

NOTE: *The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.*

- Ignition ON.
- Access the DCDC and monitor the DCDC_ENABLE PID
. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U0111:00 present?

Yes	GO to Pinpoint Test I
No	GO to A2

A2 PERFORM THE BECM (BATTERY ENERGY CONTROL MODULE) SELF-TEST

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

Are any BECM Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE any BECM Diagnostic Trouble Codes (DTCs). REFER to: High Voltage Battery, Mounting and Cables (414-03 High Voltage Battery, Mounting and Cables, Diagnosis and Testing).
No	GO to A3

A3 CHECK FOR DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) P0D32:00

- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC P0D32:00 present?

Yes	GO to Pinpoint Test B
No	GO to A4

A4 CHECK THE INTERNAL MODULE TEMPERATURE PID

NOTE: Let vehicle sit with the key off for minimum for 3 hours to allow the Direct Current/Direct Current Converter Control Module (DC/DC) to cool prior to performing next steps.

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Access the DCDC and monitor the INT_TEMP (Deg C) PID
- Record the DCDC INT_TEMP PID.
- Access the SOBDMC and monitor the ECT (Deg C) PID
- Record the SOBDMC ECT PID.

Is the DCDC value similar to the SOBDMC value?

Yes	DIAGNOSE the electric motor cooling system concern. REFER to: Electric Powertrain Cooling (303-03E Electric Powertrain Cooling - 3.3L Duratec-V6 â€” Hybrid (BP), Diagnosis and Testing).
No	GO to A5

A5 CLEAR THE DIAGNOSTIC TROUBLE CODES (DTCS) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

- Using a diagnostic scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC P0A94:4B present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
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.

PINPOINT TEST B : P0D32:00

Normal Operation and Fault Conditions

The DCDC is cooled by the electric powertrain cooling system. The DCDC monitors its temperature internally. If the internal temperature becomes excessive, DTC P0D32:00 sets and the DCDC goes to standby mode (DCDC disabled) until the over-temperature condition clears. Presence of this DTC results in CHECK CHARGING SYSTEM being displayed in the message center and the 12-volt battery discharged. Reduced or no functionality of 12-volt systems (such as the headlamps, and HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC P0D32:00	DC/DC Converter Over Temperature: No Sub Type Information	Sets in the DCDC when one or all of the internal thermistor(s) reach a temperature above 110Â°C (230Â°F), or the base plate thermistor reaches a temperature above 86Â°C (187Â°F).

Possible Sources

- Electric motor cooling system
- DCDC
- BECM

B1 CHECK FOR DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) U0111:00

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Ignition ON.
- Access the DCDC and monitor the DCDC_ENABLE PID
If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U0111:00 present?

Yes	GO to Pinpoint Test I
No	GO to B2

B2 PERFORM THE BECM (BATTERY ENERGY CONTROL MODULE) SELF-TEST

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform BECM self-test.

Are any BECM Diagnostic Trouble Codes (DTCs) present?

Yes	DIAGNOSE any BECM Diagnostic Trouble Codes (DTCs). REFER to: High Voltage Battery, Mounting and Cables (414-03 High Voltage Battery, Mounting and Cables, Diagnosis and Testing).
No	GO to B3

B3 CHECK FOR DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) P0A94:4B

- Using a diagnostic scan tool, perform DCDC self-test.

Is DTC P0A94:4B present?

Yes	Using a diagnostic scan tool, perform PCM self-test. If a cooling system component DTC is present, refer to the appropriate DTC chart. REFER to: Engine Cooling (303-03D Engine Cooling - 3.3L Duratec-V6 â€” Hybrid (BP), Diagnosis and Testing). If a cooling system component DTC is not present, refer the appropriate symptom chart. REFER to: Electric Powertrain Cooling (303-03E Electric Powertrain Cooling - 3.3L Duratec-V6 â€” Hybrid (BP), Diagnosis and Testing). If there are no cooling system Diagnostic Trouble Codes (DTCs) GO to B4
No	GO to B5

B4 CHECK THE INTERNAL MODULE TEMPERATURE PID

NOTE: Let vehicle sit with the key off for minimum for 3 hours to allow the Direct Current/Direct Current Converter Control Module (DC/DC) to cool prior to performing next steps.

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Access the DCDC and monitor the INT_TEMP (Deg C) PID
- Record the DCDC INT_TEMP PID.
- Access the SOBDMC and monitor the ECT (Deg C) PID
- Record the SOBDMC ECT PID.

Is the DCDC value similar to the SOBDMC value?

Yes	DIAGNOSE the electric motor cooling system concern. REFER to: Electric Powertrain Cooling (303-03E Electric Powertrain Cooling - 3.3L Duratec-V6 â€” Hybrid (BP), Diagnosis and Testing).
No	GO to B5

B5 CLEAR THE DIAGNOSTIC TROUBLE CODES (DTCs) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform DCDC self-test.

Is DTC P0D32:00 present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
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.

[PINPOINT TEST C : P0E56:00, P0E56:13](#)

Normal Operation and Fault Conditions

The DCDC monitors the high-voltage available from the high-voltage battery. If the DCDC senses high voltage of less than 152 volts, it sets P0E56:00. The DCDC also compares that high-voltage reading with the high-voltage available to the SOBDMC, which is communicated via a HS-CAN message. When the DCDC compares its available high-voltage to that available to the SOBDMC and determines the difference to be 120 volts or more, it sets DTC P0E56:13. Both DTCs result in a request the CHECK CHARGING SYSTEM message be displayed in the message center. The DCDC attempts to maintain operation. An open high-voltage, low-current fuse (located in the high voltage battery junction box) may cause the DCDC to be non-functional, resulting in the 12-volt battery eventually becoming drained. Reduced or no functionality of 12-volt systems (such as the headlamps, HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC P0E56:00	DC/DC Converter Input Voltage Too Low: No Sub Type Information	Sets in the DCDC when the high voltage measured by the DCDC is less than 152 volts.
DCDC P0E56:13	DC/DC Converter Input Voltage Too Low: Circuit Open	Sets in the DCDC when the difference in high voltage between the SOBDMC and DCDC is greater than 120 volts.

Possible Sources

- High voltage low current fuse
- High voltage cables
- Wiring, terminals or connectors
- DCDC

C1 COMPARE HIGH VOLTAGE BUS VOLTAGE PID (PARAMETER IDENTIFICATION) VALUES AT THE SOBDMC (SECONDARY ON-BOARD DIAGNOSTIC CONTROL MODULE C) AND DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE)

NOTE: *The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.*

- Ignition ON.
- Access the DCDC and monitor the DCDC_ENABLE PID.
. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Access the SOBDMC and monitor the HVBAT_V (V) PID
- Record the SOBDMC HVBAT_V PID.
- Access the DCDC and monitor the HEV_HI_VOL (V) PID
- Record the DCDC HEV_HI_VOL PID.

Is the difference between the SOBDMC PID and the DCDC PID 120V or greater?

Yes	GO to C2
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.

C2 CHECK THE HIGH VOLTAGE CONNECTIONS AT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) AND HIGH VOLTAGE BATTERY

- Ignition OFF.
- Depower the high voltage battery.
REFER to: High Voltage Battery Disconnect and Connect - Hybrid Electric Vehicle (HEV) (414-03 High Voltage Battery, Mounting and Cables)
- Disconnect DCDC [C1457A](#) .
- Disconnect High voltage battery [C4236D](#) HEV or [C494](#) PHEV .
- Inspect DCDC [C1457A](#) and high voltage battery [C4236D](#) HEV or [C494](#) PHEV for:
 - corrosion
 - damaged or bent pins
 - pushed-out pins

Are any concerns present?

Yes	INSTALL a new (14B322) wiring harness.
No	GO to C3

C3 CHECK THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) S

- Connect DCDC [C1457A](#) .
- Connect High voltage battery [C4236D](#) HEV or [C494](#) PHEV .
- Verify the high voltage DCDC [C1457A](#) and high voltage battery [C4236D](#) HEV or [C494](#) PHEV are fully seated.
- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform DCDC self-test.

Are DTCs P0E56:00 or P0E56:13 present?

Yes	GO to C4
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.

