

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.

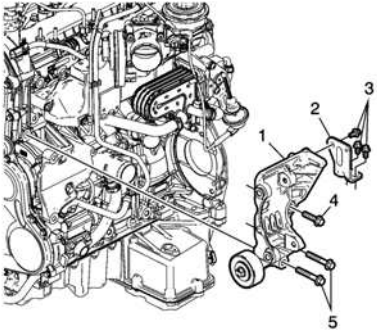
[Charging System Indicator](#)

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

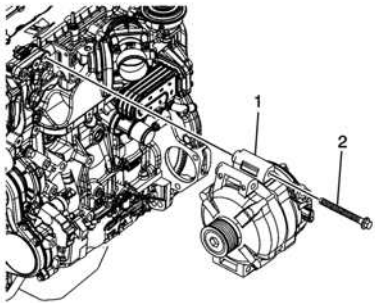
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:



1. Install the brackets (1 and 2).

Caution: Refer to Fastener Caution.

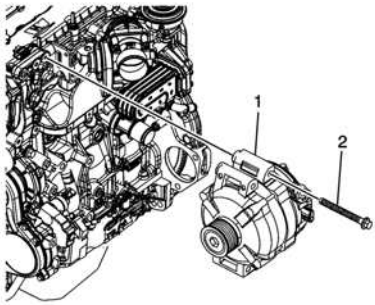
2. Install the bracket mounting bolts (3–5) and tighten to **45 Y (33 lb ft)**.



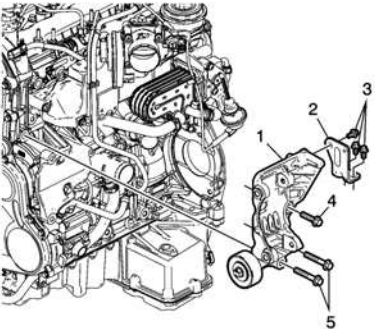
3. Install the generator (1).
4. Install the bolts (2) and tighten to **33 Y (24 lb ft)**.

2013 Chevrolet Colorado

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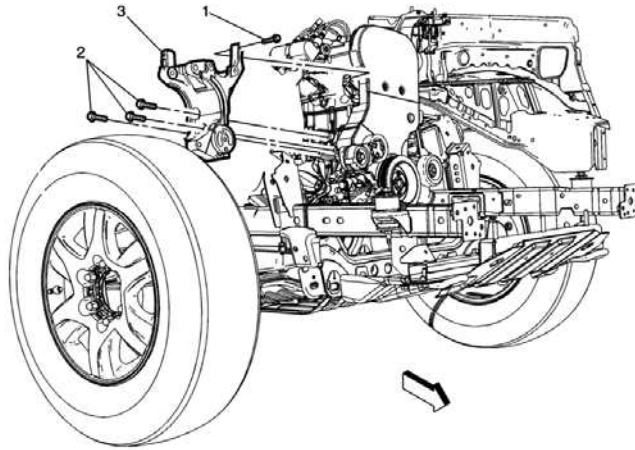
1. Remove the generator mounting bolts (2) and the generator (1).



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

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:
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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

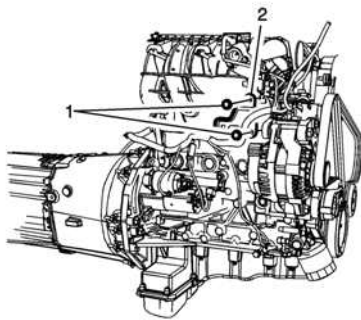
Generator and Power Steering Pump Bracket

2013 Chevrolet Colorado

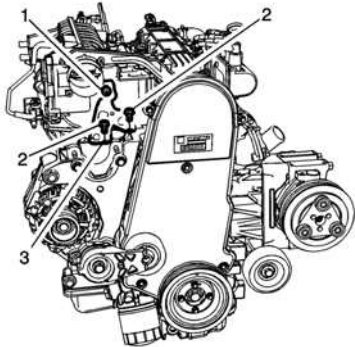
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

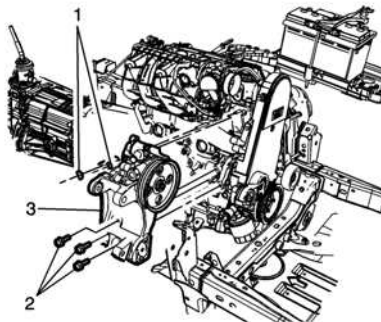
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.
3. Remove the power steering fluid reservoir outlet hose. Refer to Power Steering Fluid Reservoir Outlet 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).



