

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.

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).

Body Control Module (BCM) DTC Chart

DTC	Description	Action
B1330:01	DC/AC Inverter Module: General Electrical Failure	GO to Pinpoint Test A
B1330:02	DC/AC Inverter Module: General Signal Failure	GO to Pinpoint Test C
B1330:08	DC/AC Inverter Module: Bus Signal / Message Failure	GO to Pinpoint Test C
B1330:49	DC/AC Inverter Module: Internal Electronic Failure	CLEAR the DTC. REPEAT the self-test. If DTC B1330:49 is retrieved again, INSTALL a new Direct Current/Alternating Current (DC/AC) Inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
B1330:55	DC/AC Inverter Module: Not Configured	CLEAR the DTC. REPEAT the self-test. If DTC B1330:55 is retrieved again, INSTALL a new Direct Current/Alternating Current (DC/AC) Inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
B1330:9A	DC/AC Inverter Module: Component or System Operating Conditions	ADDRESS all other Diagnostic Trouble Codes (DTCs) first. If no other Diagnostic Trouble Codes (DTCs) are present ADDRESS any symptoms. REFER to SYMPTOM CHART in this section. If no symptoms are present clear the DTC. If the DTC returns and no symptoms are present INSTALL a new Direct Current/Alternating Current (DC/AC) Inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
All Other DTCs	â€”	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).

Symptom 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).

Symptom	Possible Sources	Action
The DC/ AC inverter does not operate correctly â€” the AC power point LED indicator is never on	Refer to the Pinpoint Test	GO to Pinpoint Test B

No power at the AC power point or the AC power point LED indicator flashes with the key in the ON position.	Refer to the Pinpoint Test	DISCONNECT all electrical accessories from the AC outlet and VERIFY that cabin temperature is below 75Â°C (167Â°F). CYCLE the ignition. TEST the system for normal operation. If the system is operating normally, RETURN the vehicle to the customer. If the AC outlet LED indicator is still flashing, GO to Pinpoint Test A
---	--	--

Pinpoint Tests

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).

No Power at the AC Power Point or the AC Power Point LED Indicator Flashes with the Key in the ON Position

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

Normal Operation and Fault Conditions

The DC/ AC inverter receives 12 volts DC on two circuits and is grounded by another circuit. The supplied DC voltage is internally converted to 110 volts 60 Hz AC voltage that is output to the AC power point.

NOTE: The electrical device that is powered by the AC power point must not exceed 400 watts.

NOTE: If the 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.

Diagnostic Trouble Code (DTC) Fault Trigger Conditions

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

Possible Sources

- Fuse(s)
- Wiring, terminals or connectors
- DC/ AC inverter
- AC power point

Visual Inspection and Diagnostic Pre-checks

- Verify that any device being used in the AC outlet is rated at less than 400 watts.
- Verify the cabin temperature is less than 75Â°C (167Â°F).
- Verify the BCM fuse 2 (10A) is OK.
- Verify the BJB fuse 38 (60A) is OK.
- Inspect the AC outlets for damage.

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

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 engine.
- Check the LED on the AC outlets

Is the LED flashing?

Yes	GO to A2
No	GO to A3

A2 DETERMINE IF THE DC/AC INVERTER IS OVERHEATED

- Determine if the DC/ AC inverter is overheated.

Is the vehicle cabin temperature is greater than 75° C (167° 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 75° C (166.9° 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 1 OPERATION

- Start the engine.
- With the engine running, plug a device rated less than 400 watts into AC power outlet 1.

Is the device operating?

Yes	If the 110V device is operating and the LED is NOT illuminated, GO to Pinpoint Test B If the device is operating and the LED is illuminated solid AC POWER OUTLET 1 is operating correctly at this time. VERIFY the customer's device is rated less than 400 watts. REFER to the Owner's Literature for a list of appropriate electrical loads/devices that can be used. If equipped with a rear power outlet, GO to A4 .
No	GO to A5

A4 CHECK AC (ALTERNATING CURRENT) POWER OUTLET 2 OPERATION

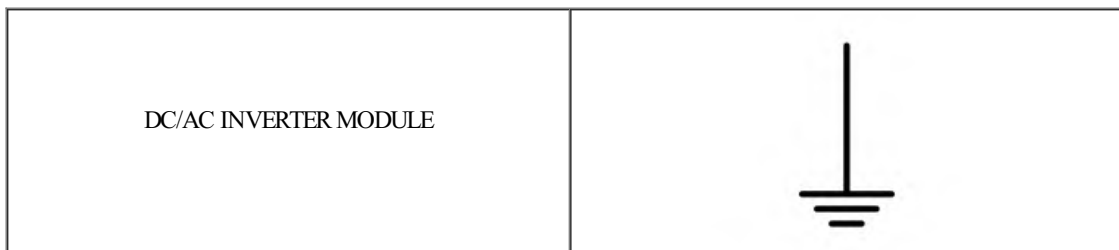
- With the engine running, plug a device rated less than 400 watts into AC power outlet 2.

