Climate Control System - Vehicles With: Electronic Manual Temperature Control (EMTC)

DTC Chart: Front Controls Interface Module (FCIM) - Electronic Manual Temperature Control (EMTC)

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).

Network Diagnostic Trouble Codes (DTCs) (U-codes) are often a result of intermittent concerns such as damaged wiring or low battery voltage occurrences. Additionally, vehicle repair procedures, such as module reprogramming, often set network Diagnostic Trouble Codes (DTCs). Replacing a module to resolve a network DTC is unlikely to resolve the concern. To prevent repeat network DTC concerns, inspect all network wiring, especially connectors. Test the vehicle battery.
REFER to: Battery (414-01) .

FCIM - Electronic Manual Temperature Control (EMTC) DTC CHART

DTC	Description	Action
B105A:12	Cabin Temperature Sensor Fan: Circuit Short To Battery	GO to Pinpoint Test P
B105A:14	Cabin Temperature Sensor Fan: Circuit Short To Ground or Open	GO to Pinpoint Test P
B1081:07	Left Temperature Damper Motor: Mechanical Failure	INSPECT for a binding or damaged linkage or door. REPAIR as necessary. If no condition is found, 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). .
B1081:11	Left Temperature Damper Motor: Circuit Short To Ground	GO to Pinpoint Test I
B1081:12	Left Temperature Damper Motor: Circuit Short To Battery	GO to Pinpoint Test I
B1081:13	Left Temperature Damper Motor: Circuit Open	GO to Pinpoint Test I
B1083:07	Recirculation Damper Motor: Mechanical Failure	INSPECT for a binding or damaged linkage or door. REPAIR as necessary. If no condition is found, INSTALL a new air inlet mode door actuator. REFER to: Air Inlet Door Actuator (412-00 Climate Control System - General Information, Removal and Installation).
B1083:11	Recirculation Damper Motor: Circuit Short To Ground	GO to Pinpoint Test D
B1083:12	Recirculation Damper Motor: Circuit Short To Battery	GO to Pinpoint Test D
B1083:13	Recirculation Damper Motor: Circuit Open	GO to Pinpoint Test D
B1086:07	Air Distribution Damper Motor: Mechanical Failure	INSPECT for a binding or damaged linkage or door. REPAIR as necessary. If no condition is found, INSTALL a new air distribution door actuator. REFER to: Air Distribution Door Actuator (412-00 Climate Control System - General Information, Removal and Installation).
B1086:11	Air Distribution Damper Motor: Circuit Short To Ground	GO to Pinpoint Test E
B1086:12	Air Distribution Damper Motor: Circuit Short To Battery	GO to Pinpoint Test E
B1086:13	Air Distribution Damper Motor: Circuit Open	GO to Pinpoint Test E
B10AF:11	Blower Fan Relay: Circuit Short To Ground	GO to Pinpoint Test J
B10AF:15	Blower Fan Relay: Circuit Short To Battery or Open	• For an inoperative blower motor, GO to Pinpoint Test J • For all other blower motor symptoms, GO to Pinpoint Test K
B10B8:63	Push Buttons: Circuit / Component Protection Time-Out	This DTC sets when the buttons have been held down too long. ATTEMPT to clean buttons. CLEAR the Diagnostic Trouble Codes (DTCs) and REPEAT the self-test. If the DTC returns,   **VIN required to access Guided Routine (FCIM)**
B10B9:12	Blower Control: Circuit Short To Battery	GO to Pinpoint Test J

DTC	Description	Action
B10B9:14	Blower Control: Circuit Short To Ground or Open	• For an inoperative blower motor, GO to Pinpoint Test J • For all other blower motor symptoms, GO to Pinpoint Test K
B11E5:12	Left HVAC Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test I
B11E5:14	Left HVAC Damper Position Sensor: Circuit Short To Ground or Open	GO to Pinpoint Test I
B11E7:12	Air Distribution Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test E
B11E7:14	Air Distribution Damper Position Sensor: Circuit Short To Ground or Open	GO to Pinpoint Test E
B11F0:12	Air Intake Damper Position Sensor: Circuit Short To Battery	GO to Pinpoint Test D
B11F0:14	Air Intake Damper Position Sensor: Circuit Short To Ground or Open	GO to Pinpoint Test D
B1A61:11	Cabin Temperature Sensor: Circuit Short To Ground	GO to Pinpoint Test P
B1A61:15	Cabin Temperature Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test P
B1A69:12	Humidity Sensor: Circuit Short To Battery	GO to Pinpoint Test P
B1A69:14	Humidity Sensor: Circuit Short To Ground or Open	GO to Pinpoint Test P
B1B71:11	Evaporator Temperature Sensor: Circuit Short To Ground	GO to Pinpoint Test L
B1B71:15	Evaporator Temperature Sensor: Circuit Short To Battery or Open	GO to Pinpoint Test L
C1B14:11	Sensor Supply Voltage A: Circuit Short To Ground	GO to Pinpoint Test M
C1B14:12	Sensor Supply Voltage A: Circuit Short To Battery	GO to Pinpoint Test M
All Other FCIM Diagnostic Trouble Codes (DTCs) not listed in this chart	—	Refer to the appropriate section in Group 415for the procedure.

DTC Chart: Powertrain Control Module (PCM)

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

Powertrain Control Module (PCM) DTC Chart

DTC	Description	Action
P0532	A/C Refrigerant Pressure Sensor “A” Circuit Low	GO to Pinpoint Test A
P0533	A/C Refrigerant Pressure Sensor “A” Circuit High	GO to Pinpoint Test A
P0645	A/C Clutch Relay Control Circuit	GO to Pinpoint Test B
P06A0	Variable A/C Compressor Control Circuit	GO to Pinpoint Test N
P1464	A/C Demand Out Of Self Test Range	If the HVAC selector was not powered off, POWER the HVAC off, CLEAR the Diagnostic Trouble Codes (DTCs) and REPEAT the self-test. If the DTC returns, GO to Pinpoint Test H
P193E	A/C Clutch Request Signal	GO to Pinpoint Test O
All Other PCM Diagnostic Trouble Codes (DTCs)	—	• For 2.3L PCM DTC Chart, REFER to: Electronic Engine Controls (303-14A Electronic Engine Controls - 2.3L EcoBoost (231kW/314PS), Diagnosis and Testing). • For 3.7L PCM DTC Chart, REFER to: Electronic Engine Controls (303-14B Electronic Engine Controls - 3.7L Duratec (227kW/301PS), Diagnosis and Testing).

DTC	Description	Action
		• For 5.0L PCM DTC Chart, REFER to: Electronic Engine Controls (303-14C Electronic Engine Controls - 5.0L 32V Ti-VCT, Diagnosis and Testing). • For 5.2L PCM DTC Chart, REFER to: Electronic Engine Controls (303-14D Electronic Engine Controls - 5.2L 32V Ti-VCT, Diagnosis and Testing).

Symptom Chart(s)

Symptom Chart: Climate Control - Electronic Manual Temperature Control (EMTC)

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).

