

Climate Control System - Vehicles With: Dual Automatic Temperature Control (DATC)

Diagnostic Trouble Code (DTC) Chart

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods (100-00 General Information, Description and Operation).

Diagnostic Trouble Code Chart

Module	DTC	Description	Action <i>New: hover over Pinpoint Test links to show title</i>
FCIM	B105A:12	Cabin Temperature Sensor Fan: Circuit Short To Battery	GO to Pinpoint Test N
FCIM	B105A:14	Cabin Temperature Sensor Fan: Circuit Short To Ground or Open	GO to Pinpoint Test N
FCIM	B1081:07	Left Temperature Damper Motor: Mechanical Failures	GO to Pinpoint Test I
FCIM	B1081:11	Left Temperature Damper Motor: Circuit Short To Ground	GO to Pinpoint Test I
FCIM	B1081:12	Left Temperature Damper Motor: Circuit Short To Battery	GO to Pinpoint Test I
FCIM	B1081:13	Left Temperature Damper Motor: Circuit Open	GO to Pinpoint Test I
FCIM	B1082:07	Right Temperature Damper Motor: Mechanical Failures	GO to Pinpoint Test J
FCIM	B1082:11	Right Temperature Damper Motor: Circuit Short To Ground	GO to Pinpoint Test J
FCIM	B1082:12	Right Temperature Damper Motor: Circuit Short To Battery	GO to Pinpoint Test J
FCIM	B1082:13	Right Temperature Damper Motor: Circuit Open	GO to Pinpoint Test J
FCIM	B1083:07	Recirculation Damper Motor: Mechanical Failure	GO to Pinpoint Test D
FCIM	B1083:11	Recirculation Damper Motor: Circuit Short To Ground	GO to Pinpoint Test D
FCIM	B1083:12	Recirculation Damper Motor: Circuit Short To Battery	GO to Pinpoint Test D
FCIM	B1083:13	Recirculation Damper Motor: Circuit Open	GO to Pinpoint Test D
FCIM	B1086:07	Air Distribution Damper Motor: Mechanical Failures	GO to Pinpoint Test E
FCIM	B1086:11	Air Distribution Damper Motor: Circuit Short To Ground	GO to Pinpoint Test E
FCIM	B1086:12	Air Distribution Damper Motor: Circuit Short To Battery	GO to Pinpoint Test E
FCIM	B1086:13	Air Distribution Damper Motor: Circuit Open	GO to Pinpoint Test E
FCIM	B10AF:11	Blower Fan Relay: Circuit Short To Ground	GO to Pinpoint Test K
FCIM	B10AF:15	Blower Fan Relay: Circuit Short To Battery or Open	GO to Pinpoint Test K
FCIM	B10AF:15	Blower Fan Relay: Circuit Short To Battery or Open	GO to Pinpoint Test L
FCIM	B10B3:11	Right Panel Air Discharge Temperature: Circuit Short To Ground	GO to Pinpoint Test M
FCIM	B10B3:15	Right Panel Air Discharge Temperature: Circuit Short To Battery or Open	GO to Pinpoint Test M
FCIM	B10B4:11	Right Floor Air Discharge Temperature: Circuit Short To Ground	GO to Pinpoint Test M
FCIM	B10B4:15	Right Floor Air Discharge Temperature: Circuit Short To Battery or Open	GO to Pinpoint Test M
FCIM	B10B5:11	Left Panel Air Discharge Temperature: Circuit Short To Ground	GO to Pinpoint Test M
FCIM	B10B5:15	Left Panel Air Discharge Temperature: Circuit Short To Battery or Open	GO to Pinpoint Test M
FCIM	B10B6:11	Left Floor Air Discharge Temperature: Circuit Short To Ground	GO to Pinpoint Test M

Module	DTC	Description	Action <i>New: hover over Pinpoint Test links to show title</i>
FCIM	B10B6:15	Left Floor Air Discharge Temperature: Circuit Short To Battery or Open	GO to Pinpoint Test M
FCIM	B10B9:12	Blower Control: Circuit Short To Battery	GO to Pinpoint Test K
FCIM	B10B9:14	Blower Control: Circuit Short To Ground or Open	GO to Pinpoint Test K
FCIM	B10B9:14	Blower Control: Circuit Short To Ground or Open	GO to Pinpoint Test L
FCIM	B11E5:12	Left HVAC Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test I
FCIM	B11E5:14	Left HVAC Damper Position Sensor: Circuit Short To Ground Or Open	GO to Pinpoint Test I
FCIM	B11E6:12	Right HVAC Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test J
FCIM	B11E6:14	Right HVAC Damper Position Sensor: Circuit Short To Ground Or Open	GO to Pinpoint Test J
FCIM	B11E7:12	Air Distribution Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test E
FCIM	B11E7:14	Air Distribution Damper Position Sensor: Circuit Short To Ground Or Open	GO to Pinpoint Test E
FCIM	B11F0:12	Air Intake Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test D
FCIM	B11F0:14	Air Intake Damper Position Sensor: Circuit Short to Ground or Open	GO to Pinpoint Test D
FCIM	B1474:11	Heater Relay 1: Circuit Short To Ground	GO to Pinpoint Test S
FCIM	B1474:15	Heater Relay 1: Circuit Short To Battery or Open	GO to Pinpoint Test S
FCIM	B147A:11	Heater Relay 2: Circuit Short To Ground	GO to Pinpoint Test S
FCIM	B147A:15	Heater Relay 2: Circuit Short To Battery or Open	GO to Pinpoint Test S
FCIM	B147B:11	Heater Relay 3: Circuit Short To Ground	GO to Pinpoint Test S
FCIM	B147B:15	Heater Relay 3: Circuit Short To Battery or Open	GO to Pinpoint Test S
FCIM	B1A61:11	Cabin Temperature Sensor: Circuit Short To Ground	GO to Pinpoint Test N
FCIM	B1A61:15	Cabin Temperature Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test N
FCIM	B1A63:11	Right Solar Sensor: Circuit Short To Ground	GO to Pinpoint Test O
FCIM	B1A63:15	Right Solar Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test O
FCIM	B1A64:11	Left Solar Sensor: Circuit Short To Ground	GO to Pinpoint Test O
FCIM	B1A64:15	Left Solar Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test O
FCIM	B1A69:12	Humidity Sensor: Circuit Short To Battery	GO to Pinpoint Test N
FCIM	B1A69:14	Humidity Sensor: Circuit Short To Ground or Open	GO to Pinpoint Test N
FCIM	B1B71:11	Evaporator Temperature Sensor: Circuit Short To Ground	GO to Pinpoint Test P
FCIM	B1B71:15	Evaporator Temperature Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test P
FCIM	C1B14:11	Sensor Supply Voltage A: Circuit Short to Ground	GO to Pinpoint Test Q
FCIM	C1B14:12	Sensor Supply Voltage A: Circuit Short to Battery	GO to Pinpoint Test Q
PCM	P0532:00	A/C Refrigerant Pressure Sensor A Circuit Low: No Sub Type Information	GO to Pinpoint Test A
PCM	P0533:00	A/C Refrigerant Pressure Sensor A Circuit High: No Sub Type Information	GO to Pinpoint Test A
PCM	P0645:00	A/C Clutch Relay Control Circuit: No Sub Type Information	GO to Pinpoint Test B
PCM	P0646:00	A/C Clutch Relay Control Circuit Low: No Sub Type Information	GO to Pinpoint Test B
PCM	P0647:00	A/C Clutch Relay Control Circuit High: No Sub Type Information	GO to Pinpoint Test B
PCM	P06A0:00	Variable Compressor Control Circuit: No Sub Type Information	GO to Pinpoint Test Y
PCM	P145B:00	A/C Demand Not Activated During Self Test: No Sub Type Information	GO to Pinpoint Test G
PCM	P1464:00	A/C Demand Out Of Self Test Range: No Sub Type Information	GO to Pinpoint Test H
PCM	P193E:00	A/C Clutch Request Signal: No Sub Type Information	GO to Pinpoint Test R

Symptom Chart

Symptom Chart: Climate Control - Dual Automatic Temperature Control (DATC)

Diagnostics in this manual assume a certain skill level and knowledge of Ford-specific diagnostic practices.
REFER to: Diagnostic Methods (100-00 General Information, Description and Operation).

NOTE: Some Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs) may inhibit A/C operation. If any Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs) are retrieved, diagnose those first. Refer to the Diagnostic Trouble Code (DTC) Chart.

Symptom Chart

Condition	Actions
A module does not communicate with the diagnostic scan tool	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
Unable To Duplicate The Customer Concern And No Diagnostic Trouble Codes (DTCs) Present	GO to Pinpoint Test C
HVAC functions are inoperative/do not operate correctly from touchscreen only	Refer to the appropriate section in Group 415 for the procedure.
The electric booster heater is inoperative or does not operate correctly	GO to Pinpoint Test S
Externally Controlled Variable Displacement Compressor (EVDC) poor performance/does not operate correctly	GO to Pinpoint Test Y
Reduced outlet airflow	GO to Pinpoint Test T
The air inlet door is inoperative	GO to Pinpoint Test D
Incorrect or erratic direction of airflow from outlets	GO to Pinpoint Test E
Insufficient, erratic or no heat	GO to Pinpoint Test F
The A/C is inoperative	GO to Pinpoint Test G
The A/C is always on "A/C mode always commanded ON	GO to Pinpoint Test H
Temperature control is inoperative/does not operate correctly "driver side	GO to Pinpoint Test I
Temperature control is inoperative/does not operate correctly "passenger side	GO to Pinpoint Test J
The blower motor is inoperative	GO to Pinpoint Test K
The blower motor does not operate correctly	GO to Pinpoint Test L
The A/C compressor pressure relief valve discharging	GO to Pinpoint Test U
Excessive hissing from the plenum when the A/C is on	GO to Pinpoint Test V
Noisy Air Conditioning (A/C) Compressor	GO to Pinpoint Test W
Insufficient A/C cooling	GO to Pinpoint Test X
Climate control does not operate only when remote start is used	GO to Pinpoint Test Z

Pinpoint Test(s)

[PINPOINT TEST A : P0532, P0533](#)

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Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

The A/C pressure transducer receives a ground from the PCM. A 5-volt reference voltage is supplied to the A/C pressure transducer from the PCM. The A/C pressure transducer then sends a voltage to the PCM to indicate the A/C pressure.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P0532:00	A/C Refrigerant Pressure Sensor "A" Circuit Low: No Sub Type Information	This DTC sets if the feedback voltage is less than 0.26 volt for at least 2 seconds and the ambient air temperature is greater than 0°C (32°F).
PCM P0533:00	A/C Refrigerant Pressure Sensor "A" Circuit High: No Sub Type Information	This DTC sets if the feedback voltage is greater than 4.95 volts for at least 2 seconds and the ambient air temperature is greater than 0°C (32°F).

Possible Sources

- Wiring terminals or connectors
- A/C pressure transducer
- PCM

Visual Inspection and Pre-checks

- Inspect for loose or corroded A/C pressure transducer connections.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

A1 COMPARE THE PCM (POWERTRAIN CONTROL MODULE) PRESSURE SENSOR (ACP_PRESS) PID (PARAMETER IDENTIFICATION) WITH THE MANIFOLD GAUGE SET READINGS

NOTE: The following pinpoint test step is tested in ambient temperature of approximately 21.1°C (70°F). As ambient temperatures near 38°C (100.4°F), the pressure value difference increases above ± 15 psi (103 kPa) range

- Allow the A/C system to stabilize to the outside ambient temperature.
- Connect a manifold gauge set.
- Ignition ON.
- With the manifold gauge set connected, compare the pressure readings of the manifold gauge set and the PCM

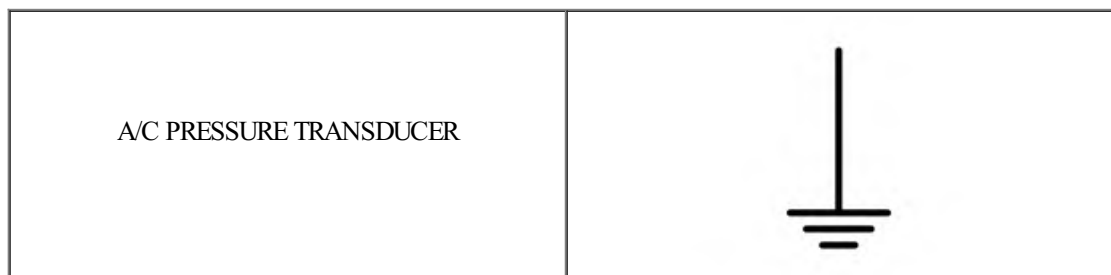
Access the PCM and monitor the ACP_PRESS (kPa) PID

Are the pressure values of the manifold gauge set and the ACP_PRESS PCM PID, dependent upon the ambient temperatures, within ± 103 kPa (15 psi)?

Yes	IGNORE the Diagnostic Trouble Codes (DTCs). REFER to the Symptom Chart in this section.
No	GO to A2

A2 CHECK THE A/C (AIR CONDITIONING) PRESSURE SENSOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect PCM [C175B](#) Gasline [C1232B](#) Diesel.
- Disconnect A/C pressure transducer [C1260](#) .
- Ignition ON.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C1260-1		Ground
C1260-2		Ground
C1260-3		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to A3

A3 CHECK THE A/C (AIR CONDITIONING) PRESSURE SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

A/C PRESSURE TRANSDUCER	
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Positive Lead	Measurement / Action	Negative Lead
C1260-1	Ω	Ground
C1260-2	Ω	Ground
C1260-3	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to A4
No	REPAIR the circuit.

A4 CHECK THE A/C (AIR CONDITIONING) PRESSURE SENSOR CIRCUITS FOR AN OPEN

- Measure:

A/C PRESSURE TRANSDUCER	POWERTRAIN CONTROL MODULE (PCM)
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Gasoline

Positive Lead	Measurement / Action	Negative Lead
C1260-1	Ω	C175B-28
C1260-2	Ω	C175B-69
C1260-3	Ω	C175B-82

Diesel

Positive Lead	Measurement / Action	Negative Lead
C1260-1	Ω	C1232B-60
C1260-2	Ω	C1232B-75
C1260-3	Ω	C1232B-90

Are the resistances less than 3 ohms?

Yes	INSTALL a new A/C pressure transducer. CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the PCM self-test. TEST the system for normal operation. If the concern is still present, GO to A5
No	REPAIR the circuit.

A5 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all PCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Voltage is provided to the A/C clutch relay. When A/C is requested and A/C line pressures allow, a ground is provided to the A/C clutch relay coil from the PCM, energizing the A/C clutch relay.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P0645:00	A/C Clutch Relay Control Circuit: No Sub Type Information	Sets when the PCM grounds the relay circuit and more current than expected is detected on the relay circuit. The DTC also sets when the relay circuit is off and voltage is detected on the relay circuit.
PCM P0646:00	A/C Clutch Relay Control Circuit Low: No Sub Type Information	Sets when the relay circuit is off and ground is detected on the relay circuit. The PCM expects to detect voltage coming through the relay coil to the relay circuit when it is not grounding it.
PCM P0647:00	A/C Clutch Relay Control Circuit High: No Sub Type Information	Sets when the PCM grounds the relay circuit and excessive current draw (short to voltage) is detected on the relay circuit.

Possible Sources

- Fuse
- Wiring, terminals or connectors
- A/C clutch relay [non-serviceable, part of BJB]
- PCM

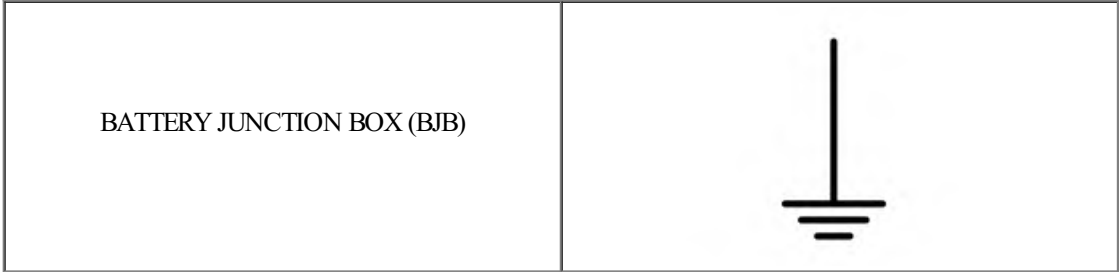
Visual Inspection and Pre-checks

- Inspect BJB fuses 17 (20A) and 20 (10A).

