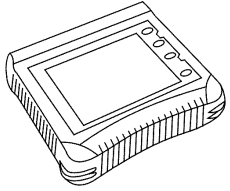
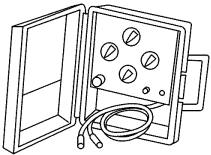
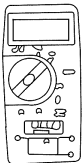


DIAGNOSIS AND TESTING

Instrument Cluster

Refer to Wiring Diagrams Cell 60, Instrument Cluster for schematic and connector information.

Special Tool(s)

 <p>ST2332-A</p>	<p>Worldwide Diagnostic System (WDS) 418-F224, New Generation STAR (NGS) Tester 418-F052, or equivalent diagnostic tool with appropriate adapter cables</p>
 <p>ST1388-A</p>	<p>Instrument Gauge System Tester 014-R1063 or equivalent</p>
 <p>ST1137-A</p>	<p>73III Automotive Meter 105-R0057 or equivalent</p>

Principles of Operation

NOTE: A new instrument cluster must be reconfigured. Refer to Section 418-01.

The instrument cluster is a hybrid electronic cluster (HEC). The instrument cluster uses both hardwired and the standard corporate protocol (SCP) communication network to transmit and receive information. As a technician it is very important to understand:

- where the input originates from.
- all information necessary in order for a feature to operate.
- which module(s) receive(s) the input or command message.
- does the module which received the input control the output of the feature, or does it output a message over the SCP network to another module?
- which module controls the output of the feature.

The instrument cluster carries out a display prove-out to verify that the warning/indicator miniature bulbs for monitored systems are functioning correctly. When the ignition switch is in the ON position with the engine off, the following warning indicators prove out:

- anti-lock brake (ABS) warning indicator
- air bag warning indicator
- BRAKE warning indicator
- charging system indicator
- fail safe cooling warning indicator
- low coolant level indicator
- low fuel warning indicator
- traction control indicator

Instrument Cluster Replacement

When it is necessary to install a new instrument cluster, contact the Instrument Cluster Program.

Gauge Indication Systems

Tachometer

Engine rpm information is relayed to the instrument cluster from the powertrain control module (PCM) over the SCP network.

Speedometer

The instrument cluster receives the vehicle speed signal from the PCM over the SCP network and displays it on the speedometer gauge. If the instrument cluster receives no vehicle speed signal after 1 second, the speedometer defaults to 0.0 km/h (0.0 mph).

Odometer

The instrument cluster receives an odometer message from the PCM and stores the mileage in memory. When the instrument cluster fails to receive the odometer message for more than 2 seconds, the odometer displays dashes.

DIAGNOSIS AND TESTING (Continued)

Fuel Gauge

NOTE: It is critical to follow the pinpoint test diagnostic methods to make sure the correct mode is being used during diagnostics.

The instrument cluster receives the fuel level signal from the fuel level sensor, part of the fuel pump module. The fuel level sensor measures variable resistance in the fuel tank depending on the current fuel level. When the fuel level is low, the resistance in the unit is low (15 ohms \pm 2 ohms). When the fuel level is high, the resistance in the unit is high (160 ohms \pm 4 ohms).

The instrument cluster uses 4 different operating modes to calculate the fuel level:

- key OFF fueling
- anti-slosh (default mode)
- key ON fueling
- recovery

After a fuel fill up, the time for the fuel gauge to move from empty (E) to full (F) ranges from 2 seconds to 55 minutes depending on which operating mode the fuel gauge is in.

The key OFF fueling mode (2 seconds to read empty [E] to full [F]) requires 3 conditions be met:

- The key must be in the OFF position when refueling the vehicle.
- At least 15 percent of the vehicle's fuel capacity must be added to the fuel tank.
- The instrument cluster must receive a valid key ON fuel sender reading within 1 second of the key being put into the RUN position. The key ON sample readings are considered valid if the fuel sender reading is between 15 ohms \pm 2 ohms and 160 ohms \pm 4 ohms. If these conditions are not met, the fuel gauge stays in the anti-slosh mode, which results in a slow to read full (F) event.

The default fuel gauge mode is called the anti-slosh mode. To prevent fuel gauge changes from fuel slosh (gauge instability due to changes in fuel sender readings caused by fuel moving around in the tank), the fuel gauge takes approximately 55 minutes to go from full (F) to empty (E).

The key ON fueling mode (approximately 90 seconds to read empty [E] to full [F]) requires 3 conditions be met:

- The transmission is in park (P) (automatic transmissions), or the parking brake applied (manual transmissions).
- The key is in the RUN position.
- At least 15 percent of the vehicle's fuel capacity must be added to the fuel tank.

In key ON fueling mode, a 30 second timer activates after the transmission is put into the park (P) position (automatic transmissions) or when the parking brake is applied (manual transmissions). When the 30 second time has elapsed and at least 15 percent of the vehicle's fuel capacity has been added, the fuel gauge response time is 90 seconds to read from empty (E) to full (F). When the transmission is shifted out of park (P) or the parking brake is released, the fuel gauge strategy reverts to the anti-slosh mode. This mode prevents slow to read full events from happening if the customer refuels the vehicle with the key in the RUN position.

Recovery mode is incorporated into the instrument cluster strategy to recover from a missing fuel level message during a refueling event. Missing fuel level messages result from intermittent opens in the fuel sender or its circuits. Recovery mode (empty [E] to full [F] approximately 20 minutes) is initiated when the following 2 conditions are met:

- The instrument cluster is in the anti-slosh (default) mode.
- The actual fuel level in the tank is greater than what is being displayed by the fuel gauge.

Engine Coolant Temperature Gauge

Engine coolant temperature information is received by the instrument cluster from the PCM over the SCP network. Engine coolant temperatures above 121°C (250°F) causes the gauge to indicate above the normal band. If the engine coolant temperature information is missing or invalid for 5 seconds, the temperature gauge indicates below the cold (C) position.

Voltage Gauge (except Cobra)

The voltage gauge displays the system voltage as measured at the instrument cluster run input.

DIAGNOSIS AND TESTING (Continued)

Boost Gauge (Cobra only)

The boost pressure gauge on the instrument cluster receives and measures the boost pressure directly from the intake manifold. The boost pressure gauge displays between 0.0 — 0.48 kpa (0.0-10 psi) boost pressure, depending upon the accelerator position, the engine load, and the engine rpm.

LOW FUEL Level Indicator

The low fuel level indicator is hardwired from the fuel sender to the instrument cluster. The instrument cluster illuminates the low fuel indicator when the usable fuel quantity is less than 1/8 tank (15%) of fuel tank capacity.

Oil Pressure Gauge

The oil pressure gauge is hardwired from the oil pressure switch to the instrument cluster. The oil pressure gauge indicates either normal or no oil pressure.

CHECK FUEL CAP

The CHECK FUEL CAP indicator is used to indicate significant leaks in the fuel tank evaporative system due to a loose fuel cap. Fuel tank pressure is monitored by the PCM. If a leak is detected the PCM signals a fault to the instrument cluster via the SCP network. Once the PCM has detected a loose fuel cap and the CHECK FUEL CAP indicator is illuminated, the indicator remains illuminated until the fuel cap is secured and the vehicle has been running for several minutes. For additional information, refer to the [Powertrain Control/Emissions Diagnosis \(PC/ED\) manual](#).

BRAKE Warning Indicator

The generic electronic module (GEM) receives the parking brake status from the parking brake switch and provides a ground to the instrument cluster when the GEM detects the ignition switch in the RUN state with the parking brake applied. The instrument cluster receives the brake fluid level status from the brake fluid level switch. The BRAKE warning indicator turns on when the GEM provides a ground to the instrument cluster or when the brake fluid level switch grounds the input circuit to the instrument cluster. The BRAKE warning indicator proves out starting when the GEM detects that the ignition circuits have made a transition to RUN or START from OFF, ACC, or keyout and ending when either 3 seconds have elapsed or when the GEM detects the ignition circuits have made a transition to OFF, ACC, or keyout.

Safety Belt Warning Indicator

The safety belt switch is hardwired to the GEM. The safety belt warning indicator illuminates when the GEM sends a ground signal to the instrument cluster.

Anti-Lock Brake System (ABS) Warning Indicator

The ABS warning indicator illuminates when the anti-lock brake control module sends a ground signal to the instrument cluster. The prove-out of the ABS indicator is controlled by the anti-lock brake control module.

SERVICE ENGINE SOON Indicator

The SERVICE ENGINE SOON indicator receives its signal from the PCM over the SCP network. If the instrument cluster does not receive a message from the PCM within 5 seconds, the instrument cluster illuminates the SERVICE ENGINE SOON indicator and log a diagnostic trouble code (DTC).

High Beam Indicator

The high beam indicator illuminates when the steering column multifunction switch is in the high beam position by sending a battery signal to the instrument cluster.

Right and Left Turn Indicator

The right and left turn indicators illuminate when the steering column multifunction switch is in either turn signal position or the hazard lamps position by sending a battery signal to the instrument cluster.

DIAGNOSIS AND TESTING (Continued)

AIR BAG Warning Indicator

The AIR BAG warning indicator illuminates when the restraint control module (RCM) sends a ground signal to the instrument cluster. The prove-out of the AIR BAG warning indicator is controlled by the RCM.

THEFT Indicator

The THEFT indicator provides a passive anti-theft system (PATS) prove-out. The THEFT indicator proves out for 3 seconds following the ignition switch cycle and flashes following an ignition switch OFF transition to indicate that PATS is active.

Charging System Indicator

The charging system indicator illuminates when the generator provides a ground signal to the instrument cluster. The instrument cluster provides a prove-out when the ignition switch is in the RUN position with the engine off. When the engine is started, the generator removes the ground to the instrument cluster and extinguishes the charging system indicator.

Overdrive Off (O/D OFF) Indicator

The O/D OFF indicator is controlled by the off/on message sent from the PCM over the SCP network. The instrument cluster does not provide a prove-out for the O/D OFF indicator, but remains illuminated if the overdrive has been commanded off following the instrument cluster prove-out.

Traction Control Indicator

During initialization, the instrument cluster receives the traction control system state status message from the traction control module to determine if the vehicle is equipped with traction control. If the vehicle is equipped with traction control, this information is stored in random access memory (RAM) and the indicator proves out for 3 seconds during each ignition cycle. If this message is not received, the instrument cluster assumes that the vehicle is not traction control equipped and the indicator remains off. When the traction control is active, the traction control module sends the instrument cluster a traction control active signal and the instrument cluster illuminates the traction control indicator. When the traction control is inactive, the traction control module removes the traction control active signal and the instrument cluster turns off the indicator. In the event of a traction control failure, the traction control indicator remains off and the ABS indicator illuminates.

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"> • Fuel tank • Engine coolant level • Accessory drive belt • Engine oil level • Parking brake position switch • Brake fluid level • Boost gauge pressure line 	<ul style="list-style-type: none"> • Central junction box (CJB) fuse(s): <ul style="list-style-type: none"> — 5 (15A) — 7 (15A) — 11 (15A) — 13 (15A) — 21 (5A) — 23 (15A) — 24 (30A) — 29 (15A) — 30 (15A) — 32 (15A) — 34 (20A) — 35 (15A) — 37 (5A) — 38 (20A) — 39 (5A) • Circuitry

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

DIAGNOSIS AND TESTING (Continued)

4. If the concern remains after the inspection, connect the diagnostic tool to the data link connector (DLC) located beneath the instrument panel and select the vehicle to be tested from the diagnostic tool menu. If the diagnostic tool does not communicate with the vehicle:
 - check that the program card is correctly installed.
 - check the connections to the vehicle.
 - check the ignition switch position.
5. If the diagnostic tool still does not power up, refer to the diagnostic tool operating manual.
6. Carry out the diagnostic tool data link test. If the diagnostic tool responds with:
 - SCP or ISO; all electronic control units, no response/not equipped, refer to Section 418-00.
 - No response/not equipped for the instrument cluster, [GO to Pinpoint Test A](#) or for the generic electronic module (GEM), [GO to Pinpoint Test W](#).
 - System passed, retrieve and record the continuous diagnostic trouble codes (DTCs), erase the continuous DTCs and carry out the self-test diagnostics for the instrument cluster or the GEM.
7. If the DTCs retrieved are related to the concern, go to the Instrument Cluster Diagnostic Trouble Code (DTC) Index or the Generic Electronic Module (GEM) Diagnostic Trouble Code (DTC) Index to continue diagnostics.
8. If no DTCs related to the concern are retrieved, [GO to Symptom Chart](#) to continue diagnosis

Instrument Cluster Self-Diagnostic Mode

To enter the instrument cluster self-diagnostic mode, press and hold the instrument cluster SELECT/RESET button, turn the ignition switch to the RUN position, and then continue pressing the SELECT/RESET button (5 seconds) until tEst is displayed in the odometer. The SELECT/RESET button must be released within 3 seconds of the odometer tEst display to begin the self-diagnostic mode. Press the SELECT/RESET button to advance through the following steps until dtc is displayed. Pressing the SELECT/RESET button displays any stored continuous DTCs before proceeding to the next step.

