

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Battery Cable Terminal Bolt	35 N·m	26 lb ft
Battery Hold Down Retainer Bolt	18 N·m	13 lb ft
Battery Negative Cable Bolt	20 N·m	15 lb ft
Battery Negative Cable Ground Bolt	20 N·m	15 lb ft
Battery Positive Cable Nut (at the underhood electrical center)	15 N·m	11 lb ft
Battery Positive Cable Nut (at the starter)	13 N·m	115 lb in
Generator BAT Terminal Nut	13 N·m	115 lb in
Generator Bolt	50 N·m	37 lb ft
Generator Bracket Bolt (at the front of the bracket)	50 N·m	37 lb ft
Generator Bracket Bolt (at the rear of the bracket)	23 N·m	17 lb ft
Starter Motor Mounting Bolt	50 N·m	37 lb ft
Starter Shield Bolt	8 N·m	115 lb in
Starter Shield Nut	8 N·m	71 lb in

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Document ID: 2085823

Battery Usage

Application	Specification
Cold Cranking Amperage (CCA)	770 A
Reserve Capacity	120 Minutes
Replacement Model Number	48-7YR

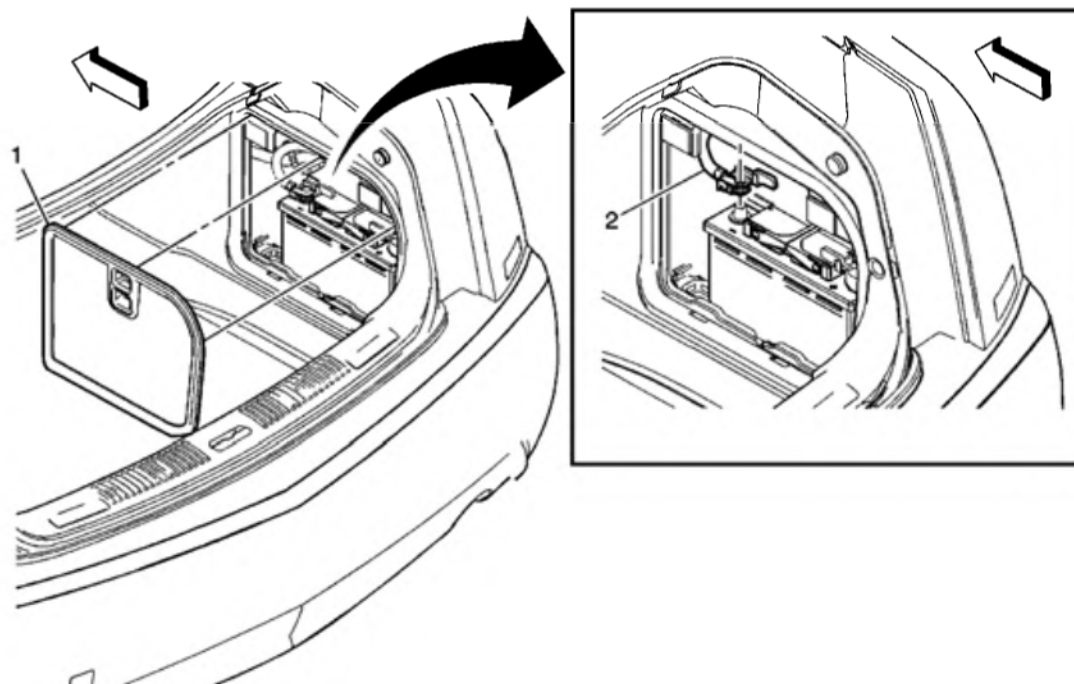
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Document ID: 2085824

