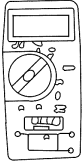
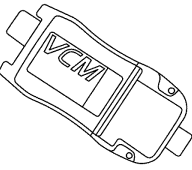
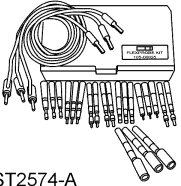


DIAGNOSIS AND TESTING

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

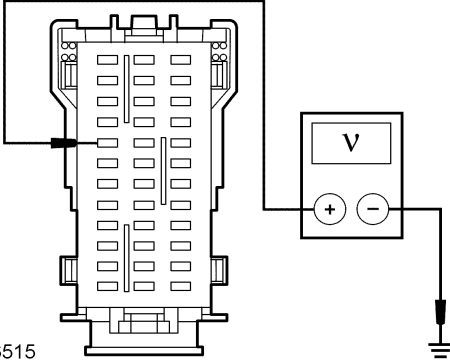
The smart junction box (SJB) is supplied voltage for the low beams through circuit 1052 (TN/BK) from the bussed electrical center (BEC). When a request for the low beams is detected, the SJB provides voltage to the low beams or high intensity discharge (HID) relays (if equipped). The headlamps share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

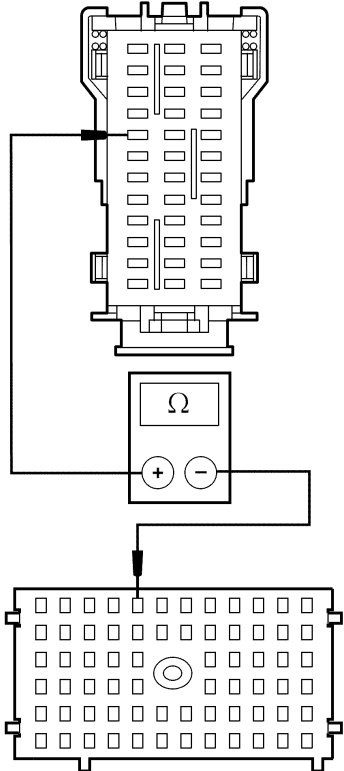
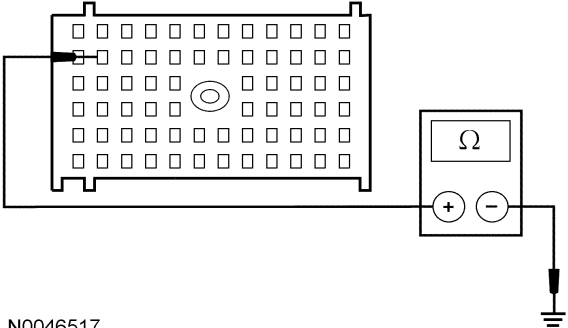
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step	Result / Action to Take
<p>A1 CHECK CIRCUIT 1052 (TN/BK) FOR A VOLTAGE</p> <ul style="list-style-type: none"> • Key in OFF position. • 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

 **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 LOW BEAMS	<p>Yes GO to B2.</p> <p>No GO to Pinpoint Test A.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • 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? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

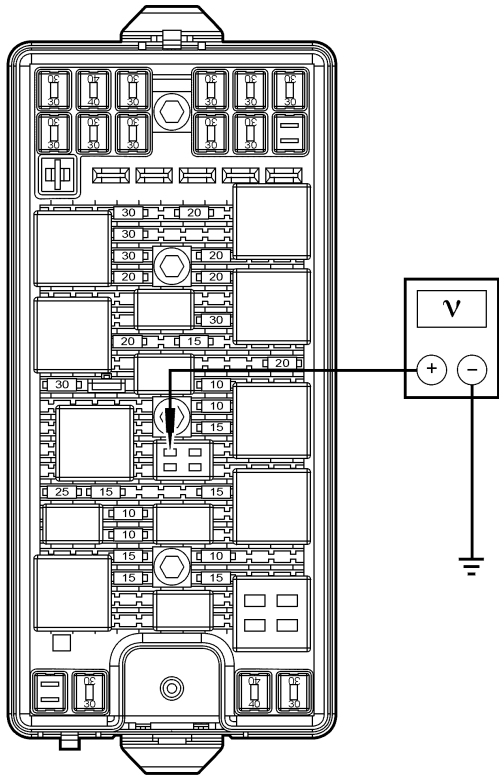
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

	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. • Key in ON position. • Measure the voltage between the high beam relay pin 86, circuit 1708 (LG/BK), BEC face side and ground. <div data-bbox="295 693 787 1459" style="text-align: center;"> </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"> • Key in OFF position. • Disconnect: BEC C1035a. • Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