Odometer Display	Description
GAGE	Activates gauge sweep of all gauges, then displays present gauge values. Also carries out the checksum tests on ROM and EE.
All segments illuminated	Illuminates all odometer segments.
bulb	Illuminates all micro-controlled indicators and LEDs. Install a new indicator or LED as necessary.
r	Returns to normal operation of all micro-controlled indicators and LEDs and displays hexadecimal value for ROM level.
EE	Displays hexadecimal value for EE level.
dt	Displays hexadecimal coding of final manufacturing test date.
dtc	Displays continuous DTCs in hexadecimal format. Pressing the SELECT/RESET button displays any DTCs stored before proceeding to the next step.
enG	Displays the English speed in mph. Speedometer indicates present speed within tolerances. Display shows 0 if input is not received, if input received is invalid for 1 second or more, or if speed is 0.

DIAGNOSIS AND TESTING (Continued)

Odometer Display	Description
m	Displays the metric speed data (km/h). Speedometer indicates present speed within tolerances. Display shows 0 if input is not received, if input received is invalid for 1 second or more, or if speed is 0.
tAc	Displays the tachometer data received from the PCM via the SCP network within tolerances. Tachometer indicates present rpm. Display shows 0 if input is not received, if input received is invalid for 1 second or more, or if engine rpm is 0.
FUEL	<p>Displays the code (0-255) for the fuel sender input to the instrument cluster. The fuel gauge displays a filtered fuel level value. This filter keeps the pointer from moving suddenly or erratically.</p> <ul style="list-style-type: none"> • 255 = open send +/- 0 • 232 = full stop +/- 0 • 215 = full mark +/- 10 • 178 = 3/4 mark +/- 8 • 138 = 1/2 mark +/- 7 • 93 = 1/4 mark +/- 5 • 41 = E mark +/- 4 • 54=LOW FUEL (0-59) • 0-18=short (0-20 max)
OIL	Displays the code (0-250) for the oil pressure switch input to the instrument cluster. Oil pressure gauge indicates present oil pressure. Normal oil pressure (greater than 6 psi) displays a value between 000 and 176. A low oil pressure or an inoperative engine oil pressure switch (less than 6 psi) displays a value greater than 176.
dEGC	<p>Display of engine temperature in degrees C input from cylinder head temperature sensor.</p> <ul style="list-style-type: none"> • 49 C = "C" mark • 60 C = normal band start • 120 C = normal band end • -40 C = no SCP message for 5 seconds
bAtt	<p>Displays the code (0-255) for the battery voltage input to the instrument cluster. Battery voltage gauge indicates present battery voltage.</p> <ul style="list-style-type: none"> • 93-102 = 6.9-9.1 volts (low voltage) • 115-124 = 8.5-10.7 volts (norm band start) • 215-225 = 15.8-18 volts (norm band end) • 230-241 = 16.9-19.1 volts (high voltage)
rhEo	Displays the present decimal rheostat dimming input, 0-255.
rhi rhS rho	Not used.
Cr	Displays the present RUN/START sense input. Displays -h for high input with the ignition switch in the START position and -L for low input with the ignition switch in the RUN position.
PA-PE7	Not used.
GAGE	Repeats test display cycle.

DIAGNOSIS AND TESTING (Continued)

To exit the instrument cluster self-diagnostic mode, turn the ignition switch to the OFF position or press and hold the SELECT/RESET button for 3 or more seconds and release.

Instrument Cluster Diagnostic Trouble Code (DTC) Index

Diagnostic Tool Displayed DTC	Self-Diagnostic Mode Displayed DTC	Description	Source	Action
B1202	9202	Fuel Sender Open Circuit	Instrument Cluster	GO to Pinpoint Test B.
B1204	9204	Fuel Sender Short to Ground	Instrument Cluster	GO to Pinpoint Test B.
B1317	9317	Battery Voltage High	Instrument Cluster	Section 414-00.
B1318	9318	Battery Voltage Low	Instrument Cluster	Section 414-00.
B1342	9342	ECU is Defective	Instrument Cluster	INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
B1343	9343	Heated Backlight Input Circuit Failure	Instrument Cluster	Section 501-11.
B1356	9356	Ignition Run Circuit Open	Instrument Cluster	GO to Pinpoint Test A.
B1364	9364	Ignition Start Circuit Open	Instrument Cluster	GO to Pinpoint Test A.
B2143	A143	Odometer NVM Memory Failure	Instrument Cluster	GO to Pinpoint Test J.
C1284	5284	Oil Pressure Switch Failure	Instrument Cluster	GO to Pinpoint Test C.
P1197	1197	Mileage Switch Circuit Failure	Instrument Cluster	GO to Pinpoint Test J.

Generic Electronic Module (GEM) Diagnostic Trouble Code (DTC) Index

DTC	Description	Source	Action
B1218	Horn Relay Coil Circuit Short to VBatt	GEM	REFER to Section 413-06.
B1312	Lamp Headlamp Input Circuit Short to Battery	GEM	REFER to Section 417-01.
B1317	Battery Voltage High	GEM	REFER to Section 414-00.
B1318	Battery Voltage Low	GEM	REFER to Section 414-00.
B1322	Driver Door Ajar Circuit Short to Ground	GEM	REFER to Section 417-02.
B1330	Passenger Door Ajar Circuit Short to Ground	GEM	REFER to Section 417-02.
B1334	Decklid Ajar Rear Door Circuit Short to Ground	GEM	REFER to Section 417-02.

DIAGNOSIS AND TESTING (Continued)**Generic Electronic Module (GEM) Diagnostic Trouble Code (DTC) Index (Continued)**

DTC	Description	Source	Action
B1339	Chime Input Request Circuit Short to Battery	GEM	REFER to Section 413-09.
B1340	Chime Input Request Circuit Short to Ground	GEM	REFER to Section 413-09.
B1342	ECU is Defective	GEM	Clear the DTCs. Retrieve the DTCs. If DTC B1342 is retrieved, INSTALL a new GEM. REFER to Section 419-10.
B1353	Ignition Key-In Circuit Open	GEM	REFER to Section 413-09.
B1359	Ignition Run/Acc Circuit Failure	GEM	REFER to Section 211-05.
B1396	Power Door Lock Circuit Short to Battery	GEM	REFER to Section 501-14B.
B1397	Power Door Unlock Circuit Short to Battery	GEM	REFER to Section 501-14B.
B1405	Driver Power Window Down Circuit Short to Battery	GEM	REFER to Section 501-11.
B1408	Driver Power Window Up Circuit Short to Battery	GEM	REFER to Section 501-11.
B1426	Lamp Safety Belt Circuit Short to Battery	GEM	GO to Pinpoint Test K.
B1428	Lamp Safety Belt Circuit Failure	GEM	GO to Pinpoint Test K.
B1431	Wiper Brake/Run Relay Circuit Failure	GEM	REFER to Section 501-16.
B1432	Wiper Brake/Run Relay Circuit Short to Battery	GEM	REFER to Section 501-16.
B1434	Wiper Hi/Low Speed Relay Coil Circuit Failure	GEM	REFER to Section 501-16.
B1436	Wiper Hi/Low Speed Relay Coil Circuit Short to Battery	GEM	REFER to Section 501-16.
B1438	Wiper Mode Select Switch Circuit Failure	GEM	REFER to Section 501-16.
B1441	Wiper Mode Select Switch Circuit Short to Ground	GEM	REFER to Section 501-16.
B1446	Wiper Park Sense Circuit Failure	GEM	REFER to Section 501-16.
B1448	Wiper Park Sense Circuit Short to Battery	GEM	REFER to Section 501-16.
B1450	Wiper Wash/Delay Switch Circuit Failure	GEM	REFER to Section 501-16.
B1453	Wiper Wash/Delay Switch Circuit Short to Ground	GEM	REFER to Section 501-16.

DIAGNOSIS AND TESTING (Continued)**Generic Electronic Module (GEM) Diagnostic Trouble Code (DTC) Index (Continued)**

DTC	Description	Source	Action
B1458	Wiper Washer Pump Motor Relay Circuit Failure	GEM	REFER to Section 501-16.
B1460	Wiper Washer Pump Motor Relay Coil Circuit Short to Battery	GEM	REFER to Section 501-16.
B1462	Safety Belt Switch Circuit Failure	GEM	REFER to Section 413-09.
B1466	Wiper Hi/Low Speed Not Switching	GEM	REFER to Section 501-16.
B1473	Wiper Low Speed Circuit Motor Failure	GEM	REFER to Section 501-16.
B1476	Wiper High Speed Circuit Motor Failure	GEM	REFER to Section 501-16.
B1551	Decklid Release Circuit Failure	GEM	REFER to Section 501-14B.
B1553	Decklid Release Circuit Short to Battery	GEM	REFER to Section 501-14B.
B1555	Ignition Run/Start Circuit Failure	GEM	REFER to Section 211-05.
B1687	Lamp Dome Input Circuit Short to Battery	GEM	REFER to Section 417-02.
B2486	Parklamp Output Relay Driver Circuit Failure	GEM	REFER to Section 417-01.
B2488	Parklamp Output Relay Driver Short to Battery	GEM	REFER to Section 417-01.
C1189	Brake Fluid Level Sensor Input Short Circuit to Ground	GEM	GO to Pinpoint Test O.
C1223	Lamp Brake Warning Output Circuit Failure	GEM	GO to Pinpoint Test O.
C1225	Lamp Brake Warning Output Circuit Short to Battery	GEM	GO to Pinpoint Test O.

Symptom Chart**Symptom Chart**

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the generic electronic module (GEM) 	<ul style="list-style-type: none"> Central junction box (CJB) fuse(s): <ul style="list-style-type: none"> — 7 (15A). — 39 (5A). — 43 (20A). Battery junction box (BJB) fuse 12 (40A). Circuitry. GEM. 	<ul style="list-style-type: none"> GO to Pinpoint Test W.

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

Condition	Possible Sources	Action
<ul style="list-style-type: none"> No communication with the instrument cluster 	<ul style="list-style-type: none"> Central junction box (CJB) fuse(s): <ul style="list-style-type: none"> — 11 (15A). — 21 (5A). — 34 (20A). Circuitry. Standard corporate protocol (SCP) network. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test A.
<ul style="list-style-type: none"> Incorrect fuel gauge indication 	<ul style="list-style-type: none"> Circuitry. Fuel pump module assembly. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test B.
<ul style="list-style-type: none"> Incorrect oil pressure gauge indication 	<ul style="list-style-type: none"> Circuitry. Engine oil pressure switch. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test C.
<ul style="list-style-type: none"> Incorrect temperature gauge indication 	<ul style="list-style-type: none"> Circuitry. Engine coolant temperature sensor. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test D.
<ul style="list-style-type: none"> Incorrect voltage gauge indication—except Cobra 	<ul style="list-style-type: none"> Circuitry. Generator. Standard corporate protocol (SCP) network. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test E.
<ul style="list-style-type: none"> Incorrect tachometer indication 	<ul style="list-style-type: none"> Standard corporate protocol (SCP) network. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test F.
<ul style="list-style-type: none"> Incorrect boost gauge indication—Cobra only 	<ul style="list-style-type: none"> Pressure line. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test G.
<ul style="list-style-type: none"> The LOW FUEL warning indicator is never/always on 	<ul style="list-style-type: none"> LOW FUEL warning indicator bulb. Standard corporate protocol (SCP) network. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test H.
<ul style="list-style-type: none"> Oil gauge reads normal with engine off 	<ul style="list-style-type: none"> Instrument cluster. 	<ul style="list-style-type: none"> INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
<ul style="list-style-type: none"> The speedometer is inoperative 	<ul style="list-style-type: none"> Standard corporate protocol (SCP) network. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test I.
<ul style="list-style-type: none"> The odometer is inoperative 	<ul style="list-style-type: none"> Circuitry. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test J.


