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Your Current Vehicle: 2012 Ford F-150




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Trailer Lamps

SECTION 417-01: Exterior Lighting	2012 F-150 Workshop Manual
DIAGNOSIS AND TESTING	Procedure revision date: 10/31/2011

Trailer Lamps

Special Tool(s)

 <small>ST3093-A</small>	<p>Fluke 77-1V Digital Multimeter</p> <p>FLU77-4 or equivalent</p>
 <small>ST2834-A</small>	<p>Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool</p>
 <small>ST2574-A</small>	<p>Flex Probe Kit</p> <p>NUD105-R025D or equivalent</p>

Principles of Operation

The trailer lamps and trailer battery charge are supplied power by relays that are energized to correspond with the exterior lighting and ignition state functions of the vehicle.

If the vehicle is not equipped with the factory manufactured Trailer Brake Control (TBC) module, the vehicle supplies circuitry to support the installation of an aftermarket TBC module (installed by the customer). To support the aftermarket TBC module, the vehicle circuitry only supplies voltage, ground, stoplamp switch input and a brake controlling circuit to the trailer tow connector. The trailer electric brakes themselves are controlled by the aftermarket trailer brake controller and not the vehicle itself.

For diagnostics and a description of the factory manufactured trailer brake control system, refer to Auxiliary Brake System.

The trailer tow battery charge relay is controlled by the Body Control Module (BCM). If the BCM detects a low voltage concern when the ignition is in ACC or RUN, the BCM disables the trailer tow battery charge relay coil circuit.

Field-Effect Transistor (FET) Protection

A Field-Effect Transistor (FET) is a type of transistor that, when used with module software, monitors and controls current flow on module outputs. The FET protection strategy prevents module damage in the event of excessive current flow.

The BCM utilizes a FET protective circuit strategy for many of its outputs (such as a headlamp output circuit). Output loads (current level) are monitored for excessive current (typically short circuits) and are shut down when a fault event is detected. A short circuit DTC is stored at the fault event and a cumulative counter is started.

When the demand for the output is no longer present, the module resets the FET protection, allowing the circuit to function. If the circuit is still shorted the next time the driver requests a circuit to activate that has been shut down by a previous short (FET protection), the FET protection shuts off the circuit again and the cumulative counter advances.

When the excessive circuit load occurs often enough, the module shuts down the output until a repair procedure is carried out. Each FET protected circuit has 3 predefined levels of short circuit tolerance based on the harmful effect of each circuit fault on the FET and the ability of the FET to withstand it. A module lifetime level of fault events is established based upon the durability of the FET . If the total tolerance level is determined to be 600 fault events, the 3 predefined levels would be 200, 400 and 600 fault events.

When a tolerance level is reached, the short circuit DTC that was stored on the first failure cannot be cleared by the clear the continuous DTCs command. The module does not allow this code to be cleared or the circuit restored to normal operation until a successful self-test proves that the fault has been repaired. After the self-test has successfully completed

(no on-demand DTCs present), DTC U1000:00 and the associated DTC (the DTC related to the shorted circuit) automatically clears and the circuit function returns. The module never resets the fault event counter to zero and continues to advance the fault event counter as short circuit fault events occur.

If the number of short circuit fault events reach the third level, then DTCs U1000:00 and U3000:49 set along with the associated short circuit DTC. DTC U3000:49 cannot be cleared and the module must be replaced after the repair.

The BCM FET protected output circuits for the trailer tow electrical system is the trailer tow battery charge relay coil ground controlled circuit.

Inspection and Verification

1. Verify the customer concern.
2. Verify the exterior lighting and charging system of the vehicle is operating correctly. If not, refer to the appropriate pinpoint test in this section.
3. Visually inspect for obvious signs of electrical damage.

Visual Inspection Chart

Electrical
<ul style="list-style-type: none"> ○ Battery Junction Box (BJB) fuse(s): <ul style="list-style-type: none"> ■ 17 (30A) (Trailer Brake Control (TBC) module) ■ 21 (30A) (trailer tow battery charge relay switch side) ■ 43 (15A) (trailer tow reversing lamps) ■ 54 (5A) (trailer tow battery charge relay coil) ■ 67 (20A) (trailer tow parking lamps) ■ 73 (20A) (trailer tow turn relays) ○ Body Control Module (BCM) fuse 31 (5A) (stoplamp switch input) ○ Wiring, terminals or connectors ○ Trailer tow connector ○ Trailer tow stop/turn relays ○ Trailer tow battery charge relay ○ Trailer tow parking lamp relay ○ TBC module (aftermarket)

- Trailer

4. If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.

5. **NOTE:** Make sure to use the latest scan tool software release.

If the cause is not visually evident, connect the scan tool to the Data Link Connector (DLC).

6. **NOTE:** The Vehicle Communication Module (VCM) LED prove-out confirms power and ground from the DLC are provided to the VCM .

If the scan tool does not communicate with the VCM :

- check the VCM connection to the vehicle.
- check the scan tool connection to the VCM .
- refer to Module Communications Network, No Power To The Scan Tool, to diagnose no power to the scan tool.

7. If the scan tool does not communicate with the vehicle:

- verify the ignition is on.
 - The air bag warning indicator prove-out confirms ignition on (other indicators may not prove ignition on). If the ignition does not turn on, refer to Steering Column Switches to diagnose no power in run.
- verify the scan tool operation with a known good vehicle.
- refer to Module Communications Network, The PCM Does Not Respond To The Scan Tool, to diagnose no response from the PCM.

8. Carry out the network test.

- If the scan tool responds with no communication for one or more modules, refer to Module Communications Network.
- If the network test passes, retrieve and record the continuous memory DTCs.

9. Clear the continuous DTCs and carry out the self-test diagnostics for the BCM .

10. If the DTCs retrieved are related to the concern, refer to Diagnostic Trouble Code (DTC) Chart in this section. For all other DTCs, refer to the Diagnostic Trouble Code (DTC) Chart in Multifunction Electronic Modules.

11. If no DTCs related to the concern are retrieved, GO to Symptom Chart.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
<ul style="list-style-type: none"> All the trailer lamps are inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Trailer tow connector Trailer 	<ul style="list-style-type: none"> GO to Pinpoint Test X.
<ul style="list-style-type: none"> The trailer stop/turn lamp is inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Trailer tow connector Trailer tow stop/turn relay Trailer 	<ul style="list-style-type: none"> GO to Pinpoint Test Y.
<ul style="list-style-type: none"> The trailer parking lamps are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Trailer tow connector Trailer tow parking lamp relay Trailer 	<ul style="list-style-type: none"> GO to Pinpoint Test Z.
<ul style="list-style-type: none"> The trailer reversing lamps are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Trailer tow connector Trailer tow reversing lamp relay Trailer 	<ul style="list-style-type: none"> GO to Pinpoint Test AA.

<ul style="list-style-type: none"> • The trailer lamps are on continuously 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Trailer tow relay • Trailer 	<ul style="list-style-type: none"> • GO to Pinpoint Test AB.
<ul style="list-style-type: none"> • The trailer battery charging is inoperative/does not operate correctly 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • Trailer tow connector • Trailer tow battery charge relay • Trailer • Body Control Module (BCM) 	<ul style="list-style-type: none"> • GO to Pinpoint Test AC.
<ul style="list-style-type: none"> • The trailer electric brakes are inoperative/always applied 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • Trailer tow connector • Trailer Brake Control (TBC) module (aftermarket) • Trailer • BCM 	<ul style="list-style-type: none"> • GO to Pinpoint Test AD.

Pinpoint Tests

Pinpoint Test X: All The Trailer Lamps Are Inoperative

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation

The trailer tow connector receives ground through a dedicated ground circuit. This circuit is the shared ground for all of the trailer lamps.

All of the trailer lamp relays share a common ground.

