

SPECIFICATIONS

Torque Specifications

Description	Nm	lb-ft	lb-in
Headlamp assembly nuts	8	—	71
Rear lamp assembly nuts	6	—	53

Torque Specifications (Continued)

Description	Nm	lb-ft	lb-in
Reversing lamp switch (T5OD transmission)	37	27	—
Reversing lamp switch (TR3650 or TR6060 transmission)	27	20	—

DESCRIPTION AND OPERATION

Exterior Lighting

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

Headlamps

The headlamps are controlled by the SJB. The headlamp and multifunction switches are constantly monitored by the SJB. The SJB processes information (such as low beam, high beam or flash-to-pass requests) from the switch inputs, and then outputs voltage to the headlamps accordingly. In the event the SJB detects a fault with any of the headlamp switch inputs, all the exterior lamps are illuminated. There is also a headlamp battery saver feature. This feature turns off the headlamps 10 minutes after the ignition switch is turned OFF.

Headlamp Functionality — Halogen

When the low beams are requested (based on inputs to the SJB), the low beams are illuminated.

When the high beams are requested, the high beams are illuminated and the low beams turn off.

When the flash-to-pass feature is requested, the high beams are illuminated as long as the multifunction switch is held in the FLASH-TO-PASS position.

Headlamp Functionality — High Intensity Discharge (HID)

Vehicles equipped with HID headlamps utilize relays to control the voltage to the HID ballasts. The ballasts are located on the side of each headlamp assembly.

When the low beams are requested (based on inputs to the SJB), the HID relays are energized and the low beams are illuminated.

When the high beams are requested, the HID relays stay energized and a shutter within each headlamp is activated. This changes the headlamp beam pattern to illuminate a greater distance.

The flash-to-pass feature is unique for HID equipped vehicles. If the low beams are off when the flash-to-pass is requested, the HID relays and the shutters within the headlamps are activated for less than 0.5 second. If the low beams are on when the flash-to-pass is requested, the shutters within the headlamps are activated as long as the multifunction switch is held in the FLASH-TO-PASS position.

Stoplamps

The stoplamp outputs are controlled by the SJB. The stoplamp switch is monitored by the SJB. When the SJB detects the brake pedal is applied, the SJB processes this information and outputs voltage to the stoplamps.

Turn Signal and Hazard Lamps

All turn signal outputs are controlled by the SJB. The multifunction switch and the hazard switch are monitored by the SJB. When the multifunction switch is in the left or right turn position, or the hazard switch is engaged, the SJB processes this information and outputs on/off voltage to the appropriate turn signal and hazard lamps. All turn signal lamps provide a lamp outage indication.

Parking, Rear or License Plate Lamps

The parking, rear, license plate and side marker lamps are controlled by the SJB. The headlamp switch is monitored by the SJB. When the headlamp switch is in the HEADLAMPS ON or PARKING LAMPS ON position, the SJB processes this information and outputs voltage to the parking, rear, licence plate and side marker lamps.

The battery saver feature does not turn the parking lamps off when the headlamp switch is in the PARKING LAMPS ON position.

Fog Lamps

The fog lamps are controlled by the SJB. The SJB monitors inputs from the headlamp switch and the multifunction switch. The SJB can only turn the fog lamps on when the ignition switch is in the RUN position, the parking lamps are on and the high beams are off. When the fog lamp switch is engaged, the SJB then activates the fog lamp relay, providing power to the fog lamps.

Reversing Lamps

The reversing lamps are controlled by the SJB. The PCM sends a message through the communication network indicating the transmission is in REVERSE (R). The SJB processes this information and outputs voltage to the reversing lamps.

DESCRIPTION AND OPERATION (Continued)**Daytime Running Lamps (DRL)**

NOTE: The DRL is not a programmable parameter for this vehicle.

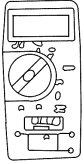
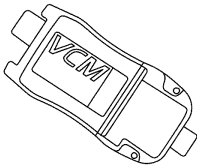
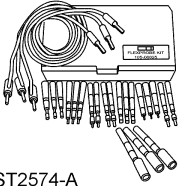
If the SJB is configured for DRL, this feature illuminates the low beam headlamps at a reduced intensity when the following conditions exist:

- The ignition switch is in the RUN position.
 - The headlamp switch is in the OFF position.
 - The parking brake is not engaged.
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DIAGNOSIS AND TESTING

Headlamps

Special Tool(s)

 <p>ST1137-A</p>	73III Automotive Meter 105-R0057 or equivalent
 <p>ST2834-A</p>	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 <p>ST2574-A</p>	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The SJB monitors the headlamp switch position by sending voltage reference signals on multiple circuits to the headlamp switch. At any given time, one of the signal circuits is routed to ground. If the SJB does not detect any of the inputs to the headlamp switch is active (routed to ground) for 5 seconds, the SJB turns on the exterior lights and keeps them on for 10 minutes after the ignition switch is turned off (or 10 minutes from the time the SJB does not detect any headlamp switch input if the ignition switch was already off). If the SJB detects multiple circuits short to ground, the SJB implements a planned strategy depending on the inputs received. If either of these situations occur, the SJB should **NOT** be ruled immediately as being at fault. This is normal behavior of the SJB design as it has detected a fault with the inputs from the headlamp switch.

The SJB also monitors the multifunction switch for a flash-to-pass or high beam request. There are 2 voltage reference circuits which monitor this. When the multifunction switch is in the FLASH-TO-PASS or HIGH BEAM position, the voltage signal for that input is routed to ground.

NOTE: The flash-to-pass feature does not require any input from the headlamp switch.

When the SJB receives an input requesting the headlamps on, the SJB supplies voltage to the low beams. If the low beams are on and the SJB receives a request for high beams (or a flash-to-pass request), the SJB energizes an internal relay which routes voltage to the headlamps.

Headlamp Functionality — Halogen

When the low beams are requested (based on inputs to the SJB), the SJB provides voltage to the low beams.

When the high beams are requested, the SJB energizes an internal relay which routes voltage to the high beams and terminates voltage to the low beams.

When the flash-to-pass feature is requested, the SJB energizes an internal high beam relay which routes voltage to the high beams as long as the multifunction switch is held in the FLASH-TO-PASS position.

Headlamp Functionality — High Intensity Discharge (HID)

Relays are utilized to control the voltage to the HID ballasts. The ballasts are located on the side of each headlamp assembly.

When the low beams are requested (based on inputs to the SJB), the HID relays are energized and voltage is routed to the HID ballasts to illuminate the HID bulbs.

When the high beams are requested, the HID relays stay energized and the SJB energizes an internal high beam relay which routes voltage to the headlamps to actuate a shutter located within each headlamp. This changes the headlamp beam pattern to illuminate a greater distance.

DIAGNOSIS AND TESTING (Continued)

The flash-to-pass feature is unique for HID equipped vehicles. If the low beams are off when the flash-to-pass is requested, the SJB provides voltage to the HID relays and energizes the internal high beam relay for the shutters within the headlamps for less than 0.5 second. If the SJB is already providing voltage to the HID relays (low beams) when the flash-to-pass is requested, the SJB energizes the internal high beam relay as long as the multifunction switch is held in the FLASH-TO-PASS position.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Headlamp switch 	<ul style="list-style-type: none"> • Bussed electrical center (BEC) fuse(s): <ul style="list-style-type: none"> — 50 (15A) (high beams) — 67 (30A) • Wiring, terminals or connectors • Bulb(s) • Smart junction box (SJB)

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

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

- Verify the ignition key is in the ON position.
- Verify the scan tool operation with a known good vehicle.
- Refer to Section 418-00 to diagnose no response from the PCM.

7. Carry out the network test:

- If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
- If the network test passes, retrieve and record the continuous memory DTCs.

8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.

9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.

10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts

Smart Junction Box (SJB) DTC Chart

DTC	Description	Action
B1470	Lamp Headlamp Input Circuit Failure	GO to Pinpoint Test F.
B2501	LF Lamp Low Beam Circuit Failure	If the low beam is inoperative, GO to Pinpoint Test C. If the low beam is always on, GO to Pinpoint Test F.

DIAGNOSIS AND TESTING (Continued)**Smart Junction Box (SJB) DTC Chart (Continued)**

DTC	Description	Action
B2503	RF Lamp Low Beam Circuit Failure	If the low beam is inoperative, GO to Pinpoint Test C. If the low beam is always on, GO to Pinpoint Test F.
B2586	Headlamp Mode Select Circuit Failure	If the high beams are inoperative, GO to Pinpoint Test B. If the high beams are always on, GO to Pinpoint Test F.
B2598	Headlamp Relay Circuit Failure	If the high beams are inoperative, GO to Pinpoint Test B. If the high beams are always on, GO to Pinpoint Test F.
All other DTCs	—	REFER to Section 419-10.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors SJB 	<ul style="list-style-type: none"> REFER to Section 418-00.
<ul style="list-style-type: none"> Both low beams are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Bussed electrical center (BEC) SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test A.
<ul style="list-style-type: none"> Both high beams are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors SJB configuration High beam relay Multifunction switch BEC SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test B.
<ul style="list-style-type: none"> One low beam headlamp is inoperative — halogen headlamps 	<ul style="list-style-type: none"> Wiring, terminals or connectors BEC SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test C.
<ul style="list-style-type: none"> One low beam headlamp is inoperative — high intensity discharge (HID) headlamps 	<ul style="list-style-type: none"> Wiring, terminals or connectors HID relay BEC Ballast HID bulb Headlamp assembly SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test D.
<ul style="list-style-type: none"> One high beam headlamp is inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Headlamp assembly BEC 	<ul style="list-style-type: none"> GO to Pinpoint Test E.

DIAGNOSIS AND TESTING (Continued)

Symptom Chart (Continued)

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The headlamps are on continuously 	<ul style="list-style-type: none"> Wiring, terminals or connectors High beam relay HID relay Headlamp switch Multifunction switch BEC SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test F.
<ul style="list-style-type: none"> The flash-to-pass feature is inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Multifunction switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test G.

Pinpoint Tests

Pinpoint Test A: Both Low Beams Are Inoperative

Refer to Wiring Diagrams Cell 85, Headlamps for schematic and connector information.

Normal Operation

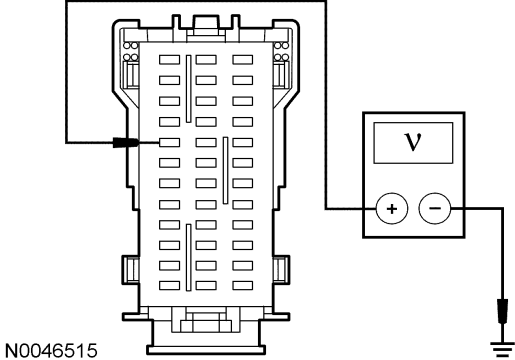
The smart junction box (SJB) is supplied voltage for the low beams through circuit 1052 (TN/BK) from the bussed electrical center (BEC). When a request for the low beams is detected, the SJB provides voltage to the low beams or high intensity discharge (HID) relays (if equipped). The headlamps share a common ground through circuit 1205 (BK).

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- BEC
- SJB

PINPOINT TEST A: BOTH LOW BEAMS ARE INOPERATIVE

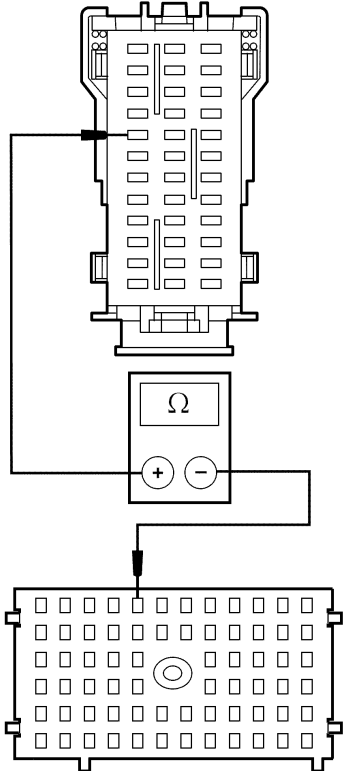
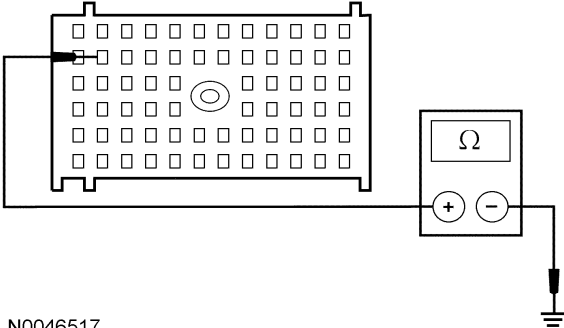
NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step	Result / Action to Take
<p>A1 CHECK CIRCUIT 1052 (TN/BK) FOR A VOLTAGE</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280h. Measure the voltage between the SJB C2280h-32, circuit 1052 (TN/BK), harness side and ground.  <p>N0046515</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to A3.</p> <p>No VERIFY the BEC fuse 67 (30A) is OK. If OK, GO to A2.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: BOTH LOW BEAMS ARE INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>A2</p>	<p>CHECK CIRCUIT 1052 (TN/BK) FOR AN OPEN</p> <ul style="list-style-type: none"> • Disconnect: BEC C1035a. • Measure the resistance between the SJB C2280h-32, circuit 1052 (TN/BK), harness side and the BEC C1035a-A5, circuit 1052 (TN/BK), harness side.  <p>N0046516</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>A3</p>	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> • Disconnect: BEC C1035c. • Measure the resistance between the BEC C1035c-E11, circuit 1205 (BK), harness side and ground.  <p>N0046517</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to A4.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST A: BOTH LOW BEAMS ARE INOPERATIVE (Continued)**

Test Step		Result / Action to Take
A4	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test B: Both High Beams Are Inoperative

Refer to [Wiring Diagrams Cell 85, Headlamps for schematic and connector information.](#)

Refer to [Wiring Diagrams Cell 11, Fuse and Relay Information for schematic and connector information.](#)

Normal Operation

When the headlamp switch is placed in the HEADLAMPS ON position, the smart junction box (SJB) monitors the multifunction switch by sending a voltage reference signal through circuit 1394 (WH/RD). When the multifunction switch is placed in the HIGH BEAM position, the signal is routed to an internal ground within the SJB through circuit 1396 (VT/WH). The SJB then supplies ground for the high beam relay coil through circuit 1708 (LG/BK). The high beam relay is supplied voltage at all times from the bussed electrical center (BEC). When the high beam relay is energized, voltage is routed to the high beams.

If the SJB is not configured for the correct headlamp type, the high beams may be inoperative.

- DTC B2586 (Headlamp Mode Select Circuit Failure) — is an on-demand DTC that sets when the SJB detects a short to ground from the multifunction switch input (headlamp mode select) circuit.
- DTC B2598 (Headlamp Relay Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to voltage from the high beam relay coil ground controlled circuit.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- SJB configuration
- High beam relay
- Multifunction switch
- BEC
- SJB

PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE

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

Test Step		Result / Action to Take
B1	CHECK THE LOW BEAMS	<p>Yes GO to B2.</p> <p>No GO to Pinpoint Test A.</p>
	<ul style="list-style-type: none"> • Ignition OFF. • Place the headlamp switch in the HEADLAMPS ON position. • Do the low beams illuminate? 	
B2	USE THE RECORDED DTCs FROM THE SJB SELF-TEST	<p>Yes For DTC B2598, GO to B3. For DTC B2586, GO to B9.</p> <p>No GO to B11.</p>
	<ul style="list-style-type: none"> • Place the headlamp switch in the OFF position. • Retrieve the recorded results from the SJB self-test. • Was DTC B2598 or B2586 present? 	

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DIAGNOSIS AND TESTING (Continued)

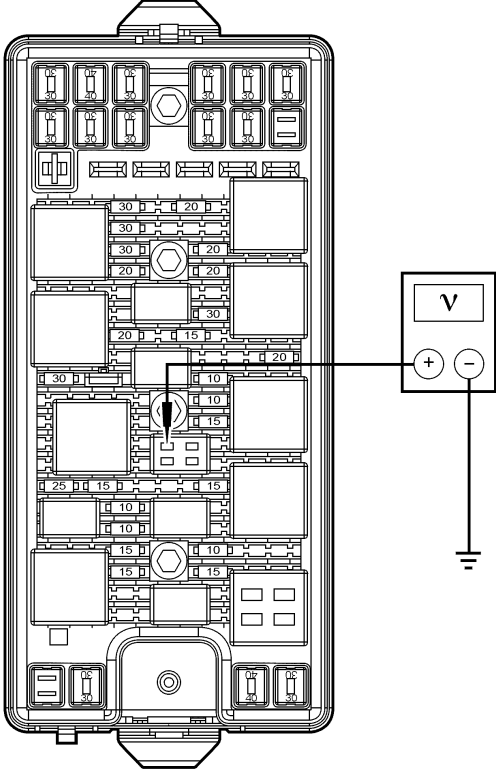
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

	Test Step	Result / Action to Take
B3	<p>CHECK THE HIGH BEAM RELAY (DTC B2598)</p> <ul style="list-style-type: none"> • Disconnect: High Beam Relay. • Substitute a known good relay and recheck the operation on the high beams. • Do the high beams operate correctly? 	<p>Yes REMOVE the known good relay. INSTALL a new high beam relay. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REMOVE the known good relay. GO to B4.</p>
B4	<p>CHECK THE HIGH BEAM RELAY CONTROL CIRCUIT FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> • Disconnect: SJB C2280c. • Ignition ON. • Measure the voltage between the high beam relay pin 86, circuit 1708 (LG/BK), BEC face side and ground. <div data-bbox="295 695 787 1465" style="text-align: center;"> <p>The diagram shows a top-down view of the SJB with various components labeled. A voltmeter symbol with '+' and '-' terminals is connected to a specific pin (pin 86) and a ground symbol. The pin is labeled with '10' and '15'.</p> </div> <p>N0014615</p> <ul style="list-style-type: none"> • Is any voltage present? 	<p>Yes GO to B5.</p> <p>No GO to B6.</p>
B5	<p>CHECK CIRCUIT 1708 (LG/BK) FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: BEC C1035a. • Ignition ON. 	

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DIAGNOSIS AND TESTING (Continued)

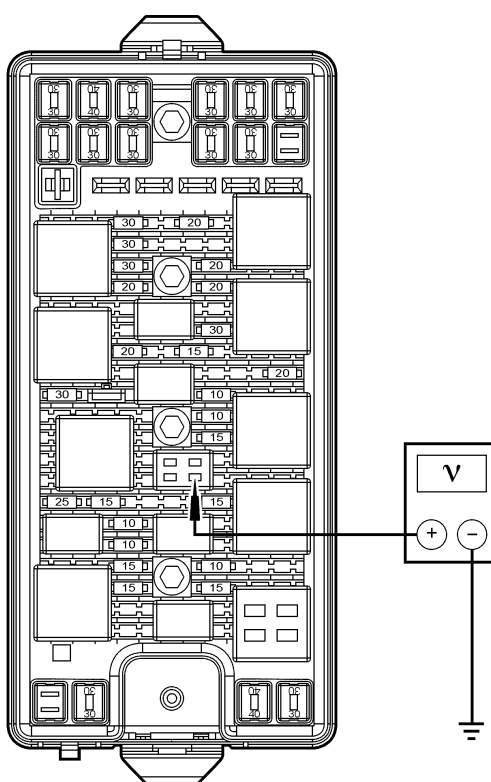
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
B5	<p>CHECK CIRCUIT 1708 (LG/BK) FOR A SHORT TO VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the high beam relay pin 86, circuit 1708 (LG/BK), BEC face side and ground.  <p>N0014615</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
B6	<p>CHECK THE VOLTAGE FEED TO THE HIGH BEAM RELAY COIL</p> <ul style="list-style-type: none"> Ignition OFF. 	

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DIAGNOSIS AND TESTING (Continued)

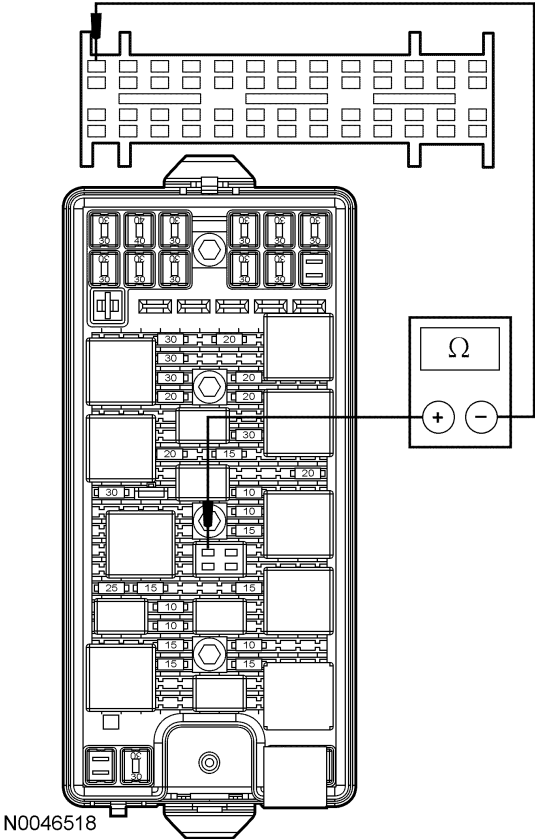
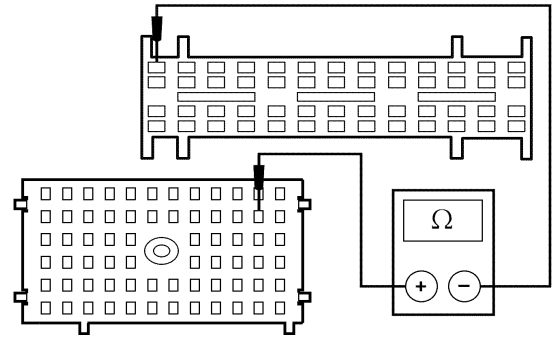
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>B6</p>	<p>CHECK THE VOLTAGE FEED TO THE HIGH BEAM RELAY COIL (Continued)</p>	
	<ul style="list-style-type: none"> Measure the voltage between the high beam relay pin 85, BEC face side and ground.  <p>The diagram shows a top-down view of a fuse block with various fuses and relays. A voltmeter is connected to pin 85, which is located in the lower-middle section of the block. The voltmeter's positive lead is connected to the pin, and the negative lead is connected to a ground symbol. The pin is labeled '85'.</p> <p>N0014616-</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to B7.</p> <p>No VERIFY the BEC fuse 50 (15A) is OK. If OK, INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>

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DIAGNOSIS AND TESTING (Continued)

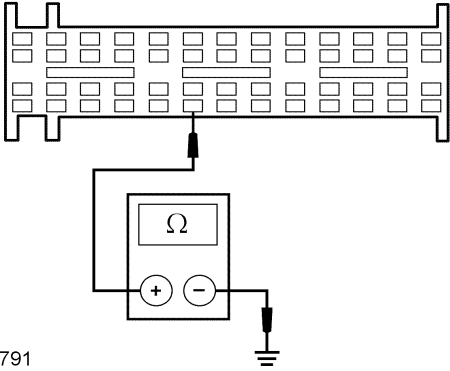
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step	Result / Action to Take
<p>B7 CHECK THE HIGH BEAM RELAY CONTROL CIRCUIT FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the high beam relay pin 86, circuit 1708 (LG/BK), BEC face side and the SJB C2280c-1, circuit 1708 (LG/BK), harness side.  <p>N0046518</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to B15.</p> <p>No GO to B8.</p>
<p>B8 CHECK CIRCUIT 1708 (LG/BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Measure the resistance between the BEC C1035a-B11, circuit 1708 (LG/BK), harness side and the SJB C2280c-1, circuit 1708 (LG/BK), harness side.  <p>N0046519</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>

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DIAGNOSIS AND TESTING (Continued)

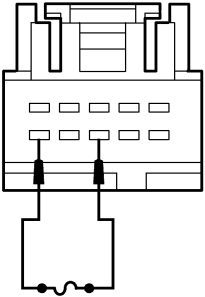
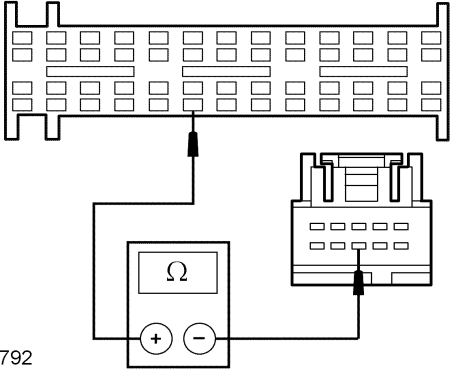
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
B9	CHECK THE MULTIFUNCTION SWITCH	Yes GO to B10 . No INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation.
	<ul style="list-style-type: none"> Disconnect: Multifunction Switch C202. Ignition ON. Enter the following diagnostic mode on the scan tool: SJB Self-Test. Repeat the SJB on-demand self-test. Is DTC B2586 retrieved again? 	
B10	CHECK CIRCUITS 1394 (WH/RD) FOR A SHORT TO GROUND	Yes GO to B15 . No REPAIR the circuit. TEST the system for normal operation.
	<ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the OFF position. Disconnect: SJB C2280b. Measure the resistance between the SJB C2280b-45, circuit 1394 (WH/RD), harness side and ground.  <p>N0072791</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	
B11	CHECK THE HIGH BEAM SWITCH INPUT	Yes GO to B12 . No GO to B13 .
	<ul style="list-style-type: none"> Ignition ON. Enter the following diagnostic mode on the scan tool: SJB DataLogger. Monitor the SJB multifunction switch status PID (HBEAMSW) while placing the multifunction switch in the HIGH BEAM position. Does the PID indicate HIGH BEAM position is active? 	
B12	CHECK THE HIGH BEAM RELAY (NO DTCs)	Yes REMOVE the known good relay. INSTALL a new high beam relay. TEST the system for normal operation. No REMOVE the known good relay. INSTALL a new BEC. TEST the system for normal operation.
	<ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the OFF position. Disconnect: High Beam Relay. Substitute a known good relay and recheck the operation on the high beams. Do the high beams operate correctly? 	
B13	CHECK THE MULTIFUNCTION SWITCH	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: Multifunction Switch C202. Ignition ON. 	

(Continued)

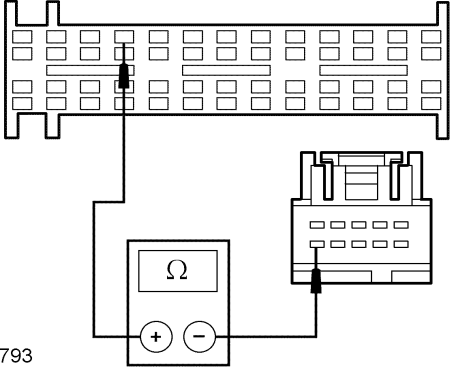
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
B13	<p>CHECK THE MULTIFUNCTION SWITCH (Continued)</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper wire between the multifunction switch C202-8, circuit 1394 (WH/RD), harness side and the multifunction switch C202-10, circuit 1396 (VT/WH), harness side.  <p>N0046520</p> <ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: SJB DataLogger. Monitor the SJB multifunction switch status PID (HBEAMSW). Does the PID indicate HIGH BEAM position is active? 	<p>Yes REMOVE the jumper wire. INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to B14.</p>
B14	<p>CHECK CIRCUITS 1394 (WH/RD) AND 1396 (VT/WH) FOR AN OPEN</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280b. Measure the resistance between the SJB C2280b-45, circuit 1394 (WH/RD), harness side and the multifunction switch C202-8, circuit 1394 (WH/RD), harness side.  <p>N0072792</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)**

Test Step		Result / Action to Take
B14	CHECK CIRCUITS 1394 (WH/RD) AND 1396 (VT/WH) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the SJB C2280b-4, circuit 1396 (VT/WH) and the multifunction switch C202-10, circuit 1396 (VT/WH).  <p>N0072793</p> <ul style="list-style-type: none"> Are the resistances less than 5 ohms? 	<p>Yes GO to B15.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>
B15	CHECK THE SJB CONFIGURATION	
	<ul style="list-style-type: none"> Ignition ON. Enter the following diagnostic mode on the scan tool: SJB DataLogger. NOTE: Vehicles equipped with halogen headlamps should display Non HID. Vehicles with HID headlamps should display HID Active Mode. Monitor the SJB headlamp configuration PID (HID Status). Is the configuration correct for the vehicle build? 	<p>Yes GO to B16.</p> <p>No CONFIGURE the module using as-built data. TEST the system for normal operation.</p>
B16	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test C: One Low Beam Headlamp Is Inoperative — Halogen Headlamps

Refer to Wiring Diagrams Cell 85, Headlamps for schematic and connector information.

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

Normal Operation

When the smart junction box (SJB) receives a request for the low beams, the SJB provides voltage to circuits 1338 (WH) and 1336 (LG/WH), through the bussed electrical center (BEC), to the LH and RH low beams, respectively. Ground for the low beams is provided through circuit 1205 (BK), which is routed through the BEC.

- DTC B2501 (LF Lamp Low Beam Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the LH headlamp voltage supply circuit.

DIAGNOSIS AND TESTING (Continued)

- DTC B2503 (RF Lamp Low Beam Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the RH headlamp voltage supply circuit.

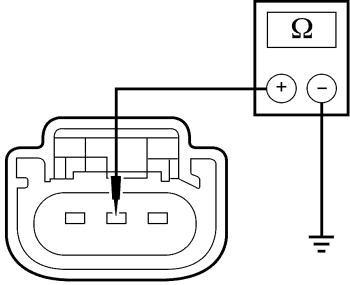
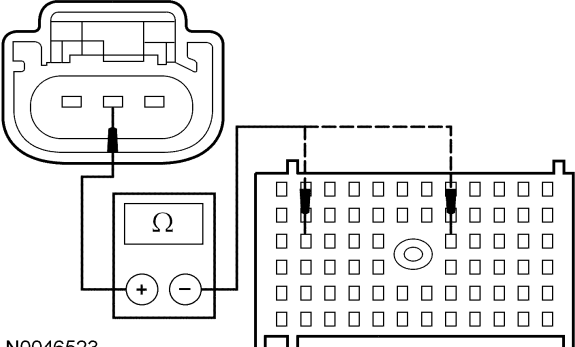
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- BEC
- SJB

PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS

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

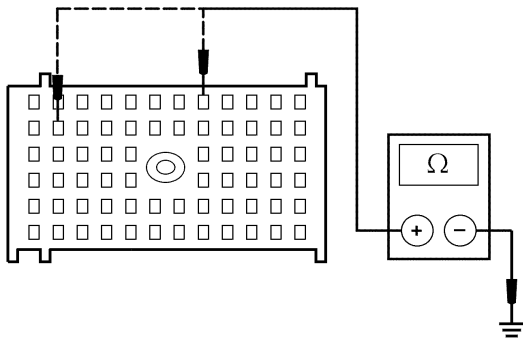
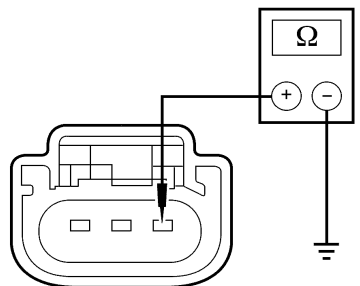
NOTE: Make sure the bulb is good before continuing diagnostics.

Test Step		Result / Action to Take
C1	<p>CHECK THE HEADLAMP GROUND CIRCUIT</p> <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Inoperative Headlamp. • Measure the resistance between the LH headlamp C1021-2, circuit 1205 (BK), harness side and ground; or between the RH headlamp C1041-2, circuit 1205 (BK), harness side and ground.  <p>N0010865</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to C4.</p> <p>No GO to C2.</p>
C2	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (HEADLAMP TO BEC)</p> <ul style="list-style-type: none"> • Disconnect: BEC C1035c. • Measure the resistance between the LH headlamp C1021-2, circuit 1205 (BK), harness side and the BEC C1035c-D5, circuit 1205 (BK), harness side; or between the RH headlamp C1041-2, circuit 1205 (BK), harness side and the BEC C1035c-D11, circuit 1205 (BK), harness side.  <p>N0046523</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to C3.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

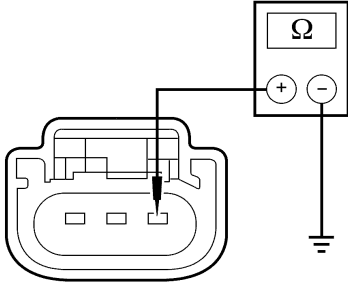
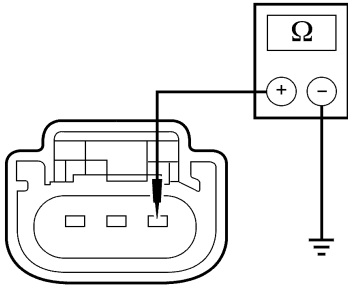
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

Test Step		Result / Action to Take
C3	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (BEC TO GROUND)</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035c-F5 (LH headlamp), circuit 1205 (BK), harness side and ground; or between the BEC C1035c-E11 (RH headlamp), circuit 1205 (BK), harness side and ground.  <p>N0046524</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
C4	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Disconnect: SJB C2280d. Measure the resistance between the LH headlamp C1021-1, circuit 1338 (WH), harness side and ground; or between the RH headlamp C1041-1, circuit 1336 (LG/WH), harness side and ground.  <p>N0010866</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to C7.</p> <p>No GO to C5.</p>
C5	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (SJB TO BEC)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

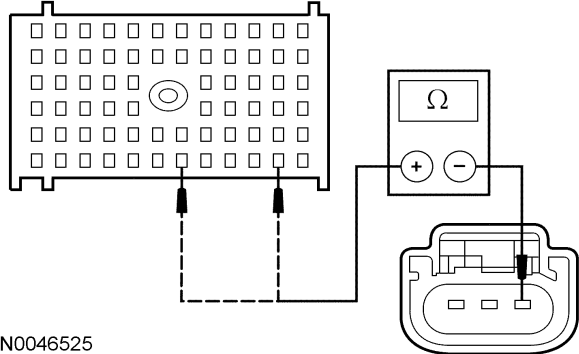
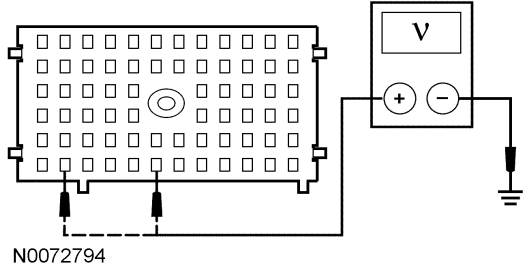
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

Test Step		Result / Action to Take
C5	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (SJB TO BEC) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the LH headlamp C1021-1, circuit 1338 (WH), harness side and ground; or between the RH headlamp C1041-1, circuit 1336 (LG/WH), harness side and ground.  <p>N0010866</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to C6.</p>
C6	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (BEC TO HEADLAMP)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the LH headlamp C1021-1, circuit 1338 (WH), harness side and ground; or between the RH headlamp C1041-1, circuit 1336 (LG/WH), harness side and ground.  <p>N0010866</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
C7	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (BEC TO HEADLAMP)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. 	

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DIAGNOSIS AND TESTING (Continued)

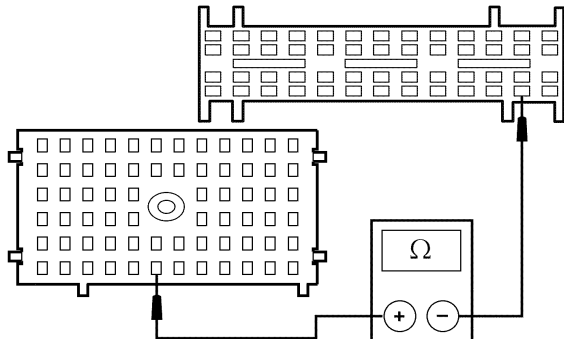
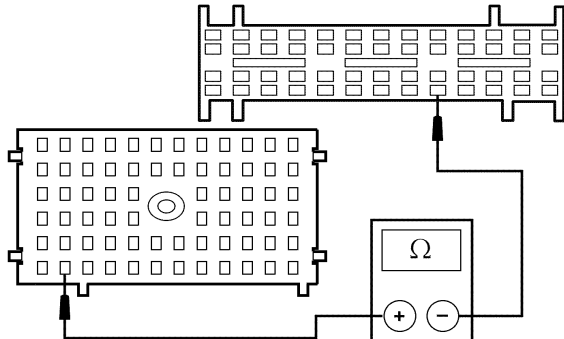
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

Test Step		Result / Action to Take
C7	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (BEC TO HEADLAMP) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035c-A6, circuit 1338 (WH), harness side and the LH headlamp C1021-1, circuit 1338 (WH), harness side; or between the BEC C1035c-A2, circuit 1336 (LG/WH), harness side and the RH headlamp C1041-1, circuit 1336 (LG/WH), harness side.  <p>N0046525</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to C8.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
C8	<p>CHECK FOR VOLTAGE TO THE BEC</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Connect: SJB C2280d. Place the headlamp switch in the HEADLAMPS ON position. Measure the voltage between the BEC C1035a-F6 (LH headlamp), circuit 1338 (WH), harness side and ground; or between the BEC C1035a-F2 (RH headlamp), circuit 1336 (LG/WH), harness side and ground.  <p>N0072794</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to C9.</p>
C9	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (SJB TO BEC)</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: SJB C2280d. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

Test Step	Result / Action to Take
<p>C9 CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (SJB TO BEC) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035a-F6 (LH headlamp), circuit 1338 (WH), harness side and the SJB C2280d-51, circuit 1338 (WH), harness side.  <p>N0072807</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035a-F2 (RH headlamp), circuit 1336 (LG/WH), harness side and the SJB C2280d-48, circuit 1336 (LG/WH), harness side.  <p>N0072808</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to C10.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
<p>C10 CHECK FOR CORRECT SJB OPERATION</p> <ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test D: One Low Beam Headlamp Is Inoperative — High Intensity Discharge (HID) Headlamps

Refer to Wiring Diagrams Cell 85, Headlamps for schematic and connector information.

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

Normal Operation

When the smart junction box (SJB) receives a request for the low beams, the SJB provides voltage to circuits 1338 (WH) and 1336 (LG/WH), through the bussed electrical center (BEC), to the LH and RH high intensity discharge (HID) relays, respectively. Ground for the HID relays is provided through circuit 1205 (BK), which is routed through the BEC.

DIAGNOSIS AND TESTING (Continued)

Voltage is supplied to the LH and RH HID relay switches through circuits 1055 (WH/LG) and 1056 (DB/LG), respectively.

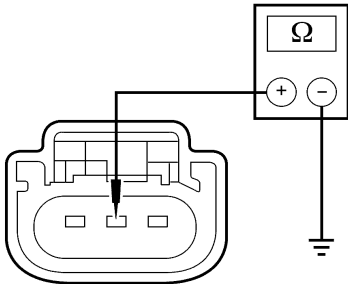
When the HID relays are energized, voltage is routed to the LH and RH headlamps through circuits 2008 (PK/WH) (PK/BK for 5.4L) and 2009 (PK/WH), respectively.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- HID relay
- BEC
- Ballast
- HID bulb
- Headlamp assembly
- SJB

PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS

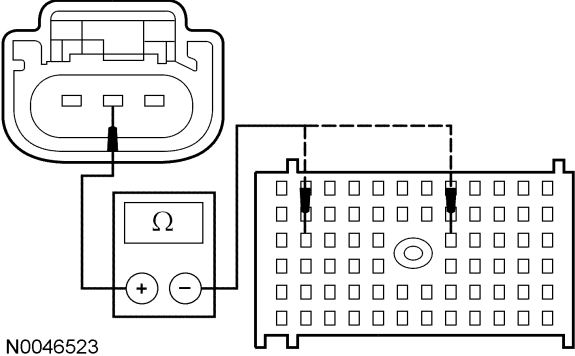
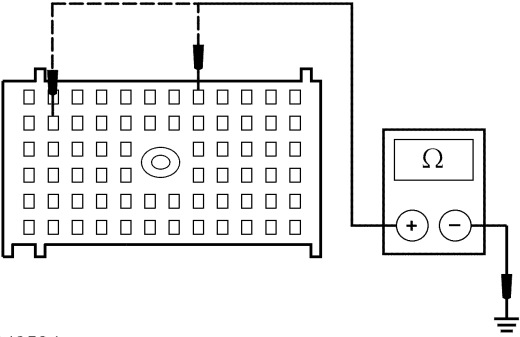
NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
D1	CHECK THE HID RELAY <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Suspect HID Relay. • Substitute a known good relay and recheck the low beam operation. • Does the headlamp in question illuminate? 	<p>Yes REMOVE the known good relay. INSTALL a new HID relay in question. TEST the system for normal operation.</p> <p>No REMOVE the known good relay. GO to D2.</p>
D2	CHECK THE HEADLAMP GROUND CIRCUIT <ul style="list-style-type: none"> • Disconnect: Inoperative Headlamp. • Measure the resistance between the LH headlamp C1284-2, circuit 1205 (BK), harness side and ground; or between the RH headlamp C1285-2, circuit 1205 (BK), harness side and ground. <div style="text-align: center;">  <p>N0010865</p> </div> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to D5.</p> <p>No GO to D3.</p>
D3	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (HEADLAMP TO BEC) <ul style="list-style-type: none"> • Disconnect: BEC C1035c. 	

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DIAGNOSIS AND TESTING (Continued)

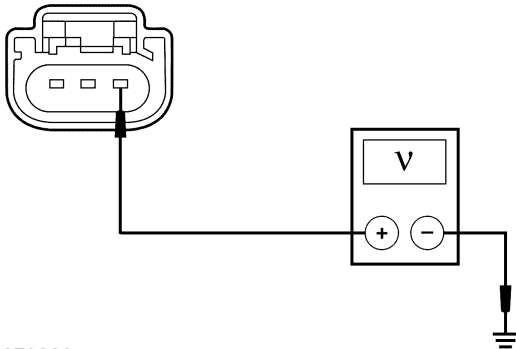
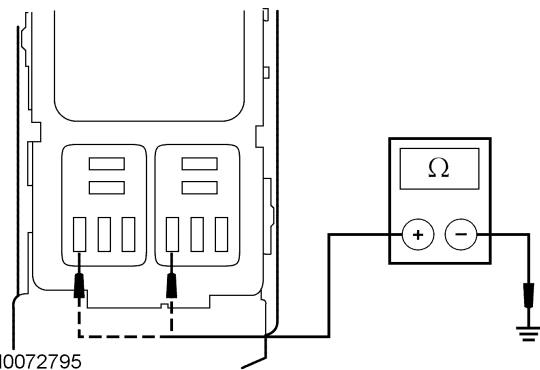
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
D3	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (HEADLAMP TO BEC) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the LH headlamp C1284-2, circuit 1205 (BK), harness side and the BEC C1035c-D5, circuit 1205 (BK), harness side; or between the RH headlamp C1285-2, circuit 1205 (BK), harness side and the BEC C1035c-D11, circuit 1205 (BK), harness side.  <p>N0046523</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to D4.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
D4	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (BEC TO GROUND)</p> <ul style="list-style-type: none"> Measure the resistance between the BEC C1035c-F5 (LH headlamp), circuit 1205 (BK), harness side and ground; or between the BEC C1035c-E11 (RH headlamp), circuit 1205 (BK), harness side and ground.  <p>N0046524</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
D5	<p>CHECK FOR VOLTAGE TO THE HEADLAMP</p> <ul style="list-style-type: none"> Connect: Suspect HID Relay. Place the headlamp switch in the HEADLAMPS ON position. 	

