

Message Center

Harness	Pin	Function	Color
12 PIN	1	Message Center Switch Input	Green
12 PIN	2	Illumination Input	Lt. Blue/Red
12 PIN	3	Fuel Level Input	Yellow/White
12 PIN	4	No PIN	No PIN
12 PIN	5	Fuel Flow Input	Lt. Blue/Pink
12 PIN	6	Lamp Out Warning	Yellow/Red
12 PIN	7	Message Center Switch Input	Dk. Green/Green
12 PIN	8	Engine Temp Sense	Red/White
12 PIN	9	Oil Temp/Level Sense	Dk. Green/White
12 PIN	10	Ignition	Grey/Yellow
12 PIN	11	Speed Sensor Input	Grey/Black
12 PIN	12	Air Ride Suspension Control	Pink/White

Message Display

16 PIN	21	Fuel Tank Select	Brown
16 PIN	22	Air Ride Suspension Control	Dk. Green/Green
16 PIN	23	Oil Level Input	White/Pink
16 PIN	24	English/Metric Output	Red
16 PIN	25	Chime Output	Tan/Yellow
16 PIN	26	No PIN	No PIN
16 PIN	27	Battery	Green/Yellow
16 PIN	28	Ground	Black/White
16 PIN	29	Lamp Out Warning	Orange/Black
16 PIN	30	Lamp Out Warning	Red/Green
16 PIN	31	Low Washer Fluid Signal	Pink/Yellow
16 PIN	32	Engine Select	Black/White
16 PIN	33	No PIN	No PIN
16 PIN	34	Tachometer Signal	Tan/Yellow
16 PIN	35	No PIN	No PIN
16 PIN	36	Ground	Black

Message Switch

8 PIN	1	Connected to this Harness	Dk. Green/Green
8 PIN	2	No PIN	No PIN
8 PIN	3	Ground	Black/White
8 PIN	4	Connected to this Harness	Green
8 PIN	5	Ground	Brown
8 PIN	6	Dimmer	Red/Black
8 PIN	7	No PIN	No PIN
8 PIN	8	No PIN	No PIN

Connection

Location	Harness	Pin	Color
Message Switch	8 PIN	4	Green
Radio Harness	16 PIN	1	Red/Black
Instrument Cluster	12 PIN	12	Yellow/White
N/A	N/A	N/A	N/A
PCM	PCM	43	Lt. Blue/Pink
N/A	N/A	N/A	N/A
Message Switch	8 PIN	1	Dk. Green/Green
Instrument Cluster	12 PIN	3	Red/White
Engine Oil Switch	3 PIN		Dk. Green/White
Radio Harness	16 PIN	3	Red/Black
Instrument Cluster	12 PIN	1	Grey/Black
N/A	N/A	N/A	N/A

OPEN	OPEN	OPEN	OPEN
N/A	N/A	N/A	N/A
Engine Oil Switch	3 PIN	2	White/Pink
EATC	13 PIN	12	Red
GEM Module	26 PIN	20	Tan/Yellow
N/A	N/A	N/A	N/A
Radio Harness	16 PIN	9	Lt. Green/Violet
Chasis	ANY	ANY	ANY
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A
Washer Fluid Bottle	2 PIN	2	Pink/Yellow
Instrument Cluster	16 PIN	16	Black/White
N/A	N/A	N/A	N/A
Instrument Cluster	16 PIN	15	Tan/Yellow
N/A	N/A	N/A	N/A
Ash Tray	2 PIN	Black	Black

Message Display	12 PIN	7	Dk. Green/Green
N/A	N/A	N/A	N/A
Ash Tray	2 PIN	Black	Black
Message Display	12 PIN	1	Green
Ash Tray	2 PIN	Black	Black
Ash Tray	2 PIN	Red	Red/Black
N/A	N/A	N/A	N/A
N/A	N/A	N/A	N/A


Description

Connects the message display with the message switch
Connects to the dimmer switch. MAX brightness=Battery Voltage, MIN Brightness=2.5V. Use the dimmer signal from either the ash tray light or from the radio harness.
Connects to the fuel tank level sensor. Full Tank = 160 Ohm ref GND.
N/A
Connects to the Fuel Flow Signal at the PCM.
Not Used
Connects the message display with the message switch
Connects the Coolant Temperature Sensor. >2.7V=OK, <2.7V=Warning
Connects the oil temperature switch. Left Side of Engine, Oil Pan.
Use the switched ignition power from the radio wire harness. IGN OFF=0V, IGN ON=Batt
Connects to the vehicle speed signal at the instrument cluster
Not Equipped
Connect this wire to +5v if you have a 20.8G Fuel Tank. Connect to GND if you have a 18.4G Fuel Tank.
Not Equipped
Connects to the oil level sensor. Left Side of Engine, Oil Pan.
Only used for those with Auto A/C Controls. It switches you're A/C between imperial and metric.
The message center output a signal to the GEM module. When the GEM receives this signal, it outputs a chime.
N/A
Connects to a constant battery voltage. ALWAYS +12V
Connect this wire to any chasis ground. I used the ground from my ash tray light.
Not Used
Not Used
Connects to the fluid sensor of your windshield washer fluid bottle. Full=GND, Low=Open
This will define which engine you have. V6=Connect to +5V, V8=Connect to GND.
N/A
Connects to your tachometer signal behind the instrument cluster
N/A
Connect this wire to any chasis ground. I used the ground from my ash tray light.
Connects the message display with the message switch
N/A
Connect this wire to any chasis ground. I used the ground from my ash tray light.
Connects the message display with the message switch
Connect this wire to any chasis ground. I used the ground from my ash tray light.
Connects to the dimmer switch. MAX brightness=Battery Voltage, MIN Brightness=2.5V. Use the dimmer signal from the ash tray light.
N/A
N/A

## Information and Message Center

Refer to Wiring Diagrams Cell [69](#), Message Center for schematic and connector information.

### Special Tool(s)

 <p>ST1137-A</p>	<p>73 Digital Multimeter 105-R0051 or equivalent</p>
---	--

### Principles of Operation

#### Display Dimming

The dimming of the indicator display is controlled by the pulse width dimmer module. The voltage on Pin 2 controls the brightness of the message center display. When the exterior lamps are off, this voltage will be zero volts and the message center display will be at maximum brightness. When the exterior lamps are on, this voltage will be controlled by the pulse width dimmer module and will be between 2.5 volts and battery voltage. The message center display will be brighter as this voltage approaches battery voltage. If there is a warning on the message center display, the display will not dim to its lowest level.

When the headlamps (13008) or parking lamps are OFF, the display of the message center indicator will be maximum brightness and the labels for the center five switches of the message center switch module will not be illuminated.

When the headlamps or parking lamps are ON, the brightness of the display of the message center indicator and the labels for the center five switches of the message center switch module will be controlled by the pulse width dimmer module.

For additional information, refer to [Section 413-00](#).

#### English/Metric Mode

The ENGLISH/METRIC switch controls the display mode for both the message center indicator and the electronic automatic temperature control. A press of the ENGLISH/METRIC switch will change both displays between english mode and metric mode.

#### Vehicle Speed Signal

The vehicle speed signal is generated by the rear anti-lock brake sensor and sent to the 4-wheel anti-lock brake system (4WABS) module. The 4WABS module sends the vehicle speed signal via circuit 679 (GY/BK) to all systems which require a vehicle speed signal input.