This pinpoint test is intended to diagnose the following:

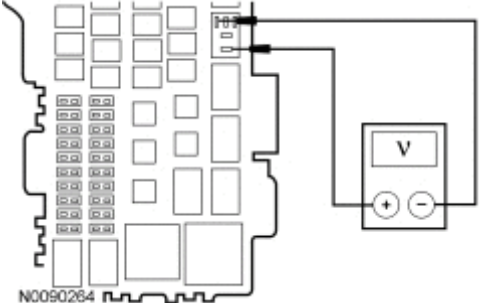
- Wiring, terminals or connectors
- Trailer tow connector
- Trailer

PINPOINT TEST X: ALL THE TRAILER LAMPS ARE INOPERATIVE

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

NOTE: Before beginning diagnostics, visually inspect the trailer tow connector mounted on the bumper for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

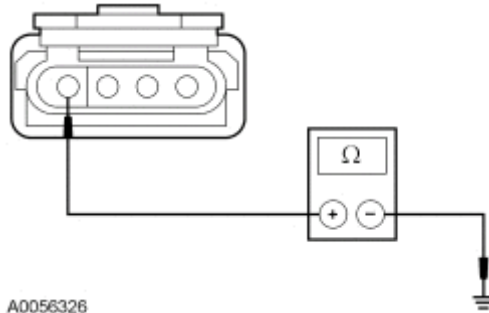
NOTE: Failure to disconnect the battery when instructed results in false resistance readings. Refer to Battery, Mounting and Cables.

Test Step	Result / Action to Take
<p>X1 CHECK THE RELAY GROUND CIRCUIT FOR AN OPEN</p>	
<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Trailer Tow Parking Lamp Relay . • Measure the voltage between the trailer tow parking lamp relay pin 3, circuit SBB67 (BU/RD), BJB face side and the trailer tow parking lamp relay pin 2, circuit GD123 (BK/GY), BJB face side.  <p style="text-align: left; font-size: small;">N0090264</p>	<p>Yes</p> <p>GO to X2.</p> <p>No</p> <p>REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation</p>

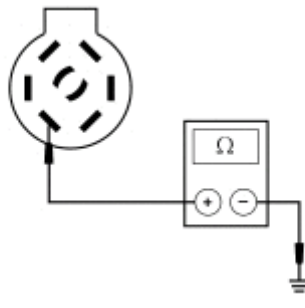
- Is the voltage greater than 10 volts?

X2 CHECK THE TRAILER TOW GROUND CIRCUIT FOR CONTINUITY TO GROUND

- Disconnect: Negative Battery Cable .
- For the 4-pin connector, measure the resistance between the trailer tow C439B-4, circuit RAT08 (WH), harness side and ground.



- For the 7-pin connector, measure the resistance between the trailer tow connector pin 2, circuit RAT08 (WH), component side and ground.



- Is the resistance less than 5 ohms?

Yes

The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.

No

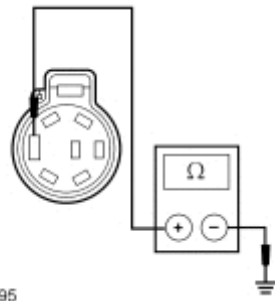
For the 4-pin connector, REPAIR circuit RAT08 (WH) for an open. TEST the system for normal operation. For the 7-pin connector, GO to X3.

X3 CHECK THE TRAILER TOW GROUND CIRCUIT FOR AN OPEN

- Disconnect: Trailer Tow C439A .
- Measure the resistance between the trailer tow C439A-2, circuit RAT08 (WH), harness side and ground.

Yes

INSTALL a new trailer tow connector. TEST the system for normal operation.



- Is the resistance less than 5 ohms?

No

REPAIR circuit RAT08 (WH) for an open. TEST the system for normal operation.

Pinpoint Test Y: The Trailer Stop/Turn Lamp Is Inoperative

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation

The trailer tow LH stop/turn relay coil receives voltage when the vehicle LH rear stoplamp is illuminated. When the trailer tow LH stop/turn relay is energized, voltage is routed to the trailer tow connector.

The trailer tow RH stop/turn relay coil receives voltage when the vehicle RH rear stoplamp is illuminated. When the trailer tow RH stop/turn relay is energized, voltage is routed to the trailer tow connector.

The Battery Junction Box (BJB) fuse 73 (20A) supplies voltage to both trailer tow stop/turn relays.

This pinpoint test is intended to diagnose the following:

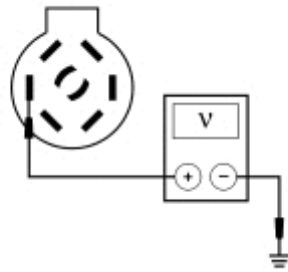
- Fuse
- Wiring, terminals or connectors
- Trailer tow connector
- Trailer tow stop/turn relay
- Trailer

PINPOINT TEST Y: THE TRAILER STOP/TURN LAMP 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: Before beginning diagnostics, visually inspect the trailer tow connector for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

Test Step	Result / Action to Take
<p>Y1 VERIFY THE TRAILER LAMP OPERATION</p> <ul style="list-style-type: none"> • Ignition OFF. • Determine if both trailer stop/turn lamps are inoperative. • Are both trailer stop/turn lamps inoperative? 	<p>Yes</p> <p>VERIFY the BJB fuse 73 (20A) is OK. If OK, REPAIR circuit SBB73 (RD) for an open. TEST the system for normal operation.</p> <p>No</p> <p>For an inoperative LH trailer lamp, GO to Y2. For an inoperative RH trailer lamp, GO to Y8.</p>
<p>Y2 CHECK FOR VOLTAGE THROUGH THE TRAILER TOW CONNECTOR (LH TRAILER STOP/TURN LAMP)</p> <ul style="list-style-type: none"> • For the 4-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439B-2, circuit CAT06 (YE), harness side and ground. <div data-bbox="354 1184 808 1482" style="text-align: center;"> <p>A0056329</p> </div> <ul style="list-style-type: none"> • For the 7-pin connector, while applying the brake pedal, measure the voltage between the trailer tow connector pin 1, circuit CAT06 (YE), component side and ground. 	<p>Yes</p> <p>The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.</p> <p>No</p> <p>For the 4-pin connector, GO to Y4. For the 7-pin connector, GO to Y3.</p>

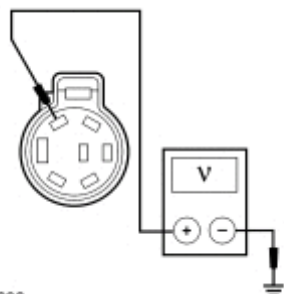


N0066879

- Is the voltage greater than 10 volts?

Y3 CHECK FOR VOLTAGE TO THE TRAILER TOW CONNECTOR (LH STOP/TURN 7-PIN)

- Disconnect: Trailer Tow C439A .
- While applying the brake pedal, measure the voltage between the trailer tow C439A-1, circuit CAT06 (YE), harness side and ground.



N0066296

- Is the voltage greater than 10 volts?

Yes

INSTALL a new trailer tow connector. TEST the system for normal operation.

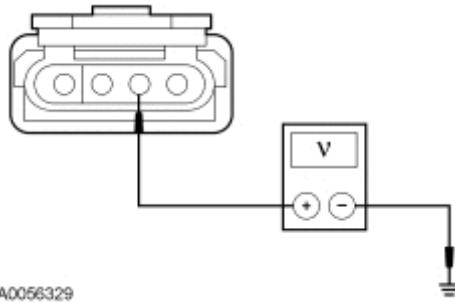
No

GO to Y4.

Y4 CHECK THE TRAILER TOW LH STOP/TURN RELAY

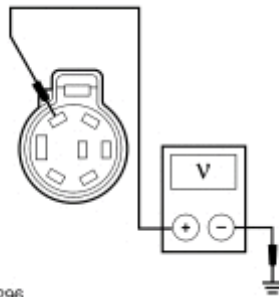
- Disconnect: Trailer Tow LH Stop/Turn Relay .
- Substitute a known good relay.
- For the 4-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439B-2, circuit CAT06 (YE), harness side and ground.

Yes



A0056329

- For the 7-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439A-1, circuit CAT06 (YE), harness side and ground.



N0066296

- **Is the voltage greater than 10 volts?**

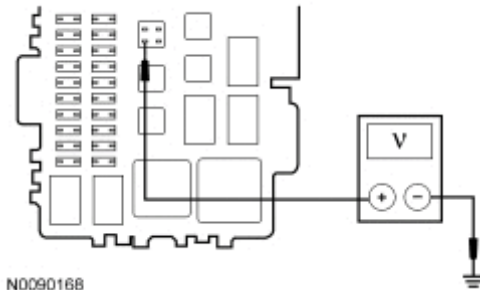
REMOVE the known good relay. INSTALL a new trailer tow turn relay. TEST the system for normal operation.