NOTICE: Use the correct probe adapter(s) from the Flex Probe Kit when taking measurements. Failure to use the correct probe adapter(s) may damage the connector.

B1 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect PCM [C175B](#) Gasoline [C1232B](#) Diesel.
- Disconnect BJB [C1035A](#) .
- Ignition ON.
- Measure:



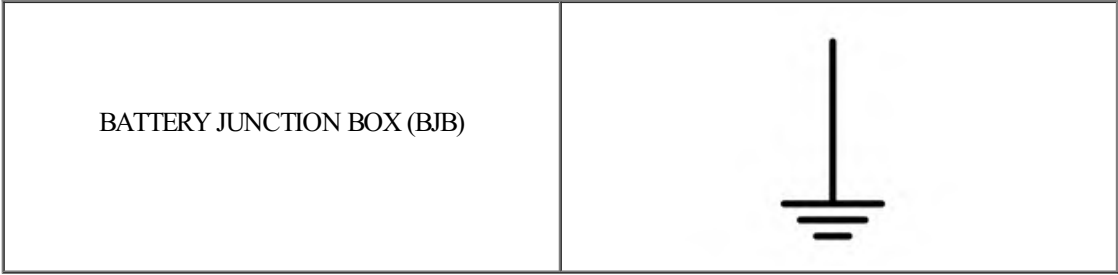
Positive Lead	Measurement / Action	Negative Lead
C1035A-27		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to B2

B2 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C1035A-27	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to B3
No	REPAIR the circuit.

B3 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY COIL CONTROL CIRCUIT FOR AN OPEN

- For vehicles equipped with a gasoline engine, measure:

BATTERY JUNCTION BOX (BJB)	POWERTRAIN CONTROL MODULE (PCM)
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Positive Lead	Measurement / Action	Negative Lead
C1035A-27	Ω	C175B-19

- For vehicles equipped with a diesel engine, measure:

BATTERY JUNCTION BOX (BJB)	POWERTRAIN CONTROL MODULE (PCM)
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Positive Lead	Measurement / Action	Negative Lead
C1035A-27	Ω	C1232B-82

Is the resistance less than 3 ohms?

Yes	GO to B4
No	REPAIR the circuit.

B4 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH FIELD COIL GROUND CIRCUIT FOR AN OPEN

- Disconnect A/C clutch and A/C clutch field coil [C100](#) .
- Measure:

AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL	
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Positive Lead	Measurement / Action	Negative Lead
C100-2	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to B5
No	REPAIR the circuit.

B5 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH FIELD COIL VOLTAGE SUPPLY CIRCUIT FOR AN OPEN

- Measure:

BATTERY JUNCTION BOX (BJB)	AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL
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Positive Lead	Measurement / Action	Negative Lead
C1035A-12	Ω	C100-1

Is the resistance less than 3 ohms?

Yes	GO to B6
No	REPAIR the circuit.

B6 CHECK THE AIR CONDITIONING CLUTCH RELAY OPERATION

- Connect PCM [C175B](#) Gasoline [C1232B](#) Diesel.
- Connect BJB [C1035A](#).
- Ignition ON.
- Access the PCM and control the ACC_CMD PID
- Measure:

AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL	
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Positive Lead	Measurement / Action	Negative Lead
C100-1		Ground

Is the voltage greater than 11 volts?

Yes	CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the PCM self-test. TEST the system for normal operation. If the concern is still present, GO to B7
No	VERIFY BJB fuses 17 (20A) and 20 (10A) are OK. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. If OK, INSTALL a new BJB.

B7 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all PCM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST C : UNABLE TO DUPLICATE THE CUSTOMER CONCERN AND NO DIAGNOSTIC TROUBLE CODES (DTCS) PRESENT

Normal Operation and Fault Conditions

The purpose of this pinpoint test is to test the functions of the HVAC system and identify the correct HVAC symptom pinpoint test.

Possible Sources

- HVAC system or related components

NOTE: Before carrying out the following test, diagnose all Front Controls Interface Module (FCIM) and Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs).

C1 CHECK THE PCM (POWERTRAIN CONTROL MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out PCM self-test.

Are any climate control related Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the DTC chart in this section.
No	GO to C2

C2 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) FOR DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, carry out FCIM self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the DTC chart in this section.
No	GO to C3

C3 CHECK THE BLOWER MOTOR OPERATION

- Ignition ON.
- Select panel mode.
- Observe blower motor operation and select each blower motor speed.

Does the blower motor operate in all ranges?

Yes	GO to C4
No	If the blower motor does not operate in any setting, GO to Pinpoint Test K If the blower motor does not correctly change speeds or shut off, GO to Pinpoint Test L

C4 CHECK AIRFLOW OPERATION

- Select the highest blower motor setting.
- While observing the airflow, select each of the airflow positions (panel, panel/floor, floor, floor/defrost, defrost).

Is the airflow directed to the correct outlets?

Yes	GO to C5
No	GO to Pinpoint Test E

C5 VERIFY TEMPERATURE CONTROL OPERATION

- Start the vehicle and allow it to reach normal operating temperature.
- With the A/C off, select panel mode.
- Change the driver and passenger temperature settings from the coldest to the warmest and back to the coldest.

Does the temperature change between very warm to cool?

Yes	GO to C6
No	If the temperature does not get very warm, GO to Pinpoint Test F If the driver side temperature does not change at all, GO to Pinpoint Test I If the passenger side temperature does not change at all, GO to Pinpoint Test J

C6 VERIFY THE AIR CONDITIONING COMPRESSOR DOES NOT ENGAGE WITH A/C (AIR CONDITIONING) OFF

- With the engine running and the A/C off, select panel mode.
- Select the coldest temperature setting.

Is the outlet temperature close to ambient air temperature?

Yes	GO to C7
No	If the driver side temperature is warmer than ambient air temperature, GO to Pinpoint Test I If the passenger side temperature is warmer than ambient air temperature, GO to Pinpoint Test J If the outlet temperature is significantly colder than ambient air temperature and the A/C compressor clutch is engaged, GO to Pinpoint Test H

C7 VERIFY THE A/C (AIR CONDITIONING) COMPRESSOR IS OPERATIONAL IN THE A/C (AIR CONDITIONING) MODE

- Make sure the ambient air temperature is above 0°C (32°F).
- With the engine running, select panel mode.
- Press the A/C button (indicator on).

Is the A/C compressor operational when the panel and A/C button (indicator on) is pressed?

Yes	GO to C8
No	GO to Pinpoint Test G

C8 CHECK THE RECIRCULATED AIR OPERATION

- With the engine running, press the recirculated air button (indicator off).
- Select panel mode.
- Select the highest blower motor setting.
- Observe airflow noise.
- Press the recirculated air button (indicator on).

Does the airflow noise increase when the recirculated air mode is selected (indicator on)?

Yes	GO to C9
No	GO to Pinpoint Test D

C9 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) LEFT DISCHARGE FLOOR TEMPERATURE (LDFTEMP) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the FCIM Parameter Identifications (PIDs).
- Monitor the LDFTEMP PID.

Is the temperature coming out of the driver footwell vent similar to the PID?

Yes	GO to C10
No	GO to Pinpoint Test M

C10 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) LEFT DISCHARGE PANEL TEMPERATURE (LDPT) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the FCIM Parameter Identifications (PIDs).
- Monitor the LDPT PID.

Is the temperature coming out of the driver side register similar to the PID?

Yes	GO to C11
No	GO to Pinpoint Test M

C11 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) DISCHARGE AIR TEMPERATURE, RIGHT PANEL (AIRTEMP_RP) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the FCIM Parameter Identifications (PIDs).
- Monitor the AIRTEMP_RP PID.

Is the temperature coming out of the passenger side register similar to the PID?

Yes	GO to C12
No	GO to Pinpoint Test M

C12 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) DISCHARGE AIR TEMPERATURE, RIGHT FLOOR (AIRTEMP_RF) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, view the FCIM Parameter Identifications (PIDs).
- Monitor the AIRTEMP_RF PID.

Is the temperature coming out of the passenger side footwell vent similar to the PID?

Yes	GO to C13
No	GO to Pinpoint Test M

C13 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) INTERIOR TEMPERATURE SENSOR (INT_TEMP) PID (PARAMETER IDENTIFICATION)

- Using a scan tool view the FCIM Parameter Identifications (PIDs).
- Monitor the INT_TEMP PID.

Is the air temperature at the cabin temperature sensor similar to the PID?

Yes	GO to C14
No	GO to Pinpoint Test N

C14 CHECK THE TOUCHSCREEN CONTROLS OPERATION

- Using the touchscreen controls, select each climate control function.
- Using the touchscreen controls, select each audio control function.

Do all touchscreen controls operate?

Yes	The system is operating correctly.
No	Refer to the appropriate section in Group 415 for the procedure.

PINPOINT TEST D : THE AIR INLET DOOR IS INOPERATIVE

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

To rotate the air inlet door actuator, the FCIM supplies voltage and ground to the air inlet door actuator through the door actuator motor circuits. To reverse the air inlet door actuator rotation, the FCIM reverses the voltage and ground circuits. The air inlet door actuator feedback resistors are supplied a ground from the FCIM by the air inlet door actuator return circuits and a 5-volt reference voltage on the air inlet door actuator reference circuits. The FCIM uses the actuator feedback resistor wiper arm position and the voltage on the air distribution door actuator feedback circuits to determine the air inlet door actuator position.

During an actuator calibration cycle, the FCIM drives the air inlet door until the door reaches both internal stops in the FCIM case. If the air inlet mode door is temporarily obstructed or binding during a calibration cycle, the FCIM may interpret this as the actual end of travel for the door. When this condition occurs and the FCIM commands the actuator to its end of travel, the air intake may not be from the expected source.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1083:07	Recirculation Damper Motor: Mechanical Failures	Module senses the air inlet door actuator motor control is awake, no actuator drive, stall before achieving target position within 15 seconds.
FCIM B1083:11	Recirculation Damper Motor: Circuit Short To Ground	Module senses a short to ground on air inlet door actuator circuits when motor movement is commanded.
FCIM B1083:12	Recirculation Damper Motor: Circuit Short To Battery	Module senses a short to voltage on air inlet door actuator circuits when motor movement is commanded.
FCIM B1083:13	Recirculation Damper Motor: Circuit Open	Module senses an open on air inlet door actuator circuits when motor movement is commanded.
FCIM B11F0:12	Air Intake Damper Position Sensor: Circuit Short To Battery	Module senses greater than 5 volts on the actuator feedback circuit, indicating a short to voltage.
FCIM B11F0:14	Air Intake Damper Position Sensor: Circuit Short To Ground Or Open	Module senses less than 1 volt on the actuator feedback circuit, indicating an open circuit or a short to ground.

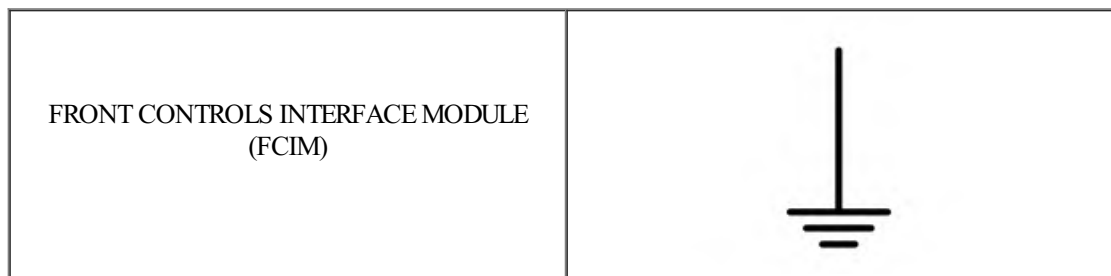
Possible Sources

- Wiring, terminals or connectors
- Actuator door binding, stuck or slipping
- Air inlet door actuator
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

D1 CHECK THE AIR INLET DOOR ACTUATOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Ignition ON.
- Measure:



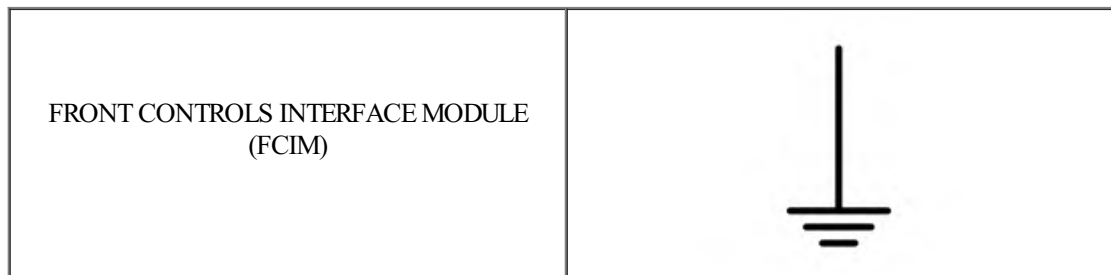
Positive Lead	Measurement / Action	Negative Lead
C2402A-2		Ground
C2402A-16		Ground
C2402A-3		Ground
C2402A-24		Ground
C2402A-25		Ground

Is there any voltage present?

Yes	REPAIR the circuit.
No	GO to D2

D2 CHECK THE AIR INLET DOOR ACTUATOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	Ground
C2402A-16	Ω	Ground
C2402A-3	Ω	Ground
C2402A-24	Ω	Ground
C2402A-25	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to D3
No	REPAIR the circuit.

D3 CHECK THE AIR INLET DOOR ACTUATOR CIRCUITS FOR AN OPEN

NOTE: Access to the connector in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect Air inlet door actuator [C289](#) .
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	AIR INLET DOOR ACTUATOR
---	-------------------------

Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	C289-1
C2402A-16	Ω	C289-2
C2402A-3	Ω	C289-3
C2402A-24	Ω	C289-5
C2402A-25	Ω	C289-6

Are the resistances less than 3 ohms?

Yes	GO to D4
No	REPAIR the circuit.

D4 CHECK THE AIR INLET DOOR ACTUATOR CIRCUITS FOR A SHORT TOGETHER

NOTE: Access to the connectors in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect In-vehicle temperature and humidity sensor [C2247](#) .
- Disconnect Drivers side temperature door actuator [C2091](#) .
- Disconnect Passenger side temperature door actuator [C2092](#) .
- Disconnect Air distribution door actuator [C236](#) .
- Measure:

AIR INLET DOOR ACTUATOR

Positive Lead	Measurement / Action	Negative Lead
C289-1	Ω	C289-2
C289-1	Ω	C289-3
C289-1	Ω	C289-5
C289-1	Ω	C289-6
C289-2	Ω	C289-3
C289-2	Ω	C289-5
C289-2	Ω	C289-6
C289-3	Ω	C289-5
C289-3	Ω	C289-6
C289-5	Ω	C289-6

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new air inlet door actuator. REFER to: Air Inlet Door Actuator (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to D5
No	REPAIR the circuit.

D5 CHECK FOR CORRECT FRONT CONTROLS INTERFACE MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect all the FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “ clean module pins)
 - damaged or bent pins “ install new terminals/pins
 - pushed-out pins “ install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM).
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST E : INCORRECT OR ERRATIC DIRECTION OF AIRFLOW FROM OUTLETS

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

To rotate the air distribution door actuator, the FCIM supplies voltage and ground to the air distribution door actuator through the door actuator motor circuits. To reverse the air distribution door actuator rotation, the FCIM reverses the voltage and ground circuits. The air distribution door actuator feedback resistors are supplied a ground from the FCIM by the air distribution door actuator return circuits and a 5-volt reference voltage on the air distribution door actuator reference circuits. The FCIM uses the actuator feedback resistor wiper arm position and the voltage on the air distribution door actuator feedback circuits to determine the air distribution door actuator position.