#### Fuel Computer — Range

The RANGE feature has two displays: the distance that can be traveled before refueling, and the distance that was traveled since the last trip odometer reset. The RANGE switch will change the message center indicator between the two displays.

The RANGE (distance to empty) feature is calculated using the fuel flow signal from the powertrain control module (PCM) (12A650), the speed signal from the 4WABS module and the fuel level signal from the fuel level sender.

The fuel flow and speed signals are used to calculate a running average fuel economy (RAFE), which is multiplied by the fuel remaining to give the range.

RAFE is not the same number as the Average Fuel Economy displayed by the message center indicator.

RAFE is based on the past driving history and can only be reset by disconnecting the battery.

When the range decreases to 80 km (50 mile) to empty, the message center will display the LOW FUEL LEVEL warning.

With a fuel tank (9002) full of fuel (160 ohm signal from fuel sender) and after a battery disconnect, the RANGE should be approximately 644 km (400 miles) to empty.

The RANGE (trip odometer) feature is calculated using the speed signal from the 4WABS module. It can be reset to zero by pressing the reset switch while the trip odometer is displayed on the message center.

### **Fuel Computer — Status**

The STATUS feature has two displays: Fuel-to-Empty and Fuel-Used. The STATUS switch will change the message center indicator between the two displays.

The fuel-to-empty calculation is achieved using the fuel level signal from the fuel level sender.

The fuel-used feature is calculated using the fuel flow signal from the PCM and can be reset to zero by pressing the RESET switch while the fuel-used feature is displayed on the message center.

### **Fuel Computer — Economy**

The economy (ECON) feature has two displays: average and instant.

Depressing the ECON switch changes the message center indicator between both displays.

The economy is calculated using the fuel flow signal from the powertrain control module and the speed signal from the 4WABS module.

The average fuel economy feature can be reset by pressing the RESET switch while the average fuel economy feature is displayed on the message center indicator.

### **System Check and Warnings**

The SYSTEM CHECK feature cycles the message center indicator through a status of each system being monitored.

- For each of the monitored systems, the message center indicator will indicate either an OK message or a warning message for two seconds.
- At normal conclusion of the system check sequence, the message center indicator will display all

active warnings or the last feature displayed before entering the SYSTEM CHECK mode.

- System warnings alert the driver to possible concerns or malfunctions in the vehicle operating systems.
- There are 7 warning messages which can be displayed for two seconds by the message center indicator to show the status of the monitored systems.
- When a warning occurs, the warning message is displayed and a one-second tone sounds. The warning message will appear at a brighter level if the message center indicator is dimmed.
- In the event of a multiple warning situation, the message center indicator will cycle the display to show all warnings by displaying each warning message for four seconds.
- To display the operator selectable features of the message center indicator while a warning is displayed, the warning message may be removed from the message center indicator display by pressing the RESET switch. The message center indicator will display the last selected feature if there are no more warning messages.
- This allows operation of all functions of the message center indicator after pressing the RESET switch and clearing the warning message.

Warning messages which have been reset will either reappear on the display in 10 minutes from the reset or will not reappear until an ignition switch OFF-RUN cycle.

If warning messages reappear it is a reminder that these warning conditions still exist. Warnings may be repeatedly reset. All warning messages will reappear after an entire SYSTEM CHECK sequence has been completed.

### **Charging System Warning (CHECK CHARGING SYSTEM)**

This warning message is displayed when the electrical system is not maintaining correct voltage at the message center indicator. There will be a few seconds delay before the warning is displayed or removed.

### **Engine Coolant Temperature Warning (CHECK ENGINE TEMP)**

This warning message is displayed when the engine coolant is overheating.

The message center indicator senses the voltage level on Circuit 39 (RD/WH) (C2008-8 to the message center indicator).

If that voltage is greater than approximately 2.7 volts, at a battery voltage of 13.5 volts there will be no warning. If it is less than approximately 2.7 volts, at a battery voltage of 13.5 volts then the warning will be displayed.

The message center indicator filters this input; therefore, there will be a few seconds delay before the warning is displayed or removed.

### **Fuel Level Warning (LOW FUEL LEVEL)**

This warning message is displayed when there is approximately 80 km (50 mile) or less left before the vehicle runs out of fuel.

### **Oil Level Warning (LOW OIL LEVEL)**

This warning message is displayed when the engine oil level is low.

When the engine oil level is normal, the input to the message center indicator will be an open circuit.

When the engine oil level is low, the low oil level sensor (6C624) will close, grounding the input to the

message center indicator and the warning will be displayed during the next ignition cycle of OFF to RUN. This low oil level sensor is only monitored when the ignition switch (11572) is OFF.

There is a delay of up to 12 minutes in this monitoring in order to allow the oil to drain back into the oil pan (6675) and reach the correct level.

### **Oil Life Warning (CHANGE OIL SOON or OIL CHANGE REQUIRED)**

If the connection to the oil temperature sensor is open circuit or shorted, the message center display will read OIL TEMP SIGNAL ERROR instead of displaying the PERCENTAGE OIL LIFE LEFT during system check sequence.

One of these warning messages is displayed when the engine oil life remaining is five percent or less.

- When oil life left is between five percent and zero percent, the "CHANGE OIL SOON" message will be displayed.
- When oil life left reaches zero percent, the "OIL CHANGE REQUIRED" message will be displayed.

The message center indicator will indicate the percent of oil life remaining during System Check. This percentage is based on the driving history and the time since the last oil change. In order to ensure accurate oil life left indications, the driver should only carry out the OIL CHANGE RESET procedure, as described in the Owner's Guide, after an oil change.

To calculate the percentage of oil life remaining, the oil life feature uses:

- oil temperature sensor input
  - tachometer input from the PCM
  - vehicle speed signal input
  - clock time (maintained internally by the message center)
- 
- The oil life will decrease from 100 percent to 0 percent in no more than 12,070 km (7,500 mile) or 6 months. It will reach zero percent sooner under different driving conditions.
  - The percentage of oil life remaining is the second display in the system check sequence.
  - When oil life remaining is between five percent and zero percent, the "CHANGE OIL SOON" message will be displayed.
  - When oil life left reaches zero percent, the "OIL CHANGE REQUIRED" message will be displayed.

### **Washer Fluid Level Warning (LOW WASHER FLUID)**

This warning message is displayed when there is less than one quarter of the container of washer fluid remaining.

- When the washer fluid level is normal, the windshield washer reservoir fluid level sensor (17B649) will close, grounding the input Circuit 82 (PK/YE) at C2009-31 of the message center indicator.
- When the washer fluid level is low, the input to the message center indicator will be open and the warning will be displayed.

The message center indicator filters this input — therefore, there will be a 20-second delay before the warning is displayed or removed.

### **Warning Chime**

A short warning chime (0.1 second) is output with every message center switch press. A longer warning

chime (1.0 second) is output when a new warning first appears on the message center indicator display.

To activate the warning, the message center pulls the chime request output below one volt during the length of the tone.

