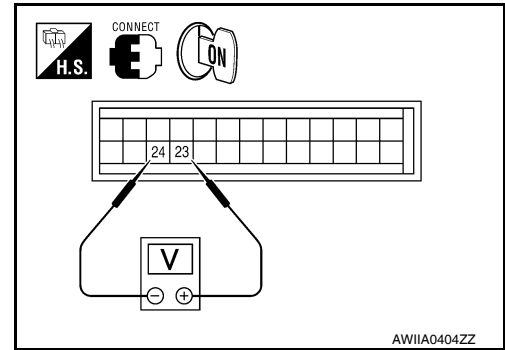
3. CHECK FRONT AIR CONTROL FOR DEFROSTER DOOR MOTOR POWER AND GROUND

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

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

Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



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

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

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

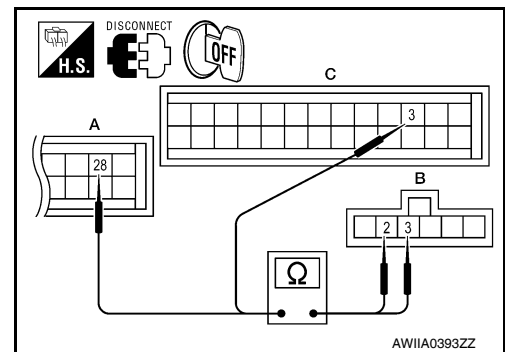
- Check continuity between front air control harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

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

Is the inspection result normal?

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

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



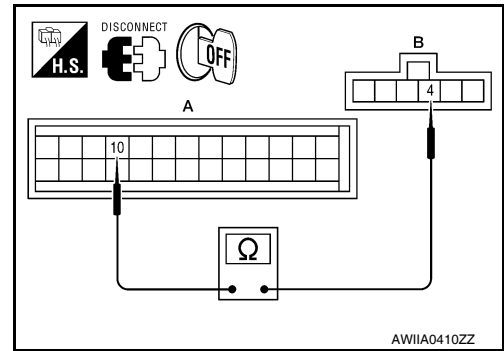
DEFROSTER DOOR MOTOR CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

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

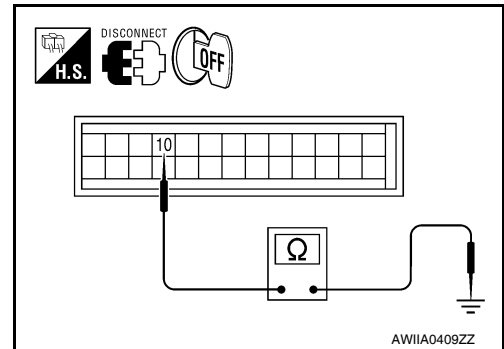


2. Check continuity between front air control harness connector M49 terminal 10 and ground.

Connector	Terminal	—	Continuity
M49	10	Ground	No

Is the inspection result normal?

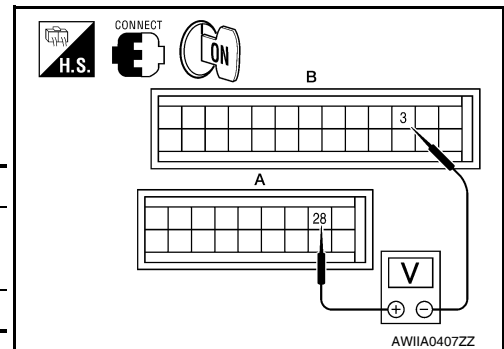
- YES >> GO TO 6.
 NO >> Repair or replace harness as necessary.



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

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

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

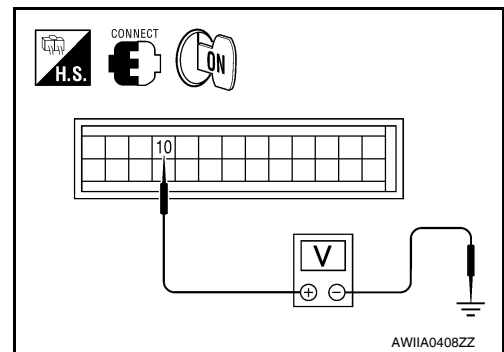


4. Check voltage between front air control harness connector M49 terminal 10 and ground.

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

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

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

DEFROSTER DOOR MOTOR CIRCUIT

[AUTOMATIC AIR CONDITIONER]

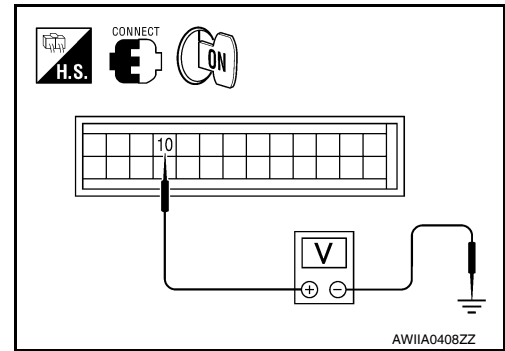
< DTC/CIRCUIT DIAGNOSIS >

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

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

Is the inspection result normal?

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



BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

BLOWER MOTOR CONTROL SYSTEM

System Description

INFOID:000000006164699

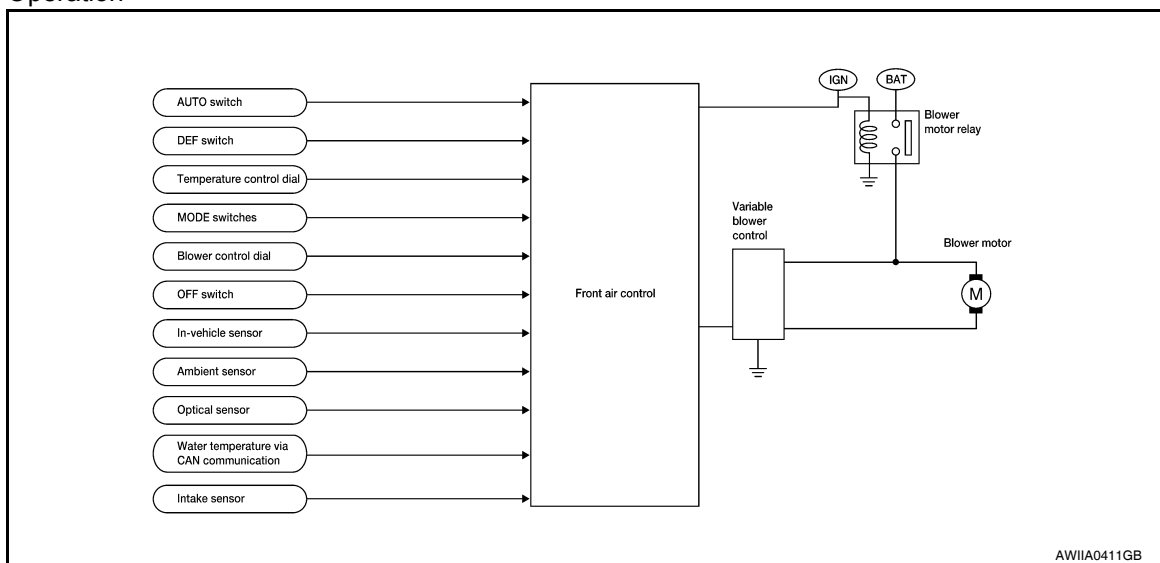
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

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

System Operation



Automatic Mode

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

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

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

Starting Blower Speed Control

Start up from cold soak condition (Automatic mode).

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

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

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

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

Blower Speed Compensation - Sunload

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

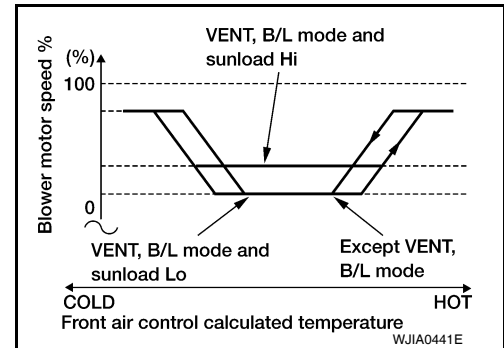
BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

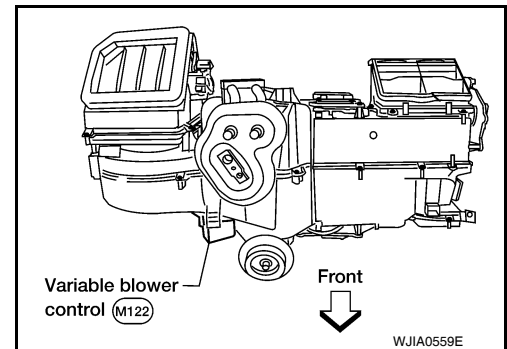
Blower Speed Control Specification



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control 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:000000006164700

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-44, "Front Blower Motor Diagnosis Procedure"](#).

Front Blower Motor Diagnosis Procedure

INFOID:000000006164701

Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

SYMPTOM: Blower motor operation is malfunctioning.

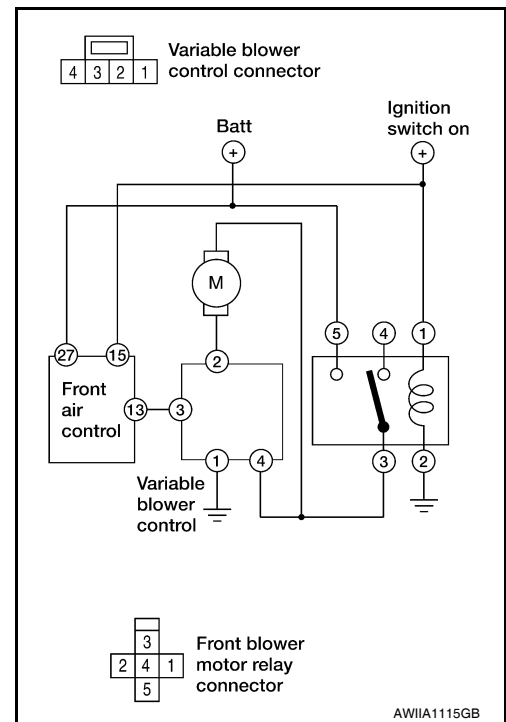
DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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



1. CHECK FUSES

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to [PG-73](#). ["Terminal Arrangement"](#).

Fuses are good.

Is the inspection result normal?

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

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT

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

2 - Ground : Battery voltage

Is the inspection result normal?

- YES >> GO TO 11.
- NO >> GO TO 3.

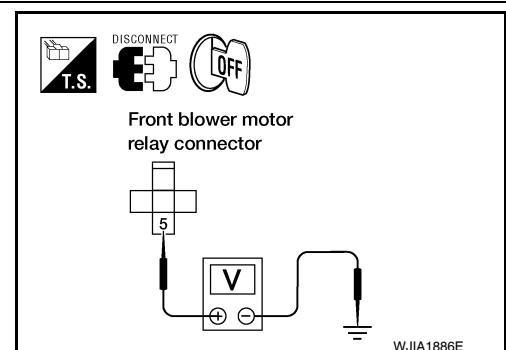
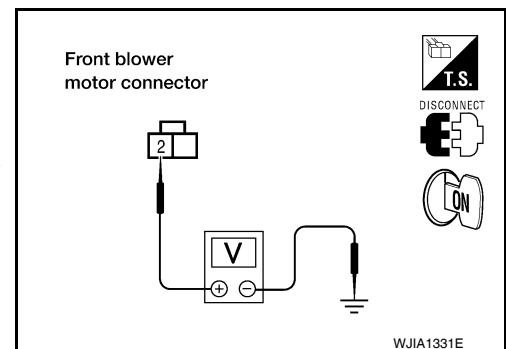
3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

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

5 - Ground : Battery voltage

Is the inspection result normal?

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



BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to [HAC-48, "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Replace front blower motor relay.

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

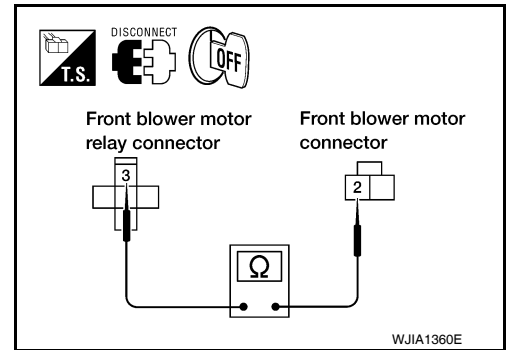
Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.



6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

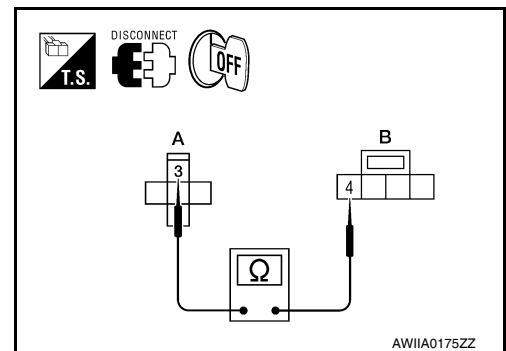
1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M122 (B) terminal 4.

3 - 4 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.



7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

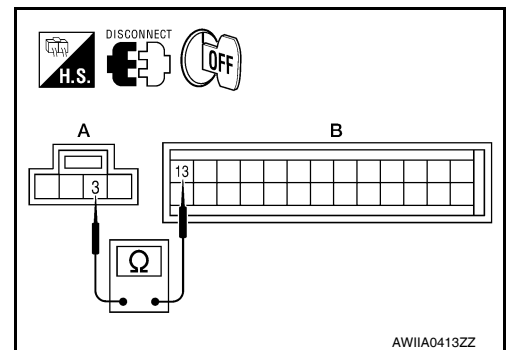
1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

13 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.



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

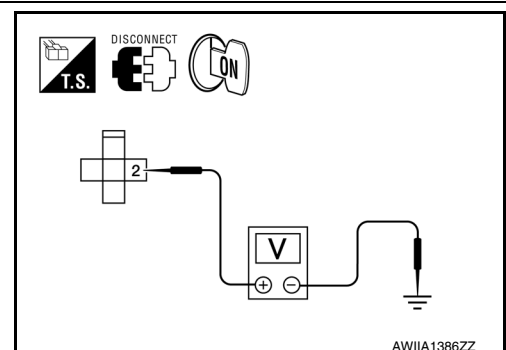
1. Turn ignition switch ON.
2. Check voltage between front blower motor relay harness connector M107 terminal 2 and ground.

2 - Ground : Battery voltage

Is the inspection result normal?

YES >> GO TO 9.

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



BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

9. REPLACE FUSES

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

Does the fuse blow?

- YES >> GO TO 10.
NO >> Inspection End.

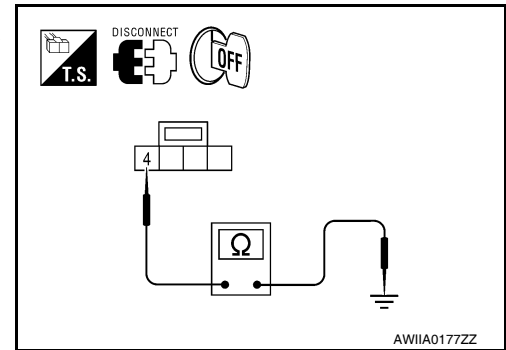
10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector and variable blower control connector.
3. Check continuity between variable blower control harness connector M122 terminal 4 and ground.

4 - Ground : Continuity should not exist.

Is the inspection result normal?

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



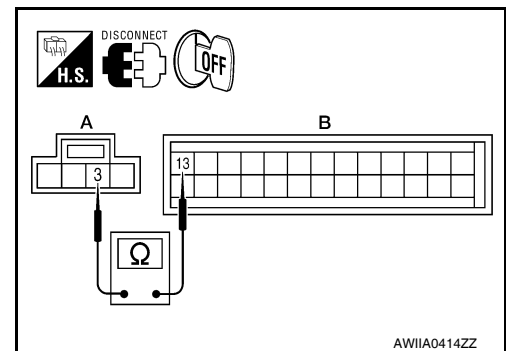
11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

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

13 - 3 : Continuity should exist.

Is the inspection result normal?

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



12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-48. "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 13.
NO >> Replace front blower motor. Refer to [VTL-12. "Removal and Installation"](#).

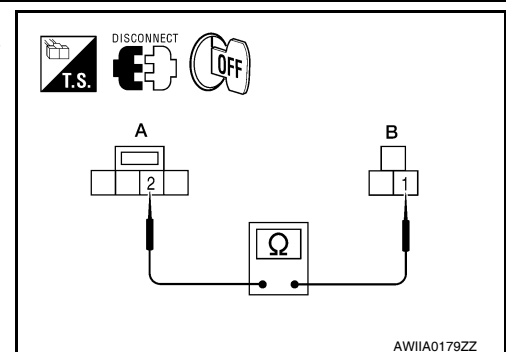
13. CHECK BLOWER MOTOR GROUND CIRCUIT

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

1 - 2 : Continuity should exist.

Is the inspection result normal?

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



14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

BLOWER MOTOR CONTROL SYSTEM

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

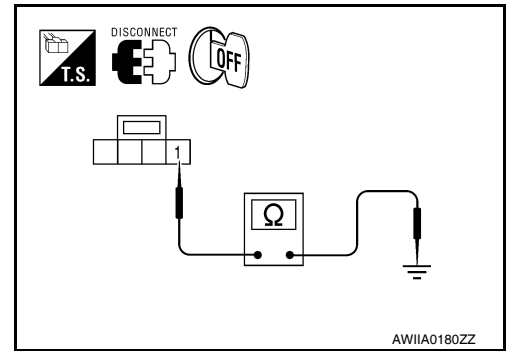
Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-22](#), "[Removal and Installation](#)".

NO >> Repair harness or connector.

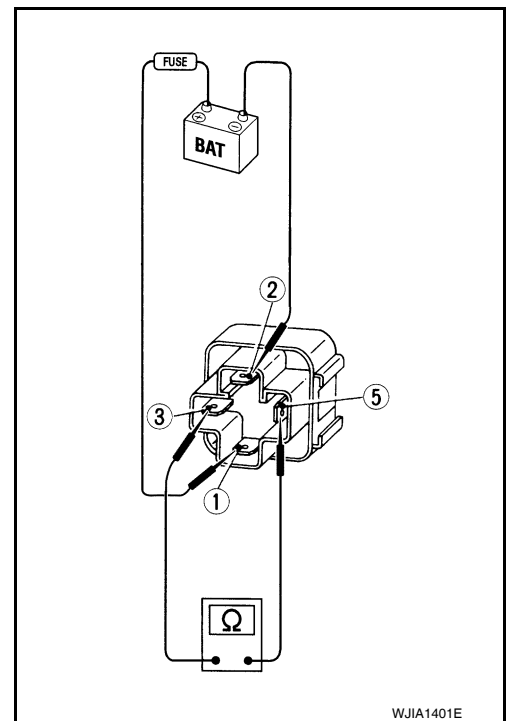


INFOID:000000006164702

Front Blower Motor Component Inspection

COMPONENT INSPECTION

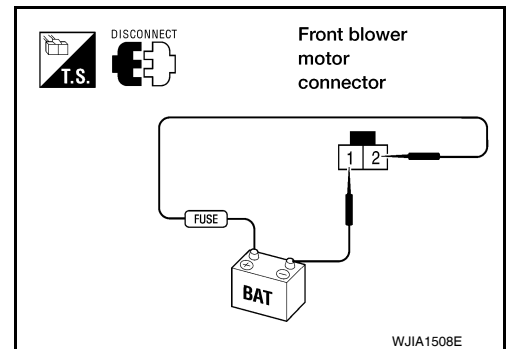
Check continuity between terminals 3, and 5 by supplying 12 volts and ground to coil side terminals 1 and 2 of relay.



Front Blower Motor

Confirm smooth rotation of the blower motor.

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



MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MAGNET CLUTCH

System Description

INFOID:000000006164703

SYSTEM DESCRIPTION

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

Low Temperature Protection Control

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

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


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

Magnet Clutch Component Function Check

INFOID:000000006164704

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-49, "Magnet Clutch Diagnosis Procedure"](#).

Magnet Clutch Diagnosis Procedure

INFOID:000000006708579

Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

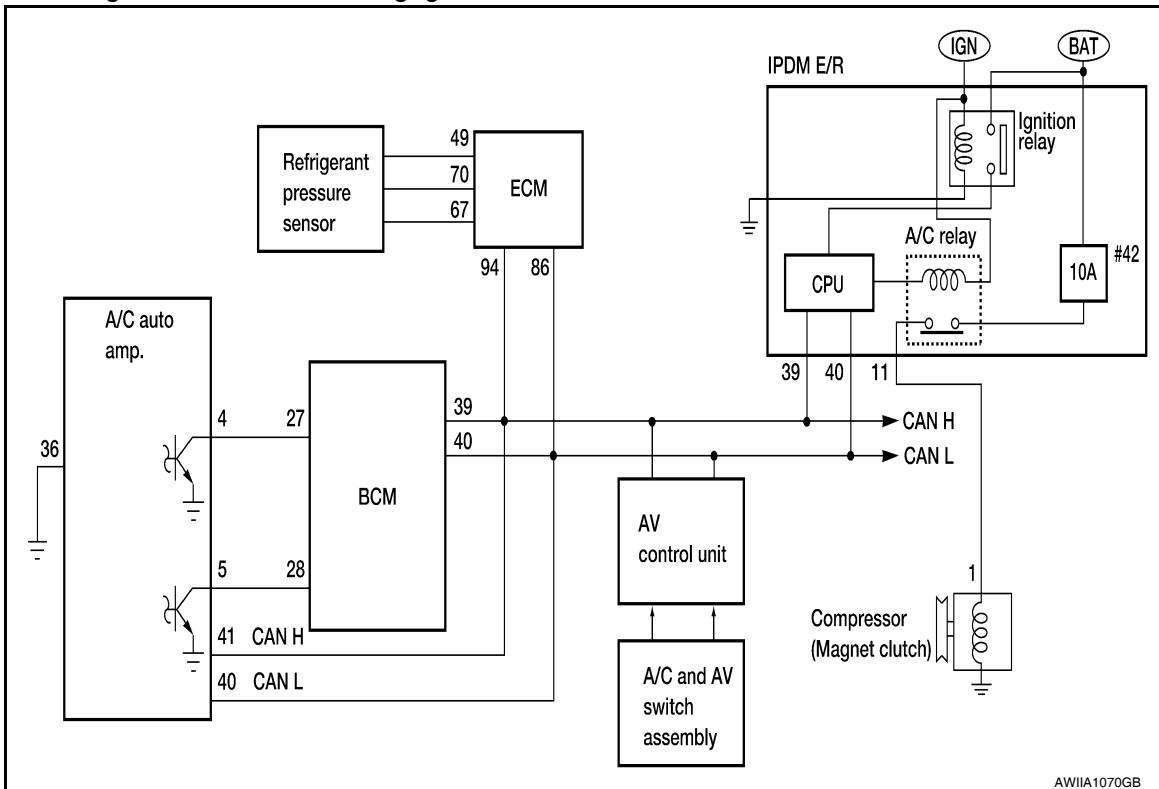
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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



1. CHECK INTAKE AND AMBIENT SENSOR CIRCUITS

Check intake and ambient sensors. Refer to [HAC-21, "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2. PERFORM AUTO ACTIVE TEST

Refer to [PCS-11, "Diagnosis Description"](#).

Does magnet clutch operate?

- YES >> • WITH CONSULT-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 IPDM E/R AND COMPRESSOR

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

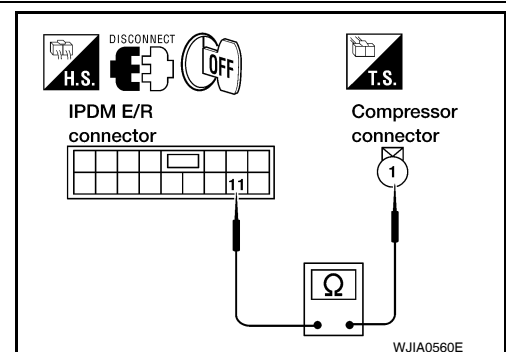
11 – 1 : Continuity should exist.

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

11 – ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 4.



WJIA0560E

MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair harness or connector.

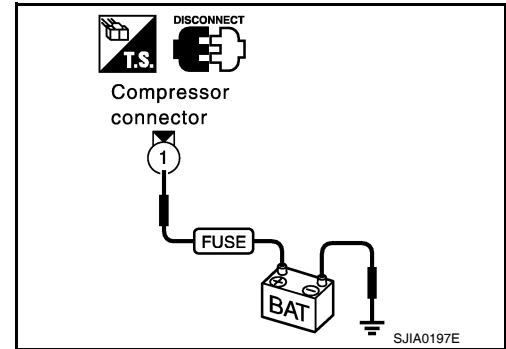
4. CHECK MAGNET CLUTCH CIRCUIT

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

Is the inspection result normal?

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

NO >> Replace magnet clutch. Refer to [HA-33, "Removal and Installation for Compressor Clutch"](#).



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

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

A/C SWITCH ON

:AIR COND SW ON

A/C SWITCH OFF

:AIR COND SW OFF

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

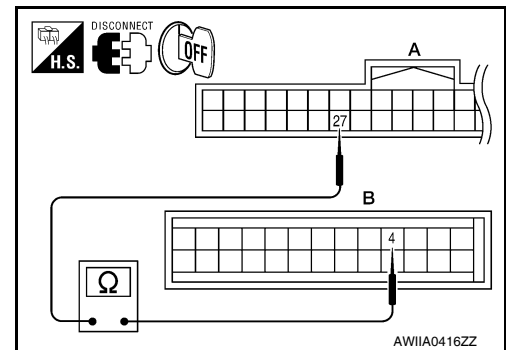
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- 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.

27 - 4 Continuity should exist.

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

27 - ground Continuity should not exist.



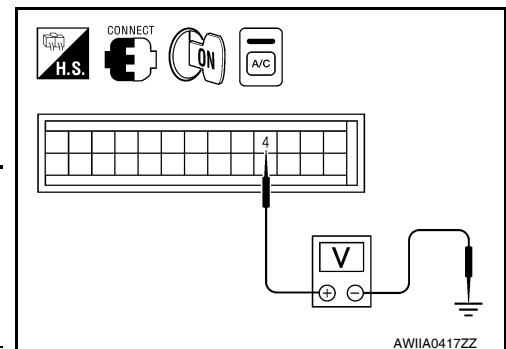
Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

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

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



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

Is the inspection result normal?

YES >> GO TO 8.

MAGNET CLUTCH

[AUTOMATIC AIR CONDITIONER]

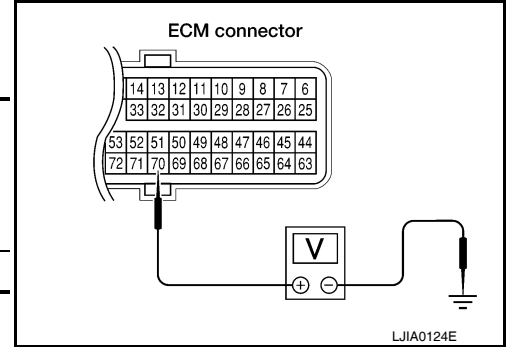
< DTC/CIRCUIT DIAGNOSIS >

- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control Refer to [VTL-8. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-53. "Removal and Installation"](#).

8. CHECK REFRIGERANT PRESSURE SENSOR

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

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



Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Refer to [EC-465. "Diagnosis Procedure"](#).

9. CHECK BCM INPUT (FAN ON) SIGNAL

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

**FRONT BLOWER CONTROL : FAN ON SIG ON
DIAL ON**

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

Is the inspection result normal?

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

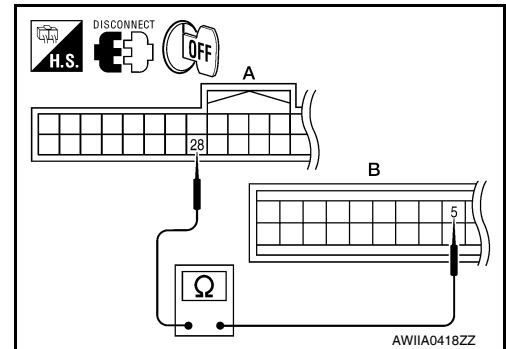
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

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

28 - 5 Continuity should exist.

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

28 - ground Continuity should not exist.



Is the inspection result normal?

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

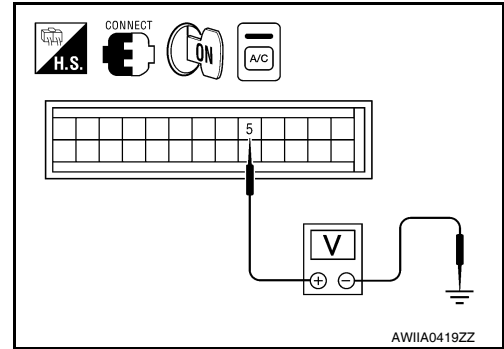
11. CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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



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

Is the inspection result normal?

YES >> GO TO 12.

NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-53, "Removal and Installation"](#).

12.CHECK CAN COMMUNICATION

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

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

Is the inspection result normal?

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

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

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

HAC

WATER VALVE CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

WATER VALVE CIRCUIT

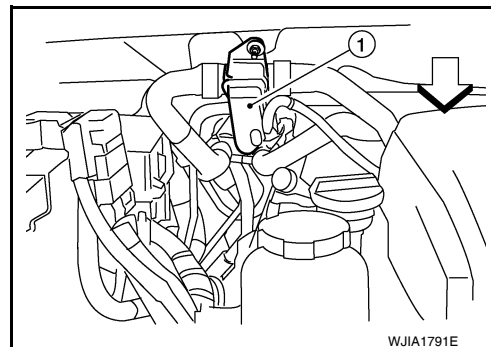
Description

INFOID:000000006164706

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:000000006164707

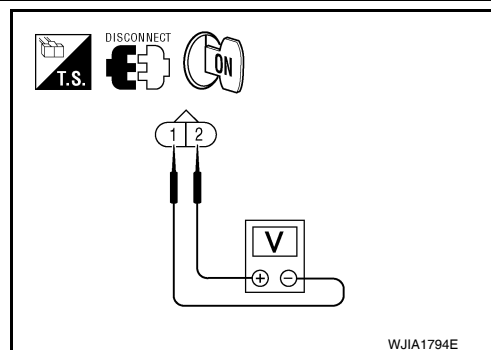
Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

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



Is the inspection result normal?

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

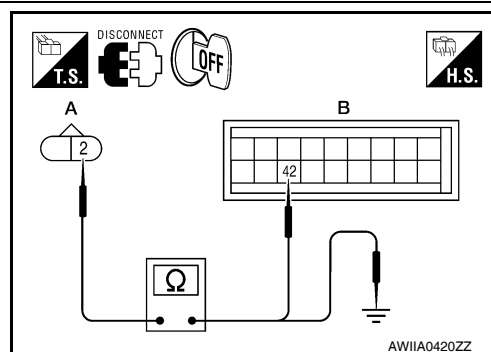
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

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

2 - 42 : Continuity should exist.

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

2 - Ground : Continuity should not exist.



Is the inspection result normal?

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

WATER VALVE CIRCUIT

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

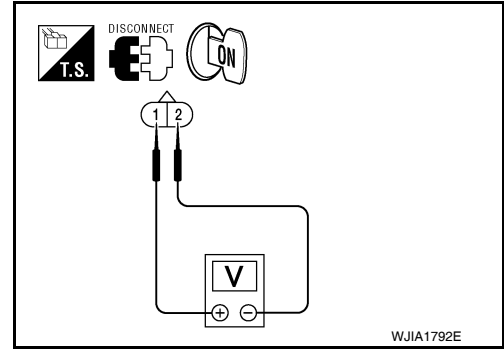
3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

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

Is the inspection result normal?

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



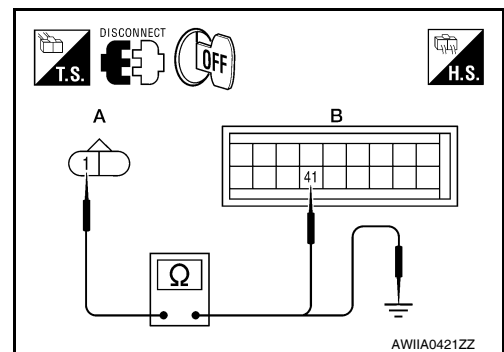
4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

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

1 - 41 : Continuity should exist.

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

1 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
 NO >> Repair harness or connector.

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

AMBIENT SENSOR

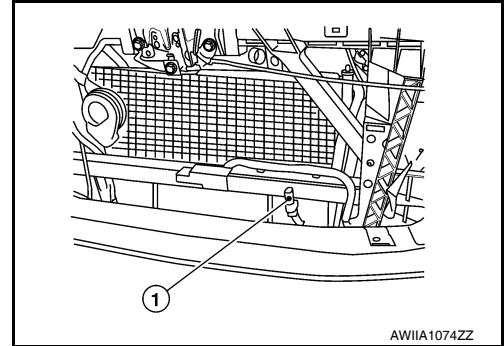
Component Description

INFOID:000000006164708

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.



AWIIA1074ZZ

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.

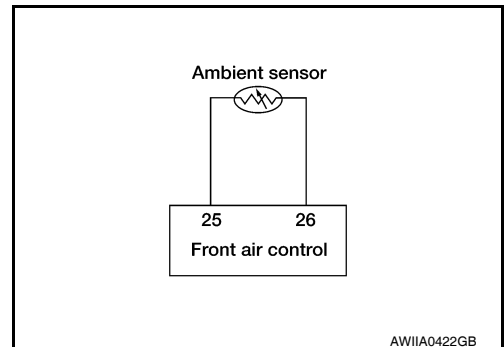
Ambient Sensor Diagnosis Procedure

INFOID:000000006164709

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. Using the Consult-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.



AWIIA0422GB

1.CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

AMBIENT SENSOR

[AUTOMATIC AIR CONDITIONER]

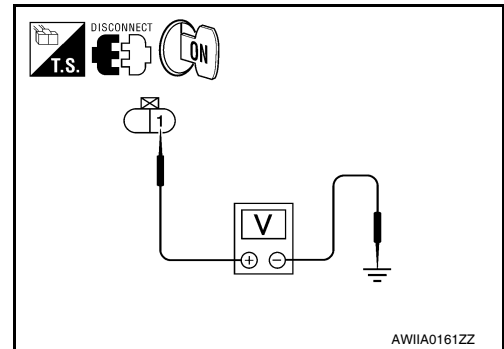
< DTC/CIRCUIT DIAGNOSIS >

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

1 - Ground : Approx. 5V

Is the inspection result normal?

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



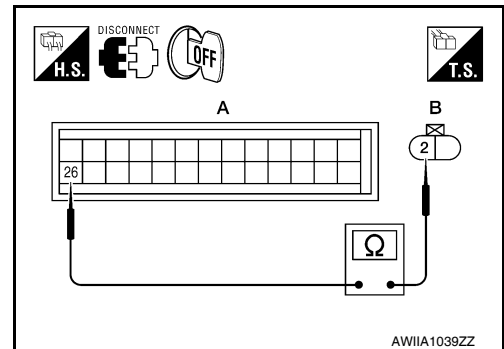
2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

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

2 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK AMBIENT SENSOR

Check the ambient sensor circuit. Refer to [HAC-57, "Ambient Sensor Component Inspection"](#).

Is the inspection result normal?

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

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

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

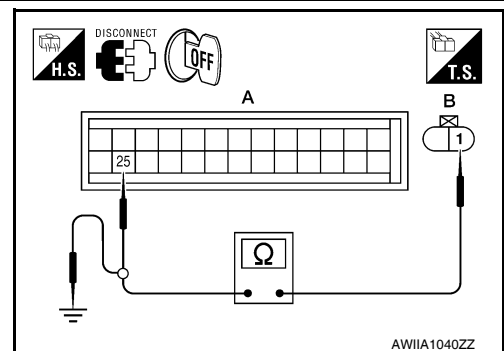
1 - 25 : Continuity should exist.

4. Check continuity between ambient sensor harness connector E1 (B) terminal 2 and ground.

1 - Ground : Continuity should not exist.

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
2. GO TO [HAC-21, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
NO >> Repair harness or connector.



Ambient Sensor Component Inspection

INFOID:000000006164710

COMPONENT INSPECTION

Ambient Sensor

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

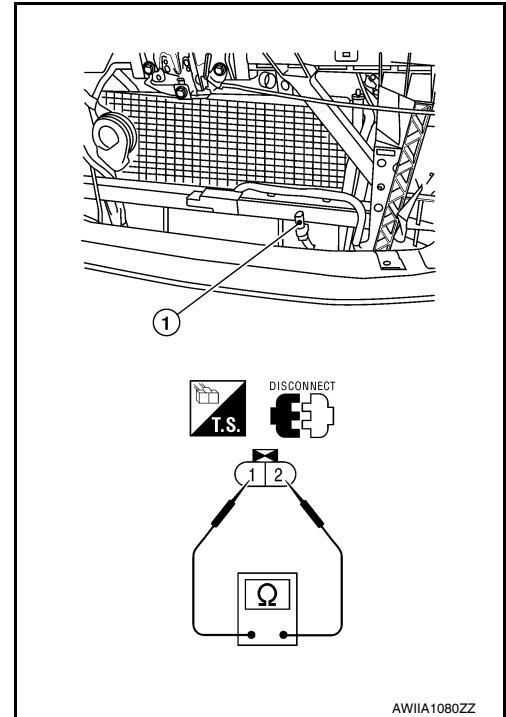
AMBIENT SENSOR

< DTC/CIRCUIT 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



AWIIA1080ZZ

If NG, replace ambient sensor. Refer to [HA-45. "Removal and Installation"](#).

< DTC/CIRCUIT DIAGNOSIS >

IN-VEHICLE SENSOR

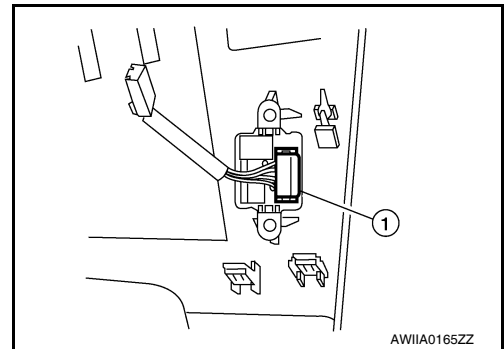
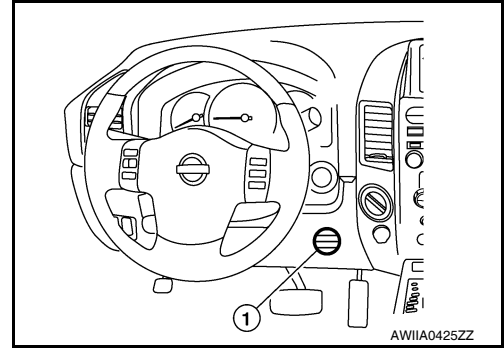
Component Description

INFOID:000000006164711

COMPONENT DESCRIPTION

In-vehicle Sensor

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



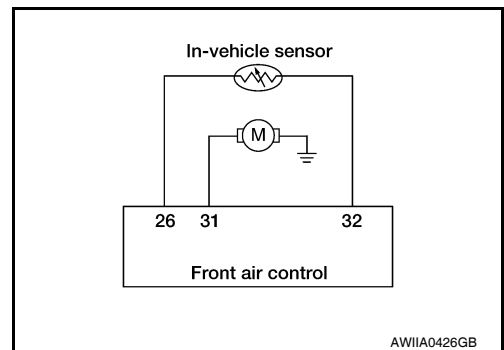
In-Vehicle Sensor Diagnosis Procedure

INFOID:000000006164712

Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. Using the CONSULT-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?

YES or NO?

YES >> GO TO 6.

NO >> GO TO 2.

2. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

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

IN-VEHICLE SENSOR

[AUTOMATIC AIR CONDITIONER]

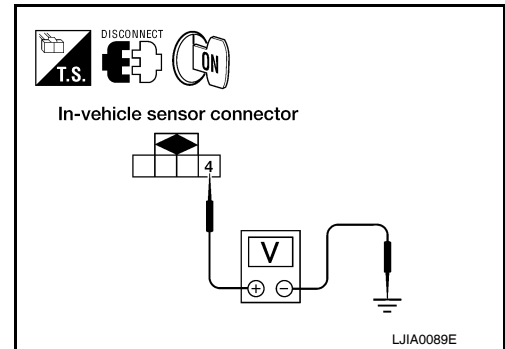
< DTC/CIRCUIT DIAGNOSIS >

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M32 terminal 4 and ground.

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

Is the inspection result normal?

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



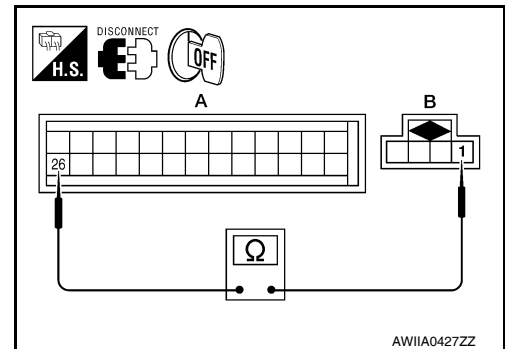
3. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND FRONT AIR CONTROL

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

1 - 26 : **Continuity should exist.**

Is the inspection result normal?

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



4. CHECK IN-VEHICLE SENSOR

Check in-vehicle sensor. Refer to [HAC-61, "In-Vehicle Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
2. Go to [HAC-21, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
NO >> 1. Replace in-vehicle sensor. Refer to [VTL-9, "Removal and Installation"](#).
2. Go to [HAC-21, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.

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

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between in-vehicle sensor harness connector M32 (B) terminal 4 and front air control harness connector M50 (A) terminal 32.

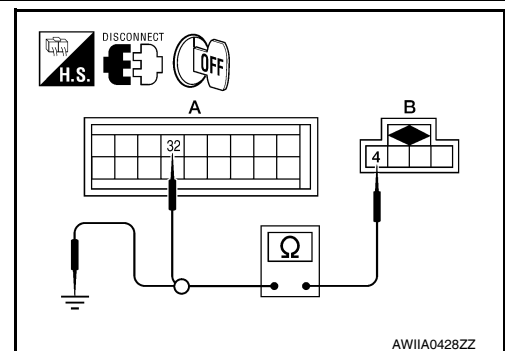
4 - 32 : **Continuity should exist.**

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

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

Is the inspection result normal?

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



6. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR MOTOR AND FRONT AIR CONTROL (SELF-DIAGNOSIS CODES 30, 31, 44, 46 OR DTC B2578, B2579)

IN-VEHICLE SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

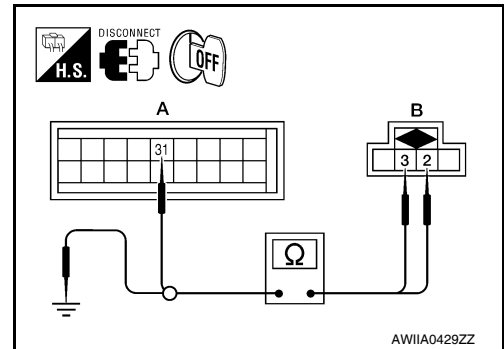
1. Turn ignition switch OFF.
2. Disconnect front air control connector and in-vehicle sensor connector.
3. Check continuity between in-vehicle sensor harness connector M32 (B) terminal 3 and front air control harness connector M50 (A) terminal 31.

3 - 31 : Continuity should exist.

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

2 - Ground : Continuity should exist.

3 - Ground : Continuity should not exist.



Is the inspection result normal?

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

In-Vehicle Sensor Component Inspection

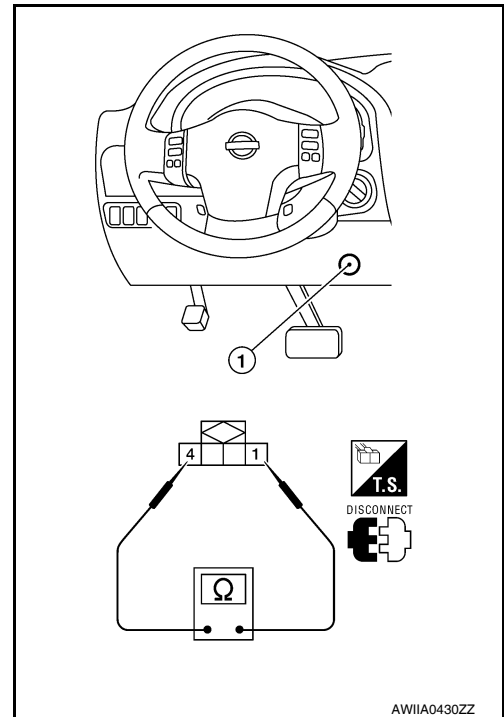
INFOID:000000006164713

COMPONENT INSPECTION

In-vehicle Sensor

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

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



If NG, replace in-vehicle sensor. Refer to [VTL-9, "Removal and Installation"](#).

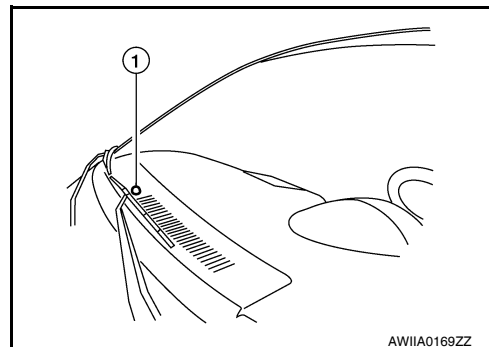
OPTICAL SENSOR

Component Description

INFOID:000000006164714

COMPONENT DESCRIPTION

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



OPTICAL INPUT PROCESS

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

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

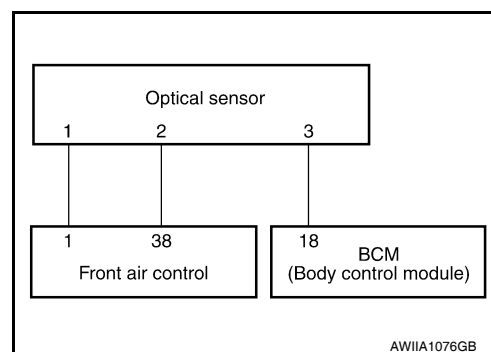
Optical Sensor Diagnosis Procedure

INFOID:000000006164715

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR OPTICAL SENSOR

SYMPTOM: Optical sensor circuit is open or shorted. Using the CONSULT-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

OPTICAL SENSOR

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

1 - 1 : Continuity should exist.

2 - 38 : Continuity should exist.

4. Check continuity between optical sensor harness connector M302 (B) terminal 1 and 2 and ground.

1, 2 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

2. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND BCM

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

3 - 18 : Continuity should exist.

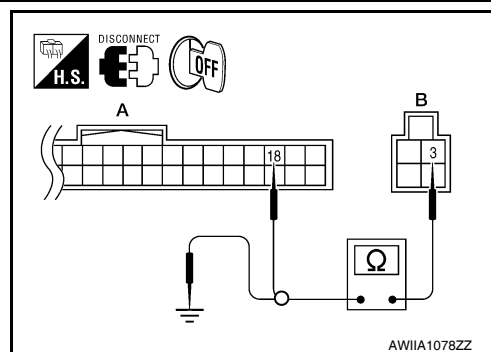
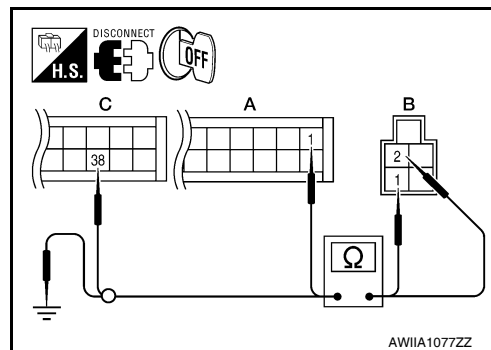
3. Check continuity between optical sensor harness connector M302 (B) terminal 4 and ground.

3 - Ground : Continuity should not exist.

Is the inspection result normal?

YES >> Replace optical sensor. Refer to [VTL-10, "Removal and Installation"](#).

NO >> Repair harness or connector.



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

INTAKE SENSOR

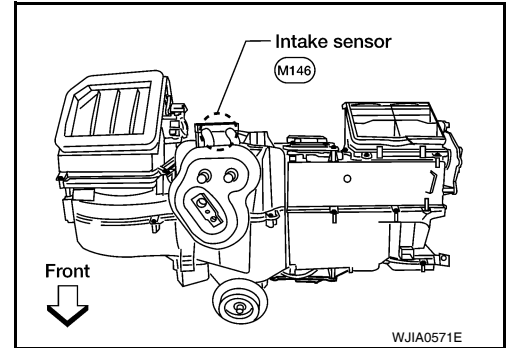
System Description

INFOID:000000006164716

COMPONENT DESCRIPTION

Intake Sensor

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



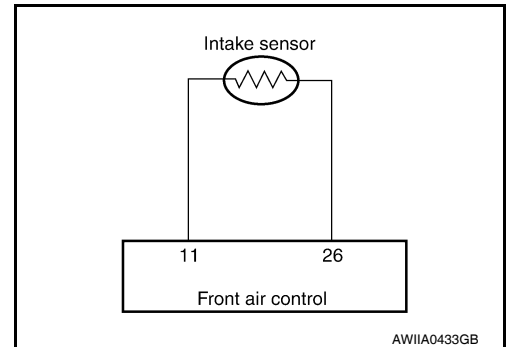
Intake Sensor Diagnosis Procedure

INFOID:000000006164717

Regarding Wiring Diagram information, refer to [HAC-71. "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. Using the CONSULT-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.



