

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

The audible warnings alert the driver of a system concern or a critical vehicle condition. The instrument panel cluster generates the audible warnings through an internal speaker located in the instrument panel cluster. The instrument panel cluster receives audible warning requests via serial data. If the instrument panel cluster receives multiple audible warning requests, the warning with the highest priority sounds first. The instrument panel cluster is the chime producer.

[Fasten Safety Belt Warning](#)

The chime producer activates the fasten safety belt audible warning as requested by the body control module (BCM). The BCM sends a serial data message to the chime producer indicating the chime as a multiple gong. The fasten safety belt warning sounds and the fasten safety belt indicator illuminates when the following occurs:

- The ignition switch transitions to ON.
- The inflatable restraint sensing and diagnostic module (SDM) detects that the driver's seat belt is not buckled and the signal is low. The SDM sends a serial data message to the BCM indicating the seat belt status. The instrument cluster receives a serial data message from the BCM indicating the driver seat belt status.

If the seat belt is buckled when the ignition is turned ON, the chime does not sound. If the seat belt is buckled while the chime is sounding, the chime stops. If the seat belt is unbuckled after the initial transition to ON, the chime does not sound.

[Lights On Warning](#)

The chime producer activates the lights on warning as requested by the BCM. The BCM sends a serial data message to the chime producer indicating the chime as a multiple gong. The lights on warning sounds when the following occurs:

- The ignition is OFF.
- The BCM determines that the driver door is open and the signal circuit is low.
- The BCM determines that the headlamp switch is in the park or head position.

[Brake Warning](#)

The chime producer activates the brake audible warning as requested by multiple control modules. The BCM, electronic brake control module or the parking brake control module sends a serial data message to the chime producer indicating the chime as a multiple gong. The brake warning sounds and the BRAKE indicator illuminates when the following occurs:

- The ignition is ON.
- The vehicle speed is greater than 8 km/h (4.9 MPH). The instrument cluster receives a serial data message from the engine control module (ECM) indicating the vehicle speed.
- The BCM determines that the parking brake is engaged and the signal circuit is low.
- The brake fluid is low.

[Key-In-Ignition Warning](#)

The chime producer activates the key-in-ignition audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer indicating the chime as a multiple gong. The key-in-ignition warning sounds when the following occurs:

- The ignition switch is OFF.
- The BCM determines that the driver door is open and the signal circuit is low.

[Door Ajar Warning](#)

The chime producer activates the door ajar audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer indicating the chime frequency of a medium rate and continuous duration. The door ajar warning sounds and the appropriate door ajar indicator illuminates in the driver information center when the BCM determines that a door is open and the signal circuit is low. The instrument cluster also receives a serial data message from the BCM indicating the door ajar status.

[Object Detection](#)

The chime producer activates the object detection audible warning as requested by the object alarm module. When an object is within the measuring range of the sensor, the ultrasonic pulse is reflected and is received by the sending or a neighboring sensor. The sensor converts this signal into a voltage signal and sends this signal to the object alarm module. The object alarm module evaluates the received sensor signals. As soon as an object is within the measuring range, the object alarm module sends a message via CAN-Bus to the chime producer in order to give out the acoustic distance signal. The measuring range is between 30–120 cm (11.81–47.24 in). From a distance of 120 cm (47.24 in), the acoustic signal is active. The frequency of the beep sound increases with decreasing distance. From a distance less than 30 cm (11.81 in), the sound becomes continuous.

[Additional Warnings](#)

The following warnings have an associated instrument cluster indicator or driver information center message:

- Turn Signal Indicators—The chime producer activates the audible warning as requested by the BCM. The chime produces two different chimes, one when the turn signal turns off and another when the turn signal turns on.
- Vehicle Overspeed Message—The chime producer activates the audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer.
- Fuel Level Low Message—The chime producer activates the audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer.
- Oil Pressure Indicator—The chime producer activates the audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer.
- Park Assist Fault Clean Rear Bumper Message—The chime producer activates the audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer.
- Tire Pressure Low Indicator—The chime producer activates the audible warning as requested by the BCM. The BCM sends a serial data message to the chime producer.

Refer to Indicator/Warning Message Description and Operation.

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In the lower middle of the instrument cluster, an additional display is installed. Its task is to give additional information, such as an odometer, select gear or error codes/warning messages. Refer to Indicator/Warning Message Description and Operation.

There are 4 switch functions for the driver information center:

- Menu
- Set/CLR
- Up
- Down

Menu

The Menu switch is used to navigate between the Vehicle Information Menu and the Trip/Fuel Information Menu. Cycle through the following vehicle parameters by successive pressing of the Menu switch.

Up and Down

The Up and the Down switches are used to navigate within the menus. Cycle through the following menu parameters by successive pressing of the Down switch.

Vehicle Information Menu

- Battery Voltage
- Hour meter
- Remaining Oil Life (only for V6 engines)
- Speed Warning
- Transmission Fluid Temperature (only for AT vehicles)
- Units Menu

Trip/Fuel Information Menu

- Average Fuel Economy
- Average Vehicle Speed
- Digital Speed Page
- Fuel Range
- Fuel Used
- Outside Air Temperature
- Timer
- Trip 1
- Trip 2

Trip 1/2

The trip odometer 1 or 2 can be accessed through the driver information center switch Up/Down function.

Trip Display

Driver Information Center Trip Display	Range		
	Europe-SI	USA	GB
TRIP 1	#####km	#####miles	#####miles
TRIP 2	#####km	#####miles	#####miles

Average Fuel Economy

Average fuel economy is calculated using the equation: Average Fuel Economy = Distance/Fuel.

- Distance = The accumulated distance travelled since the last reset of this value
- Fuel = The accumulated fuel consumption since the last reset of this value

The ECM sends the average fuel economy GMLAN message to the instrument cluster. The value of this mode is retained during ignition OFF and can be changed between English units and metric units by selecting from the driver information center options menu.

Fuel Range

This message indicates the estimated distance that the vehicle can travel under the current fuel economy and fuel level conditions since the last battery connection to the instrument cluster. Fuel Range is calculated using the equation: Fuel Range = Range Distance/Range Fuel Used.

- Range Distance = The accumulated distance travelled since the last reset of this value
- Fuel Used = The accumulated fuel delivered since the last reset of this value

The engine control module (ECM) sends the fuel range value to the instrument cluster. The instrument cluster receives a GMLAN message with fuel information. The fuel range value is retained during ignition OFF and can be changed between Europe-SI, USA and GB units by accessing the driver information center Units menu. The Fuel Range display cannot be reset. LOW is displayed when fuel range is below a predetermined value.

Average Vehicle Speed

Average speed is calculated using the equation: Average Speed = Average Speed Distance/Average Speed Time.

- Distance = The accumulated distance travelled since the last reset of this value
- Ignition ON = The accumulated ignition on time since the last reset of this value

Outside Air Temperature

The outside air temperature can be accessed through the driver information center Trip/Fuel switch function. The driver information center shows the outside air temperature as a damped

value. The time and rate of the temperature update is based on an algorithm in the instrument cluster. Factors such as last temperature reading, current temperature reading, length of time the vehicle was off, current vehicle speed, and the distance driven effect when the displayed temperature is updated. To get the vehicle to display the most accurate temperature faster, drive the vehicle. Constant moving traffic will update the display to the correct temperature more quickly than stop and go traffic.

Timer

The timer records elapsed time starting from activation. When the driver information center displays the timer, pressing the Set/Reset switch for longer than 1 s the driver information center resets the timer. Pressing the Set/Reset button on the driver information center switch for approximately 1 s starts and stops the timer. The driver information center displays the timer in one of the following formats:

The driver information center displays the timer in the following format: XX:XX:XX:

The first XX represents hours elapsed, the second XX represents minutes elapsed, and the third XX represents seconds elapsed. The maximum range of the timer is 99 h, 59 min, and 59 s. After the maximum range is reached, the timer displays zeros in all positions. (00:00:00).

Oil Life Remaining

The ECM sends the oil life remaining percentage to the instrument cluster via a GMLAN message. The instrument panel cluster receives a GMLAN message indicating the engine oil life remaining. The driver information center displays the current percentage of the GM Oil Life System as determined by the ECM. When the oil life remaining percentage drops below 5%, the driver information center displays CHANGE ENGINE OIL SOON. When the engine oil is changed, reset the GM Oil Life System. Refer to the owners manual for instructions on resetting the oil life monitor.

Units Menu

The unit mode is used to toggle between Europe-SI, USA and GB units and can be accessed through the driver information center Menu switch and the driver information center Set/Reset switch.

Tire Pressure Monitor

The instrument cluster receives a GMLAN message from the tire pressure monitoring system for front and rear tire pressure data. The driver information center will display the pressure for each of the front and rear tires. When a tire with low air pressure is present, the driver information center displays a warning, CHECK XX TIRE PRESSURE.

Compass

The vehicle may have a compass display on the Driver Information Center (DIC). On most vehicles, the compass receives its heading and other information from the Global Positioning System (GPS) antenna, StabiliTrak, and vehicle speed information. On vehicles without a telematics communication interface control module, a dedicated compass module is used to perform the same function as the telematics communication interface module.

Avoid covering the GPS antenna for long periods of time with objects that may interfere with the antenna's ability to receive a satellite signal.

Battery Voltage

The battery voltage can be accessed through the driver information center Trip/Fuel switch function. The driver information center shows the battery voltage measured at the B+ input circuit.

