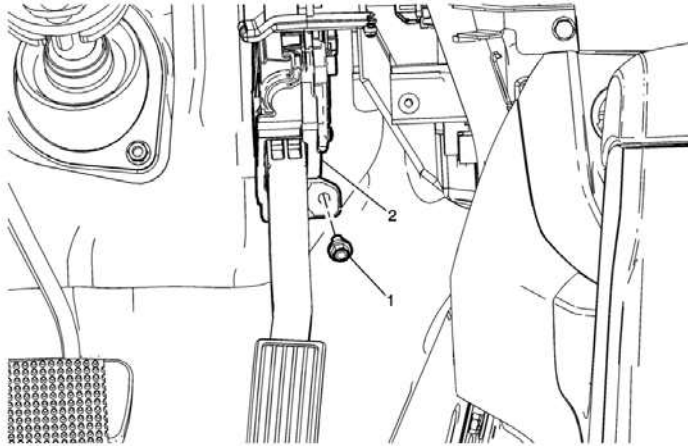


2013 Chevrolet Colorado

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

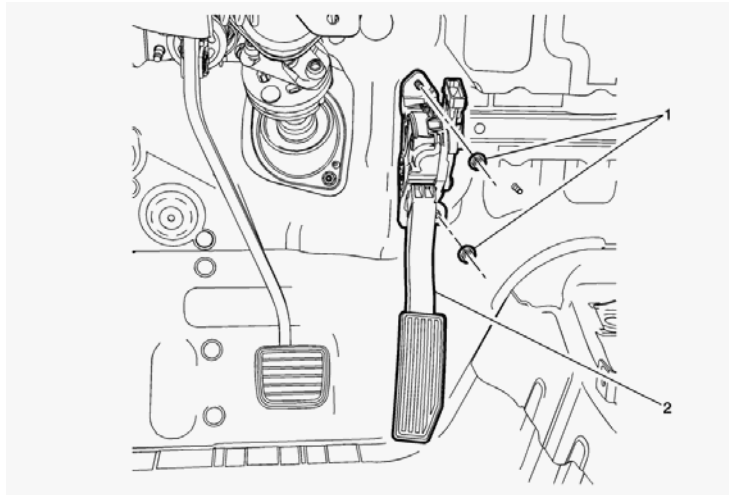
2

Procedure

Disconnect the electrical connector from the accelerator pedal position sensor.

2013 Chevrolet Colorado

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



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

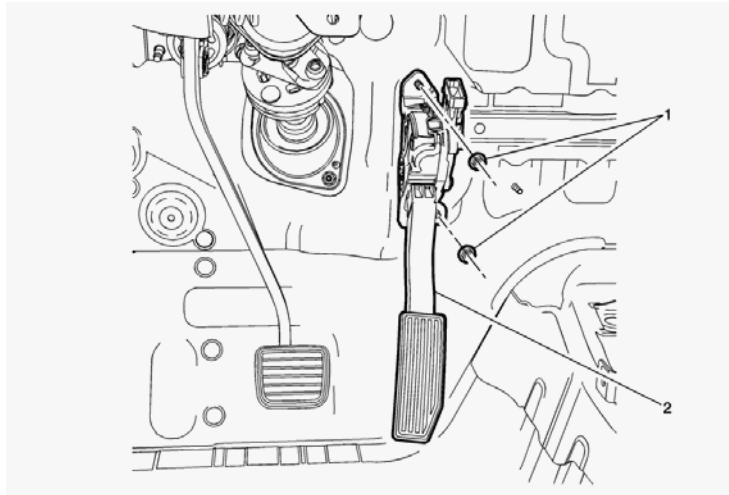
Procedure

Disconnect the electrical wiring harness connector from the accelerator pedal position sensor.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Accelerator Pedal with Position Sensor Assembly Replacement

Callout

Component Name

Preliminary Procedure

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

Accelerator Pedal with Position Sensor Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

9 Y(80 lb in)

Accelerator Pedal with Position Sensor

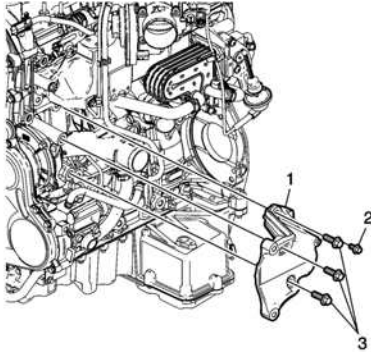
2

Procedure

Disconnect the electrical wiring harness connector from the accelerator pedal with position sensor.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
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1. Install the air conditioning compressor mounting bracket (1).

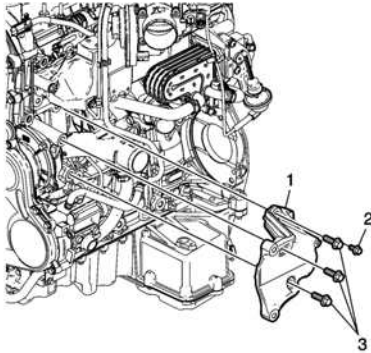
Caution: Refer to Fastener Caution.

2. Install the bracket bolts (2) and tighten to **45 Y (33 lb ft)**.
3. Install the water pump inlet pipe bolt and tighten to **25 Y (18 lb ft)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



1. Remove the water pump inlet pipe bolt (2).
2. Remove the air conditioning bracket bolts (3) and bracket (1).

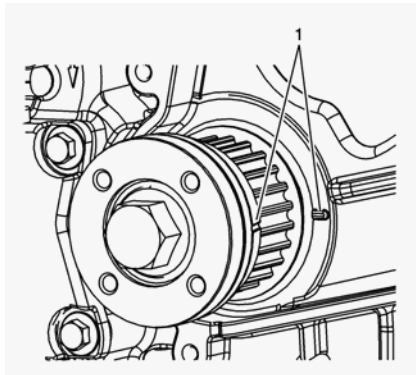
2013 Chevrolet Colorado

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

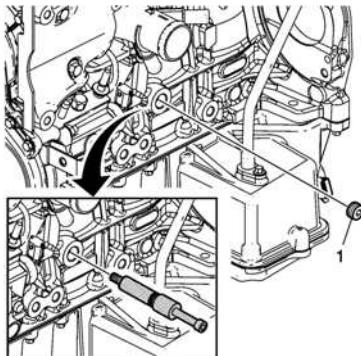
Special Tools

EN-50030 Crankshaft Locking Tool

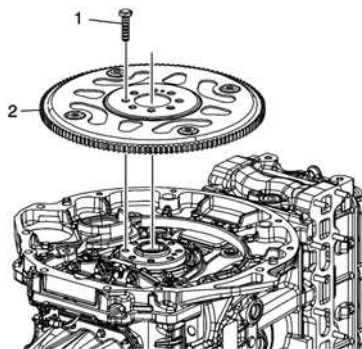
For equivalent regional tools, refer to Special Tools



1. Ensure that the timing mark on the crankshaft timing pulley (1) is aligned at 90 degrees ATDC with the mark on the front cover (1).



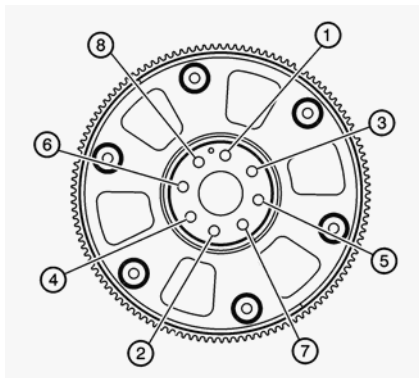
2. Remove the plug (1) and install the EN-50030 locking tool.



3. Install the flexplate (2).

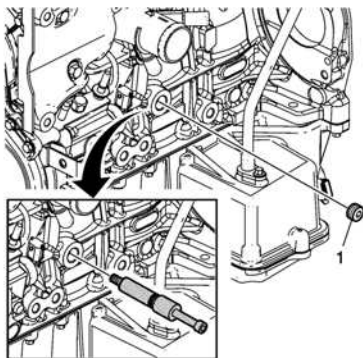
Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

4. Install the NEW flexplate bolts (1) and hand tighten.



Caution: Refer to Fastener Caution.

5. Tighten the NEW bolts in sequence to **50 Y (37 lb ft)**.
6. Loosen the flywheel bolts 90 degrees.
7. Tighten the NEW flywheel bolts in sequence to **25 Y (18 lb ft)**.
8. Tighten additional 60 degrees.
9. After each bolt is tightened, mark the head with a dot of brown paint as evidence of correct tightening.



10. Remove the *EN-50030* locking tool.
11. Install the block plug (1) and tighten to **79 Y (58 lb ft)**.

2013 Chevrolet Colorado

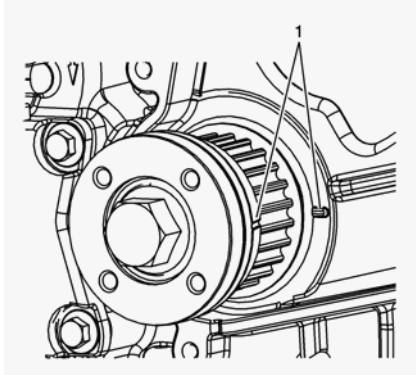
Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

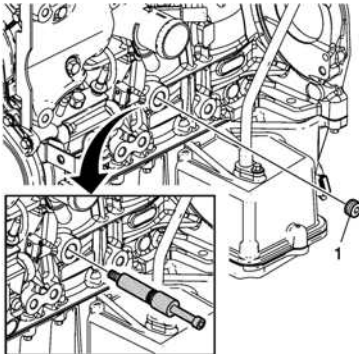
Special Tools

EN-50030 Crankshaft Locking Tool

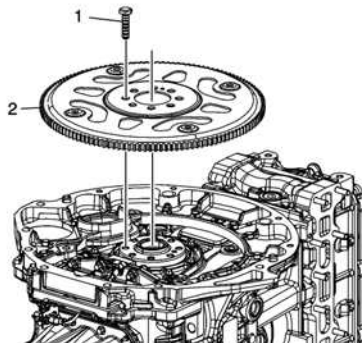
For equivalent regional tools, refer to Special Tools



1. Ensure that the timing mark on the crankshaft timing pulley (1) is aligned at 90 degrees ATDC with the mark on the front cover (1).



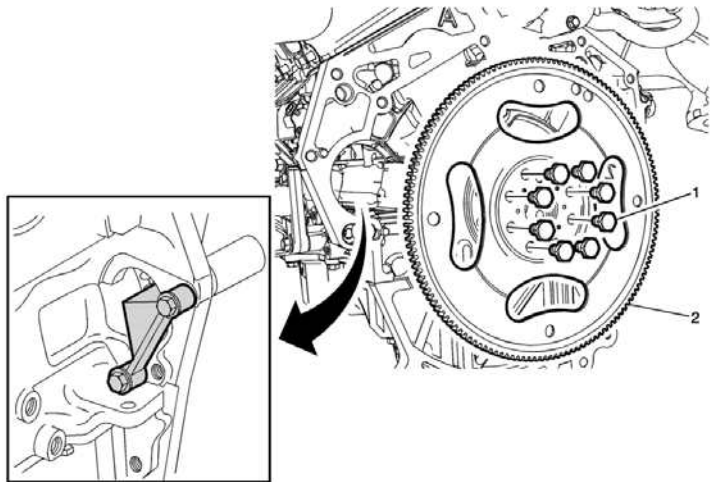
2. Remove the plug (1) and install the EN-50030 locking tool .



3. Remove the flexplate bolts (1) and flexplate (2).

2013 Chevrolet Colorado

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



Automatic Transmission Flex Plate Replacement

Callout	Component Name
Procedure Remove the transmission. Refer to Transmission Replacement. Flexplate Fastener (Qty, 8) Caution: Refer to Fastener Caution. Procedure 1. Install the <i>EN 46106</i> tool through the starter mounting hole to secure crankshaft. 2. Remove the engine flexplate bolts and discard. 3. New bolts must be used whenever removing the flexplate. Tighten 1 • 30 Y (22 lb ft) • Tighten an additional 45 degrees using the <i>EN 45059</i> meter Special Tools • <i>EN 46106</i> Flywheel Holding Tool • <i>EN 45059</i> Torque Angle Sensor Kit For equivalent regional tools, refer to Special Tools	
2	Flexplate

2013 Chevrolet Colorado

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

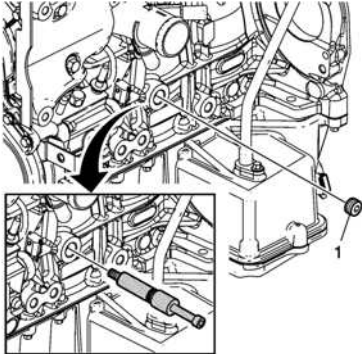
Special Tools

EN-50030 Crankshaft Locking Tool

For equivalent regional tools, refer to Special Tools.

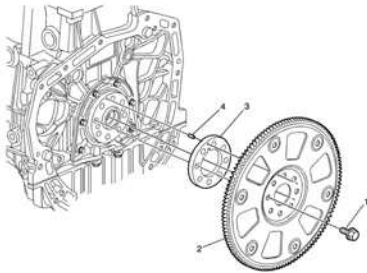
Removal Procedure

1. Remove the transmission. Refer to Transmission Replacement.



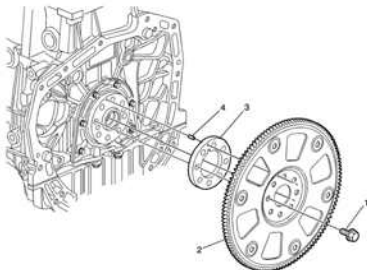
Note: Ensure the engine is at 90 degrees ATDC before installing the tool.

2. Remove the plug (1) and rotate the aligned tool EN-50030. Ensure the crankshaft is at 90 degrees ATDC before trying to install the crank locking tool.

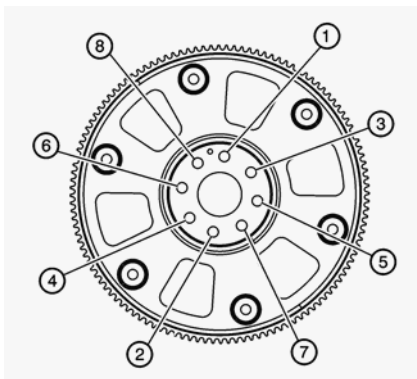


3. Remove the automatic transmission flex plate bolts (1).
4. Remove the flex plate (2), locating pin (4), and adapter plates (3).
5. For engine flywheel / automatic transmission flex plate cleaning and inspection. Refer to Engine Flywheel Cleaning and Inspection.

Installation Procedure

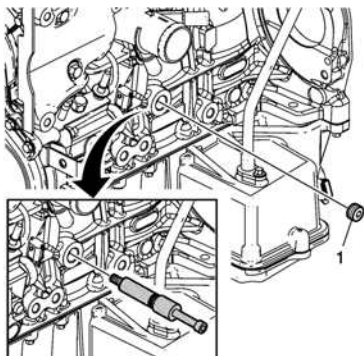


1. Install the automatic transmission flex plate (2) and bolts (1).



Caution: Refer to Fastener Caution.

2. Tighten the flex plate bolts in sequence to **50 Y (37 lb ft)**.
3. Loosen the flex plate bolts one at a time and then retighten in sequence to **25 Y (18 lb ft)** plus 60, 75, and 90 degrees respectively for bolts of 40, 50, 60 mm.
4. After each bolt is tightened, mark the head with a dot of brown paint as evidence of correct tightening.

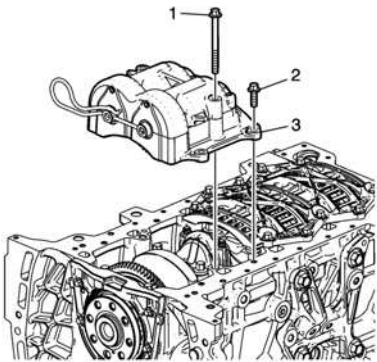


5. Remove the *EN-50030* Crank locking tool .
6. Install the block plug (1) and tighten to **79 Y (58 lb ft)**.
7. Install the transmission. Refer to Transmission Replacement.

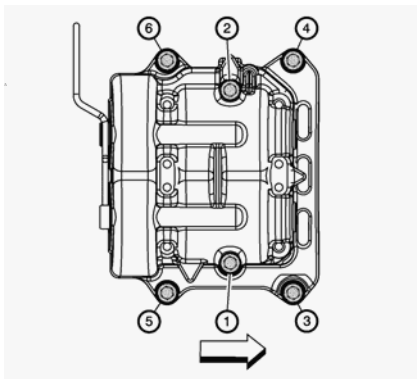
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



1. Install the balance shaft assembly (3).
2. Install the balance shaft assembly bolts (1 and 2) and hand tighten.

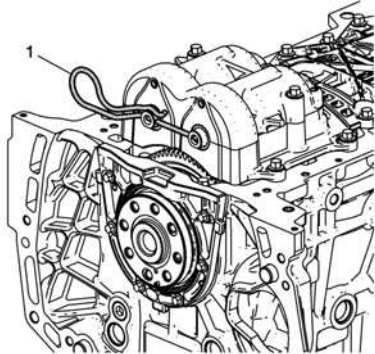


Caution: Refer to Fastener Caution.

3. Tighten the bolts in sequence to **32 Y (24 lb ft)**.
4. Remove GM P/N 12628143 balancer shaft gear pin (1).

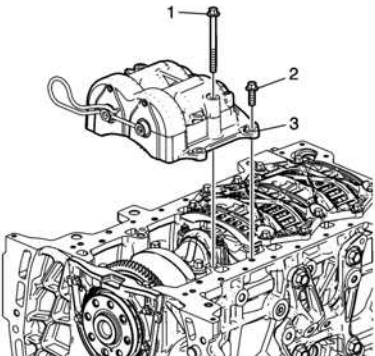
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Note:

- Install GM P/N 12628143 balancer shaft gear pin to the balancer shafts before removing the assembly to maintain timing and aid installation.
 - If GM P/N 12628143 balancer shaft gear pin is not available, install a 4–5 mm dowel rod through the holes in both balancer shafts to maintain timing.
1. Install GM P/N 12628143 balancer shaft gear pin on the balance shaft assembly.



2. Remove the balance shaft assembly bolts (1, 2) and balance shaft assembly (3).

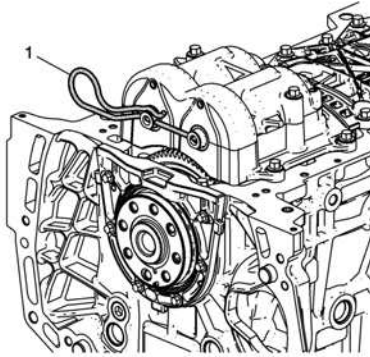
2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

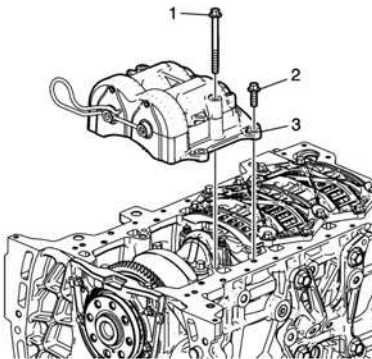
[Removal Procedure](#)

1. Remove the upper oil pan. Refer to Upper Oil Pan Replacement.



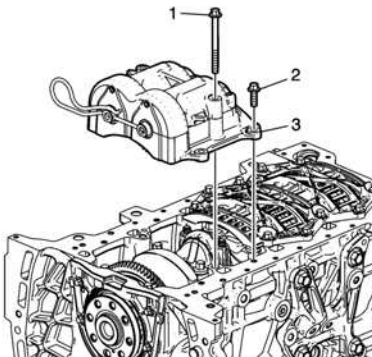
Note:

- Install GM P/N 12628143 balancer shaft gear pin to the balancer shafts before removing the assembly to maintain timing and aid installation.
 - If GM P/N 12628143 balancer shaft gear pin is not available, install a 4–5 mm dowel rod through the holes in both balancer shafts to maintain timing.
2. Install GM P/N 12628143 balancer shaft gear pin on the balance shaft assembly.

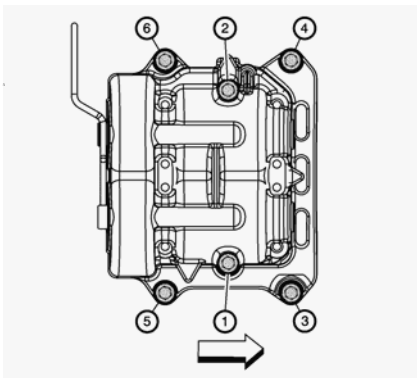


3. Remove the balance shaft assembly bolts (1, 2) and balance shaft assembly (3).
4. For balance shaft cleaning and inspection, refer to Balance Shaft Cleaning and Inspection.

[Installation Procedure](#)



1. Install the balance shaft assembly (3).
2. Install the balance shaft assembly bolts (1 and 2) and hand tighten.



Caution: Refer to Fastener Caution.

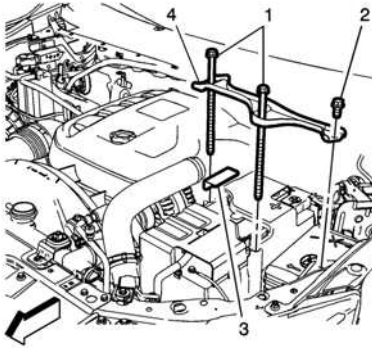
3. Tighten the bolts in sequence to **32 Y (24 lb ft)**.
4. Remove GM P/N 12628143 balancer shaft gear pin (1).
5. Install the upper oil pan. Refer to Upper Oil Pan Replacement.

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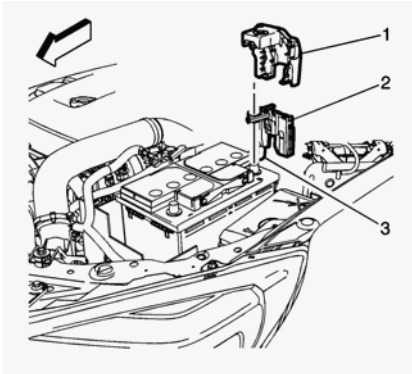
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

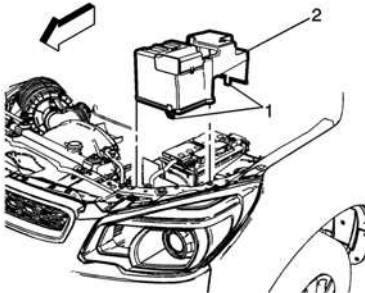
1. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection



2. Remove the battery hold down retainer fasteners (1) and (2).
3. Remove the battery hold down retainer (4).

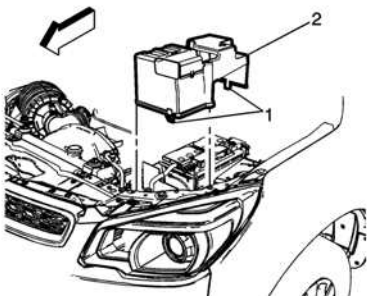


4. Remove the battery positive cover (1) and release the battery positive cable clamp (2).
5. Remove the battery positive cable (3) from the battery positive post.

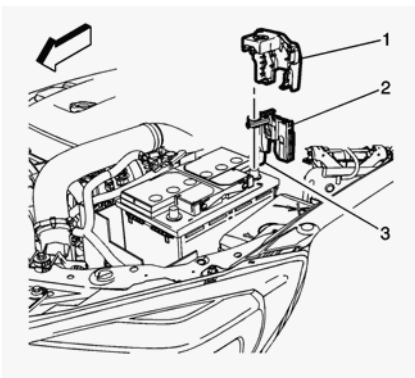


6. Release the battery box retainer tabs (1) securing the battery box to the battery tray.
7. Remove the battery box (2).

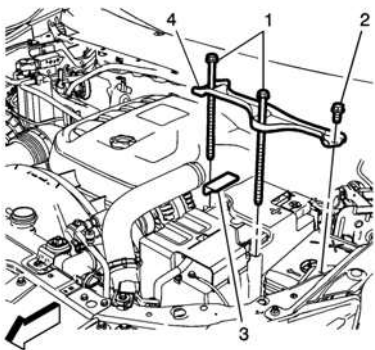
[Installation Procedure](#)



1. Install the battery box (2) to the battery tray with the battery box retainer tabs (1).



2. Install the battery positive cable (3) to the battery positive post.
3. Install the battery positive cable clamp (2) to the battery post and install the cover (1).



4. Install the retainer (4) to the top of the battery.

Caution: Refer to Fastener Caution.

5. Install the retainer fasteners (1) and tighten to **5 Y (44 lb in)**.
6. Install the upper tie bar fastener (2) and tighten to **20 Y (15 lb ft)**.
7. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection

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Special Tools

EL 50313 Battery Tester

For equivalent regional tools, refer to Special Tools.

Diagnostic Aids

- For best results, use an automatic taper-rate battery charger with a voltage capability of 16 V.
- The charging area should be well ventilated.
- Do not charge a battery that appears to be frozen. Allow the battery to warm to room temperature and test it using the EL 50313 before charging.

Battery State of Charge

Note: Using voltage to determine the batteries state of charge is only accurate after the battery has been at rest for 24 hours. This is enough time for the acid in each cell to equalize. If the battery has been charged or discharged in the past 24 hours, the battery state of charge will only be an estimate.

The maintenance-free batteries state of charge is estimated by reading the voltage of the battery across the battery terminals. Because the voltage is affected by current flow into or out of the battery, the engine must be stopped and all electrical loads turned OFF, including parasitic loads, when checking the voltage. The voltage can also be affected if the battery has just been charged or discharged, so it is important to consider what has happened to the battery in the time just before testing. Use the following procedure to determine the battery's state of charge:

1. Be sure all electrical loads are turned OFF.
2. Determine whether the battery has been used in a vehicle or charged within the past 12 hours.

- If the answer is no, the terminal voltage will be stabilized and no action is necessary before reading the voltage. Skip to step 3.
- If the answer is yes, terminal voltage will not be stabilized and you should wait 12 hours since the last time the battery was used.
- Estimate the battery temperature by determining the average temperature to which the battery has been exposed for the past 12 hours.

Note: The table is accurate to 10 % only after the battery has been at rest for 12 hours.

- Measure the battery voltage at the battery terminals. Refer to the following table to determine the state of charge according to the estimated battery temperature:

Battery Voltage	% Charge at 0°C (32°F)	% Charge at 25°C (75°F)
12.75 V	100%	100%
12.7 V	100%	90%
12.6 V	90%	75%
12.45 V	75%	65%
12.2 V	65%	45%
12.0 V	40%	20%

Use the state of charge information as follows:

- A battery with a state of charge that is below 65% must always be recharged before returning it to service or continuing storage.
- A battery with a state of charge that is 65% or greater is generally considered to be charged enough in order to be returned to normal service or in order to continue storage. However, if the battery is being used in slow traffic or with short drive times, or if the temperature is very hot or very cold, the battery should be fully charged, to at least 90%, before returning it to service or continuing storage.

Charging Time Required

The time required to charge a battery will vary depending upon the following factors:

- The battery charger capacity—The higher the charger amperage, the less time it will take to charge the battery.
- The state of charge of the battery—A completely discharged battery requires more than twice as much charging time as a half charged battery. In a discharged battery with a voltage below 11 V, the battery has a very high internal resistance and may only accept a very low current at first. Later, as the charging current causes the acid content to increase in the electrolyte, the charging current will increase. Extremely discharged batteries may not activate the reversed voltage protection in some chargers. Refer to the manufacturer's instructions for operating this circuitry.
- The temperature of the battery—The colder the battery is, the more time it takes to recharge the battery. The charging current accepted by a cold battery is very low at first. As the battery warms, the charging current will increase.

Charging Procedure

Caution: Turn OFF the ignition when connecting or disconnecting the battery cables, the battery charger or the jumper cables. Failure to do so may damage the ECM/PCM or other electronic components.

Caution: Refer to Fastener Caution.

When charging side-terminal batteries with the battery cables connected, connect the charger to the positive cable bolt and to a ground located away from the battery. When charging side-terminal batteries with the battery cables disconnected, install the battery side terminal adapters and connect the charger to the

adapters.

Tighten

Tighten the battery side terminal adapters to 15 Y (11 lb ft).

Use the following procedure to charge the battery:

1. Turn OFF the charger.
2. Ensure that all of the battery terminal connections are clean and tight.
3. Connect the charger positive lead to the battery positive terminal on the battery or the remote jumper stud underhood.

Caution: Do not connect the negative charger lead to the housings of other vehicle electrical accessories or equipment. The action of the battery charger may damage such equipment.

4. Connect the negative charger lead to a solid engine ground or to a ground stud in the engine compartment that is connected directly to the battery negative terminal, but away from the battery. If the negative battery cable is disconnected and a terminal adapter is being used, connect directly to the adapter.
5. Turn ON the charger and set to the highest setting for normal charging.
6. Inspect the battery every half hour after starting the battery charger.

- Charge the battery until the taper-rate charger indicates that the battery is fully charged.
- Estimate the battery temperature by feeling the side of the battery. If it feels hot to the touch or its temperature is over 45°C (125°F), discontinue charging and allow the battery to cool before resuming charging.
- After charging, test the battery. Refer to Battery Inspection/Test.

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Submodel: | Engine Type: | Liters:
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Warning: Batteries produce explosive gases, contain corrosive acid, and supply levels of electrical current high enough to cause burns. Therefore, to reduce the risk of personal injury when working near a battery:

- Always shield your eyes and avoid leaning over the battery whenever possible.
- Do not expose the battery to open flames or sparks.
- Do not allow the battery electrolyte to contact the eyes or the skin. Flush immediately and thoroughly any contacted areas with water and get medical help.
- Follow each step of the jump starting procedure in order.
- Treat both the booster and the discharged batteries carefully when using the jumper cables.

Note: Because of the materials used in the manufacture of automotive lead acid batteries, dealers and service shops that handle them are subject to various regulations issued by OSHA, EPA, DOT, and various state or local agencies. Other regulations may also apply in other locations. Always know and follow these regulations when handling batteries.

Batteries that are no longer wanted must be disposed of by an approved battery recycler and must never be thrown in the trash or sent to a landfill.

Batteries that are not part of the vehicle itself, not the battery under the hood, must only be transported on public streets for business purposes via approved hazardous material transportation procedures.

Battery storage, charging and testing facilities in repair shops must meet various requirements for ventilation, safety equipment, material segregation, etc.

The maintenance free battery is standard. There are no vent plugs in the cover. The battery is completely sealed except for 2 small vent holes in the side. These vent holes allow the small amount of gas that is produced in the battery to escape.

The battery has 3 functions as a major source of energy:

- Engine cranking
- Voltage stabilizer
- Alternate source of energy with generator overload

[Battery Low Start Vehicle Message](#)

The body control module (BCM) monitors battery positive voltage to determine battery state of charge. If one or more of the BCM battery positive voltage terminals measure less than approximately 11.6V compared to the BCM ground circuits, this message will display and four chimes may sound. Start the vehicle immediately. If the vehicle is not started and the battery continues to discharge, the climate controls, heated seats, and audio systems will shut off and the vehicle may require a jump start. These systems will function again after the vehicle is started.

[Battery Ratings](#)

A battery has 2 ratings:

- Cold cranking amperage
- Amperage hours

When a battery is replaced use a battery with similar ratings. See battery specification label on the original battery.

[Amperage Hours](#)

The amperage hour rating tells you how much amperage is available when discharged evenly over a 20 hour period. The amperage hour rating is cumulative, so in order to know how many constant amperage the battery will output for 20 h, you have to divide the amperage hour rating by 20. Example: If a battery has an amperage hour rating of 74, dividing by 20 = 3.75. Such a battery can carry a 3.75 A load for 20 hours before dropping to 10.5 V. (10.5 V is the fully discharged level, at which point the battery needs to be recharged.) A battery with an amperage hour rating of 55 will carry a 2.75 A load for 20 hours before dropping to 10.5 V.

[Cold Cranking Amperage](#)

The cold cranking amperage is an indication of the ability of the battery to crank the engine at cold temperatures. The cold cranking amperage rating is the minimum amperage the battery must maintain for 30 seconds at -18°C (0°F) while maintaining at least 7.2 V. See battery label for the cold cranking amperage rating of this battery.

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Diagnostic Aids

Warning: Refer to Battery Disconnect Warning.

Note:

- The battery test using the *EL 42000* Battery Tester requires correct connections to the battery terminals. A failure to obtain the correct connections during the test may result in a failed test on a good battery.
- Use the Out of Vehicle test for each battery when testing a vehicle with dual batteries.

Follow these instructions in order to avoid an incorrect diagnosis because of connections:

- If testing the vehicle with the battery cables still connected, wiggle the EL 42000 clips on the terminal bolt. This may cut through any coating or through any oxidation that may be present on the bolt.

Even new bolts contain a protective coating that may insulate or cause a resistance in the test circuit.

- If correct connections to the battery terminal bolts in the vehicle are in doubt, perform the following steps:
 1. Disconnect the negative battery cable.
 2. Disconnect the positive battery cable.
 3. Install the test adapters on the terminals.
 4. Follow the instructions for testing a removed battery.
- If the tester displays a REPLACE BATTERY or BAD CELL REPLACE result for a battery tested in the vehicle with the battery cables connected, perform the following steps:

1. Disconnect the negative battery cable.
2. Disconnect the positive battery cable.
3. Install the tester adapters.

Note: Always write the test code displayed by the tester on the repair order for any warranty purposes. The number is a unique code that describes the test data for a particular battery at a particular time. The test code may occasionally repeat when you retest the same battery. More often, each test will result in a different code. Use the test code from the second, or Out of Vehicle test.

4. Follow the instructions for testing a removed battery.
5. Replace the battery only if the second test shows a REPLACE BATTERY or BAD CELL REPLACE result.

Use the test code from the second test for any warranty purposes.

- Use the correct terminal adapters.

Do not use any common bolts or a combination of bolts, of nuts, and of washers as adapters when testing the battery.

Use the test adapters that are provided with the EL 42000 or GM P/N 12303040 terminal adapters. If the adapters that are provided with the EL 42000 require replacement, use GM P/N 12303040. Any other adapter may not contact the correct areas of the battery terminal, causing a resistance that may result in an invalid battery test result.

Reference Information

Schematic Reference

Starting and Charging Schematics

Connector End View Reference

Component Connector End Views

Description and Operation

Starting System Description and Operation

Electrical Information Reference

- Circuit Testing
- Connector Repairs
- Testing for Intermittent Conditions and Poor Connections
- Wiring Repairs

Scan Tool Reference

Control Module References for scan tool information

Special Tools

EL 42000 Battery Tester

For equivalent regional tools, refer to Special Tools.

Circuit/System Testing

Warning: Unless directed otherwise, the ignition and start switch must be in the OFF or LOCK position, and all electrical loads must be OFF before servicing any electrical component. Disconnect the negative battery cable to prevent an electrical spark should a tool or equipment come in contact with an exposed electrical terminal. Failure to follow these precautions may result in personal injury and/or damage to the vehicle or its components.

For Vehicles equipped with OnStar® (UE1) with Back Up Battery:

The Back Up Battery is a redundant power supply to allow limited OnStar® functionality in the event of a main vehicle battery power disruption to the VCIM (OnStar® module). Do not disconnect the main vehicle battery or remove the OnStar® fuse with the ignition key in any position other than OFF. Retained accessory power should be allowed to time out or be disabled (simply opening the driver door should disable retained accessory power) before disconnecting power. Disconnecting power to the OnStar® module in any way while the ignition is On or with retained accessory power activated may cause activation of the OnStar® Back-Up Battery system and will discharge and permanently damage the back-up battery. Once the Back-Up Battery is activated it will stay on until it has completely discharged. The back-up battery is not rechargeable and once activated the back-up battery must be replaced.

1. Inspect the C1 Battery for a cracked, broken, or damaged case, which may be indicated by battery acid leakage.
 - If there is any apparent damage, replace the C1 Battery.
 - Verify the cold cranking amperage and amperage hour rating of the C1 Battery to the original C1 Battery or original equipment specification.
 - If the C1 Battery does not meet or exceed specifications, replace the C1 Battery.
 - Verify that the C1 Battery cables are clean and tight. The C1 Battery terminal bolts should be torqued as specified in Fastener Tightening Specifications.
 - If the C1 Battery cables need to be cleaned, clean as required and tighten as specified.
 - If the C1 Battery cables are damaged, replace then tighten as specified.
 - Install the EL 42000 and follow directions supplied by the tester.
 - If the tester calls for charging the C1 Battery, refer to Battery Charging.
 - The battery should not have a history of being discharged or having low voltage.
 - If the battery has frequently been discharged or had low voltage while the engine is running, refer to Charging System Test.
 - If the battery has frequently been discharged or had low voltage while the ignition is OFF, refer to Battery Electrical Drain/Parasitic Load Test.

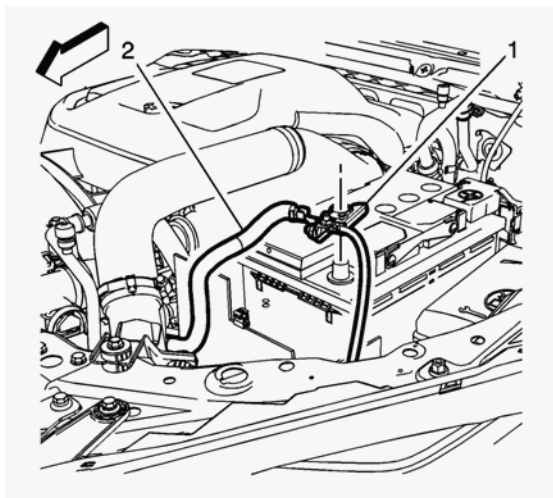
[Repair Instructions](#)

Perform the Diagnostic Repair Verification after completing the diagnostic procedure.

- Battery Positive and Negative Cable Replacement
- Battery Replacement

2013 Chevrolet Colorado

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



Battery Negative Cable Disconnection and Connection

Callout

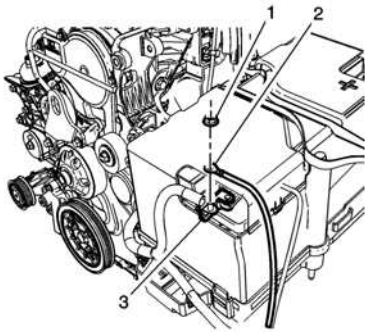
Component Name

- | | |
|---|--|
| 1 | Warning: Refer to Battery Disconnect Warning. |
| | Battery Negative Post Clamp |
| 2 | Battery Negative Cable |

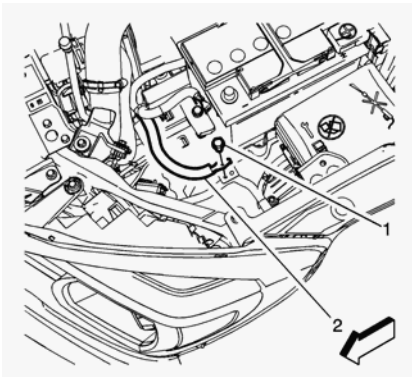
2013 Chevrolet Colorado

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

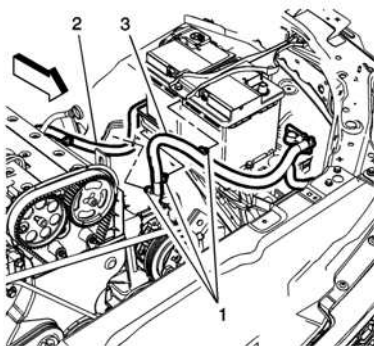
[Removal Procedure](#)



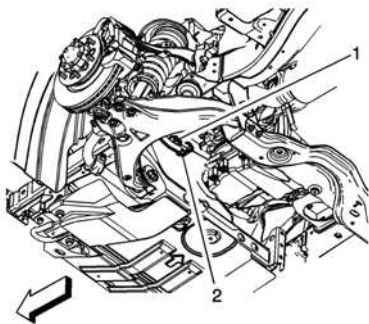
1. Remove the body harness fastener (1) and the body harness terminal (2) from the negative battery clamp (3).
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



3. Remove the battery negative cable battery tray ground fastener (1) and remove the battery negative cable (2).



4. Remove the battery negative retainers (1) from the battery positive cable (2) and the battery tray.
5. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
6. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.

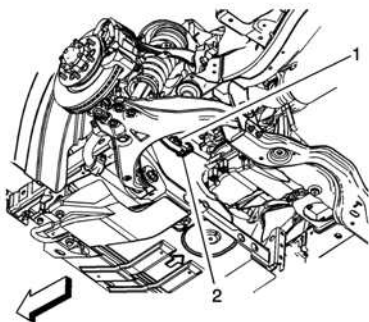


7. Remove the battery negative cable fastener (1) and the battery negative cable (2) , from the engine block.

Note: Observe how the battery negative cable was routed within the engine compartment.

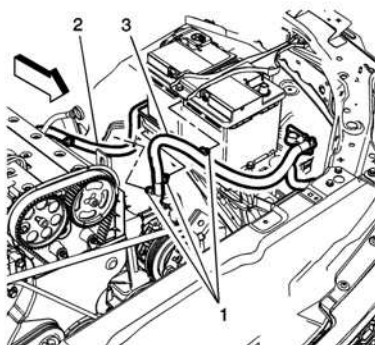
8. Remove the battery negative cable from the engine compartment.

[Installation Procedure](#)

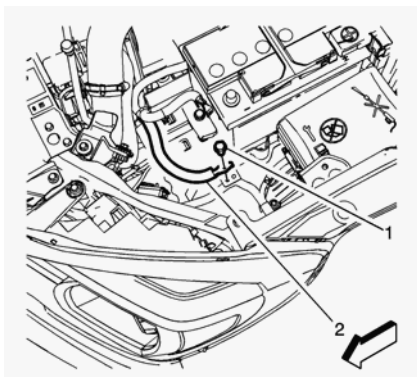


Caution: Refer to Fastener Caution.

1. Install the battery negative cable (2) to the engine block and tighten the fastener (1) to **40 Y (29 lb ft)**.

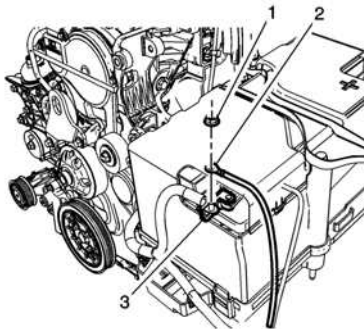


2. Install the battery negative cable (3) to the battery positive cable (2) and battery tray with the retainers (1).
3. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
4. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



Battery Negative Cable Replacement (LE6)

5. Install the battery negative cable (2) to the left front frame rail and tighten the fastener (1) to **22 Y (16 lb ft)**.

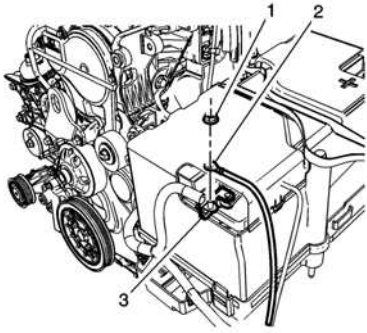


6. Install body harness terminal (2) to the negative battery clamp (3) and tighten the fastener (1) to **10 Y (89 lb in)**.

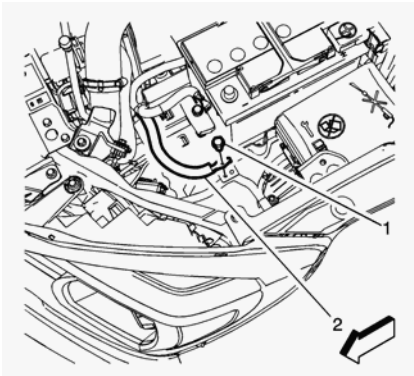
2013 Chevrolet Colorado

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

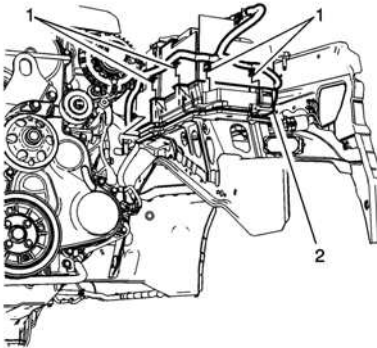
[Removal Procedure](#)



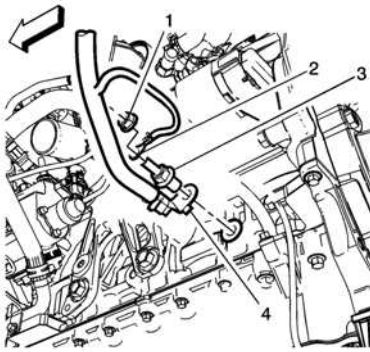
1. Remove the body harness fastener (1) and the body harness terminal (2) from the negative battery clamp (3).
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



3. Remove the battery negative cable battery tray ground fastener (1) and remove the battery negative cable (2).

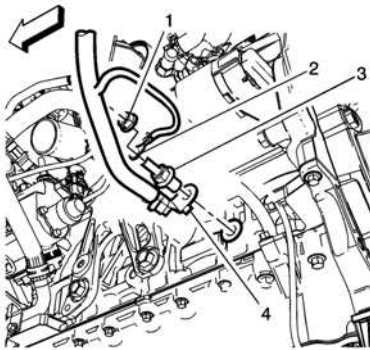


4. Remove the battery negative retainers (1) from the battery tray (2).
5. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
6. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.



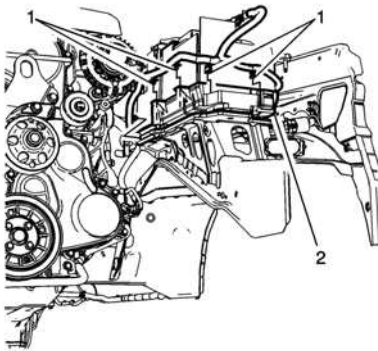
7. Remove the fuel injector harness fastener (1) and the fuel injector harness ground terminal (2).
 8. Remove the battery negative stud (3) and the battery negative cable (4) from the engine block.
- Note:** Observe how the battery negative cable was routed within the engine compartment.
9. Remove the battery negative cable from the engine compartment.

[Installation Procedure](#)

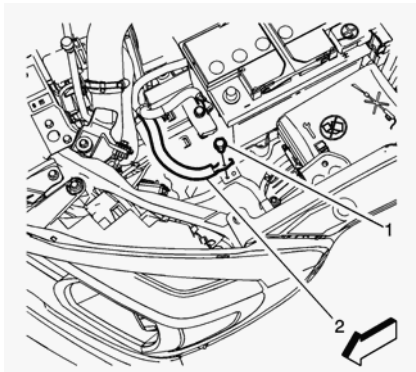


Caution: Refer to Fastener Caution.

1. Install the battery negative cable (4) to the engine block and tighten the stud (3) to **60 Y (44 lb ft)**.
2. Install the fuel injector harness terminal (2) and tighten the fastener (1) to **22 Y (16 lb ft)**.



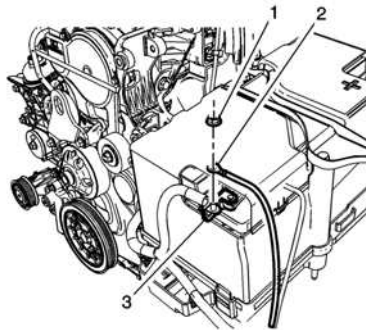
3. Install the battery negative cable to the battery tray (2) with the retainers (1).



4. Install the battery negative cable (2) to the left front frame rail and tighten the fastener (1) to **22 Y (16 lb ft)**.

Battery Negative Cable Replacement (LWH)

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

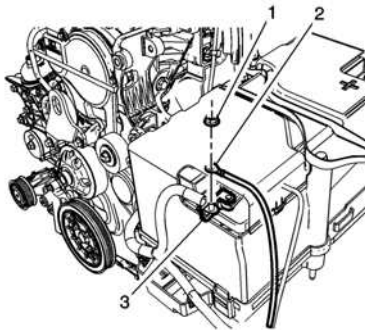


6. Install body harness terminal (2) to the negative battery clamp (3) and tighten the fastener (1) to **10 Y (89 lb in)**.

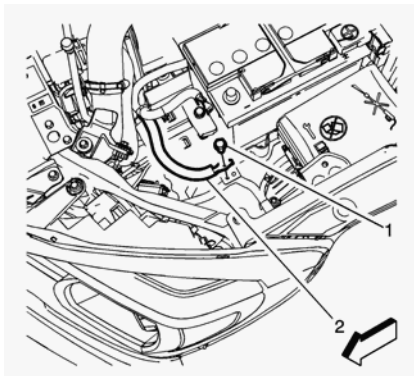
2013 Chevrolet Colorado

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

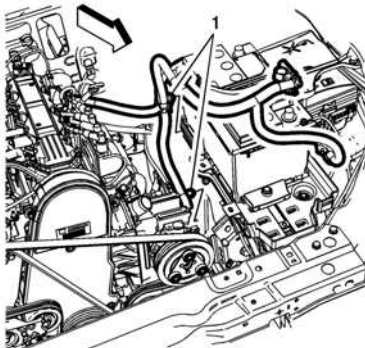
[Removal Procedure](#)



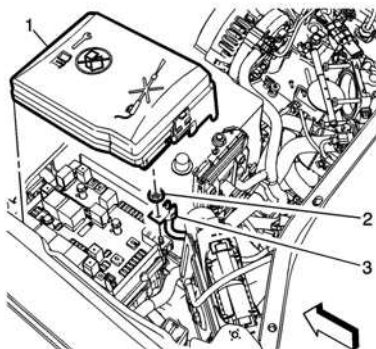
1. Remove the body harness fastener (1) and the body harness terminal (2) from the negative battery clamp (3).
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



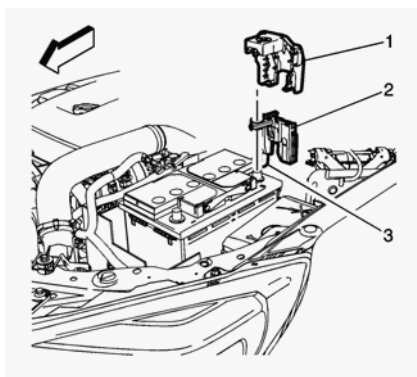
3. Remove the battery negative cable battery tray ground fastener (1) and remove the battery negative cable (2).



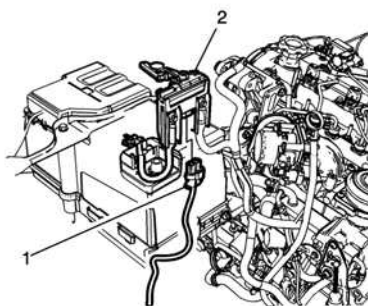
4. Remove the battery positive and negative cable retainers (1), from the battery tray and left front wheel well.



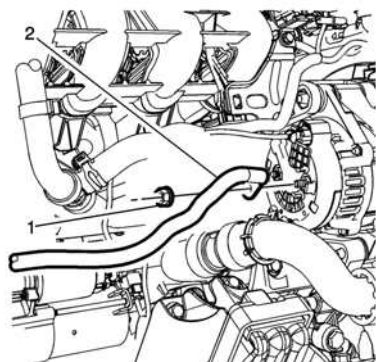
5. Remove the underhood fuse block cover (1).
6. Remove the battery positive cable fastener (2) and remove the battery positive cable (3).



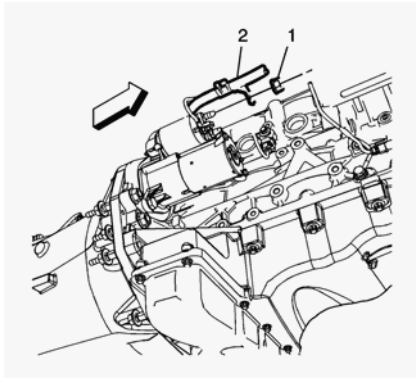
7. Remove the battery positive cable cover (1) and release the clamp (2) securing the battery positive cable (3) to the battery post.



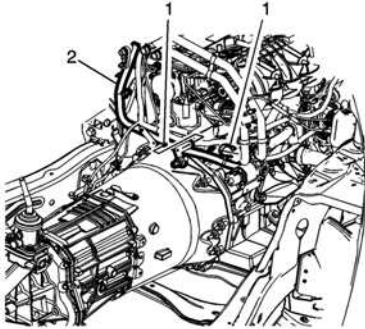
8. Remove the body harness connector (1) from the battery positive cable (2).



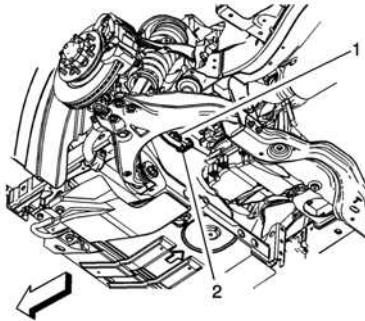
9. Remove the battery positive cable fastener (1) and the battery positive cable (2) from the back of the generator.



10. Remove the battery positive cable fastener (1) and the battery positive cable terminal (2) , from the starter.



11. Remove the battery positive retainers (1) securing the battery positive cable (2) to the transmission bracket and heater hose.
12. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
13. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.

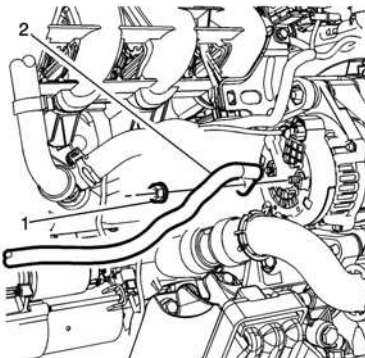


14. Remove the battery negative cable fastener (1) and the battery negative cable (2) , from the engine block.

Note: Observe how the battery positive and negative cable was routed within the engine compartment.

15. Remove the battery positive and negative cable, from the engine compartment.

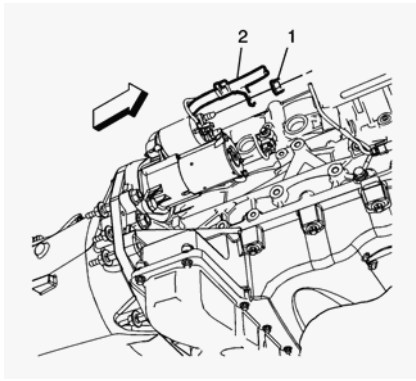
[Installation Procedure](#)



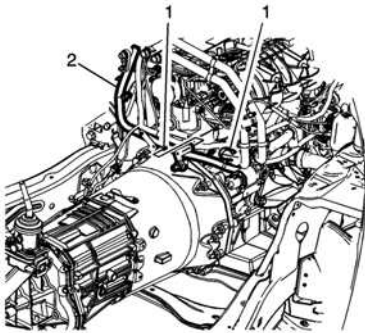
Caution: Refer to Fastener Caution.

1. Install the battery positive cable (2) to the generator and tighten the fastener (1) to **14 Y (124 lb in)**.

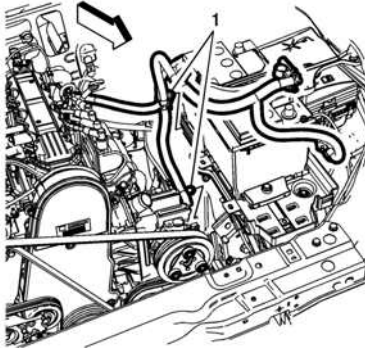
2. Install the battery negative cable (6) to the engine block and tighten the fastener (5) to **60 Y (44 lb ft)**.



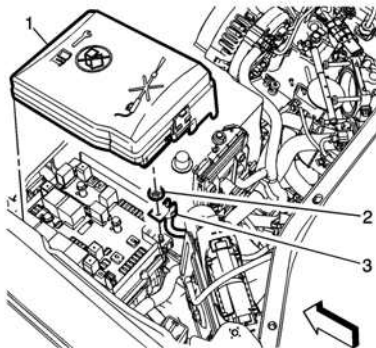
3. Install the battery positive cable (2) to the starter and tighten the fastener (1) to **10 Y (89 lb in)**.



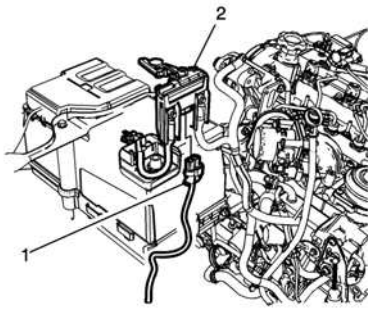
4. Install the battery positive cable (2) to the transmission bracket and heater hose (1).



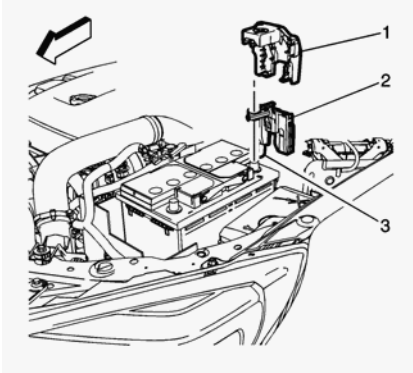
5. Install the battery positive retainers (1) securing the battery positive cable to the battery tray and the left front wheel well.



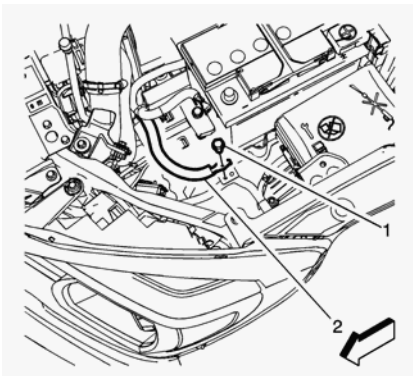
6. Install the battery positive cable (3) to the underhood fuse block stud and tighten the fastener (2) to **10 Y (89 lb in)**.
7. Install the underhood fuse block cover (1).



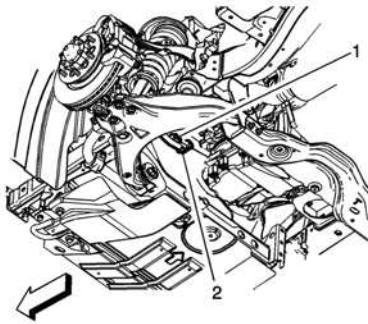
8. Install the body harness connector (1) to the battery positive cable (2).



9. Install the battery positive cable (3) to the battery post with the clamp (2).
10. Install the battery positive clamp cover (1).

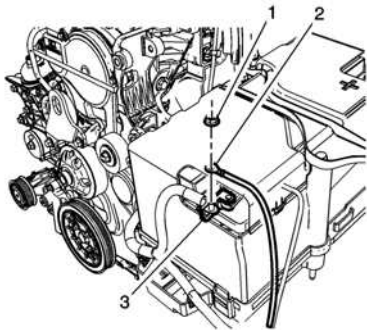


11. Install the battery negative cable battery tray ground fastener (1) and tighten to **10 Y (89 lb in)**.



12. Install the battery negative cable (2) to the engine block and tighten the fastener (1) to **40 Y (29 lb ft)**.
13. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

Battery Positive and Negative Cable Replacement (LP8)

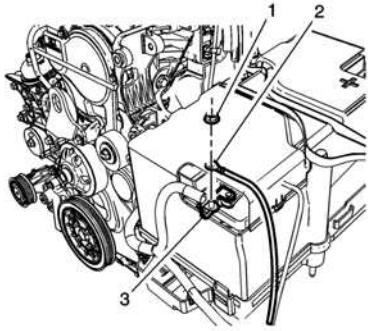


14. Install body harness terminal (2) to the negative battery clamp (3) and tighten the fastener (1) to **10 Y (89 lb in)**.

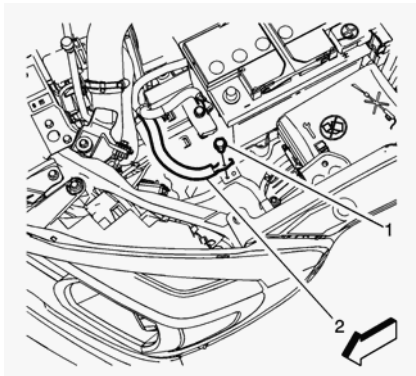
2013 Chevrolet Colorado

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

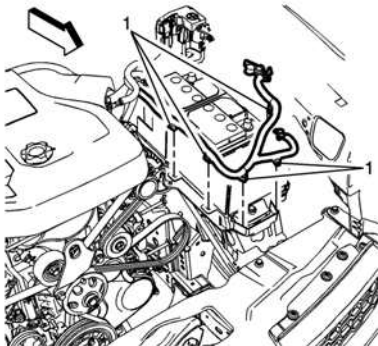
[Removal Procedure](#)



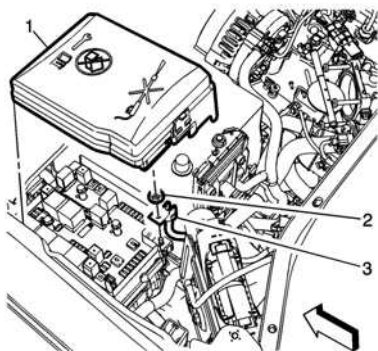
1. Remove the body harness fastener (1) and the body harness terminal (2) from the negative battery clamp (3).
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



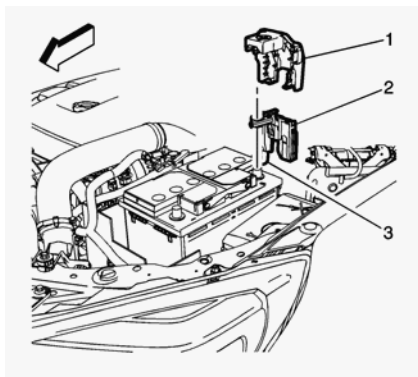
3. Remove the battery negative cable battery tray ground fastener (1) and remove the battery negative cable (2).



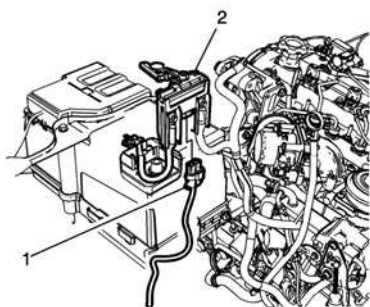
4. Disconnect the battery negative cable retainers (1) from the battery tray.



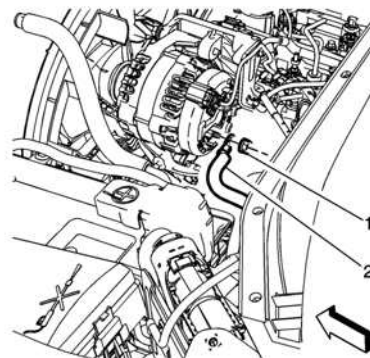
5. Remove the underhood fuse block cover (1).
6. Remove the battery positive cable fastener (2) and remove the battery positive cable (3).



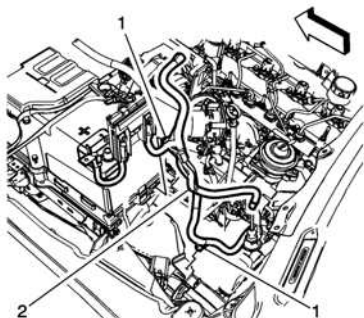
7. Remove the battery positive cable cover (1) and release the clamp (2) securing the battery positive cable (3) to the battery post.



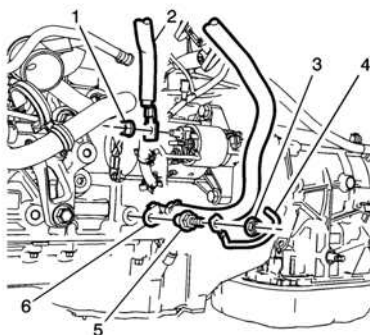
8. Remove the body harness connector (1) from the battery positive cable (2).



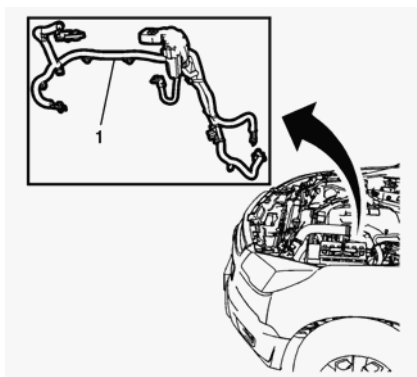
9. Remove the battery positive cable fastener (1) and the battery positive cable (2), from the back of the generator.



10. Remove the battery positive retainers (1) securing the battery positive cable (2) to the battery tray and the left front frame rail.
11. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
12. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.



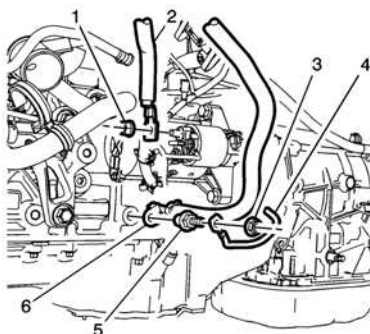
13. Remove the battery positive fastener (1) and remove the battery positive cable (2) from the starter.
14. Remove the engine harness ground fastener (3) and remove the engine harness terminal (4).
15. Remove the battery negative cable fastener (5) and remove the battery negative cable (6) from the engine block.
16. Remove the battery positive cable (2).



Note: Observe how the battery positive and negative cable was routed within the engine compartment.

17. Remove the battery positive and negative cable (1) from the front engine compartment.

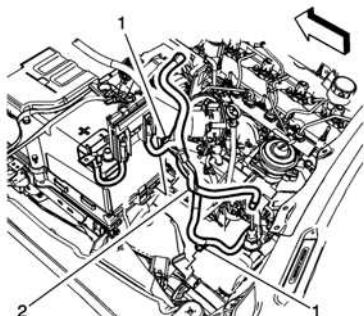
[Installation Procedure](#)



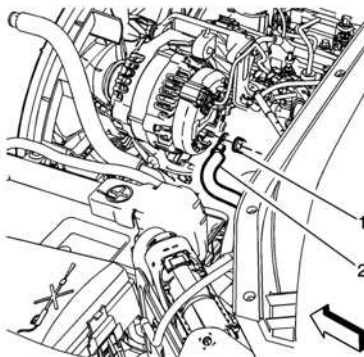
Battery Positive and Negative Cable Replacement (LVN)

Caution: Refer to Fastener Caution.

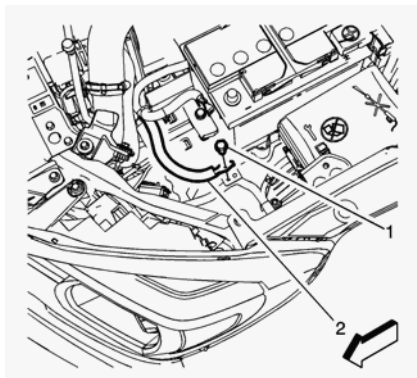
1. Install the battery positive cable (2) to the starter and tighten the fastener (1) to **10 Y (89 lb in)**.
2. Install the battery negative cable (6) to the engine block and tighten the fastener (5) to **60 Y (44 lb ft)**.
3. Install the engine harness ground terminal (4) and tighten the fastener 3) to **10 Y (89 lb in)**.
4. Install the engine protection shield. Refer to Engine Protection Shield Replacement.
5. Lower the vehicle.



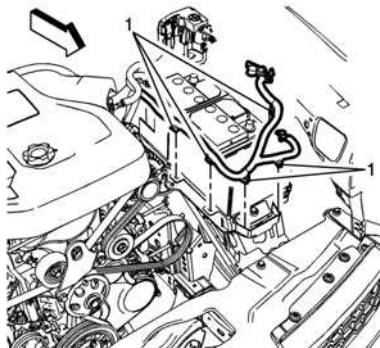
6. Install the battery positive retainers (1) securing the battery positive cable (2) to the battery tray and the left front frame rail.



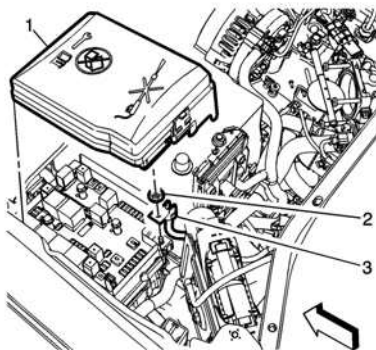
7. Install the battery positive cable fastener (1) from the back of the generator and tighten the fastener to **14 Y (10 lb ft)**.



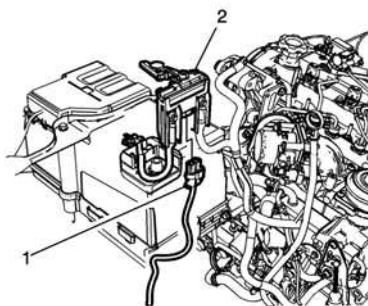
8. Install the battery negative cable battery tray ground fastener (1) and tighten to **10 Y (89 lb in)**.



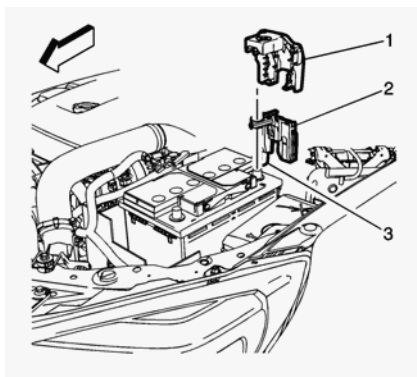
9. Connect the battery negative cable retainers (1) to the battery tray.



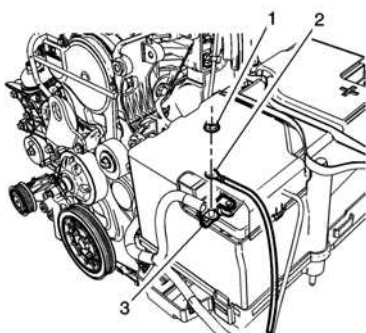
10. Install the battery positive cable (3) to the underhood fuse block stud and tighten the fastener (2) to **10 Y (89 lb in)**.
11. Install the underhood fuse block cover (1).



12. Install the body harness connector (1) to the battery positive cable (2).



13. Install the battery positive cable (3) to the battery post with the clamp (2).
14. Install the battery positive clamp cover (1).
15. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

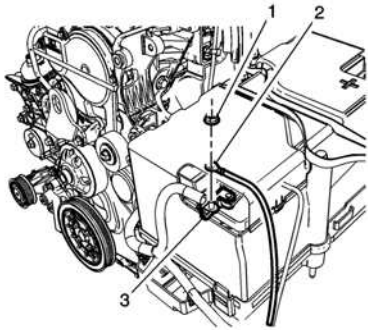


16. Install body harness terminal (2) to the negative battery clamp (3) and tighten the fastener (1) to **10 Y (89 lb in)**.

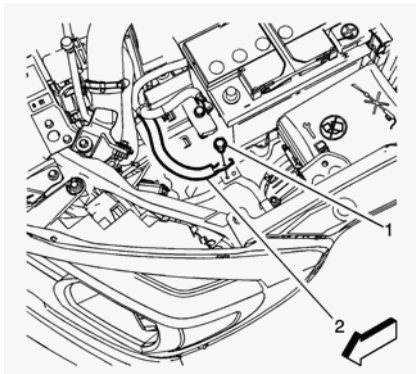
2013 Chevrolet Colorado

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

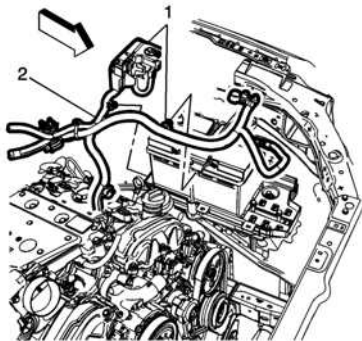
[Removal Procedure](#)



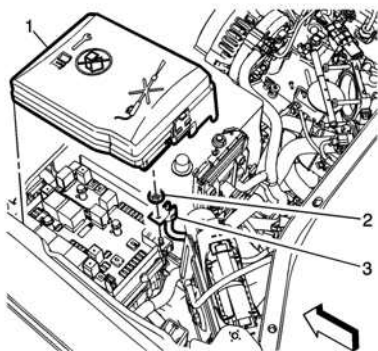
1. Remove the body harness fastener (1) and the body harness terminal (2) from the negative battery clamp (3).
2. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.



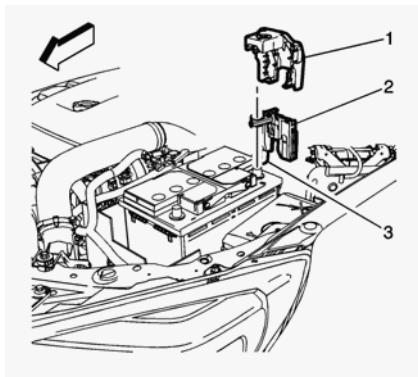
4. Remove the battery negative cable battery tray ground fastener (1) and remove the battery negative cable (2).



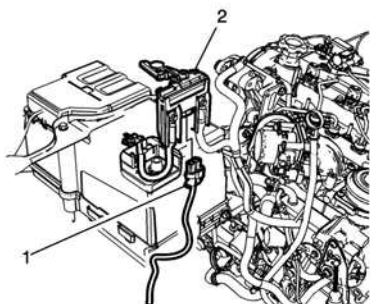
5. Remove the battery positive and negative cable retainers (1), from the battery tray.



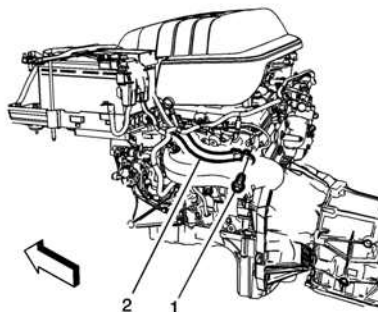
6. Remove the underhood fuse block cover (1).
7. Remove the battery positive cable fastener (2) and remove the battery positive cable (3).



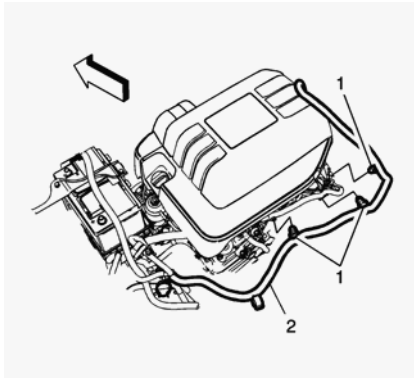
8. Remove the battery positive cable cover (1) and release the clamp (2) securing the battery positive cable (3) to the battery post.



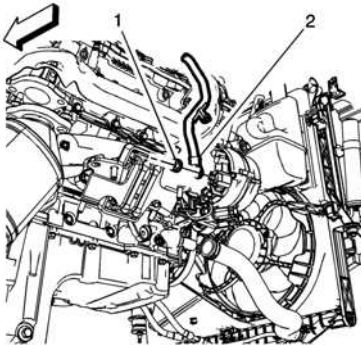
9. Remove the body harness connector (1) from the battery positive cable (2).



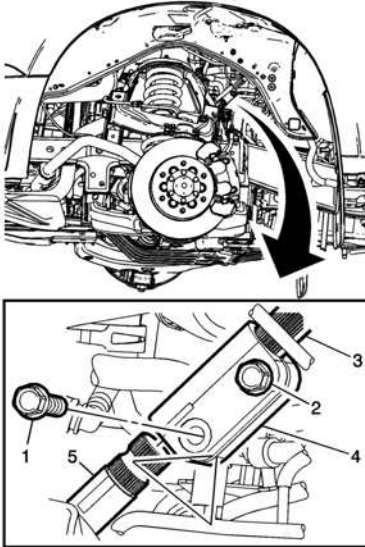
10. Remove the battery negative engine ground fastener (1) and remove the battery negative cable terminal (2).



11. Remove the battery positive cable retainers (1) from the engine harness holders.
12. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

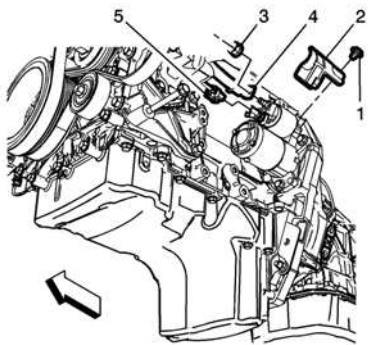


13. Remove the battery positive cable fastener (1) and the battery positive cable (2) from the back of the generator.
14. Remove the left front engine lower front splash shield. Refer to Engine Lower Front Splash Shield Replacement.



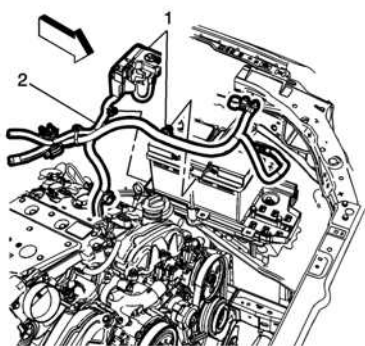
15. Place match marks on the following parts:

- The intermediate steering shaft (3)
- The intermediate steering shaft clamp (4)
- The lower steering shaft (5)
- Loosen the intermediate steering shaft clamp upper bolt (2).
- Remove the intermediate steering shaft clamp lower bolt (1).
- Disconnect the intermediate steering shaft clamp from the lower steering shaft.

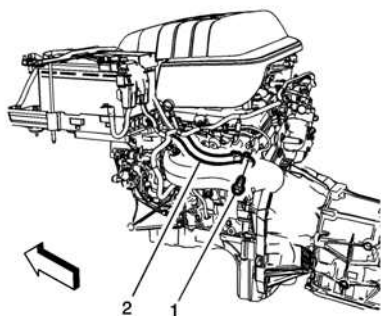


- Remove the starter heat shield fastener (1) and the starter heat shield (2).
 - Remove the battery positive cable fastener (3) and remove the battery positive cable (4) from the starter solenoid.
- Note:** Observe how the battery positive and negative cable was routed within the engine compartment.
- Remove the battery positive and negative cable, from the engine compartment.

[Installation Procedure](#)

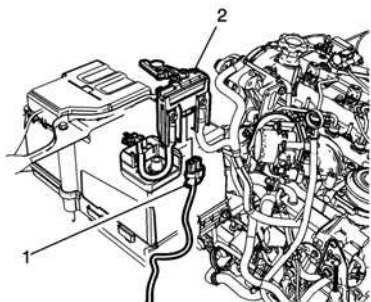


1. Install the battery positive and negative cable retainers (1), to the battery tray.

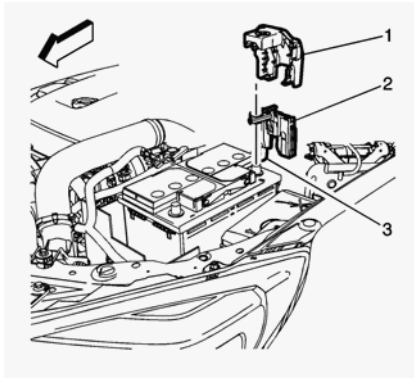


Caution: Refer to Fastener Caution.

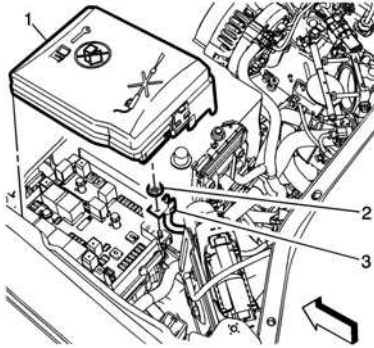
2. Install the battery negative cable engine ground terminal (2) and tighten the fastener (1) to **58 Y (43 lb ft)**.



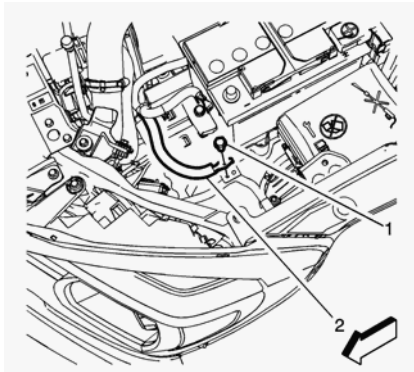
3. Install the body harness connector (1) to the battery positive cable (2).



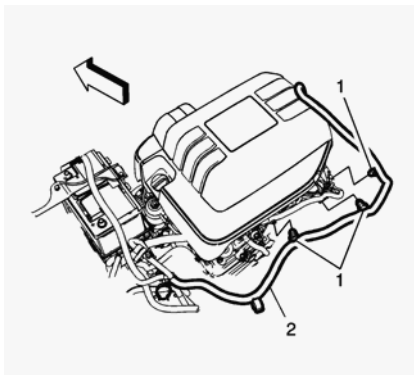
4. Install the battery positive cable (3) to the battery post with the clamp (2).
5. Install the battery positive clamp cover (1).



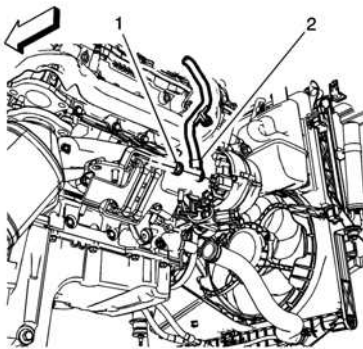
6. Install the battery positive cable (3) to the underhood fuse block stud and tighten the fastener (2) to **10 Y (89 lb in)**.
7. Install the underhood fuse block cover (1).



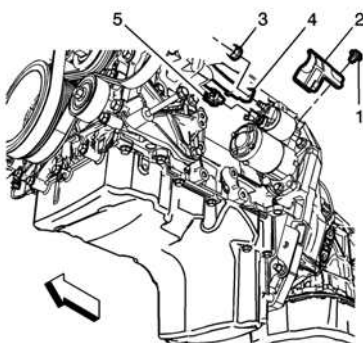
8. Install the battery negative cable battery tray ground fastener (1) and tighten to **10 Y (89 lb in)**.



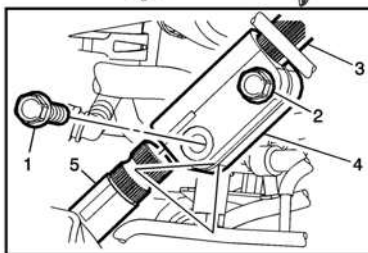
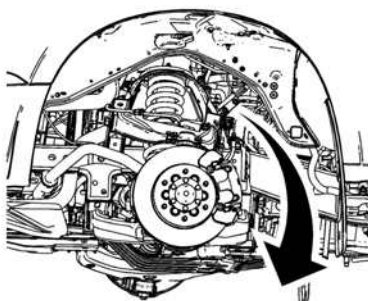
9. Install the battery positive cable retainers (1) to the engine harness holders.



10. Install the battery positive cable terminal (2) to the back of the generator and tighten the fastener (1) to **20 Y (15 lb ft)**.
11. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.

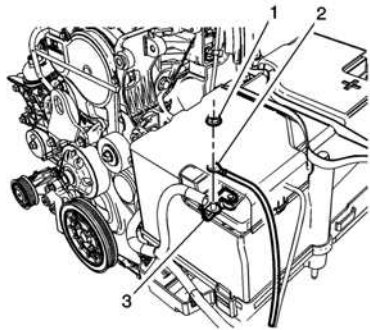


12. Install the battery positive cable terminal (4) to the starter solenoid and tighten the fastener (1) to **10 Y (89 lb in)**.
13. Install the starter heat shield (2) and tighten the fastener (1) to **5 Y (44 lb in)**.



14. Align the match marks and connect the intermediate steering shaft clamp (4) to the lower steering shaft (5).
15. Install the intermediate steering shaft clamp lower bolt (1) and tighten to **31 Y (23 lb ft)**.
16. Tighten the intermediate steering shaft clamp upper bolt (2) to **31 Y (23 lb ft)**.
17. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement.
18. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

Battery Positive and Negative Cable Replacement (LY7)



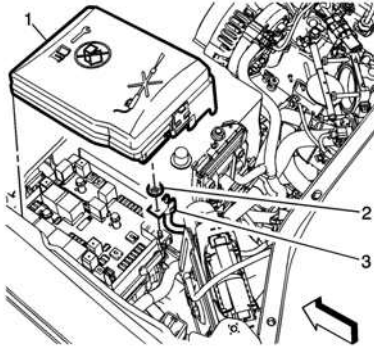
19. Install body harness terminal (2) to the negative battery clamp (3) and tighten the fastener (1) to **10 Y (89 lb in)**.