Generator Usage

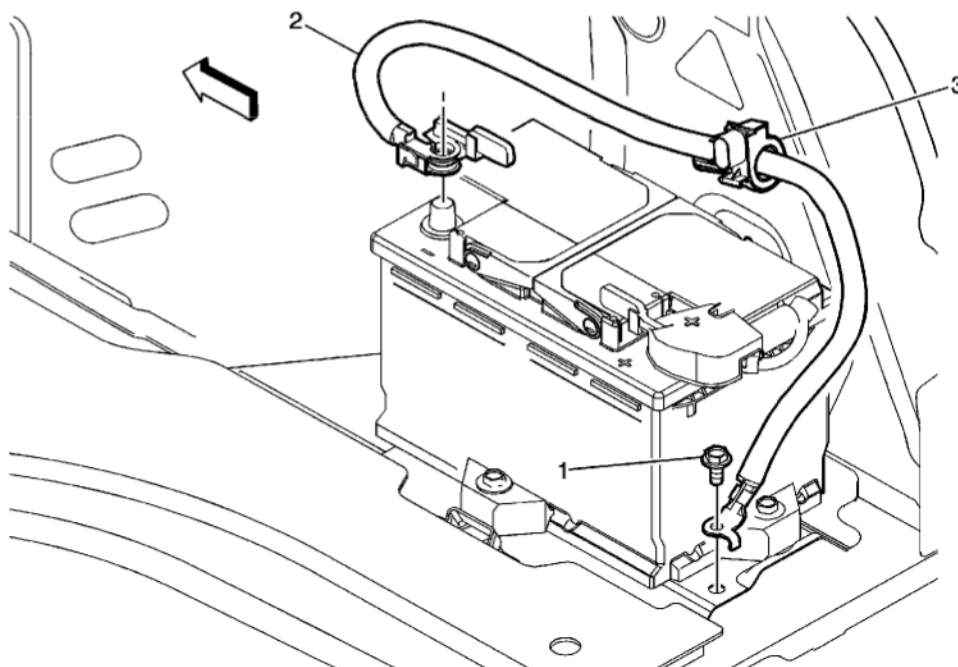
Application	Specification
Generator Model	Denso SC2
Rated Output	150 Amps
Load Test Output	105 Amps

Battery Negative Cable Disconnection and Connection



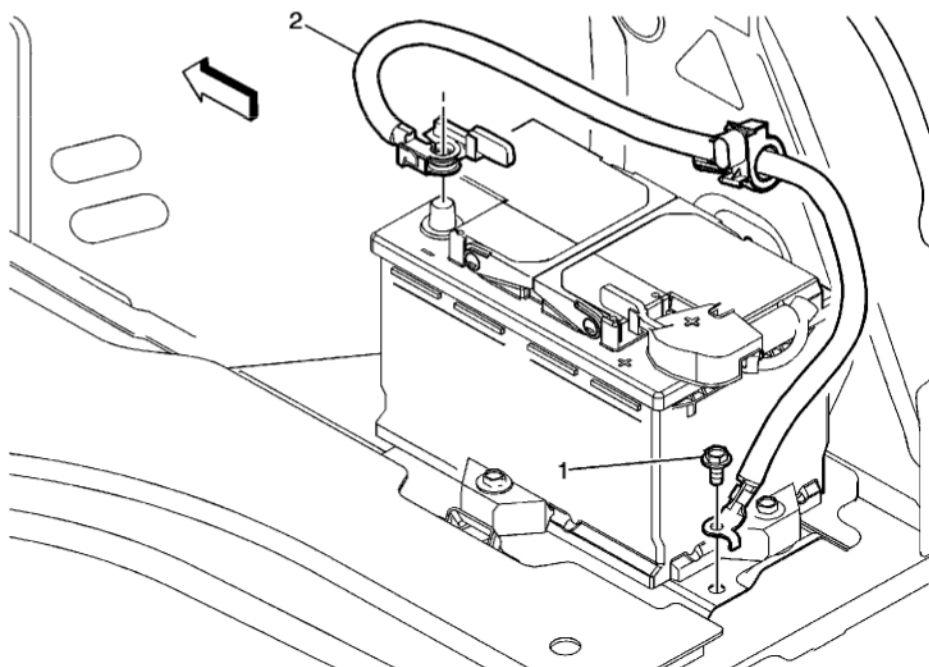
Callout	Component Name
1	Rear Compartment Side Trim Panel Door
2	Battery Negative Cable
	Procedure 1. Turn the battery negative cable handle to release the clamping force on the battery negative post. 2. To disconnect, pull the battery negative cable off of the battery negative post. 3. When connecting, ensure the battery negative cable is seated properly before turning the battery negative cable handle.

