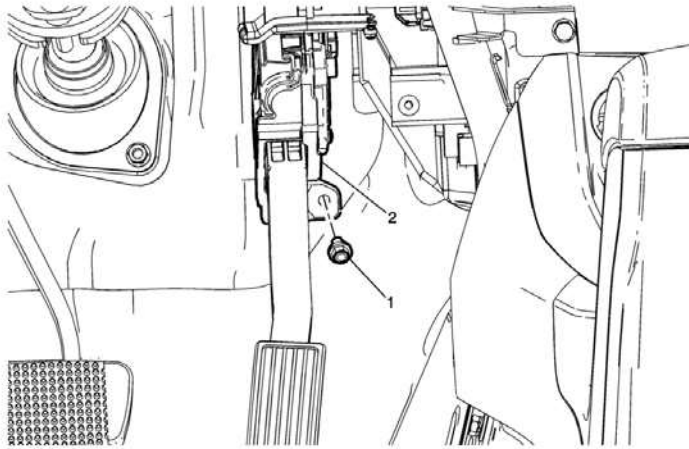


2013 Chevrolet Colorado

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



Accelerator Pedal Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

Accelerator Pedal Position Sensor Fastener (Qty: 2)

Caution: Refer to Fastener Caution

1

Tighten

9 Y(80 lb in)

Accelerator Pedal Position Sensor

2

Procedure

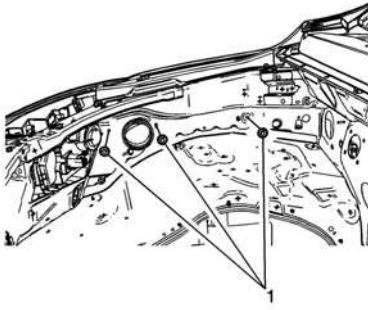
Disconnect the electrical connector from the accelerator pedal position sensor.

2013 Chevrolet Colorado

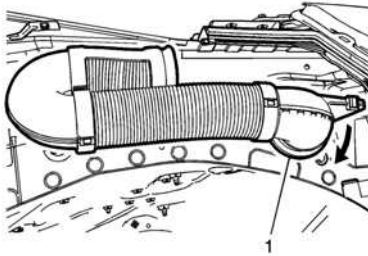
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the right front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement.

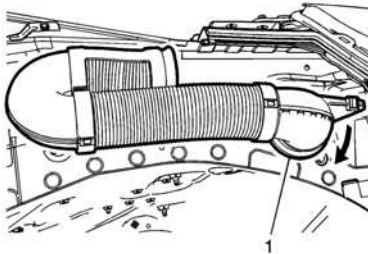


2. Remove the air cleaner inlet duct fasteners (1) shown.



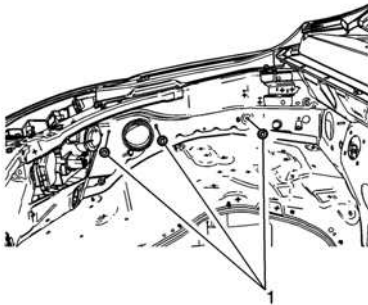
3. Remove the air cleaner inlet duct (1) from the air cleaner assembly and inner fender.

[Installation Procedure](#)



1. Install the air cleaner inlet duct (1) to the air cleaner assembly and inner fender.

Air Cleaner and Front Intake Air Duct Replacement

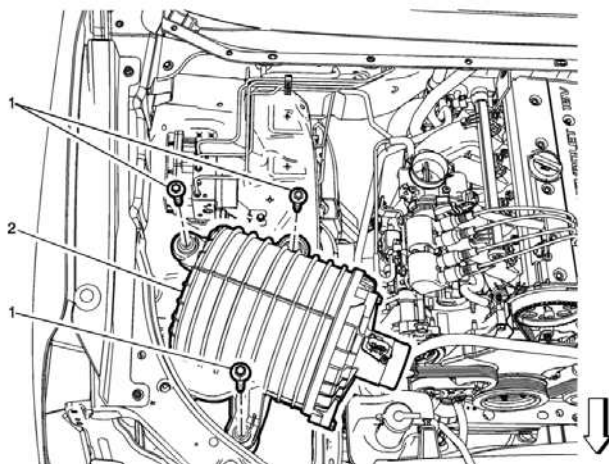


Caution: Refer to Fastener Caution.

2. Install the air cleaner inlet duct fasteners (1).
3. Install the right front wheelhouse liner. Refer to Front Wheelhouse Liner Replacement.

2013 Chevrolet Colorado

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



Air Cleaner Assembly Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Disconnect the mass airflow with intake air temperature sensor electrical connector.

Air Cleaner Assembly Fasteners (Qty: 3)

Caution: Refer to Fastener Caution.

1

Tighten

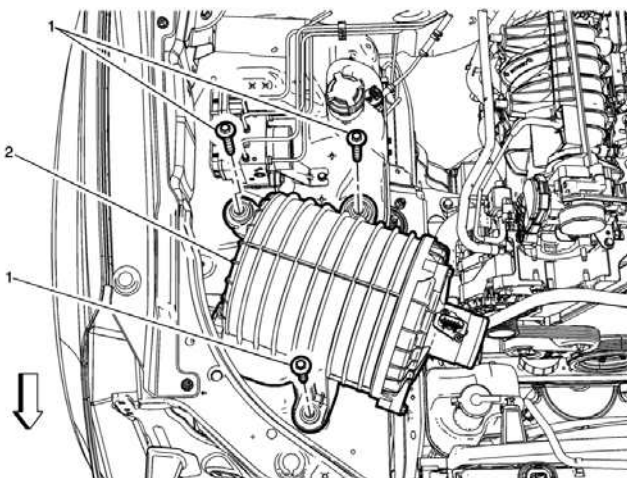
10 Y (89 lb in)

2

Air Cleaner Assembly

2013 Chevrolet Colorado

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

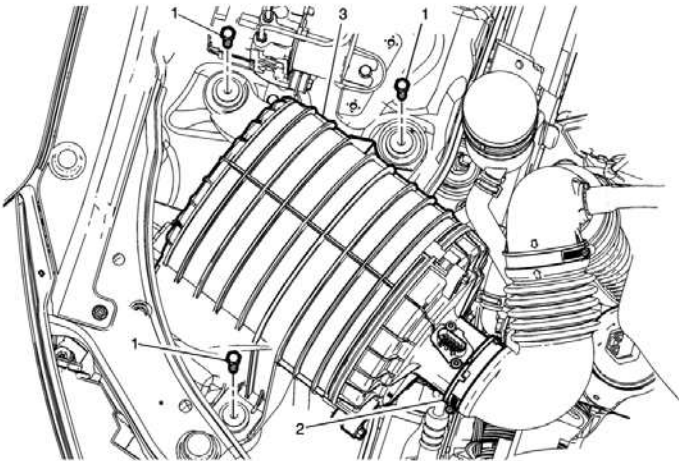


Air Cleaner Assembly Replacement

Callout	Component Name
Preliminary Procedure	
1.	Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2.	Disconnect the mass airflow with intake air temperature sensor electrical connector.
	Air Cleaner Assembly Fasteners (Qty: 3)
	Caution: Refer to Fastener Caution.
1	Tighten 10 Y (89 lb in)
2	Air Cleaner Assembly

2013 Chevrolet Colorado

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



Air Cleaner Assembly Replacement

Callout

Component Name

Preliminary Procedures

1. Disconnect the air cleaner outlet duct from the air cleaner assembly. Refer to Air Cleaner Outlet Duct Replacement.
2. If replacing, remove the mass air flow sensor. Refer to Mass Airflow Sensor with Intake Air Temperature Sensor Replacement.

Air Cleaner Assembly Fastener (Qty: 3)

Caution: Refer to Fastener Caution

1

Tighten

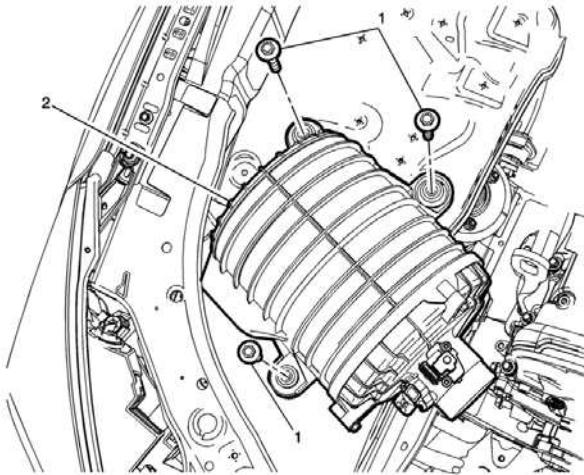
10 Y (89 lb in)

2

Air Cleaner Assembly

2013 Chevrolet Colorado

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



Air Cleaner Assembly Replacement

Callout

Component Name

Preliminary Procedures

1. Disconnect the air cleaner outlet duct from the air cleaner assembly. Refer to Air Cleaner Outlet Duct Replacement.
2. If replacing the air cleaner assembly, remove the mass air flow sensor and the Manifold Absolute Pressure Sensor. Refer to Mass Airflow Sensor with Intake Air Temperature Sensor Replacement and Manifold Absolute Pressure Sensor Replacement.

Air Cleaner Assembly Fastener (Qty: 3)

Caution: Refer to Fastener Caution

1

Tighten

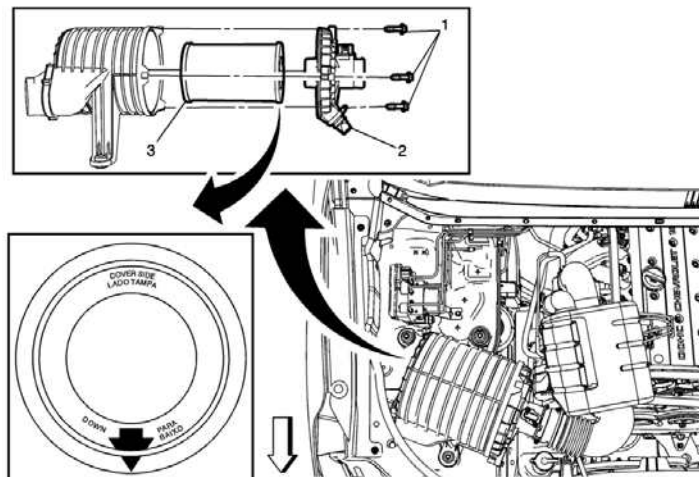
10 Y (89 lb in)

2

Air Cleaner Assembly

2013 Chevrolet Colorado

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



Air Cleaner Element Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.

Air Cleaner Element Assembly Fasteners (Qty: 3)

1

Caution: Refer to Fastener Caution.

Tighten

4 Y (35 lb in)

Air Cleaner Element Assembly Cover

2

Procedure

Disconnect the mass airflow with intake air temperature sensor electrical connector.

Air Cleaner Element

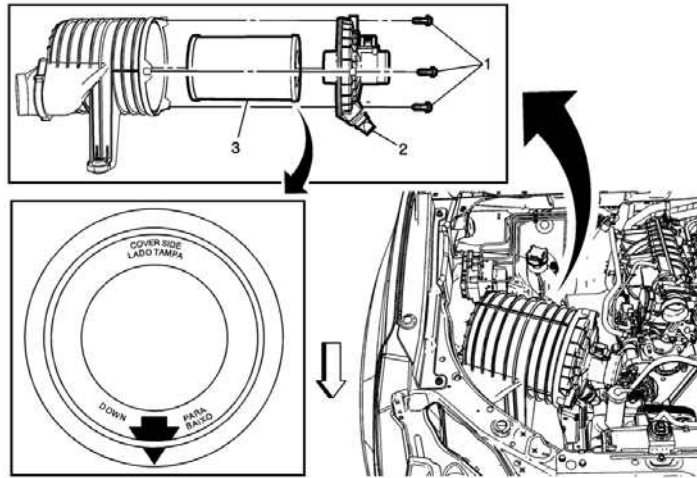
3

Procedure

Ensure the air cleaner is positioned correctly with the arrow placed downward. This will ensure proper airflow and maximum performance.

2013 Chevrolet Colorado

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



Air Cleaner Element Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

Air Cleaner Element Assembly Fasteners (Qty: 3)

1

Caution: Refer to Fastener Caution.

Tighten

4 Y(35 lb in)

Air Cleaner Element Assembly Cover

2

Procedure

Disconnect the mass airflow with intake air temperature sensor electrical connector.

Air Cleaner Element

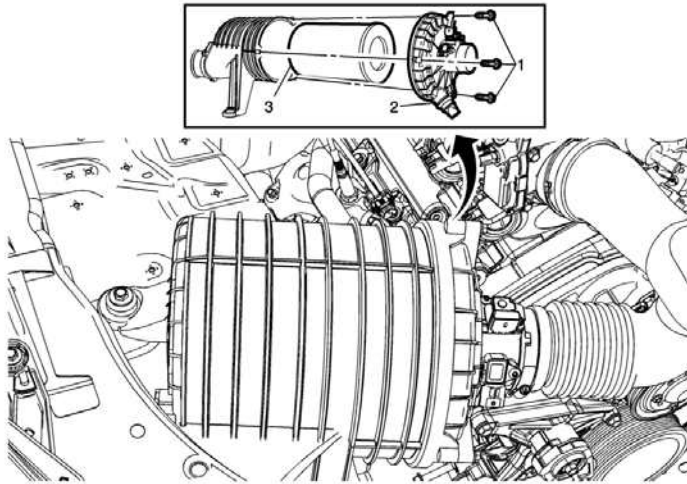
3

Procedure

Ensure the air cleaner is positioned correctly with the arrow placed downward. This will ensure proper airflow and maximum performance.

2013 Chevrolet Colorado

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



Air Cleaner Element Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the air cleaner outlet duct from the air cleaner. Refer to Air Cleaner Outlet Duct Replacement.

Air Cleaner Element Assembly Fastener (Qty:3)

1

Caution: Refer to Fastener Caution

Tighten

4 Y (35 lb in)

Air Cleaner Cover Assembly

Procedure

2

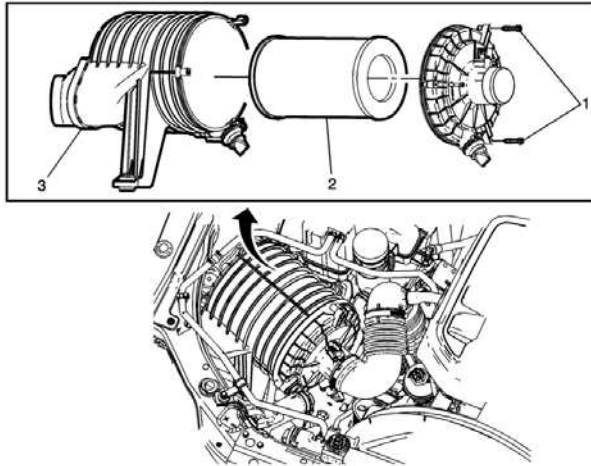
1. Disconnect the mass airflow with intake air temperature sensor electrical wiring harness connector.
2. Disconnect the manifold absolute pressure sensor electrical wiring harness connector.
3. Remove the air cleaner element.

3

Air Cleaner Element

2013 Chevrolet Colorado

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



Air Cleaner Element Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the air cleaner outlet duct from the air cleaner. Refer to Air Cleaner Outlet Duct Replacement.

Air Cleaner Element Assembly Fastener (Qty:3)

1

Caution: Refer to Fastener Caution

Tighten

4 Y(35 lb in)

Air Cleaner Element

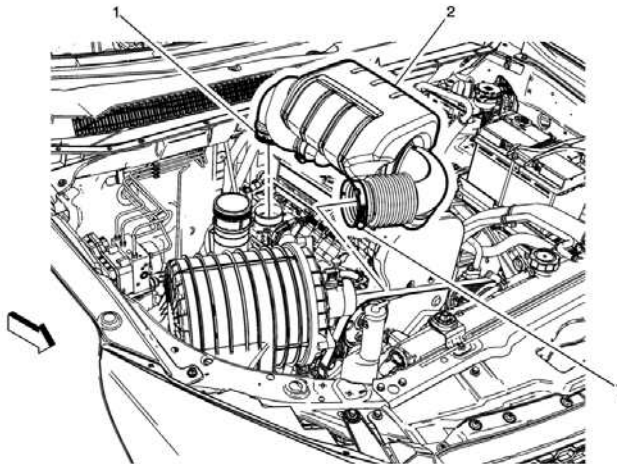
Procedure

2

1. Disconnect the mass airflow with intake air temperature sensor electrical connector.
2. Remove the air cleaner element.

2013 Chevrolet Colorado

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



Air Cleaner Outlet Duct Replacement

Callout

Component Name

Air Cleaner Outlet Duct Clamps (Qty: 2)

Caution: Refer to Fastener Caution

1

Tighten

4 Y (35 lb in)

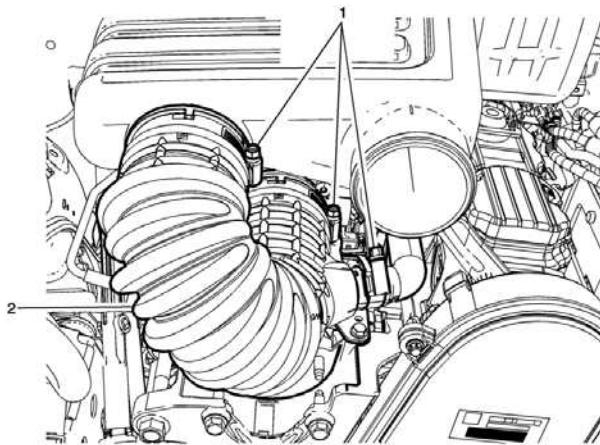
2

Air Cleaner Outlet Duct

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Air Cleaner Outlet Duct Replacement

Callout

Component Name

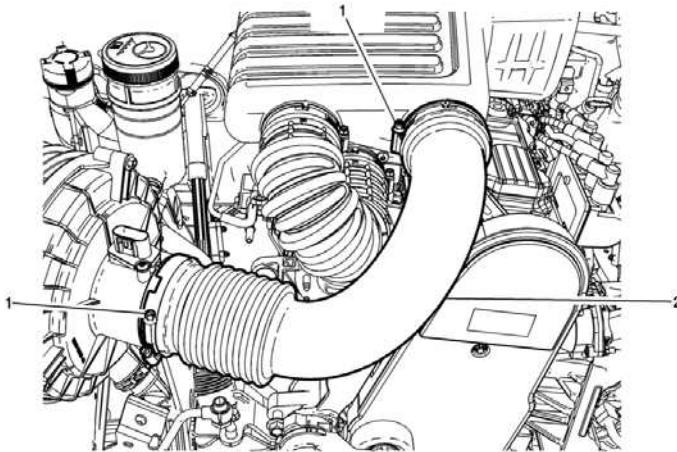
Preliminary Procedure

Remove the air cleaner resonator. Refer to Air Cleaner Outlet Resonator Replacement.

- 1 Air Cleaner Outlet Duct Clamp (Qty: 3)
Caution: Refer to Fastener Caution.
- 2 Air Cleaner Outlet Duct

2013 Chevrolet Colorado

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



Air Cleaner Outlet Duct Replacement

Callout

Component Name

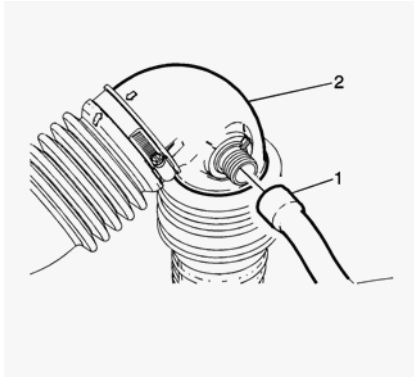
- | | |
|---|--|
| 1 | Air Cleaner Outlet Duct Clamp (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 2 | Air Cleaner Outlet Duct |

2013 Chevrolet Colorado

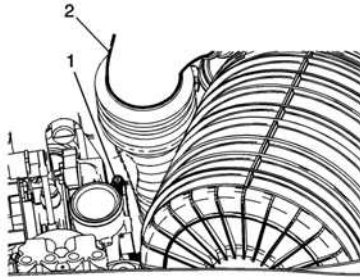
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

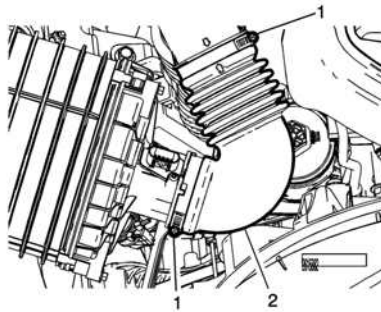
1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.



2. Disconnect the crankcase ventilation pipe(1) from the air cleaner outlet duct(2).

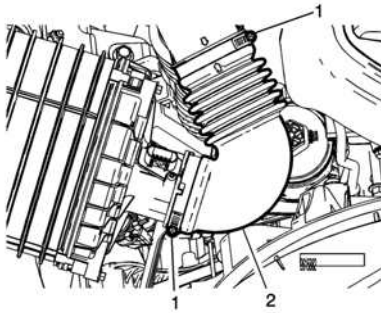


3. Loosen the lower clamp(1) and remove the air cleaner outlet tube(2) from the turbo assembly.

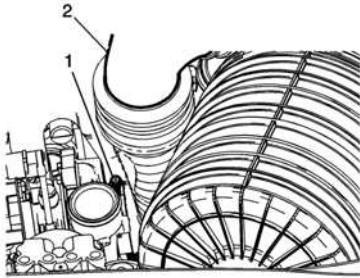


4. Loosen the upper clamps(1) and remove the outlet duct(2) from the air cleaner assembly.

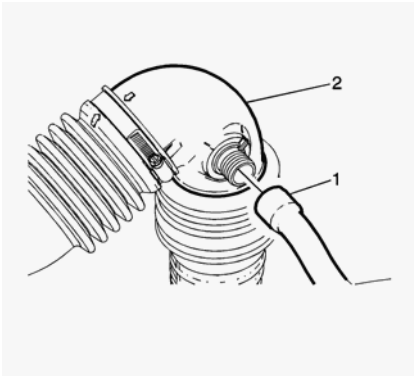
[Installation Procedure](#)



1. Install the outlet duct(2) to the air cleaner assembly.



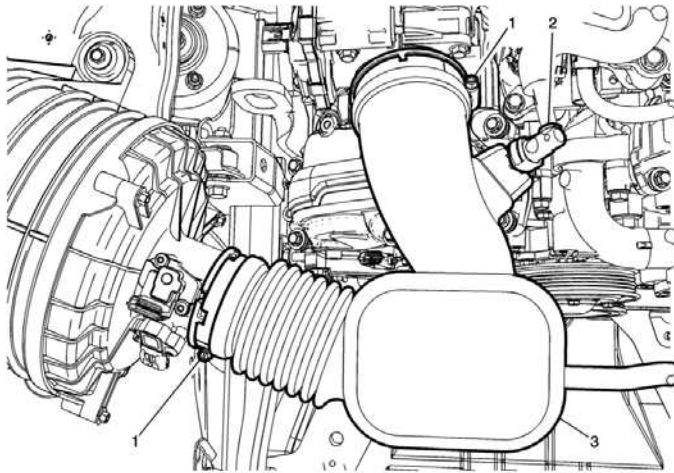
2. Install the air cleaner outlet tube(2) to the turbo assembly and tighten the upper and lower clamps.



3. Connect the crankcase ventilation pipe(1) to the air cleaner outlet duct(2).
4. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement.

2013 Chevrolet Colorado

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



Air Cleaner Outlet Duct Replacement

Callout

Component Name

Preliminary Procedure

Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

- 1 **Caution:** Refer to Fastener Caution.
Air Cleaner Outlet Clamps (Qty: 2)
- Positive Crankcase Ventilation Hose

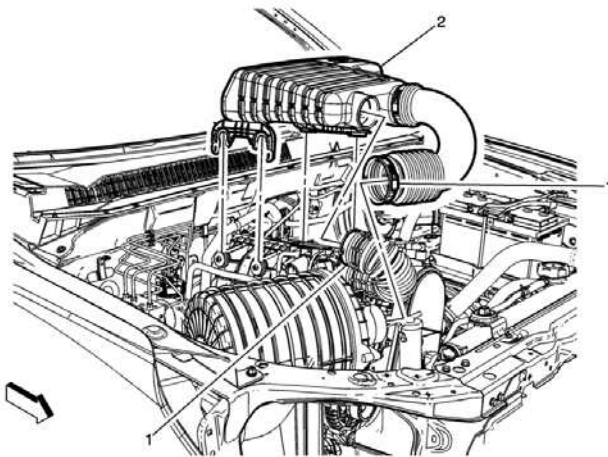
- 2 **Procedure**
Remove the positive crankcase ventilation hose from the air cleaner outlet duct. Refer to Plastic Collar Quick Connect Fitting Service.

- 3 Air Cleaner Outlet Duct

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Air Cleaner Outlet Resonator Replacement

Callout

Component Name

- | | |
|---|--|
| | Air Cleaner Resonator Clamps (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 1 | Tighten |
| | 4 Y (35 lb in) |
| 2 | Air Cleaner Resonator |

2013 Chevrolet Colorado

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

The camshaft (CMP) actuator system enables the engine control module (ECM) to change camshaft timing of all camshafts while the engine is running. The CMP actuator assembly varies the camshaft position in response to directional changes in oil pressure. The CMP actuator solenoid valve controls the oil pressure that is applied to advance or retard a camshaft. Modifying camshaft timing under changing engine demand provides better balance between the following performance concerns:

- Engine power output
- Fuel economy
- Lower tailpipe emissions

The CMP actuator solenoid valve is controlled by the ECM. The crankshaft position (CKP) sensor and the CMP sensors are used to monitor changes in camshaft positions. The ECM uses the following information in order to calculate the desired camshaft positions:

- The engine speed
- The engine load
- The camshaft position (CMP) sensors
- The crankshaft position (CKP) sensor
- The manifold absolute pressure (MAP) sensor
- The throttle position (TP) sensors
- The barometric pressure (BARO)

Operation

The CMP actuator assembly has an outer housing that is driven by an engine timing chain. Inside the assembly is a rotor with fixed vanes that is attached to the camshaft. Oil pressure that is applied to the fixed vanes will rotate a specific camshaft in relationship to the crankshaft. The movement of the intake camshafts will advance the intake valve timing. The movement of the exhaust camshafts will retard the exhaust valve timing. When oil pressure is applied to the return side of the vanes, the camshafts will return to 0 crankshaft degrees, or top dead center (TDC). The CMP actuator solenoid valve directs the oil flow that controls the camshaft movement. The ECM commands the CMP solenoid to move the solenoid plunger and spool valve until oil flows from the advance passage. Oil flowing through the CMP actuator assembly from the CMP solenoid advance passage applies pressure to the advance side of the vanes in the CMP actuator assembly. When the camshaft position is retarded, the CMP actuator solenoid valve directs oil to flow into the CMP actuator assembly from the retard passage. The ECM can also command the CMP actuator solenoid valve to stop oil flow from both passages in order to hold the current camshaft position.

The ECM operates the CMP actuator solenoid valve by pulse width modulation (PWM) of the solenoid coil. The higher the PWM duty cycle, the larger the change in camshaft timing. The CMP actuator assembly also contains a lock pin that prevents movement between the outer housing and the rotor vane assembly. The lock pin is released by oil pressure before any movement in the CMP actuator assembly takes place. The ECM is continuously comparing CMP sensor inputs with CKP sensor input in order to monitor camshaft position and detect any system malfunctions. If a condition exists in either the intake or exhaust camshaft actuator system, the opposite bank, intake or exhaust, camshaft actuator will default to 0 crankshaft degrees.

CMP Actuator System Operation

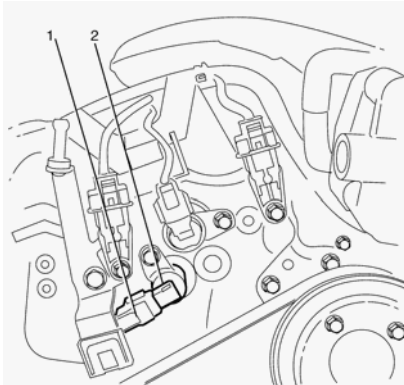
Driving Condition	Change in Camshaft Position	Objective	Result
Idle	No Change	Minimize Valve Overlap	Stabilize Idle Speed
Light Engine Load	Retard Valve Timing	Decrease Valve Overlap	Stable Engine Output
Medium Engine Load	Advance Valve Timing	Increase Valve Overlap	Better Fuel Economy with Lower Emissions
Low to Medium RPM with Heavy Load	Advance Valve Timing	Advance Intake Valve Closing	Improve Low to Mid-range Torque
High RPM with Heavy Load	Retard Valve Timing	Retard Intake Valve Closing	Improve Engine Output

2013 Chevrolet Colorado

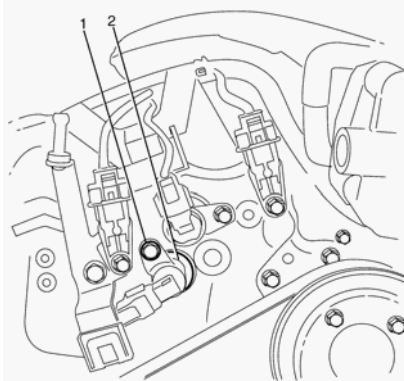
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.
2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.



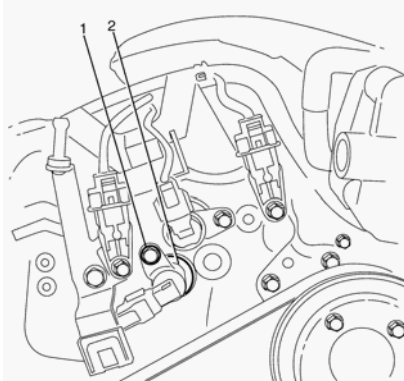
3. Remove the camshaft position (CMP) actuator valve electrical connector (1) from the CMP (2).



4. Remove the CMP actuator solenoid valve to engine front cover retaining bolt (1).
5. Remove the CMP actuator valve (2).
6. Inspect the CMP actuator valve seal and replace as necessary.

[Installation Procedure](#)

1. Inspect the CMP actuator valve seal for damage. Replace the seal if necessary.

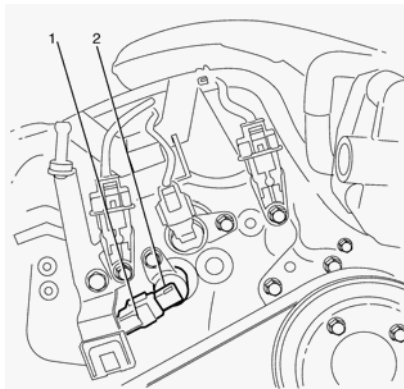


2. Install the CMP actuator valve (2) to the engine front cover.

Caution: Refer to Fastener Caution.

3. Install the CMP actuator solenoid valve to engine front cover retaining bolt (1).
Tighten
Tighten the bolt to 9 Y (80 lb in).

Camshaft Position Actuator Solenoid Valve Solenoid Replacement - Bank 1 (Right Side) Exhaust

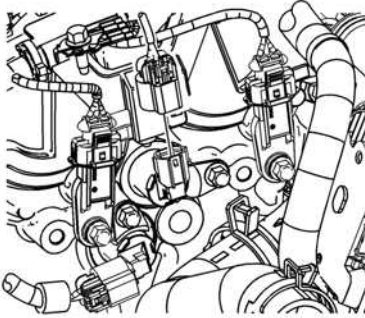


4. Install the CMP valve electrical connector (1) to the CMP actuator valve.
5. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

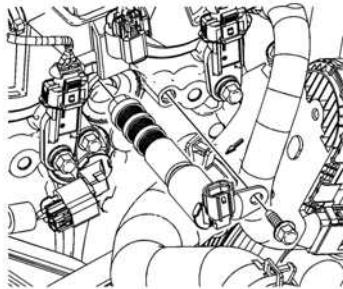
2013 Chevrolet Colorado

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

[Removal Procedure](#)



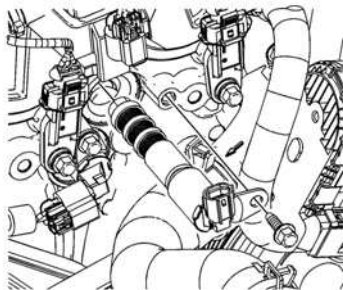
1. Turn the ignition OFF.
2. Disconnect the camshaft position (CMP) actuator valve electrical connector.



3. Remove the CMP actuator valve bolt.
4. Remove the CMP actuator valve.
5. Inspect the CMP actuator valve seal for damage. Replace the seal if necessary.

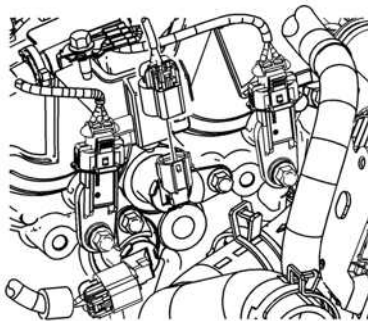
[Installation Procedure](#)

1. Inspect the CMP actuator valve seal for damage. Replace the seal if necessary.



2. Install the CMP actuator valve.
Caution: Refer to Fastener Caution.
3. Install the CMP actuator valve bolt and tighten to **10 Y (89 lb in)**.

Camshaft Position Actuator Solenoid Valve Solenoid Replacement - Bank 1 (Right Side) Intake



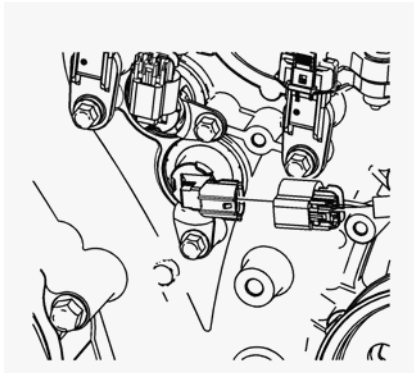
4. Connect the CMP actuator valve electrical connector.

2013 Chevrolet Colorado

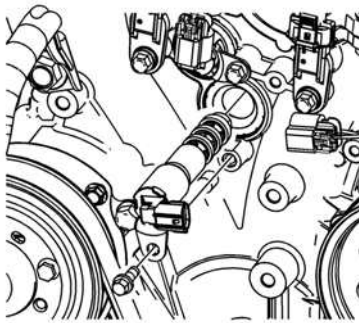
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement



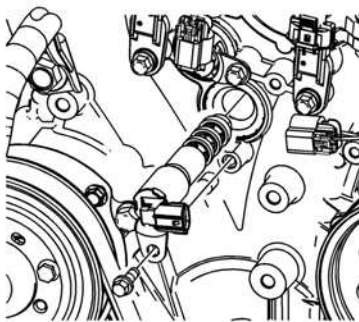
3. Remove the camshaft position (CMP) actuator valve electrical connector.



4. Remove the CMP actuator valve bolt.
5. Remove the CMP actuator valve.
6. Inspect the CMP actuator valve seal for damage and replace as necessary.

[Installation Procedure](#)

1. Inspect the CMP actuator valve seal for damage. Replace the seal if necessary.

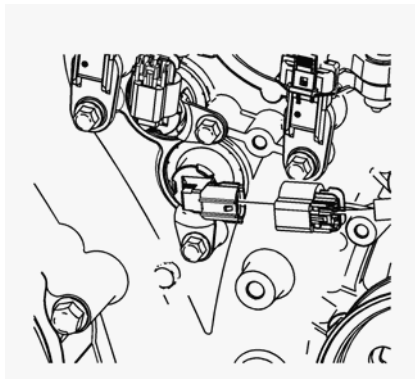


2. Install the CMP actuator valve.

Caution: Refer to Fastener Caution.

3. Install the CMP actuator valve bolt and tighten to **10 Y (89 lb in)**.

Camshaft Position Actuator Solenoid Valve Solenoid Replacement - Bank 2 (Left Side) Exhaust



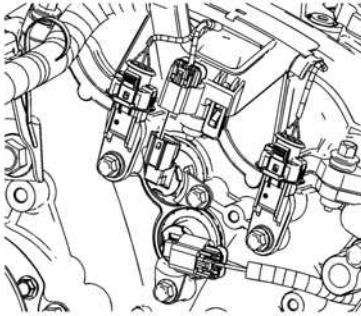
4. Install the CMP actuator valve electrical connector.
5. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement

2013 Chevrolet Colorado

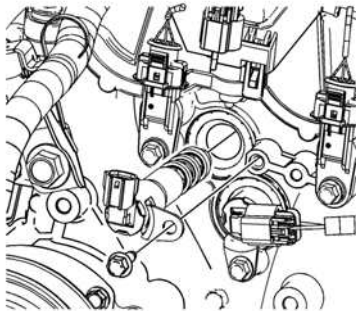
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement



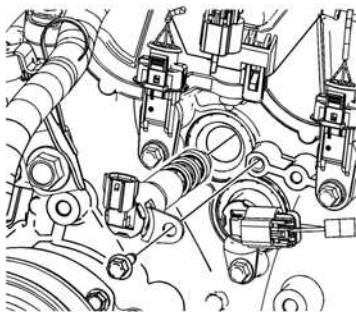
3. Remove the camshaft position (CMP) actuator valve electrical connector.



4. Remove the CMP actuator valve bolt.
5. Remove the CMP actuator valve.
6. Inspect the CMP actuator valve seal for damage and replace as necessary.

[Installation Procedure](#)

1. Inspect the CMP actuator valve seal for damage. Replace the seal if necessary.

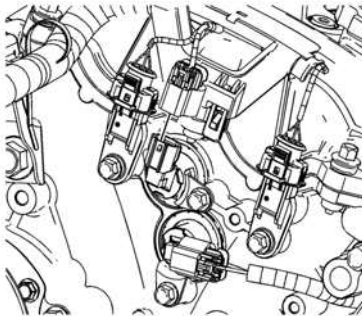


2. Install the CMP actuator valve.

Caution: Refer to Fastener Caution.

3. Install the CMP actuator valve bolt and tighten to **10 Y (89 lb in)**.

Camshaft Position Actuator Solenoid Valve Solenoid Replacement - Bank 2 (Left Side) Intake

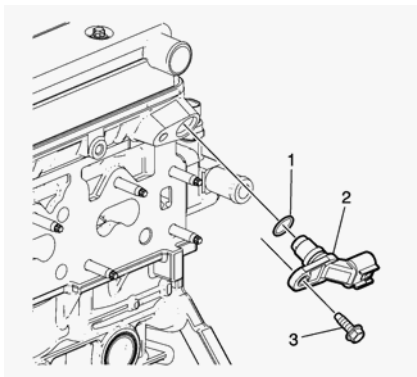


4. Install the CMP actuator valve electrical connector.
5. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



1. Install the camshaft position sensor (2) and NEW seal (1).
2. Install the camshaft position sensor bolt (3).

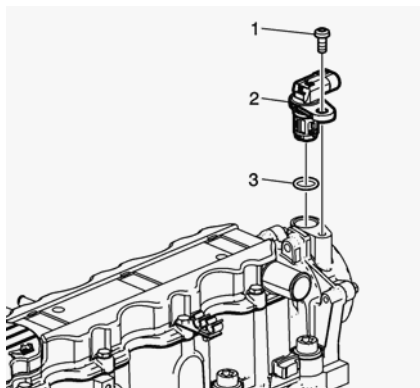
Caution: Refer to Fastener Caution.

3. Tighten to **10 Y(89 lb in)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



1. Install the camshaft position sensor (2) and NEW seal (3).
2. Install the camshaft position sensor bolt (1).

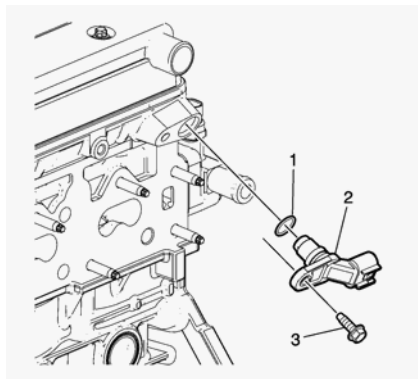
Caution: Refer to Fastener Caution.

3. Tighten to **10 Y(89 lb in)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

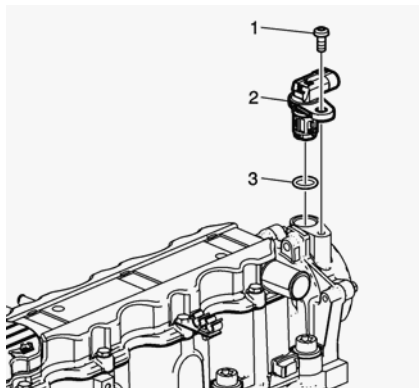


1. Remove the camshaft position sensor bolt (3).
2. Remove the camshaft position sensor (2) and seal (1).

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

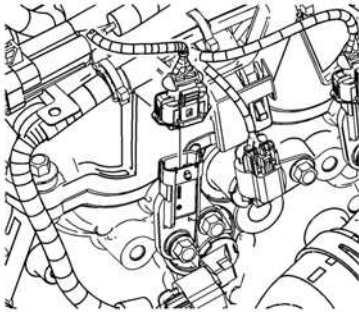


1. Remove the camshaft position sensor bolt (1).
2. Remove the camshaft position sensor (2) and seal (3).

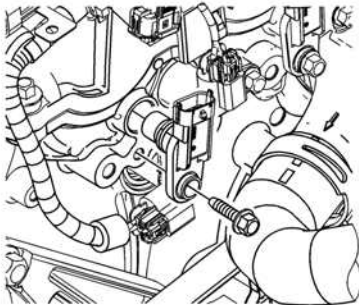
2013 Chevrolet Colorado

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

[Removal Procedure](#)

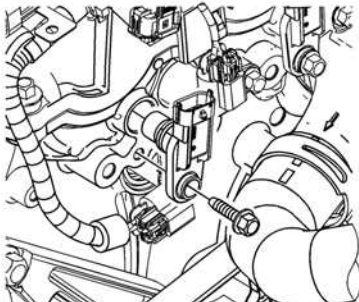


1. Turn the ignition OFF.
2. Disconnect the camshaft position (CMP) sensor electrical connector.



3. Remove the CMP sensor bolt.
4. Remove the CMP sensor.

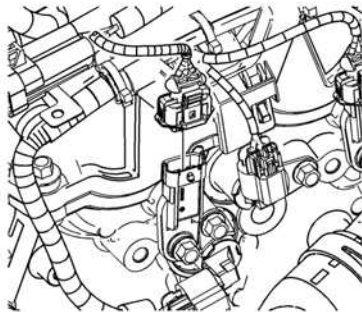
[Installation Procedure](#)



1. Install the CMP sensor.
2. Install the CMP sensor bolt and tighten to **10 Y (89 lb in)**.

Caution: Refer to Fastener Caution.

Camshaft Position Sensor Replacement - Bank 1 (Right Side) Exhaust



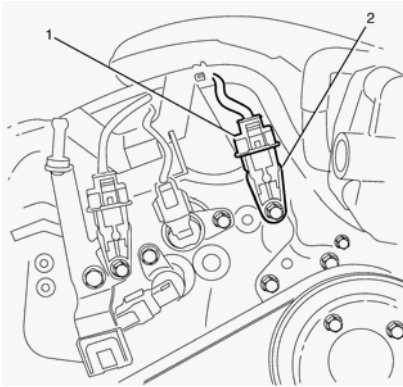
3. Connect the CMP sensor electrical connector.

2013 Chevrolet Colorado

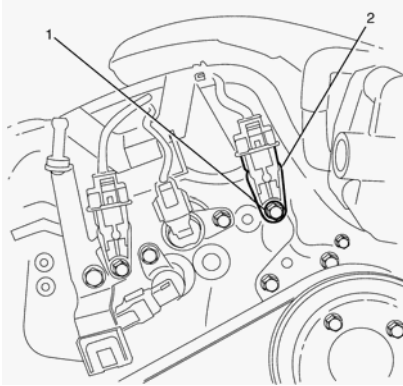
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.

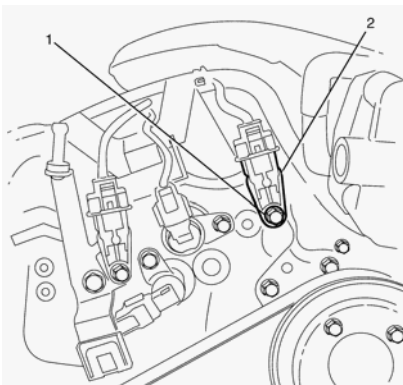


2. Remove the camshaft position (CMP) sensor electrical connector (1) from the CMP sensor (2).



3. Remove the CMP sensor to engine front cover retaining bolt (1).
4. Remove the CMP sensor from the engine front cover (2).

[Installation Procedure](#)

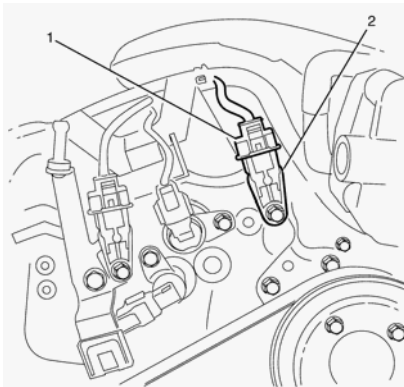


1. Install the CMP sensor (2) to the engine front cover.

Caution: Refer to Fastener Caution.

2. Install the CMP sensor to engine front cover retaining bolt (1) and tighten to **10 Y (89 lb in)**.

Camshaft Position Sensor Replacement - Bank 1 (Right Side) Intake



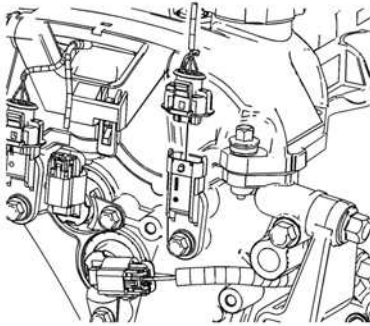
3. Install the CMP sensor electrical connector (1) to the CMP sensor.

2013 Chevrolet Colorado

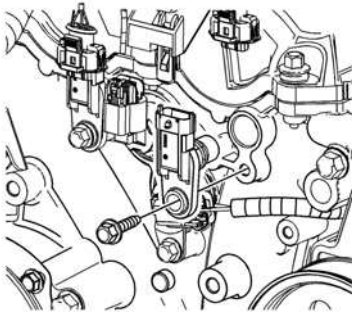
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement

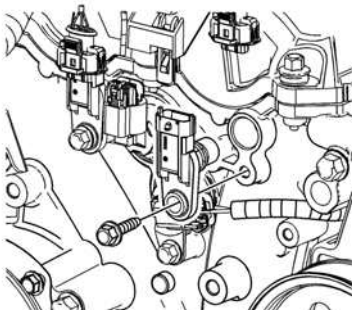


3. Remove the camshaft position (CMP) sensor electrical connector.



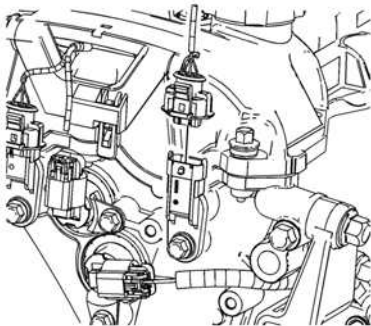
4. Remove the CMP sensor bolt.
5. Remove the CMP sensor.

[Installation Procedure](#)



1. Install the CMP sensor.
Caution: Refer to Fastener Caution.
2. Install the CMP sensor bolt and tighten to **10 Y (89 lb in)**.

Camshaft Position Sensor Replacement - Bank 2 (Left Side) Exhaust



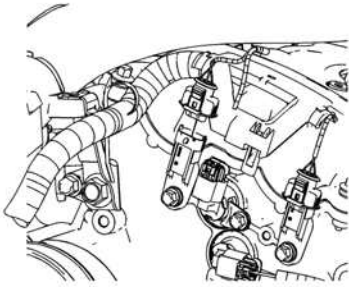
3. Install the CMP sensor electrical connector.
4. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement

2013 Chevrolet Colorado

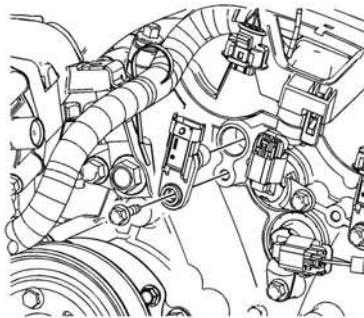
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement

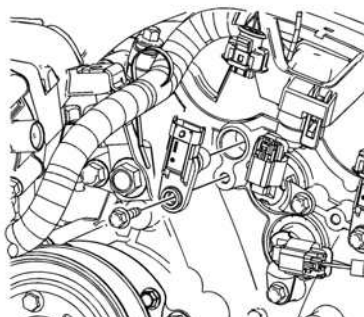


3. Remove the camshaft position (CMP) sensor electrical connector.



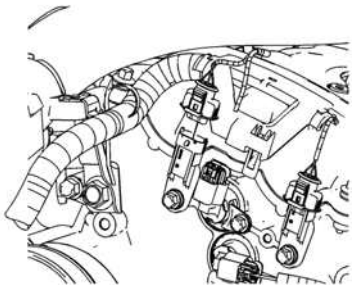
4. Remove the CMP sensor bolt.
5. Remove the CMP sensor.

[Installation Procedure](#)



1. Install the CMP sensor.
Caution: Refer to Fastener Caution.
2. Install the CMP sensor bolt and tighten to **10 Y (89 lb in)**.

Camshaft Position Sensor Replacement - Bank 2 (Left Side) Intake

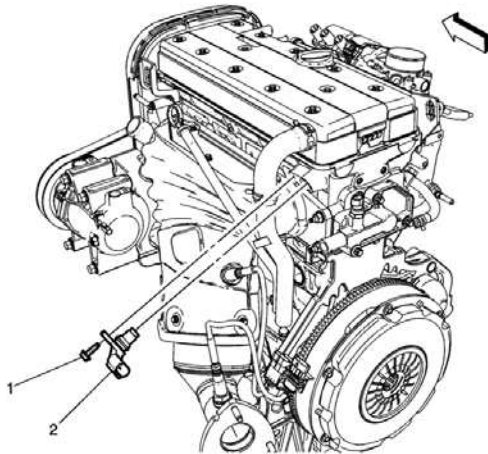


3. Install the CMP sensor electrical connector.
4. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Camshaft Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect camshaft position sensor electrical connector.

Camshaft Position Sensor Bolt

Caution: Refer to Fastener Caution.

1

Tighten

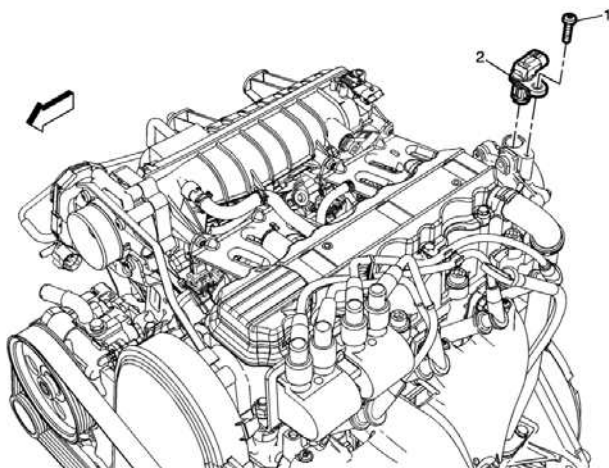
10 Y (89 lb in)

2

Camshaft Position Sensor

2013 Chevrolet Colorado

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



Camshaft Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

Camshaft Position Sensor Fastener

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Camshaft Position Sensor

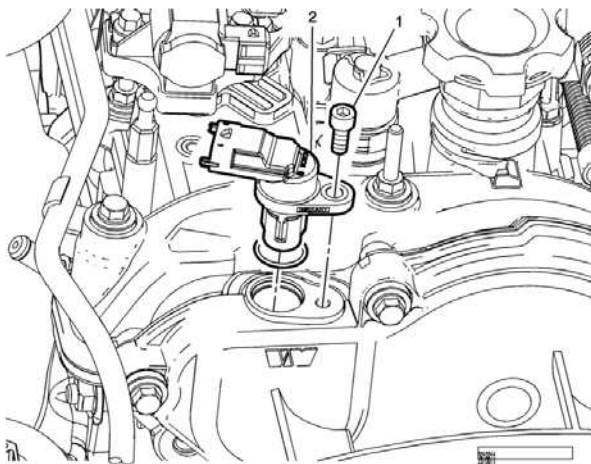
2

Procedure

Disconnect the camshaft position sensor electrical connector.

2013 Chevrolet Colorado

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



Camshaft Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Camshaft Position Sensor Fastener

1

Caution: Refer to Fastener Caution.

Tighten

10 Y (89 lb in)

Camshaft Position Sensor

2

Procedure

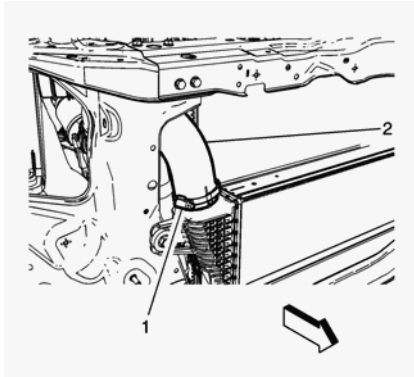
Disconnect the electrical connector from the camshaft position sensor.

2013 Chevrolet Colorado

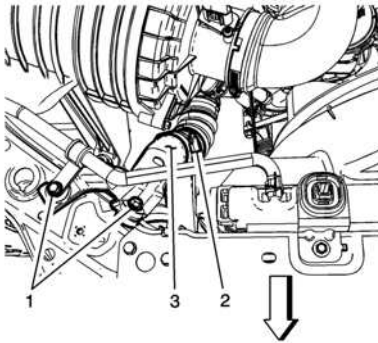
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the right side radiator air side baffle. Refer to Radiator Air Side Baffle Replacement - Right Side.

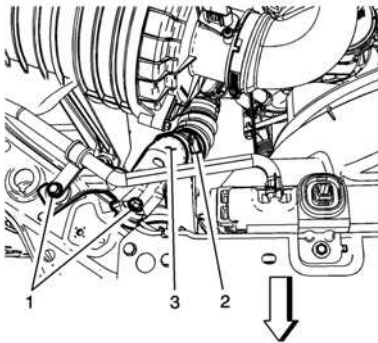


2. Remove the charge air cooler inlet air hose clamp (1) from the charge air cooler inlet air hose (2).



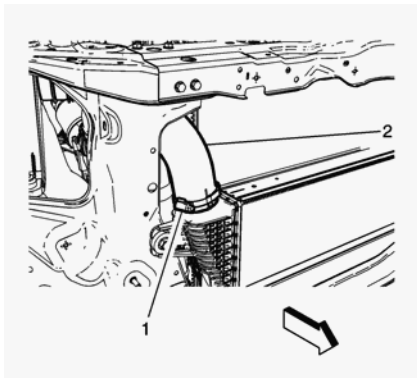
3. Remove the charge air cooler inlet air hose bolts (1) from the charge air cooler inlet air hose (3).
4. Remove the charge air cooler inlet air hose clamp (2) from the charge air cooler inlet air hose (3).
5. Remove the charge air cooler inlet air hose (3) from the vehicle.

[Installation Procedure](#)



1. Install the charge air cooler inlet air hose (3) to the vehicle.
 2. Install the charge air cooler inlet air hose clamp (2) to the charge air cooler inlet air hose (3).
- Caution:** Refer to Fastener Caution.
3. Install the charge air cooler inlet air hose bolts (1) to the charge air cooler inlet air hose (3) and tighten to 9 Y (80 lb in).

Charge Air Cooler Inlet Air Hose Replacement (At Cooler)



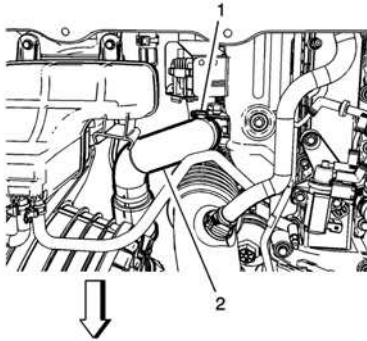
4. Install the charge air cooler inlet air hose clamp (1) to the charge air cooler inlet air hose (2).
5. Install the right side radiator air side baffle. Refer to Radiator Air Side Baffle Replacement - Right Side.

2013 Chevrolet Colorado

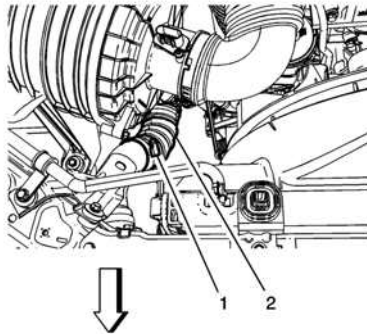
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the power steering tank from the radiator surge tank. Refer to Power Steering Fluid Reservoir Replacement.

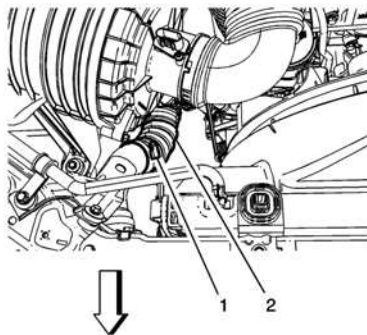


2. Remove the charge air cooler inlet air hose clamp (1) from the charge air cooler inlet air hose (2).



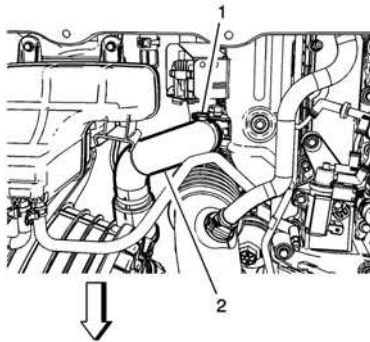
3. Remove the charge air cooler inlet air hose clamp (1) from the charge air cooler inlet air hose (2).
4. Remove the charge air cooler inlet air hose (2) from the vehicle.

[Installation Procedure](#)



1. Install the charge air cooler inlet air hose (2) to the vehicle.
2. Install the charge air cooler inlet air hose clamp (1) to the charge air cooler inlet air hose (2).

Charge Air Cooler Inlet Air Hose Replacement (At Turbo)



3. Install the charge air cooler inlet air hose clamp (1) to the charge air cooler inlet air hose (2).
4. Install the power steering tank to the radiator surge tank. Refer to Power Steering Fluid Reservoir Replacement.

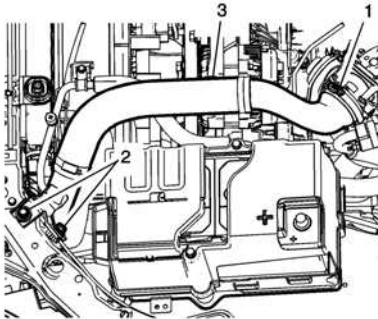
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

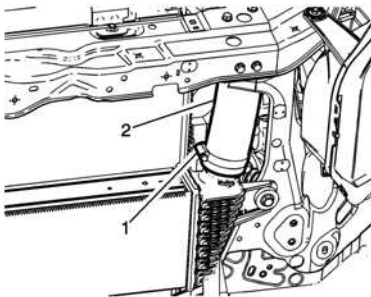
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Remove the front fascia. Refer to Front Bumper Fascia Replacement.
3. Remove radiator air side baffle from left side. Refer to Radiator Air Side Baffle Replacement - Left Side.

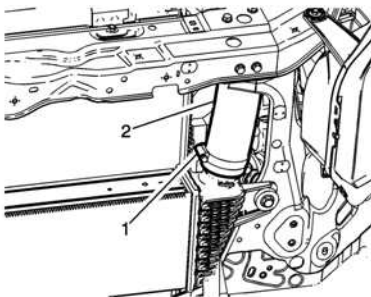


4. Loosen the clamp(1) at the throttle body and remove the charge air cooler outlet air tube bracket fasteners(2)(Qty 2).
5. Remove the charge air cooler outlet air tube(3) from the throttle body.



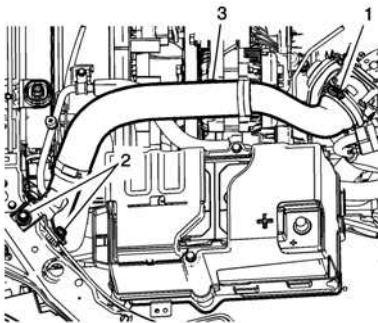
6. Loosen the lower clamp(1) and remove the charge air cooler outlet air hose(2) from the charge air cooler.
7. Remove the charge air cooler outlet air tube from the vehicle.

[Installation Procedure](#)



1. Install the charge air cooler outlet air tube(2) to the charge air cooler.

Charge Air Cooler Outlet Air Hose Replacement



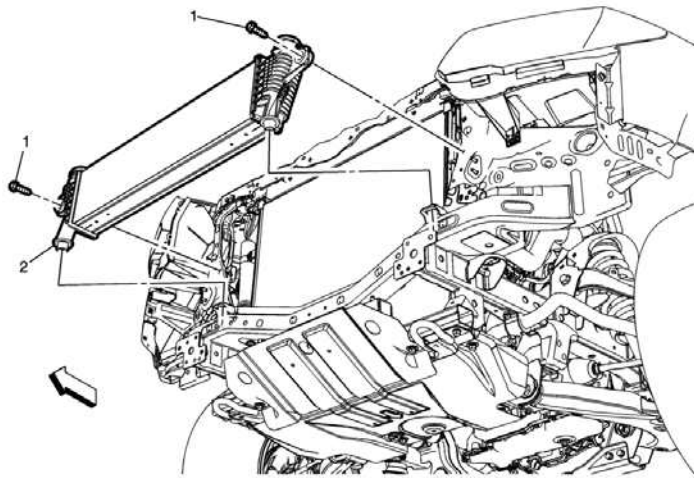
2. Install the charge air cooler outlet air tube(3) to the throttle body inlet.
3. Install the clamp (1) at the throttle body.

Caution: Refer to Fastener Caution.

4. Install the charge air cooler outlet air hose bracket fasteners(2)(Qty 2) and tighten the fasteners to **9 Y (80 lb in)**.
5. Tighten the upper and lower charge air cooler outer air hose clamps.
6. Install radiator air side baffle to the left side. Refer to Radiator Air Side Baffle Replacement - Left Side.
7. Install the front fascia. Refer to Front Bumper Fascia Replacement.
8. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement.

2013 Chevrolet Colorado

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



Charge Air Cooler Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the charge air cooler outlet hose. Refer to Charge Air Cooler Outlet Air Hose Replacement.
2. Remove the charge air cooler inlet air hose . Refer to Charge Air Cooler Inlet Air Hose Replacement.
3. Remove the front bumper upper impact bar. Refer to Front Bumper Upper Impact Bar Replacement.
4. Remove the hood primary latch support. Refer to . Hood Primary Latch Support Replacement.

Charge Air Cooler Bracket Fastener (Qty: 2)

1

Tighten

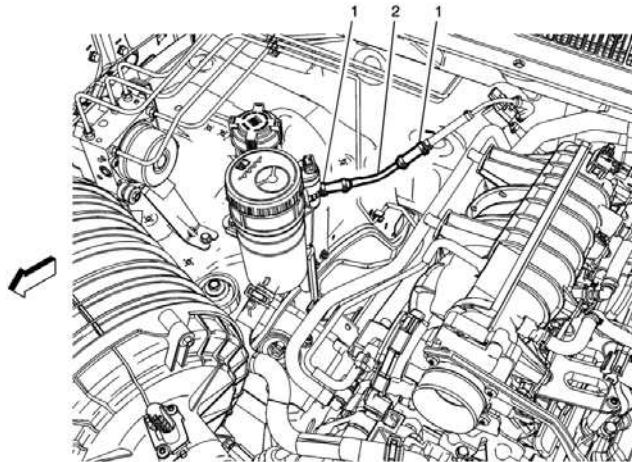
9 Y (80 lb in)

2

Charge Air Cooler

2013 Chevrolet Colorado

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



Cold Start Fuel Feed Hose Replacement

Callout

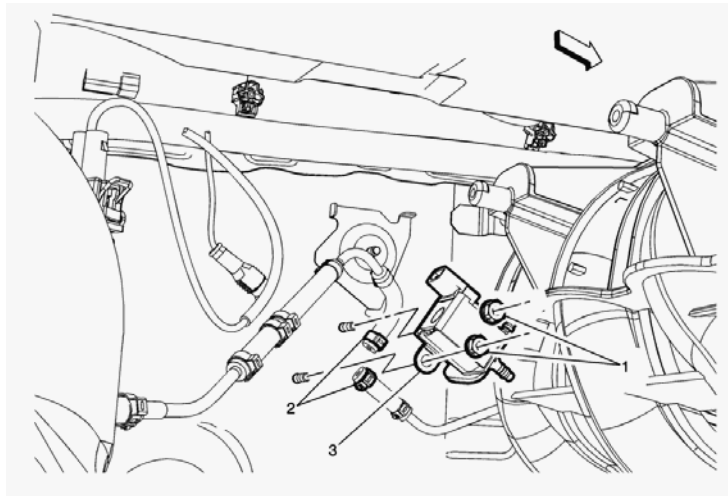
- | | |
|---|---|
| 1 | Cold Start Fuel Feed Hose Clamps (Qty: 2) |
| 2 | Cold Start Fuel Feed Hose |

Component Name

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Cold Start Fuel Feed Valve Replacement

Callout

Component Name

Preliminary Procedure

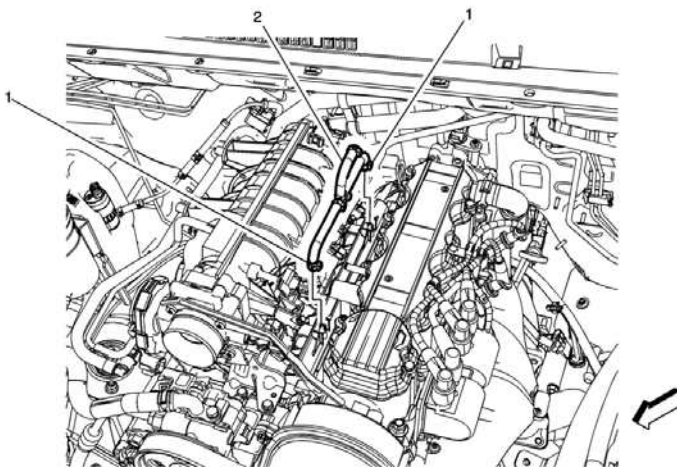
Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

- | | |
|---|---|
| 1 | Cold Start Fuel Feed Valve Fasteners (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 2 | Cold Start Fuel Feed Valve Clamps (Qty: 2) |
| 3 | Cold Start Fuel Feed Valve |

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Cold Start Fuel Injector Hose Replacement

Callout

Component Name

Preliminary Procedure

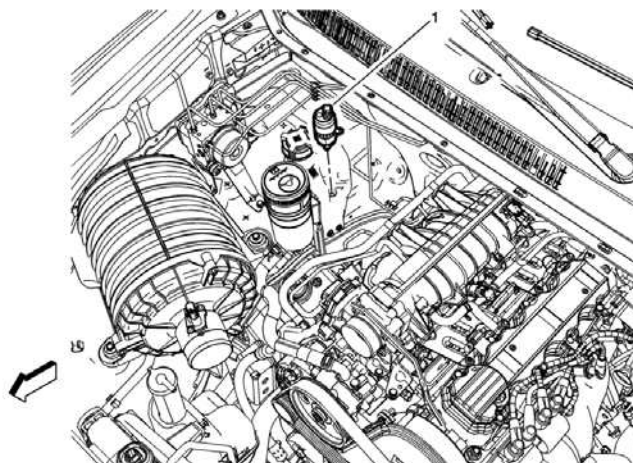
1. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
2. Remove the cold start fuel feed valve. Refer to Cold Start Fuel Feed Valve Replacement.

1 Cold Start Fuel Injector Hose Clamps (Qty: 2)

2 Cold Start Fuel Injector Hose

2013 Chevrolet Colorado

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



Cold Start Fuel Pump Replacement

Callout

Component Name

Preliminary Procedure

Remove the cold start fuel feed hose. Refer to Cold Start Fuel Feed Hose Replacement.

