Electronic Compass

Special Tool(s)

 ST1137-A	73III Automotive Meter 105-R0057 or equivalent

Principles of Operation

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

The compass is capable of self-calibrating. This decreases the need to manually set the compass. If the compass is displaying a heading (and not displaying the C or CAL indicator), the compass is in auto-calibration mode. In this mode, the compass automatically calibrates for changes in vehicle magnetics over the life of the vehicle. This auto-calibration mode assures the compass heading is always accurate.

If the compass displays the C or CAL indicator for an extended period of time (longer than 5 seconds), this indicates the compass has been placed in the manual calibration mode and therefore, requires manual calibration. The compass may temporarily display the C or CAL indicator if the vehicle characteristics have changed (car wash, collision or other factors), with the C or CAL indicator turning off after the vehicle characteristics have returned to normal. If the C or CAL indicator does not turn off after the vehicle characteristics have returned to normal, manual calibration will be necessary. Refer to Compass Calibration in this section. After calibration, the normal compass display will return.

Compass calibration/zone adjustment is controlled by the MODE button on the mirror, which provides access to the calibration and zone adjustment procedures. This is the same switch that is used to turn the compass display on and off.

Excessive magnetism in or near the vehicle may cause the compass to illuminate all segments on the display. In order to distinguish between vehicle magnetics and surrounding magnetics, drive the vehicle to an area that is free from large metal objects, such as bridges, steel buildings, etc. Cycling the key ON and OFF resets the compass. If all segments are still illuminated after 20 seconds, the mirror should be replaced due to excessive vehicle magnetism. Refer to Section 501-09 .

Inspection and Verification

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

Visual Inspection Chart

Mechanical	Electrical
• Interior rear view mirror	• Smart Junction Box (SJB) fuse 7 (10A) • Wiring, terminals or connectors • Compass sensor (integral to the interior rear view mirror)

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

4. If the cause is not visually evident, verify the symptom. GO to Symptom Chart .

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• The compass is inoperative	• Fuse • Wiring, terminals or connectors • Interior rear view mirror	• GO to Pinpoint Test A .
• The compass is inaccurate	• Incorrect compass zone setting • Compass calibration • Interior rear view mirror	• GO to Pinpoint Test B .
• The display is locked in one position — all segments on	• Interior rear view mirror	• INSTALL a new interior rear view mirror. REFER to Section 501-09 . TEST the system for normal operation.
• The display is locked in one position — display of "C" or "CAL"	• Compass has lost calibration • Interior rear view mirror	• CYCLE the ignition and DRIVE slowly in circles until the "C" or "CAL" disappears and the compass returns to a normal display. If this does not occur within 5 complete circles, INSTALL a new interior rear view mirror. REFER to Section 501-09 . TEST the system for normal operation.

Pinpoint Tests

Pinpoint Test A: The Compass Is Inoperative

Refer to Wiring Diagrams Cell 124 , Power Mirrors for schematic and connector information.

Normal Operation

The compass display and module are integrated into the interior rear view mirror. The interior rear view mirror receives switched battery voltage through circuit 46 (VT). Circuit 1205 (BK) provides the mirror/compass ground.

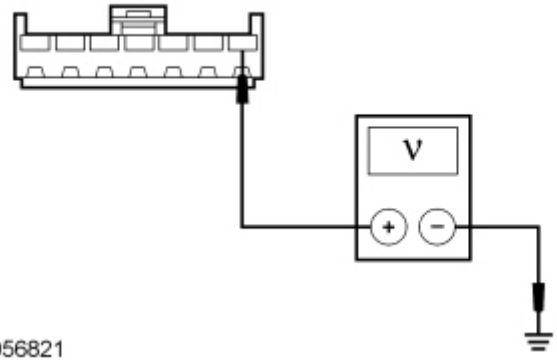
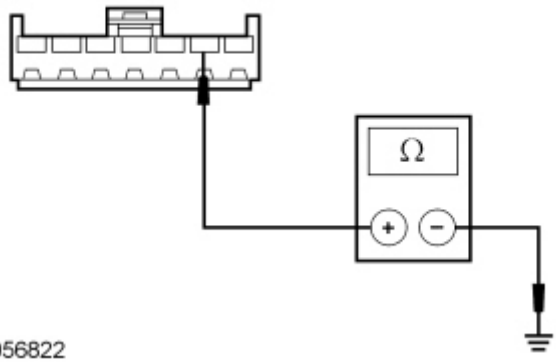
This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Interior rear view mirror