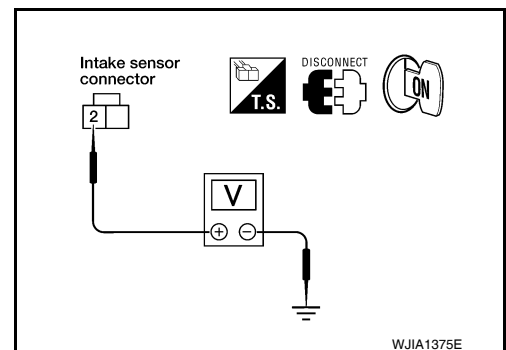
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

2 - Ground : Approx. 5V

Is the inspection result normal?

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



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

INTAKE SENSOR

[AUTOMATIC AIR CONDITIONER]

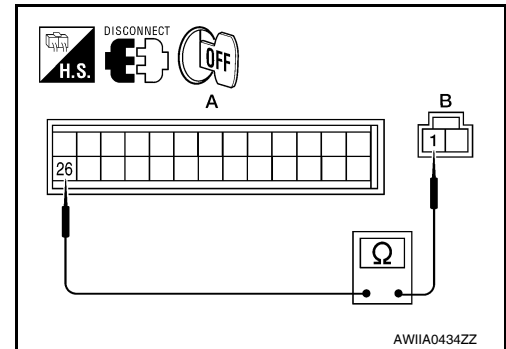
< DTC/CIRCUIT DIAGNOSIS >

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

1 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-65, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

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

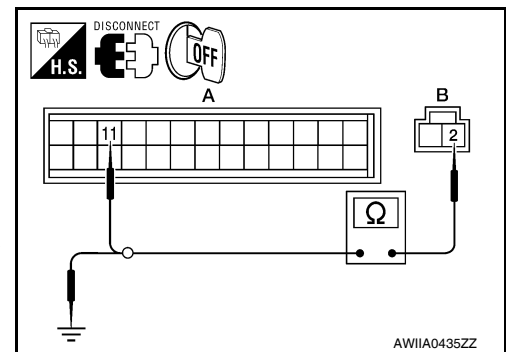
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M49 (A) terminal 11.

2 - 11 : Continuity should exist.

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

2 - Ground : Continuity should not exist.



Is the inspection result normal?

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

Intake Sensor Component Inspection

INFOID:000000006164718

COMPONENT INSPECTION

Intake Sensor

INTAKE SENSOR

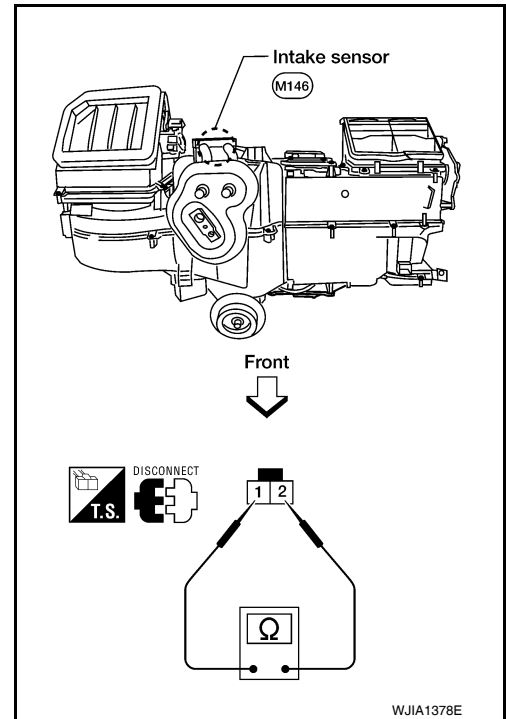
[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-11, "Removal and Installation"](#).



POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

INFOID:000000006164719

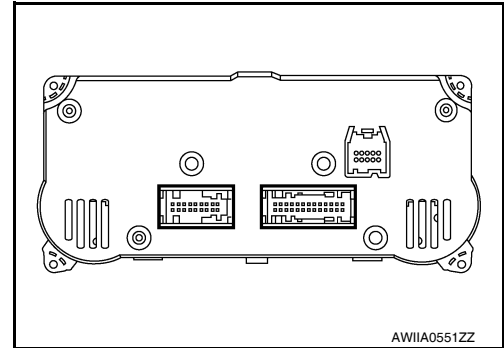
COMPONENT DESCRIPTION

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.

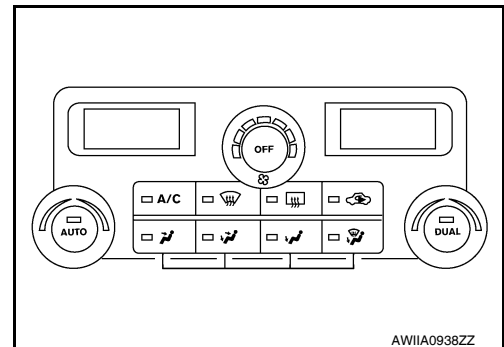
The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.

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



Potential Temperature Control (PTC)

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



Front Air Control Component Function Check

INFOID:000000006164720

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - AUTO MODE

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

Is the inspection result normal?

- YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to [HAC-67, "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000006164721

Regarding Wiring Diagram information, refer to [HAC-71, "Wiring Diagram - Automatic Air Conditioner"](#).

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

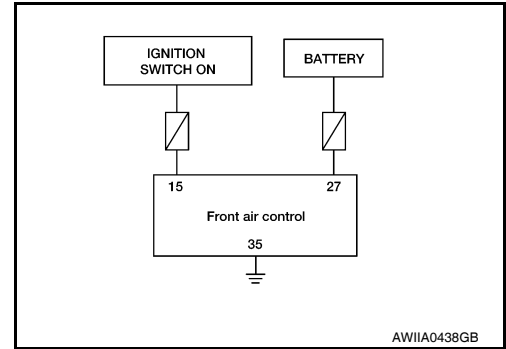
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

[AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

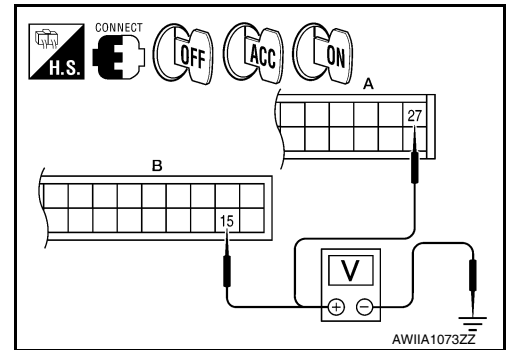
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- Turn ignition switch ON.
- Check voltage between front air control harness connector M49 (B) terminal 15 and M50 (A) terminal 27, and ground.

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



Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-73, "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

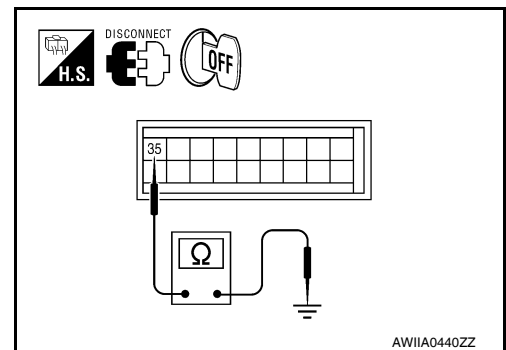
- Turn ignition switch OFF.
- Disconnect front air control connectors.
- Check continuity between front air control harness connector M50 terminal 35 and ground.

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.



AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

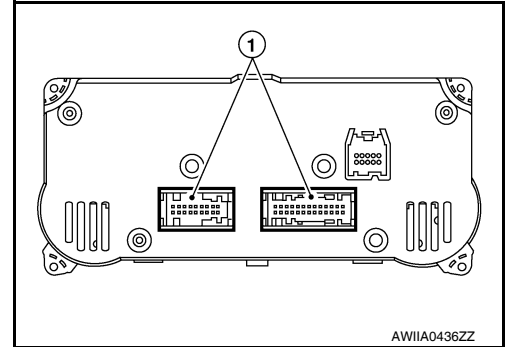
ECU DIAGNOSIS INFORMATION

AIR CONDITIONER CONTROL

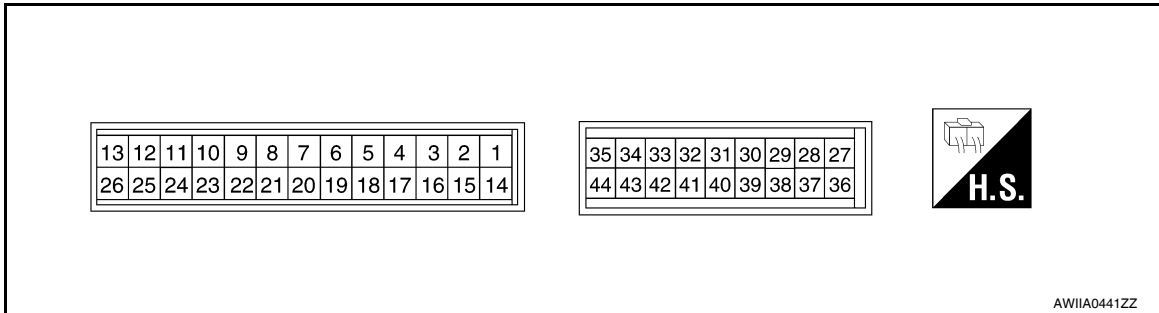
Front Air Control Terminals Reference Values

INFOID:000000006164722

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



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	G/O	Optical sensor (driver)	ON	-	0 - 5V
2	L	Air mix door motor (passenger) CCW	ON	-	Battery voltage
3	P	V ref ACTR (ground)	ON	-	5V
4	W/R	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
5	L/R	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
6	SB	Air mix door motor (driver) feedback	ON	-	0 - 5V
7	GR	Mode door motor feedback	ON	-	0 - 5V
8	R/L	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	<p>PIIA2344E</p>
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 INFORMATION >

[AUTOMATIC AIR CONDITIONER]

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

*1: If equipped

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

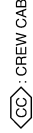
< WIRING DIAGRAM >

WIRING DIAGRAM

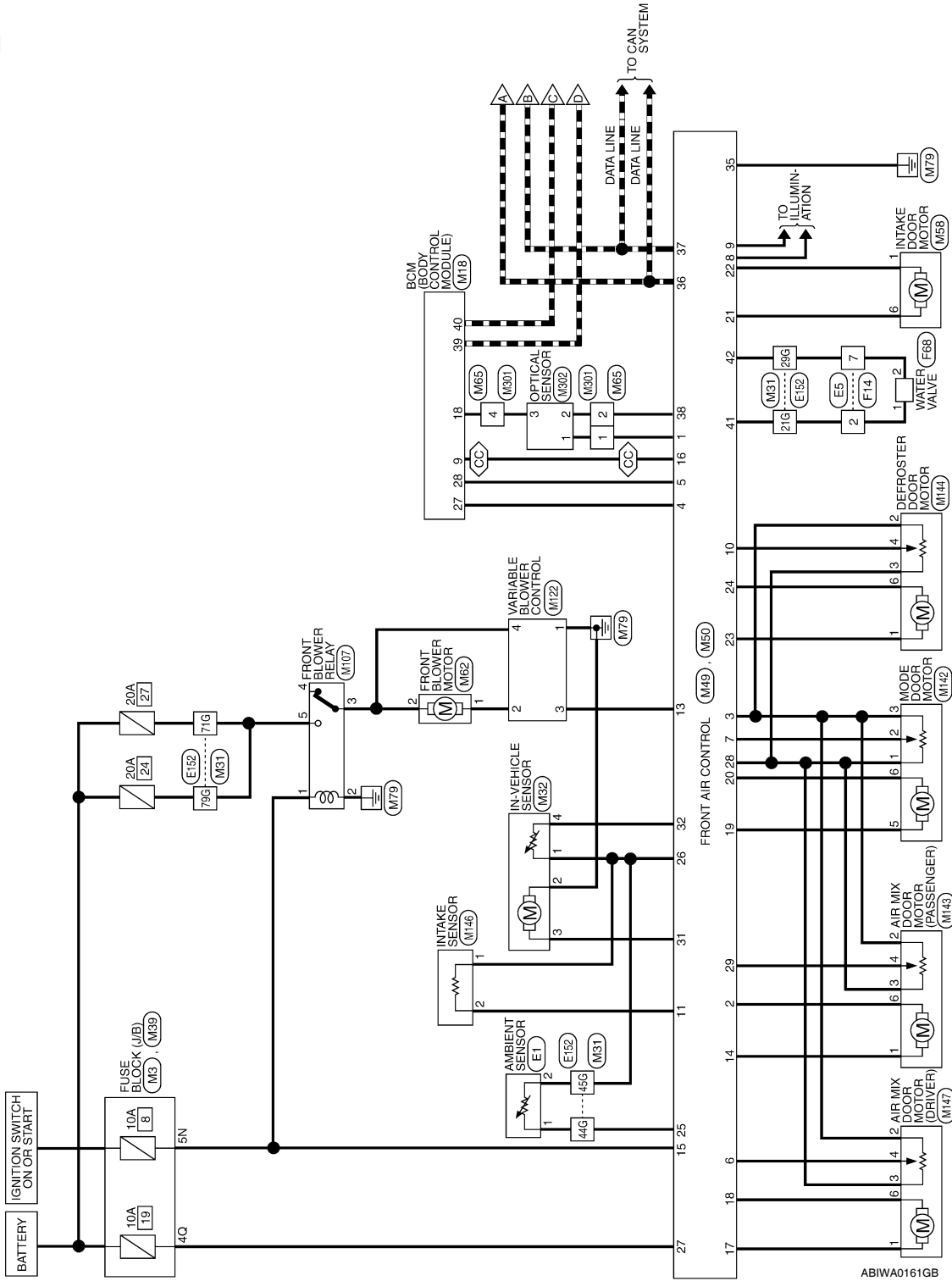
AIR CONDITIONER CONTROL

Wiring Diagram - Automatic Air Conditioner

INFOID:000000006464307



AIR CONDITIONER CONTROL - AUTOMATIC AIR CONDITIONER



ABIWA0161GB

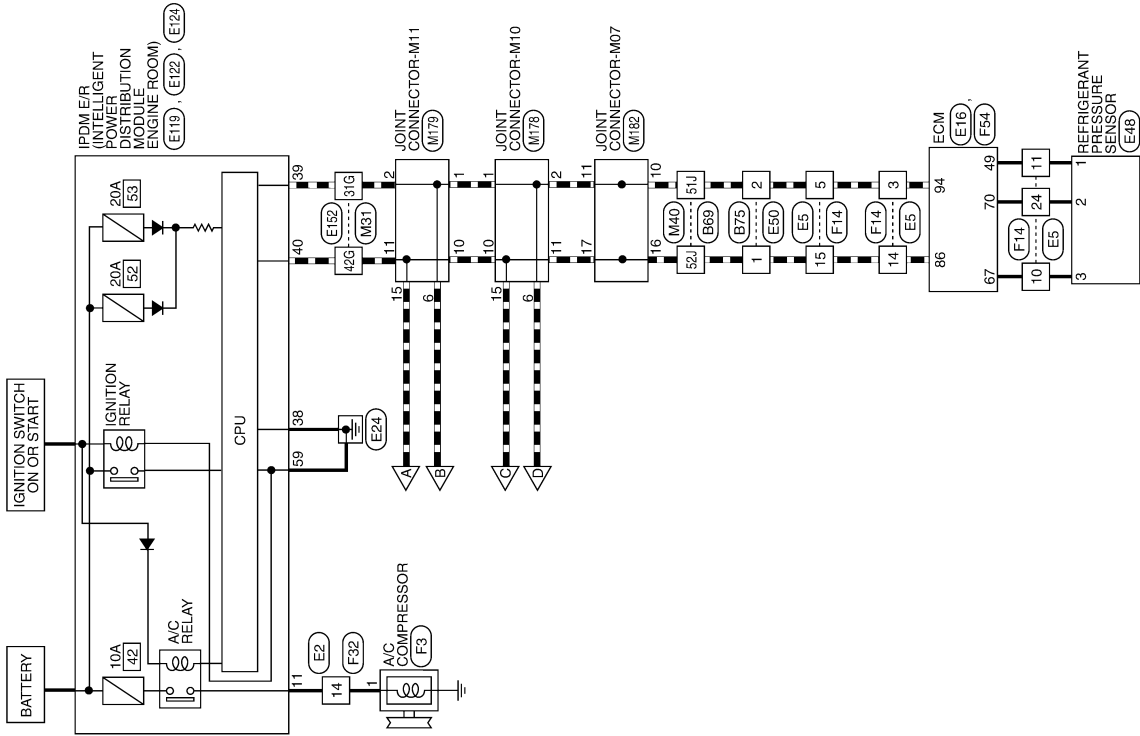
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P

HAC

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >



ABIWA0164GB

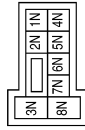
AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

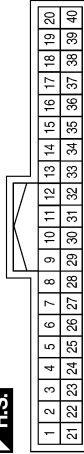
AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC AIR CONDITIONER

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



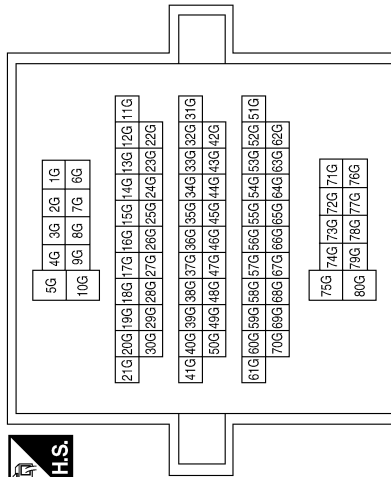
Terminal No.	Color of Wire	Signal Name
5N	Y/G	-

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



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

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



Terminal No.	Color of Wire	Signal Name
21G	Y/L	-
29G	W/G	-
31G	L	-
42G	P	-
44G	P	-
45G	V/R	-
71G	P	-
79G	P	-

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



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

ABIIA0675GB

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

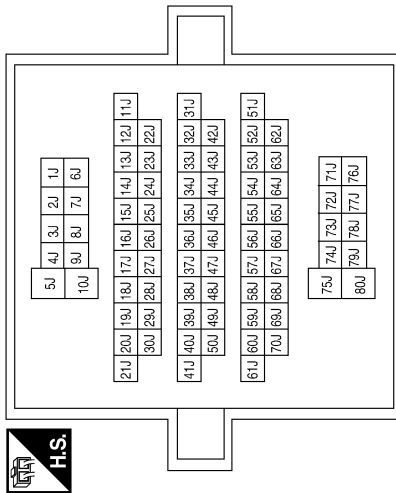
AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

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



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

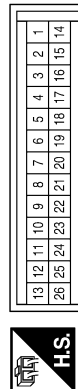


Terminal No.	Color of Wire	Signal Name
4Q	Y/R	-

Terminal No.	Color of Wire	Signal Name
20	P/L	PNL/FLR DR B
21	G/B	RECIRC DRT A
22	O	RECIRC DRT B
23	LG	DEFROST DR A
24	P/B	DEFROST DR B
25	P	AMBIENT TEMP SEN
26	V/R	SENSOR RETURN

Terminal No.	Color of Wire	Signal Name
10	LG/B	DEFROST FEEDBACK
11	L/B	EVAP TEMP SENSOR
12	-	-
13	G/R	FRONT BLWR SPEED
14	G/W	PASS BLND DR A
15	Y/G	IGN
16	Y/B	REAR DEF REQ
17	W/G	DRVR BLND DR A
18	G	DRVR BLND DR B
19	BR/W	PNL/FLR DR A

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



Terminal No.	Color of Wire	Signal Name
1	G/O	SUN LD SEN LFT
2	L	PASS BLND DR B
3	P	V REF RET
4	W/R	AC REQ
5	L/R	FAN ON
6	SB	DRVR BLND DR FF
7	GR	PNL/FLR DR FB
8	R/L	ILLUM +
9	BR	ILLUM -

ABIIA0676GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

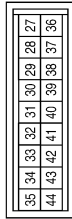
Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	BLACK



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

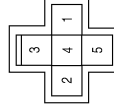
Terminal No.	Color of Wire	Signal Name
32	LG/R	IN-CAR TEMP SEN
33	-	-
34	-	-
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	W/V	SUN LD SEN RIGHT
39	-	-
40	-	-
41	Y/L	WATER VALVE A
42	W/G	WATER VALVE B
43	-	-
44	-	-

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



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

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



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

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



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

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



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

ABIIA0639GB

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

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

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



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

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



Terminal No.	Color of Wire	Signal Name
1	Y	-(2 CONTROL DIAL SYSTEM OR AUTO A/C)
2	GR	-
3	P	-(2 CONTROL DIAL SYSTEM OR AUTO A/C)
5	BR/W	-
6	P/L	-

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



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

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



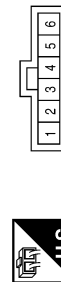
Terminal No.	Color of Wire	Signal Name
1	W/G	-
2	P	-
3	Y	-
4	SB	-
6	G	-

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



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

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



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

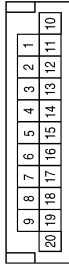
ABIIA0640GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

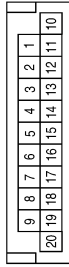
< WIRING DIAGRAM >

Connector No.	M182
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE



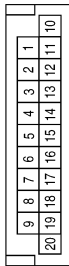
Terminal No.	Color of Wire	Signal Name
10	L	-
11	L	-
16	P	-
17	P	-

Connector No.	M179
Connector Name	JOINT CONNECTOR-M11
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
6	L	-
10	P	-
11	P	-
15	P	-

Connector No.	M178
Connector Name	JOINT CONNECTOR-M10
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
6	L	-
10	P	-
15	P	-

Connector No.	E1
Connector Name	AMBIENT SENSOR
Connector Color	GRAY



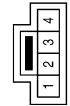
Terminal No.	Color of Wire	Signal Name
1	P	-
2	V/R	-

Connector No.	M302
Connector Name	OPTICAL SENSOR
Connector Color	WHITE



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

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



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

ABIIA0641GB

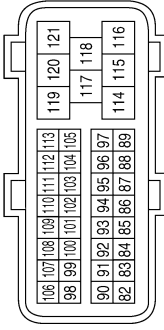
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

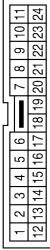
< WIRING DIAGRAM >

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



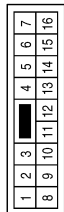
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

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



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

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



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

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



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

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



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

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



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

ABIIA0642GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

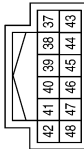
< WIRING DIAGRAM >

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



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

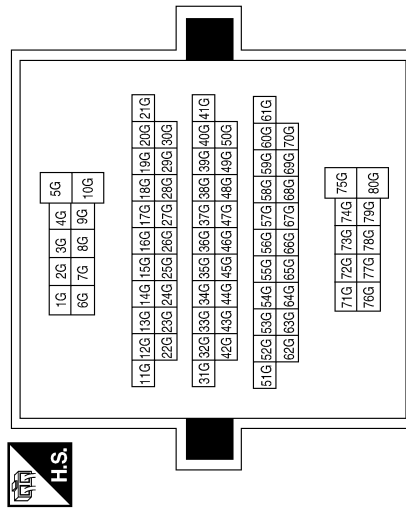
Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



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

Terminal No.	Color of Wire	Signal Name
21G	Y/L	-
29G	W/G	-
31G	L	-
42G	P	-
44G	P	-
45G	V/R	-
71G	GR	-
79G	P	-

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



ABIIA0643GB

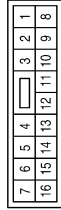
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

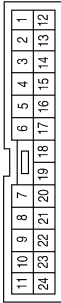
< WIRING DIAGRAM >

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



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

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



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

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



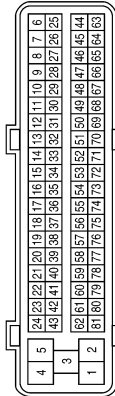
Terminal No.	Color of Wire	Signal Name
1	Y/B	-

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY



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

Connector No.	F54
Connector Name	ECM
Connector Color	BLACK



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

ABIIA0644GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

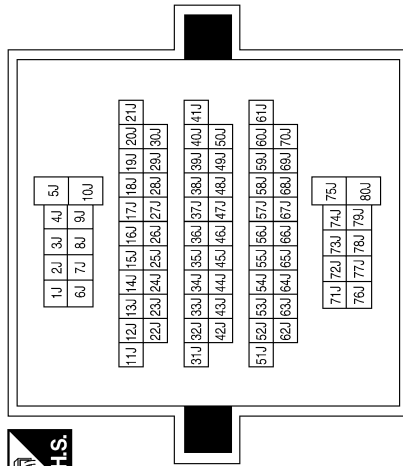
Connector No.	B75
Connector Name	WIRE TO WIRE
Connector Color	BROWN



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

Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

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



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

ABIIA0645GB

AIR CONDITIONER CONTROL

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:000000006164724

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-67
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-21
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-23
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-28
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-36
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-38
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-44
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-49
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-83
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-91
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-93
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-67
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-94

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

INSUFFICIENT COOLING

Component Function Check

INFOID:000000006164725

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can the symptom be duplicated?

YES >> GO TO 3.

NO >> GO TO 2.

2. CHECK FOR ANY SYMPTOMS

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

Does another symptom exist?

YES >> Refer to [HAC-82. "Symptom Matrix Chart"](#).

NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis Refer to [HAC-21. "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

YES >> GO TO 5.

NO >> Refer to [HAC-21. "Front Air Control Self-Diagnosis Code Chart"](#).

5. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-13. "Checking Drive Belts"](#).

Is the inspection result normal?

YES >> GO TO 6.

NO >> Adjust or replace compressor belt. Refer to [EM-13. "Removal and Installation"](#).

6. CHECK AIR MIX DOOR OPERATION

Check and verify air mix door mechanism for smooth operation. Refer to [HAC-28. "Air Mix Door Motor \(Driver\) Component Function Check"](#).

Does air mix door operate correctly?

YES >> GO TO 7.

NO >> Check air mix door motor circuit. Refer to [HAC-28. "Air Mix Door Motor \(Driver\) Diagnosis Procedure"](#) or [HAC-32. "Air Mix Door Motor \(Passenger\) Diagnosis Procedure"](#).

7. CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to [EC-439. "Component Inspection"](#).

Does cooling fan motor operate correctly?

YES >> GO TO 8.

NO >> Check cooling fan motor. Refer to [EC-439. "Diagnosis Procedure"](#).

8. CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to [HAC-54. "Description"](#).

Does water valve operate correctly?

YES >> GO TO 9.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

NO >> Check water valve circuit. Refer to [HAC-54. "Water Valve Diagnosis Procedure"](#).

9. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

>> GO TO 10.

10. CHECK REFRIGERANT PURITY

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Check contaminated refrigerant. Refer to [HAC-95. "Working with HFC-134a \(R-134a\)"](#).

11. CHECK FOR EVAPORATOR FREEZE UP

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

Does evaporator freeze up?

YES >> Perform performance test diagnoses. Refer to [HAC-84. "Diagnostic Work Flow"](#).

NO >> GO TO 12.

12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-86. "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to [HAC-84. "Diagnostic Work Flow"](#).

NO >> GO TO 13.

13. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

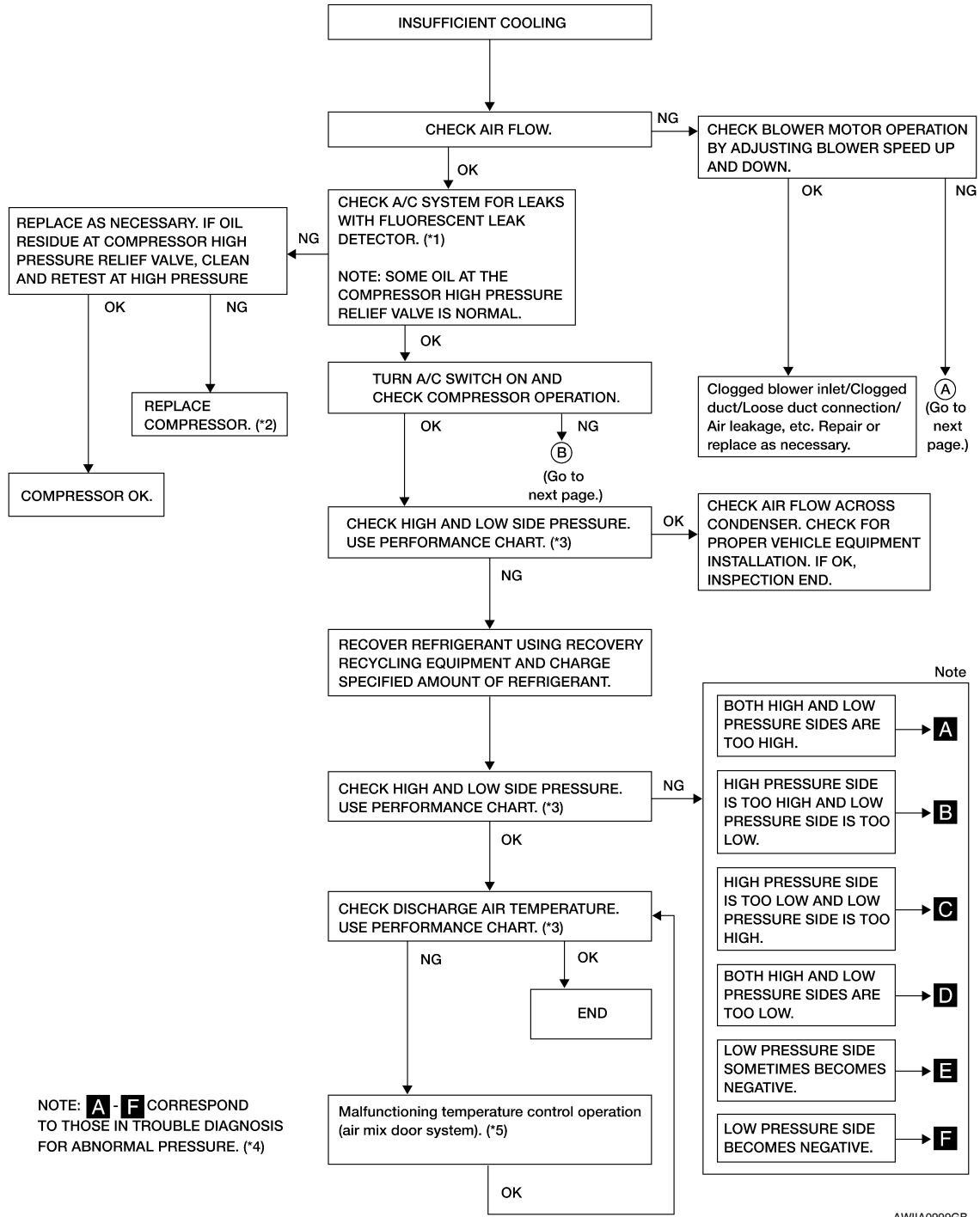
Diagnostic Work Flow

INFOID:000000006164726

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >



*1 [HA-24. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*3 [HAC-86. "Performance Chart"](#)

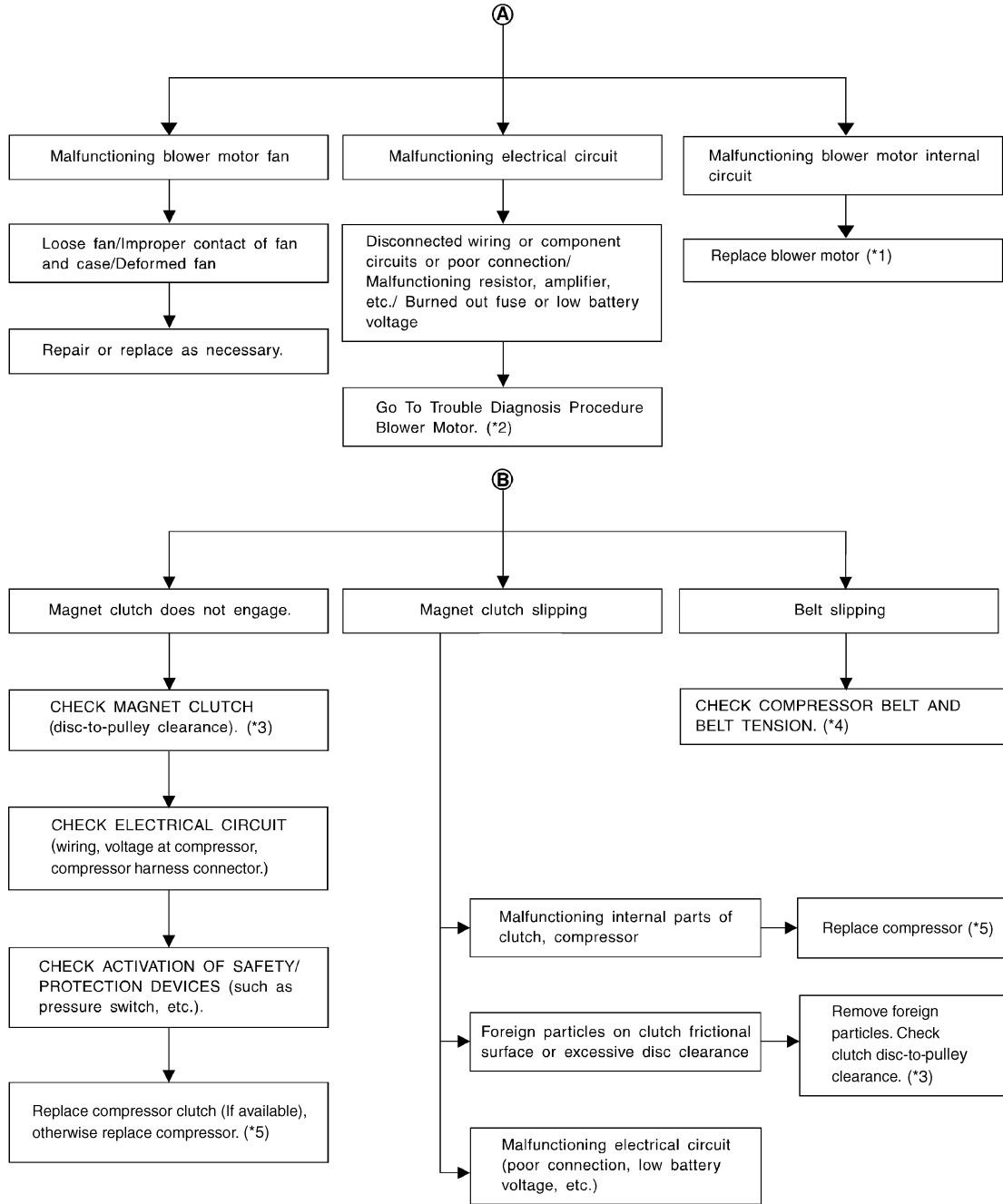
*4 [HAC-87. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-28. "Air Mix Door Motor \(Driver\) Component Function Check"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



AWI1A1000GB

*1 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*2 [HAC-44. "Front Blower Motor Component Function Check"](#)

*3 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*4 [EM-13. "Checking Drive Belts"](#)

*5 [HA-32. "Removal and Installation for Compressor"](#)

Performance Chart

INFOID:000000006164727

TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

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

Recirculating-to-discharge Air Temperature Table

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

Ambient Air Temperature-to-operating Pressure Table

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

Trouble Diagnoses for Abnormal Pressure

INFOID:000000006164728

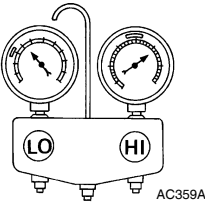
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient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

INSUFFICIENT COOLING

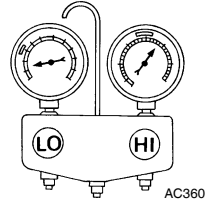
[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

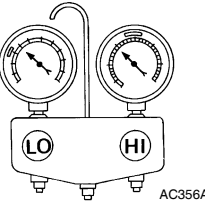
Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>A Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p>  <p style="text-align: right; font-size: small;">AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check oil for contamination.

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

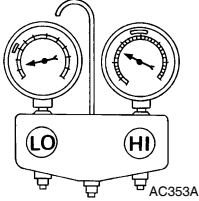
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p>  <p style="text-align: right; font-size: small;">AC356A</p>	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.
	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

INSUFFICIENT COOLING

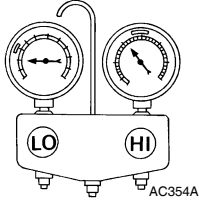
[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
<p>D Both high- and low-pressure sides are too low.</p> 	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-23, "Checking of Refrigerant Leaks" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	Air flow volume is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-64, "Intake Sensor Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-44, "Front Blower Motor Component Function Check".

Low-pressure Side Sometimes Becomes Negative

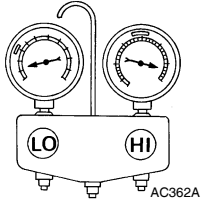
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> Air conditioning system does not function and does not cyclically cool the compartment air. The system constantly functions for a certain period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

Low-pressure Side Becomes Negative

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

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

INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

INSUFFICIENT HEATING

Component Function Check

INFOID:000000006164729

SYMPTOM: Insufficient heating

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE

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

Can this symptom be duplicated?

YES >> GO TO 2.

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

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis. Refer to [HAC-21, "Front Air Control Self-Diagnosis"](#).

Is the inspection results normal?

YES >> GO TO 4.

NO >> Refer to [HAC-21, "Front Air Control Self-Diagnosis Code Chart"](#).

4. CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to [CO-10, "Inspection"](#).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-10, "Inspection"](#).
4. Check for air in cooling system.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check the air mix door motor circuit. Refer to [HAC-28, "Air Mix Door Motor \(Driver\) Component Function Check"](#).

6. CHECK AIR DUCTS

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair all disconnected or leaking air ducts.

7. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

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

NO >> • Inlet hose cold: GO TO 11.

• Both hoses warm: GO TO 9.

8. CHECK ENGINE COOLANT SYSTEM

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

< SYMPTOM DIAGNOSIS >

Check engine coolant temperature sensor. Refer to [EC-177, "Component Inspection"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

9.CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-11, "Changing Engine Coolant"](#).

4. GO TO 10 to retest.

10.CHECK HEATER HOSE TEMPERATURES

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

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

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [VTL-15, "Removal and Installation"](#).

11.CHECK WATER VALVE

Check the operation of the water valve. Refer to [HAC-54, "Water Valve Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

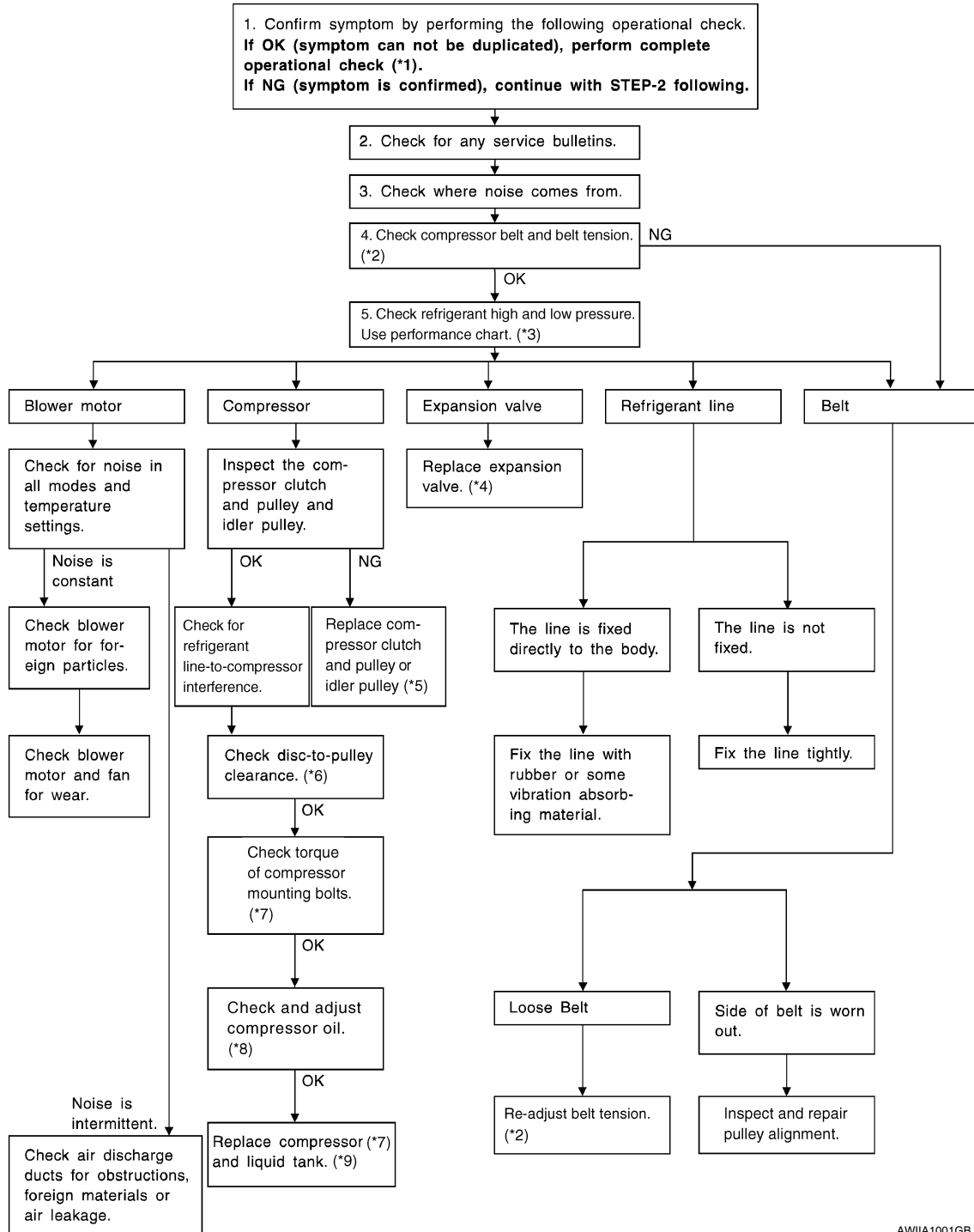
NOISE

Component Function Check

INFOID:000000006164730

SYMPTOM: Noise

INSPECTION FLOW



AWI1001GB

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

*2 [EM-13, "Checking Drive Belts"](#)

*3 [HAC-86, "Performance Chart"](#)

*4 [HA-43, "Removal and Installation for Expansion Valve"](#)

*5 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*6 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*7 [HA-32, "Removal and Installation for Compressor"](#)

*8 [HA-32, "Removal and Installation for Compressor"](#)

*9 [HA-41, "Removal and Installation for Condenser"](#)

MEMORY FUNCTION DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

MEMORY FUNCTION DOES NOT OPERATE

Memory Function Check

INFOID:000000006164731

SYMPTOM: Memory function does not operate.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MEMORY FUNCTION

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

Can the symptom be duplicated?

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

2. PERFORM COMPLETE OPERATIONAL CHECK

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

Can a symptom be duplicated?

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

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis to check for any codes. Refer to [HAC-21, "Front Air Control Self-Diagnosis"](#).

Are any self-diagnosis codes present?

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

5. CHECK POWER AND GROUND CIRCUIT

Check main power supply and ground circuit. Refer to [HAC-67, "Front Air Control Component Function Check"](#).

Is the inspection result normal?

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

6. RECHECK FOR SYMPTOMS

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

Does another symptom exist?

- YES >> Refer to [HAC-5, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#).
NO >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

< PRECAUTION >

PRECAUTION

PRECAUTIONS

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

INFOID:000000006164732

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

WARNING:

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

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

WARNING:

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

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

INFOID:000000006164733

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

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

PRECAUTIONS

[AUTOMATIC AIR CONDITIONER]

< PRECAUTION >

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

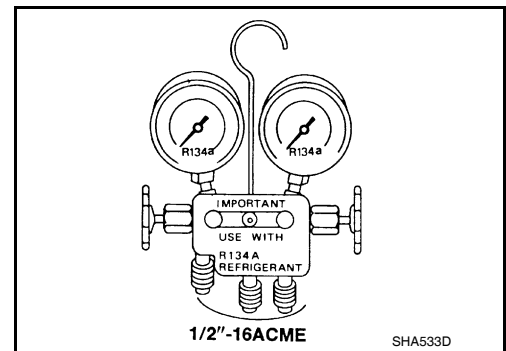
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

Precaution for Service Equipment

INFOID:000000006164734

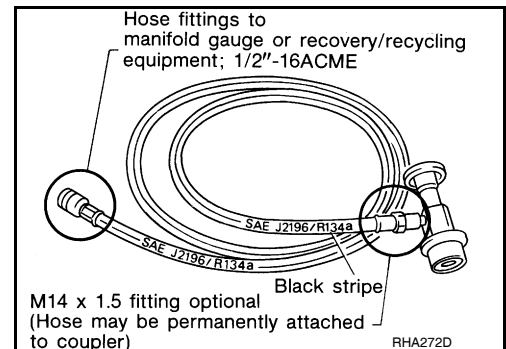
MANIFOLD GAUGE SET

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



SERVICE HOSES

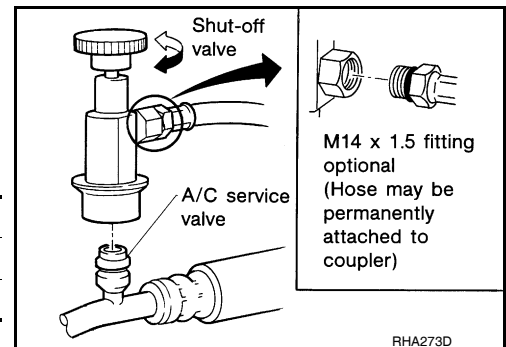
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

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

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



MANUAL A/C IDENTIFICATION TABLE

< BASIC INSPECTION >

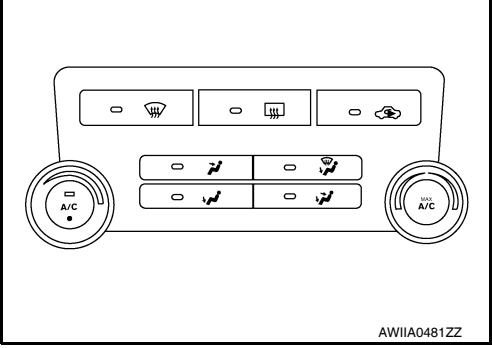
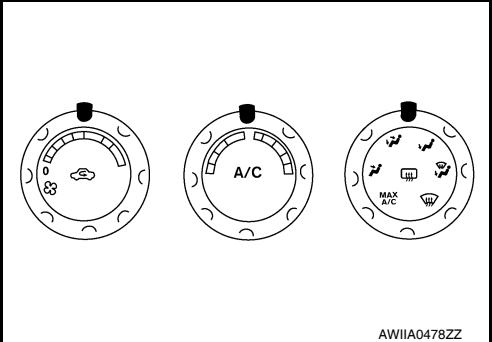
[MANUAL A/C (TYPE 1)]

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164735

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)]	

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

HAC

DIAGNOSIS AND REPAIR WORKFLOW

How to Perform Trouble Diagnosis For Quick And Accurate Repair

INFOID:000000006164736

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-99. "Operational Check"](#).

>> GO TO 4

4. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HAC-166. "Symptom Matrix Chart"](#).

>> If equipped with NAVI, GO TO 5.

>> If equipped without NAVI, GO TO 6.

5. PERFORM THE FRONT AIR CONTROL SELF-DIAGNOSIS

Perform front air control self-diagnosis. Refer to [HAC-21. "Front Air Control Self-Diagnosis"](#).

>> If any diagnostic trouble codes set. Refer to [HAC-21. "Front Air Control Self-Diagnosis Code Chart"](#).

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

6. REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 7

7. FINAL CHECK

Final check.

Is the inspection result normal?

YES >> Inspection End

NO >> GO TO 4

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000006164737

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

Conditions : Engine running and at normal operating temperature


CHECKING BLOWER

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

If NG, go to trouble diagnosis procedure for [HAC-132. "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR

1. Press each MODE switch and the DEF  switch.
2. Each MODE position indicator should illuminate.
3. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-109. "Discharge Air Flow"](#).

Mode door position is checked in the next step.



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

If OK, continue the check.

NOTE:

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





CHECKING RECIRCULATION (,  ONLY)

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

If NG, go to trouble diagnosis procedure for [HAC-126. "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

CHECKING TEMPERATURE DECREASE

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

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

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-175. "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-120. "Air Mix Door Motor Component Function Check"](#).

If OK, continue with next check.

CHECK A/C SWITCH

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

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 [HAC-137, "Magnet Clutch Diagnosis Procedure"](#).

If all operational checks are OK (symptom cannot be duplicated), go to [HAC-98, "How to Perform Trouble Diagnosis For Quick And Accurate Repair"](#) and perform tests as outlined. If symptom appears, refer to [HAC-166, "Symptom Matrix Chart"](#) and perform applicable trouble diagnosis procedures.

