

Horns

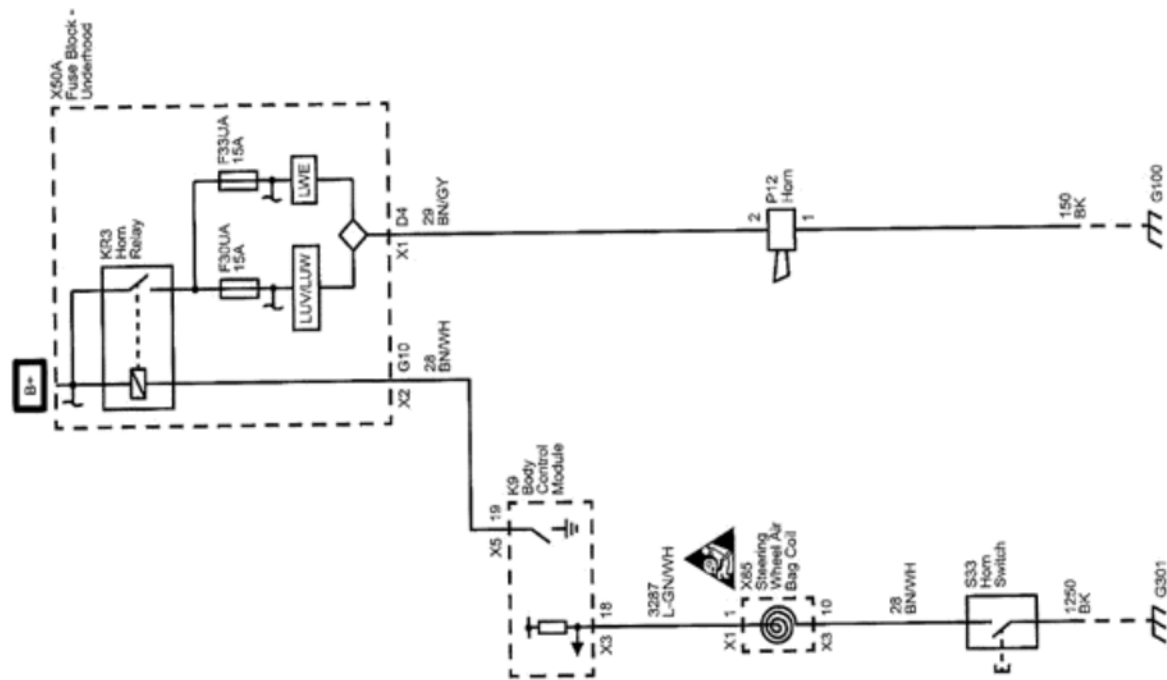
Specifications

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Horn Nut	17 N•m	13 lb ft
Steering Wheel Horn Contact Bolts	5.5 N•m	49 lb in

Schematic and Routing Diagrams

Horn Schematics (Horn)



Diagnostic Information and Procedures

DTC B2750

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- *Diagnostic Procedure Instructions* on page 6-59 provides an overview of each diagnostic category.

DTC Descriptors

DTC B2750: Horn Relay Secondary Circuit

For symptom byte information refer to: *Symptom Byte List* on page 6-85

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Control	B2750 02	B2750 04	B2750 01	—

Circuit/System Description

The Body Control Module provides a ground for the Horn printed circuit board relay within the underhood fuse block. The underhood fuse block will then provide B+ voltage to the horn control circuit, sounding the horn.

Conditions for Running the DTC

When the horn output is actively being requested by the Body Control Module.

Conditions for Setting the DTC

B2750 01

The Body Control Module detects a short to voltage in the horn relay control circuit.

B2750 02

The Body Control Module detects a short to ground in the horn relay control circuit.

B2750 04

The Body Control Module detects an open/high resistance in the horn relay control circuit.

Action Taken When the DTC Sets

B2750 01, B2750 04

The Body Control Module will command the horn when requested but the horn will be inoperative.

B2750 02

The horn will sound continuously until the horn is disconnected or when the horn overheats and becomes inoperative.

