BALER & AIR CONDITIONING CONTROL SYSTEM

CONTENTS

AUTOMATIC AIR CONDITIONER

PRECAUTION6
PRECAUTIONS 6 Precaution for Supplemental Restraint System (SRS) "AIR BAG" and "SEAT BELT PRE-TEN-SIONER" SIONER" 6 Working with HFC-134a (R-134a) 6 Precaution for Service Equipment 7 Precaution for Work 7
PREPARATION9
PREPARATION 9 Special Service Tool 9 Commercial Service Tool 9 SYSTEM DESCRIPTION 10
STSTEM DESCRIPTION10
COMPONENT PARTS10Component Parts Location10Intake Sensor13Air Mix Door Motor LH14Air Mix Door Motor RH14Mode Door Motor14Intake Door Motor14Front Blower Motor14Variable Blower Control14A/C Compressor14A/C Auto Amp.15Water Valve (VK56VD)15PTC Heater (Cummins 5.0L)15Ambient Sensor16In-vehicle Sensor16Refrigerant Pressure Sensor16
SYSTEM18System Description18Temperature Control19Air Outlet Control19

Air Flow Control	F
Door Control	G
OPERATION	Н
DIAGNOSIS SYSTEM (A/C AUTO AMP.)29 CONSULT Function (HVAC)	HA
ECU DIAGNOSIS INFORMATION31	
A/C AUTO AMP	J
ECM, IPDM E/R, BCM35 List of ECU Reference35	Κ
WIRING DIAGRAM36	L
AUTOMATIC AIR CONDITIONING SYSTEM 36	
CUMMINS 5.0L	Μ
VK56VD	Ν
BASIC INSPECTION55	
DIAGNOSIS AND REPAIR WORKFLOW55 Work Flow	0
OPERATION INSPECTION	Ρ
CONFIGURATION (HVAC)	
61 SYSTEM SETTING61 Temperature Setting Trimmer	

А

В

С

D

Ε

Foot Position Setting Trimmer Inlet Port Memory Function (FRE) Inlet Port Memory Function (REC)	. 61 . 61 . 62
DTC/CIRCUIT DIAGNOSIS	. 63
U1000 CAN COMM CIRCUIT	. 63
DTC Description	. 63
Diagnosis Procedure	63
U1010 CONTROL UNIT (CAN)	. 64
DIC Description	. 64 64
	. 04
U1321 CONFIGURATION	. 65
Dic Description	. 65 65
B25/8, B25/9 IN-VEHICLE SENSOR	. 66 66
Diagnosis Procedure	. 66 . 66
Component Inspection	. 68
B257B B257C AMBIENT SENSOR	69
DTC Description	. 69
Diagnosis Procedure	. 69
Component Inspection	. 71
B2581, B2582 INTAKE SENSOR	. 72
DTC Description	. 72
Diagnosis Procedure Component Inspection	. 72 . 74
B2630, B2631 SUNLOAD SENSOR	. 75
DTC Description	. 75
Diagnosis Procedure	. 75
	. 70
	70
DTC Description	. 70 . 78
Diagnosis Procedure	. 78
B2634, B2635 AIR MIX DOOR MOTOR (PAS-	
DTC Description	. 80 80
Diagnosis Procedure	. 80 . 80
B2636 B2637 B2638 B2639 B2654 B2655	
MODE DOOR MOTOR	. 82
DTC Description	. 82
Diagnosis Procedure	. 83
B263D, B263E, B263F INTAKE DOOR MO-	. 84
DTC Description	. 84
Diagnosis Procedure	. 84
B2796 CONTROL COMMUNICATION	. 86
DTC Description	. 86
Diagnosis Procedure	. 86

POWER SUPPLY AND GROUND CIRCUIT 88
A/C AUTO AMP
AIR MIX DOOR MOTOR (DRIVER SIDE)
AIR MIX DOOR MOTOR (PASSENGER SIDE) 89 AIR MIX DOOR MOTOR (PASSENGER SIDE) : Diagnosis Procedure
MODE DOOR MOTOR
INTAKE DOOR MOTOR
A/C SWITCH ASSEMBLY
A/C SWITCH ASSEMBLY : Diagnosis Procedure 93
DOOR MOTOR
DOOR MOTOR COMMUNICATION CIRCUIT 96 Diagnosis Procedure
FRONT BLOWER MOTOR98Diagnosis Procedure98Component Inspection (Front Blower Motor)101Component Inspection (Front Blower Relay)101
MAGNET CLUTCH102Component Function Check102Diagnosis Procedure102
WATER VALVE CIRCUIT
PTC HEATER RELAY105Description105Component Function Check105Diagnosis Procedure105Component Inspection106
PTC HEATER
SYMPTOM DIAGNOSIS109
HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS
INSUFFICIENT COOLING
INSUFFICIENT HEATING113

Description	113
Diagnosis Procedure	113
COMPRESSOR DOES NOT OPERATE	115
Description	115
Diagnosis Procedure	115
REMOVAL AND INSTALLATION	117
A/C SWITCH ASSEMBLY	117
Exploded View	117
Removal and Installation	117
A/C AUTO AMP.	118
Exploded View	118
Removal and Installation	118
AMBIENT SENSOR	119
Removal and Installation	119
IN-VEHICLE SENSOR	120 120
SUNLOAD SENSOR	121
Removal and Installation	121
INTAKE SENSOR	122
Removal and Installation	122
REFRIGERANT PRESSURE SENSOR	123 123
DOOR MOTOR	124
Exploded View	124
INTAKE DOOR MOTOR INTAKE DOOR MOTOR : Removal and Installa- tion	125 125
MODE DOOR MOTOR	125 125
AIR MIX DOOR MOTOR AIR MIX DOOR MOTOR : Removal and Installa- tion - Air Mix Door Motor LH AIR MIX DOOR MOTOR : Removal and Installa- tion - Air Mix Door Motor RH	125 125 126
FRONT BLOWER MOTOR	127 127
COMPRESSOR	128
Removal and Installation	128
PTC HEATER	129
Removal and Installation	129
VARIABLE BLOWER CONTROL Exploded View Removal and Installation MANUAL AIR CONDITIONER	130 130 130
PRECAUTION	132

PRECAUTIONS	. 132	
Precaution for Supplemental Restraint System		
SIONER"	132	
Working with HFC-134a (R-134a)	.132	
Precaution for Service Equipment	.133	
Precaution for Work	.133	
PREPARATION	. 135	
PREPARATION	. 135	
Special Service Tool	. 135	
Commercial Service Tool	. 135	
SYSTEM DESCRIPTION	136	
COMPONENT PARTS	. 136	
Component Parts Location	.136	
Intake Sensor	.139	
Alf MIX Door Motor	.139	
Intake Door Motor	140	
Front Blower Motor	.140	
Variable Blower Control	. 140	
A/C Compressor	. 140	
Water Valve (VK56VD)	.141	
PTC Heater Control (Cummins 5.0L)	.141	
Ambient Sensor (Cummins 5.0L)	. 14 1 142	
Refrigerant Pressure Sensor	.142	
OVOTEN		
System Description	. 143	
Temperature Control	. 143 144	
Air Outlet Control	.144	
Air Flow Control	. 144	
Air Inlet Control	. 144	
Compressor Control	.144	
Door Control	.145	
OPERATION	. 149	
Switch Name and Function	. 149	
DIAGNOSIS SYSTEM (HVAC)	151	
CONSULT Function (HVAC)	. 151	
	. 152	
COMMON ITEM	.152	
COMMON ITEM : CONSULT Function (BCM -		
COMMON ITEM)	.152	
AIR CONDITIONER	.153	
AIR CONDITIONER : CONSULT Function (BCM -		
AIR CONDITIONER)	. 153	
DIAGNOSIS SYSTEM (IPDM E/R)	. 155	
CONSULT Function (IPDM E/R)	. 155	
ECU DIAGNOSIS INFORMATION	. 157	
	157	
	. 15/	
:-3 2016 Titan N	AM	

Reference Value
PTC HEATER CONTROL UNIT 160 Reference Value
ECM, IPDM E/R, BCM 162 List of ECU Reference
WIRING DIAGRAM163
MANUAL AIR CONDITIONING SYSTEM 163
CUMMINS 5.0L
VK56VD
BASIC INSPECTION181
DIAGNOSIS AND REPAIR WORKFLOW 181 Work Flow
OPERATION INSPECTION
CONFIGURATION (HVAC)
DTC/CIRCUIT DIAGNOSIS187
U1000 CAN COMM CIRCUIT
DTC Description
U1010 CONTROL UNIT (CAN) 188
FRONT A/C CONTROL
PTC HEATER CONTROL UNIT
188 PTC HEATER CONTROL UNIT : Diagnosis Pro- cedure
B257B. B257C AMBIENT SENSOR
DTC Description190
Diagnosis Procedure
B2581, B2582 INTAKE SENSOR 193
DTC Description
Diagnosis Procedure
B2632, B2633 AIR MIX DOOR MOTOR
(DRIVER SIDE) 196
DTC Description
Diagnosis i roccuire

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR
Diagnosis Procedure
B263D, B263E, B263F INTAKE DOOR MO-
TOR200
DTC Description 200
Diagnosis Procedure 200
POWER SUPPLY AND GROUND CIRCUIT 202
FRONT A/C CONTROL 202
FRONT A/C CONTROL : Component Function
Check
FRONT A/C CONTROL : Diagnosis Procedure 202
AIR MIX DOOR MOTOR 203
AIR MIX DOOR MOTOR : Diagnosis Procedure . 203
MODE DOOR MOTOR
MODE DOOR MOTOR . Diagnosis i rocedure 204
INTAKE DOOR MOTOR 205
INTAKE DOOR MOTOR : Diagnosis Procedure . 205
PTC HEATER CONTROL UNIT : Diagnosis Pro-
cedure 206
200
DOOR MOTOR207
Diagnosis Procedure 207
Diagnosis Procedure 200
FRONT BLOWER MOTOR210
Diagnosis Procedure 210
Component Inspection (Front Blower Motor) 213
Component Inspection (Front Blower Relay) 213
Component Eurotion Check 214
Diagnosis Procedure 214
WATER VALVE CIRCUIT215
Description215
Diagnosis Procedure 215
Description 217
Component Function Check 217
Diagnosis Procedure 217
Component Inspection
PIC HEATER
Diagnosis Procedure 219
SYMPTOM DIAGNOSIS221
HEATER AND AIR CONDITIONING SYSTEM
CONTROL SYMPTOMS
Symptom Table
- /

INSUFFICIENT COOLING	223
Description	223
Diagnosis Procedure	223
INSUFFICIENT HEATING	225
Description	225
Diagnosis Procedure	225
	007
COMPRESSOR DOES NOT OPERATE	
Description	
Diagnosis Procedure	
REMOVAL AND INSTALLATION	229
FRONT AIR CONTROL	229
FRONT AIR CONTROL	229
FRONT AIR CONTROL Exploded View Removal and Installation	229 229 229
FRONT AIR CONTROL Exploded View Removal and Installation	229 229 229
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR	229 229 229 230
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR Removal and Installation	
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR Removal and Installation	229 229 229 230 230
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR Removal and Installation INTAKE SENSOR	
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR Removal and Installation INTAKE SENSOR Removal and Installation	
FRONT AIR CONTROL Exploded View Removal and Installation AMBIENT SENSOR Removal and Installation INTAKE SENSOR Removal and Installation	
FRONT AIR CONTROL	

DOOR MOTOR	233
Exploded View	.233
INTAKE DOOR MOTOR INTAKE DOOR MOTOR : Removal and Installa-	.234
tion	.234
MODE DOOR MOTOR MODE DOOR MOTOR : Removal and Installation	.234 .234
AIR MIX DOOR MOTOR AIR MIX DOOR MOTOR : Removal and Installa- tion - Air Mix Door Motor	. 234
	.204
FRONT BLOWER MOTOR	236
Removal and Installation	.236
COMPRESSOR	237
Removal and Installation	.237
	238
	238
Removal and Installation	.200
Removal and Installation	.200
Removal and Installation	.230 .239
PTC HEATER Removal and Installation VARIABLE BLOWER CONTROL Exploded View Removal and Installation	.230 . 239 .239 .239
PIC HEATER Removal and Installation VARIABLE BLOWER CONTROL Exploded View Removal and Installation	.239 .239 .239 .239

HAC

J

Κ

L

M

Ν

0

Ρ

< PRECAUTION >

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. 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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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 Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.

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

INFOID:000000012545448

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to <u>HA-17</u>, "<u>Description</u>". To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
- When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
- When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
- Only use the specified oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.
- Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment], If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.

CONTAMINATED REFRIGERANT

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

• Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.

PRECAUTIONS

< PRECAUTION >

[AUTOMATIC AIR CONDITIONER]

А

В

D

Ε

INFOID:000000012545449

- 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

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.



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



Precaution for Work

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.



PRECAUTIONS

< PRECAUTION >

- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:
- Water soluble dirt:
- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.
- Oily dirt:
- Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
- Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

PREPARATION

PREPARATION

Special Service Tool

INFOID:000000013163885 B

[AUTOMATIC AIR CONDITIONER]

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name	Description	C
	Removing trim components	
(J-46534) Trim Tool Set		E
		— F

Commercial Service Tool

INFOID:000000013163886

Tool name		Description	G
Power tool		Loosening nuts, screws and bolts	
			Н
			HAC
	PIIB1407E		
			1

Κ

L

Μ

Ν

Ο

Ρ

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION COMPONENT PARTS

Component Parts Location

INFOID:000000012923333

CUMMINS 5.0L



< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

from vehicle)

Α. Relay box Β. View with grille removed C. Behind LH center of instrument panel А (view with A/C assembly removed from vehicle) D. Center of instrument panel Ε. Behind RH center of instrument panel F. Behind RH side of instrument panel В (view with A/C assembly removed from (view with A/C assembly removed

vehicle)

No.	Component	Description
1.	IPDM E/R	 A/C relay is integrated into IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line. Refer to <u>PCS-5. "Component Parts Location"</u> for detailed installation location.
2.	ECM	 The ECM sends an A/C compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the A/C compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the A/C auto amp. via CAN communication line. Refer to EC-34, "Component Parts Location" for detailed installation location.
3.	A/C compressor	Refer to HAC-14, "A/C Compressor".
4.	Sunload sensor	Refer to HAC-16, "Sunload Sensor".
5.	ВСМ	 BCM transmits blower motor ON signal to the front blower motor relay. Refer to <u>BCS-5, "BODY CONTROL SYSTEM : Component Parts Location"</u> for detailed installation location.
6.	In-vehicle sensor	Refer to HAC-16, "In-vehicle Sensor".
7.	Fuse block (J/B) (Front blower mo- tor relay)	 Located in the passenger compartment behind the instrument panel RH, the fuse block (J/B) contains the front blower motor relay and several fuses required for the air conditioner control system. The front blower motor relay controls the flow of current to fuse 17 and 27 in the fuse block (J/B). The relay is connected directly to ground and is controlled by the BCM.
8.	PTC relay-2	Refer to HAC-15, "PTC Heater (Cummins 5.0L)".
9.	PTC relay-3	Refer to HAC-15, "PTC Heater (Cummins 5.0L)".
10.	PTC relay-1	Refer to HAC-15, "PTC Heater (Cummins 5.0L)".
11.	Ambient sensor	Refer to HAC-16, "Ambient Sensor".
12.	Refrigerant pressure sensor	Refer to HAC-16, "Refrigerant Pressure Sensor".
13.	Air mix door motor LH	Refer to HAC-14, "Air Mix Door Motor LH".
14.	PTC heater	Refer to HAC-15, "PTC Heater (Cummins 5.0L)".
15.	A/C switch assembly	A/C control operation signal is transmitted from the A/C switch assembly to the A/C auto amp.
16.	A/C auto amp.	Refer to HAC-15, "A/C Auto Amp.".
17.	Mode door motor	Refer to <u>HAC-14</u> , "Mode Door Motor".
18.	Air mix door motor RH	Refer to HAC-14, "Air Mix Door Motor RH".
19.	Intake sensor	Refer to HAC-13, "Intake Sensor".
20.	Intake door motor	Refer to HAC-14, "Intake Door Motor".
21.	Variable blower control	Refer to HAC-14, "Variable Blower Control".
22.	Front blower motor	Refer to HAC-14, "Front Blower Motor".

VK56VD



A. Water valve

- B. View with grille removed
- D. Center of instrument panel
- E. Behind RH center of instrument panel F. (view with A/C assembly removed from vehicle)
- C. Behind LH center of instrument panel (view with A/C assembly removed from vehicle)
 - Behind RH side of instrument panel (view with A/C assembly removed from vehicle)

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

1. II 2. E 3. A 4. S 5. E	PDM E/R ECM A/C compressor Sunload sensor	 A/C relay is integrated into IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line. Refer to PCS-5, "Component Parts Location" for detailed installation location. The ECM sends an A/C compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the A/C compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the A/C auto amp. via CAN communication line. Refer to EC-34, "Component Parts Location" for detailed installation location. Refer to HAC-14, "A/C Compressor".
2. E 3. A 4. S	ECM A/C compressor Sunload sensor	 The ECM sends an A/C compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the A/C compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the A/C auto amp. via CAN communication line. Refer to EC-34, "Component Parts Location" for detailed installation location. Refer to HAC-14, "A/C Compressor". Refer to HAC-16, "Sunload Sensor".
3. A 4. S	A/C compressor Sunload sensor	Refer to HAC-14. "A/C Compressor". Refer to HAC-16. "Sunload Sensor". a. RCM transmits blower meter CNL signal to the front blower meter relay.
4. S	Sunload sensor	Refer to <u>HAC-16</u> , "Sunload Sensor".
5. E	BCM	 DCM transmits blower mater CN signal to the fract blower mater relation
	50m	 Refer to <u>BCS-5</u>, "<u>BODY CONTROL SYSTEM</u>: Component Parts Location" for de- tailed installation location.
6. Ir	n-vehicle sensor	Refer to HAC-16, "In-vehicle Sensor".
7. F	Fuse block (J/B) (Front blower mo- or relay)	 Located in the passenger compartment behind the instrument panel RH, the fuse block (J/B) contains the front blower motor relay and several fuses required for the air conditioner control system. The front blower motor relay controls the flow of current to fuse 17 and 27 in the fuse block (J/B). The relay is connected directly to ground and is controlled by the BCM.
8. V	Water valve	Refer to HAC-15. "Water Valve (VK56VD)".
9. A	Ambient sensor	Refer to HAC-16. "Ambient Sensor".
10. F	Refrigerant pressure sensor	Refer to HAC-16, "Refrigerant Pressure Sensor".
11. A	Air mix door motor LH	Refer to HAC-14, "Air Mix Door Motor LH".
12. A	A/C switch assembly	A/C control operation signal is transmitted from the A/C switch assembly to the A/C auto amp.
13. A	A/C auto amp.	Refer to HAC-15, "A/C Auto Amp.".
14. N	Mode door motor	Refer to HAC-14, "Mode Door Motor".
15. A	Air mix door motor RH	Refer to HAC-14, "Air Mix Door Motor RH".
16. lı	ntake sensor	Refer to HAC-13. "Intake Sensor".
17. lr	ntake door motor	Refer to HAC-14, "Intake Door Motor".
18. V	Variable blower control	Refer to HAC-14, "Variable Blower Control".
19. F	Front blower motor	Refer to HAC-14, "Front Blower Motor".

Intake Sensor

Intake sensor measures evaporator fin temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



INFOID:000000012923334

Ο

< SYSTEM DESCRIPTION >

Air Mix Door Motor LH

- Air mix door motor LH consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with A/C auto amp. Refer to <u>HAC-22</u>, "Door Control".
- Rotation of motor is transmitted to air mix door LH by link and lever. Air flow temperature is switched.

Air Mix Door Motor RH

- Air mix door motor RH consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with A/C auto amp. Refer to <u>HAC-22</u>, "<u>Door Control</u>".
- Rotation of motor is transmitted to air mix door RH by link and lever. Air flow temperature is switched.

Mode Door Motor

- Mode door motor consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door
 position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with A/C auto
 amp. Refer to <u>HAC-22, "Door Control"</u>.
- Rotation of motor is transmitted to mode door (ventilator door, foot door, and defroster door) by link and lever. Air outlet is switched.

Intake Door Motor

- Intake door motor consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door
 position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with A/C auto
 amp. Refer to <u>HAC-22. "Door Control"</u>.
- Rotation of motor is transmitted to intake door by lever. Air inlet is switched.

Front Blower Motor

- The blower motor utilizes a brush-less motor with a rotating magnet.
- Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



INFOID:000000013089618

Variable Blower Control

The variable blower control controls the speed of the blower motor by controlling the ground circuit of the front blower motor. The A/C auto amp. provides voltage to the gate of the variable blower control based on the position of the blower control dial. The variable blower control is a metal-oxide semiconductor field effect transistor (MOS-FET) that varies the ground side current of the front blower motor. By applying a variable voltage to the gate, the variable blower control controls the current flow to ground, thereby controlling the speed of the front blower motor.



A/C Compressor

Vaporized refrigerant is drawn into the A/C compressor from the evaporator where it is compressed to a highpressure, high-temperature vapor. The hot compressed vapor is then discharged to the condenser.

MAGNET CLUTCH

Revision: March 2016



2016 Titan NAM

INFOID-000000012923340

INFOID:000000012923335

INFOID:000000012923336

INFOID:000000012923337

INFOID:000000012923338

< SYSTEM DESCRIPTION >

Description

A/C compressor is driven by the magnet clutch which is magnetized by electric power supply.

Structure and Operation

- Magnet clutch consists of pulley, clutch disc, and field coil.
- Pulley is connected with crankshaft pulley of engine via drive belt and is always rotated while engine is running.
- Clutch disc is connected with driveshaft of A/C compressor.
- Field coil, which becomes a strong electric magnet when electricity is supplied, strongly pulls clutch disc and presses it to pulley.
- When A/C relay integrated in IPDM E/R turns ON, electricity is supplied to field coil, clutch disc is presses to pulley, and engine rotational movement is transmitted from crankshaft pulley ⇒ drive belt ⇒ pulley ⇒ clutch disc ⇒ driveshaft. A/C compressor is operated. When A/C relay turns OFF, electricity is not supplied to field coil, and clutch disc is released from pulley. A/C compressor is not operated.

A/C Auto Amp.

A/C auto amp. controls automatic air conditioning system by inputting and calculating signals from each sensor and each switch.

Water Valve (VK56VD)

The water valve 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 front air control.

PTC Heater (Cummins 5.0L)

- PTC stands for "Positive Temperature Coefficient" and is a ceramic material with barium titanate as the primary component.
- The positive temperature coefficient (PTC) heater provides supplemental heat by warming the air as it flows through its electrically controlled heating grid.
- The PTC relays control the flow of current to the PTC heater. The PTC relays are controlled by the A/C auto amp.







INFOID:000000013088789



А

D

K

M

N

Ρ

INFOID-000000012923341

Ambient Sensor

Ambient sensor measures ambient air temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

18 16.50 16 G14 Resistance (9.92 6.19 3.99 2.65 .19 1.81 1.27 -20 -10 0 10 20 25 30 40 (°C) -4 -14 32 50 68 77 86 104 [°F] Temperature

[AUTOMATIC AIR CONDITIONER]

Ambient sensor characteristics

In-vehicle Sensor

In-vehicle sensor measures temperature of intake air that flows through aspirator to passenger room. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.

Sunload Sensor

Sunload sensor measures sunload amount. This sensor converts sunload amount to voltage signal by photodiode and transmits it to A/C auto amp.

Refrigerant Pressure Sensor

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

9.92 6.19 3.99 2.65 2.19 27 -10 -20 0 20 25 30 40 (°C) 10 -4 -14 32 50 68 77 86 104 [°F] Temperature TMT TA172 INFOID:000000012923344 Sunload sensor characteristic 5 3.75

In-vehicle sensor characteristics

18

16

G14 €12

Resistance (

ſ

16.50



INFOID:000000012923345

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection area and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

Н

А

С

D

Ε

F

HAC

J

Κ

Μ

Ν

Ο

Ρ

SYSTEM

System Description

INFOID:000000012923209

[AUTOMATIC AIR CONDITIONER]

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

 Front automatic air conditioning system is controlled by each function of A/C auto amp., ECM, IPDM E/R and BCM.

Control by A/C auto amp.

- HAC-20, "Air Flow Control"
- HAC-21, "Air Inlet Control"
- HAC-19, "Air Outlet Control"

HAC-21, "Compressor Control"

HAC-22, "Door Control" -

HAC-19, "Temperature Control"

- Correction for input value of each sensor

Ambient sensor (setting temperature correction)

 A/C auto amp. controls passenger room temperature so that the optimum level always matches the temperature level that the passenger may feel. Correction is applied to the target temperature that is set using temperature control dial according to ambient temperature detected by ambient sensor.

In-vehicle sensor (in-vehicle temperature correction)

 Passenger room temperature detected by in-vehicle sensor is corrected for each front air conditioning control (driver side and passenger side).

Intake sensor (intake temperature correction)

 A/C auto amp. performs correction to change recognition intake temperature of A/C auto amp. guickly when difference is large between recognition intake temperature and intake temperature detected by intake temperature sensor. The correction is performed to change recognition intake temperature slowly when difference is small.

Sunload sensor (sunload amount correction)

- Sunload amount detected by sunload sensor is corrected for each air conditioning control.
- A/C auto amp. performs correction to change recognition sunload amount of A/C auto amp. slowly when sunload amount changes quickly, for example when entering or exiting a tunnel.

Control by IPDM E/R

- Relay control

Control by BCM

 Relay control Refer to BCS-16, "POWER CONSUMPTION CONTROL SYSTEM : System Description".

Temperature Control

- When ignition switch is in the ON position, A/C auto amp. always automatically controls temperature regardless of front air conditioning operational state.
- A/C auto amp. calculates the target air mix door opening angle depending on set temperature, in-vehicle temperature, ambient temperature, and sunload.
- Air mix door is controlled depending on the comparison of current air mix door opening angle and target air mix door opening angle.
- Regardless of in-vehicle temperature, ambient temperature, and sunload, air mix door is fixed at the fully cold position when set temperature is 18.0°C (60°F) and at the fully hot position when set temperature is 32.0°C (90°F).

Air Outlet Control

- While air outlet is in automatic control, A/C auto amp. selects the mode door position depending on a target air mix door angle and outlet air temperature calculated from sunload.
- · If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.





INFOID:000000012923215

Ρ

Revision: March 2016

Н

А

В

D

Ε

F

Refer to PCS-6, "RELAY CONTROL SYSTEM : System Description".

< SYSTEM DESCRIPTION >

Air Flow Control

DESCRIPTION

- A/C auto amp. changes duty ratio of blower motor drive signal and controls air flow continuously. When air flow is increased, duty ratio of blower motor control signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control and automatic control, air flow control consists of starting fan speed control, low coolant temperature starting control, high in-vehicle temperature starting control and fan speed control at door motor operation

AUTOMATIC AIR FLOW CONTROL

- A/C auto amp. decides target air flow depending on target air mix door opening angle.
- A/C auto amp. changes duty ratio of blower motor control signal and controls the air flow continuously so that air flow matches the target air flow.
- When air outlet is VENT or B/L, the minimum air flow is changed depending on sunload.



STARTING AIR FLOW CONTROL

- When blower motor is activated, A/C auto amp. gradually increases duty ratio of blower motor control signal to prevent a sudden increase in discharge air flow.
- It takes approximately 8 seconds for air flow to reach HI from LOW.



LOW COOLANT TEMPERATURE STARTING CONTROL

If the engine coolant temperature is 56°C (133°F) or less, to prevent a cold discharged air flow, A/C auto amp. suspends blower motor activation for a maximum of 150 seconds depending on target air mix door opening angle. After this, blower motor control signal is increased gradually, and blower motor is activated.



HIGH IN-VEHICLE TEMPERATURE STARTING CONTROL

When front evaporator fin temperature is high [intake sensor value is 35°C (95°F) or more], to prevent a hot discharged air flow, A/C auto amp. suspends blower motor activation for approximately 3 seconds so that front evaporator is cooled by refrigerant.

FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When mode door motor is activated while air flow is more than the specified value, A/C auto amp. reduces fan speed temporarily so that mode door moves smoothly.

Air Inlet Control

The intake door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON/OFF operation of the compressor. Intake door automatic control selects FRE, 20% FRE, or REC depending on a target air mix door opening angle, based on in-vehicle temperature, ambient temperature, and sunload.

INFOID:000000012923211 FRESH 20% FRESH RECIRCULATION Cold Hot Target front air mix door opening angle

Compressor Control

INFOID:000000012923213

IMITA0732G

А

D

Ε

F

HAC

DESCRIPTION

- When the compressor activation condition is satisfied while blower motor is activated, A/C auto amp. transmits A/C ON signal and blower fan ON signal to ECM via CAN communication.
- · ECM judges that the compressor can be activated depending on the state of each sensor (refrigerant pressure sensor signal and others) and transmits A/C compressor request signal to IPDM E/R via CAN communication.
- IPDM E/R turns A/C relay ON and activates the compressor depending on request from ECM.

COMPRESSOR PROTECTION CONTROL AT PRESSURE MALFUNCTION

When high-pressure side value that is detected by refrigerant pressure sensor is as per the following state, Н ECM requests IPDM E/R to turn A/C relay OFF and stops the compressor.

- 3.12 MPa (31.82 kg/cm², 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm², 397.3 psi) or more (When the engine speed is 1,500 rpm or more)
- 0.14 MPa (1.43 kg/cm², 20.3 psi) or less

COMPRESSOR OIL CIRCULATION CONTROL

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

LOW TEMPERATURE PROTECTION CONTROL

- When intake sensor detects that front evaporator fin temperature is 2.5°C (37°F) or less, A/C auto amp. requests ECM to turn compressor OFF and stops the compressor.
- When the front evaporator fin temperature returns to 5.0°C (41°F) or more, the compressor is activated.



OPERATING RATE CONTROL

When set temperature is other than fully cold or air outlet is "VENT", "B/L" or "FOOT" A/C auto amp. controls the compressor activation depending on ambient temperature.

AIR CONDITIONING CUT CONTROL

Ρ When the engine is running in excessively high load condition, ECM requests IPDM E/R to turn A/C relay OFF and stops the compressor.

< SYSTEM DESCRIPTION >

Door Control

INFOID:000000012923214

[AUTOMATIC AIR CONDITIONER]

DOOR MOTOR CONTROL



- LCU (Local Control Unit) is built into each door motor, and detects door position by PBR (Potentio Balance Resistor).
- A/C auto amp. communicates with each LCU via communication line and receives each door position feedback signal from each LCU.
- Each LCU controls each door to the appropriate position depending on the control signal from A/C auto amp.
- Each LCU transmits the signal of door movement completion to A/C auto amp., when the door movement is completed.

SWITCHES AND THEIR CONTROL FUNCTION



[AUTOMATIC AIR CONDITIONER]



				Ventilato	Мах. сос	Defroste	Foot c	Intak	Driver	Passeng	F			
AUTO switch	AUTO switch - H-						AUTO							
		•	7	Α	Α	Α	А				(
MODE switch		;	i	В	В	Α	В							
MODE Switch		•	ن.		С	В	В							
		8		С	В	В	В		—	_	1			
DEF switch		ŧ		С	Α	С	С		4					
Intake switch [*]		6 5		_				Α						
								В			_			
	DUAL	Full [18°C	cold (60°F)]							A				
Temperature control switch (Driver side)	switch: OFF	18.5°C (61°F -	18.5°C – 31.5°C (61°F – 89 °F)						Al	JTO	-			
		Ful [32°C	Full hot [32°C (90°F)]							В				
		Full [18°C	Full cold [18°C (60°F)] 18.5°C – 31.5°C (61°F – 89 °F)		_	_	_	_	А					
Temperature control switch (Driver side)		18.5°C (61°F							AUTO	_	P			
	DUAL	Ful [32°C	Full hot [32°C (90°F)]						В		I			
	ON	Full [18°C	cold (60°F)]							А	1			
Temperature control switch (Passenger side)		18.5°C (61°F -	– 31.5°C – 89 °F)						_	AUTO	_			
		Ful [32°C	ll hot (90°F)]							В	- (
ON-OFF switch		OFF		С	С	В	В	В	1	—	-			

*: Inlet status is displayed by indicator when activating automatic control.

AIR DISTRIBUTION

< SYSTEM DESCRIPTION >

< SYSTEM DESCRIPTION >

VENT MODE (🎲)									
	VENT								
OUTLET	ASST	C.	TR	ΠR	RR				
	7001	ASST	DR	DIX					
AIR FLOW DISTRIBUTION RATIO (%)	22	22	22	22	12				

B/L MODE (💙)											
OUTLET			VENT		FOOT						
	Δςςτ	CTR		DP	DD	Fr ASST		Dr ASST			
	A331	ASST	DR	DR		FLASSI	TIDK	RI ASST			
AIR FLOW DISTRIBUTION RATIO (%)	11	11	11	11	16	15	15	5	5		

D/F1 MODE (📢)											
OUTLET			VENT				FC	DEF			
	ASST	C	TR	DR	RR	Fr ASST	Fr DR	Rr ASST	Rr DR	Fr	Side
		ASST	DR								Olde
AIR FLOW DISTRIBUTION RATIO (%)	6			6	16	18	18	7	7	17	5

D/F2 MODE (💱)											
OUTLET			VENT			FOOT				DEF	
	ASST	C.	TR	DR	RR	Fr ASST	Fr DR	Rr ASST	Rr DR	Fr	Side
		ASST	DR								Olde
AIR FLOW DISTRIBUTION RATIO (%)	5	_	_	5	16	15	15	6	6	25	7

DEF MODE (👾)											
OUTLET			VENT			FOOT				DEF	
	ASST	C	TR	DR	RR	Fr ASST	Fr DR	Rr ASST	Rr DR	Fr	Side
		ASST	DR								0140
AIR FLOW DISTRIBUTION RATIO (%)	5	_		5	14	_	_	_		60	16

Fail-safe

INFOID:000000012923216

FAIL-SAFE FUNCTION

If a communication error exists between the A/C auto amp. and the AV control unit and preset switch for 30 seconds or longer, air conditioning is controlled under the following conditions:

When ambient temperature is less than 3°C (37°F) and engine coolant temperature is less than 56°C (133°F)

Compressor	: ON
Air outlet	: DEF
Air inlet	: FRE (Fresh air intake)

Blower fan s Set temperat	speed : AUTO ture : Setting b	efore communication error occurs	A
When ambient temperature	e is 3°C (37°F) or more, or engine cool	ant temperature is 56°C (133°F) or more	
Compressor	· : ON		В
Air outlet	: AUTO		
Air inlet	: 20% FRE	(20% fresh air intake)	
Blower fan s	speed : AUTO		С
Set temperat	ture : Setting b	efore communication error occurs	

Н

D

Ε

F

G

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

< SYSTEM DESCRIPTION >

OPERATION

Switch Name and Function

INFOID:000000012923217

CONTROL OPERATION

A/C Switch Assembly



- 7. A/C switch
- 10. Fresh air switch
- 13. AUTO switch

Switch Operation

- Temperature control dial (passen- 9. ger side)
- 11. DUAL switch

- . Recirculation switch
- 12. Display

OPERATION

< SYSTEM DESCRIPTION >

[AUTOMATIC AIR CONDITIONER]

	Turns the switch indicator lamp and "AUTO" indicator on the display ON, and then front air condition- ing system becomes the following state: • Air inlet: Automatic control	A
AUTO switch	Air outlet: Automatic control Blower fan: Automatic control Compressor: ON	В
	Turne defrector mode (quiteb indicator) between ON + OFF each time	
	 When defroster mode (switch indicator) between ON G OFF each time. When defroster switch is pressed while front air conditioning system is in the ON position When defroster mode is turned ON, front air conditioning system becomes the following state: Air inlet: Fresh air intake Air outlet: DEE 	С
	 Blower fan: Automatic control (If fan speed other than AUTO is selected before pressing defroster switch, fan speed is manual control.) Compressor: ON 	D
Defroster switch	 When defroster mode is turned OFF, front air conditioning system state returns to the previous state before defroster mode is selected. But, the following state is continued: Air inlet: Fresh air intake Compresser: ON 	E
	 Compressor. ON When defroster switch is pressed while front air conditioning system is in the OFF position. When defroster mode is turned ON, front air conditioning system becomes the following state: Air inlet: Fresh air intake Air outlet: Defroster 	F
	- Blower fan: Automatic control	G
	 Compressor: ON When defroster mode is turned OFF, entire front air conditioning system is set to AUTO mode. NOTE: 	
	When defroster mode turns ON while front air conditioning system is in automatic control ("AUTO" is indicated), automatic control is released ("AUTO" turns OFF).	Н
	 Turns left and right ventilation temperature control (switch indicator) between ON	HAC
	 When DUAL switch indicator is ON, the driver side and passenger side temperatures can each be set independently. When DUAL switch indicator is OFF, the driver side outlet and setting temperature is applied to both 	
DUAL switch	sides.	J
	NOTE:	
	When front air conditioning system is in the OFF position, left and right ventilation temperature control can be selected only while front air conditioning system state (when MODE switch is pressed) is indicated on the display.	K
	Blower fan speed is manually controlled with these switches. Seven speeds are available for manual control (as shown on the display screen).	L
Fan switch (UP/DOWN)	 When fan switch is pressed while front air conditioning system is in OFF, front air conditioning system is activated. (Compressor control state returns to the previous state before front air condition- ion system OFF) 	M
	 When fan switch is pressed while front air conditioning system is in automatic control ("AUTO" is indicated), automatic control is released ("AUTO" turns OFF). 	1 4 1
	Compressor control (switch indicator) changes between ON ⇔ OFF each time this switch is pressed while front blower motor is operated.	Ν
A/C switch	A/C switch cannot be turned ON when front blower motor is OFF.	
	• A/C switch cannot be turned OFF when air outlet is D/F or DEF.	0
	Air inlet changes to fresh air intake when A/C switch is turned OFF while air inlet is set to recircu- lation.	
	Selects air outlet sequentially from VENT \Rightarrow B/L \Rightarrow FOOT \Rightarrow D/F \Rightarrow VENT each time. NOTE:	Р
MODE switch	 When front air conditioning system is in the OFF position, air outlet can be selected. When MODE switch is pressed while front air conditioning system is in automatic control ("AUTO" is indicated), automatic control is released ("AUTO" turns OFF). 	
ON/OFF switch	 Turns front air conditioning system ON/OFF. When front air conditioning system turns OFF, air inlet changes to recirculation (REC), recirculation switch indicator ON and air outlet becomes automatic control. 	

OPERATION

< SYSTEM DESCRIPTION >

Fresh air switch	 Air inlet changes to fresh air (FRE) when this switch is pressed. Fresh air switch indicator ON: Fresh air intake Fresh air switch indicator OFF: Recirculation NOTE:
	When front air conditioning system is in the OFF position, air inlet can be selected.
Recirculation switch	 Air inlet changes to recirculation (REC) when this switch is pressed. Recirculation switch indicator ON: Recirculation Recirculation switch indicator OFF: Fresh air intake NOTE: When front air conditioning system is in the OEE position, air inlet can be selected.
	 When MODE switch and DEF switch is in the D/F or DEF position, air inlet cannot be selected to recirculation (REC).
Temperature control dial (Driver side)	Setting temperature is selected using this dial within a range between 18°C (60°F) and 32°C (90°F) at a rate of 0.5°C (1.0°F) per adjustment. NOTE: When air conditioning system is OFF, setting temperature can be selected only while air conditioning
	system status screen [only when MODE switch (driver side) is pressed] is indicated on display.
Temperature control dial	 Outlet air flow temperature of passenger side can be changed without changing outlet air flow temperature of driver side. Setting temperature is selected using this dial within a range between 18°C (60°F) and 32°C (90°F) at a rate of 0.5°C (1.0°F) per adjustment.
(Passenger side)	 When air conditioning system is OFF, setting temperature can be selected only while air conditioning system status screen [only when MODE switch (passenger side) is pressed] is indicated on display. When DEF mode is ON, temperature control dial (passenger side) is inoperative.

DIAGNOSIS SYSTEM (A/C AUTO AMP.) N > [AUTOMATIC AIR CONDITIONER]

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (A/C AUTO AMP.)

CONSULT Function (HVAC)

CONSULT can display each diagnosis item using the diagnosis test modes as shown.

CONSULT application items

Diagnosis mode	Description	-
Self Diagnostic Result	Displays the diagnosis results judged by A/C auto amp.	(
Data Monitor	Displays A/C auto amp. input/output data in real time.	_
Work support	Changes the setting for each system function.	- -
Active Test	The signals used to activate each device are forcibly supplied from A/C auto amp.	- L
ECU Identification	Displays the A/C auto amp. number.	

SELF DIAGNOSTIC RESULT

Refer to HAC-34, "DTC Index".

DATA MONITOR

Display item list

Monitor item [Uni	t]	Description	
AMB TEMP SEN	[°C]	Ambient sensor value converted from ambient sensor signal received from ambient sensor	G
IN-VEH TEMP	[°C]	In-vehicle sensor value converted from in-vehicle sensor signal received from in-vehi- cle sensor	Н
INT TEMP SEN	[°C]	Intake sensor value converted from intake sensor signal received from intake sensor	
SUNLOAD SEN	[w/m ²]	Sunload sensor value converted from sunload sensor signal received from sunload sensor	HA
AMB SEN CAL	[°C]	Ambient sensor value calculated by A/C auto amp.	
IN-VEH CAL	[°C]	In-vehicle sensor value calculated by A/C auto amp.	
INT TEMP CAL	[°C]	Intake sensor value calculated by A/C auto amp.	J
SUNL SEN CAL	[w/m ²]	Sunload sensor value calculated by A/C auto amp.	
COMP REQ SIG	[On/Off]	Displays A/C switch ON/OFF status transmitted to other units via CAN communication	Κ
FAN REQ SIG	[On/Off]	Displays blower switch ON/OFF status transmitted to other units via CAN communica- tion	
FAN DUTY	[%]	Duty ratio of blower motor judged by A/C auto amp.	L
XM		Target discharge air temperature judged by A/C auto amp. according to the tempera- ture setting and the value from each sensor	
ENG COOL TEMP	[°C]	Water temperature signal value received from ECM via CAN communication	M
VEHICLE SPEED	[km/h (mph)]	Vehicle speed signal value received from meter via CAN communication	
PA TARGET A/TEMP		Target discharge front air temperature (passenger side) judged by A/C auto amp. de- pending on the temperature setting and the value from each sensor	Ν

WORK SUPPORT

А

В

Ε

F

Р

Ο

Work item	Description	Reference
TEMP SET CORRECT (Setting of difference between tem- perature setting and control tempera- ture)	If the temperature felt by the customer is different than the air flow temperature controlled by the temperature setting, the auto ampli- fier control temperature can be adjusted to compensate for the temperature setting.	HAC-61. "Temperature Setting Trimmer"
REC MEMORY SET (REC memory function setting)	 If the ignition switch is turned to the OFF position while the REC switch is set to ON (recirculation), "With" or "Without" of the REC switch ON (recirculation) condition can be selected. If "With" was set, the REC switch will be ON (recirculation) when turning the ignition switch to the ON position again. If "Without" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. 	HAC-62, "Inlet Port Memory Function (REC)"
FRE MEMORY SET (FRE memory function setting)	 If the ignition switch is turned to the OFF position while the FRE switch is set to ON (fresh air intake), "With" or "Without" of the FRE switch ON (fresh air intake) condition can be selected. If "With" was set, the FRE switch will be ON (fresh air intake) when turning the ignition switch to the ON position again. If "Without" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again. 	HAC-61, "Inlet Port Memory Function (FRE)"
BLOW SET (Blow setting to DEF in FOOT mode)	In the FOOT mode, the air blowing to the DEF can change ON/ OFF.	HAC-61, "Foot Position Setting Trimmer"

NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of "Work support" may be cancelled.

ACTIVE TEST

Test item	Description
HVAC TEST	The operation check of A/C system can be performed by selecting the mode. Refer to the fol- lowing table for the conditions of each mode.

HVAC TEST

	Test item							
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7	
Mode door position	VENT	VENT	B/L	D/F1	D/F2	DEF	DEF	
Intake door position	REC	REC	20%FRE	FRE	FRE	FRE	FRE	
Air mix door position (driver & passenger side)	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT	
Blower motor (V)	4	4	8	HI	HI	8	HI	
A/C compressor (Mag- net clutch)	ON	ON	ON	OFF	OFF	ON	ON	
PTC heater 1	OFF	OFF	OFF	ON	ON	ON	ON	
PTC heater 2	OFF	OFF	OFF	OFF	ON	ON	ON	
PTC heater 3	OFF	OFF	OFF	OFF	OFF	ON	ON	

NOTE:

Perform the inspection of each output device after starting the engine because the A/C compressor has been operating.

< ECU DIAGNOSIS INFORMATION >

ECU DIAGNOSIS INFORMATION A/C AUTO AMP.

Reference Value

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Co	Value/Status	
AMB TEMP SEN	Ignition switch ON	_	–30 - 55°C (22 - 131°F)
IN-VEH TEMP	Ignition switch ON	—	–30 - 55°C (22 - 131°F)
INT TEMP SEN	Ignition switch ON	—	–30 - 55°C (22 - 131°F)
SUNLOAD SEN	Ignition switch ON	_	0 - 1045 w/m ² (0 - 899 kcal/m ² ·h)
AMB SEN CAL	Ignition switch ON	_	–30 - 55°C (22 - 131°F)
IN-VEH CAL	Ignition switch ON	_	–30 - 55°C (22 - 131°F)
INT TEMP CAL	Ignition switch ON	_	–30 - 55°C (22 - 131°F)
SUNL SEN CAL	Ignition switch ON	-	0 - 1045 w/m ² (0 - 899 kcal/m ² ·h)
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (A/C compressor operation status)	On
		A/C switch: OFF	Off
	Engine: Run at idle after	Blower fan: ON	On
FAN REQ SIG	warming up	Blower fan: OFF	Off
	Engine: Run at idle after	Blower fan: ON	Varies
	warming up	Blower fan: OFF	0%
XM	Ignition switch ON	_	-100 - 155
ENG COOL TEMP	Ignition switch ON	_	Varies according to coolant temperature
VEHICLE SPEED	Driving	_	Equivalent to speedometer reading
PA TARGET A/TEMP	Ignition switch ON	_	Value according to target air flow temperature (passen- ger side)

TERMINAL LAYOUT



PHYSICAL VALUES

А

В

INFOID:000000012923219

Μ

Ν

Ο

Ρ

A/C AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

Terminal N (Wire colo	No. or)	Description		Condition		Value
+	_	Signal name	Input/ Output	Condition		(Approx.)
1 (L)	_	CAN high	Input/ Output		_	_
2 (B)	_	Ground	_		_	_
3 (SB)	Ground	Battery power supply	Input	Ignition swit	ch OFF	Battery voltage
4 (BR)	Ground	TX FR	Output	Ignition swit	ch ON	0 – 5 V
7 (W)	Ground	Ambient sensor signal	Input	Ignition swit	ch ON	0 – 4.8 V Output voltage varies with ambi- ent temperature
8 ^{*1} (BR)	Ground	Heated steering wheel switch signal	Input	Heated steer- ing wheel Ignition switch: While switch ON pressing		0 V
					Other than the above	Battery voltage
9 (G)	Ground	Sunload sensor signal	Input	Ignition swit	ch ON	0 – 4.8 V Output voltage varies with sun- load amount
12 ^{*2}	Ground	Water valve	ON	Water valve open		Battery voltage
(W)	Ciouna	Water valve	ON	Water valve closed		0V
13 (W)	Ground	IGN 2	Input	Ignition swit	ch ON	Battery voltage
14 (P)	Ground	Front blower motor control signal	Output	 Ignition sv Front fan speed (m 	witch ON speed: 1st anual)	(V) 6 4 2 0
15				Defroster	OFF	0 V
(Y)	Ground	RR DEF switch	Output	switch	ON	5 V
16 (G)	Ground	Each door motor LIN signal	Input/ Output	Ignition swit	ch ON	(V) 10 5 0 •••••••••••••••••••••••••••••••
17 (W)	Ground	Each door motor power supply	Output	Ignition swit	ch ON	Battery voltage
19 ^{*3}		PTC1 relay output signal	Input	Ignition	PTC heater: ON	0 V
(G/R)	Ground		input	switch ON	PTC heater: OFF	Battery voltage

A/C AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

lerminal (Wire col	No. or)	Description		Ca	adition	Value	А
+	-	Signal name	Input/ Output			(Approx.)	
20 ^{*1} (P)	Ground	Heated steering wheel relay control signal	Output	Ignition switch ON	Within 30 sec- onds after turning ON the heated steering switch	0 V	B
					Other than the above	Battery voltage	D
21 (P)	_	CAN low	Input/ Output		_	_	_
22 (B)	—	Ground	_		_	_	E
23 (G)	Ground	Ignition power supply	Input	Ignition swit	ch ON	Battery voltage	F
24 (V)	Ground	RX FR	Input	Ignition swit	ch ON	0 – 5 V	
26 (R)	—	Sensor ground	—		_	_	G
27 (G)	Ground	In-vehicle sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with in-vehi- cle temperature	Н
28 (P)	Ground	Intake sensor signal	Input	Ignition switch ON		0 – 4.8 V Output voltage varies with front evaporator fin temperature	HA
32 ^{*2}	Ground	Water valve	ON	Water valve	open	0V	
(L)	Croana		ON	Water valve	closed	Battery voltage	J
33	Ground	Compressor ON signal	ON	A/C switch OFF		5 V	
(Y)			ON	A/C switch	ON	0 V	k
34 (L/W)	Ground	Front blower motor feed- back	ON		-	Battery voltage	r.
35 (BAAI)	Ground	RR DEF feedback	Input	Defroster	OFF	0 V	L
(B/W)				SWIICH	ON	Battery voltage	
37 (B)	_	ACTR Ground	—		_	_	
38	Ground		ON	Blower swite	ch OFF	5 V	IVI
(W)	Ground	ran UN signal	ON	Blower swit	ch ON	0 V	
39 ^{*3}	Ground	PTC2 relay output signal	Input	Ignition	PTC heater: ON	0 V	Ν
(LG)			mpar	switch ON	PTC heater: OFF	Battery voltage	0
	1				PTC heater		
40 ^{*3}	Ground	PTC3 relay output signal	Innut	Ignition	ON	0 V	

*1: With heated steering wheel

*2: With VK56VD

*3: With Cummins 5.0L

A/C AUTO AMP.