C4 CHECK THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) HIGH VOLTAGE CIRCUITS

- Ignition OFF.
- Disconnect DCDC [C1457A](#) .
- Disconnect High voltage battery [C4236D](#) HEV or [C494](#) PHEV .
- For HEV measure:

DIRECT CURRENT/DIRECT CURRENT (DC/DC) CONVERTER CONTROL MODULE	HIGH VOLTAGE BATTERY JUNCTION BOX
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Positive Lead	Measurement / Action	Negative Lead
C1457A-2	Ω	C4236D-1
C1457A-3	Ω	C4236D-2

- For PHEV measure:

DIRECT CURRENT/DIRECT CURRENT (DC/DC) CONVERTER CONTROL MODULE	INLINE
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Positive Lead	Measurement / Action	Negative Lead
C1457A-2	Ω	C494-4
C1457A-3	Ω	C494-1

Are the resistances less than 3 ohms?

Yes	GO to C5
No	INSTALL a new (14B322) wiring harness.

C5 CHECK THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) HIGH VOLTAGE LOW CURRENT FUSE

WARNING: Never install the service disconnect plug when a high-voltage service cover is removed. Always install the cover prior to connecting the service disconnect plug. The cover prevents inadvertent contact with the high voltage which is present at several points under the cover. Failure to follow these instructions may result in serious personal injury or death.

- Remove the high voltage low current fuse. HEV
REFER to: High Voltage Low Current Fuse - Hybrid Electric Vehicle (HEV) (414-03 High Voltage Battery, Mounting and Cables, Removal and Installation).
For PHEV
REFER to: High Voltage Low Current Fuse - Plug-In Hybrid Electric Vehicle (PHEV) (414-03 High Voltage Battery, Mounting and Cables) .
- Measure the resistance of the high voltage low current fuse.

Is the resistance less than 3 ohms?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
No	For HEV INSTALL a new (50A) high voltage low current fuse. REFER to: High Voltage Low Current Fuse - Hybrid Electric Vehicle (HEV) (414-03 High Voltage Battery, Mounting and Cables, Removal and Installation). INSPECT the high voltage cable between the high voltage battery and DCDC for signs of an obvious short condition. INSTALL a new (14B322) wiring harness if a short exists. If an obvious short condition is not identified, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation). For PHEV INSTALL a new (40A) high voltage low current fuse. REFER to: High Voltage Low Current Fuse - Plug-In Hybrid Electric Vehicle (PHEV) (414-03 High Voltage Battery, Mounting and Cables) . INSPECT the high voltage cable between the high voltage battery and DCDC for signs of an obvious short condition. INSTALL a new (14B322) wiring harness if a short exists. If an obvious short condition is not identified, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).

PINPOINT TEST D : P0E57:00

Normal Operation and Fault Conditions

The DCDC monitors the high voltage available from the high voltage battery. If the DCDC senses high voltage of greater than 327 volts for HEV or 413 volts for PHEV, it sets DTC P0E57:00 and requests the CHECK CHARGING SYSTEM message be displayed in the message center. The DCDC goes to standby mode (DCDC disabled) until the high voltage condition clears, resulting in the 12-volt battery eventually becoming discharged. Reduced or no functionality of 12-volt systems (such as the headlamps and HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC P0E57:00	DC/DC Converter Input Voltage Too High: No Sub Type Information	Sets in the DCDC when the high voltage battery voltage is greater than 327 volts for HEV or 413 volts for PHEV.

Possible Sources

- High voltage battery system fault
- High voltage cables
- DCDC

D1 CHECK THE SOBDMC (SECONDARY ON-BOARD DIAGNOSTIC CONTROL MODULE C) FOR HIGH VOLTAGE DIAGNOSTIC TROUBLE CODES (DTCS)

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, perform the SOBDMC self-test and record the results.

Is SOBDMC DTC P1A07:00 reported?

Yes	REFER to: Electric Powertrain Control (303-14 Electric Powertrain Control) .
No	GO to D2

D2 CHECK THE HIGH VOLTAGE PID (PARAMETER IDENTIFICATION) TO THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE)

- Access the DCDC and monitor the HEV_HI_VOL (V) PID

Does the PID read less than 327 volts for HEV or 413 volts for PHEV?

Yes	The system is operating correctly at this time. The DTC may have been set due to high network traffic or an intermittent fault condition.
No	Perform the BECM self-test. If BECM DTCs are present, DIAGNOSE the BECM DTCs first. If there are no BECM DTCs present, GO to D3

D3 CHECK THE HIGH VOLTAGE CONNECTIONS AT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) AND HIGH VOLTAGE BATTERY

- Ignition OFF.
- Depower the high voltage battery.
REFER to: High Voltage Battery Disconnect and Connect - Hybrid Electric Vehicle (HEV) (414-03 High Voltage Battery, Mounting and Cables)
- Disconnect DCDC [C1457A](#) .
- Disconnect High voltage battery [C4236D](#) HEV or [C494](#) PHEV .
- Inspect DCDC [C1457A](#) and high voltage battery [C4236D](#) HEV or [C494](#) PHEV for:
 - corrosion
 - damaged or bent pins
 - pushed-out pins

Is a concern present?

Yes	Install a new (14B322) wiring harness.
No	GO to D4

D4 CLEAR THE DIAGNOSTIC TROUBLE CODES (DTCs) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Connect DCDC [C1457A](#) .
- Connect High voltage battery [C4236D](#) HEV or [C494](#) PHEV .
- Connect the high voltage battery.
REFER to: High Voltage Battery Disconnect and Connect - Hybrid Electric Vehicle (HEV) (414-03 High Voltage Battery, Mounting and Cables) .
- Ignition ON.
- Using the scan tool, clear the DCDC DTCs.
- Using a diagnostic scan tool, view DCDC PIDs.
- Access the DCDC and monitor the DCDC_ENABLE PID
If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other DTC's have been addressed.
- Using a diagnostic scan tool, perform DCDC self-test.

Is DTC P0E57:00 present?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
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.

PINPOINT TEST E : U3003:16

Normal Operation and Fault Conditions

The DCDC monitors the 12-volt battery system voltage internally at the B+ terminal of the DCDC. If the voltage drops below 10.3 volts at the B+ terminal (output of DC/DC) while the ignition is ON, the DCDC sets DTC U3003:16. The DCDC will continue to produce output current until the B+ terminal voltage is less than 8V. At that point the DCDC goes to standby mode (DCDC disabled) and the 12-volt battery can eventually be discharged. Reduced or no functionality of 12-volt systems (such as the headlamps and HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U3003:16	Battery Voltage: Circuit Voltage Below Threshold	Sets if the DCDC detects an output of less than 10.3 volts.

Possible Sources

- 12-volt battery
- 12-volt battery cables
- Wiring, terminals or connectors
- Fuse(s)
- DCDC
- PCM

E1 TEST 12V BATTERY CONDITION

NOTE: All testing should be completed at the main engine compartment 12v battery.

- Ignition OFF.
- Perform the battery condition test.
REFER to: Battery (414-01 Battery, Mounting and Cables, Diagnosis and Testing).

Did the battery pass the condition test?

Yes	GO to E2
No	INSTALL a new 12V battery. REFER to: Battery (414-01 Battery, Mounting and Cables, Removal and Installation).

E2 CHECK FOR DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) S P0E56:00 OR P0E56:13

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Ignition ON.
- Access the DCDC and monitor the DCDC_ENABLE PID
. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Are DTCs P0E56:00 or P0E56:13 present?

Yes	GO to Pinpoint Test C
No	GO to E3

E3 REMOVE AND INSPECT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) AUX BATTERY FUSE

- Ignition OFF.
- Remove and inspect BJB fuse 159 (15A) for being open.

Is the fuse open?

Yes	REFER to the Wiring Diagrams manual to identify the possible cause of the circuit short. If no short is identified install a new fuse and test for normal operation.
No	GO to E4

E4 PERFORM THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) AND PCM (POWERTRAIN CONTROL MODULE) SELF-TESTS

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Inspect the DCDC [C1457B](#), make sure it is seated and latched correctly.
- Ignition ON.
- Using a diagnostic scan tool, view the DCDC PIDs.
- Access the DCDC and monitor the DCDC_ENABLE PID

. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.