Cold Start Fuel Pump

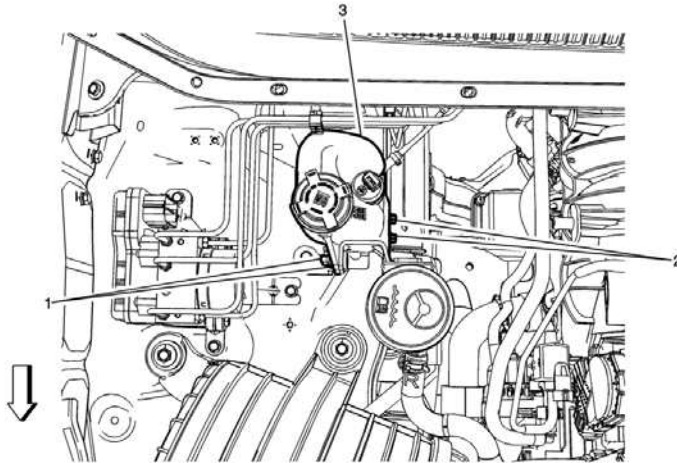
1

Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

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



Cold Start Fuel Reservoir Replacement

Callout

Component Name

Preliminary Procedure

Remove the cold start fuel feed hose. Refer to Cold Start Fuel Feed Hose Replacement.

Cold Start Fuel Reservoir Nuts (Qty: 2)

1

Caution: Refer to Fastener Caution.

Tighten

10 Y (89 lb in)

Cold Start Fuel Reservoir Bolts (Qty: 2)

2

Tighten

10 Y (89 lb in)

Cold Start Fuel Reservoir

3

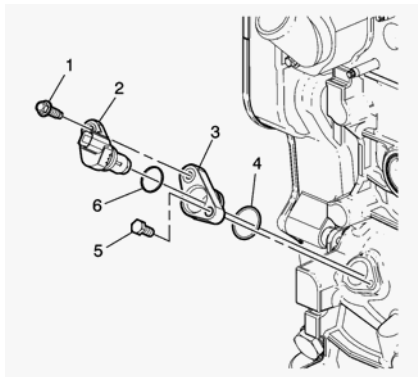
Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

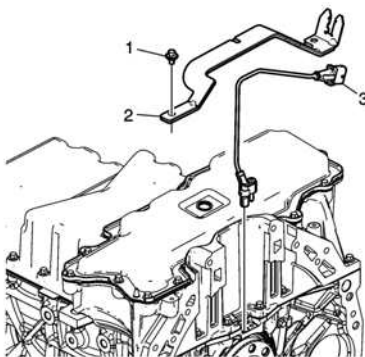


Caution: Refer to Fastener Caution.

1. Install the crankshaft position sensor bracket (3) with NEW seal (4).
2. Install the crankshaft position sensor bracket bolt (5).
3. Tighten the crankshaft position sensor bracket bolt to **9 Y (80 lb in)**.
4. Install the crankshaft position sensor (2) with NEW seal (6).
5. Install the crankshaft position sensor bolt (1).
6. Tighten the crankshaft position sensor bolt to **9 Y (80 lb in)**.

2013 Chevrolet Colorado

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



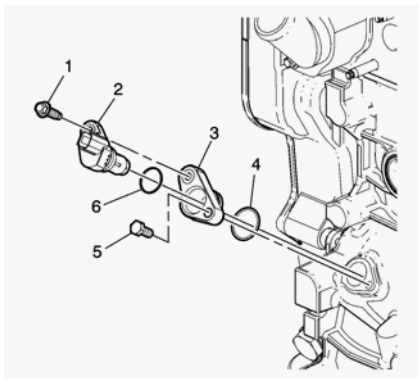
Caution: Refer to Fastener Caution.

1. Install the crankshaft position sensor bracket (2) and bolts (1), tighten the bolts to **15 Y (11 lb ft)**.
2. Install the crankshaft position sensor (3), and tighten the bolt to **5 Y (44 lb in)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

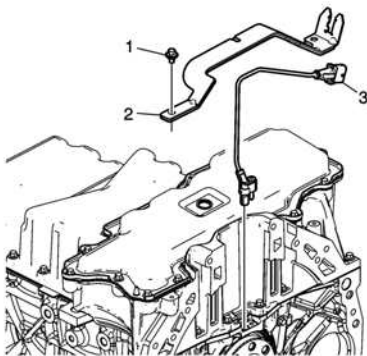


1. Remove the crankshaft position sensor bolt (1).
2. Remove the crankshaft position sensor (2) and seal (6).
3. Remove the crankshaft position sensor bracket bolt (5).
4. Remove the crankshaft position sensor bracket (3) and seal (4).

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

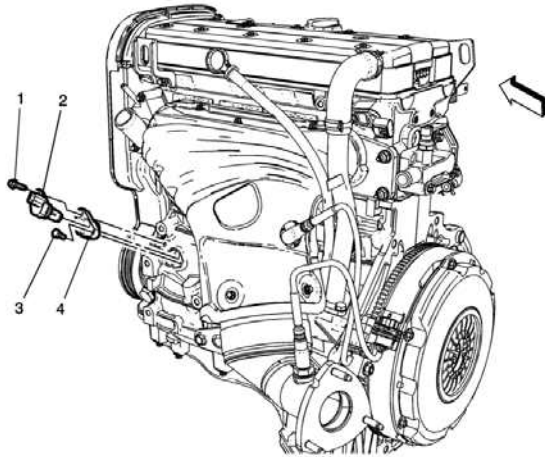


1. Remove the crankshaft position sensor connector from the bracket (2).
2. Remove the crankshaft position sensor bracket bolts (1) and bracket (2).
3. Remove the crankshaft position sensor bolt and sensor (3) from the bottom pan retainer.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Crankshaft Position Sensor Replacement

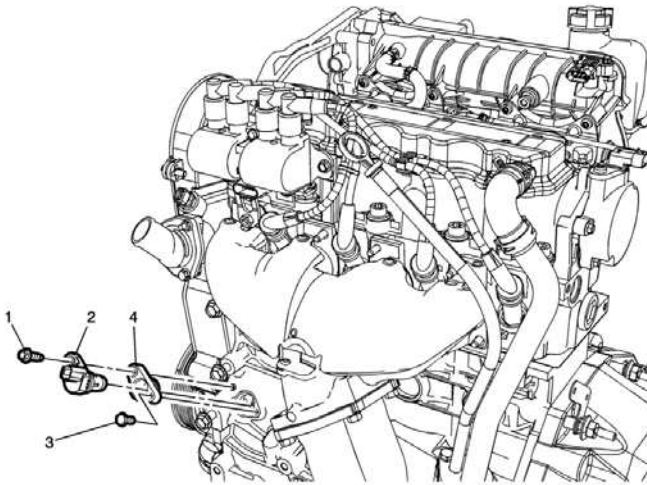
Callout

Component Name

- | | |
|---|---|
| | Crankshaft Position Sensor Fastener |
| | Caution: Refer to Fastener Caution. |
| 1 | Tighten |
| | 9 Y (80 lb in) |
| | Crankshaft Position Sensor |
| 2 | Procedure |
| | Disconnect the crankshaft position sensor electrical connector. |
| | Crankshaft Position Sensor Housing Fastener |
| 3 | Tighten |
| | 9 Y (80 lb in) |
| 4 | Crankshaft Position Sensor Housing |

2013 Chevrolet Colorado

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



Crankshaft Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the air conditioning compressor bracket. Refer to Air Conditioning Compressor Bracket Replacement.

Crankshaft Position Sensor Fastener

1

Caution: Refer to Fastener Caution.

Tighten

9 Y(80 lb in)

Crankshaft Position Sensor

2

Procedure

Disconnect the crankshaft position sensor electrical connector.

Crankshaft Position Sensor Housing Fastener

3

Tighten

9 Y(80 lb in)

4

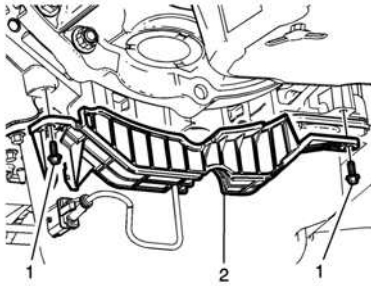
Crankshaft Position Sensor Housing

2013 Chevrolet Colorado

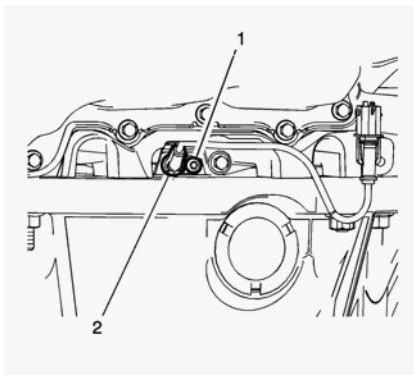
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

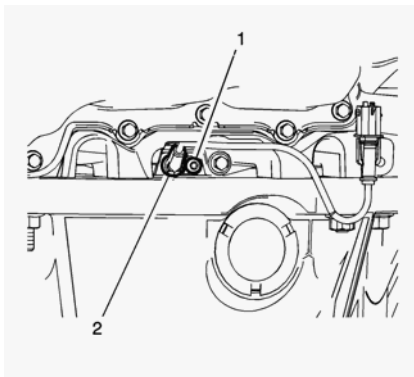


2. Remove the flywheel and crank shaft position sensor access cover fasteners(1)(Qty 2).
3. Unclip the crankshaft position sensor electrical wiring harness connector from the flywheel and crankshaft position sensor access cover.
4. Remove the flywheel and crankshaft position sensor access cover.



5. Remove the crankshaft position sensor fastener(1) and remove the sensor(2).

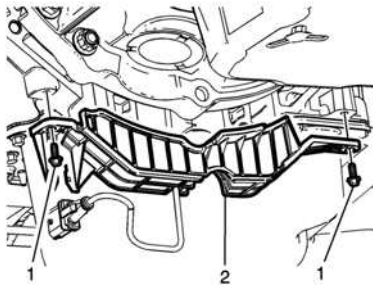
[Installation Procedure](#)



Caution: Refer to Fastener Caution.

1. Install the crankshaft position sensor(2) and fastener(1) and tighten the fastener to **10 Y (65 lb in)**.

Crankshaft Position Sensor Replacement



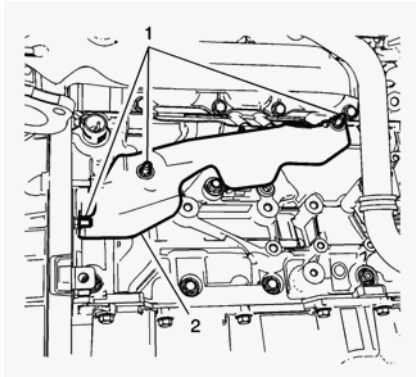
2. Position the flywheel and crankshaft position sensor access cover(2) and install the cover fasteners(1)(Qty 2) and tighten the fastener to **10 Y (65 lb in)**.
3. Clip the crankshaft position sensor electrical wiring harness connector to the flywheel and crankshaft position sensor access cover.

2013 Chevrolet Colorado

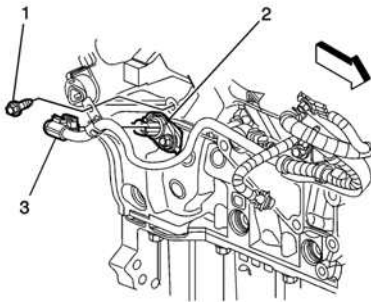
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Remove the crankshaft position sensor heat shield retainers (1) and the heat shield (2) to gain access to the crank position sensor.



3. Disconnect the crankshaft position (CKP) electrical connector (3).



4. Remove the crankshaft sensor fastener (1).
5. Remove the crankshaft sensor (2).

[Installation Procedure](#)

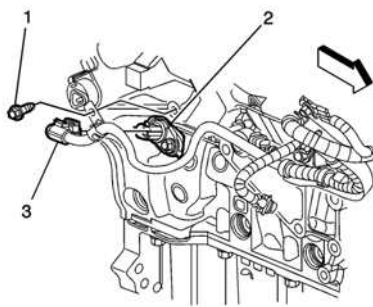
Crankshaft Position Sensor Replacement



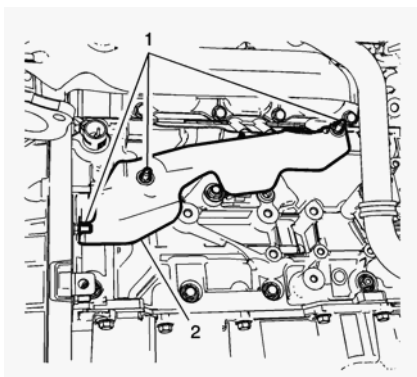
1. If reinstalling the existing sensor, inspect the O-ring for damage and replace as necessary.
2. Install the crankshaft position sensor (2) .

Caution: Refer to Fastener Caution.

3. Install the crankshaft position sensor fastener (1) and tighten to **10 Y (89 lb in)**.



4. Connect the CKP electrical connector (3) and tighten to **10 Y (89 lb in)**.



5. Install the crankshaft position sensor heat shield (2) and retainers (1) and tighten to **10 Y (89 lb in)**.

2013 Chevrolet Colorado

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

Note: If the crankshaft position variation learn procedure has not learned, a false misfire could be detected and DTC P0300 00 may set. If sent here from DTC P0300 00, proceed with the crankshaft position variation learn procedure.

1. Install a scan tool.
2. Monitor the ECM for DTCs with a scan tool. If other DTCs are set, except DTC P0300 00, or DTC P0315 00, refer to Diagnostic Trouble Code (DTC) List - Vehicle for the applicable DTC that set.
3. With a scan tool, select the Crankshaft Position Variation Learn procedure and perform the following:

1. Observe the fuel cut-off for the applicable engine.
2. Block the drive wheels.
3. Set the parking brake.
4. Place the vehicle transmission in Park or Neutral.
5. Turn the air conditioning (A/C) off.
6. Cycle the ignition from off to on.
7. Apply and hold the brake pedal for the duration of the procedure.
8. Start and idle the engine.

Note: While the learn procedure is in progress, release the throttle immediately when the engine starts to decelerate. The engine control is returned to the operator and the engine responds to throttle position after the learn procedure is complete.

9. Accelerate to wide open throttle (WOT). The engine should not accelerate beyond the calibrated fuel cut-off RPM value noted in step 3.1. Release the throttle immediately if the value is exceeded.
10. Release the throttle when fuel cut-off occurs.
4. The scan tool displays Learn Status: Learned this Ignition. If the scan tool indicates that DTC P0315 00 ran and passed, the crankshaft position sensor variation learn procedure is complete. If the scan tool indicates DTC P0315 00 failed or did not run, refer to DTC P0315. If any other DTCs set, refer to Diagnostic Trouble Code (DTC) List - Vehicle for the applicable DTC that set.
5. Turn OFF the ignition for 30 s after the learn procedure is completed successfully.

The crankshaft position variation learn procedure is also required when the following service procedures have been performed, regardless of whether or not DTC P0315 00 is set:

- An engine replacement
- An ECM replacement
- A crankshaft balancer replacement
- A crankshaft replacement
- A crankshaft position sensor replacement
- Any engine repairs which disturb the crankshaft to crankshaft position sensor relationship

2013 Chevrolet Colorado

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

Note: The Crankshaft Position System Variation Learn procedure is also required when the following service procedures have been performed, regardless of whether DTC P0315 is set:

- An engine replacement
- A engine control module (ECM) or body control module (BCM) replacement
- A crankshaft balancer replacement
- A crankshaft removal and/or replacement
- A crankshaft position sensor disturbance/removal and/or replacement
- Any engine repairs which disturb the crankshaft to crankshaft position sensor relationship.

Note: The ECM monitors certain component signals to determine if all the conditions are met to continue with the crankshaft position System Variation Learn Procedure. The scan tool only displays the condition that inhibits the procedure. The scan tool displays the signals of the following components:

- Crankshaft position sensors activity—If there is a crankshaft position sensor condition, refer to the applicable DTC that set.
- Camshaft position sensor signal activity—If there is a camshaft position sensor signal condition, refer to the applicable DTC that set.
- Engine coolant temperature (ECT)—If the engine coolant temperature is not warm enough, idle the engine until the engine coolant temperature reaches the correct temperature.

Note: The ECM monitors certain component signals to determine if all the conditions are met to continue with the Crankshaft Position Variation Learn procedure.

1. Ignition ON, observe the DTC information with a scan tool. Verify no other DTCs are set, except DTCs P0300–P0306, or P0315.

- If DTCs are set, except DTCs P0300–P0306, or P0315, refer to Diagnostic Trouble Code (DTC) List - Vehicle for further diagnosis.
- Select the Crankshaft Position Variation Learn Procedure with a scan tool and follow the on screen instructions:
- Verify DTC P0315 does not set.
- *If DTC P0315 set, or another DTC is present* refer to Diagnostic Trouble Code (DTC) List - Vehicle for the applicable DTC that set.
- *If the DTC does not set*
- All OK.

2013 Chevrolet Colorado

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

The electronic ignition system produces and controls a high-energy secondary spark. This spark is used to ignite the compressed air/fuel mixture at precisely the correct time. This provides optimal performance, fuel economy, and control of exhaust emissions. This ignition system uses an individual coil for each cylinder. The ignition coils are mounted in the center of each camshaft cover with short integrated boots connecting the coils to the spark plugs. The driver modules within each ignition coil are commanded ON/OFF by the engine control module (ECM). The ECM primarily uses engine speed, the mass air flow (MAF) sensor signal, and position information from the crankshaft position and the camshaft position sensors. This controls the sequence, dwell, and timing of the spark. The electronic ignition system consists of the following components:

Crankshaft Position Sensor

The crankshaft position sensor works in conjunction with a reluctor wheel on the crankshaft (front mounted crankshaft position sensor) or a reluctor wheel that is part of the flywheel (rear mounted crankshaft position sensor). The engine control module (ECM) monitors the voltage frequency on the crankshaft position sensor signal circuit. As each reluctor wheel tooth rotates past the sensor, the sensor creates a digital ON/OFF pulse. This digital signal is processed by the ECM. This creates a signature pattern that enables the ECM to determine the crankshaft position. The ECM uses the signal to determine which pair of cylinders is approaching top dead center based on the crankshaft position signal alone. The camshaft position sensor signals are used in order to determine which of these 2 cylinders is on a firing stroke, and which is on the exhaust stroke. The ECM uses this to properly synchronize the ignition system, the fuel injectors, and the knock control. This sensor is also used in order to detect misfire.

The ECM also has a dedicated replicated crankshaft position sensor signal output circuit that may be used as an input signal to other modules for monitoring engine RPM.

Camshaft Position Sensor

This engine uses a camshaft position sensor for each camshaft. The camshaft position sensor signals are a digital ON/OFF pulse and output 4 times per revolution of the camshaft. The camshaft position sensor does not directly affect the operation of the ignition system. The camshaft position sensor information is used by the engine control module (ECM) to determine the position of the camshaft relative to the crankshaft position. By monitoring the camshaft position and crankshaft position signals the ECM can accurately time the operation of the fuel injectors. The ECM supplies the camshaft position sensor with a 5 V reference circuit and a low reference circuit. The camshaft position sensor signals are an input to the ECM. These signals are also used to detect camshaft alignment with the crankshaft.

The ECM also has a dedicated replicated camshaft position sensor signal output circuit that may be used as an input signal to other modules for monitoring engine RPM.

Knock Sensor

The knock sensor system enables the control module to control the ignition timing for the best possible performance while protecting the engine from potentially damaging levels of detonation, also known as spark knock. The knock sensor system uses 1 or 2 flat response 2-wire sensors. The sensor uses piezo-electric crystal technology that produces an AC voltage signal of varying amplitude and frequency based on the engine vibration or noise level. The amplitude and frequency depend upon the level of knock that the knock sensor detects. The control module receives the knock sensor signal through the signal circuit. The knock sensor ground is supplied by the control module through the low reference circuit.

The control module learns a minimum noise level, or background noise, at idle from the knock sensor and uses calibrated values for the rest of the RPM range. The control module uses the minimum noise level to calculate a noise channel. A normal knock sensor signal will ride within the noise channel. As engine speed and load change, the noise channel upper and lower parameters will change to accommodate the normal knock sensor signal, keeping the signal within the channel. In order to determine which cylinders are knocking, the control module only uses knock sensor signal information when each cylinder is near top dead center (TDC) of the firing stroke. If knock is present, the signal will range outside of the noise channel.

If the control module has determined that knock is present, it will retard the ignition timing to attempt to eliminate the knock. The control module will always try to work back to a zero compensation level, or no spark retard. An abnormal knock sensor signal will stay outside of the noise channel or will not be present. Knock sensor diagnostics are calibrated to detect faults with the knock sensor circuitry inside the control module, the knock sensor wiring, or the knock sensor voltage output. Some diagnostics are also calibrated to detect constant noise from an outside influence such as a loose/damaged component or excessive engine mechanical noise.

Ignition Coils

Each ignition coil contains a solid state driver module as its primary element. The engine control module (ECM) signals the coil driver to initiate a firing event by applying ignition control (IC) circuit voltage for the appropriate amount of time otherwise known as dwell. When the voltage is removed the coil fires the spark plug.

Engine Control Module (ECM)

The engine control module (ECM) controls all ignition system functions and constantly corrects the spark timing. The ECM monitors information from various sensor inputs that may include the following components, if applicable:

- Throttle position sensor
- Engine coolant temperature (ECT) sensor
- Mass air flow (MAF) sensor
- Intake air temperature (IAT) sensor
- Vehicle speed sensor (VSS)
- Transmission gear position or range information sensors
- Engine knock sensors
- Ambient pressure sensor (BARO)

2013 Chevrolet Colorado

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

The ignition system is responsible for producing and controlling a high energy secondary spark. This spark is used to ignite the compressed air/fuel mixture at precisely the correct time. This provides optimal performance, fuel economy, and control of exhaust emissions. This ignition system uses one coil for each pair of cylinders. Each pair of cylinders that are at top dead center (TDC) at the same time are known as companion cylinders. The cylinder that is at TDC of the compression stroke is called the event cylinder. The cylinder that is at TDC of the exhaust stroke is called the waste cylinder. When the coil is triggered both companion cylinder spark plugs fire at the same time, completing a series circuit. Because the lower pressure inside the waste cylinder offers very little resistance, the event cylinder uses most of the available voltage to produce a very high energy spark. This is known as waste spark ignition. The ignition system consists of the following components:

Crankshaft Position Sensor

The crankshaft position sensor works in conjunction with a reluctor wheel on the crankshaft (front mounted crankshaft position sensor) or a reluctor wheel that is part of the flywheel (rear mounted crankshaft position sensor). The engine control module (ECM) monitors the voltage frequency on the crankshaft position sensor signal circuit. As each reluctor wheel tooth rotates past the sensor, the sensor creates a digital ON/OFF pulse. This digital signal is processed by the ECM. This creates a signature pattern that enables the ECM to determine the crankshaft position. The ECM uses the signal to determine which pair of cylinders is approaching top dead center based on the crankshaft position signal alone. The camshaft position sensor signals are used in order to determine which of these 2 cylinders is on a firing stroke, and which is on the exhaust stroke. The ECM uses this to properly synchronize the ignition system, the fuel injectors, and the knock control. This sensor is also used in order to detect misfire.

Crankshaft Reluctor Wheel

The crankshaft reluctor wheel is part of the crankshaft. The reluctor wheel consists of 58 teeth and a reference gap. Each tooth on the reluctor wheel is spaced 6 degrees apart with a 12-degree space for the reference gap. The pulse from the reference gap is known as the sync pulse. The sync pulse is used to synchronize the coil firing sequence with the crankshaft position, while the other teeth provide cylinder location during a revolution.

Camshaft Position Sensor

The camshaft position sensor is a Hall-Effect type sensor. The camshaft position signal is a digital ON/OFF pulse, which outputs once per revolution of the camshaft. The camshaft position sensor does not directly affect the operation of the ignition system. The camshaft position sensor information is used by the engine control module (ECM) to determine the position of the valve train relative to the crankshaft position. By monitoring the camshaft position and crankshaft position signals, the ECM can accurately trigger the fuel injectors. This allows the ECM to calculate true sequential fuel injection mode of operation. If the camshaft position signal is lost while the engine is running, the fuel injection system will shift to a calculated sequential fuel injection mode based on the last fuel injection pulse, and the engine will continue to run. The camshaft position sensor consists of an ignition 1 voltage circuit, a ground circuit, and a signal circuit.

Camshaft Reluctor Wheel

The camshaft reluctor wheel is bolted to the front of the camshaft. The wheel is a smooth track, half of which is of a lower profile than the other half. This track is read in a radial or axial fashion respectively. This allows the camshaft position sensor to supply a signal as soon as the key is turned ON, since the camshaft position sensor reads the track profile, instead of a notch.

Ignition Coils (IC)

The ignition coil (IC) provides the voltage for 2 spark plugs simultaneously. The IC is a dual coil pack, and directly supplies voltage to each spark plug. The engine control module (ECM) will command the IC circuit ON, this allows the current to flow through the primary coil windings for the appropriate time or dwell. When the ECM commands the IC circuit OFF, this will interrupt current flow through the primary coil windings. The magnetic field created by the primary coil windings will collapse across the secondary coil windings, which induces a high voltage. The secondary coil voltage travels from the coil output terminal, through the spark plug wire, and across the spark plug gap to the engine block. The IC is not serviceable and must be replaced as an assembly. The IC consists of an ignition 1 voltage circuit, an IC 1 and 4 control circuit, and an IC 2 and 3 control circuit.

Engine Control Module (ECM)

The engine control module (ECM) is responsible for maintaining proper spark and fuel injection timing for all driving conditions. The electronic spark timing (EST) is the method the ECM uses to control spark advance. The ignition module is integrated inside the ECM, and the primary coil ON/OFF is directly controlled by the ECM. To provide optimum driveability and emissions, the ECM monitors input signals from the following components in calculating ignition spark timing:

- The crankshaft position sensor
- The throttle position (TP) sensor
- The engine coolant temperature (ECT) sensor
- The manifold absolute pressure (MAP) sensor
- The intake air temperature (IAT) sensor
- The vehicle speed sensor (VSS)
- The knock sensor (KS)

Noteworthy Ignition Information

The ignition coils secondary output voltage is more than 40,000 volts. Avoid body contact with the ignition high voltage secondary components when the engine is running or personal injury may result.

Be careful not to damage the secondary ignition coil boots when servicing the ignition system. Rotate each spark plug wire in order to loosen the boot from the spark plug before removing. Never pierce a secondary ignition boot for any testing purposes. Future ignition system problems are guaranteed if pinpoints or test lights are pushed through the secondary ignition component insulation during testing.

2013 Chevrolet Colorado

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

The Engine Control Module (ECM) interacts with many emission related components and systems, and monitors emission related components and systems for deterioration. OBD II diagnostics monitor the system performance and a diagnostic trouble code (DTC) sets if the system performance degrades. The ECM is part of a network and communicates with various other vehicle control modules.

Malfunction indicator lamp (MIL) operation and DTC storage are dictated by the DTC type. A DTC is ranked as a Type A or Type B if the DTC is emissions related. Type C is a non-emissions related DTC.

The ECM is the control center of the engine controls system. Review the components and wiring diagrams in order to determine which systems are controlled by the ECM.

The ECM constantly monitors the information from various sensors and other inputs, and controls the systems that affect engine performance and emissions. The ECM also performs diagnostic tests on various parts of the system and can turn on the MIL when it recognizes an operational problem that affects emissions. When the ECM detects a malfunction, the ECM stores a DTC. The condition area is identified by the particular DTC that is set. This aids the technician in making repairs.

ECM Function

The ECM can supply 5 V or 12 V to various sensors or switches. This is done through pull-up resistors to regulated power supplies within the ECM. In some cases, even an ordinary shop voltmeter will not give an accurate reading due to low input resistance. Therefore, a digital multimeter (DMM) with at least 10 megaohms input impedance is required in order to ensure accurate voltage readings.

The ECM controls the output circuits by controlling the ground or the power feed circuit through transistors or a device called an output driver module.

EEPROM

The electronically erasable programmable read only memory (EEPROM) is an integral part of the ECM. The EEPROM contains program and calibration information that the ECM needs in order to control engine operation.

Special equipment, as well as the correct program and calibration for the vehicle, are required in order to reprogram the ECM.

Data Link Connector (DLC)

The data link connector (DLC) provides serial data communication for ECM diagnosis. This connector allows the technician to use a scan tool in order to monitor various serial data parameters, and display DTC information. The DLC is located inside the driver's compartment, underneath the instrument panel.

Malfunction Indicator Lamp (MIL)

The malfunction indicator lamp (MIL) is inside the instrument panel cluster (IPC). The MIL is controlled by the ECM and illuminates when the ECM detects a condition that affects vehicle emissions.

ECM Service Precautions

The ECM, by design, can withstand normal current draws that are associated with vehicle operations. However, care must be used in order to avoid overloading any of these circuits. When testing for opens or shorts, do not ground or apply voltage to any of the ECM circuits unless the diagnostic procedure instructs you to do so. These circuits should only be tested with a DMM unless the diagnostic procedure instructs otherwise.

Emissions Diagnosis For State I/M Programs

This OBD II equipped vehicle is designed to diagnose any conditions that could lead to excessive levels of the following emissions:

- Hydrocarbons (HC)
- Carbon monoxide (CO)
- Oxides of nitrogen (NOx)
- Evaporative emission (EVAP) system losses

Should this vehicle's on-board diagnostic system (ECM) detect a condition that could result in excessive emissions, the ECM turns ON the MIL and stores a DTC that is associated with the condition.

Aftermarket (Add-On) Electrical And Vacuum Equipment

Caution: Do not attach add-on vacuum operated equipment to this vehicle. The use of add-on vacuum equipment may result in damage to vehicle components or systems.

Caution: Connect any add-on electrically operated equipment to the vehicle's electrical system at the 12 V battery (power and ground) in order to prevent damage to the vehicle.

Aftermarket, add-on, electrical and vacuum equipment is defined as any equipment installed on a vehicle after leaving the factory that connects to the vehicle's electrical or vacuum systems. No allowances have been made in the vehicle design for this type of equipment.

Add-on electrical equipment, even when installed to these strict guidelines, may still cause the powertrain system to malfunction. This may also include equipment not connected to the vehicle electrical system, such as portable telephones and radios. Therefore, the first step in diagnosing any powertrain condition is to eliminate all of the aftermarket electrical equipment from the vehicle. After this is done, if the problem still exists, the problem may be diagnosed in the normal manner.

Electrostatic Discharge (ESD) Damage

Note: In order to prevent possible electrostatic discharge damage to the ECM, DO NOT touch the connector pins on the ECM.

The electronic components that are used in the control systems are often designed to carry very low voltage. These electronic components are susceptible to damage caused by electrostatic discharge. Less than 100 V of static electricity can cause damage to some electronic components. By comparison, it takes as much as 4,000 V for a person to even feel a static discharge.

There are several ways for a person to become statically charged. The most common methods of charging are by friction and by induction. An example of charging by friction is a person sliding across a car seat.

Charging by induction occurs when a person with well insulated shoes stands near a highly charged object and momentarily touches ground. Charges of the same polarity are drained off leaving the person highly charged with the opposite polarity. Static charges can cause damage, therefore, it is important to use care when handling and testing electronic components.

Engine Control Module Description

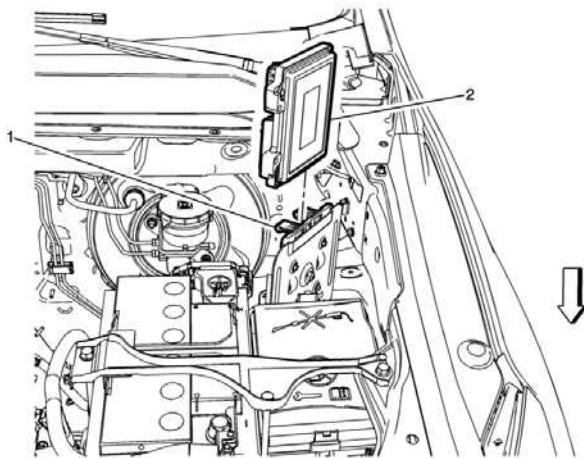
Emissions Control Information Label

The underhood Vehicle Emissions Control Information Label contains important emission specifications. This identifies the year, the displacement of the engine in liters, and the class of the vehicle.

This label is located in the engine compartment of every General Motors vehicle. If the label has been removed, it can be ordered from GM service parts operations (GMSPO).

2013 Chevrolet Colorado

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



Engine Control Module Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

Engine Control Module Bracket Tabs

1

Procedure

Use a suitable tool to pry back the locking tabs and remove the engine control module from the bracket.

Engine Control Module

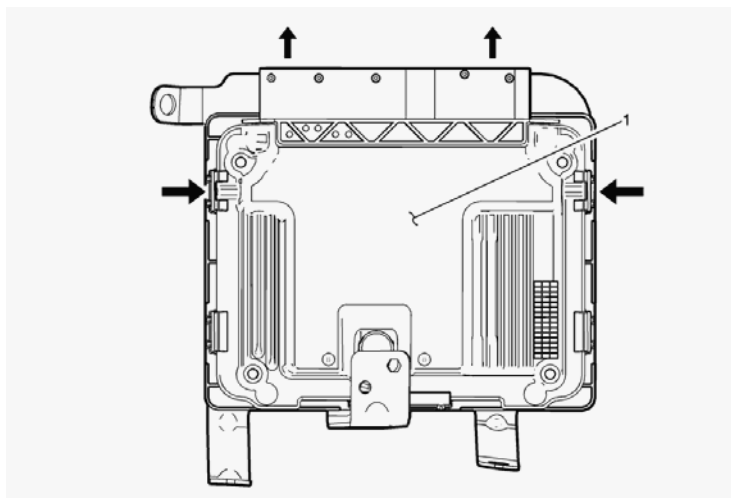
Procedure

2

1. Disconnect the electrical connectors from the engine control module.
2. If replacing the engine control module, it is necessary to reprogram the replacement module. Refer to Control Module References.

2013 Chevrolet Colorado

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



Engine Control Module Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

Engine Control Module

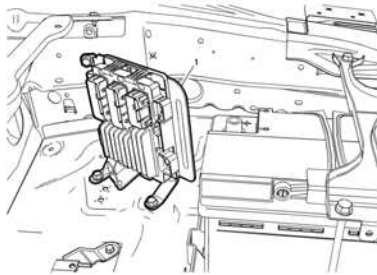
Procedure

1

1. Disconnect the electrical connectors from the engine control module.
2. Use a suitable tool to pry back the locking tabs and slide the engine control module upward to remove the module from the bracket as indicated by the arrows.
3. If replacing ECM, reprogram the ECM. Refer to Control Module References.

2013 Chevrolet Colorado

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



Engine Control Module Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

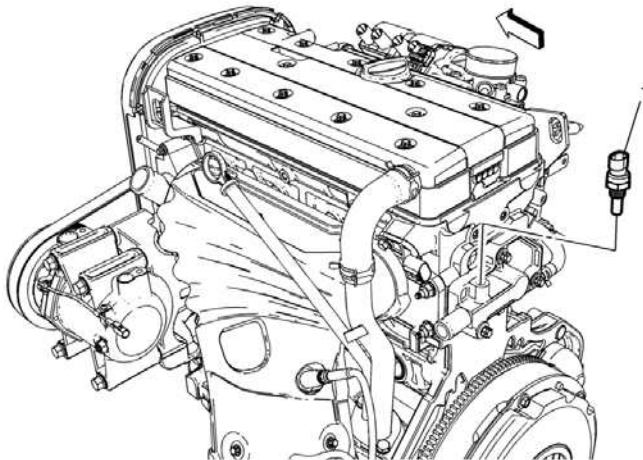
Engine Control Module

Procedure

1. Disconnect the electrical connectors from the engine control module.
2. Use a suitable tool to pry back the locking tabs and remove the engine control module from the bracket.
3. If replacing the engine control module, it is necessary to reprogram the replacement module. Refer to Control Module References.

2013 Chevrolet Colorado

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



Engine Coolant Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.

Engine Coolant Temperature Sensor

Caution: Refer to Component Fastener Tightening Caution.

Procedure

1

Disconnect the engine coolant temperature sensor electrical connector.

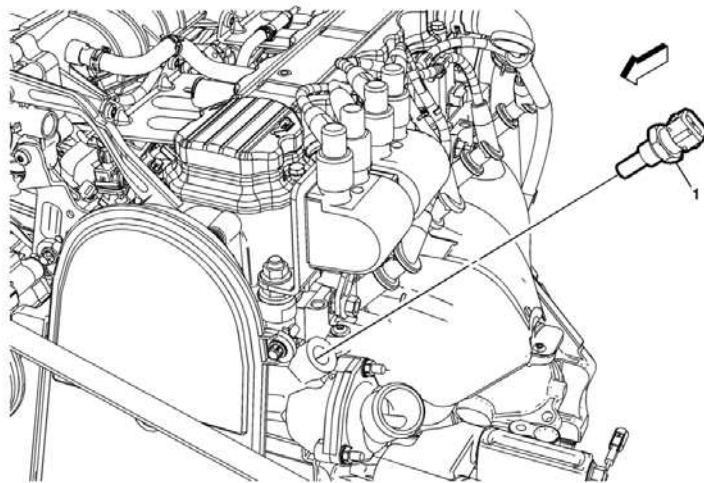
Tighten

20 Y(15 lb ft)

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Engine Coolant Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.

Engine Coolant Temperature Sensor

Caution: Refer to Component Fastener Tightening Caution.

Procedure

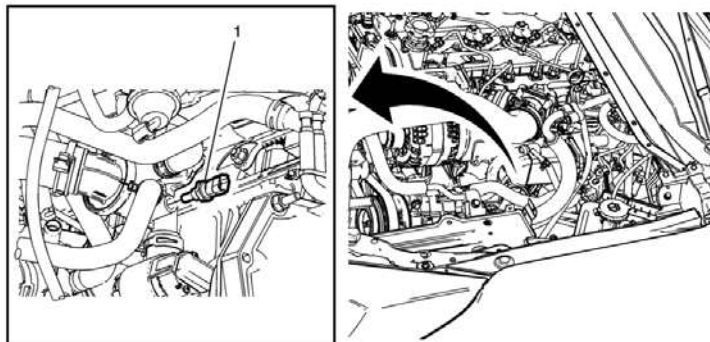
Disconnect the engine coolant temperature sensor electrical connector.

Tighten

20 Y(15 lb ft)

2013 Chevrolet Colorado

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



Engine Coolant Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.

Engine Coolant Temperature Sensor

Caution: Refer to Fastener Caution.

Procedure

Disconnect the electrical connector from the engine coolant temperature sensor.

Tighten

20 Y (15 lb ft)

1

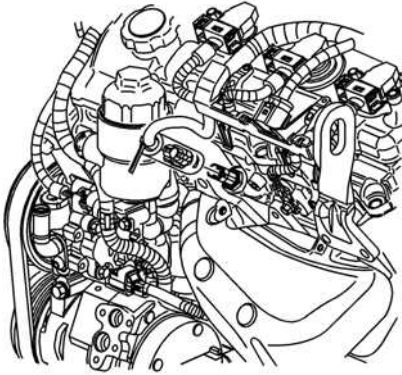
2013 Chevrolet Colorado

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

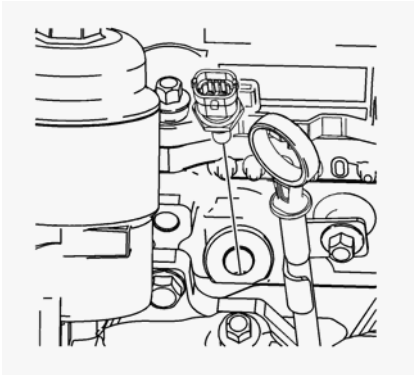
[Removal Procedure](#)

Warning: Allow sufficient time for the engine to cool before removing the ECT sensor. A hot engine may cause an excessive coolant loss or a personal injury.

1. Turn the ignition OFF.
2. Drain the engine coolant to below the engine coolant temperature sensor. Refer to Cooling System Draining and Filling.
3. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

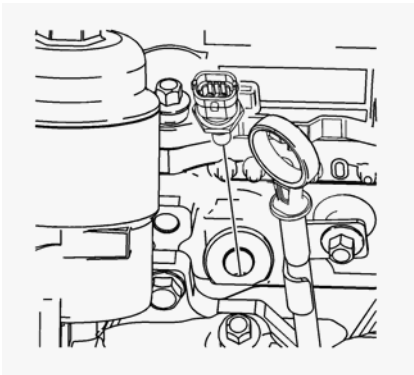


4. Disconnect the engine coolant temperature sensor electrical connector.



5. Remove the engine coolant temperature sensor.

[Installation Procedure](#)

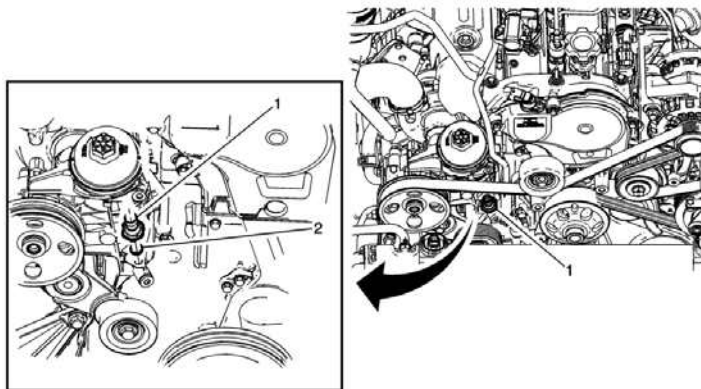


Caution: Refer to Component Fastener Tightening Caution.

1. Install the engine coolant temperature sensor and tighten to **30 Y (22 lb ft)**.
2. Install the engine coolant temperature sensor electrical connector.
3. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement.
4. Inspect and fill the cooling system as necessary. Refer to Cooling System Draining and Filling.

2013 Chevrolet Colorado

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



Engine Oil Pressure Switch Replacement

Callout

Component Name

Preliminary Procedure

Remove the engine coolant fan clutch. Refer to Fan Blade Clutch Replacement.

Oil Pressure Switch

Caution: Refer to Component Fastener Tightening Caution.

Procedure

Disconnect the oil pressure switch electrical connectors.

1

Tighten

35 Y (25 lb ft)

Special Tool

J-35669 Oil Pressure Switch Removal

Oil Pressure Switch Seal

2

Procedure

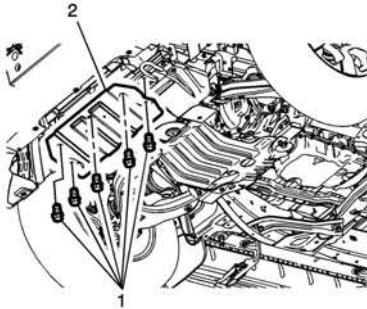
Use a NEW seal when installing the sensor.

2013 Chevrolet Colorado

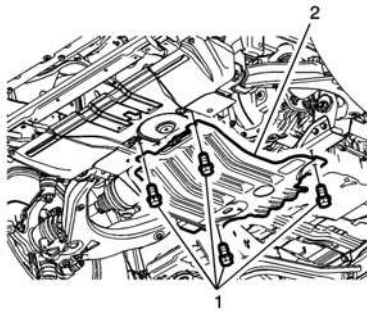
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

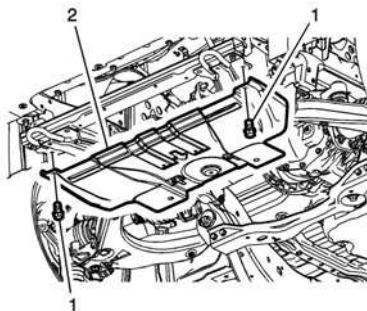
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



2. Remove the front shield bolts (1).
3. Remove the front shield (2) from the vehicle.

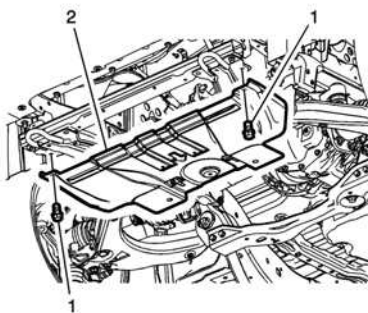


4. Remove the rear shield bolts (1).
5. Remove the rear shield (2) from the vehicle.



6. Remove the center shield bolts (1).
7. Remove the center shield (2) from the vehicle.

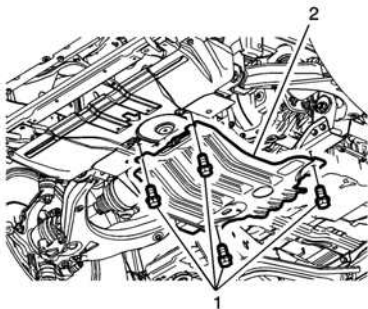
[Installation Procedure](#)



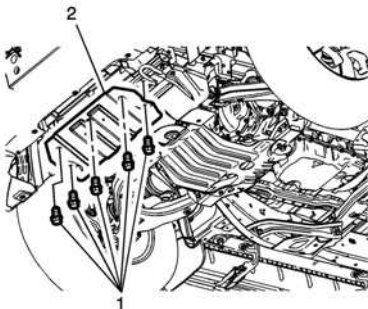
1. Install the center shield (2) on the vehicle.

Caution: Refer to Fastener Caution.

2. Install the center shield bolts (1) and tighten to **51 Y (38 lb ft)**.



3. Install the rear shield (2) on the vehicle.
4. Install the rear shield bolts (1) and tighten to **51 Y (38 lb ft)**.

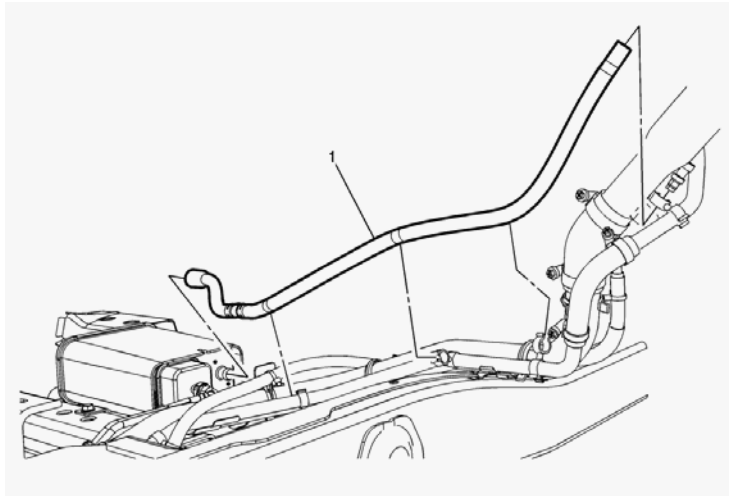


5. Install the front shield on the vehicle (2).
6. Install the front shield bolts (1) and tighten to **51 Y (38 lb ft)**.
7. Lower the vehicle.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Canister Hose Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the spare tire.

Evaporative Emission Canister Hose

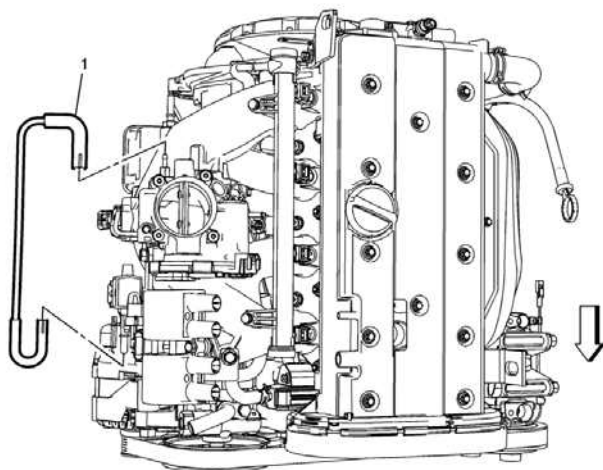
1

Procedure

Disconnect the evaporative emission canister hose from the evaporative emission canister and the fuel fill pipe assembly.

2013 Chevrolet Colorado

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



Evaporative Emission Canister Purge Control Vacuum Hose Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.

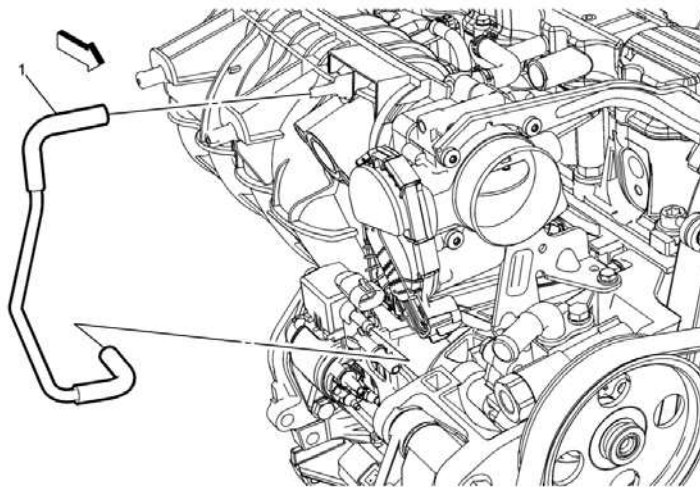
1

Evaporative Emission Canister Purge Control Vacuum Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Canister Purge Control Vacuum Hose Replacement

Callout

Component Name

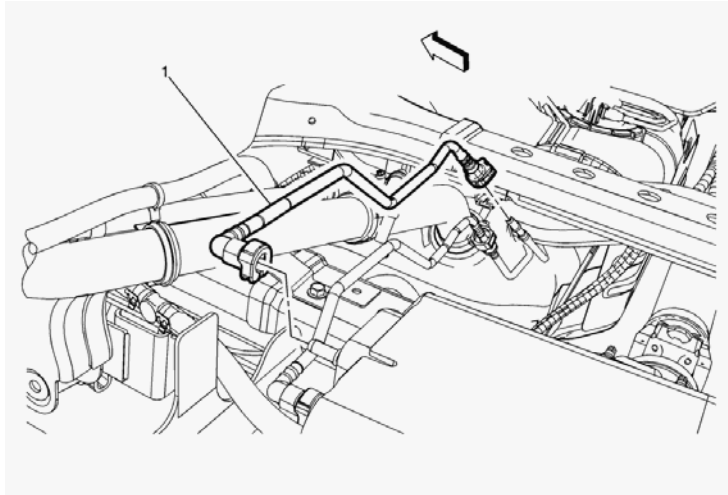
1

Evaporative Emission Canister Purge Control Vacuum Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Canister Purge Rear Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the spare tire.

Evaporative Emission Canister Purge Rear Pipe

1

Procedure

Disconnect the evaporative emission canister purge rear pipe from the evaporative emission canister and evaporative intermediate pipe. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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

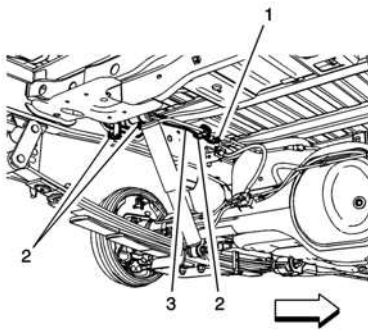
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

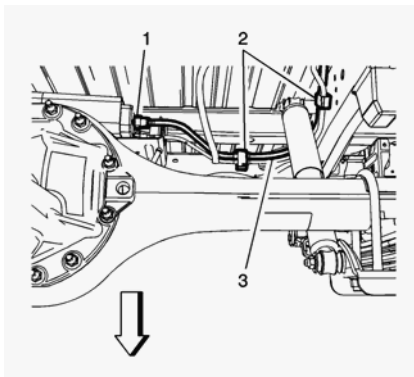
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

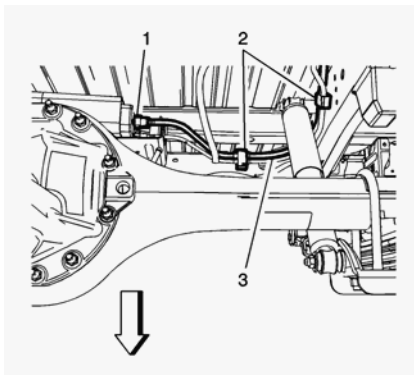


2. Disconnect the evaporative emission canister purge rear pipe (1) from the evaporative emission intermediate pipe. Refer to Plastic Collar Quick Connect Fitting Service.
3. Disconnect the evaporative emission canister purge rear pipe (2) from the retainers.



4. Disconnect the evaporative emission canister purge rear pipe (1) from the evaporative emission canister. Refer to Plastic Collar Quick Connect Fitting Service.
5. Disconnect the evaporative emission canister purge rear pipe (2) from the retainers.
6. Remove the evaporative emission canister purge rear pipe (3) from the vehicle.

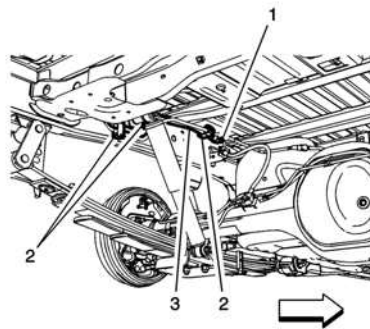
[Installation Procedure](#)



1. Install the evaporative emission canister purge rear pipe (3) to the vehicle.

Evaporative Emission Canister Purge Rear Pipe Replacement

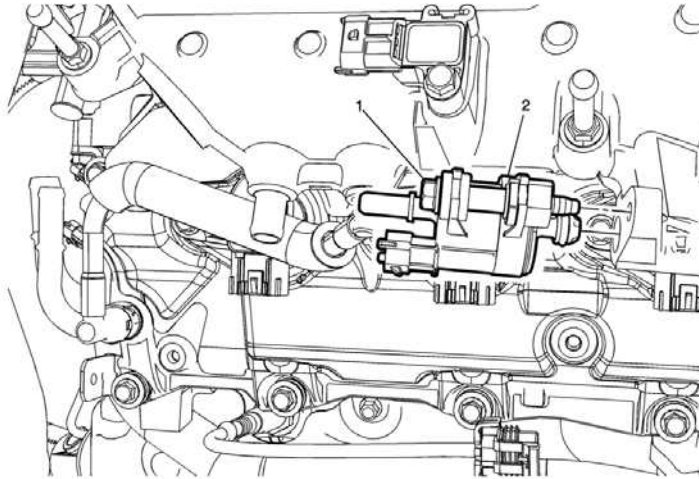
2. Connect the evaporative emission canister purge rear pipe (2) to the retainers.
3. Connect the evaporative emission canister purge rear pipe (1) to the evaporative emission canister. Refer to Plastic Collar Quick Connect Fitting Service.



4. Connect the evaporative emission canister purge rear pipe (2) to the retainers.
5. Connect the evaporative emission canister purge rear pipe (1) to the evaporative emission intermediate pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Lower the vehicle.

2013 Chevrolet Colorado

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



Evaporative Emission Canister Purge Solenoid Valve Replacement

Callout

Component Name

Preliminary Procedures

1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Disconnect the evaporative emissions front pipe from the evaporative emissions canister purge solenoid valve. Refer to Evaporative Emission Front Pipe Replacement.

Evaporative Emission Canister Purge Solenoid Valve Bolt

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Evaporative Emission Canister Purge Solenoid Valve

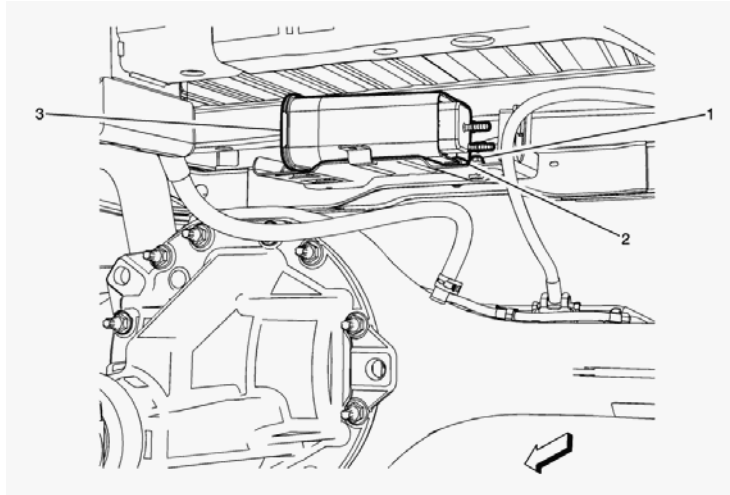
Procedure

2

1. Disconnect the electrical wiring harness connector.
2. Install a NEW O-ring.

2013 Chevrolet Colorado

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



Evaporative Emission Canister Replacement

Callout

Component Name

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

Preliminary Procedures

1. Remove the spare tire from the vehicle.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Disconnect the evaporative emission canister pipes. Refer to Plastic Collar Quick Connect Fitting Service.
4. Disconnect the evaporator emission canister hose from the emission canister.

Evaporative Emission Canister Fastener

Caution: Refer to Fastener Caution.

1

Tighten

17 Y (13 lb ft)

2

Evaporative Emission Canister Bracket

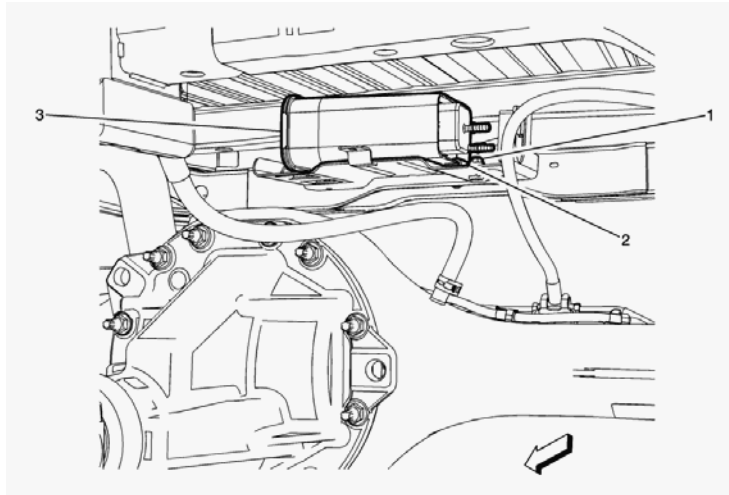
3

Evaporative Emission Canister

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Canister Replacement

Callout

Component Name

Preliminary Procedure

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the spare tire.
3. Remove the evaporative emission canister purge rear pipe. Refer to Evaporative Emission Canister Purge Rear Pipe Replacement.
4. Remove the evaporative emission canister vent pipe. Refer to Evaporative Emission Canister Vent Pipe Replacement.
5. Remove the filter evaporator emission canister hose from evaporative emission canister.

Evaporative Emission Canister Fastener

1

Caution: Refer to Fastener Caution.

Tighten

17 Y (13 lb ft)

2

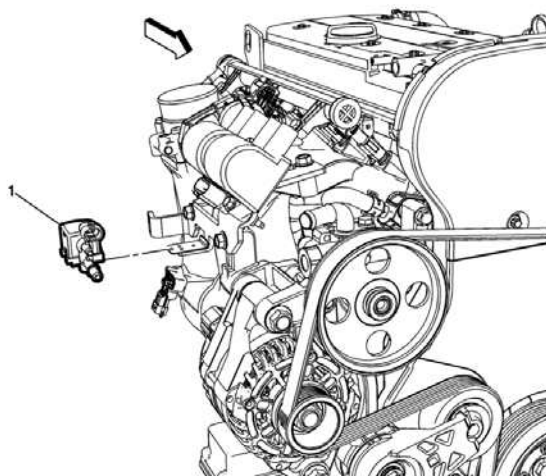
Evaporative Emission Canister Bracket

3

Evaporative Emission Canister

2013 Chevrolet Colorado

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



Evaporative Emission Canister Solenoid Valve Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
2. Remove the evaporative emission canister purgr control vacuum hose. Refer to Evaporative Emission Canister Purge Control Vacuum Hose Replacement.
3. Remove the evaporative emission pipe. Refer to Evaporative Emission Pipe Replacement.

Evaporative Emission Canister Solenoid Valve.

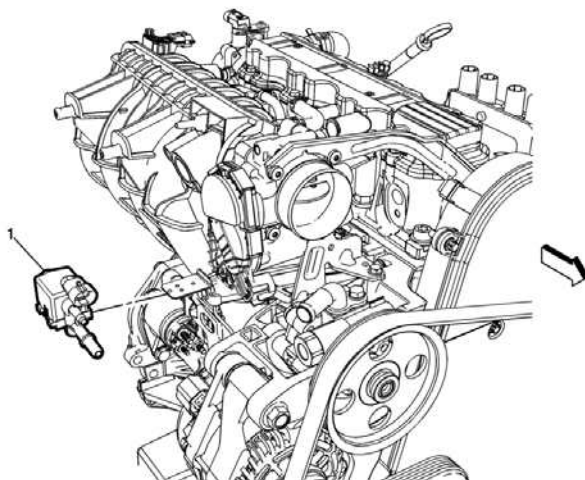
1

Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

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



Evaporative Emission Canister Solenoid Valve Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the evaporative emission canister purge control vacuum hose. Refer to Evaporative Emission Canister Purge Control Vacuum Hose Replacement.
2. Remove the evaporative emission pipe. Refer to Evaporative Emission Pipe Replacement.

Evaporative Emission Canister Solenoid Valve.

1

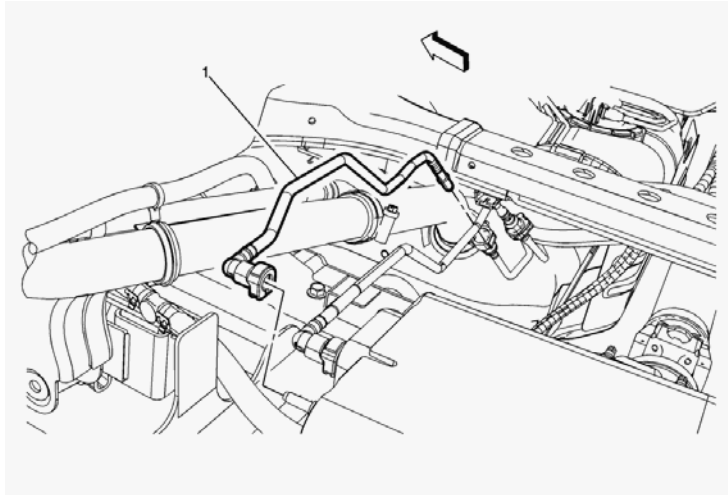
Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Canister Vent Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the spare tire.

Evaporative Emission Canister Purge Vent Pipe

Procedure

1

Disconnect the evaporative emission canister purge rear vent pipe from the evaporative emission canister and evaporative emission fuel tank vent pipe. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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

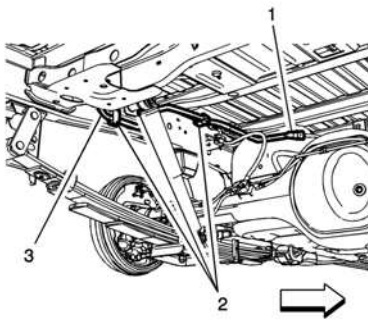
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

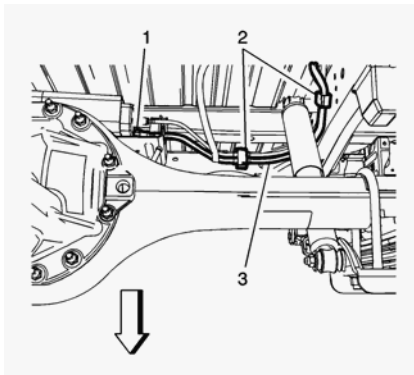
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

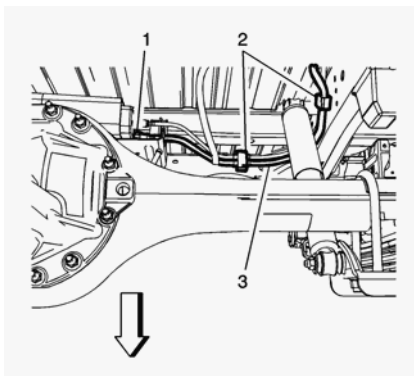


2. Disconnect the evaporative emission canister vent pipe (1) from the fuel tank. Refer to Plastic Collar Quick Connect Fitting Service.
3. Disconnect the evaporative emission canister vent pipe (2) from the retainers.



4. Disconnect the evaporative emission canister vent pipe (1) from the evaporative emission canister. Refer to Plastic Collar Quick Connect Fitting Service.
5. Disconnect the evaporative emission canister vent pipe (2) from the retainers.
6. Remove the evaporative emission canister vent pipe (3) from the vehicle.

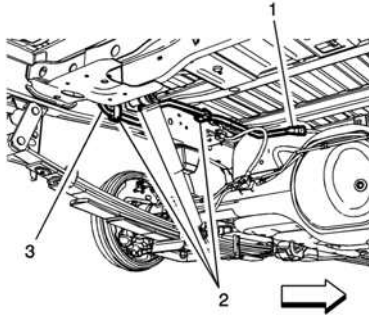
[Installation Procedure](#)



1. Install the evaporative emission canister vent pipe (3) to the vehicle.
2. Connect the evaporative emission canister vent pipe (2) to the retainers.

Evaporative Emission Canister Vent Pipe Replacement

3. Connect the evaporative emission canister vent pipe (1) to the evaporative emission canister. Refer to Plastic Collar Quick Connect Fitting Service.



4. Connect the evaporative emission canister vent pipe (2) to the retainers.
5. Connect the evaporative emission canister vent pipe (1) to the fuel tank. Refer to Plastic Collar Quick Connect Fitting Service.
6. Lower the vehicle.

2013 Chevrolet Colorado

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

[EVAP System Operation](#)

The evaporative emission (EVAP) control system used is the charcoal canister storage method. This method transfers fuel vapor from the fuel tank to an activated carbon, charcoal, storage device, or canister, to hold the vapors when the vehicle is not operating. When the engine is running, the fuel vapor is purged from the carbon element by intake airflow and consumed in the normal combustion process.

Fuel vapors from the fuel tank flow into the canister. These vapors are absorbed into the carbon. The canister is purged by the engine control module (ECM) when the engine has been running for a specified amount of time. Air is drawn into the canister and mixed with the vapor. This mixture is then drawn into the intake manifold.

The ECM supplies a ground to energize the evaporative emission (EVAP) canister purge solenoid valve. This valve is pulse width modulated (PWM) or turned ON and OFF several times a second. The evaporative emission (EVAP) canister purge solenoid valve PWM duty cycle varies according to operating conditions determined by engine load, fuel trim, and intake air temperature.

Poor idle, stalling, and poor driveability can be caused by the following conditions:

- An inoperative evaporative emission (EVAP) canister purge solenoid valve
- A damaged canister
- Hoses that are split, cracked, or not connected to the proper tubes

[EVAP System Components](#)

The evaporative emission (EVAP) system consists of the following components:

EVAP Canister

The canister is filled with carbon pellets used to absorb and store fuel vapors. Fuel vapor is stored in the canister until the engine control module determines that the vapor can be consumed in the normal combustion process.

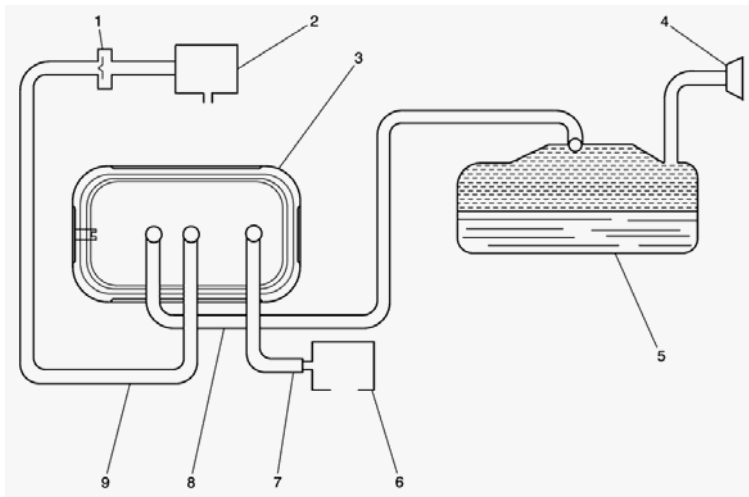
EVAP Purge Solenoid Valve

The EVAP purge solenoid valve controls the flow of vapors from the EVAP system to the intake manifold. The purge solenoid valve opens when commanded ON by the control module. This normally closed valve is pulse width modulated (PWM) by the control module to precisely control the flow of fuel vapor to the engine.