< ECU DIAGNOSIS INFORMATION >

[AUTOMATIC AIR CONDITIONER]

DTC Index

INFOID:000000012923221

DTC	Items (CONSULT screen terms)	Reference
U1000	CAN COMM CIRCUIT	HAC-63, "DTC Description"
U1010	CONTROL UNIT (CAN)	HAC-64, "DTC Description"
U1321	NOT CONFIGURED	HAC-65, "DTC Description"
B257B	AMBIENT SENSOR (SHORT)	HAC-69, "DTC Description"
B257C	AMBIENT SENSOR (OPEN)	HAC-69, "DTC Description"
B2578	IN-VEHICLE SENSOR (SHORT)	HAC-66, "DTC Description"
B2579	IN-VEHICLE SENSOR (OPEN)	HAC-66, "DTC Description"
B2581	INTAKE SENSOR (SHORT)	HAC-72, "DTC Description"
B2582	INTAKE SENSOR (OPEN)	HAC-72, "DTC Description"
B2630 [*]	SUNLOAD SENSOR (SHORT)	HAC-75, "DTC Description"
B2631 [*]	SUNLOAD SENSOR (OPEN)	HAC-75, "DTC Description"
B2632	DR AIR MIX DOOR MOT (SHORT)	HAC-78, "DTC Description"
B2633	DR AIR MIX DOOR MOT (OPEN)	HAC-78, "DTC Description"
B2634	PASS AIR MIX DOOR MOT (SHORT)	HAC-80, "DTC Description"
B2635	PASS AIR MIX DOOR MOT (OPEN)	HAC-80, "DTC Description"
B2636	DR VENT DOOR FAIL	HAC-82, "DTC Description"
B2637	DR B/L DOOR FAIL	HAC-82, "DTC Description"
B2638	DR D/F1 DOOR FAIL	HAC-82, "DTC Description"
B2639	DR DEF DOOR FAIL	HAC-82, "DTC Description"
B263D	FRE DOOR FAIL	HAC-84, "DTC Description"
B263E	20P FRE DOOR FAIL	HAC-84, "DTC Description"
B263F	REC DOOR FAIL	HAC-84, "DTC Description"
B2654	D/F2 DOOR FAIL	HAC-82, "DTC Description"
B2655	B/L2 DOOR FAIL	HAC-82, "DTC Description"
B2796	FR SW COMM ERROR	HAC-86, "DTC Description"

*: Perform self-diagnosis under direct sunlight. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise selfdiagnosis reports an error even though the sunload sensor is functioning normally.

< ECU DIAGNOSIS INFORMATION >

ECM, IPDM E/R, BCM

List of ECU Reference

INFOID:000000012923222

[AUTOMATIC AIR CONDITIONER]

ECU	Reference	D
	EC-114, "Reference Value"	
ECM (Cummins 5.0L)	EC-126, "Fail safe"	С
	EC-135, "DTC Index"	
	EC-1337, "Reference Value"	D
ECM (VK56VD)	EC-1361, "Fail-safe"	D
	EC-1366, "DTC Index"	
	PCS-14, "Reference Value"	Ε
IPDM E/R	PCS-22, "Fail Safe"	
	PCS-23, "DTC Index"	_
	BCS-32, "Reference Value"	F
RCM	BCS-51, "Fail Safe"	
	BCS-51, "DTC Inspection Priority Chart"	G
	BCS-52, "DTC Index"	

Н

J

Κ

L

Μ

Ν

Ο

Ρ

А

< WIRING DIAGRAM >

[AUTOMATIC AIR CONDITIONER]

WIRING DIAGRAM

AUTOMATIC AIR CONDITIONING SYSTEM CUMMINS 5.0L

CUMMINS 5.0L : Wiring Diagram




Revision: March 2016

	E75	-	ı	TO ENGINE CONTROL HARNESS -	6	ı	I
	AMBIENT SENSOD		4	TICHT CONTROL INDUITO	10	'	'
ame	AMBIENT SENSOR	5	۹.	TO ENGINE CONTROL HARNESS - DIESEL	11	1	I
be	RS02FB	6	Y/B	TO ENGINE CONTROL HABNESS -	12	-	1
lor	BLACK			DIESEL	13	'	
		4	'	TO ENGINE CONTROL HARNESS - DIESEL	14	, <u>e</u>	AT CENICOD DTN
		5	8	TO ENGINE CONTROL HARNESS -	16	5 4	CAN-L
	Ź	ď	WV I	TO ENGINE CONTROL HABNESS -	17	'	I
			1	DIESEL	18	σ	J1939 +
]				19	1	
		Connector	No.	E88	20	g	SMART POWER LSD
olor o		Connector	Name	REFRIGERANT PRESSURE	21	1	1
Wire	Signal Name			SENSOR	52	'	
œ	SENS GND	Connector	Type	RK03FB	8	, ę	
W/B	AMB SENS	Connector	Color	BLACK	24	8	
					26	BL	REF PRESS SENS SIGNAL
	E78				27		I
ame	PTC HEATER	H.S.		<	28	•	
be	ALA05FB-R-RH				29	-	-
lor	BLACK				30	1	I
					31		
					32	۲	AT SSR SUPPLY
L		Terminal	Color of		33	L	CAN-H
-		No.	Wire	Signal Name	34	1	I
		-	RW	REF PRESS SENS RETURN	35	>	J1939 +
		2	RL	REF PRESS SENS SIGNAL	36	'	
		8	8	PPS2 SUPPLY	37	-	MAIN RLY LSD
				-	38	1	-
color o	f Signal Name	Connector		E03	39	'	1
Wire					40	ß	FUEL PUMP RLY SIG
В	IGNITION	Connector	Name	ECM (WITH CUMMINS 5.0L)	41	BB	SW RETURN
8	GND	Connector	Type	1-928-405-452	42	'	
σ	IGNITION	Connector	Color	BLACK	43	'	1
œ	GND	Ŧ			44	'	1
-	IGNITION	NHAN			45	1	I
		ЗН	23 22 21 20 40 39 38 37	19 18 17 16 15 14 13 12 11 10 9 8 7 2 38 35 34 33 32 31 30 29 28 27 28 25 24	46	ı	1
	E87	5		4	47	'	
			57 56 55 54 74 73 72 71	53 52 51 50 48 48 47 46 45 44 43 42 41 1 70 88 65 65 65 64 63 64 83 52 61 60 59 58	48		I
alle			91 90 89 88	87 88 85 84 83 82 81 80 79 78 77 76 75 6	49	1	I
be	54200608	2			20	'	Т
olor	BLACK				51	•	
		Terminal	Color of	Signal Name	52	'	1
		NO.	MIG		53	R/G	BRAKE SW OPEN
		-		GROUND	54	-	BRAKE NC
		2	в	GROUND	55	1	I
	6 4 5 6 C	e	BR	SW BATTERY	56	'	1
		4	8	GROUND	57	1	I
		5	В	SW BATTERY	58	1	1
10101		9	ВВ	SW BATTERY	59	GV	ASCD SIGNAL
Wire v	Signal Name	2	0	DOF DELTA PRESS	60	1	1
2		80	,	1	61	BV	ASCD RETURN
		Nor E/202FB Nor E/202FB Nor BLACK Nor Signal Name Signal Name Signal Name Signal Name Signal Name Signal Name Signal Name Signal Name Signal Name	Nor E73 BLACK Dir BLACK Dir BLACK Dir BLACK Dir BLACK Dir BLACK Dir Signal Name Dir Signal Name Dir F78 Nine Signal Name Dir F78 Nine F78 Nine Signal Name Dir PTC HEATER Nine PTC HEATER Nine Nine Nine Signal Name Nine Signal Name Dir PTC HEATER Nine Nine Nine Signal Name Nine Signal Name Nine Signal Name Nine Signal Name Dir LANOSEB-R-R-H Nine Nine Nine Signal Name Nine Signal Name Nine Signal Name Nine Nine Nine Nine Nine Nine	No. E73 Bio VB Nor VB Nor VB Nor VB Nor VB Nor VB Nor Signal Name Nor	No. Event min Millelin YENSOR min Millelin	0: 0: <td< td=""><td>iv Evolution iv Proteine constraint iv</td></td<>	iv Evolution iv Proteine constraint iv



PPS2 RETURN	PPS1 RETURN	REF PRESS SENS RETURN	IGN/KEYSWITCH	-	1	1	-	1	1	'	DOSER RETURN	DOSER HS	COOLANT SIGNAL	1	WIF SIGNAL	PPS2 SIGNAL	PPS1 SIGNAL	PPS1 SUPPLY	PPS2 SUPPLY	1	BATTERY	-		1	1	1
в	œ	RW	LVW	ı	1	1	ı	1	ı	ı	œ	GR/R	L/W	ı	-		BR	M	8	ı	BR	1	1	1	1	I
62	63	64	65	99	67	68	69	70	71	72	73	74	75	76	22	78	62	80	81	82	83	84	85	98	87	88

AUTOMATIC AIR CONDITIONING SYSTEM [AUTOMATIC AIR CONDITIONER]

8 6 5

< WIRING DIAGRAM >





F150		CLIMMINS 5 01)		2080-0802	BLACK		[Í	[[1]]				Signal Name		ACCOMP	-	M3	FUSE BLOCK (J/B)	CS06FW-M2	WHITE	1			NI NZ	AN 6N 5N 4N			-	r of Signal Name	Le care	IGN	BATTERY	IGNITION	BATTEDV	BATTERY	ACC RFI AV OUT	IGNITION												
Connector No.	Connector Moneo	Connector Name	F	CONTECTOR Type	Connector Color	Æ		S H	5				ŀ			-		Connector No.	Connector Name	Connector Type	Connector Color		(GPD)		0.E					Terminal Colo	No.	N1 0	2N V	3N	4N V	- M		N8												
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		08				ACK			ربا 2 3 2 1 1.1 الم					Signal Name	,	TO ENGINE ROOM HARNESS													
Γ	SHIELD	w	œ	R/G	σ	M	-	æ	_	œ	_		W/B	B/B	W/B	٩	_	σ	σ	٨/٧	BB	σ	σ	M	в	W/B	BB	GR/W		do.	W omen											Color of	wire		0	Å	'	٩	RV	
72G	73G	74G	75G	76G	77G	78G	79G	80G	81G	82G	83G	84G	85G	86G	87G	88G	89G	90G	91G	92G	93G	94G	95G	96G	97G	98G	996	100G		Connector	Connector			Connector	E		<u>ю</u> .П					Terminal	NO.	-	2	e	4	5	9	
TO MAIN HARNESS - (WITH	CUMMINS 5.0L)	TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN LADNESS	TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN HADNESS	TO MAIN HABNESS	TO MAIN HADNESS	TO MAIN HABNESS	TO MAIN HARNESS - WITH	CUMMINS 5.0L)	TO MAIN HARNESS - (WITH		TO MAIN HARNESS	I U MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS							
G/B	RN	н	ГG	G/B	G/B	BR/Y	•		æ	•	. 5	2		5	n Ma	a		·		c	- a		σ		γH (5	2	œ 3	>	' 2	H (× -	13	: >	σ	3	>	ß	BG	BG	8	>	æ	ML	W/R	BG	BG	в	>	RN L
24G	25G	26G	27G	28G	29G	30G	31G		31G	326	336	540	oto Sec	296	376	386	200	406	011	426	436	2	43G		44G	904	46G	47G	48G	49G	500	516	250	54G	55G	56G	57G	58G	59G	60G	61G	62G	63G	64G	65G	66G	67G	68G	69G	71G
E152			TH80MW-CS16-TM4	WHITE					56 46 36 26 16	100 30 90 / 0 90	216206196186176186156146136126116	306236236276266256246236226	416 406 396 376 366 356 346 336 326 316	506496486476466456446436426	610 600 590 570 560 550 540 530 520 510	706696686676666656646636626	81G 80G 79G 77G 76G 75G 74G 73G 72G 71G	905896885876865855846835826		956 946 936 936 926 ³ 10 1006 996 986 976 acc					بر بر	Signal Name	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	VK56VD)	TO MAIN HARNESS - (WITH CUMMINS 5.0L)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS
or No.	- Nomo	or name	or Type	or Color										_	<u> </u>										Color of	Wire	J	B/B	W/B	BR/W	B	•		MA	>	σ	н	N	R/G	W/B	BB	Y/B	G/W	σ	G√	€	۸X	G√	ΒΛ	G/R Y/R
Connecto		Connecti	Connectu	Connecto	Æ		SH																		Terminal	No.	5	26	3G	4G	5G	99		99	76	86	96	10G	11G	12G	13G	14G	15G	16G	17G	18G	19G	20G	21G	236

AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH Cummins 5.0L)

2016 Titan NAM

< WIRING DIAGRAM >

Connector Name FUSE BLOCK (J/B) Connector Type NS16FW-CS Connector Color WHITE Tp Fp Signal Name		4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	· · · · · · · · · · · · · · · · · · ·	
The length of the len		6 6 4 7 4 7 8 8 8 9 9 9 9 9 9 9 9 9 9 9 9 9	· · · · · · · · · · · · · · · · · · ·	
Donnector Type NS16FW-CS I	COMBL SWN N.5 COMBL SWN N.3 COMBL SWN N.3 COMBL SWN N.1 - COMBL SWN N.1 - COMBL SWN N.1 - COMBL SWN N.1 - COMBL SWN N.1 - COMBL SWN CONT - CARE CONT - ARRE SW - COMPL CONT - CARE SW - COMPL STATUS - COMPL STATUS - CO	66 4 4 7 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9 2 9	· · · · · · · · · · · · · · · · · · ·	
The left of lef	COMBL SWN N4 COMBL SWN N2 COMBL SWN N2 COMBL SWN N2 COMBL SWN N2 COMBL SWN N2 COMBL SWN N2 COMBL SWN 2 COMP F ALC COMP F ALC COMP F AN SW COMP COMP COMP COMP COMP COMP COMP COMP	1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,1,	· · · · · · · · · · · · · · · · · · ·	HIGH SIDE STAFT SW LED AUDIO DONGLE - AUDIO DONGLE
The for 5p 4p 1p 1p 0p	COMEI SW N1 3 COMEI SW N1 2 - COMEI SW N1 2 - COMEI SW N1 2 - SHET P - SHET P - SHET P - ARCON SW - ARCON SW - ARCON SW - ARCON SW - ARCON SW - ARCON SW - COWE FAN SW - SHIFT NP - SHIFT NP - SHIFT NP - SHIFT NP	13 148 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 14 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149 149	α , , , , , , , , , , , , , , , , , , ,	HIGH SIDE START SW LED AUDIO DONGLE PW UART LAR SENSOR K-LINE
The left of the lef	COMBL SW IN 2 COMBL SW IN 2 	49 49 10 10 11 10 12 11 13 11 14 11 15 11 16 11 17 11 17 11	· · · · · · · · · · · · · · · · · · ·	
The The V ComBIS/WIN The The<	COMBL SW N1 1	20 20 24 24 25 25 25 25 25 25 25 25 25 25 25 25 25	· · · » · · · · · · · · · · · · · · · ·	AUDIO DONGLE AUDIO DONGLE
TP 0H 3H 2F 1H 15 2 1H 1H 2 2 1H 1H 2 1H 1H 2 1H 1H 2 2 1H 1H 2		11 12 12 12 12 12 12 12 12 12		AUDIO DONALE – – – LAR SENSOR K-LINE – – – – – – – – – – – – –
IfePI15P[14P[13P[14P[13P]12P[11P][10P]9P]8P] Is Is Is Is Terminal No. Color of tip Signal Name Signal Name Signal Name Signal Name Signal Name Signal Name 2P V Signal Name Sig		22 23 25 25 25 25 25 25 25 25 25 25 25 25 25	· · · · · · · · · · · · · · · · · · ·	AUDIO DONGLE PW UART L&R SENSOR K-LINE - - - - - - - - - - - - -
Terminal No. Color Micro Name Color Micro Signal Name Terminal second Color Micro second Color Micro Micro Color Micro Micro Micro Micro Micro Micro Color Micro Micro Micro	IND RF A/L UNTY INDICATIOR SHIFT P SHIFT P SHIFT P SHIFT P SHIFT P SHIFT P SHIFT P SHIFT P ARK SW LWP ARK SW W HAZARD SW ARY SW W ARY SW W SHIFT NP	5 55 55 55 55 55 55 55 55 55 55 55 55 5		PW UART L&R SENSOR K-LINE CAN-L CAN-
Terminal No. Connector No. V Securarry More and Terminal V Securarry More and Terminal 1P R No. No. No. No. No. No. No. 2P V Idantion No. Y Idantion Signal Name -<	URITY INDICATIOR - SHIFT P EP LAMP CONT - T - ARRON SW - ARRON - ARRONN - ARRON - ARRONN - ARRONN - A	24 25 25 25 25 25 25 25 25 25 25 25 25 25	м м м м м м м м м м м м м м м м м м м	PW UART L&R SENSOR K-LINE - - - - - - CAN-L CAN-
Terminal No. Color of Wire Signal Name 19 C 19 C 10 Signal Name 20 RHETP 20 2P Y RAINTON ERVOUT 22 Y AIRCONSIN 2P Q IGNITION RELVOUT 23 Y AIRCONSIN 2P BW RADEF RLY 23 Y AIRCONSIN 2P Q IGNITION RELVOUT 23 Y BRAKE SWILA 2P Q IRRDEF RLY 25 Y BRAKE SWILA 2P Q IRRDIN 23 Y BRAKE SWILA 2P Q IRRDIN 23 Y BRAKE SWILA 2P L BRAKE SWILA 23 Y BRAKE SWILA 1P <td></td> <td>1 55 1 555 55 55 56 50 50 56 55 55 56 55 55 57 55 55 56 55 55 57 55 55 56 56 55 57 56 56 73 73 73 77 73 73</td> <td></td> <td>LAR SENSOR K-LINE </td>		1 55 1 555 55 55 56 50 50 56 55 55 56 55 55 57 55 55 56 55 55 57 55 55 56 56 55 57 56 56 73 73 73 77 73 73		LAR SENSOR K-LINE
Nummer Signal Name Signan Name Signal Name <	BHIFT P EP LAMP CONT - AIRCON SW - AIRCON SW - ARKE SW LAMP - AKE SW LAMP - - - - - - - - - - - - - - - - - - -	66 595 596 596 595 595 595 595 595 595 5		CAN-L CAN-L CAN-L CAN-H CAN-H EAR RELAY OUT REAR RELAY OUT BLOWER FAN RELAY OUT 16N ELEC RELAY OUT 16N ELEC RELAY OUT 16N USAN OUT 16N USAN OUT 17 D R REQUEST SW AS REQUEST SW
IP RIM CITE LANPE Control Contro Control Contro <t< td=""><td>EP LAMP CONT - AIRCON SW - AIRCON SW - BAKE SW FUSE BAKE SW FUSE ART IN PIN INPUT - AKE SW LAMP - ONER FAN SW - OR LOCK STATUS - ONER FAN SW </td><td>57 888 899 899 893 893 893 893 893 893 893</td><td>· · · · · · · · · · · · · · · · · · ·</td><td>- CAN-L CAN-L CAN-H CAN-H CAN-H CAN-H CAN-H CAN-H BRATER RELAY OUT BUOWER FAN RELAY OUT BUOWER FAN RELAY OUT I ON LETER FAN RELAY OUT I ON LETER FAN RELAY OUT I ON LETER FAN ROUT T I ON USM OUT 1 DR REOURST SW AS REQUEST SW</td></t<>	EP LAMP CONT - AIRCON SW - AIRCON SW - BAKE SW FUSE BAKE SW FUSE ART IN PIN INPUT - AKE SW LAMP - ONER FAN SW - OR LOCK STATUS - ONER FAN SW 	57 888 899 899 893 893 893 893 893 893 893	· · · · · · · · · · · · · · · · · · ·	- CAN-L CAN-L CAN-H CAN-H CAN-H CAN-H CAN-H CAN-H BRATER RELAY OUT BUOWER FAN RELAY OUT BUOWER FAN RELAY OUT I ON LETER FAN RELAY OUT I ON LETER FAN RELAY OUT I ON LETER FAN ROUT T I ON USM OUT 1 DR REOURST SW AS REQUEST SW
P N	AIRCON SW - - ARKE SW FUSE RAME SW FUSE AKK SW LAMP AKK SW LAMP - - - - - - - - - - - - -	88 59 59 59 58 58 58 58 58 58 58 59 59 59 50 57 77 77 57 57 57 57 57 57 57 57 57 57	· · □ □ 0 ≥ · · □ · ≥ ∞ □ 22 · · 22 · · · · · · · · · · · · · ·	Can-L Can-L Can-L Can-H REAR DEFOGGER RELAY OUT STARTER RELAY OUT BUCWER FAN RELAY OUT - BUCWER FAN RELAY OUT CAN-DUT BUCWER FAN RELAY OUT IGN ULT DUT AT DEVICE OUT IGN ULT DUT AT DEVICE OUT IGN USM OUT 7 AR DUT 7 AR DU
Bit Connector Mile Mile <td>AIRCON SW AKK SW FUSE PRT IN PIN INPUT AKK SW LAMP AKK SW LAMP OOR LOCK STATUS OOR LOCK STATUS - R DEFOGGER SW - - - - - SHIFT NP SHIFT NP</td> <td>890 812 812 813 813 813 813 813 813 813 813 813 813</td> <td></td> <td>CAN-L CAN-L CAN-H EREAR DEFOGGER RELAV OUT STARTER RELAV OUT BUZZER OUT BUZZER OUT BUZZER OUT CANALETAY OUT 2 REQUEST SW AS REQUEST SW</td>	AIRCON SW AKK SW FUSE PRT IN PIN INPUT AKK SW LAMP AKK SW LAMP OOR LOCK STATUS OOR LOCK STATUS - R DEFOGGER SW - - - - - SHIFT NP SHIFT NP	890 812 812 813 813 813 813 813 813 813 813 813 813		CAN-L CAN-L CAN-H EREAR DEFOGGER RELAV OUT STARTER RELAV OUT BUZZER OUT BUZZER OUT BUZZER OUT CANALETAY OUT 2 REQUEST SW AS REQUEST SW
4P B/W RRDEF RLV 24 - - 7P 0 RRDEF RLV 26 L SHORT NENU 7P 0 RRDEF RLV 26 L SHORT NENU 7P 0 RRDEF RLV 27 RAGE SWLA 7P 0 RRDEF RLV 28 - SHORT NENU 9P L BATTERV 28 - BRAKE SWLA 10P - BATTERV 28 - BLOWER FAN 11P - - - - - - 12P - - - - - - 13P Y BATTERV 31 - BLOWER FAN RELV -	RAKE SW FUSE BRT IN PIN INPUT AAKE SW LAMP 	0 00 00 00 00 00 00 00 00 00 00 00 00 0		CANH REAR DEFOGGER RELAY OUT STAFTER RELAY OUT BUZZER OUT BUZZER OUT BUZZER OUT IGN BLOWER FAN RELAY OUT 2 MR OUTPUT IGN BLOWER OUT 2 MR OUTPUT IGN USAN OUT 2 MR OUTPUT IGN USAN OUT 1 D R REQUEST SW
F BM RIDEFAUL 25 W BAKES WFL F 0 REDEFALY OUT 26 W BAKES WFL F 0 REDEFALY OUT 26 W BAKES WFL F 0 REDEFALY OUT 26 W BAKES WFL F 0 RATERY 27 RA BAKES WL F 0 INTON 26 W BLOWERFAN 10P - - - - - - 11P -	AKK SW FUSE PRT IN PIN INPUT AKK SW LAMP - AKK SW LAMP - ODEL LOCK STATUS - COMER SW - C	151 252 253 255 255 257 252 253 253 253 253 253 253 253 253 253	O ≥ 1 ⊂ 1 ≥ 0 ⊐ 8 − 0 0 1 7	REAR DEFOGGER RELAY OUT STARTER RELAY OUT – BUZZER OUT ELOWER FAN RELAY OUT (ON ELEC RELAY OUT (ON ELEC RELAY OUT 2 (ON ELEC RELAY OUT 2 (ON USM OUT 1 IGN USM OUT 1 DR REOUEST SW
Browner Connector Mis Bit Mis Bit Nit Bit Nit Bit Nit Bit Connector Connector Connector Connector Connector Connector Connector Mis Bit Mis Bit Mis Bit Mis Bit Mis Bit	RIT IN INI INPUT AME SW LAMP ORE FAN SW - OWER FAN SW - ONE LOCK STATUS - ONE R DEFOOGER SW HAZARD SW HAZARD SW 	22 23 23 27 27 27 27 23 23 23 23 23 23 23 23 23 23 23 23 23	≥ ı a ı ≥ o ı	STATTER RELAY OUT BUZZER OUT BLOWER FAN RELAY OUT IGN ELEC RELAY OUT 2 IGN UER OUT 1 AT DEVICE OUT IGN USM OUT 1 DR REOUEST SW AS REQUEST SW
The G Instruction 27 R/d BRAKESWLA 8P L BATTERY 2 ISMITION 2 EXAMPLE BRAKESWLA 9P L BATTERY 3 L BLOWER SWLA 10P - - - BLOWER SWLA EXAMPLE 11P - - - - - - 13P R BATTERY 3 - DE DOOR LOCKS - 13P R BATTERY 3 - - - - 13P R BATTERY 3 - <td< td=""><td>AKE SW LAMP OWER FAN SW DOR LOCK STATUS R DEFOGGER SW SHIET NP SHIET NP</td><td>33 55 55 55 55 55 71 71 77 77</td><td>· · · · · · · · · · · · · · · · · · ·</td><td>BUZZER OUT BLOWER FAN RELAY OUT 2 IGN ELEC RELAY OUT 2 AT DEVICE OUT AT DEVICE OUT IGN USAN OUT 1 DA REQUEST SW</td></td<>	AKE SW LAMP OWER FAN SW DOR LOCK STATUS R DEFOGGER SW SHIET NP SHIET NP	33 55 55 55 55 55 71 71 77 77	· · · · · · · · · · · · · · · · · · ·	BUZZER OUT BLOWER FAN RELAY OUT 2 IGN ELEC RELAY OUT 2 AT DEVICE OUT AT DEVICE OUT IGN USAN OUT 1 DA REQUEST SW
Production Connector No. Misuantion 28 - - - 9P L BATTERY 29 V BILOWER FAM 20 PILOWER FAM 9P - - - - - BILOWER FAM 10P - - - - BILOWER FAM BILOWER FAM 12P - - - - - - - 13P X BATTERY -	OWER FAN SW ODEN LOCK STATUS DOEN LOCK STATUS A REVERSE SW HAZARD SW HAZARD SW SHIFT NP	94 555 567 567 567 71 71 72 73 73 77 77		BLOWER FAN RELAY OUT BLOWER FAN RELAY OUT IGN ELEC RELAY OUT 2 MR OUTPUT IGN USTOUT IGN USAN OUT 1 D R REQUEST SW AS REQUEST SW
9P L BLOWRF FAIL 10P - BLOWER FAIL 11P - - 12P - - 13P R BATTEN 13P - - 14P Y BATTEN 200 M18 BATTEN 200 M18 BATTEN 200 M0DULE - 200 Connector Name BCM (BOP) CONT 200	OWER FAN SW DOR LOCK STATUS DOR LOCK STATUS R DEFOGGER SW A DEFOGGER SW HAZARD SW - - SHIFT NP	866 666 657 77 73 74 77 77	· ≥ ɑ ⊐ ಱ a o ʊ · ·	BLOWER FAN RELAY OUT IGN ELEC RELAY OUT 2 MR OUTPUT AT DEVICE OUT IGN USM OUT 1 DA REQUEST SW AS REQUEST SW
10P -	OOR LOCK STATUS 	666 67 688 888 889 77 73 73 73 75 77 77	× ت ت 88 م o ت ، ،	BLOWER FAN RELAY OUT IGN ELEC RELAY OUT MR DUTUT AT DEVICE OUT IGN USM OUT 1 DR REQUEST SW AS REQUEST SW
11P -	R DEFOGGER SW R PEFOGGER SW HAZARD SW 	67 68 68 59 77 73 73 75 75 77 77	ی با 20 م م ا	IGN ELEC RELAY OUT 2 MR OUTPUT AT DEVICE OUT IGN USM OUT 1 DR REQUEST SW AS REQUEST SW
12P -	R DEFOGGER SW - - HAZARD SW - - SHIFT NP SHIFT NP	888 599 71 72 75 75 77 77		MR OUTPUT AT DEVICE OUT IGN USM OUT 1 DR REQUEST SW AS REQUEST SW
13P R BATTERY 33 - - 14P Y BATTERY 34 - - 14P Y BATTERY 35 P/G REVERSE Si 15P YLG BATTERY 35 P/G REVERSE Si 16P W BLOWER FAN RELAY OUT 37 - - 20mector No. M18 - - - - 20mector Type TH40FG-NH - - - - 20mector Type TH40FG-NH - - - - 20mector Type TH40FG-NH Connector Name BCM (BODY CONTINUE) - - 20mector Type TH40FG-NH Connector Name BCM (BODY CONTINUE) - -		59 70 72 72 73 75 75 77	<u>ه</u> د ه ه ، ،	AT DEVICE OUT IGN USM OUT 1 DR REQUEST SW AS REQUEST SW
14P V BATTERV 35 P/O REVENSE SI 15P V/LG BATTERV 35 P/O REVENSE SI 16P V/LG BATTERV 35 P/O REVENSE SI 16P V/LG BATTERV 37 - - 20 Connector No. M18 SHIFT NP - - Connector Type TH40FG-NH Connector Name BCM (BODY CONTROL - - Connector Type TH40FG-NH Connector Name BCM (BODY CONTROL - - Connector Type TH40FG-NH Connector Name BCM (BODY CONTROL - -	HEVERSE SW HAZARD SW - - SHIFT N/P	77	- O U I I	DR REQUEST SW AS REQUEST SW
Isp YILe BATTERY Set Texason 16P w BLOWER FAIN RELAY OUT 36 word word 16P w BLOWER FAIN RELAY OUT 37 word word Connector No. M18 37 word word word Connector No. M18 9 mon word word Connector No. M18 9 B.R Similar word Connector No. M18 0 - - - Connector No. M18 Connector No. M19 - Connector Type TH40FG-NH Connector No. M19 Connector Color GREEN Connector No. M19 Connector Color GREEN Connector No. M19	HAZARD SW HAZARD SW - - SHIFT N/P	72 73 73 73 75 75 75 75 75 75 75 75 75 75 75 75 75	, o , ,	AS REQUEST SW
isp w BLOWER FAN RELAY OUT 30 BLOWER FAN RELAY OUT 7 - Connector No M18 Connector Name BCM (BODY CONTROL 8 B.R 9 - 9 - 9 - 9 - 9 - 14165-NH Connector Type TH40FG-NH Connector No M19	we decrete	77 75 74 4	5 1 7	AO DEGUEST OW
Connector No. M18 Connector Name BCM (BODY CONTROL Connector Type TH40FG-NH Connector Color GREEN Connector Name BCM (BODY CONT Connector Name BCM (BODY CONT Connector Name BCM (BODY CONT Connector Name BCM (BODY CONT Connector Color BLACK	- SHIFT MP	77	. ,	
Connector No. M18 Connector Name BCM (BODY CONTROL Connector Type TH40FG-NH Connector Type TH40FG-NH Connector Name BCM (BODY CONTINUE) Connector Name BCM (BODY CONTINUE) Connector Color GREEN Connector Color BLACK Connector Color BLACK	- SHIFT N/P	75		-
Connector Name BCM (BODY CONTROL Connector Name BCM (BODY CONTROL Connector Type TH40FG-NH Connector Color GREEN Connector Name BCM (BODY CONT Connector Name BCM (BODY CONT Connector Color BLACK		20	NV	COMBLEW OLT 5
Dominactor Name Pownicour Name Dominactor Type TH40FG-NH Connector Name BCM (BODY CONTI Connector Name BCM (BODY CONTI Connector Name BCM (BODY CONTI Connector Name BCM (BODY CONTI Connector Color BLACK Connector Color BLACK		2	5	COMBLOW OUT 3
Donnector Type TH40FG-NH Connector No. M19 Donnector Color GREEN Connector Name BCM (BODY CONTINUE) Connector Color GREEN Connector Type TH40FE-NH H.S. Connector Color BLACK				COMBI SW OUT 3
Connector Color GREN Connector Name BCM (BODY CONTI Connector Name BCM (BODY CONTI Connector Type TH40FB-NH HLS Connector Color BLACK		78	0/B	COMBI SW OUT 2
Connector Name BLCM (BUDY CONIN		62	WW	COMBI SW OUT 1
Connector Type TH40FB-NH	DY CONTROL	08	,	I
H.S. Connector Color BLACK				
	Ę			
HS	R			
00 39 38 57 56 55 54 53 52 51 59 49 49	51 50 49 48 47 46 45 44 43 42 41			
Terminal Color of Signal Name No Wire Signal Name	71 70 69 68 67 66 65 64 63 62 61			
1 G ENG START SW NO ESCL				
2 Tauninal Calaraf				
3 R A/L POWER SUPPLY 5V IETITITIAI COIOT OI Signal Nan No. Wire Signal Nan	ignal Name			
4 W/R A/L SIGNAL 41 Y/L TRAILER LIGHT CHE	I LIGHT CHECK RELAY			
	001			
6 42 R/Y CARGO LAMP	RGO LAMP OUT			

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

< WIRING DIAGRAM >



AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH Cummins 5.0L)

Revision: March 2016

2016 Titan NAM

AAIIA0853GB

TX (FR CONT)		AMB SENS	STRG HEATER SW	SUN SENS		WATER VALVE OPEN(WITH	IGN2(ACC)	FAN GATE	RR DEF ON	LIN SIG	VACIH -	PTC1(WITH CUMMINS 5.0L)	STRG HEATER RLY	CAN-L	P-GND	DX (ED CONT)		SENS GND	INCAR SENS	INTAKE SENS	1		WATER VALVE CLOSE(WITH	COMP ON	FANFB	RR DEF F/B	-	ACTR GND	PTC300TH CLIMMINS 6 01)	PTC3(WITH CUMMINS 5.0L)													
BB		>	BR	ບ		>	8	٩	>	ت ع	× '	G/R	٩	۹.		5 >	> 1	œ	σ	٩	'		-	>	- N	B/W	1	<u>ه</u>	s <u>-</u>	5 8													
4	<u>ہ</u> ہ	2	8	6	₽₽	12	13	14	15	16	18	19	20	21	8	87	25	26	27	28	50	8 6	32	33	34	35	36	37	88 8	6 9													
M135	SUNLOAD SENSOR	K02FB	BLACK				7			Signal Name	SUN SENS	SENS GND		M136	IN-VEHICLE SENSOR	A02FW	WHITE				12			Ciccol Name	Signal Name	IN CAR SENS	SENS GND		M137	A/C AUTO AMP.					5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20	5 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40			Signal Name	CAN-H	GND	BAT	
No.	Name	Type	Color							Color of Wire	5	æ		No.	Name	Type	Color							Color of	Wire	5	m		- No.		- June	10100			1 2 3 4 5	1 22 23 24 2		Color of	Wire	-	в	ß	
Connector	Connector	Connector	Connector	n T	ů L	0 L				Terminal No.	-	2		Connector	Connector	Connector	Connector	fe		H.S.				Terminal	No.		5		Connector	Connector	Connector			HS				Terminal	No.	-	2	3	
Connector No. M130	Connector Name VARIABLE BLOWER	CONTROL	Connector Type M04FW-LC	Connector Color WHITE		H.S.				Terminal Color of	No. Wire Signal Name	1 B GND	2 P FAN GATE	3 L/W FAN SPEED		Connector No. M133	Connector Name A/C SWITCH ASSEMBLY	Connector Type TH12FW-NH	Connector Color WHITE			1 2 3 4 5 6	7 8 9 10 11 12			Terminal Color of Signal Name	1 B GND	2	3 -	4	5 L ILLUMINATION +		8	9 BR RX	10 V TX	11							
	K (J/B)	BR-CS	NMC		-	5R 4R 3R 2R 1R	ווארו ארו בען וואן וטא שאן מא			Signal Name	TAIL LAMP 2	IGNITION	BATTERY	-		BATTERY			BATTERY	-	BATTERY	BATTERY	BATTERY	ACCESSORY		M95	WIRE TO WIRE	AUSINIW	WHITE			-	2	3		Signal Name	TO HVAC SUB HARNESS	TO HVAC SUB HARNESS	TO HVAC SUB HARNESS				
M70	FUSE BLOC	NS16F	ВД										i 1.	- 1							<u>م</u> .	. >		œ	ŀ		<u>л</u>	-	_							r of							
No. M70	Name FUSE BLOC	Type NS16F	Color BR(7R 6R				Color of Wire	-	G/R	Y/R	' ;	A V	δ G	: '	'	3	_	ă °	0		9		°,	Nam	- Me	Color							Colo Vii	3	8	G				

AUTOMATIC AIR CONDITIONING SYSTEM

[AUTOMATIC AIR CONDITIONER]

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

< WIRING DIAGRAM >



VK56VD

AUTOMATIC AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

[AUTOMATIC AIR CONDITIONER]





aertor No E9	16	æ	TO ENGINE CONTROL HARNESS	145	×	POWER SUPPLY FOR ECM	Connector N		75
	17	œ	TO ENGINE CONTROL HARNESS	146	W/G	SENSOR POWER SUPPLY			
ector Name WIRE 10 WIRE	18	œ	TO ENGINE CONTROL HARNESS	147	в	ECM GROUND	Connector N	ame	MBIENT SENSOR
ector Type RS08MGY-PR	19	B/B	TO ENGINE CONTROL HARNESS	148	æ	SENSOR GROUND	Connector Ty	/pe	S02FB
ector Color GRAY	20	GR	TO ENGINE CONTROL HARNESS	149	в	ECM GROUND	Connector C	olor B	LACK
	21	N/R	TO ENGINE CONTROL HARNESS	150	W/R	ACCELERATOR PEDAL POSITION SENSOR 1	E		
	22		TO ENGINE CONTROL HARNESS	151	RV	SENSOR GROUND			
	23		TO ENGINE CONTROL HARNESS	165	•		H.S.		
5 6 7 8	24	۹.	TO ENGINE CONTROL HARNESS	201	•				21
	Connector	ON	16	Connector	No.	:40			
	Connector	Name		Connector	Vame F	REFRIGERANT PRESSURE			
Color of					0,	ENSOR (WITH VK56VD)	Tominol	olor of	
Wire Wire Signal Name	Connector	Color		Connector	Type F	RK03FB	No.	Wire	Signal Name
W TO ENGINE CONTROL HARN	IESS			Connector (Color	BLACK	-	ж	SENS GND
L TO ENGINE CONTROL HARN	IESS (474)	6		f			2	W/B	AMB SENS
R/W TO ENGINE CONTROL HARN	H C H C	_	121 125 129 133 137 141 145 149			<			
W TO ENGINE CONTROL HARN	IESS		122126130134138142 146150	НS		\ll	Connector N	ы	122
SHIELD TO ENGINE CONTROL HARN	LESS		123 127 131 135 139 143 147 151			(((Connector N	ame	DM E/R (INTELLIGENT
GR/R TO ENGINE CONTROL HARN BR TO ENGINE CONTROL HARN	LESS LESS	Ľ	124128132136140144148152			6 7 1		₫ ≥	OWER DISTRIBUTION
B TO ENGINE CONTROL HARN	IESS						T rotococo	: F	
-	Terminal	Color of Wire	Signal Name	Terminal	Color of	Signal Namo	Connector C	olor V	HITE
ctor No. E5	101	avo	EVAP CONTROL SYSTEM	No.	Wire		Į		
ctor Name WIRE TO WIRE	2	5	PRESSURE SENSOR	-	W/L	GND A PRESS	1444m		
ctor Type TH24MW-NH	122		1	2	Ŋ	PD PRES			
ctor Color WHITE	123	٩	CAN COMMUNICATION LINE	ę	SB	AVCC2 PRESS	0.1		2 41 40 30 38 37
]		(CAN-L)					r	
	124	-	CAN COMMUNICATION LINE (CAN-H)	Connector	No.	:65		4	8 47 46 45 44 43
	125	SB	SENSOR POWER SUPPLY	Connector	Vame V	VATER VALVE			
	11 12 126	1	1	Connector	Type F	R02FGY	Terminal	Color of	
13 14 15 16 17 18 19 20 21 22 2	23 24 127	'	I	Connector (Color	BRAY	No.	Wire	Signal Name
	128	٨٧	FUEL TEMPERATURE SENSOR				37		
	129	•	I	14HAN			38	,	I
nal Color of	130	ВW	FUEL PUMP CONTROL MODULE (FPCM) CHECK	SH		~	39	5	WIPER AUTO STOP SW
Wire Signal Name	131		1	þ			40	٩	CAN-L
L/R TO ENGINE CONTROL HARN	IESS 132		-			((2 1))	41	_	CAN-H
BR TO ENGINE CONTROL HARN	IESS 133	×	IGNITION SWITCH				42	В	DTRL RLY
V TO ENGINE CONTROL HARN	JESS 134	GΛ	ASCD STEERING SWITCH				43	1	-
L/O TO ENGINE CONTROL HARN	JESS 135	ΒΛ	SENSOR GROUND	Terminal	Color of		44	W/B	START CONT
W TO ENGINE CONTROL HARN	136 136	GR	FUEL PUMP CONTROL MODULE	No.	Wire	Signal Name	45	HB >	FUEL RLY CON I
P TO ENGINE CONTROL HARN	LESS 197	WVC		-	-	WATER VALVE CLOSE	49 1	> >	
Y/R TO ENGINE CONTROL HARN	IESS 13/	M/H		2	>	WATER VALVE OPEN	4/	×	ALI C - (WITH VK56VU)
BR TO ENGINE CONTROL HARN	IESS 138	s C	CTOD I AND CUITON LINE	-	:		48	RW	HORN HLY CONI
W/L TO ENGINE CONTROL HARN	139 140	5	STOP LAMP SWITCH						
L/Y TO ENGINE CONTROL HARN	IESS 140	5	EVAD CANISTED VENT CONTROL						
SB TO ENGINE CONTROL HARN	TESS	-	VALVE						
L TO ENGINE CONTROL HARN	142 142	ΓW	SENSOR POWER SUPPLY						
	143 1555 143	0	ACCELERATOR PEDAL POSITION						
	144	č							
	=00	77							

AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH VK56VD)

< WIRING DIAGRAM >

2016 Titan NAM

AUTOMATIC AIR CONDITIONING SYSTEM [AUTOMATIC AIR CONDITIONER]

C D F

А

В

Н

HAC

J

Κ

L

Μ

Ν

0

Ρ

G

E130	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH10FB-NH	BLACK	67 66 65 64 63 72 71 70 69 66
Connector No.	Connector Name	Connector Type	Connector Color	H.S.
E123	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	NS08FBR-CS	BROWN	51 50 49 56 55 54 53 52
Connector No.	Connector Name	Connector Type	Connector Color	际可 H.S.

Signal Name	A/C COMP - (WITH CUMMINS 5.0L)	A/C COMP - (WITH VK56VD)	TRAILER TOW	1	S-GND	1	1	1	1	E124	IPDM E/R (INTELLIGENT
Color of Wire	Y/B	GR/R	BR		8	•	1	1	1	No.	Name
Terminal No.	49	49	50	51	52	53	54	55	56	Connector	Connector

Signal Name

Color of Wire

Terminal

ю́

8 64 PUSH START SW

۵.

65 99 69 69 70 7

DETENT SW

IGN SIGNAL

E-CPLG - (WITH VK56VD)

HOOD SW2

B >

22

Connector No.	E124
Connector Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector Type	M06FB-LC
Connector Color	BLACK
E	
H.S.	59 58 57 51 50
	00 10 70

Signal Name	RR DEF	FUEL PUMP - (WITH CUMMINS 5.0L)	FUEL PUMP - (WITH VK56VD)	I	I	1	P GND	
Color of Wire	W/B	ВВ	ВΛ				8	
Terminal No.	57	58	58	59	60	61	62	
					A	AII	AO	863GE

TO ENGINE ROOM HARNESS TO FNGINE ROOM HARNESS	TO ENGINE POOM HABNESS	TO ENGINE POOM HABNESS		TO ENGINE HOUM HARNESS	I U ENGINE KUUM HARNESS	TO ENGINE ROOM HARNESS	TO FNGINE ROOM HABNESS	TO ENGINE ROOM HARNESS	TO ENGINE BOOM HABNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS		652	VE MIDE TO WIDE		1300FGT-FH	THAT		[4 3 2 1	8 7 6 5				Signal Name	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS																
BR	1 ~ 1	5 8	8 -		M/H	7	8	8	æ	в	B/B	GB	d//	SHIFLD	SHIELD	٩			. Namel		adh	COLOR							Color of	Wire	M	-	RW	A Line	SHIELU	BB	8												
ωσ	, ç	2 7	-	2 9	22	14	15	16	17	18	61	202	1 2	- 66	3	24		Connector	Connector		Connector	Connector	f		N H S				Tarminal	No.	-	2	e	4	5 U	~ ~	60												
TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HADNESS	TO MAIN HADNESS		TO MAIN HAHNESS	I U MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		4	IRE TO WIRE	124FW-NH	HITE				0 9 8 7 6 5 4 3 2 1	22 21 20 19 18 1/ 19 19 14 13			Signal Name		TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS				
BW	WV			s (r	R/G	σ	M		8	-		-	- 1	W/B	B/R	W/B	٩	L	g	σ	٨٧	BR	σ (ງ ≩	* ~	W/B	ß	GR/W		o. F	lame W	ype Th	olor W				12 11 1	24 23 2			Color of	wire	5 8	5 >	9	M	٩	Y/R
70G	962	790	012	/4G	500/	76G	77G	78G	79G	80G	816	82G	830	846	85G	96G	87G	88G	89G	90G	91G	92G	93G	94G	95G 96G	57G	986	966	100G		Connector N	Connector N	Connector T	Connector C			H.S.					Terminal	on ,	- •	N 65	4	2	9	7
TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HADNESS	I U MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	CUMMINS 5.0L)	TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HABNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH CUMMINS 5.0L)	TO MAIN HARNESS - (WITH	VK56VD)		TO MAIN HARNESS TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS
Š	Y/R	G/B	RW	œ	ß	90	a 6/5	G/B	BRY	٩.	1	œ	•	- 17	GR	G/R	B	R/W	BR	BR	'	R/G	0	۵	σ	ž	λ/H (3 œ	N	,	BR	œ .	- 3	* *	σ	w	7	BG	BG	BB 1	n 3	× ۵	WL	W/R	BG	BG	8	7
22G	23G	24G	25G	26G	276	000	5962	29G	30G	31G		31G	326	336	34G	35G	36G	37G	38G	39G	40G	41G	42G	43G	43G		2440	45G	47G	48G	49G	50G	51G	52G 52G	54G	55G	56G	57G	58G	59G	60G	616	929 936	64G	65G	66G	67G	68G	69G
E152	WIRE TO WIRE	TH80MW-CS16-TM4	MHITE						5G 4G 3G 2G 1G	10G 9G 8G 7G 8G	almated sol sol 56 156 156 136 136 136	002302302770280250240230220		0400 390 390 30 30 30 30 30 30 30 30 30 30 30 30 30	ตศตตรรดรรรดรรรดรรรดรรดราคา	700690680670660650640630620	Glaod/196/186/176/166/156/136/136/126/1716	900890 886 876 866 850 846 836 826	200 000 000 000 0000	1006 996 986 976 asc					Signal Name		TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	TO MAIN HARNESS - WITH	CUMMINS 5.0L)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	CUMMINS 5.0L)	
No.	Name \	Type	Color	IDIDO							16	7]	4	54		1								Color of	Wire	5	A/B	BR/W	BR	٩	RW		>	ۍ د	- ≥	R/G	W/B	BR	Y/B	G/W	IJ	S	1/5	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	BV	G/R		
nector	nnector	nnector	nontor		G		U H	5																	erminal Ma	No.	2 6	36	4G	5G	99	99		7G	8	106	116	12G	13G	14G	15G	16G	17G	501	500	216	22G		

Revision: March 2016

2016 Titan NAM

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

AUTOMATIC AIR CONDITIONING SYSTEM [AUTOMATIC AIR CONDITIONER]

< WIRING DIAGRAM >

16P W BLOWER FAN RELAY OUT		
M3 FUSE BLOCK (J/B) CS06FW-M2 WHITE 31 2N 1N 8N 7N 6N 5N 4N signal Name	IGN BATTERY INTERY INTERY BATT	Signal Name Signal Name I arritor I ricri rucri 27 i rucri 107 i rucri 201100 I controlo
Connector No. Connector Name Connector Type Connector Type Connector Color H.S.	NO. WIE 1N 0 2N W 3N W 5N V 6N V 6N V 7N V 6N V 7N V 6N V 7N V 6N V 7N V	Terminal Color o 1p P 1p P 2p V 2p V 3p G 4p P 5p B 6p B 11p - 13p - 13p - 14p V/1d
BATTERY TEMPERATURE ESISOR CRANKSHAFT POSTION SENSOR (POS) ENOR ENOR TEMPERATURE ESISOR MASS ART FLOW SENSOR MASS ART FLOW SENSOR MASS ART FLOW SENSOR MASS ART FLOW SENSOR BATTERY CURRENT SENSOR ENALGY FAULE TIMING CAMINATY MALE TIMING CONTROL POSTION SENSOR	Image: Serson anound serson anound serson anound serson anound serson anound serson anound serson anound high Presure Fuel, with Fuel, NueEron ko. 1 (Lo) Fuel, NueEron ko. 4 (Lo) Fuel, NueEron ko. 7 (H) Bander Superview Danger Superview D	Signal Name Arc coMP
32 LG 33 RW 34 - 1 35 RW 35 RW 36 GO 36 GO 37 GB 38 CO 38 CO 38 CO 38 CO 38 CO 38 CO 39 CO 39 CO 30 CO 30 CO 30 CO 30 CO 30 30 30 CO 30 30 30 30 30 30 30 30 30 30 30 30 30	42 8 43 4 44 6 45 8 46 8 47 8 48 9 49 7 49 7 49 8 50 8 51 7 53 8 54 4 55 8 56 8 57 8 53 8 54 4 55 8 56 8 57 8 56 8 57 8 56 8 57 8 56 9 57 9 58 8 56 9 57 9 58 9 59 9 50 9 10 9 57 <th>Connector Tanne P Connector Type 6 Connector Color E H.S. H.S. H.S. Mire Color of Mire A</th>	Connector Tanne P Connector Type 6 Connector Color E H.S. H.S. H.S. Mire Color of Mire A
F78 End MB35FB-MEB20-LH MB35FB-MEB20-LH BLACK 11 16 11 55 1 1 17 17 17 55 1 1 11 17 27 23 33 41 55 1 1 11 13 22 23 33 43 45 54 1 1 13 22 23 33 43 45 54 45 54 44 54 44 54 44 54 44 55 55 55 55 55 55 55 55 55 55 55 <th>FUEL INJECTION BRIVER POWER FUEL INJECTION BRIVER POWER FUEL INJECTION BRIVER POWER HIGH PRESSURE FUEL PUMP HIGH PRESSURE FUEL PUMP FUEL INJECTION NO. 3 (L0) FUEL INJECTION NO. 5 (L0) FUEL INJECTION NO. 5 (L0) RULL INJECTION NO. 5 (L0) REFINICERAT REFINICERAT RESURF ROUND SENSOR BROUND SENSOR BROUND SENSOR BROUND</th> <th>KNOCK SENSOR (BANK 1) EKHAUST GAS TEMPERATURE ESHSOR (BANK 2) KNOCK SENSOR (BANK 2) ECHAUST GAS TEMPERATURE SENSOR (BANK 1) ECHAURT GAS TEMPERATURE SENSOR (BANK 1) SENSOR (BANK 1) SENSOR (BANK 1) ERGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE SENSOR POWER SUPPLY SENSOR POWER SUPPLY</th>	FUEL INJECTION BRIVER POWER FUEL INJECTION BRIVER POWER FUEL INJECTION BRIVER POWER HIGH PRESSURE FUEL PUMP HIGH PRESSURE FUEL PUMP FUEL INJECTION NO. 3 (L0) FUEL INJECTION NO. 5 (L0) FUEL INJECTION NO. 5 (L0) RULL INJECTION NO. 5 (L0) REFINICERAT REFINICERAT RESURF ROUND SENSOR BROUND SENSOR BROUND SENSOR BROUND	KNOCK SENSOR (BANK 1) EKHAUST GAS TEMPERATURE ESHSOR (BANK 2) KNOCK SENSOR (BANK 2) ECHAUST GAS TEMPERATURE SENSOR (BANK 1) ECHAURT GAS TEMPERATURE SENSOR (BANK 1) SENSOR (BANK 1) SENSOR (BANK 1) ERGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE ENGINE CLI TEMPERATURE SENSOR POWER SUPPLY SENSOR POWER SUPPLY
Connector No. Connector Name Connector Type Connector Color Connector Color Color Connector Colo	Terminal Color on 1 1 1 No. 2 SB 3 B/R 3 B/R 6 R 7 V/B 9 R/W 11 - 12 L/V 13 M/M 14 SHIML	15 W 16 - 17 V 18 W 19 GA/R 20 SHIELD 21 - 22 U/Y 23 U/Y 23 U/Y 23 U/Y 24 P/GR 25 U/Y 26 V/W 27 U/Y 28 V/W 26 V/W 27 U/Y 28 V/M 29 SB 30 SB 31 BR

AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH VK56VD)

2016 Titan NAM

< WIRING DIAGRAM >

ILECTOR INC		M18	fe y	B/B	SHIFT N/P	75	× ,	COMBI SW OUT 5
nector Na	ame	BCM (BODY CONTROL	40	'	1	e/ 12	× _	COMBI SW OUT 4 COMBI SW OUT 3
1		MUDULE)	Connecto	NON Y	M10	78	0/B	COMBI SW OUT 2
nector ly	be	I H40FG-NH	Connecto	r Name	BCM (BODY CONTROL	62	R/W	COMBI SW OUT 1
		GREEN			MODULE)	80	1	
			Connecto	r Type	TH40FB-NH			
S.			Connecto	r Color	BLACK			
20 40 3	19 18 17 39 38 37	16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 3 2 8 38 33 32 31 30 29 28 27 26 25 24 23 22 22 3	E					
			H.S.	60 59 58 57 5		42 41		
minal C	Color of Wire	F Signal Name		1 11 01 21 00		10 70		
-	σ	ENG START SW NO ESCL						
2		-	Terminal	Color of	Signal Name			
4	H N	A/L POWEH SUPPLY 5V	41	۲۲ ۸۲	TRAILER LIGHT CHECK RELAY			
. 5	•				OUT			
9	.	-	42	RV	CARGO LAMP OUT			
7		-	43	'	1			
8		1	44	'	I			
6		1	45	'	I			
10	SB	COMBI SW IN 5	46	'	1			
=	G√	COMBI SW IN 4	47	'	1			
12	>	COMBI SW IN 3	48	œ	HIGH SIDE START SW LED			
13	G/B	COMBI SW IN 2	49	'	1			
14	>	COMBI SW IN 1	20	1	1			
15	'	1	5	3				
16		I	20					
17	•	GND RF A/L	20	M	PW HABT			
8	>	SECURITY INDICATOR	55	W/B	L&R SENSOR K-LINE			
19	، a	-	56	<u>'</u>				
		STIFL F	57	1	1			
	MA	SIEP LAWP CONT	58	-	-			
4 8	 >	AIRCON SW	59	٩	CAN-L			
24		1	60		CAN-H			
25	×	BRAKE SW FUSE	61	0	REAR DEFOGGER RELAY OUT			
26	-	SHORT IN PIN INPUT	62	>	STARTER RELAY OUT			
27	R/G	BRAKE SW LAMP	63	، د				
28		I	65		DUZZEN OUT			
29	N	BLOWER FAN SW	89	- 3	BLOWED FAN DELAY OLIT			
30	•	DR DOOR LOCK STATUS	67	: 0	IGN ELEC RELAY OLIT 2			
31	1	1	89		MBOUTPUT			
32	>	REAR DEFOGGER SW	69	R/B	AT DEVICE OUT			
8	'	-	02	_	IGN USM OUT 1			
34	1		7	0	DR REQUEST SW			
35	B/G	REVERSE SW	72	σ	AS REQUEST SW			
36	W/B	HAZARD SW	73		1			
37	•	1	74	'	1			
88	ī	1	:	_				

Ο

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν



AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH VK56VD)

< WIRING DIAGRAM >

AAIIA0867GB

[AUTOMATIC AIR CONDITIONER]

R TX (FR CONT)	-	AMB SENS	R STRG HEATER SW	SUN SENS	-	1	V WATER VALVE OPEN(WITH VK56VD)	V IGN2(ACC)	FAN GATE	R DEF ON	LIN SIG	V VACIR	R PTC1(WITH CUMMINS 5.0L)	STRG HEATER RLY	CAN-L	B-GND	IGN	HA (FR CONT)	SENS GND	INCAR SENS	INTAKE SENS	1	•	-	- WAIER VALVE CLOSE(WITH VK56VD)	COMP ON	W FAN FB		ACTR GND	V FAN ON	G PTC2(WITH CUMMINS 5.0L)	B PTC3(WITH CUMMINS 5.0L)														
8	'	3		5	-	'	~	~	4	>	۳ ۳		G/I	•	-		۳ : 	+ 1		0	- -	-	' 			~		5 '	2	8	e Co	S														
4				6	1	-		12	1÷	7	÷ ;	- -	1	5	×1	8	Ň	Ň	1 21	10	122	3	ĕ	ά i		ĕ	ñ ñ		ι. Έ	ĕ	ñ	4				ſ	9 20	8 40								
M135	SUNLOAD SENSOR	K02FB	BLACK				-	-			Signal Name	SUN SENS	SENS GND		M136	N-VEHICLE SENSOR	402FW	NHITE			R	-	1 7			Signal Name	IN CAR SENS	SENS GND		M137	A/C AUTO AMP.	TH40FW-NH	NHITE				6 7 8 9 10 11 12 13 14 15 16 17 18 1	0 72 73 73 30 31 37 38 39 39 30 31 38 3			Signal Name	CAN-H	GND	BAT	:	
No.	Name 5	Type	Color								Color of Wire	o o	œ		No.	Name	Type /	Color								Color of Wire	σ	æ		No.	Name /	Type 1	Color \				1 2 3 4 5	27 27 29 24 22			Wire	-	m	ß	}	
Connector	Connector	Connector	Connector	ł	d HA	HS					Terminal	-	2		Connector	Connector	Connector	Connector		1 HA	H.S.					Ierminal No	-	2		Connector	Connector	Connector	Connector	Ę		H.S.					No.	-	2	6	,	
Connector No. M130	Connector Name VARIABLE BLOWER	CONTROL	Connector Type M04FW-LC	Connector Color WHITE			H.S.	1			Terminal Color of	No. Wire Signal Name	1 B GND	2 P FAN GATE	3 L/W FAN SPEED		Connector No. M133	Connector Name A/C SWITCH ASSEMBLY	Connector Type TH12FW-NH	Connector Color WHITE			H.S.	1 2 3 4 5 6			Terminal Color of Signal Name	No. Wire Jugital Natile	and and	-		5 L ILLUMINATION +	6 GR ILLUMINATION -	7	- I - 0	9 BR RX	10 V TX	12 G IGNITION	-							
M70	FUSE BLOCK (J/B)	NS16FBR-CS	BROWN				214R13R13R11811R10R 0R 8R				Signal Name	TAIL LAMP 2	IGNITION	BATTERY	1	BATTERY	ACCESSORY		1	BATTERY	-	BATTERY	ACCESSORY	BATTERY	ACCESSORY	-	M95	WIRE TO WIRE	AO3MW	WHITE		•	•	c	N (Signal Name	TO HVAC SUB HARNESS	TO HVAC SUB HARNESS	TO HVAC SUB HARNESS					
ir No.	ir Name	ir Type	r Color				16R 15F				Color of Wire		G/R	Y/R	1	>	Ng a	-	,	×	-	BG	•	×9,	G/R		ir No.	nr Name	r Type	ir Color								Color of Wire	>	•	σ					
ecto	lecto	necto	necto			ŝ					ninal I		8	н	щ,	E I	H		H6	В	1R	2R	3R	#	16R		necto	necto	necto	necto			Ś.				.	Minal Vo.	-	2	8					

AUTOMATIC AIR CONDITIONING SYSTEM

[AUTOMATIC AIR CONDITIONER]

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο

< WIRING DIAGRAM >



AIR CONDITIONER CONTROL CONNECTORS - AUTOMATIC (WITH VK56VD)

AAIIA0875GB

[AUTOMATIC AIR CONDITIONER]

BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW Work Flow

INFOID:000000012923280

А





ALAIA0158GB

< BASIC INSPECTION >

1.GET INFORMATION FOR SYMPTOM

- 1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
- 2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

2.CHECK DTC

- 1. Check DTC.
- 2. Perform the following procedure if DTC is detected:
- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.
- 3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3. Symptom is described, DTC is not detected>>GO TO 4. Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer. Also study the normal operation and fail-safe related to the symptom. Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer. Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time. If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included in Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIR-MATION PROCEDURE.

Is DTC detected?

YES >> GO TO 7.

NO >> Check according to <u>GI-43. "Intermittent Incident"</u>.

6. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

- YES >> GO TO 7.
- NO >> Monitor input data from related sensors or check voltage of related module terminals using CON-SULT.

1.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

DIAGNOSIS AND REPAIR WORKFLOW

< BASIC INSPECTION >	[AUTOMATIC AIR CONDITIONER]
Inspect according to Diagnosis Procedure of the system.	
Is malfunctioning part detected?	
YES >> GO TO 8.	
NO >> Check according to <u>GI-43. "Intermittent Incident"</u> .	
8.REPAIR OR REPLACE THE MALFUNCTIONING PART	
 Repair or replace the malfunctioning part. Reconnect parts or connectors disconnected during Diagnosis F ment. Check DTC. If DTC is detected, erase it. 	Procedure again after repair and replace-
>> GO TO 9. 9.FINAL CHECK	
When DTC is detected in step 2, perform DTC CONFIRMATION F	ROCEDURE again, then check that the
malfunction is repaired. When symptom is described by the customer, refer to confirmed syn symptom is not detected.	mptom in step 3 or 4, and check that the
Is DTC detected and does symptom remain?	
YES-1 >> DTC is detected: GO TO 7. YES-2 >> Symptom remains: GO TO 4. NO >> Before returning the vehicle to the customer, always eras	se DTC.

HAC

J

Κ

L

M

Ν

0

OPERATION INSPECTION

< BASIC INSPECTION >

OPERATION INSPECTION

Work Procedure

INFOID:000000012923281

[AUTOMATIC AIR CONDITIONER]

DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

Conditions : Engine running at normal operating temperature

INSPECTION PROCEDURE

1.CHECK MEMORY FUNCTION

- 1. Start the engine.
- 2. Operate the temperature control switch (driver side) and raise the temperature setting to 32°C (90°F).
- 3. Press the OFF switch.
- 4. Turn the ignition switch OFF.
- 5. Turn the ignition switch ON.
- 6. Press the AUTO switch.
- 7. Check that the temperature setting, before turning the ignition switch OFF, is stored.

Is the inspection result normal?

YES >> GO TO 2.

NO >> Check power and ground circuits for A/C auto amp. Refer to <u>HAC-88, "A/C AUTO AMP. : Diagno-</u> sis Procedure".

2. CHECK BLOWER MOTOR SPEED

- 1. Operate the fan control dial. Check that the fan speed changes.
- Check the operation for all fan speeds.

Is the inspection result normal?

YES >> GO TO 3.

NO >> Check blower motor system. Refer to <u>HAC-98, "Diagnosis Procedure"</u>.

3.CHECK DISCHARGE AIR (MODE SWITCH AND DEF SWITCH)

- 1. Press the MODE switch and the DEF switch.
- Check that the air outlets change according to each indicated air outlet by placing a hand in front of the outlets. Refer to <u>HAC-22</u>, "<u>Door Control</u>".

NOTE:

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

Is the inspection result normal?

YES >> GO TO 4.

NO >> Check mode door system. Refer to <u>HAC-90, "MODE DOOR MOTOR : Diagnosis Procedure"</u>.

4.CHECK INTAKE AIR

- 1. Press the REC (
- 2. Press the FRE (2) switch. Indicator is turned ON.
- 3. Listen for the intake door position change. (Slight change of blower sound can be heard.)

NOTE:

Confirm that the A/C compressor clutch is engaged (sound or visual inspection) and the FRE (\bigtriangleup) switch is pressed when the D/F (\circledast) or DEF (\circledast) is selected.

Is the inspection result normal?

YES >> GO TO 5.

NO >> Check intake door system. Refer to <u>HAC-91, "INTAKE DOOR MOTOR : Diagnosis Procedure"</u>.

5. CHECK A/C SWITCH

- 1. Press the A/C switch.
- 2. The A/C switch indicator is turned ON.
- Confirm that the A/C compressor clutch engages (sound or visual inspection).

Is the inspection result normal?

HAC-58

OPERATION INSPECTION

< BASIC INSPECTION > [AUTOMATIC AIR CONDITIONER]	
YES >> GO TO 6. NO >> Check magnet clutch system. Refer to <u>HAC-102</u> , " <u>Diagnosis Procedure</u> ".	
6.CHECK TEMPERATURE DECREASE	
 Operate the A/C compressor. Operate the temperature control switch (driver side) and lower the temperature setting to 18°C (60°F). Check that the cool air blows from the outlets. 	
Is the inspection result normal?	
NO >> Check for insufficient cooling. Refer to HAC-111, "Diagnosis Procedure".	
7. CHECK TEMPERATURE INCREASE	
1. Operate the temperature control switch (driver side) and raise the temperature setting to 32°C (90°F) after warming up the engine.	
2. Check that the warm air blows from the outlets.	
<u>Is the inspection result normal?</u> YES >> GO TO 8	
NO >> Check for insufficient heating. Refer to <u>HAC-113, "Diagnosis Procedure"</u> .	
8. CHECK DUAL MODE FUNCTION	
 Press the DUAL mode switch, and then check that "DUAL" is shown on the display. Operate the temperature control switch (driver side). Check that the discharge air temperature (driver side) changes. 	
 Operate the temperature control switch (passenger side). Check that the discharge air temperature (passenger side) changes. Press the DUAL mode switch, and then check that the temperature setting (driver/passenger) is unified to the driver side temperature setting. 	
Is the inspection result normal?	
YES >> GO TO 9.	
NO >> Refer to <u>HAC-109. "Symptom Table"</u> and perform the appropriate diagnosis. \mathbf{Q} output Auto MODE	
J . CHECK AUTO MODE	
 Operate the temperature control switch (driver side). Check that the fan speed, outlet air or intake air changes. The discharge air temperature or fan speed varies depending on the ambient temperature, invehicle temperature, and temperature setting. 	
Is the inspection result normal?	
 YES >> Inspection End. NO >> Refer to <u>HAC-109, "Symptom Table"</u> and perform the appropriate diagnosis. 	

CONFIGURATION (HVAC)

Work Procedure

NOTE:

• Use "Manual Configuration".

• If an error occurs during configuration, start over from the beginning.

1.CHECK DATA PART NO. (TYPE ID)

1. Use FAST (service parts catalog) to search A/C auto amp. "DATA PART NO. (TYPE ID)".

2. Write down "DATA PART NO. (TYPE ID)".

>> GO TO 2.

2.WRITE CONFIGURATION

CONSULT Configuration

1. Select "Manual Configuration" of "HVAC".

2. Select the "DATA PART NO. (TYPE ID)" found using FAST (service parts catalog) to write the "DATA PART NO. (TYPE ID)" into the A/C auto amp.

>> GO TO 3.

3.VERIFY DATA PART NO. (TYPE ID)

Compare the "DATA PART NO. (TYPE ID)" written into the A/C auto amp. with the one found using FAST (service parts catalog) to confirm they match.

Do DATA PART NOs match?

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

4.PERFORM SUPPLEMENTARY WORK

1. Perform self-diagnosis of all systems.

2. Erase self-diagnosis results.

>> GO TO 5.

5.OPERATION CHECK

Confirm that each function controlled by A/C auto amp. operates normally.

>> Work End.

SYSTEM SETTING

Temperature Setting Trimmer

Description

If the temperature felt by the customer is different than the airflow temperature controlled by the temperature setting, the auto amplifier control temperature can be adjusted to compensate for the temperature setting.

How to set

Using CONSULT, perform "TEMP SET CORRECT" in "Work support" of "HVAC".

Work support items	Display (°F)	Display (°C)	•
	6	3.0	•
	5	2.5	
	4	2.0	
	3	1.5	•
	2	1.0	•
	1	0.5	
TEMP SET CORRECT	0 (initial status)	0 (initial status)	
	-1	-0.5	
	-2	-1.0	•
	-3	-1.5	•
	-4	-2.0	•
	-5	-2.5	•
	-6	-3.0	

NOTE:

• When the temperature setting is set to 25.0°C (77°F) and -3.0°C (-6°F), the temperature controlled by auto amp. is 25.0°C (77°F) - 3.0°C (6°F) = 22.0°C (71°F) and the temperature becomes lower than the temperature setting.

• When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the difference between the temperature setting and control temperature may be cancelled.

Foot Position Setting Trimmer

Description

In the FOOT mode, the air blowing to the DEF can be turned ON/OFF.

How to set

Using CONSULT, perform "BLOW SET" in "Work support" of "HVAC".

Work support itoms	Display	DEF doc	or position	-
work support items	Display	Auto control	Manual control	N
	Mode 1	OPEN	CLOSE	-
	Mode 2 (initial status)	OPEN	OPEN	
BLOW SET	Mode 3	CLOSE	OPEN	C
	Mode 4	CLOSE	CLOSE	-

NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the discharge air mix ratio in FOOT mode may be cancelled.

Inlet Port Memory Function (FRE)

Description

INFOID:0000000012923282

А

В

1

C

INFOID:000000012923283

L

SYSTEM SETTING

< BASIC INSPECTION >

- If the ignition switch is turned to the OFF position while the FRE () switch is set to ON (fresh air intake), "Perform the memory" or "Do not perform the memory" of the FRE () switch ON (fresh air intake) condition can be selected.
- If "Do not perform the memory" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

How to set

Using CONSULT, perform "FRE MEMORY SET" in "Work support" of "HVAC".

Work support items	Display	Setting
	WITHOUT	Perform the memory of manual FRE.
FRE MEMORY SET	WITH (initial status)	Do not perform the memory of manual FRE (auto control).

NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the FRE switch memory function may be cancelled.

Inlet Port Memory Function (REC)

INFOID:000000012923285

Description

- If the ignition switch is turned to the OFF position while the REC () switch is set to ON (recirculation), "Perform the memory" or "Do not perform the memory" of the REC () switch ON (recirculation) condition can be selected.
- If "Perform the memory" was set, the REC () switch will be ON (recirculation) when turning the ignition switch to the ON position again.
- If "Do not perform the memory" was set, the air inlets will be controlled automatically when turning the ignition switch to the ON position again.

How to set

Using CONSULT, perform "REC MEMORY SET" in "Work support" of "HVAC".

Work support items	Display	Setting
	WITHOUT (initial status)	Perform the memory of manual REC.
REC MEMORY SET	WITH	Do not perform the memory of manual REC (auto control).

NOTE:

When the battery cable is disconnected from the negative terminal or when the battery voltage becomes 10V or less, the setting of the REC switch memory function may be cancelled.

DTC/CIRCUIT DIAGNOSIS U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012923346

CAN (Controller Area Network) is a serial communication system for real time application. It is an on-vehicle multiplex communication system with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto vehicles, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-70, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	
		Diagnosis condition	When ignition switch is ON.	F
114000	CAN COMM CIRCUIT	Signal (terminal)	-	
01000	(CAN COMM CIRCUIT)	Threshold	-	
		Diagnosis delay time	2 seconds or more	G
POSSIBLE CAN commu FAIL-SAFE	CAUSE nication system			Н
- DTC CONFI	RMATION PROCEDURE			HAC
1.PERFORM	M SELF-DIAGNOSIS			
 CONSULT Turn igni Perform Chook D 	tion switch ON and wait for 2 "Self Diagnostic Result" mode	seconds or more. e of "HVAC".		J
Is DTC detec	ited?			
YES >> F NO >> F	Refer to <u>HAC-63, "Diagnosis F</u> Refer to <u>GI-43, "Intermittent In</u>	Procedure". cident".		L
Diagnosis	Procedure		INFOID:000000012	923347
1.снеск с	AN COMMUNICATION SYST	EM		Μ
Check CAN of	communication system. Refer	to LAN-51, "Trouble Di	agnosis Flow Chart".	
>>	nspection End.			Ν

A

Е

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS > U1010 CONTROL UNIT (CAN)

DTC Description

INFOID:000000012923348

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
		Diagnosis condition	When ignition switch is ON.
11010	CONTROL UNIT (CAN)	Signal (terminal)	-
01010	[CONTROL UNIT (CAN)]	Threshold	-
		Diagnosis delay time	-

POSSIBLE CAUSE

A/C auto amp.

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

YES >> Refer to <u>HAC-64, "Diagnosis Procedure"</u>.

NO >> Inspection End.

Diagnosis Procedure

1.REPLACE A/C AUTO AMP.

Replace A/C auto amp. Refer to HAC-118, "Removal and Installation".

>> Inspection End.

INFOID:000000012923349

[AUTOMATIC AIR CONDITIONER]

U1321 CONFIGURATION [AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

U1321 CONFIGURATION

DTC Description

DTC No.	CONSULT screen terms (Trouble diagnosis content)	C	TC detection condition
		Diagnosis condition	When ignition switch is ON.
111321		Signal (terminal)	-
01521	NOTCONTOURED	Threshold	If A/C auto amp. is not configured
		Diagnosis delay time	-
VC auto amp	o. not configured		
TC CONFI	RMATION PROCEDURE	E	
	DTC CONFIRMATION P	- ROCEDURE	
Start the Perform " Check if I	engine. 'All DTC Reading" mode. DTC U1321 is detected as	the current malfunction in	"Self Diagnostic Result" mode of "HVAC".
<u>s DTC U132'</u> YES >> R NO >> Ir	<u>1 detected as the current magnetic to HAC-65, "Diagnosised aspection End.</u>	nalfunction? s Procedure".	-
Diagnosis	Procedure		INFOID:000000012923371
	I CONFIGURATION OF A	/C AUTO AMP.	

J

L

Μ

Ν

Ο

Ρ

IAC

D

А

B2578, B2579 IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

B2578, B2579 IN-VEHICLE SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to <u>HAC-63, "DTC Description"</u>.
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to <u>HAC-64</u>, "DTC Description".

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
		Diagnosis condition	When ignition switch is ON.
D2579	IN-VEHICLE SENSOR (SHORT)	Signal (terminal)	-
B2370	(In-vehicle sensor)	Threshold	More than 100°C (212°F)
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
P2570	IN-VEHICLE SENSOR (OPEN)	Signal (terminal)	-
B2379	(In-vehicle sensor)	Threshold	Less than -42°C (-44°F)
		Diagnosis delay time	-

POSSIBLE CAUSE

- · In-vehicle sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- $\check{1}$. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

YES >> Refer to <u>HAC-66, "Diagnosis Procedure"</u>. NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012923351

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram".

1. CHECK IN-VEHICLE SENSOR POWER SUPPLY

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

INFOID:000000012923350

B2578, B2579 IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

				Voltage
In-vehicle sensor		—		(Approx.)
Connector	Terminal			
M136	1	Groui	nd	5 V
YES >> GO TO NO >> GO TO CHECK IN-VEF . Turn ignition so . Check continu) 2.) 4. IICLE SENSOR G witch OFF. ity between in-veh	ROUND CIRCUIT	connector and grou	Ind.
In-vehicle	e sensor			
Connector	Terminal	—		Continuity
M136	2	Groui	nd	Yes
YES >> Replace NO >> Replace CHECK IN-VEF CHECK IN-VEF CHECK IN-VEF Disconnect A/0 Check continu	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh	Refer to <u>HAC-118, "</u> or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness	Removal and Install 0. "Removal and Ins RCUIT FOR OPEN connector and A/C	ation". <u>stallation"</u> . auto amp. harness connect
YES >> Replac NO >> Replac 1 .CHECK IN-VEH 1. Turn ignition so 2. Disconnect A/0 3. Check continu	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh	Refer to <u>HAC-118</u> , " or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness	Removal and Install 0, "Removal and Ins RCUIT FOR OPEN connector and A/C	ation". stallation". auto amp. harness connect
YES >> Replac NO >> Replac 1. CHECK IN-VEH I. Turn ignition s 2. Disconnect A/0 3. Check continu In-vehicle Connector	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh	Refer to <u>HAC-118, "</u> or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness A/C auto Connector	Removal and Install 0. "Removal and Install 0. "Removal and Install RCUIT FOR OPEN connector and A/C amp. Terminal	<u>ation"</u> . <u>stallation"</u> . auto amp. harness connect Continuity
YES >> Replace NO >> Replace CHECK IN-VEF I. Turn ignition so 2. Disconnect A/0 3. Check continu In-vehicle Connector M136	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh e sensor Terminal 1	Refer to <u>HAC-118, "</u> or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness A/C auto <u>Connector</u> <u>M137</u>	Removal and Install 0. "Removal and Install RCUIT FOR OPEN connector and A/C amp. Terminal 27	ation". stallation". auto amp. harness connect Continuity Yes
YES >> Replace NO >> Replace A.CHECK IN-VEH 1. Turn ignition st 2. Disconnect A/0 3. Check continut In-vehicle Connector M136 s the inspection replace YES >> GO TO NO >> Repair D.CHECK IN-VEH Check continuity b	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh e sensor Terminal 1 sult normal? O 5. harness or conne IICLE SENSOR P etween in-vehicle sensor	Refer to <u>HAC-118</u> , " or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness <u>A/C auto</u> <u>Connector</u> <u>M137</u> ector. OWER SUPPLY CII sensor harness con	Removal and Install 0, "Removal and Install RCUIT FOR OPEN connector and A/C amp. Terminal 27 RCUIT FOR GROU nector and ground.	ation". auto amp. harness connect Continuity Yes ND SHORT
YES >> Replace NO >> Replace A.CHECK IN-VEH 1. Turn ignition st 2. Disconnect A/0 3. Check continut In-vehicle Connector M136 s the inspection replace YES >> GO TC NO >> Repair D.CHECK IN-VEH Check continuity b	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh e sensor Terminal 1 sult normal? O 5. harness or conne IICLE SENSOR P etween in-vehicle sensor	Refer to <u>HAC-118</u> , " or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness <u>A/C auto</u> <u>Connector</u> <u>M137</u> octor. OWER SUPPLY CII sensor harness con	Removal and Install O, "Removal and Install O, "Removal and Install RCUIT FOR OPEN Terminal 27 RCUIT FOR GROU nector and ground.	ation". auto amp. harness connect Continuity Yes ND SHORT
YES >> Replace NO >> Replace CHECK IN-VEH . Turn ignition so . Disconnect A/0 . Check continue In-vehicle Connector M136 sthe inspection replace YES >> GO TO NO >> Repair CHECK IN-VEH Check continuity b	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh e sensor Terminal 1 sult normal? 0 5. harness or conne IICLE SENSOR P etween in-vehicle sensor Terminal	Refer to <u>HAC-118</u> , " or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness <u>A/C auto</u> <u>Connector</u> <u>M137</u> ector. OWER SUPPLY CII sensor harness con	Removal and Install O, "Removal and Install O, "Removal and Install RCUIT FOR OPEN connector and A/C amp. Terminal 27 RCUIT FOR GROU nector and ground.	ation". auto amp. harness connect Continuity Yes ND SHORT Continuity
YES >> Replace NO >> Replace CHECK IN-VEF . Turn ignition st . Disconnect A/0 . Check continut In-vehicle Connector M136 . CHECK IN-VEF Check continuity b In-vehicle Connector M136 . CHECK IN-VEF	ce A/C auto amp. I ce in-vehicle senso IICLE SENSOR P witch OFF. C auto amp. conne ity between in-veh e sensor Terminal 1 sult normal? 0 5. harness or conne IICLE SENSOR P etween in-vehicle sensor Terminal 1 secure auto amp. conne a sensor Terminal	Refer to <u>HAC-118</u> , " or. Refer to <u>HAC-120</u> OWER SUPPLY CII ector. icle sensor harness <u>A/C auto</u> <u>Connector</u> <u>M137</u> ector. OWER SUPPLY CII sensor harness con <u>Grour</u>	Removal and Install 0, "Removal and Install 0, "Removal and Install RCUIT FOR OPEN amp. Terminal 27 RCUIT FOR GROU nector and ground.	ation". auto amp. harness connect Continuity Yes ND SHORT Continuity No

HAC-67

B2578, B2579 IN-VEHICLE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000012923352

+ In-vehicle sensor		_	Voltage	
Connector	Terminal		(Approx.)	
M136	1	Ground	0 V	

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

NO >> Repair harness or connector.

Component Inspection

1.CHECK IN-VEHICLE SENSOR

1. Turn ignition switch OFF.

2. Disconnect in-vehicle sensor connector.

3. Check resistance between in-vehicle sensor terminals.

Terminal		Condition	Posistance: kO							
		Temperature: °C (°F)								
		-15 (5)	12.73							
		-10 (14)	9.92							
		-5 (23)	7.80							
		0 (32)	6.19							
	-	5 (41)	4.95							
										10 (50)
1	2	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							

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace in-vehicle sensor. Refer to <u>HAC-120, "Removal and Installation"</u>.

B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

B257B, B257C AMBIENT SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to <u>HAC-63. "DTC Description"</u>.
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to <u>HAC-64</u>, "DTC Description".

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
B257B		Diagnosis condition	When ignition switch is ON.	— E
	AMBIENT SENSOR (SHORT)	Signal (terminal)	-	
	(Ambient sensor)	Threshold	More than 100°C (212°F)	
		Diagnosis delay time	-	F
	AMBIENT SENSOR (OPEN) (Ambient sensor)	Diagnosis condition	When ignition switch is ON.	
B257C		Signal (terminal)	-	
		Threshold	Less than -42°C (-44°F)	G
		Diagnosis delay time	-	

POSSIBLE CAUSE

Ambient sensor

- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

(\square)	CONSULT
1.	Turn ignition switch ON.
2.	Perform "Self Diagnostic Result" mode of "HVAC".
3.	Check DTC.
ls I	DTC detected?
Y	ES >> Refer to <u>HAC-69, "Diagnosis Procedure"</u> .

NO >> Inspection End.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to <u>HAC-36, "CUMMINS 5.0L : Wiring Diagram"</u> or <u>HAC-45, "VK56VD : Wiring Diagram"</u>.

1.CHECK AMBIENT SENSOR POWER SUPPLY

1. Turn ignition switch OFF.

- 2. Disconnect ambient sensor connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between ambient sensor harness connector and ground.

С

INFOID:000000012923353

А

HAC

Κ

L

Μ

Ο

Ρ

Н

INFOID:000000012923354

B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+		Veltage
Ambient sensor		_	(Approx.)
Connector	Terminal		
E75	2	Ground	5 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2. CHECK AMBIENT SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between ambient sensor harness connector and ground.

Ambient sensor			Continuity	
Connector	Terminal		Continuity	
E75	1	Ground	Yes	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK AMBIENT SENSOR

Check ambient sensor. Refer to HAC-71, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118, "Removal and Installation"</u>.

NO >> Replace ambient sensor. Refer to <u>HAC-119. "Removal and Installation"</u>.

4.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect A/C auto amp. connector.

3. Check continuity between ambient sensor harness connector and A/C auto amp. harness connector.

Ambient sensor		A/C au	Continuity	
Connector	Terminal	Connector Terminal		Continuity
E75	2	M137	7	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

5.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR GROUND SHORT

Check continuity between ambient sensor harness connector and ground.

Ambient sensor			Continuity	
Connector	Terminal		Continuity	
E75	2	Ground	No	

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

6.CHECK AMBIENT SENSOR POWER SUPPLY CIRCUIT FOR POWER SHORT

1. Turn ignition switch ON.

2. Check voltage between ambient sensor harness connector and ground.

B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

+		Voltage		Voltage	A	
	Ambien	t sensor		—	(Approx.)	
Conn	ector	Terminal				В
E7	′5 .:	2		Ground	0 V	
YES >	>> Repla >> Repla >> Repai	ce A/C auto amp. I r harness or conne	Refer to <u>HAC</u> ector.	-118, "Removal and In	stallation".	С
	nent in	spection			INFOID:000000012923355	D
1.CHEC	K AMBIE	NT SENSOR				
 Turn Disco Chec 	ignition s onnect an k resistai	witch OFF. nbient sensor conr nce between ambie	iector. ent sensor te	rminals.		E
Torr	ninal	Condition		Desistance kO	—	F
Ierr	ninai	Temperature: °	C (°F)	Resistance: KD		
		-15 (5)		12.73	—	G
		-10 (14)		9.92		
		-5 (23)		7.80		
		0 (32)		6.19		Н
		5 (41)		4.95		
		10 (50)		3.99		НАС
1	2	15 (59)		3.24		1.010
		20 (68)		2.65		
		25 (77)		2.19		J
		30 (86)		1.81		
		35 (95)		1.51		k
		40 (104)		1.27		r×.
		45 (113)		1.07		
Is the insp	oection re	esult normal?				L
YES > NO >	>> Inspec >> Repla	ction End. ce ambient sensor	. Refer to <u>HA</u>	<u>.C-119, "Removal and I</u>	Installation".	Б. Д.
						IVI
						Ν
						\cap
						0

< DTC/CIRCUIT DIAGNOSIS >

B2581, B2582 INTAKE SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to <u>HAC-63. "DTC Description"</u>.
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to <u>HAC-64</u>, "DTC Description".

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
B2581		Diagnosis condition	When ignition switch is ON.	
	INTAKE SENSOR (SHORT) (Intake sensor)	Signal (terminal)	-	
		Threshold	More than 100°C (212°F)	
		Diagnosis delay time	-	
B2582	INTAKE SENSOR (OPEN) (Intake sensor)	Diagnosis condition	When ignition switch is ON.	
		Signal (terminal)	-	
		Threshold	Less than -42°C (-44°F)	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- Intake sensor
- A/C auto amp.
- Harness or connectors (The sensor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

YES >> Refer to <u>HAC-72, "Diagnosis Procedure"</u>. NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012923357

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1. CHECK INTAKE SENSOR POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect intake sensor connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between intake sensor harness connector and ground.

INFOID:000000012923356
B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

• • •				Voltage
Intake s	Terminel	—		(Approx.)
	ıerminai	Grou	nd	5.1/
the inequation re	oult normal?	Grou	iu	5 V
ES >> GO TO IO >> GO TO CHECK INTAKE) 2.) 4. E SENSOR GROL	IND CIRCUIT		
. Check continui	ity between intake	sensor harness col	nnector and ground.	
Intake	sensor			
Connector	Terminal	—		Continuity
M64	2	Grou	nd	Yes
theck intake sense the inspection re	or. Refer to <u>HAC-7</u> sult normal?	74, "Component Ins	<u>pection"</u> .	
YES >> Replac NO >> Replac 1. CHECK INTAKE	ce A/C auto amp. I ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne	Refer to <u>HAC-118, "</u> Refer to <u>HAC-122, "I</u> ER SUPPLY CIRCU ector.	Removal and Install Removal and Installa IT FOR OPEN	<u>ation"</u> . a <u>tion"</u> .
YES >> Replac NO >> Replac 1. CHECK INTAKE 1. Turn ignition sv 2. Disconnect A/0 3. Check continui	ce A/C auto amp. I ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake	Refer to <u>HAC-118, "</u> Refer to <u>HAC-122, "</u> ER SUPPLY CIRCU ector. sensor harness co	Removal and Install Removal and Installa IT FOR OPEN nnector and A/C aut	ation". ation". o amp. harness connector
YES >> Replac NO >> Replac 1. CHECK INTAKE I. Turn ignition sv 2. Disconnect A/C 3. Check continui	ce A/C auto amp. ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122, "</u> ER SUPPLY CIRCU ector. sensor harness col	Removal and Install Removal and Installa IT FOR OPEN nnector and A/C aut	ation". ation". o amp. harness connector Continuity
YES >> Replac NO >> Replac .CHECK INTAKE . Turn ignition so . Disconnect A/C . Check continui Intake s Connector M64	ce A/C auto amp. 1 ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake sensor Terminal	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122, "</u> ER SUPPLY CIRCU ector. sensor harness con A/C auto <u>Connector</u> M137	Removal and Install Removal and Installa IT FOR OPEN nnector and A/C aut amp. Terminal 28	ation". ation". o amp. harness connector Continuity Yes
YES >> Replac NO >> Replac CHECK INTAKE I. Turn ignition sv Disconnect A/C Disconnect A/C Connector M64 s the inspection re YES >> GO TO NO >> Repair D.CHECK INTAKE Check continuity be	ce A/C auto amp. I ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake sensor Terminal 1 esult normal? O 5. harness or conne E SENSOR POWE etween intake sen	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122, "</u> ER SUPPLY CIRCU ector. Sensor harness con <u>A/C auto</u> <u>Connector</u> <u>M137</u> ector. ER SUPPLY CIRCU sor harness connect	Removal and Install Removal and Install IT FOR OPEN nnector and A/C aut amp. Terminal 28 IT FOR GROUND S ttor and ground.	ation". o amp. harness connector Continuity Yes HORT
YES >> Replac NO >> Replac CHECK INTAKE Disconnect A/C Check continui Intakes Connector M64 S the inspection re YES >> GO TO NO >> Repair D.CHECK INTAKE Check continuity be	ce A/C auto amp. 1 ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake sensor Terminal 1 esult normal? O 5. harness or conne E SENSOR POWE etween intake sen	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122, "</u> ER SUPPLY CIRCU ector. Sensor harness con A/C auto Connector M137 ector. ER SUPPLY CIRCU sor harness connector	Removal and Install Removal and Install IT FOR OPEN nnector and A/C aut amp. Terminal 28 IT FOR GROUND S ctor and ground.	ation". ation". c amp. harness connector Continuity Yes HORT
YES >> Replac NO >> Replac I.CHECK INTAKE Disconnect A/C Disconnect A/C Connector M64 Sthe inspection re YES >> GO TC NO >> Repair D.CHECK INTAKE Check continuity be Intake s Connector	ce A/C auto amp. 1 ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne- ity between intake sensor Terminal 1 esult normal? 0 5. harness or conne- E SENSOR POWE etween intake sen sensor Terminal	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122</u> , " ER SUPPLY CIRCU ector. sensor harness con <u>A/C auto</u> <u>Connector</u> <u>M137</u> ector. ER SUPPLY CIRCU sor harness connec	Removal and Install Removal and Install IT FOR OPEN nnector and A/C aut amp. Terminal 28 IT FOR GROUND S ctor and ground.	ation". ation". c amp. harness connector Continuity Yes HORT Continuity
YES >> Replac NO >> Replac CHECK INTAKE Disconnect A/C Disconnect A/C Check continui Intake s Connector M64 Sthe inspection re YES >> GO TO NO >> Repair D.CHECK INTAKE Check continuity be Intake s Connector M64	ce A/C auto amp. I ce intake sensor. F E SENSOR POWE witch OFF. C auto amp. conne ity between intake sensor Terminal 1 esult normal? 0 5. harness or conne E SENSOR POWE etween intake sen sensor Terminal 1	Refer to <u>HAC-118</u> , " Refer to <u>HAC-122</u> , "] ER SUPPLY CIRCU ector. Sensor harness con A/C auto Connector M137 ector. ER SUPPLY CIRCU sor harness connect Grout	Removal and Install Removal and Install IT FOR OPEN nnector and A/C aut amp. Terminal 28 IT FOR GROUND S ctor and ground.	ation". p amp. harness connector Continuity Yes HORT Continuity No

B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000012923358

	+		Valaria
Intake sensor		—	(Approx.)
Connector	Terminal		
M64	1	Ground	0 V

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-118, "Removal and Installation".

NO >> Repair harness or connector.

Component Inspection

1.CHECK INTAKE SENSOR

1. Turn ignition switch OFF.

2. Disconnect intake sensor connector.

3. Check resistance between intake sensor terminals.

Terminal		Condition	Pesistance: kO	
		Temperature: °C (°F)		
		-15 (5)	17.73	
		-10 (14)	13.46	
		-5 (23)	10.33	
		0 (32)	8.00	
	1 2	1 2	5 (41)	6.25
			10 (50)	4.93
1			15 (59)	3.92
		20 (68)	3.14	
		25 (77)	25 (77)	2.54
		30 (86)	2.06	
		35 (95)	1.69	
		40 (104)	1.39	
		45 (113)	1.15	

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace intake sensor. Refer to HAC-122, "Removal and Installation".

< DTC/CIRCUIT DIAGNOSIS >

B2630, B2631 SUNLOAD SENSOR

DTC Description

DTC No.	CONSULT screen terms (Trouble diagnosis content)	E	DTC detection condition
		Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
B2630	(Sunload sensor)	Threshold	Detected calorie at sunload sensor is 1395 w/m ² (1200 kcal/m ² ·h) or more
		Diagnosis delay time	-
	B2631 SUNLOAD SENSOR (OPEN) (Sunload sensor)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
B2631		Threshold	Detected calorie at sunload sensor is 0 w/ m ² (0 kcal/m ² ·h)
		Diagnosis delay time	_
OSSIBLE Sunload se A/C auto a Harness ar	CAUSE ensor mp. nd connector (The sensor circ	uit is open or shorted.)	
AIL-SAFE			
_			
TC CONF	IRMATION PROCEDURE		

- Turn ignition switch ON. 1.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- Check DTC. 3.

NOTE:

- If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to HAC-63, "DTC Description" or HAC-64, "DTC Description".
- Sunload sensor may register a malfunction when indoors, at dusk, or at other times when light is insufficient. When performing the diagnosis indoors, light the sunload sensor with a lamp (60W or more).

Is DTC "B2630" or "B2631" displayed?

- YES >> Perform trouble diagnosis for the sunload sensor. Refer to HAC-75, "Diagnosis Procedure".
- NO >> Inspection End.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to HAC-36, "CUMMINS 5.0L : Wiring Diagram" or HAC-45, "VK56VD : Wiring Diagram".

1.CHECK SUNLOAD SENSOR POWER SUPPLY

1. Disconnect sunload sensor connector.

- 2. Turn ignition switch ON.
- 3. Check voltage between sunload sensor harness connector and ground.

INFOID:000000012923360

[AUTOMATIC AIR CONDITIONER]

INFOID:000000012923359

Κ

L

Μ

Ν

Ρ

B2630, B2631 SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+	Veltage		Voltage	
Sunloa	d sensor	—	(Approx.)		
Connector	Terminal				
M135	1	Ground	5 V		

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2.CHECK CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

- 1. Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. connector.
- 3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

Sunload sensor		A/C auto amp.		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M135	2	M137	26	Yes	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK SUNLOAD SENSOR

1. Reconnect sunload sensor connector and A/C auto amp. connector.

2. Check sunload sensor. Refer to HAC-76, "Component Inspection".

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

NO >> Replace sunload sensor. Refer to <u>HAC-121, "Removal and Installation"</u>.

4.CHECK CONTINUITY BETWEEN SUNLOAD SENSOR AND A/C AUTO AMP.

1. Turn ignition switch OFF.

2. Disconnect A/C auto amp. connector.

3. Check continuity between sunload sensor harness connector and A/C auto amp. harness connector.

Sunloa	Sunload sensor		ito amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M135	1	M137	9	Yes

4. Check continuity between sunload sensor harness connector and ground.

Sunload sensor			Continuity
Connector	Terminal		Continuity
M135	1	Ground	No

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-118, "Removal and Installation".

NO >> Repair harness or connector.

Component Inspection

1.CHECK SUNLOAD SENSOR

1. Turn ignition switch ON.

2. Check voltage between A/C auto amp. harness connector and ground.

INFOID:000000012923361

B2630, B2631 SUNLOAD SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]



NOTE:

Select a place in direct sunlight when checking sunload sensor.

Is the inspection result normal?

YES >> Inspection End.

>> Replace sunload sensor. Refer to HAC-121, "Removal and Installation". NO

HAC

Κ

L

Μ

Ν

Ο

Ρ

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

DTC Description

INFOID:000000012923362

[AUTOMATIC AIR CONDITIONER]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
	B2632 DR AIR MIX DOOR MOT (SHORT) (Driver side air mix door motor)	Diagnosis condition	When ignition switch is ON.	
Pasaa		Signal (terminal)	-	
B2032		Threshold	PBR position is 95% or more.	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
B2633 DR AIR MIZ (Driver side	DR AIR MIX DOOR MOT (OPEN)	Signal (terminal)	-	
	(Driver side air mix door motor)	Threshold	PBR position is 5% or less.	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- Air mix door motor LH
- · Air mix door motor LH installation condition
- · A/C auto amp.
- Harness and connector (Air mix door motor LH circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-78, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012923363

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1. CHECK AIR MIX DOOR MOTOR LH COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between air mix door motor LH harness connector and ground with oscilloscope.

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Е

Н

L

Μ

Ν

Ο

Ρ

4	ŀ			А
Air mix doo	or motor LH] —	Output waveform	
Connector	Terminal]		B
M228	3	Ground	(V) 15 10 5 0 → ← 20 ms	C
			SJIA1453J	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INSTALLATION OF AIR MIX DOOR MOTOR LH

Check air mix door motor LH is properly installed. Refer to <u>HAC-124, "Exploded View"</u> .	
---	--

Is the inspection result normal?

YES >> Replace air mix door motor LH. Refer to <u>HAC-125</u>, "AIR MIX DOOR MOTOR : Removal and <u>Installation - Air Mix Door Motor LH"</u>.

NO >> Repair or replace malfunctioning part.

$\mathbf{3}$.check air mix door motor LH communication signal circuit

1. Turn ignition switch OFF.

- 2. Disconnect air mix door motor LH connector and A/C auto amp. connector.
- 3. Check continuity between air mix door motor LH harness connector and A/C auto amp. harness connector.

Air mix door motor LH		A/C auto amp.		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M228	3	M137	16	Yes	-
		:		:	K

Is the inspection result normal?

NO >> Repair harness or connector.

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

B2634, B2635 AIR MIX DOOR MOTOR (PASSENGER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

B2634, B2635 AIR MIX DOOR MOTOR (PASSENGER SIDE)

DTC Description

INFOID:000000012923364

[AUTOMATIC AIR CONDITIONER]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC de	etection condition
		Diagnosis condition	When ignition switch is ON.
B2634	PASS AIR MIX DOOR MOT (SHORT)	Signal (terminal)	-
B2034	(Passenger side air mix door motor)	Threshold	PBR position is 95% or more.
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
B2635	PASS AIR MIX DOOR MOT (OPEN) (Passenger side air mix door motor)	Signal (terminal)	-
		Threshold	PBR position is 5% or less.
		Diagnosis delay time	-

POSSIBLE CAUSE

- Air mix door motor RH
- Air mix door motor RH installation condition
- A/C auto amp.
- Harness and connector (Air mix door motor RH circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-80, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012923365

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK AIR MIX DOOR MOTOR RH COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between front air mix door motor RH harness connector and ground with oscilloscope.

B2634, B2635 AIR MIX DOOR MOTOR (PASSENGER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

	+			А
Air mix doo	or motor RH	—	Output waveform	
Connector	Terminal			В
M229	3	Ground	(V) 10 5 0 •••••••••••••••••••••••••••••••	C

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INSTALLATION OF AIR MIX DOOR MOTOR RH

Check air mix door motor RH is properly installed. Refer to <u>HAC-124, "Exploded View"</u>.

Is the inspection result normal?

YES >> Replace air mix door motor RH. Refer to <u>HAC-126</u>, "<u>AIR MIX DOOR MOTOR</u> : <u>Removal and</u> <u>Installation - Air Mix Door Motor RH</u>".

NO >> Repair or replace malfunctioning part.

3. CHECK AIR MIX DOOR MOTOR RH COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect air mix door motor RH connector and A/C auto amp. connector.
- 3. Check continuity between air mix door motor RH harness connector and A/C auto amp. harness connector.

Air mix do	or motor RH	A/C auto amp.		Continuity	J
Connector	Terminal	Connector	Terminal	Continuity	
M229	3	M137	16	Yes	
			•		K

Is the inspection result normal?

NO >> Repair harness or connector.

L

Μ

Ν

Ο

Ρ

Е

Н

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR < DTC/CIRCUIT DIAGNOSIS > [AUTOMATIC AIR CONDITIONER]

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

DTC Description

INFOID:000000012923366

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	When ignition switch is ON.	
DOGOG	DR VENT DOOR FAIL	Signal (terminal)	-	
B2030	(DR VENT DOOR FAIL)	Threshold	-	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
B 2637	DR B/L DOOR FAIL	Signal (terminal)	-	
D2037	(DR B/L DOOR FAIL)	Threshold	-	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
D 2620	DR D/F1 DOOR FAIL (DR D/F1 DOOR FAIL)	Signal (terminal)	-	
B2038		Threshold	-	
		Diagnosis delay time	-	
	2639 DR DEF DOOR FAIL (DR DEF DOOR FAIL)	Diagnosis condition	When ignition switch is ON.	
P2620		Signal (terminal)	-	
62039		Threshold	-	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
B2654	D/F2 DOOR FAIL	Signal (terminal)	-	
B2004	(D/F2 DOOR FAIL)	Threshold	-	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
B2655	B/L2 DOOR FAIL	Signal (terminal)	-	
D2000	(B/L2 DOOR FAIL)	Threshold	-	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- · Mode door motor
- Mode door motor control linkage installation condition
- A/C auto amp.
- Harness and connector (Mode door motor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-83</u>, "Diagnosis Procedure".
- NO >> Inspection End.