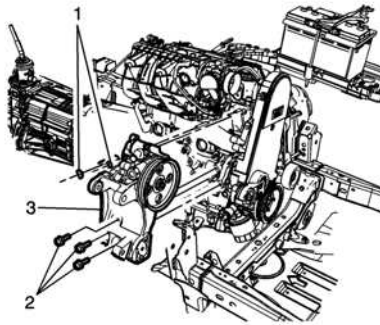
7. Remove the throttle body fastener (1) and remove the intake manifold bracket fasteners (2).
8. Remove the intake manifold bracket (3).



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](#)

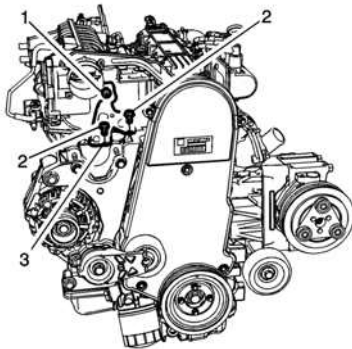
1. Install the power steering pump. Refer to Power Steering Pump Replacement.



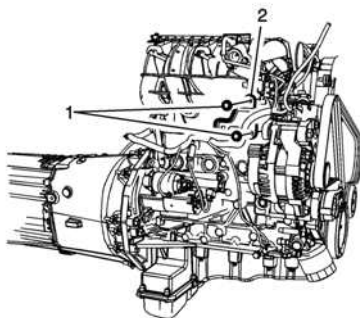
2. Install the generator and power steering pump bracket (3).

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)**.



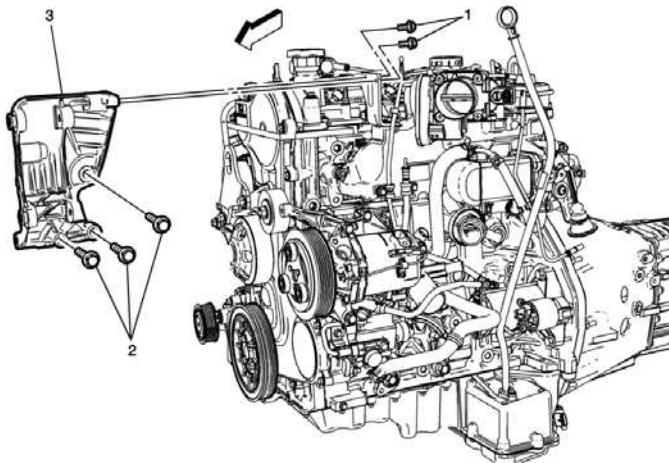
5. Install the intake manifold bracket (3) and tighten the throttle body fastener (1) to **10 Y (89 lb in)**.
6. Tighten the fasteners (2) to **10 Y (89 lb in)**.



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:
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Generator Bracket Replacement

Callout

Component Name

Preliminary Procedure

Remove the generator. Refer to Generator Replacement.

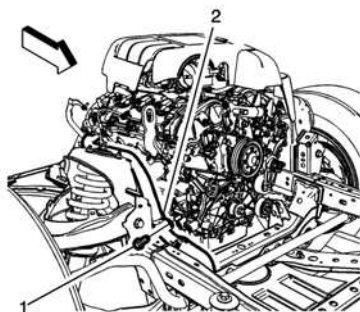
- | | |
|---|--|
| | Generator Adjust Bracket Brace Fastener (Qty: 2) |
| 1 | Caution: Refer to Fastener Caution. |
| | Tighten |
| | 20 Y (15 lb ft) |
| | Generator Bracket Fastener (Qty: 3) |
| 2 | Tighten |
| | 45 Y (33 lb ft) |
| 3 | Generator Bracket |