[Odometer](#)

The instrument cluster displays the vehicle odometer in the driver information center. The ECM send a distance rolling count message on GMLAN to the body control module (BCM). The BCM uses this information to calculate the vehicle odometer. This odometer value is then sent to the instrument cluster on GMLAN. The instrument cluster does not calculate the odometer. The odometer displays miles or kilometers as selected in the Units menu.

The odometer value is stored in multiple modules. The instrument cluster is a secondary storage module for the odometer, while the BCM is the primary storage and accumulator.

In addition to storing the odometer value for the vehicle, the instrument cluster and the BCM store the VIN. Software checks are performed to ensure these modules, and their stored odometer information, can not be move or transferred between different vehicles.

If the VINs do not match, the instrument cluster will go into an error mode and display "—" (dashes). If the VIN mismatch exists over a calibrated distance, the instrument cluster will "lock" the odometer display and only show dashes, even if the VIN mismatch is subsequently correct. The only way to clear or "unlock" the instrument cluster is to perform a BCM programming event using SPS.

[Gear Indication](#)

If the vehicle is equipped with an automatic transmission the driver information center displays the actual gear . The instrument cluster receives a GMLAN message with actual gear information from the automatic transmission module.

[Park Assist Menu](#)

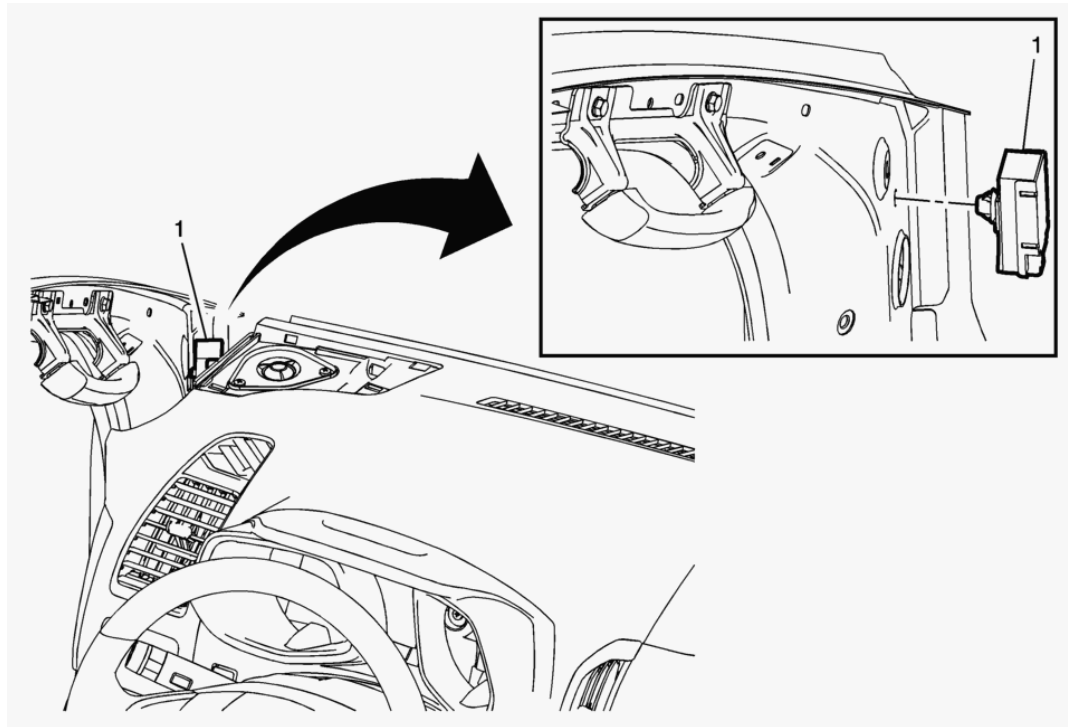
If the parallel parking assistant is activate, the parallel parking assist menu is displayed in the driver information center. The driver information center displays the current state of the parallel parking assist until the instrument cluster receives a message indicating otherwise.

[Language](#)

The driver information center is capable of displaying in different languages, corresponding to the radio language settings. The instrument cluster receives a GMLAN message with language information from the radio. This message is only sent one time, after a new language is selected. To set the language, see the owners manual.

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High Frequency Radio Audio Speaker Filter Replacement

Callout

Component Name

Preliminary Procedure

Remove the windshield side garnish molding. Refer to Windshield Side Garnish Molding Replacement.

Callout

Component Name

1

High Frequency Radio Audi Speaker Filter

Procedure

Disconnect the electrical connector.

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INDICATOR LIGHT ON

Refer to the OWNER'S MANUAL for the descriptions and explanations of all indicator lights.

For diagnosis and repair information related to an indicator light refer to the System Diagnosis and the Description of Operation that the message relates to.

MESSAGE DISPLAYED

Refer to the OWNER'S MANUAL for descriptions and explanations of all messages displayed.

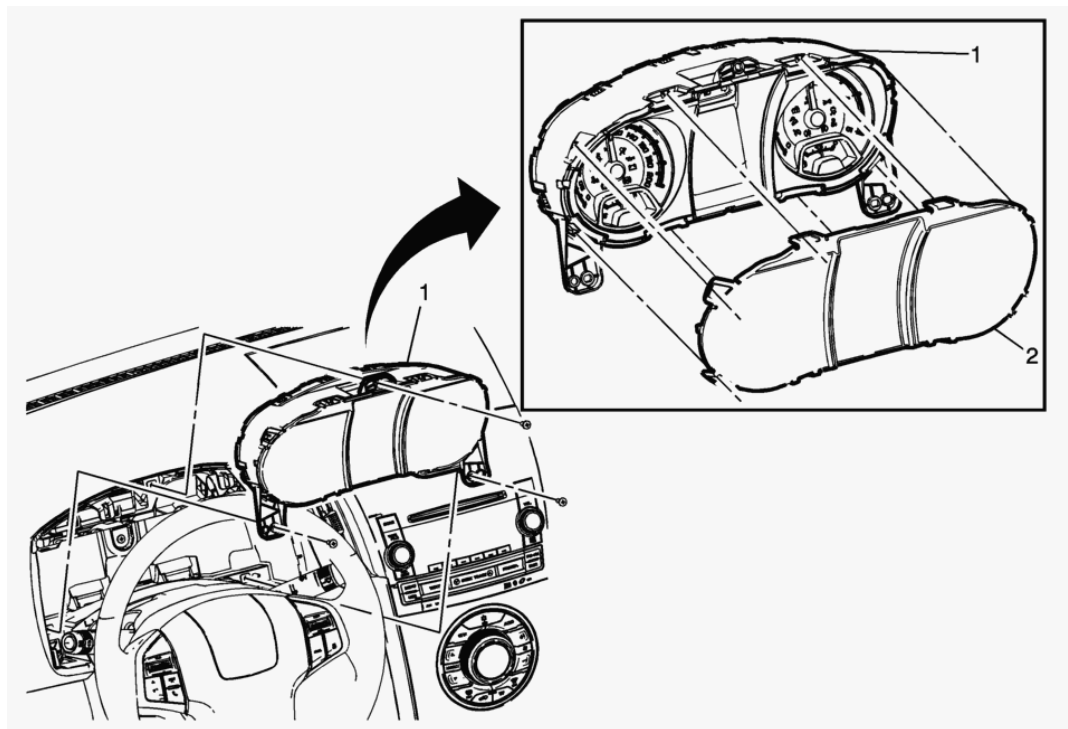
For diagnosis and repair information related to a displayed message refer to the System Diagnosis and the Description of Operation that the message relates to.

CHANGE TIMING BELT MESSAGE

The Instrument Cluster monitors the odometer mileage to determine when timing belt (if equipped) replacement may be necessary. After the vehicle has accumulated approximately 100,000 miles (160,000 kilometers), the Instrument Cluster may display the CHANGE TIMING BELT message. After the engine timing belt has been replaced, reset the CHANGE TIMING BELT message by locating and removing the fuses that supply power to the Instrument Cluster for two minutes.

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Instrument Cluster Lens Replacement

Callout

1

Instrument Cluster
Refer to Instrument Cluster Replacement

Component Name

Callout

Component Name

Instrument Cluster Lens

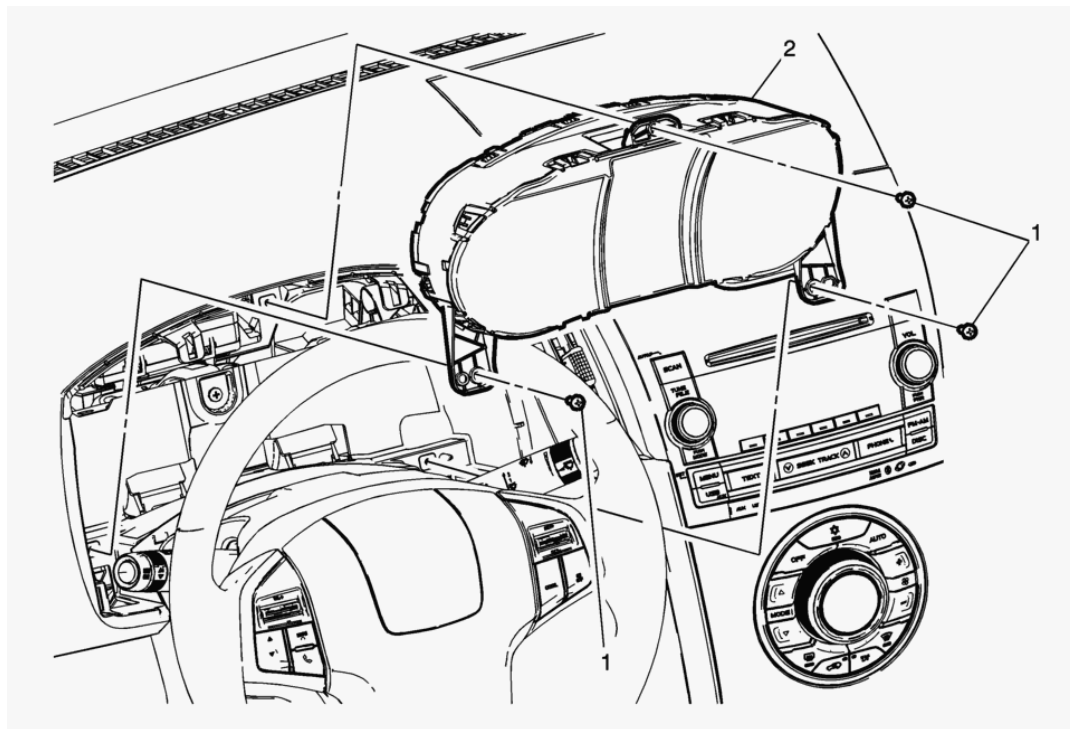
2

Procedure

Unsnap the instrument cluster lens from the instrument cluster assembly.