No

REMOVE the known good relay. GO to Y5.

Y5 CHECK FOR VOLTAGE TO THE LH STOP/TURN LAMP RELAY COIL

- While applying the brake pedal, measure the voltage between the trailer tow LH turn relay pin 1, circuit CLS18 (GY/BN), BJB face side and ground.



N0090168

- **Is the voltage greater than 10 volts?**

Yes

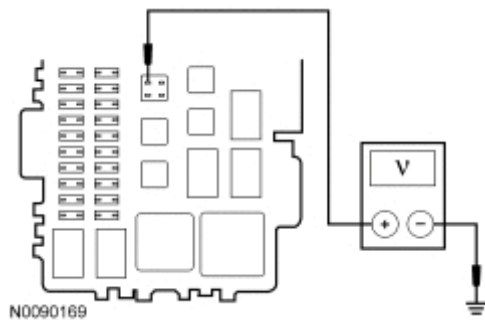
GO to Y6.

No

REPAIR circuit CLS18 (GY/BN) for an open. TEST the system for normal operation.

Y6 CHECK THE VOLTAGE SUPPLY CIRCUIT TO THE LH STOP/TURN LAMP RELAY

- Measure the voltage between the trailer tow LH turn relay pin 3, circuit SBB73 (RD), BJB face side and ground.



- **Is the voltage greater than 10 volts?**

Yes

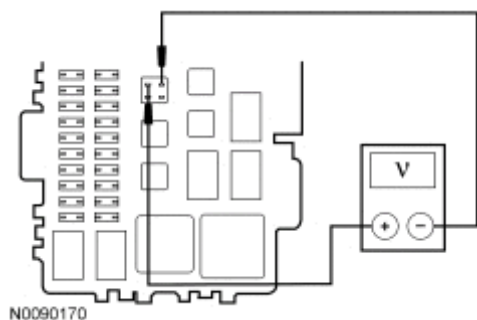
GO to Y7.

No

REPAIR circuit SBB73 (RD) for an open. TEST the system for normal operation.

Y7 CHECK THE LH STOP/TURN LAMP RELAY GROUND CIRCUIT FOR AN OPEN

- Measure the voltage between the trailer tow LH turn relay pin 3, circuit SBB73 (RD), BJB face side and the trailer tow LH turn relay pin 2, circuit GD123 (BK/GY), BJB face side.



- **Is the voltage greater than 10 volts?**

Yes

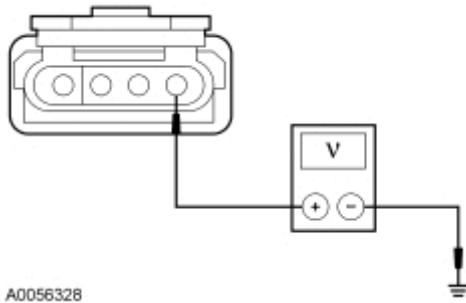
REPAIR circuit CAT06 (YE) for an open. TEST the system for normal operation.

No

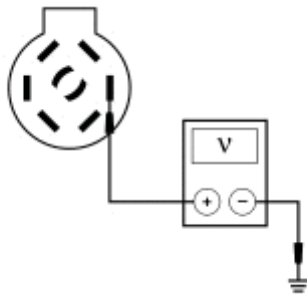
REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation.

Y8 CHECK FOR VOLTAGE THROUGH THE TRAILER TOW CONNECTOR (RH TRAILER STOP/TURN LAMP)

- For the 4-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439B-1, circuit CAT09 (GN), harness side and ground.



- For the 7-pin connector, while applying the brake pedal, measure the voltage between the trailer tow connector pin 4, circuit CAT09 (GN), component side and ground.



- **Is the voltage greater than 10 volts?**

Yes

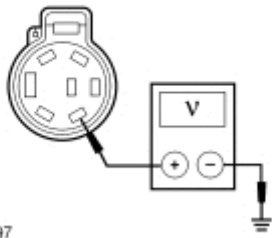
The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.

No

For the 4-pin connector, GO to Y10. For the 7-pin connector, GO to Y9.

Y9 CHECK FOR VOLTAGE TO THE TRAILER TOW CONNECTOR (RH STOP/TURN 7-PIN)

- Disconnect: Trailer Tow C439A .
- While applying the brake pedal, measure the voltage between the trailer tow C439A-4, circuit CAT09 (GN), harness side and ground.



- **Is the voltage greater than 10 volts?**

Yes

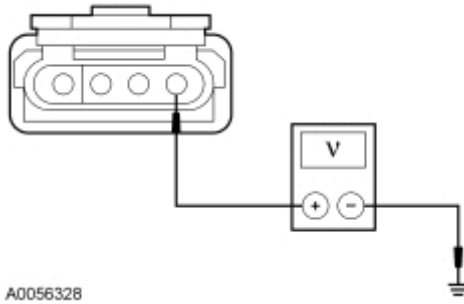
INSTALL a new trailer tow connector. TEST the system for normal operation.

No

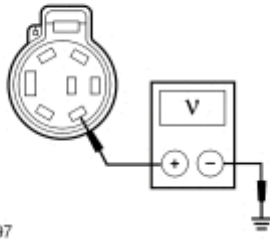
GO to Y10.

Y10 CHECK THE TRAILER TOW RH STOP/TURN RELAY

- Disconnect: Trailer Tow RH Stop/Turn Relay .
- Substitute a known good relay.
- For the 4-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439B-1, circuit CAT09 (GN), harness side and ground.



- For the 7-pin connector, while applying the brake pedal, measure the voltage between the trailer tow C439A-4, circuit CAT09 (GN), harness side and ground.



- **Is the voltage greater than 10 volts?**

Yes

REMOVE the known good relay.
INSTALL a new trailer tow turn relay. TEST the system for normal operation.

No

REMOVE the known good relay. GO to Y11.

Y11 CHECK FOR VOLTAGE TO THE RH STOP/TURN LAMP RELAY COIL

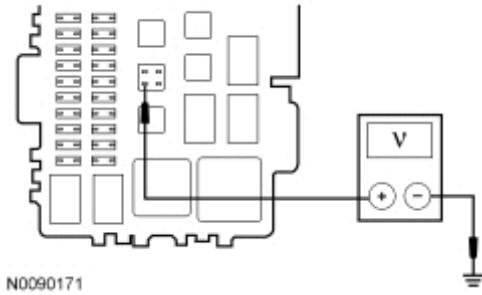
- While applying the brake pedal, measure the voltage between the trailer tow RH turn relay pin 1, circuit CLS19 (VT/OG), BJB face side and ground.

Yes

GO to Y12.

No

REPAIR circuit CLS19 (VT/OG) for an

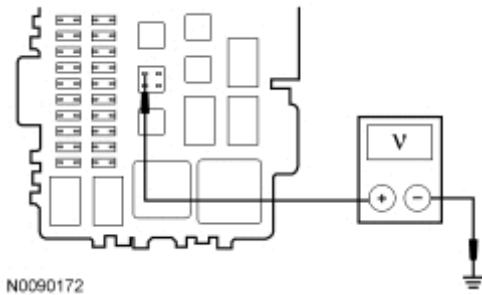


- Is the voltage greater than 10 volts?

open. TEST the system for normal operation.

Y12 CHECK THE VOLTAGE SUPPLY CIRCUIT TO THE RH STOP/TURN LAMP RELAY

- Measure the voltage between the trailer tow RH turn relay pin 3, circuit SBB73 (RD), BJB face side and ground.



- Is the voltage greater than 10 volts?

Yes

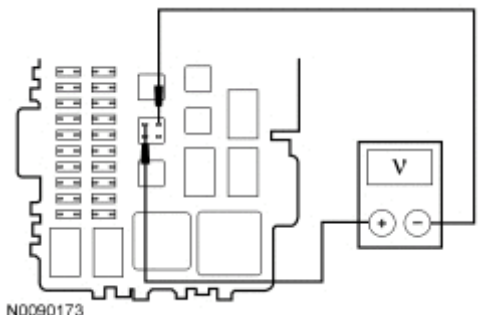
GO to Y13.

No

REPAIR circuit SBB73 (RD) for an open. TEST the system for normal operation.

