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# **HEATER & AIR CONDITIONING CONTROL SYSTEM**

## **CONTENTS**

AUTOMATIC AIR CONDITIONER	DTC/CIRCUIT DIAGNOSIS25	F
BASIC INSPECTION3	MODE DOOR MOTOR25	
DIAGNOSIS AND REPAIR WORKFLOW 3	System Description25	G
How to Perform Trouble Diagnosis For Quick And	Mode Door Motor (Front) Component Function	
Accurate Repair3	Check	
Accurate Repair	Mode Door Motor (Front) Diagnosis Procedure26	Н
INSPECTION AND ADJUSTMENT4	AIR MIX DOOR MOTOR30	J
Operational Check (Front)4	System Description30	
Operational Check (Rear)5	Air Mix Door Motor (Driver) Component Function	HA
SYSTEM DESCRIPTION7	Check31	
STSTEW DESCRIPTION	Air Mix Door Motor (Driver) Diagnosis Procedure31	
FUNCTION INFORMATION7	Air Mix Door Motor (Passenger) Component	J
Component Part Location7	Function Check34	
Symptom Table9	Air Mix Door Motor (Passenger) Diagnosis Proce-	
	dure35	K
REFRIGERATION SYSTEM11	INTAKE DOOR MOTOR39	
Refrigerant Cycle11	System Description39	
Refrigerant System Protection11	Intake Door Motor Component Function Check40	
AUTOMATIC AIR CONDITIONER SYSTEM13	Intake Door Motor Diagnosis Procedure40	
Control System Diagram13	•	
Control System Description	DEFROSTER DOOR MOTOR CIRCUIT42	
Discharge Air Flow (Front)16	System Description42	M
Discharge Air Flow (Rear)16	Defroster Door Motor Component Function Check	
Switches And Their Control Function (Front)18	43 Defroster Door Motor Diagnosis Procedure43	
Switches And Their Control Function (Rear)19	Dell'oster Door Motor Diagnosis Procedure43	N
DIAGNOSIS SYSTEM (HVAC)	BLOWER MOTOR CONTROL SYSTEM47	
DIAGNOSIS SYSTEM (HVAC)20	System Description47	
CONSULT-III Function (HVAC)20	Front Blower Motor Component Function Check48	0
DIAGNOSIS SYSTEM (BCM)21	Front Blower Motor Diagnosis Procedure48	1
CONSULT-III Function (BCM - COMMON ITEM)21	Front Blower Motor Component Inspection52	
CONSULT-III Function (BCM - AIR CONDITION-	Rear Blower Motor Description52	
ER)22	Rear Blower Motor Component Function Check53	
CELE DIA CNOCIO FUNCTION	Rear Air Control (Front) Diagnosis Procedure #154	
SELF-DIAGNOSIS FUNCTION23	Rear Air Control (Rear) Diagnosis Procedure #255	
A/C and A// Switch Assembly Solf Diagnosis	Rear Blower Motor Component Inspection56	
A/C and AV Switch Assembly Self-Diagnosis23 A/C System Self-Diagnosis Code Chart24	REAR AIR CONTROL SYSTEM58	i
A/O System Self-Diagnosis Code Chart24	Rear Air Control System Description 58	

Rear Air Control Component Function Check  Air Mix Door Motor (Rear) Diagnosis Procedure		ECU DIAGNOSIS INFORMATION	88
Mode Door Motor (Rear) Diagnosis Procedure		AIR CONDITIONER CONTROL	
MAGNET CLUTCH	. 67	·	
System Description		WIRING DIAGRAM	90
Magnet Clutch Component Function Check		AIR CONDITIONER CONTROL	00
Magnet Clutch Diagnosis Procedure	. 67	Wiring Diagram	
WATER VALVE CIRCUIT	. 72		
Description	. 72	SYMPTOM DIAGNOSIS	. 106
Water Valve Diagnosis Procedure	. 72	AIR CONDITIONER CONTROL	106
AMBIENT SENSOR	74	Symptom Matrix Chart	
Component Description		• •	
Ambient Sensor Diagnosis Procedure		INSUFFICIENT COOLING	
Ambient Sensor Component Inspection		Component Function Check	
·		Diagnostic Work Flow	
IN-VEHICLE SENSOR		Performance Chart	
Component Description		Trouble Diagnoses for Abnormal Pressure	. 112
In-Vehicle Sensor Diagnosis Procedure		INSUFFICIENT HEATING	115
In-Vehicle Sensor Component Inspection	. 79	Component Function Check	
OPTICAL SENSOR	. 80		
Component Description		NOISE	
Optical Sensor Diagnosis Procedure		Component Function Check	. 117
INTAKE SENSOR	. 82	MEMORY FUNCTION DOES NOT OPERATE.	
System Description		Memory Function Check	. 119
Intake Sensor Diagnosis Procedure		PRECAUTION	400
Intake Sensor Component Inspection		PRECAUTION	. 120
·		PRECAUTIONS	.120
POWER SUPPLY AND GROUND CIRCUIT		Precaution for Supplemental Restraint System	
FOR CONTROLLER		(SRS) "AIR BAG" and "SEAT BELT PRE-TEN-	
Component Description		SIONER"	. 120
A/C Auto Amp. Component Function Check	. 85	Precaution Necessary for Steering Wheel Rota-	
A/C Auto Amp Power and Ground Diagnosis Pro-	00	tion After Battery Disconnect	
cedure	. 86	Working with HFC-134a (R-134a)	
		Precaution for Service Equipment	. 121

## **DIAGNOSIS AND REPAIR WORKFLOW**

< BASIC INSPECTION >	[AUTOMATIC AIR CONDITIONER]
BASIC INSPECTION	
DIAGNOSIS AND REPAIR WORKFLOW	A
How to Perform Trouble Diagnosis For Quick And A	ccurate Repair
WORK FLOW	
1.LISTEN TO CUSTOMER COMPLAINT	
Listen to customer complaint. Get detailed information about the composition occurs.	conditions and environment when the symp-
>> GO TO 2	
2.CHECK FOR SERVICE BULLETINS	E
Check for any service bulletins.	
>> GO TO 3.	F
3. VERIFY THE SYMPTOM WITH OPERATIONAL CHECK	
Verify the symptom with operational check. Refer to HAC-4, "Operational check."	ational Check (Front)".
Can a symptom be duplicated?	
YES >> GO TO 4 NO >> GO TO 5	ŀ
4.GO TO APPROPRIATE TROUBLE DIAGNOSIS	
Go to appropriate trouble diagnosis. Refer to HAC-106, "Symptom	Matrix Chart".
Can a symptom be duplicated?	17
>> GO TO 5.	
5. PERFORM THE A/C AUTO AMP SELF-DIAGNOSIS	
Perform A/C auto amp. self-diagnosis. Refer to HAC-23, "A/C Auto	o Amp. Self-Diagnosis".
>> If any diagnostic trouble codes set. Refer to HAC-24.	"A/C System Self-Diagnosis Code Chart".
>> Confirm the repair by performing operational check. R	efer to HAC-4, "Operational Check (Front)".
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#### INSPECTION AND ADJUSTMENT

< BASIC INSPECTION >

[AUTOMATIC AIR CONDITIONER]

## INSPECTION AND ADJUSTMENT

## Operational Check (Front)

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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-119, "Memory Function Check".

If OK, continue with next check.

#### CHECKING BLOWER

- Press the blower speed control switch (+) once, blower should operate on low speed. The fan display should have one bar lit (on display).
- Press the blower speed control switch (+) again, and continue checking blower speed and fan display until all speeds are checked.
- 3. Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for HAC-48, "Front Blower Motor Diagnosis Procedure".

If OK, continue with next check.

#### CHECKING DISCHARGE AIR

- Press MODE switch four times and the DEF switch.
- Each position indicator should change shape (on display).
- Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-16</u>. "<u>Discharge Air Flow (Front)</u>".

Mode door position is checked in the next step.

If NG, go to trouble diagnosis procedure for <u>HAC-26</u>, "<u>Mode Door Motor (Front) Diagnosis Procedure</u>". If OK, continue the check.

#### NOTE:

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

#### CHECKING RECIRCULATION (♥, ♥ ONLY)

- Press recirculation ( ) switch one time. Recirculation indicator should illuminate.
- 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 <u>HAC-40</u>, "Intake <u>Door Motor Diagnosis Procedure"</u>. If OK, continue the check.

#### NOTE:

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

#### CHECKING TEMPERATURE DECREASE

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

#### **INSPECTION AND ADJUSTMENT**

#### < BASIC INSPECTION >

#### [AUTOMATIC AIR CONDITIONER]

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for HAC-107, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-31, "Air Mix Door Motor (Driver) Component Function Check".

If OK, continue the check.

#### CHECKING TEMPERATURE INCREASE

- 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-115, "Component Function Check". If air mix door motor appears to be malfunctioning, go to HAC-31, "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.
- 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-67, "Magnet Clutch Diagnosis Procedure". If OK, continue with next check.

#### CHECKING AUTO MODE

- 1. Press AUTO switch.
- Display should indicate AUTO.

 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-86, "A/C Auto Amp Power and Ground Diagnosis Procedure", then if necessary, trouble diagnosis procedure for HAC-67, "Magnet Clutch Diagnosis Procedure". If all operational checks are OK (symptom cannot be duplicated), go to malfunction Simulation Tests in HAC-3, "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-106, "Symptom Matrix Chart", and perform applicable trouble diagnosis procedures.

## Operational Check (Rear)

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

#### **Conditions** : Engine running and at normal operating temperature

#### CHECKING REAR BLOWER MOTOR

- 1. Turn the ignition switch ON.
- Rotate rear air control (front) blower control dial to low speed.
- 3. Rotate the blower control dial clockwise and continue checking blower speed until all speeds are checked.
- Leave blower on maximum speed.
- Press the REAR CTRL switch from the rear air control (front).
- Rotate rear air control (rear) blower control dial to low speed.
- Rotate the blower control dial clockwise and continue checking blower speed until all speeds are checked.
- 8. Leave blower on maximum speed.

If NG, go to trouble diagnosis procedure for HAC-53, "Rear Blower Motor Component Function Check". If OK, continue with next check.

#### CHECKING REAR DISCHARGE AIR

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HAC-5 Revision: July 2010 2011 Armada

#### **INSPECTION AND ADJUSTMENT**

#### < BASIC INSPECTION >

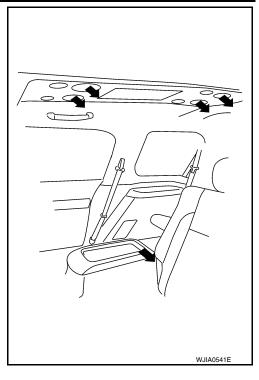
#### [AUTOMATIC AIR CONDITIONER]

- The REAR CTRL indicator must be off. Press each rear air control (front) mode door switches and confirm the discharge air comes out relative to the icon on each switch and according to the air distribution table. Refer to <a href="HAC-16">HAC-16</a>, "Discharge Air Flow (Rear)".
- Press the REAR CTRL switch (indicator on) from the rear air control (front).
- Press each rear air control (rear) mode door switches and confirm the discharge air comes out relative to the icon on each switch and according to the air distribution table. Refer to <a href="HAC-16">HAC-16</a>, "Discharge Air Flow (Rear)".

Air mix door position is checked in the next step.

If NG, go to <u>HAC-31</u>, "Air Mix Door Motor (Driver) Component Function Check".

If OK, continue with next check.



#### CHECKING REAR TEMPERATURE DECREASE

- Press the REAR CTRL switch (indicator off).
- Rotate the rear air control (front) temperature control dial counterclockwise to maximum cold.
- 3. Check for cold air at appropriate discharge air outlets.
- 4. Press the REAR CTRL switch (indicator on) from the rear air control (front).
- Rotate the rear air control (rear) temperature control dial counterclockwise to maximum cold.
- 6. Check for cold air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for <u>HAC-31</u>. "<u>Air Mix Door Motor (Driver) Component Function Check</u>". If air mix door motor appears to be malfunctioning, go to <u>HAC-59</u>, "<u>Air Mix Door Motor (Rear) Diagnosis Procedure</u>". If OK, continue with next check.

#### CHECKING REAR TEMPERATURE INCREASE

- 1. Press the REAR CTRL switch (indicator off).
- Rotate the rear air control (front) temperature control dial clockwise to maximum heat.
- 3. Check for hot air at appropriate discharge air outlets.
- 4. Press the REAR CTRL switch (indictor on) from the rear air control (front).
- 5. Rotate the rear air control (rear) temperature control dial clockwise to maximum heat.
- Check for hot air at appropriate discharge air outlets.

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for <u>HAC-31</u>, <u>"Air Mix Door Motor (Driver) Component Function Check"</u>. If air mix door motor appears to be malfunctioning, go to <u>HAC-59</u>, "Air Mix Door Motor (Rear) <u>Diagnosis Procedure"</u>.

If NG, go to trouble diagnosis procedure for HAC-115, "Component Function Check".

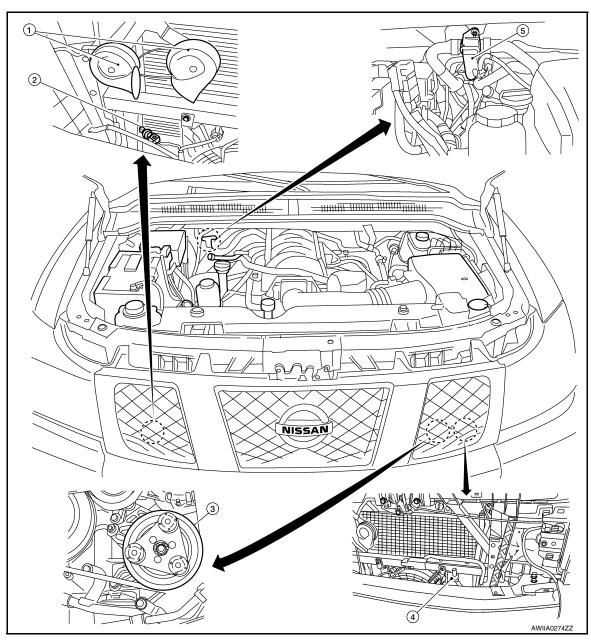
If all operational checks are OK (symptom cannot be duplicated), go to <u>HAC-3</u>, "How to <u>Perform Trouble Diagnosis For Quick And Accurate Repair"</u> and perform tests as outlined. If symptom appears, refer to <u>HAC-106</u>, "Symptom Matrix Chart" and perform applicable trouble diagnosis procedures.

# SYSTEM DESCRIPTION

## **FUNCTION INFORMATION**

**Component Part Location** 

**ENGINE COMPARTMENT** 



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

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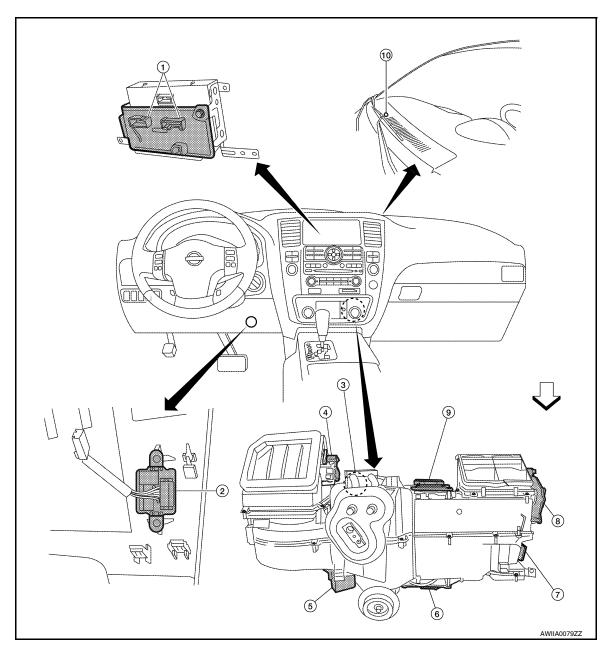
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#### PASSENGER COMPARTMENT



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

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

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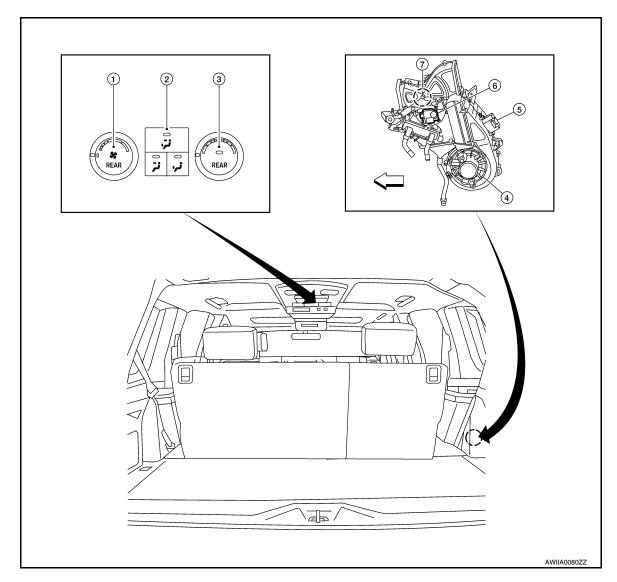
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#### REAR PASSENGER COMPARTMENT



- 1. Rear blower control (rear)
- 4. Rear blower motor B134
- Mode door motor (rear) B156
- 2. Rear mode switch (rear)
- 5. Variable blower control (rear) B133 6. Air mix door motor (rear) B155
- : Front
- 3. Rear temperature control (rear)

## Symptom Table

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Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-85
A/C system display is malfunctioning (with NAVI).	Go to Navigation System.	<u>AV-324</u>
A/C system display is malfunctioning (without NAVI).	Go to Base Audio System.	<u>AV-31</u>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-23
Air outlet does not change.	Co to Trouble Diagnosis Presedure for Made Door Mater	114.0.06
Mode door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	<u>HAC-26</u>
Discharge air temperature does not change.	Co to Trouble Diagnosis Presedure for Air Mir Door Motor	110.0.24
Air mix door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	<u>HAC-31</u>

HAC-9 Revision: July 2010 2011 Armada

## **FUNCTION INFORMATION**

## < SYSTEM DESCRIPTION >

## [AUTOMATIC AIR CONDITIONER]

Symptom	Reference Page	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-40
Intake door motor is malfunctioning.	Go to Houble Diagnosis Procedure for Illiake Door Motor.	<u> </u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-43
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-48
Rear blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Rear Blower Motor.	<u>HAC-53</u>
Rear air discharge outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor (rear).	HAC-58
Rear air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor (rear).	HAC-58
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-67
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-107
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-115
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-117
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	HAC-85
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	<u>HAC-119</u>

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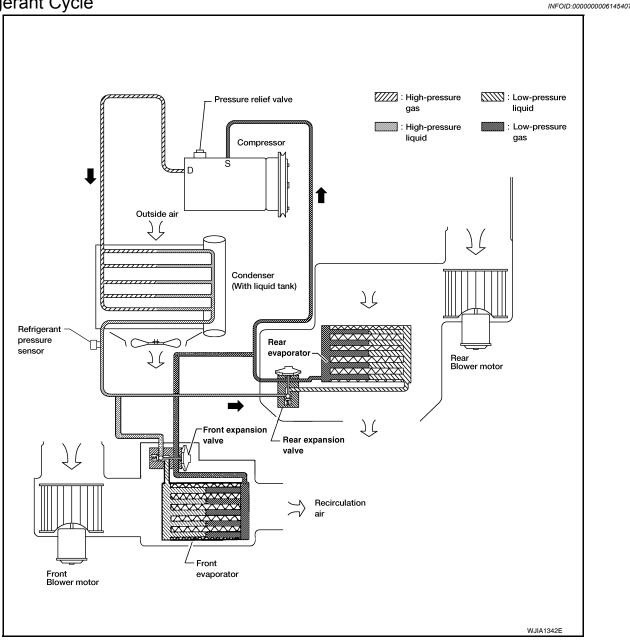
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## REFRIGERATION SYSTEM

## Refrigerant Cycle



#### REFRIGERANT FLOW

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

## Refrigerant System Protection

#### REFRIGERANT PRESSURE SENSOR

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

#### REFRIGERATION SYSTEM

#### < SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

#### 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  $(30.5 \text{ kg/cm}^2, 433.6 \text{ psi})]$ , the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

## **AUTOMATIC AIR CONDITIONER SYSTEM**

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

## **AUTOMATIC AIR CONDITIONER SYSTEM**

## Control System Diagram

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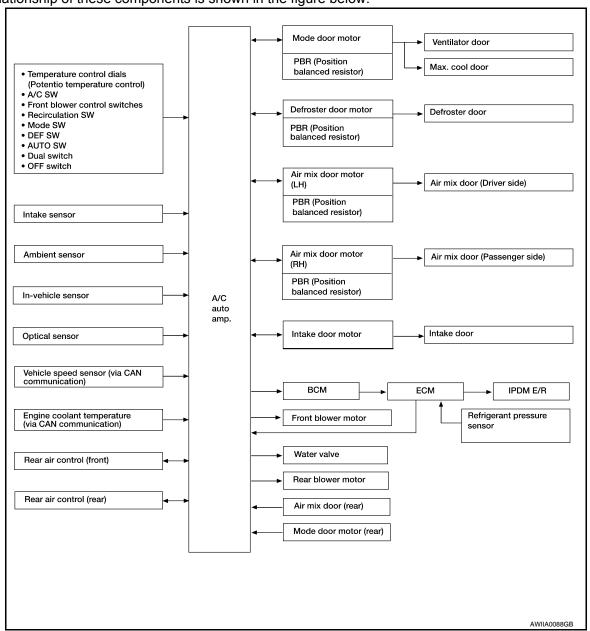
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#### **CONTROL SYSTEM**

The control system consists of input sensors, switches, the A/C auto amp.(microcomputer) and outputs. The relationship of these components is shown in the figure below:



Control System Description

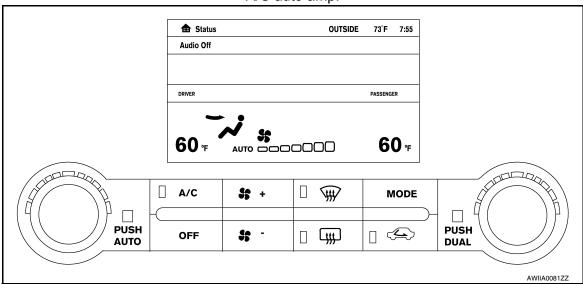
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CONTROL OPERATION

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#### A/C auto amp.



#### **DISPLAY SCREEN**

Displays the operational status of the system.

#### **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

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.