### Inspection and Verification

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

#### Visual Inspection Chart

Mechanical	Electrical
<ul style="list-style-type: none"> <li>• Damaged message center indicator</li> <li>• Damaged message center switch module</li> <li>• Low engine coolant level</li> <li>• Low engine oil level</li> <li>• Low windshield washer fluid level</li> </ul>	<ul style="list-style-type: none"> <li>• Blown central junction box (CJB) fuse(s):               <ul style="list-style-type: none"> <li>• Fuse 10 (7.5A)</li> <li>• Fuse 36 (7.5A)</li> </ul> </li> <li>• Damaged wiring harness</li> <li>• Loose or corroded connector(s)</li> <li>• Circuitry open/shorted</li> </ul>

3. If inspection reveals obvious concerns that can be readily identified, repair as required.
4. Carry out the Message Center On-Board Diagnostic Test as follows:
  - Press RANGE and SYSTEM CHECK simultaneously while turning the ignition switch from the OFF position to the RUN position.
  - The following chart describes each test.

#### Message Center On-Board Diagnostic Test

Test	Description
ROM Level	Displays the Read Only Memory (ROM) level of the message center. This is used when requesting assistance from the hotline.
NVM Level	Displays the Non-Volatile Memory (NVM) level of the message center. This is used when requesting assistance from the hotline.
NVM Check	Displays the Non-Volatile Memory (NVM) for accuracy. If the message is NVM OK, proceed to the next step. If the message is REPLACE M/C, remove the message center switch module and install a new message center.
Display Check	Displays the same character in all 24 character positions. The initial character is all dots ON. Presses of the ENGLISH/METRIC switch sequence the display character through the entire character set. INSTALL a new message center indicator if the characters are not displayed correctly.
Tach Check	Determines if a tach signal is being received by the message center. If the message is TACH SIGNAL OK, the tach signal is being retrieved. If the message is TACH SIGNAL ERROR, no tach signal is being received. The engine must be running to receive a tach signal. GO to pinpoint test F, to check signal circuit. INSTALL a new message center indicator if concern is not in circuit or powertrain control module.
A/D (Analog-to-Digital)	Displays the status of each of the analog inputs to the message center. Pressing the ENGLISH/METRIC switch sequences the A/D test forward, and the FUEL STATUS switch

Channel)	sequences the test backwards. See the A/D table for the analog voltage inputs associated with each test. This is used when requesting assistance from the hotline.
Digital Port	Displays the status of each of the digital inputs to the message center. Presses of the ENGLISH/METRIC switch sequence the digital port tests forward. See the digital port tables for the digital inputs associated with each test. This is used when requesting assistance from the hotline.

**A/D Table**

Test #	Analog Input Voltage Tested	Message Center Pin
A/D 0	Battery	27
A/D 1	Run	10
A/D 2	Fuel Level	3
A/D 3	Oil Temperature	9
A/D 4	Rheostat (Dimming)	2
A/D 5	Coolant Temperature	8
A/D 6	Switch Bank #2	1
A/D 7	Switch Bank #1	7

**Digital Port Table (Port A)**

Port A	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Bit Function	Internal Use Only	Internal Use Only	Internal Use Only	Fuel Tank Select	Internal Use Only	Internal Use Only	Washer Fluid Level	Engine Select
Bit = 0	N/A	N/A	N/A	20.8 gal Fuel Tank Selected	N/A	N/A	Low Washer Fluid	V6 Engine Selected
Message Center Pin	N/A	N/A	N/A	Pin 21 = 5V	N/A	N/A	Pin 31 = 5V	Pin 32 = 5V
Bit = 1	N/A	N/A	N/A	18.4 gal Fuel Tank Selected	N/A	N/A	Washer Fluid OK	V8 Engine Selected
Message Center Pin	N/A	N/A	N/A	Pin 21 = 0V	N/A	N/A	Pin 31 = 0V	Pin 32 = 0V

**Digital Port Table (Port B)**

Port B	Bit 7	Bit 6	Bit 5	Bit 4	Bit 3	Bit 2	Bit 1	Bit 0
Bit Function	Oil Level Input	Spare	Spare	Internal Use Only	Spare	Internal Use Only	Internal Use Only	Internal Use Only
Bit = 0	Oil Level	N/A	N/A	N/A	N/A	N/A	N/A	N/A

	OK							
Message Center Pin	Pin 23 = 5V	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Bit = 1	Low Oil Level	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Message Center Pin	Pin 23 = 0V	N/A	N/A	N/A	N/A	N/A	N/A	N/A

- Press the RANGE switch to advance the message center indicator to the next test.
  - To abort the on-board diagnostic mode and return to normal operation, turn the ignition switch to the OFF position.
5. If the concern(s) remain(s) after the inspection, determine the symptom(s) and proceed to Symptom Chart.

## Symptom Chart

### Symptom Chart



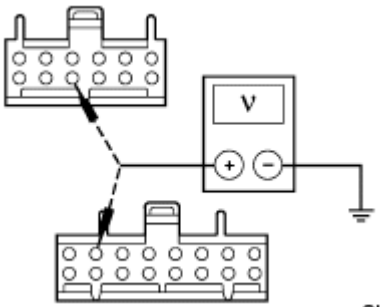
Condition	Possible Sources	Action
<ul style="list-style-type: none"> <li>• The Message Center Is Not Operating Correctly</li> </ul>	<ul style="list-style-type: none"> <li>• CJB fuse(s): <ul style="list-style-type: none"> <li>■ Fuse 10 (7.5A)</li> <li>■ Fuse 36 (7.5A)</li> </ul> </li> <li>• Circuitry.</li> <li>• Message center indicator.</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test A</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• The Message Center Switch Is Not Operating Correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Circuitry.</li> <li>• Message center switch module.</li> <li>• Message center indicator.</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test B</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• The Fuel Computer Range Is Incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Circuitry.</li> <li>• Message center indicator.</li> <li>• Fuel level sender.</li> <li>• Powertrain control module (PCM).</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test C</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• The Charging System Warning Is Incorrect</li> </ul>	<ul style="list-style-type: none"> <li>• Circuitry.</li> <li>• Message center indicator.</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test D</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• The Engine Coolant Temperature Warning Is Not Operating Correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Circuitry.</li> <li>• Message center indicator.</li> <li>• Water temperature sender unit.</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test E</a>.</li> </ul>
<ul style="list-style-type: none"> <li>• The Oil Life Warning Is Incorrect — Oil Temp Signal Error</li> </ul>	<ul style="list-style-type: none"> <li>• Circuitry.</li> <li>• Message center indicator.</li> <li>• Low oil level sensor.</li> <li>• PCM.</li> </ul>	<ul style="list-style-type: none"> <li>• GO to <a href="#">Pinpoint Test F</a>.</li> </ul>



<ul style="list-style-type: none"> <li>The Oil Level Warning Is Not Operating Correctly</li> </ul>	<ul style="list-style-type: none"> <li>Circuitry.</li> <li>Message center indicator.</li> <li>Low oil level sensor.</li> </ul>	<ul style="list-style-type: none"> <li>GO to <a href="#">Pinpoint Test G</a>.</li> </ul>
<ul style="list-style-type: none"> <li>The Washer Fluid Level Warning Is Not Operating Correctly</li> </ul>	<ul style="list-style-type: none"> <li>Circuitry.</li> <li>Message center indicator.</li> <li>Windshield washer reservoir fluid level sensor.</li> </ul>	<ul style="list-style-type: none"> <li>GO to <a href="#">Pinpoint Test H</a>.</li> </ul>
<ul style="list-style-type: none"> <li>The Audible Warning Is Inoperative</li> </ul>	<ul style="list-style-type: none"> <li>Circuitry.</li> <li>Message center indicator.</li> <li>CTM/GEM.</li> </ul>	<ul style="list-style-type: none"> <li>REFER to <a href="#">Section 413-09</a>.</li> </ul>