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Instrument Cluster Replacement

Callout

Component Name

Preliminary Procedure

Remove the instrument panel cluster trim plate. Refer to Instrument Panel Cluster Trim Plate Replacement.

Callout

Component Name

1

Instrument Cluster Fasteners (Qty: 3)

Caution: Refer to Fastener Caution.

Tighten

2.3 Y(20 lb in)

Instrument Cluster Assembly

2

Procedure

1. Disconnect the electrical connections.
2. Refer to Control Module References for programming and setup information.

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[Displays Test](#)

Certain instrument cluster features are tested when the ignition is turned on in order to verify the features are working properly. The following occurs when the ignition is turned on:

- The ABS indicator illuminates briefly.
- The battery indicator illuminates briefly.
- The brake indicator illuminates briefly.
- The fuel level low indicator illuminates briefly.
- The oil pressure low indicator illuminates briefly.
- The park assist service indicator illuminates briefly.
- The security indicator illuminates briefly.
- The tire pressure low indicator illuminates briefly.
- The electronic stability control service indicator illuminates briefly.

[Indicators and Warning Messages](#)

Refer to Indicator/Warning Message Description and Operation.

[Engine Coolant Temperature Gauge](#)

The instrument cluster displays the engine coolant temperature as determined by the engine control module (ECM). The ECM sends the engine coolant temperature information via a High Speed CAN-Bus signal to the body control module (BCM). The BCM then sends the information via a Low Speed CAN-Bus signal to the instrument cluster to display the engine coolant temperature. The engine coolant temperature gauge defaults to 40°C (104°F) or below if:

- The ECM detects a malfunction in the engine coolant temperature sensor circuit.
- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

[Fuel Level Gauge](#)

The instrument cluster displays the fuel level based on the information from the ECM. The ECM converts the data from the fuel level sensors to a fuel level signal. The ECM sends the fuel level signal via a High Speed CAN-Bus signal to the BCM. The BCM then sends the information via a Low Speed CAN-Bus signal to the instrument cluster to display the fuel level. If the fuel level falls under 11% the instrument cluster switches on the low fuel level indicator. The fuel gauge defaults to empty if:

- The ECM detects a malfunction in the fuel level sensor circuit.
- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

[Speedometer](#)

The instrument cluster displays the vehicle speed based on the information from the ECM. The ECM sends the vehicle speed information via a High Speed CAN-Bus signal to the BCM. The BCM then sends the vehicle speed information via a Low Speed CAN-Bus signal to the instrument cluster in order to display the vehicle speed, either in kilometers or miles, based on the vehicle requirements. The speedometer defaults to 0 km/h (0 MPH) if:

- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

[Tachometer](#)

The instrument cluster displays the engine speed based on the information from the ECM. The ECM converts the data from the engine speed sensor to an engine revolution signal. The ECM sends the engine speed information via a High Speed CAN-Bus signal to the BCM. The BCM then sends the information via a Low Speed CAN-Bus signal to the instrument cluster to display the engine speed. The tachometer defaults to 0 RPM if:

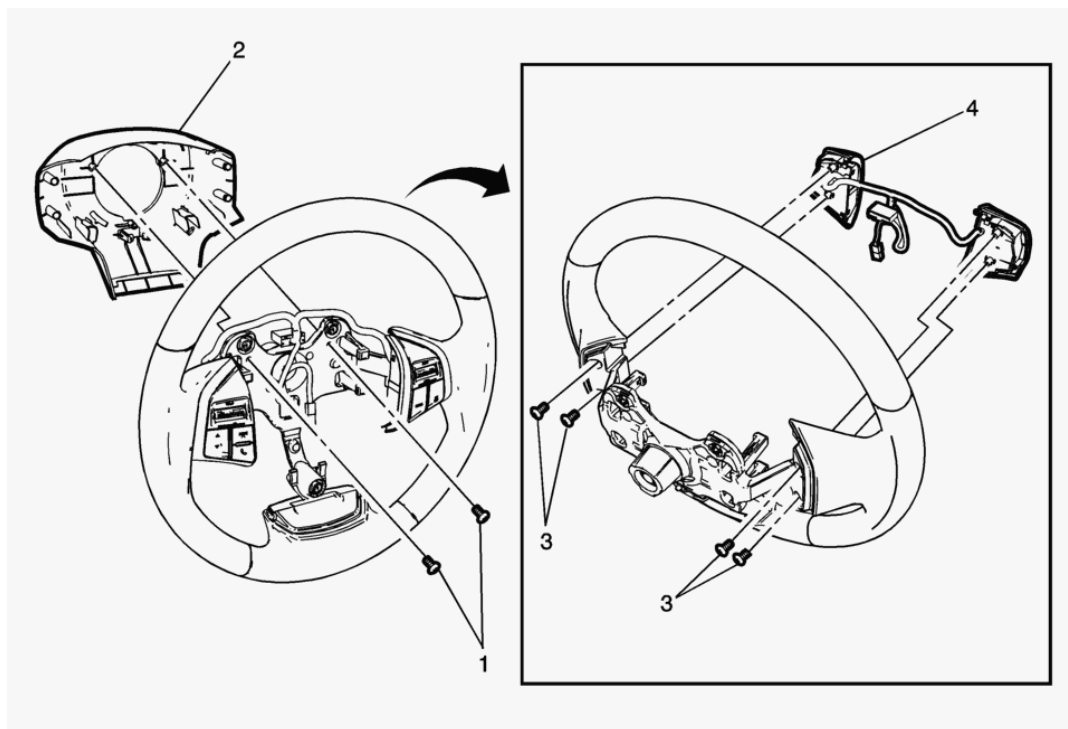
- The ECM detects a malfunction in the engine speed sensor circuit.
- The BCM detects a loss of serial data communications with the ECM.
- The instrument cluster detects a loss of serial data communications with the BCM.

[Driver Information Center Display](#)

In the lower middle of the instrument cluster, an additional display is installed. Its task is to give additional information, such as an odometer or error codes. This part of the instrument cluster is available in 4 different variants, mostly depending on the assembled engine. For further information refer to Driver Information Center (DIC) Description and Operation.

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Radio and Trip Odometer Control Switch Replacement

Callout

Component Name

Preliminary Procedure

Remove the steering wheel. Refer to Steering Wheel Replacement.

Callout

Component Name

1

Steering Wheel Cover Bolts (Qty: 2)

Caution: Refer to Fastener Caution.

2

Steering Wheel Cover

3

Radio and Trip Odometer Control Switch Bolts (Qty: 4)

Caution: Refer to Fastener Caution.

4

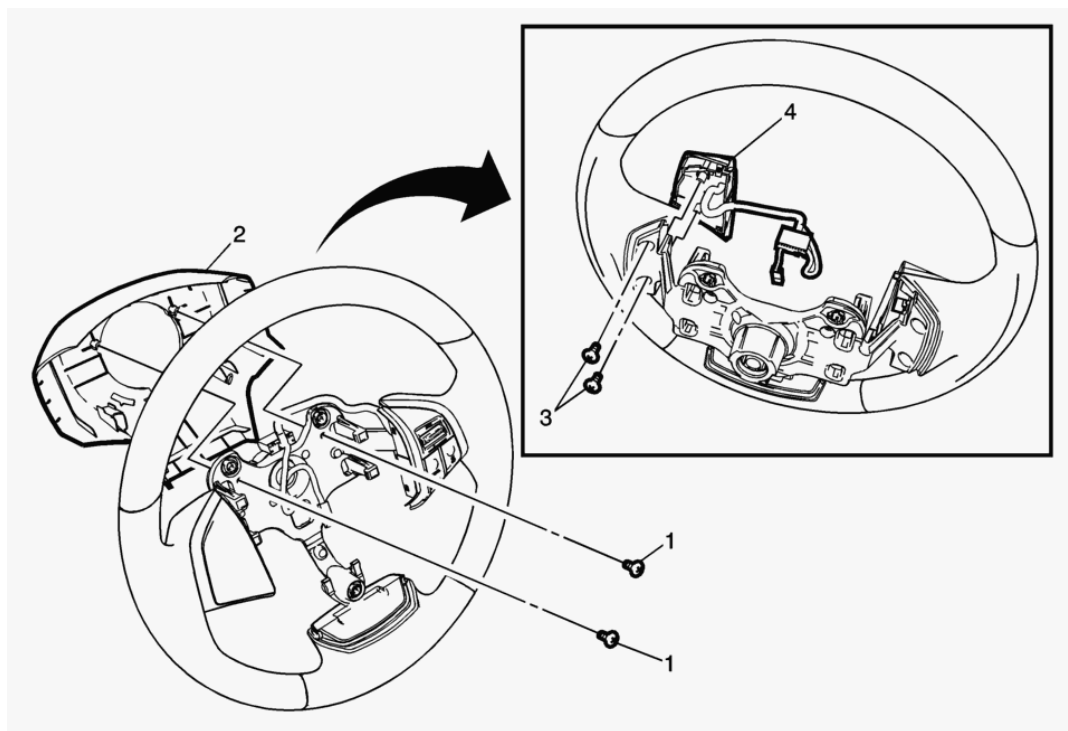
Radio and Trip Odometer Control Switch

Procedure

Disconnect the electrical connectors.

