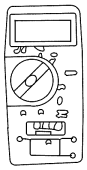
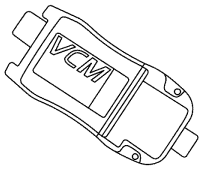
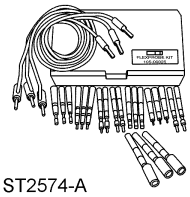
DIAGNOSIS AND TESTING

Stoplamps

Special Tool(s)

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

Inspection and Verification

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

Visual Inspection Chart

Mechanical	Electrical
• Stoplamp switch	• Bussed electrical center (BEC) fuse: — 59 (30A) (RH stoplamps) — 63 (30A) (LH stoplamps) — 67 (30A) (high mounted stoplamp) • Smart junction box (SJB) fuse 15 (10A) (stoplamp switch) • Circuitry • Bulbs • 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 powertrain control module (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 the Smart Junction Box (SJB) Diagnostic Trouble Code (DTC) Index. For all other DTCs, refer to Section 419-10.
10. If no DTCs related to the concern are retrieved, GO to Symptom Chart.

DIAGNOSIS AND TESTING (Continued)

Smart Junction Box (SJB) Diagnostic Trouble Code (DTC) Index

DTC	Description	Action
B1342	ECU is Faulted	REPAIR all other DTCs first. CLEAR the DTCs. RETRIEVE the DTCs. If DTC B1342 is retrieved again, INSTALL a new SJB. REFER to Section 419-10. TEST the system for normal operation.
B1485	Brake Pedal Input Short to Battery	GO to Pinpoint Test H.
B2044	Left Rear Stop Lamp Circuit Short to Ground	GO to Pinpoint Test G.
B2046	Right Rear Stop Lamp Circuit Short to Ground	GO to Pinpoint Test G.
B2048	Left Rear Turn Lamp Circuit Short to Ground	GO to Pinpoint Test G.
B2049	Left Rear Turn Lamp Circuit Open	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
B2050	Right Rear Turn Lamp Circuit Short to Ground	GO to Pinpoint Test G.
B2051	Right Rear Turn Lamp Circuit Open	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
B2519	High Mount Stop Lamp Circuit Failure	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
B2527	Left Rear Stop Lamp Circuit Failure	GO to Pinpoint Test G.
B2528	Left Rear Stop Lamp Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
B2529	Left Rear Turn Lamp Circuit Failure	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
B2533	Right Rear Stop Lamp Circuit Failure	GO to Pinpoint Test G.
B2534	Right Rear Stop Lamp Circuit Short to Battery	If the lamp is inoperative, GO to Pinpoint Test G. If the lamp is always on, GO to Pinpoint Test H.
All other DTCs	—	REFER to Section 419-10.

DIAGNOSIS AND TESTING (Continued)

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• No communication with the smart junction box (SJB)	• Circuitry • SJB	• REFER to Section 418-00.
• One or more stoplamps are inoperative	• Fuse • Circuitry • Stoplamp switch • Bussed electrical center (BEC) • SJB	• GO to Pinpoint Test G.
• The stoplamps are on continuously	• Circuitry • Stoplamp switch • SJB • Powertrain control module (PCM)	• GO to Pinpoint Test H.

Pinpoint Tests

Pinpoint Test G: 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 B2044 — sets when the SJB detects a short to ground on the LH stoplamp 1 voltage supply circuit.

DTC B2046 — sets when the SJB detects a short to ground on the RH stoplamp 1 voltage supply circuit.

DTC B2048 — sets when the SJB detects a short to ground on the LH stoplamp 1 voltage supply circuit.

DTC B2049 — sets when the SJB detects an open or short to ground on the LH stoplamp 1 voltage supply circuit.

DTC B2050 — sets when the SJB detects a short to ground on the RH stoplamp 1 voltage supply circuit.

DTC B2051 — sets when the SJB detects an open or short to ground on the LH stoplamp 1 voltage supply circuit.

DTC B2519 — sets when the SJB detects an open or short to ground on the high mounted stoplamp voltage supply circuit.