Conditions for Clearing the DTC

- The DTC clears when the fault is no longer detected.
- The current DTC will become history when the request for the output is removed.
- The history DTC will clear after 50 consecutive fault-free ignition cycles have occurred.

Reference Information

Schematic Reference

Horn Schematics on page 4-72

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Horns System Description and Operation on page 4-80

Electrical Information Reference

- *Circuit Testing* on page 11-526
- *Connector Repairs* on page 11-548
- *Testing for Intermittent Conditions and Poor Connections* on page 11-531
- *Wiring Repairs* on page 11-537

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the operation of the P12 Horn when commanding the Horn Relay On and Off with a scan tool.

⇒ **If the P12 Horn is always ON or always OFF**

Refer to Circuit/System Testing.

↓ **If the P12 Horn turns ON and OFF**

3. All OK.

Circuit/System Testing

1. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block-Underhood, ignition ON.
2. Verify the P12 Horn is not activated.

⇒ **If the P12 Horn is activated**

- 2.1. Ignition OFF, disconnect the harness connector at the P12 Horn, ignition ON.
- 2.2. Test for less than 1 V between the control circuit terminal 2 and ground.
 - ⇒ If 1 V or greater, repair the short to voltage on the circuit.
 - ⇒ If less than 1 V, test or replace the P12 Horn.

↓ **If the P12 Horn is not activated**

3. Connect a 15A fused jumper wire between the control circuit terminal D4 and B+.
4. Verify the P12 Horn activates.

⇒ **If the P12 Horn does not activate**

- 4.1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the P12 Horn, ignition ON.
- 4.2. Test for infinite resistance between the control circuit and ground.
 - ⇒ If less than Infinite resistance, repair the short to ground on the circuit.
- ↓ If infinite resistance
- 4.3. Test for less than 2 Ω in the control circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω, test or replace the P12 Horn.

↓ **If the P12 Horn activates**

5. Ignition OFF, connect the X1 harness connector at the X50A Fuse Block-Underhood. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
6. Verify the P12 Horn is not activated.

⇒ **If the P12 Horn is activated**

- 6.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block-Underhood.

- 6.2. Test for infinite resistance between the control circuit terminal 19 X5 at the K9 Body Control Module and ground.

⇒ If less than Infinite resistance, repair the short to ground on the circuit.

⇒ If infinite resistance, test or replace the X50A Fuse Block-Underhood.

↓ **If the P12 Horn is not activated**

7. Connect a 3 A fused jumper wire between the control circuit terminal 19 and ground.

8. Verify the P12 Horn activates.

⇒ **If the P12 Horn does not activate**

- 8.1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the X50A Fuse Block-Underhood, ignition ON.
- 8.2. Test for less than 1 V between the control circuit terminal 19 X5 at the K9 Body Control Module and ground.

⇒ If 1 V or greater, repair the short to voltage on the circuit.

↓ If less than 1 V

- 8.3. Test for less than 2 Ω in the control circuit end to end.

⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω, test or replace the X50A Fuse Block-Underhood.

↓ **If the P12 Horn activates**

9. Replace the K9 Body Control Module.

Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Front Compartment Fuse Block Replacement* on page 11-609
- *Control Module References* on page 6-3 for Body Control Module replacement, programming and setup

Symptoms - Horns

Important: The following steps must be completed before using the symptom tables:

1. Perform *Diagnostic System Check - Vehicle* on page 6-66, before using the symptom tables in order to verify that all of the following are true:
 - There are no DTCs set
 - The control modules can communicate via the serial data link
2. Review the system operation in order to familiarize yourself with the system functions. Refer to *Horns System Description and Operation* on page 4-80.

Visual/Physical Inspection

- Inspect for aftermarket devices which could affect the operation of the horn system. Refer to *Checking Aftermarket Accessories* on page 11-525.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Perform the following if a horn buzzes or has a harsh tone.
 - Inspect for debris in the joint where the horn fastens to the vehicle.
 - Test the torque of the horn mounting hardware. The horn mounting hardware should be tightened to a torque of 10 N•m (7 lb ft).