During an actuator calibration cycle, the FCIM drives the air distribution door until the door reaches both internal stops in the FCIM case. If the air distribution door is temporarily obstructed or binding during a calibration cycle, the FCIM may interpret this as the actual end of travel for the door. When this condition occurs and the FCIM commands the actuator to its end of travel, the airflow may not be from the expected outlets.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1086:07	Air Distribution Damper Motor: Mechanical Failures	Module senses the air distribution door actuator motor control is awake, no actuator drive, stall before achieving target position within 15 seconds.
FCIM B1086:11	Air Distribution Damper Motor: Circuit Short To Ground	Module senses a short to ground on air distribution door actuator circuits when motor movement is commanded.
FCIM B1086:12	Air Distribution Damper Motor: Circuit Short To Battery	Module senses a short to voltage on air distribution door actuator circuits when motor movement is commanded.
FCIM B1086:13	Air Distribution Damper Motor: Circuit Open	Module senses an open on air distribution door actuator circuits when motor movement is commanded.
FCIM B11E7:12	Air Distribution Damper Position Sensor: Circuit Short To Battery	Module senses greater than 5 volts on the actuator feedback circuit, indicating a short to voltage
FCIM B11E7:14	Air Distribution Damper Position Sensor: Circuit Short To Ground Or Open	Module senses less than 1 volt on the actuator feedback circuit, indicating an open circuit or a short to ground

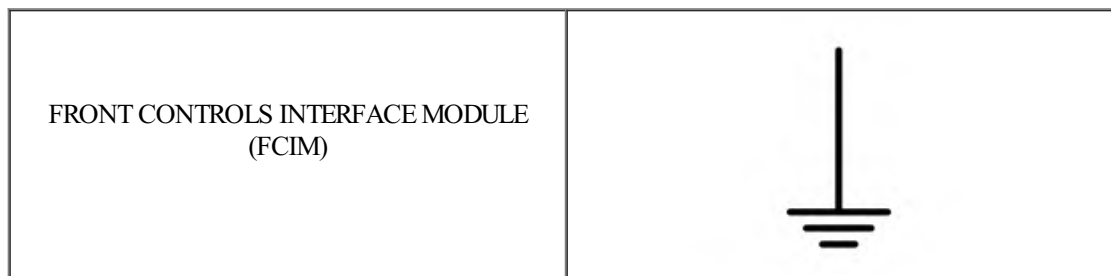
Possible Sources

- Wiring, terminals or connectors
- Actuator doors binding, stuck or slipping
- Air distribution door actuator
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

E1 CHECK THE AIR DISTRIBUTION DOOR ACTUATOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Ignition ON.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-20		Ground
C2402A-2		Ground
C2402A-3		Ground
C2402A-22		Ground
C2402A-21		Ground

Is there any voltage present?

Yes	REPAIR the circuit.
No	GO to E2

E2 CHECK THE AIR DISTRIBUTION DOOR ACTUATOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	
---	--

Positive Lead	Measurement / Action	Negative Lead
C2402A-20	Ω	Ground
C2402A-2	Ω	Ground
C2402A-3	Ω	Ground
C2402A-22	Ω	Ground
C2402A-21	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to E3
No	REPAIR the circuit.

E3 CHECK THE AIR DISTRIBUTION DOOR ACTUATOR CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect Air distribution door actuator [C236](#) .
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	AIR DISTRIBUTION DOOR ACTUATOR
---	--------------------------------

Positive Lead	Measurement / Action	Negative Lead
C2402A-20	Ω	C236-1
C2402A-2	Ω	C236-2
C2402A-3	Ω	C236-3
C2402A-22	Ω	C236-4
C2402A-21	Ω	C236-6

Are the resistances less than 3 ohms?

Yes	GO to E4
No	REPAIR the circuit.

E4 CHECK THE AIR DISTRIBUTION DOOR ACTUATOR CIRCUITS FOR A SHORT TOGETHER

NOTE: Access to the connectors in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect In-vehicle temperature and humidity sensor [C2247](#) .
- Disconnect Drivers side temperature door actuator [C2091](#) .
- Disconnect Passenger side temperature door actuator [C2092](#) .
- Disconnect Air inlet door actuator [C289](#) .
- Measure:

AIR DISTRIBUTION DOOR ACTUATOR

Positive Lead	Measurement / Action	Negative Lead
C236-1	Ω	C236-2
C236-1	Ω	C236-3
C236-1	Ω	C236-4
C236-1	Ω	C236-6
C236-2	Ω	C236-3
C236-2	Ω	C236-4
C236-2	Ω	C236-6
C236-3	Ω	C236-4
C236-3	Ω	C236-6
C236-4	Ω	C236-6

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new air distribution door actuator, REFER to: Air Distribution Door Actuator (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to E5
No	REPAIR the circuit.

E5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all the FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST F : INSUFFICIENT, ERRATIC OR NO HEAT

Normal Operation and Fault Conditions

When the engine is at operating temperature hot coolant flows from the engine through the heater core and back to the engine. Correct coolant temperatures are critical for good heater performance.

Possible Sources

- Low engine coolant level
- Plugged or partially plugged heater core
- Temperature door binding or stuck
- Temperature door actuator

Visual Inspection and Pre-checks

- Inspect for low engine coolant level.

F1 CHECK FOR CORRECT ENGINE COOLANT LEVEL

- Ignition OFF.
- Check the engine coolant level.

Is the engine coolant at the correct level (hot or cold) as indicated on the engine coolant recovery reservoir?

Yes	GO to F3
No	GO to F2

F2 CHECK THE ENGINE COOLING SYSTEM FOR LEAKS

- Pressure test the cooling system for leaks. Refer to the appropriate section in Group 303 for the procedure.

Does the cooling system leak?

Yes	REPAIR the coolant leak.
No	FILL and BLEED the cooling system. Refer to the appropriate section in Group 303 for the procedure. After filling and bleeding the cooling system, GO to F3

F3 CHECK FOR COOLANT FLOW TO THE HEATER CORE

- Run the motor until it reaches normal operating temperature. Refer to the appropriate engine cooling section specifications for temperatures, group 303-03, specifications. Select the floor position on the control assembly. Set the temperature control to full warm and the blower to the lowest setting.
- Increase engine speed to 3,500 RPM and hold for 30 seconds.
- Allow the engine to idle for 30 seconds.
- Using a suitable temperature measuring device, check the heater core inlet hose to see if it is hot, near the normal engine operating temperature.

Is the heater core inlet hose hot, near the normal engine operating temperature?

Yes	GO to F4
No	Diagnose the engine cooling system does not reach operating temperature. Refer to the appropriate section in Group 303 for the procedure.

F4 CHECK FOR A PLUGGED OR RESTRICTED HEATER CORE

- Using a suitable temperature measuring device, measure the heater core outlet hose temperature.

Is the heater core outlet hose temperature similar to the inlet hose temperature (within approximately 6-17°C [10-30°F])?

Yes	DIAGNOSE for a blend door actuator not operating correctly. For inadequate driver side temperature, GO to Pinpoint Test I For inadequate passenger side temperature, GO to Pinpoint Test J
No	REFER to the appropriate General Procedure in Group 303-03, Heater Core Backflushing or Engine Cooling System Flushing. REPAIR as needed. If the concern is still present after flushing the system, INSTALL a new heater core. REFER to: Heater Core (412-00 Climate Control System - General Information, Removal and Installation).

PINPOINT TEST G : THE A/C (AIR CONDITIONING) IS INOPERATIVE

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Control System Logic REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P145B:00	A/C Demand Not Activated During Self Test: No Sub Type Information	Sets when the PCM does not sense an A/C request during a PCM self-test.

Possible Sources

- Wiring, terminals or connectors
- A/C system discharged or low refrigerant charge
- Network concerns
- A/C pressure transducer
- Evaporator temperature sensor
- Electric cooling fan (if equipped)
- Temperature sensors
- Active grille shutters (if equipped)
- BJB
- A/C compressor clutch air gap
- A/C compressor clutch field coil
- FCIM

Visual Inspection and Pre-checks

- Inspect BJB fuses 17 (20A) and 20 (10A)

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

NOTE: Some Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs) may inhibit Air Conditioning (A/C) operation. If any Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs) are retrieved, diagnose those first. Refer to the Diagnostic Trouble Code (DTC) Chart.

G1 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCs)

- Ignition ON.
- Make sure the HVAC control module is powered ON.
- Using a diagnostic scan tool, clear the PCM Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, carry out the PCM KOEO self-test.

Does DTC P145B return?

Yes	GO to G2
No	IGNORE the DTC and CONTINUE diagnosing other Diagnostic Trouble Codes (DTCs) or symptoms. GO to the DTC Chart or Symptom Chart â€” Climate Control in this section.

G2 CHECK THE A/C (AIR CONDITIONING) SYSTEM PRESSURE

NOTE: Static refrigerant pressure, under perfect conditions, should approximately reflect ambient air temperature. Do not rely upon the static refrigerant pressure alone to determine if the system is properly charged. Refer to the current Ford Web Based Technical Training courses for basic HVAC system refrigerant operation.

- Ignition OFF.
- Connect a manifold gauge set.
- With the manifold gauge set connected, check for minimum A/C system pressure.

Is the A/C system pressure above 290 kPa (42 psi)?

Yes	GO to G3
No	CHECK the A/C system for leaks. REFER to the appropriate General Procedures in Group 412-00. After the leak is repaired, RECHARGE the A/C system. REFER to the appropriate General Procedure in Group 412-00.

G3 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, carry out the network test.

Do the FCIM and the PCM pass the network test?

Yes	GO to G4
No	DIAGNOSE the FCIM or PCM does not communicate with the diagnostic scan tool. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

G4 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) PRESSURE SENSOR (ACP_PRESS) PID (PARAMETER IDENTIFICATION)

NOTE: The following pinpoint test step is tested in ambient temperature of approximately 21.1 $\hat{A}$ °C (70 $\hat{A}$ °F). As ambient temperatures near 38 $\hat{A}$ °C (100.4 $\hat{A}$ °F), the pressure value difference increases above $\hat{A}\pm 15$ psi (103 kPa) range.

- Ignition ON.
- With a manifold gauge set connected, compare the pressure readings of the manifold gauge set and the

Access the PCM and monitor the ACP_PRESS (kPa) PID

Are the pressure values of the manifold gauge set and the ACP_PRESS PCM PID, dependent upon ambient temperatures, within $\hat{A}\pm 103$ kPa (15 psi)?

Yes	If equipped with electric cooling fan, GO to G5 If not equipped with electric cooling fan, GO to G6
No	DIAGNOSE the A/C pressure transducer. GO to Pinpoint Test A

G5 ELECTRIC COOLING FAN FUNCTIONAL CHECK

- Ignition ON.
- Using a diagnostic scan tool, carry out the PCM KOEO self-test.

Does the electric cooling fan operate during the KOEO self-test?

Yes	GO to G6
No	DIAGNOSE the electric cooling fan operation. REFER to Powertrain Control/Emissions Diagnosis (PC/ED) manual, Section 3 Symptom Charts.

G6 COMPARE THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C EVAPORATOR TEMPERATURE (EVAP_TEMP) PID (PARAMETER IDENTIFICATION) TO THE PCM (POWERTRAIN CONTROL MODULE) AMBIENT AIR TEMPERATURE (AAT) PID (PARAMETER IDENTIFICATION)

- Ignition OFF.
- Allow the vehicle exterior and interior to stabilize to ambient temperature. This can take a soak period of at least 6 hours.
- Ignition ON.
- Using a diagnostic scan tool, monitor and record the
Access the PCM and monitor the AAT (Deg C) PID
.
- Monitor and record the
Access the FCIM and monitor the EVAP_TEMP (Deg C) PID
.

Are the temperature values similar [typically within 18Â°C (32.4Â°F)]?

Yes	GO to G7
No	DIAGNOSE the evaporator temperature sensor. GO to Pinpoint Test P

G7 COMPARE THE PCM (POWERTRAIN CONTROL MODULE) INTAKE AIR TEMPERATURE (IAT) PID (PARAMETER IDENTIFICATION) AND THE OTHER TEMPERATURE SENSOR READINGS TO THE PCM (POWERTRAIN CONTROL MODULE) AMBIENT AIR TEMPERATURE (AAT) PID (PARAMETER IDENTIFICATION)

NOTE: Compare multiple engine sensor readings to the ambient temperature to determine sensors are reading correctly. A faulty sensor can cause the Powertrain Control Module (PCM) to disable the Air Conditioning (A/C) with or without a Diagnostic Trouble Code (DTC).

- Allow the vehicle exterior and interior to stabilize to ambient temperature. This can take a soak period of at least 6 hours.
- Monitor the temperature Parameter Identifications (PIDs) (as applicable):
 - Access the PCM and monitor the AAT (Deg C) PID
 - Access the PCM and monitor the CAC_T (Deg C) PID
 - Access the PCM and monitor the CHT (Deg C) PID
 - Access the PCM and monitor the ECT (Deg C) PID
 - Access the PCM and monitor the IAT (Deg C) PID
 - Access the PCM and monitor the IAT2 (Deg C) PID

Are the temperature values similar [typically within 18Â°C (32.4Â°F)]?

Yes	If equipped with grille shutter, GO to G8 If not equipped with grille shutter, GO to G9
No	DIAGNOSE the suspect temperature sensor. REFER to Section 413-01 for Ambient Air Temperature (AAT) sensor or Outside Air Temperature Display concerns. For all other temperature sensor concerns, REFER to Powertrain Control/Emissions Diagnosis (PC/ED) manual.

G8 VERIFY THE GRILLE SHUTTER OPERATION USING THE PCM (POWERTRAIN CONTROL MODULE) GRILL SHUTTER A POSITION - COMMANDED (GRILL_A_CMD) PID (PARAMETER IDENTIFICATION)

- Start the engine and allow it to idle for at least 30 seconds to allow for the grille shutter calibration to complete.
- Access the PCM and control the GRILL_A_CMD (% Open) PID
- Using a diagnostic scan tool, command the grille shutter from 100% (open) to 0% (closed) while observing the grille shutter operation from the front of the vehicle.

Does the grille shutter fully open and close when commanded by the scan tool?

Yes	GO to G9
No	DIAGNOSE the active grille shutter is inoperative or does not operate correctly. REFER to the appropriate procedure in section 501-02.

G9 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C (AIR CONDITIONING) SWITCH (CC_SW_AC) PID (PARAMETER IDENTIFICATION) WITH THE A/C (AIR CONDITIONING) ON

- Access the FCIM and monitor the CC_SW_AC PID
- On the HVAC controls, select PANEL and then press the A/C button (indicator ON).

Does the PID display Active or On when the button is pressed?

Yes	GO to G10
No	GO to G18

G10 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) REQUEST SIGNAL (AC_REQ) PID (PARAMETER IDENTIFICATION) WITH THE A/C (AIR CONDITIONING) ON

- Start the engine.
- Access the PCM and monitor the AC_REQ PID
- On the HVAC controls, select PANEL and then press the A/C button (indicator ON).

Does the PID display ON or Yes when the button is pressed?

Yes	GO to G12
No	GO to G11

G11 RESET THE AMBIENT AIR TEMPERATURE (AAT) SENSOR

- On the HVAC controls, press the A/C (air conditioning) and Recirc buttons simultaneously for 5 seconds, then release both. Within 2 seconds press A/C button again.
- Start the engine.
- On the HVAC controls, set the temperature to full cold, select PANEL and select the A/C button (indicator ON).

Does the A/C compressor turn on?

Yes	TEST the A/C system for normal operation. REFER to the appropriate Refrigerant System Tests General Procedure in Group 412-00.
No	GO to G12

G12 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) COMPRESSOR COMMANDED STATE (ACC_CMD) PID (PARAMETER IDENTIFICATION) WITH THE A/C (AIR CONDITIONING) COMMANDED ON

- Access the PCM and control the ACC_CMD PID

Does the A/C compressor turn on?

Yes	GO to G19
No	GO to G13

G13 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY COIL CONTROL CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect PCM [C175B](#) Gasoline [C1232B](#) Diesel.
- Disconnect BJB [C1035A](#).
- For vehicles equipped with a gasoline engine, measure:

BATTERY JUNCTION BOX (BJB)	POWERTRAIN CONTROL MODULE (PCM)
----------------------------	---------------------------------

Positive Lead	Measurement / Action	Negative Lead
C1035A-27	Ω	C175B-19

- For vehicles equipped with a diesel engine, measure:

BATTERY JUNCTION BOX (BJB)	POWERTRAIN CONTROL MODULE (PCM)
----------------------------	---------------------------------

Positive Lead	Measurement / Action	Negative Lead
C1035A-27	Ω	C1232B-82

Is the resistance less than 3 ohms?

Yes	GO to G14
No	REPAIR the circuit.