MANUAL A/C IDENTIFICATION TABLE

< SYSTEM DESCRIPTION >

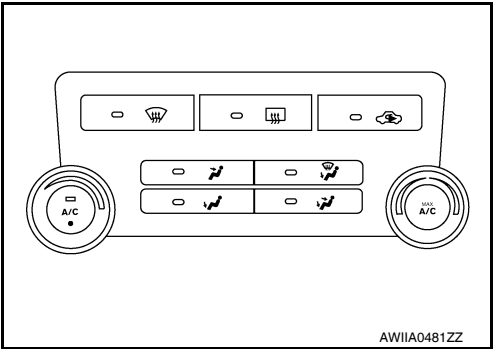
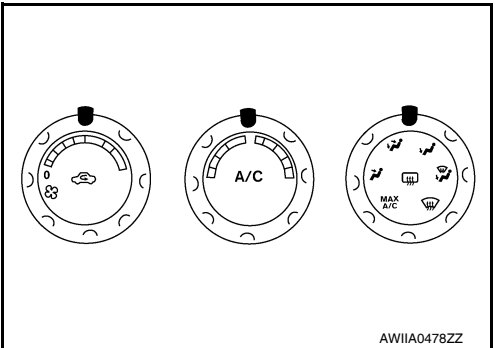
[MANUAL A/C (TYPE 1)]

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164738

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)]	

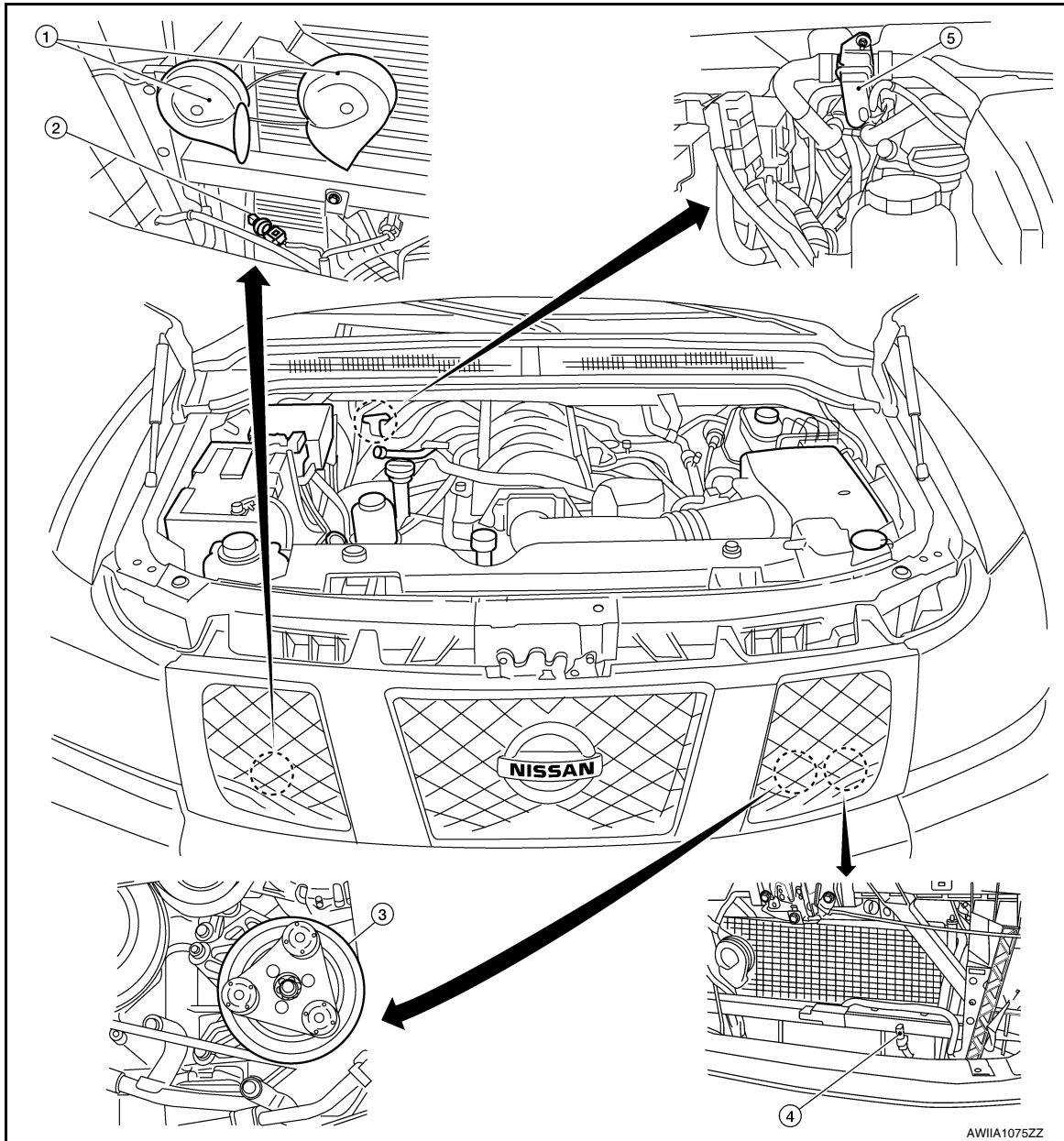
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

FUNCTION INFORMATION

Component Part Location

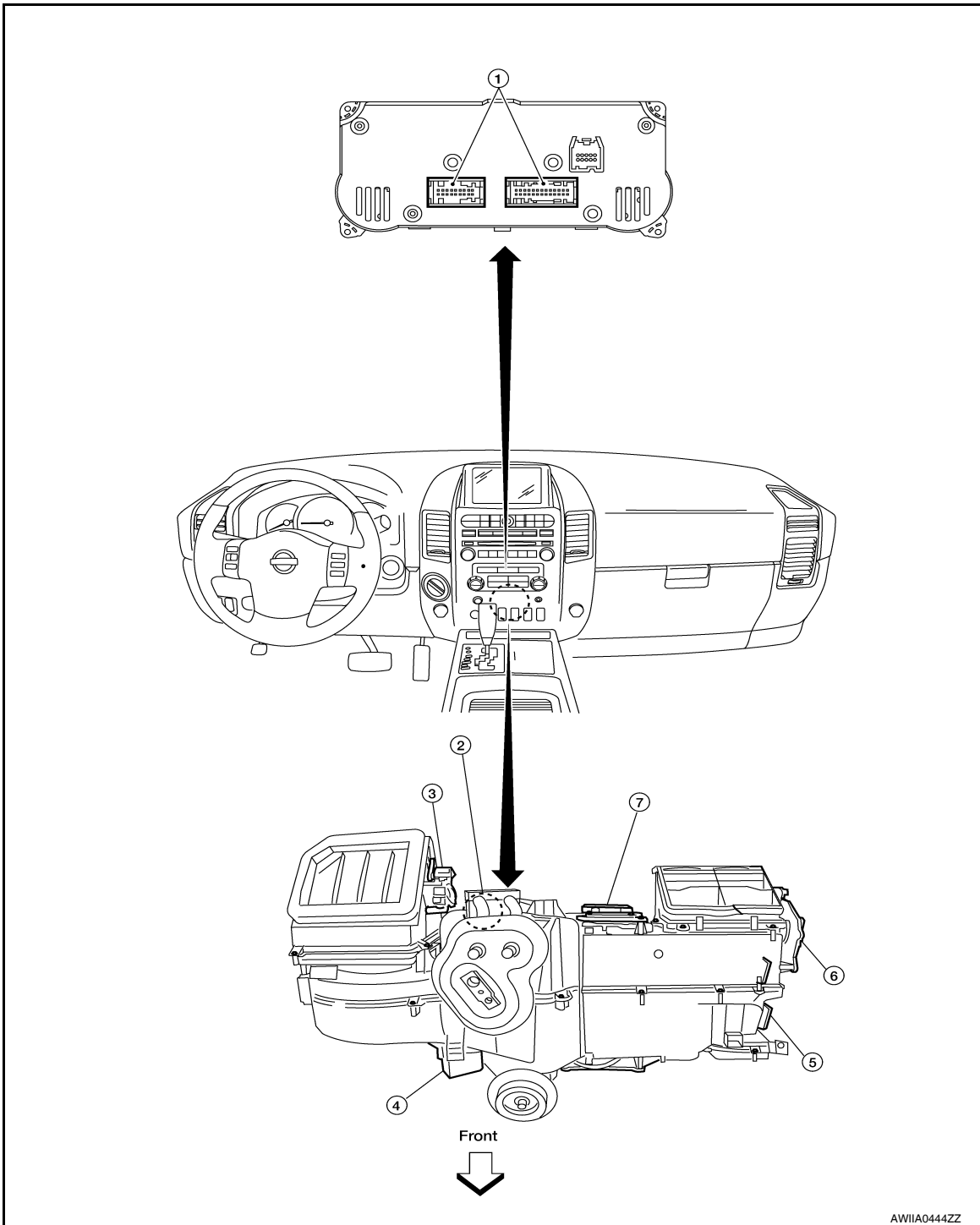
INFOID:000000006164739

ENGINE COMPARTMENT



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

PASSENGER COMPARTMENT



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

AWIIA0444ZZ

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

FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

Symptom Table

INFOID:000000006164740

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

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:000000006164741

A

REFRIGERANT FLOW

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

B

C

Refrigerant System Protection

INFOID:000000006164742

REFRIGERANT PRESSURE SENSOR

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

D

E

F

PRESSURE RELIEF VALVE

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

G

H

HAC

J

K

L

M

N

O

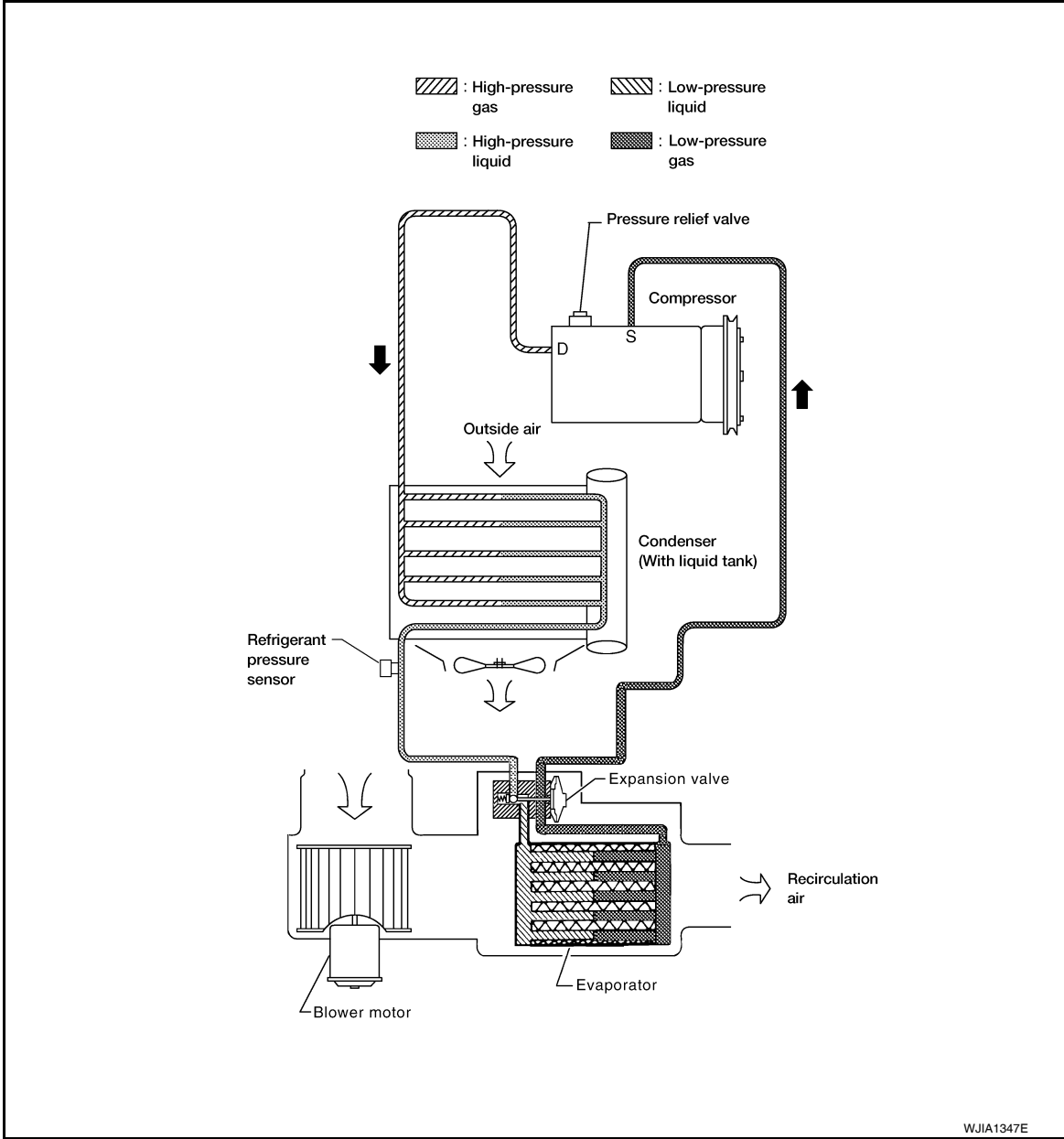
P

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

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



MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

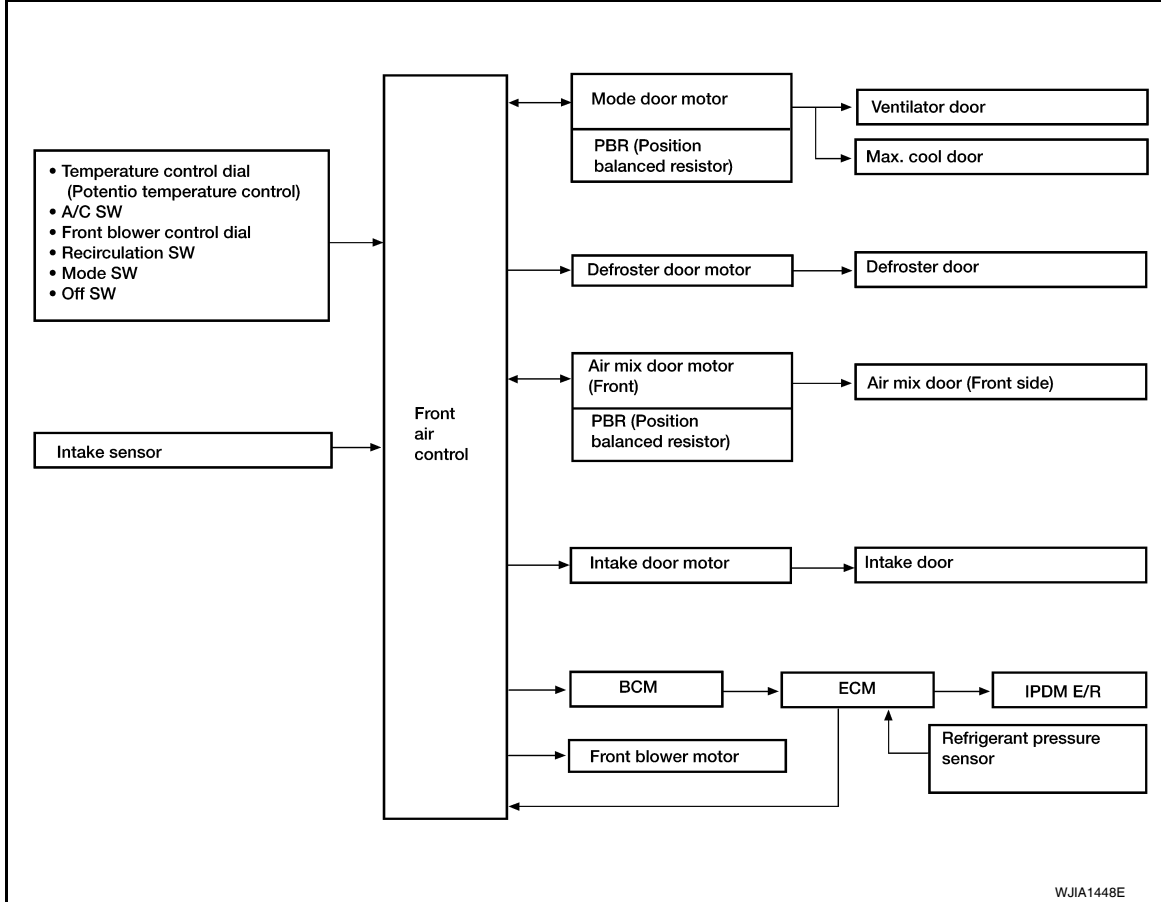
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:000000006164743

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:

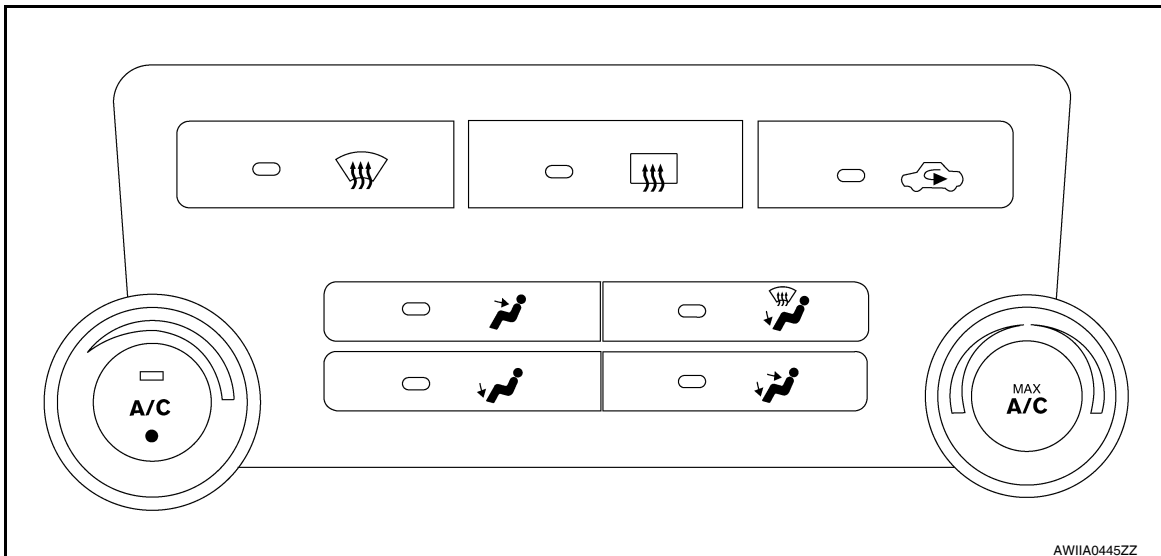


Control System Description

INFOID:000000006164744

CONTROL OPERATION

Front air control



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

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[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

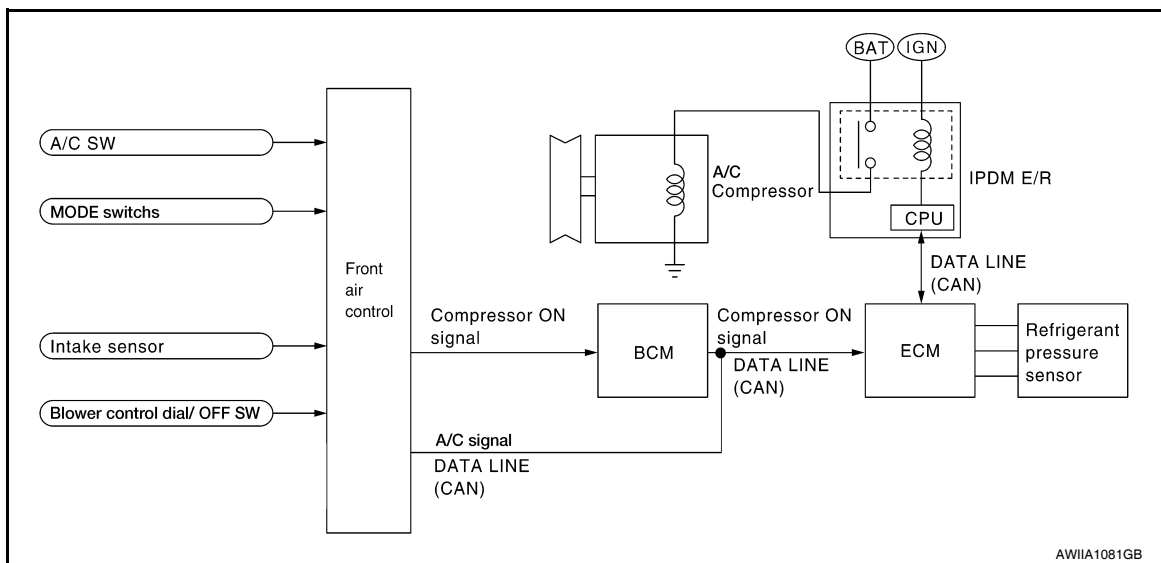
The compressor is ON or OFF.

(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.

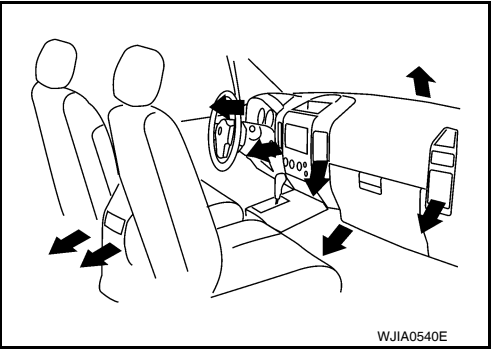
MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

Discharge Air Flow

INFOID:000000006164745

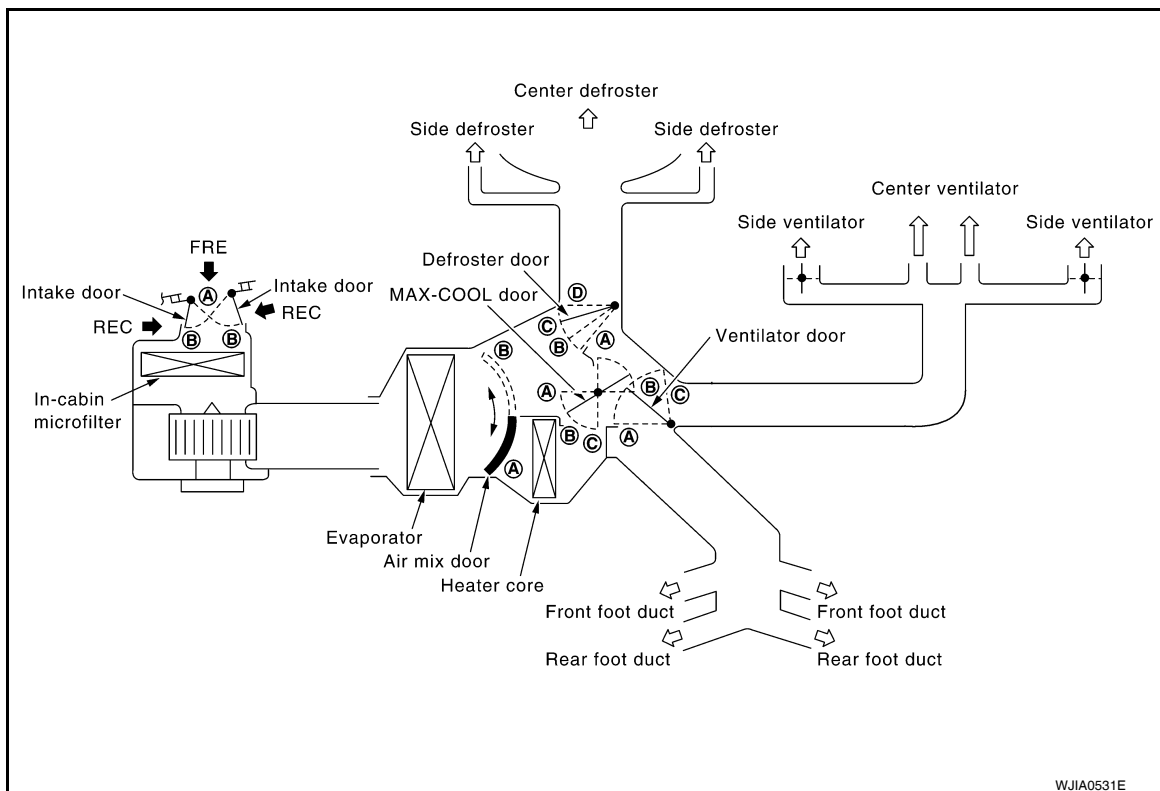


Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	95%	5%	—
	60%	40%	—
	—	70%	30%
	—	60%	40%
	—	10%	90%

Switches And Their Control Function

INFOID:000000006164746

HAC



MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

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

AWIIA0447GB

DIAGNOSIS SYSTEM (HVAC)

CONSULT-III Function (HVAC)

INFOID:000000006164747

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

Diagnostic mode	Description
SELF DIAGNOSTIC RESULT	Displays Front air control self-diagnosis results.
DATA MONITOR	Displays Front air control input/output data in real time.
CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
ECU IDENTIFICATION	Front air control part number can be read.

SELF-DIAGNOSIS

Display Item List

DTC	Description	Reference page
B2573	Battery voltage out of range	CHG-4, "Work Flow"
B257B	Ambient sensor circuit short	HAC-144, "Ambient Sensor Diagnosis Procedure"
B257C	Ambient sensor circuit open	
B2581	Intake sensor circuit short	HAC-147, "Intake Sensor Diagnosis Procedure"
B2582	Intake sensor circuit open	
U1000	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"

DATA MONITOR

Display Item List

Monitor item	Value	Contents
BATT VIA CAN	"V"	Displays battery voltage signal.
IGN VIA CAN	"ON/OFF"	Displays ignition switch signal.
AMB TEMP SEN	"°C"	Displays ambient sensor signal.
EVAP TEMP SEN	"°C"	Displays intake sensor signal.
MODE FDBCK	"V"	Displays mode door motor feedback signal.
DVR MIX FDBCK	"V"	Displays air mix door motor feedback signal.
DEF FDBCK	"V"	Displays defroster door motor feedback signal.
RECIRC	"ON/OFF"	Displays recirculation switch signal.
DEFROST	"ON/OFF"	Displays defroster switch signal.
A/C	"ON/OFF"	Displays A/C switch signal.
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.
MODE SELECT	"DTNT"	Displays blower motor (blower speed decrease) signal.
FAN DOWN	"ON/OFF"	Displays blower motor (blower speed decrease) signal.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM - COMMON ITEM)

INFOID:000000006625985

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

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

SYSTEM APPLICATION

BCM can perform the following functions.

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

CONSULT-III Function (BCM - AIR CONDITIONER)

INFOID:000000006625986

DATA MONITOR

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 1)]

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

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

SELF-DIAGNOSIS FUNCTION

Front Air Control Self-Diagnosis

INFOID:000000006164751




A/C SYSTEM SELF-DIAGNOSIS FUNCTION

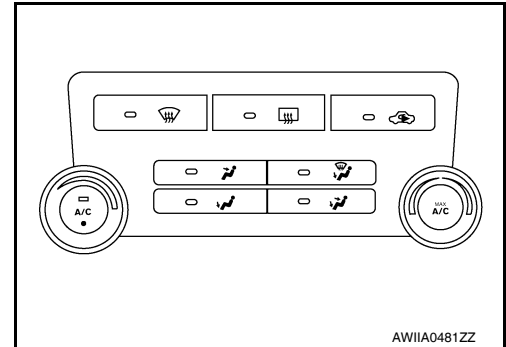
The self-diagnosis function is built into the front air control to quickly locate the cause of malfunctions.

DESCRIPTION

The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on front air control. Refer to applicable sections (items) for details. Fault codes (if any are present) will be displayed in the ambient temperature display area (if equipped). Refer to [HAC-114, "Front Air Control Self-Diagnosis Code Chart"](#).

SELF-DIAGNOSTIC MODE

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



Front Air Control Self-Diagnosis Code Chart

INFOID:000000006164752

SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page	
03	Battery voltage out of range	CHG-4, "Work Flow"
40	Ambient sensor circuit short	HAC-56, "Ambient Sensor Diagnosis Procedure"
41	Ambient sensor circuit open	
56	Intake sensor circuit short	HAC-64, "Intake Sensor Diagnosis Procedure"
57	Intake sensor circuit open	
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"
90	Stuck button	VTL-8, "Removal and Installation"

MANUAL A/C IDENTIFICATION TABLE

< DTC/CIRCUIT DIAGNOSIS >

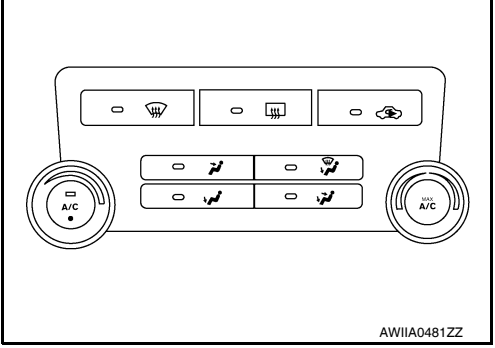
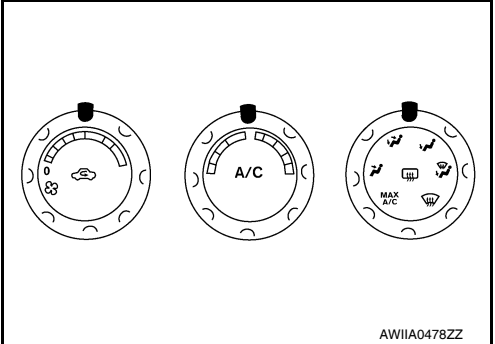
[MANUAL A/C (TYPE 1)]

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164753

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)]	

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

MODE DOOR MOTOR

System Description

INFOID:000000006164754

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

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

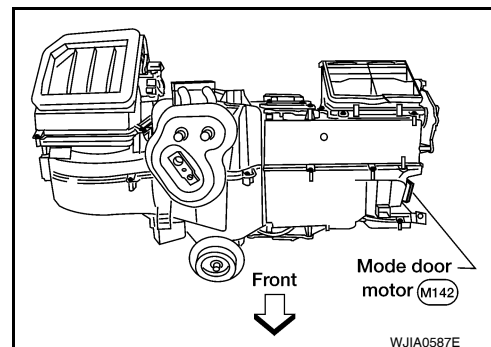
System Operation

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

COMPONENT DESCRIPTION

Mode Door Motor

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




Mode Door Motor Component Function Check




INFOID:000000006164755

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Press each mode switch and press the  (DEF) switch. Each position indicator should illuminate.
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-109, "Discharge Air Flow"](#).

NOTE:

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

Is the inspection result normal?

YES >> Inspection End.

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

Mode Door Motor Diagnosis Procedure

INFOID:000000006164756

Regarding Wiring Diagram information, refer to [HAC-155, "Wiring Diagram - Manual With 2 Control Dial System"](#).

SYMPTOM:

- Air outlet does not change.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

- Mode door motor does not operate normally.

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

- Turn ignition switch ON.
- Using CONSULT-III, check "MODE FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to [HAC-111, "CONSULT-III Function \(HVAC\)"](#).
- Observe "MODE FDBCK" voltage while cycling front air control mode switch through all modes.

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

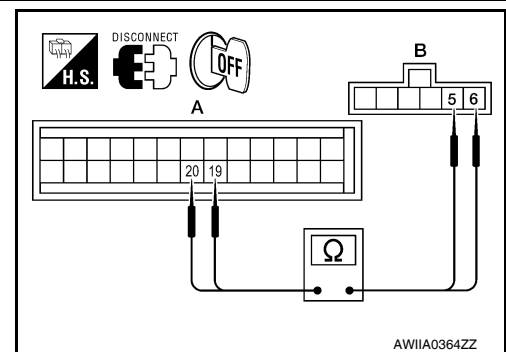
Is the inspection result normal?

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

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

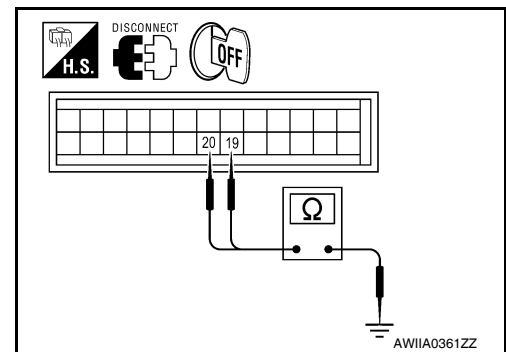
- Turn ignition switch OFF.
- Disconnect the front air control harness connector M180 (A) and the mode door motor harness connector M142 (B).
- Check continuity between front air control harness connector M180 (A) terminals 19, 20 and the mode door motor harness connector M142 (B) terminals 5, 6.

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



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

Connector	Terminal	—	Continuity
M180	19	Ground	No
	20		



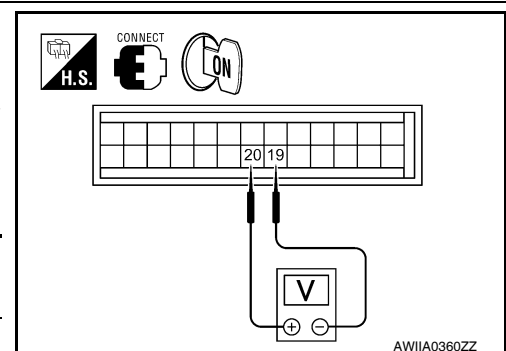
Is the inspection result normal?

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

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

- Reconnect front air control harness connector.
- Turn ignition switch ON.
- Press the mode switch to the D/F (☁) mode.
- Check voltage between front air control harness connector M180 terminal 19 and terminal 20 while pressing the mode switch to the VENT (🌀), and then the B/L (🌀) mode.

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



Is the inspection result normal?

- YES >> GO TO 4.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

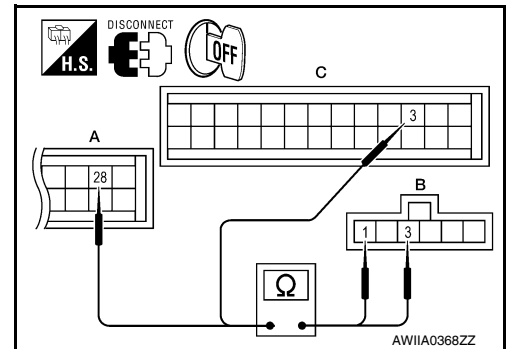
[MANUAL A/C (TYPE 1)]

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M180 (C) terminal 3, and M181 (A) terminal 28 and the mode door motor harness connector M142 (B) terminals 1, 3.

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



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

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

Is the inspection result normal?

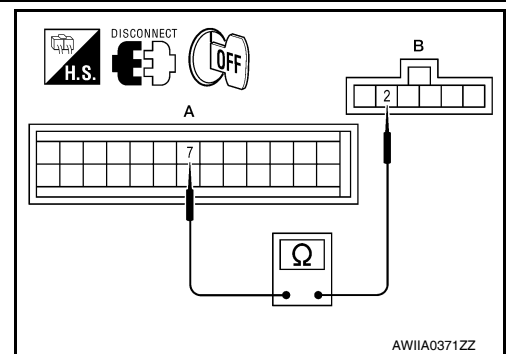
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

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

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



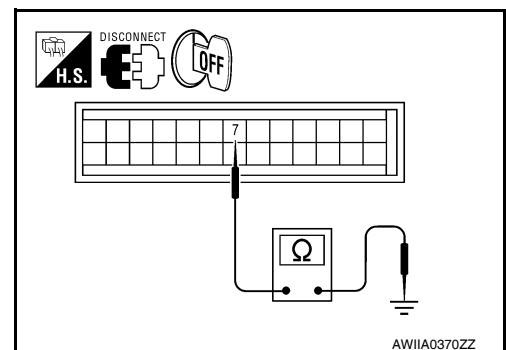
2. Check continuity between front air control harness connector M180 terminal 7 and ground.

Connector	Terminal	—	Continuity
M180	7	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.



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

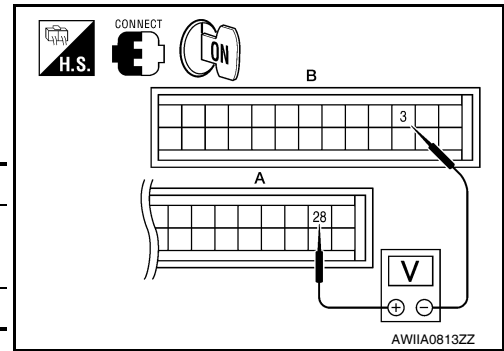
MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

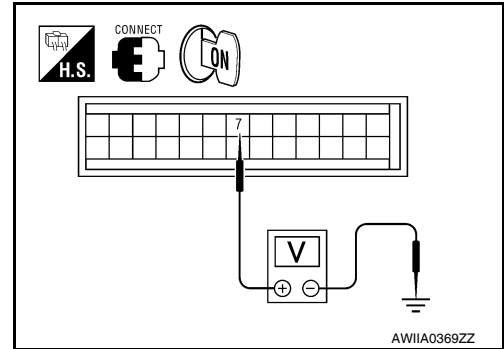
1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 (B) terminal 3, and M181 (A) terminal 28.

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



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

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



Is the inspection result normal?

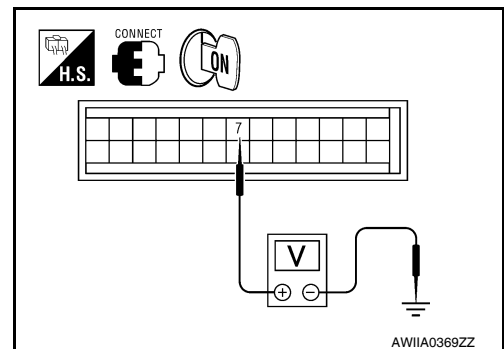
YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M180 terminal 7 and ground.

Connector	Terminal	—	Voltage (Approx.)
M180	7	Ground	0.2 to 4.8 Volts



Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-19. "Removal and Installation"](#).

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

AIR MIX DOOR MOTOR

System Description

INFOID:000000006164757

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

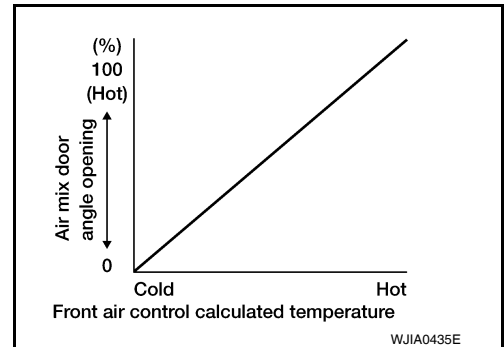
Air mix door control system components are:

- Front air control
- Air mix door motor
- Position balanced resistor (PBR) (built-into air mix door motors)
- Intake sensor

System Operation

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

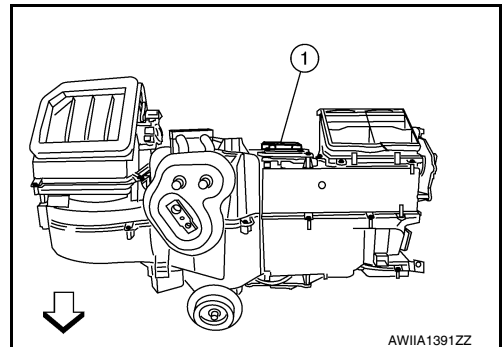
Air Mix Door Control Specification



COMPONENT DESCRIPTION

Air Mix Door Motors

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



Air Mix Door Motor Component Function Check

INFOID:000000006164758

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.

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Is the inspection result normal?

- YES >> Inspection End.
 NO >> Go to diagnosis procedure. Refer to [HAC-121, "Air Mix Door Motor Diagnosis Procedure"](#).

Air Mix Door Motor Diagnosis Procedure

INFOID:000000006164759

Regarding Wiring Diagram information, refer to [HAC-155, "Wiring Diagram - Manual With 2 Control Dial System"](#).

SYMPTOM:

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

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

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

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

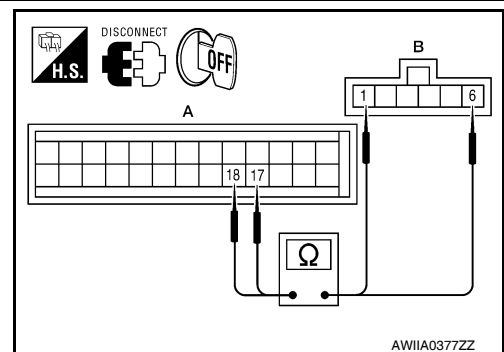
Is the inspection result normal?

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

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

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

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



AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

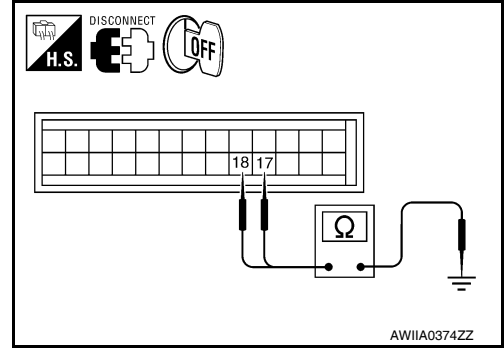
[MANUAL A/C (TYPE 1)]

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

Connector	Terminal	—	Continuity
M180	17	Ground	No
	18		

Is the inspection result normal?

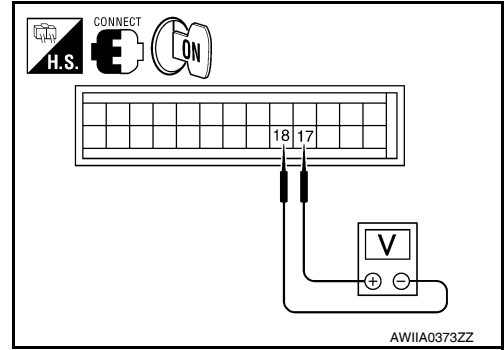
- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.



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

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

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



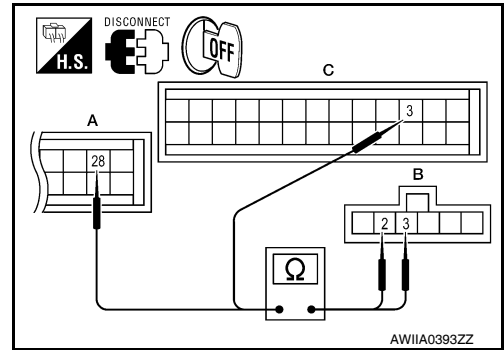
Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

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

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connectors.
3. Check continuity between front air control harness connector M180 (C) terminal 3, connector M181 (A) terminal 28 and air mix door motor harness connector M147 (B) terminals 3, 2.

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



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

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

Is the inspection result normal?

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

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

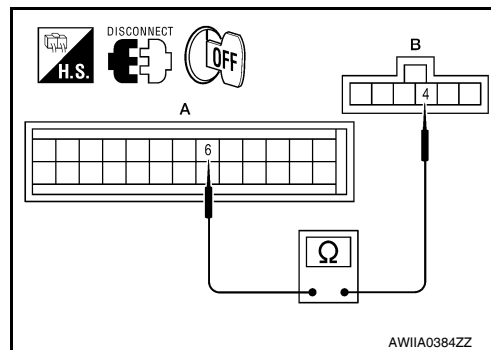
AIR MIX DOOR MOTOR

[MANUAL A/C (TYPE 1)]

< DTC/CIRCUIT DIAGNOSIS >

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

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



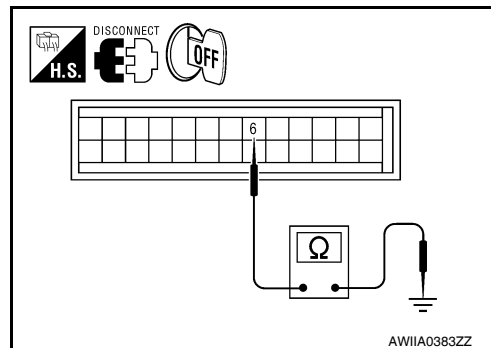
2. Check continuity between front air control harness connector M180 terminal 6 and ground.

Connector	Terminal	—	Continuity
M180	6	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

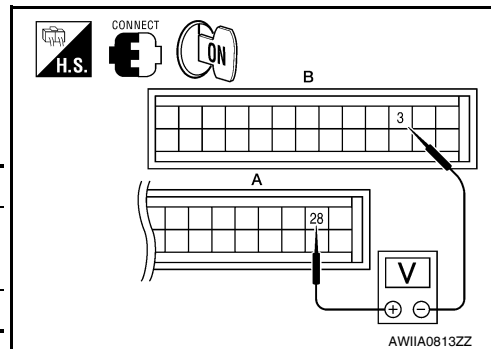
NO >> Repair or replace harness as necessary.



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

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

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



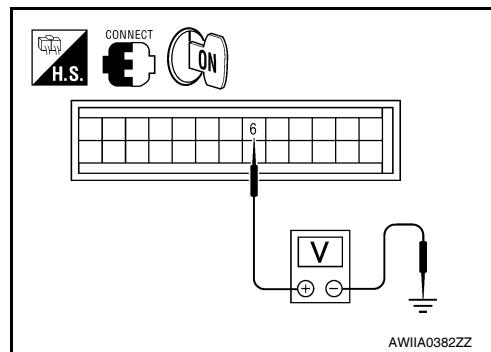
4. Check voltage between front air control harness connector M180 terminal 6 and ground.

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

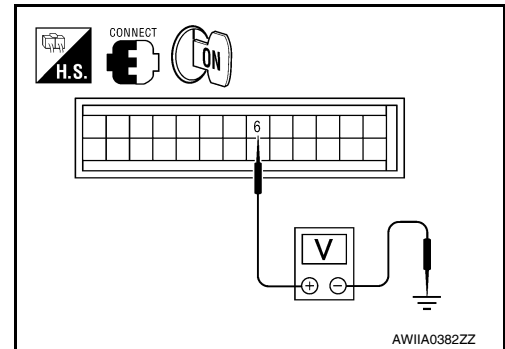
[MANUAL A/C (TYPE 1)]

1. Reconnect the air mix door motor harness connector M147.
2. Check voltage between front air control harness connector M180 terminal 6 and ground.

Connector	Terminal	—	Voltage (Approx.)
M180	6	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect air mix door for binding or mechanical failure. If air mix door moves freely, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
- NO >> Replace air mix door motor. Refer to [VTL-20, "Removal and Installation"](#).



INTAKE DOOR MOTOR

System Description

INFOID:000000006164760

SYSTEM DESCRIPTION

SYMPTOM:

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

SYSTEM DESCRIPTION

Component Parts

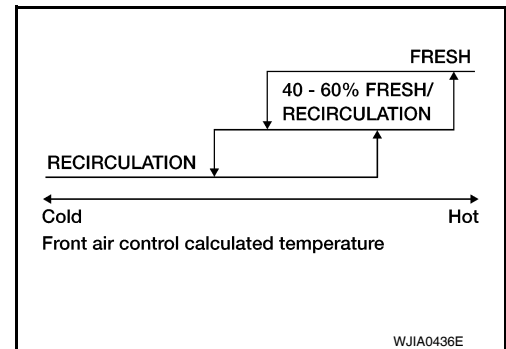
Intake door control system components are:

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

System Operation

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

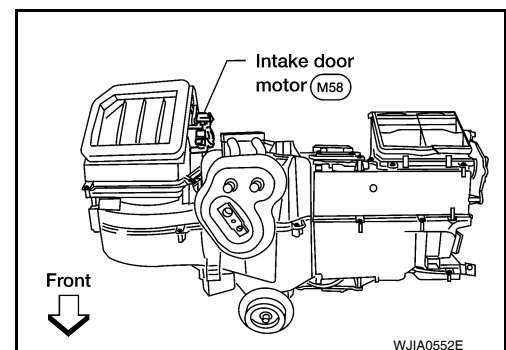
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake door motor

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








Intake Door Motor Component Function Check

INFOID:000000006164761

INSPECTION FLOW

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

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

INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-126. "Intake Door Motor Diagnosis Procedure"](#).

Intake Door Motor Diagnosis Procedure

INFOID:000000006164762

Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

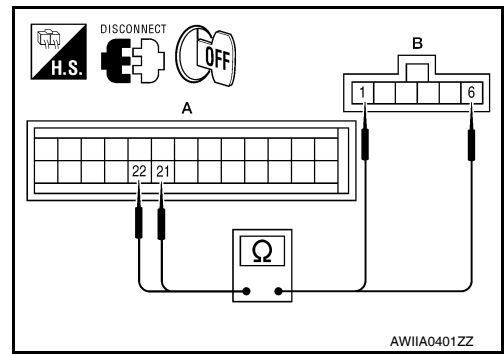
SYMPTOM:

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

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

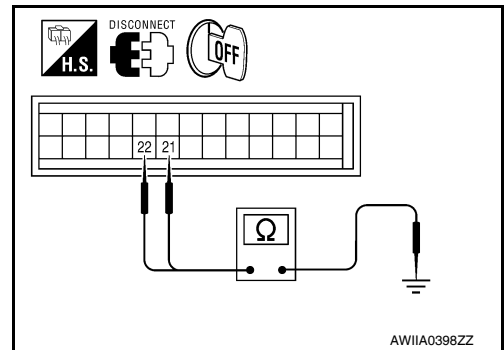
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.

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



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

Connector	Terminal	—	Continuity
M180	21	Ground	No
	22		



Is the inspection result normal?