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

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The safety belt warning indicator is inoperative (chime is operative)/does not operate correctly 	<ul style="list-style-type: none"> Circuitry. Generic electronic module (GEM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test K.
<ul style="list-style-type: none"> Inaccurate speedometer reading 	<ul style="list-style-type: none"> Instrument cluster. Powertrain control module (PCM). 	<ul style="list-style-type: none"> GO to Pinpoint Test L.
<ul style="list-style-type: none"> The O/D OFF indicator is never on 	<ul style="list-style-type: none"> Circuitry. O/D cancel switch. O/D OFF indicator bulb. Standard corporate protocol (SCP) network. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test M.
<ul style="list-style-type: none"> The O/D OFF indicator is always on 	<ul style="list-style-type: none"> Circuitry. O/D cancel switch. Powertrain control module (PCM). 	<ul style="list-style-type: none"> REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.
<ul style="list-style-type: none"> The CHECK FUEL CAP INDICATOR is never on 	<ul style="list-style-type: none"> Circuitry. Standard corporate protocol (SCP) network. Powertrain control module (PCM). 	<ul style="list-style-type: none"> GO to Pinpoint Test N.
<ul style="list-style-type: none"> The CHECK FUEL CAP INDICATOR is always on 	<ul style="list-style-type: none"> Circuitry. Powertrain control module (PCM). Fuel system. 	<ul style="list-style-type: none"> REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.
<ul style="list-style-type: none"> The BRAKE warning indicator is never on 	<ul style="list-style-type: none"> Circuitry. Brake fluid level switch. Parking brake switch. Instrument cluster. Generic electronic module (GEM). 	<ul style="list-style-type: none"> GO to Pinpoint Test O.
<ul style="list-style-type: none"> The BRAKE warning indicator is always on 	<ul style="list-style-type: none"> Circuitry. Low brake fluid level. Brake fluid level switch. Parking brake switch. Instrument cluster. Generic electronic module (GEM). 	<ul style="list-style-type: none"> GO to Pinpoint Test X.
<ul style="list-style-type: none"> The charging system warning indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. Generator. Charging system warning indicator bulb. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test P.
<ul style="list-style-type: none"> The high beam indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. High beam indicator bulb. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test Q.
<ul style="list-style-type: none"> The air bag warning indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. Air bag warning indicator bulb. Instrument cluster. Restraint control module (RCM). 	<ul style="list-style-type: none"> REFER to Section 501-20B.

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

Condition	Possible Sources	Action
<ul style="list-style-type: none"> The anti-lock brake system (ABS) warning indicator is never on 	<ul style="list-style-type: none"> Circuitry. ABS warning indicator bulb. Anti-lock brake control module. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test R.
<ul style="list-style-type: none"> The ABS warning indicator is always on 	<ul style="list-style-type: none"> Circuitry. Anti-lock brake control module. 	<ul style="list-style-type: none"> REFER to Section 206-09A or Section 206-09B.
<ul style="list-style-type: none"> The SERVICE ENGINE SOON indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. SERVICE ENGINE SOON indicator bulb. Powertrain control module (PCM). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test S.
<ul style="list-style-type: none"> The turn/hazard indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. Turn/hazard bulb(s). Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test T.
<ul style="list-style-type: none"> The THEFT indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. THEFT indicator LED. Instrument cluster. 	<ul style="list-style-type: none"> REFER to Section 419-01.
<ul style="list-style-type: none"> The traction control indicator is never/always on 	<ul style="list-style-type: none"> Circuitry. Traction control switch. Standard corporate protocol (SCP) network. Powertrain control module (PCM). ABS module. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test U.
<ul style="list-style-type: none"> The integrated circuit display is inoperative/erratic 	<ul style="list-style-type: none"> Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test V.
<ul style="list-style-type: none"> The instrument cluster is inoperative 	<ul style="list-style-type: none"> Central junction box (CJB) fuse(s): <ul style="list-style-type: none"> — 11 (15A). — 21 (5A). — 34 (20A). Circuitry. Instrument cluster. 	<ul style="list-style-type: none"> GO to Pinpoint Test V.

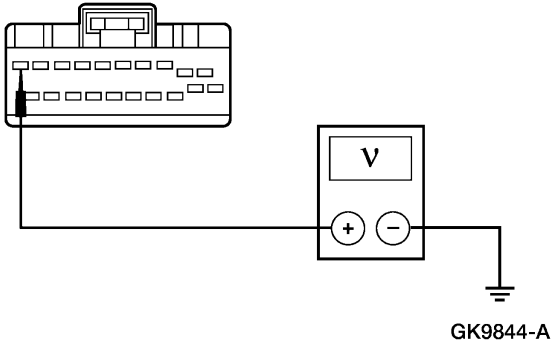
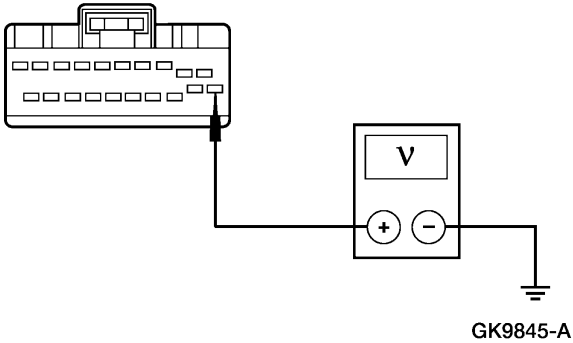
Pinpoint Tests**PINPOINT TEST A: NO COMMUNICATION WITH THE INSTRUMENT CLUSTER**

Test Step		Result / Action to Take
A1	CHECK THE BATTERY POWER SUPPLY TO THE INSTRUMENT CLUSTER	
<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. 		

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DIAGNOSIS AND TESTING (Continued)

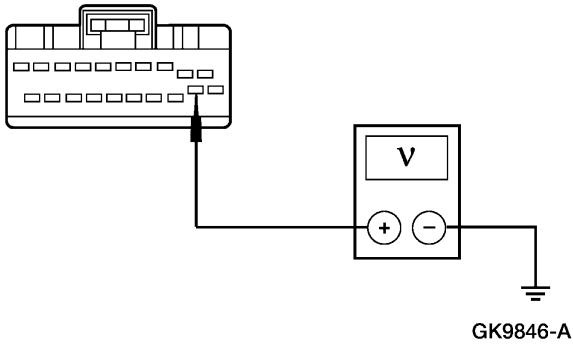
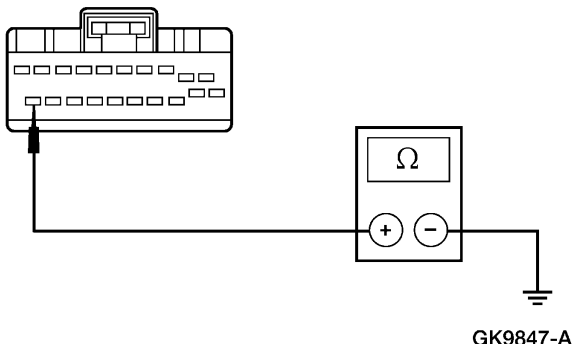
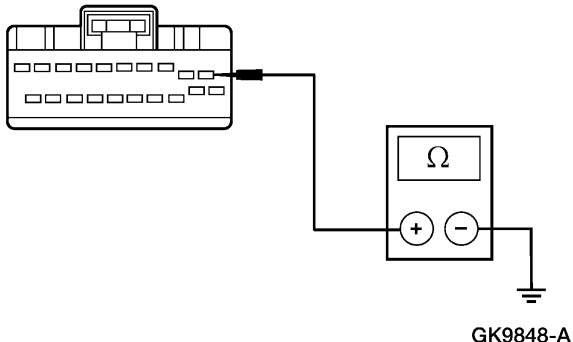
PINPOINT TEST A: NO COMMUNICATION WITH THE INSTRUMENT CLUSTER (Continued)

Test Step		Result / Action to Take
A1	CHECK THE BATTERY POWER SUPPLY TO THE INSTRUMENT CLUSTER (Continued)	
	<ul style="list-style-type: none"> Measure voltage between the instrument cluster C220b pin 10, circuit 729 (RD/WH), harness side and ground.  <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to A2.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
A2	CHECK THE RUN POWER SUPPLY TO THE INSTRUMENT CLUSTER	
	<ul style="list-style-type: none"> Key in ON position. Measure the voltage between the instrument cluster C220b pin 11, circuit 489 (PK/BK), harness side and ground.  <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to A3.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
A3	CHECK THE RUN/START POWER SUPPLY TO THE INSTRUMENT CLUSTER	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Key in ON position. 	

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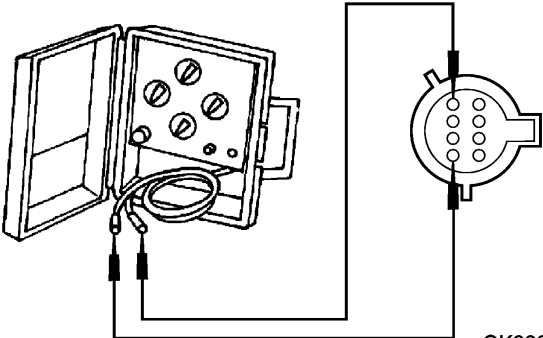
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST A: NO COMMUNICATION WITH THE INSTRUMENT CLUSTER (Continued)

	Test Step	Result / Action to Take
<p>A3</p>	<p>CHECK THE RUN/START POWER SUPPLY TO THE INSTRUMENT CLUSTER (Continued)</p>	
	<ul style="list-style-type: none"> Measure the voltage between the instrument cluster C220b pin 12, circuit 20 (WH/LB), harness side and ground.  <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to A4.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>A4</p>	<p>CHECK GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN</p>	
	<ul style="list-style-type: none"> Key in OFF position. Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and ground.  <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to A5.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>A5</p>	<p>CHECK GROUND CIRCUIT 1205 (BK) FOR AN OPEN</p>	
	<ul style="list-style-type: none"> Measure the resistance between the instrument cluster C220b pin 1, circuit 1205 (BK), harness side and ground.  <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes REFER to Section 418-00.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>

DIAGNOSIS AND TESTING (Continued)

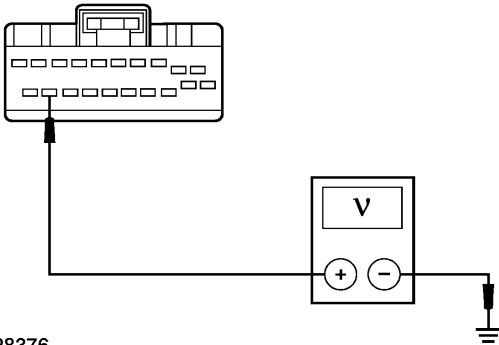
PINPOINT TEST B: INCORRECT FUEL GAUGE INDICATION

Test Step		Result / Action to Take
B1	CARRY OUT THE INSTRUMENT CLUSTER FUEL GAUGE ACTIVE COMMAND	
<p>⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> • Key in ON position. • Select the instrument cluster FUELLEVEL active command. Trigger, monitor, and scroll FUELLEVEL at: 0%, 50%, and 100%. • Does the fuel gauge display: below E at 0%, half at 50%, and F at 100%? 		<p>Yes GO to B2.</p> <p>No GO to B8.</p>
B2	CHECK THE FUEL GAUGE OPERATION	
<ul style="list-style-type: none"> • Key in OFF position. • NOTE: The fuse must be removed to reset the fuel gauge timers. Failure to complete this step may result in erroneous test results. Remove the central junction box (CJB) fuse 21 (5A). Wait 1 minute and reinstall the fuse. • Disconnect: Fuel Pump Module Assembly C463. • Connect 1 lead of the Instrument Gauge System Tester to the fuel pump module assembly C463 pin 8, circuit 29 (YE/WH), harness side and the other lead of the Instrument Gauge System Tester to the fuel pump module assembly C463 pin 5, circuit 327 (BK/OG), harness side.  <p style="text-align: center;">GK9921-A</p> <ul style="list-style-type: none"> • Key in ON position. • On vehicles equipped with an automatic transmission, apply the brake and move the transmission shift lever from P (park) to D (drive). Wait 10 seconds, and move the transmission shift lever back to P (park). Wait 30 seconds. On vehicles equipped with a manual transmission, apply the parking brake. Wait 10 seconds, and release the parking brake. Wait 30 seconds. Do not change the tool settings or the ignition switch position until 30 seconds have elapsed. • Key in OFF position. • Set the tester to 160 ohms. • Key in ON position. • On vehicles equipped with an automatic transmission, apply the brake and move the transmission shift lever from P (park) to D (drive). Wait 10 seconds, and move the transmission shift lever back to P (park). Wait 30 seconds. On vehicles equipped with a manual transmission, apply the parking brake. Wait 10 seconds, and release the parking brake. Wait 30 seconds. Do not change the tool settings or the ignition switch position until 30 seconds have elapsed. • Key in OFF position. • Wait 30 seconds. Do not change the tool settings or the ignition switch position until 30 seconds have elapsed. • Set the tester to 15 ohms. • Key in ON position. 		

