

2008 Ford Mustang

2008 ACCESSORIES & BODY, CAB Horn - Mustang

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Horn - Mustang

SPECIFICATIONS

TORQUE SPECIFICATIONS

Description	Nm	lb-in
Horn bracket nut	9	80
Radiator bracket bolts	10	89

DESCRIPTION AND OPERATION

HORN

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The horn system consists of the following:

- Dual tone horns
- Horn switch (part of the steering wheel)
- Horn relay, located in the bussed electrical center (BEC)
- SJB

Horn Location

The horn is mounted on the RH side of the core support behind the radiator grille.

DIAGNOSTIC TESTS

HORN

Special Tools

Illustration	Tool Name	Tool Number
 ST1137-A	73III Automotive Meter	105-R0057 or equivalent
	Vehicle Communications Module (VCM) and Integrated Diagnostic System (IDS) software with	

Microsoft

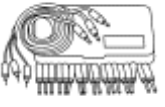
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Page 1

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2008 Ford Mustang

2008 ACCESSORIES & BODY, CAB Horn - Mustang

 ST1138-A	appropriate hardware, or equivalent scan tool	
 ST2834-A	Flex Probe Kit	105-R025C or equivalent

Principles of Operation

NOTE: The smart junction box (SJB) is also known as the generic electronic module (GEM).

The horn switch is incorporated within the steering wheel. When the switch is closed, ground is supplied through the clockspring from the vehicle harness. The horn relay is then energized, supplying voltage to the horn enabling the horn to sound. The horn relay is located in the bussed electrical center (BEC).

Inspection and Verification

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

VISUAL INSPECTION CHART

Mechanical	Electrical
• Horns • Horn switch (part of the steering wheel) • Clockspring	• Bussed electrical center (BEC) fuse 46 (25A) • Wiring, terminals or connectors • Horn relay • Horn switch (part of the steering wheel)

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

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

4. If the cause is not visually evident, connect the scan tool to the data link connector (DLC).

NOTE: The vehicle communication module (VCM) LED prove-out confirms power

and ground from the DLC are provided to the VCM.

5. 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 **MODULE COMMUNICATIONS NETWORK** article, No Power To The Scan Tool, to diagnose no communication with the vehicle.
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 **MODULE COMMUNICATIONS NETWORK** article to diagnose no response from the PCM.
7. Carry out the network test.
 - If the scan tool responds with no communication with one or more modules, refer to **MODULE COMMUNICATIONS NETWORK** article.
 - If the network test passes, retrieve and record the continuous memory DTCs.
8. Clear the continuous DTCs and carry out the self-test diagnostics for the SJB.
9. If the DTCs retrieved are related to the concern, go to DTC Charts. For all other DTCs, refer to **MULTIFUNCTION ELECTRONIC MODULES** article.
10. If no DTCs related to the concern are retrieved, go to **Symptom Chart**.

DTC Charts

SMART JUNCTION BOX (SJB) DTC CHART

DTC	Description	Action
B1217	Horn Relay Coil Circuit Failure	Go to <u>Pinpoint Test A.</u>
B1897	Horn Switch Circuit Failure	Go to <u>Pinpoint Test B.</u>
All other DTCs	-	REFER to <u>MULTIFUNCTION ELECTRONIC MODULES</u> article.

Symptom Chart

Symptom Chart

Condition	Possible Sources	Action
• The horn is inoperative	• Fuse • Wiring, terminals or connectors • Horn relay • Horn switch (part of the steering wheel) • Horns	• Go to <u>Pinpoint Test A.</u>

2008 Ford Mustang

2008 ACCESSORIES & BODY, CAB Horn - Mustang

	• Clockspring • Bussed electrical center (BEC) • Smart junction box (SJB)	
• The horn is always on	• Wiring, terminals or connectors • Horn switch (part of the steering wheel) • Clockspring • Horn relay • BEC • SJB	• Go to <u>Pinpoint Test B.</u>

Pinpoint Tests

Pinpoint Test A: The Horn Is Inoperative

Refer to appropriate SYSTEM WIRING DIAGRAM ARTICLE, Horn/Cigar Lighter for schematic and connector information.