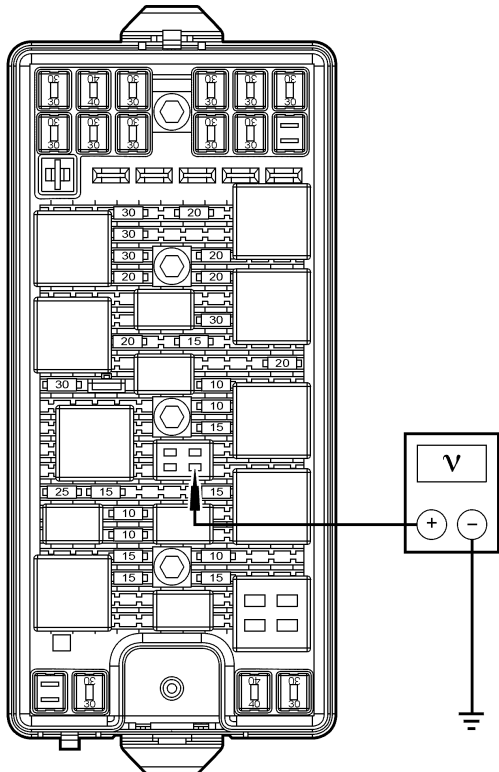
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

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"> Key in OFF position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

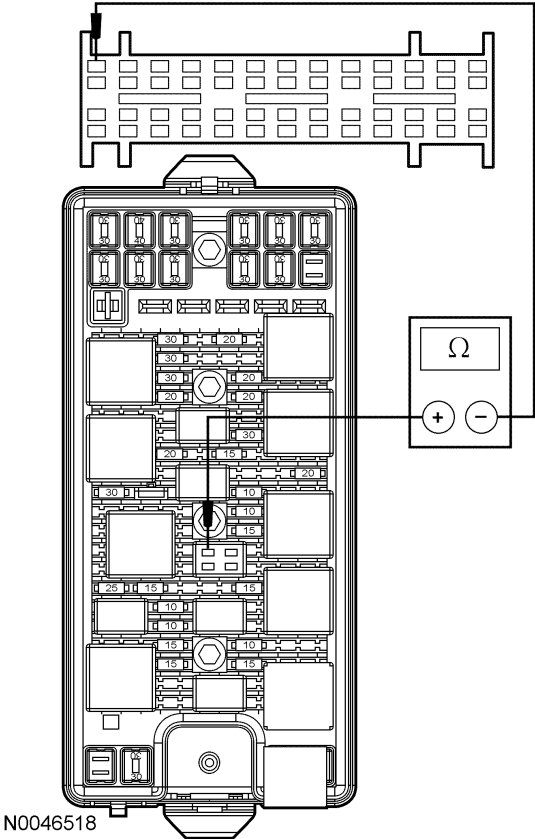
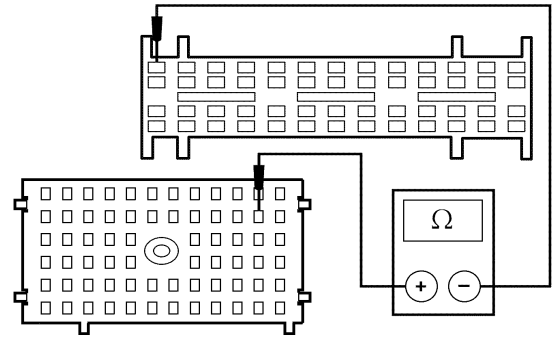
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
B6	<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>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>

(Continued)

DIAGNOSIS AND TESTING (Continued)

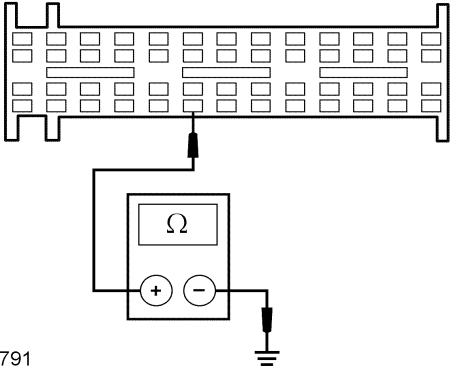
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

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>

(Continued)

DIAGNOSIS AND TESTING (Continued)

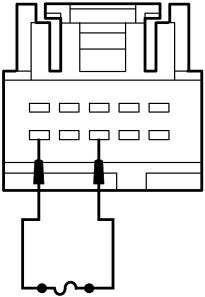
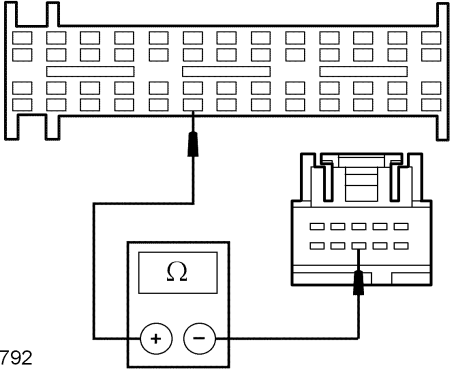
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
B9	CHECK THE MULTIFUNCTION SWITCH	<p>Yes GO to B10.</p> <p>No INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> • Disconnect: Multifunction Switch C202. • Key in ON position. • 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	<p>Yes GO to B15.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • 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. <div style="text-align: center;">  <p>N0072791</p> </div> <ul style="list-style-type: none"> • Is the resistance greater than 10,000 ohms? 	
B11	CHECK THE HIGH BEAM SWITCH INPUT	<p>Yes GO to B12.</p> <p>No GO to B13.</p>
	<ul style="list-style-type: none"> • Key in ON position. • 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)	<p>Yes REMOVE the known good relay. INSTALL a new high beam relay. TEST the system for normal operation.</p> <p>No REMOVE the known good relay. INSTALL a new BEC. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> • Key in OFF position. • 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"> • Key in OFF position. • Disconnect: Multifunction Switch C202. • Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