#### 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.)

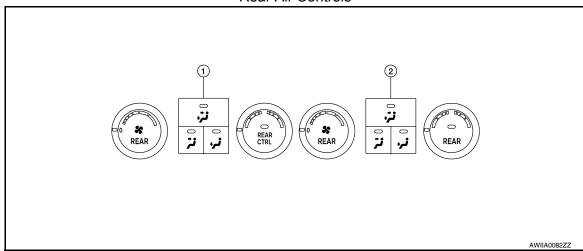
#### MODE SWITCH

Controls the air discharge outlets.

#### FRONT BLOWER CONTROL SWITCHES

Manually control the blower speed.

## Rear Air Controls



- Rear air control (front)
- Rear air control (rear)

#### REAR TEMPERATURE CONTROL DIAL (FRONT/REAR)

The temperature increases or decreases the set temperature.

#### REAR MODE SWITCHES (FRONT/REAR)

Controls the air discharge outlets.

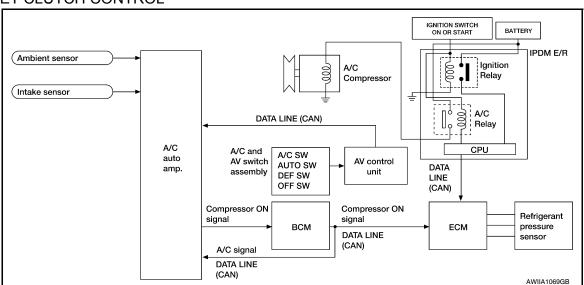
#### REAR BLOWER CONTROL DIAL (FRONT)

When the REAR CTRL switch is in the off (indicator off) the rear air control (front) controls the rear blower motor speed regardless of the rear air control (rear) blower control dial (rear) position. The rear air control (front) controls the blower motor speed.

## REAR BLOWER CONTROL DIAL (REAR)

When the REAR CTRL switch is in the on (indicator on) the rear air control (rear) controls the rear blower motor speed regardless of the rear air control (front) blower control dial (front) position. The rear air control (rear) controls the blower motor speed.

#### MAGNET CLUTCH CONTROL



When A/C switch or DEF switch is pressed, A/C auto amp. inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM and A/C auto amp., 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.

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## **AUTOMATIC AIR CONDITIONER SYSTEM**

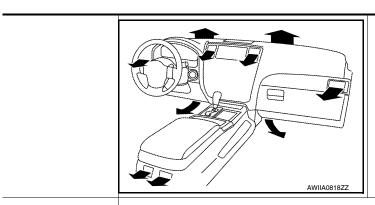
< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

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

## Discharge Air Flow (Front)

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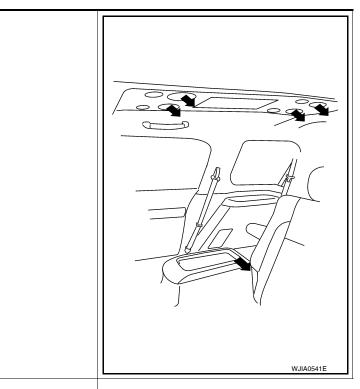
Mode door position		Air outlet/distribution	
	Vent	Foot	Defroster
~;	95%	5%	_
<del>"</del>	60%	40%	_
<b></b>	_	70%	30%
<b>*</b>	_	60%	40%
<b>W</b>	_	10%	90%

Discharge Air Flow (Rear)

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## **AUTOMATIC AIR CONDITIONER SYSTEM**

## [AUTOMATIC AIR CONDITIONER]



Mode door position	Air	outlet/distribution
	Vent	Foot
~;	100%	_
Ÿ	50%	50%
· i	_	100%

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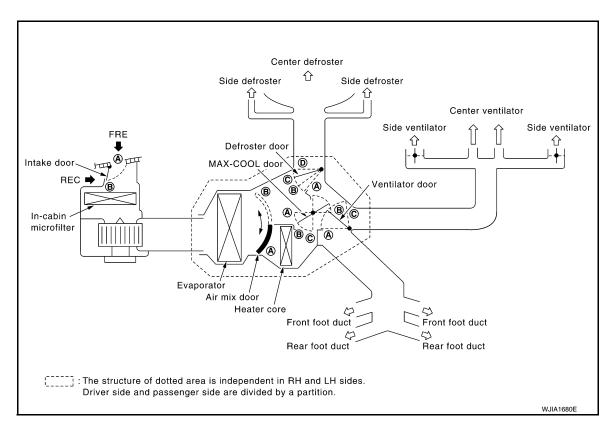
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Switches And Their Control Function (Front)

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Position	Position MODE SW DEF SW REC SW		REC	SW	Tempera	ture control dial	OFF				
or	VENT	B/L	FOOT	D/F	ON	OFF	ON	OFF		Succession 1	SW
switch	→ •	_+.	_ •	<b>W</b> •	_	TAC	Y	<b>₹</b> >	PUSH		OFF
	<b>~</b>	+,~	+,~	+,~	֥:	0		0	COLD	~ HOT	011
Ventilator door	<b>(A)</b>	B	©	©	©		_	_			©
MAX-COOL door	<b>(A)</b>	B	B	B	©		_	_			B
Defroster door	<b>(D)</b>	<b>(D)</b>	<b>O</b> or <b>©</b>	B	A		_	_			©
Intake door		_	_		B		<b>(A)</b>	B			B
Air mix door		_	_				_	_	(A)	аито 🔞	

Switches And Their Control Function (Rear)

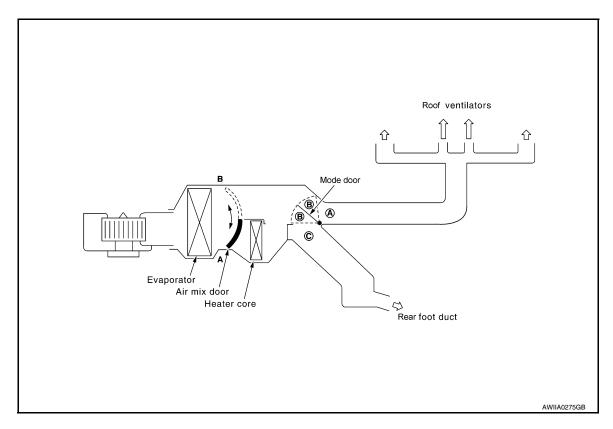
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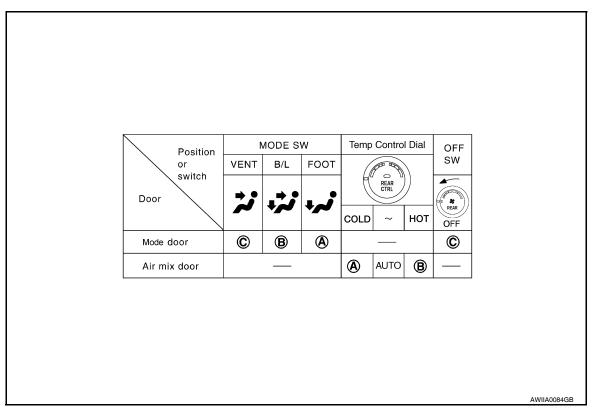
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## **DIAGNOSIS SYSTEM (HVAC)**

## [AUTOMATIC AIR CONDITIONER]

# DIAGNOSIS SYSTEM (HVAC)

## CONSULT-III Function (HVAC)

INFOID:0000000006145415

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

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

#### **SELF-DIAGNOSIS**

#### Display Item List

DTC	Description	Reference page
B2573	Battery voltage out of range	CHG-9, "Inspection Procedure"
B2578	In-vehicle sensor circuit out of range (low)	HAC-77, "In-Vehicle Sensor Diagnosis Procedure"
B2579	In-vehicle sensor circuit out of range (high)	HAC-11. III-Verlicie Serisor Diagnosis Procedure
B257B	Ambient sensor circuit short	HAC-74, "Ambient Sensor Diagnosis Procedure"
B257C	Ambient sensor circuit open	TIAC-14, Ambient Sensor Diagnosis Procedure
B257F	Optical sensor (Driver) circuit open or short	HAC-80, "Optical Sensor Diagnosis Procedure".
B2580	Optical sensor (Passenger) circuit open or short	- MAC-60. Optical Serisor Diagnosis Procedure.
B2581	Intake sensor circuit short	HAC-82. "Intake Sensor Diagnosis Procedure"
B2582	Intake sensor circuit open	TIMO-02, IIIIake Sensor Diagnosis Procedure
U1000	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"

#### **DATA MONITOR**

#### Display Item List

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

## **DIAGNOSIS SYSTEM (BCM)**

## < SYSTEM DESCRIPTION >

#### [AUTOMATIC AIR CONDITIONER]

## **DIAGNOSIS SYSTEM (BCM)**

## CONSULT-III Function (BCM - COMMON ITEM)

INFOID:0000000006624683

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

#### SYSTEM APPLICATION

BCM can perform the following functions.

				Direct D	Diagnosti	c Mode		
System	Sub System	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			×				
Intelligent Key system	INTELLIGENT KEY			×				
Combination switch	COMB SW			×				
BCM	BCM	×	×			×	×	×
Immobilizer	IMMU		×	×	×			
Interior room lamp battery saver	BATTERY SAVER			×	×	×		
Back door open	TRUNK			×	×			
Vehicle security system	THEFT ALM			×	×	×		
RAP system	RETAINED PWR			×	×	×		
Signal buffer system	SIGNAL BUFFER			×	×			
TPMS	AIR PRESSURE MONITOR		×	×	×	×		
Panic alarm system	PANIC ALARM				×			

Revision: July 2010 HAC-21 2011 Armada

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## **DIAGNOSIS SYSTEM (BCM)**

< SYSTEM DESCRIPTION >

## [AUTOMATIC AIR CONDITIONER]

# CONSULT-III Function (BCM - AIR CONDITIONER)

INFOID:0000000006624684

#### **DATA MONITOR**

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

## **SELF-DIAGNOSIS FUNCTION**

## A/C Auto Amp. Self-Diagnosis

#### A/C SYSTEM SELF-DIAGNOSIS FUNCTION

The self-diagnosis function is built into the A/C auto amp. to quickly locate the cause of malfunctions.

#### DESCRIPTION

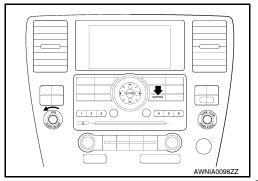
The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on A/C auto amp. Refer to applicable sections (items) for details. Fault codes (if any are present) will be displayed in the ambient temperature display area. Refer to HAC-24, "A/C System Self-Diagnosis Code Chart".

#### SELF-DIAGNOSTIC MODE

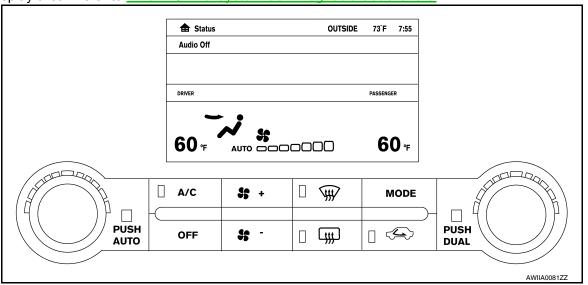
#### NOTE:

Radio must be off.

- On the A/C and AV switch assembly, press the "SETTING" button and twist the volume knob clockwise and counterclockwise until the Self-Diagnosis screen shows on the display.
- 2. Scroll down to "Confirmation/Adjustment" and press the "ENTER" button.
- 3. Scroll down to "Climate Control" and press the "ENTER" button.
- 4. The fan bars will flash on the display during the self-test, and then the fault codes will display in the ambient temperature area. They will continue scrolling until diagnostic mode is exited.
- 5. Exit by pressing the "BACK" button on A/C and AV switch assembly until display returns to its normal operation screen. HVAC system will be OFF.



The self-diagnostic system diagnoses sensors, CAN system, and battery voltage on A/C auto amp. 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-24, "A/C System Self-Diagnosis Code Chart".



## A/C and AV Switch Assembly Self-Diagnosis

A/C and AV switch assembly self-diagnosis function

The ON/OFF operation (continuity) of each switch in the A/C and AV switch assembly can be checked.

Self-diagnosis mode

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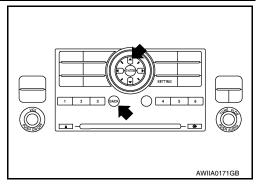
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#### **SELF-DIAGNOSIS FUNCTION**

#### < SYSTEM DESCRIPTION >

#### [AUTOMATIC AIR CONDITIONER]

- Press the "BACK" switch and the "UP" switch within 10 seconds after turning the ignition switch from OFF to ACC and hold them for 3 seconds or more. Then the buzzer sounds, all indicators of the preset switch illuminate, and the self-diagnosis mode starts.
- The continuity of each switch and control dials (A/C and AV switch assembly only) at the ON position can be checked by pressing each switch and turning each control dial. The buzzer sounds and LED's will illuminate if the switch is normal.



Finishing self-diagnosis mode

Self-diagnosis mode is canceled when turning the ignition switch OFF.

## A/C System Self-Diagnosis Code Chart

INFOID:0000000006145420

#### SELF-DIAGNOSTIC CODE CHART

Code No.	Reference page				
03	Battery voltage out of range	CHG-9, "Inspection Procedure"			
30	In-vehicle sensor circuit out of range (low)	HAC 77 "In Vehicle Conser Diagnosis Dressdure"			
31	In-vehicle sensor circuit out of range (high)	HAC-77, "In-Vehicle Sensor Diagnosis Procedure"			
40	Ambient sensor circuit short	HAC-74, "Ambient Sensor Diagnosis Procedure"			
41	Ambient sensor circuit open	MAC-74. Ambient Sensor Diagnosis Procedure			
50	Optical sensor (Driver) circuit open or short	HAC-80, "Optical Sensor Diagnosis Procedure"			
52	Optical sensor (Passenger) circuit open or short	— IAC-00, Optical Serisor Diagnosis Procedure			
56	Intake sensor circuit short	HAC-82, "Intake Sensor Diagnosis Procedure"			
57	Intake sensor circuit open	TAC-02. IIIIdate Selisui Didyllosis Plocedule			
80	CAN bus fault	LAN-14, "Trouble Diagnosis Flow Chart"			

## DTC/CIRCUIT DIAGNOSIS

## MODE DOOR MOTOR

## System Description

#### SYSTEM DESCRIPTION

#### Component Parts

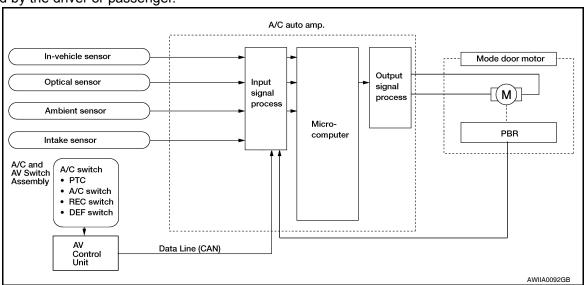
Mode door control system components are:

- A/C auto amp.
- A/C and AV switch assembly
- Mode door motor (front)
- Position Balanced Resistor (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 A/C auto amp. by means of the mode door motor (front). When a mode door position is selected on the A/C auto amp., voltage is applied to one circuit of the mode door motor (front) while ground is applied to the other circuit, causing the mode door motor (front) 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 A/C auto amp. monitors the mode door position by measuring the voltage signal on the Position Balanced Resistor (PBR) circuit. The PBR indicates the position of the mode door to the A/C auto amp. through a variable voltage return signal.

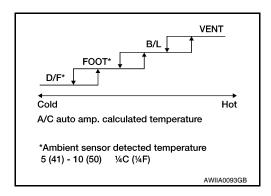
In AUTO mode the mode door position is set by the A/C auto amp. which determines the proper position based on inputs from the in-vehicle sensor, ambient sensor, optical sensor, intake sensor, and the temperature selected by the driver or passenger.



Mode Door Control Specification

#### COMPONENT DESCRIPTION

Mode Door Motor (Front)



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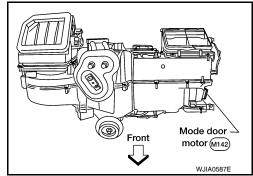
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#### **MODE DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

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



## Mode Door Motor (Front) Component Function Check

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#### INSPECTION FLOW

## 1. CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - DISCHARGE AIR

- 1. Press mode switch four times and then press the (DEF) switch. Each position indicator should change shape (on display).
- 2. Confirm that discharge air comes out according to the air distribution table. Refer to <a href="HAC-16">HAC-16</a>, "Discharge Air Flow (Front)".

#### 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 <a href="HAC-26">HAC-26</a>, "Mode Door Motor (Front) Diagnosis Procedure".

## Mode Door Motor (Front) Diagnosis Procedure

INFOID:0000000006145423

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

#### SYMPTOM:

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

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

- 1. Turn ignition switch ON.
- Using CONSULT-III, check "MODE FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to <u>HAC-20</u>. "CONSULT-III Function (HVAC)".
- 3. Observe "MODE FDBCK" voltage while cycling A/C auto amp 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 (front) for mechanical failure. Refer to VTL-29, "Components".

NO >> GO TO 2.

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

#### **MODE DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

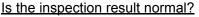
#### [AUTOMATIC AIR CONDITIONER]

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

А		В	Continuity		
Connector	Terminal	Connector Termina		Continuity	
M49	19	M142	5	Yes	
IVI49	20	IVI 142	6	res	

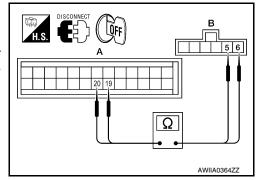
 Check continuity between A/C auto amp. harness connector M49 terminals 19, 20 and ground.

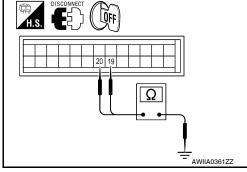
Connector	Terminal	_	Continuity
M49	19	Ground	No
	20	Ground	140



YES >> GO TO 3.

NO >> Repair or replace harness as necessary.

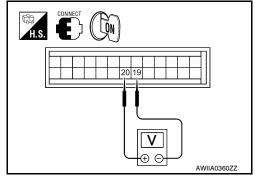




# $3. \mathrm{check}$ a/c auto amp. for mode door motor (front) power and ground

- 1. Reconnect A/C auto amp. harness connector.
- 2. Turn ignition switch ON.
- 3. Press the mode switch to the D/F ( ) mode.
- 4. Check voltage between A/C auto amp. 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	
Connector	(+)	(-)	Condition	Voltage (Approx.)
M49	19	20	D/F ( ) mode to VENT ( ) mode	Battery voltage
10149	20	19	VENT (*) mode to B/L (*) mode	Battery voltage



#### Is the inspection result normal?

YES >> GO TO 4.

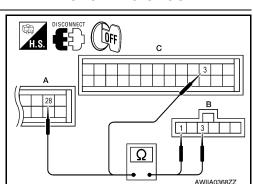
NO >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

## 4. CHECK MODE DOOR MOTOR (FRONT) PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the A/C auto amp. harness connectors.
- 3. Check continuity between A/C auto amp. 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		В	Continuity	
Connector	Terminal	Connector Terminal		Continuity
M49 (C)	3	M142	3	Yes
M50 (A)	28	IVITAZ	1	100

4. Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.



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Revision: July 2010 HAC-27 2011 Armada

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

#### Is the inspection result normal?

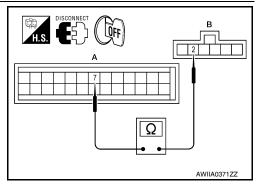
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

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

 Check continuity between A/C auto amp. harness connector M49 (A) terminal 7 and mode door motor harness connector M142 (B) terminal 2.

Α		В	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
M49	7	M142	2	Yes



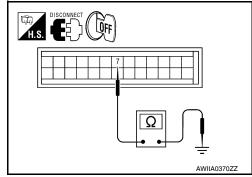
2. Check continuity between A/C auto amp. harness connector M49 terminal 7 and ground.

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 A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- 3. Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

А		В		
Connector	Terminals	Connector	Terminals	Voltage (Approx.)
Connector	(+)	Connector	(-)	voltage (Approx.)
M50	28	M49	3	5 Volts

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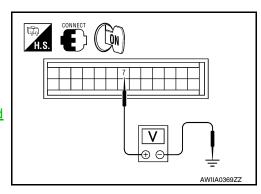
4. Check voltage between A/C auto amp. harness connector M49 terminal 7 and ground.

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

#### Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace A/C auto amp. Refer to <u>VTL-8</u>, "Removal and Installation".



#### **MODE DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

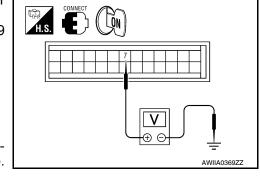
# 7. CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL

- 1. Reconnect the mode door motor (front) harness connector M142.
- 2. Check voltage between A/C auto amp. 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 (front) for binding or mechanical failure. If mode door moves freely, replace A/C auto amp. Refer to VTL-8, "Removal and Installation".



NO >> Replace the mode door motor (front). Refer to <u>VTL-30</u>, "Removal and Installation".

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## System Description

#### INFOID:0000000006145424

#### 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:

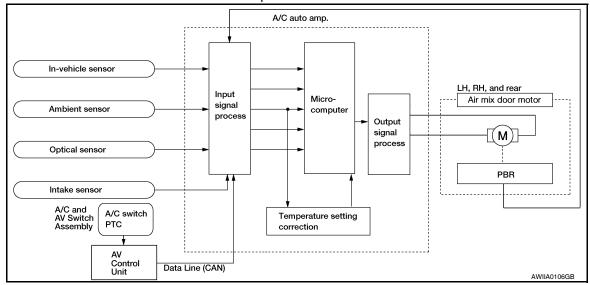
- A/C auto amp.
- A/C and AV switch assembly
- · Air mix door motors (driver, passenger, and rear)
- Position Balanced Resistor (PBR) (built-into air mix door motors)
- · In-vehicle sensor
- · Ambient sensor
- · Optical sensor
- · Intake sensor

#### System Operation

The A/C auto amp. receives data from the temperature selected by the driver side, passenger side, and rear. The A/C auto amp. 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 A/C auto amp. monitors the air mix door positions by measuring the voltage signal on the Position Balanced Resistor (PBR) circuits of each door.

In AUTO mode the air mix, intake, mode door, and defrost door positions are set by the A/C auto amp. 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.

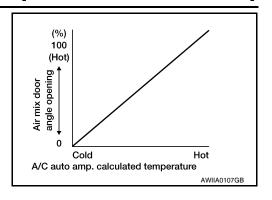
Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new door position data is returned to the A/C auto amp.



#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

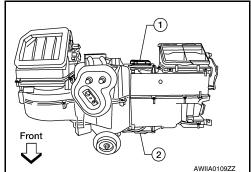
Air Mix Door Control Specification



#### COMPONENT DESCRIPTION

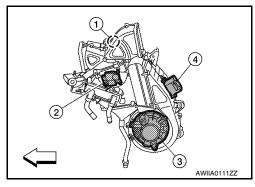
#### Air Mix Door Motors (front)

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 A/C auto amp. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the A/C auto amp. by the Position Balanced Resistor (PBR) built into the air mix door motors.