2013 Chevrolet Colorado

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

[EVAP System Operation](#)



- (1) Purge Tube Check Valve, Turbo-Charged Applications Only
- (2) EVAP Canister Purge Solenoid Valve
- (3) EVAP Canister
- (4) Fuel Fill Cap/Fill Neck
- (5) Fuel Tank
- (6) EVAP Air Inlet
- (7) EVAP Vent Pipe
- (8) EVAP Vapor Pipe
- (9) EVAP Purge Pipe

The evaporative emission (EVAP) control system limits fuel vapors from escaping into the atmosphere. Fuel tank vapors are allowed to move from the fuel tank, due to pressure in the tank, through the vapor pipe, into the EVAP canister. Carbon in the canister absorbs and stores the fuel vapors. Excess pressure is vented through the vent pipe and EVAP air inlet to atmosphere. The EVAP canisters store the fuel vapors until the engine is able to use them. At an appropriate time, the control module will command the EVAP purge solenoid valve open, allowing engine vacuum to be applied to the EVAP canister. Fresh air will be drawn through the EVAP air inlet and vent pipe to the EVAP canisters. Fresh air is drawn through the EVAP canister, pulling fuel vapors from the carbon. The air/fuel vapor mixture continues through the EVAP purge pipe and EVAP purge solenoid valve into the intake manifold to be consumed during normal combustion.

[EVAP System Components](#)

The EVAP system is made up of the following components:

- The purge tube check valve, turbo-charged applications only
- The EVAP canister purge solenoid valve
- The EVAP canister
- The fuel fill cap/fill neck
- The fuel tank
- The EVAP air inlet
- The EVAP vent pipe
- The EVAP vapor pipe
- The EVAP purge pipe

[EVAP Canister](#)

The EVAP canister is a sealed unit with 3 ports.

The canister is filled with carbon pellets used to absorb and store fuel vapors. Fuel vapor is stored in the canister until the control module determines that the vapor can be consumed in the normal combustion process.

[EVAP Purge Solenoid Valve](#)

The EVAP purge solenoid valve controls the flow of vapors from the EVAP system to the intake manifold. This normally closed valve is pulse width modulated (PWM) by the control module to precisely control the flow of fuel vapor to the engine.

[EVAP Air Inlet](#)

The EVAP air inlet filters air entering the EVAP canister.

[Purge Tube Check Valve](#)

Turbocharged vehicles have a check valve in the purge tube, between the EVAP purge solenoid valve and the EVAP canister, to prevent pressurization of the EVAP system under boost conditions.

2013 Chevrolet Colorado

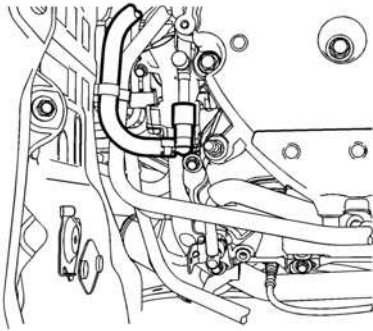
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

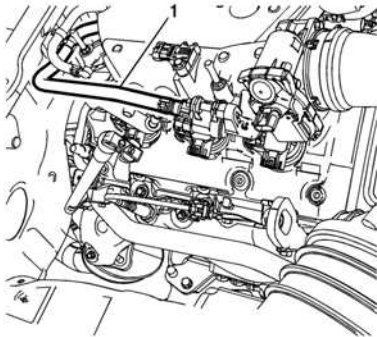
The fuel system fuel feed and evaporative emissions hose/pipes are serviceable individually or as a complete bundled assembly, the following procedure details the removal of both the fuel feed pipe and the evaporative emissions pipe.

Warning: Refer to Relieving Fuel Pressure Warning.

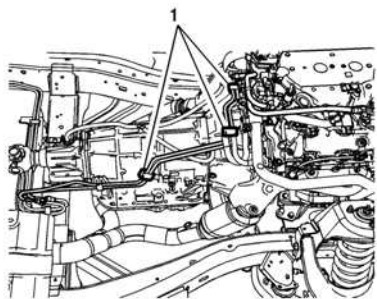
1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.



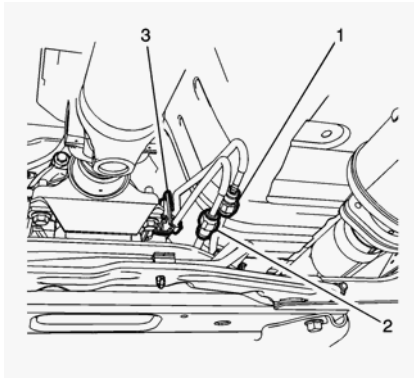
2. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Metal Collar Quick Connect Fitting Service.



3. Disconnect the evaporative emission (EVAP) purge line (1) from the purge solenoid.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



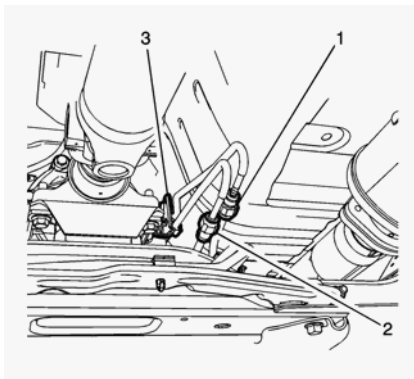
5. Open the retaining clips (1) at the locations shown and remove the pipes from the retainers.



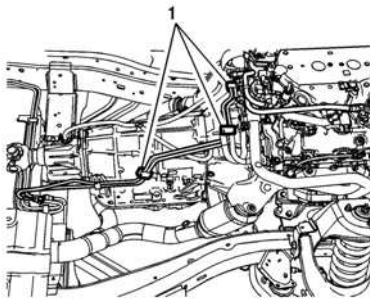
6. Disconnect the fuel feed front pipe (1) and the EVAP front pipe (2) at the location shown. Refer to Plastic Collar Quick Connect Fitting Service.
7. Carefully guide the front fuel feed and EVAP hose/pipes down through the engine compartment, removing from the bottom.

[Installation Procedure](#)

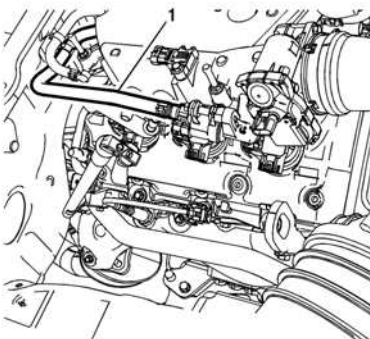
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. With the aid of an assistant, carefully guide the front fuel feed and EVAP hose/pipes up through the engine compartment into position.



3. Connect the fuel feed front pipe (1) and the EVAP front pipe (2) at the location shown. Refer to Plastic Collar Quick Connect Fitting Service.

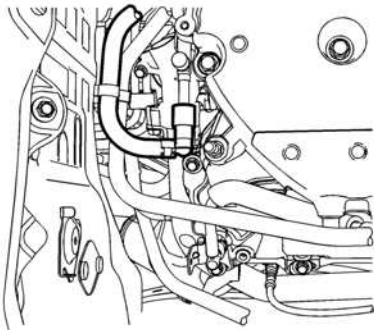


4. Install the pipes to the retaining clips (1) at the locations shown and close the retaining clips.
5. Lower the vehicle.



6. Connect the evaporative emission (EVAP) purge line (1) to the purge solenoid.

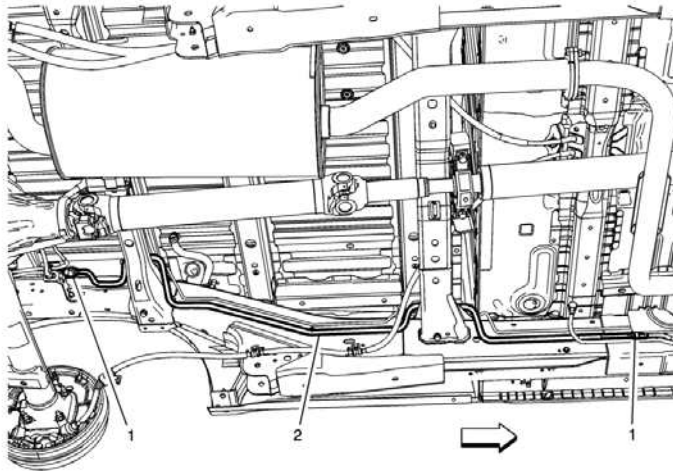
Evaporative Emission Front Pipe Replacement



7. Connect the fuel feed pipe (1) to the fuel rail. Refer to Metal Collar Quick Connect Fitting Service.
8. Start the vehicle and check for leaks.

2013 Chevrolet Colorado

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



Evaporative Emission Intermediate Pipe Replacement

Callout

Component Name

Preliminary Procedure

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Quick Disconnect Fitting

1

Procedure

Disconnect the quick connect fitting at each end of the pipe. Refer to Plastic Collar Quick Connect Fitting Service.

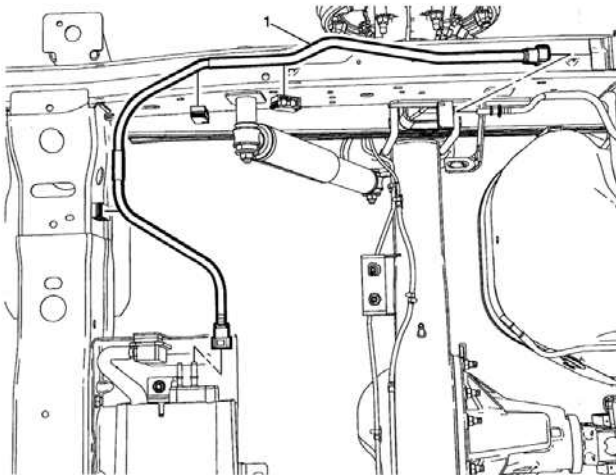
2

Evaporative Emission Intermediate Pipe

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Line Replacement - Chassis to Canister

Callout

Component Name

Preliminary Procedure

Raise and properly support the vehicle. Refer to Lifting and Jacking the Vehicle.

Evaporative Emissions Line Chassis to Canister

1

Procedure

Disconnect the evaporative emissions pipe. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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

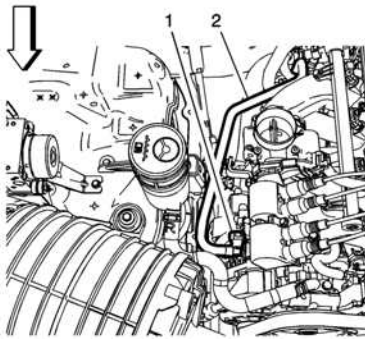
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

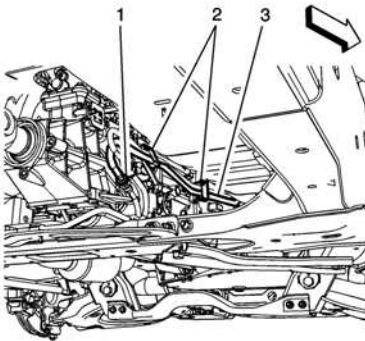
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.



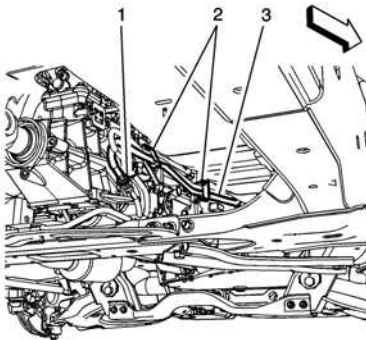
2. Disconnect the evaporative emission pipe quick connect fitting (1) from the evaporative emission canister solenoid valve. Refer to Plastic Collar Quick Connect Fitting Service.
3. Remove the evaporative emission pipe (2) from the evaporative emission canister solenoid valve.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



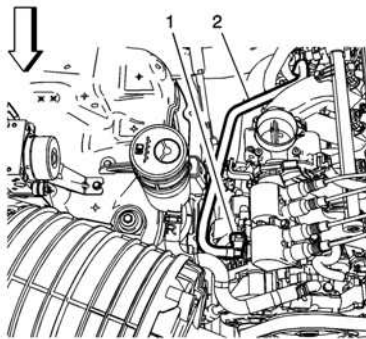
5. Disconnect the evaporative emission pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Remove the evaporative emission pipe (3) from the retainers (2).
7. Remove the evaporative emission pipe (3) from the vehicle.

[Installation Procedure](#)

Evaporative Emission Pipe Replacement (LE6)



1. Install the evaporative emission pipe (3) to the vehicle.
2. Install the evaporative emission pipe (3) to the retainers (2).
3. Connect the evaporative emission pipe quick connect fitting (1) to the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
4. Lower the vehicle.



5. Install the evaporative emission pipe (2) to the evaporative emission canister solenoid valve.
6. Connect the evaporative emission pipe quick connect fitting (1) to the evaporative emission canister solenoid valve. Refer to Plastic Collar Quick Connect Fitting Service.
7. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.

2013 Chevrolet Colorado

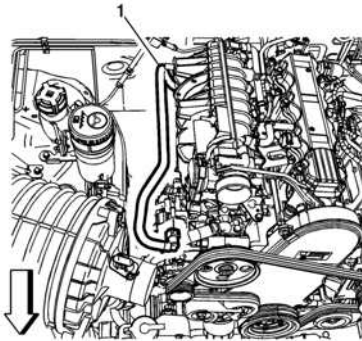
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

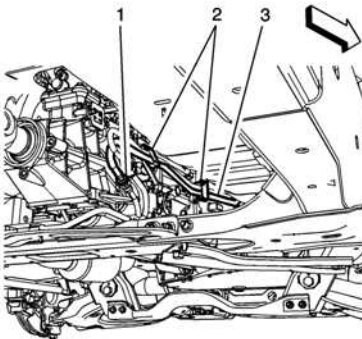
Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

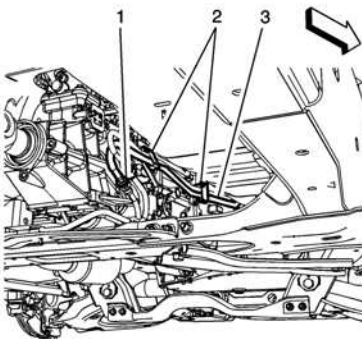


1. Disconnect the evaporative emission pipe (1) from the evaporative emission canister solenoid valve. Refer to Plastic Collar Quick Connect Fitting Service.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



3. Disconnect the evaporative emission pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
4. Remove the evaporative emission pipe (3) from the retainers (2).
5. Remove the evaporative emission pipe (3) from the vehicle.

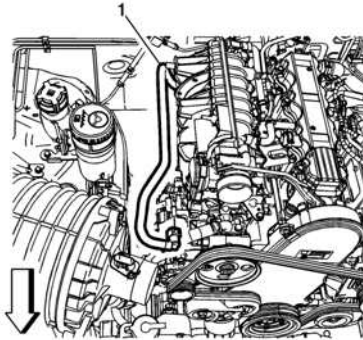
[Installation Procedure](#)



1. Install the evaporative emission pipe (3) to the vehicle.

Evaporative Emission Pipe Replacement (LP8)

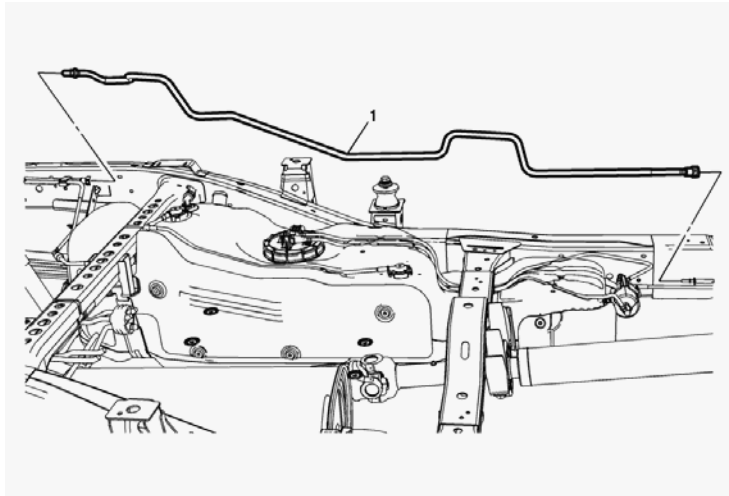
2. Install the evaporative emission pipe (3) to the retainers (2).
3. Connect the evaporative emission pipe quick connect fitting (1) to the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
4. Lower the vehicle.



5. Connect the evaporative emission pipe (1) to the evaporative emission canister solenoid valve. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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



Evaporative Emission Pipe Replacement

Callout

Component Name

Preliminary Procedure

Raise and properly support the vehicle. Refer to **Lifting and Jacking the Vehicle**.

Evaporative Emissions Pipe

1

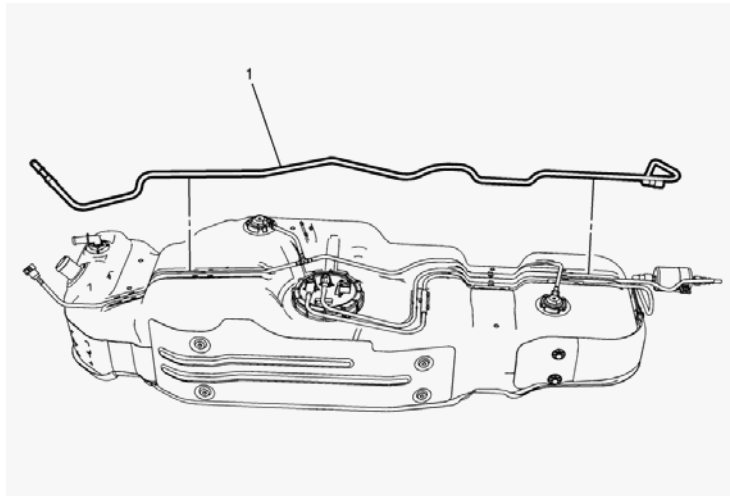
Procedure

Disconnect the evaporative emissions pipe. Refer to **Plastic Collar Quick Connect Fitting Service**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Pipe Replacement

Callout

Component Name

Preliminary Procedure

Remove the fuel tank. Refer to Fuel Tank Replacement.

Evaporative Emissions Pipe

1

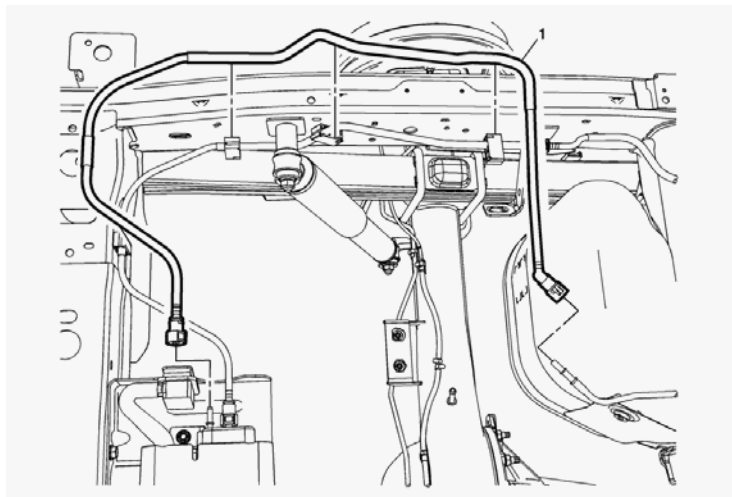
Procedure

Release the evaporative emission pipe from the fuel tank. Note the routing for installation.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Evaporative Emission Rear Pipe Replacement

Callout

Component Name

Preliminary Procedure

Raise and properly support the vehicle. Refer to **Lifting and Jacking the Vehicle**.

1

Evaporative Emissions Rear Pipe

Procedure

Disconnect the evaporative emissions rear pipe. Refer to **Plastic Collar Quick Connect Fitting Service**.

2013 Chevrolet Colorado

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

Caution: The oxygen sensor may be difficult to remove when the engine temperature is below 48°C (120°F). Excessive force may damage threads in the exhaust manifold or the exhaust pipe.

2013 Chevrolet Colorado

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

The exhaust gas recirculation (EGR) system is used to reduce the amount of nitrogen oxide (NOx) emission levels caused by high combustion temperatures. At temperatures above 1,371°C (2,500°F), oxygen and nitrogen combine to form NOx. Introducing small amounts of exhaust gas back into the combustion chamber displaces the amount of oxygen entering the engine. With less oxygen in the air/fuel mixture, the combustion pressures are reduced and as a result, combustion temperatures are decreased, restricting the formation of NOx.

System Components

The EGR system consists of the following components:

- EGR valve
- EGR valve solenoid
- EGR valve position sensor
- EGR cooler by-pass valve
- EGR cooler by-pass valve solenoid
- EGR cooler
- Mass air flow (MAF) sensor

System Operation

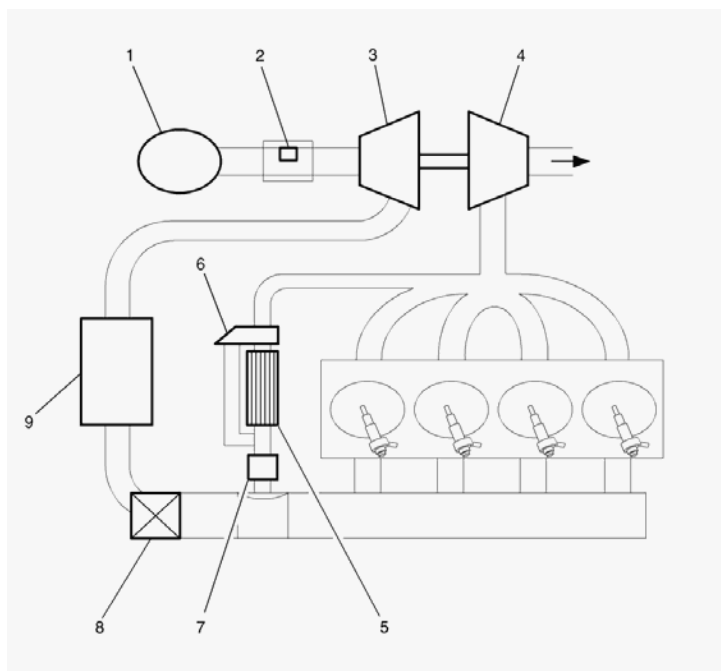
The engine control module (ECM) controls the EGR valve to ensure both driveability and low emissions. The EGR flow amount is based on engine speed, engine coolant temperature (ECT), intake air temperature (IAT), barometric pressure (BARO) and fuel injection quantity. The mass air flow (MAF) sensor monitors EGR flow amount. The expected MAF is compared to actual MAF to determine if the EGR system is functioning correctly.

The EGR valve is vacuum operated through a remote solenoid valve controlled by pulse width modulation (PWM) signal from the ECM. The EGR valve is mounted directly on the intake manifold and consists of a spring-loaded diaphragm connected to a pintle. The valve is held normally closed by the spring tension. As it receives vacuum, the diaphragm rises and pulls the pintle off its seat to enable exhaust flow into the valve's chamber and then on to the intake manifold. An integral valve position sensor detects the position of the pintle and provides a feedback signal to the ECM.

The EGR cooler by-pass valve is a two position, vacuum operated valve. In the rest position, the recirculated gases pass through the cooler. When the by-pass valve is operated, an integral deflector directs the gases directly to the EGR valve. The ECM controls the position of the by-pass valve by means of a solenoid valve.

The cooler by-pass valve is controlled by the ECM to allow cooling of the exhaust gases during high engine load operation or exclusion of the cooling process during idle and light engine load applications.

System Diagram



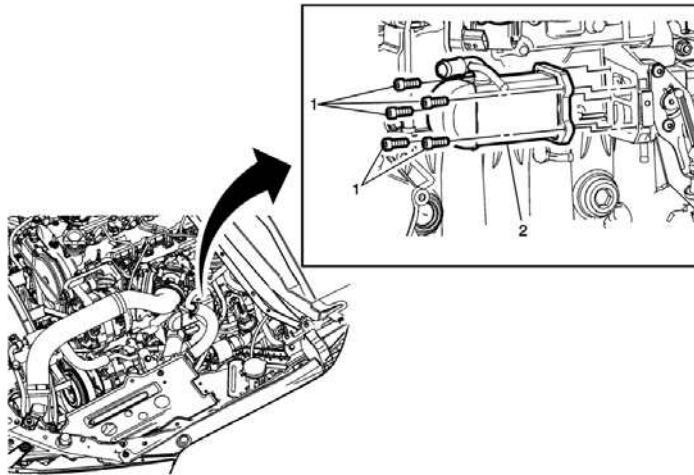
- (1) Air Filter
- (2) Mass Air Flow Sensor
- (3) Turbocharger Compressor
- (4) Turbocharger Turbine
- (5) EGR Cooler
- (6) EGR Cooler By-Pass Valve
- (7) EGR Valve
- (8) Throttle Body

Exhaust Gas Recirculation (EGR) System Description

(9) Turbocharger Intercooler

2013 Chevrolet Colorado

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



Exhaust Gas Recirculation Cooler Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the battery to aid in accessing the EGR Cooler. Refer to Battery Replacement.
2. Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.
3. Disconnect the coolant hoses from the EGR cooler. Refer to Exhaust Gas Recirculation Manifold Cooling Feed Hose Replacement and Exhaust Gas Recirculation Manifold Cooling Return Hose Replacement.

Exhaust Gas Recirculation Cooler Fastener (Qty: 5)

Caution: Refer to Fastener Caution.

1

Tighten

15 Y (11 lb ft)

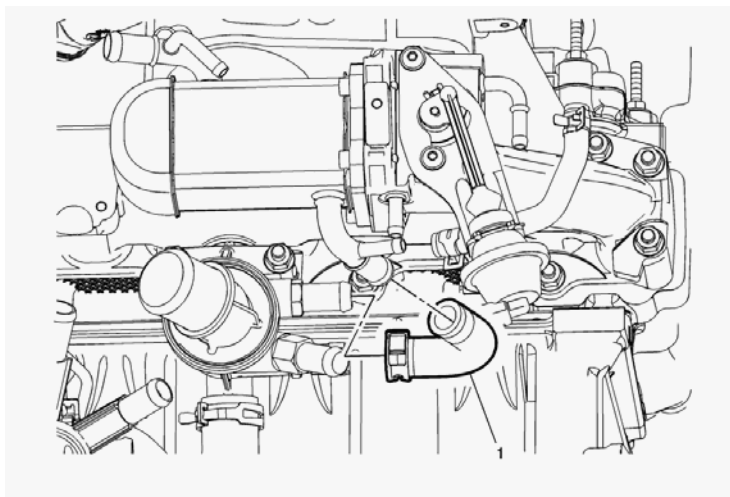
2

Exhaust Gas Recirculation Cooler

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Exhaust Gas Recirculation Manifold Cooling Feed Hose Replacement

Callout

Component Name

Preliminary Procedure

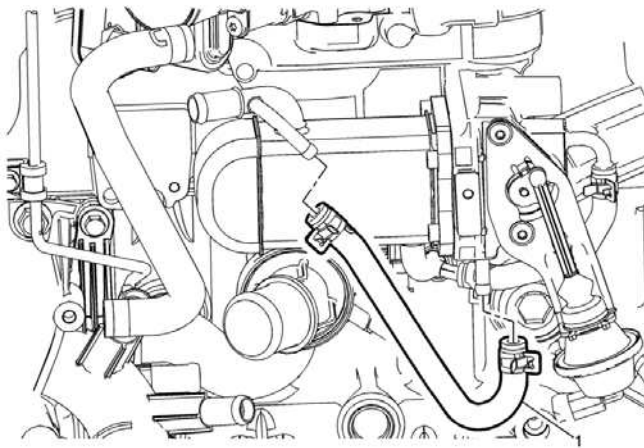
1. Remove the battery to aid in accessing the EGR cooler hoses. Refer to Battery Replacement.
2. Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.

- 1 Exhaust Gas Recirculation Manifold Cooling Feed Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Exhaust Gas Recirculation Manifold Cooling Return Hose Replacement

Callout

Component Name

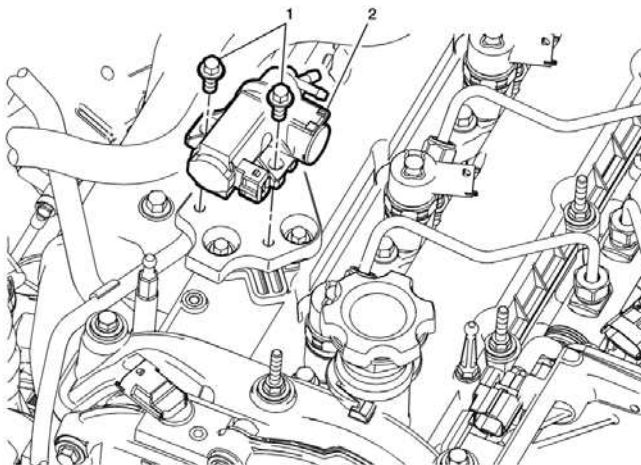
Preliminary Procedure

1. Remove the battery to aid in accessing the EGR cooler hoses. Refer to Battery Replacement.
2. Partially drain the coolant and refill after repair is complete. Refer to Cooling System Draining and Filling.

- 1 Exhaust Gas Recirculation Manifold Cooling Return Hoses

2013 Chevrolet Colorado

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



Exhaust Gas Recirculation Vacuum Regulator Valve Solenoid Replacement

Callout

Component Name

Preliminary Procedure

Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Exhaust Gas Recirculation Vacuum Regulator Valve Solenoid Fastener (Qty: 2)

1

Caution: Refer to Fastener Caution

Tighten

10 Y (89 lb in)

Exhaust Gas Recirculation Vacuum Regulator Valve Solenoid

Procedure

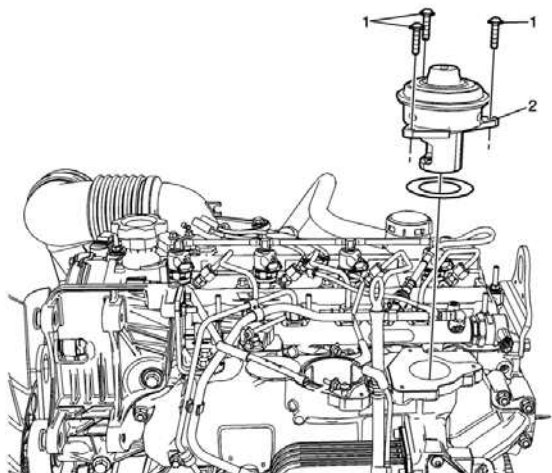
2

1. Disconnect the electrical connector.
2. Disconnect the vacuum hoses.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Exhaust Gas Recirculation Valve Replacement

Callout

Component Name

Preliminary Procedure

Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Exhaust Gas Recirculation Fastener

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Exhaust Gas Recirculation

2

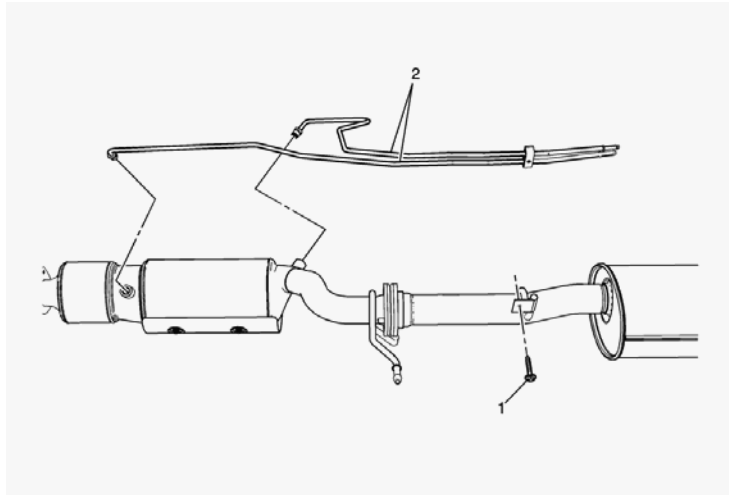
Procedure

Reinstall the EGR using a gasket.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Exhaust Pressure Differential Sensor Pipe Replacement

Callout

Component Name

Preliminary Procedure

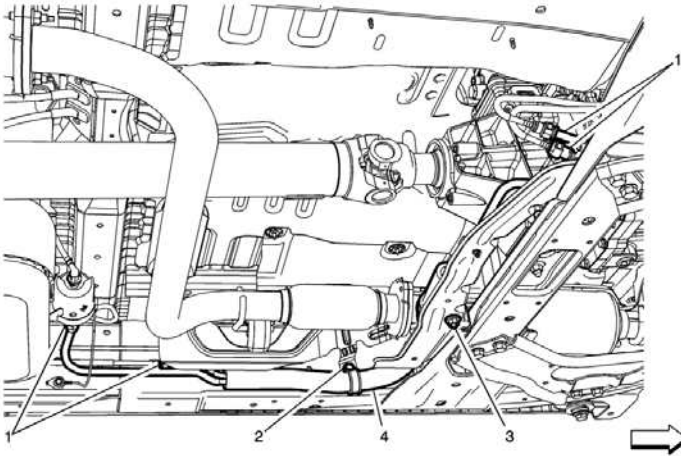
Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

- | | |
|---|--|
| | Exhaust Pressure Differential Sensor Pipe Fastener |
| 1 | Caution: Refer to Fastener Caution. |
| | Tighten |
| | 9 Y (80 lb in) |
| | Exhaust Pressure Differential Sensor Pipe |
| | Procedure |
| 2 | Disconnect the pressure hoses. |
| | Tighten |
| | 45 Y (33 lb ft) |

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Feed and Evaporative Emission Pipe Replacement

Callout	Component Name
Preliminary Procedure	
1. Revile the fuel system pressure. Refer to Fuel Pressure Relief.	
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.	
	Quick Connect Fittings (Qty: 4)
1	Procedure Disconnect the fuel feed and evaporative emission pipe quick connect fittings. Refer to Plastic Collar Quick Connect Fitting Service.
	Fuel Feed and Evaporative Emission Pipe Bolt
2	Caution: Refer to Fastener Caution. Tighten 25 Y (18 lb ft)
	Fuel Feed and Evaporative Emission Pipe Nut
3	Caution: Refer to Fastener Caution. Tighten 25 Y (18 lb ft)
4	Fuel Feed and Evaporative Emission Pipe

2013 Chevrolet Colorado

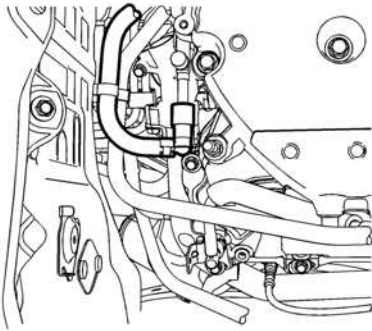
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

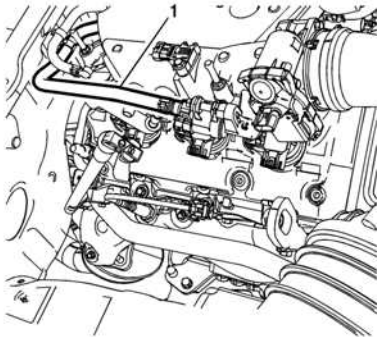
The fuel system fuel feed and evaporative emissions hose/pipes are serviceable individually or as a complete bundled assembly, the following procedure details the removal of both the fuel feed pipe and the evaporative emissions pipe.

Warning: Refer to Relieving Fuel Pressure Warning.

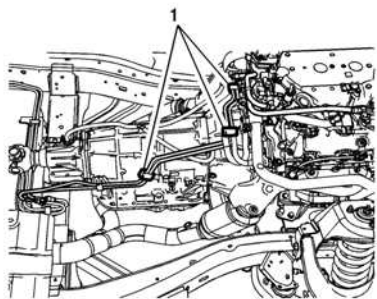
1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.



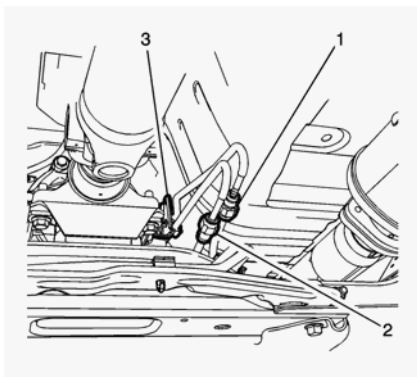
2. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Metal Collar Quick Connect Fitting Service.



3. Disconnect the evaporative emission (EVAP) purge line (1) from the purge solenoid.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



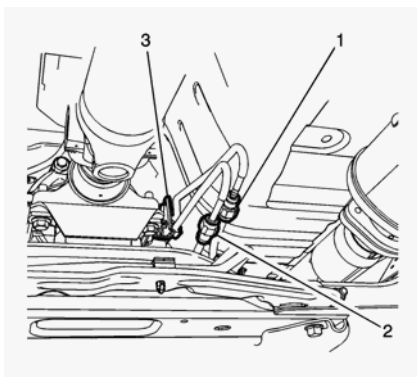
5. Open the retaining clips (1) at the locations shown and remove the pipes from the retainers.



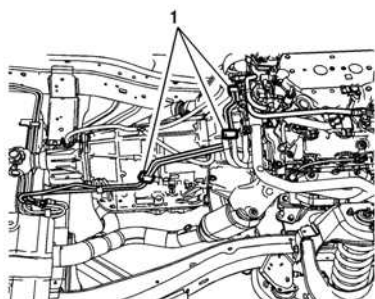
6. Disconnect the fuel feed front pipe (1) and the EVAP front pipe (2) at the location shown. Refer to Plastic Collar Quick Connect Fitting Service.
7. Carefully guide the front fuel feed and EVAP hose/pipes down through the engine compartment, removing from the bottom.

[Installation Procedure](#)

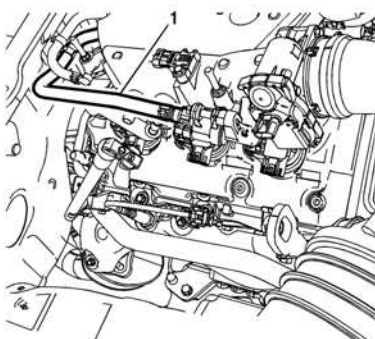
1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. With the aid of an assistant, carefully guide the front fuel feed and EVAP hose/pipes up through the engine compartment into position.



3. Connect the fuel feed front pipe (1) and the EVAP front pipe (2) at the location shown. Refer to Plastic Collar Quick Connect Fitting Service.

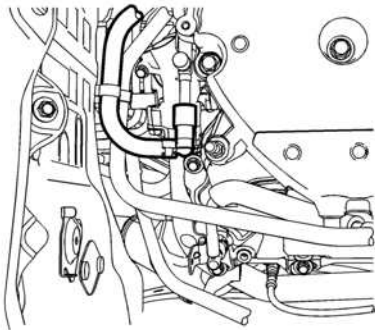


4. Install the pipes to the retaining clips (1) at the locations shown and close the retaining clips.
5. Lower the vehicle.



6. Connect the evaporative emission (EVAP) purge line (1) to the purge solenoid.

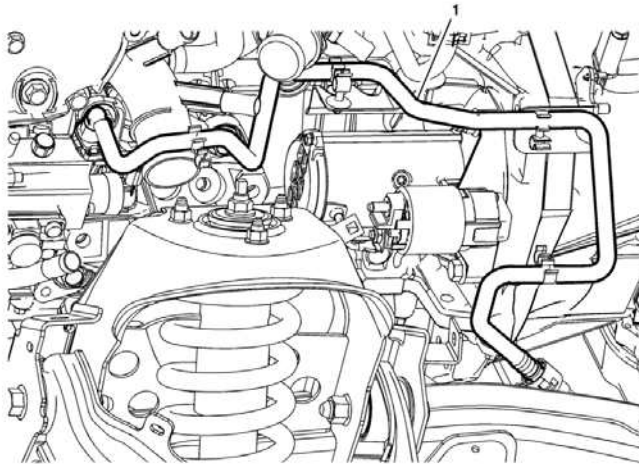
Fuel Feed Front Pipe Replacement



7. Connect the fuel feed pipe (1) to the fuel rail. Refer to Metal Collar Quick Connect Fitting Service.
8. Start the vehicle and check for leaks.

2013 Chevrolet Colorado

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



Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Raise and properly support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Remove the left front wheel assembly. Refer to Tire and Wheel Removal and Installation.
4. Remove the engine lower front splash shield. Refer to Engine Lower Front Splash Shield Replacement.

Fuel Feed Pipe

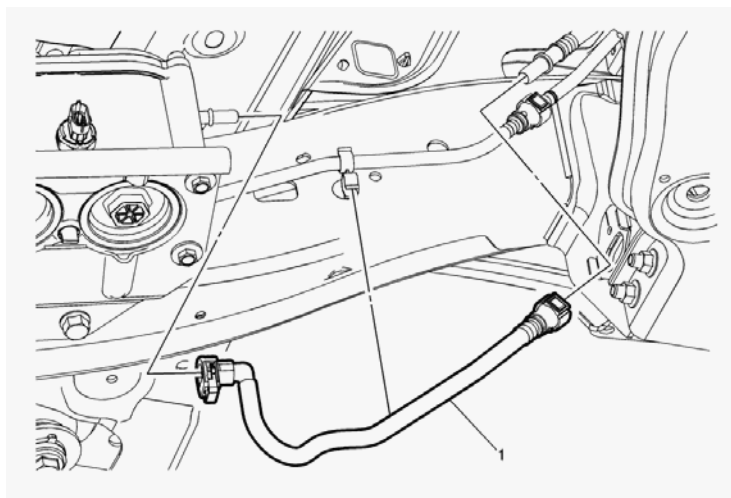
1

1. Disconnect the fuel line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel line from the fuel line brackets, if necessary, and remove the fuel line.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Raise and properly support the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Feed Pipe

Procedure

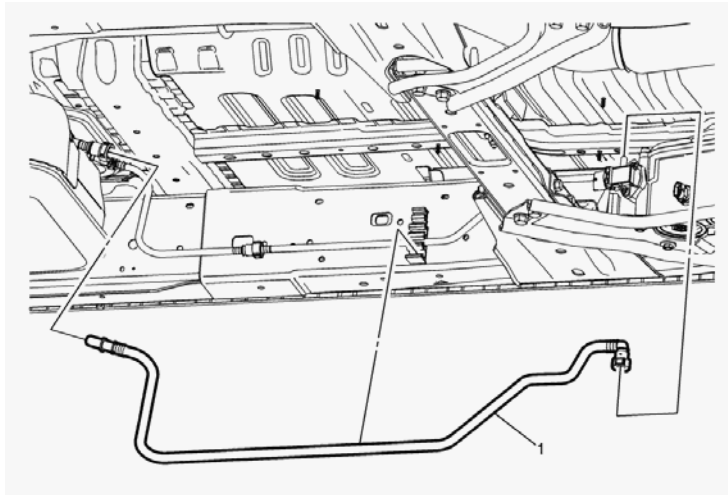
1

1. Disconnect the fuel line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel line from the fuel line brackets, if necessary, and remove the fuel line.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Raise and properly support the vehicle. Refer to Lifting and Jacking the Vehicle.

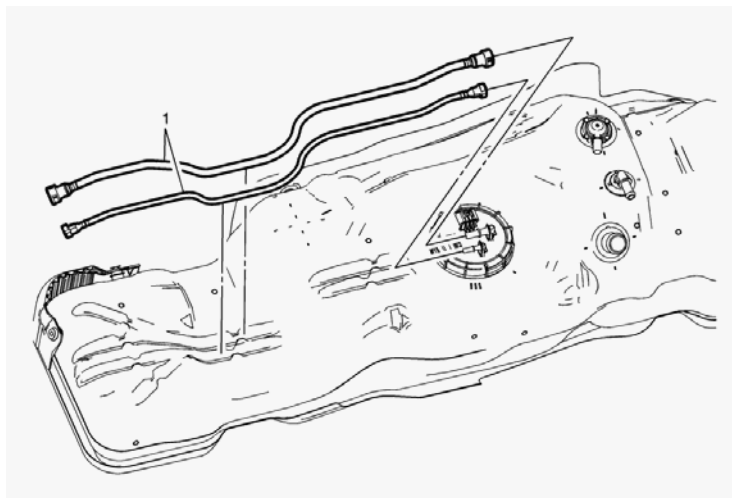
Fuel Feed Pipe

1

1. Disconnect the fuel line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel line from the fuel line brackets, if necessary, and remove the fuel line.

2013 Chevrolet Colorado

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



Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Raise and properly support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Remove the fuel tank. Refer to Fuel Tank Replacement.

Fuel Feed and Return Pipes

Procedure

1

1. Disconnect the fuel line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel line from the fuel line brackets, if necessary, and remove the fuel line.

2013 Chevrolet Colorado

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

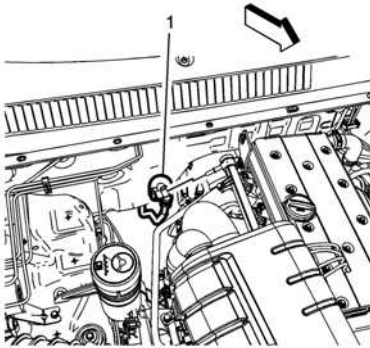
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

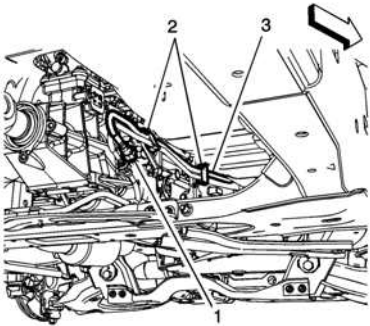
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.

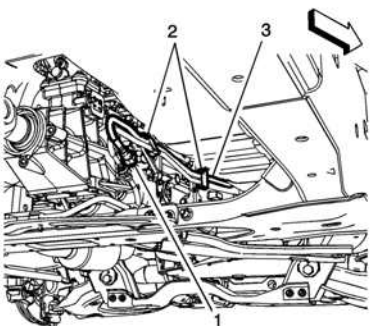


3. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



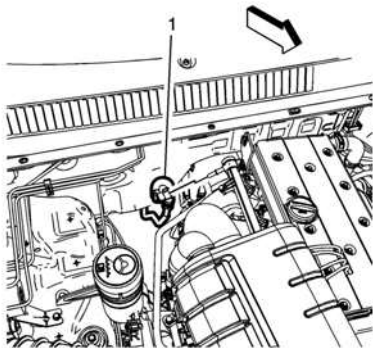
5. Disconnect the fuel feed pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Remove the fuel feed pipe (3) from the retainers (2).
7. Remove the fuel feed pipe (3) from the vehicle.

[Installation Procedure](#)



Fuel Feed Pipe Replacement (LE6)

1. Install the fuel feed pipe (3) to the vehicle.
2. Install the fuel feed pipe (3) to the retainers (2).
3. Connect the fuel feed pipe quick connect fitting (1) to the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
4. Lower the vehicle.



5. Connect the fuel feed pipe (1) to the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
6. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.

2013 Chevrolet Colorado

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

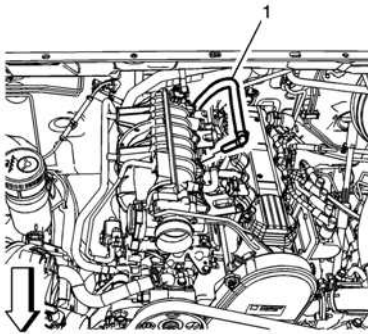
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

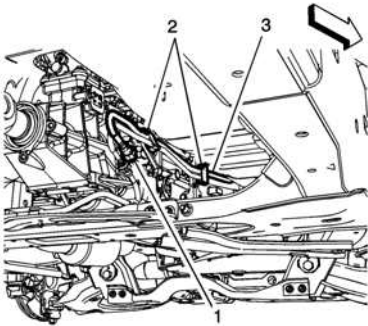
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
2. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.

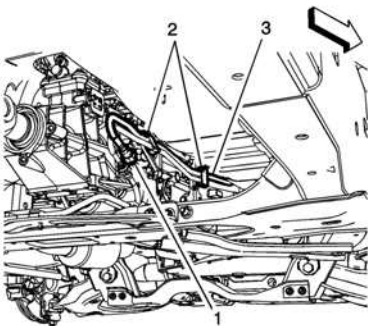


3. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



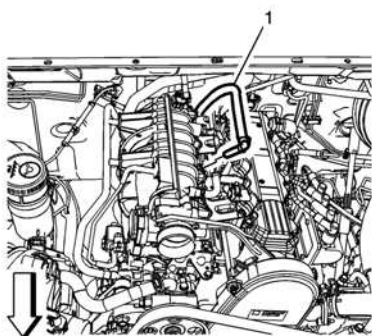
5. Disconnect the fuel feed pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Remove the fuel feed pipe (3) from the retainers (2).
7. Remove the fuel feed pipe (3) from the vehicle.

[Installation Procedure](#)



Fuel Feed Pipe Replacement (LP8)

1. Install the fuel feed pipe (3) to the vehicle.
2. Install the fuel feed pipe (3) to the retainers (2).
3. Connect the fuel feed pipe quick connect fitting (1) to the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
4. Lower the vehicle.

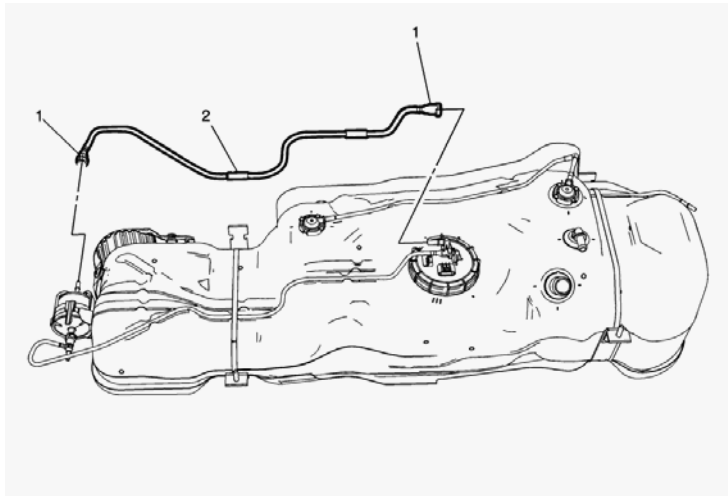


5. Connect the fuel feed pipe (1) to the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
6. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Remove the fuel tank. Refer to Fuel Tank Replacement.

Quick Connect Fittings (Qty: 2)

1

Procedure

Disconnect the fuel feed pipe quick connect fittings. Refer to Plastic Collar Quick Connect Fitting Service.

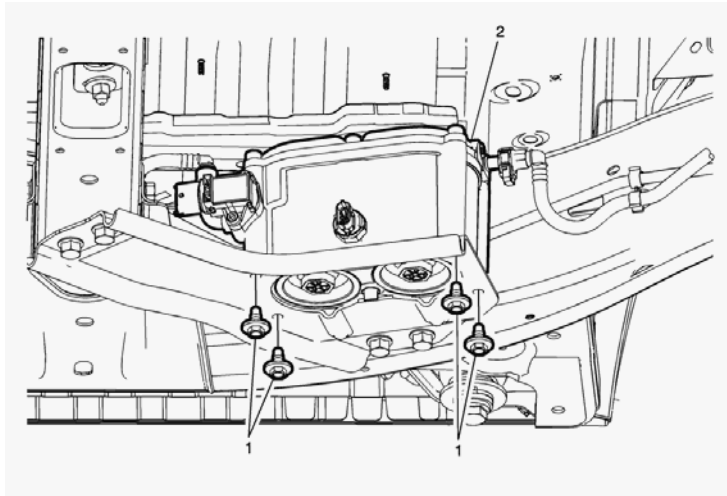
2

Fuel Feed Pipe

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Filter Assembly Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine, for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Disconnect the fuel filter feed and return pipes. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Filter Fasteners (Qty 4)

Caution: Refer to Fastener Caution.

1

Tighten

25 Y (18 lb ft)

Fuel Filter

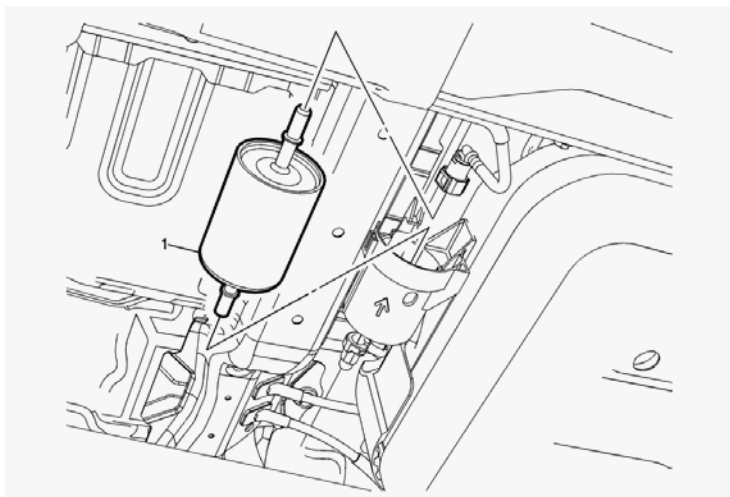
2

Procedure

Disconnect the fuel filter assembly wiring harness connectors.

2013 Chevrolet Colorado

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



Fuel Filter Replacement

Callout

Component Name

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Disconnect the fuel lines from the fuel filter. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Filter

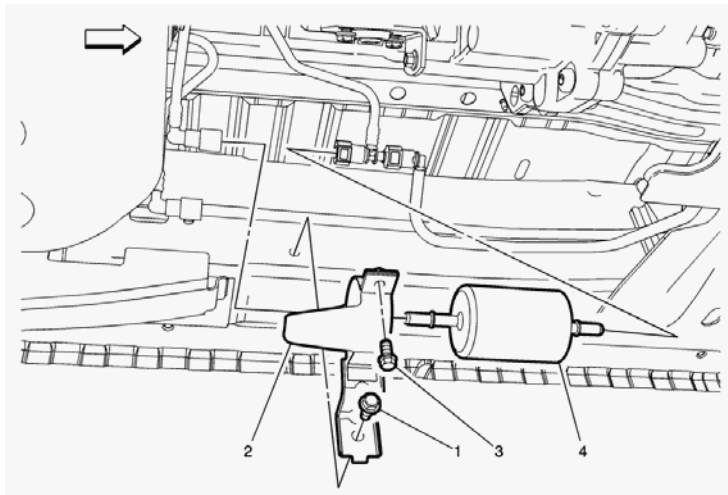
1

Procedure

Depress the fuel filter housing retaining feature and remove the fuel filter from the housing.

2013 Chevrolet Colorado

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



Fuel Filter Replacement

Callout

Component Name

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
3. Disconnect the fuel feed and return lines from the fuel filter. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Filter Bracket Fastener

Caution: Refer to Fastener Caution.

1

Tighten

22 Y (16 lb ft)

2

Fuel Filter Bracket

Fuel Filter Bracket Filter Fastener

3

Tighten

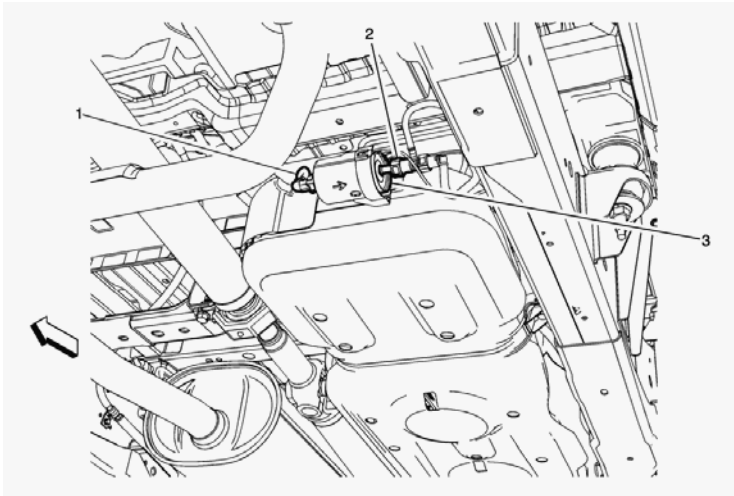
6 Y (53 lb in)

4

Fuel Filter

2013 Chevrolet Colorado

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



Fuel Filter Replacement

Callout

Component Name

Preliminary Procedure

- Warning:** Refer to Fuel and Evaporative Emission Pipe Warning.
- Warning:** Refer to Gasoline/Gasoline Vapors Warning.
- Caution:** Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.
1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
 2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Feed Pipe

1

Procedure

Disconnect the quick connect fitting. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Return Pipe

2

Procedure

Disconnect the quick connect fitting. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Filter

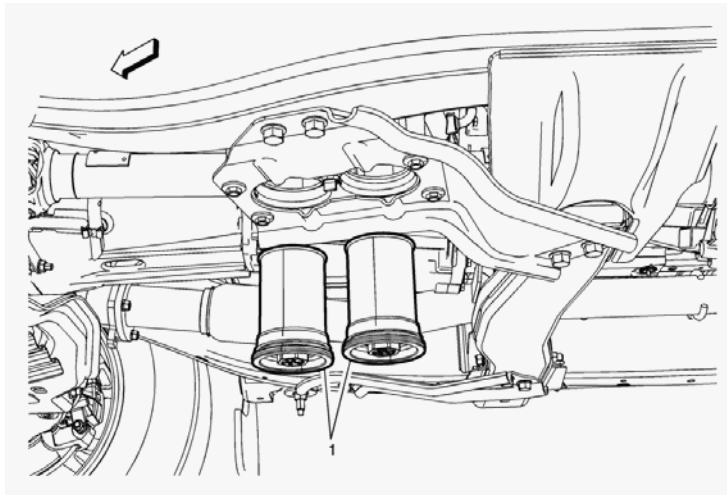
3

Procedure

Depress the tab on the housing and remove the fuel filter.

2013 Chevrolet Colorado

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



Fuel Filter Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine, for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Filter (Qty: 2)

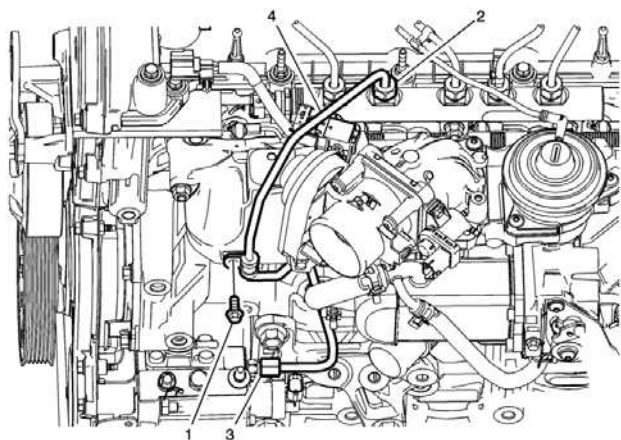
Caution: Refer to Component Fastener Tightening Caution.

Procedure

Rotate the filters counter clockwise to remove.

2013 Chevrolet Colorado

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

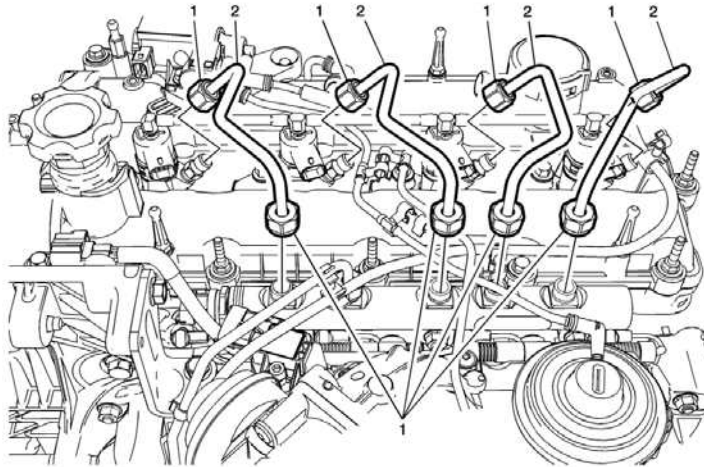


Fuel Injection Fuel Feed Pipe Replacement

Callout	Component Name
Preliminary Procedures	
- Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system. - Remove the engine cover. Refer to Intake Manifold Cover Replacement. - Remove the air conditioning compressor. Refer to Air Conditioning Compressor Replacement.	
1	Fuel Injection Fuel Feed Pipe Fastener
	Caution: Refer to Fastener Caution.
	Tighten 10 Y (89 lb in)
2	Fuel Injection Fuel Feed Pipe to Fuel Rail Fitting (Qty: 2)
	Caution: Refer to Fastener Caution.
	Tip: Fuel lines with a threaded fitting cannot be reused, but must be replaced with a new one. Tighten 24 Y (18 lb ft)
3	Fuel Injection Fuel Feed Pipe to Fuel Injection Pump Fitting (Qty:2)
	Caution: Refer to Fastener Caution.
	Tip: Fuel lines with a threaded fitting cannot be reused, but must be replaced with a new one. Tighten 28 Y (20 lb ft)
4	Fuel Injection Fuel Feed Pipe
	Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.
	Procedure - Prime the fuel system. Refer to Fuel System Priming. - With the engine running, check the fuel system for leaks.

2013 Chevrolet Colorado

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



Fuel Injection Fuel Feed Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the engine cover. Refer to Intake Manifold Cover Replacement.

Fuel Injection Fuel Feed Pipe Fitting (Qty: 8)

Caution: Refer to Fastener Caution.

Tip: Fuel lines with a threaded fitting cannot be reused, but must be replaced with a new one.

1

Tighten

- The fittings at the fuel rail to 24 Y (18 lb ft)
- The fittings at the injectors to 28 Y (20 lb ft)

Fuel Injection Fuel Feed Pipe (Qty: 8)

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

2

Procedure

1. Prime the fuel system. Refer to Fuel System Priming.
2. With the engine running, check the fuel system for leaks.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

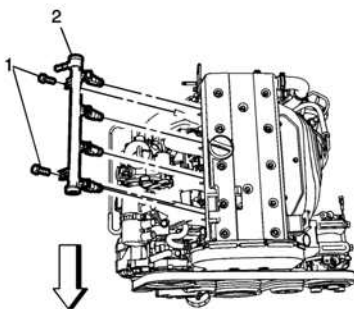
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

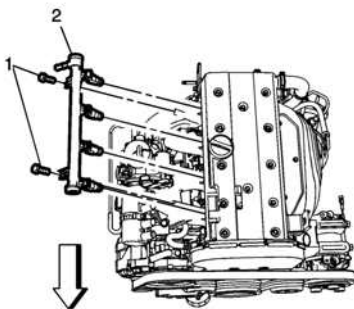
Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
4. Remove the fuel feed pipe from the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
5. Disconnect the fuel rail harness connectors.



6. Remove the fuel injection fuel rail bolts (1) from the intake.
7. Remove the fuel injection fuel rail (2) from the vehicle.

[Installation Procedure](#)



1. Install the fuel injection fuel rail (2) to the vehicle.
2. Install the fuel injection fuel rail bolts (1) to the intake and tighten to **8 Y(71 lb in)**.
3. Connect the fuel rail harness connectors.
4. Install the fuel feed pipe to the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
5. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
6. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

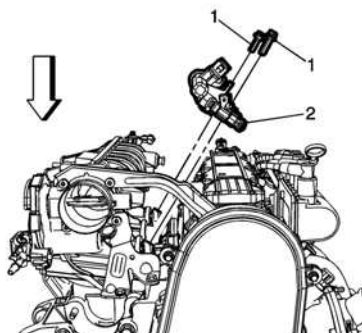
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Warning: Refer to Gasoline/Gasoline Vapors Warning.

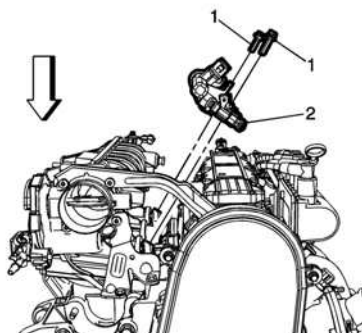
Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
2. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
3. Remove the fuel feed pipe from the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
4. Remove the positive crankcase ventilation hose. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement
5. Remove the intake brackets from the intake.



6. Remove the fuel injection fuel rail bolts (1) from the intake.
7. Remove the fuel injection fuel rail (2) from the vehicle.

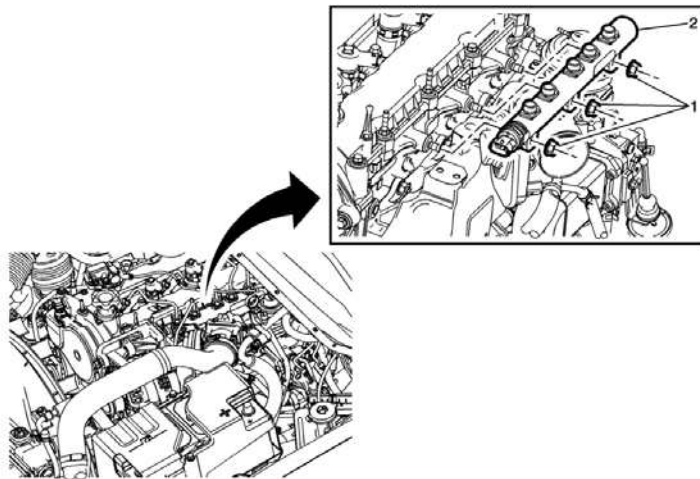
[Installation Procedure](#)



1. Install the fuel injection fuel rail (2) to the vehicle.
2. Install the fuel injection fuel rail bolts (1) to the intake and tighten to **8 Y(71 lb in)**.
3. Install the intake brackets to the intake.
4. Install the positive crankcase ventilation hose. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement
5. Install the fuel feed pipe to the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
6. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

2013 Chevrolet Colorado

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



Fuel Injection Fuel Rail Assembly Replacement

Callout

Component Name

Preliminary Procedure

1. Remove intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
3. Remove the fuel injection pipes. Refer to Fuel Injection Fuel Feed Pipe Replacement.

Fuel Injection Fuel Rail Assembly Fastener (Qty: 3)

Caution: Refer to Fastener Caution.

1

Tighten

25 Y (18 lb ft)

Fuel Injection Fuel Rail Assembly

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

Procedure

2

1. Disconnect the electrical connector.
2. Transfer parts as necessary.
3. Prime the fuel system. Refer to Fuel System Priming.
4. With the engine running, check the fuel system for leaks.

2013 Chevrolet Colorado

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

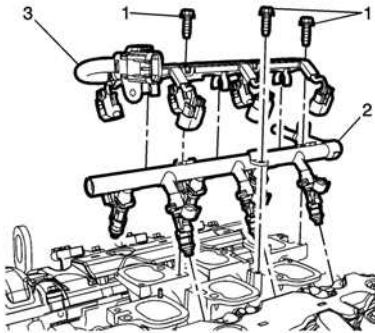
[Removal Procedure](#)

Warning: Refer to Relieving Fuel Pressure Warning.

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Remove the upper intake manifold. Refer to Upper Intake Manifold Replacement.
3. Disconnect the fuel feed pipe from the fuel injector rail. Refer to Metal Collar Quick Connect Fitting Service.

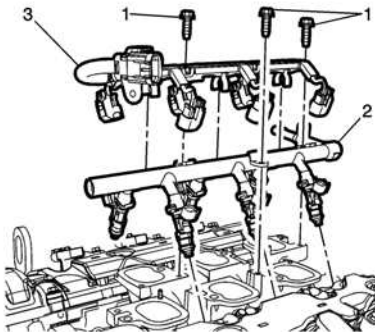
Warning: Refer to Safety Glasses and Compressed Air Warning.