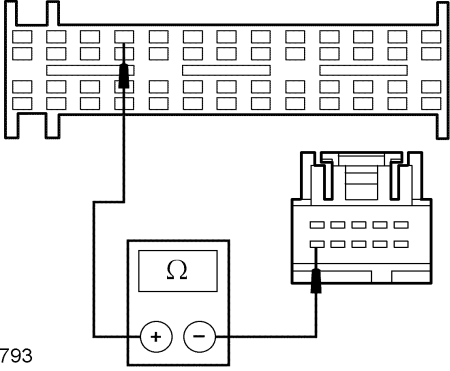
PINPOINT TEST B: BOTH HIGH BEAMS ARE INOPERATIVE (Continued)

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"> Key in OFF position. 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	<p>CHECK CIRCUITS 1394 (WH/RD) AND 1396 (VT/WH) FOR AN OPEN (Continued)</p> <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	<p>CHECK THE SJB CONFIGURATION</p> <ul style="list-style-type: none"> Key in ON position. 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	<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>

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.

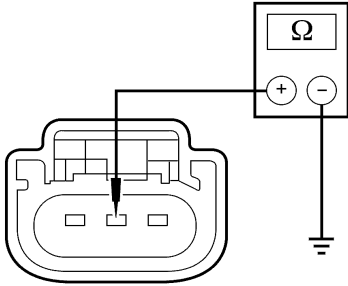
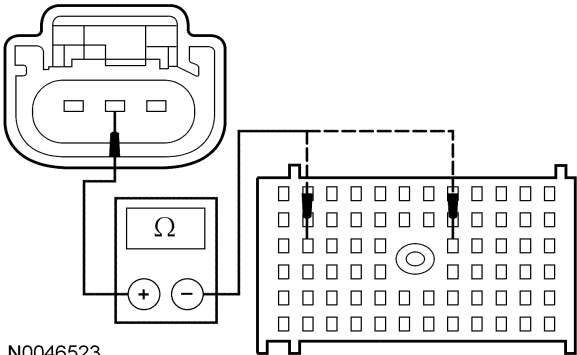
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- BEC
- SJB

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

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

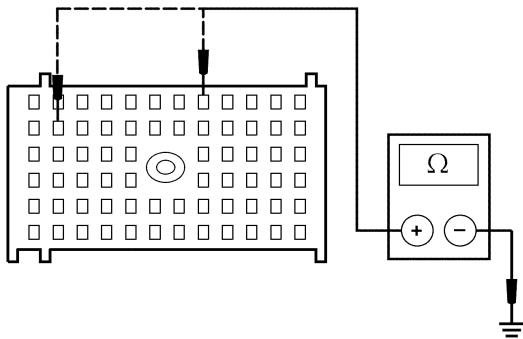
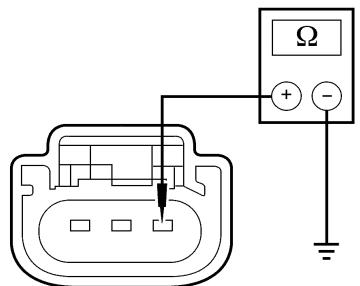
NOTE: Make sure the bulb is good before continuing diagnostics.

	Test Step	Result / Action to Take
<p>C1</p>	<p>CHECK THE HEADLAMP GROUND CIRCUIT</p> <ul style="list-style-type: none"> • Key in OFF position. • 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>
<p>C2</p>	<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)

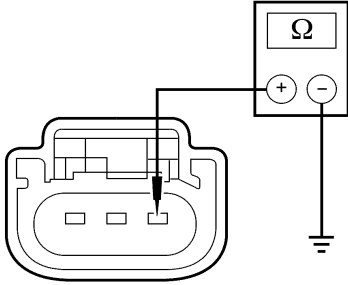
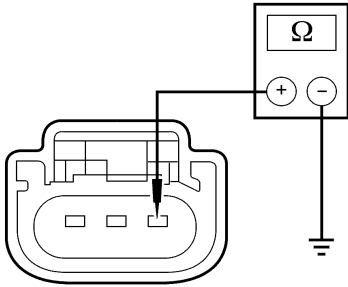
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

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)