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DIAGNOSIS AND TESTING (Continued)

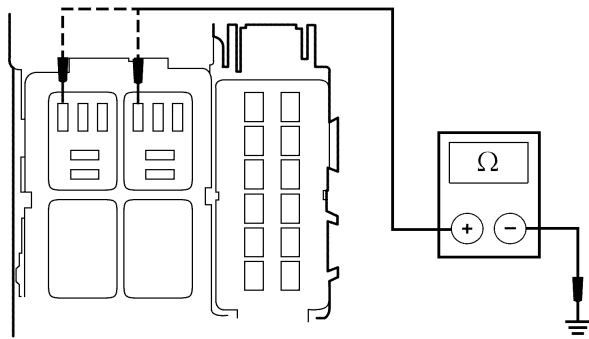
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
D5	<p>CHECK FOR VOLTAGE TO THE HEADLAMP (Continued)</p> <ul style="list-style-type: none"> Measure the voltage the LH headlamp C1284-1, circuit 2008 (PK/WH) (PK/BK for 5.4L), harness side and ground; or between the RH headlamp C1285-1, circuit 2009 (PK/WH), harness side and ground.  <p>A0073882</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to D17.</p> <p>No GO to D6.</p>
D6	<p>CHECK THE HID RELAY GROUND CIRCUIT</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: Suspect HID Relay. For 4.0L or 4.6L vehicles, measure the resistance between the LH HID relay pin 1, circuit 1205 (BK), harness side and ground; or between the RH HID relay pin 1, circuit 1205 (BK), harness side and ground.  <p>N0072795</p>	

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DIAGNOSIS AND TESTING (Continued)

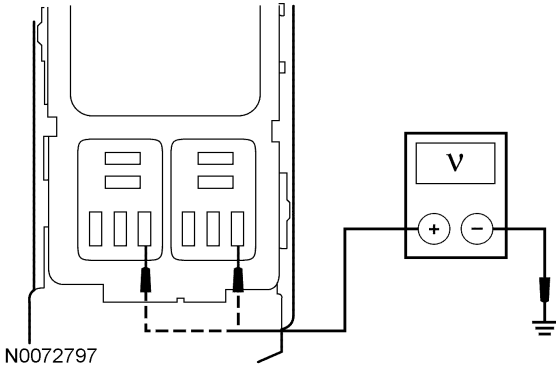
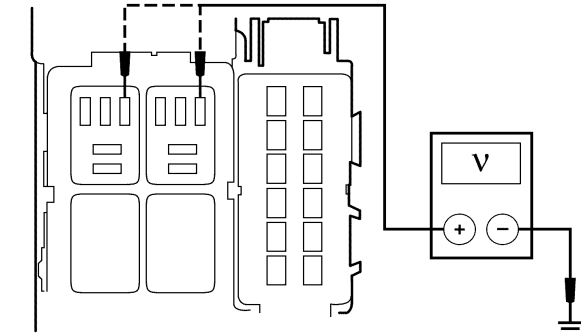
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take																					
D6	CHECK THE HID RELAY GROUND CIRCUIT (Continued)																						
<ul style="list-style-type: none"> For 5.4L vehicles, measure the resistance between the LH HID relay pin 2, circuit 1205 (BK), harness side and ground; or between the RH HID relay pin 2, circuit 1205 (BK), harness side and ground.  <p>N0075666</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 		<p>Yes GO to D8.</p> <p>No GO to D7.</p>																					
D7	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (HID RELAY TO BEC)																						
<ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the suspect HID relay pin, harness side and the BEC, harness side as follows: <table border="1" data-bbox="142 1050 966 1354"> <thead> <tr> <th>HID Relay Pin</th> <th>BEC Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td colspan="3">4.0L or 4.6L</td> </tr> <tr> <td>LH HID relay pin 1</td> <td>C1035c-F3</td> <td>1205 (BK)</td> </tr> <tr> <td>RH HID relay pin 1</td> <td>C1035c-F10</td> <td>1205 (BK)</td> </tr> <tr> <td colspan="3">5.4L</td> </tr> <tr> <td>LH HID relay pin 2</td> <td>C1035c-F3</td> <td>1205 (BK)</td> </tr> <tr> <td>RH HID relay pin 2</td> <td>C1035c-F10</td> <td>1205 (BK)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 		HID Relay Pin	BEC Connector-Pin	Circuit	4.0L or 4.6L			LH HID relay pin 1	C1035c-F3	1205 (BK)	RH HID relay pin 1	C1035c-F10	1205 (BK)	5.4L			LH HID relay pin 2	C1035c-F3	1205 (BK)	RH HID relay pin 2	C1035c-F10	1205 (BK)	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
HID Relay Pin	BEC Connector-Pin	Circuit																					
4.0L or 4.6L																							
LH HID relay pin 1	C1035c-F3	1205 (BK)																					
RH HID relay pin 1	C1035c-F10	1205 (BK)																					
5.4L																							
LH HID relay pin 2	C1035c-F3	1205 (BK)																					
RH HID relay pin 2	C1035c-F10	1205 (BK)																					
D8	CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR VOLTAGE																						
<ul style="list-style-type: none"> Place the headlamp switch in the HEADLAMPS ON position. 																							

(Continued)

DIAGNOSIS AND TESTING (Continued)

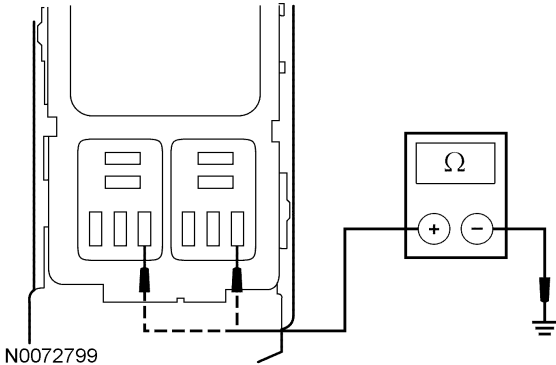
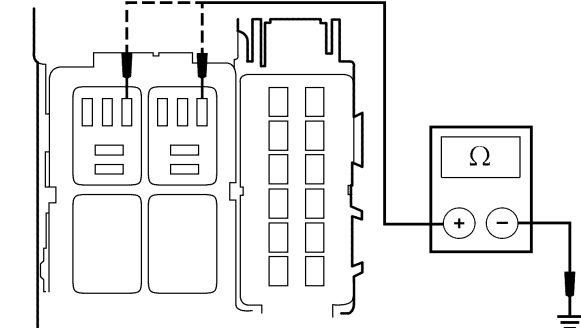
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
D8	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> For 4.0L or 4.6L vehicles, measure the voltage between the LH HID relay pin 2, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 2, circuit 1336 (LG/WH), harness side and ground.  <p>N0072797</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the voltage between the LH HID relay pin 1, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 1, circuit 1336 (LG/WH), harness side and ground.  <p>N0072798</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to D15.</p> <p>No GO to D9.</p>
D9	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: SJB C2280d. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

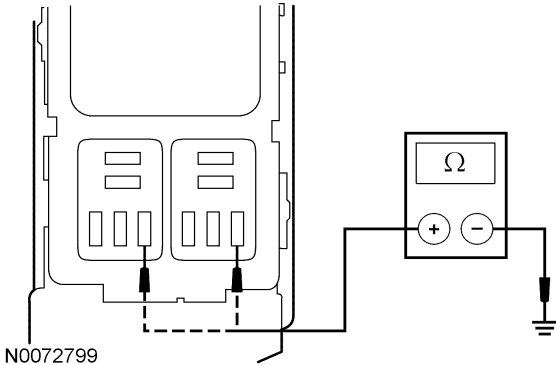
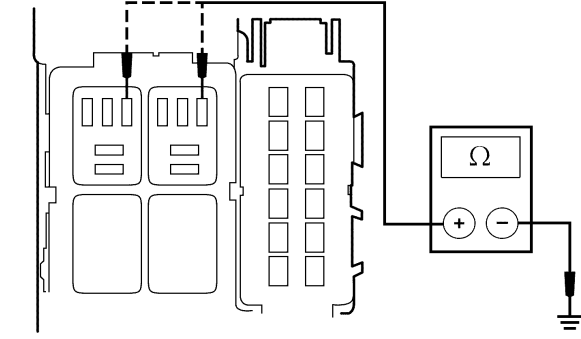
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

	Test Step	Result / Action to Take
D9	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (Continued)</p> <ul style="list-style-type: none"> For 4.0L or 4.6L vehicles, measure the resistance between the LH HID relay pin 2, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 2, circuit 1336 (LG/WH), harness side and ground.  <p>N0072799</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the resistance between the LH HID relay pin 1, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 1, circuit 1336 (LG/WH), harness side and ground.  <p>N0072800</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to D12.</p> <p>No GO to D10.</p>
D10	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (SJB TO BEC)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

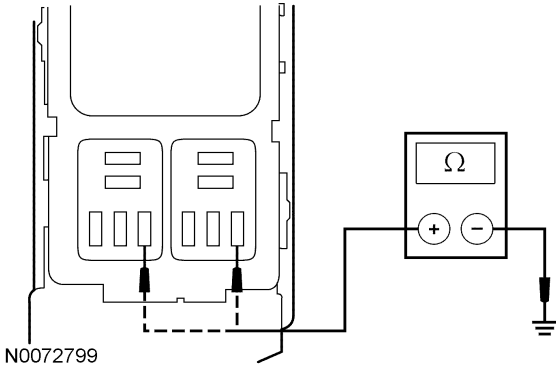
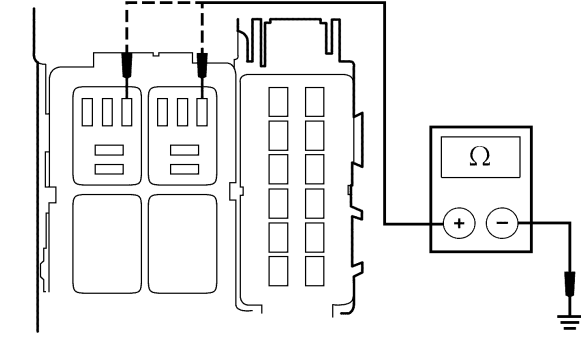
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step	Result / Action to Take
<p>D10 CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (SJB TO BEC) (Continued)</p> <ul style="list-style-type: none"> For 4.0L or 4.6L vehicles, measure the resistance between the LH HID relay pin 2, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 2, circuit 1336 (LG/WH), harness side and ground.  <p>N0072799</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the resistance between the LH HID relay pin 1, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 1, circuit 1336 (LG/WH), harness side and ground.  <p>N0072800</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to D11.</p>
<p>D11 CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (BEC TO HEADLAMP)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

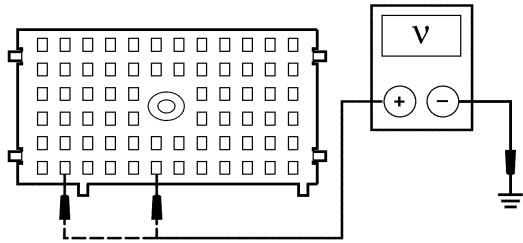
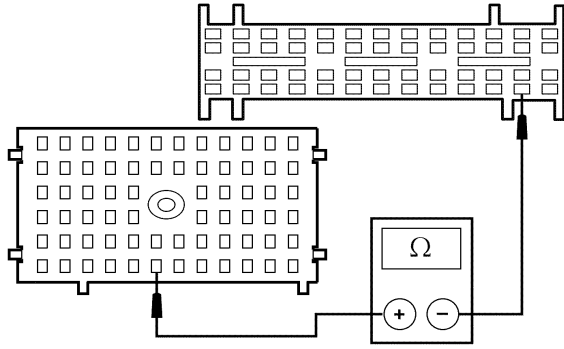
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take																					
D11	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR A SHORT TO GROUND (BEC TO HEADLAMP) (Continued)</p> <ul style="list-style-type: none"> For 4.0L or 4.6L vehicles, measure the resistance between the LH HID relay pin 2, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 2, circuit 1336 (LG/WH), harness side and ground.  <p>N0072799</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the resistance between the LH HID relay pin 1, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 1, circuit 1336 (LG/WH), harness side and ground.  <p>N0072800</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>																					
D12	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (BEC TO HID RELAY)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the suspect HID relay pin, harness side and the BEC, harness side as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>HID Relay Pin</th> <th>BEC Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td colspan="3">4.0L or 4.6L</td> </tr> <tr> <td>LH HID relay pin 2</td> <td>C1035c-A6</td> <td>1338 (WH)</td> </tr> <tr> <td>RH HID relay pin 2</td> <td>C1035c-A2</td> <td>1336 (LG/WH)</td> </tr> <tr> <td colspan="3">5.4L</td> </tr> <tr> <td>LH HID relay pin 1</td> <td>C1035c-A6</td> <td>1338 (WH)</td> </tr> <tr> <td>RH HID relay pin 1</td> <td>C1035c-A2</td> <td>1336 (LG/WH)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	HID Relay Pin	BEC Connector-Pin	Circuit	4.0L or 4.6L			LH HID relay pin 2	C1035c-A6	1338 (WH)	RH HID relay pin 2	C1035c-A2	1336 (LG/WH)	5.4L			LH HID relay pin 1	C1035c-A6	1338 (WH)	RH HID relay pin 1	C1035c-A2	1336 (LG/WH)	<p>Yes GO to D13.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
HID Relay Pin	BEC Connector-Pin	Circuit																					
4.0L or 4.6L																							
LH HID relay pin 2	C1035c-A6	1338 (WH)																					
RH HID relay pin 2	C1035c-A2	1336 (LG/WH)																					
5.4L																							
LH HID relay pin 1	C1035c-A6	1338 (WH)																					
RH HID relay pin 1	C1035c-A2	1336 (LG/WH)																					

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DIAGNOSIS AND TESTING (Continued)

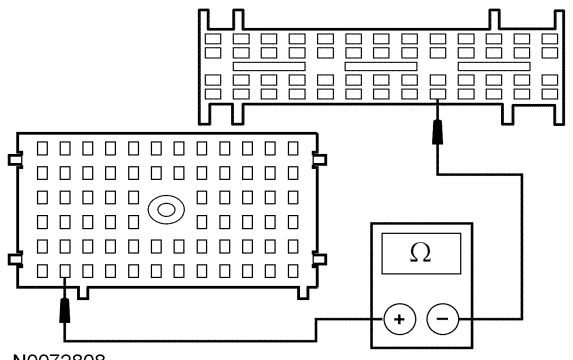
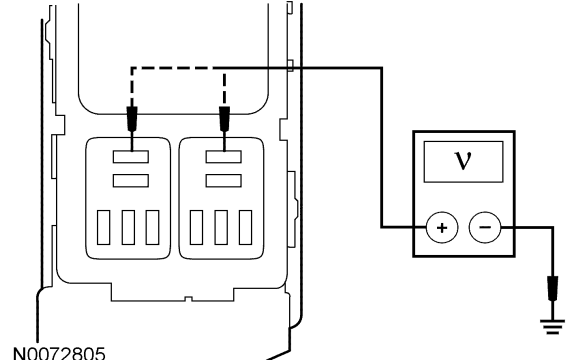
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
D13	<p>CHECK FOR VOLTAGE TO THE BEC</p> <ul style="list-style-type: none"> • Disconnect: BEC C1035a. • Place the headlamp switch in the HEADLAMPS ON position. • Measure the voltage between the BEC C1035a-F6 (LH headlamp), circuit 1338 (WH), harness side and ground; or between the BEC C1035a-F2 (RH headlamp), circuit 1336 (LG/WH), harness side and ground.  <p>N0072794</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to D14.</p>
D14	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (SJB TO BEC)</p> <ul style="list-style-type: none"> • Place the headlamp switch in the OFF position. • Disconnect: SJB C2280d. • For an inoperative LH headlamp, measure the resistance between the BEC C1035a-F6, circuit 1338 (WH), harness side and the SJB C2280d-51, circuit 1338 (WH), harness side.  <p>N0072807</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

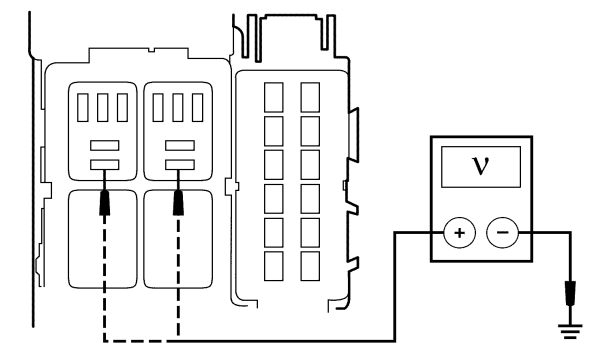
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
<p>D14</p> <p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR AN OPEN (SJB TO BEC) (Continued)</p> <ul style="list-style-type: none"> For an inoperative RH headlamp, measure the resistance between the BEC C1035a-F2, circuit 1336 (LG/WH), harness side and the SJB C2280d-48, circuit 1336 (LG/WH), harness side.  <p>N0072808</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to D19.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>	
<p>D15</p> <p>CHECK CIRCUIT 1055 (WH/LG) OR CIRCUIT 1056 (DB/LG) FOR VOLTAGE</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. For 4.0L or 4.6L vehicles, measure the voltage between the LH HID relay pin 3, circuit 1055 (WH/LG), harness side and ground; or between the RH HID relay pin 3, circuit 1056 (DB/LG), harness side and ground.  <p>N0072805</p>		

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take																					
D15	<p>CHECK CIRCUIT 1055 (WH/LG) OR CIRCUIT 1056 (DB/LG) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the voltage between the LH HID relay pin 3, circuit 1055 (WH/LG), harness side and ground; or between the RH HID relay pin 3, circuit 1056 (DB/LG), harness side and ground.  <p>N0072806</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes REPAIR circuit 2008 (PK/WH) (PK/BK for 5.4L) (LH headlamp) or circuit 2009 (PK/WH) (RH headlamp) for an open.</p> <p>No GO to D16.</p>																					
D16	<p>CHECK CIRCUIT 1055 (WH/LG) OR CIRCUIT 1056 (DB/LG) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the suspect HID relay pin, harness side and the BEC, harness side as follows: <table border="1" data-bbox="142 1075 967 1373"> <thead> <tr> <th>HID Relay Pin</th> <th>BEC Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td colspan="3">4.0L or 4.6L</td> </tr> <tr> <td>LH HID relay pin 3</td> <td>C1035c-B8</td> <td>1055 (WH/LG)</td> </tr> <tr> <td>RH HID relay pin 3</td> <td>C1035c-A9</td> <td>1056 (DB/LG)</td> </tr> <tr> <td colspan="3">5.4L</td> </tr> <tr> <td>LH HID relay pin 3</td> <td>C1035c-B8</td> <td>1055 (WH/LG)</td> </tr> <tr> <td>RH HID relay pin 3</td> <td>C1035c-A9</td> <td>1056 (DB/LG)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	HID Relay Pin	BEC Connector-Pin	Circuit	4.0L or 4.6L			LH HID relay pin 3	C1035c-B8	1055 (WH/LG)	RH HID relay pin 3	C1035c-A9	1056 (DB/LG)	5.4L			LH HID relay pin 3	C1035c-B8	1055 (WH/LG)	RH HID relay pin 3	C1035c-A9	1056 (DB/LG)	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
HID Relay Pin	BEC Connector-Pin	Circuit																					
4.0L or 4.6L																							
LH HID relay pin 3	C1035c-B8	1055 (WH/LG)																					
RH HID relay pin 3	C1035c-A9	1056 (DB/LG)																					
5.4L																							
LH HID relay pin 3	C1035c-B8	1055 (WH/LG)																					
RH HID relay pin 3	C1035c-A9	1056 (DB/LG)																					
D17	<p>CHECK THE HEADLAMP HARNESS</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Inspect the headlamp harness for an open between the ballast and the vehicle harness connector. Is the headlamp harness OK? 	<p>Yes GO to D18.</p> <p>No REPAIR or INSTALL a new headlamp assembly. REFER to Headlamp Assembly in this section. TEST the system for normal operation.</p>																					
D18	<p>CHECK THE BALLAST</p> <ul style="list-style-type: none"> Substitute a known good ballast. Connect: Inoperative Headlamp. Place the headlamp switch in the HEADLAMPS ON position. Does the inoperative headlamp now illuminate? 	<p>Yes INSTALL a new ballast. REFER to Headlamp Assembly in this section. TEST the system for normal operation.</p> <p>No INSTALL a new HID bulb. REFER to Headlamp Bulb in this section. TEST the system for normal operation.</p>																					

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
D19	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test E: One High Beam Headlamp Is Inoperative

Refer to [Wiring Diagrams Cell 85, Headlamps for schematic and connector information.](#)

Normal Operation

When the high beam relay is energized, voltage is provided from the bussed electrical center (BEC) through circuits 1337 (VT/YE) and 1335 (YE/WH) to the LH and RH headlamps, respectively.

Vehicles equipped with high intensity discharge (HID) headlamps utilize a shutter within the headlamp assembly to increase the beam pattern.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Headlamp assembly
- BEC

PINPOINT TEST E: ONE HIGH BEAM HEADLAMP IS INOPERATIVE

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

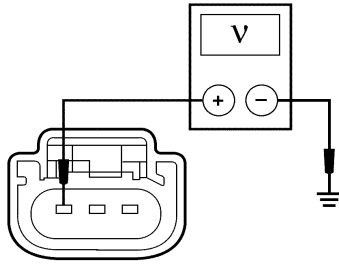
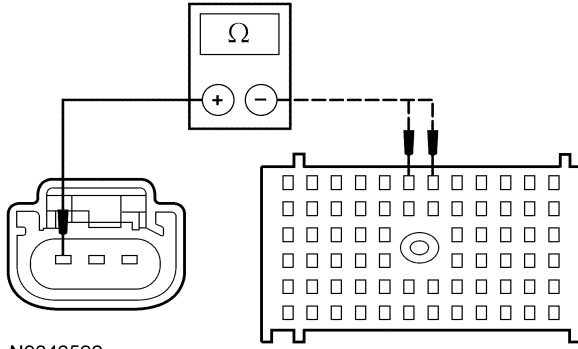
NOTE: For halogen headlamps, make sure the bulb is good before continuing diagnostics.

Test Step		Result / Action to Take
E1	CHECK THE LOW BEAMS	
	<ul style="list-style-type: none"> • Ignition OFF. • NOTE: Make sure the multifunction switch is in the LOW BEAM position. Place the headlamp switch in the HEADLAMPS ON position. • Does the low beam illuminate in the headlamp in question? 	<p>Yes For HID headlamps, GO to E2. For halogen headlamps, GO to E3.</p> <p>No For halogen headlamps, GO to Pinpoint Test C. For HID headlamps, GO to Pinpoint Test D.</p>
E2	CHECK CIRCUIT 1335 (YE/WH) OR CIRCUIT 1337 (VT/YE) FOR VOLTAGE	
	<ul style="list-style-type: none"> • Disconnect: Inoperative Headlamp. • Place the headlamp switch in the HEADLAMPS ON position. • Place sure the multifunction switch is in the HIGH BEAM position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: ONE HIGH BEAM HEADLAMP IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
E2	<p>CHECK CIRCUIT 1335 (YE/WH) OR CIRCUIT 1337 (VT/YE) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the LH headlamp C1021-3 or C1284-3, circuit 1337 (VT/YE), harness side and ground; or between the RH headlamp C1041-3 or C1285-3, circuit 1335 (YE/WH), harness side and ground.  <p>N0072803</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes REPAIR or INSTALL a new headlamp assembly. REFER to Headlamp Assembly in this section. TEST the system for normal operation.</p> <p>No GO to E3.</p>
E3	<p>CHECK CIRCUIT 1335 (YE/WH) OR CIRCUIT 1337 (VT/YE) FOR AN OPEN</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: Inoperative Headlamp. Disconnect: BEC C1035c. Measure the resistance between the LH headlamp C1021-3 or C1284-3, circuit 1337 (VT/YE), harness side and the BEC C1035c-F6, circuit 1337 (VT/YE), harness side; or between the RH headlamp C1041-3 or C1285-3, circuit 1335 (YE/WH), harness side and the BEC C1035c-F7, circuit 1335 (YE/WH), harness side.  <p>N0046528</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>

Pinpoint Test F: The Headlamps Are On Continuously

Refer to Wiring Diagrams Cell 85, Headlamps for schematic and connector information.

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

Normal Operation

The smart junction box (SJB) sends voltage reference signals to the headlamp switch through circuits 1400 (TN/WH), 1401 (BK/LG), and 1402 (RD/WH). At any given time, the headlamp switch routes one of the input circuits to ground through circuit 1205 (BK).

DIAGNOSIS AND TESTING (Continued)

When the SJB detects the headlamp switch in the HEADLAMPS ON position (or a fault with the headlamp switch inputs) and the multifunction switch in the LOW BEAM position, the SJB sends voltage through circuits 1338 (WH) and 1336 (LG/WH) to the LH and RH low beams, or the LH and RH high intensity discharge (HID) relays (if equipped), respectively.

When the HID relays are energized, voltage is routed to the LH and RH headlamps through circuits 2008 (PK/BK) and 2009 (PK/WH), respectively.

The SJB also sends a voltage reference signal to the multifunction switch through circuits 1394 (WH/RD) and 1395 (RD/PK). When the multifunction switch is placed in the FLASH-TO-PASS or HIGH BEAM position, the signal is routed back to the SJB (ground internal to the SJB). When the SJB detects a request for flash-to-pass or high beams, the SJB provides ground to the high beam relay through circuit 1708 (LG/BK). When the high beam relay is energized, voltage is routed through circuits 1337 (VT/YE) and 1335 (YE/WH) to the LH and RH headlamps, respectively.

DTC Description	Fault Trigger Conditions
• B1470 — Lamp Headlamp Input Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects an unexpected or conflicting value from the headlamp switch input circuits, such as an open or short to ground.
• B2501 — LF Lamp Low Beam Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the LH headlamp voltage supply circuit.
• B2503 — RF Lamp Low Beam Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the RH headlamp voltage supply circuit.
• B2586 — Headlamp Mode Select Circuit Failure	An on-demand DTC that sets when the SJB detects a short to ground from either of the multifunction switch input circuits.
• B2598 — Headlamp Relay Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the high beam relay coil ground controlled circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- High beam relay
- HID relay
- Headlamp switch
- Multifunction switch
- BEC
- SJB

PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY

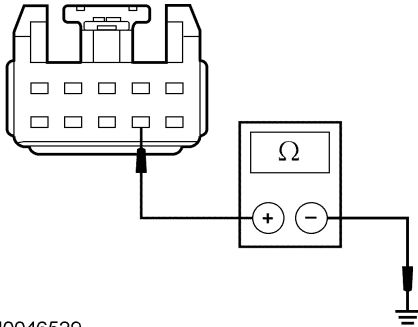
NOTICE: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step	Result / Action to Take
F1 DETERMINE IF THE HIGH BEAMS ARE ALWAYS ON <ul style="list-style-type: none"> • Ignition ON. • While observing the headlamps, engage the flash-to-pass feature. • Does the headlamp brightness increase? 	Yes GO to F2 . No GO to F13 .

(Continued)

DIAGNOSIS AND TESTING (Continued)

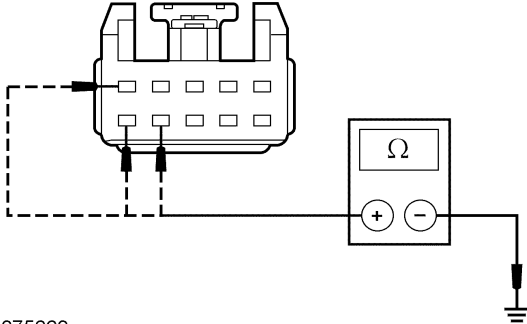
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take								
F2	USE THE RECORDED DTCs FROM THE SJB SELF-TEST (LOW BEAMS ALWAYS ON)									
	<ul style="list-style-type: none"> Using the recorded results from the SJB self-test: Was DTC B1470 or DTC B1833 recorded? 	<p>Yes For DTC B1470, GO to F3. For DTC B1833, REFER to Section 419-01A.</p> <p>No GO to F8.</p>								
F3	CHECK THE SJB HEADLAMP SWITCH PIDs									
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: SJB DataLogger. NOTE: Make sure the headlamp switch is correctly lined up (in a detent position) when checking each PID. Monitor the SJB headlamp switch (HD_LMP_SW, P_LMP_SW, LAMP_SW) PIDs while moving the headlamp switch through all positions. Do the headlamp switch positions agree with the PIDs? 	<p>Yes The system is operating correctly. The concern may have been caused by the headlamp switch between detent positions.</p> <p>No GO to F4.</p>								
F4	CHECK CIRCUIT 1205 (BK) FOR AN OPEN									
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: Headlamp Switch C205. Measure the resistance between the headlamp switch C205-7, circuit 1205 (BK), harness side and ground. <div style="text-align: center;">  <p>N0046529</p> </div> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to F5.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>								
F5	CHECK THE HEADLAMP SWITCH									
	<ul style="list-style-type: none"> Carry out the headlamp switch component test. Refer to Wiring Diagrams Cell 149 for component testing. Is the headlamp switch OK? 	<p>Yes GO to F6.</p> <p>No INSTALL a new headlamp switch. REFER to Headlamp Switch in this section. CLEAR the DTCs. REPEAT the self-test.</p>								
F6	CHECK THE HEADLAMP SWITCH INPUT CIRCUITS FOR A SHORT TO GROUND									
	<ul style="list-style-type: none"> Disconnect: SJB C2280b. Measure the resistance between the headlamp switch, harness side and ground as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Headlamp Switch Connector-Pin</th> <th style="text-align: center;">Circuit</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">C205-9</td> <td style="text-align: center;">1400 (TN/WH)</td> </tr> <tr> <td style="text-align: center;">C205-5</td> <td style="text-align: center;">1401 (BK/LG)</td> </tr> <tr> <td style="text-align: center;">C205-10</td> <td style="text-align: center;">1402 (RD/WH)</td> </tr> </tbody> </table>	Headlamp Switch Connector-Pin	Circuit	C205-9	1400 (TN/WH)	C205-5	1401 (BK/LG)	C205-10	1402 (RD/WH)	
Headlamp Switch Connector-Pin	Circuit									
C205-9	1400 (TN/WH)									
C205-5	1401 (BK/LG)									
C205-10	1402 (RD/WH)									

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DIAGNOSIS AND TESTING (Continued)

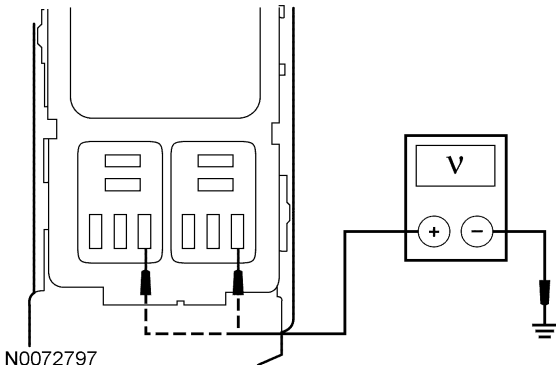
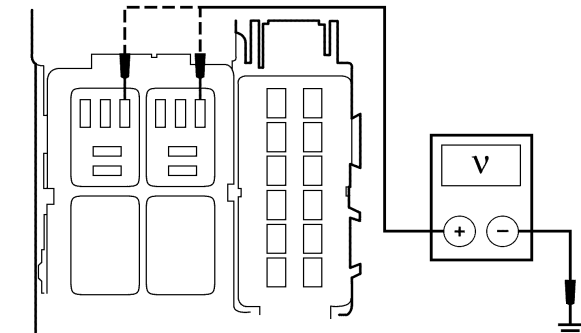
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take												
F6	CHECK THE HEADLAMP SWITCH INPUT CIRCUITS FOR A SHORT TO GROUND (Continued)													
 <p>N0075663</p> <ul style="list-style-type: none"> • Are the resistances greater than 10,000 ohms? 		<p>Yes GO to F7.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>												
F7	CHECK THE HEADLAMP SWITCH INPUT CIRCUITS FOR AN OPEN													
<ul style="list-style-type: none"> • Measure the resistance between the headlamp switch, harness side and the SJB, harness side as follows: <table border="1" data-bbox="142 919 967 1119"> <thead> <tr> <th>Headlamp Switch Connector-Pin</th> <th>SJB Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C205-9</td> <td>C2280b-27</td> <td>1400 (TN/WH)</td> </tr> <tr> <td>C205-5</td> <td>C2280b-31</td> <td>1401 (BK/LG)</td> </tr> <tr> <td>C205-10</td> <td>C2280b-46</td> <td>1402 (RD/WH)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> • Are the resistances less than 5 ohms? 		Headlamp Switch Connector-Pin	SJB Connector-Pin	Circuit	C205-9	C2280b-27	1400 (TN/WH)	C205-5	C2280b-31	1401 (BK/LG)	C205-10	C2280b-46	1402 (RD/WH)	<p>Yes GO to F21.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
Headlamp Switch Connector-Pin	SJB Connector-Pin	Circuit												
C205-9	C2280b-27	1400 (TN/WH)												
C205-5	C2280b-31	1401 (BK/LG)												
C205-10	C2280b-46	1402 (RD/WH)												
F8	CHECK THE SJB													
<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: SJB C2280d. • Ignition ON. • Does either headlamp continue to illuminate? 		<p>Yes GO to F9.</p> <p>No GO to F21.</p>												
F9	CHECK CIRCUITS 1336 (LG/WH) AND 1338 (WH) FOR A SHORT TO VOLTAGE (SJB TO BEC)													
<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: BEC C1035a. • Ignition ON. • Does either headlamp continue to illuminate? 		<p>Yes GO to F10.</p> <p>No REPAIR circuit 1338 (WH) (LH headlamp) or circuit 1336 (LG/WH) (RH headlamp). CLEAR the DTCs. REPEAT the self-test.</p>												
F10	CHECK CIRCUITS 1336 (LG/WH) AND 1338 (WH) FOR A SHORT TO VOLTAGE (BEC TO HEADLAMP) (HALOGEN HEADLAMPS)													
<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: BEC C1035c. • Ignition ON. • Does either headlamp continue to illuminate? 		<p>Yes For halogen headlamps, REPAIR circuit 1338 (WH) (LH headlamp) or circuit 1336 (LG/WH) (RH headlamp). CLEAR the DTCs. REPEAT the self-test. For HID headlamps, GO to F11.</p> <p>No INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>												

(Continued)

DIAGNOSIS AND TESTING (Continued)

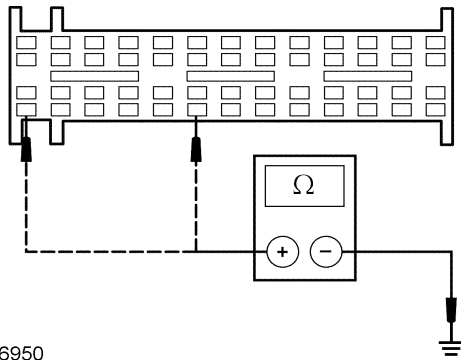
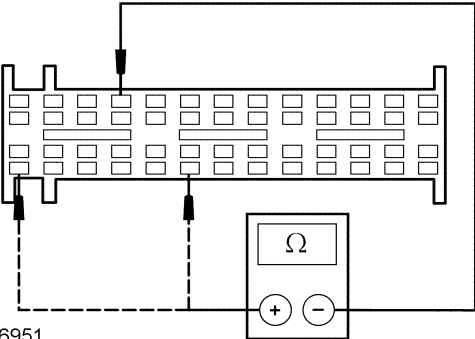
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
F11	CHECK CIRCUITS 2008 (PK/BK) AND 2009 (PK/WH) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: Suspect HID Relay. Ignition ON. Does the headlamp in question continue to illuminate? 	<p>Yes REPAIR circuit 2008 (PK/BK) (LH headlamp) or circuit 2009 (PK/WH) (RH headlamp). TEST the system for normal operation.</p> <p>No GO to F12.</p>
F12	CHECK CIRCUITS 1336 (LG/WH) AND 1338 (WH) FOR A SHORT TO VOLTAGE (BEC TO HEADLAMP) (HID HEADLAMPS)	
	<ul style="list-style-type: none"> For 4.0L or 4.6L vehicles, measure the voltage between the LH HID relay pin 2, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 2, circuit 1336 (LG/WH), harness side and ground.  <p>N0072797</p> <ul style="list-style-type: none"> For 5.4L vehicles, measure the voltage between the LH HID relay pin 1, circuit 1338 (WH), harness side and ground; or between the RH HID relay pin 1, circuit 1336 (LG/WH), harness side and ground.  <p>N0072798</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR circuit 1338 (WH) (LH headlamp) or circuit 1336 (LG/WH) (RH headlamp). CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new HID relay. TEST the system for normal operation.</p>
F13	USE THE RECORDED DTCs FROM THE SJB SELF-TEST (HIGH BEAMS ALWAYS ON)	
	<ul style="list-style-type: none"> Retrieve the recorded results from the SJB self-test. Was DTC B2586 or B2598 recorded? 	<p>Yes For DTC B2586, GO to F14. For DTC B2598, GO to F17.</p> <p>No GO to F19.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
F14	CHECK THE MULTIFUNCTION SWITCH	<p>Yes GO to F15.</p> <p>No INSTALL a new multifunction switch. REFER to Section 211-05. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: Multifunction Switch C202. Ignition ON. Enter the following diagnostic mode on the scan tool: SJB Self-Test. Clear the SJB DTCs. Repeat the SJB on-demand self-test. Is DTC B2586 still present? 	
F15	CHECK CIRCUITS 1394 (WH/RD) AND 1395 (RD/PK) FOR A SHORT TO GROUND	<p>Yes GO to F16.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280b. Measure the resistance between the SJB C2280b-45, circuit 1394 (WH/RD), harness side and ground; and between the SJB C2280b-40, circuit 1395 (RD/PK), harness side and ground.  <p>N0046950</p> <ul style="list-style-type: none"> Are the resistances greater than 10,000 ohms? 	
F16	CHECK CIRCUITS 1394 (WH/RD) AND 1395 (RD/PK) FOR A SHORT TO CIRCUIT 1396 (VT/WH)	<p>Yes GO to F21.</p> <p>No REPAIR the circuits in question. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Measure the resistance between the SJB C2280b-45, circuit 1394 (WH/RD), harness side and the SJB C2280b-4, circuit 1396 (VT/WH), harness side; and between the SJB C2280b-40, circuit 1395 (RD/PK), harness side and the SJB C2280b-4, circuit 1396 (VT/WH), harness side.  <p>N0046951</p> <ul style="list-style-type: none"> Are the resistances greater than 10,000 ohms? 	
F17	CHECK THE SJB HIGH BEAM CONTROL	<p>Yes GO to F18.</p> <p>No GO to F21.</p>
	<ul style="list-style-type: none"> Disconnect: SJB C2280c. Ignition ON. Do the headlamps continue to illuminate? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)**

Test Step		Result / Action to Take
F18	CHECK CIRCUIT 1708 (LG/BK) FOR A SHORT TO GROUND	Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test. No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. Ignition ON. Do the headlamps continue to illuminate? 	
F19	CHECK THE HIGH BEAM RELAY	Yes GO to F20 . No INSTALL a new high beam relay. TEST the system for normal operation.
	<ul style="list-style-type: none"> Disconnect: High Beam Relay. Ignition ON. Do the headlamps continue to illuminate? 	
F20	CHECK CIRCUITS 1335 (YE/WH) AND 1337 (VT/YE) FOR A SHORT TO VOLTAGE	Yes REPAIR circuit 1337 (VT/YE) (LH headlamp) or circuit 1335 (YE/WH) (RH headlamp). TEST the system for normal operation. No INSTALL a new BEC. TEST the system for normal operation.
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035c. Ignition ON. Does either headlamp continue to illuminate? 	
F21	CHECK FOR CORRECT SJB OPERATION	Yes INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

Pinpoint Test G: The Flash-to-Pass Feature is Inoperative

Refer to [Wiring Diagrams Cell 85, Headlamps for schematic and connector information](#).

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the multifunction switch through circuit 1395 (RD/PK). When the flash-to-pass feature is activated, the multifunction switch routes the signal back to the SJB. The SJB then provides voltage to the high beams.

Vehicles equipped with high intensity discharge (HID) headlamps utilize a shutter within the headlamp assembly to increase the beam pattern. When the flash-to-pass feature is activated, the SJB activates the low beams and the shutters momentarily (less than 0.5 second).

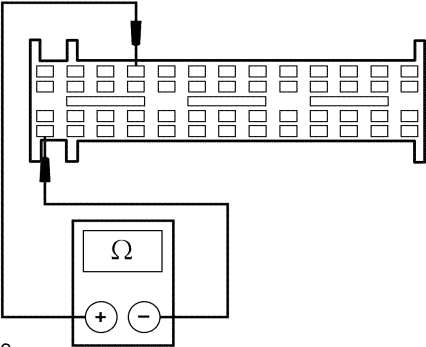
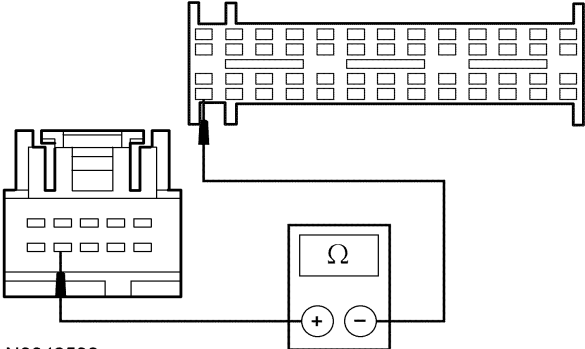
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Multifunction switch
- SJB

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST G: THE FLASH-TO-PASS FEATURE IS INOPERATIVE

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

Test Step		Result / Action to Take
G1	<p>CHECK THE HIGH BEAM OPERATION</p> <ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the HEADLAMPS ON position. Place the multifunction switch in the HIGH BEAM position. Do the high beams illuminate? 	<p>Yes GO to G2.</p> <p>No GO to Pinpoint Test B.</p>
G2	<p>CHECK THE INPUT FROM THE MULTIFUNCTION SWITCH</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: SJB C2280b. Place the multifunction switch in the FLASH-TO-PASS position. Measure the resistance between the SJB C2280b-40, circuit 1395 (RD/PK), harness side and the SJB C2280b-4, circuit 1396 (VT/WH), harness side.  <p>N0046533</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	
G3	<p>CHECK CIRCUIT 1395 (RD/PK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: Multifunction Switch C202. Measure the resistance between the multifunction switch C202-9, circuit 1395 (RD/PK), harness side and the SJB C2280b-40, circuit 1395 (RD/PK), harness side.  <p>N0046532</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

(Continued)

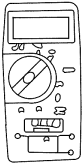
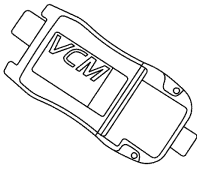
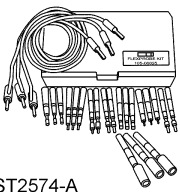
DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST G: THE FLASH-TO-PASS FEATURE IS INOPERATIVE (Continued)**

Test Step		Result / Action to Take
G4	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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>

DIAGNOSIS AND TESTING

Stoplamps

Special Tool(s)

 <p>ST1137-A</p>	73III Automotive Meter 105-R0057 or equivalent
 <p>ST2834-A</p>	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 <p>ST2574-A</p>	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The SJB monitors the input from the stoplamp switch. When the brake pedal is applied, voltage is routed to the SJB. The SJB then supplies voltage to the rear lamps and the high mounted stoplamp.

The turn and hazard lamp functions override the rear stoplamp function.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Stoplamp switch 	<ul style="list-style-type: none"> • Bussed electrical center (BEC) fuse: <ul style="list-style-type: none"> — 59 (30A) (RH stoplamps) — 63 (30A) (LH stoplamps) — 67 (30A) (high mounted stoplamp) • smart junction box (SJB) fuse 15 (10A) (stoplamp switch) • Wiring, terminals or connectors • Bulb(s) • SJB

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

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

- Verify the ignition key is in the ON position.
- Verify the scan tool operation with a known good vehicle.
- Refer to Section 418-00 to diagnose no response from the PCM.

DIAGNOSIS AND TESTING (Continued)

7. Carry out the network test:
 - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B1485	Brake Pedal Input Short to Battery	GO to Pinpoint Test I.
B2044	Left Rear Stop Lamp Circuit Short to Ground	GO to Pinpoint Test H.
B2046	Right Rear Stop Lamp Circuit Short to Ground	GO to Pinpoint Test H.
B2048	Left Rear Turn Lamp Circuit Short to Ground	GO to Pinpoint Test H.
B2049	Left Rear Turn Lamp Circuit Open	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
B2050	Right Rear Turn Lamp Circuit Short to Ground	GO to Pinpoint Test H.
B2051	Right Rear Turn Lamp Circuit Open	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
B2519	High Mount Stop Lamp Circuit Failure	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
B2527	Left Rear Stop Lamp Circuit Failure	GO to Pinpoint Test H.
B2528	Left Rear Stop Lamp Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
B2529	Left Rear Turn Lamp Circuit Failure	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
B2533	Right Rear Stop Lamp Circuit Failure	GO to Pinpoint Test H.
B2534	Right Rear Stop Lamp Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test H. If the lamp is always on, GO to Pinpoint Test I.
All other DTCs	—	REFER to Section 419-10.

DIAGNOSIS AND TESTING (Continued)**Symptom Chart****Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors SJB 	<ul style="list-style-type: none"> REFER to Section 418-00.
<ul style="list-style-type: none"> One or more stoplamps are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Stoplamp switch Bussed electrical center (BEC) SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test H.
<ul style="list-style-type: none"> The stoplamps are on continuously 	<ul style="list-style-type: none"> Wiring, terminals or connectors Stoplamp switch SJB PCM 	<ul style="list-style-type: none"> GO to Pinpoint Test I.

Pinpoint Tests**Pinpoint Test H: One Or More Stoplamps Are Inoperative**

Refer to [Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps](#) for schematic and connector information.

Normal Operation

Voltage is supplied from the bussed electrical center (BEC) to the smart junction box (SJB) through circuits 1523 (DG), 905 (GY/LB), and 1052 (TN/BK) to power the LH stoplamps, RH stoplamps, and the high mounted stoplamp.

The stoplamp switch is provided voltage through circuit 10 (LG/RD). When the brake pedal is applied, the stoplamp switch routes voltage to the SJB through circuit 511 (LG). The SJB then provides voltage to the stoplamps through circuits 1783 (RD/WH), 1374 (TN/LB), 1728 (LB/OG), and 1363 (WH/RD). Ground for the stoplamps is provided through circuit 1205 (BK).

DTC Description	Fault Trigger Conditions
<ul style="list-style-type: none"> B2044 — Left Rear Stop Lamp Circuit Short to Ground 	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the LH rear lamp 1 voltage supply circuit.
<ul style="list-style-type: none"> B2046 — Right Rear Stop Lamp Circuit Short to Ground 	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the RH rear lamp 1 voltage supply circuit.
<ul style="list-style-type: none"> B2048 — Left Rear Turn Lamp Circuit Short to Ground 	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the LH rear lamp 1 voltage supply circuit.
<ul style="list-style-type: none"> B2049 — Left Rear Turn Lamp Circuit Open 	A continuous and on-demand DTC that sets when the SJB detects an open from the LH rear lamp 1 voltage supply circuit.
<ul style="list-style-type: none"> B2050 — Right Rear Turn Lamp Circuit Short to Ground 	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the RH rear lamp 1 voltage supply circuit.