Symptom Chart

Condition	Possible Sources	Actions
A module does not communicate with the diagnostic scan tool	• Fuse(s) • Wiring, terminals or connectors	REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).
Externally Controlled Variable Displacement Compressor (EVDC) poor performance/does not operate correctly	Refer to Pinpoint Test	GO to Pinpoint Test N
Unable To Duplicate The Customer Concern And No Diagnostic Trouble Codes (DTCs) Present	Refer to Pinpoint Test	GO to Pinpoint Test C
Reduced outlet airflow	Plugged cabin air filter	INSPECT the cabin air filter. REFER to: Cabin Air Filter (412-00 Climate Control System - General Information, Removal and Installation). If OK, DIAGNOSE for low refrigerant charge, A/C always commanded on or blower motor not operating correctly.
	Improper refrigerant level	CARRY OUT the refrigerant system tests. REFER to: Refrigerant System Tests - 2.3L EcoBoost (231kW/314PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 3.7L Duratec (227kW/301PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.0L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.2L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). If refrigerant charge is OK, GO to Pinpoint Test H
	Blower motor	GO to Pinpoint Test K
The air inlet door is inoperative	Refer to Pinpoint Test	GO to Pinpoint Test D
Incorrect or erratic direction of airflow from outlets	Refer to Pinpoint Test	GO to Pinpoint Test E
Insufficient, erratic or no heat	Refer to Pinpoint Test	GO to Pinpoint Test F
The A/C is inoperative	Refer to Pinpoint Test	GO to Pinpoint Test G
The A/C is always on — A/C mode always commanded ON	Refer to Pinpoint Test	GO to Pinpoint Test H
Temperature control is inoperative/does not operate correctly	Refer to Pinpoint Test	GO to Pinpoint Test I
The blower motor is inoperative	Refer to Pinpoint Test	GO to Pinpoint Test J
The blower motor does not operate correctly	Refer to Pinpoint Test	GO to Pinpoint Test K
Insufficient A/C cooling	Improper refrigerant level	CARRY OUT the refrigerant system tests. REFER to: Refrigerant System Tests - 2.3L EcoBoost (231kW/314PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 3.7L Duratec (227kW/301PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.0L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.2L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). If OK, DIAGNOSE for a temperature door actuator not operating correctly.
	Temperature door actuator	GO to Pinpoint Test I

Condition	Possible Sources	Actions
A/C pressure relief valve discharging	A/C pressure relief valve	CHECK the high side system pressure. REFER to: Specifications (412-00 Climate Control System - General Information, Specifications). If the pressure is below the A/C pressure relief valve open pressure, INSTALL a new A/C pressure relief valve. Refer to the appropriate section in Group 412for the procedure.
	High system pressure	CHECK the high side system pressure. REFER to: Specifications (412-00 Climate Control System - General Information, Specifications). If the system pressure is above the A/C pressure relief valve open pressure, REPAIR the A/C system for a restriction.
Climate control does not operate only when remote start is used	• IPC information display settings • Non-Ford approved remote start system installed	• VERIFY Remote Start - Message Center Set To Auto, or Remote Start - Message Center Set To Last User Settings. 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). • VERIFY module communications network operation. DIAGNOSE Diagnostic Trouble Codes (DTCs) if present.

Symptom Chart: Noise, Vibration, and Harshness (NVH)

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).

Symptom Chart

Condition	Possible Sources	Actions
Noisy A/C compressor	A/C compressor pulley bearing worn	INSPECT the A/C compressor pulley bearing for roughness. If bearing roughness is found, INSTALL a new A/C compressor clutch and A/C clutch field coil. REFER to: Air Conditioning (A/C) Clutch and Air Conditioning (A/C) Clutch Field Coil (412-00 Climate Control System - General Information, General Procedures).
Excessive hissing from the plenum when the A/C is on	Incorrect A/C refrigerant level	CHECK the A/C refrigerant level. REFER to: Refrigerant System Tests - 2.3L EcoBoost (231kW/314PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 3.7L Duratec (227kW/301PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.0L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.2L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures).

Pinpoint Test(s)

P0532, P0533

Refer to Wiring Diagrams Cell 54 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 Conditions
P0532	A/C Refrigerant Pressure Sensor "A" Circuit Low	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).
P0533	A/C Refrigerant Pressure Sensor "A" Circuit High	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 Diagnostic Pre-checks

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

PINPOINT TEST A: P0532, P0533

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

- Allow the A/C system to stabilize to the outside ambient temperature.
- Ignition ON.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- With the manifold gauge set connected, compare the pressure readings of the manifold gauge set and the PCM ACP_PRESS PID .

Are the pressure values of the manifold gauge set and the ACP_PRESS PCM PID 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 , 2.3L C1551B, 3.7L C1381B or 5.0L and 5.2L C175B.
- Disconnect A/C pressure transducer C1260.
- Disconnect Turbocharger boost pressure sensor C1588 (if equipped).
- Disconnect Generator current sensor C1645.
- Ignition ON.
- Measure:

Click to display connectors

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

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:

Click to display connectors

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

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:

Click to display connectors

2.3L

Positive Lead	Measurement / Action	Negative Lead
C1260 Pin 1	Ω	C1551B Pin 18
C1260 Pin 2	Ω	C1551B Pin 52
C1260 Pin 3	Ω	C1551B Pin 11

Click to display connectors

3.7L

Positive Lead	Measurement / Action	Negative Lead
C1260 Pin 1	Ω	C1381B Pin 51
C1260 Pin 2	Ω	C1381B Pin 33
C1260 Pin 3	Ω	C1381B Pin 52

Click to display connectors

5.0L or 5.2L

Positive Lead	Measurement / Action	Negative Lead
C1260 Pin 1	Ω	C175B Pin 51
C1260 Pin 2	Ω	C175B Pin 33
C1260 Pin 3	Ω	C175B Pin 52

Are the resistances less than 3 ohms?

Yes	GO to A5
No	REPAIR the circuit.

A5 CHECK THE A/C (AIR CONDITIONING) PRESSURE SENSOR CIRCUITS FOR A SHORT TOGETHER

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1260 Pin 1	Ω	C1260 Pin 2
C1260 Pin 1	Ω	C1260 Pin 3
C1260 Pin 2	Ω	C1260 Pin 3

Are the resistances greater than 10,000 ohms?

Yes	INSTALL a new A/C pressure transducer. REFER to: Air Conditioning (A/C) Pressure Transducer (412-00 Climate Control System - General Information, Removal and Installation). TEST the system for normal operation. If the concern is still present, GO to A6
No	REPAIR the circuits.

A6 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 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,   **VIN required 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.

P0645

Refer to Wiring Diagrams Cell 54 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 Conditions
P0645	A/C Clutch Relay Control Circuit	This DTC sets when the PCM grounds the relay circuit and more voltage than expected is detected on the relay circuit. This DTC also sets when the relay circuit is off and no voltage 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.

Possible Sources

- Wiring, terminals or connectors
- A/C clutch relay
- PCM

Visual Inspection and Diagnostic Pre-checks

- Inspect BJB fuses 23 (10A) and 42 (15A).

PINPOINT TEST B: P0645

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 VOLTAGE TO THE A/C (AIR CONDITIONING) CLUTCH RELAY VOLTAGE SUPPLY CIRCUITS

- Ignition OFF.
- Disconnect A/C clutch relay.
- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 1	V	Ground
A/C clutch relay socket 3	V	Ground

Are the voltages greater than 11 volts?

Yes	GO to B2

No	VERIFY BJB fuses 23 (10A) and 42 (15A) are OK. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. If OK, REPAIR the circuit.

B2 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY

- Carry out the component test on the A/C clutch relay.
  Refer to Wiring Diagrams Cell 149 for schematic and connector information.

Did the relay pass the component test?

Yes	GO to B3
No	INSTALL a new A/C clutch relay.

B3 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect A/C clutch relay.
- Disconnect PCM , 2.3L C1551B, 3.7L C1381B or 5.0L and 5.2L C175B.
- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 2	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to B4

B4 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY CONTROL CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to B5
No	REPAIR the circuit.