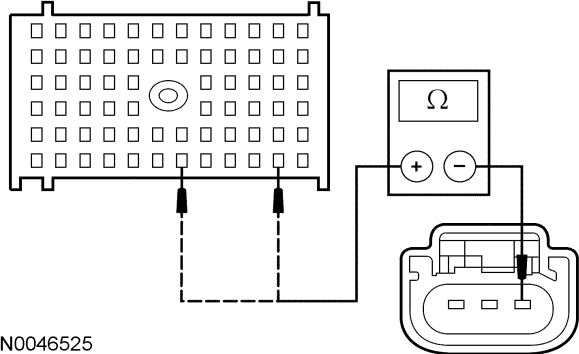
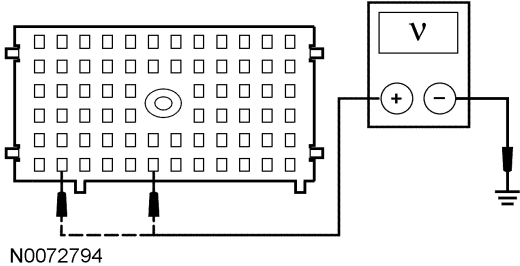
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

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. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

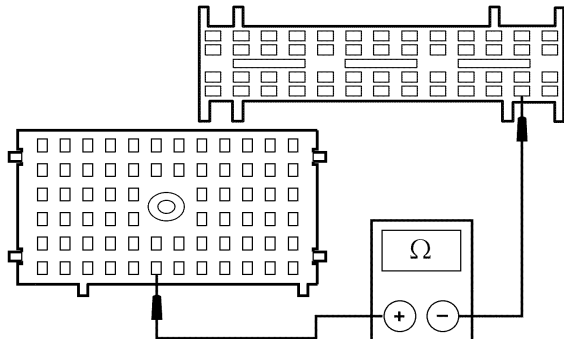
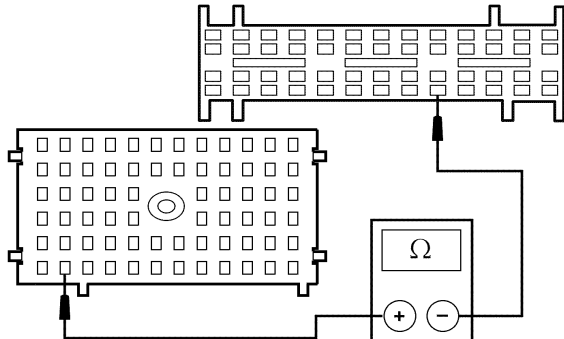
PINPOINT TEST C: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HALOGEN HEADLAMPS (Continued)

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.

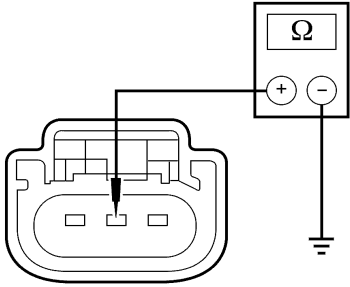
When the HID relays are energized, voltage is routed to the LH and RH headlamps through circuits 2008 (PK/WH) (PK/BK for 5.4L) and 2009 (PK/WH), respectively.

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

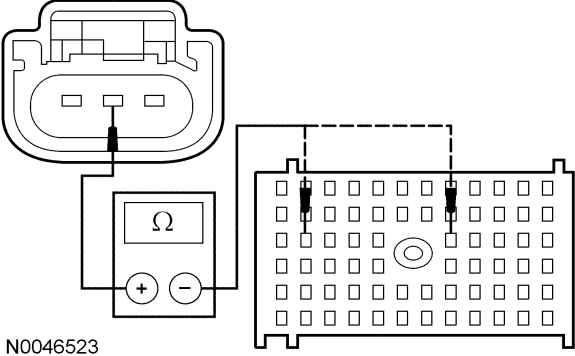
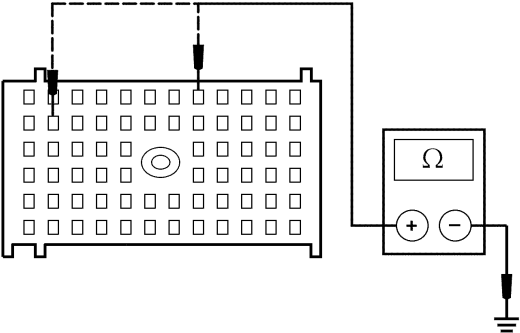
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
D1	CHECK THE HID RELAY <ul style="list-style-type: none"> • Key in OFF position. • 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. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