#### Air Mix Door Motor (rear)

The air mix door motor (rear) (1) is attached to the rear heater & cooling unit assembly. These motors rotate so that the air mix door is opened or closed to a position set by the front (or rear) air control. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the A/C auto amp. by the Position Balanced Resistor (PBR) built into the air mix door motors.



## Air Mix Door Motor (Driver) Component Function Check

INFOID:0000000006145425

#### 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.
- 3. Turn temperature control dial (driver) counterclockwise until 18°C (60°F) is displayed.
- Check for cool air at discharge air outlets.

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to HAC-31, "Air Mix Door Motor (Driver) Diagnosis Procedure".

## Air Mix Door Motor (Driver) Diagnosis Procedure

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Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

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#### < DTC/CIRCUIT DIAGNOSIS >

SYMPTOM:

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

## $1. {\sf CHECK\,AIR\,MIX\,DOOR\,MOTOR\,(DRIVER)\,POSITION\,BALANCED\,RESISTOR\,(PBR)\,FEEDBACK\,VOLT-}$ **AGE**

- 1. Turn ignition switch ON.
- Using CONSULT-III, check "DVR MIX FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to HAC-20, "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-107, "Component Function Check" for insufficient cooling or HAC-115, "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 A/C auto amp. harness connector M49 (A) and 2. the air mix door motor (driver) harness connector M147 (B).
- Check continuity between A/C auto amp. harness connector M49 (A) terminals 17, 18 and the air mix door motor (driver) harness connector M147 (B) terminals 1, 6.

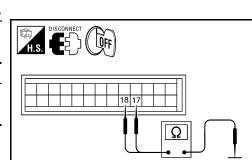
А		В		Continuity
Connector	Terminal	Connector Terminal		Continuity
M49	17	M147	1	Yes
IVI49	18	IVI 147	6	165

Check continuity between A/C auto amp. harness connector M49 terminals 17, 18 and ground.

Connector	Terminal	_	Continuity
M49	17	Ground	No
	18	Ground	NO

#### Is the inspection result normal?

YES >> GO TO 3.



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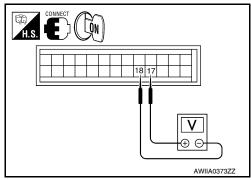
NO	>> Repair or replace harness as necessary.	
<b>3.</b> CHE	CK A/C AUTO AMP. FOR AIR MIX DOOR MOTOR (DRIVER	L R) POWER AND GROUND

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

- Reconnect A/C auto amp. harness connector.
- Turn ignition switch ON.
- 3. Rotate temperature control dial (driver) to 32°C (90°F).
- 4. Check voltage between A/C auto amp. 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	Tern	ninals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition		
M49	17	18	While rotating temperature control dial (driver) from 32°C (90°F) to 18°C (60°F)	Battery voltage	
IVITO	18	17	While rotating temperature control dial (driver) from 18°C (60°F) to 32°C (90°F)	Battery voltage	



#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

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

- Turn ignition switch OFF.
- Disconnect the A/C auto amp. harness connectors. 2.
- Check continuity between A/C auto amp. 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	С	В		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M49 (C)	3	M147	2	Yes
M50 (A)	28	IVI 147	3	165

4. Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

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

#### Is the inspection result normal?

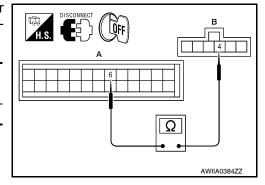
YES >> GO TO 5.

NO >> Repair or replace harness as necessary.

## ${f 5}.$ CHECK PBR FEEDBACK SIGNAL CIRCUIT FOR OPEN AND SHORT TO GROUND

Check continuity between A/C auto amp. harness connector M49 (A) terminal 6 and air mix door motor (driver) harness connector M147 (B) terminal 4.

А		В		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M49	6	M147	4	Yes



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**HAC-33** Revision: July 2010 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

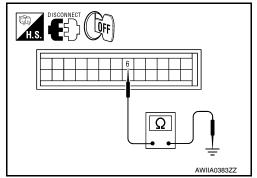
Check continuity between A/C auto amp. harness connector M49 terminal 6 and ground.

Connector	Terminal	_	Continuity
M49	6	Ground	No

#### Is the inspection result normal?

YES >> GO TO 6.

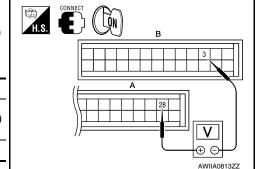
NO >> Repair or replace harness as necessary.



## 6.CHECK A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- 3. Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

Α		В		
Connector	Connector		Terminals	Voltage (Approx.)
Connector	(+)	Connector	(-)	voitage (Approx.)
M50	28	M49	3	5 Volts



 Check voltage between A/C auto amp. 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 A/C auto amp. Refer to <u>VTL-8, "Removal and</u> Installation".

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## 7.CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL

- Reconnect the air mix door motor (driver) harness connector M147
- 2. Check voltage between A/C auto amp. 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 A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

NO >> Replace air mix door motor (driver). Refer to <u>VTL-32</u>, "Removal and Installation".

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INFOID:0000000006145427

## Air Mix Door Motor (Passenger) Component Function Check

#### 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.

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

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

#### Is the inspection result normal?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to <u>HAC-35, "Air Mix Door Motor (Passenger) Diagnosis Procedure"</u>.

## Air Mix Door Motor (Passenger) Diagnosis Procedure

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Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

#### 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 <u>HAC-20.</u> "CONSULT-III Function (HVAC)".
- 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.

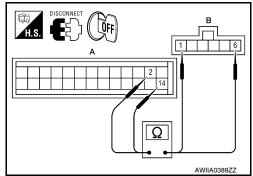
 Inspect air mix door (passenger) for mechanical failure and repair if necessary. If air mix door (passenger) is OK, refer to <u>HAC-107</u>, "<u>Component Function Check</u>" for insufficient cooling or <u>HAC-115</u>, "<u>Component Function Check</u>" for insufficient heating.

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 A/C auto amp. harness connector M49 (A) and the air mix door motor (passenger) harness connector M143 (B).
- 3. Check continuity between A/C auto amp. harness connector M49 (A) terminals 2, 14 and the air mix door motor (passenger) harness connector M143 (B) terminals 1, 6.

А		В		Continuity
Connector	Terminal	Connector Terminal		Continuity
M49	14	M143	Yes	
IVI <del>4</del> 3	2	IVITAS	6	163



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Revision: July 2010 HAC-35 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

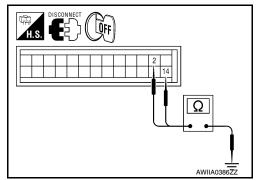
 Check continuity between A/C auto amp. harness connector M49 terminals 2, 14 and ground.

Connector	Terminal	_	Continuity	
M49	14	Ground	No	
	2	Ground	NO	

#### Is the inspection result normal?

YES >> GO TO 3.

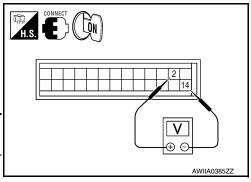
NO >> Repair or replace harness as necessary.



# $3. { m CHECK}$ A/C AUTO AMP. FOR AIR MIX DOOR MOTOR (PASSENGER) POWER AND GROUND

- 1. Reconnect A/C auto amp. harness connector.
- 2. Turn ignition switch ON.
- 3. Rotate temperature control dial (passenger) to 32°C (90°F).
- 4. Check voltage between A/C auto amp. 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).

	Tern	ninals			
Connector		Condition	Voltage (Approx.)		
	(+)	(-)			
M49	2   14   8		Rotate temperature control dial (passenger) to 18°C (60°F)	Battery voltage	
M49 14		2	Rotate temperature control dial (passenger) to 32°C (90°F)	Battery voltage	



#### Is the inspection result normal?

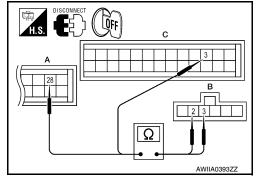
YES >> GO TO 4.

NO >> Replace A/C auto amp. 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.
- Disconnect the A/C auto amp. harness connectors M49 (C) and M50 (A).
- Check continuity between A/C auto amp. harness connector M49 (C) terminal 3 and M50 (A) terminal 28 and air mix door motor (passenger) harness connector M143 (B) terminal 2, 3.

Continuity	В		A and C	
Continuity	Terminal	Connector	Terminal	Connector
Yes	2	M143	3	M49 (C)
163	3	101143	28	M50 (A)



4. Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

Connector	Terminal	_	Continuity	
M49 (C)	3	Ground	No	
M50 (A)	28	Ground	110	

#### 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

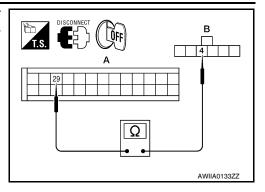
#### **AIR MIX DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

 Check continuity between A/C auto amp. harness connector M50 (A) terminal 29 and air mix door motor (passenger) harness connector M143 (B) terminal 4.

Α	А		В	
Connector	Terminal	Connector	Terminal	Continuity
M50	29	M143	4	Yes



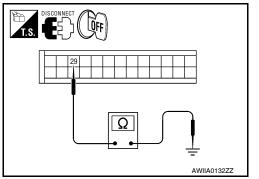
2. Check continuity between A/C auto amp. harness connector M50 terminal 29 and ground.

Connector	Terminal	_	Continuity
M50	29	Ground	No

#### Is the inspection result normal?

YES >> GO TO 6.

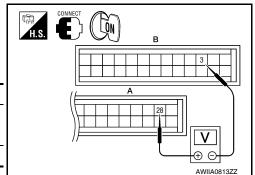
NO >> Repair or replace harness as necessary.



6.CHECK A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

Α		В		
Connector	Terminals	Connector	Terminals	Voltage (Approx.)
Connector	(+)	Connector	(-)	voltage (Approx.)
M50	28	M49	3	5 Volts



Check voltage between A/C auto amp. 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 A/C auto amp. Refer to <u>VTL-8, "Removal and</u> Installation".



7.CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL

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#### **AIR MIX DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

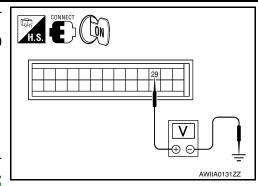
#### [AUTOMATIC AIR CONDITIONER]

- 1. Reconnect the air mix door motor (passenger) harness connector M143.
- 2. Check voltage between A/C auto amp. 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 A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".



NO >> Replace the air mix door motor (passenger). Refer to <u>VTL-32, "Removal and Installation"</u>.

#### **INTAKE DOOR MOTOR**

# System Description

#### INFOID:0000000006145429

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#### SYSTEM DESCRIPTION

#### SYMPTOM:

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

#### SYSTEM DESCRIPTION

#### Component Parts

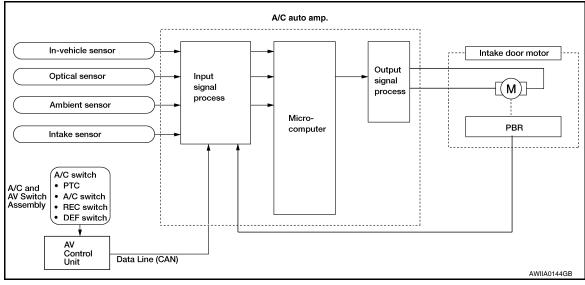
Intake door control system components are:

- A/C auto amp.
- A/C and AV switch assembly
- Intake door motor (PRB built into the intake door motor)
- In-vehicle sensor
- Ambient sensor
- · Optical sensor
- · Intake sensor

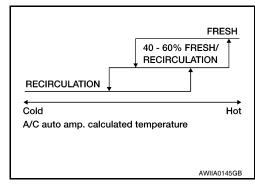
#### **System Operation**

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 A/C auto amp. 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 A/C auto amp. sets the intake door at the fresh position.



Intake Door Control Specification



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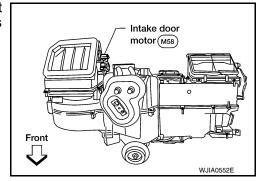
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#### COMPONENT DESCRIPTION

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 A/C auto amp. Motor rotation is conveyed to a lever which activates the intake door.



# Intake Door Motor Component Function Check

INFOID:0000000006145430

#### INSPECTION FLOW

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

- 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-40, "Intake Door Motor Diagnosis Procedure".

#### Intake Door Motor Diagnosis Procedure

INFOID:0000000006145431

Regarding Wiring Diagram information, refer to <u>HAC-90</u>, "Wiring Diagram".

#### SYMPTOM:

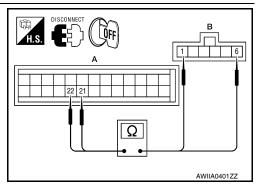
- · Intake door does not change.
- Intake door motor does not operate normally.

#### 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 A/C auto amp. harness connector M49 (A) and the intake door motor harness connector M58 (B).
- Check continuity between A/C auto amp. harness connector M49 (A) terminals 21, 22 and the intake door motor harness connector M58 (B) terminals 1, 6.

Α		В	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
M49	21	M58	6	Yes
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#### **INTAKE DOOR MOTOR**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

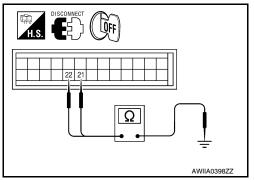
Check continuity between A/C auto amp. harness connector M49 terminals 21, 22 and ground.

Connector	Terminal	_	Continuity
M49	21	Ground	No
	22	Ground	110

#### Is the inspection result normal?

YES >> GO TO 3.

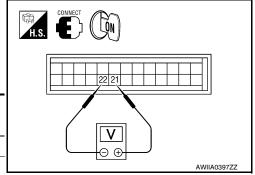
NO >> Repair or replace harness as necessary.



# 2.CHECK A/C AUTO AMP. FOR INTAKE AIR DOOR MOTOR POWER AND GROUND

- 1. Reconnect A/C auto amp. harness connector.
- Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49 terminal 21 and terminal 22 while placing the HVAC system into self-diagnostic mode.

Connector	Tern	ninals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	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-28, "Removal and Installation".

NO >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

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#### System Description

#### INFOID:0000000006145432

#### SYSTEM DESCRIPTION

#### Component Parts

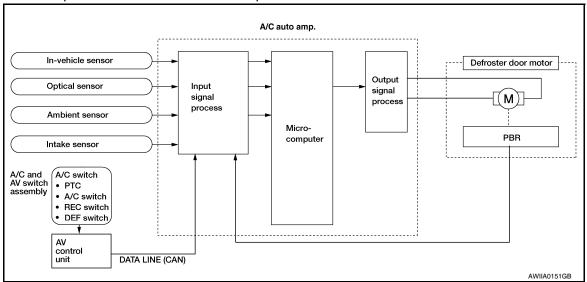
Defroster door control system components are:

- A/C auto amp.
- A/C and AV switch assembly
- Defroster door motor
- Position Balanced Resistor (PBR) (Built into defroster door motor)
- · In-vehicle sensor
- · Ambient sensor
- · Optical sensor
- · Intake sensor

#### **System Operation**

The A/C auto amp. 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. The A/C auto amp. monitors the defroster door position by measuring the voltage signal on the Position Balanced Resistor (PBR) circuits of the door.

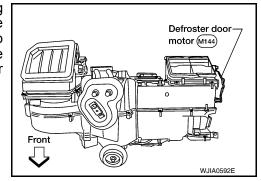
In the AUTO mode, the A/C auto amp. determines defroster door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature.



#### COMPONENT DESCRIPTION

#### Defroster door motor

The defroster door motor is attached to the front heater & cooling unit assembly. The A/C auto amp. 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.



#### < DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

#### Defroster Door Motor Component Function Check

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#### INSPECTION FLOW

# 1.confirm symptom by performing operational check - defroster door

- Press the mode switch and select vent (\*).
- Press the defrost switch ( ). Defroster indicator should illuminate (on display).
- Listen for defroster door position change (blower sound should change slightly).

#### Is the inspection result normal?

>> Inspection End. YES

>> Go to diagnosis procedure. Refer to <u>HAC-43, "Defroster Door Motor Diagnosis Procedure"</u>. NO

#### Defroster Door Motor Diagnosis Procedure

INFOID:0000000006145434

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

#### SYMPTOM:

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

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

- Turn ignition switch ON.
- Using CONSULT-III, check "DEF FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to HAC-20, "CONSULT-III Function (HVAC)".
- 3. Observe "DEF FDBCK" voltage while cycling A/C auto amp 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.

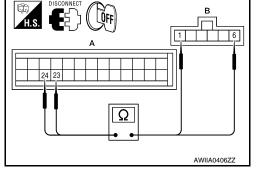
Inspect defroster door for mechanical failure. Refer to VTL-29, "Components".

NO >> GO TO 2.

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

- Turn ignition switch OFF.
- Disconnect the A/C auto amp. harness connector M49 (A) and the defroster door motor harness connector M144 (B).
- Check continuity between A/C auto amp. harness connector M49 (A) terminals 23, 24 and the defroster door motor harness connector M144 (B) terminals 1, 6.

А		В		Continuity
Connector	Terminal	Connector Termin		Continuity
M49	23	M144	1	Yes
10149	24	IVI 144	6	165



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#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

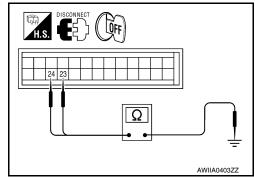
 Check continuity between A/C auto amp. harness connector M49 terminals 23, 24 and ground.

Connector	Terminal	_	Continuity
M49	23	Ground	No
	24	Giouna	110

#### Is the inspection result normal?

YES >> GO TO 3.

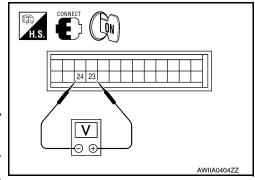
NO >> Repair or replace harness as necessary.



# $3.\mathsf{CHECK}$ A/C AUTO AMP. FOR DEFROSTER DOOR MOTOR POWER AND GROUND

- 1. Reconnect A/C auto amp. harness connector.
- 2. Turn ignition switch ON.
- 3. Press the mode switch to the VENT (\*) mode.
- 4. Check voltage between A/C auto amp. harness connector M49 terminal 23 and terminal 24 while pressing the defroster switch (₩).

Connector	Tern	ninals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition	voitage (Approx.)	
M49	23	24	Following defroster switch ( ) on	Battery voltage	
IVITO	24	23	Following defroster switch ( ) off	Battery voltage	



#### Is the inspection result normal?

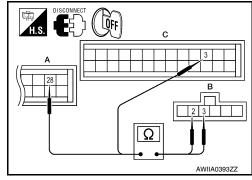
YES >> GO TO 4.

NO >> Replace A/C auto amp. 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 A/C auto amp. harness connectors M49 (C) and M50 (A).
- 3. Check continuity between A/C auto amp. 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	С	В	Continuity	
Connector	Terminal	Connector Terminal		Continuity
M49 (C)	3	M144	2	Yes
M50 (A)	28	101144	3	165



4. Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

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

#### 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

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

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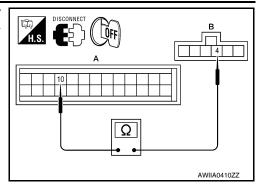
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 Check continuity between A/C auto amp. harness connector M49 (A) terminal 10 and defroster door motor harness connector M144 (B) terminal 4.

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



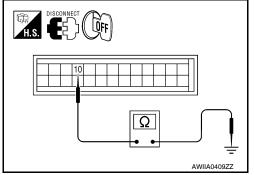
2. Check continuity between A/C auto amp. harness connector M49 terminal 10 and ground.

Connector	Terminal	_	Continuity
M49	10	Ground	No

#### Is the inspection result normal?

YES >> GO TO 6.

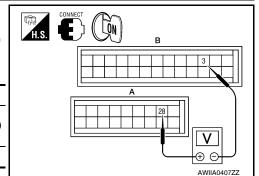
NO >> Repair or replace harness as necessary.



6.CHECK A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

Α		В			
Connector	Connector		Terminals	Voltage (Approx.)	
Connector	(+)	Connector	(-)	voltage (Approx.)	
M50	28	M49	3	5 Volts	



4. Check voltage between A/C auto amp. harness connector M49 terminal 10 and ground.

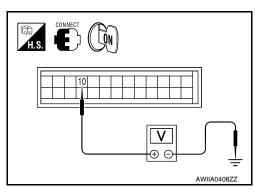
Connector	Terminal	_	Voltage (Approx.)
M49	10	Ground	0 Volts

#### Is the inspection result normal?

YES >> GO TO 7.

NO >> Replace A/C auto amp. Refer to <u>VTL-8, "Removal and</u> Installation".

7. CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL



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Revision: July 2010 HAC-45 2011 Armada

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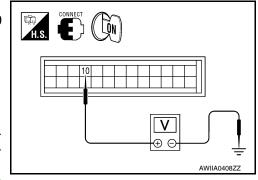
#### [AUTOMATIC AIR CONDITIONER]

- 1. Reconnect the defroster door motor harness connector M144.
- 2. Check voltage between A/C auto amp. 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 A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".
- NO >> Replace the defroster door motor. Refer to <u>VTL-30</u>, <u>"Removal and Installation"</u>.



< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

#### **BLOWER MOTOR CONTROL SYSTEM**

# System Description

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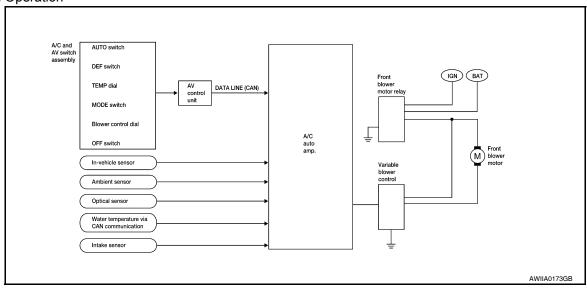
# SYSTEM DESCRIPTION

#### **Component Parts**

Blower speed control system components are:

- A/C auto amp.
- A/C and AV switch assembly
- 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 A/C auto amp. and variable blower control based on input from the in-vehicle sensor, optical sensor, intake sensor and ambient sensor, and potentio temperature control (PTC).

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

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

#### Starting Blower Speed Control

Start up from cold soak condition (Automatic mode).

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

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

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

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

Revision: July 2010 HAC-47 2011 Armada

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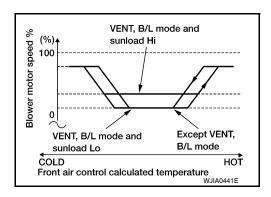
[AUTOMATIC AIR CONDITIONER]

#### < DTC/CIRCUIT DIAGNOSIS >

Blower Speed Compensation - Sunload

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

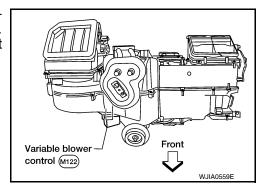
Blower Speed Control Specification



#### 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 A/C auto amp. to steplessly maintain the blower motor voltage in the 0 to 5 volt range (approx.).