B5 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY CONTROL CIRCUIT FOR AN OPEN

- Measure:

Click to display connectors

2.3L

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 2	Ω	C1551B Pin 2

Click to display connectors

3.7L

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 2	Ω	C1381B Pin 15

Click to display connectors

5.0L or 5.2L

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 2	Ω	C175B Pin 15

Is the resistance less than 3 ohms?

Yes	GO to B6
No	REPAIR the circuit.

B6 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 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,   **VIN required 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.

Unable To Duplicate The Customer Concern And No Diagnostic Trouble Codes (DTCs) Present

This diagnostic procedure tests the functions of the HVAC system and identifies the correct HVAC symptom pinpoint test.

Normal Operation and Fault Conditions

System Operation
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).

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

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

- Ignition ON.
- Using a scan tool, perform PCM self-test.

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

Yes	REFER to the PCM 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, perform FCIM self-test.

Are any Diagnostic Trouble Codes (DTCs) present?

Yes	REFER to the FCIM 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 J If the blower motor does not correctly change speeds or shut off, GO to Pinpoint Test K

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 temperature does not change at all, GO to Pinpoint Test I

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 temperature is warmer than ambient air temperature, GO to Pinpoint Test I 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	The system is operating correctly.
No	GO to Pinpoint Test D

The Air Inlet Door Is Inoperative

Refer to Wiring Diagrams Cell 54 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 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 Conditions
B1083:11	Recirculation Damper Motor: Circuit Short To Ground	This DTC sets when the module senses lower than expected voltage on an actuator motor circuit when voltage is applied to drive the motor, indicating a short to ground. The motor can move only in one direction.
B1083:12	Recirculation Damper Motor: Circuit Short To Battery	This DTC sets when the module senses higher than expected voltage on the actuator motor circuit when ground is applied to drive the motor, indicating a short to voltage. The motor can move only in one direction.
B1083:13	Recirculation Damper Motor: Circuit Open	This DTC sets when the module senses no voltage on the actuator motor circuit when ground is applied to drive the motor, indicating an open circuit. The motor cannot move.
B11F0:12	Air Intake Damper Position Sensor: Circuit Short to Battery	This DTC sets when the module senses greater than 5 volts on the actuator feedback circuit, indicating a short to voltage.
B11F0:14	Air Intake Damper Position Sensor: Circuit Short to Ground or Open	This DTC sets when the 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
- Air inlet door actuator
- Air inlet door binding or stuck
- FCIM

PINPOINT TEST D: THE AIR INLET DOOR IS INOPERATIVE

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 Air distribution door actuator C232.
- Disconnect In-vehicle temperature and humidity sensor C233.
- Disconnect Driver side temperature door actuator C2091.
- Disconnect Air inlet door actuator C282.
- Ignition ON.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 1	V	Ground
C282 Pin 2	V	Ground
C282 Pin 3	V	Ground

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 5	V	Ground
C282 Pin 6	V	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

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 1	Ω	Ground
C282 Pin 2	Ω	Ground
C282 Pin 3	Ω	Ground
C282 Pin 5	Ω	Ground
C282 Pin 6	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

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 1	Ω	C2402A Pin 2
C282 Pin 2	Ω	C2402A Pin 16
C282 Pin 3	Ω	C2402A Pin 3
C282 Pin 5	Ω	C2402A Pin 24
C282 Pin 6	Ω	C2402A Pin 25

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

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 1	Ω	C282 Pin 2
C282 Pin 1	Ω	C282 Pin 3

Positive Lead	Measurement / Action	Negative Lead
C282 Pin 1	Ω	C282 Pin 5
C282 Pin 1	Ω	C282 Pin 6
C282 Pin 2	Ω	C282 Pin 3
C282 Pin 2	Ω	C282 Pin 5
C282 Pin 2	Ω	C282 Pin 6
C282 Pin 3	Ω	C282 Pin 5
C282 Pin 3	Ω	C282 Pin 6
C282 Pin 5	Ω	C282 Pin 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). 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

- 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 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,   **VIN required 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.

Incorrect Or Erratic Direction Of Airflow From Outlets

Refer to Wiring Diagrams Cell 54 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 Conditions
B1086:11	Air Distribution Damper Motor: Circuit Short to Ground	This DTC sets when the module senses lower than expected voltage on an actuator motor circuit when voltage is applied to drive the motor, indicating a short to ground. The motor can move only in one direction.

DTC	Description	Fault Trigger Conditions
B1086:12	Air Distribution Damper Motor: Circuit Short to Battery	This DTC sets when the module senses higher than expected voltage on the actuator motor circuit when ground is applied to drive the motor, indicating a short to voltage. The motor can move only in one direction.
B1086:13	Air Distribution Damper Motor: Circuit Open	This DTC sets when the module senses no voltage on the actuator motor circuit when ground is applied to drive the motor, indicating an open circuit. The motor cannot move.
B11E7:12	Air Distribution Damper Position Sensor: Circuit Short to Battery	This DTC sets when the module senses greater than 5 volts on the actuator feedback circuit, indicating a short to voltage.
B11E7:14	Air Distribution Damper Position Sensor: Circuit Short to Ground or Open	This DTC sets when the 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
- Air distribution door actuator
- Air distribution door binding or stuck
- FCIM

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

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 In-vehicle temperature and humidity sensor C233.
- Disconnect Driver side temperature door actuator C2091.
- Disconnect Air inlet door actuator C282.
- Disconnect Air distribution door actuator C232.
- Ignition ON.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C232 Pin 1	V	Ground
C232 Pin 2	V	Ground
C232 Pin 3	V	Ground
C232 Pin 5	V	Ground
C232 Pin 6	V	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

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C232 Pin 1	Ω	Ground
C232 Pin 2	Ω	Ground
C232 Pin 3	Ω	Ground
C232 Pin 5	Ω	Ground
C232 Pin 6	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.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C232 Pin 1	Ω	C2402A Pin 2
C232 Pin 2	Ω	C2402A Pin 22
C232 Pin 3	Ω	C2402A Pin 3
C232 Pin 5	Ω	C2402A Pin 20
C232 Pin 6	Ω	C2402A Pin 21

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

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C232 Pin 1	Ω	C232 Pin 2
C232 Pin 1	Ω	C232 Pin 3
C232 Pin 1	Ω	C232 Pin 5
C232 Pin 1	Ω	C232 Pin 6
C232 Pin 2	Ω	C232 Pin 3
C232 Pin 2	Ω	C232 Pin 5
C232 Pin 2	Ω	C232 Pin 6
C232 Pin 3	Ω	C232 Pin 5
C232 Pin 3	Ω	C232 Pin 6
C232 Pin 5	Ω	C232 Pin 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). 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

- 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 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,   **VIN required 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.

Insufficient, Erratic Or No Heat

Normal Operation and Fault Conditions

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

Possible Sources

- Wiring, terminals or connectors
- Temperature door actuator(s)
- Air trapped in the coolant system
- Heater core

Visual Inspection and Diagnostic Pre-checks

- Inspect for low engine coolant level.

PINPOINT TEST F: INSUFFICIENT, ERRATIC OR NO HEAT

F1 CHECK FOR CORRECT ENGINE COOLANT LEVEL

- Ignition OFF.
- Check the engine coolant level.

Is the engine coolant at the correct level 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 303for the procedure..

Does the engine cooling system leak?