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Radio and Trip Odometer Control Switch Replacement

Callout

Component Name

Preliminary Procedure

Remove the steering wheel. Refer to Steering Wheel Replacement.

Callout**Component Name**

1

Steering Wheel Cover Bolts (Qty: 2)

Caution: Refer to Fastener Caution.

2

Steering Wheel Cover

3

Radio and Trip Odometer Control Switch Bolts (Qty: 2)

Caution: Refer to Fastener Caution.

4

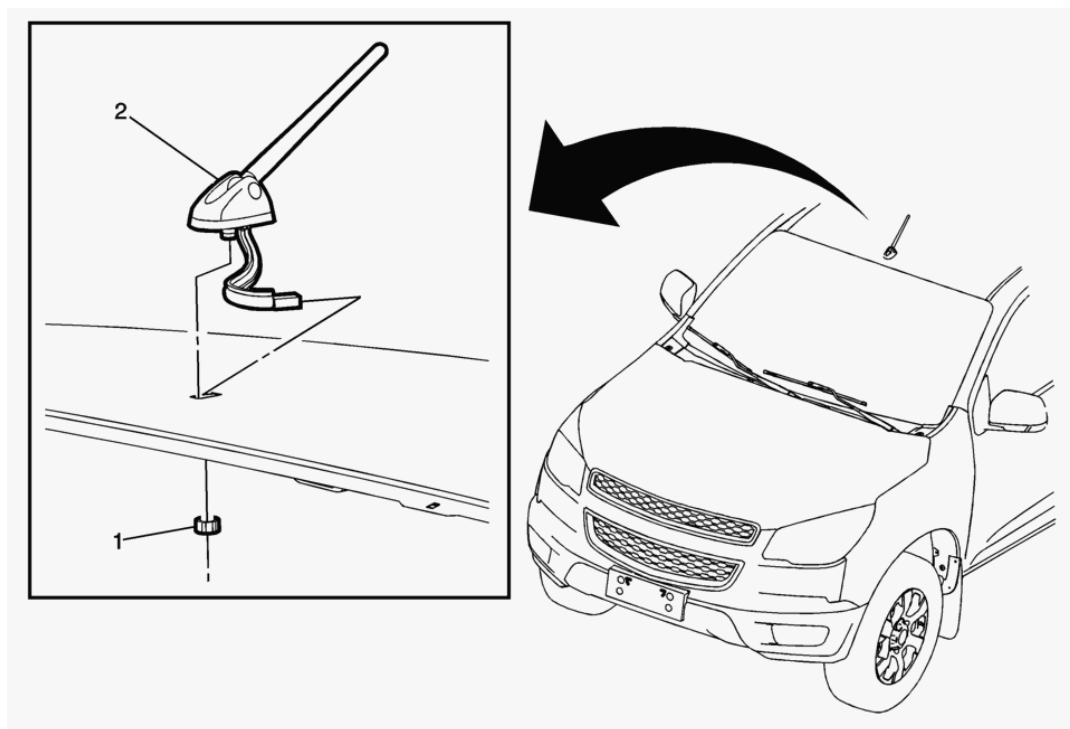
Radio and Trip Odometer Control Switch

Procedure

Disconnect the electrical connectors.

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Radio Antenna Base Replacement

Callout

Component Name

Preliminary Procedure

Lower the front of the headlining trim panel. Refer to Headlining Trim Panel Replacement.

Callout

Component Name

1

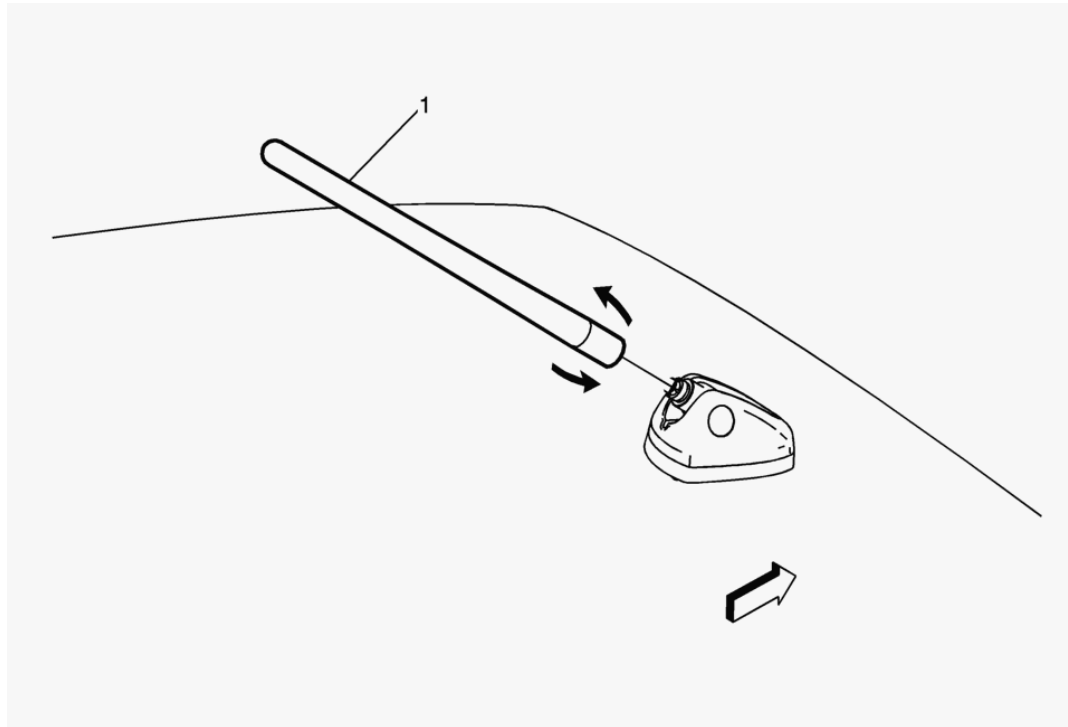
Radio Antenna Base Fastener
Caution: Refer to Fastener Caution.
Tighten
9 Y (80 lb in)

2

Radio Antenna Base
Procedure
Disconnect the electrical connector.

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Radio Antenna Replacement

Callout

1

Radio Antenna

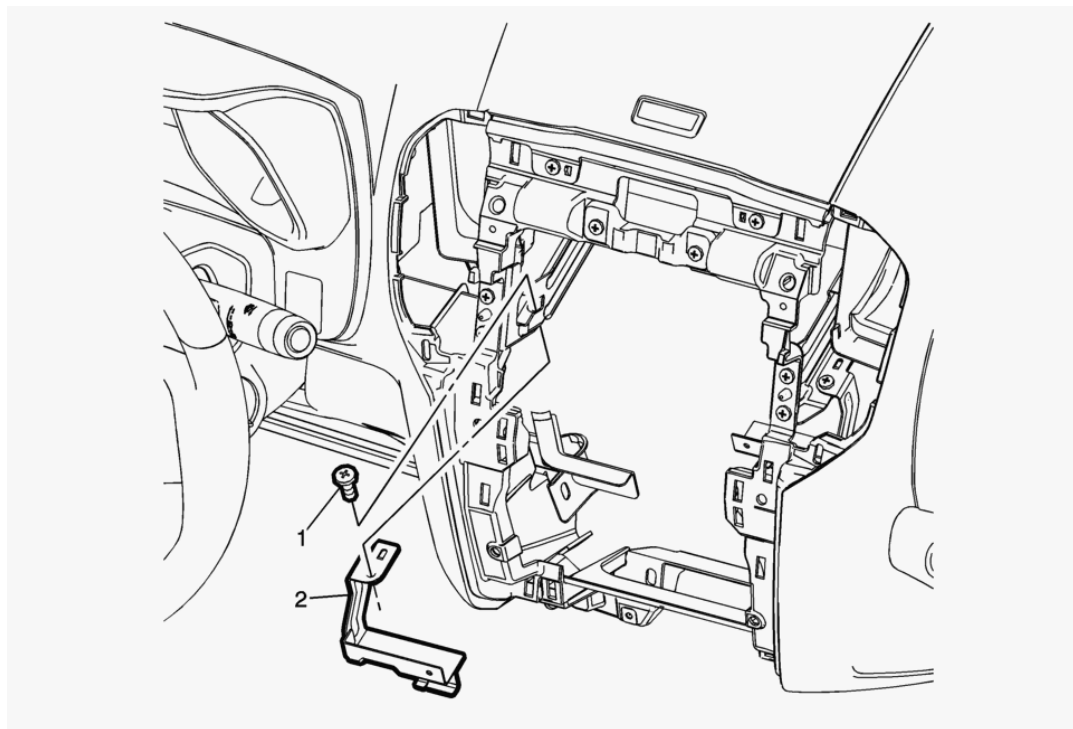
Component Name

Procedure

Rotate the mast counterclockwise in order to release the mast from the antenna base.