DIAGNOSIS AND TESTING (Continued)

DTC Description	Fault Trigger Conditions
• B2051 — Right Rear Turn Lamp Circuit Open	A continuous and on-demand DTC that sets when the SJB detects an open from the RH rear lamp 1 voltage supply circuit.
• B2519 — High Mount Stop Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the high mounted stoplamp voltage supply circuit.
• B2527 — Left Rear Stop Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the LH rear lamp 2 voltage supply circuit.
• B2528 — Left Rear Stop Lamp Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects an open from the LH rear lamp 1 or lamp 2 voltage supply circuit.
• B2529 — Left Rear Turn Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the LH rear lamp 1 voltage supply circuit.
• B2533 — Right Rear Stop Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the RH rear lamp 2 voltage supply circuit.
• B2534 — Right Rear Stop Lamp Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects an open from the RH rear lamp 1 or lamp 2 voltage supply circuit.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Stoplamp switch
- BEC
- SJB

PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE

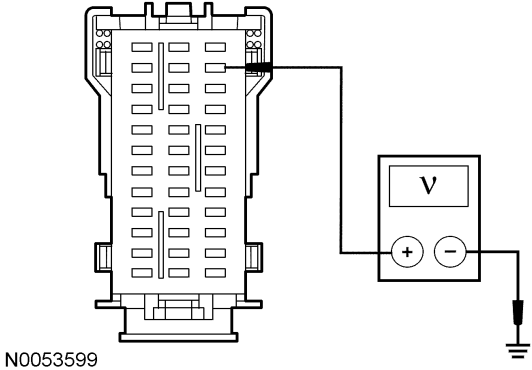
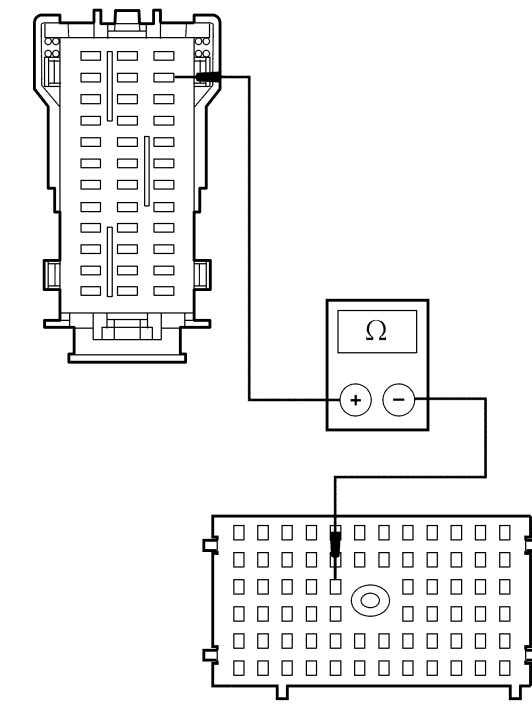
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
H1	DETERMINE IF ALL THE STOPLAMPS ARE INOPERATIVE	Yes GO to H2 . No GO to H8 .
	<ul style="list-style-type: none"> • Ignition OFF. • Apply the brake pedal and observe the rear lamps. • Are all the stoplamps inoperative? 	
H2	CHECK CIRCUIT 1523 (DG) FOR VOLTAGE	
	<ul style="list-style-type: none"> • Disconnect: SJB C2280h. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

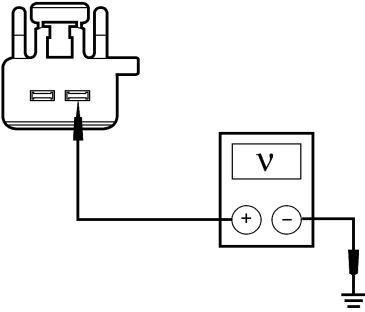
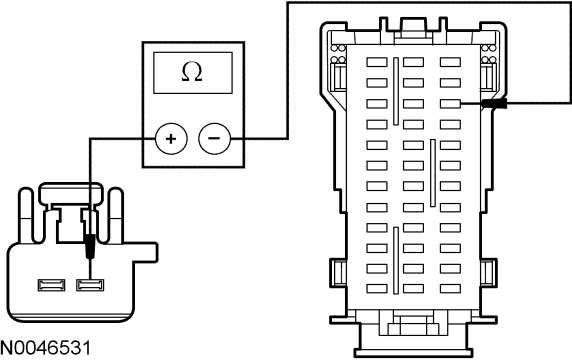
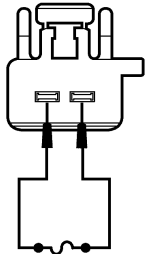
PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
H2	<p>CHECK CIRCUIT 1523 (DG) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the SJB C2280h-11, circuit 1523 (DG), harness side and ground.  <p>N0053599</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to H4.</p> <p>No VERIFY the BEC fuse 63 (30A) is OK. If OK, GO to H3.</p>
H3	<p>CHECK CIRCUIT 1523 (DG) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Measure the resistance between the SJB C2280h-11, circuit 1523 (DG), harness side and BEC C1035a-C5, circuit 1523 (DG), harness side.  <p>N0053600</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
H4	<p>CHECK CIRCUIT 10 (LG/RD) FOR VOLTAGE</p> <ul style="list-style-type: none"> Connect: SJB C2280h. Disconnect: Stoplamp Switch C2314. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

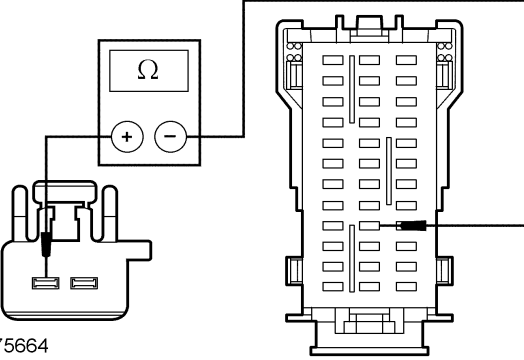
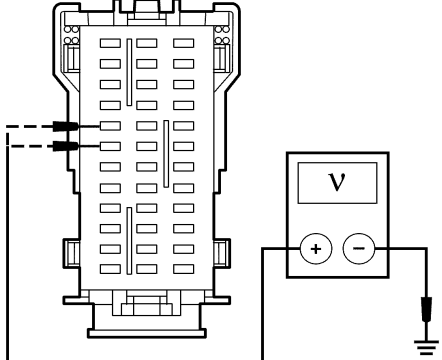
PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>H4</p>	<p>CHECK CIRCUIT 10 (LG/RD) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the stoplamp switch C2314-1, circuit 10 (LG/RD), harness side and ground.  <p>N0037278</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to H6.</p> <p>No VERIFY the SJB fuse 15 (10A) is OK. If OK, GO to H5.</p>
<p>H5</p>	<p>CHECK CIRCUIT 10 (LG/RD) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: SJB C2280h. Measure the resistance between the stoplamp switch C2314-1, circuit 10 (LG/RD), harness side and the SJB C2280h-10, circuit 10 (LG/RD), harness side.  <p>N0046531</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to H13.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>H6</p>	<p>BYPASS THE STOPLAMP SWITCH</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper wire between the stoplamp switch C2314-1, circuit 10 (LG/RD), harness side and the stoplamp switch C2314-2, circuit 511 (LG), harness side.  <p>N0037280</p> <ul style="list-style-type: none"> Do the stoplamps illuminate? 	<p>Yes REMOVE the jumper wire. INSTALL a new stoplamp switch. REFER to Stoplamp Switch in this section. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to H7.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take									
H7	<p>CHECK CIRCUIT 511 (LG) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: SJB C2280h. Measure the resistance between the stoplamp switch C2314-2, circuit 511 (LG), harness side and the SJB C2280h-16, circuit 511 (LG), harness side.  <p>N0075664</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to H13.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>									
H8	<p>CHECK THE VOLTAGE TO THE SJB</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280h. Measure the voltage between the SJB, harness side and ground as follows: <table border="1" data-bbox="142 1018 966 1144"> <thead> <tr> <th>SJB Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C2280h-31</td> <td>905 (GY/LB)</td> </tr> <tr> <td>C2280h-32</td> <td>1052 (TN/BK)</td> </tr> </tbody> </table>  <p>N0075665</p> <ul style="list-style-type: none"> Are the voltages greater than 10 volts? 	SJB Connector-Pin	Circuit	C2280h-31	905 (GY/LB)	C2280h-32	1052 (TN/BK)	<p>Yes GO to H10.</p> <p>No VERIFY the BEC fuses 59 (30A) and 67 (30A) are OK. If OK, GO to H9.</p>			
SJB Connector-Pin	Circuit										
C2280h-31	905 (GY/LB)										
C2280h-32	1052 (TN/BK)										
H9	<p>CHECK THE VOLTAGE SUPPLY CIRCUITS TO THE SJB FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Measure the resistance between the SJB, harness side and the BEC, harness side as follows: <table border="1" data-bbox="142 1785 966 1911"> <thead> <tr> <th>SJB Connector-Pin</th> <th>BEC Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C2280h-31</td> <td>C1035a-F8</td> <td>905 (GY/LB)</td> </tr> <tr> <td>C2280h-32</td> <td>C1035a-A5</td> <td>1052 (TN/BK)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Are the resistances less than 5 ohms? 	SJB Connector-Pin	BEC Connector-Pin	Circuit	C2280h-31	C1035a-F8	905 (GY/LB)	C2280h-32	C1035a-A5	1052 (TN/BK)	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
SJB Connector-Pin	BEC Connector-Pin	Circuit									
C2280h-31	C1035a-F8	905 (GY/LB)									
C2280h-32	C1035a-A5	1052 (TN/BK)									

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take																		
H10	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: Inoperative Stoplamp. Measure the resistance between the inoperative stoplamp, harness side and ground as follows: <table border="1"> <thead> <tr> <th>Inoperative Stoplamp</th> <th>Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>High mounted stoplamp</td> <td>C475-1</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear lamp 1</td> <td>C4112-1</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear lamp 2</td> <td>C4113-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear lamp 1</td> <td>C4114-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear lamp 2</td> <td>C4115-1</td> <td>1205 (BK)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	Inoperative Stoplamp	Connector-Pin	Circuit	High mounted stoplamp	C475-1	1205 (BK)	LH rear lamp 1	C4112-1	1205 (BK)	LH rear lamp 2	C4113-1	1205 (BK)	RH rear lamp 1	C4114-1	1205 (BK)	RH rear lamp 2	C4115-1	1205 (BK)	<p>Yes GO to H11.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
Inoperative Stoplamp	Connector-Pin	Circuit																		
High mounted stoplamp	C475-1	1205 (BK)																		
LH rear lamp 1	C4112-1	1205 (BK)																		
LH rear lamp 2	C4113-1	1205 (BK)																		
RH rear lamp 1	C4114-1	1205 (BK)																		
RH rear lamp 2	C4115-1	1205 (BK)																		
H11	<p>CHECK THE STOPLAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Disconnect: SJB C2280d. Measure the resistance between the inoperative stoplamp, harness side and ground as follows: <table border="1"> <thead> <tr> <th>Inoperative Stoplamp</th> <th>Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>High mounted stoplamp</td> <td>C475-2</td> <td>1374 (TN/LB)</td> </tr> <tr> <td>LH rear lamp 1</td> <td>C4112-3</td> <td>1783 (RD/WH)</td> </tr> <tr> <td>LH rear lamp 2</td> <td>C4113-3</td> <td>1783 (RD/WH)</td> </tr> <tr> <td>RH rear lamp 1</td> <td>C4114-3</td> <td>1783 (RD/WH)</td> </tr> <tr> <td>RH rear lamp 2</td> <td>C4115-3</td> <td>1783 (RD/WH)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	Inoperative Stoplamp	Connector-Pin	Circuit	High mounted stoplamp	C475-2	1374 (TN/LB)	LH rear lamp 1	C4112-3	1783 (RD/WH)	LH rear lamp 2	C4113-3	1783 (RD/WH)	RH rear lamp 1	C4114-3	1783 (RD/WH)	RH rear lamp 2	C4115-3	1783 (RD/WH)	<p>Yes GO to H12.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
Inoperative Stoplamp	Connector-Pin	Circuit																		
High mounted stoplamp	C475-2	1374 (TN/LB)																		
LH rear lamp 1	C4112-3	1783 (RD/WH)																		
LH rear lamp 2	C4113-3	1783 (RD/WH)																		
RH rear lamp 1	C4114-3	1783 (RD/WH)																		
RH rear lamp 2	C4115-3	1783 (RD/WH)																		
H12	<p>CHECK THE STOPLAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the inoperative stoplamp, harness side and the SJB, harness side as follows: <table border="1"> <thead> <tr> <th>Inoperative Stoplamp Connector-Pin/ Circuit</th> <th>SJB Connector-Pin/ Circuit</th> </tr> </thead> <tbody> <tr> <td>High mounted stoplamp C475-2 1374 (TN/LB)</td> <td>C2280d-39 1374 (TN/LB)</td> </tr> <tr> <td>LH rear lamp 1 C4112-3 1783 (RD/WH)</td> <td>C2280d-14 1363 (WH/RD)</td> </tr> <tr> <td>LH rear lamp 2 C4113-3 1783 (RD/WH)</td> <td>C2280d-18 1728 (LB/OG)</td> </tr> <tr> <td>RH rear lamp 1 C4114-3 1783 (RD/WH)</td> <td>C2280d-47 1783 (RD/WH)</td> </tr> <tr> <td>RH rear lamp 2 C4115-3 1783 (RD/WH)</td> <td>C2280d-40 1783 (RD/WH)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	Inoperative Stoplamp Connector-Pin/ Circuit	SJB Connector-Pin/ Circuit	High mounted stoplamp C475-2 1374 (TN/LB)	C2280d-39 1374 (TN/LB)	LH rear lamp 1 C4112-3 1783 (RD/WH)	C2280d-14 1363 (WH/RD)	LH rear lamp 2 C4113-3 1783 (RD/WH)	C2280d-18 1728 (LB/OG)	RH rear lamp 1 C4114-3 1783 (RD/WH)	C2280d-47 1783 (RD/WH)	RH rear lamp 2 C4115-3 1783 (RD/WH)	C2280d-40 1783 (RD/WH)	<p>Yes GO to H13.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>						
Inoperative Stoplamp Connector-Pin/ Circuit	SJB Connector-Pin/ Circuit																			
High mounted stoplamp C475-2 1374 (TN/LB)	C2280d-39 1374 (TN/LB)																			
LH rear lamp 1 C4112-3 1783 (RD/WH)	C2280d-14 1363 (WH/RD)																			
LH rear lamp 2 C4113-3 1783 (RD/WH)	C2280d-18 1728 (LB/OG)																			
RH rear lamp 1 C4114-3 1783 (RD/WH)	C2280d-47 1783 (RD/WH)																			
RH rear lamp 2 C4115-3 1783 (RD/WH)	C2280d-40 1783 (RD/WH)																			

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST H: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)**

Test Step		Result / Action to Take
H13	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test I: The Stoplamps Are On Continuously

Refer to [Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps](#) for schematic and connector information.

Normal Operation

When the brake pedal is applied, the stoplamp switch routes voltage to the smart junction box (SJB) through circuit 511 (LG). Voltage is also routed to the PCM through circuit 599 (PK/LG). The SJB then provides voltage to the stoplamps through circuits 1783 (RD/WH), 1374 (TN/LB), 1728 (LB/OG), and 1363 (WH/RD). Ground for the stoplamps is provided through circuit 1205 (BK).

DTC Description	Fault Trigger Conditions
• B1485 — Brake Pedal Input Short to Battery	An on-demand DTC that sets when the SJB detects a short to voltage from the stoplamp switch input.
• B2049 — Left Rear Turn Lamp Circuit Open	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the LH rear lamp 1 voltage supply circuit.
• B2051 — Right Rear Turn Lamp Circuit Open	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the RH rear lamp 1 voltage supply circuit.
• B2519 — High Mount Stop Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the high mounted stoplamp voltage supply circuit.
• B2528 — Left Rear Stop Lamp Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the LH rear lamp 1 or lamp 2 voltage supply circuit.
• B2529 — Left Rear Turn Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the LH rear lamp 1 voltage supply circuit.
• B2534 — Right Rear Stop Lamp Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the RH rear lamp 1 or lamp 2 voltage supply circuit.

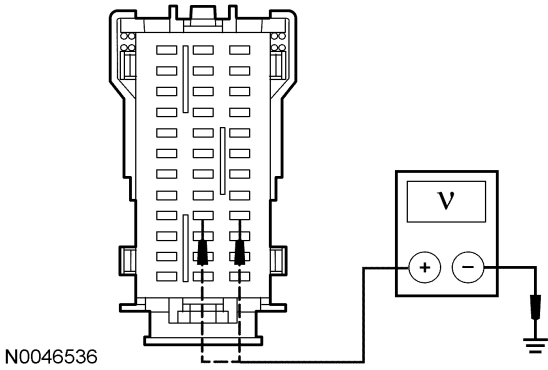
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Stoplamp switch
- SJB
- PCM

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST I: THE STOPLAMPS ARE ON CONTINUOUSLY

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

Test Step		Result / Action to Take
I1	USE THE RECORDED DTCs FROM THE SJB SELF-TEST	
	<ul style="list-style-type: none"> Ignition OFF. Retrieve the recorded results from the SJB self-test. Was DTC B1485 present? 	<p>Yes GO to I2.</p> <p>No GO to I5.</p>
I2	CHECK THE STOPLAMP SWITCH	
	<ul style="list-style-type: none"> Disconnect: Stoplamp Switch C2314. Do the stoplamps continue to illuminate? 	<p>Yes GO to I3.</p> <p>No INSTALL a new stoplamp switch. REFER to Stoplamp Switch in this section. CLEAR the DTCs. REPEAT the self-test.</p>
I3	CHECK THE PCM	
	<ul style="list-style-type: none"> Disconnect: PCM C175b. Do the stoplamps continue to illuminate? 	<p>Yes GO to I4.</p> <p>No GO to I6.</p>
I4	CHECK CIRCUITS 511 (LG) AND 599 (PK/LG) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Disconnect: SJB C2280h. Measure the voltage between the SJB C2280h-16, circuit 511 (LG), harness side and ground; and between the SJB C2280h-4, circuit 599 (PK/LG), harness side and ground.  <p>N0046536</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to I7.</p>
I5	CHECK CIRCUITS 1363 (WH/RD), 1728 (LB/OG), 1783 (RD/WH) AND 1374 (TN/LB) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Disconnect: SJB C2280d. Do any stoplamps continue to illuminate? 	<p>Yes For the high mounted stoplamp, REPAIR circuit 1374 (TN/LB). CLEAR the DTCs. REPEAT the self-test. For the LH rear stoplamp 1, REPAIR circuit 1363 (WH/RD). CLEAR the DTCs. REPEAT the self-test. For the LH rear stoplamp 2, REPAIR circuit 1728 (LB/OG). CLEAR the DTCs. REPEAT the self-test. For either RH rear stoplamp 1 or 2, REPAIR circuit 1783 (RD/WH). CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to I7.</p>

(Continued)

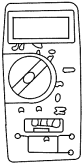
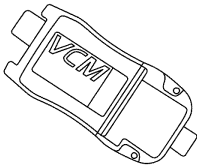
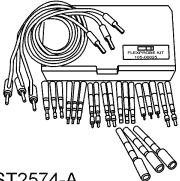
DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST I: THE STOPLAMPS ARE ON CONTINUOUSLY (Continued)**

Test Step		Result / Action to Take
I6	CHECK FOR CORRECT PCM OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the PCM connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the PCM 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 PCM. REFER to Section 303-14. CLEAR the DTCs. REPEAT the self-test.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
I7	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING

Turn Signal and Hazard Lamps

Special Tool(s)

 <p>ST1137-A</p>	73III Automotive Meter 105-R0057 or equivalent
 <p>ST2834-A</p>	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 <p>ST2574-A</p>	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The SJB monitors the multifunction switch position by sending voltage reference signals to the multifunction switch. When the multifunction switch is in the LH or RH TURN positions, the input signal is routed to an internal ground within the SJB. When the hazard flasher lamp switch is pressed, the input signal is routed to ground.

NOTE: The hazard switch is a momentary contact switch.

When the SJB receives a request for a turn signal or the hazard lamps, the SJB supplies on/off voltage to the appropriate turn lamps.

The rear stoplamps are combined with the turn lamps. The turn and hazard lamp functions override the rear stoplamp function.

The timed on/off cycle is determined by the SJB and is set to flash approximately 80 times per minute if both the front and rear turn lamps operate correctly. If an individual turn signal lamp is inoperative, the SJB flashes the remaining turn lamp approximately 160 times per minute.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Multifunction switch • Hazard flasher switch 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Bulb(s) • Smart junction box (SJB)

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

6. If the scan tool does not communicate with the vehicle:
 - Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.
 - Refer to Section 418-00 to diagnose no response from the PCM.

DIAGNOSIS AND TESTING (Continued)

7. Carry out the network test:
 - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B1499	Lamp Turn Signal Left Circuit Failure	GO to Pinpoint Test L.
B1502	Lamp Turn Signal Left Circuit Short to Ground	GO to Pinpoint Test L.
B1503	Lamp Turn Signal Right Circuit Failure	GO to Pinpoint Test L.
B1506	Lamp Turn Signal Right Circuit Short to Ground	GO to Pinpoint Test L.
B2048	Left Rear Turn Lamp Circuit Short to Ground	REFER to Stoplamps in this section to continue diagnosis.
B2049	Left Rear Turn Lamp Circuit Open	REFER to Stoplamps in this section to continue diagnosis.
B2050	Right Rear Turn Lamp Circuit Short to Ground	REFER to Stoplamps in this section to continue diagnosis.
B2051	Right Rear Turn Lamp Circuit Open	REFER to Stoplamps in this section to continue diagnosis.
B2071	Hazard Switch Signal Short to Ground	GO to Pinpoint Test M.
B2281	Right Turn Switch Short to Ground	GO to Pinpoint Test K.
B2282	Left Turn Switch Short to Ground	GO to Pinpoint Test K.
B2529	Left Rear Turn Lamp Circuit Failure	REFER to Stoplamps in this section to continue diagnosis.
All other DTCs	—	REFER to Section 419-10.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • SJB 	<ul style="list-style-type: none"> • REFER to Section 418-00.
<ul style="list-style-type: none"> • The turn signal lamps are inoperative 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Multifunction switch • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test J.
<ul style="list-style-type: none"> • The turn signal lamps are always on 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Multifunction switch • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test K.

DIAGNOSIS AND TESTING (Continued)

Symptom Chart (Continued)

Condition	Possible Sources	Action
<ul style="list-style-type: none"> One turn signal lamp is inoperative/always on 	<ul style="list-style-type: none"> Wiring, terminals or connectors Bulb holder Bussed electrical center (BEC) SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test L.
<ul style="list-style-type: none"> The hazard lamps are inoperative/always on 	<ul style="list-style-type: none"> Wiring, terminals or connectors Hazard flasher switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test M.

Pinpoint Tests

Pinpoint Test J: The Turn Signal Lamps Are Inoperative

Refer to [Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps](#) for schematic and connector information.

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the multifunction switch through circuit 1393 (LB/RD) (LH turn signal) and circuit 1392 (LG/OG) (RH turn signal). When the multifunction switch is placed in the LH or RH TURN position, the signal is routed through circuit 1396 (VT/WH) to an internal ground within the SJB.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Multifunction switch
- SJB

PINPOINT TEST J: THE TURN SIGNAL LAMPS ARE INOPERATIVE

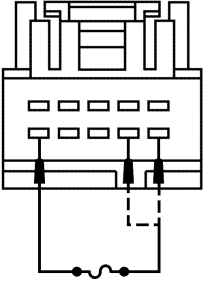
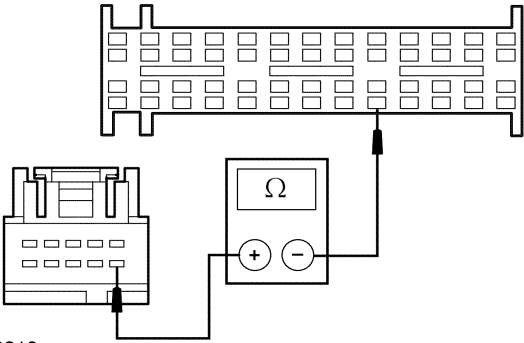
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
J1	CHECK THE HIGH BEAM OPERATION	Yes GO to J2 . No REFER to Headlamps in this section.
	<ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the HEADLAMPS ON position. Place the multifunction switch in the HIGH BEAM position. Do the high beams operate correctly? 	
J2	CHECK THE MULTIFUNCTION SWITCH	
	<ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: Multifunction Switch C202. Ignition ON. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

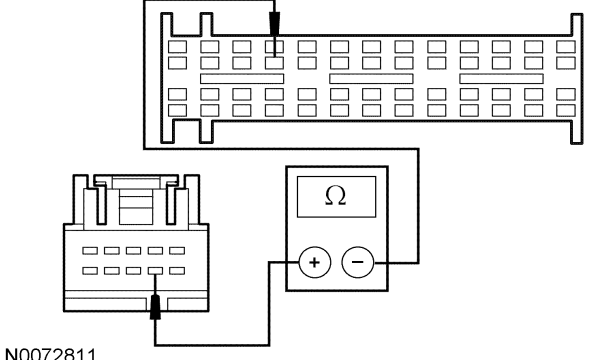
PINPOINT TEST J: THE TURN SIGNAL LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
J2	<p>CHECK THE MULTIFUNCTION SWITCH (Continued)</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper wire between the multifunction switch C202-6 (LH turn signal), circuit 1393 (LB/RD) and the multifunction switch C202-10, circuit 1396 (VT/WH), harness side; or between the multifunction switch C202-7 (RH turn signal), circuit 1392 (LG/OG) and the multifunction switch C202-10, circuit 1396 (VT/WH), harness side.  <p>N0046898</p> <ul style="list-style-type: none"> Does the LH or RH turn signal operate? 	<p>Yes REMOVE the jumper wire. INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to J3.</p>
J3	<p>CHECK CIRCUIT 1393 (LB/RD) OR CIRCUIT 1392 (LG/OG) FOR AN OPEN</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280b. For an inoperative LH turn signal, measure the resistance between the multifunction switch C202-6, circuit 1393 (LB/RD) and the SJB C2280b-48, circuit 1393 (LB/RD), harness side.  <p>N0072810</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST J: THE TURN SIGNAL LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
J3	CHECK CIRCUIT 1393 (LB/RD) OR CIRCUIT 1392 (LG/OG) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> For an inoperative RH turn signal, measure the resistance between the multifunction switch C202-7, circuit 1392 (LG/OG) and the SJB C2280b-17, circuit 1392 (LG/OG), harness side.  <p>N0072811</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to J4.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>
J4	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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 K: The Turn Signal Lamps Are Always On

Refer to [Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps for schematic and connector information.](#)

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the multifunction switch through circuit 1393 (LB/RD) (LH turn signal) and circuit 1392 (LG/OG) (RH turn signal). When the multifunction switch is placed in the LH or RH TURN position, the signal is routed through circuit 1396 (VT/WH) to an internal ground within the SJB.

- DTC B2281 (Right Turn Switch Short to Ground) — is an on-demand DTC that sets when the SJB detects a short to ground from the RH turn signal input circuit.

- DTC B2282 (Left Turn Switch Short to Ground) — is an on-demand DTC that sets when the SJB detects a short to ground from the LH turn signal input circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Multifunction switch
- SJB

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST K: THE TURN SIGNAL LAMPS ARE ALWAYS ON**

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

Test Step		Result / Action to Take
K1	CHECK THE MULTIFUNCTION SWITCH	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: Multifunction Switch C202. Ignition ON. Do the turn signal lamps continue to flash on and off? 	<p>Yes GO to K2.</p> <p>No INSTALL a new multifunction switch. REFER to Section 211-05. CLEAR the DTCs. REPEAT the self-test.</p>
K2	CHECK CIRCUIT 1393 (LB/RD) OR CIRCUIT 1392 (LG/OG) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280b. Measure the resistance between the multifunction switch C202-6 (LH turn signal), circuit 1393 (LB/RD), harness side and ground; and between the multifunction switch C202-7 (RH turn signal), circuit 1392 (LG/OG), harness side and ground. <p>N0046900</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to K3.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
K3	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test L: One Turn Signal Lamp Is Inoperative/Always On

Refer to [Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps](#) for schematic and connector information.

Normal Operation

When the smart junction box (SJB) detects a request for the LH or RH turn signal, the SJB provides voltage, through the bussed electrical center (BEC), to the front turn lamps through circuit 1342 (GY/BK) (LH front turn lamp) or circuit 1341 (DB/OG) (RH front turn lamp). The turn lamps are grounded through circuit 1205 (BK) through the BEC.

The rear lamps are combination stop/turn lamps. The function of the rear turn lamps uses the stoplamp circuitry.

DIAGNOSIS AND TESTING (Continued)

DTC Description	Fault Trigger Conditions
• B1499 — Lamp Turn Signal Left Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects an open or short to voltage from the LH front turn signal voltage supply circuit.
• B1502 — Lamp Turn Signal Left Circuit Short to Ground	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the LH front turn signal voltage supply circuit.
• B1503 — Lamp Turn Signal Right Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects an open or short to voltage from the RH front turn signal voltage supply circuit.
• B1506 — Lamp Turn Signal Right Circuit Short to Ground	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the RH front turn signal voltage supply circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Bulb holder
- BEC
- SJB

PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON

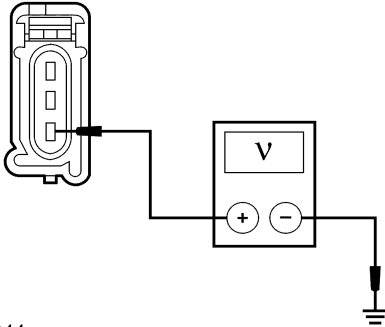
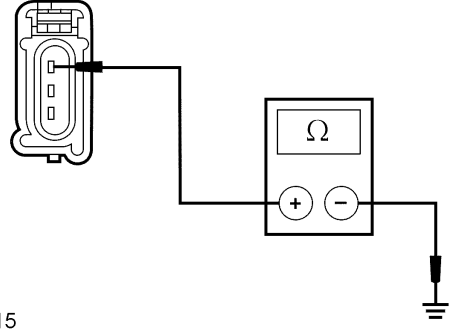
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
L1	CHECK THE STOPLAMPS	Yes GO to L2 . No REFER to Stoplamps in this section.
	<ul style="list-style-type: none"> • Ignition ON. • Apply and release the brake pedal, while observing the stoplamps. • Do the stoplamps operate correctly? 	
L2	DETERMINE IF A LAMP IS ALWAYS ON	Yes GO to L3 . No GO to L6 .
	NOTE: Make sure the multifunction switch is in the NEUTRAL position. <ul style="list-style-type: none"> • Observe the front turn lamps. • Is either turn lamp illuminated? 	
L3	CHECK THE TURN LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO VOLTAGE	Yes GO to L4 . No GO to L16 .
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: SJB 2280d. • Ignition ON. • Does either turn lamp continue to illuminate? 	
L4	CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO VOLTAGE (SJB TO BEC)	Yes GO to L5 . No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: BEC C1035a. • Ignition ON. • Does either turn lamp continue to illuminate? 	
L5	CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO VOLTAGE (BEC TO TURN LAMP)	
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: BEC C1035c. • Disconnect: Always On Lamp. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

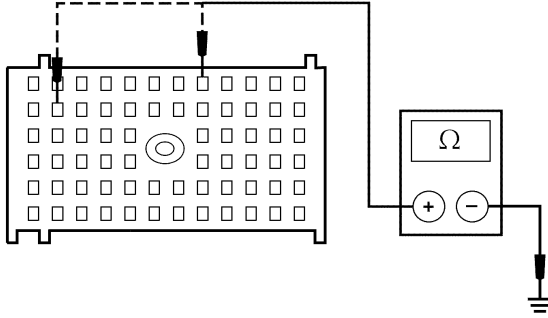
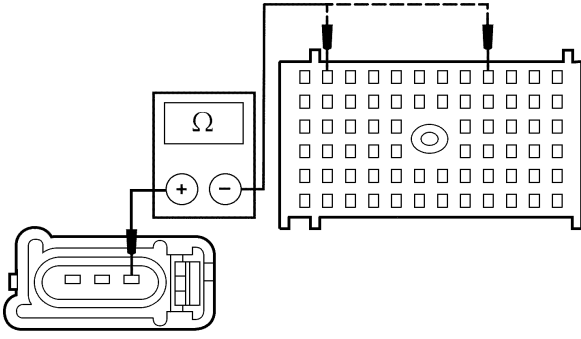
PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

Test Step	Result / Action to Take
<p>L5 CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO VOLTAGE (BEC TO TURN LAMP) (Continued)</p> <ul style="list-style-type: none"> Ignition ON. Measure the voltage between the LH front turn lamp C1023-3, circuit 1342 (GY/BK), harness side and ground; or between the RH front turn lamp C1043-3, circuit 1341 (DB/OG), harness side and ground.  <p>N0046944</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>
<p>L6 CHECK THE TURN LAMP GROUND CIRCUIT FOR AN OPEN</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: Inoperative Turn Lamp. Measure the resistance between the LH turn lamp C1023-1, circuit 1205 (BK), harness side and ground; or between the RH turn lamp C1043-1, circuit 1205 (BK), harness side and ground.  <p>A0074015</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to L9.</p> <p>No GO to L7.</p>
<p>L7 CHECK CIRCUIT 1205 (BK) FOR AN OPEN (BEC TO GROUND)</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035c. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

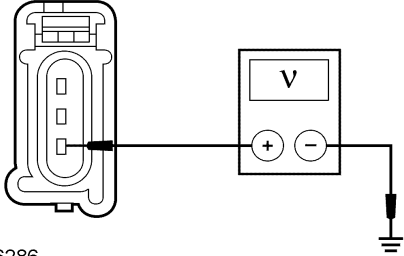
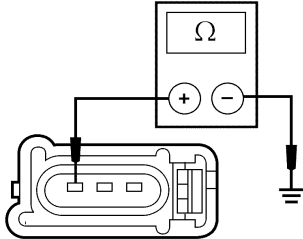
PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

Test Step		Result / Action to Take
L7	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (BEC TO GROUND) (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the BEC C1035c-F5 (LH turn lamp), circuit 1205 (BK), harness side and ground; or between the BEC C1035c-E11 (RH turn lamp), circuit 1205 (BK), harness side and ground.  <p>N0046899</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to L8.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
L8	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (TURN LAMP TO BEC)	
	<ul style="list-style-type: none"> Measure the resistance between the LH front turn lamp C1023-1, circuit 1205 (BK), harness side and the BEC C1035c-F4, circuit 1205 (BK), harness side; or between the RH front turn lamp C1043-1, circuit 1205 (BK), harness side and the BEC C1035c-F11, circuit 1205 (BK), harness side.  <p>N0046901</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
L9	CHECK FOR VOLTAGE TO THE INOPERATIVE TURN LAMP	
	<ul style="list-style-type: none"> Turn the hazard flasher lamp function on. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

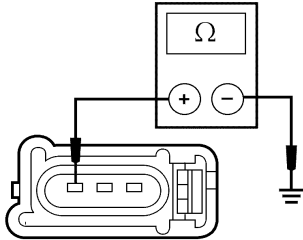
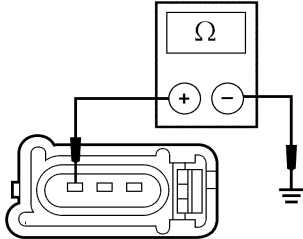
PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

Test Step		Result / Action to Take
L9	<p>CHECK FOR VOLTAGE TO THE INOPERATIVE TURN LAMP (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the LH front turn lamp C1023-3, circuit 1342 (GY/BK), harness side and ground; or between the RH front turn lamp C1043-3, circuit 1341 (DB/OG), harness side and ground.  <p>N0066286</p> <ul style="list-style-type: none"> Does the voltage alternate between 0 and greater than 10 volts? 	<p>Yes INSTALL a new bulb holder. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to L10.</p>
L10	<p>CHECK THE TURN LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Turn the hazard flasher lamp function off. Disconnect: SJB C2280d. Measure the resistance between the LH turn lamp C1023-3, circuit 1342 (GY/BK), harness side and ground; or between the RH turn lamp C1043-3, circuit 1341 (DB/OG), harness side and ground.  <p>N0046902</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to L13.</p> <p>No GO to L11.</p>
L11	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO GROUND (SJB TO BEC)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. 	

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DIAGNOSIS AND TESTING (Continued)

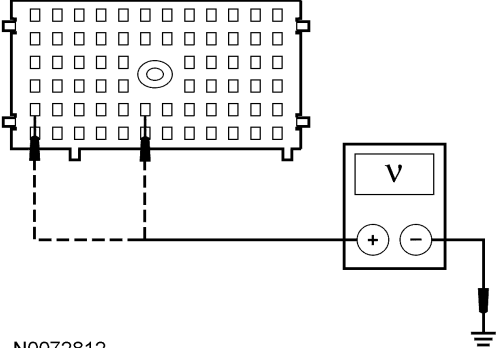
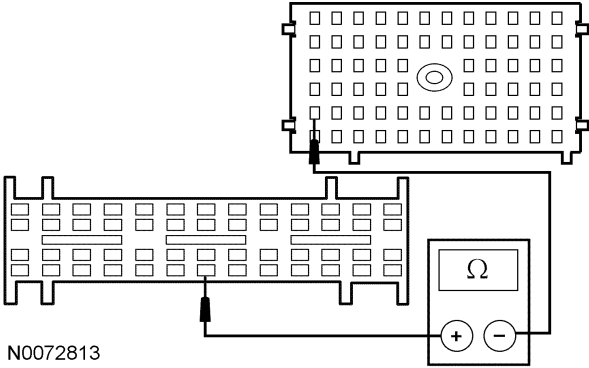
PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

Test Step		Result / Action to Take
L11	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO GROUND (SJB TO BEC) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the LH turn lamp C1023-3, circuit 1342 (GY/BK), harness side and ground; or between the RH turn lamp C1043-3, circuit 1341 (DB/OG), harness side and ground.  <p>N0046902</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to L12.</p>
L12	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR A SHORT TO GROUND (BEC TO TURN LAMP)</p> <ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the LH turn lamp C1023-3, circuit 1342 (GY/BK), harness side and ground; or between the RH turn lamp C1043-3, circuit 1341 (DB/OG), harness side and ground.  <p>N0046902</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
L13	<p>CHECK FOR VOLTAGE TO THE BEC</p> <ul style="list-style-type: none"> Connect: SJB C2280d. Disconnect: BEC C1035a. Turn the hazard flasher lamp function on. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

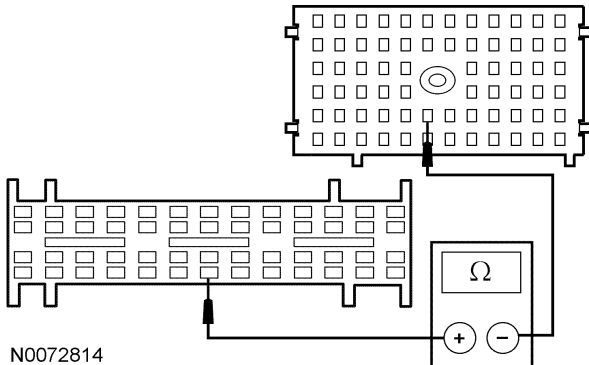
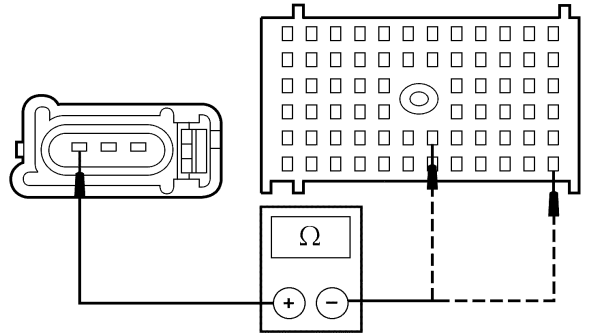
PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

	Test Step	Result / Action to Take
L13	<p>CHECK FOR VOLTAGE TO THE BEC (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the BEC C1035a-E1 (LH turn lamp), circuit 1342 (GY/BK), harness side and ground; or between the BEC C1035a-E6 (RH turn lamp), circuit 1341 (DB/OG), harness side and ground.  <p>N0072812</p> <ul style="list-style-type: none"> Does the voltage alternate from 0 to greater than 10 volts? 	<p>Yes GO to L15.</p> <p>No GO to L14.</p>
L14	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR AN OPEN (SJB TO BEC)</p> <ul style="list-style-type: none"> Turn the hazard flasher lamp function off. Disconnect: SJB C2280d. For an inoperative LH turn lamp, measure the resistance between the SJB C2280d-46 (LH turn lamp), circuit 1342 (GY/BK), harness side and the BEC C1035a-E1, circuit 1342 (GY/BK), harness side.  <p>N0072813</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST L: ONE TURN SIGNAL LAMP IS INOPERATIVE/ALWAYS ON (Continued)

	Test Step	Result / Action to Take
L14	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR AN OPEN (SJB TO BEC) (Continued)</p>	
	<ul style="list-style-type: none"> For an inoperative RH turn lamp, measure the resistance between the SJB C2280d-41 (RH turn lamp), circuit 1341 (DB/OG), harness side and the BEC C1035a-E6, circuit 1341 (DB/OG), harness side.  <p>N0072814</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to L16.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
L15	<p>CHECK CIRCUIT 1341 (DB/OG) (RH TURN SIGNAL) OR CIRCUIT 1342 (GY/BK) (LH TURN SIGNAL) FOR AN OPEN (BEC TO TURN LAMP)</p>	
	<ul style="list-style-type: none"> Turn the hazard flasher lamp function off. Disconnect: BEC C1035c. Measure the resistance between the LH turn lamp C1023-3, circuit 1342 (GY/BK), harness side and the BEC C1035c-A1, circuit 1342 (GY/BK), harness side; or between the RH turn lamp C1043-3, circuit 1341 (DB/OG), harness side and the BEC C1035c-B6, circuit 1341 (DB/OG), harness side.  <p>N0046905</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
L16	<p>CHECK FOR CORRECT SJB OPERATION</p>	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test M: The Hazard Lamps Are Inoperative/Always On

Refer to Wiring Diagrams Cell 90, Turn Signal/Stop/Hazard Lamps for schematic and connector information.

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the hazard flasher switch through circuit 1689 (RD/WH). When the hazard flasher switch is pressed, the signal is routed to ground through circuit 1205 (BK).

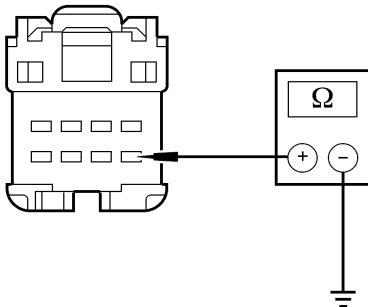
- DTC B2071 (Hazard Switch Signal Short to Ground) — is an on-demand DTC that sets when the SJB detects a short to ground from the hazard flasher lamp switch input circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Hazard flasher switch
- SJB

PINPOINT TEST M: THE HAZARD LAMPS ARE INOPERATIVE/ALWAYS ON

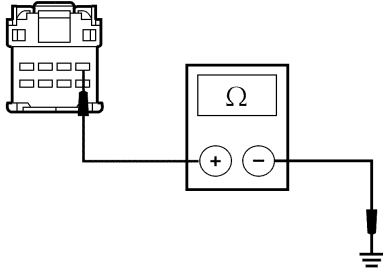
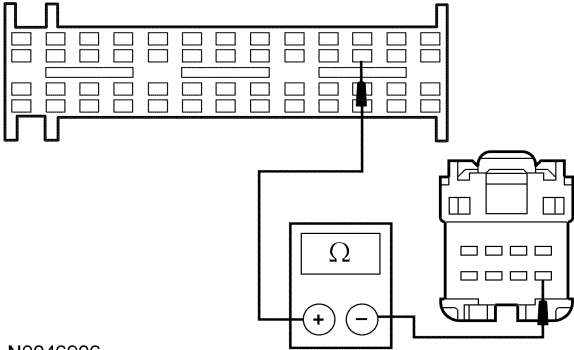
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
M1	USE THE RECORDED DTCs FROM THE SJB SELF-TEST	Yes GO to M2 . No GO to M4 .
	<ul style="list-style-type: none"> • Ignition OFF. • Retrieve the recorded results from the SJB self-test. • Was DTC B2071 present? 	
M2	CHECK THE HAZARD FLASHER LAMP SWITCH (DTC B2071)	Yes GO to M3 . No INSTALL a new hazard flasher switch. TEST the system for normal operation.
	<ul style="list-style-type: none"> • Disconnect: Hazard Flasher Switch C2039. • Ignition ON. • Enter the following diagnostic mode on the scan tool: SJB Self-Test. • Repeat the SJB on-demand self-test. • Is DTC B2071 present? 	
M3	CHECK CIRCUIT 1689 (RD/WH) FOR SHORT TO GROUND	Yes GO to M7 . No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: SJB C2280b. • Measure the resistance between the hazard flasher switch C2039-5, circuit 1689 (RD/WH), harness side and ground. <div style="text-align: center;">  <p>N0010906</p> </div> <ul style="list-style-type: none"> • Is the resistance greater than 10,000 ohms? 	
M4	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	
	<ul style="list-style-type: none"> • Disconnect: Hazard Flasher Switch C2039. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

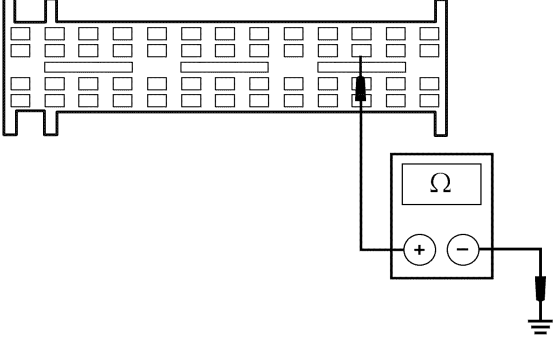
PINPOINT TEST M: THE HAZARD LAMPS ARE INOPERATIVE/ALWAYS ON (Continued)

Test Step		Result / Action to Take
M4	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the hazard flasher switch C2039-1, circuit 1205 (BK), harness side and ground.  <p>N0038814</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to M5.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
M5	<p>CHECK CIRCUIT 1689 (RD/WH) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: SJB C2280b. Measure the resistance between the SJB C2280b-24, circuit 1689 (RD/WH), harness side and the hazard flasher switch C2039-5, circuit 1689 (RD/WH), harness side.  <p>N0046906</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to M6.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
M6	<p>CHECK THE HAZARD FLASHER SWITCH</p> <ul style="list-style-type: none"> Connect: Hazard Flasher Switch C2039. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

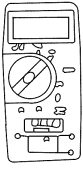
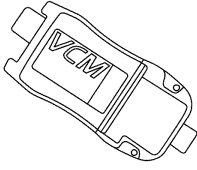
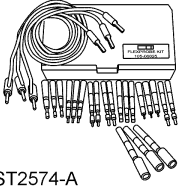
PINPOINT TEST M: THE HAZARD LAMPS ARE INOPERATIVE/ALWAYS ON (Continued)

Test Step		Result / Action to Take
M6	<p>CHECK THE HAZARD FLASHER SWITCH (Continued)</p> <ul style="list-style-type: none"> While pressing and releasing the hazard flasher switch, measure the resistance between the SJB C2280b-24, circuit 1689 (RD/WH), harness side and ground.  <p>N0046907</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms with the hazard flasher switch pressed and greater than 10,000 ohms with the hazard flasher switch released? 	<p>Yes GO to M7.</p> <p>No INSTALL a new hazard flasher switch. TEST the system for normal operation.</p>
M7	<p>CHECK FOR CORRECT SJB OPERATION</p> <ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING

Parking, Rear and License Plate Lamps

Special Tool(s)

 <p>ST1137-A</p>	<p>73III Automotive Meter 105-R0057 or equivalent</p>
 <p>ST2834-A</p>	<p>Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool</p>
 <p>ST2574-A</p>	<p>Flex Probe Kit 105-R025C or equivalent</p>

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

When the SJB receives an input from the headlamp switch indicating a request for the parking lamps, the SJB supplies voltage to the parking lamps.