Intermittent

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to *Testing for Intermittent Conditions and Poor Connections* on page 11-531.

Symptom List

Refer to a symptom diagnostic procedure *Horns Malfunction* on page 4-75 in order to diagnose the symptom.

Horns Malfunction

Diagnostic Instructions

- Perform the *Diagnostic System Check - Vehicle* on page 6-66 prior to using this diagnostic procedure.
- Review *Strategy Based Diagnosis* on page 6-58 for an overview of the diagnostic approach.
- Diagnostic Procedure Instructions* on page 6-59 provides an overview of each diagnostic category.

Diagnostic Fault Information

Circuit	Short to Ground	Open/High Resistance	Short to Voltage	Signal Performance
Horn Switch Signal	1	2	2	—
Horn Relay Control	B2750 02	B2750 04	B2750 01	—
Horn Control	2	2	1	—
Horn Ground	—	2	—	—
1. Horn Always On 2. Horn Inoperative				

Circuit/System Description

The Body Control Module monitors the horn switch signal circuit, when the horn pad is pressed, the Body Control Module detects the drop in the horn switch signal circuit and provides a ground for the Horn printed circuit board relay within the underhood fuse block. The underhood fuse block will then provide B+ voltage to the horn control circuit, sounding the horns

Diagnostic Aids

A short to ground in the horn relay control circuit or a short to voltage in the horn control circuit will cause the horns to sound continuously until the horns overheat and become inoperative.

Rotate the steering wheel while pressing the horn pad to identify intermittent and poor connections within the steering column.

If diagnosing a Horn- Poor Tone condition, inspect the following:

- Debris or water in the horn assembly
- Proper horn mounting hardware torque—Refer to *Fastener Tightening Specifications* on page 4-71.
- Debris in the joint where the horns attach to the vehicle
- Debris in direct contact with the horn
- Vehicle components vibrating while the horn is sounding

Reference Information

Schematic Reference

Horn Schematics on page 4-72

Connector End View Reference

Component Connector End Views on page 11-269

Description and Operation

Horns System Description and Operation on page 4-80

Electrical Information Reference

- *Circuit Testing on page 11-526*
- *Connector Repairs on page 11-548*
- *Testing for Intermittent Conditions and Poor Connections on page 11-531*
- *Wiring Repairs on page 11-537*

Scan Tool Reference

Control Module References on page 6-3 for scan tool information

Circuit/System Verification

1. Ignition ON.
2. Verify the scan tool Horn Switch parameter changes between Active and Inactive when pressing and releasing the horn pad.
 - ⇒ **If the parameter does not change**
Refer to Circuit/System Testing — Horn Switch Malfunction.
 - ⇓ **If the parameter changes**
3. Verify the P12 Horn turns ON and OFF and emits a clear and even tone when commanding the Horn Relay On and Off with a scan tool.
 - ⇒ **If the P12 Horn does not turn ON and OFF**
Refer to Circuit/System Testing – Horns or Horn Command Malfunction.
 - ⇒ **If the sound emitted is not clear and even**
Refer to Circuit/System Testing – Horn - Poor Tone.
 - ⇓ **If the P12 Horn turns ON and OFF and emit a even and clear tone**
4. All OK.

Circuit/System Testing

Horn Switch Malfunction

Note: Refer to *SIR Service Precautions on page 13-113*.

1. Ignition OFF, disconnect the X1 harness connector at the X85 Steering Wheel Air Bag Coil. Ignition ON.
2. Verify the scan tool Horn Switch parameter is Inactive.
 - ⇒ **If not Inactive**
 - 2.1. Ignition OFF, disconnect the harness connector at the K9 Body Control Module.
 - 2.2. Test for infinite resistance between the signal circuit terminal 1 and ground.
 - ⇒ If less than infinite resistance, repair the short to ground on the circuit.
 - ⇒ If infinite resistance, replace the K9 Body Control Module.
 - ⇓ **If Inactive**
3. Install a 3 A fused jumper wire between the signal circuit terminal 1 and ground.