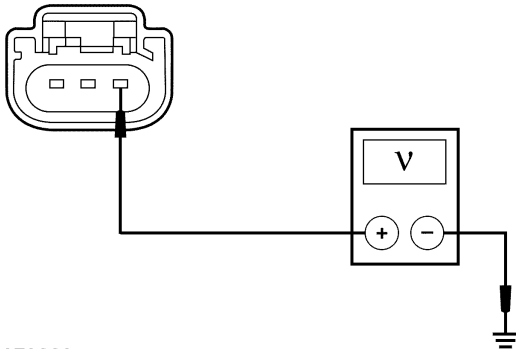
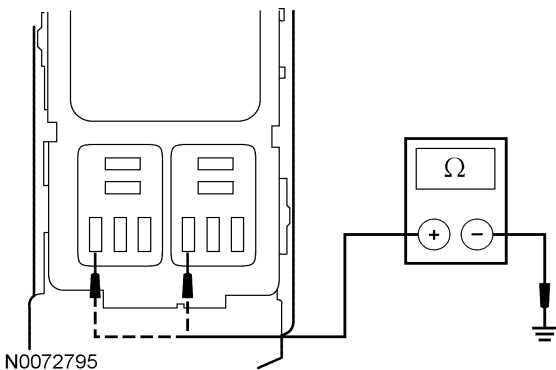
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take
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. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

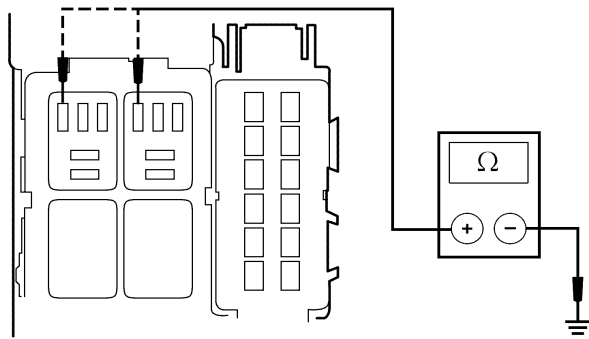
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step	Result / Action to Take
<p>D5 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>
<p>D6 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>	

(Continued)

DIAGNOSIS AND TESTING (Continued)

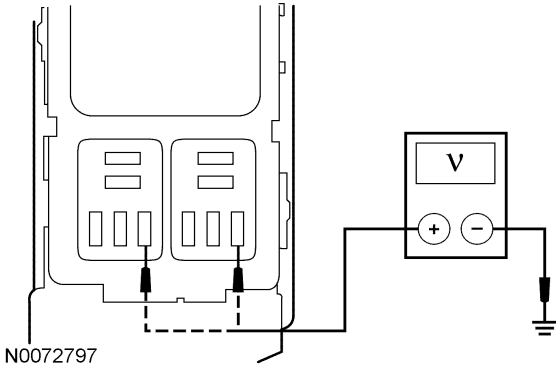
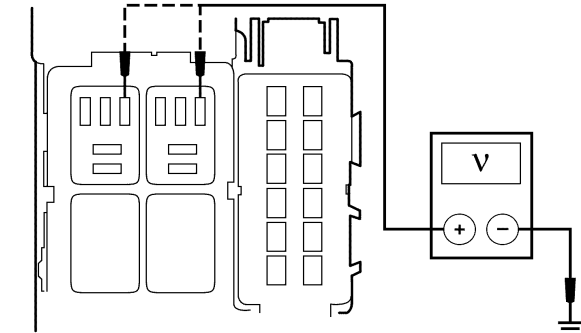
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step		Result / Action to Take																					
D6	<p>CHECK THE HID RELAY GROUND CIRCUIT (Continued)</p> <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	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN (HID RELAY TO BEC)</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 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	<p>CHECK CIRCUIT 1336 (LG/WH) OR CIRCUIT 1338 (WH) FOR VOLTAGE</p> <ul style="list-style-type: none"> Place the headlamp switch in the HEADLAMPS ON position. 																						

(Continued)

DIAGNOSIS AND TESTING (Continued)

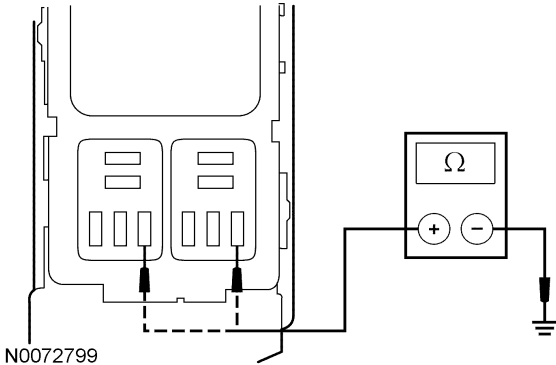
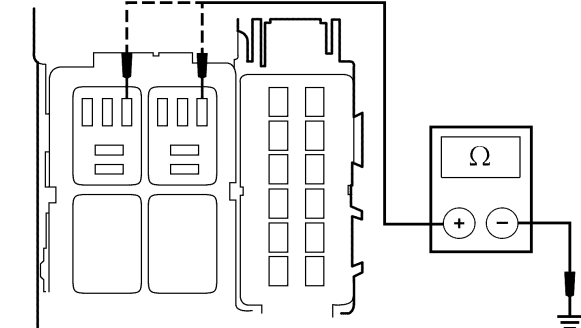
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

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)