The battery saver feature does not turn the parking lamps off when the headlamp switch is in the PARKING LAMPS ON position.

The SJB monitors the headlamp switch position by sending voltage reference signals on multiple circuits to the headlamp switch. At any given time, one of the signal circuits is routed to ground. If the SJB does not detect any of the inputs to the headlamp switch is active (routed to ground) for 5 seconds, the SJB turns on the exterior lights and keeps them on for 10 minutes after the ignition switch is turned off (or 10 minutes from the time the SJB does not detect any headlamp switch input if the ignition switch was already off). If the SJB detects multiple circuits short to ground, the SJB implements a planned strategy depending on the multiple inputs received. If either of these situations occur, the SJB should **NOT** be ruled immediately as being at fault. This is normal behavior of the SJB design as it has detected a fault with the inputs from the headlamp switch.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Headlamp switch 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Bulb(s) • Smart junction box (SJB)

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

DIAGNOSIS AND TESTING (Continued)

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.
6. If the scan tool does not communicate with the vehicle:
- Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.

- Refer to Section 418-00 to diagnose no response from the PCM.
7. Carry out the network test:
- If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B1470	Lamp Headlamp Input Circuit Failure	GO to Pinpoint Test O.
B2035	LF Side Repeater Lamp Output Ckt Failure	If the lamps are inoperative, GO to Pinpoint Test N. If the lamps are always on, GO to Pinpoint Test O.
B2491	RF Park Lamp Output Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test N. If the lamp is always on, GO to Pinpoint Test O.
B2493	LF Park Lamp Output Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test N. If the lamp is always on, GO to Pinpoint Test O.
B2523	License Lamp Circuit Failure	If the lamps are inoperative, GO to Pinpoint Test N. If the lamps are always on, GO to Pinpoint Test O.
All other DTCs	—	REFER to Section 419-10.

DIAGNOSIS AND TESTING (Continued)**Symptom Chart****Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors SJB 	<ul style="list-style-type: none"> REFER to Section 418-00.
<ul style="list-style-type: none"> One or more parking, rear, or license plate lamp is inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Bulb holder Bussed electrical center (BEC) SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test N.
<ul style="list-style-type: none"> The parking, rear, or license plate lamps are on continuously 	<ul style="list-style-type: none"> Wiring, terminals or connectors Headlamp switch BEC SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test O.

Pinpoint Tests**Pinpoint Test N: One Or More Parking, Rear Or License Plate Lamp Is Inoperative**

Refer to [Wiring Diagrams Cell 92, Parking Rear and License Lamps](#) for schematic and connector information.

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the headlamp switch through circuit 1401 (BK/LG). When the headlamp switch is placed in the PARKING LAMPS ON position, the SJB provides voltage to the parking, rear, license plate and side marker lamps. The lamps are grounded through circuit 1205 (BK).

DTC Description	Fault Trigger Conditions
<ul style="list-style-type: none"> B2035 — LF Side Repeater Lamp Output Ckt Failure 	A continuous and on-demand DTC that sets when the SJB detects an open or short to ground from all the side marker lamps voltage supply circuit.
<ul style="list-style-type: none"> B2491 — RF Park Lamp Output Circuit Short to Battery 	A continuous and on-demand DTC that sets when the SJB detects an open from the RH front parking lamp voltage supply circuit.
<ul style="list-style-type: none"> B2493 — LF Park Lamp Output Circuit Short to Battery 	A continuous and on-demand DTC that sets when the SJB detects an open from the LH front parking lamp voltage supply circuit.
<ul style="list-style-type: none"> B2523 — License Lamp Circuit Failure 	A continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the license plate lamp and both rear parking lamp voltage supply circuits.

DIAGNOSIS AND TESTING (Continued)

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Bulb holder
- BEC
- SJB

PINPOINT TEST N: ONE OR MORE PARKING, REAR OR LICENSE PLATE LAMP IS INOPERATIVE

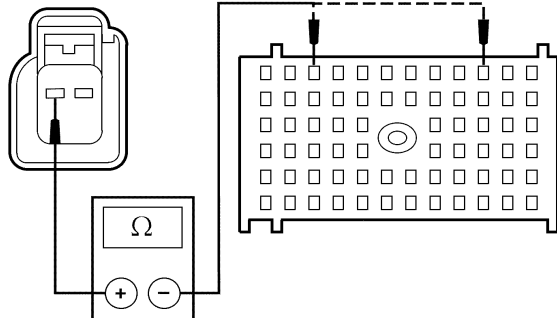
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take																												
N1	CHECK THE STOPLAMP OPERATION	Yes GO to N2 . No REFER to Stoplamps in this section.																												
	<ul style="list-style-type: none"> • Ignition OFF. • Apply and release the brake pedal while observing the stoplamps. • Do the stoplamps operate correctly? 																													
N2	CHECK THE TURN SIGNAL OPERATION	Yes GO to N3 . No REFER to Turn Signal and Hazard Lamps in this section.																												
	<ul style="list-style-type: none"> • Ignition ON. • Place the multifunction switch in the LH and then RH TURN position. • Do the turn lamps operate correctly? 																													
N3	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	Yes For a side marker or front lamp, GO to N5 . For a rear or license plate lamp, GO to N6 . No For a front side marker lamp, GO to N4 . For all others, REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.																												
	<p>NOTE: Make sure the bulb is good before continuing diagnostics.</p> <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Inoperative Parking Lamp. • Measure the resistance between the inoperative parking lamp, harness side and ground as follows: 																													
	<table border="1"> <thead> <tr> <th>Inoperative Parking Lamp Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>LH front C1023-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH front C1043-1</td> <td>1205 (BK)</td> </tr> <tr> <td>LH front side marker C151-2</td> <td>1205 (BK)</td> </tr> <tr> <td>RH front side marker C161-2</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear side marker C481-2</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear side marker C482-2</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear 1 C4112-1</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear 2 C4113-1</td> <td>1205 (BK)</td> </tr> <tr> <td>LH rear parking C412-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear 1 C4114-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear 2 C4115-1</td> <td>1205 (BK)</td> </tr> <tr> <td>RH rear parking C415-1</td> <td>1205 (BK)</td> </tr> <tr> <td>License plate C4046-2</td> <td>1205 (BK)</td> </tr> </tbody> </table>		Inoperative Parking Lamp Connector-Pin	Circuit	LH front C1023-1	1205 (BK)	RH front C1043-1	1205 (BK)	LH front side marker C151-2	1205 (BK)	RH front side marker C161-2	1205 (BK)	LH rear side marker C481-2	1205 (BK)	RH rear side marker C482-2	1205 (BK)	LH rear 1 C4112-1	1205 (BK)	LH rear 2 C4113-1	1205 (BK)	LH rear parking C412-1	1205 (BK)	RH rear 1 C4114-1	1205 (BK)	RH rear 2 C4115-1	1205 (BK)	RH rear parking C415-1	1205 (BK)	License plate C4046-2	1205 (BK)
Inoperative Parking Lamp Connector-Pin	Circuit																													
LH front C1023-1	1205 (BK)																													
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RH rear parking C415-1	1205 (BK)																													
License plate C4046-2	1205 (BK)																													
	<ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 																													
N4	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (SIDE LAMP TO BEC)																													
	<ul style="list-style-type: none"> • Disconnect: BEC C1035c. 																													

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST N: ONE OR MORE PARKING, REAR OR LICENSE PLATE LAMP IS INOPERATIVE (Continued)

Test Step	Result / Action to Take														
<p>N4 CHECK CIRCUIT 1205 (BK) FOR AN OPEN (SIDE LAMP TO BEC) (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the LH front side marker C151-2, circuit 1205 (BK), harness side and the BEC C1035c-F3, circuit 1205 (BK), harness side; or between the RH front side marker C161-2, circuit 1205 (BK), harness side and the BEC C1035c-F10, circuit 1205 (BK), harness side.  <p>N0046914</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>														
<p>N5 CHECK FOR VOLTAGE TO THE BULB HOLDER</p> <ul style="list-style-type: none"> Place the headlamp switch in the PARKING LAMPS ON position. Measure the voltage between the inoperative parking lamp, harness side and ground as follows: <table border="1" data-bbox="142 1102 971 1428"> <thead> <tr> <th>Inoperative Parking Lamp Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>LH front C1023-2</td> <td>1340 (DG)</td> </tr> <tr> <td>RH front C1043-2</td> <td>1339 (BK/PK)</td> </tr> <tr> <td>LH front side marker C151-1</td> <td>667 (WH/RD)</td> </tr> <tr> <td>RH front side marker C161-1</td> <td>14 (BN)</td> </tr> <tr> <td>LH rear side marker C481-1</td> <td>1361 (RD/PK)</td> </tr> <tr> <td>RH rear side marker C482-1</td> <td>1361 (RD/PK)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	Inoperative Parking Lamp Connector-Pin	Circuit	LH front C1023-2	1340 (DG)	RH front C1043-2	1339 (BK/PK)	LH front side marker C151-1	667 (WH/RD)	RH front side marker C161-1	14 (BN)	LH rear side marker C481-1	1361 (RD/PK)	RH rear side marker C482-1	1361 (RD/PK)	<p>Yes INSTALL a new bulb holder. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to N6.</p>
Inoperative Parking Lamp Connector-Pin	Circuit														
LH front C1023-2	1340 (DG)														
RH front C1043-2	1339 (BK/PK)														
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<p>N6 CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND</p> <p>NOTE: If testing at a rear side marker lamp, both rear side marker lamps must be disconnected for correct test results.</p> <p>NOTE: If testing at the rear lamp 1 or rear lamp 2, both lamps must be disconnected for correct test results.</p> <ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Disconnect: SJB C2280d. Measure the resistance between the inoperative parking lamp, harness side and ground as follows: 															

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST N: ONE OR MORE PARKING, REAR OR LICENSE PLATE LAMP IS INOPERATIVE (Continued)

Test Step		Result / Action to Take																												
N6	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND (Continued)	<p>Yes GO to N9.</p> <p>No For a front lamp or front side marker, GO to N7. For all others, REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>																												
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License plate C4046-1	1370 (DG/LG)																													
N7	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND (BEC TO SJB)	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to N8.</p>																												
	<ul style="list-style-type: none"> • Disconnect: BEC C1035a. • Measure the resistance between the inoperative parking lamp, harness side and ground as follows: 																													
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RH front side marker C161-1	14 (BN)																													
N8	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND (BEC TO FRONT LAMP)																													
	<ul style="list-style-type: none"> • Disconnect: BEC C1035c. • Measure the resistance between the inoperative parking lamp, harness side and ground as follows: 																													

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST N: ONE OR MORE PARKING, REAR OR LICENSE PLATE LAMP IS INOPERATIVE (Continued)**

Test Step		Result / Action to Take																												
N8	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND (BEC TO FRONT LAMP) (Continued)	<p>Yes REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>																												
	<table border="1"> <thead> <tr> <th>Inoperative Parking Lamp Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>LH front C1023-2</td> <td>1340 (DG)</td> </tr> <tr> <td>RH front C1043-2</td> <td>1339 (BK/PK)</td> </tr> <tr> <td>LH front side marker C151-1</td> <td>667 (WH/RD)</td> </tr> <tr> <td>RH front side marker C161-1</td> <td>14 (BN)</td> </tr> </tbody> </table>		Inoperative Parking Lamp Connector-Pin	Circuit	LH front C1023-2	1340 (DG)	RH front C1043-2	1339 (BK/PK)	LH front side marker C151-1	667 (WH/RD)	RH front side marker C161-1	14 (BN)																		
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	<ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 																													
N9	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN (SJB TO LAMP)	<p>Yes GO to N12.</p> <p>No For a front lamp or front side marker, GO to N10. For all others, REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>																												
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	<ul style="list-style-type: none"> Is the resistance less than 5 ohms? 																													
N10	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN (SJB TO BEC)																													
	<ul style="list-style-type: none"> Disconnect: BEC C1035a. 																													

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST N: ONE OR MORE PARKING, REAR OR LICENSE PLATE LAMP IS INOPERATIVE (Continued)

Test Step		Result / Action to Take		
N10	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN (SJB TO BEC) (Continued)	<p>Yes GO to N11.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>		
<ul style="list-style-type: none"> Measure the resistance between the BEC, harness side and the SJB, harness side as follows: 				
Inoperative Parking Lamp	BEC Connector-Pin		SJB Connector-Pin	Circuit
LH front	C1035a-D3		C2280d-29	1340 (DG)
RH front	C1035a-D1		C2280d-31	1339 (BK/PK)
LH front side marker	C1035a-A6	C2280d-16	667 (WH/RD)	
RH front side marker	C1035a-D10	C2280d-17	14 (BN)	
<ul style="list-style-type: none"> Is the resistance less than 5 ohms? 				
N11	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN (BEC TO LAMP)	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>		
<ul style="list-style-type: none"> Disconnect: BEC C1035c. Measure the resistance between the inoperative parking lamp, harness side and the BEC, harness side as follows: 				
Inoperative Parking Lamp Connector-Pin	BEC Connector-Pin		Circuit	
LH front C1023-2	C1035c-A3		1340 (DG)	
RH front C1043-2	C1035c-C1		1339 (BK/PK)	
LH front side marker C151-1	C1035c-D1	667 (WH/RD)		
RH front side marker C161-1	C1035c-B10	14 (BN)		
<ul style="list-style-type: none"> Is the resistance less than 5 ohms? 				
N12	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>		
<ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 				

Pinpoint Test O: The Parking, Rear Or License Plate Lamps Are On Continuously

Refer to Wiring Diagrams Cell 92, Parking Rear and License Lamps for schematic and connector information.

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the headlamp switch through circuit 1401 (BK/LG). When the headlamp switch is placed in the PARKING LAMPS ON position, the SJB provides voltage to the parking, license plate and side marker lamps.

DIAGNOSIS AND TESTING (Continued)

DTC Description	Fault Trigger Conditions
• B1470 — Lamp Headlamp Input Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to ground from the headlamp switch input circuit (parking lamps).
• B2035 — LF Side Repeater Lamp Output Ckt Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the side marker lamps voltage supply circuit.
• B2491 — RF Park Lamp Output Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the RH front parking lamp voltage supply circuit.
• B2493 — LF Park Lamp Output Circuit Short to Battery	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the LH front parking lamp voltage supply circuit.
• B2523 — License Lamp Circuit Failure	A continuous and on-demand DTC that sets when the SJB detects a short to voltage from the license plate lamp and both tail lamp voltage supply circuits.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Headlamp switch
- BEC
- SJB

PINPOINT TEST O: THE PARKING, REAR OR LICENSE PLATE LAMPS ARE ON CONTINUOUSLY

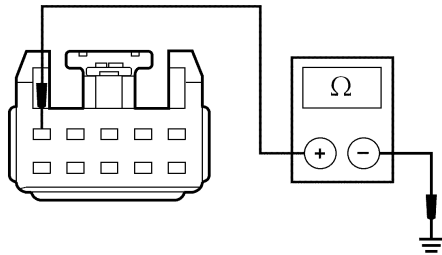
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
O1	USE THE RECORDED DTCs FROM THE SJB SELF-TEST	Yes GO to O2 . No GO to O4 .
	<ul style="list-style-type: none"> • Ignition OFF. • Retrieve the recorded results from the SJB self-test. • Was DTC B1470 present? 	
O2	CHECK THE HEADLAMP SWITCH	Yes GO to O3 . No INSTALL a new headlamp switch. REFER to Headlamp Switch in this section. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> • Disconnect: Headlamp Switch C205. • Carry out the headlamp switch component test. Refer to Wiring Diagrams Cell 149 for component testing. • Is the headlamp switch OK? 	
O3	CHECK CIRCUIT 1401 (BK/LG) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> • Disconnect: SJB C2280b. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST O: THE PARKING, REAR OR LICENSE PLATE LAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take															
O3	CHECK CIRCUIT 1401 (BK/LG) FOR A SHORT TO GROUND (Continued)																
	<ul style="list-style-type: none"> Measure the resistance between the headlamp switch C205-5, circuit 1401 (BK/LG), harness side and ground.  <p>N0046915</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to O7.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>															
O4	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUITS FOR A SHORT TO VOLTAGE																
	<ul style="list-style-type: none"> Disconnect: SJB C2280d. Ignition ON. Does any parking lamp continue to illuminate? 	<p>Yes If a front side marker or front lamp continues to illuminate, GO to O5. For all other lamps, REPAIR the voltage supply circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to O7.</p>															
O5	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUITS FOR A SHORT TO VOLTAGE (SJB to BEC)																
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. Ignition ON. Does any parking lamp continue to illuminate? 	<p>Yes GO to O6.</p> <p>No REPAIR the voltage supply circuit in question between the SJB and the BEC. CLEAR the DTCs. REPEAT the self-test.</p>															
O6	CHECK THE PARKING LAMP VOLTAGE SUPPLY CIRCUITS FOR A SHORT TO VOLTAGE (BEC to LAMP)																
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035c. Disconnect: Suspect Parking Lamp. Ignition ON. Measure the voltage between suspect parking lamp, harness side and ground as follows: <table border="1" data-bbox="142 1602 967 1812"> <thead> <tr> <th>Suspect Lamp</th> <th>Connector-Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>LH front</td> <td>C1023-2</td> <td>1340 (DG)</td> </tr> <tr> <td>RH front</td> <td>C1043-2</td> <td>1339 (BK/PK)</td> </tr> <tr> <td>LH side marker</td> <td>C151-1</td> <td>667 (WH/RD)</td> </tr> <tr> <td>RH side marker</td> <td>C161-1</td> <td>14 (BN)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Is any voltage present? 	Suspect Lamp	Connector-Pin	Circuit	LH front	C1023-2	1340 (DG)	RH front	C1043-2	1339 (BK/PK)	LH side marker	C151-1	667 (WH/RD)	RH side marker	C161-1	14 (BN)	<p>Yes REPAIR the voltage supply circuit in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>
Suspect Lamp	Connector-Pin	Circuit															
LH front	C1023-2	1340 (DG)															
RH front	C1043-2	1339 (BK/PK)															
LH side marker	C151-1	667 (WH/RD)															
RH side marker	C161-1	14 (BN)															

(Continued)

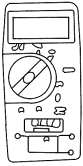
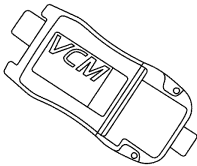
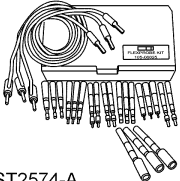
DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST O: THE PARKING, REAR OR LICENSE PLATE LAMPS ARE ON CONTINUOUSLY
(Continued)**

Test Step		Result / Action to Take
07	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING

Fog Lamps

Special Tool(s)

 <p>ST1137-A</p>	<p>73III Automotive Meter 105-R0057 or equivalent</p>
 <p>ST2834-A</p>	<p>Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool</p>
 <p>ST2574-A</p>	<p>Flex Probe Kit 105-R025C or equivalent</p>

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The SJB monitors the fog lamp switch input by sending a voltage reference signal to the headlamp switch. When the fog lamp switch is engaged, the voltage reference signal is routed to ground.

The fog lamps can be turned on when the following conditions are met:

- The ignition switch is in the RUN or START position.
- The low beam headlamps or the parking lamps are on.
- The high beams are off.

When the SJB receives an input from the headlamp switch indicating a request for the fog lamps, the SJB provides ground for the fog lamp relay coil. When the fog lamp relay is energized, voltage is routed to the fog lamps and the fog lamps on indicator located within the headlamp switch.

Inspection and Verification

1. Verify the customer concern.

2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Headlamp switch 	<ul style="list-style-type: none"> • Bussed electrical center (BEC) fuse 58 (15A) (fog lamp relay) • Wiring, terminals or connectors • Fog lamp relay • Bulb(s) • BEC • Smart junction box (SJB)

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

6. If the scan tool does not communicate with the vehicle:
 - Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.
 - Refer to Section 418-00 to diagnose no response from the PCM.

DIAGNOSIS AND TESTING (Continued)

7. Carry out the network test:
 - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B2030	Front Fog Lamp Relay Ckt Failure	If the fog lamps are inoperative, GO to Pinpoint Test P . If the fog lamps are always on, GO to Pinpoint Test R .
B2254	Front Fog Lamp Switch Failure	GO to Pinpoint Test R .
All other DTCs	—	REFER to Section 419-10.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • SJB 	<ul style="list-style-type: none"> • REFER to Section 418-00.
<ul style="list-style-type: none"> • The fog lamps are inoperative 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • Fog lamp relay • Headlamp switch • Bussed electrical center (BEC) • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test P.
<ul style="list-style-type: none"> • An individual fog lamp is inoperative 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • BEC 	<ul style="list-style-type: none"> • GO to Pinpoint Test Q.
<ul style="list-style-type: none"> • The fog lamps are on continuously 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Fog lamp relay • Headlamp switch • BEC • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test R.
<ul style="list-style-type: none"> • The fog lamp on indicator is inoperative 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Headlamp switch • BEC 	<ul style="list-style-type: none"> • GO to Pinpoint Test S.

DIAGNOSIS AND TESTING (Continued)

Pinpoint Tests

Pinpoint Test P: The Fog Lamps Are Inoperative

Refer to Wiring Diagrams Cell 86, Fog Lamps for schematic and connector information.

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

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the headlamp switch through circuit 1669 (OG/LG). When the fog lamp switch is engaged, the voltage signal is routed to ground. The fog lamp relay is provided voltage through the bussed electrical center (BEC). When the ignition switch is in the ON position, the parking lamps are on and the SJB detects a request for the fog lamps, the SJB provides a ground for the fog lamp relay coil through circuit 1347 (DB/WH). When the relay is energized, voltage is routed through circuits 1721 (LB/BK) and 1776 (TN/OG) to the LH and RH fog lamps, respectively. The fog lamps share the ground circuit with the headlamps.

- DTC B2030 (Front Fog Lamp Relay Ckt Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to voltage from the fog lamp relay coil ground controlled circuit.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Fog lamp relay
- Headlamp switch
- BEC
- SJB

PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE

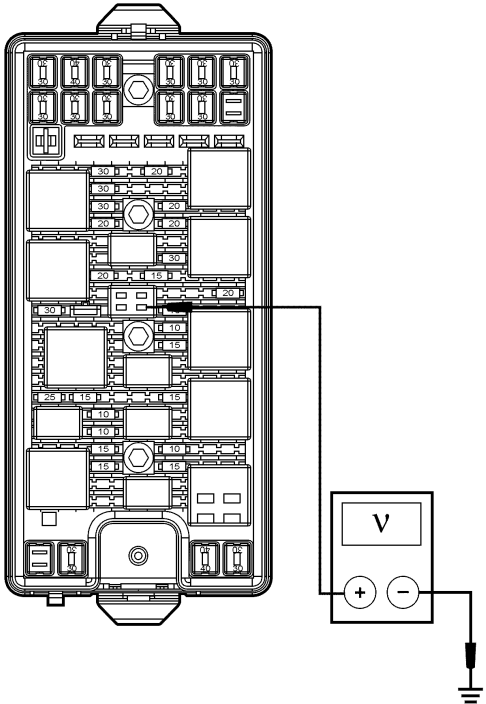
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
P1	USE THE RECORDED DTCs FROM THE SJB SELF-TEST	Yes GO to P2 . No GO to P8 .
	<ul style="list-style-type: none"> • Ignition OFF. • Retrieve the recorded results from the SJB self-test. • Is DTC B2030 present? 	
P2	CHECK THE FOG LAMP RELAY (DTC B2030)	Yes REMOVE the known good relay. INSTALL a new fog lamp relay. CLEAR the DTCs. REPEAT the self-test. No REMOVE the known good relay. GO to P3 .
	<ul style="list-style-type: none"> • Disconnect: Fog Lamp Relay. • Substitute a known good relay and recheck the system. • Do the fog lamps operate correctly? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

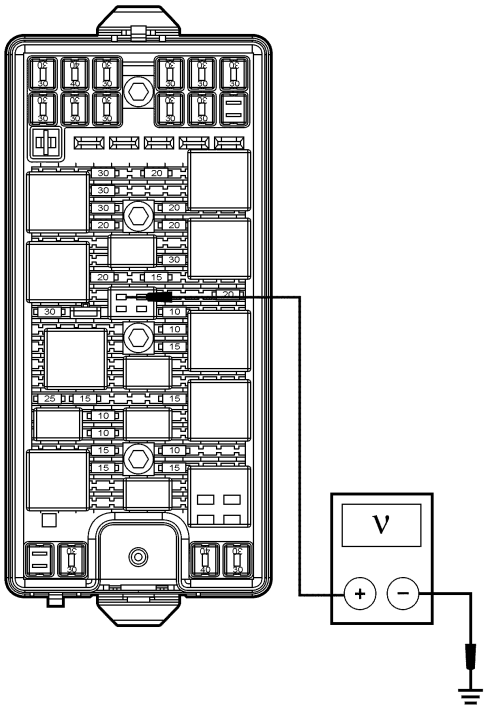
PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
P3	<p>CHECK VOLTAGE TO THE RELAY COIL</p> <ul style="list-style-type: none"> Measure the voltage between the fog lamp relay pin 86, BEC face side and ground.  <p>N0053606</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to P4.</p> <p>No VERIFY the BEC fuse 58 (15A) is OK. If OK, INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p>
P4	<p>CHECK THE FOG LAMP RELAY COIL GROUND CONTROL CIRCUIT FOR SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> Disconnect: SJB C2280c. Ignition ON. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

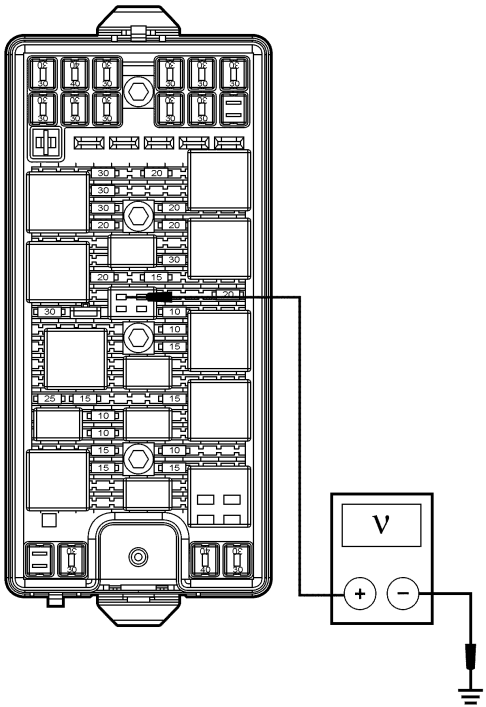
PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
P4	<p>CHECK THE FOG LAMP RELAY COIL GROUND CONTROL CIRCUIT FOR SHORT TO VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the fog lamp relay pin 85, circuit 1347 (DB/WH), BEC face side and ground.  <p>The diagram shows a top-down view of a fuse block with various fuses and relays. A voltmeter (V) is connected to a specific pin (pin 85) and a ground symbol. The voltmeter has a '+' sign on the left and a '-' sign on the right. A ground symbol is shown below the voltmeter.</p> <p>N0053605</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes GO to P5.</p> <p>No GO to P6.</p>
P5	<p>CHECK CIRCUIT 1347 (DB/WH) FOR SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. Ignition ON. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

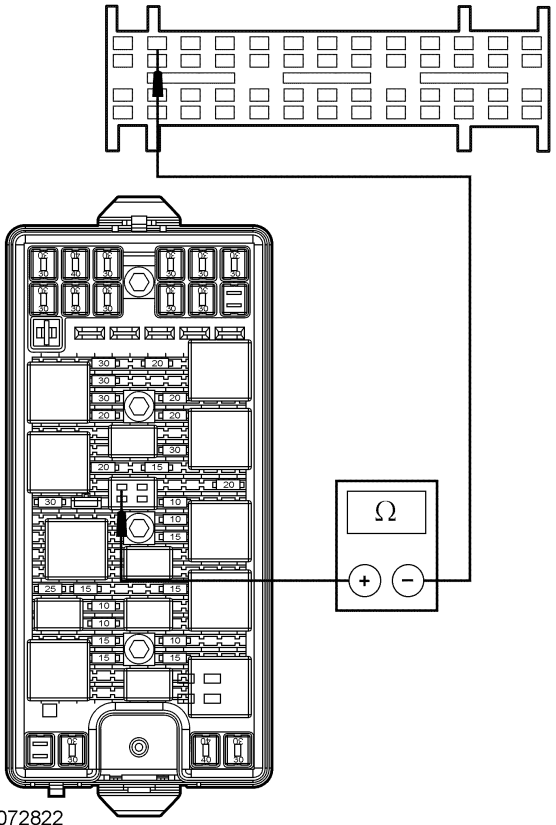
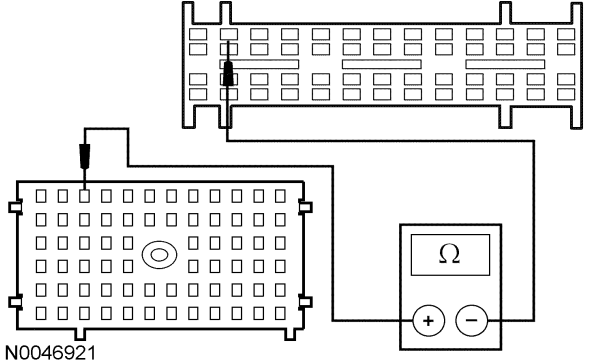
PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
P5	<p>CHECK CIRCUIT 1347 (DB/WH) FOR SHORT TO VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the fog lamp relay pin 85, circuit 1347 (DB/WH), BEC face side and ground. <div style="text-align: center;">  <p>N0053605</p> </div> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
P6	<p>CHECK THE FOG LAMP RELAY COIL GROUND CONTROL CIRCUIT FOR AN OPEN</p> <ul style="list-style-type: none"> Ignition OFF. 	

(Continued)

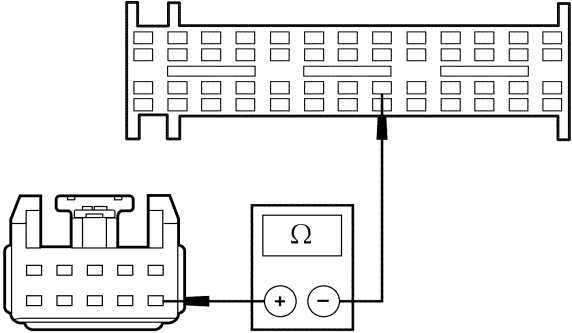
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE (Continued)

Test Step	Result / Action to Take
<p>P6 CHECK THE FOG LAMP RELAY COIL GROUND CONTROL CIRCUIT FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the fog lamp relay pin 85, circuit 1347 (DB/WH), BEC face side and the SJB C2280c-2, circuit 1347 (DB/WH), harness side.  <p>N0072822</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to P12.</p> <p>No GO to P7.</p>
<p>P7 CHECK CIRCUIT 1347 (DB/WH) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Measure the resistance between the BEC C1035a-A3, circuit 1347 (DB/WH), harness side and the SJB C2280c-2, circuit 1347 (DB/WH), harness side.  <p>N0046921</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
<p>P8 CHECK THE FOG LAMP SWITCH INPUT</p> <ul style="list-style-type: none"> Ignition ON. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST P: THE FOG LAMPS ARE INOPERATIVE (Continued)**

Test Step		Result / Action to Take
P8	CHECK THE FOG LAMP SWITCH INPUT (Continued)	
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: SJB DataLogger. Monitor the SJB headlamp switch PID (FOG_SW) while placing the headlamp switch in the PARKING LAMPS ON position and engaging the fog lamp switch. Does the PID indicate the fog lamp switch is active? 	Yes GO to P11 . No GO to P9 .
P9	CHECK THE HEADLAMP SWITCH	
	<ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the OFF position. Disconnect: Headlamp Switch C205. Carry out the headlamp switch component test. Refer to Wiring Diagrams Cell 149 for component testing. Is the headlamp switch OK? 	Yes GO to P10 . No INSTALL a new headlamp switch. REFER to Headlamp Switch in this section. TEST the system for normal operation.
P10	CHECK CIRCUIT 1669 (OG/LG) FOR AN OPEN	
	<ul style="list-style-type: none"> Disconnect: SJB C2280b. Measure the resistance between the headlamp switch C205-6, circuit 1669 (OG/LG), harness side and the SJB C2280b-34, circuit 1669 (OG/LG), harness side.  <p>N0046922</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	Yes GO to P12 . No REPAIR the circuit. TEST the system for normal operation.
P11	CHECK THE FOG LAMP RELAY (NO DTCs)	
	<ul style="list-style-type: none"> Ignition OFF. Place the headlamp switch in the OFF position. Substitute a known good relay and recheck the system. Do the fog lamps operate correctly? 	Yes REMOVE the known good relay. INSTALL a new fog lamp relay. TEST the system for normal operation. No REMOVE the known good relay. INSTALL a new BEC. TEST the system for normal operation.
P12	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	Yes INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation. No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.

Pinpoint Test Q: An Individual Fog Lamp Is Inoperative

Refer to [Wiring Diagrams Cell 86, Fog Lamps for schematic and connector information](#).

Normal Operation

When the fog lamp relay is energized, voltage is routed through circuits 1721 (LB/BK) and 1776 (TN/OG) to the LH and RH fog lamps, respectively. The fog lamps are provided ground through circuit 1205 (BK).

DIAGNOSIS AND TESTING (Continued)

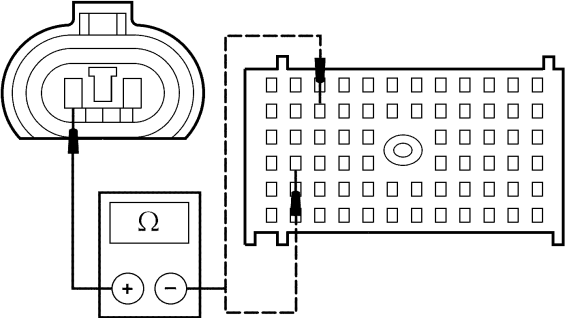
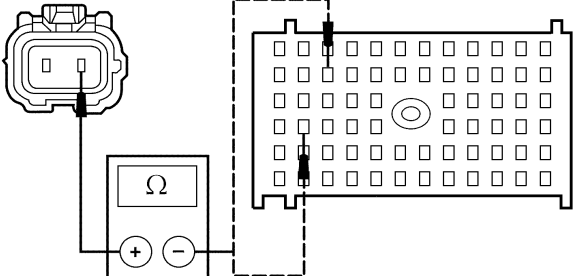
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- BEC

PINPOINT TEST Q: AN INDIVIDUAL FOG LAMP IS INOPERATIVE

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

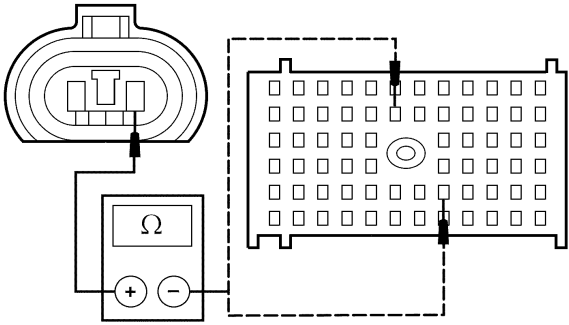
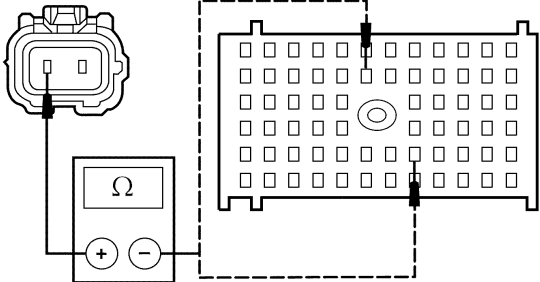
NOTE: Make sure the fog lamp bulb is good before continuing diagnostics.

	Test Step	Result / Action to Take
Q1	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Inoperative Fog Lamp. • Disconnect: BEC C1035c. • For 4.0L or 4.6L, measure the resistance between the LH fog lamp C152-2, circuit 1205 (BK), harness side and the BEC C1035c-E10, circuit 1205 (BK), harness side; or between the RH fog lamp C162-2, circuit 1205 (BK), harness side and the BEC C1035c-C11, circuit 1205 (BK), harness side.  <p>N0046924</p> <ul style="list-style-type: none"> • For 5.4L, measure the resistance between the LH fog lamp C1322-B, circuit 1205 (BK), harness side and the BEC C1035c-E10, circuit 1205 (BK), harness side; or between the RH fog lamp C1323-B, circuit 1205 (BK), harness side and the BEC C1035c-C11, circuit 1205 (BK), harness side.  <p>N0072823</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to Q2.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST Q: AN INDIVIDUAL FOG LAMP IS INOPERATIVE (Continued)

	Test Step	Result / Action to Take
Q2	<p>CHECK CIRCUIT 1776 (TN/OG) OR CIRCUIT 1721 (LB/BK) FOR AN OPEN</p>	
	<ul style="list-style-type: none"> For 4.0L or 4.6L, measure the resistance between the LH fog lamp C152-1, circuit 1721 (LB/BK), harness side and the BEC C1035c-B5, circuit 1721 (LB/BK), harness side; or between the RH fog lamp C162-1, circuit 1776 (TN/OG), harness side and the BEC C1035c-E7, circuit 1776 (TN/OG), harness side.  <p>N0046925</p> <ul style="list-style-type: none"> For 5.4L, measure the resistance between the LH fog lamp C1322-A, circuit 1721 (LB/BK), harness side and the BEC C1035c-B5, circuit 1721 (LB/BK), harness side; or between the RH fog lamp C1323-A, circuit 1776 (TN/OG), harness side and the BEC C1035c-E7, circuit 1776 (TN/OG), harness side.  <p>N0072824</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>

Pinpoint Test R: The Fog Lamps Are On Continuously

Refer to Wiring Diagrams Cell 86, Fog Lamps for schematic and connector information.

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

DIAGNOSIS AND TESTING (Continued)

Normal Operation

The smart junction box (SJB) sends a voltage reference signal to the headlamp switch through circuit 1669 (OG/LG). When the fog lamp switch is engaged, the voltage signal is routed to ground. The fog lamp relay is provided voltage through the bussed electrical center (BEC). When the ignition switch is in the ON position, the parking lamps are on, and the SJB detects a request for the fog lamps, the SJB provides a ground for the fog lamp relay coil through circuit 1347 (DB/WH). When the relay is energized, voltage is routed through circuits 1721 (LB/BK) and 1776 (TN/OG) to the LH and RH fog lamps, respectively.

- DTC B2030 (Front Fog Lamp Relay Ckt Failure) — is a continuous and on-demand DTC that sets when the SJB detects a short to ground from the fog lamp relay coil ground controlled circuit.

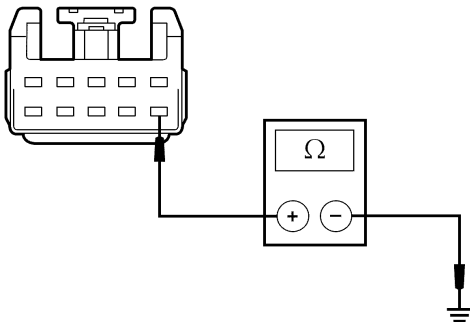
- DTC B2254 (Front Fog Lamp Switch Failure) — is an on-demand DTC that sets when the SJB detects a short to ground from the fog lamp switch input circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Fog lamp relay
- Headlamp switch
- BEC
- SJB

PINPOINT TEST R: THE FOG LAMPS ARE ON CONTINUOUSLY

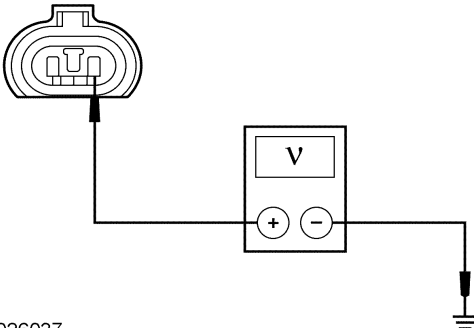
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
R1	RETRIEVE THE RECORDED DTCs FROM THE SJB SELF-TEST <ul style="list-style-type: none"> • Ignition OFF. • Retrieve the recorded results from the SJB self-test. • Was DTC B2030 or B2254 present? 	Yes For DTC B2254, GO to R2 . For DTC B2030, GO to R4 . No GO to R6 .
R2	CHECK THE HEADLAMP SWITCH <ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Headlamp Switch C205. • Carry out the headlamp switch component test. Refer to Wiring Diagrams Cell 149 for component testing. • Is the headlamp switch OK? 	Yes GO to R3 . No INSTALL a new headlamp switch. CLEAR the DTCs. REPEAT the self-test.
R3	CHECK CIRCUIT 1669 (OG/LG) FOR A SHORT TO GROUND <ul style="list-style-type: none"> • Disconnect: SJB C2280b. • Measure the resistance between the headlamp switch C205-6, circuit 1669 (OG/LG), harness side and ground. <div style="text-align: center;">  <p>N0037299</p> </div> <ul style="list-style-type: none"> • Is the resistance greater than 10,000 ohms? 	Yes GO to R9 . No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.