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DIAGNOSIS AND TESTING (Continued)

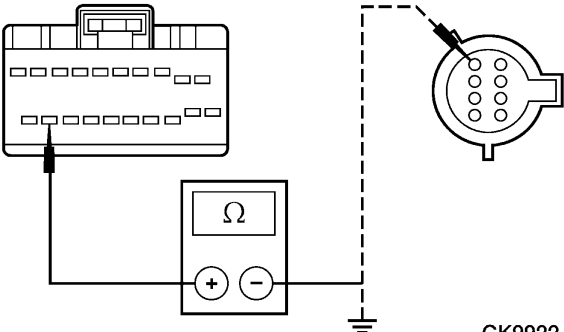
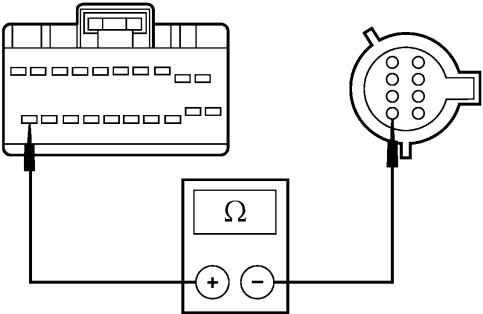
PINPOINT TEST B: INCORRECT FUEL GAUGE INDICATION (Continued)

Test Step		Result / Action to Take
B2	CHECK THE FUEL GAUGE OPERATION (Continued)	
	<ul style="list-style-type: none"> On vehicles equipped with an automatic transmission, apply the brake and move the transmission shift lever from P (park) to D (drive). Wait 10 seconds, and move the transmission shift lever back to P (park). Wait 30 seconds. On vehicles equipped with a manual transmission, apply the parking brake. Wait 10 seconds, and release the parking brake. Wait 30 seconds. Do not change the tool settings or the ignition switch position until 30 seconds have elapsed. Observe the fuel gauge. The fuel gauge should read F (full) or above. Key in OFF position. Wait 30 seconds. Do not change the tool settings or the ignition switch position until 30 seconds have elapsed. Set the tester to 160 ohms. Key in ON position. <p>NOTE: Wait 1 minute for the fuel gauge to respond. Observe the fuel gauge. The fuel gauge should read E (empty) or below.</p> <ul style="list-style-type: none"> Does the fuel gauge operate correctly? 	<p>Yes DISCONNECT the instrument gauge system tester. GO to B3.</p> <p>No DISCONNECT the instrument gauge system tester. GO to B5.</p>
B3	CHECK THE FUEL TANK	
	<ul style="list-style-type: none"> Check the fuel tank for any damage or deformation. Is the fuel tank OK? 	<p>Yes GO to B4.</p> <p>No INSTALL a new fuel tank; REFER to Section 310-01. TEST the system for normal operation.</p>
B4	CHECK THE FUEL PUMP ASSEMBLY	
	<ul style="list-style-type: none"> Check the fuel pump assembly in-tank mounting, float, float rod, wiring and connections for damage or obstruction. Is the fuel pump assembly and wiring OK? 	<p>Yes INSTALL a new fuel sender. TEST the system for normal operation.</p> <p>No REPAIR as necessary. TEST the system for normal operation.</p>
B5	CHECK CIRCUIT 29 (YE/WH) FOR A SHORT TO POWER	
	<ul style="list-style-type: none"> Disconnect: Instrument Cluster C220b. Key in ON position. Measure the voltage between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and ground.  <p>A0028376</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No GO to B6.</p>
B6	CHECK THE FUEL PUMP ASSEMBLY FEED CIRCUIT 29 (YE/WH)	
	<ul style="list-style-type: none"> Key in OFF position. 	

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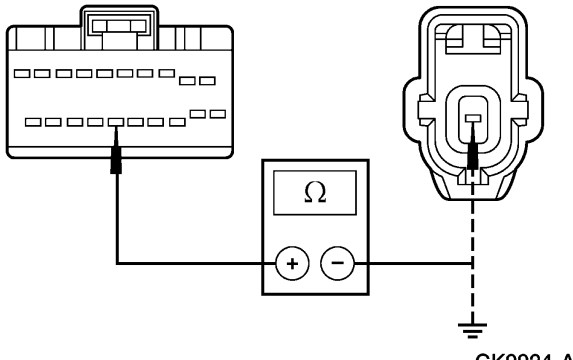
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST B: INCORRECT FUEL GAUGE INDICATION (Continued)

Test Step		Result / Action to Take
B6	CHECK THE FUEL PUMP ASSEMBLY FEED CIRCUIT 29 (YE/WH) (Continued)	
	<ul style="list-style-type: none"> Measure the resistances between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and the fuel pump module assembly C463 pin 8, circuit 29 (YE/WH), harness side; and between the instrument cluster C220b pin 19, circuit 29 (YE/WH), harness side and ground.  <p style="text-align: right;">GK9922-B</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms between the instrument cluster and the fuel pump module, and greater than 10,000 ohms between the instrument cluster and ground? 	<p>Yes GO to B7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
B7	CHECK FUEL PUMP MODULE GROUND CIRCUIT 327 (BK/OG) AND CIRCUIT 397 (BK/WH)	
	<ul style="list-style-type: none"> Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and the fuel pump module assembly C463 pin 5, circuit 327 (BK/OG), harness side.  <p style="text-align: right;">GK9923-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to B8.</p> <p>No REPAIR the circuit(s) in question. TEST the system for normal operation.</p>
B8	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST C: INCORRECT OIL PRESSURE GAUGE INDICATION

Test Step		Result / Action to Take
C1	CHECK THE INSTRUMENT CLUSTER OPERATION	
	<p>CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster active command OIL GAUGE. Scroll to 0%, 50%, and 100%. Did the gauge display L at 0%, the middle of the gauge at 50%, and H at 100%? 	<p>Yes GO to C2.</p> <p>No GO to C3.</p>
C2	CHECK CIRCUIT 31 (WH/RD) FOR AN OPEN OR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Disconnect: Oil Pressure Switch C103. Measure the resistances between the instrument cluster C220b pin 16, circuit 31 (WH/RD), harness side and the oil pressure switch C103, circuit 31 (WH/RD), harness side; and between the instrument cluster C220b pin 16, circuit 31 (WH/RD), harness side and ground.  <p style="text-align: center;">GK9924-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms between the instrument cluster and the oil pressure switch, and greater than 10,000 ohms between the instrument cluster and ground? 	<p>Yes INSTALL a new oil pressure switch. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
C3	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

PINPOINT TEST D: INCORRECT TEMPERATURE GAUGE INDICATION


Test Step		Result / Action to Take
D1	CARRY OUT THE INSTRUMENT CLUSTER ENGINE COOLANT TEMPERATURE GAUGE ACTIVE COMMAND	
	<ul style="list-style-type: none"> Connect the scan tool. Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST D: INCORRECT TEMPERATURE GAUGE INDICATION (Continued)**

Test Step		Result / Action to Take
D1	CARRY OUT THE INSTRUMENT CLUSTER ENGINE COOLANT TEMPERATURE GAUGE ACTIVE COMMAND (Continued)	
	<ul style="list-style-type: none"> Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger instrument cluster active command ENGCOOLNT. Monitor the engine coolant temperature gauge while adjusting the ENGCOOLNT active command to read 50% and 100%. Does the temperature gauge start at cold, move to half at 50%, and full hot at 100%? 	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to D2.</p>
D2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

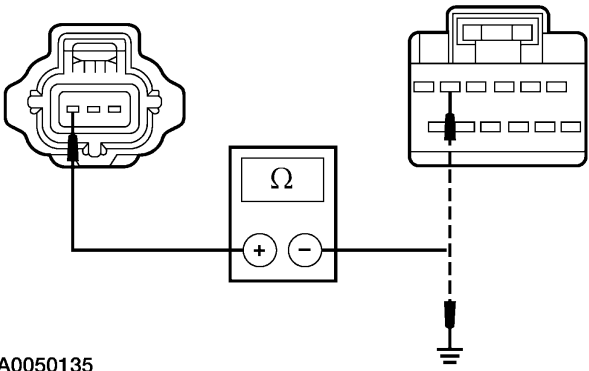
PINPOINT TEST E: INCORRECT VOLTAGE GAUGE INDICATION—EXCEPT COBRA

Test Step		Result / Action to Take
E1	CHECK THE INSTRUMENT CLUSTER	
	<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster voltage gauge active command. Scroll to 0%, 50%, and 100%. Did the voltage gauge indicate L at 0%, the middle of the gauge at 50%, and H at 100%? 	<p>Yes GO to E2.</p> <p>No GO to E4.</p>
E2	CHECK CHARGING SYSTEM	
	<ul style="list-style-type: none"> Check the charging system operation. REFER to Section 414-00. Is the charging system operating correctly? 	<p>Yes GO to E3.</p> <p>No REPAIR the charging system as needed. REFER to Section 414-00.</p>
E3	CHECK CIRCUIT 904 (LG/RD) FOR AN OPEN OR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a. Disconnect: Generator C102a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST E: INCORRECT VOLTAGE GAUGE INDICATION—EXCEPT COBRA (Continued)

Test Step		Result / Action to Take
E3	CHECK CIRCUIT 904 (LG/RD) FOR AN OPEN OR A SHORT TO GROUND (Continued)	
	<ul style="list-style-type: none"> Measure resistance between the generator C102a pin 1, circuit 904 (LG/RD), harness side and the instrument cluster C220a pin 5, circuit 904 (LG/RD), harness side; and between the generator C102a pin 1, circuit 904 (LG/RD), harness side and ground.  <p>A0050135</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms between the generator and the instrument cluster, and greater than 10,000 ohms between the generator and ground? 	<p>Yes The system is operating correctly at this time.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
E4	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

PINPOINT TEST F: INCORRECT TACHOMETER INDICATION

Test Step		Result / Action to Take
F1	CHECK THE TACHOMETER OPERATION	
	<ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster active command TCHOMETER. Scroll to 0%, 50%, and 100%. Did the tachometer display read 0 at 0%, half the tachometer display at 50%, and the full tachometer display at 100%? 	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to F2.</p>
F2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST G: INCORRECT BOOST GAUGE INDICATION—COBRA ONLY**

Test Step		Result / Action to Take
G1	CHECK THE BOOST GAUGE PRESSURE LINE	Yes CHECK for a plugged manifold fitting. TEST the system for normal operation. No GO to G2 .
	<ul style="list-style-type: none"> Disconnect the boost gauge pressure line from the intake manifold. Apply 69 kPa (10 psi) to the boost gauge pressure line. Does the boost gauge indicate maximum boost pressure? 	
G2	CHECK THE BOOST GAUGE	Yes INSTALL a new boost gauge pressure line. TEST the system for normal operation. No INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.
	<ul style="list-style-type: none"> Disconnect the boost gauge pressure line from the instrument cluster. Apply 10 psi to the boost gauge. Does the boost gauge indicate maximum boost pressure? 	