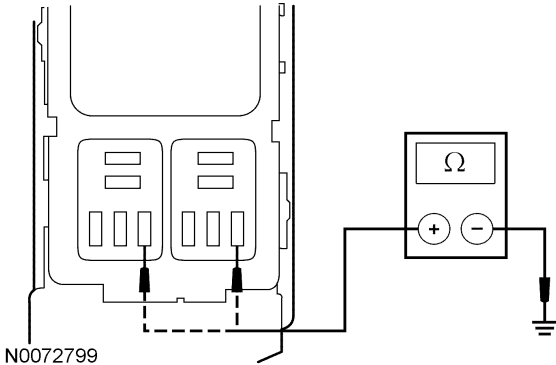
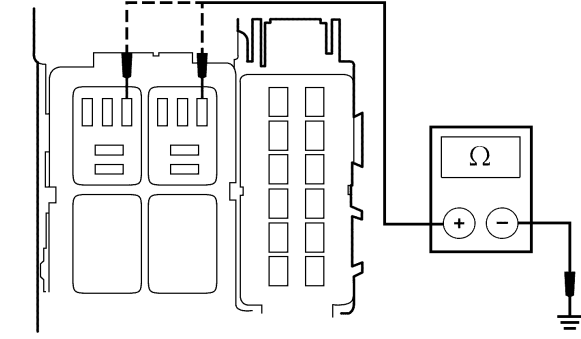
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

	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. 	

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DIAGNOSIS AND TESTING (Continued)

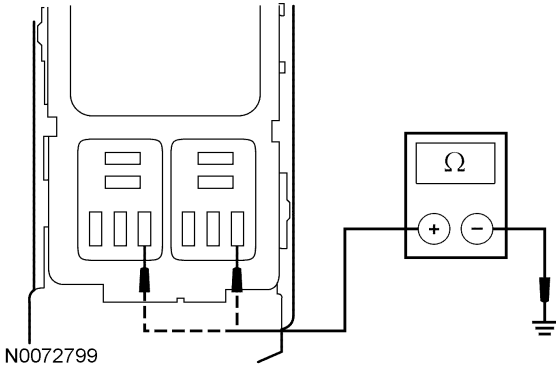
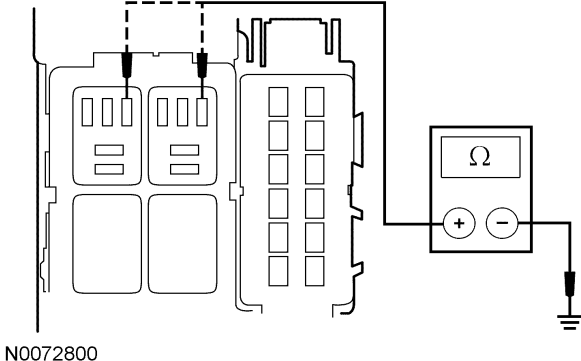
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step	Result / Action to Take
<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)

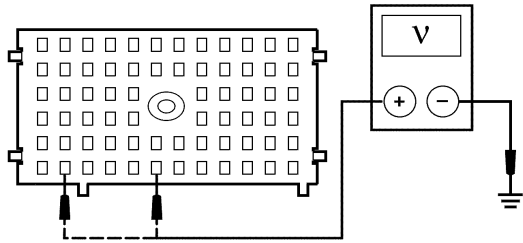
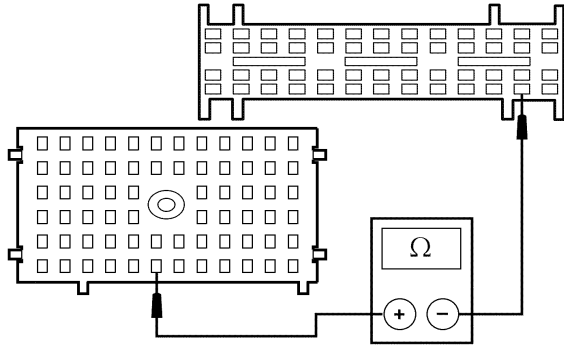
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

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)

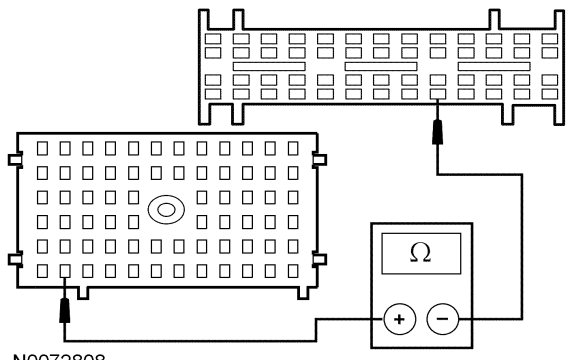
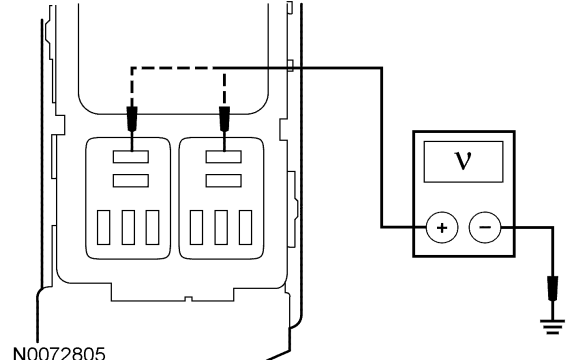
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