Y13 CHECK THE RH STOP/TURN LAMP RELAY GROUND CIRCUIT FOR AN OPEN

- Measure the voltage between the trailer tow RH turn relay pin 3, circuit SBB73 (RD), BJB face side and the trailer tow RH turn relay pin 2, circuit GD123 (BK/GY), BJB face side.



- Is the voltage greater than 10 volts?

Yes

REPAIR circuit CAT09 (GN) for an open. TEST the system for normal operation.

No

REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation.

Pinpoint Test Z: The Trailer Parking Lamps Are Inoperative

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation

The trailer tow parking lamp relay coil receives voltage when the vehicle parking lamps are illuminated. The Battery Junction Box (BJB) fuse 67 (20A) supplies voltage to the trailer tow parking lamp relay switch side. When the trailer tow parking lamp relay is energized, voltage is routed to the trailer tow connector.

This pinpoint test is intended to diagnose the following:

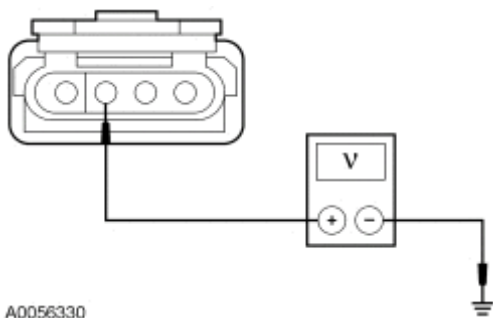
- Fuse
- Wiring, terminals or connectors
- Trailer tow connector
- Trailer tow parking lamp relay
- Trailer

PINPOINT TEST Z: THE TRAILER PARKING LAMPS ARE INOPERATIVE

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

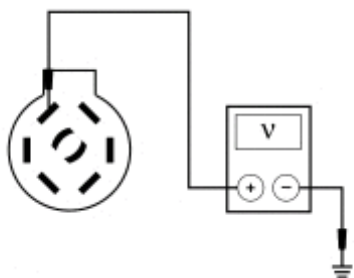
NOTE: Before beginning diagnostics, visually inspect the trailer tow connector for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

Test Step	Result / Action to Take
Z1 CHECK FOR VOLTAGE THROUGH THE TRAILER TOW CONNECTOR	
<ul style="list-style-type: none"> • Ignition OFF. • Place the headlamp switch in the PARKING LAMPS ON position. • For the 4-pin connector, measure the voltage between the trailer tow C439B-3, circuit CAT17 (BN), harness side and ground. 	



A0056330

- For the 7-pin connector, measure the voltage between the trailer tow connector pin 6, circuit CAT17 (BN), component side and ground.



N0066881

- **Is the voltage greater than 10 volts?**

Yes

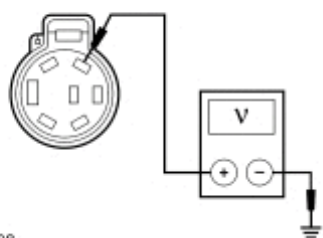
The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.

No

For the 4-pin connector, GO to Z3. For the 7-pin connector, GO to Z2.

Z2 CHECK FOR VOLTAGE TO THE TRAILER TOW CONNECTOR (7-PIN)

- Disconnect: Trailer Tow C439A .
- Measure the voltage between the trailer tow C439A-6, circuit CAT17 (BN), harness side and ground.



N0066298

- **Is the voltage greater than 10 volts?**

Yes

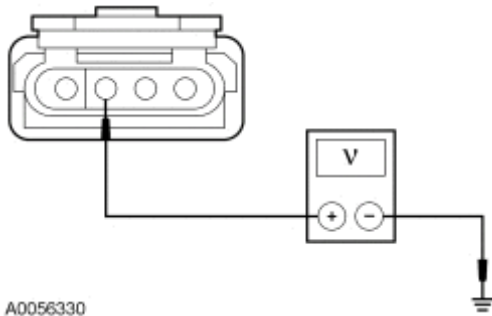
INSTALL a new trailer tow connector. TEST the system for normal operation.

No

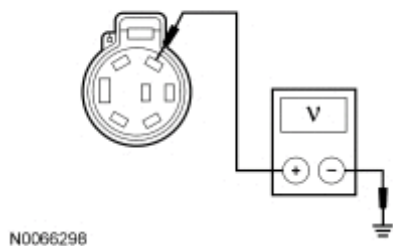
GO to Z3.

Z3 CHECK THE TRAILER TOW PARKING LAMP RELAY

- Place the headlamp switch in the OFF position.
- Disconnect: Trailer Tow Parking Lamp Relay .
- Substitute a known good relay.
- Place the headlamp switch in the PARKING LAMPS ON position.
- For the 4-pin connector, measure the voltage between the trailer tow C439B-3, circuit CAT17 (BN), harness side and ground.



- For the 7-pin connector, measure the voltage between the trailer tow C439A-6, circuit CAT17 (BN), harness side and ground.



- **Is the trailer tow parking lamp relay OK?**

Yes

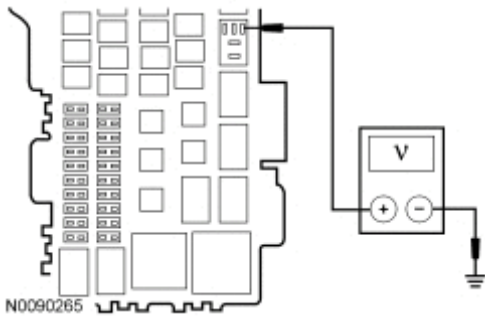
REMOVE the known good relay. GO to Z4.

No

REMOVE the known good relay. INSTALL a new trailer tow parking lamp relay. TEST the system for normal operation.

Z4 CHECK FOR VOLTAGE TO THE TRAILER TOW PARKING LAMP RELAY COIL

- Measure the voltage between the trailer tow parking lamp relay pin 1, circuit CBP40 (YE/GN), BJB face side and ground.



- **Is the voltage greater than 10 volts?**

Yes

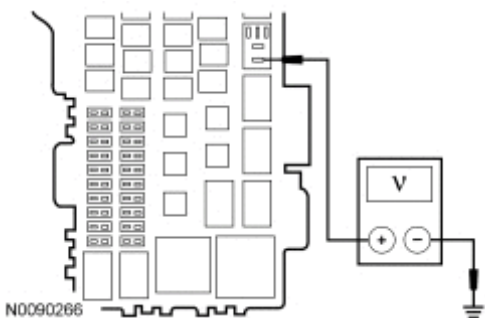
GO to Z5.

No

REPAIR circuit CBP40 (YE/GN) for an open. TEST the system for normal operation.

Z5 CHECK THE VOLTAGE SUPPLY CIRCUIT TO THE TRAILER TOW PARKING LAMP RELAY

- Place the headlamp switch in the OFF position.
- Measure the voltage between the trailer tow parking lamp relay pin 3, circuit SBB67 (BU/RD), BJB face side and ground.



- **Is the voltage greater than 10 volts?**

Yes

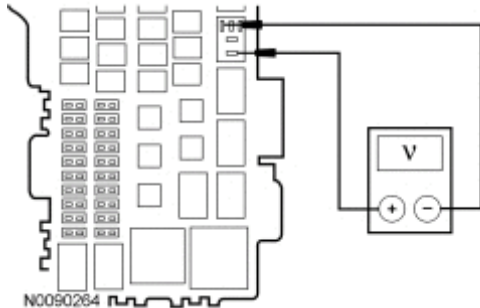
GO to Z6.

No

VERIFY the BJB fuse 67 (20A) is OK. If OK, REPAIR circuit SBB67 (BU/RD) for an open. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

Z6 CHECK THE TRAILER TOW PARKING LAMP RELAY GROUND CIRCUIT FOR AN OPEN

- Measure the voltage between the trailer tow parking lamp relay pin 3, circuit SBB67 (BU/RD), BJB face side and the trailer tow parking lamp relay pin 2, circuit GD123 (BK/GY), BJB face side.



- **Is the voltage greater than 10 volts?**

Yes

REPAIR circuit CAT17 (BN) for an open. TEST the system for normal operation.

No

REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation.