Is the device operating?

Yes	If the 110V device is operating and the LED is NOT illuminated, GO to Pinpoint Test B If the device is operating and the LED is illuminated solid AC POWER OUTLET 2 operating correctly at this time. VERIFY the customer's device is rated less than 400 watts. REFER to the Owner's Literature for a list of appropriate electrical loads/devices that can be used.
No	GO to A5

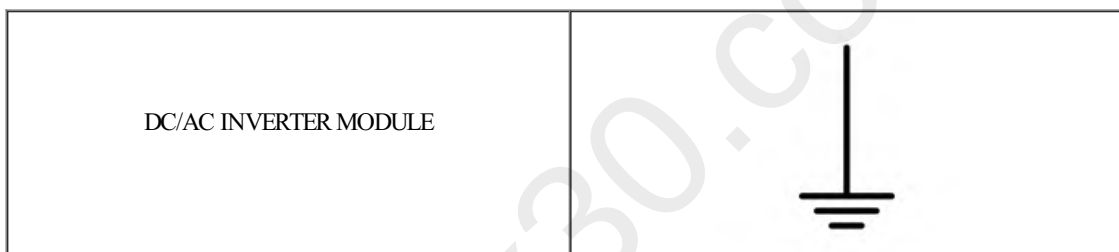
A5 CHECK THE INVERTER MODULE POWER SUPPLY CIRCUITS FOR VOLTAGE

- Ignition OFF.
- Disconnect DC/ AC Inverter [C2293A](#) .
- Disconnect DC/ AC Inverter [C2293B](#) .
- Ignition ON.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2293B-12		Ground

- Measure:

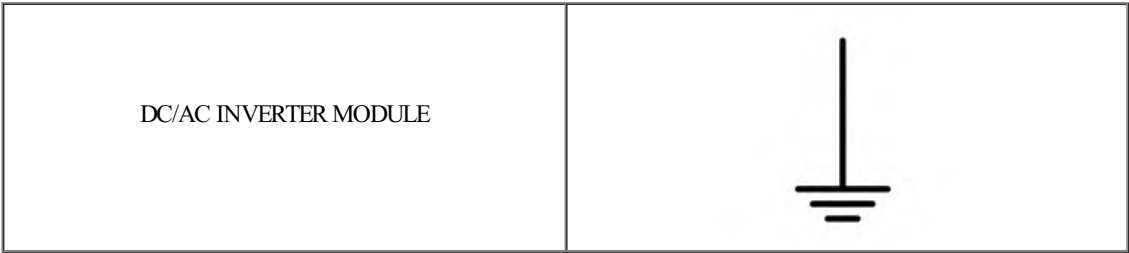


Positive Lead	Measurement / Action	Negative Lead
C2293A-1		Ground

Are the voltages greater than 11 volts?

Yes	GO to A6
No	VERIFY BCM fuse 2 (10A) and BJB fuse 38 (60A) are OK. If OK, REPAIR the open circuit or high resistance on the affected circuit(s). If not OK, REFER to the Wiring Diagrams manual to identify the possible cause of the circuit short.

- Ignition OFF.
- Measure:



Positive Lead	Measurement / Action	Negative Lead
C2293A-2	Ω	Ground

Is the resistance less than 3 ohms?

Yes	GO to A7
No	REPAIR the circuit.

A7 CHECK THE AC (ALTERNATING CURRENT) CIRCUITS FOR AN OPEN

- Disconnect AC Outlet 1 [C2292](#) .
- Disconnect AC Outlet 2 [C301](#) .
- Disconnect DC/ AC Inverter [C2293B](#) .
- Measure:

DC/AC INVERTER MODULE	AC OUTLET 1
-----------------------	-------------

Positive Lead	Measurement / Action	Negative Lead
C2293B-14	Ω	C2292-1
C2293B-13	Ω	C2292-3
C2293B-14	Ω	C301-1
C2293B-13	Ω	C301-3

Are the resistances less than 3 ohms?