(Continued)

DIAGNOSIS AND TESTING (Continued)

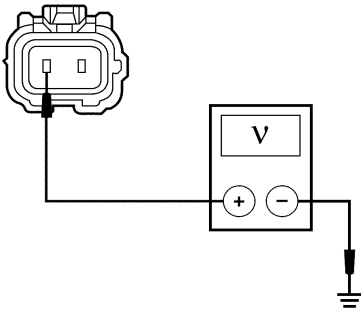
PINPOINT TEST R: THE FOG LAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
R4	CHECK THE SJB	Yes GO to R5 . No GO to R9 .
	<ul style="list-style-type: none"> Disconnect: SJB C2280c. Ignition ON. Do the fog lamps continue to illuminate? 	
R5	CHECK CIRCUIT 1347 (DB/WH) FOR A SHORT TO GROUND	Yes INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test. No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. Ignition ON. Do the fog lamps continue to illuminate? 	
R6	CHECK THE FOG LAMP RELAY	Yes GO to R7 . No INSTALL a new fog lamp relay. TEST the system for normal operation.
	<ul style="list-style-type: none"> Disconnect: Fog Lamp Relay. Ignition ON. Do the fog lamps continue to illuminate? 	
R7	CHECK CIRCUIT 2024 (VT/OG) FOR A SHORT TO VOLTAGE	Yes GO to R8 . No REPAIR the circuit. TEST the system for normal operation.
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. Ignition ON. Do the fog lamps continue to illuminate? 	
R8	CHECK CIRCUITS 1721 (LB/BK) (LH FOG LAMP) AND 1776 (TN/OG) (RH FOG LAMP) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035c. Ignition ON. For 4.0L or 4.6L, measure the voltage between the LH fog lamp C152-1, circuit 1721 (LB/BK), harness side and ground; or between the RH fog lamp C162-1, circuit 1776 (TN/OG), harness side and ground.  <p>A0026037</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST R: THE FOG LAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
R8	CHECK CIRCUITS 1721 (LB/BK) (LH FOG LAMP) AND 1776 (TN/OG) (RH FOG LAMP) FOR A SHORT TO VOLTAGE (Continued)	
<ul style="list-style-type: none"> For 5.4L, measure the voltage between the LH fog lamp C1322-A, circuit 1721 (LB/BK), harness side and ground; or between the RH fog lamp C1323-A, circuit 1776 (TN/OG), harness side and ground.  <p>N0072825</p> <ul style="list-style-type: none"> Is any voltage present? 		<p>Yes REPAIR the circuit in question. TEST the system for normal operation.</p> <p>No INSTALL a new BEC. TEST the system for normal operation.</p>
R9	CHECK FOR CORRECT SJB OPERATION	
<ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

Pinpoint Test S: The Fog Lamp On Indicator Is Inoperative

Refer to [Wiring Diagrams Cell 86, Fog Lamps for schematic and connector information.](#)

Normal Operation

When the fog lamp relay is energized, the bussed electrical center (BEC) routes voltage through circuit 2024 (VT/OG) to the headlamp switch.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Headlamp switch
- BEC

PINPOINT TEST S: THE FOG LAMPS ON INDICATOR IS INOPERATIVE

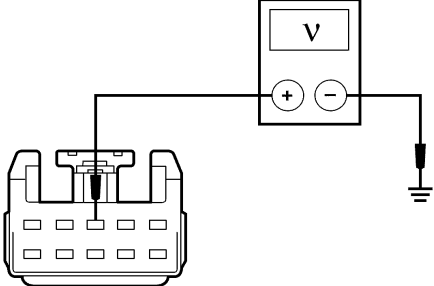
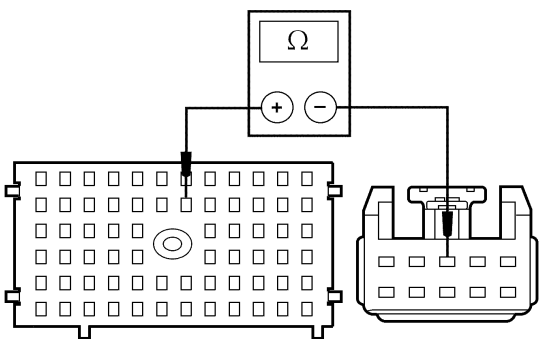
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
S1	CHECK CIRCUIT 2024 (VT/OG) FOR VOLTAGE	
<ul style="list-style-type: none"> Ignition OFF. Disconnect: Headlamp Switch C205. Enter the following diagnostic mode on the scan tool: SJB DataLogger. Select the SJB fog lamp relay (FOG__RLY) active command. Command the fog lamps on. 		

(Continued)

DIAGNOSIS AND TESTING (Continued)

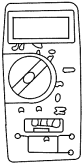
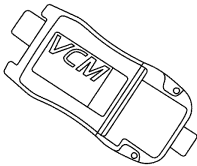
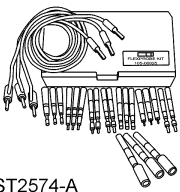
PINPOINT TEST S: THE FOG LAMPS ON INDICATOR IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
S1	<p>CHECK CIRCUIT 2024 (VT/OG) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the headlamp switch C205-3, circuit 2024 (VT/OG), harness side and ground.  <p>N0046945</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes INSTALL a new headlamp switch. REFER to Headlamp Switch in this section. TEST the system for normal operation.</p> <p>No GO to S2.</p>
S2	<p>CHECK CIRCUIT 2024 (VT/OG) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: BEC C1035a. Measure the resistance between the BEC C1035a-B7, circuit 2024 (VT/OG), harness side and the headlamp switch C205-3, circuit 2024 (VT/OG), harness side.  <p>N0072849</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

DIAGNOSIS AND TESTING

Reversing Lamps

Special Tool(s)

 <p>ST1137-A</p>	<p>73III Automotive Meter 105-R0057 or equivalent</p>
 <p>ST2834-A</p>	<p>Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool</p>
 <p>ST2574-A</p>	<p>Flex Probe Kit 105-R025C or equivalent</p>

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The digital transmission range (TR) sensor (automatic transmission) or the reversing lamp switch (manual transmission) is hardwired to the PCM, which monitors the transmission gear status. When the PCM detects the transmission is in REVERSE (R), the PCM sends a message over the network indicating the transmission is in REVERSE (R). When the SJB receives this message, the SJB provides voltage to the reversing lamps.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical or electrical damage.

Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> • Reversing lamp switch (manual transmission) • Digital transmission range (TR) sensor (automatic transmission) 	<ul style="list-style-type: none"> • Bussed electrical center (BEC) fuse 62 (20A) • Wiring, terminals or connectors • Bulb(s) • Smart junction box (SJB)

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

4. **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).

5. **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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.

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

- Verify the ignition key is in the ON position.
- Verify the scan tool operation with a known good vehicle.
- Refer to Section 418-00 to diagnose no response from the PCM.

7. Carry out the network test:

- If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
- If the network test passes, retrieve and record the continuous memory DTCs.

DIAGNOSIS AND TESTING (Continued)

8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B2525	Left Rear Backup Lamp Circuit Failure	If the reversing lamp is inoperative, GO to Pinpoint Test U . If the reversing lamp is always on, GO to Pinpoint Test V .
B2532	Right Rear Backup Lamp Circuit Short to Battery	If the reversing lamp is inoperative, GO to Pinpoint Test U . If the reversing lamp is always on, GO to Pinpoint Test V .
All other DTCs	—	REFER to Section 419-10.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> • No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • SJB 	<ul style="list-style-type: none"> • REFER to Section 418-00.
<ul style="list-style-type: none"> • Both reversing lamps are inoperative 	<ul style="list-style-type: none"> • Fuse • Wiring, terminals or connectors • Reversing lamp switch (manual transmission) • Digital transmission range (TR) sensor input (automatic transmission) concern • Bussed electrical center (BEC) • SJB • PCM 	<ul style="list-style-type: none"> • GO to Pinpoint Test T.
<ul style="list-style-type: none"> • An individual reversing lamp is inoperative 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • SJB 	<ul style="list-style-type: none"> • GO to Pinpoint Test U.
<ul style="list-style-type: none"> • The reversing lamps are on continuously 	<ul style="list-style-type: none"> • Wiring, terminals or connectors • Reversing lamp switch (manual transmission) • Digital transmission range (TR) sensor input (automatic transmission) concern • SJB • PCM 	<ul style="list-style-type: none"> • GO to Pinpoint Test V.

DIAGNOSIS AND TESTING (Continued)

Pinpoint Tests

Pinpoint Test T: Both Reversing Lamps Are Inoperative

Refer to [Wiring Diagrams Cell 93, Reversing Lamps](#) for schematic and connector information.

Normal Operation — Manual Transmission

The powertrain control module (PCM) sends a voltage reference signal to the reversing lamp switch through circuit 1789 (VT/WH). When the transmission is placed in REVERSE (R), the reversing lamp switch closes and routes the signal back to the PCM through circuit 359 (GY/RD). The PCM then sends a message to the smart junction box (SJB), through the instrument cluster (IC) gateway function, over the communication network. The SJB then provides voltage to the reversing lamps. The SJB is provided voltage from the bussed electrical center (BEC) through circuit 1679 (WH/YE) to power the reversing lamps.

Normal Operation — Automatic Transmission

When the PCM detects the transmission is in REVERSE (R), a message is sent to the SJB, through the instrument cluster (IC) gateway function, over the communication network. The SJB then provides voltage to the reversing lamps. The SJB is provided voltage from the BEC through circuit 1679 (WH/YE) to power the reversing lamps.

The PCM sets DTCs if any faults with the digital transmission range (TR) sensor inputs are detected.

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Reversing lamp switch (manual transmission)
- Digital transmission range (TR) sensor input (automatic transmission) concern
- BEC
- SJB
- PCM

PINPOINT TEST T: BOTH REVERSING LAMPS ARE INOPERATIVE

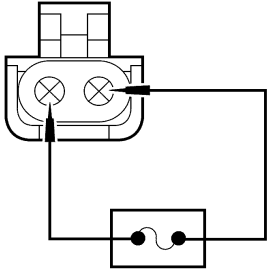
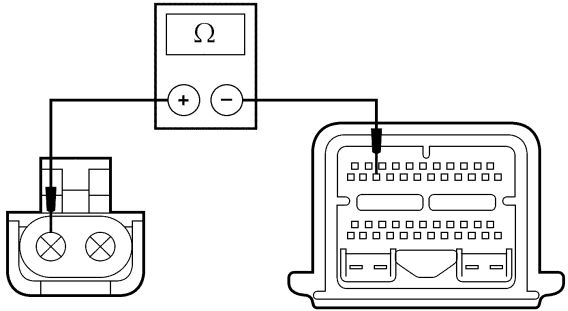
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
T1	CHECK THE SJB OUTPUT	<p>Yes For vehicles with an automatic transmission, REFER to Section 307-01 to continue diagnosis of the digital transmission range (TR) sensor. For vehicles with a manual transmission, GO to T2.</p> <p>No GO to T4.</p>
	<ul style="list-style-type: none"> • Ignition ON. • Enter the following diagnostic mode on the scan tool: SJB DataLogger. • Select the SJB reversing lamps (BACKUP__1, BACKUP__2) active command. Command the reversing lamps on. • Do the reversing lamps illuminate? 	
T2	CHECK THE REVERSING LAMP SWITCH	
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Reversing Lamp Switch C169. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST T: BOTH REVERSING LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
T2	<p>CHECK THE REVERSING LAMP SWITCH (Continued)</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper wire between the reversing lamp switch C169-A, circuit 1789 (VT/WH), harness side and the reversing lamp switch C169-B, circuit 359 (GY/RD), harness side.  <p>N0011231</p> <ul style="list-style-type: none"> Ignition ON. Do the reversing lamps illuminate? 	<p>Yes REMOVE the jumper wire. INSTALL a new reversing lamp switch. REFER to Reversing Lamp Switch in this section. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to T3.</p>
T3	<p>CHECK CIRCUITS 1789 (VT/WH) AND 359 (GY/RD) FOR AN OPEN</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect: PCM C175t. Measure the resistance between the reversing lamp switch C169-A, circuit 1789 (VT/WH), harness side and the PCM C175t-21, circuit 1789 (VT/WH), harness side.  <p>N0072826</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST T: BOTH REVERSING LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
T3	CHECK CIRCUITS 1789 (VT/WH) AND 359 (GY/RD) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the reversing lamp switch C169-B, circuit 359 (GY/RD), harness side and the PCM C175t-41, circuit 359 (GY/RD), harness side. <p>N0072827</p> <ul style="list-style-type: none"> Are the resistances less than 5 ohms? 	<p>Yes GO to T7.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>
T4	CHECK CIRCUIT 1679 (WH/YE) FOR VOLTAGE	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: SJB C2280h. Measure the voltage between the SJB C2280h-29, circuit 1679 (WH/YE), harness side and ground. <p>N0046932</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to T6.</p> <p>No VERIFY the BEC fuse 62 (20A) is OK. If OK, GO to T5.</p>
T5	CHECK CIRCUIT 1679 (WH/YE) FOR AN OPEN	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: BEC C1035a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST T: BOTH REVERSING LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
T5	<p>CHECK CIRCUIT 1679 (WH/YE) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the SJB C2280h-29, circuit 1679 (WH/YE), harness side and the BEC C1035a-D9, circuit 1679 (WH/YE), harness side. <p>N0046933</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new BEC. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
T6	<p>CHECK FOR CORRECT SJB OPERATION</p> <ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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>
T7	<p>CHECK FOR CORRECT PCM OPERATION</p> <ul style="list-style-type: none"> Disconnect all the PCM connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the PCM 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 PCM. REFER to Section 303-14. 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 U: An Individual Reversing Lamp Is Inoperative

Refer to [Wiring Diagrams Cell 93, Reversing Lamps](#) for schematic and connector information.

DIAGNOSIS AND TESTING (Continued)

Normal Operation

When the transmission is placed in REVERSE (R), the PCM sends a message to the smart junction box (SJB), through the instrument cluster (IC) gateway function, over the communication network. The SJB then provides voltage through circuits 1362 (DG/OG) and 1367 (WH/YE) to the LH and RH reversing lamps, respectively. Ground for the lamps is provided through circuit 1205 (BK).

- DTC B2525 (Left Rear Backup Lamp Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the LH reversing lamp voltage supply circuit.

- DTC B2532 (Right Rear Backup Lamp Circuit Short to Battery) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to ground from the RH reversing lamp voltage supply circuit.

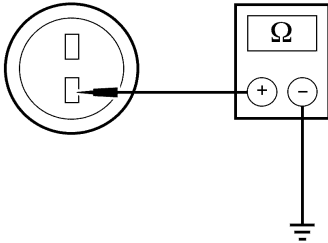
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- SJB

PINPOINT TEST U: AN INDIVIDUAL REVERSING LAMP IS INOPERATIVE

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

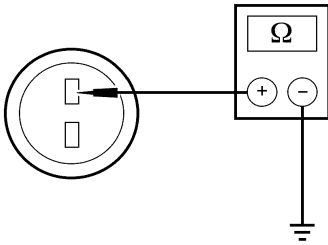
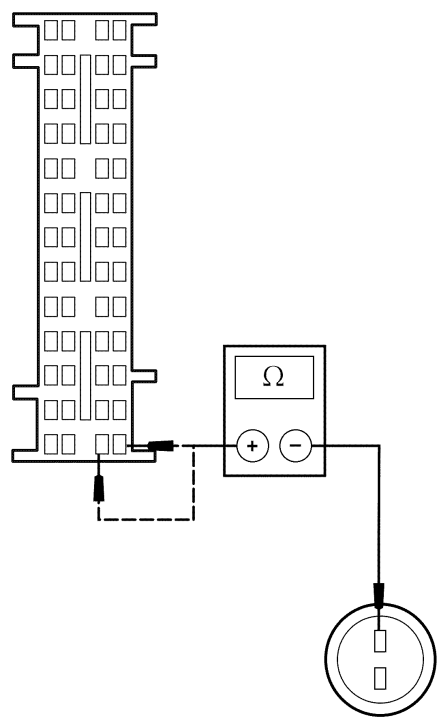
NOTE: Make sure the bulb is good before continuing diagnostics.

Test Step		Result / Action to Take
U1	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	
	<ul style="list-style-type: none"> • Ignition OFF. • Disconnect: Inoperative Reversing Lamp. • Measure the resistance between the LH reversing lamp C451-1, circuit 1205 (BK), harness side and ground; or between the RH reversing lamp C461-1, circuit 1205 (BK), harness side and ground. <div style="text-align: center;">  </div> <p>N0011227</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to U2.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
U2	CHECK CIRCUIT 1362 (DG/OG) OR CIRCUIT 1367 (WH/YE) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> • Disconnect: SJB C2280d. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST U: AN INDIVIDUAL REVERSING LAMP IS INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>U2</p>	<p>CHECK CIRCUIT 1362 (DG/OG) OR CIRCUIT 1367 (WH/YE) FOR A SHORT TO GROUND (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the LH reversing lamp C451-2, circuit 1367 (WH/YE), harness side and ground; or between the RH reversing lamp C461-2, circuit 1367 (WH/YE), harness side and ground.  <p>N0011229</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to U3.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
<p>U3</p>	<p>CHECK CIRCUIT 1362 (DG/OG) OR CIRCUIT 1367 (WH/YE) FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the LH reversing lamp C451-2, circuit 1367 (WH/YE), harness side and the SJB C2280d-26, circuit 1362 (DG/OG), harness side; or between the RH reversing lamp C461-2, circuit 1367 (WH/YE), harness side and the SJB C2280d-13, circuit 1367 (WH/YE), harness side.  <p>N0046934</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to U4.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST U: AN INDIVIDUAL REVERSING LAMP IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
U4	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test V: The Reversing Lamps Are On Continuously

Refer to Wiring Diagrams Cell 93, Reversing Lamps for schematic and connector information.

Normal Operation — Manual Transmission

The PCM sends a voltage reference signal to the reversing lamp switch through circuit 1789 (VT/WH). When the transmission is placed in REVERSE (R), the reversing lamp switch closes and routes the signal back to the PCM through circuit 359 (GY/RD). The PCM then sends a message to the smart junction box (SJB), through the instrument cluster (IC) gateway function, over the communication network. The SJB then provides voltage through circuits 1362 (DG/OG) and 1367 (WH/YE) to the LH and RH reversing lamps, respectively.

Normal Operation — Automatic Transmission

When the PCM detects the transmission is in REVERSE (R), a message to the smart junction box (SJB), through the instrument cluster (IC) gateway function, over the communication network. The SJB then provides voltage through circuits 1362 (DG/OG) and 1367 (WH/YE) to the LH and RH reversing lamps, respectively.

The PCM sets DTCs if any faults with the digital transmission range (TR) sensor inputs are detected.

- DTC B2525 (Left Rear Backup Lamp Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects a short to voltage on the LH reversing lamp voltage supply circuit.
- DTC B2532 (Right Rear Backup Lamp Circuit Short to Battery) — is a continuous and on-demand DTC that sets when the SJB detects a short to voltage on the RH reversing lamp voltage supply circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Reversing lamp switch (manual transmission)
- Digital transmission range (TR) sensor input (automatic transmission) concern
- SJB
- PCM

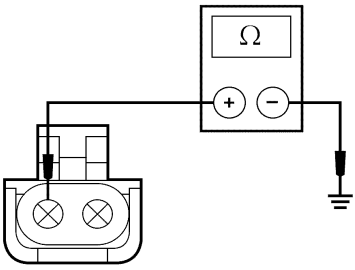
PINPOINT TEST V: THE REVERSING LAMPS ARE ON CONTINUOUSLY

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

Test Step		Result / Action to Take
V1	RETRIEVE THE RECORDED DTCs FROM THE SJB SELF-TEST	<p>Yes GO to V2.</p> <p>No GO to V3.</p>
	<ul style="list-style-type: none"> • Ignition OFF. • Retrieve the recorded results from the SJB self-test. • Was DTC B2525 or B2532 present? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST V: THE REVERSING LAMPS ARE ON CONTINUOUSLY (Continued)**

Test Step		Result / Action to Take
V2	CHECK CIRCUITS 1362 (DG/OG) AND 1367 (WH/YE) FOR A SHORT TO VOLTAGE	
	<ul style="list-style-type: none"> Disconnect: SJB C2280d. Ignition ON. Does either reversing lamp continue to illuminate? 	<p>Yes REPAIR circuit 1362 (DG/OG) (LH reversing lamp) or circuit 1367 (WH/YE) (RH reversing lamp) as necessary. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to V6.</p>
V3	CHECK THE PCM	
	<ul style="list-style-type: none"> Disconnect: PCM C175t. Ignition ON. Do the reversing lamps continue to illuminate? 	<p>Yes GO to V6.</p> <p>No If equipped with a manual transmission, GO to V4. If equipped with an automatic transmission, REFER to Section 307-01 to continue diagnosis of the digital transmission range (TR) sensor.</p>
V4	CHECK THE REVERSING LAMP SWITCH	
	<ul style="list-style-type: none"> Ignition OFF. Connect: PCM C175t. Disconnect: Reversing Lamp Switch C169. Ignition ON. Do the reversing lamps continue to illuminate? 	<p>Yes GO to V5.</p> <p>No INSTALL a new reversing lamp switch. REFER to Reversing Lamp Switch in this section. TEST the system for normal operation.</p>
V5	CHECK CIRCUIT 1789 (VT/WH) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect: PCM C175t. Measure the resistance between the reversing lamp switch C169-A, circuit 1789 (VT/WH), harness side and ground. <div style="text-align: center;">  <p>The diagram illustrates a testing procedure. A multimeter with a resistance symbol (Ω) is shown. One lead is connected to a terminal on a reversing lamp switch, and the other lead is connected to a ground symbol. The switch has two lamp symbols on its face.</p> </div> <p>N0072828</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to V7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
V6	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Ignition OFF. Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>
V7	CHECK FOR CORRECT PCM OPERATION	
	<ul style="list-style-type: none"> Ignition OFF. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST V: THE REVERSING LAMPS ARE ON CONTINUOUSLY (Continued)**

Test Step		Result / Action to Take
V7	CHECK FOR CORRECT PCM OPERATION (Continued)	
	<ul style="list-style-type: none"> • Disconnect all the PCM connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the PCM 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 PCM. REFER to Section 303-14. 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>

DIAGNOSIS AND TESTING

Daytime Running Lamps (DRL)

Principles of Operation

NOTE: The Smart Junction Box (SJB) is also known as the Generic Electronic Module (GEM).

NOTE: The Daytime Running Lamps (DRL) is not a programmable parameter for this vehicle.

The Smart Junction Box (SJB) controls the DRL by using various inputs to determine whether or not the DRL should be illuminated. These inputs include:

- Ignition switch position
- Parking brake switch input
- Headlamps on or off
- Transaxle gear selection

For vehicles with halogen headlamps, when the DRL is active, the SJB provides a pulse-width modulated voltage to the low beam headlamps. This illuminates the headlamps at a reduced intensity.

For vehicles with High Intensity Discharge (HID) headlamps, the SJB activates the fog lamp relay. This illuminates the fog lamps at full intensity.

Inspection and Verification

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

NOTE: Make sure the headlamp switch is in the OFF position.

NOTE: Make sure the multifunction switch is in the LOW BEAM position.

3. **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).

4. **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 Section 418-00, No Power To The Scan Tool, to diagnose no power to the scan tool.
5. If the scan tool does not communicate with the vehicle:
 - Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.
 - Refer to Section 418-00 to diagnose no response from the PCM.
 6. Carry out the network test.
 - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
 7. If any DTCs are retrieved, refer to the Diagnostic Trouble Code (DTC) Chart in Section 419-10.
 8. If no DTCs are retrieved, GO to [Symptom Chart](#).

DIAGNOSIS AND TESTING (Continued)

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The Daytime Running Lamps (DRL) are inoperative 	<ul style="list-style-type: none"> Parking brake switch input concern Headlamp operation Ignition switch input concern Smart Junction Box (SJB) 	<ul style="list-style-type: none"> GO to Pinpoint Test W.
<ul style="list-style-type: none"> The Daytime Running Lamps (DRL) are on with the parking brake set 	<ul style="list-style-type: none"> Parking brake switch input SJB 	<ul style="list-style-type: none"> With the ignition switch on, apply the parking brake and observe the brake warning indicator. <ul style="list-style-type: none"> If the brake warning indicator is inoperative, REFER to Section 413-01 to diagnose the brake warning indicator. If the brake warning indicator illuminates, INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation.

Pinpoint Tests

Pinpoint Test W: The Daytime Running Lamps (DRL) Are Inoperative

Normal Operation

When the ignition switch is in the RUN position, the parking brake is not applied and the headlamps are not requested on from the headlamp switch, the Smart Junction Box (SJB) provides a pulse-width modulated voltage to the low beam headlamps. This illuminates the headlamps at a reduced intensity.

This pinpoint test is intended to diagnose the following:

- Parking brake switch input concern
- Headlamp operation
- Ignition switch input concern
- SJB

PINPOINT TEST W: THE DRL ARE INOPERATIVE

Test Step		Result / Action to Take
W1	VERIFY THE DRL OPERATION	<p>Yes The system is operating correctly. INFORM the customer of the conditions required for the DRL to operate correctly.</p> <p>No GO to W2.</p>
	<ul style="list-style-type: none"> Ignition ON. Verify the parking brake is fully released. Are the DRL illuminated? 	
W2	CHECK THE BRAKE WARNING INDICATOR (DRL INOPERATIVE)	<p>Yes REFER to Section 413-01 to diagnose the brake warning indicator.</p> <p>No For vehicles with halogen headlamps, GO to W3. For vehicles with High Intensity Discharge (HID) headlamps, GO to W4.</p>
	<ul style="list-style-type: none"> Observe the brake warning indicator. Is the brake warning indicator illuminated? 	

(Continued)

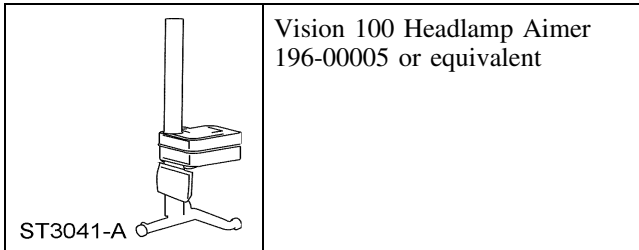
DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST W: THE DRL ARE INOPERATIVE (Continued)**

Test Step		Result / Action to Take
W3	CHECK THE OPERATION OF THE HEADLAMPS	Yes GO to W5 . No REFER to Headlamps in this section.
	<ul style="list-style-type: none"> Place the headlamp switch in the HEADLAMPS ON position and observe the headlamps. Do the headlamps operate correctly? 	
W4	CHECK THE OPERATION OF THE FOG LAMPS	Yes GO to W5 . No REFER to Fog Lamps in this section.
	<ul style="list-style-type: none"> Place the headlamp switch in the PARKING LAMPS ON position and engage the fog lamp switch. Do the fog lamps operate correctly? 	
W5	CHECK THE IGNITION SWITCH INPUT	Yes INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation. No REFER to Section 211-05 to diagnose the input from the ignition switch.
	<ul style="list-style-type: none"> Place the headlamp switch in the OFF position. Enter the following diagnostic mode on the scan tool: SJB DataLogger. Monitor the SJB ignition switch PID (IGN_SW) while cycling the ignition switch through all its positions. Does the PID agree with the ignition switch positions? 	

GENERAL PROCEDURES

Headlamp Adjustment

Special Tool(s)



Headlamp Aiming

- The headlamp aiming procedure depends on what type of beam pattern the headlamp is equipped with. Vehicles may come equipped with VOL or VOR headlamps. To identify the headlamp beam pattern, look on the headlamp lens. Molded in small letters on the headlamp lens is one of the following:
 - VOL and SAE
 - VOR and SAE
- Once the headlamp beam pattern is identified, aim the headlamps using one of the following methods as applicable.
 - Photometric aimers can aim VOL- and VOR- headlamps. This is the preferred method of headlamp aiming.
 - Visual or screen method aiming can be used to aim VOL- and VOR- headlamps.
 - Mechanical aimers cannot be used with VOR- or VOL-type headlamps. Aerodynamic lamps that can be aimed mechanically have 3 nibs molded into the lens of the lamp.

Photometric Aiming

- For the photometric aiming procedure, refer to the appropriate photometric headlamp aimer instruction manual.

Screen Method Aiming

All headlamp types

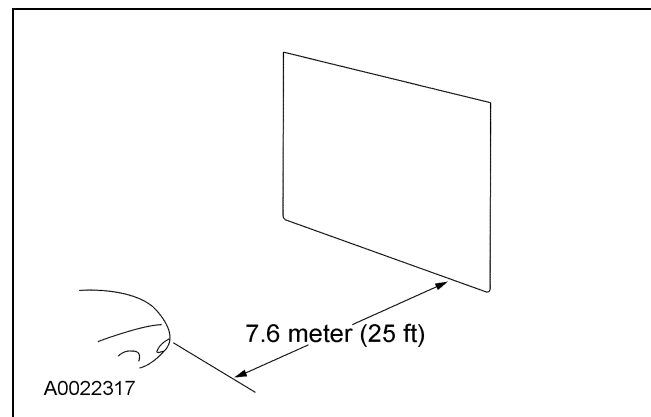
NOTE: Horizontal aim is not necessary for VOL or VOR headlamps.

NOTE: Consult your state vehicle inspection manual for recommended tolerance ranges for visual aiming.

NOTE: The sight shield may need to be positioned or removed for access to the adjusters.

- Before starting headlamp adjustment:
 - check the tire inflation.
 - check that no other load is in the vehicle other than a half tank of fuel.
 - check that the headlamps are clean.
 - check for correct headlamp operation.
 - check that the vehicle is on level ground.
 - if the vehicle is equipped with air suspension, make sure that the switch is on.
- NOTE:** The vertical wall or screen must be a minimum of 2.4 m (8 ft) wide.

Park the vehicle on a level surface approximately 7.6 m (25 ft) from the vertical wall or screen directly in front of it.

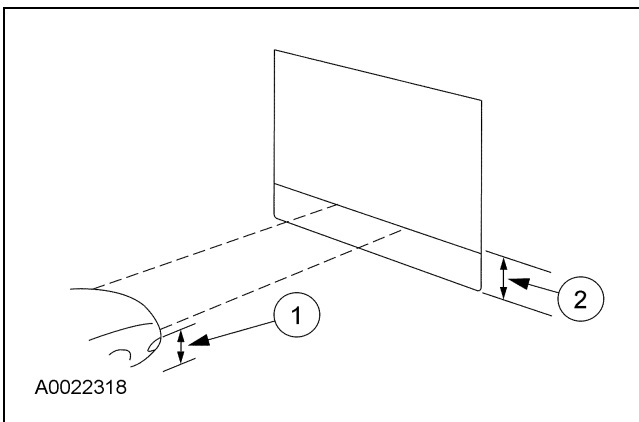


GENERAL PROCEDURES (Continued)

3. **NOTE:** The center of the lamp is marked either on the lens (circle, crosshair or other mark) or on the bulb shield internal to the lamp (crosshair or other mark).

Mark a horizontal reference line on the vertical wall or screen.

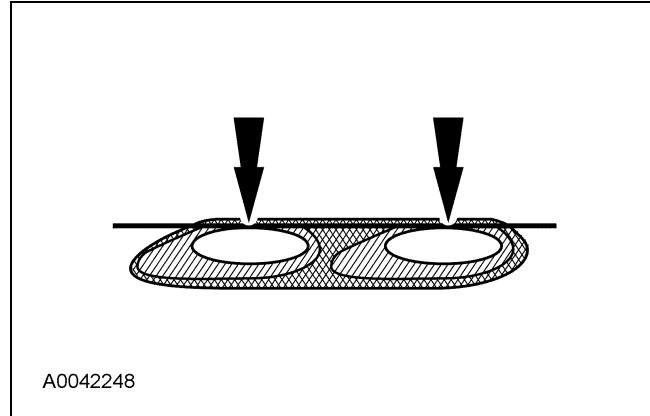
- 1 Measure the center of the headlamp height to ground and record the measurement.
- 2 Make a 2.4 m (8 ft) horizontal mark (using masking tape) on the vertical wall or screen at the same distance from the ground as previously recorded.



4. **NOTE:** This procedure should be done in a dark environment to effectively see the headlamp beam pattern.
- Turn on the low beam headlamps to illuminate the wall or screen and open the hood.
5. On the wall or screen, locate the high intensity area of the beam pattern.

VOR-type headlamps

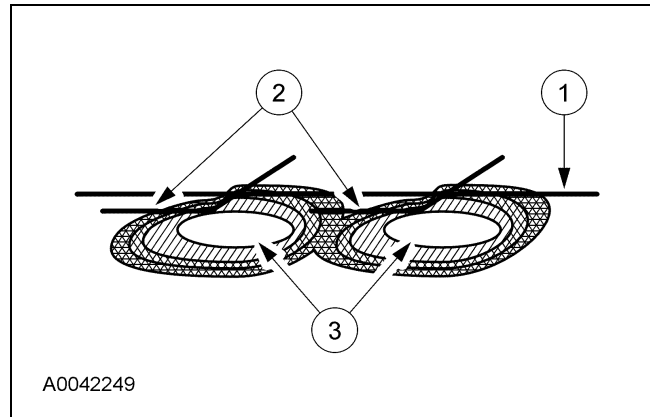
6. **NOTE:** The appearance of the VOR beam pattern may vary between vehicles.
- Identify at the top edge of this high intensity area a distinct horizontal cutoff in the beam pattern. If the top edge of this cutoff is not even with the horizontal reference line, the headlamp beam needs to be adjusted using the headlamp adjusting screw.



VOL-type headlamps

7. For VOL-type headlamps, there is a distinct cutoff in the left portion of the beam pattern. The edge of this cutoff should be positioned 50.2 mm (2 in) below the horizontal reference line. Adjust the headlamp as necessary using the headlamp adjusting screw.

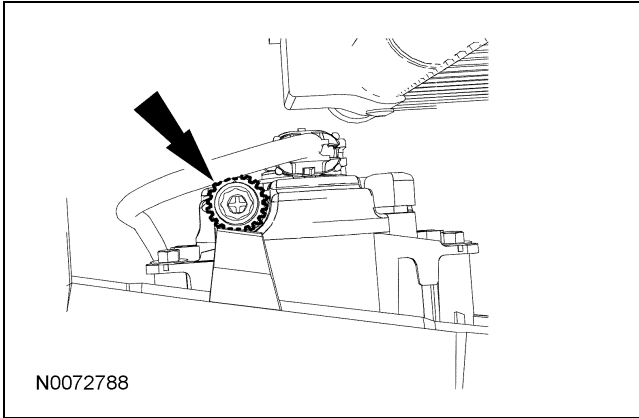
- 1 Horizontal reference line.
- 2 Top edge of the beam pattern.
- 3 High intensity zone.



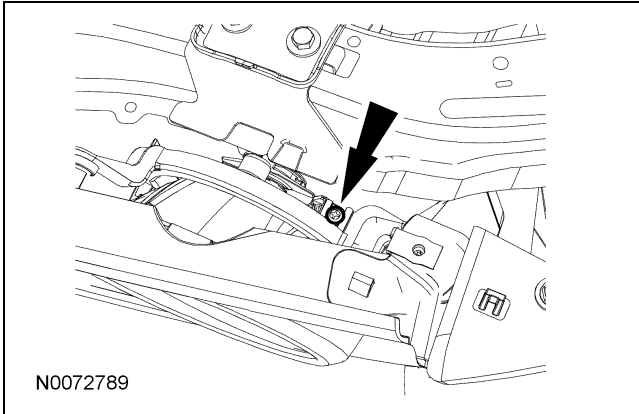
GENERAL PROCEDURES

Front Fog Lamp Adjustment

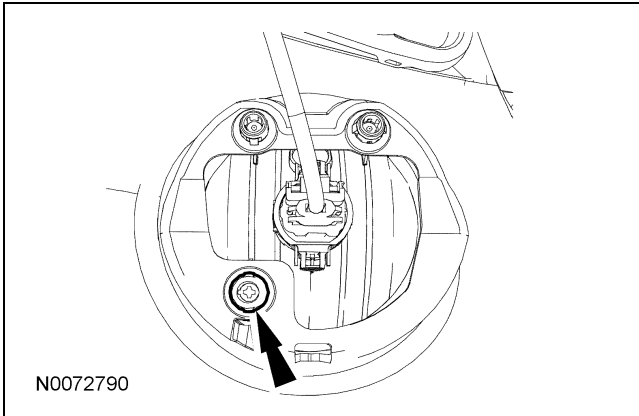
Fog Lamp Adjustment Screw Location — 4.0L



Fog Lamp Adjustment Screw Location — 4.6L



Fog Lamp Adjustment Screw Location — 5.4L



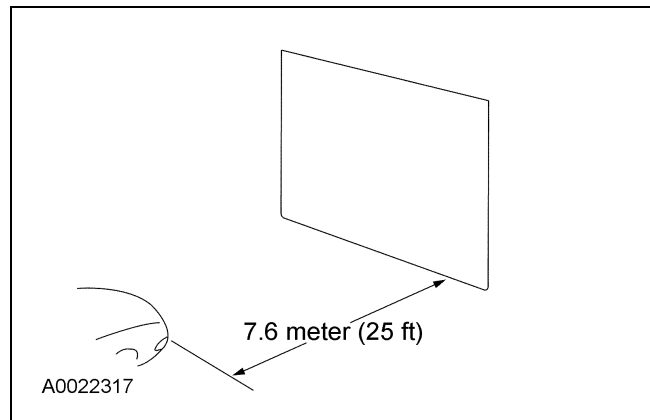
- NOTE:** Horizontal aim is not required for this vehicle and is not adjustable. Consult your state vehicle inspection center for recommended tolerance ranges for visual aiming.

Before starting the fog lamp assembly adjustment:

- Check the tire inflation.
- Make sure there are no other loads in the vehicle other than a half tank of fuel.
- Make sure the vehicle is on level ground.
- Make sure the fog lamps and headlamps are clean.
- Make sure the headlamps are operating and are correctly aimed.

- NOTE:** The vertical wall screen must be a minimum of 2.4 meters (8 ft) wide.

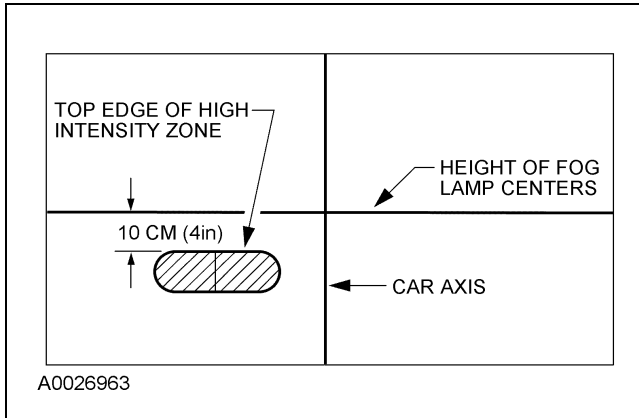
Park the vehicle on a level surface approximately 7.6 meters (25 ft) from the vertical wall or screen directly in front of it.



GENERAL PROCEDURES (Continued)

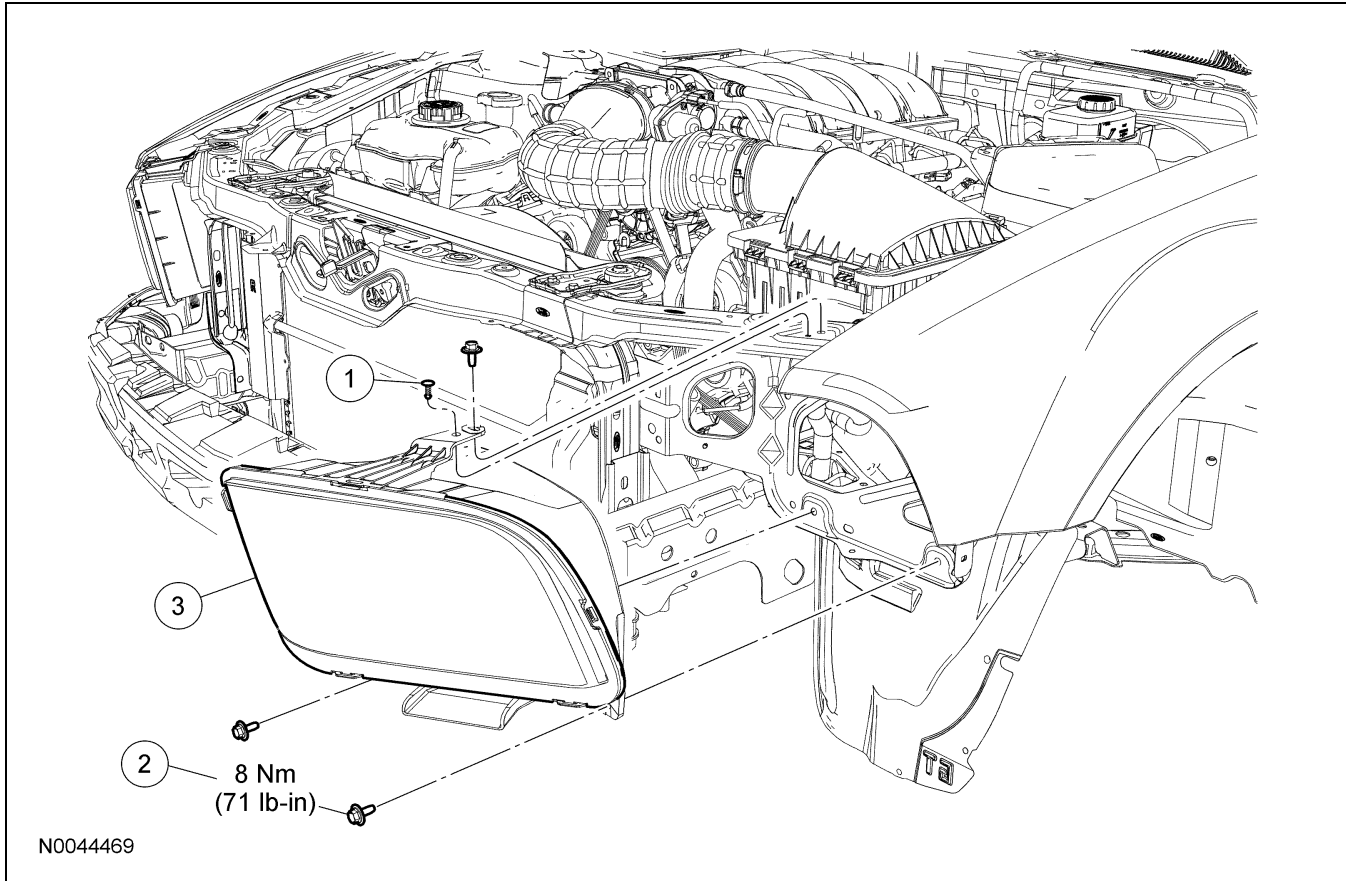
3. The correct visual aim for the fog lamps is with the top edge of the high-intensity zone 10 cm (4 in) below the horizontal center of the fog lamps.

4. If necessary, rotate the adjusting screw until the fog lamp beam is within specification.



REMOVAL AND INSTALLATION

Headlamp Assembly



Item	Part Number	Description
1	58403D24	Pushpin
2	W712277	Headlamp assembly bolts (3 required)
3	13008/13035	Headlamp assembly (RH/LH)

2. Remove the pushpin.
3. Remove the 3 bolts and the headlamp assembly.
 - Disconnect the electrical connector.
 - To install, tighten the bolts to 8 Nm (71 lb-in).
4. To install, reverse the removal procedure.

Removal and Installation

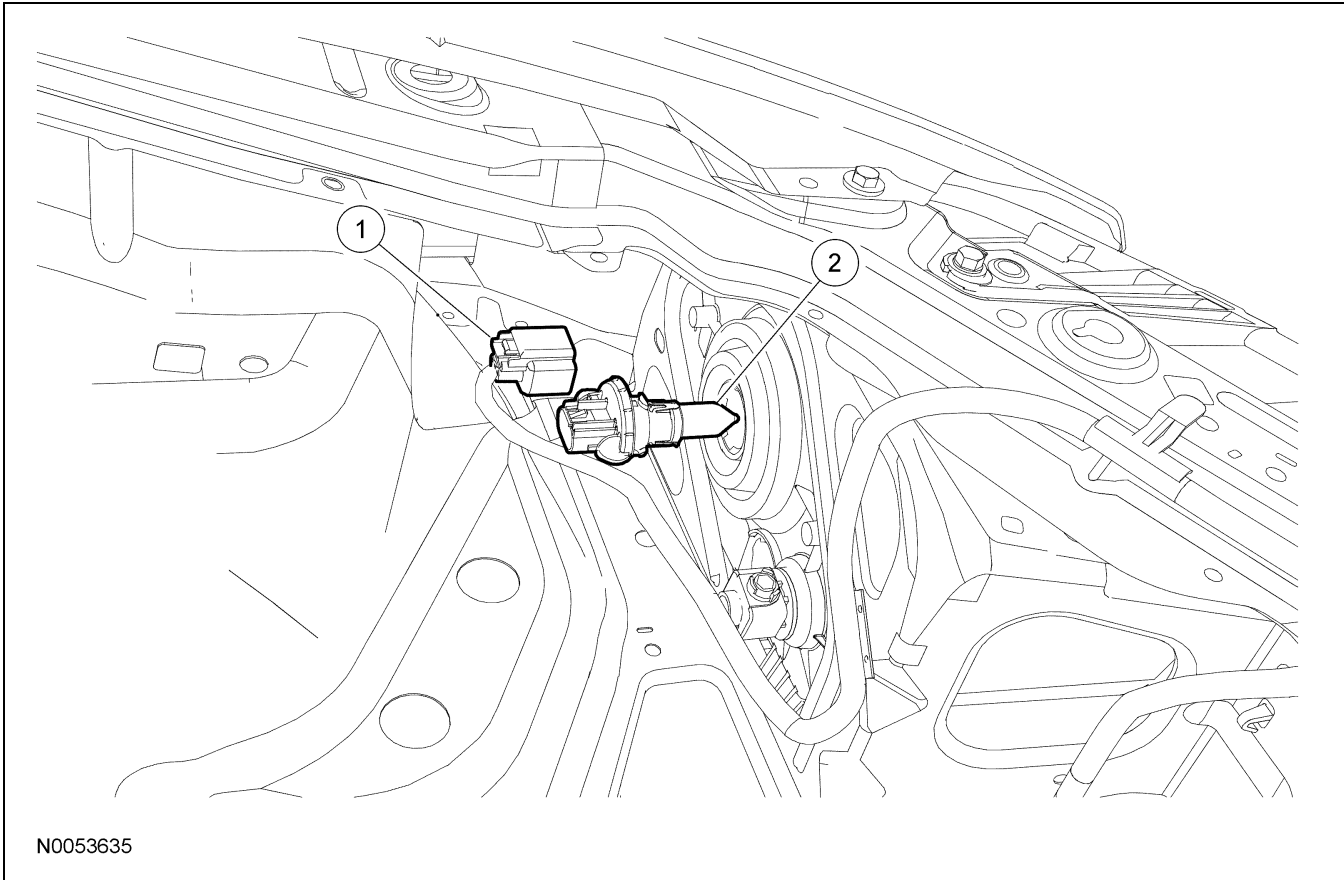
1. Remove the front bumper cover. For additional information, refer to Section 501-19.