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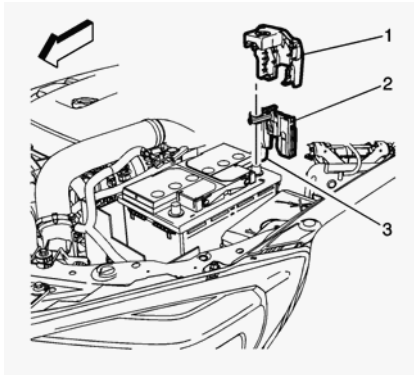
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

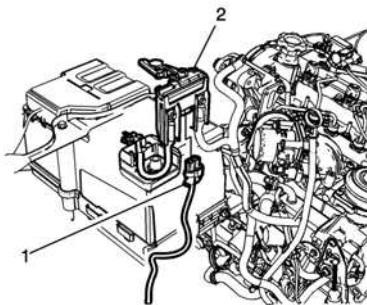
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



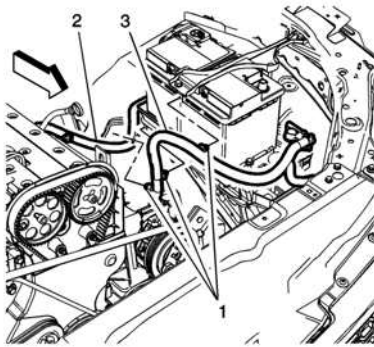
2. Remove the underhood fuse block cover (1).
3. Remove the battery positive cable fastener (2) and remove the battery positive cable (3).



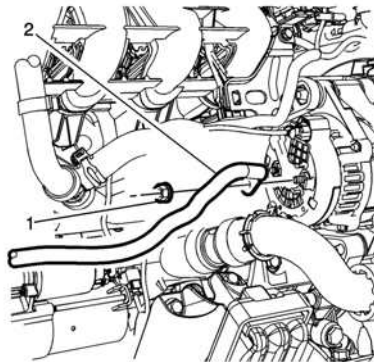
4. Remove the battery positive cable cover (1) and release the clamp (2) securing the battery positive cable (3) to the battery post.



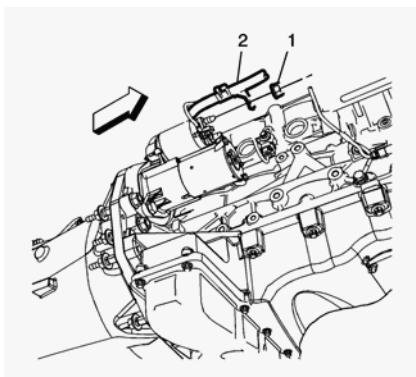
5. Remove the body harness connector (1) from the battery positive cable (2).



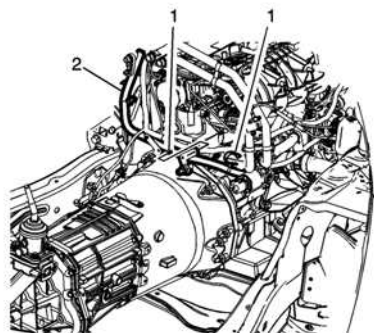
6. Remove the battery negative retainer (1) from the battery positive cable (2).
7. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



8. Remove the battery positive cable fastener (1) and the battery positive cable (2) from the back of the generator.
9. Remove the starter. Refer to Starter Replacement.

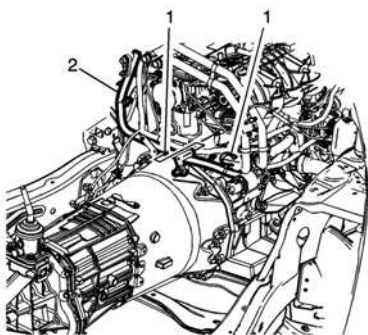


10. Remove the battery positive cable fastener (1) and the battery positive cable terminal (2) , from the starter.

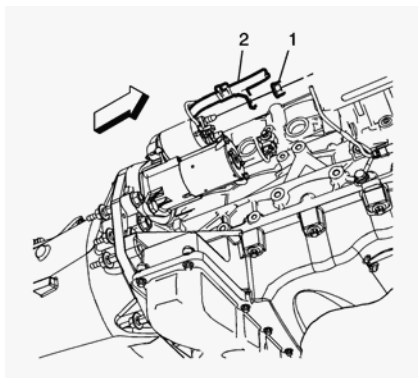


11. Remove the battery positive retainers (1) securing the battery positive cable (2) to the transmission bracket and heater hose.
Note: Observe how the battery positive cable was routed within the engine compartment.
12. Remove the battery positive cable, from the engine compartment.

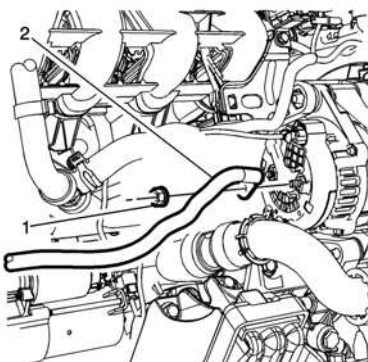
[Installation Procedure](#)



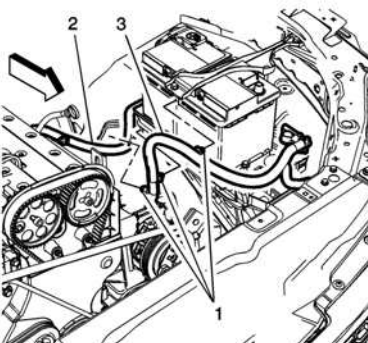
1. Install the battery positive cable (2) to the transmission bracket and heater hose (1).



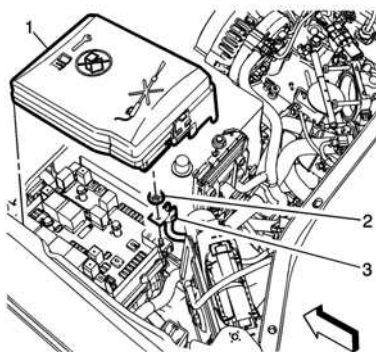
- Caution:** Refer to Fastener Caution.
2. Install the battery positive cable (2) to the starter and tighten the fastener (1) to **10 Y (89 lb in)**.
 3. Install the starter. Refer to Starter Replacement.



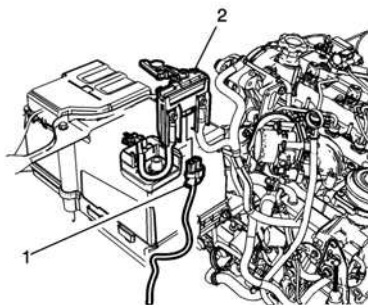
4. Install the battery positive cable (2) to the generator and tighten the fastener (1) to **14 Y (124 lb in)**.
5. Lower the vehicle. Refer to Lifting and Jacking the Vehicle.



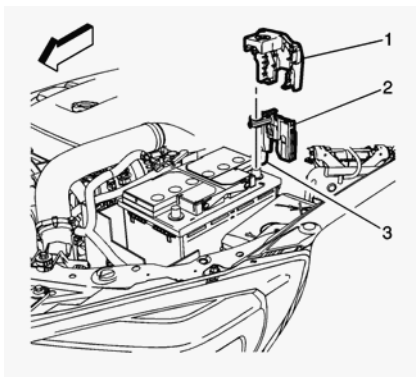
6. Install the battery positive cable (2) to the battery negative retainer (1) on the battery negative cable (3).



7. Install the battery positive cable (3) to the underhood fuse block stud and tighten the fastener (2) to **10 Y (89 lb in)**.
8. Install the underhood fuse block cover (1).



9. Install the body harness connector (1) to the battery positive cable (2).



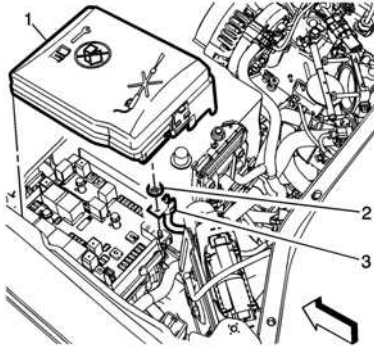
10. Install the battery positive cable (3) to the battery post with the clamp (2).
11. Install the battery positive clamp cover (1).
12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
13. Install the battery negative cable (6) to the engine block and tighten the fastener (5) to **60 Y (44 lb ft)**.

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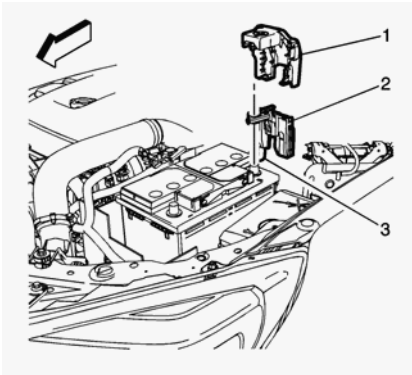
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

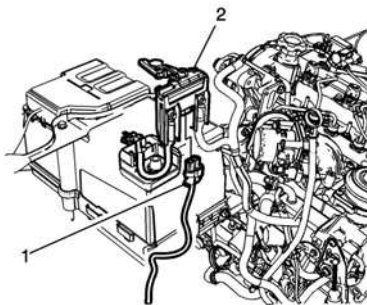
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



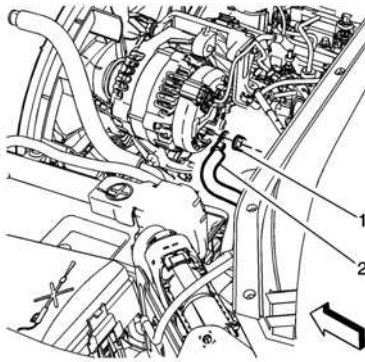
2. Remove the underhood fuse block cover (1).
3. Remove the battery positive cable fastener (2) and remove the battery positive cable (3).



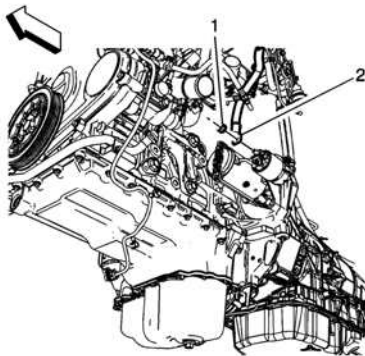
4. Remove the battery positive cable cover (1) and release the clamp (2) securing the battery positive cable (3) to the battery post.



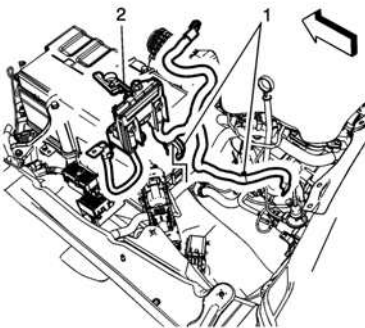
5. Remove the body harness connector (1) from the battery positive cable (2).



6. Remove the battery positive cable fastener (1) and the battery positive cable (2), from the back of the generator.
7. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.
8. Remove the engine protection shield. Refer to Engine Protection Shield Replacement.



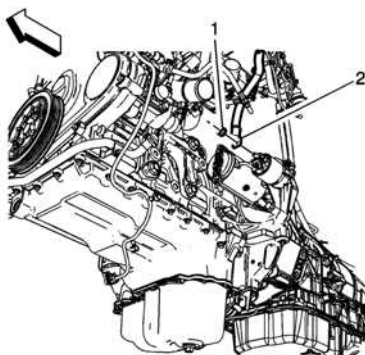
9. Remove the battery positive fastener (1) and remove the battery positive cable (2) from the starter.



Note: Observe how the battery positive and negative cable was routed within the engine compartment.

10. Remove the battery positive retainers (1) and remove the battery positive cable (2) from the engine compartment.

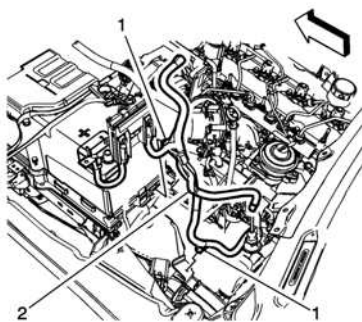
[Installation Procedure](#)



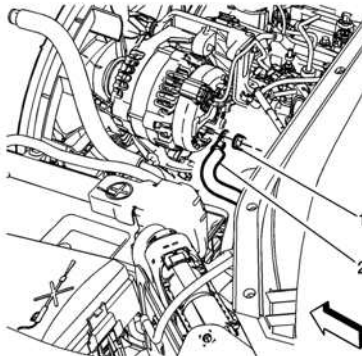
Caution: Refer to Fastener Caution.

1. Install the battery positive cable (2) to the starter and tighten the fastener (1) to **10 Y (89 lb in)**.
2. Install the engine protection shield. Refer to Engine Protection Shield Replacement.

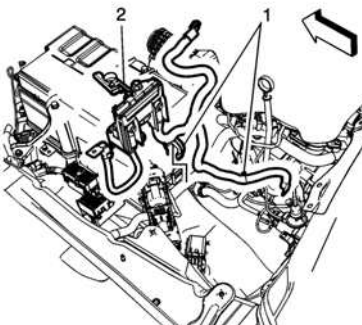
3. Lower the vehicle.



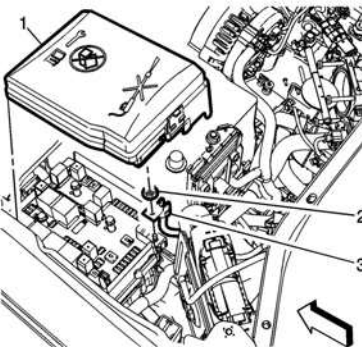
4. Install the battery positive retainers (1) securing the battery positive cable (2) to the battery tray and the left front frame rail.



5. Install the battery positive cable (2) and battery positive cable fastener (1) from the back of the generator and tighten the fastener (1) to **14 Y (10 lb ft)**.

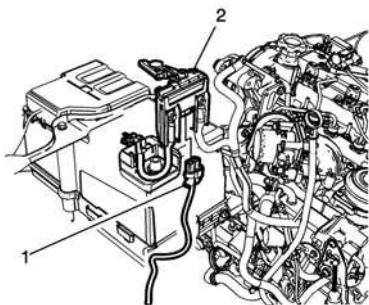


6. Connect the battery positive retainers (1) securing the battery positive cable (2).

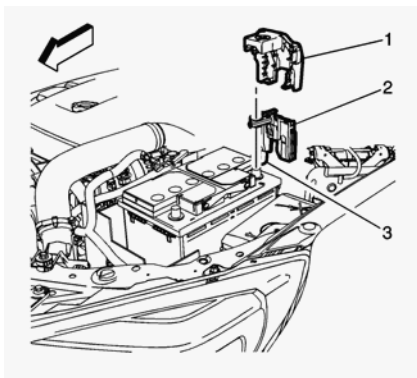


7. Install the battery positive cable (3) to the underhood fuse block stud and tighten the fastener (2) to **10 Y (89 lb in)**.
8. Install the underhood fuse block cover (1).

Battery Positive Cable Replacement (LWH)



9. Install the body harness connector (1) to the battery positive cable (2).



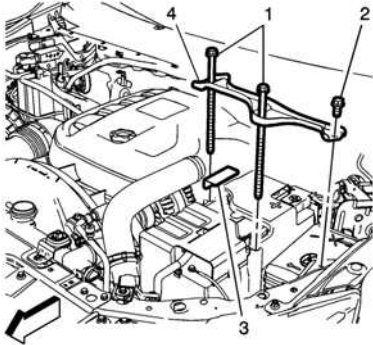
10. Install the battery positive cable (3) to the battery post with the clamp (2).
11. Install the battery positive clamp cover (1).
12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

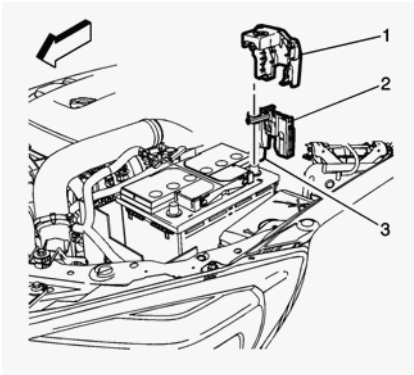
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

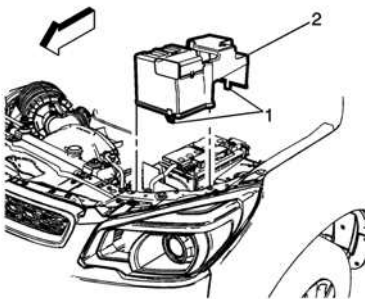
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.



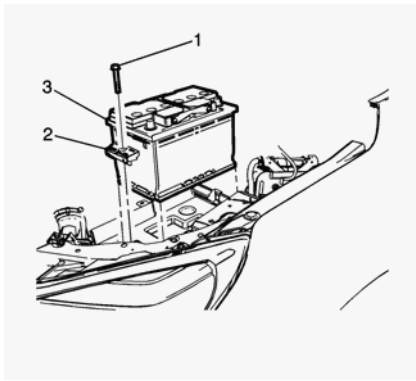
2. Remove the battery retainer fasteners (1) and (2).
3. Remove the battery retainer (4)



4. Remove the battery positive cover (1) and release the battery positive cable clamp (2).
5. Remove the battery positive cable (3) from the battery positive post.

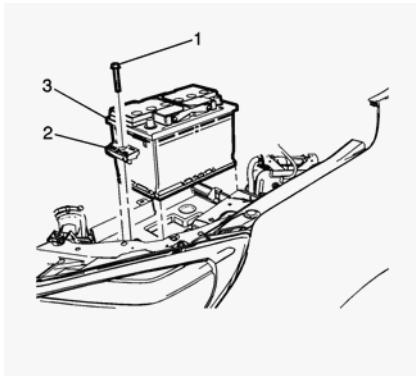


6. Release the battery box retainer tabs (1) and remove the battery box (2).



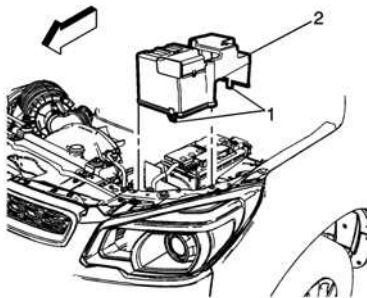
7. Remove the battery hold down retainer fastener (1) and the battery hold down retainer (2).
8. Remove the battery (3) from the engine compartment.

[Installation Procedure](#)

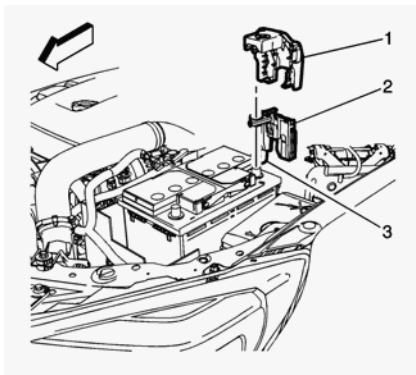


Caution: Refer to Fastener Caution.

1. Install the battery (3) onto the battery tray with the battery hold down retainer (2). Tighten the fastener (1) to **20 Y (15 lb ft)**.

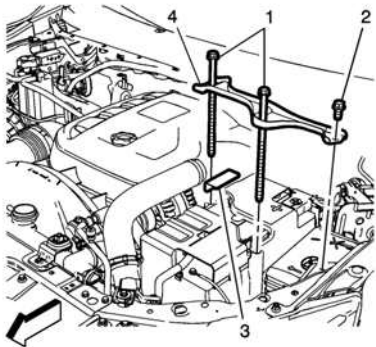


2. Install the battery box (2) to the battery tray with the retainer tabs (1).



3. Install the battery positive cable (3) to the battery positive post.
4. Install the battery positive cable clamp (2) to the battery post and install the cover (1).

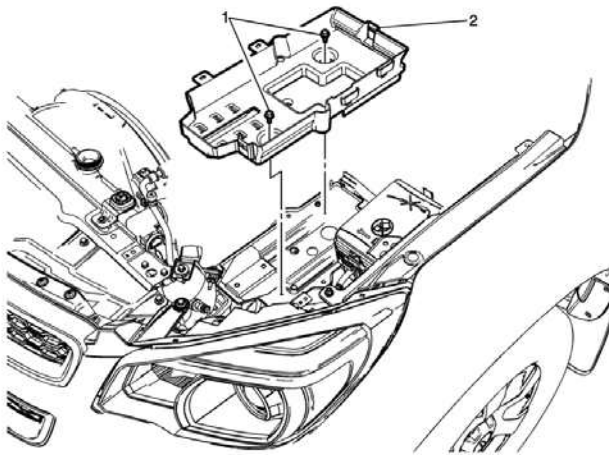
Battery Replacement



5. Install the retainer (4) to the top of the battery.
6. Install the retainer fasteners (1) and tighten to **5 Y (44 lb in)**.
7. Install the upper tie bar fastener (2) and tighten to **20 Y (15 lb ft)**.
8. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

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



Battery Tray Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the battery. Refer to Battery Replacement.
2. Loosen junction block base bolt from the inner wheelhouse. Refer to Front Compartment Fuse Block Replacement.

Caution: Refer to Fastener Caution.

Battery Tray Fastener

1

Tighten

5 Y (44 lb in).

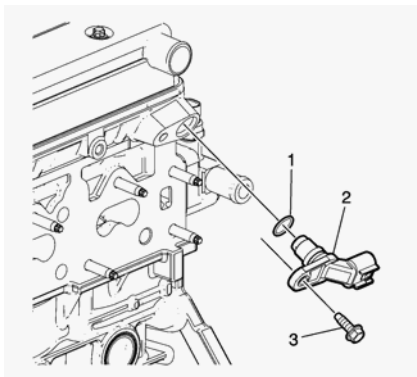
2

Battery Tray

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).

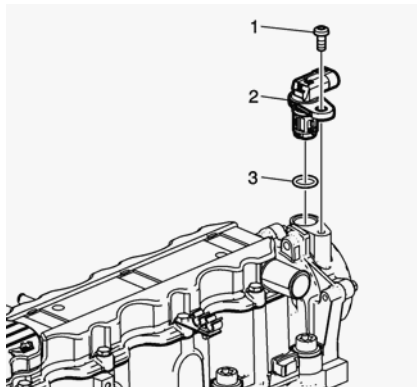
Caution: Refer to Fastener Caution.

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).

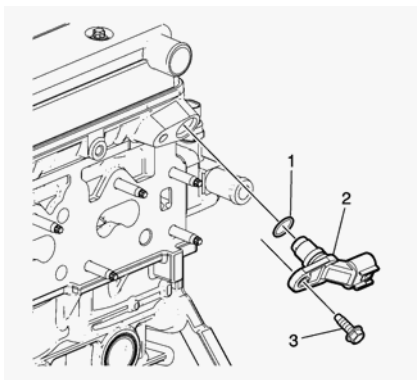
Caution: Refer to Fastener Caution.

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

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

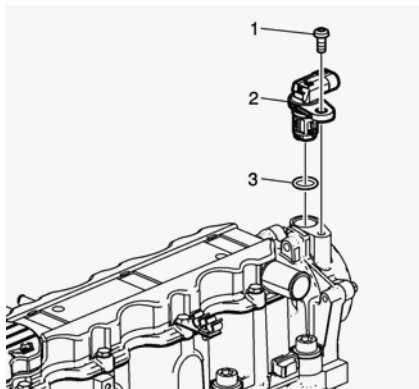


1. Remove the camshaft position sensor bolt (3).
2. Remove the camshaft position sensor (2) and seal (1).

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

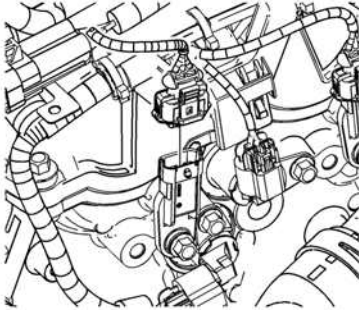


1. Remove the camshaft position sensor bolt (1).
2. Remove the camshaft position sensor (2) and seal (3).

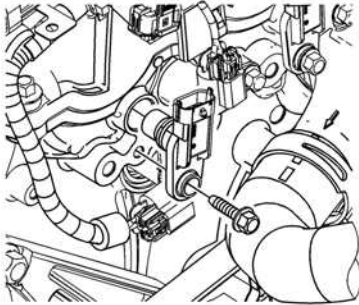
2013 Chevrolet Colorado

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

[Removal Procedure](#)

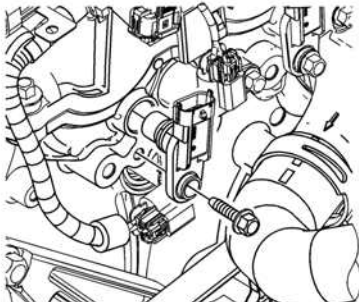


1. Turn the ignition OFF.
2. Disconnect the camshaft position (CMP) sensor electrical connector.



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

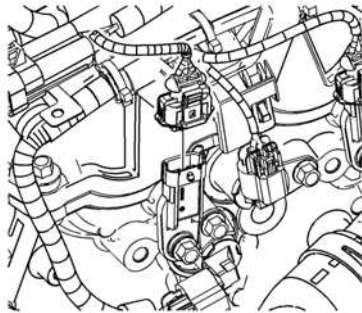
[Installation Procedure](#)



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



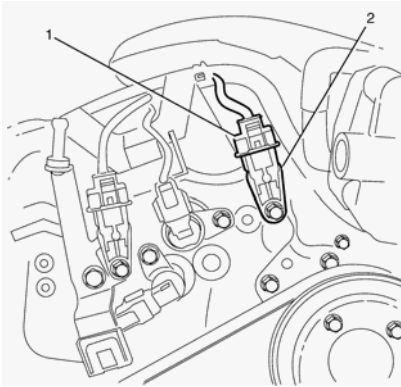
3. Connect the CMP sensor electrical connector.

2013 Chevrolet Colorado

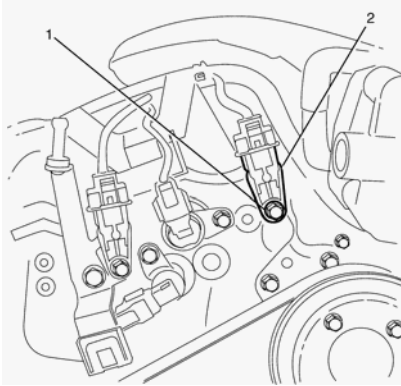
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Turn the ignition OFF.

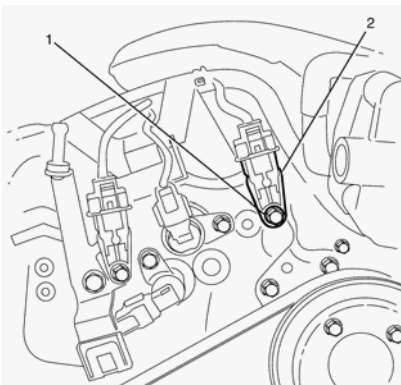


2. Remove the camshaft position (CMP) sensor electrical connector (1) from the CMP sensor (2).



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](#)

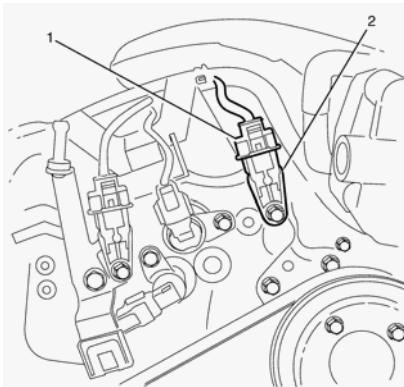


1. Install the CMP sensor (2) to the engine front cover.

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



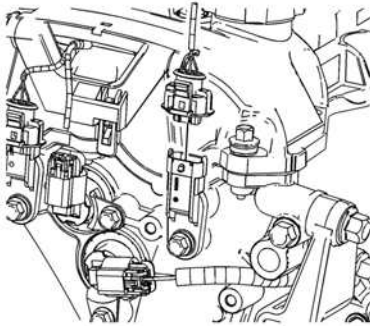
3. Install the CMP sensor electrical connector (1) to the CMP sensor.

2013 Chevrolet Colorado

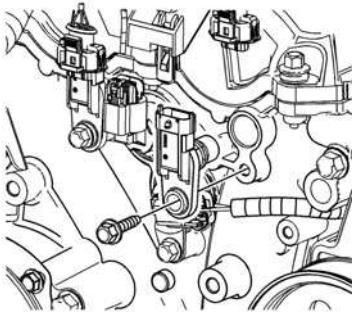
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

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

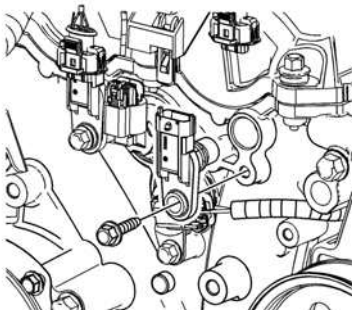


3. Remove the camshaft position (CMP) sensor electrical connector.



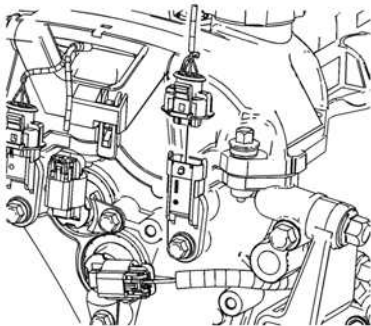
4. Remove the CMP sensor bolt.
5. Remove the CMP sensor.

[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



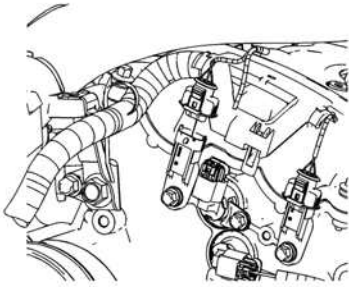
3. Install the CMP sensor electrical connector.
4. Install the intake manifold cover. Refer to Intake Manifold Cover Replacement

2013 Chevrolet Colorado

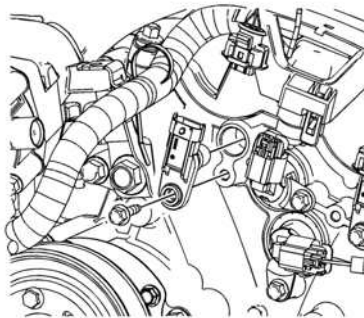
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

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

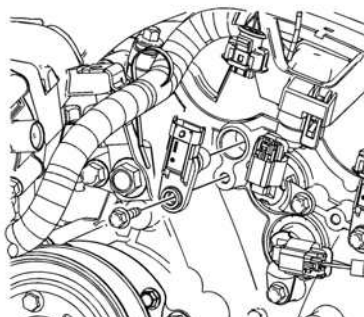


3. Remove the camshaft position (CMP) sensor electrical connector.



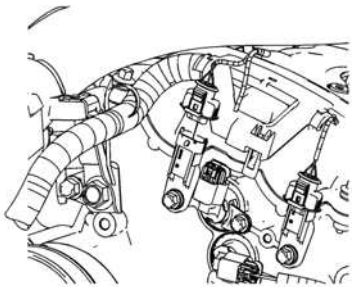
4. Remove the CMP sensor bolt.
5. Remove the CMP sensor.

[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)**.

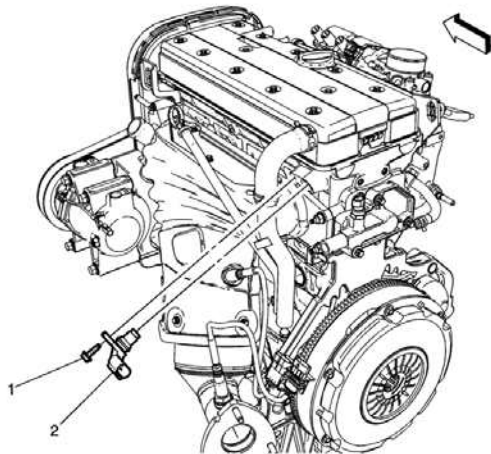
Camshaft Position Sensor Replacement - Bank 2 (Left Side) Intake



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

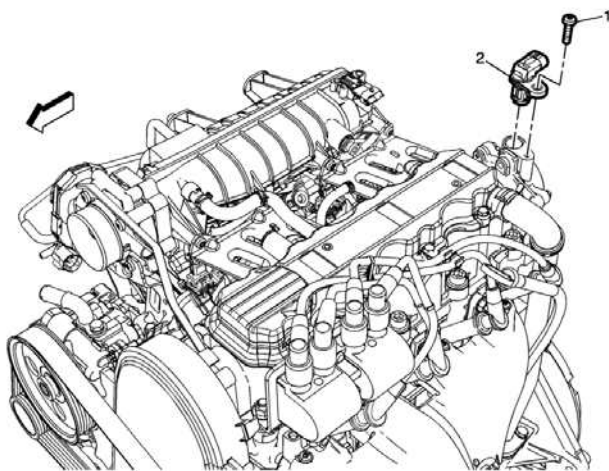
10 Y (89 lb in)

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

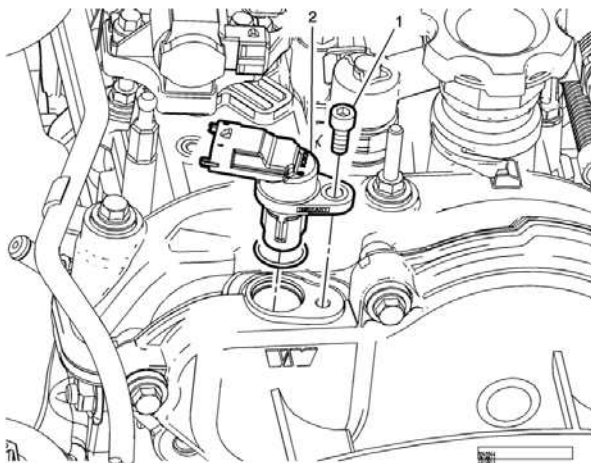
2

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

Caution: Refer to Fastener Caution.

1

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:**

[Generator](#)

The generator features the following major components:

- The delta stator
- The rectifier bridge
- The rotor with slip rings and brushes
- A solid pulley
- Dual internal fans
- The regulator

The pulley and the fan cool the slip ring and the frame.

The generator features permanently lubricated bearings. Service should only include tightening of mount components. Otherwise, replace the generator as a complete unit.

[Regulator](#)

The voltage regulator controls the rotor field current in order to limit the system voltage. When the field current is ON, the regulator switches the current ON and OFF at a rate of 400 cycles per second in order to perform the following functions:

- Radio noise control
- Obtain the correct average current needed for proper system voltage control.

At high speeds, the on-time may be 10% with the off-time at 90%. At low speeds, the on-time may be 90% and the off-time 10%.

[Circuit Description](#)

The generator provides voltage to operate the vehicle's electrical system and to charge its battery. A magnetic field is created when current flows through the rotor. This field rotates as the rotor is driven by the engine, creating an AC (alternating current) voltage in the stator windings. The AC voltage is converted to DC by the rectifier bridge and is supplied to the electrical system at the battery terminal.

When the engine is running, the generator turn-on signal is sent to the generator from the engine control module (ECM), turning ON the regulator. The generator's voltage regulator controls current to the rotor, thereby controlling the output voltage. The rotor current is proportional to the electrical pulse width supplied by the regulator. When the engine is started, the regulator senses generator rotation by detecting AC voltage at the stator through an internal wire. Once the engine is running, the regulator varies the field current by controlling the pulse width. This regulates the generator output voltage for proper battery charging and electrical system operation. When the voltage regulator detects a charging system condition, it grounds this circuit to signal the ECM that a condition exists.

[Charging System Indicator](#)

The instrument panel cluster illuminates the charge indicator in the message center when the following occurs:

- The ECM detects that the generator output is less than 11 V or greater than 16 V. The instrument panel cluster receives a serial data message from the ECM requesting illumination.
- The instrument panel cluster determines that the system voltage is less than 11 V or greater than 16 V.
- The instrument panel cluster performs the displays test at the start of each ignition cycle. The indicator illuminates for approximately 3 s.
- The ignition is ON, with the engine OFF.

2013 Chevrolet Colorado

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

An automobile engine is a combination of many of the following surfaces:

- Machined
- Honed
- Polished
- Lapped

The tolerances of these surfaces are measured in the ten-thousandths of an inch. When you service any internal engine part, cleanliness and care are important. Apply a liberal coating of engine oil to the friction areas during assembly in order to protect and lubricate the surfaces on initial operation. Throughout this section, practice proper cleaning and protection procedures to the machined surfaces and to the friction areas.

Caution: Engine damage may result if an abrasive paper, pad, or motorized wire brush is used to clean any engine gasket surfaces.

Whenever you remove the valve train components, keep the components in order. Follow this procedure in order to install the components in the same locations and with the same mating surfaces as when removed.

Warning: Refer to Battery Disconnect Warning.

Disconnect the negative battery cables before you perform any major work on the engine.

2013 Chevrolet Colorado

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

An automobile engine is a combination of many machined, honed, polished, and lapped surfaces with tolerances that are measured in ten thousandths of an inch. When any internal engine parts are serviced, care and cleanliness are important. A liberal coating of engine oil should be applied to friction areas during assembly to protect and lubricate the surfaces during initial operation. Throughout this section, it should be understood that proper cleaning and protection of machined surfaces and friction areas are part of the repair procedure. This is considered standard shop practice even if not specifically stated.

When valve train components are removed for service, they should be retained in order. At the time of installation, they should be installed in the same locations and with the same mating surfaces as when removed.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

An automobile engine is a combination of many of the following surfaces:

- Machined
- Honed
- Polished
- Lapped

The tolerances of these surfaces are measured in the ten-thousandths of an inch. When you service any internal engine part, cleanliness and care are important. Apply a liberal coating of engine oil to the friction areas during assembly in order to protect and lubricate the surfaces on initial operation. Throughout this section, practice proper cleaning and protection procedures to the machined surfaces and to the friction areas.

Caution: Engine damage may result if an abrasive paper, pad, or motorized wire brush is used to clean any engine gasket surfaces.

Whenever you remove the valve train components, keep the components in order. Follow this procedure in order to install the components in the same locations and with the same mating surfaces as when removed.

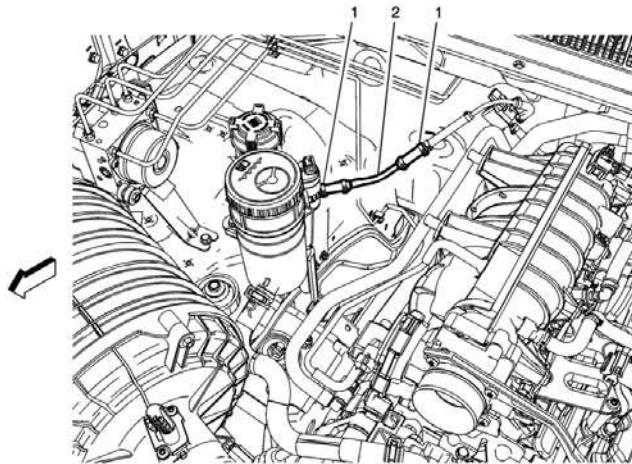
Warning: Refer to Battery Disconnect Warning.

Disconnect the negative battery cables before you perform any major work on the engine. For more information on the disconnection of the battery, refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Cold Start Fuel Feed Hose Replacement

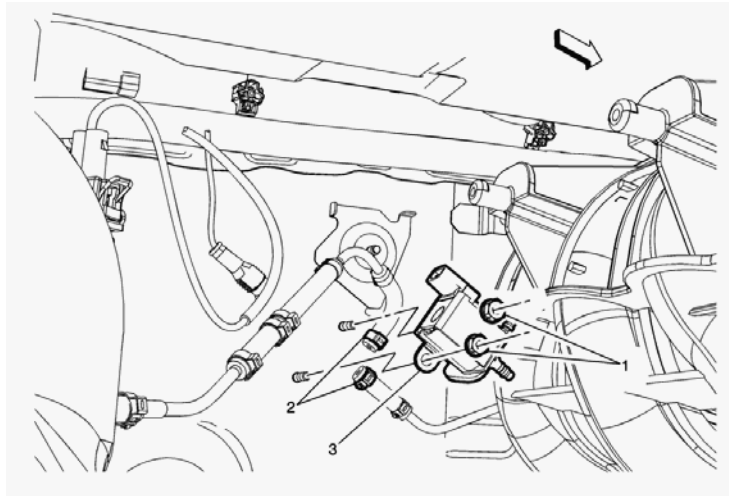
Callout

Component Name

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

2013 Chevrolet Colorado

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



Cold Start Fuel Feed Valve Replacement

Callout

Component Name

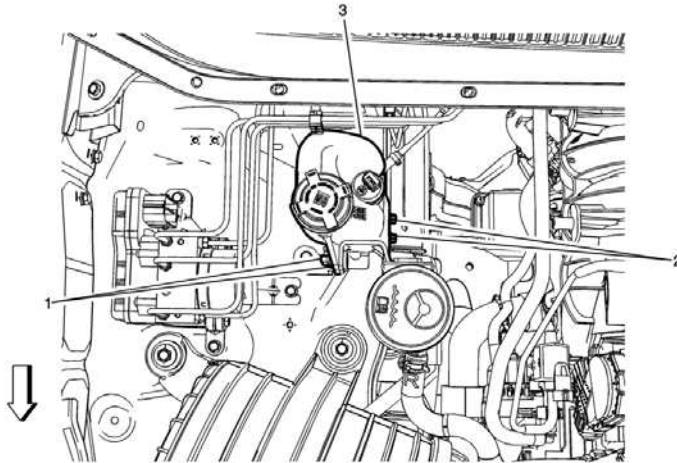
Preliminary Procedure

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 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

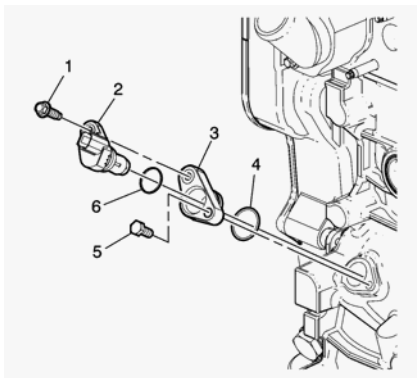
Procedure

Disconnect the electrical connector.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



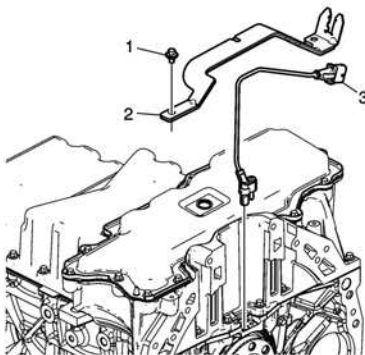
Caution: Refer to Fastener Caution.

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:



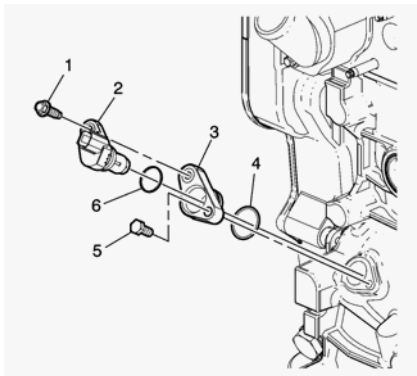
Caution: Refer to Fastener Caution.

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:

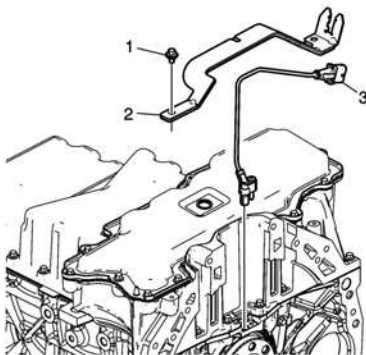


1. Remove the crankshaft position sensor bolt (1).
2. Remove the crankshaft position sensor (2) and seal (6).
3. Remove the crankshaft position sensor bracket bolt (5).
4. Remove the crankshaft position sensor bracket (3) and seal (4).

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

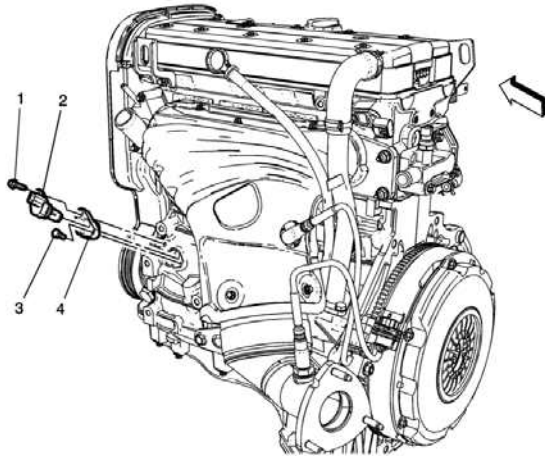
Fuel Delivery: | Fuel:



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

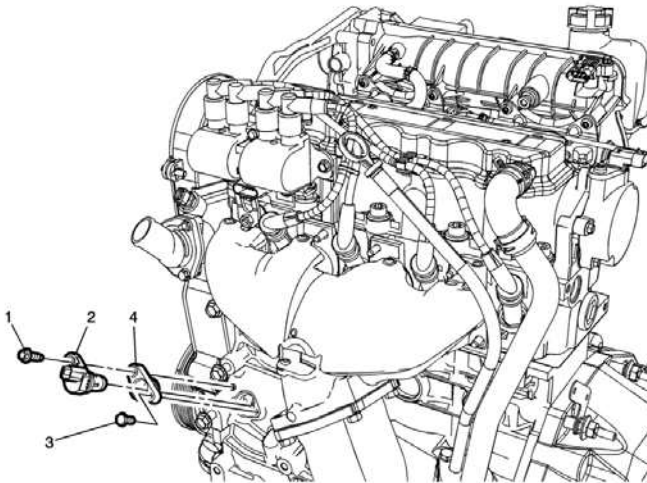
Callout

Component Name

- | | |
|---|---|
| | Crankshaft Position Sensor Fastener |
| 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:



Crankshaft Position Sensor Replacement

Callout

Component Name

Preliminary Procedure

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

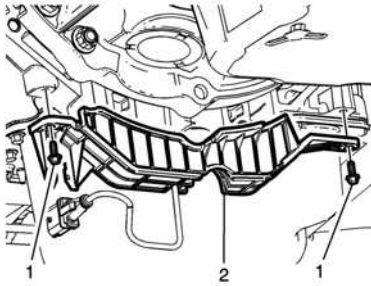
- | | |
|---|---|
| | Crankshaft Position Sensor Fastener |
| | Caution: Refer to Fastener Caution. |
| 1 | Tighten |
| | 9 Y(80 lb in) |
| | Crankshaft Position Sensor |
| 2 | Procedure |
| | Disconnect the crankshaft position sensor electrical connector. |
| | Crankshaft Position Sensor Housing Fastener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

2013 Chevrolet Colorado

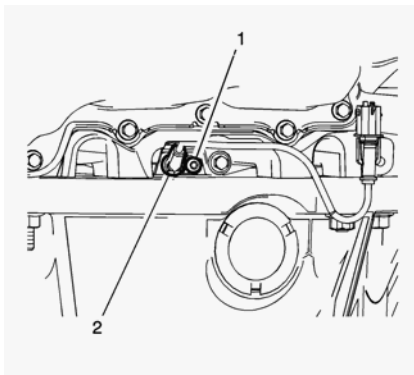
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

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

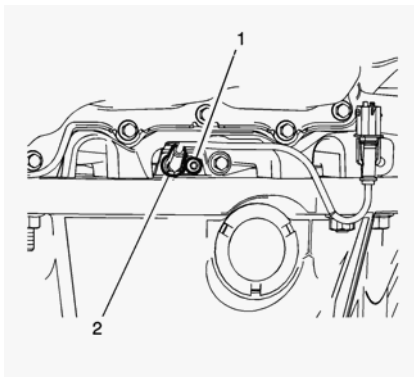


2. Remove the flywheel and crank shaft position sensor access cover fasteners(1)(Qty 2).
3. Unclip the crankshaft position sensor electrical wiring harness connector from the flywheel and crankshaft position sensor access cover.
4. Remove the flywheel and crankshaft position sensor access cover.



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

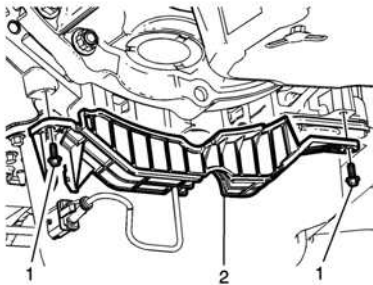
[Installation Procedure](#)



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



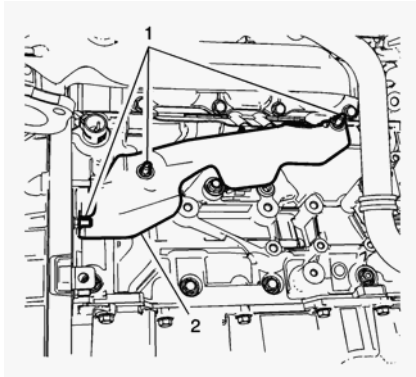
-
2. Position the flywheel and crankshaft position sensor access cover(2) and install the cover fasteners(1)(Qty 2) and tighten the fastener to **10 Y (65 lb in)**.
3. Clip the crankshaft position sensor electrical wiring harness connector to the flywheel and crankshaft position sensor access cover.

2013 Chevrolet Colorado

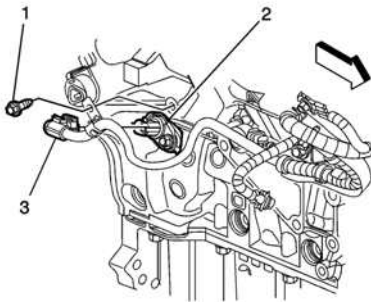
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[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](#)

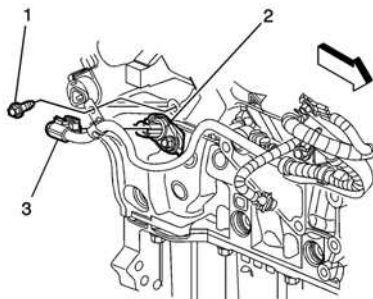
Crankshaft Position Sensor Replacement



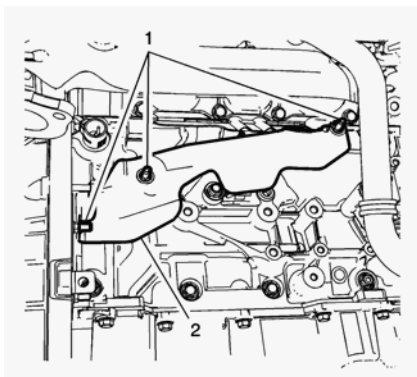
1. If reinstalling the existing sensor, inspect the O-ring for damage and replace as necessary.
2. Install the crankshaft position sensor (2) .

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:**

Cruise control is a speed control system that maintains a desired vehicle speed under normal driving conditions at speeds above 40 km/h (25 mph). Steep grades may cause variations in the selected vehicle speeds.

The following are the main components of the Cruise Control System:

- The accelerator pedal
- The brake pedal position (BPP) sensor
- The body control module (BCM)
- The cruise on/off switch
- The cruise control cancel switch
- The + RES switch (equivalent to resume/accel switch)
- The - SET switch (equivalent to set/coast switch)
- The engine control module (ECM)
- The throttle actuator control (TAC) motor
- The vehicle speed sensor

The body control module (BCM) monitors the signal circuit of the cruise control switches, which are located on the steering wheel. The BCM relays the cruise control switch status to the engine control module (ECM) via the serial data circuit. The ECM uses the status of the cruise control switch to determine when to capture and maintain the vehicle speed. The ECM monitors the vehicle speed signal circuit in order to determine the desired vehicle speed.

Voltage is supplied to the cruise control switch via the steering wheel control switch reference voltage circuit supplied by the BCM. The cruise control function switches are arranged in a resistive ladder design, with each cruise control function switch having a different resistance value. The BCM detects a specific voltage value that is associated with the cruise control function switch being activated. The BCM sends a serial data message to the ECM indicating that the on/off switch is active. Similarly, when the normally open + RES switch or the normally open - SET switch are pressed, the switch closes and the BCM detects the predetermined voltage signal on the cruise control resume/accel and set/coast switch signal circuit. The BCM sends a serial data message to the ECM indicating that the + RES switch or the - SET switch is active.

Cruise Control Engaged

The Cruise Control System will engage and adjust vehicle speeds, based on the activation of the following cruise control switches, which are located on the steering wheel:

- On/Off
- + RES
- - SET

To engage the Cruise Control System, ensure that the vehicle speed is above 40.2 km/h (25 mph), turn the cruise On/Off switch ON and momentarily press the - SET switch. The ECM will engage the Cruise Control System and record the vehicle speed. The ECM sends a serial data message to the instrument panel cluster (IPC) in order to illuminate the Cruise Engaged indicator in the IPC. Refer to the vehicle owner's manual for the location and operation of the cruise control On/Off indicators and driver information center (DIC) messages.

Pressing the accelerator pedal while the Cruise Control System is engaged, allows the driver to override the Cruise Control System in order to accelerate the vehicle beyond the current set vehicle speed. When the accelerator pedal is released, the vehicle will decelerate and resume the current set vehicle speed.

The driver can also override the current set vehicle speed via the - SET switch and the + RES switch. When the Cruise Control System is engaged, pressing and holding the - SET switch will allow the vehicle to decelerate from the current set vehicle speed without deactivating the Cruise Control System. When the - SET switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the - SET switch will allow the vehicle to decelerate at a vehicle specific calibratable increment, commonly 1.6 km/h (1 mph), each time that the - SET is momentarily pressed, with a minimum vehicle speed of 38 km/h (24 mph). Refer to the vehicle Owner's Manual for more information.

Pressing and holding the + RES switch, when the Cruise Control System is engaged, will allow the vehicle to accelerate to a greater vehicle speed than the current set vehicle speed. When the + RES switch is released, the ECM will record the vehicle speed and maintain the vehicle speed as the new set vehicle speed. When the Cruise Control System is engaged, momentarily pressing the + RES switch will allow the vehicle to accelerate at a vehicle specific calibratable increment, commonly 1.6 km/h (1 mph), each time that the + RES switch is momentarily pressed. Momentarily activating the + RES switch will recall the previous vehicle speed, after the cruise control system has been disengaged by pressing the brake pedal, or CANCEL switch. Refer to the vehicle Owner's Manual for more information.

Cruise Control Disengaged

The engine control module (ECM) disengages the cruise control operation based on the signals from the following switches:

- The brake pedal position (BPP) sensor
- The On/Off switch
- The cruise control cancel switch

The Cruise Control System will disengage when the brake pedal is applied. The body control module (BCM) monitors the BPP sensor via the BPP sensor signal circuit as the voltage signal increases while the pedal is further applied. The ECM monitors the BPP signal through a discrete input and a serial data message signal from the BCM indicating the brake status. When either signal indicates the brake pedal is applied, the ECM will disengage the cruise control system.

The Cruise Control System will also disengage when the cruise control on/off switch is switched OFF, or the cruise control cancel switch is activated. The body control module (BCM) determines when the cruise control cancel switch is activated. When the normally open cancel switch is closed, the BCM detects the predetermined voltage signal on the cruise control function switch circuit. The vehicle speed stored in the memory of the engine control module will be erased when the cruise control On/Off switch is turned OFF, or the ignition switch is turned OFF. The BCM sends a serial data message to the ECM in order to disengage the cruise control system. When the Cruise Control System has been disengaged, the ECM sends a serial message to the instrument panel cluster (IPC) in order to turn OFF the Cruise Engaged indicator.

Every time the Cruise Control System is disengaged, the ECM will keep track of the reason for system disengagement. The last 8 disengagement reasons will be recorded within the ECM memory. The scan tool will display the last 8 Cruise Disengage History parameters, in which one out of approximately 50 possible

reasons will be displayed in each of these 8 parameters. For the disengagement reason to be displayed within the scan tool parameter the Cruise Control System is active and disengagement is requested.

When engagement of the system is requested but an engagement inhibit is present, the most recent inhibit reason is recorded in the ECM history. The scan tool will display the most recent inhibit reason, in which one out of approximately 50 possible reasons will be displayed.

Cruise Control Inhibited

The engine control module (ECM) inhibits the cruise control operation when any of the following conditions exist:

- The ECM has not detected a brake pedal activation from the body control module (BCM) this ignition cycle.
- A Cruise Control System DTC has been set.
- The vehicle speed is less than 38.6 km/h (24 mph).
- The vehicle speed is too high.
- The vehicle is in PARK, REVERSE, NEUTRAL, or 1st gear.
- The engine RPM is low.
- The engine RPM is high.
- The system voltage is not between 9 volts and 16 volts.
- The Antilock Brake System (ABS)/Traction Control System (TCS) is active for more than a calibratable time (typically 0.3 to 0.7 seconds).

Cruise Control Inhibit Reasons

This is a general list of inhibit reasons. Not every inhibit reason is applicable to all vehicles. Refer to the scan tool inhibit reason list for the last 8 reasons that have been recorded during the current ignition cycle.

Scan Tool Name	Description	Long Description
ACC BRAKE INOP	Adaptive Cruise Control Automatic Braking Failed	Adaptive Cruise Control Automatic Braking Inoperative
ACC DATA	Serial data fault for Adaptive Cruise Control Throttle Control and Brake Control signals sent by Adaptive Cruise Control module	Adaptive Cruise Control Module serial data fault is active or communication has been lost between ACC module and ECM.
ACC INHIBIT	Adaptive Cruise Control Inhibited	Adaptive Cruise Control Inhibited
ACC OPTION	Adaptive Cruise Control option mismatch	Cruise control type (adaptive cruise or conventional cruise) mismatched between ECM and BCM.
ACCEL RATE	High acceleration	Vehicle acceleration rate is too high.
Accel Time	Rate Limiting Fault	Cruise torque request rate limiting active too long
APP OVERRIDE	Pedal greater than cruise (override)	Driver has overridden cruise control set speed with accelerator pedal for greater than an allowable time.
Auto Brk Data	Automatic Braking Engine Torque Request Signal Communication Malfunction	ECM to EBCM serial data fault is active or communication has been lost between ECM and EBCM.
AXLE RANGE	Rear Axle Low	Rear axle in low range
BPP DATA	DTC P0703 active or maximum time elapsed without receiving valid Brake Pedal Position signal.	Serial data fault is active or communication has been lost with module sending brake pedal apply state
BPP DTC	Brake Pedal Position signal invalid	Brake Pedal Apply Circuit fault has been detected.
BPP Not Learned	Brake Apply Sensor Home Position Not Learned	Brake Pedal Position Sensor Released Position Not Learned.
BRAKE	Brake pedal apply	Brake Pedal was applied.
Brk Ped Press	Brake Pedal Driver Applied Pressure Detected	A Brake Pedal Apply has been detected based on brake pedal pressure as measured by the EBCM.
Calc Eng Torque	Calculated Torque	Engine torque calculation is incorrect.
CANCEL	Cancel switch active	Cancel Switch was depressed.
CLUTCH	Clutch switch active	Clutch Pedal was applied.
COAST DISENGAGE	Coast disengage	Cruise control is in coast mode with the Set/Coast switch depressed and is requesting no throttle
COAST SPEED LOW	Coast below low speed inhibit	Set / Coast switch was depressed. Vehicle slowed below minimum cruise operating speed.
Cruise Brk Inop	Brake System Malfunction	EBCM has detected a failure that does not allow automatic braking to be performed.

Scan Tool Name	Description	Long Description
CRUISE S/W	Sequence of completion checks	Cruise control software execution error has occurred.
CRUISE SW DATA	Serial data fault (Cruise switch serial communication fault)	Cruise switch serial data fault is active or communication has been lost with module sending cruise switch states
CRUISE SW. OFF	On/Off switch in Off state	Cruise On/Off switch turned Off
DECEL RATE	High deceleration	Vehicle deceleration rate is too high.
DLC OVERRIDE	ALDL	Scan Tool plugged into ALDL connector
DTC SET	Malfunction in PCM/ECM (DTC active)	DTC is active or in history that inhibits cruise control operation.
D WHL SPD HI	Driven Whl Spd Greater (wheel slip detection)	Driven wheel speed greater than Non Driven wheel speed (slip detection)
D WHL SPD LOW	Un-driven Whl speed Greater	Non Driven wheel speed greater than driven wheel speed
ECM INHIBIT	PCM/ECM inhibit (RAM corruption)	ECM internal communication error
ECM RESET	ECM Running Reset	ECM Running Reset occurred
ECT OVERTEMP	Engine metal overtemp active	Engine over temperature. Overheated.
ENG RUN TIME	Engine run time not elapsed	Engine has not been running long enough, typically five seconds.
ENGINE SPEED	Engine speed too low or too high	Engine RPM too low (near stall) or too high (near engine RPM fuel shutoff).
FIRST GEAR	1st Gear	Transmission is engaged in 1st gear
HIGH SPEED	Vehicle speed exceeds high speed threshold	Vehicle speed has exceeded maximum cruise operating speed
HIGH VOLTAGE	Voltage above high voltage threshold	Ignition Voltage High at ECM (typically 18 volts)
ILLEGAL MODE	Illegal cruise mode	Cruise control mode is incorrect based on switch states.
LOST FWD GEAR	Transmission in neutral. Reverse or park	Gear selector not in forward gear
LOW SPEED	Vehicle speed drops below low speed threshold	Vehicle speed dropped below the cruise control minimum operating speed. May be due to hilly terrain and low vehicle speed. Manual transmission gear selection and engine torque may contribute to this disengagement reason.
LOW VOLTAGE	Voltage below low voltage threshold	Ignition Voltage Low at ECM (typically 9 volts)
MEMORY DTC	Memory Failure	Control module memory failure detected.
MPH LIMIT	MPH Limited Fuel (Vehicle overspeed fuel cut-off active)	Vehicle overspeed protection active with fuel cut off active
M/T Gear Changed	Manual transmission out of gear with no clutch pedal apply	Manual transmission shifted to Neutral without clutch pedal being applied.
NONE	None	This disengagement reason may be displayed after a dead battery repair or module replacement.
OVER SET SPEED	Over schedule	Vehicle speed has exceeded driver selected set speed by more than an allowable amount. This may occur while driving down a significant grade or driver overriding cruise while performing a passing maneuver.
PARK BRAKE	Park Brake Switch signal Active	Parking Brake Applied
PEDAL INITIALIZE	Brake before cruise	The brake pedal has not been seen as applied prior to driver request to engage cruise with set switch. A brake pedal apply must be seen before allowing cruise engagement during each key cycle. On a vehicle equipped with a manual transmission, a clutch pedal apply may satisfy the brake pedal apply criteria.
PTO ACTIVE	Power Take Off Active	Power Take Off is active.

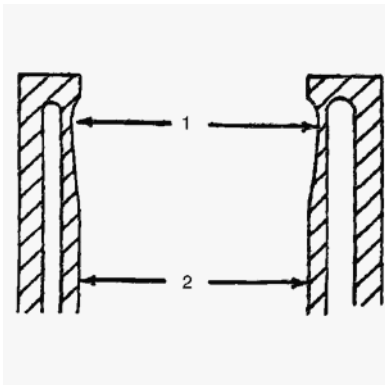
Cruise Control Description and Operation

Scan Tool Name	Description	Long Description
Ram DTC	Processor Integrity Fault (Ram corruption)	ECM software error has occurred
RPM LIMIT	Injectors Disabled (Engine overspeed fuel cut-off active)	Engine RPM limiter active with fuel cut off active.
S/C ON SPEED HI	Over schedule tap-down	Set/Coast switch selected, vehicle speed is above set speed and does not decrease. May be due to traveling down hill
SIMUL S/C-R/A	SET and RESUME switches simultaneously active	Set/Coast and Resume Accelerate switches pressed simultaneously
SL/W Sys On	Speed Limiter / Warning On/Off switch turned on	Driver has turned on the Speed Limiter/Warning on/off switch. Cruise is disabled / inhibited and cruise on/off switch will be set to OFF.
SW. INVALID	Analog cruise switch input out of range	Cruise switch voltage signal in invalid range
TAC INHIBIT	ETC prevents cruise operation	Electronic Throttle Control has detected a failure in the throttle control hardware
TCS	Traction control active	Traction Control was Active
TRANS DTC	Trans Gear Fault	Transmission DTC is active or in history that inhibits cruise control operation
UNDER SET SPEED	Under schedule	Vehicle speed is below cruise control set speed by more than an allowable amount
VSES	Vehicle stability active	Vehicle Stability Control was active
4WD Low	4WD Low	Transfer case in low range

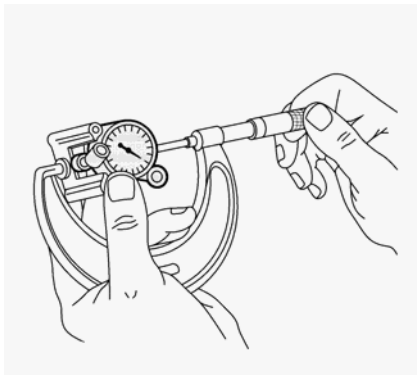
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1. Measure the cylinder bore for out-of-round and taper.
2. Measure dimension (1) at 13 mm ($\frac{1}{2}$ in) below the head gasket surface. Measure dimension (2) at 100 mm (4 in) below the head gasket surface.



3. Measure the cylinder bores by setting the cylinder bore gauge dial at zero in the cylinder at the point of the desired measurement. Lock the dial indicator at zero before removing the dial from the cylinder. Measure across the gauge contact points with an outside micrometer, with the gauge at the same zero setting as when the gauge was removed from the cylinder. Refer to Engine Mechanical Specifications.
4. Fine vertical scratches made by the ring ends do not, by themselves, cause excessive oil consumption. Do not hone the cylinder in order to remove these scratches.
5. If the bore is glazed but otherwise serviceable, lightly break the glaze with a hone. Replace the piston rings.
 1. The honing stones must be clean, sharp, and straight.
 2. Move the hone slowly up and down to produce a 45 degree cross-hatch pattern.
 3. Clean the bore thoroughly with solvent.
 4. Dry the bore.
 5. Rub clean engine oil in the bore.
 6. Re-measure the bore.
6. If honing is not required, clean the cylinder bores with hot water and detergent. Apply clean engine oil to the bore after washing and drying the bore.

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When the gear selector lever is moved to the Drive (D) range from the Neutral (N) position, the transmission will provide engine braking. In this operating range, the normally-low C1234 pressure control solenoid 5 is commanded ON and in the engine braking mode the following changes occur within the hydraulic circuits:

Fluid Pressure is Directed to the 1-2-3-4 Clutch and the Low and Reverse Clutch to Provide Engine Braking

Manual Valve

The manual valve is moved to the Drive (D) position and allows line fluid pressure to enter the drive fluid circuit. Drive fluid is then routed to the clutch select valve 2.

Clutch Select Valve 2

Drive fluid at the clutch select valve 2 passes through the valve and enters the drive brake circuit. Drive brake fluid is then routed to the clutch select valve 3.

Clutch Select Valve 3

Drive brake fluid at the clutch select valve 3 passes through the valve and enters the Drive B fluid circuit. Drive B fluid is then routed to #1 ball check valve.

#1 Ball Check Valve

Drive B fluid seats the #1 ball check valve against drive 1-6 fluid to force drive B fluid into the CB26/C1234 feed passage. CB26/C1234 feed fluid is routed to the #6 ball check valve, through orifice #43 and, to the 2-6 clutch regulator valve. CB26/C1234 feed fluid passes through the 2-6 clutch regulator valve and enters the pressure switch 3 (PS3) fluid circuit. PS3 fluid is then routed to the normally closed pressure switch 3 and opens the switch.

#6 Ball Check Valve

CB26/C1234 feed fluid seats the #6 ball check valve against the 1234 clutch feed passage forcing CB26/C1234 feed fluid through orifice #32 before entering the 1234 clutch feed circuit. The 1234 clutch feed fluid is routed through orifice #33 and then to the 1-2-3-4 clutch regulator valve.

1-2-3-4 Clutch Applies

C1234 Pressure Control Solenoid 5

The C1234 pressure control solenoid 5 is commanded ON allowing actuator feed limit fluid to enter the PCS1234 clutch fluid circuit. PCS1234 clutch fluid is then routed through orifice #35 to the 1-2-3-4 clutch regulator valve. PCS1234 clutch fluid is also routed through orifice #29 and then to the 1-2-3-4 clutch boost valve.

1-2-3-4 Clutch Regulator Valve

PCS1234 clutch fluid moves the 1-2-3-4 clutch regulator valve against 1-2-3-4 clutch regulator valve spring force to allow 1234 clutch feed fluid to pass through the valve and enter the 1234 clutch fluid circuit. The 1234 clutch fluid is then routed to the 1234 clutch boost valve and the 1-2-3-4 clutch.

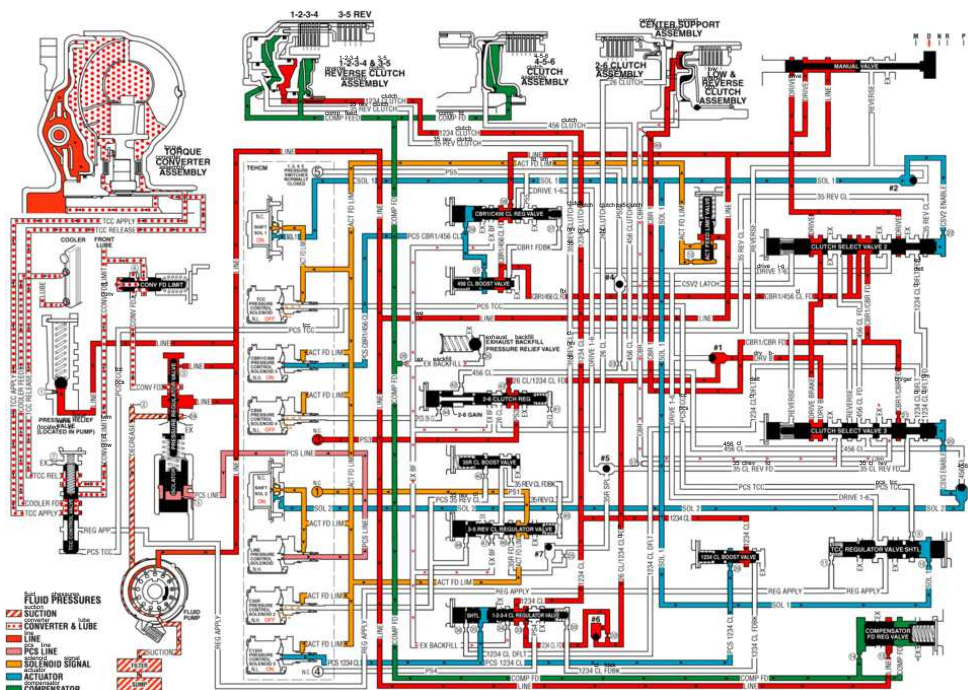
1-2-3-4 Clutch Boost Valve

PCS1234 clutch fluid pressure acts on a differential area moving the 1234 clutch boost valve against the 1234 clutch boost valve spring. The 1234 clutch fluid passes through the valve and enters the 1234 clutch feedback circuit. As PCS 1234 clutch fluid pressure is increased to a given value, the 1234 clutch boost valve opens the 1234 clutch feedback circuit to exhaust. This results in the 1234 clutch regulator valve moving to the full feed position sending full 26 CL/1234 CL feed pressure (full line pressure) to the clutch.

1-2-3-4 Clutch

The 1234 clutch fluid enters the 1234 clutch housing to move the piston against spring force and compensator feed fluid to apply the 1-2-3-4 clutch plates.

Drive Range, First Gear Engine Braking



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Electrical Power Management

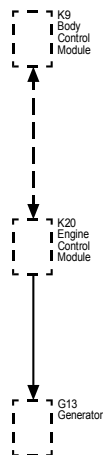
The electrical power management is used to monitor and control the charging system and alert the driver of possible problems within the charging system. The electrical power management system makes the most efficient use of the generator output, improves the battery state-of-charge, extends battery life, and manages system electrical loads.

The load shed operation is a means of reducing electrical loads during a low voltage or low battery state-of-charge condition.

The idle boost operation is a means of improving generator performance during a low voltage or low battery state-of-charge condition.

Each electrical power management function, either idle boost or load shed, is discrete. No two functions are active at the same time. Idle boost is activated in incremental steps, idle boost 1 must be active before idle boost 2 can be active. The criteria used by the body control module (BCM) to regulate electrical power management are outlined below:

Electrical Power Management Block Diagram



Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
Idle Boost 1 Start	Less Than -15°C (5°F)	Less Than 13 V	—	First level Idle boost requested
Idle Boost 1 Start	—	—	Battery has a net loss greater than 0.6 Ah	First level Idle boost requested
Idle Boost 1 Start	—	Less Than 10.9 V	—	First level Idle boost requested
Idle Boost 1 End	Greater Than -15°C (5°F)	Greater Than -12 V	Battery has a net loss less than 0.2 Ah	First level Idle boost request cancelled
Load Shed 1 Start	—	—	Battery has a net loss of 4 Ah	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 20% of their cycle
Load Shed 1 Start	—	Less Than 10.9 V	—	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 20% of their cycle
Load Shed 1 End	—	Greater Than 12 V	Battery has a net loss of less than 2 Ah	Clear Load Shed 1

Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
Idle Boost 2 Start	—	—	Battery has a net loss greater than 1.6 Ah	Second level Idle boost requested
Idle Boost 2 Start	—	Less Than 10.9 V	—	Second level Idle boost requested
Idle Boost 2 End	—	Greater Than 12 V	Battery has a net loss less than 0.8 Ah	Second level Idle boost request cancelled
Idle Boost 3 Start	—	—	Battery has a net loss of 10 Ah	Third level Idle boost requested
Idle Boost 3 Start	—	Less Than 10.9 V	—	Third level Idle boost requested
Idle Boost 3 End	—	Greater Than 12 V	Battery has a net loss of less than 6.0 Ah	Third level Idle boost request cancelled
Load Shed 2 Start	—	Less Than 10 V	Battery has a net loss greater than 12 Ah	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 Start	—	Less Than 10.9 V	—	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 End	—	Greater Than 12.6 V	Battery has a net loss of less than 10.5 Ah	Clear Load Shed 2
Load Shed 3 Start	—	Less Than 11.9 V	Battery has a net loss greater than 20 Ah	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 100% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 3 End	—	Greater Than 12.6 V	Battery has a net loss of less than 15 Ah	Clear Load Shed 3

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The High Feature V6 VIN Code 7 RPO LY7 is a 3.6L engine incorporating 2 intake and 2 exhaust valves per cylinder. Individual intake and exhaust camshafts, dual overhead camshafts (DOHC), with camshaft position actuators are mounted on each cylinder head. The cylinder bore is 94 mm (3.7008 in) and the piston stroke is 85.6 mm (3.3701 in). The cylinders are arranged in 2 banks of 3 with a 60 degree included angle. The right bank of cylinders are number 1-3-5 and the left bank of cylinders are 2-4-6. The engine firing order is 1-2-3-4-5-6.

Crankcase

The cylinder block is constructed of aluminum alloy by precision sand-casting with cast in place iron cylinder liners. Each copper-infiltrated sintered steel main bearing cap incorporates 6 bolts bolting the cap into the engine block. Along with 2 outer and 2 inner bolts, 2 side bolts are used in the deep skirt block. To prevent aeration, oil return from the valvetrain and cylinder heads is channeled away from the rotating and reciprocating components through oil drain back passages incorporated into the cylinder heads and engine block. Pressure-actuated piston oil cooling jets are mounted between opposing cylinders. A knock sensor is located on the each side of the exterior of the engine block. The crankshaft position sensor is located on the right side of the exterior of the engine block.

Crankshaft

The crankshaft is a forged steel design with 4 main bearings. Crankshaft thrust is controlled by the number 3 main bearing. The crankshaft position reluctor wheel is pressed onto the rear of the crankshaft in front of the rear main journal. The crankshaft is internally balanced with an integral oil pump drive machined into the nose in front of the front main journal.

Connecting Rods and Pistons

The connecting rods are sinterforged steel and have full floating piston pins. The piston pins are a slip fit in the bronze bushed connecting rod. Round wire retainers are used to retain the piston pin into the piston. The cast aluminum pistons incorporate a polymer-coated skirt to reduce friction. The piston uses 2 low tension compression rings and one multi-piece oil control ring. The top compression ring is plasma sprayed. The second compression ring is cast iron napier. The oil control ring incorporates a steel expander and 2 chrome plated steel rails.

Camshaft Drive System

The camshaft drive system consists of one primary timing drive chain driven by the crankshaft sprocket. The primary timing drive chain drives two intermediate drive shaft sprockets. Each oil pressure fed intermediate drive shaft sprocket drives separate secondary timing drive chains. Each secondary timing drive chain drives the respective cylinder head's intake and exhaust camshaft position actuators.

The primary timing drive chain uses two stationary timing drive chain guides and an oil pressure hydraulically actuated tensioner with built-in shoe. The tensioner minimizes timing drive chain noise and provides accurate valve action by keeping slack out of the timing drive chains and continuously adjusting for timing drive chain wear. The tensioner incorporates a plunger that adjusts out with wear allowing only a minimal amount of backlash. The tensioner is equipped with an oiling jet to spray oil onto the timing components during engine operation. The secondary timing drive chains use a stationary timing drive chain guide and movable timing drive chain shoe. The secondary timing drive chain shoe is under tension from an oil pressure hydraulically actuated tensioner. All tensioners are sealed to the head or block using a rubber coated steel gasket. The gasket traps an adequate oil reserve to ensure quiet start-up.

From the initial production of the High Feature V6 there have been four timing drive systems. This application was built using the fourth design.

Note: The pitch of the IT chain has changed therefore third and fourth primary IT components are not interchangeable.

The fourth design uses IT timing drive components on both the primary and secondary components.

The two timing drive system's individual rotating components cannot be mixed. DO NOT mix third design timing drive chain rotating components with fourth design timing drive chain rotating components.

The following components are the ONLY components that are same between the third and fourth design:

- All timing drive tensioners
- Primary Guides
- Secondary Shoes – Pivoting guides

Camshaft Position Actuator System

The engine incorporates a camshaft position actuator for each intake and exhaust camshaft. Camshaft phasing changes the inlet and exhaust valve timing within a range of 25 camshaft degrees as engine operating conditions vary. Dual camshaft phasing allows the further optimization of performance, fuel economy and emissions without compromising overall engine response and driveability. Variable valve timing also contributes to a reduction in exhaust emissions. It optimizes exhaust and inlet valve overlap and eliminates the need for an exhaust gas recirculation (EGR) system.

The camshaft position actuator is a hydraulic vane-type actuator that changes the camshaft lobe timing relative to the camshaft drive sprocket. Engine oil is directed by a camshaft position actuator oil control valve to the appropriate passages in the camshaft position actuator. Oil acting on the vane in the camshaft position actuator, rotates the camshaft relative to the sprocket. At idle, both camshafts are at the default or "home" position. At this position, the exhaust camshaft is fully advanced and the intake is fully retarded to minimize valve overlap for smooth idle. An internal lock pin locks the inner rotor to the outer camshaft position actuator housing at idle and maintains this position during start-up conditions. Under other engine operating conditions, the camshaft position actuator is controlled by the engine control module (ECM) to deliver optimal intake and exhaust valve timing for performance, driveability and fuel economy. The camshaft position actuator incorporates an integral trigger wheel, which is sensed by the camshaft position sensor mounted in the front cover to accurately determine the position of each camshaft. Each camshaft position actuator has a specific timing drive mark for right or left bank application, as the camshaft position actuators are common bank to bank. The exhaust camshaft position actuator has a different internal configuration than the intake camshaft position actuator since the exhaust camshaft position actuator phases in the opposite direction relative to the inlet camshaft position actuator.

The camshaft position actuator oil control valve (OCV) directs oil from the oil feed in the head to the appropriate camshaft position actuator oil passages. There is one OCV for each camshaft position actuator. The OCV is sealed and mounted to the front cover. The ported end of the OCV is inserted into the cylinder head with a sliding fit. A filter screen protects each OCV oil port from any contamination in the oil supply.

The camshaft front journal has several drilled oil holes to allow camshaft position actuator control oil to transfer from the cylinder head to the camshaft position actuator. The center camshaft bolt hole is counterbored to allow oil to flow around the camshaft bolt and to the camshaft position actuator. Oil in this oil passage is used to move the camshaft position actuator to the default or home position. Radially outward from the center of the journal is a set of 4 drilled camshaft position actuator oil holes. Oil in this group of oil holes is used to move the camshaft from the default position to a specific set position as determined by the ECM. Seal rings are used at the front and rear of the front camshaft journal to prevent oil leakage from the camshaft position actuator hydraulic system. The seal is made from a plastic compound that resists wear and has a diagonal end gap to enhance sealing. The camshaft position actuator is mounted to the front end of the camshaft and the timing notch in the nose of the camshaft aligns with the dowel pin in the camshaft position actuator to ensure proper cam timing and camshaft position actuator oil hole alignment.

Engine Component Description (LY7)

Cylinder Heads

The cylinder heads are semi permanent mold cast aluminum with powdered metal valve seat inserts and valve guides. Two 36.96 mm (1.4551 in) intake valves and two 30.60 mm (1.2047 in) exhaust valves are actuated by roller finger followers pivoting on a stationary hydraulic lash adjuster (SHLA). Separate exhaust and intake camshafts are supported by 4 bearings machined into the cylinder head. The front camshaft bearing cap is used as a thrust control surface for each camshaft. Each spark plug is shielded by a tube that is pressed into the cylinder head. Each spark plug ignition coil is also mounted through the spark plug tube. The engine coolant temperature (ECT) sensor is threaded into the left cylinder head.

Induction System

A dual-stage variable intake manifold is achieved through the use of a variable intake manifold (VIM) valve. The engine control module (ECM) controlled valve changes the plenum volume available for resonance tuning of the inlet flow path. With the VIM valve shut the intake manifold is using dual plane flow with the cylinders feeding from 2 separate plenums. In this mode the system boosts cylinder charging in the low to mid speed range. At higher engine speeds the VIM valve opens creating a single plane flow with the cylinders all feeding from a common large plenum. In this mode the system boosts charging in the high speed range. An electronically controlled throttle (ETC), through the ECM, coordinates the input from the driver with various control components.

Right and Left Bank Designation

Right hand (RH) and left hand (LH) designation through the engine mechanical section are viewed from the rear, non-front-cover side, of the engine or from inside the vehicle. These banks are also referred to as Bank 1 (RH) and Bank 2 (LH).

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[Engine Description](#)

Cylinder Block

The cylinder block is grey cast iron. The cylinder block has four in-line cylinders which are numbered 1 through 4 starting from the crankshaft pulley. The cylinder block contains coolant jackets through which coolant flows around the cylinders, to cool the cylinder block and maintain a constant operating temperature.

Crankshaft

The crankshaft is cast nodular iron with eight counterweights. Oil holes run through the center of the crankshaft to supply oil to the connecting rods, bearings, pistons and other components. The end thrust load is taken by the thrust washers installed at the center number three bearing journal.

Connecting Rod and Piston

The connecting rod incorporates the semi-floating type pin. The pistons are cast with tin plated crown and first groove anodized.

Oil Pan

The oil pan is constructed of stamped steel and is mounted to the crankcase. The oil pan includes a baffle that helps prevent the oil from shifting away from the oil pump suction pipe during hard turns, acceleration or stopping.

Cylinder Head

The cylinder head is an aluminum alloy casting with pressed-in valve guides and valve seat inserts.

Valves

There are one intake and one exhaust valve per cylinder. The valve springs are conical-shaped. Positive valve stem seals are used on all valves.