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)

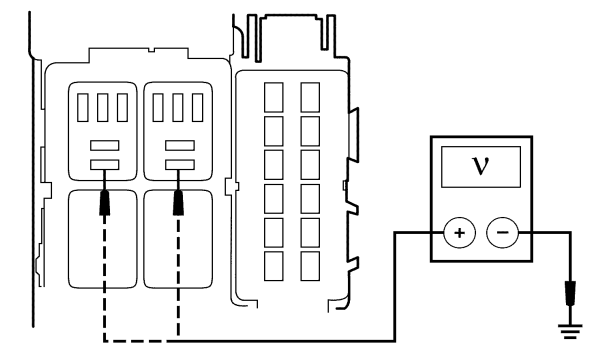
PINPOINT TEST D: ONE LOW BEAM HEADLAMP IS INOPERATIVE — HIGH INTENSITY DISCHARGE (HID) HEADLAMPS (Continued)

Test Step	Result / Action to Take
<p>D14 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 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

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

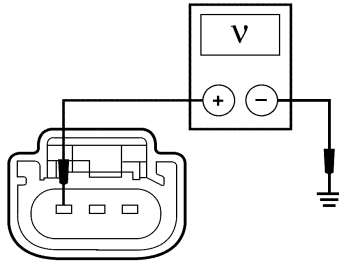
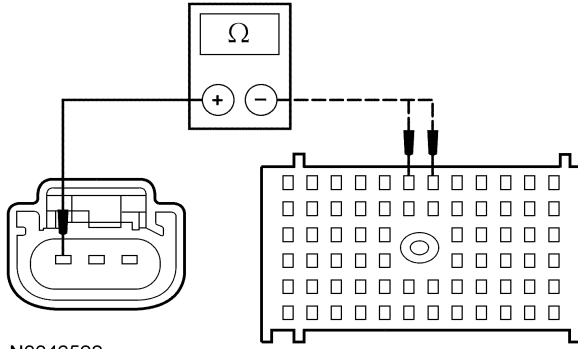
NOTE: For halogen headlamps, make sure the bulb is good before continuing diagnostics.

Test Step		Result / Action to Take
E1	CHECK THE LOW BEAMS	
	<ul style="list-style-type: none"> • Key in OFF position. • 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

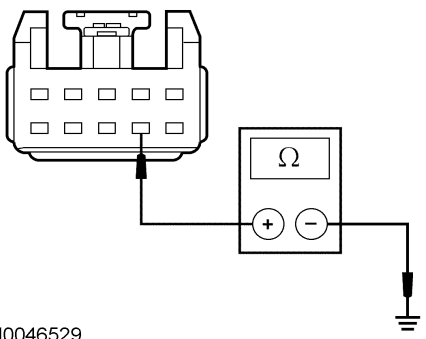
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step	Result / Action to Take
F1 DETERMINE IF THE HIGH BEAMS ARE ALWAYS ON	Yes GO to F2 . No GO to F13 .
<ul style="list-style-type: none"> • Key in ON position. • While observing the headlamps, engage the flash-to-pass feature. • Does the headlamp brightness increase? 	
F2 USE THE RECORDED DTCs FROM THE SJB SELF-TEST (LOW BEAMS ALWAYS ON)	Yes GO to F3 . No GO to F8 .
<ul style="list-style-type: none"> • Using the recorded results from the SJB self-test: • Was DTC B1470 recorded? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

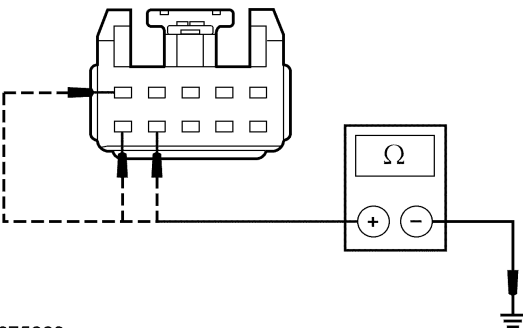
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take							
F3	CHECK THE SJB HEADLAMP SWITCH 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>							
	<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? 								
F4	CHECK CIRCUIT 1205 (BK) FOR AN OPEN	<p>Yes GO to F5.</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: 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? 								
F5	CHECK THE HEADLAMP SWITCH	<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>							
	<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? 								
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
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)