PINPOINT TEST H: THE LOW FUEL WARNING INDICATOR IS NEVER/ALWAYS ON

Test Step		Result / Action to Take
H1	CARRY OUT THE INSTRUMENT CLUSTER WARNING LAMPS AND CHIME ACTIVE COMMAND USING THE DIAGNOSTIC TOOL	Yes GO to H2 . No GO to H3 .
	<ul style="list-style-type: none"> Key in OFF position. Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Select the instrument cluster WARNING LAMPS AND CHIME active command. Trigger the ALL LAMPS active command. Observe the LOW FUEL warning indicator. Is the LOW FUEL warning indicator illuminating? 	
H2	THE LOW FUEL GAUGE WARNING INDICATOR IS NEVER/ALWAYS ON	Yes GO to H3 . No GO to Pinpoint Test B.
	<ul style="list-style-type: none"> Check the fuel gauge for correct operation. Is the fuel gauge operating correctly? 	
H3	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. 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"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

PINPOINT TEST I: THE SPEEDOMETER IS INOPERATIVE

Test Step		Result / Action to Take
I1	TEST THE INSTRUMENT CLUSTER	Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual . No GO to I2 .
	<ul style="list-style-type: none"> Carry out the instrument cluster self-diagnostic mode. Did the gauge sweep? 	

(Continued)


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

Test Step		Result / Action to Take
I2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

PINPOINT TEST J: THE ODOMETER IS INOPERATIVE

Test Step		Result / Action to Take
J1	CHECK THE ODOMETER DISPLAY	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to J2.</p>
	<ul style="list-style-type: none"> Key in ON position. Is the odometer displaying all dashes? 	
J2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

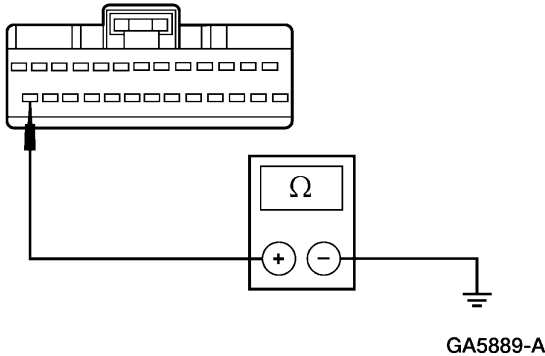
PINPOINT TEST K: THE SAFETY BELT INDICATOR IS INOPERATIVE (CHIME IS OPERATIVE)/DOES NOT OPERATE CORRECTLY

Test Step		Result / Action to Take
K1	CHECK IF THE GEM IS RECEIVING THE CORRECT IGNITION SWITCH STATUS	<p>Yes GO to K2.</p> <p>No REFER to Section 211-05.</p>
	<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Generic Electronic Module (GEM) PID. Monitor the GEM PIDs IGN__KEY, IGN__S, IGN__R, and IGN__A, while inserting the ignition key and cycling the ignition switch through all the positions. Did the PIDs agree with the ignition switch positions? 	
K2	CHECK IF THE GEM IS RECEIVING THE CORRECT SAFETY BELT SWITCH STATUS	<p>Yes GO to K3.</p> <p>No REFER to Section 413-09.</p>
	<ul style="list-style-type: none"> Monitor GEM PID D__SBELT while buckling and unbuckling the driver safety belt. Did the PID display IN with the safety belt buckled and OUT with the safety belt unbuckled? 	
K3	CHECK THE GEM FOR AN INTERNAL OPEN OR A SHORT	
	<ul style="list-style-type: none"> Key in OFF position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

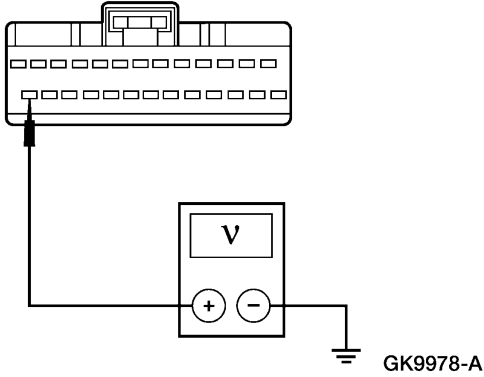
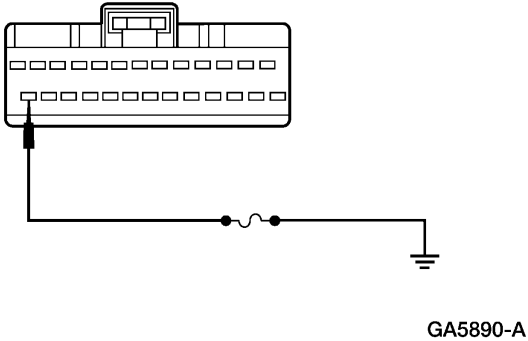
PINPOINT TEST K: THE SAFETY BELT INDICATOR IS INOPERATIVE (CHIME IS OPERATIVE)/DOES NOT OPERATE CORRECTLY (Continued)

Test Step		Result / Action to Take
K3	CHECK THE GEM FOR AN INTERNAL OPEN OR A SHORT (Continued)	<p>Yes GO to K10.</p> <p>No GO to K4.</p>
	<ul style="list-style-type: none"> Monitor the safety belt warning indicator when turning the ignition from the OFF to the ON position. Key in ON position. Did the safety belt warning indicator illuminate for approximately 3 seconds and turn off? 	
K4	DETERMINE IF SAFETY BELT INDICATOR CIRCUIT IS SHORTED TO GROUND	<p>Yes GO to K5.</p> <p>No GO to K7.</p>
	<ul style="list-style-type: none"> Buckle the driver safety belt. Is the safety belt indicator always on? 	
K5	CHECK IF THE GEM IS INTERNALLY GROUNDED	<p>Yes GO to K6.</p> <p>No GO to K10.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM C201e. Key in ON position. Observe the safety belt warning indicator. Is the safety belt warning indicator always on? 	
K6	CHECK CIRCUIT 450 (DG/LG) FOR A SHORT TO GROUND	<p>Yes GO to K11.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a. Measure the resistance between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  <p style="text-align: center;">GA5889-A</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	
K7	CHECK CIRCUIT 450 (DG/LG) FOR A SHORT TO BATTERY	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM C201e. Disconnect: Instrument Cluster C220a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST K: THE SAFETY BELT INDICATOR IS INOPERATIVE (CHIME IS OPERATIVE)/DOES NOT OPERATE CORRECTLY (Continued)

Test Step		Result / Action to Take
K7	<p>CHECK CIRCUIT 450 (DG/LG) FOR A SHORT TO BATTERY (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No GO to K8.</p>
K8	<p>CHECK THE GEM MODULE FOR AN INTERNAL OPEN</p> <ul style="list-style-type: none"> Connect: Instrument Cluster C220a. Install a fused (10A) jumper wire between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and ground.  <ul style="list-style-type: none"> Key in ON position. Did the safety belt indicator illuminate? 	<p>Yes GO to K10.</p> <p>No GO to K9.</p>
K9	<p>CHECK CIRCUIT 450 (DG/LG) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST K: THE SAFETY BELT INDICATOR IS INOPERATIVE (CHIME IS OPERATIVE)/DOES NOT OPERATE CORRECTLY (Continued)

Test Step		Result / Action to Take
K9	CHECK CIRCUIT 450 (DG/LG) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the GEM C201e pin 26, circuit 450 (DG/LG), harness side and instrument cluster C220a pin 4, circuit 450 (DG/LG), harness side. <p style="text-align: center;">GK9979-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to K11.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
K10	CHECK FOR CORRECT GEM OPERATION	
	<ul style="list-style-type: none"> Disconnect all GEM connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all GEM 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 GEM. 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>
K11	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

PINPOINT TEST L: INACCURATE SPEEDOMETER READING

Test Step		Result / Action to Take
L1	CHECK SPEEDOMETER OPERATION	
	<ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster active command SPDOMETER. Scroll to 0%, 50%, and 100%. Did the speedometer display read 0 at 0%, half the speedometer display at 50%, and the full speedometer display at 100%? 	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to L2.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST L: INACCURATE SPEEDOMETER READING (Continued)**

Test Step		Result / Action to Take
L2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

PINPOINT TEST M: THE O/D OFF INDICATOR IS NEVER ON

Test Step		Result / Action to Take
M1	CHECK THE O/D OFF INDICATOR OPERATION	<p>Yes GO to M2.</p> <p>No GO to M3.</p>
	<ul style="list-style-type: none"> Key in ON position. Observe the O/D OFF indicator. Is the O/D OFF indicator always on? 	
M2	CHECK THE INSTRUMENT CLUSTER	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to M4.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a. Key in ON position. Observe the O/D OFF indicator. Did the indicator turn off? 	
M3	CHECK THE INSTRUMENT CLUSTER OPERATION	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to M4.</p>
	<ul style="list-style-type: none"> Carry out the instrument cluster self-diagnostic mode. Did the O/D OFF indicator illuminate? 	
M4	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

PINPOINT TEST N: THE CHECK FUEL CAP INDICATOR IS NEVER ON

Test Step		Result / Action to Take
N1	RETRIEVE AND RECORD DTCs FROM CONTINUOUS AND ON-DEMAND SELF-TESTS—PCM	<p>Yes If PCM DTC P0457, REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to N2.</p>
	<p>NOTE: Once the check fuel cap indicator does turn on, it does not turn off unless the fuel cap has been correctly secured and the vehicle has been driven for several minutes.</p> <ul style="list-style-type: none"> Use recorded PCM DTCs from the continuous and on-demand self-test. Are any DTCs recorded? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST N: THE CHECK FUEL CAP INDICATOR IS NEVER ON (Continued)

Test Step		Result / Action to Take
N2	CARRY OUT THE INSTRUMENT CLUSTER INDICATOR LAMP CONTROL III ACTIVE COMMAND USING THE DIAGNOSTIC TOOL	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to N3.</p>
	<ul style="list-style-type: none"> Connect the scan tool. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Select the instrument cluster INDICATOR LAMP CONTROL III active command. Trigger the CHECK FUEL CAP active command ON. Observe the CHECK FUEL CAP indicator. Does the CHECK FUEL CAP indicator illuminate? 	
N3	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER ON

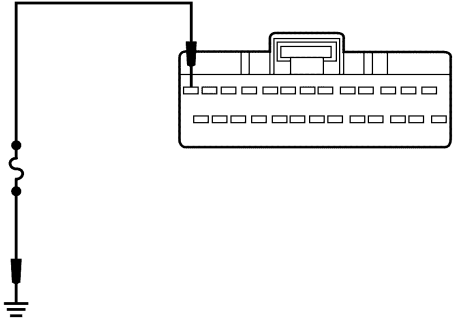
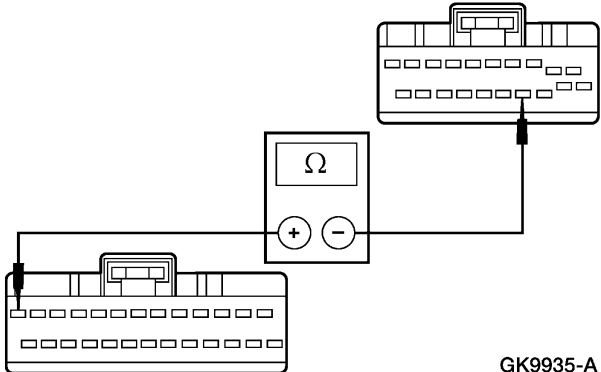
 **CAUTION:** Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take												
O1	CARRY OUT THE INSTRUMENT INDICATOR LAMP CONTROL ACTIVE COMMAND USING THE SCAN TOOL	<p>Yes GO to O2.</p> <p>No GO to O14.</p>												
	<ul style="list-style-type: none"> Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Select the instrument cluster warning lamps and chime command. Trigger the all lamps command on. Observe the brake warning indicator. Does the brake warning indicator illuminate when commanded on? 													
O2	CHECK IF THE GENERIC ELECTRONIC MODULE (GEM) IS RECEIVING THE CORRECT IGNITION SWITCH STATUS	<p>Yes GO to O4.</p> <p>No GO to O3.</p>												
	<ul style="list-style-type: none"> Key in ON position. Enter the following diagnostic mode on the scan tool: Generic Electronic Module (GEM) PID. Monitor the GEM PID IGN_R. Does the PID agree with the ignition switch position? 													
O3	CHECK THE GEM RUN VOLTAGE INPUT CIRCUITS FOR VOLTAGE	<p>Yes GO to O13.</p> <p>No REPAIR the circuit in question. TEST the system for normal operation.</p>												
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM Module C201a. Disconnect: GEM Module C201e. Key in ON position. Measure the voltage between the GEM, harness side and ground as follows: 													
	<table border="1"> <thead> <tr> <th>GEM Connector</th> <th>Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C201a</td> <td>4</td> <td>400 (LB/BK)</td> </tr> <tr> <td>C201e</td> <td>22</td> <td>1002 (BK/PK)</td> </tr> <tr> <td>C201e</td> <td>8</td> <td>911 (WH/LG)</td> </tr> </tbody> </table>		GEM Connector	Pin	Circuit	C201a	4	400 (LB/BK)	C201e	22	1002 (BK/PK)	C201e	8	911 (WH/LG)
GEM Connector	Pin		Circuit											
C201a	4		400 (LB/BK)											
C201e	22	1002 (BK/PK)												
C201e	8	911 (WH/LG)												
	<ul style="list-style-type: none"> Are the voltages greater than 10 volts? 													