**Pinpoint Tests**

**PINPOINT TEST A: THE MESSAGE CENTER IS NOT OPERATING CORRECTLY**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<p><b>A1 CHECK POWER FEED CIRCUITS 1003 (GY/YE) AND 54 (LG/YE)</b></p>	
<p>1</p>  <p>Message Center Indicator</p> <p>2</p>  <p>3</p>  <p>GK3243-A</p>	<p>3</p> <p>Measure the voltage between message center indicator C2008 Pin 10, Circuit 1003 (GY/YE), harness side and ground; and between message center indicator C2009 Pin 27, Circuit 54 (LG/YE), harness side and ground.</p> <ul style="list-style-type: none"> <li>Are the voltages greater than 10 volts?</li> </ul> <p>→ <b>Yes</b> GO to <a href="#">A2</a>.</p>

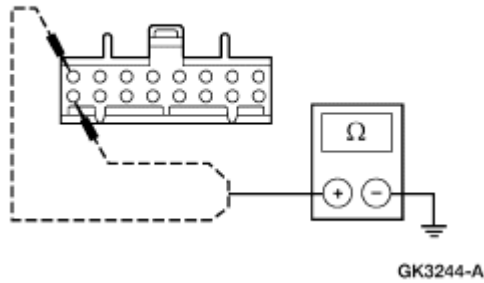
→ **No**  
REPAIR the circuit(s) in question. TEST the system for normal operation.

**A2 CHECK GROUND CIRCUITS 570 (BK/WH) AND 57 (BK)**

1



2



2 Measure the resistance between message center indicator C2009 Pin 28, Circuit 570 (BK/WH), harness side and ground; and between message center indicator C2009 Pin 36, Circuit 57 (BK), harness side and ground.

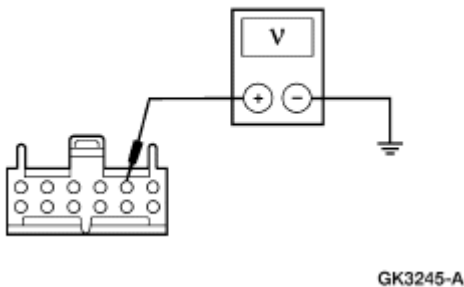
• Are the resistances less than 5 ohms?

→ **Yes**  
GO to [A3](#).

→ **No**  
REPAIR the circuit(s) in question. TEST the system for normal operation.

**A3 CHECK CIRCUIT 19 (LB/RD)**

3



1 Place the headlamp switch (11654) in the PARK position.




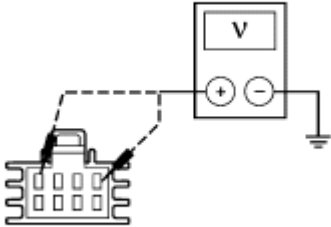
2 Rotate the panel dimmer switch to the full illumination position.

3 Measure the voltage between message center indicator C2008 Pin 2, Circuit 19 (LB/RD), and ground.

• Is the voltage greater than 10 volts?

	<p>→ <b>Yes</b>                  INSTALL a new message center indicator.                  REFER to <a href="#">Message Center Assembly</a>. TEST the system for normal operation.</p> <p>→ <b>No</b>                  REPAIR the circuit. TEST the system for normal operation.</p>
--	---

**PINPOINT TEST B: THE MESSAGE CENTER SWITCH IS NOT OPERATING CORRECTLY**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>B1 CHECK THE VOLTAGE INPUTS TO THE MESSAGE CENTER SWITCH</b>	
<p>1 </p> <p>2                   Message Center Switch Module C2007</p> <p>3 </p> <p>4                   GK4251-A</p>	<p>4 Measure the voltage between message center switch module C2007 Pin 1, Circuit 704 (DG/LG), harness side and ground; and between message center switch module C2007 Pin 4, Circuit 715 (LG), harness side and ground.</p> <ul style="list-style-type: none"> <li>• <b>Are the voltages approximately 5 volts?</b></li> </ul> <p>→ <b>Yes</b>                  GO to <a href="#">B4</a>.</p> <p>→ <b>No</b>                  GO to <a href="#">B2</a>.</p>
<b>B2 CHECK CIRCUIT 704 (DG/LG) FOR AN OPEN OR SHORT</b>	
1	

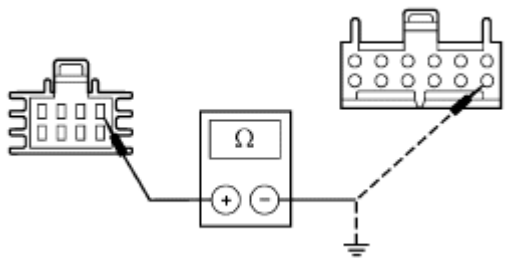


2



Message Center Indicator C2008

3



GK3248-A

3

Measure the resistance between message center switch module C2007 Pin 1, Circuit 704 (DG/LG), harness side and message center indicator C2008 Pin 7, Circuit 704 (DG/LG), harness side; and between the message center switch module C2007 Pin 1, Circuit 704 (DG/LG), harness side and ground.

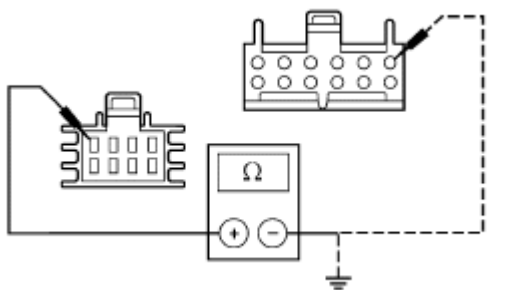
- Is the resistance less than 5 ohms between message center switch module and message center indicator, and greater than 10,000 ohms between the message center switch module and ground?

→ **Yes**  
GO to [B3](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**B3 CHECK CIRCUIT 715 (LG) FOR AN OPEN OR SHORT**

1



GK3249-A

1

Measure the resistance between message center switch module C2007 Pin 4, Circuit 715 (LG), harness side and message center indicator C2008 Pin 1, Circuit 715 (LG), harness side; and between the message center switch module C2007 Pin 4, Circuit 715 (LG), harness side and ground.

- Is the resistance less than 5 ohms between message center switch module and message center indicator, and greater than 10,000 ohms between the

**message center switch module and ground?**

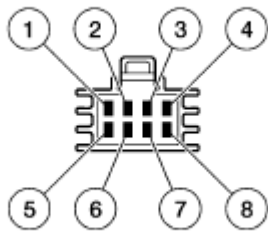
- **Yes**  
INSTALL a new message center indicator. REFER to [Message Center Assembly](#). TEST the system for normal operation.
- **No**  
REPAIR the circuit. TEST the system for normal operation.