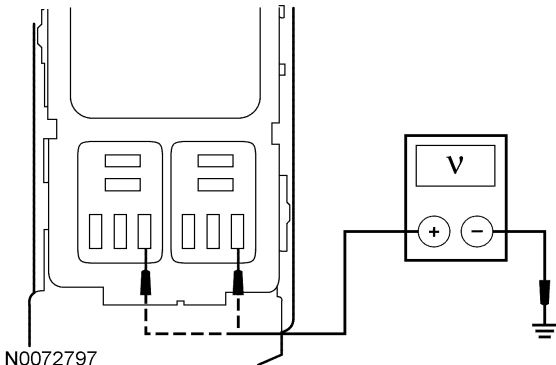
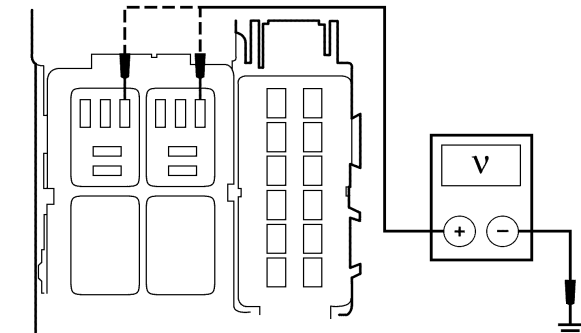
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

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"> • Key in OFF position. • Disconnect: SJB C2280d. • Key in ON position. • 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"> • Key in OFF position. • Disconnect: BEC C1035a. • Key in ON position. • 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"> • Key in OFF position. • Disconnect: BEC C1035c. • Key in ON position. • 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)

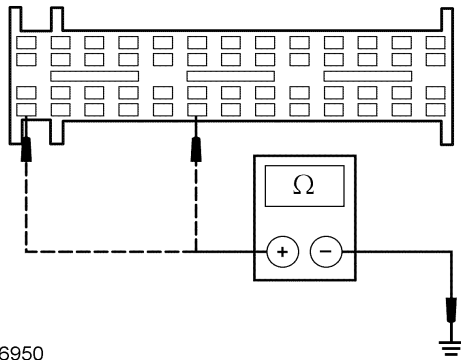
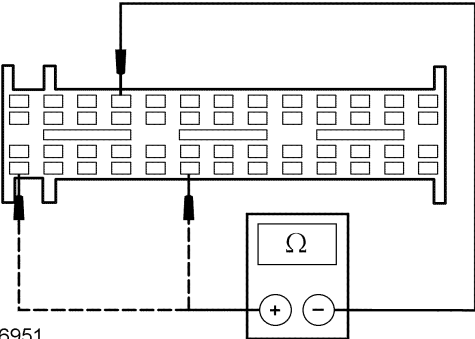
PINPOINT TEST F: THE HEADLAMPS ARE ON CONTINUOUSLY (Continued)

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"> Key in OFF position. Disconnect: Suspect HID Relay. Key in ON position. 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"> • Key in OFF position. • Disconnect: Multifunction Switch C202. • Key in ON position. • 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"> • Key in OFF position. • 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. • Key in ON position. • 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"> Key in OFF position. Disconnect: BEC C1035a. Key in ON position. 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. Key in ON position. 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"> Key in OFF position. Disconnect: BEC C1035c. Key in ON position. 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"> Key in OFF position. 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).

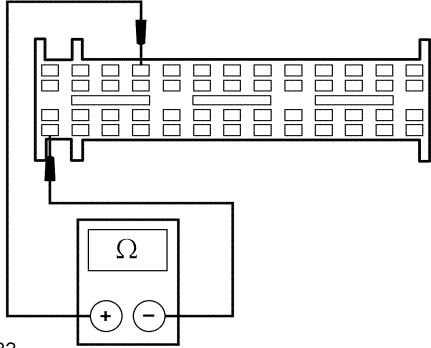
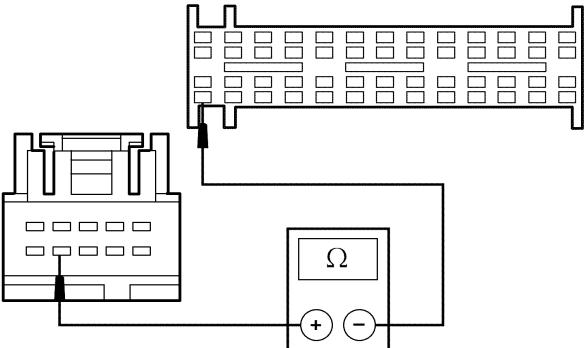
This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Multifunction switch
- SJB

DIAGNOSIS AND TESTING (Continued)

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

⚠ 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 HIGH BEAM OPERATION	Yes GO to G2 . No GO to Pinpoint Test B.
	<ul style="list-style-type: none"> • Key in OFF position. • Place the headlamp switch in the HEADLAMPS ON position. • Place the multifunction switch in the HIGH BEAM position. • Do the high beams illuminate? 	
G2	CHECK THE INPUT FROM THE MULTIFUNCTION SWITCH	Yes GO to G4 . No GO to G3 .
	<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	CHECK CIRCUIT 1395 (RD/PK) FOR AN OPEN	Yes INSTALL a new multifunction switch. REFER to Section 211-05. TEST the system for normal operation. No REPAIR the circuit. TEST the system for normal operation.
	<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? 	

(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>