Normal Operation

The horn relay control and switched voltage is supplied by the bussed electrical center (BEC) through fuse 46 (25A). The SJB receives the horn signal through circuit 1 (DB) from the horn switch (part of the steering wheel). When the horn switch is pressed, ground is supplied through the clockspring to the vehicle harness through circuit 1205 (BK). The SJB then activates the horn relay through circuit 1323 (OG/RD). Voltage is then sent to the horn through circuit 6 (YE/LG), enabling the horns to sound. Ground is provided to the horns through circuit 1205 (BK).

- DTC B1217 (Horn Relay Coil Circuit Failure) - is a continuous and on-demand DTC that sets when the SJB detects a short to voltage on circuit 1323 (OG/RD) or circuit 1 (DB).

This pinpoint test is intended to diagnose the following:

- Fuse
- Wiring, terminals or connectors
- Horn relay
- Horn switch (part of the steering wheel)
- Horns
- Clockspring
- BEC
- SJB

PINPOINT TEST A: THE HORN IS INOPERATIVE

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Saturday, September 19, 2009 6:03:05 PM

Page 4

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

A1 CHECK THE HORN CONTROL COMMAND

- Key in ON position.
- Enter the following diagnostic mode on the diagnostic tool: SJB DataLogger
- Select the SJB PID (HORN), and command the HORN ON.
- **Does the horn sound?**

YES : Go to A10.

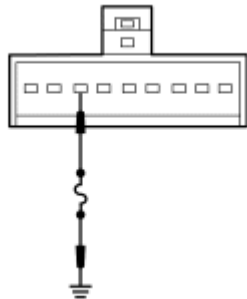
NO : Go to A2.

A2 CHECK THE HORN RELAY FOR CORRECT OPERATION

- Key in OFF position.
 - Disconnect: Horn Relay
 - Install a known functioning relay and retest the system.
 - **Does the known functioning relay fix the problem?**
- YES :** INSTALL a new horn relay. TEST the system for normal operation.
- NO :** Go to A3.

A3 CHECK THE HORN SWITCH

- Connect: Horn Relay
- Disconnect: Clockspring C2274



N0072741

Fig. 1: Connecting Fused (5A) Jumper Wire Between Clockspring C2274-7, Circuit 1 (DB), Harness Side & Ground
Courtesy of FORD MOTOR CO.

NOTE: If the jumper wire fails, repair circuit 1323 (OG/RD) or 1 (DB) for a short to voltage.

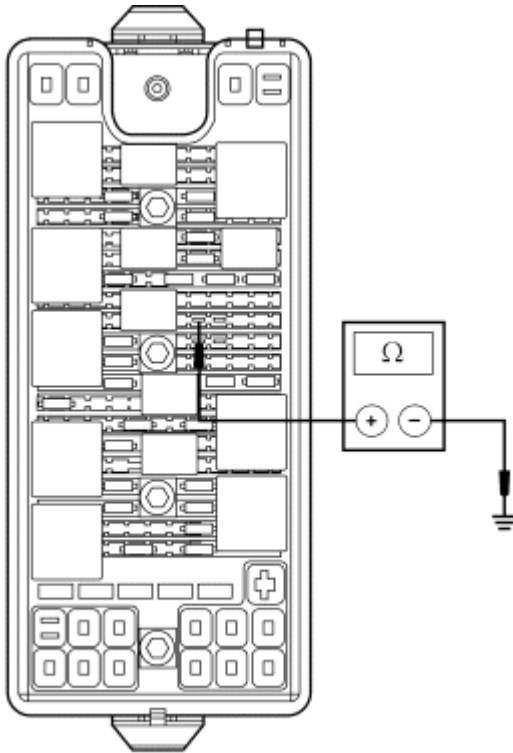
- Connect a fused (5A) jumper wire between the clockspring C2274-7, circuit 1 (DB), harness side and ground.
- **Does the horn sound?**

YES : REMOVE the jumper wire. Go to A14.

NO : LEAVE the jumper wire connected. Go to A4.

A4 CHECK THE HORN RELAY CONTROL FOR AN OPEN

- Disconnect: Horn Relay



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Fig. 2: Checking Horn Relay Control For An Open
Courtesy of FORD MOTOR CO.

- Measure the resistance between the horn relay pin 85, harness side and ground.
- **Is the resistance less than 5 ohms?**

YES : REMOVE the jumper wire. Go to A6.

NO : REMOVE the jumper wire. Go to A5.