Yes	GO to A8
No	REPAIR the affected circuit(s).

A8 CHECK THE AC (ALTERNATING CURRENT) CIRCUITS FOR A SHORT TOGETHER

- Measure:

DC/AC INVERTER MODULE

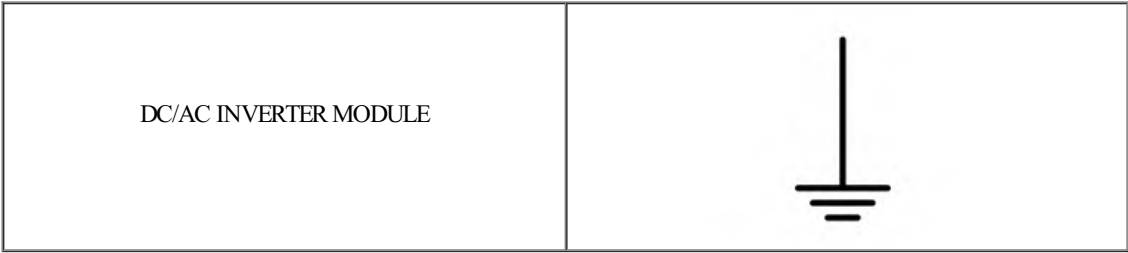
Positive Lead	Measurement / Action	Negative Lead
C2293B-13	Ω	C2293B-14

Is the resistance greater than 10,000 ohms?

Yes	GO to A9
No	REPAIR the circuits.

A9 CHECK THE AC (ALTERNATING CURRENT) CIRCUITS FOR A SHORT TO GROUND

- Measure:



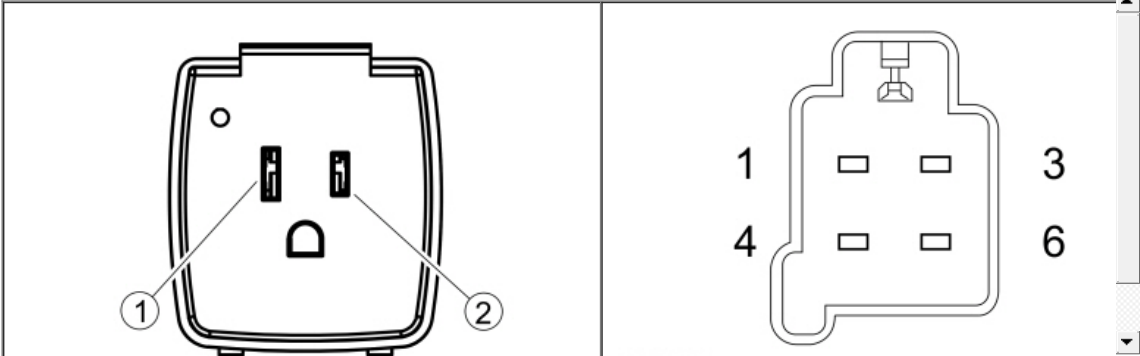
Positive Lead	Measurement / Action	Negative Lead
C2293B-13	Ω	Ground
C2293B-14	Ω	Ground

Are the resistances greater than 10,000 ohms?

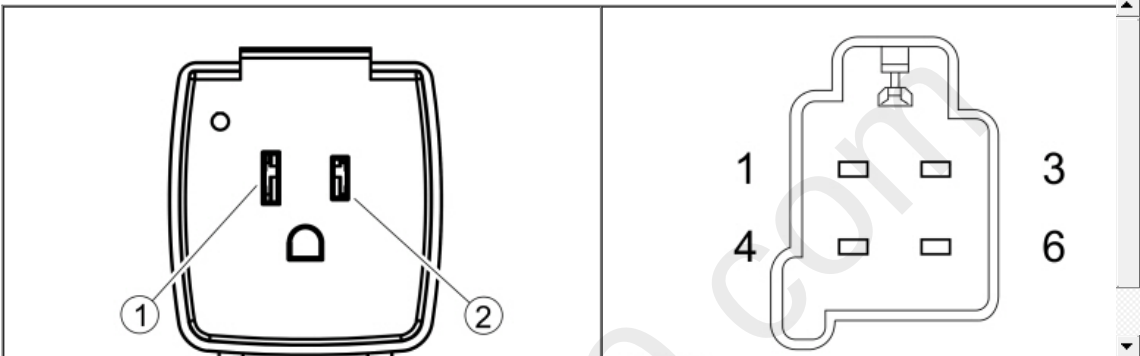
Yes	GO to A10
No	REPAIR the affected circuit(s).