4. Use compressed air in order to remove debris from the area where the fuel injectors enter the intake manifold.



5. Disconnect the fuel injector electrical wiring harness connectors (3).
6. Remove the fuel rail bolts (1).
7. Remove the fuel rail (2) with the fuel injectors.

[Installation Procedure](#)



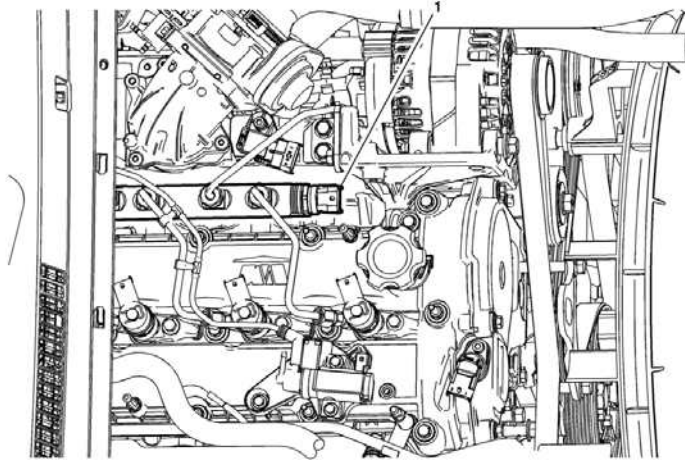
Caution: Refer to Fastener Caution.

1. Install the fuel rail and fuel injectors assembly (2).
2. Install the fuel rail bolts (1) and tighten to **10 Y (89 lb in)**.
3. Install the fuel injector electrical wiring harness connectors (3).
4. Connect the fuel feed pipe to the fuel rail. Refer to Metal Collar Quick Connect Fitting Service.
5. Install the upper intake manifold. Refer to Upper Intake Manifold Replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Injection Fuel Rail Fuel Pressure Sensor Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Fuel Pressure Sensor

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

Caution: Refer to Fastener Caution.

Procedure

1

1. Disconnect the electrical connector.
2. Ensure to replace fuel pressure sensor seal.
3. Transfer parts as needed.
4. Prime the fuel system before starting the engine. Refer to Fuel System Priming.
5. With the engine running, check the fuel system for leaks.

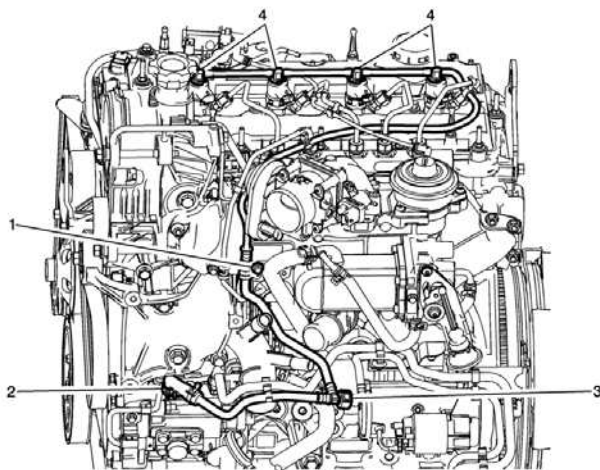
Tip: Fuel lines with a threaded fitting can not be reused, but must be replaced with a new one.

Tighten

35 Y (26 lb ft)

2013 Chevrolet Colorado

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



Fuel Injection Fuel Return Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the engine cover. Refer to Intake Manifold Cover Replacement.
3. Disconnect the plastic connector. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Injection Fuel Return Pipe Fastener

1

Caution: Refer to Fastener Caution.

Tighten

10 Y (89 lb in)

2

Fuel Injection Fuel Return Pipe Clamp

Note: It is necessary to install a NEW fuel injection return pipe clamp when the return pipe is removed.

Fuel Return Line Plastic Quick Connect

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

3

Procedure

1. Disconnect the plastic connector. Refer to Plastic Collar Quick Connect Fitting Service.
2. Prime the fuel system. Refer to Fuel System Priming.
3. With the engine running, check the fuel system for leaks.

4

Fuel Injection Fuel Return Pipe Retainers

2013 Chevrolet Colorado

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

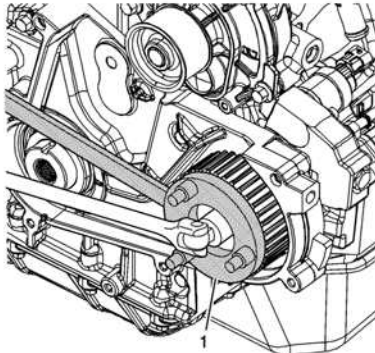
[Removal Procedure](#)

Special Tools

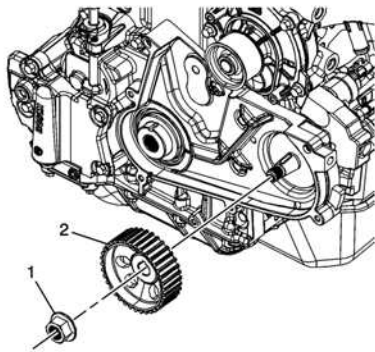
EN-50025 Pulley Holding Wrench

Refer to Special Tools

1. Remove the timing belt. Refer to Timing Belt Replacement

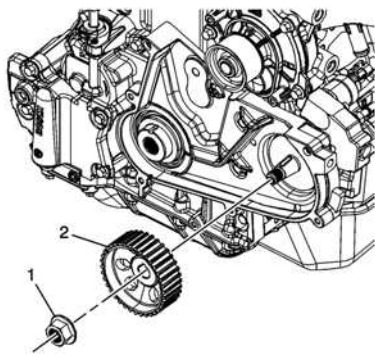


2. Hold the fuel injection pump drive pulley with the EN-50025 wrench (1) and loosen the retaining nut.



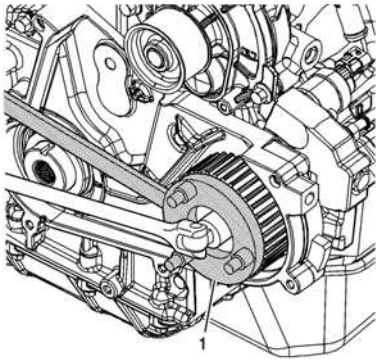
3. Remove the fuel injection pump drive pulley nut (1) and pulley (2).

[Installation Procedure](#)



1. Install the fuel injection pump drive pulley (2) and nut (1). Hand tight only.

Fuel Injection Pump Drive Pulley Replacement



Caution: Refer to Fastener Caution.

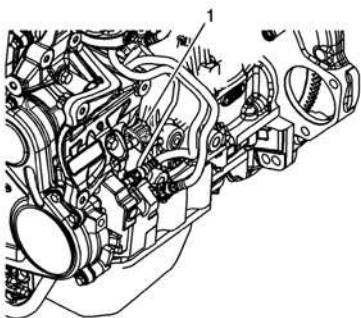
2. Hold the fuel injection pump drive pulley with the *EN-50025* wrench (1) and tighten the retaining nut to **88 Y (65 lb ft)**.
3. Install the timing belt. Refer to Timing Belt Replacement

2013 Chevrolet Colorado

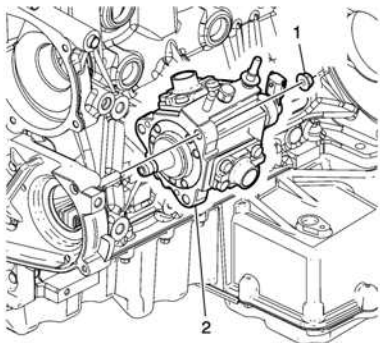
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

1. Turn OFF the engine, for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove engine front cover. Refer to Engine Front Cover Replacement
3. Disconnect the fuel injection pump wiring harness from the engine wiring harness and the fuel Injection pump.

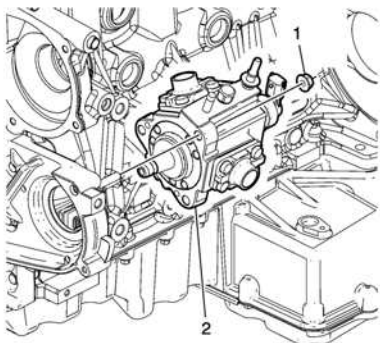


4. Disconnect the engine wiring harness (1) from the fuel injection pump.



5. Remove the three fuel injection nuts (1).
6. Remove the fuel injection pump (2) from the engine.

Installation Procedure



1. Position the fuel injection pump (2) to the engine.

Caution: Refer to Fastener Caution.

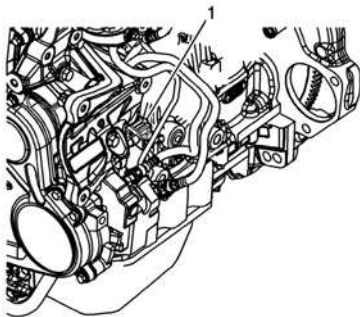
2. Install the fuel injection nuts (1) and tighten to **28 Y (20 lb ft)**.

Note: Fuel lines with a threaded fitting can not be reused, but must be replaced with a new one.

3. Install engine front cover. Refer to Engine Front Cover Replacement.
4. Connect the fuel feed pipe between the pump and fuel rail and tighten the fitting to **25 Y (18 lb ft)**
5. Connect the fuel feed and return pipes to the fuel injection pump. Refer to Plastic Collar Quick Connect Fitting Service.

Fuel Injection Pump Replacement

6. Connect the water return pipe to the water outlet.



7. Connect the engine wiring harness (1) to the fuel injection pump.
8. Prime the fuel system. Refer to Fuel System Priming

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

9. With the engine running, check the fuel system for leaks.

2013 Chevrolet Colorado

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

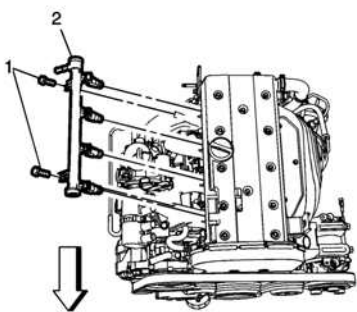
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

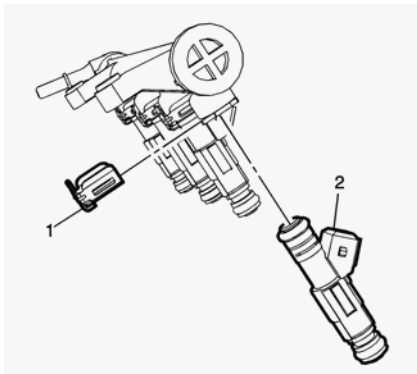
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
4. Remove the fuel feed pipe from the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
5. Disconnect the fuel rail harness connectors.

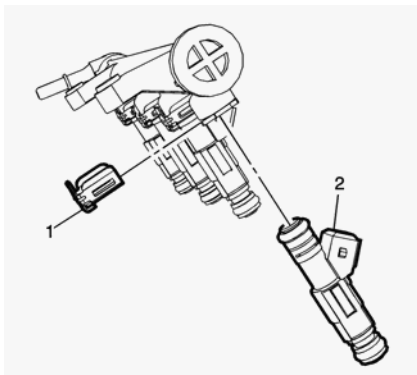


6. Remove the fuel injection fuel rail bolts (1) from the intake.
7. Remove the fuel injection fuel rail (2) from the vehicle.



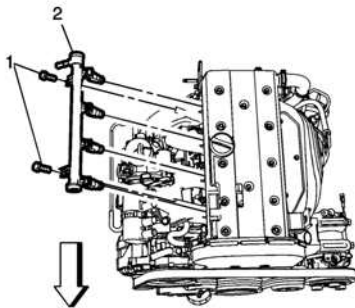
8. Remove the fuel injector clip (1) from the fuel rail.
9. Remove the fuel injector (2) from the fuel rail.

[Installation Procedure](#)



Fuel Injector Replacement (LE6)

1. Install the fuel injector (2) to the fuel rail.
2. Install the fuel injector clip (1) to the fuel rail.



3. Install the fuel injection fuel rail (2) to the vehicle.
4. Install the fuel injection fuel rail bolts (1) to the intake and tighten to **8 Y (71 lb in)**.
5. Connect the fuel rail harness connectors.
6. Install the fuel feed pipe to the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
7. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
8. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

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

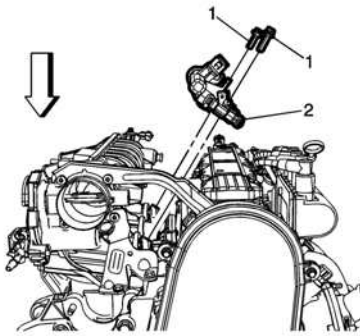
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

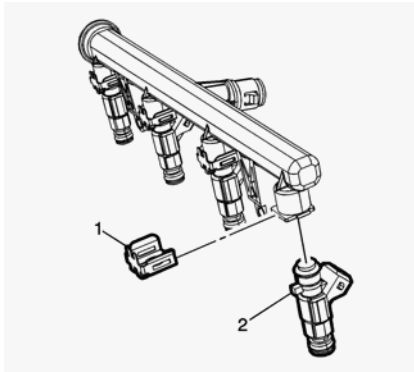
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

1. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
2. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
3. Remove the fuel feed pipe from the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
4. Remove the positive crankcase ventilation hose. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement
5. Remove the intake brackets from the intake.

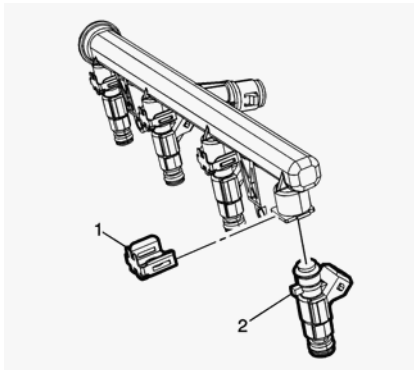


6. Remove the fuel injection fuel rail bolts (1) from the intake.
7. Remove the fuel injection fuel rail (2) from the vehicle.



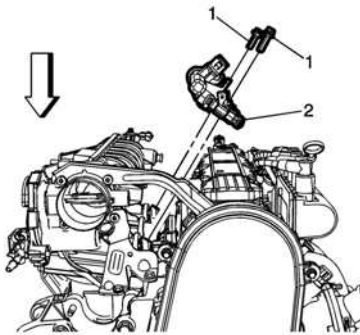
8. Remove the fuel injector clip (1) from the fuel rail.
9. Remove the fuel injector (2) from the fuel rail.

[Installation Procedure](#)



Fuel Injector Replacement (LP8)

1. Install NEW fuel injector upper and lower O-rings.
2. Install the fuel injector (2) to the fuel rail.
3. Install the fuel injector clip (1) to the fuel rail.



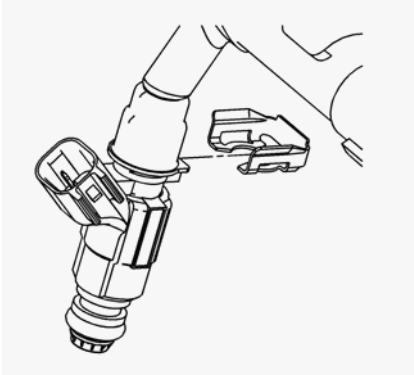
4. Install the fuel injection fuel rail (2) to the vehicle.
5. Install the fuel injection fuel rail bolts (1) to the intake and tighten to **8 Y (71 lb in)**.
6. Install the intake brackets to the intake.
7. Install the positive crankcase ventilation hose. Refer to Positive Crankcase Ventilation Hose/Pipe/Tube Replacement
8. Install the fuel feed pipe to the fuel injection fuel rail. Refer to Fuel Feed Pipe Replacement.
9. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

2013 Chevrolet Colorado

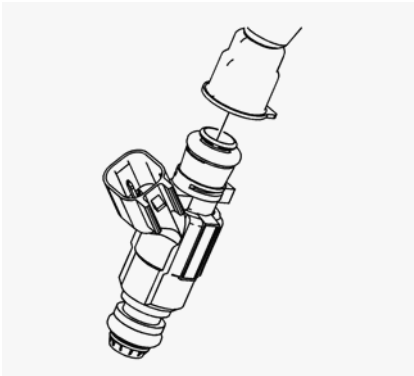
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the fuel injection fuel rail assembly. Refer to Fuel Injection Fuel Rail Assembly Replacement.



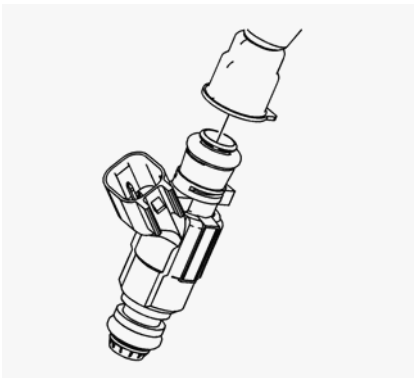
2. Remove the fuel injector retainer clip.



3. Remove the fuel injector.
4. Remove and discard the fuel injector seals.

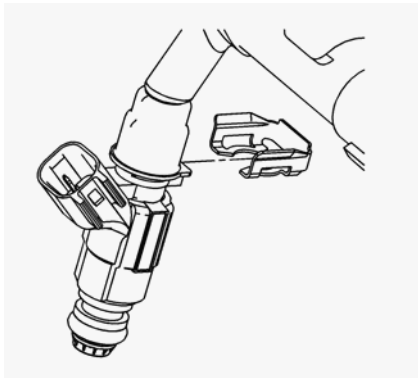
[Installation Procedure](#)

1. Install NEW fuel injector seals.



2. Install the fuel injector.

Fuel Injector Replacement

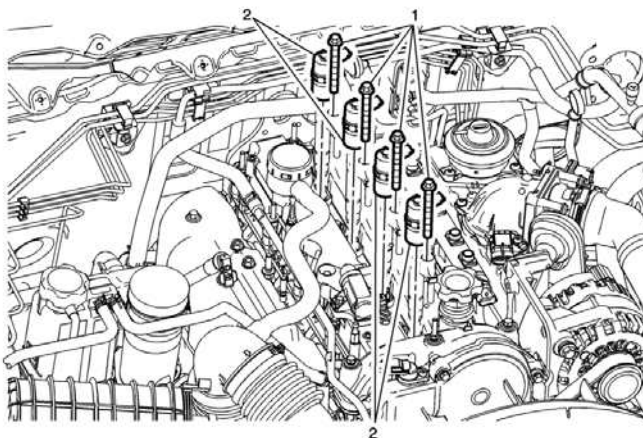


3. Install the fuel injector retainer clip.
4. Install the fuel injection fuel rail assembly. Refer to Fuel Injection Fuel Rail Assembly Replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Injector Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the fuel injection feed pipe. Refer to Fuel Injection Fuel Feed Pipe Replacement.
3. Remove the fuel injection return pipe. Refer to Fuel Injection Fuel Return Pipe Replacement.
4. Remove the cowl front panel. Refer to Cowl Front Panel Replacement.

Fuel Injector Fastener (Qty: 4)

Caution: Refer to Fastener Caution.

1

Tighten

32 Y (24 lb ft)

Fuel Injector

Danger: High Pressure Lines deliver diesel fuel under extreme pressure from the injection pump to the fuel injectors. This may be as high as 1600 Bar (23,200 psi). Use extreme caution when inspecting for high pressure leaks. Fuel under this amount of pressure can penetrate skin causing personal injury, or death. Wear safety goggles and adequate clothing when servicing this fuel system.

Procedure

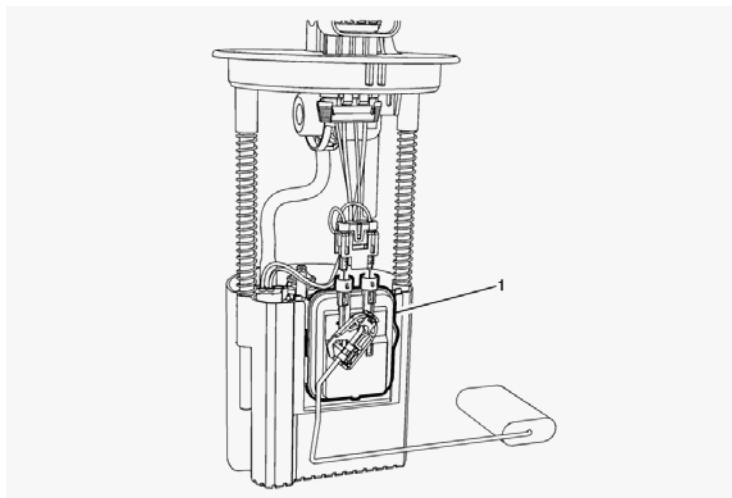
2

1. Disconnect the electrical connector.
2. Prime the fuel system. Refer to Fuel System Priming.
3. With the engine running, check the fuel system for leaks.
4. Set the fuel injector flow rate. Refer to Fuel Injector Flow Rate Programming.

Tip: Fuel lines with a threaded fitting can not be reused, but must be replaced with a new one.

2013 Chevrolet Colorado

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



Fuel Level Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the fuel tank fuel pump module. Refer to Fuel Tank Fuel Pump Module Replacement.

Fuel Level Sensor

Procedure

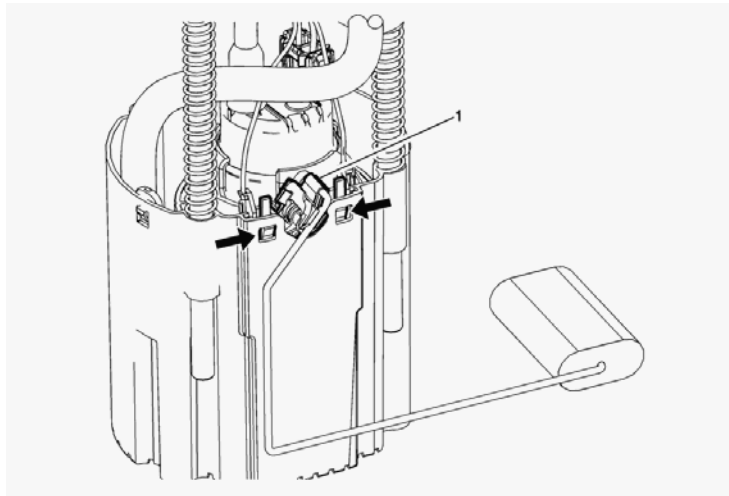
1

1. Disconnect the electrical connector from the sensor.
2. Push the plastic tabs forward and simultaneously pull upwards.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Level Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the fuel pump cycle control module. Refer to Fuel Pump Cycle Control Module Replacement.

Fuel Level Sensor

Procedure

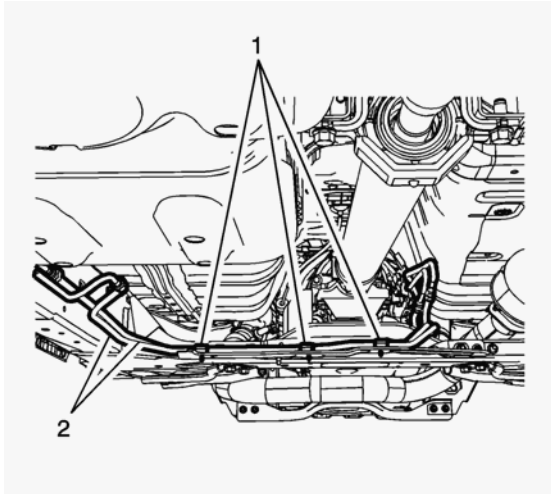
1

1. Disconnect the electrical connector from the fuel pump assembly.
2. Using a suitable tool, press inward on the tabs to release the fuel level sensor from the fuel pump assembly as indicated by the arrows.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Line Replacement - Chassis

Callout

Component Name

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Line Clips (Qty 3)

1

Procedure

Disconnect the fuel feed pipe from the fuel and evap pipe retaining clips.

Fuel Feed Line

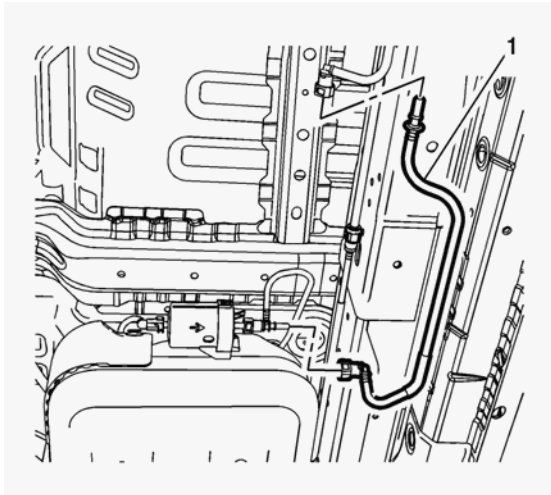
Procedure

2

1. Disconnect the fuel feed line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel feed line.

2013 Chevrolet Colorado

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



Fuel Line Replacement - Chassis

Callout

Component Name

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Feed Line

Procedure

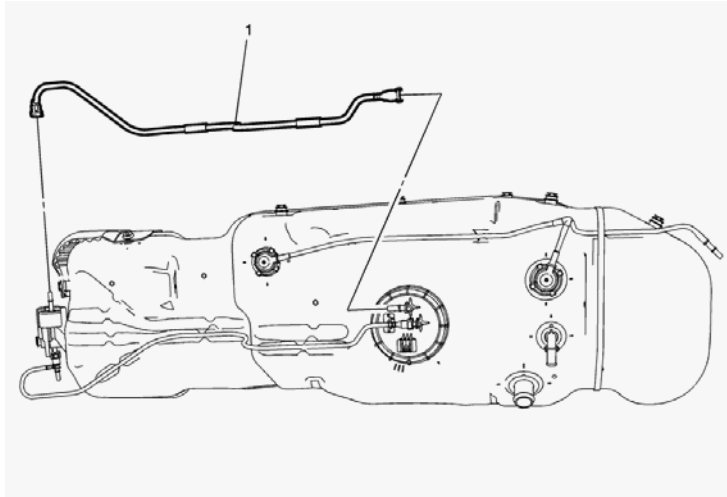
1

1. Disconnect the fuel feed line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel feed line.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Line Replacement - Filter to Tank

Callout

Component Name

Preliminary Procedure

Remove the fuel tank. Refer to Fuel Tank Replacement.

Fuel Feed and Return Pipes

Procedure

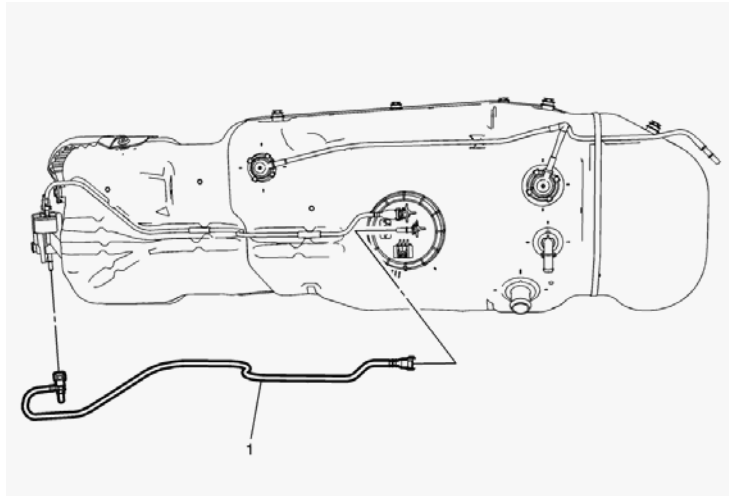
1

1. Disconnect the fuel feed line plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel feed line from the fuel tank.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Line Replacement - Filter to Tank

Callout

Component Name

Preliminary Procedure

Remove the fuel tank. Refer to Fuel Tank Replacement.

Fuel Feed and Return Pipes

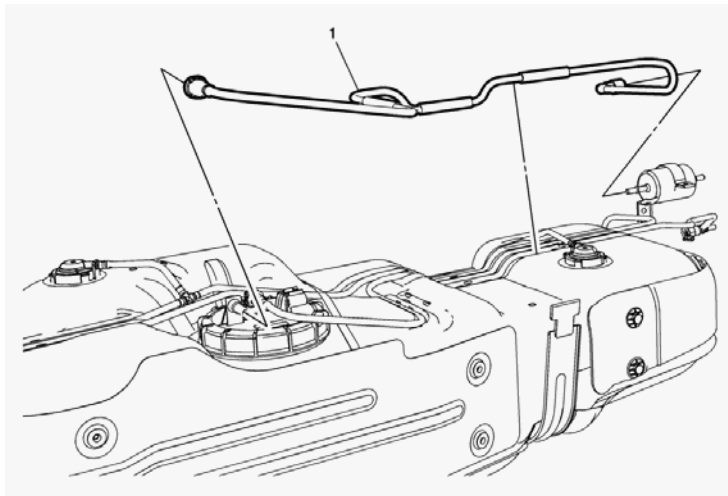
Procedure

1

1. Disconnect the fuel return plastic collar quick connects. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel return line from the fuel tank.

2013 Chevrolet Colorado

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



Fuel Line Replacement - Filter to Tank

Callout

Component Name

Preliminary Procedure

Remove the fuel tank. Refer to Fuel Tank Replacement.

Fuel Feed Line

Procedure

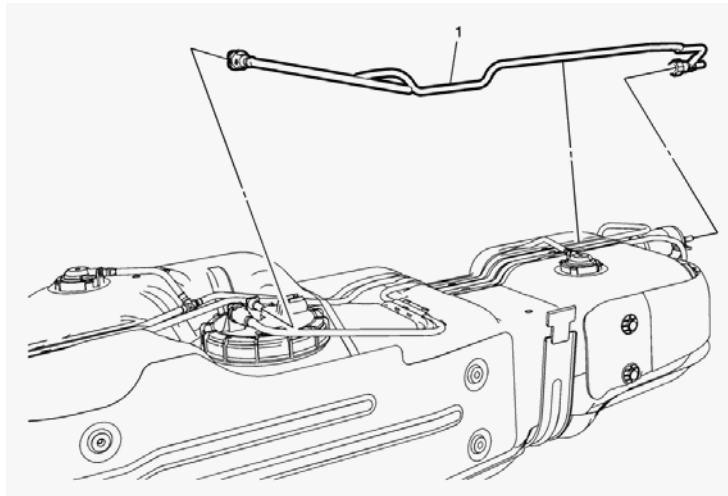
1

1. Disconnect the fuel feed line from the fuel tank fuel pump module and fuel filter. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel feed line from the fuel tank.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Line Replacement - Filter to Tank

Callout

Component Name

Preliminary Procedure

Remove the fuel tank. Refer to Fuel Tank Replacement.

Fuel Return Line

Procedure

1

1. Disconnect the fuel return line from the fuel tank fuel pump module and fuel filter. Refer to Plastic Collar Quick Connect Fitting Service.
2. Remove the fuel return line from the fuel tank.

2013 Chevrolet Colorado

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

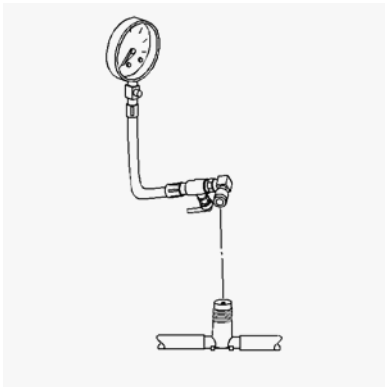
Special Tools

J 34730-1A Fuel Pressure Gauge

For regional tools refer to Special Tools

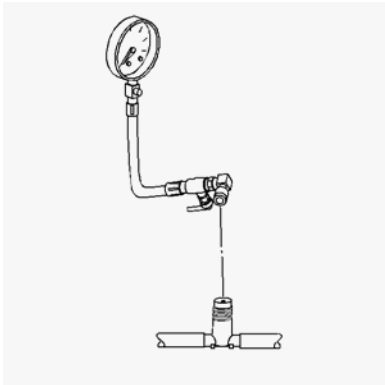
Installation Procedure

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. After you 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. In order 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 leak out. Place the towel 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 manufacture's directions.

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 absorb any fuel leakage that occurs during the connection of the fuel pressure gauge. Place the towel in an approved container when the connection of the fuel pressure gauge 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.

Fuel Pressure Gauge Installation and Removal

3. Install the fuel rail service port cap.
4. Tighten the fuel fill cap.

2013 Chevrolet Colorado

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

Special Tools

J 34730-1A Fuel Pressure Gauge

For regional tools refer to Special Tools

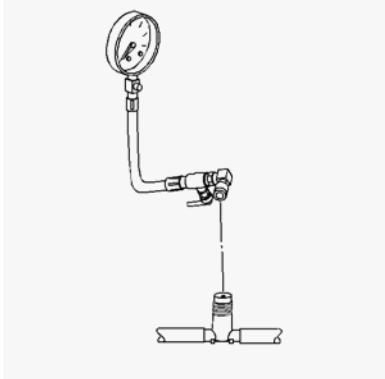
Warning: Refer to Gasoline/Gasoline Vapors Warning.

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. After you 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. In order 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 leak out. Place the towel in an approved container when the disconnection is complete.

1. If the fuel system requires repair, prevent fuel spillage by removing the fuel pump fuse. Refer to Electrical Center Identification Views.
2. Remove the engine cover, if required.
3. Loosen the fuel fill cap in order to relieve the fuel tank vapor pressure.
4. Remove the fuel rail service port cap.

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

5. Wrap a shop towel around the fuel rail service port.



6. Connect the J 34730-1A fuel pressure gauge (4) to the fuel rail service port.
7. Place the hose into an approved gasoline container.
8. Open the valve in order to bleed any fuel from the fuel rail.
9. Close the valve.
10. Remove the hose from the 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

Note: If relieving the fuel pressure for the fuel pressure gauge installation and removal, it is NOT necessary to proceed with the following steps.

11. Disconnect the J 34730-1A fuel pressure gauge (4) from the fuel rail service port.
12. Remove the shop towel from around the fuel rail service port, and place in an approved gasoline container.
13. Install the fuel rail service port cap.
14. Install the engine cover, if required.
15. Tighten the fuel fill cap.

2013 Chevrolet Colorado

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

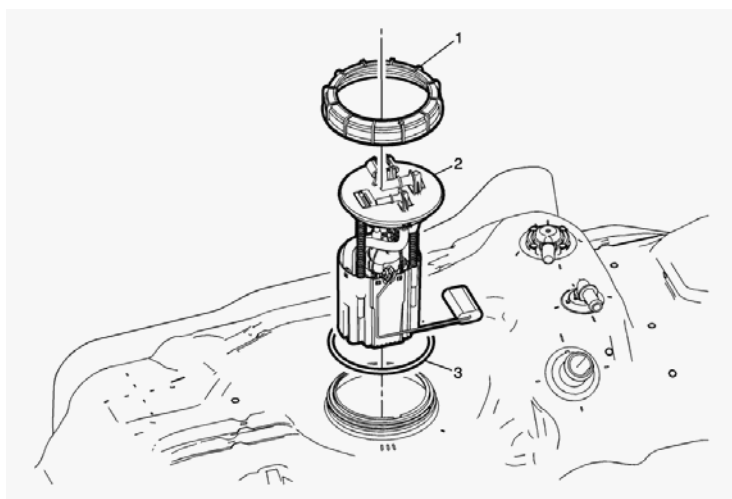
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Warning: Refer to Relieving Fuel Pressure Warning.

1. If the fuel system requires repair, prevent fuel spillage by removing the fuel pump fuse. Refer to Electrical Center Identification Views.
2. Loosen the fuel fill cap in order to relieve the fuel tank vapor pressure.
3. Remove the engine cover, if required.
4. Remove the fuel rail service port cap.
5. Wrap a shop towel around the fuel rail service port and using a small flat-bladed tool, depress (open) the fuel rail test port valve.
6. Remove the shop towel from around the fuel rail service port, and place in an approved gasoline container.
7. Install the fuel rail service port cap.
8. Install the engine cover, if required.
9. Tighten the fuel fill cap.

2013 Chevrolet Colorado

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



Fuel Pump Cycle Control Module Replacement

Callout

Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the fuel tank. Refer to Fuel Tank Replacement.
3. Remove the fuel feed pipe. Refer to Fuel Feed Pipe Replacement.
4. Remove the fuel return pipe. Refer to Fuel Return Pipe Replacement.
5. Disconnect the electrical wiring harness connector from the fuel pump module.

Fuel Pump Cycle Control Module Lock Ring

Procedure

1

Using the *CH-38879-B* wrench , remove the cam lock ring by turning counterclockwise.

Special Tools

CH-38879-B Fuel Pump Lock Ring Tool

For equivalent regional tools, refer to Special Tools.

Fuel Pump Cycle Control Module

2

Procedure

Partially lift the fuel pump cycle control module and disconnect the vapor hose (1). Refer to Plastic Collar Quick Connect Fitting Service, then remove the pump.

O-Ring Seal

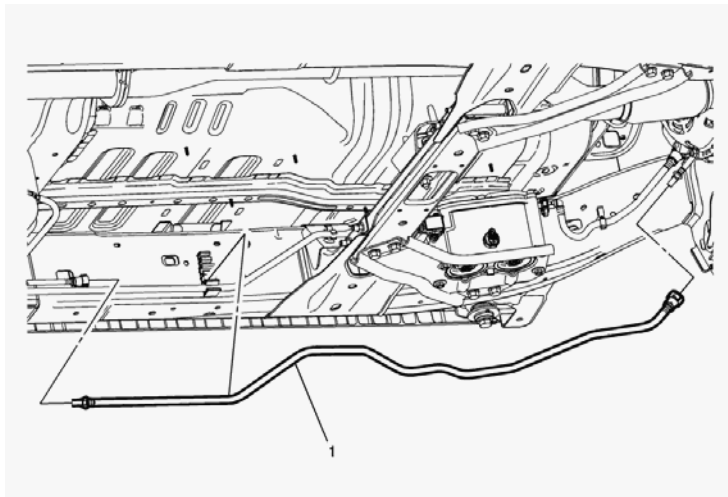
Procedure

3

1. Replace the O-ring.
2. Allow the engine to run and check for leaks.

2013 Chevrolet Colorado

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



Fuel Return Pipe Replacement

Callout

Component Name

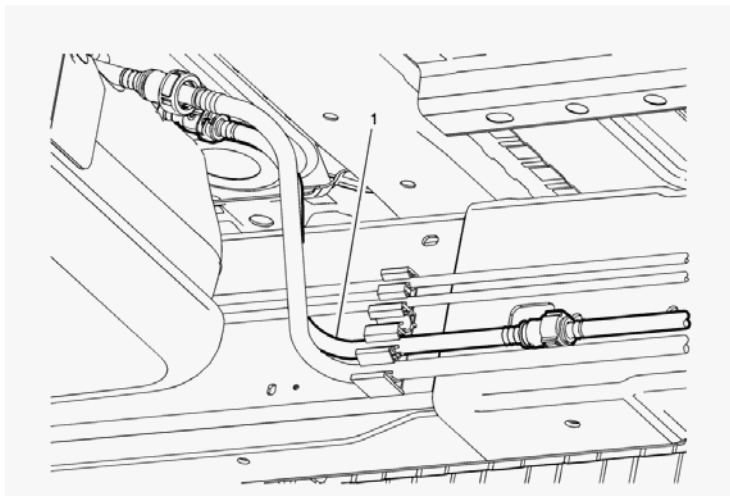
Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Disconnect the plastic connector. Refer to Plastic Collar Quick Connect Fitting Service.

1 Fuel Return Pipe

2013 Chevrolet Colorado

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



Fuel Return Pipe Replacement

Callout

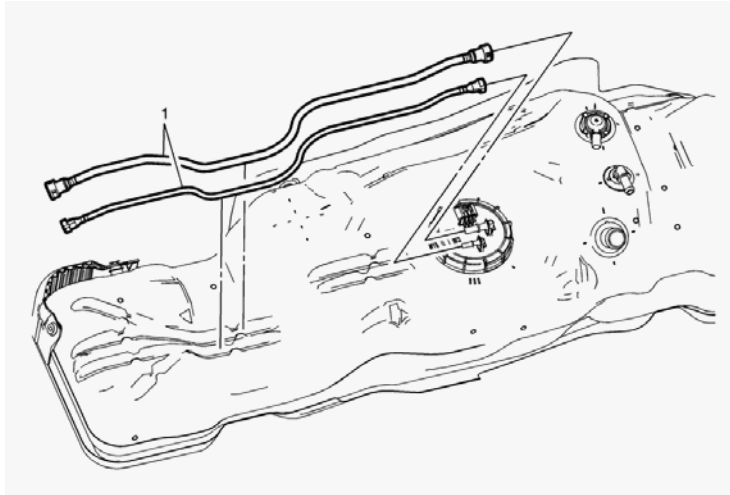
Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Disconnect the plastic connector. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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



Fuel Return Pipe Replacement

Callout

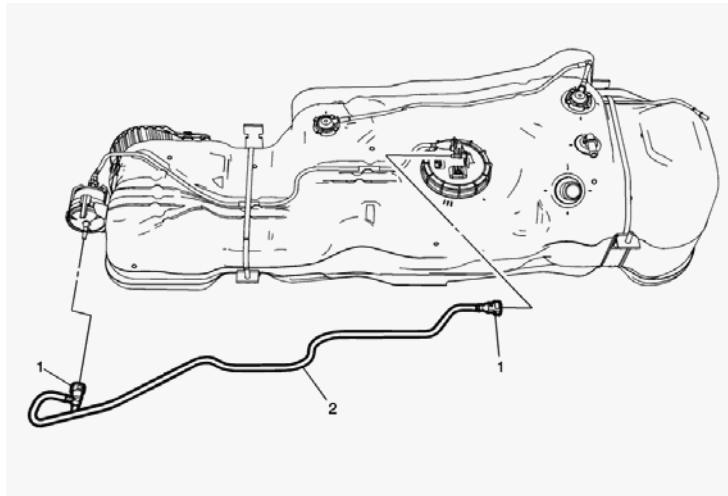
Component Name

Preliminary Procedure

1. Turn OFF the engine for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Remove the fuel tank. Refer to Fuel Tank Replacement.
3. Disconnect the plastic connector. Refer to Plastic Collar Quick Connect Fitting Service.

2013 Chevrolet Colorado

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



Fuel Return Pipe Replacement

Callout

Component Name

Preliminary Procedure

1. Revile the fuel system pressure. Refer to Fuel Pressure Relief.
2. Remove the fuel tank. Refer to Fuel Tank Replacement.

Quick Connect Fittings (Qty: 2)

1

Procedure

Disconnect the fuel return pipe quick connect fittings. Refer to Plastic Collar Quick Connect Fitting Service.

2

Fuel Return Pipe

2013 Chevrolet Colorado

Submodel: | **Engine Type:** | **Liters:**

Fuel Delivery: | **Fuel:**

Note: If the fuel filter is plugged, the fuel tank should be inspected internally and cleaned if necessary.

1. Drain the fuel tank. Refer to Fuel Tank Draining.
2. Remove the fuel pump module assembly. Refer to Fuel Tank Fuel Pump Module Replacement.
3. Inspect the fuel pump module strainer. Replace the pump module assembly if the fuel strainer is contaminated.

Note: When flushing the fuel tank, handle the fuel and water mixture as a hazardous material. Handle the fuel and water in accordance with all applicable local, state, and federal laws and regulations.

4. Flush the fuel tank with hot water.
5. Pour the water out of the fuel sender assembly opening in the fuel tank. Rock the fuel tank in order to be sure that the removal of the water from the fuel tank is complete.
6. Allow the tank to dry completely before reassembly.
7. Disconnect the fuel feed pipe at the engine fuel rail. Refer to Fuel Feed Front Pipe Replacement.

Note: Only use oil-free compressed air to blow out the fuel pipes.

8. Clean the fuel pipes by applying air pressure in the opposite direction of the fuel flow.
9. Connect the fuel feed pipe to the engine fuel rail. Refer to Fuel Feed Front Pipe Replacement.
10. Install the fuel pump module assembly. Refer to Fuel Tank Fuel Pump Module Replacement.

2013 Chevrolet Colorado

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

[Removal Procedure](#)

Warning: Refer to Gasoline/Gasoline Vapors Warning.

The following procedure covers the disassembly and the inspection of the complete fuel supply system. If the fuel system is contaminated, the fuel system can be cleaned. You can usually determine the extent of the fuel system contamination during the disassembly.

1. Inspect the fuel system for contamination of the in-line fuel filter. Replace the filter after cleaning the fuel lines if the filter is plugged or contaminated.
2. Remove the fuel module assembly. Refer to Fuel Pump Cycle Control Module Replacement.
3. Locate the tank in a suitable work area away from any heat, any flame, or any other source of ignition.
4. Inspect the fuel sender strainer. Replace the fuel tank module if the strainer is contaminated.

Note: When flushing the fuel tank, handle the fuel and water mixture as a hazardous material. Handle the fuel and water in accordance with all applicable local, state, and federal laws and regulations.

5. Flush the fuel tank with running hot water for at least five minutes. Pour the water out of the fuel sender assembly opening. Rock the tank in order to ensure that the removal of the water from the tank is complete.
6. Refer to Plastic Collar Quick Connect Fitting Service in order to disconnect the following quick connect fittings from the fuel rail:

- The feed hose/pipe
- The return hose/pipe
- Remove the fuel injectors and fuel rail. Refer to Fuel Injector Replacement.
- Use compressed air in order to apply air pressure to the fuel lines in the opposite direction from the normal fuel flow.
- Clean and inspect the fuel injectors and fuel rail.

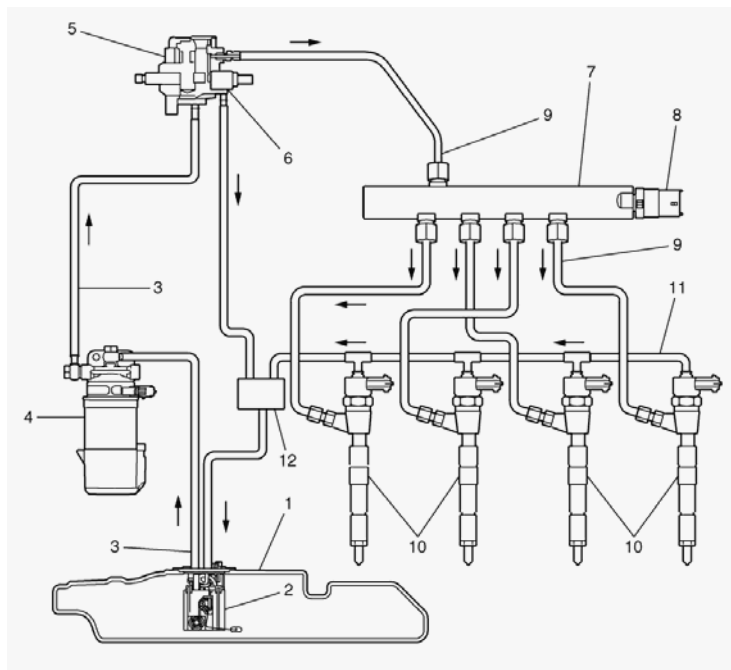
[Installation Procedure](#)

1. Install the fuel injectors and fuel rail. Refer to Fuel Injector Replacement.
2. Install the fuel module assembly. Refer to Fuel Pump Cycle Control Module Replacement.
3. Refer to Plastic Collar Quick Connect Fitting Service in order to connect the following quick connect fittings to the fuel rail:

- The feed hose/pipe
- The return hose/pipe

2013 Chevrolet Colorado

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



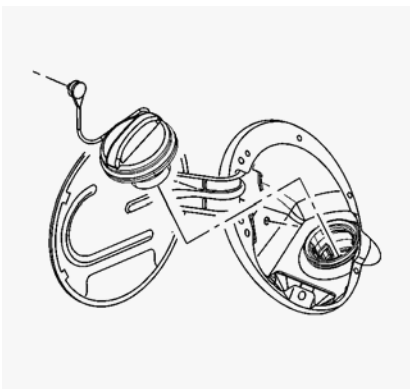
- (1) Fuel Tank
- (2) Fuel Pump Module
- (3) Fuel Lines
- (4) Fuel Conditioning Module
- (5) High Pressure Fuel Injection Pump
- (6) Fuel Pressure Regulator
- (7) Fuel Rail Assembly
- (8) Fuel Pressure Sensor
- (9) High Pressure Pipe
- (10) Fuel Injectors
- (11) Fuel Return Hoses/Pipes
- (12) Return Fuel Container

The fuel tank (1) stores the fuel supply. An electric fuel pump module (2) mounted in the tank provides low pressure fuel to the injection pump. The engine control module (ECM) controls the fuel pump operation. Fuel is drawn through a strainer filter at the bottom of the fuel pump, through the rear fuel lines to the fuel conditioning module (4). The fuel conditioning module is mounted on the left frame rail near the transmission. The fuel conditioning module consists of a fuel filter/water separator, fuel heater, fuel temperature sensor, and a water in fuel sensor. Fuel flows out of the fuel conditioning module through the front fuel lines to the high pressure fuel injection pump (5). The belt driven fuel injection pump is mounted on the lower left corner of the engine block. High pressure fuel is supplied through the metal high pressure fuel line to the fuel rail assembly (7). Then through the metal fuel injector lines to the injectors (9). Fuel pressure is controlled by the ECM and fuel pressure regulator (6). Excess fuel is delivered to the high pressure pump and injectors to lubricate and cool the components. The excess fuel then returns to the fuel tank through the return lines (11). The fuel injection pump also supplies low pressure to the injector return lines to ensure proper injector operation.

Fuel Tank

The fuel tank (7) stores the fuel supply. The fuel tank is held in place by 2 metal straps that attach to the frame. The fuel tank is molded from high density polyethylene.

Fuel Filler Cap



The fuel filler cap has a torque-limiting device that prevents the cap from being over tightened. To install, turn the cap clockwise until you hear audible clicks. This indicates that the cap is fully seated.

Fuel Sender Assembly

The fuel tank module (8) is located inside of the fuel tank. The fuel tank module consists of the following major components:

- The fuel level sensor
- The fuel pump and reservoir assembly
- The fuel strainer

Fuel Level Sensor

The fuel level sensor consists of a float, a wire float arm, and a ceramic resistor card. The position of the float arm indicates the fuel level. The fuel level sensor contains a variable resistor which changes resistance in correspondence with the amount of fuel in the fuel tank. The engine control module (ECM) sends the fuel level information to the instrument panel cluster (IPC). This information is used for the instrument panel (I/P) fuel gauge and the low fuel warning indicator. The ECM also monitors the fuel level input for various diagnostics.

Fuel Pump

The fuel pump (8) is mounted in the primary fuel tank module reservoir. The fuel pump is an electric pump. Fuel is pumped to the mechanical fuel injection pump at a specified flow and pressure. The control module controls the electric fuel pump operation through a fuel pump relay.

Fuel Strainer

The fuel strainer attaches to the lower end of the fuel sender. The fuel strainer is made of woven plastic. The functions of the fuel strainer are to filter contaminants and to wick fuel. The fuel strainer is self-cleaning and normally requires no maintenance. Fuel stoppage at this point indicates that the fuel tank contains an abnormal amount of sediment.

Fuel Conditioning Module

The fuel filter assembly (9) is located on the left frame rail. The paper filter element traps particles in the fuel that may damage the fuel injection system.

- Fuel Filter/Water Separator
- Fuel Heater
- Fuel Temperature Sensor
- Water in Fuel Sensor

Fuel Filter/Water Separator

The paper filter element traps particles in the fuel that may damage the fuel injection system and is designed to allow trapped water particles to settle to the bottom of the filter assembly.

Fuel Heater

The fuel heater located in the fuel conditioning module is controlled by the engine control module (ECM). When the temperature of the fuel is below the calibrated level the ECM will command the fuel heater relay ON. With the relay ON battery voltage is supplied to the fuel heater to assist in cold weather operation.

Fuel Temperature Sensor

The fuel temperature sensor is a thermistor that is located in the fuel conditioning module. The ECM monitors the fuel temperature sensor signal circuit in order to calculate the temperature of the fuel entering the fuel injection pump.

Water in Fuel Sensor

The water in fuel sensor is a 3 wire sensor that monitors the presence of diesel and water. When water is present the ECM detects low voltage on the signal circuit and sends a serial data message to the instrument panel cluster to display the WATER IN FUEL SERVICE REQUIRED message.

Fuel Feed and Return Pipes

The fuel feed pipe carries fuel from the fuel tank to the fuel filter/heater element housing. The fuel return pipe carries fuel from the fuel rail assemblies back to the fuel tank. The fuel pipes consist of 2 sections:

- The rear fuel pipe assemblies are located from the top of the fuel tank to the chassis fuel pipes. The rear fuel pipes are constructed of steel with sections of rubber hose covered with braiding.
- The chassis fuel pipes are located under the vehicle and connect the rear fuel pipes to the fuel rail pipes. These pipes are constructed of steel with sections of rubber hose covered with braiding.

Quick-Connect Fittings

Quick-connect fittings provide a simplified means of installing and connecting fuel system components. The fittings consist of a unique female connector and a compatible male pipe end. O-rings, located inside the female connector, provide the fuel seal. Integral locking tabs inside the female connector hold the fittings together.

Fuel Pipe O-Rings

O-rings seal the connections in the fuel system. Fuel system O-ring seals are made of special material. Service the O-ring seals with the correct service part.

Fuel System Description

Fuel Injection Pump

The fuel injection pump (1) is a mechanical high pressure pump. The fuel injection pump is located on the lower left side of the engine. Fuel is pumped to the fuel rail (3) at a specified pressure. Fuel pressure is regulated by the fuel pressure regulator which is located on the inlet side of the fuel injection pump, controlled by the engine control module (ECM). Excess fuel from the fuel injection pump returns to the fuel tank through the fuel return pipe.

Fuel Pressure Regulator

The engine control module (ECM) controls the fuel rail pressure using a pulse width modulated fuel rail pressure regulator. The fuel pressure regulator is located on the inlet of the fuel injection pump and meters the amount of fuel that enters the fuel injection pump. The ECM varies the pulse width modulated voltage to the fuel pressure regulator to control the fuel rail pressure.

Fuel Pressure Sensor

The fuel rail pressure sensor is located in the front of the fuel rail assembly. The fuel rail pressure sensor provides the engine control module (ECM) an indication of the actual fuel rail pressure. The ECM uses this information to regulate the fuel pressure, by commanding the fuel pressure regulator to obtain the desired fuel pressure.

Fuel Rail Assembly

The fuel rail assembly (3) attaches to the cylinder head. The fuel rail assembly distributes pressurized fuel to the fuel injectors through the fuel lines.

Fuel Injectors

The fuel injectors are located above each cylinder and deliver fuel directly into the cylinder. Each injector has a high pressure fuel pipe from the fuel rail and a return line.

The engine control module (ECM) provides both a high side and low side driver to operate the fuel injector.

Fuel Return Lines

Fuel is returned to the fuel tank from the fuel injectors, high pressure fuel pump, and fuel rail.

2013 Chevrolet Colorado

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

[Fuel System Overview](#)

The main fuel system is a returnless on-demand design. The fuel pressure regulator is a part of the fuel pump module, eliminating the need for a return pipe from the engine. A returnless fuel system reduces the internal temperature of the fuel tank by not returning hot fuel from the engine to the fuel tank. Reducing the internal temperature of the fuel tank results in lower evaporative emissions.

An electric turbine-style fuel pump is attached to the fuel pump module inside the fuel tank. The fuel pump supplies high pressure fuel through the fuel feed pipe to the fuel injection system. The fuel pump provides fuel at a higher rate of flow than is needed by the fuel injection system. The fuel pressure regulator, a part of the fuel pump module, maintains the correct fuel pressure to the fuel injection system. The fuel pump module contains a reverse flow check valve. The check valve and the fuel pressure regulator maintain fuel pressure in the fuel feed pipe and the fuel rail in order to prevent long cranking times.

[E 100 Flex Fuel Description](#)

This E 100 flex fuel vehicle no longer use an alcohol sensor to determine and adjust for the alcohol content of the fuel in the tank. Instead, the vehicle calculates the alcohol content of the fuel through measured adjustments.

The ethanol calculation occurs with the engine running after a refueling event has been detected via a measured change in the fuel level sender output. The virtual flex fuel sensor algorithm temporarily closes the canister purge valve for a few seconds and monitors information from the closed loop fuel trim system to calculate the ethanol content. This logic executes several times until the ethanol calculation is deemed to be stable. This may take several minutes under low fuel flow conditions such as idle, or a shorter time during higher fuel flow, off idle conditions.

Air-fuel ratios and the corresponding ethanol percentage are updated following each purge off sequence. The fuel alcohol content percentage value can be read on a scan tool using the Fuel Alcohol Content parameter.

When an E 100 compatible vehicles ECM is replaced, or if the learned alcohol content has been reset with a scan tool, the fuel system will need to contain ASTM gasoline with 22% or less ethanol content.

A minimum of 11 liters (3 gallons) must be put in the tank in order for the vehicle to recognize a refueling event. It is not necessary to turn the ignition OFF in order to have the refueling event recognized, however local safety regulations should be followed.

After the refueling event, the system registers the amount of fuel that was added, relative to the amount that was in the tank. Reading fuel trim and heated oxygen sensor activity, the system determines if the fuel added was either ASTM Gasoline (E 22) or ASTM Ethanol E 100. Based on that determination, the system adjusts to the expected alcohol mix in the fuel tank, and then the fuel trim and heated oxygen sensor activity fine tunes the adjustments. The system must remain in closed loop in order for this adjustment to occur. Numerous short trips after switching from gasoline to E 100, or E 100 to gasoline, can result in driveability symptoms due to the inability of the system to adjust for fuel composition by not attaining closed loop operation.

[Gasoline \(E 22\) and Ethanol \(E 100\)](#)

The gasoline available is considered to be E 22, which means that the gasoline has 22% ethanol and 78% gasoline. E 100 that is available means that it has 93% ethanol and 7% water.

[Switching Between Gasoline \(E 22\) and Ethanol \(E 100\)](#)

No special precautions need to be taken when switching back and forth between gasoline (E 22) and ethanol E 100 other than refueling events must be 11 liters (3 gallons) or greater, and the vehicle must remain in closed loop long enough, usually by the time the engine has maintained full operating temperature, to calculate the composition of the new blend in the tank.

[Flex Fuel Cold Start Auxiliary System](#)

During cold days 4°C (40°F) or colder, when the alcohol content in the fuel tank as determined by the engine control module (ECM) is approximately E 100, the cold start system is enabled injecting gasoline in the intake manifold, helping the engine to a fast start.

Under the hood is a small gasoline reservoir. You fill it up at the gas station with gasoline (E 22) by way of a separate fuel cap that is a part of the underhood gasoline reservoir. There is a small electric fuel pump attached onto the bottom of this reservoir of gasoline. A small fuel hose is connected to the output of that small electric cold start pump. The gasoline that the pump pushes through the small fuel hose leads to a cold start fuel injector (solenoid valve), and another fuel hose from this cold start fuel injector (solenoid valve) to a "nozzle" mounted in the intake manifold. The "nozzle" is located on the intake manifold somewhere centrally located, so that whatever amount of injected gasoline is distributed evenly into all the intake ports of the manifold.

When the ECM measures cold engine temperature and determines the engine is cranking, it energizes both the cold start relay (cold start fuel pump), and the cold start fuel injector (solenoid valve) to allow gasoline to the intake manifold. Once the ECM has determined the engine has started and the RPM is above approximately 600, the ECM will turn off the cold start relay (cold start fuel pump), and the cold start fuel injector (solenoid valve).

The purpose of the cold start fuel injector (solenoid valve) is to close the fuel hose between the engine and the gasoline reservoir. If the solenoid did not close the fuel hose, engine vacuum would draw the gasoline from the reservoir into the engine until the reservoir is empty, and create a vacuum leak.

[Fuel Tank](#)

The fuel tank stores the fuel supply. The fuel tank is located in the rear of the vehicle. The fuel tank is held in place by 2 metal straps that are attached to the underbody. The fuel tank is molded from high-density polyethylene.

[Fuel Filler Cap](#)

Note: If a fuel tank filler cap requires replacement, use only a fuel tank filler cap with the same features. Failure to use the correct fuel tank filler cap can result in a serious malfunction of the fuel and Evaporative Emission (EVAP) system.

The fuel fill pipe has a tethered fuel filler cap. A torque-limiting device prevents the cap from being overtightened. To install the cap, turn the cap clockwise until the cap clicks audibly. This indicates that the cap is correctly torqued and fully seated. A fuel filler cap that is not fully seated may cause a malfunction in the emission system.

[Fuel Pump Module](#)

The fuel pump module consists of the following major components:

- The fuel level sensor
- The fuel pump
- The fuel strainer

- The fuel pressure regulator
- The fuel filter

Fuel Level Sensor

The fuel level sensor consists of a float, a wire float arm, and a ceramic resistor card. The position of the float arm indicates the fuel level. The fuel level sensor contains a variable resistor which changes resistance in correspondence with the position of the float arm. The ECM sends the fuel level information via the serial data circuit to the instrument panel cluster. This information is used for the instrument panel cluster fuel gauge and the low fuel warning indicator, if applicable. The ECM also monitors the fuel level input for various diagnostics.

Fuel Pump

The fuel pump is mounted in the fuel pump module reservoir. The fuel pump is an electric high-pressure pump. Fuel is pumped to the fuel injection system at specified rates of flow and pressure. The fuel pump delivers a constant flow of fuel to the engine even during low fuel conditions and aggressive vehicle maneuvers. The ECM controls the electric fuel pump operation through a fuel pump relay. The fuel pump flex pipe acts to dampen the fuel pulses and noise generated by the fuel pump.

Fuel Strainer

The fuel strainer is attached to the lower end of the fuel pump module. The fuel strainer is made of woven plastic. The functions of the fuel strainer are to filter contaminants and to wick away fuel. Normally, the fuel strainer does not require maintenance. Fuel stoppage at this point indicates that the fuel tank contains an abnormal amount of sediment or contamination.

Fuel Pressure Regulator

The fuel pressure regulator is contained in the fuel pump module near the fuel pump outlet. The fuel pressure regulator is a diaphragm relief valve. The diaphragm has fuel pressure on one side and regulator spring pressure on the other side. The fuel pressure regulator is not vacuum biased. Fuel pressure is controlled by a pressure balance across the regulator. The fuel system pressure is constant.

Fuel Feed Pipes

The fuel feed pipe carries fuel from the fuel tank to the fuel injection system. The fuel pipe consists of 3 sections:

- The rear fuel pump fuel feed hose runs from the top of the fuel tank to the chassis fuel pipe. The rear fuel hose is constructed of nylon.
- The fuel feed intermediate pipe is located under the vehicle and connects the rear fuel pump fuel feed hose to the front fuel pump fuel feed hose. The intermediate fuel pipe is constructed of a combination of nylon and steel pipes.
- The front fuel pump fuel feed hose connects the fuel feed intermediate pipe to the fuel rail. The front fuel hose contains the fuel pulse dampener and is constructed of a combination of nylon and steel pipes.

Nylon Fuel Pipes

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

Nylon pipes are constructed to withstand maximum fuel system pressure, exposure to fuel additives, and changes in temperature.

Heat resistant rubber hose or corrugated plastic conduit protect the sections of the pipes that are exposed to chafing, high temperature, or vibration.

Nylon fuel pipes are somewhat flexible and can be shaped around gradual turns under the vehicle. However, if nylon fuel pipes are forced into sharp bends, the pipes may kink and restrict the flow of fuel. Also, once exposed to fuel, nylon pipes may become stiffer and are more likely to kink if bent too far. Exercise special care when working on a vehicle with nylon fuel pipes.

Fuel Pulse Dampener

The fuel pulse dampener is a part of the front fuel pump fuel feed hose. The fuel pulse dampener is diaphragm-operated with fuel pump pressure on one side and with spring pressure on the other side. The function of the dampener is to dampen the fuel pump pressure pulsations.

Fuel Rail Assembly

The fuel rail assembly is attached to the cylinder head. The fuel rail assembly performs the following functions:

- Positions the injectors in the intake ports of the cylinder head
- Distributes fuel evenly to the injectors

Fuel Injectors

The fuel injector assembly is a solenoid device controlled by the ECM that meters pressurized fuel to a single engine cylinder. The ECM energizes the high-impedance, 12 Ω , injector solenoid to open a ball valve, normally closed. This allows fuel to flow into the top of the injector, past the ball valve, and through a director plate at the injector outlet. The director plate has machined holes that control the flow of fuel, generating a spray of finely atomized fuel at the injector tip. Fuel from the injector tip is directed at the intake valve, causing the fuel to become further atomized and vaporized before entering the combustion chamber. This fine atomization improves fuel economy and emissions. The fuel pressure regulator compensates for engine load by increasing fuel pressure as the engine vacuum drops.

Fuel Metering Modes of Operation

The ECM monitors voltages from several sensors in order to determine how much fuel to feed to the engine. The ECM controls the amount of fuel delivered to the engine by changing the fuel injector pulse width. The fuel is delivered under one of several modes.

Starting Mode

When the ECM detects reference pulses from the crankshaft position sensor, the ECM will enable the fuel pump. The fuel pump runs and builds up pressure in the fuel system. The ECM then monitors the manifold absolute pressure (MAP), intake air temperature (IAT), engine coolant temperature (ECT), and accelerator pedal position (APP) sensor signals in order to determine the required injector pulse width for starting.

Clear Flood Mode

If the engine is flooded with fuel during starting and will not start, the clear flood mode can be manually enabled. To enable Clear Flood Mode, press the accelerator to wide open throttle (WOT). The ECM will completely turn OFF the fuel injectors and will maintain this mode as long as the ECM detects a WOT condition with engine speed below a predetermined value.

Run Mode

The run mode has 2 conditions referred to as open loop and closed loop. When the engine is first started and the engine speed is above a predetermined RPM, the system begins open loop operation. The ECM ignores the signal from the heated oxygen sensor (HO2S). The engine ECM calculates the air/fuel ratio based on inputs from the engine coolant temperature (ECT), the manifold absolute pressure (MAP), and accelerator pedal position (APP) sensor. The system stays in open loop until meeting the following conditions:

- The heated oxygen sensor (HO2S) has varying voltage output, showing that the heated oxygen sensor (HO2S) is hot enough to operate properly.

- The ECT sensor is above a specified temperature.
- A specific amount of time has elapsed after starting the engine.

Specific values for the above conditions exist for each different engine, and are stored in the programmable read-only memory (EEPROM), which may be erased electrically. The system begins closed loop operation after reaching these values. In closed loop, the ECM calculates the air/fuel ratio, injector ON time, based upon the signal from various sensors, but mainly from the heated oxygen sensor (HO2S). This allows the air/fuel ratio to stay very close to 14.7:1.

Acceleration Mode

The ECM monitors the changes in the accelerator pedal position (APP) sensor, and the manifold absolute pressure (MAP) sensor signal in order to determine when the vehicle is being accelerated. The ECM will then increase the injector pulse width in order to provide more fuel for increased performance.

Deceleration Mode

The ECM monitors changes in accelerator pedal position (APP) sensor and manifold absolute pressure (MAP) sensor signals to determine when the vehicle is being decelerated. The ECM will then decrease injector pulse width or even turn OFF injectors for short periods to reduce exhaust emissions, and for better (engine braking) deceleration.

Battery Voltage Correction Mode

When the battery voltage is low, the ECM compensates for the weak spark delivered by the ignition system in the following ways:

- Increasing the amount of fuel delivered
- Increasing the idle RPM
- Increasing the ignition dwell time

Fuel Cutoff Mode

The ECM cuts OFF fuel from the fuel injectors when the following conditions are met in order to protect the powertrain from damage and improve driveability:

- The ignition is OFF. This prevents engine run-on.
- The ignition is ON but there is no ignition reference signal. This prevents flooding or backfiring.
- The engine speed is too high, above red line.
- The vehicle speed is too high, above rated tire speed.
- During an extended, high speed, closed throttle coast down, this reduces emissions and increases engine braking.
- During extended deceleration, in order to prevent damage to the catalytic converters.