A5 CHECK CIRCUIT 1323 (OG/RD) FOR AN OPEN

- Disconnect: BEC C1035a
- Disconnect: SJB C2280c

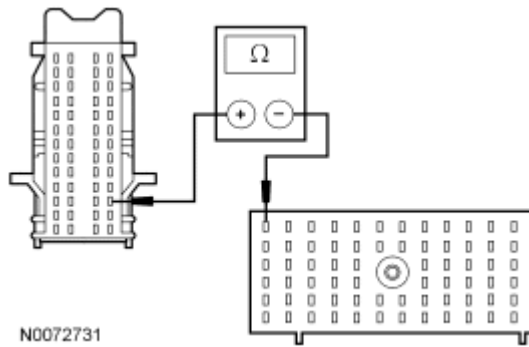


Fig. 3: Checking Circuit 1323 (OG/RD) For An Open
Courtesy of FORD MOTOR CO.

- Measure the resistance between the SJB C2280c-29, circuit 1323 (OG/RD), harness side and the BEC C1035a-A1, circuit 1323 (OG/RD), harness side.

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

YES : INSTALL a new BEC. TEST the system for normal operation.

NO : REPAIR the circuit. TEST the system for normal operation.

A6 CHECK THE VOLTAGE SUPPLY TO THE HORN RELAY

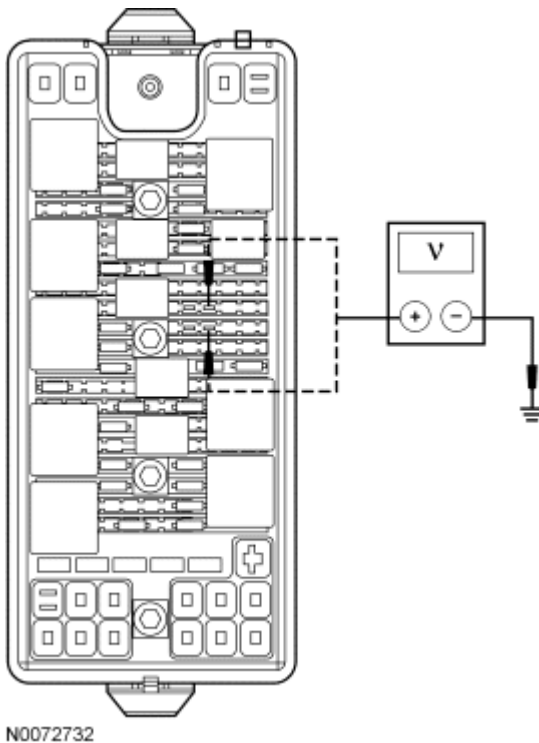


Fig. 4: Checking Voltage Supply To Horn Relay
Courtesy of FORD MOTOR CO.

- Measure the voltage between the horn relay pin 86, harness side and ground; and between the horn relay pin 87, harness side and ground.

- Are the voltages greater than 10 volts?

YES : Go to A7.

NO : VERIFY the BEC fuse 46 (25A) is OK. If OK, INSTALL a new BEC. TEST the system for normal operation.

A7 CHECK CIRCUIT 6 (YE/LG) FOR AN OPEN

- Disconnect: BEC C1035c
- Disconnect: Horn C131

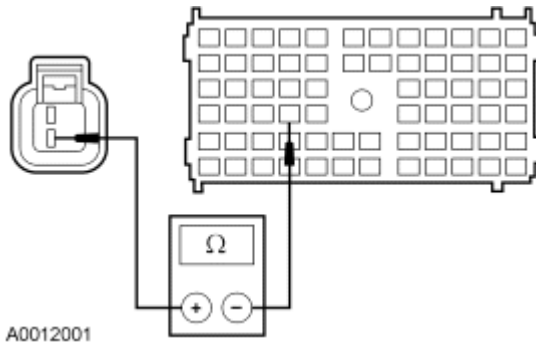


Fig. 5: Measuring Resistance Between Horn C131-2, Circuit 6 (YE/LG), Harness Side
Courtesy of FORD MOTOR CO.

- Measure the resistance between the horn C131-2, circuit 6 (YE/LG), harness side and the BEC C1035c-D4, circuit 6 (YE/LG), harness side.
- Is the resistance less than 5 ohms?
YES : Go to A8.
NO : REPAIR the circuit. TEST the system for normal operation.