Pinpoint Test AA: The Trailer Reversing Lamps Are Inoperative

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation

The trailer tow reversing lamp relay coil receives voltage when the vehicle reversing lamps are illuminated. The Battery Junction Box (BJB) fuse 43 (15A) supplies voltage to the trailer tow reversing lamp relay switch side. When the trailer tow reversing lamp relay is energized, voltage is routed to the trailer tow connector.

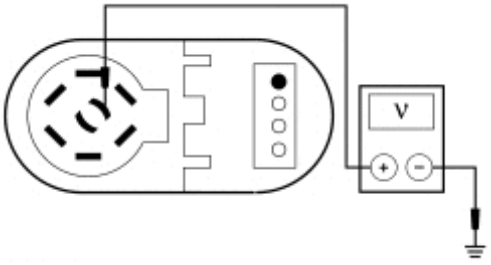
This pinpoint test is intended to diagnose the following:

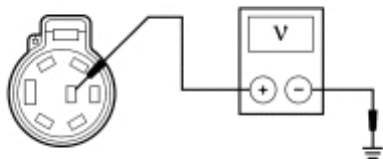
- Fuse
- Wiring, terminals or connectors
- Trailer tow connector
- Trailer tow reversing lamp relay
- Trailer

PINPOINT TEST AA: THE TRAILER REVERSING LAMPS ARE INOPERATIVE

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

NOTE: Before beginning diagnostics, visually inspect the trailer tow connector mounted on the bumper for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

Test Step	Result / Action to Take
<p>AA1 CHECK FOR VOLTAGE THROUGH THE TRAILER TOW CONNECTOR</p> <ul style="list-style-type: none"> • Apply the parking brake. • Ignition ON. • Select REVERSE. • Measure the voltage between the trailer tow connector reversing lamp voltage supply pin, circuit CAT16 (GY/BN), component side and ground.  <p style="text-align: center;">N0084021</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 	<p>Yes</p> <p>The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.</p> <p>No</p> <p>VERIFY the BJB fuse 43 (15A) is OK. If OK, GO to AA2. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.</p>
<p>AA2 CHECK FOR VOLTAGE TO THE TRAILER TOW CONNECTOR (VEHICLE HARNESS)</p> <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Trailer Tow C439A . • Ignition ON. • Select REVERSE. • Measure the voltage between the trailer tow C439A-7, circuit CAT16 (GY/BN), harness side and ground. 	<p>Yes</p> <p>INSTALL a new trailer tow connector. TEST the system for normal operation.</p>



A0025848

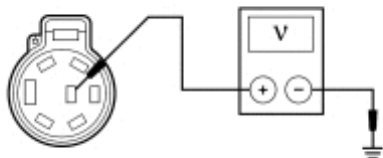
- Is the voltage greater than 10 volts?

No

GO to AA3.

AA3 CHECK THE TRAILER TOW REVERSING LAMP RELAY

- Ignition OFF.
- Disconnect: Trailer Tow Parking Lamp Relay .
- Substitute a known good relay.
- Ignition ON.
- Select REVERSE.
- Measure the voltage between the trailer tow C439A-7, circuit CAT16 (GY/BN), harness side and ground.



A0025848

- Is the voltage greater than 10 volts?

Yes

REMOVE the known good relay. INSTALL a new trailer tow reversing lamp relay. TEST the system for normal operation.

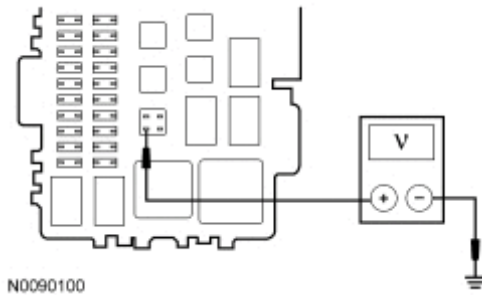
No

REMOVE the known good relay. GO to AA4.

AA4 CHECK FOR VOLTAGE TO THE TRAILER TOW REVERSING LAMP RELAY COIL

- Select REVERSE.
- Measure the voltage between the trailer tow reversing lamp relay pin 1, circuit CLS28 (BU/WH), BJB face side and ground.

Yes



- Is the voltage greater than 10 volts?

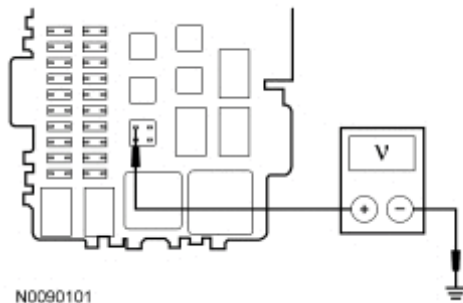
GO to AA5.

No

REPAIR circuit CLS28 (BU/WH) for an open. TEST the system for normal operation.

AA5 CHECK THE TRAILER TOW REVERSING LAMP RELAY BJB VOLTAGE SUPPLY

- Select PARK.
- Ignition OFF.
- Measure the voltage between the trailer tow reversing lamp relay pin 3, circuit SBB43 (BU/RD), BJB face side and ground.



- Is the voltage greater than 10 volts?

Yes

GO to AA6.

No

REPAIR circuit SBB43 (BU/RD) for an open. TEST the system for normal operation.

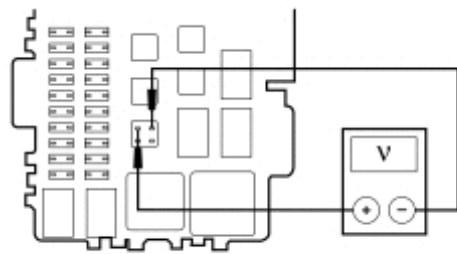
AA6 CHECK THE TRAILER TOW REVERSING LAMP RELAY GROUND CIRCUIT FOR AN OPEN

- Measure the voltage between the trailer tow reversing lamp relay pin 3, circuit SBB43 (BU/RD), BJB face side and the trailer tow reversing lamp relay pin 2, circuit GD123 (BK/GY), BJB face side.

Yes

REPAIR circuit CAT16 (GY/BN) for an open. TEST the system for normal operation.

No



N0117369

- **Is the voltage greater than 10 volts?**

REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation.

Pinpoint Test AB: The Trailer Lamps Are On Continuously

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation — Trailer Tow Stop/Turn Lamps

The trailer tow LH stop/turn relay coil receives voltage when the vehicle LH rear stoplamp is illuminated. When the trailer tow LH stop/turn relay is energized, voltage is routed to the trailer tow connector.

The trailer tow RH stop/turn relay coil receives voltage when the vehicle RH rear stoplamp is illuminated. When the trailer tow RH stop/turn relay is energized, voltage is routed to the trailer tow connector.

Trailer Tow Parking Lamps

The trailer tow parking lamp relay coil receives voltage when the vehicle parking lamps are illuminated. When the trailer tow parking lamp relay is energized, voltage is routed to the trailer tow connector.

Trailer Tow Reversing Lamps

The trailer tow reversing lamp relay coil receives voltage when the vehicle reversing lamps are illuminated. When the trailer tow reversing lamp relay is energized, voltage is routed to the trailer tow connector.