A10 CHECK AC (ALTERNATING CURRENT) OUTLET 1 FOR AN OPEN

- Measure:



Positive Lead	Measurement / Action	Negative Lead
pin 1 (component side)	Ω	pin 1 (component side)



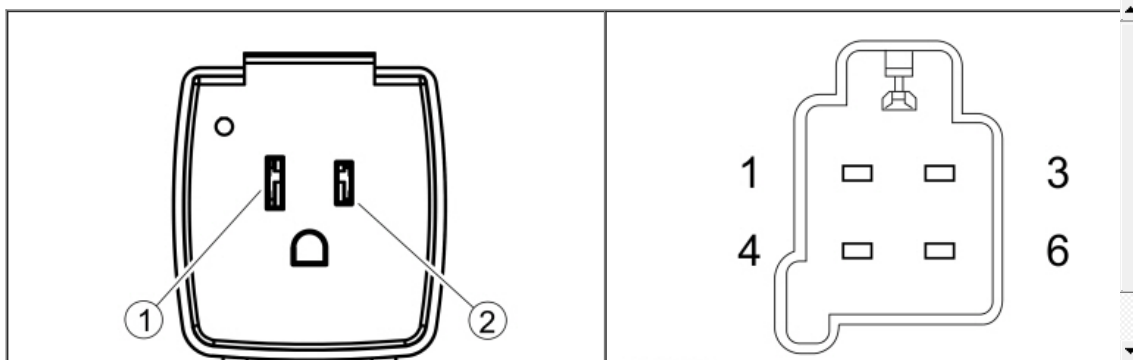
Positive Lead	Measurement / Action	Negative Lead
pin 2 (component side)	Ω	pin 3 (component side)

Are the resistances less than 3 ohms?

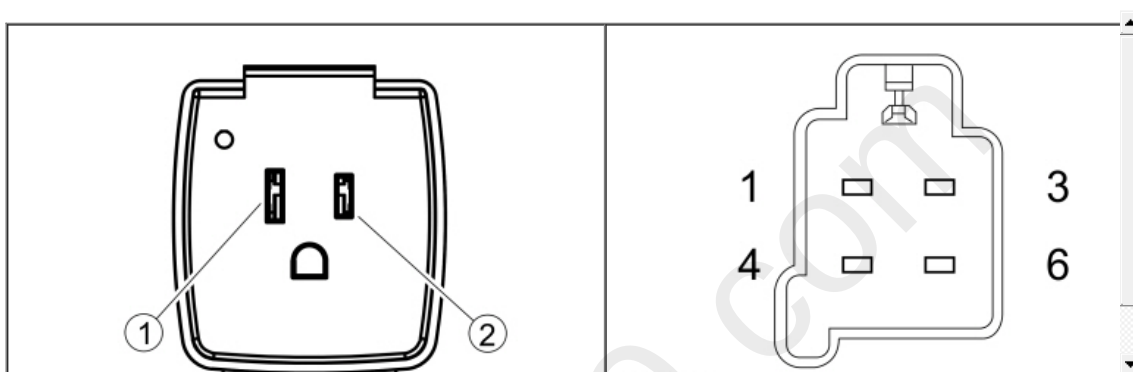
Yes	GO to A11
No	INSTALL a new AC outlet 1. REFER to: Alternating Current (AC) Power Outlet Socket (414-05 Voltage Converter/Inverter, Removal and Installation).

A11 CHECK AC (ALTERNATING CURRENT) OUTLET 2 FOR AN OPEN

- Measure:



Positive Lead	Measurement / Action	Negative Lead
pin 1 (component side)	Ω	pin 1 (component side)



Positive Lead	Measurement / Action	Negative Lead
pin 2 (component side)	Ω	pin 3 (component side)

Are the resistances less than 3 ohms?

Yes	INSTALL a new DC/ AC inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
No	INSTALL a new AC outlet 2. REFER to: Alternating Current (AC) Power Outlet Socket (414-05 Voltage Converter/Inverter, Removal and Installation).

The DC/ AC Inverter Does Not Operate Correctly “ The AC Power Point LED Indicator is Never On

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

Normal Operation and Fault Conditions

The DC/ AC inverter receives 12 volts DC on two circuits and is grounded by another circuit. The supplied DC voltage is internally converted to 60 Hz 110 volts AC voltage that is output to the AC outlets. When the key is in the ON position, an LED on the AC outlet illuminates continuously if the system is operating correctly. The DC/ AC inverter supplies 12V DC and a ground to the LED. If a fault in the system is detected, the LED flashes when the key is in the ON position.