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000012923367

А

В

D

HAC

Κ

L

[AUTOMATIC AIR CONDITIONER]

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1. CHECK MODE DOOR MOTOR COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between mode door motor harness connector and ground with oscilloscope.

Mode do	or motor		Output waveform
Connector	Terminal		
M226	2	Cround	(Y) 15 10
M226	3	Ground	0 → ← 20 ms
			SJIA1453J

YES >> GO TO 2.

NO >> GO TO 3.

2.CHECK INSTALLATION OF MODE DOOR MOTOR

Check mode door motor is properly installed. Refer to <u>HAC-124, "Exploded View"</u>.

Is the inspection result normal?

- YES >> Replace mode door motor. Refer to <u>HAC-125</u>, "MODE DOOR MOTOR : Removal and Installation".
- NO >> Repair or replace malfunctioning part.

3.CHECK MODE DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect mode door motor connector and A/C auto amp. connector.

3. Check continuity between mode door motor harness connector and A/C auto amp. harness connector.

N	Continuity	A/C auto amp.		Mode door motor	
	Continuity	Terminal	Connector	Terminal	Connector
	Yes	16	M137	3	M226

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

NO >> Repair harness or connector.

Ο

B263D, B263E, B263F INTAKE DOOR MOTOR [AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

B263D, B263E, B263F INTAKE DOOR MOTOR

DTC Description

INFOID:000000012923368

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	When ignition switch is ON.	
DJEJD	FRE DOOR FAIL	Signal (terminal)	_	
B203D	(FRE DOOR FAIL)	Threshold	Detected at FRE position	
		Diagnosis delay time	_	
	B263E 20P FRE DOOR FAIL (20P FRE DOOR FAIL)	Diagnosis condition	When ignition switch is ON.	
DOCOL		Signal (terminal)	_	
B203E (20P		Threshold	Detected at 20% FRE position	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
DOGOE	REC DOOR FAIL	Signal (terminal)	-	
DZUJF	(REC DOOR FAIL)	Threshold	Detected at REC position	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- Intake door motor
- A/C auto amp.
- Harness and connector (Intake door motor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

- T. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-84, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012923369

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "<u>CUMMINS 5.0L</u> : <u>Wiring Diagram</u>" or <u>HAC-45</u>, "<u>VK56VD</u> : <u>Wiring Diagram</u>".

1. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between intake door motor harness connector and ground with oscilloscope.

B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Е

F

Н

HAC

Κ

L

Μ

Ν

Ο

Ρ

	+			А
Intake d	oor motor	—	Output waveform	
Connector	Terminal			В
M227	3	Ground	(y) 15 10 5 0 • • 20 ms JIA1453J	C

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INSTALLATION OF INTAKE DOOR MOTOR

Check intake door motor is properly installed. Refer to HAC-124, "Exploded View".

Is the inspection result normal?

YES >> Replace intake door motor. Refer to <u>HAC-125</u>, "INTAKE DOOR MOTOR : Removal and Installation".

NO >> Repair or replace malfunctioning part.

$\mathbf{3}$. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect intake door motor connector and A/C auto amp. connector.

3. Check continuity between intake door motor harness connector and A/C auto amp. harness connector.

	Continuity	A/C auto amp.		Intake door motor	
J	Continuity		Connector	Terminal	Connector
	Yes	16	M137	3	M227

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to HAC-118, "Removal and Installation".

NO >> Repair harness or connector.

B2796 CONTROL COMMUNICATION

< DTC/CIRCUIT DIAGNOSIS >

B2796 CONTROL COMMUNICATION

DTC Description

INFOID:000000012927349

[AUTOMATIC AIR CONDITIONER]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition	
		Diagnosis condition	When ignition switch is ON.
B2796 FR S		Signal (terminal)	_
	FR SW Comm error	Threshold	When A/C auto amp. is not transmitting or receiving communication signal
		Diagnosis delay time	2 or more seconds

POSSIBLE CAUSE

- Harness and connector (communication line is open or shorted.)
- A/C switch assembly

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

NOTE:

If DTC is displayed along with DTC U1000 or U1010, first diagnose the DTC U1000 or U1010. Refer to <u>HAC-63, "DTC Description"</u> or <u>HAC-64, "DTC Description"</u>.

Is DTC "B2796" displayed?

YES >> Refer to HAC-86, "Diagnosis Procedure".

NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012927350

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK TX (A/C SWITCH ASSEMBLY \rightarrow A/C AUTO AMP.) CIRCUIT CONTINUITY

- 1. Turn ignition switch OFF.
- 2. Disconnect the A/C switch assembly connector and the A/C auto amp. connector.
- 3. Check continuity between A/C switch assembly harness connector and A/C auto amp. harness connector.

A/C switch assembly		A/C auto amp.		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	
M133	10	M137	24	Yes	

4. Check continuity between A/C switch assembly harness connector and ground.

A/C switch assembly			Continuity	
Connector	Terminal		Continuity	
M133	10	Ground	No	

B2796 CONTROL COMMUNICATION (AUTOMATIC AIR CONDITIONER)

< DTC/CIRCUIT D	IAGNOSIS >
-----------------	------------

Is the inspection re	esult normal?				
YES >> GO T	0 2.				Α
NO >> Repai	r harness or conne	ctor.			
2.CHECK RX (A	C AUTO AMP. \rightarrow A	VC SWITCH ASSE	EMBLY) CIRCUIT CO	NTINUITY	_
1. Check continu	ity between A/C sw	vitch assembly har	ness connector and A	VC auto amp. harness connector.	В
	-	-			
A/C switcl	n assembly	A/C aut	o amp.	Continuity	С
Connector	Terminal	Connector	Terminal	Continuity	
M133	9	M137	4	Yes	
2. Check continu	uity between A/C sv	vitch assembly har	ness connector and g	ground.	D
A/C switcl	n assembly		_	Continuity	E
Connector	Terminal			Continuity	
M133	9	Gro	und	No	
Is the inspection re	esult normal?				F
YES >> Perfor	rm trouble diagnosi	s for the A/C switc	h assembly. Refer to	HAC-93, "A/C SWITCH ASSEM-	
<u>BLY :</u>	Diagnosis Procedu	<u>re"</u> .			
NO >> Repai	r harness or conne	ctor.			G
					H

J

Κ

L

Μ

Ν

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

POWER SUPPLY AND GROUND CIRCUIT A/C AUTO AMP.

A/C AUTO AMP. : Diagnosis Procedure

INFOID:000000012923372

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK FUSE

Check fuses [No. 14 and 30, located in the fuse block (J/B)]. **NOTE:**

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

2.check a/c auto amp. Power supply

1. Turn ignition switch OFF.

- 2. Disconnect A/C auto amp. connector.
- 3. Check voltage between A/C auto amp. harness connector and ground.

	Voltage				
A/C au	ito amp.	—		Ignition switch position	1
Connector	Terminal		OFF	ACC	ON
M137	3	Ground	Battery voltage	Battery voltage	Battery voltage
101137	23	Ground	Approx. 0 V	Approx. 0 V	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector between A/C auto amp. and fuse block (J/B).

3.CHECK A/C AUTO AMP. GROUND CIRCUIT

1. Turn ignition switch OFF.

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

A/C au	to amp.		Continuity
Connector	Terminal		Continuity
M137	2	Ground	Ves
101107	22	Ground	105

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair harness or connector.

AIR MIX DOOR MOTOR (DRIVER SIDE)

AIR MIX DOOR MOTOR (DRIVER SIDE) : Diagnosis Procedure

INFOID:000000012923373

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK AIR MIX DOOR MOTOR LH POWER SUPPLY

POWER SUPPLY AND GROUND CIRCUIT [AUTOMATIC AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

1. Turn ignition switch ON.

2. Check voltage between air mix door motor LH harness connector and ground.

Air mix doo		_		Voltage
Connector	Torminal			(Approx.)
Connector	Terminai	Cround		Pattory voltage
WI228		Ground		Ballery voltage
YES >> GO TO NO >> GO TO) 2.) 4. X DOOR MOTOR	LH GROUND CIRCUIT		
 Turn ignition s Disconnect air Check continut 	witch OFF. mix door motor LH ity between air mix	l connector. door motor LH harness o	connector and	ground.
Air mix doo	or motor LH			Continuity
Connector	Terminal			
M228	2	Ground		Yes
		Ului LII. Relei lu <u>HAC-1</u>	<u>25, "AIR MIX</u>	DOOR MOTOR : Removal a
NO >> Repai CHECK AIR MI CHECK AIR MI Disconnect air Check continu- tor.	ation - Air Mix Door r or replace malfun X DOOR MOTOR witch OFF. mix door motor LF ity between air mix	<u>Motor LH.</u> <u>Motor LH</u> . ctioning part. LH POWER SUPPLY CIF connector and A/C auto door motor LH harness	25, "AIR MIX RCUIT amp. connect connector and	DOOR MOTOR : Removal a or. A/C auto amp. harness conn
NO >> Repai CHECK AIR MI . Turn ignition s . Disconnect air . Check continutor.	Air Mix Quer In ation - Air Mix Door r or replace malfun X DOOR MOTOR witch OFF. mix door motor LH	<u>Motor LH"</u> . ctioning part. LH POWER SUPPLY CIF connector and A/C auto door motor LH harness	25, "AIR MIX RCUIT amp. connect connector and	DOOR MOTOR : Removal a or. A/C auto amp. harness conn
NO >> Repai .CHECK AIR MI . Turn ignition s . Disconnect air . Check continu tor. Air mix door Connector	ation - Air Mix Door r or replace malfun X DOOR MOTOR witch OFF. mix door motor LH ity between air mix	A/C auto amp.	25, "AIR MIX RCUIT amp. connect connector and	DOOR MOTOR : Removal a or. A/C auto amp. harness conn Continuity
NO >> Repai I. CHECK AIR MI I. Turn ignition s 2. Disconnect air 3. Check continutor. Air mix doc Connector M228	Air Mix door mation - Air Mix Door r or replace malfun X DOOR MOTOR witch OFF. mix door motor LF ity between air mix or motor LH Terminal 1	Motor LH". ctioning part. LH POWER SUPPLY CIF I connector and A/C auto adoor motor LH harness A/C auto amp. Connector Te M137	25, "AIR MIX RCUIT amp. connect connector and erminal	DOOR MOTOR : Removal a or. A/C auto amp. harness conn Continuity Yes

I.CHECK AIR MIX DOOR MOTOR RH POWER SUPPLY

1. Turn ignition switch ON.

2. Check voltage between air mix door motor RH harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Air mix doo	+ or motor RH	_	Voltage
Connector	Terminal		
M229	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2.CHECK AIR MIX DOOR MOTOR RH GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect air mix door motor RH connector.

3. Check continuity between air mix door motor RH harness connector and ground.

Air mix doo	or motor RH		Continuity
Connector	Terminal		Continuity
M229	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK INSTALLATION OF AIR MIX DOOR MOTOR RH

Check air mix door motor RH is properly installed. Refer to HAC-124, "Exploded View".

Is the inspection result normal?

YES >> Replace air mix door motor RH. Refer to <u>HAC-126</u>, "<u>AIR MIX DOOR MOTOR</u> : <u>Removal and</u> <u>Installation - Air Mix Door Motor RH</u>".

NO >> Repair or replace malfunctioning part.

4.CHECK AIR MIX DOOR MOTOR RH POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.

- 2. Disconnect air mix door motor RH connector and A/C auto amp. connector.
- Check continuity between air mix door motor RH harness connector and A/C auto amp. harness connector.

Air mix door motor RH		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M229	1	M137	17	Yes

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

NO >> Repair harness or connector.

MODE DOOR MOTOR

MODE DOOR MOTOR : Diagnosis Procedure

INFOID:000000012923375

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1. CHECK MODE DOOR MOTOR POWER SUPPLY

- 1. Turn ignition switch ON.
- 2. Check voltage between mode door motor harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

L .	-			
+ Mode door motor			Voltage	
			(Approx.)	
M226	1	Ground	Battery voltage	
the inspection re	sult normal?	Crodina	Datiely voltage	
YES >> GO TO NO >> GO TO) 2.) 4. DOOR MOTOR (
Disconnect mc	ode door motor co	nnector.		
Check continu	ity between mode	door motor harness connector and	ground.	
Mode do	or motor		Continuity	
Connector		Cround	Yaa	
	2	Ground	Tes	
heck mode door	motor control linka	age is properly installed. Refer to HA	AGE AC-124, "Exploded View".	
the inspection re YES >> Replace tion". NO >> Repair CHECK MODE Turn ignition so Disconnect mo Check continue	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode	tor. Refer to <u>HAC-125, "MODE DC</u> nctioning part. POWER SUPPLY CIRCUIT nnector and A/C auto amp. connect door motor harness connector and A/C auto amp.	OR MOTOR : Removal and Insta or. A/C auto amp. harness connector	
the inspection re YES >> Replace NO >> Repair CHECK MODE Turn ignition so Disconnect mo Check continue Mode do	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode or motor Terminal	tor. Refer to <u>HAC-125, "MODE DC</u> nctioning part. POWER SUPPLY CIRCUIT nnector and A/C auto amp. connect door motor harness connector and <u>A/C auto amp.</u> <u>Connector</u> Terminal	OR MOTOR : Removal and Insta or. A/C auto amp. harness connector	
the inspection re YES >> Replace tion". NO >> Repair .CHECK MODE Turn ignition so Disconnect mode Check continue Mode do Connector M226 the inepection of the solution of the solut	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode or motor Terminal 1	tor. Refer to <u>HAC-125</u> , "MODE DO nctioning part. POWER SUPPLY CIRCUIT nnector and A/C auto amp. connect door motor harness connector and <u>A/C auto amp.</u> <u>Connector Terminal</u> <u>M137 17</u>	OR MOTOR : Removal and Insta or. A/C auto amp. harness connector Continuity Yes	
the inspection re YES >> Replace tion". NO >> Repair CHECK MODE Turn ignition so Disconnect mc Check continu Mode do Connector M226 the inspection re YES >> Replace NO >> Repair NO >> Repair NO >> Repair NO >> Repair NO >> Repair	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode or motor Terminal 1 esult normal? ce A/C auto amp. harness or conne R MOTOR R MOTOR : Di	tor. Refer to <u>HAC-125</u> , "MODE DO nctioning part. POWER SUPPLY CIRCUIT nnector and A/C auto amp. connect door motor harness connector and <u>A/C auto amp.</u> <u>A/C auto amp.</u> <u>Connector Terminal</u> <u>M137 17</u> Refer to <u>HAC-118</u> , "Removal and In ector. agnosis Procedure	or. A/C auto amp. harness connector Continuity Yes stallation".	
the inspection re YES >> Replace tion". NO >> Repair CHECK MODE Turn ignition sv Disconnect mc Check continu Mode do Connector Mode do Connector M226 the inspection re YES >> Replace YES >> Replace NO >> Repair NTAKE DOOI NTAKE DOOF egarding Wiring (K56VD : Wiring I CHECK INTAKE	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode or motor Terminal 1 esult normal? ce A/C auto amp. harness or conne R MOTOR R MOTOR : Di Diagram informat Diagram informat	tor. Refer to <u>HAC-125</u> , "MODE DO Actioning part. POWER SUPPLY CIRCUIT Innector and A/C auto amp. connect door motor harness connector and <u>A/C auto amp.</u> <u>Connector Terminal</u> <u>M137 17</u> Refer to <u>HAC-118</u> , "Removal and In actor. agnosis Procedure tion, refer to <u>HAC-36</u> , "CUMMINS	OR MOTOR : Removal and Insta or. A/C auto amp. harness connector Continuity Yes stallation". INFOID:000000012 5.0L : Wiring Diagram" or HAC-	
the inspection re YES >> Replace TES >> Replace NO >> Repair CHECK MODE Turn ignition so Disconnect mode Connector Mode do Connector M226 the inspection re YES >> Replace NO >> Repair NO >> Repair NO >> Repair NO >> Repair NO >> Repair NO >> Repair NO >> Replace NO >> Re	esult normal? ce mode door mo or replace malfur DOOR MOTOR F witch OFF. ode door motor co ity between mode or motor Terminal 1 sult normal? ce A/C auto amp. harness or conne R MOTOR R MOTOR : Di Diagram informat Diagram informat	tor. Refer to <u>HAC-125</u> , "MODE DC nctioning part. POWER SUPPLY CIRCUIT nnector and A/C auto amp. connect door motor harness connector and <u>A/C auto amp.</u> <u>Connector Terminal</u> <u>M137 17</u> Refer to <u>HAC-118</u> , "Removal and In ector. agnosis Procedure tion, refer to <u>HAC-36</u> , "CUMMINS POWER SUPPLY	OR MOTOR : Removal and Insta or. A/C auto amp. harness connector - Continuity Yes stallation". ////////////////////////////////////	

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

Intake d	+ oor motor	_	Voltage (Approx.)
Connector	Terminal		(++)
M227	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2. CHECK INTAKE DOOR MOTOR GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect intake door motor connector.

3. Check continuity between intake door motor harness connector and ground.

Intake d	oor motor		Continuity
Connector	Terminal		Continuity
M227	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3. CHECK INSTALLATION OF INTAKE DOOR MOTOR

Check intake door motor is properly installed. Refer to <u>HAC-124</u>, "Exploded View".

Is the inspection result normal?

- YES >> Replace intake door motor. Refer to <u>HAC-125</u>, "INTAKE DOOR MOTOR : Removal and Installation".
- NO >> Repair or replace malfunctioning part.

4.CHECK INTAKE DOOR MOTOR POWER SUPPLY CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect intake door motor connector and A/C auto amp. connector.
- 3. Check continuity between intake door motor harness connector and A/C auto amp. harness connector.

Intake de	Intake door motor		ito amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M227	1	M137	17	Yes

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118. "Removal and Installation"</u>.

NO >> Repair harness or connector.

A/C SWITCH ASSEMBLY

A/C SWITCH ASSEMBLY : Component Function Check

INFOID:000000012923377

1.CHECK OPERATION

- 1. Press the AUTO switch, and then check that "AUTO" is shown on the display.
- 2. Operate the temperature control switch (driver side). Check that the fan speed or outlet changes. (The discharge air temperature or fan speed varies depending on the ambient temperature, in-vehicle temperature, and temperature setting.)

Does it operate normally?

- YES >> Inspection End.
- NO >> Perform trouble diagnosis for the A/C switch assembly. Refer to <u>HAC-93</u>, "A/C <u>SWITCH ASSEM-</u> <u>BLY : Diagnosis Procedure"</u>.

A/C SWITCH ASSEMBLY : Diagnosis Procedure

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK A/C SWITCH ASSEMBLY POWER SUPPLY

1. Disconnect the A/C switch assembly connector.

2. Turn ignition switch ON.

< DTC/CIRCUIT DIAGNOSIS >

3. Check voltage between A/C switch assembly harness connector and ground.

(+)		(–)		Voltage	
A/C switch a	assembly			gnition switch position	
Connector	Terminal	—	OFF	ACC	ON
M133	12	Ground	Approx. 0 V	Approx. 0 V	Battery voltage

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK FUSE

Check 10A fuse [No. 30, located in the fuse block (J/B)].

NOTE:

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> Check harness for open circuit. Repair or replace if necessary.

NO >> Check harness for short circuit. Repair or replace if necessary.

${\it 3.}$ CHECK A/C SWITCH ASSEMBLY GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between A/C switch assembly harness connector and ground.

A/C switch	assembly		Continuity	
Connector	Terminal		Continuity	
M133	1	Ground	Yes	L

Is the inspection result normal?

YES >> Replace the A/C switch assembly. Refer to <u>HAC-117</u>, "Removal and Installation".

NO >> Repair the harness or connector.

INFOID:000000012923378

А



В

_

Н

HAC

Μ

Ν

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

DOOR MOTOR

Diagnosis Procedure

INFOID:000000012923379

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "<u>VK56VD : Wiring Diagram"</u>.

1. CHECK EACH DOOR MOTOR POWER SUPPLY

- 1. Turn ignition switch ON.
- 2. Check voltage between intake door motor harness connector and ground.

	+		Vallage
Intake de	por motor		voltage (Approx.)
Connector	Terminal		
M227	1	Ground	Battery voltage

Is the inspection result normal?

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

2. CHECK EACH DOOR MOTOR GROUND CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect intake door motor connector.
- 3. Check continuity between intake door motor harness connector and ground.

Intake d	oor motor		Continuity
Connector	Terminal		Continuity
M227	2	Ground	Yes

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair harness or connector.

3. CHECK EACH DOOR MOTOR POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect A/C auto amp. connector.

2. Check continuity between intake door motor harness connector and A/C auto amp. harness connector.

Intake d	oor motor	A/C au	to amp.	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M227	1	M137	17	Yes

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4.CHECK EACH DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

- 1. Disconnect following connectors:
- Air mix door motor LH
- Air mix door motor RH
- Mode door motor
- 2. Check continuity between intake door motor harness connector and ground.

DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

	Intake doo	r motor		Continuity	A
Co	nnector	Terminal	—	Continuity	
1	M227	1	Ground	No	B
Is the in	spection res	ult normal?			
YES NO	>> Replace >> Repair h	A/C auto amp. Refer narness or connector.	to <u>HAC-118. "Removal and li</u>	nstallation".	С
					D
					E
					F
					G
					Н
					HAC
					J
					K
					L
					Μ
					Ν
					0

Ρ

DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

DOOR MOTOR COMMUNICATION CIRCUIT

Diagnosis Procedure

INFOID:000000012923380

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

NOTE:

If all door motor DTCs are detected, check this circuit.

1. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL

1. Turn ignition switch ON.

2. Check output waveform between A/C auto amp. harness connector and ground with oscilloscope.

A/C au	+ ito amp.	_	Output waveform
Connector	Terminal		
M137	16	Ground	(v) 15 10 5 0 • 20 ms SJIA1453J

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK EACH DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect A/C auto amp. connector and intake door motor connector.

3. Check continuity between A/C auto amp. harness connector and intake door motor harness connector.

A/C au	ito amp.	Intake de	oor motor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M137	16	M227	3	Yes

Is the inspection result normal?

YES >> Inspection End.

NO >> Repair harness or connector.

 $\mathbf{3}$.check each door motor communication signal circuit for short

1. Disconnect following connectors:

Air mix door motor LH

Air mix door motor RH

Mode door motor

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

A/C au	ito amp.		Continuity
Connector	Terminal		Continuity
M137	16	Ground	No

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

NO >> Repair harness or connector.

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

А

В

С

D

Е

F

G

Н

Revision: March 2016

Diagnosis Procedure

INFOID:000000013053675

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK FUSE

- 1. Turn ignition switch OFF.
- Check 15A fuses [No. 17 and 27, located in fuse block (J/B)]. NOTE:

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY

1. Disconnect front blower motor connector.

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

Front blo	+ wer motor		Voltage
Connector	Terminal		(,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,
M44	1	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK FRONT BLOWER RELAY

- 1. Turn ignition switch OFF.
- 2. Check front blower relay. Refer to HAC-101, "Component Inspection (Front Blower Relay)".

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse.
- NO >> Replace front blower relay.

4.CHECK FRONT BLOWER MOTOR CONTROL CIRCUIT

1. Turn ignition switch OFF.

- 2. Connect front blower motor connector.
- 3. Disconnect variable blower control connector.
- 4. Turn ignition switch ON.
- 5. Check voltage between variable blower control harness connector and ground.

Variable blo	+ ower control	_	Voltage
Connector	Terminal		(, , , , , , , , , , , , , , , , , , ,
M130	3	Ground	Battery voltage

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK FRONT BLOWER MOTOR CONTROL CIRCUIT FOR OPEN

< DTC/CIRCUIT DIAGNOSIS >

А

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

Connector Terminal Connector Terminal Connector M130 3 M44 2 Y Is the inspection result normal? YES >> Replace front blower motor. Refer to HAC-127, "Removal and Installation". NO >> Repair harness or connector. 6. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT FOR OPEN 1. Turn ignition switch OFF. 2. Check continuity between variable blower control harness connector and ground. Variable blower control Connector Terminal — Continu Variable blower control M130 1 Ground Yes Is the inspection result normal? YES >> GO TO 7. NO >> Repair harness or connector. 7 OCHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT 1. Turn blower control dial fully counterclockwise to the OFF position. 2. 2. While turning the blower control dial clockwise, through each detent, check voltage betwee blower control and ground.	ector Terminal 30 3		ower motor	Continuity
M130 3 M44 2 Y Is the inspection result normal? YES >> Replace front blower motor. Refer to HAC-127, "Removal and Installation". NO >> Repair harness or connector. 6. CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT FOR OPEN 1 Turn ignition switch OFF. 2 2. Check continuity between variable blower control harness connector and ground.	30 3	Connector	Terminal	Continuity
Is the inspection result normal? YES >> Replace front blower motor. Refer to HAC-127. "Removal and Installation". NO >> Repair harness or connector. O.CHECK VARIABLE BLOWER CONTROL GROUND CIRCUIT FOR OPEN 1. Turn ignition switch OFF. 2. Check continuity between variable blower control harness connector and ground. Variable blower control — Connector Terminal M130 1 Ground YES >> GO TO 7. NO >> Repair harness or connector. Z.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT 1. Turn blower control dial fully counterclockwise to the OFF position. 2. While turning the blower control dial clockwise, through each detent, check voltage betwee blower control and ground.		M44	2	Yes
Variable blower control	<u>ction result normal?</u> Replace front blower motor. I Repair harness or connector. VARIABLE BLOWER CONTF nition switch OFF. continuity between variable bl	Refer to <u>HAC-127, "Rem</u> ROL GROUND CIRCUIT	FOR OPEN	
Connector Terminal Continu M130 1 Ground Yes s the inspection result normal? YES >> GO TO 7. NO >> Repair harness or connector. Y.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT 1. Turn blower control dial fully counterclockwise to the OFF position. 2. While turning the blower control dial clockwise, through each detent, check voltage betwe blower control and ground. 2.	Variable blower control			Continuity
M130 1 Ground Yes Is the inspection result normal? YES >> GO TO 7. NO >> Repair harness or connector. 7.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT 1. Turn blower control dial fully counterclockwise to the OFF position. 2. While turning the blower control dial clockwise, through each detent, check voltage betwee blower control and ground. Sector of the turning the blower control dial clockwise, through each detent, check voltage betwee blower control and ground.	onnector Terr	ninal	—	Continuity
 Is the inspection result normal? YES >> GO TO 7. NO >> Repair harness or connector. 7.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT 1. Turn blower control dial fully counterclockwise to the OFF position. 2. While turning the blower control dial clockwise, through each detent, check voltage betwe blower control and ground. 	M130	1	Ground	Yes

< DTC/CIRCUIT DIAGNOSIS >

Variable blo	ower control		Condition		
Connector	Terminal	-	Blower control dial detents	Voltage	
			OFF	0.00	
			1	4.00	
			2	4.75	
			3	5.00	
			4	5.50	
			5	5.75	
			6	6.00	
			7	6.50	
			8	6.75	
			9	7.00	
			10	7.50	
			11	8.00	
M130	2	Ground	12	8.25	
			13	8.50	
			14	9.00	
			15	9.25	
			16	9.75	
			17	10.00	
			18	10.50	
			19	10.75	
			20	11.00	
			21	11.50	
			22	11.75	
			23	12.25	
			24	12.50	

Is the inspection result normal?

YES >> Replace variable blower control. Refer to HAC-130, "Removal and Installation".

NO >> GO TO 8.

8.CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect variable blower control connector and A/C auto amp. connector.

Check continuity between variable blower control harness connector and A/C auto amp. harness connector.

Variable blower control		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M130	2	M137	14	Yes

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

 ${f 9.}$ CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT FOR SHORT

Check continuity between variable blower control harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

	Variable blowe	r control			Continuity	-
Connee	ctor	Terminal		_	Continuity	
M13	0	2		Ground	No	
Is the inspectio	n result normal	?				-
YES >> Re	place A/C auto	amp. Refer to HA	<u>C-118, "Remov</u>	val and Installatio	<u>n"</u> .	
NU >> Re	pair namess or					
Component	Inspection	Front Blower	Motor)		INFOID:0000000130536	76
1.CHECK FRO	ONT BLOWER	MOTOR				
1 Connect be		terminal 1 of from	t blower motor			-
2. Connect gr	round to termina	al 2 of front blowe	r motor.			
Does the blowe	er fan operate?					
YES >> Ch	eck intermitten	incident. Refer to	0 <u>GI-43, "Interm</u>	ittent Incident".		
NO >> Re	place front blov	ver motor. Refer to	o <u>HAC-127, "Re</u>	moval and Instal	llation".	
Component	Inspection (Front Blower	Relay)		INFOID:0000000130536	77
I.CHECK FRU	JNT BLOWER	RELAI				_
1. Turn ignitio	on switch OFF.					
2. Remove in 3. Check con	tinuity betweer	front blower rela	v terminals 3 :	and 5		٦
when volta	ge is supplied b	between terminals	1 and 2.			
Term	ninals	Voltage	Continuity			
2	5	ON	Yes			
5	5	OFF	No			

Is the inspection result normal?

YES >> Inspection End.

>> Replace front blower relay. NO



L

Μ

Ν

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

MAGNET CLUTCH

Component Function Check

INFOID:000000012923385

1. CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

YES >> Inspection End.

NO >> Refer to <u>HAC-102</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000012923386

Regarding Wiring Diagram information, refer to <u>HAC-36</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-45</u>, "VK56VD : Wiring Diagram".

1.CHECK FUSE

- 1. Turn ignition switch OFF.
- 2. Check 10A fuse (No. 53, located in IPDM E/R). NOTE:

Refer to PG-163, "IPDM E/R Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

2. CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT

- 1. Disconnect A/C compressor connector and IPDM E/R connector.
- 2. Check continuity between A/C compressor harness connector and IPDM E/R harness connector.

A/C cor	npressor	IPDM E/R		Continuity
Connector	Terminal	Connector	Terminal	Continuity
F150	1	E123	49	Yes

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK MAGNET CLUTCH

Directly apply battery voltage to the magnet clutch. Check operation visually and by sound. Does it operate normally?

YES >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation of IPDM E/R".

NO >> Replace magnet clutch. Refer to <u>HA-33. "Removal and Installation"</u>.

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

WATER VALVE CIRCUIT

Description

The water valve 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..

Diagnosis Procedure

Regarding Wiring Diagram information, refer to HAC-45, "VK56VD : Wiring Diagram".

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1.CHECK WATER VALVE POWER AND GROUND CIRCUITS

- 1. Disconnect water valve connector E65.
- 2. Turn ignition switch ON.
- 3. Rotate temperature control dial to full warm.
- 4. Check voltage between water valve harness connector E65 terminal 1 and terminal 2 while rotating temperature control dial to full cool.

Water valve connector	Terminals		Condition	Voltage	G
	(+)	(-)	Condition	(Approx.)	
E65	2	1	Rotate temperature control dial	Battery voltage	Н

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect A/C auto amp. harness connector M137.

3. Check continuity between water valve harness connector E65 terminal 2 and A/C auto amp. harness connector M137 terminal 12.

Wate	r valve	lve A/C au		Continuity
Connector	Terminal	Connector Terminal		Continuity
E65	2	M137	12	Yes

4. Check continuity between water valve harness connector E65 terminal 2 and ground.

Wate	r valve		Continuity
Connector	Terminal		Continuity
E65	2	Ground	No

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118, "Removal and Installation"</u>.

NO >> Repair the harness or connector.

3.CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial full cool.

2. Check voltage between water valve harness connector E65 terminal 1 and terminal 2 while rotating temperature control dial to full warm.

Water value connector	7	Ferminals	Condition	Voltage (Approx.)	
	(+)	(-)	Condition		
E65	1	2	Rotate temperature control dial	Battery voltage	

2016 Titan NAM

(

INFOID:000000013923903

INFOID:000000013923904

D

Ε

А

HAC

J

Κ

L

M

Ο

Ρ

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

<u>Is the inspection result normal?</u> YES >> Replace the water valve.

NO >> GO TO 4.

4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

- 1. Turn ignition switch OFF.
- 2. Disconnect A/C auto amp. harness connector M137.

3. Check continuity between water valve harness connector E65 terminal 1 and A/C auto amp. harness connector M137 terminal 32.

Water valve		A/C au	Continuity	
Connector	Terminal	Connector	Terminal	Continuity
E65	1	M137	32	Yes

4. Check continuity between water valve harness connector E65 terminal 1 and ground.

Wate	r valve		Continuity	
Connector	Terminal		Continuity	
E65	1	Ground	No	

Is the inspection result normal?

YES >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

NO >> Repair the harness or connector.

PTC HEATER RELAY

[AUTOMATIC AIR CONDITIONER]

PDTC HEATER RELAY Description Power is supplied to the PTC heater with A/C auto amp. control. Component Function Check 1. CHECK PTC HEATER RELAY POWER SUPPLY CIRCUIT Check that an operation noise of PTC heater relays (located in relay box) can be heard when operating the a sonditioning system result normal? YES >> PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure	< DTC/CIRCUIT DIAGN	OSIS >			[AUTOMATIC	C AIR CONDITIONER	
Description Are executed Power is supplied to the PTC heater with A/C auto amp. control. Are executed Component Function Check Are executed 1. CHECK PTC HEATER RELAY POWER SUPPLY CIRCUIT Calcolater and the executed in relay box) can be heard when operating the a conditioning system in heat mode. 2 he inspection result normal? See any system in heat mode. YES >> PTC heater relay power supply circuit is OK. NO NO >> Refer to <u>HAC-105. "Diagnosis Procedure".</u> Diagnosis Procedure Areasessense Regarding Wiring Diagram information, refer to <u>HAC-36. "CUMMINS 5.01. Wiring Diagram".</u> 1. CHECK PTC HEATER RELAY GROUND CIRCUIT 1. Turn ignition switch ON. 2. Check voltage between A/C auto amp. connector and ground. YES >> Replace A/C auto amp. Refer to <u>HAC-118. "Removal and Installation".</u> NO >> Goround Battery voltage 2. CHECK HARNESS CONTINUITY Image: Continuity between A/C auto amp. connector. Area duo amp. and PTC heater relay connector. Continuity and and any and and any and and any and and any and any and any and any and any and any any and any	PTC HEATER RE	LAY					
Ower is supplied to the PTC heater with A/C auto amp. control. Component Function Check I. CHECK PTC HEATER RELAY POWER SUPPLY CIRCUIT The inspection result normal? YES > PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure	Description					INFOID:0000000130536	
Component Function Check Areasecondents 1. CHECK PTC HEATER RELAY POWER SUPPLY CIRCUIT Check that an operation noise of PTC heater relays (located in relay box) can be heard when operating the <i>i</i> conditioning system in heat mode. as the inspection result normal? YES >> PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure Areasecondents. Regarding Wiring Diagram information, refer to HAC-36. "CUMMINS 5.0L : Wiring Diagram". 1. CHECK PTC HEATER RELAY GROUND CIRCUIT 1. Turn ignition switch ON. 2. Check voltage between A/C auto amp. connector and ground. Yes >> Replace A/C auto amp. Terminal (*) (*) (*) Yoltage (V) (Approx.) M137 39 Ground Battery voltage 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Check continuity between A/C auto amp. connector and PTC heater relay connector. AC auto amp. connector Terminal PTC heater relay connector. AC auto amp. c	Power is supplied to the I	PTC heater with	A/C auto amp.	control.			
ACHECK PTC HEATER RELAY POWER SUPPLY CIRCUIT Check that an operation noise of PTC heater relays (located in relay box) can be heard when operating the a conditioning system in heat mode. Sithe inspection result normal? YES >> PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure	Component Functio	n Check	· · · · · · · · · · · · · · · · · · ·			INFOID:0000000130536	
1. CHECK PTC HEATER RELAY POWER SUPPEr CIRCUIT She inspection result normal? YES >> PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure avecessessesses Regarding Wiring Diagram information, refer to HAC-36. "CUMMINS 5.0L.: Wiring Diagram". . 1. CHECK PTC HEATER RELAY GROUND CIRCUIT . 1. Turn ignition switch ON. . 2. Check voltage between A/C auto amp. connector and ground. . M137 19 M137 19 M137 19 M137 19 CHECK HARNESS CONTINUITY . 2. CHECK HARNESS CONTINUITY . 1. Turn ignition switch OFF. . 2. CHECK HARNESS CONTINUITY . 1. Turn ignition switch OFF. . 2. CHECK HARNESS CONTINUITY . 1. Turn ignition switch OFF. . 2. CHECK HARNESS CONTINUITY . 1. Turn ignition switch OFF. . 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. 3. Check conti							
Site inspection result normal? YES >> PtC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure	Check PIC HEATER				ov) can be bear	d when energy the a	
is the inspection result normal? YES >> PTC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure ************************************	conditioning system in he	at mode.	alei Telays (loca	iteu in relay i	JUX) Call De fieal	u when operating the a	
YES >> PIC heater relay power supply circuit is OK. NO >> Refer to HAC-105. "Diagnosis Procedure". Diagnosis Procedure ************************************	s the inspection result no	ormal?					
Diagnosis Procedure Regarding Wiring Diagram information, refer to <u>HAC-36, "CUMMINS 5.0L : Wiring Diagram"</u> . 1. CHECK PTC HEATER RELAY GROUND CIRCUIT 1 Turn ignition switch ON. 2 2. Check voltage between A/C auto amp. connector and ground. Voltage (V) (Approx.) Voltage (V) (Approx.) M137 19 40 Ground Battery voltage s the inspection result normal? YES >> Replace A/C auto amp. Refer to <u>HAC-118. "Removal and Installation"</u> . NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 1. 1. Urun ignition switch OFF. 2 Yes 2. CHECK HARNESS CONTINUITY 1. 1. 1. 1. Urun ignition switch OFF. 1. 1. Continuity between A/C auto amp. connector and PTC heater relay connector. 2. CHECK HARNESS CONTINUITY 1. 1. Yes 4. 1. Oncolsector 1. 1. 1. Continuity 1. Oncolsector 1. 1. 1. Yes 4. Check continuity between A/C auto amp. connector and ground. 1. Yes 1. 4. Check continuity between A/C auto amp. conne	NO >> Refer to HAC	elay power supp 2-105, "Diagnosi	oly circuit is OK. <u>s Procedure"</u> .				
Regarding Wiring Diagram information, refer to HAC-36, "CUMMINS 5.0L : Wiring Diagram". 1. CHECK PTC HEATER RELAY GROUND CIRCUIT 1. Turn ignition switch ON. 2. Check voltage between A/C auto amp. connector and ground. Voltage (V) (Approx.) (*) (-) (*) (-) A/C auto amp. Terminal (*) (-) A/C auto amp. Terminal (*) (-) M137 39 Ground Battery voltage s the inspection result normal? YES YES > Replace A/C auto amp. Refer to HAC-118, "Removal and Installation". NO > GO TO 2. 2. CHECK HARNESS CONTINUITY 1 1. Turn ignition switch OFF. 2 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal 19 E144 2 Yes 40 E145 2 Yes 4137 19 Ground No	Diagnosis Procedur	e				INFOID:000000013053(
Regarding Wiring Diagram information, refer to HAC-36, "CUMMINS 5.0L : Wiring Diagram". 1. CHECK PTC HEATER RELAY GROUND CIRCUIT Image: State of the state o	0						
Contraction of the terminal contraction, but to the terminal contraction of terminal content of terminal content of terminal content of terminal content of terminal continuity contector. All terminal content of terminal continuity content of terminal continuity content of terminal continuity content of terminal content of terminal continuity content of terminal continuity content of terminal content of terminal continuity content of terminal content of terminal continuity content of terminal continuity content of terminal content of terminal continuity content of terminal continuity content of terminal content content of terminal content of terminal content of ter	Regarding Wiring Diagray	m information re	efer to HAC-36	"CUMMINIS	5 0L · Wiring Die	agram"	
1. CHECK PTC HEATER RELAY GROUND CIRCUIT 1. Turn ignition switch ON. 2. Check voltage between A/C auto amp. connector and ground. Voltage (V) (Approx.) (+) (-) A/C auto amp. Terminal (+) (-) A/C auto amp. Terminal M137 39 Ground Battery voltage s the inspection result normal? YES > Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal 19 E144 M137 39 40 E145 4. Yes 4. Continuity M137 19 M137 19 M137 19 M137 19 M137 19 M137 19 M137 19<						igrafff.	
1. Turn ignition switch ON. 2. Check voltage between A/C auto amp. connector and ground. Terminals (+) (+) (+) A/C auto amp. Terminal (-) Voltage (V) (A) M137 19 M137 A) Battery voltage M137 A) Terminal M137 A) Terminal	1. СНЕСК РТС НЕАТЕГ	R RELAY GROU	IND CIRCUIT				
2. Check voltage between A/C auto amp. connector and ground. Terminals Voltage (V) (Approx.) (+) (-) Voltage (V) (Approx.) A/C auto amp. Terminal 19 M137 39 Ground Battery voltage Is the inspection result normal? YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal Continuity M137 19 E144 2 Yes 40 E145 2 Yes A/C auto amp. connector and ground. A/C auto amp. connector and ground. A/C auto amp. connector and ground. A/C auto amp. connector Terminal <t< td=""><td>1. Turn ignition switch (</td><td>)N.</td><td></td><td></td><td></td><td></td></t<>	1. Turn ignition switch ()N.					
Terminals Voltage (V) (Approx.) A/C auto amp. Terminal (-) Voltage (V) (Approx.) M137 19 Ground Battery voltage M137 39 Ground Battery voltage VES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". NO NO >> GO TO 2. 2 CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2 Check continuity between A/C auto amp. connector and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. Continuity M137 19 E144 2 Yes 4. Check continuity between A/C auto amp. connector and ground. Yes 19 Ground No M137 19 Ground Misi No No No	2. Check voltage betwe	en A/C auto am	p. connector an	d ground.			
Terminals Voltage (V) (Approx.) (+) Terminal (-) Voltage (V) (Approx.) A/C auto amp. 19 Battery voltage M137 39 Ground Battery voltage VS >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". Battery voltage YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". Pattery voltage YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". Pattery voltage YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". Pattery voltage YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". Pattery voltage YES >> Replace A/C auto amp. and PTC heater relay connector. Pattery voltage 2. CHECK HARNESS CONTINUITY 1 Turn ignition switch OFF. Disconnector Ind PTC heater relay connector A/C auto amp. connector Terminal PTC heater relay connector Terminal Continuity M137 19 E146 2 Yes A/C auto amp. connector Terminal Ground No M137 19 Ground No <		To	ala				
A/C auto amp. Terminal (-) (Approx.) M137 19 Ground Battery voltage M137 39 Ground Battery voltage is the inspection result normal? YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. Terminal Continuity M137 19 E144 2 Yes 40 E145 2 Yes 4. Check continuity between A/C auto amp. connector and ground. Continuity M137 19 E146 2 Yes 4. Check continuity between A/C auto amp. connector and ground. No No No		(+)	ais	minal (–)		Voltage (V)	
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	A/C auto amp.		Terminal			(Approx.)	
M13739 40GroundBattery voltages the inspection result normal? YES YES NO >> GO TO 2.YES 			19				
$\frac{40}{\text{VES}} \Rightarrow \text{Replace A/C auto amp. Refer to } \frac{\text{HAC-118. "Removal and Installation".}}{\text{NO}} \Rightarrow \text{GO TO 2.}$ 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. $\frac{\text{A/C auto amp. connector}}{19} \frac{\text{PTC heater relay connector}}{19} \frac{\text{Continuity}}{19}$ 4. Check continuity between A/C auto amp. connector and ground. $\frac{\text{A/C auto amp. connector}}{19} \frac{\text{Terminal}}{19} \frac{\text{Continuity}}{19}$ 4. Check continuity between A/C auto amp. connector and ground.	M137		39	Grour	nd	Battery voltage	
is the inspection result normal? YES >> Replace A/C auto amp. Refer to HAC-118. "Removal and Installation". NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal 19 E144 M137 39 40 E145 4. Check continuity between A/C auto amp. connector and ground. A/C auto amp. connector Terminal M137 19 M137			40				
NO >> GO TO 2. 2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal 19 E144 M137 39 40 E145 4. Check continuity between A/C auto amp. connector and ground. A/C auto amp. connector Terminal M137 19 E145 2 Yes 19 M137 39 19 Ground M137 19	<u>s the inspection result no</u>	<u>ormal?</u> auto amp. Refe	r to H∆C₋118 ."I	Removal and	Installation"		
2. CHECK HARNESS CONTINUITY 1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal 19 E144 M137 39 40 E145 4. Check continuity between A/C auto amp. connector and ground. A/C auto amp. connector Terminal 40 E145 4. Check continuity between A/C auto amp. connector and ground. Continuity M137 19 M137 10 <td>NO >> GO TO 2.</td> <td>auto amp. Reiel</td> <td>1 to <u>11/10 110, 1</u></td> <td></td> <td><u>. mstanation</u>.</td> <td></td>	NO >> GO TO 2.	auto amp. Reiel	1 to <u>11/10 110, 1</u>		<u>. mstanation</u> .		
1. Turn ignition switch OFF. 2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal PTC heater relay connector Terminal Continuity M137 19 E144 2 Yes 40 E145 2 Yes 4. Check continuity between A/C auto amp. connector and ground. Continuity A/C auto amp. connector Terminal Continuity M137 19 Ground No M137 19 Ground No	2. CHECK HARNESS C	ONTINUITY					
2. Disconnect A/C auto amp. and PTC heater relay connector. 3. Check continuity between A/C auto amp. connector and PTC heater relay connector. A/C auto amp. connector Terminal PTC heater relay connector Terminal Continuity M137 19 E144 2 Yes 40 E145 2 No M137 19 Ground No M137 19 Ground No	1. Turn ignition switch C)FF.					
$\begin{tabular}{ c c c c } \hline A/C auto amp. connector & Terminal & Continuity \\ \hline 19 & E144 & & & & & & & & & & & & & & & & & & $	 Disconnect A/C auto Check continuity betv 	ween A/C auto a	imp. connector	and PTC hea	ater relay connec	ctor.	
A/C auto amp. connectorTerminalPTC heater relay connectorTerminalContinuity19E1442YesM13739E1462Yes40E1452Yes4. Check continuity between A/C auto amp. connector and ground.ContinuityA/C auto amp. connectorA/C auto amp. connectorTerminalM13719GroundM13739No							
$\begin{array}{c c c c c c c c c c c c c c c c c c c $	A/C auto amp. connector	Terminal	PTC heater rel	ay connector	Terminal	Continuity	
Milling 33 E 140 2 163 40 E145 E145 E145 E145 4. Check continuity between A/C auto amp. connector and ground. A/C auto amp. connector Terminal Continuity A/C auto amp. connector Terminal Ground No M137 39 A/O No	M137	19	E14	14	2	Ves	
4. Check continuity between A/C auto amp. connector and ground. A/C auto amp. connector Terminal Continuity 19 Ground No	W137	40	E14	146 2		165	
A/C auto amp. connectorTerminalContinuityM13719GroundNo4040NoNo	4. Check continuity bet	ween A/C auto a	mp. connector	and ground.			
A/C auto amp. connectorTerminalContinuity1919GroundNoM13739No401010No	, 		•	5			
19 Ground No M137 39 Original No	A/C auto amp. connecto	or -	Terminal			Continuity	
M137 39 No 40			19	Grou	und		
40	M137		39		No		
M137 39 No 40	 Check continuity betw A/C auto amp. connector 	40 ween A/C auto a	Imp. connector	and ground.	und	Continuity	
			40				

PTC HEATER RELAY

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000013053682

NO >> Repair or replace harness.

3. CHECK PTC HEATER RELAY

Check PTC heater relay. Refer to HAC-106, "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to GI-43, "Intermittent Incident".

NO >> Replace appropriate PTC heater relay.

Component Inspection

1.CHECK PTC HEATER RELAY

- 1. Turn ignition switch OFF.
- 2. Remove PTC heater relay.
- 3. Check continuity between PTC heater relay terminal 3 and 5 when voltage is supplied between terminal 1 and 2.

Terr	ninal	Voltage	Continuity
3	5	ON	Yes
5	5	OFF	No

Is the inspection result normal?

- YES >> Inspection End.
- NO >> Replace PTC heater relay.



< DTC/CIRCUIT DIAGNOSIS > PTC HEATER

Diagnosis Procedur	е
--------------------	---

INFOID:000000013053678

А

В

D

Ε

F

L

Μ

Ρ

Reg	arding Wiring Diagram information, refer to <u>HAC-36. "CUMMINS 5.0L : Wiring Diagram"</u> .				
1 .c	CHECK FUSE				
1.	Turn ignition switch OFF.				
2.	2. Check 50A fuses (No. S, V and Z, located in relay box).				
	NOTE:				
	Refer to PG-155, "Terminal Arrangement".				
<u>Is th</u>	ne inspection result normal?				
YE	S >> GO TO 2.				
NC	>> Replace the blown fuse after repairing the affected circuit.				

- 2. CHECK POWER SUPPLY CIRCUIT
- 1. Turn ignition switch ON.
- 2. Check voltage between PTC heater connector and ground.

Terminals						
(+)			Condition of PTC heater	Voltage	Н	
PTC heater connector	Terminal	()		(Approx.)		
	1		ON	Battery voltage	HAC	
		I		I	OFF	0 V
F7 0	3 Gr	Oreverd	ON	Battery voltage		
E78		Ground	OFF	0 V	J	
	5	_	ON	Battery voltage		
		Э	5	OFF	0 V	K

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 4.

3. CHECK GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect PTC heater connector.

3. Check continuity between PTC heater connector and ground.

PTC heater connector	Terminal		Continuity	N
	2	Ground	Vac	-
E78	4	-	res	0

Is the inspection result normal?

YES >> Replace PTC heater. Refer to <u>HAC-129</u>, "Removal and Installation".

NO >> Repair or replace harness.

4. CHECK HARNESS CONTINUITY

1. Disconnect PTC relay connectors.

2. Check continuity between PTC heater connector and PTC heater relay connector.

PTC heater connector	Terminal	PTC heater relay connector	Terminal	Continuity

PTC HEATER

< DTC/CIRCUIT DIAGNOSIS >

	1	E144		
E78	3	E146	5	Yes
	5	E145		

3. Check continuity between PTC heater connector and ground.

PTC heater connector	Terminal	Ground	Continuity
E78	1		No
	3		
	5		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

NO >> Replace or repair harness.
HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

SYMPTOM DIAGNOSIS HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

Symptom Table

INFOID:000000012923292

А

С

NOTE:

Perform the self-diagnoses with CONSULT before performing the symptom diagnosis. If DTC is detected, perform the corresponding diagnosis.