**B4 CHECK THE MESSAGE CENTER SWITCH**

1



2

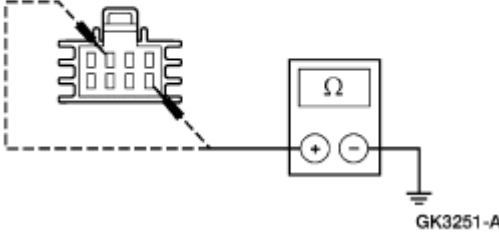


GK3250-A



2 Measure the resistance between the following switch terminals:

Switch Depressed	Switch Bank 1 Resistance Between Terminals 1 and 3	Switch Bank 2 Resistance Between Terminals 3 and 4
—	between 4374 and 5376 ohms	between 3645 and 4455 ohms
ENGLISH METRIC	between 1313 and 1606 ohms	between 3645 and 4455 ohms
RANGE	between 4374 and 5376 ohms	between 270 and 330 ohms
STATUS	between 4374 and 5376 ohms	between 567 and 693 ohms
ECON	between 4374 and 5376 ohms	between 1026 and 1254 ohms
RESET	between 4374 and 5376 ohms	between 1845 and 2255 ohms
SYSTEM CHECK	between 486 and 594 ohms	between 3645 and 4455 ohms
OIL CHANGE RESET	between 810 and 990 ohms	between 3645 and 4455 ohms

- Are all resistance values within

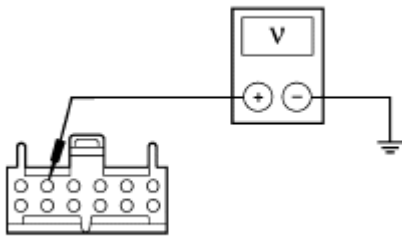
	<p><b>specification?</b></p> <p>→ <b>Yes</b> GO to <a href="#">B5</a>.</p> <p>→ <b>No</b> INSTALL a new message center switch module. REFER to <a href="#">Switch</a>. TEST the system for normal operation.</p>
<p><b>B5 CHECK CIRCUITS 57 (BK) AND 570 (BK/WH)</b></p>	
<p>1</p> 	<p>1 Measure the resistance between message center switch module C2007 Pin 5, Circuit 57 (BK), harness side and ground; and between the message center switch module C2007 Pin 3, Circuit 570 (BK/WH), harness side and ground.</p> <ul style="list-style-type: none"> <li>• <b>Are the resistances less than 5 ohms?</b></li> </ul> <p>→ <b>Yes</b> INSTALL a new message center indicator. REFER to <a href="#">Message Center Assembly</a>. TEST the system for normal operation.</p> <p>→ <b>No</b> REPAIR the circuit(s) in question. TEST the system for normal operation.</p>

**PINPOINT TEST C: THE FUEL COMPUTER RANGE IS INCORRECT**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<p><b>C1 CHECK THE POWERTRAIN CONTROL MODULE (PCM) OUTPUT</b></p>	
<p><b>⚠ CAUTION:</b> Use correct probe adapter(s) when making measurements. Failure to use correct probe adapter(s) may damage the connector.</p>	
<p>1</p>  <p>2</p> 	

Message Center Indicator

3



GK3252-A

3

Measure the voltage between message center indicator C2008 Pin 5, Circuit 305 (LB/PK), harness side and ground while starting the engine.

- Is the voltage greater than 10 volts when the engine is being started and drops to about 2 volts at idle?

→ Yes  
GO to [C3](#).

→ No  
GO to [C2](#).

**C2 CHECK CIRCUIT 305 (LB/PK)**

1

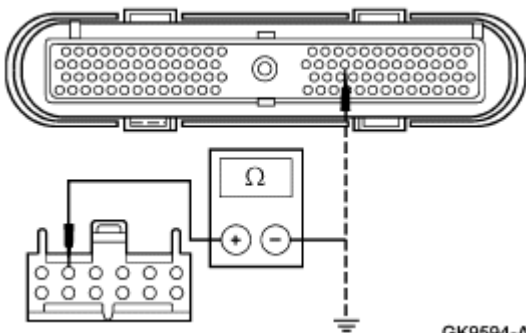


2



PCM C202

3



GK9594-A

3

Measure the resistance between message center indicator C2008 Pin 5, Circuit 305 (LB/PK), harness side and PCM C202 Pin 43, Circuit 305 (LB/PK), harness side; and between message center indicator C2008 Pin 5, Circuit 305 (LB/PK), harness side and ground.

- Is the resistance less than 5 ohms between the message center indicator and the PCM; and greater than 10,000 ohms between the message center indicator and ground?

→ **Yes**  
 INSTALL a new PCM. TEST the system for normal operation.

→ **No**  
 REPAIR the circuit. TEST the system for normal operation.

**C3 CHECK CIRCUIT 651 (BK/YE) FOR AN OPEN**

1

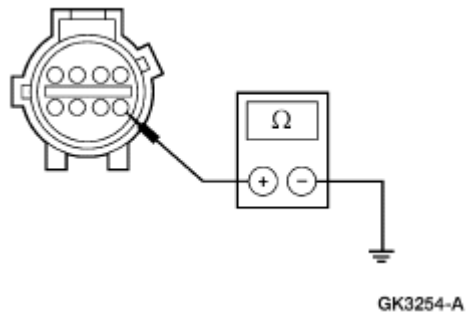


2



Fuel Level Sensor and Pump C311

3



3 Measure the resistance between the fuel level sensor and pump C311 Pin 5, Circuit 651 (BK/YE), harness side and ground.

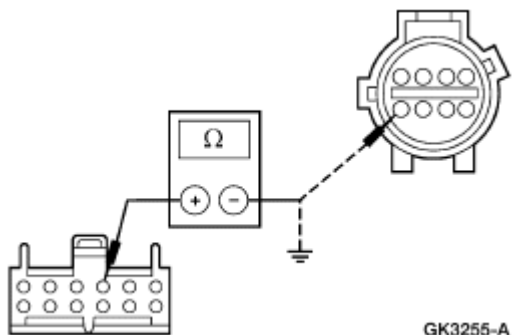
• Is the resistance less than 5 ohms ?

→ **Yes**  
 GO to [C4](#).

→ **No**  
 REPAIR the circuit. TEST the system for normal operation.

**C4 CHECK CIRCUIT 29 (YE/WH)**

1



GK3255-A

1 Measure the resistance between message center indicator C2008 Pin 3, Circuit 29 (YE/WH), harness side and fuel level sensor and pump C311 Pin 8, Circuit 29 (YE/WH), harness side; and between message center indicator C2008 Pin 3, Circuit 29 (YE/WH), harness side and ground.



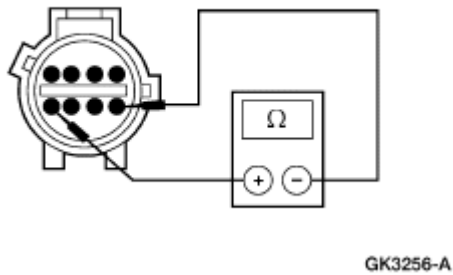
- Is the resistance less than 5 ohms between message center indicator and fuel level sensor and pump; and greater than 10,000 ohms between message center indicator and ground?

→ **Yes**  
GO to [C5](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**C5 CHECK THE FUEL LEVEL SENDER**

1



1 Measure the resistance between fuel level sensor and pump Pin 5 (component side) and Pin 8 (component side).

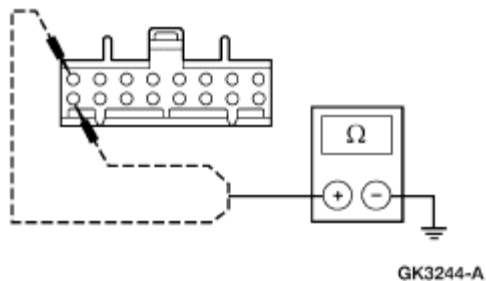
- Is the resistance between 15 and 160 ohms?