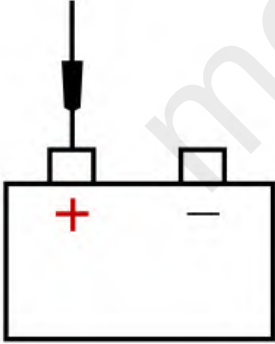
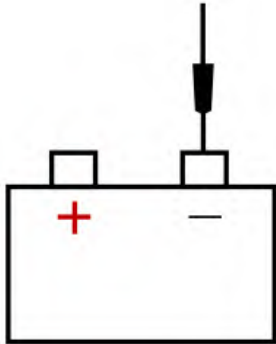
- Using the scan tool, clear the DCDC DTCs.
- Using a diagnostic scan tool, perform the DCDC self-test and record any DTCs.
- Using the scan tool, clear the PCM DTCs.
- Using a diagnostic scan tool, perform the PCM self-test and record any DTCs.

Did both the DCDC and PCM perform a self-test?

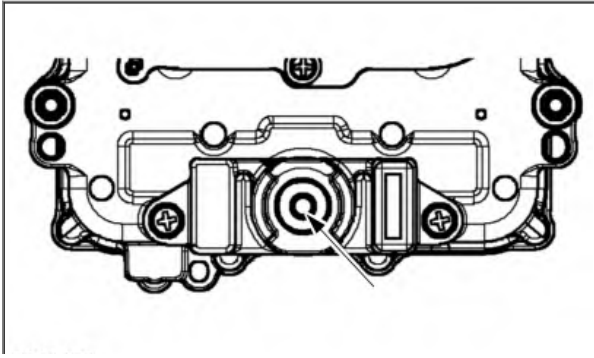
Yes	GO to E5
No	DIAGNOSE the scan tool communication with the DCDC and/or PCM. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

E5 COMPARE VOLTAGE AT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) TO THE BATTERY VOLTAGE

- Start the vehicle (Ready indicator light ON).
- Turn the headlamps on and the blower on high.
- Measure:

Positive Lead	Measurement / Action	Negative Lead
 E142358		 E142359

- Ignition OFF.
- Disconnect the 12V battery.
REFER to: Battery Disconnect and Connect (414-01 Battery, Mounting and Cables, General Procedures).
- Inspect the DCDC 12V B+ terminal to verify there are at least 3 threads above the nut. If not, disassemble and inspect the terminal and stud, clean or replace one or both.
- Start the vehicle (Ready indicator light ON).
- Turn the headlamps on and the blower on high.
- Measure:



NOTE: Place the positive lead on the DC/DC Converter B+ stud.

Positive Lead	Measurement / Action	Negative Lead
C1457C (12V DC/DC B+)		G117

Is the measured voltage within 0.5V of 12V battery?

Yes	For PCM DTC P0562:00 without DCDC DTC U3003:16, GO to E6 For DCDC DTC U3003:16 with or without PCM DTC P0562:00 OR if there are NO DTC's, GO to E9
No	GO to E9

E6 REMOVE AND INSPECT THE PCM (POWERTRAIN CONTROL MODULE) VPWR FUSE

- Ignition OFF.
- Remove and inspect BJB fuse 6 (20A) for being open.

Is the fuse open?

Yes	REFER to the Wiring Diagrams manual to identify the possible cause of the circuit short. If no short is identified install a new fuse and test for normal operation.
No	GO to E7

E7 CHECK THE PCM (POWERTRAIN CONTROL MODULE) VPWR CIRCUITS

- Ignition OFF.
- Disconnect PCM HEV [C175B](#) or PHEV [C1551B](#).
- For HEV, connect a 5A fused jumper between:

POWERTRAIN CONTROL MODULE (PCM)	
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Positive Lead	Measurement / Action	Negative Lead
C175B-60		Ground

- For PHEV, connect a 5A fused jumper between:

POWERTRAIN CONTROL MODULE (PCM)	
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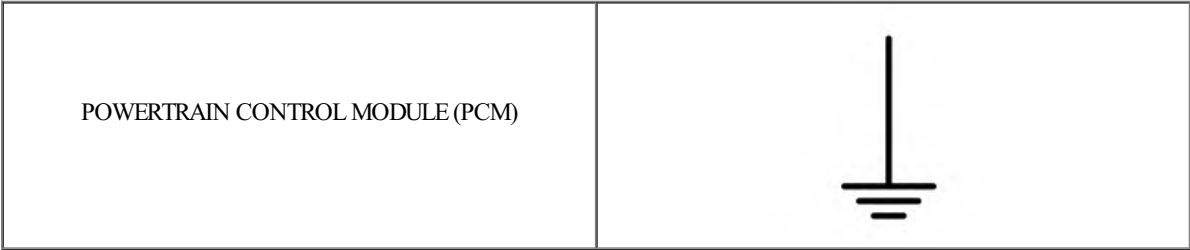
Positive Lead	Measurement / Action	Negative Lead
C1551B-60		Ground

- Ignition ON.
- For HEV, measure and record:

POWERTRAIN CONTROL MODULE (PCM)	
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Positive Lead	Measurement / Action	Negative Lead
C175B-1		Ground
C175B-2		Ground
C175B-16		Ground

- For PHEV, measure and record:

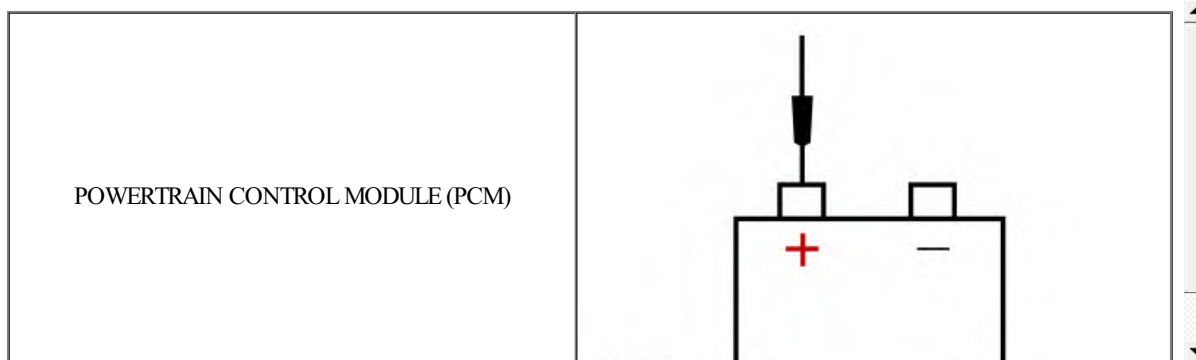


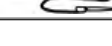
Positive Lead	Measurement / Action	Negative Lead
C1551B-1		Ground
C1551B-2		Ground
E8 CHECK THE PCM (POWERTRAIN CONTROL MODULE) GROUND CIRCUITS		Ground

Is the measured voltage within 0.5V of 12V battery?

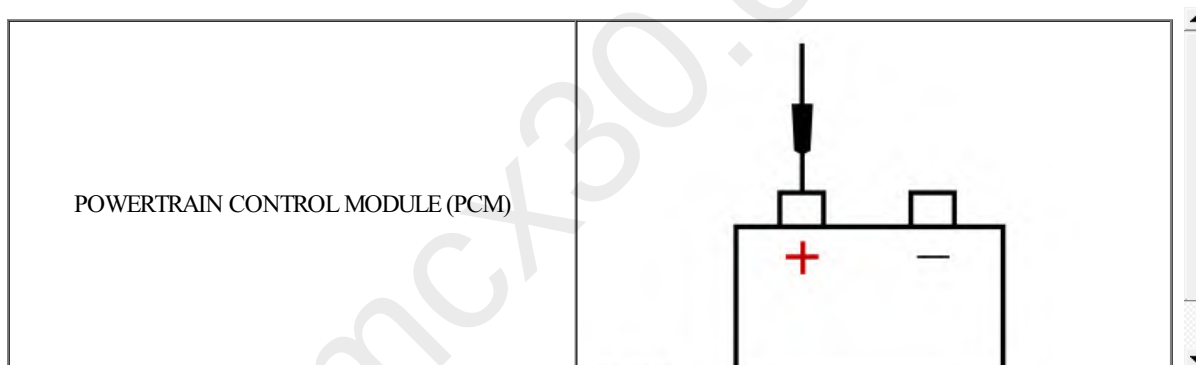
Yes	GO to E8
No	REPAIR the affected circuit.