(Continued)

DIAGNOSIS AND TESTING (Continued)

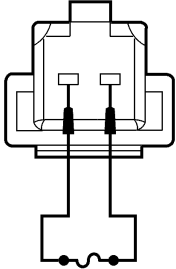
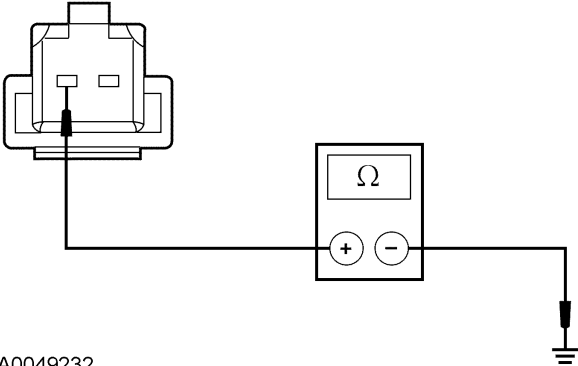
PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER ON (Continued)

Test Step	Result / Action to Take
<p>O4 DETERMINE IF THE GEM IS RECEIVING THE CORRECT PARKING BRAKE INPUT</p> <ul style="list-style-type: none"> Monitor the GEM PID PRK_BRK while applying the parking brake. Does the PID read ON with the parking brake applied? 	<p>Yes GO to O5.</p> <p>No GO to O8.</p>
<p>O5 DETERMINE IF BRAKE WARNING INDICATOR OPERATES WITH THE PARKING BRAKE</p> <ul style="list-style-type: none"> Apply the parking brake while observing the brake warning indicator. Does the brake warning indicator illuminate with the parking brake applied? 	<p>Yes GO to O11.</p> <p>No GO to O6.</p>
<p>O6 CHECK THE BRAKE WARNING INDICATOR OPERATION</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM C201e. Connect a fused (5A) jumper wire between the GEM C201e pin 13, circuit 128 (VT/YE), harness side.  <p>N0064541</p> <ul style="list-style-type: none"> Key in ON position. Does the brake warning indicator illuminate with the jumper wire connected? 	<p>Yes REMOVE the jumper wire. GO to O13.</p> <p>No REMOVE the jumper wire. GO to O7.</p>
<p>O7 CHECK CIRCUIT 128 (VT/YE) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Measure the resistance between the GEM C201e pin 13, circuit 128 (VT/YE), harness side and the instrument cluster C220b pin 14, circuit 128 (VT/YE), harness side.  <p>GK9935-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to O14.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>O8 CHECK THE PARKING BRAKE SWITCH</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Parking Brake Switch C306. 	

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DIAGNOSIS AND TESTING (Continued)

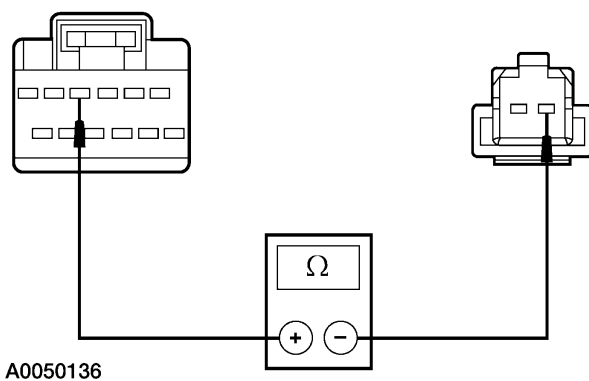
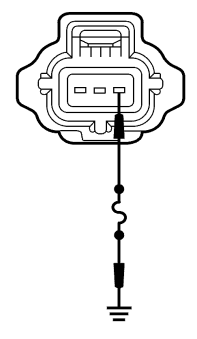
PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER ON (Continued)

	Test Step	Result / Action to Take
<p>O8</p>	<p>CHECK THE PARKING BRAKE SWITCH (Continued)</p> <ul style="list-style-type: none"> Connect a fused (5A) jumper wire between the parking brake switch C306 pin 1, circuit 22 (LB/BK), harness side and the parking brake switch C306 pin 2, circuit 1205 (BK), harness side.  <p>N0027214</p> <ul style="list-style-type: none"> Key in ON position. Monitor the GEM PID PRK__BRK. Does the PID read ON? 	<p>Yes INSTALL a new parking brake switch. TEST the system for normal operation.</p> <p>No REMOVE the jumper wire. GO to O9.</p>
<p>O9</p>	<p>CHECK CIRCUIT 1205 (BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Parking Brake Switch C306. Measure the resistance between the parking brake switch C306 pin 2, circuit 1205 (BK), harness side and ground.  <p>A0049232</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to O10.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
<p>O10</p>	<p>CHECK CIRCUIT 128 (VT/YE) AND CIRCUIT 22 (LB/BK) FOR AN OPEN</p> <ul style="list-style-type: none"> Disconnect: GEM C201d. 	

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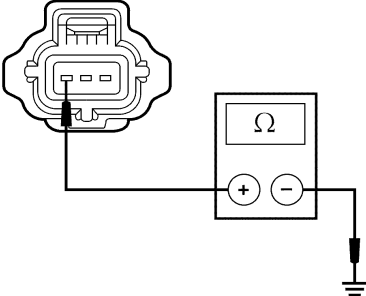
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER ON (Continued)


Test Step		Result / Action to Take
O10	<p>CHECK CIRCUIT 128 (VT/YE) AND CIRCUIT 22 (LB/BK) FOR AN OPEN (Continued)</p> <ul style="list-style-type: none"> Measure the resistance between the GEM C201d pin 4, circuit 128 (VT/YE), harness side and the parking brake switch C306 pin 1, circuit 22 (LB/BK), harness side.  <p>A0050136</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to O13.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
O11	<p>CHECK THE BRAKE WARNING INDICATOR AT THE BRAKE FLUID LEVEL SWITCH</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Brake Fluid Level Switch C124. Connect a fused (5A) jumper wire between the brake fluid level switch C124 pin 3, circuit 128 (VT/YE), harness side and ground.  <p>N0064542</p> <ul style="list-style-type: none"> Key in ON position. Monitor the brake warning indicator. Does the brake warning indicator illuminate after prove-out? 	<p>Yes REMOVE the jumper wire. GO to O12.</p> <p>No REMOVE the jumper wire. REPAIR circuit 128 (VT/YE). TEST the system for normal operation.</p>

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST O: THE BRAKE WARNING INDICATOR IS NEVER ON (Continued)**

Test Step		Result / Action to Take
O12	CHECK CIRCUIT 1205 (BK) AT THE BRAKE FLUID LEVEL SWITCH FOR AN OPEN	
	<ul style="list-style-type: none"> Measure the resistance between the brake fluid level switch C124 pin 1, circuit 1205 (BK), harness side and ground.  <p>N0064543</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes INSTALL a new brake fluid reservoir. REFER to section Section 206-06. TEST the system for normal operation.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
O13	CHECK FOR CORRECT GEM OPERATION	
	<ul style="list-style-type: none"> Disconnect all the GEM connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the GEM 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 GEM. 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>
O14	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

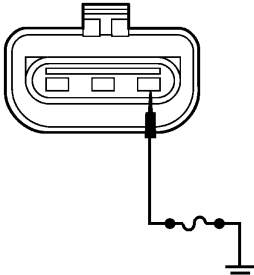
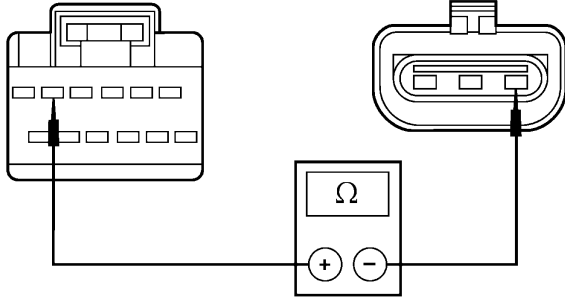
PINPOINT TEST P: THE CHARGING SYSTEM WARNING INDICATOR IS NEVER/ALWAYS ON

Test Step		Result / Action to Take
P1	CHECK THE CHARGING SYSTEM	
	<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Check the charging system operation. Refer to Section 414-00. Is the charging system operating correctly? 	<p>Yes GO to P2.</p> <p>No REFER to Section 414-00.</p>
P2	CHECK THE CHARGING SYSTEM WARNING INDICATOR WITH THE ENGINE OFF	
	<ul style="list-style-type: none"> Key in ON position. Observe the charging system warning indicator. Is the charging system warning indicator on? 	<p>Yes GO to P5.</p> <p>No GO to P3.</p>
P3	CHECK THE INSTRUMENT CLUSTER INPUT	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Generator C102c. 	

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DIAGNOSIS AND TESTING (Continued)

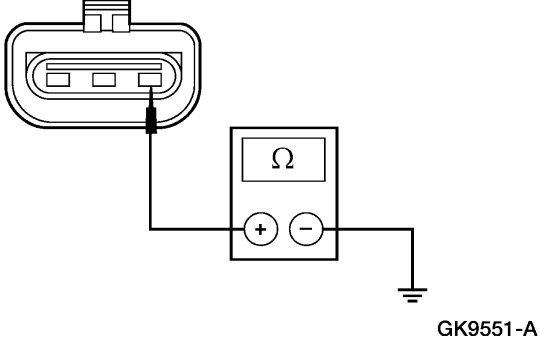
PINPOINT TEST P: THE CHARGING SYSTEM WARNING INDICATOR IS NEVER/ALWAYS ON (Continued)

Test Step		Result / Action to Take
P3	CHECK THE INSTRUMENT CLUSTER INPUT (Continued)	
	<ul style="list-style-type: none"> Connect a fused (10A) jumper wire between the generator C102c pin 1, circuit 904 (LG/RD), harness side and ground.  <p style="text-align: center;">GK9549-A</p> <ul style="list-style-type: none"> Key in ON position. Does the charging system indicator illuminate? 	<p>Yes INSTALL a new generator. REFER to Section 414-02. TEST the system for normal operation.</p> <p>No GO to P4.</p>
P4	CHECK CIRCUIT 904 (LG/RD) FOR AN OPEN	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a. Measure the resistance between the instrument cluster C220a pin 5, circuit 904 (LG/RD), harness side and the generator C102c pin 1, circuit 904 (LG/RD), harness side.  <p style="text-align: center;">GK9925-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to P7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
P5	CHECK THE GENERATOR	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Generator C102c. Key in ON position. Does the charging system indicator illuminate? 	<p>Yes GO to P6.</p> <p>No INSTALL a new generator. REFER to Section 414-02. TEST the system for normal operation.</p>
P6	CHECK CIRCUIT 904 (LG/RD) FOR A SHORT TO GROUND	
	<ul style="list-style-type: none"> Key in OFF position. 	