REMOVAL AND INSTALLATION

Headlamp Bulb

NOTE: The air cleaner assembly is shown removed for clarity.

NOTE: Halogen bulb shown, High Intensity Discharge (HID) bulb similar.



N0053635

Item	Part Number	Description
1	—	Headlamp bulb electrical connector (part of 14290)
2	13N021	Headlamp bulb

Removal and Installation

⚠ WARNING: The bulb contains gas under pressure. The bulb may shatter if the glass envelope is scratched or if the bulb is dropped. Handle the bulb only by its base. Avoid touching the glass envelope. Failure to follow these instructions may result in personal injury.

NOTE: The headlamp bulb should not be removed from the headlamp until just before a new bulb is installed. Removing the bulb for an extended period of time may affect headlamp bulb performance. Contaminants may enter the headlamp where they can settle on the lens and reflector. Never turn on the headlamps with the bulb removed from the headlamp.

NOTE: Make sure the headlamp switch and the ignition switch are in the OFF position.

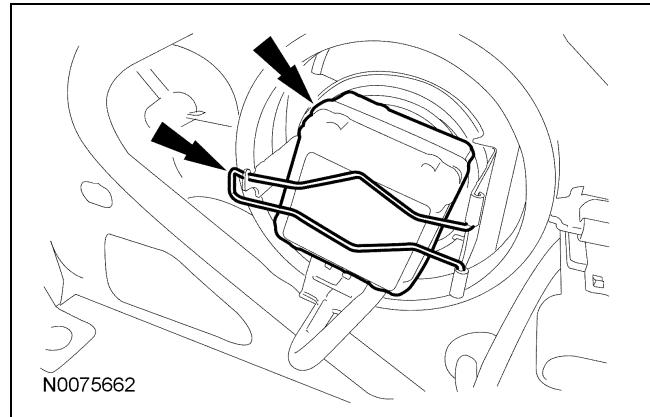
REMOVAL AND INSTALLATION (Continued)**Halogen bulb**

1. For the LH bulb on vehicles equipped with the Bullitt™ package, remove the air cleaner. For additional information, refer to Section 303-12.
2. Disconnect the headlamp bulb electrical connector.
3. Rotate the headlamp bulb approximately one-eighth turn counterclockwise and remove the bulb from the headlamp assembly.

High Intensity Discharge (HID) bulb

4. For the LH bulb, remove the air cleaner. For additional information, refer to Section 303-12.
5. Disconnect the electrical connector from the headlamp assembly.
6. Remove the HID bulb access cover.

7. Release the retainer and remove the headlamp bulb.
 - Disconnect the electrical connector.

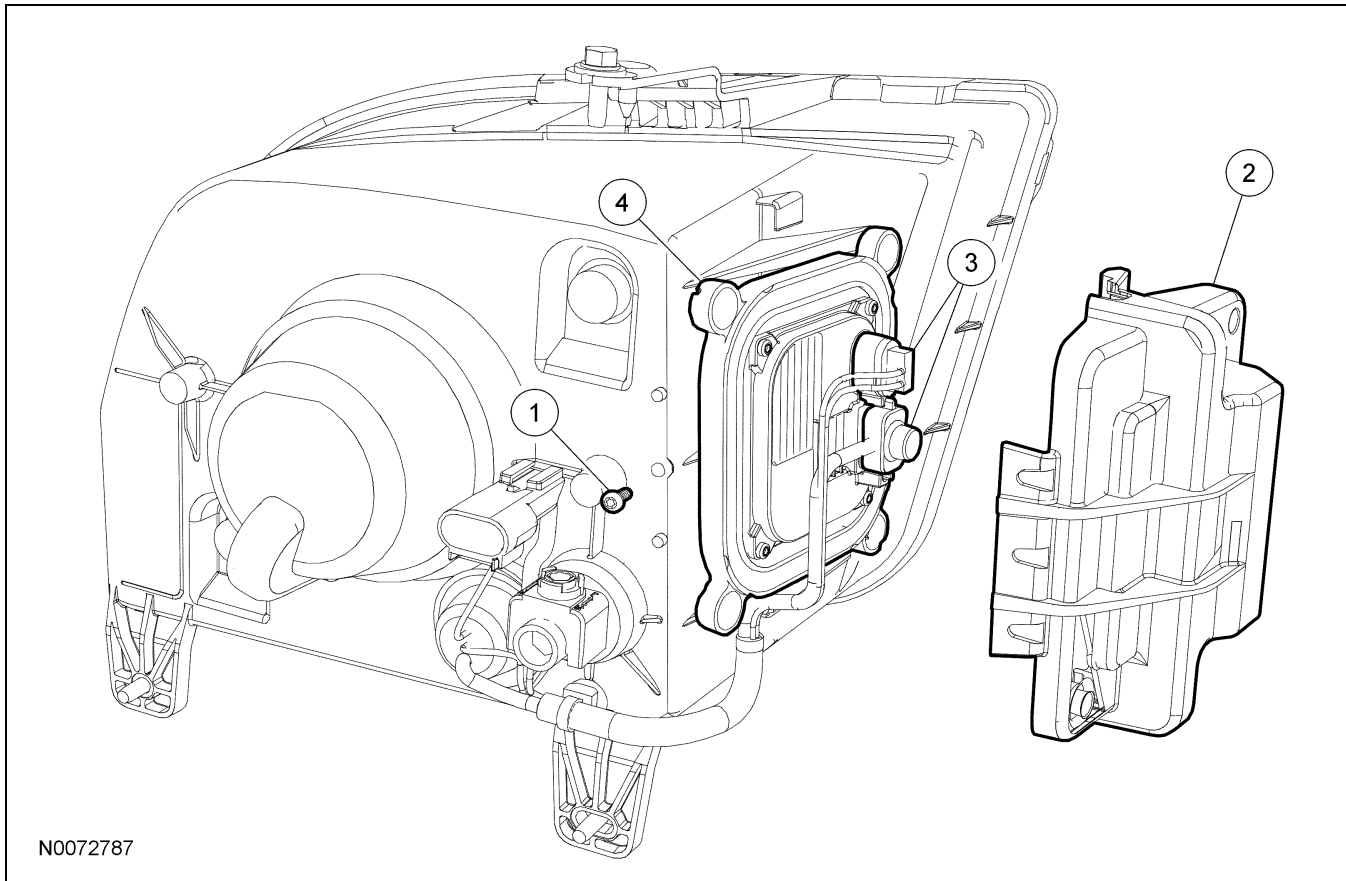
**All bulb types**

8. To install, reverse the removal procedure.
 - For vehicles equipped with HID headlamps, make sure the bulb cover is fully seated.

REMOVAL AND INSTALLATION

Ballast

NOTE: GT shown, others similar.



Item	Part Number	Description
1	—	Ballast cover screw
2	13008	Ballast cover
3	—	Ballast electrical connector (part of 13005/13006)
4	13C170	Ballast

- Remove the screw (2 screws for Shelby GT500) and ballast cover.
- Disconnect the electrical connectors and remove the ballast.
- To install, reverse the removal procedure.

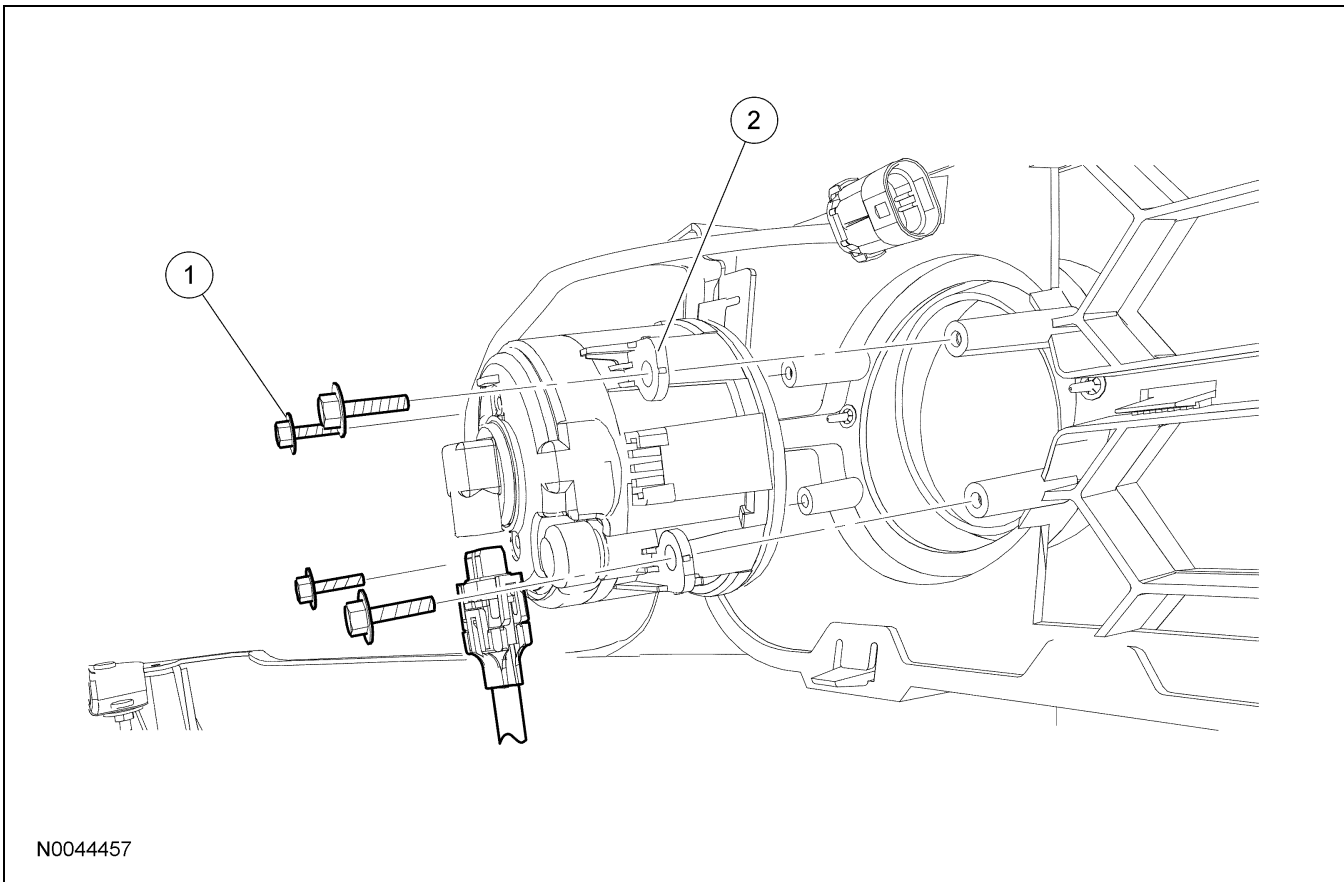
Removal and Installation

- Remove the headlamp assembly. For additional information, refer to Headlamp Assembly in this section.

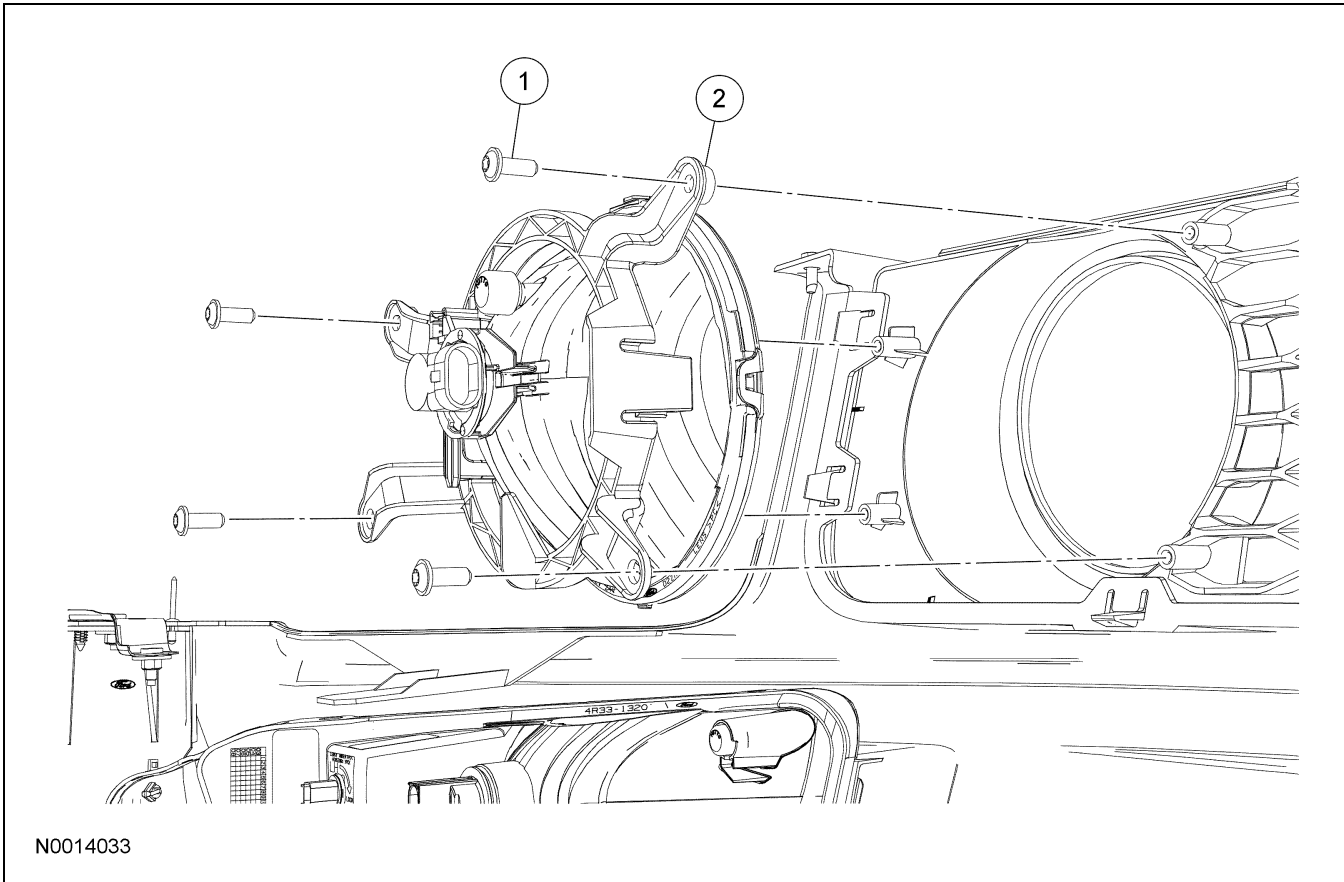
REMOVAL AND INSTALLATION

Fog Lamp

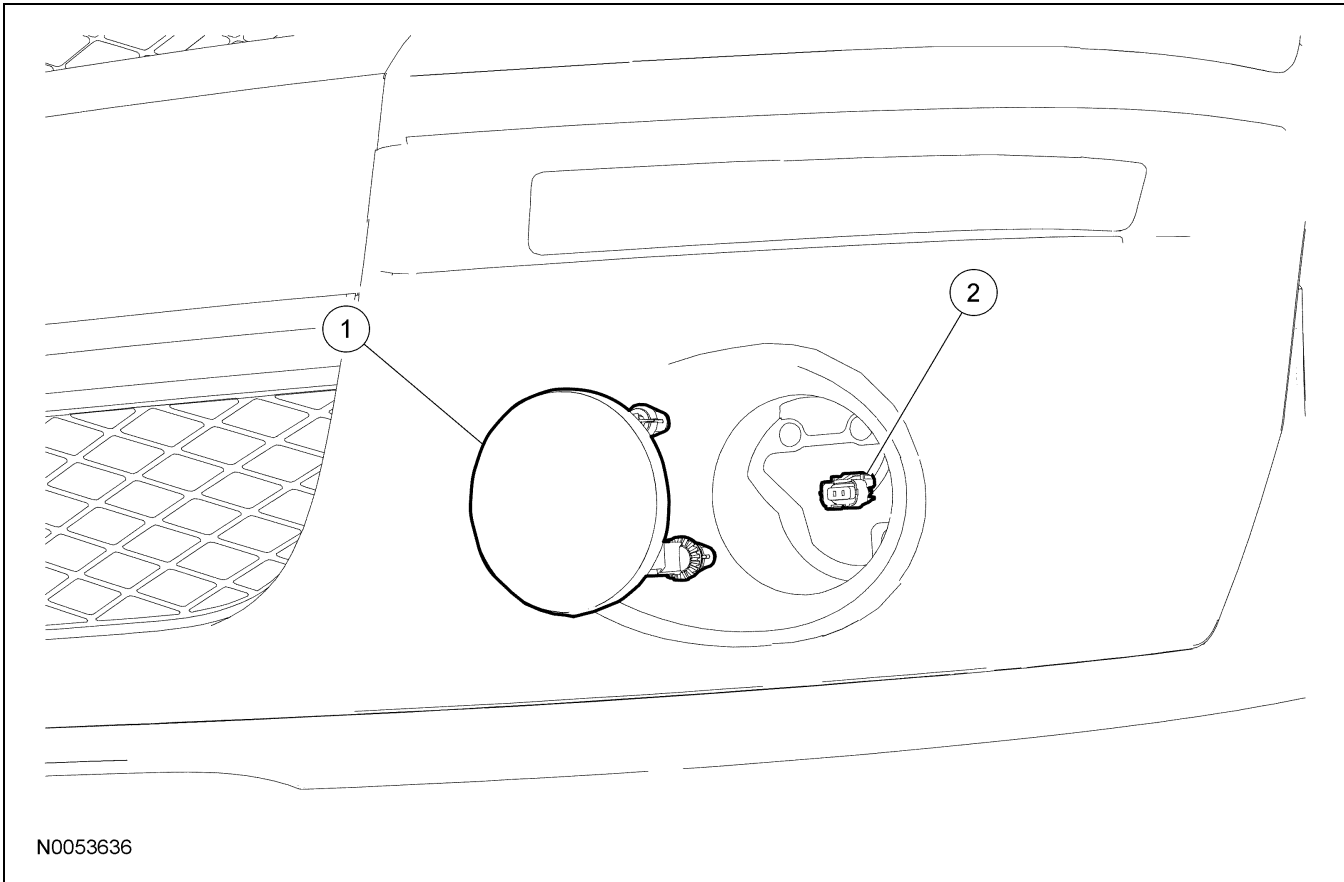
4.0L Vehicles



Item	Part Number	Description
1	W707607S	Fog lamp mounting screws (4 required)
2	15200	Fog lamp

REMOVAL AND INSTALLATION (Continued)**4.6L Vehicles**

Item	Part Number	Description
1	W505974S	Fog lamp mounting screws (4 required)
2	15K201/15201	Fog lamp (RH/LH)

REMOVAL AND INSTALLATION (Continued)**5.4L Vehicles**

Item	Part Number	Description
1	15K201	Fog lamp
2	—	Fog lamp electrical connector (part of 14290)

Removal and Installation**4.0L and 4.6L vehicles**

1. Remove the front bumper cover. For additional information, refer to Section 501-19.
2. Remove the 4 screws and the fog lamp.

5.4L vehicles

3. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
4. Release the tabs and remove the fog lamp.
 - Disconnect the electrical connector.

All vehicles

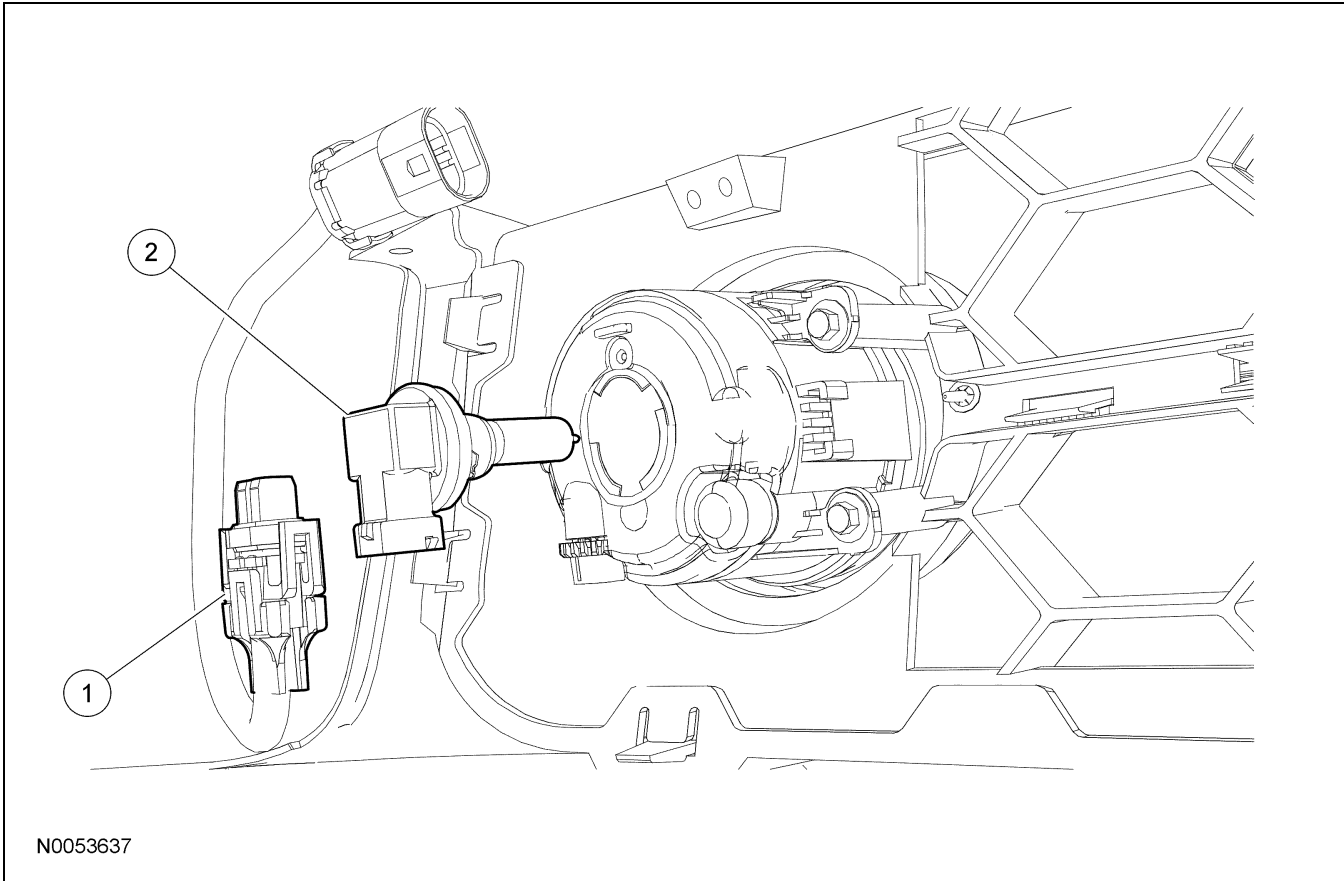
5. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Fog Lamp Bulb

4.0L and 4.6L Vehicles

NOTE: 4.0L fog lamp shown, 4.6L fog lamp similar.



Item	Part Number	Description
1	—	Fog lamp bulb electrical connector (part of 15A211)
2	13N021	Fog lamp bulb

REMOVAL AND INSTALLATION (Continued)**5.4L Vehicles**

Item	Part Number	Description
1	—	Fog lamp bulb electrical connector (part of 14290)
2	13N021	Fog lamp bulb

NOTE: Make sure the headlamp switch and the ignition switch are in the OFF position.

4.0L and 4.6L vehicles

1. Remove the front bumper cover. For additional information, refer to Section 501-19.
2. Disconnect the electrical connector and remove the fog lamp bulb.

5.4L vehicles

3. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.
4. Release (squeeze) the tabs and remove the fog lamp bulb.
 - Disconnect the electrical connector.

Removal and Installation

⚠ WARNING: The bulb contains gas under pressure. The bulb may shatter if the glass envelope is scratched or if the bulb is dropped. Handle the bulb only by its base. Avoid touching the glass envelope. Failure to follow these instructions may result in personal injury.

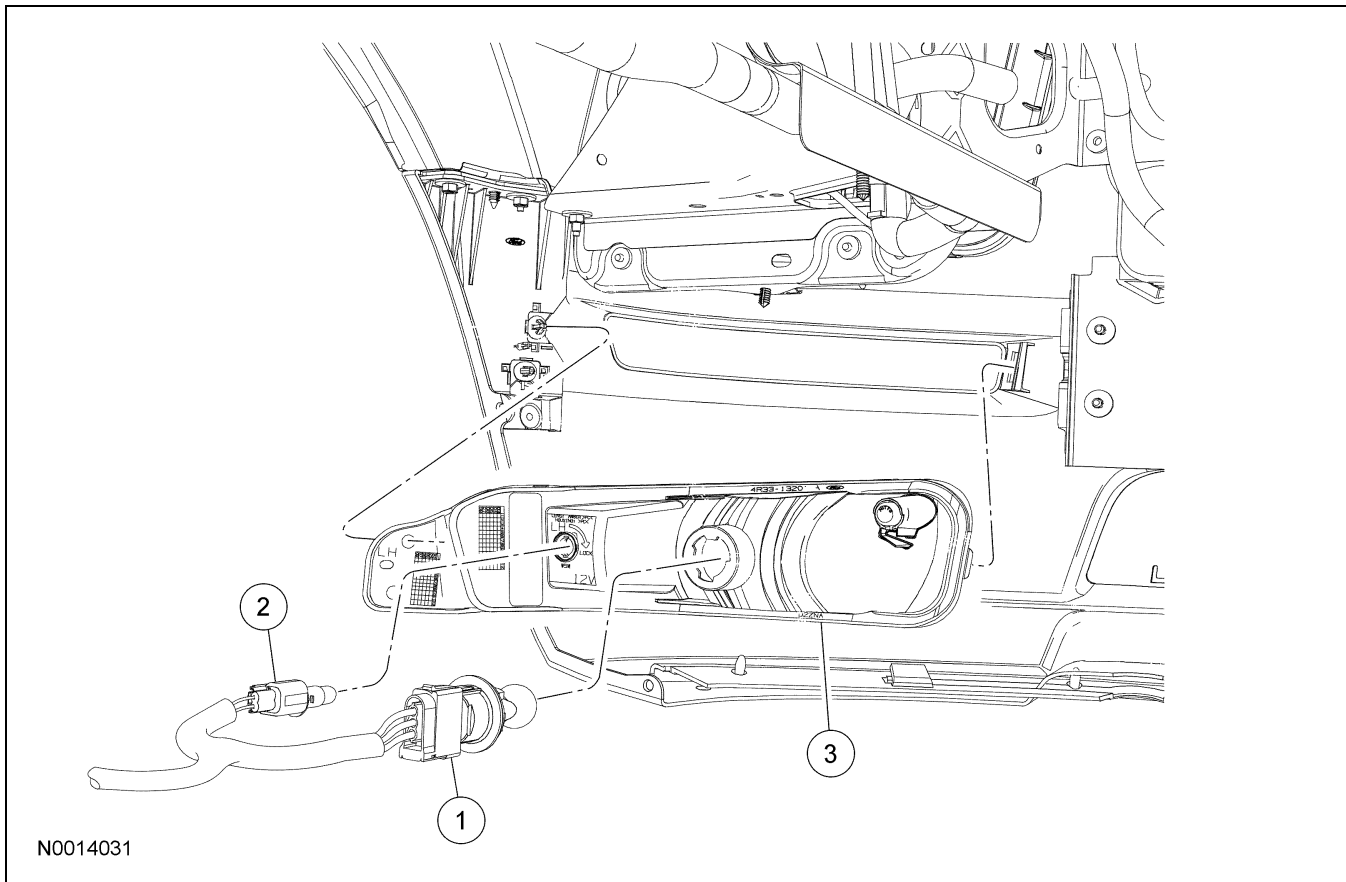
NOTE: The fog lamp bulb should not be removed from the fog lamp until just before a new bulb is installed. Removing the bulb for an extended period of time may affect fog lamp bulb performance. Contaminants may enter the fog lamp where they can settle on the lens and reflector. Never turn on the fog lamps with the bulb removed.

REMOVAL AND INSTALLATION (Continued)**All vehicles**

5. To install, reverse the removal procedure.
-

REMOVAL AND INSTALLATION

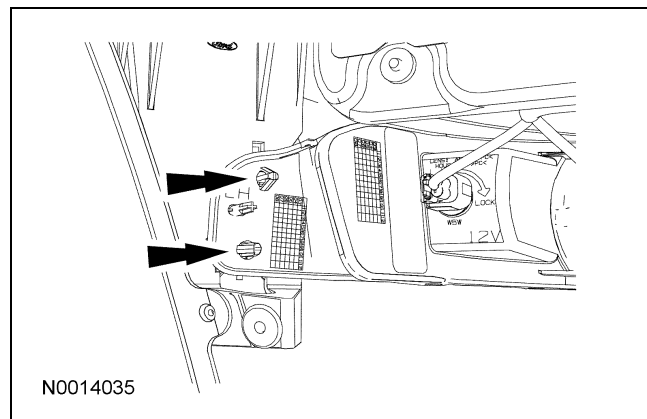
Side Lamp/Front Turn Signal Lamp Bulb



Item	Part Number	Description
1	13411	Bulb socket
2	13411	Bulb socket
3	13200/13201	Front side marker lamp assembly (RH/LH)

Removal and Installation

1. Remove the front fender splash shield. For additional information, refer to Section 501-02.
2. Release the 2 locking tabs and remove the front side marker lamp assembly.
 - Disconnect the electrical connectors.

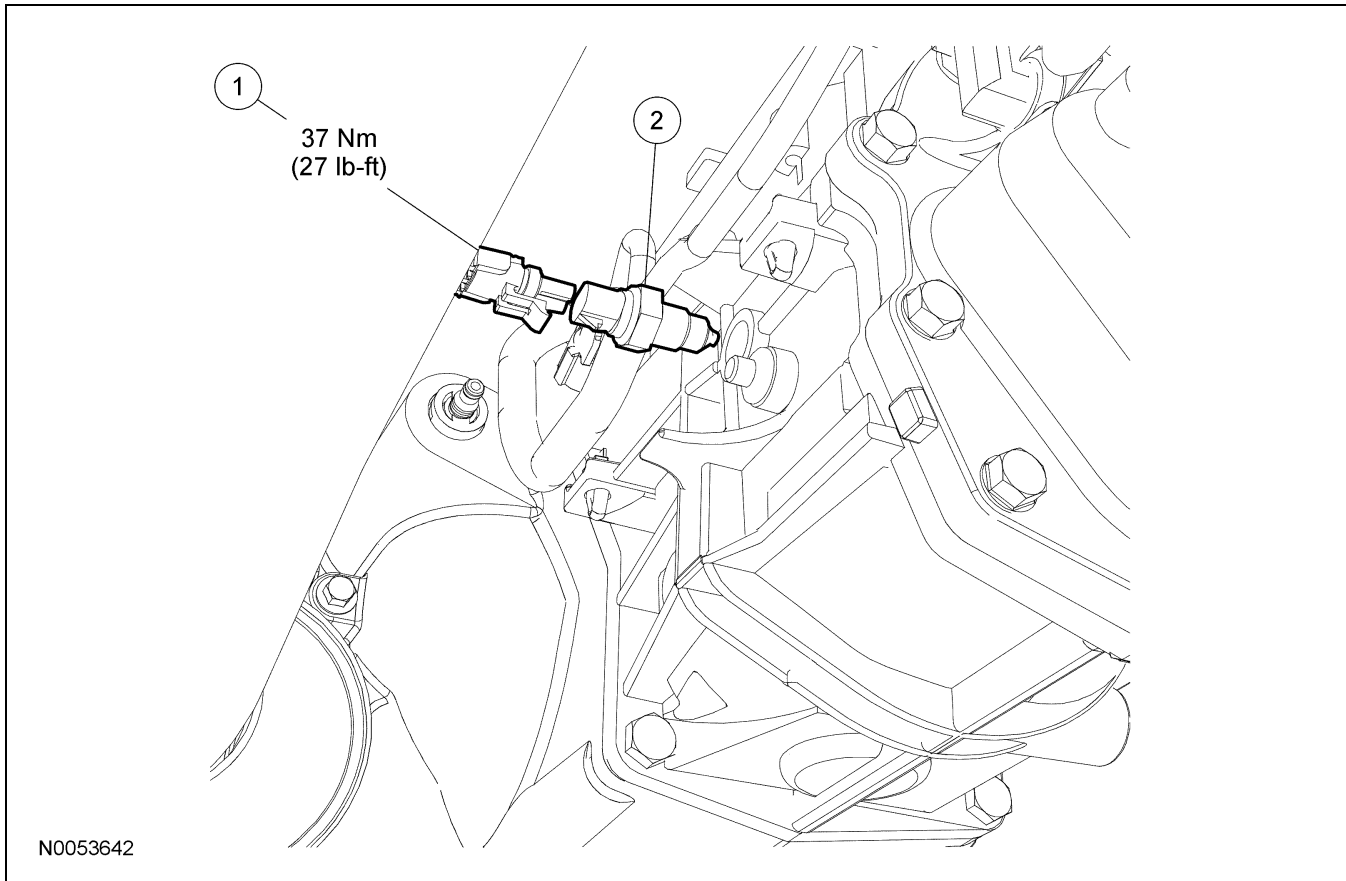


3. To install, reverse the removal procedure.

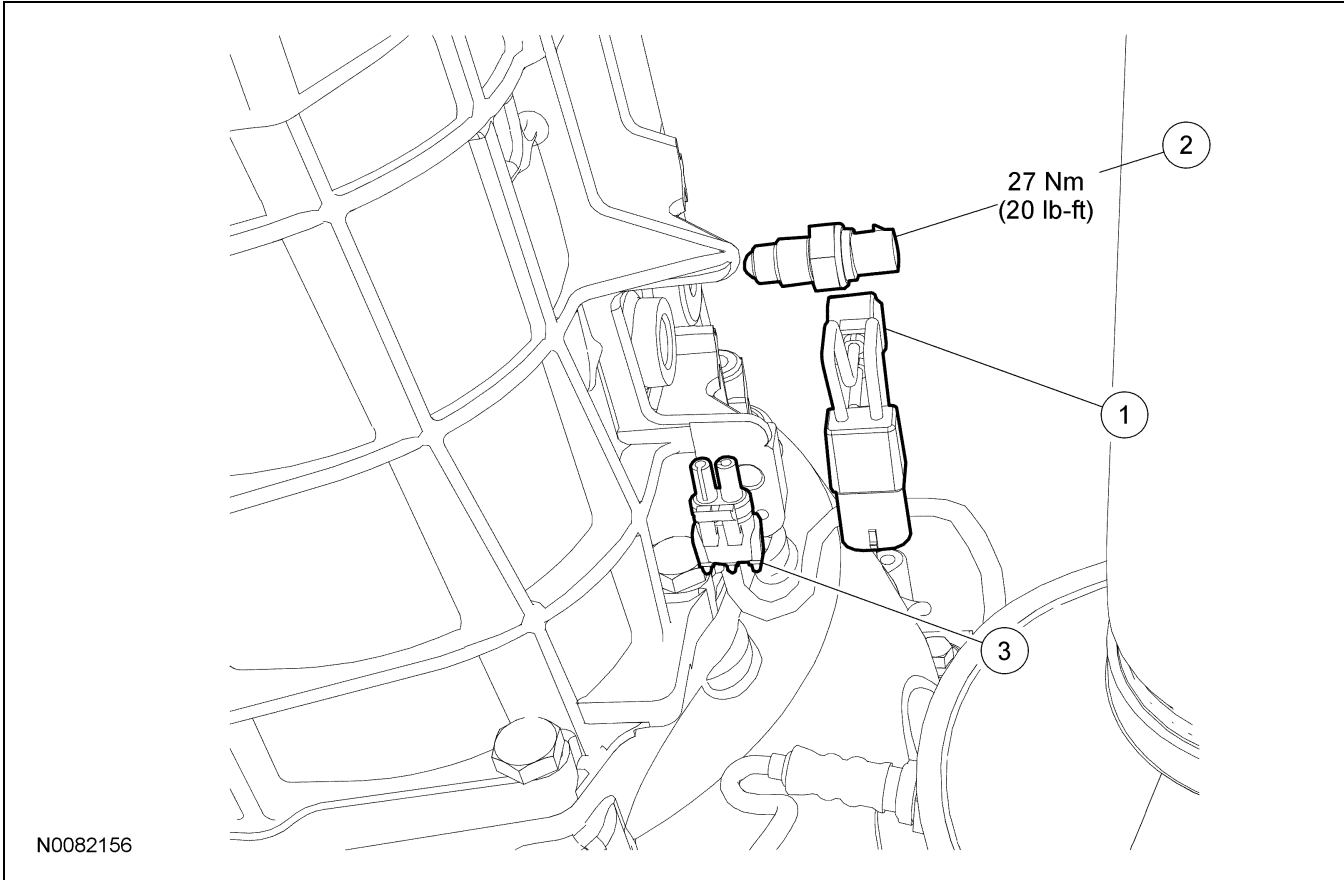
REMOVAL AND INSTALLATION

Reversing Lamp Switch

NOTE: T5OD transmission shown, TR3650 transmission similar.



Item	Part Number	Description
1	—	Reversing lamp switch electrical connector (part of 12B637)
2	15520	Reversing lamp switch

REMOVAL AND INSTALLATION (Continued)**TR6060 Transmission**

Item	Part Number	Description
1	—	Reversing lamp switch jumper harness
2	15520	Reversing lamp switch
3	—	Reversing lamp switch electrical connector (part of 12B637)

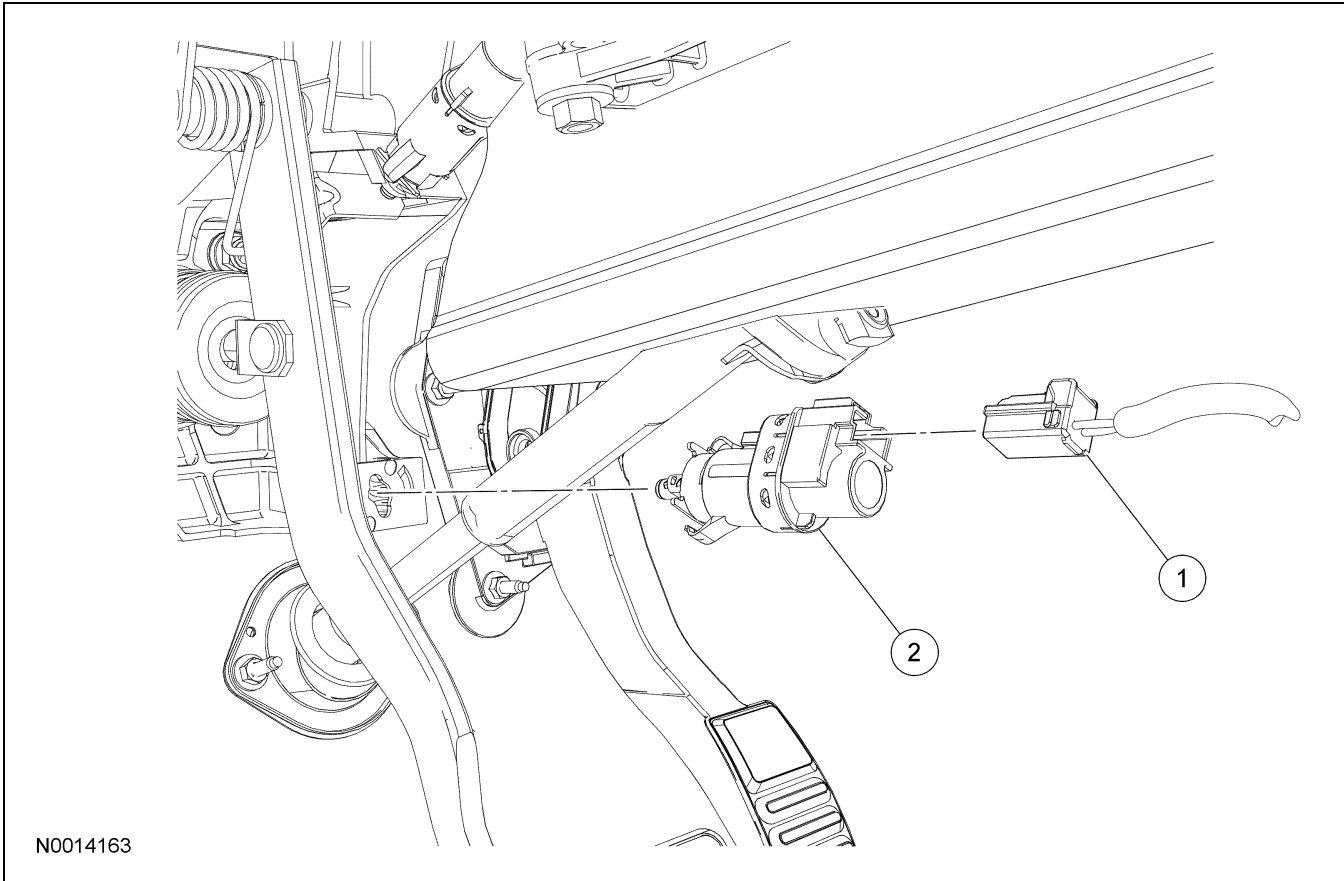
Removal and Installation

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to Section 100-02.

2. Disconnect the electrical connector and remove the reversing lamp switch.
 - To install, tighten to 37 Nm (27 lb-ft) (T50D transmission).
 - To install, tighten to 27 Nm (20 lb-ft) (TR3650 or TR6060 transmission).
3. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Stoplamp Switch



Item	Part Number	Description
1	—	Stoplamp switch electrical connector (part of 14A005)
2	13480	Stoplamp switch

REMOVAL AND INSTALLATION (Continued)**Removal and Installation**

2. To install, reverse the removal procedure.

NOTICE: Do not press, pull or otherwise move the brake pedal while removing or installing the stoplamp switch. The switch must be installed with the booster push rod attached to the brake pedal and with the brake pedal in the at-rest position. Installing the switch with the brake pedal in any other position results in incorrect adjustment and damage to the switch.

1. **NOTICE:** The switch plunger must be compressed for the switch to rotate in the bracket. Attempting to remove the switch with the plunger extended (during brake pedal apply) results in damage to the switch.

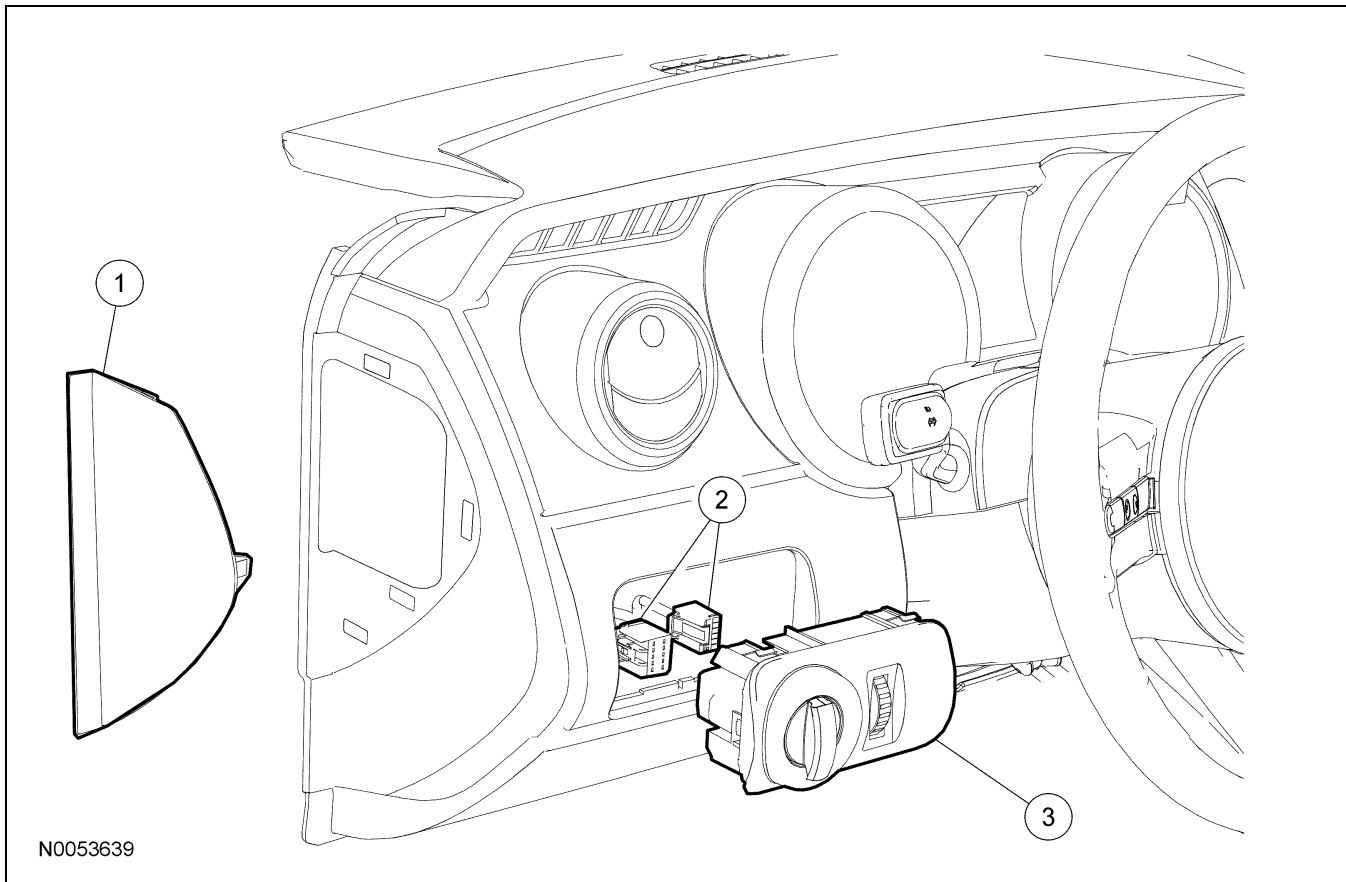
NOTE: Rotate the stoplamp switch clockwise approximately one-eighth turn to remove.