- Ignition OFF.
- Disconnect the fused jumper.
- For HEV, measure:



Positive Lead	Measurement / Action	Negative Lead
C175B-46		12V BATTERY B+
C175B-47		12V BATTERY B+
C175B-61		12V BATTERY B+
C175B-62		12V BATTERY B+
C175B-76		12V BATTERY B+
C175B-77		12V BATTERY B+

- For PHEV, measure:



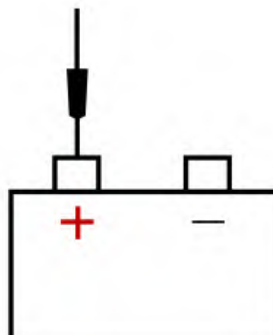
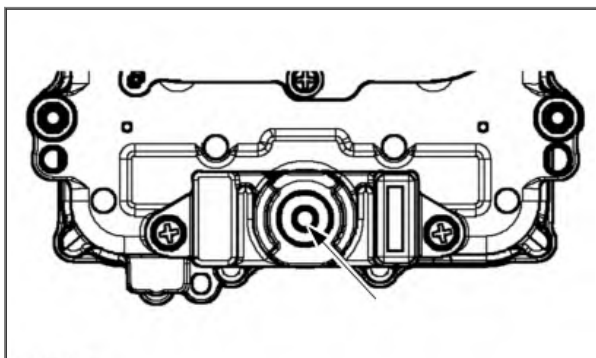
Positive Lead	Measurement / Action	Negative Lead
C1551B-46		12V BATTERY B+
C1551B-47		12V BATTERY B+
C1551B-61		12V BATTERY B+
C1551B-62		12V BATTERY B+
C1551B-76		12V BATTERY B+
C1551B-77		12V BATTERY B+

Does the test lamp illuminate on all pins?

Yes	GO to E12
No	REPAIR the affected circuit or chassis ground.

E9 MEASURE VOLTAGE DROP OF DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) B+ CABLE

- Measure:



NOTE: Place the positive lead on the DC/DC Converter B+ stud.

Positive Lead	Measurement / Action	Negative Lead
C1457C (12V DC/DC B+)		12V BATTERY B+

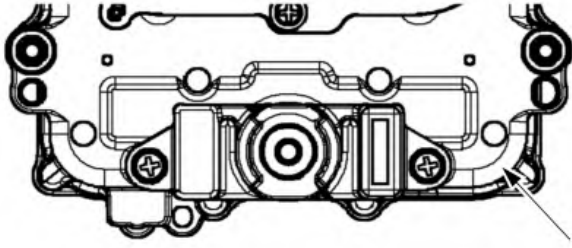
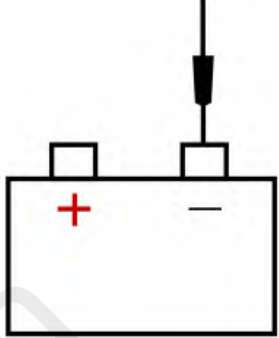
Is the voltage drop less than 0.5 volt?

Yes	Verify G117 and G119 body connections are OK. If not OK, REPAIR the connection. If OK, REPAIR 12V Battery B- circuit or INSTALL a new 12V battery negative cable if necessary. GO to E10 If there are NO DTC's, GO to E13 .
No	VERIFY the high current fuse box fuse 201 (275A) is OK. If OK, REPAIR circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. INSTALL new B+ cables, if necessary.

E10 VERIFY THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CASE GROUND

- Reconnect the PCM connectors.
- Start the vehicle (Ready indicator light ON).
- Turn the headlamps on and the blower on high.
- Measure:

NOTE: Place the positive lead on the DC/DC Converter Case.

Positive Lead	Measurement / Action	Negative Lead
 E310947 DC/DC Case		 E142359

Is the voltage drop less than 0.5V?

Yes	GO to E11
No	INSPECT and REPAIR the DCDC case ground issue or the battery ground for corrosion.

E11 CLEAR THE DIAGNOSTIC TROUBLE CODES (DTCS) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Using the scan tool, clear the DCDC DTCs.
- Using a diagnostic scan tool, view DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other DTC's have been addressed.
- Using a diagnostic scan tool, perform DCDC self-test.

Is DTC U3003:16 present?

Yes	GO to E13
No	The system is operating correctly at this time. The concern may have been caused by a discharged battery.

E12 CHECK FOR CORRECT PCM (POWERTRAIN CONTROL MODULE) OPERATION

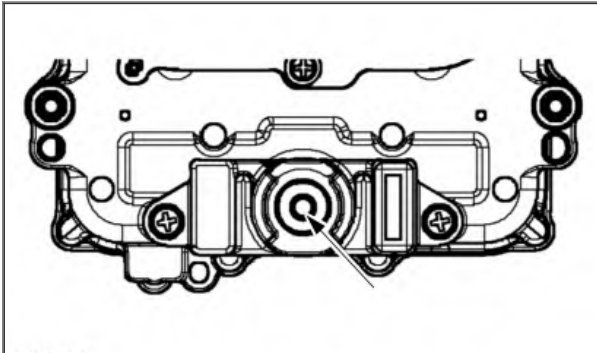
- Ignition OFF.
- Disconnect and inspect all PCM connectors.
- Repair:
 - corrosion (install new connector or terminals â€“ clean module pins)
 - damaged or bent pins â€“ install new terminals/pins
 - pushed-out pins â€“ install new pins as necessary
- Reconnect the PCM connectors. Make sure they seat 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 service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM) .
No	The system is operating correctly at this time. The concern may have been caused by module connections. Address the root cause of any connector or pin issues.

E13 CHECK FOR CORRECT DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CONVERTER OPERATION

- Ignition OFF.
- Ignition ON.
- Using a diagnostic scan tool, view DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other DTC's have been addressed.
- Measure:



NOTE: Place the positive lead on the DC/DC Converter B+ stud.

Positive Lead	Measurement / Action	Negative Lead
C1457C (12V DC/DC B+)		G117

Is the voltage greater than 13 volts?

Yes	Make sure the 12V battery voltage is within 0.5V, if not GO to E9 If the voltage is within 0.5V the system is operating correctly at this time. The concern may have been caused by module connections. Address the root cause of any connection issues.
No	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).

PINPOINT TEST F : U3003:17

Normal Operation and Fault Conditions

The DCDC monitors the 12-volt battery system voltage internally at the B+ terminal of the DCDC. If the voltage is greater than 16 volts, the DCDC sets DTC U3003:17. The DCDC goes to standby mode (DCDC disabled) and the 12-volt battery can eventually be discharged. Reduced or no functionality of 12-volt systems (such as the headlamps and HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U3003:17	Battery Voltage: Circuit Voltage Above Threshold	Sets in the DCDC if the 12-volt battery system voltage is greater than 16 volts.

Possible Sources

- External 12V battery charger
- Aftermarket accessories
- Wiring, terminals or connectors
- Fuse(s)
- DCDC
- PCM

F1 PERFORM THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) AND PCM (POWERTRAIN CONTROL MODULE) SELF-TESTS

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

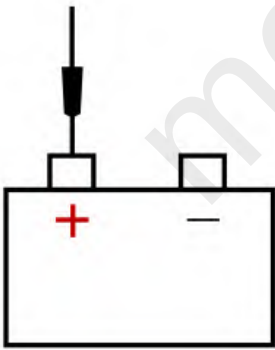
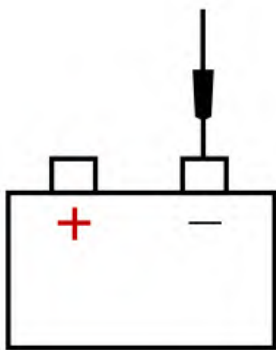
- Ignition ON.
 - Using a diagnostic scan tool, view the DCDC PIDs.
 - Access the DCDC and monitor the DCDC_ENABLE PID
- . If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear all DCDC Diagnostic Trouble Codes (DTCs).
 - Using a diagnostic scan tool, perform the DCDC self-test and record Diagnostic Trouble Codes (DTCs).
 - Using a diagnostic scan tool, clear all PCM Diagnostic Trouble Codes (DTCs).
 - Using a diagnostic scan tool, perform the PCM self-test.

If DTC U3003:17 is reported in the DCDC and/or DTC P0563:00 reported in the PCM?