Possible Sources

- Fuse(s)
- Wiring, terminals or connectors
- DC/ AC inverter

- AC power point

Visual Inspection and Diagnostic Pre-checks

- Verify the BCM fuse 2 (10A) is OK.
- Inspect the AC outlet for damage.

PINPOINT TEST B : THE DC (DIRECT CURRENT) / AC (ALTERNATING CURRENT) INVERTER DOES NOT OPERATE CORRECTLY " THE AC (ALTERNATING CURRENT) POWER POINT LED INDICATOR IS NEVER ON

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 AC (ALTERNATING CURRENT) POWER OUTLET 1 OPERATION

- Start the engine.
- With the engine running, plug a device rated less than 400 watts into AC power outlet 1.

Is the device operating?

Yes	GO to B2
No	GO to Pinpoint Test A

B2 CHECK AC (ALTERNATING CURRENT) POWER OUTLET 2 OPERATION

- Start the engine.
- With the engine running, plug a device rated less than 400 watts into AC power outlet 2.

Is the device operating?

Yes	GO to B5
No	GO to Pinpoint Test A

B3 CHECK THE POWER OUTLET 1 LED CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect DC/ AC Inverter [C2293B](#) .
- Disconnect AC Outlet 1 [C2292](#) .
- Measure:

DC/AC INVERTER MODULE	AC OUTLET 1
-----------------------	-------------

Positive Lead	Measurement / Action	Negative Lead
C2293B-6	Ω	C2292-6
C2293B-5	Ω	C2292-4

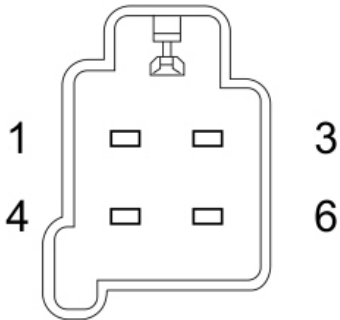
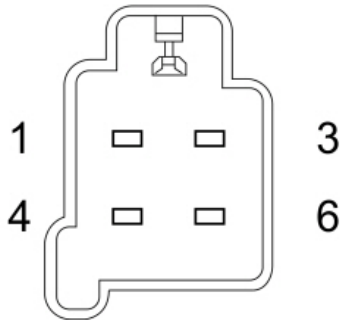
Are the resistances less than 3 ohms?

Yes	GO to B4
No	REPAIR the affected circuit(s).

B4 CHECK THE AC (ALTERNATING CURRENT) OUTLET 1 LED (LIGHT EMITTING DIODE)

- Measure the diode in both directions:

NOTE: This step requires using the diode test position on an approved multimeter.

Positive Lead	Measurement / Action	Negative Lead
 E193748 pin 4 (component side)	Diode Test	 E193748 pin 6 (component side)

Is the voltage between 1.5v and 2.0v in one direction?

Yes	INSTALL a new DC/ AC inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
No	INSTALL a new AC outlet 1. REFER to: Alternating Current (AC) Power Outlet Socket (414-05 Voltage Converter/Inverter, Removal and Installation).

B5 CHECK THE POWER OUTLET 2 LED CONTROL CIRCUITS FOR AN OPEN

- Ignition OFF.
- Disconnect DC/ AC Inverter [C2293B](#) .
- Disconnect AC Outlet 2 [C301](#) .
- Measure:

DC/AC INVERTER MODULE	AC OUTLET
-----------------------	-----------

Positive Lead	Measurement / Action	Negative Lead
C2293B-3	Ω	C301-6
C2293B-4	Ω	C301-4

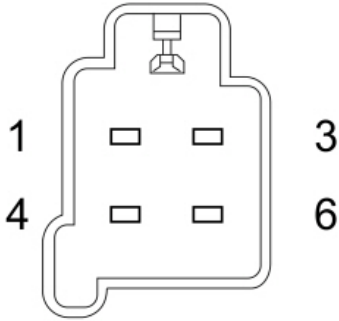
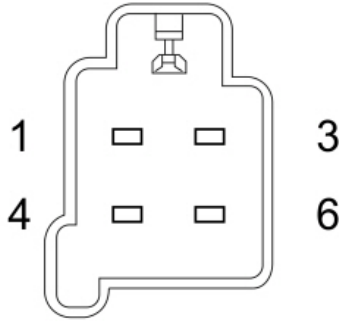
Are the resistances less than 3 ohms?