2013 Chevrolet Colorado

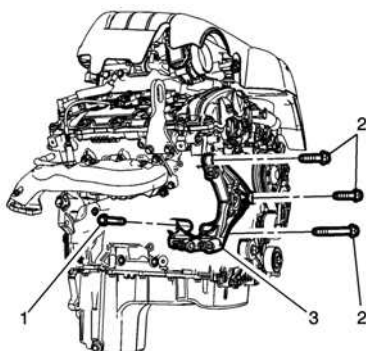
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

Removal Procedure

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

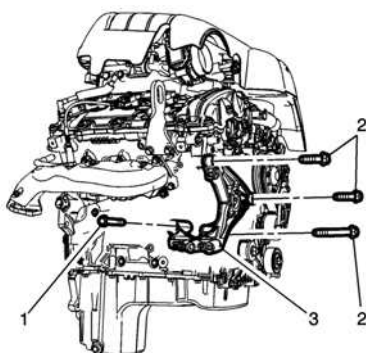


3. Remove the radiator outlet pipe retainer fastener (1) and set aside the radiator outlet pipe (2).



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



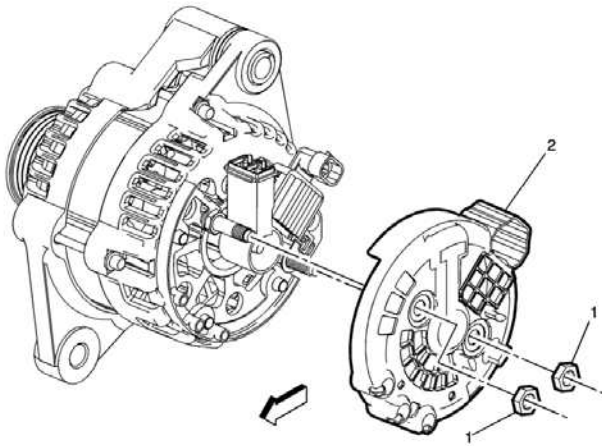
1. Install the generator bracket (3) to the engine and loosely tighten the fastener (1).

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

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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

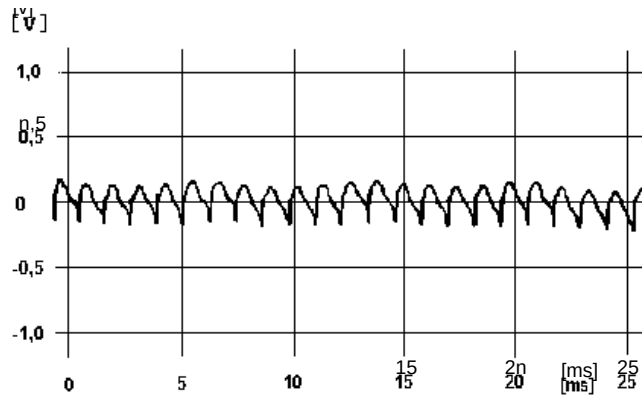
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Oscilloscope – Reference Images](#)

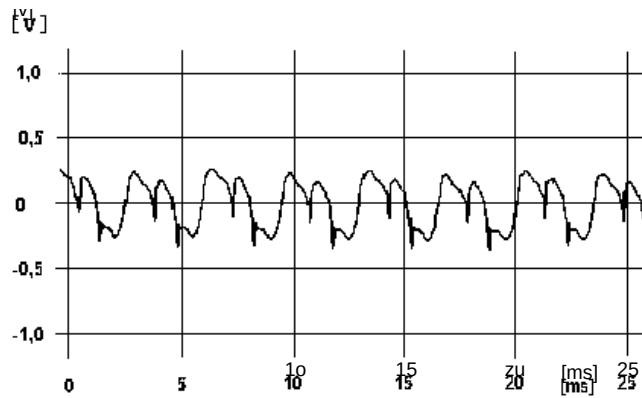
Test generator with oscilloscope (connect as for voltage measurement to B+ and generator housing).