Yes	If DTC U3003:17 is reported in the DCDC with other Diagnostic Trouble Codes (DTCs) REPAIR all other DCDC Diagnostic Trouble Codes (DTCs) before repairing U3003:17. GO to the DCDC DTC chart in this section. If U3003:17 is the only DTC reported in the DCDC and/or if DTC P0563:00 is reported in the PCM GO to F2
No	The vehicle concern is not present at this time.

F2 CHECK VOLTAGE OF THE 12V BATTERY

- Start the vehicle (Ready indicator light ON).
- Turn off the headlamps, blower and any other accessories.
- Measure:

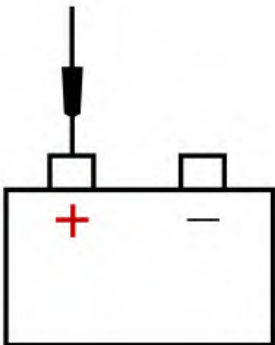
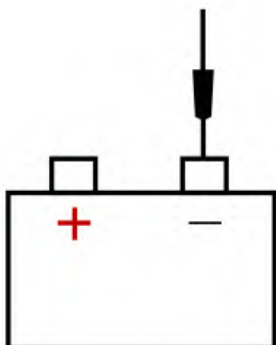
Positive Lead	Measurement / Action	Negative Lead
 E142358		 E142359

Is the voltage less than 16 volts?

Yes	GO to F4
No	GO to F3

F3 INSPECT VEHICLE ACCESSORIES

- Ignition OFF.
- Inspect the vehicle and disable any customer installed accessories.
- Start the vehicle (Ready indicator light ON).
- Measure:

Positive Lead	Measurement / Action	Negative Lead
 E142358		 E142359

Is the voltage less than 16 volts?

Yes	COMMUNICATE the accessory concern to the customer.
No	GO to F4

F4 REMOVE AND INSPECT THE PCM (POWERTRAIN CONTROL MODULE) VPWR FUSE

- Ignition OFF.
- Remove and inspect BJB fuse 6 (20A) for being open.

Is the fuse open?

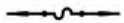
Yes	REFER to the Wiring Diagrams manual to identify the possible cause of the circuit short. If no short is identified install a new fuse and test for normal operation.
No	GO to F5

F5 CHECK THE PCM (POWERTRAIN CONTROL MODULE) VPWR CIRCUITS

- Ignition OFF.
- Disconnect PCM HEV [C175B](#) or PHEV [C1551B](#) .
- For HEV, connect a 5A fused jumper between:

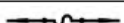
POWERTRAIN CONTROL MODULE (PCM)	
---------------------------------	---

Positive Lead	Measurement / Action	Negative Lead
---------------	----------------------	---------------

Positive Lead	Measurement / Action	Negative Lead
C175B-60		Ground

- For PHEV, connect a 5A fused jumper between:

POWERTRAIN CONTROL MODULE (PCM)	
---------------------------------	---

Positive Lead	Measurement / Action	Negative Lead
C1551B-60		Ground

- Ignition ON.
- For HEV, measure and record:

POWERTRAIN CONTROL MODULE (PCM)	
---------------------------------	--

Positive Lead	Measurement / Action	Negative Lead
C175B-1		Ground
C175B-2		Ground
C175B-16		Ground

- For PHEV, measure and record:

POWERTRAIN CONTROL MODULE (PCM)	
---------------------------------	---

Positive Lead	Measurement / Action	Negative Lead
C1551B-1		Ground
C1551B-2		Ground
C1551B-16		Ground

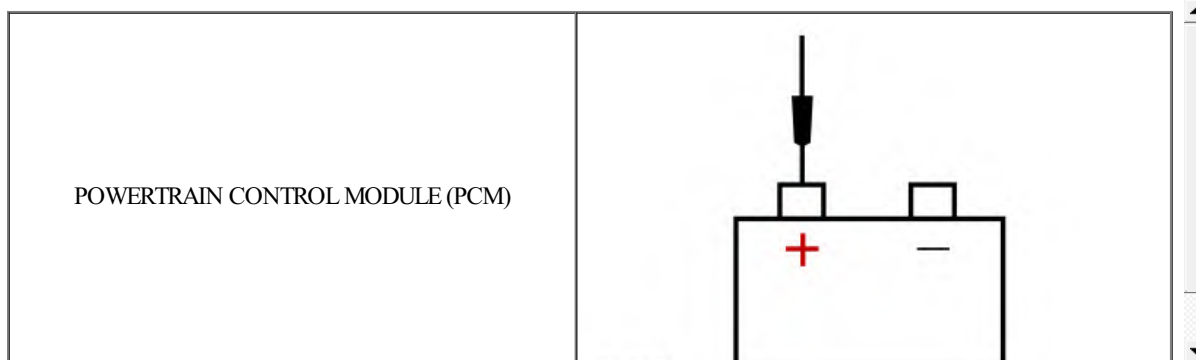
Is the measured voltage within 0.5V of 12V battery?

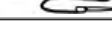
Yes	GO to F6
No	REPAIR the affected circuit.

F6 CHECK THE PCM (POWERTRAIN CONTROL MODULE) GROUND CIRCUITS

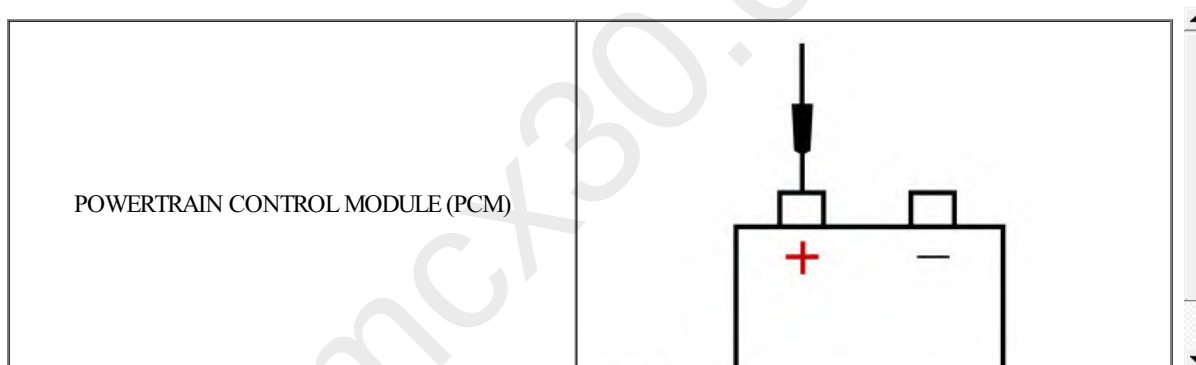
mcx30.com

- Ignition OFF.
- Disconnect the fused jumper.
- For HEV, measure:



Positive Lead	Measurement / Action	Negative Lead
C175B-46		12V BATTERY B+
C175B-47		12V BATTERY B+
C175B-61		12V BATTERY B+
C175B-62		12V BATTERY B+
C175B-76		12V BATTERY B+
C175B-77		12V BATTERY B+

- For PHEV, measure:



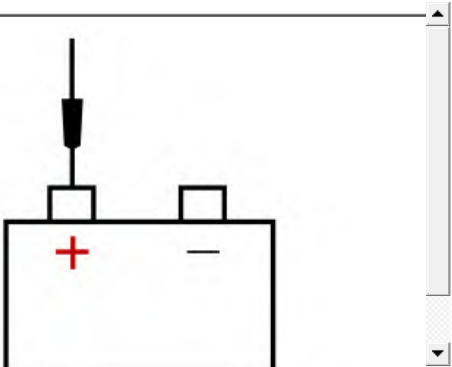
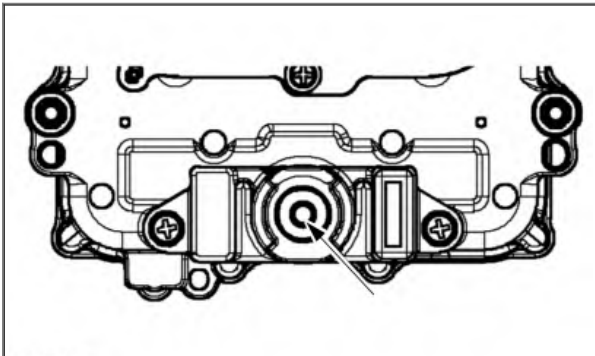
Positive Lead	Measurement / Action	Negative Lead
C1551B-46		12V BATTERY B+
C1551B-47		12V BATTERY B+
C1551B-61		12V BATTERY B+
C1551B-62		12V BATTERY B+
C1551B-76		12V BATTERY B+
C1551B-77		12V BATTERY B+

Does the test lamp illuminate on all pins?

