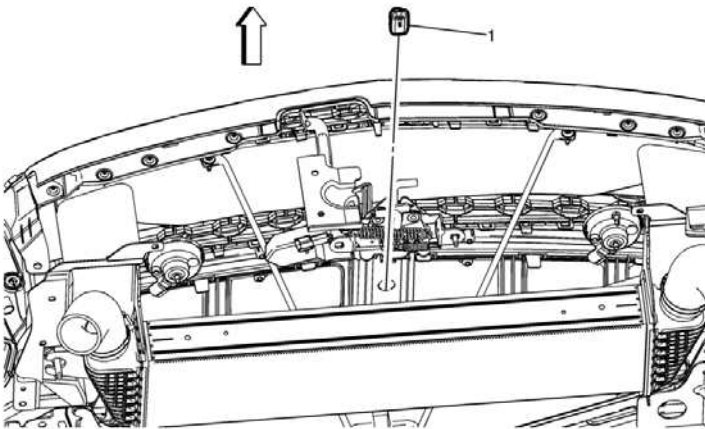


2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Ambient Air Temperature Gauge Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove radiator grille support Refer to. Front Grille Support Reinforcement Replacement.

Ambient Air Temperature Sensor

Procedure

1

1. Disconnect the electrical connector.
2. Unsnap the temperature sensor.

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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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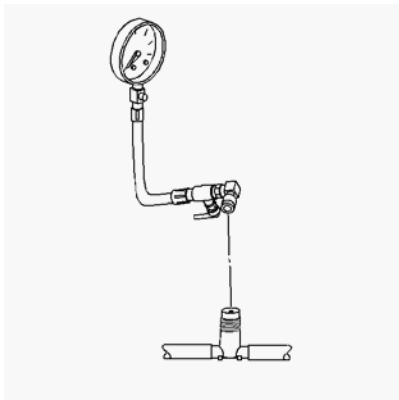
Special Tools

J 34730-1A Fuel Pressure Gauge

For regional tools refer to Special Tools

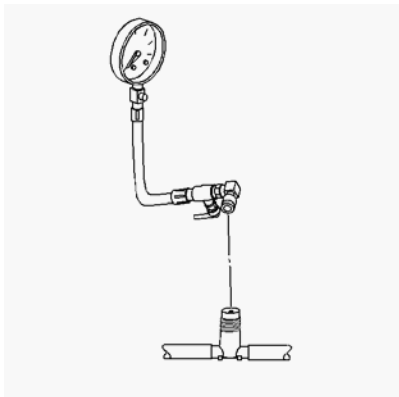
[Installation Procedure](#)

Warning: Remove the fuel tank cap and relieve the fuel system pressure before servicing the fuel system in order to reduce the risk of personal injury. To relieve the fuel system pressure, a small amount of fuel may be released when servicing the fuel lines, the fuel injection pump, or the connections. To reduce the risk of personal injury, cover the fuel system components with a shop towel before disconnection. This will catch any fuel that may be released in an approved container when the disconnection is complete.



1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Remove the shop towel from around the fuel rail service port, and place in an approved gasoline container.
3. Perform any tests and/or diagnostics as needed. For the proper usage of the J 34730-1A fuel pressure gauge, refer to the manufacturer's instructions.

[Removal Procedure](#)



1. Relieve the fuel system pressure, if required. Perform the following steps:

Warning: Wrap a shop towel around the fuel pressure connection in order to reduce the risk of fire and personal injury. The towel will catch any fuel leakage that occurs during the connection of the fuel pressure gauge. Place the towel in an approved container when the connection is complete.

1. Wrap a shop towel around the fuel rail service port.
2. Place the hose approved gasoline container.
3. Open the valve in order to bleed any fuel from the fuel rail.
4. Close the valve.
5. Remove the hose from the approved gasoline container.
6. Remove the shop towel from around the fuel rail service port, and place in an approved gasoline container.

Caution: Clean all of the following areas before performing any disconnections in order to avoid possible contamination in the system:

- The fuel pipe connections
 - The hose connections
 - The areas surrounding the connections
2. Disconnect the *J 34730-1A* fuel pressure gauge from the fuel rail service port.
 3. Install the fuel rail service port cap.
 4. Tighten the fuel fill cap.

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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.