[Generator Images](#)

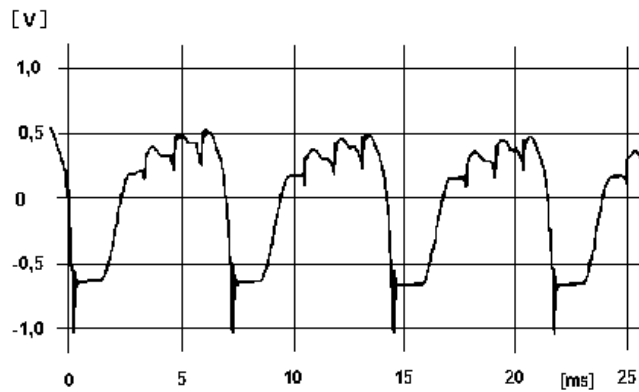
[Generator without Error](#)



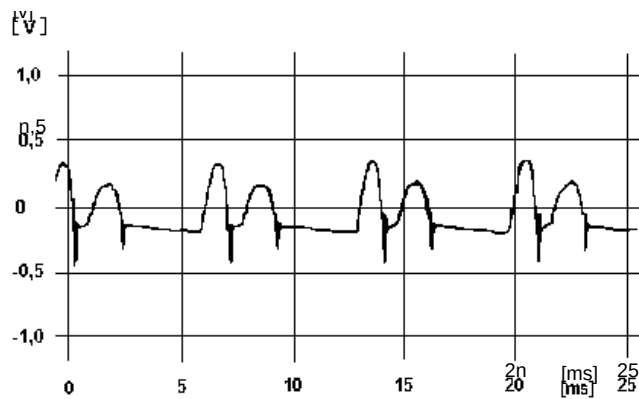
[Generator with Phase Error](#)



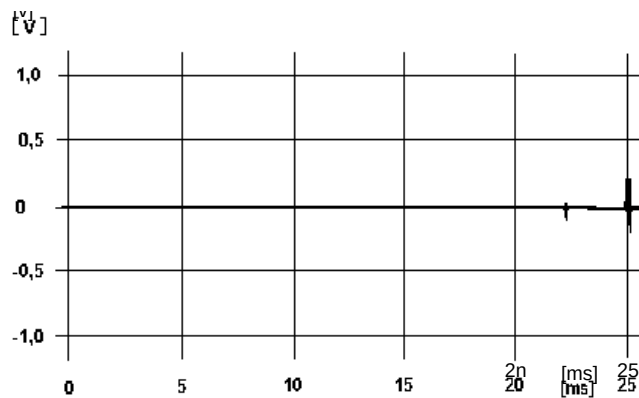
[Generator with Diode Error \(Plus or Minus Diode Break\)](#)



[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:

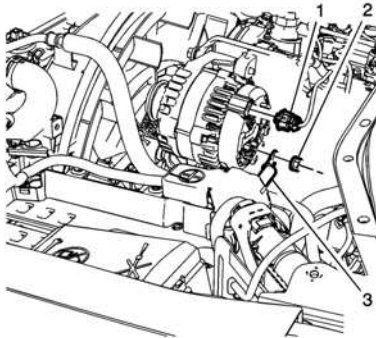
- Vehicle equipment
- Control module tracking time

2013 Chevrolet Colorado

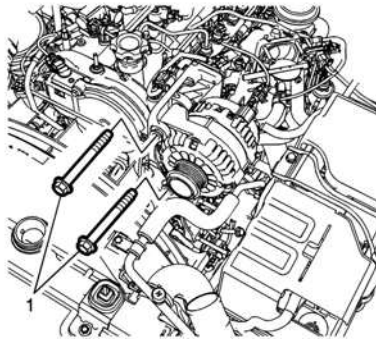
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

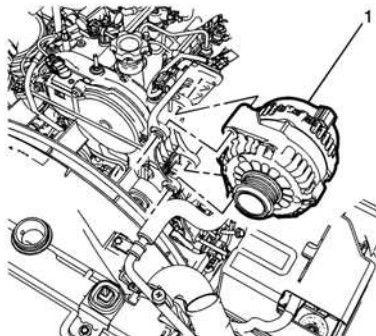
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the charge air cooler outlet hose. Refer to Charge Air Cooler Outlet Air Hose Replacement.
3. Remove the drive belt. Refer to Drive Belt Replacement.