Remove the stoplamp switch.

- Disconnect the electrical connector.
-

REMOVAL AND INSTALLATION

Headlamp Switch



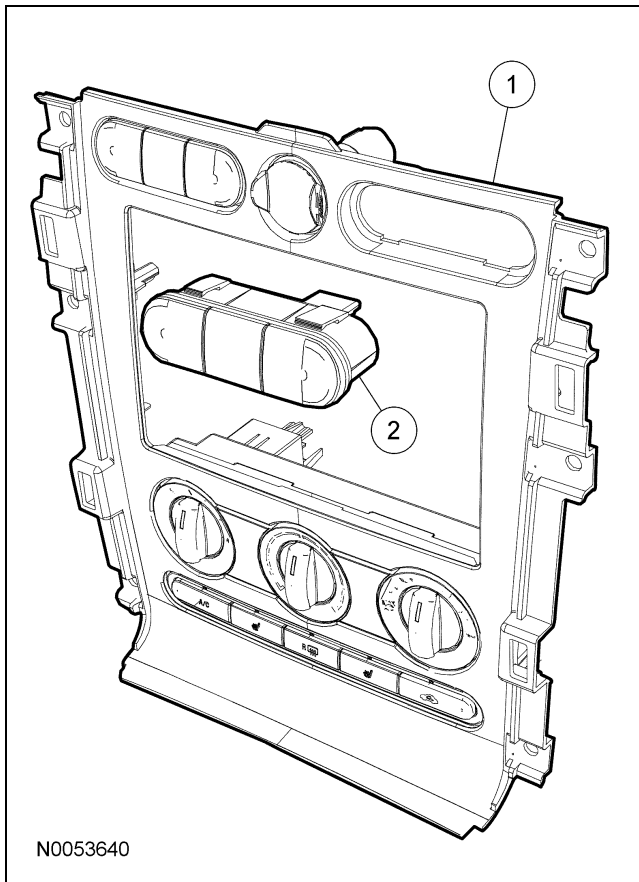
Item	Part Number	Description
1	6304481	Instrument panel side finish panel
2	11654	Headlamp switch
3	—	Headlamp switch electrical connectors (part of 14401)

Removal and Installation

1. Remove the instrument panel side finish panel.
2. **NOTE:** The headlamp switch is removed by pushing from behind.
Remove the headlamp switch.
 - Disconnect the electrical connectors.
3. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Hazard Flasher Lamp Switch



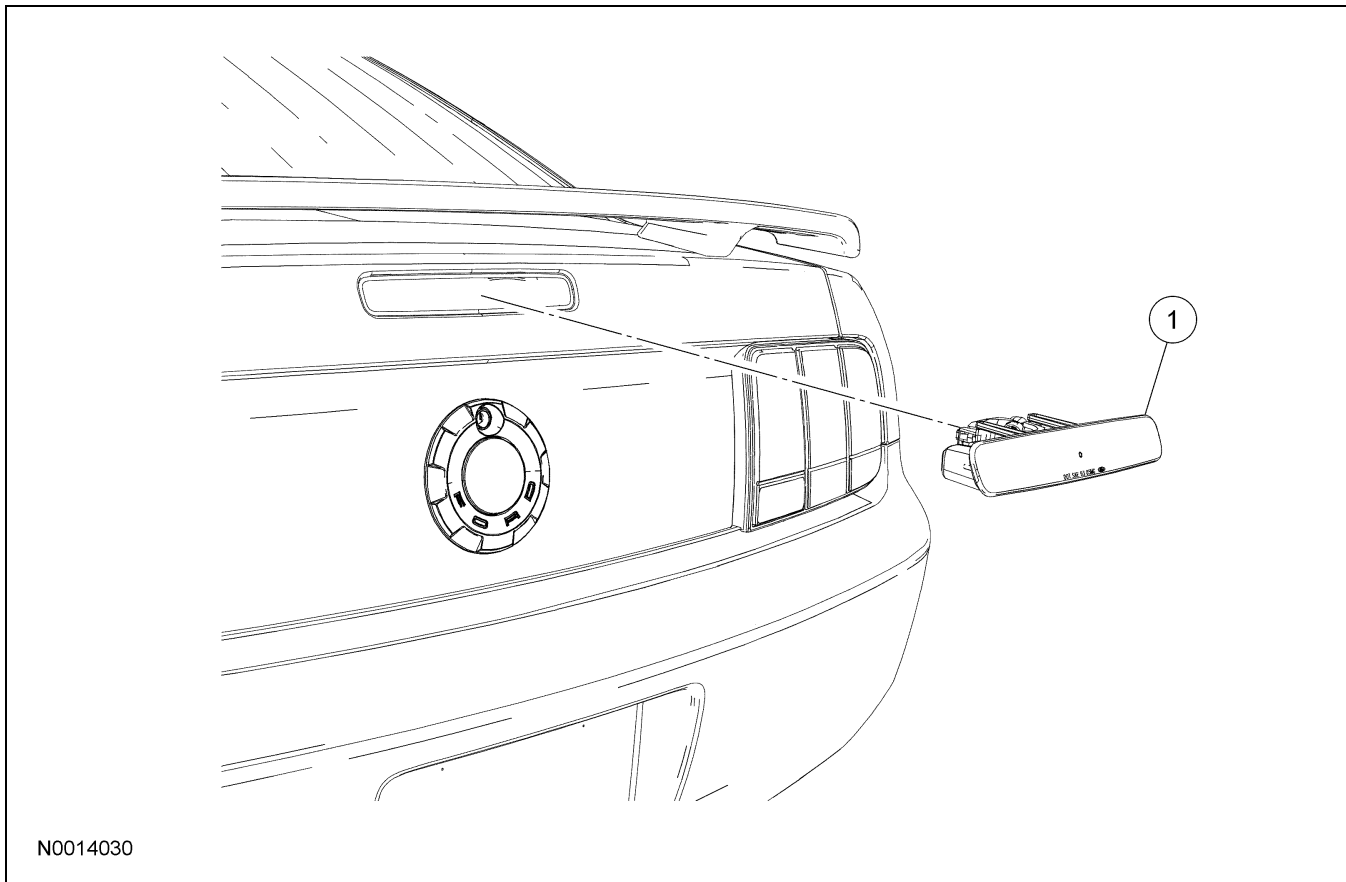
Item	Part Number	Description
1	6304302	Instrument panel center finish panel
2	13D734	Hazard flasher lamp switch

Removal and Installation

1. Remove the instrument panel center finish panel. For additional information, refer to Section 501-12.
2. Release the tabs and remove the hazard flasher lamp switch.
3. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

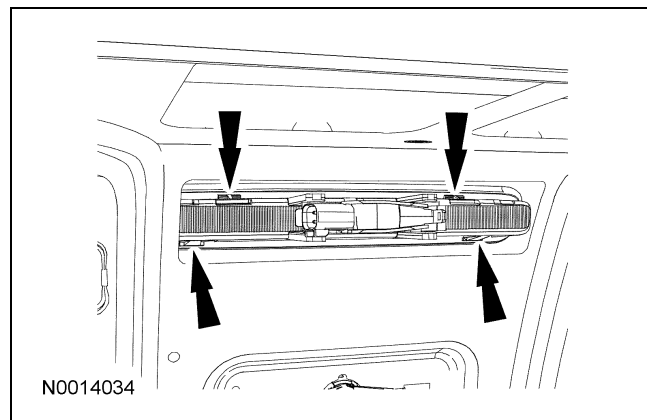
High Mounted Stoplamp



Item	Part Number	Description
1	13A613	High mounted stoplamp assembly

Removal and Installation

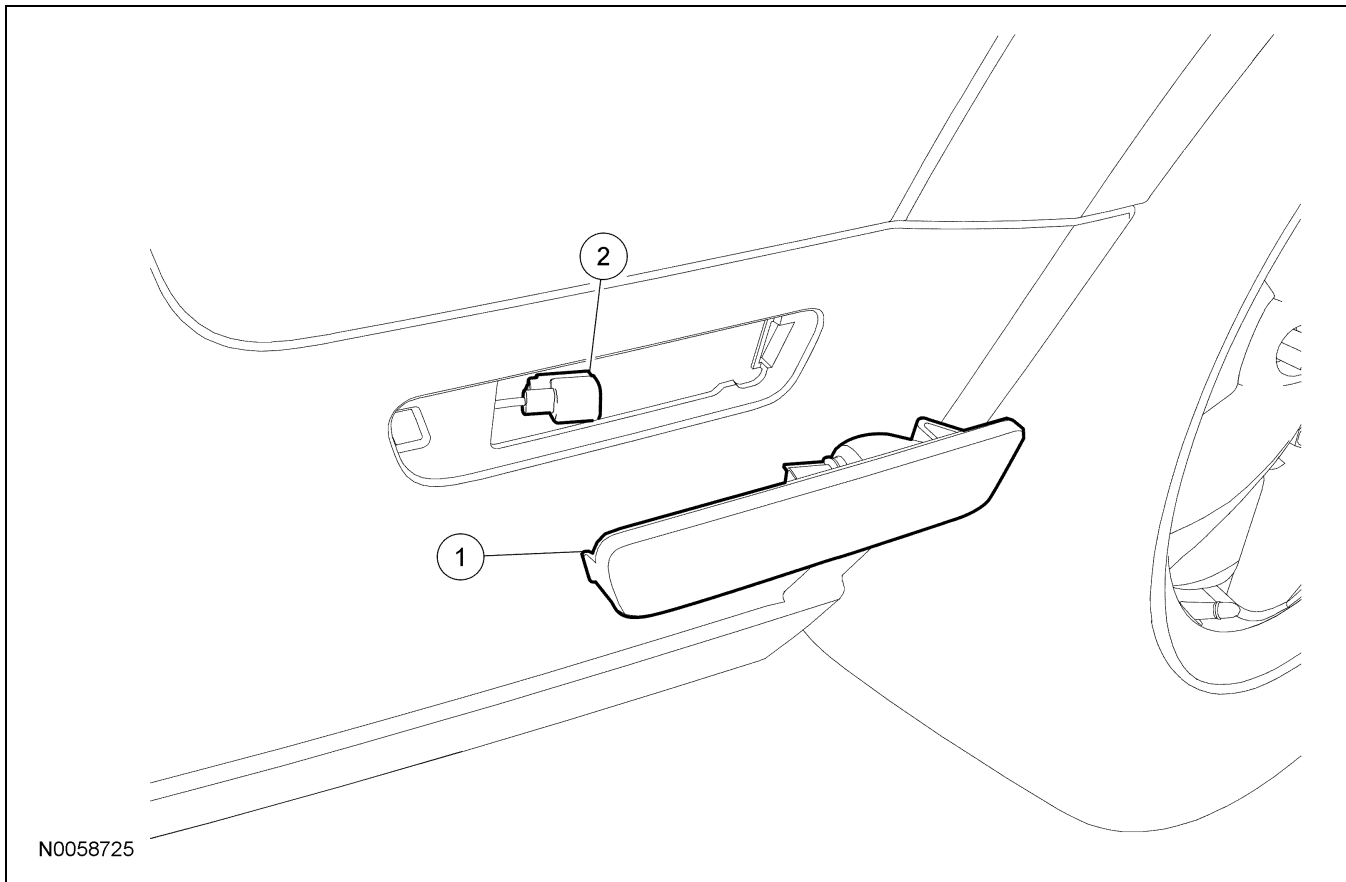
1. Remove the decklid latch trim cover.
2. Release the locking tabs and remove the high mounted stoplamp assembly.
 - Disconnect the electrical connector.



3. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Side Marker Lamp — Rear



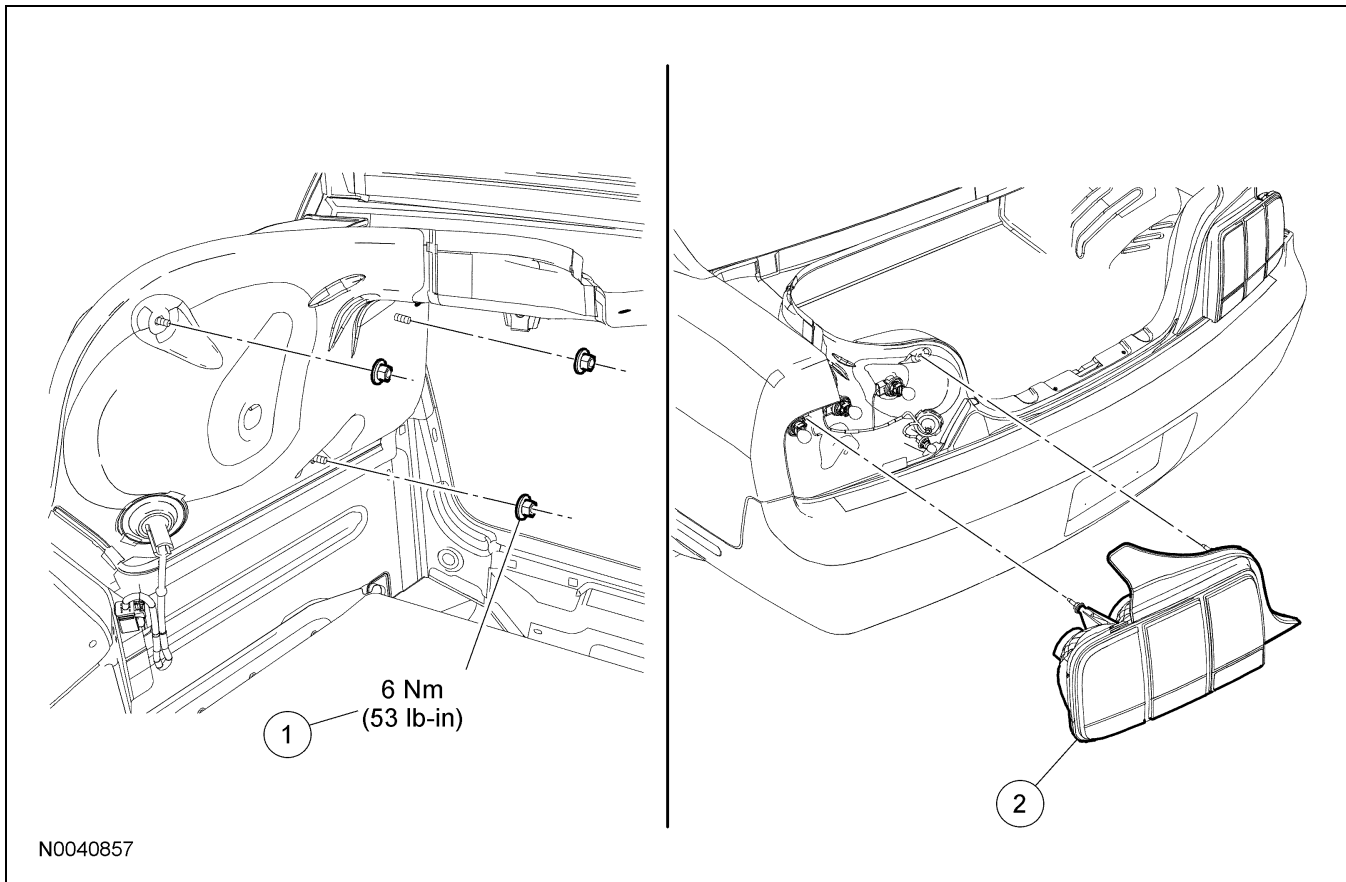
Item	Part Number	Description
1	15A201	Rear side marker lamp
2	—	Rear side marker lamp electrical connector (part of 13A444)

Removal and Installation

- NOTE:** Using a suitable thin-bladed tool, separate the rear of the side marker lamp from the bumper cover first.
 Remove the rear side marker lamp.
 - Disconnect the electrical connector.
- To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Rear Lamp Assembly



Item	Part Number	Description
1	N621926-S424	Rear lamp mounting nuts (3 required)
2	13B404/13B405	Rear lamp assembly (RH/LH)

Removal and Installation

NOTE: If the vehicle is equipped with a factory installed subwoofer, the subwoofer must be removed before removing the right side rear lamp.

1. Remove the rear luggage compartment trim panel.
2. Remove the pushpin retainer and position the trim panel aside.
3. Remove the LH side luggage compartment trim panel.
4. Remove the 3 rear lamp mounting nuts.
 - To install, tighten to 6 Nm (53 lb-in).
5. Remove the rear lamp assembly.
 - Remove the bulbs from the rear lamp assembly.
6. To install, reverse the removal procedure.

DESCRIPTION AND OPERATION

Interior Lighting

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The interior lighting system consists of the following components:

- SJB
- Bussed electrical center
- Illumination dimmer switch
- Dome/map lamps
- Door ajar switches
- Luggage compartment lamp
- Luggage compartment lid ajar switch
- Ambient lighting module (if equipped)
- Ambient lighting switch (if equipped)

The interior lighting system may consist of up to 3 subsystems:

- Courtesy lamps
- Demand lamps
- Ambient lighting (if equipped)

The bussed electrical center (BEC) supplies power to the interior lighting system through the SJB. The SJB sets DTCs if certain circuit failures exist with the interior lighting system.

Courtesy Lamps

The courtesy lamps are controlled by the SJB. The courtesy lamp subsystem consists of the interior dome lamps. The SJB controls the courtesy lamps by providing power and ground to the courtesy lamps. The courtesy lighting feature requests the courtesy lamps to be illuminated when any of the vehicle doors are opened or become ajar and the vehicle speed is less than 15 km/h (9 mph). The courtesy lamps turn off when the doors are closed or the vehicle speed reaches 15 km/h (9 mph). The courtesy lamps can also be turned on by rotating the instrument panel dimmer switch to the highest point. The theatre dimming feature raises the courtesy lamps over 0.7 seconds when courtesy lamp activation is requested, and lowers the courtesy lamps over 1.7 seconds when courtesy lighting deactivation is requested.

Demand Lamps

The demand lamp subsystem consists of the map lamps and the luggage compartment lamp. Map lamps are switched individually and share a common ground circuit. The luggage compartment lamp is illuminated when the trunk is opened.

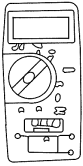
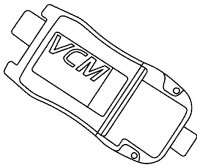
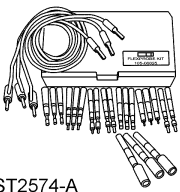
Ambient Lighting

The ambient lighting system consists of the ambient lighting switch, the ambient lighting module, and the harness with hard-wired light emitting diodes (LEDs) located within the front and rear footwells and the floor console cup holders. The ambient lighting is powered on when the ignition key is in the run or accessory position. The ambient lighting module is powered through the electrochromatic (EC) mirror circuit. The ambient lighting switch is used to cycle the LEDs through 7 different color combinations or to turn the ambient lighting off. The ambient lighting module provides the necessary voltage to the LEDs to illuminate the cup holders and the front and rear footwell areas.

DIAGNOSIS AND TESTING

Interior Lighting

Special Tool(s)

 <p>ST1137-A</p>	73III Automotive Meter 105-R0057 or equivalent
 <p>ST2834-A</p>	Vehicle Communications Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 <p>ST2574-A</p>	Flex Probe Kit 105-R025C or equivalent

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

When the SJB detects a request for lighting, it turns on the interior lamps by supplying power and ground to the lamps. The request for lighting can be an open door signal from a door ajar switch, an interior lighting on command from the instrument panel dimmer switch or an unlock command from a remote keyless entry (RKE) transmitter.

The SJB monitors input from the door ajar switches and the luggage compartment lid ajar switch. The switches are normally closed when the doors/luggage compartment lid are closed. When the door/luggage compartment lid is opened, the ajar switch opens signalling the SJB. The ajar switches receive a voltage signal from the SJB and each has its own ground circuit.

The instrument panel dimmer switch receives a voltage signal from the SJB. The instrument panel dimmer switch provides variable resistance for backlighting the instrument cluster and a toggle on/off function for the courtesy lamps.

The RKE receiver is contained inside the SJB. When the SJB receives an unlock request from a RKE transmitter, it unlocks the doors and turns on the courtesy lamps.

Ambient Lighting

The ambient lighting feature provides illumination of the cup holders in the center floor console and to the front and rear footwell areas. There are a total of 5 LED lighting locations. The ambient lighting feature is only available when the ignition key is in the run or accessory position.

The ambient lighting module provides voltage and ground to the LEDs. There are 3 different color (red, blue and green) LEDs housed within each LED assembly. By illuminating various color combinations, the LEDs are able to produce 7 different colors of ambient light. The ambient lighting switch is an input to the ambient lighting module. With each press of the ambient lighting switch, the ambient lighting module cycles through a different color variation or turns the ambient lighting feature off. The module retains the last color setting between uses.

Inspection and Verification

1. Verify the customer concern.
2. Visually inspect for obvious signs of mechanical and electrical damage.

DIAGNOSIS AND TESTING (Continued)**Visual Inspection Chart**

Mechanical	Electrical
<ul style="list-style-type: none"> • Door ajar switch(es) • Luggage compartment lid ajar switch 	<ul style="list-style-type: none"> • Smart junction box (SJB) fuse 7 (10A) (ambient lighting if equipped) • Bussed electrical center (BEC) fuse(s): <ul style="list-style-type: none"> — 59 (30A) — 67 (30A) • Wiring, terminals or connectors • Illumination dimmer switch • Dome/map lamp • Luggage compartment lamp • Ambient lighting switch (if equipped) • Ambient lighting module (if equipped) • SJB

- If an obvious cause for an observed or reported concern is found, correct the cause (if possible) before proceeding to the next step.
- NOTE:** Make sure to use the latest scan tool release software.
If the cause is not visually evident, connect the scan tool to the data link connector (DLC).
- 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 Section 418-00, No Power To The Scan Tool, to diagnose no communication with the scan tool.
- If the scan tool does not communicate with the vehicle:
 - Verify the ignition key is in the ON position.
 - Verify the scan tool operation with a known good vehicle.
 - Refer to Section 418-00 to diagnose no response from the PCM.
- Carry out the network test.
 - If the scan tool responds with no communication with the SJB, refer to Section 418-00.
 - If the network test passes, retrieve and record the continuous memory DTCs.
- Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
- If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to Section 419-10.
- If no DTCs related to the concern are retrieved, GO to [Symptom Chart](#).

DTC Charts**Smart Junction Box (SJB) DTC Chart**

DTC	Description	Action
B1084	Trunk Lamp Circuit Failure	If the luggage compartment lamp is inoperative, GO to Pinpoint Test F . If the luggage compartment lamp is always on, GO to Pinpoint Test G .
B1319	Driver Door Ajar Circuit Failure	GO to Pinpoint Test D .
B1327	Passenger Door Ajar Circuit Failure	GO to Pinpoint Test D .
B2021	Dome Lamp Output Return Circuit Failure	GO to Pinpoint Test A .

DIAGNOSIS AND TESTING (Continued)**Smart Junction Box (SJB) DTC Chart (Continued)**

DTC	Description	Action
B2550	Dome Lamp Output Circuit Short to Ground	GO to Pinpoint Test A.
B2554	Dome Lamp Output Circuit Failure	If the interior lamps are inoperative, GO to Pinpoint Test A. If the interior lamps are always on, GO to Pinpoint Test D. If the battery saver does not deactivate, GO to Pinpoint Test H.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the smart junction box (SJB) 	<ul style="list-style-type: none"> Wiring, terminals or connectors SJB 	<ul style="list-style-type: none"> REFER to Section 418-00.
<ul style="list-style-type: none"> The courtesy lamps are inoperative 	<ul style="list-style-type: none"> Fuse Wiring, terminals or connectors Interior lamp SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test A.
<ul style="list-style-type: none"> The courtesy lamps do not turn on with one door open 	<ul style="list-style-type: none"> Wiring, terminals or connectors Door ajar switch Power window motor SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test B.
<ul style="list-style-type: none"> The courtesy lamps are inoperative — using the dimmer switch 	<ul style="list-style-type: none"> Wiring, terminals or connectors Dimmer switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test C.
<ul style="list-style-type: none"> The courtesy lamps stay on continuously 	<ul style="list-style-type: none"> Wiring, terminals or connectors Door ajar switch Dimmer switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test D.
<ul style="list-style-type: none"> The demand lamps are inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Interior lamp 	<ul style="list-style-type: none"> GO to Pinpoint Test E.
<ul style="list-style-type: none"> The luggage compartment lamp is inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Luggage compartment lamp Luggage compartment lid ajar switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test F.
<ul style="list-style-type: none"> The luggage compartment lamp stays on continuously 	<ul style="list-style-type: none"> Wiring, terminals or connectors Luggage compartment lid ajar switch SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test G.
<ul style="list-style-type: none"> The battery saver does not deactivate after timeout 	<ul style="list-style-type: none"> Wiring, terminals or connectors SJB 	<ul style="list-style-type: none"> GO to Pinpoint Test H.

DIAGNOSIS AND TESTING (Continued)**Symptom Chart (Continued)**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The illuminated entry is inoperative when using the remote keyless entry (RKE) transmitter 	<ul style="list-style-type: none"> RKE system SJB 	<ul style="list-style-type: none"> Using the RKE transmitter, lock and unlock the doors. <ul style="list-style-type: none"> If the doors lock and unlock correctly, INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation. If the doors do not lock and unlock correctly, REFER to Section 501-14 to continue diagnosis of the RKE system.
<ul style="list-style-type: none"> The ambient lighting is inoperative 	<ul style="list-style-type: none"> Wiring, terminals or connectors Ambient lighting harness Ambient lighting switch Ambient lighting module 	<ul style="list-style-type: none"> GO to Pinpoint Test I.
<ul style="list-style-type: none"> An individual ambient light emitting diode (LED) is inoperative/does not operate correctly 	<ul style="list-style-type: none"> LED 	<ul style="list-style-type: none"> INSTALL a new LED assembly following the instructions within the repair kit. TEST the system for normal operation.
<ul style="list-style-type: none"> The ambient lighting does not operate correctly — does not cycle through all color combinations 	<ul style="list-style-type: none"> Wiring, terminals or connectors Ambient lighting harness Ambient lighting switch Ambient lighting module 	<ul style="list-style-type: none"> GO to Pinpoint Test J.

Pinpoint Tests**Pinpoint Test A: The Courtesy Lamps Are Inoperative**

Refer to [Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.](#)

Normal Operation

Voltage is supplied to the smart junction box (SJB) through the bussed electrical center (BEC) fuse 67 (30A) to the SJB. When a door is opened, the ajar switch opens, signaling the SJB. The SJB monitors the ajar circuits, and based on the ajar status, the SJB supplies voltage to the courtesy lamps on circuit 53 (BK/LB). Ground for the courtesy lamps is controlled by the SJB through circuit 54 (LG/YE).

- DTC B2021 (Dome Lamp Output Return Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects a short to voltage on the dome lamp return circuit.

- DTC B2550 (Dome Lamp Output Circuit Short to Ground) — is a continuous and on-demand DTC that sets when the SJB detects a short to ground on the dome lamp output supply circuit.
- DTC B2554 (Dome Lamp Output Circuit Failure) — is a on-demand DTC that sets when the SJB detects an open on the dome lamp supply or return circuits.

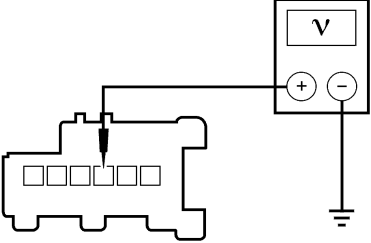
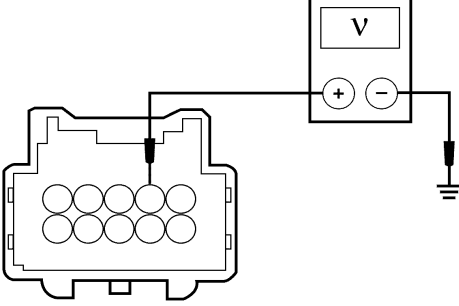
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Interior lamp
- SJB

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: THE COURTESY LAMPS ARE INOPERATIVE

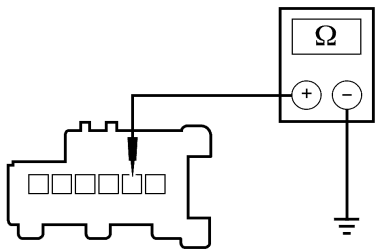
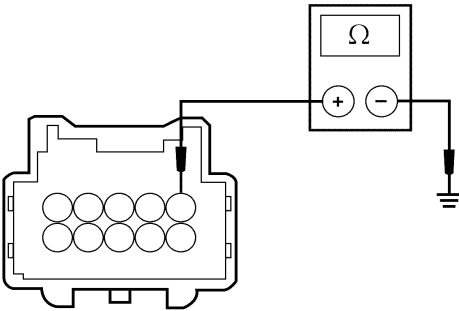
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
A1	CHECK THE RECORDED DTCs FROM THE SJB SELF-TEST	<p>Yes For DTC B2021, GO to A2. For DTC B2550, GO to A4. For DTC B2554, GO to A6.</p> <p>No GO to A10.</p>
	<ul style="list-style-type: none"> Check the recorded results from the SJB self-test. Is DTC B2021, B2250 or B2554 present? 	
A2	CHECK THE INTERIOR LAMP (DTC B2021)	<p>Yes GO to A3.</p> <p>No INSTALL a new interior lamp. Clear the SJB DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Overhead Console C930. Disconnect: Overhead Console (With Convertible Top) C9013. Key in ON position. Enter the following diagnostic mode on the scan tool: SJB Self-Test. NOTE: DTC B2254 may be present and should be ignored. Clear the SJB DTCs and REPEAT the self-test. Is DTC B2021 retrieved again? 	
A3	CHECK CIRCUIT 54 (LG/YE) FOR A SHORT TO VOLTAGE	<p>Yes REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to A11.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: SJB C2280f. Key in ON position. For vehicles without a convertible top, measure the voltage between the overhead console C930-4, circuit 54 (LG/YE), harness side and ground. <div style="text-align: center;">  </div> <p>N0014696</p> <ul style="list-style-type: none"> For vehicles with a convertible top, measure the voltage between the overhead console C9013-4, circuit 54 (LG/YE), harness side and ground. <div style="text-align: center;">  </div> <p>N0053562</p> <ul style="list-style-type: none"> Is any voltage present? 	

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DIAGNOSIS AND TESTING (Continued)

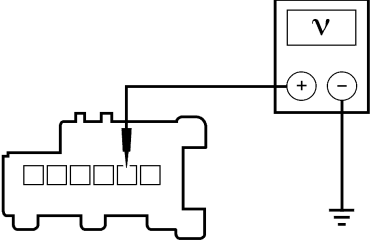
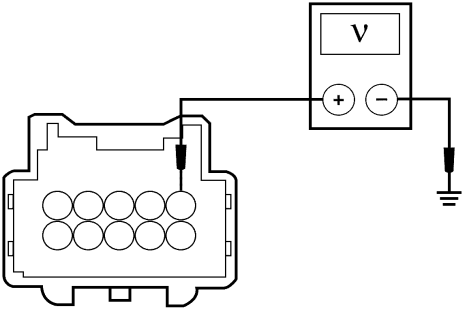
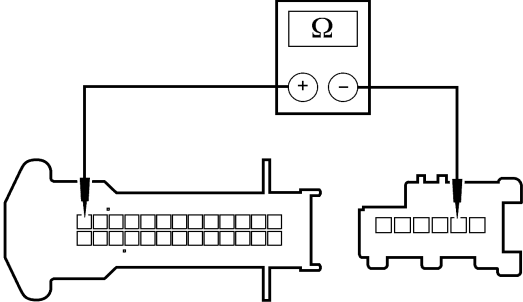
PINPOINT TEST A: THE COURTESY LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
A4	CHECK THE INTERIOR LAMP (DTC B2250)	<p>Yes GO to A5.</p> <p>No INSTALL a new interior lamp. Clear the SJB DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Overhead Console C930. • Disconnect: Overhead Console (With Convertible Top) C9013. • Key in ON position. • Enter the following diagnostic mode on the scan tool: SJB Self-Test. • NOTE: DTC B2254 may be present and should be ignored. Clear the SJB DTCs and REPEAT the self-test. • Is DTC B2050 retrieved again? 	
A5	CHECK CIRCUIT 53 (BK/LB) FOR A SHORT TO GROUND	<p>Yes GO to A11.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280f. • For vehicles without a convertible top, measure the resistance between the overhead console C930-5, circuit 53 (BK/LB), harness side and ground.  <p>N0014697</p> <ul style="list-style-type: none"> • For vehicles with a convertible top, measure the resistance between the overhead console C9013-5, circuit 53 (BK/LB), harness side and ground.  <p>N0053563</p> <ul style="list-style-type: none"> • Is the resistance greater than 10,000 ohms? 	
A6	CHECK CIRCUIT 53 (BK/LB) FOR VOLTAGE	
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Overhead Console C930. • Disconnect: Overhead Console (With Convertible Top) C9013. • Key in ON position. 	

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DIAGNOSIS AND TESTING (Continued)

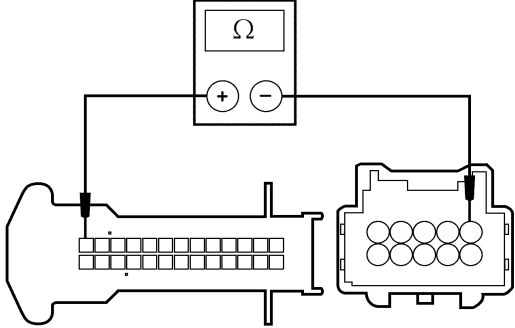
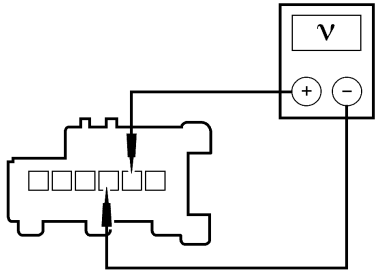
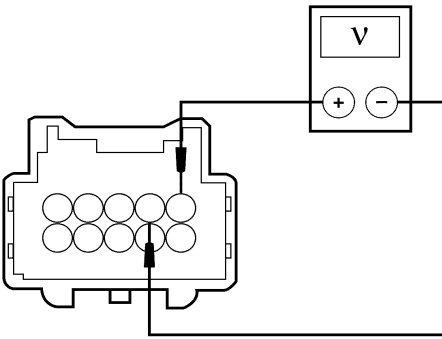
PINPOINT TEST A: THE COURTESY LAMPS ARE INOPERATIVE (Continued)

Test Step	Result / Action to Take
<p>A6 CHECK CIRCUIT 53 (BK/LB) FOR VOLTAGE (Continued)</p> <ul style="list-style-type: none"> For vehicles without a convertible top, measure the voltage between the overhead console C930-5, circuit 53 (BK/LB), harness side and ground.  <p>N0014699</p> <ul style="list-style-type: none"> For vehicles with a convertible top, measure the voltage between the overhead console C9013-5, circuit 53 (BK/LB), harness side and ground.  <p>N0053564</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to A8.</p> <p>No GO to A7.</p>
<p>A7 CHECK CIRCUIT 53 (BK/LB) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: SJB C2280f. For vehicles without a convertible top, measure the resistance between the overhead console C930-5, circuit 53 (BK/LB), harness side and the SJB C2280f-26, circuit 53 (BK/LB), harness side.  <p>N0014700</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

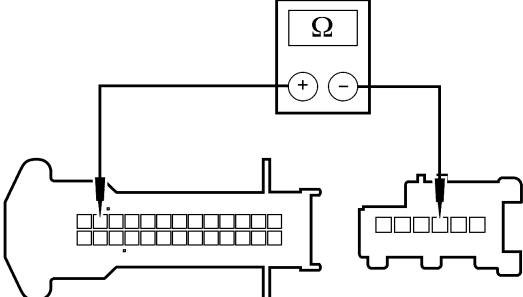
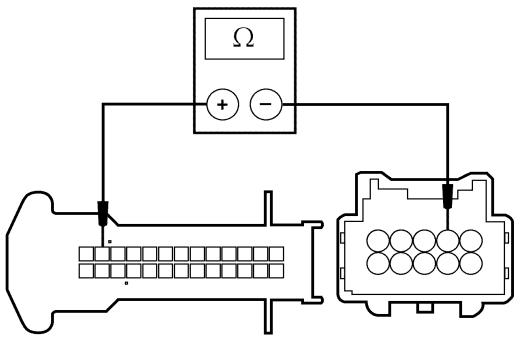
PINPOINT TEST A: THE COURTESY LAMPS ARE INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>A7</p>	<p>CHECK CIRCUIT 53 (BK/LB) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> For vehicles with a convertible top, measure the resistance between the overhead console C9013-5, circuit 53 (BK/LB), harness side and the SJB C2280f-26, circuit 53 (BK/LB), harness side.  <p>N0053565</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to A11.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
<p>A8</p>	<p>CHECK THE GROUND CIRCUIT TO THE OVERHEAD CONSOLE</p> <ul style="list-style-type: none"> For vehicles without a convertible top, measure the voltage between the overhead console C930-5, circuit 53 (BK/LB), harness side and the overhead console C930-4, circuit 54 (LG/YE), harness side.  <p>N0014701</p> <ul style="list-style-type: none"> For vehicles with a convertible top, measure the voltage between the overhead console C9013-5, circuit 53 (BK/LB), harness side and the overhead console C930-4, circuit 54 (LG/YE), harness side.  <p>N0053566</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes INSTALL a new interior lamp. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to A9.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: THE COURTESY LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
A9	<p>CHECK CIRCUIT 54 (LG/YE) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: SJB C2280f. For vehicles without a convertible top, measure the resistance between the overhead console C930-4, circuit 54 (LG/YE), harness side and the SJB C2280f-25, circuit 54 (LG/YE), harness side.  <p>N0014702</p> <ul style="list-style-type: none"> For vehicles with a convertible top, measure the resistance between the overhead console C9013-4, circuit 54 (LG/YE), harness side and the SJB C2280f-25, circuit 54 (LG/YE), harness side.  <p>N0053567</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to A11.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
A10	<p>CHECK THE SJB DOOR AJAR AND THE DIMMER SWITCH PIDs</p> <ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: SJB DataLogger. Monitor the SJB door ajar switch PIDs (D_DR_SW, P_DR_SW) while opening and each door. Monitor the SJB dome lamp switch PID (DOMELM_SW) while operating the dimmer switch in the interior lamp ON positions. Do the SJB door ajar and dome lamp switch PIDs correspond? 	<p>Yes GO to A11.</p> <p>No For a door ajar switch, GO to Pinpoint Test B. For the dome lamp switch, GO to Pinpoint Test C.</p>
A11	<p>CHECK FOR CORRECT SJB OPERATION</p> <ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test B: The Courtesy Lamps Do Not Turn On With One Door Open

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

When a door is open, the ajar switch opens the circuit to the smart junction box (SJB). The SJB monitors the ajar circuits, and based on the ajar status, the SJB supplies voltage and ground to the courtesy lamps.

The SJB sends a voltage reference signal to the LH door ajar switch through circuit 1312 (LG/BK) and the RH door ajar switch through circuit 1314 (YE/LG). The door ajar switch routes the signal to ground through circuit 1205 (BK). When the door is opened, the door ajar switch opens the circuit, signalling the SJB a request for the courtesy lamps.

The power window motors also use this input for the short drop feature. For additional information, refer to Section 501-11.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Door ajar switch
- Power window motor
- SJB

PINPOINT TEST B: THE COURTESY LAMPS DO NOT TURN ON WITH ONE DOOR OPEN

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

Test Step		Result / Action to Take
B1	CHECK THE POWER WINDOW MOTOR FOR SHORT TO GROUND	
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Power Window Motor C518 (LH) or C623 (RH). • Do the courtesy lamps turn on? 	<p>Yes INSTALL a new power window motor. REFER to Section 501-11. TEST the system for normal operation.</p> <p>No GO to B2.</p>
B2	CHECK THE DOOR AJAR SWITCH	
	<ul style="list-style-type: none"> • Disconnect: Suspect Door Ajar Switch. • Do the courtesy lamps turn on? 	<p>Yes INSTALL a new door ajar switch for the switch in question. REFER to Section 501-14. TEST the system for normal operation.</p> <p>No GO to B3.</p>
B3	CHECK THE DOOR AJAR SWITCH SIGNAL CIRCUIT FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> • Disconnect: SJB C2280e. • Measure the resistance between the LH door ajar switch C526-2, circuit 1312 (LG/BK), harness side and ground; or between the RH door ajar switch C602-2, circuit 1314 (YE/LG), harness side and ground. • Is the resistance greater than 10,000 ohms? 	<p>Yes GO to B4.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>
B4	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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>

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test C: The Courtesy Lamps Are Inoperative — Using The Dimmer Switch

Refer to [Wiring Diagrams Cell 89, Interior Lamps](#) for schematic and connector information.

Normal Operation

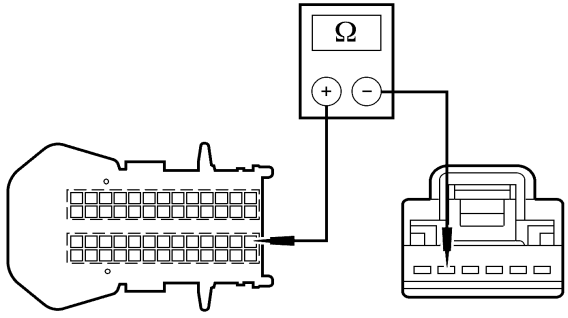
The smart junction box (SJB) monitors the dimmer switch status on circuit 2085 (VT/YE) to determine if the courtesy lamps are requested. Based on the dimmer switch status, the SJB supplies voltage and ground to the courtesy lamps.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Dimmer switch
- SJB

PINPOINT TEST C: THE COURTESY LAMPS ARE INOPERATIVE — USING THE DIMMER SWITCH

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

Test Step		Result / Action to Take
C1	RETRIEVE THE SJB DTCs FROM BOTH THE CONTINUOUS AND THE ON-DEMAND SELF-TESTS	
	<ul style="list-style-type: none"> • Check the recorded results from the SJB self-test. • Are any DTCs present? 	<p>Yes REFER to Section 419-10.</p> <p>No GO to C2.</p>
C2	CHECK THE DIMMER SWITCH	
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Dimmer Switch C2298. • Carry out the dimmer switch component test. Refer to Wiring Diagrams Cell 149 for component testing. • Is the dimmer switch OK? 	<p>Yes GO to C3.</p> <p>No INSTALL a new dimmer switch. TEST the system for normal operation.</p>
C3	CHECK CIRCUIT 2085 (VT/YE) FOR AN OPEN	
	<ul style="list-style-type: none"> • Disconnect: SJB C2280b. • Measure the resistance between the SJB C2280b-14, circuit 2085 (VT/YE), harness side and the dimmer switch C2298-5, circuit 2085 (VT/YE), harness side. <div style="text-align: center;">  <p>N0014704</p> </div> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to C4.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
C4	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB 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 SJB. REFER to Section 419-10. 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>

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test D: The Courtesy Lamps Stay On Continuously

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

When a door is opened, the door ajar input from circuit 1312 (LG/BK) or circuit 1314 (YE/GN) to the smart junction box (SJB) opens. When the SJB identifies that the circuit is open, the SJB provides voltage and ground to the courtesy lamps through circuit 53 (BK/LB) and 54 (LG/YE). The door ajar switches are grounded through circuit 1205 (BK).

When the dimmer switch is rotated to the interior lamps ON position, the SJB receives a signal through circuit 2085 (VT/YE), requesting the courtesy lamps.