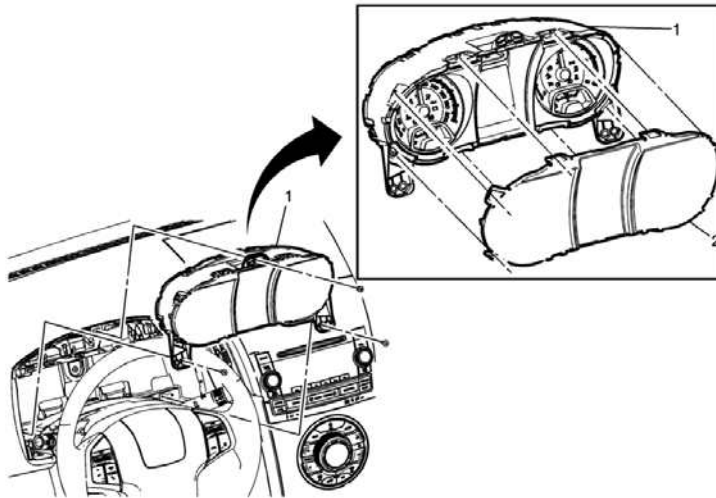
CHANGE TIMING BELT MESSAGE

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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Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Instrument Cluster Lens Replacement

Callout

1

Instrument Cluster

Refer to Instrument Cluster Replacement

2

Instrument Cluster Lens

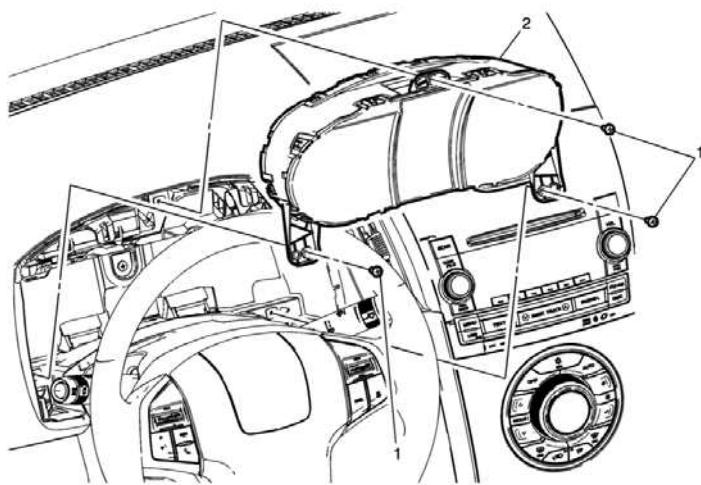
Procedure

Unsnap the instrument cluster lens from the instrument cluster assembly.

Component Name

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

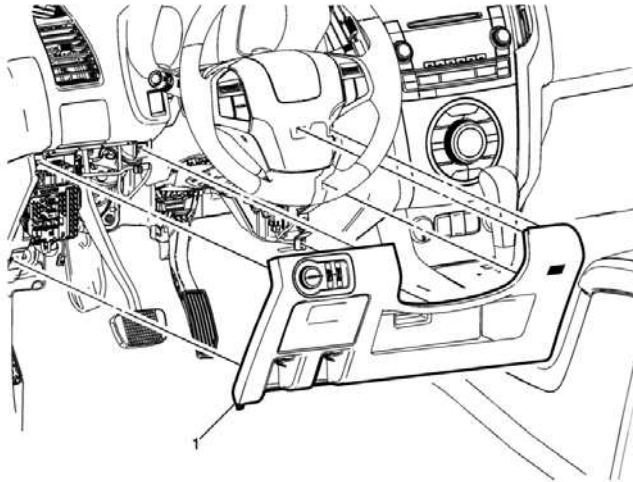


Instrument Cluster Replacement

Callout	Component Name
Preliminary Procedure	
Remove the instrument panel cluster trim plate. Refer to Instrument Panel Cluster Trim Plate Replacement.	
Instrument Cluster Fasteners (Qty: 3)	
1	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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Instrument Lower Panel Replacement

Callout

Component Name

Preliminary Procedures

1. Remove the hood primary latch release cable handle. Refer to Hood Primary Latch Release Cable Handle Replacement.
2. Remove the fuel tank filler door latch release cable level. Refer to Fuel Tank Filler Door Latch Release Cable Lever Replacement.