→ **Yes**  
GO to [C6](#).

→ **No**  
INSTALL a new fuel level sender. TEST the system for normal operation.


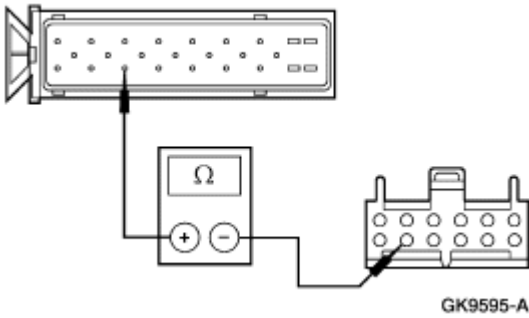
**C6 CHECK GROUND CIRCUITS 570 (BK/WH) AND 57 (BK)**

1





1 Measure the resistance between message center indicator C2009 Pin 28, Circuit 570 (BK/WH), harness side and ground; and between message center indicator C2009 Pin 36, Circuit 57 (BK), harness side and ground.

- Are the resistances less than 5 ohms?

	<p>→ <b>Yes</b> GO to <a href="#">C7</a>.</p> <p>→ <b>No</b> REPAIR the circuit(s) in question. TEST the system for normal operation.</p>
<p><b>C7 CHECK CIRCUIT 679 (GY/BK)</b></p>	
<p>1</p>  <p>4WABS Module C186</p> <p>2</p>  <p>GK9595-A</p>	<p>2 Measure the resistance between message center indicator C2008 Pin 11, Circuit 679 (GY/BK), harness side and 4WABS module C186 Pin 19, Circuit 679 (GY/BK), harness side.</p> <ul style="list-style-type: none"> <li>• <b>Is the resistance less than 5 ohms?</b></li> </ul> <p>→ <b>Yes</b> INSTALL a new message center indicator. REFER to <a href="#">Message Center Assembly</a> . TEST the system for normal operation.</p> <p>→ <b>No</b> REPAIR the circuit. TEST the system for normal operation.</p>

**PINPOINT TEST D: THE CHARGING SYSTEM WARNING IS INCORRECT**

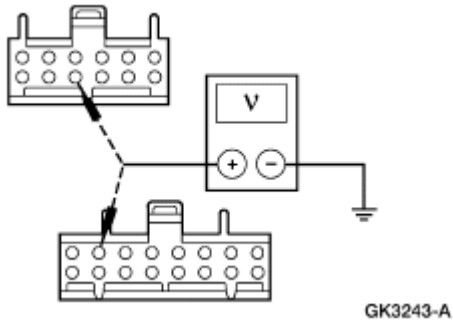
CONDITIONS	DETAILS/RESULTS/ACTIONS
<p><b>D1 CHECK FOR VOLTAGE TO THE MESSAGE CENTER</b></p>	
<p>1</p>  <p>2</p> 	

## Message Center Indicator

3



4



4

Measure the voltage between message center indicator C2008 Pin 10, Circuit 1003 (GY/YE), harness side and ground; and between message center indicator C2009 Pin 27, Circuit 54 (LG/YE), harness side and ground.

- Are the voltages greater than 10 volts?

→ Yes

GO to [D2](#).

→ No

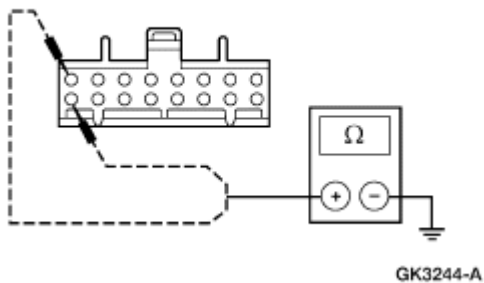
REPAIR the circuit(s) in question. TEST the system for normal operation.

**D2 CHECK GROUND CIRCUIT 570 (BK/WH) AND CIRCUIT 57 (BK)**

1



2



2

Measure the resistance between message center indicator C2009 Pin 28, Circuit 570 (BK/WH), harness side and ground; and between message center indicator C2009 Pin 36, Circuit 57 (BK), harness side and ground.




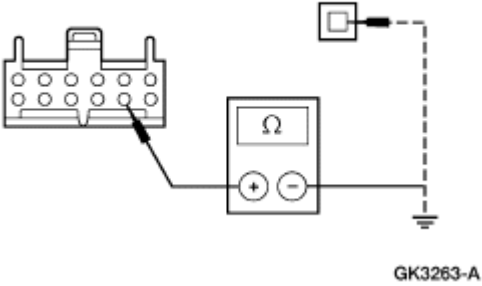
- Are the resistances less than 5 ohms?

→ Yes

INSTALL a new message center indicator. REFER to [Message Center Assembly](#). TEST the system for normal operation.

→ **No**  
REPAIR the circuit(s) in question. TEST the system for normal operation.

**PINPOINT TEST E: THE ENGINE COOLANT TEMPERATURE WARNING IS NOT OPERATING CORRECTLY**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<p><b>E1 CHECK CIRCUIT 39 (RD/WH)</b></p>	
<p>1 </p> <p>2  Message Center Indicator C2008</p> <p>3  Water Temperature Sender Unit C104</p> <p>4  GK3263-A</p>	<p>4 Measure the resistance between message center indicator C2008 Pin 8, Circuit 39 (RD/WH), harness side and water temperature sender unit C104 Pin 1, Circuit 39 (RD/WH), harness side; and between message center indicator C2008 Pin 8, Circuit 39 (RD/WH), harness side and ground.</p> <ul style="list-style-type: none"> <li>• Is the resistance less than 5 ohms between the message center indicator and water temperature sender unit; and greater than 10,000 ohms between the message center indicator and ground?</li> </ul> <p>→ <b>Yes</b> RECONNECT the message center indicator. GO to <a href="#">E2</a>.</p> <p>→ <b>No</b> REPAIR the circuit. TEST the system for normal operation.</p>

**E2 CHECK THE MESSAGE CENTER INDICATOR**

1



2 Check the message center indicator for the engine coolant temperature warning error.

- Does the error exist?

→ **Yes**  
 INSTALL a new message center indicator.  
 REFER to [Message Center Assembly](#). TEST the system for normal operation.

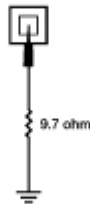
→ **No**  
 GO to [E3](#).

**E3 CHECK THE MESSAGE CENTER INDICATOR FOR ERROR**

1



2



GK3264-A

2 Short to ground Circuit 39 (RD/WH) through a 9.7 ohm resistor between engine coolant temperature sender C104 Pin 1, harness side, and ground.

3



4 Check the message center indicator for the engine coolant temperature warning error.





- Does the error exist?