4. Verify the scan tool Horn Switch parameter is Active.

⇒ If not Active

- 4.1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the K9 Body Control Module, Ignition ON.
- 4.2. Test for less than 1 V between the signal circuit and ground.
 - ⇒ If 1 V or greater, repair the short to voltage on the circuit.
 - ⇓ If less than 1 V
- 4.3. Test for less than 2 Ω in the signal circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω , replace the K9 Body Control Module.

⇓ If Active

5. Test or replace the S33 Horn Switch.

Horns or Horn Command Malfunction

1. Ignition OFF, and all vehicle systems OFF. Disconnect the harness connector at the P12 Horn. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.
 - ⇒ **If 10 Ω or greater**
 - 2.1. Ignition OFF.
 - 2.2. Test for less than 2 Ω in the ground circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω , repair the open/high resistance in the ground connection.
 - ⇓ **If less than 10 Ω**
3. Connect a test lamp between the control circuit terminal 2 and ground, Ignition ON.
4. Verify the test lamp does not turn ON and OFF when commanding the Horn Relay On and Off with a scan tool.
 - ⇒ **If the test lamp turns ON and OFF**
Test or replace the P12 Horn.
 - ⇓ **If the test lamp does not turn ON and OFF**
5. Ignition OFF, connect the harness connector at the P12 Horn. Disconnect the X1 harness connector at the X50A Fuse Block-Underhood, Ignition ON.
6. Verify the P12 Horn is not activated.
 - ⇒ **If the P12 Horn is activated**
 - 6.1. Ignition OFF, disconnect the harness connector at the P12 Horn, Ignition ON.
 - 6.2. Test for less than 1 V between the control circuit terminal 2 and ground.
 - ⇒ If 1 V or greater, repair the short to voltage on the circuit.
 - ⇒ If less than 1 V, test or replace the P12 Horn.
 - ⇓ **If the P12 Horn is not activated**

7. Connect a 15 A fused jumper wire between the control circuit terminal D4 and B+.
8. Verify the P12 Horn activates.
 - ⇒ **If the P12 Horn does not activate**
 - 8.1. Ignition OFF, remove the jumper wire, disconnect the harness connector at the P12 Horn, ignition ON.
 - 8.2. Test for infinite resistance between the control circuit and ground.
 - ⇒ If less than Infinite resistance, repair the short to ground on the circuit.
 - ⇓ If infinite resistance
 - 8.3. Test for less than 2 Ω in the control circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.
 - ⇒ If less than 2 Ω , test or replace the P12 Horn.
 - ⇓ **If the P12 Horn activates**
9. Ignition OFF, connect the X1 harness connector at the X50A Fuse Block-Underhood. Disconnect the X5 harness connector at the K9 Body Control Module, ignition ON.
10. Verify the P12 Horn is not activated.
 - ⇒ **If the P12 Horn is activated**
 - 10.1. Ignition OFF, disconnect the X2 harness connector at the X50A Fuse Block-Underhood.
 - 10.2. Test for infinite resistance between the control circuit terminal 19 X5 at the K9 Body Control Module and ground.
 - ⇒ If less than Infinite resistance, repair the short to ground on the circuit.
 - ⇒ If infinite resistance, replace the X50A Fuse Block-Underhood.
 - ⇓ **If the P12 Horn is not activated**
11. Connect a 3 A fused jumper wire between the control circuit terminal 19 and ground.
12. Verify the P12 Horn activates.
 - ⇒ **If the P12 Horn does not activate**
 - 12.1. Ignition OFF, remove the jumper wire, disconnect the X2 harness connector at the X50A Fuse Block-Underhood, ignition ON.
 - 12.2. Test for less than 1 V between the control circuit terminal 19 X5 at the K9 Body Control Module and ground.
 - ⇒ If 1 V or greater, repair the short to voltage on the circuit.
 - ⇓ If less than 1 V
 - 12.3. Test for less than 2 Ω in the control circuit end to end.
 - ⇒ If 2 Ω or greater, repair the open/high resistance in the circuit.

⇒ If less than 2 Ω , replace the X50A Fuse Block-Underhood.