Yes	REPAIR the engine coolant leak. Refer to the appropriate section in Group 303for the procedure. TEST the system for normal operation.
No	FILL and BLEED the cooling system. Refer to the appropriate section in Group 303for 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. 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.

Is the heater core inlet hose hot?

Yes	GO to F4
No	BLEED the cooling system per the cooling system draining and vacuum filling general procedure. Refer to the appropriate section in Group 303for the procedure. After bleeding the cooling system, GO to F4

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 temperature, GO to Pinpoint Test I
No	INSTALL a new heater core. REFER to: Heater Core (412-00 Climate Control System - General Information, Removal and Installation).

The A/C Is Inoperative

Refer to Wiring Diagrams Cell 54 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).

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
- Intake Air Temperature (IAT) or other temperature sensors
- Active grille shutters (if equipped)
- A/C compressor clutch air gap
- A/C compressor clutch field coil
- A/C clutch relay
- FCIM

Visual Inspection and Diagnostic Pre-checks

- Inspect BJB fuses 23 (10A) and 42 (15A).

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

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

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

G1 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.
- With a 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 G2
No	CHECK the A/C system for leaks. REFER to: Electronic Leak Detection - Vehicles With: R134A Refrigerant (412-00) . REFER to: Fluorescent Dye Leak Detection - Vehicles With: R134A Refrigerant (412-00) . After leak is repaired, RECHARGE the A/C system. REFER to: Air Conditioning (A/C) System Recovery, Evacuation and Charging - Vehicles With: R134A Refrigerant (412-00) .

G2 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 G3

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).

G3 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) PRESSURE SENSOR (ACP_PRESS) PID (PARAMETER IDENTIFICATION)

- Ignition ON.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- With a manifold gauge set connected, compare the pressure readings of the manifold gauge set and the PCM ACP_PRESS PID .

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

Yes	GO to G4
No	DIAGNOSE the A/C pressure transducer. GO to Pinpoint Test A

G4 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 sometime during the KOEO self-test?

Yes	GO to G5
No	DIAGNOSE the electric cooling fan operation. REFER to Powertrain Control/Emissions Diagnosis (PC/ED) manual, Section 3 Symptom Charts.

G5 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 PCM to disable the A/C with or without a DTC .*

- Allow the vehicle exterior and interior to stabilize to ambient temperature. This can take a soak period of at least 6 hours.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the AAT, CACT, CHT, ECT, IAT, IAT2, MAF, MAPT, TCB and TCIPT Parameter Identifications (PIDs) (as applicable).

Are the temperature values similar (typically within 18ºC (32.4ºF)?

Yes	GO to G6
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.

G6 COMPARE THE EVAPORATOR TEMPERATURE SENSOR TO THE PCM (POWERTRAIN CONTROL MODULE) AMBIENT AIR TEMPERATURE (AAT) PID (PARAMETER IDENTIFICATION)

- Ignition OFF.
- Disconnect Evaporator temperature sensor C296.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C296-1 (component side)	Ω	C296-2 (component side)

- Compare the resistance values to the table below:

Ambient Temperature °F (°C)	Resistance ohms
-39.9 °F (-40 °C)	98,625 - 103,275 ohms
-4.0 °F (-20 °C)	28,640 - 29,600 ohms
32.0 °F (0 °C)	9695 - 9895 ohms
68.0 °F (20 °C)	3675 - 3810 ohms
77.0 °F (25 °C)	2950 - 3050 ohms
86.0 °F (30 °C)	2370 - 2565 ohms
103.9 °F (40 °C)	1565 - 1635 ohms

- Ignition ON.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the AAT PID .

Is the resistance within the specified values for the temperatures?

Yes	GO to G7
No	INSTALL a new evaporator temperature sensor. REFER to: Evaporator Temperature Sensor (412-00 Climate Control System - General Information, Removal and Installation).

G7 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.
- Using a diagnostic scan tool, view PCM PID .
- Using a diagnostic scan tool, select the PCM PID GRILL_A_CMD and 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 G8
No	DIAGNOSE the active grille shutter is inoperative or does not operate correctly. REFER to: Active Grille Shutter (501-02 Front End Body Panels, Diagnosis and Testing).

G8 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

- Using a diagnostic scan tool, view FCIM Parameter Identifications (PIDs).
- 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 when the button is pressed?

Yes	GO to G9
No	GO to G17

G9 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.
- Using a diagnostic scan tool, monitor the PCM AC_REQ PID .
- On the HVAC controls, select PANEL and then press the A/C button (indicator on).

Does the PID display Yes when the button is pressed?

Yes	GO to G11
No	GO to G10

G10 RESET THE AMBIENT AIR TEMPERATURE (AAT) SENSOR

- On the HVAC controls, press the A/C (air conditioning) and Recirc buttons simultaneously, 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	RETEST the A/C system for normal operation. REFER to: Refrigerant System Tests - 2.3L EcoBoost (231kW/314PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 3.7L Duratec (227kW/301PS) (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.0L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures). REFER to: Refrigerant System Tests - 5.2L 32V Ti-VCT (412-00 Climate Control System - General Information, General Procedures).
No	GO to G11

G11 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

- Using a diagnostic scan tool, activate the PCM ACC_CMD PID .

Does the A/C compressor turn on?

Yes	GO to G18
No	GO to G12

G12 CHECK THE VOLTAGE TO THE A/C (AIR CONDITIONING) CLUTCH RELAY

- Ignition OFF.
- Disconnect the A/C clutch relay.
- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 1	V	Ground Pin -
A/C clutch relay socket 3	V	Ground Pin -

Are the voltages greater than 11 volts?

Yes	GO to G13
No	VERIFY BJB fuses 23 (10A) and 42 (15A) are OK. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

G13 BYPASS THE A/C (AIR CONDITIONING) CLUTCH RELAY

- Ignition OFF.
- Connect a fused jumper wire:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
A/C clutch relay socket 3		A/C clutch relay socket 5

- Ignition ON.

Does the A/C compressor clutch engage?

Yes	REMOVE the fused jumper wire. INSTALL a new A/C clutch relay.
No	LEAVE the fused jumper wire installed. GO to G14

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

- Disconnect A/C compressor clutch field coil C100.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C100 Pin 1	V	Ground Pin -

Is the voltage greater than 11 volts?

Yes	REMOVE the fused jumper wire. GO to G15
No	REMOVE the fused jumper wire. REPAIR the circuit.

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

- Ignition OFF.
- Measure:

Click to display connectors

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

Is the resistance less than 3 ohms?

Yes	GO to G16
No	REPAIR the circuit.

G16 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: Air Conditioning (A/C) Clutch Air Gap Adjustment (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: Air Conditioning (A/C) Clutch Air Gap Adjustment (412-00) .
No	INSTALL a new A/C compressor clutch and A/C clutch field coil. REFER to: Air Conditioning (A/C) Clutch and Air Conditioning (A/C) Clutch Field Coil (412-00 Climate Control System - General Information, General Procedures).

G17 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- 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 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,   **VIN required 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.

G18 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 IDS 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. Refer to the reference value information in Section 6 of the Powertrain Control/Emissions Diagnosis (PC/ED) manual.

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 the IDS 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.

The A/C Is Always On - A/C Mode Always Commanded On

Refer to Wiring Diagrams Cell 54 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 Conditions
P1464	A/C Demand Out Of Self Test Range	This DTC sets when the PCM senses an A/C request during a PCM self-test.