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.

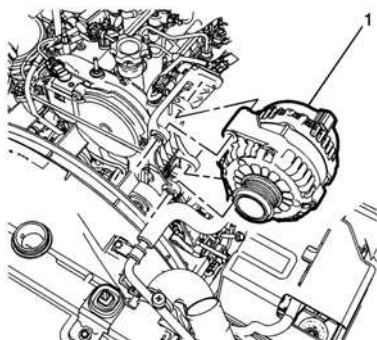


6. Remove the generator mounting fasteners (1).

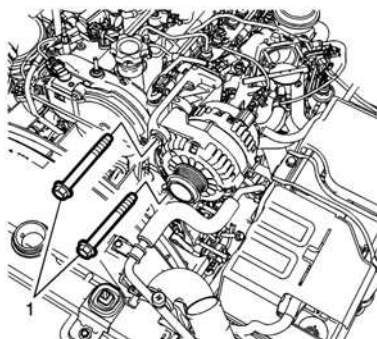


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

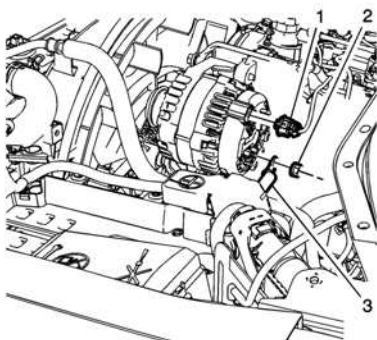


1. Install the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

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



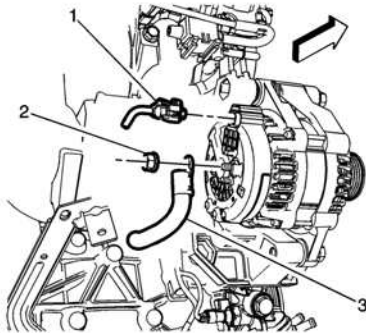
3. Connect the engine harness connector (1).
4. Install the battery positive cable (3), to the back of the generator and tighten the fastener (2) to **14 Y (10 lb ft)**.
5. Install the drive belt. Refer to Drive Belt Replacement.
6. Install the charge air cooler outlet hose. Refer to Charge Air Cooler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

2013 Chevrolet Colorado

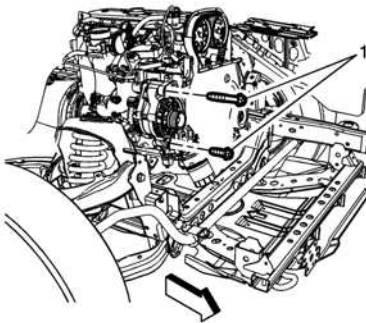
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

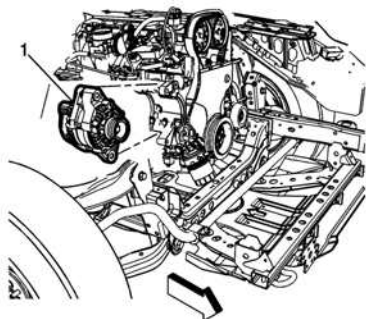
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
3. Reposition the power steering pump. Refer to Power Steering Pump Replacement.



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.