G14 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH FIELD COIL GROUND CIRCUIT FOR AN OPEN

- Disconnect A/C clutch and A/C clutch field coil [C100](#) .
- Measure:

AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL	
---	--

Positive Lead	Measurement / Action	Negative Lead
C100-2	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to G15
No	REPAIR the circuit.

G15 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH FIELD COIL VOLTAGE SUPPLY CIRCUIT FOR AN OPEN

- Measure:

BATTERY JUNCTION BOX (BJB)	AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL
----------------------------	---

Positive Lead	Measurement / Action	Negative Lead
C1035A-12	Ω	C100-1

Is the resistance less than 3 ohms?

Yes	GO to G16
No	REPAIR the circuit.

G16 CHECK THE AIR CONDITIONING CLUTCH RELAY OPERATION

- Connect PCM [C175B](#) Gasoline [C1232B](#) Diesel.
- Connect BJB [C1035A](#).
- Ignition ON.
- Access the PCM and control the ACC_CMD PID
- Measure:

AIR CONDITIONING (A/C) CLUTCH AND AIR
CONDITIONING (A/C) CLUTCH FIELD COIL



Positive Lead	Measurement / Action	Negative Lead
C100-1	A small icon of a multimeter with a red '+' sign and a black '-' sign.	Ground

Is the voltage greater than 11 volts?

Yes	GO to G17
No	VERIFY BJB fuses 17 (20A) and 20 (10A) are OK. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. If OK, INSTALL a new BJB.

G17 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH AIR GAP

- Measure the A/C compressor clutch air gap at 3 equally spaced locations between the clutch hub and the A/C compressor clutch pulley. Refer to the appropriate General Procedure in Group 412-00.

Is the A/C compressor clutch air gap greater than 0.6 mm (0.0236 in)?

Yes	ADJUST the A/C compressor clutch air gap. REFER to the appropriate General Procedure in Group 412-00.
No	INSTALL a new A/C compressor clutch and A/C clutch field coil. REFER to the appropriate General Procedure in Group 412-00.

G18 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “ clean module pins)
 - damaged or bent pins “ install new terminals/pins
 - pushed-out pins “ install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

G19 CHECK FOR AN INPUT DISABLING THE A/C (AIR CONDITIONING) CLUTCH RELAY

NOTE: The PCM strategy may disable the A/C compressor operation. If the A/C compressor clutch can be commanded on using a diagnostic scan tool PCM Parameter Identifications (PIDs) Active Commands, PCM replacement will not resolve the condition.

- Diagnose the PCM not energizing the A/C clutch relay using the suggestions in the table below.

A/C Clutch Engagement is inhibited because strategy has not yet detected hardware that indicates vehicle is equipped with A/C
A/C Clutch Engagement is inhibited because the strategy is operating in Ignition System Failure Mode
A/C Clutch Engagement is inhibited because the (ECU) received a Request to Command the A/C Off
A/C Clutch Engagement is inhibited because the engine has not yet reached a stable running mode after starting
A/C Clutch Engagement is inhibited because the A/C Discharge (Head) Pressure is Too High
A/C Clutch Engagement is inhibited because the Engine Coolant Temperature is Too High
A/C Clutch Engagement is inhibited to Prevent Frost and Ice Build Up on the Evaporator
A/C Clutch Engagement is inhibited to Prevent an Engine Stall during a Low Engine Speed condition
A/C Clutch Engagement is inhibited to Protect the Compressor from a Compressor Over-speed condition
A/C Clutch Engagement is inhibited to temporarily make more power available when Accelerator Pedal is Fully Depressed
A/C Clutch Engagement is inhibited because Low A/C Refrigerant Charge has been detected
A/C Clutch Engagement is inhibited to Protect the Compressor from Operating at Too Low of an Ambient Temperature
A/C Clutch Engagement is inhibited due to Missing Climate Control Message
A/C Clutch Engagement is inhibited because the strategy is operating in Failsafe Cooling Mode
A/C Clutch Engagement is inhibited to Protect the Clutch from Damage because the Compressor Load and Speed are Too High
A/C Clutch Engagement is inhibited by the off portion of the A/C Cycling Strategy invoked to manage High Engine Temperature
A/C Clutch Engagement is inhibited due to Low Battery State of Charge
A/C Clutch Engagement is inhibited to Protect the Variable Displacement Compressor from Operating at Too Low of a Temperature
A/C Clutch Engagement is inhibited to improve Brake Booster Vacuum
A/C Clutch Engagement is inhibited because Evaporator Temperature is sufficiently low and compressor was at minimum displacement
A/C Clutch Engagement is inhibited (Disabled) because the Evaporator Temperature is sufficiently below the target temperature
A/C Clutch Engagement is inhibited to satisfy A/C Clutch minimum off time
A/C Clutch Engagement is inhibited Due to Request from Torque Control Strategy (to Temporarily Make More Power Available)
A/C Clutch Engagement is inhibited to Prevent Engine Stalling
A/C Clutch Engagement is inhibited Due to Request to Disable A/C from Stop-Start Strategy
A/C Clutch Engagement is inhibited (Delayed) to make Power Available for Power Steering
A/C Clutch Engagement Is Inhibited Due To State Of Auxiliary A/C Disable (Typically A Pressure Or Temperature) Switch 1 input
A/C Clutch Engagement is inhibited due to state of auxiliary A/C Disable (Typically a Pressure or Temperature) Switch 2 input

Are any of the conditions described above not within normal parameters?

Yes	DIAGNOSE the condition found to be disabling the A/C clutch relay. REFER to the appropriate Workshop Manual (WSM) section or the Powertrain Control/Emissions Diagnosis (PC/ED) manual.
No	The A/C compressor clutch can be commanded on using a diagnostic scan tool PCM Active command PID. The A/C inoperative concern may be caused by an intermittent condition due to a component or module connection, wiring or pin issue. ADDRESS the root cause of any connector or pin issues. CHECK the vehicle service history for recent service actions that have replaced modules. This condition may be due to incomplete or incorrect PMI procedures.

PINPOINT TEST H : THE A/C (AIR CONDITIONING) IS ALWAYS ON - A/C (AIR CONDITIONING) MODE ALWAYS COMMANDED ON

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Control System Logic REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P1464:00	A/C Demand Out Of Self Test Range: No Sub Type Information	DTC sets when the PCM senses an A/C request during a PCM self-test.

Possible Sources

- Wiring, terminals or connectors
- A/C pressure transducer
- Evaporator temperature sensor
- FCIM
- PCM

Visual Inspection and Pre-checks

- Inspect BJB fuses 17 (20A) and 20 (10A)

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

H1 RECHECK THE PCM (POWERTRAIN CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Make sure the HVAC control module is powered off.
- Using a diagnostic scan tool, clear the PCM Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, carry out the PCM self-test.

Does DTC P1464 return?

Yes	GO to H2
No	IGNORE the DTC and CONTINUE diagnosing other Diagnostic Trouble Codes (DTCs) or symptoms. GO to the DTC Chart: PCM or Symptom Chart “Climate Control” in this section.

H2 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR CLUTCH FIELD COIL VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect A/C compressor clutch field coil [C100](#) .
- Ignition ON.
- Measure:

AIR CONDITIONING (A/C) CLUTCH AND AIR CONDITIONING (A/C) CLUTCH FIELD COIL	
---	--

Positive Lead	Measurement / Action	Negative Lead
C100-1		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to H3

H3 COMPARE THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C EVAPORATOR TEMPERATURE (EVAP_TEMP) PID (PARAMETER IDENTIFICATION) TO THE PCM (POWERTRAIN CONTROL MODULE) AMBIENT AIR TEMPERATURE (AAT) PID (PARAMETER IDENTIFICATION)

- Ignition OFF.
- Allow the vehicle exterior and interior to stabilize to ambient temperature.
- Ignition ON.
- Monitor and record the
Access the FCIM and monitor the EVAP_TEMP (Deg C) PID
- Monitor and record the
Access the PCM and monitor the AAT (Deg C) PID

Are the temperature values similar (typically within 18Â°C (32.4Â°F))?

Yes	GO to H4
No	GO to Pinpoint Test P

H4 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C (AIR CONDITIONING) SWITCH STATUS (CC_SW_AC) PID (PARAMETER IDENTIFICATION)

- Ignition ON.
- Access the FCIM and monitor the CC_SW_AC PID
- Select panel mode, press and release the A/C button (indicator off) on the HVAC controls.

Does the PID display Active when pressed and Inactive when released?

Yes	GO to H5
No	GO to H8

H5 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) PRESSURE SENSOR (ACP_PRESS) PID (PARAMETER IDENTIFICATION)

NOTE: The following pinpoint test step is tested in ambient temperature of approximately 21.1°C (70°F). As ambient temperatures near 38°C (100.4°F), the pressure value difference increases above ± 15 psi (103 kPa) range.

- Ignition ON.
 - With a manifold gauge set connected, compare the pressure readings of the manifold gauge set and the
- Access the PCM and monitor the ACP_PRESS (kPa) PID

Are the pressure values of the manifold gauge set and the ACP_PRESS PCM PID, dependent upon ambient temperatures, within ± 103 kPa (15 psi)?

Yes	GO to H6
No	DIAGNOSE the A/C pressure transducer. GO to Pinpoint Test A

H6 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) REQUEST SIGNAL (AC_REQ) PID (PARAMETER IDENTIFICATION) WITH THE A/C (AIR CONDITIONING) OFF

- Access the PCM and monitor the AC_REQ PID
- While in panel mode, release the A/C button (indicator off) on the HVAC controls.

Does the PID display No or OFF?

Yes	GO to H9
No	GO to H7

H7 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) REQUEST SIGNAL (AC_REQ) PID (PARAMETER IDENTIFICATION) WITH FCIM (FRONT CONTROLS INTERFACE MODULE) DISCONNECTED

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Ignition ON.
- Access the PCM and monitor the AC_REQ PID

Does the PID display No or OFF?

Yes	GO to H9
No	GO to H8

H8 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

H9 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all PCM connectors. Make sure they seat and latch correctly.
- Operate the system and verify the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW TSB instructions. If no Technical Service Bulletins (TSBs) address this concern, Click here to access Guided Routine (PCM) .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST I : THE TEMPERATURE CONTROL IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY - DRIVER SIDE

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

To rotate the driver side temperature door actuator, the FCIM supplies voltage and ground to the temperature door actuator through the motor circuits. To reverse the temperature door actuator rotation, the FCIM reverses the voltage and ground circuits. The actuator feedback resistors are supplied a ground from the FCIM by the actuator return circuits and a 5-volt reference voltage on the actuator reference circuits. The FCIM uses the actuator feedback resistor wiper arm position and the voltage on the actuator feedback circuits to determine the temperature door actuator position.

During an actuator calibration cycle, the FCIM drives the temperature door until the door reaches both internal stops in the HVAC case. If the temperature door is temporarily obstructed or binding during a calibration cycle, the FCIM may interpret this as the actual end of travel for the door. When this condition occurs and the FCIM commands the actuator to its end of travel, the temperature may not be as expected.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1081:07	Left Temperature Damper Motor: Mechanical Failures	Module senses the temperature door actuator motor control is awake, no actuator drive, stall before achieving target position within 15 seconds.
FCIM B1081:11	Left Temperature Damper Motor: Circuit Short To Ground	Module senses a short to ground on the temperature door actuator circuits when motor movement is commanded.
FCIM B1081:12	Left Temperature Damper Motor: Circuit Short To Battery	Module senses a short to voltage on the temperature door actuator circuits when motor movement is commanded.
FCIM B1081:13	Left Temperature Damper Motor: Circuit Open	Module senses an open on the temperature door actuator circuits when motor movement is commanded.
FCIM B11E5:12	Left HVAC Damper Position Sensor: Circuit Short To Battery	Module senses greater than 5 volts on the temperature door actuator feedback circuit, indicating a short to voltage
FCIM B11E5:14	Left HVAC Damper Position Sensor: Circuit Short To Ground Or Open	Module senses less than 1 volt on the temperature door actuator feedback circuit, indicating an open circuit or a short to ground

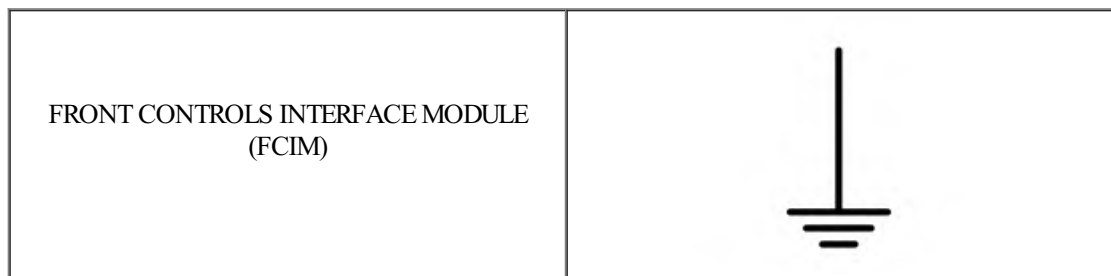
Possible Sources

- Wiring, terminals or connectors
- Actuator doors binding, stuck or slipping
- Temperature door actuator
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

II CHECK THE DRIVER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Ignition ON.
- Measure:



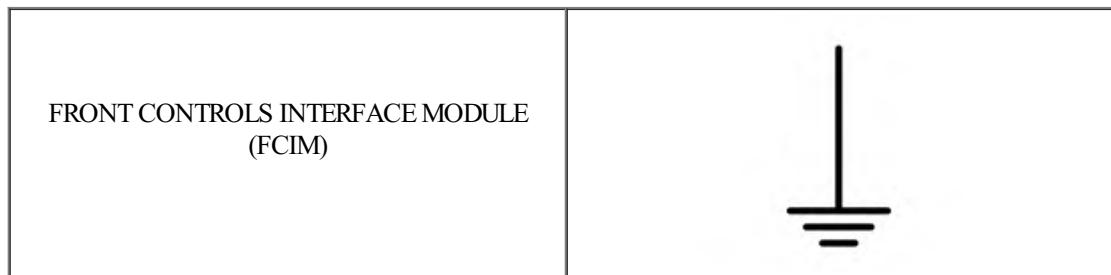
Positive Lead	Measurement / Action	Negative Lead
C2402A-8		Ground
C2402A-2		Ground
C2402A-3		Ground
C2402A-10		Ground
C2402A-9		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to I2

I2 CHECK THE DRIVER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-8	Ω	Ground
C2402A-2	Ω	Ground
C2402A-3	Ω	Ground
C2402A-10	Ω	Ground
C2402A-9	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to I3
No	REPAIR the circuit.

I3 CHECK THE DRIVER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR AN OPEN

- Disconnect Drivers side temperature door actuator [C2091](#) .
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	DRIVER SIDE TEMPERATURE DOOR ACTUATOR
---	--

Positive Lead	Measurement / Action	Negative Lead
C2402A-8	Ω	C2091-1
C2402A-2	Ω	C2091-2
C2402A-3	Ω	C2091-3
C2402A-10	Ω	C2091-4
C2402A-9	Ω	C2091-6

Are the resistances less than 3 ohms?

Yes	GO to I4
No	REPAIR the circuit.

I4 CHECK THE DRIVER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TOGETHER

NOTE: Access to the connectors in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect In-vehicle temperature and humidity sensor [C2247](#) .
- Disconnect Air inlet door actuator [C289](#) .
- Disconnect Air distribution door actuator [C236](#) .
- Disconnect Passenger side temperature door actuator [C2092](#) .
- Measure:

DRIVER SIDE TEMPERATURE DOOR ACTUATOR

Positive Lead	Measurement / Action	Negative Lead
C2091-1	Ω	C2091-2
C2091-1	Ω	C2091-3
C2091-1	Ω	C2091-4
C2091-1	Ω	C2091-6
C2091-2	Ω	C2091-3
C2091-2	Ω	C2091-4
C2091-2	Ω	C2091-6
C2091-3	Ω	C2091-4
C2091-3	Ω	C2091-6
C2091-4	Ω	C2091-6

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new driver side temperature door actuator. REFER to: Driver Side Temperature Door Actuator (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to I5
No	REPAIR the circuit.