Instrument Lower Panel - Driver Side

Procedure

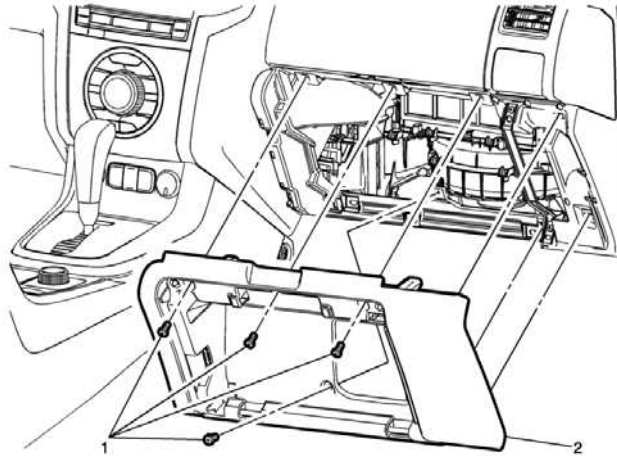
1

1. Use a flat bladed plastic trim tool in order to release the retainers securing the instrument lower panel to the instrument panel assembly.
2. Disconnect the electrical connections, the data link connector and the inside air temperature sensor.

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Instrument Lower Panel Replacement

Callout

Component Name

Preliminary Procedure

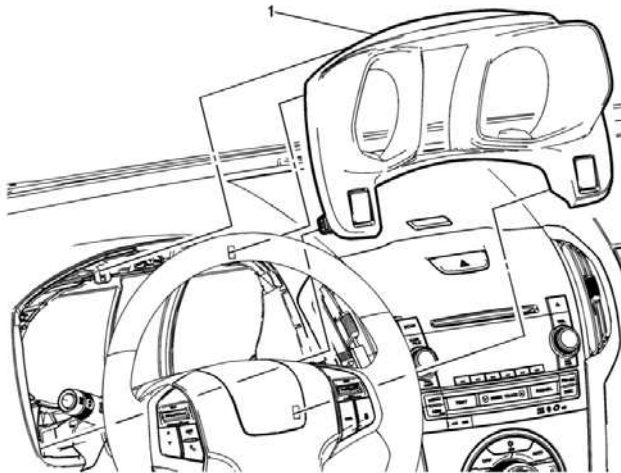
Remove the instrument panel compartment door. Refer to Instrument Panel Compartment Door Replacement.

- 1 Instrument Panel Lower Insulator Fastener (Qty: 4)
Caution: Refer to Fastener Caution.
- 2 Instrument Lower Panel - Passenger Side

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

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Instrument Panel Cluster Trim Plate Replacement

Callout

Component Name

Instrument Panel Cluster Trim Plate Assembly

Procedure

1

1. Use a flat bladed plastic trim tool in order to release the retainer clips securing the cluster trim plate to the instrument panel assembly.
2. Disconnect electrical connections, if applicable.

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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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Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Special Tools

EL 49642 SPS Programming Support Tool

For equivalent regional tools, refer to Special Tools.

Note:

- DO NOT program a control module unless directed to by a service procedure or a service bulletin. If the ECU is not properly configured with the correct calibration software, the ECU will not control all of the vehicle features properly.
- Ensure the programming tool is equipped with the latest software and is securely connected to the data link connector. If there is an interruption during programming, programming failure or ECU damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. Install the *EL-49642* SPS Programming Support Tool to maintain system voltage. If not available, connect a fully charged 12 V jumper or booster pack disconnected from the AC voltage supply. DO NOT connect a battery charger.
- Turn OFF or disable systems that may put a load on the vehicles battery such as; interior lights, exterior lights (including daytime running lights), HVAC, radio, etc.
- During the programming procedure, follow the SPS prompts for the correct ignition switch position.
- Clear DTCs after programming is complete. Clearing powertrain DTCs will set the Inspection/Maintenance (I/M) system status indicators to NO.

Replace and Program ECU or Reprogram ECU

To program a replacement or an existing ECU, perform the following procedure:

1. Install *EL-49642* SPS programming support tool
2. Access the Service Programming System (SPS) and follow the on-screen instructions.
3. On the SPS Supported Controllers screen, select Instrument Cluster – Programming and follow the on-screen instructions.
4. On the SPS Supported Controllers screen, select Instrument Cluster – Setup and follow the on-screen instructions.
5. On the SPS Supported Controllers screen, select Instrument Cluster – Configuration and follow the on-screen instructions.
6. At the end of programming, choose the "Clear All DTCs" function on the SPS screen.