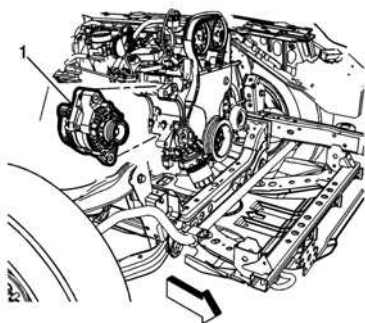


6. Remove the generator mounting fasteners (1).

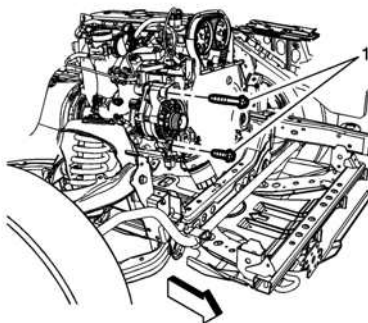


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

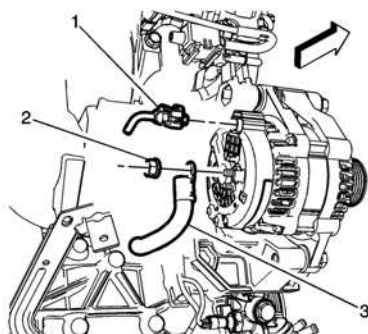


1. Position the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

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



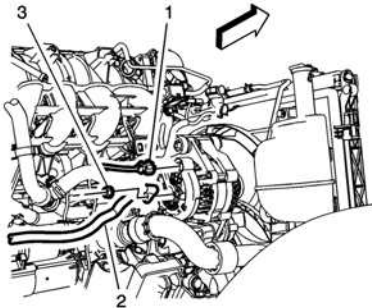
3. Connect the engine harness connector (1).
4. Install the battery positive cable (3), to the back of the generator and tighten the fastener (2) to **14 Y (10 lb ft)**.
5. Install the power steering pump. Refer to Power Steering Pump Replacement.
6. Install the air cleaner outlet duct. Refer to Air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

2013 Chevrolet Colorado

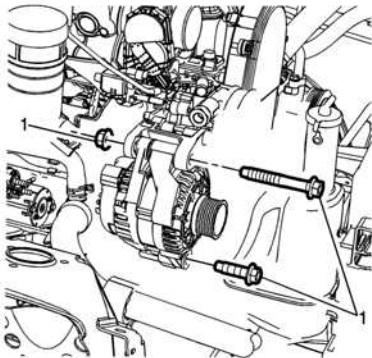
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

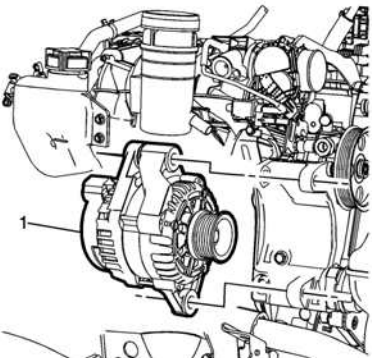
1. Disconnect the negative battery cable. Refer to Battery Negative Cable Disconnection and Connection.
2. Remove the drive belt. Refer to Drive Belt Replacement.
3. Remove the air cleaner outlet resonator. Refer to Air Cleaner Outlet Resonator Replacement.



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.

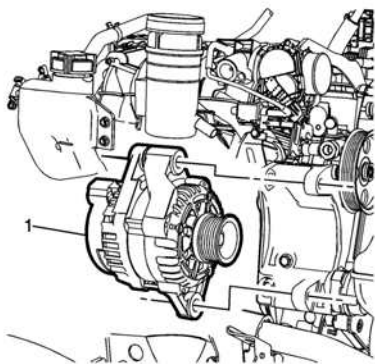


6. Remove the generator mounting fasteners (1).

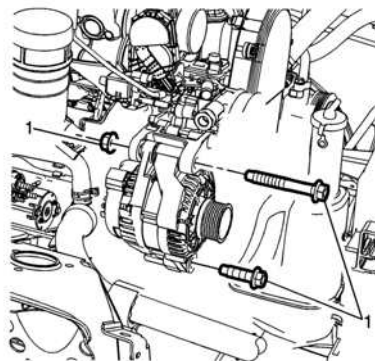


7. Remove the generator (1) from the engine compartment.

[Installation Procedure](#)

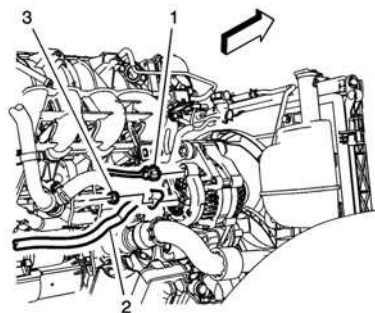


1. Position the generator (1) into the generator bracket.



Caution: Refer to Fastener Caution.