Camshaft

One camshaft is used, for all intake valves, and exhaust valves. The camshaft is cast iron. The camshaft also has the camshaft position sensor lobe cast onto it.

Camshaft Housing and Cover

The camshaft housing and cover are cast aluminum. The camshaft runs directly in a camshaft housing without bearing inserts.

Camshaft Drive

A toothed belt is used to drive the camshaft. Tension is controlled by an adjustable mechanical tensioner.

2013 Chevrolet Colorado

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

[Engine Description](#)

Cylinder Block

The cylinder block is grey cast iron with 4 cylinders arranged in-line. It is a deep skirt block with 2 bolt main bearing caps. There are 5 crankshaft bearings with the thrust bearing located at the third main bearing cap.

Crankshaft

The crankshaft is made from forged alloy steel. The rod and main journals are induction hardened for increased durability. A balance shaft drive gear is located at the rear of the crankshaft. The crankshaft position sensor exciter ring is sandwiched between the crankshaft and the flexplate/flywheel.

Connecting Rod and Piston

The connecting rods are forged steel and are fractured split. The piston pins are full floating. The pistons are made from aluminum alloy and have a graphite coated skirt.

Oil Pan

The oil pan is die cast aluminum. The oil pan includes an attachment to the transmission to provide additional structural support.

Balance Shaft Assembly (2.8L)

The balance shaft assembly is bolted to the bottom of the cylinder block. It is driven from a gear at the rear of the crankshaft. The balance shaft must be timed correctly to the crankshaft.

Cylinder Head

The cylinder head is made from aluminum alloy. Sintered powdered metal valve seats and valve guides are pressed into the cylinder head.

Valvetrain

The valvetrain is a belt driven overhead cam design. A belt drives the sprocket on the intake camshaft. The intake camshaft drives the exhaust camshaft through gears pressed onto each camshaft.

Valves

There are 2 intake and 2 exhaust valves per cylinder. Rotators are used on all of the intake valves. The rotators are located at the bottom of the valve spring to reduce valve train reciprocating mass. Positive valve stem seals are used on all valves.

Valve Lifters

The valve train uses a roller finger follower acted on by a hydraulic lash adjuster. The roller finger follower reduces friction and noise.

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

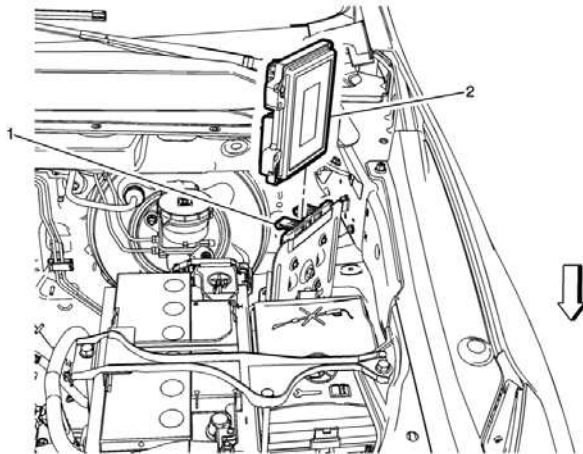
Emissions Control Information Label

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

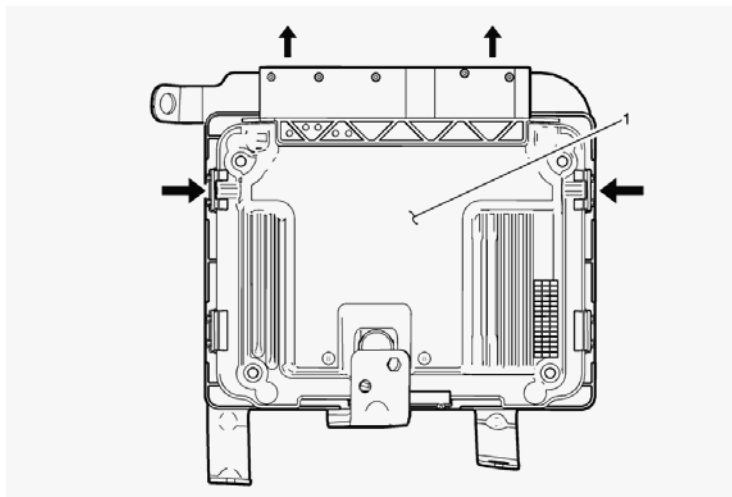
2

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

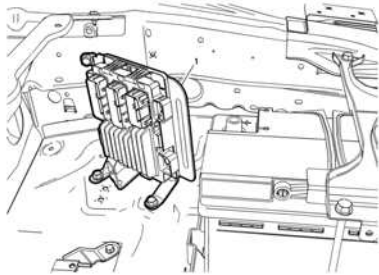
Procedure

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

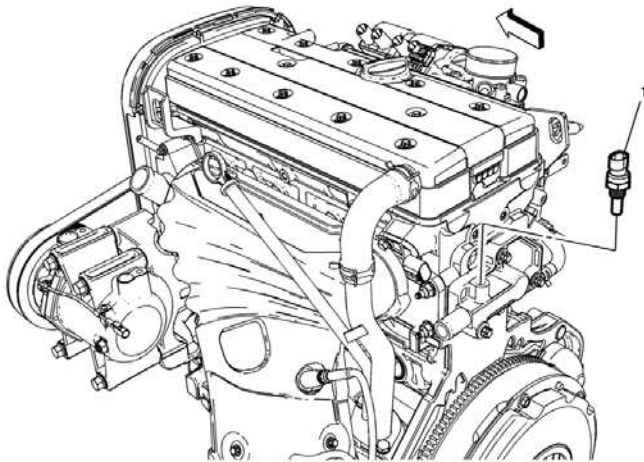
Procedure

1

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

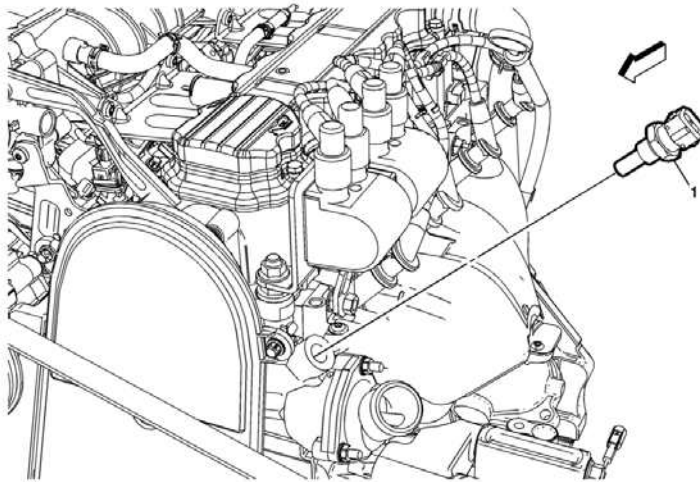
Disconnect the engine coolant temperature sensor electrical connector.

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

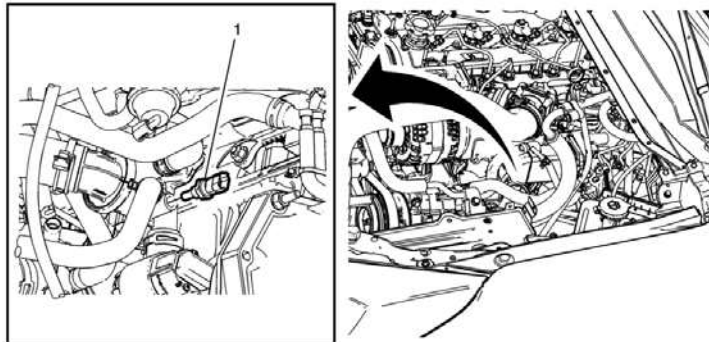
Disconnect the engine coolant temperature sensor electrical connector.

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

1

Disconnect the electrical connector from the engine coolant temperature sensor.

Tighten

20 Y (15 lb ft)

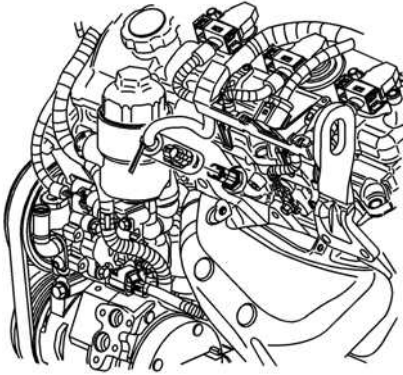
2013 Chevrolet Colorado

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

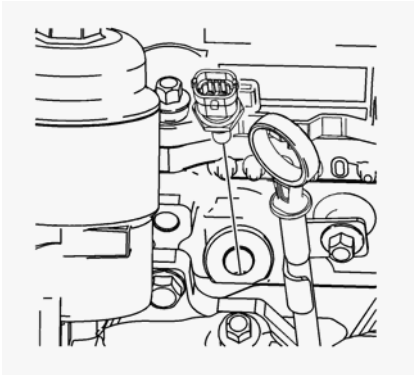
[Removal Procedure](#)

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.

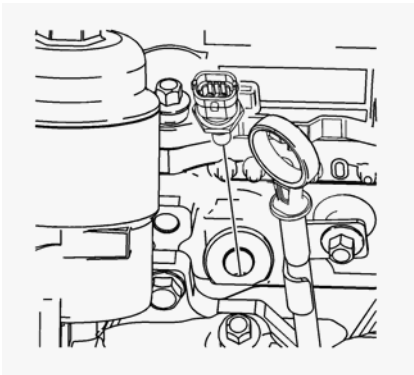


4. Disconnect the engine coolant temperature sensor electrical connector.



5. Remove the engine coolant temperature sensor.

[Installation Procedure](#)

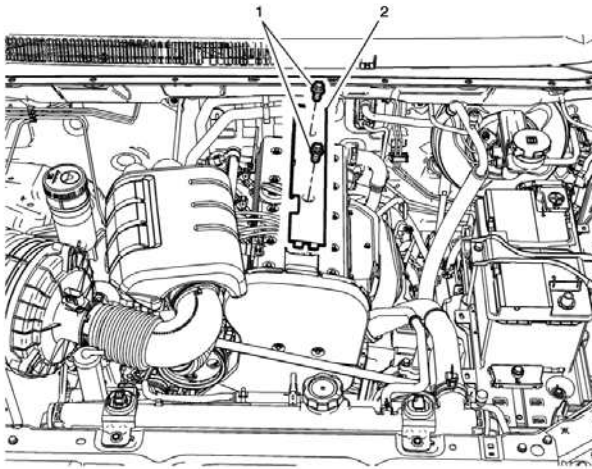


Caution: Refer to Component Fastener Tightening Caution.

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 Emblem Replacement

Callout

Component Name

- | | |
|---|--|
| | Engine Emblem Fastener (Qty: 2) |
| | Caution: Refer to Fastener Caution. |
| 1 | Tighten |
| | 10 Y (89 lb in) |
| 2 | Engine Emblem |

2013 Chevrolet Colorado

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

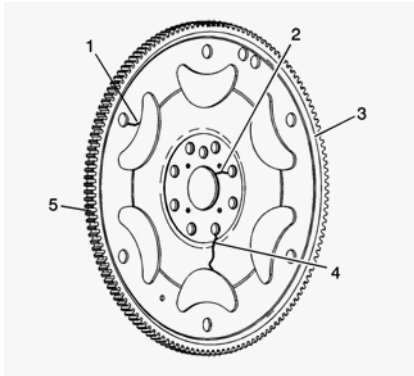
[Cleaning Procedure](#)

1. Clean the engine flywheel in solvent.

Warning: Refer to Safety Glasses Warning.

2. Dry the engine flywheel with compressed air.

[Inspection Procedure](#)



1. Inspect the engine flywheel for the following conditions:

- Stress cracks around the engine flywheel-to-torque converter mounting bolt hole locations (1) and/or engine flywheel-to-crankshaft (2, 4)

Note: Do not attempt to repair the welded areas that retain the ring gear to the engine flywheel plate. Install a new engine flywheel.

- Cracks at welded areas that retain the ring gear onto the engine flywheel (3)
- Damaged or missing ring gear teeth (5)
- Replace the engine flywheel as necessary.

2013 Chevrolet Colorado

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

[Cleaning Procedure](#)

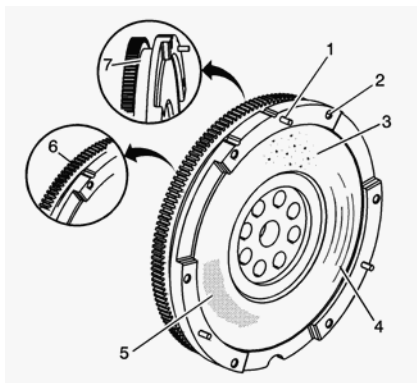
Note: In order to maintain the proper component balance, contact surface taper and heat transfer, manual transmission flywheels are NOT to be machined.

1. Clean the engine flywheel in solvent.

Warning: Refer to Safety Glasses Warning.

2. Dry the engine flywheel with compressed air.

[Inspection Procedure](#)



1. Inspect the manual transmission engine flywheel for the following conditions:

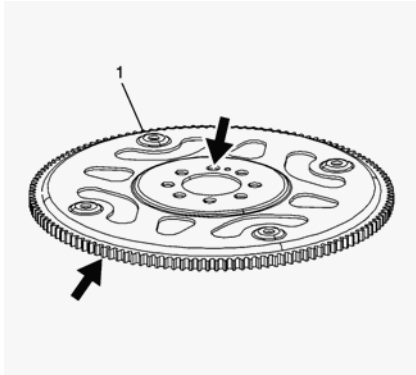
- Missing and/or damaged alignment pins (1)
- Damaged threaded holes (2)
- Pitted surface (3)
- Scoring or grooves (4)
- Rust or other surface damaged (5)
- Damaged ring gear teeth (6)
- Loose or improperly positioned ring gear

The ring gear has an interference fit onto the engine flywheel and should be positioned completely against the flange of the engine flywheel (7).

- Replace the engine flywheel as necessary.

2013 Chevrolet Colorado

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

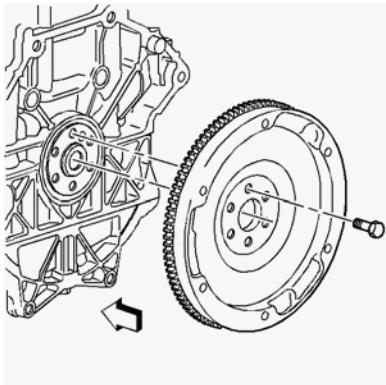


Note: In order to maintain the proper component balance, contact surface taper, and heat transfer, manual transmission flywheels are NOT to be machined.

1. Clean the flywheel (1) in solvent.

Warning: Refer to Safety Glasses Warning.

2. Dry the flywheel with compressed air.

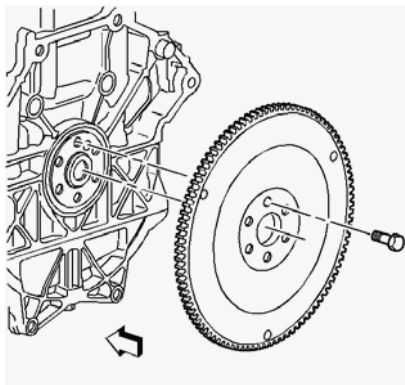


3. Inspect the manual transmission flywheel for the following:

- Damaged ring gear teeth
- Loose or improperly positioned ring gear

The ring gear has an interference fit onto the flywheel and should be positioned completely against the flange of the flywheel.

- A scored, grooved or damaged friction surface



- Inspect the automatic transmission flywheel for the following:

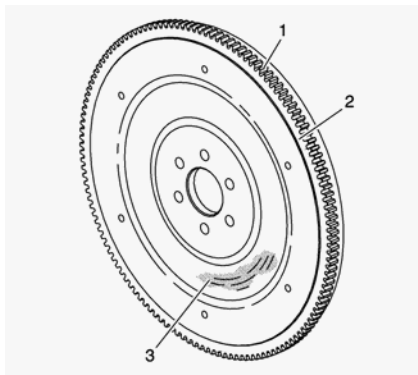
- Damaged ring gear teeth
- Stress cracks around the flywheel-to-crankshaft bolt hole locations

Engine Flywheel Cleaning and Inspection

- Weight saving holes

2013 Chevrolet Colorado

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



Note: In order to maintain the proper component balance, contact surface taper, and heat transfer, manual transmission flywheels are NOT to be machined.

1. Clean the flywheel in solvent.

Warning: Refer to Safety Glasses Warning.

2. Dry the flywheel with compressed air.
3. Inspect the manual transmission flywheel for the following:

- Damaged ring gear teeth (1)
- Loose or improperly positioned ring gear (2)

The ring gear has an interference fit onto the flywheel and should be positioned completely against the flange of the flywheel.

- A scored, grooved or damaged friction surface (3)

2013 Chevrolet Colorado

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

Special Tools

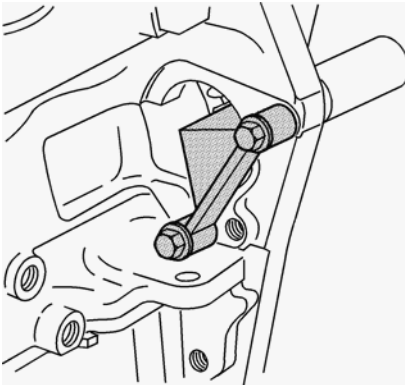
- EN 45059 Angle Meter
- EN 46106 Flywheel Holding Tool

For equivalent regional tools, refer to Special Tools.

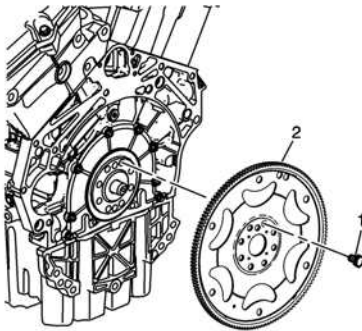
1. Place the engine flywheel in position on the crankshaft.

Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

2. Install 2 NEW bolts in location at the top and bottom of the engine flywheel bolt pattern allowing the engine flywheel to hang in position.



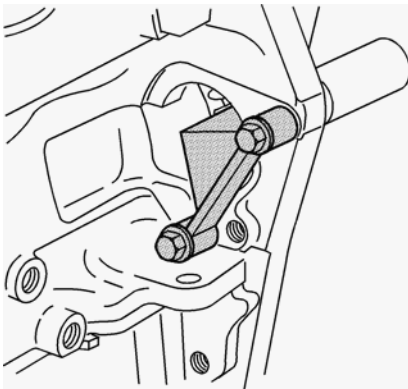
3. Install the EN 46106 tool.



Caution: Refer to Fastener Caution.

4. Install the remaining NEW engine flywheel bolts.
 1. Tighten the NEW engine flywheel bolts to **30 Y (22 lb ft)**.
 2. Tighten the NEW engine flywheel bolts an additional **45 degrees** using the EN 45059 meter.

Engine Flywheel Installation (Automatic Transmission)



5. Remove the *EN 46106* tool.

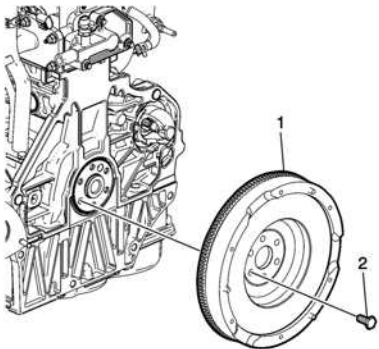
2013 Chevrolet Colorado

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

Special Tools

- EN-0206978 Flywheel Lock
- J-05824-A Alignment Tool
- EN-45059 Angle Meter

For equivalent regional tools, refer to Special Tools.

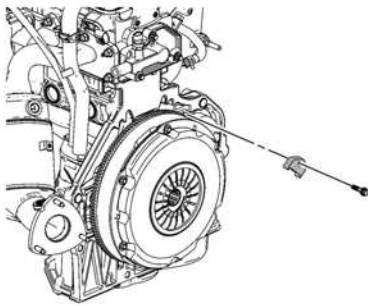


1. Install the flywheel (1).

Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

2. Apply sealant to the NEW flywheel bolts. Refer to Adhesives, Fluids, Lubricants, and Sealers.

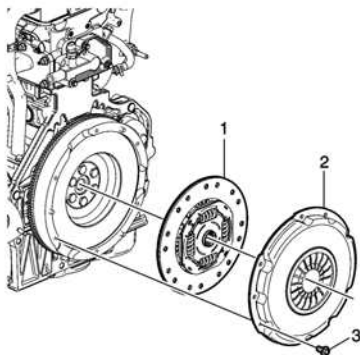
Install the flywheel bolts (2) finger tight.



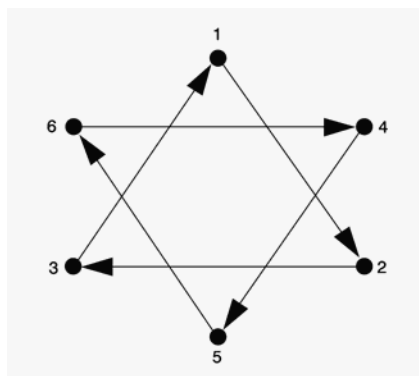
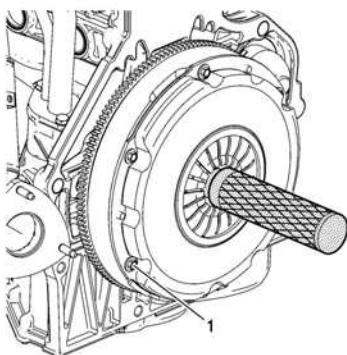
Caution: Refer to Fastener Caution.

3. Attach the EN-0206978 Flywheel Lock to flywheel and tighten the flywheel bolts to **35 Y (26 lb ft)**.

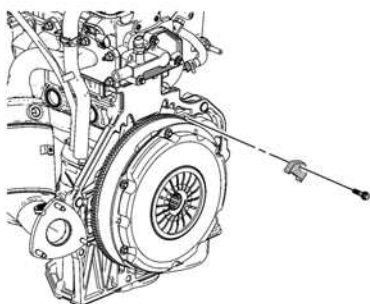
- Using the EN-45059 Angle Meter tighten the bolts **an additional 30 degrees**.
- Using the EN-45059 Angle Meter tighten one more pass **an additional 15 degrees**.



- Install the clutch driven plate (1), pressure plate assembly (2) and bolts (3) finger tight.



- Install the J-05824-A Alignment Tool and tighten the pressure plates bolts (1) in the sequence shown to **40 Y (30 lb ft)**.



- Remove the bolt and the EN-0206978 Flywheel Lock from the flywheel assembly.
- Remove the J-05824-A Alignment Tool.

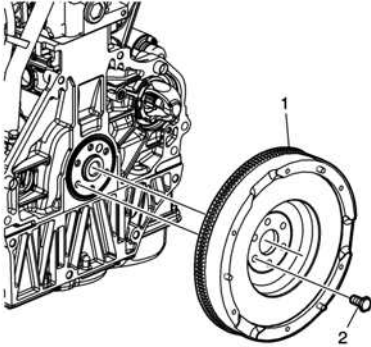
2013 Chevrolet Colorado

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

Special Tools

- S-0206978 Flywheel Holding Tool
- S9407183 Alignment Tool

For equivalent regional tools, refer to Special Tools.

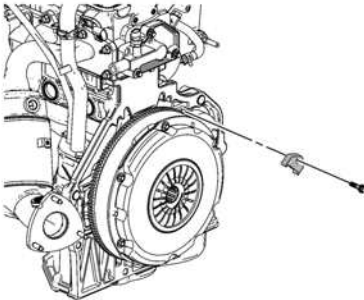


1. Install the flywheel (1).

Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

2. Apply sealant to the NEW flywheel bolts. Refer to Adhesives, Fluids, Lubricants, and Sealers.

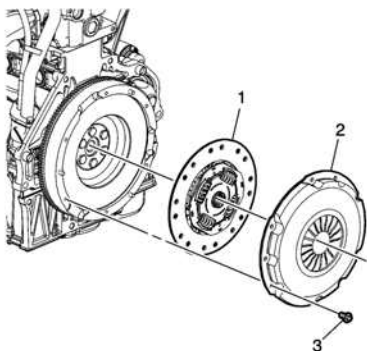
Install the flywheel bolts (2) finger tight.



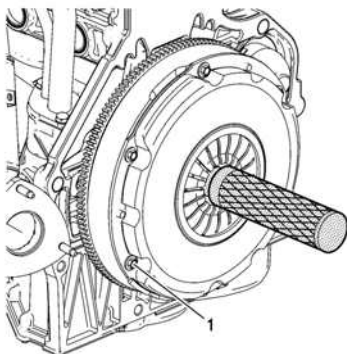
Caution: Refer to Fastener Caution.

3. Attach the S-0206978 holding tool to flywheel and tighten the flywheel bolts to **35 Y (26 lb ft)**.

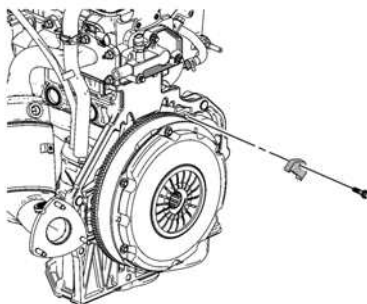
- Tighten the bolts **an additional 30 degrees**.
- Tighten one more pass **an additional 15 degrees**.



- Install the clutch driven plate (1), pressure plate assembly (2) and bolts (3) finger tight.



- Install the S9407183 alignment tool and tighten the pressure plates bolts (1) in a uniform cross pattern to **15 Y (11 lb ft)**.



- Remove the bolt and the S-0206978 flywheel holding tool from the flywheel assembly.
- Remove the S9407183 alignment tool.

2013 Chevrolet Colorado

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

Special Tools

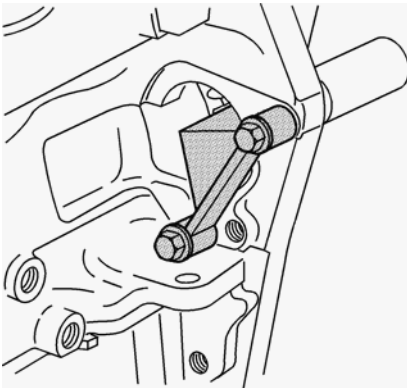
- EN 46106 Flywheel Holding Tool
- J 33169 Clutch Alignment Arbor

For equivalent regional tools, refer to Special Tools.

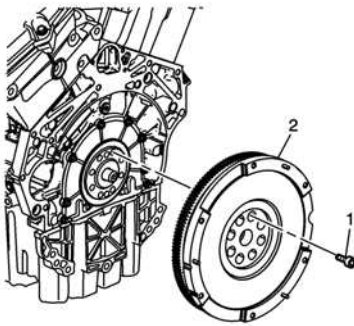
1. Place the engine flywheel in position on the crankshaft.

Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

2. Install 2 NEW bolts in location at the top and bottom of the engine flywheel bolt pattern allowing the engine flywheel to hang in position.

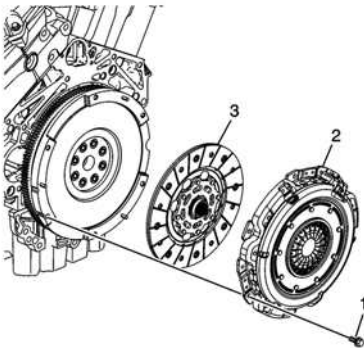


3. Install the EN 46106 tool.



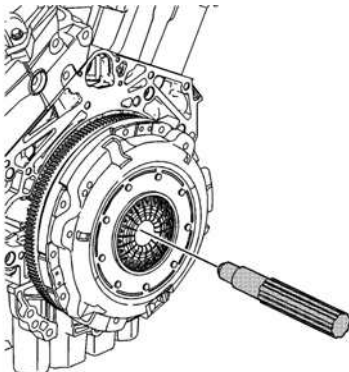
Caution: Refer to Fastener Caution.

4. Install the remaining NEW engine flywheel bolts and tighten the NEW engine flywheel bolts to 67 Y (49 lb ft).



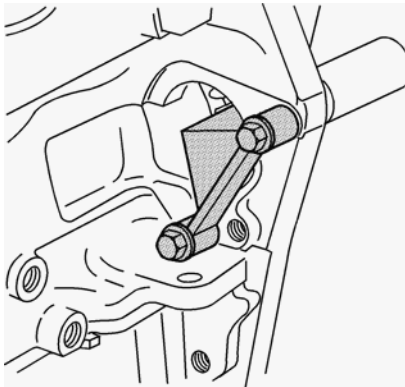
5. Install the clutch driven plate disc and the clutch pressure plate to the engine flywheel. Ensure to align the clutch pressure plate to the pins in the engine flywheel.

6. Loosely install the clutch pressure plate bolts.



Engine Flywheel Installation (Manual Transmission)

7. Install the *J 33169* arbor through the clutch driven plate disc and into the end of the crankshaft in order to align the clutch driven plate disc.
8. Tighten the clutch pressure plate bolts to **30 Y (22 lb ft)**.
9. Remove the *J 33169* arbor.



10. Remove the *EN 46106* tool.

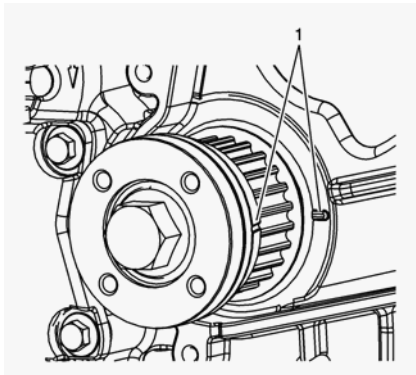
2013 Chevrolet Colorado

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

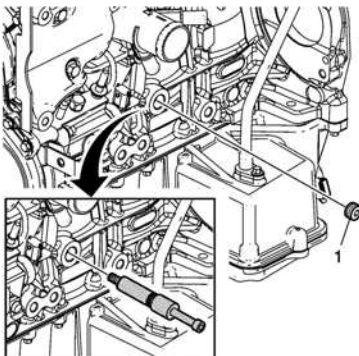
Special Tools

EN-50030 Crankshaft Locking Tool

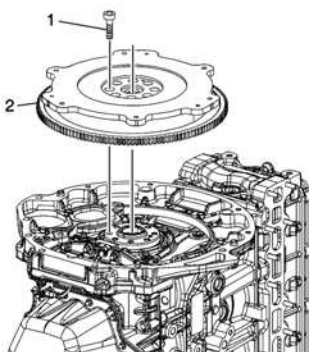
For equivalent regional tools, refer to Special Tools



1. Ensure that the timing mark on the crankshaft timing pulley (1) is aligned at 90 degrees ATDC with the mark on the front cover (1).



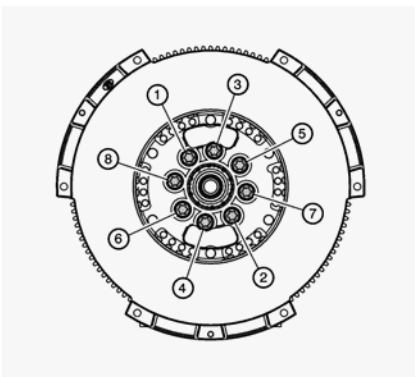
2. Remove the plug (1) and install the EN-50030 locking tool.



3. Install the flywheel (2).

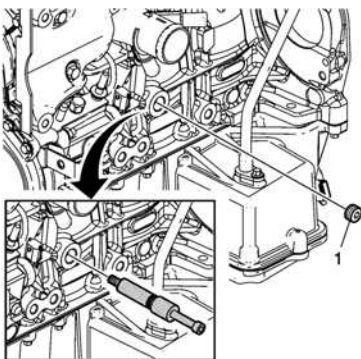
Caution: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

4. Install the NEW flywheel bolts (1) and hand tighten.



Caution: Refer to Fastener Caution.

5. Tighten the NEW flywheel bolts in sequence to **50 Y (37 lb ft)**.
6. Loosen the flywheel bolts 90 degrees.
7. Tighten the NEW flywheel bolts in sequence to **25 Y (18 lb ft)**.
8. Tighten additional 60 degrees.
9. After each bolt is tightened, mark the head with a dot of brown paint as evidence of correct tightening.



10. Remove the *EN-50030* locking tool.
11. Install the block plug (1) and tighten to **79 Y (58 lb ft)**.

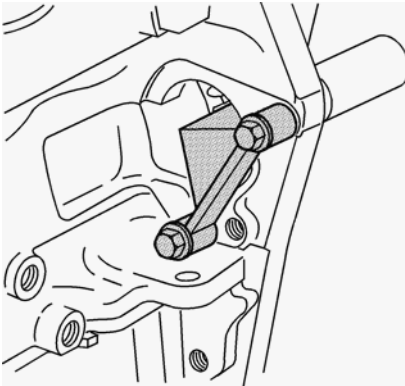
2013 Chevrolet Colorado

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

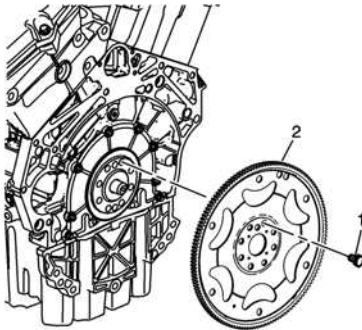
Special Tools

EN 46106 Flywheel Holding Tool

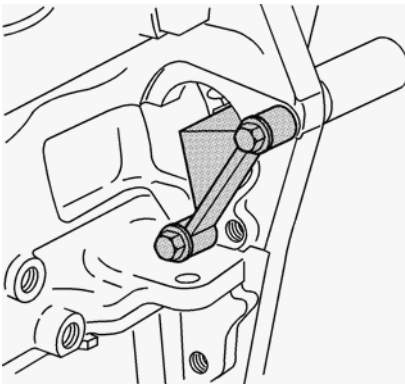
For equivalent regional tools, refer to Special Tools.



1. Install the EN 46106 tool through the starter mounting hole.



2. Remove the engine flywheel bolts and discard.
3. Remove the engine flywheel from the crankshaft.



4. Remove the EN 46106 tool .

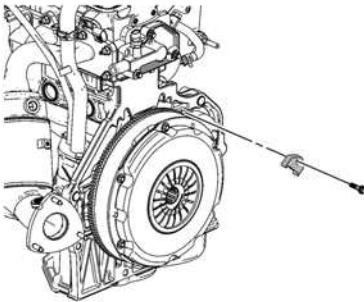
2013 Chevrolet Colorado

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

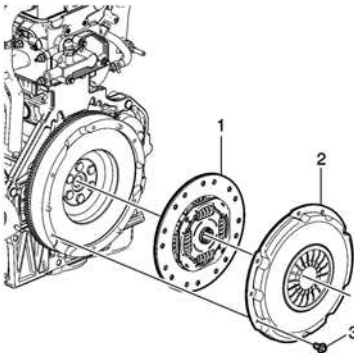
Special Tools

EN-0206978 Flywheel Lock

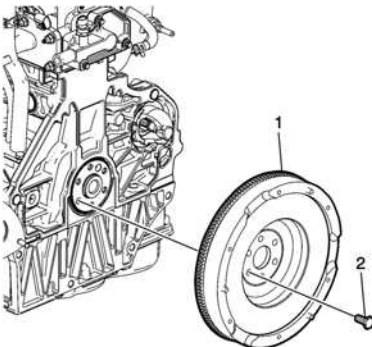
For equivalent regional tools, refer to Special Tools.



1. Install the EN-0206978 Flywheel Lock to prevent crankshaft rotation to the flywheel assembly.



2. Remove the clutch pressure plate bolts (3) and the pressure plate (2).
3. Remove the clutch driven plate (1).



4. Remove the flywheel bolts (2) and flywheel (1).
5. Clean the thread adhesive from the flywheel bolt holes. Use a nylon bristle brush to clean the holes in the crankshaft.

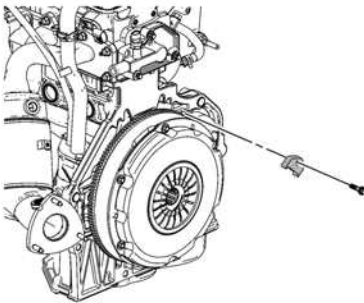
2013 Chevrolet Colorado

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

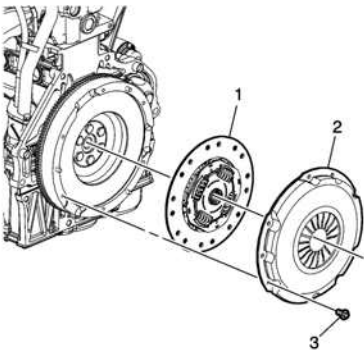
Special Tools

S-0206978 Flywheel Lock

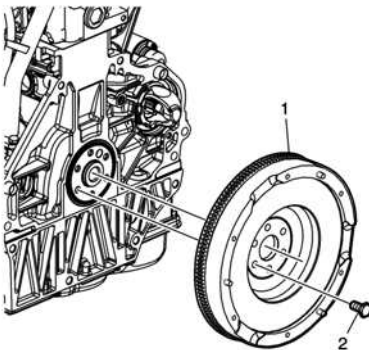
For equivalent regional tools, refer to Special Tools.



1. Install the S-0206978 flywheel lock to prevent crankshaft rotation to the flywheel assembly (1).



2. Remove the clutch pressure plate bolts (3) and the pressure plate (2).
3. Remove the clutch driven plate (1).



4. Remove the flywheel bolts (2) and flywheel (1).
5. Clean the thread adhesive from the flywheel bolt holes. Use a nylon bristle brush to clean the holes in the crankshaft.

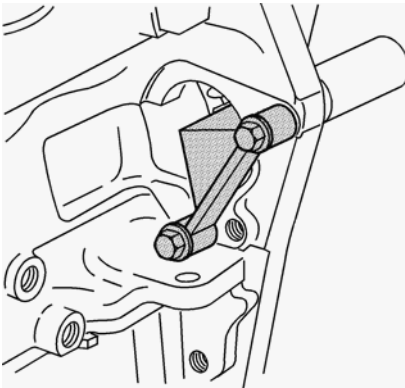
2013 Chevrolet Colorado

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

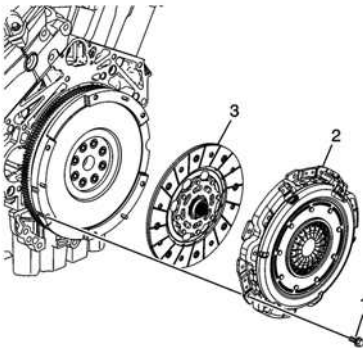
Special Tools

EN 46106 Flywheel Holding Tool

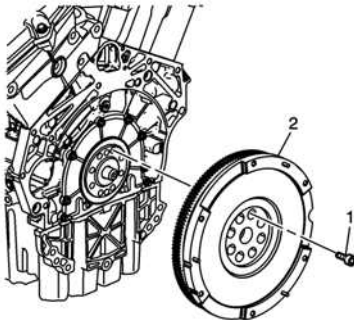
For equivalent regional tools, refer to Special Tools.



1. Install the EN 46106 tool through the starter mounting hole.

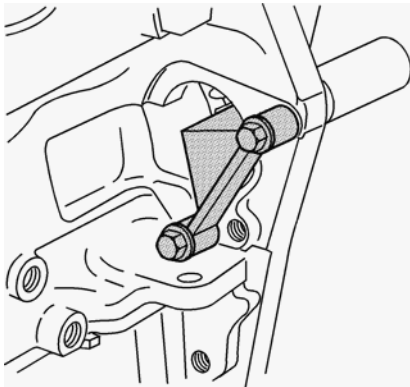


2. Remove the clutch pressure plate bolts (1).
3. Remove the clutch pressure plate (2) and the clutch driven plate disc (3).



4. Remove the engine flywheel bolts (1) and discard.
5. Remove the engine flywheel (2) from the crankshaft.

Engine Flywheel Removal (Manual Transmission)



6. Remove the *EN 46106* tool.

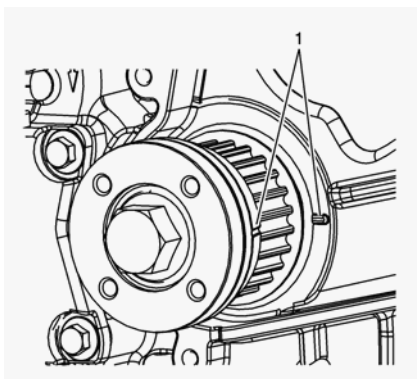
2013 Chevrolet Colorado

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

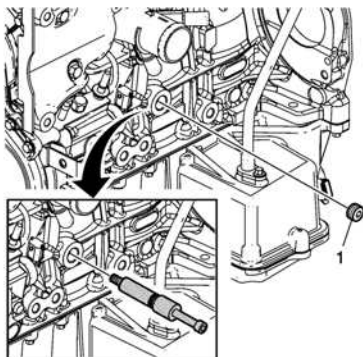
Special Tools

EN-50030 Crankshaft Locking Tool

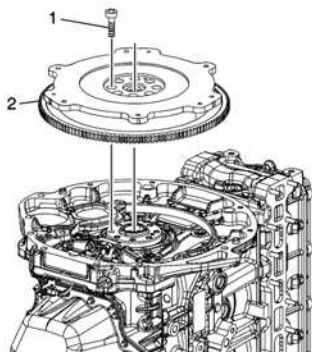
For equivalent regional tools, refer to Special Tools



1. Ensure that the timing mark on the crankshaft timing pulley (1) is aligned at 90 degrees ATDC with the mark on the front cover (1).



2. Remove the plug (1) and install the EN-50030 locking tool .



3. Remove the flywheel bolts (1) and flywheel (2).

2013 Chevrolet Colorado

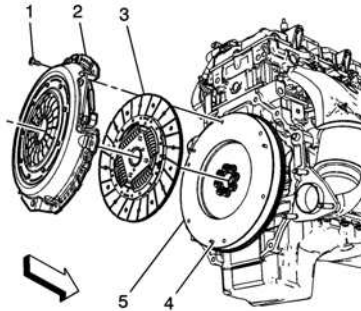
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Special Tools

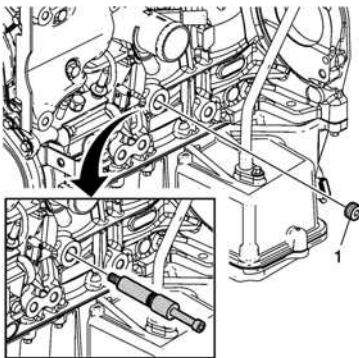
EN-50030 Crankshaft Locking Tool

For equivalent regional tools, refer to Special Tools.

[Removal Procedure](#)

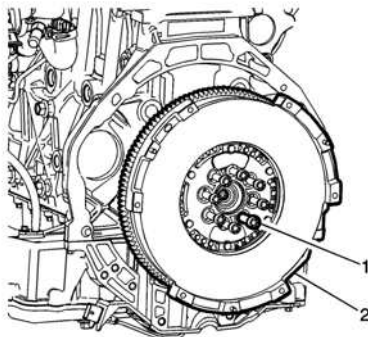


1. Remove the clutch assembly. Refer to Clutch Assembly Replacement.
2. Remove the front left tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
3. Remove the engine lower front splash shield. Refer to Engine Lower Front Splash Shield Replacement.



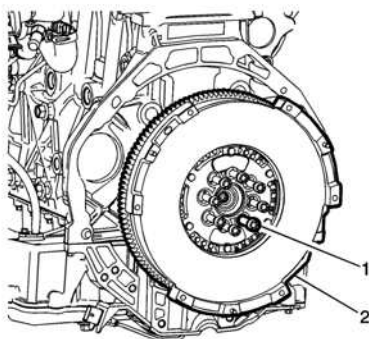
Note: Ensure the engine is at 90 degrees ATDC before installing the tool.

4. Remove the plug (1) and rotate the aligned tool EN-50030. Ensure the crankshaft is at 90 degrees ATDC before trying to install the crank locking tool.

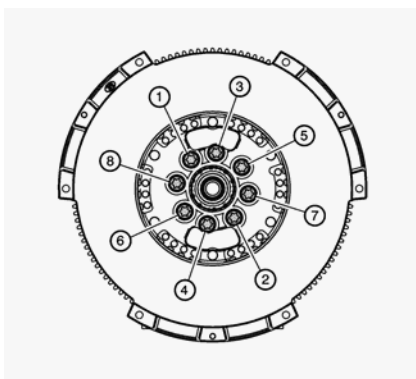


5. Remove the flywheel attaching bolts (1).
6. Remove the flywheel (2).
7. For engine flywheel cleaning and inspection. Refer to Engine Flywheel Cleaning and Inspection.

[Installation Procedure](#)

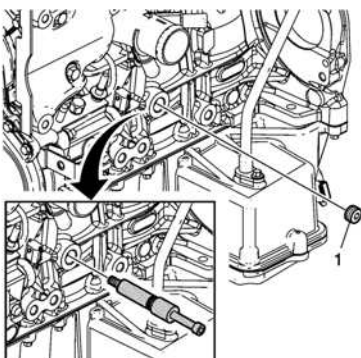


1. Install the flywheel (2) and bolts (1).



Caution: Refer to Fastener Caution.

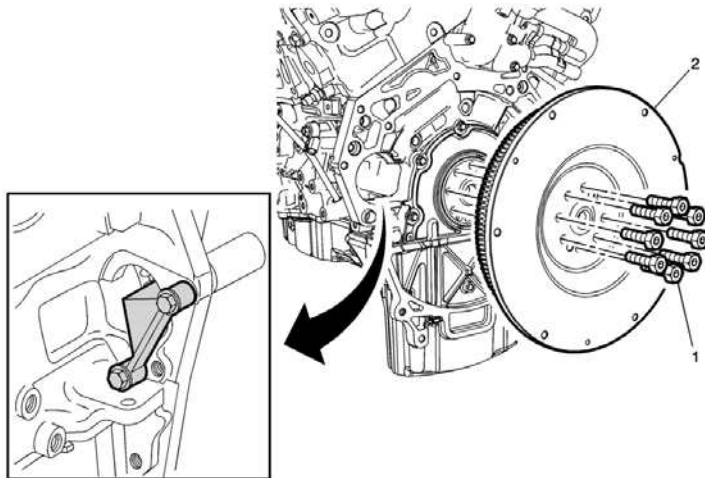
2. Tighten the flywheel bolts in sequence to **50 Y (37 lb ft)**.
3. Loosen the flywheel bolts one at a time and then retighten in sequence to **25 Y (18 lb ft)** plus 60, 75, and 90 degrees respectively for bolts of 40, 50, 60 mm.
4. After each bolt is tightened, mark the head with a dot of brown paint as evidence of correct tightening.



5. Remove the *EN-50030* Crank locking tool.
6. Install the block plug (1) and tighten to **79 Y (58 lb ft)**.
7. Install the engine lower front splash shield. Refer to Engine Lower Front Splash Shield Replacement.
8. Install the front left tire and wheel assembly. Refer to Tire and Wheel Removal and Installation.
9. Install the clutch assembly. Refer to Clutch Assembly Replacement.

2013 Chevrolet Colorado

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



Engine Flywheel Replacement

Callout

Component Name

Preliminary Procedure

Remove the clutch assembly. Refer to Clutch Assembly Replacement.

Flywheel Fastener (Qty: 8)

Caution: Refer to Fastener Caution.

Procedure

1. Install the *EN-46106* tool through the starter mounting hole to secure crankshaft.
2. Remove the engine flywheel bolts and discard.
3. New bolts must be used whenever removing the flywheel.

1

Tighten

- 30 Y (22 lb ft)
- Tighten an additional 90 degrees using the *EN-45059* meter.

Special Tools

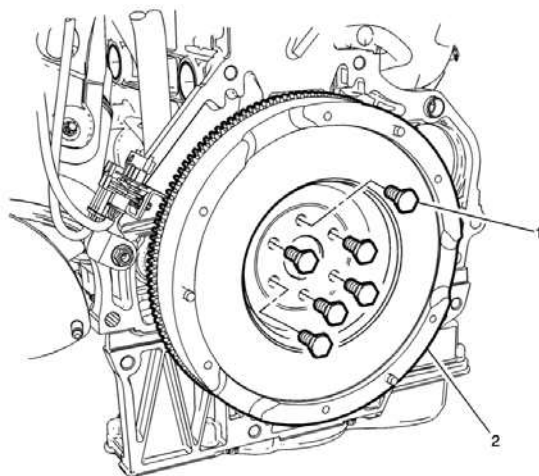
- *EN-46106* Flywheel Holding Tool
- *EN-45059* Torque Angle Sensor Kit

2

Flywheel

2013 Chevrolet Colorado

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



Engine Flywheel Replacement

Callout

Component Name

Preliminary Procedure

Remove the clutch pressure and driven Plate . Refer to Clutch Assembly Replacement.

Special Tools

- EN-0206978 Flywheel Holding Tool
- EN-45059 Torque Angle Sensor Kit

For equivalent regional tools. Refer to Special Tools.

Flywheel Fastener (Qty: 6)

Caution: Refer to Fastener Caution.

Procedure

Discard the flywheel fastener and use a NEW fastener for installation.

1

Tighten

- First pass to 35 Y (26 lb ft)
- Second pass to additional 30°.
- Final pass to an additional 15°.

Flywheel

Procedure

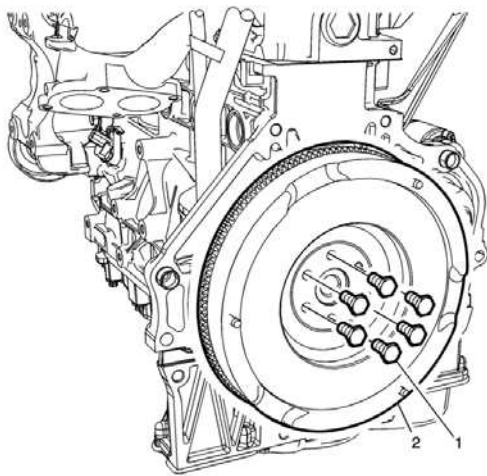
Inspect the engine flywheel for the following:

2

1. Stress cracks around the engine flywheel.
2. Cracks at welded areas that retain the ring gear onto the engine flywheel.
3. Damaged or missing ring gear teeth.
4. Do not attempt to repair the welded areas that retain the ring gear to the engine flywheel plate. Install a new engine flywheel.

2013 Chevrolet Colorado

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



Engine Flywheel Replacement

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

Preliminary Procedure

Remove the clutch pressure and driven Plate . Refer to Clutch Assembly Replacement.

Special Tools

- S-0206978 Flywheel Holding Tool
- S9407183 Alignment Tool .
- EN-45059 Torque Angle Sensor Kit

For equivalent regional tools. Refer to Special Tools.

Flywheel Fastener (Qty: 6)

Caution: Refer to Fastener Caution.

Procedure

Discard the flywheel fastener and use a NEW fastener for installation.

1

Tighten

- First pass to 35 Y (26 lb ft)
- Second pass to additional 30°.
- Final pass to an additional 15°.

Flywheel

Procedure

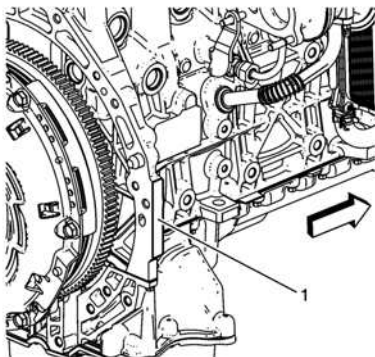
Inspect the engine flywheel for the following:

2

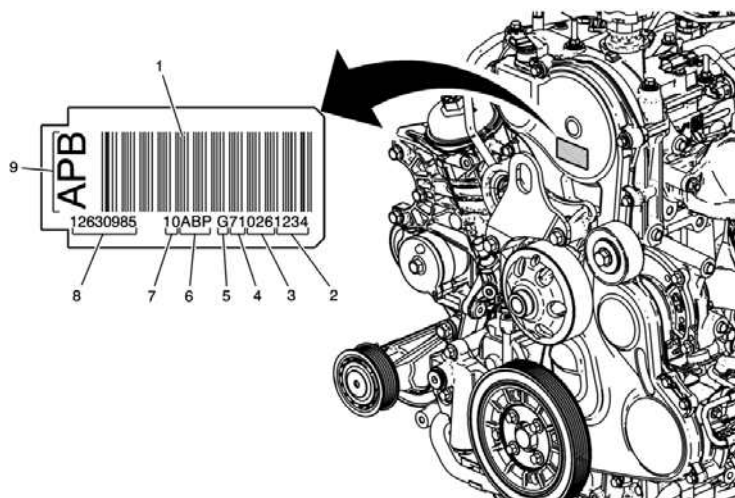
1. Stress cracks around the engine flywheel.
2. Cracks at welded areas that retain the ring gear onto the engine flywheel.
3. Damaged or missing ring gear teeth.
4. Do not attempt to repair the welded areas that retain the ring gear to the engine flywheel plate. Install a new engine flywheel.

2013 Chevrolet Colorado

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



The engine serial number (1) is located on the right side rear of the engine block.



The engine identification label is located on the engine front cover.

- Barcode (1)
- Sequence Number (2)
- Julian Day (3)
- Calendar Year (4)
- Plant Code (5)
- Broadcast Code (6)
- Part Designation (7)
- Part Number (8)
- Broadcast Code (9)

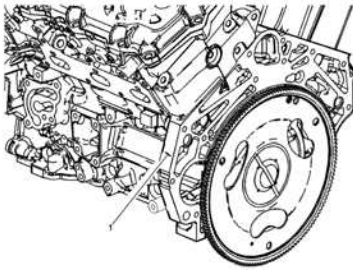
2013 Chevrolet Colorado

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

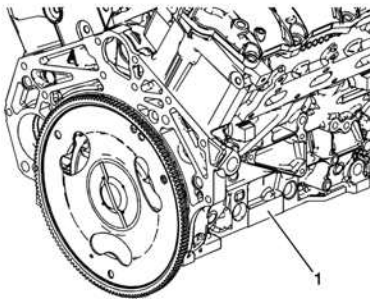
[Vehicle Identification Number](#)

The Vehicle Identification Number (VIN) Derivative is located in two places on the engine and is a nine digit number stamped or laser etched onto the block at the vehicle assembly plant. If reading the identification number the following information can be obtained:

- The first digit identifies the vehicle division.
- The second digit is the model year.
- The third digit identifies the assembly plant.
- The fourth through ninth digits are the last six digits of the Vehicle Identification Number (VIN).



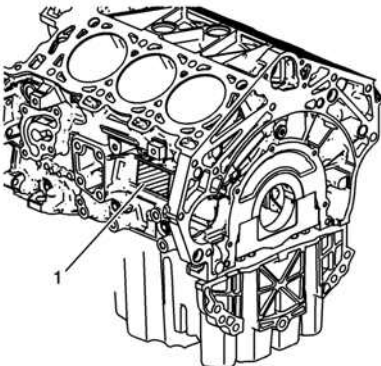
The engine block is marked with the VIN on a pad area on the left rear side (1).



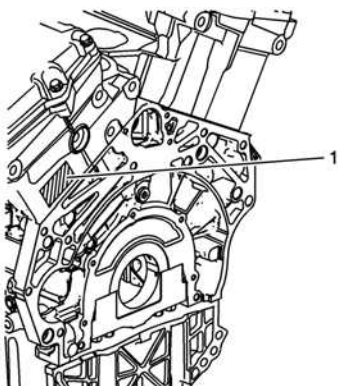
The engine block is marked with the VIN on a pad area on the center lower right side (1).

[Engine Traceability Label](#)

The engine traceability label is located in two places on the engine and consists of the broadcast code, bar code and sequence number. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.



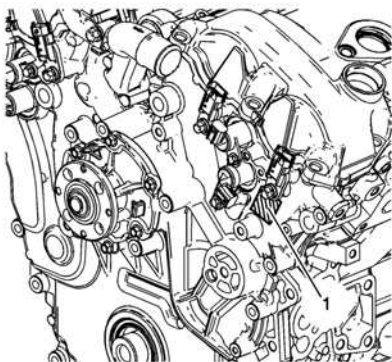
One engine traceability label (1) is located on the left rear side of the engine block. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.



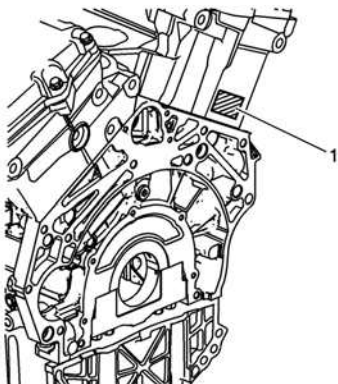
Another engine traceability label (1) is located on the rear of the left cylinder head. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.

[Engine Verification Label](#)

The engine verification label is located in two places on the engine and consists of the broadcast code and bar code. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.



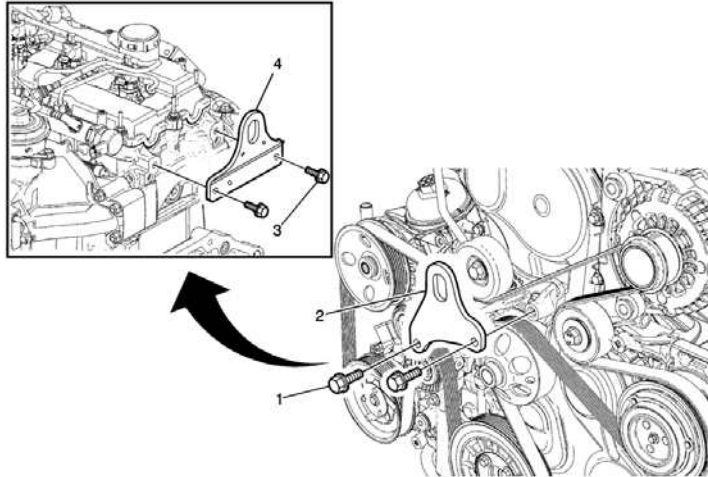
One engine verification label (1) is located on the left side of the engine front cover below the exhaust camshaft position sensor. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.



Another engine verification label (1) is located on the rear of the right cylinder head. This label is used in engine and vehicle assembly plants and is not intended to be permanent. If it is missing refer back to the engine block VIN pad for the permanent ID.

2013 Chevrolet Colorado

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



Engine Lift Front Bracket Replacement

Callout

Component Name

Preliminary Procedures

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

Engine Lift Bracket Front Fastener (Qty: 2)

Caution: Refer to Fastener Caution.

1

Tighten

68 Y (50 lb ft)

Engine Lift Front Bracket

2

Note: Only remove the front bracket for belt replacement .

Engine Lift Bracket Rear Fastener (Qty: 2)

3

Tighten

68 Y (50 lb ft)

Engine Lift Rear Bracket

4

2013 Chevrolet Colorado

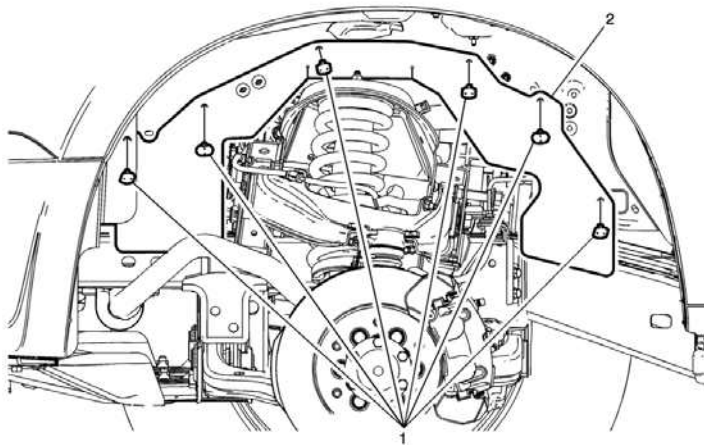
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Caution: When raising or supporting the engine for any reason, do not use a jack under the oil pan, any sheet metal, or the crankshaft pulley. Lifting the engine in an unapproved manner may cause component damage.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Engine Lower Front Splash Shield Replacement

Callout

Component Name

1

Engine Lower Front Splash Shield Push-in Retainers (Qty: 6)

Caution: Refer to Fastener Caution.

Engine Lower Front Splash Shield

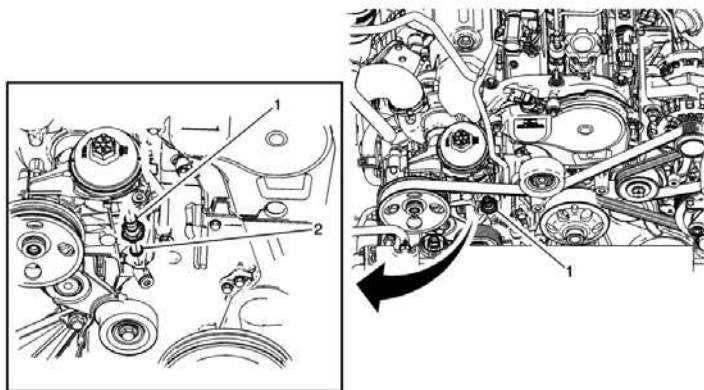
2

Procedure

Slide the front edge of the front splash shield from under the front fender liner.

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

1

Disconnect the oil pressure switch electrical connectors.

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:

Special Tools

J 45299 Engine Preluber

Caution: Refer to Fastener Caution.

Note: A constant/continuous flow of clean engine oil is required to properly prime the engine. Be sure to use an approved engine oil as specified in the owners manual.

1. Remove the engine oil filter, fill with clean engine oil, and reinstall. Tighten the oil filter to **24 Y (18 lb ft)**.
2. Remove the oil pressure sensor.
3. Install the M16 x 1.5 adapter P/N 509375.



4. Install the flexible hose to the adapter and open the valve.
5. Pump the handle on J 45299 preluber to flow a minimum of 1–2 quarts of engine oil. Observe the flow of engine oil through the flexible hose and into the engine assembly.
6. Close the valve and remove the flexible hose and adapter from the engine.
7. Install the oil pressure sensor and tighten to **14 Y (124 lb in)**.
8. Top off the engine oil to the proper level.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

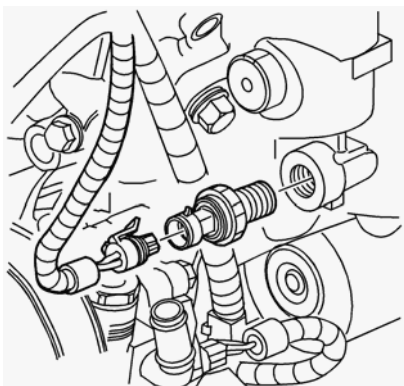
Fuel Delivery: | Fuel:

Special Tools

EN 45299 Engine Preluber

EN 50789 Oil Pressure Adapter Fitting

For equivalent regional tools, refer to Special Tools.



Note: A constant and continuous flow of clean engine oil is required in order to properly prime the engine. Be sure to use an approved engine oil as specified in the owners manual.

1. Remove the oil filter cap.
2. Install the NEW oil filter cartridge.
3. Lubricate the threads of the oil filter cap with clean engine oil.

Caution: Refer to Fastener Caution.

4. Install the oil filter cap and tighten to **25 Y (18 lb ft)**.
5. Remove the oil pressure sending unit from the oil filter adapter.
6. Install the EN 50789 adapter fitting.



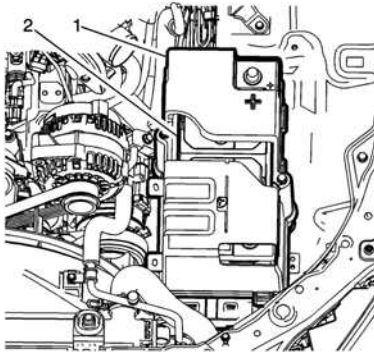
7. Install the flexible hose to the adapter and open the valve.
8. Pump the handle on the EN 45299 preluber in order to flow a minimum of 1–1.9 liters (1–2 quarts) of engine oil. Observe the flow of engine oil through the flexible hose and into the engine assembly.
9. Close the valve and remove the flexible hose and adapter from the engine.
10. Install the oil pressure sending unit and tighten to **20 Y (15 lb ft)**.
11. Top-off the engine oil to the proper level.

2013 Chevrolet Colorado

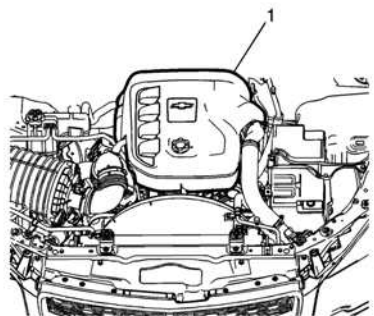
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

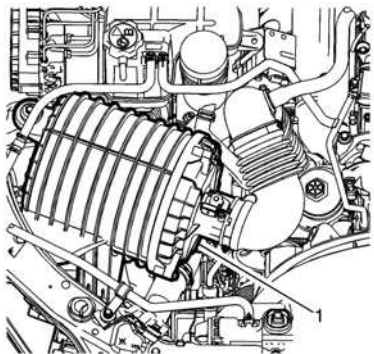
1. Remove the hood. Refer to Hood Replacement.
2. Drain the coolant system. Refer to Cooling System Draining and Filling.
3. Drain the engine oil. Refer to Engine Oil and Oil Filter Replacement.



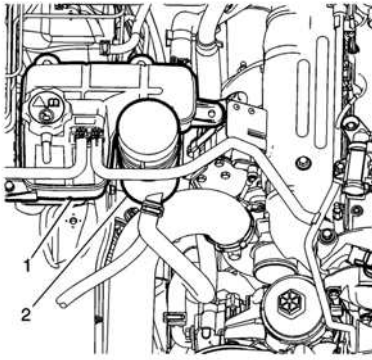
4. Remove the battery (2). Refer to Battery Replacement.



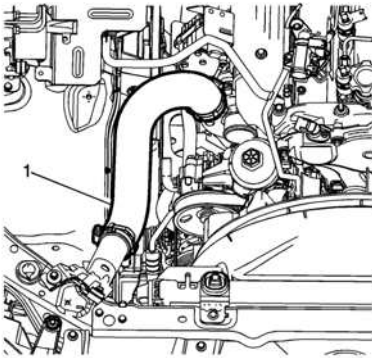
5. Remove the intake manifold cover (1). Refer to Intake Manifold Cover Replacement.
6. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.



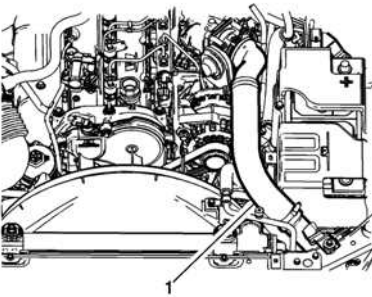
7. Remove the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement.



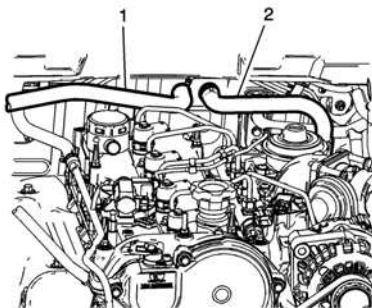
8. Remove the radiator surge tank (1). Refer to Radiator Surge Tank Replacement.
9. Reposition the power steering Pump reservoir (2). Refer to Power Steering Fluid Reservoir Replacement.



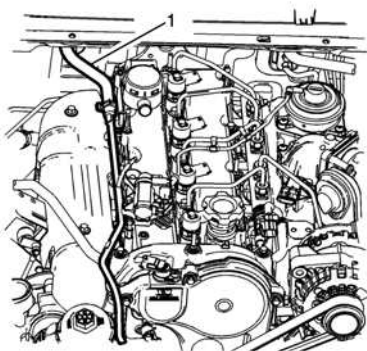
10. Remove the charge air cooler inlet air hose (1). Refer to Charge Air Cooler Inlet Air Hose Replacement.



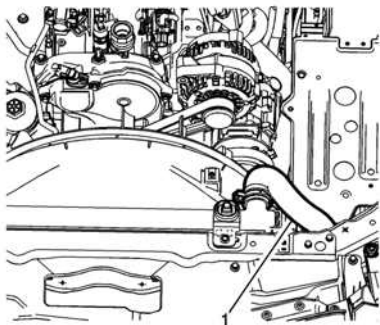
11. Remove the charge air cooler outlet air hose (1). Refer to Charge Air Cooler Outlet Air Hose Replacement.
12. Remove the air conditioning compressor and condenser hose. Refer to Air Conditioning Compressor and Condenser Hose Replacement.
13. Remove the air conditioning compressor hose. Refer to Air Conditioning Compressor Hose Replacement.
14. Remove the generator. Refer to Generator Replacement.
15. Remove the air conditioning compressor. Refer to Air Conditioning Compressor Replacement.



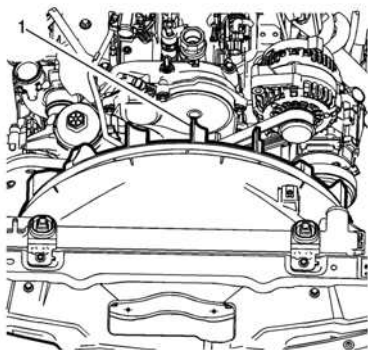
16. If equipped with heat, remove the heater outlet hose (1). Refer to Heater Outlet Hose Replacement.
17. If equipped with heat, remove the heater inlet hose (2). Refer to Heater Inlet Hose Replacement.



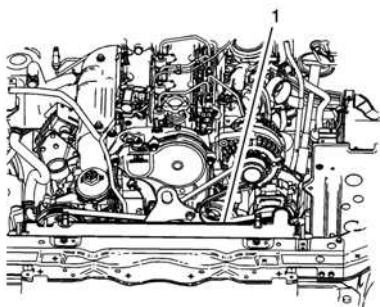
18. Disconnect vacuum hose (1). Refer to Power Brake Booster Vacuum Check Valve and Hose Replacement.



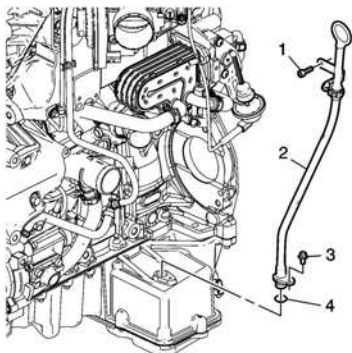
19. Remove the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



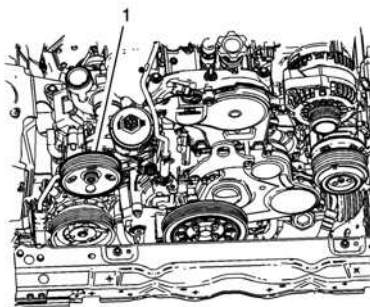
20. Remove the engine coolant fan shroud (1) . Refer to Engine Coolant Fan Shroud Replacement.



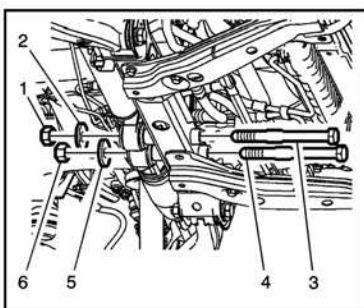
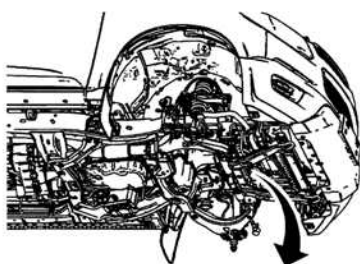
21. Remove the radiator (1). Refer to Radiator Replacement.



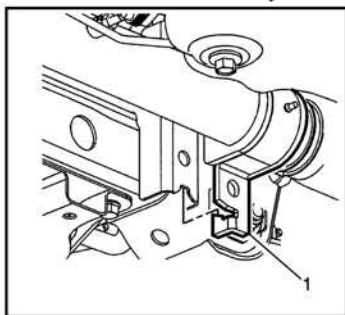
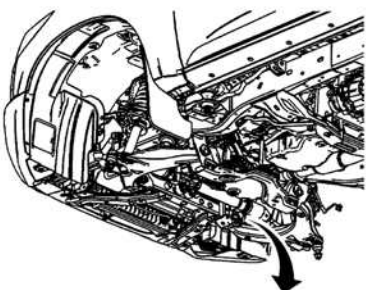
22. Remove the oil level indicator tube. Refer to Oil Level Indicator Tube Replacement.



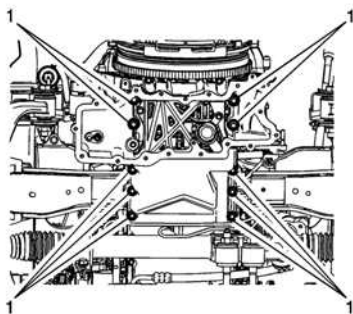
23. Reposition the power steering to the side. Refer to Power Steering Pump Replacement.
24. Remove the cowl panel. Refer to Cowl Front Panel Replacement.
25. Remove the oxidation catalytic converter. Refer to Oxidation Catalytic Converter Replacement.
26. Install engine support fixture. Refer to Engine Support Fixture.
27. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.
28. Remove the transmission. Refer to the appropriate procedure:
- Transmission Replacement.
 - Transmission Replacement.
 - Remove the lower oil pan. Refer to Lower Oil Pan Replacement.



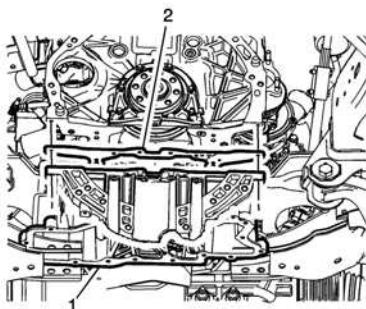
- Remove the following components from the driver's side of the steering gear:
 - The 2 steering gear nut (1,6).
 - The 2 steering gear washer (2, 5).
 - The 2 steering gear bolts (3,4).



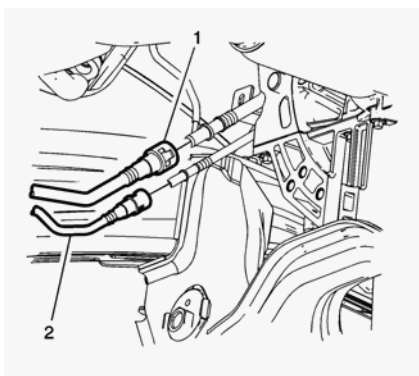
- Disconnect the steering gears bracket hook (1).



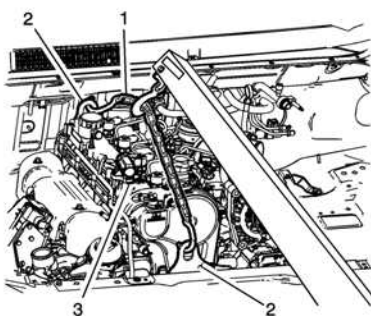
- Remove the upper oil pan bolts (1).



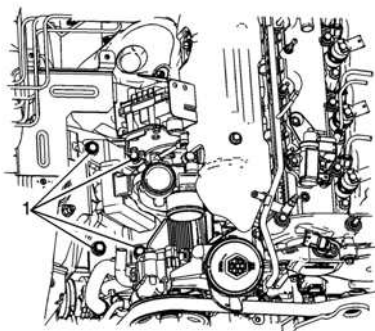
- Remove the oil pan and gasket (2) and oil pan (1).



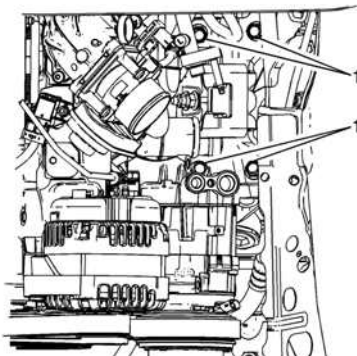
- Disconnect the fuel lines (1) and (2). Refer to Plastic Collar Quick Connect Fitting Service.
- Support the powertrain using a jack stand.



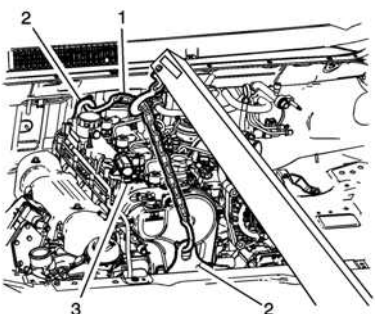
- Install an engine lift chain (1) to the engine lift brackets (2) and attach to an engine lift device.
- Using the engine lift device, raise the engine only enough to remove the tension from the engine mounts.



- Remove the left side engine mount bolts (1). Refer to Engine Mount Replacement - Left Side.



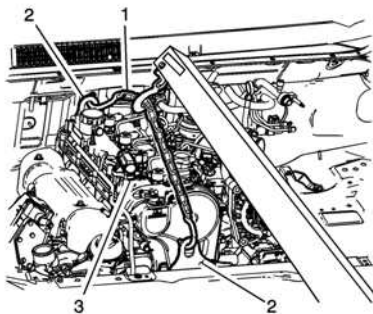
- Remove the right side engine mount bolts (1). Refer to Engine Mount Replacement - Right Side.
- Disconnect the electrical connector as necessary.
- Disconnect the coolant hoses as necessary.



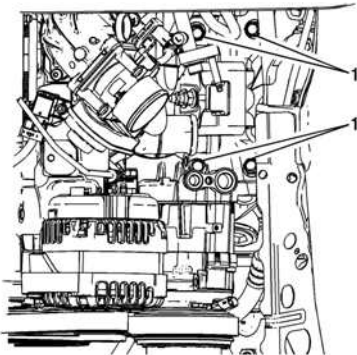
Note: Ensure clearance is maintained between the engine and the following:

- The A/C hoses.
- The engine mounts.
- The engine wiring harness.
- The heater outlet hose/pipe.
- Carefully raise the engine (3) from the engine compartment.

[Installation Procedure](#)

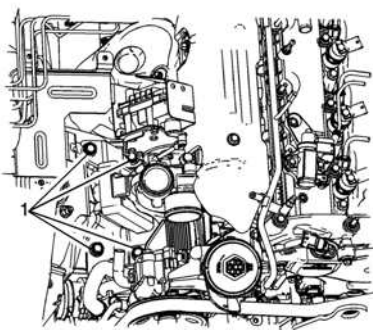


1. Carefully lower the engine (3) from the engine compartment.

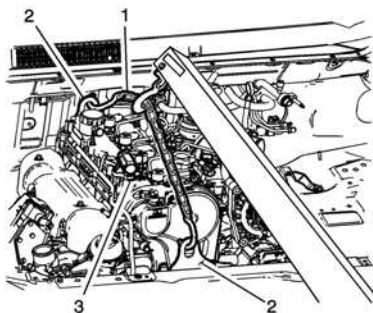


Caution: Refer to Fastener Caution.

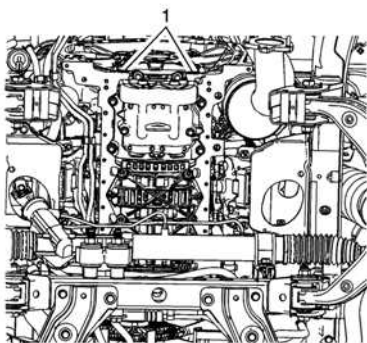
2. Install the right side engine mount bolts (1) and tighten to **70 Y (52 lb ft)**.



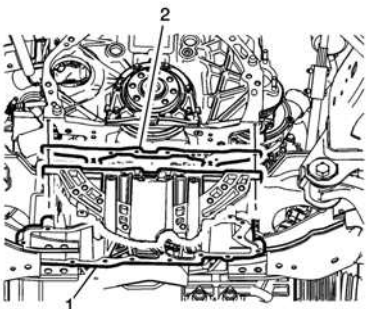
3. Install the left side engine mount bolts (1) and tighten to **70 Y (52 lb ft)**.
4. Support the powertrain using a jack stand.



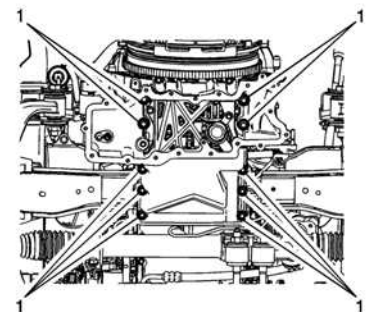
5. Remove the engine lift belt (1) from the engine lift brackets (2).
6. Install the oxidation catalytic converter. Refer to Oxidation Catalytic Converter Replacement.
7. Install the cowl panel. Refer to Cowl Front Panel Replacement.
8. Install the engine support fixture. Refer to Engine Support Fixture.
9. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



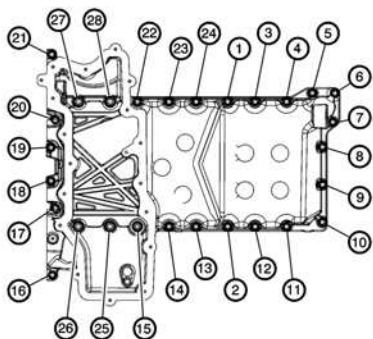
10. Install a thin bead of sealant at the upper oil pan to front and rear cover joints (1). Refer to Adhesives, Fluids, Lubricants, and Sealers.



11. Install the upper oil pan gasket (2) and oil pan (1).

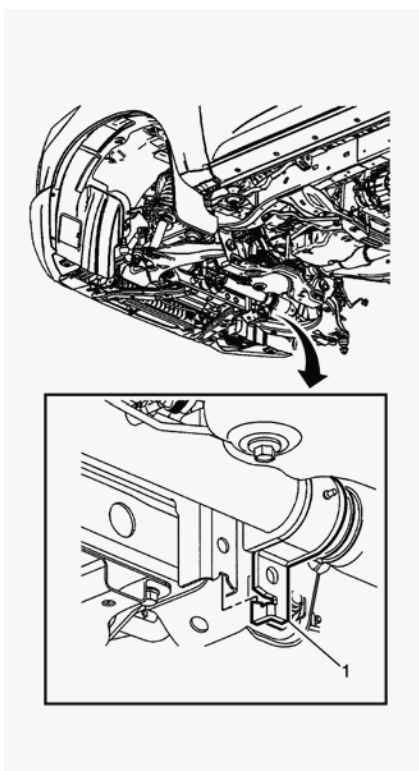


12. Install the upper oil pan bolts (1) and hand tighten.

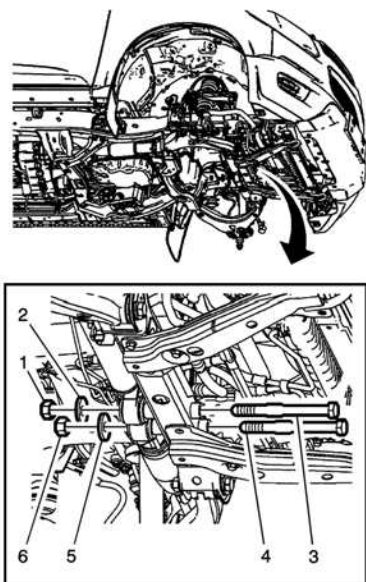


13. Tighten the upper oil pan bolts in sequence, first pass:

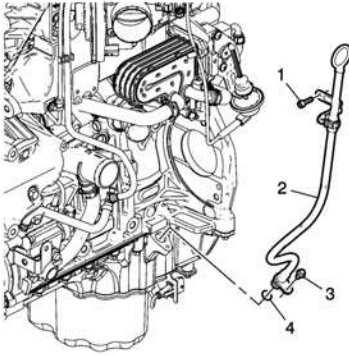
- M6 to 15Y (12 lb ft).
- M8 to 32Y (23 lb ft).
- Loosen all the bolts by 90 degrees.
- Tighten the upper oil pan bolts in sequence, final pass:
 - M6 to 15Y (12 lb ft).
 - M8 to 32Y (23 lb ft).



- Connect the steering gear bracket hook (1) to the bracket.



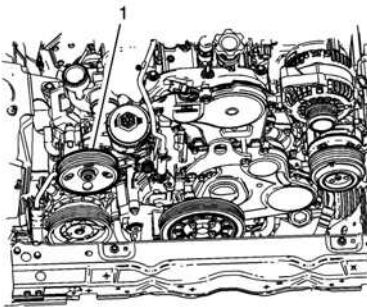
- Install the following components to the driver's side of the vehicle:
 - The 2 steering gear bolts (3, 4).
 - The 2 steering gear washers (2, 5).
 - The 2 steering gear nuts (1, 6).
- Use a wrench in order to hold the steering gear bolts. Tighten the steering gear nuts to **220Y (162 lb ft)**.



