Horn

Special Tool(s)

 ST3093-A	Fluke 77-IV Digital Multimeter FLU77-4 or equivalent
 ST2834-A	Vehicle Communication Module (VCM) and Integrated Diagnostic System (IDS) software with appropriate hardware, or equivalent scan tool
 ST2574-A	Flex Probe Kit NUD105-R025D or equivalent

Principles of Operation

The Body Control Module (BCM) supplies the switched and control voltage to the horn relay (integrated into the BCM).

The horn switch consists of 2 sets of contacts separated by springs. The lower set is connected to ground and the upper set is connected to the horn signal circuit. When the driver air bag module is pressed, it pushes down on the upper set of contacts, collapsing the springs and allowing the contacts to touch. When the contacts touch, it completes the circuit and provides the ground signal which is routed through the clockspring and Steering Column Control Module (SCCM). The horn relay (integral to the BCM) is energized and the horn sounds.

The BCM provides a momentary ground to the horn relay when the anti-theft system is armed, and an alternating on/off ground when the panic button is pressed on the Remote Keyless Entry (RKE) transmitter.

Inspection and Verification

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

Visual Inspection Chart

Mechanical	Electrical
• Horn	• Body Control Module (BCM) fuse 22 (20A) • Wiring, terminals or connectors

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. **NOTE:** Make sure to use the latest scan tool software release.

   If the cause is not visually evident, connect the scan tool to the Data Link Connector (DLC).

5. **NOTE:** The Vehicle Communication Module (VCM) LED prove-out confirms power and ground from the DLC are provided to the VCM.

   If the scan tool does not communicate with the VCM:
   - check the VCM connection to the vehicle.
   - check the scan tool connection to the VCM.
   - refer to Section 418-00, No Power To The Scan Tool, to diagnose no power to the scan tool.

6. If the scan tool does not communicate with the vehicle:
   - verify the ignition key is in the ON position.
   - verify the scan tool operation with a known good vehicle.
   - refer to Section 418-00, The PCM Does Not Respond To The Scan Tool, to diagnose no response from the PCM.

7. Carry out the network test.
   - If the scan tool responds with no communication for one or more modules, refer to Section 418-00.
   - If the network test passes, verify the symptom. GO to Symptom Chart.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• The horn is inoperative	• Fuse • Wiring, terminals or connectors • Horn • Steering wheel harness • Clockspring • Horn switch (part of the steering wheel) • Body Control Module (BCM) • Steering Column Control Module (SCCM)	• GO to Pinpoint Test A.
• The horn is always on	• Wiring, terminals or connectors • Clockspring • Steering wheel harness	• GO to Pinpoint Test B.

	• Horn switch (part of the steering wheel) • BCM • SCCM	

Pinpoint Tests

Pinpoint Test A: The Horn Is Inoperative

Refer to Wiring Diagrams Cell 44 , Horn/Cigar Lighter for schematic and connector information.

Normal Operation

When the driver air bag module is pressed, the normally open horn switch (part of the steering wheel) is closed and a path to ground is routed through the clockspring and the Steering Column Control Module (SCCM), energizing the horn relay. The Body Control Module (BCM) supplies the switched and control voltage to the horn relay, which is integrated into the BCM . The horn relay then provides voltage to the horn, enabling the horn to sound.

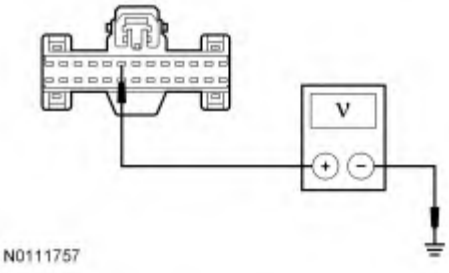
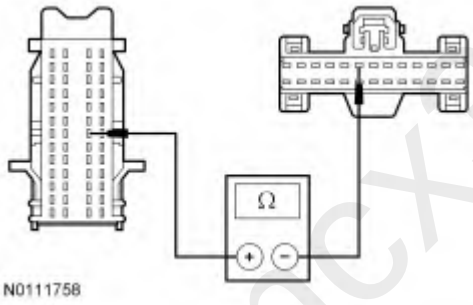
This pinpoint test is intended to diagnose the following:

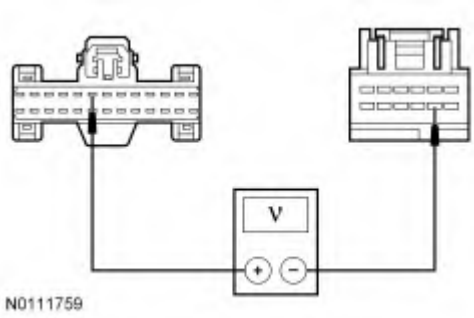
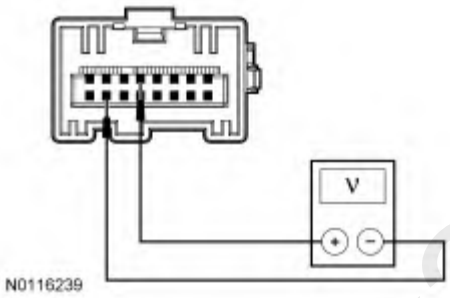
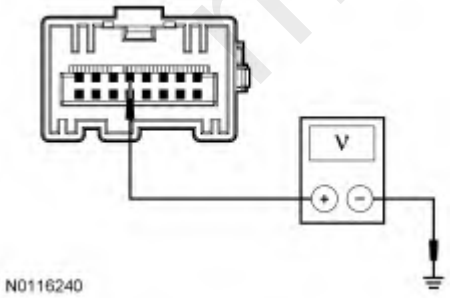
- Fuse
- Wiring, terminals or connectors
- Steering wheel harness
- Horn
- Clockspring
- Horn switch (part of the steering wheel)
- BCM
- SCCM

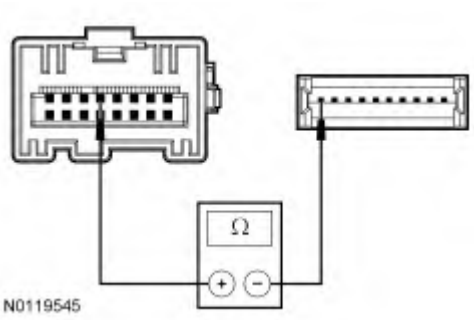
PINPOINT TEST A: THE HORN IS INOPERATIVE

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

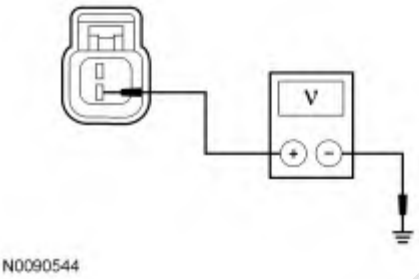
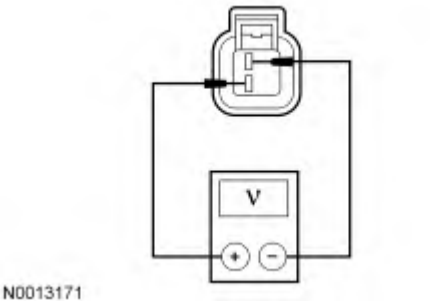
Test Step	Result / Action to Take
A1 CHECK THE BCM OUTPUT	
• Ignition ON. • Enter the following diagnostic mode on the scan tool: BCM DataLogger. • Select the active command BCM HORN PID. Command the horn on and then off. • **Does the horn sound when commanded on?**	**Yes** GO to A2 . **No** VERIFY the BCM fuse 22 (20A) is OK. If OK, GO to A8 . If not OK, REFER to the Wiring Diagrams Manual to identify the possible causes of the circuit short.
A2 CHECK FOR VOLTAGE TO THE SCCM	