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



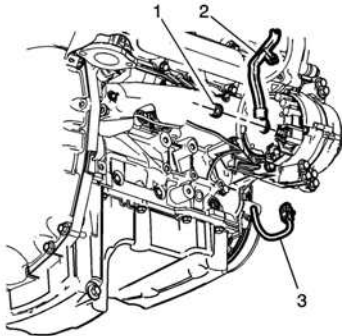
3. Connect the engine harness connector (1).
4. Install the battery positive cable (2), to the back of the generator and tighten the fastener (3) to **14 Y (10 lb ft)**.
5. Install the drive belt. Refer to Drive Belt Replacement.
6. Install the air cleaner outlet resonator. Refer to Air Cleaner Outlet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

2013 Chevrolet Colorado

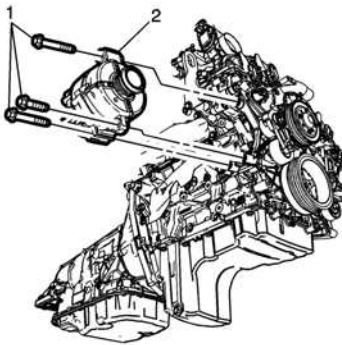
Submodel: | Engine Type: | Liters:
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[Removal Procedure](#)

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.

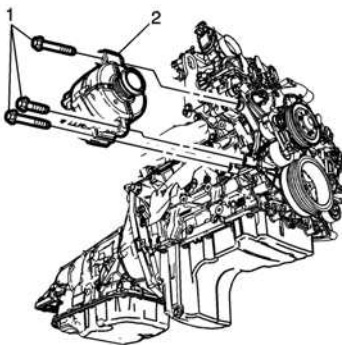


4. Disconnect the engine harness connector (3).
5. Remove the battery positive cable fastener (1) and remove the battery positive cable (2), from the back of the generator.



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

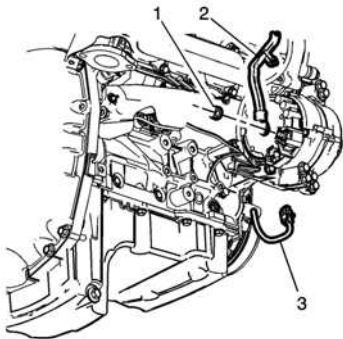
[Installation Procedure](#)



Caution: Refer to Fastener Caution.

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

Generator Replacement (LY7)



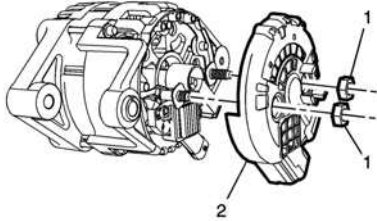
2. Connect the engine harness connector (3).
3. Install the battery positive cable (2), to the back of the generator and tighten the fastener (1) to **20 Y (15 lb ft)**.
4. Install the water pump and generator belt. Refer to Water Pump and Generator Belt Replacement.
5. Install the air cleaner assembly.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

2013 Chevrolet Colorado

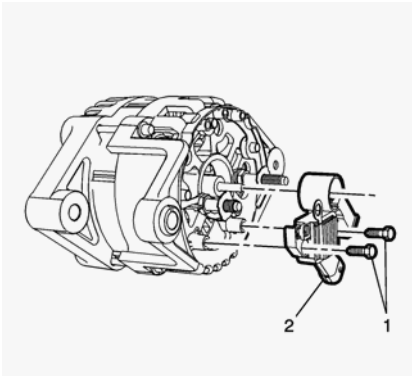
Submodel: | Engine Type: | Liters:
Fuel Delivery: | Fuel:

[Removal Procedure](#)