Unsuccessful Programming Recovery

In the event of an interrupted or unsuccessful programming event, perform the following steps:

1. DO NOT turn the ignition OFF. Ensure that all ECU, DLC and programming tool connections are secure and the TIS terminal operating software is up to date.
 2. Attempt to reprogram the ECU.
 3. If the ECU can still not be programmed, turn the ignition OFF for at least one minute.
 4. Turn the ignition ON and attempt to reprogram the ECU. The ECU should program.
- If the ECU still cannot be programmed, replace the ECU.

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Table 1: [Instrument Cluster Scan Tool Data Parameters.](#)

Table 2: [Instrument Cluster Scan Tool Output Controls.](#)

Instrument Cluster Scan Tool Data Parameters

Parameter	Expected Value	Description
<i>Operating Conditions:</i> Ignition ON		
Battery Voltage	12–14 V	The scan tool displays Volts. This is the current battery voltage signal.
Key in Ignition Status	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the key in ignition switch.
Driver Information Center Switch	Varies	The scan tool displays Volts. This is the current driver information center switch input voltage.
Driver Information Center Switch	Inactive	The scan tool displays either Inactive, Up, Down, or Menu. This is the state of the driver information center switch.
Reset Switch	Active/Inactive	The scan tool displays Active or Inactive. This is the state of the reset switch.
Ambient Air Temperature	15°C	The scan tool displays outside temperature in °C.
Washer Fluid Level Switch	Open	The scan tool displays either Open, Closed, or Not Available.
Odometer Lock Status	Active/Inactive	The scan tool displays Active or Inactive depending on the state of the odometer.
Engine Speed	0 RPM	The scan tool displays the filtered value of engine speed.
Vehicle Speed	0 km/h	The scan tool displays the filtered vehicle speed value.
Fuel Level Sensor	—	The scan tool displays the filtered value of the fuel level.
Engine Coolant Temperature	—	The scan tool displays the filtered value of the engine coolant temperature.
Engine Oil Pressure	—	The scan tool displays the filtered value of the engine oil pressure.

Instrument Cluster Scan Tool Output Controls

Output Control	Description
Instrument Cluster Gauge Sweep	This function is used to command the gauges to sweep from minimum to maximum.
Driver Information Center Dimming	This function is used to command the dimming of the driver information display to Increase or Decrease by 10%.
Instrument Panel Dimmer Switch	This function is used to command the dimming of the instrument cluster to Increase or Decrease by 10%.
Driver Information Center Segments	This function is used to command the driver information center segments ON and OFF.
All Indicators	This function is used to command all the indicators ON or OFF.
Driver Information Center Options	This function is used to command the driver information center buttons using the scan tool.
Odometer Programming	This function is used to command the odometer to reset.
CAN Bus Configuration Learn	This function is used to Reset the source ID for low speed CAN Bus communications.

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Fuel Delivery: | Fuel:

Paint thickness gauges measure the total thickness of the vehicle finish. It is important to accurately measure the thickness of the finish on each vehicle as the thickness of the finish will vary on each vehicle. Use a paint gauge before the sanding process in order to accurately measure how much finish there is to remove before, during, and after the sanding process. Paint gauges range from magnetic pull type to sophisticated electronic types, and are available from a variety of sources. The older magnetic type gauges, at best have a 5 percent accuracy range and are not sensitive enough to detect removal of 0.02 mm 0.5 mil (0.0005 in) clearcoat. The newer type magnetic gauges have improved accuracy ranges. Most gauges are confined to checking either ferrous metal, steel, non-ferrous metal, or aluminum panel. At this time, there are no viable gauges for reading film thickness on composite (SCM doors, RIM fenders) panels. The more sophisticated (ETG) electronic paint thickness gauges digital type gauges are able to read film thickness on both ferrous and non-ferrous metal panel. Digital ETG gauges may have an accuracy range of 1 percent and include thickness standards for recalibration. The following paint thickness gauges are available. Call 1-800-GM-TOOLS for information:

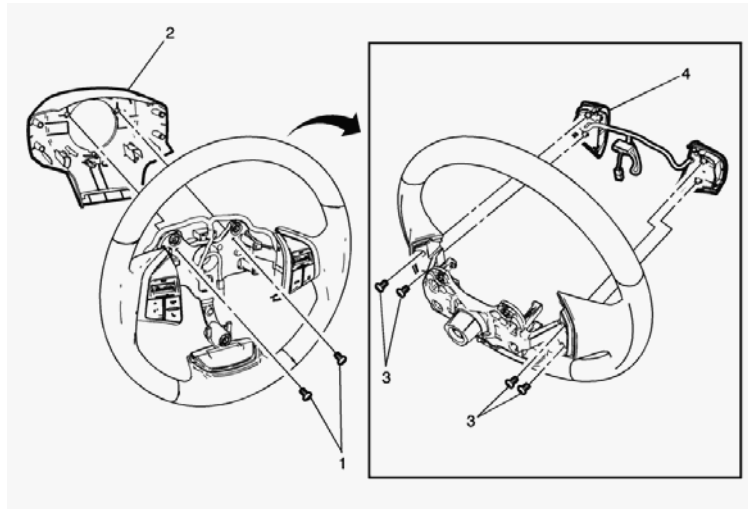
[Paint Thickness Gauges](#)

- 147-5437-ETG Standard model
- 147-5437-ETG-P Standard model with print option
- 147-5437-N-ETG-N Non-ferrous model for aluminum panels
- 147-5437-NP-ETG-NP Non-ferrous model with print option
- 147-54437-SD-ETG Steel and aluminum gauge

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Radio and Trip Odometer Control Switch Replacement

Callout

Component Name

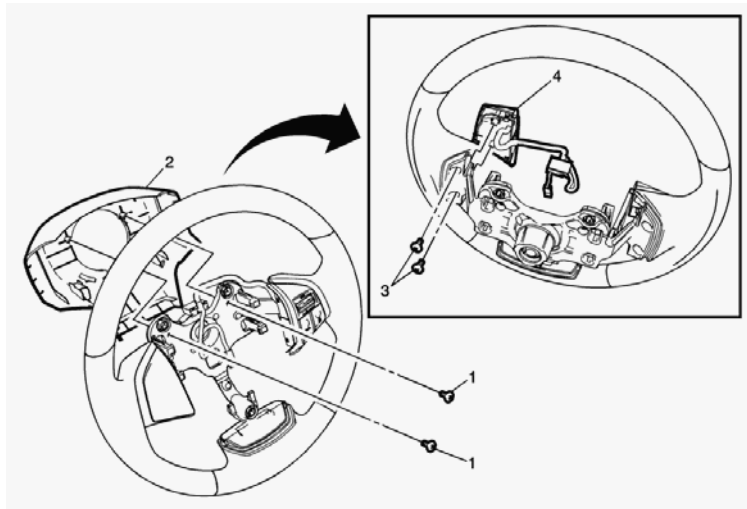
Preliminary Procedure

Remove the steering wheel. Refer to Steering Wheel Replacement.

- 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.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Radio and Trip Odometer Control Switch Replacement

Callout

Component Name

Preliminary Procedure

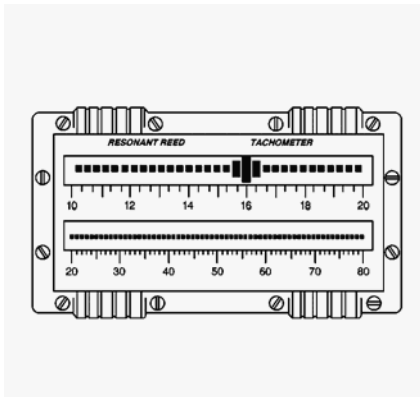
Remove the steering wheel. Refer to Steering Wheel Replacement.

- | | |
|---|---|
| 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. |

2013 Chevrolet Colorado

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The reed tachometer consists of 2 rows of reeds arranged side-by-side. Each reed is tuned to vibrate or resonate when it is excited by a specific frequency. The reeds are arranged by their specific resonant frequency, increasing from left to right, ranging from 10–80 Hz. This arrangement allows for a visual display of the frequencies which fall within this range.

The reed tachometer can be a helpful diagnostic tool, however it is extremely sensitive to external inputs that are not related to the vibration concern, road surfaces, etc., and it is difficult to master its use. Due to these conditions, the reed tachometer has limited diagnostic capability.

Due to the limited diagnostic capability, limited availability and increasing costs of the reed tachometer, it is NOT recommended as the primary tool to a vibration concern.

When diagnosing a vibration concern, use the *EL-38792-A* Electronic Vibration Analyzer (EVA) 2 . The *EL-38792-A* Electronic Vibration Analyzer (EVA) designed to overcome the shortcomings to the reed tachometer. Refer to Electronic Vibration Analyzer (EVA) Description and Operation.