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Radio Bracket Bracket Replacement

Callout

Component Name

Preliminary Procedure

Remove the radio. Refer to Radio Replacement.

Callout

1

Radio Bracket Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

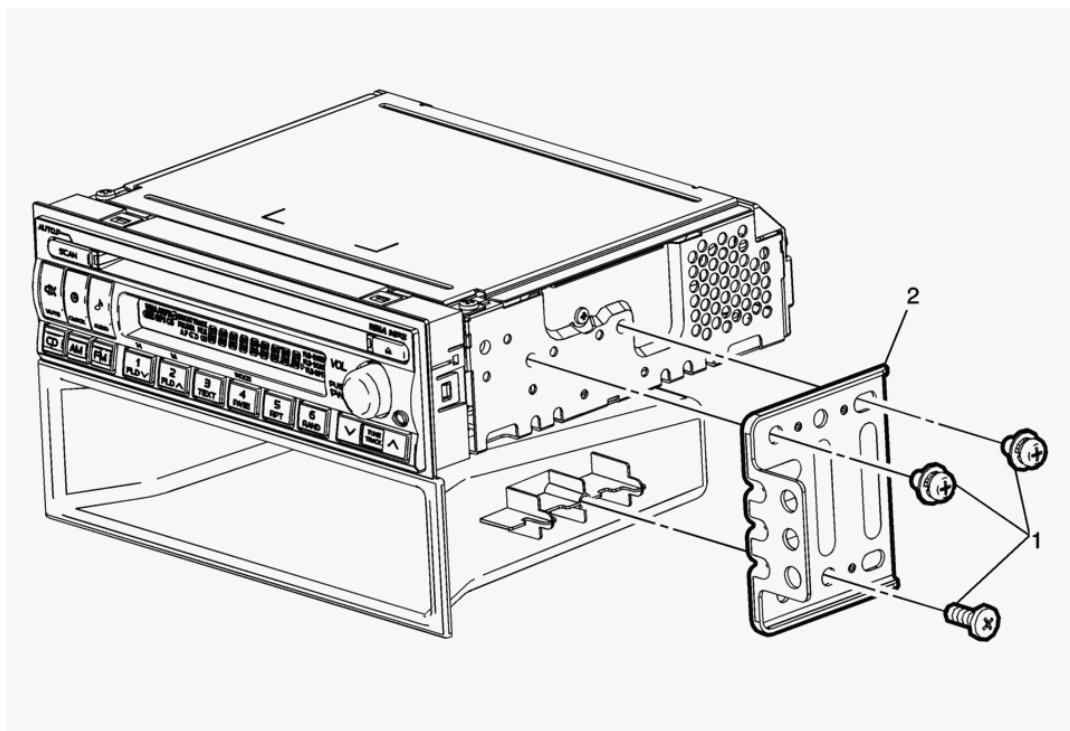
2

Radio Bracket Bracket (Qty: 2)

Component Name

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Radio Bracket Replacement

Callout

Component Name

Preliminary Procedure

Remove the radio. Refer to Radio Replacement.

Callout

1

Radio Bracket Fastener (Qty: 6)

Caution: Refer to Fastener Caution.

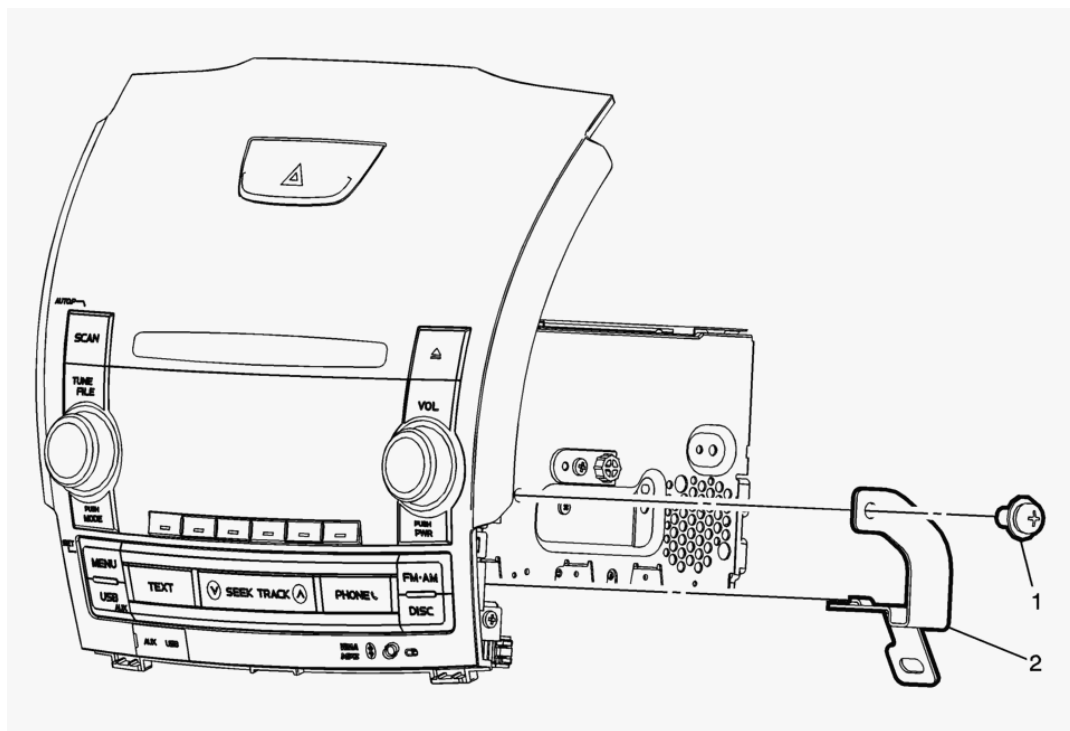
2

Radio Bracket (Qty: 2)

Component Name

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Radio Bracket Replacement

Callout

Component Name

Preliminary Procedure

Remove the radio. Refer to Radio Replacement.

Callout

1

Radio Bracket Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

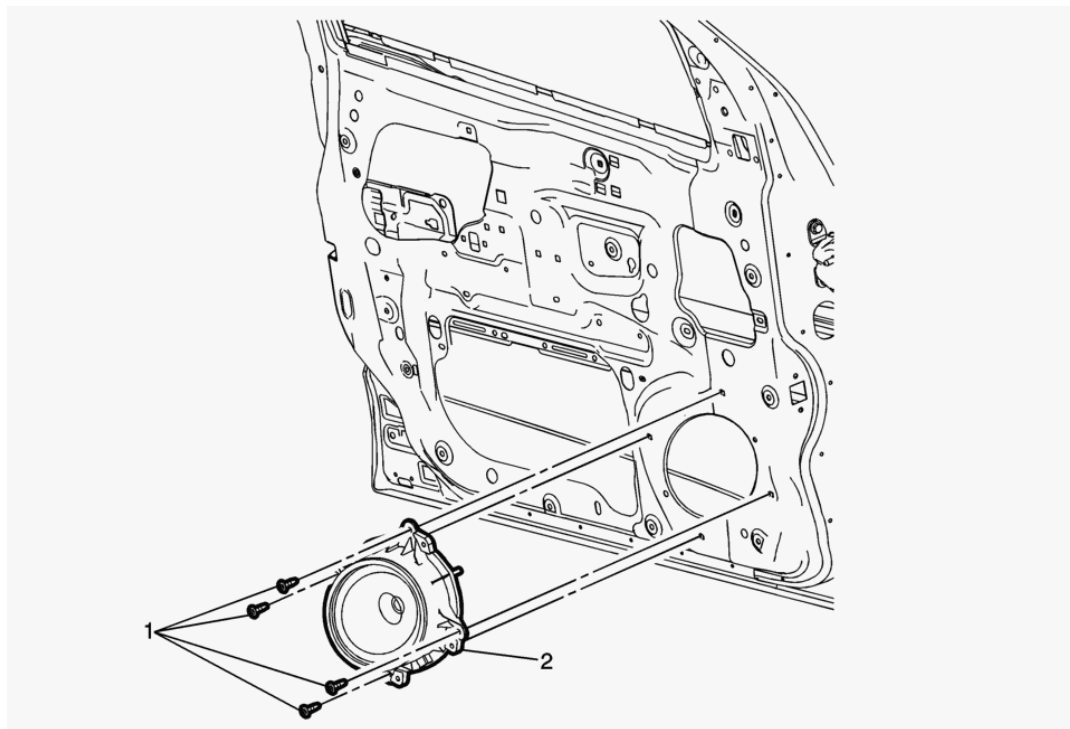
2

Radio Bracket (Qty: 2)

Component Name

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Radio Front Side Door Speaker Replacement

Callout

Component Name

Preliminary Procedure

Remove the front side door trim panel. Refer to Front Side Door Trim Panel Replacement.

Callout

Component Name

1

Radio Front Side Door Speaker Fastener (Qty: 4)

Caution: Refer to Fastener Caution.