A8 CHECK CIRCUIT 1205 (BK) FOR AN OPEN

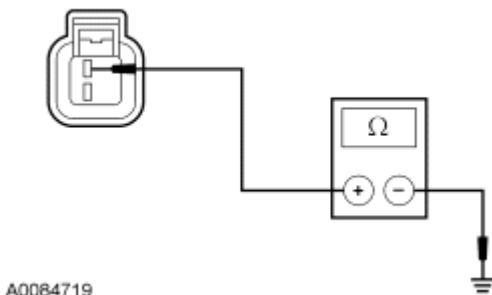


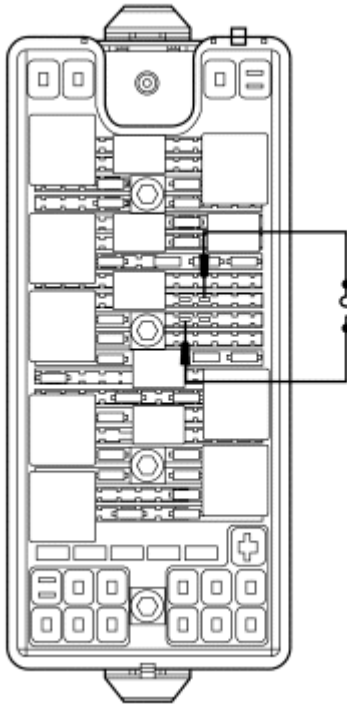
Fig. 6: Checking Circuit 1205 (BK) For An Open
Courtesy of FORD MOTOR CO.

- Measure the resistance between the horn C131-1, circuit 1205 (BK), harness side and ground.
- Is the resistance less than 5 ohms?
YES : Go to A9.

NO : REPAIR the circuit. TEST the system for normal operation.

A9 CHECK THE BEC FOR AN INTERNAL OPEN

- Connect: BEC C1035c

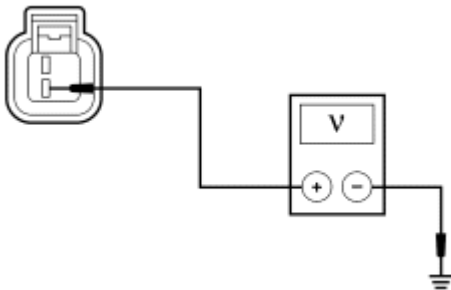


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Fig. 7: Connecting Fused (5A) Jumper Wire Between Horn Relay C1006-30 And Horn Relay C1006-87

Courtesy of FORD MOTOR CO.

- Connect a fused (5A) jumper wire between the horn relay pin 30, harness side and the horn relay pin 87, harness side.



N0012006

Fig. 8: Measuring Voltage Between Horn C131-2 And Ground

Courtesy of FORD MOTOR CO.

- Measure the voltage between the horn C131-2, circuit 6 (YE/LG), harness side and ground.

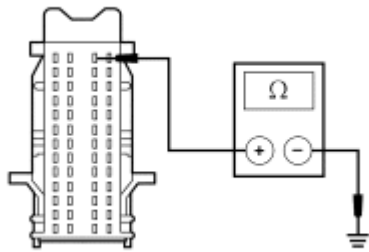
- **Is the voltage greater than 10 volts?**

YES : INSTALL a new horn. REFER to **Horn**. TEST the system for normal operation.

NO : INSTALL a new BEC. TEST the system for normal operation.

A10 CHECK THE HORN SIGNAL TO THE SJB

- Key in OFF position.
- Disconnect: SJB C2280b



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Fig. 9: Checking Horn Signal To SJB

Courtesy of FORD MOTOR CO.

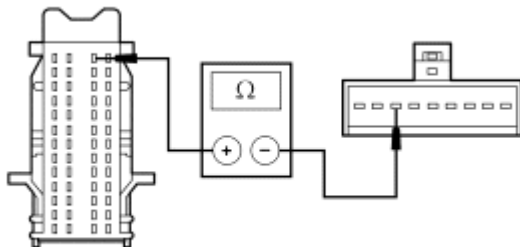
- Measure the resistance between the SJB C2280b-39, circuit 1 (DB), harness side and ground, while pressing and releasing the horn switch.
- **Is the resistance less than 5 ohms with the horn switch pressed, and greater than 10,000 ohms with the horn switch released?**

YES : Go to A14.

NO : Go to A11.

A11 CHECK CIRCUIT 1 (DB) FOR AN OPEN

- Depower the supplemental restraint system (SRS). Refer to **SUPPLEMENTAL RESTRAINT SYSTEM** article.
- Disconnect: Clockspring C2274



N0072734

Fig. 10: Checking Circuit 1 (DB) For An Open

Courtesy of FORD MOTOR CO.