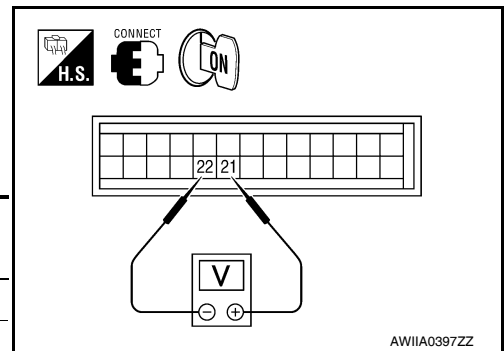
YES >> GO TO 3.

NO >> Repair or replace harness as necessary.

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M180 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M180	21	22	Self-diagnostic mode (opening)	Battery voltage
	22	21	Self-diagnostic mode (closing)	Battery voltage



Is the inspection result normal?

YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-18. "Removal and Installation"](#).

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:000000006164763

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:

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

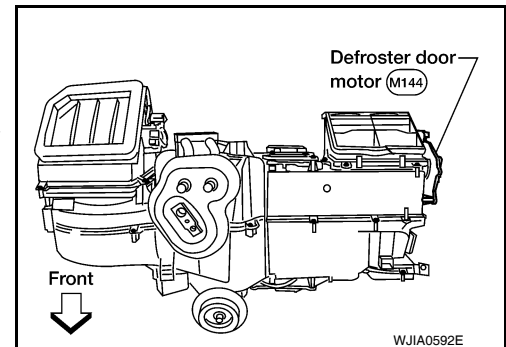
System Operation

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

COMPONENT DESCRIPTION

Defroster door motor

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





Defroster Door Motor Component Function Check

INFOID:000000006164764

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-127. "Defroster Door Motor Diagnosis Procedure"](#)

Defroster Door Motor Diagnosis Procedure

INFOID:000000006164765

Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

SYMPTOM:

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

DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

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

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

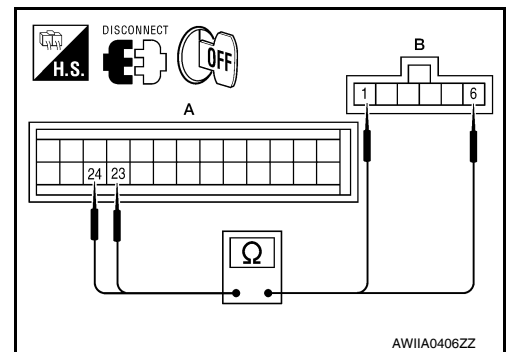
Is the inspection result normal?

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

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

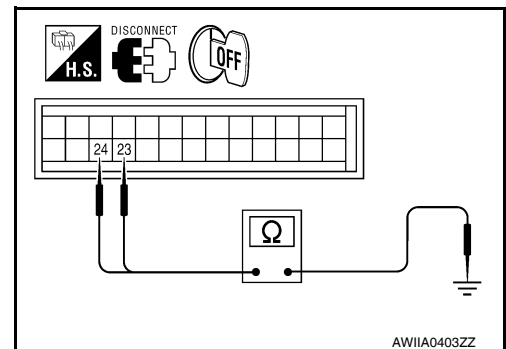
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M180 (A) and the defroster door motor harness connector M144 (B).
3. Check continuity between front air control harness connector M180 (A) terminals 23, 24 and the defroster door motor harness connector M144 (B) terminals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

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



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

Connector	Terminal	—	Continuity
M180	23	Ground	No
	24		



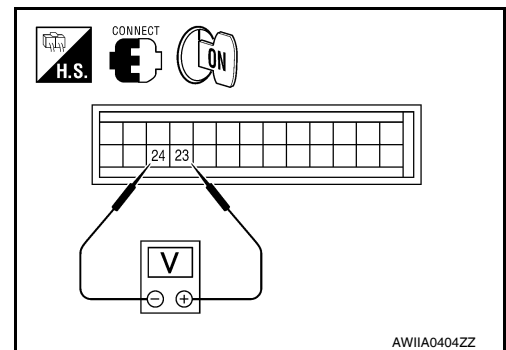
Is the inspection result normal?

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

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

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

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



Is the inspection result normal?

- YES >> GO TO 4.

DEFROSTER DOOR MOTOR CIRCUIT

[MANUAL A/C (TYPE 1)]

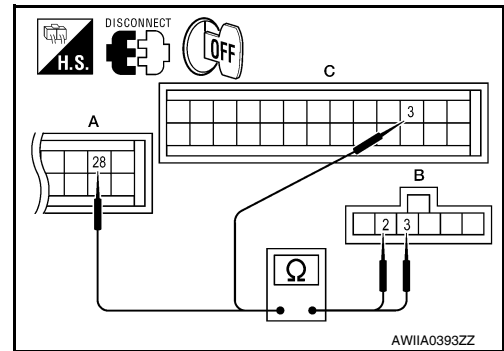
< DTC/CIRCUIT DIAGNOSIS >

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

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

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

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



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

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

Is the inspection result normal?

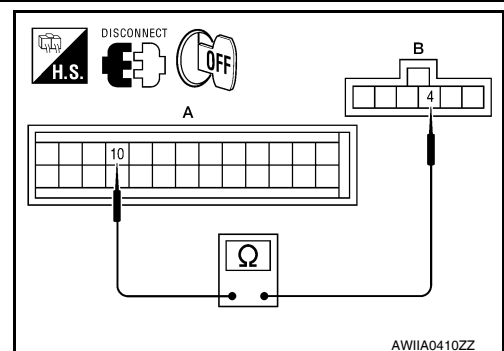
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

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

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



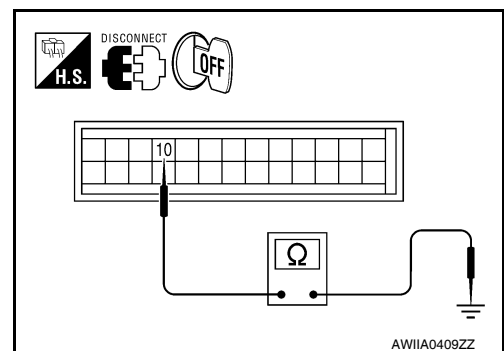
2. Check continuity between front air control harness connector M180 terminal 10 and ground.

Connector	Terminal	—	Continuity
M180	10	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.



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

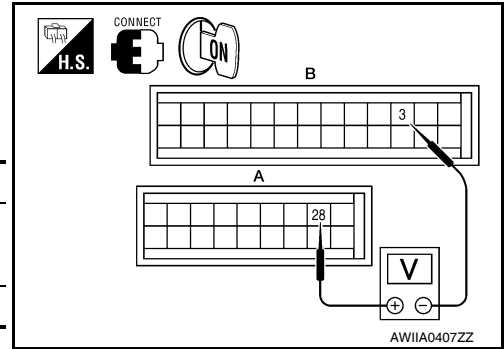
DEFROSTER DOOR MOTOR CIRCUIT

[MANUAL A/C (TYPE 1)]

< DTC/CIRCUIT DIAGNOSIS >

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

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



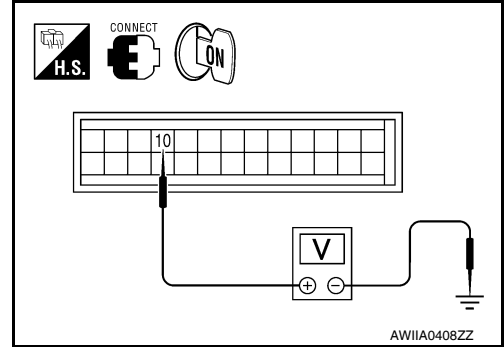
4. Check voltage between front air control harness connector M180 terminal 10 and ground.

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

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).



7. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

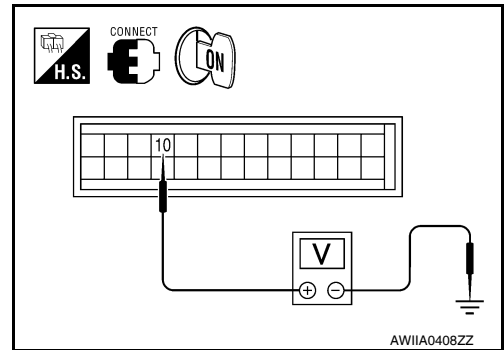
1. Reconnect the defroster door motor harness connector M144.
2. Check voltage between front air control harness connector M180 terminal 10 and ground.

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

Is the inspection result normal?

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

NO >> Replace the defroster door motor. Refer to [VTL-17, "Removal and Installation"](#).



BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

BLOWER MOTOR CONTROL SYSTEM

System Description

INFOID:000000006164766

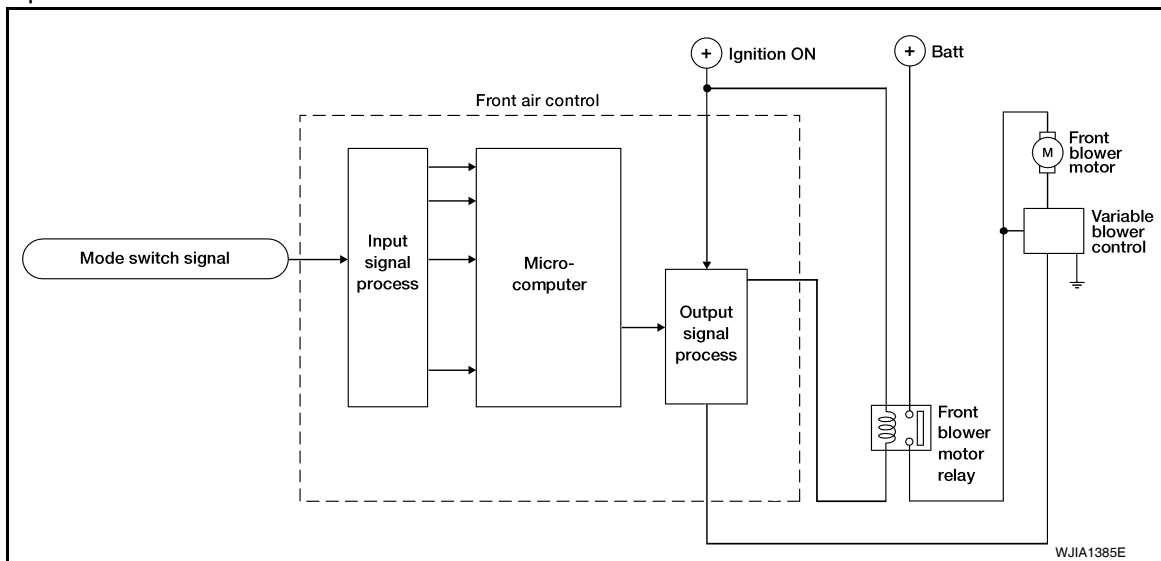
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

- Front air control
- Variable blower control
- Front blower motor relay
- Front blower motor
- Ambient sensor
- Intake sensor

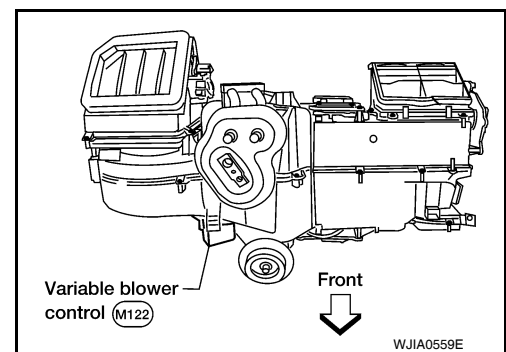
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

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



Front Blower Motor Component Function Check

INFOID:000000006164767

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

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

Is the inspection result normal?

YES >> Inspection End.

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Go to diagnosis procedure. Refer to [HAC-132. "Front Blower Motor Diagnosis Procedure"](#).

Front Blower Motor Diagnosis Procedure

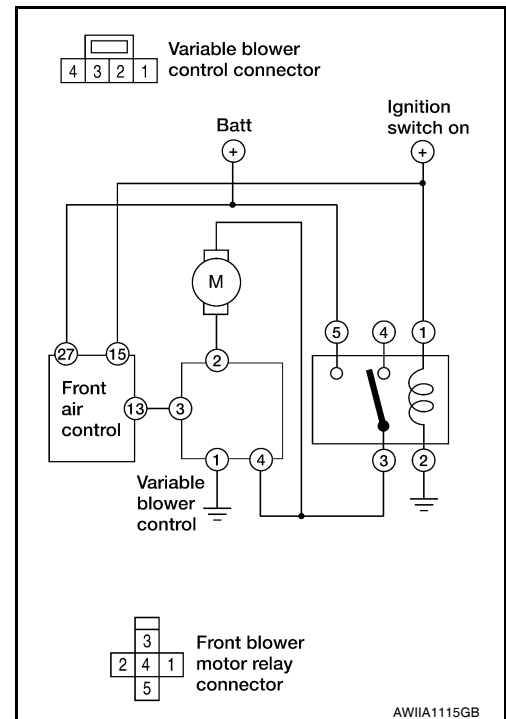
INFOID:000000006164768

Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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



1. CHECK FUSES

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to [PG-72. "Terminal Arrangement"](#).

Fuses are good.

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 9.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT

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

2 - Ground

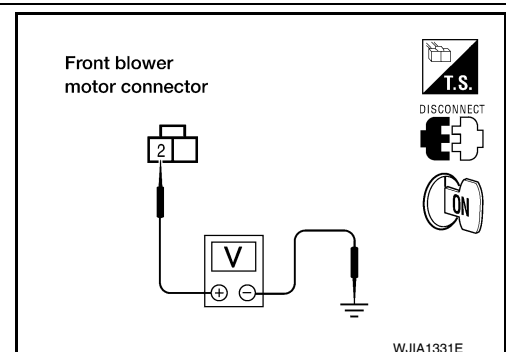
: Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 3.

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



WJIA1331E

BLOWER MOTOR CONTROL SYSTEM

[MANUAL A/C (TYPE 1)]

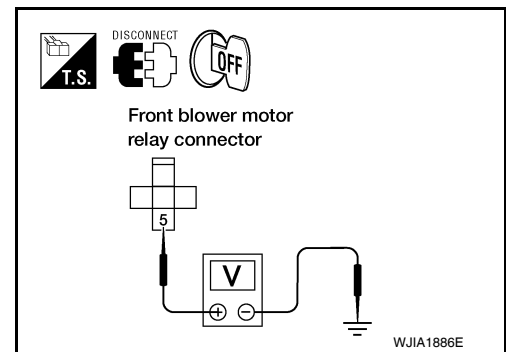
< DTC/CIRCUIT DIAGNOSIS >

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

5 - Ground : Battery voltage

Is the inspection result normal?

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



4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to [HAC-135. "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

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

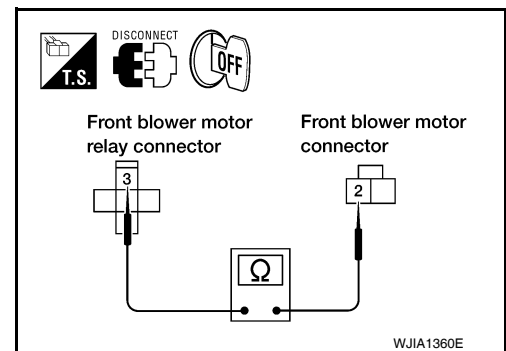
5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

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

3 - 2 : Continuity should exist.

Is the inspection result normal?

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



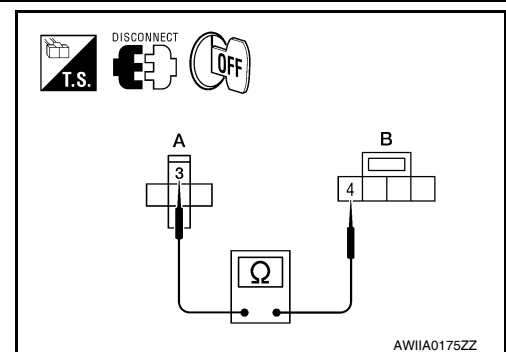
6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

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

3 - 4 : Continuity should exist.

Is the inspection result normal?

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



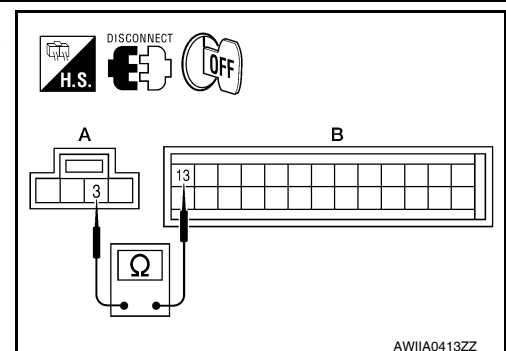
7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

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

13 - 3 : Continuity should exist.

Is the inspection result normal?

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



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

BLOWER MOTOR CONTROL SYSTEM

[MANUAL A/C (TYPE 1)]

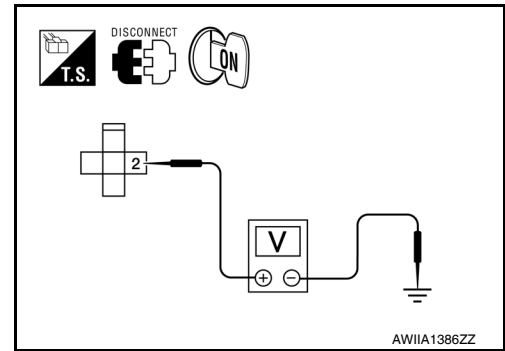
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.
2. 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.

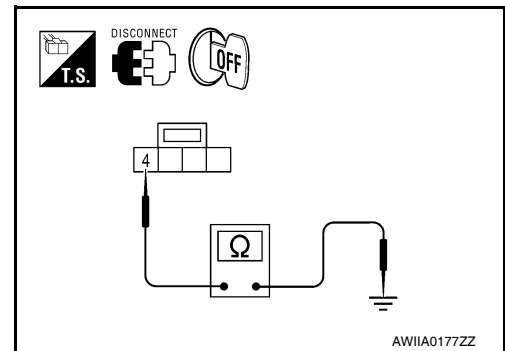
10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

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.



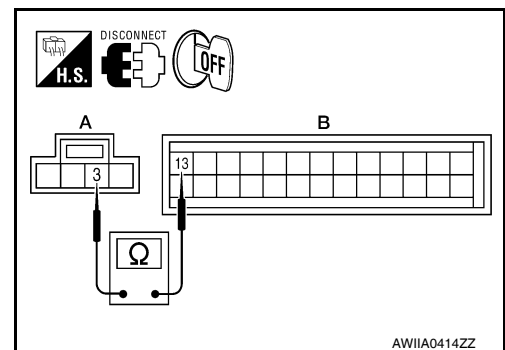
11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

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

13 - 3 : Continuity should exist.

Is the inspection result normal?

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



12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-131, "Front Blower Motor Component Function Check"](#).

Is the inspection result normal?

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

13. CHECK BLOWER MOTOR GROUND CIRCUIT

BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

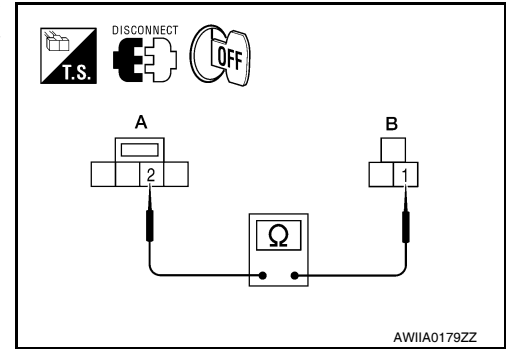
Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M122 (A) terminal 2.

1 - 2 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.



14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

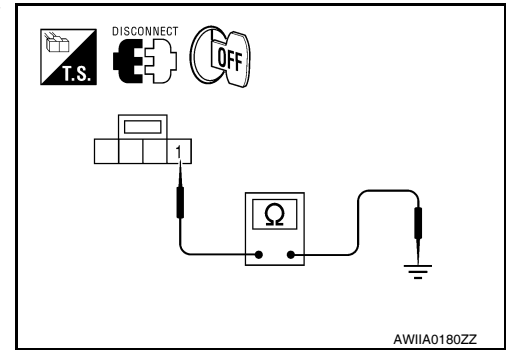
Check continuity between variable blower control harness connector M122 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-22, "Removal and Installation"](#).

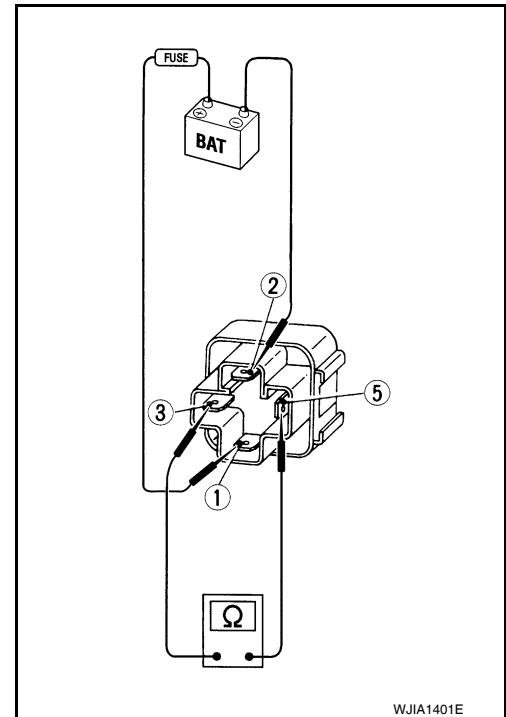
NO >> Repair harness or connector.



Front Blower Motor Component Inspection

COMPONENT INSPECTION

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



Front Blower Motor

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

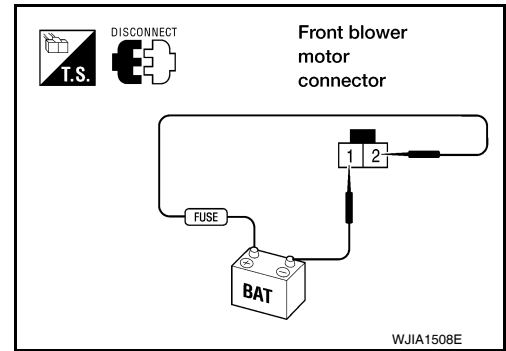
BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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:000000006164770

SYSTEM DESCRIPTION

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

Low Temperature Protection Control

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

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


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

Magnet Clutch Component Function Check

INFOID:000000006164771

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

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

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Go to diagnosis procedure. Refer to [HAC-137, "Magnet Clutch Diagnosis Procedure"](#).

Magnet Clutch Diagnosis Procedure

INFOID:000000006164772

Regarding Wiring Diagram information, refer to [HAC-155, "Wiring Diagram - Manual With 2 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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

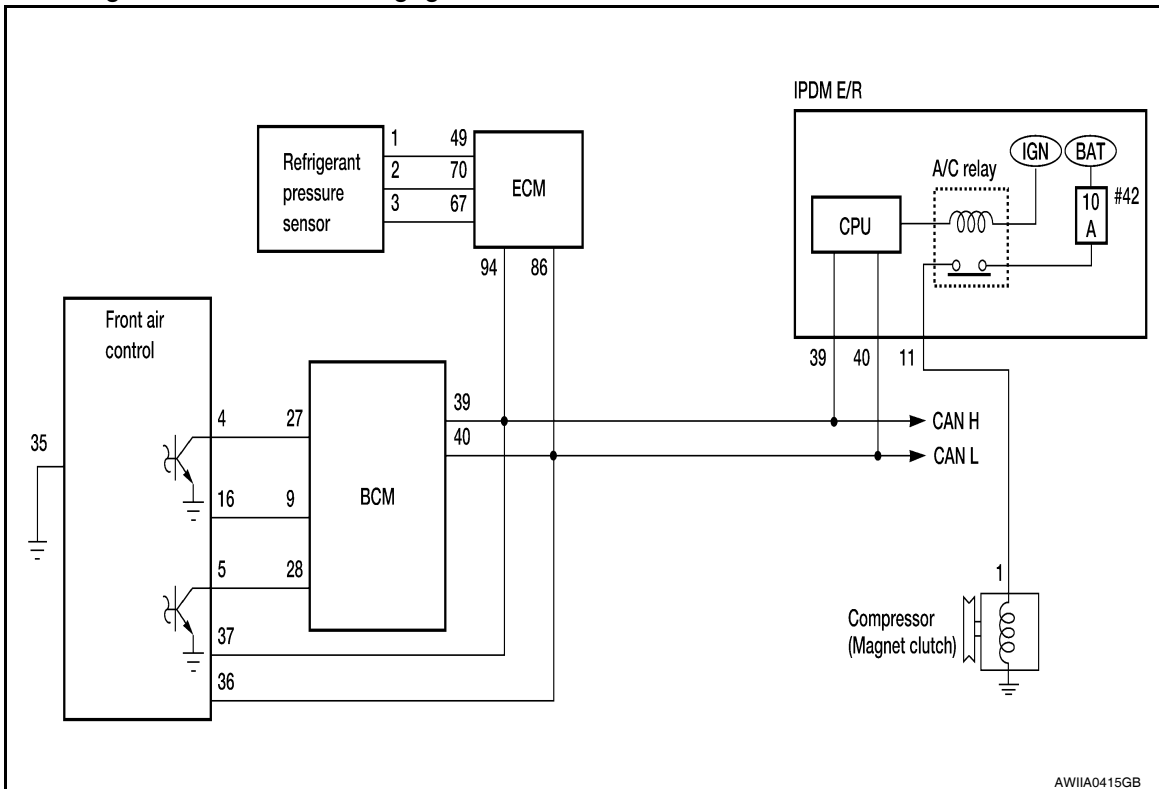
HAC

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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



1. CHECK INTAKE AND AMBIENT SENSOR CIRCUITS

Check intake and ambient sensors. Refer to [HAC-114, "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

YES >> GO TO 2.

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

2. PERFORM AUTO ACTIVE TEST

Refer to [PCS-11, "Diagnosis Description"](#).

Does magnet clutch operate?

YES >> • WITH CONSULT-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 IPDM E/R AND COMPRESSOR

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

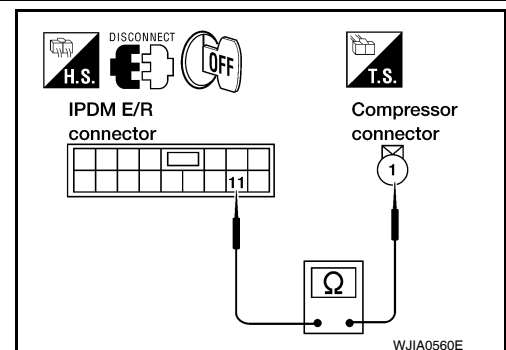
11 – 1 : Continuity should exist.

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

11 – ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 4.



MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Repair harness or connector.

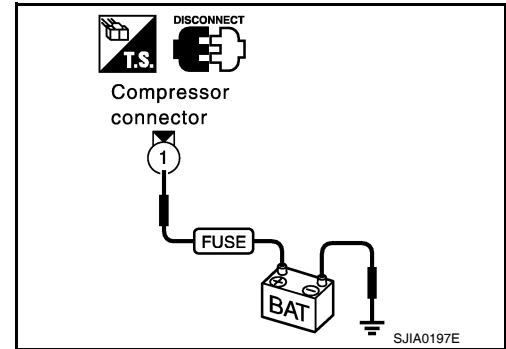
4. CHECK MAGNET CLUTCH CIRCUIT

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

Is the inspection result normal?

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

NO >> Replace magnet clutch. Refer to [HA-33, "Removal and Installation for Compressor Clutch"](#).



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to [HAC-112, "CONSULT-III Function \(BCM - AIR CONDITIONER\)"](#).

A/C SW ON : AIR COND SW ON

A/C SW OFF : AIR COND SW OFF

Is the inspection result normal?

YES >> GO TO 8.

NO >> GO TO 6.

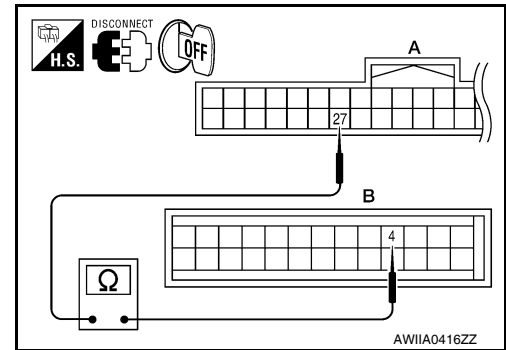
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

- 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 M180 (B) terminal 4.

27 - 4 Continuity should exist.

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

27 - ground Continuity should not exist.



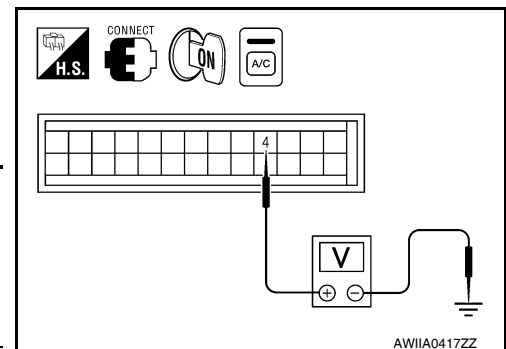
Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair harness or connector.

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

- Reconnect BCM connector and front air control connector.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M180 terminal 4 and ground.



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

Is the inspection result normal?

YES >> GO TO 8.

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

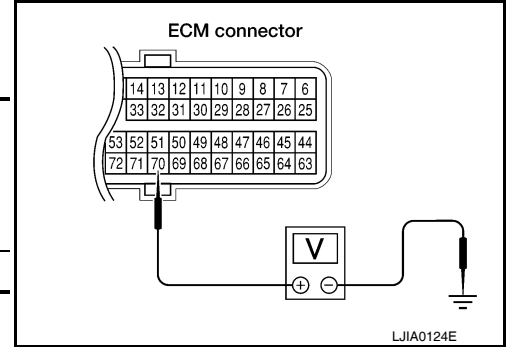
[MANUAL A/C (TYPE 1)]

- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
- NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-53. "Removal and Installation"](#).

8. CHECK REFRIGERANT PRESSURE SENSOR

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

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



Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Refer to [EC-465. "Diagnosis Procedure"](#).

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [HAC-112. "CONSULT-III Function \(BCM - AIR CONDITIONER\)"](#).

**FRONT BLOWER CONTROL : FAN ON SIG ON
DIAL ON**

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

Is the inspection result normal?

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

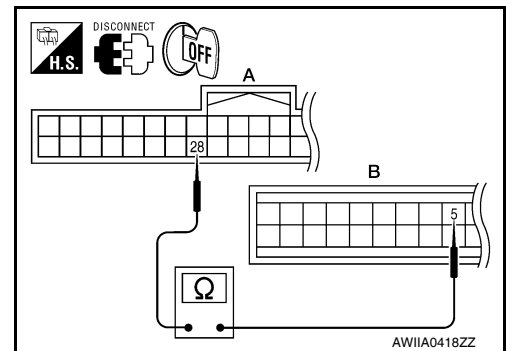
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M180 (B) terminal 5.

28 - 5 Continuity should exist.

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

28 - ground Continuity should not exist.



Is the inspection result normal?

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

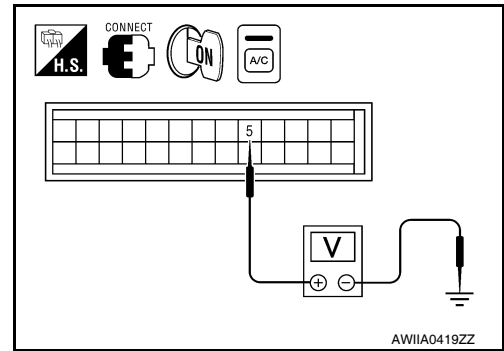
11. CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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



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

Is the inspection result normal?

YES >> GO TO 12.

NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-53, "Removal and Installation"](#).

12.CHECK CAN COMMUNICATION

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

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

Is the inspection result normal?

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

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

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

WATER VALVE CIRCUIT

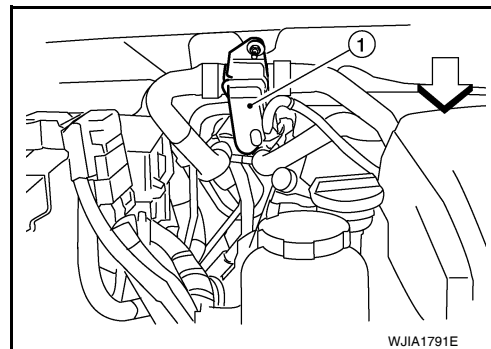
Description

INFOID:000000006164773

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:000000006164774

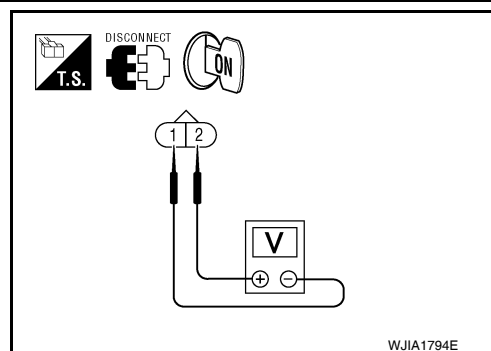
Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

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



Is the inspection result normal?

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

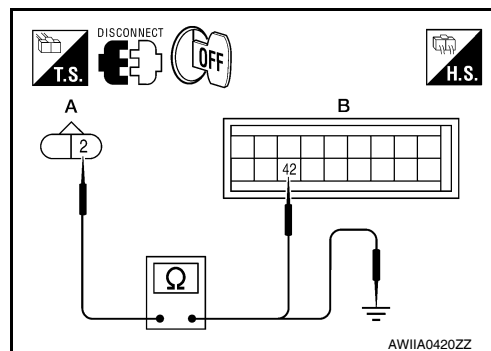
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

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

2 - 42 : Continuity should exist.

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

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Repair harness or connector.

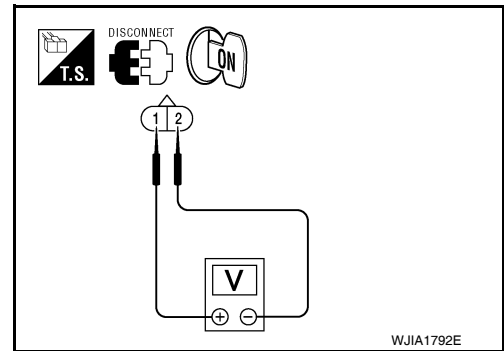
3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

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

Is the inspection result normal?

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



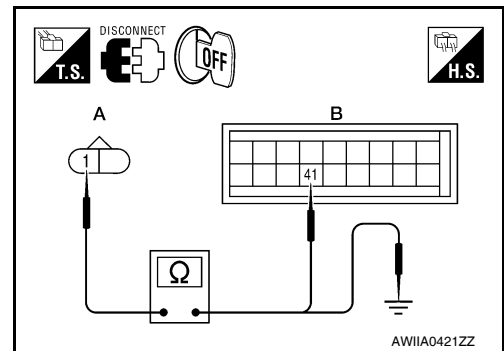
4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

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

1 - 41 : Continuity should exist.

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

1 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
 NO >> Repair harness or connector.

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

HAC

AMBIENT SENSOR

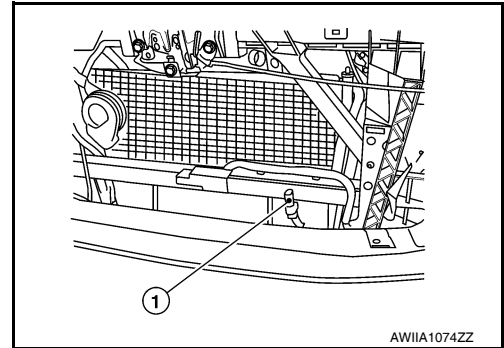
Component Description

INFOID:000000006164775

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.

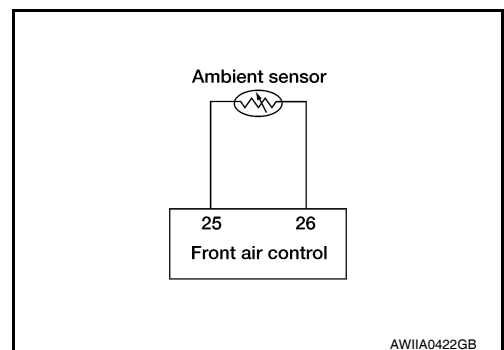
Ambient Sensor Diagnosis Procedure

INFOID:000000006164776

Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted.



1.CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

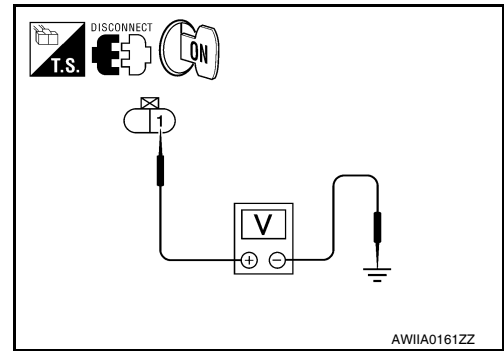
[MANUAL A/C (TYPE 1)]

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

1 - Ground : Approx. 5V

Is the inspection result normal?

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



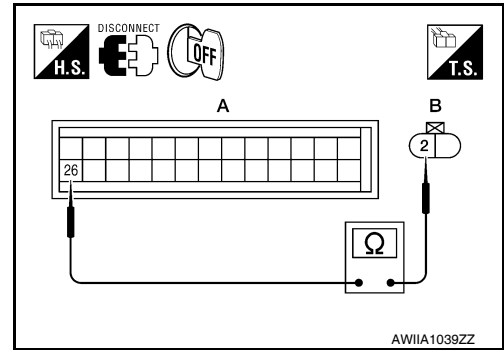
2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E1 (B) terminal 2 and front air control harness connector M180 (A) terminal 26.

2 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK AMBIENT SENSOR

Check the ambient sensor circuit. Refer to [HAC-144, "Ambient Sensor Diagnosis Procedure"](#).

Is the inspection result normal?

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

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

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

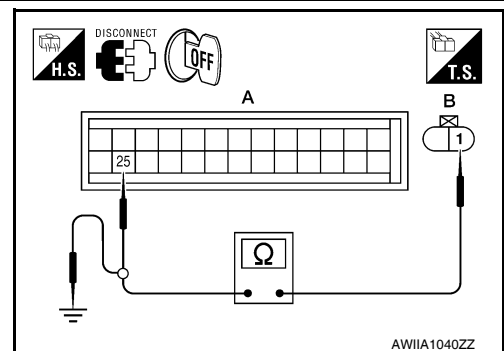
1 - 25 : Continuity should exist.

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

1 - Ground : Continuity should not exist.

Is the inspection result normal?

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



Ambient Sensor Component Inspection

INFOID:000000006164777

COMPONENT INSPECTION

Ambient Sensor

AMBIENT SENSOR

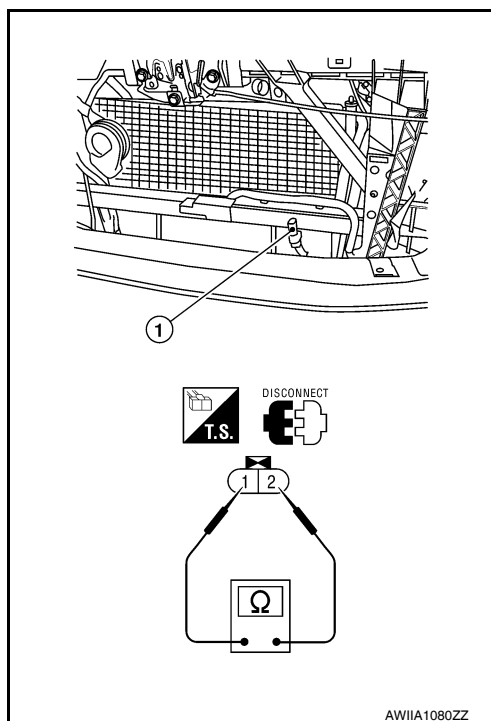
< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

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

If NG, replace ambient sensor. Refer to [HA-45. "Removal and Installation"](#).



AWIIA1080ZZ

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

INTAKE SENSOR

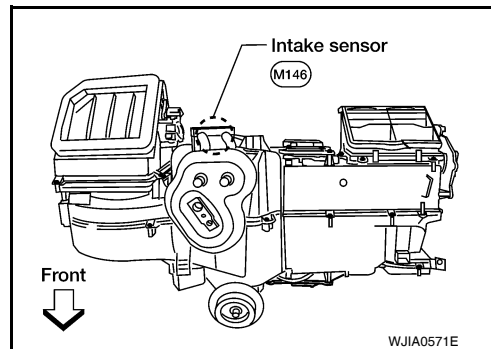
System Description

INFOID:000000006164778

COMPONENT DESCRIPTION

Intake Sensor

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



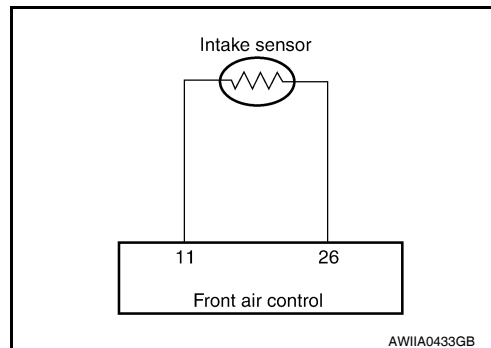
Intake Sensor Diagnosis Procedure

INFOID:000000006164779

Regarding Wiring Diagram information, refer to [HAC-155. "Wiring Diagram - Manual With 2 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



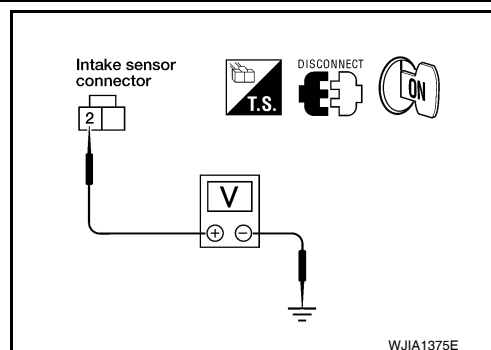
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

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

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

Is the inspection result normal?

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



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

INTAKE SENSOR

[MANUAL A/C (TYPE 1)]

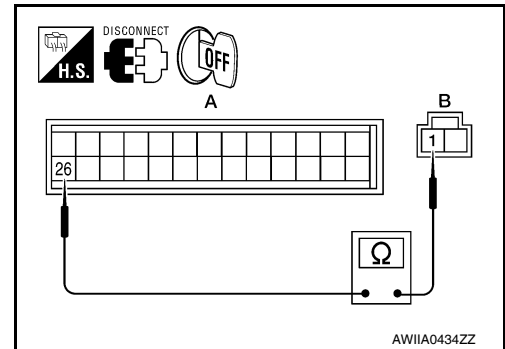
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M180 (A) terminal 26.

1 - 26 : Continuity should exist.

Is the inspection result normal?

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



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-148, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> 1. Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
2. Go to [HAC-114, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.
NO >> 1. Replace intake sensor. Refer to [VTL-11, "Removal and Installation"](#).
2. Go to [HAC-114, "Front Air Control Self-Diagnosis"](#) and perform self-diagnosis.

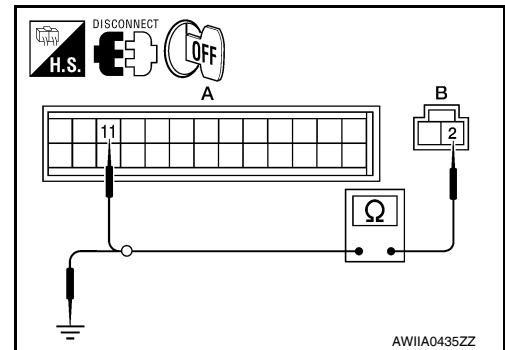
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 11 and front air control harness connector M180 (A) terminal 11.

2 - 11 : Continuity should exist.

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

2 - Ground : Continuity should not exist.



Is the inspection result normal?

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

Intake Sensor Component Inspection

INFOID:000000006164780

COMPONENT INSPECTION

Intake Sensor

INTAKE SENSOR

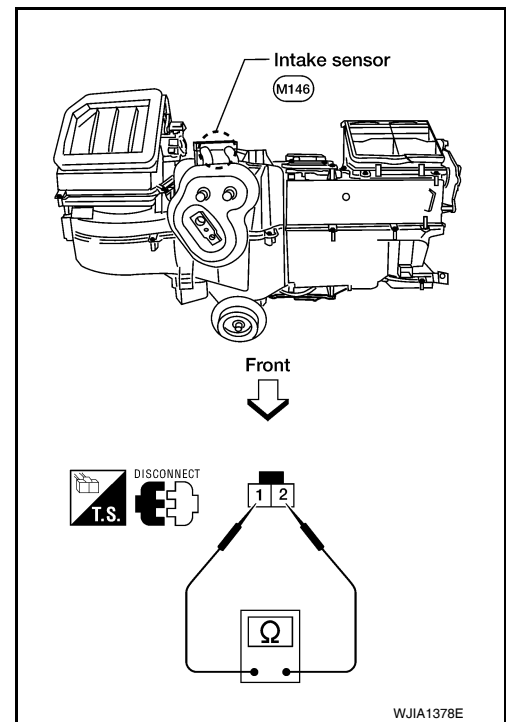
< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-11. "Removal and Installation"](#).



A
B
C
D
E
F
G
H

HAC

J
K
L
M
N
O
P

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

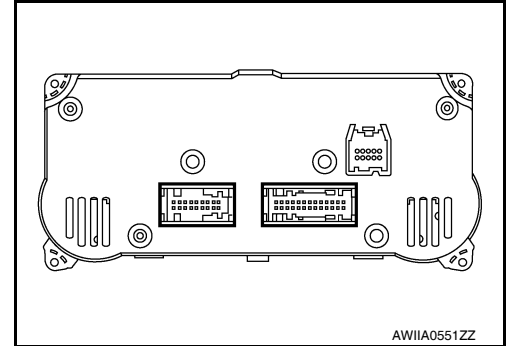
INFOID:000000006164781

COMPONENT DESCRIPTION

Front Air Control

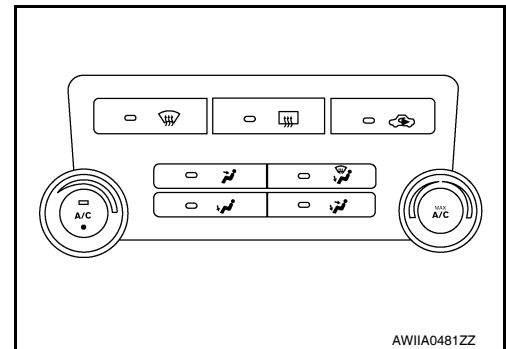
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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.



Potential Temperature Control (PTC)

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



Front Air Control Component Function Check

INFOID:000000006164782

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - AUTO MODE

1. Turn the blower control dial clockwise to low speed.
2. Press the A/C Turn the blower control dial clockwise to low speed.
3. Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-150, "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000006164783

Regarding Wiring Diagram information, refer to [HAC-155, "Wiring Diagram - Manual With 2 Control Dial System"](#).

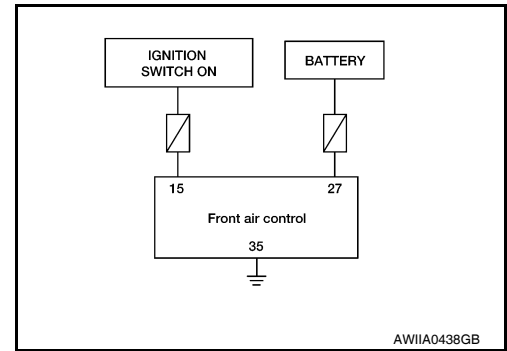
DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

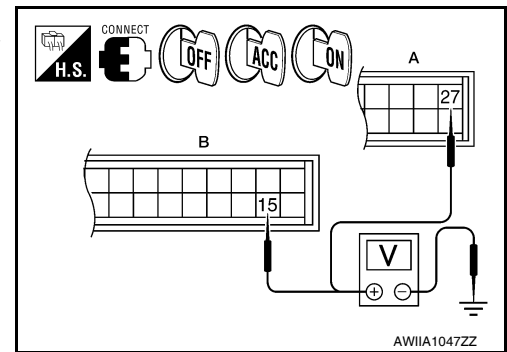
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

- Turn ignition switch ON.
- Check voltage between front air control harness connector M180 (B) terminal 15 and M181 (A) terminal 27, and ground.

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



Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-72, "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

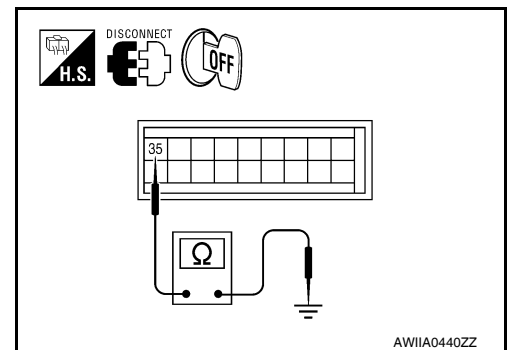
- Turn ignition switch OFF.
- Disconnect front air control connectors.
- Check continuity between front air control harness connector M181 terminal 35 and ground.

35 - Ground : Continuity should exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NG >> Repair harness or connector.