Possible Sources

- A/C clutch relay
- Wiring, terminals or connectors
- PCM
- FCIM

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

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.
H1 CHECK THE A/C (AIR CONDITIONING) CLUTCH RELAY
• Carry out the component test on the A/C clutch relay. Refer to Wiring Diagrams Cell 149 for schematic and connector information.

Did the relay pass the component test?

Yes	GO to H2
No	INSTALL a new A/C clutch relay.

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.
- Disconnect the A/C clutch relay.
- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C100 Pin 1	V	Ground Pin -

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to H3

H3 COMPARE THE EVAPORATOR TEMPERATURE SENSOR 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.
- Disconnect Evaporator Temperature Sensor C296.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C296-1 (component side)	Ω	C296-2 (component side)

- Compare the resistance values to the table below:

Ambient Temperature °F (°C)	Resistance ohms
-39.9 °F (-40 °C)	98,625 - 103,275 ohms
-4.0 °F (-20 °C)	28,640 - 29,600 ohms
32.0 °F (0 °C)	9695 - 9895 ohms
68.0 °F (20 °C)	3675 - 3810 ohms
77.0 °F (25 °C)	2950 - 3050 ohms
86.0 °F (30 °C)	2370 - 2565 ohms
103.9 °F (40 °C)	1565 - 1635 ohms

- Ignition ON.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the AAT PID .

Is the resistance within the specified values for the temperatures?

Yes	GO to H4
No	INSTALL a new evaporator temperature sensor. REFER to: Evaporator Temperature Sensor (412-00 Climate Control System - General Information, Removal and Installation).

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

- Ignition ON.
- Using a diagnostic scan tool, view FCIM Parameter Identifications (PIDs).

- Monitor the CC_SW_AC PID .
- Select panel mode, press and release the A/C button (indicator off) on the FCIM controls.

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

Yes	GO to H5
No	GO to H8

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

- Using a diagnostic scan tool, view the PCM Parameter Identification (PIDs).
- With a manifold gauge set connected, compare the pressure readings of the manifold gauge set and the PCM Parameter Identification (PID) ACP_PRESS.

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

Yes	GO to H6
No	INSTALL a new A/C pressure transducer. REFER to: Air Conditioning (A/C) Pressure Transducer (412-00 Climate Control System - General Information, Removal and Installation).

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

- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the AC_REQ PID .
- While in panel mode, release the A/C button (indicator off) on the FCIM controls.

Does the PID display No?

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 ON.
- Disconnect FCIM C2402A.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDs).
- Monitor the AC_REQ PID .

Does the PID display No?

Yes	GO to H9
No	GO to H8

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

- Connect FCIM C2402A.
- 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 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,   **VIN required 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 (replace connector or terminals – clean module pins)
  • damaged or bent pins – replace terminals/pins
  • pushed-out pins – replace 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, **VIN required 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.

The Temperature Control Is Inoperative Or Does Not Operate Correctly

Refer to Wiring Diagrams Cell 54 for schematic and connector information.

Normal Operation and Fault Conditions

Temperature Door Actuator - Driver side,
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).

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 module may interpret this as the actual end of travel for the door. When this condition occurs and the module commands the actuator to its end of travel, the airflow may not be the expected temperature.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1081:11	Left Temperature Damper Motor: Circuit Short To Ground	This DTC sets when the module senses lower than expected voltage on an actuator motor circuit when voltage is applied to drive the motor, indicating a short to ground. The motor can move only in one direction.
B1081:12	Left Temperature Damper Motor: Circuit Short To Battery	This DTC sets when the module senses higher than expected voltage on the actuator motor circuit when ground is applied to drive the motor, indicating a short to voltage. The motor can move only in one direction.
B1081:13	Left Temperature Damper Motor: Open Circuit	This DTC sets when the module senses no voltage on the actuator motor circuit when ground is applied to drive the motor, indicating an open circuit. The motor cannot move.
B11E5:12	Left HVAC Damper Position Sensor: Circuit Short to Battery	This DTC sets when the module senses greater than 5 volts on the actuator feedback circuit, indicating a short to voltage.
B11E5:14	Left HVAC Damper Position Sensor: Circuit Short to Ground or Open	This DTC sets when the 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
- Driver side temperature door actuator
- FCIM

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

NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.
I1 CHECK THE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TO VOLTAGE
• Ignition OFF. • Disconnect In-vehicle temperature and humidity sensor C233. • Disconnect Air inlet door actuator C282. • Disconnect Air distribution door actuator C232. • Disconnect Driver side temperature door actuator C2091. • Ignition ON.

- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2091 Pin 1	V	Ground
C2091 Pin 2	V	Ground
C2091 Pin 3	V	Ground
C2091 Pin 5	V	Ground
C2091 Pin 6	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to I2

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

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2091 Pin 1	Ω	Ground
C2091 Pin 2	Ω	Ground
C2091 Pin 3	Ω	Ground
C2091 Pin 5	Ω	Ground
C2091 Pin 6	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to I3
No	REPAIR the circuit.

I3 CHECK THE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR AN OPEN

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2091 Pin 1	Ω	C2402A Pin 2
C2091 Pin 2	Ω	C2402A Pin 10
C2091 Pin 3	Ω	C2402A Pin 3
C2091 Pin 5	Ω	C2402A Pin 8
C2091 Pin 6	Ω	C2402A Pin 9

Are the resistances less than 3 ohms?

Yes	GO to I4
No	REPAIR the circuit.

I4 CHECK THE TEMPERATURE DOOR ACTUATOR CIRCUITS FOR A SHORT TOGETHER

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2091 Pin 1	Ω	C2091 Pin 2
C2091 Pin 1	Ω	C2091 Pin 3
C2091 Pin 1	Ω	C2091 Pin 5
C2091 Pin 1	Ω	C2091 Pin 6
C2091 Pin 2	Ω	C2091 Pin 3
C2091 Pin 2	Ω	C2091 Pin 5
C2091 Pin 2	Ω	C2091 Pin 6
C2091 Pin 3	Ω	C2091 Pin 5
C2091 Pin 3	Ω	C2091 Pin 6
C2091 Pin 5	Ω	C2091 Pin 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). 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

- 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 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,   **VIN required 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.

The Blower Motor Is Inoperative

Refer to Wiring Diagrams Cell 54 for schematic and connector information.

Normal Operation and Fault Conditions

Voltage is supplied to the blower motor relay switched contact from the BJB . Ground to the relay coil is a dedicated circuit. When the blower motor relay coil receives power from the FCIM , the relay coil is energized and voltage is delivered to the blower motor speed control. Power and ground for the blower motor is provided by the blower motor speed control. The FCIM sends a PWM signal to the blower motor speed control to control the blower speed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B10AF:11	Blower Fan Relay: Circuit Short To Ground	This DTC sets when the module senses low voltage on the relay coil voltage circuit when the module is energizing the circuit. The blower motor relay is permanently inactive.
B10AF:15	Blower Fan Relay: Circuit Short To Battery or Open	This DTC sets when the module senses greater than expected voltage on the blower relay coil voltage circuit, indicating an open circuit or a short to voltage. The blower motor relay is inactive when circuit is open; the blower motor relay is on all the time when shorted to battery.
B10B9:12	Blower Control: Circuit Short To Battery	This DTC sets when the module senses high voltage on the blower motor control PWM circuit, indicating a short directly to voltage. The blower motor is inoperative.
B10B9:14	Blower Control: Circuit Short To Ground or Open	This DTC sets when the 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

- Wiring, terminals or connectors
- Fuse
- Blower motor relay
- Blower motor
- Blower motor speed control
- FCIM

Visual Inspection and Diagnostic Pre-checks

- Inspect BJB fuse 10 (40A).