Yes	GO to B6
No	REPAIR the affected circuit(s).

B6 CHECK THE AC (ALTERNATING CURRENT) OUTLET 2 LED (LIGHT EMITTING DIODE)

- Measure the diode in both directions:

NOTE: This step requires using the diode test position on an approved multimeter.

Positive Lead	Measurement / Action	Negative Lead
 E193748 pin 3 (component side)	Diode Test	 E193748 pin 4 (component side)

Is the voltage between 1.5v and 2.0v in one direction?

Yes	INSTALL a new DC/ AC inverter. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation).
No	INSTALL a new AC outlet 2. REFER to: Alternating Current (AC) Power Outlet Socket (414-05 Voltage Converter/Inverter, Removal and Installation).

B1330:02, B1330:08

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

Normal Operation and Fault Conditions

The DC/ AC inverter communicates with the BCM over a LIN. If the DC/ AC inverter does not receive an engine running message from the BCM, the inverter will not enable the power outlet The video camera system (if equipped) shares this LIN. Refer to the proper wiring diagram for your parking aid system to confirm what components are on this LIN.

Refer to Wiring Diagrams Cell [145](#) for schematic and connector information.

Diagnostic Trouble Code (DTC) Fault Trigger Conditions

DTC	Description	Fault Trigger Conditions
B1330:02	DC/AC Inverter Module: General Signal Failure	Sets in the BCM when sets when a general signal failure occurs on the LIN.
B1330:08	DC/AC Inverter Module: Bus Signal / Message Failure	Sets in the BCM when there is a LIN communication fault from the DC/ AC inverter.

Possible Sources

- Wiring, terminals or connectors
- DC/ AC inverter
- BCM

Visual Inspection and Diagnostic Pre-checks

- Verify the concern by monitoring the AC outlet LED indicator for 13 minutes with the engine running. If the LED indicator starts to flash after 13 minutes, continue to the pinpoint test. If the system continues to operate normally after 13 minutes, make sure the customer is aware of the DC/ AC inverter time-out function.

PINPOINT TEST C : B1330:02, B1330:08

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.

C1 RETRIEVE BCM (BODY CONTROL MODULE) DIAGNOSTIC TROUBLE CODES (DTCS)

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

Is DTC U0100:00 present?

Yes	REFER to: Body Control Module (BCM) (419-10 Multifunction Electronic Modules, Diagnosis and Testing).
No	GO to C2

C2 CHECK THE LIN (LOCAL INTERCONNECT NETWORK) COMMUNICATION CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect BCM [C2280E](#) .
- Disconnect DC/ AC Inverter module [C2293B](#) .
- Disconnect Inline connector [C212](#) .
- If equipped with rear park aid camera, disconnect [C316](#)
- If equipped with 360 camera disconnect [C339](#)
- If equipped with LED high mounted stoplamp camera, disconnect [C3047](#)
- Ignition ON.
- Measure:

DC/AC INVERTER MODULE	
-----------------------	--

Positive Lead	Measurement / Action	Negative Lead
C2293B-11		Ground

Is any voltage present?

Yes	REPAIR the circuit.
No	GO to C3

C3 CHECK THE LIN (LOCAL INTERCONNECT NETWORK) COMMUNICATION CIRCUIT FOR A SHORT TO GROUND

- Ignition OFF.
- Measure:

DC/AC INVERTER MODULE	
-----------------------	--

Positive Lead	Measurement / Action	Negative Lead
C2293B-11	Ω	Ground

Is the resistance greater than 10,000 ohms?

Yes	GO to C4
No	REPAIR the circuit.

C4 CHECK THE LIN (LOCAL INTERCONNECT NETWORK) COMMUNICATION CIRCUIT FOR AN OPEN

- Measure:

DC/AC INVERTER MODULE	BODY CONTROL MODULE (BCM)
-----------------------	---------------------------

Positive Lead	Measurement / Action	Negative Lead
C2293B-11	Ω	C2280E-37

Is the resistance less than 3 ohms?

Yes	INSTALL a new DC/ AC inverter module. REFER to: Direct Current/Alternating Current (DC/AC) Inverter (414-05 Voltage Converter/Inverter, Removal and Installation). TEST the system for normal operation. If the AC outlet still turns off after 13 minutes when the engine is running, Click here to access Guided Routine (BCM) .
No	REPAIR the circuit.