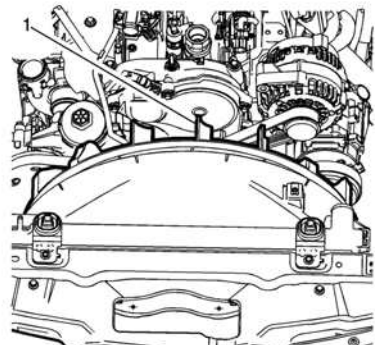
- Install the oil level indicator tube (2). Refer to Oil Level Indicator Tube Replacement.
- Install the lower oil pan. Refer to Lower Oil Pan Replacement.
- Install the transmission. Refer to the appropriate procedure:
 - Transmission Replacement.
 - Transmission Replacement.
- Connect electrical connector as necessary.



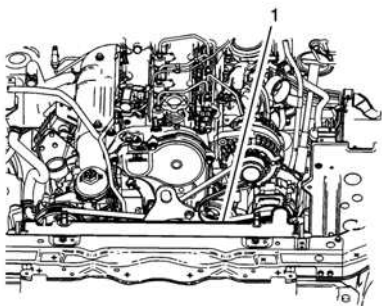
- Connect the fuel lines (1) and (2). Refer to Plastic Collar Quick Connect Fitting Service.



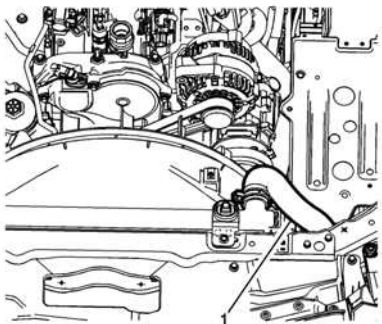
- Install the power steering pump. Refer to Power Steering Pump Replacement.



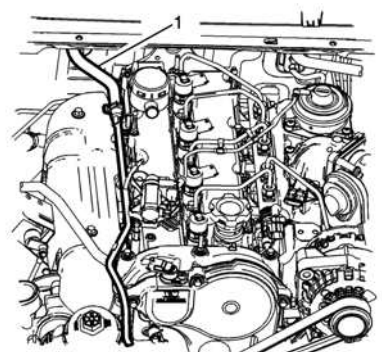
- Install the engine coolant fan shroud (1) . Refer to Engine Coolant Fan Shroud Replacement.



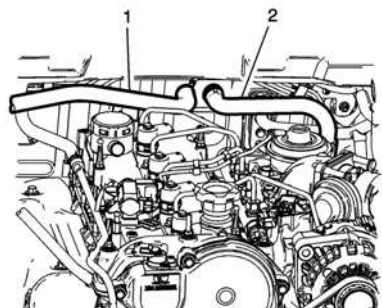
- Install the radiator (1). Refer to Radiator Replacement.



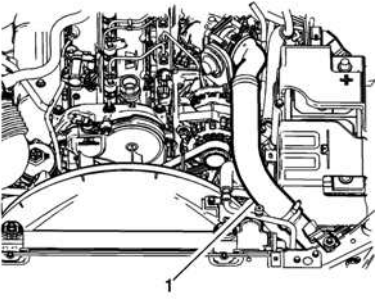
- Install the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



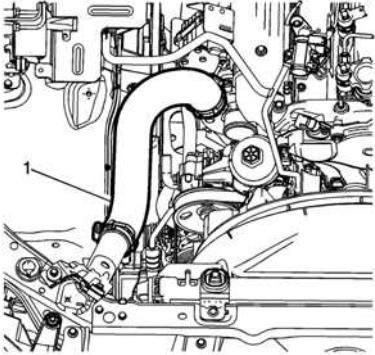
- Connect the vacuum hose (1). Refer to Power Brake Booster Vacuum Check Valve and Hose Replacement.



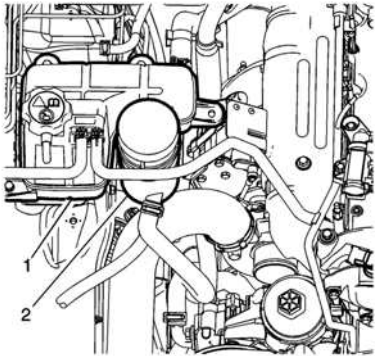
- If equipped with inside heat, install the heater outlet hose (1). Refer to Heater Outlet Hose Replacement.
- If equipped with inside heat, install the heater inlet hose (2). Refer to Heater Inlet Hose Replacement.
- Install the generator. Refer to Generator Replacement.
- Install the air conditioning compressor. Refer to Air Conditioning Compressor Replacement.
- Install the air conditioning compressor and condenser hose. Refer to Air Conditioning Compressor and Condenser Hose Replacement.
- Install the air conditioning compressor hose. Refer to Air Conditioning Compressor Hose Replacement.



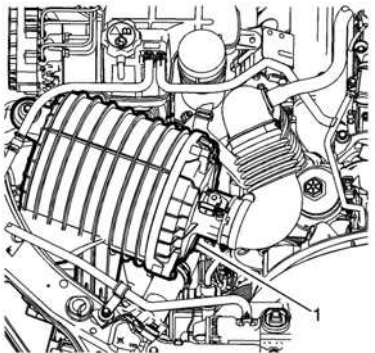
- Install the charge air cooler outlet air hose (1). Refer to Charge Air Cooler Outlet Air Hose Replacement.



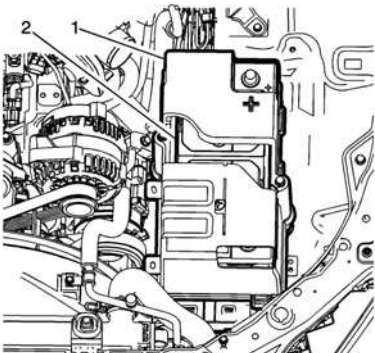
- Install the charge air cooler inlet air hose (1). Refer to Charge Air Cooler Inlet Air Hose Replacement.



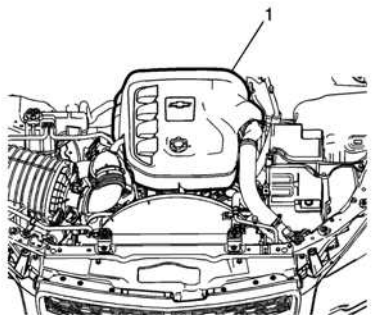
- Install the radiator surge tank (1). Refer to Radiator Surge Tank Replacement.
- Install the power steering fluid reservoir (2). Refer to Power Steering Fluid Reservoir Replacement.



- Install the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement.
- Recharge the A/C system. Refer to Refrigerant Recovery and Recharging.
- Fill the coolant system. Refer to Cooling System Draining and Filling.



- Install the battery (2). Refer to Battery Replacement.



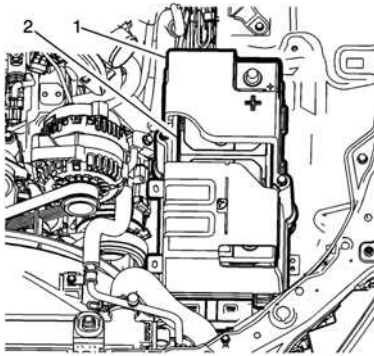
- Install the intake manifold cover (1). Refer to Intake Manifold Cover Replacement.
- Install the hood. Refer to Hood Replacement.
- Refill the engine oil. Refer to Engine Oil and Oil Filter Replacement.
- Refill the coolant system. Refer to Cooling System Draining and Filling.

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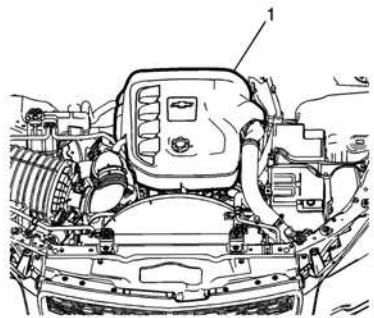
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

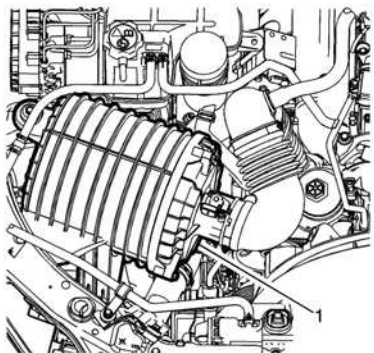
1. Drain the coolant system. Refer to Cooling System Draining and Filling.



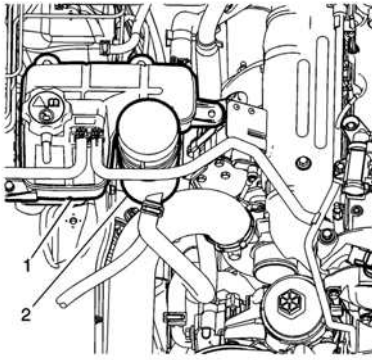
2. Remove the battery box (1). Refer to Battery Box Replacement.
3. Remove the battery (2). Refer to Battery Replacement.



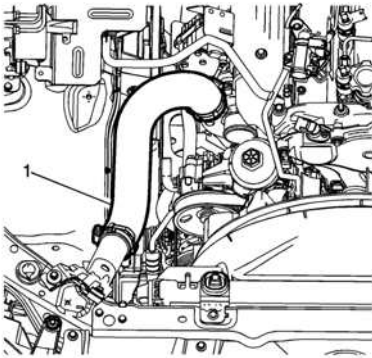
4. Remove the intake manifold cover (1). Refer to Intake Manifold Cover Replacement.
5. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.



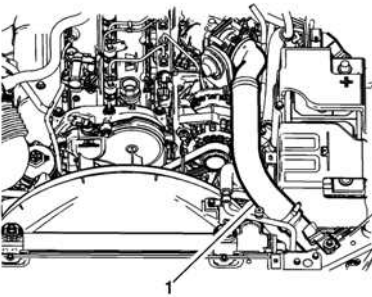
6. Remove the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement.



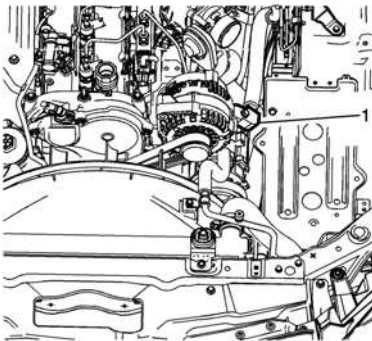
7. Remove the radiator surge tank (1). Refer to Radiator Surge Tank Replacement.
8. Reposition power steering Pump reservoir (2). Refer to Power Steering Fluid Reservoir Replacement.



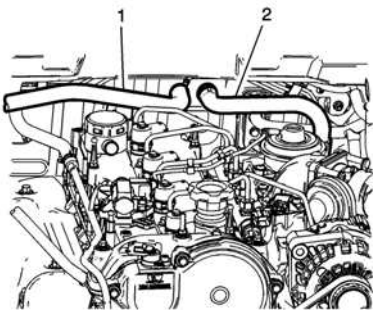
9. Remove the charge air cooler inlet air hose (1). Refer to Charge Air Cooler Inlet Air Hose Replacement.



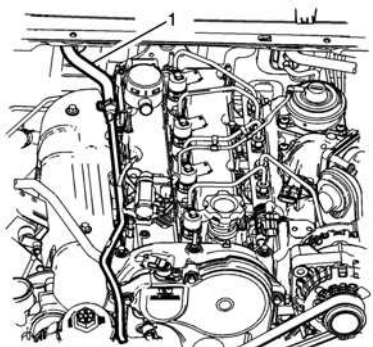
10. Remove the charge air cooler outlet air hose (1). Refer to Charge Air Cooler Outlet Air Hose Replacement.



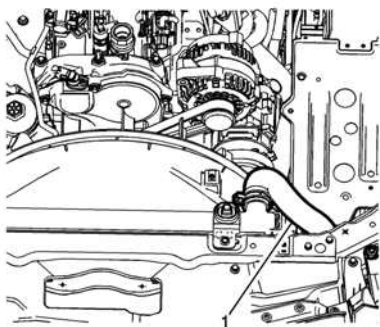
11. Remove the air conditioning compressor and condenser hose (1). Refer to Air Conditioning Condenser and Air Conditioning Evaporator Tube Replacement.



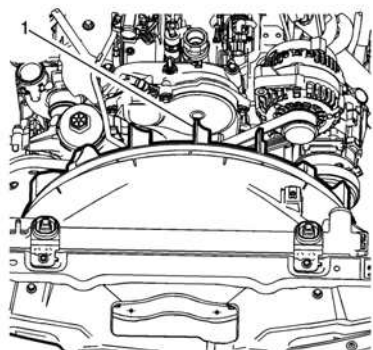
- 12. Remove the heater outlet hose (1). Refer to Heater Outlet Hose Replacement.
- 13. Remove the heater inlet hose (2). Refer to Heater Inlet Hose Replacement.



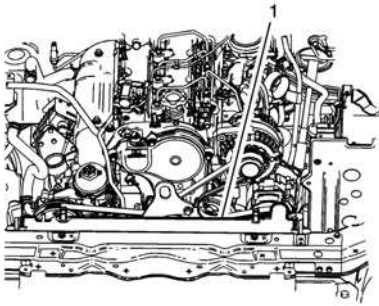
- 14. Disconnect vacuum hose (1). Refer to Power Brake Booster Vacuum Check Valve and Hose Replacement.



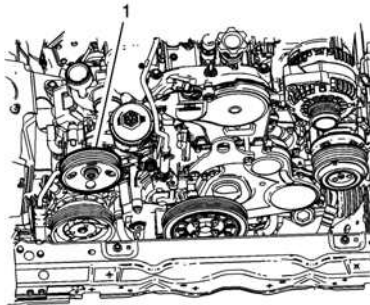
- 15. Remove the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



- 16. Remove the engine coolant fan shroud (1). Refer to Engine Coolant Fan Shroud Replacement.

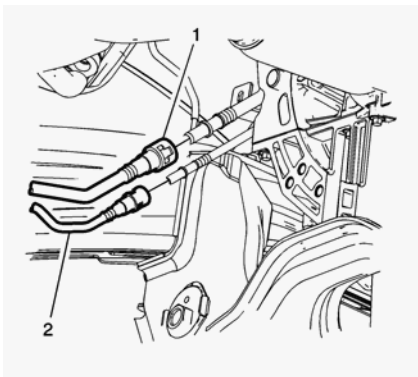


17. Remove the radiator (1). Refer to Radiator Replacement.

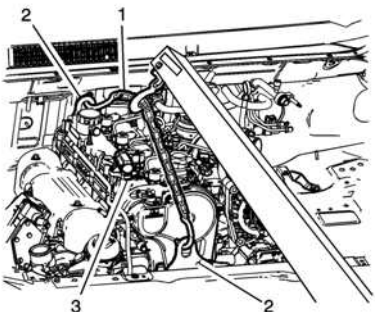


18. Reposition the power steering to the side. Refer to Power Steering Pump Replacement.
19. Raise the vehicle. Refer to Lifting and Jacking the Vehicle.
20. Remove the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.
21. Remove the transmission. Refer to the appropriate procedure:

- Transmission Replacement.
- Transmission Replacement.

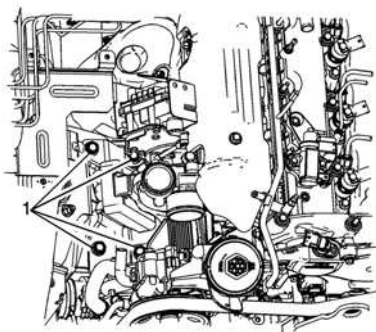


- Disconnect fuel lines (1) and (2). Refer to Plastic Collar Quick Connect Fitting Service.
- Support the powertrain using a jack stand.

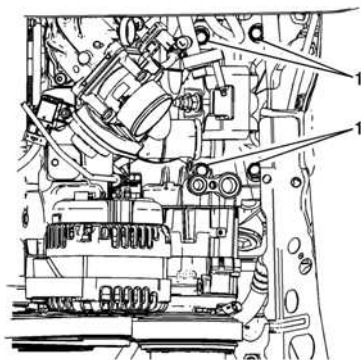


- Install an engine lift belt (1) to the engine lift brackets (2) and attach to an engine lift device.

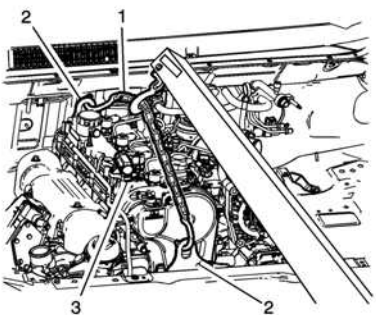
- Using the engine lift device, raise the engine only enough to remove the tension from the engine mounts.



- Remove the left side engine mount bolts (1). Refer to Engine Mount Replacement - Left Side.



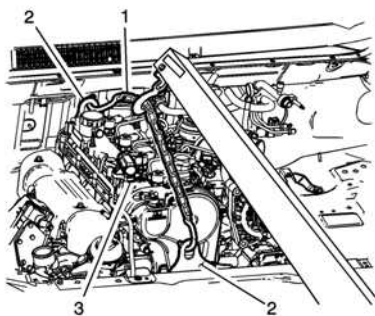
- Remove the right side engine mount bolts (1). Refer to Engine Mount Replacement - Right Side.
- Disconnect the electrical connector as necessary.
- Disconnect the coolant hoses as necessary.



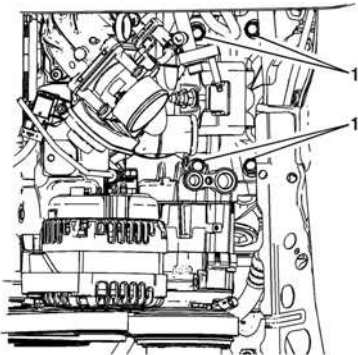
Note: Ensure clearance is maintained between the engine and the following:

- The A/C hoses
- The engine mounts
- The engine wiring harness
- The heater outlet hose/pipe
- Carefully raise the engine (3) from the engine compartment.

[Installation Procedure](#)

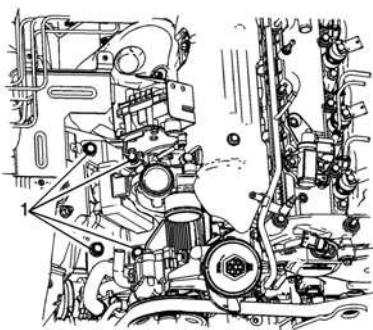


1. Carefully lower the engine (3) from the engine compartment.

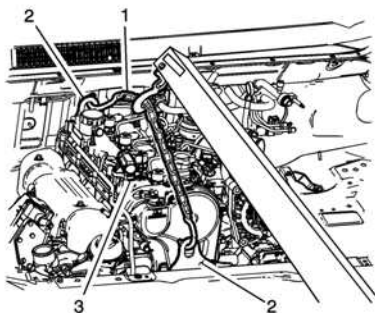


Caution: Refer to Fastener Caution.

2. Install the right side engine mount bolts (1) and tighten to **70 Y (52 lb ft)**.

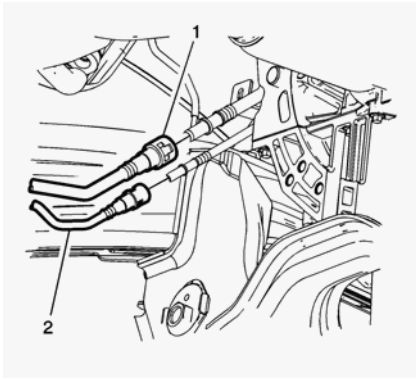


3. Install the left side engine mount bolts (1) and tighten to **70 Y (52 lb ft)**.
4. Support the powertrain using a jack stand.

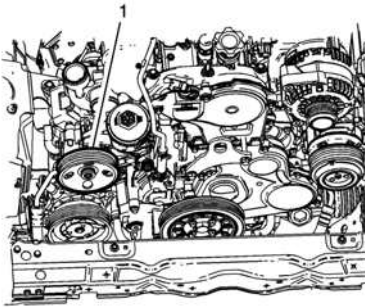


5. Remove the engine lift belt (1) from the engine lift brackets (2).
6. Install the transmission. Refer to the appropriate procedure:

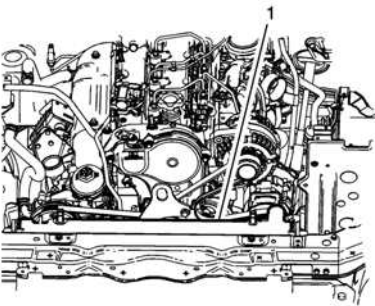
- Transmission Replacement.
- Transmission Replacement.
- Connect electrical connector as necessary.



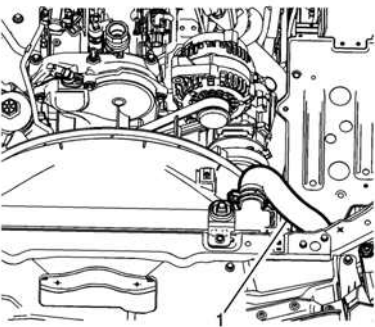
- Connect fuel lines (1) and (2). Refer to Plastic Collar Quick Connect Fitting Service.
- Install the differential carrier assembly. Refer to Differential Carrier Assembly Replacement.



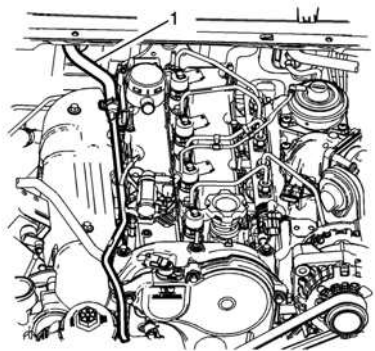
- Install the power steering pump. Refer to Power Steering Pump Replacement.



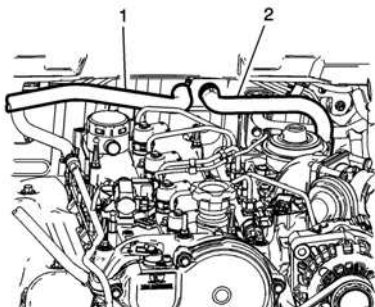
- Install the radiator (1). Refer to Radiator Replacement.



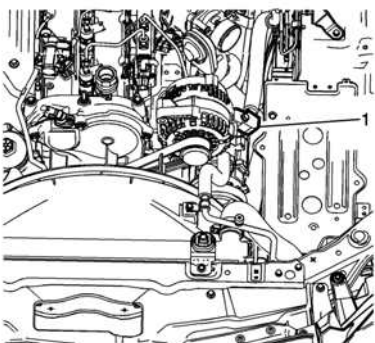
- Install the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



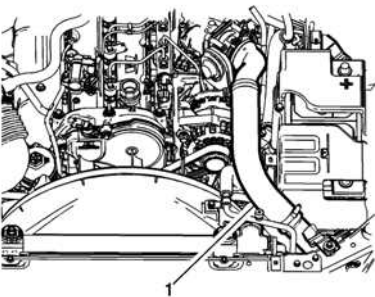
- Connect vacuum hose (1). Refer to Power Brake Booster Vacuum Check Valve and Hose Replacement.



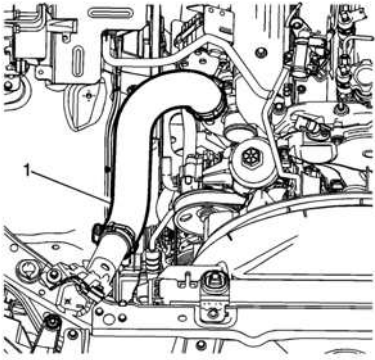
- Install the heater outlet hose (1). Refer to Heater Outlet Hose Replacement.
- Install the heater inlet hose (2). Refer to Heater Inlet Hose Replacement.



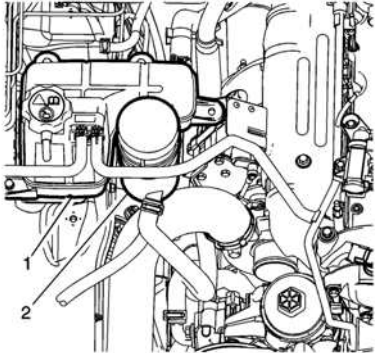
- Install the air conditioning compressor and condenser hose (1). Refer to Air Conditioning Condenser and Air Conditioning Evaporator Tube Replacement.



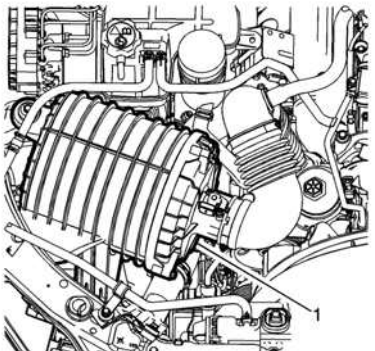
- install the charge air cooler outlet air hose (1). Refer to Charge Air Cooler Outlet Air Hose Replacement.



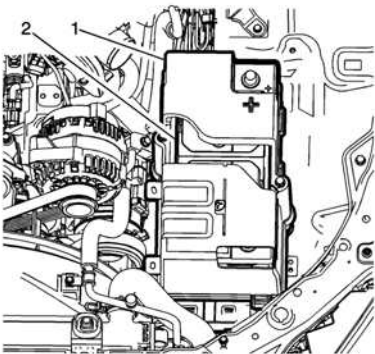
- Install the charge air cooler inlet air hose (1). Refer to Charge Air Cooler Inlet Air Hose Replacement.



- Install the radiator surge tank (1). Refer to Radiator Surge Tank Replacement.
- install the power steering fluid reservoir (2). Refer to Power Steering Fluid Reservoir Replacement.

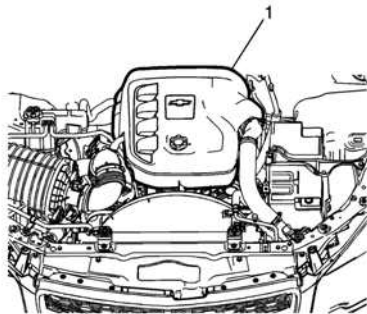


- Install the air cleaner assembly (1). Refer to Air Cleaner Assembly Replacement.
- Recharge the A/C system . Refer to Refrigerant Recovery and Recharging.
- Fill the coolant system. Refer to Cooling System Draining and Filling.



- Install the battery (2). Refer to Battery Replacement.
- Install the battery box (1). Refer to Battery Box Replacement.

Engine Replacement (4x4)



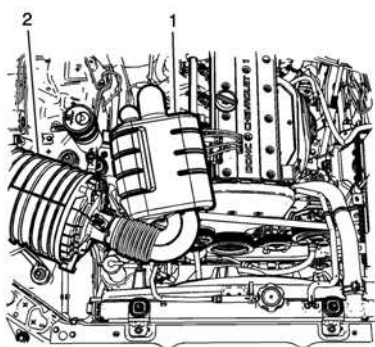
- Install the intake manifold cover (1). Refer to Intake Manifold Cover Replacement.

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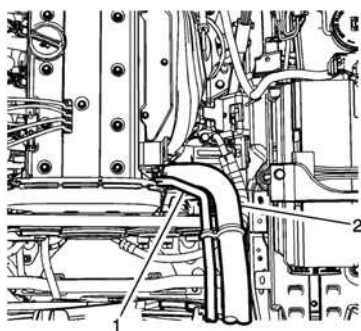
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

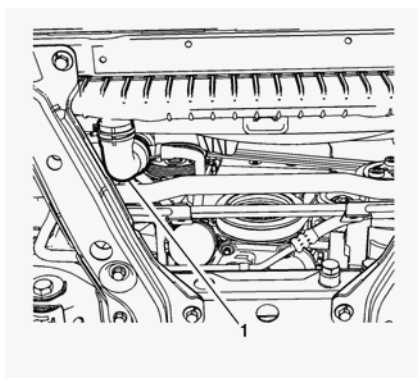
1. Remove the hood. Refer to Hood Replacement.
2. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
3. Drain the coolant system. Refer to Cooling System Draining and Filling.
4. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.
5. Remove the cowl front panel. Refer to Cowl Front Panel Replacement.
6. Drain the engine oil. Refer to Engine Oil and Oil Filter Replacement.
7. Disconnect the exhaust pipe to get clearance from the exhaust manifold. Refer to Exhaust Pipe Replacement.
8. Disconnect the positive cable from the battery. Refer to Battery Positive and Negative Cable Replacement.



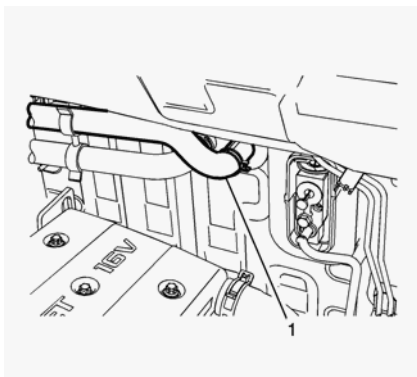
9. Remove the air cleaner outlet duct (1). Refer to Air Cleaner Outlet Duct Replacement.
10. Remove the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.



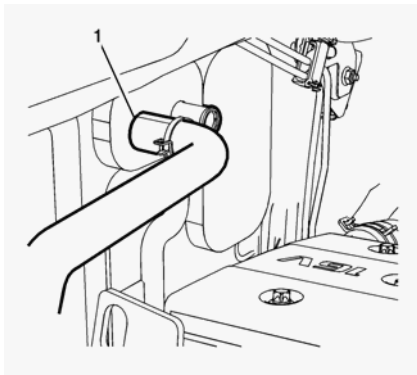
11. Release the hose clamp and remove the engine coolant air bleeder hose (1).
12. Release the hose clamp and remove the radiator inlet hose (2). Refer to Radiator Inlet Hose Replacement.



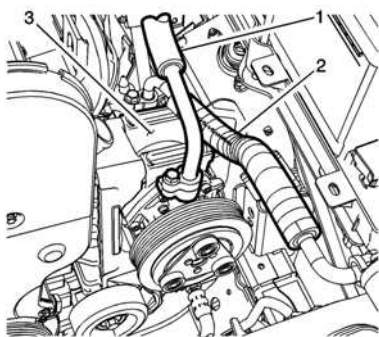
13. Remove the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



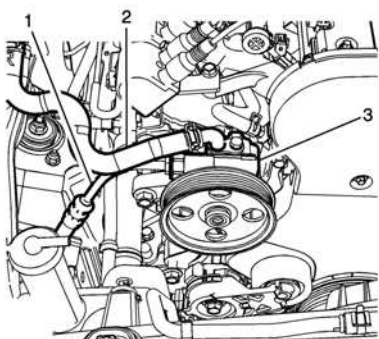
14. Release hose clamp and disconnect the inlet heater hose (1). Refer to Heater Inlet Hose Replacement.



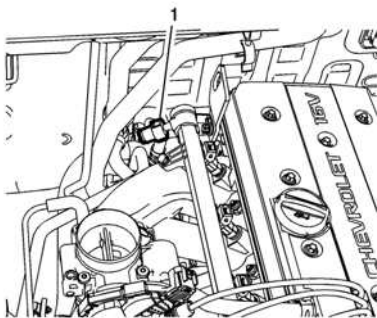
15. Release hose clamp and disconnect the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.



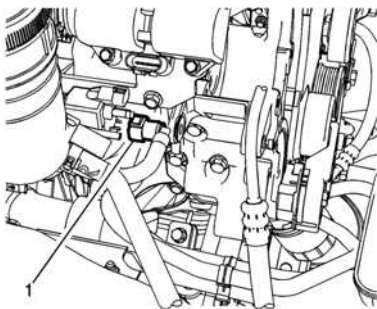
16. Disconnect the electrical connection, the air conditioning compressor and condenser hose (1) and the air conditioning compressor hose (2) from the air conditioning compressor (3). Refer to Air Conditioning Compressor Replacement.



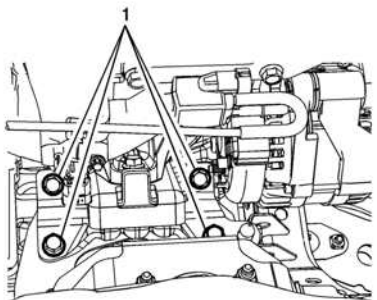
17. Disconnect the power steering gear inlet hose (1) and the power steering fluid reservoir outlet hose (2) from the power steering pump (3). Refer to Power Steering Pump Replacement.



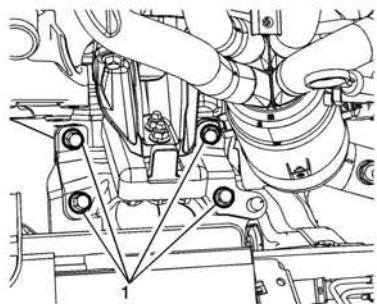
18. Disconnect the fuel feed line (1). Refer to Plastic Collar Quick Connect Fitting Service.



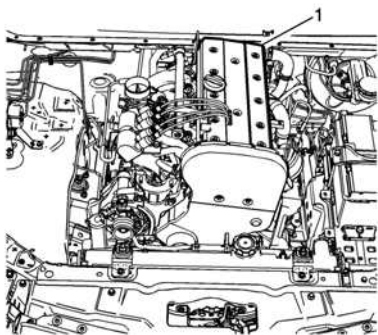
19. Disconnect the EVAP line (1). Refer to Plastic Collar Quick Connect Fitting Service.
20. Remove the transmission. Refer to Transmission Replacement.
21. Install suitable chains to the engine lift brackets and attach to an engine lift device.
22. Using the engine lift device, raise the engine only enough to remove the tension from the engine mounts.



23. Remove the right side engine mount bolts (1).



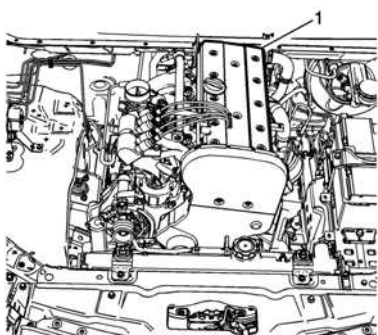
24. Remove the left side engine mount bolts (1).
25. Disconnect electrical connector as necessary.
26. Disconnect coolant hoses as necessary.



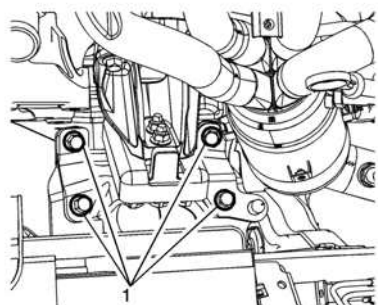
Note: Ensure clearance is maintained between the engine and the following:

- The A/C hoses.
 - The engine mounts.
 - The engine wiring harness.
 - The heater outlet hose/pipe.
27. Carefully raise the engine (1) from the engine compartment.

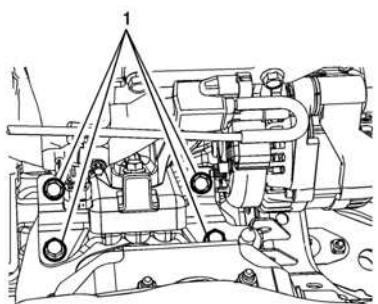
[Installation Procedure](#)



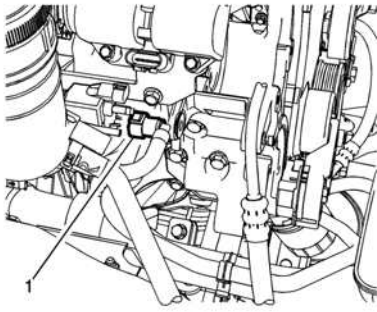
1. Carefully lower the engine (1) from the engine compartment.



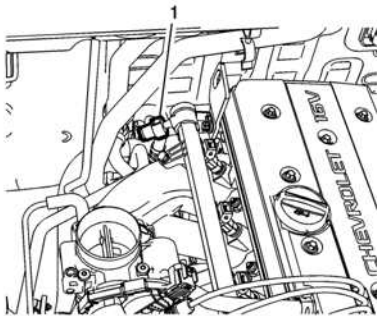
2. Install the left side engine mount bolts (1) and tighten to **60 Y (45 lb ft)**.



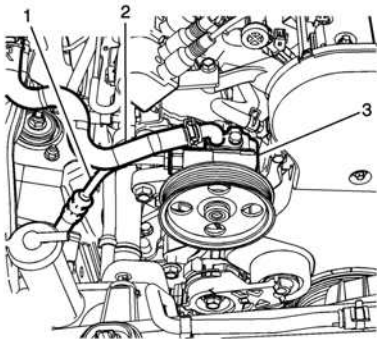
3. Install the right side engine mount bolts (1) and tighten to **60 Y (45 lb ft)**.
4. Install the transmission. Refer to Transmission Replacement.
5. Remove the suitable chains from the engine lift brackets.



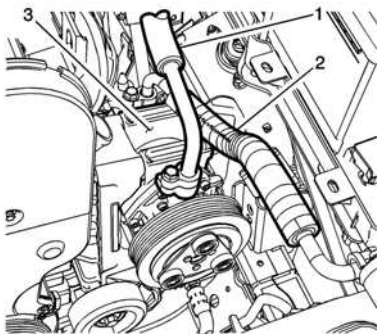
6. Connect the EVAP line (1). Refer to Plastic Collar Quick Connect Fitting Service.



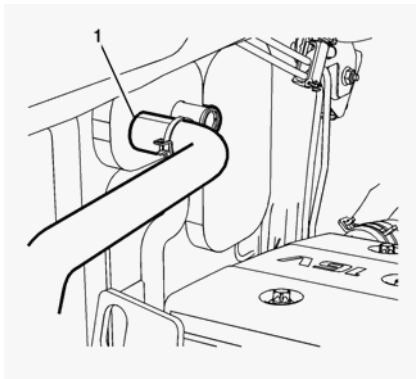
7. Connect the fuel feed line (1). Refer to Plastic Collar Quick Connect Fitting Service.



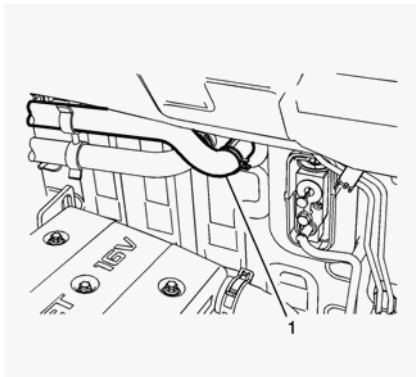
8. Connect the power steering gear inlet hose (1) and the power steering fluid reservoir outlet hose (2) in the power steering pump (3). Refer to Power Steering Pump Replacement.



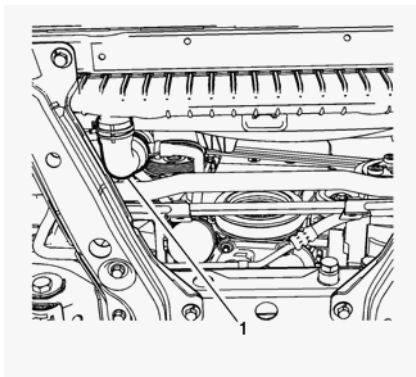
9. Connect the electrical connection, the air conditioning compressor and condenser hose (1) and the air conditioning compressor hose (2) install in the air conditioning compressor (3). Refer to Air Conditioning Compressor Replacement.



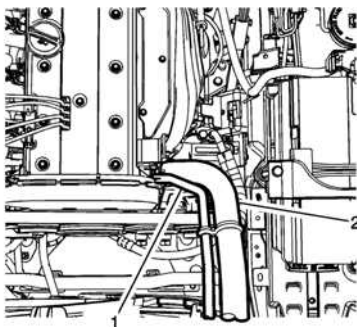
10. Reinstall the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.



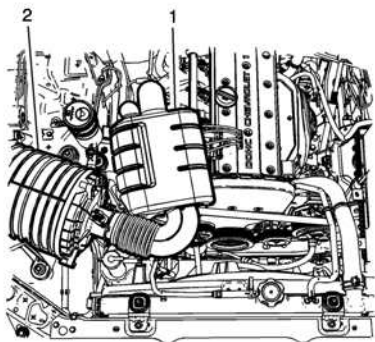
11. Reinstall the inlet heater hose (1). Refer to Heater Inlet Hose Replacement.



12. Install the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



13. Install the engine coolant air bleeder hose (1).
14. Install the radiator inlet hose (2). Refer to Radiator Inlet Hose Replacement.



15. Install the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.
16. Install the air cleaner outlet duct (1). Refer to Air Cleaner Outlet Duct Replacement.
17. Connect the positive cable in the battery. Refer to Battery Negative Cable Disconnection and Connection.
18. Install the transmission. Refer to Transmission Replacement.
19. Install the exhaust pipe. Refer to Exhaust Pipe Replacement.
20. Install the cowl front panel. Refer to Cowl Front Panel Replacement.
21. Refill the refrigerant system. Refer to Refrigerant Recovery and Recharging.
22. Refill the coolant system. Refer to Cooling System Draining and Filling.
23. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
24. Connect the positive cable from the battery. Refer to Battery Positive and Negative Cable Replacement.
25. Refill the engine oil. Refer to Engine Oil and Oil Filter Replacement.
26. Install the hood. Refer to Hood Replacement.
27. Test the vehicle using the following procedure:

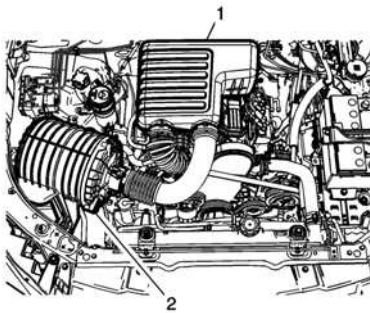
- Crank the engine several times. Listen for any unusual noises or evidence that parts are binding.
- Start the engine and listen for unusual noises.
- Check the vehicle oil pressure gauge or light and confirm that the engine has acceptable oil pressure.
- Run the engine speed at about 1,000 RPM until the engine has reached normal operating temperature.
- Listen for sticking lifter and other unusual noises.
- Inspect for fuel, oil and/or coolant leaks while the engine is running.
- Inspect for coolant, oil, gas or exhaust leaks.
- Road test the vehicle for normal operation.

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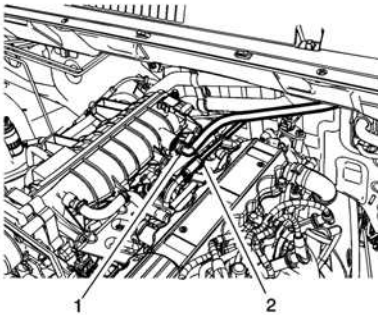
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

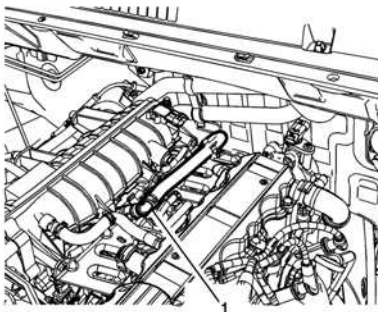
1. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Drain the coolant system. Refer to Cooling System Draining and Filling.
3. Remove the hood. Refer to Hood Replacement.
4. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.
5. Drain the engine oil. Refer to Engine Oil and Oil Filter Replacement.
6. Remove the catalytic converter. Refer to Catalytic Converter Replacement.
7. Disengage transmission from the engine. Refer to Transmission Replacement.
8. Disconnect electrical connectors from generator. Refer to Generator Replacement.
9. Disconnect electrical connectors from starter. Refer to Starter Replacement.



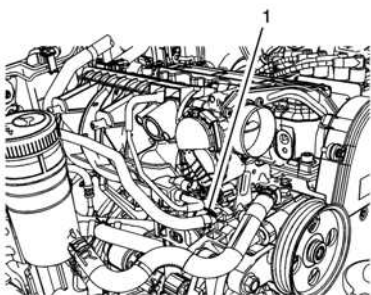
10. Remove the resonator (1). Refer to Air Cleaner Outlet Resonator Replacement.
11. Remove the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.



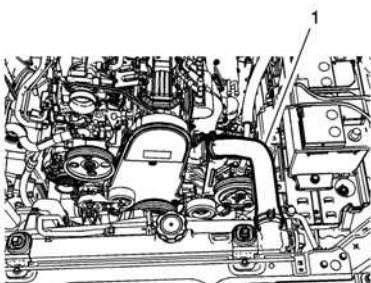
12. Disconnect the vacuum hose (1).
13. Disconnect the cold start hose (2).



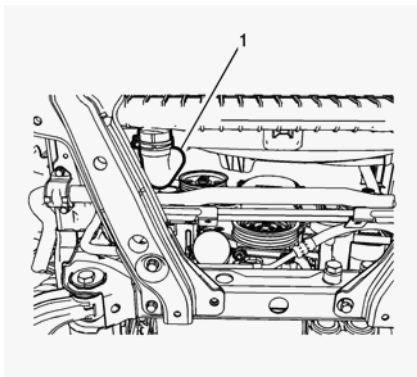
14. Disconnect the fuel feed hose (1). Refer to Plastic Collar Quick Connect Fitting Service.



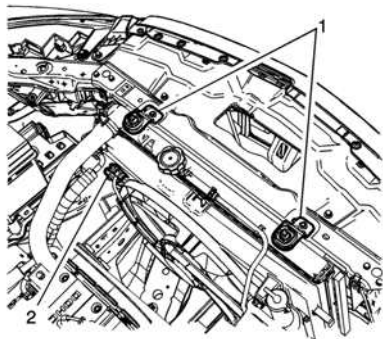
15. Disconnect the EVAP hose (1). Refer to Plastic Collar Quick Connect Fitting Service.



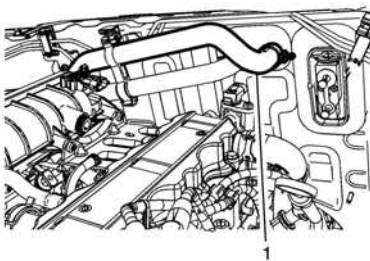
16. Remove the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



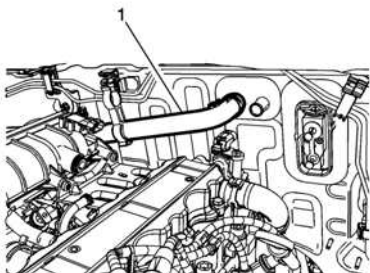
17. Remove the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



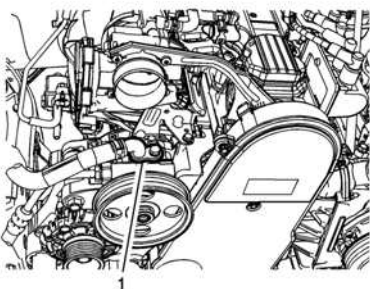
18. Remove the radiator, engine coolant fan shroud and fan together.
19. Remove the bolts (1) and disconnect the electrical connector (2).



20. Release hose clamp and disconnect the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.



21. Release hose clamp and disconnect the inlet heater hose (1). Refer to Heater Inlet Hose Replacement.
22. Remove the air conditioning compressor . Refer to Air Conditioning Compressor Replacement.

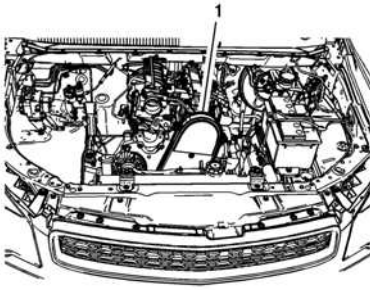


23. Loosen the hose clamp and disconnect the power steering fluid reservoir outlet hose (1) from the power steering pump .
24. Disconnect the power steering gear inlet hose from the power steering pump. Refer to Power Steering Gear Inlet Pipe/Hose Replacement.
25. Install an engine lift belt to the engine lift brackets and attach to an engine lift device.
26. Using the engine lift device, raise the engine only enough to remove the tension from the engine mounts.
27. Remove the left and right side engine mount bolts from chassis. Refer to Engine Front Mount Replacement.



28. Loosen the left and right side engine mount nuts (1) from the bracket.
29. Disconnect the electrical connector as necessary.

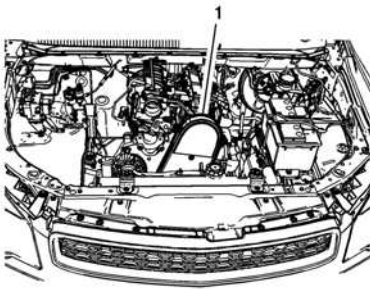
30. Disconnect coolant hoses as necessary.



Note: Ensure clearance is maintained between the engine and the following:

- The A/C hoses.
 - The engine mounts.
 - The engine wiring harness.
 - The heater outlet hose/pipe.
31. Carefully raise the engine (1) from the engine compartment.
 32. Put the engine on a suitable engine stand.
 33. Transfer any additional parts as necessary.

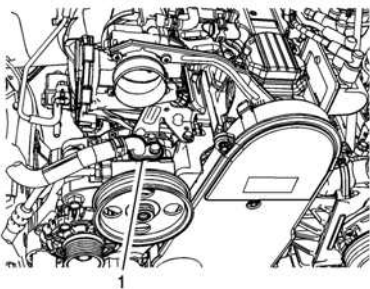
[Installation Procedure](#)



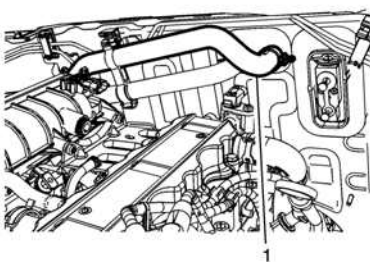
1. Carefully lower the engine (1) on the engine compartment.
2. Install the left and right side engine mount bolts from chassis. Refer to Engine Front Mount Replacement.



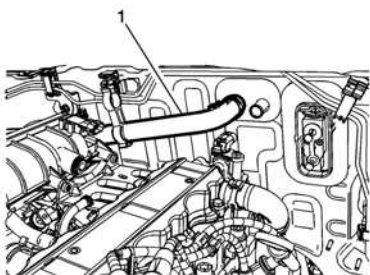
3. Tighten the left and right side engine mount nuts (1) on bracket and tighten to 58 Y (43 lb ft).
4. Remove the engine lift belt from the engine lift brackets.



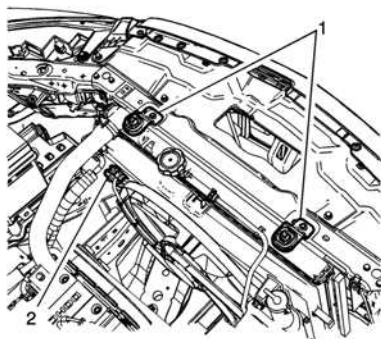
5. Connect the power steering fluid reservoir outlet hose (1) to the power steering pump. Secure the hose with the clamp.
6. Install a NEW power steering gear inlet hose O-ring seal to the power steering gear inlet hose.
7. Connect the power steering gear inlet hose from the power steering pump. Refer to Power Steering Gear Inlet Pipe/Hose Replacement.
8. Install the air conditioning compressor. Refer to Air Conditioning Compressor Replacement.



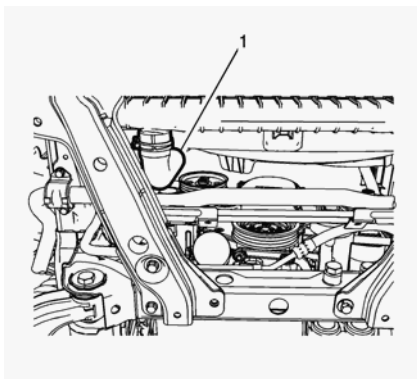
9. Reinstall the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.



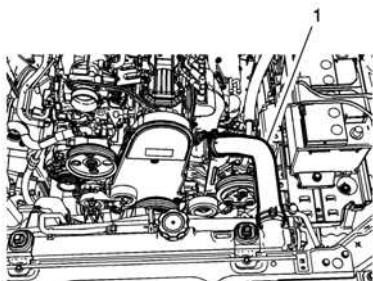
10. Reinstall the inlet heater hose (1). Refer to Heater Inlet Hose Replacement.



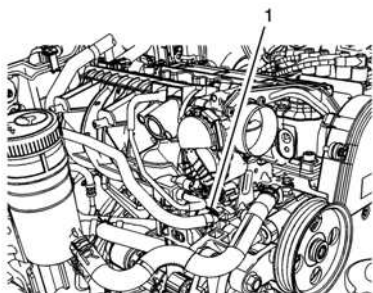
11. Install the radiator, engine coolant fan shroud and fan together.
12. Install the bolts (1) and tighten.
13. Connect the electrical connector (2).



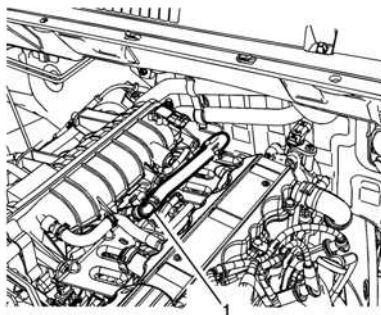
14. Install the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



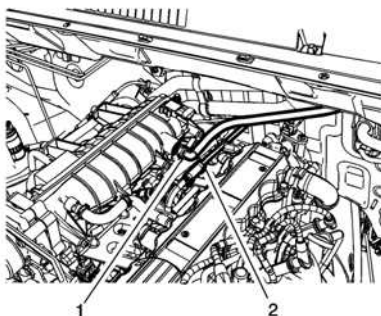
15. Reinstall the inlet heater hose (1). Refer to Heater Inlet Hose Replacement.



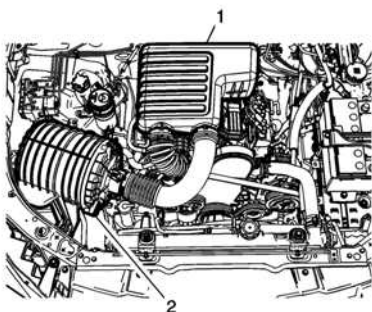
16. Connect the EVAP line (1). Refer to Plastic Collar Quick Connect Fitting Service.



17. Connect the fuel feed line (1). Refer to Plastic Collar Quick Connect Fitting Service.



18. Connect the cold start hose (2).
19. Connect the intake vacuum hose (1).



20. Install the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.
21. Install the air cleaner outlet resonator (1). Refer to Air Cleaner Outlet Resonator Replacement.
22. Connect electrical connectors from generator. Refer to Generator Replacement.
23. Connect electrical connectors from starter. Refer to Starter Replacement.
24. Engage transmission on the engine. Refer to Transmission Replacement.
25. Install the exhaust pipe. Refer to Exhaust Pipe Replacement.
26. Refill the refrigerant system. Refer to Refrigerant Recovery and Recharging.
27. Refill the coolant system. Refer to Cooling System Draining and Filling.
28. Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
29. Refill the engine oil. Refer to Engine Oil and Oil Filter Replacement.
30. Install the hood. Refer to Hood Replacement.
31. Test the vehicle using the following procedure:
 - Crank the engine several times. Listen for any unusual noises or evidence that parts are binding.
 - Start the engine and listen for unusual noises.
 - Check the vehicle oil pressure gauge or light and confirm that the engine has acceptable oil pressure.
 - Run the engine speed at about 1,000 RPM until the engine has reached normal operating temperature.
 - Listen for sticking lifter and other unusual noises.
 - Inspect for fuel, oil and/or coolant leaks while the engine is running.
 - Inspect for coolant, oil, gas or exhaust leaks.
 - Road test the vehicle for normal operation.

2013 Chevrolet Colorado

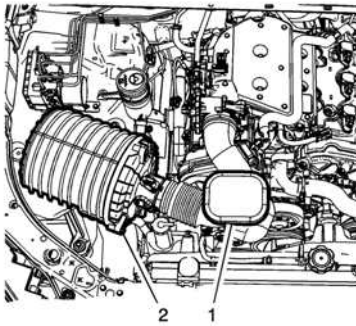
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

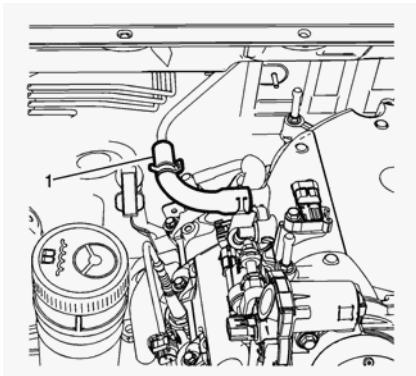
1. Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
3. Drain the coolant system. Refer to Cooling System Draining and Filling.
4. Recover the refrigerant. Refer to Refrigerant Recovery and Recharging.
5. Drain the engine oil. Refer to Engine Oil and Oil Filter Replacement.
6. Disconnect the front exhaust pipe from the exhaust manifolds. Refer to Front Pipe Replacement.

Note: Complete removal of the transmission is not necessary. Follow the necessary steps in the transmission replacement procedure to separate the transmission from the engine. Then suitably support the transmission in the chassis.

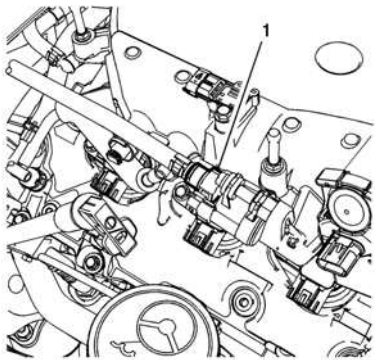
7. Separate the transmission from the engine. Refer to the appropriate procedure:
- If equipped with automatic transmission. Refer to Transmission Replacement.
 - If equipped with manual transmission. Refer to Transmission Replacement.



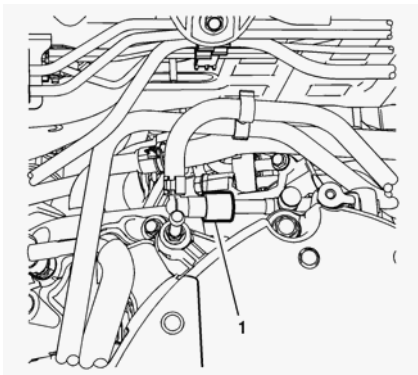
- Remove the air cleaner outlet duct (1). Refer to Air Cleaner Outlet Resonator Replacement.
- Remove the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.
- Remove the cowl front panel. Refer to Cowl Front Panel Replacement.



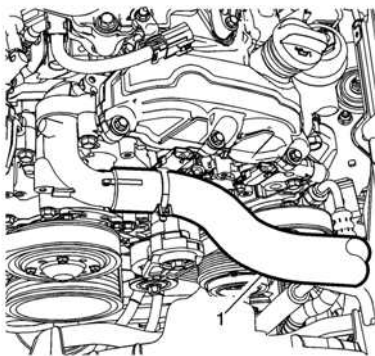
- Disconnect the vacuum hose (1).



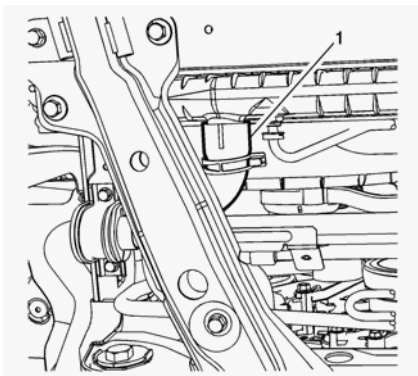
- Disconnect the EVAP hose (1). Refer to Plastic Collar Quick Connect Fitting Service.



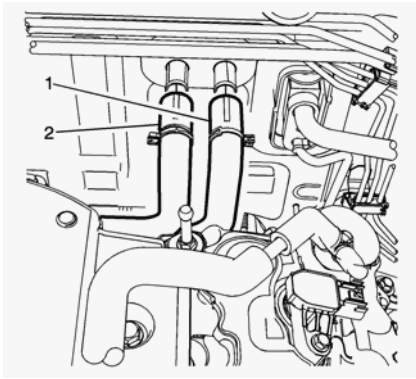
- Disconnect the fuel feed hose (1). Refer to Plastic Collar Quick Connect Fitting Service.



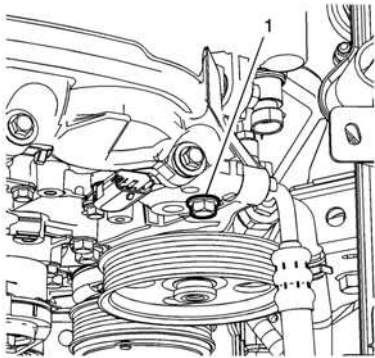
- Remove the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



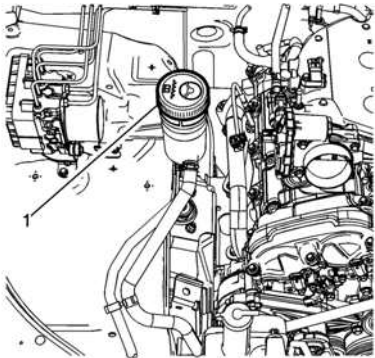
- Remove the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



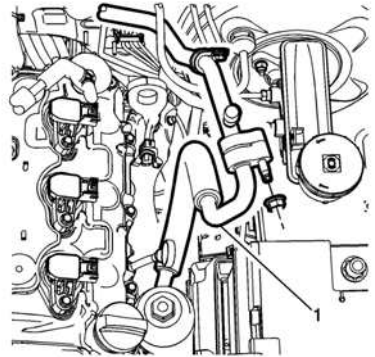
- Release hose clamp and disconnect the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.
- Release hose clamp and disconnect the inlet heater hose (2). Refer to Heater Inlet Hose Replacement.



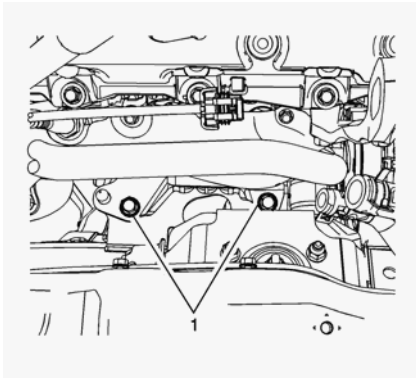
- Reposition power steering pump (1). Refer to Power Steering Pump Replacement.



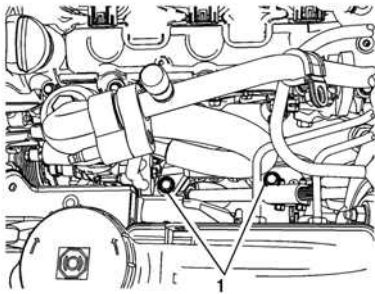
- Reposition the power steering reservoir (1)



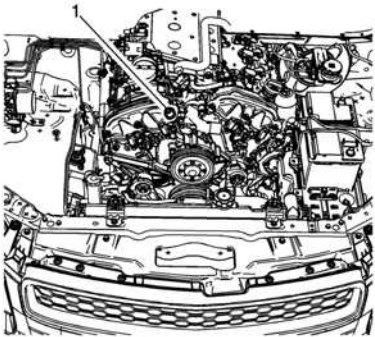
- Remove the air conditioning compressor hose (1). Refer to Air Conditioning Compressor Hose Replacement.



- Remove the 4 lower right side engine mount. Refer to Engine Mount Replacement - Right Side.



- Remove the 4 lower left side engine mount. Refer to Engine Mount Replacement - Left Side.
- Install an engine lift belt to the engine lift brackets and attach to an engine lift device.
- Using the engine lift device, raise the engine only enough to remove the tension from the engine mounts.
- Disconnect electrical connector as necessary.
- Disconnect coolant hoses as necessary.

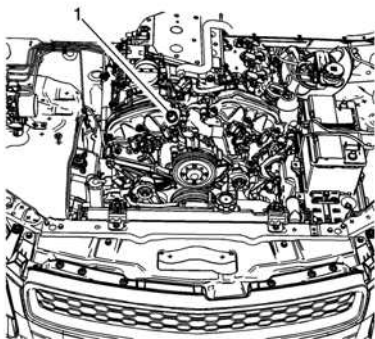


Note: Ensure clearance is maintained between the engine and the following:

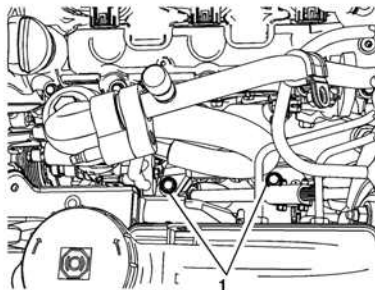
- The A/C hoses.
- The engine mounts.
- The engine wiring harness.
- The heater outlet hose/pipe.
- Carefully raise the engine (1) from the engine compartment.
- Install the engine on a suitable engine stand.

[Installation Procedure](#)

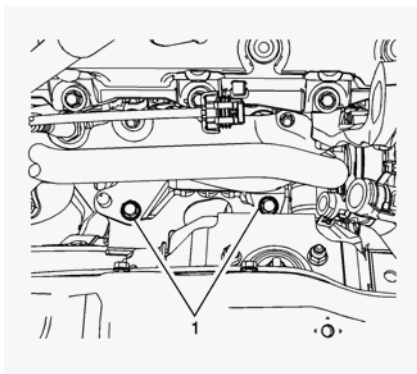
1. Remove the engine from the engine stand.



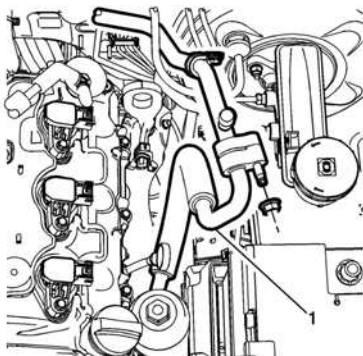
2. Carefully lower the engine (1) from the engine compartment.



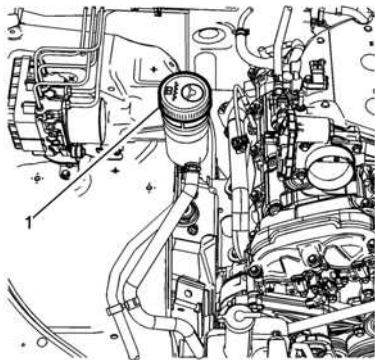
3. Install the 4 lower left side engine mount. Refer to Engine Mount Replacement - Left Side.



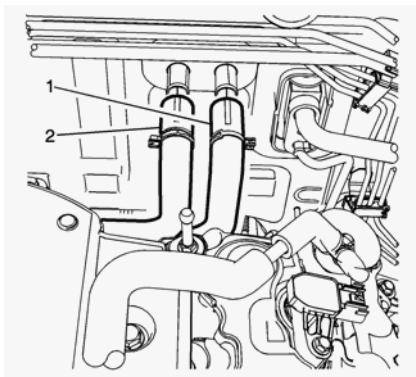
4. Install the 4 lower right side engine mount. Refer to Engine Mount Replacement - Right Side.
5. Remove the engine lift belt from the engine lift brackets.



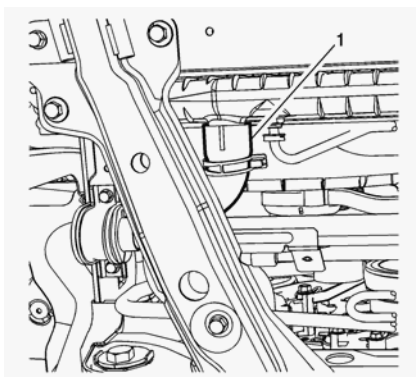
6. Install the air conditioning compressor hose (1). Refer to Air Conditioning Compressor Hose Replacement.



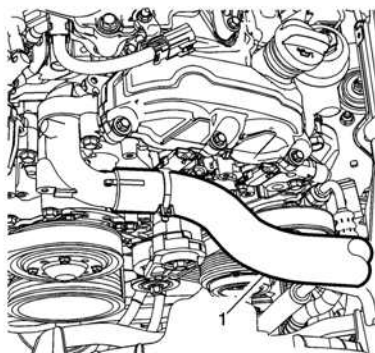
7. Install the power steering reservoir (1)
8. Install the cowl front panel. Refer to Cowl Front Panel Replacement.



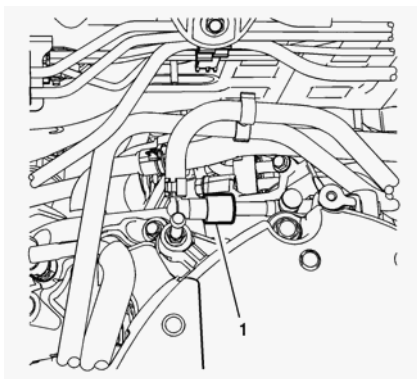
9. Connect the outlet heater hose (1). Refer to Heater Outlet Hose Replacement.
10. Connect the inlet heater hose (2). Refer to Heater Inlet Hose Replacement.



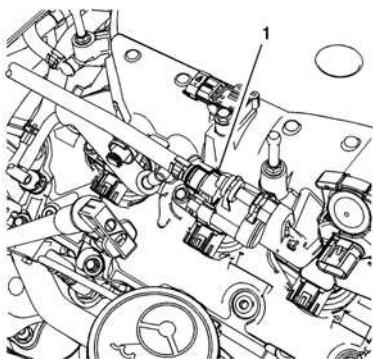
11. Install the radiator outlet hose (1). Refer to Radiator Outlet Hose Replacement.



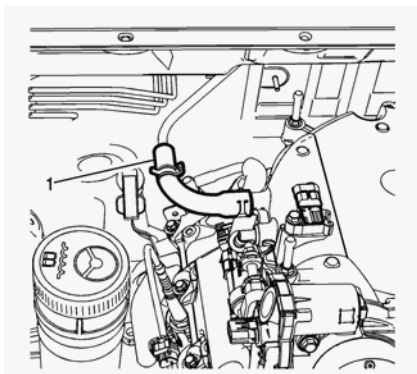
12. Install the radiator inlet hose (1). Refer to Radiator Inlet Hose Replacement.



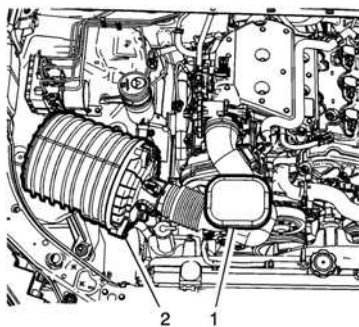
13. Connect the fuel feed hose (1).



14. Connect the EVAP hose (1).



15. Connect the vacuum hose (1).



16. Install the air cleaner outlet duct (1). Refer to Air Cleaner Outlet Resonator Replacement.

17. Install the air cleaner assembly (2). Refer to Air Cleaner Assembly Replacement.

18. Install the front exhaust pipes to the exhaust manifolds. Refer to Front Pipe Replacement.

19. Install the transmission. Refer to the appropriate procedure:

- If equipped with automatic transmission. Refer to Transmission Replacement.
- If equipped with manual transmission. Refer to Transmission Replacement.
- Refill the refrigerant system. Refer to Refrigerant Recovery and Recharging.
- Refill the coolant system. Refer to Cooling System Draining and Filling.
- Connect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection.

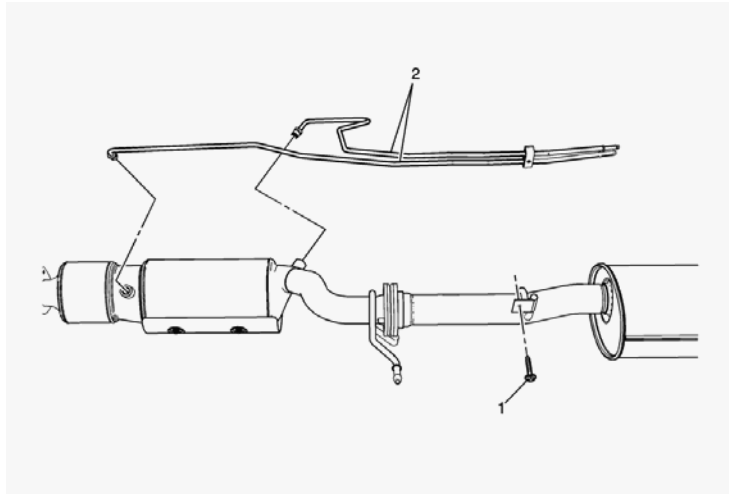
Engine Replacement

- Refill the engine oil. Refer to Engine Oil and Oil Filter Replacement.
- Install the intake manifold cover. Refer to Intake Manifold Cover Replacement.
- Test the vehicle using the following procedure:
 - Crank the engine several times. Listen for any unusual noises or evidence that parts are binding.
 - Start the engine and listen for unusual noises.
 - Check the vehicle oil pressure gauge or light and confirm that the engine has acceptable oil pressure.
 - Run the engine speed at about 1,000 RPM until the engine has reached normal operating temperature.
 - Listen for sticking lifter and other unusual noises.
 - Inspect for fuel, oil and/or coolant leaks while the engine is running.
 - Inspect for coolant, oil, gas or exhaust leaks.
 - Road test the vehicle for normal operation.

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

Caution: Refer to Fastener Caution.

1

Tighten

9 Y (80 lb in)

Exhaust Pressure Differential Sensor Pipe

Procedure

2

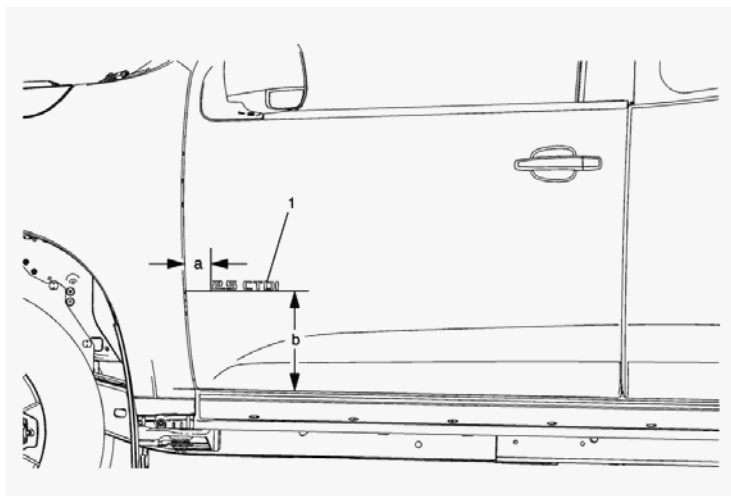
Disconnect the pressure hoses.

Tighten

45 Y (33 lb ft)

2013 Chevrolet Colorado

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



Front Side Door Engine Nameplate Replacement

Callout

Component Name

Front Side Door Engine Nameplate

Caution: Refer to Exterior Trim Emblem Removal Caution.

Procedure

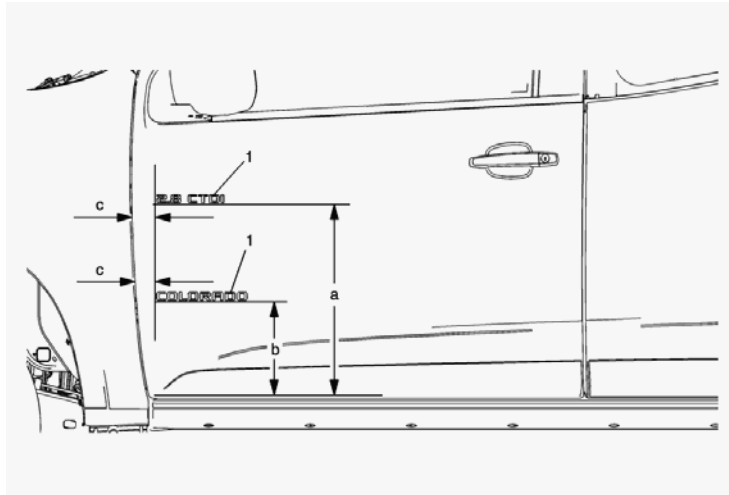
1. Measure and mark positions of nameplate before removing.
2. The part and surface should be 21°C (70°F) prior to installation. The vehicle should remain 21°C (70°F) for 1 hour after assembly to allow adhesive to develop sufficient bond strength.
3. Apply two layers of masking tape at each end of the front side door nameplate.
4. Using a heat gun or equivalent heat the nameplate to soften the adhesive and use a flat-bladed plastic tool to assist in the removal process. Clean all adhesive and wipe the surface dry with a clean lint-free towel prior to installation.
5. Remove the protective liners from the adhesive tape being careful not to touch tape with hands and do not allow the tape to come in contact with dirt or any foreign matter prior to installation.
6. Position the front side door nameplate.
7. Use the palm of the hand and a dry clean lint-free towel to ensure proper adhesion is made.
8. Inspect the front side door nameplate for proper adhesion and fit to the front door.

Measurement

1. A - equals the measurement from the front edge of the front door to the 2 in 2.5 CTDI as 70 mm (2.75 in)
2. Apply a line using masking tape to indicate that reference point.
3. B - equals the measurement from the bottom edge of the front door to the bottom edge of 2.5 CTDI as 250 mm (9.85 in).
4. Apply a line using masking tape to indicate that reference point.

2013 Chevrolet Colorado

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



Front Side Door Engine Nameplate Replacement

Callout

Component Name

Front Side Door Engine Nameplate

Caution: Refer to Exterior Trim Emblem Removal Caution.

Procedure

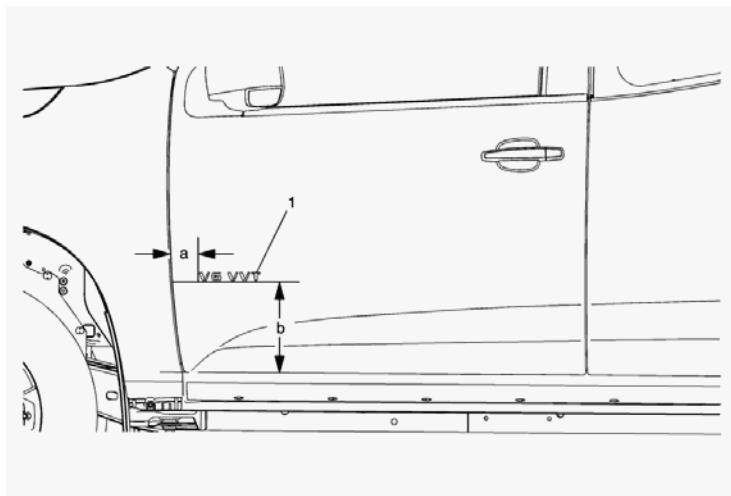
1. Measure and mark positions of nameplate before removing.
2. The part and surface should be 21°C (70°F) prior to installation. The vehicle should remain 21°C (70°F) for 1 hour after assembly to allow adhesive to develop sufficient bond strength.
3. Apply two layers of masking tape at each end of the front side door nameplate.
4. Using a heat gun or equivalent heat the nameplate to soften the adhesive and use a flat-bladed plastic tool to assist in the removal process. Clean all adhesive and wipe the surface dry with a clean lint-free towel prior to installation.
5. Remove the protective liners from the adhesive tape being careful not to touch tape with hands and do not allow the tape to come in contact with dirt or any foreign matter prior to installation.
6. Position the front side door nameplate.
7. Use the palm of the hand and a dry clean lint-free towel to ensure proper adhesion is made.
8. Inspect the front side door nameplate for proper adhesion and fit to the front door.

Measurement

1. A - equals the measurement from the bottom edge of the front door to the bottom edge of 2.8 CTDI as 491 mm (19.30 in).
2. Apply a line using masking tape to indicate that reference point.
3. B - equals the measurement from the bottom edge of the front door to the bottom edge of COLORADO as 250 mm (9.85 in).
4. Apply a line using masking tape to indicate that reference point.
5. C - equals the measurement from the front edge of the front door to the front edge of the nameplate as 70 mm (2.75 in).
6. Apply a line using masking tape to indicate that reference point.

2013 Chevrolet Colorado

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



Front Side Door Engine Nameplate Replacement

Callout

Front Side Door Engine Nameplate

Caution: Refer to Exterior Trim Emblem Removal Caution.

Procedure

1. Measure and mark positions of nameplate before removing.
2. The part and surface should be 21°C (70°F) prior to installation. The vehicle should remain 21°C (70°F) for 1 hour after assembly to allow adhesive to develop sufficient bond strength.
3. Apply two layers of masking tape at each end of the front side door nameplate.
4. Using a heat gun or equivalent, heat the nameplate to soften the adhesive and use a flat-bladed plastic tool to assist in the removal process. Clean all adhesive and wipe the surface dry with a clean lint-free towel prior to installation.
5. Remove the protective liners from the adhesive tape being careful not to touch tape with hands and do not allow the tape to come in contact with dirt or any foreign matter prior to installation.
6. Position the front side door nameplate.
7. Use the palm of the hand and a dry clean lint-free towel to ensure proper adhesion is made.
8. Inspect the front side door nameplate for proper adhesion and fit to the front door.

Measurement

1. A - equals the measurement from the front edge of the front door to the V in V6 VVT as 70 mm (2.75 in)
2. Apply a line using masking tape to indicate that reference point.
3. B - equals the measurement from the bottom edge of the front door to the bottom edge of V6 VVT as 250 mm (9.85 in).
4. Apply a line using masking tape to indicate that reference point.

2013 Chevrolet Colorado

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

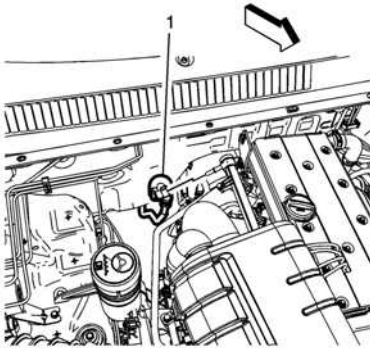
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

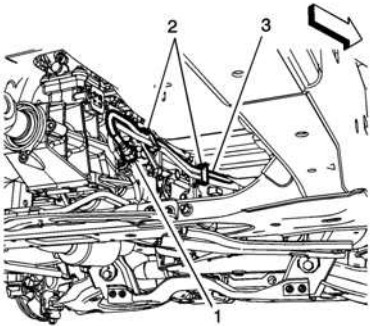
Warning: Refer to Gasoline/Gasoline Vapors Warning.

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.

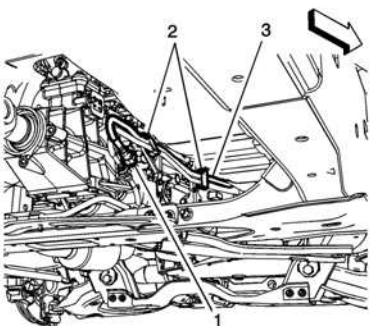


3. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



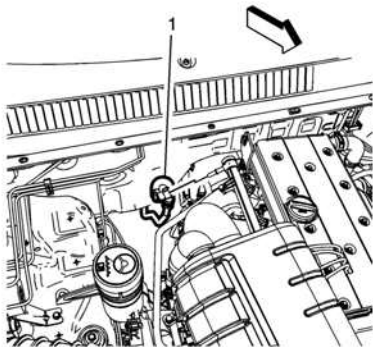
5. Disconnect the fuel feed pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Remove the fuel feed pipe (3) from the retainers (2).
7. Remove the fuel feed pipe (3) from the vehicle.

[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:

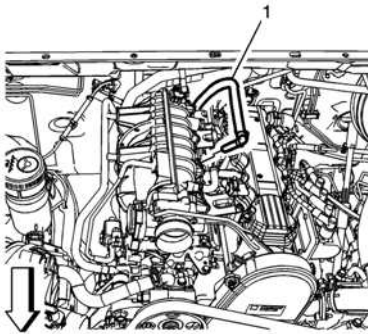
[Removal Procedure](#)

Warning: Refer to Fuel and Evaporative Emission Pipe Warning.

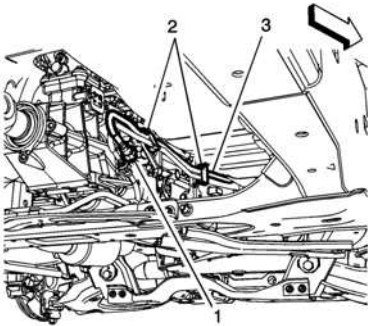
Warning: Refer to Gasoline/Gasoline Vapors Warning.