2

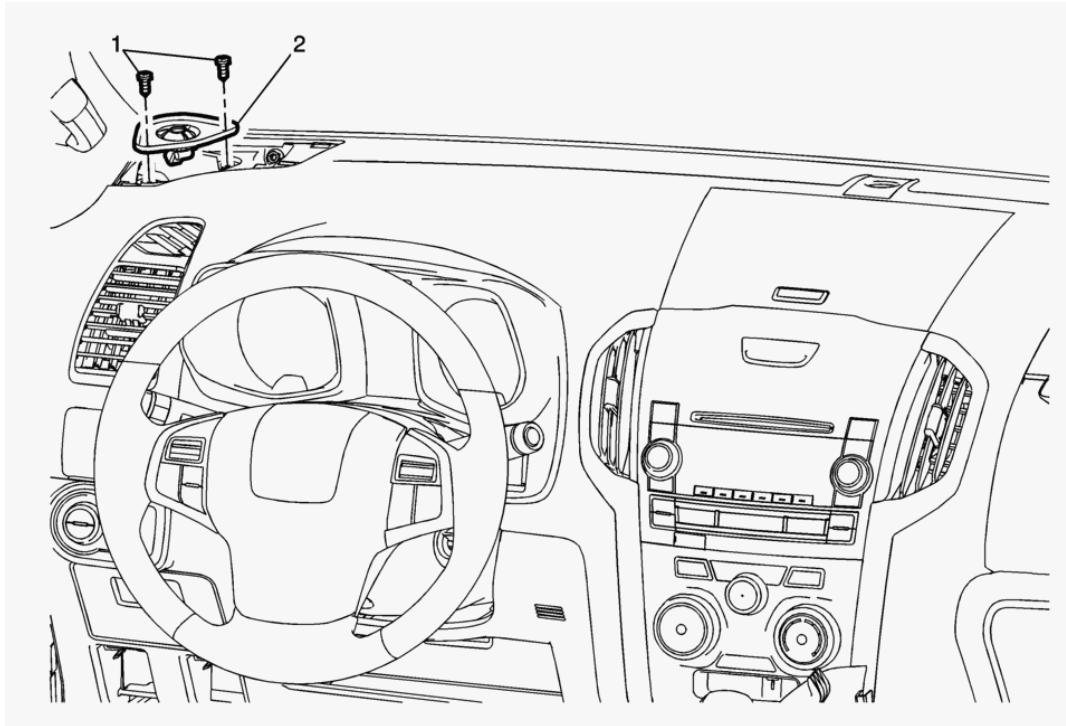
Radio Front Side Door Speaker

Procedure

Disconnect the electrical connector.

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Radio Front Side Door Upper Speaker Replacement

Callout

Component Name

Preliminary Procedure

Remove the instrument panel accessory trim plate grille. Refer to Instrument Panel Accessory Trim Plate Grille Replacement.

Callout

Component Name

1

Radio Front Side Door Upper Speaker Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

2

Radio Front Side Door Upper Speaker

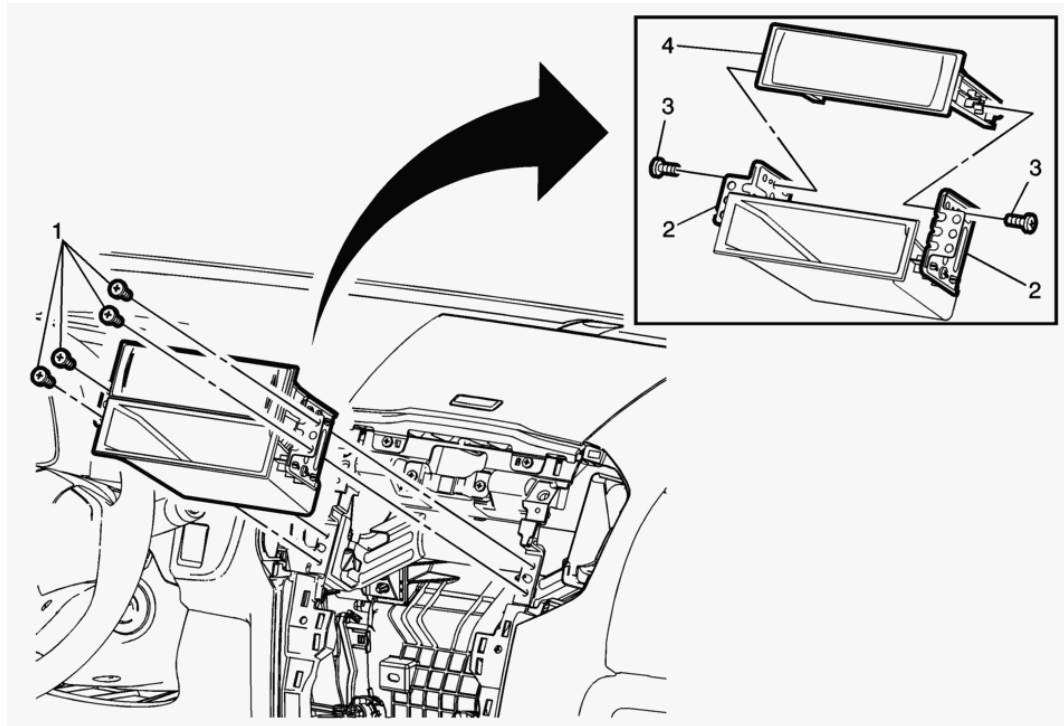
Procedure

Disconnect the electrical connector.

Note: Left side speaker shown, right side is similar.

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Radio Installation Opening Cover Replacement

Callout

Component Name

Preliminary Procedure

Remove the instrument panel center air outlet grille. Refer to Instrument Panel Center Air Outlet Grille Replacement.

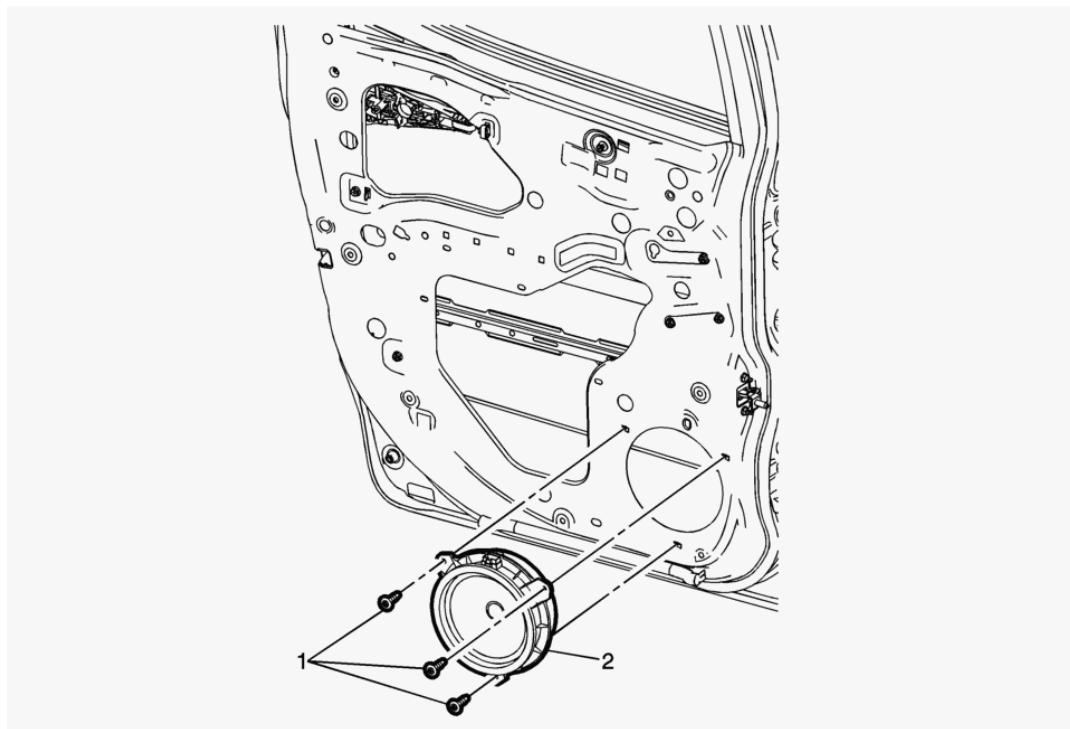
Callout

Component Name

- 1
Tighten
Radio Bracket Bolt (Qty: 4)
Caution: Refer to Fastener Caution.
8 Y (71 lb in)
- 2
Radio Bracket (Qty: 2)
- 3
Tighten
Radio Opening Cover Bolt (Qty: 2)
2 Y (18 lb in)
- 4
Radio Opening Cover

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Radio Rear Side Door Speaker Replacement

Callout

Component Name

Preliminary Procedure

Remove the rear side door trim. Refer to Rear Side Door Trim Panel Replacement.

Callout

Component Name

1

Radio Rear Side Door Speaker Fasteners (Qty: 3)

Caution: Refer to Fastener Caution.