Battery Current Sensor Replacement



Callout	Component Name
Preliminary Procedure	
Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .	
1	Battery Negative Cable Bolt Caution: Refer to Fastener Caution in the Preface section. Tighten 20 N·m (15 lb ft)
2	Battery Negative Cable
3	Battery Current Sensor Procedure 1. Disconnect any electrical connectors as needed. 2. Mark the position of the battery current sensor before removing it from the battery negative cable.

Battery Negative Cable Replacement

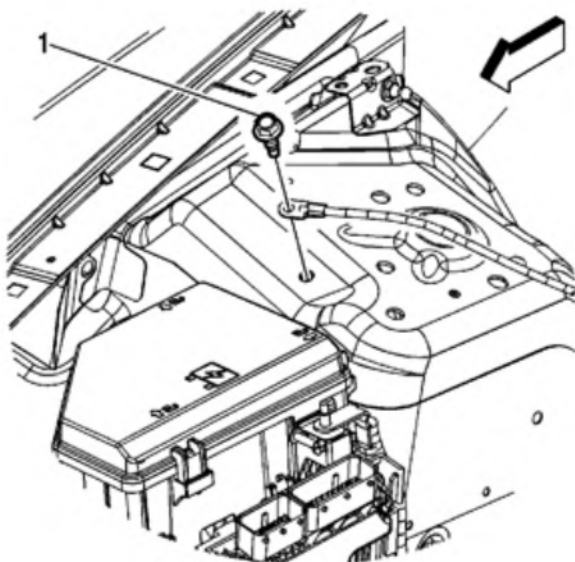


Callout	Component Name
Preliminary Procedure	
Disconnect the battery negative cable. Refer to Battery Negative Cable Disconnection and Connection .	
1	Battery Negative Cable Bolt Caution: Refer to Fastener Caution in the Preface section. Tighten 20 N·m (15 lb ft)
2	Battery Negative Cable Procedure Transfer any parts as needed.

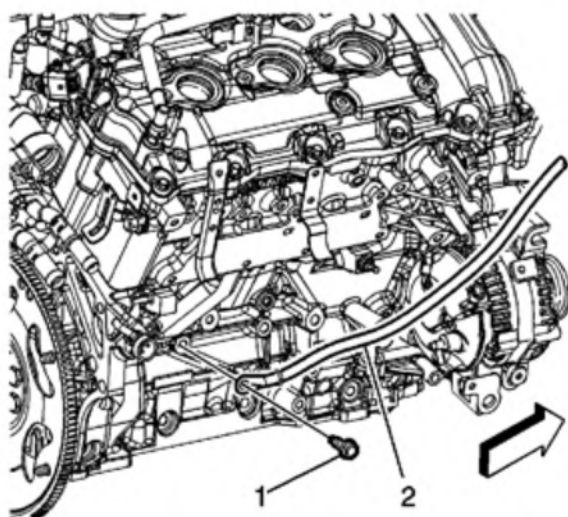
Battery Negative Cable Extension Cable Replacement

Removal Procedure

1. Remove the front compartment side sight shield. Refer to [Front Compartment Side Sight Shield Replacement](#).
2. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

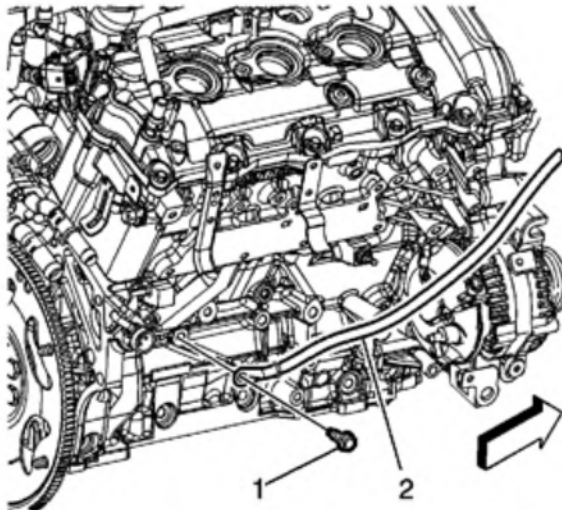


3. Remove the battery negative cable ground bolt (1).
4. Lift the vehicle. Refer to [Lifting and Jacking the Vehicle](#).