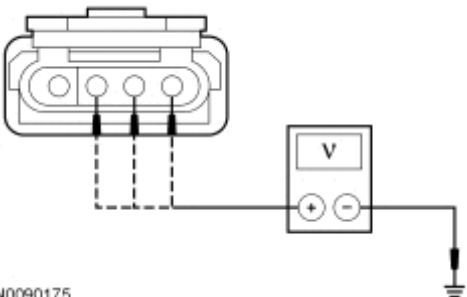
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Trailer tow relay
- Trailer

PINPOINT TEST AB: THE TRAILER LAMPS ARE ON CONTINUOUSLY

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

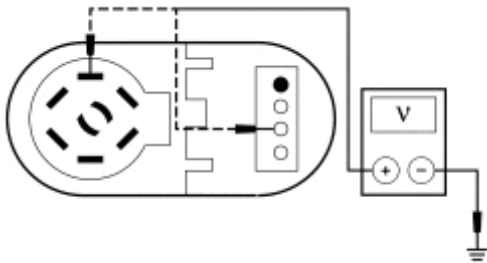
NOTE: Before beginning diagnostics, visually inspect the trailer tow connector mounted on the bumper for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

Test Step	Result / Action to Take								
<p>AB1 CHECK THE VEHICLE EQUIPMENT FOR A 7-PIN CONNECTOR</p>									
<ul style="list-style-type: none"> • Ignition OFF. • Inspect the vehicle for a 7-pin trailer tow connector. • Is the vehicle equipped with a 7-pin trailer tow connector? 	<p>Yes GO to AB3.</p> <p>No GO to AB2.</p>								
<p>AB2 CHECK FOR VOLTAGE AT THE TRAILER TOW 4-PIN CONNECTOR</p>									
<ul style="list-style-type: none"> • Ignition ON. • Measure the voltage between the trailer tow 4-pin connector, harness side and ground as follows: <table border="1" data-bbox="217 1325 771 1654"> <thead> <tr> <th>Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C439B-1 (RH stop/turn lamp)</td> <td>CAT09 (GN)</td> </tr> <tr> <td>C439B-2 (LH stop/turn lamp)</td> <td>CAT06 (YE)</td> </tr> <tr> <td>C439B-3 (parking lamps)</td> <td>CAT17 (BN)</td> </tr> </tbody> </table>  <p>N0090175</p>	Connector-Pin	Circuit	C439B-1 (RH stop/turn lamp)	CAT09 (GN)	C439B-2 (LH stop/turn lamp)	CAT06 (YE)	C439B-3 (parking lamps)	CAT17 (BN)	<p>Yes GO to AB4.</p> <p>No The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.</p>
Connector-Pin	Circuit								
C439B-1 (RH stop/turn lamp)	CAT09 (GN)								
C439B-2 (LH stop/turn lamp)	CAT06 (YE)								
C439B-3 (parking lamps)	CAT17 (BN)								

- Is any voltage present?

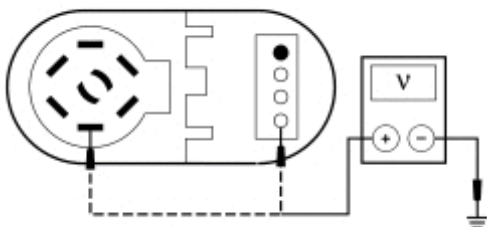
AB3 CHECK FOR VOLTAGE AT THE TRAILER TOW 7-PIN CONNECTOR

- Ignition ON.
- For the LH trailer stop/turn lamp, measure the voltage between the trailer tow connector LH stop/turn lamp voltage supply pins, circuit CAT06 (YE), component side and ground.



N0084018

- For the RH trailer stop/turn lamp, measure the voltage between the trailer tow connector RH stop/turn lamp voltage supply pins, circuit CAT09 (GN), component side and ground.



N0084019

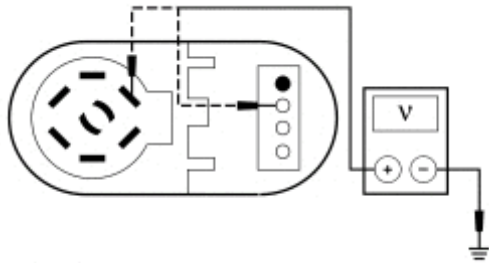
- For the trailer parking lamps, measure the voltage between the trailer tow connector parking lamp voltage supply pins, circuit CAT17 (BN), component side and ground.

Yes

GO to AB4.

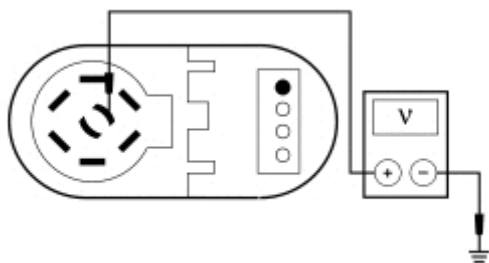
No

The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.



N0084020

- For the trailer reversing lamps, measure the voltage between the trailer tow connector reversing lamp voltage supply pin, circuit CAT16 (GY/BN), component side and ground.



N0084021

- **Is any voltage present?**

AB4 CHECK THE SUSPECT RELAY

- Ignition OFF.
- Disconnect: Suspect Trailer Tow Relay .
- Carry out the component test for the suspect trailer tow relay.
Refer to Wiring Diagrams Cell 149 for component testing.

- **Is the trailer tow relay OK?**

Yes

REPAIR circuit CAT06 (YE) (LH stop/turn), circuit CAT09 (GN) (RH stop/turn), circuit CAT17 (BN) (parking lamps) or CAT16 (GY/BN) (reversing lamps) for a short to voltage. TEST the system for normal operation.

No

INSTALL a new trailer tow relay in question. TEST the system for normal operation.

Pinpoint Test AC: The Trailer Battery Charging Is Inoperative/Does Not Operate Correctly

Refer to Wiring Diagrams Cell 11 , Fuse and Relay Information for schematic and connector information.

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

Normal Operation

The trailer battery charge relay coil receives voltage from the Battery Junction Box (BJB) fuse 54 (5A) when the ignition is in RUN. The BJB fuse 21 (30A) supplies voltage to the trailer battery charge relay switch side at all times. The Body Control Module (BCM) controls the ground side for the battery charge relay coil.

The BCM provides ground for the trailer battery charge relay when the ignition is in RUN and the BCM determines that the battery voltage is not low. When the trailer battery charge relay is energized, the voltage is routed to the trailer tow connector.

DTC Description	Fault Trigger Conditions
<ul style="list-style-type: none"> • B130C:12 — Load Shed Control: Circuit Short To Battery 	<p>This DTC sets when the BCM detects a short to battery from the trailer battery charge relay coil ground controlled circuit.</p>
<ul style="list-style-type: none"> • B130C:14 — Load Shed Control: Circuit Short To Ground or Open 	<p>This DTC sets when the BCM detects an open or short to ground from the trailer battery charge relay coil ground controlled circuit.</p>
<ul style="list-style-type: none"> • U1000:00 — Solid State Driver Protection Active - Driver Disabled: No Sub Type Information 	<p>This DTC sets when the BCM has temporarily shut down the control driver. The module has temporarily disabled the trailer battery charge relay control because an excessive current draw exists (such as a short to ground). The BCM cannot enable the trailer battery charge relay control until the cause of the short is corrected, the DTCs have been cleared and a successful self-test is run.</p>

<ul style="list-style-type: none"> • U3000:49 — Control Module: Internal Electronic Failure 	<p>This DTC sets when the BCM has permanently shut down the output driver. The module has permanently disabled the trailer battery charge relay control because an excessive current draw fault (such as a short to ground) has exceeded the limits that the BCM can withstand. CORRECT the cause of the excessive current draw before installing a new BCM .</p>
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This pinpoint test is intended to diagnose the following:

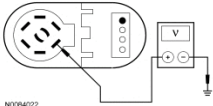
- Fuse
- Wiring, terminals or connectors
- Trailer tow connector
- Trailer battery charge relay
- Trailer
- BCM

PINPOINT TEST AC: THE TRAILER BATTERY CHARGING IS INOPERATIVE/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.

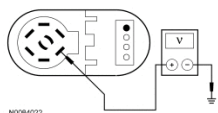
NOTE: Before beginning diagnostics, visually inspect the trailer tow connector mounted on the bumper for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

Test Step	Result / Action to Take
AC1 CHECK FOR VOLTAGE THROUGH THE TRAILER TOW CONNECTOR (BATTERY CHARGE INOPERATIVE)	
<ul style="list-style-type: none"> • Start the engine. 	

<ul style="list-style-type: none"> Measure the voltage between the trailer tow connector battery charge voltage supply pin, circuit CAT14 (OG), component side and ground.  <p><small>N0084022</small></p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to AC2.</p> <p>No VERIFY the BJB fuse 21 (30A) is OK. If OK, GO to AC7. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.</p>
<p>AC2 CHECK FOR VOLTAGE AT THE TRAILER TOW CONNECTOR (BATTERY CHARGE ALWAYS ON)</p>	
<ul style="list-style-type: none"> Ignition OFF. Measure the voltage between the trailer tow connector battery charge voltage supply pin, circuit CAT14 (OG), 	<p>Yes GO to AC3.</p> <p>No</p>

component side and ground.

GO to AC5.