- Measure the resistance between the SJB C2280b-39, circuit 1 (DB), harness side and the clockspring C2274-7, circuit 1 (DB), harness side.

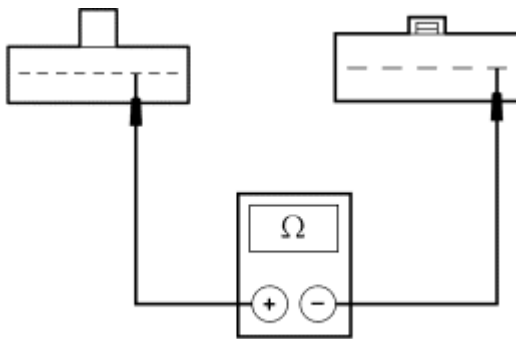
- **Is the resistance less than 5 ohms?**

YES : Go to A12.

NO : REPAIR the circuit. REPOWER the SRS. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. TEST the system for normal operation.

A12 CHECK THE CLOCKSPRING FOR AN OPEN

- Remove the driver side air bag module. Refer to **SUPPLEMENTAL RESTRAINT SYSTEM** article.
- Disconnect: Upper Clockspring Connector

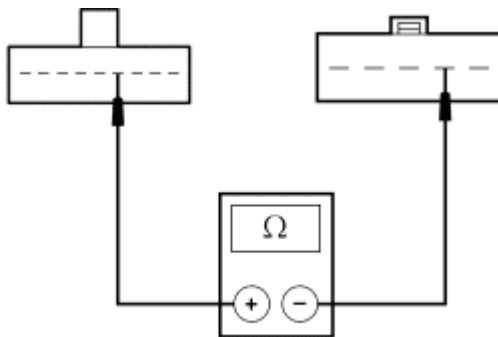


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Fig. 11: Measuring Resistance Between Upper Clockspring Connector Pin 5, Component Side & Clockspring C2274 Pin 7

Courtesy of FORD MOTOR CO.

- Measure the resistance between the upper clockspring connector pin 5, component side and the clockspring C2274 pin 7, component side.



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Fig. 12: Measuring Resistance Between Upper Clockspring Connector Pin 4, Component Side & Clockspring C2274 Pin 6

Courtesy of FORD MOTOR CO.

- Measure the resistance between the upper clockspring connector pin 4, component side and the

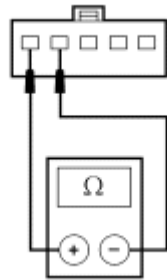
clockspring C2274 pin 6, component side.

- **Are the resistances less than 5 ohms?**

YES : Go to A13.

NO : INSTALL a new clockspring. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. TEST the system for normal operation.

A13 CHECK THE HORN SWITCH FOR CORRECT OPERATION



N0012003

Fig. 13: Checking Horn Switch For Correct Operation
Courtesy of FORD MOTOR CO.

- Measure the resistance between the upper clockspring connector pin 5, circuit 1 (BK), harness side and the upper clockspring connector pin 4, circuit 1205 (GN), harness side, while pressing and releasing the horn switch.
- **Is the resistance less than 5 ohms with the horn switch pressed, and greater than 10,000 ohms with the horn switch released?**

YES : REPAIR circuit 1205 (BK) between the clockspring and ground. INSTALL the driver air bag module. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. TEST the system for normal operation.

NO : INSTALL a new steering wheel. REFER to **STEERING COLUMN** article. INSTALL the driver air bag module. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. TEST the system for normal operation.

A14 CHECK FOR CORRECT SJB OPERATION

- Disconnect all the SJB connectors.
- Check for:
 - corrosion
 - damaged pins
 - pushed-out pins
- Connect all the SJB connectors and make sure they seat correctly.
- Operate the system and verify the concern is still present.
- **Is the concern still present?**

YES : INSTALL a new SJB. REFER to **MULTIFUNCTION ELECTRONIC MODULES** article. 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.

Pinpoint Test B: The Horn Is Always On

Refer to appropriate SYSTEM WIRING DIAGRAM ARTICLE, Horn/Cigar Lighter for schematic and connector information.