DTC B2527 — sets when the SJB detects a short to ground on the LH stoplamp 2 voltage supply circuit.

DTC B2528 — sets when the SJB detects an open on the LH stoplamp 2 voltage supply circuit.

DTC B2529 — sets when the SJB detects an open or short to ground on the LH stoplamp 1 voltage supply circuit.

DTC B2533 — sets when the SJB detects a short to ground on the RH stoplamp 2 voltage supply circuit.

DTC B2534 — sets when the SJB detects an open on the RH stoplamp 2 voltage supply circuit.

Possible Causes

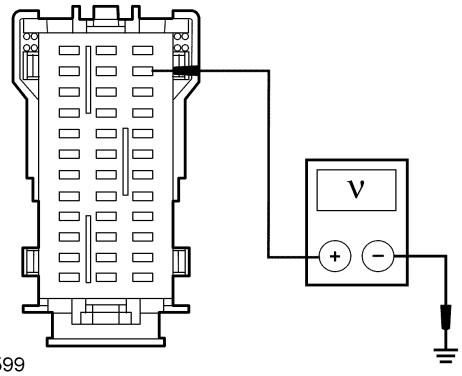
- Fuse
- Circuit 10 (LG/RD) open
- Circuit 511 (LG) open
- Circuit 905 (GY/LB) open
- Circuit 1052 (TN/BK) open
- Circuit 1205 (BK) open
- Circuit 1363 (WH/RD) open or short to ground
- Circuit 1374 (TN/LB) open or short to ground

DIAGNOSIS AND TESTING (Continued)

- Circuit 1523 (DG) open
- Circuit 1728 (LB/OG) open or short to ground
- Circuit 1783 (RD/WH) open or short to ground
- Stoplamp switch
- SJB
- BEC

PINPOINT TEST G: ONE OR MORE STOPLAMPS ARE INOPERATIVE

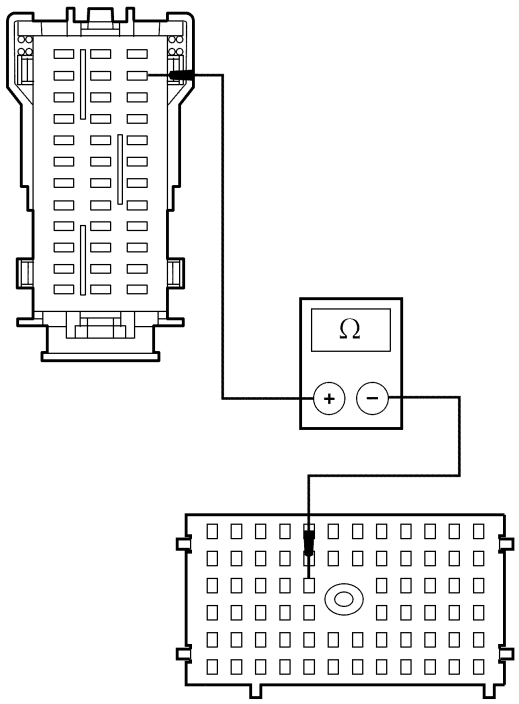
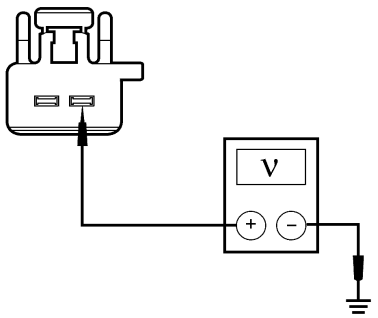
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
G1	**DETERMINE IF ALL THE STOPLAMPS ARE INOPERATIVE**	
	• Key in OFF position. • Apply the brake pedal and observe the rear lamps. • **Are all the stoplamps inoperative?**	**Yes** GO to G2. **No** GO to G8.
G2	**CHECK CIRCUIT 1523 (DG) FOR VOLTAGE**	
	• Disconnect: SJB C2280h. • Measure the voltage between the SJB C2280h-11, circuit 1523 (DG), harness side and ground.  N0053599 • **Is the voltage greater than 10 volts?**	**Yes** GO to G4. **No** VERIFY the BEC fuse 63 (30A) is OK. If OK, GO to G3.
G3	**CHECK CIRCUIT 1523 (DG) FOR AN OPEN**	
	• Disconnect: BEC C1035a.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