⇓ **If the P12 Horn activates**

13. Replace the K9 Body Control Module.

Horn - Poor Tone

1. Ignition OFF and all vehicle systems OFF, disconnect the harness connector at the P12 Horn. It may take up to 2 minutes for all vehicle systems to power down.
2. Test for less than 10 Ω between the ground circuit terminal 1 and ground.
 - ⇒ **If 10 Ω or greater**
 - 2.1. Ignition OFF.
 - 2.2. Test for less than 2 Ω in the ground circuit end to end.
 - ⇒ If 2 Ω or greater, repair the high resistance in the circuit.
 - ⇒ If less than 2 Ω , repair high resistance in the ground connection.
 - ⇓ **If less than 10 Ω**
3. Ignition OFF, disconnect the X1 harness connector at the X50A Fuse Block-Underhood.
4. Test for less than 2 Ω between the P12 Horn control circuit terminal 2 and the X50A Fuse Block-Underhood control circuit terminal D4 X1.
 - ⇒ **If 2 Ω or greater**

Repair the high resistance in the control circuit.
 - ⇓ **If less than 2 Ω**
5. Test or replace the P12 Horn.

Component Testing

Horn Test

1. Ignition OFF, disconnect the harness connector at the P12 Horn.
2. Install a 15 A fused jumper wire between the control terminal 2 and 12 V. Install a jumper wire between the ground terminal 1 and ground.
3. Verify the P12 Horn turns ON and OFF
 - ⇒ **If the P12 Horn does not turn ON and OFF**