Yes	GO to F7
No	REPAIR the affected circuit or chassis ground.

F7 MEASURE VOLTAGE DROP OF DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) B+ CABLE

- Measure:



NOTE: Place the positive lead on the DC/DC Converter B+ stud.

Positive Lead	Measurement / Action	Negative Lead
C1457C (12V DC/DC B+)		12V BATTERY B+

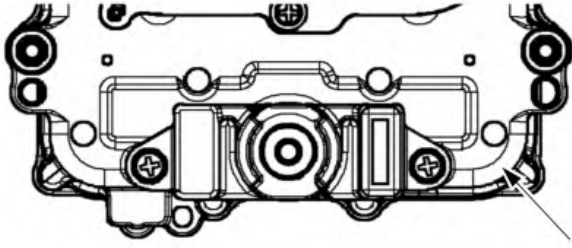
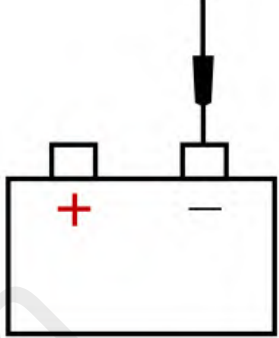
Is the voltage drop less than 0.5 volt?

Yes	Verify G117 and G119 body connections are OK. If not OK, REPAIR the connection. If OK, REPAIR 12V Battery B- circuit or INSTALL a new 12V battery negative cable if necessary.GO to F8 If there are NO DTC's, GO to F9 .
No	VERIFY the high current fuse box fuse 201 (275A) is OK. If OK, REPAIR circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. INSTALL new B+ cables, if necessary.

F8 VERIFY THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CASE GROUND

- Reconnect the PCM connectors.
- Start the vehicle (Ready indicator light ON).
- Turn the headlamps on and the blower on high.
- Measure:

NOTE: Place the positive lead on the DC/DC Converter Case.

Positive Lead	Measurement / Action	Negative Lead
 E310947 DC/DC Case		 E142359

Is the voltage drop less than 0.5V?

Yes	For PCM DTC P0563:00 without DCDC DTC U3003:17 GO to F10 For DCDC DTC U3003:17 with or without PCM DTC P0563:00 GO to F9
No	INSPECT and REPAIR the DCDC case ground issue or the battery ground for corrosion.

F9 CLEAR DIAGNOSTIC TROUBLE CODES (DTCs) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Using the scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, view the DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the High Voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U3003:17 reported in the DCDC or is DTC P0563:00 reported in the PCM?

Yes	INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
No	Concern is not present at this time. DTC U3003:17 or P0563:00 was most likely set due to the 12-volt battery being recently jump started or incorrectly charged using a battery charger.

F10 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 service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, Click here to access Guided Routine (PCM) .
No	Concern is not present at this time. DTC P0563:00 was most likely set due to the 12-volt battery being recently jump started, incorrectly charged using a battery charger, or by module connections.

PINPOINT TEST G : U3003:62

Normal Operation and Fault Conditions

The DCDC monitors the 12-volt battery system voltage internally at the B+ terminal and at the low voltage connector in the DCDC and compares the voltage. If the voltage difference is greater than 4.3 volts, the DCDC sets DTC U3003:62. The DCDC goes to standby mode (DCDC disabled) and the 12-volt battery can eventually be discharged. Reduced or no functionality of 12-volt systems (such as the headlamps and HVAC blower motor) may also be noticed.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U3003:62	Battery Voltage: Signal Compare Failure	Sets in the DCDC when the 12-volt battery system voltage measured at the DCDC B+ stud terminal and the DCDC low voltage connector voltage difference is greater than 4.3 volts.

Possible Sources

- External 12V battery charger
- Aftermarket accessories
- Fuse(s)
- Wiring, terminals or connectors
- DCDC

G1 PERFORM THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

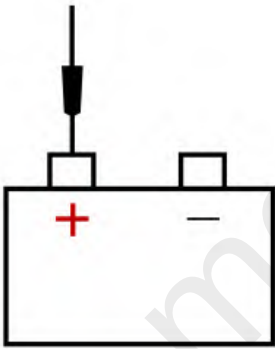
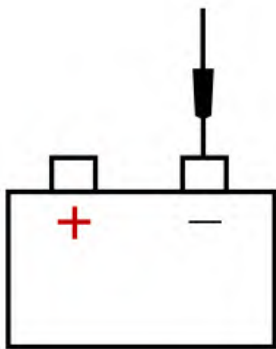
- Ignition ON.
 - Using a diagnostic scan tool, view the DCDC PIDs.
 - Access the DCDC and monitor the DCDC_ENABLE PID
- . If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using the scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
 - Using a diagnostic scan tool, perform the DCDC self-test and record Diagnostic Trouble Codes (DTCs).

Is DTC U3003:62 present?

Yes	REPAIR all other DCDC Diagnostic Trouble Codes (DTCs) before repairing U3003:62. GO to the DCDC DTC chart in this section. If U3003:62 is the only DTC reported in the DCDC. GO to G2
No	The vehicle concern is not present at this time.

G2 CHECK VOLTAGE OF THE 12V BATTERY

- Start the vehicle (Ready indicator light ON).
- Turn off the headlamps, blower and any other accessories.
- Measure and record:

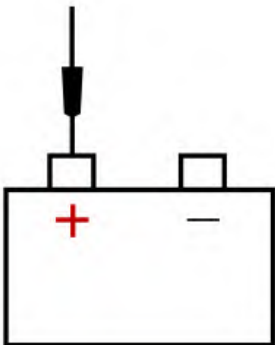
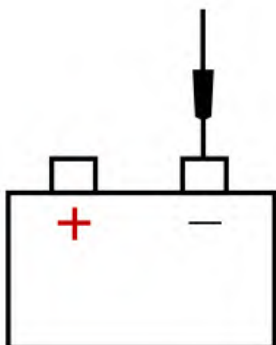
Positive Lead	Measurement / Action	Negative Lead
 E142358		 E142359

Is the voltage less than 16 volts?

Yes	GO to G3
No	GO to G4

G3 INSPECT VEHICLE ACCESSORIES

- Ignition OFF.
- Inspect the vehicle and disable any customer installed accessories.
- Start the vehicle (Ready indicator light ON).
- Measure:

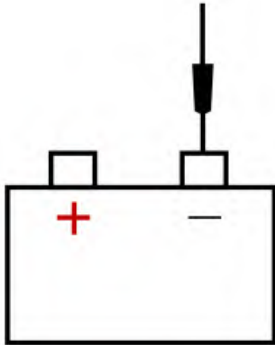
Positive Lead	Measurement / Action	Negative Lead
 E142358		 E142359

Is the voltage less than 16 volts?

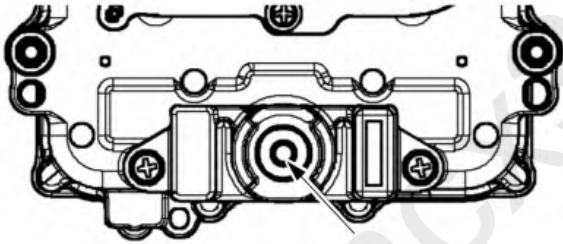
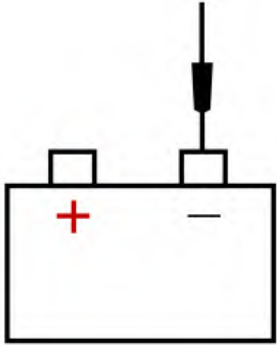
Yes	GO to G5
No	COMMUNICATE the accessory concern to the customer.