Normal Operation

The horn relay control and switched voltage is supplied by the bussed electrical center (BEC) through fuse 46 (25A). The SJB receives the horn signal through circuit 1 (DB) from the horn switch (part of the steering wheel). When the horn switch is pressed, ground is supplied through the clockspring to the vehicle harness through circuit 1205 (BK). The SJB then activates the horn relay through circuit 1323 (OG/RD). Voltage is then sent to the horn through circuit 6 (YE/LG), enabling the horns to sound. Ground is provided to the horns through circuit 1205 (BK).

- DTC B1897 (Horn Switch Circuit Failure) - is an on-demand DTC that sets when the SJB detects a short to ground on circuit 1 (DB).

This pinpoint test is intended to diagnose the following:

- Wiring, terminals or connectors
- Horn switch (part of the steering wheel)
- Clockspring
- Horn relay
- BEC
- SJB

PINPOINT TEST B: THE HORN IS ALWAYS ON

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

B1 RETRIEVE THE SJB DTCs

- Check the recorded results from the SJB on-demand self-test.
- **Is DTC B1897 retrieved?**

YES : Go to B2.

NO : Go to B7.

B2 CHECK THE HORN SWITCH FOR A SHORT TO GROUND

- Remove the driver air bag module. Refer to **SUPPLEMENTAL RESTRAINT SYSTEM** article.
- Disconnect: Horn Switch Connector
- Repeat the SJB on-demand self-test.
- **Is DTC B1897 retrieved again?**

YES : Go to B3.

NO : INSTALL a new steering wheel. REFER to **STEERING COLUMN** article. INSTALL the driver air bag module. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. CLEAR the DTCs. REPEAT the self-test.

B3 CHECK THE CLOCKSPRING FOR A SHORT TO GROUND

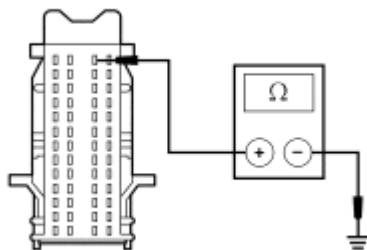
- Disconnect: Clockspring C2274
- Repeat the SJB on-demand self-test.
- **Is DTC B1897 retrieved again?**

YES : Go to B4.

NO : INSTALL a new clockspring. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. INSTALL the driver air bag module. REFER to **SUPPLEMENTAL RESTRAINT SYSTEM** article. CLEAR the DTCs. REPEAT the self-test.

B4 CHECK CIRCUIT 1 (DB) FOR A SHORT TO GROUND

- Disconnect: SJB C2280b
- Install the driver air bag module. Refer to **SUPPLEMENTAL RESTRAINT SYSTEM** article.



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Fig. 14: Checking Circuit 1 (DB) For A Short To Ground
Courtesy of FORD MOTOR CO.

- Measure the resistance between the SJB C2280b-39, circuit 1 (DB), harness side and ground.
- **Is the resistance greater than 10,000 ohms?**

YES : Go to B5.

NO : REPAIR the circuit. CLEAR the DTCs. REPEAT the self-test.

B5 CHECK THE SJB FOR CORRECT OPERATION

- Key in OFF position.
- Disconnect: SJB C2280c
- **Does the horn continue to sound?**

YES : Go to B6.

NO : Go to B9.

B6 CHECK CIRCUIT 1323 (OG/RD) FOR A SHORT TO GROUND

- Disconnect: BEC C1035a

- **Does the horn continue to sound?**

YES : INSTALL a new BEC. CLEAR the DTCs. REPEAT the self-test.

NO : REPAIR the circuit. TEST the system for normal operation.

B7 CHECK THE HORN RELAY FOR CORRECT OPERATION

- Disconnect: Horn Relay
- Install a known functioning relay and retest the system.
- **Does the known functioning relay fix the problem?**

YES : INSTALL a new horn relay. TEST the system for normal operation.

NO : Go to B8.

B8 CHECK CIRCUIT 6 (YE/LG) FOR A SHORT TO VOLTAGE

- Disconnect: BEC C1035c
- **Does the horn continue to sound?**

YES : REPAIR the circuit. TEST the system for normal operation.

NO : INSTALL a new BEC. TEST the system for normal operation.