- DTC B1319 (Driver Door Ajar Circuit Failure) — is a on-demand DTC that sets when the SJB detects an open on the driver door ajar switch circuit.
- DTC B1327 (Passenger Door Ajar Circuit Failure) — is a on-demand DTC that sets when the SJB detects an open on the passenger door ajar switch circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Door ajar switch
- Dimmer switch
- SJB

PINPOINT TEST D: THE COURTESY LAMPS STAY ON CONTINUOUSLY

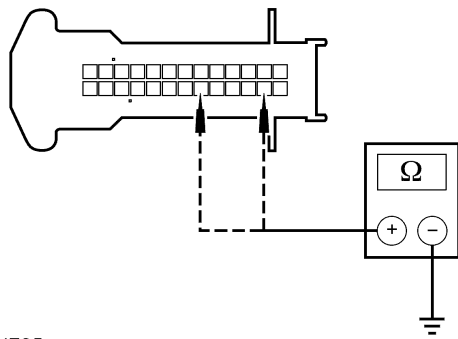
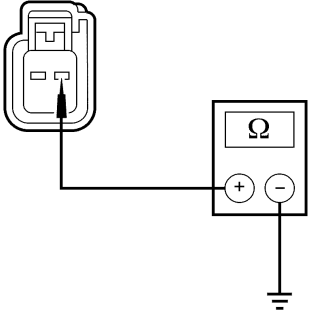
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take									
D1	CHECK THE RECORDED DTCs FROM THE SJB SELF-TEST	Yes GO to D2 . No GO to D5 .									
	<ul style="list-style-type: none"> • Check the recorded results from the SJB self-test. • Is DTC B1319 or B1327 present? 										
D2	CHECK THE AJAR SIGNAL CIRCUIT FOR GROUND										
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280e. • NOTE: Make sure the doors are closed. Measure the resistance between the SJB, harness side and ground as follows: 										
	<table border="1"> <thead> <tr> <th>DTC</th> <th>Location</th> <th>Connector-Pin/ Circuit</th> </tr> </thead> <tbody> <tr> <td>B1319</td> <td>LH door</td> <td>C2280e-2 1312 (LG/BK)</td> </tr> <tr> <td>B1327</td> <td>RH door</td> <td>C2280e-6 1314 (YE/LG)</td> </tr> </tbody> </table>		DTC	Location	Connector-Pin/ Circuit	B1319	LH door	C2280e-2 1312 (LG/BK)	B1327	RH door	C2280e-6 1314 (YE/LG)
DTC	Location		Connector-Pin/ Circuit								
B1319	LH door	C2280e-2 1312 (LG/BK)									
B1327	RH door	C2280e-6 1314 (YE/LG)									

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DIAGNOSIS AND TESTING (Continued)

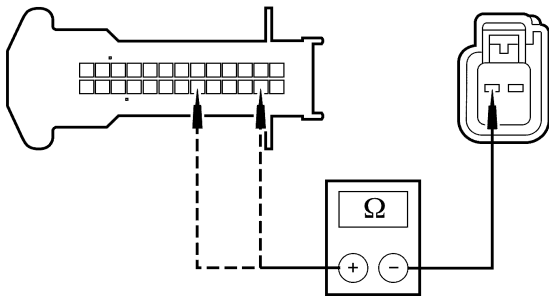
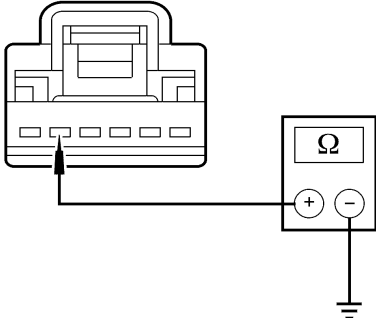
PINPOINT TEST D: THE COURTESY LAMPS STAY ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take												
D2	<p>CHECK THE AJAR SIGNAL CIRCUIT FOR GROUND (Continued)</p>  <p>N0014705</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to D9.</p> <p>No GO to D3.</p>												
D3	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: Suspect Door Ajar Switch. Measure the resistance between the suspect door ajar switch, harness side and ground as follows: <table border="1" data-bbox="142 898 971 1113"> <thead> <tr> <th>DTC</th> <th>Location</th> <th>Connector-Pin/ Circuit</th> </tr> </thead> <tbody> <tr> <td>B1319</td> <td>LH door</td> <td>C526-1 1205 (BK)</td> </tr> <tr> <td>B1327</td> <td>RH door</td> <td>C602-1 1205 (BK)</td> </tr> </tbody> </table>  <p>N0014706</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	DTC	Location	Connector-Pin/ Circuit	B1319	LH door	C526-1 1205 (BK)	B1327	RH door	C602-1 1205 (BK)	<p>Yes GO to D4.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>			
DTC	Location	Connector-Pin/ Circuit												
B1319	LH door	C526-1 1205 (BK)												
B1327	RH door	C602-1 1205 (BK)												
D4	<p>CHECK THE DOOR AJAR SIGNAL CIRCUIT FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the suspect door ajar switch, harness side and the SJB, harness side as follows: <table border="1" data-bbox="142 1705 971 1948"> <thead> <tr> <th>DTC</th> <th>Location</th> <th>SJB Connector- Pin/Circuit</th> <th>Ajar Switch Connector- Pin/Circuit</th> </tr> </thead> <tbody> <tr> <td>B1319</td> <td>LH door</td> <td>C2280e-2 1312 (LG/BK)</td> <td>C526-2 1312 (LG/BK)</td> </tr> <tr> <td>B1327</td> <td>RH door</td> <td>C2280e-6 1314 (YE/LG)</td> <td>C602-2 1314 (YE/LG)</td> </tr> </tbody> </table>	DTC	Location	SJB Connector- Pin/Circuit	Ajar Switch Connector- Pin/Circuit	B1319	LH door	C2280e-2 1312 (LG/BK)	C526-2 1312 (LG/BK)	B1327	RH door	C2280e-6 1314 (YE/LG)	C602-2 1314 (YE/LG)	
DTC	Location	SJB Connector- Pin/Circuit	Ajar Switch Connector- Pin/Circuit											
B1319	LH door	C2280e-2 1312 (LG/BK)	C526-2 1312 (LG/BK)											
B1327	RH door	C2280e-6 1314 (YE/LG)	C602-2 1314 (YE/LG)											

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: THE COURTESY LAMPS STAY ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
D4	CHECK THE DOOR AJAR SIGNAL CIRCUIT FOR AN OPEN (Continued)	
 <p>N0014708</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 		<p>Yes INSTALL a new ajar switch in question. CLEAR the DTCs. REPEAT the self-test.</p> <p>No REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</p>
D5	CHECK THE DIMMER SWITCH	
<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Dimmer Switch C2298. • Does the dome lamp turn off? 		<p>Yes INSTALL a new dimmer switch. TEST the system for normal operation.</p> <p>No GO to D6.</p>
D6	CHECK CIRCUIT 2085 (VT/YE) FOR A SHORT TO GROUND	
<ul style="list-style-type: none"> • Disconnect: SJB C2280b. • Measure the resistance between the dimmer switch C2298-5, circuit 2085 (VT/YE), harness side and ground.  <p>N0014709</p> <ul style="list-style-type: none"> • Is the resistance greater than 10,000 ohms? 		<p>Yes GO to D7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
D7	CHECK THE DOME LAMP CONTROL GROUND CIRCUIT FOR A SHORT TO GROUND	
<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280f. • Measure the resistance between the SJB C2280f-25, circuit 54 (LG/YE), harness side and ground. • Is the resistance greater than 10,000 ohms? 		<p>Yes GO to D9.</p> <p>No GO to D8.</p>
D8	CHECK CIRCUIT 54 (LG/YE) FOR A SHORT TO GROUND	
<ul style="list-style-type: none"> • Disconnect: Overhead Console C930. • Disconnect: Overhead Console (With Convertible Top) C9013. • Measure the resistance between the SJB C2280f-25, circuit 54 (LG/YE), harness side and ground. • Is the resistance greater than 10,000 ohms? 		<p>Yes INSTALL a new overhead console. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST D: THE COURTESY LAMPS STAY ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
D9	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test E: The Demand Lamps Are Inoperative

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

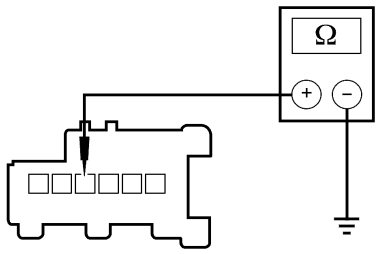
The smart junction box (SJB) provides voltage to the demand lamps through circuit 53 (BK/LB). Ground for the demand lamps is provided through circuit 1205 (BK).

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Interior lamp

PINPOINT TEST E: THE DEMAND LAMPS ARE INOPERATIVE

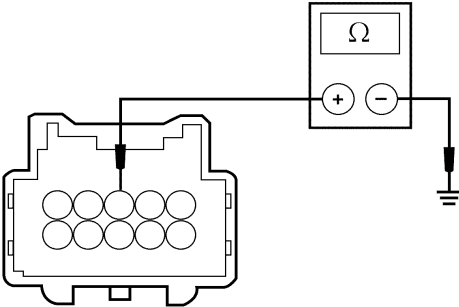
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
E1	CHECK THE COURTESY LAMP OPERATION	<p>Yes GO to E2.</p> <p>No GO to Symptom Chart for correct diagnosis.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • Attempt to turn the courtesy lamps on by opening the doors and using the dimmer switch. • Does the courtesy lamp turn on? 	
E2	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Overhead Console C930. • Disconnect: Overhead Console (With Convertible Top) C9013. • For vehicles without a convertible top, measure the resistance between the overhead console C930-3, circuit 1205 (BK), harness side and ground. <div style="text-align: center;">  </div> <p>N0014703</p>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: THE DEMAND LAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
E2	CHECK CIRCUIT 1205 (BK) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> For vehicles with a convertible top, measure the resistance between the overhead console C9013-3, circuit 1205 (BK), harness side and ground.  <p>N0053570</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new overhead console. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

Pinpoint Test F: The Luggage Compartment Lamp Is Inoperative

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

When the luggage compartment lid is open, circuit 1351 (TN) to the smart junction box (SJB) opens. When the SJB identifies that the circuit is open, the SJB provides voltage to the luggage compartment lamp through circuit 707 (WH/YE). The luggage compartment lid ajar switch and the luggage compartment lamp are grounded through circuit 1205 (BK).

- DTC B1084 (Trunk Lamp Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects an open or short to ground on the luggage compartment lamp supply circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Luggage compartment lamp
- Luggage compartment lid ajar switch
- SJB

PINPOINT TEST F: THE LUGGAGE COMPARTMENT LAMP IS INOPERATIVE

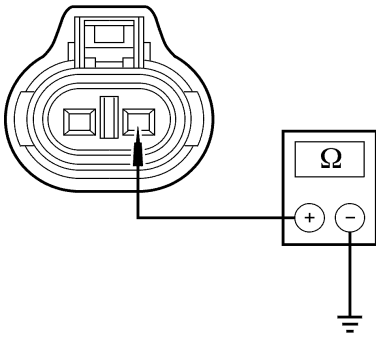
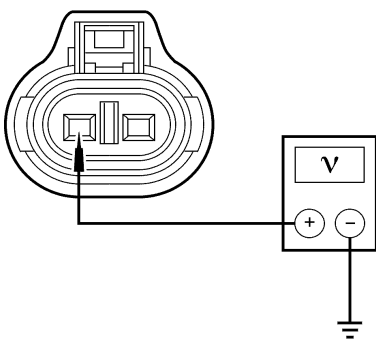
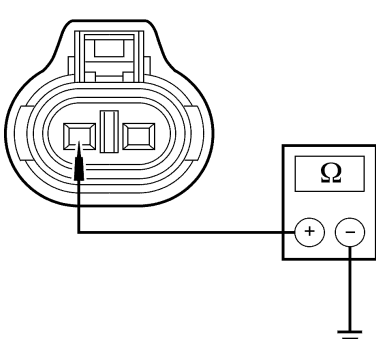
CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
F1	CHECK THE RECORDED DTCs FROM THE SJB SELF-TEST	
	<ul style="list-style-type: none"> Check the recorded results from the SJB self-test. Is DTC B1084 present? 	<p>Yes GO to F2.</p> <p>No GO to F6.</p>
F2	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Luggage Compartment Lamp C428. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

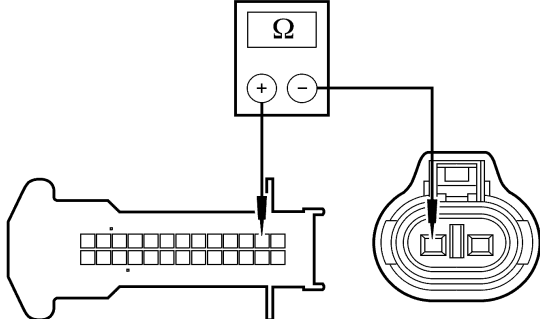
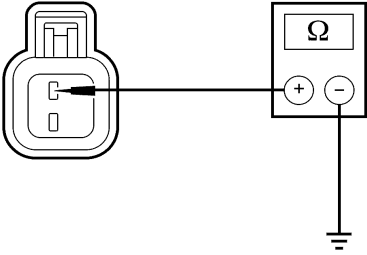
PINPOINT TEST F: THE LUGGAGE COMPARTMENT LAMP IS INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>F2</p>	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the luggage compartment lamp C428-2, circuit 1205 (BK), harness side and ground.  <p>N0014711</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to F3.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
<p>F3</p>	<p>CHECK CIRCUIT 707 (WH/YE) FOR VOLTAGE</p> <ul style="list-style-type: none"> Key in ON position. Measure the voltage between the luggage compartment lamp C428-1, circuit 707 (WH/YE), harness side and ground.  <p>N0014712</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes INSTALL a new luggage compartment lamp. CLEAR the DTCs. REPEAT the self-test.</p> <p>No GO to F4.</p>
<p>F4</p>	<p>CHECK CIRCUIT 707 (WH/YE) FOR A SHORT TO GROUND</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: SJB C2280e. Measure the resistance between the luggage compartment lamp C428-1, circuit 707 (WH/YE), harness side and ground.  <p>N0014713</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to F5.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST F: THE LUGGAGE COMPARTMENT LAMP IS INOPERATIVE (Continued)

	Test Step	Result / Action to Take
F5	CHECK CIRCUIT 707 (WH/YE) FOR AN OPEN	
	<ul style="list-style-type: none"> Measure the resistance between the luggage compartment lamp C428-1, circuit 707 (WH/YE), harness side and the SJB C2280e-15, circuit 707 (WH/YE), harness side.  <p>N0014714</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to F8.</p> <p>No REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</p>
F6	CHECK THE SJB LUGGAGE COMPARTMENT LID AJAR SWITCH	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Luggage Compartment Lid Ajar Switch C429. Key in ON position. Does the luggage compartment lamp turn on? 	<p>Yes INSTALL a new luggage compartment lid ajar switch. REFER to Section 501-14. TEST the system for normal operation.</p> <p>No GO to F7.</p>
F7	CHECK CIRCUIT 1351 (TN) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: SJB C2280c. Measure the resistance between the luggage compartment lid ajar switch C429-1, circuit 1351 (TN), harness side and ground.  <p>N0014715</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	<p>Yes GO to F8.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
F8	CHECK FOR CORRECT SJB OPERATION	
	<ul style="list-style-type: none"> Disconnect all the SJB connectors. Check for: <ul style="list-style-type: none"> corrosion damaged pins pushed-out pins Connect all the SJB 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 SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)

Pinpoint Test G: The Luggage Compartment Lamp Stays On Continuously

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

When the luggage compartment lid is open, circuit 1351 (TN) to the smart junction box (SJB) opens. When the SJB identifies that the circuit is open, the SJB provides voltage to the luggage compartment lamp through circuit 707 (WH/YE). The luggage compartment lid ajar switch is grounded through circuit 1205 (BK).

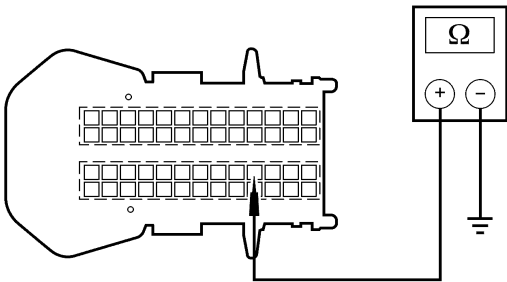
- DTC B1084 (Trunk Lamp Circuit Failure) — is a continuous and on-demand DTC that sets when the SJB detects a short to voltage on the luggage compartment lamp supply circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Luggage compartment lid ajar switch
- SJB

PINPOINT TEST G: THE LUGGAGE COMPARTMENT LAMP STAYS ON CONTINUOUSLY

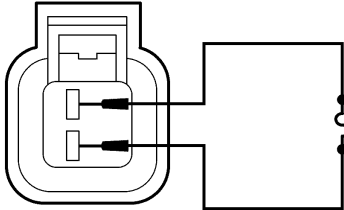
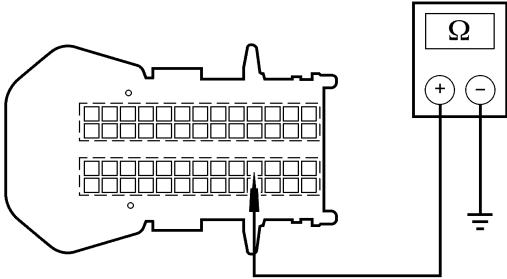
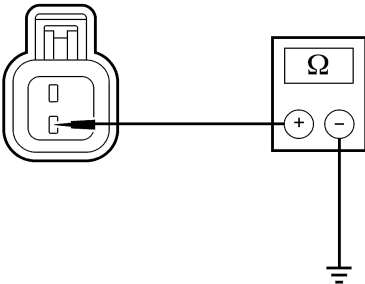
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
G1	CHECK THE RECORDED DTCs FROM THE SJB SELF-TEST <ul style="list-style-type: none"> • Check the recorded results from the SJB self-test. • Is DTC B1084 present? 	Yes GO to G2 . No GO to G3 .
G2	CHECK CIRCUIT 707 (WH/YE) FOR A SHORT TO VOLTAGE <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280e. • Key in ON position. • Does the luggage compartment lamp continue to illuminate? 	Yes REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test. No GO to G6 .
G3	CHECK THE AJAR SIGNAL CIRCUIT FOR GROUND <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280c. • NOTE: The luggage compartment lid must be closed. Measure the resistance between the SJB C2280c-17, circuit 1351 (TN), harness side and ground. <div style="text-align: center;">  <p>N0014716</p> </div> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	Yes GO to G6 . No GO to G4 .
G4	CHECK THE LUGGAGE COMPARTMENT LID AJAR SWITCH <ul style="list-style-type: none"> • Disconnect: Luggage Compartment Lid Ajar Switch C429. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST G: THE LUGGAGE COMPARTMENT LAMP STAYS ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
G4	<p>CHECK THE LUGGAGE COMPARTMENT LID AJAR SWITCH (Continued)</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper between the luggage compartment lid ajar switch C429-2, circuit 1205 (BK), harness side and the luggage compartment lid ajar switch C429-1, circuit 1351 (TN), harness side.  <p>A0062632</p> <ul style="list-style-type: none"> Measure the resistance between the SJB C2280c-17, circuit 1351 (TN), harness side and ground.  <p>N0014716</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes REMOVE the jumper wire. INSTALL a new luggage compartment lid ajar switch. REFER to Section 501-14. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to G5.</p>
G5	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Measure the resistance between the luggage compartment lid ajar switch C429-2, circuit 1205 (BK), harness side and ground.  <p>N0014717</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes REPAIR circuit 1351 (TN) for an open. TEST the system for normal operation.</p> <p>No REPAIR circuit 1205 (BK) for an open. TEST the system for normal operation.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST G: THE LUGGAGE COMPARTMENT LAMP STAYS ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
G6	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test H: The Battery Saver Does Not Deactivate After Timeout

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

The smart junction box (SJB) controls the battery saver feature. The SJB provides voltage to circuit 53 (BK/LB). When the battery saver activates, the SJB stops providing voltage on circuit 53 (BK/LB) to the demand lamps.

- DTC B2554 (Dome Lamp Output Circuit Failure) — is a on-demand DTC that sets when the SJB detects a short to voltage on the dome lamp output supply circuit.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- SJB

PINPOINT TEST H: THE BATTERY SAVER DOES NOT DEACTIVATE AFTER TIMEOUT

Test Step		Result / Action to Take
H1	CHECK CIRCUIT 53 (BK/LB) FOR A SHORT TO VOLTAGE	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No GO to H2.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • Disconnect: SJB C2280f. • Key in ON position. • Turn the interior lamp on using the demand switch. • Does the demand lighting illuminate? 	
H2	CHECK FOR CORRECT SJB OPERATION	<p>Yes INSTALL a new SJB. REFER to Section 419-10. 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. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> • Disconnect all the SJB connectors. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect all the SJB connectors and make sure they seat correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 	

Pinpoint Test I: The Ambient Lighting Is Inoperative

Refer to Wiring Diagrams Cell 89, Interior Lamps for schematic and connector information.

Normal Operation

When the ignition key is in the run or accessory position, the ambient lighting module supplies voltage and ground to the light emitting diodes (LEDs) located in the floor console cup holders and the front and rear footwells. The ambient lighting switch is used to cycle through the 7 color combinations or to turn the ambient lighting feature off. There are 3 different color (red, blue and green) LEDs housed within each LED assembly.

DIAGNOSIS AND TESTING (Continued)

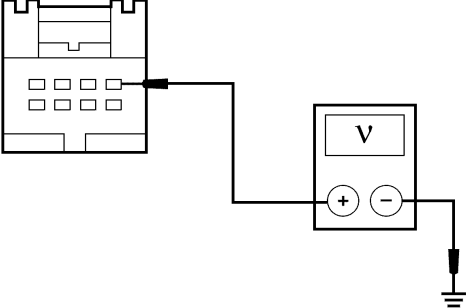
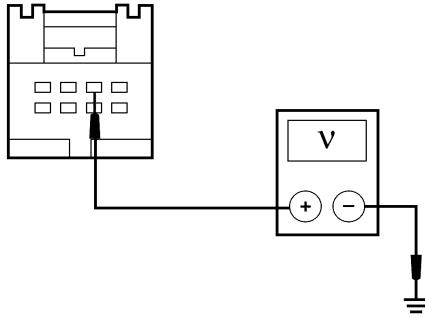
When the ignition key is in the run or accessory position, the ambient lighting switch and the ambient lighting module receives voltage through circuit CLN46 (BU) (shared with the electrochromatic mirror voltage supply circuit). Ground for the ambient lighting module is provided through circuit GD908 (BK). When the ambient lighting switch is pressed, voltage is routed to the ambient lighting module through circuit CLN54 (BN/YE), indicating a request for the module to cycle the ambient lighting to the next setting.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Ambient lighting harness
- Ambient lighting switch
- Ambient lighting module

PINPOINT TEST I: THE AMBIENT LIGHTING IS INOPERATIVE

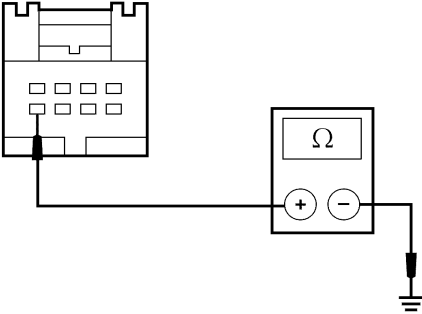
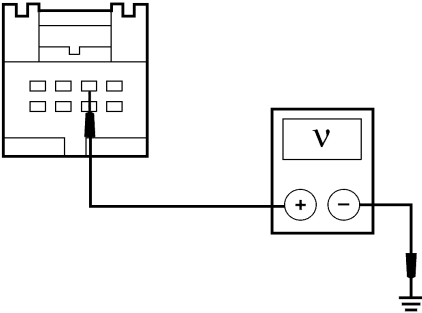
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

	Test Step	Result / Action to Take
<p>I1</p>	<p>CHECK CIRCUIT CBX07 (GN/RD) FOR AN OPEN (TO AMBIENT LIGHTING MODULE)</p> <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Ambient Lighting Module C3347. • Key in ON position. • Measure the voltage between the ambient lighting module C3347-1, circuit CBX07 (GN/RD), harness side and ground.  <p>N0064678</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 	<p>Yes GO to I2.</p> <p>No VERIFY the SJB fuse 7 (10A) is OK. If OK, REPAIR the circuit. TEST the system for normal operation.</p>
<p>I2</p>	<p>CHECK THE INPUT FROM CIRCUIT CLN54 (BN/YE)</p> <ul style="list-style-type: none"> • While pressing and releasing the ambient lighting switch, measure the voltage between the ambient lighting module C3347-2, circuit CLN54 (BN/YE), harness side and ground.  <p>N0064679</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts with the switch pressed and 0 volts with the switch released? 	<p>Yes GO to I3.</p> <p>No If voltage is always present, GO to I4. If no voltage is present, GO to I5.</p>

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DIAGNOSIS AND TESTING (Continued)

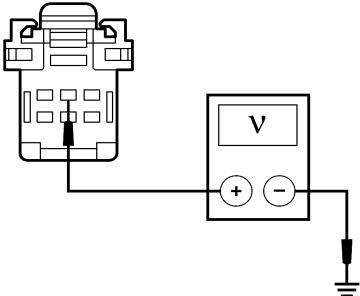
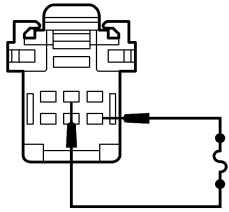
PINPOINT TEST I: THE AMBIENT LIGHTING IS INOPERATIVE (Continued)

	Test Step	Result / Action to Take
<p>I3</p>	<p>CHECK CIRCUIT GD908 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> • Key in OFF position. • Measure the resistance between the ambient lighting module C3347-8, circuit GD908 (BK), harness side and ground.  <p>N0064680</p> <ul style="list-style-type: none"> • Is the resistance less than 5 ohms? 	<p>Yes GO to I7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>I4</p>	<p>CHECK CIRCUIT CLN54 (BN/YE) FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> • Key in OFF position. • Disconnect: Ambient Lighting Switch C3348. • Key in ON position. • Measure the voltage between the ambient lighting module C3347-2, circuit CLN54 (BN/YE), harness side and ground.  <p>N0064679</p> <ul style="list-style-type: none"> • Is any voltage present? 	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No INSTALL a new ambient lighting switch. REFER to Ambient Lighting Switch in this section. TEST the system for normal operation.</p>
<p>I5</p>	<p>CHECK CIRCUIT CBX07 (GN/RD) FOR AN OPEN (TO AMBIENT LIGHTING SWITCH)</p> <ul style="list-style-type: none"> • Key in OFF position. • Connect: Ambient Lighting Module C3347. • Disconnect: Ambient Lighting Switch C3348. • Key in ON position. 	

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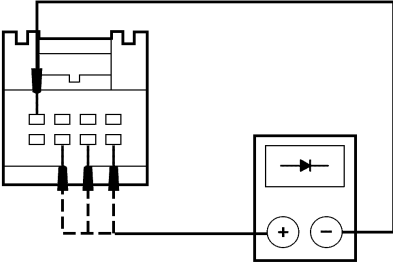
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST I: THE AMBIENT LIGHTING IS INOPERATIVE (Continued)

Test Step		Result / Action to Take								
15	<p>CHECK CIRCUIT CBX07 (GN/RD) FOR AN OPEN (TO AMBIENT LIGHTING SWITCH) (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the ambient lighting switch C3348-2, circuit CBX07 (GN/RD), harness side and ground.  <p style="text-align: center;">N0072739</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to I6.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>								
16	<p>CHECK THE AMBIENT LIGHTING SWITCH</p> <ul style="list-style-type: none"> Connect and remove a fused (5A) jumper wire between the ambient lighting switch C3348-2, circuit CBX07 (GN/RD), harness side and the ambient lighting switch C3348-6, circuit CLN54 (BN/YE), harness side.  <p style="text-align: center;">N0072740</p> <ul style="list-style-type: none"> Do the ambient LEDs illuminate and cycle through a color change each time the jumper wire is connected and removed? 	<p>Yes INSTALL a new ambient lighting switch. REFER to Ambient Lighting Switch in this section. TEST the system for normal operation.</p> <p>No REPAIR circuit CLN54 (BN/YE) for an open. TEST the system for normal operation.</p>								
17	<p>CHECK THE AMBIENT LIGHTING HARNESS</p> <ul style="list-style-type: none"> Key in OFF position. Check any of the diode circuits between the ambient lighting module, harness side as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Connector-Pin/ Circuit</th> <th style="text-align: center;">Connector-Pin/ Circuit</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">C3347-5 CLN45 (GN)</td> <td style="text-align: center;">C3347-4 RLN44 (BN)</td> </tr> <tr> <td style="text-align: center;">C3347-6 CLN46 (BU)</td> <td style="text-align: center;">C3347-4 RLN44 (BN)</td> </tr> <tr> <td style="text-align: center;">C3347-7 CLN44 (OG)</td> <td style="text-align: center;">C3347-4 RLN44 (BN)</td> </tr> </tbody> </table>	Connector-Pin/ Circuit	Connector-Pin/ Circuit	C3347-5 CLN45 (GN)	C3347-4 RLN44 (BN)	C3347-6 CLN46 (BU)	C3347-4 RLN44 (BN)	C3347-7 CLN44 (OG)	C3347-4 RLN44 (BN)	
Connector-Pin/ Circuit	Connector-Pin/ Circuit									
C3347-5 CLN45 (GN)	C3347-4 RLN44 (BN)									
C3347-6 CLN46 (BU)	C3347-4 RLN44 (BN)									
C3347-7 CLN44 (OG)	C3347-4 RLN44 (BN)									

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST I: THE AMBIENT LIGHTING IS INOPERATIVE (Continued)**

Test Step		Result / Action to Take
17	CHECK THE AMBIENT LIGHTING HARNESS (Continued)	
 <p>N0064681</p> <ul style="list-style-type: none"> • Does the meter indicate the circuit is good? 		<p>Yes GO to I8.</p> <p>No REPAIR or INSTALL a new ambient lighting harness. TEST the system for normal operation.</p>
18	CHECK FOR CORRECT AMBIENT LIGHTING MODULE OPERATION	
<ul style="list-style-type: none"> • Disconnect the ambient lighting module connector. • Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins • Connect the ambient lighting module connector and make sure it seats correctly. • Operate the system and verify the concern is still present. • Is the concern still present? 		<p>Yes INSTALL a new ambient lighting module. REFER to Ambient Lighting Module in this section. TEST the system for normal operation.</p> <p>If the concern is still present, INSTALL the original ambient lighting module. INSTALL a new ambient lighting harness. 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 J: The Ambient Lighting Does Not Operate Correctly — Does Not Cycle Through Color Variations

Refer to [Wiring Diagrams Cell 89, Interior Lamps](#) for schematic and connector information.

Normal Operation

When the ignition key is in the run or accessory position, the ambient lighting module supplies voltage and ground to the light emitting diodes (LEDs) located in the floor console cup holders and the front and rear footwells. The ambient lighting switch is used to cycle through the 7 color combinations or to turn the ambient lighting feature off. There are 3 different color (red, blue and green) LEDs housed within each LED assembly.

When the ignition key is in the run or accessory position, the ambient lighting switch and the ambient lighting module receives voltage through the circuit CLN46 (BU) (shared with the electrochromatic mirror voltage supply circuit). Ground for the ambient lighting module is provided through circuit GD908 (BK). When the ambient lighting switch is pressed, voltage is routed to the ambient lighting module through circuit CLN54 (BN/YE), indicating a request for the module to cycle the ambient lighting to the next setting.

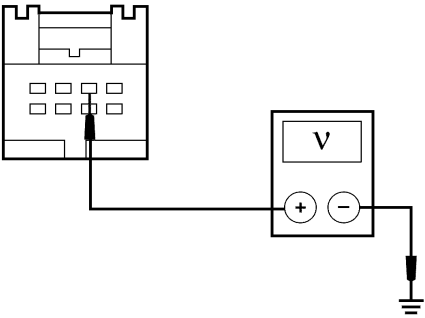
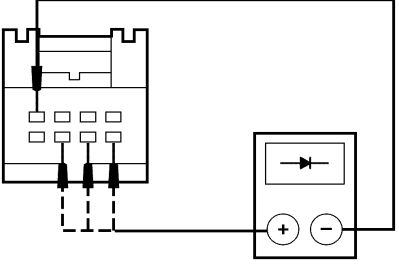
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Ambient lighting switch
- Ambient lighting harness
- Ambient lighting module

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST J: THE AMBIENT LIGHTING DOES NOT OPERATE CORRECTLY — DOES NOT CYCLE THROUGH ALL COLOR VARIATIONS

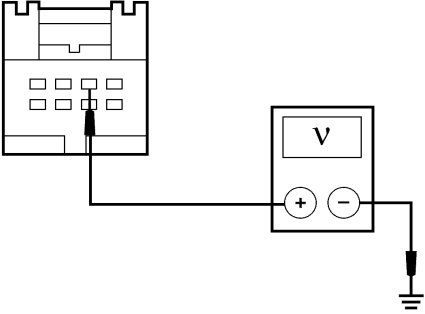
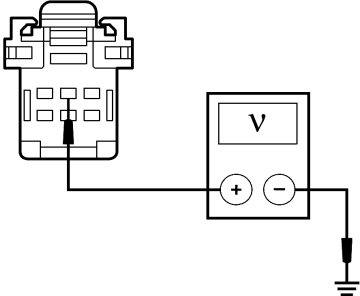
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take								
J1	<p>CHECK THE INPUT FROM CIRCUIT CLN54 (BN/YE)</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Ambient Lighting Module C3347. Key in ON position. While pressing and releasing the ambient lighting switch, measure the voltage between the ambient lighting module C3347-2, circuit CLN54 (BN/YE), harness side and ground.  <p>N0064679</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts with the switch pressed and 0 volts with the switch released? 	<p>Yes GO to J2.</p> <p>No If voltage is always present, GO to J3. If no voltage is present, GO to J4.</p>								
J2	<p>CHECK THE AMBIENT LIGHTING HARNESS</p> <ul style="list-style-type: none"> Key in OFF position. Check the diode circuits between the ambient lighting module, harness side as follows: <table border="1" data-bbox="142 1171 971 1432"> <thead> <tr> <th>Connector-Pin/ Circuit</th> <th>Connector-Pin/ Circuit</th> </tr> </thead> <tbody> <tr> <td>C3347-5 CLN45 (GN)</td> <td>C3347-4 RLN44 (BN)</td> </tr> <tr> <td>C3347-6 CLN46 (BU)</td> <td>C3347-4 RLN44 (BN)</td> </tr> <tr> <td>C3347-7 CLN44 (OG)</td> <td>C3347-4 RLN44 (BN)</td> </tr> </tbody> </table>  <p>N0064681</p> <ul style="list-style-type: none"> Does the meter indicate good for each circuit check? 	Connector-Pin/ Circuit	Connector-Pin/ Circuit	C3347-5 CLN45 (GN)	C3347-4 RLN44 (BN)	C3347-6 CLN46 (BU)	C3347-4 RLN44 (BN)	C3347-7 CLN44 (OG)	C3347-4 RLN44 (BN)	<p>Yes GO to J6.</p> <p>No REPAIR or INSTALL a new ambient lighting harness. TEST the system for normal operation.</p>
Connector-Pin/ Circuit	Connector-Pin/ Circuit									
C3347-5 CLN45 (GN)	C3347-4 RLN44 (BN)									
C3347-6 CLN46 (BU)	C3347-4 RLN44 (BN)									
C3347-7 CLN44 (OG)	C3347-4 RLN44 (BN)									
J3	<p>CHECK CIRCUIT CLN54 (BN/YE) FOR A SHORT TO VOLTAGE</p> <ul style="list-style-type: none"> Key in OFF position. 									

(Continued)

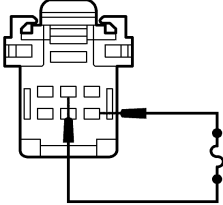
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST J: THE AMBIENT LIGHTING DOES NOT OPERATE CORRECTLY — DOES NOT CYCLE THROUGH ALL COLOR VARIATIONS (Continued)

Test Step		Result / Action to Take
<p>J3</p> <p>CHECK CIRCUIT CLN54 (BN/YE) FOR A SHORT TO VOLTAGE (Continued)</p> <ul style="list-style-type: none"> • Disconnect: Ambient Lighting Switch C3348. • Key in ON position. • Measure the voltage between the ambient lighting module C3347-2, circuit CLN54 (BN/YE), harness side and ground.  <p>N0064679</p> <ul style="list-style-type: none"> • Is any voltage present? 	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No INSTALL a new ambient lighting switch. REFER to Ambient Lighting Switch in this section. TEST the system for normal operation.</p>	
<p>J4</p> <p>CHECK CIRCUIT CBX07 (GN/RD) FOR AN OPEN (TO AMBIENT LIGHTING SWITCH)</p> <ul style="list-style-type: none"> • Key in OFF position. • Connect: Ambient Lighting Module C3347. • Disconnect: Ambient Lighting Switch C3348. • Key in ON position. • Measure the voltage between the ambient lighting switch C3348-2, circuit CBX07 (GN/RD), harness side and ground.  <p>N0072739</p> <ul style="list-style-type: none"> • Is the voltage greater than 10 volts? 		

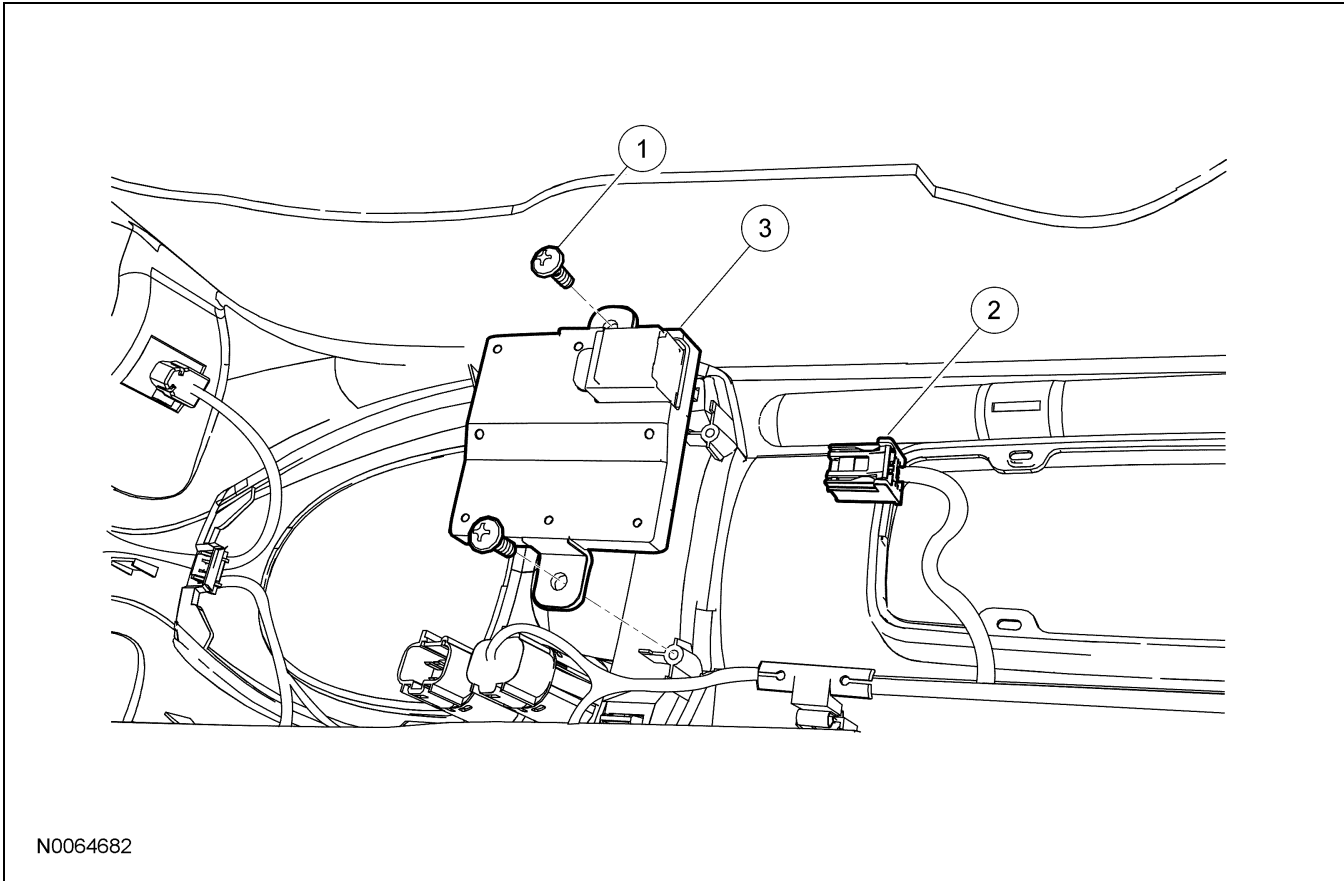
(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST J: THE AMBIENT LIGHTING DOES NOT OPERATE CORRECTLY — DOES NOT CYCLE THROUGH ALL COLOR VARIATIONS (Continued)**

Test Step		Result / Action to Take
J5	CHECK THE AMBIENT LIGHTING SWITCH	
	<ul style="list-style-type: none"> Connect and remove a fused (5A) jumper wire between the ambient lighting switch C3347-2, circuit CBX07 (GN/RD), harness side and the ambient lighting switch C3347-6, circuit CLN54 (BN/YE), harness side.  <p>N0072740</p> <ul style="list-style-type: none"> Do the ambient LEDs illuminate and cycle through a color change each time the jumper wire is connected and removed? 	<p>Yes INSTALL a new ambient lighting switch. REFER to Ambient Lighting Switch in this section. TEST the system for normal operation.</p> <p>No REPAIR circuit CLN54 (BN/YE) for an open. TEST the system for normal operation.</p>
J6	CHECK FOR CORRECT AMBIENT LIGHTING MODULE OPERATION	
	<ul style="list-style-type: none"> Disconnect the ambient lighting module connector. Check for: <ul style="list-style-type: none"> — corrosion — damaged pins — pushed-out pins Connect the ambient lighting module connector and make sure it seats correctly. Operate the system and verify the concern is still present. Is the concern still present? 	<p>Yes INSTALL a new ambient lighting module. REFER to Ambient Lighting Module in this section. 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>

REMOVAL AND INSTALLATION

Ambient Lighting Module



N0064682

Item	Part Number	Description
1	W701679	Ambient lighting module screws (2 required)
2	—	Ambient lighting module electrical connector (part of 14D375)
3	13C788	Ambient lighting module

Removal and Installation

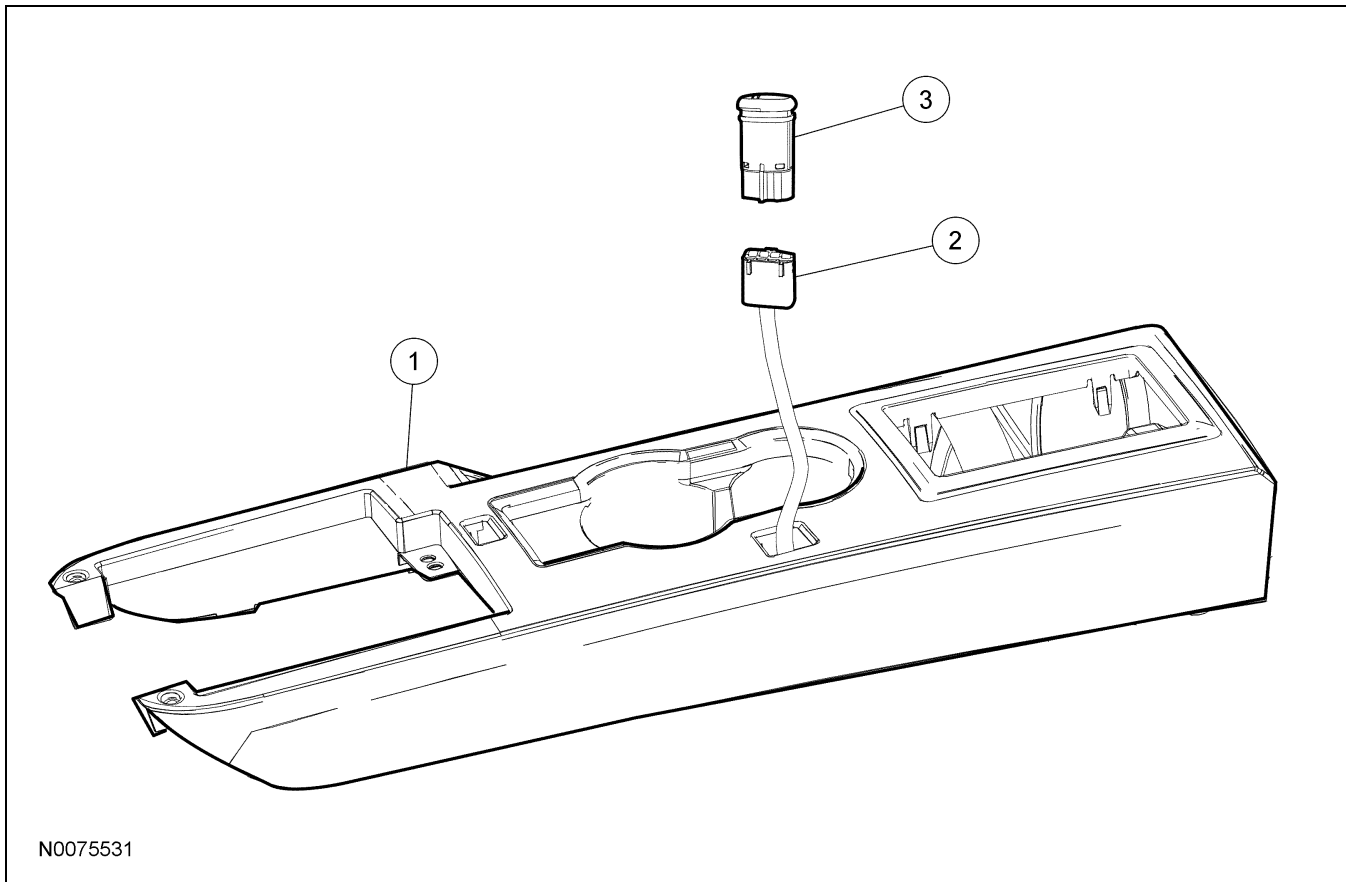
1. Remove the floor console finish panel. For additional information, refer to Section 501-12.

NOTE: The ambient lighting module is mounted under the bottom of the floor console finish panel cup holder.

2. Remove the 2 screws and the ambient lighting module.
 - Disconnect the electrical connector.
3. To install, reverse the removal procedure.

REMOVAL AND INSTALLATION

Ambient Lighting Switch



N0075531

Item	Part Number	Description
1	63044F06	Floor console finish panel
2	—	Ambient lighting switch electrical connector (part of 14D375)
3	—	Ambient lighting switch

Removal and Installation

1. Remove the floor console finish panel. For additional information, refer to Section 501-12.
 - Disconnect the electrical connectors.
2. Squeeze the retaining tabs and remove the ambient lighting switch.
3. To install, reverse the removal procedure.