Symptom	Corresponding malfunction part	Reference
 Air conditioning does not activate. Air conditioning cannot be controlled. Operation status of air conditioning is not indicated on display. 	 A/C auto amp. ignition power supply circuit Front A/C control (A/C auto amp.) 	HAC-88, "A/C AUTO AMP. : Diag- nosis Procedure"
Air outlet does not change.Mode door motor does not operate normally.	 Circuit between mode door motor and A/C auto amp. Mode door motor control linkage Mode door motor A/C auto amp. 	HAC-90, "MODE DOOR MOTOR : Diagnosis Procedure"
 Discharge air temperature of driver side does not change. Air mix door motor LH does not operate normally. 	 Circuit between air mix door motor LH and A/C auto amp. Air mix door motor LH installation condition Air mix door motor LH A/C auto amp. 	HAC-88, "AIR MIX DOOR MOTOR (DRIVER SIDE) : Diagnosis Proce- dure"
 Discharge air temperature of passenger side does not change. Air mix door motor RH does not operate normally. 	 Circuit between air mix door motor RH and A/C auto amp. Air mix door motor RH installation condition Air mix door motor RH A/C auto amp. 	HAC-89, "AIR MIX DOOR MOTOR (PASSENGER SIDE) : Diagnosis Procedure"
 Intake door does not change. Intake door motor does not operate normally. 	 Circuit between intake door motor and A/C auto amp. Intake door motor control linkage Intake door motor A/C auto amp. 	HAC-91, "INTAKE DOOR MOTOR : Diagnosis Procedure"
All door motors do not operate normally.	 Each door motor power supply and ground circuit A/C auto amp. 	HAC-94, "Diagnosis Procedure"
Blower motor operation is malfunctioning.	 Power supply system of front blower motor Circuit between front blower motor and A/C auto amp. Front blower motor A/C auto amp. 	HAC-98, "Diagnosis Procedure"
Compressor does not operate.	 Circuit between magnet clutch and IPDM E/R Magnet clutch IPDM E/R (A/C relay) Circuit between ECM and refriger- ant pressure sensor Refrigerant pressure sensor CAN communication circuit A/C auto amp. 	HAC-102. "Diagnosis Procedure"

HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

Sympto	om	Corresponding malfunction part	Reference
 Insufficient cooling. No cool air comes out. (Air flow volume is normal.) 		 Magnet clutch control system Drive belt slipping Refrigerant cycle ECV (electrical control valve) Air leakage from each duct A/C auto amp. connection recognition signal circuit Temperature setting trimmer (front) 	HAC-111, "Diagnosis Procedure"
 Insufficient heating. No warm air comes out. (<i>i</i> mal.) 	Air flow volume is nor-	 Engine cooling system Heater hose Heater core PTC heater (Cummins 5.0L) Air leakage from each duct Temperature setting trimmer (front) 	HAC-113, "Diagnosis Procedure"
	During compressor operation	Refrigerant cycle	HA-30, "Symptom Table"
Noise is heard when front air conditioning system op- erates. During front blower motor operation		 Mixing any foreign object in front blower motor Front blower motor fan breakage Front blower motor rotation inferiori- ty 	HAC-101, "Component Inspection (Front Blower Motor)"
 Memory function does not operate. Setting temperature is not memorized. 		 Battery power supply system of A/C auto amp. A/C auto amp. 	HAC-88, "A/C AUTO AMP. : Diag- nosis Procedure"

INSUFFICIENT COOLING

[AUTOMATIC AIR CONDITIONER]

INSUFFICIENT COOLING	٥
Description	А
Symptom Insufficient cooling No cool air comes out. (Air flow volume is normal.) 	В
Diagnosis Procedure	С
NOTE: Perform self-diagnoses with CONSULT before performing symptom diagnosis. If any DTC is detected, perform the corresponding diagnosis. 1. CHECK MAGNET CLUTCH OPERATION	D
 Turn ignition switch ON. Operate fan switch. Direct A/O switch. 	E
 Press A/C switch. Check that A/C indicator turns ON. Check visually and by sound that compressor operates. Press A/C switch again 	F
 6. Check that A/C indicator turns OFF. Check that compressor stops. <u>Is the inspection result normal?</u> YES >> GO TO 2. NO >> Perform diagnosis of "COMPRESSOR DOES NOT OPERATE" in "SYMPTOM DIAGNOSIS". 	G
Refer to <u>HAC-115, "Diagnosis Procedure"</u> . 2.CHECK DRIVE BELT	Н
Check tension of drive belt. Refer to <u>EM-190</u> , " <u>Removal and Installation - Drive Belt</u> ". <u>Is the inspection result normal?</u>	HA
NO >> Adjust or replace drive belt depending on the inspection results. 3. CHECK REFRIGERANT CYCLE	J
Connect recovery/recycling recharging equipment to the vehicle and perform pressure inspection with gauge. Refer to <u>HA-24</u> . "Inspection".	K
<u>Is the inspection result normal?</u> YES >> GO TO 4. NO >> Repair or replace parts depending on the inspection results.	L
4.CHECK AIR LEAKAGE FROM EACH DUCT	
Check duct and nozzle, etc. of the front air conditioning system for leakage. <u>Is the inspection result normal?</u>	M
NO >> Repair or replace parts depending on the inspection results. 5 CHECK AMBIENT TEMPERATURE DISPLAY	Ν
Check that there is not much difference between actual ambient temperature and indicated temperature on information display in combination meter.	0
YES >> GO TO 6. NO >> Perform diagnosis for the A/C auto amp. connection recognition signal circuit. Refer to <u>HAC-69.</u> <u>"Diagnosis Procedure"</u> .	Ρ
6.CHECK SETTING OF TEMPERATURE SETTING TRIMMER (FRONT)	
 Check setting value of temperature setting trimmer (front). Refer to <u>HAC-61. "Temperature Setting Trimmer"</u>. Check that temperature setting trimmer (front) is set to "+ direction". NOTE: 	

< SYMPTOM DIAGNOSIS >

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

The control temperature can be set with the setting of the temperature setting trimmer (front).

3. Set difference between set temperature and control temperature to "0".

Is inspection result normal?

YES >> Inspection End.

NO >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

INSUFFICIENT HEATING

[AUTOMATIC AIR CONDITIONER]

INSUFFICIENT HEATING	^
Description INFOID:000000012923295	A
Symptom Insufficient heating No warm air comes out. (Air flow volume is normal.) 	В
Diagnosis Procedure	С
NOTE: Perform self-diagnosis with CONSULT before performing symptom diagnosis. If DTC is detected, perform the corresponding diagnosis. 1. CHECK COOLING SYSTEM	D
 Check engine coolant level and check leakage. Refer to <u>CO-39, "System Inspection"</u>. Check reservoir tank cap. Refer to <u>CO-39</u>, "System Inspection". 	Ε
 Check vater flow sounds of the engine coolant. Refer to <u>CO-39</u>, "System Inspection". Is the inspection result normal? 	F
NO >> Refill engine coolant and repair or replace parts depending on the inspection results. 2.CHECK HEATER HOSE	G
Check installation of heater hose visually or by touching. <u>Is the inspection result normal?</u> YES >> GO TO 3. NO >> Repair or replace parts depending on the inspection results	Η
3. CHECK HEATER CORE	HA
 Check temperature of inlet hose and outlet hose of front heater core. Check that inlet side of heater core is hot and the outlet side is slightly lower than/almost equal to the inlet side. CAUTION: Always perform the temperature inspection in a short period of time because the engine coolant 	J
temperature is very hot.	Κ
YES (Cummins 5.0L)>>GO TO 4. YES (VK56VD)>>GO TO 5. NO >> Replace heater core. Refer to HA-46. "HEATER CORE : Removal and Installation"	L
4.CHECK PTC HEATER	
Check PTC heater. Refer to <u>HAC-107, "Diagnosis Procedure"</u> . Is the inspection result normal?	Μ
YES >> GO TO 5. NO >> Replace PTC heater. Refer to <u>HAC-129, "Removal and Installation"</u> .	Ν
Check duct and nozzle, etc. of front air conditioning system for air leakage	0
Is the inspection result normal? YES >> GO TO 6. NO >> Repair or replace parts depending on the inspection results	Р
6. CHECK SETTING OF TEMPERATURE SETTING TRIMMER (FRONT)	
 Check setting value of temperature setting trimmer (front). Refer to <u>HAC-61, "Temperature Setting Trimmer"</u>. Check that temperature setting trimmer (front) is set to "- direction". NOTE: 	

< SYMPTOM DIAGNOSIS >

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

3. Set difference between the set temperature and control temperature to "0".

Are the symptoms solved?

YES >> Inspection End.

NO >> Replace A/C auto amp. Refer to <u>HAC-118</u>, "Removal and Installation".

COMPRESSOR DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

[AUTOMATIC AIR CONDITIONER]

COMPRESSOR D			
Description			INFOID:000000012923297
Symptom: Compressor do	es not operate.		
Diagnosis Procedure	9		INFOID:000000012923298
NOTE: Perform self-diagnoses the corresponding diagn Check that refrigerant sy	with CONSULT before performin osis.	g symptom diagnosis. perant amount is below	If DTC is detected, perform
inspection of refrigerant	leakage.		the proper amount, perform
I.CHECK MAGNET CLU	ITCH OPERATION		
Check magnet clutch. Ref	er to <u>HAC-102, "Component Fun</u>	ction Check".	
YES >> GO TO 2.			
NO >> Repair or repl	ace malfunctioning parts.		
L.CHECK REFRIGERAN	IT PRESSURE SENSOR		
Check refrigerant pressur	e sensor. Refer to <u>EC-653, "Dia</u>	agnosis Procedure" or	EC-656. "Diagnosis Proce-
<u>s the inspection result no</u>	rmal?		
<u>sure</u> . Is the inspection result not YES >> GO TO 3. NO >> Repair or repl	rmal? ace malfunctioning parts.		
Is the inspection result not YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL		
Is the inspection result not YES >> GO TO 3. NO >> Repair or repl CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG"	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mor	nitor" mode of "HVAC".	
s the inspection result not YES >> GO TO 3. NO >> Repair or repl CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG"	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mo Condition	nitor" mode of "HVAC".	Status
s the inspection result nor YES >> GO TO 3. NO >> Repair or repl CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG"	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mor Condition	nitor" mode of "HVAC".	<u>Status</u> On
s the inspection result not YES >> GO TO 3. NO >> Repair or repl CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG"	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mon Condition	nitor" mode of "HVAC".	Status On Off
s the inspection result not YES >> GO TO 3. NO >> Repair or repl CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mod Condition A/C switch Blower motor	nitor" mode of "HVAC". ON OFF ON	Status On Off On
S the inspection result not YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG a the inequation result on	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mol Condition A/C switch Blower motor	nitor" mode of "HVAC". ON OFF ON OFF	Status On Off On Off
s the inspection result nor s the inspection result nor YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG s the inspection result nor YES >> GO TO 4. NO >> Replace A/C a 4.CHECK ECM INPUT S	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mod Condition A/C switch Blower motor rmal? auto amp. Refer to <u>HAC-118, "Re</u>	nitor" mode of "HVAC". ON OFF ON OFF	Status On Off On Off
s the inspection result nor YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG s the inspection result nor YES >> GO TO 4. NO >> Replace A/C a 4.CHECK ECM INPUT S With CONSULT Check "AIR COND SIG" a	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mod Condition A/C switch Blower motor mal? auto amp. Refer to <u>HAC-118, "Re</u> GIGNAL	nitor" mode of "HVAC". ON OFF ON OFF emoval and Installation" Monitor" mode of "ECM	Status On Off On Off
s the inspection result nor YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG s the inspection result nor YES >> GO TO 4. NO >> Replace A/C a 4.CHECK ECM INPUT S With CONSULT Check "AIR COND SIG" a Monitor item	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mod Condition A/C switch Blower motor rmal? auto amp. Refer to <u>HAC-118, "Re</u> sIGNAL nd "HEATER FAN SW" in "Data M	nitor" mode of "HVAC". ON OFF ON OFF emoval and Installation" Monitor" mode of "ECM	Status On Off On Off
s the inspection result nor YES >> GO TO 3. NO >> Repair or repl 3.CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG s the inspection result nor YES >> GO TO 4. NO >> Replace A/C a 4.CHECK ECM INPUT S With CONSULT Check "AIR COND SIG" a Monitor item	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mod Condition A/C switch Blower motor rmal? auto amp. Refer to <u>HAC-118, "Re</u> GIGNAL nd "HEATER FAN SW" in "Data Mathematical Condition	nitor" mode of "HVAC". ON OFF ON OFF emoval and Installation" Wonitor" mode of "ECM	Status On Off On Off
s the inspection result nor YES >> GO TO 3. NO >> Repair or repl 3. CHECK A/C AUTO AM With CONSULT Check "COMP REQ SIG" Monitor item COMP REQ SIG FAN REQ SIG s the inspection result nor YES >> GO TO 4. NO >> Replace A/C a 4. CHECK ECM INPUT S With CONSULT Check "AIR COND SIG" a Monitor item	rmal? ace malfunctioning parts. IP. OUTPUT SIGNAL and "FAN REQ SIG" in "Data Mode Condition A/C switch Blower motor rmal? auto amp. Refer to HAC-118, "Recondition AIGNAL nd "HEATER FAN SW" in "Data Mode Condition A/C switch	nitor" mode of "HVAC". ON OFF ON OFF emoval and Installation" Monitor" mode of "ECM	Status On Off On Off

5.CHECK IPDM E/R INPUT SIGNAL

(B) With CONSULT

COMPRESSOR DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

1. Start engine.

2. Check "AC COMP REQ" in "Data Monitor" mode of "IPDM E/R".

Monitor item	Condition		Status
	A/C switch	ON	On
AC COMINE		OFF	Off

Is the inspection result normal?

YES >> Inspection End.

NO >> Check CAN communication system. Refer to <u>LAN-51, "Trouble Diagnosis Flow Chart"</u>.

< REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION

A/C SWITCH ASSEMBLY

Exploded View

INFOID:000000013163938

А

L

Μ

Ν

Ο

Ρ

[AUTOMATIC AIR CONDITIONER]



Installation is in the reverse order of removal.

< REMOVAL AND INSTALLATION > A/C AUTO AMP.

[AUTOMATIC AIR CONDITIONER]

Exploded View

INFOID:000000013089617



4. Audio unit bracket (RH)

Removal and Installation

INFOID:000000013053587

REMOVAL

CAUTION:

Before disconnecting the AV control unit and battery terminals, turn the ignition switch OFF and wait at least 30 seconds.

NOTE:

- Before replacing A/C auto amp., perform "Before Replace ECU" of "Read / Write Configuration" to save or print current vehicle specification. Refer to <u>HAC-60</u>, "Work Procedure".
- After the ignition switch is turned OFF, the AV control unit continues operating for approximately 30 seconds. Therefore, data corruption may occur if battery voltage is cut off within 30 seconds.
- 1. Disconnect battery or batteries. Refer to PG-174, "Battery Disconnect".
- 2. Remove AV control unit. Refer to <u>AV-157</u>, "Removal and Installation" (NAVIGATION WITHOUT AMPLI-FIER) or <u>AV-277</u>, "Removal and Installation" (NAVIGATION WITH AMPLIFIER).
- 3. Disconnect harness connectors from AV control unit and remove.
- 4. Remove screws and A/C auto amp.

INSTALLATION

CAUTION:

Be sure to perform "After Replace ECU" of "Read / Write Configuration" or "Manual Configuration" when replacing A/C auto amp. Refer to <u>HAC-60</u>, "Work Procedure". Installation is in the reverse order of removal.

AMBIENT SENSOR

Removal and Installation

REMOVAL

- 1. Remove front grille. Refer to EXT-24. "Removal and Installation".
- 2. Disconnect harness connector from ambient sensor.
- 3. Remove ambient sensor (1).



INSTALLATION Installation is in the reverse order of removal.

G

А

В

INFOID:000000013053589

Н

HAC

J

K

L

M

Ν

0

Ρ

Revision: March 2016

IN-VEHICLE SENSOR

Removal and Installation

REMOVAL

- 1. Remove instrument lower panel LH. Refer to IP-22, "Removal and Installation".
- 2. Remove screw (A).
- 3. Disconnect harness connector from in-vehicle sensor (1) and remove.



INSTALLATION Installation is in the reverse order of removal. INFOID:000000013053590

SUNLOAD SENSOR

Removal and Installation

REMOVAL

- 1. Disconnect harness connector (A) from sunload sensor (1).
- Release pawls and remove sunload sensor from defroster grille (2).



INSTALLATION Installation is in the reverse order of removal.

J

Κ

L

Μ

Ν

Ο

Ρ

F

G

Н

А

INFOID:000000013053592



Revision: March 2016

INTAKE SENSOR

Removal and Installation

INFOID:000000013053593

REMOVAL

- 1. Remove evaporator from heating and cooling unit. Refer to IP-21, "Removal and Installation".
- 2. Disconnect harness connector from intake sensor.
- 3. Remove intake sensor (2) from evaporator (1). CAUTION:
 - Mark mounting position of intake sensor.
 - Do not damage evaporator core.



[AUTOMATIC AIR CONDITIONER]

INSTALLATION Installation is in the reverse order of removal.

[AUTOMATIC AIR CONDITIONER]

REFRIGERANT PRESSURE SENSOR

Removal and Installation

REMOVAL

- 1. Discharge refrigerant. Refer to HA-19, "Recycle Refrigerant".
- 2. Remove front grille. Refer to EXT-24, "Removal and Installation".
- 3. Disconnect harness connector from refrigerant pressure sensor.
- 4. Remove refrigerant pressure sensor (1).



INSTALLATION Installation is in the reverse order of removal. CAUTION:

- Be careful not to damage the condenser fins.
- Do not reuse O-rings.
- Apply A/C oil to the O-ring of the refrigerant pressure sensor for installation.
- After charging refrigerant, check for leaks. Refer to <u>HA-17, "Leak Test"</u>.

Н

HAC

Κ

L

Μ

Ν

Ο

Ρ

А

INFOID:000000013053594

DOOR MOTOR

Exploded View

INFOID:000000013053659



- 1. Heating and cooling unit assembly
- 4. Air mix door motor RH
- Air mix door motor LH
 Intake door motor
- 3. Mode door motor
- ← Front

А

В

D

Е

F

Н

HAC

J

Ο

INEOID:000000013053660

(2)

INFOID:000000013053661

< REMOVAL AND INSTALLATION > INTAKE DOOR MOTOR INTAKE DOOR MOTOR : Removal and Installation REMOVAL 1. Remove the heating and cooling unit assembly. Refer to HA-46, "HEATING AND COOLING UNIT ASSEMBLY : Removal and Installation". Disconnect the harness connector from the intake door motor. 3. Remove the intake door motor screws (A) and intake door motor (1) from the blower unit (2). INSTALLATION Installation is in the reverse order of removal. MODE DOOR MOTOR MODE DOOR MOTOR : Removal and Installation REMOVAL 1. Remove heating and cooling unit assembly. Refer to HA-46, "HEATING AND COOLING UNIT ASSEM-BLY : Removal and Installation". Remove blower unit. Refer to VTL-16, "BLOWER UNIT : Removal and Installation". 3. Remove mode door motor screws (A).

4. Disconnect the harness connector from the mode door motor (1) and remove.



INSTALLATION Installation is in the reverse order of removal.

AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor LH

INFOID:000000013053662 P

REMOVAL

DOOR MOTOR

< REMOVAL AND INSTALLATION >

- 1. Remove the air mix door motor LH screws (A).
- 2. Disconnect the harness connector from the air mix door motor LH (1) and remove.

[AUTOMATIC AIR CONDITIONER]



INSTALLATION

Installation is in the reverse order of removal.

AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor RH

INFOID:000000013053663

REMOVAL

- 1. Remove heating and cooling unit assembly. Refer to <u>HA-46, "HEATING AND COOLING UNIT ASSEM-</u><u>BLY : Removal and Installation"</u>.
- 2. Remove blower unit. Refer to VTL-16, "BLOWER UNIT : Removal and Installation".
- 3. Remove air mix door motor RH screws (A).
- 4. Disconnect harness connector from air mix door motor RH (1) and remove.



INSTALLATION Installation is in the reverse order of removal.

FRONT BLOWER MOTOR

< REMOVAL AND INSTALLATION > [AUTOMATIC AIR CONDITIONER] FRONT BLOWER MOTOR Removal and Installation For removal and installation of the front blower motor, refer to <u>VTL-16</u>, "BLOWER MOTOR : Removal and Installation".

HAC

J

Κ

L

Μ

Ν

Ο

Ρ

А

В

С

D

Е

F

G

Н

COMPRESSOR

Removal and Installation

For removal and installation of the compressor, refer to HA-31, "Removal and Installation".

INFOID:000000013053655

PTC HEATER A Removal and Installation Image: Comparison of the PTC heater, refer to HA-47, "PTC HEATER : Removal and Installation." B C D D E F F G H

HAC

J

Κ

L

Μ

0

Ρ

VARIABLE BLOWER CONTROL

< REMOVAL AND INSTALLATION >

VARIABLE BLOWER CONTROL

Exploded View

INFOID:000000013152876

[AUTOMATIC AIR CONDITIONER]



1. Blower unit

2. Heating and cooling unit assembly 3. Variable blower control

← Front

Removal and Installation

INFOID:000000013053657

REMOVAL

- 1. Remove glove box assembly and housing. Refer to <u>IP-21, "Removal and Installation"</u>.
- 2. Disconnect harness connector from variable blower control.

VARIABLE BLOWER CONTROL

< REMOVAL AND INSTALLATION >

3. Remove two screws (A) and variable blower control (1).

[AUTOMATIC AIR CONDITIONER]



INSTALLATION Installation is in the reverse order of removal.



J

Κ

L

Μ

Ν

Ο

Ρ

Н

Е

F

G

< PRECAUTION >

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. 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, it is recommended that all maintenance and repair be performed by an authorized NISSAN/INFINITI dealer.
- Improper repair, 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 Air Bag Diagnosis Sensor Unit or other Air Bag 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 or batteries, and wait at least three minutes before performing any service.

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

INFOID:000000012545510

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed compressor failure is likely to occur. Refer to <u>HA-17, "Description"</u>. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) oil rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
- When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
- When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
- Only use the specified oil from a sealed container. Immediately reseal containers of oil. Without proper sealing, oil will become moisture saturated and should not be used.
- Avoid breathing A/C refrigerant and oil vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system using certified service equipment meeting requirements of SAE J2210 [HFC-134a (R-134a) recycling equipment], or J2209 [HFC-134a (R-134a) recycling equipment], If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and oil manufacturers.
- Do not allow A/C oil to come in contact with styrofoam parts. Damage may result.

CONTAMINATED REFRIGERANT

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

• Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.

PRECAUTIONS

< PRECAUTION >

[MANUAL AIR CONDITIONER]

- 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

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.



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



Precaution for Work

- When removing or disassembling each component, be careful not to damage or deform it. If a component may be subject to interference, be sure to protect it with a shop cloth.
- When removing (disengaging) components with a screwdriver or similar tool, be sure to wrap the component with a shop cloth or vinyl tape to protect it.
- Protect the removed parts with a shop cloth and prevent them from being dropped.
- Replace a deformed or damaged clip.

Revision: March 2016

HAC-133

INFOID:000000012545511

А

В

D





INFOID:000000013515965

PRECAUTIONS

< PRECAUTION >

- If a part is specified as a non-reusable part, always replace it with a new one.
- Be sure to tighten bolts and nuts securely to the specified torque.
- After installation is complete, be sure to check that each part works properly.
- Follow the steps below to clean components:
- Water soluble dirt:
- Dip a soft cloth into lukewarm water, wring the water out of the cloth and wipe the dirty area.
- Then rub with a soft, dry cloth.
- Oily dirt:
- Dip a soft cloth into lukewarm water with mild detergent (concentration: within 2 to 3%) and wipe the dirty area.
- Then dip a cloth into fresh water, wring the water out of the cloth and wipe the detergent off.
- Then rub with a soft, dry cloth.
- Do not use organic solvent such as thinner, benzene, alcohol or gasoline.
- For genuine leather seats, use a genuine leather seat cleaner.

PREPARATION

PREPARATION

Special Service Tool

INFOID:000000013164027 B

А

The actual shape of the tools may differ from those illustrated here.

Tool number (TechMate No.) Tool name		Description	C
_		Removing trim components	
(J-46534) Trim Tool Set	AWJIA04832Z		E
			F

Commercial Service Tool

INFOID:000000013164028

Tool name		Description	G
Power tool		Loosening nuts, screws and bolts	
			Н
			НАС
	∼ g		
	PIIB1407E		

L

Μ

Ν

Ο

Ρ

< SYSTEM DESCRIPTION > SYSTEM DESCRIPTION COMPONENT PARTS

Component Parts Location

INFOID:000000012923389

CUMMINS 5.0L



< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

from vehicle)

Α. Relay box Β. View with grille removed C. Behind LH center of instrument panel А (view with A/C assembly removed from vehicle) D. Center of instrument panel Ε. Behind RH center of instrument panel F. Behind RH side of instrument panel В (view with A/C assembly removed from (view with A/C assembly removed

vehicle)

No.	Component	Description	С
1.	IPDM E/R	 A/C relay is integrated into IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line. Refer to <u>PCS-5</u>. "Component Parts Location" for detailed installation location. 	D
2.	ECM	 The ECM sends an A/C compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the A/C compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the front air control via CAN communication line. Refer to EC-34. "Component Parts Location" for detailed installation location. 	E
3.	A/C compressor	Refer to HAC-140, "A/C Compressor".	
4.	ВСМ	 BCM transmits blower motor ON signal to the front blower motor relay. Refer to <u>BCS-5, "BODY CONTROL SYSTEM : Component Parts Location"</u> for detailed installation location. 	G
5.	Fuse block (J/B) (Front blower mo- tor relay)	 Located in the passenger compartment behind the instrument panel RH, the fuse block (J/B) contains the front blower motor relay and several fuses required for the air conditioner control system. The front blower motor relay controls the flow of current to fuse 17 and 27 in the fuse block (J/B). The relay is connected directly to ground and is controlled by the BCM. 	H
6.	PTC relay-2	Refer to HAC-141, "PTC Heater (Cummins 5.0L)".	
7.	PTC relay-3	Refer to HAC-141, "PTC Heater (Cummins 5.0L)".	
8.	PTC relay-1	Refer to HAC-141, "PTC Heater (Cummins 5.0L)".	J
9.	Ambient sensor	Refer to HAC-142, "Ambient Sensor (Cummins 5.0L)".	
10.	Refrigerant pressure sensor	Refer to HAC-142, "Refrigerant Pressure Sensor".	K
11.	Air mix door motor	Refer to HAC-139, "Air Mix Door Motor".	
12.	PTC heater	Refer to HAC-141, "PTC Heater (Cummins 5.0L)".	
13.	Front air control	The front air control controls the operation of the A/C and heating system based on inputs from the temperature control knob, the mode switches, the blower control dial, and inputs received from the ECM and combination meter across the CAN.	L
14.	PTC heater control	Refer to HAC-141, "PTC Heater Control (Cummins 5.0L)".	M
15.	Mode door motor	Refer to HAC-140, "Mode Door Motor".	
16.	Intake sensor	Refer to HAC-139, "Intake Sensor".	NI
17.	Intake door motor	Refer to HAC-140, "Intake Door Motor".	IN
18.	Variable blower control	Refer to HAC-140, "Variable Blower Control".	
19.	Front blower motor	Refer to HAC-140, "Front Blower Motor".	0

VK56VD

Ρ

< SYSTEM DESCRIPTION >



A. Water valve

- B. View with grille removed
- D. Center of instrument panel
- E. Behind RH center of instrument panel F. (view with A/C assembly removed from vehicle)
- C. Behind LH center of instrument panel (view with A/C assembly removed from vehicle)
 - Behind RH side of instrument panel (view with A/C assembly removed from vehicle)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

No.	Component	Description
1.	IPDM E/R	 A/C relay is integrated into IPDM E/R. IPDM E/R operates A/C relay when A/C compressor request signal is received from ECM via CAN communication line. Refer to <u>PCS-5</u>, "Component Parts Location" for detailed installation location.
2.	ECM	 The ECM sends an A/C compressor ON request to the IPDM E/R based on the status of engine operation and load as well as refrigerant pressure information. If all the conditions are met for A/C operation, the ECM transmits the A/C compressor ON request to the IPDM E/R. The ECM shares the refrigerant pressure sensor signal, engine RPM, and engine coolant temperature with the front air control via CAN communication line. Refer to EC-34, "Component Parts Location" for detailed installation location.
3.	A/C compressor	Refer to HAC-140. "A/C Compressor".
4.	ВСМ	 BCM transmits blower motor ON signal to the front blower motor relay. Refer to <u>BCS-5, "BODY CONTROL SYSTEM : Component Parts Location"</u> for detailed installation location.
5.	Fuse block (J/B) (Front blower mo- tor relay)	 Located in the passenger compartment behind the instrument panel RH, the fuse block (J/B) contains the front blower motor relay and several fuses required for the air conditioner control system. The front blower motor relay controls the flow of current to fuse 17 and 27 in the fuse block (J/B). The relay is connected directly to ground and is controlled by the BCM.
6.	Water valve	Refer to HAC-141, "Water Valve (VK56VD)".
7.	Ambient sensor	Refer to HAC-142, "Ambient Sensor (Cummins 5.0L)".
8.	Refrigerant pressure sensor	Refer to HAC-142, "Refrigerant Pressure Sensor".
9.	Air mix door motor	Refer to HAC-139, "Air Mix Door Motor".
10.	Front air control	The front air control controls the operation of the A/C and heating system based on inputs from the temperature control knob, the mode switches, the blower control dial, and inputs received from the ECM and combination meter across the CAN.
11.	Mode door motor	Refer to HAC-140, "Mode Door Motor".
12.	Intake sensor	Refer to HAC-139, "Intake Sensor".
13.	Intake door motor	Refer to HAC-140, "Intake Door Motor".
14.	Variable blower control	Refer to HAC-140, "Variable Blower Control".
15.	Front blower motor	Refer to HAC-140, "Front Blower Motor".

Intake Sensor

Intake sensor measures evaporator fin temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



Air Mix Door Motor

INFOID:000000012923391

INFOID:000000013089010

L

- Air mix door motor consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door
 position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with front air control. Refer to <u>HAC-145</u>, "Door Control".
- Rotation of motor is transmitted to air mix door by link and lever. Air flow temperature is switched.

< SYSTEM DESCRIPTION >

Mode Door Motor

INFOID:000000012923393

INFOID:000000012923394

INFOID:000000012923395

[MANUAL AIR CONDITIONER]

- Mode door motor consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door
 position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with front air control. Refer to <u>HAC-145</u>, "Door Control".
- Rotation of motor is transmitted to mode door (ventilator door, foot door, and defroster door) by link and lever. Air outlet is switched.

Intake Door Motor

- Intake door motor consists of a motor that drives door, PBR (Potentio Balance Resistor) that detects door
 position and LCU (Local Control Unit) that performs multiplex communication control (LIN) with front air control. Refer to <u>HAC-145</u>. "Door Control".
- Rotation of motor is transmitted to intake door by lever. Air inlet is switched.

Front Blower Motor

- The blower motor utilizes a brush-less motor with a rotating magnet.
- Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



The variable blower control controls the speed of the blower motor by controlling the ground circuit of the front blower motor. The front air control provides voltage to the gate of the variable blower control based on the position of the blower control dial. The variable blower control is a metal-oxide semiconductor field effect transistor (MOS-FET) that varies the ground side current of the front blower motor. By applying a variable voltage to the gate, the variable blower control controls the current flow to ground, thereby controlling the speed of the front blower motor.



A/C Compressor

Vaporized refrigerant is drawn into the A/C compressor from the evaporator where it is compressed to a highpressure, high-temperature vapor. The hot compressed vapor is then discharged to the condenser.

MAGNET CLUTCH

Description

A/C compressor is driven by the magnet clutch which is magnetized by electric power supply.

Structure and Operation

Revision: March 2016



INFOID:000000013089784

< SYSTEM DESCRIPTION >

- Magnet clutch consists of pulley, clutch disc, and field coil.
- Pulley is connected with crankshaft pulley of engine via drive belt and is always rotated while engine is running.
- Clutch disc is connected with driveshaft of A/C compressor.
- Field coil, which becomes a strong electric magnet when electricity is supplied, strongly pulls clutch disc and presses it to pulley.
- When A/C relay integrated in IPDM E/R turns ON, electricity is supplied to field coil, clutch disc is presses to pulley, and engine rotational movement is transmitted from crankshaft pulley ⇒ drive belt ⇒ pulley ⇒ clutch disc ⇒ driveshaft. A/C compressor is operated. When A/C relay turns OFF, electricity is not supplied to field coil, and clutch disc is released from pulley. A/C compressor is not operated.

Water Valve (VK56VD)

The water valve 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 front air control.

PTC Heater Control (Cummins 5.0L)

PTC heater control unit controls the operation of the PTC heater by controlling the PTC relays.

PTC Heater (Cummins 5.0L)

- PTC stands for "Positive Temperature Coefficient" and is a ceramic material with barium titanate as the primary component.
- The positive temperature coefficient (PTC) heater provides supplemental heat by warming the air as it flows through its electrically controlled heating grid.
- The PTC relays control the flow of current to the PTC heater. The PTC relays are controlled by the PTC heater control unit.



INFOID:000000013924863

JMIIA1767G

Drive shaft





INFOID:000000013089008

ALIIA1152ZZ

INFOID:000000013089009

K

M

Ν



Field coil

Compressor

А

D

-Pulley

Clutch disc

Ambient Sensor (Cummins 5.0L)

Ambient sensor measures ambient air temperature. The sensor uses a thermistor which is sensitive to the change in temperature. The electrical resistance of the thermistor decreases as temperature increases.



Refrigerant Pressure Sensor

INFOID:000000012923401

INFOID:000000012923402

DESCRIPTION

- The refrigerant pressure sensor converts high-pressure side refrigerant pressure into voltage and outputs it to ECM.
- ECM operates cooling system protection and idle speed control according to voltage value that is input.



STRUCTURE AND OPERATION

- The refrigerant pressure sensor is a capacitance type sensor. It consists of a pressure detection area and a signal processing area.
- The pressure detection area, which is a variable capacity condenser, changes internal static capacitance according to pressure force.
- The signal processing area detects the static capacitance of the pressure detection area, converts the static capacitance into a voltage value, and transmits the voltage value to ECM.

[MANUAL AIR CONDITIONER]

А

В

INFOID:000000012923302

< SYSTEM DESCRIPTION >

SYSTEM

System Description

SYSTEM DIAGRAM



SYSTEM DESCRIPTION

• The manual air conditioning system is controlled by a sequence of functions from the front air control, BCM, ECM, and IPDM E/R.

Controlled by front air control: - <u>HAC-144</u>, "Air Flow Control"

- HAC-144, "Air Inlet Control"
- HAC-144, "Air Outlet Control"

< SYSTEM DESCRIPTION >

- HAC-144, "Compressor Control"
- HAC-145, "Door Control"

- HAC-144, "Temperature Control"

Controlled by BCM:

Air conditioning request signal.
 Refer to <u>BCS-7, "BODY CONTROL SYSTEM : System Description"</u>.

Control by IPDM E/R - Relay control Refer to <u>PCS-6, "RELAY CONTROL SYSTEM : System Description"</u>.

Temperature Control

INFOID:000000012923308

- When the ignition switch is in the ON position, the customer uses the front air control temperature control dial to set the desired temperature.
- The front air control calculates the target front air mix door opening angle depending on the selected temperature, intake temperature sensor, engine coolant temperature and rpm, and ambient temperature.
- Front air mix door is controlled depending on the comparison of current front air mix door opening angle and target front air mix door opening angle.
- Regardless of ambient temperature, the front air mix door is fixed at the fully cold position when the temperature control dial is set at the full cold position and fixed at the fully hot position when the temperature control dial is set at the full hot position.

Air Outlet Control

INFOID:000000012923305

Air outlet control is controlled by customer input. When the A/C is turned off by turning the blower control dial fully counterclockwise, the front air control retains the current selections and returns to these selections the next time the blower control dial is turned to any fan position.

NOTE:

If ambient temperature is excessively low, D/F is selected to prevent windshield fogging when air outlet is set to FOOT.

Air Flow Control

INFOID:000000012923303

DESCRIPTION

- Front air control changes duty ratio of front blower motor control signal to control air flow continuously. When air flow is increased, duty ratio of front blower motor control signal gradually increases to prevent a sudden increase in air flow.
- In addition to manual control, air flow control is composed of fan speed control at door motor operation.

FAN SPEED CONTROL AT DOOR MOTOR OPERATION

When mode door motor is activated while air flow is more than the specified value, front air control temporarily reduces fan speed so that mode door moves smoothly.

Air Inlet Control

INFOID:000000012923304

The intake door position is automatically controlled in MAX A/C and DEF modes. The intake door is controlled by customer input in the other modes.

Compressor Control

INFOID:000000012923306

DESCRIPTION

In order for the IPDM E/R to complete a compressor ON request, the following conditions must be met:

- 1. The BCM detects a fan ON signal from the front air control. The front air control grounds the fan ON signal monitored by the BCM when the blower speed dial is in any of the fan speed positions.
- 2. The BCM detects an A/C ON signal from the front air control. The front air control grounds the A/C ON signal monitored by the BCM when:
- The A/C switch is pressed. The A/C switch LED illuminates and the front air control grounds the A/C ON signal monitored by the BCM. Any mode control button except D/F may be selected.
< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

- The A/C switch is OFF, and the MAX A/C button is pressed. The A/C switch LED will automatically illuminate and the front air control grounds the A/C ON signal monitored by the BCM.
- The A/C switch is OFF, and the mode button for either D/F or DEF is selected. The front air control grounds the A/C ON signal monitored by the BCM, but it does not illuminate the A/C switch LED.

NOTE:

If the compressor was engaged by pressing the D/F or DEF mode buttons and the time spent in either mode exceeds 1 minute, then the compressor stays requested, even when modes other than D/F or DEF are selected, until either:

The ignition switch is turned OFF. 1.

The blower speed dial is turned completely counterclockwise to the OFF position. 2.

3. The A/C switch is manually turned OFF.

In other words, the compressor ON request cannot be turned off in D/F or DEF modes.

REFRIGERANT PRESSURE PROTECTION

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the liquid tank on the condenser. The refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. If the system pressure rises above or falls below the following values, the ECM requests the IPDM E/R to de-energize the A/C relay and disengage the compressor.

- 3.12 MPa (31.82 kg/cm², 452.4 psi) or more (When the engine speed is less than 1,500 rpm)
- 2.74 MPa (27.95 kg/cm², 397.3 psi) or more (When the engine speed is 1,500 rpm or more)

• 0.14 MPa (1.43 kg/cm², 20.3 psi) or less

PRESSURE RELIEF VALVE

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

COMPRESSOR OIL CIRCULATION CONTROL

When the engine starts while the engine coolant temperature is 56°C (133°F) or less, ECM activates the compressor for approximately 6 seconds and circulates the compressor lubricant once.

OPERATING RATE CONTROL

When the set temperature is other than fully cold or the air outlet is "VENT", "B/L" or "FOOT", the front air control controls the compressor activation depending on ambient temperature.

Door Control

DOOR MOTOR CONTROL Communication line Power supply line LCU LCU Ξ Front air control PBR PBR



 A Local Control Unit (LCU) is built into each door motor and detects the door position by using a Potentio Balanced Resistor (PBR).

HAC

А

D

Е

J

Κ

L

INFOID:000000012923307

< SYSTEM DESCRIPTION >

- Each door motor LCU has a unique address. The front air control communicates with the door motor LCUs using each door's unique communication address. The front air control sends requested door position commands to each door motor LCU via a Local Interconnect Network (LIN) communication line. Each door motor's LCU receives the command and sends back a door position feedback signal.
- Each LCU controls each door to the appropriate position depending on the control signal from the front air control. When the door movement is complete, the LCU transmits a signal to the front air control indicating that the door movement is complete.

SWITCHES AND THEIR CONTROL FUNCTION



< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

				Doc	or position			A	
				Mode	e door				-
Switch position	Ventilator door	Max. cool door	Defroster door	Foot door	Intake door	Air mix door	B		
		7	A	А	А	A			-
MODE switch	さ		В	В	А	В			D
		ن	С	С	В	В	_		
			С	В	В	В		—	_
DEF switch	¥		С	А	С	С			E
latoko owitah [*]	~						А		
Intake Switch							В		F
	Full cold [18°C (60°F)]		_	_	_	_	_	A	
Temperature control dial	18.5°C – 31.5°C (61°F – 89 °F)							AUTO	G
	Full hot [32°C (90°F)]							В	Н

*: Inlet status is displayed by indicator when activating Max A/C or D/F modes.

AIR DISTRIBUTION

VENT MODE (🎲)									
OUTLET	VENT								
	Δ99Τ	C.	TR	סח	RR				
	A001	ASST	DR	DIX					
AIR FLOW DISTRIBUTION RATIO (%)	25	25	25	25	_				

B/L MODE (💙)										
OUTLET			VENT		FOOT					
	ASST	CTR		סח	DD	Fr ASST		Dr ASST	Pr DP	
		ASST	DR	DIX		11 A001	TIDK	NI A331		
AIR FLOW DISTRIBUTION RATIO (%)	15	15	15	15	_	14	14	6	6	

D/F1 MODE (🦋)										(
			VENT			FOOT				DEF		
OUTLET	ASST	C ASST	TR DR	DR	RR	Fr ASST	Fr DR	Rr ASST	Rr DR	Fr	Side	ŀ
AIR FLOW DISTRIBUTION RATIO (%)	6		_	6	24	24	20	9	9	17	5	

HAC

J

Κ

L

Μ

Ν

Revision: March 2016

< SYSTEM DESCRIPTION >

D/F2 MODE (髎)											
OUTLET			VENT			FOOT				DEF	
	ASST	C.	CTR		RR	Fr	Fr DR	Rr	Pr DP	Fr	Side
		ASST	DR	DIX		ASST	TT BIX	ASST			Cide
AIR FLOW DISTRIBUTION RATIO (%)	6			6		20	20	8	8	25	7

DEF MODE (👾)											
OUTLET			VENT			FOOT				DEF	
	ASST	C.	CTR		PP	Fr	Fr DR	Rr	Pr DP	Fr	Side
	7001	ASST	DR	DIX		ASST	TT DR	ASST			Olde
AIR FLOW DISTRIBUTION RATIO (%)	5			5						70	20

< SYSTEM DESCRIPTION >

OPERATION

Switch Name and Function

INFOID:000000012923309

[MANUAL AIR CONDITIONER]

Front Air Control



Switch Operation

A/C switch	Switches the compressor control switch indicator between ON ⇔ OFF with each press while front blower fan is activated. The circuit used by the BCM to detect an A/C ON request is grounded. NOTE: When front blower fan is OFF, the compressor control cannot be activated.
Blower control dial (with OFF switch)	 Blower fan speed is manually controlled with the dial for varying blower speed. When ON, the circuit used by the BCM to detect a fan ON request signal is grounded. Turns air conditioning system OFF. NOTE: When blower control dial is turned to any ON position, the air conditioning system is activated. (Compressor control state returns to the previous state before air conditioning system was turned OFF.)
DEF switch	Switches DEF mode (switch indicator) between ON ⇔ OFF with each press. • When DEF mode is turned ON, the air conditioning system changes to the following state: • Air inlet: Fresh air intake • Air outlet: DEF • Blower fan: Manual setting. • Compressor: ON • When DEF mode is turned OFF, the air conditioning system state returns to the previous state before DEF mode was selected, but the following state is continued: • Air inlet: Fresh air intake • Compressor: ON When previous state previous state before DEF mode was selected, but the following state is continued: • Air inlet: Fresh air intake • Compressor: ON NOTE: When front blower fan is OEE DEE cannot be activated

В

J

OPERATION

< SYSTEM DESCRIPTION >

MAX A/C switch	 Switches the MAX A/C and compressor control switch indicators between ON ⇔ OFF with each press while front blower fan is activated. When MAX A/C mode is turned ON, the air conditioning system changes to the following state: Air inlet: Recirculation air intake Air outlet: Manual setting Blower fan: Manual setting Compressor: ON When MAX A/C mode is turned OFF, the air conditioning system state returns to the previous state before MAX A/C mode is selected. But, the following state is changed: Air inlet: Fresh air intake Compressor: ON When front blower fan is OFF, the compressor control cannot be activated.
MODE switches	Selects air outlet from VENT, B/L, FOOT, and D/F. NOTE: When the air conditioning system is OFF, the air outlet can still be selected.
REC switch	 Air inlet is selected to fresh air intake (REC) by pressing this switch. REC indicator: ON NOTE: When the air conditioning system is OFF, the air inlet can still be selected. When D/F mode or DEF is selected, the REC button is disabled.
Temperature control dial	 Selects desired temperature between full cold and full hot. Clockwise rotation: Temperature increases. Counterclockwise rotation: Temperature decreases.

DIAGNOSIS SYSTEM (HVAC)

CONSULT Function (HVAC)

CONSULT can display each diagnosis item using the diagnosis test modes as shown.

CONSULT application items

Diagnosis mode	Description	
Self Diagnostic Result	Displays the diagnosis results judged by front air control.	(
Data Monitor	Displays A/C auto amp. input/output data in real time.	
Work support	Changes the setting for each system function.	
Active Test	The signals used to activate each device are forcibly supplied from front air control.	
ECU Identification	Displays the front air control number.	

SELF DIAGNOSTIC RESULT

Refer to HAC-34, "DTC Index".

DATA MONITOR

Display item list

Monitor item [Un	it]	Description	
INT TEMP SEN	[°C]	Intake sensor value converted from intake sensor signal received from intake sensor	G
COMP REQ SIG	[On/Off]	Displays A/C switch ON/OFF status transmitted to other units via CAN communication	
FAN REQ SIG	[On/Off]	Displays blower switch ON/OFF status transmitted to other units via CAN communica- tion	Н
FAN DUTY	[%]	Duty ratio of blower motor judged by front air control	
ENG COOL TEMP	[°C]	Water temperature signal value received from ECM via CAN communication	ЦЛ
VEHICLE SPEED	[km/h (mph)]	Vehicle speed signal value received from meter via CAN communication	

ACTIVE TEST

Test item	Description	
HVAC TEST	The operation check of A/C system can be performed by selecting the mode. Refer to the fol- lowing table for the conditions of each mode.	K

HVAC TEST

		Test item										
	MODE 1	MODE 2	MODE 3	MODE 4	MODE 5	MODE 6	MODE 7					
Mode door position	VENT1	VENT2	B/L	D/F1	D/F2	DEF	DEF					
Intake door position	REC	REC	20%FRE	FRE	FRE	FRE	FRE					
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT					
Blower motor (V)	4	4	8	HI	HI	8	Н					
A/C compressor (Mag- net clutch)	ON	ON	ON	OFF	OFF	ON	ON	_				

NOTE:

Perform the inspection of each output device after starting the engine, because the A/C compressor has been operating.

А

INFOID:000000013123247

Ε

F

IAC

L

DIAGNOSIS SYSTEM (BCM) COMMON ITEM

COMMON ITEM : CONSULT Function (BCM - COMMON ITEM)

INFOID:000000013504722

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with BCM.

Direct Diagnostic Mode	Description
ECU Identification	The BCM part number is displayed.
Self Diagnostic Result	The BCM self diagnostic results are displayed.
Data Monitor	The BCM input/output data is displayed in real time.
Active Test	The BCM activates outputs to test components.
Work support	The settings for BCM functions can be changed.
Configuration	The vehicle specification can be read and saved.The vehicle specification can be written when replacing BCM.
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.

SYSTEM APPLICATION BCM can perform the following functions:

		Direct Diagnostic 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			×	×	×		
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			×	×			
Vehicle security system	THEFT ALM			×	×	×		
RAP system	RETAINED PWR			×				
Signal buffer system	SIGNAL BUFFER			×				

FREEZE FRAME DATA (FFD)

The BCM records the following vehicle condition at the time a particular DTC is detected, and displays it on CONSULT.

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

[MANUAL AIR CONDITIONER]

CONSULT screen item	Indication/Unit	Description						
Vehicle Speed	km/h	Vehicle speed at the moment a particular DTC is detected						
Odo/Trip Meter	km	Total mileage (Odometer value) at the moment a particular DTC is detected						
	SLEEP>LOCK		While turning BCM status from low power consumption mode to normal mode (Power supply position is "LOCK"*).	В				
	SLEEP>OFF		While turning BCM status from low power consumption mode to normal mode (Power supply position is "OFF".)	С				
	LOCK>ACC		While turning power supply position from "LOCK" *to "ACC"					
	ACC>ON		While turning power supply position from "ACC" to "IGN"	D				
	RUN>ACC		While turning power supply position from "RUN" to "ACC" (Vehicle is stopped and selector lever is in P position.)	D				
	CRANK>RUN		While turning power supply position from "CRANKING" to "RUN" (From cranking up the engine to run it)	Е				
	RUN>URGENT	Power position status at the moment a particular DTC is detected*	-	While turning power supply position from "RUN" to "ACC" (Emer- gency stop operation)	F			
	ACC>OFF		While turning power supply position from "ACC" to "OFF"	- F				
Vehicle Condition	OFF>LOCK		While turning power supply position from "OFF" to "LOCK"*					
	OFF>ACC		While turning power supply position from "OFF" to "ACC"	G				
	ON>CRANK		While turning power supply position from "IGN" to "CRANKING"					
	OFF>SLEEP				While turning BCM status from normal mode (Power supply position is "OFF".) to low power consumption mode	Н		
	LOCK>SLEEP		While turning BCM status from normal mode (Power supply posi- tion is "LOCK"*.) to low power consumption mode					
	LOCK		Power supply position is "LOCK" (Ignition switch OFF)*	HA				
	OFF		Power supply position is "OFF" (Ignition switch OFF)					
	ACC		Power supply position is "ACC" (Ignition switch ACC)	.1				
	ON		Power supply position is "IGN" (Ignition switch ON with engine stopped)	0				
	ENGINE RUN		Power supply position is "RUN" (Ignition switch ON with engine running)	K				
	CRANKING		Power supply position is "CRANKING" (At engine cranking)					
IGN Counter	0 - 39	 The number of times that The number is 0 wher The number increases whenever ignition is so The number is fixed to 	at ignition switch is turned ON after DTC is detected a a malfunction is detected now. s like $1 \rightarrow 2 \rightarrow 338 \rightarrow 39$ after returning to the normal condition witched OFF \rightarrow ON. b 39 until the self-diagnosis results are erased if it is over 39.	L				

NOTE:

*: Power supply position shifts to "LOCK" from "OFF", when ignition switch is in the OFF position, selector lever is in the P position, and any of the following conditions are met:

Closing door

Opening door

Door is locked using door request switch

Door is locked using Intelligent Key

The power supply position shifts to "ACC" when the push-button ignition switch (push switch) is pushed at "LOCK".