G4 COMPARE THE BATTERY VOLTAGE

- Disconnect DCDC [C1457C](#) .
- Disconnect DCDC [C1457B](#) .
- Start the vehicle (Ready indicator light ON).
- Turn off the headlamps, blower and any other accessories.
- Measure and record :

Positive Lead	Measurement / Action	Negative Lead
C1457B-1		 E142359

- Measure and record:

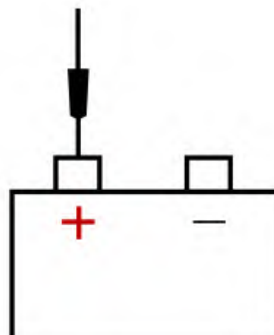
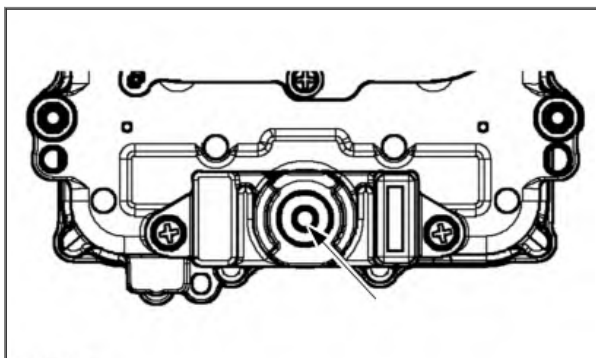
Positive Lead	Measurement / Action	Negative Lead
 E301475 C1457C (12V DC/DC B+)		 E142359

Is the difference in voltage between the measurements greater than 4.3 volts?

Yes	If the voltage at the C1457C connector is less than 16 volts. GO to G5 If the voltage at the C1457B connector pin 1 is less than 12 volts. VERIFY the BJB fuse 159 (15A) is OK. If OK, REPAIR circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.
No	GO to G8

G5 MEASURE VOLTAGE DROP OF DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) B+ CABLE

- Measure:



NOTE: Place the positive lead on the DC/DC Converter B+ stud.

Positive Lead	Measurement / Action	Negative Lead
C1457C (12V DC/DC B+)		12V BATTERY B-

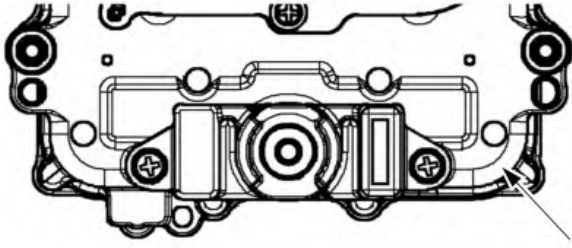
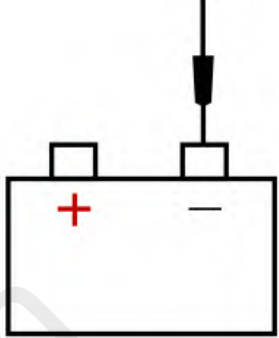
Is the voltage drop less than 0.5 volt?

Yes	Verify G117 and G119 body connections are OK. If not OK, REPAIR the connection. If OK, REPAIR 12V Battery B- circuit or INSTALL a new 12V battery negative cable if necessary. GO to G6
No	VERIFY the high current fuse box fuse 201 (275A) is OK. If OK, REPAIR circuit. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. INSTALL new B+ cables, if necessary.

G6 VERIFY THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CASE GROUND

- Reconnect the PCM connectors.
- Start the vehicle (Ready indicator light ON).
- Turn the headlamps on and the blower on high.
- Measure:

NOTE: Place the positive lead on the DC/DC Converter Case.

Positive Lead	Measurement / Action	Negative Lead
 E310947 DC/DC Case		 E142359

Is the voltage drop less than 0.5V?

Yes	GO to G7
No	INSPECT and REPAIR the DCDC case ground issue or the battery ground for corrosion.

G7 INSPECT ALL THE LOW VOLTAGE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CONNECTORS

- Ignition OFF.
- Disconnect and inspect all DCDC 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 DCDC 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	GO to G8
No	Concern is not present at this time. DTC U3003:62 was most likely set due to module connections.

G8 CLEAR DIAGNOSTIC TROUBLE CODES (DTCs) AND REPEAT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF-TEST

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Using the scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, view the DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the High Voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U3003:62 present?

Yes	INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
No	The concern is not present at this time.

PINPOINT TEST H : U0100:00

Normal Operation and Fault Conditions

The DCDC communicates with the PCM over a HS-CAN to send and receive important vehicle data. When powered on, the DCDC continually monitors the HS-CAN. If communication with a module is lost, a fault is detected and the DCDC sets the appropriate DTC.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U0100:00	Lost Communication With ECM/PCM "A": No Sub Type Information	This DTC sets if the DCDC does not receive an expected message from the PCM.

Possible Sources

- Network traffic
- Wiring, terminals or connectors
- DCDC
- PCM

H1 CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform a network test.

Does the PCM pass the network test?

Yes	GO to H2
No	DIAGNOSE the scan tool communication with the PCM concern. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

H2 CHECK THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Using a diagnostic scan tool, view DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U0100:00 retrieved?

Yes	GO to H3
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.

H3 REVIEW THE DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE)

- Review the Diagnostic Trouble Codes (DTCs) recorded during the DCDC self-test.

Is DTC U3003:16 or U3003:17 recorded?

Yes	DIAGNOSE the battery voltage DTC stored in the DCDC. REFER to the DCDC DTC chart.
No	GO to H4

H4 RETRIEVE THE DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE PCM (POWERTRAIN CONTROL MODULE)

- Using a diagnostic scan tool, perform the PCM self-test.

Is DTC P0562:00 or P0563:00 recorded?

Yes	DIAGNOSE the PCM DTC. Refer to the PCM DTC chart in this section.
No	GO to H5

H5 INSPECT ALL THE PCM (POWERTRAIN CONTROL MODULE) CONNECTORS

- 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	GO to H6
No	Concern is not present at this time. DTC U0100:00 was most likely set due to module connections.

H6 CHECK FOR A LOST COMMUNICATION WITH THE PCM (POWERTRAIN CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) IN OTHER MODULES

- Using a diagnostic scan tool, retrieve Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.

Is DTC U0100:00 set in multiple modules?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, it is necessary to seek additional help. REFER to the Service Repair And Technical Assistance Process. A vehicle data recorder (VDR) or similar recorder may also be useful.
No	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).

PINPOINT TEST I: U0111:00

Normal Operation and Fault Conditions

The DCDC communicates with the BECM over a HS-CAN to send and receive important vehicle data. When powered on, the DCDC continually monitors the HS-CAN. If communication with a module is lost, a fault is detected and the DCDC sets the appropriate DTC.

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U0111:00	Lost Communication With Battery Energy Control Module "A": No Sub Type Information	This DTC sets if the DCDC does not receive an expected message from the BECM.

Possible Sources

- Network traffic
- Wiring, terminals or connectors
- DCDC
- BECM

II CHECK THE COMMUNICATION NETWORK

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform a network test.

Does the BECM pass the network test?

Yes	GO to I2
No	DIAGNOSE the scan tool communication with the BECM concern. REFER to: Communications Network (418-00 Module Communications Network, Diagnosis and Testing).

I2 CHECK THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) CONTINUOUS MEMORY DIAGNOSTIC TROUBLE CODES (CMDTCS)

NOTE: The Direct Current/Direct Current Converter Control Module (DC/DC) will not self test if it is not Enabled.

- Using a diagnostic scan tool, view DCDC PIDs.
- Monitor the EnableStat PID. If the PID does not read Enable verify the high voltage battery service disconnect is installed and all other Diagnostic Trouble Codes (DTCs) have been addressed.
- Using a diagnostic scan tool, clear the DCDC Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, perform the DCDC self-test.

Is DTC U0111:00 retrieved?

Yes	GO to I3
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.

I3 REVIEW THE DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE)

- Review the Diagnostic Trouble Codes (DTCs) recorded during the DCDC self-test.

Is DTC U3003:16 or U3003:17 recorded?

Yes	DIAGNOSE the battery voltage DTC stored in the DCDC. REFER to the DCDC DTC chart.
No	GO to I4

I4 RETRIEVE THE DIAGNOSTIC TROUBLE CODES (DTCs) FROM THE BECM (BATTERY ENERGY CONTROL MODULE)

- Using a diagnostic scan tool, perform the BECM self-test.

Is DTC U3003:16 or U3003:17 recorded?

Yes	DIAGNOSE the BECM DTC. REFER to: High Voltage Battery, Mounting and Cables (414-03 High Voltage Battery, Mounting and Cables, Diagnosis and Testing).
No	GO to I5

I5 INSPECT ALL THE BECM (BATTERY ENERGY CONTROL MODULE) CONNECTORS

- Ignition OFF.
- Disconnect and inspect all BECM 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 BECM 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	GO to I6
No	Concern is not present at this time. DTC U0111:00 was most likely set due to module connections.