Fuel Trim

The ECM controls the air/fuel metering system in order to provide the best possible combination of driveability, fuel economy, and emission control. The ECM monitors the heated oxygen sensor (HO2S) signal voltage while in closed loop and regulates the fuel delivery by adjusting the pulse width of the injectors based on this signal. The ideal fuel trim values are around 0% for both short and long term fuel trim. A positive fuel trim value indicates the ECM is adding fuel in order to compensate for a lean condition by increasing the pulse width. A negative fuel trim value indicates that the ECM is reducing the amount of fuel in order to compensate for a rich condition by decreasing the pulse width. A change made to the fuel delivery changes the long and short term fuel trim values. The short term fuel trim values change rapidly in response to the heated oxygen sensor (HO2S) signal voltage. These changes fine-tune the engine fueling. The long term fuel trim makes rough adjustments to fueling in order to recenter and restore control to short term fuel trim. A scan tool can be used to monitor the short and long term fuel trim values. The long term fuel trim diagnostic is based on an average of several of the long term speed load learn cells. The ECM selects the cells based on the engine speed and engine load. If the ECM detects an excessively lean or rich condition, the ECM will set a fuel trim diagnostic trouble code (DTC).

2013 Chevrolet Colorado

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

Priming Procedure

The electric fuel pump in the fuel tank is used to prime the complete fuel system utilizing the following procedure:

1. Turn ON the Ignition, with the engine OFF.
2. Wait **10 - 30 seconds** for the system to prime.
3. Turn the ignition to the start position.
4. Repeat steps 1 through 3 if the engine does not start.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

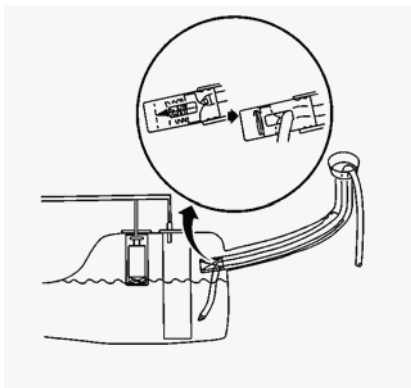
Fuel Delivery: | Fuel:

Warning: Refer to Gasoline/Gasoline Vapors Warning.

Warning: Never drain or store fuel in an open container. Always use an approved fuel storage container in order to reduce the chance of fire or explosion.

Warning: Place a dry chemical (Class B) fire extinguisher nearby before performing any on-vehicle service procedures. Failure to follow these precautions may result in personal injury.

1. Remove the fuel filler cap.



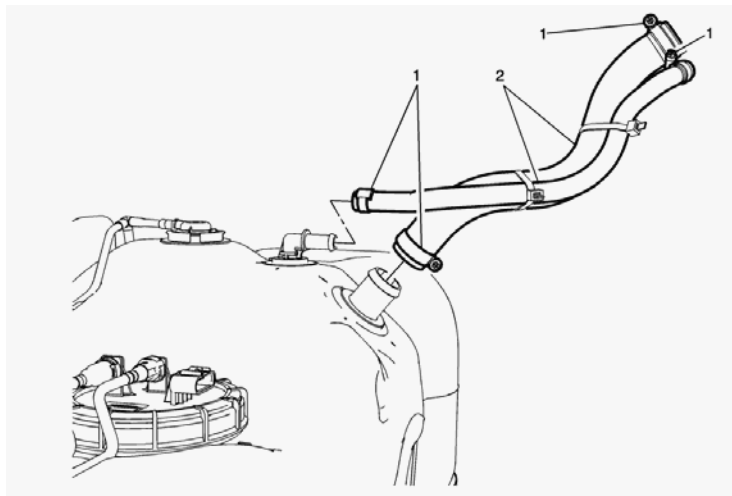
Note: Lubricate a suitable hose to aid in hose insertion and removal.

2. Insert the hose into the fuel tank until the hose reaches the bottom of the fuel tank.
3. Use an air operated pump device in order to drain the fuel into an approved gasoline container.
4. Simultaneously twist and pull in order to remove the hose from the fuel tank.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Hose Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
3. Lower the fuel tank enough to remove the fuel tank filler hose. Refer to Fuel Tank Replacement.

1 Fuel Filler Tube Clamps (Qty: 4)

Fuel Tank Filler Hose

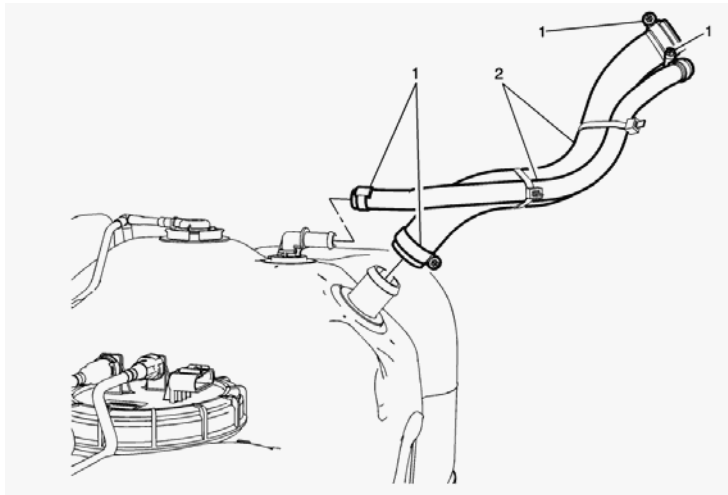
2 **Procedure**

Separate the fuel tank filler hose from the fuel tank vent hose.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Hose Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
3. Lower the fuel tank enough to remove the fuel tank filler hose. Refer to Fuel Tank Replacement.

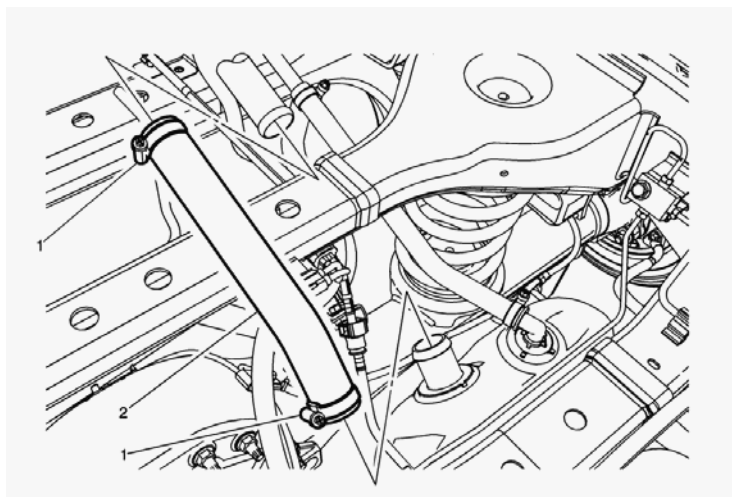
1 Fuel Filler Tube Clamps (Qty: 4)

2 Fuel Tank Filler Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Hose Replacement

Callout

Component Name

Warning: Do not allow smoking or the use of open flames in the area where work on the fuel or EVAP system is taking place. Anytime work is being done on the fuel system, disconnect the negative battery cable, except for those tests where battery voltage is required.

Preliminary Procedure

1. Drain the fuel system. Refer to Fuel Tank Draining
2. Raise and Support the vehicle. Refer to Lifting and Jacking the Vehicle.

1 Fuel Tank Filler Hose Clamps (Qty: 2)

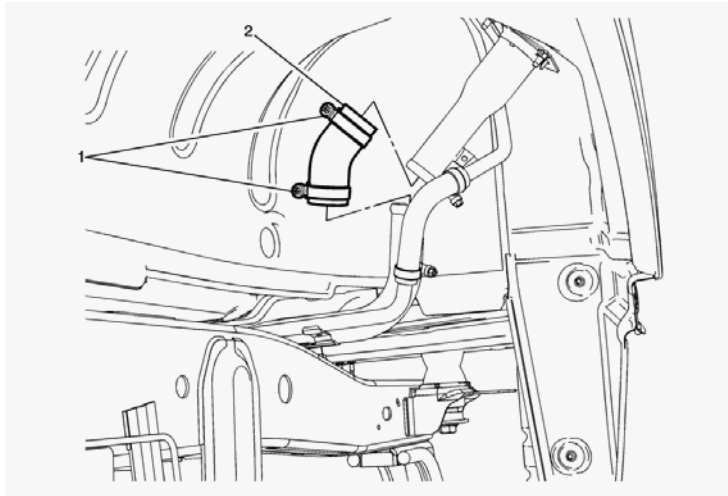
Caution: Refer to Fastener Caution.

2 Fuel Tank Filler Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Hose Replacement

Callout

Component Name

Warning: Do not allow smoking or the use of open flames in the area where work on the fuel or EVAP system is taking place. Anytime work is being done on the fuel system, disconnect the negative battery cable, except for those tests where battery voltage is required.

Preliminary Procedure

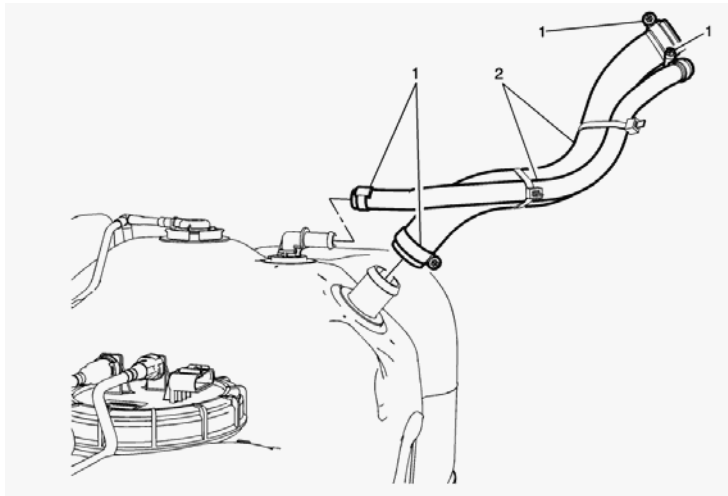
Remove the rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.

- 1 Fuel Tank Filler Hose Clamps (Qty: 2)
Caution: Refer to Fastener Caution.
- 2 Fuel Tank Filler Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Hose Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
3. Lower the fuel tank enough to remove the fuel tank filler hose. Refer to Fuel Tank Replacement.

1 Fuel Filler Tube Clamps (Qty: 4)

Fuel Tank Filler Hose

2 Procedure

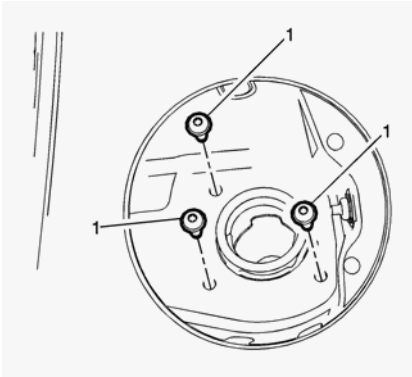
Separate the fuel tank filler hose from the fuel tank vent hose.

2013 Chevrolet Colorado

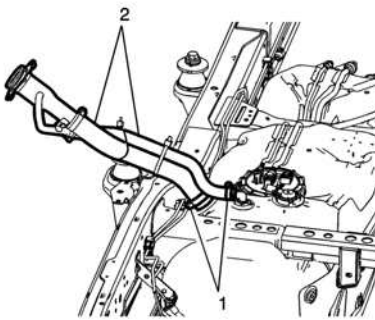
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Drain the fuel below the fuel fill neck. Refer to Fuel Tank Draining.

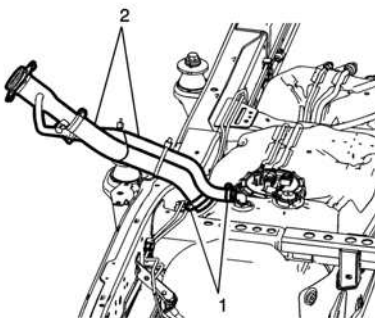


2. Remove the fuel tank filler pipe housing fasteners (1).
3. Remove the rear wheelhouse panel liner. Refer to Rear Wheelhouse Liner Replacement.



4. Loosen the fuel tank filler pipe assembly hose clamps (1) at the fuel tank.
5. Remove the fuel tank filler pipe assembly (2) from the vehicle.

[Installation Procedure](#)

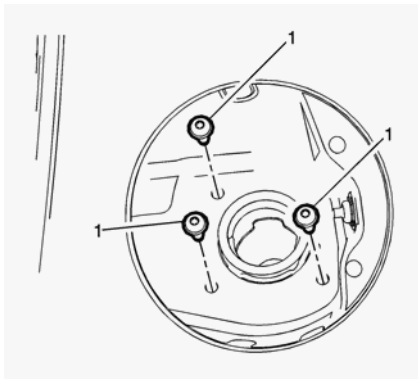


1. Install the fuel tank filler pipe assembly (2) to the vehicle.

Caution: Refer to Fastener Caution.

2. Tighten the fuel tank filler pipe assembly hose clamps at the fuel tank (1) to **6 Y(53 lb in)**.

Fuel Tank Filler Pipe Replacement (Pickup)



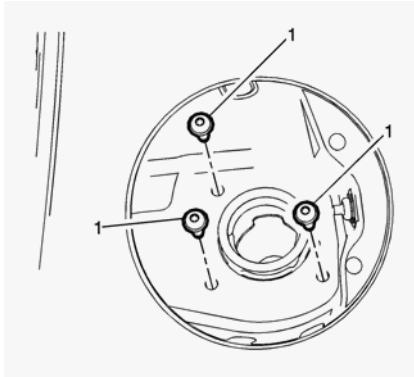
3. Tighten the filler housing fasteners (1) to **10 Y (89 lb in)**
4. Install the rear wheelhouse panel liner. Refer to Rear Wheelhouse Liner Replacement.

2013 Chevrolet Colorado

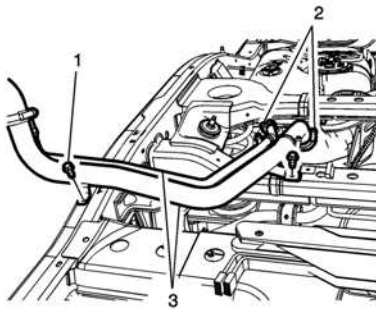
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

1. Drain the fuel below the fuel fill neck. Refer to Fuel Tank Draining.

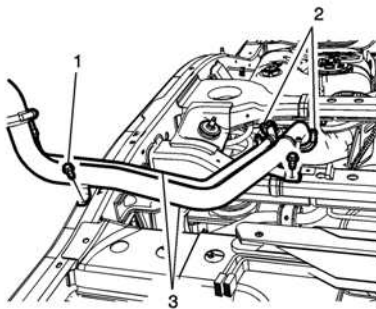


2. Remove the filler housing fasteners (1).
3. Remove the rear wheelhouse panel liner. Refer to Rear Wheelhouse Liner Replacement.



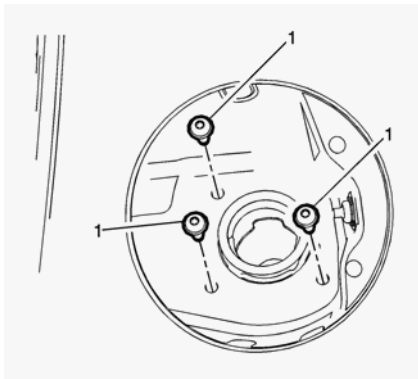
4. Remove the fuel tank filler pipe fasteners (1).
5. Loosen the fuel filler pipe assembly hose clamps (2) at the fuel tank.
6. Remove the fuel filler pipe assembly (3) from the vehicle.

Installation Procedure



1. Install the fuel filler pipe assembly (3) to the vehicle.
- Caution:** Refer to Fastener Caution.
2. Install the fuel tank filler pipe fasteners (1) and tighten to **10 Y (89 lb in)**.
 3. Tighten the fuel filler hose clamps (2) to **6 Y (53 lb in)**.

Fuel Tank Filler Pipe Replacement (SUV)



4. Tighten the filler housing fasteners (1) to **10 Y (89 lb in)**
5. Install the rear wheelhouse panel liner. Refer to Rear Wheelhouse Liner Replacement.
6. Fill the fuel to the previous level.

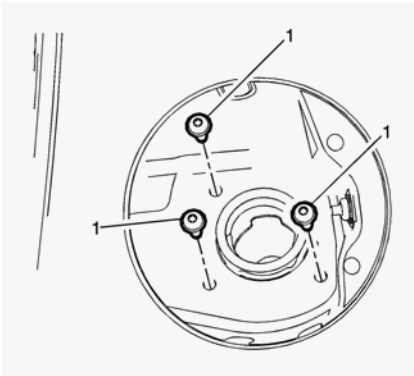
2013 Chevrolet Colorado

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

[Removal Procedure](#)

Warning: Do not allow smoking or the use of open flames in the area where work on the fuel or EVAP system is taking place. Anytime work is being done on the fuel system, disconnect the negative battery cable, except for those tests where battery voltage is required.

1. Drain the fuel below the fuel fill neck. Refer to Fuel Tank Draining.



2. Remove the filler housing fasteners (1).
3. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.



4. Loosen the fuel filler tube clamps (1).
5. Remove the fuel tank filler pipe assembly from the fuel filler and vent hoses (2).

[Installation Procedure](#)

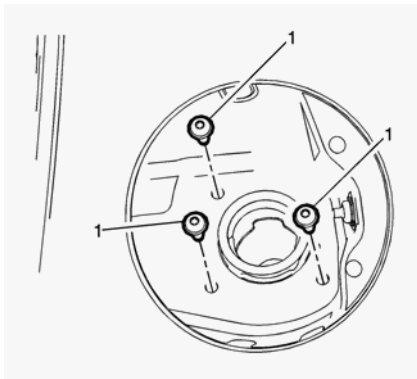


1. Install the fuel tank filler pipe assembly to the fuel filler and vent hoses (2).

Caution: Refer to Fastener Caution.

2. Tighten the hose clamps (1) to **6 Y(53 lb in)**.

Fuel Tank Filler Pipe Replacement

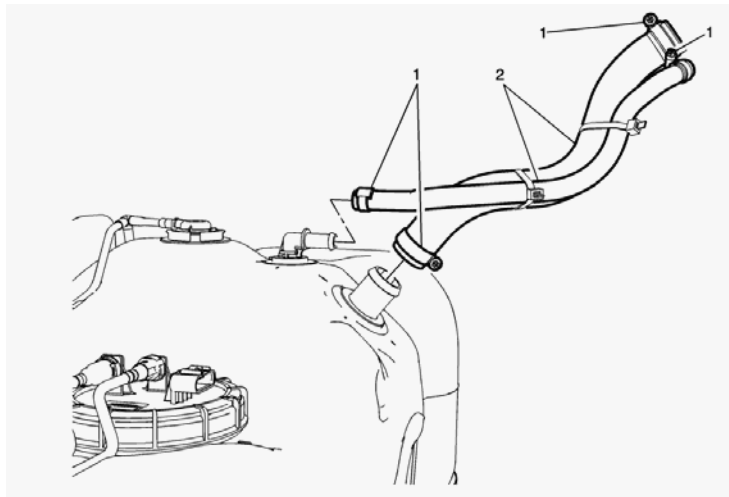


3. Install the fuel tank filler pipe housing fasteners (1) and tighten to **10 Y (89 lb in)**.
4. Install the rear wheelhouse panel liner. Refer to Rear Wheelhouse Liner Replacement.
5. Fill the fuel to the previous level.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Vent Hose Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
3. Lower the fuel tank enough to disconnect the fuel tank filler vent hose. Refer to Fuel Tank Replacement.

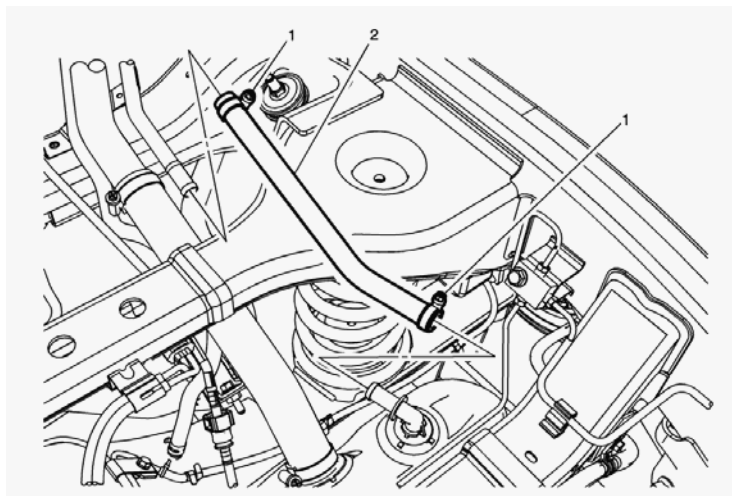
1 Fuel Tank Filler Vent Hose Clamps (Qty: 2)

2 Fuel Tank Filler Vent Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Vent Hose Replacement

Callout

Component Name

Warning: Do not allow smoking or the use of open flames in the area where work on the fuel or EVAP system is taking place. Anytime work is being done on the fuel system, disconnect the negative battery cable, except for those tests where battery voltage is required.

Preliminary Procedure

1. Drain the fuel system. Refer to Fuel Tank Draining
2. Raise and Support the vehicle. Refer to Lifting and Jacking the Vehicle.

Fuel Tank Filler Vent Hose Clamps (Qty: 2)

1

Caution: Refer to Fastener Caution.

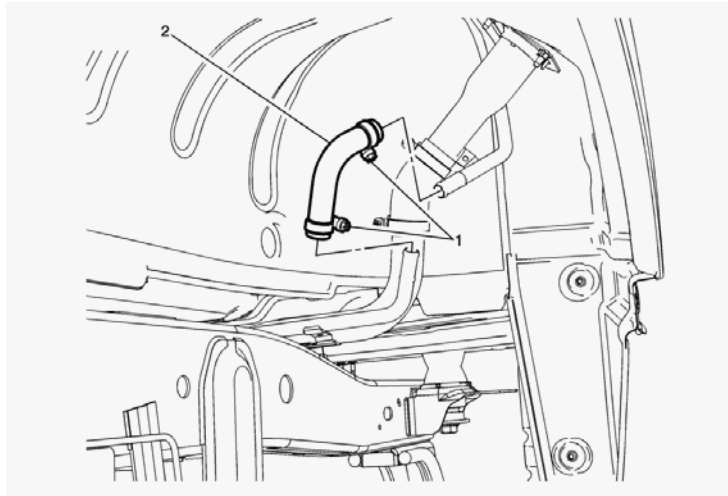
2

Fuel Tank Filler Vent Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Vent Hose Replacement

Callout

Component Name

Warning: Do not allow smoking or the use of open flames in the area where work on the fuel or EVAP system is taking place. Anytime work is being done on the fuel system, disconnect the negative battery cable, except for those tests where battery voltage is required.

Preliminary Procedure

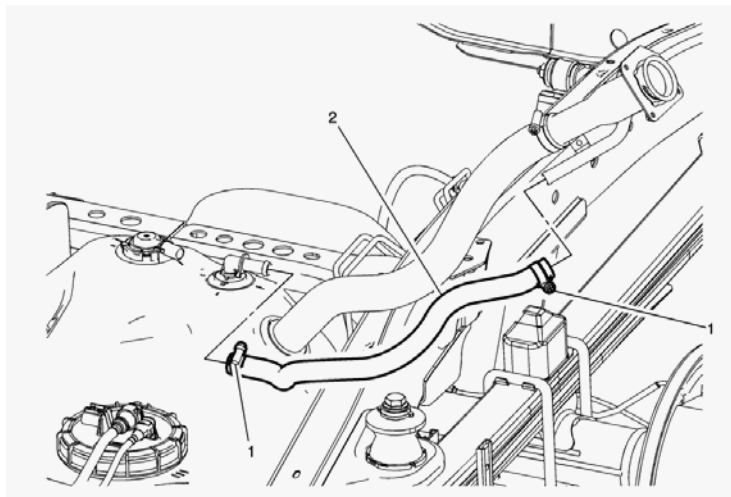
Remove the rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.

- | | |
|---|--|
| 1 | Fuel Tank Filler Vent Hose Clamps (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 2 | Fuel Tank Filler Vent Hose |

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Filler Vent Hose Replacement

Callout

Component Name

Fuel Tank Filler Vent Hose Clamps (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

6 Y (53 lb in)

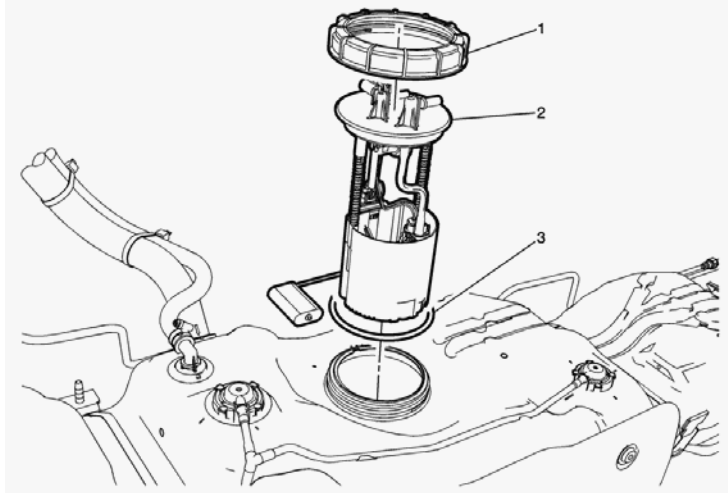
2

Fuel Tank Filler Vent Hose

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Fuel Pump Module Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the fuel tank. Refer to Fuel Tank Replacement.
2. Remove the fuel feed and return lines from the fuel tank. Refer to Fuel Line Replacement - Filter to Tank.
3. Disconnect the electrical wiring harness connector from the fuel pump module.

Fuel Tank Fuel Pump Module Lock Ring

Caution: Refer to Fastener Caution.

Procedure

Using the *CH-38879-B* fuel pump lock ring tool, remove the cam lock ring by turning counterclockwise.

1

Tighten

70 Y (52 lb ft)

Special Tools

CH-38879-B Fuel Pump Lock Ring Tool

For equivalent regional tools, refer to Special Tools.

O-Ring Seal

2

Procedure

Replace the O-ring seal.

Fuel Tank Fuel Pump Module

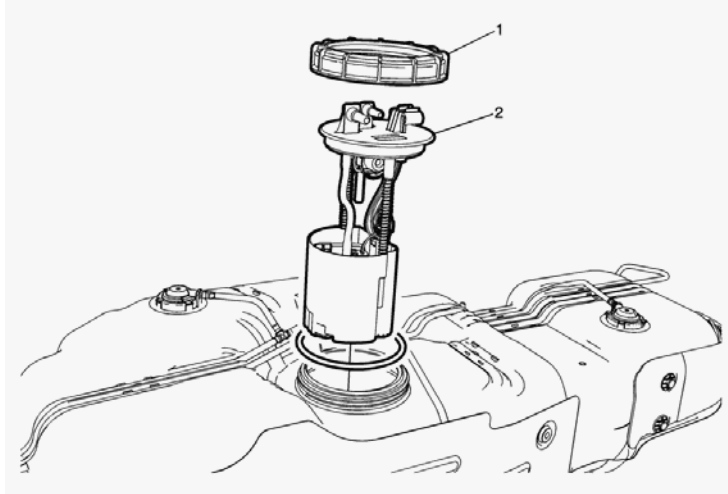
3

Procedure

Allow the engine to run and check for leaks.

2013 Chevrolet Colorado

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



Fuel Tank Fuel Pump Module Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the fuel tank. Refer to Fuel Tank Replacement.
2. Remove the fuel feed and return lines from the fuel tank. Refer to Fuel Line Replacement - Filter to Tank.
3. Disconnect the electrical wiring harness connector from the fuel pump module.

Fuel Tank Fuel Pump Module Lock Ring

Caution: Refer to Fastener Caution.

Procedure

Using the *CH-38879-B* fuel pump lock ring tool, remove the cam lock ring by turning counterclockwise.

1

Tighten

70 Y (52 lb ft)

Special Tools

CH-38879-B Fuel Pump Lock Ring Tool

For equivalent regional tools, refer to Special Tools.

Fuel Tank Fuel Pump Module

Procedure

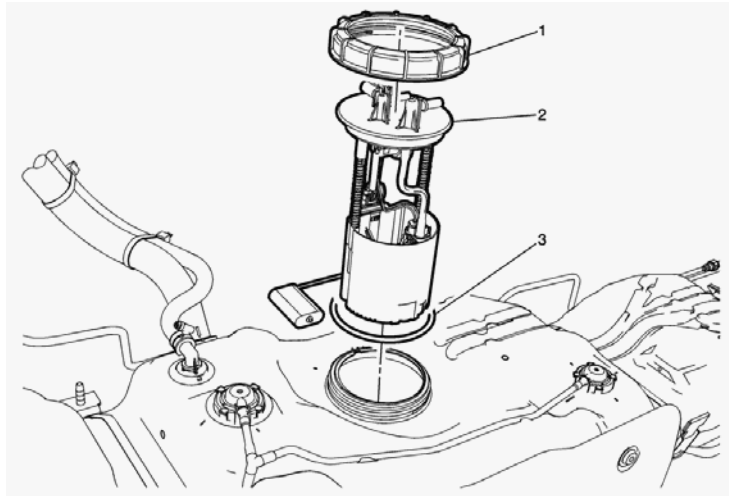
2

1. Install a NEW fuel tank fuel pump module O-ring.
2. Allow the engine to run and check for leaks.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Fuel Pump Module Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the fuel tank. Refer to Fuel Tank Replacement.
2. Disconnect the electrical wiring harness connector from the fuel tank fuel pump module.

Fuel Tank Fuel Pump Module Lock Ring

Procedure

1. Using the *CH 38879-B* fuel pump lock ring tool., remove the cam lock ring by turning counterclockwise.

Special Tools

CH 38879-B Fuel Pump Lock Ring Tool.

For equivalent regional tools, refer to Special Tools.

2. Fuel Tank Fuel Pump Module

O-Ring Seal

Procedure

3.
 1. Replace the O-ring seal.
 2. Allow the engine to run and check for leaks.

2013 Chevrolet Colorado

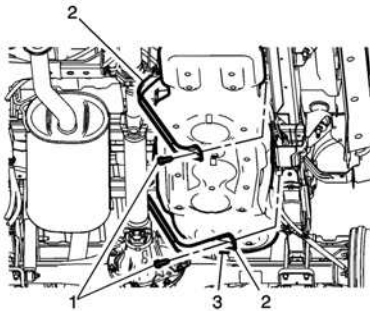
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Drain the fuel tank. Refer to Fuel Tank Draining.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.



5. Loosen the fuel tank filler hose clamps (1) and disconnect the fuel tank filler and vent hoses from the fuel tank filler pipe (2).
6. Disconnect the fuel feed line at the fuel filter. Refer to Fuel Line Replacement - Chassis.
7. Disconnect the fuel filter ground harness.
8. Disconnect the evaporative emissions rear pipe at the fuel tank. Refer to Evaporative Emission Rear Pipe Replacement.
9. Position an adjustable jack under the fuel tank for support.



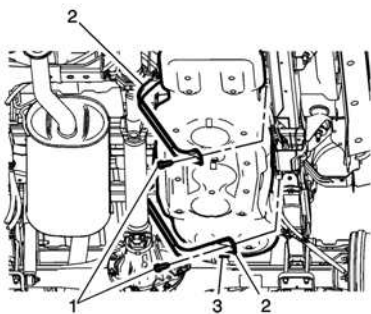
Caution: Do not bend the fuel tank straps. Bending the fuel tank straps may damage the straps.

10. Remove the fuel tank strap bolts (1).
11. Remove the fuel tank straps (2).
12. With the aid of an assistant, carefully lower the fuel tank until the fuel pump electrical connections can be accessed.
13. Disconnect the fuel tank module electrical wiring harness connector from the fuel tank.
14. Completely lower the fuel tank and place the fuel tank in a suitable work area.
15. If the fuel tank is not being replaced, proceed to the installation procedure.
16. Disconnect the fuel feed and return lines from the fuel tank. Refer to Fuel Line Replacement - Filter to Tank.
17. Remove the fuel filler and vent tubes from the fuel tank. Refer to Fuel Tank Filler Vent Hose Replacement.
18. Remove the fuel tank fuel pump module. Refer to Fuel Tank Fuel Pump Module Replacement.

Installation Procedure

1. If the fuel tank is not being replaced, proceed to Step 5.
2. Install the fuel tank fuel pump module. Refer to Fuel Tank Fuel Pump Module Replacement.
3. Install the fuel filler and vent tubes to the fuel tank. Refer to Fuel Tank Filler Vent Hose Replacement.
4. Connect the fuel feed and return lines to the fuel tank. Refer to Fuel Line Replacement - Filter to Tank.
5. With the aid of an assistant, place the fuel tank onto the jack and support the fuel tank.
6. Partially raise the fuel tank until the electrical connections can be made.
7. Connect the fuel tank module (2) electrical connector to the fuel tank.

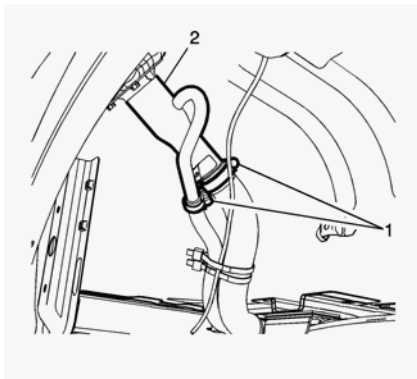
Fuel Tank Replacement (Pickup)



8. Install the fuel tank straps.

Caution: Refer to Fastener Caution.

9. Install the fuel tank front strap bolts and tighten to **32 Y (24 lb ft)**.
10. Connect the evaporative emissions rear pipe at the fuel tank. Refer to Evaporative Emission Rear Pipe Replacement.
11. Connect the fuel feed line at the fuel filter. Refer to Fuel Line Replacement - Chassis.
12. Lower the vehicle only enough to gain access to the fuel tank through the wheelhouse.

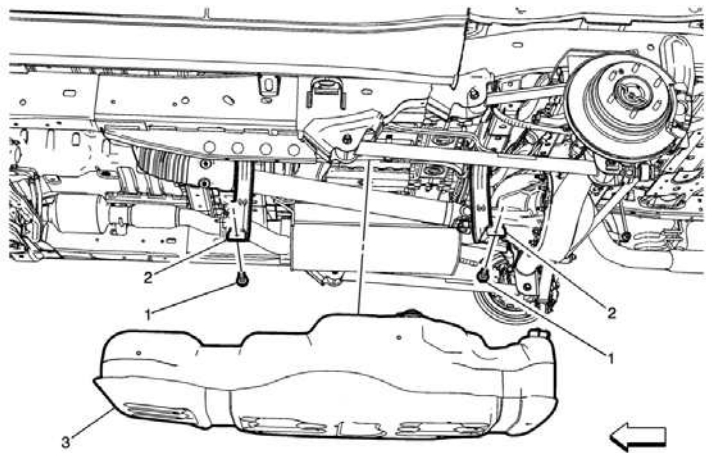


13. Connect the fuel tank filler and vent hoses to the fuel tank filler pipe (2) and tighten the fuel tank filler hose clamps (1).
14. Connect the fuel filter ground harness.
15. Install the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
16. Lower the vehicle.
17. Refill the fuel tank.
18. Install the fuel fill cap.
19. Inspect for leaks.

1. Turn ON the ignition, with the engine OFF for 10 seconds.
2. Turn OFF the ignition for 10 seconds.
3. Turn ON the ignition, with the engine OFF.
4. Inspect for fuel leaks.

2013 Chevrolet Colorado

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



Fuel Tank Replacement

Callout	Component Name
---------	----------------

Preliminary Procedure

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Drain the fuel tank. Refer to Fuel Tank Draining.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Disconnect the fuel tank filler and vent pipes from the fuel tank.
5. Disconnect the fuel tank fuel feed and return pipes from the fuel filter. Refer to Plastic Collar Quick Connect Fitting Service.
6. Disconnect the evaporative emission purge and vent pipes from the Intermediate and fuel tank vent pipes. Refer to Plastic Collar Quick Connect Fitting Service.
7. Support the fuel tank.

Fuel Tank Strap Fastener

1. **Caution:** Refer to Fastener Caution.

Tighten

32 Y (24 lb ft)

2. Fuel Tank Strap

Fuel Tank

3.
 1. Carefully lower the fuel tank.
 2. If replacing the fuel tank transfer the following components:

Fuel Tank Fuel Pump Module Replacement

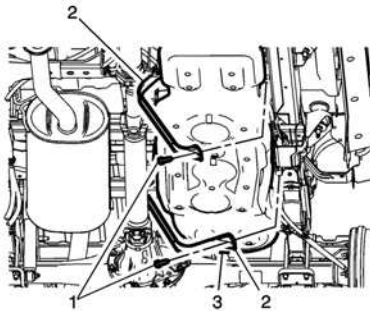
Evaporative Emission Pipe Replacement

2013 Chevrolet Colorado

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

[Removal Procedure](#)

1. Turn OFF the engine, for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Drain the fuel tank. Refer to Fuel Tank Draining.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Position an adjustable jack under the fuel tank for support.

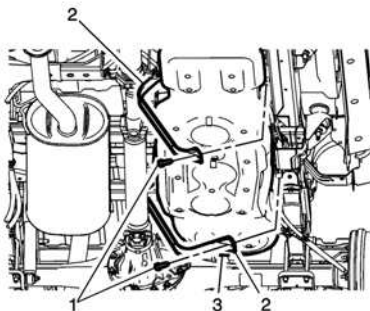


Caution: Do not bend the fuel tank straps. Bending the fuel tank straps may damage the straps.

5. Remove the fuel tank strap bolts(1).
6. Remove the fuel tank straps(2).
7. With the aid of an assistant, carefully lower the fuel tank until the electrical connections can be accessed.
8. Disconnect the fuel tank module electrical connector from the fuel tank.
9. Disconnect the fuel feed line at the fuel tank. Refer to Plastic Collar Quick Connect Fitting Service.
10. Disconnect the fuel return line at the fuel tank. Refer to Fuel Return Pipe Replacement.
11. Completely lower the fuel tank and place the fuel tank in a suitable work area.
12. If the fuel tank is not being replaced, proceed go to the Installation Procedure.

[Installation Procedure](#)

1. With the aid of an assistant, place the fuel tank onto the jack and support the fuel tank.
2. Partially raise the fuel tank until the electrical connections can be made.
3. Connect the fuel feed line at the fuel tank. Refer to Plastic Collar Quick Connect Fitting Service.
4. Connect the fuel tank module (2) electrical connector to the fuel tank.
5. Connect the fuel return line at the fuel tank. Refer to Fuel Return Pipe Replacement.



6. Install the fuel tank straps.
7. Install the fuel tank front strap bolts.

Caution: Refer to Fastener Caution.

8. Tighten the fuel tank strap bolts to **32 Y (24 lb ft)**.
9. Lower the vehicle only enough to gain access to the fuel tank through the wheelhouse.
10. Reconnect the fuel fill hose and vent pipe at the tank.
11. Lower the vehicle.
12. Refill the fuel tank.

Fuel Tank Replacement

13. Install the fuel fill cap.
14. Inspect for leaks.
 1. Turn ON the ignition, with the engine OFF for 10 seconds.
 2. Turn OFF the ignition for 10 seconds.
 3. Turn ON the ignition, with the engine OFF.
 4. Inspect for fuel leaks.
15. Prime the fuel system.

2013 Chevrolet Colorado

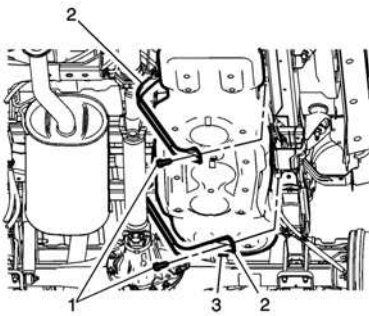
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Relieve the fuel system pressure. Refer to Fuel Pressure Relief.
2. Drain the fuel tank. Refer to Fuel Tank Draining.
3. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
4. Remove the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.



5. Loosen the fuel tank filler hose clamps (1) and disconnect the fuel tank filler and vent hoses from the fuel tank filler pipe (2).
6. Disconnect the fuel feed and evaporative emission pipe at the fuel filter. Refer to Fuel Feed and Evaporative Emission Pipe Replacement.
7. Disconnect the evaporative emission canister vent pipe. Refer to Evaporative Emission Canister Vent Pipe Replacement.
8. Remove the propeller shaft strap.
9. Remove the fuel filter ground harness.
10. Position an adjustable jack under the fuel tank for support.

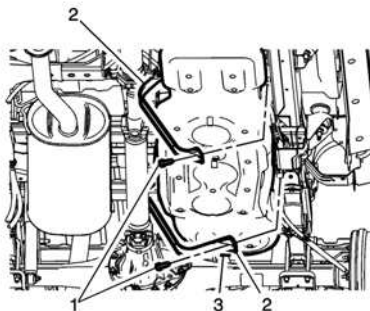


Caution: Do not bend the fuel tank straps. Bending the fuel tank straps may damage the straps.

11. Remove the fuel tank strap bolts (1).
12. Remove the fuel tank straps (2).
13. With the aid of an assistant, carefully lower the fuel tank until the fuel pump electrical connections can be accessed.
14. Disconnect the fuel tank module electrical wiring harness connector from the fuel tank.
15. Completely lower the fuel tank and place the fuel tank in a suitable work area.
16. If the fuel tank is not being replaced, proceed to the installation procedure.
17. Disconnect the fuel feed and return lines from the fuel tank. Refer to Fuel Feed Pipe Replacement and Fuel Return Pipe Replacement.
18. Remove the fuel filler and vent tubes from the fuel tank. Refer to Fuel Tank Filler Vent Hose Replacement.
19. Remove the fuel tank fuel pump module. Refer to Fuel Tank Fuel Pump Module Replacement.

[Installation Procedure](#)

1. If the fuel tank is not being replaced, proceed to Step 5.
2. Install the fuel tank fuel pump module. Refer to Fuel Tank Fuel Pump Module Replacement.
3. Install the fuel filler and vent tubes to the fuel tank. Refer to Fuel Tank Filler Vent Hose Replacement.
4. Connect the fuel feed and return lines to the fuel tank. Refer to Fuel Feed Pipe Replacement and Fuel Return Pipe Replacement.
5. With the aid of an assistant, place the fuel tank onto the jack and support the fuel tank.
6. Partially raise the fuel tank until the electrical connections can be made.
7. Connect the fuel tank module (2) electrical connector to the fuel tank.



8. Install the fuel tank straps.
9. Install the fuel tank front strap bolts.

Caution: Refer to Fastener Caution.

10. Tighten the fuel tank strap bolts to **32 Y (24 lb ft)**.
11. Install the fuel filter ground harness.
12. Install the propeller shaft strap.
13. Connect the evaporative emission canister vent pipe. Refer to Evaporative Emission Canister Vent Pipe Replacement.
14. Connect the fuel feed and evaporative emission pipe at the fuel filter. Refer to Fuel Feed and Evaporative Emission Pipe Replacement.
15. Lower the vehicle only enough to gain access to the fuel tank through the wheelhouse.

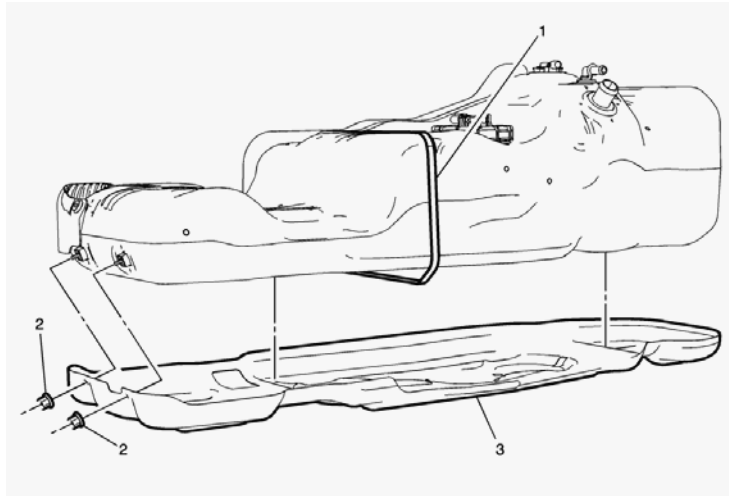


16. Connect the fuel tank filler and vent hoses to the fuel tank filler pipe (2) and tighten the fuel tank filler hose clamps (1).
17. Install the left rear wheelhouse liner. Refer to Rear Wheelhouse Liner Replacement.
18. Lower the vehicle.
19. Refill the fuel tank.
20. Install the fuel fill cap.
21. Inspect for leaks.
 1. Turn ON the ignition, with the engine OFF for 10 seconds.
 2. Turn OFF the ignition for 10 seconds.
 3. Turn ON the ignition, with the engine OFF.
 4. Inspect for fuel leaks.
22. Prime the fuel system.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Fuel Tank Shield Replacement

Callout

Component Name

Preliminary Procedures

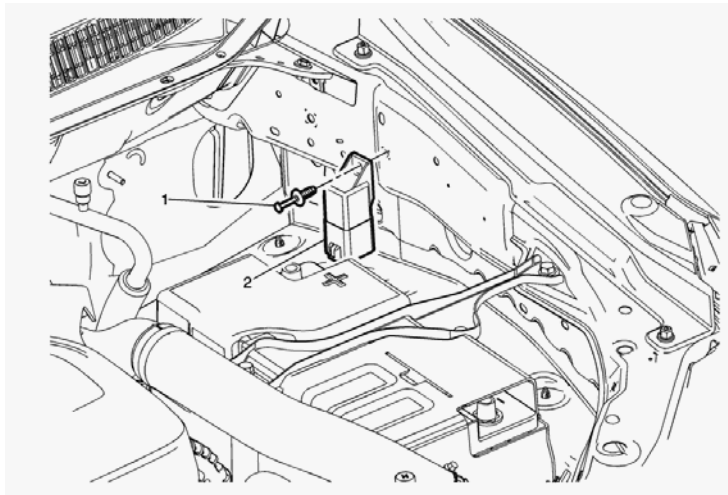
Remove the fuel tank. Refer to Fuel Tank Replacement.

- | | |
|---|--|
| 1 | Fuel Tank Shield Assembly Strap |
| 2 | Fuel Tank Shield Retainers (Qty: 2) |
| 2 | Caution: Refer to Fastener Caution. |
| 3 | Fuel Tank Shield |

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Glow Plug Controller Replacement

Callout

1 Glow Plug Controller Push Pin

Glow Plug Controller

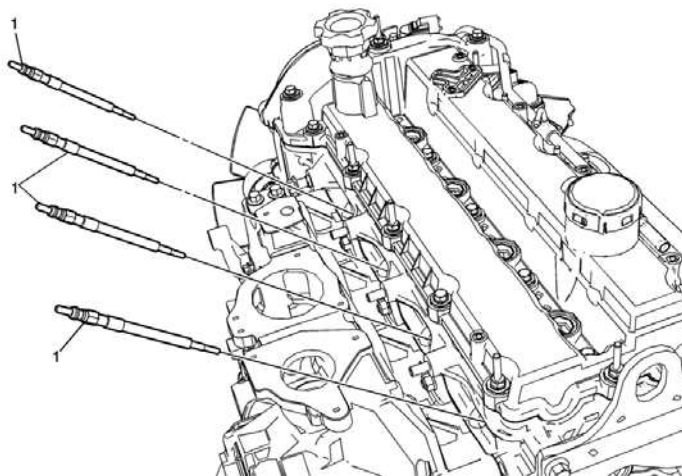
2 **Procedure**

Disconnect the electrical connector.

Component Name

2013 Chevrolet Colorado

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



Glow Plug Replacement

Callout

Component Name

Preliminary Procedure

Remove the fuel rail. Refer to Fuel Injection Fuel Rail Assembly Replacement.

Glow Plug (Qty: 4)

Caution: Refer to Fastener Caution.

Procedure

1

Disconnect the electrical connector.

Tighten

14 Y (10 lb ft)

2013 Chevrolet Colorado

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

In the diesel engine, air alone is compressed in the cylinder. Then, after the air has been compressed, a charge of fuel is sprayed into the cylinder and ignition occurs, due to the heat of compression. Glow plugs are used as an aid to starting.

Control of the glow plugs is accomplished by a glow plug controller. The temperature and the power consumption is controlled between the engine control module (ECM) and the controller within a wide range to suit the engine's pre-heating requirements. Each glow plug is energized individually. This capability yields more optimum heat times for the glow plugs, thus pre-glow times can be kept to a minimum for short wait to crank times and maximum glow plug durability. A DTC will set if there is a glow plug system fault.

A normal functioning system operates as follows:

- Turn the ignition ON with the engine OFF, and at room temperature.
- The glow plugs turn ON and heat up in 2 seconds and then are pulse-width modulated (PWM) for another 2 seconds.
- The glow plug wait lamp is ON for 1 second during cold start.
- The glow plug wait lamp may not illuminate during a warm engine start.
- If the engine is cranked during or after the above sequence, the glow plugs may cycle ON and OFF after the ignition switch is returned from the start position, whether the engine starts or not. The engine does not have to be running to terminate the glow plug cycling.

The glow plug initial ON time will vary based on the system voltage and temperature. Lower temperatures cause longer ON times.

The ECM provides glow plug operation after starting a cold engine. This post-start operation is initiated when the ignition switch is returned to Run, from the Start position. This function helps clean up excessive white smoke and/or poor idle quality after starting.

Glow Plugs

The glow plugs are 4.4 volt heaters in each of the cylinders that turn ON, then are pulse-width modulated when the ignition switch is turned to the RUN position prior to starting the engine. The glow plug controller remains pulsing the glow plugs a short time after starting, then are turned OFF.

A Wait to Start lamp on the instrument panel provides information on engine starting conditions. The Wait to Start lamp will not illuminate during post-start glow plug operation.

Glow Plug Controller

The glow plug controller is a solid state device which operates the glow plugs. The glow plug controller is connected to the following circuits:

- The battery voltage circuits
- The CAN communication circuit located between the engine control module (ECM) and the glow plug controller - If equipped
- The engine ground circuit
- The glow plug supply voltage circuits located between the glow plug controller and the glow plugs.

The glow plug diagnostic circuits are directly monitored individually by using a separate transistor to control current to each glow plug. Individual diagnosis is thus possible for every glow plug.

2013 Chevrolet Colorado

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

Caution: Do not remove the pigtail from either the heated oxygen sensor (HO2S) or the oxygen sensor (O2S). Removing the pigtail or the connector will affect sensor operation.

Handle the oxygen sensor carefully. Do not drop the HO2S. Keep the in-line electrical connector and the louvered end free of grease, dirt, or other contaminants. Do not use cleaning solvents of any type.

Do not repair the wiring, connector or terminals. Replace the oxygen sensor if the pigtail wiring, connector, or terminal is damaged.

This external clean air reference is obtained by way of the oxygen sensor signal and heater wires. Any attempt to repair the wires, connectors, or terminals could result in the obstruction of the air reference and degraded sensor performance.

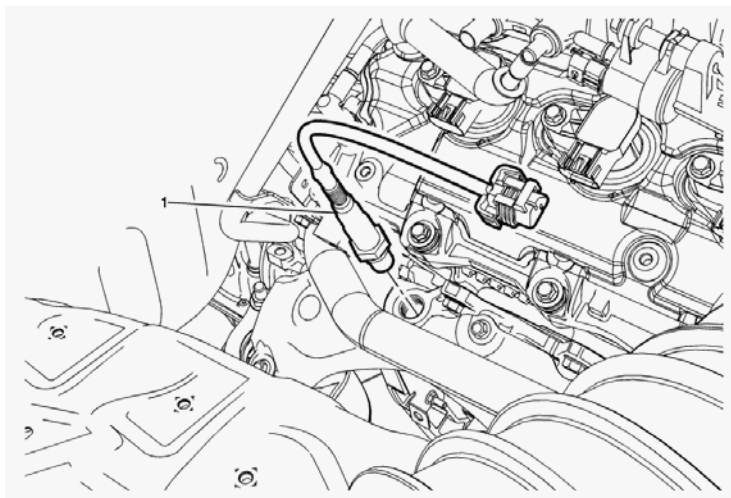
The following guidelines should be used when servicing the heated oxygen sensor:

- Do not apply contact cleaner or other materials to the sensor or vehicle harness connectors. These materials may get into the sensor causing poor performance.
- Do not damage the sensor pigtail and harness wires in such a way that the wires inside are exposed. This could provide a path for foreign materials to enter the sensor and cause performance problems.
- Ensure the sensor or vehicle lead wires are not bent sharply or kinked. Sharp bends or kinks could block the reference air path through the lead wire.
- Do not remove or defeat the oxygen sensor ground wire, where applicable. Vehicles that utilize the ground wired sensor may rely on this ground as the only ground contact to the sensor. Removal of the ground wire will cause poor engine performance.
- Ensure that the peripheral seal remains intact on the vehicle harness connector in order to prevent damage due to water intrusion. The engine harness may be repaired using Packard's Crimp and Splice Seals Terminal Repair Kit. Under no circumstances should repairs be soldered since this could result in the air reference being obstructed.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Heated Oxygen Sensor Replacement - Bank 1 Sensor 1

Callout

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the electrical wiring harness connector from the heated oxygen sensor.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y (31 lb in)

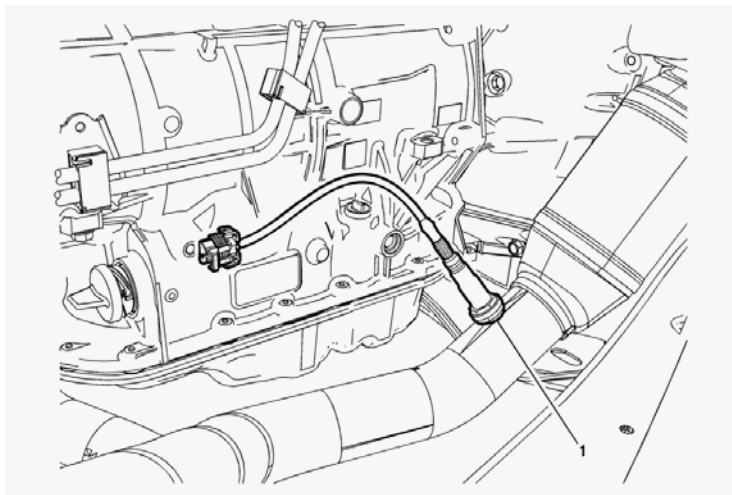
Special Tools

EN-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools.

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Bank 1 Sensor 2

Callout

Component Name

Preliminary Procedure

Raise the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the electrical wiring harness connector from the heated oxygen sensor.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

1

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y (31 lb in)

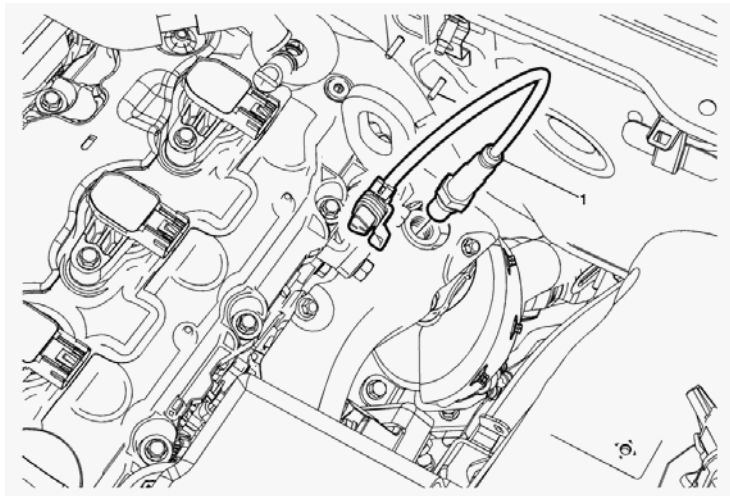
Special Tools

EN-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools.

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Bank 2 Sensor 1

Callout

Component Name

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the electrical wiring harness connector from the heated oxygen sensor.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y (31 lb in)

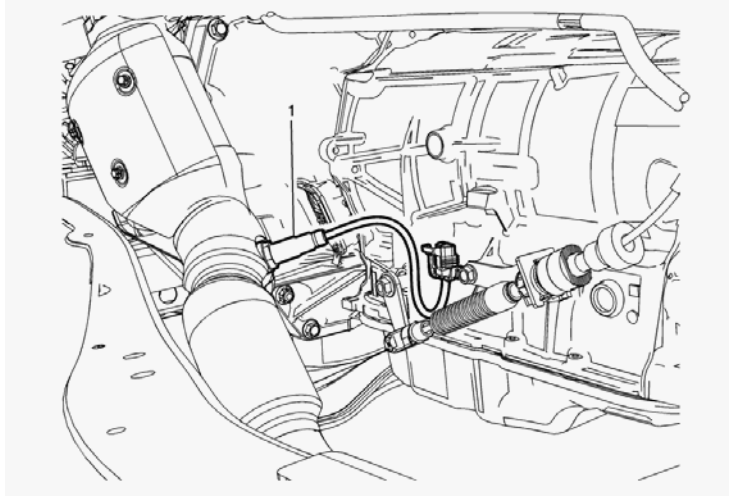
Special Tools

EN-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools.

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Bank 2 Sensor 2

Callout

Component Name

Preliminary Procedure

Raise the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the electrical wiring harness connector from the heated oxygen sensor.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

1

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y (31 lb in)

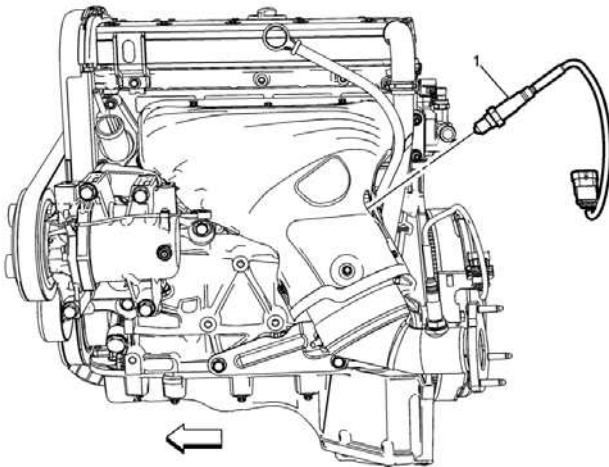
Special Tools

EN-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools.

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Sensor 1

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the heated oxygen sensor harness electrical connector.
2. Use a J-39194-Coxygen sensor wrench
3. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-sieze compound applied before reinstallation.

Tighten

42 Y(31 lb ft)

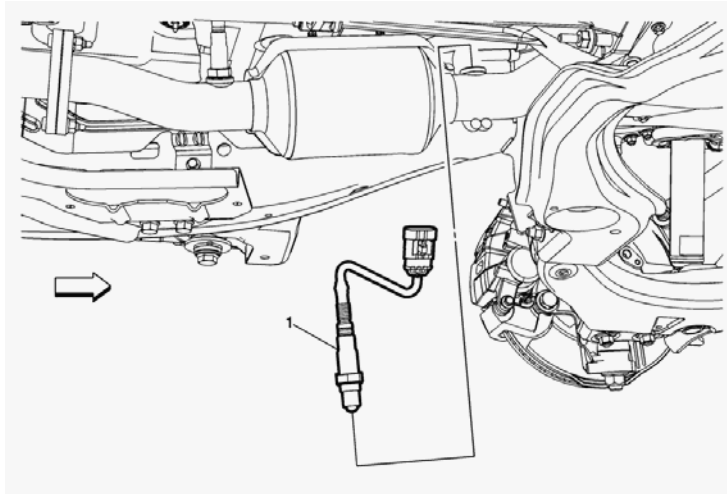
Special Tools

J-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Sensor 1

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1

1. Disconnect the heated oxygen sensor harness electrical connector.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

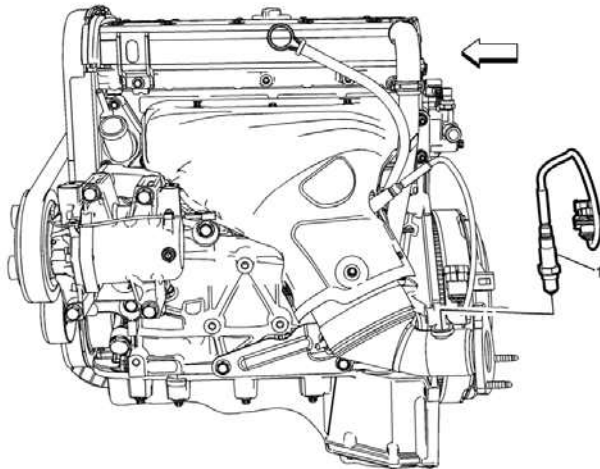
Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphic and glass beads. The graphic tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y(31 lb ft)

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Sensor 2

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1. Disconnect the heated oxygen sensor harness electrical connector.
2. Use a J-39194-Coxygen sensor wrench
3. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphite and glass beads. The graphite tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y(31 lb ft)

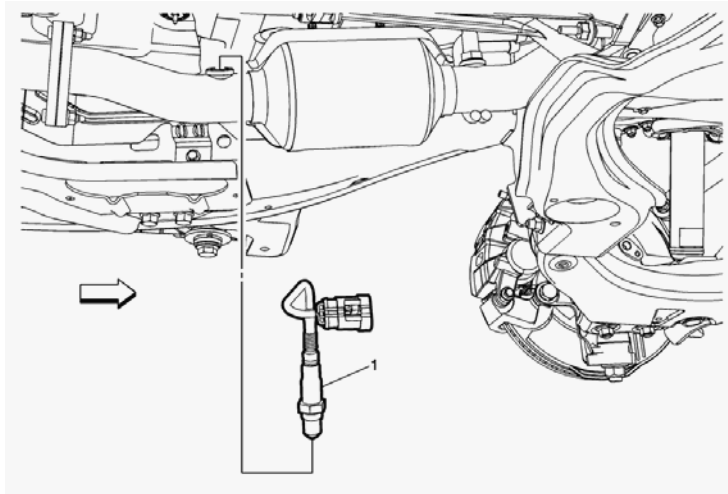
Special Tools

J-39194-C Oxygen Sensor Wrench

For equivalent regional tools, refer to Special Tools

2013 Chevrolet Colorado

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



Heated Oxygen Sensor Replacement - Sensor 2

Callout

Component Name

Preliminary Procedure

Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Heated Oxygen Sensor

Caution: Refer to Heated Oxygen and Oxygen Sensor Caution.

Caution: Refer to Fastener Caution.

Procedure

1

1. Disconnect the heated oxygen sensor harness electrical connector.
2. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphic and glass beads. The graphic tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. If the sensor is removed from an exhaust component and if for any reason the sensor is to be reinstalled, the threads must have anti-seize compound applied before reinstallation.

Tighten

42 Y(31 lb ft)

2013 Chevrolet Colorado

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

Caution: When replacing the HO2S perform the following:

- A code clear with a scan tool, regardless of whether or not a DTC is set
- HO2S heater resistance learn reset with a scan tool, where available

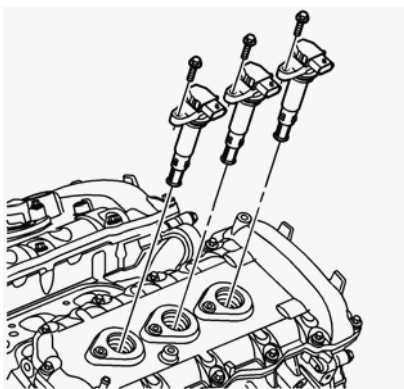
Perform the above in order to reset the HO2S resistance learned value and avoid possible HO2S failure.

2013 Chevrolet Colorado

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

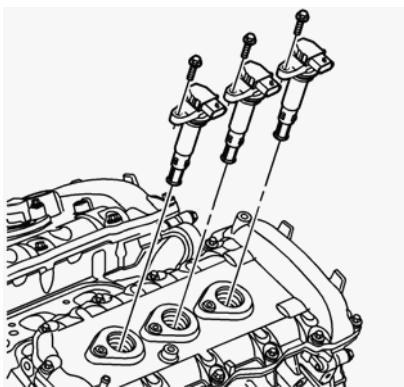
[Removal Procedure](#)

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the intake cover. Refer to Intake Manifold Cover Replacement.
3. Disconnect the electrical wiring harness connectors from the ignition coils.



4. Remove the ignition coil bolt(s).
5. Remove the ignition coil(s).

[Installation Procedure](#)



1. Install the ignition coil(s).
- Caution:** Refer to Fastener Caution.
2. Install the ignition coil bolt(s) and tighten to **10 Y (89 lb in)**.
 3. Connect the ignition coil electrical wiring harness connector(s).
 4. Install the intake cover. Refer to Intake Manifold Cover Replacement.
 5. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

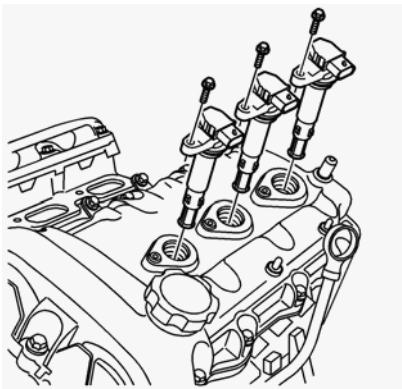
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

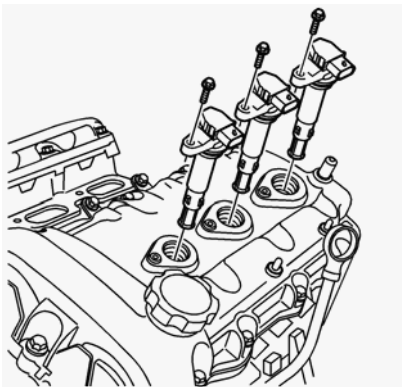
[Removal Procedure](#)

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the intake cover. Refer to Intake Manifold Cover Replacement.
3. Disconnect the electrical wiring harness connectors from the ignition coils.
4. Remove the upper intake manifold. Refer to Upper Intake Manifold Replacement.



5. Remove the ignition coil bolt(s).
6. Remove the ignition coil(s).

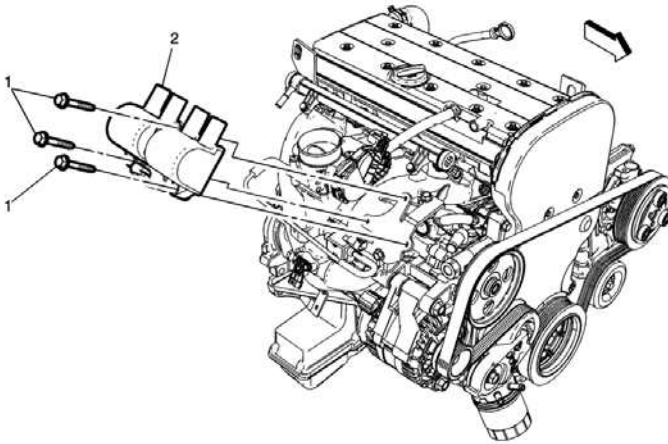
[Installation Procedure](#)



1. Install the ignition coil(s).
- Caution:** Refer to Fastener Caution.
2. Install the ignition coil bolts and tighten to **10 Y (89 lb in)**.
 3. Install the upper intake manifold. Refer to Upper Intake Manifold Replacement.
 4. Connect the ignition coil electrical wiring harness connector(s).
 5. Install the intake cover. Refer to Intake Manifold Cover Replacement.
 6. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

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Fuel Delivery: | Fuel:



Ignition Coil Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Remove the spark plug wires. Refer to Spark Plug Wire Replacement.

Ignition Coil Fasteners (Qty: 3)

Caution: Refer to Fastener Caution.

1

Tighten

9 Y(80 lb in)

Ignition Coil

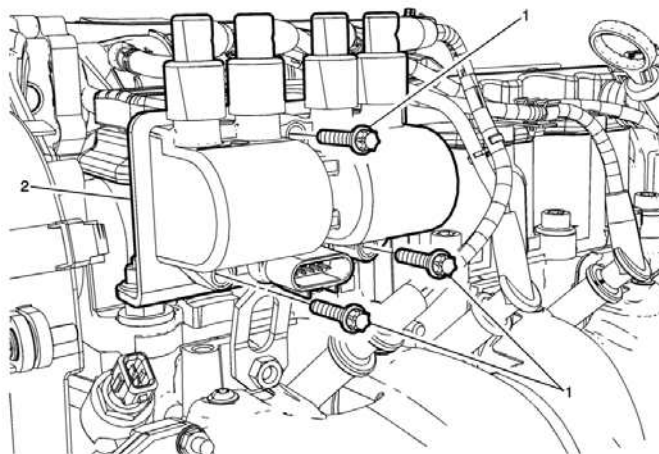
2

Procedure

Disconnect the ignition coil electrical connector.

