

Secondary and Configurable Customer Controls

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Description and Operation

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1. DRIVER INFORMATION AND ENTERTAINMENT
2. SECONDARY AND CONFIGURABLE CUSTOMER CONTROLS
3. DESCRIPTION AND OPERATION
- 4.

### **Steering Wheel Controls Description and Operation**

The steering wheel control switches duplicate the function of the primary controls of the associated component, through a network of momentary contact switches and a series of resistors. The radio supplies voltage to the switch and monitors the return signal. When a switch is pressed, a specific voltage drops across the resistor unique to that switch. The radio identifies the switch selected and sends a serial data message to the component controlled by the switch, activating the feature.

This section is intended to diagnose the circuits between the radio and the steering wheel control switches. If the primary control for the device is inoperative, refer to the appropriate section for the component the steering wheel control switch is used for.

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Diagnostic Information and Procedures

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3. DIAGNOSTIC INFORMATION AND PROCEDURES
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## **Symptoms - Secondary and Configurable Customer Controls**

Note:

The following steps must be completed before using the symptom tables.

1. Perform the [Diagnostic System Check - Vehicle](#) before using the symptom tables in order to verify that all of the following are true:
2.
  - There are no DTCs set.
  - The control modules can communicate via the serial data link.
3. Review the system description and operation in order to familiarize yourself with the system functions. Refer to [Steering Wheel Controls Description and Operation](#).

### **Visual/Physical Inspection**

- Inspect for aftermarket devices which could affect the operation of the steering wheel controls. Refer to [Checking Aftermarket Accessories](#).
- Inspect the easily accessible or visible system components, for obvious damage or conditions, which could cause the symptom.

### **Intermittent**

Faulty electrical connections or wiring may be the cause of intermittent conditions. Refer to [Testing for Intermittent Conditions and Poor Connections](#).

### **Symptom List**

Refer to a symptom diagnostic procedure from the following list in order to diagnose the symptom:

[Steering Wheel Controls Malfunction](#)

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## **Steering Wheel Controls Malfunction**

### **Diagnostic Instructions**

- Perform the [Diagnostic System Check - Vehicle](#) prior to using this diagnostic procedure.
- Review [Strategy Based Diagnosis](#) for an overview of the diagnostic approach.
- [Diagnostic Procedure Instructions](#) provides an overview of each diagnostic category.

### **Circuit/System Description**

The radio supplies voltage to the audio steering wheel control switch and monitors the return signal. Each switch state is associated to a set resistance value and when pressed a specific voltage drop occurs across the resistor unique to the switch. The radio identifies the switch selection and activates the feature.

### **Diagnostic Aids**

- This diagnostic is for the audio steering wheel controls.
- Before diagnosis of the steering wheel controls, ensure the primary controls of the associated component are functioning properly.
- If a single switch function is inoperative, test the suspect switch. Refer to Component Testing.

### **Reference Information**

Schematic Reference

[Steering Wheel Secondary/Configurable Control Schematics](#)

Connector End View Reference

[Master Electrical Component List](#)

Description and Operation

[Steering Wheel Controls Description and Operation](#)

Electrical Information Reference

- [Circuit Testing](#)
- [Wiring Repairs](#)
- [Testing for Intermittent Conditions and Poor Connections](#)
- [Connector Repairs](#)

Scan Tool Reference

[Control Module References](#) for scan tool information

### **Circuit/System Testing**

1. Ignition OFF, disconnect the X1 harness connector at the inflatable restraint steering wheel module coil.
2. Ignition ON, test for B+ between the voltage reference circuit terminal 3 (X1) male side and ground.
3.
  - If less than the specified value, test the voltage reference circuit for a short to ground or an open/high resistance. If the circuit tests normal, replace the radio.
4. Test for B+ between the voltage reference circuit terminal 3 (X1) male side and the signal circuit terminal 2 (X1) male side.

5.
  - If less than the specified value, test the signal circuit for a short to voltage or an open/high resistance. If the circuit tests normal, replace the radio.
6. Ignition OFF, disconnect the X1 harness connector at the radio.
7. Test for infinite resistance between the signal circuit terminal 2 (X1) male side at the inflatable restraint steering wheel module coil and ground.
8.
  - If less than the specified value, test the signal circuit for a short to ground.
9. If all circuits test normal, test or replace the right steering wheel control switch.