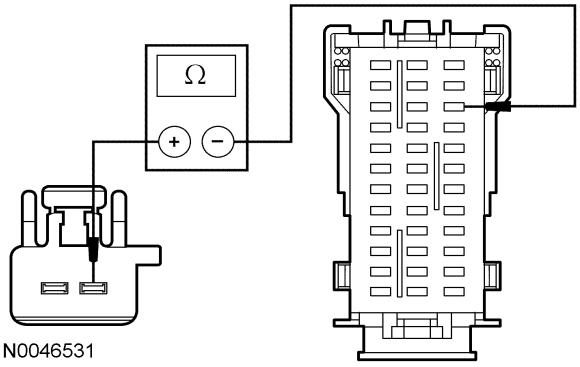
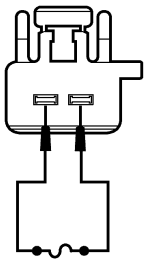
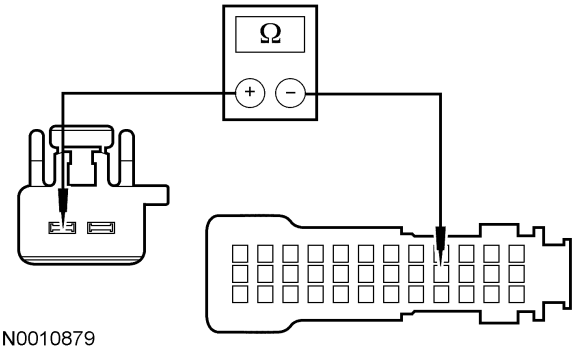
PINPOINT TEST G: ONE OR MORE STOPLAMPS ARE INOPERATIVE (Continued)

Test Step		Result / Action to Take
G3	CHECK CIRCUIT 1523 (DG) FOR AN OPEN (Continued)	
	• Measure the resistance between the SJB C2280h-11, circuit 1523 (DG), harness side and BEC C1035a-C5, circuit 1523 (DG), harness side.  N0053600 • **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new BEC. TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.
G4	CHECK CIRCUIT 10 (LG/RD) FOR VOLTAGE	
	• Connect: SJB C2280h. • Disconnect: Stoplamp Switch C2314. • Measure the voltage between the stoplamp switch C2314-1, circuit 10 (LG/RD), harness side and ground.  N0037278 • **Is the voltage greater than 10 volts?**	**Yes** GO to **G6**. **No** VERIFY the SJB fuse 15 (10A) is OK. If OK, GO to **G5**.
G5	CHECK CIRCUIT 10 (LG/RD) FOR AN OPEN	
	• Disconnect: SJB C2280h.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

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

Test Step	Result / Action to Take
G5 CHECK CIRCUIT 10 (LG/RD) FOR AN OPEN (Continued)	
• 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.  N0046531 • **Is the resistance less than 5 ohms?**	**Yes** GO to **G13**. **No** REPAIR the circuit. TEST the system for normal operation.
G6 CHECK THE STOPLAMP SWITCH	
• 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.  N0037280 • **Do the stoplamps illuminate?**	**Yes** INSTALL a new stoplamp switch. REFER to Stoplamp Switch in this section. TEST the system for normal operation. **No** REMOVE the jumper wire. GO to **G7**.
G7 CHECK CIRCUIT 511 (LG) FOR AN OPEN	
• 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.  N0010879 • **Is the resistance less than 5 ohms?**	**Yes** GO to **G13**. **No** REPAIR the circuit. TEST the system for normal operation.