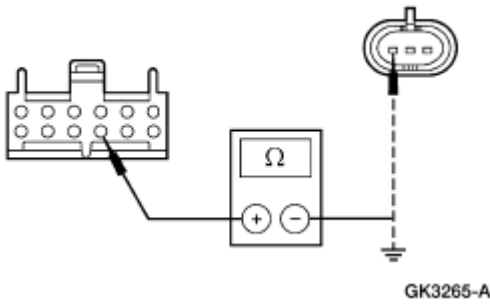
→ **Yes**  
 INSTALL a new water temperature sender unit.  
 TEST the system for normal operation.

→ **No**  
 INSTALL a new message center indicator.

	TEST the system for normal operation.
--	---------------------------------------

**PINPOINT TEST F: THE OIL LIFE WARNING IS INCORRECT — OIL TEMP SIGNAL ERROR**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>F1 VERIFY THE LOW OIL LEVEL SENSOR CONNECTOR IS SECURELY SEATED</b>	
 <b>CAUTION: Use correct probe adapter(s) when making measurements. Failure to use correct probe adapter(s) may damage the connector.</b>	
	<p><b>1</b> Verify low oil level sensor C174 is securely seated.</p> <ul style="list-style-type: none"> <li>• <b>Is low oil level sensor C174 securely seated?</b></li> </ul> <p>→ <b>Yes</b> GO to <a href="#">F2</a>.</p> <p>→ <b>No</b> REPAIR as necessary. TEST the system for normal operation.</p>
<b>F2 CHECK CIRCUIT 254 (DG/WH)</b>	
<p><b>1</b></p>  <p><b>2</b></p>  <p style="text-align: center;">Low Oil Level Sensor C174</p> <p><b>3</b></p>  <p style="text-align: center;">Message Center Indicator C2008</p> <p><b>4</b></p>	<p><b>4</b> Measure the resistance between message center indicator C2008 Pin 9, Circuit 254 (DG/WH), harness side and low oil level sensor C174 Pin 1, Circuit 254 (DG/WH), harness side; and between message center indicator C2008 Pin 9, Circuit 254 (DG/WH), harness side and ground.</p>



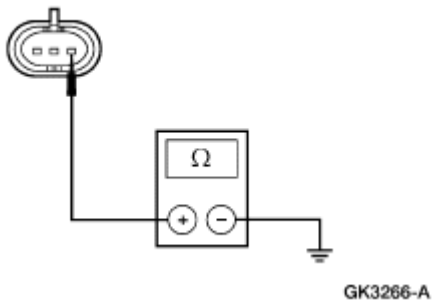
- Is the resistance less than 5 ohms between message center indicator and low oil level sensor; and greater than 10,000 ohms between the message center indicator and ground?

→ **Yes**  
GO to [F3](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**F3 CHECK GROUND CIRCUIT 570 (BK/WH)**

1



1 Measure the resistance between low oil level sensor C174 Pin 3, Circuit 570 (BK/WH), harness side and ground.

- Is the resistance less than 5 ohms?

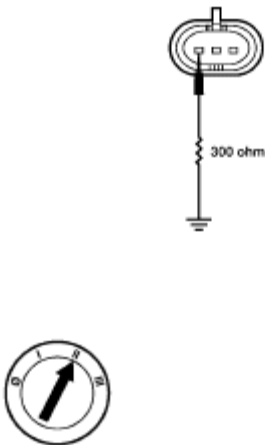
→ **Yes**  
RECONNECT message center indicator C2008. GO to [F4](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.




**F4 CHECK THE LOW OIL LEVEL SENSOR**

1

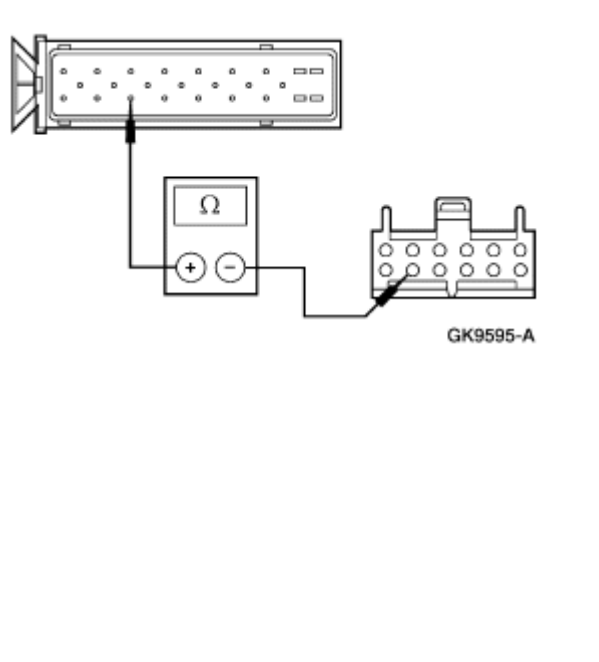
1 Short to ground Circuit 254 (DG/WH) through a 300 ohm resistor between low oil level sensor C174 Pin 1, harness side, and ground.

 <p style="text-align: center;">GK3267-A</p>	<ul style="list-style-type: none"> <li>• Does the message center indicator read <b>OIL TEMP SIGNAL ERROR</b> during system check?</li> </ul> <p>→ <b>Yes</b> GO to <a href="#">F5</a>.</p> <p>→ <b>No</b> INSTALL a new low oil level sensor. TEST the system for normal operation.</p>
---	---

**F5 CHECK CIRCUIT 679 (GY/BK)**

<p><b>1</b></p>  <p><b>2</b></p>  <p style="text-align: center;">4WABS Module C186</p> <p><b>3</b></p>  <p style="text-align: center;">Message Center Indicator C2008</p> <p><b>4</b></p>	<p><b>4</b> Measure the resistance between message center indicator C2008 Pin 11 , Circuit 679 (GY/BK), harness side and 4WABS module C186 Pin 19, Circuit 679 (GY/BK), harness side.</p>
--	---



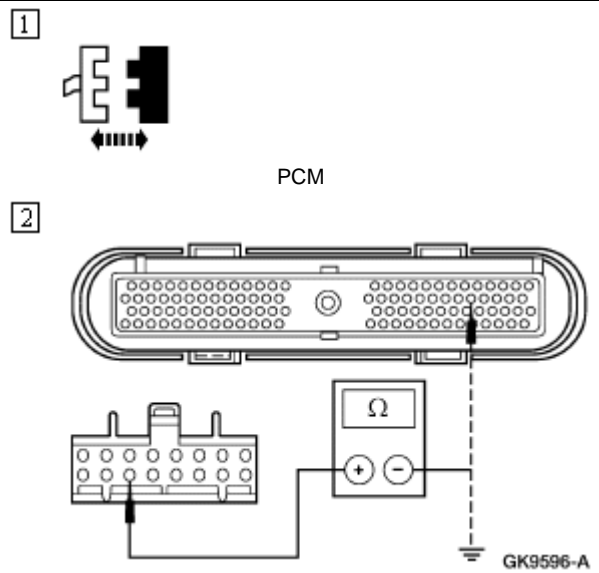


• Is the resistance less than 5 ohms?

→ **Yes**  
GO to [F6](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**F6 CHECK CIRCUIT 11 (TN/YE)**



**2** Measure the resistance between message center indicator C2009 Pin 34, Circuit 11 (TN/YE), harness side and PCM C202 Pin 48, Circuit 11 (TN/YE), harness side; and between message center indicator C2009 Pin 34, Circuit 11 (TN/YE), harness side and ground.