2

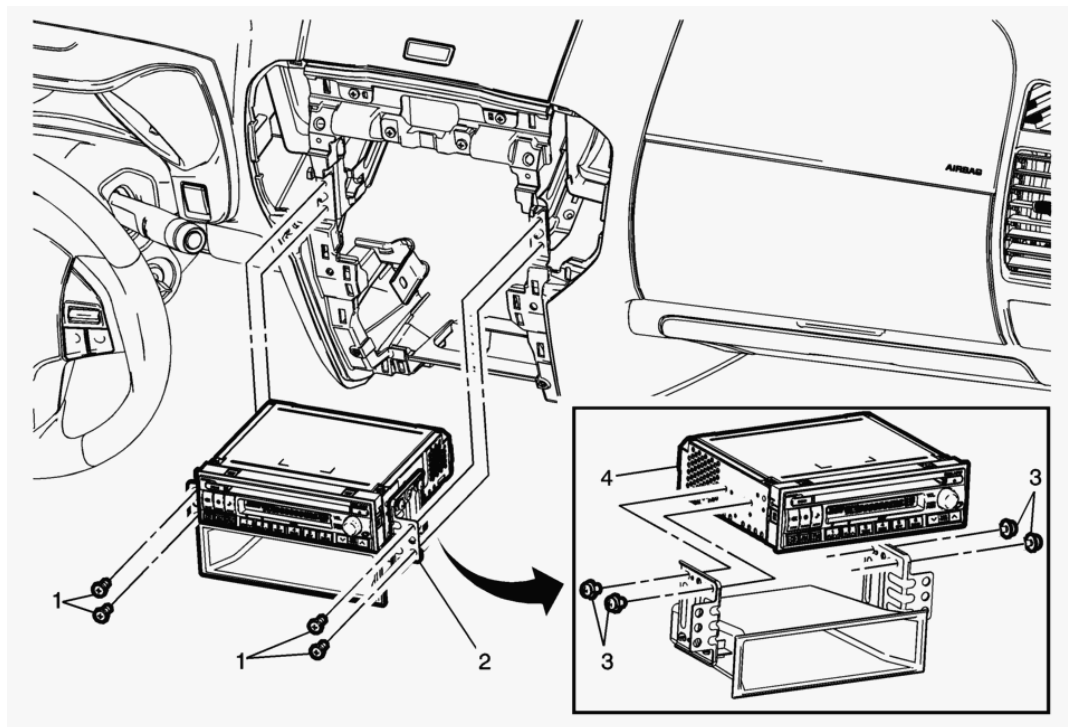
Radio Rear Side Door Speaker

Procedure

Disconnect the electrical connectors.

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Radio Replacement

Callout

Component Name

Preliminary Procedure

Remove the instrument panel center trim plate. Refer to Instrument Panel Center Trim Plate Replacement.

Callout

Component Name

1 Radio Bracket Fastener (Qty: 4)
Caution: Refer to Fastener Caution.
Tighten
8 Y (71 lb in)

2 Radio Bracket (Qty: 2)

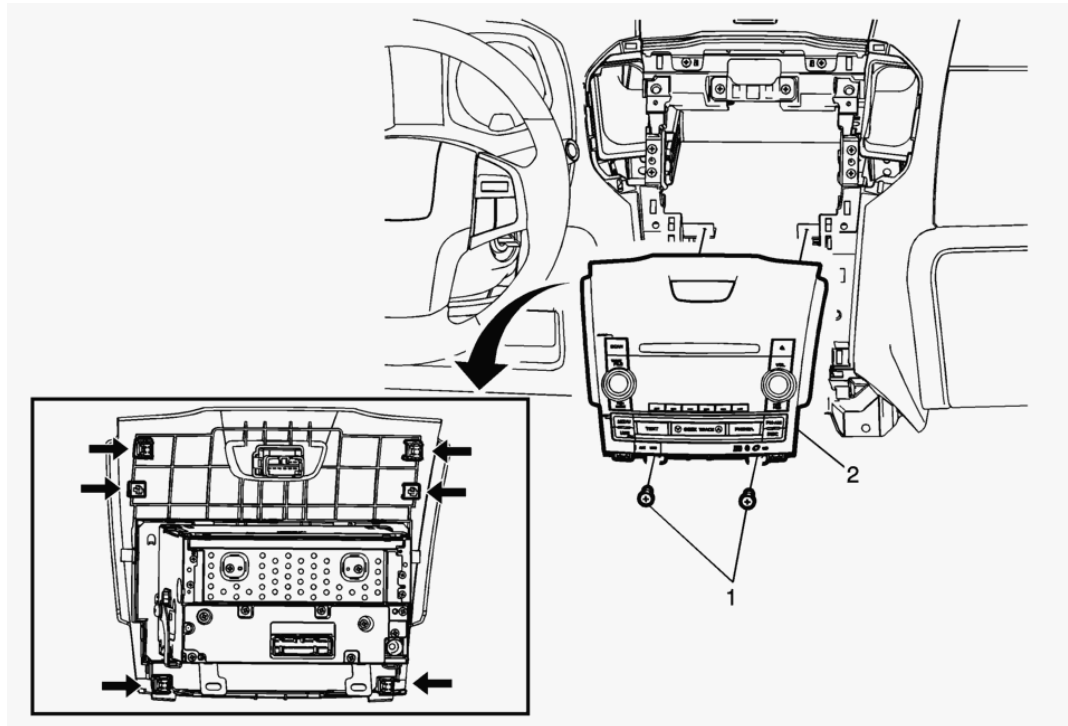
3 Radio Fastener (Qty: 4)
Caution: Refer to Fastener Caution.

Radio
Procedure
4

1. Disconnect the electrical connectors.
2. Refer to Control Module References for programming and set up information.

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Radio Replacement

Callout

Preliminary Procedure

Remove the automatic heater and air conditioning control. Refer to Heater and Air Conditioning Control Replacement or the manual heater and air conditioning control. Refer to Heater and Air Conditioning Control Replacement.

Component Name

Callout

Component Name

1

Radio Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

Radio Assembly

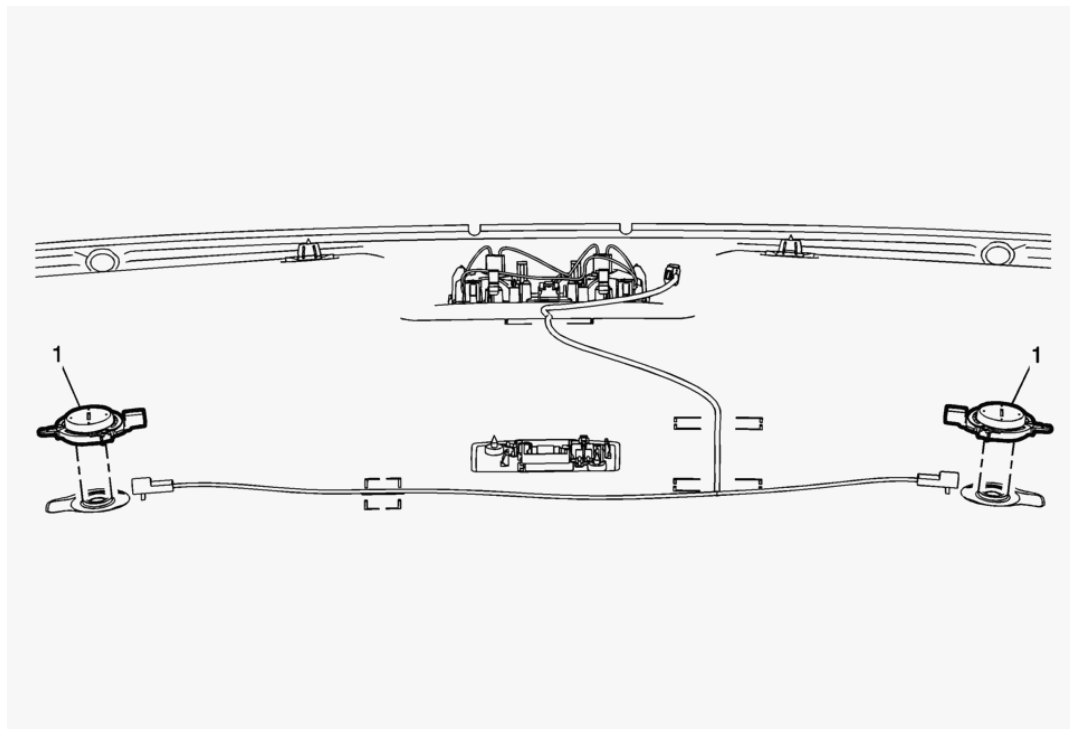
Procedure

2

1. Using the appropriate tool, gently pull assembly forward, releasing the six tabs.
2. Disconnect the electrical connections.
3. Refer to Control Module References for programming and setup information.

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Radio Roof Speaker Replacement

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Component Name

Preliminary Procedure

Remove the headlining trim panel. Refer to Headlining Trim Panel Replacement.