MANUAL A/C IDENTIFICATION TABLE

< ECU DIAGNOSIS INFORMATION >

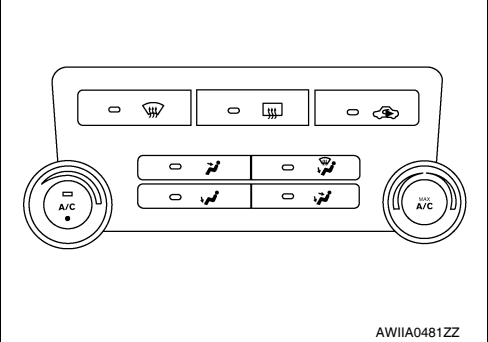
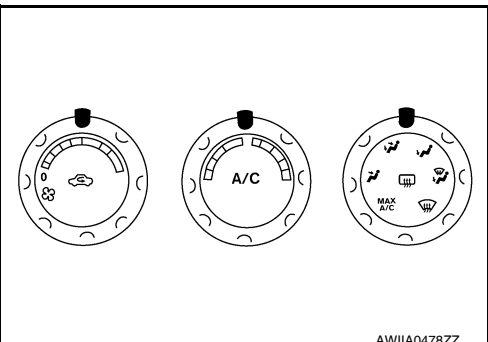
[MANUAL A/C (TYPE 1)]

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164784

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)]	

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

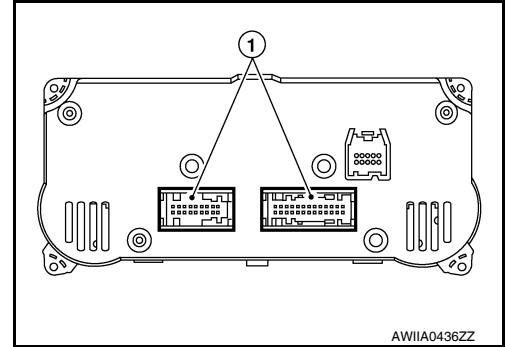
[MANUAL A/C (TYPE 1)]

AIR CONDITIONER CONTROL

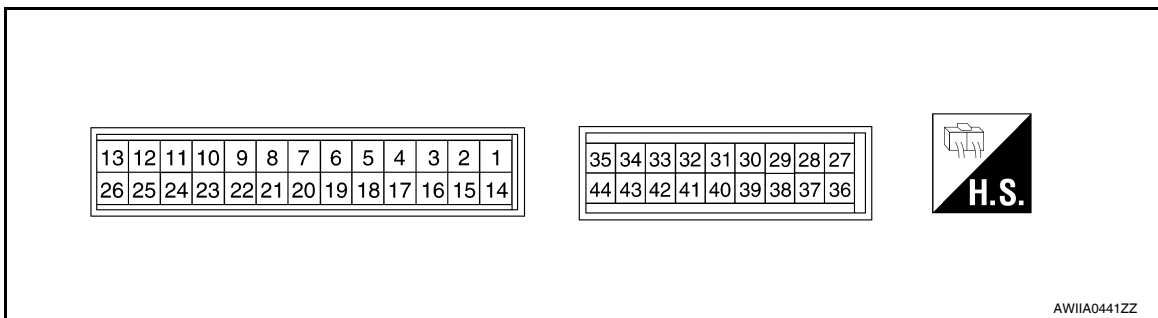
Front Air Control Terminals Reference Values

INFOID:000000006164785

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



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

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

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL A/C (TYPE 1)]

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

*1: If equipped

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

WIRING DIAGRAM

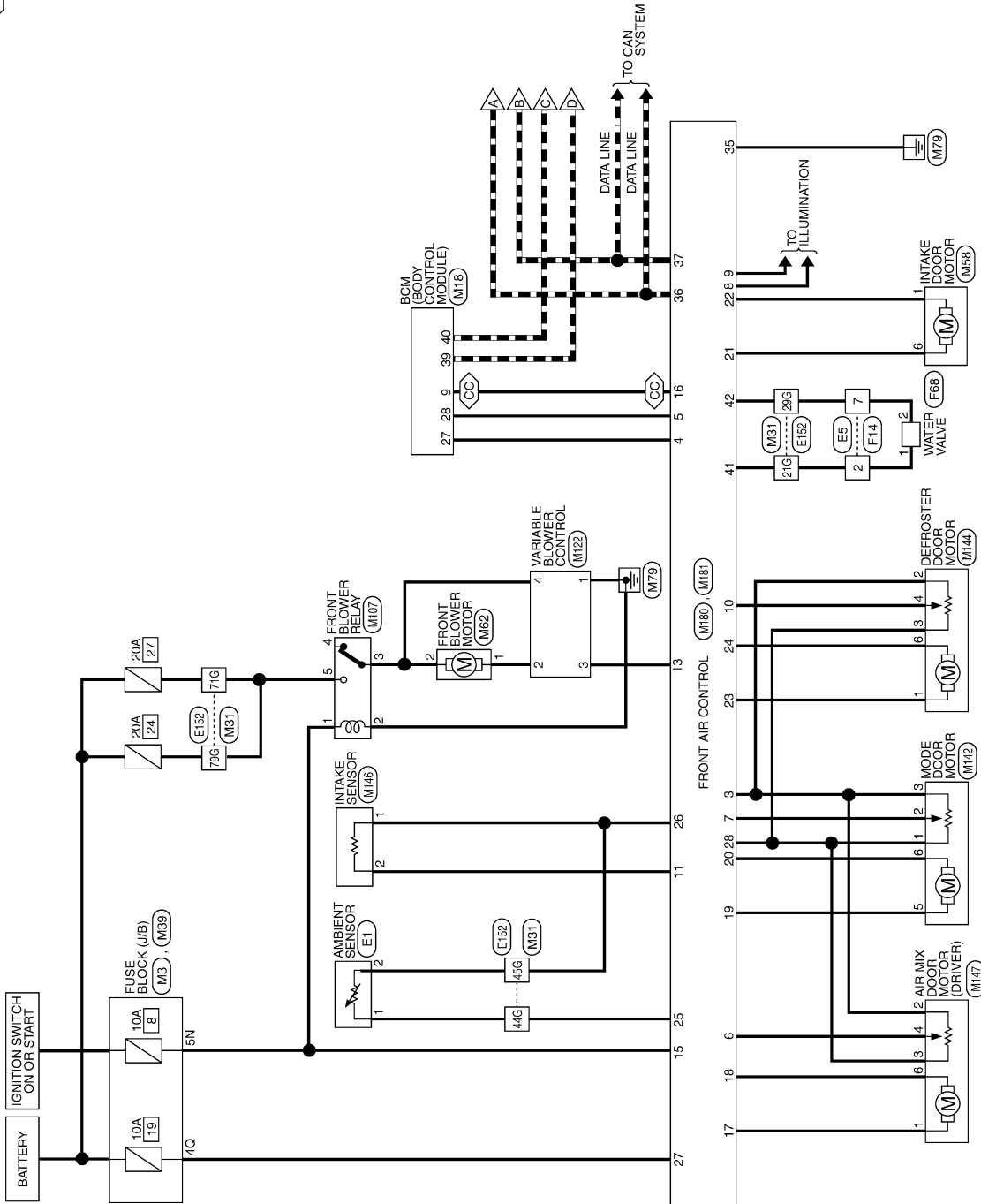
AIR CONDITIONER CONTROL

Wiring Diagram - Manual With 2 Control Dial System

INFOID:000000006464309

CC: CREW CAB

AIR CONDITIONER CONTROL - MANUAL WITH 2 CONTROL DIAL SYSTEM



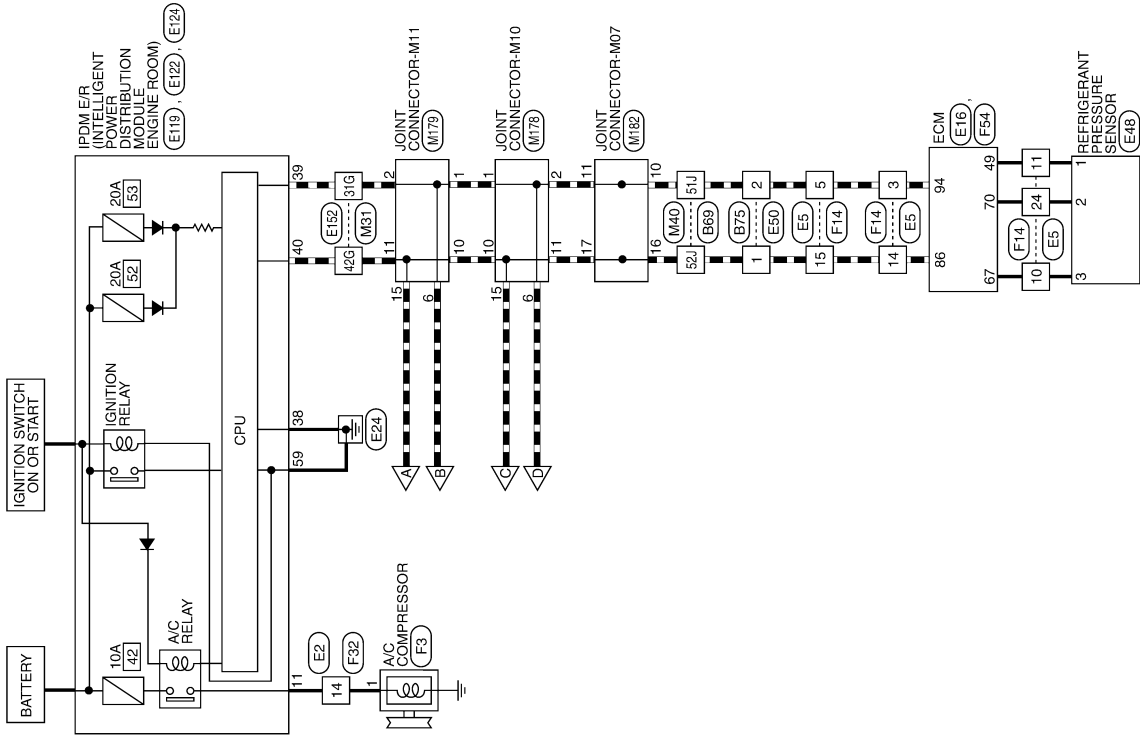
ABIWA0162GB

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

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

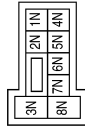
[MANUAL A/C (TYPE 1)]



ABIWA0165GB

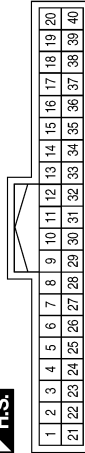
AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH 2 CONTROL DIAL SYSTEM

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



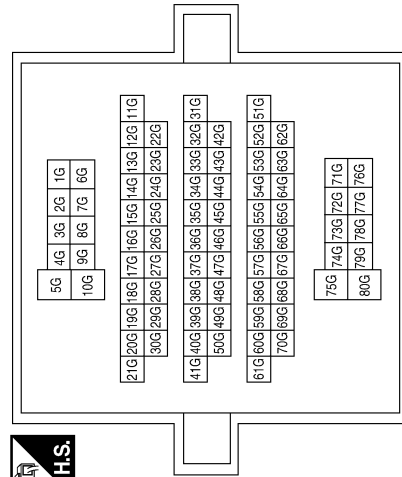
Terminal No.	Color of Wire	Signal Name
5N	Y/G	-

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



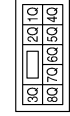
Terminal No.	Color of Wire	Signal Name
9	Y/B	REAR DEFOGGER SW
27	W/R	AIRCON SW
28	L/R	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

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



Terminal No.	Color of Wire	Signal Name
21G	Y/L	-
29G	W/G	-
31G	L	-
42G	P	-
44G	P	-
45G	V/R	-
71G	P	-
79G	P	-

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



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

ABIIA0017GB

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

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

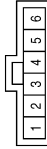
[MANUAL A/C (TYPE 1)]

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



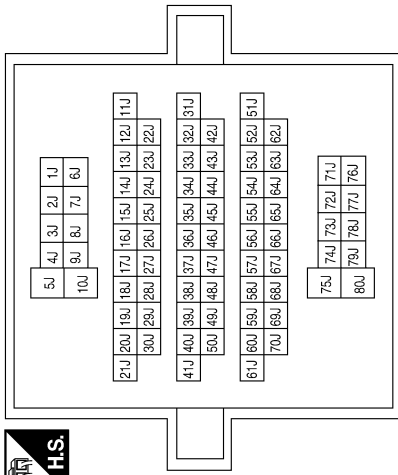
Terminal No.	Color of Wire	Signal Name
1	L/W	-
2	W/L	-

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



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

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



Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

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



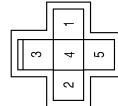
Terminal No.	Color of Wire	Signal Name
1	Y	-(2 CONTROL DIAL SYSTEM OR AUTO A/C)
2	GR	-
3	P	-(2 CONTROL DIAL SYSTEM OR AUTO A/C)
5	BR/W	-
6	P/L	-

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



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

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



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

ABIIA0646GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

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



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

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



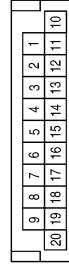
Terminal No.	Color of Wire	Signal Name
1	V/R	-
2	L/B	-

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



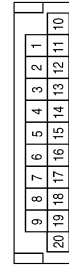
Terminal No.	Color of Wire	Signal Name
1	LG	-
2	P	-
3	Y	-
4	LG/B	-
6	P/B	-

Connector No.	M179
Connector Name	JOINT CONNECTOR-M11
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
6	L	-
10	P	-
11	P	-
15	P	-

Connector No.	M178
Connector Name	JOINT CONNECTOR-M10
Connector Color	BLUE



Terminal No.	Color of Wire	Signal Name
1	L	-
6	L	-
10	P	-
15	P	-

ABIIA0647GB

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

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

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

13	12	11	10	9	8	7	6	5	4	3	2	1
26	25	24	23	22	21	20	19	18	17	16	15	14



Terminal No.	Color of Wire	Signal Name
1	-	-
2	-	-
3	P	V REF RET
4	W/R	AC REQ
5	L/R	FAN ON
6	SB	DRVR BLND DR FB
7	GR	PNL/FLR DR FB
8	R/L	ILLUM +
9	BR	ILLUM -

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

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



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

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

Terminal No.	Color of Wire	Signal Name
33	-	-
34	-	-
35	B	GND
36	P	CAN-L
37	L	CAN-H
38	-	-
39	-	-
40	-	-
41	Y/L	WATER VALVE A
42	W/G	WATER VALVE B
43	-	-
44	-	-

Connector No.	M182
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

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



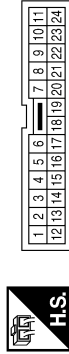
Terminal No.	Color of Wire	Signal Name
10	L	-
11	L	-
16	P	-
17	P	-

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

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



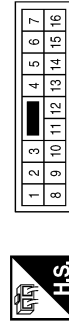
Terminal No.	Color of Wire	Signal Name
2	Y/L	-
3	L	-
5	L	-
7	W/G	-
10	B	-
11	R/Y	-
14	P	-
15	P	-
24	B/W	-

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



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

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



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

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



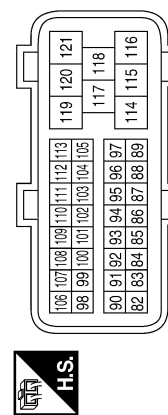
Terminal No.	Color of Wire	Signal Name
1	R/Y	-
2	B/W	-
3	B	-

Connector No.	E1
Connector Name	AMBIENT SENSOR
Connector Color	GRAY



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

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



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

ABIIA0649GB

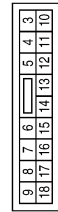
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

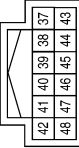
[MANUAL A/C (TYPE 1)]

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



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

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



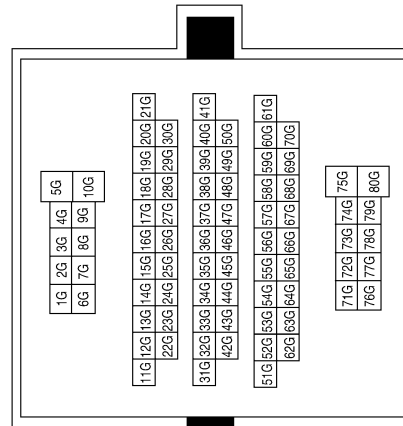
Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

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



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

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



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



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

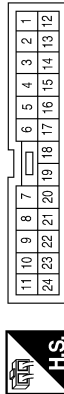
ABIIA0650GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

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



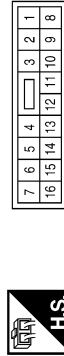
Terminal No.	Color of Wire	Signal Name
2	Y/L	-
3	L	-
5	L	-
7	W/G	-
10	B	-
11	R/Y	-
14	P	-
15	P	-
24	B/W	-

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY



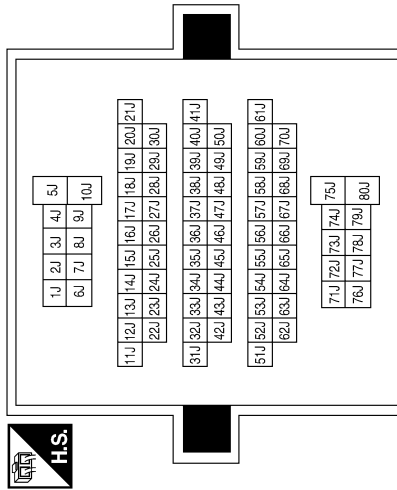
Terminal No.	Color of Wire	Signal Name
1	Y/L	-
2	W/G	-

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

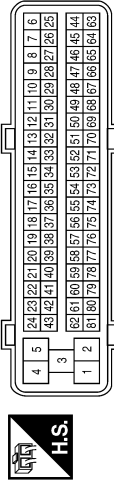


Terminal No.	Color of Wire	Signal Name
14	Y/B	-

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



Connector No.	F54
Connector Name	ECM
Connector Color	BLACK



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

Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

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

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 1)]

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



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

ABIIA0652GB

MANUAL A/C IDENTIFICATION TABLE

< SYMPTOM DIAGNOSIS >

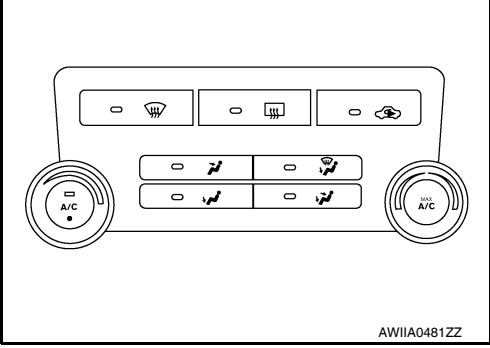
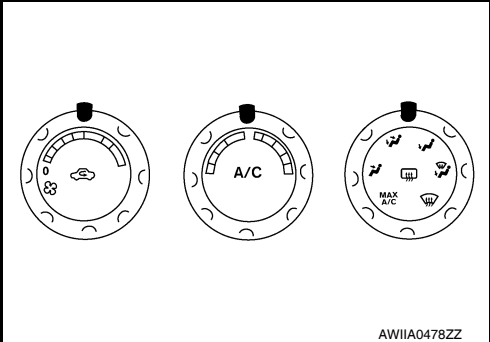
[MANUAL A/C (TYPE 1)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164787

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)]	

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:000000006164788

SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-150
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-114
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-116
Mode door motor is malfunctioning.		
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-120
Air mix door motor is malfunctioning.		
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-125
Intake door motor is malfunctioning.		
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-127
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-131
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-137
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-167
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-175
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-177
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-67

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

INSUFFICIENT COOLING

Component Function Check

INFOID:000000006164789

SYMPTOM: Insufficient cooling

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

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

Can the symptom be duplicated?

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

2. CHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to [HAC-99, "Operational Check"](#).

Does another symptom exist?

- YES >> Refer to [HAC-166, "Symptom Matrix Chart"](#).
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

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

4. PERFORM SELF-DIAGNOSIS

Perform self-diagnosis Refer to [HAC-114, "Front Air Control Self-Diagnosis"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Refer to [HAC-166, "Symptom Matrix Chart"](#).

5. CHECK DRIVE BELTS

Check compressor belt tension. Refer to [EM-13, "Checking Drive Belts"](#).

Is the inspection result normal?

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

6. CHECK AIR MIX DOOR OPERATION

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

Does air mix door operate correctly?

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

7. CHECK COOLING FAN MOTOR OPERATION

Check and verify cooling fan motor for smooth operation. Refer to [EC-358, "Overall Function Check"](#).

Does cooling fan motor operate correctly?

- YES >> GO TO 8.
NO >> Check cooling fan motor. Refer to [EC-359, "Diagnosis Procedure"](#).

8. CHECK WATER VALVE OPERATION

Check and verify water valve for smooth operation. Refer to [HAC-142, "Description"](#).

Does water valve operate correctly?

- YES >> GO TO 9.

A
B
C
D
E
F
G
H

HAC

J
K
L
M
N
O
P

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

NO >> Check water valve circuit. Refer to [HAC-142. "Water Valve Diagnosis Procedure"](#).

9.CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

>> GO TO 10.

10.CHECK REFRIGERANT PURITY

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

Is the inspection result normal?

YES >> GO TO 11.

NO >> Check contaminated refrigerant. Refer to [HAC-178. "Working with HFC-134a \(R-134a\)"](#).

11.CHECK FOR EVAPORATOR FREEZE UP

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

Does evaporator freeze up?

YES >> Perform performance test diagnoses. Refer to [HAC-168. "Diagnostic Work Flow"](#).

NO >> GO TO 12.

12.CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-170. "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to [HAC-168. "Diagnostic Work Flow"](#).

NO >> GO TO 13.

13.CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

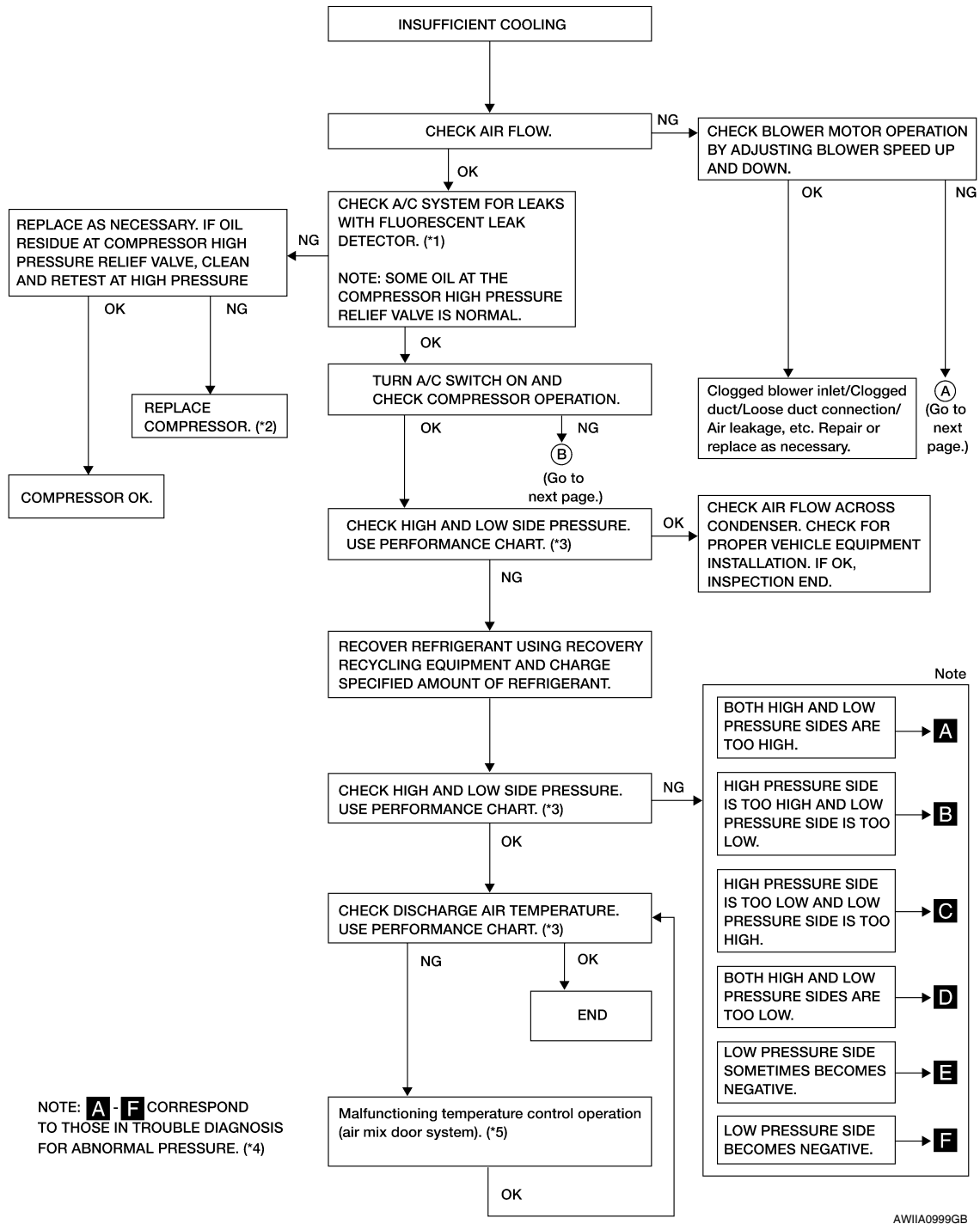
Diagnostic Work Flow

INFOID:000000006164790

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]



*1 [HA-24. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*3 [HAC-170. "Performance Chart"](#)

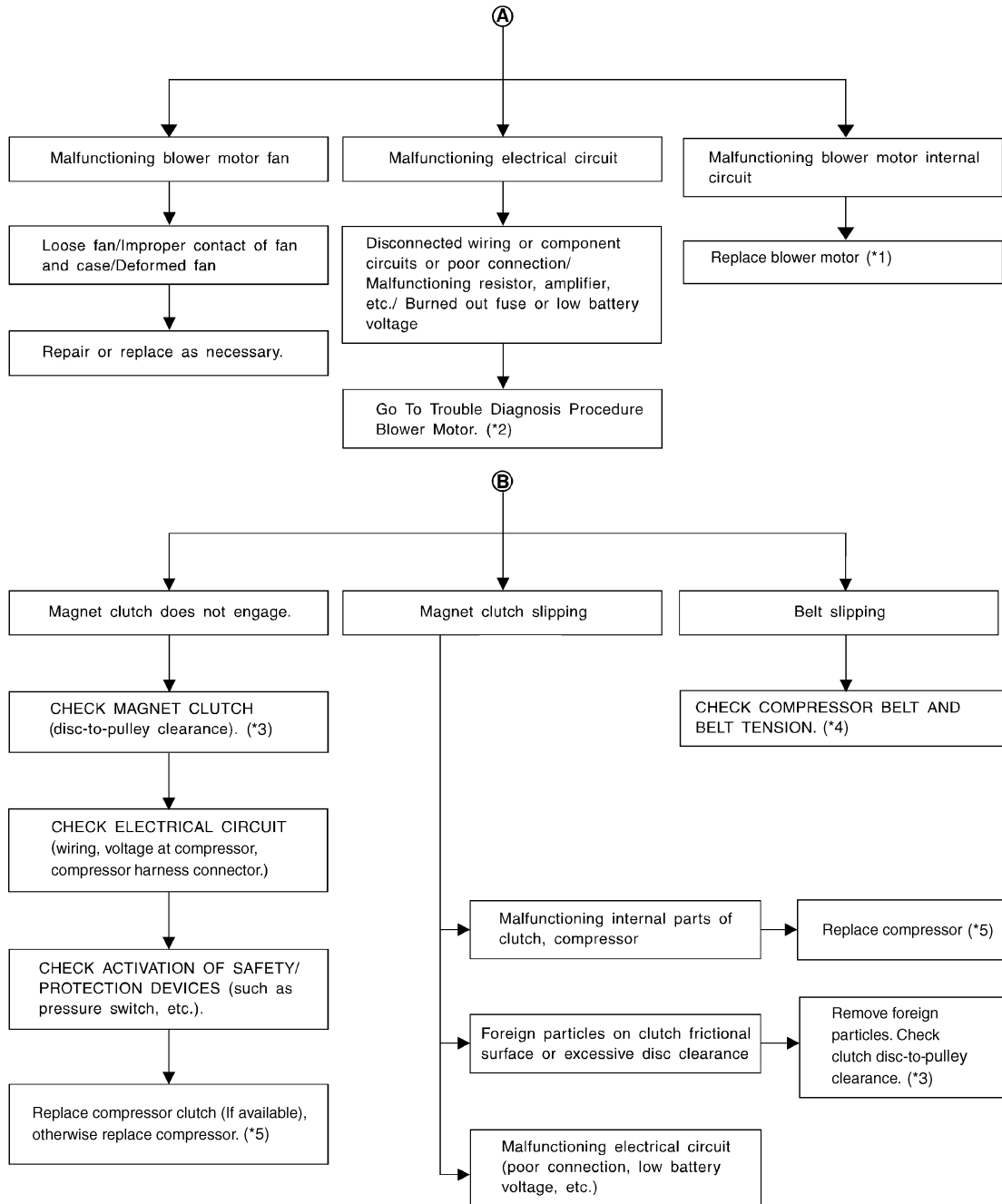
*4 [HAC-171. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-120. "Air Mix Door Motor Component Function Check"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]



AWIA1000GB

*1 [VTL-12. "Removal and Installation"](#)

*2 [HAC-131. "Front Blower Motor Component Function Check"](#)

*3 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*4 [EM-13. "Checking Drive Belts"](#)

*5 [HA-33. "Removal and Installation for Compressor Clutch"](#)

Performance Chart

INFOID:000000006164791

TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

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

TEST READING

Recirculating-to-discharge Air Temperature Table

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

Ambient Air Temperature-to-operating Pressure Table

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

Trouble Diagnoses for Abnormal Pressure

INFOID:000000006164792

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

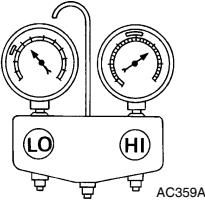
INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

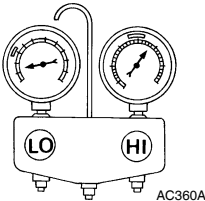
[MANUAL A/C (TYPE 1)]

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

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

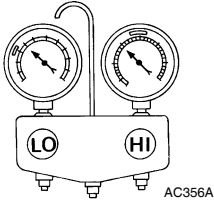
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p> 	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser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

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

INSUFFICIENT COOLING

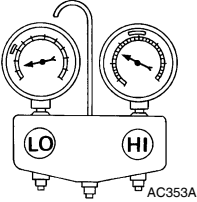
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

A
B
C
D

Both High- and Low-pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>D Both high- and low-pressure sides are too low.</p> 	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	High-pressure pipe located between liquid tank and expansion valve is clogged.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	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" .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment. 2. Malfunctioning expansion valve. 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.

E
F
G
H
J
K
L
M
N
O
P

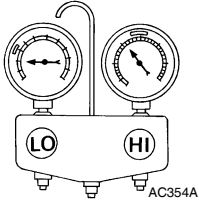
HAC

Low-pressure Side Sometimes Becomes Negative

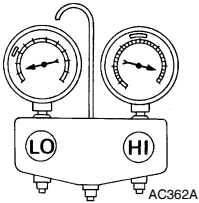
INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

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

Low-pressure Side Becomes Negative

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

INSUFFICIENT HEATING**Component Function Check**

INFOID:000000006164793

SYMPTOM: Insufficient heating

INSPECTION FLOW**1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE**

1. Turn the blower control dial to low speed.
2. Turn the temperature control dial clockwise to maximum heat.
3. Check for hot air at discharge air outlets.

Can this symptom be duplicated?

YES >> GO TO 2.

NO >> Perform complete system operational check. Refer to [HAC-99, "Operational Check"](#).**2. CHECK FOR SERVICE BULLETINS**

Check for any service bulletins.

>> If equipped with NAVI, GO TO 3.

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

3. PERFORM SELF-DIAGNOSISPerform self-diagnosis. Refer to [HAC-114, "Front Air Control Self-Diagnosis"](#).Is the inspection results normal?

YES >> GO TO 4.

NO >> Refer to [HAC-166, "Symptom Matrix Chart"](#).**4. CHECK ENGINE COOLING SYSTEM**

1. Check for proper engine coolant level. Refer to [CO-10, "Inspection"](#).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-10, "Inspection"](#).
4. Check for air in cooling system.

>> GO TO 5.

5. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Check the air mix door motor circuit. Refer to [HAC-120, "Air Mix Door Motor Component Function Check"](#).**6. CHECK AIR DUCTS**

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair all disconnected or leaking air ducts.

7. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

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

NO >> • Inlet hose cold: GO TO 11.
• Both hoses warm: GO TO 9.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 1)]

8. CHECK ENGINE COOLANT SYSTEM

Check engine control temperature sensor. Refer to [EC-177. "Component Inspection"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

9. CHECK HEATER HOSES

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-11. "Changing Engine Coolant"](#).

4. GO TO 10 to retest.

10. CHECK HEATER HOSE TEMPERATURES

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

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

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [VTL-15. "Removal and Installation"](#).

11. CHECK WATER VALVE

Check the operation of the water valve. Refer to [HAC-142. "Water Valve Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

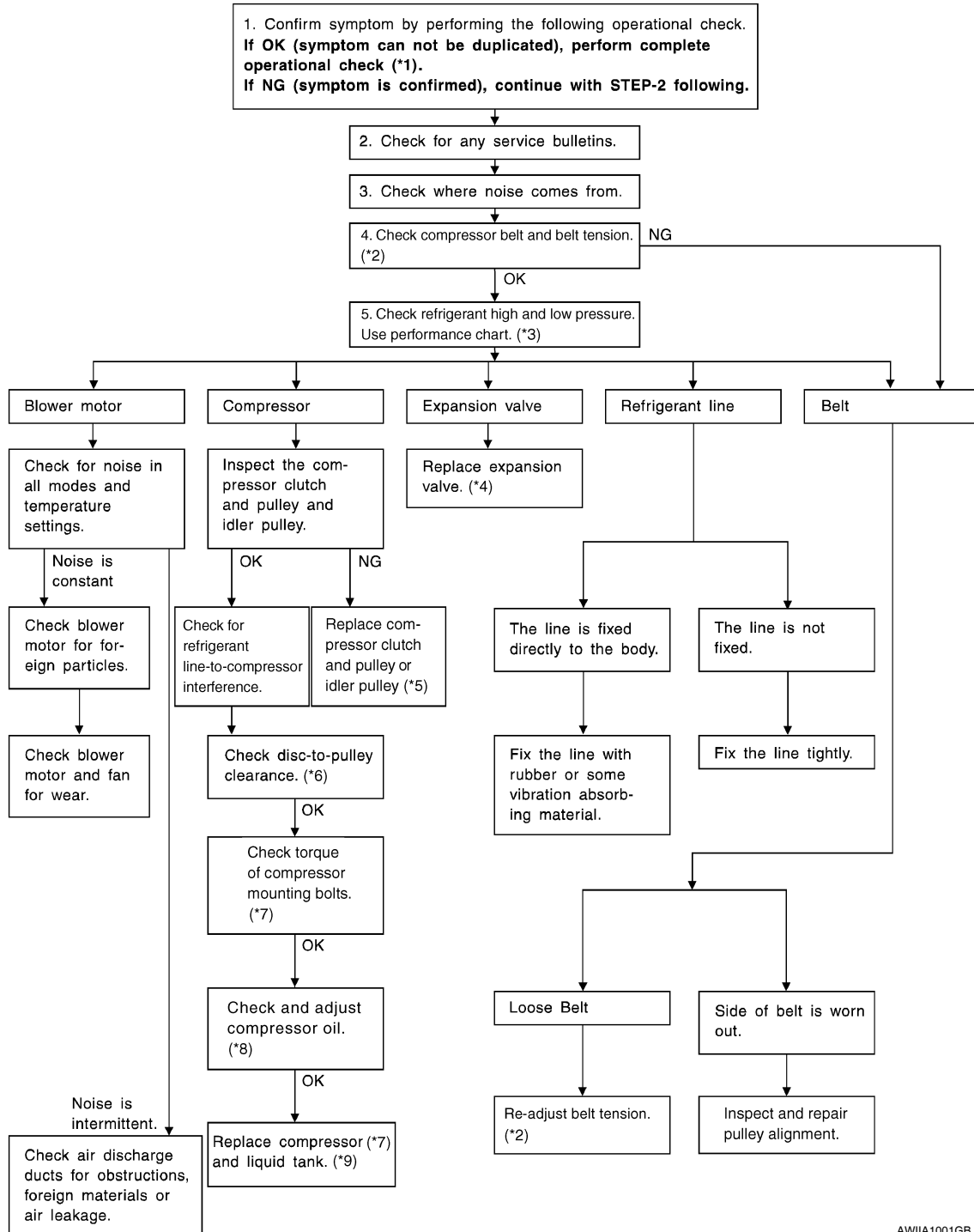
NOISE

Component Function Check

INFOID:000000006164794

SYMPTOM: Noise

INSPECTION FLOW



AWI1A1001GB

*1 [HAC-99, "Operational Check"](#)

*2 [EM-13, "Checking Drive Belts"](#)

*3 [EM-13, "Checking Drive Belts"](#)

*4 [HA-43, "Removal and Installation for Expansion Valve"](#)

*5 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*6 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*7 [HA-32, "Removal and Installation for Compressor"](#)

*8 [HA-32, "Removal and Installation for Compressor"](#)

*9 [HA-41, "Removal and Installation for Condenser"](#)

PRECAUTION

PRECAUTIONS

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

INFOID:000000006164795

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

WARNING:

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

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

WARNING:

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

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

INFOID:000000006164796

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

PRECAUTIONS

< PRECAUTION >

[MANUAL A/C (TYPE 1)]

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

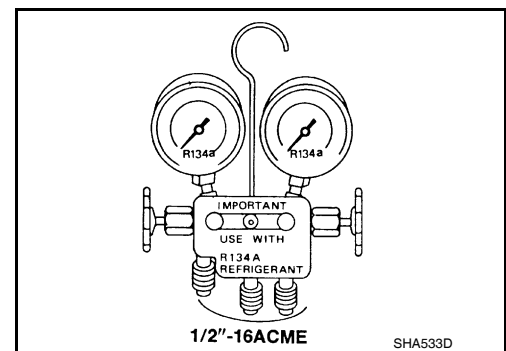
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

Precaution for Service Equipment

INFOID:000000006164797

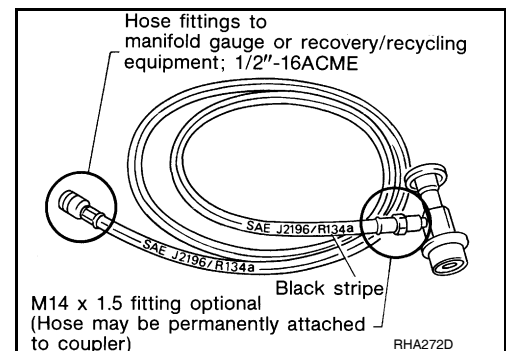
MANIFOLD GAUGE SET

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



SERVICE HOSES

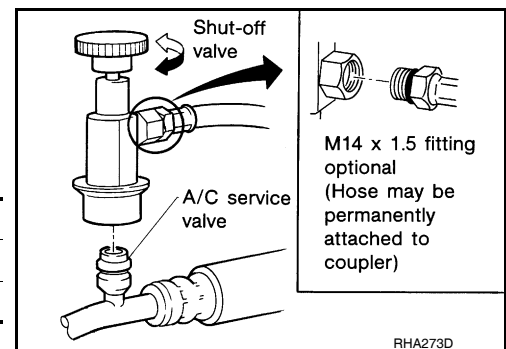
Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

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

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



MANUAL A/C IDENTIFICATION TABLE

< BASIC INSPECTION >

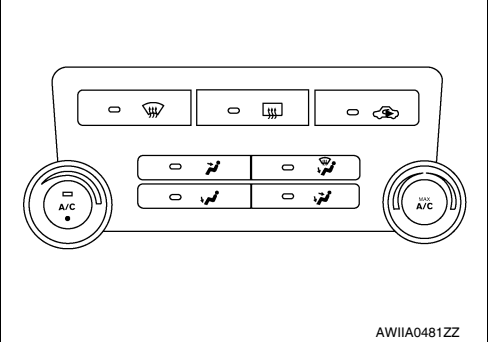
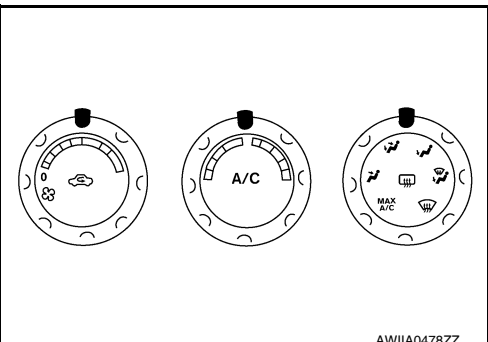
[MANUAL A/C (TYPE 2)]

BASIC INSPECTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164798

Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 <p style="text-align: right; font-size: small;">AWIIA0481ZZ</p>
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 <p style="text-align: right; font-size: small;">AWIIA0478ZZ</p>

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:000000006164799

WORK FLOW

1. LISTEN TO CUSTOMER COMPLAINT

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

>> GO TO 2

2. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 3.

3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK

Verify the symptom with operational check. Refer to [HAC-182. "Operational Check"](#).

>> GO TO 4

4. GO TO APPROPRIATE TROUBLE DIAGNOSIS

Go to appropriate trouble diagnosis. Refer to [HAC-243. "Symptom Matrix Chart"](#).

>> GO TO 5.

5. REPAIR OR REPLACE

Repair or replace the specific parts.

>> GO TO 7

6. FINAL CHECK

Final check.

Is the inspection result normal?

YES >> Inspection End.

NO >> GO TO 4

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

INSPECTION AND ADJUSTMENT

Operational Check

INFOID:000000006164800

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

Conditions : Engine running and at normal operating temperature


CHECKING BLOWER

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

If NG, go to trouble diagnosis procedure for [HAC-212, "Front Blower Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECKING DISCHARGE AIR

1. Rotate MODE control dial to each position and the DEF  mode.
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-191, "Discharge Air Flow"](#).

Mode door position is checked in the next step.



If NG, go to trouble diagnosis procedure for [HAC-197, "Mode Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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





CHECKING RECIRCULATION (,  ONLY)

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

If NG, go to trouble diagnosis procedure for [HAC-206, "Intake Door Motor Diagnosis Procedure"](#).

If OK, continue the check.

NOTE:

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

CHECKING TEMPERATURE DECREASE

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

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

If OK, continue the check.

CHECKING TEMPERATURE INCREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [HAC-252, "Component Function Check"](#). If air mix door motor appears to be malfunctioning, go to [HAC-202, "Air Mix Door Motor Diagnosis Procedure"](#).

If OK, continue with next check.