I5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

☐ **PINPOINT TEST J : THE TEMPERATURE CONTROL IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY - PASSENGER SIDE**

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

To rotate the passenger side temperature door actuator, the FCIM supplies voltage and ground to the temperature door actuator through the motor circuits. To reverse the temperature door actuator rotation, the FCIM reverses the voltage and ground circuits. The actuator feedback resistors are supplied a ground from the FCIM by the actuator return circuits and a 5-volt reference voltage on the actuator reference circuits. The FCIM uses the actuator feedback resistor wiper arm position and the voltage on the actuator feedback circuits to determine the temperature door actuator position.

During an actuator calibration cycle, the FCIM drives the temperature door until the door reaches both internal stops in the HVAC case. If the temperature door is temporarily obstructed or binding during a calibration cycle, the FCIM may interpret this as the actual end of travel for the door. When this condition occurs and the FCIM commands the actuator to its end of travel, the temperature may not be as expected.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1082:07	Right Temperature Damper Motor: Mechanical Failures	Module senses the temperature door actuator motor control is awake, no actuator drive, stall before achieving target position within 15 seconds.
FCIM B1082:11	Right Temperature Damper Motor: Circuit Short To Ground	Module senses a short to ground on the temperature door actuator circuits when motor movement is commanded.
FCIM B1082:12	Right Temperature Damper Motor: Circuit Short To Battery	Module senses a short to voltage on the temperature door actuator circuits when motor movement is commanded.
FCIM B1082:13	Right Temperature Damper Motor: Circuit Open	Module senses an open on the temperature door actuator circuits when motor movement is commanded.
FCIM B11E6:12	Right HVAC Damper Position Sensor: Circuit Short To Battery	Module senses greater than 5 volts on the temperature door actuator feedback circuit, indicating a short to voltage
FCIM B11E6:14	Right HVAC Damper Position Sensor: Circuit Short To Ground Or Open	Module senses less than 1 volt on the temperature door actuator feedback circuit, indicating an open circuit or a short to ground

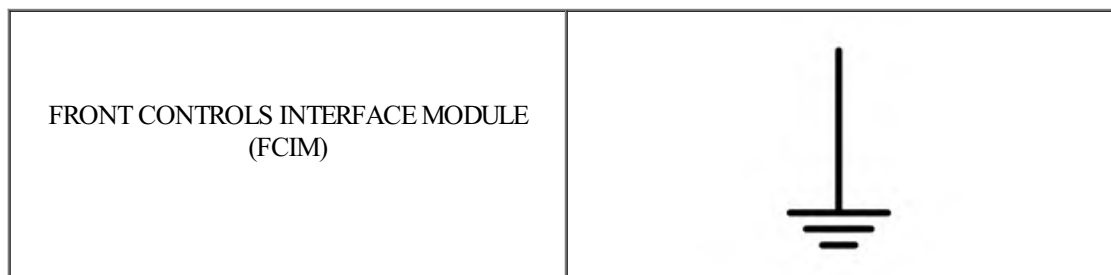
Possible Sources

- Wiring, terminals or connectors
- Actuator doors binding, stuck or slipping
- Temperature door actuator
- FCIM

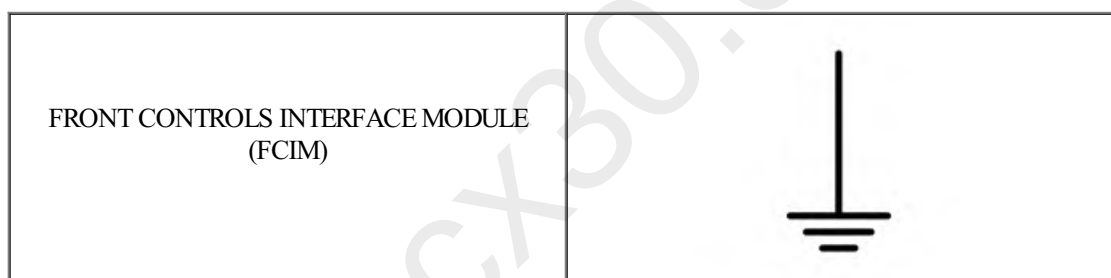
NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

J1 CHECK THE PASSENGER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Disconnect FCIM [C2402B](#) .
- Ignition ON.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-2		Ground
C2402A-3		Ground



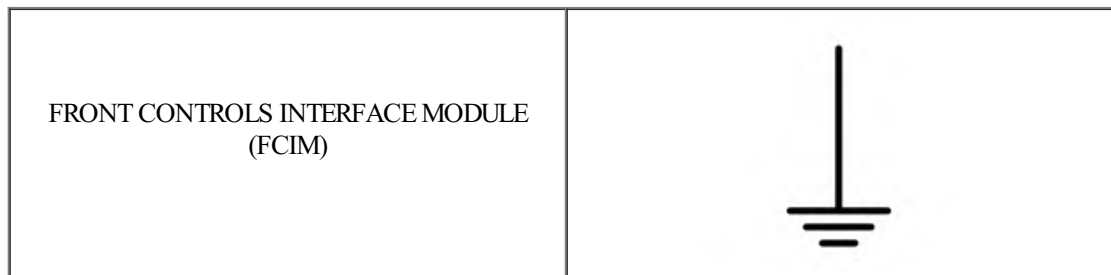
Positive Lead	Measurement / Action	Negative Lead
C2402B-13		Ground
C2402B-18		Ground
C2402B-14		Ground

Is any voltage present?

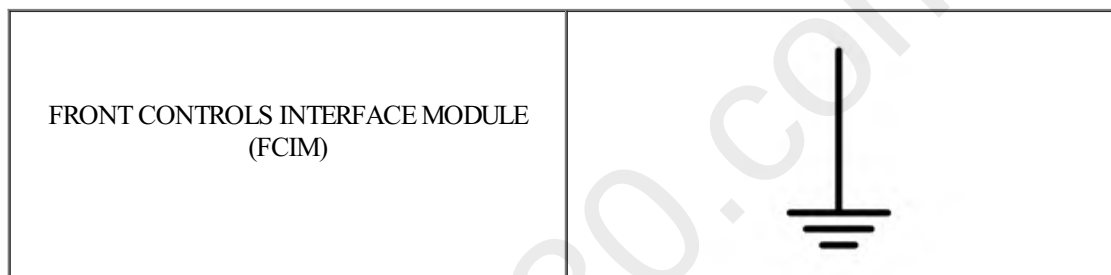
Yes	REPAIR the circuit.
No	GO to J2

J2 CHECK THE PASSENGER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	Ground
C2402A-3	Ω	Ground



Positive Lead	Measurement / Action	Negative Lead
C2402B-13	Ω	Ground
C2402B-18	Ω	Ground
C2402B-14	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to J3
No	REPAIR the circuit.

J3 CHECK THE PASSENGER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR AN OPEN

NOTE: Access to the connector in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect Passenger side temperature door actuator [C2092](#).
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	PASSENGER SIDE TEMPERATURE DOOR ACTUATOR
---	---

Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	C2092-2
C2402A-3	Ω	C2092-3

FRONT CONTROLS INTERFACE MODULE (FCIM)	PASSENGER SIDE TEMPERATURE DOOR ACTUATOR
---	---

Positive Lead	Measurement / Action	Negative Lead
C2402B-13	Ω	C2092-1
C2402B-18	Ω	C2092-4
C2402B-14	Ω	C2092-6

Are the resistances less than 3 ohms?

Yes	GO to J4
No	REPAIR the circuit.

J4 CHECK THE PASSENGER SIDE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TOGETHER

NOTE: Access to the connectors in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect In-vehicle temperature and humidity sensor [C2247](#) .
- Disconnect Drivers side temperature door actuator [C2091](#) .
- Disconnect Air inlet door actuator [C289](#) .
- Disconnect Air distribution door actuator [C236](#) .
- Measure:

PASSENGER SIDE TEMPERATURE DOOR ACTUATOR
--

Positive Lead	Measurement / Action	Negative Lead
C2092-1	Ω	C2092-2
C2092-1	Ω	C2092-3
C2092-1	Ω	C2092-4
C2092-1	Ω	C2092-6
C2092-2	Ω	C2092-3
C2092-2	Ω	C2092-4
C2092-2	Ω	C2092-6
C2092-3	Ω	C2092-4
C2092-3	Ω	C2092-6
C2092-4	Ω	C2092-6

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new passenger side temperature door actuator. REFER to: Passenger Side Temperature Door Actuator (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to J5
No	REPAIR the circuit.

J5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST K : THE BLOWER MOTOR IS INOPERATIVE

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Air Handling REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B10AF:11	Blower Fan Relay: Circuit Short To Ground	Module senses low voltage on the relay coil voltage circuit when the module is energizing the circuit. Blower relay is permanently inactive.
FCIM B10AF:15	Blower Fan Relay: Circuit Short To Battery Or Open	Module senses high voltage when fan is in the off position or no change in voltage on the blower relay coil voltage circuit when the module is energizing the circuit. The blower motor relay is always active when shorted to battery, inactive when circuit is open.
FCIM B10B9:12	Blower Control: Circuit Short To Battery	Module senses high voltage on the blower motor control PWM circuit, indicating a short directly to voltage. The blower motor is inoperative.
FCIM B10B9:14	Blower Control: Circuit Short To Ground Or Open	Module senses no voltage on the blower motor control PWM circuit, indicating a short directly to ground or an open circuit. The blower motor runs at full speed if the circuit is shorted to ground. The blower motor is inoperative if the circuit is open

Possible Sources

- Fuse
- Wiring, terminals or connectors
- Blower motor relay (non-serviceable, part of the BJB)
- Blower motor control module
- FCIM

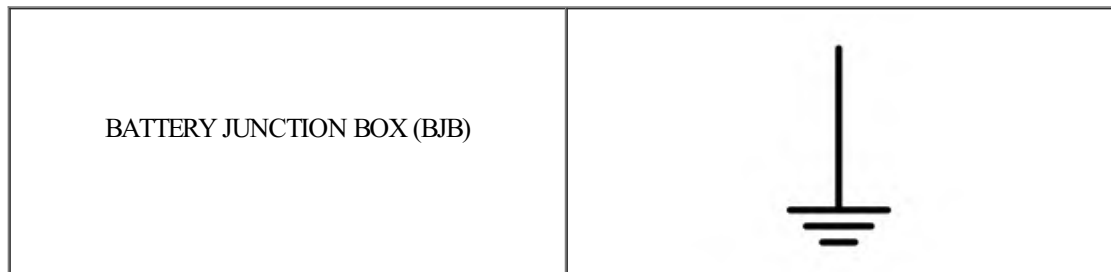
Visual Inspection and Pre-checks

- Make sure BJB fuse 62 (40A) is OK.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

K1 CHECK THE BLOWER MOTOR RELAY COIL GROUND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Disconnect BJB [C1035A](#).
- Measure:



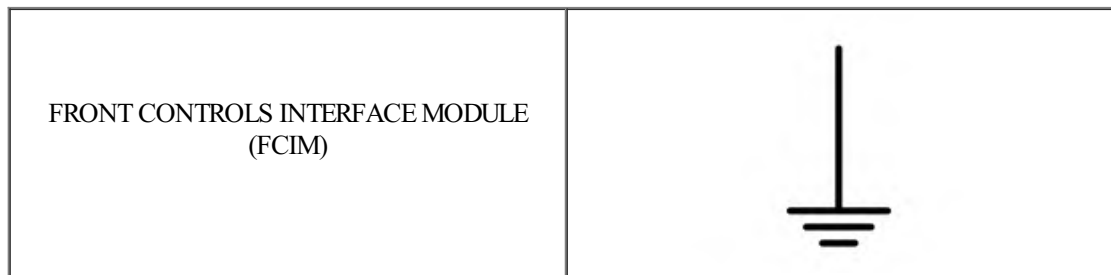
Positive Lead	Measurement / Action	Negative Lead
C1035A-7	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to K2
No	REPAIR the circuit.

K2 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR A SHORT TO GROUND

- Disconnect FCIM [C2402A](#) .
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-11	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to K3
No	REPAIR the circuit.

K3 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR AN OPEN

- Measure:



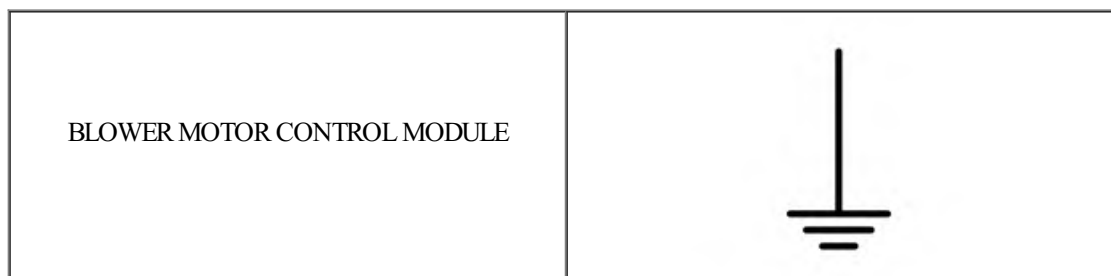
Positive Lead	Measurement / Action	Negative Lead
C2402A-11	Ω	C1035A-20

Is the resistance less than 3 ohms?

Yes	GO to K4
No	REPAIR the circuit.

K4 CHECK THE BLOWER MOTOR CONTROL MODULE PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect Blower motor control module [C297](#) .
- Ignition ON.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C297-4		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to K5

K5 CHECK THE BLOWER MOTOR CONTROL MODULE CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

BLOWER MOTOR CONTROL MODULE	
-----------------------------	--

Positive Lead	Measurement / Action	Negative Lead
C297-3	Ω	Ground
C297-4	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to K6
No	REPAIR the circuit.

K6 CHECK THE BLOWER MOTOR CONTROL MODULE CIRCUITS FOR AN OPEN

- Measure:

BLOWER MOTOR CONTROL MODULE	
-----------------------------	--

Positive Lead	Measurement / Action	Negative Lead
C297-1	Ω	Ground

BLOWER MOTOR CONTROL MODULE

BATTERY JUNCTION BOX (BJB)

Positive Lead	Measurement / Action	Negative Lead
C297-3	Ω	C1035A-30

BLOWER MOTOR CONTROL MODULE

FRONT CONTROLS INTERFACE MODULE
(FCIM)

Positive Lead	Measurement / Action	Negative Lead
C297-4	Ω	C2402A-23

K7 CHECK THE BLOWER MOTOR CONTROL MODULE CIRCUITS FOR A SHORT TOGETHER

Yes	GO to K7
No	REPAIR the circuit.

- Measure:

BLOWER MOTOR CONTROL MODULE

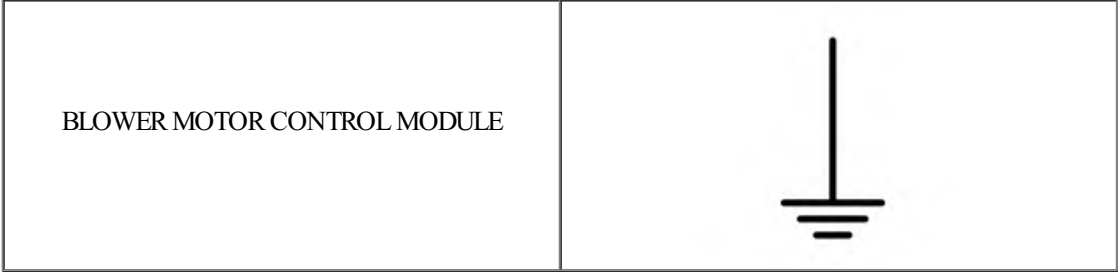
Positive Lead	Measurement / Action	Negative Lead
C297-1	Ω	C297-3
C297-1	Ω	C297-4
C297-3	Ω	C297-4

Are the resistances greater than 10,000 ohms?

Yes	GO to K8
No	REPAIR the circuits.

K8 CHECK FOR VOLTAGE TO THE BLOWER MOTOR CONTROL MODULE

- Connect BJB [C1035A](#) .
- Connect FCIM [C2402A](#) .
- Ignition ON.
- Select PANEL on the HVAC controls.
- Select the highest blower motor setting.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C297-3		Ground

Is the voltage greater than 11 volts?

Yes	GO to K9
No	VERIFY BJB fuse 62 (40A) is OK. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. If OK, INSTALL a new BJB.