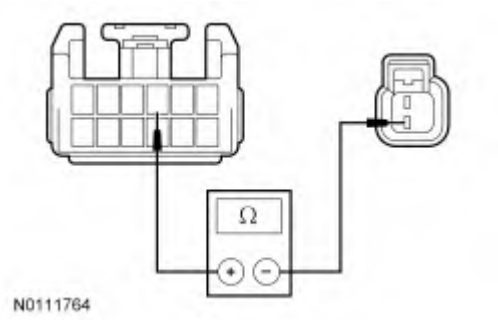
• Ignition OFF. • Disconnect: SCCM C2414A. • Ignition ON. • Measure the voltage between the SCCM C2414A-8, circuit CRH04 (VT), harness side and ground.  • **Is the voltage greater than 10 volts?**	**Yes** GO to A4 . **No** GO to A3 .
A3 CHECK THE HORN RELAY COIL GROUND CIRCUIT FOR AN OPEN	
• Ignition OFF. • Disconnect: BCM C2280B. • Measure the resistance between the BCM C2280B-33, circuit CRH04 (VT), harness side and the SCCM C2414A-8, circuit CRH04 (VT), harness side.  • **Is the resistance less than 5 ohms?**	**Yes** GO to A11 . **No** REPAIR circuit CRH04 (VT) for an open. TEST the system for normal operation.
A4 CHECK THE CLOCKSPRING GROUND CIRCUIT FOR AN OPEN	
• Ignition OFF. • Disconnect: Clockspring C218A. • Ignition ON. • Measure the voltage between the SCCM C2414A-8, circuit CRH04 (VT), harness side and the clockspring C218A-8, circuit GD133 (BK), harness side.	**Yes** GO to A5 . **No** REPAIR circuit GD133 (BK) for an open. TEST the system for normal operation.

 • **Is the voltage greater than 10 volts?**	
A5 CHECK FOR VOLTAGE TO THE CLOCKSPRING	
• Ignition OFF. • Disconnect: Clockspring C218B. • Ignition ON. • Measure the voltage between the clockspring connector C218B pin 4, component side and the clockspring C218B pin 10, component side.  • **Is the voltage greater than 10 volts?**	**Yes** INSTALL a new steering wheel. REFER to Section 211-04 . TEST the system for normal operation. **No** GO to A6 .
A6 CHECK THE CLOCKSPRING FOR AN OPEN	
• Measure the voltage between the clockspring connector C218B pin 4, component side and ground.  • **Is the voltage greater than 10 volts?**	**Yes** INSTALL a new clockspring. REFER to Section 501-20B . TEST the system for normal operation. **No** GO to A7 .
A7 CHECK FOR AN OPEN IN THE CLOCKSPRING	
• Remove the clockspring. • Measure the resistance between the clockspring connector C218B pin 4, component side and the clockspring connector C218C pin 1, component side	**Yes** GO to A12 . **No** INSTALL a new clockspring. REFER to Section 501-20B . TEST the system for normal operation.



- **Is the resistance less than 5 ohms?**

A8 CHECK FOR VOLTAGE TO THE HORN	
• Ignition OFF. • Disconnect: Horn C131. • While pressing the driver air bag module against the steering wheel, measure the voltage between the horn C131-2, circuit SRH01 (YE/RD), harness side and ground.  • **Is the voltage greater than 10 volts?**	**Yes** GO to A9 . **No** GO to A10 .
A9 CHECK THE HORN GROUND CIRCUIT FOR CONTINUITY	
• While pressing the driver air bag module against the steering wheel, measure the voltage between the horn C131-2, circuit SRH01 (YE/RD), harness side, and the horn C131-1, circuit GD123 (BK/GY), harness side.  • **Is the voltage greater than 10 volts?**	**Yes** INSTALL a new horn. REFER to Horn in this section. TEST the system for normal operation. **No** REPAIR circuit GD123 (BK/GY) for an open. TEST the system for normal operation.
A10 CHECK THE BCM HORN OUTPUT CIRCUIT FOR AN OPEN	
• Disconnect: BCM C2280E. • Measure the resistance between the BCM C2280E-3, circuit SRH01 (YE/RD), harness side, and the horn C131-	**Yes** GO to A11 .

2, circuit SRH01 (YE/RD), harness side.  • **Is the resistance less than 5 ohms?**	**No** REPAIR circuit SRH01 (YE/RD) for an open. TEST the system for normal operation.
A11 CHECK FOR CORRECT BCM OPERATION	

• Disconnect all the BCM connectors.
• Check for:
  ▪ corrosion
  ▪ damaged pins
  ▪ pushed-out pins
• Connect all the BCM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new BCM. REFER to Section 419-10. TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector. TEST the system for normal operation.