CHECK A/C SWITCH

1. Press A/C switch.
 - Confirm that the compressor clutch engages (sound or visual inspection).

NOTE:

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

INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[MANUAL A/C (TYPE 2)]

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

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

MANUAL A/C IDENTIFICATION TABLE

< SYSTEM DESCRIPTION >

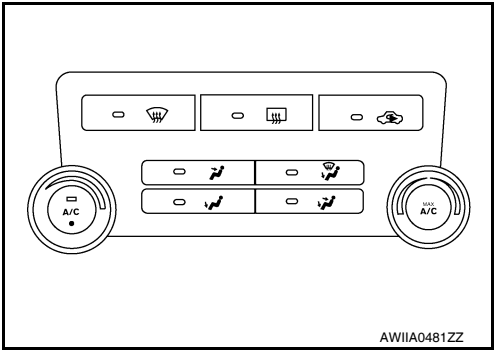
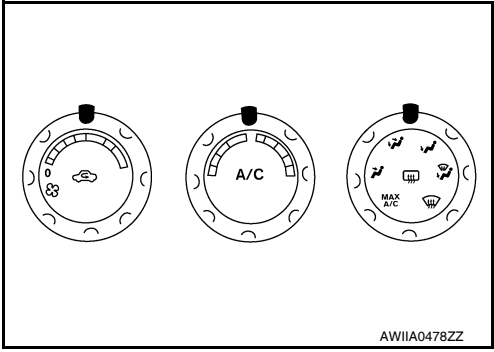
[MANUAL A/C (TYPE 2)]

SYSTEM DESCRIPTION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164801

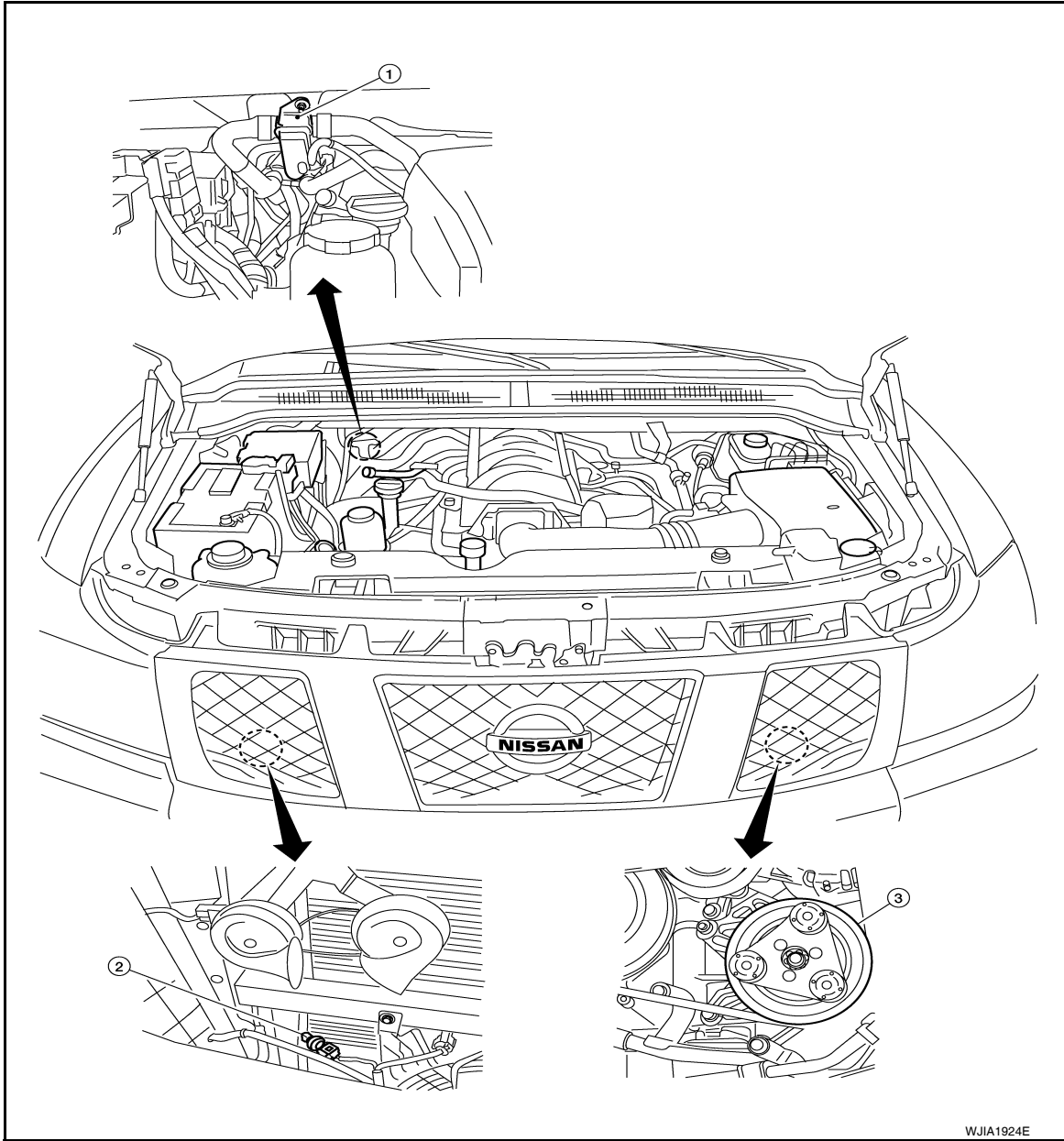
Manual A/C Type	Description	Visual Identification
Manual A/C (Type 1)	Two Control Dial System	 <p style="text-align: right; font-size: small;">AWIIA0481ZZ</p>
Manual A/C (Type 2)	Three Control Dial System [with variable blower control (VBC)]	 <p style="text-align: right; font-size: small;">AWIIA0478ZZ</p>

FUNCTION INFORMATION

Component Part Location

INFOID:000000006164802

ENGINE COMPARTMENT



1. Water valve F68

2. Refrigerant pressure sensor E48
(view with grille removed)

3. A/C compressor F3

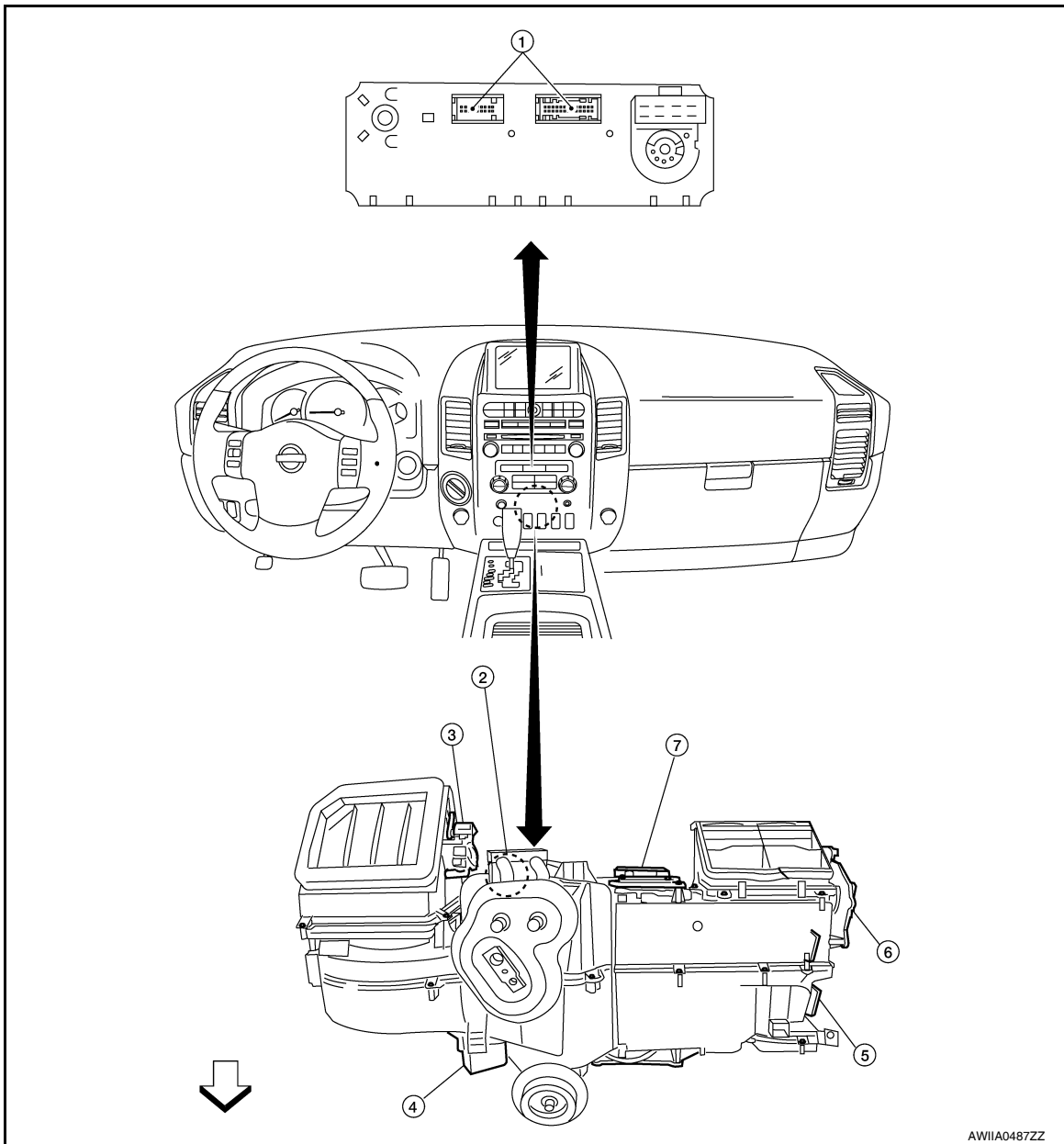
PASSENGER COMPARTMENT

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

FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]



AWIIA0487ZZ

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

FUNCTION INFORMATION

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

Symptom Table

INFOID:000000006164803

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

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

HAC

REFRIGERATION SYSTEM

Refrigerant Cycle

INFOID:000000006164804

REFRIGERANT FLOW

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

Refrigerant System Protection

INFOID:000000006164805

REFRIGERANT PRESSURE SENSOR

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

PRESSURE RELIEF VALVE

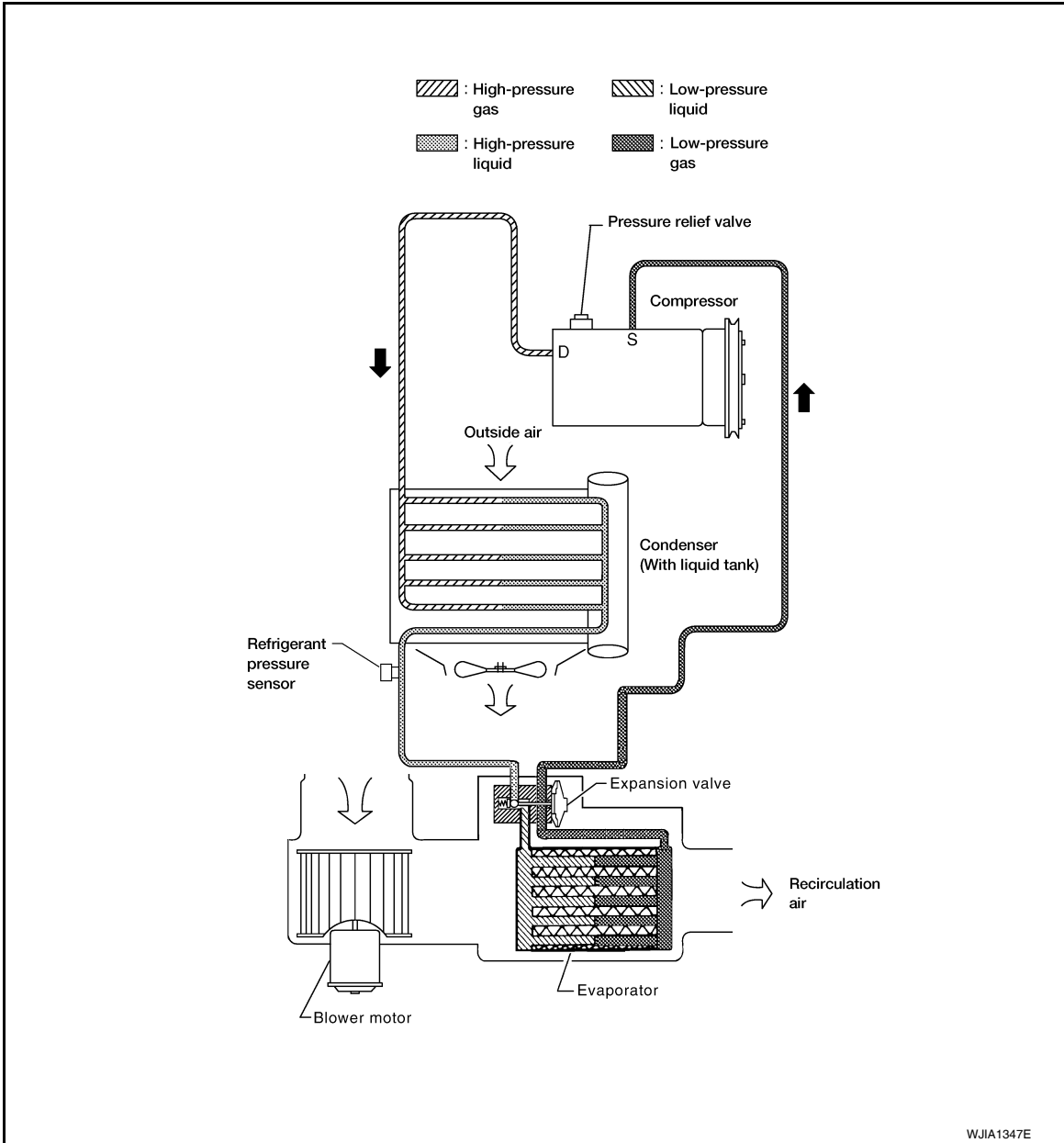
The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 2,990 kPa (30.5 kg/

REFRIGERATION SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

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



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

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

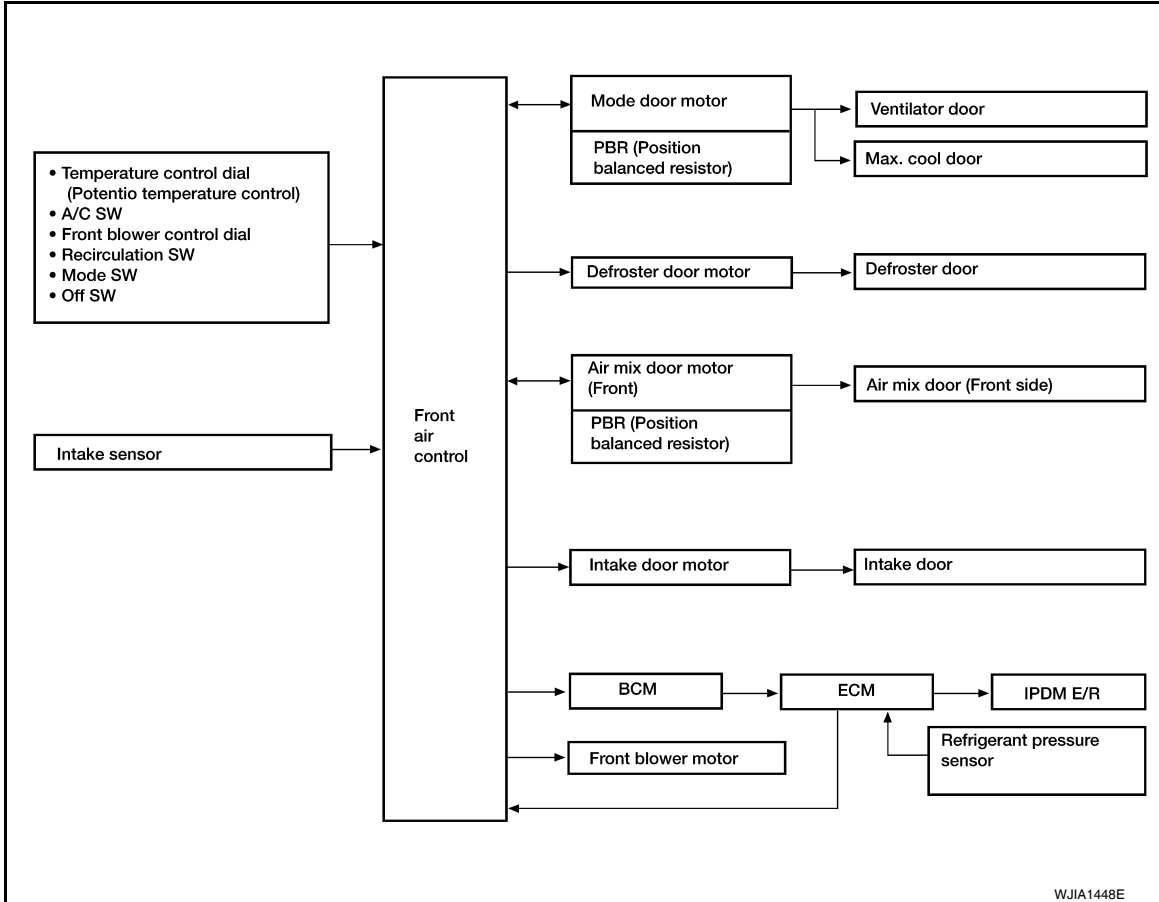
MANUAL AIR CONDITIONER SYSTEM

Control System Diagram

INFOID:000000006164806

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:



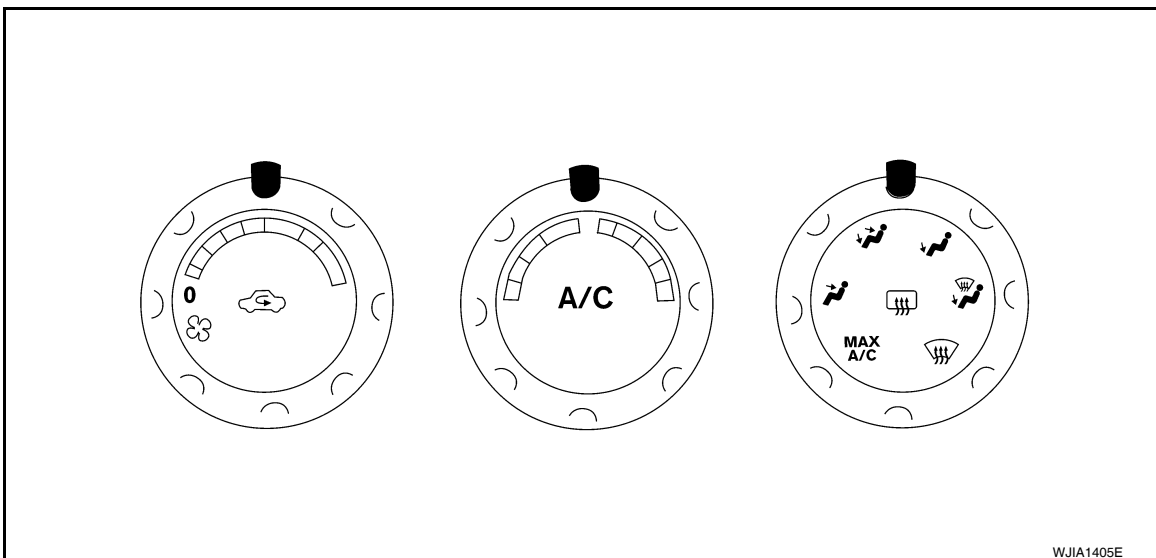
WJIA1448E

Control System Description

INFOID:000000006164807

CONTROL OPERATION

Front air control



WJIA1405E

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[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

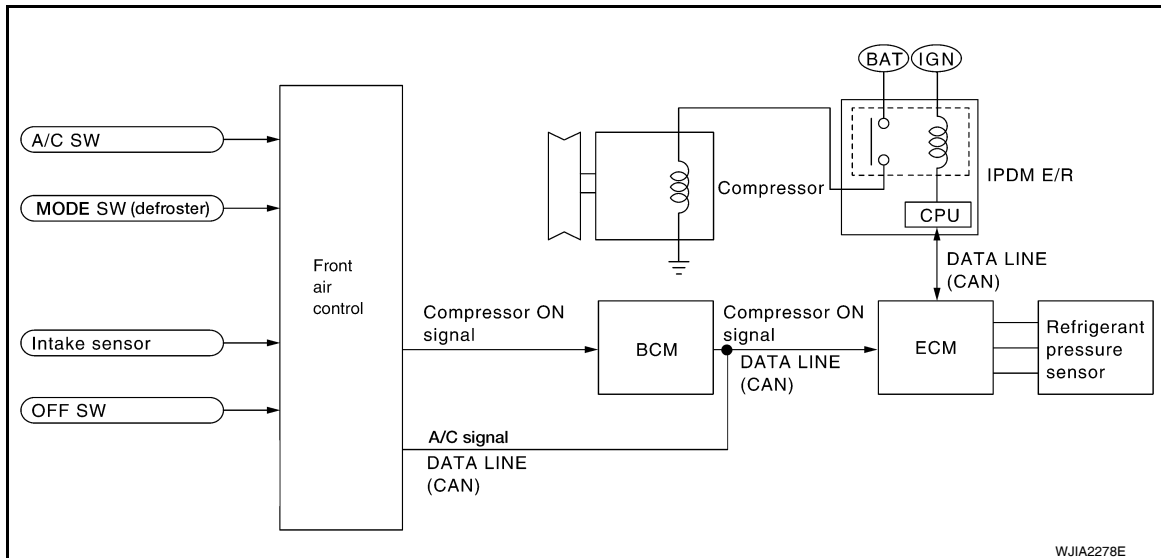
The compressor is ON or OFF.

(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.

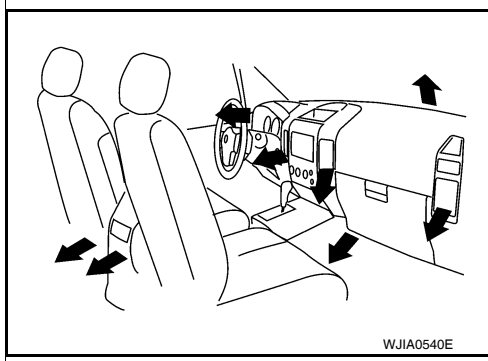
Discharge Air Flow

INFOID:000000006164808

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

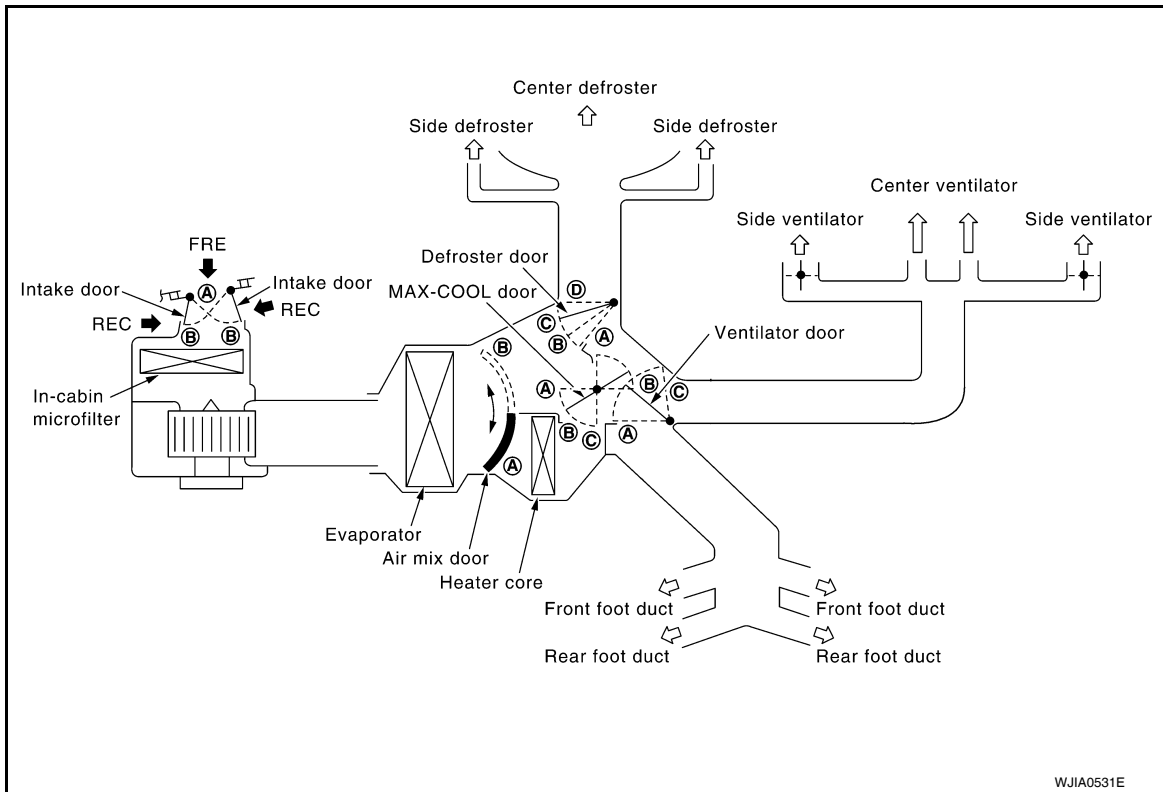


WJIA0540E

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

Switches And Their Control Function

INFOID:000000006164809



WJIA0531E

MANUAL AIR CONDITIONER SYSTEM

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

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

WJIA1406E

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

HAC

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

DIAGNOSIS SYSTEM (BCM)

CONSULT-III Function (BCM - COMMON ITEM)

INFOID:000000006625987

APPLICATION ITEM

CONSULT-III performs the following functions via CAN communication with BCM.

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

SYSTEM APPLICATION

BCM can perform the following functions.

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

CONSULT-III Function (BCM - AIR CONDITIONER)

INFOID:000000006625988

DATA MONITOR

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL A/C (TYPE 2)]

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

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

MANUAL A/C IDENTIFICATION TABLE

< DTC/CIRCUIT DIAGNOSIS >

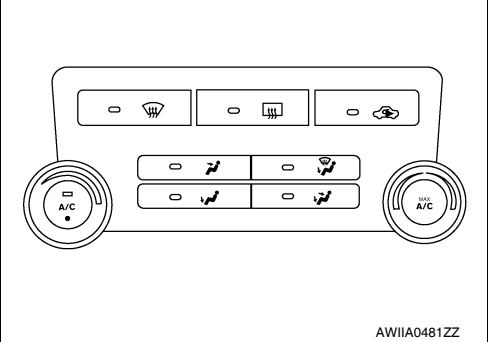
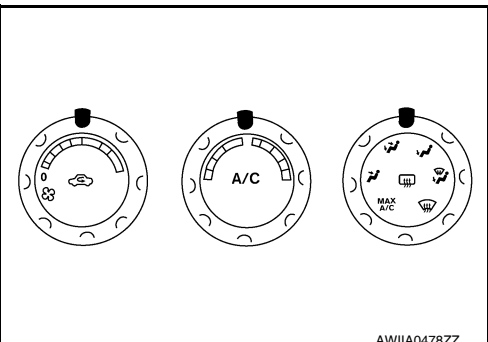
[MANUAL A/C (TYPE 2)]

DTC/CIRCUIT DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164812

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)]	

MODE DOOR MOTOR

System Description

INFOID:000000006164813

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

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

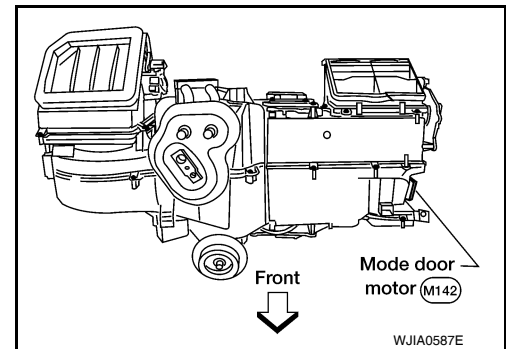
System Operation

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:000000006164814

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

1. Rotate the mode control dial and check each position and press the (DEF) mode.
2. Confirm that discharge air comes out according to the air distribution table. Refer to [HAC-191. "Discharge Air Flow"](#).

NOTE:

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

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-197. "Mode Door Motor Diagnosis Procedure"](#).

Mode Door Motor Diagnosis Procedure

INFOID:000000006164815

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

SYMPTOM:

- Air outlet does not change.

MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

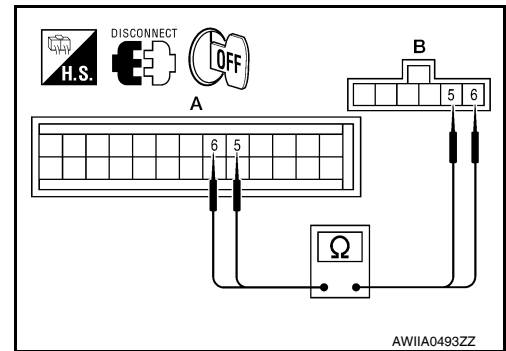
[MANUAL A/C (TYPE 2)]

- Mode door motor does not operate normally.

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

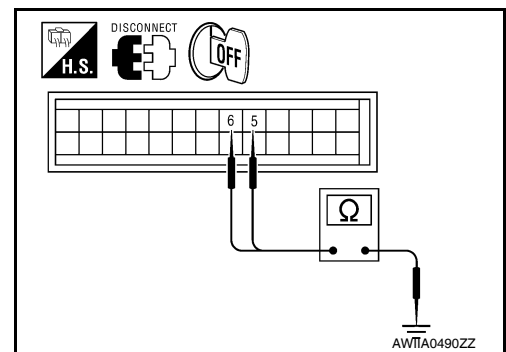
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the mode door motor harness connector M142 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 5, 6 and the mode door motor harness connector M142 (B) terminals 5, 6.

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



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

Connector	Terminal	—	Continuity
M176	5	Ground	No
	6		



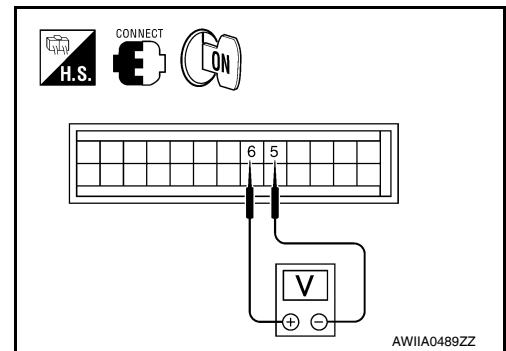
Is the inspection result normal?

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

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

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate the mode switch to the D/F (D/F) mode.
4. Check voltage between front air control harness connector M176 terminal 5 and terminal 6 while rotating the mode control dial to the VENT (VENT) mode, and then the B/L (B/L) mode.

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



Is the inspection result normal?

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

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

MODE DOOR MOTOR

[MANUAL A/C (TYPE 2)]

< DTC/CIRCUIT DIAGNOSIS >

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

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

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

Connector	Terminal	—	Continuity
M176	2	Ground	No
	15		

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

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

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

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

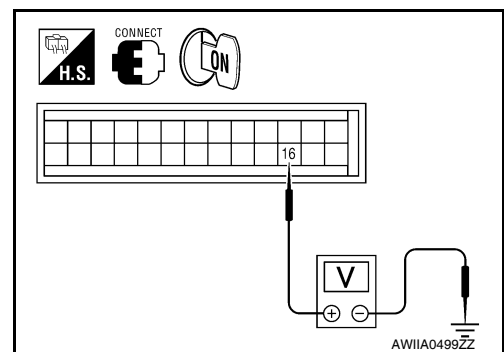
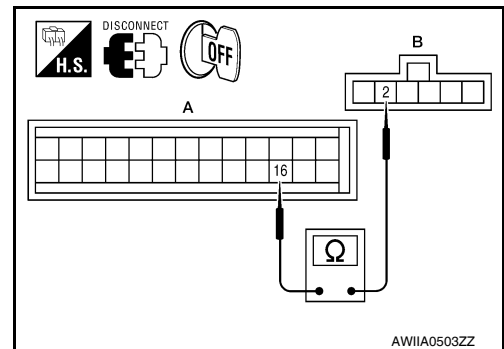
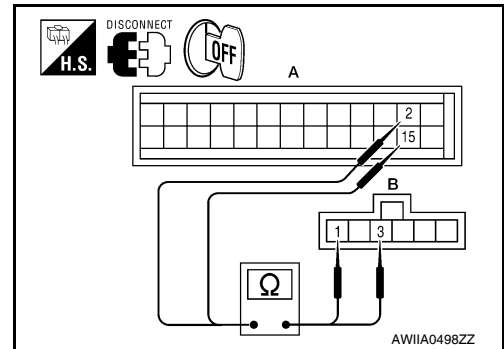
Connector	Terminal	—	Continuity
M176	16	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.

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



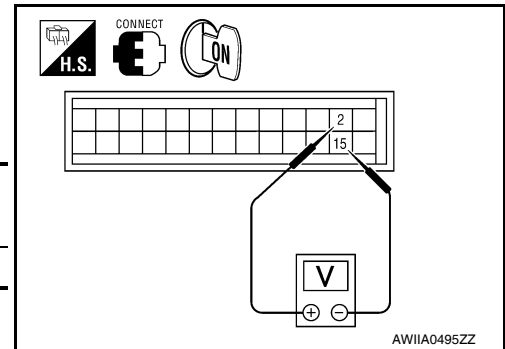
MODE DOOR MOTOR

[MANUAL A/C (TYPE 2)]

< DTC/CIRCUIT DIAGNOSIS >

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

Connector	Terminals	Connector	Terminals	Voltage (Approx.)
	(+)		(-)	
M176	2	M176	15	5 Volts



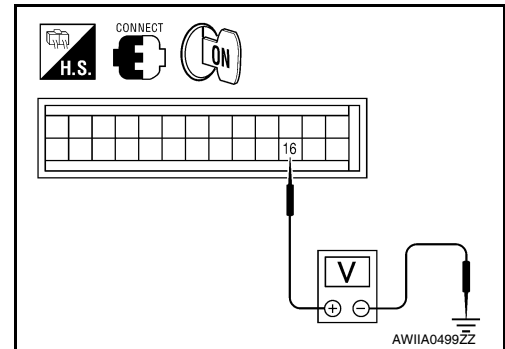
4. Check voltage between front air control harness connector M176 terminal 16 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	16	Ground	0 Volts

Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

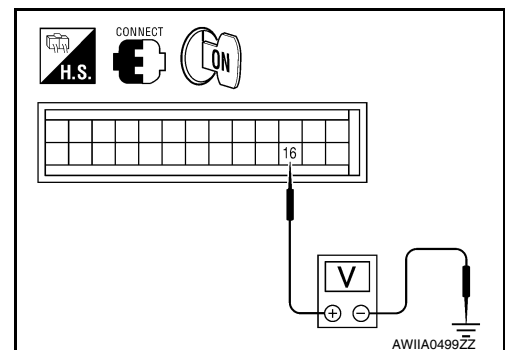
1. Reconnect the mode door motor harness connector M142.
2. Check voltage between front air control harness connector M176 terminal 16 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	16	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

YES >> Inspect mode door for binding or mechanical failure. If mode door moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

NO >> Replace the mode door motor. Refer to [VTL-19. "Removal and Installation"](#).



AIR MIX DOOR MOTOR

System Description

INFOID:000000006164816

SYSTEM DESCRIPTION

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

SYSTEM DESCRIPTION

Component Parts

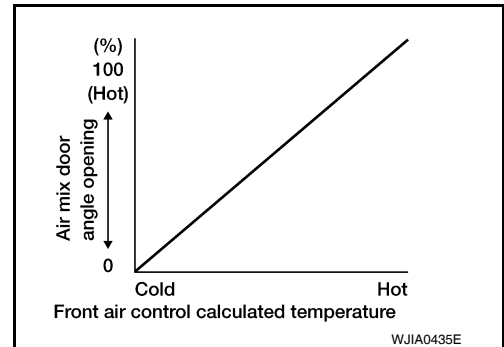
Air mix door control system components are:

- 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.

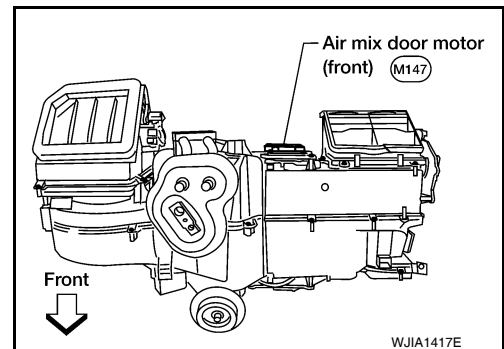
Air Mix Door Control Specification



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:000000006164817

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.

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

>> GO TO 2.

2. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE DECREASE

1. Turn the temperature control dial counterclockwise to maximum cold.
2. Check for cold air at discharge air outlets.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-202. "Air Mix Door Motor Diagnosis Procedure"](#).

Air Mix Door Motor Diagnosis Procedure

INFOID:000000006164818

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

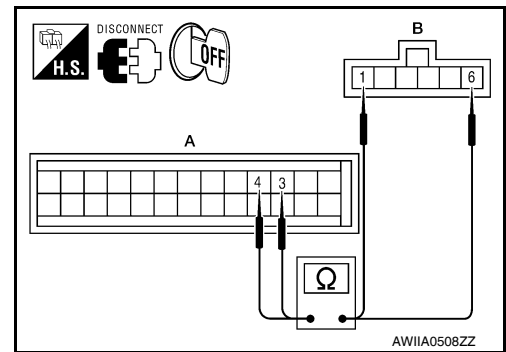
SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

1. CHECK AIR MIX DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

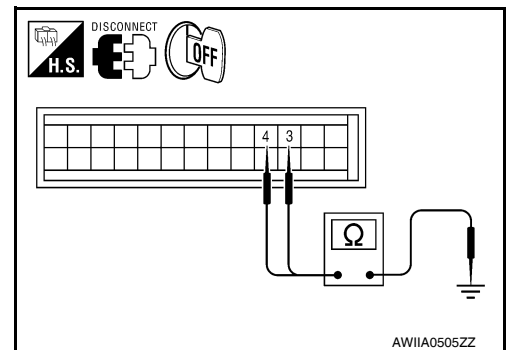
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the air mix door motor harness connector M147 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 3, 4 and the air mix door motor harness connector M147 (B) terminals 1, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	3	M147	1	Yes
	4		6	



4. Check continuity between front air control harness connector M176 terminals 3, 4 and ground.

Connector	Terminal	—	Continuity
M176	3	Ground	No
	4		



Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR AIR MIX DOOR MOTOR POWER AND GROUND

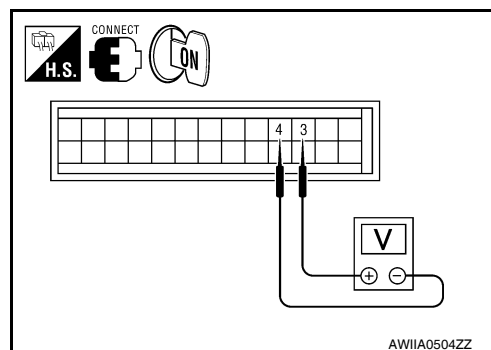
AIR MIX DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Rotate temperature control dial to 32°C (90°F).
4. Check voltage between front air control harness connector M176 terminal 3 and terminal 4 while rotating temperature control dial to 18°C (60°F) and back to 32°C (90°F).

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	3	4	While rotating temperature control dial from 32°C (90°F) to 18°C (60°F)	Battery voltage
	4	3	While rotating temperature control dial from 18°C (60°F) to 32°C (90°F)	Battery voltage



Is the inspection result normal?

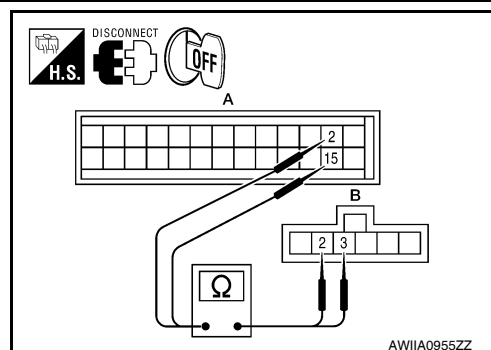
YES >> GO TO 4.

NO >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

3. CHECK AIR MIX DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A).
3. Check continuity between front air control harness connector M176 (A) terminals 2, 15 and air mix door motor harness connector M147 (B) terminals 2, 3.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	15	M147	2	Yes
	2		3	



4. Check continuity between front air control harness connector M176 terminals 2, 15 and ground.

Connector	Terminal	—	Continuity
M176	15	Ground	No
	2		

Is the inspection result normal?

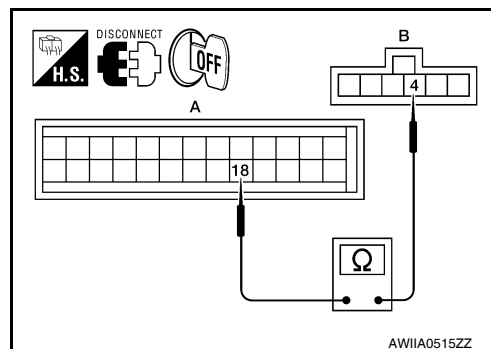
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M176 (A) terminal 18 and air mix door motor harness connector M147 (B) terminal 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	18	M147	4	Yes



AIR MIX DOOR MOTOR

[MANUAL A/C (TYPE 2)]

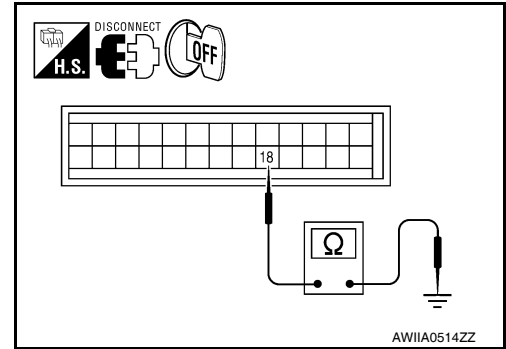
< DTC/CIRCUIT DIAGNOSIS >

- Check continuity between front air control harness connector M176 terminal 18 and ground.

Connector	Terminal	—	Continuity
M176	18	Ground	No

Is the inspection result normal?

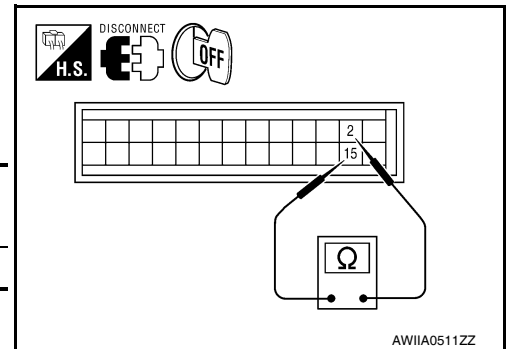
- YES >> GO TO 6.
 NO >> Repair or replace harness as necessary.



5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- Reconnect front air control harness connectors.
- Turn ignition switch ON.
- Check voltage between front air control harness connector M176 terminal 2 and terminal 15.

Connector	Terminal	Connector	Terminal	Voltage (Approx.)
	(+)		(-)	
M176	2	M176	15	5 Volts

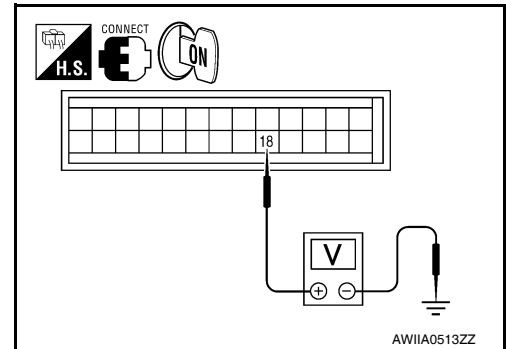


- Check voltage between front air control harness connector M176 terminal 18 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	18	Ground	0 Volts

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



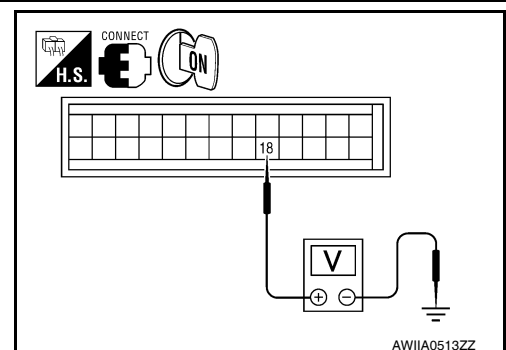
6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

- Reconnect the air mix door motor harness connector M147.
- Check voltage between front air control harness connector M176 terminal 18 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	18	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect air mix door for binding or mechanical failure. If air mix door moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
 NO >> Replace air mix door motor. Refer to [VTL-20. "Removal and Installation"](#).



INTAKE DOOR MOTOR

System Description

INFOID:000000006164819

SYSTEM DESCRIPTION

SYMPTOM:

- Intake door motor does not operate normally.
- Intake door does not change.

SYSTEM DESCRIPTION

Component Parts

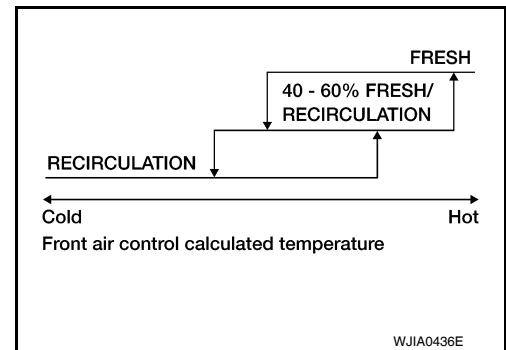
Intake door control system components are:

- Front air control
- Intake door motor (PBR built into the intake door motor)
- Intake sensor

System Operation

The intake door control determines the intake door position based on the position of the recirculation switch. When the recirculation switch is depressed the intake door motor rotates closing off the fresh air inlet and recirculating the cabin air. If the recirculation switch is depressed again, the intake door motor rotates in the opposite direction, again allowing fresh air into the cabin.

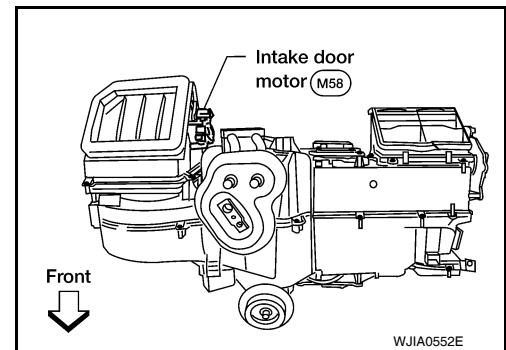
Intake Door Control Specification



COMPONENT DESCRIPTION

Intake door motor

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the front air control. Motor rotation is conveyed to a lever which activates the intake door.








Intake Door Motor Component Function Check

INFOID:000000006164820

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - REC ()

1. Press the vent mode switch ().
2. Press REC () switch. The REC () indicator should illuminate.
3. Press REC () switch again. The REC () indicator should go out.
4. Listen for intake door position change (you should hear blower sound change slightly).

INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-206. "Intake Door Motor Diagnosis Procedure"](#)

Intake Door Motor Diagnosis Procedure

INFOID:000000006164821

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

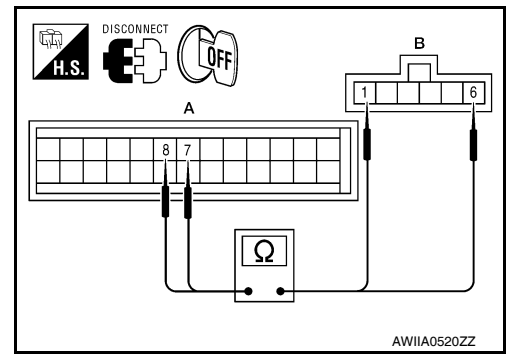
SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

1. CHECK INTAKE DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

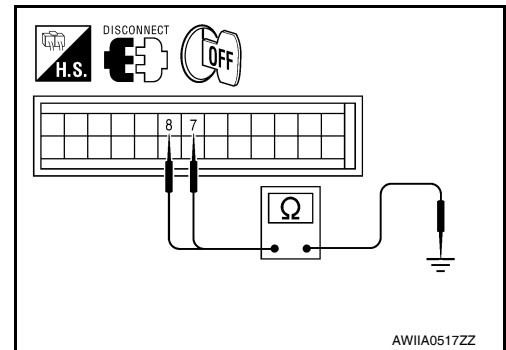
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the intake door motor harness connector M58 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 8, 7 and the intake door motor harness connector M58 (B) terminals 1, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	8	M58	6	Yes
	7		1	



4. Check continuity between front air control harness connector M176 terminals 8, 7 and ground.

Connector	Terminal	—	Continuity
M176	8	Ground	No
	7		



Is the inspection result normal?

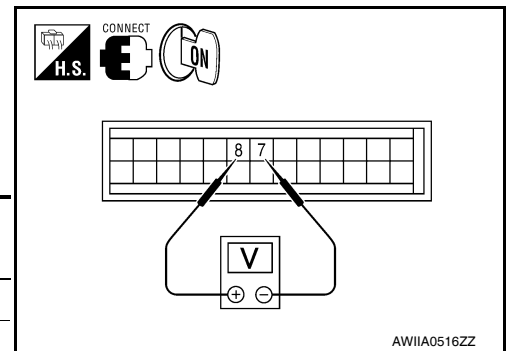
YES >> GO TO 3.

NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR INTAKE AIR DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminal 8 and terminal 7 while placing the HVAC system into self-diagnostic mode.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	8	7	Self-diagnostic mode (opening)	Battery voltage
	7	8	Self-diagnostic mode (closing)	Battery voltage



Is the inspection result normal?

YES >> Inspect intake air door for binding or mechanical failure. If intake air door moves freely, replace the intake air door motor. Refer to [VTL-18. "Removal and Installation"](#).

NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

DEFROSTER DOOR MOTOR CIRCUIT

System Description

INFOID:000000006164822

SYSTEM DESCRIPTION

Component Parts

Defroster door control system components are:

- Front air control
- Defroster door motor
- PBR (Built into defroster door motor)
- Intake sensor

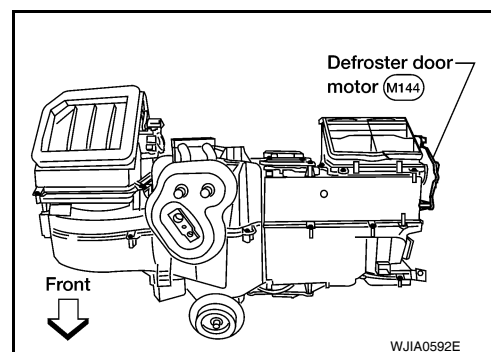
System Operation

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:000000006164823

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DEFROSTER DOOR

1. Select vent () mode.
2. Rotate mode control dial to defrost mode ().
3. Listen for defroster door position change (blower sound should change slightly).

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-207. "Defroster Door Motor Diagnosis Procedure"](#).

Defroster Door Motor Diagnosis Procedure

INFOID:000000006164824

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

SYMPTOM:

- Defroster door does not change.
- Defroster door motor does not operate normally.

1. CHECK DEFROSTER DOOR MOTOR CIRCUITS FOR OPEN AND SHORT TO GROUND

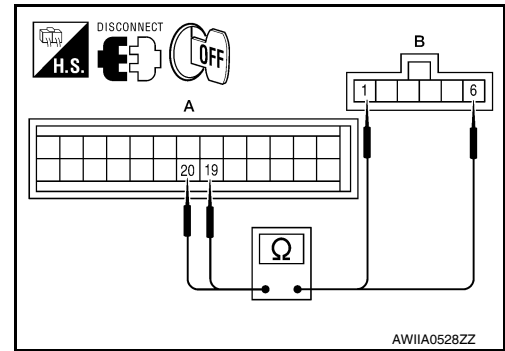
DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

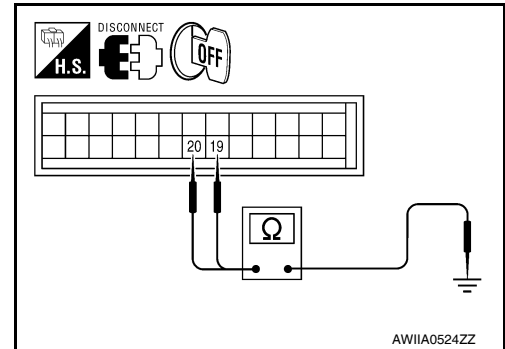
1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A) and the defroster door motor harness connector M144 (B).
3. Check continuity between front air control harness connector M176 (A) terminals 19, 20 and the defroster door motor harness connector M144 (B) terminals 1, 6.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	19	M144	1	Yes
	20		6	



4. Check continuity between front air control harness connector M176 terminals 19, 20 and ground.

Connector	Terminal	—	Continuity
M176	19	Ground	No
	20		



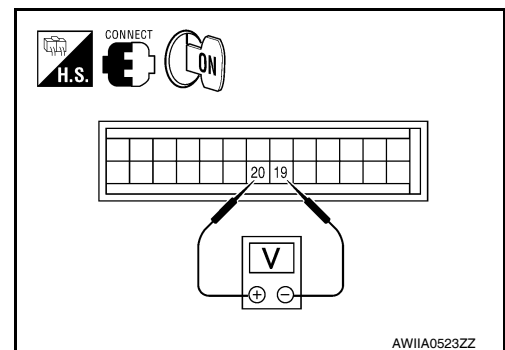
Is the inspection result normal?

- YES >> GO TO 3.
 NO >> Repair or replace harness as necessary.

2. CHECK FRONT AIR CONTROL FOR DEFROSTER DOOR MOTOR POWER AND GROUND

1. Reconnect front air control harness connector.
2. Turn ignition switch ON.
3. Press the mode switch to the VENT (V) mode.
4. Check voltage between front air control harness connector M176 terminal 19 and terminal 20 while pressing the defroster switch (W).

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
M176	19	20	Following defroster switch (W) on	Battery voltage
	20	19	Following defroster switch (W) off	Battery voltage



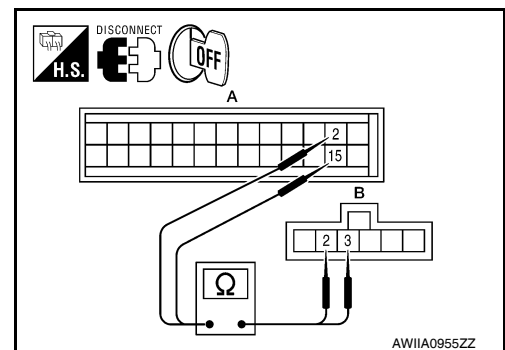
Is the inspection result normal?

- YES >> GO TO 4.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

3. CHECK DEFROSTER DOOR MOTOR PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.
2. Disconnect the front air control harness connector M176 (A).
3. Check continuity between front air control harness connector M176 (A) terminals 15, 2 and the defroster door motor harness connector M144 (B) terminals 2, 3.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	2	M144	3	Yes
	15		2	



4. Check continuity between front air control harness connector M176 terminal 2, 15 and ground.

DEFROSTER DOOR MOTOR CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Connector	Terminal	—	Continuity
M176	2	Ground	No
	15		

Is the inspection result normal?

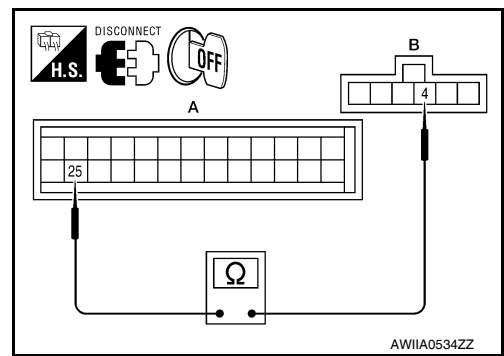
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

4. CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

1. Check continuity between front air control harness connector M176 (A) terminal 25 and defroster door motor harness connector M144 (B) terminal 4.