# Front Blower Motor Component Function Check

INFOID:0000000006145436

#### INSPECTION FLOW

# 1.confirm symptom by performing operational check - front blower

- 1. Push blower motor (+) switch. Blower motor should operate.
- 2. Push blower motor (+) switch and continue checking blower speed and fan symbol until all speeds are checked.

#### Is the inspection result normal?

YES >> Inspection End.

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

## Front Blower Motor Diagnosis Procedure

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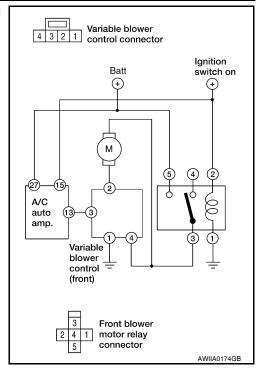
Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

#### DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

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



# 1. CHECK FUSES

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

#### 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.
- Press the A/C switch.
- 5. Press the front blower control "+" switch to maximum speed.
- Check voltage between front blower motor harness connector M62 terminal 2 and ground.

#### 2 - Ground : Battery voltage

#### Is the inspection result normal?

YES >> GO TO 11.

NO >> GO TO 3.

# ${f 3.}$ CHECK FRONT BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

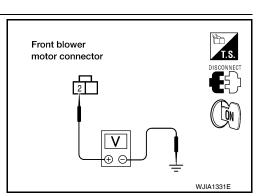
- 1. Turn ignition switch OFF.
- 2. Disconnect front blower motor relay.
- 3. Turn ignition switch ON.
- 4. Check voltage between front blower motor relay harness connector M107 terminal 5 and ground.

#### 5 - Ground : Battery voltage

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



Front blower motor relay connector

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#### < DTC/CIRCUIT DIAGNOSIS >

## 4. CHECK FRONT BLOWER MOTOR RELAY

Turn ignition switch OFF.

Check front blower motor relay. Refer to HAC-52, "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

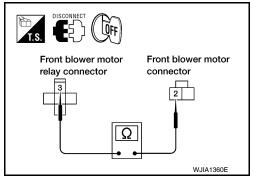
Check continuity between front blower motor relay harness connector M107 terminal 3 and front blower motor harness connector M62 terminal 2.

#### 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.
- 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.

# DISCONNECT OFF

# 7.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

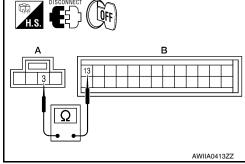
- 1. Disconnect A/C auto amp. connector.
- Check continuity between A/C auto amp. harness connector M49 (B) terminal 13 and variable blower control harness connector M122 (A) terminal 3.

# 13 - 3 : Continuity should exist.

#### Is the inspection result normal?

YES >> GO TO 8.

NO >> Repair harness or connector.



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

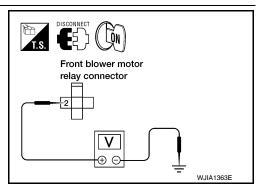
- Turn ignition switch ON.
- 2. Check voltage between front blower motor relay harness connector M107 terminal 2 and ground.

#### 2 - Ground : Battery voltage

#### Is the inspection result normal?

YES >> GO TO 9.

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



#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

# 9.REPLACE FUSES

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

#### Does the fuse blow?

YES >> GO TO 10.

NO >> Inspection End.

# 10.CHECK FRONT BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

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

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

#### Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

# 11. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

- 1. Disconnect A/C auto amp. connector.
- Check continuity between A/C auto amp. 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 <u>HAC-52</u>, "Front Blower Motor Component Inspection".

#### Is the inspection result normal?

YES >> GO TO 13.

NO >> Replace front blower motor. Refer to <a href="VTL-13">VTL-13</a>, "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.

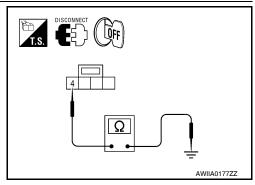
#### 1 - 2 : Continuity should exist.

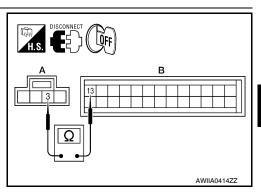
#### Is the inspection result normal?

YES >> GO TO 14.

NO >> Repair harness or connector.

# 14. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT





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Revision: July 2010 HAC-51 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

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

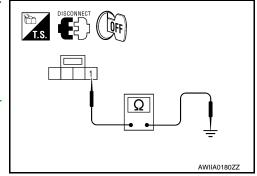
#### 1 - Ground

#### : Continuity should exist.

#### Is the inspection result normal?

YES >> Replace variable blower control. Refer to <u>VTL-16</u>. "Removal and Installation".

NO >> Repair harness or connector.

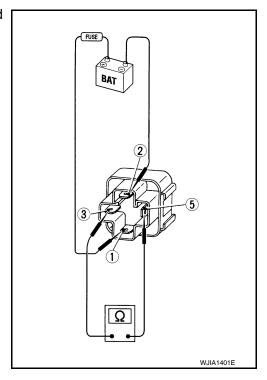


INFOID:0000000006145438

# Front Blower Motor Component Inspection

#### COMPONENT INSPECTION

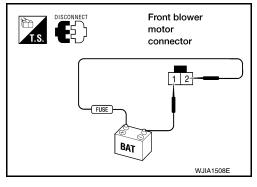
Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



#### Front Blower Motor

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.



# Rear Blower Motor Description

#### INFOID:0000000006145439

#### SYSTEM DESCRIPTION

#### **Component Parts**

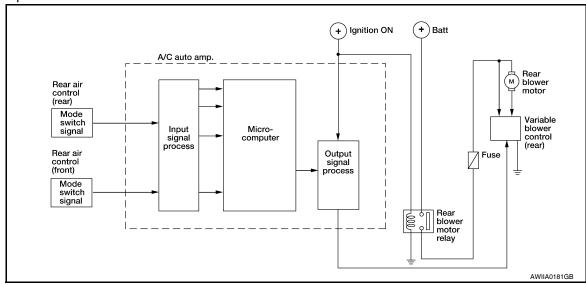
Rear blower speed control system components are:

· A/C auto amp.

#### < DTC/CIRCUIT DIAGNOSIS >

- A/C and AV switch assembly
- Rear air control (front)
- Rear air control (rear)
- Variable blower control (rear)
- · Rear blower motor
- Rear blower motor relay

#### System Operation



#### Rear Blower Control

When the rear blower control dial (front) REAR CTRL switch is pressed (indicator on), it allows the rear air control (rear) to control the rear blower motor speed. If the REAR CTRL switch is off (indicator off), the rear air control (front) controls the rear blower motor speed regardless of the rear air control (rear) position.

# Rear Blower Motor Component Function Check

INFOID:0000000006145440

[AUTOMATIC AIR CONDITIONER]

#### INSPECTION FLOW

#### SYMPTOM:

- Rear blower motor does not operate from the rear air control (front) and the rear air control (rear).
- Rear blower motor operates from rear air control (front) only.
- Rear blower motor operates in high at all times.

#### INSPECTION FLOW

# 1. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

#### >> GO TO 2.

# 2.CONFIRM SYMPTOM BY PERFORMING REAR BLOWER MOTOR OPERATIONAL CHECK FROM REAR AIR CONTROL (FRONT)

- Turn ignition switch ON.
- Turn the rear air control (front) blower control dial to the lowest speed and check for rear blower operation (REAR CTRL indicator off).
- Continue checking that rear blower speed increases as the rear blower control dial is rotated clockwise.

#### Does the rear blower motor operate correctly?

YES >> GO TO 3.

NO >> Check the rear blower motor operation. Refer to HAC-53, "Rear Blower Motor Component Function Check".

# 3.CONFIRM SYMPTOM BY PERFORMING REAR BLOWER MOTOR OPERATIONAL CHECK FROM REAR AIR CONTROL (REAR)

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**HAC-53** Revision: July 2010 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

- 1. Press the REAR CTRL switch (indicator on) on the rear air control (front) to send control of the rear blower motor back the rear air control (rear).
- 2. Turn the rear air control (rear) blower control dial to the lowest speed and check for rear blower operation.
- 3. Continue checking that rear blower speed increases as the rear blower control dial is rotated clockwise.

#### Does the rear blower motor operate correctly?

YES >> GO TO 4.

NO >> • Check the rear air control (rear). Refer to <u>HAC-55, "Rear Air Control (Rear) Diagnosis Procedure #2".</u>

#### 4. RECHECK FOR ANY SYMPTOMS

Perform a complete operational check for any symptoms. Refer to <u>HAC-5</u>, "Operational Check (Rear)". <u>Does another symptom exist?</u>

YES >> Refer to HAC-3, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> Inspection End.

#### Rear Air Control (Front) Diagnosis Procedure #1

INFOID:0000000006145441

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

REAR BLOWER MOTOR INOPERATIVE/ON AT ALL TIMES.

#### 1. CHECK FUSES

Check 10A fuse [No. 19 (Located in the fuse block J/B)].

#### Fuse is good.

#### Is the inspection result normal?

YES >> GO TO 2. NO >> GO TO 6.

# 2.CHECK REAR AIR CONTROL (FRONT) POWER SUPPLY

- 1. Disconnect rear air control (front) harness connector.
- 2. Turn ignition switch ON.
- 3. Check voltage between rear air control (front) harness connector R108 terminal 1 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

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# $3. \mathsf{CHECK}$ REAR AIR CONTROL (FRONT) LIN BUS VOLTAGE

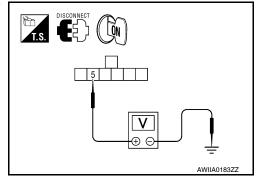
Check voltage between rear air control (front) harness connector R108 terminal 5 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



# 4. CHECK REAR AIR CONTROL (FRONT) GROUND CIRCUIT

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

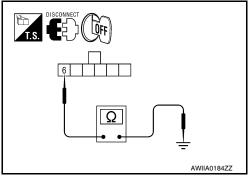
- Turn ignition switch OFF.
- Check continuity between rear air control (front) harness connector R108 terminal 6 and ground.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.



# ${f 5.}$ CHECK REAR AIR CONTROL (FRONT) LIN BUS CIRCUIT FOR OPEN

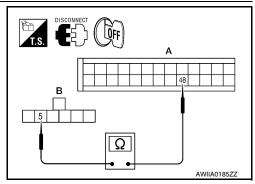
- 1. Disconnect A/C auto amp. connector.
- 2. Check continuity between A/C auto amp. harness connector M50 (A) terminal 48 and rear air control (front) harness connector R108 (B) terminal 5.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

NO >> Repair harness or connector.



# **6.**REPLACE FUSE

- Replace fuse.
- Activate the rear blower motor.

#### Does the fuse blow?

>> GO TO 7. YES

NO >> Inspection End.

# .CHECK REAR AIR CONTROL (FRONT) POWER SUPPLY CIRCUIT FOR SHORT

- Turn ignition switch OFF.
- Disconnect rear air control (front), (rear), and A/C auto amp. 2.
- 3. Check continuity between rear air control (front) harness connector R108 terminal 1 and ground.

#### 1 - Ground

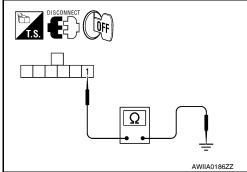
#### : Continuity should not exist.

#### Is the inspection result normal?

YES >> Repair harness or connector for a short.

NO >> System OK.

# Rear Air Control (Rear) Diagnosis Procedure #2



INFOID:0000000006145442

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

#### REAR AIR CONTROL (REAR) INOPERATIVE

1. CHECK REAR AIR CONTROL (REAR) POWER SUPPLY

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**HAC-55** Revision: July 2010 2011 Armada В

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#### [AUTOMATIC AIR CONDITIONER]

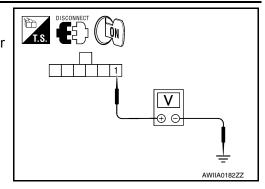
- 1. Disconnect rear air control (rear) harness connector.
- Turn ignition switch ON.
- 3. Check voltage between rear air control (rear) harness connector R209 terminal 1 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.



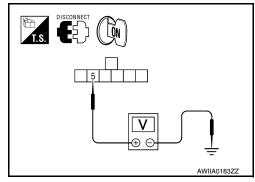
# 2. CHECK REAR AIR CONTROL (REAR) LIN BUS CIRCUIT

Check voltage between rear air control (rear) harness connector R209 terminal 5 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

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



# 3.check rear air control (rear) ground circuit

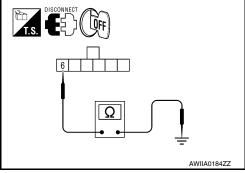
- 1. Turn ignition switch OFF.
- Check continuity between rear air control (rear) harness connector R209 terminal 6 and ground.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.



# 4. CHECK REAR AIR CONTROL (REAR) LIN BUS CIRCUIT FOR OPEN

- 1. Disconnect A/C auto amp. connector.
- 2. Check continuity between A/C auto amp. harness connector M50 (A) terminal 47 and rear air control (rear) harness connector R209 (B) terminal 5.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>VTL-8, "Removal and</u> Installation".

NO >> Repair harness or connector.

# DISCONNECT OFF

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# Rear Blower Motor Component Inspection

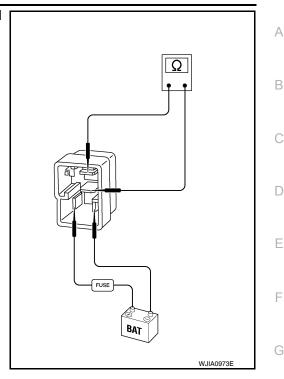
#### COMPONENT INSPECTION

Rear Blower Motor Relay

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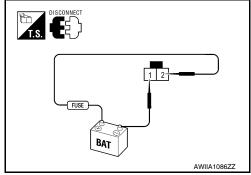
#### [AUTOMATIC AIR CONDITIONER]

Check circuit continuity between terminals by supplying 12 volts and ground to coil side terminals of relays.



#### Rear Blower Motor

Check that there are no foreign particles inside the intake unit. Apply 12 volts to terminal 2 and ground to terminal 1 and ensure that the blower motor rotates freely and quietly.



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#### Rear Air Control System Description

#### INFOID:0000000006145444

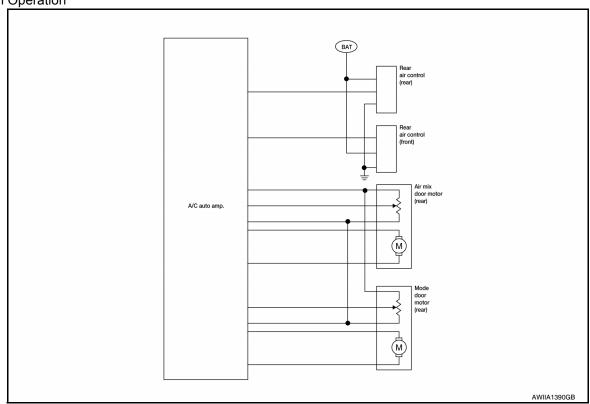
#### SYSTEM DESCRIPTION

#### Component Parts

Rear air control system components are:

- · A/C auto amp.
- Rear air control (front)
- Rear air control (rear)
- · Air mix door motor (rear)
- · Mode door motor (rear)

#### System Operation



#### Rear Air Control

When the REAR CTRL indicator is off the rear air control (front) will control all rear blower motor speeds and the rear temperature and mode operations. When the REAR CTRL switch is pressed (indicator on), the rear air control (rear) will control all the rear blower motor speeds and the rear temperature and mode operations.

# Rear Air Control Component Function Check

INFOID:0000000006145445

#### SYMPTOM:

- Temperature cannot be adjusted from the rear air controls.
- · Mode cannot be adjusted from the rear air controls.

#### INSPECTION FLOW

# 1. CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 2.

2.CONFIRM SYMPTOM BY PERFORMING REAR AIR CONTROL (FRONT) AIR MIX DOOR MOTOR OPERATIONAL CHECK

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

- 1. Start and run engine to operating temperature.
- 2. Turn the rear blower motor to maximum speed from the rear air control (front).
- Turn rear air control (front) temperature control dial clockwise and then counterclockwise (REAR CTRL indicator off).
- 4. Check for hot air at rear discharge air outlets in the maximum heat position and cold air at discharge air outlets in the maximum cold position.

#### Does the rear air control (front) operate properly?

YES >> GO TO 3.

NO >> Check rear air control (front). Refer to <a href="HAC-59">HAC-59</a>, "Air Mix Door Motor (Rear) Diagnosis Procedure".

 $\bf 3.$  CONFIRM SYMPTOM BY PERFORMING REAR AIR CONTROL (REAR) AIR MIX DOOR MOTOR OPERATIONAL CHECK

- 1. Press the REAR CTRL switch on rear air control (front) to send control to the rear air control (rear).
- 2. Turn rear air control (rear) temperature control dial slowly clockwise and then counterclockwise (REAR CTRL indicator on).
- 3. Check for hot air at rear discharge air outlets in the maximum heat position and cold air at rear discharge air outlets in the maximum cold position.

#### Does the rear air control (rear) operate properly?

YES >> GO TO 4.

NO >> Check rear air control (rear). Refer to <u>HAC-55</u>, "Rear Air Control (Rear) <u>Diagnosis Procedure #2</u>".

# 4.CONFIRM SYMPTOM BY PERFORMING REAR AIR CONTROL (FRONT) MODE OPERATIONAL CHECK

- 1. Press the REAR CTRL switch on rear air control (front) (REAR CTRL indicator off).
- 2. Press each mode switch and check for proper air discharge at the appropriate locations.

#### Does the rear air control (front) operate properly?

YES >> GO TO 5.

NO >> Check mode door motor (rear). Refer to <a href="HAC-63">HAC-63</a>, "Mode Door Motor (Rear) Diagnosis Procedure".

# ${f 5.}$ CONFIRM SYMPTOM BY PERFORMING REAR AIR CONTROL (REAR) MODE OPERATIONAL CHECK

- 1. Press the REAR CTRL switch on rear air control (front) to send control to the rear air control (rear).
- Press each mode switch and check for proper air discharge at the appropriate locations.

#### Does the rear air control (rear) operate properly?

YES >> System OK.

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

## Air Mix Door Motor (Rear) Diagnosis Procedure

INFOID:0000000006145446

Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

#### DIAGNOSTIC PROCEDURE FOR INOPERATIVE AIR MIX DOOR MOTOR (REAR)

#### SYMPTOM:

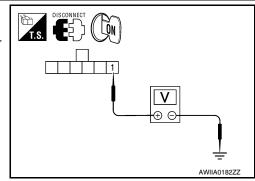
- Temperature control (rear) operation is malfunctioning.
- 1.CHECK REAR AIR CONTROL (FRONT) POWER SUPPLY
- 1. Disconnect rear air control (front) harness connector.
- 2. Turn ignition switch ON.
- Check voltage between rear air control (front) harness connector R108 terminal 1 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.



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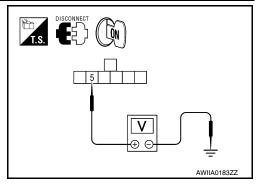
# $2.\mathsf{CHECK}$ REAR AIR CONTROL (FRONT) LIN BUS VOLTAGE

Check voltage between rear air control (front) harness connector R108 terminal 5 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

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



# $3.\mathsf{CHECK}$ REAR AIR CONTROL (FRONT) GROUND CIRCUIT

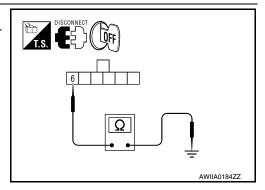
- 1. Turn ignition switch OFF.
- Check continuity between rear air control (front) harness connector R108 terminal 6 and ground.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.



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# 4. CHECK LIN BUS VOLTAGE CIRCUIT FOR OPEN

- Turn ignition switch OFF.
- 2. Disconnect the mode door motor (rear) harness connector.
- Check continuity between rear air control (front) harness connector R108 (B) terminal 5 and A/C auto amp. harness connector M50 (A) terminal 48.

#### 48 - 5 : Continuity should exist.

Check continuity between rear air control (front) harness connector R108 (B) terminal 5 and ground.

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#### 48 - ground : Continuity should not exist.

#### Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

NO >> Repair or replace harness as necessary.

# **5.**CHECK AIR MIX DOOR MOTOR (REAR) POSITION BALANCED RESISTOR (PBR) FEEDBACK VOLTAGE

- 1. Turn ignition switch ON.
- Using CONSULT-III, check "RR FDBCK" in "DATA MONITOR" mode in "HVAC". Refer to <u>HAC-20, "CON-SULT-III</u> Function (HVAC)".
- Observe "RR FDBCK" voltage while rotating temperature control dial (driver) between 32°C (90°F) and 18°C (60°F).

Monitor Item	Condition	Results
RR FDBCK	Rotate temperature control dial (rear) between maximum cold and maximum hot	Voltage varies between 0.2 and 4.8 volts.

#### Is the inspection result normal?

- YES >> Air mix door motor (rear) is OK.
  - Inspect air mix door (rear) for mechanical failure and repair if necessary.

NO >> GO TO 6.

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

# $6. \mathsf{CHECK}$ AIR MIX DOOR MOTOR (REAR) CIRCUITS FOR OPEN AND SHORT TO GROUND

- 1. Turn ignition switch OFF.
- 2. Disconnect the A/C auto amp. harness connector M50 (A) and the air mix door motor (rear) harness connector B155 (B).
- 3. Check continuity between A/C auto amp. harness connector M50 (A) terminals 49, 50 and the air mix door motor (rear) harness connector B155 (B) terminal 1, 6.

А		В		
Connector	Terminal	Connector Terminal		Continuity
M50	49	B155	1	Yes
UCIVI	50	D 100	6	168

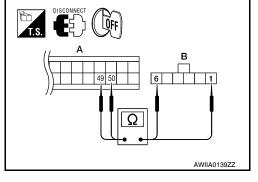
4. Check continuity between A/C auto amp. harness connector M50 terminals 49, 50 and ground.

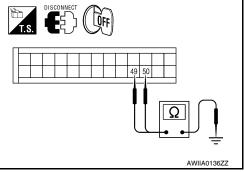
Connector	Terminal	— Continuity	
M50	49	Ground	No
WOO	50	Ground	140

#### Is the inspection result normal?

YES >> GO TO 7.

NO >> Repair or replace harness as necessary.