(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST P: THE CHARGING SYSTEM WARNING INDICATOR IS NEVER/ALWAYS ON (Continued)

Test Step		Result / Action to Take
P6	CHECK CIRCUIT 904 (LG/RD) FOR A SHORT TO GROUND (Continued)	
<ul style="list-style-type: none"> Measure the resistance between the generator C102c pin 1, circuit 904 (LG/RD), harness side and ground.  <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 		<p>Yes GO to P7.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
P7	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

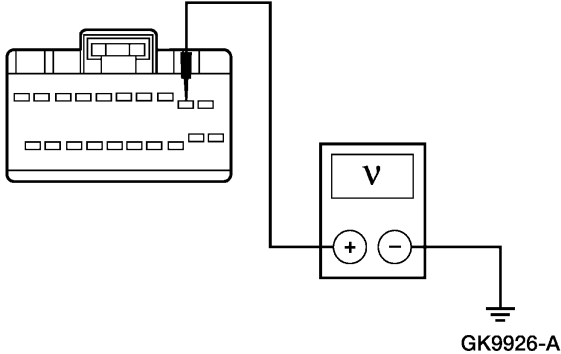
PINPOINT TEST Q: THE HIGH BEAM INDICATOR IS NEVER/ALWAYS ON

Test Step		Result / Action to Take
Q1	CHECK THE HIGH BEAM LAMP OPERATION	
<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Key in ON position. Operate the high beams. Do the high beams operate correctly? 		<p>Yes GO to Q2.</p> <p>No REFER to Section 417-01.</p>
Q2	CHECK CIRCUIT 932 (GY/WH) AND CIRCUIT 12 (LG/BK) FOR AN OPEN	
<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Key in ON position. 		


(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST Q: THE HIGH BEAM INDICATOR IS NEVER/ALWAYS ON (Continued)

Test Step		Result / Action to Take
Q2	CHECK CIRCUIT 932 (GY/WH) AND CIRCUIT 12 (LG/BK) FOR AN OPEN (Continued)	
<ul style="list-style-type: none"> Measure the voltage between the instrument cluster C220b pin 2, circuit 12 (LG/BK), harness side and ground, while turning the high beams on and off.  <ul style="list-style-type: none"> Is the voltage 0 volts with the high beams off and greater than 10 volts with the high beams on? 		<p>Yes GO to Q3.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
Q3	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

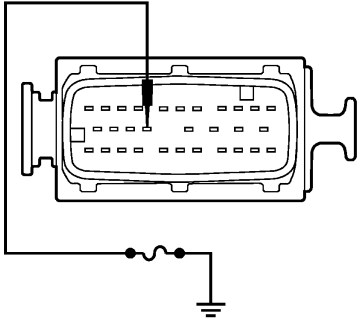
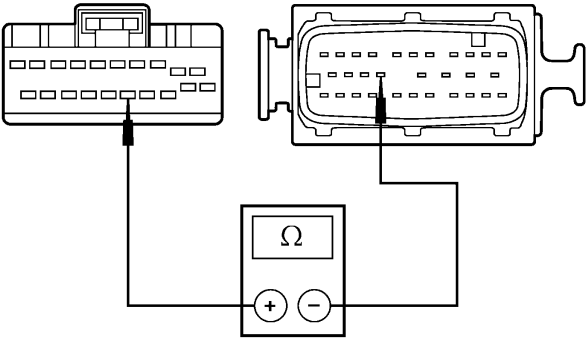
PINPOINT TEST R: THE ABS WARNING INDICATOR IS NEVER ON

Test Step		Result / Action to Take
R1	CHECK THE ABS WARNING INDICATOR OPERATION	
<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Key in ON position. Observe the ABS warning indicator. The ABS indicator should prove out for approximately six seconds then turn off. Does the ABS warning indicator operate correctly? 		<p>Yes The system is operating normally at this time.</p> <p>No If the indicator is inoperative, GO to R2. If the indicator is always on, REFER to Section 206-09A or Section 206-09B.</p>
R2	CHECK THE INSTRUMENT CLUSTER INPUT	
<ul style="list-style-type: none"> Key in OFF position. Disconnect: Anti-Lock Brake Control Module C135. 		

(Continued)

DIAGNOSIS AND TESTING (Continued)


PINPOINT TEST R: THE ABS WARNING INDICATOR IS NEVER ON (Continued)

Test Step		Result / Action to Take
R2	<p>CHECK THE INSTRUMENT CLUSTER INPUT (Continued)</p> <ul style="list-style-type: none"> Connect a fused (10A) jumper wire between the anti-lock brake control module C135 pin 16, circuit 603 (DG), harness side and ground.  <p style="text-align: center;">GK9972-A</p> <ul style="list-style-type: none"> Key in ON position. Does the ABS indicator illuminate? 	<p>Yes REFER to Section 206-09A or Section 206-09B.</p> <p>No GO to R3.</p>
R3	<p>CHECK CIRCUIT 603 (DG) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Measure the resistance between the instrument cluster C220b pin 15, circuit 603 (DG), harness side and the anti-lock brake control module C135 pin 16, circuit 603 (DG), harness side.  <p style="text-align: center;">GK9973-A</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to R4.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
R4	<p>CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION</p> <ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST S: THE SERVICE ENGINE SOON INDICATOR IS NEVER/ALWAYS ON**

Test Step		Result / Action to Take
S1	CARRY OUT THE INSTRUMENT CLUSTER SERVICE ENGINE SOON INDICATOR ACTIVE COMMAND	
	<ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster active command MIL. Did the SERVICE ENGINE SOON indicator illuminate? 	<p>Yes REFER to the Powertrain Control/Emissions Diagnosis (PC/ED) manual.</p> <p>No GO to S2.</p>
S2	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

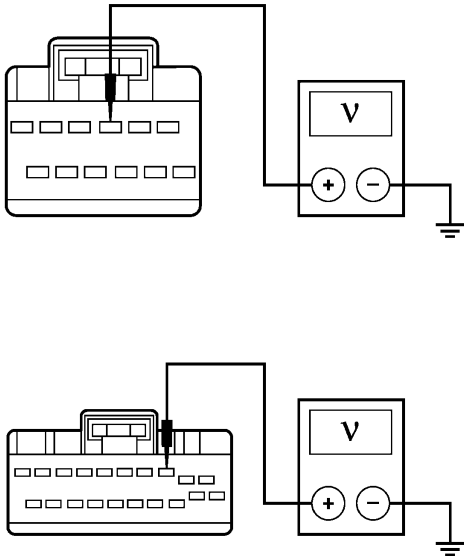
PINPOINT TEST T: THE TURN/HAZARD INDICATOR IS NEVER/ALWAYS ON

Test Step		Result / Action to Take
T1	CHECK THE TURN SIGNAL AND HAZARD LAMPS OPERATION	
	<p> CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Key in ON position. Operate the left and right turn signals. Operate the hazard lamps. Do the turn signals and hazard lamps operate correctly? 	<p>Yes GO to T2.</p> <p>No REFER to Section 417-01.</p>
T2	CHECK THE CIRCUIT IN QUESTION — CIRCUIT 2 (WH/LB) (RH) OR CIRCUIT 3 (LG/WH) (LH)	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220a (RH) or C220b (LH). Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST T: THE TURN/HAZARD INDICATOR IS NEVER/ALWAYS ON (Continued)

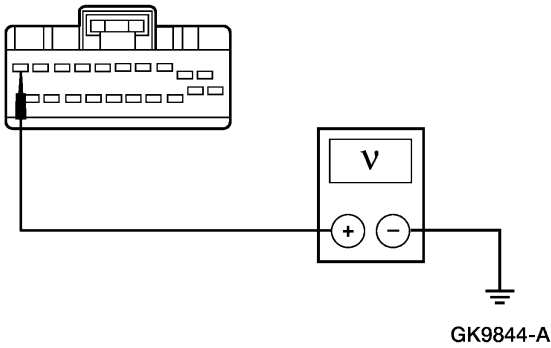
	Test Step	Result / Action to Take
<p>T2</p>	<p>CHECK THE CIRCUIT IN QUESTION — CIRCUIT 2 (WH/LB) (RH) OR CIRCUIT 3 (LG/WH) (LH) (Continued)</p> <ul style="list-style-type: none"> Measure the voltage between the instrument cluster C220a pin 3, circuit 3 (LG/WH), harness side and ground, while the steering column multifunction switch is placed in the left turn position (LH); or between the instrument cluster C220b pin 3, circuit 2 (WH/LB), harness side and ground, while the steering column multifunction switch is placed in the right turn position (RH).  <p style="text-align: center;">GK9927-A</p> <ul style="list-style-type: none"> Does the voltage alternate between 0 volts and 10 volts with the turn signal on? 	<p>Yes GO to T3.</p> <p>No REPAIR the circuit(s) in question. TEST the system for normal operation.</p>
<p>T3</p>	<p>CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION</p> <ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST U: THE TRACTION CONTROL INDICATOR IS NEVER/ALWAYS ON

Test Step		Result / Action to Take
U1	DETERMINE IF THE TRACTION CONTROL INDICATOR IS ALWAYS ON	Yes REFER to Section 206-09B. No GO to U2 .
	<ul style="list-style-type: none"> Observe the traction control indicator. Is the indicator always on? 	
U2	DETERMINE IF THE INSTRUMENT CLUSTER IS AT FAULT	Yes REFER to Section 206-09B. No GO to U3 .
	<ul style="list-style-type: none"> Connect the scan tool. Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Trigger the instrument cluster active command TRAC OFF. Did the traction control indicator illuminate? 	
U3	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. 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"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	

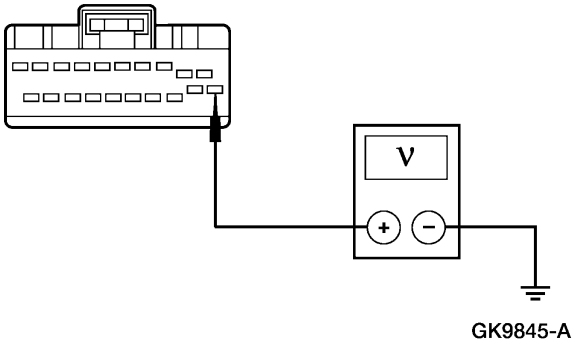
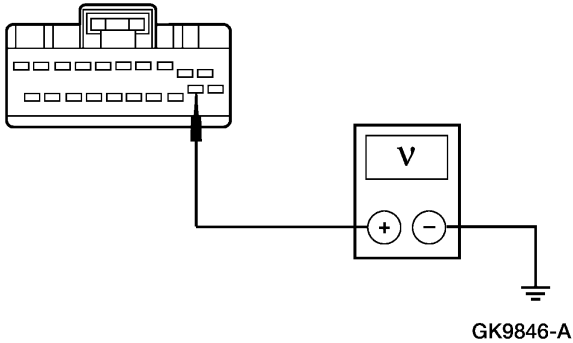
PINPOINT TEST V: THE INSTRUMENT CLUSTER IS INOPERATIVE

Test Step		Result / Action to Take
V1	CHECK THE BATTERY POWER SUPPLY TO THE INSTRUMENT CLUSTER	Yes GO to V2 . No REPAIR the circuit. TEST the system for normal operation.
	<p>⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.</p> <ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Measure voltage between the instrument cluster C220b pin 10, circuit 729 (RD/WH), harness side and ground.  <p style="text-align: center;">GK9844-A</p> <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	
V2	CHECK THE RUN POWER SUPPLY TO THE INSTRUMENT CLUSTER	
	<ul style="list-style-type: none"> Key in ON position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

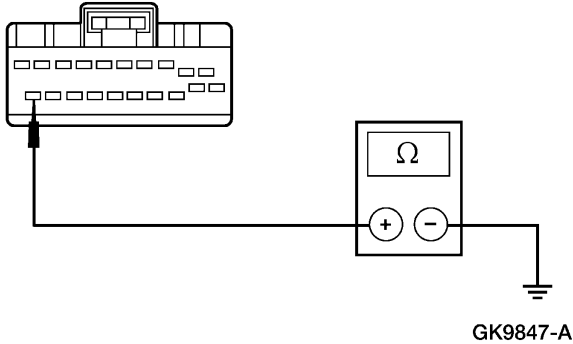
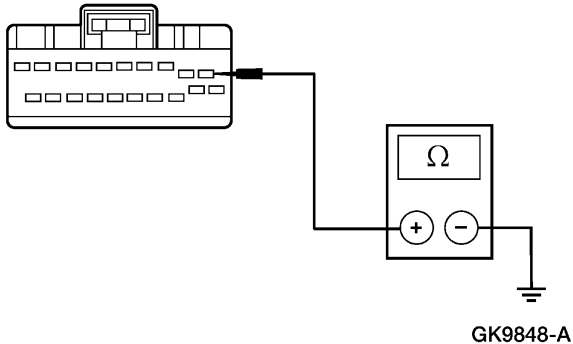
PINPOINT TEST V: THE INSTRUMENT CLUSTER IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
V2	CHECK THE RUN POWER SUPPLY TO THE INSTRUMENT CLUSTER (Continued)	
	<ul style="list-style-type: none"> Measure the voltage between the instrument cluster C220b pin 11, circuit 489 (PK/BK), harness side and ground.  <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to V3.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
V3	CHECK RUN/START POWER SUPPLY TO THE INSTRUMENT CLUSTER	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Key in ON position. Measure the voltage between the instrument cluster C220b pin 12, circuit 20 (WH/LB), harness side and ground.  <ul style="list-style-type: none"> Is the voltage greater than 10 volts? 	<p>Yes GO to V4.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
V4	CHECK GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN	
	<ul style="list-style-type: none"> Key in OFF position. 	