B9 CHECK FOR CORRECT SJB OPERATION

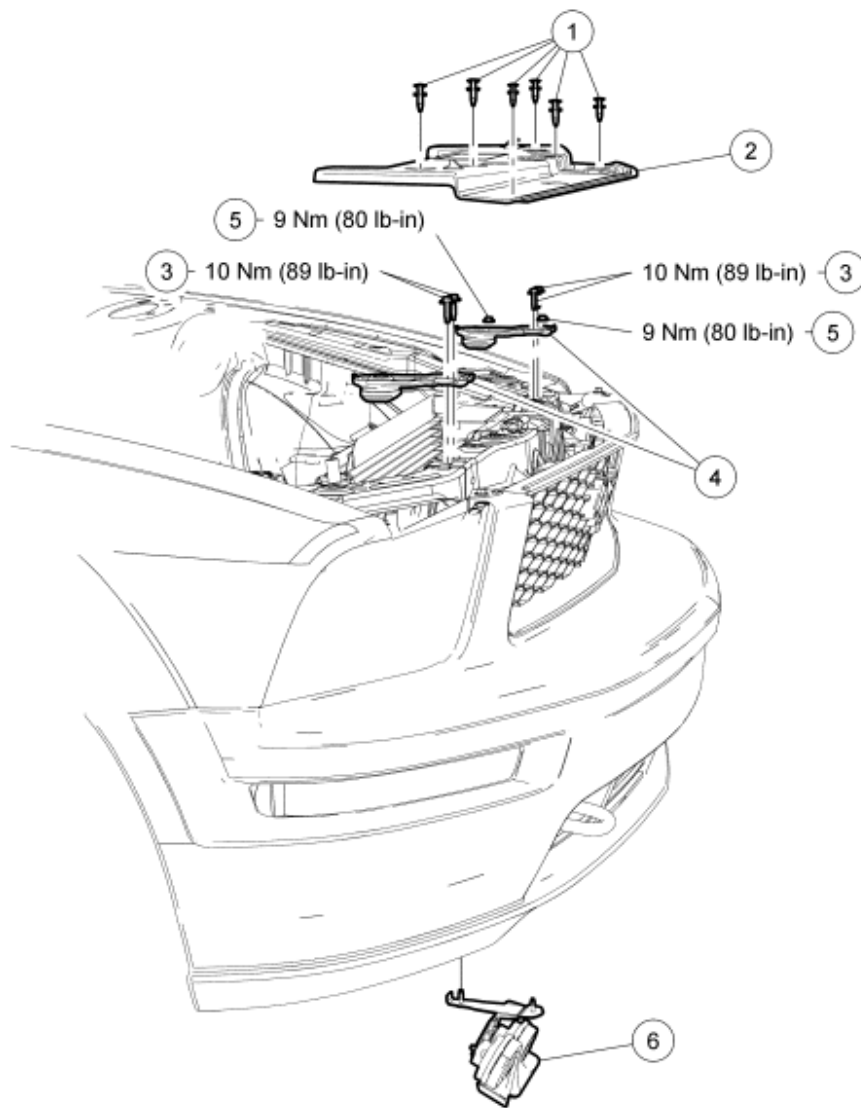
- Disconnect all the SJB connectors.
- Check for:
 - corrosion
 - damaged pins
 - pushed-out pins
- Connect all the SJB connectors and make sure they seat correctly.
- Operate the system and verify the concern is still present.
- **Is the concern still present?**

YES : INSTALL a new SJB. REFER to **MULTIFUNCTION ELECTRONIC MODULES** article. 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.

REMOVAL AND INSTALLATION

HORN



N0027716

Fig. 15: Exploded View Of Horn Components With Torque Specifications
 Courtesy of FORD MOTOR CO.

Item	Part Number	Description
1	W705436	Upper radiator sight shield pin-type retainers (6 required)
2	8C291	Upper radiator sight shield
3	W505424	Radiator support bracket bolts (4 required)
4	8226	Radiator support brackets (2 required)
5	W709450	Horn bracket nuts (2 required)
6	13832	Horn

REMOVAL AND INSTALLATION

1. With the vehicle in NEUTRAL, position it on a hoist. For additional information, refer to **JACKING AND LIFTING** article.
2. Remove the 6 pin-type retainers and the upper radiator sight shield.
3. Remove the 4 bolts and the 2 radiator support brackets.
 - To install, tighten to 10 Nm (89 lb-in).
4. Position the top of the radiator and condenser assembly toward the engine.
5. Remove the 2 horn bracket nuts.
 - To install, tighten to 9 Nm (80 lb-in).
6. If equipped, remove the 6 front bumper cover-to-valance panel screws and remove the valance panel.
7. Disconnect the electrical connector and remove the horn.
8. To install, reverse the removal procedure.