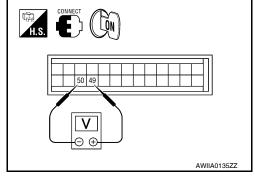




# 7.CHECK A/C AUTO AMP. FOR AIR MIX DOOR MOTOR (REAR) POWER AND GROUND

- 1. Reconnect A/C auto amp. harness connector.
- Turn ignition switch ON.
- 3. Rotate temperature control dial (rear) to maximum hot.
- 4. Check voltage between A/C auto amp. harness connector M50 terminal 49 and terminal 50 while rotating temperature control dial (rear) to maximum cold and back to maximum heat.

Connector	Tern	ninals	Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition	voilage (Approx.)	
M50	49	50	Rotate temperature control dial (rear) to maximum cold	Battery voltage	
WISO	50	49	Rotate temperature control dial (rear) to maximum heat	Battery voltage	



#### Is the inspection result normal?

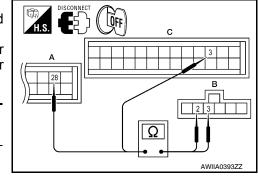
YES >> GO TO 8.

NO >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

# 8.CHECK AIR MIX DOOR MOTOR (REAR) PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

- Turn ignition switch OFF.
- 2. Disconnect the A/C auto amp. harness connectors M49 (C) and M50 (A).
- Check continuity between A/C auto amp. harness connector M49 (C) terminal 3 and M50 (A) terminal 28 and air mix door motor (rear) harness connector B155 (B) terminal 3, 2.

A and	A and C B		Continuity	
Connector	Terminal	Connector Terminal		Continuity
M49 (C)	3	B155	2	Yes
M50 (A)	28	Б133	3	165



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Revision: July 2010 HAC-61 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

4. Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

Connector	Terminal	_	Continuity
M49 (C)	3	Ground	No
M50 (A)	28	Ground	140

#### Is the inspection result normal?

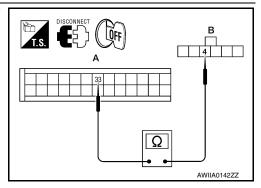
YES >> GO TO 9.

NO >> Repair or replace harness as necessary.

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

 Check continuity between A/C auto amp. harness connector M50 (A) terminal 33 and air mix door motor (rear) harness connector B155 (B) terminal 4.

А	А		В	
Connector	Terminal	Connector	Terminal	Continuity
M50	33	B155	4	Yes



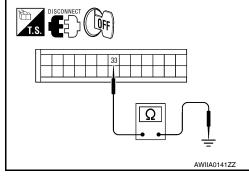
2. Check continuity between A/C auto amp. harness connector M50 terminal 33 and ground.

Connector	Terminal	_	Continuity
M50	33	Ground	No

#### Is the inspection result normal?

YES >> GO TO 10.

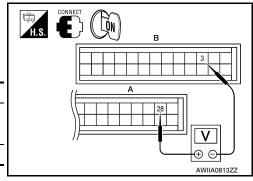
NO >> Repair or replace harness as necessary.



# 10. CHECK A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- 3. Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

Α		В		
Connector	Terminals	Connector	Terminals	Voltage (Approx.)
Connector	(+)	Connector	(-)	voltage (Approx.)
M50	28	M49	3	5 Volts



#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

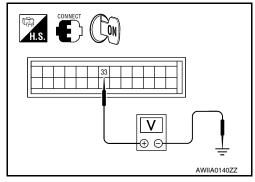
Check voltage between A/C auto amp. harness connector M50 terminal 33 and ground.

Connector	Terminal	_	Voltage (Approx.)
M50	33	Ground	0 Volts

#### Is the inspection result normal?

YES >> GO TO 11.

NO >> Replace A/C auto amp. Refer to <u>VTL-8</u>, "Removal and Installation".



# 11. CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL

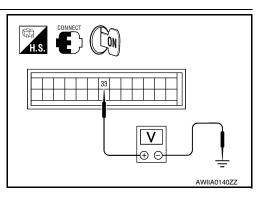
- 1. Reconnect the air mix door motor (rear) harness connector B155.
- 2. Check voltage between A/C auto amp. harness connector M50 terminal 33 and ground.

Connector	Terminal	_	Voltage (Approx.)
M50	33	Ground	0.2 to 4.8 Volts

#### Is the inspection result normal?

YES >> Inspect air mix door (rear) for binding or mechanical failure. If air mix door (rear) moves freely, replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

NO >> Replace the air mix door motor (rear). Refer to <u>VTL-32</u>, "Removal and Installation".



# Mode Door Motor (Rear) Diagnosis Procedure

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

## DIAGNOSTIC PROCEDURE INOPERATIVE MODE DOOR MOTOR (REAR)

# 1. CHECK REAR AIR CONTROL (FRONT) POWER SUPPLY

- Disconnect rear air control (front) harness connector.
- 2. Turn ignition switch ON.
- Check voltage between rear air control (front) harness connector R108 terminal 1 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

# DISCONNECT CON AWIJA0182ZZ

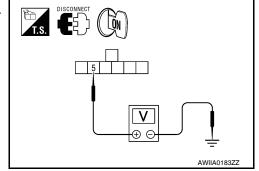
# 2.CHECK REAR AIR CONTROL (FRONT) LIN BUS VOLTAGE

Check voltage between rear air control (front) harness connector R108 terminal 5 and ground.

#### Battery voltage should exist.

#### Is the inspection result normal?

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



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Revision: July 2010 HAC-63 2011 Armada

#### < DTC/CIRCUIT DIAGNOSIS >

# $\overline{3}$ .check rear air control (front) ground circuits

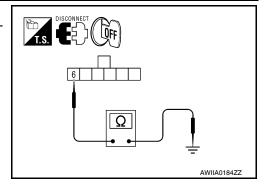
- 1. Turn ignition switch OFF.
- 2. Check continuity between rear air control (front) harness connector R108 terminal 6 and ground.

#### Continuity should exist.

#### Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.



# 4. CHECK LIN BUS VOLTAGE CIRCUIT FOR OPEN

- 1. Turn ignition switch OFF.
- 2. Disconnect the mode door motor (rear) harness connector.
- Check continuity between rear air control (front) harness connector R108 (B) terminal 5 and A/C auto amp. harness connector M50 (A) terminal 48.

#### 48 - 5 : Continuity should exist.

Check continuity between rear air control (front) harness connector R108 (B) terminal 5 and ground.

#### 48 - ground : Continuity should not exist.

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#### Is the inspection result normal?

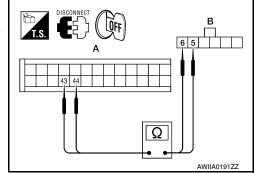
YES >> Replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

NO >> Repair or replace harness as necessary.

# ${f 5.}$ CHECK MODE DOOR MOTOR (REAR) CIRCUITS FOR OPEN AND SHORT TO GROUND

- 1. Disconnect the A/C auto amp. harness connector M50 (A) and the mode door motor (rear) harness connector B156 (B).
- Check continuity between A/C auto amp. harness connector M50 (A) terminals 43, 44 and the mode door motor (rear) harness connector B156 (B) terminal 5, 6.

A		В		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M50	43	B156	5	Yes
IVIOU	44	D 130	6	163



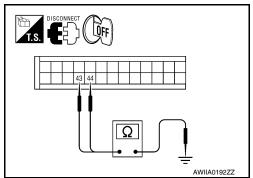
Check continuity between A/C auto amp. harness connector M50 terminals 43, 44 and ground.

Connector	Terminal	_	Continuity
M50	43	Ground	No
	44	Ground	140

#### Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair or replace harness as necessary.



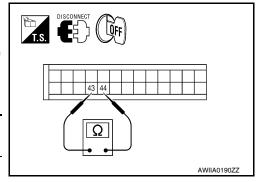
# 6. CHECK A/C AUTO AMP. FOR MODE DOOR MOTOR (REAR) POWER AND GROUND

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

- 1. Reconnect A/C auto amp. harness connector.
- 2. Turn ignition switch ON.
- 3. Press the mode switch (rear) to the FOOT ( ) mode.
- 4. Check voltage between A/C auto amp. harness connector M50 terminal 43 and terminal 44 while pressing the mode switch (rear) to the VENT (\*\*) mode and back to the FOOT (\*\*) mode.

Connector	Terminals		Condition	Voltage (Approx.)	
Connector	(+)	(-)	Condition	voltage (Approx.)	
M50	43	44	Press mode switch (rear) to the VENT (*) mode	Battery voltage	
44 43		43	Press mode switch (rear) to the FOOT ( 🕩 ) mode	Battery voltage	



#### Is the inspection result normal?

YES >> GO TO 7.

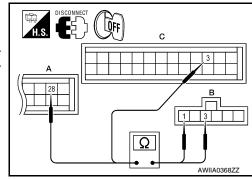
NO >> Replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

# 7.CHECK MODE DOOR MOTOR (REAR) PBR CIRCUITS FOR OPEN AND SHORT TO GROUND

1. Turn ignition switch OFF.

- 2. Disconnect the A/C auto amp. harness connectors M49 (C) and M50 (A).
- Check continuity between A/C auto amp. harness connector M49 (C) terminal 3 and M50 (A) terminal 28 and mode door motor (rear) harness connector B156 (B) terminal 1, 3.

A and	A and C B		Continuity	
Connector	Terminal	Connector	Terminal	Continuity
M49 (C)	3	D156	3	Yes
M50 (A)	28	B156	1	165



 Check continuity between A/C auto amp. harness connector M49 (C) terminal 3, M50 (A) terminal 28 and ground.

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

#### Is the inspection result normal?

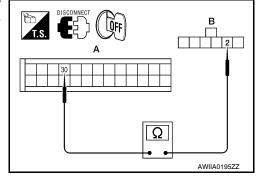
YES >> GO TO 8.

NO >> Repair or replace harness as necessary.

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

 Check continuity between A/C auto amp. harness connector M50 (A) terminal 30 and mode door motor (rear) harness connector B156 (B) terminal 2.

А		В		Continuity	
Connector	Terminal	Connector Terminal		Continuity	
M50	30	B156	2	Yes	



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#### [AUTOMATIC AIR CONDITIONER]

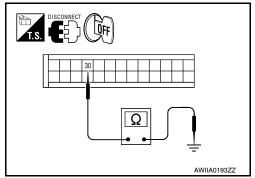
Check continuity between A/C auto amp. harness connector M50 terminal 30 and ground.

Connector	Terminal	_	Continuity
M50	30	Ground	No

#### Is the inspection result normal?

YES >> GO TO 9.

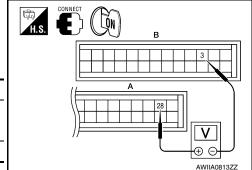
NO >> Repair or replace harness as necessary.



# $9.\mathsf{CHECK}$ A/C AUTO AMP. FOR 5 VOLT REFERENCE (VREF), VREF RETURN, AND FEEDBACK SIGNAL

- 1. Reconnect A/C auto amp. harness connectors.
- 2. Turn ignition switch ON.
- 3. Check voltage between A/C auto amp. harness connector M49 (B) terminal 3, and M50 (A) terminal 28.

Α		В		
Connector	Terminals	- Connector -	Terminals	Voltage (Approx.)
Connector	(+)		(-)	voitage (Approx.)
M50	28	M49	3	5 Volts



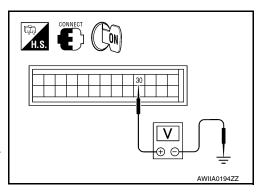
4. Check voltage between A/C auto amp. harness connector M50 terminal 30 and ground.

Connector	Terminal	_	Voltage (Approx.)
M50	30	Ground	0 Volts

#### Is the inspection result normal?

YES >> GO TO 10.

NO >> Replace A/C auto amp. Refer to <u>VTL-8, "Removal and</u> Installation".



# 10. CHECK A/C AUTO AMP. FOR FEEDBACK SIGNAL

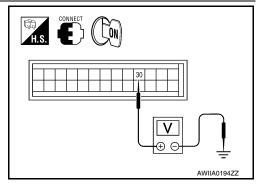
- 1. Reconnect the mode door motor (rear) harness connector B156.
- 2. Check voltage between A/C auto amp. harness connector M50 terminal 30 and ground.

Connector	Terminal	_	Voltage (Approx.)
M50	30	Ground	0.2 to 4.8 Volts

#### Is the inspection result normal?

YES >> Inspect mode door (rear) for binding or mechanical failure. If mode door (rear) moves freely, replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

NO >> Replace the mode door motor (rear). Refer to <u>VTL-32</u>. "Removal and Installation".



#### [AUTOMATIC AIR CONDITIONER]

#### MAGNET CLUTCH

# System Description

#### INFOID:0000000006145448

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#### SYSTEM DESCRIPTION

The A/C auto amp. controls compressor operation based on ambient and intake temperature and a signal from ECM.

#### Low Temperature Protection Control

The A/C auto amp, 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

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#### INSPECTION FLOW

# 1.confirm symptom by performing operational check - magnet clutch

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

#### Does the magnet clutch operate?

YES >> Inspection End.

NO >> Go to diagnosis procedure. Refer to HAC-67, "Magnet Clutch Diagnosis Procedure".

# Magnet Clutch Diagnosis Procedure

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Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

#### DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

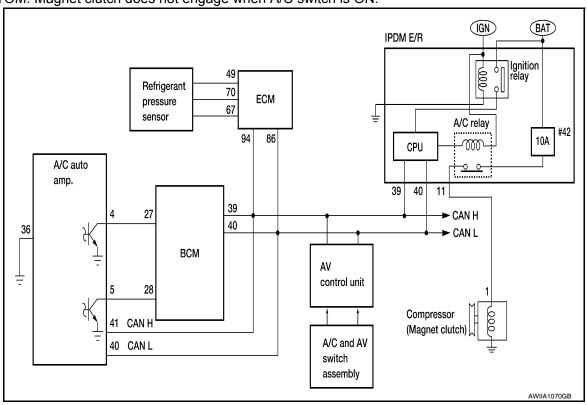
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**HAC-67** Revision: July 2010 2011 Armada HAC

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



# 1. CHECK INTAKE AND AMBIENT SENSOR CIRCUITS

Check intake and ambient sensors. Refer to <u>HAC-23</u>, "A/C and AV Switch Assembly Self-Diagnosis". <u>Is the inspection result normal?</u>

YES >> GO TO 2.

NO >> • Malfunctioning intake sensor. Refer to <a href="HAC-82">HAC-82</a>, "Intake Sensor Diagnosis Procedure".

• Malfunctioning ambient sensor. Refer to HAC-74, "Ambient Sensor Diagnosis Procedure".

#### PERFORM AUTO ACTIVE TEST

Refer to PCS-12, "Diagnosis Description".

#### Does magnet clutch operate?

YES >> • (P)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.
- 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.

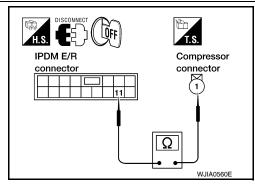
4. Check continuity between IPDM E/R harness connector E119 terminal 11 and ground.

#### 11 – ground : Continuity should not exist.

#### Is the inspection result normal?

YES >> GO TO 4.

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#### < DTC/CIRCUIT DIAGNOSIS >

NO >> Repair harness or connector.

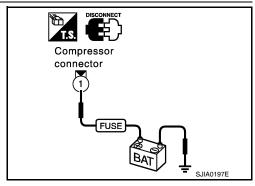
# 4. CHECK MAGNET CLUTCH CIRCUIT

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

#### Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to <u>PCS-31, "Removal and Installation of IPDM E/R"</u>.

NO >> Replace magnet clutch. Refer to <u>HA-32</u>. "Removal and <u>Installation for Compressor Clutch"</u>.



H.S. CONNECT OFF

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# 5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to HAC-20, "CONSULT-III Function (HVAC)".

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

#### Is the inspection result normal?

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

6.CHECK CIRCUIT CONTINUITY BETWEEN BCM AND A/C AUTO AMP.

- Turn ignition switch OFF.
- Disconnect BCM connector and A/C auto amp. connector.
- Check continuity between BCM harness connector M18 (A) terminal 27 and A/C auto amp. harness connector M49 (B) terminal

#### 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?

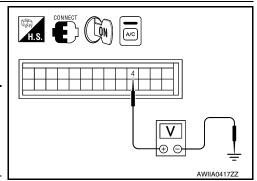
YES >> GO TO 7.

NO >> Repair harness or connector.

# .CHECK VOLTAGE FOR A/C AUTO AMP. (A/C COMPRESSOR ON SIGNAL)

- 1. Reconnect BCM connector and A/C auto amp. connector.
- 2. Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49 terminal 4 and ground.

Terminals				
(	(+)			
A/C auto amp. con- nector	Terminal No.	(-)	Condition	Voltage
M49	4	Ground	A/C switch: ON	Approx. 0V
	7	Orodria	A/C switch: OFF	Approx. 5V



Is the inspection result normal?

YES >> GO TO 8.

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#### **MAGNET CLUTCH**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

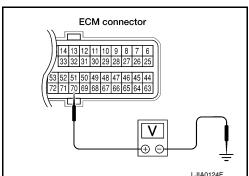
NO-1 >> If the voltage is approx. 5V when A/C switch is ON, replace A/C auto amp. Refer to <u>VTL-8</u>. "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to BCS-56, "Removal and Installation".

# 8.CHECK REFRIGERANT PRESSURE SENSOR

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

Terminals					
(+)			Condition	Voltage	
ECM con- nector	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-471, "Diagnosis Procedure".

9. CHECK BCM INPUT (FAN ON) SIGNAL

Check FAN ON/OFF signal. Refer to HAC-20, "CONSULT-III Function (HVAC)".

FRONT BLOWER CONTROL : FAN ON SIG ON

**DIAL ON** 

FRONT BLOWER CONTROL : FAN ON SIG OFF

**DIAL OFF** 

#### Is the inspection result normal?

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

10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND A/C AUTO AMP.

- 1. Turn ignition switch OFF.
- 2. Disconnect BCM connector and A/C auto amp. connector.
- Check continuity between BCM harness connector M18 (A) terminal 28 and A/C auto amp. harness connector M49 (B) terminal 5.

#### 28 - 5 Continuity should exist.

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

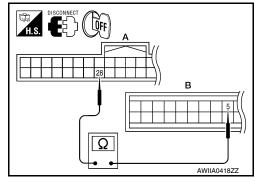
#### 28 - ground Continuity should not exist.

#### Is the inspection result normal?

YES >> GO TO 11.

NO >> Repair harness or connector.

11. CHECK VOLTAGE FOR A/C AUTO AMP. (FAN ON SIGNAL)



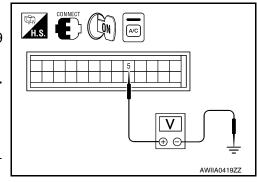
#### **MAGNET CLUTCH**

#### < DTC/CIRCUIT DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

- 1. Reconnect BCM connector and A/C auto amp. connector.
- 2. Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49 terminal 5 and ground.

	Terminals			
(+)			Condition	Voltage
A/C auto amp. connector	Terminal No.	(-)	00.14.14.01.1	
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 A/C auto amp. Refer to <u>VTL-8</u>. "Removal and Installation".

NO-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to <u>BCS-56, "Removal and Installation"</u>.

# 12. CHECK CAN COMMUNICATION

Check CAN communication. Refer to LAN-4, "System Description".

- BCM ECM
- ECM IPDM E/R
- ECM A/C auto amp.

#### Is the inspection result normal?

YES >> Replace IPDM E/R. Refer to PCS-31, "Removal and Installation of IPDM E/R".

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

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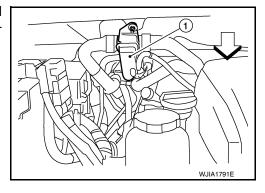
#### WATER VALVE CIRCUIT

Description INFOID:000000006145451

#### COMPONENT DESCRIPTION

#### Water Valve

The water valve (1) cuts the flow of engine coolant to the front and rear heater cores to allow for maximum cooling during A/C operation. It is controlled by the A/C auto amp.



# Water Valve Diagnosis Procedure

INFOID:0000000006145452

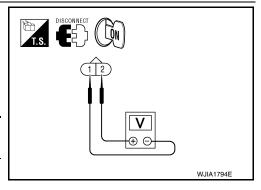
Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

#### DIAGNOSTIC PROCEDURE FOR WATER VALVE

# 1. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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



#### Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

# 2.CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector M50.
- Check continuity between water valve harness connector F68

   (A) terminal 2 and A/C auto amp. harness connector M50 (B) terminal 46.

#### 2 - 46 : Continuity should exist.

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

## 2 - Ground : Continuity should not exist.

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#### Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

NO >> Repair harness or connector.

# **WATER VALVE CIRCUIT**

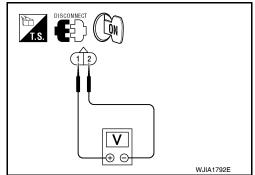
# < DTC/CIRCUIT DIAGNOSIS >

# [AUTOMATIC AIR CONDITIONER]

# 3. CHECK WATER VALVE POWER AND GROUND CIRCUITS

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

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



# Is the inspection result normal?

YES >> Replace the water valve.

NO >> GO TO 4.

# 4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector M50.
- Check continuity between water valve harness connector F68

   (A) terminal 1 and A/C auto amp. harness connector M50 (B) terminal 45.

# 1 - 45 : Continuity should exist.

Check continuity between water valve harness connector F68

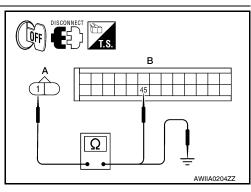
 (A) terminal 1 and ground.

# 1 - Ground : Continuity should not exist.

# Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

NO >> Repair harness or connector.



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# AMBIENT SENSOR

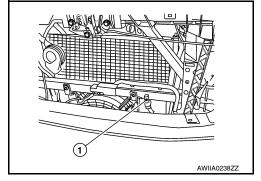
# Component Description

INFOID:0000000006145453

### 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 A/C auto amp.



# AMBIENT TEMPERATURE INPUT PROCESS

The A/C auto amp. 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 A/C auto amp. function. It only allows the A/C auto amp. 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.

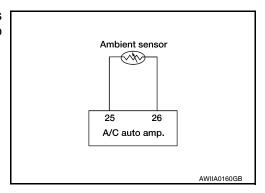
# Ambient Sensor Diagnosis Procedure

INFOID:0000000006145454

Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

### DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. (40 or 41 is indicated on A/C auto amp. as a result of conducting the A/C auto amp. self-diagnosis)



# 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

# AMBIENT SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

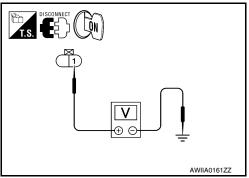
# [AUTOMATIC AIR CONDITIONER]

- 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 A/C AUTO AMP.

- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector.
- 3. Check continuity between ambient sensor harness connector E1 (B) terminal 2 and A/C auto amp. 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 <u>HAC-75</u>, "<u>Ambient Sensor Component Inspection</u>". Is the inspection result normal?

- YES >> 1. Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".
  - 2. GO TO HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.
- NO >> 1. Replace ambient sensor.
  - 2. GO TO HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

# 4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND A/C AUTO AMP.

- 1. Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector.
- 3. Check continuity between ambient sensor harness connector E1 (B) terminal 1 and A/C auto amp. harness connector M49 (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 A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

2. GO TO HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

# Ambient Sensor Component Inspection

# COMPONENT INSPECTION

**Ambient Sensor** 

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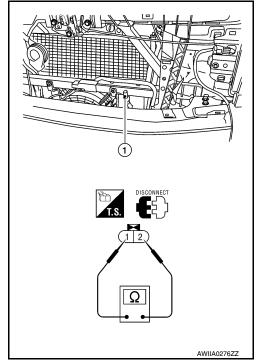
# **AMBIENT SENSOR**

# < 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 $k\Omega$
-15 (5)	12.73
-10 (14)	9.92
-5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



If NG, replace ambient sensor. Refer to <u>HA-45, "Removal and Installation"</u>.

# [AUTOMATIC AIR CONDITIONER]

# **IN-VEHICLE SENSOR**

# Component Description

### INFOID:0000000006145456

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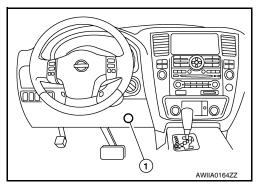
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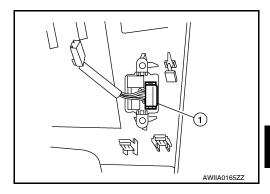
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### COMPONENT DESCRIPTION

### 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 A/C auto amp.





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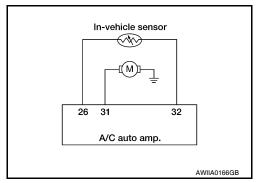
# In-Vehicle Sensor Diagnosis Procedure

INFOID:0000000006145457

Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

# 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, 44 or 46 is indicated on A/C auto amp. 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 44 or 46 (without CONSULT-III) present?

## YES or NO?

YES >> GO TO 6.

NO >> GO TO 2.

# 2. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

Revision: July 2010 HAC-77 2011 Armada

# **IN-VEHICLE SENSOR**

# < DTC/CIRCUIT DIAGNOSIS >

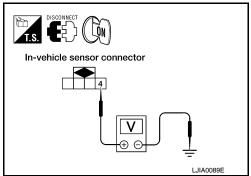
# [AUTOMATIC AIR CONDITIONER]

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

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

# Is the inspection result normal?

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



# $3. \mathrm{check}$ circuit continuity between in-vehicle sensor and a/c auto amp.

- 1. Turn ignition switch OFF.
- Disconnect A/C auto amp. connector M49.
- Check continuity between in-vehicle sensor harness connector M32 (B) terminal 1 and A/C auto amp. 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-79, "In-Vehicle Sensor Component Inspection".

### Is the inspection result normal?

- YES >> 1. Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".
  - 2. Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.
- NO >> 1. Replace in-vehicle sensor. Refer to VTL-10, "Removal and Installation".
  - Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

# 5.CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND A/C AUTO AMP.

- 1. Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector.
- Check continuity between in-vehicle sensor harness connector M32 (B) terminal 4 and A/C auto amp. 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.

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# Is the inspection result normal?

- >> 1. Replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation". YES
  - Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

**6.**CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR MOTOR AND A/C AUTO AMP. (SELF-DIAGNOSIS CODES 30, 31, 44, 46 OR DTC B2578, B2579)

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# **IN-VEHICLE SENSOR**

# < DTC/CIRCUIT DIAGNOSIS >

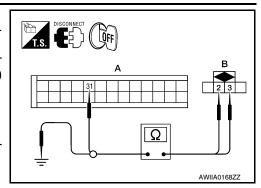
# [AUTOMATIC AIR CONDITIONER]

- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector and in-vehicle sensor con-
- 3. Check continuity between in-vehicle sensor harness connector M32 (B) terminal 3 and A/C auto amp. harness connector M50 (A) terminal 31.

3 - 31 : Continuity should exist.

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

> : Continuity should exist. 2 - Ground 3 - Ground : Continuity should not exist.



# Is the inspection result normal?

>> 1. Replace A/C auto amp. Refer to <a href="VTL-8">VTL-8</a>, "Removal and Installation".

Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

# In-Vehicle Sensor Component Inspection

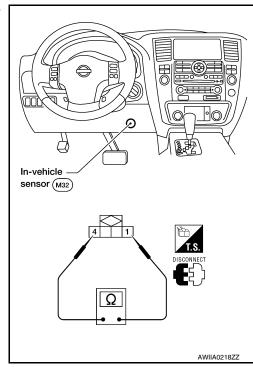
### COMPONENT INSPECTION

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-10, "Removal and Installation".



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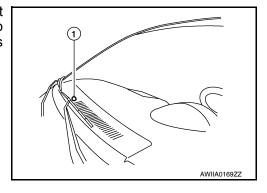
# **OPTICAL SENSOR**

# **Component Description**

INFOID:0000000006145459

### 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 A/C auto amp.



# OPTICAL INPUT PROCESS

The A/C auto amp. 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.

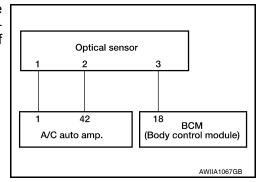
# Optical Sensor Diagnosis Procedure

INFOID:0000000006145460

Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

# 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 A/C auto amp. as a result of conducting self-diagnosis.



1. CHECK CIRCUIT CONTINUITY BETWEEN OPTICAL SENSOR AND A/C AUTO AMP.

# **OPTICAL SENSOR**

# < DTC/CIRCUIT DIAGNOSIS >

# [AUTOMATIC AIR CONDITIONER]

1. Turn ignition switch OFF.

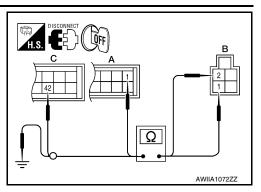
Disconnect A/C auto amp. connector and optical sensor connector

3. Check continuity between optical sensor harness connector M302 (B) terminals 1 and 2 and A/C auto amp. harness connector M50 (C) terminal 42 and M49 (A) terminal 1.

1 - 1 : Continuity should exist.

2 - 42 : 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.

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

3 - 18 : Continuity should exist.

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

3 - Ground : Continuity should not exist.

# DISCONNECT OFF

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# Is the inspection result normal?

YES >> Replace optical sensor. Refer to VTL-11, "Removal and Installation".

NO >> Repair harness or connector.

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Revision: July 2010 HAC-81 2011 Armada

# INTAKE SENSOR

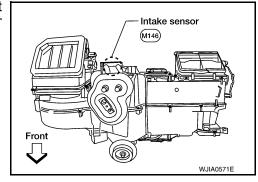
# **System Description**

### INFOID:0000000006145461

### COMPONENT DESCRIPTION

### Intake Sensor

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



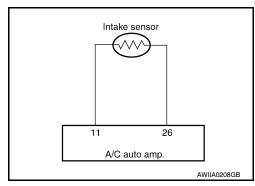
# Intake Sensor Diagnosis Procedure

INFOID:0000000006145462

Regarding Wiring Diagram information, refer to <a href="HAC-90">HAC-90</a>, "Wiring Diagram".

# 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 A/C auto amp. as a result of conducting self-diagnosis.



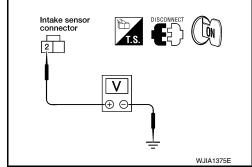
# 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

- 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 A/C AUTO AMP.

# INTAKE SENSOR

# < DTC/CIRCUIT DIAGNOSIS >

# [AUTOMATIC AIR CONDITIONER]

Turn ignition switch OFF.

1 - 26

YES

NO

- Disconnect A/C auto amp. connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 1 and A/C auto amp, harness connector M49 (A) terminal 26.

# : Continuity should exist. Is the inspection result normal? >> GO TO 3. >> Repair harness or connector.

# 3. CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-83, "Intake Sensor Component Inspection".

### Is the inspection result normal?

YES >> 1. Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

> 2. Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

NO Replace intake sensor. Refer to VTL-12, "Removal and Installation".

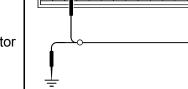
Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis. 2.

# f 4.CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND A/C AUTO AMP.

- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector.
- Check continuity between intake sensor harness connector M146 (B) terminal 2 and A/C auto amp. harness connector M49 (A) terminal 11.



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 A/C auto amp. Refer to VTL-8, "Removal and Installation".

Go to HAC-23, "A/C Auto Amp. Self-Diagnosis" and perform self-diagnosis.

NO >> Repair harness or connector.

# Intake Sensor Component Inspection

### COMPONENT INSPECTION

Intake Sensor

**HAC-83** 

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Revision: July 2010

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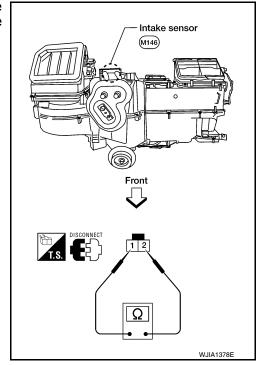
# **INTAKE SENSOR**

# < DTC/CIRCUIT DIAGNOSIS >

# [AUTOMATIC AIR CONDITIONER]

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

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



If NG, replace intake sensor. Refer to  $\underline{\text{VTL-12.}}$  "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:0000000006145464

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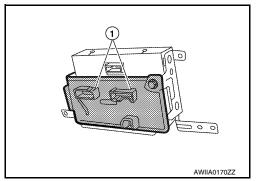
### COMPONENT DESCRIPTION

# A/C auto amp.

The A/C auto amp. 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.

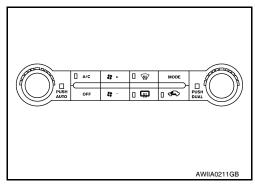
The A/C auto amp. is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the A/C auto amp.

Self-diagnostic functions are also built into the A/C auto amp. to provide quick check of malfunctions in the auto air conditioner system.



# Potentio Temperature Control (PTC)

There are two PTCs (driver and passenger) built into the A/C auto amp. 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.



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# A/C Auto Amp. Component Function Check

SYMPTOM: A/C system does not come on.

# INSPECTION FLOW

# 1.confirm symptom by performing operational check - auto mode

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

### Can a symptom be duplicated?

YES >> GO TO 3.

NO >> GO TO 2.

# 2. PERFORM COMPLETE OPERATIONAL CHECK

Perform a complete operational check and check for any symptoms. Refer to <u>HAC-4, "Operational Check (Front)"</u>.

# Can a symptom be duplicated?

YES >> Refer to HAC-3, "How to Perform Trouble Diagnosis For Quick And Accurate Repair".

NO >> System OK.

# 3.CHECK FOR SERVICE BULLETINS

Check for any service bulletins.

>> GO TO 4.

# 4. CHECK POWER AND GROUND CIRCUIT

Revision: July 2010 HAC-85 2011 Armada

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

# < DTC/CIRCUIT DIAGNOSIS >

Check main power supply and ground circuit. Refer to <u>HAC-86</u>, "A/C Auto Amp Power and Ground Diagnosis Procedure".

### Is the inspection result normal?

YES >> System OK.

NO >> Replace A/C auto amp. Refer to VTL-8, "Removal and Installation".

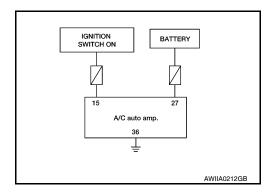
# A/C Auto Amp Power and Ground Diagnosis Procedure

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Regarding Wiring Diagram information, refer to HAC-90, "Wiring Diagram".

# DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

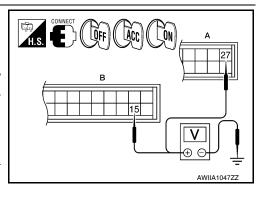
SYMPTOM: A/C system does not come on.



# 1. CHECK POWER SUPPLY CIRCUITS FOR A/C AUTO AMP.

- 1. Turn ignition switch ON.
- Check voltage between A/C auto amp. harness connector M49
   (B) terminal 15 and M50 (A) terminal 27, and ground.

	Terminals		Ignit	tion switch pos	sition
	(+)				
A/C auto amp. con- nector	Terminal No.	(-)	OFF	ACC	ON
M49	15	Ground	Approx. 0V	Approx. 0V	Battery voltage
M50	27	Giodila	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 <u>PG-72, "Terminal Arrangement".</u>

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 A/C AUTO AMP.

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

# < DTC/CIRCUIT DIAGNOSIS >

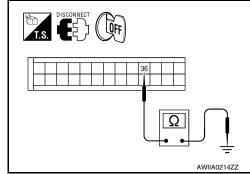
- Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connectors.
- Check continuity between A/C auto amp. harness connector M50 terminal 36 and ground.

# 36 - Ground

: Continuity should exist.

# Is the inspection result normal?

- >> Replace A/C auto amp. Refer to VTL-8, "Removal and YES Installation".
- NO >> Repair harness or connector.



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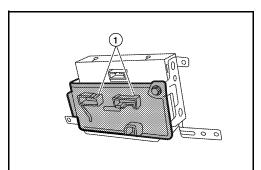
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# **ECU DIAGNOSIS INFORMATION**

# AIR CONDITIONER CONTROL

# A/C Auto Amp. Terminals Reference Values

Measure voltage between each terminal and ground by following Terminals and Reference Value for A/C auto amp. (1).



# A/C AUTO AMP. HARNESS CONNECTOR TERMINAL LAYOUT

13 12 11 10 9 8 7 6 5 4 3 2 1 26 25 24 23 22 21 20 19 18 17 16 15 14 39 38 37 36 35 34 33 32 31 30 29 28 27 52 51 50 49 48 47 46 45 44 43 42 41 40



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# TERMINALS AND REFERENCE VALUES FOR A/C AUTO AMP.

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)	ON	-	Battery voltage
3	Р	V ref ACTR (ground)	ON	-	5V
4	W/R	Compressor ON signal	ON	A/C switch OFF	5V
4	VV/FC	Compressor ON signal	ON	A/C switch ON	0V
5	L/R	For ON signal	ON	Blower switch OFF	5V
5	L/K	Fan ON signal	ON	Blower switch ON	0V
6	SB	Air mix door motor (driver) feedback	ON	-	0 - 5V
7	GR	Mode door motor feedback	ON	-	0 - 5V
8	R/L	Illumination +	ON	Park lamps ON	Battery voltage
9	BR	Illumination -	-	Park lamps ON	(V) 15 10 5 0 200 ms
10	LG/B	Defroster door motor feedback	ON	-	0 - 5V
11	L/B	Intake sensor	ON	-	0 - 5V
12	G/Y	Variable blower control (rear)	ON	-	0 - 5V
13	G/R	Variable blower control (front)	ON	-	0 - 5V

# AIR CONDITIONER CONTROL

# < ECU DIAGNOSIS INFORMATION >

# [AUTOMATIC AIR CONDITIONER]

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
14	G/W	Air mix door motor (passenger) CW	ON	Clockwise rotation	Battery voltage
15	Y/G	Power supply for IGN	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 (front)	ON	Clockwise rotation	Battery voltage
20	P/L	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
21	G/B	Intake door motor CCW	ON	Counterclockwise rotation	Battery voltage
22	0	Intake door motor CW	ON	Clockwise rotation	Battery voltage
23	LG	Defroster door motor CW	ON	Clockwise rotation	Battery voltage
24	P/B	Defroster door motor CCW	ON	Counterclockwise rotation	Battery voltage
25	Р	Ambient sensor	ON	-	0 - 5V
26	V/R	Sensor ground	ON	-	0V
27	Y/R	Power supply for BAT	-	-	Battery voltage
28	Υ	V ref ACTR (5V)	ON	-	0 - 5V
29	R/W	Air mix door motor (passenger) feedback	ON	-	0 - 5V
30	R/Y	Mode door motor (Rear) feedback	ON	-	0 - 5V
31	BR/Y	In-vehicle sensor motor (+)	ON	-	Battery voltage
32	LG/R	In-vehicle sensor signal	ON	-	0 - 5V
33	R/Y	Air mix door motor (Rear) feedback	ON	-	0 - 5V
36	В	Ground	-	-	0V
40	Р	CAN-L	ON	-	0 - 5V
41	L	CAN-H	ON	-	0 - 5V
42	W/V	Optical sensor (passenger)	ON	-	0 - 5V
43	GR/R	Mode door motor (Rear) CW	ON	Clockwise rotation	Battery voltage
44	L/Y	Mode door motor (Rear) CCW	ON	Counterclockwise rotation	Battery voltage
45	Y/L	Water value	ON	Water valve open	Battery voltage
45	1/L	Water valve	ON	Water valve closed	0V
46	MIC	Water value	ON	Water valve open	0V
46	W/G	Water valve	ON	Water valve closed	Battery voltage
47	0	LIN BUS (rear)	ON	-	Battery voltage
48	0	LIN BUS (front)	ON	-	Battery voltage
49	GR/R	Air mix door motor (Rear) CW	ON	Clockwise rotation	Battery voltage
50	L/Y	Air mix door motor (Rear) CCW	ON	Counterclockwise rotation	Battery voltage

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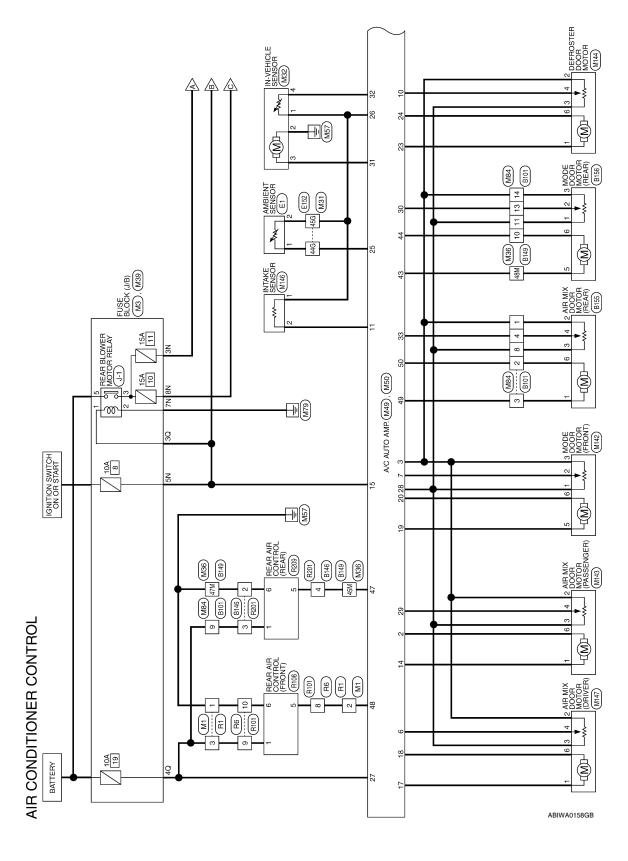
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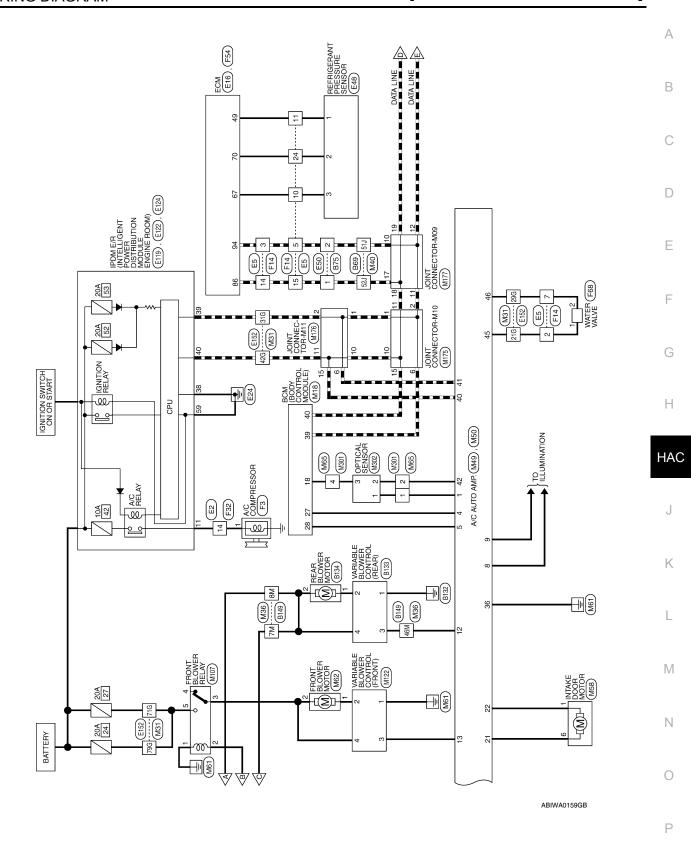
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# WIRING DIAGRAM

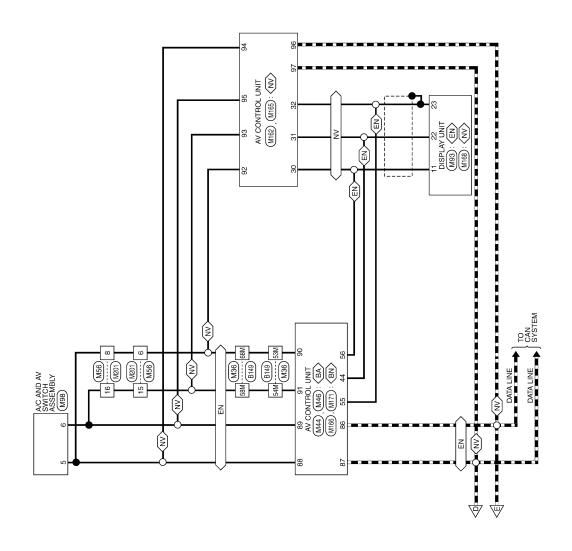
# AIR CONDITIONER CONTROL

Wiring Diagram





(BA): WITH BASE AUDIO SYSTEM,
(BN): WITH BOSE AUDIO SYSTEM,
(EN): WITHOUT NAVI
(NV): WITH NAVI



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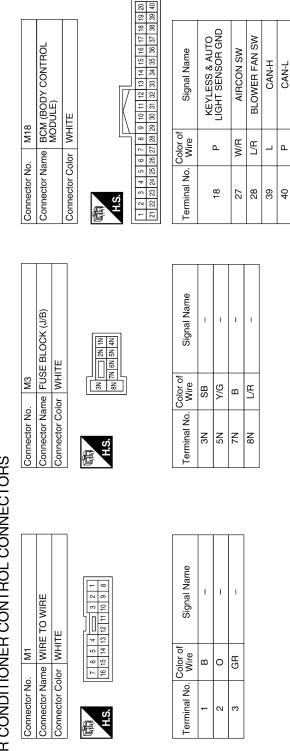
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# AIR CONDITIONER CONTROL CONNECTORS