(Continued)

DIAGNOSIS AND TESTING (Continued)

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

<table>
<tr><th colspan="2">Test Step</th><th>Result / Action to Take</th></tr>
<tr><td>G8</td><td>CHECK THE VOLTAGE TO THE SJB
• Key in OFF position.
• Disconnect: SJB C2280h.
• Measure the voltage between the SJB, harness side and ground as follows:
<table><tr><th>SJB Connector-Pin</th><th>Circuit</th></tr><tr><td>C2280h-31</td><td>905 (GY/LB)</td></tr><tr><td>C2280h-32</td><td>1052 (TN/BK)</td></tr></table>• Are the voltages greater than 10 volts?</td><td>Yes
GO to G10.
No
VERIFY the BEC fuses 59 (30A) and 67 (30A) are OK. If OK, GO to G9.</td></tr>
<tr><td>G9</td><td>CHECK THE VOLTAGE SUPPLY CIRCUITS TO THE SJB FOR AN OPEN
• Disconnect: BEC C1035a.
• Measure the resistance between the SJB, harness side and the BEC, harness side as follows:
<table><tr><th>SJB Connector-Pin</th><th>BEC Connector-Pin</th><th>Circuit</th></tr><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></table>• Are the resistances less than 5 ohms?</td><td>Yes
INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.
No
REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</td></tr>
<tr><td>G10</td><td>CHECK CIRCUIT 1205 (BK) FOR AN OPEN
• Disconnect: Inoperative Stoplamp.
• Measure the resistance between the inoperative stoplamp, harness side and ground as follows:
<table><tr><th>Inoperative Stoplamp</th><th>Connector-Pin</th><th>Circuit</th></tr><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></table>• Is the resistance less than 5 ohms?</td><td>Yes
GO to G11.
No
REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.</td></tr>
<tr><td>G11</td><td>CHECK THE STOPLAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND
• Disconnect: SJB C2280d.
• Measure the resistance between the inoperative stoplamp, harness side and ground as follows:</td><td></td></tr>
</table>

(Continued)

DIAGNOSIS AND TESTING (Continued)

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

<table>
<tr><th colspan="2">Test Step</th><th>Result / Action to Take</th></tr>
<tr><td>G11</td><td>CHECK THE STOPLAMP VOLTAGE SUPPLY CIRCUIT FOR A SHORT TO GROUND (Continued)</td><td rowspan="2">Yes
GO to G12.
No
REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</td></tr>
<tr><td colspan="2">
<table>
<tr><th>Inoperative Stoplamp</th><th>Connector-Pin</th><th>Circuit</th></tr>
<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>1363 (WH/RD)</td></tr>
<tr><td>LH rear lamp 2</td><td>C4113-3</td><td>1728 (LB/OG)</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>
</table>
• Is the resistance greater than 10,000 ohms?
</td></tr>
<tr><td>G12</td><td>CHECK THE STOPLAMP VOLTAGE SUPPLY CIRCUIT FOR AN OPEN</td><td rowspan="2">Yes
GO to G13.
No
REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test.</td></tr>
<tr><td colspan="2">
• Measure the resistance between the inoperative stoplamp, harness side and the SJB, harness side as follows:
<table>
<tr><th>Inoperative Stoplamp Connector-Pin</th><th>SJB Connector-Pin</th><th>Circuit</th></tr>
<tr><td>High mounted stoplamp C475-2</td><td>C2280d-39</td><td>1374 (TN/LB)</td></tr>
<tr><td>LH rear lamp 1 C4112-3</td><td>C2280d-14</td><td>1363 (WH/RD)</td></tr>
<tr><td>LH rear lamp 2 C4113-3</td><td>C2280d-18</td><td>1728 (LB/OG)</td></tr>
<tr><td>RH rear lamp 1 C4114-3</td><td>C2280d-47</td><td>1783 (RD/WH)</td></tr>
<tr><td>RH rear lamp 2 C4115-3</td><td>C2280d-40</td><td>1783 (RD/WH)</td></tr>
</table>
• Is the resistance less than 5 ohms?
</td></tr>
<tr><td>G13</td><td>CHECK FOR CORRECT SJB OPERATION</td><td>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.</td></tr>
<tr><td colspan="2">
• Disconnect all the SJB connectors.
• Check for:
— 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?
</td><td></td></tr>
</table>

Pinpoint Test H: The Stoplamps Are On Continuously

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

DIAGNOSIS AND TESTING (Continued)

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 powertrain control module (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 B1485 — sets when the SJB detects a short to voltage from the stoplamp switch input.