- **Is any voltage present?**

AC3 CHECK THE TRAILER BATTERY CHARGE VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE

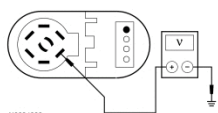
- Disconnect: Trailer Battery Charge Relay .
- Measure the voltage between the trailer tow connector battery charge voltage supply pin, circuit CAT14 (OG), component side and ground.

Yes

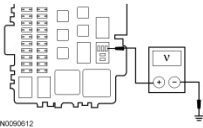
REPAIR circuit CAT14 (OG) for a short to voltage. TEST the system for normal operation.

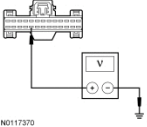
No

GO to AC4.

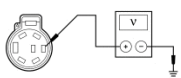


- **Is any voltage present?**

<p>AC4 CHECK FOR VOLTAGE TO THE TRAILER BATTERY CHARGE RELAY COIL (ALWAYS ON)</p>	
<ul style="list-style-type: none"> • Measure the voltage between the trailer battery charge relay pin 1, circuit CBB54 (VT/OG), BJB face side and ground.  <ul style="list-style-type: none"> • Is any voltage present? 	<p>Yes REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short. TEST the system for normal operation.</p> <p>No INSTALL a new trailer battery charge relay. TEST the system for normal operation.</p>
<p>AC5 CHECK FOR DTC B130C:14</p>	
<ul style="list-style-type: none"> • Review the DTCs recorded from the BCM self-test. • Is DTC B130C:14 present? 	<p>Yes GO to AC6.</p> <p>No The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.</p>
<p>AC6 CHECK FOR VOLTAGE TO THE</p>	

<p>BCM (DTC B130C:14)</p>	
<ul style="list-style-type: none"> • Disconnect: BCM C2280F . • Measure the voltage between the BCM C2280F-22, circuit CDC66 (BN/YE), harness side and ground.  <p style="font-size: small;">N0117370</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 	<p>Yes GO to AC13.</p> <p>No REPAIR circuit CDC66 (BN/YE) for a short to ground. TEST the system for normal operation.</p>
<p>AC7 CHECK FOR VOLTAGE AT THE TRAILER TOW CONNECTOR (BATTERY CHARGE INOPERATIVE)</p>	
<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Trailer Tow C439A . • Ignition ON. • Measure the voltage between the trailer tow C439A-5, 	<p>Yes</p>

circuit CAT14 (OG), harness side and ground.



A0025426

- Is the voltage greater than 10 volts?

INSTALL a new trailer tow connector. TEST the system for normal operation.

No

GO to AC8.

AC8 CHECK THE TRAILER BATTERY CHARGE RELAY (INOPERATIVE CONDITION)

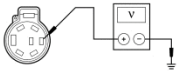
- Ignition OFF.
- Disconnect: Trailer Battery Charge Relay .
- Substitute a known good relay.
- Ignition ON.
- Measure the voltage between the trailer tow C439A-5, circuit CAT14 (OG), harness side and ground.

Yes

REMOVE the known good relay. INSTALL a new trailer battery charge relay. TEST the system for normal operation.

No

REMOVE the known good relay. GO to AC9.

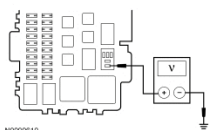


A0025426

- Is the voltage greater than 10 volts?

AC9 CHECK FOR VOLTAGE TO THE BATTERY CHARGE RELAY (SWITCH SIDE)

- Ignition OFF.
- Measure the voltage between the trailer battery charge relay pin 3, SBB21 (GY/RD), BJB face side and ground.



N0090610

- Is the voltage greater than 10 volts?

Yes

GO to AC10.

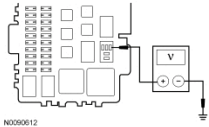
No

REPAIR circuit SBB21 (GY/RD) for an open. TEST the system for normal operation.

AC10 CHECK FOR VOLTAGE TO THE TRAILER BATTERY CHARGE RELAY COIL (INOPERATIVE CONDITION)

- Ignition ON.

- Measure the voltage between the trailer battery charge relay pin 1, circuit CBB54 (VT/OG), BJB face side and ground.



- **Is the voltage greater than 10 volts?**

Yes

GO to AC11.

No

VERIFY the BJB fuse 54 (5A) is OK. If OK, REPAIR circuit CBB54 (VT/OG) for an open. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

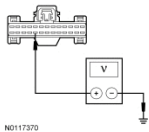
AC11 CHECK THE BATTERY CHARGE RELAY COIL GROUND CONTROLLED CIRCUIT FOR A SHORT TO VOLTAGE

- Ignition OFF.
- Disconnect: Trailer Battery Charge Relay .
- Disconnect: BCM C2280F .
- Ignition ON.
- Measure the voltage between the BCM C2280F-22, circuit

Yes

REPAIR circuit CDC66 (BN/YE) for a short to voltage. TEST the system for normal operation. After the repair: If no DTCs are present, TEST the system for normal operation. If DTC U1000:00 is present, CLEAR the DTCs **and REPEAT the self-test (required to enable the trailer battery charge relay control driver if DTC U1000:00 is present).**

CDC66 (BN/YE), harness side and ground.



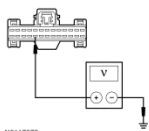
- Is any voltage present?

TEST the system for normal operation. If DTC U3000:49 is present, INSTALL a new BCM . REFER to Multifunction Electronic Modules. TEST the system for normal operation.

No
GO to AC12.

AC12 CHECK THE BATTERY CHARGE RELAY COIL GROUND CONTROLLED CIRCUIT FOR AN OPEN

- Ignition OFF.
- Connect: Trailer Battery Charge Relay .
- Ignition ON.
- Measure the voltage between the BCM C2280F-22, circuit CDC66 (BN/YE), harness side and ground.



Yes
GO to AC13.

No
REPAIR circuit CDC66 (BN/YE) for an open. TEST the system for normal operation.

<ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 	
<p>AC13 CHECK FOR CORRECT BCM OPERATION</p>	
<ul style="list-style-type: none"> • Disconnect all the BCM connectors. • Check for: <ul style="list-style-type: none"> • corrosion • damaged pins • pushed-out pins • Connect all the BCM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	<p>Yes INSTALL a new BCM . REFER to Multifunction Electronic Modules. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.</p>

Pinpoint Test AD: The Trailer Electric Brakes Are Inoperative/Always Applied

Refer to Wiring Diagrams Cell 95 , Trailer/Camper Adapter for schematic and connector information.

NOTE: This pinpoint test diagnoses the circuitry supplied for an aftermarket Trailer Brake Control (TBC) module. For diagnostics of the factory trailer brake control system, refer to Auxiliary Brake System.

Normal Operation

The TBC module is provided voltage at all times by the Battery Junction Box (BJB) fuse 17 (30A). The TBC module receives voltage from the Body Control Module (BCM) fuse 31 (5A) when the brake pedal is applied. When a brake application is detected from the stoplamp switch, the TBC module sends voltage to the trailer tow connector.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Trailer tow connector
- TBC module (aftermarket)
- Trailer
- BCM

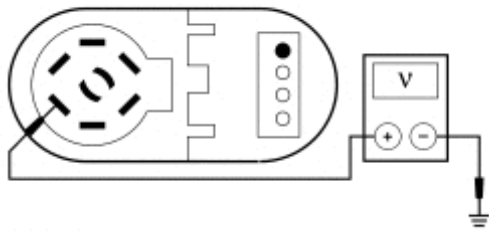
PINPOINT TEST AD: THE TRAILER ELECTRIC BRAKES ARE INOPERATIVE/ALWAYS APPLIED

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

NOTE: Before beginning diagnostics, visually inspect the trailer tow connector mounted on the bumper for signs of corrosion or damage. Repair or install a new trailer tow connector as required.

NOTE: Make sure the vehicle stoplamps operate correctly before beginning diagnostics of the trailer brakes.

Test Step	Result / Action to Take
AD1 CHECK THE TRAILER ELECTRIC BRAKE CONTROLLER FOR A SHORTED OUTPUT	
<ul style="list-style-type: none"> • Ignition ON. • Measure the voltage between the trailer tow connector electric brake control supply pin, circuit CAT19 (BU), component side and ground. 	<p>Yes</p>



N0084023

- Is any voltage present?