Connector No. M32 Connector Name INLYEHIC! E SENSOR			Ļ	2 1		i	Signal Name	ı	1	1	ı	
M32	or WHIT			4 3		Color of	Wire	N/R	В	BR/Y	LG/R	
Connector No.	Connector Color WHITE			H.S.			lerminal No.	-	2	က	4	
Signal Name	ı	I	ı	I	ı	I	ı	1				
Solor of Wire	Y/L	M/G	_	۵	۵	N/R	<u>a</u>	А				
Terminal No. Wire	21G	29G	31G	42G	44G	45G	71G	79G				
Connector No. M31	Connector Color WHITE			56 46 36 26 16	10G 9G 8G 7G 6G		21G 20G 13G 17G 18G 17G 18G 13G 13G 11G		416 406 396 386 376 366 356 346 336 326 316	50G 49G 48G 47G 48G 45G 44G 43G 42G	616 606 596 586 576 566 556 546 536 526 516	700 (800 (800 (800 (800 ) 800 ) 800 (800 ) 800 (800 ) 800 (800 ) 800 (700 ) 700 (700 ) 700 (700 ) 700 (700 ) 700 (700 ) 8

**HAC-93** Revision: July 2010 2011 Armada

Connector Name WIRE TO WIRE	IRE		Terminal No.	Color of Wire	Signal Name	Connector No.		M39 FUSE BLOCK (J/B)
WHITE			7M	L/R	ı	Connector Color	+	WHITE
			8M	SB	ı		4	
SM AM	W No	'	45M	0	1		l S	30 20 10
M 9M 4M	3M 3M 2M 1M		46M	Z/S	ı	U II	8	70 60 50 40
INIO			47M	В	1			
21M 20M 19M 18M 17M 16M 15M 14M			48M	GR/R	1		Color of	
30M 29M 28M 27M 26M 25M 24M	M 25M 24M 23M 22M		53M	M	ı	l erminal No	.	Signal Name
41M 40M 39M 38M 37M 36M 35M 34M			24M	B/P	1	Ø.	Y/G	ı
50M 49M 48M 47M 46M 45M 44M	M 45M 44M 43M 42M		28M	P/B	1	4Q	Y/R	ı
61M 60M 59M 58M 57M 56M 55M 54M 70M 69M 68M 67M 66M 65M 64M	M  55M  54M  53M  52M  51M M  65M  64M  63M  62M		98M	M/L	1			
75M 74M 7	75M 72M 72M 72M 71M 80M 79M 78M 77M 76M							
M40			Connector No.	. M44		Connector No.	No. M46	9
WIRE TO WIRE	IRE		Connector Na	me AV CC BASE	Connector Name AV CONTROL UNIT (WITH BASE AUDIO SYSTEM)	Connector	Name AV	Connector Name AV CONTROL UNIT
WHIIE			Connector Color	lor WHITE		Connector	Connector Color WHITE	II.E
Ţ								
100 88 83	¬I¬I ∟		ν.	46 45 58 57	44 43 42 41 40 39 38 37 36 56 55 54 53 52 51 50 49 48	S.H	91 90 89 88 87	91 90 89 88 87 86 85 84 83 82 81 86 98 7 36 7 37 78 77 107 107 108 105 104 105 100 100 100 100 100 100 100 100 100
30, 29, 28, 27, 26, 25, 24,			Terminal No.	Color of Wire	Signal Name	Terminal No.	Color of Wire	Signal Name
41.1 40.1 39.1 38.1 37.1 36.1 35.1 34.1 50.1 49.1 48.1 47.1 48.1 45.1 44.1	35. 34. 33. 32. 31.		44	LG	DISP IT	98	_	CAN-H
St. St.		1	55	SHIELD	SHIELD	87	۵	CAN-L
61J 60J 59J 58J 57J 56J 55J 54J 70J 69J 68J 67J 66J 65J 64J	55J 54J 53J 52J 51J   651 641 631 621		56	^	IT_DISP	88	M/L	M CAN1-H
200 000 000						88	P/B	M CAN1-L
750 740 7	75J 74J 73J 72J 71J					06	ΓW	M CAN2-H
80, 79, 78	80. 79. 78. 77. 76.					91	B/P	M CAN2-L
Color of Wire S	Signal Name	_						
	1							
<u> </u>	1							

Signal Name	IGN	ı	TEMP_DOOR_A_FR_LH	TEMP_DOOR_B_FR_LH	FLOOR_DR_A	FLOOR_DR_B	RECIRC_DOOR_A	RECIRC_DOOR_B	PANEL_DEFROST_ DOOR_A	PANEL_DEFROST_ DOOR_B	AMB_TEMP_SENS	SENSOR_RETURN
Color of Wire	Y/G	ı	W/G	ŋ	BR/W	P/L	G/B	0	ГG	P/B	۵	N/R
Terminal No.	15	16	17	18	19	20	21	22	23	24	25	26

Signal Name	FAN_ON	TEMP_DOOR_F EEDBACK_FR_LH	FLOOR_FEEDBACK	T+	-TII	PANEL_DEFROST_ FEEDBACK	EVAP_AIR_TEMP _SENS	AUX_VBC	FR_VBC	TEMP_DOOR_A_ FR_RH
Color of Wire	5	SB	GR	R/L	BR	LG/B	L/B	G∕Y	G/R	G/W
Terminal No.	5	9	7	∞	6	10	11	12	13	14

			1						
6	A/C AUTO AMP.	BLACK		9 8 7 6 5 4 3 2 1 22 21 20 19 18 17 16 15 14	Signal Name	SUNLOAD_SEN_ LEFT(DR)	TEMP_DOOR_B_ FR_RH	V_REF_RETURN (GND)	AC_REQUEST
M49		-		12 11 10 25 24 23	Color of Wire	G/O	٦	۵	M/R
Connector No.	Connector Name	Connector Color		H.S.	Terminal No.	τ-	2	ю	4

Signal Name	SUNLOAD_SEN_ RIGHT(PASS)	AUX_MODE_A	AUX_MODE_B	WATER_VAVLE_ CLOSE_A	WATER_VAVLE_ OPEN_B	RR_LIN_BUS	FR_LIN_BUS	AUX_TEMP_A	AUX_TEMP_B	I	ı
Color of Wire	W/V	GR/R	ζ	A//L	M/G	0	0	GR/R	Š	ı	ı
Terminal No.	42	43	44	45	46	47	48	49	20	51	52

Signal Name	INCAR_MTR+	INCAR_TEMP_SEN	AUX_TEMP_ FEEDBACK_	1	ı	GND	ı	1	ı	CAN-L	CAN-H
Color of Wire	BR/Y	LG/R	R/Υ	1	ı	В	1	1	1	Ь	٦
Terminal No. Wire	31	32	33	34	35	36	37	38	39	40	41

	A/C AUTO AMP.		34 33 32 31 30 29 28 27 47 46 45 44 43 42 41 40	Signal Name	В	V_REF.ACTR(5V)	TEMP_DR_ FEEDBACK_FR_RH	AUX_MODE_ FEEDBACK
	$\rightarrow$	or BLUE	37 36 35 50 49 48	Color of Wire	Y/R	У	R/W	R/Y
Connector No.	Connector Name	Connector Color	H.S. 52 51	Terminal No.	27	28	56	30

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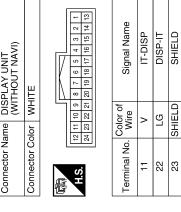
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Connector No.	o. M62	
Connector Name	l	FRONT BLOWER MOTOR
Connector Color	olor BLACK	X
画 H.S.		<u> </u>
Terminal No.	Color of Wire	Signal Name
-	N/	ı
2	M/L	1

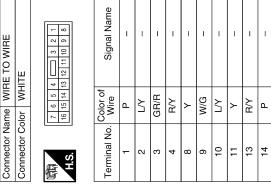
╗	Signal Name	1	1
1 2	Color of Wire	MΠ	M/L
H.S.	Terminal No.	-	2

Connector No.	M93
Connector Name	DISPLAY UNIT (WITHOUT NAVI)
Connector Color WHITE	WHITE
H.S. 121	12   11   10   9   8   7   6   5   4   3   2   1



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	INTAKE DOOR MOTOR	×	8 5 6	Signal Name	_
M58	me INTA	or BLACK	2   -	Color of Wire	0
Connector No.	Connector Name	Connector Color	崎南 H.S.	Terminal No.	-

M84	WIRE TO WIRE	WHITE	
Connector No.	Connector Name WIRE TO WIRE	Connector Color	



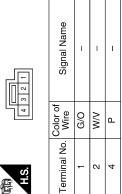
Connector No.	M56
Connector Name	Connector Name WIRE TO WIRE
Connector Color WHITE	WHITE
ą	
	2 3
H.S.	9 10 11 12 13 14 15 16

Signal Name	- (WITHOUT NAVI)	– (WITH NAVI)	ı	- (WITHOUT NAVI)	- (WITH NAVI)	-
Color of Wire	M/L	Γ/M	M/L	P/B	B/P	B/B
Terminal No.	9	9	8	15	15	16

G/B

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



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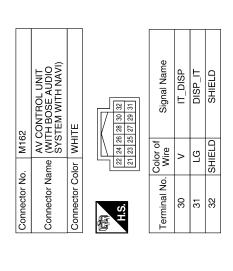
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Connector No. M122 Connector Name VARIABLE BLOWER CONTROL (FRONT) Connector Color WHITE	Terminal No. Wire Signal Name  1 B/W -  2 L/W -  3 G/R -  4 W/L -	Connector No. M144 Connector Name DEFROSTER DOOR MOTOR Connector Color BLACK  TIZ3456	Terminal No. Wire Signal Name  1 LG 2 P 3 Y 4 LG/B 6 P/B
or No. M107  or Name FRONT BLOWER RELAY  or Color BLACK	No. Wire Signal Name  B	or No. M143 Pr Name AIR MIX DOOR MOTOR (PASSENGER)  or Color BLACK	Color of GNW         Signal Name           G/W         -           Y         -           R/W         -           L         -
Connector No. Connector Name Connector Color H.S.	Terminal No.	Connector No. Connector Name Connector Color	Terminal No.
Connector No. M98  Connector Name A/C AND AV SWITCH ASSEMBLY  Connector Color WHITE	Terminal No. Wire Signal Name 5 W/L M-CAN-H 6 P/B M-CAN-L	Connector No. M142 Connector Name MODE DOOR MOTOR (FRONT) Connector Color BLACK	Terminal No. Wire Signal Name  1 Y 2 GR 3 P 5 BR/W 6 P/L

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Revision: July 2010 HAC-97 2011 Armada



21	AIR MIX DOOR MOTOR (DRIVER)	CK	3 4 5 6	Signal Name	Ī	Ī	1	I	ı
. M147		lor BLACK	1 2	Color of Wire	W/G	۵	>	SB	മ
Connector No.	Connector Name	Connector Color	H.S.	Terminal No.	-	2	င	4	9

	INTAKE SENSOR
	<u>ب</u>
Color of Wire	Signal Name
N/R	I
L/B	ı

			1				
88	DISPLAY UNIT (WITH NAVI)	里	10 9 8 7 6 5 4 3 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Signal Name	IT DISP	LG DISP IT	SHIELD
. M168		lor WHITE	23 22 21 22 21 22 21 22 21 22 21 21 22 21 21	Color of Wire	>	ГG	SHIELD
Connector No.	Connector Name	Connector Color	H.S. 12	Terminal No.	1	22	23

Connector No.	M166
Connector Name	AV CONTROL UNIT Connector Name (WITH BOSE AUDIO SYSTEM WITHOUT NAVI)
Connector Color WHITE	WHITE

AV CONTROL UNIT Connector Name (WITH BOSE AUDIO SYSTI WITHOUT NAVI)	IE .	1   1   1   1   1   1   1   1   1   1	100 99 98 97 96 95 94 93 92	Signal Name	CAN-H	CAN-L	M-CAN1-H	M-CAN1-L	M-CAN2-H	M-CAN2-L
me WIT	lor WHITE	87 86 85	103102101	Color of Wire	_	۵	M/L	P/B	M	B/P
Connector Na	Connector Color	H.S.	107 106 105 104 103 102 101 100 99	Terminal No.	98	87	88	88	06	91

Connector No.	M165
Connector Name	AV CONTROL UNIT (WITH BOSE AUDIO SYSTEM WITH NAVI)
Connector Color WHITE	WHITE

	102 104	99 101 103							
	96 98 100 102 104	93 95 97 99	ле			_			
	3 90 92 94	89 91	Signal Name	M-CAN2-H	M-CAN2-L	M-CAN1-H	M-CAN1-L	CAN-H	CAN-L
	82 84 86 88	31 83 85 87		Ν	2	2	2		
	76 78 80	75 77 79 81	Color of Wire	L/W	B/P	M/L	P/B	Т	۵
H.S.	66 68 70 72 74	65 67 69 71 73 75 77	Terminal No.	76	63	94	92	96	26

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# **AIR CONDITIONER CONTROL**

# [AUTOMATIC AIR CONDITIONER]

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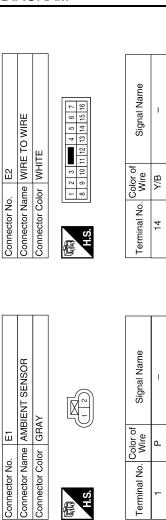
Connector No. M176  Connector Name JOINT CONNECTOR-M11  Connector Color BLUE	Terminal No. Color of Signal Name  1 L 2 L 6 L 10 P 11 P 15 P	Connector No. M301 Connector Color WHE TO WIRE Connector Color WHITE  H.S  Terminal No. Wire Signal Name  2 W/V  4 P
Connector No. M175  Connector Name JOINT CONNECTOR-M10  Connector Color BLUE    10   8   7   6   5   4   3   2   1         10   10   10   10   10   10	Terminal No. Wire   Signal Name   1   L   -	Connector No.   M201
Connector No. M171  Connector Name BOSE AUDIO SYSTEM WITHOUT NAVI)  Connector Color WHITE  AV CONTROL UNIT (WITH WITHOUT NAVI)  Connector Color WHITE  AT 46 45 44 43 42 41 40 39 38 77 36 49 44 48 42 41 40 39 38 77 38 49 44 48 42 41 40 39 38 77 38 49 44 48 42 41 40 39 38 77 38 49 44 48 42 41 40 39 38 77 38 49 44 48 42 41 40 39 38 77 38 49 44 48 48 48 48 48 48 48 48 48 48 48 48	Terminal No. Color of Signal Name 44 LG DISP IT 55 SHIELD SHIELD 56 V IT DISP	M177   Connector No.   M177   Connector Name   JOINT CONNECTOR-M09   Connector Color   GREEN   Signal Name   Sig

Revision: July 2010 HAC-99 2011 Armada

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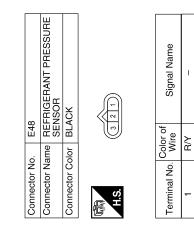
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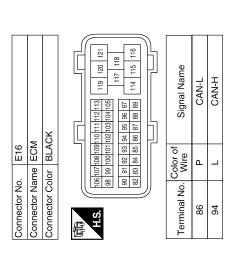
Connector Name OPTICAL SENSOR

M302

Connector No.

Connector Color WHITE



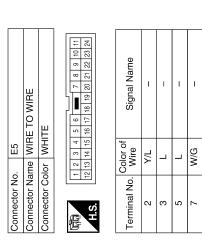


	Signal Name	ı	ı	1	
J	Color of Wire	G/0	//M	۵	
	erminal No.	-	2	3	

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# AIR CONDITIONER CONTROL

# [AUTOMATIC AIR CONDITIONER]

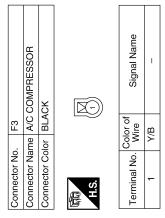
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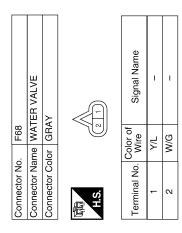
			А
트워드      /  # :	Signat Name GND (SIGNAL) CAN-H CAN-L	Signal Name	В
	Color of Wire B B P P	Color of Wire Wire W/A W/G W/A GGR GGR	С
Connector No. Connector Name Connector Color	Terminal No. C 38 39 40	Terminal No. C 21G 29G 31G 44G 44G 45G 77G 77G 77G	D
	- Φ 		Е
		20 20 20 20 20 20 20 20 20 20 20 20 20 2	F
RIBUTION SINE ROOM	Signal Name A/C COMPRESSOR	F   F   F   F   F   F   F   F   F   F	G
PE119 IPDM E/R (INTELLIGENT MODULE ENGINE ROOM) or WHITE 9 8 7 6 5 4 3 18 17 16 15 14 13 12 11 10		Connector No. E152  Connector Name WIRE TO WIRE  Connector Color WHITE  16 26 36 46 56  16 76 86 96 106  226 236 246 256 266 276 286 286 806 816  316 226 236 246 256 266 276 286 286 806 816  316 226 236 246 256 266 276 286 286 806 816  226 236 246 256 26 26 276 286 286 806 816  226 236 246 256 26 276 286 286 806 816  226 236 246 256 266 276 286 286 806 816  2276 236 246 856 856 276 286 286 806 816  2276 236 246 856 856 276 286 286 806 816  2276 236 246 856 856 276 286 286 806 816  2276 2376 2777 786 779 807 80	Н
or ne	Color of Wire	Connector No. E. Connector Name W Connector Color W Lie 126 226 426 426 626 626 626 626 626 626 6	HAG
Connector No.	Terminal No.	Connector No. Connector Cold	J
			K
	аше	LIGENT UTION E ROOM) WER)	L
E50 WIRE TO WIRE BROWN	Signal Name	E124 IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM) BLACK  Signal Name  GOD (POWER)	M
Vo. E50 Vame WIRE TC	Color of Wire P	125181	N
Connector No. Connector Name Connector Color	Terminal No.	Connector No.  Connector Name Connector Color Terminal No.  S9  Terminal No.  M.  S9  Terminal No.  M.  S9  Terminal No.  M.  M.  S9  Terminal No.  M.  M.  M.  S9  Terminal No.  M.  M.  M.  M.  S9  Terminal No.  M.  M.  M.  S9  Terminal No.  M.  M.  S9  Terminal No.  M.  M.  M.  S9  Terminal No.  M.  M.  M.  M.  M.  M.  S9  Terminal No.  M.  M.  M.  M.  M.  Span  Terminal No.  M.  M.  M.  M.  Span  Terminal No.  M.  M.  M.  M.  M.  M.  M.  M.  M.	0
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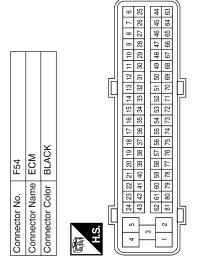
Connector No	F32	
Connector Name	Je	WIRE TO WIRE
Connector Color WHITE	or WHI	TE
语. H.S.	7 6 5 4 10 12 12	12 11 10 9 8
Terminal No. Wire	Color of Wire	Signal Name
14	Y/B	ı

	Connector No. F14	
Connector Name	_	WIRE TO WIRE
Connector Color	WHITE	ш
11 10	9 8 7	10 18 17 16 15 11 13 12 1
ုပ္ပ	Color of Wire	Signal Name
_	Y/L	ı
		1
		1
>	W/G	1
_	В	I
<u> </u>	R/Y	I
	_	1
	Д.	ı
ГШ.	B/W	1





Signal Name	AVCC (PDPRES)	GND-A	PD PRESS	
Color of Wire	R/Y	В	B/W	
Terminal No.	49	29	20	



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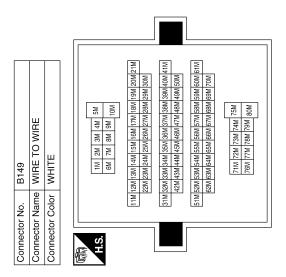
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Connector Color WHITE	H.S. 8 9 10 11 12 13 14 15 16 7	Terminal No. Wire Signal Name	2   L/Y   -	3 GR/R –	<u> </u>	۲,	13 R/Y -	14 P		Connector No. B146 Connector Name WIRE TO WIRE Connector Color BROWN	1 2 3 4 5 6	Terminal No. Wire Signal Name	2 B -	3 W/G –	4 O/R –	
Connector Name WIRE TO WIRE Connector Color BROWN	H.S.	Terminal No. Wire Signal Name	Ь	2						Connector No. B134 Connector Name REAR BLOWER MOTOR Connector Color WHITE	H.S.	Terminal No. Wire Signal Name	1 L/B –	2 L/R –		
Connector Name WIRE TO WIRE Connector Color WHITE	H.S. (8) 44 54 64 64 65 64 72 89 89 501	J 15J 16J 17J	7 -	42J 43J 44J 45J 46J 48J 43J 48J 49J 50J	51.0 52.0 53.0 54.0 55.0 55.0 55.0 55.0 55.0 55.0 55	7.1 723 734 754 754	000	Terminal No.   Color of   Signal Name	52J P – 52J P –	l <del></del>	(南) (1234)	Terminal No. Wire Signal Name	В 1		ဇ	B 4 W/L –

Revision: July 2010 HAC-103 2011 Armada

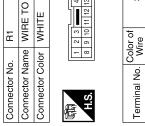
or No. B155	or Name AIR MIX DOOR MOTOR (REAR)	or Color BLACK	1 2 3 4 5 6	L No. Wire Signal Name	GR/R –	- -	\ \	R/Y	
Connector No.	Connector Name	Connector Color	雨 H.S.	Terminal No.	-	2	က	4	9

Signal Name	ı	ı	ı	1	ı	ı	1	– (WITH BASE AUDIO SYSTEM)	- (WITH BOSE AUDIO SYSTEM WIHTOUT NAVI)	– (WITH BASE AUDIO SYSTEM)	- (WITH BOSE AUDIO SYSTEM WIHTOUT NAVI)	ı
Color of Wire	L/R	L/R	O/R	G/Y	В	GR/R	M/L	Y/L	P/B	Y/L	P/B	M/L
Terminal No.	MZ	8M	45M	46M	47M	48M	53M	54M	54M	28M	58M	68M



Connector No.		R6	
Connector Name		WIRE	WIRE TO WIRE
Connector Color		WHITE	Ш
SH	7 6 15 16 15	5 4 13 14 13	12 11 10 9 8
Terminal No.	Color of Wire	jo e	Signal Name
8	0		ı
6	GR		ſ
10	В		I

	WIRE TO WIRE			5 6 7	13 14 15 16	
	7	l		4		
	果	WHITE	١,	Щ	11 12	
표	Ϋ́	₹		က	10	
ш.	_	_		2	თ	
No.	Vame	Solor		-	8	



4 5 6 7	Signal N	I	1	1
8 9 10 10 10 10 10 10 10 10 10 10 10 10 10	Color of Wire	В	0	GR
H.S.	Terminal No.	-	2	3
	S. 8 9 10 11 12 13 14 5	Sol	Solo   Solo	

Connector No.	B156
Connector Name MODE DOOR MOTOR (REA	MODE DOOR MOTOR (REAR)
Connector Color   BLACK	BLACK
崎 H.S.	2 3 4 4 5 6

9019	MODE DOOR MOTOR (REAR)	BLACK	2 3 4 5 6
ormector No.	onnector Name	onnector Color	H.S.

	_		_		
Signal Name	I	I	-	-	_
Color of Wire	<b>\</b>	R/Y	Ь	GR/R	$\Gamma \lambda$
Terminal No. Wire	-	2	3	2	9

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6 2 4 C C C C C C C C C C C C C C C C C C		A E
MIRE 6 5 4 17 16 15	Signal Name	(
1101811	Color of Wire O/R	
Connector No. Connector Color Connector Color H.S.	Terminal No.	E
		F
MTROL	Signal Name	(
R108 REAR AIR CONTROL (FRONT) BLACK		
ctor No.		H
Conne	Terminal No Connector Nar Connector Col	,
		ŀ
VIRE	REAR AIR CONTROL (REAR)  BLACK  C Signal Name  C Signal Name  C Signal Name  C C C C C C C C C C C C C C C C C C C	l
PH101  WHIRE  WHITE    2   3     4   5   6   7   1   1   1   1   1   1   1   1   1	PEAR Alf (REAR) or of (REAR) or of (REAR) and or of (REAR	N
nector No.	minal No.  Minal No.  S. S	ľ
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# AIR CONDITIONER CONTROL

# SYMPTOM DIAGNOSIS

# AIR CONDITIONER CONTROL

# Symptom Matrix Chart

### INFOID:0000000006145469

# SYMPTOM TABLE

Symptom	Reference Page	
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System.	HAC-85
A/C system display is malfunctioning. (W NAVI)	Go to Navigation System.	AV-323
A/C system display is malfunctioning. (W/O NAVI)	Go to Display System.	<u>AV-131</u>
A/C system cannot be controlled.	Go to Self-diagnosis Function.	HAC-23
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor.	HAC-26
Mode door motor is malfunctioning.	Go to Houble Diagnosis Flocedure for wode Door Wotor.	<u>HAC-20</u>
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor.	HAC-31
Air mix door motor is malfunctioning.	Go to Houble Diagnosis Flocedure for All Mix Door Motor.	<u> </u>
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor.	HAC-40
Intake door motor is malfunctioning.	Go to Houble Diagnosis Flocedule for Ilitake Door Wotor.	<u> 11AC-40</u>
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.	HAC-43
Front blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Front Blower Motor.	HAC-48
Rear blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Rear Blower Motor.	HAC-53
Rear discharge air temperature and/or air outlet does not change.	Go to Trouble Diagnosis Procedure for Rear Air Control circuit.	<u>HAC-58</u>
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch.	HAC-67
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HAC-107
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating.	HAC-115
Noise	Go to Trouble Diagnosis Procedure for Noise.	HAC-117
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis.	<u>HAC-85</u>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function.	HAC-119

# **INSUFFICIENT COOLING**

<	SYN	IPTOM	DIAG	NOSIS >

YES >> GO TO 9.