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.

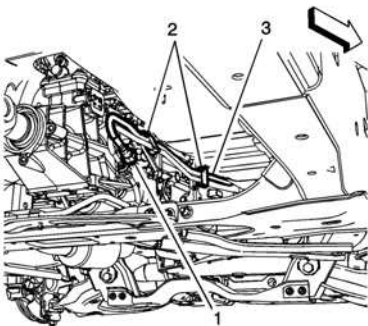


3. Disconnect the fuel feed pipe (1) from the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
4. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle.



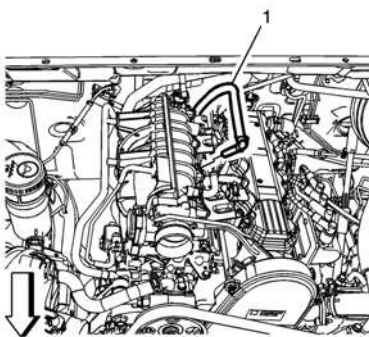
5. Disconnect the fuel feed pipe quick connect fitting (1) from the fuel feed and evaporative emission pipe. Refer to Plastic Collar Quick Connect Fitting Service.
6. Remove the fuel feed pipe (3) from the retainers (2).
7. Remove the fuel feed pipe (3) from the vehicle.

[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.

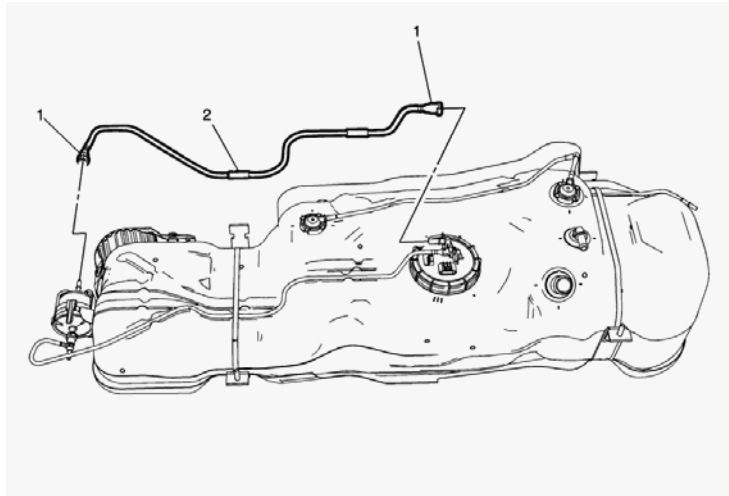


5. Connect the fuel feed pipe (1) to the fuel rail. Refer to Plastic Collar Quick Connect Fitting Service.
6. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.

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:

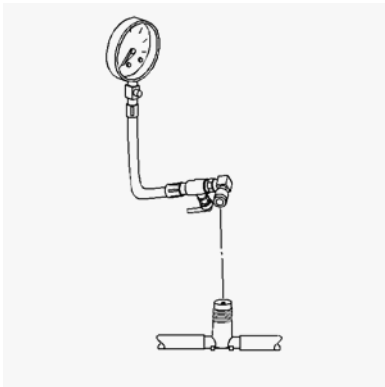
Special Tools

J 34730-1A Fuel Pressure Gauge

For regional tools refer to Special Tools

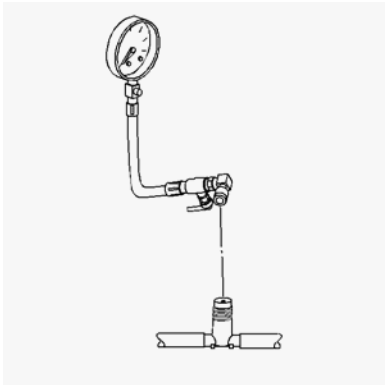
Installation Procedure

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:

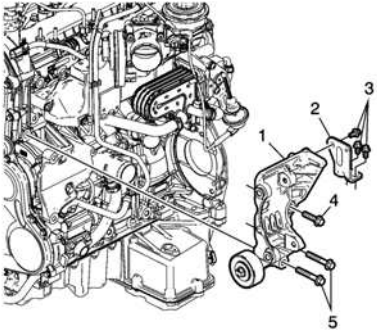
- The fuel pipe connections
 - The hose connections
 - The areas surrounding the connections
2. Disconnect the J 34730-1A fuel pressure gauge from the fuel rail service port.

Fuel Pressure Gauge Installation and Removal

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

2013 Chevrolet Colorado

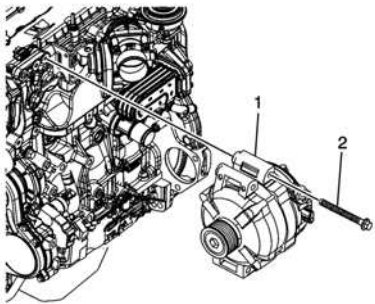
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



1. Install the brackets (1 and 2).

Caution: Refer to Fastener Caution.

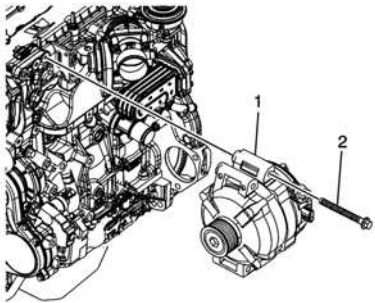
2. Install the bracket mounting bolts (3–5) and tighten to **45 Y (33 lb ft)**.



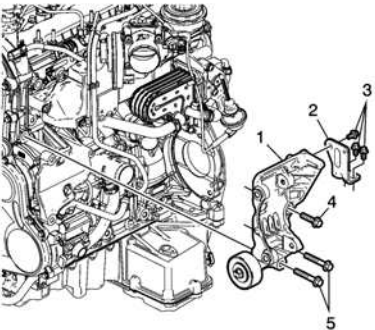
3. Install the generator (1).
4. Install the bolts (2) and tighten to **33 Y (24 lb ft)**.

2013 Chevrolet Colorado

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



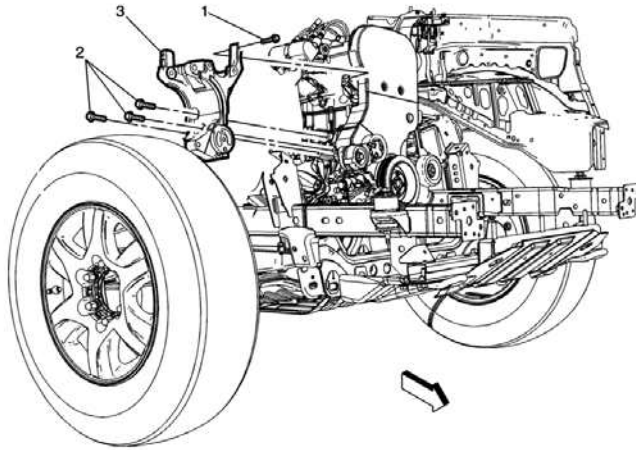
1. Remove the generator mounting bolts (2) and the generator (1).



2. Remove the bracket mounting bolts (3, 4, and 5) and remove the brackets (1 and 2).

2013 Chevrolet Colorado

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



Generator and Power Steering Pump Bracket Replacement

Callout	Component Name
Preliminary Procedures	

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
3. Reposition the power steering pump. Refer to Power Steering Pump Replacement.
4. Remove the generator. Refer to Generator Replacement.

Generator and Power Steering Pump Bracket Fastener

Caution: Refer to Fastener Caution.

1

Tighten

25 Y (18 lb ft)

Generator and Power Steering Pump Bracket Fasteners (Qty: 3)

2

Tighten

45 Y (33 lb ft)

3

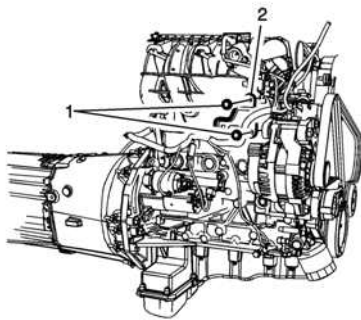
Generator and Power Steering Pump Bracket

2013 Chevrolet Colorado

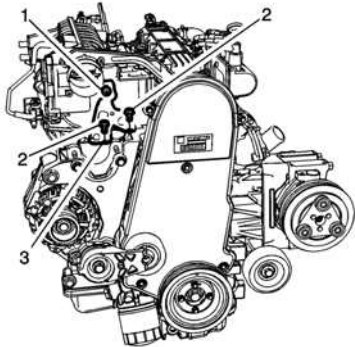
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

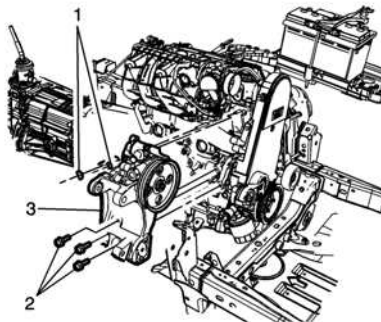
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
3. Remove the power steering fluid reservoir outlet hose. Refer to Power Steering Fluid Reservoir Outlet Hose Replacement.
4. Remove the power steering gear inlet pipe/hose. Refer to Power Steering Gear Inlet Pipe/Hose Replacement.
5. Remove the generator. Refer to Generator Replacement.



6. Remove the intake manifold bracket fasteners (1) and remove the intake manifold bracket (2).



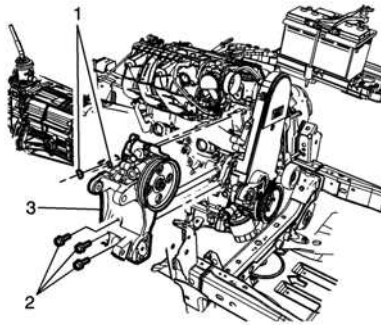
7. Remove the throttle body fastener (1) and remove the intake manifold bracket fasteners (2).
8. Remove the intake manifold bracket (3).



9. Remove the generator and power steering bracket fasteners (1) and the lower bracket fasteners (2).
10. Remove the generator and power steering pump bracket (3) from the engine compartment.
11. Remove the power steering pump. Refer to Power Steering Pump Replacement.

[Installation Procedure](#)

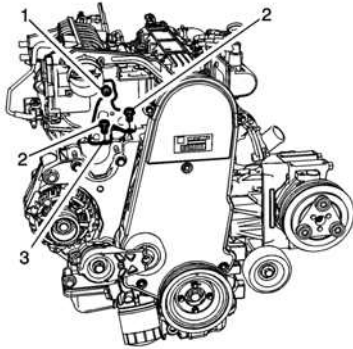
1. Install the power steering pump. Refer to Power Steering Pump Replacement.



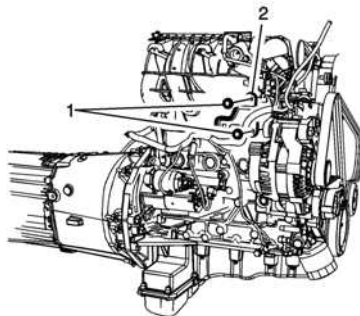
2. Install the generator and power steering pump bracket (3).

Caution: Refer to Fastener Caution.

3. Tighten the upper fasteners (1) to **25 Y (18 lb ft)**.
4. Tighten the lower fasteners (2) to **45 Y (33 lb ft)**.



5. Install the intake manifold bracket (3) and tighten the throttle body fastener (1) to **10 Y (89 lb in)**.
6. Tighten the fasteners (2) to **10 Y (89 lb in)**.

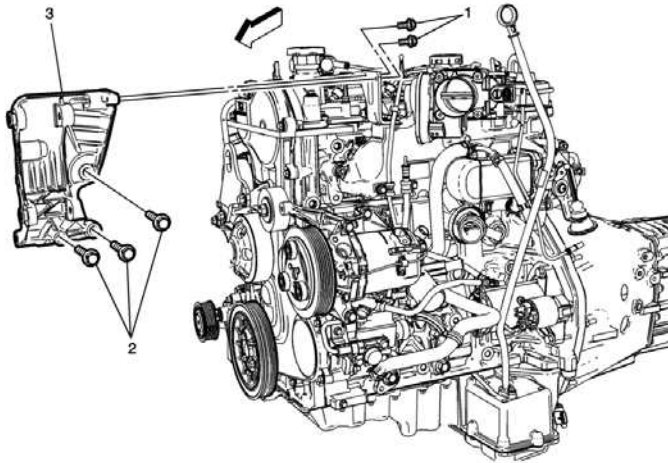


7. Install the intake manifold bracket (2) and tighten the fasteners (1) to **10 Y (89 lb in)**.
8. Install the generator. Refer to Generator Replacement.
9. Install the power steering fluid reservoir outlet hose. Refer to Power Steering Fluid Reservoir Outlet Hose Replacement.
10. Install the power steering gear inlet pipe/hose. Refer to Power Steering Gear Inlet Pipe/Hose Replacement.
11. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
12. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Generator Bracket Replacement

Callout

Component Name

Preliminary Procedure

Remove the generator. Refer to Generator Replacement.

Generator Adjust Bracket Brace Fastener (Qty: 2)

1

Caution: Refer to Fastener Caution.

Tighten

20 Y (15 lb ft)

Generator Bracket Fastener (Qty: 3)

2

Tighten

45 Y (33 lb ft)

3

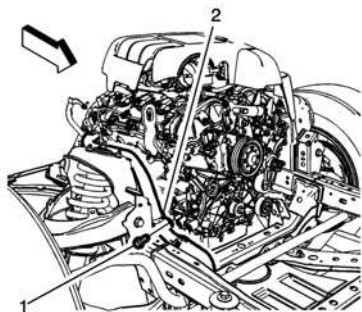
Generator Bracket

2013 Chevrolet Colorado

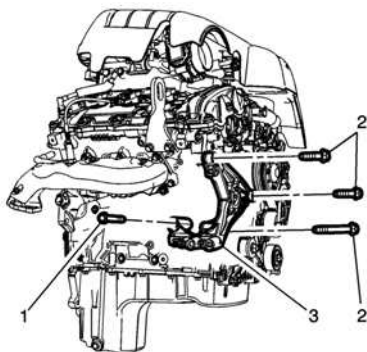
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the generator. Refer to Generator Replacement.

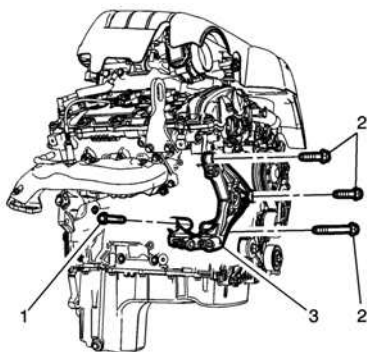


3. Remove the radiator outlet pipe retainer fastener (1) and set aside the radiator outlet pipe (2).



4. Remove the side engine generator bracket mounting fastener (1) and the front generator bracket fasteners (2).
5. Remove the generator bracket (3).

Installation Procedure



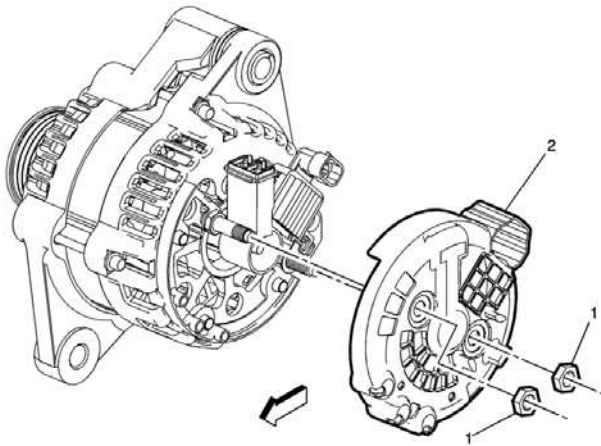
1. Install the generator bracket (3) to the engine and loosely tighten the fastener (1).

Caution: Refer to Fastener Caution.

2. Install the front generator bracket fasteners (2) and tighten to **58 Y (43 lb ft)**.
3. Tighten the side engine block fastener (1) to **22 Y (16 lb ft)**.
4. Install the generator. Refer to Generator 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:



Generator Cover Replacement

Callout	Component Name
Preliminary Procedure	
1. Remove the battery positive cable from the generator. Refer to Generator Replacement.	
2. Disconnect the electrical connector from the generator.	
Generator Cover Fasteners (Qty: 2)	
Caution: Refer to Fastener Caution.	
1	Tighten 22 Y (16 lb ft)
2	Generator Cover

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

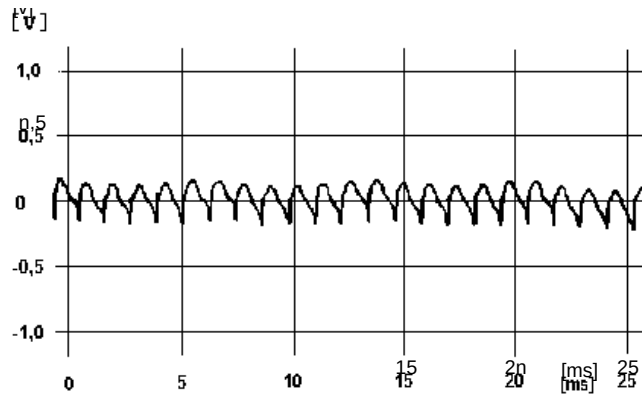
Fuel Delivery: | Fuel:

[Oscilloscope – Reference Images](#)

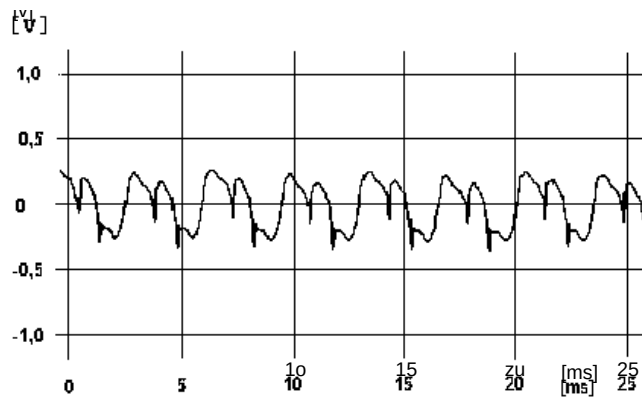
Test generator with oscilloscope (connect as for voltage measurement to B+ and generator housing).

[Generator Images](#)

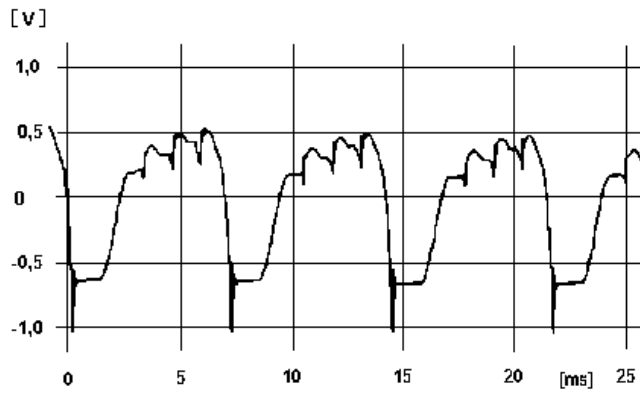
[Generator without Error](#)



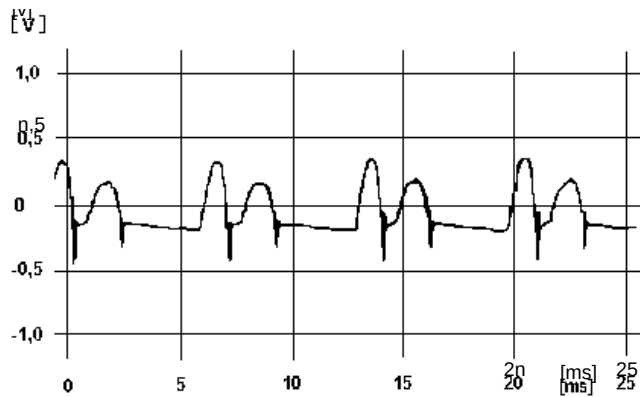
[Generator with Phase Error](#)



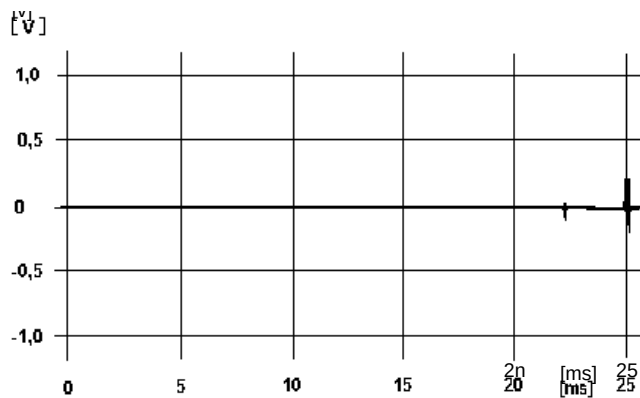
[Generator with Diode Error \(Plus or Minus Diode Break\)](#)



[Generator with Diode Error, Plus or Minus Diode \(Short Circuit– Generator Excited\)](#)



[Generator with Diode Error, Plus or Minus Diode \(Short Circuit– Generator Not Excited\)](#)



Instruction for Static Current Measurement

Impermissible high battery discharge may also result from drawing of an increased static current.

Drawing of the static current is dependent on:

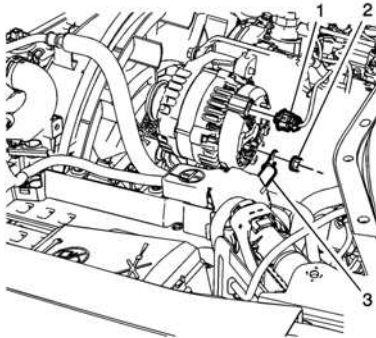
- Vehicle equipment
- Control module tracking time

2013 Chevrolet Colorado

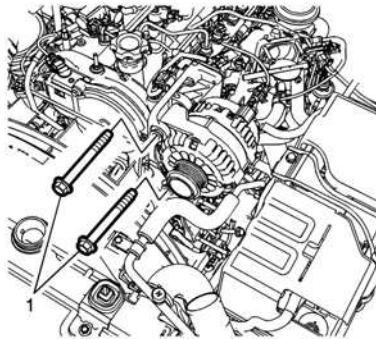
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

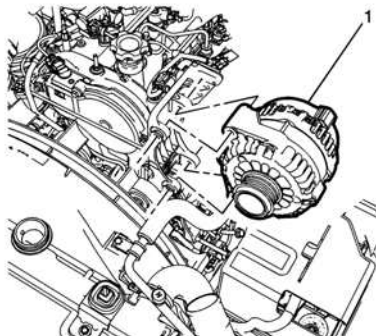
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the charge air cooler outlet hose. Refer to Charge Air Cooler Outlet Air Hose Replacement.
3. Remove the drive belt. Refer to Drive Belt Replacement.



4. Disconnect the engine harness connector (1).
5. Remove the battery positive cable fastener (2) and remove the battery positive cable (3), from the back of the generator.

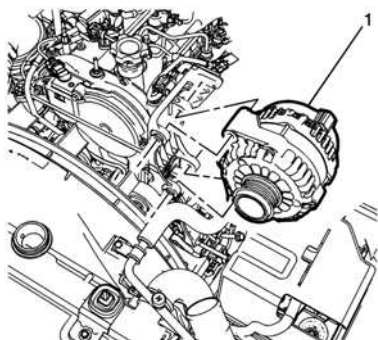


6. Remove the generator mounting fasteners (1).

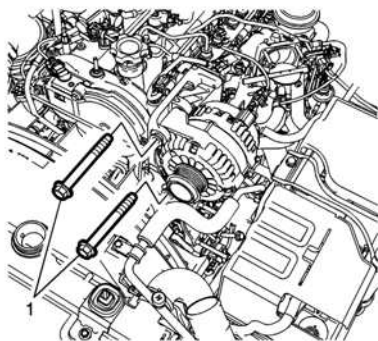


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

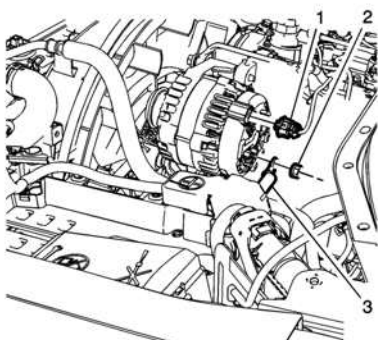


1. Install the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

2. Install the generator mounting fasteners (1) and tighten to **45 Y (89 lb in)**.



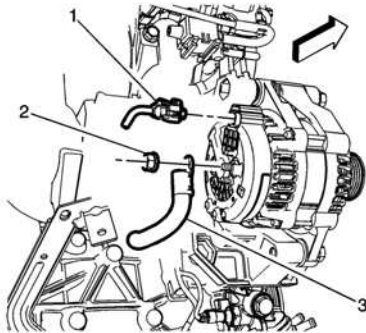
3. Connect the engine harness connector (1).
4. Install the battery positive cable (3), to the back of the generator and tighten the fastener (2) to **14 Y (10 lb ft)**.
5. Install the drive belt. Refer to Drive Belt Replacement.
6. Install the charge air cooler outlet hose. Refer to Charge Air Cooler Outlet Air Hose Replacement.
7. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

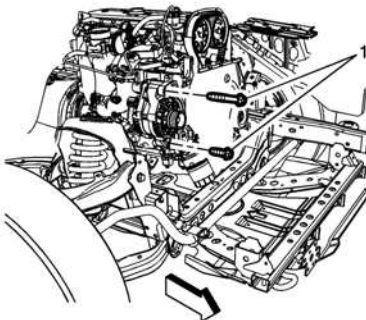
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

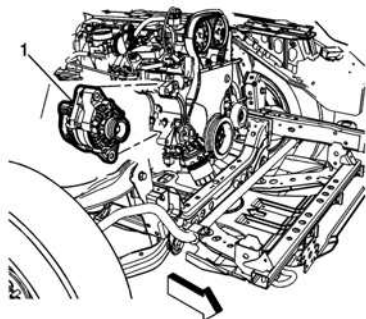
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
3. Reposition the power steering pump. Refer to Power Steering Pump Replacement.



4. Disconnect the engine harness connector (1).
5. Remove the battery positive cable fastener (2) and remove the battery positive cable (3), from the back of the generator.

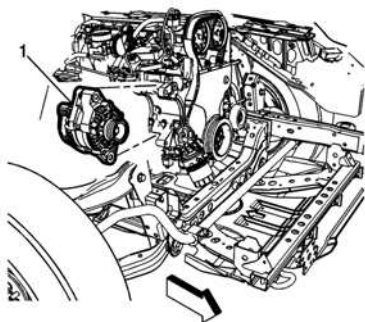


6. Remove the generator mounting fasteners (1).

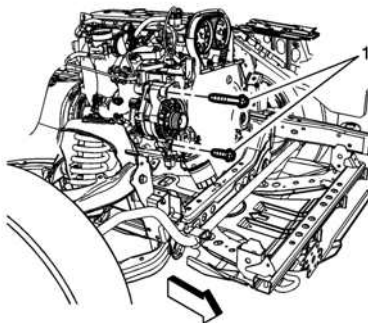


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

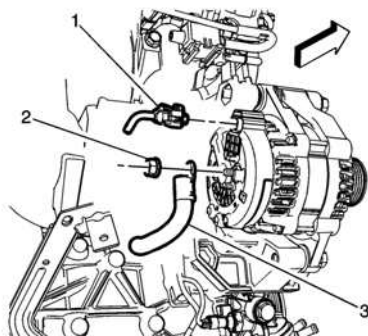


1. Position the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

2. Install the generator mounting fasteners (1) and tighten to **50 Y (37 lb ft)**.



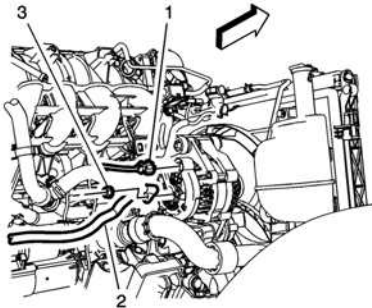
3. Connect the engine harness connector (1).
4. Install the battery positive cable (3), to the back of the generator and tighten the fastener (2) to **14 Y (10 lb ft)**.
5. Install the power steering pump. Refer to Power Steering Pump Replacement.
6. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
7. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

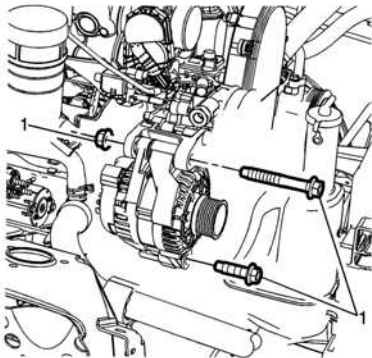
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

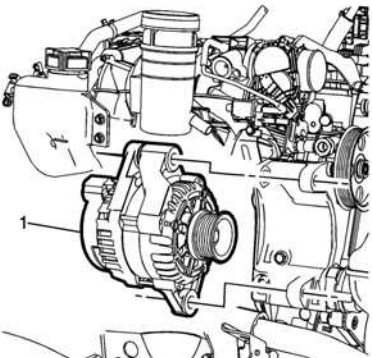
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the drive belt. Refer to Drive Belt Replacement.
3. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.



4. Disconnect the engine harness connector (1).
5. Remove the battery positive cable fastener (3) and remove the battery positive cable (2), from the back of the generator.

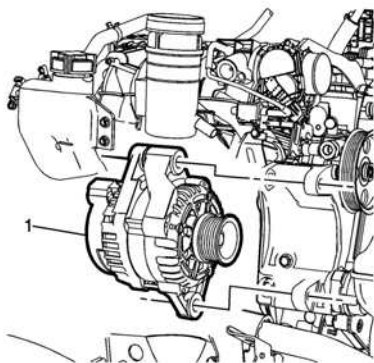


6. Remove the generator mounting fasteners (1).

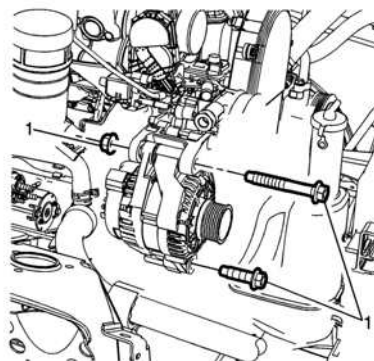


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

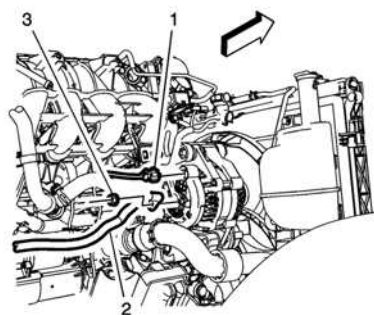


1. Position the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

2. Install the generator mounting fasteners (1) and tighten to **50 Y (37 lb ft)**.



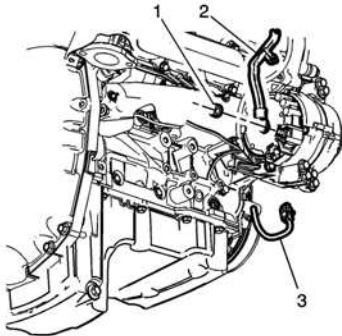
3. Connect the engine harness connector (1).
4. Install the battery positive cable (2), to the back of the generator and tighten the fastener (3) to **14 Y (10 lb ft)**.
5. Install the drive belt. Refer to Drive Belt Replacement.
6. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
7. Connect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.

2013 Chevrolet Colorado

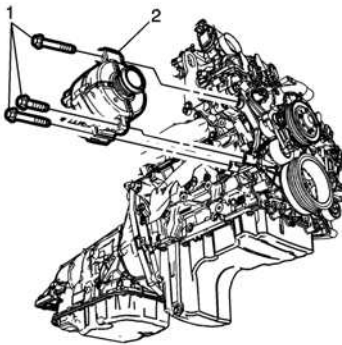
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner assembly. Refer to Air Cleaner Assembly Replacement.
3. Remove the water pump and generator belt. Refer to Water Pump and Generator Belt Replacement.

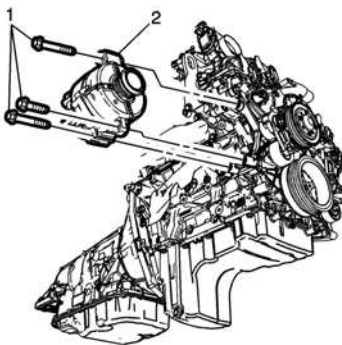


4. Disconnect the engine harness connector (3).
5. Remove the battery positive cable fastener (1) and remove the battery positive cable (2), from the back of the generator.



6. Remove the generator mounting fasteners (1) and remove the generator (2).

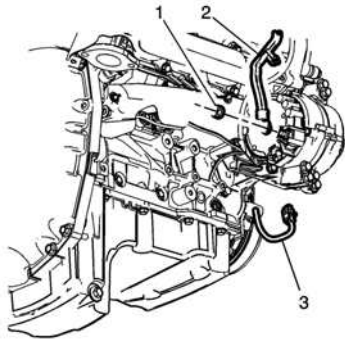
[Installation Procedure](#)



Caution: Refer to Fastener Caution.

1. Install the generator (2) and tighten the fasteners (1) to **58 Y (43 lb ft)**.

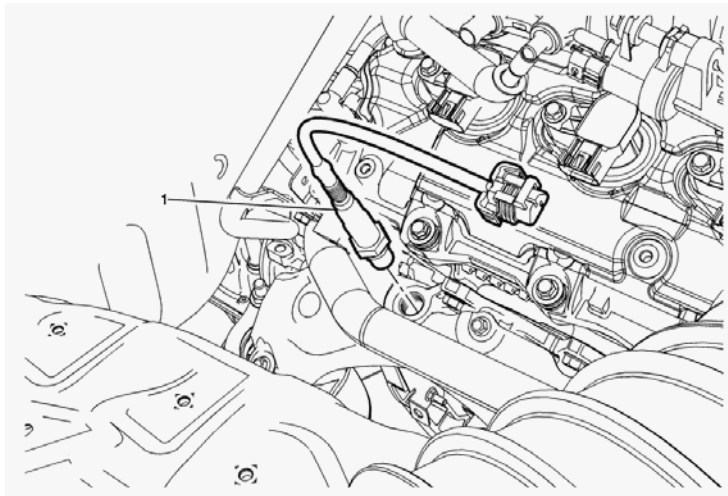
Generator Replacement (LY7)



2. Connect the engine harness connector (3).
3. Install the battery positive cable (2), to the back of the generator and tighten the fastener (1) to **20 Y (15 lb ft)**.
4. Install the water pump and generator belt. Refer to Water Pump and Generator Belt Replacement.
5. Install the air cleaner assembly. Refer to Air Cleaner Assembly 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:



Heated Oxygen Sensor Replacement - Bank 1 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)

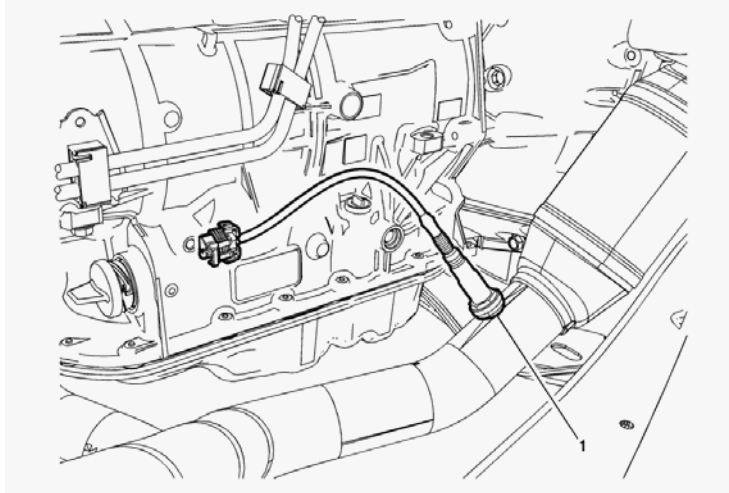
Special Tools

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 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)

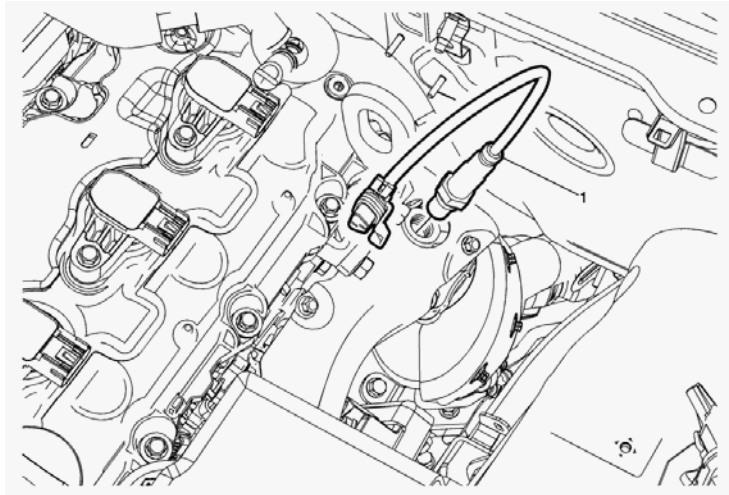
Special Tools

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

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

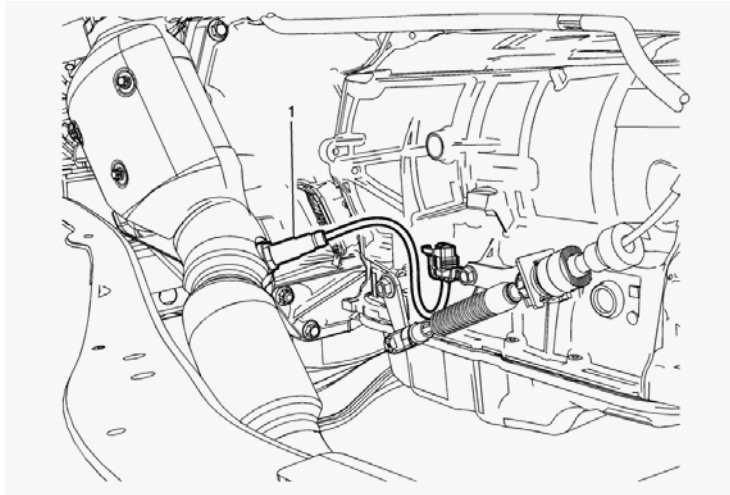
EN-39194-C Oxygen Sensor Wrench

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 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)

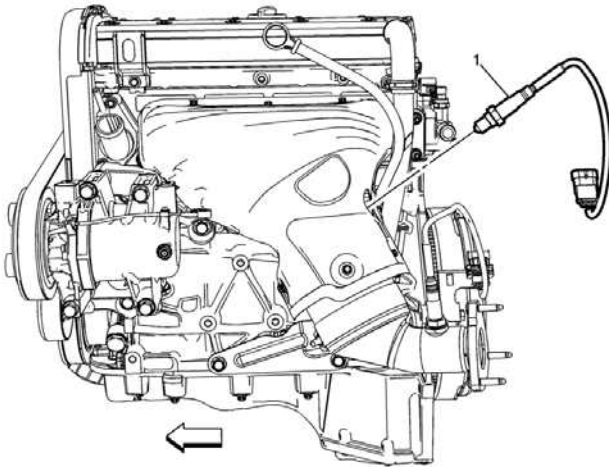
Special Tools

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-seize compound applied before reinstallation.

Tighten

42 Y(31 lb ft)

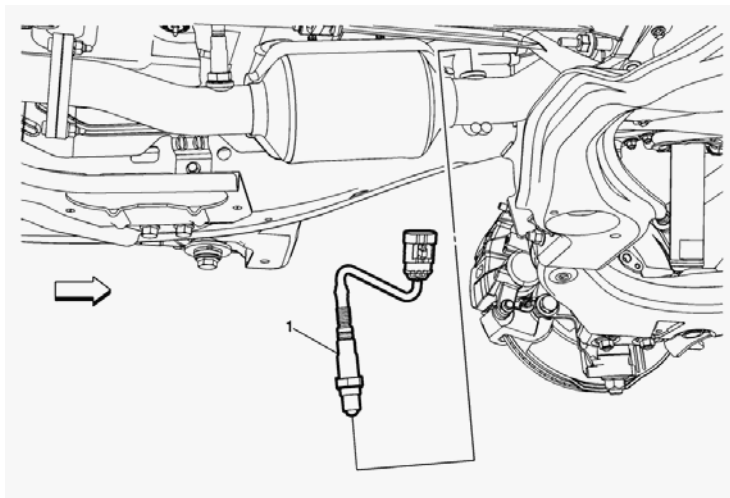
Special Tools

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 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. If reinstalling the old sensor, coat the threads with anti-seize compound. Refer to Adhesives, Fluids, Lubricants, and Sealers.

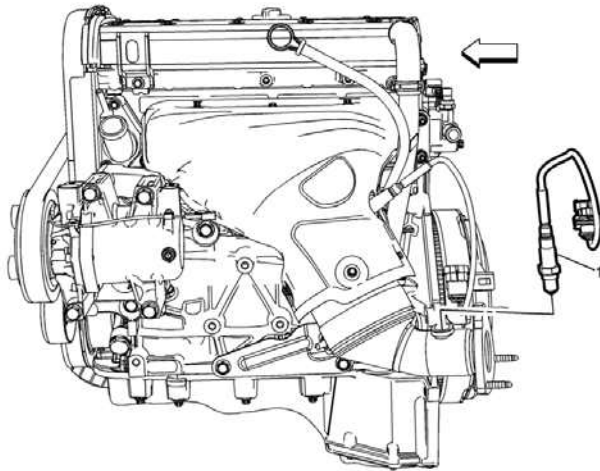
Note: A special anti-seize compound is used in the HO2S threads. The compound consists of liquid graphic and glass beads. The graphic tends to burn away, but the glass beads remain, making the sensor easier to remove. New, or service replacement sensors already have the compound applied to the threads. 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)

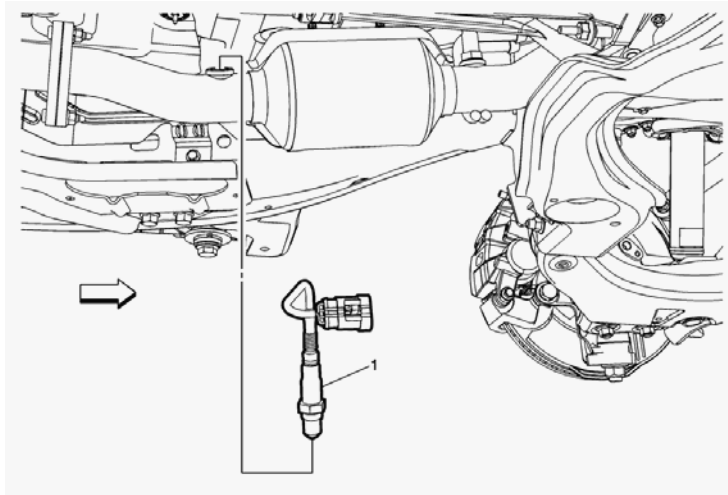
Special Tools

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. 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.

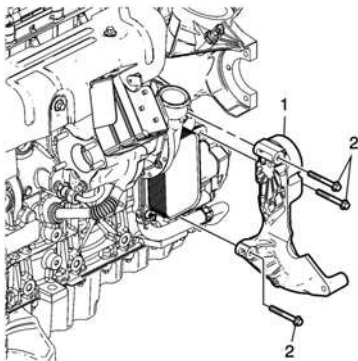
Tighten

42 Y(31 lb ft)

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

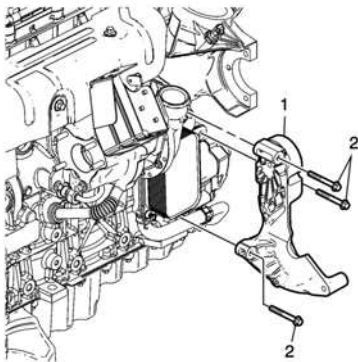


1. Install the heater bracket (1).
2. Install the heater bracket bolts (2) and tighten to **25 Y (18 lb ft)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

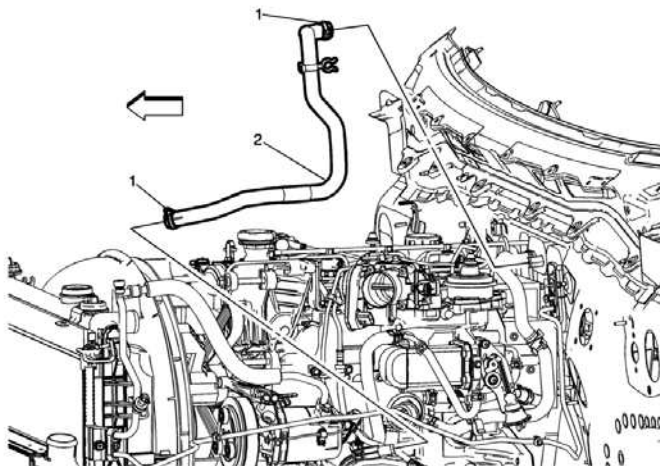
Fuel Delivery: | Fuel:



1. Remove the heater bracket bolts (2).
2. Remove the heater bracket (1).

2013 Chevrolet Colorado

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



Heater Inlet Hose Replacement

Callout

Component Name

Preliminary Procedures

1. Drain the cooling system. Refer to Cooling System Draining and Filling.
2. Remove the battery tray. Refer to Battery Tray Replacement.
3. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.

Heater Inlet Hose Clamp (Qty: 2)

Procedure

Reposition the heater inlet hose clamp using the *BO-38185* pliers.

1

Special Tools

BO-38185 Hose Clamp Pliers

For equivalent regional tools, refer to Special Tools.

Heater Inlet Hose

2

Procedure

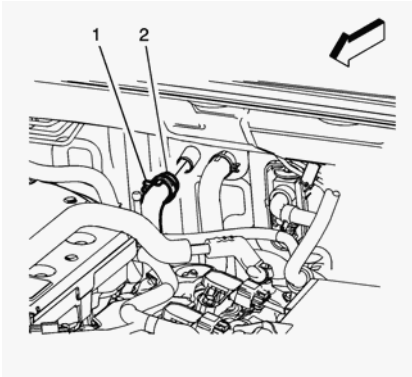
Remove the quick disconnect retainer from the quick disconnect clamp.

2013 Chevrolet Colorado

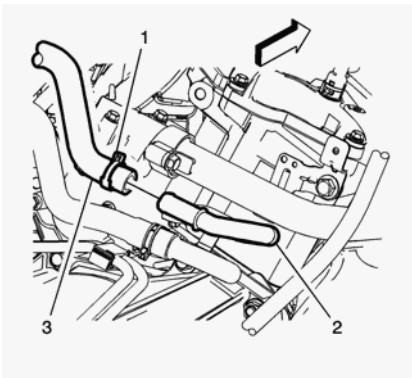
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

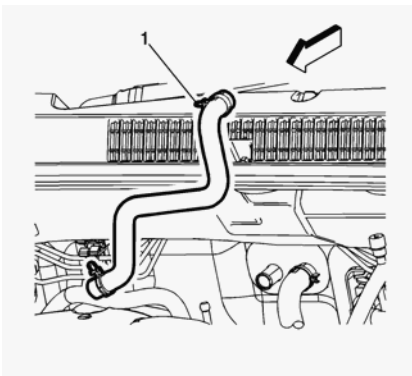
1. Drain the cooling system . Refer to Cooling System Draining and Filling.



2. Loosen the clamp (1), enough to disconnect the heater inlet hose (2) from the heater core.



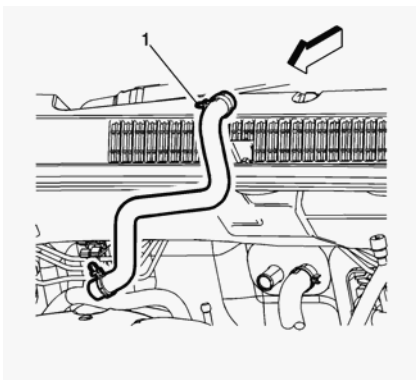
3. Loosen the clamp (2), enough to disconnect the heater inlet hose (3) from the engine outlet pipe (1).



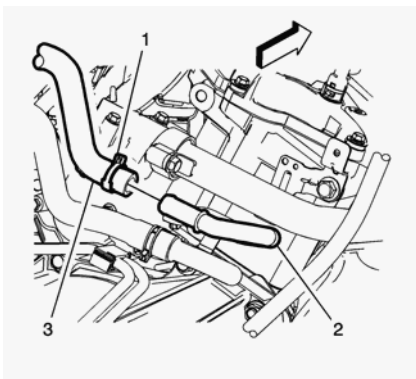
4. Remove the heater inlet hose (1) from the vehicle.

[Installation Procedure](#)

Heater Inlet Hose Replacement (With LY7 Engine)



1. Position the heater inlet hose (1) to the vehicle.



2. Connect the heater inlet hose (3) to the engine outlet pipe (1). Assure the clamp (2) is positioned correctly.

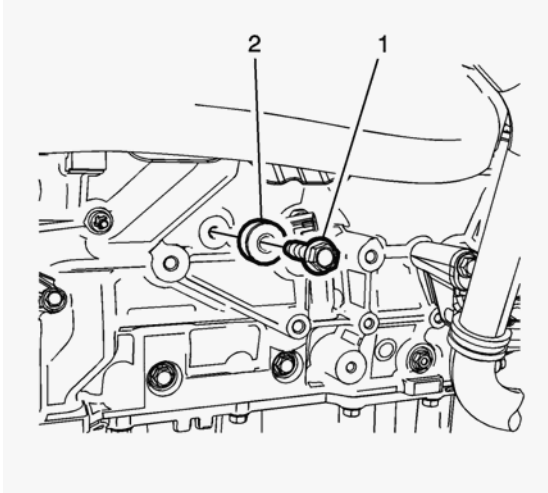


3. Connect the heater inlet hose (2) to the heater core. Assure the clamp (1) is positioned correctly.
4. Refill the cooling system . Refer to Cooling System Draining and Filling.

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

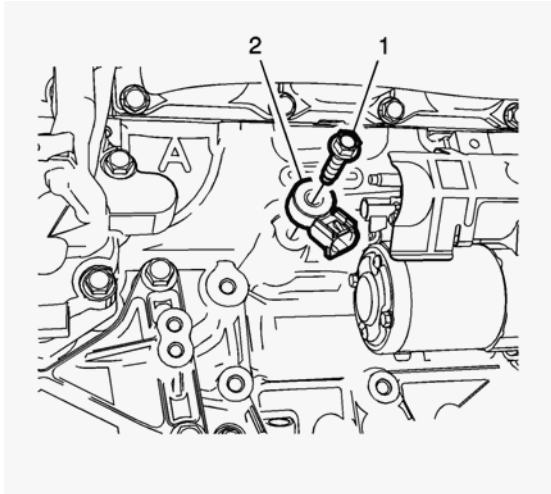
2

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

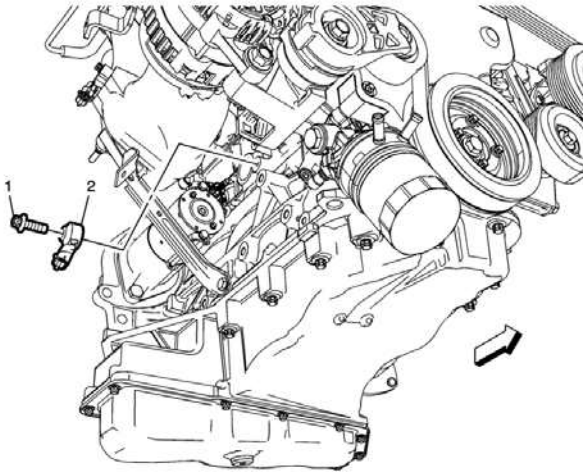
Procedure

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

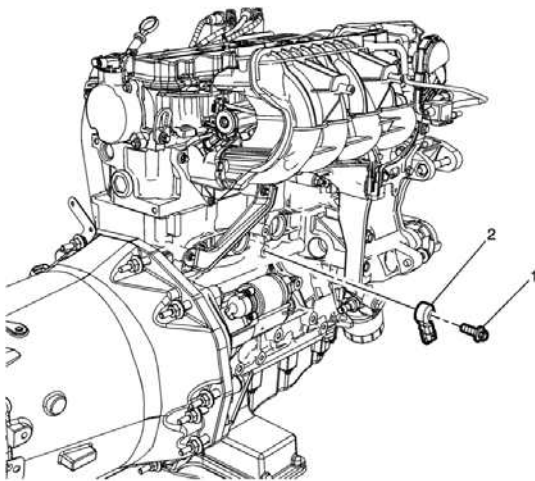
2

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:

Electrical Power Management

The electrical power management is used to monitor and control the charging system and alert the driver of possible problems within the charging system. The electrical power management system makes the most efficient use of the generator output, improves the battery state-of-charge, extends battery life, and manages system electrical loads.

The load shed operation is a means of reducing electrical loads during a low voltage or low battery state-of-charge condition.

The idle boost operation is a means of improving generator performance during a low voltage or low battery state-of-charge condition.

Each electrical power management function, either idle boost or load shed, is discrete. No two functions are active at the same time. Idle boost is activated in incremental steps, idle boost 1 must be active before idle boost 2 can be active. The criteria used by the body control module (BCM) to regulate electrical power management are outlined below:

Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
Idle Boost 1 Start	Less Than -15°C (5°F)	Less Than 13 V	—	First level Idle boost requested
Idle Boost 1 Start	—	—	Battery has a net loss greater than 0.6 AH	First level Idle boost requested
Idle Boost 1 Start	—	Less Than 10.9 V	—	First level Idle boost requested
Idle Boost 1 End	Greater Than -15°C (5°F)	Greater Than -12 V	Battery has a net loss less than 0.2 AH	First level Idle boost request cancelled
Load Shed 1 Start	—	—	Battery has a net loss of 4 AH	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 20% of their cycle
Load Shed 1 Start	—	Less Than 10.9 V	—	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 20% of their cycle
Load Shed 1 End	—	Greater Than 12 V	Battery has a net loss of less than 2 AH	Clear Load Shed 1
Idle Boost 2 Start	—	—	Battery has a net loss greater than 1.6 AH	Second level Idle boost requested
Idle Boost 2 Start	—	Less Than 10.9 V	—	Second level Idle boost requested
Idle Boost 2 End	—	Greater Than 12 V	Battery has a net loss less than 0.8 AH	Second level Idle boost request cancelled
Idle Boost 3 Start	—	—	Battery has a net loss of 10.0 AH	Third level Idle boost requested
Idle Boost 3 Start	—	Less Than 10.9 V	—	Third level Idle boost requested
Idle Boost 3 End	—	Greater Than 12 V	Battery has a net loss of less than 6.0 AH	Third level Idle boost request cancelled
Load Shed 2 Start	—	Less Than 10.9 V	Battery has a net loss greater than 12 AH	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 2 Start	—	Less Than 10.9 V	—	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 50% of their cycle. The BATTERY SAVER ACTIVE message will

Load Shed System Description and Operation

Function	Battery Temperature Calculation	Battery Voltage Calculation	Amp-Hour Calculation	Action Taken
				be displayed on the DIC
Load Shed 2 End	—	Greater Than 12.6 V	Battery has a net loss of less than 10.5 AH	Clear Load Shed 2
Load Shed 3 Start	—	Less Than 11.9 V	Battery has a net loss greater than 20 AH	Rear Defrost, Heated Mirrors, Heated Seats cycled OFF for 100% of their cycle. The BATTERY SAVER ACTIVE message will be displayed on the DIC
Load Shed 3 End	—	Greater Than 12.6 V	Battery has a net loss of less than 15 AH	Clear Load Shed 3

2013 Chevrolet Colorado

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

Fuel Delivery: | **Fuel:**

A structural diecast aluminum oil pan incorporates an oil suction tube and a windage tray. The oil suction tube is bolted into the oil pan and seals to the bottom of the block with O-ring gasket. The windage tray is bolted to the upper portion of the oil pan and reduces friction losses at high speed.

A crankshaft driven gerotor oil pump with internal pressure-relief valve is mounted to the front of the engine block and pulls oil from the oil suction tube through the lower passage in the engine block. The oil pump then directs the flow of pressurized oil back through the upper passage in the block to the left side of the engine block where the oil filter adapter is mounted.

An oil filter adapter is mounted with a gasket to the left side of the engine block.

RWD Applications: The oil filter adapter incorporates a top-access, cartridge style oil filter. The filter is accessed through a screw on cap with an O-ring gasket. The oil filter adapter cap has a built-in oil bypass valve. The oil filter adapter housing incorporates a drain back control valve and a threaded oil pressure sending unit. Oil flows through the lower passage in the oil filter adapter up to and through the oil filter cartridge. Filtered oil travels back through the upper passage of the oil filter adapter and back into the engine block.

FWD Applications: An oil filter adapter is mounted with a gasket to the left side of the engine block. The oil filter adapter incorporates a bottom-access, spin-on oil filter. The oil filter adapter housing incorporates a threaded oil pressure sending unit. Oil flows through the lower passage in the oil filter adapter to and through the oil filter. Filtered oil travels back through the upper passage of the oil filter adapter and back into the engine block.

Oil is directed up and across the engine block front through several drilled passages. These front passages feed oil to each cylinder head, oil to the passage for the main bearings and piston oil jets, oil to the right and left secondary idler sprockets, and oil to the primary timing drive chain tensioner.

Each cylinder head passage directs oil into the cylinder head where it is directed to oiling circuits for the stationary hydraulic lifter assemblies (SHLAs) and the camshaft bearing journals. Oil is also directed through 2 passages each with a spring-loaded check-ball valve to the 2 chambers where the camshaft position actuator oil control solenoid valves are mounted. Each chamber contains a camshaft position actuator oil control solenoid valve with built-in oil filter screen. One camshaft position actuator oil control solenoid valve is used to control the exhaust camshaft position actuator and 1 camshaft position actuator oil control solenoid valve is used to control the intake camshaft position actuator. The engine control module (ECM) electrically controls each camshaft position actuator oil control solenoid valve. When energized by the ECM the camshaft position actuator oil control solenoid valve directs oil to pass up through the cylinder head front camshaft bearing cap. Oil passes through the camshaft bearing cap passage into oil holes drilled into the side of the front camshaft journal and onto the front of the camshaft mounting surface. Oil passes through to matching passages in the camshaft position actuator. Oil is directed by the camshaft position actuator oil control solenoid valve to the appropriate passage in the system to pressurize oil on the vanes on the inside of the camshaft position actuator. Oil acting on the vanes rotates the camshaft mounted to the inner camshaft position actuator rotor relative to the sprocket mounted to the outer camshaft position actuator housing. An internal lock pin locks the inner rotor to the outer camshaft position actuator housing at idle and maintains the camshaft position actuator in the home or default position during start-up conditions. Oil pressure directed by the camshaft position actuator oil control solenoid valve unlocks the pin and allows the camshaft position actuator to function. An additional passage in the cylinder head also directs oil to the secondary timing drive chain tensioner mounted to each cylinder head.

The oil passage that supplies oil to the main bearings also supplies oil to pressure-actuated piston-cooling oil jets. Each oil jet is mounted between opposing cylinder bores and directs oil to the 2 bores to provide extra cooling and control piston temperatures.

Oil is directed from the front passages to the front of the block where the right and left secondary idler sprockets and the primary timing drive chain tensioner are mounted. Each camshaft timing drive chain tensioner relies on a gasket in order to maintain an oil reserve after the engine is turned OFF. All camshaft timing drive chain tensioners incorporate a small oil jet to supply an oil spray onto the camshaft timing drive chain components.

Oil returns to the oil pan sump either through the camshaft timing drive chain area or through the cast oil drain back passages on the outboard walls of the cylinder heads and engine block.

2013 Chevrolet Colorado

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

Fuel Delivery: | **Fuel:**

The lubrication system consists of an oil pan, oil pump screen, oil pump, oil filter and oil pressure regulator. This pressure-fed lubrication system supplies oil to the moving parts of the engine.

The oil pump picks up oil from the oil pan and feeds it under pressure to the various parts of the engine. An oil strainer is mounted before the inlet to the oil pump to remove impurities which could clog or damage the oil pump or other engine components. The oil pump itself is a duocentric gear type pump with internal drive and driven gears. When the drive rotates, the driven gear rotates in the same direction, but on a different center point. This causes the space between the gears to constantly open and narrow, pulling oil in from the oil pan when the space opens and pumping the oil out to the engine as it narrows.

The oil filter is a full flow type with a relief valve built into the paper filter element. Contaminants which can get into the oil during operation could cause accelerated engine wear or seizing if allowed into the engine. The oil filter, situated at the beginning of the oil passage circuit, removes these contaminants as the oil passes through it. The relief valve spring will open under the pressure of the oil and allow oil to bypass the filter and flow directly to the engine.

At high engine speeds, the oil pump supplies a much higher amount of oil than required for lubrication of the engine. The oil pressure regulator prevents too much oil from entering the engine lubrication passages. During normal oil supply, a coil spring and valve keeps the bypass closed, directing all oil pumped to the engine. When the amount of oil being pumped increases, the pressure becomes high enough to overcome the force of the spring, opening the valve and allowing excess oil to flow through the valve and drain back to the oil pan.

Oil is pumped from the oil pan by the oil pump. After it passes through the oil filter, it is fed through two paths to lubricate the cylinder block and cylinder head.

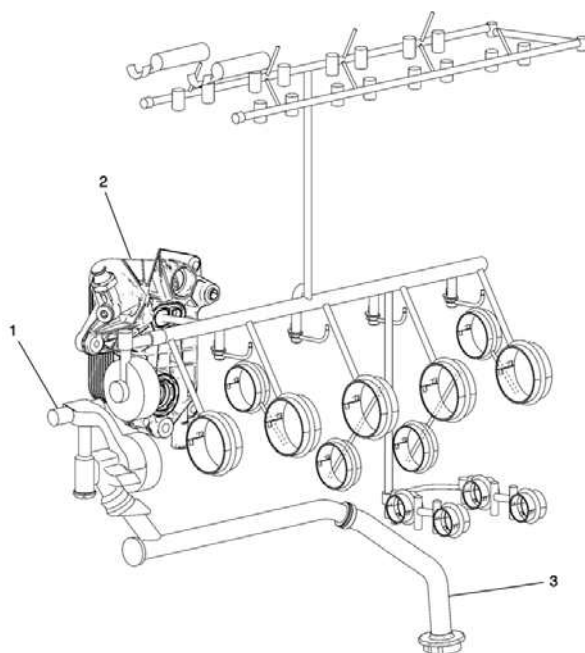
In one path, the oil is pumped through oil passages in the crankshaft to the connecting rods, then to the pistons and cylinders. It then drains back to the oil pan.

In the second path, the oil is pumped through passages to the camshaft. The oil passes through internal passageways in the camshafts to lubricate the valve assemblies before draining back to the oil pan.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



The gerotor style oil pump (1) is located in the front cover and is gear driven by the crankshaft. The oil pump draws oil through the suction pipe (3) and provides pressurized oil to the engine oil filter/cooler assembly (2) through a passage in the block. A pressure relief valve is mounted to the front cover. An oil filter bypass valve is located under the oil filter cap and opens at 1.5 bar. An anti-drainback valve is located at the oil inlet from the block. Cooled and filtered oil exits the oil filter/cooler assembly (2) and enters the main oil galley in the block. Branches from the main oil galley feed the following components:

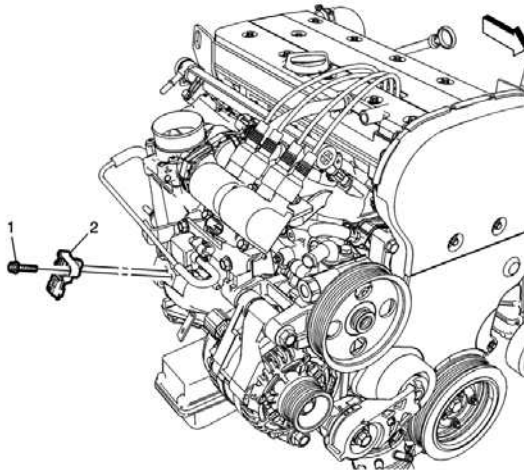
- Cylinder head
 - Cam bearings
- Piston oil jets, opening pressure 1.5 bar
- Main bearings
 - Crankshaft
 - Connecting rod bearings
- Vacuum pump
- Balance shaft (2.8L)
- Turbocharger

Oil drainback passages on both sides of the cylinder head and block return oil to the pan.

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.

Manifold Absolute Pressure Sensor

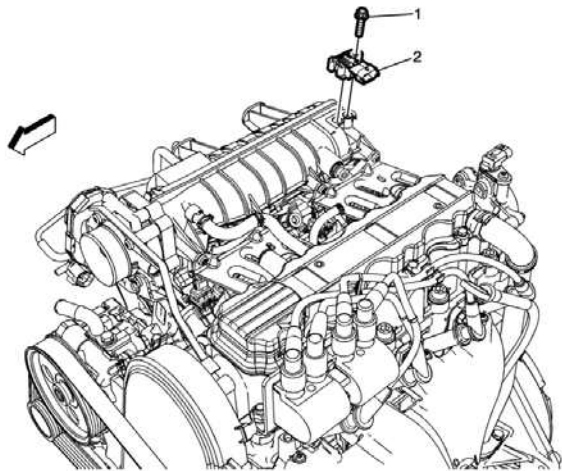
2

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.

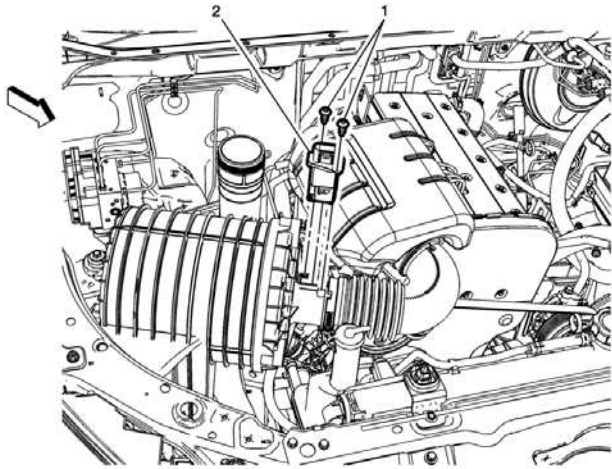
- 2 Manifold Absolute Pressure Sensor
Procedure

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

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)

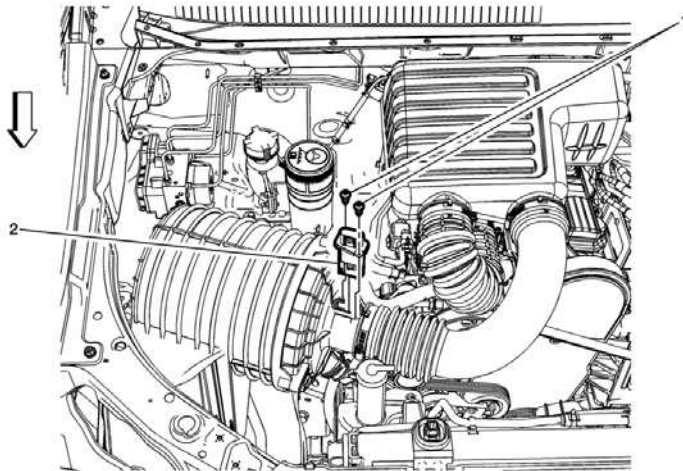
2

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)

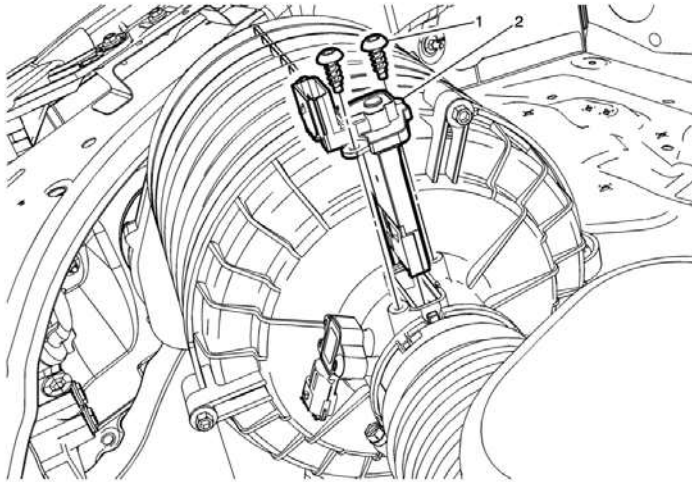
2

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

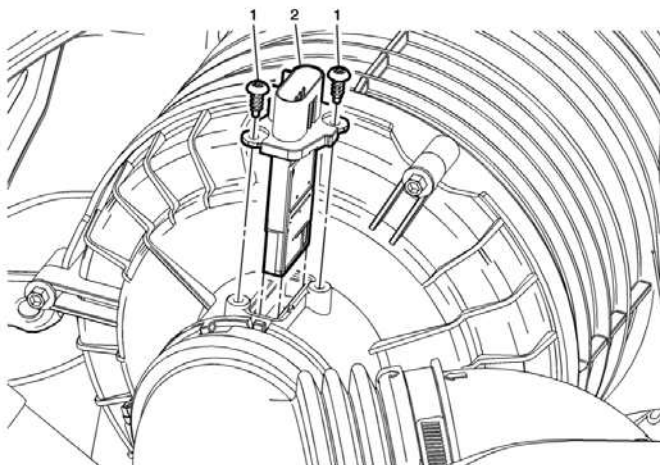
2

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 Fastener (Qty: 2) |
| 1 | Caution: Refer to Fastener Caution. |
| | 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:

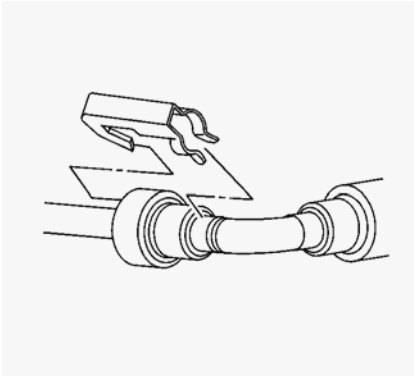
Special Tools

J-37088-A Fuel Line Disconnect Tool Set

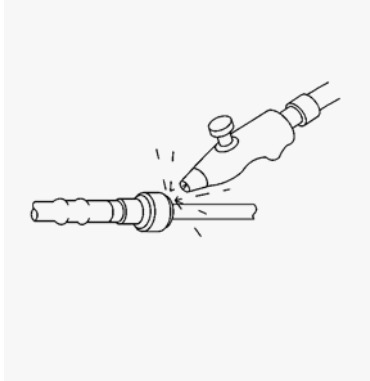
[Removal Procedure](#)

Warning: Refer to Gasoline/Gasoline Vapors Warning.

1. Relieve the fuel system pressure before servicing any fuel system connection.

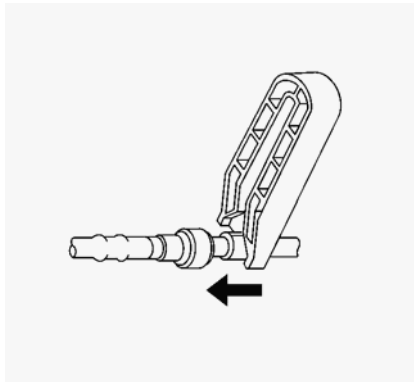


2. Remove the retainer from the quick-connect fitting.

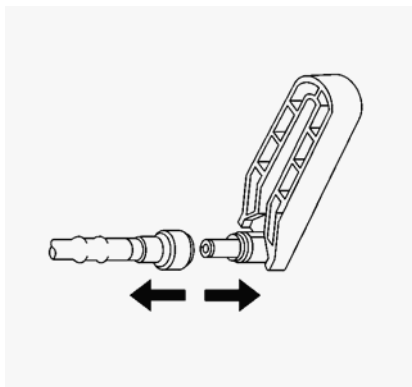


Warning: Wear safety glasses when using compressed air, as flying dirt particles may cause eye injury.

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.



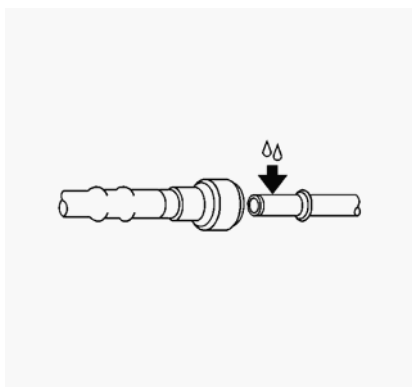
5. Pull the connection apart.

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](#)

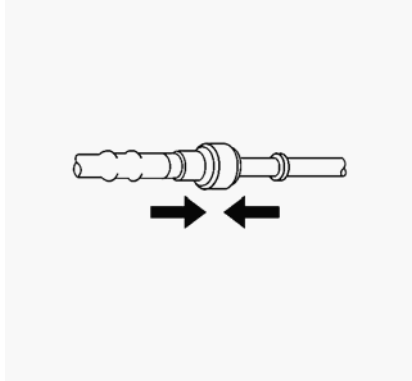


Warning: In order to reduce the risk of fire and personal injury, before connecting fuel pipe fittings, always apply a few drops of clean engine oil to the male pipe ends.

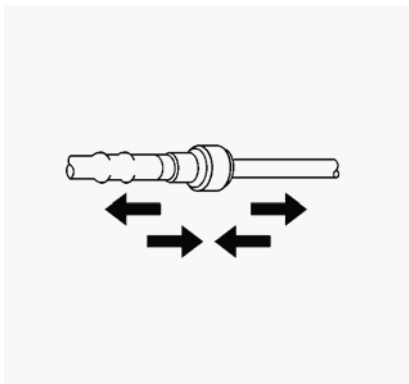
This will ensure proper reconnection and prevent a possible fuel leak.

During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.

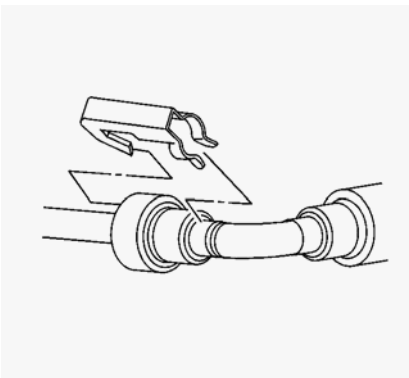
1. Apply a few drops of clean engine oil to the male pipe end.



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:
Fuel Delivery: | Fuel:

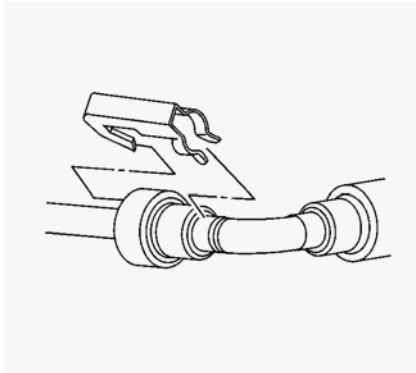
Special Tools

EN-37088-A Disconnect Tool Fuel Line

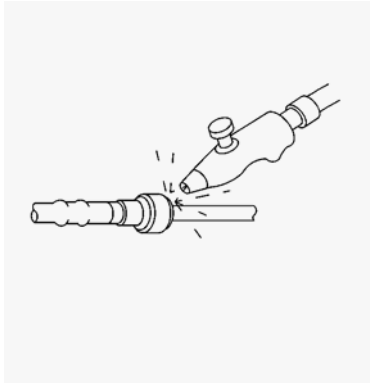
[Removal Procedure](#)

Warning: Refer to Gasoline/Gasoline Vapors Warning.

1. Relieve the fuel system pressure before servicing any fuel system connection. Refer to the Fuel Pressure Relief.

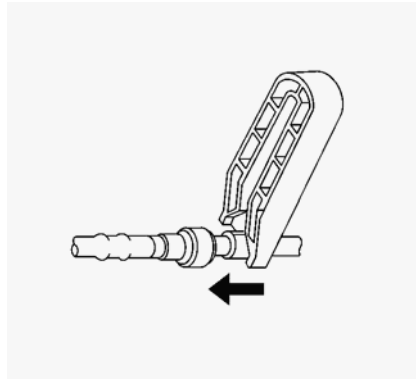


2. Remove the retainer from the quick-connect fitting.

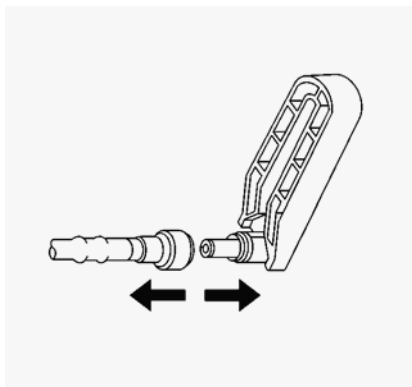


Warning: Wear safety glasses when using compressed air, as flying dirt particles may cause eye injury.

3. Blow dirt out of the fitting using compressed air.



4. Choose the correct EN-37088-A Disconnect Tool Fuel Line for the size of the fitting. Insert the EN-37088-A Disconnect Tool Fuel Line into the female connector, then push inward in order to release the locking tabs.



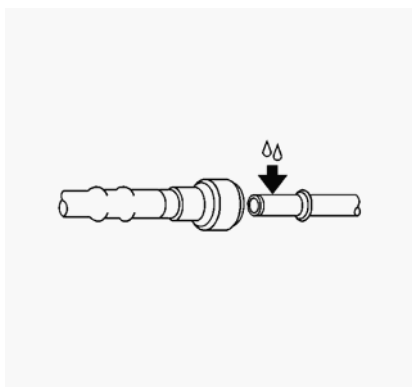
5. Pull the connection apart.

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](#)

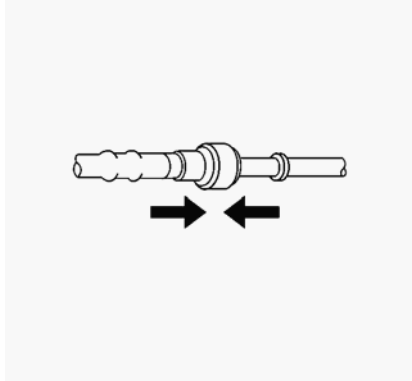


Warning: In order to reduce the risk of fire and personal injury, before connecting fuel pipe fittings, always apply a few drops of clean engine oil to the male pipe ends.

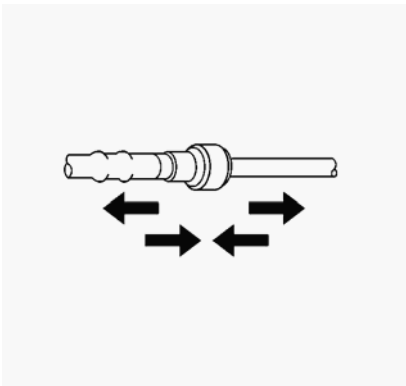
This will ensure proper reconnection and prevent a possible fuel leak.

During normal operation, the O-rings located in the female connector will swell and may prevent proper reconnection if not lubricated.

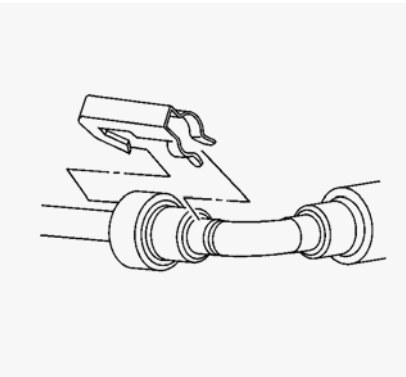
1. Apply a few drops of clean engine oil to the male pipe end.



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:
Fuel Delivery: | Fuel:

When the gear selector is moved to the Neutral (N) position, the hydraulic and electrical system operation is identical to Park (P) range. However, if Neutral is selected after the vehicle was operating in Reverse (R), the normally high C35R pressure control solenoid 2 is commanded OFF and the following changes would occur in the hydraulic system:

3-5 Reverse Clutch Releases

Manual Valve

The manual valve is moved to the Neutral position and blocks line pressure from entering the reverse and drive fluid circuits. The reverse fluid from the #2 ball check valve and clutch select valve 3 is opened to an exhaust passage at the manual valve.

C35R Pressure Control Solenoid 2

The C35R pressure control solenoid 2 is commanded OFF allowing PCS 3-5 reverse clutch fluid from the 3-5 reverse clutch boost valve and 3-5 reverse clutch regulator valve to exhaust.

3-5 Reverse Clutch Boost Valve

The 3-5 reverse boost valve spring force moves the valve to allow 3-5 reverse clutch feedback fluid from the 3-5 reverse clutch regulator valve to enter the 3-5 reverse clutch circuit and exhaust.

3-5 Reverse Clutch Regulator Valve

The 3-5 reverse clutch regulator valve spring force moves the valve to allow 3-5 reverse clutch fluid from the 3-5 reverse clutch and clutch select valve 2 to pass through the valve and enter the exhaust backfill fluid circuit. The 3-5 reverse clutch fluid then enters the exhaust backfill fluid circuit and is routed through orifice #30 to the exhaust backfill pressure relief valve where excess pressure is exhausted.

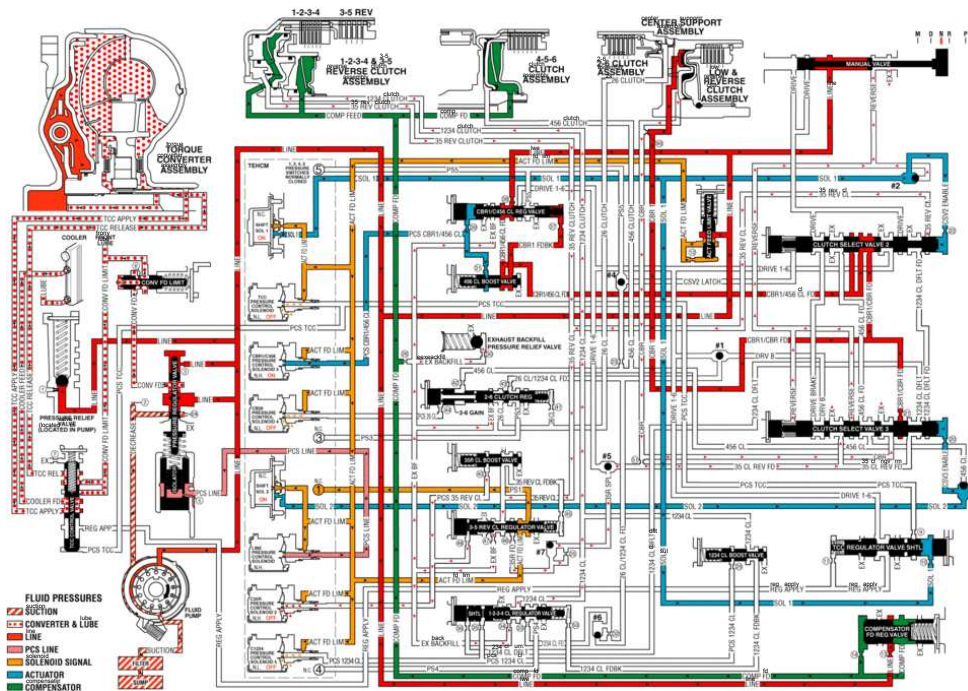
3-5 Reverse Clutch

The 3-5 reverse clutch spring force combined with a force from the compensator moves the 3-5 reverse clutch piston to release the 3-5 reverse clutch plates and force 3-5 reverse clutch fluid to exhaust from the 1-2-3-4 and 3-5 reverse clutch housing. The 3-5 reverse clutch fluid is then routed to the 3-5 reverse clutch regulator valve allowing the 3-5 reverse clutch to release.

Clutch Select Valve 3

When reverse fluid exhausts through the manual valve, CSV3 enable fluid moves the valve against clutch select valve 3 spring force. The 3-5 reverse feed fluid is routed around #7 ball check valve and into the 3-5 reverse supply circuit. The 3-5 reverse supply fluid is routed around #5 ball check valve and into the 3-5 clutch reverse feed circuit and exhausts at the clutch select valve 3.