2013 Chevrolet Colorado

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



Ignition Coil Replacement

Callout

Component Name

Preliminary Procedure

Remove the spark plug wires. Refer to Spark Plug Wire Replacement.

Ignition Coil Fasteners (Qty: 3)

Caution: Refer to Fastener Caution.

1

Tighten

9 Y(80 lb in)

Ignition Coil

2

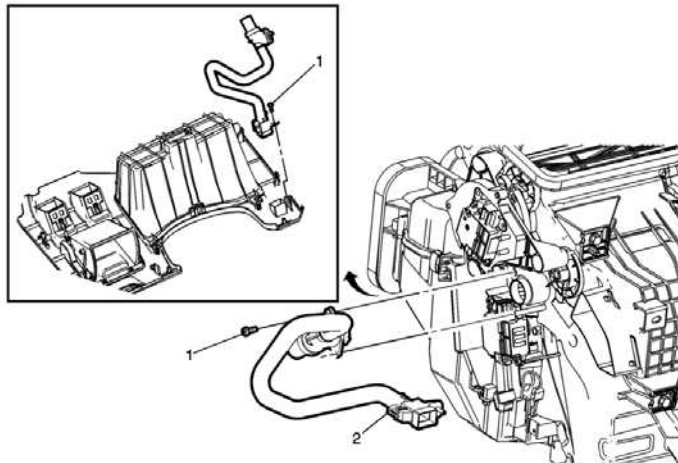
Procedure

Disconnect the ignition coil electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Inside Air Temperature Sensor Replacement

Callout

Component Name

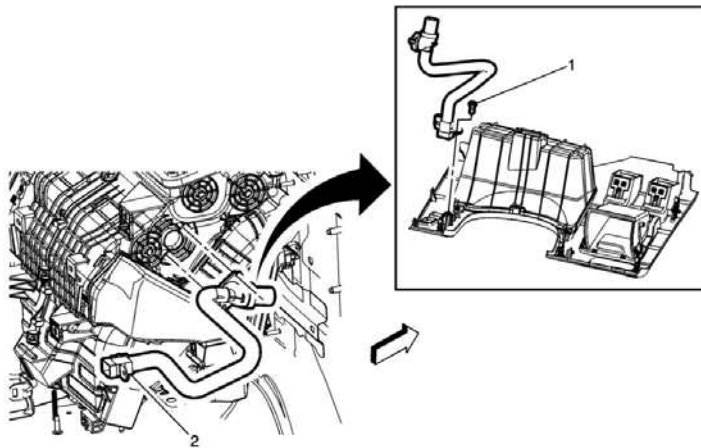
Preliminary Procedure

Remove Lower Instrument Panel. Refer to Instrument Lower Panel Replacement.

- | | |
|---|---|
| 1 | Inside Air Temperature Sensor Fastener (Qty: 2) |
| | Caution: Refer to Fastener Caution |
| 2 | Inside Air Temperature Sensor Assembly |

2013 Chevrolet Colorado

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



Inside Air Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove driver side lower Instrument panel. Refer to Instrument Lower Panel Replacement.

- | | |
|---|---|
| 1 | Inside Air Temperature Sensor Fastener |
| | Caution: Refer to Fastener Caution |
| 2 | Inside Air Temperature Sensor Assembly |

2013 Chevrolet Colorado

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 control module is not properly configured with the correct calibration software, the control module 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 control module damage may occur.
- Stable battery voltage is critical during programming. Any fluctuation, spiking, over voltage or loss of voltage will interrupt programming. When required 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.
- Note the engine oil life remaining percentage.

[Replace and Program Control Module](#)

To program a replacement K20 Engine Control Module (ECM), 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. Before removing the old control module, perform the SPS function Prepare Control Module for Removal, if available.
Note: The Prepare Control Module for Removal function can only be performed when communication with the old control module is still possible.
4. Replace the ECM.
5. Perform the SPS function K20 Engine Control Module - Programming and follow the on-screen instructions.
6. Clear the DTCs after completing the Programming procedure.
7. Perform the SPS function Immobilizer Learn and follow the on-screen instructions. Refer to Immobilizer System Component Programming.
8. Perform the SPS function K20 Engine Control Module - Configuration & Setup and follow the on-screen instructions.
9. Clear DTCs after completing the Configuration & Setup procedure.

[Reprogram Control Module](#)

To reprogram an existing K20 Engine Control Module, 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. Clear DTCs after completing the Programming procedure.
4. Perform the SPS Function Immobilizer Learn and follow the on-screen instructions. Refer to Immobilizer System Component Programming.
5. Perform the SPS function Engine Control Module - Configuration & Setup and follow the on-screen instructions, if available.
6. Clear DTCs after completing the Configuration & Setup procedure.

[Unsuccessful Programming Recovery](#)

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

1. Ignition ON. Ensure the control module, DLC, and programming tool connections are secure and the SPS software is up to date.
 2. Verify the control module can be reprogrammed.
- *If the control module cannot be reprogrammed*
 1. Ignition OFF for one minute, ignition ON.
 2. Verify the control module can be reprogrammed.
 - If the control module cannot be reprogrammed, replace the K20 Engine Control Module.
 - *If the control module can be reprogrammed*
 - All OK.

[Repair Instructions](#)

Perform the Diagnostic Repair Verification after completing the repair.

Control Module References for ECM replacement, programming and setup.

2013 Chevrolet Colorado

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

Table 1: [Engine Control Module Scan Tool Data Parameters](#)

Table 2: [Engine Control Module \(ECM\) Scan Tool Output Controls](#)

The engine control module scan tool data list contains all engine related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists, and in some cases may appear more than once, or in more than one data list in order to group certain related parameters together.

Use the engine scan tool data list only after the following is determined:

- The Diagnostic System Check - Vehicle is completed.
- No diagnostic trouble codes (DTCs)
- On-board diagnostics are functioning properly.

The scan tool values from a properly running engine may be used for comparison with the engine you are diagnosing. The engine scan tool data list represents values that may be seen on a normally running engine.

Note: A scan tool that displays faulty data should not be used. The scan tool concern should be reported to the manufacturer. Use of a faulty scan tool can result in misdiagnosis and unnecessary parts replacement.

Only the parameters listed below are referenced in this service manual for use in diagnosis. If all values are within the typical range described below, refer to Symptoms - Engine Controls for engine diagnosis.

Engine Control Module Scan Tool Data Parameters

Parameter	System State	Expected Value	Description
<i>Operating Conditions:</i> Engine Idling/Radiator Hose Hot/Closed Throttle/Park or Neutral/Closed Loop/Accessories Off/Brake Pedal Released			
5 V Reference 1, 2, 3, or 4	Ignition ON	5 V	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
5 V Reference 1, 2, 3, or 4 Circuit Status	Ignition ON	OK	This parameter displays OK if there is no 5 V reference circuit condition. If the circuit is shorted to ground or shorted to B+, Fault is displayed.
A/C Disengage 1–8 History	A/C ON	Reason for A/C Disengagement	The parameter indicates the reason the air conditioning (A/C) compressor was disengaged. The scan tool displays None, A/C Pressure, Engine Speed, Battery Voltage, Anti Stall, RPM Unstable, wide open throttle (WOT), Launch Performance, Coolant Hot, Accelerator Pedal Position (APP), Air Bag Deploy, or A/C Relay DTC.
A/C High Side Pressure Sensor	A/C OFF	0.75–1.5 V*	This parameter displays the voltage from the A/C high side pressure sensor signal circuit to the control module.
	A/C ON	1.3–2.5 V*	*Varies with temperature and relative humidity.
A/C High Side Pressure Sensor	A/C OFF	450–650 kPa* (65–95 PSI)*	This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module.
	Engine Speed at 2,000 RPM	1.117–2.350 kPa* (162–341 PSI)*	*Varies with temperature and relative humidity.
A/C Off for WOT	A/C ON	No	This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for WOT.
A/C Disable – A/C Pressure Out of Range	A/C ON	No	This parameter displays whether the A/C pressure is out of range for normal operation as determined by the control module.
A/C Compressor Clutch Relay Control Circuit Open Test Status	A/C ON or Off	OK/Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
A/C Compressor Clutch Relay Control Circuit Low Voltage Test Status	A/C ON or Off	OK/Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit

Parameter	System State	Expected Value	Description
			faults are detected during the current test.
A/C Compressor Clutch Relay Control Circuit High Voltage Test Status	A/C ON or Off	OK/Not Run	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
A/C Compressor Clutch Relay Command	A/C ON	On	This parameter displays the state of the air conditioning (A/C) clutch relay control circuit as commanded by the control module.
A/C Request Signal	A/C ON	Yes	This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls.
Accelerator Pedal Position	Accelerator pedal not actuated	0%	This parameter displays the angle of the APP as calculated by the control module using the signals from the APP sensors.
	Accelerator pedal fully actuated	100%	
Air/Fuel Equivalence Ratio Command	—	Varies	This parameter displays the ratio of air to fuel as calculated by the control module based on various sensor inputs. The scan tool will display a lower air fuel ratio when a richer air to fuel mixture is commanded. The scan tool will display a higher air fuel ratio when a leaner air to fuel mixture is commanded. In closed loop operation the air fuel ratio should normally be approximately 14.7:1.
Ambient Air Temperature	—	°C (°F) Varies	This parameter displays the surrounding air temperature, at any given altitude.
Ambient Air Temperature When Recommended Maximum Fuel Alcohol Content Exceeded	Ignition ON	0°C (32°F) or less	This parameter displays Ambient Air temperature when recommended Ethanol concentration exceeded.
APP Sensor 1	Accelerator pedal not actuated	0.88–1.08 V	This parameter displays the actual voltage on the accelerator pedal position (APP) Sensor 1 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	4.17–4.37 V	
APP Sensor 1 Circuit Status	Ignition ON	OK Fault	APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range.
APP Sensor 1 Learned Released Position	Ignition ON	Varies	This Parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.)
APP Sensor 2	Accelerator pedal not actuated	0.39–0.59 V	This parameter displays the actual voltage on the accelerator pedal position (APP) Sensor 2 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	2.02–2.22 V	
APP Sensor 2 Circuit Status	Ignition ON	OK Fault	APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range.
APP Sensor 2 Learned Released Position	Ignition ON	Varies	This Parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.)
APP Sensor 1 and 2	—	Agree	This parameter displays the results of a control module test that compares the signals from the APP sensors 1 and 2. The scan tool will display Agree or Disagree. Agree indicates that APP sensor 1 and APP sensor 2

Parameter	System State	Expected Value	Description
			voltages correspond to the same accelerator pedal position. Disagree indicates that APP sensor 1 and APP sensor 2 voltages correspond to different accelerator pedal positions.
APP Sensors	—	0%	This parameter displays the average of the APP sensors as calculated by the throttle actuator control (TAC) module. The APP average is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
APP Sensor 1 Position	Accelerator pedal not actuated	0%	This parameter displays the angle of the APP sensor 1 as calculated by the control module using the signal from the APP sensor 1. APP sensor 1 is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
	Accelerator pedal fully actuated	100%	
APP Sensor 2 Position	Accelerator pedal not actuated	0%	This parameter displays the angle of the APP sensor 2 as calculated by the control module using the signal from the APP sensor 2. APP sensor 2 is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
	Accelerator pedal fully actuated	100%	
BARO	—	65–104 kPa (8–16 PSI) – Varies with altitude	This parameter displays the barometric pressure (BARO). The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
Brake Pedal Position	The brake pedal is applied	Applied	This parameter displays the status of the brake pedal switch.
	The brake pedal is released	Released	
Calculated Air Flow	—	g/s Varies	This parameter displays the air flow of the engine as calculated by the control module.
Calculated Catalyst Temperature	—	°C (°F) Varies	This parameter displays the catalyst temperature as calculated by the control module.
Calculated Engine Oil Temperature	—	°C (°F) Varies	This parameter displays the temperature of the engine oil as calculated by the control module using various sensor inputs. The engine oil temperature calculated has a range of values indicating a low value when the oil temperature is low to a high value when the oil temperature is high.
Camshaft Position Active Counter	—	0–255 Counts	This parameter displays an incrementing counter when the control module receives a signal from the camshaft position sensors.
Camshaft Position Sensor	—	Engine Speed	This parameter displays the speed of the engine as calculated by the signal from the camshaft position sensor, shown in RPM.
Catalyst Monitor Complete	—	Yes or No	This parameter displays the monitor completion status.
Catalyst Monitor Complete This Ignition Cycle	—	Yes or No	This parameter displays the monitor completion status during the current driving/monitoring cycle.
Catalyst Monitor Enabled	—	Yes or No	This parameter displays the monitor enable status.
Catalyst Monitor Enabled This Ignition Cycle	—	Yes or No	This parameter displays the monitor enable status during the current driving/monitoring cycle.
Catalyst Monitor Not At Idle Test Conditions Met	—	Yes or No	This parameter displays the status of the catalyst monitor diagnostic. Off Idle Conditions Met indicates if the off idle conditions for the catalyst monitor diagnostic have been met. Once the Off Idle Conditions are met the vehicle can return to idle and allow the catalyst monitor diagnostic test to run.
Catalyst Monitor Test Counter	—	Counts	This parameter displays the number of catalyst monitor diagnostics that have passed.

Parameter	System State	Expected Value	Description
Catalyst Monitor Test Result	—	Varies	This parameter displays the status of the catalyst monitor diagnostic.
Catalyst Monitor Test State	—	Varies	This parameter displays when the catalyst monitor diagnostic is actively running a test. This condition will only be true when the vehicle is at idle.
Change Engine Oil Indicator Command	—	On/Off	This parameter displays the state of the change engine oil lamp commanded by the engine control module.
Cold Start Fuel Injector Command	Engine Cranking	%	This Parameter displays the commanded duty cycle for the cold start fuel injector.
Cold Start Fuel Injector Control Circuit High Voltage Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel injector control circuit. The parameter displays Malfunction if the cold start fuel injector control circuit is shorted to voltage.
Cold Start Fuel Injector Control Circuit Low Voltage Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel injector control circuit. The parameter displays Malfunction if the cold start fuel injector control circuit is shorted to ground.
Cold Start Fuel Injector Control Circuit Open Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel injector control circuit. The parameter displays Malfunction if the cold start fuel injector control circuit is open.
Cold Start Fuel Pump Relay Command	Engine Cranking	ON	This parameter displays the engine control modules commanded state of the cold start fuel pump relay command control circuit.
Cold Start Fuel Pump Relay Control Circuit High Voltage Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel relay control circuit. The parameter displays Malfunction if the cold start fuel relay control circuit is shorted to voltage.
Cold Start Fuel Pump Relay Control Circuit Low Voltage Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel relay control circuit. The parameter displays Malfunction if the cold start fuel relay control circuit is shorted to ground.
Cold Start Fuel Pump Relay Control Circuit Open Test Status	Engine Cranking	OK/Malfunction/Not Run	This parameter displays the state of the cold start fuel relay control circuit. The parameter displays Malfunction if the cold start fuel relay control circuit is open.
Cold Start Up	—	Varies	This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during this ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle.
Component Monitor Complete	—	Yes/No	This parameter displays the component monitor completion status during the current driving/monitoring cycle.
Component Monitor Enabled	—	Yes/No	This parameter displays the component monitor enable status during the current driving/monitoring cycle.
Cooling Fan Relay 1 Control Circuit Open Test Status	—	OK or Not Run	This parameter displays the status of the fan relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cooling Fan Relay 1 Control Circuit Low Voltage Test Status	—	OK or Not Run	This parameter displays the status of the fan relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cooling Fan Relay 1 Control Circuit High Voltage Test Status	—	OK or Not Run	This parameter displays the status of the fan relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.

Parameter	System State	Expected Value	Description
Cooling Fan Relay 1 Command	—	Varies	This parameter displays the commanded state of the cooling fan relay 1 control circuit. The cooling fan relay 1 should be ON when the scan tool indicates the fan control relay 1 command is ON. The cooling fan relay 1 should be OFF when the scan tool indicates the fan control Relay 1 Command is OFF.
Cooling Fan Relay 2 Control Circuit Open Test Status	—	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Fault if the fan relay control circuit is open.
Cooling Fan Relay 2 Control Circuit Low Voltage Test Status	—	OK or Not Run	This parameter displays the status of the fan relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cooling Fan Relay 2 Control Circuit High Voltage Test Status	—	OK or Not Run	This parameter displays the status of the fan relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cooling Fan Relay 2 Command	—	Varies	This parameter displays the commanded state of the cooling fan relay 2 control circuit. The cooling fan relay 2 should be ON when the scan tool indicates the fan control Relay 2 command is ON. The cooling fan relay 2 should be OFF when the scan tool indicates the fan control Relay 2 command is OFF.
CPP Learned Apply Position	—	V	This parameter displays the position learned for the clutch pedal position (CPP) sensor when the clutch pedal is fully applied during the associated learn procedure.
CPP Learned Release Position	—	Varies	This parameter displays the position learned for the clutch pedal position sensor when the clutch pedal is released.
CPP Sensor	—	%	This parameter displays the displacement of the clutch pedal (corrected and normalized based upon its learned released and fully applied positions), where 0% corresponds to the clutch pedal being released and 100% corresponds to the clutch pedal being fully applied.
CPP Sensor	—	Varies	This parameter displays the clutch pedal position sensor analog input as a percentage of its reference voltage.
Crankshaft Position Active Counter	—	0–255 Counts	This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor.
Crankshaft Position Resynchronization Counter	—	0 Counts	This parameter displays the number of counts the control module resynchronizes with the crankshaft position sensor.
Crankshaft Position Sensor	—	Engine Speed	This parameter displays the engine speed as calculated by the control module using the signal from the crankshaft position sensor.
Crank Request Signal	Ignition switch not in the crank position	No	This parameter displays whether the ignition switch has been cycled to the crank position requesting the control module to activate the starter relay.
	Ignition switch in the crank position	Yes	
Cruise Control	Cruise Control ON	Active/Inactive	This parameter displays the status of the cruise control system as determined by the control module.
Cruise Control Accelerate Switch	Cruise Control ON	Active/Inactive /Invalid	The scan tool displays ON, when the cruise ON/OFF switch is ON and the accelerate switch is pressed, the ECM detects a predetermined voltage value for this switch.
Cruise Control Cancel Switch	Cruise Control ON	Active/Inactive /Invalid	This parameter displays the status of the cruise control cancel switch.
Cruise Control Coast Switch	Cruise Control ON	Active/Inactive /Invalid	The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined

Parameter	System State	Expected Value	Description
			voltage value for the coast switch.
Cruise Control Disengage History 1–8	Cruise Control ON	Reason for Cruise Disengagement	The parameter displays the last 8 cruise control disengages in order from 1–8, with 8 being the most recent. There are approximately 40 possible causes for the cruise control to disengage.
Cruise Control Inhibit Reason	Cruise Control ON	Varies	The parameter displays the reason why the cruise control system is inhibited. There are approximately 40 possible causes for the cruise control to be inhibited.
Cruise Control On/Off Switch	Cruise Control ON	ON/OFF	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON.
Cruise Control Resume Switch	Cruise Control ON	Active/Inactive /Invalid	The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume switch is pressed, the ECM detects a predetermined voltage value for the resume switch.
Cruise Control Set Switch	Cruise Control ON	Active/Inactive /Invalid	The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set switch.
Current Gear	Transmission in Park/Neutral	P/N	This parameter displays the transmission gear commanded by the transmission control module.
	Transmission not in Park/Neutral	Reverse/1st–5th	
Cycles of Misfire Data	—	Incrementing 0–100 Counts	This parameter displays the number of cylinder firing events recorded by the control module.
Cylinder 1–4 Current Misfire Counter	—	0 Counts	The scan tool displays 0–255 counts. This parameter displays the number of misfires that have been detected during the last 200 cylinder firing events. The counters may normally display some activity, but the activity should be nearly equal for all of the cylinders, and in low numbers.
Cylinder 1–4 History Misfire Counter	—	0 Counts	The scan tool displays 0–255 counts. The misfire history counters display the total level of misfire that has been detected on each cylinder. The misfire history counters will not update or show any activity until a misfire DTC P0300 has become active. The misfire history counters will update every 200 cylinder firing events.
Cylinder 1–4 Injector Control Circuit Open Test Status	—	OK	This parameter displays the state of the injector control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cylinder 1–4 Injector Disabled – Misfire Detected	—	No	This parameter displays the status of the fuel injector driver by the control module. The scan tool will display YES if the fuel injector is being disabled due to a misfire detection. The scan tool will display NO if the fuel injector is not being disabled by the control module due to a misfire.
Cylinder 1–4 Injector Control Circuit Low Voltage Test Status	—	OK	This parameter displays the state of the injector control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cylinder 1–4 Injector Control Circuit High Voltage Test Status	—	OK	This parameter displays the state of the injector control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Cylinder 1–4 Knock Detected	—	NO	This parameter displays the status of each cylinder for knock detection by the control module. The scan tool will display YES if a knock condition has been detected related to that cylinder combustion event. The scan tool will display NO if there is no knock condition detected related to that cylinder combustion event.
Deceleration Fuel Cut-Off	—	Inactive	This parameter displays the status of the operating mode used to turn off the fuel injectors during certain deceleration conditions. When the scan tool displays Active, the control module has turned off the fuel injectors. When the scan tool displays Inactive, the fuel

Parameter	System State	Expected Value	Description
			system is operating normally.
Desired ECT	—	°C (°F) Varies	This parameter displays the desired engine coolant temperature (ECT) in °C (°F) .
Desired Idle Speed	—	600–950 RPM	This parameter displays the desired engine idle speed as commanded by the control module.
Desired Throttle Position	—	2–6%	This parameter displays the desired throttle position angle commanded by the control module.
Distance Since DTC Cleared	—	Varies	This parameter displays the distance accumulated since an emission diagnostic trouble code was cleared. The scan tool will display increasing distance as the vehicle is driven.
Distance Since First Malfunction	Ignition ON	0 km/h (0 MPH)	This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred.
Distance Since Last Malfunction	—	Varies	This parameter displays the distance accumulated when the emission diagnostic trouble code last failed.
Distance Since Last Oil Pressure Warning	Ignition ON	0 km/h (0 MPH)	This parameter displays in kilometers or miles the distance traveled since the last oil pressure warning Malfunction occurred.
Distance Since Recommended Maximum Fuel Alcohol Content Exceeded	Ignition ON	0 km/h (0 MPH)	This parameter displays in kilometers or miles the distance driven since the most recent time that the Recommended Ethanol Concentration Exceeded occurred.
Distance This Driving Cycle	Ignition ON	0 km/h (0 MPH)	This parameter displays in kilometers or miles the distance driven during this ignition cycle.
Driver Requested Axle Torque	—	Y	This parameter displays the driver intended axle torque.
ECM Authentication Status	Ignition ON	Unknown/Incorrect /Negative Response/Valid	ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM.
ECM Challenge Status	Ignition ON	Valid/Invalid	ECM Challenge Status indicates the challenge between ECM and the immobilizer.
ECM Response Source	Ignition ON	Ignition Switch Start/Remote Vehicle Start/Exterior PTO Vehicle Start	ECM Response Source indicates the source used to calculate the ECM response.
ECT Sensor	—	–39 to +140°C (–38 to +284°F) Varies	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
Electric Power Management Inhibit Reason	—	Varies	The scan tool displays the reason why the regulated voltage control is inhibit.
Engine Calibration Monitoring	—	Present/Not Present	This parameter indicates if the Engine Upgrade Protection are supported by ECM.
Engine Calibration Monitoring Identifier	v	Programmed/Not Programmed	This parameter indicates the status if the Engine Performance Identifier has been programmed
Engine Controls Ignition Relay Control Circuit Open Test Status	—	Not Run	This parameter displays the state of the engine control ignition relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Engine Controls Ignition Relay Control Circuit Low Voltage Test Status	—	OK	This parameter displays the state of the engine control ignition relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status	—	Not Run	This parameter displays the state of the engine control ignition relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Engine Controls Ignition Relay Command	—	ON	This parameter displays the commanded state of the engine control ignition relay control circuit. The scan tool will display ON or OFF. ON indicates the engine control ignition relay control circuit is being grounded by

Parameter	System State	Expected Value	Description
Engine Controls Ignition Relay Feedback Signal	—	B+	the control module, allowing voltage to other control module circuits and systems. OFF indicates the engine control ignition relay is not being commanded ON by the control module.
Engine Load	Engine Idling	11–30%	This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors.
	Engine speed at 2,500 RPM	Varies	
Engine Off Time	Engine speed at 2,500 RPM	25–40%	This parameter displays the amount of time that has elapsed since the engine was last cycled OFF. The scan tool displays the time in hours, minutes, and seconds. The engine OFF time will reset to zero when the engine starts.
	Ignition Switch in the OFF Position	Varies	
Engine Oil Life Remaining	Ignition ON	0–100%	This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed.
Engine Oil Pressure Switch	—	OK	This parameter displays the state of the engine oil pressure as determined by the control module. The control module monitors the engine oil pressure switch to determine if the engine oil pressure is sufficient. The scan tool displays Low when the engine oil pressure is below a predetermined value.
Engine Oil Temperature When Engine Overspeed Is Detected	—	Varies	This parameter displays the temperature of the engine oil if overspeed detected.
Engine Overspeed	—	Not Present	This parameter displays the status if overspeed detected.
Engine Overspeed Counter	—	Varies	This parameter displays the status if overspeed detected.
Engine Run Time	Engine Operating	Varies	This parameter displays the time elapsed since the engine was started. The scan tool will display the time in hours, minutes and seconds. The engine run time will reset to zero when the engine stops running.
Engine Speed	Engine Cranking	Greater than 60 RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position sensor.
	Engine Idling	Approximately 650–950 RPM	
Engine Speed When Engine Overspeed Detected	—	Varies	This parameter displays the speed of the engine crankshaft rotation stored if an engine overspeed is detected.
Engine Torque Command	—	Y	This parameter displays the estimated amount of torque that is delivered from the engine. The scan tool displays engine torque in Y (lb ft).
EVAP Purge Solenoid Valve Control Circuit Open Test Status	—	OK	This parameter displays the status of the evaporative emission (EVAP) purge solenoid control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status	—	OK	This parameter displays the status of the evaporative emission (EVAP) purge solenoid control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status	—	OK	This parameter displays the status of the evaporative emission (EVAP) purge solenoid control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
EVAP Purge Solenoid Valve Command	—	10–20%	This parameter displays the on-time or duty cycle of the EVAP canister purge solenoid commanded by the control module. Zero percent indicates no purge. One hundred percent indicates full purge.

Parameter	System State	Expected Value	Description
Fuel Control Loop Status	—	Closed Loop	This parameter displays the state of the fuel control system as commanded by the control module. Closed loop operation indicates that the control module is controlling the fuel delivery based off the oxygen sensors input signal. In open loop operation the control module ignores the oxygen sensor input signal and bases the amount of fuel to be delivered on other sensor inputs.
Fuel Economy	Engine Idling	Liters per Hour	This Parameter displays the instant fuel consumption rate of the engine in liters per hour.
Fuel Enrichment – Hot Catalyst	—	No	This parameter displays if the control module is commanding catalyst protection.
Fuel Enrichment – Hot Coolant	—	Inactive	This parameter displays the status of the fuel delivery system. The scan tool will display Active if the fuel system is running in open loop due to a temperature condition. The scan tool will display Inactive if the fuel system is operating normally.
Fuel Level Sensor	—	Varies	This parameter displays the approximate fuel level in the fuel tank as a voltage. The control module calculates this level using the signal from the sensor used to monitor the fuel in the tank. The scan tool will display a low reading when the fuel level in the tank is near empty. The scan tool will display a high reading when the fuel level in the tank is high or near full.
Fuel Level Sensor Reference Command	—	Varies	This parameter displays the approximate fuel level in the fuel tank as a percentage.
Fuel Pump Relay Control Circuit Open Test Status	—	Not Run	This parameter displays the status of the fuel pump relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Fuel Pump Relay Control Circuit Low Voltage Test Status	—	OK	This parameter displays the status of the fuel pump relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Fuel Pump Relay Control Circuit High Voltage Test Status	—	Not Run	This parameter displays the status of the fuel pump relay control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Fuel Pump Relay Command	Ignition ON, engine OFF	Fuel pump on for 2 s	This parameter displays the control modules commanded state of the fuel pump relay control circuit.
	Engine idling	On	
Fuel System Monitor Complete	—	Yes/No	This parameter indicates the status of the fuel system monitoring.
Fuel System Monitor Enabled	—	Yes/No	
Fuel Tank Rated Capacity	—	70 L (18.4 Gal)	This parameter displays the rated maximum quantity of fuel the fuel tank will hold. This is calibrated in the control module to match the vehicle.
Fuel Trim Memory Cell	—	Varies	This parameter displays the fuel trim cell number as calculated by the control module based on engine speed and load inputs. The scan tool will display a lower number as conditions are closer to idle, and a higher number as conditions approach maximum engine speed and maximum load.
Fuel Trim Learn	—	Enabled	This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond to changes in short term fuel trim.
Fuel Trim System Test State	—	Monitoring	This parameter indicates the status of the Fuel Trim System Test. The scan tool will display Disabled, Enabled, Monitoring, or Run Purge Test.
Generator F-Terminal Signal	—	Varies	This parameter indicates the generator field duty cycle as commanded by the voltage regulator or control module. The scan tool will display a higher value for a higher commanded generator output, and a lower value for a lower commanded generator output.

Parameter	System State	Expected Value	Description
Generator L-Terminal Circuit Open Test Status	—	Not Run	This parameter displays the status of the generator L-terminal circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Generator L-Terminal Circuit Low Voltage Test Status	—	OK	This parameter displays the status of the generator L-terminal circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Generator L-Terminal Circuit High Voltage Test Status	—	OK	This parameter displays the status of the generator L-terminal circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Generator L-Terminal Signal Command	—	ON	This parameter displays the commanded state of the generator L-terminal output.
HO2S 1 or HO2S 2	Ignition ON, Engine OFF	mV	This parameter indicates the heated oxygen sensor (HO2S) sensor 1 or 2, output voltage as measured by the control module. The scan tool will display a higher value during a rich condition, and a lower value during a lean condition.
	Engine Operating	Varies	
HO2S 1 or HO2S 2 Heater	—	A	This parameter displays the amperage of the HO2S heater commanded by the control module.
HO2S 1 or HO2S 2 Heater Command	—	ON	This parameter displays the commanded state of the HO2S 1 or HO2S 2 heater circuit by the control module. The scan tool will display ON when the heater is commanded ON. The scan tool will display OFF when the heater is commanded OFF.
HO2S 1 or HO2S 2 Heater Command	—	0–99%	This parameter displays the commanded state of the HO2S 1 or HO2S 2 heater by the control module. The scan tool will display a higher value as the heater command is increased, and a lower value if the heater is not commanded ON.
HO2S 1 or HO2S 2 Heater Control Circuit Open Test Status	—	OK	This parameter displays the status of the control circuit for the HO2S 1 or HO2S 2. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
HO2S 1 or HO2S 2 Heater Control Circuit Low Voltage Test Status	—	OK	This parameter displays the status of the control circuit for the HO2S 1 or HO2S 2. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
HO2S 1 or HO2S 2 Heater Control Circuit High Voltage Test Status	—	OK	This parameter displays the status of the control circuit for the HO2S 1 or HO2S 2. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
HO2S Heater Monitor Complete	Engine Idling	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S Heater Monitor Complete This Ignition Cycle	—	Yes or No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S Heater Monitor Enabled	Engine Idling	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
HO2S Heater Monitor Enabled This Ignition Cycle	—	Yes or No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
IAT Sensor	—	–39 to +140°C (–38 to +284°F)	This parameter displays the temperature of the air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
Idle Speed Correction	—	Varies	This parameter indicates the idle speed correction.
Ignition 1 Signal	—	B+	This parameter displays B+ when the control module detects a voltage at the ignition 1 input terminal.
Ignition Accessory Signal	—	ON	This parameter displays the state of the ignition accessory position input to the control module from the ignition switch.

Parameter	System State	Expected Value	Description
Ignition Timing	—	-4 to +15°	This parameter displays the amount of spark advance the control module is commanding. The control module determines the desired advance.
Ignition Coil 1 and 4 Control Circuit Open Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Coil 1 and 4 Control Circuit Low Voltage Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Coil 1 and 4 Control Circuit High Voltage Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Coil 2 and 3 Control Circuit Open Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Coil 2 and 3 Control Circuit Low Voltage Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Coil 2 and 3 Control Circuit High Voltage Test Status	—	OK	This parameter displays the state of the Ignition control circuit. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Ignition Cycles with Malfunction Since 1st Malfunction	Ignition ON	Counts	This Parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles without Completed Test Since 1st Malfunction	Ignition ON	Counts	This Parameter contains the number of ignition cycles without a completed test since the first ignition cycle with a failure reported.
Ignition Cycles without Malfunction Since Last Malfunction	Ignition ON	Counts	This Parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported.
Immobilizer Auto Learn Counter	Ignition ON	Counts	This Parameter displays the number of times the immobilizer auto learn function was activated.
Immobilizer Automatic Learn Timer	Ignition ON	hh:mm:ss	The scan tool displays the automatic learn timer.
Immobilizer ECM Identifier	—	OK/Incorrect	This parameter displays the state of the immobilizer ECM identifier.
Immobilizer Environment Device 1-4	—	OK/Unknown	The scan tool displays Incorrect, Correct, Not Received, Not Programmed or Unknown. This parameter displays the immobilizer source status.
Immobilizer Fuel Disable	—	Active/Inactive	This parameter displays the state of the immobilizer fuel disabling.
Immobilizer Module Environment Identification	—	Active/Inactive	This parameter displays the state of the environment identification.
Immobilizer Module Fuel Disable	—	Active/Inactive	This parameter displays the immobilizer module state of the immobilizer fuel disabling.
Immobilizer Module Identification	—	Complete/Incomplete	This parameter displays the activation state of the immobilizer module.
Immobilizer Security Code Programmed	—	Yes/No	This parameter displays the programmed state of the security code.
Immobilizer Password Learn	Ignition ON	Enabled/Disabled	Learning Enabled indicates that learning of immobilizer code information is enabled.
Immobilizer Password Learn Scan Tool Delay	—	Active/Inactive	This parameter displays the auto learn timer status.
Immobilizer Password Programmed	—	Yes/No	The parameter displays No or Yes.

Parameter	System State	Expected Value	Description
Immobilizer Post-Release Passive State	—	Active/Inactive	The parameter displays active or inactive.
Immobilizer Post-Release State	—	Active/Inactive	The parameter displays active or inactive.
Immobilizer Pre-Release State	—	Active/Inactive	The parameter displays active or inactive.
Immobilizer Release State	—	Active/Inactive	The parameter displays active or inactive.
Immobilizer Security Code Accepted	—	Yes/No	The parameter displays Yes or No.
Immobilizer Security Code Function	—	Present/Not Present	This parameter displays the presence of the security code information.
Immobilizer Security Code Lockout	—	Active/Inactive	The parameter displays active or inactive.
Immobilizer Security Code Programmed	—	Yes/No	The parameter displays Yes or No.
Immobilizer Security Code Programming Counter	—	Counts	This parameter displays the counts of the security code programming.
Immobilizer Security Code Reset Counter	—	Counts	This parameter displays the counts of the security code resets.
Immobilizer Security Code Lockout Active Timer	Ignition ON	ms	This Parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered.
Immobilizer Security Code Programming Counter	Ignition ON	Counts	This Parameter displays the number of times a new immobilizer security code has been programmed through secure access. This counter can only be incremented.
Immobilizer Security Code Reset Counter	Ignition ON	Counts	This Parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented.
Immobilizer Security Information Programmed	Ignition ON	Yes/No	This Parameter displays the status of the immobilizer system.
Immobilizer System Status	Ignition ON	Standby / Immobilized at Startup / Immobilized No Response / Immobilized Negative Response / Immobilized Incorrect Response / Post-Release State / Pre-Release State / Release State	This Parameter displays the status of the immobilizer system.
Immobilizer Transponder Identification	—	Active/Inactive	This parameter displays the state of the transponder identification
Immobilizer Transponder Key	—	OK/Incorrect	This parameter displays when the transponder is incorrect.
Immobilizer Transponder Key Identification	—	OK/Unknown	This parameter displays when the transponder is unknown.
Immobilizer Transponder Valid Response Received Time	—	ms	This parameter displays the time elapsed until the transponder valid response is received.
Injector Duty Cycle	—	2–3 ms	This parameter displays the average pulse width of the fuel injectors as determined by the control module.
Intake Manifold Pressure	—	32–53 kPa (4.6–7.6 PSI)	This parameter displays the pressure difference between the MAP and the barometric pressure (BARO) as calculated by the control module.
Knock Retard	—	0°	This parameter displays the amount of spark advance the control module removes from the ignition control spark advance in response to the signal from the knock sensors.

Parameter	System State	Expected Value	Description
Long Term Fuel Trim	—	-10 to +10%	The scan tool range is -99 to +99%. This parameter indicates the Long Term fuel trim correction as commanded by the ECM. A change made to the fuel delivery will be indicated by the Long and Short Term values. The Short Term values change rapidly in response to the HO2S signal voltages. These changes fine tune the engine fueling. The Long Term values change in response to the changes in the Short Term. The Long Term makes coarse adjustments to the fueling in order to recenter and restore control to the Short Term. The Short Term and the Long Term can be monitored with a scan tool. A positive fuel trim value indicates that the ECM is adding fuel in order to compensate for a lean condition. A negative fuel trim value indicates that the ECM is reducing the amount of fuel in order to compensate for a rich condition.
Long Term Fuel Trim Test Average	—	0.98% Varies	This parameter is the average long term fuel trim for this bank as calculated by the control module. The scan tool will display a value more than 0% indicating that time is being added to the injector pulse width, increasing the amount of fuel to this bank of the engine. The scan tool will display a value of less than 0, indicating time is being subtracted from the injector pulse width, reducing the amount of fuel to this bank of the engine. A value of 0% indicates no compensation is required to operate the engine at the desired air/fuel ratio.
Long Term Fuel Trim Test Average without Purge	—	1.02% Varies	This parameter is calculated by the control module based on the Short Term Fuel Trim value. The Long Term Fuel Trim is used for the long term correction of the fuel delivery. The scan tool will display a high value for a large amount of long term fuel correction, and 0% for no long term fuel trim correction. The scan tool will display a negative value when fuel system is running too rich and fuel is being removed from the combustion event. The scan tool will display a positive value if the fuel system is running lean and fuel is being added to the combustion event.
Low Engine Oil Pressure Indicator Command	Ignition ON	On/Off	This parameter displays the output state.
MAF Performance Test	—	OK	This parameter displays the status of the mass air flow (MAF) performance test by the control module. The scan tool will display OK if no condition is detected. The scan tool will display Fault if the control module detects a condition during the test.
MAF Sensor	Engine Idling	1.7–3.7 g/s	This parameter indicates the quantity calculated by the control module based on a signal from the MAF sensor. The scan tool will display a high value at high engine speeds, and a low value at low engine speeds.
	Engine speed at 2,500 RPM	5.5–7.5 g/s	
MAF Sensor	—	1.700–2.100 Hz	This parameter indicates the frequency signal received from the MAF sensor by the control module. The scan tool will display a high value at high engine speeds, and a low value at low engine speeds.
MAF When Engine Overspeed Detected	—	g/s	This parameter displays the intake mass air flow at overspeed condition detection.
MAP Performance Test 1	—	OK	This parameter displays the status of the MAP performance test 1 by the control module. The scan tool will display OK if no fault is found. The scan tool will display Fault if the control module detects a fault during the test.
MAP Performance Test 2	—	OK	This parameter displays the status of the MAP performance test 2 by the control module. The scan tool will display OK if no fault is found. The scan tool will display Fault if the control module detects a fault during the test.
MAP Sensor	—	26–52 kPa (3.7–7.6 PSI)	This parameter displays the pressure from the MAP sensor to the control module.
MAP Sensor	—	0.98–1.42 V	This parameter displays the signal voltage from the MAP sensor to the control module.
Maximum Engine Speed When Engine Overspeed Detected	—	RPM	This parameter displays the engine speed peak value at overspeed condition.

Parameter	System State	Expected Value	Description
MIL Command	Ignition ON	ON/OFF	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the engine control module (ECM).
MIL Control Circuit Open Test Status	—	OK	This parameter displays the status of the control circuit for the malfunction indicator lamp control (MIL). The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
MIL Control Circuit Low Voltage Test Status	—	OK	This parameter displays the status of the control circuit for the malfunction indicator lamp control (MIL). The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
MIL Control Circuit High Voltage Test Status	—	OK	This parameter displays the status of the control circuit for the malfunction indicator lamp control (MIL). The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
MIL Requested by DTC	—	Yes/No	This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission DTCs.
MIL Requested	Ignition ON	Yes/No	This parameter displays the state of the MIL request.
Misfire Diagnostic Engine Load	—	%	This parameter displays the misfire diagnostic engine load.
Misfire Diagnostic Engine Speed	—	RPM	This parameter displays the misfire diagnostic engine speed.
Misfire Monitor Complete	—	Yes/No	This parameter displays the misfire monitor status.
Misfire Monitor Enabled	—	Yes/No	This parameter displays the misfire monitor enabling state.
Number of DTC(s)	—	0	This parameter indicates the number of diagnostic trouble codes (DTCs).
O2S/HO2S Monitor Complete	Engine Idling	Yes/No	This Parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Complete This Ignition Cycle	—	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
O2S/HO2S Monitor Enabled	Engine Idling	Yes/No	This Parameter displays the enable and completion status during the current driving/monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled This Ignition Cycle	—	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
Output Shaft Speed Sensor	Vehicle needs to be moving	RPM	This Parameter displays the transmission output speed (the speed at the output of the gear box) determined from the speed measured by the transmission output speed sensor.
Odometer When Engine Overspeed Detected	—	km/miles	This parameter displays the absolute vehicle odometer reading at overspeed condition detection.
Power Enrichment	—	Inactive	This parameter displays the status of the operating mode of the control module used to increase fuel delivery during certain acceleration conditions.
Power Mode	Ignition ON	OFF / Accessory / Run / Crank Request	This Parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics. If the serial data signal not received, the Parameter will display OFF.

Parameter	System State	Expected Value	Description
Reduced Engine Power	—	Inactive	This parameter displays the status of the operating mode of the control module used to reduce engine power to prevent catalyst or engine damage or due to a Throttle Actuator Control (TAC) system condition.
Reduced Engine Power History	—	OK	This parameter displays the last reason that ECM has Commanded Reduced Engine Power. The scan tool displays one of the following when Reduced Engine Power is commanded: • TAC DTC • Fan Control DTC • ECT Overtemperature • Engine Oil Overtemperature
Remaining Fuel in Tank	—	Liters (Gallons) Varies	This parameter displays the amount of fuel remaining in the fuel tank as measured in liters (gallons). The control module determines the amount of fuel remaining in the tank by using information from the fuel level sensor. The scan tool will display a higher value with a full fuel tank, and a lower value with an empty fuel tank.
Remaining Fuel in Tank	—	0–100% Varies	This parameter displays the amount of fuel remaining in the fuel tank as measured in percentage. The control module determines the amount of fuel remaining in the tank by using information from the fuel level sensors. The scan tool will display a higher value with a full fuel tank, and a lower value with an empty fuel tank.
Reverse Position Switch	—	On/Off	This parameter displays the reverse gear switch state.
Short Term Fuel Trim	—	–10 to +10%	The Short Term values change rapidly in response to the HO2S signal voltages. These changes fine tune the engine fueling. The Long Term values change in response to the changes in the Short Term. The Long Term makes coarse adjustments to the fueling in order to recenter and restore control to the Short Term. The Short Term and the Long Term can be monitored with a scan tool. A positive fuel trim value indicates that the ECM is adding fuel in order to compensate for a lean condition. A negative fuel trim value indicates that the ECM is reducing the amount of fuel in order to compensate for a rich condition.
Short Term Fuel Trim Test Average	—	–3 to +99% Varies	This parameter displays the short term closed loop fuel correction. This value is compared to predetermined thresholds to determine if the fuel trim diagnostic is passing or failing.
Start Up ECT	—	–39 to +140°C (–38 to +284°F)	This parameter displays the temperature of the engine coolant on start up based on input to the control module from the ECT sensor 1.
Start Up IAT	—	–39 to +140°C (–38 to +284°F)	This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor.
Starter Relay Control Circuit Open Test Status	—	OK	This parameter displays the status of the control circuit for the starter relay. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Starter Relay Control Circuit Low Voltage Test Status	—	Not Run	This parameter displays the status of the control circuit for the starter relay. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Starter Relay Control Circuit High Voltage Test Status	—	OK	This parameter displays the status of the control circuit for the starter relay. The scan tool displays OK, Fault, or Not Run. OK indicates that no circuit faults are detected during the current test.
Starter Relay Command	—	OFF	The scan tool displays ON or OFF. The scan tool displays OFF until the ignition is placed into the CRANK position.
SVS Indicator Command	—	On/Off	This parameter displays the service engine non emission related indication state.
TAC Forced Engine Shutdown	—	NO	This parameter indicates the status of TAC control by the control module. The scan tool will display YES if the

Parameter	System State	Expected Value	Description
			engine has been shut down due to a throttle control fault. The scan tool will display NO if the engine has not been shut down by a throttle control fault.
TAC Motor	—	Disabled	This parameter indicates the status of the TAC motor driver by the ECM. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display disabled if the TAC motor is disabled.
TAC Motor Command	—	0–100% Varies	This parameter displays the percentage of the commanded state of the TAC motor by the control module.
Throttle Body Idle Air Flow Compensation	—	0–100% Varies	This parameter displays the amount of airflow compensation in response to engine intake air flow restrictions. For example, throttle plate coking.
Throttle Position	—	2–6%	This parameter displays the actual throttle position angle indicated by the control module using information from the two Throttle Body sensors.
Throttle Position Performance Test	—	OK	This parameter displays the status of the throttle position performance test by the control module. The scan tool will display OK if no fault is found. The scan tool will display Fault if the control module detects a fault during the test.
Throttle Position Sensor 1	Accelerator pedal not actuated	4.14–4.34 V	This parameter displays the voltage signal sent to the control module from throttle position sensor 1 of the throttle assembly. The throttle position sensor 1 is a range of values indicating a high voltage when the throttle is closed to a low voltage when the throttle plate is fully open.
	Accelerator pedal fully actuated	3.50–3.37 V	
Throttle Position Sensor 1 Position	—	2–6%	This parameter displays the angle of the throttle position sensor 1 as calculated by the control module using the signal from the throttle position sensor 1. The throttle position sensor 1 is a range of values indicating a low percentage when the throttle is closed to a high percentage when the throttle is fully open.
Throttle Position Sensor 1 Learned Minimum	—	0.5–0.71 V	This parameter displays the learned minimum voltage for throttle position sensor 1 as determined by the control module this ignition cycle.
Throttle Position Sensor 2	Accelerator pedal not actuated	0.68–0.88 V	This parameter displays the voltage signal sent to the control module from throttle position sensor 2 of the throttle assembly. The throttle position sensor 2 is a range of values indicating a low voltage when the throttle is closed to a high voltage when the throttle plate is fully open.
	Accelerator pedal fully actuated	1.35–1.55 V	
Throttle Position Sensor 2 Position	—	2–6%	This parameter displays the angle of the throttle position sensor 2 as calculated by the control module using the signal from the throttle position sensor 2. The throttle position sensor 2 is a range of values indicating a low percentage when the throttle is closed to a high percentage when the throttle is fully open.
Throttle Position Sensor 2 Learned Minimum	—	0.55–0.75 V	This parameter displays the learned minimum voltage for throttle position sensor 2 as determined by the control module this ignition cycle.
Throttle Position Sensors 1 and 2	—	Agree	This parameter displays the results of a control module test that compares the signals from the Throttle Body sensors 1 and 2. The scan tool will display Agree or Disagree. Agree indicates that throttle position sensor 1 and throttle position sensor 2 voltages correspond to the same throttle position. Disagree indicates that throttle position sensor 1 and throttle position sensor 2 voltages correspond to different throttle positions.
Torque Delivered Signal	—	Y	This parameter displays the torque delivered from the engine to the transmission.
Torque Management Ignition Timing Retard	—	15–25°	This parameter displays how much the ignition spark timing is being retarded to control torque by the control module. The scan tool will display a higher value under extreme torque control conditions such as spinning wheels. The scan tool will display a lower value under low torque control conditions such as light driving.

Parameter	System State	Expected Value	Description
Torque Request Inhibit – Fuel	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Ignition Timing	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Ignition Timing Advance	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Idle	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – Minimum Torque	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit – TAC Limit	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Total Knock Retard	—	0°	This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module. The scan tool will display a high value during extreme conditions such as high temperatures and antilock braking. The scan tool will display a lower value during lighter driving conditions.
Total Misfire	—	0 Counts	This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Vehicle Speed Sensor	—	0 km/h (0 MPH)	This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor.
Vehicle Speed When Engine Overspeed Detected	—	0 km/h (0 MPH)	This parameter displays the vehicle speed at overspeed condition detection.
VIN Programming Counter	Ignition ON	Counts	This Parameter displays the number of times the VIN has been programmed. This counter can only be incremented.
Warm-ups Since DTC Cleared	—	Varies	This parameter displays the number of warm-ups since the DTC was cleared in counts.
Warm-Ups without Emission Malfunctions	—	Varies	This parameter displays the number of warm up cycles that have occurred without an emission fault present. The scan tool will display a 0 if a fault has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without an emission fault.
Warm-Ups without Non Emission Malfunctions	—	Varies	This parameter displays the number of warm up cycles that have occurred without a non emission fault present. The scan tool will display a 0 if a fault has occurred. The scan tool will display a higher count if a number of warm up cycles have occurred without a non emission fault.
Wide Open Throttle	—	Yes/No	This parameter displays the throttle status commanded by the control module. The scan tool will display YES if the vehicle throttle is commanded to wide open. The scan tool will display NO if the vehicle throttle is commanded to an amount less than 100%.

Engine Control Module (ECM) Scan Tool Output Controls

Output Control	Description
A/C Compressor Clutch Relay	This function activates the A/C compressor relay. The normal commanded state of the A/C relay is None. The A/C compressor will turn ON or OFF when commanded ON or OFF. The system remains in the commanded state until cancelled by the scan tool. The scan tool initiates the test when the following

Output Control	Description
	conditions are met: • In the correct power mode • A/C high side pressure is in range • Engine speed is in range • Ignition voltage is in range. • There are no A/C pressure sensor DTCs set.
Brake Pedal Position Sensor Learned	This device control is used to reset the brake pedal fully released learned position to its initialized value after a brake system repair.
Compression Test	This device control is used to set up the internal combustion engine for a compression test. The fuel pump, fuel injectors, and spark are all disabled. The throttle is opened to a WOT position. For conventional engine vehicles, the extended crank feature is not active. Engine cranking is completely controlled by the technician either through the ignition key or through a remote starter switch as applicable. The device control limits and rejects will apply normally upon entry to the device control. Once the device control is active, the limits will be monitored (to prevent unwanted starter operation, for example), but in the case of a limit exceeded or a tester disconnect, device control of the fuel and spark will not be released until the Power Mode switches to Accessory or OFF. This will prevent unexpected fuel and spark operation in the case of a device control abort.
Cooling Fan Relay 1	This function controls the cooling fan relay 1. The normal commanded state of the fan relay is None. The scan tool initiates the test when the following conditions are met: • Engine coolant temperature is not out of range • In the correct power mode
Cooling Fan Relay 2	This function controls the cooling fan relay 2. The normal commanded state of the fan relay is OFF. The scan tool initiates the test when the following conditions are met: • Engine coolant temperature is not out of range. • In the correct power mode
Crankshaft Position Variation Learn	This device control is used to activate the crankshaft position variation learn algorithm which calculates the reference pulse correction factors for the misfire diagnostic. This function disables the selected fuel injector. The normal commanded state is None. The scan tool initiates the test when the following conditions are met:
Cylinder Power Balance	• The engine is operating and the engine idle is stable. • The vehicle speed is 0 km/h (0 MPH). • There are no vehicle speed sensor DTCs set. If the fuel injector is disabled after 30 s, fuel injector control is not allowed again on the same fuel injector for 60 s.
Engine Controls Ignition Relay	This function controls the engine control ignition relay or main relay. The normal commanded state is None. When commanded ON or OFF, the engine control module (ECM) turns the relay ON or OFF. The system remains in the commanded state until cancelled by the scan tool. The scan tool initiates the test when the following conditions are met: • The ignition is ON with the engine OFF. • There are no crankshaft position or VSS sensor DTCs set. • The vehicle speed is 0 km/h (0 MPH). • In the correct power mode
Engine Oil Life Reset	This function is used to reset the engine oil life. The engine oil remaining life is determined from engine revolutions and the distance driven since the last oil change.
Engine Speed	This function controls the idle speed override in 25 RPM, 100 RPM, and 500 RPM increments, from the base idle speed to 1.950 RPM. The scan tool initiates the test when the following conditions are met: • The vehicle speed is 0 km/h (0 MPH). • There are no VSS sensor DTCs set.
EVAP Purge Solenoid Valve	This function controls the EVAP purge solenoid valve. The normal commanded state is None. The system will increase or decrease the amount of purge by changing the duty cycle of the purge valve in 10% increments within a range of 0–100%. The scan tool initiates the test when the following conditions are met: • The vacuum level in the EVAP purge system is within range. • There are no EVAP DTCs set. • The EVAP system test is not in progress.

Output Control	Description
	In the correct power mode
Fuel Control Loop Status	This device control is used to enable or disable closed loop fuel control. This function enables the fuel injector in order to verify proper fuel injector flow. The ECM will pulse the selected injector when the following conditions are met:
Fuel Injector Balance	- All instruction on the scan tool completed. - Fuel injector selected. - Key ON, engine OFF. The selected fuel injector can only be flowed or pulsed once per ignition cycle. This function controls the fuel pump relay. The normal commanded state is None. When commanded ON or OFF, the ECM turns the fuel pump ON or OFF. The scan tool initiates the test when the following conditions are met:
Fuel Pump Relay	- The engine speed is 0 RPM. - In the correct power mode. - The output control timer has not expired. - The ignition voltage is within range.
Fuel Trim Enable	This function enables or disables the ECM fuel trim learning. The normal commanded state is None.
Fuel Trim Reset	This function is used to reset the learned fuel trim values to their initial values. This function is used to override the state of the generator L-terminal output. The commanded states are ON and OFF. Selecting OFF commands the ECM to turn OFF the generator and stop generating an output voltage. The scan tool initiates the test when the following conditions are met:
Generator L-Terminal	- The engine is operating to turn OFF the component. - The vehicle speed is 0 km/h (0 MPH). - In the correct power mode. - The output control timer has not expired.
HO2S Heater Learn	This function is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time. This function controls the selected HO2S heater. The normal commanded state is None, on, and off. Commanding the HO2S heater ON turns on the heater driver. The scan tool initiates the test when the following conditions are met:
HO2S Heater Sensor 1 or 2	- The engine is operating. - The exhaust temperature is within range. - In the correct power mode. - The HO2S heaters are not over temperature. - The ignition voltage is not out of range while commanding the heaters ON.
Idle Ignition Timing	Disables and enables idle spark advance with the engine running. This function is used to reset the learned airflow adaptive values to the initial values. The scan tool initiates the test when the following conditions are met:
Idle Learn	- The vehicle speed is 0 km/h (0 MPH). - In the correct power mode - There are no throttle actuator control system DTCs set.
Idle Speed Adjustment	This device control allows a service technician to add an offset to the engine idle speed within a restricted range to address customer complaints for vehicle vibration.
Malfunction Indicator Lamp (MIL)	This function controls the malfunction indicator lamp (MIL). The normal commanded state is None. When commanded ON or OFF, the ECM turns the malfunction indicator lamp (MIL) ON or OFF. This output can also be monitored on the scan tool data parameter MIL Command. The system remains in the commanded state until cancelled by the scan tool.
Misfire Graphic	This function is used to graph the accumulated misfires occurring in each cylinder. The scan tool allows for a reset of the misfire graph.
Programming History	This function displays the history buffer entries for the primary calibration part in the engine controller.
Starter Relay	This function is used to override the state of the Starter Relay output. Fuel and spark are disabled to prevent the engine from starting if the starter relay output is commanded ON. The scan tool initiates the test when the following conditions are met:

Output Control	Description
	• The engine speed is 0 RPM. • There are no crankshaft position sensor DTCs set. • The vehicle speed is 0 km/h (0 MPH) • There are no VSS sensor DTCs set. • There are no theft deterrent DTCs set. • There are no TAC system DTCs set. • The ignition voltage is within range. • In the correct power mode. • Not enough time has elapsed since the last time the starter has been enabled with a scan tool. This function controls the throttle valve in 10% increments. The scan tool initiates the test when the following conditions are met:
Throttle Position	• The engine speed is 0 RPM. • The vehicle speed is 0 km/h (0 MPH). The system remains in the commanded state until cancelled by the scan tool.
Throttle Sweep	This device control is used to automatically command the throttle blade from 0% to 100% and then back to 0%.
Tire Size	This function is used for correcting vehicle speed and odometer calculations when tire size is changed.

2013 Chevrolet Colorado

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

Table 1: [Engine Control Module Scan Tool Data](#)

Table 2: [Engine Control Module \(ECM\) Scan Tool Output Controls](#)

The Engine Control Module Scan Tool Data List contains all engine-related parameters that are available on the scan tool. This is a master list arranged in alphabetical order and not all the parameters listed are in every engine platform.

Use the Engine Scan Tool Data List only after the following is determined:

- The Diagnostic System Check - Vehicle is completed.
- No diagnostic trouble codes (DTCs)
- On-board diagnostics are functioning properly

The scan tool values from a properly running engine may be used for comparison with the engine you are diagnosing. The Engine Scan Tool Data List represents values that would be seen on a normally running engine.

Note: A scan tool that displays faulty data should not be used. The scan tool concern should be reported to the manufacturer. Use of a faulty scan tool can result in misdiagnosis and unnecessary parts replacement.

Only the parameters listed below are referenced in this service manual for use in diagnosis.

Engine Control Module Scan Tool Data

Parameter	System State	Expected Value	Description
<i>Base Operating Conditions:</i> Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop			
A/C Disengage Reason	A/C OFF	Invalid	This parameter displays the A/C compressor disengage reason. There are 8 different possible faults for the A/C compressor to disengage.
A/C High Side Pressure Sensor	A/C OFF	0–5 Volts	This parameter displays the voltage from the A/C high side pressure sensor signal circuit to the control module.
	A/C ON	0–5 Volts	
A/C High Side Pressure Sensor	A/C OFF	700–900 kPa (101–130 psi)	This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module.
	A/C ON	900–1300 kPa (130–174 psi)	
APP Sensor 1	—	0%	This parameter displays the angle of accelerator pedal position as calculated by the control module using the signals from the APP sensors.
APP Sensor 1	—	Volts	This parameter displays the voltage signal sent to the control module from APP sensor 1 of the APP sensor assembly. APP sensor 1 is a range of values indicating a low voltage when the accelerator pedal is not depressed to a high voltage when the accelerator pedal is fully depressed.
APP Sensor 2	—	0%	This parameter displays the angle of the APP sensor 2 as calculated by the control module using the signal from the APP sensor 2. APP sensor 2 is a range of values indicating a low percentage when the accelerator pedal is not depressed to a high percentage when the accelerator pedal is fully depressed.
APP Sensor 2	—	Volts	This parameter displays the voltage signal sent to the control module from APP sensor 2 of the APP sensor assembly. APP sensor 2 is a range of values indicating a low voltage when the accelerator pedal is not depressed to a high voltage when the accelerator pedal is fully depressed.
APP Sensors	—	0%	This Parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).

Parameter	System State	Expected Value	Description
Balancing Rate Cyl. 1–4	—	mm3	These parameters display the adjustment in fuel volume for each cylinder as calculated by the control module. The scan tool will display a negative balancing rate if the fuel volume is lowered. The scan tool will display a positive balancing rate if the fuel volume is increased.
BARO Sensor	—	kPa	This parameter displays the barometric pressure as calculated by the control module using the signal from the MAP sensor measured when the ignition is turned on with the engine not running. The control module will update the barometric pressure during wide-open throttle (WOT) conditions.
Boost Pressure Sensor	—	kPa	This parameter shows the turbocharger boost pressure in kPa.
BPP Circuit Signal	—	Released	This parameter displays the status of the brake pedal as determined by the stop lamp pedal switch.
Cruise Control ON/OFF Switch	Cruise Control ON	Yes	This parameter displays the state of the cruise ON/OFF switch input to the control module.
Cruise Resume Switch	Cruise Resume Switch ON	Active	This parameter displays the state of the cruise Resume switch input to the control module from the cruise control system.
Cruise Set Switch	Cruise Set Switch ON	Active	This parameter displays the state of the cruise Set/Coast switch input to the control module from the cruise control system.
Desired Air Mass Per Cylinder	—	mg/stroke	The parameter displays the amount of air (on a per cylinder event) that is being requested.
Desired EGR Position	—	%	This parameter displays the EGR commanded percentage from the engine control module.
Desired Fuel Rail Pressure	—	42500.0–44500.0 kPa 6215.0–6265.0 psi	This parameter displays the desired fuel rail pressure as calculated by the control module. This value is calculated based on engine speed, engine load, and sensor inputs.
Desired PressureBoost	—	98 kPa	This parameter displays the desired turbocharger boost pressure inside the engine as calculated by the control module based on the signal from the Boost pressure sensor.
Distance Since DTC Cleared	—	km/miles	This parameter displays the distance accumulated since an emission diagnostic trouble code was cleared. The scan tool will display increasing distance as the vehicle is driven.
Desired Idle Speed	—	700–800 RPM	This parameter displays the desired engine idle speed as commanded by the control module.
ECT Sensor	—	–39 to +140°C (–38 to +284°F)	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
EGR Command	—	%	This parameter displays the duty cycle commanded by the control module for the EGR valve. The scan tool will display a high percentage when the EGR valve is commanded open. The scan tool will display a low percentage when the EGR valve is commanded closed.
Engine Load	Engine Idling	20–35%	This parameter displays the percent of the calculated engine load based on inputs to the control module from various engine sensors.
	Engine speed at 2,500 RPM	15–25%	
Engine Oil Pressure Switch	—	OK	This parameter displays the pressure of the engine oil calculated by the control module using a signal from the engine oil pressure (EOP) sensor.
Engine Run Time	Engine Operating	0:00:00 Increments when the engine is operating	This parameter displays the time elapsed since the engine was started.

Parameter	System State	Expected Value	Description
Engine Speed	Engine Cranking	Greater than 60 RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
	Engine Idling	Approximately 750–850 RPM	
Fuel Heater Command	—	OFF	This parameter displays the control module commanded state of the fuel heater control circuit.
Fuel Level Sensor	—	Volts	This parameter displays the voltage of fuel in the fuel tank calculated by the engine control module.
Fuel Level Sensor	—	0–100%	This parameter displays the percent of fuel in the fuel tank calculated by the engine control module.
Fuel Pressure Regulator 1	—	1300–1400 mA	This parameter displays the engine control modules commanded state of the fuel rail pressure regulator 1.
Fuel Pump Relay Command	Ignition ON, engine OFF	Fuel pump on for 2 seconds	This parameter displays the control modules commanded state of the fuel pump relay control circuit.
	Engine idling	On	
Fuel Rail Pressure Sensor	—	42.8–43.8 MPa (6207–6352 psi)	This parameter displays the fuel rail pressure calculated by the control module using the signal from the fuel rail pressure (FRP) sensor.
Fuel Rail Pressure Sensor	—	1.40–1.50 Volts	This parameter displays the voltage of the fuel rail pressure calculated by the control module using the signal from the fuel rail pressure (FRP) sensor.
Fuel Tank Level Remaining	—	Varies	This parameter displays the amount of fuel remaining in the fuel tank as measured in a percentage. The control module determines the amount of fuel remaining in the tank by using information from the fuel level sensor(s). The scan tool will display a higher value with a full fuel tank, and a lower value with an empty fuel tank.
Fuel Temperature Sensor	—	25 to 40°C (77 to 104°F)	This parameter displays the fuel temperature calculated by the control module based on input from the fuel temperature sensor.
Fuel Temperature Sensor	—	2.80 Volts	This parameter displays the voltage calculated by the control module based on input from the fuel temperature sensor.
Generator F Terminal Signal	—	25–35%	This parameter displays the commanded state of the generator by the control module.
Glow Plug Command	—	OFF	This parameter displays the control module commanded state of the glow plug.
Glow Plug Feedback Signal	—	OK	This parameter displays the state of the Glow Plug Feedback Signal circuit.
Intake Air Flow Valve Motor Command	—	55–65%	This parameter displays the percent of the control modules commanded state of the intake air flow valve.
IAT Sensor 2	—	–39 to +140°C (–38 to +284°F)	This parameter displays the temperature of the air entering the engine air duct calculated by the control module based on the input from the intake air temperature sensors.
Ignition 1 Signal	Ignition ON	ON	This parameter displays the voltage measured at the ignition 1 circuit of the control module. Voltage is applied to the control module when the ignition switch is in the ignition 1 position.
MAF Sensor	—	g/s	This parameter indicates the quantity calculated by the control module based on a signal from the mass air flow (MAF) Sensor.
MAP Sensor	—	95–104 kPa	This parameter indicates the manifold absolute pressure inside the engine as calculated by the control module based on the signal from the manifold absolute pressure (MAP) sensor.
MAP Sensor	—	0.95–1.06 Volts	This parameter indicates the voltage signal received by the control module from the MAP sensor. The scan tool displays a low voltage at

Parameter	System State	Expected Value	Description
			idle, and a high voltage at wide open throttle. Barometric pressure and altitude can effect these values.
MIL Command	—	OFF	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the control module.
Starter Relay Command	—	OFF	This parameter displays the commanded state of the starter relay.
TAC Motor Command	—	%	This parameter displays the percentage of the throttle plate opening.
Vehicle Speed Sensor	—	0 Km/h 0 mph	This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor (VSS).
Warm ups Since DTC cleared	—	Varies	This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.

Engine Control Module (ECM) Scan Tool Output Controls

Output Control	Description
Compression Test	This function activates the starter motor but without starting the engine. All Fuel Injectors are shut off in order to allow the compression test.
Coolant Temperature Gauge	This function sweeps the coolant temperature gauge from 0% to 100%.
EGR Solenoid	This function opens or closes the exhaust gas recirculation (EGR) solenoid. The EGR solenoid increases or decreases in 10 percent increments. The device control will not change unless changed or cancelled by the scan tool.
Engine High Temp. Lamp	This function activates On or Off the high coolant temp lamp.
Engine Speed Control	This function is used to override the Idle engine speed.
Fuel Filter Heater	This function activates the fuel heater relay ON or OFF. The Device Control will not change unless changed or cancelled by the scan tool.
Fuel Pump Relay	Note: This function is only allowed with the ignition ON, engine OFF. This function activates the fuel transfer pump or prime pump (depending on application) ON or OFF. The Device Control will not change unless changed or cancelled by the scan tool.
Generator L-Terminal	Note: This function is only allowed with the engine idling. This function controls the system voltage. When commanded ON, normal system voltage output is present. When commanded OFF, system voltage output is no longer present, Ignition 1 signal continues to drop, Gen L-Terminal goes to OFF and Gen F-Terminal continues to drop.
Glow Plugs	This function activates the Glow Plug Controller ON or OFF. The Device Control will be aborted after 12 seconds for the first activation, and after 5 seconds for every other activation. The Device Control is inhibited if the engine is running.
Glow Plug Lamp	This function activates the glow plug indicator lamp. The glow plug indicator lamp will remain illuminated until cancelled by the scan tool.
IAF Valve Motor	This function controls the opening and closing of the Intake Air Flow valve.
IMT Valve	This function controls the opening or closing of the Intake Manifold Tuning Valve
Injector Flow Rate Programming	This function will essentially erase the stored Zero Fuel Control (ZFC) for a given injector(s). The ECM will relearn these values over time in situations where the pulse width is very small (i.e., over run mode - going down a hill where very little fuel is injected).
Intake Manifold Runner Control	This function activates the Intake manifold runner control output by opening or closing the valve.
Malfunction Indicator Lamp (MIL)	This function activates the malfunction indicator lamp (MIL). The MIL will remain illuminated until cancelled by the scan tool.
Oil Life Reset	This device control displays the engine oil life remaining determined by the engine control module (ECM). Also this device control can be used to reset engine oil remaining life to 100% after an oil change.
TC Vane Position Ctrl Solenoid	Note: This function is only allowed with the engine idling. Cycles the turbocharger vane position solenoid to 95 percent boost and back to 0 percent boost. The device control is limited to engine speeds less than 2,000 RPM .