DTC B2049 — sets when the SJB detects a short to voltage on the LH stoplamp 1 voltage supply circuit.

DTC B2051 — sets when the SJB detects a short to voltage on the LH stoplamp 1 voltage supply circuit.

DTC B2519 — sets when the SJB detects a short to voltage on the high mounted stoplamp voltage supply circuit.

DTC B2528 — sets when the SJB detects a short to voltage on the LH stoplamp 2 voltage supply circuit.

DTC B2529 — sets when the SJB detects a short to voltage on the LH stoplamp 1 voltage supply circuit.

DTC B2534 — sets when the SJB detects a short to voltage on the RH stoplamp 2 voltage supply circuit.

Possible Causes

- Circuit 511 (LG) short to voltage
- Circuit 599 (PK/LG) short to voltage
- Circuit 1363 (WH/RD) short to voltage
- Circuit 1374 (TN/LB) short to voltage
- Circuit 1728 (LB/OG) short to voltage
- Circuit 1783 (RD/WH) short to voltage
- Stoplamp switch
- SJB
- PCM

PINPOINT TEST H: THE STOPLAMPS ARE ON CONTINUOUSLY

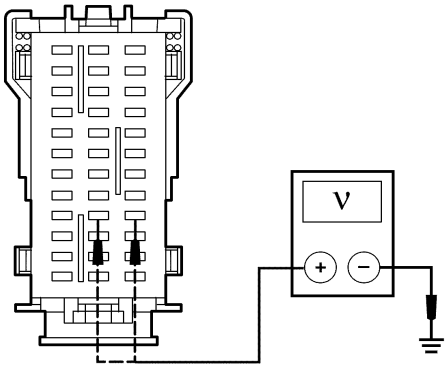
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
H1	**USE THE RECORDED DTCs FROM THE SJB SELF-TEST**	
	• Key in OFF position. • Using the recorded results from the SJB self-test: • **Was DTC B1485 present?**	**Yes** GO to H2. **No** GO to H5.
H2	**CHECK THE STOPLAMP SWITCH**	
	• Disconnect: Stoplamp Switch C2314. • **Do the stoplamps continue to illuminate?**	**Yes** GO to H3. **No** INSTALL a new stoplamp switch. REFER to Stoplamp Switch in this section. CLEAR the DTCs. REPEAT the self-test.
H3	**CHECK THE PCM**	
	• Disconnect: PCM C175b. • **Do the stoplamps continue to illuminate?**	**Yes** GO to H4. **No** GO to H6.
H4	**CHECK CIRCUITS 511 (LG) AND 599 (PK/LG) FOR A SHORT TO VOLTAGE**	
	• Disconnect: SJB C2280h.	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST H: THE STOPLAMPS ARE ON CONTINUOUSLY (Continued)

Test Step		Result / Action to Take
H4	**CHECK CIRCUITS 511 (LG) AND 599 (PK/LG) FOR A SHORT TO VOLTAGE (Continued)**	
	• 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.  N0046536 • **Is any voltage present?**	**Yes** REPAIR the circuit in question. CLEAR the DTCs. REPEAT the self-test. **No** GO to H7.
H5	**CHECK CIRCUITS 1363 (WH/RD), 1728 (LB/OG), 1783 (RD/WH) AND 1374 (TN/LB) FOR A SHORT TO VOLTAGE**	
	• Disconnect: SJB C2280d. • **Do any stoplamps continue to illuminate?**	**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, REPAIR circuit 1783 (RD/WH). CLEAR the DTCs. REPEAT the self-test. **No** GO to H7.
H6	**CHECK FOR CORRECT PCM OPERATION**	
	• Disconnect all the PCM connectors. • Check for: — 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?**	**Yes** INSTALL a new PCM. REFER to Section 303-14. CLEAR the DTCs. REPEAT the self-test. **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.
H7	**CHECK FOR CORRECT SJB OPERATION**	
	• Disconnect all the SJB connectors. • Check for: — 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.