Neutral- Engine Running



2013 Chevrolet Colorado

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

Fuel Delivery: | **Fuel:**

When the gear selector lever is in the Park (P) position, fluid is drawn into the pump through the transmission fluid filter assembly, from the transmission fluid pan assembly. Line pressure is then directed to the following valves:

[Fluid Pressure Directed in Preparation for a Shift](#)

Manual Valve

Mechanically controlled by the gear selector lever, the manual valve is in the Park (P) position and prevents line pressure from the pressure regulator valve from entering the reverse and drive circuits.

CBR1/C456 Pressure Control (PC) Solenoid 3

The CBR1/C456 pressure control solenoid (PCS) is energized (HIGH) allowing actuator feed limit fluid to enter the PCS CBR1/C456 CL fluid circuit. PCS CBR1/C456 CL fluid is then routed through orifice #31 to the 4-5-6 clutch boost valve and through orifice #39 to the CBR1/ C456 clutch regulator valve.

CBR1/C456 Clutch Regulator Valve

PCS CBR1/C456 CL fluid at the CBR1/C4-5-6 clutch regulator valve moves the valve against CBR1/C4-5-6 clutch regulator spring force and CBR1/FDBK fluid. This allows line pressure to pass through the valve and enter the CBR1/456CL FD circuit. CBR1/456CL FD is then routed to clutch select valve 2.

Shift Solenoid 1

Shift solenoid 1 is energized (ON) allowing actuator feed limit fluid to enter the solenoid 1 circuit. Solenoid 1 fluid is routed to the #2 ball check valve and through orifice #10 to the torque converter clutch (TCC) regulator valve and shuttle valve (SHTL).

TCC Regulator Valve and Shuttle Valve

Solenoid 1 fluid is routed to the TCC regulator valve and shuttle valve and moves the valve against TCC regulator valve spring force.

#2 Ball Check Valve

Solenoid 1 fluid seats the #2 ball check valve against the reverse fluid passage and fluid is forced through orifice #22 into the CSV2 enable fluid circuit.

Clutch Select Valve 2

CSV2 enable fluid is routed to the clutch select valve 2 and moves the valve against clutch select valve 2 spring force. This allows CBR1/456 CL FD fluid to pass through the valve and enter the CBR1/CBR FD circuit. CBR1/CBR FD fluid is then routed: to clutch select valve 3, into the CBR1 fluid circuit and, through orifice #49 where it enters the CBR fluid circuit and an exhaust passage at the clutch select valve 3 (this fluid is intended to keep the low and reverse clutch full of fluid but not pressurized). CBR1 fluid is then routed to the low & reverse clutch assembly in preparation for a shift into low or reverse gear.

Shift Solenoid 2

Shift solenoid 2 is energized (ON) allowing actuator feed limit fluid to enter the solenoid 2 fluid circuit and is then routed to the #3 ball check valve.

3-5 Reverse Clutch Regulator Valve

Actuator feed limit fluid is routed through the valve and into the PS1 fluid passage. PS1 fluid is then sent to the normally closed #1 pressure switch and opens the switch.

#3 Ball Check Valve

Solenoid 2 fluid seats the #3 ball check valve against 456 CL fluid passage and fluid is forced through orifice #20 into the CSV3 enable fluid circuit. CSV3 enable fluid is then routed to the clutch select valve 3.

Clutch Select Valve #3

CSV3 enable fluid moves the clutch select valve 3 against clutch select valve 3 spring force. CBR fluid at the clutch select valve 3 passes through the valve and exhausts.



2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

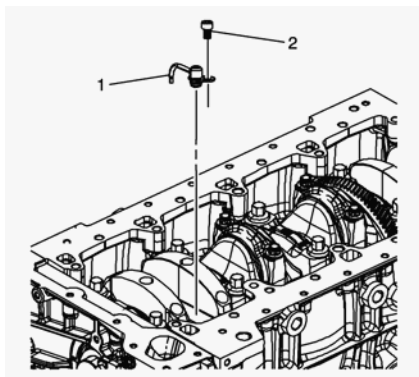


1. Inspect the piston oil cooling nozzle (1) for damage.
2. Replace the piston oil cooling nozzle if any damage is found.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Caution: The piston oil cooling nozzle must be aligned to direct oil towards the oil inlet hole on the bottom of the piston. Improper alignment of the piston oil cooling nozzle will allow insufficient oil lubrication to the piston and cause severe engine damage.

1. Install the piston oil cooling nozzles (1).

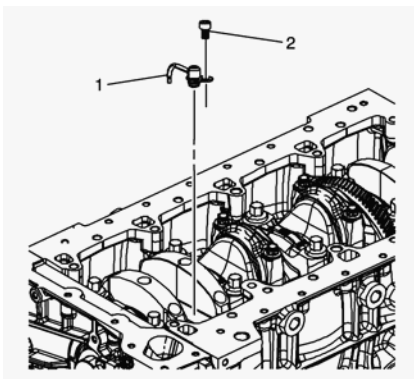
Caution: Refer to Fastener Caution.

2. Install the piston oil cooling nozzle bolt (2) and tighten to **11 Y (97 lb in)**.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

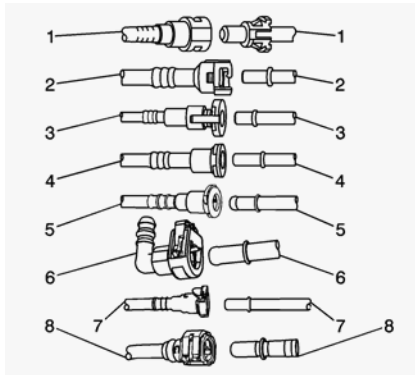


Remove the piston oil cooling nozzle bolt (2) and nozzle (1).

2013 Chevrolet Colorado

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

[Removal Procedure](#)



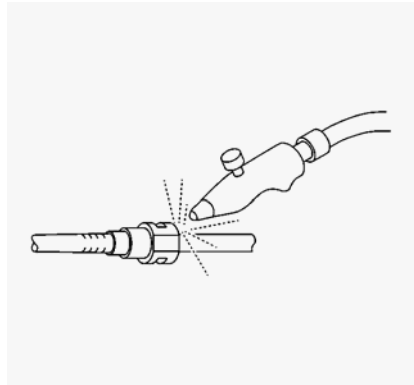
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Note: There are several types of Plastic Collar Fuel and Evaporative Emission Quick Connect Fittings used on this vehicle.

- Bartholomew (1)
- Q Release (2)
- Squeeze to Release (3)
- Sliding Retainer (4)
- Global Connect (5)
- TI Loc (6)
- Safe Lock (7)

The following instructions apply to all of these types of Plastic Collar Quick Connect Fittings except where indicated.

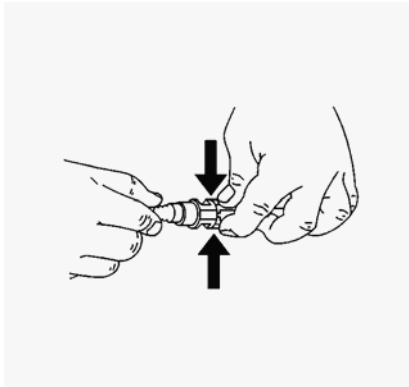
1. Relieve the fuel system pressure before servicing any fuel system connection.



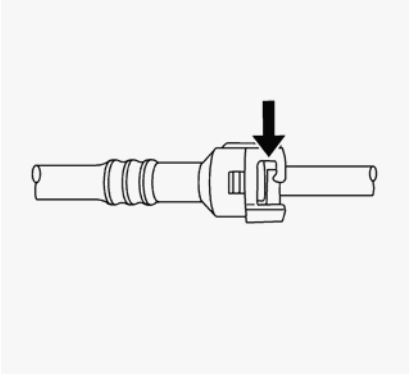
Warning: Refer to Safety Glasses and Compressed Air Warning.

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

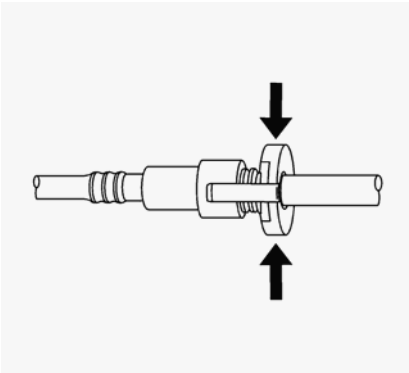
2. Using compressed air, blow any dirt out of the quick-connect fitting.



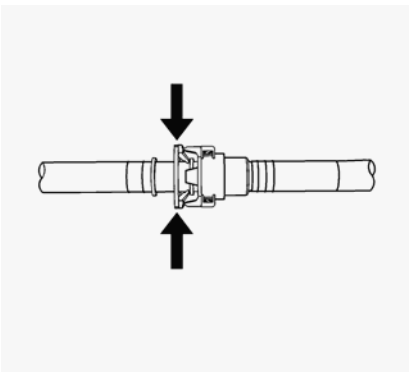
3. This step applies to Bartholomew style connectors ONLY. Squeeze the plastic quick-connect fitting release tabs.



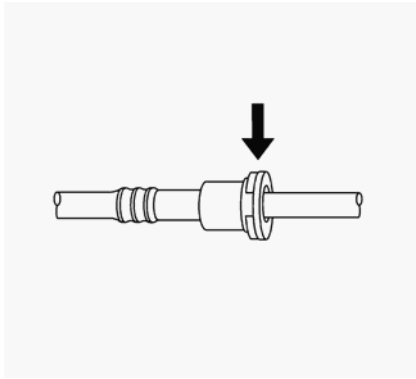
4. This step applies to Q Release style connectors ONLY. Release the fitting by Pushing the tab toward the other side of the slot in the fitting.



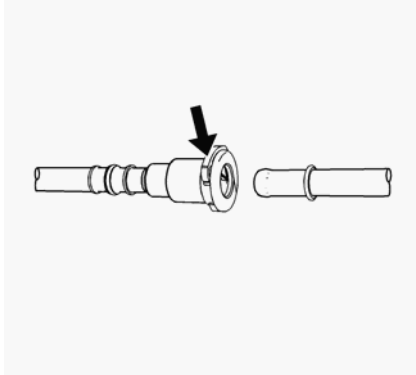
5. This step applies to Squeeze to Release style connectors ONLY. Squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



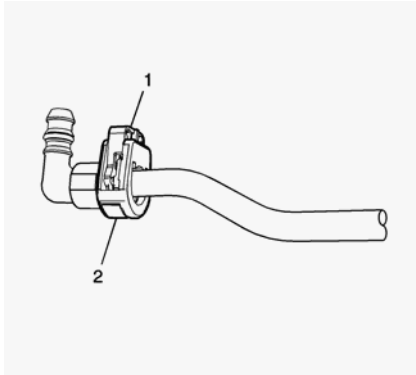
6. This step applies to Squeeze to Release style connectors ONLY. Push in the male side slightly in order to slide the retainer away from the retainers, squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



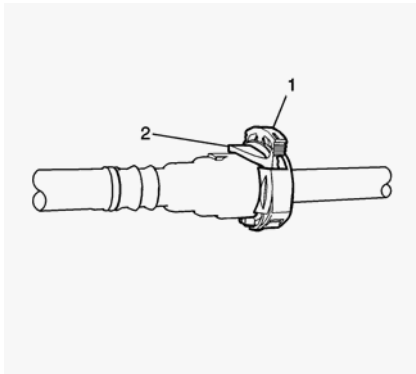
7. This step applies to Sliding Retainer style connectors ONLY. Release the fitting by pressing on one side of the release tab causing it to push in slightly. If the tab doesn't move try pressing the tab in from the opposite side. The tab will only move in one direction.



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.

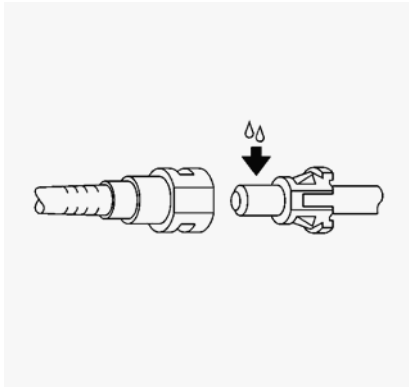


10. This step applies to the Safe Lock style only. Push the connector toward the tube in order to release the pressure. Release the second latch (1) with two fingers. Then press and hold down the bottom release mechanism (2) and pull the connector straight out.

Warning: Refer to Relieving Fuel Pressure Warning.

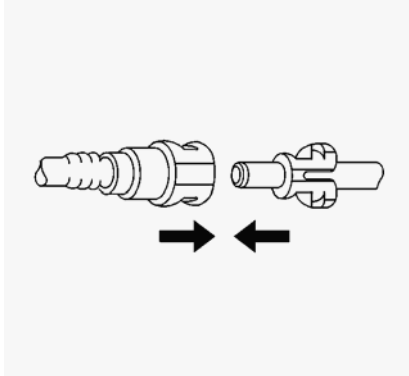
11. Using a clean shop towel, wipe off the male pipe end.
12. Inspect both ends of the fitting for dirt and burrs.
13. Clean or replace components as necessary.

[Installation Procedure](#)

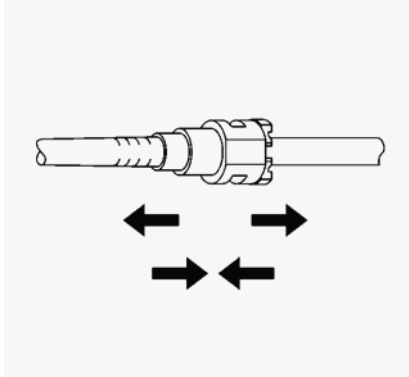


Warning: Refer to Fuel Pipe Fitting Warning.

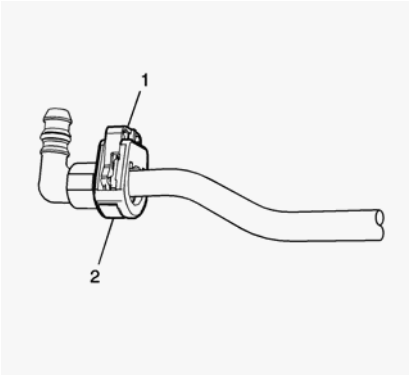
1. Apply a few drops of clean engine oil to the male pipe end.



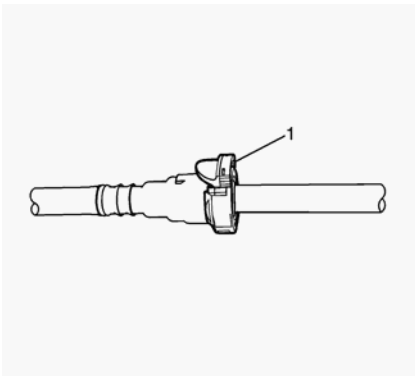
2. Push both sides of the quick-connect fitting together in order to cause the retaining feature to snap into place.



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.

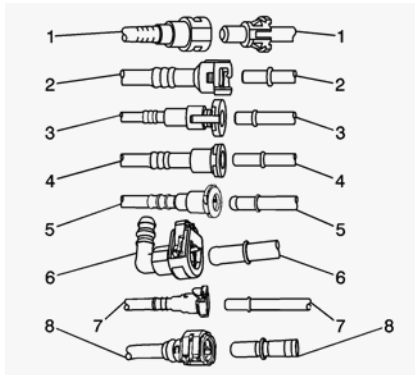


6. Insert the tube in the connector until the retainer snaps in place.
7. Push down on the second latch (1) in order to secure the connection.
8. Inspect for leaks using the following procedure:
 1. Turn the ignition ON, with the engine OFF for 2 seconds.
 2. Turn the ignition OFF, for 10 seconds.
 3. 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:

[Removal Procedure](#)



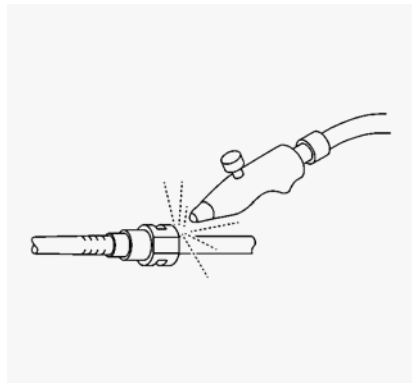
Warning: Refer to Gasoline/Gasoline Vapors Warning.

Note: There are several types of Plastic Collar Fuel and Evaporative Emission Quick Connect Fittings used on this vehicle.

- Bartholomew (1)
- Q Release (2)
- Squeeze to Release (3)
- Sliding Retainer (4)
- Global Connect (5)
- TI Loc (6)
- Safe Lock (7)

The following instructions apply to all of these types of Plastic Collar Quick Connect Fittings except where indicated.

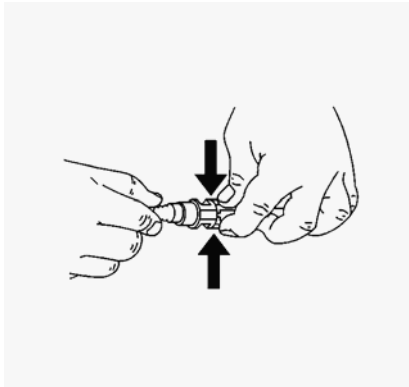
1. Relieve the fuel system pressure before servicing any fuel system connection. Refer to the Fuel Pressure Relief.



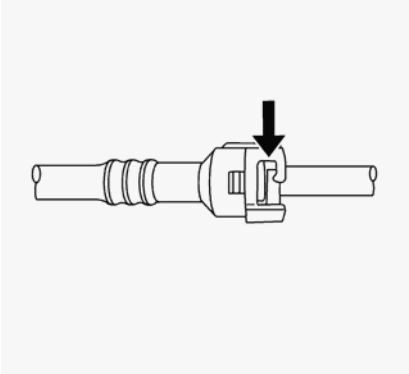
Warning: Refer to Safety Glasses and Compressed Air Warning.

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

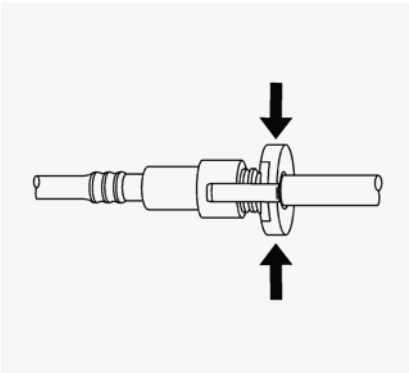
2. Using compressed air, blow any dirt out of the quick-connect fitting.



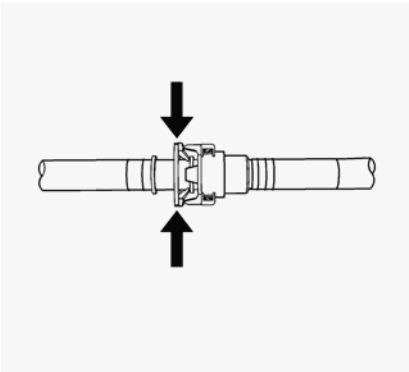
3. This step applies to Bartholomew style connectors ONLY. Squeeze the plastic quick-connect fitting release tabs.



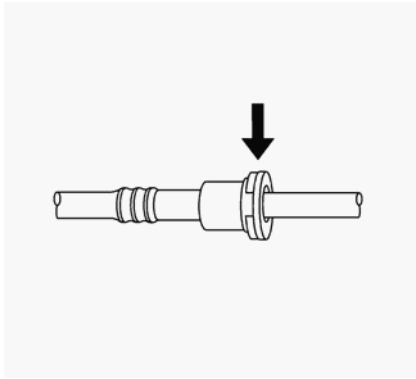
4. This step applies to Q Release style connectors ONLY. Release the fitting by pushing the tab toward the other side of the slot in the fitting.



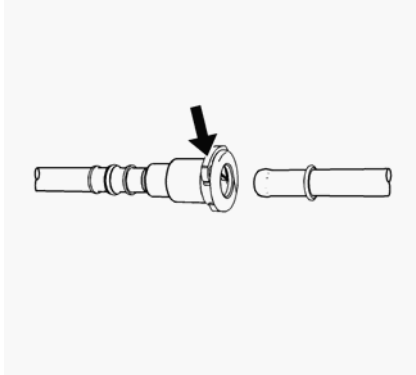
5. This step applies to Squeeze to Release style connectors ONLY. Squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



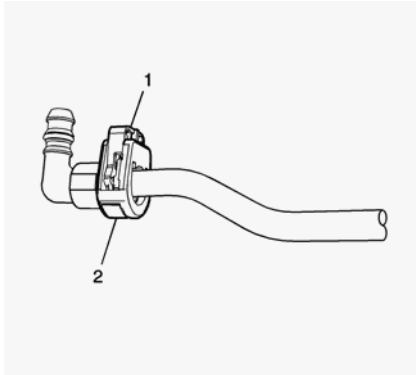
6. This step applies to Squeeze to Release style connectors ONLY. Push in the male side slightly in order to slide the retainer away from the retainers, squeeze where indicated by arrows on both sides of the plastic ring surrounding the quick-connect fitting.



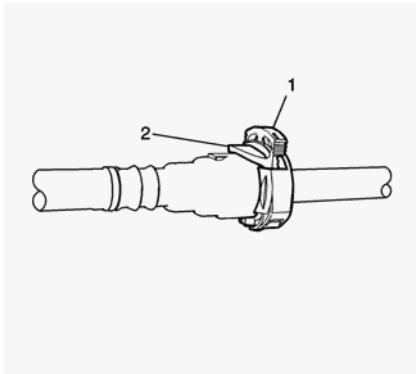
7. This step applies to Sliding Retainer style connectors ONLY. Release the fitting by pressing on one side of the release tab causing it to push in slightly. If the tab doesn't move try pressing the tab in from the opposite side. The tab will only move in one direction.



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.

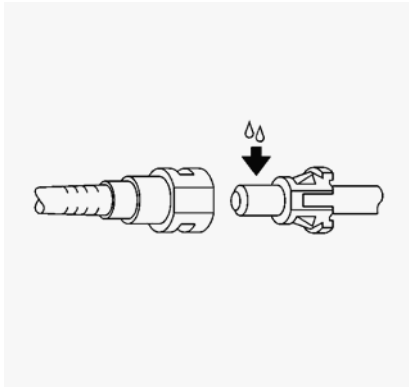


10. This step applies to the Safe Lock style only. Push the connector toward the tube in order to release the pressure. Release the second latch (1) with two fingers. Then press and hold down the bottom release mechanism (2) and pull the connector straight out.

Warning: Refer to Relieving Fuel Pressure Warning.

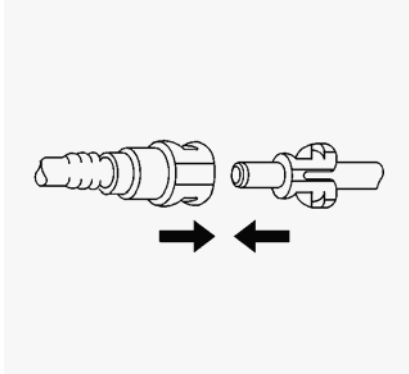
11. Using a clean shop towel, wipe off the male pipe end.
12. Inspect both ends of the fitting for dirt and burrs.
13. Clean or replace components as necessary.

[Installation Procedure](#)

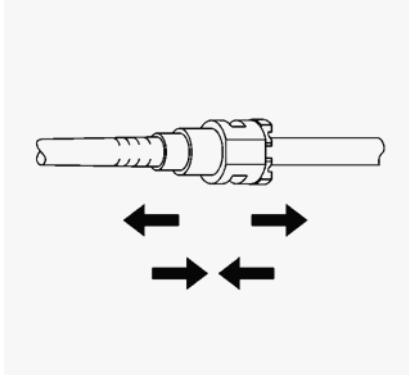


Warning: Refer to Fuel Pipe Fitting Warning.

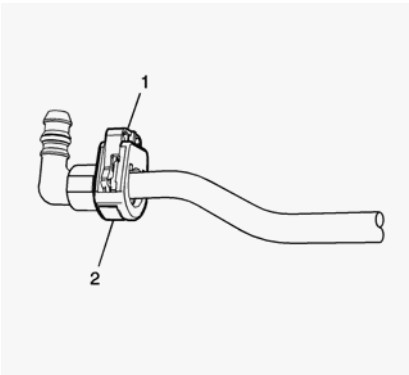
1. Apply a few drops of clean engine oil to the male pipe end.



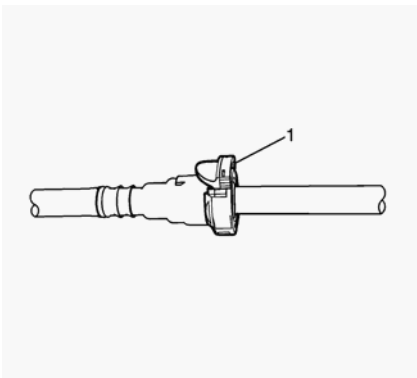
2. Push both sides of the quick-connect fitting together in order to cause the retaining feature to snap into place.



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.

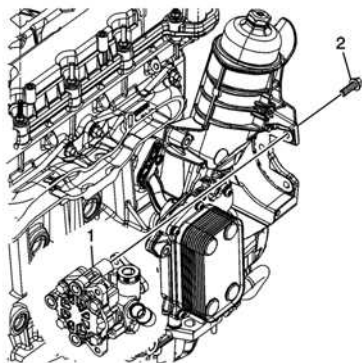


6. Insert the tube in the connector until the retainer snaps in place.
7. Push down on the second latch (1) in order to secure the connection.
8. Inspect for leaks using the following procedure:
 1. Turn the ignition ON, with the engine OFF for 2 seconds.
 2. Turn the ignition OFF, for 10 seconds.
 3. 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:



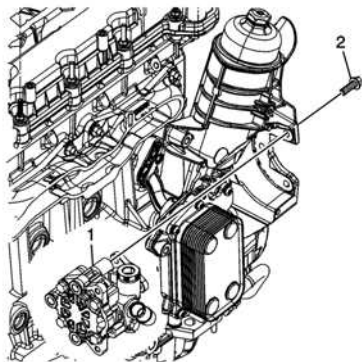
1. Install the power steering pump (1).

Caution: Refer to Fastener Caution.

2. Install the power steering pump bolts (2) and tighten to **25 Y (18 lb ft)**.

2013 Chevrolet Colorado

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



Remove the power steering pump mounting bolts (2) and the power steering pump (1).

2013 Chevrolet Colorado

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

Description

The engine control module (ECM) learns the airflow through the throttle body to ensure the correct idle. The learned airflow values are stored within the ECM. These values are learned to adjust for production variation and will continuously learn during the life of the vehicle to compensate for reduced airflow due to throttle body coking. Anytime the throttle body airflow rate changes, for example due to cleaning or replacing, the values must be relearned.

An engine that had a heavily coked throttle body that has been cleaned or replaced may take several drive cycles to learn out the coking. To accelerate the process, the scan tool has the ability to reset all learned values back to zero. A new ECM will also have values set to zero.

The idle may be unstable or a DTC may set if the learned values do not match the actual airflow.

Conditions for Running the Throttle Learn Procedure

Scan tool Idle Learn or Idle Learn Reset Procedure

- DTCs P0068, P0101, P0102, P0103, P0106, P0107, P0108, P0116, P0117, P0118, P0120, P0122, P0123, P0128, P0171, P0172, P0174, P0175, P0201–P0208, P0220, P0222, P0223, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, P0277, P0279, P0280, P0282, P0283, P0300–P0308, P0351–P0358, P0496, P0601, P0604, P0606, P060D, P0641, P0651, P1516, P2101, P2119, P2120, P2122, P2123, P2125, P2127, P2128, P2135, P2138, or P2176 are not set.
- Ignition ON, engine OFF.
- The vehicle speed sensor (VSS) is 0 km/h (0 mph).

Service Bay/On Road Learn Procedure

- DTCs P0068, P0101, P0102, P0103, P0106, P0107, P0108, P0116, P0117, P0118, P0120, P0122, P0123, P0128, P0171, P0172, P0174, P0175, P0201–P0208, P0220, P0222, P0223, P0261, P0262, P0264, P0265, P0267, P0268, P0270, P0271, P0273, P0274, P0276, P0277, P0279, P0280, P0282, P0283, P0300–P0308, P0351–P0358, P0496, P0601, P0604, P0606, P060D, P0641, P0651, P1516, P2101, P2119, P2120, P2122, P2123, P2125, P2127, P2128, P2135, P2138, or P2176 are not set.
- The engine speed is between 450–4,000 RPM.
- The manifold absolute pressure (MAP) is greater than 5 kPa.
- The mass air flow (MAF) is greater than 2 g/s.
- The ignition voltage is greater than 10 volts.

Throttle Learn

Scan Tool Idle Learn or Idle Learn Reset Procedure – Performed after the throttle body is cleaned or replaced

1. Ignition ON, engine OFF, perform the Idle Learn or Idle Learn Reset in Configuration/Reset or Module Setup.
2. Engine idling, observe the scan tool Throttle Body Idle Airflow Compensation parameter. The Throttle Body Idle Airflow Compensation value should equal 0 % and the engine should be idling at a normal idle speed.
3. Clear the DTCs and return to the diagnostic that referred you here.

Service Bay/On Road Idle Learn Procedure – Performed after the ECM is programmed or replaced

Note: Do NOT perform this procedure if DTCs are set. Refer to Diagnostic Trouble Code (DTC) List - Vehicle.

1. Engine idling for 3 minutes.
2. Observe the scan tool Desired Idle Speed and the actual Engine Speed parameters.
3. The ECM will start to learn the new idle cells and the Desired Idle Speed should start to decrease.
4. Ignition OFF for 60 seconds.
5. Start and idle the engine for 3 minutes.
6. After the 3 minute run time the engine should be idling normal.

Note: During the drive cycle the check engine light may come on with idle speed DTCs. If idle speed codes are set, clear codes so the ECM can continue to learn.

- If the engine idle speed has not been learned the vehicle will need to be driven at speeds above 70 km/h (44 mph) with several decelerations and extended idles.
- After the drive cycle, the engine should be idling normally.
- If the engine idle speed has not been learned, turn OFF the ignition for 60 seconds and repeat step 6.
- Once the engine speed has returned to normal, clear DTCs and return to the diagnostic that referred you here.

2013 Chevrolet Colorado

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

[Gasket Reuse and Applying Sealant](#)

- Do not reuse any gasket unless specified.
- Gaskets that can be reused will be identified in the service procedure.
- Do not apply sealant to any gasket or sealing surface unless specified in the service procedure.

[Separating Components](#)

- Use a rubber mallet in order to separate the components.
- Bump the part sideways in order to loosen the components.
- Bumping of the component should be done at bends or reinforced areas of the component to prevent distortion of the components.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

Gasket Reuse and Applying Sealant

- Do not reuse any gasket unless specified.
- Gaskets that can be reused will be identified in the service procedure.
- Do not apply sealant to any gasket or sealing surface unless specified in the service procedure.

Separating Components

- Use incorporated pry points to separate components using an RTV sealing system.
- Do not try to separate RTV sealed components by prying against other engine components.
- Pry points are positioned so no other vital engine components are damaged when they are used.

Cleaning Gasket Surfaces

- Use care to avoid gouging or scraping the sealing surfaces.
- Use a plastic or wood scraper in order to remove all the sealant from the components.
 - Do not use any other method or technique to remove the sealant or the gasket material from a part.
- Do not use abrasive pads, sand paper, or power tools to clean the gasket surfaces.
 - These methods of cleaning can cause damage to the component sealing surfaces.
 - Abrasive pads also produce a fine grit that the oil filter cannot remove from the engine oil.

This fine grit is an abrasive and can cause internal engine damage.

Assembling Components

- Assemble components using only the sealant, or equivalent, that is specified in the service procedure.
- Sealing surfaces must be clean and free of debris or oil.
- Specific components such as crankshaft oil seals or valve stem oil seals may require lubrication during assembly.
- Components requiring lubrication will be identified in the service procedure.
- Apply only the amount of sealant specified in the service procedure to a component.
- Do not allow the sealant to enter into any blind threaded holes, as the sealant may prevent the fastener from clamping properly or cause component damage when tightened.

Important: Do not overtighten the fasteners.

- Tighten the fasteners to the proper specifications.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

Gasket Reuse and Applying Sealant

- Do not reuse any gasket unless specified.
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Important: Do not overtighten the fasteners.

- Tighten the fasteners to the proper specifications.

2013 Chevrolet Colorado

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

Important:

- Many internal engine components will develop specific wear patterns on their friction surfaces.
- When disassembling the engine, internal components **MUST** be separated, marked, or organized in a way to ensure installation to their original location and position.

Separate, mark, or organize the following components:

- Piston and the piston pin
- Piston to the specific cylinder bore
- Piston rings to the piston
- Connecting rod location and orientation to the crankshaft journal
- Connecting rod to the bearing cap

A paint stick or etching/engraving type tool are recommended. Stamping the connecting rod or cap near the bearing bore may affect component geometry.

- Crankshaft main and connecting rod bearings
- Camshaft and valve lifters
- Valve lifters, lifter guides, pushrods and rocker arm assemblies
- Valve to the valve guide
- Valve spring to the cylinder head location
- Engine block main bearing cap location and direction
- Oil pump drive and driven gears

2013 Chevrolet Colorado

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

Fuel Delivery: | **Fuel:**

Important: Many internal engine components will develop specific wear patterns on their friction surfaces.

When disassembling the engine, internal components **MUST** be separated, marked, or organized in a way to ensure reinstallation to their original location and position.

Separate, mark, or organize the following components:

- Piston and the piston pin
- Piston to the specific cylinder bore
- Piston rings to the piston
- Connecting rod to the crankshaft journal
- Connecting rod to the bearing cap

A paint stick or etching/engraving type tool are recommended. Stamping the connecting rod or cap near the bearing bore may affect component geometry.

- Crankshaft main and connecting rod bearings
- Camshaft and valve lifters
- Valve lifters, guides, pushrods, pivot supports and rocker arms
- Valve to the valve guide
- Valve spring and shim to the cylinder head location
- Engine block main bearing cap location and direction
- Oil pump drive and driven gears

2013 Chevrolet Colorado

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

In addition to the room temperature vulcanizing (RTV) sealant's sealing capabilities, the RTV sealants may form an adhesive bond between the components. This may make the components difficult to remove or to separate. Pry points have been provided in the components that utilize RTV as the sealing system. Pry points are positioned so they can be used without damaging other vital engine components.

2013 Chevrolet Colorado

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

- Dirt will cause premature wear of the rebuilt engine. Clean all the components.
- Use the proper tools to measure the components when checking for excessive wear. Components not within the manufacturer's specification must be repaired or replaced.
- When the components are reinstalled into an engine, return the components to their original location, position, and direction.
- During assembly, lubricate all the moving parts with clean engine oil (unless otherwise specified). This will provide initial lubrication when the engine is first started.

2013 Chevrolet Colorado

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

The importance of cleanliness during assembly cannot be overstated. Dirt or debris will cause engine damage. An automobile engine is a combination of many machined, honed, polished and lapped surfaces with tolerances that are measured in ten thousandths of an inch. When any internal engine parts are serviced, care and cleanliness are important. A liberal coating of engine oil should be applied to friction areas during assembly in order to protect and lubricate the surfaces on initial operation. Throughout this section, it should be understood that proper cleaning and protection of machined surfaces and friction areas are part of the repair procedure. This is considered standard shop practice even if not specifically stated.

Lubricate all moving parts with engine oil or a specified assembly lubricant. This will provide lubrication for initial start up.

2013 Chevrolet Colorado

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

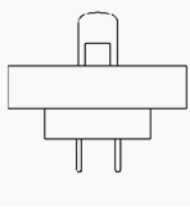
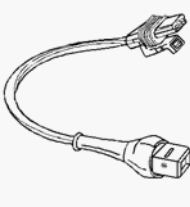
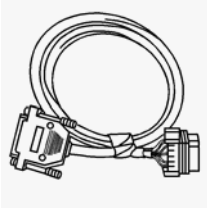
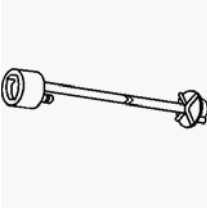
Illustration	Tool Number/Description
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	CH-38641-B J-38641-B Diesel Fuel Quality Tester
	CH-39021-301 J-39021-301 Fuel Injector Harness Adapter
	CH-39021-460 J-39021-460 Fuel Injector Test Adapter
	CH-41415-30 GE-41415-30 J-41415-30 Fuel Tank Cap Adapter
	CH-42960-2 J-42960-2 Fuel Flapper Door Holder
	CH-42982 J-42982 Fuel Pressure Gauge Adapter

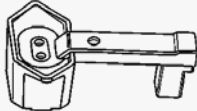
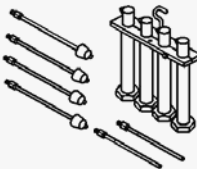
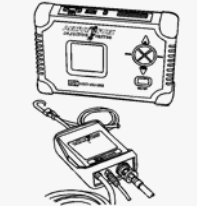
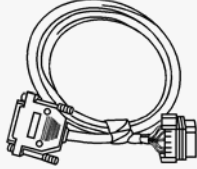
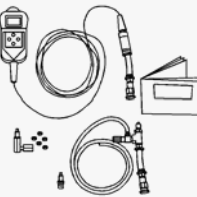
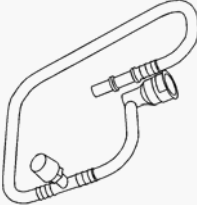
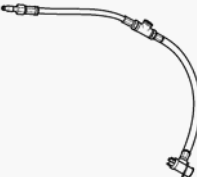
Illustration	Tool Number/Description
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	CH-45004 J-45004 Fuel Tank Drain Hose
	CH-45873 J-45873 Fuel Return Volume Test Kit
	CH-47976 Active Fuel Injector Tester (AFIT)
	CH-47976-75 Fuel Injector Harness Adapter
	CH-48027 Fuel Pressure Gauge
	CH-48096 EVAP Service Access Port Tool
	CH-50375 Diesel Injector Return Line Pressure Adapter

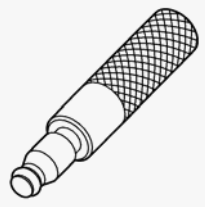
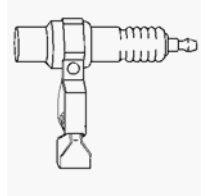
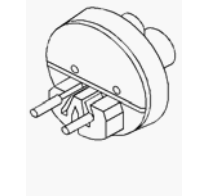
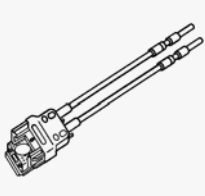
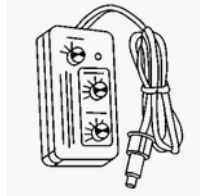
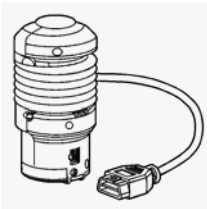
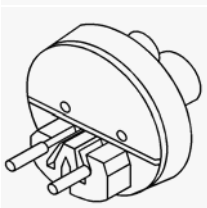
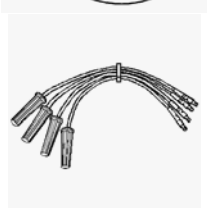
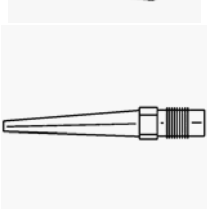
Illustration	Tool Number/Description
	CH-50377-A Injector Return Line Cap
	CH-50378 Injector Return Leakage Test Adapter
	EL-26792 J-26792 HEI Spark Tester
	EL-34730-405 J-34730-405 Injector Test Lamp
	EL-36169-HD Heavy Duty Fused Jumper
	EL-38522-A J-38522-A Variable Signal Generator
	EL-39021 J-39021 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

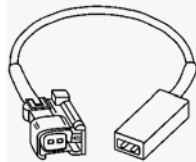
Evaporative Emissions System Tester (EEST)



EN-41413-VLV

J-41413-VLV

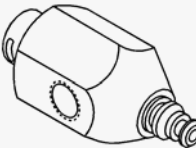
EVAP Service Port Vent Fitting



EN-44602

J-44602

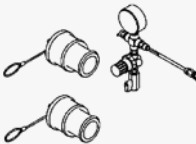
Injector Test Adapter



EN-45873-30

J-45873-30

Injector Flow Test Adapter



EN-46091

J-46091

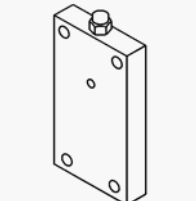
Charge Air Cooler Tester



EN-46091-15A

J-46091-15A

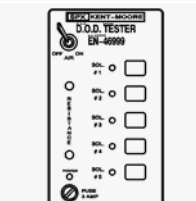
Diesel Engine Pressure Test Adapter



EN-46091-5

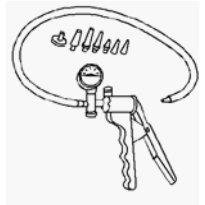
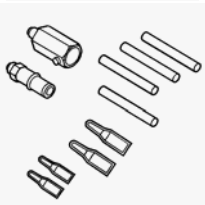
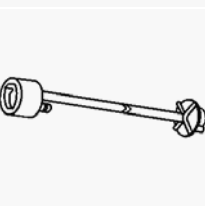
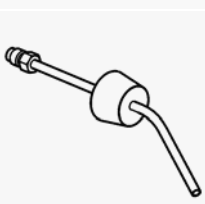
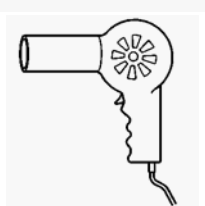
J-46091-5

Charge Air Cooler Tester Adapter



EN-46999

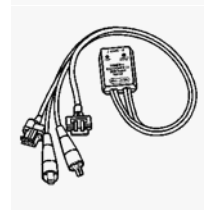
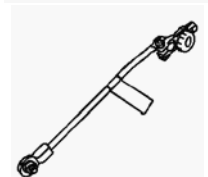
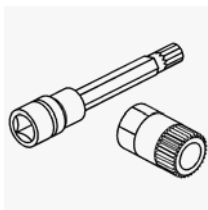
Displacement On Demand Electric Tool

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

EN 6372
KM 6372
Counterhold

J 38758
Parasitic Draw Test Switch

J 41450-B
Universal CS Generator Tester Harness

J 42000
Battery Tester

J 45681
Jumper Harness

2013 Chevrolet Colorado

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

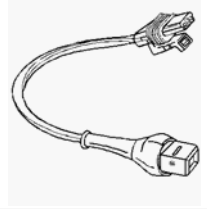
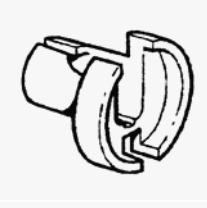
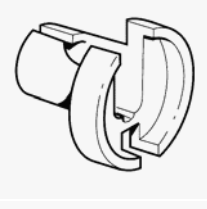
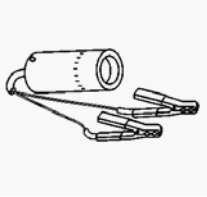
Illustration	Tool Number/Description
	CH 35800-A J 35800-A Fuel Injector Cleaner
	CH 38641-C J 38641-B Diesel Fuel Quality Tester
	CH 39021-380 J 39021-380 Fuel Injector Harness Adapter
	CH 39021-450 J 39021-450 Fuel Injector Harness Adapter
	CH 41769-1 Fuel Line Quick Connect Separator 3/8
	CH 41769-2 Fuel Line Quick Connect Separator 5/16
	CH 42220 J 42220 Universal 12-Volt Leak Detection Lamp

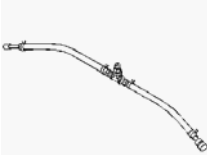
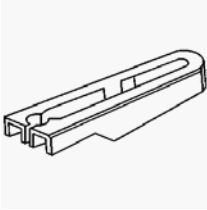
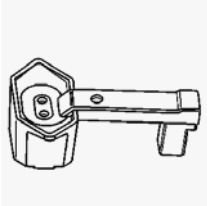
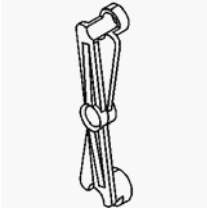
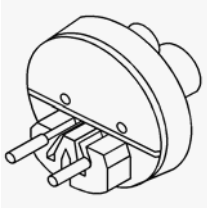
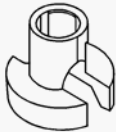
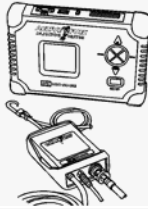
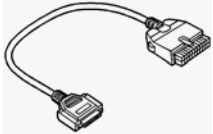
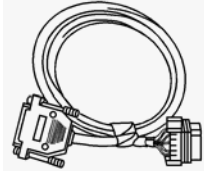
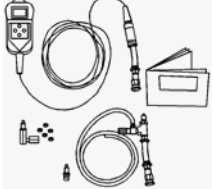
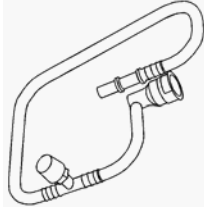
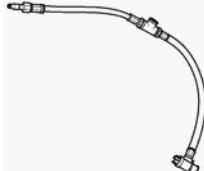
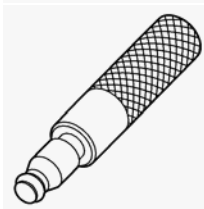
Illustration	Tool Number/Description
	CH 42960-2 J 42960-2 Fuel Flapper Door Holder
	CH 42982 J 42982 Fuel Pressure Gauge Adapter
	CH 43178 J 43178 Fuel Line Disconnect Tool
	CH 44175 J 44175 Fuel Composition Tester Brazil— Use local equivalent
	CH 44581 J 44581 Fuel Line Disconnect Tool
	CH 44603 J 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

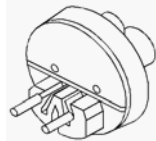
Illustration

Tool Number/Description



CH 50378

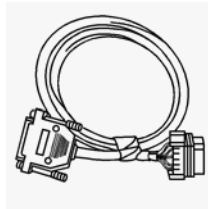
Injector Return Leakage Test Adapter



EL 34730-405

J 34730-405

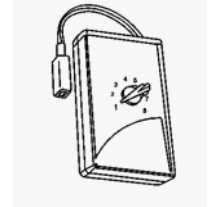
Injector Test Lamp



EL 39021

J 39021

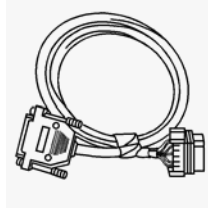
Fuel Injector Coil and Balancer Tester



EL 39021-210

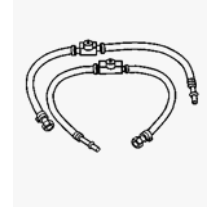
J 39021-210

Injector Tester Adapter Box



EL 39021-460

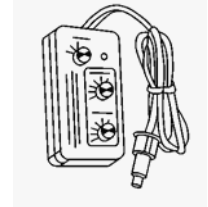
Fuel Injector Test Adapter



EN 37287

J 37287

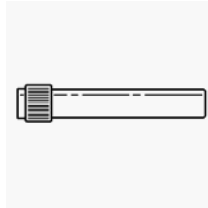
Fuel Line Shut-Off Adaptors (Flex Fuel)



EN 38522

J 38522

Variable Signal Generator



EN 41413-VLV

J 41413-VLV

EVAP Service Port Vent Fitting

Brazil— Use local equivalent

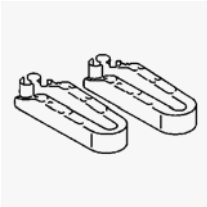
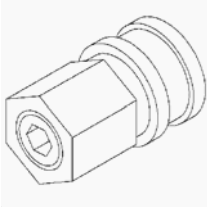
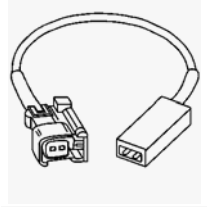
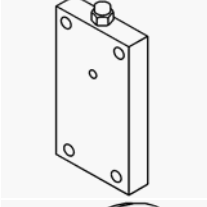
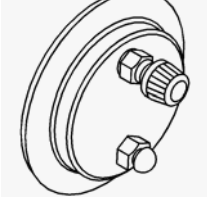
Illustration	Tool Number/Description
	EN 41769 J 41769 KM J 41769 Fuel Line Disconnect Tool Set
	EN 43936 J 43936 Fuel Pressure Adapter Cap
	EN 43937 J 43937 Fuel Pressure Adapter Lines
	EN 44602 J 44602 Injector Test Adapter
	EN 45873-30 J 45873-30 Injector Flow Test Adapter
	EN 46091 J 46091 Charge Air Cooler Tester
	EN 46091-5 J 46091-5 Charge Air Cooler Tester Adapter
	EN 46091-15 J 46091-15 Engine Pressure Test Adapter

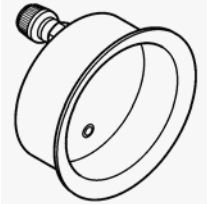
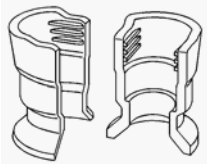
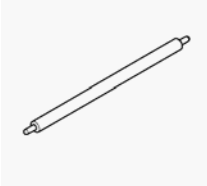
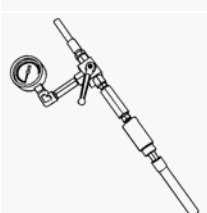
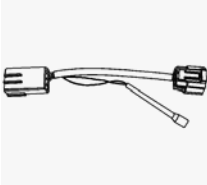
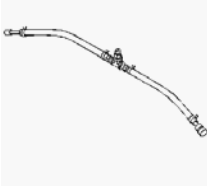
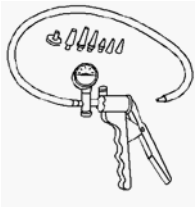
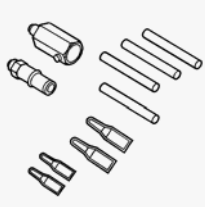
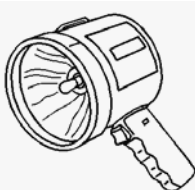
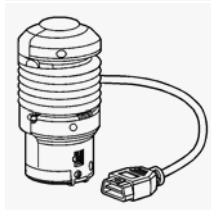
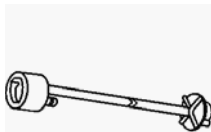
Illustration	Tool Number/Description
	EN 46091-15A J 46091-15A Adapter, Diesel Engine Pressure Test
	EN 46843 Quick Connect Release Tool
	EN 47603 Compression Gauge Adapter
	EN 47632 32 025 010 Cleaning Tool
	EN 47969 Fuel Supply Diagnostic Hose
	EN 48248 Cylinder Compression Pressure Gauge
	EN 48565 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

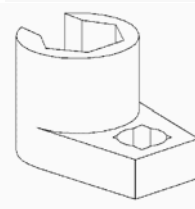


Tool Number/Description

J-34730-1A

Fuel Pressure Gauge

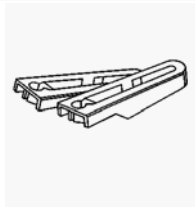
South America– Use Local Equivalent



EN-39194-C

J-39194-C

Oxygen Sensor Wrench



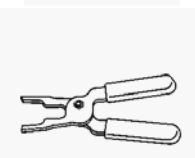
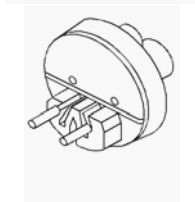
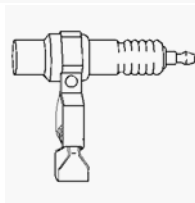
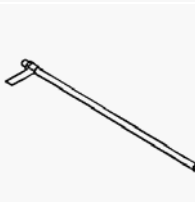
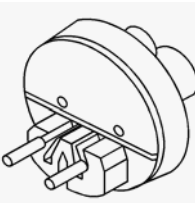
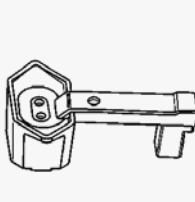
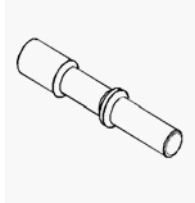
J-37088-A

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

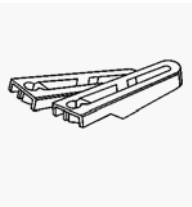
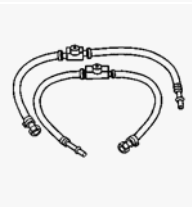
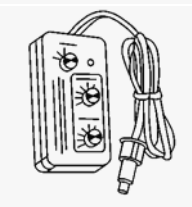
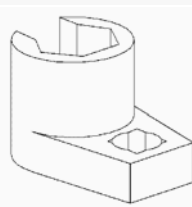
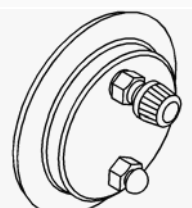
EL 34730-405

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:

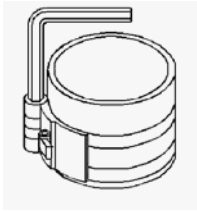
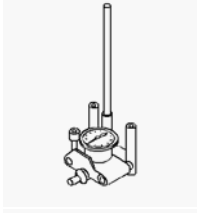
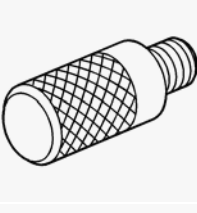
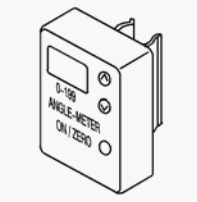
Illustration	Tool Number/ Description
	EN-8037 J-8037 Ring Compressor
	EN-8062 J-8062 KM-348 09916-14510 Valve Spring Compressor– Head Off
	EN-8087 J-8087 Cylinder Bore Gauge
	EN-26999 J 26999 Compression Gauge Adapter
	EN-35667-A J 35667-A Cylinder Head Leakdown Tester
	EN-42183 J-42183 Driver Handle
	EN-45059 J 45059 KM-470-B Angle Meter South America and Thailand– Use Local Equivalent

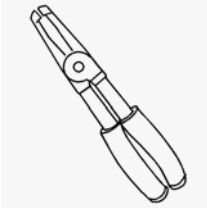
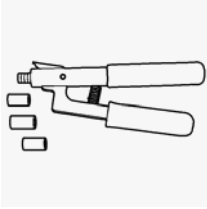
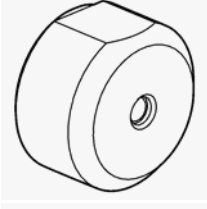
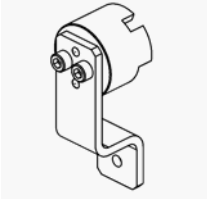
Illustration	Tool Number/ Description
	EN-45299 J 45299 Engine Pre-Luber
	EN-46116 Valve Stem Seal Remover/Installer
	EN-46745 Piston Pin Clip Remover/Installer
	EN-47909 Injector Bore and Sleeve Cleaning Kit
	EN-48974 EGR Cooler Pressure Tester Adapter Set
	EN-50025 Pulley Holding Wrench
	EN-50026 Rear Main Seal Installer
	EN-50029 Camshaft Holding Tool

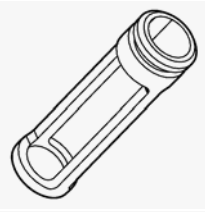
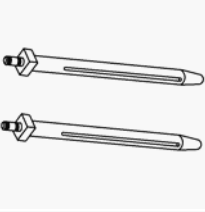
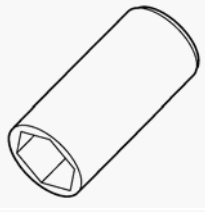
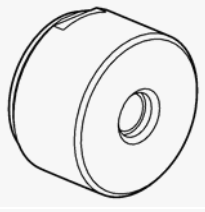
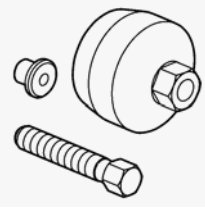
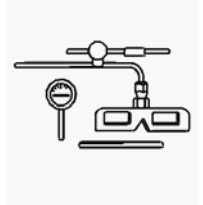
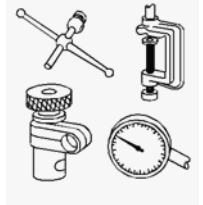
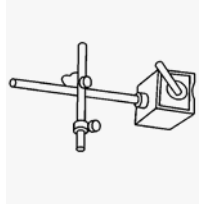
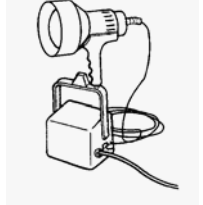
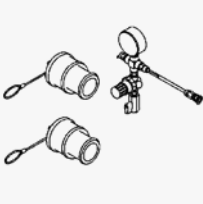
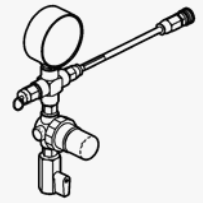
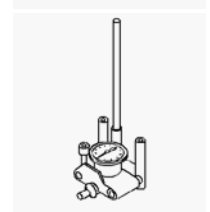
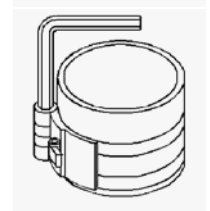
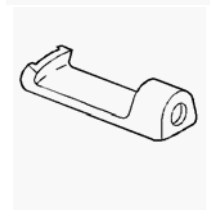
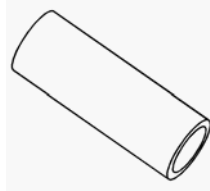
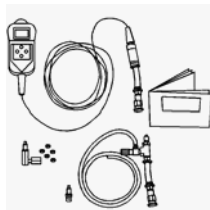
Illustration	Tool Number/ Description
	EN-50030 Crankshaft Locking Tool
	EN-50031 Valve Spring Compressor (off-vehicle)
	EN-50033 Compression Tester Adapter
	EN-50034 Connecting Rod Guides
	EN-50038 Glow Plug Socket
	EN-50629 Injection Pump Sprocket Puller
	EN-50718 Crankshaft Front Seal Installer
	EN-50719 Crankshaft Front Oil Seal Remover

Illustration	Tool Number/ Description
	EN-50723 Valve Seal Installer
	EN 28467-700 EN 47649 X-0206951 Engine Bridge Tool
	GE-7872 J 7872 Magnetic Base Dial Indicator
	J 8001 Dial Indicator Set
	J 26900-13 Magnetic Indicator Base
	J 28428-E High-Intensity Black Light Kit
	J 46091 Charge Air Cooler Tester
	J 46901-1 Charge Air Cooler Tester

2013 Chevrolet Colorado

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

Illustration



Tool Number/Description

CH 48027
Digital Pressure Gauge

DT 5590
J 24254
J 5590
Bearing and Seal Driver

DT 23129
J 23129
KM 586
Universal Seal Remover

EN 8037
J 8037
Ring Compressor

EN 8062
J 8062
KM 348
09916-14510
83 96 384
Valve Spring Compressor - Head Off

EN 8087
J 8087
Cylinder Bore Gauge

EN 22738-B
J 22738-B
Valve Spring Tester

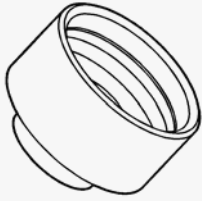
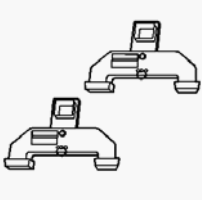
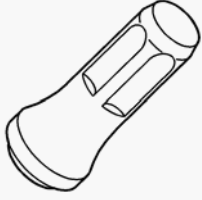
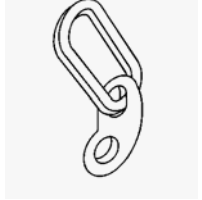
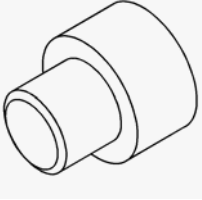
Illustration	Tool Number/Description
	EN 24254-A J 24254-A J 24254 Oil Seal Installer
	EN 28410 J 28410 Gasket Remover (Aluminum Components)
	EN 28467-501 J 28467-501 Engine Support Fixture Adapters
	EN 28467-700 EN 47649 X-0206951 Engine Bridge Tool
	EN 29184 EN 47635 EN 47635 & J 41998-B J 29184 Oil Seal Installer
	EN 35667-A J 35667-A Cylinder Head Leakdown Tester
	EN 36857 J 36857 Engine Lift Bracket
	EN 38416-2 J 38416-2 Crankshaft Button

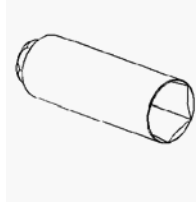
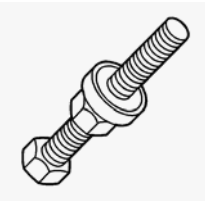
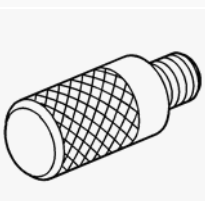
Illustration	Tool Number/Description
	EN 39313 J 39313 Spark Plug Port Adapter
	EN 41712 Oil Pressure Switch Socket
	EN 41998-B J 41998-B J 41998 Crankshaft Balancer Installer
	EN 42096 J 42096 Valve Guide Reamer
	EN 42183 J 42183 Handle
	EN 42385-700 J 42385-700 High Feature Thread Repair Kit
	EN 42385-2000 J 42385-2000 J 42385-100 & J 42385-200 Thread Insert Kit
	EN 43690-A J 43690-A Rod Bearing Clearance Checking Tool

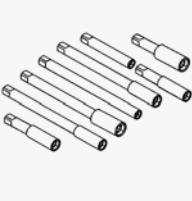
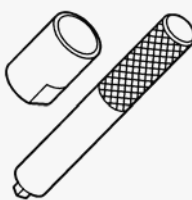
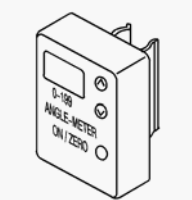
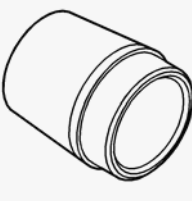
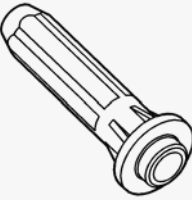
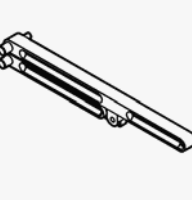
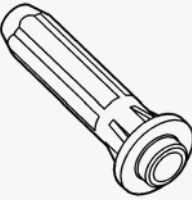
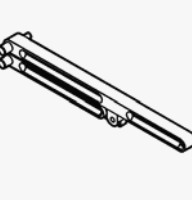
Illustration	Tool Number/Description
	EN 43965
	J 43965
	Thread Repair Extension Kit
	EN 45000
	J 45000
	KM J 45000
	E308
	87 91 360
	Seal Remover
	EN 45027
	J 45027
	Tensioner Tool
	EN-45059
	J 45059
	KM-470-B
	Angle Meter
	South America and Thailand– Use Local Equivalent
	EN 45299
	J 45299
	Engine Preluber
	EN 46101
	Spark Plug Tube Seal Guide
	EN 46103
	Camshaft Actuator Valve Seal Remover/Installer
	EN 46104
	Water Pump Pulley Holding Tool

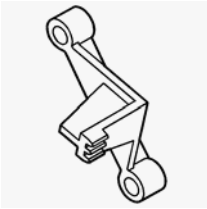
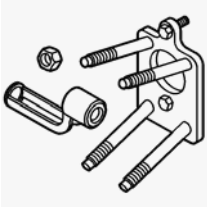
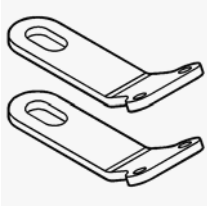
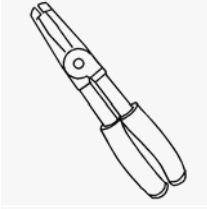
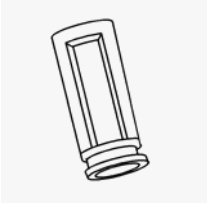
Illustration	Tool Number/Description
	EN 46106 J 46106 KM 652 Flywheel Holding Tool
	EN 46109 Guide Pins
	EN 46110 EN 46110-EU On-Vehicle Valve Spring Compressor
	EN 46112 Tensioner Retraction Pins
	EN 46114 Engine Lift Brackets
	EN 46116 KM 840 Remover/EN 47986 Installer 83 94 157 Valve Stem Seal Remover/Installer
	EN 46117 Valve Stem Key Remover/Installer
	EN 46119 Off-Vehicle Valve Spring Compressor Adapter

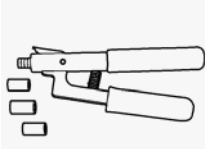
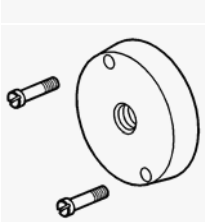
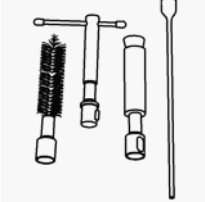
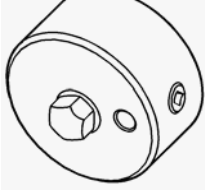
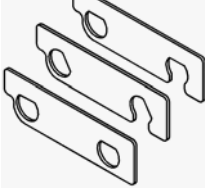
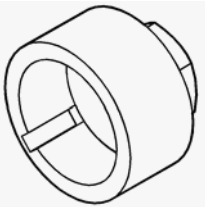
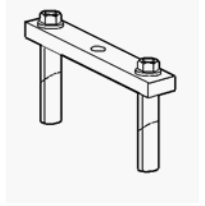
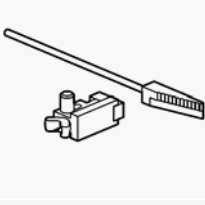
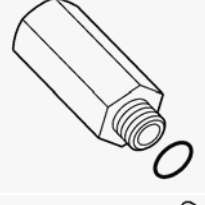
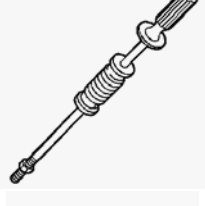
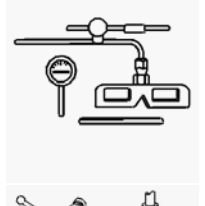
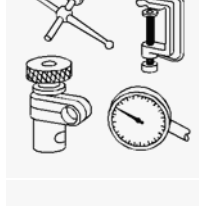
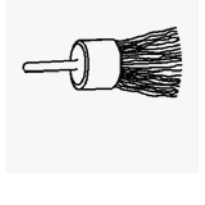
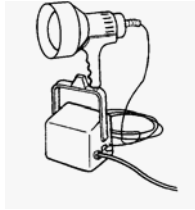
Illustration	Tool Number/Description
	EN 46121 Connecting Rod Guide Pin Set
	EN 46122 Camshaft Position Actuator Check-Ball Valve Remover/Installer
	EN 46745 J 43654 Piston Pin Clip Remover/Installer
	EN 47839 Crankshaft Rear Oil Seal Installation Tool
	EN 47909 Injector Bore and Sleeve Cleaning Kit
	EN 47971 Oil Pressure Gauge Adapter
	EN 48313 Timing Chain Retention Tool
	EN 48383 Camshaft Retaining Tools

Illustration	Tool Number/Description
	EN 48589-A Crankshaft Rotation Socket
	EN 49102 J 41818 J 41818 & EN 47985 Crankshaft Bearing Cap Remover
	EN 49982 Timing Chain Retainer
	EN 50789 Oil Pressure Adapter Fitting
	GE 6125-1B J 6125-1B KM J-7004 Slide Hammer with Adapter
	GE 7872 J 7872 Magnetic Base Dial Indicator
	GE 8001 J 8001 MKM 571-B Dial Indicator Set
	GE 8358 J 8358 Carbon Removal Brush

Illustration

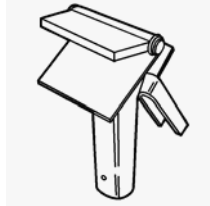


Tool Number/Description

GE 28428-E

J 28428-E

High Intensity Black Light Kit



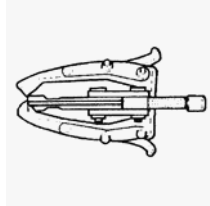
GE 48326

Sealant Dispenser



J 33169

Clutch Alignment Arbor



J 41816

Crankshaft Balancer Remover

2013 Chevrolet Colorado

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

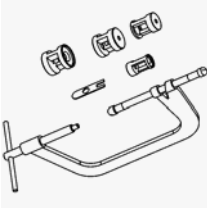
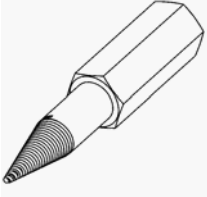
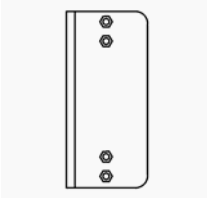
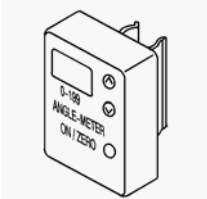
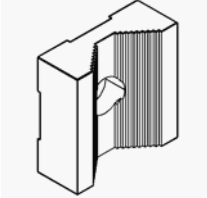
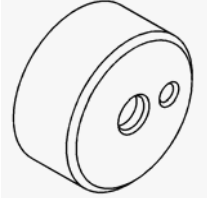
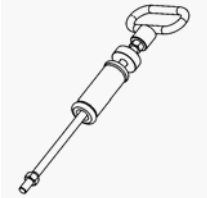
Illustration	Tool Number/Description
	EN-70006798 7-0006798 Valve Spring Compressor
	7-0006832 Camshaft Front Oil Seal Remover
	EN-9806539 Holding Fixture
	EN-45059 J 45059 KM-470-B Angle Meter South America and Thailand— Use Local Equivalent
	EN-8606014 J 8606014 Support Base to Remove Piston Pin
	J-810619 Camshaft Front Oil Seal Installer
	M 68770 Camshaft Front Oil Seal Remover

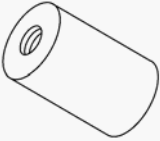
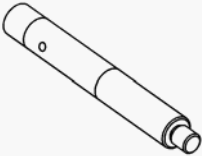
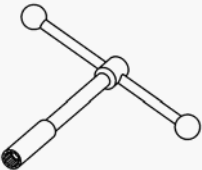
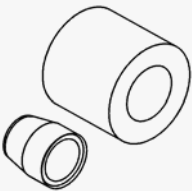
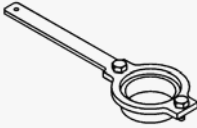
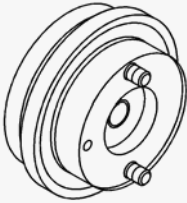
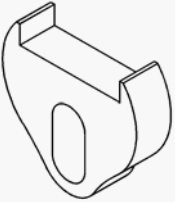
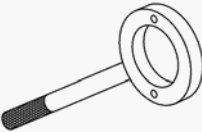
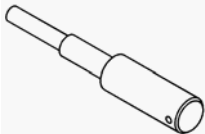
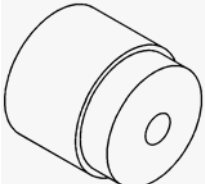
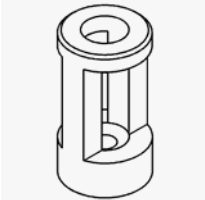
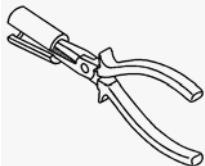
Illustration	Tool Number/Description
	DT-9806680 T-9806680 Piston Pin Remover and Installer
	EN-840911-A M 840911-A Universal Handle
	EN-730651 Spark Plug Wrench
	J-810604 Crankshaft Front Seal Installer
	S-0206909 Wrench for Blocking the Engine Pulley
	3-0006775 Rear Main Seal Installer
	EN-0206978 S-0206978 Flywheel Lock
	3-0006772 Sprocket Holder

Illustration	Tool Number/Description
	EN-9806681 T 9806681 Connecting Rod Guide
	J-05824-A S-9407183 Alignment Tool
	X-0206747 Engine Seal Installer
	X-0206951 Device for Holding the Engine and the Transmission
	EN-606050 X-0606050 Valve Spring Remover/Installer Use with EN-70006798
	EN-50889 X-0606051 Valve Seals Removal Pliers
	X-606052 Valve Seal Installer

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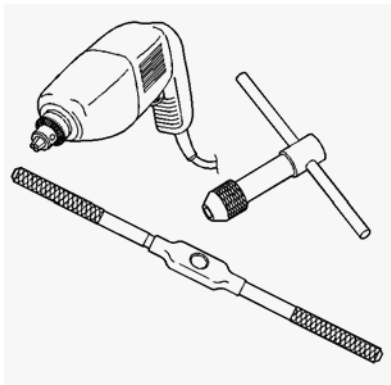
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Special Tools

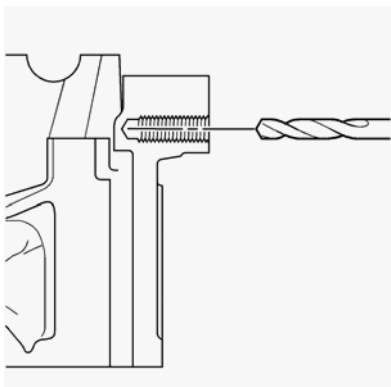
- EN 42385-700 High Feature Thread Repair Kit
- EN 42385-2000 Thread Insert Kit
- EN 43965 Thread Repair Extension Kit

For equivalent regional tools, refer to Special Tools.

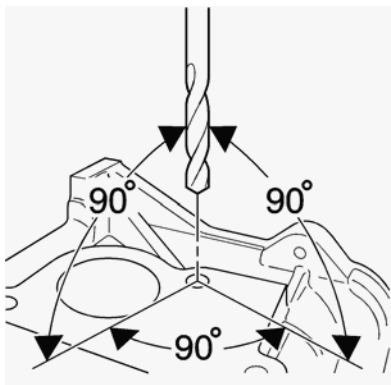
The thread repair process involves a solid, thin walled, self-locking, carbon steel, bushing type insert. During the insert installation process, the installation driver tool cold-rolls the bottom internal threads and expands the bottom external threads of the insert into the base material. This action mechanically locks the insert into place.



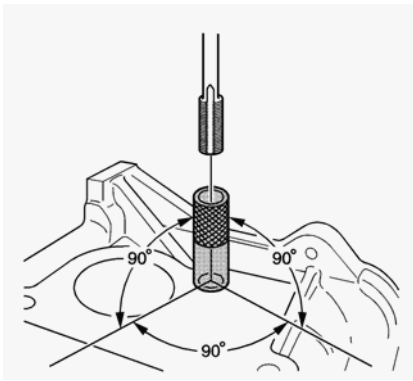
The drill bit and counter bore tool from the tool kit EN 42385-700 kit and EN 42385-2000 insert kit is designed for use with either a suitable tap wrench or drill motor. Limited access and larger hole repair may process better using a tap wrench. An extension from kit EN 43965 extension kit may also be necessary to drive the thread repair tooling dependent on access to the hole being repaired. Use only a tap wrench when tapping the hole and during installation of the insert.



It is critical that the drilling, counterboring and tapping of the hole to be repaired follows the same centerline as the original hole.



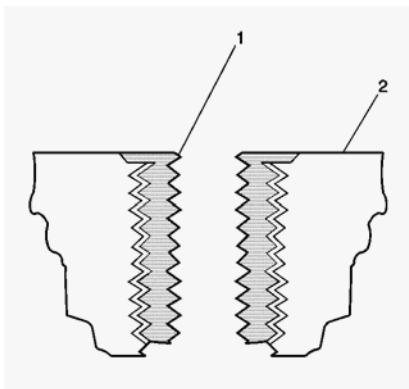
During the drilling and tapping of the hole being repaired ensure the tooling is consistently machining perpendicular to the surface of the base material.



If the threaded hole being repaired has a base surface perpendicular to the hole centerline, tapping guides are available to aid in tapping the hole.

Tap Size	Tap Guide	Tap Size	Tap Guide	Tap Size	Tap Guide
—	EN 42385-	—	EN 42385-	—	EN 42385-
6 x 1.0	729	10 x 1.5	731	14 x 1.5	736
8 x 1.25	730	12 x 1.5	732	20 x 1.5	737

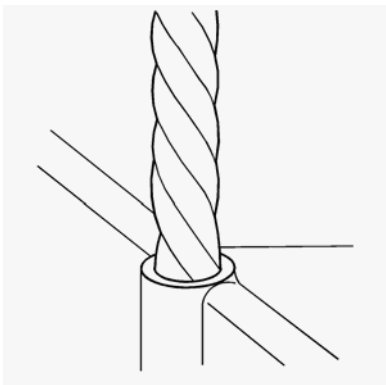
[Standard Thread Repair – Flush Hole](#)



Warning: Refer to Safety Glasses Warning.

Note: The use of a cutting type fluid GM P/N 1052864, (Canadian P/N 992881), WD 40® or equivalent is recommended when performing the drilling, counterboring and tapping procedures.

When installed to the proper depth, the flange (1) of the insert will be seated against the counterbore of the drilled/tapped hole and just below the surface (2) of the base material.



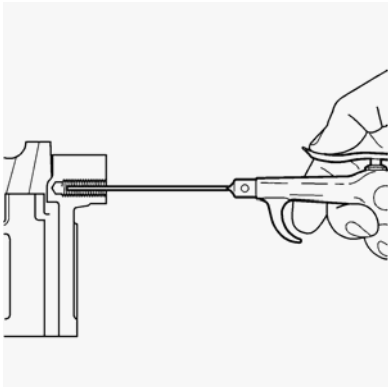
Note:

- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
- Do NOT drill any further than the original hole depth.

1. Drill out the threads of the damaged hole.

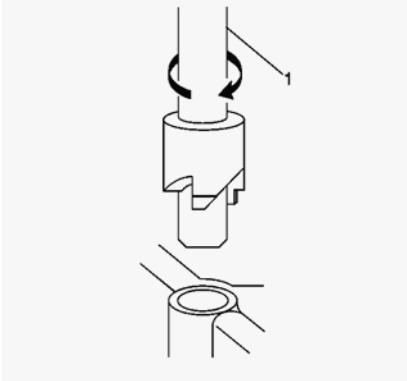
Specifications

- M6 inserts require a minimum drill depth of 15 mm (0.59 in).
- M8 inserts require a minimum drill depth of 20 mm (0.79 in).
- M10 inserts require a minimum drill depth of 23.5 mm (0.93 in).



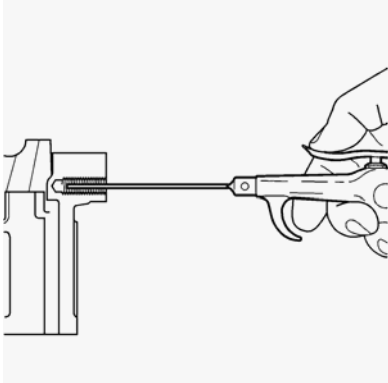
Note: All chips must be removed from the drilled hole prior to tapping.

2. Using compressed air, clean out any chips.



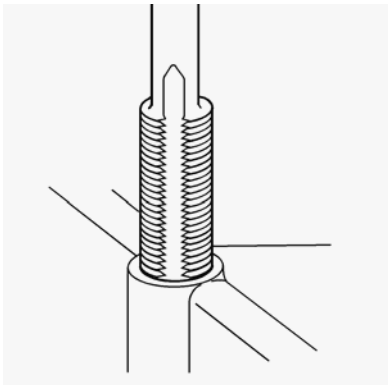
Note: A properly counterbored hole will show a slight burnishing on the surface of the base material for 360 degrees around the drilled hole.

3. Counterbore the drilled hole to the full depth permitted by the tool (1).



Note: All chips must be removed from the drilled hole prior to tapping.

4. Using compressed air, clean out any chips.

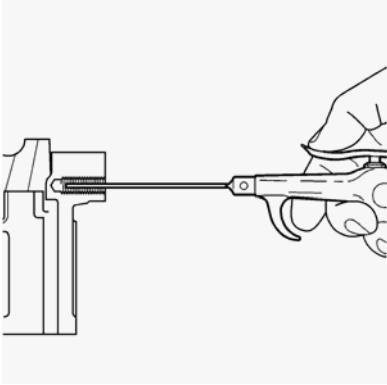


Note:

- During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.
 - Ensure the tap has created full threads at least to the depth equal to the insert length.
5. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

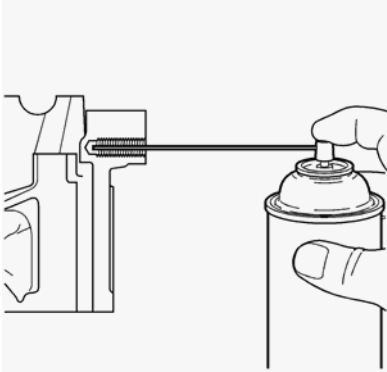
Specifications

- M6 inserts require a minimum tap depth of 15 mm (0.59 in).
- M8 inserts require a minimum tap depth of 20 mm (0.79 in).
- M10 inserts require a minimum tap depth of 23.5 mm (0.93 in).

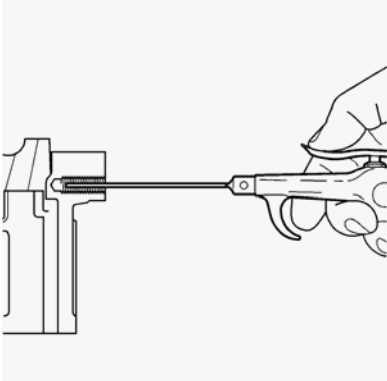


Note: All chips must be removed from the tapped hole prior to insert installation.

6. Using compressed air, clean out any chips.

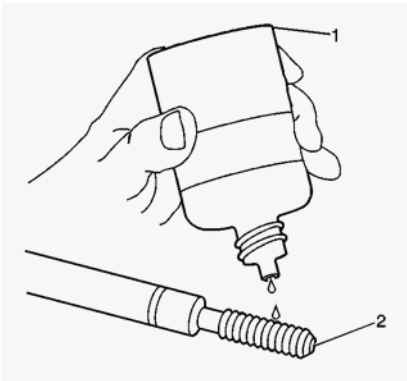


7. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



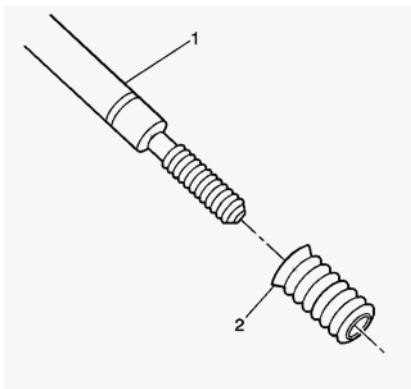
Note: All chips must be removed from the tapped hole prior to insert installation.

8. Using compressed air, clean out any chips.

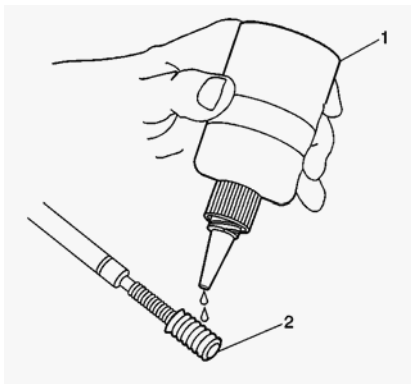


Note: Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

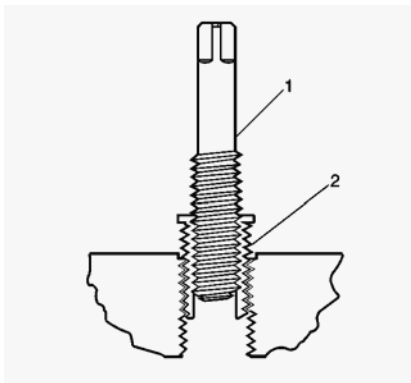
9. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



10. Install the insert (2) onto the driver installation tool (1).



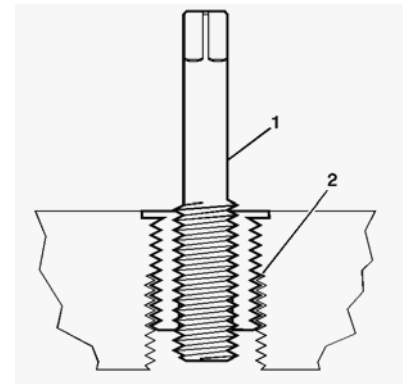
11. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277® or equivalent (1) to the insert OD threads (2).