2013 Chevrolet Colorado

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

Table 1: [Engine Control Module Scan Tool Data](#)

Table 2: [Engine Control Module \(ECM\) Scan Tool Output Controls](#)

The Engine Control Module Scan Tool Data List contains all engine-related parameters that are available on the scan tool. The list is arranged in alphabetical order. A given parameter may appear in any one of the data lists, and in some cases may appear more than once, or in more than one data list in order to group certain related parameters together.

Use the Engine Scan Tool Data List only after the following is determined:

- The Diagnostic System Check - Vehicle is completed.
- No diagnostic trouble codes (DTCs)
- On-board diagnostics are functioning properly

The scan tool values from a properly running engine may be used for comparison with the engine you are diagnosing. The Engine Scan Tool Data List represents values that would be seen on a normally running engine.

Note: A scan tool that displays faulty data should not be used. The scan tool concern should be reported to the manufacturer. Use of a faulty scan tool can result in misdiagnosis and unnecessary parts replacement.

Only the parameters listed below are referenced in this service manual for use in diagnosis.

Engine Control Module Scan Tool Data

Parameter	System State	Expected Value	Description
<i>Base Operating Conditions: Engine Idling/Radiator Hose Hot/Park or Neutral/Closed Loop</i>			
5 V Reference 1, 2, 3 or 4 Circuit Status	Engine Idling	OK-Malfunction	This parameter will display OK if the circuit is good or Malfunction if a short to ground, short to B+ is present.
5 V Reference 1, 2, 3 or 4	Engine Idling	5 V	This parameter displays the voltage sensed on the 5 V reference circuits at the control module. The scan tool will display a higher value at higher voltage. The scan tool will display a lower value at lower voltage.
A/C Compressor Operation	A/C ON	Allowed/Not Allowed	This parameter displays if the A/C compressor is allowed or not allowed to operate.
A/C Disengage 1–8 History	A/C ON	Reason for A/C Disengagement	The parameter displays reason for the last 8 air conditioning (A/C) compressor disengagements in order from 1 to 8 with 8 being the most recent. There are 8 possible causes for the A/C compressor to disengage.
A/C High Side Pressure Sensor	A/C OFF	0.75–1.5 V*	This parameter displays the voltage signal from the A/C high side pressure sensor input to the control module.
	A/C ON	1.3–2.5 V*	* Varies with temperature, humidity, and altitude.
A/C High Side Pressure Sensor	A/C OFF	450–827 kPa (65–120 psi)*	This parameter displays the pressure from the A/C high side pressure sensor signal circuit to the control module.
	A/C ON	827–2,350 kPa (120–341 psi)*	* Varies with temperature, humidity, and altitude.
A/C OFF for WOT	A/C ON	Yes-No	This parameter displays whether the control module is commanding the A/C compressor clutch relay OFF for wide open throttle (WOT).
A/C Pressure Out of Range	A/C ON	Yes-No	This parameter displays whether the A/C pressure is out of range for normal operation as determined by the control module.
A/C Request Signal	A/C ON	Yes-No	This parameter displays the state of the A/C request input to the control module from the heating, ventilation, and air conditioning (HVAC) controls.
Accelerator Pedal Position	Engine Idling	0–100 %	This parameter displays the angle of the accelerator pedal position (APP) as calculated by the control module using the signals from the APP sensors.

Parameter	System State	Expected Value	Description
Accelerator Pedal Position When Engine Overspeed Detected	Engine Idling	%	This parameter displays the accelerator pedal position (APP) observed upon initial detection of an overspeed condition. This value will be updated upon each overspeed condition.
Ambient Air Temperature	Engine Idling	Varies	This parameter displays temperature from the input of the Intake Air Temperature Sensor.
APP Sensor 1 Circuit Status	Engine Idling	OK/Malfunction	APP Sensor 1 Out of Range indicates that the sensed accelerator pedal position 1 sensor value is currently out of range or that a Malfunction has been detected based upon the sensed accelerator pedal position 1 sensor value being out of range
APP Sensor 1 Learned Applied Position	Ignition ON	78 %	This parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 1.
APP Sensor 1 Learned Released Position	Ignition ON	0.98 V	This Parameter indicates the accelerator pedal sensor 1 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by the calibration.
APP Sensor 1 Position	Pedal Released	0 %	This Parameter contains the displacement determined from accelerator pedal position sensor 1 (corrected and normalized based upon its learned minimum and maximum positions).
	Pedal Fully Applied	99 %	
APP Sensor 2	Ignition ON	V	This Parameter contains the accelerator pedal position sensor 2 analog input as a percentage of its reference voltage
APP Sensor 2 Circuit Status	Ignition ON	OK/Malfunction	APP Sensor 2 Out of Range indicates that the sensed accelerator pedal position 2 sensor value is currently out of range or that a malfunction has been detected (and latched) based upon the sensed accelerator pedal position 2 sensor value being out of range
APP Sensor 2 Learned Applied Position	Ignition ON	78 %	This Parameter contains the learned maximum (fully applied) accelerator pedal position relating to absolute accelerator pedal position (no correction or normalization based upon learned minimum or maximum positions) from accelerator pedal position sensor 2.
APP Sensor 2 Learned Released Position	Ignition ON	0.49 V	This Parameter indicates the accelerator pedal sensor 2 signal at its minimum learned position (pedal released) as a percentage of its reference voltage. (The minimum learned position is automatically updated periodically as determined by an algorithm.
APP Sensor 2 Position	Pedal Released	0 %	This Parameter contains the displacement determined from accelerator pedal position sensor 2 (corrected and normalized based upon its learned minimum and maximum positions).
	Pedal Fully Applied	100 %	
APP Sensors	Pedal Released	0 %	This Parameter contains the accelerator pedal position resulting directly from the settling of differences of the accelerator pedal position sensors (prior to any compensation to determine driver intent).
	Pedal Fully Applied	99 %	
Ambient Air Temperature	Ignition ON	°C °F Varies	This parameter displays the outside air temperature as calculated by the control module.
APP Sensor 1	Accelerator pedal not actuated	0.98 V	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 1 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	4.25 V	
APP Sensor 2	Accelerator pedal not actuated	0.49 V	This parameter displays the actual voltage on the accelerator pedal position (APP) sensor 2 signal circuit as measured by the control module.
	Accelerator pedal fully actuated	2.14 V	

Parameter	System State	Expected Value	Description
APP Sensor 1 and 2	Ignition ON	Agree/Disagree	This parameter displays Disagree if the control module detects the signal voltage from APP sensor 1 is not in correct relationship to APP sensor 2. The scan tool displays Agree under the normal operating conditions.
BARO	Engine Idling	65–104 kPa (8–16 psi)	This parameter displays the barometric pressure. The control module uses the barometric pressure sensor input for fuel control to compensate for altitude differences.
BARO Sensor	Engine Idling	2.5–4.0 V	This parameter displays the barometric pressure sensor voltage.
Brake Pedal Position Circuit Signal	Ignition ON	Open/Closed	This parameter displays the serial data message of the brake signal from the electronic brake and traction control module (EBTCM).
Brake Pedal Position Sensor Signal	Ignition ON	Applied/Released/Invalid	This parameter displays the serial data message of the brake position sensor signal from the electronic brake and traction control module (EBTCM).
Calculated Air Flow	Engine Idling	G/S	This Parameter contains the mass airflow determined from the speed density (MAP based) calculation of air mass per cylinder.
Calculated Catalyst Temperature Bank 1 or Bank 2	Engine Idling	Approximately 552°C (1026°F)	This Parameter contains the estimated catalyst temperature for bank 1 sensor 1 (as a function of engine speed, engine airflow, and fuel ethanol percentage) for use in the oxygen sensor and catalyst monitor diagnostic algorithms.
Calculated Engine Oil Temperature	Engine Idling	105°C (221°F)	This Parameter displays the estimated engine oil temperature (as a function of engine coolant temperature and other parameters).
Camshaft Position Sensor	Engine Idling	0 RPM	This parameter displays the speed of the engine as calculated by the signal from a camshaft position (CMP) sensor. This parameter will always display 0 unless a condition with the CKP sensor or CKP reluctor exists. If a CKP condition exists the control module will use a valid CMP sensor signal to determine engine speed and crank/camshaft position.
Camshaft Position Signal Output Circuit High Voltage Test Status	Engine Idling	OK	This Parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to voltage.
Camshaft Position Signal Output Circuit Low Voltage Test Status	Engine Idling	OK	This Parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is shorted to ground.
Camshaft Position Signal Output Circuit Open Test Status	Engine Idling	OK	This Parameter displays the state of the Camshaft Position Signal Output Circuit. The parameter displays Malfunction if the Camshaft Position Signal Output Circuit is open.
Catalyst Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This Parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test
Catalyst Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This Parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test
Catalyst Monitor Not At Idle Test Conditions Met	Engine Idling	Yes/No	This Parameter indicates the status of the catalyst monitor diagnostic. Catalyst Monitor Test Running indicates yes or no when the catalyst monitor diagnostic is actively running a test
Catalyst Monitor Test Counter Bank 1 or 2	Engine Idling	Counts	This Parameter contains the number of repeated results of the catalyst monitor diagnostic test that have been performed since a code clear for bank 1 or bank 2 (used to determine if a sufficient number of tests have run to report a passing condition).

Parameter	System State	Expected Value	Description
Catalyst Monitor Test Result Bank 1 or 2	Engine Idling	No Decision/Failed /Passed	This Parameter indicates the status of the catalyst monitor diagnostic for bank 1 or bank 2. Multiple tests may run before the diagnostic reports a "Pass" or "Fail" and will be tracked by Catalyst Monitor Diagnostic Test Counter Bank 1 or bank 2. When this Parameter reports a "Pass" or "Fail", the diagnostic is complete for the current trip and will not attempt any further tests on bank 1 or bank 2.
Catalyst Monitor Test State	Engine Idling	Active/Inactive	This Parameter indicates the status of the catalyst monitor diagnostic by displaying active or inactive. This test will only run with the engine at idle.
Change Engine Oil Indicator Command	Ignition ON	ON/OFF	This Parameter sends a signal through the serial communication to inform the driver to change the engine oil. It is based on a calibrated amount of time.
Catalyst Monitor Enabled this Ignition Cycle	Engine Idling	Yes-No	This parameter displays the monitor enable status during the current driving/monitoring cycle.
Crankshaft Position Active Counter	Engine Idling	0–255 Counts	This parameter displays an incrementing counter when the control module receives a signal from the crankshaft position sensor (CKP).
Crankshaft Position Resync Counter	Engine Idling	0 Counts	This parameter displays the number of times the control module has to resynchronize with the CKP sensor. The parameter will begin to increment if the control module does not detect a CKP reference pulse. The parameter will reset to 0 after the Ignition is switched OFF.
Cold Startup	Ignition ON	Yes/No	This parameter displays whether the engine meets the conditions for a cold startup during the present ignition cycle. The scan tool displays Yes when the conditions for a cold startup are met during the ignition cycle. The scan tool displays No when the conditions for a cold startup are not met during the present ignition cycle. Conditions for a cold startup require the coolant temperature and the intake air temperature to be below a predetermined temperature and within a certain range of each other. These conditions must occur after the engine was warmed up to a specific temperature during the previous ignition cycle.
Cooling Fan Relay 1 Command	Ignition ON	ON/OFF	This parameter displays the commanded state of the fan relay 1 control circuit. The cooling fan relay 1 should be ON when the scan tool indicates the FC Relay 1 Command is ON. The cooling fan relay 1 should be OFF when the scan tool indicates the FC Relay 1' Command is OFF.
Cooling Fan Relay 1 Control Circuit High Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is shorted to voltage.
Cooling Fan Relay 1 Control Circuit Low Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is shorted to ground.
Cooling Fan Relay 1 Control Circuit Open Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is open.
Cooling Fan Relays 2 Command	Ignition ON	ON/OFF	This Parameter displays the commanded state of the fan relay 2 output. .
Cooling Fan Relays 2 Control Circuit High Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is shorted to voltage.
Cooling Fan Relays 2 Control Circuit Low Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is shorted to ground.
Cooling Fan Relays 2 Control Circuit Open Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the fan relay control circuit. The parameter displays Malfunction if the fan relay control circuit is open.
Crankshaft Position Sensor	Engine Idling	RPM	This Parameter displays engine speed.

Parameter	System State	Expected Value	Description
Crank Request Signal	Ignition switch not in the crank position	No	This parameter displays whether the ignition switch has been cycled to the crank position requesting the control module to activate the starter relay.
	Ignition switch in the crank position	Yes	
Cruise Control	Cruise ON	Active/Inactive	This parameter displays the status of the cruise control system as determined by the control module.
Cruise Control Cancel Switch	Cruise ON	Active/Inactive/Invalid	This parameter displays the status of the cruise control cancel switch
Cruise Control Disengage 1-8 History	Cruise ON	Reason for Cruise Disengagement	The parameter displays the last 8 cruise control disengages in order from 1 to 8, with 8 being the most recent. There are approximately 30 possible causes for the cruise control to disengage
Cruise Control Inhibit Reason	Cruise OFF	OFF	The parameter displays the reason the cruise control system cannot engage.
	Cruise ON	Park/Neutral	
Cruise Control ON/OFF Switch	Cruise ON	ON/OFF	The engine control module (ECM) monitors the signal circuit of the cruise control switch. A closed switch is displayed as ON.
Cruise Control Resume/Accelerator Switch	Cruise ON	ON/OFF	The scan tool displays ON, when the cruise ON/OFF switch is ON and the resume/accel (+) button is pressed, the ECM detects a predetermined voltage value for the resume/accel. switch.
Cruise Control Set/Coast Switch	Cruise ON	ON/OFF	The scan tool displays ON, when the cruise ON/OFF switch is ON and the ECM detects a predetermined voltage value for the set/coast (-) switch.
Current Gear	Transmission in Park/Neutral	P/N	This parameter displays the transmission gear commanded by the transmission control module.
	Transmission not in Park/Neutral	Reverse/1st-5th	
Current Gear When Engine Overspeed Detected	Engine Idling	Varies	This parameter displays the transmission actual gear observed upon initial detection of an overspeed condition.
Cylinder 1-6 Current Misfire Counter	Engine Idling	Counts	The scan tool displays a range of 0-255 counts. This parameter displays the number of misfires that have been detected during the last 255 cylinder firing events. The counters may normally display some activity, but the activity should be nearly equal for all of the cylinders, and in low numbers.
Cylinder 1-6 History Misfire Counter	Engine Running	Counts	The scan tool displays a range of 0-65,535 counts. The misfire history counters display the total level of misfire that has been detected on each cylinder. The misfire history counters will not update or show any activity until a misfire DTC P0300 has become active. The misfire history counters will update every 255 cylinder firing events.
Cycles of Misfire Data	Engine Running	0-3,000 counts	This parameter displays the number of cylinder firing events recorded by the control module.
Ignition Coil 1-6 Control Circuit High Voltage Test Status	Engine Running	OK or Not Run	This parameter displays the state of the Ignition control circuit. The parameter displays Malfunction if the Ignition control circuit is shorted to voltage.
Ignition Coil 1-6 Control Circuit Low Voltage Test Status	Engine Idling	OK or Not Run	This parameter displays the state of the Ignition control circuit. The parameter display Malfunctions if the Ignition control circuit is shorted to ground.
Ignition Coil 1-6 Control Circuit Open Test Status	Engine Idling	OK or Not Run	This parameter displays the state of the Ignition control circuit. The parameter displays if Malfunction the Ignition control circuit is open.
Ignition Coil Supply Voltage Bank 1 or 2	Engine Idling	ON/OFF	This parameter displays ON when voltage is supplied to the Ignition coil bank 1 or bank 2.

Parameter	System State	Expected Value	Description
Ignition Cycles Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	Counts	This Parameter displays the number of Ignition Cycles since Recommended Maximum Fuel Alcohol Content Exceeded.
Ignition Cycles Without Malfunction Since Last Malfunction	Engine Idling	Counts	This Parameter displays the number of ignition cycles with a pass reported and no malfunctions reported since the first ignition cycle with a malfunction reported.
Inspection/Maintenance Drive Cycle Complete	Engine Idling	Yes/No	Inspection/Maintenance Drive Cycle Complete means that all required components of the standard drive cycle have completed.
Inspection/Maintenance Drive Cycle Idle Time Complete	Engine Idling	Yes/No	Inspection/Maintenance Drive Cycle Idle Time Complete indicates that the engine idle time requirement is complete.
Inspection/Maintenance Drive Cycle Idle Timer	Engine Idling	hh:mm:ss	This parameter displays the Inspection/Maintenance Drive Cycle Idle Timer.
Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete	Engine Idling	No	This parameter displays the Inspection/Maintenance Drive Cycle Propulsion System Active Time Complete. The parameter displays Yes when the Inspection/Maintenance Drive Cycle Propulsion System Active Time is Complete.
Inspection/Maintenance Drive Cycle Propulsion System Active Timer	Engine Idling	hh:mm:ss	This parameter displays the total accumulated time in which the propulsion system has been active after the 1st time the engine is started.
Inspection/Maintenance Drive Cycle Vehicle Speed Time Complete	Engine Idling	No	This parameter displays Yes when the Vehicle Speed Time Complete indicates that the vehicle has been above 25 mph for five minutes.
Inspection/Maintenance Drive Cycle Vehicle Speed Timer	Engine Idling	hh:mm:ss	This parameter displays the total accumulated time in which the vehicle speed has been greater than 25 mph after the 1st time the engine is started.
Intake Air Humidity Sensor	Engine Idling	%	This Parameter displays the signal from the Intake Air Humidity sensor, which represents the relative humidity of the intake air.
Cylinder 1-6 Injector Control Circuit Status	Engine Idling	OK or Not Run	This parameter displays the state of the fuel injector control circuit.
Cylinder 1-6 Injector Disabled Misfire Detected	Engine Idling	Yes/No	This parameter displays the injector that has been disabled by the misfire catalyst converter protection calibration.
Cylinder 1-6 Knock Detected	Engine Idling	Yes/No	This parameter displays yes if a knock has been detected in an individual cylinder.
Decel. Fuel Cutoff	Engine Idling	Active/Inactive	This parameter displays the status of the operating mode of the control module used to turn OFF the fuel injectors and the EVAP canister purge valve during certain deceleration conditions.
Desired Exhaust Camshaft Position (If Equipped)	Engine Idling	0 Degrees	This parameter displays the desired exhaust camshaft angle as commanded by the control module.
Desired Exhaust Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the desired exhaust camshaft angle as commanded by the control module.
	Engine speed at 2000 RPM	10 Degrees	
Desired Idle Speed	Engine Idling	Approximately 650 RPM	This parameter displays the desired engine idle speed as commanded by the control module. The desired idle speed varies depending on engine load.
Desired Intake Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the desired intake camshaft angle as commanded by the control module.
	Engine speed at 2000 RPM	10 Degrees	
Desired Throttle Position	Engine Idling	%	Commanded Throttle Actuator Control
Distance Since DTC Cleared	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since a DTC was cleared.

Parameter	System State	Expected Value	Description
Distance Since First Malfunction	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since a Malfunction occurred.
Distance Since Last Malfunction	Engine Idling	0 Km/mi	This parameter displays the distance accumulated since last malfunction was captured. This parameter is only meaningful within the context of a failure record or freeze frame.
Distance Since Last Oil Level Warning	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since the last oil level warning Malfunction occurred.
Distance Since Last Oil Pressure Warning	Engine Idling	0 Km/mi	This parameter displays in kilometers or miles the distance traveled since the last oil pressure warning Malfunction occurred.
Distance Since Recommended Maximum Fuel Alcohol Content Exceeded	Engine Idling	0 Km/mi	This Parameter displays in kilometers or miles the distance Since Recommended Maximum Fuel Alcohol Content Exceeded.
Drag Control Status	Engine Idling	Inactive	EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the traction control system signal input is active.
Engine Drag Control Status	Vehicle Moving	Active/Inactive	EDC Active (Drag Active) control mode is indicated when the requested torque signal is above the driver requested value while the traction control system signal input is active.
ECM Authentication Status	Ignition ON	Unknown/Incorrect /Negative Response/Valid	ECM Authentication Status indicates the result of the comparison between the last received immobilizer response and the expected response calculated into the ECM.
ECM Response Source	Ignition ON	Ignition Switch Start/Remote Vehicle Start/Exterior PTO Vehicle Start	ECM Response Source indicates the source used to calculate the ECM response
Engine Controls Ignition Relay Command	Ignition ON	ON/OFF	This parameter displays the state of the control circuit for control module power relay as commanded by the control module.
Engine Controls Ignition Relay Control Circuit High Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to voltage.
Engine Controls Ignition Relay Controls Circuit Low Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is shorted to ground.
Engine Controls Ignition Relay Controls Circuit Open Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the Engine Controls Ignition Relay control circuit. The parameter displays Malfunction if the Engine Controls Ignition Relay control circuit is open.
Engine Controls Ignition Relay Feedback Signal	Ignition ON	12.0–14.9 V	This parameter displays the voltage available at the EC ignition relay pin of the control module.
ECT Sensor	Ignition ON	88 to 105°C (190 to 221°F)	This parameter displays the temperature of the engine coolant based on input to the control module from the engine coolant temperature (ECT) sensor.
EGR/Camshaft Position Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This Parameter displays Yes or No of the completion status during the current driving / monitoring cycle of emission related monitors.
EGR/Camshaft Position Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This Parameter displays Yes or No of the completion status during the current driving / monitoring cycle of emission related monitors.
Electric Power Management Inhibit Reason	Engine Idling	None	This Parameter displays the reason for the source of the Regulated Voltage Control (RVC) override command. RVC lowers system operating voltage to reduce system electrical load and improve fuel economy performance. The following is a list of possible reasons. None, Control Function,

Parameter	System State	Expected Value	Description
Engine Load	Engine Idling	25–45 %	This parameter displays the calculated engine load in percent based on inputs to the control module from various engine sensors.
	Engine speed at 2,500 RPM	40–60 %	
Engine OFF Time	Engine Idling	0:00:00 Seconds - Varies	This parameter displays the amount of time that has elapsed since the engine was last cycled OFF.
Engine Oil Life Remaining	Engine Idling	0–100 %	This parameter displays the percent of engine oil life remaining. The controller calculates the engine oil life by monitoring engine load, coolant temperature, and engine speed.
Engine Oil Pressure Switch	Engine Idling	OK	This parameter displays the status of the engine oil level switch as determined by the control module. The control module uses this information to turn on the low engine oil lamp if the engine oil level remains approximately 1 quart low for a sufficient amount of time. The scan tool will display Low when the engine oil level is low. The scan tool will display OK when the engine oil level is correct.
Engine Oil Temperature When Engine Overspeed Detected	Engine Idling	Temperature	This parameter displays the temperature of the engine oil as determined by the control module.
Engine Overspeed	Engine Idling	Not Present	This Parameter displays if an Engine Overspeed is Present or Not Present.
Engine Run Time	Engine Idling	0:00:00 Increments when the engine is operating	This parameter displays the time elapsed since the engine was started.
Engine Speed	Engine Cranking	Greater than 60 RPM	This parameter displays the speed of the engine crankshaft rotation from information received from the crankshaft position (CKP) sensor. If there is a CKP sensor DTC, the ECM calculates the engine speed from one of the camshaft position (CMP) sensors.
	Engine Idling	550–700 RPM	
Engine Speed When Engine Overspeed Detected	Engine Idling	RPM	This parameter displays the engine speed observed upon initial detection of an overspeed condition. This value will be updated after each overspeed condition.
EVAP Malfunction History	Engine Running	None	This parameter displays the result of the evaporative emission (EVAP) system as determined by the control module. The scan tool will display the following: • None • Excess Vacuum • Purge Valve Leak • Small Leak • Weak Vacuum • No Test Result
EVAP Monitor Complete This Ignition Cycle	Engine Running	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
EVAP Monitor Enabled This Ignition Cycle	Engine Running	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
EVAP Purge Solenoid Valve Command	Engine Idling	%	This Parameter displays the commanded duty cycle for the canister purge output.
EVAP Purge Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to ground.

Parameter	System State	Expected Value	Description
EVAP Purge Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is open.
EVAP Purge Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the evaporative emission (EVAP) purge solenoid control circuit. The parameter displays Malfunction if the EVAP purge solenoid control circuit is shorted to voltage.
EVAP Vent Solenoid Valve Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is open. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Valve Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the state of the EVAP vent solenoid control circuit. The parameter displays Malfunction if the EVAP vent solenoid control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the EVAP vent solenoid ON.
EVAP Vent Solenoid Command	Engine Idling	Venting/Not Venting	This parameter displays the state of the control circuit for evaporative emission (EVAP) vent solenoid as commanded by the control module.
Exhaust Camshaft position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the actual exhaust camshaft position in degrees.
	Engine speed at 2000 RPM	10 Degrees	
Exhaust Camshaft Position Variance	Engine Idling	0 Degrees	This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
Exhaust Camshaft Position Variance Bank 1 or 2.	Engine Idling	0 Degrees	This parameter displays in degrees, the difference between the desired exhaust camshaft position and the actual exhaust camshaft position.
	Engine speed at 2000 RPM	0 Degrees	
Exhaust Camshaft Position Active Counter (If Equipped)	Engine Idling	0–255	This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor.
Exhaust Camshaft Position Active Counter Bank 1 or 2	Engine Idling	0–255	This parameter displays an incrementing counter when the control module receives a signal from the exhaust camshaft position (CMP) sensor.
Exhaust Camshaft Position Command	Engine Idling	0 %	This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
Exhaust Camshaft Position Command Bank 1 or 2.	Engine Idling	20 %	This parameter displays the on-time or duty cycle of the exhaust camshaft position (CMP) actuator solenoid valve as commanded by the control module.
	Engine speed at 2000 RPM	50 %	
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2.	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2.	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Exhaust Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test	Engine Idling	OK	This parameter displays the state of the exhaust camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to

Parameter	System State	Expected Value	Description
Status Bank 1 or 2.			voltage.
Extended Travel Brake Pedal Position Signal	Engine Idling	Released	This parameter displays the status of the Extended Travel Brake Pedal Position sensor.
Fuel Level Sensor Reference Command	Engine Idling	%	This Parameter displays the percentage of time that the power supply for the fuel level sensor is on. This percentage is minimized when the fuel has high ethanol content and is maximized when the fuel has low ethanol content.
Fuel Control Loop Status	Engine Idling	Open/Closed	Fuel Closed Loop Active indicates that oxygen sensor 1 of each bank is being used as feedback to adjust the amount of fuel delivered to the engine.
Fuel Economy	Engine Idling	Liters per Hour	This Parameter displays the instant fuel consumption rate of the engine in liters per hour.
Fuel Enrichment-Hot Catalyst	Engine Running	Active/Inactive	Fuel Enrichment Catalyst Protection Active indicates fuel is being added to cool the catalytic converter.
Fuel Enrichment-Hot Coolant	Engine Running	Active/Inactive	Hot Coolant Enrichment Active indicates that the conditions to enable hot coolant enrichment are active and that a richer than stoichiometric air/fuel ratio is being commanded in order to help cool the engine when a system malfunction is causing the engine to run at extreme temperatures.
Fuel Level Sensor	Ignition ON	0–5 V	This parameter displays the voltage signal received by the control module from the fuel level sensor.
Fuel Pump Relay Control Circuit High Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to voltage in the circuit.
Fuel Pump Relay Control Circuit Low Voltage Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an short to ground in the circuit.
Fuel Pump Relay Control Circuit Open Test Status	Ignition ON	OK	This parameter displays the status of the output driver for the fuel pump control circuit. The scan tool will display OK if the circuit is operating correctly or Not Run if a diagnosis has not been made. The scan tool will display Malfunction if there is an open in the circuit.
Fuel Pump Enable Command	Ignition ON	ON/OFF	This Parameter displays the commanded state of the fuel pump output (the output is considered to be commanded ON if its duty cycle is not zero)
Fuel Tank Rated Capacity	Ignition ON	Varies	This parameter displays the capacity of the fuel tank in liters or gallons. The rated capacity displayed by the scan tool will varies with vehicle type.
Fuel Trim Learn	Engine Idling	Enabled/Disabled	This parameter displays Enabled when conditions are appropriate for enabling long term fuel trim corrections. This indicates that the long term fuel trim is adapting continuing amounts of short term fuel trim. If the scan tool displays Disabled, then long term fuel trim will not respond to changes in short term fuel trim.
Fuel Trim Memory Cell	Engine Idling	Counts 0 250	This Parameter displays long term fuel corrections that is active based upon the current operating conditions (MAP, engine speed, purge duty cycle, A/C compressor state, and transmission range).
Fuel Trim System Test State	Engine Idling	Disabled/Running/EVAP Purge Test Running/Complete	This Parameter displays the current state of the fuel adjustment system diagnostic.
Fuel Volatility	Engine Idling	Varies	This parameter indicates the rate the fuel can be vaporized in the cylinder as calculated by the control module. The scan tool will display HIGH when the fuel volatility is high. The scan tool will

Parameter	System State	Expected Value	Description
			display LOW when the fuel volatility is low.
Generator F Terminal Signal	Engine Idling	0–100 %	This parameter displays the amount of generator ON-time as commanded by the control module. The higher the percentage the greater the generator output.
Generator Indicator Command	Engine Idling	ON/OFF	This Parameter displays ON or OFF associated with the status of the generator
Generator L Terminal Circuit High Voltage Test Status	Engine Idling	OK	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to voltage.
Generator L Terminal Circuit Low Voltage Test Status	Engine Idling	OK	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is shorted to ground.
Generator L Terminal Circuit Open Test Status	Engine Idling	OK	This parameter displays the state of the generator L circuit terminal. The parameter displays Malfunction if the generator L circuit is open.
Generator L-Terminal Command	Engine Idling	0–100 %	This parameter displays the control modules commanded state of the voltage regulator on the generator.
HO2S Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	0.00–1.00 V - Varies	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	0.00–1.00 V - Varies	This parameter displays the voltage output from the HO2S to the control module. A lower voltage indicates a lean exhaust, while a higher voltage indicates a rich exhaust.
HO2S Heater Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	mA	This Parameter display the current feedback for the oxygen sensor heater output for bank 1 sensor 1 or bank 2 sensor 1.
HO2S Heater Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	mA	This Parameter display the current feedback for the oxygen sensor heater output for bank 1 sensor 2 or bank 2 sensor 2.
HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit High Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to voltage.
HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Low Voltage Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is shorted to ground.
HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 1 or Bank 2 Sensor 1	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S Heater Control Circuit Open Test Status Bank 1 Sensor 2 or Bank 2 Sensor 2	Engine Idling	OK	This parameter displays the state of the oxygen sensor heater control circuit. The parameter displays Malfunction if the oxygen sensor heater control circuit is open.
HO2S Heater Command Bank 1 or 2 Sensor 1 or 2 Heater Command	Engine Idling	0–100 %	This parameter displays the HO2S heater ON time in percentage, as commanded by the control module.
HO2S Heater Command Bank 1 or 2 Sensor 1 or 2	Engine Idling	ON/OFF	This parameter display the state of the HO2S heater control circuit as commanded by the control module.

Parameter	System State	Expected Value	Description
HO2S/Heater Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the diagnostic monitor completion status during the current driving/monitoring cycle.
HO2S/Heater Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This parameter displays the diagnostic monitor enable status during the current driving/monitoring cycle.
IAT Sensor	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the air entering the air induction system based on input to the control module from the intake air temperature (IAT) sensor.
Ignition Accessory Signal	Ignition ON	ON/OFF	This parameter displays ON when the control module detects a voltage at the ignition accessory input terminal.
Ignition 1 Signal	Ignition ON	B+	This parameter displays B+ when the control module detects a voltage at the ignition 1 input terminal.
Injector Duty Cycle Bank 1 or 2	Engine idling	0.82–1.50 ms	This parameter displays the amount of fuel injector ON time or pulse width as commanded by the control module.
Ignition Cycles with Malfunction Since 1st Malfunction	Ignition ON	Counts	This Parameter contains the number of ignition cycles with a failure reported since the first ignition cycle with a failure reported.
Ignition Cycles without Malfunction Since Last Malfunction	Ignition ON	Counts	This Parameter contains the number of ignition cycles with a pass reported and no failures reported since the first ignition cycle with a failure reported.
Ignition Timing	Engine Idling	Degrees	This Parameter displays the final spark advance in terms of a crankshaft angle
Immobilizer Auto Learn Counter	Ignition ON	Counts	This Parameter displays the number of auto-learn cycles that have been successfully completed within the immobilizer system.
Immobilizer Automatic Learn Timer	Ignition ON	h/m/s	This Parameter displays the time elapsed within the current auto-learn cycle within the immobilizer system.
Immobilizer Password Learn	Ignition ON	Active/Inactive	Learning Enabled indicates that learning of immobilizer code information is enabled.
Immobilizer Password Learn Scan Tool Delay	Engine Idling	Active/Inactive	Scan tool Learn Delay Active indicates that the security code has been accepted but the scan tool learn delay is active and will not allow learning enabled, programming security code, or resetting security code.
Immobilizer Security Code Accepted	Engine Idling	Yes/No	Security Code Accepted displaying Yes indicates that the received security code is correct
Immobilizer Security Code Lockout	Engine Idling	Yes/No	Security Code Lockout Active indicates that the security code has not passed and lockout is active.
Immobilizer Security Code Lockout Active Timer	Engine Idling	ms	This Parameter displays the time elapsed since the immobilizer security code lockout has been activated either due to a battery disconnect or an incorrect immobilizer security code being entered
Immobilizer Security Code Programmed	Ignition ON	Yes/No	Security Code Programmed indicates that the security code has been programmed.
Immobilizer Security Code Programming Counter	Ignition ON	Counts	This Parameter displays the number of times a new immobilizer security code has been programmed through secure access. This counter can only be incremented.
Immobilizer Security Code Reset Counter	Ignition ON	Counts	This Parameter displays the number of times the immobilizer security code has been reset to the default value through secure access. This counter can only be incremented.
Immobilizer Security Information Programmed	Ignition ON	Yes/No	This Parameter displays the status of the immobilizer system

Parameter	System State	Expected Value	Description
Immobilizer System Status	Ignition ON	Varies	This Parameter displays the status of the immobilizer system, the following maybe displayed. Standby, Immobilized at Startup, Immobilized, No Response, Immobilized Negative Response, Immobilized, Incorrect Response, Post-Release State, Pre-Release State, Release State
Immobilizer Valid Response Received Time	Ignition ON	ms	This Parameter displays the actual time observed for a valid immobilizer response.
Intake Camshaft Position Bank 1 or 2	Engine Idling	0 Degrees	This parameter displays the actual intake camshaft position in degrees.
	Engine speed at 2000 RPM	10 Degrees	
Intake Camshaft position Variance Bank 1 or 2.	Engine Idling	0 Degrees	This parameter displays in degrees, the difference between the desired intake camshaft position and the actual intake camshaft position.
	Engine speed at 2000 RPM	0 Degrees	
Intake Camshaft Position Active Counter Bank 1 or 2	Engine Idling	0–255	This parameter displays an incrementing counter when the control module receives a signal from the intake camshaft position (CMP) sensor.
Intake Camshaft Position Commanded Bank 1 or 2	Engine Idling	20 %	This parameter displays the ON-time or duty cycle of the intake camshaft position (CMP) actuator solenoid valve as commanded by the control module.
	Engine speed at 2000 RPM	50 %	
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Low Voltage Test Status Bank 1 or 2.	Engine Idling	OK or Not Run	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to ground.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit Open Test Status Bank 1 or 2.	Engine Idling	OK or Not Run	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is open.
Intake Camshaft Position Actuator Solenoid Valve Control Circuit High Voltage Test Status Bank 1 or 2.	Engine Idling	OK or Not Run	This parameter displays the state of the intake camshaft actuator solenoid control circuit. The parameter displays Malfunction if the camshaft actuator solenoid control circuit is shorted to voltage.
Intake Manifold Pressure	Engine Idling	kPa/psi	This Parameter displays the engine intake manifold vacuum pressure calculated as the difference between ambient air pressure (barometric pressure) and intake manifold absolute pressure (MAP).
Knock Retard	Engine Idling	0 Degrees	This parameter indicates the amount of spark advance the control module removes from the ignition control (IC) spark advance in response to the signal from the knock sensors.
Long Term Fuel Trim Bank 1 or 2	Engine Idling	0 %	This parameter displays the commanded Long Term Fuel Trim correction by the control module for bank 1 or bank 2 for cruise and acceleration conditions.
Long Term Fuel Trim Test Average Bank 1 or 2	Engine Idling	0 %	This Parameter displays the filtered long term closed loop fuel correction for bank 1 or 2. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Long Term Fuel Trim Test Average without Purge	Engine Idling	0 %	This Parameter displays the filtered non purge long term closed loop fuel correction for bank 1 or 2. This value is compared to thresholds to determine if the fuel adjustment system diagnostic is passing, failing, or indeterminate during normal purge-OFF operation as well as during the intrusive excess purge vapor test.
Long Term Fuel Trim Test Average without Purge Bank 1 or 2	Engine Idling	0 %	This Parameter displays the filtered non purge long term closed loop fuel correction for bank 1 or 2. This value is compared to thresholds to determine if the fuel adjustment system diagnostic

Parameter	System State	Expected Value	Description
			is passing, failing, or indeterminate during normal purge-OFF operation as well as during the intrusive excess purge vapor test.
Low Engine Oil Level Indicator Command	Engine Idling	OFF	The scan tool displays ON or OFF. This is the state of the low engine oil level indicator as monitored by the ECM.
Low Engine Oil Pressure Indicator Command	Engine Idling	ON/OFF	This parameter displays the commanded state of the low EOP lamp control circuit by the control module.
MAP Performance Test 1	Engine Idling	OK	MAP Test 1 Residual Out of Tolerance indicates that the filtered MAP Test 1 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the mass airflow predicted from the throttle model) exceeds a failure threshold.
MAP Performance Test 2	Engine Idling	OK	MAP Test 2 Residual Out of Tolerance indicates that the filtered MAP Test 2 residual (the difference between the measured intake manifold pressure and the intake manifold pressure predicted from the intake manifold model using the measured mass airflow) exceeds a failure threshold.
MAP Sensor	Engine Idling	kPa/psi	This Parameter displays the actual engine intake manifold absolute pressure (MAP).
MAP Sensor	Engine Idling	0.4–2.0V	The Parameter displays The MAP sensor voltage as it measures the change in the intake manifold pressure which results from engine load and speed changes. As the intake manifold pressure increases, the air density in the intake also increases and additional fuel is required.
Maximum Engine Speed When Engine Overspeed Detected	Engine Idling	RPM	This Parameter displays the Maximum Engine Speed When Engine Overspeed Detected
MAF Sensor	Engine Idling	3.0–8.3 g/s	This parameter displays in grams per second, the measured quantity of air flowing into the engine during all operating conditions.
	Engine speed at 2,500 RPM	11.88 g/s	
MAF Sensor	Engine Idling	2,000–2,500 Hz	The scan tool displays a range of 0-65,555 hertz. This parameter displays the frequency signal input to the control module, and represents measured quantity of air flowing into the engine during all operating conditions.
MIL Control Circuit Low Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to ground.
MIL Control Circuit Open Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is open.
MIL Control Circuit High Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the MIL control circuit. The parameter displays Malfunction if the MIL control circuit is shorted to voltage.
MIL Command	Engine Idling	ON/OFF	This parameter displays the commanded state of the malfunction indicator lamp (MIL) control circuit by the control module.
Mil Requested by DTC	Engine Idling	Yes/No	This parameter indicates the reason the control module illuminated the MIL. The scan tool will display YES when the MIL is requested as a result of an A or B type DTC. The scan tool will display NO if the MIL is illuminated for another reason, such as transmission DTCs.
Misfire Diagnostic Engine Load	Engine Idling	%	This Parameter displays the engine load used within the misfire diagnostic (calculated as the ratio of the mass of air predicted to be in the cylinder two firing events into the future to the maximum possible mass of air in the cylinder based on the current ambient air pressure and charge temperature).

Parameter	System State	Expected Value	Description
O2S/HO2S Monitor Complete This Ignition Cycle	Engine Idling	Yes/No	This Parameter displays the enable and completion status during the current driving / monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
O2S/HO2S Monitor Enabled This Ignition Cycle	Engine Idling	Yes/No	This Parameter displays the enable and completion status during the current driving / monitoring cycle of each continuous legislated emission related monitor and non continuous legislated emission related monitor.
Odometer When Engine Overspeed Detected	Engine Idling	km/miles	This Parameter displays the kilometers or miles of the Odometer When Engine Overspeed Detected.
Park/Neutral Position Switch (If Equipped)	Engine Idling	Park/Neutral	This parameter indicates the range selection of the automatic transmission as calculated by the control module based on input from the PNP switch. The scan tool will display, In Gear, Park, or Neutral depending on the PNP switch position.
Power Enrichment	Engine Idling	Inactive	This parameter indicates if the control module has detected conditions appropriate to operate in Power Enrichment mode. The scan tool will display Active if the mode is in operation, and Inactive if the mode is not in operation. The control module enters Open Loop operation and increases injector pulse width when in power enrichment mode.
Power Mode	Engine Idling	OFF/Accessory /Run/Crank Request	This Parameter displays the state of the System Power Mode. This signal is based upon the state of the system power mode received over serial communication from the vehicle electronics. If the serial data signal not received, the Parameter will display OFF.
Reduced Engine Power	Engine Idling	Active/Inactive	This parameter displays Active if the control module is commanding reduced engine power due to a throttle actuator control (TAC) system condition.
Remote Vehicle Start Disable History 1–8	Engine Cranking	Reason for RVS Disable	These parameters displays the last eight reasons the control module disabled remote vehicle start (RVS).
Reduced Engine Power History	Engine Idling	Throttle Malfunction, Cooling Fan Malfunction, Engine Over-temperature Protection Active, Engine Oil Temperature Too High, Remote Vehicle Speed Limiting, Engine Calibration Malfunction, Engine Oil Life, High Pressure Fuel System Malfunction	This Parameter Displays the last reason that Powertrain Module has illuminated the Reduced Engine Power (REP) indication.
Redundant Odometer Memory	Engine Idling	Present/Not Present	ECU Odometer Programmed indicates if the ECU odometer value has been programmed
Remaining Fuel in Tank	Engine Idling	%	This Parameter displays the total fuel level as a percentage of the rated capacity of the fuel tank.
Remaining Fuel in Tank	Engine Idling	Liters/Gallons	This Parameter displays the actual total fuel volume contained in the fuel tank.
Remote Vehicle Start Request Signal	Ignition OFF	ON/OFF	Remote Vehicle Start Request indicates the state of the request received over serial communication from the remote vehicle start (RVS) system to start the vehicle in remote mode.
Short Term Fuel Trim Bank 1 or Bank 2	Engine Idling	-5 % to +5 %	This parameter displays the short-term correction to the fuel delivery by the control module in response to oxygen sensor 1 or 2. If the oxygen sensor indicates a lean air/fuel mixture, the control module will add fuel increasing the short term fuel trim above 0. If the oxygen sensor indicates a rich air/fuel mixture, the control module will reduce fuel decreasing the short term fuel trim below 0.
Short Term Fuel Trim Test Average Bank 1 or Bank 2	Engine Idling	%	This Parameter display's the filtered short term closed loop fuel correction for bank 1 or 2. This value is compared to thresholds to determine if

Parameter	System State	Expected Value	Description
			the fuel adjustment system diagnostic is passing or failing or if an excess purge vapor test should be executed.
Starter Relay Control Circuit Low Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to ground. This parameter may not change if the scan tool is used to command the relay control circuit ON.
Starter Relay Control Circuit Open Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is open. This parameter may not change if the scan tool is used to command the relay control circuit ON.
Starter Relay Control Circuit High Voltage Test Status	Ignition ON	OK or Not Run	This parameter displays the state of the starter relay control circuit. The parameter displays Malfunction if the starter relay control circuit is shorted to voltage. This parameter may not change if the scan tool is used to command the relay control circuit ON.
Starter Relay Command	Ignition switch not in the crank position	ON/OFF	This parameter indicates whether the control module is commanding the starter relay to go ON or OFF.
	Ignition switch in the crank position	ON	
Start Up ECT	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the engine coolant on start-up based on input to the control module from the ECT sensor.
Start Up IAT	Ignition ON	-39° to +140°C (-38° to +284°F)	This parameter displays the temperature of the intake air at start in the air induction system based on input to the control module from the IAT sensor.
SVS Indicator Command	—	Off	This parameter displays ON when a Service Engine System Non Emission Related Indication is detected.
TAC Forced Engine Shutdown	Ignition ON	Yes/No	This parameter indicates the status of the TAC motor by the control module. The scan tool will display Yes if the engine has been shut down due to a throttle control fault.
TAC Motor	Ignition ON	Enabled/Disabled	This parameter indicates the status of the throttle actuator control (TAC) motor driver in the control module. The scan tool will display Enabled if TAC motor operation is allowed. The scan tool will display Disabled if the control module detects a condition that affects TAC motor operation.
TAC Motor Command	Ignition ON	%	This Parameter displays the commanded duty cycle for the throttle actuator output.
Throttle Position Performance Test	Engine Idling	OK/Malfunction	Throttle Position Residual Out of Tolerance indicates that the filtered throttle position residual (the product of the MAF residual and the MAP Test 1 residual) exceeds a failure threshold.
Total Knock Retard	Engine Idling	0°	This parameter displays how much ignition spark timing is being retarded due to all control systems monitored by the control module.
Total Misfire	Engine Idling	0	This parameter displays the total number of cylinder firing events that the control module detected as misfires for the last 200 crankshaft revolution sample period.
Throttle Position	Ignition ON	0–100 %	This parameter displays the desired TP angle commanded by the control module.
Throttle Position Sensor 1	Ignition ON	3.7–4.3 V	This parameter displays the actual voltage on the TP sensor 1 signal circuit as measured by the control module.
Throttle Position Sensor 1 Learned Minimum	Ignition ON	4.1–4.7 V	This parameter displays the learned minimum value of throttle position (TP) sensor 1 as recorded by the control module during the last

Parameter	System State	Expected Value	Description
			learn procedure.
Throttle Position Sensor 1 or 2 Position	Ignition ON	%	This parameter displays the actual voltage on the TP sensor 2 signal circuit as measured by the control module.
Throttle Position Sensor 2 Learned Minimum	Ignition ON	0.5–0.9 V	This parameter displays the learned minimum value of TP sensor 2 as recorded by the control module during the last learn procedure.
Throttle Position Sensors 1 and 2	Ignition ON	Agree/Disagree	This parameter displays Disagree when the control module detects that TP sensor 1 voltage signal is not within the correct relationship to TP sensor 2. The scan tool displays Agree under the normal operating conditions.
Traction Control Status	Ignition ON	Active/Inactive	This parameter displays Active if the electronic brake and traction control module (EBTCM) is commanding traction control.
Torque Delivered Signal	Vehicle Moving	Y/Lb Ft	This Parameter displays the engine torque based upon the airflow through the engine and the torque losses due to spark retard and fuel shutoff. Since this is a steady state engine torque, it does not include the inertial component of engine torque.
Torque Management Ignition Timing Retard	Engine Idling	Degrees	This Parameter displays the total spark retard (in terms of a crankshaft angle).
Torque Request Inhibit-Fuel	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-Ignition Timing	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-Ignition Timing Advance	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-Minimum Idle	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-Minimum Torque	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-TAC	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Torque Request Inhibit-TAC Limit	Engine Idling	Yes/No	This Parameter displays the existing condition in the ECM causing the transmission torque request to be limited.
Total Engine Overspeed Time	Engine Idling	ms	This Parameter displays the Total Engine Overspeed Time.
VIN Programming Counter	Ignition ON	Counts	This Parameter displays the number of times the VIN has been programmed. This counter can only be incremented.
Vehicle Speed Sensor	Vehicle Moving	Km/h mph	This parameter displays the speed of the vehicle as calculated by the transmission control module (TCM) from information received from the vehicle speed sensor (VSS).
Vehicle Speed When Engine Overspeed Detected	Engine Idling	Km/h mph	This Parameter displays the Vehicle Speed When Engine Overspeed Detected.
Warm Ups Since DTC Cleared	Engine Idling	Counts	This parameter indicates the number of warm up cycles that have occurred Since DTCs were cleared. The scan tool will display a higher counts as more warm up cycles have occurred since the DTCs were cleared.
Warm Ups without Emission Malfunctions	Engine Idling	Counts	This Parameter displays the number of OBD defined warm up cycles since the last emissions related (fault type A or B) fail report or MIL request. Emissions related DTCs are cleared from

Parameter	System State	Expected Value	Description
Warm Ups without Non Emission Malfunctions	Engine Idling	Counts	memory when this counter reaches 40. This Parameter displays the number of OBD defined warm up cycles since the last non emissions related (fault type C) fail report. Non emissions related DTCs are cleared from memory when this counter reaches 40.
Wide Open Throttle	Engine Idling	Yes/NO	This parameter displays the throttle status commanded by the control module. The scan tool will display YES if the vehicle throttle is commanded to 100 percent.

Engine Control Module (ECM) Scan Tool Output Controls

Output Control	Description
Compression Test	This device control is used to set up the internal combustion engine for a compression test. The fuel pump, fuel injectors, and spark are all disabled. The throttle is opened to a Wide Open Throttle (WOT) position. For conventional engine vehicles, the extended crank feature is not active, and for strong hybrid vehicles, the Hybrid Powertrain Control Module is configured to crank at the speed specified in the device control command. Engine cranking is completely controlled by the technician either through the ignition key or through a remote starter switch as applicable. The device control limits and rejects will apply normally upon entry to the device control. Once the device control is active, the limits will be monitored (to prevent unwanted starter operation, for example), but in the case of a limit exceeded or a tester disconnect, device control of the fuel and spark will not be released until the Power Mode switches to Accessory or OFF. This will prevent unexpected fuel and spark operation in the case of a device control abort.
Cooling Fan Relay 1	This function activates the cooling fan relay 1. The normal commanded state of the fan relay is NONE. The relay command status can also be monitored on the scan tool data parameter Cooling Fan Relay 1 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F)
Cooling Fan Relay 1,2 and 3	This function activates the cooling fan relay 1, 2 and 3. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameters Cooling Fan Relay 1 Command and Cooling Fan Relays 2 and 3 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F)
Cooling Fan 2	This function activates the cooling fan relay 2. The normal commanded state of the fan relays is NONE. The relay command status can also be monitored on the scan tool data parameter 2 Command. The control module allows cooling fan relay control when the following conditions are met: • The Ignition is ON or the engine is running. • A/C compressor operation is not requested. • The engine coolant temperature is less than 106°C (224°F)
Crankshaft Position Variation Learn	This device control is used to activate the crankshaft position variation learn algorithm which calculates the reference pulse correction factors for the misfire diagnostic.
Engine Controls Ignition Relay	This device control is used to override the state of the Powertrain Relay.
Engine Oil Life Reset	This device control contains the engine oil remaining life determined from a calculation based upon the effective engine revolutions and the distance driven since the last oil change. This device control may be used to reset the engine oil remaining life to 100 % after an oil change or to any other value when replacing a control module Note: The Misfire Current and Misfire History parameters may not increment when using this function. This function disables the selected fuel injector. The normal commanded state is None. The scan tool initiates the test when the following conditions are met:
Cylinder Power Balance	• The engine is operating and the engine idle is stable. • The vehicle speed is 0 km/h (0 mph). • There are no DTCs set for the vehicle speed sensor. If the fuel injector was disabled for 30 seconds, fuel injector control is not allowed again on the same fuel injector for 60 seconds.
Engine Speed	This function controls the idle speed override in 25 RPM, 100 RPM, and 500 RPM increments, from the base idle speed to 1,400 RPM. The scan tool initiates the test when the following conditions are met:

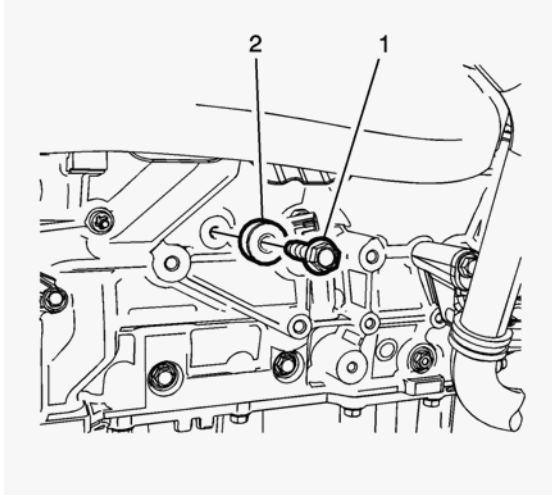
Output Control	Description
	- The transmission is in park or neutral. - The engine speed is less than 1,000 RPM. The engine speed will remain in the commanded state until cancelled by the scan tool.
EVAP Test	This device control is used to activate the evaporative emissions service bay test. Note: The EVAP Purge Solenoid Command parameter may not change states when using this output control.
EVAP Purge Solenoid Valve	This function controls the evaporative emission (EVAP) purge solenoid valve. The normal commanded state is NONE. The system will increase or decrease the amount of purge by changing the duty cycle of the purge valve in 10 percent increments within a range of 0–100 percent. The system remains in the commanded state until cancelled by the scan tool or the fuel tank pressure (FTP) sensor exceeds –24 mm Hg (–12 inch H2O). Note: The EVAP Purge and Vent Solenoid Command parameters may not change states when using this output control.
EVAP Purge/Seal	This function activates both the EVAP purge solenoid valve and EVAP vent solenoid to seal the EVAP system. When activated, the purge valve is commanded to 0 percent and the vent valve is commanded ON, Not-venting. The normal commanded state for both solenoids is None. Both of the solenoids remain in the commanded state until cancelled by the scan tool or the FTP sensor exceeds –24 mm Hg (–12 inch H2O). Note: The EVAP Vent Solenoid Command parameter may not change states when using this output control.
EVAP Vent Solenoid Valve	This function controls the EVAP vent solenoid. The normal commanded state is NONE. When commanded ON, the vent valve switches to Not-venting. The system remains in the commanded state unless one of the following conditions occur: - Cancelled by the scan tool - The EVAP canister purge solenoid is more than 0 percent, and the FTP sensor exceeds –24 mm Hg (–12 inch H2O).
Exhaust Camshaft Position Actuator Bank 1	This device control is used to override the state of the exhaust cam phase output for bank 1. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).
Exhaust Camshaft Position Actuator Bank 2	This device control is used to override the state of the exhaust cam phase output for bank 2. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (retard for exhaust camshaft) from the park position (a camshaft position of zero represents the park position).
Exhaust Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the exhaust cam phase solenoid output for bank 1.
Exhaust Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the exhaust cam phase solenoid output for bank 2.
Fuel Control Loop Status	This function controls the heated oxygen sensor (HO2S) loop status. The commanded states include NONE, OPEN, and CLOSED. The normal commanded state is NONE. The loop status changes as commanded, OPEN or CLOSED. The system remains in the commanded state until cancelled by the scan tool. This function enables the fuel injector in order to verify the correct fuel injector flow. The ECM will pulse the selected fuel injector when the following conditions are met:
Fuel Injector Balance (If Available)	- All instruction on the scan tool is complete. - A fuel injector is selected. - The ignition is ON with the engine OFF. The selected fuel injector can only be flowed/pulsed once per ignition cycle. This function controls the fuel pump. The normal commanded state is NONE. The scan tool initiates the test when the following conditions are met:
Fuel Pump Relay	- There are no vehicle speed sensor DTCs set. - The vehicle speed is 0 km/h (0 mph). When commanded ON/OFF, the engine control module (ECM) turns the fuel pump ON/OFF. If the engine is running and the fuel pump is commanded OFF, the engine will stall. The system remains in the commanded state for about 2 seconds or until cancelled by the scan tool or the ECM detects a vehicle speed.
Fuel Trim Enable	This function disables the control modules ability to learn new fuel trim parameters. The commanded states are NONE, ENABLED, DISABLED. The normal commanded state is NONE. The system remains in the commanded state until cancelled by the scan tool.
Fuel Trim Reset	This function is used to reset the learned fuel trim values to their initial values.

Output Control	Description
Generator L-Terminal	Commands the generator L terminal ON and OFF.
HO2S Heater Bank 1 Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 1 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 1	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Bank 2 Sensor 2	This device control is used to override the duty cycle of the oxygen sensor heaters. With the engine OFF, this device control is intended to be used as a discrete control for circuit diagnosis. With the engine OFF, none of the oxygen sensor heaters can be commanded ON for more than 3.0 seconds, after which the selected oxygen sensor heater must be disabled for a limited duration (typically 60 seconds) before it may be enabled again. With the engine running, this device control is used to operate the oxygen sensor heaters at the various duty cycles available to the engine controller.
HO2S Heater Learn	This device control is used to trigger the reset of the learned resistances for the oxygen sensor heaters following a replacement in service. The learned resistances are reset to a calibration used to prevent overheating of the sensors until more accurate resistances may be learned following an extended engine OFF time (typically 12 or more hours).
Idle Learn	This function allows the throttle position and the idle speed to be relearned by the ECM, once the following conditions have been met. • The ignition is ON with the engine OFF. • The ECT is between 5–85°C (41–185°F). • No throttle actuator control (TAC) system DTCs are set.
Idle Ignition Timing	Disables and enables idle spark advance with the engine running.
Ignition Timing Retard	This device control is used to retard the spark angle from the software calculated spark angle. For example, if the software calculated spark angle was 15 degrees advanced and this device control requested a 3 degree retard, the commanded spark angle that would be delivered would be 12 degrees advanced.
Intake Camshaft Position Actuator Bank 1	This device control is used to override the state of the intake cam phase output for bank 1. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator Bank 2	This device control is used to override the state of the intake cam phase output for bank 2. The commanded camshaft position is expressed in terms of degrees of camshaft rotation (advance for intake camshafts) from the park position (a camshaft position of zero represents the park position).
Intake Camshaft Position Actuator Solenoid Valve Bank 1	This device control is used to override the state of the intake cam phase solenoid output for bank 1.
Intake Camshaft Position Actuator Solenoid Valve Bank 2	This device control is used to override the state of the intake cam phase solenoid output for bank 2.
Malfunction Indicator Lamp (MIL)	This function controls the malfunction indicator lamp (MIL). The normal commanded state is NONE. When commanded ON/OFF, the ECM turns the MIL ON/OFF. The system remains in the commanded state until cancelled by the scan tool.
Misfire Graphic	This function clears the misfire graphics from the scan tool.
Remote Vehicle Start Disable History Reset	This function clears the remote vehicle start (RVS) disable history. When RESET is selected the reason the control module did not allow RVS in the last 8 attempts is cleared.
Starter Relay (If Available)	Commands the starter relay ON and OFF.
Throttle Position	This device control is used to override the commanded throttle position.
Throttle Sweep	This function moves the Throttle plate slowly from a closed position to wide open position, aiding diagnosis of TAC motor.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Knock Sensor Replacement - Bank 1

Callout

Component Name

Preliminary Procedure

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Knock Sensor Bolt

Caution: Refer to Fastener Caution.

1

Tighten

23 Y (17 lb in)

Knock Sensor

2

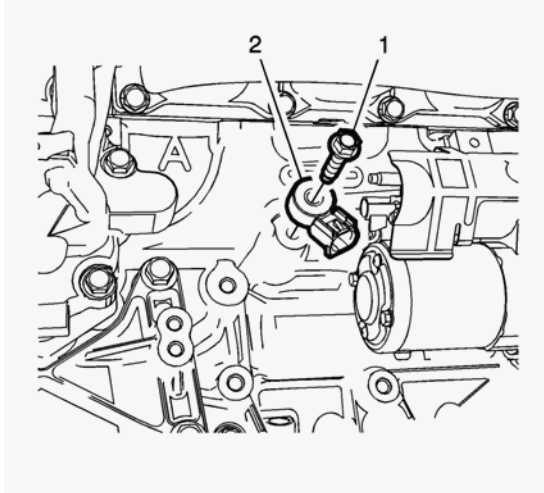
Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Knock Sensor Replacement - Bank 2

Callout

Component Name

Preliminary Procedure

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

Knock Sensor Bolt

Caution: Refer to Fastener Caution.

1

Tighten

25 Y (18 lb in)

Knock Sensor

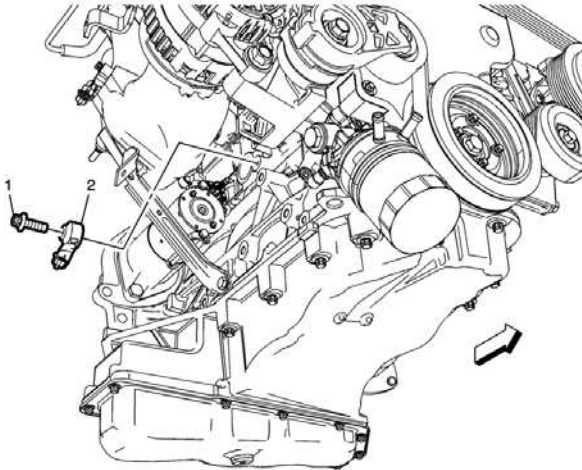
2

Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

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



Knock Sensor Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the engine front mount. Refer to Engine Front Mount Replacement.

Knock Sensor Fastener

Caution: Refer to Fastener Caution.

1

Tighten

15 Y (11 lb ft)

Knock Sensor

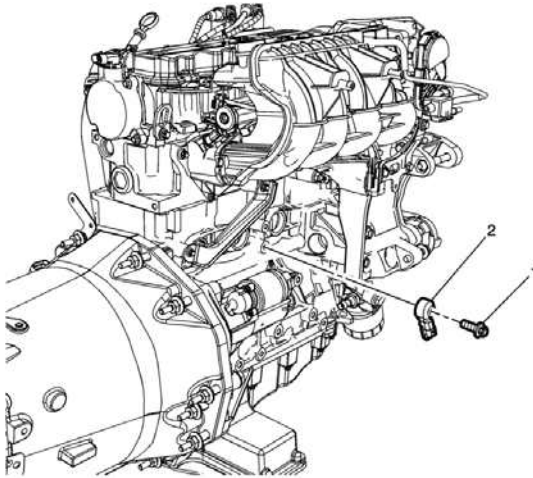
2

Procedure

Disconnect the knock sensor electrical connector.

2013 Chevrolet Colorado

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



Knock Sensor Replacement

Callout

Component Name

Preliminary Procedure

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
2. Remove the tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
3. Remove the right front engine lower front splash shield. Refer to Engine Lower Front Splash Shield Replacement.

Knock Sensor Fastener

Caution: Refer to Fastener Caution.

1

Tighten

15 Y (11 lb ft)

Knock Sensor

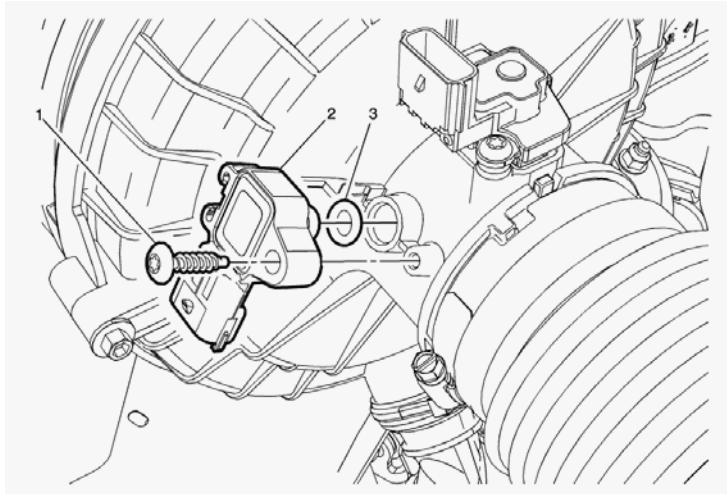
2

Procedure

Disconnect the knock sensor electrical connector.

2013 Chevrolet Colorado

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



Manifold Absolute Pressure Sensor Replacement

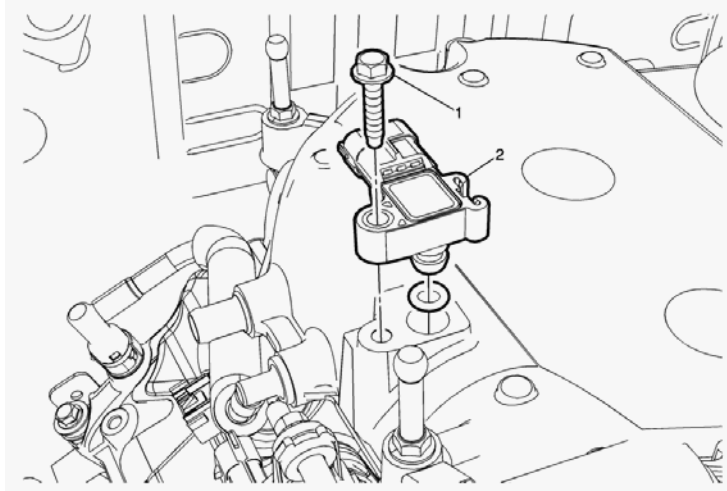
Callout

Component Name

- | | |
|---|--|
| | Manifold Absolute Pressure Sensor Fastener |
| 1 | Caution: Refer to Fastener Caution. |
| | Tighten |
| | 10 Y (89 lb in) |
| | Manifold Absolute Pressure Sensor |
| 2 | Procedure |
| | Disconnect the electrical wiring harness connector from the manifold absolute pressure sensor. |
| | Seal |
| 3 | Procedure |
| | Inspect the seal for damage and replace if necessary. |

2013 Chevrolet Colorado

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



Manifold Absolute Pressure Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Manifold Absolute Pressure Sensor Fastener

1

Caution: Refer to Fastener Caution.

Tighten

10 Y (80 lb in)

Manifold Absolute Pressure Sensor

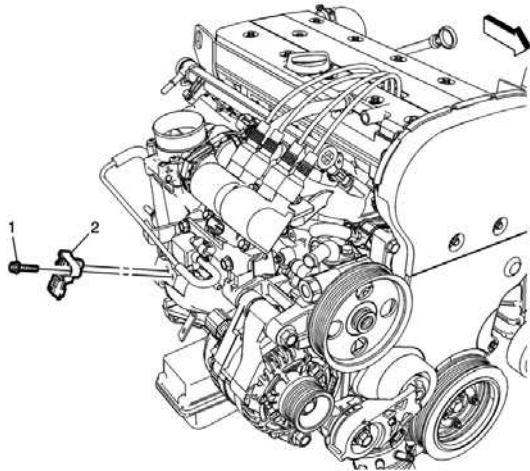
Procedure

2

1. Disconnect the electrical wiring harness connector from the manifold absolute pressure sensor.
2. Inspect the seal for damage and replace if necessary.

2013 Chevrolet Colorado

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



Manifold Absolute Pressure Sensor Replacement

Callout

Component Name

1

Manifold Absolute Pressure Sensor Fastener

Caution: Refer to Fastener Caution.