A		B		Continuity
Connector	Terminal	Connector	Terminal	
M176	25	M144	4	Yes



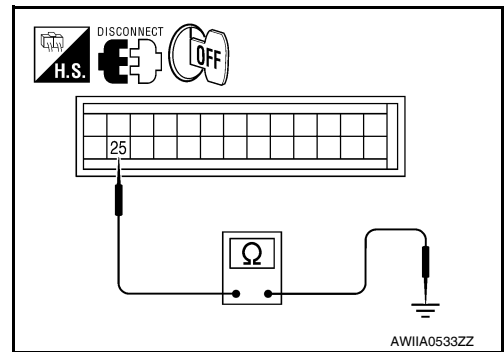
2. Check continuity between front air control harness connector M176 terminal 25 and ground.

Connector	Terminal	—	Continuity
M176	25	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

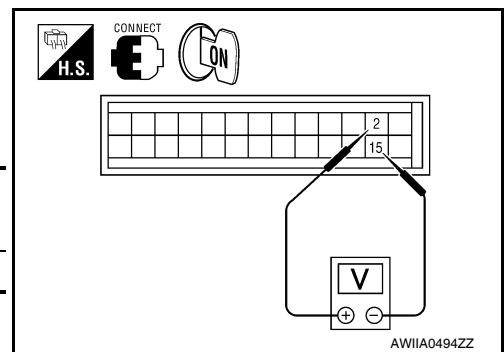
NO >> Repair or replace harness as necessary.



5. CHECK FRONT AIR CONTROL FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

1. Reconnect front air control harness connectors.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminals 2, 15.

Connector	Terminals	Connector	Terminals	Voltage (Approx.)
	(+)		(-)	
M176	2	M176	15	5 Volts



DEFROSTER DOOR MOTOR CIRCUIT

[MANUAL A/C (TYPE 2)]

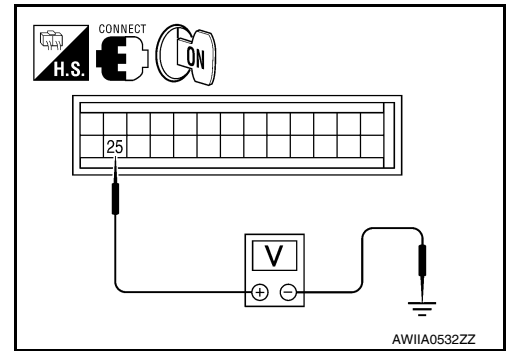
< DTC/CIRCUIT DIAGNOSIS >

4. Check voltage between front air control harness connector M176 terminal 25 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	25	Ground	0 Volts

Is the inspection result normal?

- YES >> GO TO 7.
 NO >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).



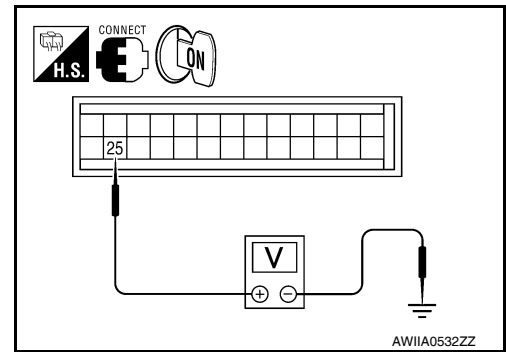
6. CHECK FRONT AIR CONTROL FOR FEEDBACK SIGNAL

1. Reconnect the defroster door motor harness connector M144.
2. Check voltage between front air control harness connector M176 terminal 25 and ground.

Connector	Terminal	—	Voltage (Approx.)
M176	25	Ground	0.2 to 4.8 Volts

Is the inspection result normal?

- YES >> Inspect defroster door for binding or mechanical failure. If defroster door moves freely, replace front air control. Refer to [VTL-8. "Removal and Installation"](#).
 NO >> Replace the defroster door motor. Refer to [VTL-17. "Removal and Installation"](#).



BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

BLOWER MOTOR CONTROL SYSTEM

System Description

INFOID:000000006164825

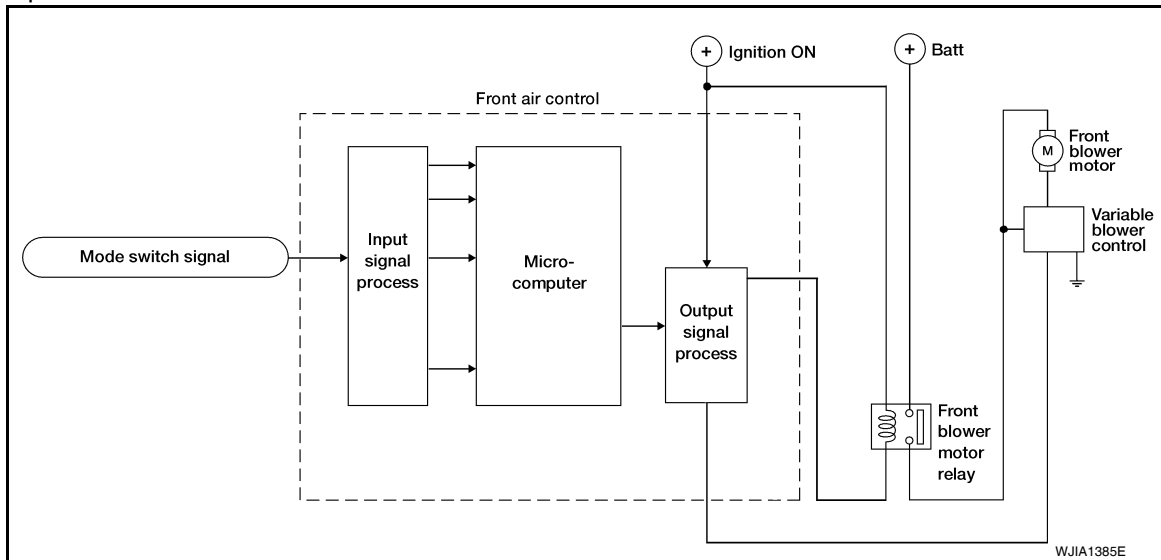
SYSTEM DESCRIPTION

Component Parts

Blower speed control system components are:

- Front air control
- Variable blower control
- Front blower motor relay
- Front blower motor
- Intake sensor

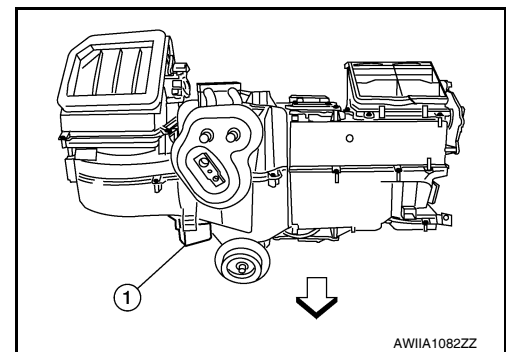
System Operation



COMPONENT DESCRIPTION

Variable Blower Control

The variable blower control is located on the cooling unit. The variable blower control (1) receives a gate voltage from the front air control to steplessly maintain the blower motor voltage in the 0 to 5 volt range (approx.).



Front Blower Motor Component Function Check

INFOID:000000006164826

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - FRONT BLOWER

1. Rotate the blower control dial clockwise once. Blower motor should operate in low speed.
2. Rotate the blower control dial clockwise, and continue checking blower speed until all speeds are checked.

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-212. "Front Blower Motor Diagnosis Procedure"](#)

A

B

C

D

E

F

G

H

HAC

J

K

L

M

N

O

P

BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Front Blower Motor Diagnosis Procedure

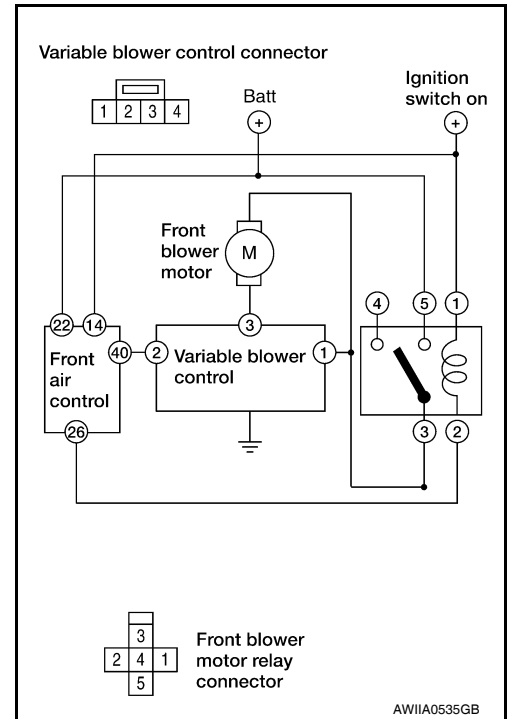
INFOID:000000006164827

Regarding Wiring Diagram information, refer to [HAC-232, "Wiring Diagram - Manual With 3 Control Dial System"](#).

SYMPTOM: Blower motor operation is malfunctioning.

DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

SYMPTOM: Blower motor operation is malfunctioning under starting blower speed control.



1. CHECK FUSES

Check 20A fuses [No. 24 and 27 (Located in the fuse and fusible link box)]. For fuse layout. Refer to [PG-72, "Terminal Arrangement"](#).

Fuses are good.

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 9.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector.
3. Turn ignition switch ON.
4. Press the A/C switch.
5. Rotate blower control dial to maximum speed.
6. Check voltage between front blower motor harness connector M62 terminal 2 and ground.

2 - Ground

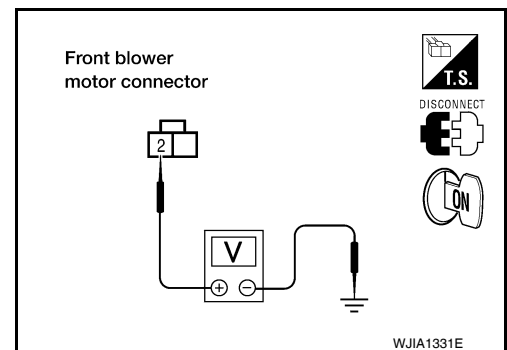
: Battery voltage

Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 3.

3. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT



BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

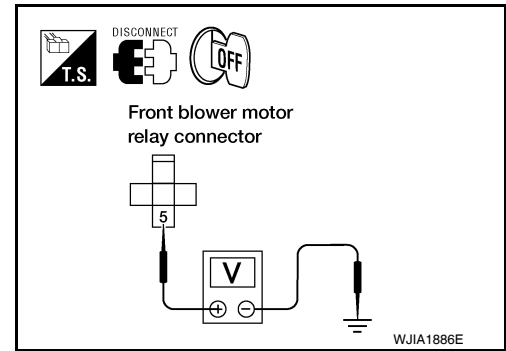
[MANUAL A/C (TYPE 2)]

1. Turn ignition switch OFF.
2. Disconnect front blower motor relay.
3. Check voltage between front blower motor relay harness connector M107 terminal 5 and ground.

5 - Ground : **Battery voltage**

Is the inspection result normal?

- YES >> GO TO 4.
NO >> Repair harness or connector.



4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to [HAC-215. "Front Blower Motor Component Inspection"](#).

Is the inspection result normal?

- YES >> GO TO 5.
NO >> Replace front blower motor relay.

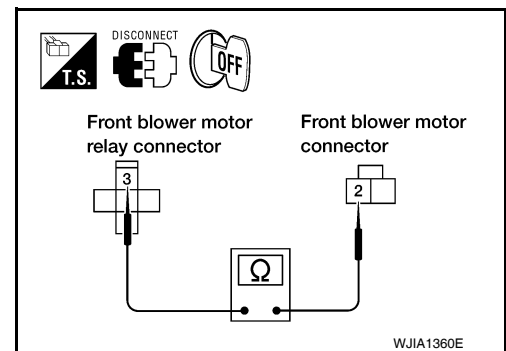
5. CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

3 - 2 : **Continuity should exist.**

Is the inspection result normal?

- YES >> GO TO 6.
NO >> Repair harness or connector.



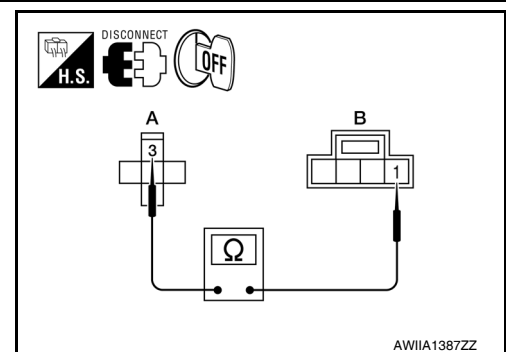
6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect variable blower control harness connector.
2. Check continuity between front blower motor relay harness connector M107 (A) terminals 3 and variable blower control harness connector M121 (B) terminal 1.

3 - 1 : **Continuity should exist.**

Is the inspection result normal?

- YES >> GO TO 7.
NO >> Repair harness or connector.



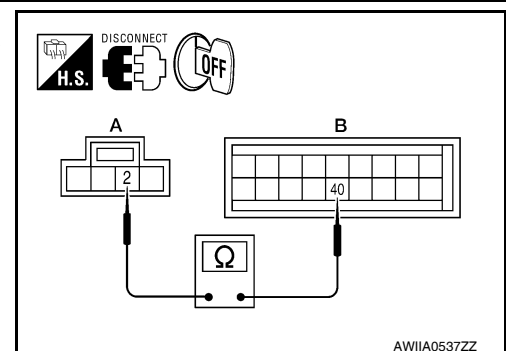
7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M177 (B) terminal 40 and variable blower control harness connector M121 (A) terminal 2.

40 - 2 : **Continuity should exist.**

Is the inspection result normal?

- YES >> GO TO 8.
NO >> Repair harness or connector.



8. CHECK FRONT BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

BLOWER MOTOR CONTROL SYSTEM

[MANUAL A/C (TYPE 2)]

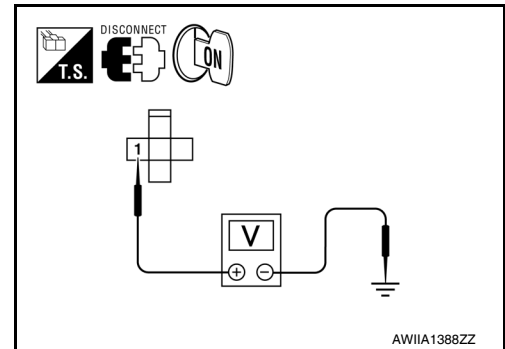
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.
2. Check voltage between front blower motor relay harness connector M107 terminal 1 and ground.

1 - Ground : **Battery voltage**

Is the inspection result normal?

- YES >> GO TO 9.
NO >> Repair front blower motor ground circuit or connector.



9. REPLACE FUSES

1. Replace fuses.
2. Activate the front blower motor.

Does the fuse blow?

- YES >> GO TO 10.
NO >> Inspection End.

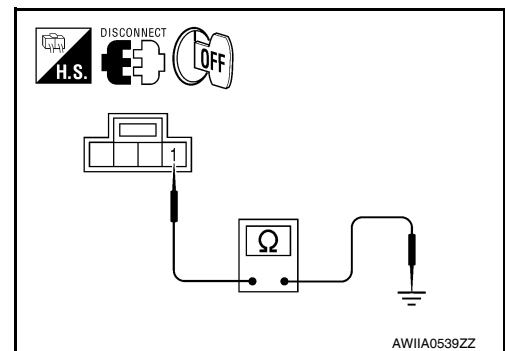
10. CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

1. Turn ignition switch OFF.
2. Disconnect front blower motor connector and variable blower control connector.
3. Check continuity between variable blower control harness connector M121 terminal 1 and ground.

1 - Ground : **Continuity should not exist.**

Is the inspection result normal?

- YES >> GO TO 11.
NO >> Repair harness or connector.



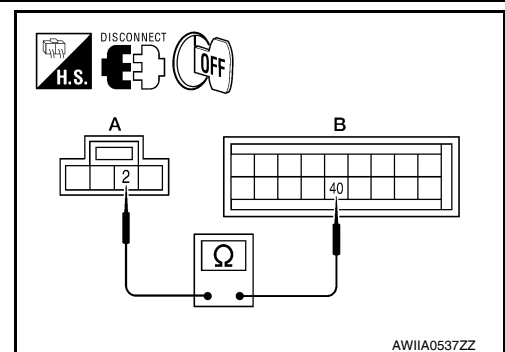
11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M177 (B) terminal 40 and variable blower control harness connector M121 (A) terminal 2.

40 - 2 : **Continuity should exist.**

Is the inspection result normal?

- YES >> GO TO 12.
NO >> Repair harness or connector.



12. CHECK FRONT BLOWER MOTOR

Check front blower motor. Refer to [HAC-211, "Front Blower Motor Component Function Check"](#).

Is the inspection result normal?

- YES >> GO TO 13.
NO >> Replace front blower motor. Refer to [VTL-12, "Removal and Installation"](#).

13. CHECK BLOWER MOTOR GROUND CIRCUIT

BLOWER MOTOR CONTROL SYSTEM

[MANUAL A/C (TYPE 2)]

< DTC/CIRCUIT DIAGNOSIS >

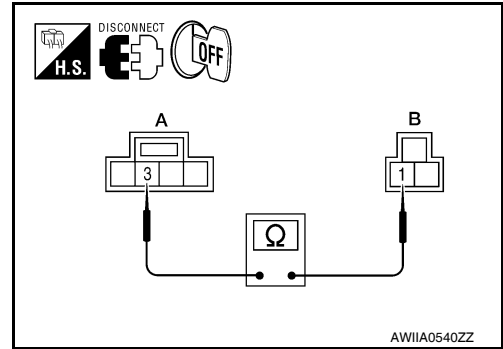
Check continuity between front blower motor harness connector M62 (B) terminal 1 and variable blower control harness connector M121 (A) terminal 3.

1 - 3 : Continuity should exist.

Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.



14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT

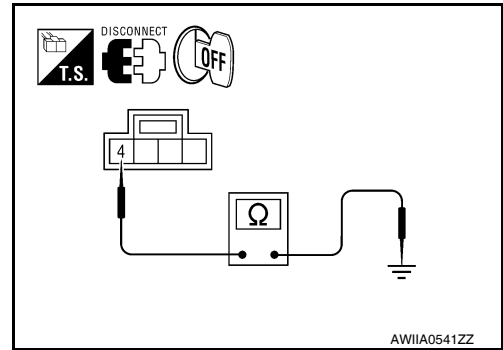
Check continuity between variable blower control harness connector M121 terminal 4 and ground.

4 - Ground : Continuity should exist.

Is the inspection result normal?

YES >> Replace variable blower control. Refer to [VTL-22, "Removal and Installation"](#).

NO >> Repair harness or connector.

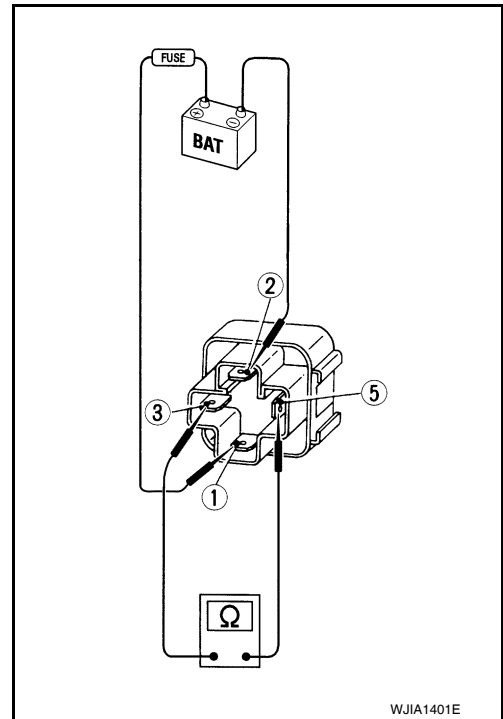


INFOID:000000006164828

Front Blower Motor Component Inspection

COMPONENT INSPECTION

Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



Front Blower Motor

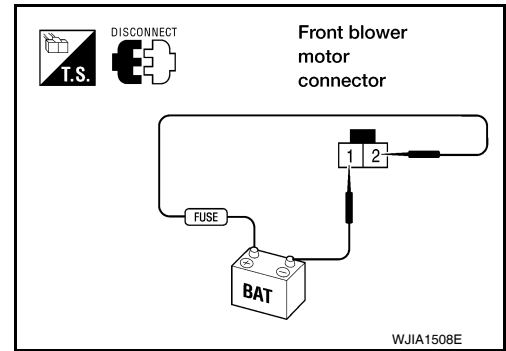
BLOWER MOTOR CONTROL SYSTEM

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

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:000000006164829

SYSTEM DESCRIPTION

The front air control controls compressor operation based on ambient and intake temperature and a signal from ECM.

Low Temperature Protection Control

The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor.

When intake air temperature is higher than the preset value, the compressor turns ON. The compressor turns OFF when intake air temperature is lower than the preset value.

Magnet Clutch Component Function Check

INFOID:000000006164830

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - MAGNET CLUTCH

1. Turn ignition switch ON.
2. Turn the blower control dial to low speed and press the A/C switch.
3. Rotate mode control dial to vent mode (↺).
4. Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to [HAC-217. "Magnet Clutch Diagnosis Procedure"](#).

Magnet Clutch Diagnosis Procedure

INFOID:000000006164831

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

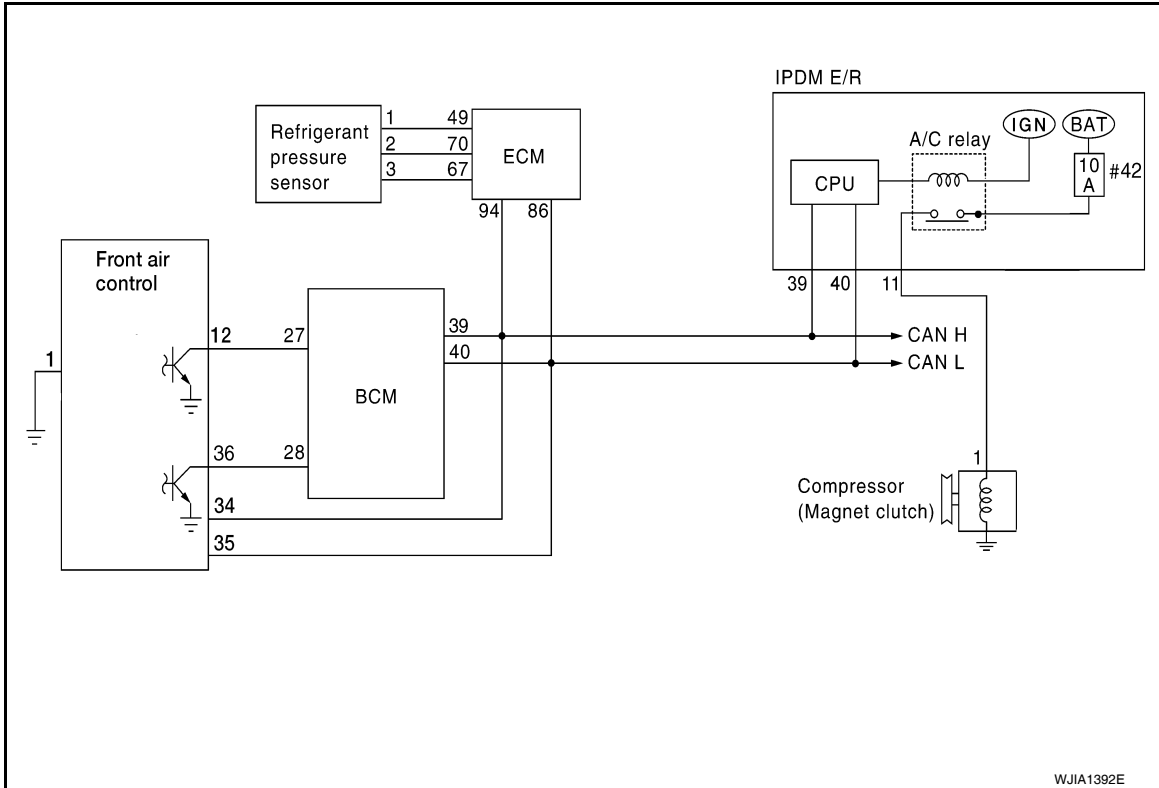
DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



1. CHECK INTAKE SENSOR CIRCUIT

Check intake sensors. Refer to [HAC-225, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check malfunctioning intake sensor. Refer to [HAC-224, "Intake Sensor Diagnosis Procedure"](#).

2. PERFORM AUTO ACTIVE TEST

Refer to [PCS-11, "Diagnosis Description"](#).

Does magnet clutch operate?

YES >> • WITH CONSULT-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 IPDM E/R AND COMPRESSOR

- Turn ignition switch OFF.
- Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
- Check continuity between IPDM E/R harness connector E119 terminal 11 and A/C compressor harness connector F3 terminal 1.

11 – 1 : Continuity should exist.

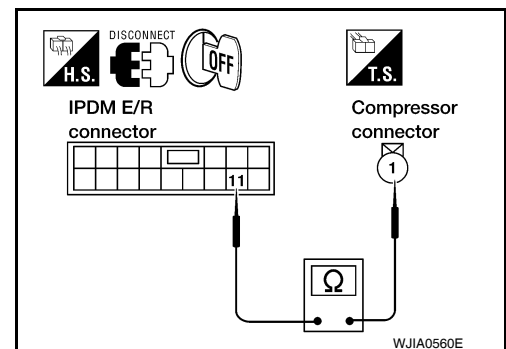
- Check continuity between IPDM E/R harness connector E119 terminal 11 and ground.

11 – ground : Continuity should not exist.

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

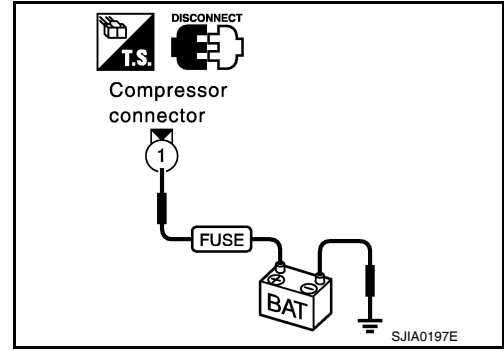
[MANUAL A/C (TYPE 2)]

4. CHECK MAGNET CLUTCH CIRCUIT

Check for operation sound when applying battery voltage direct current to terminal.

Is the inspection result normal?

- YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).
- NO >> Replace magnet clutch. Refer to [HA-33, "Removal and Installation for Compressor Clutch"](#).



5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to [HAC-194, "CONSULT-III Function \(BCM - AIR CONDITIONER\)"](#).

- A/C SW ON : AIR COND SW ON**
- A/C SW OFF : AIR COND SW OFF**

Is the inspection result normal?

- YES >> GO TO 8.
- NO >> GO TO 6.

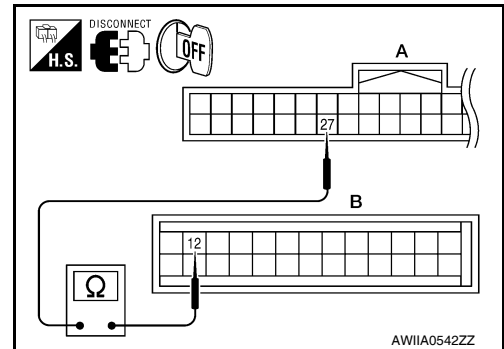
6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 27 and front air control harness connector M176 (B) terminal 12.

27 - 12 Continuity should exist.

4. Check continuity between BCM harness connector M18 (A) terminal 27 and ground.

27 - ground Continuity should not exist.

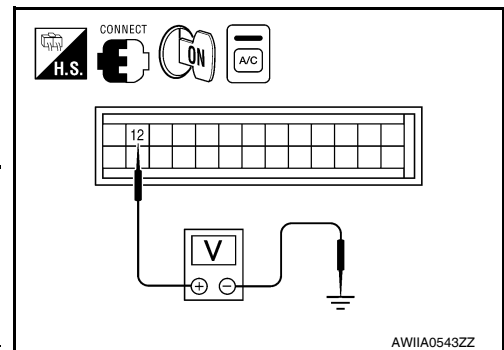


Is the inspection result normal?

- YES >> GO TO 7.
- NO >> Repair harness or connector.

7. CHECK VOLTAGE FOR FRONT AIR CONTROL (A/C COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M176 terminal 12 and ground.



Terminals		Condition	Voltage
(+)	(-)		
front air control connector	Terminal No.		
M176	12	Ground	A/C switch: ON Approx. 0V
			A/C switch: OFF Approx. 5V

Is the inspection result normal?

- YES >> GO TO 8.
- NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

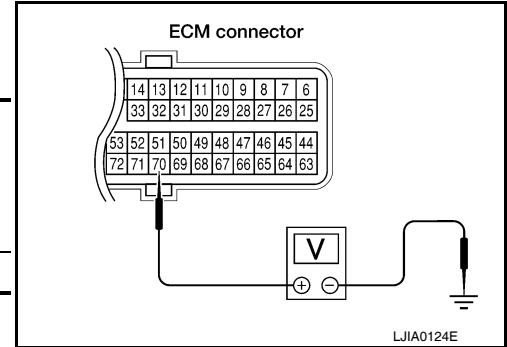
[MANUAL A/C (TYPE 2)]

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-53, "Removal and Installation"](#).

8. CHECK REFRIGERANT PRESSURE SENSOR

1. Start engine.
2. Check voltage between ECM harness connector F54 terminal 70 and ground.

Terminals		(-)	Condition	Voltage
(+) ECM connector				
ECM connector	Terminal No.			
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-465, "Diagnosis Procedure"](#).

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to [HAC-194, "CONSULT-III Function \(BCM - AIR CONDITIONER\)"](#).

**FRONT BLOWER CONTROL : FAN ON SIG ON
 DIAL ON**

**FRONT BLOWER CONTROL : FAN ON SIG OFF
 DIAL OFF**

Is the inspection result normal?

- YES >> GO TO 12.
 NO >> GO TO 10.

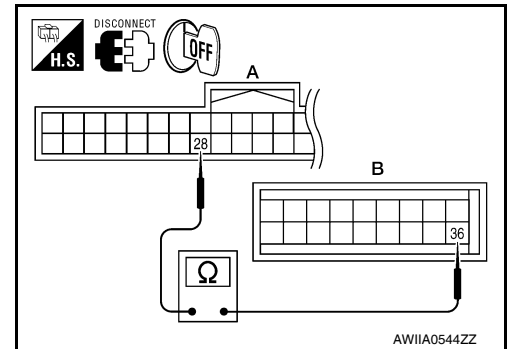
10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M18 (A) terminal 28 and front air control harness connector M177 (B) terminal 36.

28 - 36 Continuity should exist.

4. Check continuity between BCM harness connector M18 (A) terminal 28 and ground.

28 - ground Continuity should not exist.

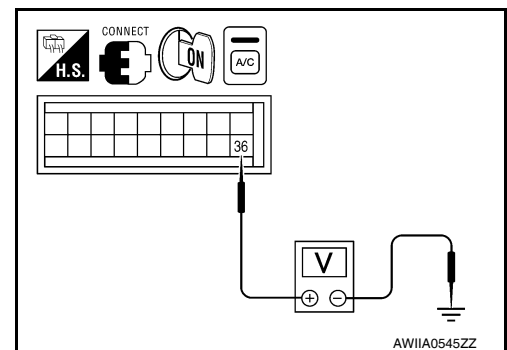


Is the inspection result normal?

- YES >> GO TO 11.
 NO >> Repair harness or connector.

11. CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M177 terminal 36 and ground.



MAGNET CLUTCH

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Terminals		(-)	Condition	Voltage
(+)	Terminal No.			
front air control connector				
M177	36	Ground	A/C switch: ON Blower motor operates	Approx. 0V
			A/C switch: OFF	Approx. 5V

Is the inspection result normal?

YES >> GO TO 12.

NO-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-53, "Removal and Installation"](#).

12.CHECK CAN COMMUNICATION

Check CAN communication. Refer to [LAN-4, "System Description"](#).

- BCM – ECM
- ECM – IPDM E/R
- ECM – Front air control

Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to [PCS-28, "Removal and Installation of IPDM E/R"](#).

NO >> Repair or replace malfunctioning part(s).

A
B
C
D
E
F
G
H
J
K
L
M
N
O
P

HAC

WATER VALVE CIRCUIT

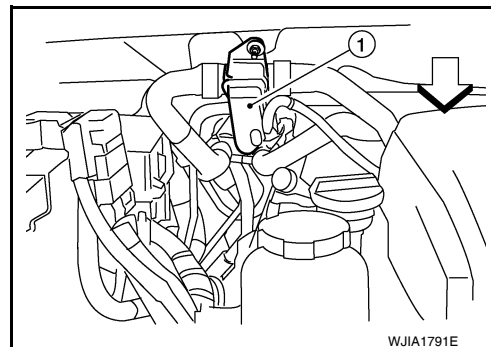
Description

INFOID:000000006164832

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:000000006164833

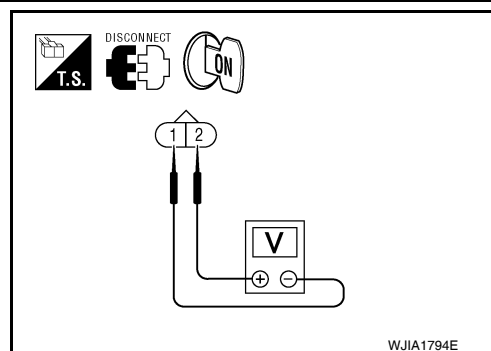
Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Disconnect water valve connector F68.
2. Turn ignition switch ON.
3. Rotate temperature control dial to maximum heat.
4. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum cold.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	2	1	Rotate temperature control dial	Battery voltage



Is the inspection result normal?

- YES >> GO TO 3.
 NO >> GO TO 2.

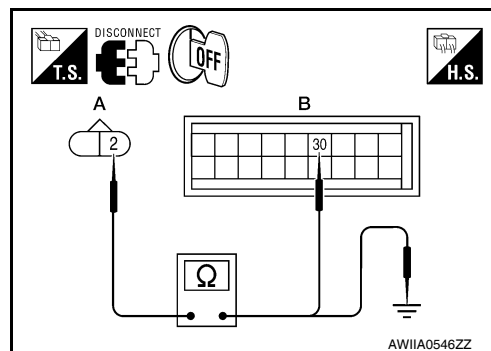
2. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M177.
3. Check continuity between water valve harness connector F68 (A) terminal 2 and front air control harness connector M177 (B) terminal 30.

2 - 30 : Continuity should exist.

4. Check continuity between water valve harness connector F68 terminal 2 and ground.

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

NO >> Repair harness or connector.

3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

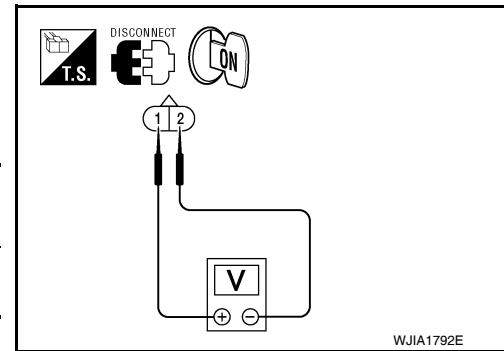
1. Rotate temperature control dial to maximum cold.
2. Check voltage between water valve harness connector F68 terminal 1 and terminal 2 while rotating temperature control dial to maximum heat.

Connector	Terminals		Condition	Voltage (Approx.)
	(+)	(-)		
Water valve: F68	1	2	Rotate temperature control dial	Battery voltage

Is the inspection result normal?

YES >> Replace the water valve.

NO >> GO TO 4.



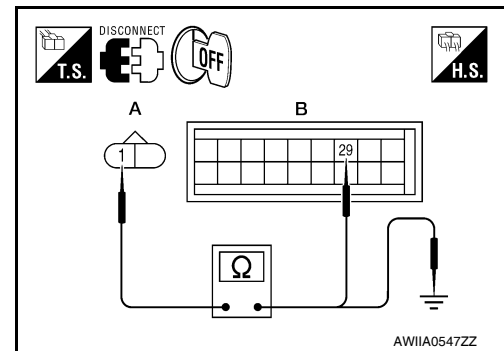
4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect front air control connector M177.
3. Check continuity between water valve harness connector F68 (A) terminal 1 and front air control harness connector M177 (B) terminal 29.

1 - 29 : Continuity should exist.

4. Check continuity between water valve harness connector F68 (A) terminal 1 and ground.

1 - Ground : Continuity should not exist.



Is the inspection result normal?

YES >> Replace front air control. Refer to [VTL-8. "Removal and Installation"](#).

NO >> Repair harness or connector.

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

INTAKE SENSOR

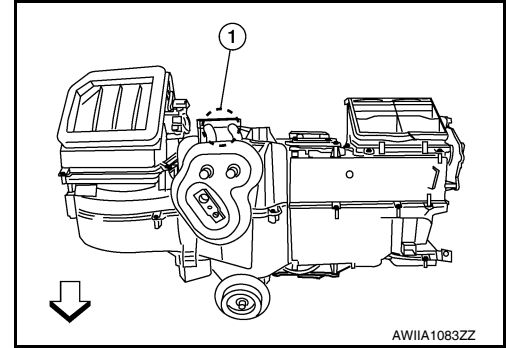
System Description

INFOID:000000006164834

COMPONENT DESCRIPTION

Intake Sensor

The intake sensor (1) is located on the heater & cooling unit assembly. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the front air control.



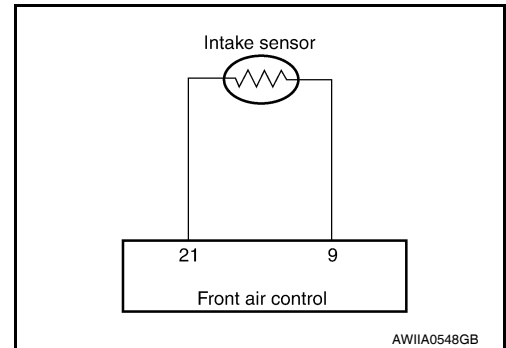
Intake Sensor Diagnosis Procedure

INFOID:000000006164835

Regarding Wiring Diagram information, refer to [HAC-232. "Wiring Diagram - Manual With 3 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted.



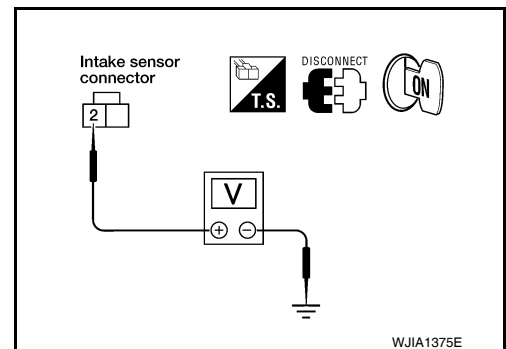
1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M146 terminal 2 and ground.

2 - Ground : Approx. 5V

Is the inspection result normal?

- YES >> GO TO 2.
NO >> GO TO 4.



2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

INTAKE SENSOR

[MANUAL A/C (TYPE 2)]

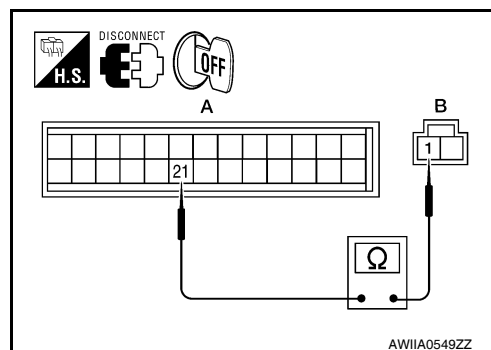
< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 1 and front air control harness connector M176 (A) terminal 21.

1 - 21 : Continuity should exist.

Is the inspection result normal?

- YES >> GO TO 3.
NO >> Repair harness or connector.



3. CHECK INTAKE SENSOR

Check intake sensor. Refer to [HAC-225, "Intake Sensor Component Inspection"](#).

Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
NO >> Replace intake sensor. Refer to [VTL-11, "Removal and Installation"](#).

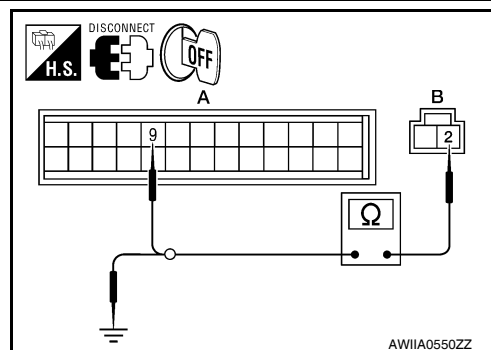
4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M146 (B) terminal 2 and front air control harness connector M176 (A) terminal 9.

2 - 9 : Continuity should exist.

4. Check continuity between intake sensor harness connector M146 (B) terminal 2 and ground.

2 - Ground : Continuity should not exist.



Is the inspection result normal?

- YES >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).
NO >> Repair harness or connector.

Intake Sensor Component Inspection

INFOID:00000006164836

COMPONENT INSPECTION

Intake Sensor

INTAKE SENSOR

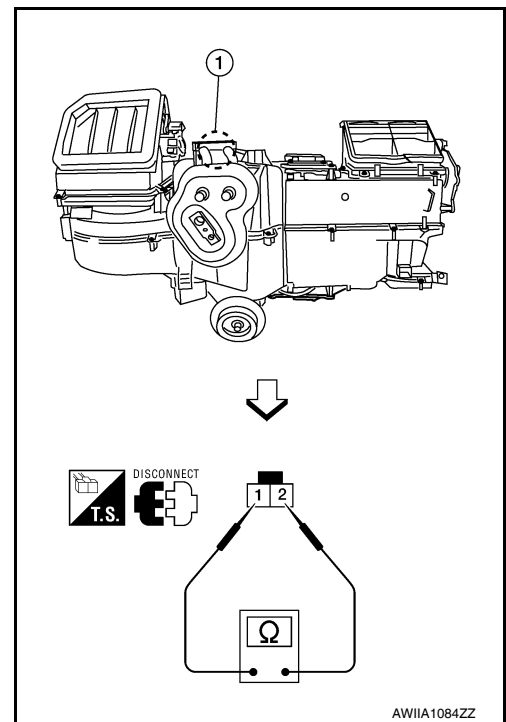
< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

After disconnecting intake sensor (1) connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.0
-10 (14)	160.0
-5 (23)	123.0
0 (32)	95.8
5 (41)	74.9
10 (50)	58.9
15 (59)	46.7
20 (68)	37.3
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor. Refer to [VTL-11, "Removal and Installation"](#).



POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

Component Description

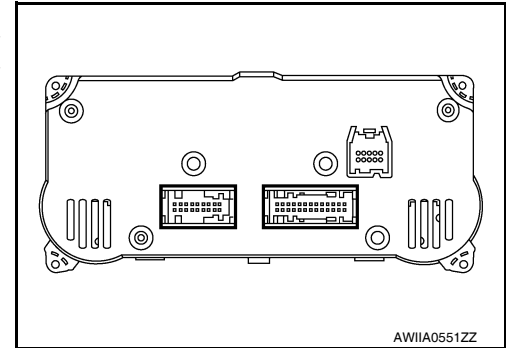
INFOID:000000006164837

COMPONENT DESCRIPTION

Front Air Control

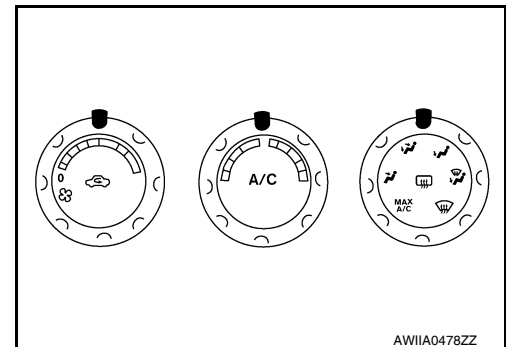
The front air control has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The air mix door motor, mode door motor, intake door motor, defroster door motor, blower motor and A/C compressor are then controlled.

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.



Potential Temperature Control (PTC)

The PTC is built into the front air control. It can be set from cold to hot or any intermediate position by rotating the temperature control dial.



Front Air Control Component Function Check

INFOID:000000006164838

SYMPTOM: A/C system does not come on.

INSPECTION FLOW

1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK

1. Turn the blower control dial clockwise to low speed.
2. Press the A/C switch.
3. Confirm that the compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

- YES >> Inspection End.
NO >> Go to diagnosis procedure. Refer to [HAC-227, "Front Air Control Power and Ground Diagnosis Procedure"](#).

Front Air Control Power and Ground Diagnosis Procedure

INFOID:000000006164839

Regarding Wiring Diagram information, refer to [HAC-232, "Wiring Diagram - Manual With 3 Control Dial System"](#).

DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

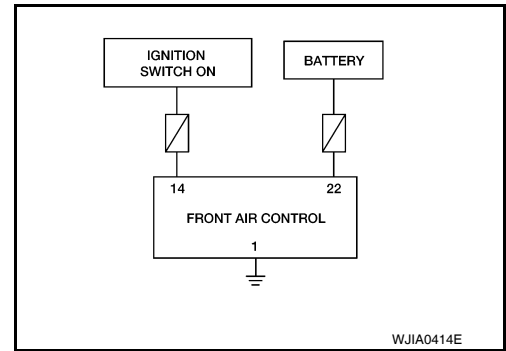
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

POWER SUPPLY AND GROUND CIRCUIT FOR CONTROLLER

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

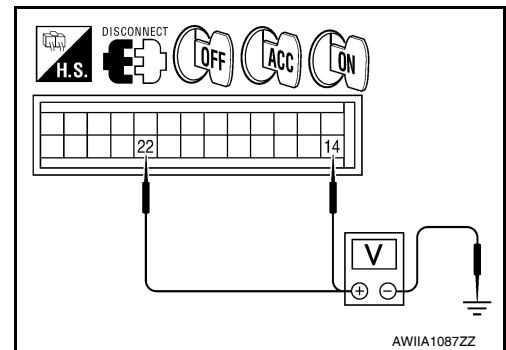
SYMPTOM: A/C system does not come on.



1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connectors.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M176 terminals 14, 22, and ground.

Terminals		Ignition switch position			
(+)		(-)	OFF	ACC	ON
front air control connector	Terminal No.				
M176	14	Ground	Approx. 0V	Approx. 0V	Battery voltage
	22		Battery voltage	Battery voltage	Battery voltage



Is the inspection result normal?

YES >> GO TO 2.

NO >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-72, "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

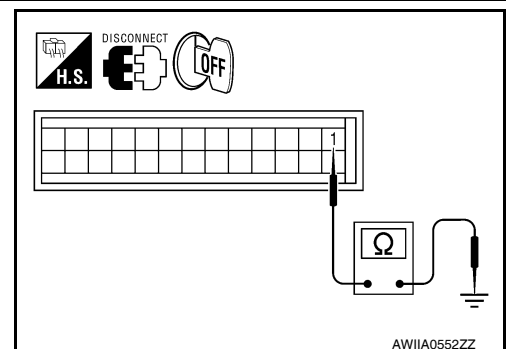
1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M176 terminal 1 and ground.

1 - Ground : Continuity should exist.

Is the inspection result normal?

OK >> Replace front air control. Refer to [VTL-8, "Removal and Installation"](#).

NG >> Repair harness or connector.



MANUAL A/C IDENTIFICATION TABLE

< ECU DIAGNOSIS INFORMATION >

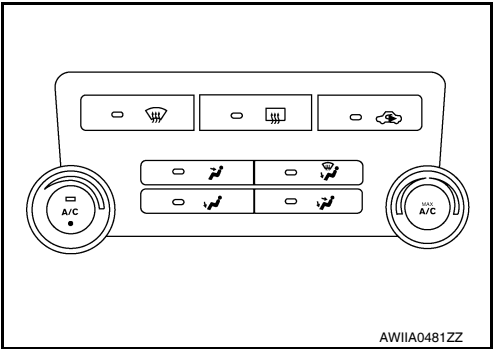
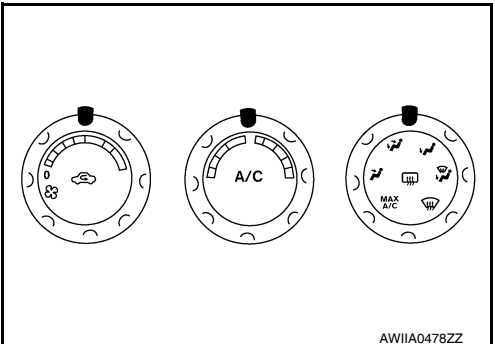
[MANUAL A/C (TYPE 2)]

ECU DIAGNOSIS INFORMATION

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164840

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)]	

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

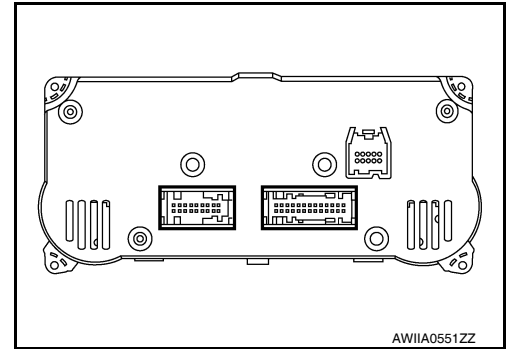
[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL

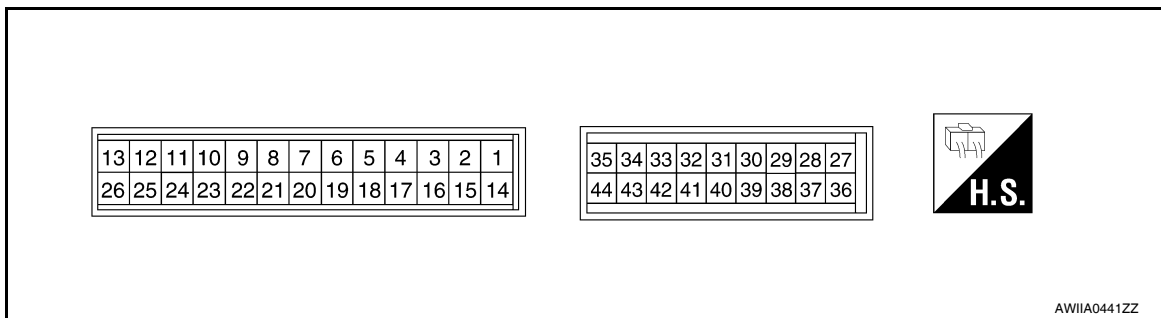
Front Air Control Terminals Reference Values

INFOID:000000006164841

Measure voltage between each terminal and ground by following Terminals and Reference Value for front air control (1).