PINPOINT TEST J: THE BLOWER MOTOR IS INOPERATIVE

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 BLOWER MOTOR RELAY

- Ignition OFF.
- Disconnect Blower motor relay.
- Carry out the component test on the blower motor relay.
  Refer to Wiring Diagrams Cell 149 for schematic and connector information.

Did the relay pass the component test?

Yes	GO to J2
No	INSTALL a new blower motor relay.

J2 CHECK THE BLOWER MOTOR RELAY SWITCH CONTACT SUPPLY VOLTAGE

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
Blower motor relay socket 3	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to J3
No	VERIFY BJB fuse 10 (40A) 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.

J3 CHECK THE BLOWER MOTOR RELAY COIL GROUND CIRCUIT FOR AN OPEN

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
Blower motor relay socket 1	Ω	Ground Pin -

Is the resistance less than 3 ohms?

Yes	GO to J4
No	REPAIR the circuit.

J4 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR A SHORT TO GROUND

- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
Blower motor relay socket 2	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to J5
No	REPAIR the circuit.

J5 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR AN OPEN

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
Blower motor relay socket 2	Ω	C2402A Pin 11

Is the resistance less than 3 ohms?

Yes	GO to J6
No	REPAIR the circuit.

J6 CHECK THE BLOWER MOTOR SPEED CONTROL VOLTAGE CIRCUIT

- Disconnect Blower motor speed control C297.
- Connect Blower motor relay.
- Connect FCIM C2402A.
- Ignition ON.
- Select PANEL on the HVAC controls.
- Select the highest blower motor setting.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C297 Pin 5	V⎓	Ground

Is the voltage greater than 11 volts?

Yes	GO to J7
No	REPAIR the circuit.

J7 CHECK THE BLOWER MOTOR SPEED CONTROL GROUND CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

Click to display connectors

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

Is the resistance less than 3 ohms?

Yes	GO to J8
No	REPAIR the circuit.

J8 CHECK THE BLOWER MOTOR CONTROL PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C297 Pin 2	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to J9

J9 CHECK THE BLOWER MOTOR CONTROL PWM (PULSE WIDTH MODULATION) CIRCUIT FOR AN OPEN

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C297 Pin 2	Ω	C2402A Pin 23

Is the resistance less than 3 ohms?

Yes	GO to J10
No	REPAIR the circuit.

J10 CHECK THE OUTPUTS TO THE BLOWER MOTOR

- Disconnect Blower motor C2066.
- Connect Blower motor speed control C297.
- Connect FCIM C2402A.
- Ignition ON.
- Select PANEL on the HVAC controls.
- Select the highest blower motor setting.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2066 Pin 1	V	C2066 Pin 2

Is the voltage greater than 11 volts?

Yes	INSTALL a new blower motor. REFER to: Blower Motor (412-00 Climate Control System - General Information, Removal and Installation).
No	GO to J11

J11 CHECK THE CIRCUITS TO THE BLOWER MOTOR FOR AN OPEN

- Ignition OFF.
- Disconnect Blower motor speed control C297.

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C297 Pin 6	Ω	C2066 Pin 1
C297 Pin 5	Ω	C2066 Pin 2

Are the resistances less than 3 ohms?

Yes	GO to J12
No	REPAIR the circuit in question.

J12 CHECK THE BLOWER MOTOR CIRCUITS FOR A SHORT TOGETHER

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2066 Pin 1	Ω	C2066 Pin 2

Is the resistance greater than 10,000 ohms?

Yes	INSTALL a new blower motor speed control. REFER to: Blower Motor Speed Control (412-00 Climate Control System - General Information, Removal and Installation). TEST the system for normal operation. If the concern is still present, GO to J13
No	REPAIR the circuits.

J13 CHECK FOR CORRECT FRONT CONTROLS INTERFACE MODULE (FCIM) OPERATION

- 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 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,   **VIN required 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.

The Blower Motor Does Not Operate Correctly

Refer to Wiring Diagrams Cell 54 for schematic and connector information.

Normal Operation and Fault Conditions

Voltage is supplied to the blower motor relay switched contact from the BJB . Ground to the relay coil is a dedicated circuit. When the blower motor relay coil receives power from the FCIM , the relay coil is energized and voltage is delivered to the blower motor speed control. Power and ground for the blower motor is provided by the blower motor speed control. The FCIM sends a PWM signal to the blower motor speed control to control the blower speed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B10AF:15	Blower Fan Relay: Circuit Short To Battery or Open	This DTC sets when the module senses greater than expected voltage on the blower relay coil voltage circuit, indicating an open circuit or a short to voltage. Blower relay is inactive when circuit is open; blower relay is on all the time when shorted to battery.
B10B9:14	Blower Control: Circuit Short To Ground or Open	This DTC sets when the 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

- Wiring, terminals or connectors
- Blower motor relay
- Blower motor speed control
- FCIM

PINPOINT TEST K: THE BLOWER MOTOR DOES NOT OPERATE CORRECTLY

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

K1 VERIFY THE BLOWER MOTOR OPERATION

- Ignition ON.
- Select PANEL on the HVAC controls. Adjust the blower motor setting to the minimum and maximum settings.

Does the blower motor operate at any setting?

Yes	GO to K2
No	GO to Pinpoint Test J

K2 CHECK THE BLOWER MOTOR CONTROL PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect Blower motor speed control C297.
- Ignition ON.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 23	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to K3

K3 CHECK THE BLOWER MOTOR CONTROL PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO GROUND

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 23	Ω	Ground Pin -

Is the resistance greater than 10,000 ohms?

Yes	GO to K4
No	REPAIR the circuit.

K4 CHECK THE BLOWER MOTOR RELAY COIL CONTROL CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect Blower motor relay.
- Connect FCIM C2402A.
- Ignition ON.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 11	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to K5

K5 CHECK THE BLOWER MOTOR OPERATION WITH THE BLOWER MOTOR RELAY DISCONNECTED

- Connect FCIM C2402A.
- Ignition OFF.
- Connect Blower motor speed control C297.
- Ignition ON.
- Operate the system and determine if the concern is still present.

Does the fan still operate all the time?

Yes	REPAIR the blower motor speed control voltage circuit CH402 (YE/GN) for a short to voltage.
No	GO to K6

K6 CHECK FOR CORRECT BLOWER MOTOR SPEED CONTROL OPERATION

- Ignition OFF.
- Disconnect and inspect all the blower motor speed control 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 the blower motor speed control connectors. Make sure they seat and latch correctly.
- Operate the system and determine if the concern is still present.

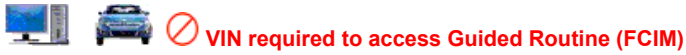
Is the concern still present?

Yes	INSTALL a new blower motor speed control. REFER to: Blower Motor Speed Control (412-00 Climate Control System - General Information, Removal and Installation). TEST the system for normal operation. If the concern is still present, GO to K7
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.

K7 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 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,  **VIN required 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.

B1B71:11, B1B71:15

Refer to Wiring Diagrams Cell 54 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 Conditions
B1B71:11	Evaporator Temperature Sensor: Circuit Short To Ground	The 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.
B1B71:15	Evaporator Temperature Sensor: Circuit Short To Battery or Open	The module senses no voltage drop on the sensor reference voltage circuit, indicating a short directly to voltage or an open circuit. The module defaults to calculated evaporator temperature and the compressor is shut off.