12. Install the insert (2) into the tapped hole by hand only.

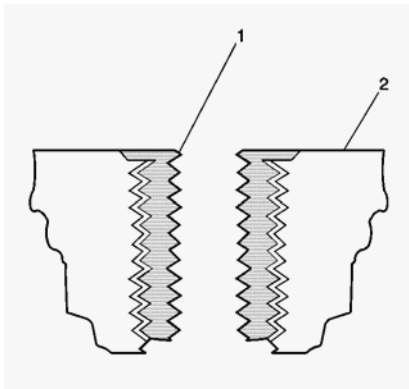
Note: If the insert will not thread down until the flange contacts the counterbored surface, remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

13. Install the insert until the flange (2) of the insert contacts the counterbored surface.

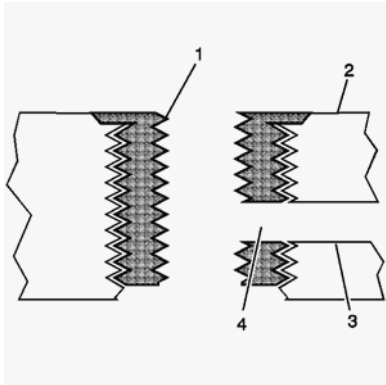


Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

14. Continue to rotate the driver installation tool (1) through the insert (2).

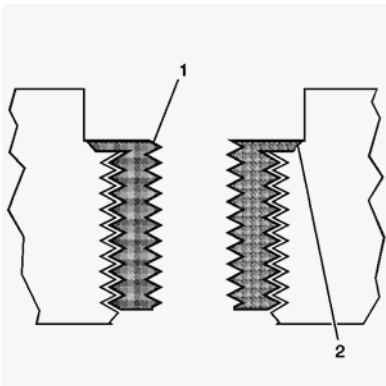


15. Inspect the insert for proper installation into the tapped hole. A properly installed insert (1) will be either flush or slightly below flush with the surface of the base material (2).



16. Any installed insert that restricts or blocks an oil or engine coolant passage (3) will need to have the oil or engine coolant passage drilled out (4) to the original size of the oil or engine coolant passage. After drilling the restriction or blockage, clean out any chips and thread the installation driver tool through the insert again to remove any burrs caused by the drilling of the oil or engine coolant passage.

Recessed Thread Repair

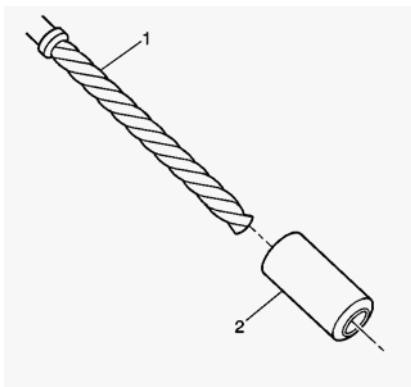


Warning: Refer to Safety Glasses Warning.

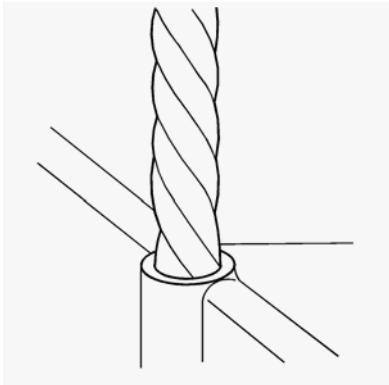
Note:

- The use of a cutting type fluid GM P/N 1052864, (Canadian P/N 992881), WD 40® or equivalent is recommended when performing the drilling, counterboring and tapping procedures.
- Do NOT remove the original stop collar from a counterbore drill.

When installed to the proper depth, the flange of the insert (1) will be seated against the counterbore (2) of the drilled/tapped hole.

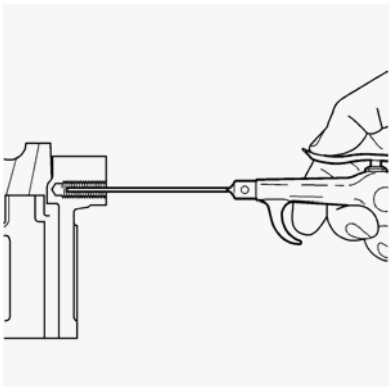


1. Install a stop collar (2) on the counterbore drill (1), if required.



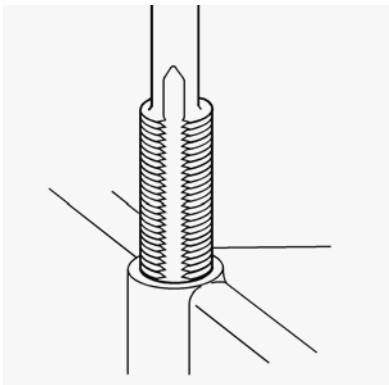
Note:

- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
 - Drill the hole until the stop collar contacts the surface of the base material.
2. Drill out the threads of the damaged hole.



Note: All chips must be removed from the drilled hole prior to tapping.

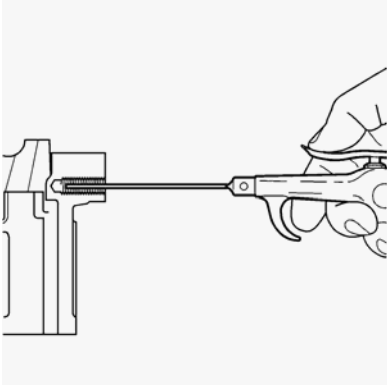
3. Using compressed air, clean out any chips.



Note:

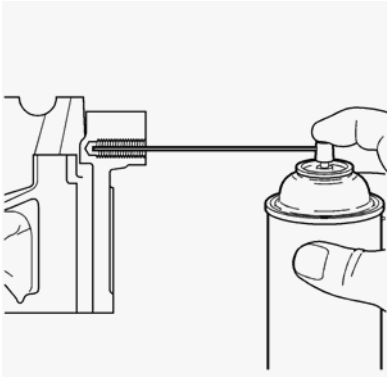
- During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.

- Ensure the tap has created full threads at least to the depth equal to the insert length.
4. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

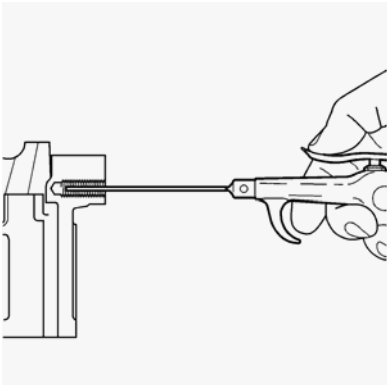


Note: All chips must be removed from the tapped hole prior to insert installation.

5. Using compressed air, clean out any chips.

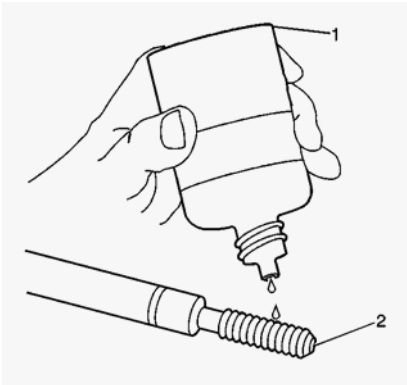


6. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



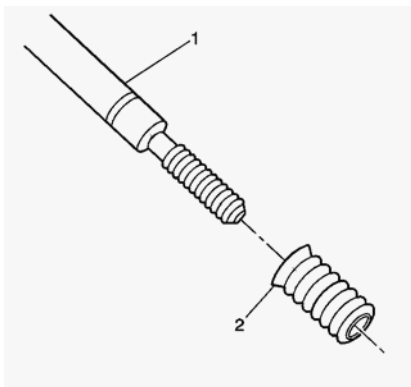
Note: All chips must be removed from the tapped hole prior to insert installation.

7. Using compressed air, clean out any chips.

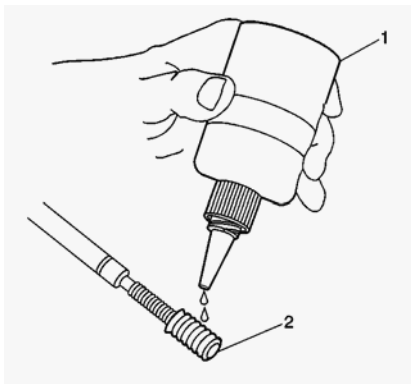


Note: Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

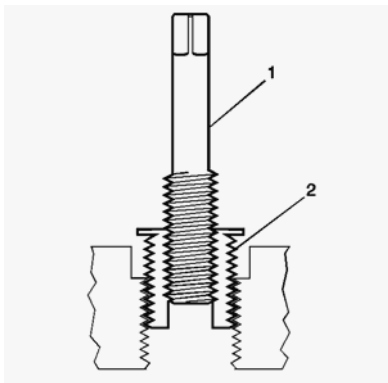
8. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



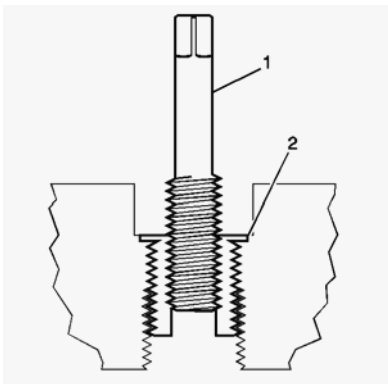
9. Install the insert (2) onto the driver installation tool (1).



10. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277® or equivalent (1) to the insert OD threads (2).

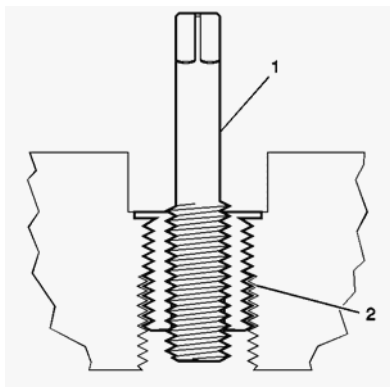


11. Install the insert (2) into the tapped hole by hand only.



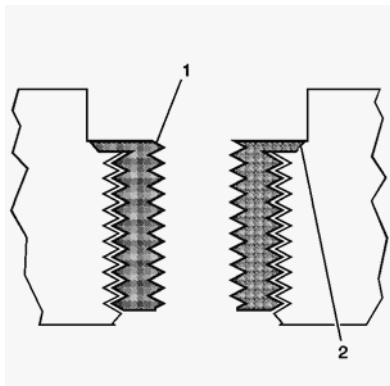
Note: If the insert will not thread down until the flange contacts the counterbored surface remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

12. Install the insert until the flange (2) of the insert contacts the counterbored surface.

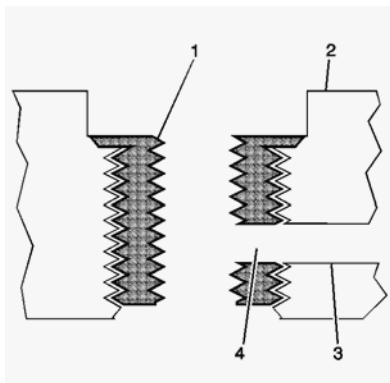


Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

13. Continue to rotate the driver installation tool (1) through the insert (2).



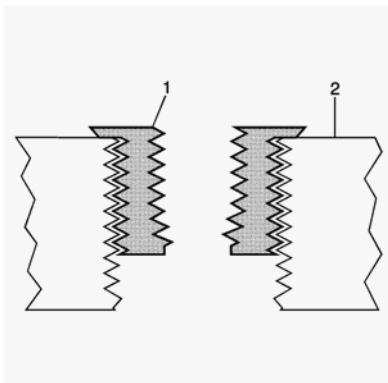
14. Inspect the insert (1) for proper installation (2) into the tapped hole.



15. Any installed insert that restricts or blocks an oil or engine coolant passage (3) will need to have the oil or engine coolant passage drilled out (4) to the original size of the oil or engine coolant passage. After drilling the restriction or blockage, clean out any chips and thread the installation driver tool through the insert again to remove any burrs caused by the drilling of the oil or engine coolant passage.

[Tapered Pipe Thread Repair](#)

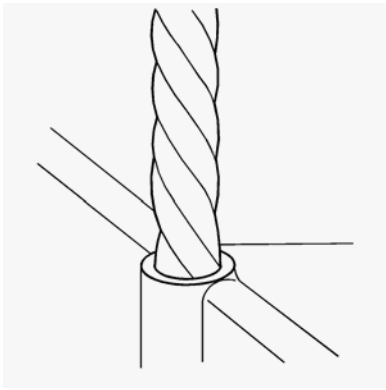
The thread repair insert for tapered pipe threads is coated with a clear silver zinc coating.



Warning: Refer to Safety Glasses Warning.

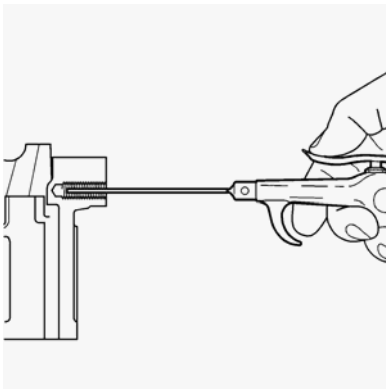
Note: The use of a cutting type fluid GM P/N 1052864, (Canadian P/N 992881), WD 40® or equivalent is recommended when performing the drilling, counterboring and tapping procedures.

When installed to the proper depth, the flange (1) of the insert will be seated against surface (2) of the base material of the drilled/tapped hole.



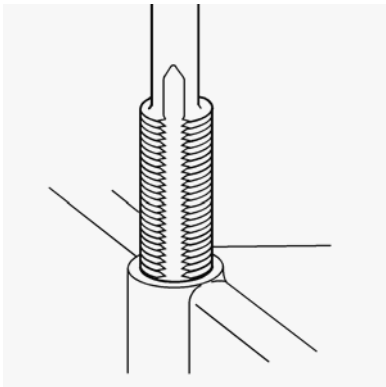
Note:

- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
 - Drill the hole until the stop collar contacts the surface of the base material.
1. Drill out the threads of the damaged hole.



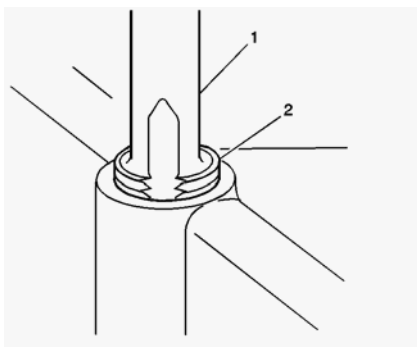
Note: All chips must be removed from the drilled hole prior to tapping.

2. Using compressed air, clean out any chips.

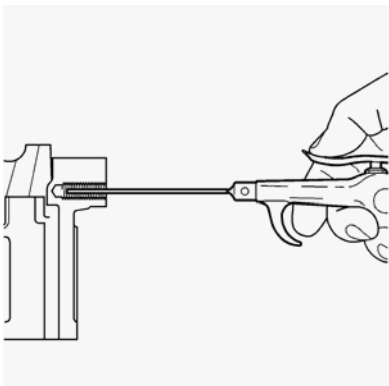


Note:

- During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.
 - Ensure the tap has created full threads at least to the depth equal to the insert length.
3. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

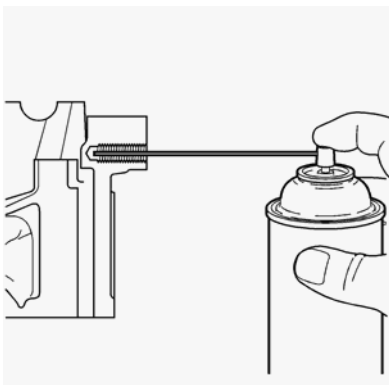


4. Tap the drilled hole until the threads at the top of the tap (2) are down to the surface of the base material.

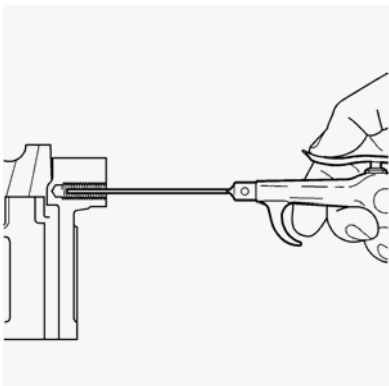


Note: All chips must be removed from the tapped hole prior to insert installation.

5. Using compressed air, clean out any chips.

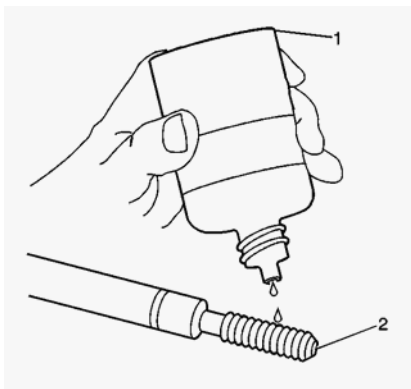


6. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



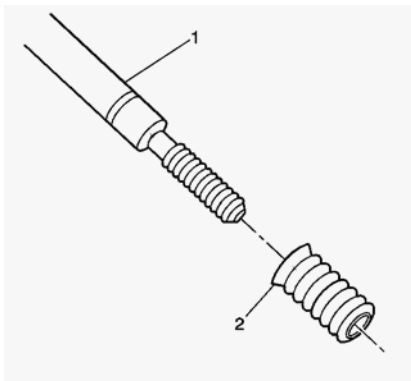
Note: All chips must be removed from the tapped hole prior to insert installation.

7. Using compressed air, clean out any chips.

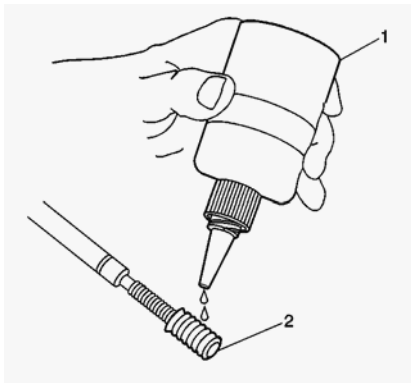


Note: Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

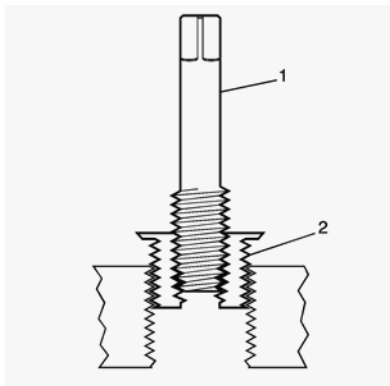
8. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



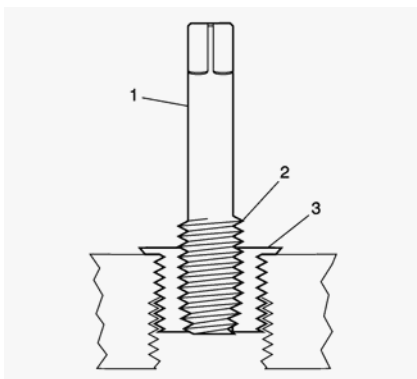
9. Install the insert (2) onto the driver installation tool (1).



10. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277® or equivalent (1) to the insert OD threads (2).



11. Install the insert (2) into the tapped hole by hand only.

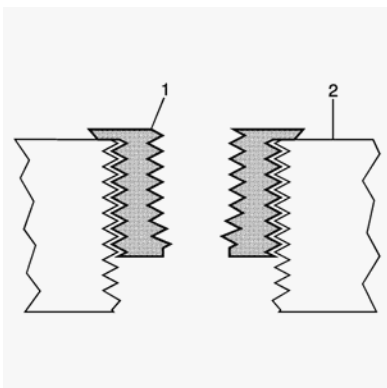


Note: If the insert will not thread down until the flange contacts the surface of the base material remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

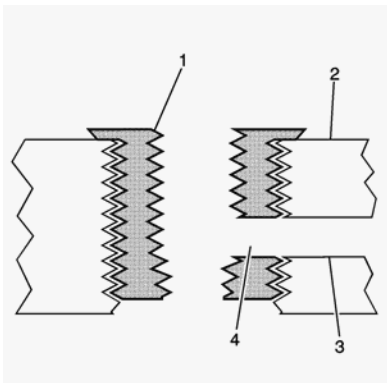
12. Install the insert until the flange of the insert (3) contacts the surface of the base material.

Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

13. Continue to rotate the driver installation tool (1) until the top of the threaded section (2) is level with the top of the insert (3).



14. Inspect the insert (1) for proper installation (2) into the tapped hole.



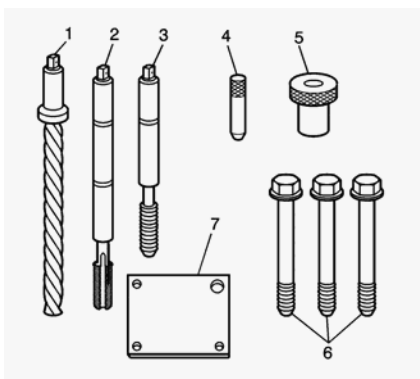
15. Any installed insert that restricts or blocks an oil or engine coolant passage (3) will need to have the oil or engine coolant passage drilled out (4) to the original size of the oil or engine coolant passage. After drilling the restriction or blockage, clean out any chips and thread the installation driver tool through the insert again to remove any burrs caused by the drilling of the oil or engine coolant passage.

Cylinder Head Bolt Hole Thread Repair

Special Tools

- EN 42385-700 High Feature Thread Repair Kit
- EN 42385-2000 Thread Insert Kit

For equivalent regional tools, refer to Special Tools.



The cylinder head bolt hole thread repair tooling are in the kits *EN 42385-2000* insert kit and *EN 42385-700* kit . The cylinder head bolt hole thread repair components consist of the following:

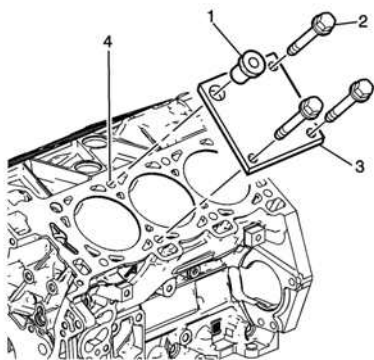
- EN 42385-723 Drill (1)
- EN 42385-724 Tap (2)
- EN 42385-725 Installation driver (3)
- EN 42385-303 Alignment pin (4)
- EN 42385-302 Bushing (5)
- EN 42385-733 Bolts (6)
- EN 42385-401 Fixture plate (7)

Warning: Refer to Safety Glasses Warning.

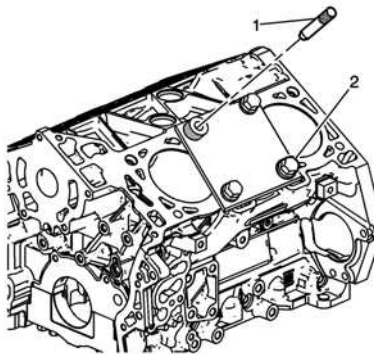
Note:

- Remove the fixture plate prior to installing the insert with the installer tool.
- The use of a cutting type fluid GM P/N 1052864 (Canadian P/N 992881) WD 40®; or equivalent is recommended when performing the drilling, counterboring and tapping procedures.

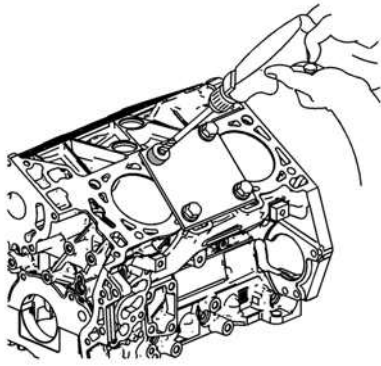
When installed to the proper depth, the flange of the insert will be seated against the counterbore of the drilled/tapped hole.



1. Position the fixture plate (3) with the bushing (1) installed over the cylinder head bolt hole to be repaired (4).
2. Loosely install the fixture plate bolts (2) into the remaining cylinder head bolt holes.

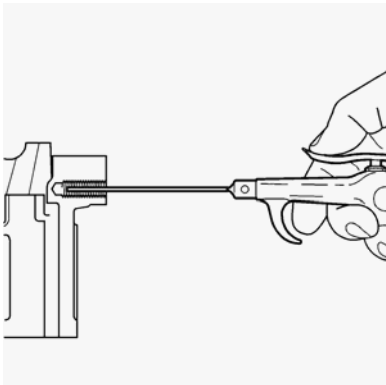


3. Position the alignment pin (1) through the bushing and into the cylinder head bolt hole.
4. With the alignment pin in the desired cylinder head bolt hole, tighten the fixture retaining bolts (2).
5. Remove the alignment pin (1) from the cylinder head bolt hole.



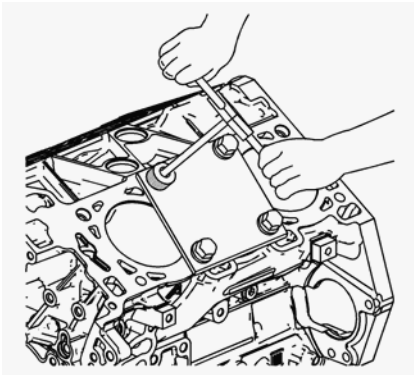
Note:

- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
 - Drill the hole until the stop collar contacts the top of the drill bushing.
6. Drill out the threads of the damaged hole.



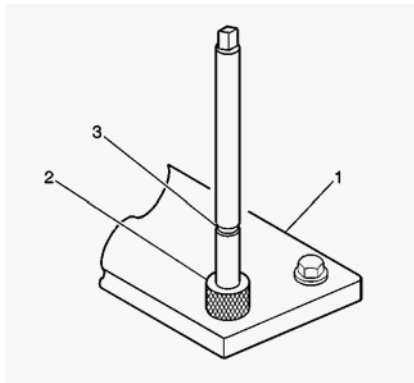
Note: All chips must be removed from the drilled hole prior to tapping.

7. Using compressed air, clean out any chips.

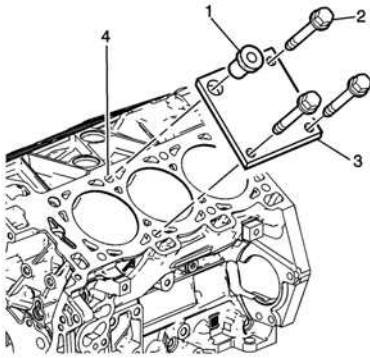


Note:

- During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.
 - Ensure the tap has created full threads at least to the depth equal to the insert length.
8. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

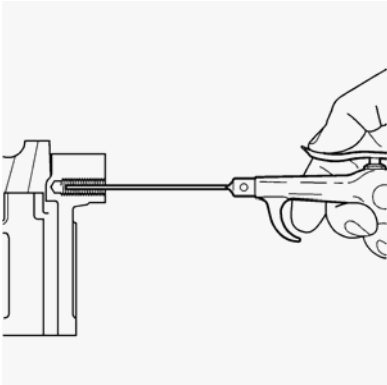


9. In order to tap the new threads for the insert to the proper depth, rotate the tap into the cylinder head bolt hole until the mark (3) on the tap aligns with the top of the drill bushing (2).



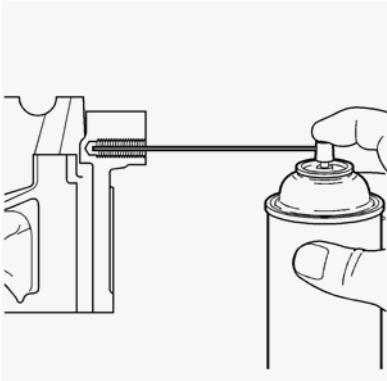
Note: Remove the fixture plate prior to installing the insert with the installer tool.

10. Remove the fixture plate bolts (2).
11. Remove the fixture plate (3) and bushing (1).

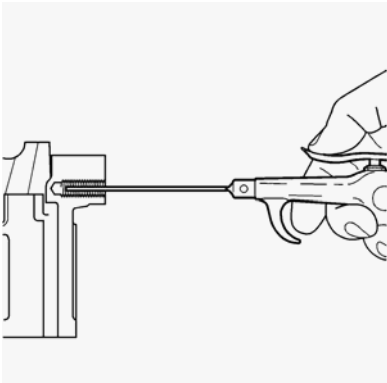


Note: All chips must be removed from the tapped hole prior to insert installation.

12. Using compressed air, clean out any chips.

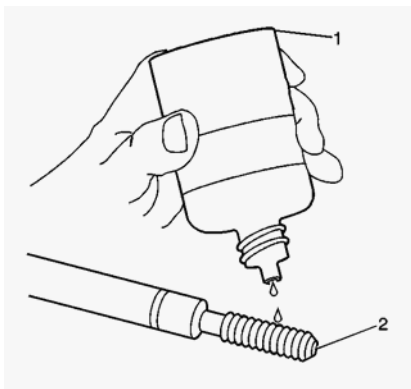


13. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



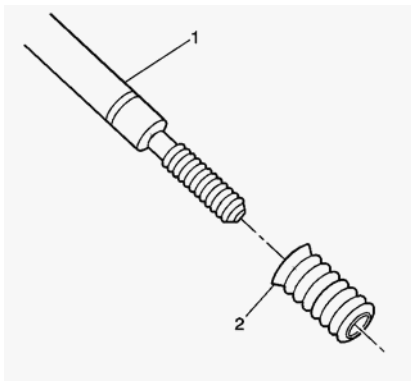
Note: All chips must be removed from the tapped hole prior to insert installation.

14. Using compressed air, clean out any chips.

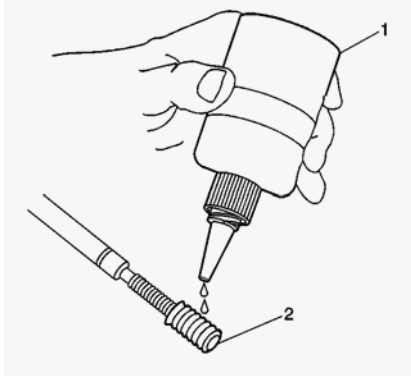


Note: Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

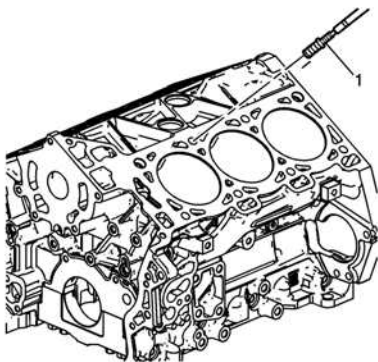
15. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



16. Install the insert (2) onto the driver installation tool (1).



17. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277®; or equivalent (1) to the insert OD threads (2).



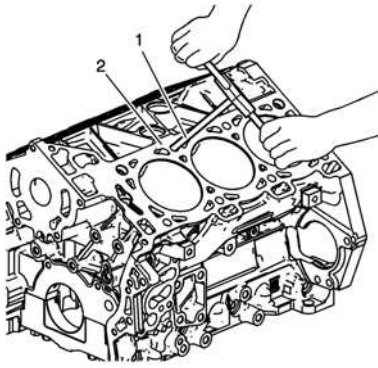
18. Install the insert and installation driver (1) into the tapped hole by hand only.
19. Start the insert into the threaded hole.

Note: If the insert will not thread down until the flange contacts the counterbored surface remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

20. Install the insert until the flange of the insert contacts the counterbored surface.

Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

21. Continue to rotate the driver installation tool through the insert.



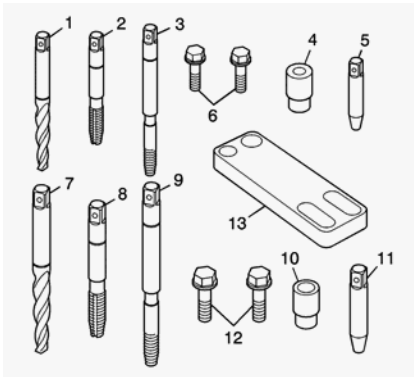
22. In order to completely form the new threads in the insert, rotate the driver installation tool through the insert until the mark (1) on the driver installation tool aligns with the surface of the engine block deck (2).
23. Inspect the insert for proper installation into the tapped hole.

Crankshaft Main Bolt Hole Thread Repair

Special Tools

- EN 42385-700 High Feature Thread Repair Kit
- EN 42385-2000 Thread Insert Kit

For equivalent regional tools, refer to Special Tools.



Note:

- In order to repair some crankshaft main bolt holes it will be necessary to mount the fixture plate upside down.
- Do NOT remove the fixture plate prior to installing the insert with the installation driver. The fixture plate remains in position throughout the thread repair process.

The crankshaft main bearing bolt hole thread repair tooling are in the kits EN 42385-2000 insert kit and EN 42385-700 kit. The crankshaft main bearing bolt hole thread repair components consist of the following:

- EN 42385-702 Drill (1) for outboard holes
- EN 42385-703 Tap (2) for outboard holes
- EN 42385-704 Installation driver (3) for outboard holes
- EN 42385-726 Bushing (4) for outboard holes
- EN 42385-727 Alignment pin (5) for outboard holes
- EN 42385-728 Bolts (6) for outboard holes
- EN 42385-720 Drill (7) for inboard holes
- EN 42385-721 Tap (8) for inboard holes
- EN 42385-722 Installation driver (9) for inboard holes
- EN 42385-713 Bushing (10)
- EN 42385-308 Alignment pin (11)
- EN 42385-734 Bolts (12)
- EN 42385-712 Fixture plate (13)

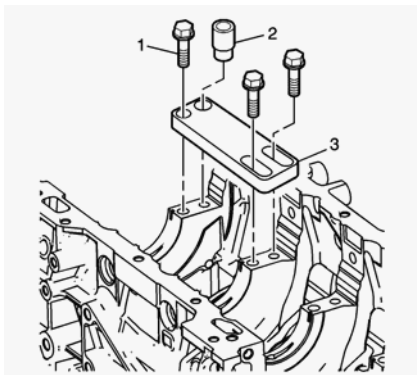
Outboard Bolt Holes

Warning: Refer to Safety Glasses Warning.

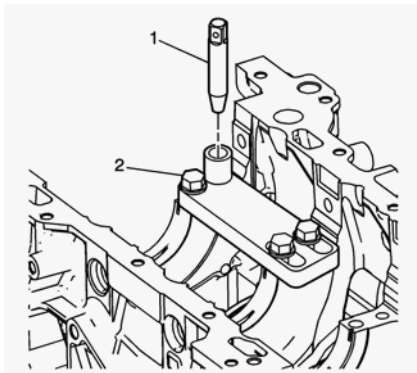
Note:

- Ensure the fixture plate is installed during the machining and installation processes of the insert.
- The use of a cutting type fluid GM P/N 1052864, (Canadian P/N 992881), WD 40® or equivalent is recommended when performing the drilling, counterboring and tapping procedures.

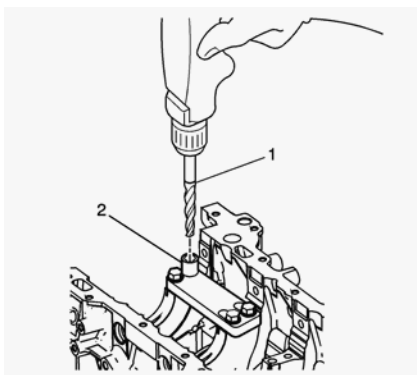
When installed to the proper depth, the flange of the insert will be seated against the counterbore of the drilled/tapped hole.



1. Position the fixture plate (3) with the bushing (2) installed over the crankshaft main cap bolt hole to be repaired.
2. Loosely install the fixture plate bolts (1) into the remaining crankshaft main cap bolt holes.



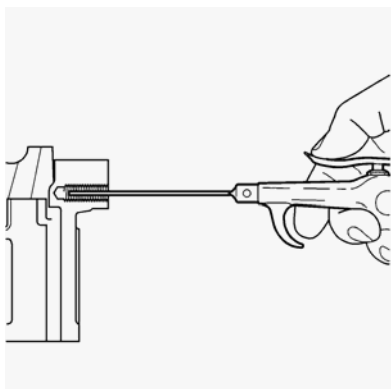
3. Position the alignment pin (1) through the bushing and into the crankshaft main cap bolt hole.
4. With the alignment pin in the desired crankshaft main cap bolt hole, tighten the fixture retaining bolts (2).
5. Remove the alignment pin (1) from the crankshaft main cap bolt hole.



Note:

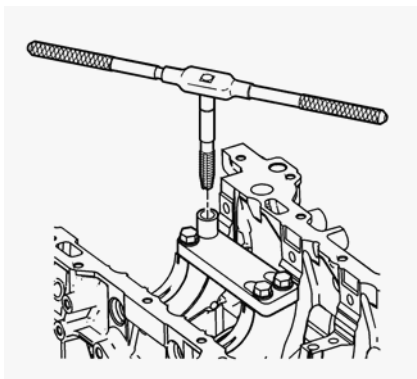
- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
- Drill the crankshaft main bolt hole until the mark (1) on the drill aligns with the top of the drill bushing (2).

6. Drill out the threads of the damaged hole.



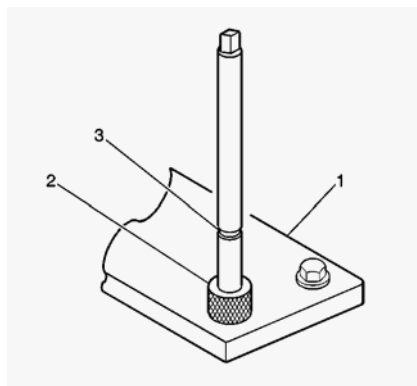
Note: All chips must be removed from the drilled hole prior to tapping.

7. Using compressed air, clean out any chips.

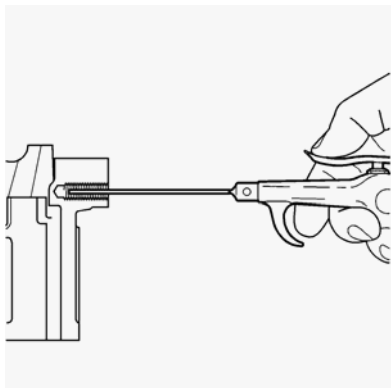


Note:

- Do not remove the fixture plate, ensure the fixture plate is installed during the machining and installation processes of the insert.
 - During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.
 - Ensure the tap has created full threads at least to the depth equal to the insert length.
8. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

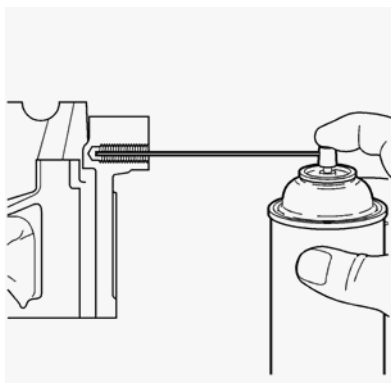


9. In order to tap the new threads for the insert to the proper depth, rotate the tap into the crankshaft main cap bolt hole until the mark (3) on the tap aligns with the top of the drill bushing (2).

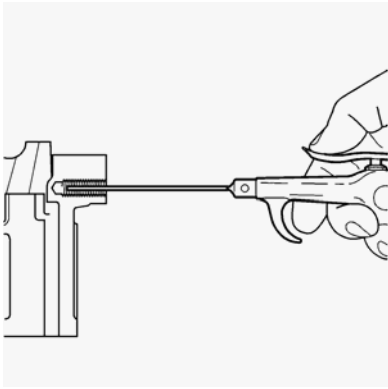


Note: All chips must be removed from the tapped hole prior to insert installation.

10. Using compressed air, clean out any chips.

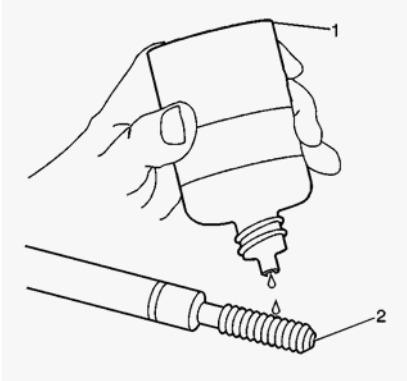


11. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



Note: All chips must be removed from the tapped hole prior to insert installation.

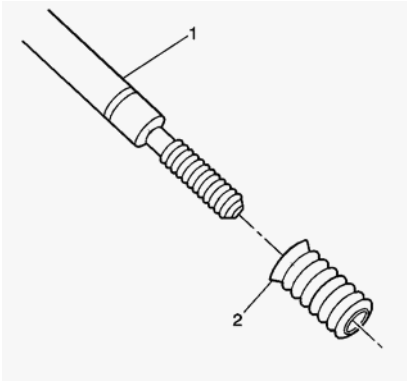
12. Using compressed air, clean out any chips.



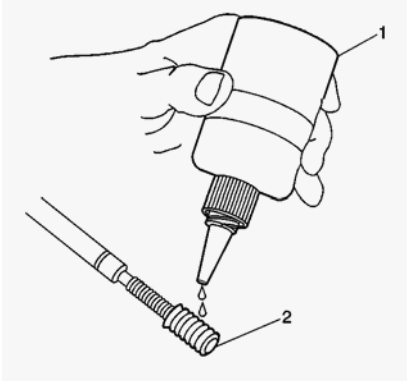
Note:

- Do not remove the fixture plate, ensure the fixture plate is installed during the installation process of the insert.
- Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

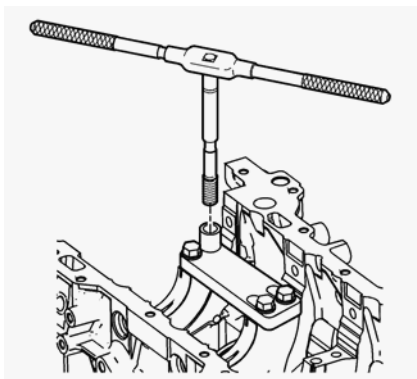
13. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



14. Install the insert (2) onto the driver installation tool (1).



15. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277®, or equivalent (1) to the insert OD threads (2).



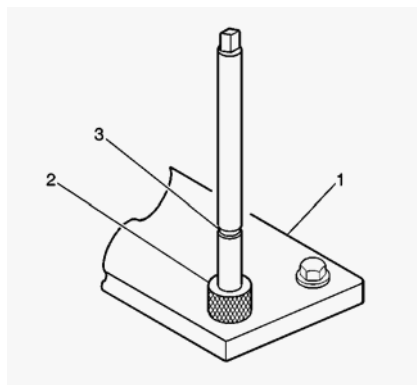
16. Install the insert and installation driver into the tapped hole by hand only.
17. Start the insert into the threaded hole.

Note: If the insert will not thread down until the flange contacts the counterbored surface remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

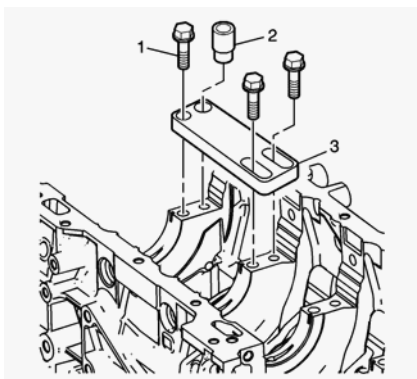
18. Install the insert until the flange of the insert contacts the counterbored surface.

Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

19. Continue to rotate the driver installation tool through the insert.



20. Rotate the driver installation tool until the mark (3) on the driver installation tool aligns with the top of the drill bushing (2).
21. Inspect the insert for proper installation into the tapped hole.



22. Remove the fixture plate bolts (1).
23. Remove the fixture plate (3) and bushing (2).

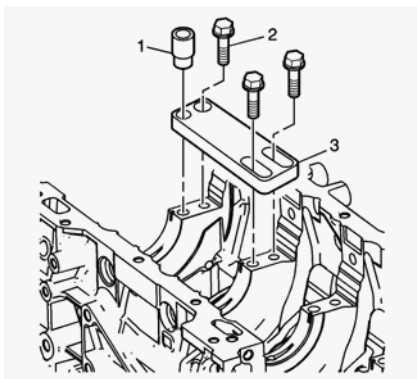
Inboard Bolt Holes

Warning: Refer to Safety Glasses Warning.

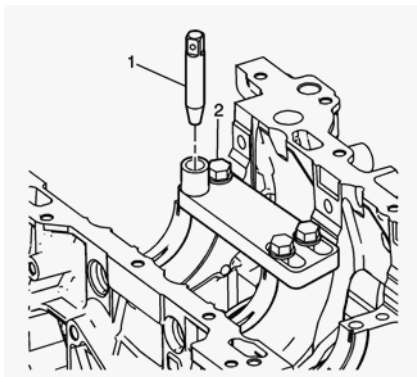
Note:

- Ensure the fixture plate is installed during the machining and installation processes of the insert.
- The use of a cutting type fluid GM P/N 1052864, (Canadian P/N 992881), WD 40® or equivalent is recommended when performing the drilling, counterboring and tapping procedures.

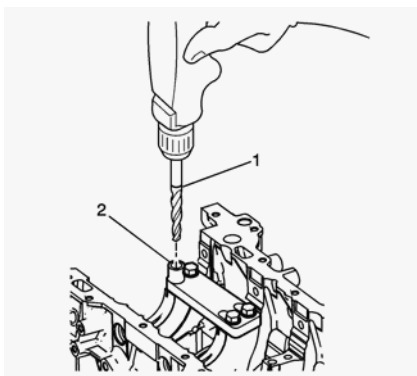
When installed to the proper depth, the flange of the insert will be seated against the counterbore of the drilled/tapped hole.



1. Position the fixture plate (3) with the bushing (1) installed over the crankshaft main cap bolt hole to be repaired.
2. Loosely install the fixture plate bolts (2) into the remaining crankshaft main cap bolt holes.

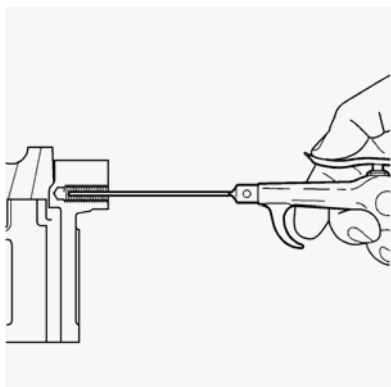


3. Position the alignment pin (1) through the bushing and into the crankshaft main cap bolt hole.
4. With the alignment pin in the desired crankshaft main cap bolt hole, tighten the fixture retaining bolts (2).
5. Remove the alignment pin (1) from the crankshaft main cap bolt hole.



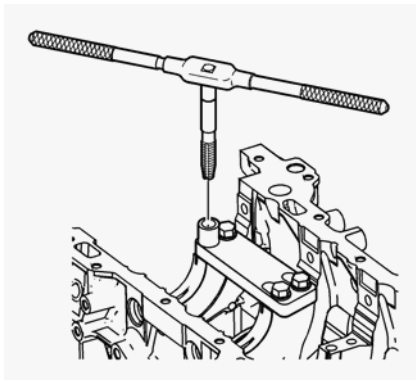
Note:

- During the drilling process, it is necessary to repeatedly remove the drill and clean chips from the hole and the flutes of the drill.
 - Drill the crankshaft main bolt hole until the mark (1) on the drill aligns with the top of the drill bushing (2).
6. Drill out the threads of the damaged hole.



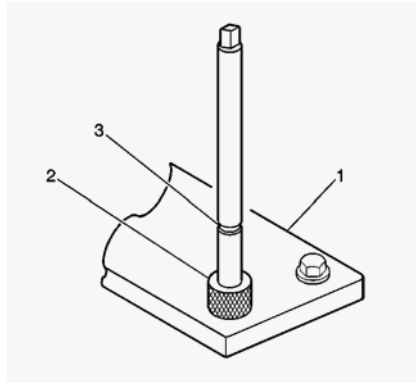
Note: All chips must be removed from the drilled hole prior to tapping.

7. Using compressed air, clean out any chips.

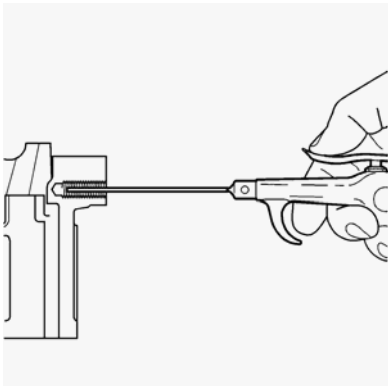


Note:

- Do not remove the fixture plate, ensure the fixture plate is installed during the machining and installation processes of the insert.
 - During the tapping process, it is necessary to repeatedly remove the tap and clean chips from the hole and the flutes of the tap.
 - Ensure the tap has created full threads at least to the depth equal to the insert length.
8. Using a suitable tapping wrench, tap the threads of the drilled hole by hand only.

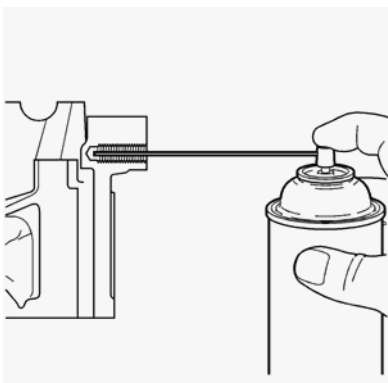


9. In order to tap the new threads for the insert to the proper depth, rotate the tap into the crankshaft main cap bolt hole until the mark (3) on the tap aligns with the top of the drill bushing (2).

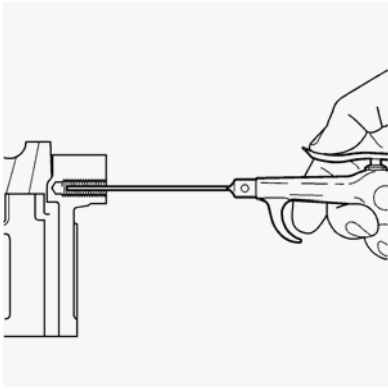


Note: All chips must be removed from the tapped hole prior to insert installation.

10. Using compressed air, clean out any chips.

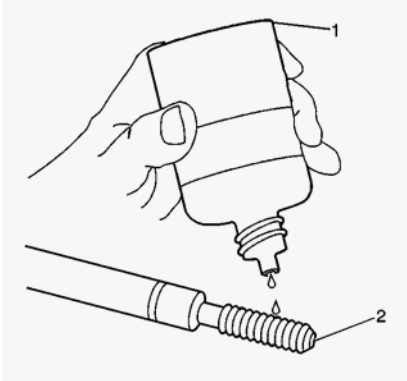


11. Spray cleaner GM P/N 12346139, GM P/N 12377981 (Canadian P/N 10953463) or equivalent into the tapped hole.



Note: All chips must be removed from the tapped hole prior to insert installation.

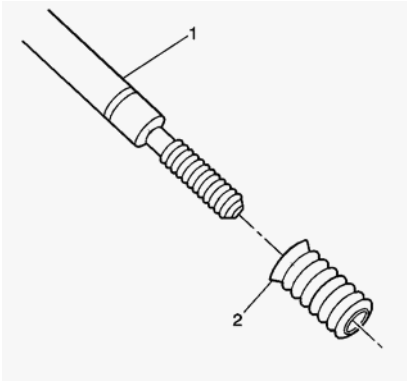
12. Using compressed air, clean out any chips.



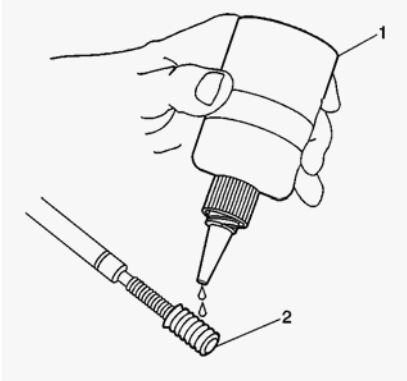
Note:

- Do not remove the fixture plate, ensure the fixture plate is installed during the installation process of the insert.
- Do not allow oil or other foreign material to contact the outside diameter (OD) of the insert.

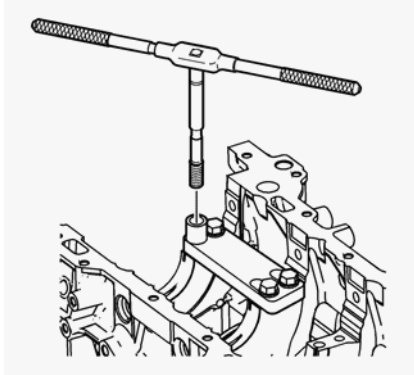
13. Lubricate the threads of the driver installation tool (2) with the EN 42385-110 (1).



14. Install the insert (2) onto the driver installation tool (1).



15. Apply threadlock sealant GM P/N 12345493, (Canadian P/N 10953488), EN 42385-109, LOCTITE 277®, or equivalent (1) to the insert OD threads (2).



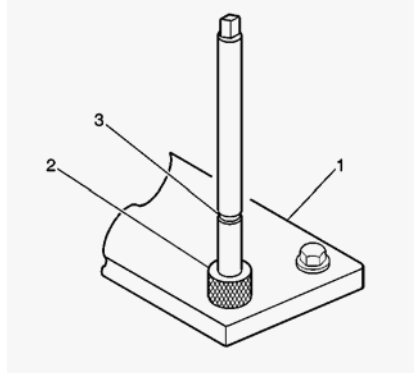
16. Install the insert and installation driver into the tapped hole by hand only.
17. Start the insert into the threaded hole.

Note: If the insert will not thread down until the flange contacts the counterbored surface remove the insert immediately with a screw extracting tool and inspect the tapped hole for any remaining chips and/or improper tapping.

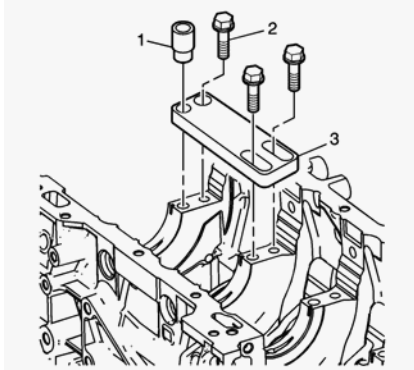
18. Install the insert until the flange of the insert contacts the counterbored surface.

Note: The driver installation tool will tighten up before screwing completely through the insert. This is acceptable. The threads at the bottom of the insert are being formed and the insert is mechanically locking the insert into the base material threads.

19. Continue to rotate the driver installation tool through the insert.



20. Rotate the driver installation tool until the mark (3) on the driver installation tool aligns with the top of the drill bushing (2).
21. Inspect the insert for proper installation into the tapped hole.



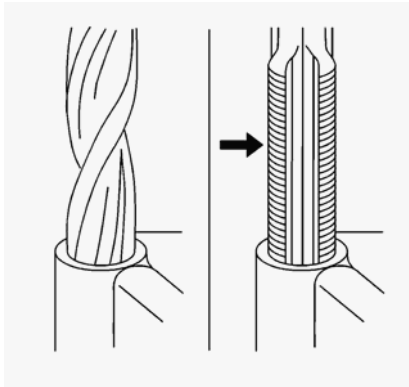
22. Remove the fixture plate bolts (2).
23. Remove the fixture plate (3) and bushing (1).

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:

General purpose thread repair kits are available commercially.

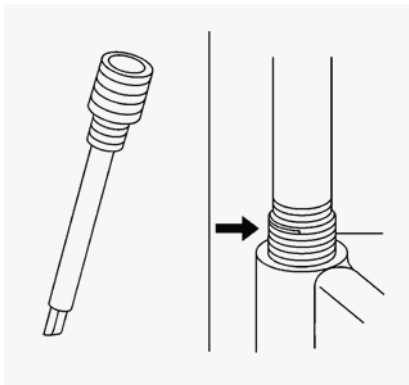


Warning: Refer to Safety Glasses Warning.

Note: Refer to the thread repair kit manufacturer's instructions regarding the size of the drill and which tap to use.

Always avoid any buildup of chips. Back out the tap every few turns and remove the chips.

1. Determine the size, the pitch, and the depth of the damaged thread.
2. Adjust the stop collars on the cutting tool as needed. Tap the stop collars to the required depth.
3. Drill out the damaged thread.
4. Remove the chips.
5. Apply clean engine oil to the top thread.
6. Use the tap in order to cut new thread.
7. Clean the thread.



8. Screw the thread insert onto the mandrel of the thread insert installer. Engage the tang of the thread insert onto the end of the mandrel.

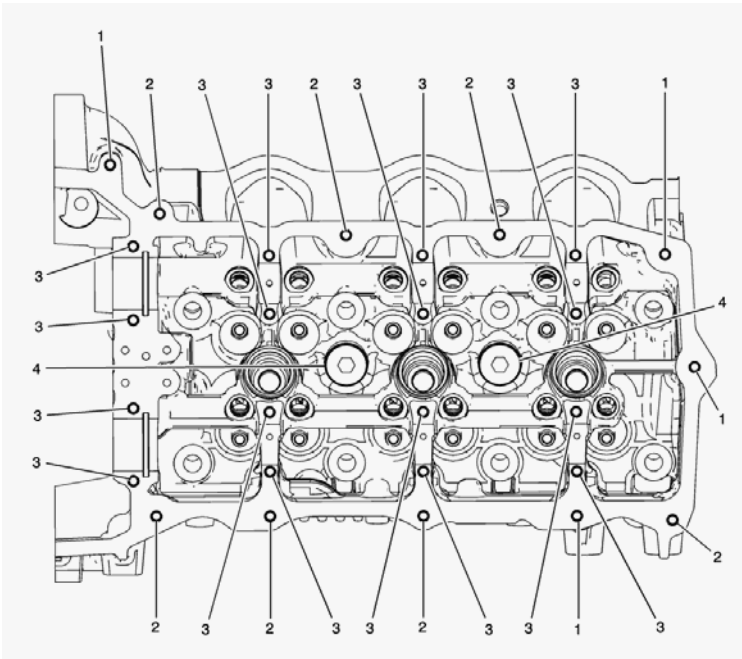
Note: The thread insert should be flush to 1 turn below the surface.

9. Lubricate the thread insert with clean engine oil – except when installing in aluminum – and install the thread insert.
10. If the tang of the thread insert does not break off when backing out the thread insert installer, break off the tang using a drift punch.

2013 Chevrolet Colorado

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

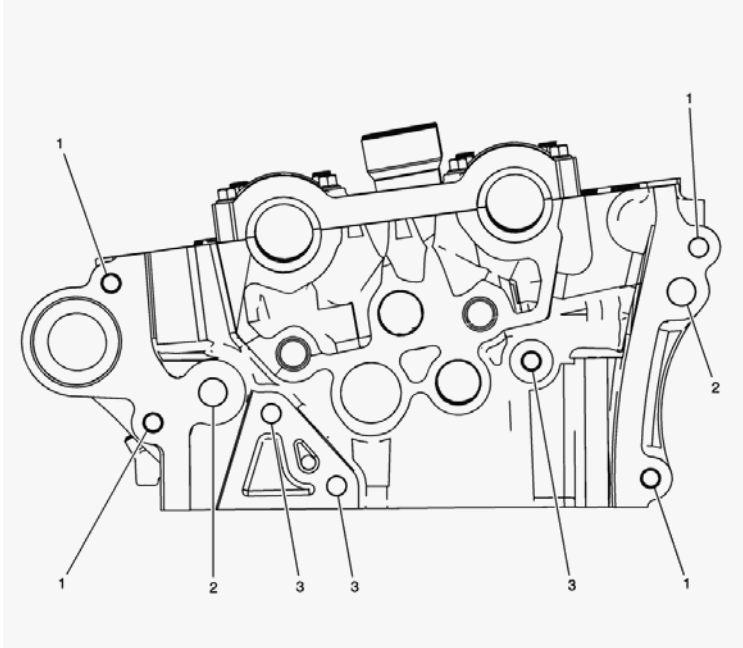
Left Cylinder Head Camshaft Cover Face



Left Cylinder Head Camshaft Cover Face

Hole Location	Thread Size	Drill	Counter Bore Tool					Drill Depth (Maximum)		Tap Depth (Minimum)	
				Stop Collar	Tap	Driver	Insert	MM	(IN)	MM	(IN)
J 42385-											
1	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087
2	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
3	M6 x 1.0	701	N/A	N/A	203	204	205	28.5	1.1220	24.0	0.9449
4	M20 x 1.5	715	716	N/A	717	718	719	25.0	0.9842	17.0	0.6693

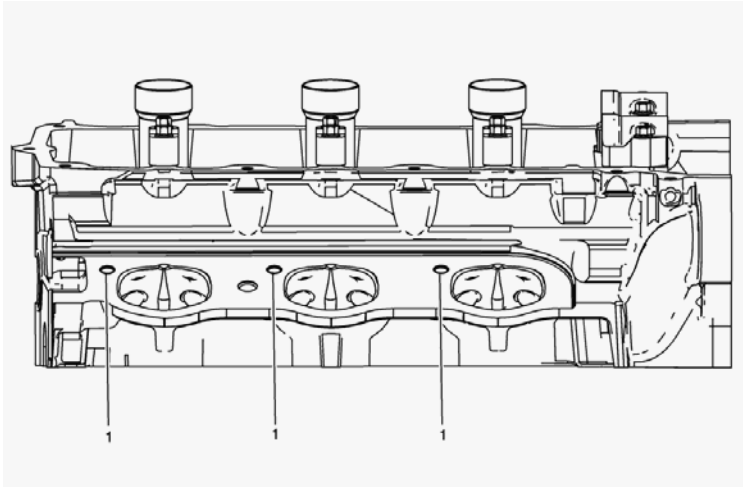
Left Cylinder Head Front Face



Left Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
2	M12 x 1.75	856	857	N/A	858	859	416	40.0	1.5748	32.5	1.2795
3	M8 x 1.25	206	207	N/A	208	209	210	18.0	0.7087	22.5	0.8858

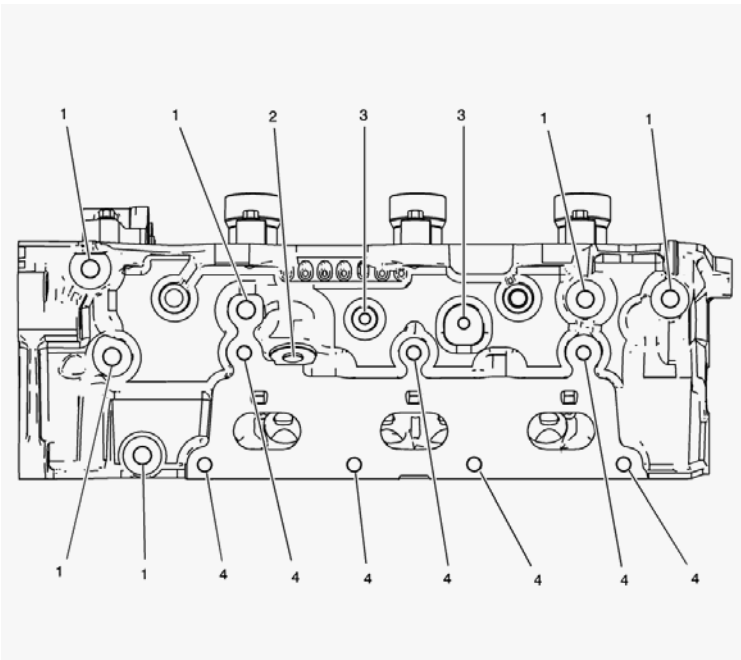
Left Cylinder Head Intake Face



Left Cylinder Head Intake Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								J 42385—	MM	(IN)	MM
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

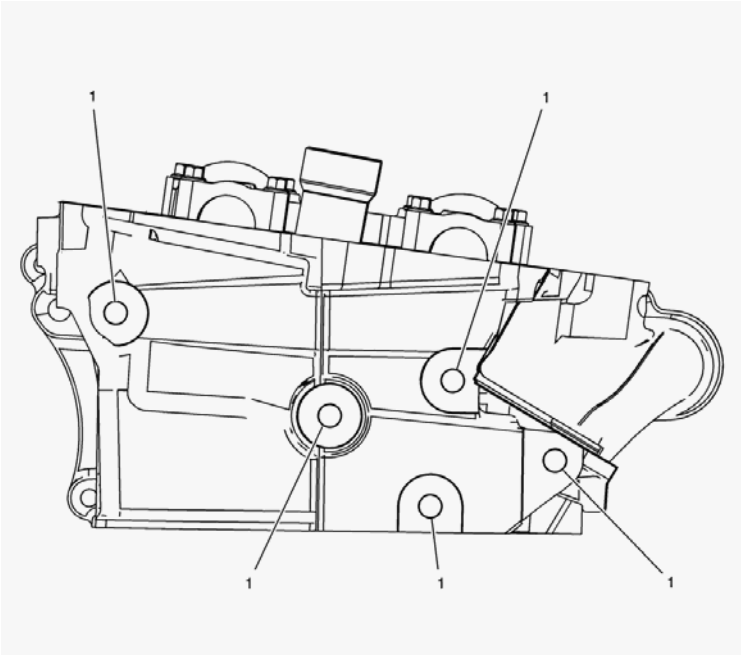
Left Cylinder Head Exhaust Face



Left Cylinder Head Exhaust Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630
2	M12 x 1.5	705	706	N/A	707	708	709	27.5	1.0827	13.0	0.5118
3	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.0000
4	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

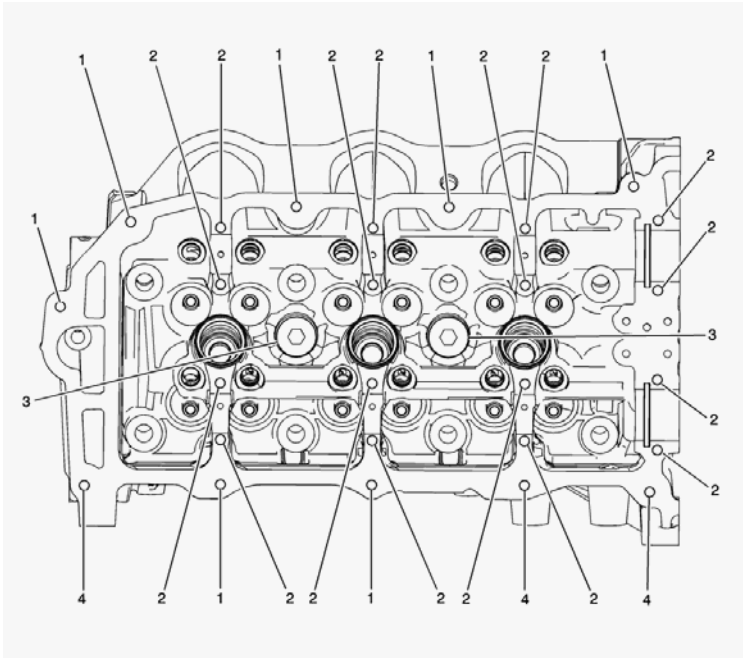
Left Cylinder Head Rear Face



Left Cylinder Head Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool					Drill Depth (Maximum)		Tap Depth (Minimum)	
				Stop Collar	Tap	Driver	Insert				
				J 42385-				MM	(IN)	MM	(IN)
1	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630

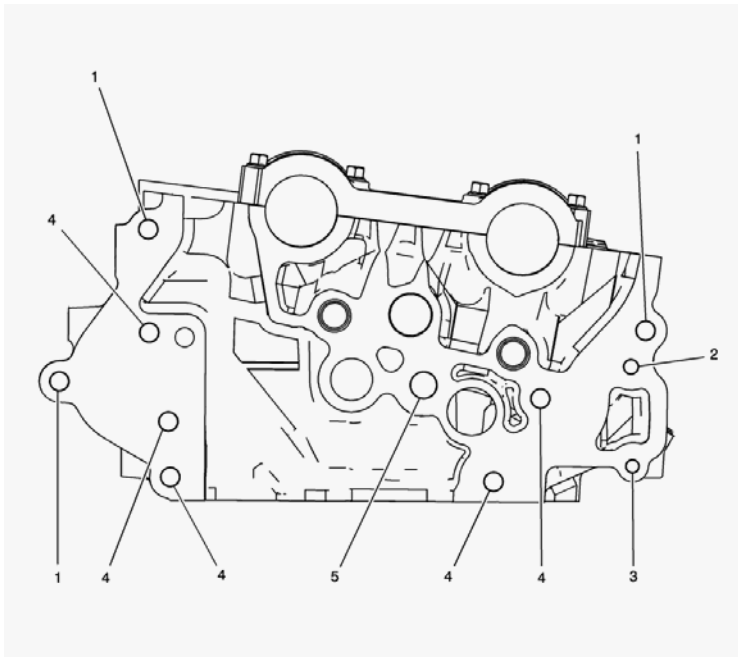
Right Cylinder Head Camshaft Cover Face



Right Cylinder Head Camshaft Cover Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	M6 x 1.0	701	N/A	N/A	203	204	205	28.5	1.1220	24.0	0.9449
3	M20 x 1.5	715	716	N/A	717	718	719	25.0	0.9842	17.0	0.6693
4	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087

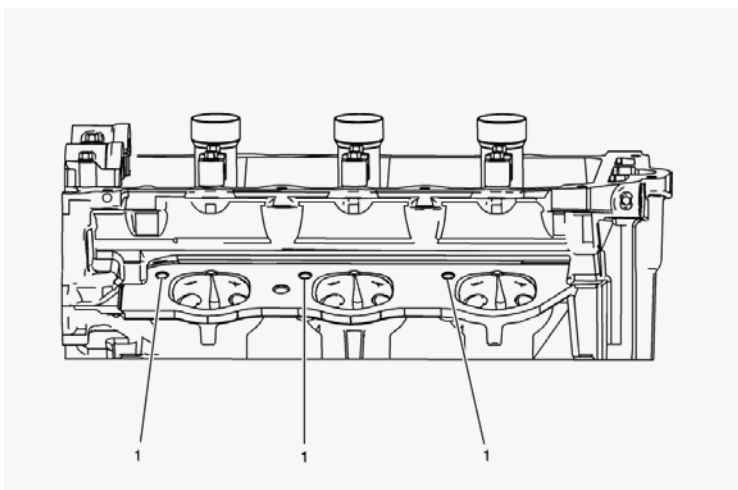
Right Cylinder Head Front Face



Right Cylinder Head Front Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
				J 42385-							
1	M8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
2	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8880	18.0	0.7087
3	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
4	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
5	M12 x 1.75	856	857	N/A	858	859	416	40.0	1.5748	32.5	1.2795

[Right Cylinder Head Intake Face](#)

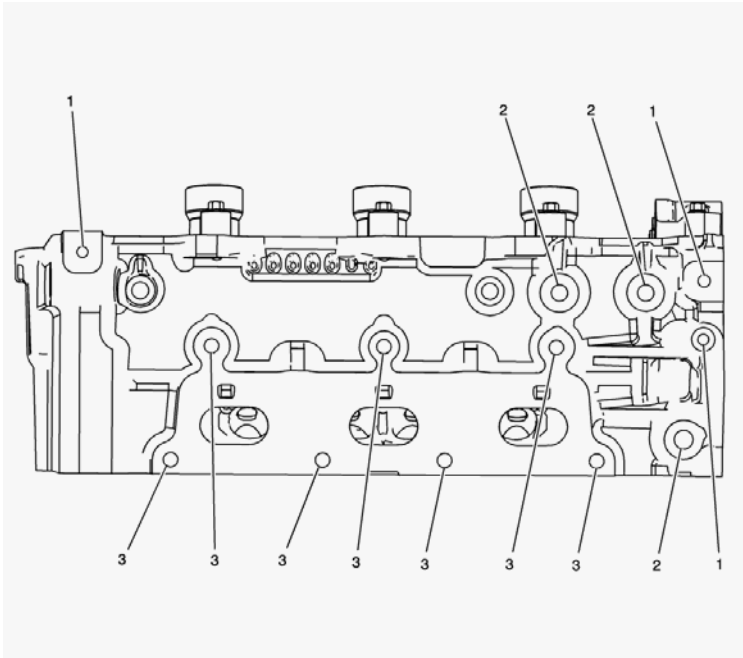


Right Cylinder Head Intake Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
---------------	-------------	-------	-------------------	-------------	-----	--------	--------	-----------------------	--	---------------------	--

J 42385—								MM	(IN)	MM	(IN)
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

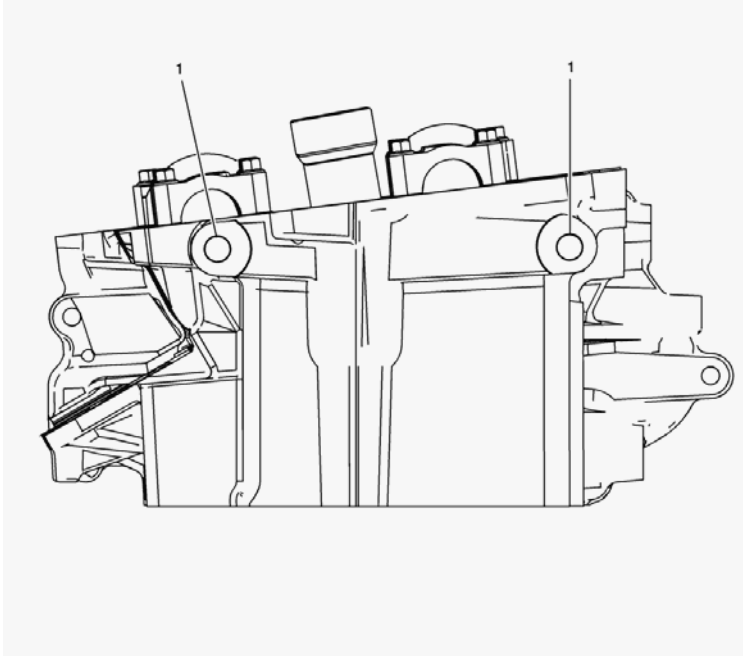
Right Cylinder Head Exhaust Face



Right Cylinder Head Exhaust Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)		
								J 42385—	MM	(IN)	MM	(IN)
1	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.0000	
2	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630	
3	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055	

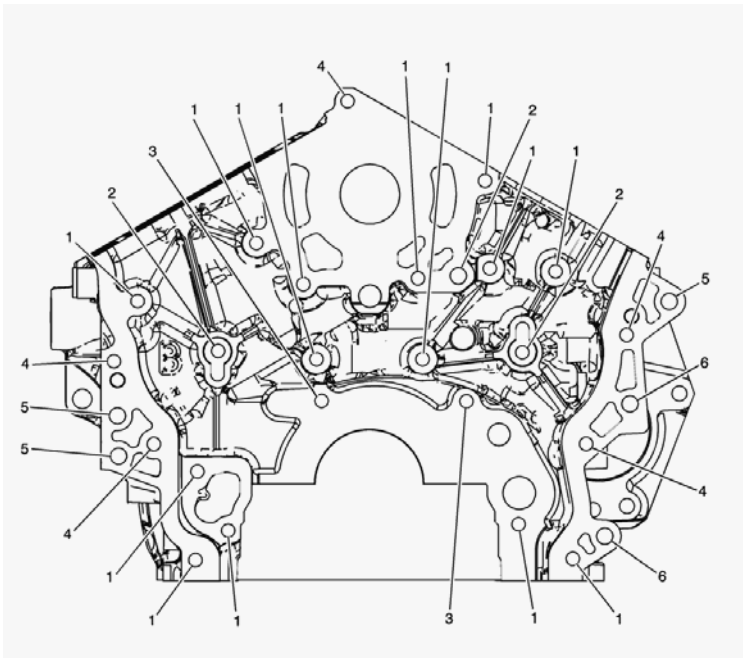
Right Cylinder Head Rear Face



Right Cylinder Head Rear Face

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
								J 42385-			
1	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630

Engine Block Front (LP1)

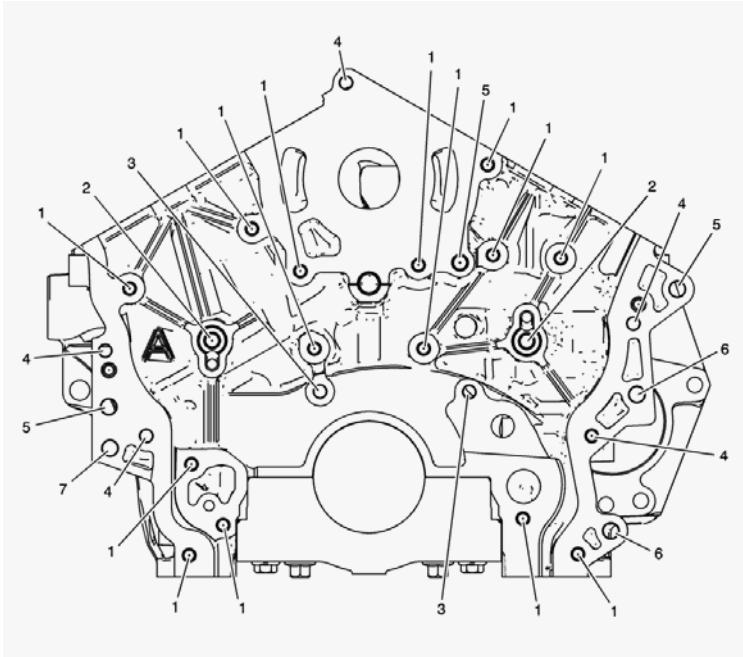


Engine Block Front (LP1)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
								J 42385-			
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

Hole Location	Thread Size	Drill	Counter	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
			Bore Tool					MM	(IN)	MM	(IN)
			J 42385--								
2	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630
3	M8 x 1.25	206	207	N/A	208	209	210	THRU		23.0	0.9055
4	M8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	
5	M10 x 1.5	211	212	N/A	213	214	215	THRU		28.0	1.1024
6	M10 x 1.5	211	212	N/A	213	214	215	THRU		20.0	0.7874

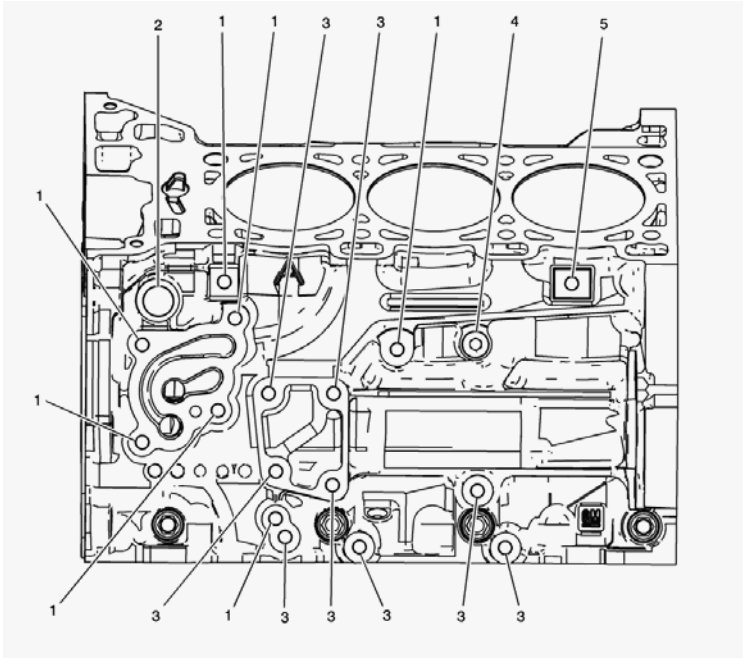
[Engine Block Front \(LY7\)](#)



Engine Block Front (LY7)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)		
								J 42385-	MM	(IN)	MM	(IN)
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055	
2	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630	
3	M8 x 1.25	206	207	N/A	208	209	210		THRU	23.0	0.9055	
4	M8 x 1.25	206	207	N/A	208	209	210		THRU		THRU	
5	M10 x 1.5	211	212	N/A	213	214	215	28.0	1.1024	28.0	1.1024	
6	M10 x 1.5	211	212	N/A	213	214	215		THRU	20.0	0.7874	
7	M10 x 1.5	211	212	N/A	213	214	215		THRU	28.0	1.1024	

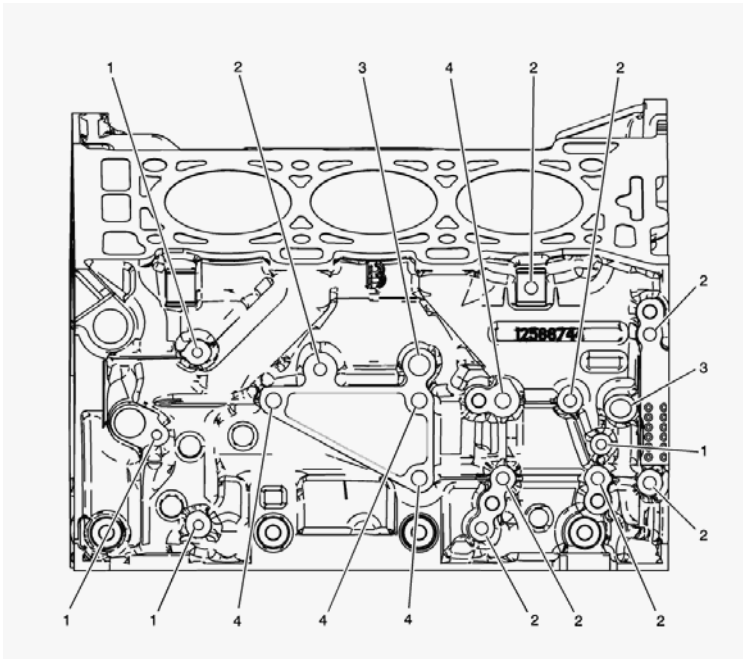
[Engine Block Left Side](#)



Engine Block Left Side

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
				J 42385--							
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
2	M20 x 1.5	715	716	N/A	717	718	719	30.0	1.1810	20.0	0.7874
3	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3190	27.0	1.0630
4	M14 x 1.5	409	410	N/A	411	412	735	THRU		15.0	0.5905
5	M8 x 1.25	206	207	N/A	208	209	415	16.5	0.6496	11.0	0.4331

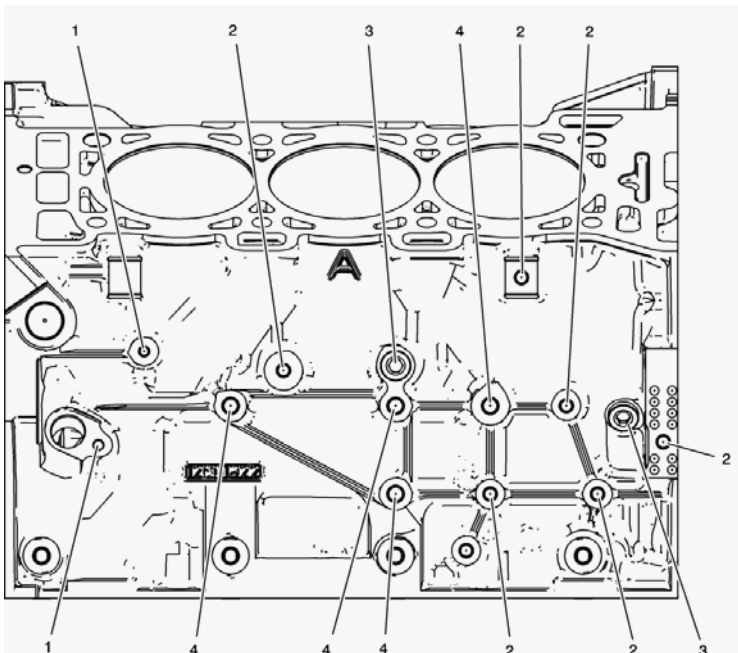
Engine Block Right Side (LP1)



Engine Block Right Side (LP1)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087
2	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
3	M14 x 1.5	409	410	N/A	411	412	735	THRU		15.0	0.5905
4	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3190	27.0	1.0630