FRONT AIR CONTROL HARNESS CONNECTOR TERMINAL LAYOUT



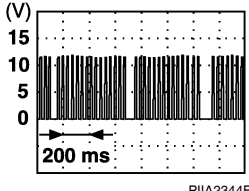
TERMINALS AND REFERENCE VALUES FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	B	Ground	-	-	0V
2	Y	V ref ACTR (5V)	ON	-	0 - 5V
3	W/G	Air mix door motor CW	ON	Clockwise rotation	Battery voltage
4	G	Air mix door motor CCW	ON	Counterclockwise rotation	Battery voltage
5	BR/W	Mode door motor CW	ON	Clockwise rotation	Battery voltage
6	P/L	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
7	O	Intake door motor CW	ON	Clockwise rotation	Battery voltage
8	G/B	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
9	L/B	Intake sensor	ON	-	0 - 5V
11	Y/B	Rear defogger request *1	ON	-	Battery voltage
12	W/R	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
14	Y/G	Power supply for IGN	ON	-	Battery voltage
15	P	V ref ACTR (ground)	ON	-	5V
16	GR	Mode door motor feedback	ON	-	0 - 5V
18	SB	Air mix door motor feedback	ON	-	0 - 5V
19	LG	Defroster door motor CW	ON	Clockwise rotation	Battery voltage
20	P/B	Defroster door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	V/R	Sensor ground	ON	-	0V
22	Y/R	Power supply for BAT	-	-	Battery voltage
23	R/L	Illumination +	ON	Park lamps ON	Battery voltage

AIR CONDITIONER CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL A/C (TYPE 2)]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
24	BR	Illumination -	-	Park lamps ON	
25	LG/B	Defroster door motor feedback	ON	-	0 - 5V
26	R/B	Front blower request	ON	Front blower motor OFF	Battery voltage
				Front blower motor ON	0V
29	Y/L	Water valve	ON	Water valve open	Battery voltage
				Water valve closed	0V
30	W/G	Water valve	ON	Water valve open	0V
				Water valve closed	Battery voltage
34	L	CAN-H	ON	-	0 - 5V
35	P	CAN-L	ON	-	0 - 5V
36	L/R	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
40	G/R	Variable blower control	ON	-	0 - 5V

*1: If equipped

A
B
C
D
E
F
G
H
J
K
L
M
N
O
P

HAC

WIRING DIAGRAM

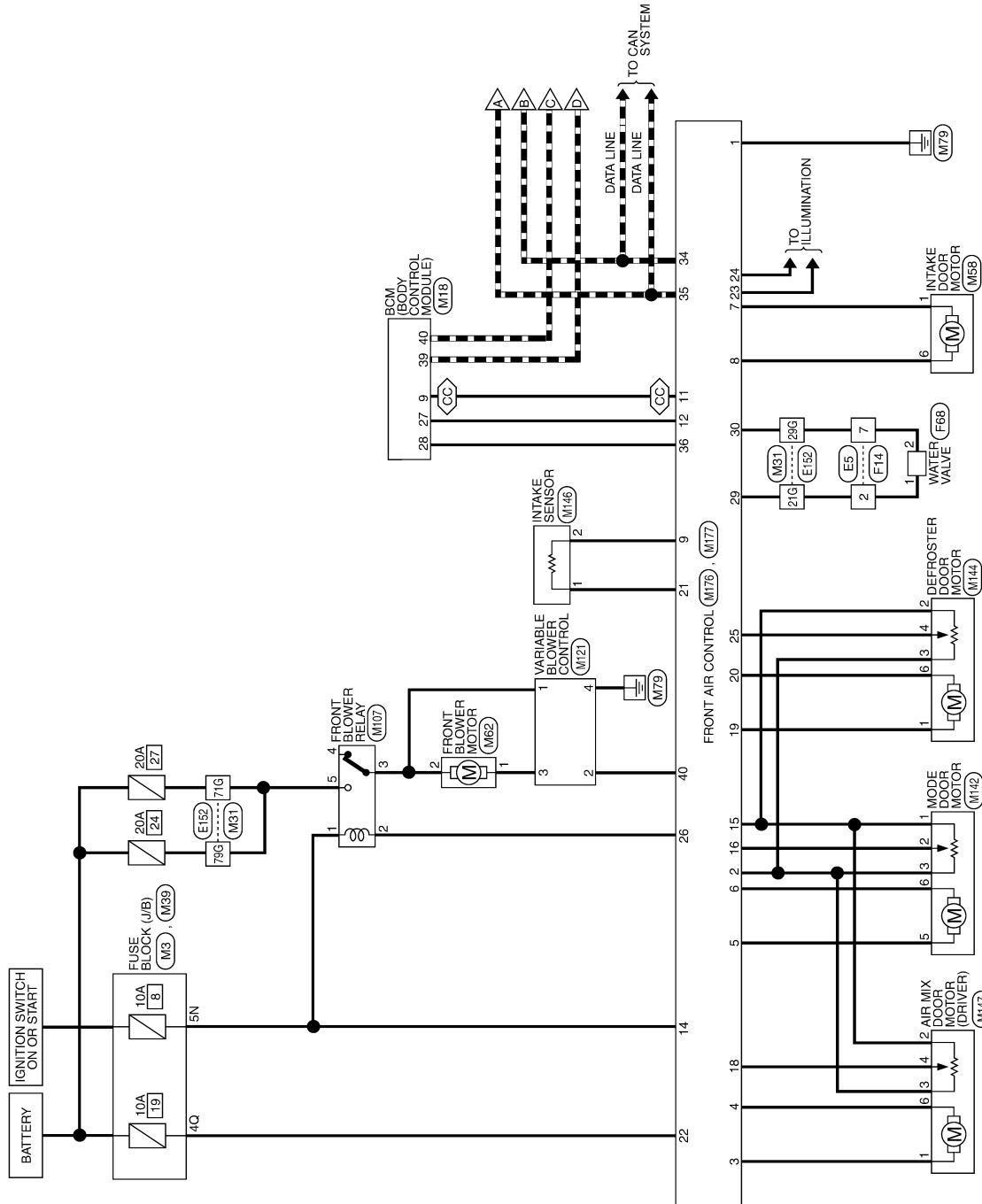
AIR CONDITIONER CONTROL

Wiring Diagram - Manual With 3 Control Dial System

INFOID:000000006464311

CC : CREW CAB

AIR CONDITIONER CONTROL - MANUAL WITH 3 CONTROL DIAL SYSTEM

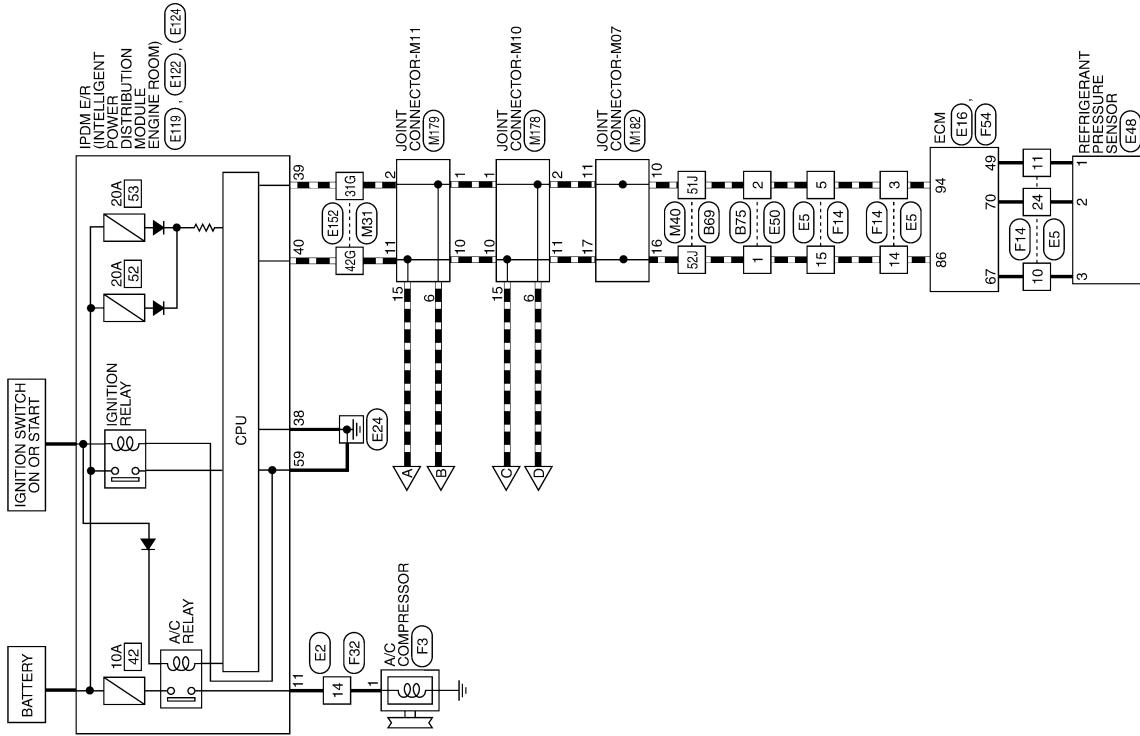


ABIWA0163GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]



A
B
C
D
E
F
G
HAC
J
K
L
M
N
O
P

ABIWA0166GB

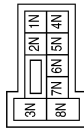
AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

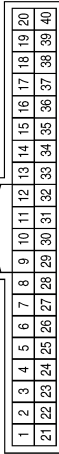
AIR CONDITIONER CONTROL CONNECTORS - MANUAL WITH 3 CONTROL DIAL SYSTEM

Connector No.	M3
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



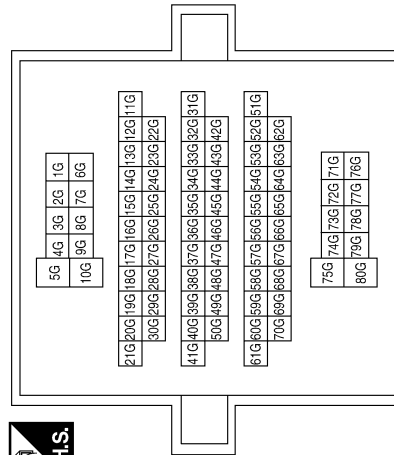
Terminal No.	Color of Wire	Signal Name
5N	Y/G	-

Connector No.	M18
Connector Name	BCM (BODY CONTROL MODULE)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
9	Y/B	REAR DEFOGGER SW
27	W/R	AIRCON SW
28	L/R	BLOWER FAN SW
39	L	CAN-H
40	P	CAN-L

Connector No.	M31
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
21G	Y/L	-
29G	W/G	-
31G	L	-
42G	P	-
71G	P	-
79G	P	-

Connector No.	M39
Connector Name	FUSE BLOCK (J/B)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
4Q	Y/R	-

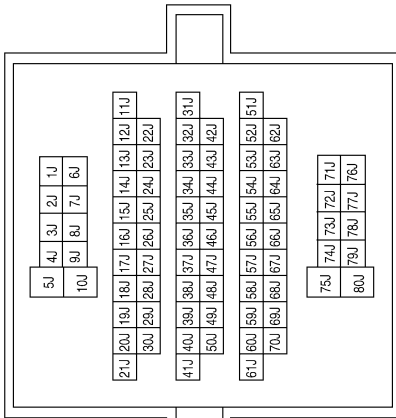
ABIIA0297GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

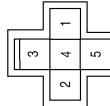
[MANUAL A/C (TYPE 2)]

Connector No.	M40
Connector Name	WIRE TO WIRE
Connector Color	WHITE

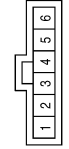


Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

Connector No.	M107
Connector Name	FRONT BLOWER RELAY
Connector Color	BLACK



Connector No.	M58
Connector Name	INTAKE DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	O	-
6	G/B	-

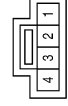
Connector No.	M52
Connector Name	FRONT BLOWER MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LW	-
2	W/L	-

Terminal No.	Color of Wire	Signal Name
1	Y/G	-
2	R/B	- (3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
3	W/L	-
4	-	-
5	GR	-

Connector No.	M121
Connector Name	VARIABLE BLOWER CONTROL (3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
1	W/L	-
2	G/R	-
3	LW	-
4	B/W	-

ABIIA0653GB

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

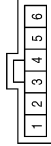
[MANUAL A/C (TYPE 2)]

Connector No.	M146
Connector Name	INTAKE SENSOR
Connector Color	GRAY



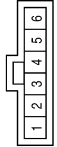
Terminal No.	Color of Wire	Signal Name
1	V/R	-
2	L/B	-

Connector No.	M144
Connector Name	DEFROSTER DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	LG	-
2	P	-
3	Y	-
4	LG/B	-
6	P/B	-

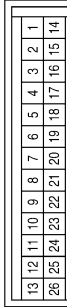
Connector No.	M142
Connector Name	MODE DOOR MOTOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	P	-(3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
2	GR	-
3	Y	-(3 CONTROL DIAL SYSTEM WITHOUT AUTO A/C)
5	BR/W	-
6	P/L	-

Terminal No.	Color of Wire	Signal Name
12	W/R	AC REQUEST
13	-	-
14	Y/G	V IGN
15	P	V REF RETURN
16	GR	PANEL/FLOOR FEEDBACK
17	-	-
18	SB	DRIVER BLEND FEEDBACK
19	LG	DEFROST CW
20	P/B	DEFROST CCW
21	V/R	SENSOR RETURN
22	Y/R	V BAT
23	R/L	ILLUM +
24	BR	ILLUM -
25	LG/B	DEFROST FEEDBACK
26	R/B	FRONT BLOWER REQUEST

Connector No.	M176
Connector Name	FRONT AIR CONTROL (WITH MANUAL 3 CONTROL DIAL SYSTEM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	B	GND
2	Y	V REF ACTUATOR 5
3	W/G	DRIVER BLEND CW
4	G	DRIVER BLEND CCW
5	BR/W	PANEL/FLOOR CW
6	P/L	PANEL/FLOOR CCW
7	O	RECIRC 1 CW
8	G/B	RECIRC 1 CCW
9	L/B	EVAP TEMP SENS
10	-	-
11	Y/B	HB REQUEST

ABIIA0654GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Terminal No.	Color of Wire	Signal Name
41	-	-
42	-	-
43	-	-
44	-	-

Terminal No.	Color of Wire	Signal Name
30	W/G	WATER VALVE CLOSE -
31	-	-
32	-	-
33	-	-
34	L	CAN-H
35	P	CAN-L
36	L/R	FAN ON
37	-	-
38	-	-
39	-	-
40	G/R	VBC OUTPUT

Connector No.	M177
Connector Name	FRONT AIR CONTROL (WITH MANUAL 3 CONTROL DIAL SYSTEM)
Connector Color	BLUE

35	34	33	32	31	30	29	28	27
44	43	42	41	40	39	38	37	36



Terminal No.	Color of Wire	Signal Name
27	-	-
28	-	-
29	Y/L	WATER VALVE OPEN +

Connector No.	M182
Connector Name	JOINT CONNECTOR-M07
Connector Color	WHITE

9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12
11	10							



Terminal No.	Color of Wire	Signal Name
10	L	-
11	L	-
16	P	-
17	P	-

Connector No.	M179
Connector Name	JOINT CONNECTOR-M11
Connector Color	BLUE

9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12
11	10							



Terminal No.	Color of Wire	Signal Name
1	L	-
2	L	-
6	L	-
10	P	-
11	P	-
15	P	-

Connector No.	M178
Connector Name	JOINT CONNECTOR-M10
Connector Color	BLUE

9	8	7	6	5	4	3	2	1
20	19	18	17	16	15	14	13	12
11	10							



Terminal No.	Color of Wire	Signal Name
1	L	-
6	L	-
10	P	-
15	P	-

ABIIA0655GB

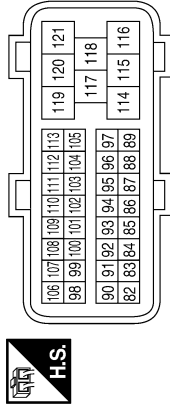
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Connector No.	E16
Connector Name	ECM
Connector Color	BLACK



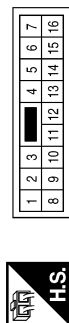
Terminal No.	Color of Wire	Signal Name
86	P	CAN-L
94	L	CAN-H

Connector No.	E5
Connector Name	WIRE TO WIRE
Connector Color	WHITE



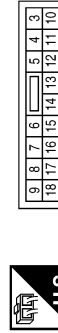
Terminal No.	Color of Wire	Signal Name
2	Y/L	-
3	L	-
5	L	-
7	W/G	-
10	B	-
11	R/Y	-
14	P	-
15	P	-
24	B/W	-

Connector No.	E2
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
14	Y/B	-

Connector No.	E119
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



Terminal No.	Color of Wire	Signal Name
11	Y/B	A/C COMPRESSOR

Connector No.	E50
Connector Name	WIRE TO WIRE
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	P	-
2	L	-

Connector No.	E48
Connector Name	REFRIGERANT PRESSURE SENSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	R/Y	-
2	B/W	-
3	B	-

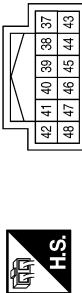
ABIIA0656GB

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Connector No.	E122
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	WHITE



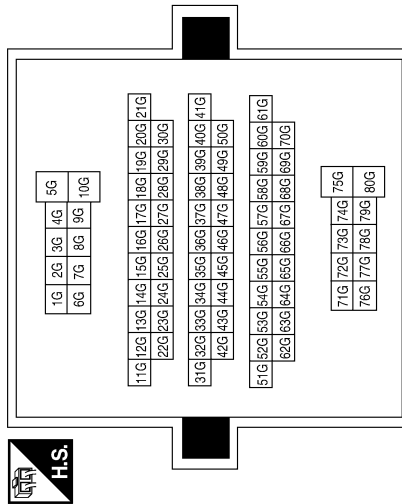
Terminal No.	Color of Wire	Signal Name
38	B	GND (SIGNAL)
39	L	CAN-H
40	P	CAN-L

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
59	B	GND (POWER)

Connector No.	E152
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	F3
Connector Name	A/C COMPRESSOR
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
1	Y/B	-

ABIIA0657GB

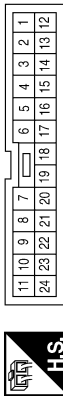
A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

Connector No.	F14
Connector Name	WIRE TO WIRE
Connector Color	WHITE



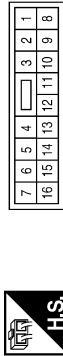
Terminal No.	Color of Wire	Signal Name
2	Y/L	-
3	L	-
5	L	-
7	W/G	-
10	B	-
11	R/Y	-
14	P	-
15	P	-
24	B/W	-

Connector No.	F68
Connector Name	WATER VALVE
Connector Color	GRAY



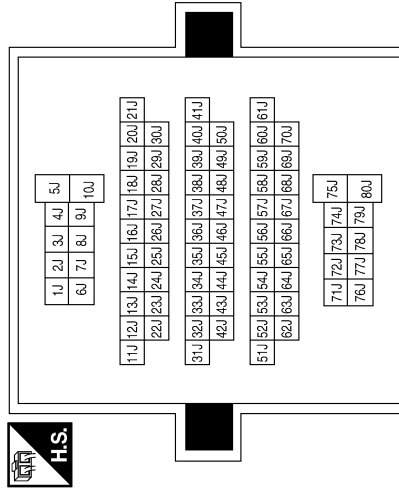
Terminal No.	Color of Wire	Signal Name
1	Y/L	-
2	W/G	-

Connector No.	F32
Connector Name	WIRE TO WIRE
Connector Color	WHITE

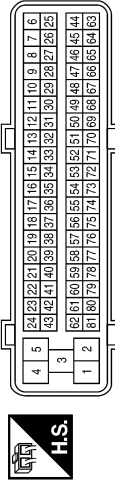


Terminal No.	Color of Wire	Signal Name
14	Y/B	-

Connector No.	B69
Connector Name	WIRE TO WIRE
Connector Color	WHITE



Connector No.	F54
Connector Name	ECM
Connector Color	BLACK



Terminal No.	Color of Wire	Signal Name
49	R/Y	AVCC (PDPRES)
67	B	GND-A
70	B/W	PD PRESS

Terminal No.	Color of Wire	Signal Name
51J	L	-
52J	P	-

AIR CONDITIONER CONTROL

< WIRING DIAGRAM >

[MANUAL A/C (TYPE 2)]

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

Connector No.	B75
Connector Name	WIRE TO WIRE
Connector Color	BROWN



Terminal No.	Color of Wire	Signal Name
1	P	-
2	L	-

ABIIA0659GB

MANUAL A/C IDENTIFICATION TABLE

< SYMPTOM DIAGNOSIS >

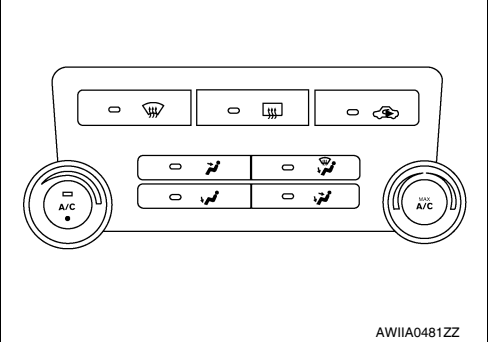
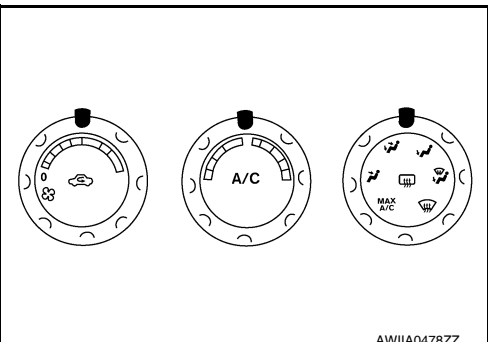
[MANUAL A/C (TYPE 2)]

SYMPTOM DIAGNOSIS

MANUAL A/C IDENTIFICATION TABLE

Application Table

INFOID:000000006164843

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)]	

AIR CONDITIONER CONTROL

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

AIR CONDITIONER CONTROL

Symptom Matrix Chart

INFOID:000000006164844

SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. HAC-227
Air outlet does not change. Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor. HAC-197
Discharge air temperature does not change. Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. HAC-201
Intake door does not change. Intake door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Intake Door Motor. HAC-205
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor. HAC-207
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor. HAC-211
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. HAC-217
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. HAC-244
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. HAC-252
Noise	Go to Trouble Diagnosis Procedure for Noise. HAC-254

A
B
C
D
E
F
G
H

HAC

J
K
L
M
N
O
P

INSUFFICIENT COOLING

Component Function Check

INFOID:000000006164845

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 SYMPTOMSPerform a complete operational check for any symptoms. Refer to [HAC-182, "Operational Check"](#).Does another symptom exist?

- YES >> Refer to [HAC-243, "Symptom Matrix Chart"](#).
NO >> System OK.

3. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

4. CHECK DRIVE BELTSCheck compressor belt tension. Refer to [EM-13, "Checking Drive Belts"](#).Is the inspection result normal?

- YES >> GO TO 5.
NO >> Adjust or replace compressor belt. Refer to [EM-13, "Removal and Installation"](#).

5. CHECK AIR MIX DOOR OPERATIONCheck and verify air mix door mechanism for smooth operation. Refer to [HAC-201, "Air Mix Door Motor Component Function Check"](#).Does air mix door operate correctly?

- YES >> GO TO 6.
NO >> Check air mix door motor circuit. Refer to [HAC-202, "Air Mix Door Motor Diagnosis Procedure"](#).

6. CHECK COOLING FAN MOTOR OPERATIONCheck and verify cooling fan motor for smooth operation. Refer to [EC-439, "Component Inspection"](#).Does cooling fan motor operate correctly?

- YES >> GO TO 7.
NO >> Check cooling fan motor. Refer to [EC-439, "Diagnosis Procedure"](#).

7. CHECK WATER VALVE OPERATIONCheck and verify water valve for smooth operation. Refer to [HAC-222, "Description"](#).Does water valve operate correctly?

- YES >> GO TO 8.
NO >> Check water valve circuit. Refer to [HAC-222, "Water Valve Diagnosis Procedure"](#).

8. CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

Check recovery/recycling equipment before connecting to vehicle. Verify there is no pressure in the recovery/recycling equipment by checking the gauges. If pressure exists, recover refrigerant from equipment lines.

>> GO TO 9.

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

9. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.
2. Confirm refrigerant purity in supply tank using recovery/recycling and refrigerant identifier.

Is the inspection result normal?

YES >> GO TO 10.

NO >> Check contaminated refrigerant. Refer to [HAC-255, "Working with HFC-134a \(R-134a\)"](#).

10. CHECK FOR EVAPORATOR FREEZE UP

Start engine and run A/C. Check for evaporator freeze up.

Does evaporator freeze up?

YES >> Perform performance test diagnoses. Refer to [HAC-245, "Diagnostic Work Flow"](#).

NO >> GO TO 11.

11. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to [HAC-247, "Performance Chart"](#).

Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to [HAC-245, "Diagnostic Work Flow"](#).

NO >> GO TO 12.

12. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

Diagnostic Work Flow

INFOID:000000006164846

HAC

J

K

L

M

N

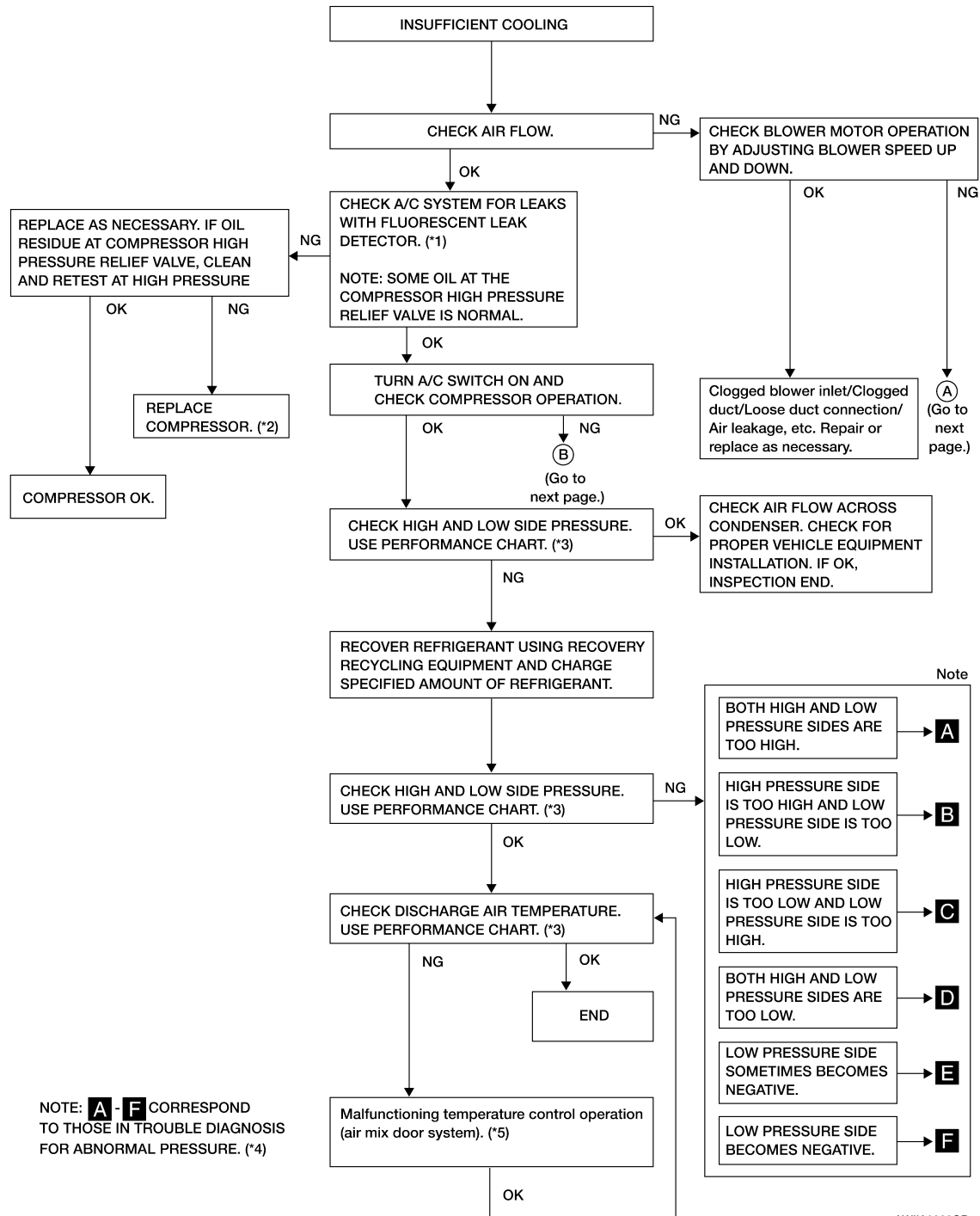
O

P

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]



AWIIA0999GB

*1 [HA-24. "Checking System for Leaks Using the Fluorescent Dye Leak Detector"](#)

*2 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*3 [HAC-247. "Performance Chart"](#)

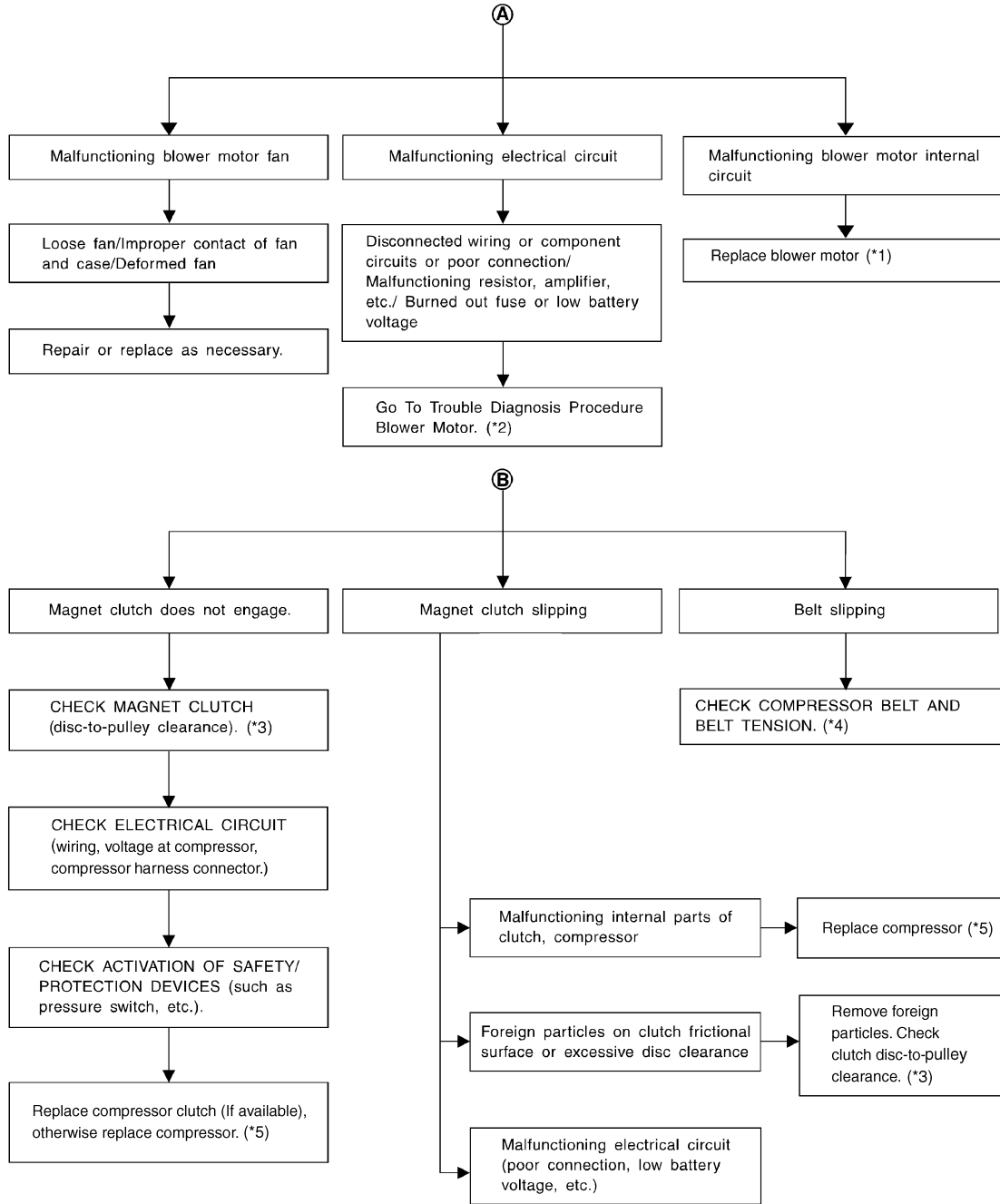
*4 [HAC-248. "Trouble Diagnoses for Abnormal Pressure"](#)

*5 [HAC-201. "Air Mix Door Motor Component Function Check"](#)

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]



A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

AWIA1000GB

*1 [VTL-12. "Removal and Installation"](#)

*2 [HAC-211. "Front Blower Motor Component Function Check"](#)

*3 [HA-33. "Removal and Installation for Compressor Clutch"](#)

*4 [EM-13. "Checking Drive Belts"](#)

*5 [HA-32. "Removal and Installation for Compressor"](#)

Performance Chart

INFOID:000000006164847




TEST CONDITION

Testing must be performed as follows:

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door window	Open
Hood	Open
TEMP.	Max. COLD
Mode control dial	 (Ventilation) set
Recirculation (REC) switch	 (Recirculation) set
 Blower speed	Max. speed set
Engine speed	Idle speed

Operate the air conditioning system for 10 minutes before taking measurements.

TEST READING

Recirculation-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	9.9 - 13.9 (50 - 57)
	25 (77)	14.6 - 18.6 (58 - 65)
	30 (86)	16.8 - 21.8 (62 - 71)
	35 (95)	21.1 - 27.1 (70 - 81)
	40 (104)	25.3 - 31.5 (78 - 89)
60 - 70	20 (68)	11.4 - 15.2 (53 - 59)
	25 (77)	15.5 - 20.0 (60 - 68)
	30 (86)	19.9 - 25.0 (68 - 77)
	35 (95)	24.5 - 29.6 (76 - 85)
	40 (104)	28.7 - 34.9 (84 - 95)

Ambient Air Temperature-to-operating Pressure Table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	1020 - 1250 (10.4 - 12.7, 147.9 - 181.3)	160 - 190 (1.63 - 1.94, 23.2 - 27.6)
	25 (77)	1236 - 1510 (12.6 - 15.4, 179.2 - 219)	206 - 245 (2.1 - 2.5, 29.9 - 35.6)
	30 (86)	1569 - 1,922 (16.0 - 19.6, 227.6 - 278.8)	265 - 324 (2.7 - 3.3, 38.4 - 46.9)
	35 (95)	1,697 - 2079 (17.3 - 21.2, 246.1 - 301.5)	304 - 363 (3.1 - 3.7, 44.1 - 52.6)
	40 (104)	1971 - 2403 (20.1 - 24.5, 285.9 - 348.5)	373 - 451 (3.8 - 4.6, 54.0 - 65.4)

Trouble Diagnoses for Abnormal Pressure

INFOID:000000006164848

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the stan-

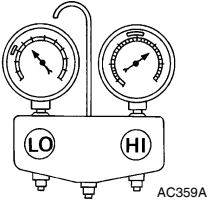
INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

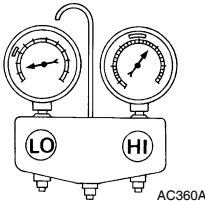
[MANUAL A/C (TYPE 2)]

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
<p>A Both high- and low-pressure sides are too high.</p> 	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓ 1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan if necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	Poor heat exchange in condenser (After compressor operation stops, high-pressure decreases too slowly.) ↓ Air in refrigeration cycle	Evacuate and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair engine cooling system.
	<ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. ↓ Improper expansion valve adjustment	Replace expansion valve.

High-pressure Side is Too High and Low-pressure Side is Too Low

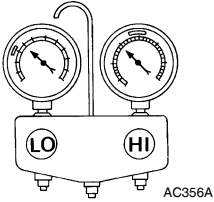
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>B High-pressure side is too high and low-pressure side is too low.</p> 	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check oil for contamination.

High-pressure Side is Too Low and Low-pressure Side is Too High

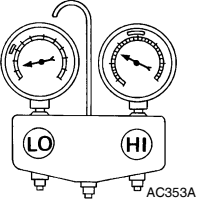
INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>C High-pressure side is too low and low-pressure side is too high.</p> 	<p>High- and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper. ↓ Damaged inside compressor packings.</p>	<p>Replace compressor.</p>
	<p>No temperature difference between high- and low-pressure sides.</p>	<p>Compressor pressure operation is improper. ↓ Damaged inside compressor packings.</p>	<p>Replace compressor.</p>

Both High- and Low-pressure Sides are Too Low

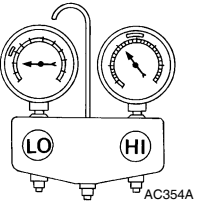
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>D Both high- and low-pressure sides are too low.</p> 	<ul style="list-style-type: none"> There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	<p>Liquid tank inside is slightly clogged.</p>	<ul style="list-style-type: none"> Replace liquid tank. Check oil for contamination.
	<ul style="list-style-type: none"> Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. Expansion valve inlet may be frosted. Temperature difference occurs somewhere in high-pressure side. 	<p>High-pressure pipe located between liquid tank and expansion valve is clogged.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
	<p>Expansion valve and liquid tank are warm or only cool when touched.</p>	<p>Low refrigerant charge. ↓ Leaking fittings or components.</p>	<p>Check refrigerant system for leaks. Refer to HA-23, "Checking of Refrigerant Leaks".</p>
	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>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.</p>	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check oil for contamination.
	<p>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check oil for contamination.
<p>Air flow volume is too low.</p>	<p>Evaporator is frozen.</p>	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HAC-224, "Intake Sensor Diagnosis Procedure". Repair evaporator fins. Replace evaporator. Refer to HAC-211, "Front Blower Motor Component Function Check". 	

Low-pressure Side Sometimes Becomes Negative

INSUFFICIENT COOLING

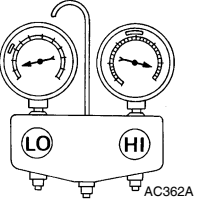
< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>E Low-pressure side sometimes becomes negative.</p> 	<ul style="list-style-type: none"> • Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted. 	<p>Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> • Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

A
B
C
D

Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>F Low-pressure side becomes negative.</p> 	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> • If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant. • If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air). • If either of the above methods cannot correct the malfunction, replace expansion valve. • Replace liquid tank. • Check oil for contamination.

E
F
G
H
HAC
J
K

INSUFFICIENT HEATING**Component Function Check**

SYMPTOM: Insufficient heating

INSPECTION FLOW**1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE**

1. Turn the blower control dial to low speed.
2. Turn the temperature control dial clockwise to maximum heat
3. Check for hot air at discharge air outlets.

Can this symptom be duplicated?

YES >> GO TO 2.

NO >> Perform complete system operational check. Refer to [HAC-182, "Operational Check"](#).**2. CHECK FOR SERVICE BULLETINS**

Check for any service bulletins.

>> GO TO 3.

3. CHECK ENGINE COOLING SYSTEM

1. Check for proper engine coolant level. Refer to [CO-10, "Inspection"](#).
2. Check hoses for leaks or kinks.
3. Check radiator cap. Refer to [CO-10, "Inspection"](#).
4. Check for air in cooling system.

>> GO TO 4.

4. CHECK AIR MIX DOOR OPERATION

Check the operation of the air mix door.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Check the air mix door motor circuit. Refer to [HAC-201, "Air Mix Door Motor Component Function Check"](#).**5. CHECK AIR DUCTS**

Check for disconnected or leaking air ducts.

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair all disconnected or leaking air ducts.

6. CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.
2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> Hot inlet hose and a warm outlet hose: GO TO 7.

NO >> • Inlet hose cold: GO TO 10.
• Both hoses warm: GO TO 8.**7. CHECK ENGINE COOLANT SYSTEM**Check engine coolant temperature sensor. Refer to [EC-177, "Component Inspection"](#).Is the inspection result normal?

YES >> System OK.

NO >> Repair or replace as necessary. Retest.

8. CHECK HEATER HOSES

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

[MANUAL A/C (TYPE 2)]

Check heater hoses for proper installation.

Is the inspection result normal?

YES >> System OK.

NO >> 1. Back flush heater core.

2. Drain the water from the system.

3. Refill system with new engine coolant. Refer to [CO-11, "Changing Engine Coolant"](#).

4. GO TO 9 to retest.

9. CHECK HEATER HOSE TEMPERATURES

1. Start engine and warm it up to normal operating temperature.

2. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be warm.

Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to [VTL-15, "Removal and Installation"](#).

10. CHECK WATER VALVE

Check the operation of the water valve. Refer to [HAC-222, "Water Valve Diagnosis Procedure"](#).

Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

A
B
C
D
E
F
G
H
J
K
L
M
N
O
P

HAC

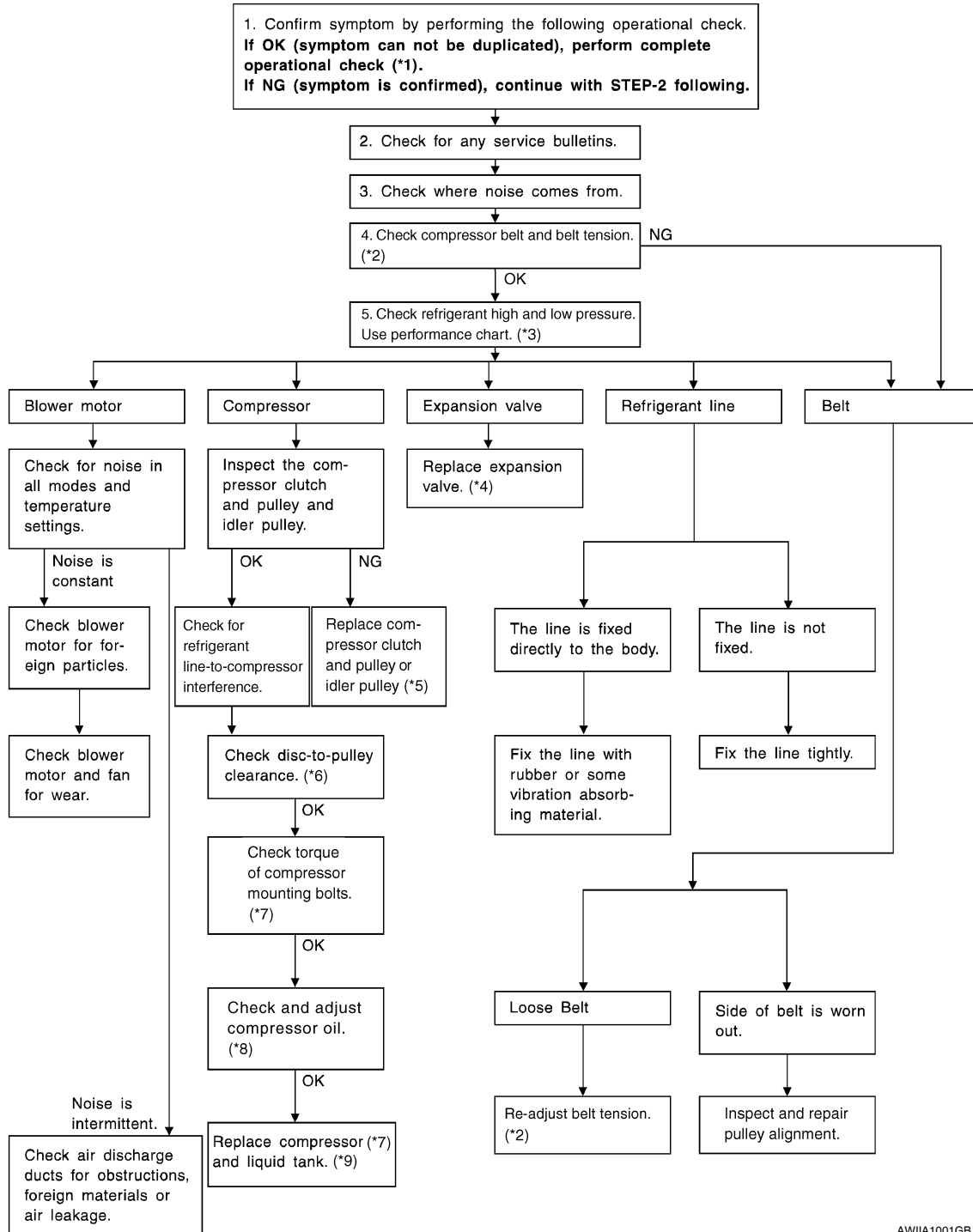
NOISE

Component Function Check

INFOID:000000006164850

SYMPTOM: Noise

INSPECTION FLOW



AWIIA1001GB

*1 [HAC-182, "Operational Check"](#)

*2 [EM-13, "Checking Drive Belts"](#)

*3 [HAC-247, "Performance Chart"](#)

*4 [HA-43, "Removal and Installation for Expansion Valve"](#)

*5 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*6 [HA-33, "Removal and Installation for Compressor Clutch"](#)

*7 [HA-32, "Removal and Installation for Compressor"](#)

*8 [HA-20, "Maintenance of Oil Quantity in Compressor"](#)

*9 [HA-41, "Removal and Installation for Condenser"](#)

PRECAUTION

PRECAUTIONS

Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TENSIONER"

INFOID:000000006164851

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER", used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SR and SB section of this Service Manual.

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN/INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system. For removal of Spiral Cable and Air Bag Module, see the SR section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

PRECAUTIONS WHEN USING POWER TOOLS (AIR OR ELECTRIC) AND HAMMERS

WARNING:

- When working near the Airbag Diagnosis Sensor Unit or other Airbag System sensors with the Ignition ON or engine running, DO NOT use air or electric power tools or strike near the sensor(s) with a hammer. Heavy vibration could activate the sensor(s) and deploy the air bag(s), possibly causing serious injury.
- When using air or electric power tools or hammers, always switch the Ignition OFF, disconnect the battery, and wait at least 3 minutes before performing any service.

Working with HFC-134a (R-134a)

INFOID:000000006164852

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

A
B
C
D
E
F
G
H
HAC
J
K
L
M
N
O
P

PRECAUTIONS

< PRECAUTION >

[MANUAL A/C (TYPE 2)]

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, your options are:

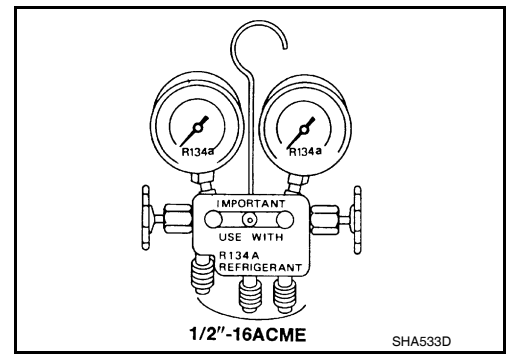
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact NISSAN Customer Affairs for further assistance.

Precaution for Service Equipment

INFOID:000000006164853

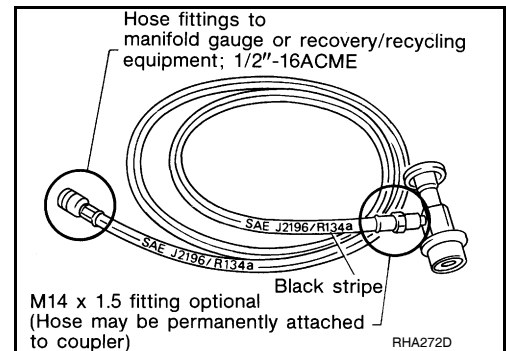
MANIFOLD GAUGE SET

Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified oil.



SERVICE HOSES

Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut-off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.



SERVICE COUPLERS

Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