K9 CHECK FOR CORRECT BLOWER MOTOR CONTROL MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the blower motor speed control connector.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect the blower motor speed control connector. Make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	INSTALL a new blower motor control module. REFER to: Blower Motor Control Module (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to K10
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

K10 CHECK FOR CORRECT FRONT CONTROLS INTERFACE MODULE (FCIM) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST L : THE BLOWER MOTOR DOES NOT OPERATE CORRECTLY](#)

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Air Handling REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B10AF:15	Blower Fan Relay: Circuit Short To Battery Or Open	Module senses high voltage when fan is in the off position or no change in voltage on the blower relay coil voltage circuit when the module is energizing the circuit. The blower motor relay is always active when shorted to battery, inactive when circuit is open.
FCIM B10B9:14	Blower Control: Circuit Short To Ground Or Open	Module senses no voltage on the blower motor control PWM circuit, indicating a short directly to ground or an open circuit. The blower motor runs at full speed if the circuit is shorted to ground. The blower motor is inoperative if the circuit is open

Possible Sources

- Fuse
- Wiring, terminals or connectors
- Blower motor control module
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

L1 VERIFY THE BLOWER MOTOR OPERATION

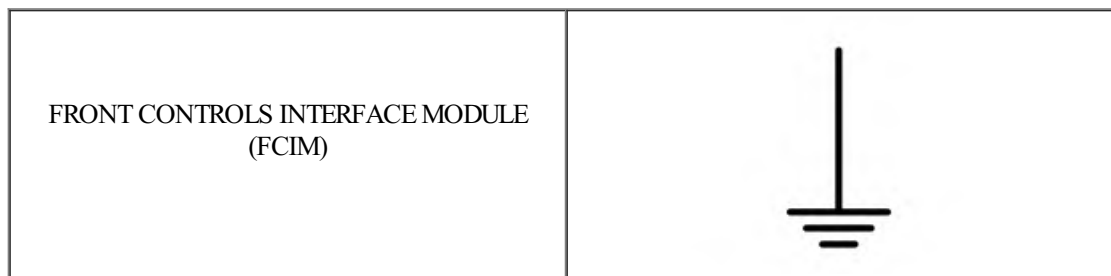
- Ignition ON.
- Select panel on the HVAC controls and, starting with LO, operate the blower motor in all settings. Observe the blower motor operation in each setting.

Does the blower motor operate at any setting?

Yes	GO to L2
No	GO to Pinpoint Test K

L2 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Ignition ON.
- Measure:



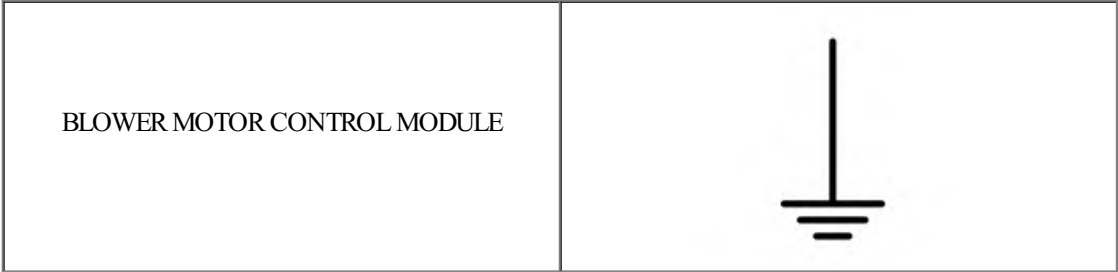
Positive Lead	Measurement / Action	Negative Lead
C2402A-11		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to L3

L3 CHECK THE BLOWER MOTOR CONTROL MODULE VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect Blower motor control module [C297](#) .
- Disconnect BJB [C1035A](#) .
- Ignition ON.
- Measure:



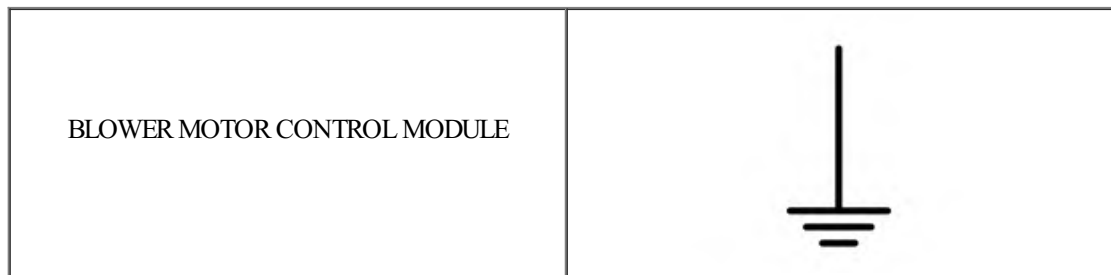
Positive Lead	Measurement / Action	Negative Lead
C297-3		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to L4

L4 CHECK THE BLOWER MOTOR CONTROL MODULE PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C297-4	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to L5
No	REPAIR the circuit.

L5 CHECK FOR CORRECT BLOWER MOTOR CONTROL MODULE OPERATION

- Ignition OFF.
- Disconnect and inspect the blower motor control module connector.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect the blower motor control module connector. Make sure it seats and latches correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	INSTALL a new blower motor control module. REFER to: Blower Motor Control Module (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to L6
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

L6 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST M : AIR DISCHARGE TEMPERATURE SENSOR CIRCUIT FAULTS

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

The air discharge sensors supply a varying voltage to the FCIM based on the temperature of the air being discharged from the vent. The module adjusts the system based on the voltage from each sensor.

Each air discharge sensor is supplied voltage from the FCIM and all sensors share a common sensor ground. An open, a short to ground, a short to voltage on one or more of these circuits or a failed air discharge sensor causes the module to set one or more Diagnostic Trouble Codes (DTCs).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B10B3:11	Right Panel Air Discharge Temperature: Circuit Short To Ground	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B3:15	Right Panel Air Discharge Temperature: Circuit Short To Battery Or Open	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B4:11	Right Floor Air Discharge Temperature: Circuit Short To Ground	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B4:15	Right Floor Air Discharge Temperature: Circuit Short To Battery Or Open	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B5:11	Left Panel Air Discharge Temperature: Circuit Short To Ground	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B5:15	Left Panel Air Discharge Temperature: Circuit Short To Battery Or Open	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B6:11	Left Floor Air Discharge Temperature: Circuit Short To Ground	Module senses erratic voltages from the air discharge temperature sensor.
FCIM B10B6:15	Left Floor Air Discharge Temperature: Circuit Short To Battery Or Open	Module senses erratic voltages from the air discharge temperature sensor.

Possible Sources

- Wiring, terminals or connectors
- Air discharge temperature sensor
- FCIM

M1 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR OUTPUT VOLTAGE CIRCUIT

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

- Ignition OFF.
- Disconnect the suspect air discharge temperature sensor:
 - Driver side footwell air discharge temperature sensor [C2436](#)
 - Driver side register air discharge temperature sensor [C2438](#)
 - Passenger side footwell air discharge temperature sensor [C2437](#)
 - Passenger side register air discharge temperature sensor [C2439](#)
- Ignition ON.
- Turn the HVAC system on.
- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-1		C2436-2

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-1		C2438-2

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead

Positive Lead	Measurement / Action	Negative Lead
C2437-1		C2437-2

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-1		C2439-2

Is the voltage between 4.7 and 5.1 volts?

Yes	INSTALL a new air discharge temperature sensor. Refer to the appropriate Removal and Installation procedure in Group 412-00. CLEAR the Diagnostic Trouble Codes (DTCs). REPEAT the self-test. If DTC returns, GO to M9
-----	--

M2 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Disconnect FCIM [C2402B](#) .
- Ignition ON.
- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE
SENSOR



Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-1		Ground

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-1		Ground

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
---	---

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-1		Ground

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
---	--

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-1		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to M3

M3 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL RETURN CIRCUIT FOR A SHORT TO VOLTAGE

- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
---	---

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-2		Ground

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
---	--

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-2		Ground

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-2		Ground

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-2		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to M4

M4 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.

- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-1	Ω	Ground

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
--	---

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-1	Ω	Ground

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
---	--

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-1	Ω	Ground

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
---	--

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-1	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to M5
No	REPAIR the circuit.

M5 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL RETURN CIRCUIT FOR A SHORT TO GROUND

- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-2	Ω	Ground

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	
--	--

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-2	Ω	Ground

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	
---	--

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-2	Ω	Ground

RIGHT PANEL DISCHARGE AIR TEMPERATURE
SENSOR



Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-2	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to M6
No	REPAIR the circuit.

M6 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL CIRCUIT FOR AN OPEN

- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE
SENSOR

FRONT CONTROLS INTERFACE MODULE
(FCIM)

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-1	Ω	C2402B-5

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
--	---

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-1	Ω	C2402B-4

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	---

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-1	Ω	C2402B-11

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	---

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead

Positive Lead	Measurement / Action	Negative Lead
C2439-1	Ω	C2402B-10

Are the resistances less than 3 ohms?

M7 CHECK THE AIR DISCHARGE TEMPERATURE SENSOR SIGNAL RETURN CIRCUIT FOR AN OPEN

• Measure:	
Yes	GO to M7
No	REPAIR the circuit.
LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-2	Ω	C2402A-2

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	--

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-2	Ω	C2402A-2

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	---

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-2	Ω	C2402A-2

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	---

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-2	Ω	C2402A-2

Are the resistances less than 3 ohms?

Yes	GO to M8
No	REPAIR the circuit.

M8 CHECK AIR DISCHARGE TEMPERATURE SENSOR SIGNAL CIRCUIT AND THE SIGNAL RETURN FOR A SHORT TO TOGETHER

- Disconnect the driver side footwell air discharge temperature sensor [C2436](#)

- Disconnect the driver side register air discharge temperature sensor [C2438](#)
- Disconnect the passenger side footwell air discharge temperature sensor [C2437](#)
- Disconnect the passenger side register air discharge temperature sensor [C2439](#)
- Measure:

LEFT FLOOR DISCHARGE AIR TEMPERATURE SENSOR

Driver side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2436-1	Ω	C2436-2

LEFT PANEL DISCHARGE AIR TEMPERATURE SENSOR

Driver side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2438-1	Ω	C2438-2

RIGHT FLOOR DISCHARGE AIR TEMPERATURE SENSOR

Passenger side footwell air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2437-1	Ω	C2437-2

RIGHT PANEL DISCHARGE AIR TEMPERATURE SENSOR

Passenger side register air discharge temperature sensor

Positive Lead	Measurement / Action	Negative Lead
C2439-1	Ω	C2439-2

M9 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new air discharge temperature sensor. Refer to the appropriate procedure in Group 412-00. CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. If DTC returns, GO to M9
No	REPAIR the circuit.

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST N : B105A:12, B105A:14, B1A61:11, B1A61:15, B1A69:12, B1A69:14

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

In-Vehicle Temperature and Humidity Sensor, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B105A:12	Cabin Temperature Sensor Fan: Circuit Short To Battery	Module senses higher than expected voltage on the in-vehicle temperature and humidity sensor fan motor circuit. The in-vehicle temperature and humidity sensor fan motor is inactive.
FCIM B105A:14	Cabin Temperature Sensor Fan: Circuit Short To Ground Or Open	Module senses no voltage on the in-vehicle temperature and humidity sensor fan motor circuit, indicating an open or a short directly to ground. The in-vehicle temperature and humidity sensor fan motor is active.
FCIM B1A61:11	Cabin Temperature Sensor: Circuit Short To Ground	Module senses lower than expected voltage on the in-vehicle temperature and humidity sensor feedback circuit, indicating a short to ground.
FCIM B1A61:15	Cabin Temperature Sensor: Circuit Short To Battery Or Open	Module senses greater than expected voltage on the in-vehicle temperature and humidity sensor feedback circuit, indicating a short to voltage or an open circuit or sensor.
FCIM B1A69:12	Humidity Sensor: Circuit Short To Battery	Module senses greater than expected voltage on the in-vehicle temperature and humidity sensor humidity input circuit, indicating a short to voltage.
FCIM B1A69:14	Humidity Sensor: Circuit Short To Ground Or Open	Module senses no voltage on the in-vehicle temperature and humidity sensor humidity input circuit, indicating a short to ground or an open circuit or sensor.

Possible Sources

- Wiring, terminals or connectors
- In-vehicle temperature and humidity sensor
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

N1 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Disconnect FCIM [C2402B](#) .
- Disconnect In-vehicle temperature and humidity sensor [C2247](#) .
- Disconnect BCM fuse 21 (5A).
- Ignition ON.
- Measure:

IN-VEHICLE TEMPERATURE/HUMIDITY SENSOR	
---	--

Positive Lead	Measurement / Action	Negative Lead
C2247-1		Ground
C2247-2		Ground
C2247-3		Ground
C2247-4		Ground
C2247-5		Ground
C2247-6		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to N2

N2 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

IN-VEHICLE TEMPERATURE/HUMIDITY SENSOR	
---	--

Positive Lead	Measurement / Action	Negative Lead
C2247-1	Ω	Ground
C2247-2	Ω	Ground
C2247-3	Ω	Ground
C2247-4	Ω	Ground
C2247-5	Ω	Ground
C2247-6	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to N3
No	REPAIR the circuit.

N3 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR AN OPEN

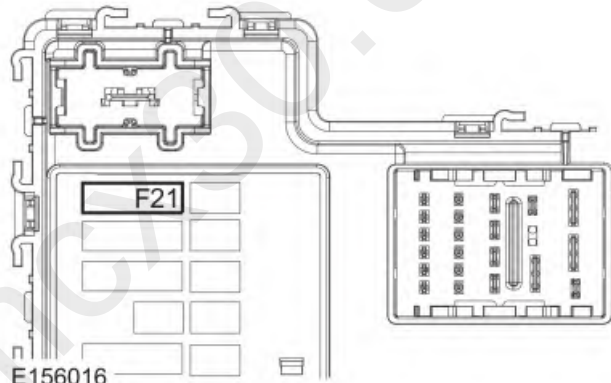
- Measure:

IN-VEHICLE TEMPERATURE/HUMIDITY SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
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Positive Lead	Measurement / Action	Negative Lead
C2247-3	Ω	C2402A-3
C2247-5	Ω	C2402A-2

IN-VEHICLE TEMPERATURE/HUMIDITY SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
---	---

Positive Lead	Measurement / Action	Negative Lead
C2247-1	Ω	C2402B-27
C2247-2	Ω	C2402B-29
C2247-4	Ω	C2402B-19

Positive Lead	Measurement / Action	Negative Lead
C2247-6	Ω	BCM fuse 21 cavity, (component side) 

Are the resistances less than 3 ohms?

Yes	GO to N4
No	REPAIR the circuit.

N4 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TOGETHER

- Disconnect Drivers side temperature door actuator [C2091](#) .
- Disconnect Passenger side temperature door actuator [C2092](#) .
- Disconnect Air inlet door actuator [C289](#) .
- Disconnect Air distribution door actuator [C236](#) .
- Measure:

IN-VEHICLE TEMPERATURE/HUMIDITY SENSOR
--

Positive Lead	Measurement / Action	Negative Lead
C2247-1	Ω	C2247-2
C2247-1	Ω	C2247-3
C2247-1	Ω	C2247-4
C2247-1	Ω	C2247-5
C2247-1	Ω	C2247-6
C2247-2	Ω	C2247-3
C2247-2	Ω	C2247-4
C2247-2	Ω	C2247-5
C2247-2	Ω	C2247-6
C2247-3	Ω	C2247-4
C2247-3	Ω	C2247-5
C2247-3	Ω	C2247-6
C2247-4	Ω	C2247-5
C2247-4	Ω	C2247-6
C2247-5	Ω	C2247-6

Are the resistances greater than 10,000 ohms?

Yes	GO to N5
No	REPAIR the circuit.

N5 CHECK FOR CORRECT IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR OPERATION

- Ignition OFF.
- Inspect the disconnected connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all disconnected connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	INSTALL a new in-vehicle temperature and humidity sensor. REFER to: In-Vehicle Temperature and Humidity Sensor (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to N6
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

N6 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST O : B1A63:11, B1A63:15, B1A64:11, B1A64:15](#)

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

The sunload sensor supplies information to the FCIM indicating the sunload intensity on the vehicle and the module adjusts the system based on that information.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1A63:11	Right Solar Sensor: Circuit Short To Ground	Module senses a short to ground from the right sunload sensor feedback circuit.
FCIM B1A63:15	Right Solar Sensor: Circuit Short To Battery Or Open	Module senses an open or a short to voltage from the right sunload sensor feedback circuit.
FCIM B1A64:11	Left Solar Sensor: Circuit Short To Ground	Module senses a short to ground from the left sunload sensor feedback circuit.
FCIM B1A64:15	Left Solar Sensor: Circuit Short To Battery Or Open	Module senses an open or a short to voltage from the left sunload sensor feedback circuit.