5. Remove the Battery Cable Terminal Bolt (1).
6. Note the routing of the battery negative cable extension cable (2) and remove it from the vehicle.

Installation Procedure



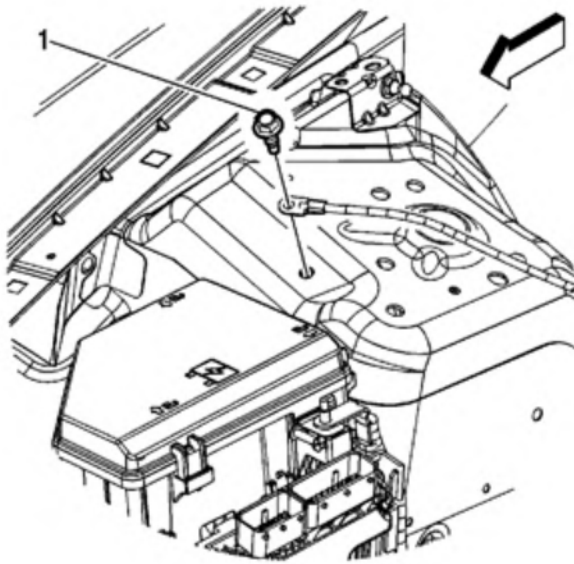
1. Position the battery negative cable extension cable (2) to the vehicle.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the Battery Cable Terminal Bolt (1).

Tighten

Tighten the bolt to 35 N·m (26 lb ft).



3. Install the battery negative cable ground bolt (1).

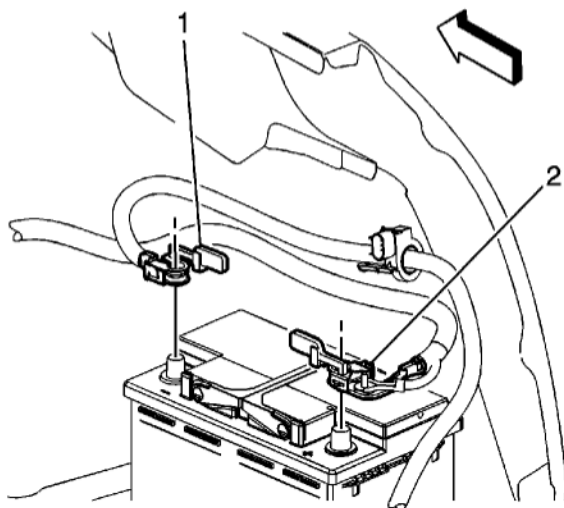
Tighten
20 N·m (15 lb ft).

4. Install the front compartment side sight shield. Refer to [Front Compartment Side Sight Shield Replacement](#).
5. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

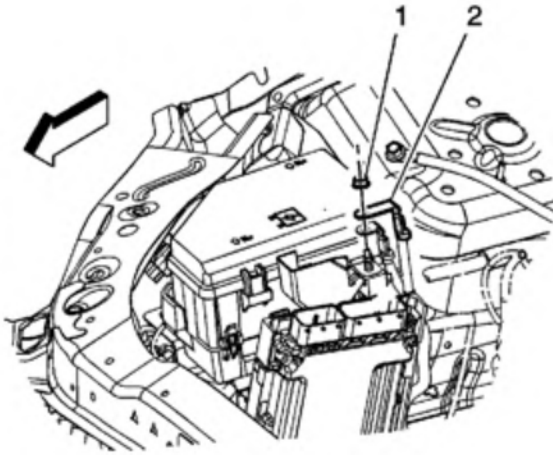
Battery Positive Cable Replacement

Removal Procedure

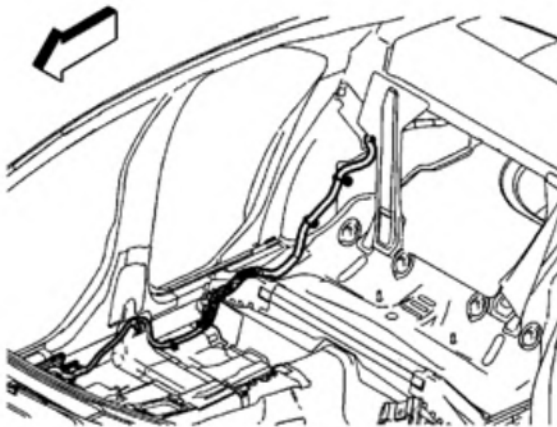
1. Remove the rear compartment side trim panel door.