I6 CHECK FOR A LOST COMMUNICATION WITH THE BECM (BATTERY ENERGY CONTROL MODULE) DTC (DIAGNOSTIC TROUBLE CODE) IN OTHER MODULES

- Using a diagnostic scan tool, retrieve Continuous Memory Diagnostic Trouble Codes (CMDTCs) from all modules.

Is DTC U0111:00 set in multiple modules?

Yes	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, it is necessary to seek additional help. REFER to the Service Repair And Technical Assistance Process. A vehicle data recorder (VDR) or similar recorder may also be useful.
No	CHECK OASIS for any applicable service articles: TSB, GSB, SSM or FSA. If a service article exists for this concern, DISCONTINUE this test and FOLLOW the service article instructions. If no service articles address this concern, INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).

PINPOINT TEST J : U0412:00

Normal Operation and Fault Conditions

REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module - System Operation and Component Description (414-05 Voltage Converter/Inverter, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U0412:00	Invalid Data Received From Battery Energy Control Module "A": No Sub Type Information	DTC U0412:00 indicates a HS-CAN message from the BECM is outside normal limits due to a faulty BECM input.

Possible Sources

- Suspect module

J1

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- Using a diagnostic scan tool, carry out the self-test for the module in question sending the invalid data.

Are any Diagnostic Trouble Codes (DTCs) present from the module sending the invalid data?

Yes	DIAGNOSE the module sending the invalid data. REFER to the appropriate section in the Workshop Manual.
No	DIAGNOSE the observable symptom present. REFER to the appropriate Symptom chart in this section.

PINPOINT TEST K : U3000:04

Normal Operation and Fault Conditions

REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module - System Operation and Component Description (414-05 Voltage Converter/Inverter, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U3000:04	Control Module: System Internal Failures	This DTC can be set due to a loose B+ connection from the 12V battery to the DCDC or due to an internal fault.

Possible Sources

- Loose B+ connection
- DCDC

K1 CHECK ALL B+ CONNECTIONS TO THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE)

- Ignition OFF.
- REFER to the wiring diagram for locations of all the B+ cable connections.
- CHECK all B+ cable connections between the 12V battery and the DCDC.

Are all of the B+ cable connections between the 12V battery and the DCDC secure?

Yes	GO to K2
No	SECURE any loose B+ cable connections between the 12V battery and the DCDC.

K2 CARRY OUT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF TEST

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- CARRY OUT the DCDC self-test.

Did the DTC return?

Yes	INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
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.

[PINPOINT TEST L : U3000:41, U3000:42, U3000:45, U3000:49, U3000:96](#)**Normal Operation and Fault Conditions**

REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module - System Operation and Component Description (414-05 Voltage Converter/Inverter, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
DCDC U3000:41	Control Module: General Checksum Failure	Sets when the DCDC detects an internal fault.
DCDC U3000:42	Control Module: General Memory Failure	Sets when the DCDC detects an internal fault.
DCDC U3000:45	Control Module: Program Memory Failure	Sets when the DCDC detects an internal fault.
DCDC U3000:49	Control Module: Internal Electronic Failure	Sets when the DCDC detects an internal fault.
DCDC U3000:96	Control Module: Component Internal Failure	Sets when the DCDC detects an internal fault.

Possible Sources

- DCDC

L1 CARRY OUT THE DCDC (DIRECT CURRENT/DIRECT CURRENT CONVERTER CONTROL MODULE) SELF TEST

- Ignition ON.
- Using a diagnostic scan tool, clear all Diagnostic Trouble Codes (DTCs).
- CARRY OUT the DCDC self-test.

Did the DTC return?

Yes	INSTALL a new DCDC. REFER to: Direct Current/Direct Current (DC/DC) Converter Control Module (414-05 Voltage Converter/Inverter, Removal and Installation).
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.

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Direct Current/Alternating Current (DC/AC) Inverter

Inspection and Verification

Before diagnosing or repairing the Direct Current/Alternating Current (DC/AC) Inverter system refer to the Owner's Literature and REFER to: Direct Current/Alternating Current (DC/AC) Inverter - System Operation and Component Description (414-05 Voltage Converter/Inverter, Description and Operation).
for proper system operation.

Diagnostic Trouble Code (DTC) Chart

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

Diagnostic Trouble Code Chart

Module	DTC	Description	Action <i>New: hover over Pinpoint Test links to show title</i>
BCM	B1330:01	DC/AC Inverter Module: General Electrical Failure	GO to Pinpoint Test A
BCM	B1330:02	DC/AC Inverter Module: General Signal Failure	GO to Pinpoint Test C
BCM	B1330:08	DC/AC Inverter Module: Bus Signal/Message Failures	GO to Pinpoint Test C
BCM	B1330:49	DC/AC Inverter Module: Internal Electronic Failure	GO to Pinpoint Test D
BCM	B1330:55	DC/AC Inverter Module: Not Configured	GO to Pinpoint Test D
BCM	B1330:9A	DC/AC Inverter Module: Component or System Operating Conditions	GO to Pinpoint Test D

Pinpoint Tests

☐ [PINPOINT TEST A : NO POWER AT THE AC \(ALTERNATING CURRENT\) POWER POINT OR THE AC \(ALTERNATING CURRENT\) POWER POINT LED \(LIGHT EMITTING DIODE\) INDICATOR FLASHES WITH THE KEY IN THE ON POSITION](#)

NOTE: The electrical device that is powered by the AC power point must not exceed 150 watts.

If the green LED is flashing, the AC power point may be overloaded, overheated or shorted. Unplug the electrical device from the AC power point and cycle the ignition. Refer to the Owner's Literature to determine if the electrical device is appropriate for the AC power point.

Refer to Wiring Diagrams Cell [44](#) for schematic and connector information.

Normal Operation and Fault Conditions

The engine **must** be started for the AC outlet to begin operation. No power will be provided to the AC outlet when the LED is flashing. REFER to: Direct Current/Alternating Current (DC/AC) Inverter - System Operation and Component Description (414-05 Voltage Converter/Inverter, Description and Operation).

DTC Fault Trigger Conditions

DTC	Description	Fault Trigger Condition
BCM B1330:01	DC/AC Inverter Module: General Electrical Failure	Sets in the BCM when the general electrical fault is detected by the direct current/alternating current (DC/AC) inverter.

Possible Sources

- Fuse(s)
- Direct current/alternating current (DC/AC) inverter
- AC Outlet
- Wiring, terminals or connectors

Visual Inspection and Pre-checks

- Verify the AC outlet is not being used with the engine off for a period longer than 13 minutes without starting the engine or cycling the ignition
- Verify the cabin temperature is less than 75Â°C (167Â°F)
- Verify the BCM Fuse 2 (10A) is OK.
- Verify that any device being used in the AC outlet is rated at less than 150 watts
- Verify the BJB fuse 36 (40A) is OK.
- Inspect the AC outlet for damage.

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.

A1 CHECK THE POWER OUTLET LED (LIGHT EMITTING DIODE) STATUS

- Start the vehicle (Ready indicator light ON).
- Check the LED on the AC outlet.

Did the LED illuminate?

Yes	If the LED is on continuously , the direct current/alternating current (DC/AC) inverter may have timed-out after 13 minutes of operation without the engine running. VERIFY correct system operation with a device rated at less than 150 watts. If there is still no power at the AC outlet, GO to A2 If the LED is flashing , GO to A2
No	VERIFY BCM Fuse 2 (10A) and BJB fuse 36 (40A) are OK. If OK, GO to Pinpoint Test B If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

A2 DETERMINE IF THE DC/AC INVERTER IS OVERHEATED

- Determine if the direct current/alternating current (DC/AC) inverter is overheated.

Is the vehicle cabin temperature is greater than 75Â° C (167Â° F) or has the inverter been in continuous use for a long period of time?

Yes	The inverter does not operate if it has overheated or if ambient (cabin) temperatures have exceeded 75Â° C (166.9Â° F). Cycle the ignition off and ALLOW to cool. Test the system for normal operation.
No	GO to A3

A3 CHECK AC (ALTERNATING CURRENT) POWER OUTLET OPERATION