## Component Testing

### Static Test

1. Disconnect the harness connector at the inflatable restraint steering wheel module coil.
2. Test the resistance between the terminals 3 (X1) female side and 2 (X1) female side of the inflatable restraint steering wheel module coil.
3.
  - If any of the resistance measurements for the individual switches are not within the specified resistance values, replace the steering wheel control switch.

| Function Switch | Minimum Resistance Value | Maximum Resistance Value |
|-----------------|--------------------------|--------------------------|
| Volume Up       | 9.5k                     | 10.5k                    |
| Volume Down     | 12.6k                    | 14.0k                    |
| Seek            | 18.9k                    | 20.9k                    |
| Mode            | 25.4k                    | 28.0k                    |
| Power           | 30.1k                    | 33.3k                    |

## Repair Instructions

Perform the [Diagnostic Repair Verification](#) after completing the diagnostic procedure.

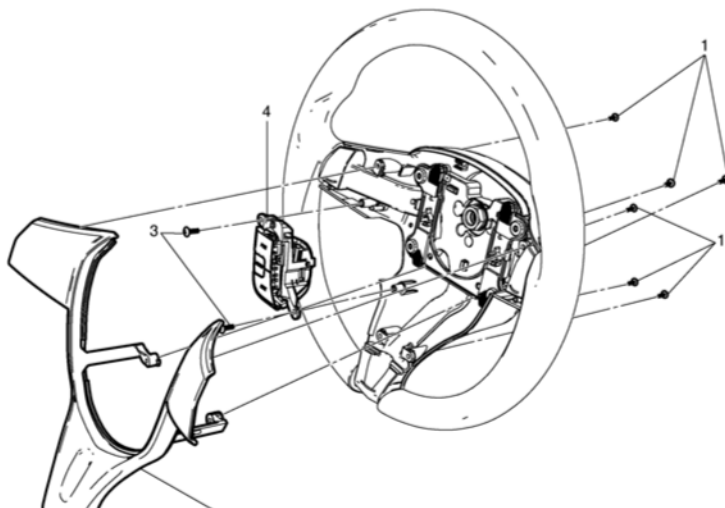
[Steering Wheel Control Switch Assembly Replacement](#)

Repair Instructions

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### Steering Wheel Control Switch Assembly Replacement



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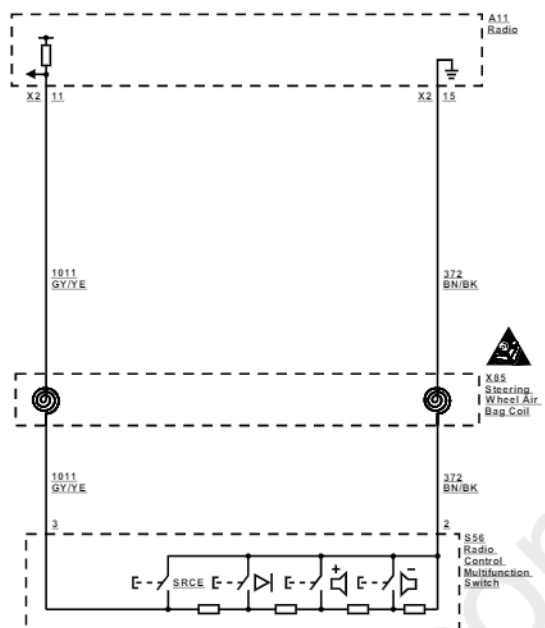
| Callout                                                                                              | Component Name                                                                                                                         |
|------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| Preliminary Procedure                                                                                |                                                                                                                                        |
| Remove the driver airbag module. Refer to <a href="#">Airbag Steering Wheel Module Replacement</a> . |                                                                                                                                        |
| 1                                                                                                    | Steering Wheel Trim Cover Screw (Qty: 6)                                                                                               |
| 2                                                                                                    | Steering Wheel Trim Cover                                                                                                              |
| 3                                                                                                    | Steering Wheel Control Switch Screw (Qty: 2)                                                                                           |
| 4                                                                                                    | Steering Wheel Control Switch Assembly<br><br>Procedure<br>1. Remove the rear object alarm.<br>2. Disconnect the electrical connector. |

Schematic and Routing Diagrams

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Steering Wheel Secondary|Configurable Control Schematics

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