AIR CONDITIONER

AIR CONDITIONER : CONSULT Function (BCM - AIR CONDITIONER)

INFOID:000000013504723

Ν

0

Ρ

DATA MONITOR

HAC-153

DIAGNOSIS SYSTEM (BCM)

< SYSTEM DESCRIPTION >

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

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

DIAGNOSIS SYSTEM (IPDM E/R)

CONSULT Function (IPDM E/R)

APPLICATION ITEM

CONSULT performs the following functions via CAN communication with IPDM E/R:

Direct Diagnostic Mode	Description	C
Self Diagnostic Result	The IPDM E/R self diagnostic results are displayed.	
Data Monitor	The IPDM E/R input/output data is displayed in real time.	
Active Test	The IPDM E/R activates outputs to test components.	
CAN Diag Support Mntr	The result of transmit/receive diagnosis of CAN communication is displayed.	
SELF DIAGNOSTIC RESULT		E

SELF DIAGNOSTIC RESULT Refer to <u>PCS-23, "DTC Index"</u>.

DATA MONITOR

Monitor Item [Unit]	Main Signals	Description	
AC COMP REQ [On/Off]	×	Indicates A/C compressor request signal received from ECM on CAN commu- nication line	G
TAIL&CLR REQ [On/Off]	×	Indicates position light request signal received from BCM on CAN communica- tion line	Н
HL LO REQ [On/Off]	×	Indicates low beam request signal received from BCM on CAN communication line	
HL HI REQ [On/Off]	×	Indicates high beam request signal received from BCM on CAN communication line	HA
FR FOG REQ [On/Off]	×	Indicates front fog light request signal received from BCM on CAN communica- tion line	J
FR WIP REQ [Stop/1LOW/Low/Hi]	×	Indicates front wiper request signal received from BCM on CAN communication line	
WIP AUTO STOP [STOP P/ACT P]	×	Indicates condition of front wiper auto stop signal	Κ
WIP PROT [Off/BLOCK]	×	Indicates condition of front wiper fail-safe operation	
IGN RLY1 -REQ [On/Off]		Indicates ignition switch ON signal received from BCM on CAN communication line.	L
IGN RLY [On/Off]	×	Indicates condition of ignition relay	
PUSH SW [On/Off]		Indicates condition of push-button ignition switch.	NЛ
INTER/NP SW [On/Off]		Indicates condition of AT shift position.	IVI
ST RLY CONT [On/Off]		Indicates starter relay status signal received from BCM on CAN communication line.	N
IHBT RLY -REQ [On/Off]		Indicates starter control relay signal received from BCM on CAN communication line.	14
ST/INHI RLY [Off/ ST /INHI]		Indicates condition of starter relay and starter control relay.	0
DETENT SW [On/Off]		Indicates condition of AT shift selector (park position switch).	
DTRL REQ [Off]		Indicates daytime light request signal received from BCM on CAN communica- tion line	Р
HOOD SW [On/Off]		Indicates condition of hood switch.	
THFT HRN REQ [On/Off]		Indicates theft warning horn request signal received from BCM on CAN commu- nication line	
HORN CHIRP [On/Off]		Indicates horn reminder signal received from BCM on CAN communication line	
HOOD SW 2 [On/Off]		Indicates condition of hood switch 2.	

ACTIVE TEST

Revision: March 2016

A

В

F

INFOID:000000013504721

DIAGNOSIS SYSTEM (IPDM E/R)

< SYSTEM DESCRIPTION >

Test item	Description
REAR DEFOGGER	This test is able to check rear defogger operation [On/Off].
FRONT WIPER	This test is able to check wiper motor operation [Hi/Lo/Off].
EXTERNAL LAMPS	This test is able to check external lamp operation [Fog/Hi/Lo/TAIL/Off].
HORN	This test is able to check horn operation [On].

ECU DIAGNOSIS INFORMATION FRONT AIR CONTROL

Reference Value

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Co	Condition		
INT TEMP SEN	Ignition switch ON	_	–30 - 55°C (22 - 131°F)	
COMP REQ SIG	Engine: Run at idle after warming up	A/C switch: ON (A/C compressor operation status)	On	
		A/C switch: OFF	Off	
	Engine: Run at idle after	Blower fan: ON	On	
FAN REQ SIG	warming up	Blower fan: OFF	Off	
	Engine: Run at idle after	Blower fan: ON	Varies	
FAN DUTY	warming up	Blower fan: OFF	0%	
ENG COOL TEMP	Ignition switch ON	_	Varies according to coolant temperature	
VEHICLE SPEED	Driving	_	Equivalent to speedometer reading	

TERMINAL LAYOUT





ALIIA0927ZZ

PHYSICAL VALUES

Terminal I (Wire col	No. or)	Description		Condition		Condition		Condition		Value	
+	-	Signal name	Input/ Output			(Approx.)	N				
1 (L)	_	CAN high	Input/ Output		_	_	N				
2 (B)	_	Ground	_		_	_					
3 (SB)	Ground	Battery power supply	Input	Ignition swit	tch OFF	Battery voltage	0				
4	Ground	Illumination (+)	ON	Lighting	OFF	0 V					
(L)	Ground			switch	1st position	Battery voltage	Ρ				
9 (W)	Ground	IGN 2	Input	Ignition switch ON		Battery voltage					

INFOID:000000012923313

А

HAC

J

Κ

L

FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

Ierminal f (Wire cold	NO. or)	Description	Description			Value
+	_	Signal name	Input/ Output	- Co	ndition	(Approx.)
10 (P)	Ground	Front blower motor control signal	Output	 Ignition switch ON Front fan speed: 1st speed (manual) 		(V) 6 4 2 0 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1
11 (Y)	Ground	RR DEF switch	Output	Defroster switch	OFF ON	0 V 5 V
12 (G)	Ground	Each door motor LIN signal	Input/ Output	Ignition switch ON		(V) 15 10 5 0 •••••••••••••••••••••••••••••••
13 (W)	Ground	Each door motor power supply	Output	Ignition switch ON		Battery voltage
15 ^{*1} (W)	Ground	Water valve	ON ON	Water valve open		Battery voltage 0V
17 (P)		CAN low	Input/ Output			_
18 (B)		Ground	_	_		_
19 (G)	Ground	Ignition power supply	Input	Ignition swit	ch ON	Battery voltage
20 (GR)	_	Illumination (-)	_		_	0 V
21 (R)		Sensor ground			_	_
22 (P)	Ground	Intake sensor signal	Input	Ignition swit	ch ON	0 – 4.8 V Output voltage varies with front evaporator fin temperature
25	Ground	Compressor ON signal	ON	A/C switch (OFF	5 V
(Y)		p	ON	A/C switch (NC	0 V
26 (L/W)	Ground	Front blower motor feed- back	ON		-	Battery voltage
27 (B/W)	Ground	RR DEF feedback	Input	Defroster switch	OFF ON	0 V Battery voltage
29 (B)		ACTR Ground	_			_
30	0		ON	Blower swite	ch OFF	5 V
(W)	Ground	ran UN signal	ON	Blower swite	ch ON	0 V
31*	Ground	Water value	ON	Water valve open		0V
(L)	Cround		ON	Water valve closed		Battery voltage

*1: With VK56VD

FRONT AIR CONTROL

< ECU DIAGNOSIS INFORMATION >

DTC Index

INFOID:000000013122926

А

[MANUAL AIR CONDITIONER]

DTC	Items (CONSULT screen terms)	Reference	
U1000	CAN COMM CIRCUIT	HAC-187, "DTC Description"	
U1010	CONTROL UNIT (CAN)	HAC-188, "FRONT A/C CONTROL : DTC Description"	
B257B	AMBIENT SENSOR (SHORT)	HAC-190, "DTC Description"	
B257C	AMBIENT SENSOR (OPEN)	HAC-190, "DTC Description"	
B2581	INTAKE SENSOR (SHORT)	HAC-193, "DTC Description"	
B2582	INTAKE SENSOR (OPEN)	HAC-193, "DTC Description"	
B2632	DR AIR MIX DOOR MOT (SHORT)	HAC-196, "DTC Description"	
B2633	DR AIR MIX DOOR MOT (OPEN)	HAC-196, "DTC Description"	
B2636	DR VENT DOOR FAIL	HAC-198, "DTC Description"	
B2637	DR B/L DOOR FAIL	HAC-198, "DTC Description"	
B2638	DR D/F1 DOOR FAIL	HAC-198, "DTC Description"	
B2639	DR DEF DOOR FAIL	HAC-198, "DTC Description"	
B263D	FRE DOOR FAIL	HAC-200, "DTC Description"	
B263E	20P FRE DOOR FAIL	HAC-200, "DTC Description"	
B263F	REC DOOR FAIL	HAC-200, "DTC Description"	
B2654	D/F2 DOOR FAIL	HAC-198, "DTC Description"	
B2655	B/L2 DOOR FAIL	HAC-198, "DTC Description"	

*: Perform self-diagnosis under direct sunlight. When performing indoors, aim a light (more than 60 W) at sunload sensor, otherwise selfdiagnosis reports an error even though the sunload sensor is functioning normally.

K

Ν

0

< ECU DIAGNOSIS INFORMATION >

PTC HEATER CONTROL UNIT

Reference Value

INFOID:000000013055561

ALIIA1148ZZ

VALUES ON THE DIAGNOSIS TOOL

Monitor item	Con	Value/Status	
AMB TEMP SEN	Ignition switch ON	—	–30 - 55°C (22 - 131°F)
AMB SEN CAL	Ignition switch ON	_	–30 - 55°C (22 - 131°F)
ENG COOL TEMP	Ignition switch ON	—	Varies according to coolant temperature

TERMINAL LAYOUT





PHYSICAL VALUES

Terminal N (Wire cold	No. or)	Description		Co	ndition	Value
+	_	Signal name	Input/ Output		nation	(Approx.)
1 (L)	_	CAN-H	Input/ Output		_	_
2 (B)		Ground			_	_
3 (G)	Ground	Ignition power supply	Input	Ignition swit	ch ON	Battery voltage
5 (R)		Sensor ground			_	_
9 (P)	_	CAN-L	Input/ Output		_	_
10 (SB)	Ground	Battery power supply	Input	Ignition swit	ch OFF	Battery voltage
12 (W)	Ground	Ambient sensor signal	Input	Ignition swit	ch ON	0 – 4.8 V Output voltage varies with ambi- ent temperature
13 (L/W)	Ground	Front blower motor feed- back	ON		-	Battery voltage
14	Ground	PTC1 relay output signal	Input	Ignition	PTC heater: ON	0 V
(G/R)	Ground		input	switch ON	PTC heater: OFF	Battery voltage
15	Ground	PTC2 relay output signal	Input	Ignition	PTC heater: ON	0 V
(LG)	Ground		input	switch ON	PTC heater: OFF	Battery voltage

PTC HEATER CONTROL UNIT

< ECU DIAGNOSIS INFORMATION >

[MANUAL AIR CONDITIONER]

Terminal N (Wire colo	No. or)	Description		Cr	ondition	Value	j	A
+	_	Signal name	Input/ Output			(Approx.)		
16	Ground	PTC3 relay output signal	Input	Ignition	PTC heater: ON	0 V	ŀ	B
(SB)	Ground	FTC3 relay output signal	mput	switch ON	PTC heater: OFF	Battery voltage	(С

DTC Index

INFOID:000000013055562

DTC	Items (CONSULT screen terms)	Reference	
U1000	CAN COMM CIRCUIT	HAC-187, "DTC Description"	
U1010	CONTROL UNIT (CAN)	HAC-188. "PTC HEATER CONTROL UNIT : DTC Description"	
B257B	AMBIENT SENSOR (SHORT)	HAC-190, "DTC Description"	
B257C	AMBIENT SENSOR (OPEN)	HAC-190, "DTC Description"	

Н

G

D

HAC

J

Κ

L

Μ

Ν

Ο

< ECU DIAGNOSIS INFORMATION >

ECM, IPDM E/R, BCM

List of ECU Reference

INFOID:000000012923314

ECU	Reference
	EC-114. "Reference Value"
ECM (Cummins 5.0L)	EC-126, "Fail safe"
	EC-135, "DTC Index"
	EC-1337. "Reference Value"
ECM (VK56VD)	EC-1361, "Fail-safe"
	EC-1366, "DTC Index"
	PCS-14, "Reference Value"
IPDM E/R	PCS-22, "Fail Safe"
	PCS-23, "DTC Index"
	BCS-32, "Reference Value"
PCM	BCS-32, "Reference Value"
	BCS-51, "DTC Inspection Priority Chart"
	BCS-52, "DTC Index"

А

В

INFOID:000000012545500

WIRING DIAGRAM MANUAL AIR CONDITIONING SYSTEM

CUMMINS 5.0L

CUMMINS 5.0L : Wiring Diagram





Name AMBIENT SENSOR Type RS02FB Color BLACK 2 2 6 6 6 6 0 0 0 0 0 0 0 0 0 0 0 0 0	۵.	TO ENGINE CONTROL HARNESS -	10					
Type RS02FB Collor BLACK 2 5 6 6 6 6					-	63	œ	PPS1 RETURN
Color BLACK		DIESEL	=	1	I	64	RW	REF PRESS SENS RETU
	Y/B	TO ENGINE CONTROL HARNESS -	12	'		65		IGN/KEYSWITCH
		UIESEL TO FNOINT CONTROL LIADNIFCO	2		1	8		1
		DIESEL	<u>t</u>	, e		10	'	
	8	TO ENGINE CONTROL HARNESS -	0 4	5 0		0		
6 (000000000000000000000000000000000000		DIESEL	17			2		
	3	TO ENGINE CONTROL HARNESS -			. 0001	2 7		
		CECE	•	5	1 929 +	- 1	'	
Connec			2	-		7)	-	
	stor No.	E88	20	σ	SMART POWER LSD	73	8	DOSER RETURN
	tor Name	REFRIGERANT PRESSURE	21	1		74	GR/R	DOSER HS
Wire Signal Name		SENSOR	22		-	75	LW	COOLANT SIGNAL
	tor Lane		23	ı	I	76	ı	
R SENS GND	in type		24	ß	DPF OUT PRESS	11	-	WIF SIGNAL
W/B AMB SENS CONNEC	ctor Color	BLACK	25	1		78	-	PPS2 SIGNAL
			26	Br	REF PRESS SENS SIGNAL	62	BR	PPS1 SIGNAL
- No. F78			27			08	M	PDS1 SLIPPLY
		<	1 6			3	: '	
r Name PTC HEATER	ő	\langle	83	ı	I	50	2	PPS2 SUPPLY
· Tvpe ALA05FB-R-RH			29	ı	I	82	ı	
		[1 2 3]	30		1	8	BB	BATTERY
r Color BLACK			24			ă		
			5 8	,		5 8		
			35	*	AI SSH SUPPLY	8	ı	
Termin	al Color of	:	33	_	CAN-H	86	T	1
NO.	Wire	Signal Name	34	ı	1	87	1	
	WVC	DEE DEESS SENIS DETLIDN	35	>	J1939 +	88	'	
	2		36	,		8	,	
2	RL	HEF PHESS SENS SIGNAL	22	-	MAIN BLY LED	6		
	8	PPS2 SUPPLY	5	,		8		I
			88	ı	-	-6	1	1
Color of Signal Name	tor No	E03	39	1	I			
Wire		2	40	GR	FUEL PUMP RLY SIG			
BR IGNITION Connec	ctor Name	ECM (WITH CUMMINS 5.0L)	41	ВВ	SW RETURN			
B GND Connec	stor Type	1-928-405-452	42	1	I			
G IGNITION Connec	tor Color	BLACK	43	-	I			
B			44	-	1			
NOILING			45					
	23 22 24 20	18 17 18 15 15 15 13 13 13 11 10 B B 7	2					
	40 39 38 37	36 35 34 33 32 31 30 29 28 27 28 25 24 25	46	1	-			
- No F87			47	I	I			
	12 22 22 22	53 52 51 50 48 48 47 48 45 44 43 42 41 ⁻	48	1				
r Name WIRE TO WIRE	/4 /3 /2 /1	/U 09 00 6/ 06 05 04 55 02 51 5U 39 30 6 87 36 36 24 69 83 84 80 76 78 77 76 76 6	40					
- Tvne 54200608			f					
			06	'	-			
			51	1	I			
		Signal Name	52	-	-			
NO.	wile		53	R/G	BRAKE SW OPEN			
-	œ	GROUND	54	-	BRAKE NC			
2	в	GROUND	55	,				
	BR	SW BATTERY	0					
4		GROUND	8 1	'				
	6	CIM DATTEDV	/6		-			
20	'n	SW BAI I EHT	58	-	-			
6 Color of	H	SW BATTERY	59	G√	ASCD SIGNAL			
Wire Signal Name	•	DOF DELTA PRESS	60	-	I			
WIE 8	1	I	61	B∕	ASCD RETURN			

AIR CONDITIONER CONTROL CONNECTORS - MANUAL (WITH Cummins 5.0L)

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

HAC

J

Κ

А

В

С

D

Е

F

G

Н

L

Ν

Ο



< WIRING DIAGRAM >

Revision: March 2016

AAIIA0856GB

F150	A/C COMPRESSOR (WITH	CUMMINS 5.0L)	6185-0862	BLACK				-				of Signal Name	olyrial Narre	A/C COMP		M3	FUSE BLOCK (J/B)	CS06FW-M2	WHITE			3N 2N 1N	TN 6N 5N 4N	NA PUD PUD PUD NO			Signal Name	IGN	BATTERY	IGNITION	BATTERY	BATTERY	ACC RFI AV OUT	IGNITION														
Connector No.	Connector Name		Connector lype	Connector Color			H.S.					Terminal Color o	No. Wire	1 RV		Connector No.	Connector Name	Connector Type	Connector Color	Æ		H.S.				- C	No. Wire	0 NI	2N W	3N W	4N V	en <	M NO	8N N														
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	I O MAIN HARNESS	TO MAIN HARNESS		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		8	RE TO WIRE	00612	lok			4 3 2 1 1	6 5 4				signal Name	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS					
	MIELU		R/G	σ	×	, ,	x .	- 1	r .		-	8/M	B/H			. o	σ	٨٧	BR	σ	5 1	s 0	W/B	BR	GR/W		lo. F10	Jame WIF	ype 542	Color BLA							Color of	Wire	'	0	NH 1	۵	RV					
72G	74G	75G	76G	77G	78G	79G	80G	81G	826	83G	84G	500	80G	588	968	906	91G	92G	93G	94G	95G	909	986	996	100G		Connector N	Connector N	Connector T	Connector C	f		Ы. И.				Terminal	No.	-	2	£ 4	- so	9					
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH CUMMINS 5.0L)	TO MAIN HABNESS - (WITH	VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HADNESS	TO MAIN HARNESS - (WITH	CUMMINS 5.0L)	TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS			
G/B	M/H H	EG	G/B	G/B	BRV	<u>م</u>		:	٩	٨/L	GR	G/R	ß	RW	8	H	, <u>c</u>	5/4			g	RY	σ	, LG		M 1	BR	в	L	N :	> (> >	>	BG	BG	BG	2 ×	. œ	W/L	N/R	BG	2 0	- ×		R/W			
24G	26G	27G	28G	29G	30G	31G	31G		32G	33G	34G	35G	36G	37G	38G	396	40G	41G	43G		43G	44G	45G	46G	47G	48G	50G	51G	52G	53G	54G	56G	57G	58G	59G	60G	67G	63G	64G	65G	66G	0/0 686	969	70G	71G			
E152	me WIRE TO WIRE	E TH80MW-CS16-TM4	or WHITE				50 40 30 36 16	102 96 86 76 66		216206196186176166156146136146136116 ancheoraecaronecaronecaro		41G4063963863763863563636346336326316 50649648644764465644644643643645		81G690G59G58G57G566G55G64G53G52G51G 70G59G58G57G6565G64G53G62G	0 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	90089688688587688687686856856846836826		95G 94G 93G 92G 91G 100C 00C 00C 00C 00C 00C					olor of Signal Name	G TO MAIN HARNESS	B/R TO MAIN HARNESS	W/B TO MAIN HARNESS	3R/W TO MAIN HARNESS	BR TO MAIN HARNESS	V IO MAIN HAHNESS - (WITH VK56VD)	R/W TO MAIN HARNESS - (WITH	V TO MAIN HAPNESS	G TO MAIN HARNESS	R TO MAIN HARNESS	W TO MAIN HARNESS	R/G TO MAIN HARNESS	W/B TO MAIN HARNESS	V/B TO MAIN HARNESS	G/W TO MAIN HARNESS	G TO MAIN HARNESS	G/Y TO MAIN HARNESS	G/Y TO MAIN HARNESS	G/Y TO MAIN HARNESS	B/Y TO MAIN HARNESS	G/R TO MAIN HARNESS	Y/R TO MAIN HARNESS			
or No.	or Nan	tor Type	tor Cold																				ਣ ਨੂੰ ਭ			Í	-	_			+	+			-	+		ľ		-	-		-					

L Ċ AIR

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

Κ

Ρ

Revision:	March	2016
------------------	-------	------



						L	!	
Connector	،No.	M4			-		53	
Connector	- Name		8	1	I		44	1
			6	1	ı		45	'
Connector	Type	NS16FW-CS	10	ß	COMBI SW IN 5		46	ï
Connector	Color	WHITE	=	G√	COMBI SW IN 4		47	
Ŧ			12	>	COMBI SW IN 3		48	œ
4444h			13	G/B	COMBI SW IN 2		49	
			14	>	COMBI SW IN 1		50	
5	7P 6F	7 5P 4P 3P 2P 1P	15		-		51	
	16P 15F	P 14P 13P 12P 11P 10P 9P 8P	16	1	I		52	×
			17	٩	GND RF A/L		53	
			18	>	SECURITY INDICATOR		54	WL
			19	1	1		55	W/B
Terminal	Color o	f Signal Name	20	œ	SHIFT P		56	.
	MIR	TOTALIO1	21	R/W	STEP LAMP CONT		57	
	-	IGNITION	22	•	I		58	
2, 1		IGNITION	33	>	AIRCON SW		59	٩
35	σ	IGNITION RELAY OUT	24	1	1		60	-
4	N B	RR DEF RLY	25	M	BRAKE SW FUSE		61	0
2	R/W		26	L	SHORT IN PIN INPUT		62	M
P F			27	R/G	BRAKE SW LAMP		63	1
e, 6	5 3		28	1	T		64	٩
2 6			29	M	BLOWER FAN SW		65	ı
r ĉ	-	0A11EKT	30	٩	DR DOOR LOCK STATUS		66	M
	'	1	31	I	-		67	g
	'	-	32	۲	REAR DEFOGGER SW		68	L
471		-	33	ı	-		69	R/B
	r ;	BALIERY	34				70	٩
4	-	BALIERY	35	B/G	REVERSE SW		71	0
15P	Y/LG	BALTERY	36	W/B	HAZARD SW		72	σ
16P	8	BLOWER FAN RELAY OUT	37	,	-		73	
			38				74	
Connector	·No.	M18	39	B/R	SHIFT N/P		75	N
Connector	' Name	BCM (BODY CONTROL	40	1	I		76	٩
		MODÚLE)					77	L
Connector	Type	TH40FG-NH	Connector	No.	/19		78	0/B
Connector	Color	GREEN	Connector	I omeN			79	RW
ł							80	
4HHh			Connector	Type 7	'H40FB-NH			
H.S.			Connector	Color	BLACK			
	20 19 18 17 40 39 38 37	16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 36 35 34 33 32 31 30 29 28 7 5 5 2 2 1 2 1	E.			-		
			H.S.			[
				60 59 58 57 56	55 54 53 52 51 50 49 48 47 46 45 44 43	42 41		
Terminal No.	Color o Wire	f Signal Name		87 77 82 62 08	75 74 73 72 71 70 69 68 67 66 65 64 63	62 61		
-	σ	ENG START SW NO ESCL						
∾ AA	1	-	Terminal	Color of				
e contra	œ	A/L POWER SUPPLY 5V	No.	Wire	Signal Name			
4	W/R	A/L SIGNAL	41	٨٦	TRAILER LIGHT CHECK RELAY	-		
	' '	1	ę	Š				
D		-	42	НУ	CAHGO LAMP UUI			

1	1	I	I	1	HIGH SIDE START SW LED	I	1	I	AUDIO DONGLE	I	PW UART	L&R SENSOR K-LINE	-	I	I	CAN-L	CAN-H	REAR DEFOGGER RELAY OUT	STARTER RELAY OUT	1	BUZZER OUT	1	BLOWER FAN RELAY OUT	IGN ELEC RELAY OUT 2	MR OUTPUT	AT DEVICE OUT	IGN USM OUT 1	DR REQUEST SW	AS REQUEST SW	I	I	COMBI SW OUT 5	COMBI SW OUT 4	COMBI SW OUT 3	COMBI SW OUT 2	COMBI SW OUT 1	I
,	•		1	-	æ		•	-	M		W/L	W/B	-			٩	۲	0	w	•	Ь		w	σ	۲	R/B	٩	0	σ	-	1	LVW	٩	_	O/B	R/W	
43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	99	67	68	69	70	71	72	73	74	75	76	77	78	79	80

10 UNIE 10 Service Foodminances 10 Service Foodminances 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 20 10 Service Foodminances 20 10 Service Foodminances PUNCS16-TUA 20 20 10 Service Foodminances 20		ene FUSE BLOCK (pe NS0FW-CS olor WHITE 001 01
V-CSIG-TM4 See Ce TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See F TO Ensure FOON HAMERS EF TO Ensure FOON HAMERS See		Pee NSOFFW-CS olor WHITE 21 51 41 61 51 41 61 51 41
296 648 10 ENGINE EOON HARKESS 300 7 10 ENGINE EOON HARKESS 300 </td <td></td> <td>Olor WHITE 21 1 61 51 Signal 4</td>		Olor WHITE 21 1 61 51 Signal 4
300 BMY TO ENGINE FOOM HARKESS (FILE (1) C ENGINE FOOM HARKESS (FILE (1)		21 11 21 11 61 51 41 Wire Signal
1 1 0		2010 of 61 51 41 Wire signal wire signal
1 1 0		21 11 61 51 41 Wire ss Batt
(a)		Dolor of 61 51 41 Wire signal
Ind Birkingelingeringeringeringeringeringeringeringer		20lor of Signal Wire Signal
Обларити Полити соврет соли налисска соврет со ранити соврет со ранити соврет сов налисска соврет со ранити соврет сов налисска соврет со ранити соврет сов налисска соврет со ранити соврет сов налисска соврет сов налисска сов с с с сов налисска сов с с с с сов налисска сов с с с с с с с с с с с с с с с с с с		Dolor of Signal Wire Signal
Standing		Zolor of Signal Wire Signal SB BATT R RRDE
Control Control <t< td=""><td></td><td>Solor of Wire Signal - - SB BATT R RR DE</td></t<>		Solor of Wire Signal - - SB BATT R RR DE
Construction Construction Construction Construction Construction	0 0 0 0 0 0 0 0	Wire Signal
Signal production Bit TO ENGINE FOOM HARNESS Sold W TO ENGINE FOOM HARNESS Signal production 410 Prod TO ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Signal production 410 Prod TO ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Signal Manne 426 0 TO ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production 430 CENCINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production 430 CENCINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production 430 CENCINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production 430 - TO ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production - 10 TO ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production - 10 ENGINE FOOM HARNESS 930 B TO ENGINE FOOM HARNESS Production		BATT BATT - BATT
Significient Consider Food HARNESS (Significient Significient (Significient Significient (Significient Significient Significient Significient Significient Significient (Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Significient Signint Signint Significient Significient Signint Significient Signif	41 31 21	SB BATT R BATT
Resperies/ (reling/including		R R DE
Портиститурания сос. 10 ENGINE FDOOM HARNESS column	0 0 0	
	4	: 0
410 R/Y 10 ENGINE FOOM HARVESS (0) [digilication] 970 R T0 ENGINE FOOM HARVESS (0) [digilication] 455 5 70 ENGINE FOOM HARVESS (10) [digilication] 970 R 70 ENGINE FOOM HARVESS (10) [digilication] 475 R 70 ENGINE FOOM HARVESS (10) [digilication] 970 R 70 ENGINE FOOM HARVESS (10) [digilication] 475 R 70 ENGINE FOOM HARVESS (10) [digilication] 970 R 70 ENGINE FOOM HARVESS (10) [digilication] 970 R 70 ENGINE FOOM HARVESS (10) [digilication] 100 ENGINE HARVESS (10) [digilication] 970 100 ENGINE HARVESS (10) [digilication] 100 ENGINE HARVESS (10) [digilication] 970 C R 70 ENGINE FOOM HARVESS (10) [digilication] 100 ENGINE HARVESS (10) [digilication] 100 ENGINE HARVESS (10) [digilication] 970 L 70 ENGINE FOOM HARVESS (10) [digilication] 100 ENGINE FOOM HARVESS (10) [digilication] 1		e BAII
	0	•
explicit/eliption 460 Lg TO ENGINE FOOM HARNESS 990 R TO ENGINE FOOM HARNESS 470 R TO ENGINE FOOM HARNESS 460 L TO ENGINE FOOM HARNESS 560 B TO ENGINE FOOM HARNESS 560 Domector Name FFONT BLOWER MOD NGINE FOOM HARNESS G V TO ENGINE FOOM HARNESS Connector Name FFONT BLOWER MOD NGINE FOOM HARNESS G W TO ENGINE FOOM HARNESS Connector Name FFONT BLOWER MOD NGINE FOOM HARNESS G W TO ENGINE FOOM HARNESS Connector Name FFONT BLOWER MOD NGINE FOOM HARNESS G W TO ENGINE FOOM HARNESS Connector Name FFONT BLOWER MOD NGINE FOOM HARNESS G W TO ENGINE FOOM HARNESS	6T	1
4700 700 <td></td> <td></td>		
Signal Name Signal	Connector N	0. M64
Signal Name Image: Construction of the c	Connector N	
Signal Name Signal Name Commetor No. Att 44 Signal Name Finder From HARNESS Signal Name Commetor No. M44 Signal Name Finder From HARNESS Signal Name Commetor No. M44 Signal Name Finder From HARNESS Signal Name Commetor Name FINDU FILOWER MO Signal Name Finder From HARNESS Signal Name Commetor Name FINDU FILOWER MO Signal Name Finder From HARNESS Signal Name Signal Name Commetor Name FINDU FILOWER MO Signal Name Finder From HARNESS Signal Name Signal Name Commetor Name FINDU FILOWER MO Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name Commetor Name FINDU FILOWER MO Signal Name Finder From HARNESS Signal Name Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name Signal Name Finder From HARNESS Signal Name Finder From HARNESS Signal Name<		
Signal Name Signal Name Find Connector Name FRONT BLOWER MOM Gaine Froom HARNESS 51 1 TO Enside ROOM HARNESS Connector Type MDZFW-LC Gaine Froom HARNESS 536 W TO Enside ROOM HARNESS 530 W TO Enside ROOM HARNESS Gaine Froom HARNESS 536 W TO Enside ROOM HARNESS 530 W TO Enside ROOM HARNESS Gaine Room HARNESS 536 W TO Enside ROOM HARNESS 560 WHITE Connector Color WHITE Gaine Room HARNESS 566 Y TO Enside ROOM HARNESS 560 W TO Enside ROOM HARNESS 560 WHITE Connector Color WHITE Gaine Room HARNESS 576 Y TO Enside ROOM HARNESS 560 WHITE Connector Color WHITE Gaine Room HARNESS 576 Y TO Enside ROOM HARNESS 560 WHITE Connector Color WHITE Gaine Room HARNESS 576 Y TO Enside ROOM HARNESS 560 WHITE Connector Color WHITE	Connector Ty	/pe C02FW
Connector Type MOZPW-LC GINE ROOM HARNESS 20 L TO Ensure ROOM HARNESS GINE ROOM HARNESS 20 L TO Ensure ROOM HARNESS GINE ROOM HARNESS 20 L TO Ensure ROOM HARNESS GINE ROOM HARNESS 266 W TO Ensure ROOM HARNESS GINE ROOM HARNESS 266 W TO Ensure ROOM HARNESS GINE ROOM HARNESS 266 W TO Ensure ROOM HARNESS GINE ROOM HARNESS 266 W TO Ensure ROOM HARNESS GINE ROOM HARNESS 266 TO Ensure ROOM HARNESS 266 GINE ROOM HARNESS 266 TO ENSURE ROOM HARNESS 267 GINE ROOM HARNESS 266 TO ENSURE ROOM HARNESS 266 GINE ROOM HARNESS 266 TO ENSURE ROOM HARNESS 267 GINE ROOM HARNESS 266 0 TO ENSURE ROOM HARNESS GINE ROOM HARNESS 266 0 TO ENSURE ROOM HARNESS GINE ROOM HARNESS 266 0 TO ENSURE ROOM HARNESS GINE ROOM HARNESS 261 0	Connector C	olor WHITE
Idial Froom Harkess Denote Fro		
aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS aime FOOM HARMESS </td <td></td> <td></td>		
Internetioner Interneit Internetioner Internetione	HS	
Inter FOOM HARNESS Inter F		
Main Find To The Manual Manuscue To The Manual Manuscue To Manual Manuscue VIGNE FOOM HARNESS 960 FIG TO ENGINE FOOM HARNESS 960 BG TO ENGINE FOOM HARNESS 960 Mine 20 0 1 Mine 20 0 1 Mine 20 0 1 Mine 20 Mine 2 Mine 1 Mine 1 Mine 1 Mine 1 Mine 2 Mintow 1 Mine 2 Mintow 1 1 Mine 1 1 1 Mine 1 1 1 1 1 1 1 1 1 1 1		1 2
Big TO ENGINE FROM HARNESS Big TO ENGINE FROM HARNESS Endine Endine <thendin< th=""> <thendine< th=""> Endine<!--</td--><td></td><td></td></thendine<></thendin<>		
Bit TO ENGINE FROM HARNESS End TO ENGINE FROM HARNESS End TO ENGINE FROM HARNESS KGINE FROM HARNESS E0G EG TO ENGINE FROM HARNESS E0G EG TO ENGINE FROM HARNESS KGINE FROM HARNESS EG 0 TO ENGINE ROOM HARNESS EG V TO ENGINE ROOM HARNESS KGINE FROM HARNESS EG 0 TO ENGINE ROOM HARNESS EG V To ENGINE ROOM HARNESS KGINE FROM HARNESS EG V TO ENGINE ROOM HARNESS EG V Virge Signal Name KGINE FROM HARNESS EG V TO ENGINE ROOM HARNESS No. Virge Signal Name KGINE FROM HARNESS EG V TO ENGINE ROOM HARNESS No. Virge Signal Name KGINE FROM HARNESS EG V TO ENGINE ROOM HARNESS 2 L/W Kignal Name KGINE FROM HARNESS EG W TO ENGINE ROOM HARNESS 2 L/W FAN SFED OMI KGINE FROM HARNESS EG V TO ENGINE ROOM HARNESS 2 <t< td=""><td></td><td></td></t<>		
Main Form Form <th< td=""><td>Terminal</td><td>Color of</td></th<>	Terminal	Color of
Nome FOOM HARNESS IG 0 TO ENGINE FOOM HARNES		Wire Signal
Marker Hoursen Color of aver encom Harvess Terminal Color of Wire Color of No. Signal Name GNIR EROOM HARNESS 83 0 TO Ensume No. Wire Signal Name GNIR EROOM HARNESS 83 0 TO Ensume No. Wire Signal Name GNIR EROOM HARNESS 63 0 TO Ensume FROM HARNESS No. Wire Signal Name GNIR EROOM HARNESS 64G W/L TO Ensume ROOM HARNESS 1 W Istwitton GNIR EROOM HARNESS 64G W/L TO Ensume ROOM HARNESS 2 L/W FAN SPEED CONT GNIR EROOM HARNESS 66G B TO ENSIME ROOM HARNESS 2 L/W FAN SPEED CONT GNIR EROOM HARNESS 66G Y TO ENSIME ROOM HARNESS 2 L/W FAN SPEED CONT GNIR EROOM HARNESS 66G Y TO ENSIME ROOM HARNESS 2 L/W FAN SPEED CONT GNIR EROOM HARNESS 66G Y TO ENSIME ROOM HARNESS 2 L/W FAN SPEED CONT <	- <u>:</u> - :	DITAKE
Mark Mo. Wire Mo. Wire Mo. GNIR FROM HARNESS 63 0 TO ENGINE FROM HARNESS No. Wire Mo. Wire Mo. GNIR FROM HARNESS 63 0 TO ENGINE FROM HARNESS No. Wire Mo. Mo	- c	
Mailler ENOM HARNESS Mailler ENOM HARNESS 1 W IGNUTION VIGNE ENOM HARNESS 64 W/L TO ENGINE FOOM HARNESS 2 L/W FAN SPEED FOOM VIGNE ENOM HARNESS 65 W/R TO ENGINE FOOM HARNESS 2 L/W FAN SPEED FOOM VIGNE ENOM HARNESS 66 BG TO ENGINE FOOM HARNESS 2 L/W FAN SPEED FOOM VIGNE ENOM HARNESS 66 BG TO ENGINE FOOM HARNESS 2 L/W FAN SPEED FOOM VIGNE FOOM HARNESS 67 0 TO ENGINE ROOM HARNESS 2 L/W FAN SPEED FOOM VIGNE FOOM HARNESS 67 0 TO ENGINE ROOM HARNESS 2 L/W FAN SPEED FOOM VIGNE FOOM HARNESS 67 0 TO ENGINE ROOM HARNESS 2 L/W FAN SPEED FOOM VIGNE FOOM HARNESS 67 0 TO ENGINE ROOM HARNESS 2 L/W FAN SPEED FOOM VIGNE FOOM HARNESS 67 7 TO ENGINE ROOM HARNESS 2 L/W 2 L/W 2	7	
VIGIRE FOOM HARNESS VIE A W/L TO ENGINE FOOM HARNESS 2 LW FAN SPEED CONT VIENT FOOM HARNESS 665 W/T TO ENGINE FOOM HARNESS 665 BG TO ENGINE FOOM HARNESS 666 BG TO ENGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS 681 B TO ENGINE FOOM HARNESS 881 B TO ENGINE FOOM HARNESS 883 97 TO ENGINE FOOM HARNESS 893 993 97 TO ENGINE FOOM HARNESS 973 97 TO ENGINE FOOM HARNESS 97		
NGINE FOOM HARNESS 554 W/H 10 ENGINE FOUM HARNESS NGINE FOOM HARNESS 660 BG TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 66G B TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 66G Y TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 66G Y TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 66G Y TO ENGINE FOOM HARNESS		
NGIRE FOOM HARNESS EVG D4 TO FRGINE FOOM HARNESS FORM FOOM HARNESS FOO TO FORME FOOM HARNESS G8G B TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 68G Y TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 98G Y TO ENGINE FOOM HARNESS		
NGINE FOOM HARNESS 67G 0 TO ENGINE FOOM HARNESS NGINE FOOM HARNESS 66G B TO ENGINE ROOM HARNESS NGINE FOOM HARNESS NGINE ROOM HARNESS NGINE POOM HARNESS NGINE POOM HARNESS		
INGINE POOM HANNESS 893 B TO ENGINE POOM HARNESS INGINE ROOM HARNESS 993 Y TO ENGINE ROOM HARNESS		
NGINE ROOM HARNESS 69G Y TO ENSINE ROOM HARNESS		
INGINE MOUNT PARTIES TO THE TO T		
NGINE HOUM HANKESS 77G 1 MV 71 CENVILLETOOM INVINCEO		
GIR POOM HANES - 736 SHIELD TO ENSINE ROUM HANESS		
dille ROOM HATNESS 756 P TO ENGINE POUN MANNESS 756 P TO ENGINE POUN MANNESS 7		
(WITH VK58VD) Tet Protection Provided Protection Protec		
NGINE ROOM HARNESS 77G RG TO FNORM HARNESS		
NGINE ROOM HARNESS		

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο



AIR CONDITIONER CONTROL CONNECTORS - MANUAL (WITH Cummins 5.0L)

< WIRING DIAGRAM >

2016 Titan NAM

15

G

AAIIA0860GB



MANUAL AIR CONDITIONING SYSTEM

[MANUAL AIR CONDITIONER]

А

В

С

D

Ε

F

J

Κ

L

Ρ

VK56VD

< WIRING DIAGRAM >

MANUAL AIR CONDITIONING SYSTEM

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

VK56VD : Wiring Diagram INFOID:000000013829921 \land CHENDER COMMUNICATION LINE FOR DIAGNOSIS (HM) : WITH HEATED MIRRORS (V3) : WITH VK56VD AND WITHOUT DRIVER ASSISTANCE SYSTEM **.** 20 TO DEFOGGER -WITH MANUAL A/C E152 M31 WATER VALVE 74G 84G ΣI FUSE BLOCK (J/B) (M60), (M4). VIR MIX M230 80 Ì AMP 16P AIR CONDITIONER CONTROL - MANUAL (WITH VK56VD) FRONT AIR CONTROL (M132) M44 15A 27 VARIABLE BLOWER CONTROL (M130) (∑) 0 FRONT BLOWER MOTOR FELAY Ş AMP 15A 17 Z ЗВ 00 MODE DOOR MOTOR M226 M225 (M95 IGNITION SWITCH ON OR START 20 N Ş 10A 30 AMP. 13 e 5A BATTERY AAIWA0308GB







2016 Titan NAM

AAIIA0868GB

۲Ľ

144

< WIRING DIAGRAM >

< WIRING DIAGRAM >	[MANUAL AIR CONDITIONER]

E130	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	TH10FB-NH	BLACK	67 67 72 71 70 66 66 64 63 64 63 64 63 64 63 64 63 64 64 72 71 70 66 66 66 66 71 70 70 66 66 66 66 70 70 70 70 70 70 70 70 70 70 70 70 70
Connector No.	Connector Name	Connector Type	Connector Color	मिन्न H.S.
E123	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)	NS08FBR-CS	BROWN	51 50 49 56 55 54 53 52
Connector No.	Connector Name	Connector Type	Connector Color	国 H.S.

Signal Name	Terminal No.	Color of Wire	Signal N
A/C COMP - (WITH CUMMINS	63	-	1
5.0L)	64	æ	DETENT
A/C COMP - (WITH VK56VD)	65	,	1
TRAILER TOW	8		Tamp Links
	99	r	PUSH SIAF
	67	,	'
S-GND			1010 101
	68	_	IGN SIGN
ı	69	,	1
I	20	,	1
I			
	F	SB	S DOOH
-	72	×	E-CPLG - MITH
	1	:	

ame

Color of Wire

Terminal No.

Y/B BR - B VK56VD)

54	1	I
55	1	1
56	-	I
Connector	No.	E124
Connector	Name	IPDM E/R (INTELLIGENT POWER DISTRIBUTION MODULE ENGINE ROOM)
Connector	Type	M06FB-LC
Connector	Color	BLACK
E		
H.S.		

59 58 57 62 61 60	Signal Name	RR DEF	FUEL PUMP - (WITH CUMMINS 5.0L)	FUEL PUMP - (WITH VK56VD)	ı	ı	1	P GND	
	Color of Wire	W/B	BR	Вγ	1	1		8	
ю́н	Terminal No.	57	58	58	59	60	61	62	
						A	AII	A08	369GB

HAC

J

А

В

С

D

Е

F

G

Н

K

Ν

Μ

0

10 L/Y TO ENGINE ROOM HARNESS	11 SB TO ENGINE ROOM HARNESS	12 L TO ENGINE ROOM HARNESS	13 W/R TO ENGINE ROOM HARNESS	14 Y TO ENGINE ROOM HARNESS	15 B TO ENGINE ROOM HARNESS	16 B I U ENGINE HOOM HARNESS	17 Y/R TO ENGINE ROOM HARNESS		19 B/R TO ENGINE ROOM HARNESS		21 V/R TO ENGINE ROOM HARNESS 29 SUICE D TO ENGINE DOOM HARNESS	22 OFFICED TO ENGINE POOM HADNESS	24 P TO FNGINE ROOM HARNESS		Connotor No. E30		Connector Name WIRE TO WIRE	Connector Type RS08FGY-PR	Connector Color GRAY			H.S.	4 3 2 1	8 7 6 5			Terminal Color of	No. Wire Signal Name	1 W TO ENGINE ROOM HARNESS	2 L TO ENGINE ROOM HARNESS	3 R/W TO ENGINE ROOM HARNESS	4 W IO ENGINE HOOM HAHNESS	6 GB/B TO ENGINE ROOM HARNESS	7 BR TO ENGINE ROOM HARNESS	8 TO ENGINE ROOM HARNESS	-												
TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	I O MAIN HARNESS	TO MAIN HARNESS		TO MAIN HARNESS		TO MAIN HARNESS TO MAIN HADNESS	TO MAIN HAPNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		F14	WIRE TO WIRE	TH24FW-NH	WHITE				10 9 8 7 6 5 4 3 2 1	22 21 20 18 18 18 18 19 10 12 27			Signal Name	0	TO ENGINE ROOM HARNESS						
۲ ۲	SHIELD	>	œ :	R/G	σ ;	M	1 1	r .		c .		, W/B	e e e	M/B	٩	_	σ	σ	N/N	BR	σ	σ	N	œ	W/B	æ	GR/W		tor No.	tor Name	tor Type	tor Color				12 12	24 23		-	al Color of	Wire	5	BB	> -	9:	> 0	<u>-</u>	
72G	73G	74G	75G	76G	776	786	79G	500	81G	070	83G	010	5 9 9 9 9	876	88G	89G	906	91G	92G	93G	94G	95G	96G	97G	98G	996	100G	,	Connec	Connec	Connec	Connec	E		H.S					Termin	No.	-	0		4	<i>.</i> ,	9	
TO MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS - (WITH	CUMMINS 5.0L)	TO MAIN HARNESS - (WITH	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	IO MAIN HARNESS	TO MAIN HARNESS TO MAIN HARNESS	TO MAIN HADNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS		TO MAIN HARNESS				
GV	A/R	a' B'B	BW	<u>م</u>	: 9	G/B	G/B	BR/Y	٩		в	•	, VI	: E	G/R	ß	RW	B	BR	'	R/G	0	•	RY	5	р Г	x	× '	8	6 8	-	M	M	σ	M	> 2		n ng	3 @	× ×		W/L	W/R	BG	BG	•		~
22G	236	246	256	26G	27G	28G	29G	30G	31G		31G	326	336	34G	35G	36G	37G	38G	39G	40G	41G	42G	43G	44G	45G	46G	47G	48G	009	51G	52G	53G	54G	55G	56G	57G	5000	909	616	62G	63G	64G	65G	66G	67G	68G		69G
E152	WIRE TO WIRE	THROWING CS16 TMA		WHIE				50 46 36 36 16	106 96 86 76 66		216206 196 186 176 166 156 146 136 126 116 306 296 286 276 286 256 246 236 226		4 10 4400 5900 500 500 500 5400 5400 5400 5	R10.600.680.570.580.550.530.530.510	706696687676666656646636626	810,810,780,780,770,780,750,740,730,770	900,0396 886,876 886 856 846 836 826		95G 94G 93G 92G ^{91G} 100G 99G 98G 97G arc					of Signal Name		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	V TO MAIN HARNESS	TO MAIN HARNESS	U MAIN HARNESS - (WITH VK56VD)	TO MAIN HARNESS - (WITH		TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	TO MAIN HARNESS	
ctor No.	etor Name	octor Tuno	ector type				ري م]			ninal Color	o. Wire	9	B/B	W/B	BRM	5 C	5	B.W	>	- c		<u>ک</u>	G R/G	G W/B	G BR	G Y/B	G GM	5 5	G√	GV	VX 5	G√	_ n 2	5

rminal No.	Color of Wire	Signal Name
-	×	TO ENGINE ROOM HARNESS
5	_	TO ENGINE ROOM HARNESS
e	RW	TO ENGINE ROOM HARNESS
4	M	TO ENGINE ROOM HARNESS
5	SHIELD	TO ENGINE ROOM HARNESS
9	GR/R	TO ENGINE ROOM HARNESS
7	BB	TO ENGINE ROOM HARNESS
8	8	TO ENGINE ROOM HARNESS

Terminal No.	Color of Wire	Signal Name
-	L/R	TO ENGINE ROOM HARN
2	BR	TO ENGINE ROOM HARN
ę	v	TO ENGINE ROOM HARN
4	٦/0	TO ENGINE ROOM HARN
S	W	TO ENGINE ROOM HARN
9	۵.	TO ENGINE ROOM HARN
2	Y/R	TO ENGINE ROOM HARN
8	BR	TO ENGINE ROOM HARN
6	W/L	TO ENGINE ROOM HARN

16P W BLOWER FAN RELAY OUT																														0																		
3	USE BLOCK (J/B)	S06FW-M2	/HITE			3N 2N 1N	TNI ENI ENI ANI	NIT NIC NIO NI/ N8			Signal Name	0	IGN	BATTERY	IGNITION	BATTERY	BATTERY	BATTERY	ACC RELAY OUT	IGNITION		14	USE BLOCK (J/B)	S16FW-CS	/HITE				5P 4P 3P 2P 1F	14P 13P 12P 11P 10P 9P 8I				Signal Name	IGNITION	IGNITION	IGNITION RELAY OUT	RR DEF RLY	PD DEF BLY OLIT		IGNITION	BATTERY	1	1	1	BATTERY	BATTERY	BATTERY
r No.	r Name F	r Type C	r Color N						_		Color of	Wire	0	>	>	>	>	>	-	8		r No.	r Name Fi	r Tvpe	r Color				7P 6P	16P 15P			Color of	Wire	æ	>	σ	BW		0	∍ ≥	:	,	'	'	œ	>	A/LG
Connecto	Connecto	Connecto	Connecto.	ł		H.S.					Terminal	No.	ň	2N	ЗN	4N	SN	8	N	8N N		Connecto	Connecto	Connecto	Connecto		E		0 I				Terminal	No.	đ	2P	зь	4	<u>г</u> , в		- 6	- d6	10P	11P	12P	13P	14P	15P
BATTERY TEMPERATURE SENSOR	CRANKSHAFT POSITION SENSOR	(POS)		TEMPERATURE SENSOR 1	INTAKE AIR TEMPERATURE SFNSOR	MASS AIR FLOW SENSOR	BATTERY CURRENT SENSOR	1	CAMSHAFT POSITION SENSOR	(PHASE) (BANK 1)	EXHAUST VALVE TIMING CONTROL POSITION SENSOR	(BANK 1)	SENSOR GROUND	SENSOR GROUND	SENSOR GROUND	SENSOR GROUND	HIGH PRESSURE FUEL PUMP			FUEL INJECTOR NO. 4 (LO)	FCM GROUND	HIGH PRESSURE FLIEL PLIMP	DRIVER POWER SUPPLY	FUEL INJECTOR NO. 6 (LO)	FUEL INJECTOR NO. 7 (LO)	FUEL INJECTOR NO. 4, 7 (HI)	ECM GROUND		F96	A/C COMPRESSOR (WITH	VK56VD)	6185-0862	BLACK			X					of Signal Name							
LG	R/W	-	1.00		G/0	G/B	>	· ·	LR		۵.		œ	œ	G/W	BR/W	SB	8	5 >	-			-	œ	>	≥	8		ctor No.	ctor Name		ctor Type	ctor Color			ó				•	nal Color							
32	33	2	5 6	~	36	37	38	39	40		41		42	43	44	45	46	17	ę	49	20	5	5	52	53	54	55		Conne	Conne		Conne	Conne			H					Termi		-					
F78	ECM (WITH VK56VD)	MAB35FB-MEB20-LH	BLACK		6 11 16 21 26 31 36 41 46 51	7	12 17 22 27 32 37 42	8 13 18 23 28 33 38 43 48 53	9 19 54	14 19 24 29 34 39 44	10 15 20 25 30 35 40 45 30 35		of Signal Name				DRIVER POWER SUPPLY	FUEL INJECTOR NO. 8 (LO)	FUEL INJECTOR NO. 3 (LO)	FUEL INJECTOR NO. 2, 3 (HI)	FUEL INJECTOR DRIVER POWER	SUPPLY	FUEL INJECTOR NO. 5, 8 (H)				- REFRIGERANT PRESSURE	SENSOR	SENSOR GROUND	D SHIELD	KNOCK SENSOR (BANK 1)		EXHAUSI GAS LEMPERALURE SENSOR (BANK 2)	KNOCK SENSOR (BANK 2)	EXHAUST GAS TEMPERATURE SENSOR (RANK 1)	D SENSOR GROUND	1	ENGINE OIL TEMPERATURE	SENSOR	ENGINE OIL PRESSURE SENSOR	POWER SI EEKING PRESSURE SENSOR	FUEL RAIL PRESSURE SENSOR	1	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	SENSOR POWER SUPPLY	FAN CLUTCH ASSEMBLY SIGNAL
ctor No.	ctor Name	ctor Type	ctor Color		-	~	-	9	4		0		nal Color	wire.	œ		8	B/B	0	σ	œ		A/B	M/0	Δ Δ	1	- 1		WL	SHIELI	>		>	×	GR/R	SHIELL	'	5	-		H9/4	W/N	1	W/G	Y/R	SB	SB	BB
Conne	Conne	Conne	Conne	£		H							Termi	NO.	-	•	N	e	4	2	9	1	r 0		₽ 5	2	F 6F	!	13	14	15	2	21	18	19	20	21	22	90	S 3	24	25	26	27	58	29	00	31