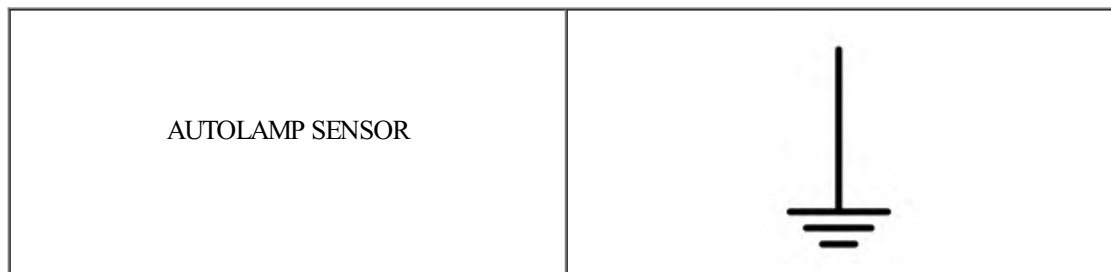
Possible Sources

- Wiring, terminals or connectors
- Autolamp and sunload sensor
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

O1 CHECK THE SUNLOAD SENSOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect Autolamp/sunload sensor [C286](#) .
- Disconnect FCIM [C2402B](#) .
- Disconnect BCM [C2280B](#) .
- Ignition ON.
- Measure:



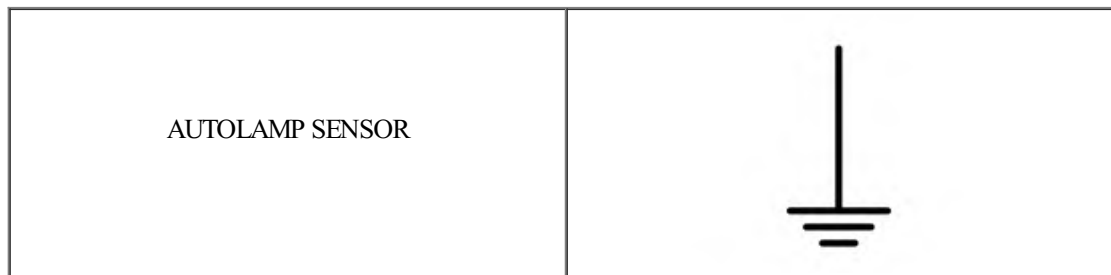
Positive Lead	Measurement / Action	Negative Lead
C286-1	  	Ground
C286-2	  	Ground
C286-3	  	Ground
C286-4	  	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to O2

O2 CHECK THE SUNLOAD SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C286-1	Ω	Ground
C286-2	Ω	Ground
C286-3	Ω	Ground
C286-4	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to O3
No	REPAIR the circuit.

O3 CHECK THE SUNLOAD SENSOR SIGNAL CIRCUITS FOR AN OPEN

- Measure:

AUTOLAMP SENSOR	FRONT CONTROLS INTERFACE MODULE (FCIM)
-----------------	--

Positive Lead	Measurement / Action	Negative Lead
C286-1	Ω	C2402B-22
C286-3	Ω	C2402B-21

AUTOLAMP SENSOR	BODY CONTROL MODULE (BCM)
-----------------	---------------------------

Positive Lead	Measurement / Action	Negative Lead
C286-2	Ω	C2280B-24
C286-4	Ω	C2280B-22

Are the resistances less than 3 ohms?

Yes	GO to O4
No	REPAIR the circuit.

O4 CHECK THE SUNLOAD SENSOR SIGNAL CIRCUITS FOR A SHORT TO EACH OTHER

- Measure:

AUTOLAMP SENSOR

Positive Lead	Measurement / Action	Negative Lead
C286-1	Ω	C286-2
C286-1	Ω	C286-3
C286-1	Ω	C286-4
C286-2	Ω	C286-3
C286-2	Ω	C286-4
C286-3	Ω	C286-4

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new sunload sensor. REFER to: Sunload Sensor (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to O5
No	REPAIR the circuit.

O5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST P : B1B71:11, B1B71:15

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

Evaporator Temperature Sensor, REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1B71:11	Evaporator Temperature Sensor: Circuit Short To Ground	Module senses excessive voltage drop on the sensor reference voltage circuit, indicating a short directly to ground. The module defaults to calculated evaporator temperature and the compressor is shut off.
FCIM B1B71:15	Evaporator Temperature Sensor: Circuit Short To Battery Or Open	Module senses no voltage drop on the sensor reference voltage circuit, indicating a short directly to voltage or an open circuit or sensor. The module defaults to calculated evaporator temperature and the compressor is shut off.

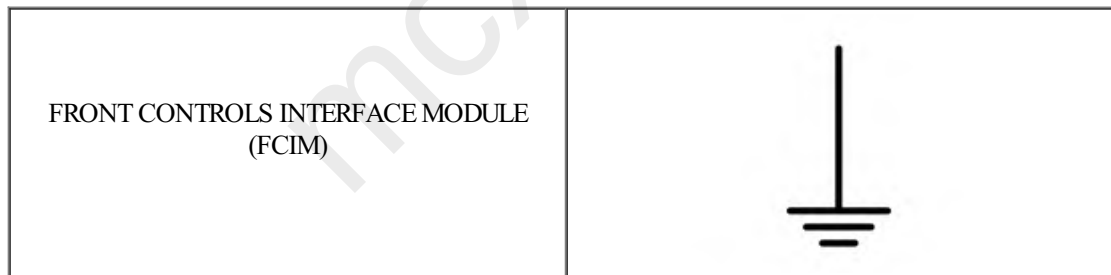
Possible Sources

- Wiring, terminals or connectors
- Evaporator temperature sensor
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

P1 CHECK THE EVAPORATOR TEMPERATURE SENSOR CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#).
- Ignition ON.
- Measure:



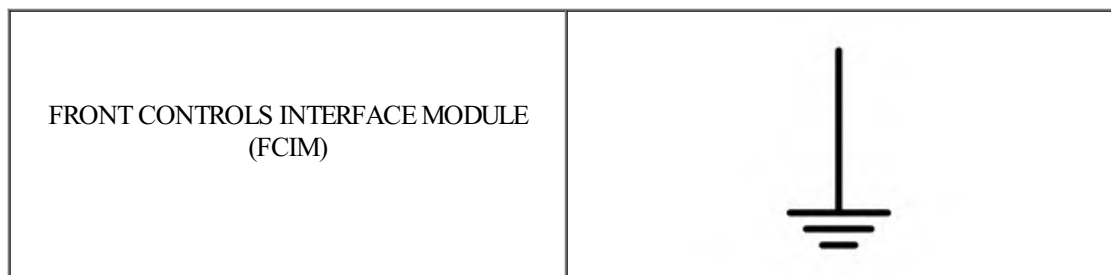
Positive Lead	Measurement / Action	Negative Lead
C2402A-2		Ground
C2402A-19		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to P2

P2 CHECK THE EVAPORATOR TEMPERATURE SENSOR CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	Ground
C2402A-19	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to P3
No	REPAIR the circuit.

P3 CHECK THE EVAPORATOR TEMPERATURE SENSOR CIRCUITS FOR AN OPEN

NOTE: Access to the connector in the following step is difficult. Before carrying out this step, visually inspect the harness for obvious damage. If no damage is evident, proceed with the test.

- Disconnect Evaporator temperature sensor [C296](#) .
- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)	EVAPORATOR TEMPERATURE SENSOR
---	-------------------------------

Positive Lead	Measurement / Action	Negative Lead
C2402A-2	Ω	C296-1
C2402A-19	Ω	C296-2

Are the resistances less than 3 ohms?

Yes	GO to P4
No	REPAIR the circuit.

P4 CHECK THE EVAPORATOR TEMPERATURE SENSOR CIRCUITS FOR A SHORT TOGETHER

- Measure:

EVAPORATOR TEMPERATURE SENSOR

Positive Lead	Measurement / Action	Negative Lead
C296-1	Ω	C296-2

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new evaporator temperature sensor. REFER to: Evaporator Temperature Sensor (412-00 Climate Control System - General Information, Removal and Installation). CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the FCIM self-test. TEST the system for normal operation. If the concern is still present, GO to P5
No	REPAIR the circuit.

P5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals “clean module pins)
 - damaged or bent pins “install new terminals/pins
 - pushed-out pins “install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

A 5-volt reference voltage and ground is supplied to the climate control sensors and actuators from the FCIM.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM C1B14:11	Sensor Supply Voltage A: Circuit Short To Ground	This DTC sets when the module senses less than 4.5 volts on the actuator voltage supply circuit, indicating a short to ground.
FCIM C1B14:12	Sensor Supply Voltage A: Circuit Short To Battery	This DTC sets when the module senses greater than 5.5 volts on the actuator voltage supply circuit, indicating a short to voltage.

Possible Sources

- Wiring, terminals or connectors
- FCIM

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Q1 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) DTCS

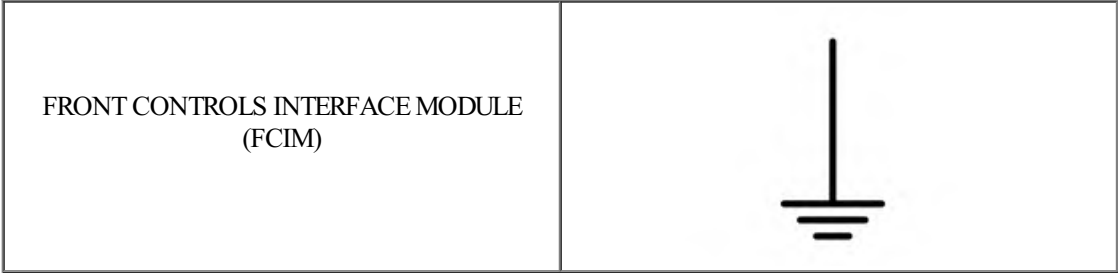
- Ignition ON.
- Using a diagnostic scan tool, carry out FCIM self-test.

Is DTC C1B14:11 or C1B14:12 present?

Yes	GO to Q2
No	VERIFY a customer concern. REFER to the symptom chart in this section.

Q2 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) REFERENCE VOLTAGE AND SIGNAL RETURN CIRCUITS FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect FCIM [C2402A](#) .
- Measure:



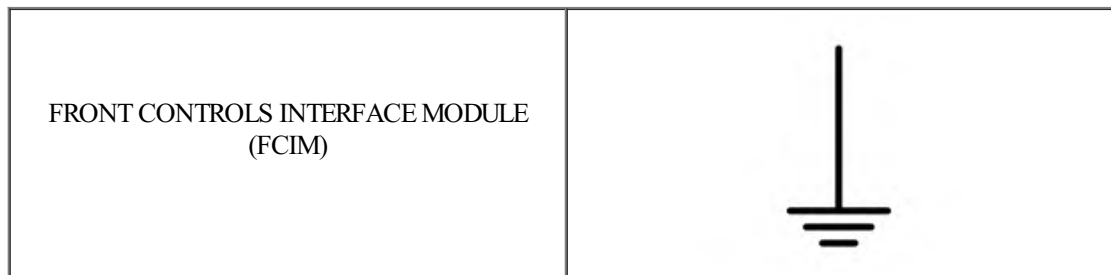
Positive Lead	Measurement / Action	Negative Lead
C2402A-3		Ground
C2402A-2		Ground

Is any voltage present?

Yes	GO to Q3
No	REPAIR the circuit.

Q3 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) REFERENCE VOLTAGE AND SIGNAL RETURN CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-3	Ω	Ground
C2402A-2	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to Q4
No	REPAIR the circuit.

Q4 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) REFERENCE VOLTAGE CIRCUIT AND THE SIGNAL RETURN CIRCUIT FOR A SHORT TOGETHER

- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2402A-3	Ω	C2402A-2

Is the resistance greater than 200 ohms?

Yes	GO to Q6
No	GO to Q5

Q5 CHECK THE A/C (AIR CONDITIONING) COMPONENTS

- Measure:

FRONT CONTROLS INTERFACE MODULE (FCIM)

Positive Lead	Measurement / Action	Negative Lead
C2402A-3	Ω	C2402A-2

- While measuring the resistance, disconnect the following components one at a time, in order. Stop disconnecting components if the measured resistance rises above 200 ohms.
 - Air distribution door actuator [C236](#)
 - Air inlet door actuator [C289](#)
 - Driver side temperature door actuator [C2091](#)
 - Passenger side temperature door actuator [C2092](#)
 - In-vehicle temperature and humidity sensor [C2247](#)

Did the resistance rise above 200 ohms?

Yes	INSTALL a new sensor or actuator (the last one to be disconnected). REFER to the appropriate Removal and Installation in Group 412-00. When installing an actuator, CONNECT the actuator electrical connector before the FCIM. This allows the actuator to be calibrated when the FCIM is connected.
No	REPAIR the circuit.

Q6 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

[PINPOINT TEST R : P193E](#)

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

The PCM controls the A/C compressor clutch field coil based on messages received from the BCM over the HS-CAN. When the FCIM determines it is necessary to activate the A/C compressor, either due to driver request or due to automatic climate control settings, the FCIM sends a message to the BCM over the MS-CAN, the BCM then sends a message to the PCM to activate the A/C compressor.

An internal failure of the PCM, BCM or FCIM, or a failure in the MS-CAN or HS-CAN, causes the PCM to set a DTC.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P193E:00	A/C Clutch Request Signal: No Sub Type Information	This DTC sets when the PCM does not receive the A/C enable request from the BCM.

Possible Sources

- Network concerns
- BCM
- PCM
- FCIM

R1 VERIFY THE CUSTOMER CONCERN

- Ignition ON.
- Verify there is an observable symptom present.

Is an observable symptom present?

Yes	GO to R2
No	CLEAR the DTC. The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

R2 CHECK THE COMMUNICATION NETWORK

- Using a diagnostic scan tool, carry out the network test.

Do the BCM, PCM and the FCIM pass the Network Test?

Yes	GO to R3
No	DIAGNOSE the BCM, PCM or FCIM does not communicate with the diagnostic scan tool. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

R3 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) REQUEST SIGNAL (AC_REQ) PID (PARAMETER IDENTIFICATION)

- Start the engine.
- Access the PCM and monitor the AC_REQ PID
- On the HVAC controls, select PANEL mode, then press the A/C button (indicator ON).

Does the AC_REQ PID display YES or On when the A/C button indicator is illuminated?

Yes	GO to R7
No	GO to R4

R4 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C (AIR CONDITIONING) SWITCH (CC_SW_AC) PID (PARAMETER IDENTIFICATION)

- Access the FCIM and monitor the CC_SW_AC PID
- On the HVAC controls, select PANEL mode, while pressing and releasing the A/C button and monitoring the FCIM SWITCH (CC_SW_AC) PID.

Does the PID display Active or On when the A/C button indicator is illuminated?

Yes	GO to R6
No	GO to R5

R5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

R6 VERIFY CORRECT BCM (BODY CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all BCM electrical connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all BCM electrical connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (BCM) .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

R7 VERIFY CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM electrical connectors.
- Repair:
 - corrosion (install new connector or terminals “ clean module pins)
 - damaged or bent pins “ install new terminals/pins
 - pushed-out pins “ install new pins as necessary
- Reconnect all PCM electrical connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM).
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

☐ [PINPOINT TEST S : THE ELECTRIC BOOSTER HEATER IS INOPERATIVE OR DOES NOT OPERATE CORRECTLY B1474:11, B1474:15, B147A:11, B147A:15, B147B:11, B147B:15](#)

Refer to Wiring Diagrams Cell [53](#) for schematic and connector information.