PINPOINT TEST A: THE COMPASS IS INOPERATIVE

NOTE: Make sure the compass is turned on by pressing the MODE button before carrying out this pinpoint test.

NOTE: Failure to disconnect the battery when instructed will result in false resistance readings. Refer to Section 414-01 .

Test Step	Result / Action to Take
A1 CHECK CIRCUIT 46 (VT) FOR VOLTAGE • Ignition OFF. • Disconnect: Interior Rear View Mirror C911. • Ignition ON. • Measure the voltage between the interior rear view mirror C911-1, circuit 46 (VT), harness side and ground.  A0056821 • **Is the voltage greater than 10 volts?**	**Yes** GO to A2 . **No** VERIFY the Smart Junction Box (SJB) fuse 7 (10A) is OK. If OK, REPAIR the circuit. If not OK, REFER to the Wiring Diagrams Manual to identify the possible causes of the short circuit. TEST the system for normal operation.
A2 CHECK CIRCUIT 1205 (BK) FOR AN OPEN • Ignition OFF. • Disconnect: Negative Battery Cable. • Measure the resistance between the interior rear view mirror C911-2, circuit 1205 (BK), harness side and ground.  A0056822 • **Is the resistance less than 5 ohms?**	**Yes** INSTALL a new interior rear view mirror. REFER to Section 501-09 . TEST the system for normal operation. **No** REPAIR the circuit. TEST the system for normal operation.

Pinpoint Test B: The Compass Is Inaccurate

Normal Operation

The compass display and module are integrated into the interior rear view mirror. The compass adjustment and zone variation are controlled by the MODE button on the mirror.

This pinpoint test is intended to diagnose the following:

- Incorrect compass zone setting
- Compass calibration
- Interior rear view mirror

PINPOINT TEST B: THE COMPASS IS INACCURATE

<table>
<tr><th>Test Step</th><th>Result / Action to Take</th></tr>
<tr><td>B1 CHECK THE COMPASS ZONE ADJUSTMENT
• Carry out the compass zone adjustment procedure. Refer to Compass Zone Adjustment in this section.
• Does the compass zone set correctly?</td><td>Yes
GO to B2.

No
INSTALL a new interior rear view mirror. REFER to Section 501-09. TEST the system for normal operation.</td></tr>
<tr><td>B2 CALIBRATE THE COMPASS
• Carry out the compass calibration adjustment procedure. Refer to Compass Calibration in this section.
• Does the compass calibrate correctly?</td><td>Yes
GO to B3.

No
INSTALL a new interior rear view mirror. REFER to Section 501-09. TEST the system for normal operation.</td></tr>
<tr><td>B3 CHECK THE VEHICLE ACCURACY
• Position the vehicle and observe the compass display as follows:
<table><tr><th>Direction</th><th>Compass Display</th></tr><tr><td>North</td><td>N</td></tr><tr><td>Northeast</td><td>NE</td></tr><tr><td>East</td><td>E</td></tr><tr><td>Southeast</td><td>SE</td></tr><tr><td>South</td><td>S</td></tr><tr><td>Southwest</td><td>SW</td></tr><tr><td>West</td><td>W</td></tr><tr><td>Northwest</td><td>NW</td></tr></table>• Does the vehicle heading match the display?</td><td>Yes
The compass is operating correctly.

No
INSTALL a new interior rear view mirror. REFER to Section 501-09. TEST the system for normal operation.</td></tr>
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