2

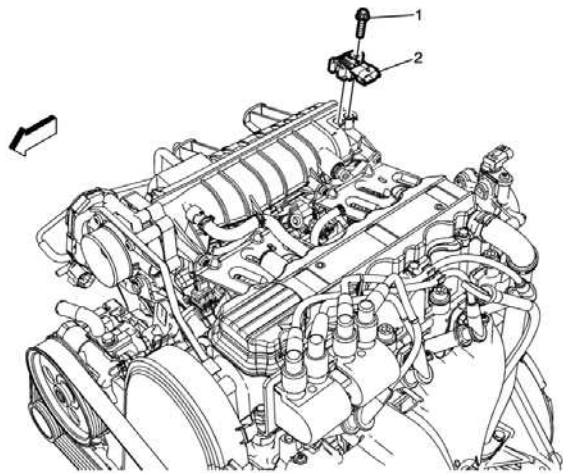
Manifold Absolute Pressure Sensor

Procedure

Disconnect the manifold absolute pressure sensor electrical connector.

2013 Chevrolet Colorado

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



Manifold Absolute Pressure Sensor Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

- 1 Manifold Absolute Pressure Sensor Fastener

Caution: Refer to Fastener Caution.

- 2 Manifold Absolute Pressure Sensor

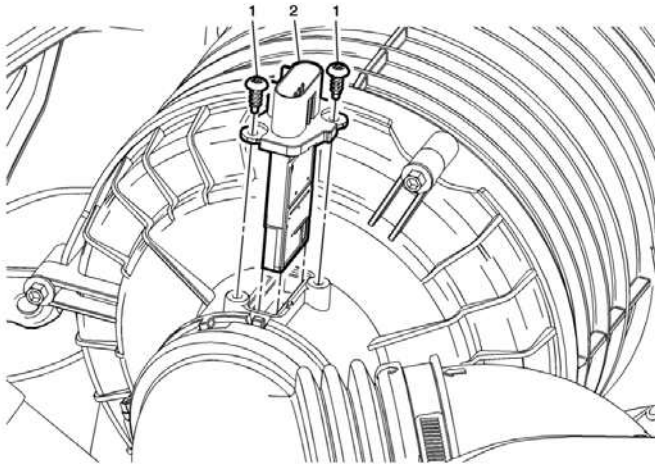
Procedure

Disconnect the manifold absolute pressure sensor electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

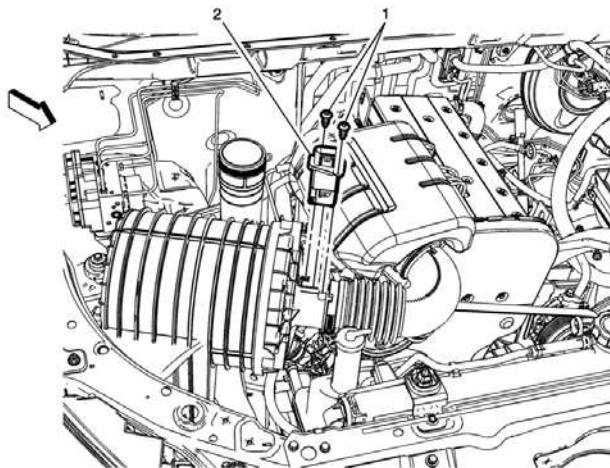
Callout

Component Name

- | | |
|---|--|
| | Mass Airflow Sensor Fastener (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 1 | Tighten |
| | 8 Y (70 lb in) |
| | Mass Airflow Sensor with Intake Air Temperature Sensor |
| 2 | Procedure |
| | Disconnect the electrical connector. |

2013 Chevrolet Colorado

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



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the mass airflow sensor with intake air temperature sensor electrical connector.

Mass Airflow Sensor with Intake Air Temperature Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y(70 lb in)

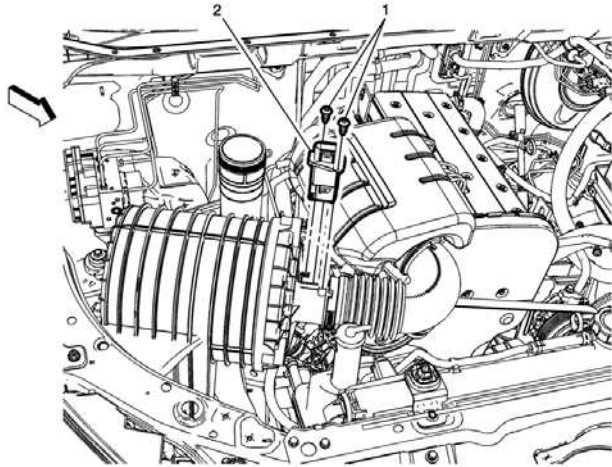
2

Mass Airflow Sensor with Intake Air Temperature Sensor

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the mass airflow sensor with intake air temperature sensor electrical connector.

Mass Airflow Sensor with Intake Air Temperature Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y(70 lb in)

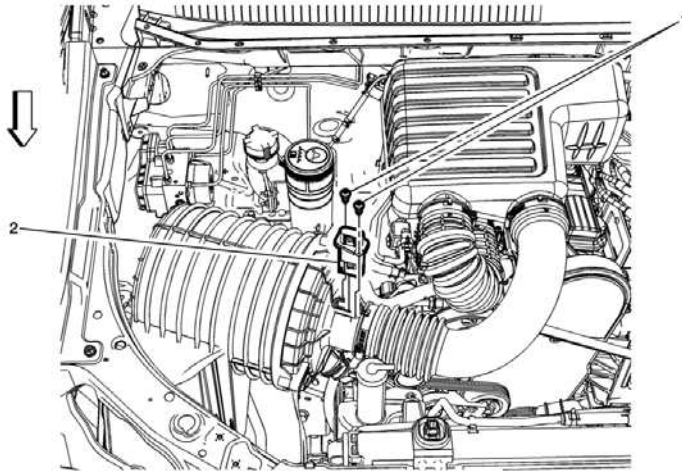
2

Mass Airflow Sensor with Intake Air Temperature Sensor

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the mass airflow sensor with intake air temperature sensor electrical connector.

Mass Airflow Sensor with Intake Air Temperature Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y (70 lb in)

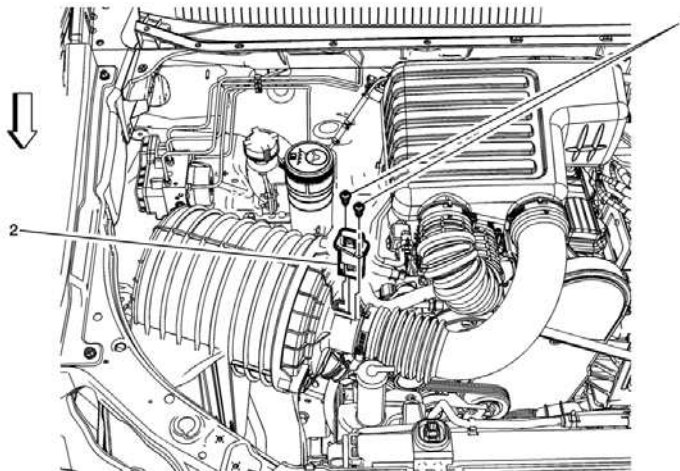
2

Mass Airflow Sensor with Intake Air Temperature Sensor

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Preliminary Procedure

Disconnect the mass airflow sensor with intake air temperature sensor electrical connector.

Mass Airflow Sensor with Intake Air Temperature Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y (70 lb in)

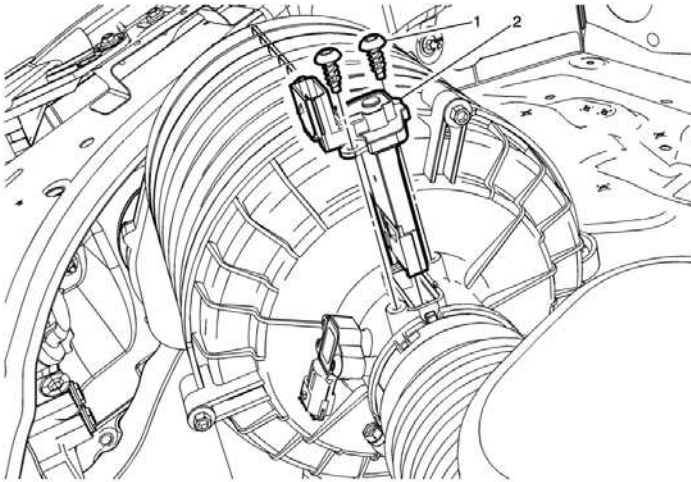
2

Mass Airflow Sensor with Intake Air Temperature Sensor

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Mass Airflow Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y (70 lb in)

Mass Airflow Sensor with Intake Air Temperature Sensor

2

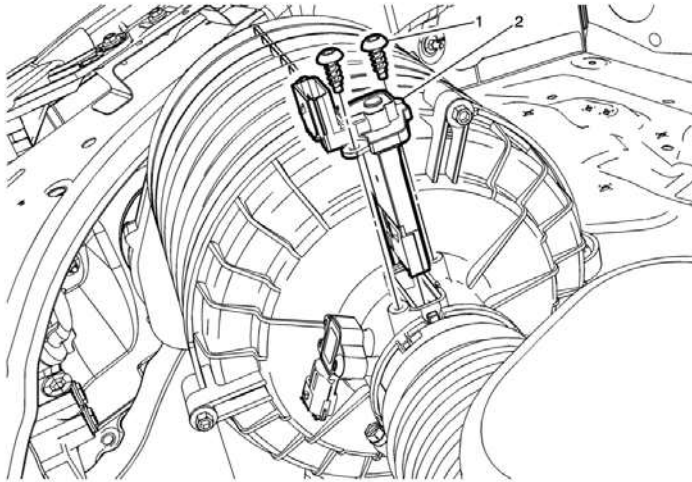
Procedure

Disconnect the electrical wiring harness connector from the mass airflow sensor.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

Mass Airflow Sensor Fasteners (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

8 Y (70 lb in)

Mass Airflow Sensor with Intake Air Temperature Sensor

2

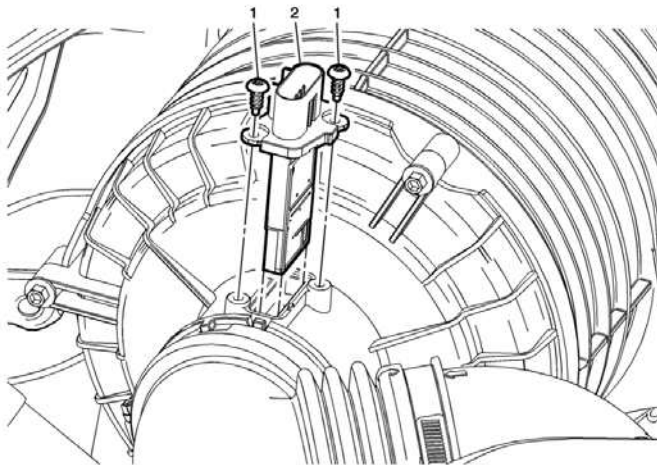
Procedure

Disconnect the electrical wiring harness connector from the mass airflow sensor.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Mass Airflow Sensor with Intake Air Temperature Sensor Replacement

Callout

Component Name

1

Mass Airflow Sensor Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

Tighten

8 Y (70 lb in)

2

Mass Airflow Sensor with Intake Air Temperature Sensor

Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

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

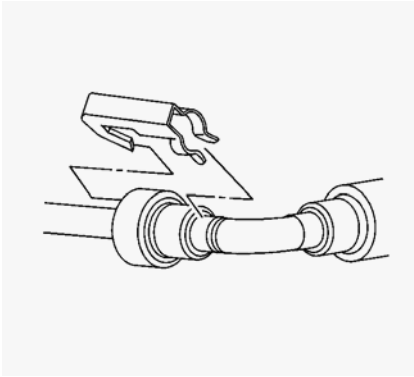
Special Tools

J-37088-A Fuel Line Disconnect Tool Set

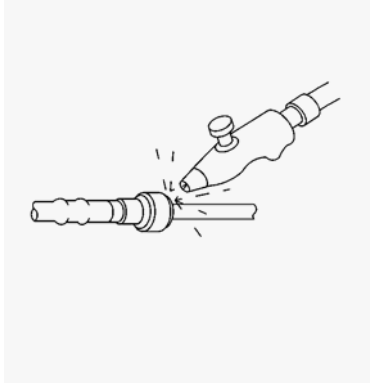
Removal Procedure

Warning: Refer to Gasoline/Gasoline Vapors Warning.

1. Relieve the fuel system pressure before servicing any fuel system connection.

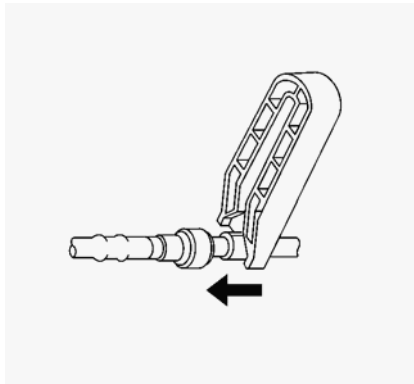


2. Remove the retainer from the quick-connect fitting.

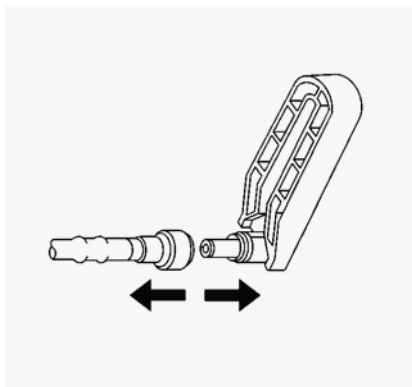


Warning: Wear safety glasses when using compressed air, as flying dirt particles may cause eye injury.

3. Blow dirt out of the fitting using compressed air.



4. Choose the correct J-37088-A fuel line disconnect tool set for the size of the fitting. Insert the J-37088-A fuel line disconnect tool set into the female connector, then push inward in order to release the locking tabs.



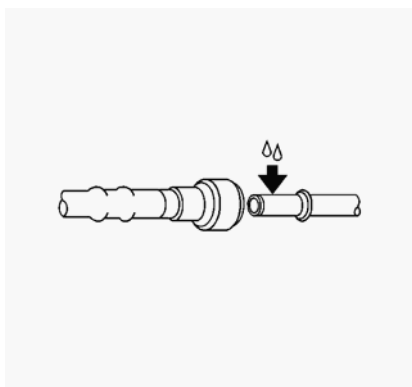
5. Pull the connection apart.

Caution: If necessary, remove rust or burrs from the fuel pipes with an emery cloth. Use a radial motion with the fuel pipe end in order to prevent damage to the O-ring sealing surface. Use a clean shop towel in order to wipe off the male tube ends. Inspect all the connections for dirt and burrs. Clean or replace the components and assemblies as required.

6. Using a clean shop towel, wipe off the male pipe end.
7. Inspect both ends of the fitting for dirt and burrs.

Clean or replace the components as required.

[Installation Procedure](#)

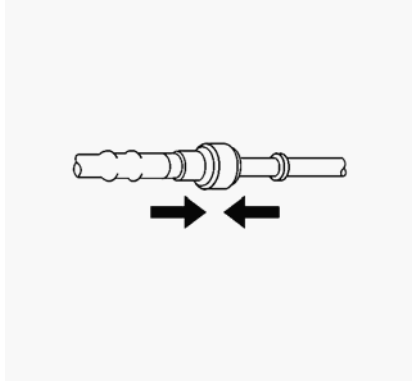


Warning: In order to reduce the risk of fire and personal injury, before connecting fuel pipe fittings, always apply a few drops of clean engine oil to the male pipe ends.

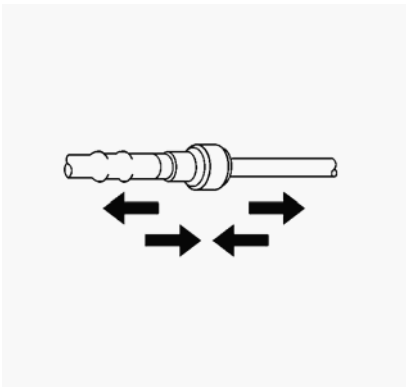
This will ensure proper reconnection and prevent a possible fuel leak.

During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.

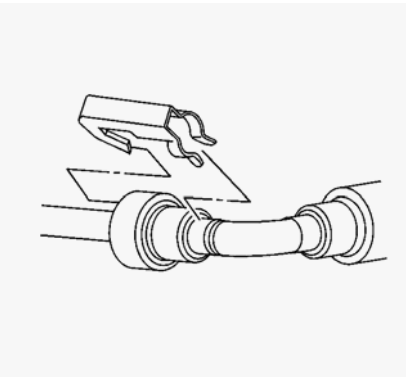
1. Apply a few drops of clean engine oil to the male pipe end.



2. Push both sides of the quick-connect fitting together in order to snap the retaining tabs into place.



3. Pull on both sides of the quick-connect fitting to make sure the connection is secure.

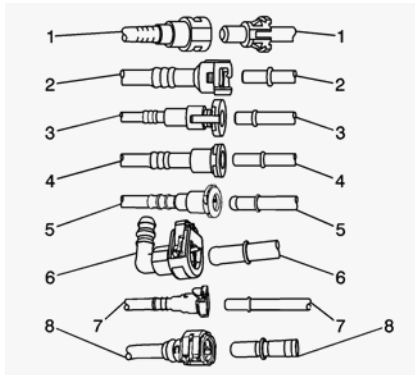


4. Install the retainer to the quick-connect fitting.
5. Inspect for leaks using the following procedure:
 1. Turn the ignition ON, with the engine OFF for 2 seconds.
 2. Turn the ignition OFF, for 10 seconds.
 3. Turn the ignition ON, with the engine OFF for 2 seconds.
 4. Turn the ignition OFF.
 5. Inspect for leaks.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
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[Removal Procedure](#)



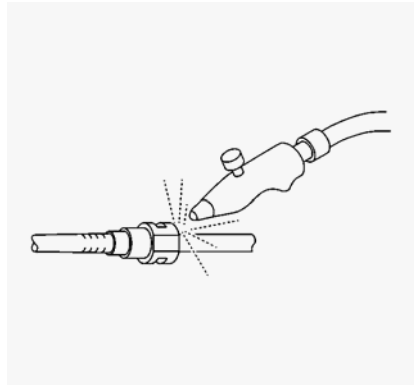
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Note: There are several types of Plastic Collar Fuel and Evaporative Emission Quick Connect Fittings used on this vehicle.

- o Bartholomew (1)
- o Q Release (2)
- o Squeeze to Release (3)
- o Sliding Retainer (4)
- o Global Connect (5)
- o TI Loc (6)
- o Safe Lock (7)

The following instructions apply to all of these types of Plastic Collar Quick Connect Fittings except where indicated.

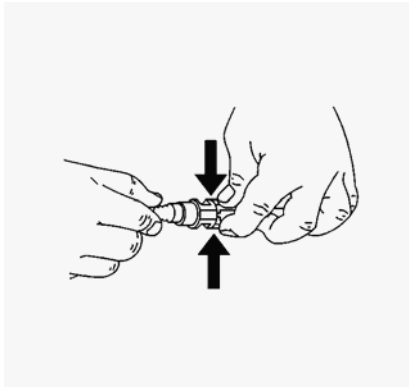
1. Relieve the fuel system pressure before servicing any fuel system connection.



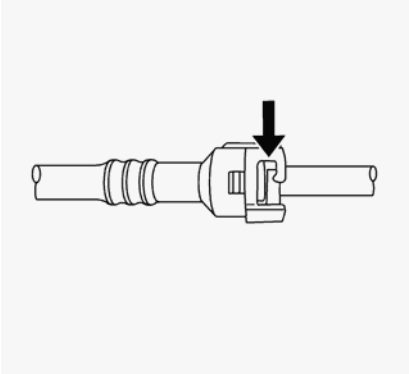
Warning: Refer to Safety Glasses and Compressed Air Warning.

Caution: Refer to Fuel and Evaporative Emission Hose/Pipe Connection Cleaning Caution.

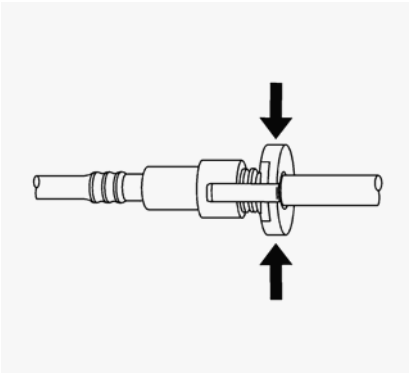
2. Using compressed air, blow any dirt out of the quick-connect fitting.



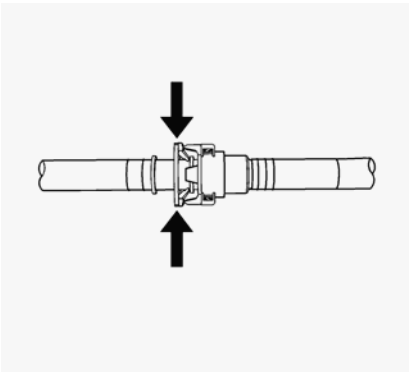
3. This step applies to Bartholomew style connectors ONLY. Squeeze the plastic quick-connect fitting release tabs.



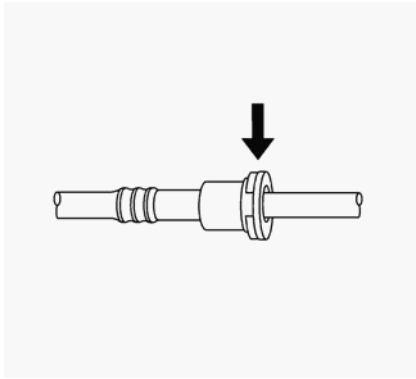
4. This step applies to Q Release style connectors ONLY. Release the fitting by Pushing the tab toward the other side of the slot in the fitting.



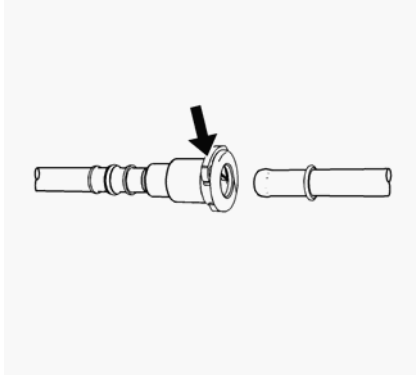
5. This step applies to Squeeze to Release style connectors ONLY. Squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



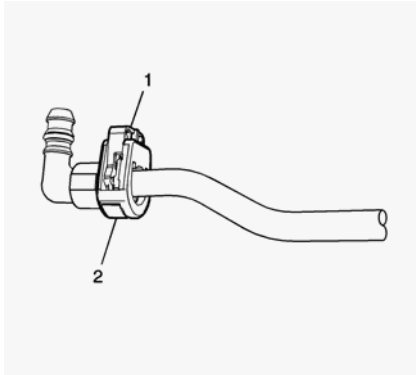
6. This step applies to Squeeze to Release style connectors ONLY. Push in the male side slightly in order to slide the retainer away from the retainers, squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



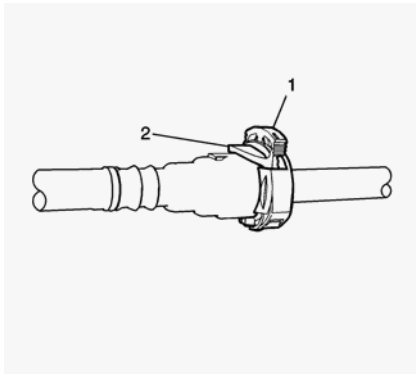
7. This step applies to Sliding Retainer style connectors ONLY. Release the fitting by pressing on one side of the release tab causing it to push in slightly. If the tab doesn't move try pressing the tab in from the opposite side. The tab will only move in one direction.



8. This step applies to the Global Connector style only. Push the connector toward the tube in order to release the pressure. Press and hold down the release mechanism, and pull the connector straight out.



9. This step applies to the TI Loc style only. Push the connector toward the tube in order to release the pressure. Release the redundant latch (1) with two fingers or a flat bladed tool. Then press and hold down the bottom release mechanism (2) and pull the connector straight out.

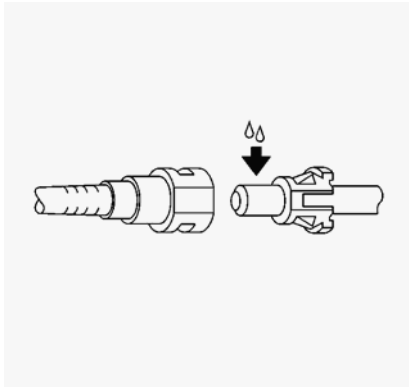


10. This step applies to the Safe Lock style only. Push the connector toward the tube in order to release the pressure. Release the second latch (1) with two fingers. Then press and hold down the bottom release mechanism (2) and pull the connector straight out.

Warning: Refer to Relieving Fuel Pressure Warning.

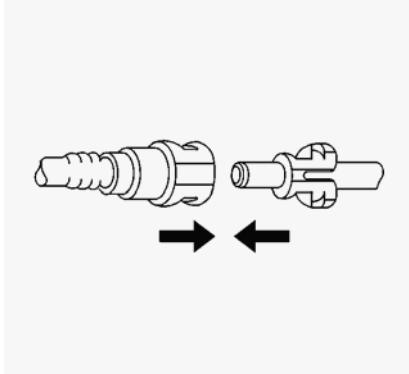
11. Using a clean shop towel, wipe off the male pipe end.
12. Inspect both ends of the fitting for dirt and burrs.
13. Clean or replace components as necessary.

[Installation Procedure](#)

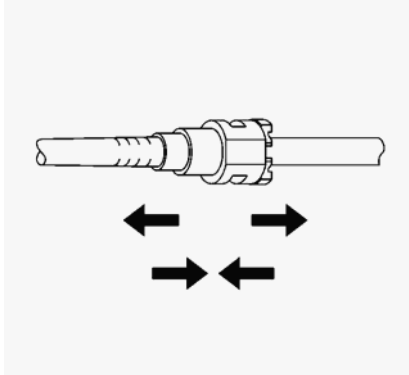


Warning: Refer to Fuel Pipe Fitting Warning.

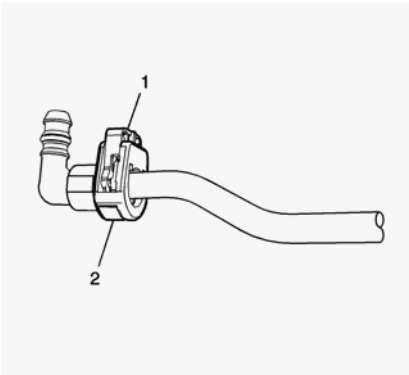
1. Apply a few drops of clean engine oil to the male pipe end.



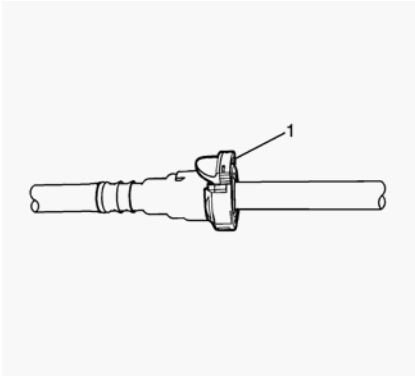
2. Push both sides of the quick-connect fitting together in order to cause the retaining feature to snap into place.



3. Pull on both sides of the quick-connect fitting to make sure the connection is secure.



4. Insert the tube in the connector until the retainer snaps in place.
5. Push down on the redundant latch (1) until it is fully engaged and snapped into position.



6. Insert the tube in the connector until the retainer snaps in place.
7. Push down on the second latch (1) in order to secure the connection.
8. Inspect for leaks using the following procedure:
 1. Turn the ignition ON, with the engine OFF for 2 seconds.
 2. Turn the ignition OFF, for 10 seconds.
 3. Turn the ignition ON, with the engine OFF for 2 seconds.
 4. Turn the ignition OFF.
 5. Inspect for leaks.

2013 Chevrolet Colorado

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

Caution: Contamination of the oxygen sensor can result from the use of an inappropriate RTV sealant (not oxygen sensor safe) or excessive engine coolant or oil consumption. Remove the HO2S and visually inspect the portion of the sensor exposed to the exhaust stream in order to check for contamination. If contaminated, the portion of the sensor exposed to the exhaust stream will have a white powdery coating. Silicon contamination causes a high but false HO2S signal voltage (rich exhaust indication). The control module will then reduce the amount of fuel delivered to the engine, causing a severe driveability problem. Eliminate the source of contamination before replacing the oxygen sensor.

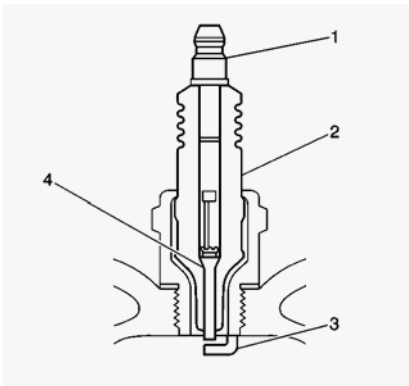
2013 Chevrolet Colorado

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

[Spark Plug Usage](#)

Ensure that the correct spark plug is installed. An incorrect spark plug causes driveability conditions. Refer to the Electronic Parts Catalog.

[Spark Plug Inspection](#)



- Inspect the terminal post (1) for damage.
 - Inspect for a bent or broken terminal post (1).
 - Test for a loose terminal post (1) by twisting and pulling the post. The terminal post (1) should NOT move.
- Inspect the insulator (2) for flashover or carbon tracking, soot. This condition is often mistakenly identified as a cracked insulator. This is caused by the electrical charge traveling across the insulator (2) between the terminal post (1) and ground. Inspect for the following conditions:
 - Inspect the spark plug boot for damage.
 - Inspect the spark plug recess area of the cylinder head for moisture, such as oil, coolant, or water. A spark plug boot that is saturated causes arcing to ground.
- Inspect the insulator (2) for cracks. All or part of the electrical charge may arc through the crack instead of the electrodes (3, 4).
- Inspect for evidence of improper arcing.
 - Measure the gap between the center electrode (4) and the side electrode (3) terminals. This must be done carefully in order to avoid damaging the small diameter Iridium center electrode. Refer to Ignition System Specifications. An excessively wide electrode gap can prevent correct spark plug operation.
 - Inspect for the correct spark plug torque. Refer to Ignition System Specifications. Insufficient torque can prevent correct spark plug operation. An over torqued spark plug, causes the insulator (2) to crack.
 - Inspect for signs of tracking that occurred near the insulator tip instead of the center electrode (4).
 - Inspect for a broken or worn side electrode (3).
 - Inspect for a broken, worn, or loose center electrode (4) by shaking the spark plug.
 - A rattling sound indicates internal damage.
 - A loose center electrode (4) reduces the spark intensity.
 - Inspect for bridged electrodes (3, 4). Deposits on the electrodes (3, 4) reduce or eliminates the gap.
 - Inspect for worn or missing platinum pads on the electrodes (3, 4) If equipped.
 - Inspect for excessive fouling.
- Inspect the spark plug recess area of the cylinder head for debris. Dirty or damaged threads can cause the spark plug not to seat correctly during installation.

[Spark Plug Visual Inspection](#)

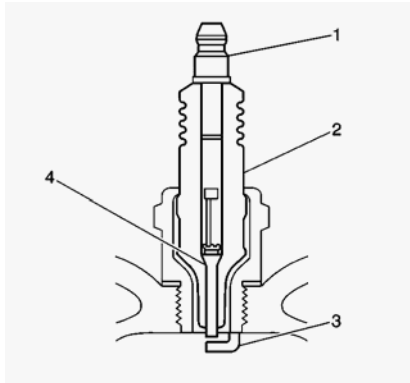
- Normal operation—Brown to grayish-tan with small amounts of white powdery deposits are normal combustion by-products from fuels with additives. Reddish orange deposits can indicate MMT fuel additive which is still used in some markets around the world (will cause misfire and cannot be burned off). MMT fuel additive use should be avoided.
- Carbon Fouled—Dry, fluffy black carbon, or soot caused by the following conditions:
 - Rich fuel mixtures
 - Leaking fuel injectors
 - Excessive fuel pressure
 - Restricted air filter element
 - Incorrect combustion
 - Reduced ignition system voltage output
 - Weak coils

Spark Plug Inspection

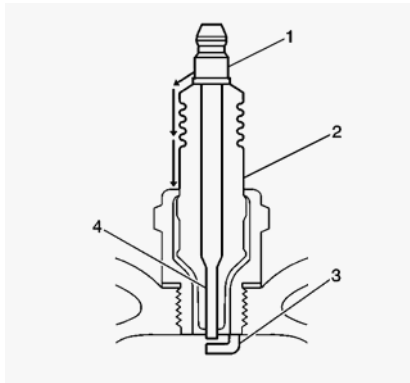
- Worn ignition wires
- Incorrect spark plug gap
 - Excessive idling or slow speeds under light loads can keep spark plug temperatures so low that normal combustion deposits may not burn off.
- Deposit Fouling—Oil, coolant, or additives that include substances such as silicone, very white coating, reduces the spark intensity. Most powdery deposits will not effect spark intensity unless they form into a glazing over the electrode.

2013 Chevrolet Colorado

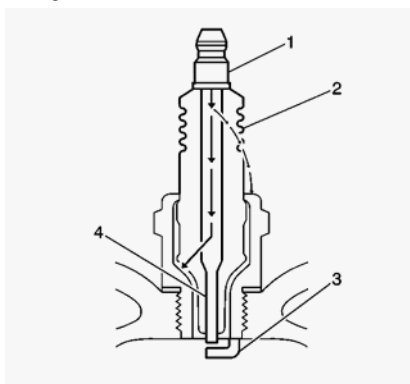
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



- Verify that the correct spark plug is installed. An incorrect spark plug causes driveability conditions. Refer to Ignition System Specifications.
- Ensure that the spark plug has the correct heat range. An incorrect heat range causes the following conditions:
 - Spark plug fouling – Colder plug
 - Pre-ignition causing spark plug and/or engine damage – Hotter plug
- Inspect the terminal post (1) for damage.
 - Inspect for a bent or broken terminal post (1)
 - Test for a loose terminal post (1) by twisting and pulling the post. The terminal post should not move.

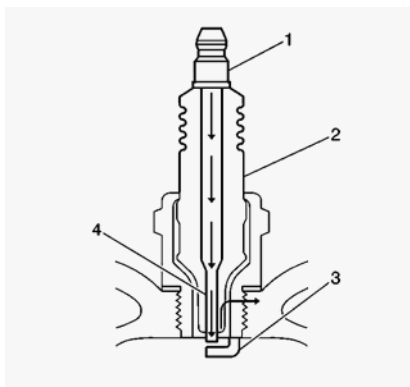


- Inspect the insulator (2) for flashover or carbon tracking, or soot. This is caused by the electrical charge traveling across the insulator between the terminal post (1) and ground. Inspect for the following conditions:
 - Inspect the spark plug boot for damage.
 - Inspect the spark plug recess area of the cylinder head for moisture, such as oil, coolant, or water. A spark plug boot that is saturated will cause arcing to ground.



- Inspect the insulator (2) for cracks. All or part of the electrical charge may arc through the crack instead of the electrodes (3,4).

Spark Plug Inspection



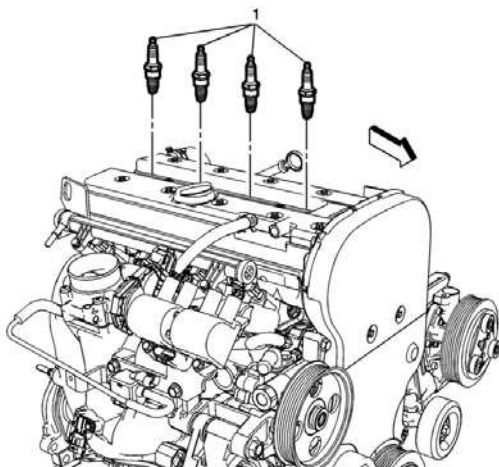
- Inspect for evidence of improper arcing.
 - Measure the gap between the center electrode (4) and the side electrode (3). Refer to Ignition System Specifications. An excessively wide electrode gap can prevent correct spark plug operation.
 - Inspect for the correct spark plug torque. Refer to Ignition System Specifications. Insufficient torque can prevent correct spark plug operation. An over torqued spark plug, causes the insulator (2) to crack.
 - Inspect for signs of tracking that occurred near the insulator tip instead of the center electrode (4).
 - Inspect for a broken or worn side electrode (3).
 - Inspect for a broken, worn, or loose center electrode (4) by shaking the spark plug.
- A rattling sound indicates internal damage.
- A loose center electrode (4) reduces the spark intensity.
- Inspect for bridged electrodes (3,4). Deposits on the electrodes (3,4) reduce or eliminate the gap.
- Inspect for worn or missing platinum pads on the electrodes (3,4), if equipped.
- Inspect for excessive fouling.
- Inspect the spark plug recess area of the cylinder head for debris. Dirty or damaged threads can cause the spark plug not to seat correctly during installation.

Visual Inspection

- Normal operation – Brown to grayish-tan with small amounts of white powdery deposits are normal combustion by-products from fuels with additives.
- Carbon fouled – Dry, fluffy black carbon, or soot caused by the following conditions:
 - Rich fuel mixtures
 - Leaking fuel injectors
 - Excessive fuel pressure
 - Restricted air filter element
 - Incorrect combustion
 - Reduced ignition system voltage output
 - Weak ignition coils
 - Worn ignition wires
 - Incorrect spark plug gap
 - Excessive idling or slow speeds under light loads can keep spark plug temperatures so low that normal combustion deposits may not burn off.
- Deposit fouling – Oil, coolant, or additives that include substances such as silicone, very white coating, reduces the spark plug intensity. Most powdery deposits will not affect spark plug intensity unless they form into a glazing over the electrode.

2013 Chevrolet Colorado

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



Spark Plug Replacement

Callout

Component Name

Preliminary Procedure

Remove the spark plug wires. Refer to Spark Plug Wire Replacement

Spark Plugs (Qty: 4)

Procedure

1

Caution: Refer to Component Fastener Tightening Caution.

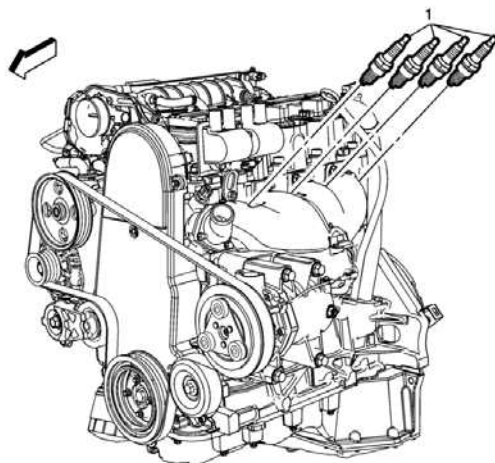
1. Loosen the spark plug 1-2 turns..
2. Brush or using compressed air, blow away any dirt from around the spark plug.

Tighten

18 Y (13 lb ft)

2013 Chevrolet Colorado

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



Spark Plug Replacement

Callout

Component Name

Preliminary Procedure

Remove the spark plug wires. Refer to Spark Plug Wire Replacement

Spark Plugs (Qty: 4)

Procedure

1

Caution: Refer to Component Fastener Tightening Caution.

1. Loosen the spark plug 1-2 turns..
2. Brush or using compressed air, blow away any dirt from around the spark plug.

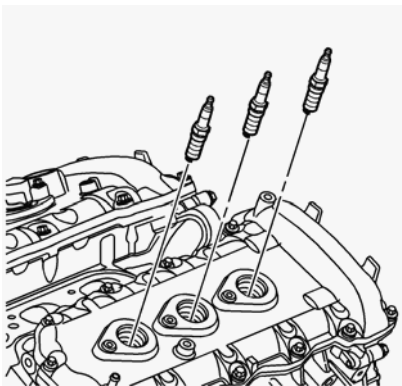
Tighten

18 Y (13 lb ft)

2013 Chevrolet Colorado

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

[Removal Procedure](#)

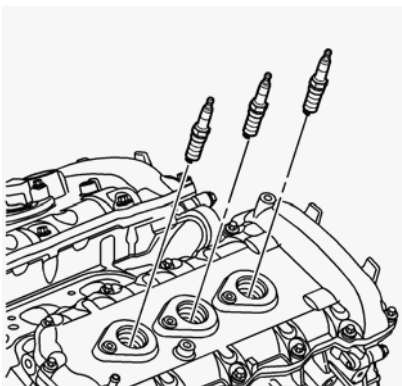


1. Turn the ignition OFF.
2. Remove the ignition coil. Refer to Ignition Coil Replacement - Bank 1 and/or Ignition Coil Replacement - Bank 2.

Warning: Refer to Safety Glasses and Compressed Air Warning.

3. Use compressed air in order to remove debris from the spark plug cavity.
4. Remove the spark plug.

[Installation Procedure](#)



1. Ensure that the spark plug gap is equivalent to the spark plug gap specification. Refer to Ignition System Specifications.

Caution: Be sure that the spark plug threads smoothly into the cylinder head and the spark plug is fully seated. Use a thread chaser, if necessary, to clean threads in the cylinder head. Cross-threading or failing to fully seat the spark plug can cause overheating of the plug, exhaust blow-by, or thread damage.

2. Install the spark plug and tighten to **20 Y (15 lb ft)**.
3. Install the ignition coil. Refer to Ignition Coil Replacement - Bank 1 and/or Ignition Coil Replacement - Bank 2.

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

Spark plug wire integrity is vital for proper engine operation. A thorough inspection is necessary to accurately identify conditions that may affect engine operation. Inspect for the following conditions:

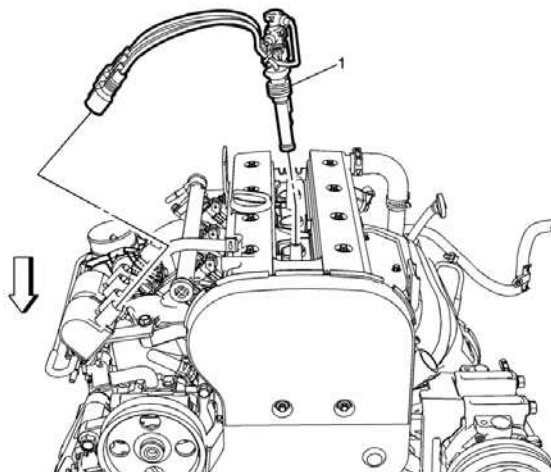
1. Correct routing of the spark plug wires – Incorrect routing may cause cross-firing.
2. Any signs of cracks or splits in the wires.
3. Inspect each boot for the following conditions:

- Tearing
- Piercing
- Arcing
- Carbon tracking
- Corroded terminal

If corrosion, carbon tracking or arcing are indicated on a spark plug wire boot or terminal, replace the wire and the component connected to the wire.

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



Spark Plug Wire Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Remove the engine emblem. Refer to Engine Emblem Replacement.

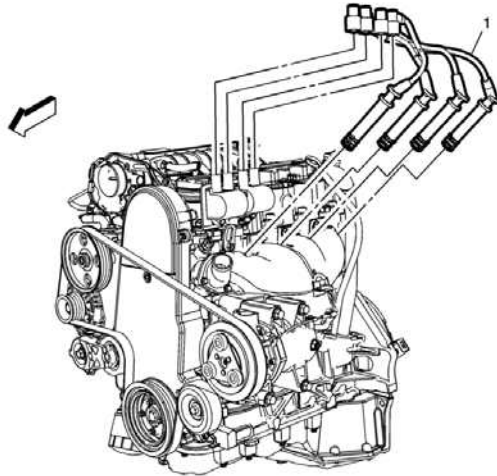
Spark Plug Wires (Qty: 4)

Procedure

1. Remove the spark plug wire from the spark plug.
 1. Twist each spark plug boot 1/2 turn.
 2. Pull only on the boot in order to remove the wire from each plug.
2. Remove the spark plug wire from the ignition coil.
 1. Twist each spark plug boot 1/2 turn.
 2. Pull only on the boot in order to remove the wire from each plug.

2013 Chevrolet Colorado

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



Spark Plug Wire Replacement

Callout

Spark Plug Wires (Qty: 4)

Component Name

Procedure

1. Remove the spark plug wire from the spark plug.

1

- Twist each spark plug boot 1/2 turn.
- Pull only on the boot in order to remove the wire from each plug.
- Remove the spark plug wire from the ignition coil.
- Twist each spark plug boot 1/2 turn.
- Pull only on the boot in order to remove the wire from each plug.

2013 Chevrolet Colorado

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

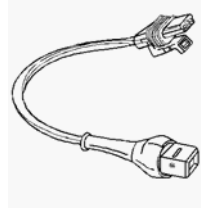
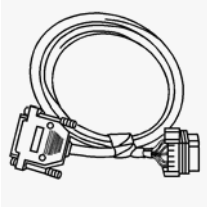
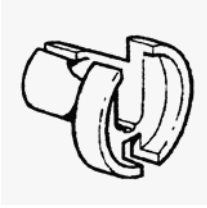
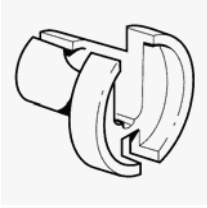
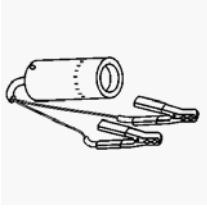
Illustration	Tool Number/Description
	CH 35800-A J 35800-A Fuel Injector Cleaner
	CH 38641-C J 38641-B Diesel Fuel Quality Tester
	CH 39021-380 J 39021-380 Fuel Injector Harness Adapter
	CH 39021-450 J 39021-450 Fuel Injector Harness Adapter
	CH 41769-1 Fuel Line Quick Connect Separator 3/8
	CH 41769-2 Fuel Line Quick Connect Separator 5/16
	CH 42220 J 42220 Universal 12-Volt Leak Detection Lamp

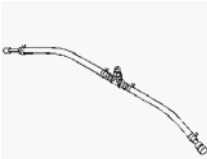
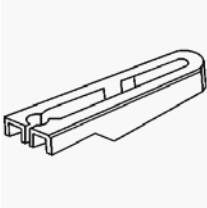
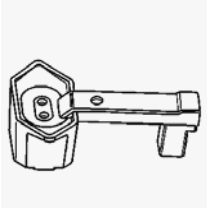
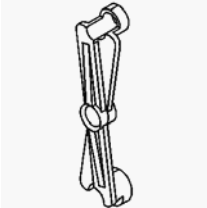
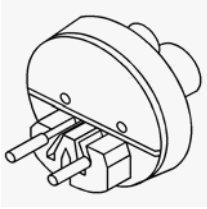
Illustration	Tool Number/Description
	CH 42960-2 J 42960-2 Fuel Flapper Door Holder
	CH 42982 J 42982 Fuel Pressure Gauge Adapter
	CH 43178 J 43178 Fuel Line Disconnect Tool
	CH 44175 J 44175 Fuel Composition Tester Brazil— Use local equivalent
	CH 44581 J 44581 Fuel Line Disconnect Tool
	CH 44603 J 44603 Injector Test Lamp
	CH 45004 J 45004 Fuel Tank Drain Hose Brazil— Use local equivalent
	CH 45873 J 45873 Fuel Return Volume Test Kit

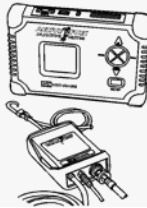
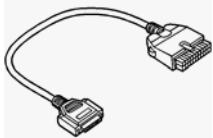
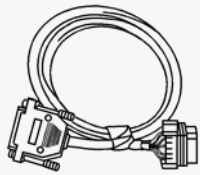
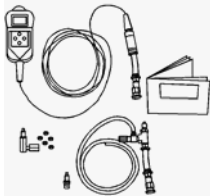
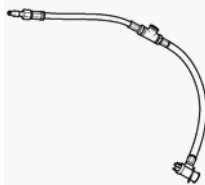
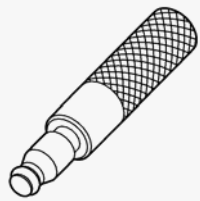
Illustration	Tool Number/Description
	CH 47831 Fuel Line Disconnect Tool
	CH 47976 Active Fuel Injector Tester
	CH 47976-60 AFIT Harness Adapter
	CH 47976-75 Fuel Injector Harness Adapter
	CH 48027 Digital Pressure Gauge Brazil— Use local equivalent
	CH 48096 EVAP Service Access Port Tool
	CH 50375 Diesel Injector Return Line Pressure Adapter
	CH 50377-A Injector Return Line Cap

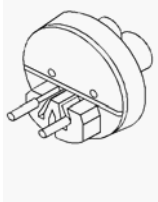
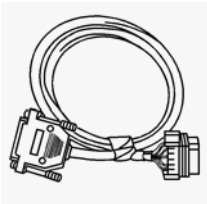
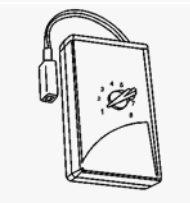
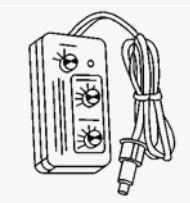
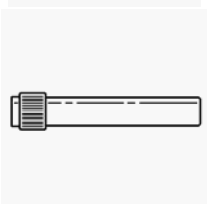
Illustration	Tool Number/Description
	CH 50378 Injector Return Leakage Test Adapter
	EL 34730-405 J 34730-405 Injector Test Lamp
	EL 39021 J 39021 Fuel Injector Coil and Balancer Tester
	EL 39021-210 J 39021-210 Injector Tester Adapter Box
	EL 39021-460 Fuel Injector Test Adapter
	EN 37287 J 37287 Fuel Line Shut-Off Adaptors (Flex Fuel)
	EN 38522 J 38522 Variable Signal Generator
	EN 41413-VLV J 41413-VLV EVAP Service Port Vent Fitting Brazil— Use local equivalent

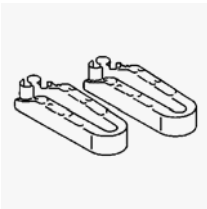
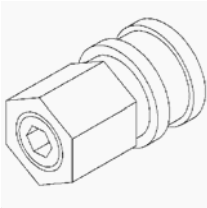
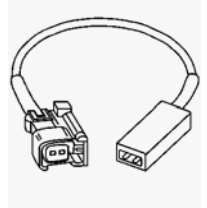
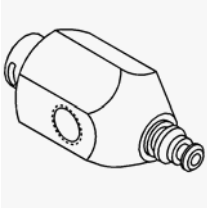
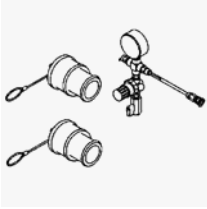
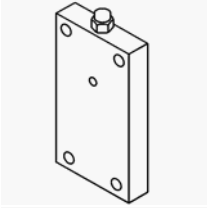
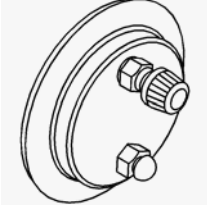
Illustration	Tool Number/Description
	EN 41769 J 41769 KM J 41769 Fuel Line Disconnect Tool Set
	EN 43936 J 43936 Fuel Pressure Adapter Cap
	EN 43937 J 43937 Fuel Pressure Adapter Lines
	EN 44602 J 44602 Injector Test Adapter
	EN 45873-30 J 45873-30 Injector Flow Test Adapter
	EN 46091 J 46091 Charge Air Cooler Tester
	EN 46091-5 J 46091-5 Charge Air Cooler Tester Adapter
	EN 46091-15 J 46091-15 Engine Pressure Test Adapter

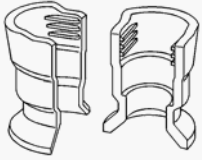
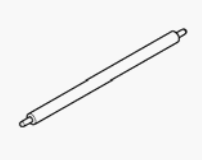
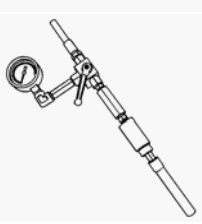
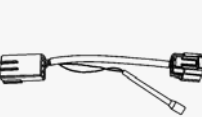
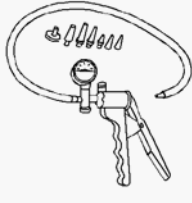
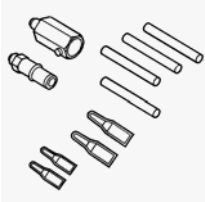
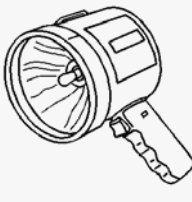
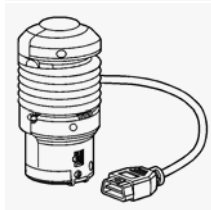
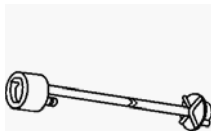
Illustration	Tool Number/Description
	EN 46091-15A J 46091-15A Adapter, Diesel Engine Pressure Test
	EN 46843 Quick Connect Release Tool
	EN 47603 Compression Gauge Adapter
	EN 47632 32 025 010 Cleaning Tool
	EN 47969 Fuel Supply Diagnostic Hose
	EN 48248 Cylinder Compression Pressure Gauge
	EN 48565 EGR Test Harness
	EN 49799 Fuel Pressure Gauge Adapter

Illustration	Tool Number/Description
	GE 23738-A J 23738-A Vacuum Pump
	GE 41413-200 J 41413-200 Evaporative Emissions System Tester (EEST) Brazil— Use local equivalent
	GE 41413-300 J 41413-300 EVAP Cap and Plug Kit Brazil— Use local equivalent
	GE 41413-SPT J 41413-SPT High Intensity White Light Brazil— Use local equivalent
	GE 41415-40 J 41415-40 Fuel Tank Cap Adapter
	GE 41415-50 J 41415-50 Fuel Tank Cap Adapter
	GE 41415-50A 2nd Design Interrupted Thread Fuel Tank Cap Adapter
	J 34730-375 Injector Test Lamp

Special Tools (Diagnostic Tools Diesel)

Illustration



Tool Number/Description

J 41415-30

Fuel Tank Cap Adapter

Brazil— Use local equivalent

J 42598-B

Vehicle Data Recorder

2013 Chevrolet Colorado

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

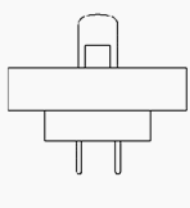
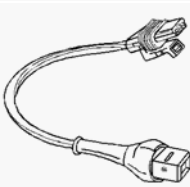
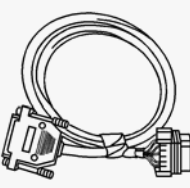
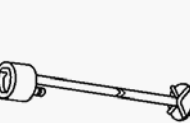
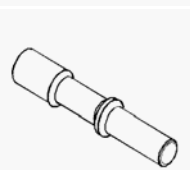
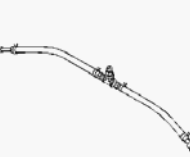
Illustration	Tool Number/Description
	CH-34730-2C J-34730-2C Injector Test Lamp
	CH-38641-B J-38641-B Diesel Fuel Quality Tester
	CH-39021-301 J-39021-301 Fuel Injector Harness Adapter
	CH-39021-460 J-39021-460 Fuel Injector Test Adapter
	CH-41415-30 GE-41415-30 J-41415-30 Fuel Tank Cap Adapter
	CH-42960-2 J-42960-2 Fuel Flapper Door Holder
	CH-42982 J-42982 Fuel Pressure Gauge Adapter

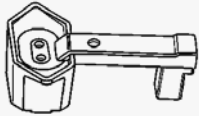
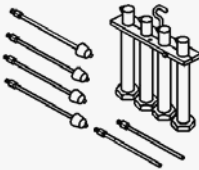
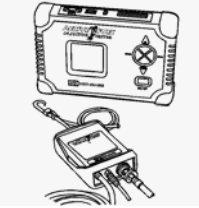
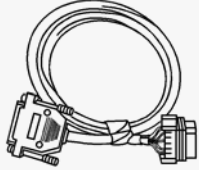
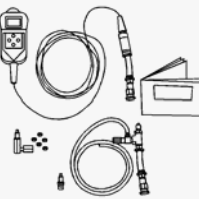
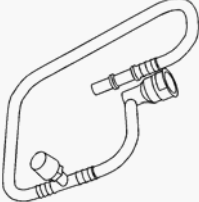
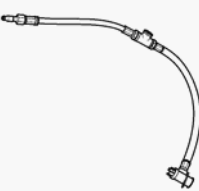
Illustration	Tool Number/Description
	CH-44175-A J-44175-A Fuel Composition Tester
	CH-45004 J-45004 Fuel Tank Drain Hose
	CH-45873 J-45873 Fuel Return Volume Test Kit
	CH-47976 Active Fuel Injector Tester (AFIT)
	CH-47976-75 Fuel Injector Harness Adapter
	CH-48027 Fuel Pressure Gauge
	CH-48096 EVAP Service Access Port Tool
	CH-50375 Diesel Injector Return Line Pressure Adapter

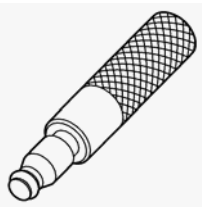
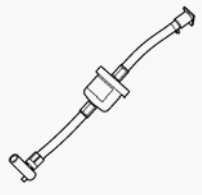
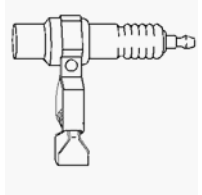
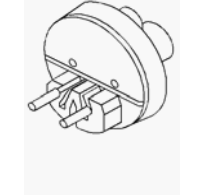
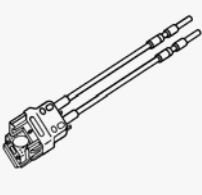
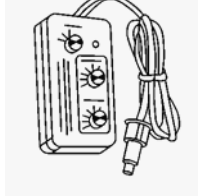
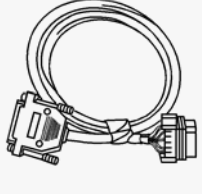
Illustration	Tool Number/Description
	CH-50377-A Injector Return Line Cap
	CH-50378 Injector Return Leakage Test Adapter
	EL-26792 J-26792 HEI Spark Tester
	EL-34730-405 J-34730-405 Injector Test Lamp
	EL-36169-HD Heavy Duty Fused Jumper
	EL-38522-A J-38522-A Variable Signal Generator
	EL-39021 J-39021 Fuel Injector Coil Balance Tester
	EL-39021-460 J-39021-460 Fuel Injector Test Adapter

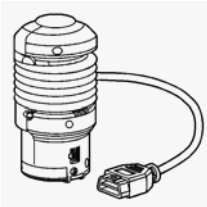
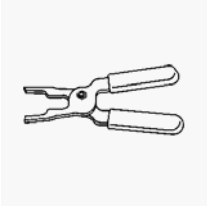
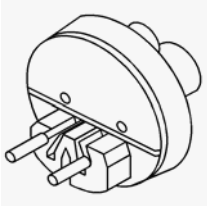
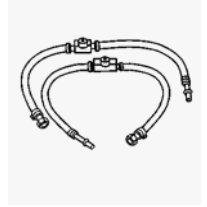
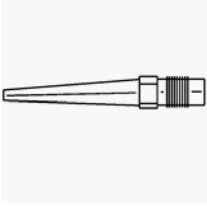
Illustration	Tool Number/Description
	EL-42598-B J-42598-B Vehicle Data Recorder
	EL-43244 J-43244 Relay Puller Pliers
	EL-44603 J-44603 Injector Test Lamp
	EN-34730-91 J-34730-91 KM-J-34730-91 Pressure Tester
	EN-36012-A J-36012-A Ignition System Diagnosis Harness
	EN-37287 J-37287 Fuel Line Shut-off Adapters
	EN-39021-210 J-39021-210 Injector Tester Adapter Box
	EN-41413-311 J-41413-311 EVAP Plug

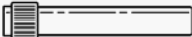
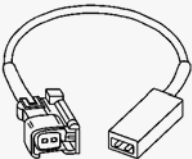
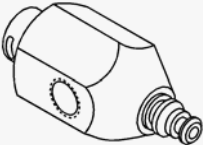
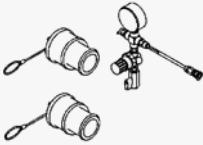
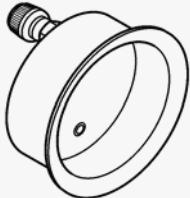
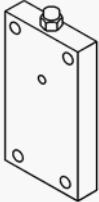
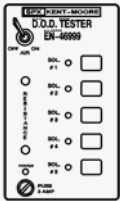
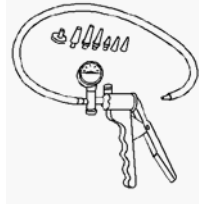
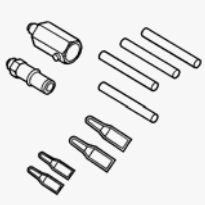
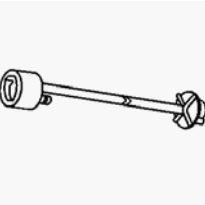
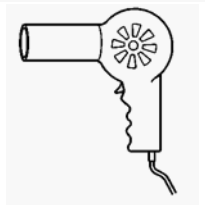
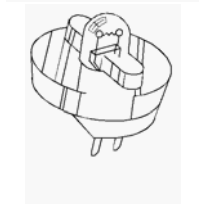
Illustration	Tool Number/Description
	GE-41413-A EN-41413-A J-41413-A Evaporative Emissions System Tester (EEST)
	EN-41413-VLV J-41413-VLV EVAP Service Port Vent Fitting
	EN-44602 J-44602 Injector Test Adapter
	EN-45873-30 J-45873-30 Injector Flow Test Adapter
	EN-46091 J-46091 Charge Air Cooler Tester
	EN-46091-15A J-46091-15A Diesel Engine Pressure Test Adapter
	EN-46091-5 J-46091-5 Charge Air Cooler Tester Adapter
	EN-46999 Displacement On Demand Electric Tool

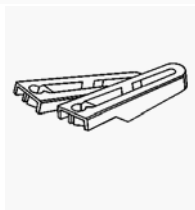
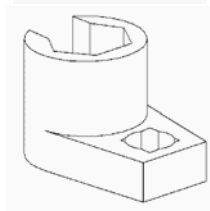
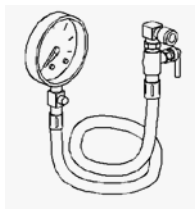
Illustration	Tool Number/Description
	EN-47603 Compression Gauge Adapter
	GE-23738-A J-23738-A Vacuum Pump
	GE-41413-300 EN-41413-300 J-41413-300 EVAP Cap and Plug Kit
	GE-41413-SPT J-41413-SPT High Intensity White Light
	GE-41415-50 J-41415-50 Fuel Tank Cap Adapter
	GE-41415-60 Engine Induction System Leak Test Adapter
	J-25070 Heat Gun 260–399°C (500–750°F)
	J-34730-375 Injector Test Lamp

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

Illustration



Tool Number/Description

J-34730-1A

Fuel Pressure Gauge

South America– Use Local Equivalent

EN-39194-C

J-39194-C

Oxygen Sensor Wrench

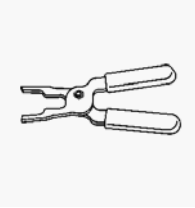
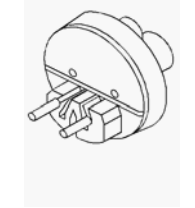
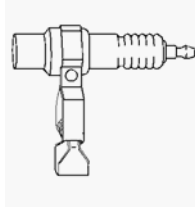
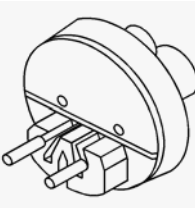
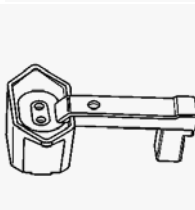
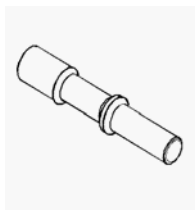
J-37088-A

Fuel Line Disconnect Tool

2013 Chevrolet Colorado

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

Illustration



Tool Number/Description

CH 42960-2

J 42960-2

Fuel Flapper Door Holder

CH 44175

J 44175

Fuel Composition Tester
Brazil – Use local equivalent

CH 44603

J 44603

Injector Test Lamp

CH 45004

J 45004

Fuel Tank Drain Hose
Brazil – Use local equivalent
HEI Spark Tester

EL 26792

J-26792

HEI Spark Tester

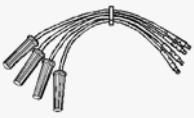
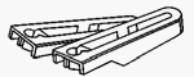
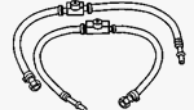
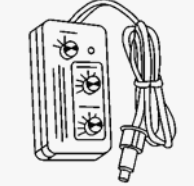
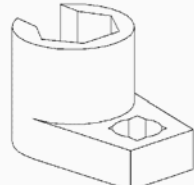
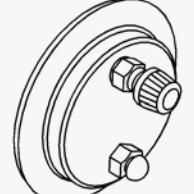
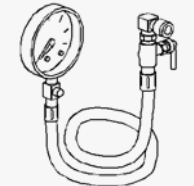
EL 34730-405

J 34730-405

Injector Test Lamp

J-43244

Relay Puller Pliers

Illustration	Tool Number/Description
	EN 36012-A J-36012-A Ignition System Diagnosis Harness
	EN 37088-A J-37088-A Fuel Line Disconnect Tool Set
	EN 37287 J 37287 Fuel Line Shut-Off Adaptors (Flex Fuel)
	EN 38522 J 38522 Variable Signal Generator
	EN 39194-C J-39194-C Oxygen Sensor Wrench
	EN 46091-15 J 46091-15 Engine Pressure Test Adapter
	J-34730 Flexible Fuel Pressure Gauge

2013 Chevrolet Colorado

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

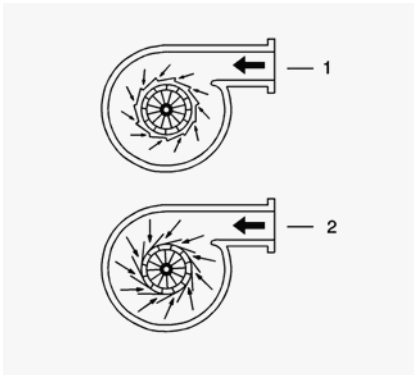
The turbocharger increases engine power by pumping compressed air into the combustion chambers, allowing a greater quantity of fuel to combust at the optimal air/fuel ratio.

[Turbocharger Pressure Sensor](#)

The intake air (boost) pressure and temperature sensor is mounted on the intake manifold and measures boost pressure and air temperature.

[Turbocharger Boost Pressure Actuator](#)

The turbocharger for this system uses a rotary electric vane position actuator provided, with a contactless position sensor, to control the turbocharger vane angle. The electric actuator uses ignition voltage, a ground circuit and a pulse width modulation (PWM) low side drive control circuit provided by the engine control module (ECM). The turbocharger vane angles are varied to control the amount of boost pressure, independent of engine speed. The turbocharger has 11 controllable vanes mounted to a drive ring that can be rotated by the electric actuator to change the vane angle. The ECM varies the boost dependent upon the load requirements of the engine.



The turbocharger vanes (2) are normally open when the engine is not under a load. The ECM commands the boost pressure actuator to close the turbocharger vanes (1) to increase engine power and to create a high pressure.

The ECM will often close the vanes (1) to create back pressure to drive exhaust gas through the exhaust gas recirculation (EGR) valve as required. At extreme cold temperatures, the ECM may close the vanes (1) at low load conditions in order to accelerate engine coolant heating. The ECM may also close the vanes (1) under exhaust braking conditions.

[The Charged Air Cooler or Turbocharger Intercooler](#)

The charged air cooler or turbocharger intercooler is located in front of the radiator. The turbocharger supplies hot compressed air from the turbine to the engine to increase power. The airflow through the radiator cools the hot compressed air from the turbocharger.

[Engine Control Module \(ECM\)](#)

The ECM controls all turbocharger control functions. The ECM monitors information from various sensor inputs that include the following:

- The accelerator pedal position sensor
- The engine coolant temperature (ECT) sensor
- The mass air flow (MAF) sensor
- The intake air pressure and temperature sensor
- The vehicle speed sensor (VSS)
- The transmission gear position or range information sensors

2013 Chevrolet Colorado

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

1. Turn OFF the engine, for 30 seconds before proceeding. This will purge the fuel pressure from the complete fuel system.
2. Turn the water-in-fuel drain screw counterclockwise.
3. Drain off water completely.
4. When finished, turn the drain screw clockwise until tightened.
5. Prime the fuel system. Refer to Fuel System Priming.