Revision: March 2016

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

А

В

С

D

Е

F

G

Н

HAC

J

Κ

L

Μ

Ν

Ο

				39	B/B	SHIFT N/P	75	N	COMBI SW OUT 5
	Connecto	L NO.	M18	40	1	1	76	٩	COMBI SW OUT 4
	Connecto	r Name	BCM (BODY CONTROL MODULE)				77		COMBI SW OUT 3
	Connector	r Tvpe	TH40FG-NH	Connecto	r No.	M19	78	0/8	COMBI SW OUT 2
	Connecto	r Color	GREEN	Connecto	r Name	BCM (BODY CONTROL MODULE)	80		
	E			Connector	r Type	TH40FB-NH			
	S H			Connector	r Color	BLACK			
		20 19 18 17 40 39 38 37	16 15 14 13 12 11 10 9 8 7 6 5 4 3 36 35 34 33 32 31 30 29 28 27 28 25 24 23 2	211 GA					
Terminal No. Solution Solution Signal Name 1 0 Bestantistyno Esc., No P 2 1 Antonerissipery No P 3 N/n Antonerissipery No P 4 N/n Antonerissipery No P 9 2 P P 9 2 P P 10 V/n Neutressipery Neutressipery Neutressipery P 11 V/n Consistential Neutressipery Neutressipery P P 12 P Consistential Neutressipery P P 13 V Consistential Neutressipery P P 14 V Consistential Neutressipery P P 15 P Consistential Neutressipery P P 16 V Consistential Neutressipery P P 16 V Consistential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutressitential Neutres				H.S.	60 59 58 57	56 54 53 52 51 50 43 44 47 46 43 42<	41		
1 0 Buo Stanten MOREGAL 2 - - - 3 N ALFONDERSUPUCY - - 4 N ALFONDERSUPUCY - - 4 N ALFONDERSUPUCY - - 4 N ALFONDERSUPUCY - - 5 - - - - 7 - - - - - 9 - - - - - - 10 GN - - - - - - 11 GN COMBENIUX - </td <td>Terminal No.</td> <td>Color c Wire</td> <td>of Signal Name</td> <td></td> <td>12 12 12 12</td> <td>76 / 75 / 74 / 73 / 72 / 71 / 70 / 69 / 68 67 / 66 65 64 63 62</td> <td>5 61</td> <td></td> <td></td>	Terminal No.	Color c Wire	of Signal Name		12 12 12 12	76 / 75 / 74 / 73 / 72 / 71 / 70 / 69 / 68 67 / 66 65 64 63 62	5 61		
2 1	-	σ	ENG START SW NO ESCL		-				
3 R ALTOWIER SUPPLYUN MM MM MML MML 1 2 2 2 2 2 2 2 2 2 2 2 3 2 2 2 2 2 3 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2 1 2 2 2 2 2	2	'	-	Terminal	Color o	f Signal Name			
a m m. cutit i - - - - i - - - - - i - - - - - - i - - - - - - i - - - - - - i - - - - - - iii - - - - - - iiii <td>e </td> <td>a a</td> <td>A/L POWER SUPPLY 5V</td> <td>41 10.</td> <td></td> <td>TRAILER LIGHT CHECK RELAV</td> <td></td> <td></td> <td></td>	e	a a	A/L POWER SUPPLY 5V	41 10.		TRAILER LIGHT CHECK RELAV			
6 - - - CAROLAMP OUT 7 - - - - 7 - - - - - 9 - - - - - - 10 67 - - - - - - 11 67 COMBISWIN - <td>+ 10</td> <td>L/M '</td> <td></td> <td>;</td> <td>:</td> <td>OUT</td> <td></td> <td></td> <td></td>	+ 10	L/M '		;	:	OUT			
7 2 - - - - - 8 - - - - - - 10 SP - - - - - 11 V COMBISWINS - - - - - 12 V COMBISWINS - - - - - 13 QB COMBISWINS - - - - - 14 V COMBISWINS - - - - - 14 V COMBISWINS - - - - - 15 V COMBISWINS - </td <td>9</td> <td> '</td> <td>1</td> <td>42</td> <td>RV</td> <td>CARGO LAMP OUT</td> <td></td> <td></td> <td></td>	9	'	1	42	RV	CARGO LAMP OUT			
8	7	1	1	- 43	'	-			
9 - - - - - 1 6/Y - CONBISWINS - - - 1 6/Y - CONBISWINS - - - - 1 6/Y - CONBISWINS - - - - 1 V CONBISWINS -	80	'	1	44					
11 6xb Comensavirus 11 6xb Comensavirus 12 x Comensavirus 13 6xb Comensavirus 14 x Comensavirus 15 x Comensavirus 16 x Comensavirus 16 x Comensavirus 16 x Municobrance 17 x Municobrance 18 x Autonobrance 19 x Municobrance 10 x Municobrance 11 x Municobrance 12 x Municobrance 13 x Municobrance 14 x Municobrance 15 x Municobrance 16 x Municobrance 17 x Municobrance 18 x Municobrance 19 x Municobrance 10 x Municobrance	6	' 6	-	46	'				
12 Y COMBLENIN3 46 R HIGH SIE STATT SWLED 13 G/B COMBLENIN1 2 - - 14 V COMBLENIN1 2 - - 16 - - - - - 16 - - - - - 17 P ORD FFA/II - - - 18 - - - - - - 19 V SECUTIVIDICICAD - <td>=</td> <td>a ya</td> <td>COMBLSW IN 5 COMPLSW IN 4</td> <td>47</td> <td>'</td> <td>1</td> <td></td> <td></td> <td></td>	=	a ya	COMBLSW IN 5 COMPLSW IN 4	47	'	1			
13 Greg Comeisvux 14 V Comeisvux 15 - - 16 - - 17 P Comeisvux 18 - - 19 V Sconeisvux 19 V Sconeix 20 P V Lansensense 21 E V Lansense 22 V Allero Coneix 23 V M Blackervicis 24 L M Blackervicis 23 V Blackervicis Sconeix 24 L	12	>	COMBI SW IN 3	48	œ	HIGH SIDE START SW LED			
14 V ComeIs/W11 1 - - - 15 - - - - - - - 16 - - - - - - - - 17 P - - - - - - - - 18 V SECUBIT/INDICATOR 90 - NutAFT -	13	G/B	COMBI SW IN 2	49	'	-			
15 -	14	>	COMBI SW IN 1	8 1	'	1			
16 -	15	'	1	6	3				
I P BIORFALL GAU BAFALL 10 X SECURTY INDICATOR SK WL PW UART 10 X SECURTY INDICATOR SK WB LGARSINGALINE 21 R.W STEP LAWP CONT SK WB LGARSINGALINE 21 R.W STEP LAWP CONT SK - - 23 Y AIRCONSW CG - - 24 V AIRCONSW CG CAN-L - 25 V BRAKESW FUSE CG C CAN-L 26 L CAN-L CAN-L - - 27 R/G R STARTER RELAY OUT - - 27 R/G R STARTER RELAY OUT - - 28 V BRAKESW FUSE C C - - 29 V BRAKESW FUSE C C - - - 29 V BRAKESW	16	'	1	53		1			
18 V SECHITY INDICATOR 19 - BHET P 20 R SHET P 21 R/W STEP LAMP CONT 22 - - 23 Y Annolational 24 - - 25 W BANCERVILISE 26 V CAN-L 27 L CAN-L 28 L CAN-L 29 V BANCERVILISE 26 V RANCERVILISE 27 NG BANCERVILISE 28 L STATTER RELAVOUT 29 W BANCERVILISE 20 W BANCERVILISE 28 L CAN-L 29 W BANCERVILISE 21 C CAN-L 28 V BANCERVILISE 29 W BANCERVILISE 21 C CAN-L 28 V BANCERERVILING	12		GND RF A/L	54	WL	PW UART			
No. R-HIT P SHIT P S 21 R.W STEPLAMP CONT 57 - - 22 - - - - - 24 V ATEN-ONIN 57 - - - 24 - - - - - - - 24 - - - - - - - 24 - - - - - - - 26 V BANCENTINPINIUT 60 L RAN-L - - - 27 V BANCENTINPINIUT 61 V RAN-L - - - - 28 - L STATTER PELVOUT -	18	>	SECURITY INDICATOR	55	W/B	L&R SENSOR K-LINE			
21 R/W STEPLAMP CONT 57 - - 22 - - - 5 5 - - 23 Y ARCONSW - 5 5 CAN-L 24 - - - 5 CAN-L 26 W BRAKE SW FUSE 6 L CAN-L 26 W BRAKE SW FUSE 6 N CAN-L 27 R/G BRAKE SW FUSE 6 N STATER RELAY OUT 27 R/G BRAKE SW LAMP 6 P DUZZER OUT 28 V BLOWER FAN SW 6 P DUZZER OUT 29 V BLOWER FAN SW 6 N BLOWER FAN OUT 30 P DEDOGROCK STATUS 6 M BLOWER FAN RELAY OUT 31 L M BLOWER FAN SW 6 M BLOWER FAN OUT 33 L M BLOWER FAN OUT 6 M	502	æ	SHIFT P	56	'	1			
22 - - - - - 23 Y AIRON SW 60 L C.M.L. 24 - - - - C.M.L. 26 L SHORT IN PIN INVIT 60 L C.M.H. 26 L SHORT IN PIN INVIT 62 W RTARTER RELAY OUT 27 R/G BRAKESW LIMP 62 W RATER RELAY OUT 28 - BLOWER FAN SW 62 W BLOWER FAN SW 30 P BLOWER FAN SW 63 - BLOWER FAN SW 31 - - - - - - 31 - BLOWER FAN SW 66 W BLOWER FAN SW - 32 Y REAND FORCIER SW - - - - 33 - - - - - - - - 34 - - - - -	21	RW	STEP LAMP CONT	57	'	I			
21 Y AIRCON SW 000 F Devel 24 - - - - - - 28 IL SHORTINPININUT 67 O REAM DEFOGGER RELAY OUT 26 IL SHORTINPININUT 62 W STATTER RELAY OUT 28 L SHORTINPININUT 62 W BIZZER OUT 28 L SHORTINPININUT 62 W BIZZER OUT 28 L STATTER RELAY OUT 62 L BIZZER OUT 29 V BLOWER FANISE 62 W BIZZER OUT 29 V BLOWER FANISE 63 L BIZZER OUT 21 L BILONER FANISE 63 W BIZZER OUT 21 L BILONER FANISE 63 W BIZZER OUT 23 L M BILONER FANISE 63 W BIZZER OUT 23 L M BILONER FANISE 63	22	1	-	28	· (-			
24 -	23	>	AIRCON SW	09		CAN-L CAN-H			
25 W STARTER RELAY OUT 26 L BAAGE SWI LANE 27 FL0 BAAGE SWI LANE 28 L STARTER RELAY OUT 28 L E 29 W BLOWER FALANSW 20 P E 29 W BLOWER FALANSW 30 P DELODORIC STATUS 31 - - 32 Y RELAR DELOCK STATUS 33 - - 34 - M. 35 FVG RELAR DELOCGER SW 36 FVG RELECE RELAY OUT 37 - - 38 FVG RELOCER SW 36 M/B ALONIC T 37 - - 38 FVG REVERSE SW 39 - - 31 - - 32 - - 34 - -	24	'	I	61	0	REAR DEFOGGER RELAY OUT			
2B L BIOLINET NUMUUT CS - - 21 R/G BRAKESW LAMP G4 P BUZER OUT 28 - BLOWEF FAUSSW G4 P BUZER OUT 29 W BLOWEF FAUSSW G6 W BLOWEF FAUSSW 30 P DRDOOLOCK STATUS G6 W BLOWEF FAUSSW 31 P DRDOOLOCK STATUS G6 W BLOWEF FAUSOUT 31 P DRDOOLOCK STATUS G7 G IM ROUTPUT 32 Y REAR DEFOGGER SW G6 V BROUT 2 33 - ME SUPPE COUT G IM ROUTPUT 34 - ME SUPPE COUT 70 P 35 F/G REVERSESW 71 O DAR USCENT 36 M/G HZARD SW 71 O DAR USCENT 36 M/G READES SW 71 O DAR USCENT 37 -	25	≥ .	BRAKE SW FUSE	62	>	STARTER RELAY OUT			
Zi Wod BHONE SYLMMY G4 P BUZZER OUT Zi - - - - - Zi Y BLOWER FAN SW 66 - BLOWER FAN SW - 30 P DR DOOR LOCK STATUS 66 W BLOWER FAN SW - 31 - - - - - - 31 - - - BROUTPUT - - 32 Y REAN DEFOGGER SW 69 AR AT DEVICE OUT - 33 - - - - - - - 34 - - - - - - - - 35 R/G R/G AT DEVICE OUT - - - - - - 34 - - - - - - - - - - - - - -	8			63	1	1			
20 W BLOWER FAN SW 66 ~ ~ 30 P DR DOOR LOCK STATUS 66 W BLOWER FAN SW 31 - - - - BLOWER FAN SW 31 - - - - BLOWER FAN SW 32 Y READ EFCOGER SW 68 L MR OUTPUT 33 - - - - MR OUTPUT 34 - - - - - 34 - - - - - - 34 - - - - - - - 34 - - - - - - - - 35 K/G P - - - - - - - 36 W/G P P - - - - - - - - 37	17. B6		BHAKE SW LAMP	64	٩	BUZZER OUT			
30 P DRDOOR LOCK STATUS 66 W BLOWER FAN RELAY OUT 31 - - - - - 66 V IGN LECERAY OUT 2 66 ICN -	29	3	BLOWER FAN SW	65	1				
31 -	30	٩	DR DOOR LOCK STATUS	99	> (BLOWER FAN RELAY OUT			
32 Y REAR DEFOGGER SW 68 L MH OUT OUT 33 - - - - - 34 - - - - - 35 R/G REVERSE SW 70 P IGN USM OUT 1 36 W/B HAZARD SW 71 O DA REQUEST SW 37 - - - - - 37 - - - - - 36 M/B HAZARD SW 73 - G AS REQUEST SW	31	1	1	/9		IGN ELEC RELAY OUL 2			
33 -	32	>	REAR DEFOGGER SW	89 09					
34 - 71 0 D REQUESTSW 35 RvG Reversesw 71 0 D REQUESTSW 36 W/B HAZARDSW 72 G AS REQUESTSW 37 - - - - - 36 W/B HAZARDSW 73 - - 73 - - - - - 74 - - - - -	33	ı	1	202	2 4	IGN USM OUT 1			
35 R/G REVERSISW 72 G AS REQUEST SW 36 W/B HAZARD SW 72 G AS REQUEST SW 37 - - - - - 37 - - - - - 36 W/B HAZARD SW 73 - -	34	'		2	. 0	DR REQUEST SW			
36 W/B HAAADSW 73	35	R/G	REVERSE SW	72	σ	AS REQUEST SW			
	36	W/B	HAZARD SW	73	-	-			
	; @	'	 	74	1	1			

< WIRING DIAGRAM >

M60	FUSE BLOCK (J/B)	NS06FW-CS	WHITE			2T 1 1T		16 14 16 10			of Signal Name		BATTERY	RR DEF RLY	BATTERY	1	1	M64	INTAKE SENSOR	C02FW	WHITE			0	1 2			of Signal Name	INTAKE SENS	SENS GND												
Connector No.	Connector Name	Connector Type	Connector Color			H.S.					Terminal Color o		2T SB	3T R	4T G	5T -	6T –	Connector No.	Connector Name	Connector Type	Connector Color	E		Ъ.П.				Terminal Color o No. Wire	-	2 R												
TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE POOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS		44	RONT BLOWER MOTOR	02FW-LC	HITE			-				Signal Name	IGNITION	FAN SPEED CONT										
<u>ا</u>	· @		н	-	_	×	B/B	> 0	5 0	۰ J	٩	٨٧	њ (m (5 œ	8	W/B	R R		40, N	Vame FI	lype M	Color W						3	Color of Wire	N	ΓW										
202	806	81G	82G	83G	84G	85G	86G	87G	500	506	91G	92G	93G	94G 06G	506	97G	98G	99G 100G		Connector	Connector	Connector	Connector (Æ		0 L			- Hereitand	No.	-	2										
	27G LG TO FNGINE ROOM HARNESS	28G G/B TO ENGINE ROOM HARNESS	29G G/B TO ENGINE ROOM HARNESS	30G BR/Y TO ENGINE ROOM HARNESS	31G R TO ENGINE ROOM HARNESS	32G R TO ENGINE ROOM HARNESS	33G Y/L TO ENGINE ROOM HARNESS	34G GR TO ENGINE ROOM HARNESS		37G R/W TO ENGINE ROOM HARNESS	38G BR TO ENGINE ROOM HARNESS	39G BR TO ENGINE ROOM HARNESS	40G - TO ENGINE ROOM HARNESS	41G HVG IO ENGINE HOOM HARNESS	42G G TO ENGINE ROOM HARNESS	44G R/Y TO ENGINE ROOM HARNESS	45G G TO ENGINE ROOM HARNESS	46G LG TO ENGINE ROOM HARNESS 47G R TO FINGINE ROOM HARNESS	48G W TO ENGINE ROOM HARNESS	49G – TO ENGINE ROOM HARNESS	50G BR TO ENGINE ROOM HARNESS	52G L TO ENGINE ROOM HARNESS	53G W TO ENGINE ROOM HARNESS	54G W TO ENGINE ROOM HARNESS	55G G TO ENGINE ROOM HARNESS	57G Y TO ENGINE ROOM HARNESS	58G BG TO ENGINE ROOM HARNESS	59G BG TO ENGINE ROOM HARNESS 60G BG TO ENGINE ROOM HARNESS	61G 0 TO ENGINE ROOM HARNESS	62G W TO ENGINE ROOM HARNESS	63G O TO ENGINE ROOM HARNESS	65G W/R TO ENGINE ROOM HARNESS	66G BG TO ENGINE ROOM HARNESS	67G O TO ENGINE ROOM HARNESS 68G R TO ENGINE ROOM HARNESS	69G Y TO ENGINE ROOM HARNESS	70G L TO ENGINE ROOM HARNESS	71G R/W TO ENGINE ROOM HARNESS	72G L/W TO ENGINE ROOM HARNESS 73G SHIELD TO ENGINE ROOM HARNESS	74G W TO ENGINE ROOM HARNESS	75G R TO ENGINE ROOM HARNESS	76G H/G TO ENGINE POOM HARNESS	
M31	WIRE TO WIRE	TH80FW-CS16-TM4	WHITE				1G 2G 3G 4G 5G	6G 7G 8G 9G 10G	16/126/136/146/156/166/176/186/196/206/216	226236246256276286276286296306	16320330346356380376380396406416	42G43G44G45G46G47G48G49G50G	165265365465565665765865996616	ezelesedetebole besele / selelesele / us	1G72G73G74G75G76G77G78G79G80G81G 300 800 800 800 800 800 800 800 800		91G 92G 93G 94G 95G	nni lass assa			Signal Name	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HAHNESS TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS TO ENGINE ROOM HARNESS	(WITH CUMMINS 5.0L)	TO ENGINE ROOM HARNESS - (WITH VK56VD)	TO ENGINE ROOM HARNESS	TO ENGINE ROOM HARNESS					
or No.	or Name	or Type	or Color																		Color of	MILE	B/B	>	BRW	BW	7	ت ¤	< ≥	R/G	W/B	HB //B	G/W	ۍ ت	o ke	~	GY	R∧ B∧	5	G∕	Y/R	G/B
nnecte	onnecto	onnecte	onnecte	Æ		H.S.															Termina	2 2 2	2G	36	4 4	9	7G	8 8	100	11G	12G	13G	15G	16G	1/6	196	20G	21G	2	22G	23G	24G

Revision: March 2016

< WIRING DIAGRAM >

[MANUAL AIR CONDITIONER]

HAC

А

В

С

D

Е

F

G

Н

J

Κ

Μ

Ν

Ο

Ρ

L



< WIRING DIAGRAM >
BASIC INSPECTION DIAGNOSIS AND REPAIR WORKFLOW

Work Flow

INFOID:000000012923315

А

OVERALL SEQUENCE



ALAIA0158GB

DETAILED FLOW

HAC-181

< BASIC INSPECTION >

1.GET INFORMATION FOR SYMPTOM

- 1. Get detailed information from the customer about the symptom (the condition and the environment when the incident/malfunction occurs).
- 2. Check operation condition of the function that is malfunctioning.

>> GO TO 2.

2.CHECK DTC

- 1. Check DTC.
- 2. Perform the following procedure if DTC is detected:
- Record DTC and freeze frame data (Print them out using CONSULT.)
- Erase DTC.
- Study the relationship between the cause detected by DTC and the symptom described by the customer.
- 3. Check related service bulletins for information.

Are any symptoms described and any DTC detected?

Symptom is described, DTC is detected>>GO TO 3. Symptom is described, DTC is not detected>>GO TO 4. Symptom is not described, DTC is detected>>GO TO 5.

3.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer. Also study the normal operation and fail-safe related to the symptom. Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 5.

4.CONFIRM THE SYMPTOM

Try to confirm the symptom described by the customer. Verify relation between the symptom and the condition when the symptom is detected.

>> GO TO 6.

5.PERFORM DTC CONFIRMATION PROCEDURE

Perform DTC CONFIRMATION PROCEDURE for the detected DTC and then check that DTC is detected again. At this time, always connect CONSULT to the vehicle, and check self diagnostic results in real time. If two or more DTCs are detected, refer to DTC INSPECTION PRIORITY CHART, and determine trouble diagnosis order.

NOTE:

- · Freeze frame data is useful if the DTC is not detected.
- Perform Component Function Check if DTC CONFIRMATION PROCEDURE is not included in Service Manual. This simplified check procedure is an effective alternative though DTC cannot be detected during this check.

If the result of Component Function Check is NG, it is the same as the detection of DTC by DTC CONFIR-MATION PROCEDURE.

Is DTC detected?

YES >> GO TO 7.

NO >> Check according to <u>GI-43. "Intermittent Incident"</u>.

6. DETECT MALFUNCTIONING SYSTEM BY SYMPTOM DIAGNOSIS

Detect malfunctioning system according to SYMPTOM DIAGNOSIS based on the confirmed symptom in step 4, and determine the trouble diagnosis order based on possible causes and symptom.

Is the symptom described?

- YES >> GO TO 7.
- NO >> Monitor input data from related sensors or check voltage of related module terminals using CON-SULT.

1.DETECT MALFUNCTIONING PART BY DIAGNOSIS PROCEDURE

DIAGNOSIS AND REPAIR WORKFLOW

Inspect according to Diagnosis Procedure of the system. Is malfunctioning part detected? A YES >> GO TO 8. NO >> Check according to GI-43, "Intermittent Incident". 8.REPAIR OR REPLACE THE MALFUNCTIONING PART B 1. Repair or replace the malfunctioning part. C 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement. C 3. Check DTC. If DTC is detected, erase it. >> GO TO 9. 9.FINAL CHECK C
Is malfunctioning part detected? A YES >> GO TO 8. NO >> Check according to GI-43. "Intermittent Incident". 8. REPAIR OR REPLACE THE MALFUNCTIONING PART Image: Comparison of the c
YES >> GO TO 8. NO >> Check according to <u>GI-43. "Intermittent Incident"</u> . 8.REPAIR OR REPLACE THE MALFUNCTIONING PART 1. Repair or replace the malfunctioning part. 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replace- ment. 3. Check DTC. If DTC is detected, erase it. >> GO TO 9. 9.FINAL CHECK
NO >> Check according to GI-43. "Intermittent Incident". 8. REPAIR OR REPLACE THE MALFUNCTIONING PART Image: Comparison of the malfunctioning part. 1. Repair or replace the malfunctioning part. Image: Comparison of the malfunction
 8.REPAIR OR REPLACE THE MALFUNCTIONING PART 1. Repair or replace the malfunctioning part. 2. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement. 3. Check DTC. If DTC is detected, erase it. > GO TO 9. 9.FINAL CHECK
 Repair or replace the malfunctioning part. Reconnect parts or connectors disconnected during Diagnosis Procedure again after repair and replacement. Check DTC. If DTC is detected, erase it. > GO TO 9. 9.FINAL CHECK
3. Check DTC. If DTC is detected, erase it. >> GO TO 9. 9.FINAL CHECK
>> GO TO 9. 9.FINAL CHECK
9.FINAL CHECK
When DTC is detected in step 2, perform DTC CONFIRMATION PROCEDURE again, then check that the
malfunction is repaired.
symptom is not detected.
Is DTC detected and does symptom remain?
YES-1 >> DTC is detected: GO TO 7.
YES-2 >> Symptom remains: GO TO 4.
NO >> Before returning the vehicle to the customer, always erase DTC.

Н

HAC

J

Κ

L

M

Ν

0

Ρ

< BASIC INSPECTION >

OPERATION INSPECTION

Work Procedure

INFOID:000000012923316

[MANUAL AIR CONDITIONER]

DESCRIPTION

The purpose of the operational check is to check that the individual system operates normally.

Check condition : Engine running at normal operating temperature.

- Check condition : Blower control dial in OFF position.
- Check condition : REC off (LED extinguished).
- Check condition : VENT selected (LED illuminated).

Check condition : DEF off (LED extinguished).

OPERATION INSPECTION

1.CHECK BLOWER

- 1. Rotate the blower control dial clockwise one detent. Blower should operate on low speed.
- 2. Rotate the blower control dial one detent at a time, and continue checking blower speed until all speeds are checked.
- 3. Leave blower on maximum speed.

Is the test result normal?

YES >> GO TO 2.

NO >> Refer to <u>HAC-210, "Diagnosis Procedure"</u>.

2.check a/c switch led

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

Is the test result normal?

YES >> GO TO 3.

NO >> Refer to <u>HAC-202</u>, "FRONT A/C CONTROL : Diagnosis Procedure".

3.CHECK A/C SWITCH

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

Is the test result normal?

YES >> GO TO 4.

NO >> Refer to <u>HAC-214</u>, "Diagnosis Procedure".

4.CHECK FRONT AIR CONTROL MODE LEDS

- 1. Press D/F (🐲), FOOT (🤳), B/L (💙), VENT (🍞), MAX A/C, and DEF (👾).
- 2. Each button indicator should illuminate.

Is the test result normal?

YES >> GO TO 5.

NO >> Refer to <u>HAC-202</u>, "FRONT A/C CONTROL : Diagnosis Procedure".

5.CHECK DISCHARGE AIR

- 1. Press D/F (𝒱), FOOT (♫), B/L (ℑ), VENT (ℑ) and DEF (∰).
- 2. Confirm that discharge air comes out according to the air distribution table. Refer to <u>HAC-145</u>, "Door Control".

Is the test result normal?

YES >> GO TO 6.

NO >> Refer to <u>HAC-221, "Symptom Table"</u>.

6.CHECK REC LED

- 1. Press DEF () and make sure LED is off.
- 2. Make sure VENT (*) or B/L (*) is selected.
- 3. Press REC (

OPERATION INSPECTION

< BASIC INSPECTION >	[MANUAL AIR CONDITIONER]
4. Press REC (ould go off.
Is the test result normal?	A
YES >> GO TO 7.	
NO >> Refer to <u>HAC-202, "FRONT A/C CONTROL : Diagn</u>	osis Procedure".
<i>I</i> .CHECK INTAKE DOOR OPERATION	В
1. Press REC (luminate.
2. Listen to the sound of the air coming out of the vent.	C
3. Press REC (ould go off.
4. There should be an addible change to the sound of the all h	
	D
NO >> Refer to HAC-207 "Diagnosis Procedure"	
8. CHECK TEMPERATURE DECREASE	E
 Press A/C switch. Rotate temperature control dial counterclockwise until maxim 	num cold.
3. Check for cold air at selected discharge air outlets.	F
Is the test result normal?	
YES >> GO IO 9.	
	G
9. CHECK TEMPERATURE INCREASE	
 Rotate temperature control dial clockwise until maximum ho Check for hot air at appropriate discharge air outlets. 	t. H
Is the test result normal?	
YES >> Inspection End.	НА
NO >> Refer to <u>HAC-225, "Diagnosis Procedure"</u> .	
	J

Κ

L

M

Ν

Ο

Ρ

CONFIGURATION (HVAC)

INFOID:000000013444970

Work Procedure

NOTE:

• Use "Manual Configuration".

• If an error occurs during configuration, start over from the beginning.

1.CHECK DATA PART NO. (TYPE ID)

1. Use FAST (service parts catalog) to search front air control "DATA PART NO. (TYPE ID)".

2. Write down "DATA PART NO. (TYPE ID)".

>> GO TO 2.

2.WRITE CONFIGURATION

CONSULT Configuration

1. Select "Manual Configuration" of "HVAC".

2. Select the "DATA PART NO. (TYPE ID)" found using FAST (service parts catalog) to write the "DATA PART NO. (TYPE ID)" into the front air control.

>> GO TO 3.

3.VERIFY DATA PART NO. (TYPE ID)

Compare the "DATA PART NO. (TYPE ID)" written into the front air control with the one found using FAST (service parts catalog) to confirm they match.

Do DATA PART NOs match?

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

4.PERFORM SUPPLEMENTARY WORK

1. Perform self-diagnosis of all systems.

2. Erase self-diagnosis results.

>> GO TO 5.

5.OPERATION CHECK

Confirm that each function controlled by front air control operates normally.

>> Work End.

DTC/CIRCUIT DIAGNOSIS

U1000 CAN COMM CIRCUIT

DTC Description

INFOID:000000012938110

А

Е

CAN (Controller Area Network) is a serial communication system for real time application. It is an on-vehicle multiplex communication system with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto vehicles, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with two communication lines (CAN-H line, CAN-L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only. Refer to LAN-70, "CAN COMMUNICATION SYSTEM : CAN Communication Signal Chart".

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)		DTC detection condition	•
		Diagnosis condition	When ignition switch is ON.	F
114000	CAN COMM CIRCUIT	Signal (terminal)		-
U1000	(CAN COMM CIRCUIT)	Threshold	-	-
		Diagnosis delay time	2 seconds or more	G
POSSIBLE CAN commu FAIL-SAFE	CAUSE inication system			Н
— DTC CONF	IRMATION PROCEDURE			HA
1.PERFOR	M SELF-DIAGNOSIS			
 CONSULT 1. Turn ign 2. Perform 3. Check E 	Γ ition switch ON and wait for 2 "Self Diagnostic Result" mode DTC.	seconds or more. e of "HVAC".		- J K
Is DTC dete	cted?			
YES >> NO >>	Refer to <u>HAC-187, "Diagnosis</u> Refer to <u>GI-43, "Intermittent In</u>	<u>Procedure"</u> . <u>icident"</u> .		L
Diagnosis	Procedure		INFOID:00000001293811:	1
1. СНЕСК С	CAN COMMUNICATION SYST	ГЕМ		M
Check CAN	communication system. Refer	to LAN-51, "Trouble Di	agnosis Flow Chart".	-
>>	Inspection End.		-	Ν
				0

Ρ

< DTC/CIRCUIT DIAGNOSIS >

U1010 CONTROL UNIT (CAN) FRONT A/C CONTROL

FRONT A/C CONTROL : DTC Description

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
	CONTROL UNIT (CAN) [CONTROL UNIT (CAN)]	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
		Threshold	-
		Diagnosis delay time	-

POSSIBLE CAUSE

Front air control

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM SELF-DIAGNOSIS

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

YES >> Refer to HAC-188, "FRONT A/C CONTROL : Diagnosis Procedure".

NO >> Inspection End.

FRONT A/C CONTROL : Diagnosis Procedure

1.REPLACE FRONT AIR CONTROL

Replace front air control. Refer to HAC-229, "Removal and Installation".

>> Inspection End. PTC HEATER CONTROL UNIT

PTC HEATER CONTROL UNIT : DTC Description

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
U1010 CONTROL UNIT (CAN) [CONTROL UNIT (CAN)]		Diagnosis condition	When ignition switch is ON.
	CONTROL UNIT (CAN) [CONTROL UNIT (CAN)]	Signal (terminal)	-
		Threshold	-
		Diagnosis delay time	_

POSSIBLE CAUSE PTC heater control

FAIL-SAFE

INFOID:000000012938112

INFOID:000000013133585

INFOID:000000012938113

U1010 CONTROL UNIT (CAN)

< DTC/CIRCUIT DIAGNOSIS >	[MANUAL AIR CONDITIONER]	
DTC CONFIRMATION PROCEDURE		
1.PERFORM SELF-DIAGNOSIS		А
CONSULT 1. Turn ignition switch ON. 2. Perform "Self Diagnostic Result" mode of "HVAC". 3. Check DTC		В
Is DTC detected?		0
YES >> Refer to <u>HAC-189</u> , "PTC HEATER CONTROL UNIT : Diagnos NO >> Inspection End.	s Procedure".	C
PTC HEATER CONTROL UNIT : Diagnosis Procedure	INFOID:000000013133586	D
1. REPLACE PTC HEATER CONTROL		
Replace PTC heater control.		Е
>> Inspection End.		F
		G
		Н
	ł	HA(
		J
		K
		L
		M
		Ν
		0
		Ρ

< DTC/CIRCUIT DIAGNOSIS >

B257B, B257C AMBIENT SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to <u>HAC-187, "DTC Description"</u>.
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to <u>HAC-188</u>, "FRONT A/C CONTROL : <u>DTC Description</u>".

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
B257B	AMBIENT SENSOR (SHORT) (Ambient sensor)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
		Threshold	More than 100°C (212°F)
		Diagnosis delay time	-
B257C	AMBIENT SENSOR (OPEN) (Ambient sensor)	Diagnosis condition	When ignition switch is ON.
		Signal (terminal)	-
		Threshold	Less than -42°C (-44°F)
		Diagnosis delay time	-

POSSIBLE CAUSE

- Ambient sensor
- PTC heater control
- Harness or connectors (The sensor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

YES >> Refer to <u>HAC-190, "Diagnosis Procedure"</u>. NO >> Inspection End.

Diagnosis Procedure

INFOID:000000012938115

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1.CHECK AMBIENT SENSOR POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect ambient sensor connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between ambient sensor harness connector and ground.

INFOID:000000012938114

B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

	+			Voltage
Ambier	nt sensor	_		(Approx.)
Connector	Terminal			
E75	2	Grou	nd	5 V
YES >> GO T NO >> GO T 2.CHECK AMBIE 1. Turn ignition s 2. Check continu Ambier Connector E75 s the inspection r YES >> GO T NO >> Repa 3.CHECK AMBIE Check ambient sets s the inspection r YES >> Repla NO >> Repla	O 2. O 4. ENT SENSOR GRO switch OFF. uity between ambie nt sensor Terminal 1 esult normal? O 3. ir harness or conne ENT SENSOR ensor. Refer to <u>HAC</u> esult normal? ace PTC heater con ace ambient sensor	DUND CIRCUIT nt sensor harness c 	connector and grour	nd. Continuity Yes
NO >> Repla	ice ambient sensor	Refer to HAC-230.		
4. CHECK AMBIE 1. Turn ignition s 2. Disconnect P	ENT SENSOR POV switch OFF. TC heater control c	VER SUPPLY CIRC	UIT FOR OPEN	allation".
4.CHECK AMBIE 1. Turn ignition s 2. Disconnect P 3. Check contine	ENT SENSOR POV switch OFF. TC heater control c uity between ambie	VER SUPPLY CIRC onnector. nt sensor harness c	CONNECTOR OPEN	heater control harness con
4.CHECK AMBIE 1. Turn ignition s 2. Disconnect P 3. Check contine Ambier	ENT SENSOR POV switch OFF. TC heater control c uity between ambie	VER SUPPLY CIRC onnector. nt sensor harness of PTC heater	Connector and PTC	heater control harness con
4.CHECK AMBIE 1. Turn ignition s 2. Disconnect P 3. Check continu Ambier Connector	ENT SENSOR POV switch OFF. TC heater control c uity between ambie nt sensor Terminal	VER SUPPLY CIRC onnector. nt sensor harness o PTC heater Connector	CONNECTOR OPEN	heater control harness con Continuity
4.CHECK AMBIE 1. Turn ignition s 2. Disconnect P 3. Check continu Ambier Connector E75 Is the inspection r	ENT SENSOR POV switch OFF. TC heater control c uity between ambie nt sensor Terminal 2 esult normal?	VER SUPPLY CIRC onnector. nt sensor harness of PTC heater Connector M131	Connector and PTC	heater control harness con Continuity Yes
 CHECK AMBIE Turn ignition s Disconnect P Check continu Ambier Connector E75 Is the inspection r YES >> GO T NO >> Repa CHECK AMBIE Check continuity b 	ENT SENSOR POV switch OFF. TC heater control c uity between ambie nt sensor Terminal 2 esult normal? O 5. ir harness or conne ENT SENSOR POV between ambient se	VER SUPPLY CIRC onnector. nt sensor harness of PTC heater Connector M131 ctor. VER SUPPLY CIRC ensor harness conn	Connector and PTC Connector and PTC Control Terminal 12 CUIT FOR GROUNE ector and ground.	heater control harness con Continuity Yes
 CHECK AMBIE Turn ignition s Disconnect P Check continu Ambier Connector E75 Is the inspection r YES >> GO T NO >> Repa CHECK AMBIE Check continuity to the continu	ENT SENSOR POV switch OFF. TC heater control c uity between ambie at sensor Terminal 2 esult normal? O 5. ir harness or conne ENT SENSOR POV between ambient se	VER SUPPLY CIRC onnector. nt sensor harness of PTC heater Connector M131 ctor. VER SUPPLY CIRC ensor harness conn	Connector and PTC Connector and PTC Control Terminal 12 CUIT FOR GROUNE Ector and ground.	heater control harness con Continuity Yes O SHORT
4.CHECK AMBIE 1. Turn ignition s 2. Disconnect P 3. Check continu- Ambier Connector E75 Is the inspection r YES $>>$ GO T NO $>>$ Repa 5.CHECK AMBIE Check continuity B Ambier Connector	ENT SENSOR POV switch OFF. TC heater control c uity between ambie nt sensor Terminal 2 esult normal? O 5. ir harness or conne ENT SENSOR POV between ambient sent sensor Terminal	VER SUPPLY CIRC onnector. nt sensor harness of PTC heater Connector M131 ctor. VER SUPPLY CIRC ensor harness conn	Connector and PTC Connector and PTC Control Terminal 12 CUIT FOR GROUNE ector and ground.	heater control harness con Continuity Yes O SHORT Continuity
4.CHECK AMBIE Turn ignition s Disconnect P Check continu Ambier Connector E75 s the inspection r YES >> GO T NO >> Repa CHECK AMBIE Check continuity to the content of the connector E75 	ENT SENSOR POV switch OFF. TC heater control c uity between ambie at sensor Terminal 2 esult normal? O 5. ir harness or conne ENT SENSOR POV between ambient sensor Terminal 2	VER SUPPLY CIRC onnector. nt sensor harness c PTC heater Connector M131 ctor. VER SUPPLY CIRC ensor harness conn Grout	Connector and PTC Connector and PTC Control Terminal 12 CUIT FOR GROUNE ector and ground.	heater control harness cont Continuity Yes O SHORT Continuity No

B257B, B257C AMBIENT SENSOR

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000012938116

+ Ambient sensor		_	Voltage (Approx.)
Connector	Terminal		
E75	2	Ground	0 V

Is the inspection result normal?

YES >> Replace PTC heater control.

NO >> Repair harness or connector.

Component Inspection

1.CHECK AMBIENT SENSOR

1. Turn ignition switch OFF.

2. Disconnect ambient sensor connector.

3. Check resistance between ambient sensor terminals.

Tor	minal	Condition	Posistance: kO		
Terrinidi		Temperature: °C (°F)	Resistance. NS2		
		-15 (5)	12.73		
		-10 (14)	9.92		
		-5 (23)	7.80		
		0 (32)	6.19		
	1 2	5 (41)	4.95		
			10 (50)	10 (50)	3.99
1		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		

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace ambient sensor. Refer to <u>HAC-230. "Removal and Installation"</u>.

< DTC/CIRCUIT DIAGNOSIS >

B2581, B2582 INTAKE SENSOR

DTC Description

DTC DETECTION LOGIC

NOTE:

- If DTC is displayed along with DTC U1000, first perform the trouble diagnosis for DTC U1000. Refer to <u>HAC-</u><u>187, "DTC Description"</u>.
- If DTC is displayed along with DTC U1010, first perform the trouble diagnosis for DTC U1010. Refer to <u>HAC-188</u>, "FRONT A/C CONTROL : <u>DTC Description</u>".

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC o	letection condition	D
		Diagnosis condition	When ignition switch is ON.	_
D0501	INTAKE SENSOR (SHORT)	Signal (terminal)	-	E
D2001	(Intake sensor)	Threshold	More than 100°C (212°F)	_
	Diagnosis delay time	-	F	
B2582 INTAKE SENSOR (OPEN) (Intake sensor)	Diagnosis condition	When ignition switch is ON.		
	Signal (terminal)	-		
	Threshold	Less than -42°C (-44°F)	G	
	Diagnosis delay time	-		

POSSIBLE CAUSE

- Intake sensor
- Front air control
- · Harness or connectors (The sensor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE **1.**PERFORM DTC CONFIRMATION PROCEDURE Turn ignition switch ON. 1. Perform "Self Diagnostic Result" mode of "HVAC". 2. Check DTC. 3. Is DTC detected? YES >> Refer to HAC-193, "Diagnosis Procedure". >> Inspection End. NO Diagnosis Procedure INFOID:000000013123239

Regarding Wiring Diagram information, refer to <u>HAC-163, "CUMMINS 5.0L : Wiring Diagram"</u> or <u>HAC-172,</u> <u>"VK56VD : Wiring Diagram"</u>.

1. CHECK INTAKE SENSOR POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect intake sensor connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between intake sensor harness connector and ground.

А

В

HAC

Κ

Μ

Ν

Ο

Ρ

Н

B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

	+		Voltage (Approx.)
Intake	sensor	_	
Connector	Terminal		
M64	1	Ground	5 V

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 4.

2. CHECK INTAKE SENSOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between intake sensor harness connector and ground.

Intake	sensor		Continuity
Connector	Terminal		
M64	2	Ground	Yes

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

 $\mathbf{3}.$ CHECK INTAKE SENSOR

Check intake sensor. Refer to HAC-195. "Component Inspection".

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Replace intake sensor. Refer to <u>HAC-231. "Removal and Installation"</u>.

4.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect front air control connector.

3. Check continuity between intake sensor harness connector and front air control harness connector.

Intake sensor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M64	1	M132	22	Yes

Is the inspection result normal?

YES >> GO TO 5.

NO >> Repair harness or connector.

5.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR GROUND SHORT

Check continuity between intake sensor harness connector and ground.

Intake	sensor		Continuity
Connector	Terminal		Continuity
M64	1	Ground	No

Is the inspection result normal?

YES >> GO TO 6.

NO >> Repair harness or connector.

6.CHECK INTAKE SENSOR POWER SUPPLY CIRCUIT FOR POWER SHORT

1. Turn ignition switch ON.

2. Check voltage between intake sensor harness connector and ground.

B2581, B2582 INTAKE SENSOR

< DTC/CIRCUIT DIAGNOSIS >

Intake s Connector M64 Is the inspection res YES >> Replac NO >> Repair Component Ins 1.CHECK INTAKE 1. Turn ignition sw 2. Disconnect inta 3. Check resistand Terminal	Terminal 1 Sult normal? e front air control. Refer to H harness or connector. pection SENSOR vitch OFF. ke sensor connector. ce between intake sensor tel Condition Temperature: °C (°F)	GroundAC-229, "Removal and Insta rminalsResistance: kΩ	(Approx.) 0 V Allation".
Connector M64 Is the inspection res YES >> Replac NO >> Repair Component Ins 1. CHECK INTAKE 1. Turn ignition sw 2. Disconnect inta 3. Check resistant Terminal	Terminal 1 sult normal? e front air control. Refer to H harness or connector. pection SENSOR vitch OFF. ke sensor connector. ce between intake sensor termination Condition Temperature: °C (°F)	Ground AC-229, "Removal and Insta "minals. Resistance: kΩ	0 V allation".
M64 Is the inspection resonance YES >> Replac NO >> Repair Component Ins 1.CHECK INTAKE 1. Turn ignition sw 2. Disconnect inta 3. Check resistant Terminal	1 sult normal? e front air control. Refer to H harness or connector. pection SENSOR vitch OFF. ke sensor connector. ce between intake sensor tel Condition Temperature: °C (°F)	Ground AC-229, "Removal and Insta "minals. Resistance: kΩ	0 V allation".
Is the inspection res YES >> Replac NO >> Repair Component Ins 1.CHECK INTAKE 1. Turn ignition sw 2. Disconnect inta 3. Check resistand Terminal	sult normal? e front air control. Refer to <u>H</u> harness or connector. pection SENSOR vitch OFF. ke sensor connector. ce between intake sensor ter <u>Condition</u> Temperature: °C (°F)	rminals.	allation".
YES >> Replac NO >> Repair Component Ins 1.CHECK INTAKE 1. Turn ignition sw 2. Disconnect inta 3. Check resistant Terminal	e front air control. Refer to <u>H</u> harness or connector. pection SENSOR <i>v</i> itch OFF. ke sensor connector. ce between intake sensor ter <u>Condition</u> Temperature: °C (°F)	rminals. Resistance: kΩ	allation".
CHECK INTAKE . CHECK INTAKE . Turn ignition sw Disconnect inta . Check resistant	SENSOR vitch OFF. ke sensor connector. ce between intake sensor ter Condition Temperature: °C (°F)	rminals. Resistance: kΩ	INFOID:000000013123240
COMPONENT INS .CHECK INTAKE . Turn ignition sw . Disconnect inta . Check resistant Terminal	pection SENSOR vitch OFF. ke sensor connector. ce between intake sensor tel Condition Temperature: °C (°F)	rminals. Resistance: kΩ	INFOID:000000013123240
LCHECK INTAKE Turn ignition sv Disconnect inta Check resistant	SENSOR vitch OFF. ke sensor connector. ce between intake sensor ter Condition Temperature: °C (°F)	rminals. Resistance: kΩ	
Turn ignition sv Disconnect inta Check resistan Terminal	vitch OFF. Ike sensor connector. ce between intake sensor ter Condition Temperature: °C (°F)	rminals. Resistance: kΩ	
 Disconnect inta Check resistan Terminal 	ke sensor connector. ce between intake sensor ter Condition Temperature: °C (°F)	r minals. 	
Terminal	Ce between Intake sensor ter Condition Temperature: °C (°F)	rminals. 	
Terminal	Condition Temperature: °C (°F)	Resistance: kΩ	
Terminal	Temperature: °C (°F)	Resistance: $k\Omega$	
	, ,		
	-15 (5)	17.73	
	-10 (14)	13.46	
	-5 (23)	10.33	
	0 (32)	8.00	
	5 (41)	6.25	
	10 (50)	4.93	
1 2	15 (59)	3.92	
	20 (68)	3.14	
	25 (77)	2.54	
	30 (86)	2.06	
	35 (95)	1.69	
	40 (104)	1.39	
	45 (113)	1.15	
the inspection res	sult normal?		
YES >> Inspect	ion End.		
NO >> Replac	e intake sensor. Refer to <u>HA</u>	C-231, "Removal and Installa	ation".

Ο

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

DTC Description

INFOID:000000013123241

[MANUAL AIR CONDITIONER]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC d	etection condition
		Diagnosis condition	When ignition switch is ON.
Pasaa	DR AIR MIX DOOR MOT (SHORT)	Signal (terminal)	-
B2032	(Driver side air mix door motor)	Threshold	PBR position is 95% or more.
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
B 2633	DR AIR MIX DOOR MOT (OPEN)	Signal (terminal)	-
B2033	(Driver side air mix door motor)	Threshold	PBR position is 5% or less.
		Diagnosis delay time	-

POSSIBLE CAUSE

- Air mix door motor
- Air mix door motor installation condition
- Front air control
- Harness and connector (Air mix door motor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-196</u>, "Diagnosis Procedure".
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000013123242

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1. CHECK AIR MIX DOOR MOTOR COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between air mix door motor harness connector and ground with oscilloscope.

B2632, B2633 AIR MIX DOOR MOTOR (DRIVER SIDE)

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Е

F

Н

Κ

L

Μ

Ν

Ο

Ρ

+				
Air mix do	oor motor	—	Output waveform	
Connector	Terminal			
M230	3	Ground	(V) 15 10 5 0 0 0 0 0 0 0 0 0 0 0 0 0	-
			SJIA1453J	

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INSTALLATION OF AIR MIX DOOR MOTOR

Check air mix door motor is properly installed. Refer to HAC-233, "Exploded View".
a the increasion requilt normally

Is the inspection result normal?