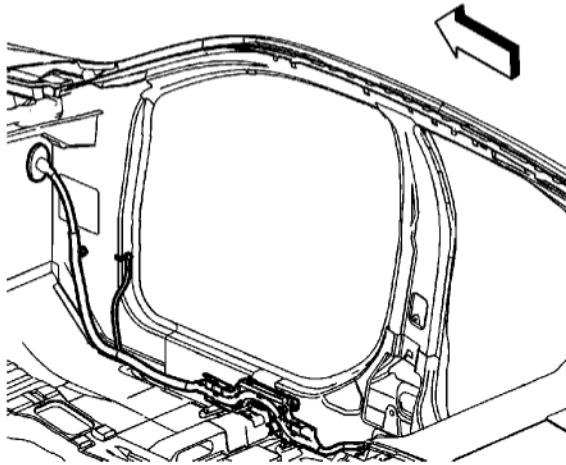
2. Turn the battery negative cable handle (1) to release the clamping force and remove battery negative cable from the battery negative post.
3. Turn the battery positive cable handle (2) to release the clamping force and remove battery positive cable from the battery positive post.
4. Remove the rear compartment side trim panel. Refer to [Rear Compartment Side Trim Panel Replacement](#).
5. Remove the center pillar lower trim panel. Refer to [Center Pillar Lower Trim Panel Replacement](#).
6. Remove the passenger side bucket front seat. Refer to [Front Seat Replacement - Bucket](#).



7. Remove the battery positive cable nut (1) from the front underhood electrical center or junction block.
8. Remove the battery positive cable (2) from the front underhood electrical center or junction block.
9. Pull the passenger side front floor panel carpet away from the right side front and rear rocker panels.



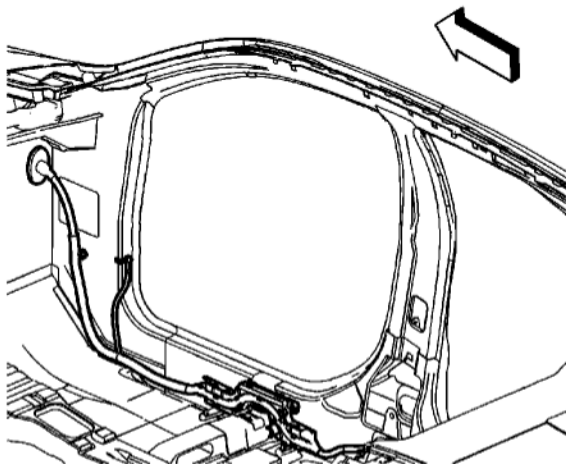
10. Starting in the rear compartment and working forward mark the location of all the retaining clips on the body harness and remove them as needed.
11. Remove the body harness from any bracket assemblies as needed.
12. In the passenger compartment, untape the body harness as needed and separate the battery positive cable from it.



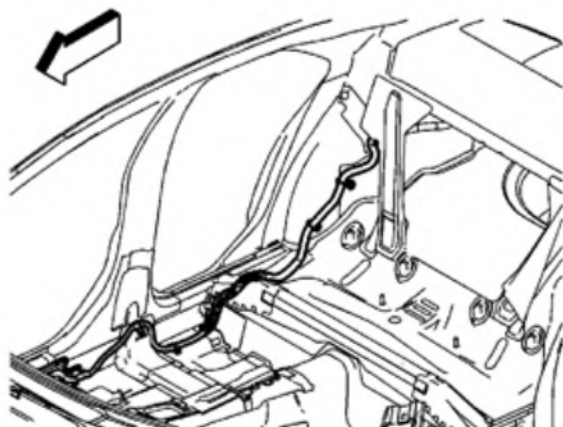
13. Push the rubber grommet in the dashboard pass-through to dislocate it from its installed position.
14. Remove the windshield washer solvent heater. Refer to [Windshield Washer Solvent Heater Replacement](#).
15. In the engine compartment, untape the body harness as needed and separate the battery positive cable from it.
16. Remove the battery positive cable from the body harness and the vehicle.