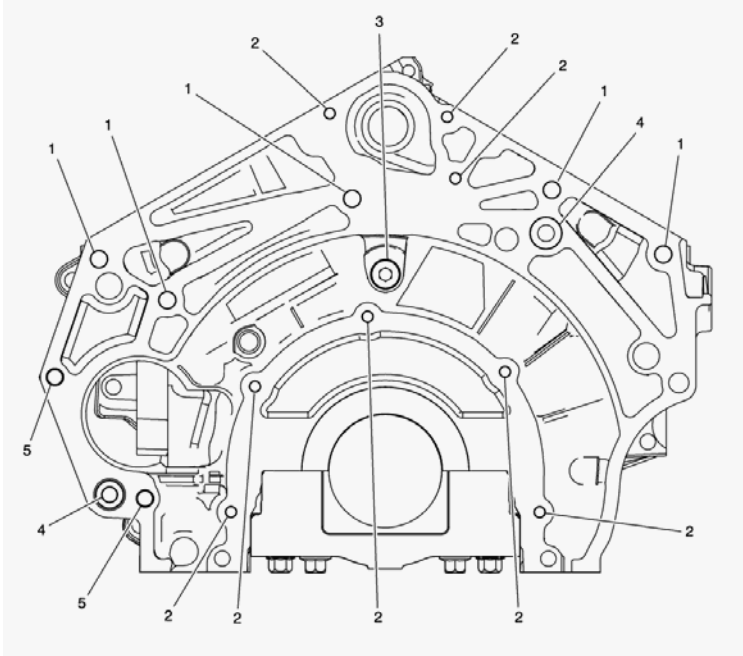
Engine Block Right Side (LY7)



Engine Block Right Side (LY7)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087
2	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
3	M14 x 1.5	409	410	N/A	411	412	735	THRU		15.0	0.5905
4	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3190	27.0	1.0630

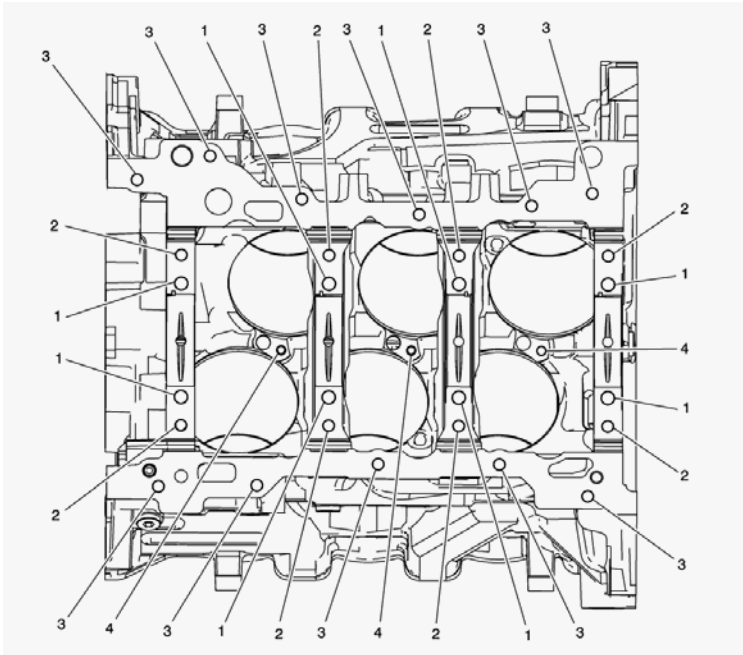
Engine Block Rear



Engine Block Rear

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M10 x 1.5	211	212	N/A	213	214	420	33.5	1.3190	27.0	1.0630
2	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087
3	M14 x 1.5	409	410	N/A	411	412	735	THRU		15.0	0.5905
4	M10 x 1.5	211	212	N/A	213	214	216	39.5	1.5551	33.0	1.2992
5	M10 x 1.5	211	212	N/A	213	214	420	THRU		THRU	

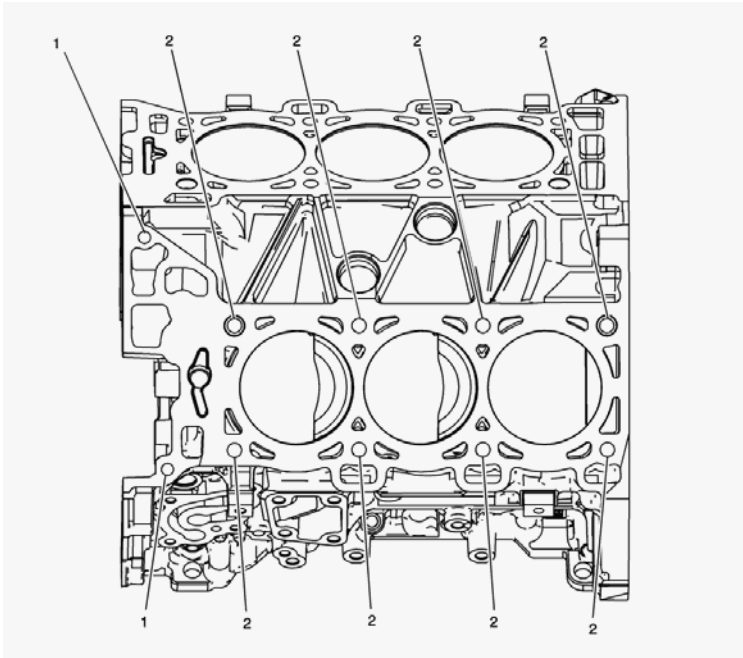
Engine Block Bottom



Engine Block Bottom

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
1	M10 x 2.0	720	N/A	N/A	721	722	104	56.0	2.2047	49.0	1.9291
2	M8 x 1.25	702	N/A	N/A	703	704	620	46.0	1.8110	40.5	1.5945
3	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
4	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	

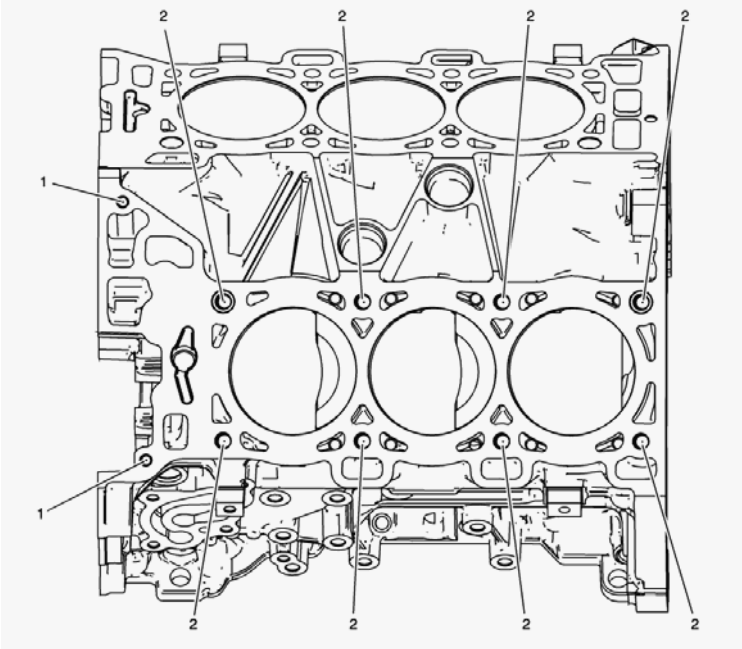
Engine Block Left Deck Face (LP1)



Engine Block Left Deck Face (LP1)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
2	M11 x 2.0	723	N/A	N/A	724	725	108	102.5	4.0354	94.0	3.7008

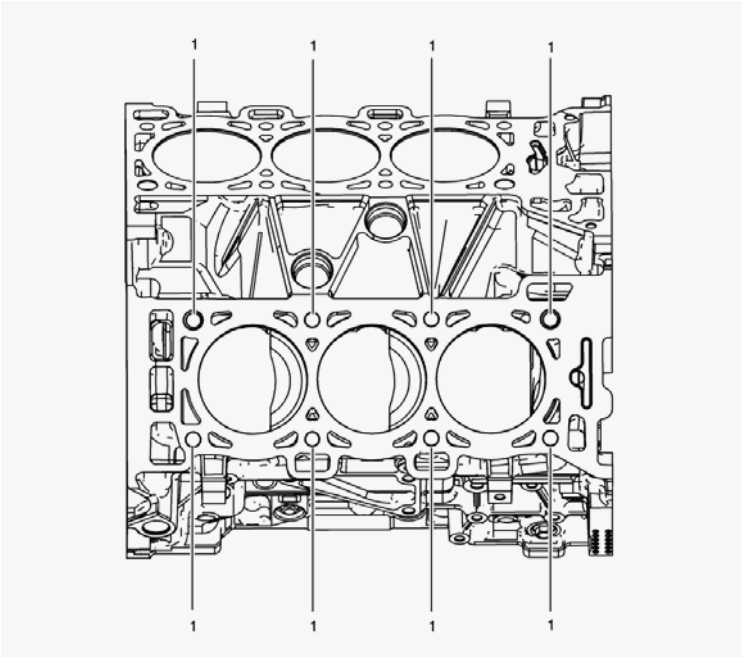
Engine Block Left Deck Face (LY7)



Engine Block Left Deck Face (LY7)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
2	M11 x 2.0	723	N/A	N/A	724	725	108	102.5	4.0354	94.0	3.7008

Engine Block Right Deck Face (LP1)



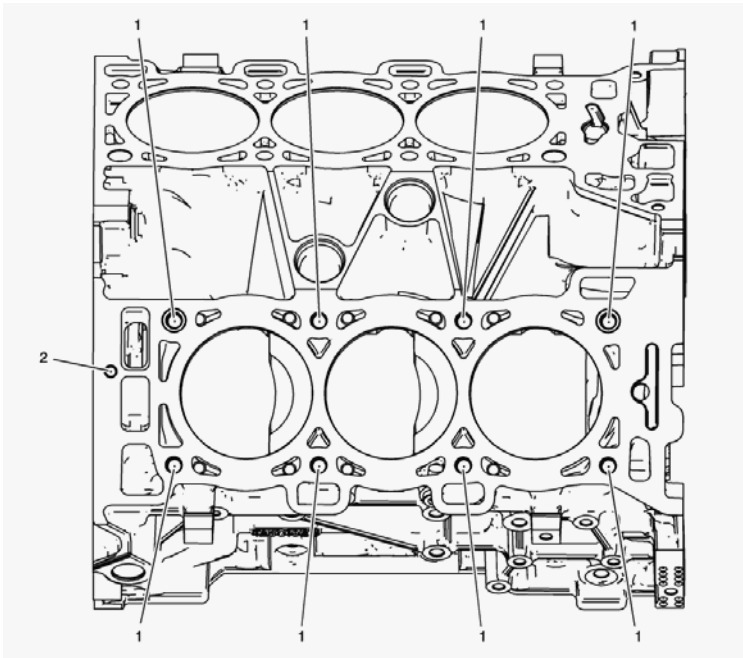
Engine Block Right Deck Face (LP1)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											

Thread Repair Specifications

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—								MM	(IN)	MM	(IN)
1	M11 x 2.0	723	N/A	N/A	724	725	108	102.5	4.0354	94.0	3.7008

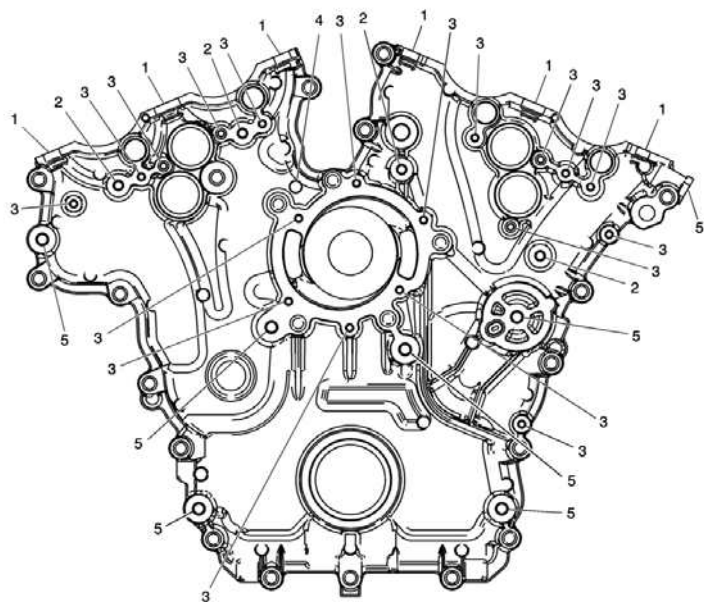
Engine Block Right Deck Face (LY7)



Engine Block Right Deck Face (LY7)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-								MM	(IN)	MM	(IN)
1	M11 x 2.0	723	N/A	N/A	724	725	108	102.5	4.0354	94.0	3.7008
2	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

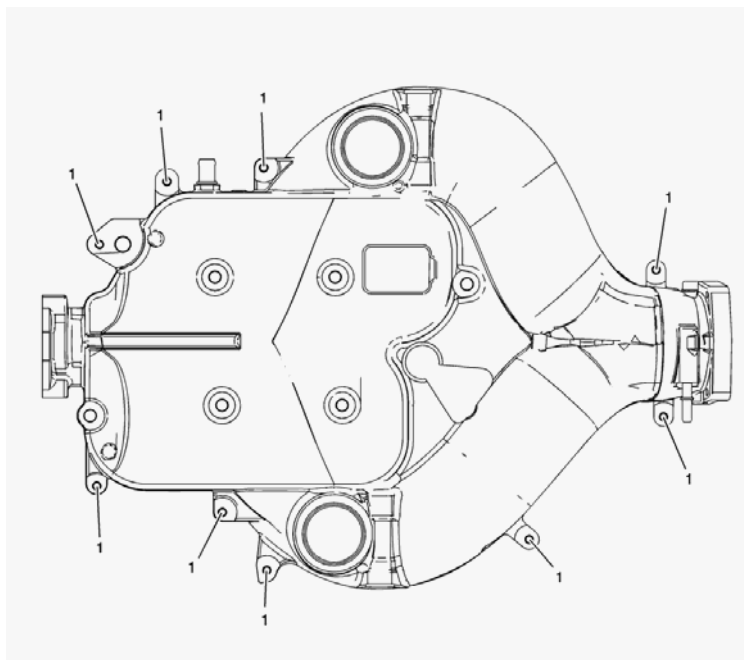
Engine Front Cover



Engine Front Cover

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
				J 42385-							
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
3	M6 x 1.0	201	202	N/A	203	204	205	21.5	0.8465	18.0	0.7087
4	M10 x 1.5	211	212	N/A	213	214	215	THRU		THRU	
5	M10 x 1.5	211	212	N/A	213	214	420	32.5	1.2795	27.0	1.0630

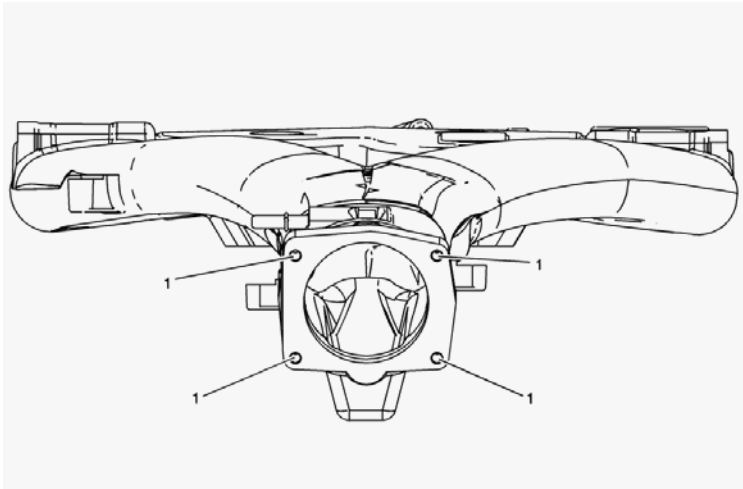
Upper Intake Manifold - Top



Upper Intake Manifold - Top

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
								J 42385-			
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	

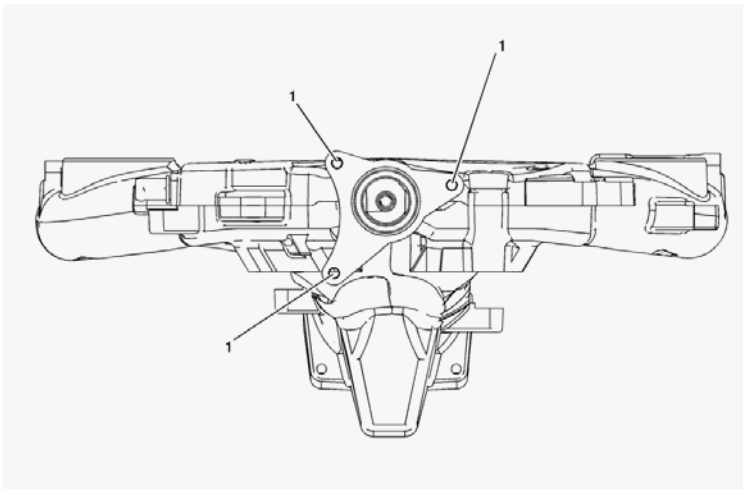
Upper Intake Manifold - Front



Upper Intake Manifold - Front

Hole Location	Thread Size	Drill	Counter Bore Tool					Drill Depth (Maximum)		Tap Depth (Minimum)	
				Stop Collar	Tap	Driver	Insert	MM	(IN)	MM	(IN)
				J 42385-							
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	

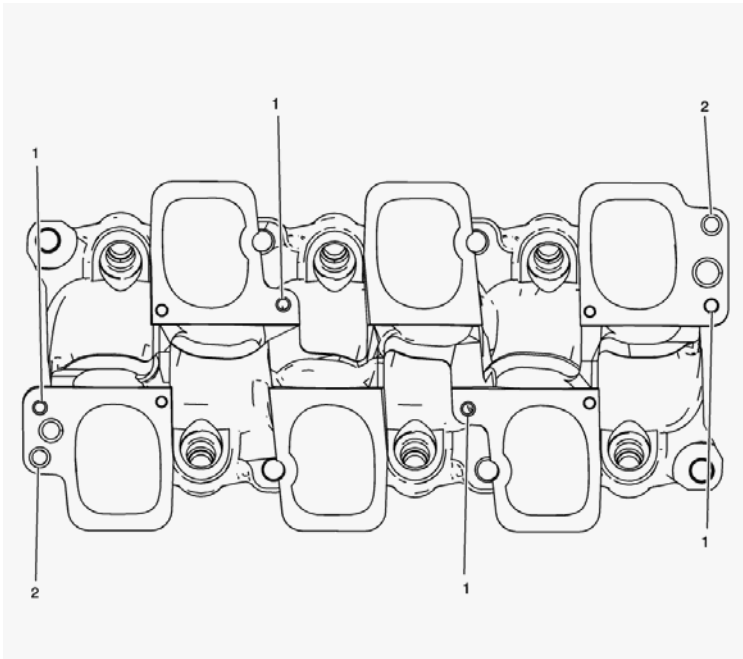
Upper Intake Manifold - Rear



Upper Intake Manifold - Rear

Hole Location	Thread Size	Drill	Counter Bore Tool					Drill Depth (Maximum)		Tap Depth (Minimum)	
				Stop Collar	Tap	Driver	Insert	MM	(IN)	MM	(IN)
				J 42385-							
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	

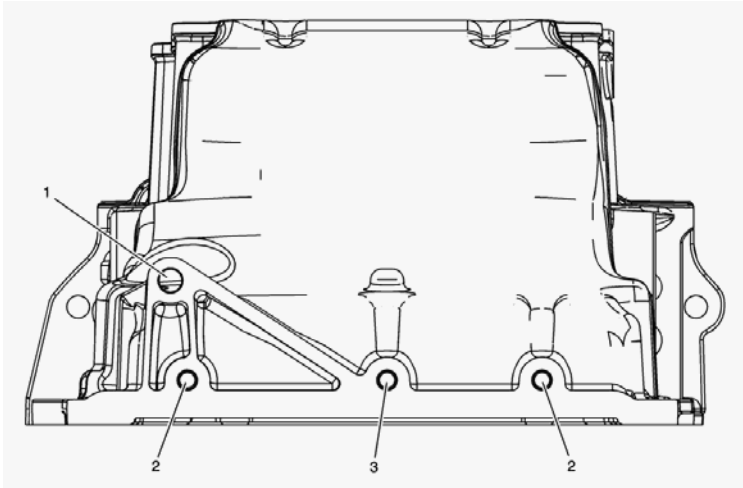
Lower Intake Manifold - Top



Lower Intake Manifold - Top

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											
1	M6 x 1.0	201	202	N/A	203	204	205	THRU		THRU	
2	M8 x 1.25	206	207	N/A	208	209	210	THRU		THRU	

[Oil Pan Front \(RWD\)](#)

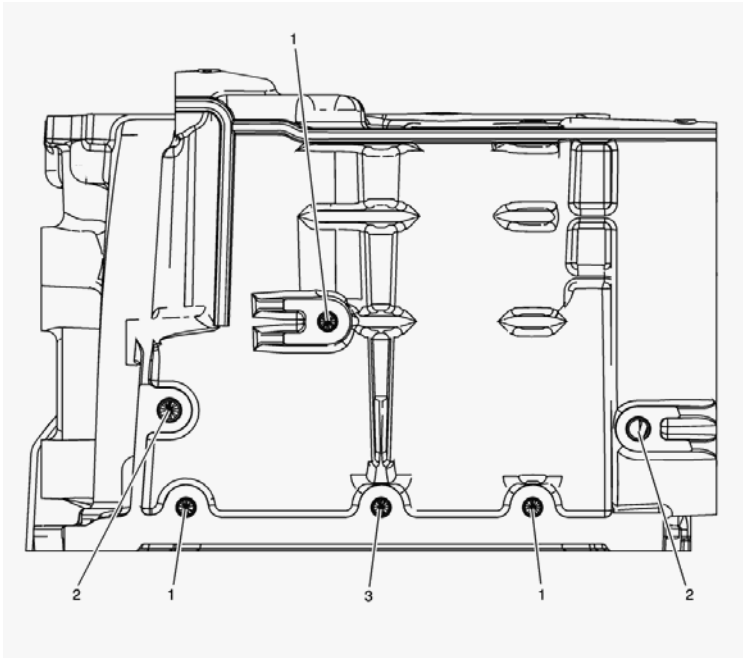


Oil Pan Front (RWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M10 x 1.5	211	212	N/A	213	214	420	33.5	1.3189	27.0	1.0630
2	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											
3	M8 x 1.25	610	N/A	N/A	208	209	620	37.5	1.4764	32.0	1.2598

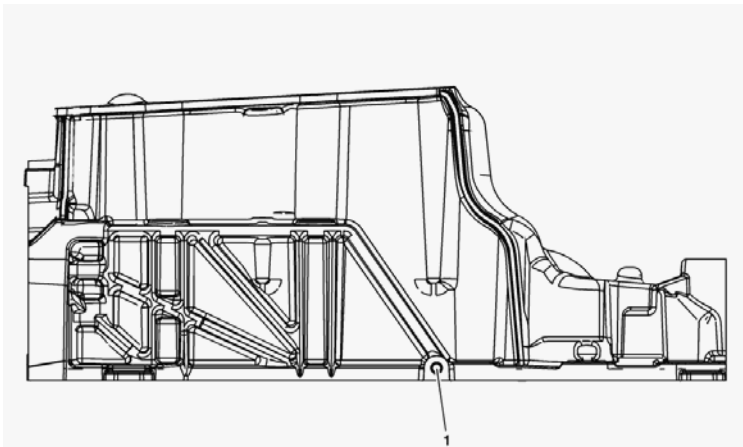
Oil Pan Front (AWD)



Oil Pan Front (AWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
2	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630
3	M8 x 1.25	610	N/A	N/A	208	209	620	37.5	1.4764	32.0	1.2598

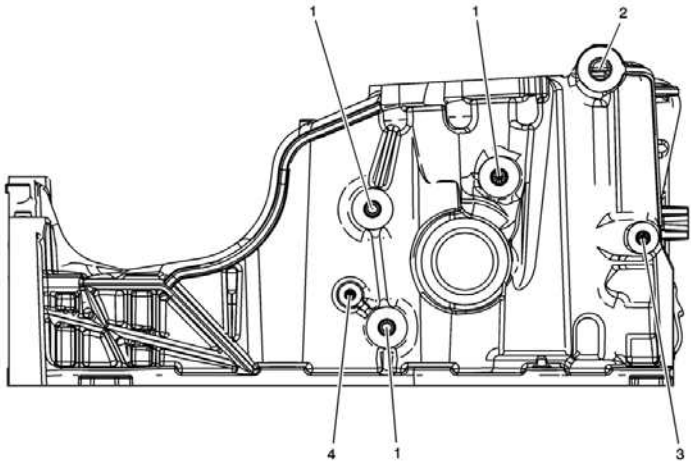
Oil Pan Left Side (RWD)



Oil Pan Left Side (RWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087

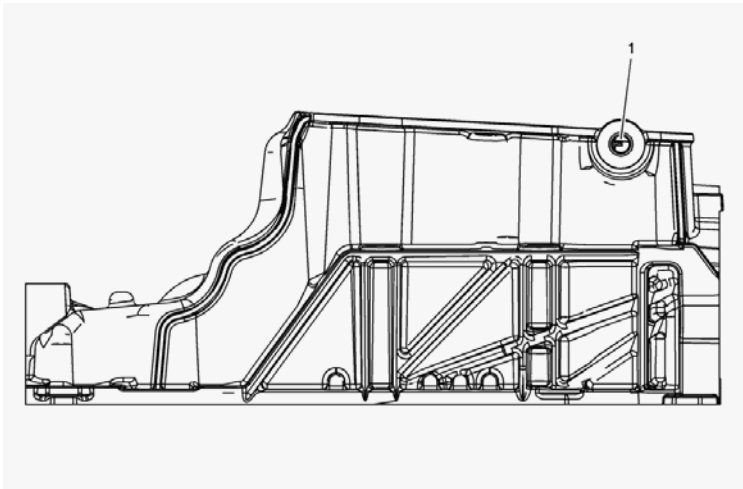
Oil Pan Left Side (AWD)



Oil Pan Left Side (AWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M10 x 1.5	211	212	N/A	213	214	420	33.5	1.3189	27.0	1.0630
2	M12 x 1.75	856	857	N/A	858	859	415	THRU		THRU	
3	M8 x 1.25	206	207	N/A	208	209	210	28.5	1.1220	23.0	0.9055
4	M6 x 1.0	201	202	N/A	203	204	205	22.5	0.8858	18.0	0.7087

Oil Pan Right Side (RWD)

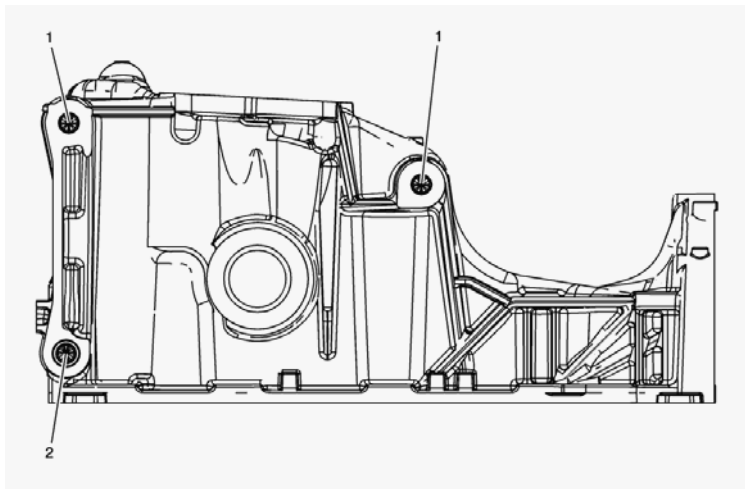


Oil Pan Right Side (RWD)

Hole	Thread	Drill	Counter	Stop	Tap	Driver	Insert	Drill Depth		Tap Depth	
------	--------	-------	---------	------	-----	--------	--------	-------------	--	-----------	--

Location	Size		Bore Tool	Collar				(Maximum)		(Minimum)	
								MM	(IN)	MM	(IN)
1	M12 x 1.75	856	857	N/A	858	859	416	THRU		THRU	

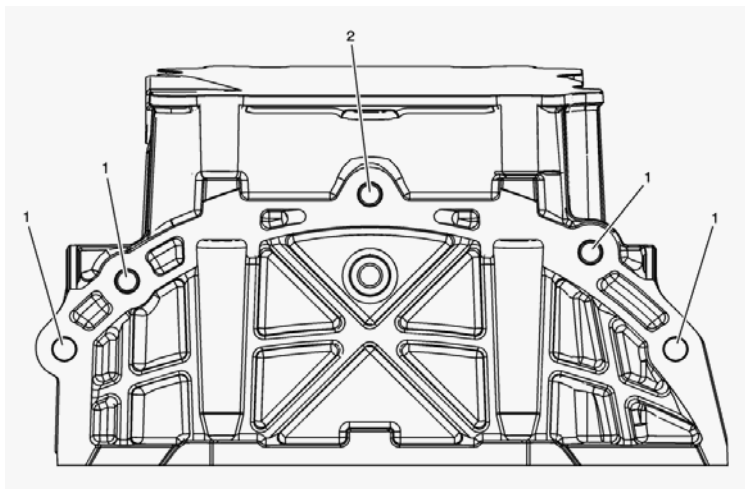
[Oil Pan Right Side \(AWD\)](#)



Oil Pan Right Side (AWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385-											
1	M12 x 1.75	856	857	N/A	858	859	855	39.5	1.5551	32.0	1.2598
2	M12 x 1.75	856	N/A	N/A	858	859	855	39.5	1.5551	32.0	1.2598

[Oil Pan Rear \(RWD\)](#)

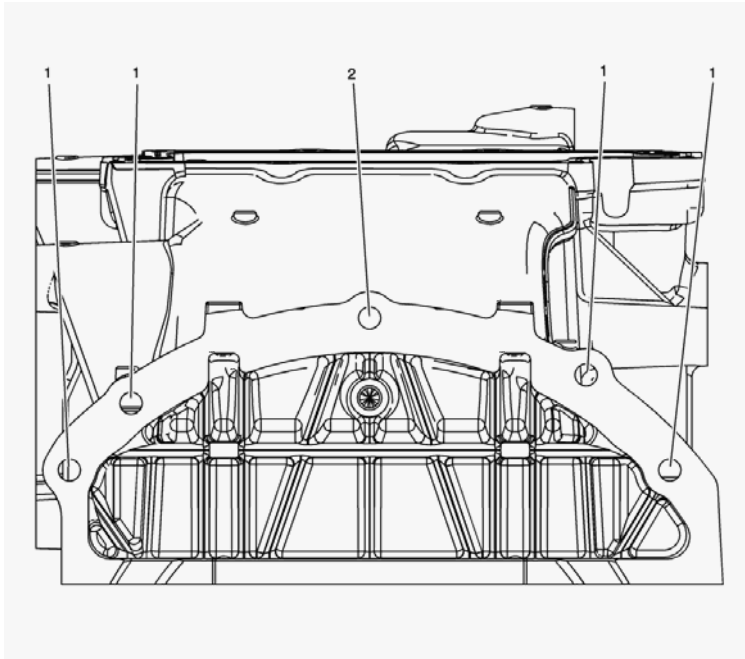


Oil Pan Rear (RWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
								J 42385-			
1	M10 x 1.5	211	212	N/A	213	214	215	THRU		THRU	

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
J 42385—											
2	M10 x 1.5	211	212	N/A	213	214	215	33.5	1.3189	27.0	1.0630

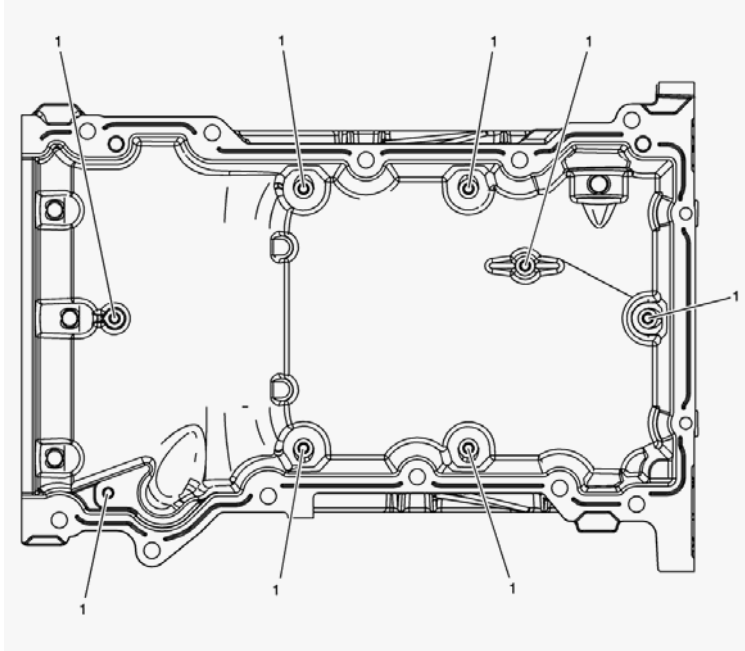
[Oil Pan Rear \(AWD\)](#)



Oil Pan Rear (AWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								MM	(IN)	MM	(IN)
1	M10 x 1.5	211	212	N/A	213	214	420	33.5	1.3189	27.0	1.0630
2	M10 x 1.5	211	212	N/A	213	214	420	THRU		THRU	

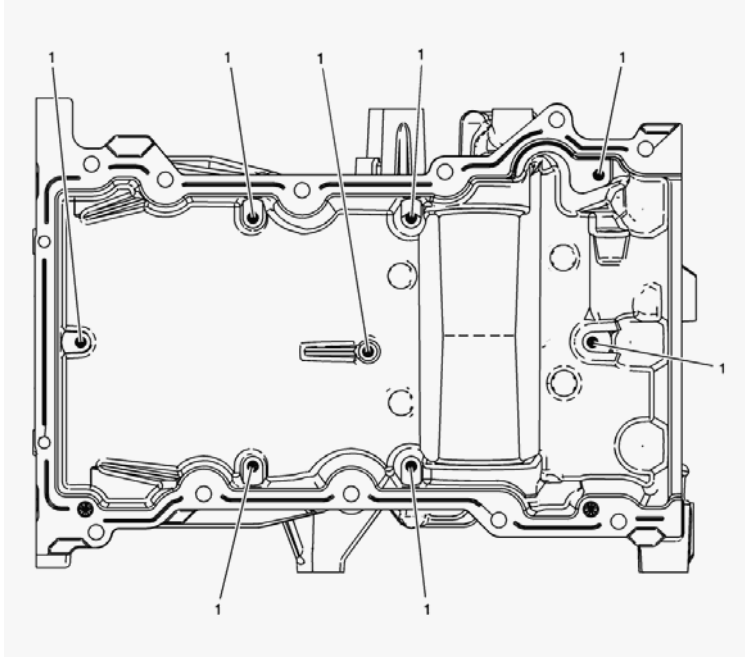
[Oil Pan Top \(RWD\)](#)



Oil Pan Top (RWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								J 42385—	MM	(IN)	MM
1	M6 x 1.0	701	N/A	N/A	203	204	205	28.0	1.1024	23.5	0.9252

Oil Pan Top (AWD)

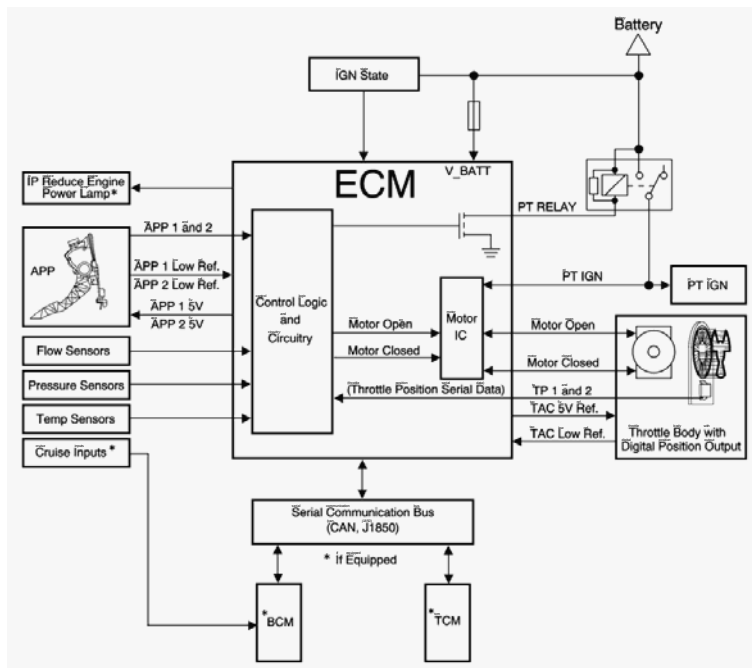


Oil Pan Top (AWD)

Hole Location	Thread Size	Drill	Counter Bore Tool	Stop Collar	Tap	Driver	Insert	Drill Depth (Maximum)		Tap Depth (Minimum)	
								J 42385—	MM	(IN)	MM
1	M6 x 1.0	701	N/A	N/A	203	204	205	28.0	1.1024	23.5	0.9252

2013 Chevrolet Colorado

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



The engine control module (ECM) is the control center for the throttle actuator control (TAC) system. The ECM determines the driver's intent based on input from the accelerator pedal position sensors, then calculates the appropriate throttle response based on the throttle position sensors. The ECM achieves throttle positioning by providing a pulse width modulated voltage to the throttle actuator motor. The throttle blade is spring loaded in both directions, and the default position is slightly open.

Modes Of Operation

Normal Mode

During the operation of the TAC system, several modes, or functions, are considered normal. The following modes may be entered during normal operations:

- Minimum pedal value—At key-up, the ECM updates the learned minimum pedal value.
- Minimum throttle position values—At key-up, the ECM updates the learned minimum throttle position value. In order to learn the minimum throttle position value, the throttle blade is moved to the Closed position.
- Ice break mode—If the throttle blade is not able to reach a predetermined minimum throttle position, the ice break mode is entered. During the ice break mode, the ECM commands the maximum pulse width several times to the throttle actuator motor in the closing direction.
- Battery saver mode—After a predetermined time without engine speed, the ECM commands the battery saver mode. During the battery saver mode, the TAC module removes the voltage from the motor control circuits, which removes the current draw used to maintain the idle position and allows the throttle to return to the spring loaded default position.

Reduced Engine Power Mode

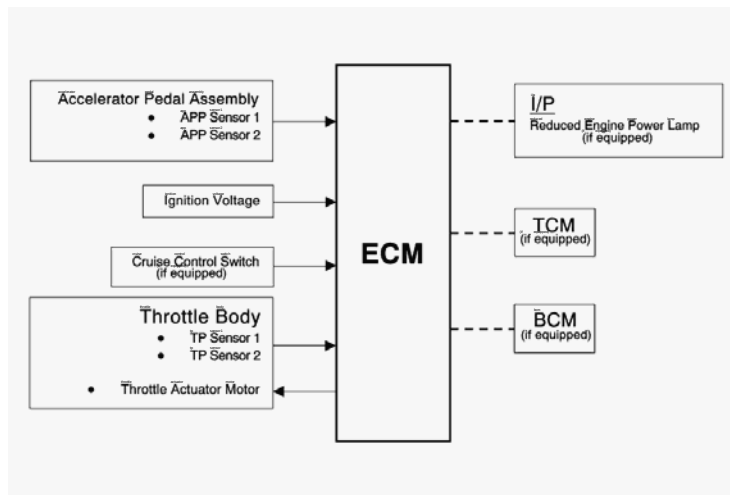
When the ECM detects a condition with the TAC system, the ECM may enter a reduced engine power mode. Reduced engine power may cause one or more of the following conditions:

- Acceleration limiting—The ECM will continue to use the accelerator pedal for throttle control, however, the vehicle acceleration is limited.
- Limited throttle mode—The ECM will continue to use the accelerator pedal for throttle control, however, the maximum throttle opening is limited.
- Throttle default mode—The ECM will turn OFF the throttle actuator motor, and the throttle will return to the spring loaded default position.
- Forced idle mode—The ECM will perform the following actions:
 - Limit engine speed to the idle position
 - Ignore the accelerator pedal input.
- Engine shutdown mode—The ECM will disable fuel and de-energize the throttle actuator.

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The engine control module (ECM) is the control center for the throttle actuator control (TAC) system. The ECM determines the driver's intent based on input from the accelerator pedal position sensors, then calculates the appropriate throttle response based on the throttle position sensors. The ECM achieves throttle positioning by providing a pulse width modulated voltage to the throttle actuator motor. The throttle blade is spring loaded in both directions, and the default position is slightly open.

Modes Of Operation

Normal Mode

During the operation of the TAC system, several modes, or functions, are considered normal. The following modes may be entered during normal operations:

- Minimum pedal value—At key-up, the ECM updates the learned minimum pedal value.
- Minimum throttle position values—At key-up, the ECM updates the learned minimum throttle position value. In order to learn the minimum throttle position value, the throttle blade is moved to the Closed position.
- Ice break mode—If the throttle blade is not able to reach a predetermined minimum throttle position, the ice break mode is entered. During the ice break mode, the ECM commands the maximum pulse width several times to the throttle actuator motor in the closing direction.
- Minimum pedal value—At key-up, the ECM updates the learned minimum pedal value.
- Battery saver mode—After a predetermined time without engine RPM, the ECM commands the Battery Saver mode. During the Battery Saver mode, the TAC module removes the voltage from the motor control circuits, which removes the current draw used to maintain the idle position and allows the throttle to return to the spring loaded default position.

Reduced Engine Power Mode

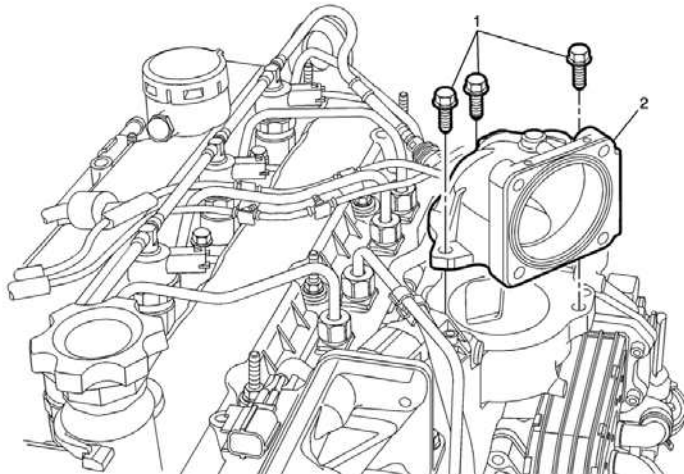
When the ECM detects a condition with the TAC system, the ECM may enter a reduced engine power mode. Reduced engine power may cause one or more of the following conditions:

- Acceleration limiting—The ECM will continue to use the accelerator pedal for throttle control, however, the vehicle acceleration is limited.
- Limited throttle mode—The ECM will continue to use the accelerator pedal for throttle control, however, the maximum throttle opening is limited.
- Throttle default mode—The ECM will turn OFF the throttle actuator motor, and the throttle will return to the spring loaded default position.
- Forced idle mode—The ECM will perform the following actions:
 - Limit engine speed to idle positioning the throttle position, or by controlling the fuel and spark if the throttle is turned OFF.
 - Ignore the accelerator pedal input.
- Engine shutdown mode—The ECM will disable fuel and de-energize the throttle actuator.

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Throttle Body Adapter Replacement

Callout

Component Name

Preliminary Procedure

Remove the throttle body. Refer to Throttle Body Assembly Replacement.

Throttle Body Adapter Fastener (Qty: 3)

Caution: Refer to Fastener Caution.

1

Tighten

10Y (89 lb in)

Throttle Body Adapter

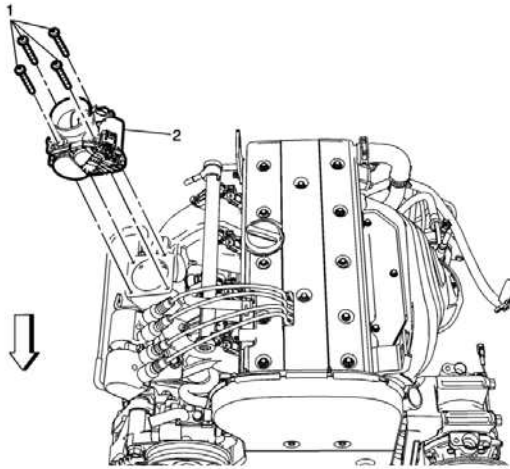
Procedure

2

1. Ensure to install NEW throttle body adapter gasket.
2. Transfer parts as needed.

2013 Chevrolet Colorado

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



Throttle Body Assembly Replacement

Callout

Component Name

Preliminary Procedure

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

Throttle Body Assembly Fasteners (Qty: 4)

Caution: Refer to Fastener Caution.

1

Tighten

10 Y(89 lb in)

Throttle Body Assembly

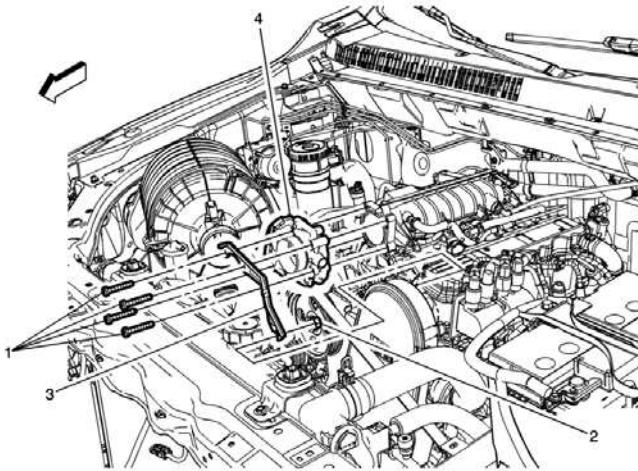
Procedure

2

1. Disconnect the throttle body harness electrical connector.
2. Install a NEW throttle body seal.
3. Perform the throttle learn procedure. Refer to Throttle/Idle Learn.

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Fuel Delivery: | Fuel:



Throttle Body Assembly Replacement

Callout

Component Name

Preliminary Procedure

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

Throttle Body Bolts (Qty: 4)

Caution: Refer to Fastener Caution.

1

Tighten

10 Y(89 lb in)

Throttle Body Bracket Nut

2

Tighten

10 Y(89 lb in)

3

Throttle Body Bracket

Throttle Body Assembly

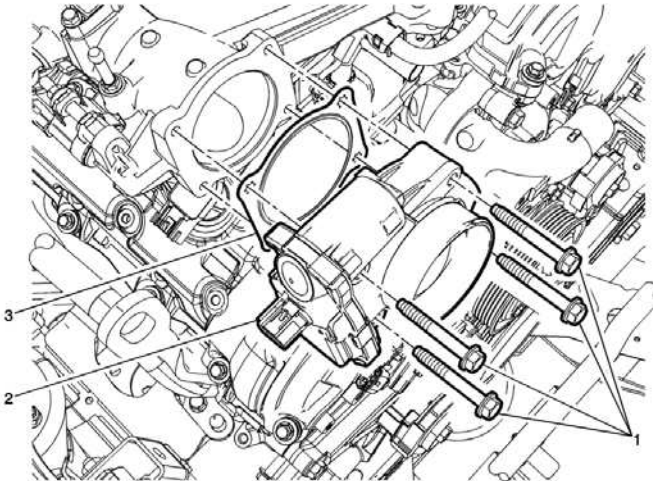
Procedure

4

1. Disconnect the throttle body harness electrical connector.
2. Install a NEW throttle body seal.
3. Perform the throttle learn procedure. Refer to Throttle/Idle Learn.

2013 Chevrolet Colorado

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



Throttle Body Assembly Replacement

Callout

Component Name

Preliminary Procedure

Remove the air cleaner outlet duct from the throttle body assembly. Refer to Air Cleaner Outlet Duct Replacement.

Throttle Body Assembly Fastener (Qty: 4)

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Throttle Body Assembly

2

Procedure

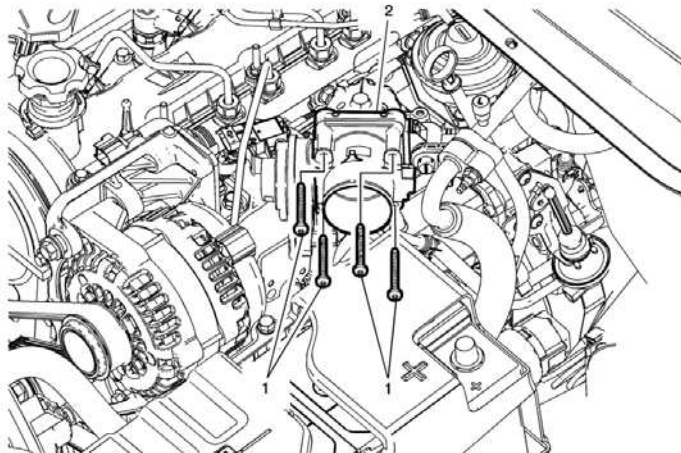
Disconnect the wiring harness electrical connector from the throttle body assembly.

3

Throttle Body Gasket

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
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Throttle Body Assembly Replacement

Callout

Component Name

Preliminary Procedure

1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Remove the charge air cooler outlet air hose from the throttle body assembly. Refer to Charge Air Cooler Outlet Air Hose Replacement.
3. Remove the intake manifold tuning vacuum control solenoid, if equipped. Refer to Intake Manifold Tuning Vacuum Control Solenoid Valve Replacement.

Throttle Body Assembly Fastener (Qty: 4)

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Throttle Body Assembly

Procedure

2

1. Disconnect the electrical connector.
2. Install a new gasket.

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

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

Warning: Turn OFF the ignition before inserting fingers into the throttle bore. Unexpected movement of the throttle blade could cause personal injury.

Caution: Do not insert any tools into the throttle body bore in order to avoid damage to the throttle valve plate.

2. Inspect the throttle body bore and the throttle valve plate for deposits. You will need to open the throttle valve in order to inspect all surfaces.

Caution: Do not use any solvent that contains Methyl Ethyl Ketone (MEK). This solvent may damage fuel system components.

3. Clean the throttle body bore and the throttle valve plate using a clean shop towel with all purpose parts cleaner or an equivalent product.
4. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
5. Perform the throttle learn procedure. Refer to Q38 Throttle Body: Throttle/Idle Learn.

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Warning: Refer to Safety Glasses Warning.

1. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
2. Fully open the throttle valve in order to inspect the throttle body bore and the throttle valve plate for any deposits.

Caution: Do not subject a throttle body assembly which contains the following components to an immersion cleaner or a strong solvent:

- Throttle position (TP) sensor
- Idle air control (IAC) valve
- Sealed throttle shaft bearings

The cleaners will damage the electric components or sensors.

The cleaners will damage some of these components that contain seals or O-rings.

Solvents can wash away or break down the grease used on non-serviceable throttle shaft bearings.

Never use a wire brush or scraper to clean the throttle body. A wire brush or sharp tools may damage the throttle body components.

Do not use a cleaner that contains methyl ethyl ketone. This extremely strong solvent may damage components and is not necessary for this type of cleaning.

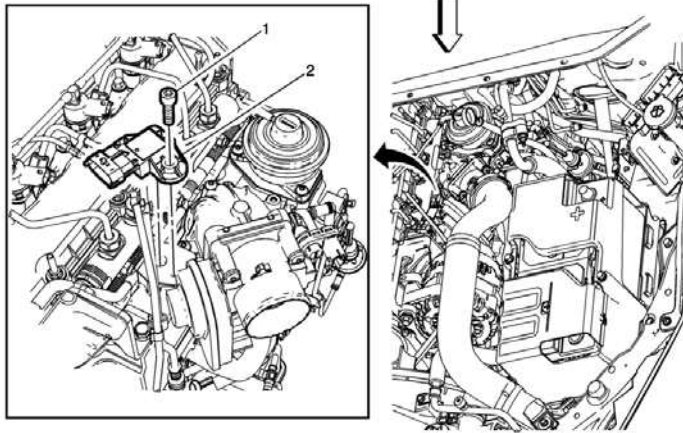
3. Use a clean shop towel and an approved GM engine cleaner. Clean the throttle body bore and the throttle valve plate.

If necessary, use a parts cleaning brush in order to remove heavy deposits.

4. Install the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
5. Perform the Throttle/Idle Learn procedure. Refer to Q38 Throttle Body: Throttle/Idle Learn.

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Throttle Inlet Absolute Pressure Sensor Replacement

Callout

Component Name

Preliminary Procedure

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

Throttle Inlet Pressure Sensor Fasteners (Qty 2)

Caution: Refer to Fastener Caution.

1

Tighten

10 Y (89 lb in)

Throttle Inlet Pressure Sensor

2

Procedure

Disconnect the electrical connector.

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Special tools are listed and illustrated throughout this section with a complete listing at the end of the section. These tools, or their equivalents, are specially designed to quickly and safely accomplish the operations for which they are intended. The use of these special tools will also minimize possible damage to engine components. Some precision measuring tools are required for inspection of certain critical components. Torque wrenches and a torque angle meter are necessary for the proper tightening of various fasteners.

To properly service the engine assembly, the following items should be readily available:

- Approved eye protection and safety gloves
- A clean, well lit, work area
- A suitable parts cleaning tank
- A compressed air supply
- Trays or storage containers to keep parts and fasteners organized
- An adequate set of hand tools
- Approved engine repair stand
- An approved engine lifting device that will adequately support the weight of the components

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Sealant Types

Important: The correct sealant and amount of sealant must be used in the proper location to prevent oil leaks, coolant leaks, or the loosening of the fasteners. DO NOT interchange the sealants. Use only the sealant (or equivalent) as specified in the service procedure.

The following 2 major types of sealant are commonly used in engines:

- Aerobic sealant (Room Temperature Vulcanizing (RTV))
- Anaerobic sealant, which include the following:
 - Gasket eliminator
 - Pipe
 - Threadlock

Aerobic Type Room Temperature Vulcanizing (RTV) Sealant

Aerobic type Room Temperature Vulcanizing (RTV) sealant cures when exposed to air. This type of sealant is used where 2 components (such as the intake manifold and the engine block) are assembled together.

Use the following information when using RTV sealant:

- Do not use RTV sealant in areas where extreme temperatures are expected. These areas include:
 - The exhaust manifold
 - The head gasket
 - Any other surfaces where a different type of sealant is specified in the service procedure
- Always follow all the safety recommendations and the directions that are on the RTV sealant container.
- Use a plastic or wood scraper in order to remove all the RTV sealant from the components.

Important: Do not allow the RTV sealant to enter any blind threaded holes, as it may prevent the fasteners from clamping properly or cause damage when the fastener is tightened.

- The surfaces to be sealed must be clean and dry.
- Use a RTV sealant bead size as specified in the service procedure.
- Apply the RTV sealant bead to the inside of any bolt holes areas.
- Assemble the components while the RTV sealant is still wet to the touch (within 3 minutes). Do not wait for the RTV sealant to skin over.
- Tighten the fasteners in sequence (if specified) and to the proper torque specifications. DO NOT overtighten the fasteners.

Anaerobic Type Gasket Eliminator Sealant

Anaerobic type gasket eliminator sealant cures in the absence of air. This type of sealant is used where 2 rigid parts (such as castings) are assembled together. When 2 rigid parts are disassembled and no sealant or gasket is readily noticeable, then the 2 parts were probably assembled using an anaerobic type gasket eliminator sealant.

Use the following information when using gasket eliminator sealant:

- Always follow all the safety recommendations and directions that are on the gasket eliminator sealant container.
- Apply a continuous bead of gasket eliminator sealant to one flange.

The surfaces to be sealed must be clean and dry.

Important: Do not allow the gasket eliminator sealant to enter any blind threaded holes, as the gasket eliminator sealant may prevent the fasteners from clamping properly, seating properly, or cause damage when the fastener tightened.

- Apply the gasket eliminator sealant evenly to get a uniform thickness of the gasket eliminator sealant on the sealing surface.

Important: Gasket eliminator sealed joint fasteners that are partially torqued and the gasket eliminator sealant allowed to cure more than five minutes, may result in incorrect shimming and sealing of the joint.

- Tighten the fasteners in sequence (if specified) and to the proper torque specifications. DO NOT overtighten the fasteners.
- After properly tightening the fasteners, remove the excess gasket eliminator sealant from the outside of the joint.

Anaerobic Type Threadlock Sealant

Anaerobic type threadlock sealant cures in the absence of air. This type of sealant is used for threadlocking and sealing of bolts, fittings, nuts, and studs. This type of sealant cures only when confined between 2 close fitting metal surfaces.

Use the following information when using threadlock sealant:

- Always follow all safety recommendations and directions that are on the threadlock sealant container.
- The threaded surfaces to be sealed must be clean and dry.
- Apply the threadlock sealant as specified on the threadlock sealant container.

Important: Fasteners that are partially torqued and then the threadlock sealant allowed to cure more than five minutes, may result in incorrect clamp load of assembled components.

- Tighten the fasteners in sequence (if specified) and to the proper torque specifications. DO NOT overtighten the fasteners.

Anaerobic Type Pipe Sealant

Use of Room Temperature Vulcanizing (RTV) and Anaerobic Sealant

Anaerobic type pipe sealant cures in the absence of air and remains pliable when cured. This type of sealant is used where 2 parts are assembled together and require a leak proof joint.

Use the following information when using pipe sealant:

- Do not use pipe sealant in areas where extreme temperatures are expected. These areas include:
 - The exhaust manifold
 - The head gasket
 - Surfaces where a different sealant is specified
- Always follow all the safety recommendations and the directions that are on the pipe sealant container.
- The surfaces to be sealed must be clean and dry.
- Use a pipe sealant bead of the size or quantity as specified in the service procedure.

Important: Do not allow the pipe sealant to enter any of the blind threaded holes, as the pipe sealant may prevent the fastener from clamping properly, or cause component damage when the fastener is tightened.

- Apply the pipe sealant bead to the inside of any bolt hole areas.
- Apply a continuous bead of pipe sealant to 1 sealing surface.
- Tighten the fasteners in sequence (if specified) and to the proper torque specifications. DO NOT overtighten the fasteners.

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Submodel: | Engine Type: | Liters:
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Sealant Types

Note: The correct sealant and amount of sealant must be used in the proper location to prevent oil leaks, coolant leaks, or the loosening of the fasteners. DO NOT interchange the sealants. Use only the sealant, or equivalent, as specified in the service procedure.

The following 2 major types of sealant are commonly used in engines:

- Anaerobic sealant room temperature vulcanizing (RTV)
- Anaerobic sealant, which include the following:
 - Gasket eliminator
 - Pipe
 - Threadlock

Anaerobic Type Room Temperature Vulcanizing (RTV) Sealant

Anaerobic type room temperature vulcanizing (RTV) sealant cures in the absence of air. This type of sealant is used where 2 components, such as the intake manifold and the engine block, are assembled together.

Use the following information when using RTV sealant:

- Do not use RTV sealant in areas where extreme temperatures are expected. These areas include:
 - The exhaust manifold
 - The head gasket
 - Any other surfaces where a different type of sealant is specified in the service procedure
- Always follow all the safety recommendations and the directions that are on the RTV sealant container.
- Use a plastic or wood scraper in order to remove all the RTV sealant from the components.

Caution: Do not allow the RTV sealant to enter any blind threaded hole. RTV sealant that is allowed to enter a blind threaded hole can cause hydraulic lock of the fastener when the fastener is tightened. Hydraulic lock of a fastener can lead to damage to the fastener and/or the components. Hydraulic lock of a fastener can also prevent the proper clamping loads to be obtained when the fastener is tightened. Improper clamping loads can prevent proper sealing of the components allowing leakage to occur. Preventing proper fastener tightening can allow the components to loosen or separate leading to extensive engine damage.

- The surfaces to be sealed must be clean and dry.
- Use a RTV sealant bead size as specified in the service procedure.
- Apply the RTV sealant bead to the inside of any bolt holes areas.

Note: Do not wait for the RTV sealant to skin over.

- Assemble the components while the RTV sealant is still wet to the touch, within 3 minutes.

Note: Do not overtighten the fasteners.

- Tighten the fasteners in sequence, if specified, and to the proper torque specifications.

Anaerobic Type Gasket Eliminator Sealant

Anaerobic type gasket eliminator sealant cures in the absence of air. This type of sealant is used where 2 rigid parts, such as castings, are assembled together. When 2 rigid parts are disassembled and no sealant or gasket is readily noticeable, then the 2 parts were probably assembled using an anaerobic type gasket eliminator sealant.

Use the following information when using gasket eliminator sealant:

- Always follow all the safety recommendations and directions that are on the gasket eliminator sealant container.
- Apply a continuous bead of gasket eliminator sealant to one flange.

The surfaces to be sealed must be clean and dry.

Caution: Do not allow the sealant to enter a blind hole. The sealant may prevent the fastener from achieving proper clamp load, cause component damage when the fastener is tightened, or lead to component failure.

Note:

- Gasket eliminator sealed joint fasteners that are partially torqued and the gasket eliminator sealant allowed to cure more than 5 minutes, may result in incorrect shimming and sealing of the joint.
- Do not overtighten the fasteners.
 - Apply the gasket eliminator sealant evenly to get a uniform thickness of the gasket eliminator sealant on the sealing surface.
 - Tighten the fasteners in sequence, if specified, and to the proper torque specifications.
 - After properly tightening the fasteners, remove the excess gasket eliminator sealant from the outside of the joint.

Anaerobic Type Threadlock Sealant

Anaerobic type threadlock sealant cures in the absence of air. This type of sealant is used for threadlocking and sealing of bolts, fittings, nuts, and studs. This type of sealant cures only when confined between 2 close fitting metal surfaces.

Use the following information when using threadlock sealant:

- Always follow all safety recommendations and directions that are on the threadlock sealant container.
- The threaded surfaces to be sealed must be clean and dry.
- Apply the threadlock sealant as specified on the threadlock sealant container.

Note:

- Fasteners that are partially torqued and then the threadlock sealant allowed to cure more than 5 minutes, may result in incorrect clamp load of assembled components.
- Do not overtighten the fasteners.
- Tighten the fasteners in sequence, if specified, and to the proper torque specifications.

[Anaerobic Type Pipe Sealant](#)

Anaerobic type pipe sealant cures in the absence of air and remains pliable when cured. This type of sealant is used where 2 parts are assembled together and require a leak proof joint.

Use the following information when using pipe sealant:

- Do not use pipe sealant in areas where extreme temperatures are expected. These areas include:
 - The exhaust manifold
 - The head gasket
 - Surfaces where a different sealant is specified
- Always follow all the safety recommendations and the directions that are on the pipe sealant container.
- The surfaces to be sealed must be clean and dry.
- Use a pipe sealant bead of the size or quantity as specified in the service procedure.

Caution: Do not allow the sealant to enter a blind hole. The sealant may prevent the fastener from achieving proper clamp load, cause component damage when the fastener is tightened, or lead to component failure.

- Apply the pipe sealant bead to the inside of any bolt hole areas.
- Apply a continuous bead of pipe sealant to one sealing surface.

Note: Do not overtighten the fasteners.

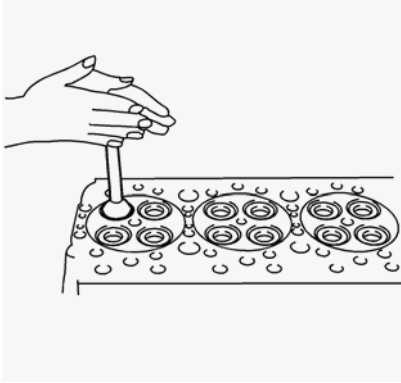
- Tighten the fasteners in sequence, if specified, and to the proper torque specifications.

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1. Remove the carbon from the valve guide and valve seat surface.
2. Resurface the valve face to 45 degrees. If valve margin falls below specifications after resurfacing then discard valve.
3. Use a suitable tool to bring the valve contact width to the standard value. The valve seat angle is 45 degrees.



4. Apply valve lapping compound to the valve seat surface.
5. Insert the valve into the cylinder head.
6. Turn the valve back and forth in its seat to lap the valve face to the valve seat.

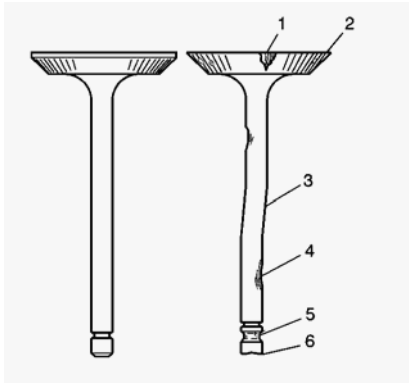
2013 Chevrolet Colorado

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

[Valve Cleaning Procedure](#)

1. Use soft bristle wire brush to clean any carbon build-up from the valve head. DO NOT use a wire brush on any part of the valve stem. The valve stem is chrome plated to provide enhanced wear characteristics. Wire brushing the stem could remove the chrome plating.
2. Thoroughly clean the valve with solvent and wipe dry.

[Valve Visual Inspection Procedure](#)



1. Inspect the valve for damage from the head to tip for the following conditions:

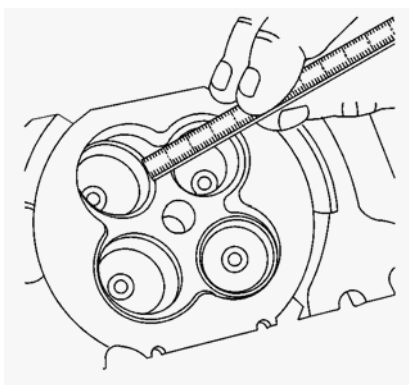
- Pitting in the valve seat area (1)
- Lack of valve margin (2)
- Bending in the valve stem (3)
- Pitting or excessive wear in the stem (4)
- Worn valve key grooves (5)
- Worn valve tip (6)
- Replace the valve if any of these conditions exist.

[Valve Measurement Overview](#)

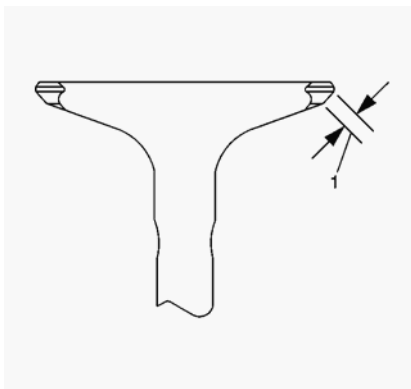
Note: The following measurement and reconditioning procedures must be followed to ensure proper engine performance.

1. Proper valve service is critical to engine performance. Therefore, all detailed measurement procedures must be followed to identify components that are out of specification.
2. If the measurement procedures reveal that the valve seat must be reconditioned, it is critical to perform the measurement procedures after reconditioning. Valves for E85-compatible engines CANNOT be reconditioned. Any grinding, lapping, wire-brushing or other similar procedure will damage or destroy the coating that gives the valve the E-85 compatible features. If an E85-compatible valve is out of specification in any area, replace it.

[Valve Seat Width Measurement Procedure](#)



1. Measure the valve seat width in the cylinder head using a proper scale.



2. Measure the seat width on the valve face (1) using a proper scale.

Note: The seat contact area must be at least 0.5 mm (0.020 in) from the outer diameter (margin) of the valve. If the contact area is too close to the margins, the valve must be replaced.

3. Compare your measurements with the specifications listed in Engine Mechanical Specifications.
4. If the seat widths are acceptable, check the valve seat roundness using the Valve Seat Roundness Measurement Procedure.
5. If the seat width is not acceptable, you must replace the valve. Proper valve seat width is critical to providing the correct amount of valve heat dissipation.

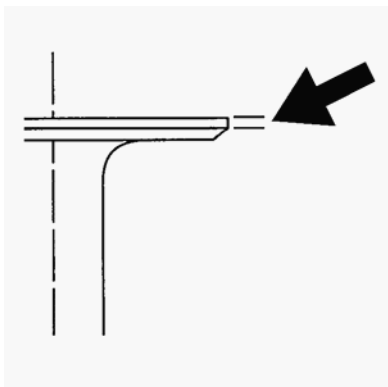
[Valve Seat Roundness Measurement Procedure](#)

1. Measure the valve seat roundness using a dial indicator attached to a tapered pilot installed in the guide. The pilot should have a slight bind when installed in the guide.

Caution: The correct size pilot must be used. Do not use adjustable diameter pilots. Adjustable pilots may damage the valve guides.

2. Compare your measurements with the specifications listed in Engine Mechanical Specifications.
3. If the valve seat exceeds the roundness specification, you must replace the valve.
4. If new valves are being used, the valve seat roundness must be within 0.05 mm (0.002 in).

[Valve Margin Measurement Procedure](#)

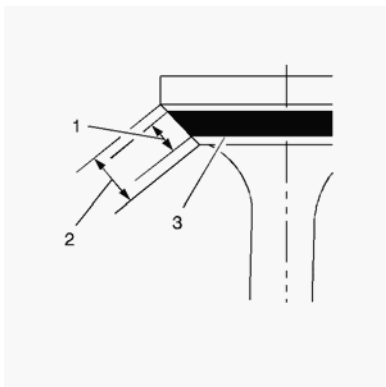


1. Measure the valve margin using an appropriate scale.
2. Reference the specifications in this section for minimum valve margin and compare them to your measurements.
3. If the valve margins are beyond specification, replace the valves.
4. If the valve margins are within specification, test the valve for seat concentricity using the Valve-to-Seat Concentricity Measurement Procedure.

[Valve-to-Seat Concentricity Measurement Procedure](#)

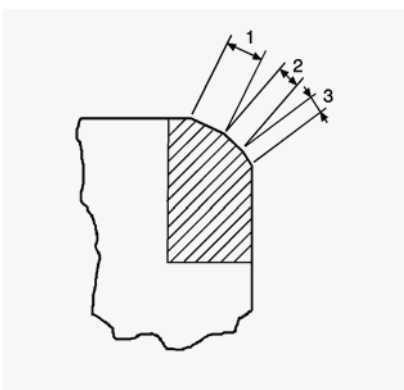
Note:

- Checking the valve-to-seat concentricity determines whether the valve and seat are sealing properly.
- You must measure the valve face and the valve seat to ensure proper valve sealing.



1. Coat the valve face lightly with blue dye (3).
 2. Install the valve in the cylinder head.
 3. Turn the valve against the seat with enough pressure to wear off the dye.
 4. Remove the valve from the cylinder head.
 5. Inspect the valve face.
- If the valve face is concentric, providing a proper seal-with the valve stem, a continuous mark will be made around the entire face (1).
Note: The wear mark **MUST** be at least 0.5 mm (0.020 in) from the outer diameter, the margin, of the valve. If the wear mark is too close to the margin, the seat must be reconditioned to move the contact area away from the margin.
 - If the face is not concentric with the stem, the mark will **NOT** be continuous around the valve face. The valve should be replaced and the seat must be reconditioned using the Valve and Seat Reconditioning Procedure.

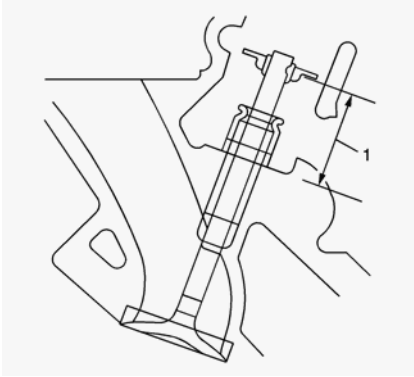
[Valve and Seat Reconditioning Procedure](#)



Note:

- If the valve seat width, roundness or concentricity is beyond specifications, you must grind the seats in order to ensure proper heat dissipation and prevent the buildup of carbon on the seats.
 - A NEW valve must be used with any reconditioned seat.
1. Grind the valve seats (2) to the proper angle specification listed in Engine Mechanical Specifications.
 2. Using the proper angle specification listed in Engine Mechanical Specifications, grind, relieve, the valve seats (1) to correctly position the valve seating surface (2) to the valve.
 3. Using the proper angle specification listed in Engine Mechanical Specifications, grind, undercut, the valve seats (3) to narrow the valve seat widths to the specifications listed in Engine Mechanical Specifications.
 4. When grinding the seats, grind off as little material as possible. Cutting valve seat results in lowering the valve spring pressure.
 5. Install the valve in the cylinder head. Do not lap the valves under any condition, whether the valves are new or used.
 6. After obtaining the proper valve seat width in the cylinder head, you must re-measure the valve stem height using the Valve Stem Height Measurement Procedure.
 7. If the valve stem height is acceptable, test the seats for concentricity using the Valve-to-Seat Concentricity Measurement Procedure.

[Valve Stem Height Measurement Procedure](#)



Note: To determine the valve stem height measurement, measure from the valve spring seat to the valve spring retainer.

1. Install the valve into the valve guide.
2. Ensure the valve is seated to the cylinder head valve seat.
3. Install the valve stem oil seal.
4. Install the valve spring retainer and valve stem locks.
5. Measure the distance (1) between the cylinder head to the bottom of the valve spring retainer. Refer to Engine Mechanical Specifications.
6. If the maximum height specification is exceeded, a new valve should be installed and the valve stem height re-measured.

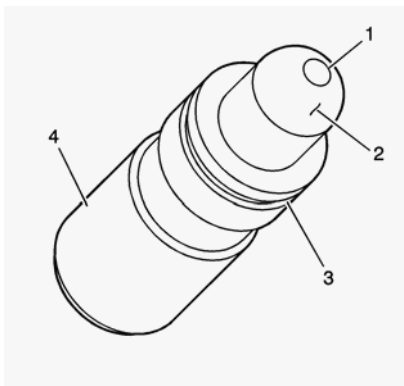
Caution: DO NOT grind the valve stem tip. The tip of the valve is hardened and grinding the tip will eliminate the hardened surface causing premature wear and possible engine damage.

Caution: DO NOT use shims in order to adjust valve stem height. The use of shims will cause the valve spring to bottom out before the camshaft lobe is at peak lift and engine damage could result.

7. If the valve stem height still exceeds the maximum height specification, the cylinder head must be replaced.

2013 Chevrolet Colorado

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

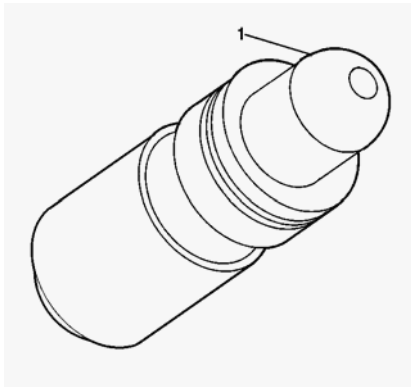


Caution: Refer to Valve Lifter Priming Caution.

1. Inspect the stationary hydraulic lash adjuster (SHLA) in the following areas:
 - A plugged oil passage (1)
 - A scored or worn camshaft follower pivot area (2)
 - A damaged or broken retainer (3), some applications
 - A severely scuffed or worn SHLA body (4)
- Replace the SHLA or SHLAs as necessary.

2013 Chevrolet Colorado

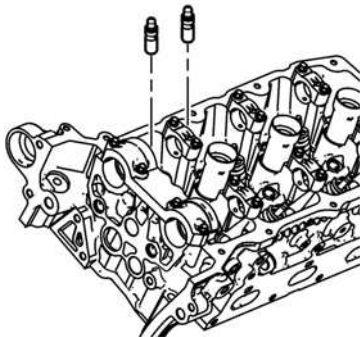
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Important: Do not stroke/cycle the stationary hydraulic lash adjuster plunger without oil in the lower pressure chamber.

Important: Do not allow the stationary hydraulic lash adjuster to tip over, plunger down, after the oil fill.

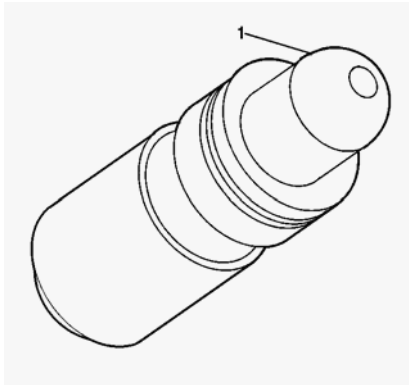
1. Fill the stationary hydraulic lash adjuster (SHLA) with clean engine oil GM P/N 12378006 or equivalent. Take precautions to prevent scratching the pivot sphere area (1) of the SHLA.
2. Lubricate the SHLA bores in the cylinder head with clean engine oil GM P/N 12378006 or equivalent.



3. Install the SHLAs in the cylinder head.
4. Apply a liberal amount of lubricant GM P/N 12345501 (Canadian P/N 992704) or equivalent to the SHLA pivot spheres.

2013 Chevrolet Colorado

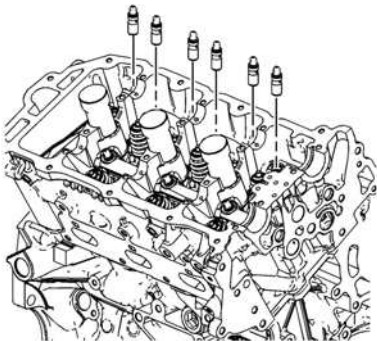
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



Important: Do not stroke/cycle the stationary hydraulic lash adjuster plunger without oil in the lower pressure chamber.

Important: Do not allow the stationary hydraulic lash adjuster to tip over, plunger down, after the oil fill.

1. Fill the stationary hydraulic lash adjuster (SHLA) with clean engine oil GM P/N 12378006 or equivalent. Take precautions to prevent scratching the pivot sphere area (1) of the SHLA.
2. Lubricate the SHLA bores in the cylinder head with clean engine oil GM P/N 12378006 or equivalent.

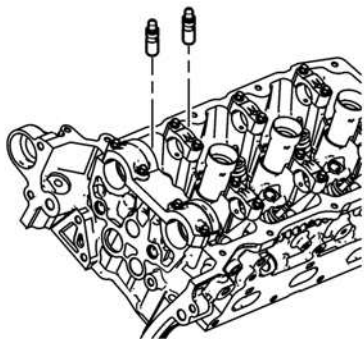


3. Install the SHLAs in the cylinder head.
4. Apply a liberal amount of lubricant GM P/N 12345501 (Canadian P/N 992704) or equivalent to the SHLA pivot spheres.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Important:

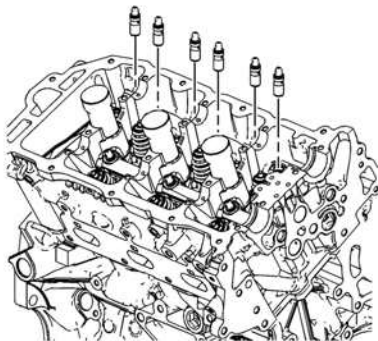
- Do not stroke/cycle the stationary hydraulic lash adjuster plunger without oil in the lower pressure chamber.
- Do not allow the stationary hydraulic lash adjuster to tip over, plunger down, after the oil fill.

Remove the valve lifters (SHLAs) from the cylinder head. If the lifters are to be reused, keep in order so they can be reinstalled in the same position.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



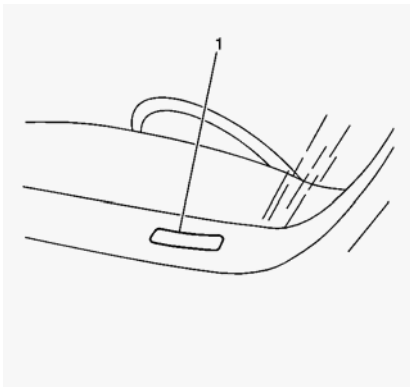
Important:

- Do not stroke/cycle the stationary hydraulic lash adjuster plunger without oil in the lower pressure chamber.
- Do not allow the stationary hydraulic lash adjuster to tip over, plunger down, after the oil fill.

Remove the valve lifters (SHLAs) from the cylinder head. If the lifters are to be reused, keep in order so they can be reinstalled in the same position.

2013 Chevrolet Colorado

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



The VIN plate (1) is the legal identifier of the vehicle. The VIN plate is located on the upper left corner of the instrument panel (I/P) and can be seen through the windshield from the outside of the vehicle:

Vehicle Identification Number (VIN) System

Position	Definition	Character	Description
1–3	World Manufacturer Identifier	MMM	General Motors Thailand – Chevrolet
		MMU	General Motors Thailand – Holden
4	Gross Vehicle Weight Rating Code	1	Not greater than 3,150 kg
5	Wheelbase	4	GMI700 LWB 3,095 mm
		5	31UX, GMI700 SWB 2,845 mm
		1	Regular Cab, Flat Deck
		4	Regular Cab, Pick Up Box
		2	Extended Cab, Pick Up Box
6	Cab Type Code	8	Crew Cab, Pick Up Box
		3	Regular, Without Box
		5	Extended Cab, Without Box
		7	Crew Cab, Without Box
		6	SUV, 31 UX
		A	DX 4x2 (Holden)
		B	DX 4x4 (Holden)
		C	LS 4X2 (Chevrolet), LX 4x2 (Holden)
		D	LS 4X4 (Chevrolet), LX 4x4 (Holden)
		E	LT 4X2 (Chevrolet, Holden)
7	Finishing Level Code	F	LT 4X4 (Chevrolet, Holden)
		L	LTZ 4X2 (Chevrolet, Holden)
		M	LTZ 4X4 (Chevrolet, Holden)
		E	LE6, 2.4 L4 Gasoline
		D	LY7, 3.6 V6 Gasoline
		G	LVN, 2.5 L4 Diesel
8	Engine Type Code		

Vehicle, Engine and Transmission ID and VIN Location, Derivative and Usage

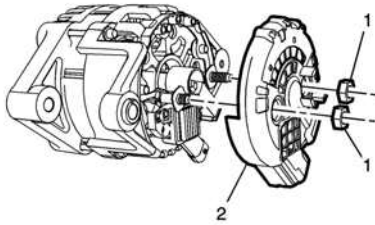
Position	Definition	Character	Description
		H	LWH, 2.8 L4 Diesel
9	Check Digit	0	For ISO, EU VIN Type
10	Model Year	D	2013
11	Manufacturer Plant Code	H	Rayong, Thailand
		C	São Jose' Dos Campos, Brazil
12–17	Plant Sequence Number	—	Start with “000001” for each new model year

2013 Chevrolet Colorado

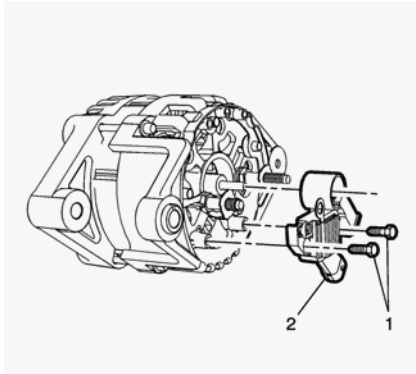
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the generator. Refer to Generator Replacement.

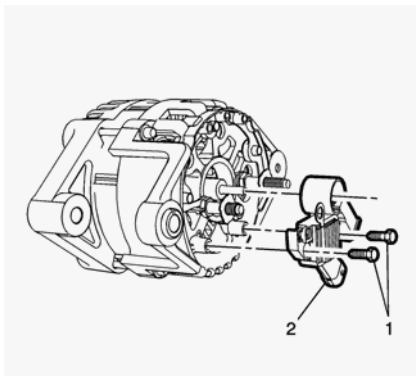


2. Remove the generator cover fasteners (1) and remove the generator cover (2).



3. Remove the fasteners (1) and the voltage regulator (2), from the generator.

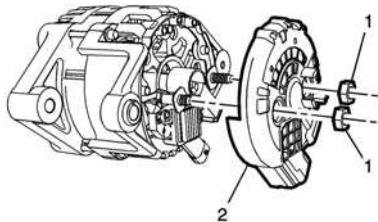
[Installation Procedure](#)



Caution: Refer to Fastener Caution.

1. Install the voltage regulator (2) to the generator and tighten the fasteners (1) to **4.5 Y (45 lb in)**.

Voltage Regulator Replacement



2. Install the generator cover (2) and tighten the fasteners (1) to **22 Y (16 lb ft)**.
3. Install the generator. Refer to Generator Replacement.