Callout

Component Name

Radio Roof Speaker

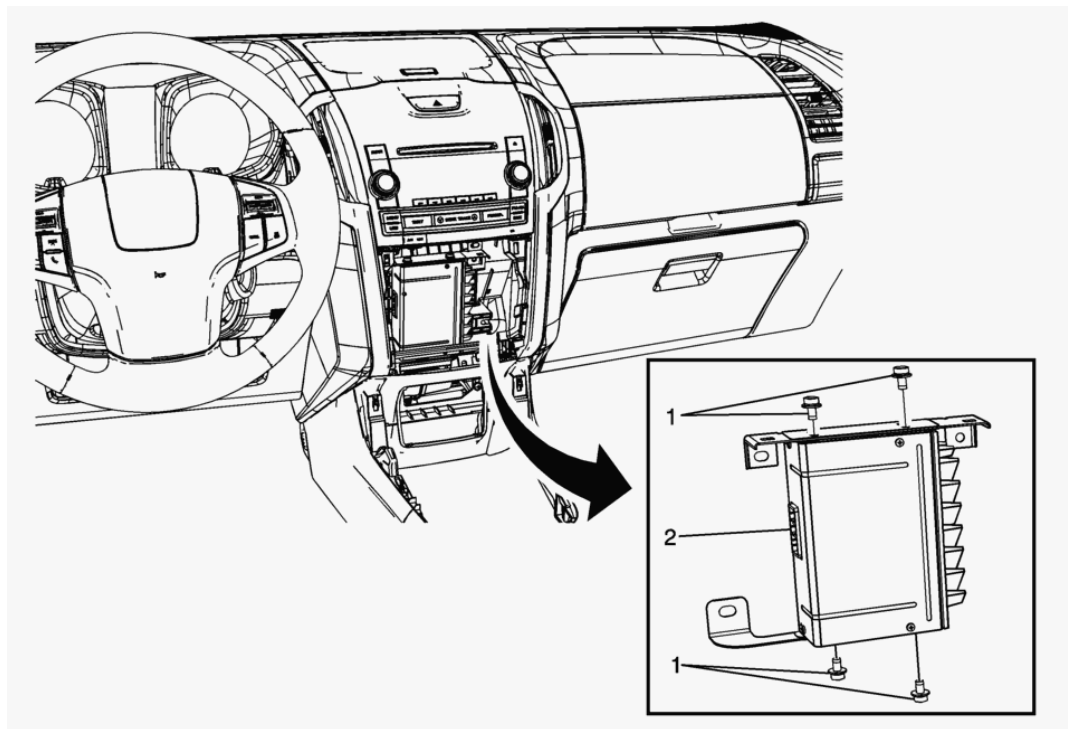
Procedure

1

1. Disconnect electrical connector.
2. Unscrew speaker from bracket on headliner assembly.

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Radio Speaker Amplifier Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the front floor console transmission shift opening bezel. Refer to Front Floor Console Transmission Shift Opening Bezel Replacement.
2. Remove the heater and air conditioning control. Refer to Heater and Air Conditioning Control Replacement.

1

Radio Speaker Amplifier Fasteners (Qty: 4)

Caution: Refer to Fastener Caution.

Radio Speaker Amplifier

Procedure

2

1. Disconnect the electrical connectors.
2. For programming and set up information, refer to Control Module References.

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[Radio System Components](#)

The entertainment system on this vehicle is available in two different configurations.

The entertainment system on this vehicle is configured with either a 1DIN or a 2DIN system. Both systems contain a radio, antenna, and up to 8 speakers, depending on the speaker configuration. The 2DIN system differs from the 1DIN system by providing the customer with enhanced audio system features. Some of those features may include steering wheel controls, auxiliary input jack, USB port, or bluetooth communication system.

Each item in the list below represents topics covered in detail below.

- Radio Circuit Operation
- Antenna System
- AM/FM Reception
- Speaker Operation
- Radio Data System (RDS) (if equipped)
- MP3/CD Formatting Information for MP3/CD Radios (if equipped)
- Steering Wheel Controls (if equipped)
- Auxiliary Input Jack (if equipped)
- USB Input Jack (if equipped)
- Bluetooth Communication System (if equipped)

[Radio Circuit Operation](#)

Radio Power

The radio is supplied with power by a fused B+ circuit. The radio uses a discrete ignition feed circuit for power moding.

Radio Grounds

The vehicle harness provides a ground for the radio circuits. The radio may also be case grounded.

Radio Outputs

At minimum volume, the plus (+) and minus (-) speaker outputs are approximately half battery voltage, measured to vehicle ground. As the volume increases, the plus and minus change to create a voltage difference between each other either driving the voice coil of the speaker, or being fed to an amplifier.

[Antenna System](#)

Fixed Mast Antenna

The fixed mast antenna can withstand most car washes without being damaged. If the mast should ever become slightly bent, straighten it out by hand. If the mast is badly bent, replace it.

[AM/FM Reception](#)

Radio Signal

The radio signal is sent from a broadcast station and is then received by an antenna. The strength of the signal received depends on the following:

- The power output (wattage) of the broadcasting station
- The location of the vehicle (or receiver) relative to the broadcast tower.
- Obstacles between the tower and the receiver
- Atmospheric conditions
- What band (AM or FM) the station is broadcasting
- Type of antenna and the ground plane

AM Reception

The AM band has a lower frequency range than the FM band. These longer wavelengths:

- Bend around obstacles
- Follow the curvature of the earth
- May reflect off the ionosphere (skip)

The AM frequencies have longer range due to the ground wave. The ground wave follows the curvature of the earth and is effected by its conductivity. Greater conductivity equates to less signal loss thus transmission over water is better than over land. The AM band has a range of 80–320 km (50–200 mi).

FM Reception

The shorter wavelengths of the higher frequency FM band:

- Reflect off obstacles
- Are absorbed by the ground
- Penetrate the ionosphere

Broadcasts in the FM band are limited to "line of sight" reception which is typically 40 km (25 mi). Even when out of a direct line of sight, the signal may be reflected into areas that may be in a "shadow" otherwise. Factors which affect the line of sight include:

- Height of the broadcast antenna
- Height of the receiving antenna
- Terrain and buildings in the broadcast path

[Speaker Operation](#)

Speakers turn electrical energy into mechanical energy to move air, using a permanent magnet and an electromagnet. The electromagnet is energized when the radio or amplifier (if equipped) delivers current to the voice coil on the speaker. The voice coil will form a north and south pole that will cause the voice coil and the speaker cone to move in relation to the permanent magnet. The current delivered to the speaker is rapidly changing alternating current (A/C). This causes the speaker cone to move in two directions producing sound. When the speaker is at rest, such as when the volume at a minimum value, the voltage applied to each side of the speaker is half ignition system voltage. This way, the speaker cone can be moved in either direction.

[Radio Data System \(RDS\) \(If Equipped\)](#)

The radio may be equipped with the Radio Data System (RDS). The RDS feature is available only on FM stations that broadcast RDS information. This system relies upon receiving specific information from these stations and only works when the information is available. While the radio is tuned to an FM RDS station, the station name or call letters display.

RDS data is carried in what is known as a "subcarrier". A subcarrier is a frequency that the FM broadcaster is authorized to use to send data that is not audible in the main audio program.

- RDS functions will only work with FM broadcast stations that are broadcasting RDS data.
- Not all FM Broadcast stations broadcast RDS data or offer all of the RDS services.
- The information displayed is dependent upon the information broadcast by the particular station. The information may vary greatly between stations.
- RDS functions may not work properly when reception is weak, reception is of poor quality, or RDS is not implemented properly by the FM Broadcaster.
- In some cases, a radio station broadcasting incorrect information may cause the RDS features of the radio to appear to work improperly

With RDS, the radio can do the following:

- Seek to stations broadcasting the selected type of programming
- Receive announcements concerning local and national emergencies
- Display messages from radio stations

RDS may display text information such as:

- The name of the station.
- The type of program
- General information such as artist and song title, call in phone numbers, etc.

[MP3/CD Formatting Information for MP3/CD Radios.](#)

The MP3/CD equipped radios will play standard audio CDs, and MP3/WMA files that were recorded on a CD-R or CD-RW disc. Customers who record their own music CDs should be aware of the following:

- The radio will only play audio from a CD-R/RW, it cannot record audio.
- Standard audio and MP3/WMA files should not be mixed on a disc.
- Song title, artist name, and album can display when files are recorded using ID3 tags version 1 and 2.
- Long file, folder, or playlist names, or a combination of a large number of files and folders, or playlists can cause the player to be unable to play up to the maximum number of files, folders, playlists, or sessions.
- The radio supports multi-session discs, but only the files from the last session will be played.

[Steering Wheel Controls \(if equipped\).](#)

Some audio functions are available using the steering wheel controls. The steering wheel controls duplicate the function of the primary controls available on the radio.

For additional information on steering wheel controls, refer to Steering Wheel Controls Description and Operation.

[Auxiliary Input Jack \(if equipped\).](#)

The 2DIN radio system has a 3.5 mm (0.14 in) auxiliary input jack located in the faceplate. An external audio device such as a MP3 player, CD changer, laptop computer, cassette tape player, etc. can be connected to the auxiliary input jack for use as another source for audio listening. This is not an audio output; do not plug a headphone set into the auxiliary input jack.

[USB Input Jack \(if equipped\).](#)

The 2DIN radio system has a USB input jack which makes it possible to play digital audio stored on a USB device via your vehicle sound system simply by connecting it to the USB port on the faceplate.

[Bluetooth Communication System \(If equipped\).](#)

The Bluetooth communication system, integrated to the 2DIN radio system allows a mobile phone (equipped with Bluetooth) to be used through the hands-free system in the vehicle without the need for connections, making it possible to keep within the law and to drive safely and comfortably. The microphone is internal to the radio, located in the faceplate. In the steering wheel controls is one button to switch the hands-free system ON and OFF. The main functions like phone menu, dialing or call options are controlled by the radio buttons.

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Speaker Replacement Reference

Component	Repair Instruction
Front Door Speaker	Radio Front Side Door Speaker Replacement
Front Tweeter Speaker	Radio Front Side Door Upper Speaker Replacement
Rear Door Speaker	Radio Rear Side Door Speaker Replacement
Subwoofer Speaker (exciter)	Radio Roof Speaker Replacement

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Fuel Delivery: | **Fuel:**

The audio steering wheel control switches duplicate the function of the primary controls of the associated component, through a network of multiple momentary contact switches and a series of resistors. The radio supplies voltage to the switches and monitors the return signal for a specific voltage drop to occur unique to the one pressed. The radio then identifies the switch selected to activate the feature, otherwise sends a serial data message that is received by the component controlled, activating the feature.

This section is intended to diagnosis the circuits between the radio and the audio 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 functioning.