Installation Procedure

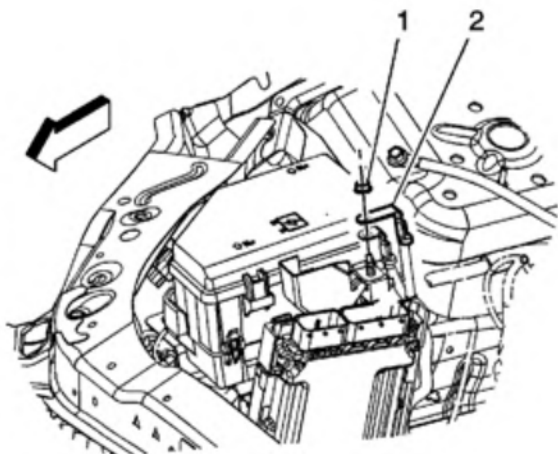
1. Position the battery positive cable to the vehicle and the body harness.
2. In the engine compartment, align the battery positive cable to the body harness and tape it as needed.



3. Install the rubber grommet in the dashboard pass-through.



4. Starting in the passenger compartment and working to the rear compartment, align the battery positive cable to the body harness and tape it as needed.
5. Install the body harness to any bracket assemblies as needed.
6. Install any new or reused retainers to the body harness as needed.
7. Secure the body harness to the vehicle.
8. Position the passenger side front floor panel carpet in place.



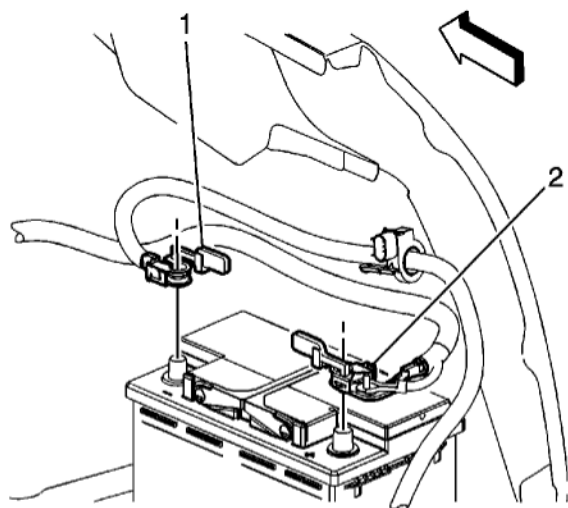
9. Install the battery positive cable (2) to the front underhood electrical center or junction block.

Caution: Refer to [Fastener Caution](#) in the Preface section.

10. Install the battery positive cable nut (1) to the front underhood electrical center or junction

block and tighten to **15 N·m (11 lb ft)**.

11. Install the windshield washer solvent heater. Refer to [Windshield Washer Solvent Heater Replacement](#).
12. Install the passenger side bucket front seat. Refer to [Front Seat Replacement - Bucket](#).
13. Install the center pillar lower trim panel. Refer to [Center Pillar Lower Trim Panel Replacement](#).
14. Install the rear compartment side trim panel. Refer to [Rear Compartment Side Trim Panel Replacement](#).



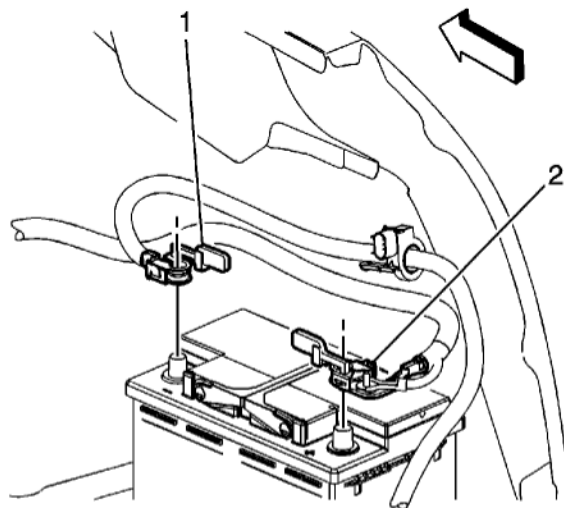
15. Turn the battery positive cable handle (2) to secure the battery positive cable to the battery positive post. Ensure the battery negative cable is seated properly.
16. Turn the battery positive cable handle (1) to secure the battery positive cable to the battery positive post. Install the rear compartment side trim panel door.
17. Install the rear compartment side trim panel door.