Possible Sources

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

PINPOINT TEST L: B1B71:11, B1B71:15

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

L1 CHECK THE EVAPORATOR TEMPERATURE SENSOR RESISTANCE

- Ignition OFF.
- Disconnect Evaporator temperature sensor C296.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C296-1 (component side)	Ω	C296-2 (component side)

- Compare the evaporator temperature sensor measured resistance with the table below.

Ambient Temperature °F (°C)	Resistance ohms
-39.9 °F (-40 °C)	98,625 - 103,275 ohms
-4.0 °F (-20 °C)	28,640 - 29,600 ohms
32.0 °F (0 °C)	9695 - 9895 ohms
68.0 °F (20 °C)	3675 - 3810 ohms
77.0 °F (25 °C)	2950 - 3050 ohms
86.0 °F (30 °C)	2370 - 2565 ohms
103.9 °F (40 °C)	1565 - 1635 ohms

Is the resistance within the specified values for the temperatures?

Yes	GO to L2
No	INSTALL a new evaporator temperature sensor. REFER to: Evaporator Temperature Sensor (412-00 Climate Control System - General Information, Removal and Installation).

L2 CHECK THE EVAPORATOR TEMPERATURE SENSOR INPUT CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON.

- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 19	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to L3

L3 CHECK THE EVAPORATOR TEMPERATURE SENSOR INPUT CIRCUIT FOR A SHORT TO GROUND

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 19	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to L4
No	REPAIR the circuit.

L4 CHECK THE EVAPORATOR TEMPERATURE SENSOR INPUT CIRCUIT FOR AN OPEN

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 19	Ω	C296 Pin 1

Is the resistance less than 3 ohms?

Yes	GO to L5
No	REPAIR the circuit.

L5 CHECK THE EVAPORATOR TEMPERATURE SENSOR SIGNAL AND SIGNAL RETURN CIRCUITS FOR A SHORT TOGETHER

- Measure:

Click to display connectors

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

Is the resistance greater than 10,000 ohms?

Yes	GO to L6
No	REPAIR the circuit.

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

- 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 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,   **VIN required 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.

C1B14:11, C1B14:12

Refer to Wiring Diagrams Cell 54 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 Conditions
C1B14:11	Sensor Supply Voltage A: Circuit Short to Ground	This DTC sets when the module senses less than 5 volts on the sensor reference voltage circuit, indicating a short to ground.
C1B14:12	Sensor Supply Voltage A: Circuit Short to Battery	This DTC sets when the module senses greater than 5 volts on the sensor reference voltage circuit, indicating a short to voltage.

Possible Sources

- Wiring, terminals or connectors
- FCIM

PINPOINT TEST M: C1B14:11, C1B14:12

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

M1 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) DTCS

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

Is DTC C1B14:11 present?

Yes	GO to M2
No	GO to M5

M2 CHECK THE REFERENCE VOLTAGE CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 3	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to M3
No	REPAIR the circuit.

M3 CHECK THE REFERENCE VOLTAGE CIRCUIT AND THE SIGNAL RETURN CIRCUIT FOR A SHORT TOGETHER

- Measure:

Click to display connectors

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

Is the resistance greater than 200 ohms?

Yes	GO to M6
No	GO to M4

M4 CHECK THE A/C (AIR CONDITIONING) COMPONENTS

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 3	Ω	C2402A Pin 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.
  - In-vehicle temperature and humidity sensor C233
  - Air distribution door actuator C232
  - Driver side temperature door actuator C2091
  - Air inlet door actuator C282

Did the resistance rise above 200 ohms?

Yes	INSTALL a new sensor or actuator (the last one to be disconnected). Refer to the appropriate section in Group 412for the procedure. 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.

M5 CHECK THE REFERENCE VOLTAGE CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C2402A Pin 3	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to M6

M6 CHECK FOR CORRECT FCIM (FRONT CONTROLS INTERFACE MODULE) OPERATION

- Connect FCIM C2402A.
- 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 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,   **VIN required 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.

P06A0

Refer to Wiring Diagrams Cell 54 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 Conditions
P06A0	Variable A/C Compressor Control Circuit	The PCM senses greater than expected voltage on the sensor feedback circuit, indicating a short to voltage or an open circuit or sensor.

Possible Sources

- Wiring, terminals or connectors
- A/C compressor
- PCM

Visual Inspection and Diagnostic Pre-checks

- Inspect for loose or corroded PCM and A/C compressor connections.

PINPOINT TEST N: P06A0

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

N1 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 21.1°C (70°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 N4 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 procedure in Group 412-00. CLEAR all Diagnostic Trouble Codes (DTCs). TEST the system for normal operation. If DTC P06A0 is present, GO to N4

N2 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 21.1°C (70°F).*

NOTE: *The following pinpoint test step is used to determine if the Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement by monitoring PCM Parameter Identifications (PIDS) soon after the air conditioning clutch is engaged. If the PCM EVACC PID is not available for the vehicle you are working on, go to step 3.*

- Start the engine.
- Using a diagnostic scan tool, view PCM Parameter Identifications (PIDS).
- Using a diagnostic scan tool, monitor 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 N4

N3 EXTERNALLY CONTROLLED VARIABLE DISPLACEMENT COMPRESSOR (EVDC) PERFORMANCE CHECK

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).*

NOTE: *The performance check test is used to determine if the Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement by measuring the amperage to the solenoid and monitoring the manifold pressure gauges soon after the air conditioning clutch is engaged. This test is used when the EVDC100 Electronic Variable Displacement A/C Compressor Control Valve Tester and the PCM EVACC PID are not available for the vehicle you are working on.*

- Ignition OFF.
- Disconnect BJB fuse 42 (15A).
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
BJB fuse 42 socket, component side	A	BJB fuse 42 socket, component side

- With a manifold gauge set connected, monitor the low side and high side pressures.
- Start the engine. Run the engine until it reaches normal operating temperature.
- Select the floor position on the HVAC controls. Set the temperature control to full warm and the blower to the highest setting. Set the A/C to off. Close all windows and doors. Run for 5 minutes to heat up the climate control housing.
- Monitor the multi meter and the manifold gauges. Select the PANEL position on the HVAC controls. Set the temperature control to full cold and the blower to the highest setting. Set the recirculated air mode to on. Set the A/C to on.
- Record the highest amperage measurement and the A/C pressures.

Did the amperage initially increase approximately 0.8A, and did the low side pressure decrease and the high side pressure increase and after a few minutes did the amperage and high side pressure decrease and low side pressure increase?

Yes	The Externally Controlled Variable Displacement Compressor (EVDC) is able to change the displacement. CHECK refrigerant charge amount. REFER to: Air Conditioning (A/C) System Recovery, Evacuation and Charging - Vehicles With: R134A Refrigerant (412-00) .
No	GO to N4

N4 CHECK FOR VOLTAGE TO THE A/C (AIR CONDITIONING) COMPRESSOR CONTROL SOLENOID

- Ignition OFF.
- Connect BJB fuse 42 (15A).
- Disconnect A/C Compressor Control Solenoid C1110.
- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1110 Pin 2	V	Ground

Is the voltage greater than 11 volts?

Yes	GO to N5

No	VERIFY the BJB fuse 42 (15A) 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.

N5 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL SOLENOID PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Disconnect PCM 2.3L C1551B.
- Measure:

Click to display connectors

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

Is the resistance greater than 10,000 ohms?

Yes	GO to N6
No	REPAIR the circuit.