(Continued)

DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST V: THE INSTRUMENT CLUSTER IS INOPERATIVE (Continued)

Test Step		Result / Action to Take
V4	CHECK GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN (Continued)	
	<ul style="list-style-type: none"> Measure the resistance between the instrument cluster C220b pin 20, circuit 397 (BK/WH), harness side and ground.  <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to V5.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
V5	CHECK GROUND CIRCUIT 1205 (BK) FOR AN OPEN	
	<ul style="list-style-type: none"> Measure the resistance between the instrument cluster C220b pin 1, circuit 1205 (BK), harness side and ground.  <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to V6.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
V6	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster 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 instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>

PINPOINT TEST W: NO COMMUNICATION WITH THE GENERIC ELECTRONIC MODULE (GEM)

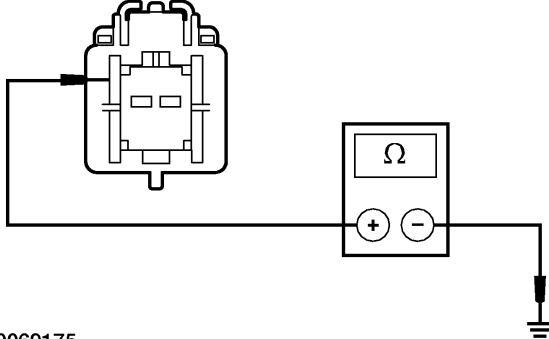
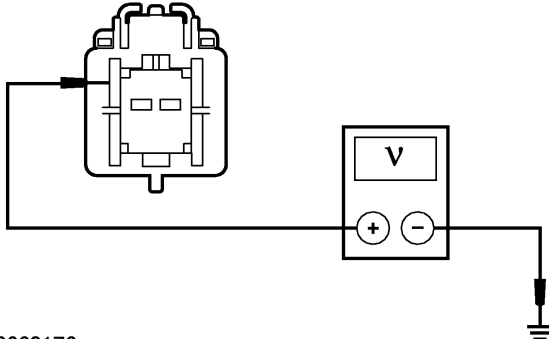
⚠ CAUTION: Use the correct probe adapter(s) when making measurements. Failure to use the correct probe adapter(s) may damage the connector.

Test Step		Result / Action to Take
W1	CHECK THE GENERIC ELECTRONIC MODULE (GEM) POWER SUPPLY	
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Generic Electronic Module (GEM) C201a. Disconnect: GEM C201b. 	

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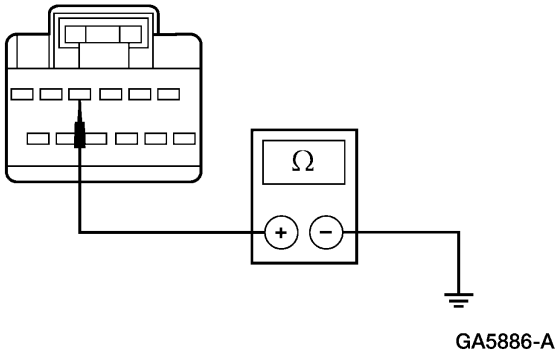
DIAGNOSIS AND TESTING (Continued)

**PINPOINT TEST W: NO COMMUNICATION WITH THE GENERIC ELECTRONIC MODULE (GEM)
(Continued)**

Test Step		Result / Action to Take															
W1	<p>CHECK THE GENERIC ELECTRONIC MODULE (GEM) POWER SUPPLY (Continued)</p> <ul style="list-style-type: none"> Key in ON position. Using the following table, measure the voltage between the GEM, harness side and ground. <table border="1"> <thead> <tr> <th>Connector</th> <th>Pin</th> <th>Circuit</th> </tr> </thead> <tbody> <tr> <td>C201a</td> <td>4</td> <td>400 (LB/BKK)</td> </tr> <tr> <td>C201a</td> <td>1</td> <td>1006 (DG/WH)</td> </tr> <tr> <td>C201b</td> <td>2</td> <td>1001 (WH/YE)</td> </tr> <tr> <td>C201b</td> <td>3</td> <td>193 (YE/LG)</td> </tr> </tbody> </table> <ul style="list-style-type: none"> Are the voltages greater than 10 volts? 	Connector	Pin	Circuit	C201a	4	400 (LB/BKK)	C201a	1	1006 (DG/WH)	C201b	2	1001 (WH/YE)	C201b	3	193 (YE/LG)	<p>Yes GO to W2.</p> <p>No REPAIR the circuit(s) in question. TEST the system for normal operation.</p>
Connector	Pin	Circuit															
C201a	4	400 (LB/BKK)															
C201a	1	1006 (DG/WH)															
C201b	2	1001 (WH/YE)															
C201b	3	193 (YE/LG)															
W2	<p>CHECK THE GEM GROUND CIRCUIT 397 (BK/WH) FOR AN OPEN</p> <ul style="list-style-type: none"> Key in OFF position. Measure the resistance between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.  <p>A0069175</p> <ul style="list-style-type: none"> Is the resistance less than 5 ohms? 	<p>Yes GO to W3.</p> <p>No REPAIR the circuit(s) in question. TEST the system for normal operation.</p>															
W3	<p>CHECK CIRCUIT 397 (BK/WH) FOR A SHORT TO POWER</p> <ul style="list-style-type: none"> Measure the voltage between the GEM C201b pin 4, circuit 397 (BK/WH), harness side and ground.  <p>A0069176</p> <ul style="list-style-type: none"> Is any voltage present? 	<p>Yes REPAIR the circuit. TEST the system for normal operation.</p> <p>No REFER to Section 418-00.</p>															

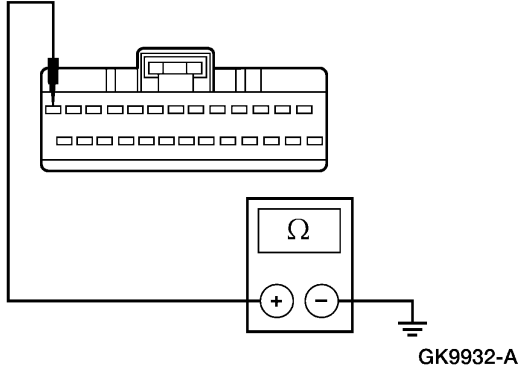
DIAGNOSIS AND TESTING (Continued)

PINPOINT TEST X: THE BRAKE WARNING INDICATOR IS ALWAYS ON

Test Step		Result / Action to Take
X1	CHECK THE BASE BRAKE SYSTEM	Yes GO to X2 . No REFER to Section 206-00.
	<ul style="list-style-type: none"> Verify that the base brake system is operating correctly. Is the base brake system operating correctly? 	
X2	CARRY OUT THE INSTRUMENT INDICATOR LAMP CONTROL ACTIVE COMMAND USING THE SCAN TOOL	Yes GO to X3 . No GO to X10 .
	<ul style="list-style-type: none"> Key in ON position. Enter the following diagnostic mode on the scan tool: Instrument Cluster Active Command. Select the instrument cluster warning lamps and chime command. Trigger the all lamps command on and off. Observe the brake warning indicator. Does the brake warning indicator illuminate when commanded on and turn off when commanded off? 	
X3	CHECK THE BRAKE WARNING INDICATOR WITH THE PARKING BRAKE SWITCH DISCONNECTED	Yes GO to X4 . No INSTALL a new parking brake switch. TEST the system for normal operation.
	<ul style="list-style-type: none"> Disconnect: Parking Brake Switch C306. Monitor the brake warning indicator with the parking brake switch disconnected. Does the brake warning indicator continue to illuminate? 	
X4	DETERMINE IF GENERIC ELECTRONIC MODULE (GEM) IS RECEIVING THE CORRECT PARKING BRAKE INPUT	Yes GO to X6 . No GO to X5 .
	<ul style="list-style-type: none"> Monitor GEM PID PRK_BRK with the parking brake switch disconnected. Does the PID read OFF? 	
X5	CHECK CIRCUITS 128 (VT/YE) AND 22 (LB/BK) FOR A SHORT TO GROUND	Yes GO to X9 . No REPAIR the circuit. TEST the system for normal operation.
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM C201d. Measure the resistance between the GEM C201d pin 4, circuit 128 (VT/YE), harness side and ground.  <p style="text-align: center;">GA5886-A</p> <ul style="list-style-type: none"> Is the resistance greater than 10,000 ohms? 	
X6	CHECK THE GEM OPERATION	Yes GO to X7 . No GO to X9 .
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: GEM C201e. Key in ON position. Monitor the brake warning indicator with the GEM disconnected. Does the brake warning indicator illuminate? 	

(Continued)

DIAGNOSIS AND TESTING (Continued)**PINPOINT TEST X: THE BRAKE WARNING INDICATOR IS ALWAYS ON (Continued)**

Test Step		Result / Action to Take
X7	CHECK THE BRAKE FLUID LEVEL SWITCH OPERATION	<p>Yes GO to X8.</p> <p>No VERIFY that the brake fluid level is full. If the brake fluid level is full, install a new brake fluid reservoir. REFER to section Section 206-06. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Brake Fluid Level Switch C124. Key in ON position. Monitor the brake warning indicator with the brake fluid level switch disconnected. Does the brake warning indicator illuminate? 	
X8	CHECK CIRCUIT 128 (VT/YE) FOR A SHORT TO GROUND BETWEEN THE GEM AND THE INSTRUMENT CLUSTER	<p>Yes GO to X10.</p> <p>No REPAIR the circuit. TEST the system for normal operation.</p>
	<ul style="list-style-type: none"> Key in OFF position. Disconnect: Instrument Cluster C220b. Measure the resistance between the GEM C201e pin 13, circuit 128 (VT/YE), harness side and ground.  <p style="text-align: center;">GK9932-A</p> <ul style="list-style-type: none"> Is resistance greater than 10,000 ohms? 	
X9	CHECK FOR CORRECT GEM OPERATION	<p>Yes INSTALL a new GEM. REFER to Section 419-10. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the GEM connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the GEM connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	
X10	CHECK FOR CORRECT INSTRUMENT CLUSTER OPERATION	<p>Yes INSTALL a new instrument cluster. REFER to Instrument Cluster in this section. TEST the system for normal operation.</p> <p>No The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. CLEAR the DTCs. REPEAT the self-test.</p>
	<ul style="list-style-type: none"> Disconnect all the instrument cluster connectors. Check for: <ul style="list-style-type: none"> corrosion pushed-out pins Connect all the instrument cluster connectors and make sure they seat correctly. Operate the system and verify the concern is still present. Is the concern still present? 	