Battery Replacement

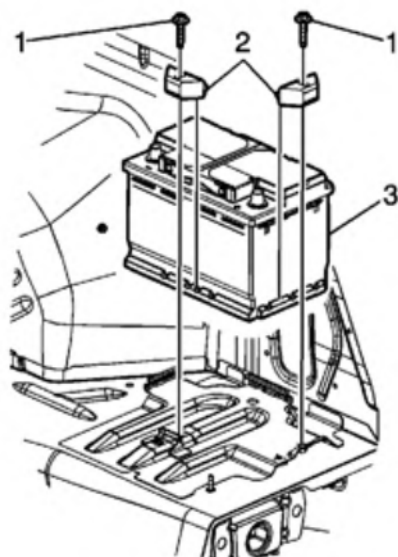
Removal Procedure

Warning: Refer to [Battery Disconnect Warning](#) in the Preface section.

1. Remove the rear compartment side trim panel door.
2. Disconnect the battery vent hose.



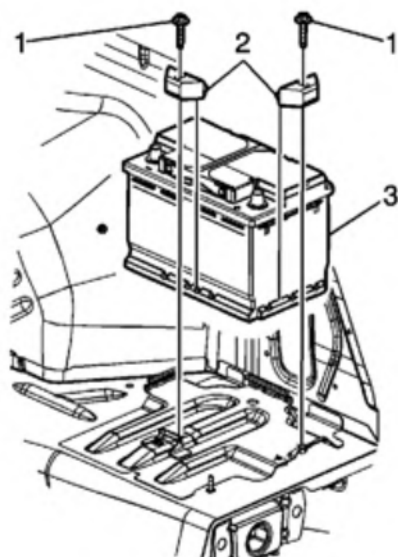
3. Turn the battery negative cable handle (1) to release the clamping force and remove battery negative cable from the battery negative post.
4. Turn the battery positive cable handle (2) to release the clamping force and remove battery positive cable from the battery positive post.





5. Remove the battery hold down retainer bolts (1) and the battery hold down retainers (2).
6. Remove the battery (3) from the vehicle.

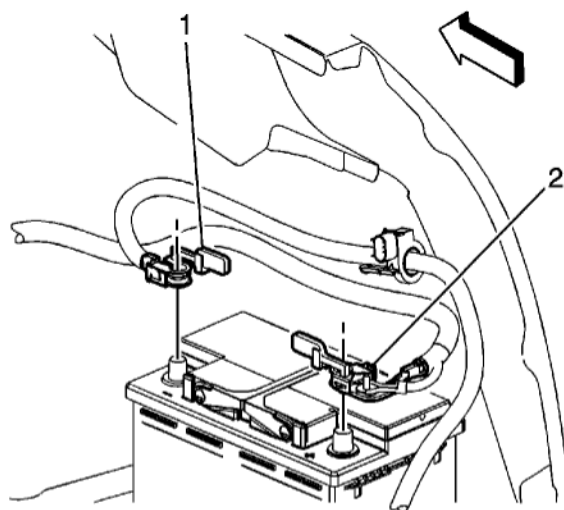
Installation Procedure



1. Install the battery (3) to the vehicle.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the battery hold down retainers (2) and the battery hold down retainer bolts (1) and tighten the bolts to **18 N·m (13 lb ft)**.





3. Ensure the battery positive cable is seated properly.
4. Turn the battery positive cable handle (2) to secure the battery positive cable to the battery positive post.
5. Ensure the battery negative cable is seated properly.
6. Turn the battery positive cable handle (1) to secure the battery positive cable to the battery positive post.