1. Remove the generator. Refer to Generator Replacement.

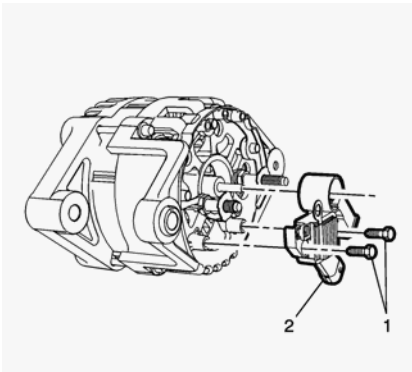


2. Remove the generator cover fasteners (1) and remove the generator cover (2).



3. Remove the fasteners (1) and the voltage regulator (2), from the generator.

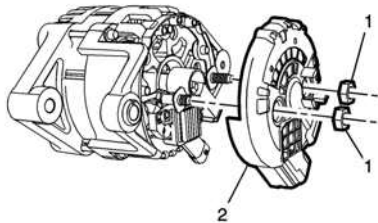
[Installation Procedure](#)



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

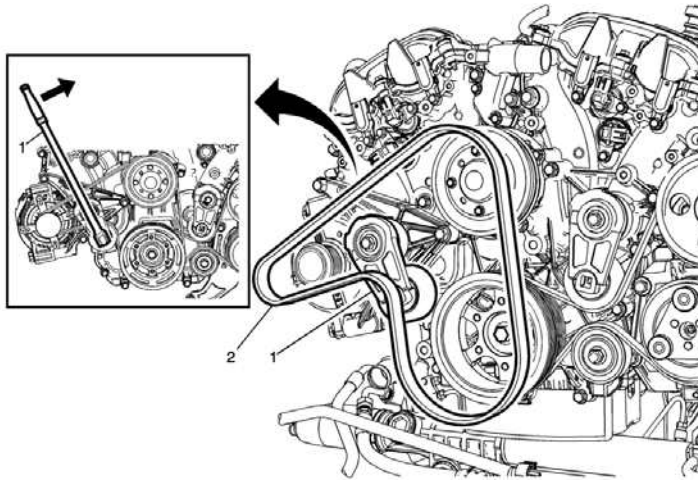


2. Install the generator cover (2) and tighten the fasteners (1) to **22 Y (16 lb ft)**.
3. Install the generator. Refer to Generator Replacement.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

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Water Pump and Generator Belt Replacement

Callout

Component Name

Preliminary Procedures

1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.

1. Water Pump and Generator Drive Belt Tensioner
Rotate the drive belt tensioner clockwise to release the drive belt tension.

Water pump and Generator Drive Belt

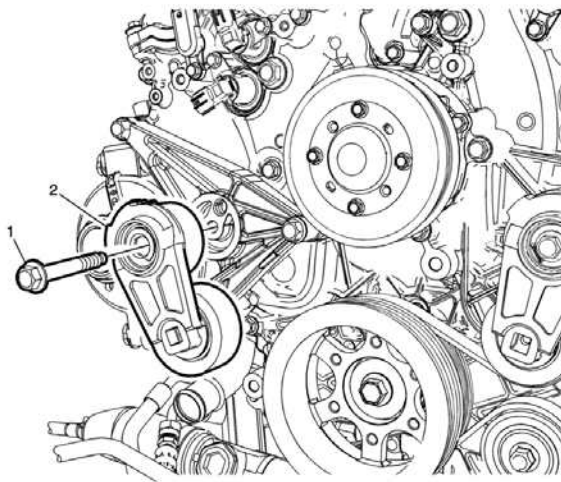
Procedure

2.
 1. Slide the drive belt off of the water pump pulley.
 2. Slowly release the drive belt tensioner.
 3. Remove the belt from behind the belt tensioner.
 4. Inspect the belt for damage including frays, cracks and glazed areas due to slippage.

2013 Chevrolet Colorado

Submodel: | Engine Type: | Liters:

Fuel Delivery: | Fuel:



Water Pump and Generator Belt Tensioner Replacement

Callout

Component Name

Preliminary Procedures

1. Remove the intake manifold cover. Refer to Intake Manifold Cover Replacement.
2. Remove the air cleaner outlet duct. Refer to Air Cleaner Outlet Duct Replacement.
3. Remove the water pump and generator belt. Water Pump and Generator Belt Replacement.

Water Pump and Generator Belt Tensioner Fastener

1

Tighten

25 Y (18 lb ft)

2

Water Pump and Generator Belt Tensioner