- YES >> Replace air mix door motor. Refer to <u>HAC-234</u>, "<u>AIR MIX DOOR MOTOR</u> : <u>Removal and Installa-</u> <u>tion - Air Mix Door Motor</u>".
- NO >> Repair or replace malfunctioning part.

3. check air mix door motor communication signal circuit

1. Turn ignition switch OFF.

2. Disconnect air mix door motor connector and front air control connector.

3. Check continuity between air mix door motor harness connector and front air control harness connector. HAC

Air mix door motor		Front air control		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	J
M230	3	M132	12	Yes	

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Repair harness or connector.

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR < DTC/CIRCUIT DIAGNOSIS > [MANUAL AIR CONDITIONER]

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

DTC Description

INFOID:000000013123243

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC c	letection condition
		Diagnosis condition	When ignition switch is ON.
DOGOG	DR VENT DOOR FAIL	Signal (terminal)	-
B2030	(DR VENT DOOR FAIL)	Threshold	-
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
B 2637	DR B/L DOOR FAIL	Signal (terminal)	-
D2037	(DR B/L DOOR FAIL)	Threshold	-
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
D 2620	DR D/F1 DOOR FAIL	Signal (terminal)	-
D2030	(DR D/F1 DOOR FAIL)	Threshold	-
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
P 2620	DR DEF DOOR FAIL	Signal (terminal)	-
B2039	(DR DEF DOOR FAIL)	Threshold	-
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
B2654	D/F2 DOOR FAIL	Signal (terminal)	-
B2004	(D/F2 DOOR FAIL)	Threshold	-
		Diagnosis delay time	-
		Diagnosis condition	When ignition switch is ON.
B2655	B/L2 DOOR FAIL	Signal (terminal)	-
D2000	(B/L2 DOOR FAIL)	Threshold	-
		Diagnosis delay time	-

POSSIBLE CAUSE

- Mode door motor
- · Mode door motor control linkage installation condition
- Front air control
- · Harness and connector (Mode door motor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

CONSULT

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-199</u>, "Diagnosis Procedure".
- NO >> Inspection End.

B2636, B2637, B2638, B2639, B2654, B2655 MODE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

Diagnosis Procedure

INFOID:000000013123244

А

В

D

HAC

Κ

L

[MANUAL AIR CONDITIONER]

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1. CHECK MODE DOOR MOTOR COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between mode door motor harness connector and ground with oscilloscope.

+				
Mode doo	or motor	—	Output waveform	_
Connector	Terminal			
M226	3	Ground	(Y) 15 10 5 10 5	F
WZZO	3	Glound	U → ← 20 ms	G
Is the inspection re	sult normal?			Н

NO >> GO TO 3.

2.check installation of mode door motor

Check mode door motor is properly installed. Refer to <u>HAC-233, "Exploded View"</u>.

Is the inspection result normal?

- YES >> Replace mode door motor. Refer to <u>HAC-234</u>, "<u>MODE DOOR MOTOR</u> : <u>Removal and Installa-</u> <u>tion</u>".
- NO >> Repair or replace malfunctioning part.

3.CHECK MODE DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect mode door motor connector and front air control connector.

3. Check continuity between mode door motor harness connector and front air control harness connector.

ľ	Continuity	Front air control		Mode door motor	
	Continuity	Terminal	Connector	Terminal	Connector
	Yes	12	M132	3	M226

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229, "Removal and Installation"</u>.

NO >> Repair harness or connector.

B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

B263D, B263E, B263F INTAKE DOOR MOTOR

DTC Description

INFOID:000000013123245

[MANUAL AIR CONDITIONER]

DTC DETECTION LOGIC

DTC No.	CONSULT screen terms (Trouble diagnosis content)	DTC detection condition		
		Diagnosis condition	When ignition switch is ON.	
Pasan	FRE DOOR FAIL	Signal (terminal)	-	
B203D	(FRE DOOR FAIL)	Threshold	Detected at FRE position	
	Diagnosis delay time	-		
		Diagnosis condition	When ignition switch is ON.	
B263E 20P FRE DOOR FAIL (20P FRE DOOR FAIL)	20P FRE DOOR FAIL (20P FRE DOOR FAIL)	Signal (terminal)	-	
		Threshold	Detected at 20% FRE position	
		Diagnosis delay time	-	
		Diagnosis condition	When ignition switch is ON.	
DOGOE	REC DOOR FAIL	Signal (terminal)	-	
BZUJF	(REC DOOR FAIL)	Threshold	Detected at REC position	
		Diagnosis delay time	-	

POSSIBLE CAUSE

- Intake door motor
- Front air control
- · Harness and connector (Intake door motor circuit is open or shorted.)

FAIL-SAFE

DTC CONFIRMATION PROCEDURE

1.PERFORM DTC CONFIRMATION PROCEDURE

- 1. Turn ignition switch ON.
- 2. Perform "Self Diagnostic Result" mode of "HVAC".
- 3. Check DTC.

Is DTC detected?

- YES >> Refer to <u>HAC-200, "Diagnosis Procedure"</u>.
- NO >> Inspection End.

Diagnosis Procedure

INFOID:000000013123246

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL

- 1. Turn ignition switch ON.
- 2. Check output waveform between intake door motor harness connector and ground with oscilloscope.

B263D, B263E, B263F INTAKE DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Е

F

Н

Κ

L

Μ

Ν

Ο

Ρ

	+			A
	oor motor	—	Output waveform	
Connector	Terminal			В
M227	3	Ground	(V) 15 10 5 10 5 10 10 10 10 10 10 10 10 10 10	C

Is the inspection result normal?

YES >> GO TO 2.

NO >> GO TO 3.

2. CHECK INSTALLATION OF INTAKE DOOR MOTOR

Check intake door motor is properly installed. Refer to HAC-233, "Exploded View".

Is the inspection result normal?

YES >> Replace intake door motor. Refer to <u>HAC-234</u>, "INTAKE DOOR MOTOR : Removal and Installation".

NO >> Repair or replace malfunctioning part.

$\mathbf{3}$. CHECK INTAKE DOOR MOTOR COMMUNICATION SIGNAL CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect intake door motor connector and front air control connector.

3. Check continuity between intake door motor harness connector and front air control harness connector. HAC

Intake do	oor motor	Front air control		Continuity	
Connector	Terminal	Connector	Terminal	Continuity	J
M227	3	M132	12	Yes	

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Repair harness or connector.

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

POWER SUPPLY AND GROUND CIRCUIT FRONT A/C CONTROL

FRONT A/C CONTROL : Component Function Check

1.CHECK OPERATION

- 1. Turn the blower motor dial clockwise and verify the blower speed increases and that one of the LEDs illuminates on the mode switch.
- 2. Press the mode switches and verify that the modes change, the LEDs illuminate, and that air flows from the various vents.
- 3. Turn the temperature control dial and verify the temperature changes at the selected vents.
- 4. Press the DEF and REC buttons and verify air flow changes.

Does it operate normally?

- YES >> Inspection End.
- NO >> Perform trouble diagnosis for the front air control system. Refer to <u>HAC-202, "FRONT A/C CON-</u> <u>TROL : Diagnosis Procedure"</u>.

FRONT A/C CONTROL : Diagnosis Procedure

INFOID:000000012923327

INFOID-000000012923326

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1. CHECK FRONT AIR CONTROL POWER SUPPLY

- 1. Turn ignition switch OFF.
- 2. Disconnect the front air control connector.
- 3. Turn ignition switch ON.
- 4. Check voltage between front air control harness connector and ground.

(+	·)	(-)	Voltage		
Front air	control		Ignition switch position		
Connector	Terminal		OFF	ACC	ON
M132	3	Ground	Battery voltage	Battery voltage	Battery voltage
101132	19	Ground	Approx. 0 V	Approx. 0 V	Battery voltage

Is the inspection result normal?

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

2.CHECK FUSE

Check fuses [No. 14 and 30, located in the fuse block (J/B)].

NOTE:

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> Check harness for open circuit. Repair or replace if necessary.

- NO >> Check harness for short circuit. Repair or replace if necessary.
- $\mathbf{3}$. CHECK FRONT AIR CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.

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

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

ult normal? the front air cor he harness or co MOTOR	Terminal 2 18		
ult normal? the front air cor ne harness or co MOTOR	2 18		Continuity
ult normal? the front air cor ne harness or co MOTOR	18	Ground	Yes
<u>ult normal?</u> the front air cor ne harness or co MOTOR		Ground	100
MOTOR : D	ntrol. Refer to <u>HAC-22</u> onnector. iagnosis Procedu	9, "Removal and Install	lation". INFOID:00000001313373.
iagram informat agram". DOOR MOTOR	ion, refer to <u>HAC-163</u> POWER SUPPLY	<u>. "CUMMINS 5.0L : W</u>	<u>/iring Diagram"</u> or <u>HAC-172</u>
tch ON. etween air mix c	door motor harness co	nnector and ground.	
motor			Voltage
Terminal			(Approx.)
1	Ground	Cround Pattery veltage	
tch OFF. hix door motor co between air mi	onnector. x door motor harness	connector and ground.	
motor	_		Continuity
Terminal			Continuity
2	Ground		Yes
uil normai?			
	iagram informati agram". DOOR MOTOR tch ON. etween air mix of r motor Terminal 1 ult normal? 2. 4. DOOR MOTOR tch OFF. nix door motor co v between air mix r motor Terminal 2	iagram information, refer to HAC-163 agram". DOOR MOTOR POWER SUPPLY tch ON. etween air mix door motor harness co r motor	iagram information, refer to HAC-163. "CUMMINS 5.0L : W agram". DOOR MOTOR POWER SUPPLY tch ON. etween air mix door motor harness connector and ground. r motor — — — — — — — — — — — — — — — — — — —

HAC-203

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Air mix d	oor motor	Front air control		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M228	1	M132	13	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Repair harness or connector.

MODE DOOR MOTOR

MODE DOOR MOTOR : Diagnosis Procedure

INFOID:000000013133734

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1. CHECK MODE DOOR MOTOR POWER SUPPLY

1. Turn ignition switch ON.

2. Check voltage between mode door motor harness connector and ground.

+ Mode door motor			Voltage	
Connector	Terminal		(
M226	1	Ground	Battery voltage	

Is the inspection result normal?

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

NO >> GO 10 4.

2.CHECK MODE DOOR MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect mode door motor connector.

3. Check continuity between mode door motor harness connector and ground.

Mode de	oor motor		Continuity	
Connector	Terminal		Continuity	
M226	2	Ground	Yes	

Is the inspection result normal?

YES >> GO TO 3.

NO >> Repair harness or connector.

3.CHECK INSTALLATION OF MODE DOOR MOTOR CONTROL LINKAGE

Check mode door motor control linkage is properly installed. Refer to HAC-233. "Exploded View".

Is the inspection result normal?

- YES >> Replace mode door motor. Refer to <u>HAC-234</u>, "<u>MODE DOOR MOTOR</u> : <u>Removal and Installa-</u> <u>tion</u>".
- NO >> Repair or replace malfunctioning part.

4.CHECK MODE DOOR MOTOR POWER SUPPLY CIRCUIT

- 2. Disconnect mode door motor connector and front air control connector.
- 3. Check continuity between mode door motor harness connector and front air control harness connector.

^{1.} Turn ignition switch OFF.

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Mode do	oor motor	Front air	- control	A	ŀ
Connector	Terminal	Connector	Terminal	Continuity	
M226	1	M132	13	Yes	
Is the inspection re	esult normal?				L
YES >> Repla NO >> Repair INTAKE DOO	ce front air control r harness or conne R MOTOR	. Refer to <u>HAC-229</u> ector.	. "Removal and Ins	stallation".	(
INTAKE DOOF	R MOTOR : Di	agnosis Proce	dure	INFOID:000000013133735	
Regarding Wiring "VK56VD : Wiring	Diagram informat <u>Diagram"</u> .	ion, refer to <u>HAC-</u>	163, "CUMMINS 5.	<u>0L : Wiring Diagram"</u> or <u>HAC-172.</u>	I
1.CHECK INTAK	E DOOR MOTOR	POWER SUPPLY			
 Turn ignition s Check voltage 	witch ON. between intake d	oor motor harness	connector and grou	und.	(
-	ł			Voltago	
Intake do	por motor			(Approx.)	
Connector	Terminal				
M227	1	Gro	und	Battery voltage	
NO >> GO TO 2.CHECK INTAK 1. Turn ignition s 2. Disconnect int 3. Check continu	D 4. E DOOR MOTOR witch OFF. ake door motor co ity between intake	GROUND CIRCUI	T ss connector and g	round.	ľ
Intake do	por motor			0	
Connector	Terminal	_	-	Continuity	
M227	2	Gro	und	Yes	
Is the inspection re YES >> GO TO NO >> Repair	esult normal? O 3. r harness or conne	ector.			
J. CHECK INSTA	LLATION OF INTA	KE DOOR MOTOR	२		
Check intake door	motor is properly	installed. Refer to <u>I</u>	HAC-233, "Explode	<u>d View"</u> .	
Is the inspection re YES >> Replaction".	esult normal? ce intake door mo	tor. Refer to <u>HAC-2</u>	234. "INTAKE DOC	R MOTOR : Removal and Installa-	(
NO >> Repair	r or replace malfur	nctioning part.			
4.CHECK INTAK	E DOOR MOTOR	POWER SUPPLY	CIRCUIT		
 Turn ignition s Disconnect int Check continut 	witch OFF. ake door motor co ity between intake	onnector and front a door motor harnes	air control connecto ss connector and fr	r. ont air control harness connector.	

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Intake door motor		Front air control		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M227	1	M132	13	Yes

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Repair harness or connector.

PTC HEATER CONTROL UNIT

PTC HEATER CONTROL UNIT : Diagnosis Procedure

INFOID:000000013053689

Regarding Wiring Diagram information, refer to <u>HAC-163, "CUMMINS 5.0L : Wiring Diagram"</u>.

1.CHECK PTC HEATER CONTROL POWER SUPPLY

1. Turn ignition switch OFF.

2. Disconnect the PTC heater control connector.

3. Turn ignition switch ON.

4. Check voltage between PTC heater control harness connector and ground.

(+)	(-)	Voltage		
PTC heate	er control		Ignition switch position		
Connector	Terminal	—	OFF	ACC	ON
M131	10	Ground	Battery voltage	Battery voltage	Battery voltage
	3		Approx. 0 V	Approx. 0 V	Battery voltage

Is the inspection result normal?

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

2.CHECK FUSE

Check fuses [No. 14 and 30, located in the fuse block (J/B)].

NOTE:

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> Repair the harnesses or connectors.

NO >> Replace the blown fuse after repairing the affected circuit.

3.CHECK PTC HEATER CONTROL GROUND CIRCUIT

1. Turn ignition switch OFF.

2. Check continuity between PTC heater control harness connector and ground.

PTC hea	ter control		Continuity	
Connector	Terminal		Continuity	
M131	2	Ground	Yes	

Is the inspection result normal?

YES >> Replace the PTC heater control.

NO >> Repair the harnesses or connectors.

DOOR MOTOR

< DTC/CIRCUIT DIAGNOSIS >

DOOR MOTOR

INFOID:000000013133598

А

Regarding Wiring "VK56VD : Wiring I	Diagram informatio <u>Diagram"</u> .	n, refer to <u>HAC-16</u>	<u>3, "CUMMINS 5.0L</u>	: Wiring Diagram" or <u>HAC-172.</u>	B
1.CHECK EACH	DOOR MOTOR PO	WER SUPPLY			
 Turn ignition st Check voltage 	witch ON. between intake doo	or motor harness co	onnector and ground	l.	D
+	-				Ε
Intake do	or motor	—		voltage (Approx.)	
Connector	Terminal				F
M227	1	Grou	nd	Battery voltage	Γ
NO >> GO TO 2.CHECK EACH I 1. Turn ignition sv 2. Disconnect inta 3. Check continu) 3. DOOR MOTOR GR witch OFF. ake door motor con ity between intake o	OUND CIRCUIT nector. loor motor harness	connector and grou	nd.	H
Intake	door motor			Quettouitu	
Connector	Terminal		—	Continuity	
M227	2	Gro	ound	Yes	J
Is the inspection reYES>> InspectionNO>> Repair3.CHECK EACH11.Disconnect fro2.Check continue	sult normal? tion End. harness or connec DOOR MOTOR PO nt air control conne ity between intake c	tor. WER SUPPLY CIR ctor. loor motor harness	CUIT FOR OPEN	air control harness connector.	K
		F	in a contra l		М
		Front a		Continuity	
M227	1	M132	13	Yes	N

Is the inspection result normal?

YES >> GO TO 4.

NO >> Repair harness or connector.

4. CHECK EACH DOOR MOTOR POWER SUPPLY CIRCUIT FOR SHORT

- 1. Disconnect following connectors:
- Air mix door motor
- Mode door motor
- 2. Check continuity between intake door motor harness connector and ground.

Intake d	oor motor		Continuity	
Connector	Terminal		Continuity	
M227	1	Ground	No	

Ο

Ρ

[MANUAL AIR CONDITIONER]

< DTC/CIRCUIT DIAGNOSIS >

Is the inspection result normal?

- YES >> Replace front air control. Refer to <u>HAC-229, "Removal and Installation"</u>.
- NO >> Repair harness or connector.

DOOR MOTOR COMMUNICATION CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

DOOR MOTOR COMMUNICATION CIRCUIT

Diagnosis Procedure

INEOID-000000013133500

А

[MANUAL AIR CONDITIONER]

Blaghoolo i rot				IN OL.0000001313333	
Regarding Wiring	Diagram informati Diagram"	ion, refer to <u>HAC-1</u>	63. "CUMMINS	5.0L : Wiring Diagram" or HAC-172.	В
VICOVE . Wining	<u>Blagrann</u> .				С
NOTE:					
If all door motor D	TCs are detected,	check this circuit.			
I.CHECK EACH	DOOR MOTOR C	OMMUNICATION S	SIGNAL		D
 Turn ignition s Check output 	witch ON. waveform betweer	n front air control ha	rness connector	and ground with oscilloscope.	Е
	F				
Front ai	r control			Output waveform	F
Connector	Terminal				
M132	12	Grou	Ind	(Y) 15 10 5 0 0	G
				→ ← 20 ms	Η
Is the inspection re	sult normal?			301414330	HA
YES >> GO TO) 2.				
NO >> GO TO) 3. 				J
Z.CHECK EACH	DOOR MOTOR C	OMMUNICATION S	SIGNAL CIRCUI	T FOR OPEN	
 Turn ignition s Disconnect from 	witch OFF. ont air control conn	ector and intake do	or motor connec	tor	K
3. Check continu	ity between front a	air control harness o	connector and inf	take door motor harness connector.	
Front ai	r control	Intake doo	or motor		L
Connector	Terminal	Connector	Terminal	- Continuity	
M132	12	M227	3	Yes	ь. г
Is the inspection re YES >> Inspection re NO >> Repair 3.CHECK EACH	esult normal? ction End. r harness or conne DOOR MOTOR C	ector. OMMUNICATION §	SIGNAL CIRCUI	T FOR SHORT	N
1. Disconnect fol	lowing connectors	:			
- Air mix door m	iotor				0
 Mode door mo Check continu 	itv between front a	air control harness o	connector and an	ound.	
	.,		girling girling girling girling		P
Front ai	r control			Continuity	I
Connector	Terminal		-	Continuity	
M137	16	Grou	ind	No	
Is the inspection re	sult normal?				

YES >> Replace front air control. Refer to HAC-229. "Removal and Installation".

NO >> Repair harness or connector.

Diagnosis Procedure

INFOID:000000013053672

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1.CHECK FUSE

- 1. Turn ignition switch OFF.
- Check 15A fuses [No. 17 and 27, located in fuse block (J/B)]. NOTE:

Refer to PG-154, "Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

2. CHECK FRONT BLOWER MOTOR POWER SUPPLY

1. Disconnect front blower motor connector.

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

Front blo	+ wer motor	_	Voltage (Approx.)	
Connector	Terminal			
M44	1	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 4.

NO >> GO TO 3.

3.CHECK FRONT BLOWER RELAY

- 1. Turn ignition switch OFF.
- 2. Check front blower relay. Refer to HAC-213, "Component Inspection (Front Blower Relay)".

Is the inspection result normal?

- YES >> Repair harness or connector between front blower motor and fuse.
- NO >> Replace front blower relay.

4.CHECK FRONT BLOWER MOTOR CONTROL CIRCUIT

1. Turn ignition switch OFF.

- 2. Connect front blower motor connector.
- 3. Disconnect variable blower control connector.
- 4. Turn ignition switch ON.
- 5. Check voltage between variable blower control harness connector and ground.

+ Variable blower control		_	Voltage	
Connector	Terminal		(, , , , , , , , , , , , , , , , , , ,	
M130	3	Ground	Battery voltage	

Is the inspection result normal?

YES >> GO TO 6.

NO >> GO TO 5.

5.CHECK FRONT BLOWER MOTOR CONTROL CIRCUIT FOR OPEN

< DTC/CIRCUIT DIAGNOSIS >

А

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

	wer control	Front blo	ower motor	Continuity
Connector	Terminal	Connector	Terminal	Continuity
M130	3	M44	2	Yes
<u>s the inspection result</u> YES >> Replace fi NO >> Repair ha 6. CHECK VARIABLE	t normal? ront blower motor. Ref rness or connector.	fer to <u>HAC-236, "Rem</u> L GROUND CIRCUIT	oval and Installation	<u>.</u>
 Turn ignition switc Check continuity b 	h OFF. between variable blow	ver control harness co	nnector and ground.	
Varia	ble blower control		_	Continuity
Connector	Termina	al		
M130	1		Ground	Yes
 while turning the blower control and 	blower control dial c	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial c ground.	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial d	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial d	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial d	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial d	clockwise, through ea	ach detent, check vo	oltage between variab
blower control and	blower control dial d	clockwise, through ea	ach detent, check vo	oltage between variab

< DTC/CIRCUIT DIAGNOSIS >

Variable blo	ower control		Cond	ition
Connector	Terminal		Blower control dial detents	Voltage
			OFF	0.00
			1	4.00
			2	4.75
			3	5.00
			4	5.50
			5	5.75
			6	6.00
			7	6.50
			8	6.75
			9	7.00
			10	7.50
			11	8.00
M130	2	Ground	12	8.25
			13	8.50
			14	9.00
			15	9.25
			16	9.75
			17	10.00
			18	10.50
			19	10.75
			20	11.00
			21	11.50
			22	11.75
			23	12.25
			24	12.50

Is the inspection result normal?

YES >> Replace variable blower control. Refer to <u>HAC-239</u>, "Removal and Installation".

NO >> GO TO 8.

$\mathbf{8}$. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT FOR OPEN

1. Turn ignition switch OFF.

2. Disconnect variable blower control connector and front air control connector.

3. Check continuity between variable blower control harness connector and front air control harness connector.

Variable bl	ower control	Front air control		Continuity
Connector	Terminal	Connector	Terminal	Continuity
M130	2	M132	10	Yes

Is the inspection result normal?

YES >> GO TO 9.

NO >> Repair harness or connector.

 ${f 9.}$ CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT FOR SHORT

Check continuity between variable blower control harness connector and ground.

< DTC/CIRCUIT DIAGNOSIS >

[MANUAL AIR CONDITIONER]

	Variable blow	ver control		Continuity
Connec	ctor	Terminal		Continuity
M130	0	2	Ground	No
Is the inspection	n result norm	al?		
YES >> Re NO >> Re	place front air pair harness	r control. Refer to <u>HAC</u> or connector.	2-229. "Removal and Installatic	<u>"nd</u> ".
Component	Inspection	(Front Blower Me	otor)	INFOID:000000013053673
1.CHECK FRO	ONT BLOWE	R MOTOR		
1. Connect ba 2. Connect gr Does the blowe YES >> Cha NO >> Re	attery voltage ound to termi er fan operate eck intermitte place front ble	to terminal 1 of front b nal 2 of front blower m ? nt incident. Refer to <u>G</u> ower motor. Refer to <u>H</u>	lower motor. notor. <u>I-43. "Intermittent Incident"</u> . IAC-236. "Removal and Install	ation".
Component	Inspectior	n (Front Blower Re	elay)	INFOID:000000013053674
1.CHECK FRO	ONT BLOWE	R RELAY		
1. Turn ignitio	n switch OFF			
 Remove fro Check con when voltage 	ont blower rel tinuity betwee ge is supplied	ay. en front blower relay t I between terminals 1 a	terminals 3 and 5 and 2.	
Term	ninals	Voltage C	Continuity	
3	5	ON	Yes	
3	5			

No

Is the inspection result normal?

YES >> Inspection End.

>> Replace front blower relay. NO

OFF



L

Μ

Ν

Ο

Ρ

< DTC/CIRCUIT DIAGNOSIS >

MAGNET CLUTCH

Component Function Check

INFOID:000000012923323

1. CHECK MAGNET CLUTCH OPERATION

Perform auto active test of IPDM E/R. Refer to PCS-10, "Diagnosis Description".

Does it operate normally?

YES >> Inspection End.

NO >> Refer to <u>HAC-214</u>, "Diagnosis Procedure".

Diagnosis Procedure

INFOID:000000012923324

Regarding Wiring Diagram information, refer to <u>HAC-163</u>, "CUMMINS 5.0L : Wiring Diagram" or <u>HAC-172</u>, "VK56VD : Wiring Diagram".

1.CHECK FUSE

1. Turn ignition switch OFF.

2. Check 10A fuse (No. 51, located in IPDM E/R). NOTE:

Refer to PG-163. "IPDM E/R Terminal Arrangement".

Is the inspection result normal?

YES >> GO TO 2.

NO >> Replace the blown fuse after repairing the affected circuit.

2. CHECK MAGNET CLUTCH POWER SUPPLY CIRCUIT

1. Disconnect compressor connector and IPDM E/R connector.

2. Check continuity between compressor harness connector and IPDM E/R harness connector.

Compressor		IPDI	M E/R	Continuity
Connector	Terminal	Connector	Terminal	Continuity
F150	1	E123	49	Yes

Is the inspection result normal?

YES >> GO TO 2.

NO >> Repair harness or connector.

3.CHECK MAGNET CLUTCH

Directly apply battery voltage to the magnet clutch. Check operation visually and by sound. <u>Does it operate normally?</u>

YES >> Replace IPDM E/R. Refer to PCS-43, "Removal and Installation of IPDM E/R".

NO >> Replace magnet clutch. Refer to <u>HA-33. "Removal and Installation"</u>.

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

WATER VALVE CIRCUIT

Description

The water valve cuts the flow of engine coolant to the heater core to allow for maximum cooling during A/C $_{\rm B}$ operation. It is controlled by the front air control.

Diagnosis Procedure

Regarding Wiring Diagram information, refer to HAC-172, "VK56VD : Wiring Diagram".

DIAGNOSTIC PROCEDURE FOR WATER VALVE

1.CHECK WATER VALVE POWER AND GROUND CIRCUITS

- 1. Disconnect water valve connector E65.
- 2. Turn ignition switch ON.
- 3. Rotate temperature control dial to full warm.
- 4. Check voltage between water valve harness connector E65 terminal 1 and terminal 2 while rotating temperature control dial to full cool.

Water valve connector	7	Ferminals	Condition	Voltage	G
	(+)	(-)	Condition	(Approx.)	
E65	2	1	Rotate temperature control dial	Battery voltage	Н

Is the inspection result normal?

YES >> GO TO 3.

NO >> GO TO 2.

2.check water valve control output circuit

1. Turn ignition switch OFF.

- 2. Disconnect front air control harness connector M132.
- 3. Check continuity between water valve harness connector E65 terminal 2 and front air control harness connector M132 terminal 15.

Water valve		A/C auto amp.		Continuity
Connector	Terminal	Connector Terminal		Continuity
E65	2	M132	15	Yes

4. Check continuity between water valve harness connector E65 terminal 2 and ground.

Water valve			Continuity	
Connector	Terminal		Continuity	
E65	2	Ground	No	·

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229, "Removal and Installation"</u>.

NO >> Repair the harness or connector.

3.CHECK WATER VALVE POWER AND GROUND CIRCUITS

1. Rotate temperature control dial full cool.

2. Check voltage between water valve harness connector E65 terminal 1 and terminal 2 while rotating temperature control dial to full warm.

Water valve connector	Terminals		Condition	Voltage	
	(+)	(-)	Condition	(Approx.)	
E65	1	2	Rotate temperature control dial	Battery voltage	

J

Κ

L

M

Ο

Ρ

А

D

Ε

INFOID:000000013923905

INFOID:000000013923906

WATER VALVE CIRCUIT

< DTC/CIRCUIT DIAGNOSIS >

<u>Is the inspection result normal?</u> YES >> Replace the water valve.

NO >> GO TO 4.

4. CHECK WATER VALVE CONTROL OUTPUT CIRCUIT

1. Turn ignition switch OFF.

2. Disconnect front air control harness connector M132.

3. Check continuity between water valve harness connector E65 terminal 1 and front air control harness connector M132 terminal 31.

Water valve		A/C auto amp.		Continuity
Connector	Terminal	Connector	Terminal	Continuity
E65	1	M132	31	Yes

4. Check continuity between water valve harness connector E65 terminal 1 and ground.

Water valve			Continuity	
Connector	Terminal		Continuity	
E65	1	Ground	No	

Is the inspection result normal?

YES >> Replace front air control. Refer to <u>HAC-229</u>, "Removal and Installation".

NO >> Repair the harness or connector.
PTC HEATER RELAY

< DTC/CIRCUIT DIAGN	IOSIS >	>			[MAI	NUAL AIR	CONDITIONER]
PTC HEATER RE	ELAY						
Description							INFOID:000000013053684
Power is supplied to the	PTC he	ater with I	PTC heater co	ontrol.			
Component Functio	on Che	eck					INFOID:000000013053685
1. СНЕСК РТС НЕАТЕ	R RELA	AY POWE	R SUPPLY CI	RCUIT			
Check that an operation	noise o	f PTC hea	ater relay (loca	ated in relay b	ox) can be	heard whe	n operating the air
conditioning system in he	eat mod	le.					
<u>S the inspection result no</u>	<u>ormal?</u> relav.nc	wer sunn	lv circuit is OK				
NO >> Refer to <u>HAC</u>	<u>C-217, '</u>	Diagnosis	<u>Procedure"</u> .				
Diagnosis Procedur	re						INFOID:000000013053686
Regarding Wiring Diagra	m infor	mation, re	fer to <u>HAC-16</u>	3, "CUMMINS	3 5.0L : Wir	ing Diagrai	<u>n"</u> .
1. СНЕСК РТС НЕАТЕ	R RELA	AY GROU	ND CIRCUIT				
1. Turn ignition switch (ON.						
 Disconnect PTC hea Check voltage between 	iter con een PT(trol conne C heater c	ctor. ontrol connect	or and groun	d.		
					-		
		Termina	als			V	oltage (V)
PTC heater control	(+)	т	orminal	()			(Approx.)
FTC fleater control			14				
M131			15	Ground		Battery voltage	tery voltage
			16				
s the inspection result no	ormal?						
YES >> Replace PTC NO >> GO TO 2.	; heate	r control.					
2. CHECK HARNESS C	ONTIN	IUITY					
1. Turn ignition switch (OFF.						
 Disconnect PTC hea Check continuity bet 	iter rela	y connect	ors. Control conne	ector and PT() heater rel	av connect	or
5. Oncor continuity bet	weenn	TO fielder	control control				
PTC heater control connec-	Те	rminal	PTC heater re	elay connector	Termin	al	Continuity
lui		14	E1	44			
M131	15		E1	146 2			Yes
		16	E1	45			
4. Check continuity bet	ween P	TC heater	control conne	ector and grou	und.		
PTC heater control conne	ector	Т	Terminal				Continuity
	14		_			,	
M131			15	Ground			No

Is the inspection result normal?

16

PTC HEATER RELAY

< DTC/CIRCUIT DIAGNOSIS >

INFOID:000000013053687

YES >> GO TO 3.

NO >> Repair or replace harness.

3. CHECK PTC HEATER RELAY

Check PTC heater relay. Refer to HAC-218. "Component Inspection".

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

NO >> Replace appropriate PTC heater relay.

Component Inspection

1.CHECK PTC HEATER RELAY

- 1. Turn ignition switch OFF.
- 2. Remove PTC heater relay.
- 3. Check continuity between PTC heater relay terminal 3 and 5 when voltage is supplied between terminal 1 and 2.

Terminal		Voltage	Continuity	
3	5	ON	Yes	
5	5	OFF	No	

Is the inspection result normal?

YES >> Inspection End.

NO >> Replace PTC heater relay.



< DTC/CIRCUIT DIAGNOSIS > PTC HEATER

Diagnosis Procedure

INFOID:000000013053683

А

В

D

Е

F

Н

HAC

Κ

L

Μ

Ν

Ρ

Regarding Wiring Diagram information, refer to <u>HAC-163, "CUMMINS 5.0L : Wiring Diagram"</u>. 1.CHECK FUSE Turn ignition switch OFF. 1. 2. Check 50A fuses (No. S, V and Z, located in relay box). NOTE: Refer to PG-155, "Terminal Arrangement". Is the inspection result normal? YES >> GO TO 2. NO >> Replace the blown fuse after repairing the affected circuit. 2. CHECK POWER SUPPLY CIRCUIT 1 Turn ignition switch ON. 2. Check voltage between PTC heater connector and ground. Terminals (+) Voltage Condition of PTC heater (Approx.) (-) PTC heater Terminal connector ON Battery voltage 1 OFF 0 V ON Battery voltage E78 3 Ground OFF 0 V ON Battery voltage 5 OFF 0 V Is the inspection result normal? YES >> GO TO 3. NO >> GO TO 4. 3. CHECK GROUND CIRCUIT 1. Turn ignition switch OFF. 2. Disconnect PTC heater connector. 3. Check continuity between PTC heater connector and ground. PTC heater connector Terminal Continuity 2 Ground E78 Yes 4 Is the inspection result normal? YES >> Replace PTC heater. Refer to HAC-238, "Removal and Installation". NO >> Repair or replace harness. CHECK HARNESS CONTINUITY

1. Disconnect PTC relay connectors.

2. Check continuity between PTC heater connector and PTC relay connector.

PTC HEATER

< DTC/CIRCUIT DIAGNOSIS >

PTC heater connector	Terminal	PTC heater relay con- nector	Terminal	Continuity
	1	E144		
E78	3	E146	5	Yes
	5	E145		

3. Check continuity between PTC heater connector and ground.

PTC heater connector	Terminal		Continuity
	1	Cround	
E78	3	Ground	No
	5		

Is the inspection result normal?

YES >> Check intermittent incident. Refer to <u>GI-43, "Intermittent Incident"</u>.

NO >> Replace or repair harness.

HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

SYMPTOM DIAGNOSIS HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

Symptom Table

INFOID:000000012923328

А

С

[MANUAL AIR CONDITIONER]

NOTE:

Perform the self-diagnoses with CONSULT before performing the symptom diagnosis. If DTC is detected, perform the corresponding diagnosis.

Symptom	Corresponding malfunction part	Reference
 Air conditioning does not activate. Air conditioning cannot be controlled. Operation status of air conditioning is not indicated on display. 	 Front air control ignition power supply circuit Front air control 	HAC-202, "FRONT A/C CONTROL : Diagnosis Procedure"
Air outlet does not change.Mode door motor does not operate normally.	 Circuit between mode door motor and front air control Mode door motor control linkage Mode door motor Front air control 	HAC-204, "MODE DOOR MOTOR : Diagnosis Procedure"
 Discharge air temperature does not change. Air mix door motor does not operate normally. 	 Circuit between air mix door motor and front air control Air mix door motor installation condi- tion Air mix door motor Front air control 	HAC-203, "AIR MIX DOOR MO- TOR : Diagnosis Procedure"
 Intake door does not change. Intake door motor does not operate normally. 	 Circuit between intake door motor and front air control Intake door motor control linkage Intake door motor Front air control 	HAC-205. "INTAKE DOOR MOTOR : Diagnosis Procedure"
All door motors do not operate normally.	 Each door motor power supply and ground circuit Front air control 	HAC-207, "Diagnosis Procedure"
Blower motor operation is malfunctioning.	 Power supply system of front blower motor Circuit between front blower motor and front air control Front blower motor Front air control 	HAC-210, "Diagnosis Procedure"
Compressor does not operate.	 Circuit between magnet clutch and IPDM E/R Magnet clutch IPDM E/R (A/C relay) Circuit between ECM and refriger- ant pressure sensor Refrigerant pressure sensor CAN communication circuit Front air control 	HAC-227, "Diagnosis Procedure"
 Insufficient cooling. No cool air comes out. (Air flow volume is normal.) 	 Magnet clutch control system Drive belt slipping Refrigerant cycle Air leakage from each duct Front air control connection recognition signal circuit 	HAC-223, "Diagnosis Procedure"
 Insufficient heating. No warm air comes out. (Air flow volume is normal.) 	 Engine cooling system Heater hose Heater core PTC heater (Cummins 5.0L) Air leakage from each duct 	HAC-225. "Diagnosis Procedure"

HEATER AND AIR CONDITIONING SYSTEM CONTROL SYMPTOMS

< SYMPTOM DIAGNOSIS >

[MANUAL AIR CONDITIONER]

Symptom		Corresponding malfunction part	Reference
	During compressor operation	Refrigerant cycle	HA-30, "Symptom Table"
Noise is heard when front air conditioning system op- erates.	During front blower motor operation	 Mixing any foreign object in front blower motor Front blower motor fan breakage Front blower motor rotation inferiori- ty 	HAC-213, "Component Inspection (Front Blower Motor)"

INSUFFICIENT COOLING

< SYMPTOM DIAGNOSIS >	[MANUAL AIR CONDITIONER]
INSUFFICIENT COOLING	
Description	ا∼ INFOID:000000013134646
	r
Symptom Insufficient cooling	E
• No cool air comes out. (Air flow volume is normal.)	
Diagnosis Procedure	INFOID:000000012923329
1. CONFIRM SYMPTOM BY PERFORMING OPERATION CHECK - TE	MPERATURE DECREASE
1. Press the A/C switch.	L
 Turn temperature control dal counterclockwise to maximum cold. Check for cold air at discharge air outlets. 	
Can a symptom be duplicated?	E
YES >> GO TO 3.	
2 check for any symptoms	F
2. CHECK FOR ANY SYMPTOMS	
Perform a complete operational check and check for any symptoms. Refe	s to <u>HAC-184, "Work Procedure"</u> .
YES >> Refer to HAC-221, "Symptom Table".	
NO >> System OK.	
3. CHECK FOR SERVICE BULLETINS	F
Check for any service bulletins.	
>> GO TO 4.	H
4. CHECK DRIVE BELTS	
Check A/C compressor belt tension. Refer to EM-190, "Removal and Inst	allation - Drive Belt".
Is the inspection result normal?	
YES >> GO TO 5.	k
NO >> Adjust or replace compressor belt. Refer to $EM-190$, "Remov	al and Installation - Drive Belt".
Check and verify air mix door mechanism for smooth operation.	L
$\Delta C = \Delta C $	
NO >> Check air mix door motor circuit. Refer to <u>HAC-207, "Diagnos</u>	sis Procedure".
6. CHECK COOLING FAN MOTOR OPERATION	
Check and verify cooling fan motor for smooth operation.	N
Does cooling fan motor operate correctly?	
YES >> GO TO 7.	
7 CHECK RECOVERY/RECYCLING FOLIDMENT REFORE USAGE	Ĺ
T. CHECK RECOVERTIRECT CLING EQUIFIVIENT DEFORE USAGE	
recycling equipment by checking the gauges. If pressure exists, recover r	efrigerant from equipment lines.

>> GO TO 8.

8. CHECK REFRIGERANT PURITY

1. Connect recovery/recycling equipment to vehicle.

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

< SYMPTOM DIAGNOSIS >

Is the inspection result normal?

YES >> GO TO 9.

NO >> Check contaminated refrigerant. Refer to <u>HA-17, "Description"</u>.

9. CHECK REFRIGERANT PRESSURE

Check refrigerant pressure with manifold gauge connected. Refer to HA-24, "Inspection".

Is the inspection result normal?

YES >> Perform diagnostic work flow. Refer to <u>HA-15, "Work Flow"</u>.

NO >> GO TO 10.

10. CHECK FOR EVAPORATOR FREEZE-UP

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

Does evaporator freeze up?

YES >> Perform diagnostic work flow. Refer <u>HA-15, "Work Flow"</u>.

NO >> GO TO 11.

11. CHECK AIR DUCTS

Check ducts for air leaks.

Is the inspection result normal?

YES >> System OK.

NO >> Repair air leaks.

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >	[MANUAL AIR CONDITIONER]
INSUFFICIENT HEATING	
Description	A INFOID:000000013134647
Symptom Insufficient heating No warm air comes out. (Air flow volume is normal.) 	В
Diagnosis Procedure	INFOID:000000012923330
1. CONFIRM SYMPTOM BY PERFORMING OPERATION CHECK - TEN	
 Turn temperature control dial clockwise to maximum heat. Check for hot air at discharge air outlets. 	D
Can a symptom be duplicated?	E
YES >> GO TO 3. NO >> GO TO 2.	
2. CHECK FOR ANY SYMPTOMS	F
Perform a complete operational check and check for any symptoms. Refer	to HAC-184, "Work Procedure".
Does another symptom exist? YES >> Refer to HAC-221, "Symptom Table". NO >> System OK.	G
3. CHECK FOR SERVICE BULLETINS	
Check for any service bulletins.	
>> GO TO 4. Δ CHECK ENCINE COOLING SYSTEM	HA
Check Engine COOLing STSTEM	Installation"
 Check for proper engine coolant level. Refer to <u>CO-49, Removal and</u> Check hoses for leaks or kinks. Check radiator cap. Refer to <u>CO-49, "Removal and Installation"</u>. Check for air in cooling system. 	J
>> GO TO 5.	
5. CHECK AIR MIX DOOR MOTOR OPERATION	L
Check and verify air mix door mechanism for smooth operation.	
Does air mix door operate correctly?	Μ
NO >> Check the air mix door motor circuit. Refer to <u>HAC-207, "Diag</u>	nosis Procedure".
6. CHECK AIR DUCTS	N
Check for disconnected or leaking air ducts.	N
Is the inspection result normal?	
YES (Cummins 5.0L)>>GO TO 7. YES (VK56VD)>>GO TO 8. NO >> Repair all disconnected or leaking air ducts.	0
7.CHECK PTC HEATER	P
Check PTC heater. Refer to HAC-219, "Diagnosis Procedure".	
Is the inspection result normal? YES >> GO TO 8. NO >> Replace PTC heater. Refer to HAC-238. "Removal and Installa	ation".

Ö. CHECK HEATER HOSE TEMPERATURES

INSUFFICIENT HEATING

< SYMPTOM DIAGNOSIS >

- 1. 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 warm.

Is the inspection result normal?

- YES >> GO TO 9.
- NO >> Both hoses warm: GO TO 10.
- 9. CHECK ENGINE COOLANT SYSTEM

Check thermostat operation. Refer to CO-39, "System Inspection".

Is the inspection result normal?

- YES >> System OK.
- NO >> Repair or replace as necessary.
- **10.** 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-41. "Changing Engine Coolant".
 - 4. To retest: GO TO 11.

11. CHECK HEATER HOSE TEMPERATURES

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

Is the inspection result normal?

- YES >> System OK.
- NO >> Replace heater core. Refer to <u>HA-46, "HEATER CORE : Removal and Installation"</u>.

[MANUAL AIR CONDITIONER]

< SYMPTOM DIAGNOSIS > COMPRESSOR DOES NOT OPERATE

А Description INFOID:000000012923331 Symptom: Compressor does not operate. В Diagnosis Procedure INFOID:000000012923332 NOTE: Perform self-diagnoses with CONSULT before performing symptom diagnosis. If DTC is detected, perform the corresponding diagnosis. Check that refrigerant system is properly charged. If refrigerant amount is below the proper amount, perform D inspection of refrigerant leakage. 1.CHECK MAGNET CLUTCH OPERATION Check magnet clutch. Refer to HAC-214, "Component Function Check". Е Does it operate normally? YES >> GO TO 2. NO >> Repair or replace malfunctioning parts. 2.CHECK REFRIGERANT PRESSURE SENSOR Check refrigerant pressure sensor. Refer to EC-653, "Diagnosis Procedure" or EC-656. "Diagnosis Procedure". Is the inspection result normal? YES >> GO TO 3. Н >> Repair or replace malfunctioning parts. NO ${
m 3.}$ CHECK FRONT AIR CONTROL OUTPUT SIGNAL HAC With CONSULT Check "FAN ON" and "AIR COND" in "Data Monitor" mode of "BCM". Monitor item Condition Status ON On AIR COND SW A/C switch Off OFF ON On FAN ON Blower motor OFF Off Is the inspection result normal? YES >> GO TO 4. NO >> Replace front air control. Refer to HAC-229, "Removal and Installation". Μ 4.CHECK ECM INPUT SIGNAL (P)With CONSULT Check "AIR COND SIG" and "HEATER FAN SW" in "Data Monitor" mode of "ECM". Ν Monitor item Condition Status ON On AIR COND SIG A/C switch OFF Off ON On HEATER FAN SW Ρ Blower motor OFF Off

Is the inspection result normal?

YES >> GO TO 5.

NO >> Check CAN communication system. Refer to LAN-51, "Trouble Diagnosis Flow Chart".

5.CHECK IPDM E/R INPUT SIGNAL

With CONSULT

COMPRESSOR DOES NOT OPERATE

< SYMPTOM DIAGNOSIS >

1. Start engine.

2. Check "AC COMP REQ" in "Data Monitor" mode of "IPDM E/R".

Monitor item	Condition		Status	
	A/C switch	ON	On	
		OFF	Off	

Is the inspection result normal?

YES >> Inspection End.

NO >> Check CAN communication system. Refer to <u>LAN-51, "Trouble Diagnosis Flow Chart"</u>.

< REMOVAL AND INSTALLATION > REMOVAL AND INSTALLATION FRONT AIR CONTROL

Exploded View

INFOID:000000013174398

А



Ν

0

AMBIENT SENSOR

Removal and Installation

REMOVAL

- 1. Remove front grille. Refer to EXT-24. "Removal and Installation".
- 2. Disconnect harness connector from ambient sensor.
- 3. Remove ambient sensor (1).



INSTALLATION Installation is in the reverse order of removal.

INTAKE SENSOR

Removal and Installation

REMOVAL

- 1. Remove evaporator from the heating and cooling unit. Refer to IP-21. "Removal and Installation".
- 2. Disconnect the harness connector from intake sensor.
- 3. Remove intake sensor (2) from evaporator (1). CAUTION:
 - Mark the mounting position of intake sensor.
 - Do not damage evaporator core.



INSTALLATION Installation is in the reverse order of removal.

Н

J

Κ

L

Μ

Ν

Ο

Ρ

INFOID:000000013053692

А

В

REFRIGERANT PRESSURE SENSOR

Removal and Installation

REMOVAL

- 1. Discharge refrigerant. Refer to HA-19, "Recycle Refrigerant".
- 2. Remove front grille. Refer to EXT-24, "Removal and Installation".
- 3. Disconnect harness connector from refrigerant pressure sensor.
- 4. Remove refrigerant pressure sensor (1).



INSTALLATION Installation is in the reverse order of removal. CAUTION:

- Be careful not to damage the condenser fins.
- Do not reuse O-rings.
- Apply A/C oil to the O-ring of the refrigerant pressure sensor for installation.
- After charging refrigerant, check for leaks. Refer to <u>HA-17, "Leak Test"</u>.

DOOR MOTOR

< REMOVAL AND INSTALLATION >

DOOR MOTOR

Exploded View

INFOID:000000013053694

А



- 1. Heating and cooling unit assembly
- 4. Intake door motor

- Mode door motor
 Front
- 3. Air mix door motor

INTAKE DOOR MOTOR

INTAKE DOOR MOTOR : Removal and Installation

REMOVAL

- 1. Remove heating and cooling unit assembly. Refer to <u>HA-46</u>, "<u>HEATING AND COOLING UNIT ASSEM-</u> <u>BLY</u>: <u>Removal and Installation</u>".
- 2. Disconnect harness connector from intake door motor.
- 3. Remove intake door motor screws (A) and intake door motor (1) from blower unit (2).



INSTALLATION Installation is in the reverse order of removal.

MODE DOOR MOTOR

MODE DOOR MOTOR : Removal and Installation

INFOID:000000013053696

REMOVAL

- 1. Remove heating and cooling unit assembly. Refer to <u>HA-46, "HEATING AND COOLING UNIT ASSEM-</u> <u>BLY : Removal and Installation"</u>.
- 2. Remove blower unit. Refer to VTL-16, "BLOWER UNIT : Removal and Installation".
- 3. Remove mode door motor screws (A).
- 4. Disconnect the harness connector from the mode door motor (1) and remove.



INSTALLATION Installation is in the reverse order of removal.

AIR MIX DOOR MOTOR

AIR MIX DOOR MOTOR : Removal and Installation - Air Mix Door Motor

REMOVAL

- 1. Remove heating and cooling unit assembly. Refer to <u>HA-46</u>, "<u>HEATING AND COOLING UNIT ASSEM-</u> <u>BLY</u> : <u>Removal and Installation</u>".
- 2. Remove blower unit. Refer to <u>VTL-16</u>, "BLOWER UNIT : Removal and Installation".

HAC-234

DOOR MOTOR

< REMOVAL AND INSTALLATION >

- 3. Remove air mix door motor screws (A).
- 4. Disconnect harness connector from the air mix door motor (1) and remove.

[MANUAL AIR CONDITIONER]



INSTALLATION

Installation is in the reverse order of removal.



HAC

J

Κ

L

Μ

Ν

Ο

Ρ

Н

Е

F

G

FRONT BLOWER MOTOR

Removal and Installation

For removal and installation of blower motor, refer to VTL-16. "BLOWER UNIT : Removal and Installation".

< REMOVAL AND INSTALLATION > [M.	ANUAL AIR CONDITIONER]
COMPRESSOR	
Removal and Installation	INFOID:000000013053699
For removal and installation of the compressor, refer to HA-31. "Removal and	Installation".
	C
	C
	E
	F
	C
	ŀ
	_
	HA
	-
	k
	1
	L
	Ν
	Γ
	C
	F

PTC HEATER

Removal and Installation

For the removal and installation of the PTC heater, refer to HA-47, "PTC HEATER : Removal and Installation".

VARIABLE BLOWER CONTROL

Exploded View

INFOID:000000013174409

А



Remove glove box assembly and housing. Refer to <u>IP-21, "Removal and Installation"</u>.
 Disconnect harness connector from variable blower control.

Р

Ο

VARIABLE BLOWER CONTROL

< REMOVAL AND INSTALLATION >

3. Remove two screws (A) and variable blower control (1).

[MANUAL AIR CONDITIONER]



INSTALLATION Installation is in the reverse order of removal.