N6 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL SOLENOID PWM (PULSE WIDTH MODULATION) CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition ON.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C1110 Pin 1	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to N7

N7 CHECK THE A/C (AIR CONDITIONING) COMPRESSOR DISPLACEMENT CONTROL SOLENOID PWM (PULSE WIDTH MODULATION) CIRCUIT FOR AN OPEN

- Ignition OFF.
- Measure:

Click to display connectors

2.3L

Positive Lead	Measurement / Action	Negative Lead
C1110 Pin 1	Ω	C1551B Pin 41

Is the resistance less than 3 ohms?

Yes	INSTALL a new A/C compressor. For 2.3L REFER to: Air Conditioning (A/C) Compressor - 2.3L EcoBoost (231kW/314PS) (412-00 Climate Control System - General Information, Removal and Installation). CLEAR the DTC and REPEAT the self-test. If the DTC returns, GO to N8
No	REPAIR the circuit.

N8 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 the 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 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,   **VIN required 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.

P193E

Refer to Wiring Diagrams Cell 54 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 due to driver request or 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 Conditions
P193E	A/C Clutch Request Signal	This DTC sets when the PCM does not receive the A/C enable request from the BCM .

Possible Sources

- Network concerns
- BCM
- PCM
- FCIM

PINPOINT TEST O: P193E

O1 VERIFY THE CUSTOMER CONCERN

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

Is an observable symptom present?

Yes	GO to O2
No	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.

O2 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 O3
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).

O3 CHECK THE PCM (POWERTRAIN CONTROL MODULE) A/C (AIR CONDITIONING) REQUEST SIGNAL (AC_REQ) PID (PARAMETER IDENTIFICATION)

- Start the engine.
- Using a diagnostic scan tool, monitor the PCM 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 when the A/C button indicator is illuminated?

Yes	GO to O7
No	GO to O4

O4 CHECK THE FCIM (FRONT CONTROLS INTERFACE MODULE) A/C (AIR CONDITIONING) SWITCH (CC_SW_AC) PID (PARAMETER IDENTIFICATION)

- Using a diagnostic scan tool, monitor the FCIM CC_SW_AC PID while pressing and releasing the A/C button.

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

Yes	GO to O6
No	GO to O5

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 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,   **VIN required 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.

O6 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 Technical Service Bulletins (TSBs). If a TSB exists for this concern, DISCONTINUE this test and FOLLOW the TSB instructions. If no Technical Service Bulletins (TSBs) address this concern,   **VIN required 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.

O7 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 or 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 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,    **VIN required 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.

B105A:12, B105A:14, B1A61:11, B1A61:15, B1A69:12, B1A69:14

Refer to Wiring Diagrams Cell 54 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 Conditions
B105A:12	Cabin Temperature Sensor Fan: Circuit Short To Battery	This DTC sets when the 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.
B105A:14	Cabin Temperature Sensor Fan: Circuit Short To Ground or Open	This DTC sets when the 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.
B1A61:11	Cabin Temperature Sensor: Circuit Short to Ground	This DTC sets when the module senses lower than expected voltage on the in-vehicle temperature and humidity sensor feedback circuit, indicating a short to ground.
B1A61:15	Cabin Temperature Sensor: Circuit Short to Battery or Open	This DTC sets when the 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.
B1A69:12	Humidity Sensor: Circuit Short To Battery	This DTC sets when the module senses greater than expected voltage on the in-vehicle temperature and humidity sensor humidity input circuit, indicating a short to voltage.
B1A69:14	Humidity Sensor: Circuit Short To Ground or Open	This DTC sets when the 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

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

Visual Inspection and Diagnostic Pre-checks

- Make sure the in-vehicle temperature and humidity sensor harness is not chaffed.

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

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 IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TO VOLTAGE
• Ignition OFF. • Disconnect Air distribution door actuator C232. • Disconnect Driver side temperature door actuator C2091. • Disconnect Passenger side temperature door actuator C2092. • Disconnect Air inlet door actuator C282. • Disconnect In-vehicle temperature and humidity sensor C233. • Disconnect BCM fuse 21 (5A).

- Ignition ON.
- Disconnect FCIM C2402A.
- Disconnect FCIM C2402B.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 1	V	Ground
C233 Pin 2	V	Ground
C233 Pin 3	V	Ground
C233 Pin 4	V	Ground
C233 Pin 5	V	Ground
C233 Pin 6	V	Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to P2

P2 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TO GROUND

- Connect FCIM C2402A.
- Ignition OFF.
- Disconnect FCIM C2402A.
- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 1	Ω	Ground
C233 Pin 2	Ω	Ground
C233 Pin 3	Ω	Ground
C233 Pin 4	Ω	Ground
C233 Pin 5	Ω	Ground
C233 Pin 6	Ω	Ground

Are the resistances greater than 10,000 ohms?

Yes	GO to P3
No	REPAIR the circuit.

P3 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR AN OPEN

- Measure:

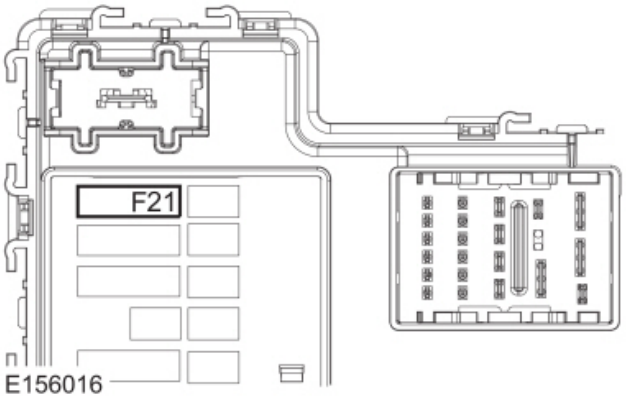
Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 3	Ω	C2402A Pin 3
C233 Pin 5	Ω	C2402A Pin 2

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 1	Ω	C2402B Pin 27
C233 Pin 2	Ω	C2402B Pin 29

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 4	Ω	C2402B Pin 19

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 6	Ω	 BCM fuse 21 cavity, (component side)

Are the resistances less than 3 ohms?

Yes	GO to P4
No	REPAIR the circuit.

P4 CHECK THE IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR CIRCUITS FOR A SHORT TOGETHER

- Measure:

Click to display connectors

Positive Lead	Measurement / Action	Negative Lead
C233 Pin 1	Ω	C233 Pin 2
C233 Pin 1	Ω	C233 Pin 3
C233 Pin 1	Ω	C233 Pin 4
C233 Pin 1	Ω	C233 Pin 5
C233 Pin 1	Ω	C233 Pin 6
C233 Pin 2	Ω	C233 Pin 3
C233 Pin 2	Ω	C233 Pin 4
C233 Pin 2	Ω	C233 Pin 5
C233 Pin 2	Ω	C233 Pin 6
C233 Pin 3	Ω	C233 Pin 4
C233 Pin 3	Ω	C233 Pin 5
C233 Pin 3	Ω	C233 Pin 6
C233 Pin 4	Ω	C233 Pin 5
C233 Pin 4	Ω	C233 Pin 6
C233 Pin 5	Ω	C233 Pin 6

Are the resistances greater than 10,000 ohms?

Yes	GO to P5
No	REPAIR the circuit.

P5 CHECK FOR CORRECT IN-VEHICLE TEMPERATURE AND HUMIDITY SENSOR OPERATION

- 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 sensor. REFER to: In-Vehicle Temperature and Humidity Sensor (412-00 Climate Control System - General Information, Removal and Installation). TEST the system for normal operation. If the concern is still present, GO to P6
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.

P6 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 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,

	  **VIN required 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.