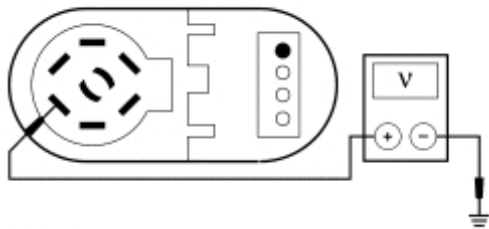
GO to AD2.

No

GO to AD3.

AD2 CHECK THE TBC MODULE OUTPUT CIRCUIT FOR A SHORT TO VOLTAGE

- Disconnect: TBC Module C2142 .
- Measure the voltage between the trailer tow connector electric brake control supply pin, circuit CAT19 (BU), component side and ground.



N0084023

- Is any voltage present?

Yes

REPAIR circuit CAT19 (BU) for a short to voltage. TEST the system for normal operation.

No

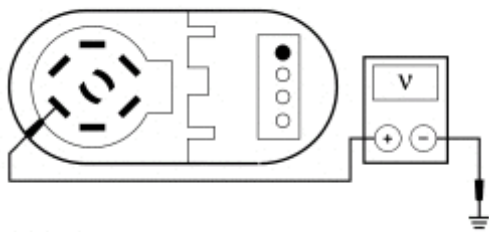
INSTALL a new TBC module. TEST the system for normal operation.

AD3 CHECK THE TBC MODULE OUTPUT

- Set the gain on the trailer electric brake controller to the maximum setting.
- While applying the brake pedal, measure the voltage between the trailer tow connector electric brake control supply pin, circuit CAT19 (BU), component side and ground.

Yes

The vehicle is operating correctly. SEND the trailer to an authorized camper/trailer repair facility.



N0084023

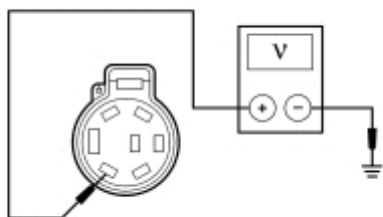
- Is the voltage greater than 10 volts?

No

GO to AD4.

AD4 CHECK FOR VOLTAGE TO THE TRAILER TOW CONNECTOR (VEHICLE HARNESS)

- Disconnect: Trailer Tow C439A .
- **NOTE:** Make sure the gain is set to the maximum setting.
- While applying the brake pedal, measure the voltage between the trailer tow C439A-3, circuit CAT19 (BU), harness side and ground.



A0025430

- Is the voltage greater than 10 volts?

Yes

INSTALL a new trailer tow connector. TEST the system for normal operation.

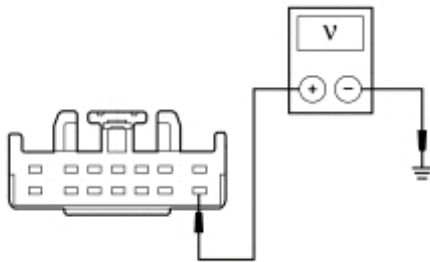
No

GO to AD5.

AD5 CHECK FOR VOLTAGE TO THE TBC MODULE

- Disconnect: TBC Module C2142 .
- Measure the voltage between the TBC module C2142-8, circuit SBB17 (RD), harness side and ground.

Yes



N0066300

- Is the voltage greater than 10 volts?

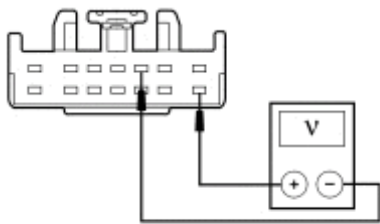
GO to AD6.

No

VERIFY the BJB fuse 17 (30A) is OK. If OK, REPAIR circuit SBB17 (RD) for an open. TEST the system for normal operation. If not OK, REFER to the Wiring Diagrams manual to identify the possible causes of the circuit short.

AD6 CHECK THE TBC MODULE GROUND CIRCUIT FOR AN OPEN

- Measure the voltage between the trailer electric brake controller C2142-8, circuit SBB17 (RD), harness side and the trailer electric brake controller C2142-3, circuit GD138 (BK/WH), harness side.



N0090813

- Is the voltage greater than 10 volts?

Yes

GO to AD7.

No

REPAIR circuit GD138 (BK/WH) for an open. TEST the system for normal operation.

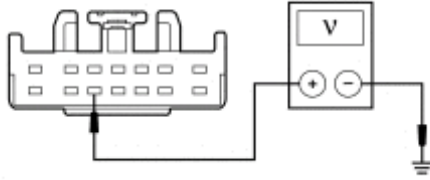
AD7 CHECK THE STOPLAMP SWITCH INPUT TO THE TBC MODULE

- While applying the brake pedal, measure the voltage between the TBC module C2142-12, circuit CBP31 (BU/OG), harness side and ground.

Yes

GO to AD9.

No



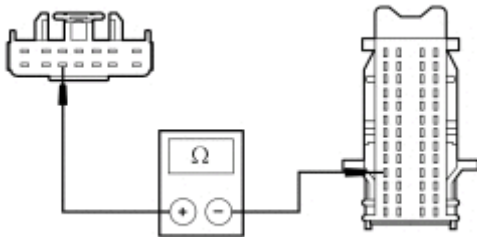
N0090814

- Is the voltage greater than 10 volts?

VERIFY the BCM fuse 31 (5A) Is OK. If OK, GO to AD8. If not OK, refer to the Wiring Diagrams manual to identify the possible causes of the circuit short.

AD8 CHECK THE STOPLAMP SWITCH INPUT CIRCUIT TO THE TBC MODULE FOR AN OPEN

- Disconnect: BCM C2280B .
- Measure the resistance between the TBC module C2142-12, circuit CBP31 (BU/OG), harness side and the BCM C2280B-4, circuit CBP31 (BU/OG), harness side.



N0117380

- Is the resistance less than 5 ohms?

Yes

GO to AD11.

No

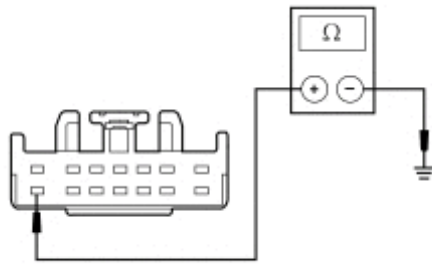
REPAIR circuit CBP31 (BU/OG) for an open.
TEST the system for normal operation.

AD9 CHECK THE TBC MODULE OUTPUT CIRCUIT FOR A SHORT TO GROUND

- Measure the resistance between the trailer electric brake controller C2142-14, circuit CAT19 (BU), harness side and ground.

Yes

GO to AD10.



N0066303

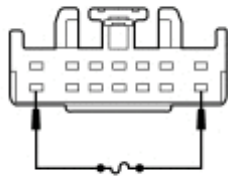
- Is the resistance greater than 10,000 ohms?

No

REPAIR circuit CAT19 (BU) for a short to ground. TEST the system for normal operation.

AD10 CHECK THE TBC MODULE OUTPUT CIRCUIT FOR AN OPEN

- Connect a fused jumper wire between the trailer electric brake controller C2142-8, circuit SBB17 (RD), harness side and the trailer electric brake controller C2142-14, circuit CAT19 (BU), harness side.



N0088194

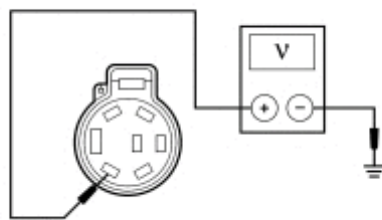
- Measure the voltage between the trailer tow C439A-3, circuit CAT19 (BU), harness side and ground.

Yes

INSTALL a new trailer electric brake controller. TEST the system for normal operation.

No

REPAIR circuit CAT19 (BU) for an open. TEST the system for normal operation.



A0025430

- Is the voltage greater than 10 volts?

AD11 CHECK FOR CORRECT BCM OPERATION	
<ul style="list-style-type: none"> • Disconnect all the BCM connectors. • Check for: <ul style="list-style-type: none"> • corrosion • damaged pins • pushed-out pins • Connect all the BCM connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	<p>Yes</p> <p>INSTALL a new BCM . REFER to Multifunction Electronic Modules. TEST the system for normal operation.</p> <p>No</p> <p>The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.</p>

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