A12 CHECK FOR CORRECT SCCM OPERATION	

• Disconnect all the SCCM connectors.
• Check for:
  ▪ corrosion
  ▪ damaged pins
  ▪ pushed-out pins
• Connect all the SCCM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new SCCM. REFER to Section 211-05. 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. RUN the on-demand self-test (required to clear certain DTCs). CORRECT any unresolved DTCs. CLEAR all DTCs. TEST the system for normal operation.

Pinpoint Test B: The Horn Is Always On

Refer to Wiring Diagrams Cell 44, Horn/Cigar Lighter for schematic and connector information.

Normal Operation

When the driver air bag module is pressed, the normally open horn switch (part of the steering wheel) is closed and ground is routed through the clockspring and the Steering Column Control Module (SCCM) to the horn relay, energizing the horn relay. The Body Control Module (BCM) supplies the switched and control voltage to the horn relay, which is integrated into the BCM. The horn relay then provides voltage to the horn, enabling the horn to sound.

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Steering wheel harness
- Clockspring
- Horn switches (part of the steering wheel)
- BCM
- SCCM

PINPOINT TEST B: THE HORN IS ALWAYS ON

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

Test Step	Result / Action to Take
B1 CHECK THE BCM HORN OUTPUT CIRCUIT FOR A SHORT TO VOLTAGE	
• Ignition OFF. • Disconnect: BCM C2280E. • **Does the horn continue to sound?**	**Yes** REPAIR circuit SRH01 (YE/RD) for a short to voltage. TEST the system for normal operation. **No** GO to B2.
B2 CHECK THE HORN SWITCH INPUT TO THE BCM	
• Connect: BCM C2280E. • Disconnect: BCM C2280B. • **Does the horn continue to sound?**	**Yes** GO to B7. **No** GO to B3.
B3 CHECK THE HORN SWITCH INPUT FOR A SHORT TO GROUND	
• Connect: BCM C2280B. • Disconnect: SCCM C2414A. • **Does the horn continue to sound?**	**Yes** REPAIR circuit CRH04 (VT) for a short to ground. TEST the system for normal operation. **No** GO to B4.
B4 CHECK THE HORN SWITCH	
• Connect: SCCM C2414A. • Remove the driver air bag module. Refer to Section 501-20B. • Disconnect: Horn Switch C217A. • **Does the horn continue to sound?**	**Yes** GO to B5. **No** INSTALL a new steering wheel. REFER to Section 211-04. TEST the system for normal operation.
B5 CHECK THE STEERING	

WHEEL HARNESS	
• Disconnect: Clockspring C218B. • **Does the horn continue to sound?**	**Yes** GO to B6 . **No** The steering wheel harness has a short circuit. INSTALL a new steering wheel. REFER to Section 211-04 . TEST the system for normal operation.
B6 CHECK THE CLOCKSPRING FOR A SHORT TO GROUND	
• Remove the clockspring. Refer to Section 501-20B . • **Does the horn continue to sound?**	**Yes** GO to B8 . **No** INSTALL a new clockspring. REFER to Section 501-20B . TEST the system for normal operation.
B7 CHECK FOR CORRECT BCM OPERATION	

• Disconnect all the BCM connectors.
• Check for:
  ▪ corrosion
  ▪ damaged pins
  ▪ pushed-out pins
• Connect all the BCM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new BCM . REFER to Section 419-10 . TEST the system for normal operation.
	
	No
	The system is operating correctly at this time. The concern may have been caused by a loose or corroded connector.

B8 CHECK FOR CORRECT SCCM OPERATION	

• Disconnect all the SCCM connectors.
• Check for:
  ▪ corrosion
  ▪ damaged pins
  ▪ pushed-out pins
• Connect all the SCCM connectors and make sure they seat correctly.
• Operate the system and verify the concern is still present.
• **Is the concern still present?**
	Yes
	INSTALL a new SCCM . REFER to Section 211-05 . 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. RUN the on-demand self-test (required to clear certain DTCs). CORRECT any unresolved DTCs. CLEAR all DTCs. TEST the system for normal operation.