# [AUTOMATIC AIR CONDITIONER]

# INSUFFICIENT COOLING Α Component Function Check INFOID:0000000006145470 SYMPTOM: Insufficient cooling INSPECTION FLOW 1.confirm symptom by performing operational check - temperature decrease Press the AUTO switch. Turn temperature control dial (driver) counterclockwise until 18°C (60°F) is displayed. Check for cold air at discharge air outlets. D Can the symptom be duplicated? YES >> GO TO 3. NO >> GO TO 2. Е $\mathbf{2}.$ CHECK FOR ANY SYMPTOMS Perform a complete operational check for any symptoms. Refer to HAC-4, "Operational Check (Front)". Does another symptom exist? YFS >> Refer to HAC-106, "Symptom Matrix Chart". >> System OK. NO 3.CHECK FOR SERVICE BULLETINS Check for any service bulletins. Н >> GO TO 4. 4. PERFORM SELF-DIAGNOSIS HAC Perform self-diagnosis Refer to HAC-23, "A/C Auto Amp. Self-Diagnosis". Is the inspection result normal? YES >> GO TO 5. NO >> Refer to HAC-24, "A/C System 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-31, "Air Mix Door Motor (Driver) Component Function Check". Does air mix door operate correctly? YES >> GO TO 7. Ν NO >> Check air mix door motor circuit. Refer to HAC-31, "Air Mix Door Motor (Driver) Diagnosis Procedure" or HAC-35, "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-445, "Component Inspection". Does cooling fan motor operate correctly? Р YES >> GO TO 8. NO >> Check cooling fan motor. Refer to EC-444, "Diagnosis Procedure". 8.CHECK WATER VALVE OPERATION Check and verify water valve for smooth operation. Refer to HAC-72, "Description". Does water valve operate correctly?

Revision: July 2010 HAC-107 2011 Armada

# **INSUFFICIENT COOLING**

# < SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

NO >> Check water valve circuit. Refer to <u>HAC-72</u>, "Water Valve Diagnosis Procedure".

# 9.CHECK RECOVERY/RECYCLING EQUIPMENT BEFORE USAGE

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

>> GO TO 10.

# 10. CHECK REFRIGERANT PURITY

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

## Is the inspection result normal?

YES >> GO TO 11.

NO >> Check contaminated refrigerant. Refer to HAC-121, "Working with HFC-134a (R-134a)".

# 11. CHECK FOR EVAPORATOR FREEZE UP

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

# Does evaporator freeze up?

YES >> Perform performance test diagnoses. Refer to <u>HAC-108</u>, "<u>Diagnostic Work Flow</u>".

NO >> GO TO 12.

# 12. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to <u>HAC-111</u>, "<u>Performance Chart</u>". Is the inspection result normal?

YES >> Perform performance test diagnoses. Refer to <u>HAC-108</u>, "Diagnostic Work Flow".

NO >> GO TO 13.

# 13. CHECK AIR DUCTS

Check ducts for air leaks.

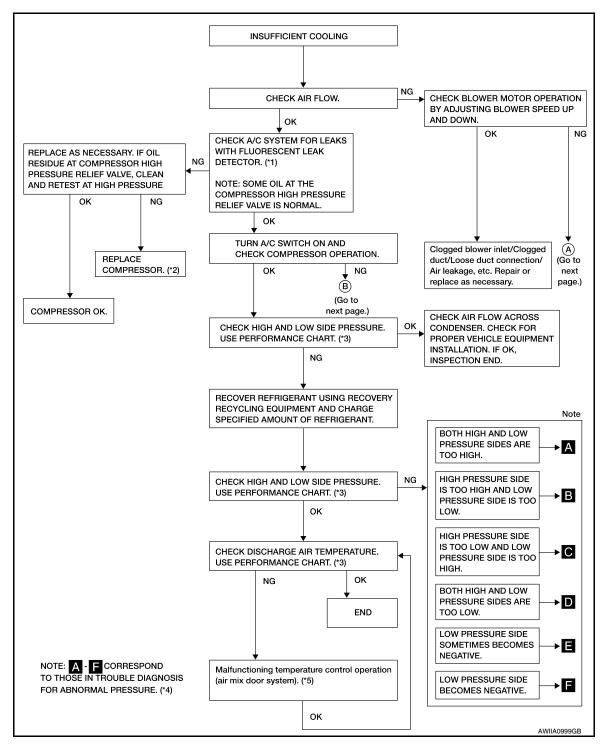
## Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

# Diagnostic Work Flow

INFOID:0000000006145471



- Using the Fluorescent Dye Leak De-
- \*4 normal Pressure"
- \*1 HA-24, "Checking System for Leaks \*2 HA-31, "Removal and Installation for \*3 HAC-111, "Performance Chart" Compressor"
  - HAC-112, "Trouble Diagnoses for Ab- \*5 HAC-31, "Air Mix Door Motor (Driver) Component Function Check"

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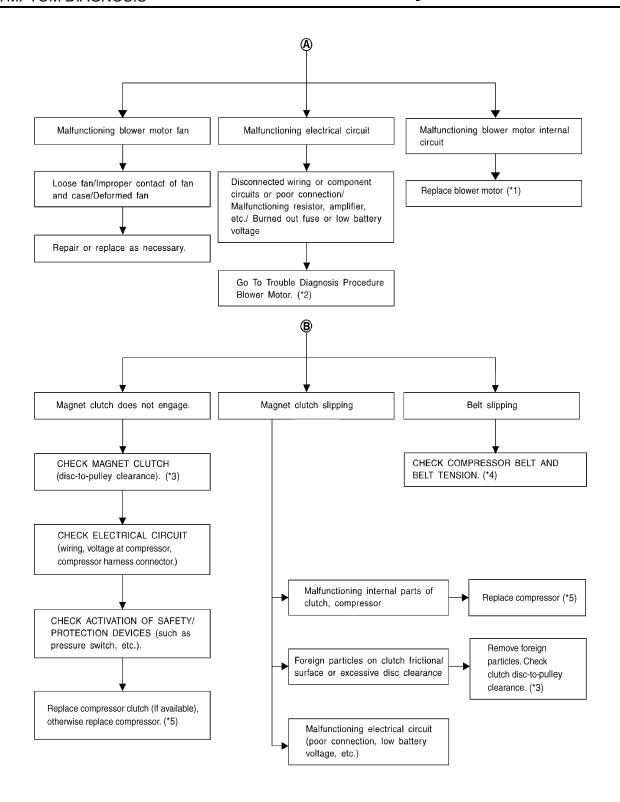
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\*1 VTL-13, "Removal and Installation"

EM-13, "Checking Drive Belts"

- \*2 HAC-48, "Front Blower Motor Component Function Check"
- \*5 HA-31, "Removal and Installation for Compressor"
- \*3 HA-32, "Removal and Installation for Compressor Clutch"

### **INSUFFICIENT COOLING**

### < SYMPTOM DIAGNOSIS >

# [AUTOMATIC AIR CONDITIONER]

# Performance Chart

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### **TEST CONDITION**

Testing must be performed as follows:

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

### **TEST READING**

Recirculating-to-discharge Air Temperature Table

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

# Ambient Air Temperature-to-operating Pressure Table

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

Revision: July 2010 HAC-111 2011 Armada

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# Trouble Diagnoses for Abnormal Pressure

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

Both High- and Low-pressure Sides are Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until speci- fied pressure is obtained.
Α	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance ↓  1. Condenser fins are clogged. 2. Improper fan rotation of cooling fan	Clean condenser. Check and repair cooling fan if necessary.
Both high- and low-pressure sides are too high.	<ul> <li>Low-pressure pipe is not cold.</li> <li>When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter.</li> </ul>	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 mal- function.	Check and repair engine cooling system.
	<ul> <li>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</li> <li>Plates are sometimes covered with frost.</li> </ul>	<ul> <li>Excessive liquid refrigerant on low-pressure side</li> <li>Excessive refrigerant discharge flow</li> <li>Expansion valve is open a little compared with the specification.</li> <li>Improper expansion valve adjustment</li> </ul>	Replace expansion valve.

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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too high and low-pressure side is too low.	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	<ul> <li>Check and repair or replace malfunctioning parts.</li> <li>Check oil for contamination.</li> </ul>

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

### **INSUFFICIENT COOLING**

# [AUTOMATIC AIR CONDITIONER]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high.	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper.  Understand the compressor packings.	Replace compressor.
(IO) HI)  AC356A	No temperature difference between high- and low-pressure sides.	Compressor pressure operation is improper.  ↓ Damaged inside compressor packings.	Replace compressor.
oth High- and Low-pressure S	Sides are Too Low		
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low.	There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted.	Liquid tank inside is slightly clogged.	<ul><li>Replace liquid tank.</li><li>Check oil for contamination.</li></ul>
	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> <li>Check and repair malfunctioning parts.</li> <li>Check oil for contamination.</li> </ul>
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge.  ↓ Leaking fittings or components.	Check refrigerant system for leaks. Refer to HA-24, "Checking of Refrigerant Leaks".
	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> <li>Remove foreign particles by using compressed air.</li> <li>Check oil for contamination.</li> </ul>
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul><li>Check and repair malfunctioning parts.</li><li>Check oil for contamination.</li></ul>
	Air flow volume is too low.	Evaporator is frozen.	<ul> <li>Check intake sensor circuit.         Refer to HAC-82, "Intake         Sensor Diagnosis Procedure".</li> <li>Repair evaporator fins.</li> <li>Replace evaporator.</li> <li>Refer to HAC-48, "Front Blower Motor Component Function Check".</li> </ul>

Low-pressure Side Sometimes Becomes Negative

# **INSUFFICIENT COOLING**

# [AUTOMATIC AIR CONDITIONER]

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative.	<ul> <li>Air conditioning system does not function and does not cy- clically cool the compart- ment air.</li> <li>The system constantly func- tions for a certain period of time after compressor is stopped and restarted.</li> </ul>	Refrigerant does not discharge cyclically.   Moisture is frozen at expansion valve outlet and inlet.  Water is mixed with refrigerant.	Drain water from refrigerant or replace refrigerant.     Replace liquid tank.

### Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative.	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.  If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant.  If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air).  If either of the above methods cannot correct the malfunction, replace expansion valve.  Replace liquid tank.

### **INSUFFICIENT HEATING**

<	SYN	IPTOM	DIAG	NOSIS >

#### [AUTOMATIC AIR CONDITIONER]

#### INSUFFICIENT HEATING Α Component Function Check INFOID:0000000006145474 SYMPTOM: Insufficient heating INSPECTION FLOW ${f 1.}$ CONFIRM SYMPTOM BY PERFORMING OPERATIONAL CHECK - TEMPERATURE INCREASE Press the AUTO switch. Turn the temperature control dial (driver) clockwise until 32°C (90°F) is displayed. Check for hot air at discharge air outlets. D Can this symptom be duplicated? YES >> GO TO 2. NO >> Perform complete system operational check. Refer to <a href="HAC-4">HAC-4</a>, "Operational Check (Front)". Е 2.CHECK FOR SERVICE BULLETINS Check for any service bulletins. >> GO TO 3. 3.PERFORM SELF-DIAGNOSIS Perform self-diagnosis. Refer to HAC-23, "A/C Auto Amp. Self-Diagnosis". Is the inspection results normal? Н YES >> GO TO 4. NO >> Refer to HAC-24, "A/C System Self-Diagnosis Code Chart". 4. CHECK ENGINE COOLING SYSTEM HAC Check for proper engine coolant level. Refer to CO-10, "Inspection". Check hoses for leaks or kinks. 2. Check radiator cap. Refer to CO-10, "Inspection". Check for air in cooling system. >> GO TO 5. K $oldsymbol{5}.$ 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-31, "Air Mix Door Motor (Driver) Component Function Check". M **6.**CHECK AIR DUCTS Check for disconnected or leaking air ducts. N Is the inspection result normal? YES >> GO TO 7. NO >> Repair all disconnected or leaking air ducts. 7.CHECK HEATER HOSE TEMPERATURES Start engine and warm it up to normal operating temperature. Touch both the inlet and outlet heater hoses. The inlet hose should be hot and the outlet hose should be 2. 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

### **INSUFFICIENT HEATING**

#### < SYMPTOM DIAGNOSIS >

#### [AUTOMATIC AIR CONDITIONER]

Check engine coolant temperature sensor. Refer to EC-179, "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

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

#### Is the inspection result normal?

YES >> System OK.

NO >> Replace heater core. Refer to VTL-25, "Removal and Installation".

# 11. CHECK WATER VALVE

Check the operation of the water valve. Refer to HAC-72, "Water Valve Diagnosis Procedure".

### Is the inspection result normal?

YES >> System OK.

NO >> Replace water valve.

#### [AUTOMATIC AIR CONDITIONER] < SYMPTOM DIAGNOSIS > **NOISE** Α Component Function Check INFOID:0000000006145475 SYMPTOM: Noise В INSPECTION FLOW 1. Confirm symptom by performing the following operational check. If OK (symptom can not be duplicated), perform complete operational check (\*1). If NG (symptom is confirmed), continue with STEP-2 following. D 2. Check for any service bulletins. Е 3. Check where noise comes from. 4. Check compressor belt and belt tension. NG (\*2) OK 5. Check refrigerant high and low pressure. Use performance chart. (\*3) Blower motor Compressor Expansion valve Refrigerant line Belt Н Inspect the com-Check for noise in Replace expansion pressor clutch all modes and valve. (\*4) temperature and pulley and HAC idler pulley. settings. Noise is OK NG constant Replace com-Check blower Check for The line is not The line is fixed pressor clutch motor for forrefrigerant directly to the body. fixed. eign particles. line-to-compressor and pulley or idler pulley (\*5) interference. Fix the line tightly. Check blower Check disc-to-pulley Fix the line with motor and fan clearance. (\*6) rubber or some for wear. vibration absorb-OK ing material. Check torque of compressor mounting bolts. (\*7) Ν OK Check and adjust Loose Belt Side of belt is worn compressor oil. out. (\*8)OK Р Noise is

(\*2)

intermittent.

Check air discharge

ducts for obstructions, foreign materials or air leakage. Replace compressor (\*7)

and liquid tank. (\*9)

Re-adjust belt tension.

Inspect and repair

AWIIA1001GB

pulley alignment.

### **NOISE**

### [AUTOMATIC AIR CONDITIONER]

- \*1 HAC-4, "Operational Check (Front)" \*2 EM-13, "Checking Drive Belts" or HAC-5, "Operational Check (Rear)"
- Front Expansion Valve"
- Compressor"
- \*4 HA-47, "Removal and Installation for \*5 HA-32, "Removal and Installation for \*6 HA-32, "Removal and Installation for Compressor Clutch"
- \*7 HA-31, "Removal and Installation for \*8 HA-22, "Maintenance of Oil Quantity \*9 HA-44, "Removal and Installation for in Compressor"
- \*3 HAC-111, "Performance Chart"
  - Compressor Clutch"
  - Condenser"

### **MEMORY FUNCTION DOES NOT OPERATE**

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

#### MEMORY FUNCTION DOES NOT OPERATE Α Memory Function Check INFOID:0000000006145476 SYMPTOM: Memory function does not operate. INSPECTION FLOW 1.confirm symptom by performing operational check - memory function Set the temperature to 32°C (90°F). 2. Rotate the front blower control dial (driver) to turn system OFF. Turn ignition switch OFF. 3. D 4. Turn ignition switch ON. 5. Press the AUTO switch. 6. Confirm that the set temperature remains at previous temperature. 7. Rotate the front blower control dial (LH) to turn system OFF. Е Can the symptom be duplicated? YES >> GO TO 3. NO >> GO TO 2. F 2.PERFORM COMPLETE OPERATIONAL CHECK Perform a complete operational check and check for any symptoms. Refer to HAC-4, "Operational Check (Front)". Can a symptom be duplicated? >> Refer to HAC-3, "How to Perform Trouble Diagnosis For Quick And Accurate Repair". Н NO >> System OK. 3.CHECK FOR SERVICE BULLETINS HAC Check for any service bulletins. >> GO TO 4. 4.PERFORM SELF-DIAGNOSIS Perform self-diagnosis to check for any codes. Refer to HAC-23, "A/C Auto Amp. Self-Diagnosis". Are any self-diagnosis codes present? K >> Refer to HAC-24, "A/C System Self-Diagnosis Code Chart". YES NO >> GO TO 5. ${f 5.}$ CHECK POWER AND GROUND CIRCUIT L Check main power supply and ground circuit. Refer to HAC-85, "A/C Auto Amp. Component Function Check". Is the inspection result normal? M YES >> GO TO 6. NO >> Repair or replace as necessary. $\mathsf{6}.$ RECHECK FOR SYMPTOMS Ν Perform a complete operational check for any symptoms. Refer to HAC-4, "Operational Check (Front)". Does another symptom exist? 0 YES >> Refer to HAC-3, "How to Perform Trouble Diagnosis For Quick And Accurate Repair". >> Replace A/C Auto amp. Refer to VTL-8, "Removal and Installation". NO Р

# **PRECAUTION**

### **PRECAUTIONS**

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

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

#### **WARNING:**

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

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

#### **WARNING:**

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

Precaution Necessary for Steering Wheel Rotation After Battery Disconnect

INFOID:0000000006598632

#### NOTE:

- This Procedure is applied only to models with Intelligent Key system and NATS (NISSAN ANTI-THEFT SYS-TEM).
- Remove and install all control units after disconnecting both battery cables with the ignition knob in the "LOCK" position.
- Always use CONSULT-III to perform self-diagnosis as a part of each function inspection after finishing work. If DTC is detected, perform trouble diagnosis according to self-diagnostic results.

For models equipped with the Intelligent Key system and NATS, an electrically controlled steering lock mechanism is adopted on the key cylinder.

For this reason, if the battery is disconnected or if the battery is discharged, the steering wheel will lock and steering wheel rotation will become impossible.

If steering wheel rotation is required when battery power is interrupted, follow the procedure below before starting the repair operation.

### **OPERATION PROCEDURE**

1. Connect both battery cables.

#### NOTE:

Supply power using jumper cables if battery is discharged.

- 2. Use the Intelligent Key or mechanical key to turn the ignition switch to the "ACC" position. At this time, the steering lock will be released.
- Disconnect both battery cables. The steering lock will remain released and the steering wheel can be rotated.
- 4. Perform the necessary repair operation.

### **PRECAUTIONS**

#### < PRECAUTION >

#### [AUTOMATIC AIR CONDITIONER]

- 5. When the repair work is completed, return the ignition switch to the "LOCK" position before connecting the battery cables. (At this time, the steering lock mechanism will engage.)
- Perform a self-diagnosis check of all control units using CONSULT-III.

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

#### INFOID:0000000006145478

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#### **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 <a href="HA-4">HA-4</a>, "Contaminated Refrigerant". To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
- When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
- When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
- Only use the specified oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.
- Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment], If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.

### CONTAMINATED REFRIGERANT

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

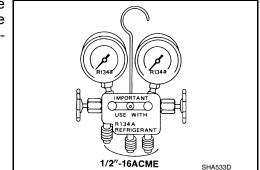
- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location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

# Precaution for Service Equipment

#### INFOID:0000000006145479

#### 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.



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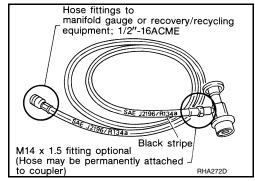
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Revision: July 2010 HAC-121 2011 Armada

#### SERVICE HOSES

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



#### SERVICE COUPLERS

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

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