Replace the P12 Horn.
 - ⇓ **If the P12 Horn turns ON and OFF**
4. All OK

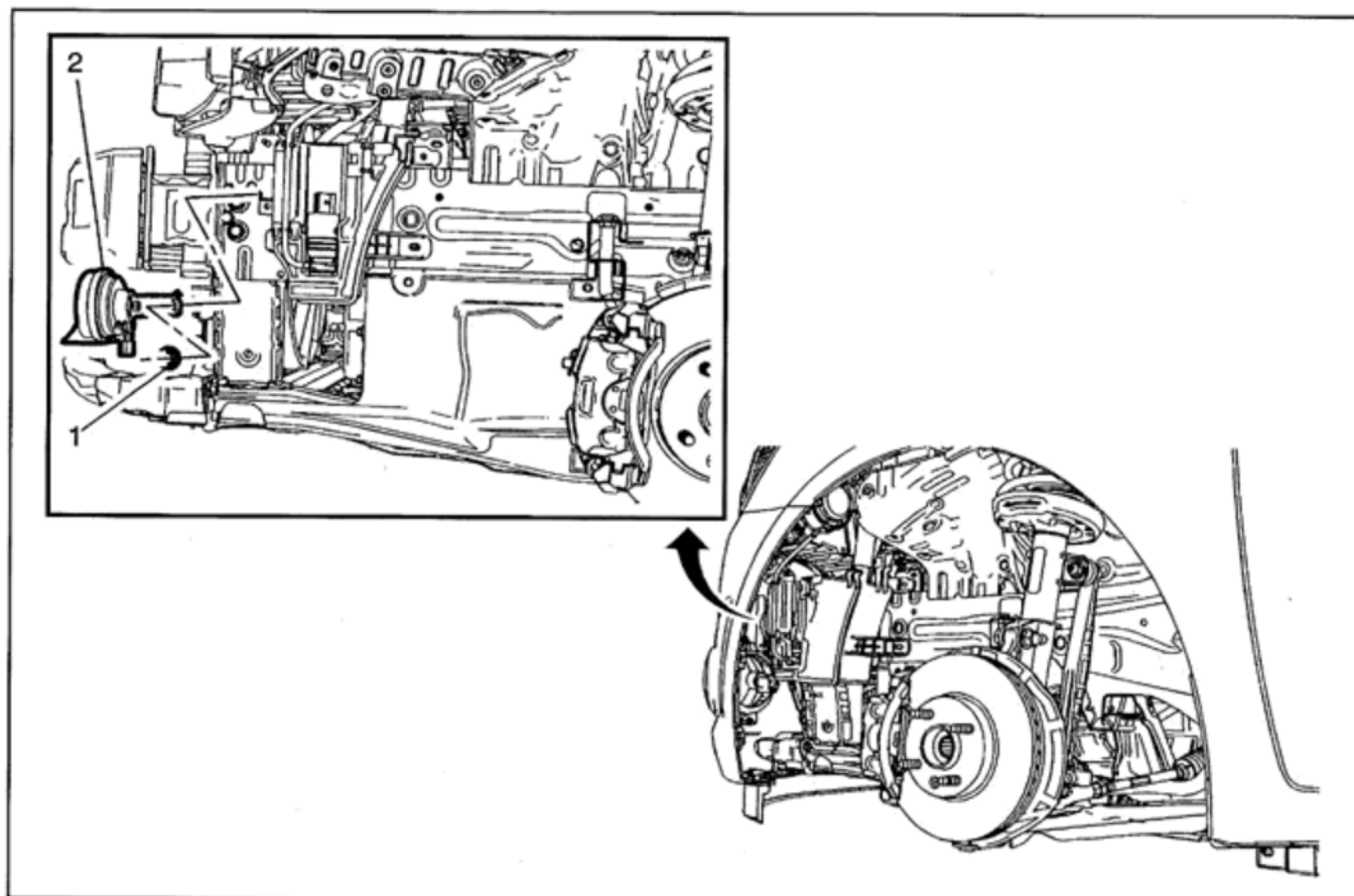
Repair Instructions

Perform the *Diagnostic Repair Verification* on page 6-92 after completing the repair.

- *Steering Wheel Horn Contact Replacement* on page 4-79
- *Horn Replacement* on page 4-78
- *Front Compartment Fuse Block Replacement* on page 11-609
- *Control Module References* on page 6-3 for Body Control Module replacement, programming and setup