• Is the resistance less than 5 ohms between the message center indicator and the PCM; and greater than 10,000 ohms between the message center indicator and ground?

→ **Yes**  
GO to [F7](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**F7 CHECK TACH SIGNAL**

**NOTE:** Carry out the TACH CHECK procedure in on-board diagnostic mode with engine running.

	<p>1 Press RANGE and SYSTEM CHECK switches simultaneously while turning the ignition switch to RUN and starting the engine.</p> <p>2 Press RANGE switch to advance the message center indicator until TACH CHECK is displayed.</p> <ul style="list-style-type: none"> <li>• <b>Is the TACH SIGNAL OK message displayed?</b></li> </ul> <p>→ <b>Yes</b> INSTALL a new message center indicator. REFER to <a href="#">Message Center Assembly</a>. TEST the system for normal operation.</p> <p>→ <b>No</b> INSTALL a new PCM. TEST the system for normal operation.</p>
--	--

**PINPOINT TEST G: THE OIL LEVEL WARNING IS NOT OPERATING CORRECTLY**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>G1 VERIFY THE LOW OIL LEVEL SENSOR CONNECTOR IS SECURELY SEATED</b>	
	<p>1 Verify low oil level sensor C174 is securely seated.</p> <ul style="list-style-type: none"> <li>• <b>Is low oil level sensor C174 securely seated?</b></li> </ul> <p>→ <b>Yes</b> GO to <a href="#">G2</a>.</p> <p>→ <b>No</b> REPAIR as necessary. TEST the system for normal operation.</p>
<b>G2 CHECK THE ENGINE OIL LEVEL</b>	
	<p>1 Check the engine oil level.</p> <ul style="list-style-type: none"> <li>• <b>Is the engine oil level in correct range?</b></li> </ul> <p>→ <b>Yes</b> GO to <a href="#">G3</a>.</p> <p>→ <b>No</b> REFILL as necessary. TEST the system for normal operation.</p>

**G3 CHECK CIRCUIT 258 (WH/PK)**

1



2



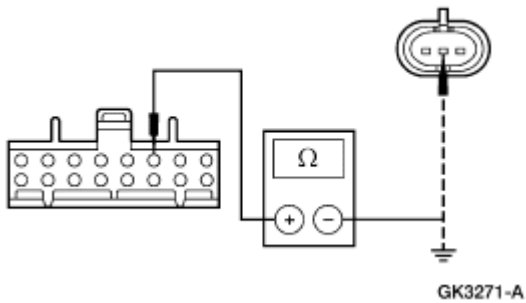
Low Oil Level Sensor C174

3



Message Center Indicator C2009

4



4

Measure the resistance between message center indicator C2009 Pin 23, Circuit 258 (WH/PK), harness side and low oil level sensor C174 Pin 2, Circuit 258 (WH/PK), harness side; and between message center indicator C2009 Pin 23, Circuit 258 (WH/PK), harness side and ground.

- Is the resistance less than 5 ohms between message center indicator and low oil level sensor; and greater than 10,000 ohms between message center indicator and ground?

→ **Yes**  
GO to [G4](#).

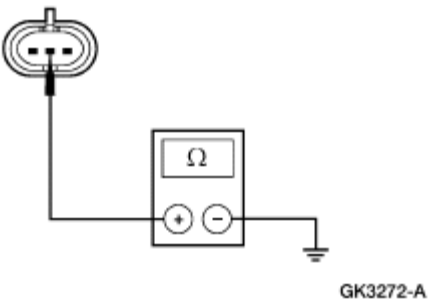
→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**G4 CHECK THE LOW OIL LEVEL SENSOR**

1

1

Measure the resistance between the low oil level sensor terminal 2 (component side) and ground.





GK3272-A

- **Is the resistance greater than 10,000 ohms?**

→ **Yes**  
INSTALL a new message center indicator. REFER to [Message Center Assembly](#). TEST the system for normal operation.

→ **No**  
INSTALL a new low oil level sensor. TEST the system for normal operation.

**PINPOINT TEST H: THE WASHER FLUID LEVEL WARNING IS NOT OPERATING CORRECTLY**

CONDITIONS	DETAILS/RESULTS/ACTIONS
<b>H1 CHECK THE WINDSHIELD WASHER RESERVOIR FLUID LEVEL</b>	
	<p>1 Check the windshield washer reservoir level.</p> <ul style="list-style-type: none"> <li>• <b>Is the windshield washer reservoir level in correct range?</b></li> </ul> <p>→ <b>Yes</b> GO to <a href="#">H2</a>.</p> <p>→ <b>No</b> REFILL as necessary. TEST the system for normal operation.</p>
<b>H2 CHECK CIRCUIT 82 (PK/YE)</b>	
<p>1 </p> <p>2 </p>	

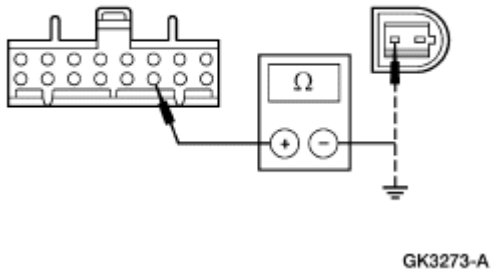
## Message Center Indicator C2009

3



## Windshield Washer Reservoir Fluid Level Sensor C197

4



4

Measure the resistance between message center indicator C2009 Pin 31, Circuit 82 (PK/YE), harness side and windshield washer reservoir fluid level sensor C197 Pin 1, Circuit 82 (PK/YE), harness side; and between message center indicator C2009 Pin 31, Circuit 82 (PK/YE), harness side and ground.

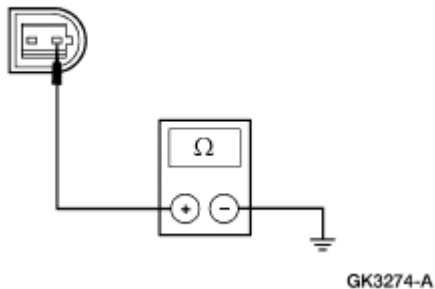
- Is the resistance less than 5 ohms between message center indicator and windshield washer reservoir fluid level sensor; and greater than 10,000 ohms between message center indicator and ground?

→ **Yes**  
GO to [H3](#).

→ **No**  
REPAIR the circuit. TEST the system for normal operation.

**H3 CHECK CIRCUIT 57 (BK)**

1




1

Measure the resistance between windshield washer reservoir fluid level sensor C197 Pin 2, Circuit 57 (BK), harness side and ground.

- Is the resistance less than 5 ohms?

→ **Yes**  
GO to [H4](#).

→ **No**

	REPAIR the circuit. TEST the system for normal operation.
<b>H4 CHECK THE WINDSHIELD WASHER RESERVOIR FLUID LEVEL SENSOR</b>	
<p>1</p>  <p>GK3275-A</p>	<p>1</p> <p>Measure the resistance between windshield washer reservoir fluid level sensor terminal 1 (component side) and terminal 2 (component side).</p> <ul style="list-style-type: none"><li>• <b>Is the resistance less than 5 ohms?</b></li></ul> <p>→ <b>Yes</b> INSTALL a new message center indicator. REFER to <a href="#">Message Center Assembly</a>. TEST the system for normal operation.</p> <p>→ <b>No</b> INSTALL a new windshield washer reservoir fluid level sensor. TEST the system for normal operation.</p>