Normal Operation and Fault Conditions

Electric Booster Heater, REFER to: Supplemental Climate Control - System Operation and Component Description (412-03 Supplemental Climate Control, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
FCIM B1474:11	Heater Relay 1: Circuit Short To Ground	This DTC sets when the control module senses lower than expected voltage on the PTC heater relay control circuit, indicating a short to ground.
FCIM B1474:15	Heater Relay 1: Circuit Short To Battery Or Open	This DTC sets when the control module senses higher than expected voltage on the PTC heater relay control circuit, indicating a short to voltage or an open circuit or sensor.
FCIM B147A:11	Heater Relay 2: Circuit Short To Ground	This DTC sets when the control module senses lower than expected voltage on the PTC heater relay control circuit, indicating a short to ground.
FCIM B147A:15	Heater Relay 2: Circuit Short To Battery Or Open	This DTC sets when the control module senses higher than expected voltage on the PTC heater relay control circuit, indicating a short to voltage or an open circuit or sensor.
FCIM B147B:11	Heater Relay 3: Circuit Short To Ground	This DTC sets when the control module senses lower than expected voltage on the PTC heater relay control circuit, indicating a short to ground.
FCIM B147B:15	Heater Relay 3: Circuit Short To Battery Or Open	This DTC sets when the control module senses higher than expected voltage on the PTC heater relay control circuit, indicating a short to voltage or an open circuit or sensor.

Possible Sources

- Fuses
- Wiring, terminals or connectors
- Electric booster heater
- FCIM

Visual Inspection and Pre-checks

- Make sure BJB fuses 24 (50A), 33 (50A), 58 (50A) are OK.
- Make sure operating conditions for the operation of the electric booster heater are met. Refer to the Description and Operation in section 412-03.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

S1 CHECK THE ELECTRIC BOOSTER HEATER CIRCUITS FOR A SHORT TO VOLTAGE

- Disconnect BJB fuses 24 (50A), 33 (50A), 58 (50A).
- Disconnect Electric Booster Heater [C2603](#) .
- Ignition ON.
- Measure:

ELECTRIC BOOSTER HEATER	
-------------------------	--

Positive Lead	Measurement / Action	Negative Lead
C2603-1		Ground
C2603-3		Ground
C2603-5		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to S2

S2 CHECK THE ELECTRIC BOOSTER HEATER CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect BJB [C1035A](#) .
- Disconnect BJB [C1035B](#) .
- Measure:

ELECTRIC BOOSTER HEATER	BATTERY JUNCTION BOX (BJB)
-------------------------	----------------------------

Positive Lead	Measurement / Action	Negative Lead
C2603-1	Ω	C1035A-57

ELECTRIC BOOSTER HEATER	BATTERY JUNCTION BOX (BJB)
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Positive Lead	Measurement / Action	Negative Lead
C2603-3	Ω	C1035B-2
C2603-5	Ω	C1035B-4

ELECTRIC BOOSTER HEATER	
-------------------------	---

Positive Lead	Measurement / Action	Negative Lead
C2603-2	Ω	Ground
C2603-4	Ω	Ground

Are the resistances less than 3 ohms?

Yes	GO to S3
No	REPAIR the circuit.

S3 CHECK THE ELECTRIC BOOSTER HEATER CIRCUITS FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

ELECTRIC BOOSTER HEATER	
-------------------------	--

Positive Lead	Measurement / Action	Negative Lead
C2603-1	Ω	Ground
C2603-3	Ω	Ground
C2603-5	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	VERIFY BJB fuses 24 (50A), 33 (50A), 58 (50A) are OK. If OK, INSTALL a new BJB. TEST the system for normal operation. If the concern is still present, GO to S4 If not OK, REPAIR the circuit.
No	REPAIR the circuit.

S4 CHECK FOR CORRECT ELECTRIC BOOSTER HEATER OPERATION

NOTE: Make sure operating conditions for the operation of the electric booster heater are met.

- Disconnect and inspect all electric booster heater electrical connectors.
- Repair:
 - corrosion (install new connector or terminal - clean module pins)
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
- Connect all electric booster heater electrical connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new electric booster heater. REFER to: Electric Booster Heater (412-03 Supplemental Climate Control, Removal and Installation). TEST the system for normal operation. If the concern is still present, GO to S5
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

S5 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all FCIM connectors.
- Repair:
 - corrosion (install new connector or terminals & clean module pins)
 - damaged or bent pins & install new terminals/pins
 - pushed-out pins & install new pins as necessary
- Reconnect all FCIM connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (FCIM) .
No	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. ADDRESS the root cause of any connector or pin issues.

PINPOINT TEST T : REDUCED OUTLET AIRFLOW

Possible Sources

- Plugged cabin air filter
- Improper A/C system refrigerant charge
- Blower motor

NOTE: Before carrying out the following test, diagnose all Heating, Ventilation And Air Conditioning (HVAC) control module and Powertrain Control Module (PCM) Diagnostic Trouble Codes (DTCs).

T1 CHECK THE CABIN AIR FILTER

- Ignition OFF.
- Inspect the cabin air filter for possibly plugged or wet.
REFER to: Cabin Air Filter (412-00 Climate Control System - General Information, Removal and Installation).

Is the cabin air filter plugged?

Yes	REPLACE or REPAIR as needed.
No	GO to T2

T2 CHECK THE BLOWER MOTOR OPERATION

- Ignition ON.
- Using the HVAC controls, select panel mode, set temperature to mid range.
- Operate the blower motor through all speeds.
- Turn off the blower motor.

Does the blower motor operate properly?

Yes	GO to T3
No	DIAGNOSE the blower motor concern. GO to Pinpoint Test L

T3 CHECK THE AIR CONDITIONING (A/C) SYSTEM FOR PROPER CHARGE

NOTE: Proper Air Conditioning (A/C) system diagnosis on a vehicle's compressor is dependent on correct refrigerant system charge and tested in ambient temperatures above 21.1°C (70°F).

- CARRY OUT the refrigerant system tests.
REFER to: Refrigerant System Tests - 6.2L V8 (412-00 Climate Control System - General Information, General Procedures).
REFER to: Refrigerant System Tests - 6.7L Power Stroke Diesel (412-00 Climate Control System - General Information, General Procedures).
REFER to: Refrigerant System Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (412-00 Climate Control System - General Information, General Procedures).

Did the system pass the refrigerant system tests?

Yes	The system is operating correctly at this time.
No	REPAIR the concern found in the refrigerant system tests chart.

[PINPOINT TEST U : THE A/C \(AIR CONDITIONING\) COMPRESSOR PRESSURE RELIEF VALVE DISCHARGING](#)

Normal Operation and Fault Conditions

The A/C pressure relief valve normal open pressure is 3,447-4,137 kPa (500-600 psi).

Possible Sources

- High system pressure
- A/C pressure relief valve

U1 DIAGNOSE THE A/C (AIR CONDITIONING) COMPRESSOR PRESSURE RELIEF VALVE

- Start the engine.
- On the HVAC controls, set the temperature to full cold, select PANEL and select the A/C button (indicator on).
- Using the appropriate manifold gauge set, check the A/C high side system pressure.

Is the high side system pressure above the A/C pressure relief valve open pressure [3,447-4,137 kPa (500-600 psi)]?

Yes	REPAIR the A/C system for a restriction. CARRY OUT the refrigerant system tests. REFER to: Refrigerant System Tests - 6.2L V8 (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 6.7L Power Stroke Diesel (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (412-00 Climate Control System - General Information, General Procedures).
No	INSTALL a new A/C compressor. REFER to the appropriate Removal and Installation procedure in Group 412-00.

☐ **PINPOINT TEST V : EXCESSIVE HISSING FROM THE PLENUM WHEN THE AIR CONDITIONING (A/C) IS ON**

Normal Operation and Fault Conditions

Low refrigerant level may cause excessive hissing from the plenum. CHECK the A/C refrigerant level. CARRY OUT the refrigerant system tests. REFER to: Refrigerant System Tests - 6.2L V8 (412-00 Climate Control System - General Information, General Procedures).

REFER to: Refrigerant System Tests - 6.7L Power Stroke Diesel (412-00 Climate Control System - General Information, General Procedures).

REFER to: Refrigerant System Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (412-00 Climate Control System - General Information, General Procedures).

Possible Sources

- Incorrect A/C refrigerant level

Diagnostic steps are not provided for this symptom or DTC. REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

☐ **PINPOINT TEST W : NOISY AIR CONDITIONING (A/C) COMPRESSOR**

Normal Operation and Fault Conditions

Noises from the A/C compressor can be caused by improper refrigerant level, improper A/C compressor air gap, A/C compressor pulley bearing worn or A/C compressor bearing worn. REFER to the appropriate General Procedures in Group 412-00.

Possible Sources

- Low refrigerant charge
- A/C compressor clutch air gap out of specification
- A/C compressor pulley bearing worn
- A/C compressor bearing worn

Diagnostic steps are not provided for this symptom or DTC. REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).

☐ **PINPOINT TEST X : INSUFFICIENT AIR CONDITIONING (A/C) COOLING**

Normal Operation and Fault Conditions

Low refrigerant level or a faulty temperature door concern may cause insufficient cooling.

Possible Sources

- Improper A/C system refrigerant charge
- Temperature door actuator

X1 CHECK THE AIR CONDITIONING (A/C) SYSTEM FOR PROPER CHARGE

NOTE: Proper Air Conditioning (A/C) system diagnosis on a vehicle's compressor is dependent on correct refrigerant system charge and tested in ambient temperatures above 21.1Â°C (70Â°F).

- CARRY OUT the refrigerant system tests.
REFER to: Refrigerant System Tests - 6.2L V8 (412-00 Climate Control System - General Information, General Procedures).
REFER to: Refrigerant System Tests - 6.7L Power Stroke Diesel (412-00 Climate Control System - General Information, General Procedures).
REFER to: Refrigerant System Tests - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (412-00 Climate Control System - General Information, General Procedures).

Did the system pass the refrigerant system tests?

Yes	DIAGNOSE for a temperature door actuator not operating correctly. GO to Pinpoint Test I GO to Pinpoint Test J
No	REPAIR the concern found in the refrigerant system tests charts.

[PINPOINT TEST Y: P06A0](#)

Refer to Wiring Diagrams Cell [55](#) for schematic and connector information.

Normal Operation and Fault Conditions

The externally controlled variable displacement compressor is electronically controlled by the PCM. The PCM pulse width modulates the ground to the externally controlled variable displacement compressor to change the displacement of the A/C compressor. REFER to: Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC) - System Operation and Component Description (412-00 Climate Control System - General Information, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
PCM P06A0:00	Variable A/C Compressor Control Circuit: No Sub Type Information	This DTC sets when the PCM senses unexpected voltage on the sensor feedback circuit, indicating a short to voltage, an open circuit or an open sensor.

Possible Sources

- Fuse
- Wiring, terminals or connectors
- Low refrigerant charge
- A/C compressor
- PCM

Visual Inspection and Pre-checks

- Inspect for loose or corroded A/C compressor connections.
- Make sure BJB fuse 17 (20A) is OK.

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may cause damage to the connector.

Y1 EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC) PERFORMANCE CHECK WITH THE AC COMPRESSOR ELECTRONIC CONTROL VALVE TESTER

NOTE: The following pinpoint test step uses the EVDC100 Electronic Variable Displacement A/C Compressor Control Valve Tester, available on the Ford Rotunda website. If you do not have the EVDC100 Electronic Variable Displacement A/C Compressor Control Valve Tester, go to step 2 of this pinpoint test.

NOTE: Proper Air Conditioning (A/C) system diagnosis on a vehicle's compressor is dependent on correct refrigerant system charge and tested in ambient temperatures above 21.1Â°C (70Â°F).

- Test the EVDC compressor displacement, following the instructions in the user manual supplied with the Model EVDC100 A/C Compressor Electronic Control Valve Tester.

Did the suction low side pressure decrease or the high side pressure increase?

Yes	The Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement. Do not replace the compressor. If DTC P06A0 is present, GO to Y3 If DTC P06A0 is not present, CHECK refrigerant charge amount. REFER to the appropriate General Procedure in Group 412-00.
No	INSTALL a new A/C compressor. REFER to the appropriate Removal and Installation procedure in Group 412-00. CLEAR all Diagnostic Trouble Codes (DTCs). CARRY OUT the PCM self-test. TEST the system for normal operation. If DTC P06A0 is present, GO to Y3

Y2 EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC) PERFORMANCE CHECK WITHOUT THE AC COMPRESSOR ELECTRONIC CONTROL VALVE TESTER

NOTE: Proper Air Conditioning (A/C) system diagnosis on a vehicle's compressor is dependent on correct refrigerant system charge and tested in ambient temperatures above 21.1Â°C (70Â°F).

NOTE: The performance check test is used to determine if the Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement by monitoring Powertrain Control Module Parameter Identifications (PIDS) soon after the air conditioning clutch is engaged.

- Start the engine.
- Access the PCM and monitor the EVACC (%) PID
- Select the floor position on the HVAC controls. Set the temperature control to full warm and the blower to the lowest setting. Set the A/C to off. Close all windows and doors. Run for 5 minutes to heat up the climate control housing.
- Select the PANEL position on the HVAC controls. Set the temperature control to full cold and the blower to the highest setting. Set the recirc mode to on. Set the A/C to on.

Did the PID initially increase and then decrease?

Yes	The Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement. Do not replace the compressor. CHECK refrigerant charge amount. REFER to the appropriate General Procedure in Group 412-00.
No	GO to Y3

Y3 CHECK FOR VOLTAGE TO THE A/C (AIR CONDITIONING) COMPRESSOR CONTROL SOLENOID

- Ignition OFF.
- Disconnect Externally Controlled Variable Displacement Compressor (EVDC) [C1110](#) .
- Ignition ON.
- Measure:

EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC)	
--	--

Positive Lead	Measurement / Action	Negative Lead
C1110-2		Ground

Is the voltage greater than 11 volts?

Yes	GO to Y4
No	VERIFY BJB fuse 17 (20A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

Y4 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL VALVE CIRCUIT FOR A SHORT TO VOLTAGE

- Measure:

EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC)	
--	--

Positive Lead	Measurement / Action	Negative Lead
C1110-1		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to Y5

Y5 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL VALVE CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect PCM [C175B](#) Gasoline or [C1232B](#) Diesel.
- Measure:

EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC)	
--	--

Positive Lead	Measurement / Action	Negative Lead
C1110-1	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to Y6
No	REPAIR the circuit.

Y6 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL VALVE CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC)	POWERTRAIN CONTROL MODULE (PCM)
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Gasoline

Positive Lead	Measurement / Action	Negative Lead
C1110-1	Ω	C175B-79

EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC)	POWERTRAIN CONTROL MODULE (PCM)
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Diesel

Positive Lead	Measurement / Action	Negative Lead
C1110-1	Ω	C1232B-65

Is the resistance less than 3 ohms?

Yes	INSTALL a new A/C compressor. REFER to: Air Conditioning (A/C) Compressor - 6.2L V8 (412-00 Climate Control System - General Information, Removal and Installation). REFER to: Air Conditioning (A/C) Compressor - 6.7L Power Stroke Diesel (412-00 Climate Control System - General Information, Removal and Installation). REFER to: Air Conditioning (A/C) Compressor - 7.3L 2V DEVCT V8 (239kW/320PS) (J0) (412-00 Climate Control System - General Information, Removal and Installation). CLEAR the DTC and REPEAT the PCM self-test. If the DTC returns, GO to Y7
No	REPAIR the circuit.

Y7 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

- Ignition OFF.
- Disconnect and inspect all PCM electrical connectors (if not previously disconnected).
- Repair:
 - corrosion (install new connector or terminal - clean module pins)
 - damaged or bent pins - install new terminals or pins
 - pushed-out pins - install new pins as necessary
- Connect all PCM electrical connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

Is the concern still present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM) .
No	The system is operating correctly at this time. The concern may have been caused by module connections. ADDRESS the root cause of any connector or pin issues.

☐ PINPOINT TEST Z: CLIMATE CONTROL DOES NOT OPERATE ONLY WHEN REMOTE START IS USED

Normal Operation and Fault Conditions

Climate control not operating only when remote start is used can be caused by incorrect IPC information display settings (Remote Start - Message Center Set To Auto or Set to Last Setting. For more information, refer to Owner's Literature), communication network concerns, the wrong level Ford approved remote start system installed or a non Ford approved remote start system installed.

Possible Sources

- Incorrect IPC information display settings
- Communication network concerns
- Wrong level Ford approved remote start system
- Non-Ford approved remote start system installed

Diagnostic steps are not provided for this symptom or DTC. REFER to: [Diagnostic Methods](#) (100-00 General Information, Description and Operation).