Repair Instructions

Horn Replacement

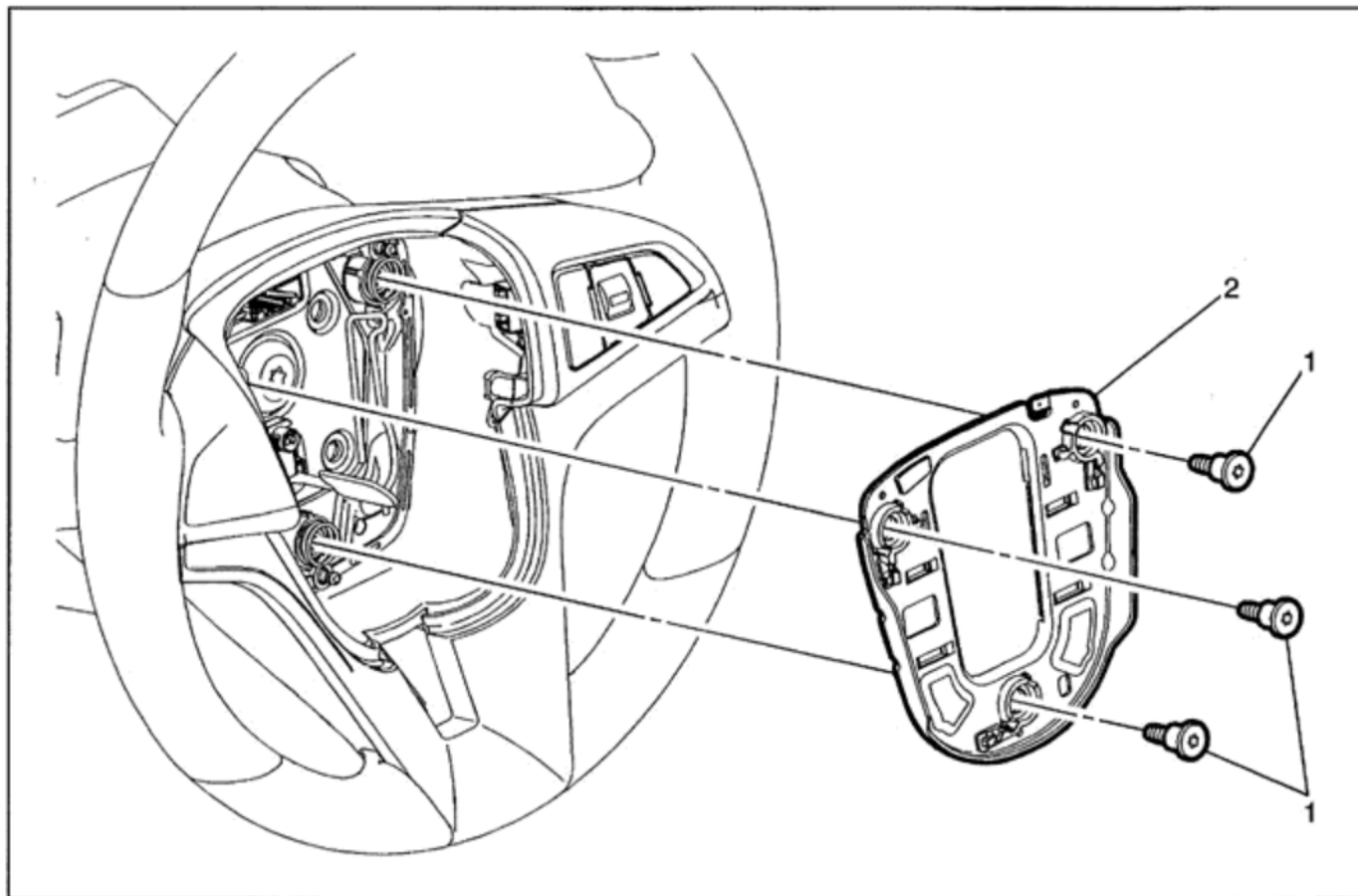


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Horn Replacement

Callout	Component Name
Preliminary Procedure Remove the front wheelhouse liner front. Refer to <i>Front Wheelhouse Liner Replacement (Rear)</i> on page 3-151 or <i>Front Wheelhouse Liner Replacement (Front)</i> on page 3-150.	
1	Horn Nut Caution: Refer to <i>Fastener Caution</i> on page 0-8. Tighten 17 N•m (13 lb ft)
2	Horn Procedure Disconnect the electrical connector.

Steering Wheel Horn Contact Replacement



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Steering Wheel Horn Contact Replacement

Callout	Component Name
Preliminary Procedure Remove the steering wheel inflatable restraint module. Refer to <i>Airbag Steering Wheel Module Replacement</i> on page 13-118.	
1	Steering Wheel Horn Contact Spring Retainer Bolt (Qty: 3) Caution: Refer to <i>Fastener Caution</i> on page 0-8. Tighten 5.5 N·m (49 lb in)
2	Steering Wheel Horn Contact Assembly Procedure Disconnect the electrical connectors.

Description and Operation

Horns System Description and Operation

System Description

The horn system consists of the following components:

- 15A circuit fuse
- Underhood fuse block (contains a non-serviceable PCB Horn relay)
- Horn switch
- Horn
- Body control module (BCM)

System Operation

- The vehicle horn is activated whenever the horn switch is depressed.
- The BCM commands the horns ON under any of the following conditions:
 - When the content theft deterrent system detects a vehicle intrusion—For further information refer to *Theft Systems Description and Operation* on page 13-153.
 - When the keyless entry system is used to lock the vehicle, a horn chirp may sound to notify the driver that the vehicle has been locked. The notification feature may be enabled or disabled through personalization. For further information refer to *Keyless Entry System Description and Operation* on page 13-44.

Circuit Operation

The BCM controls the horn operation, when the horn switch is pressed, it closes a switch pulling the horn signal circuit low. When the BCM detects the drop in voltage in the horn switch signal circuit, it energizes the PCB Horn relay which provides B+ voltage to the horn control circuit, sounding the horn.

When the vehicle is in the Off Power Mode the BCM will attempt to detect a stuck or continuously activated horn switch. When enabled, activation of the horn will be limited to 10 seconds to protect the horn from excessive use.