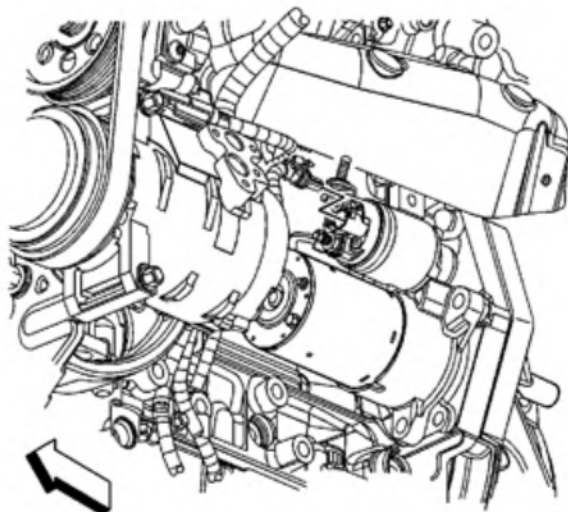
Note: Replacement batteries may require the vent plug in the battery vent hole to be moved from one end of the battery to the other to permit vent tube installation per original design.

7. Connect the battery vent hose.
8. Install the rear compartment side trim panel door.

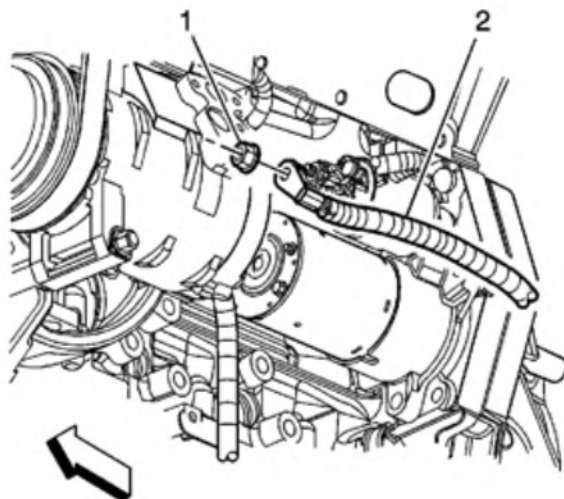
Starter Replacement (LY7)

Removal Procedure

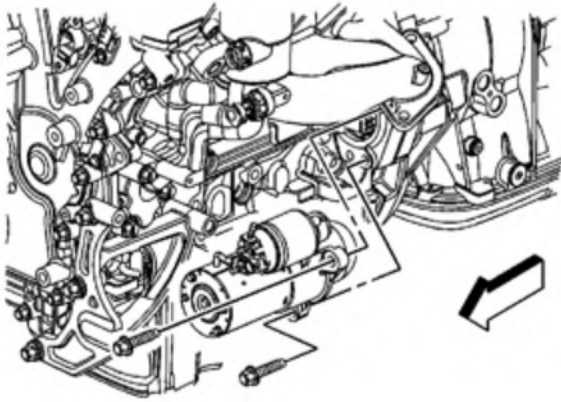
1. Turn OFF the ignition.
2. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
3. Remove the left catalytic converter. Refer to [Catalytic Converter Replacement - Left Side](#).



4. Remove the starter solenoid electrical connector from the starter.

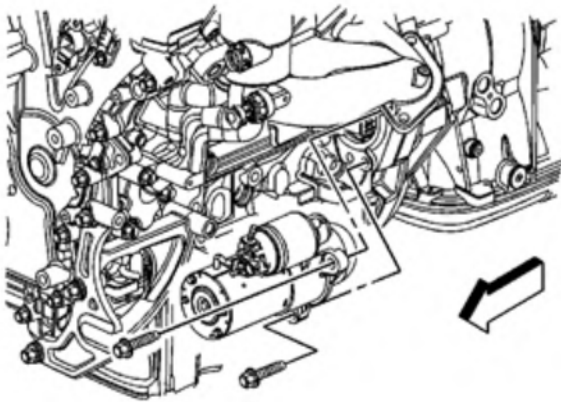


5. Remove the starter terminal nut (1) and the battery positive cable (2) from the starter.



6. Remove the starter motor bolts.
7. Remove the starter motor.

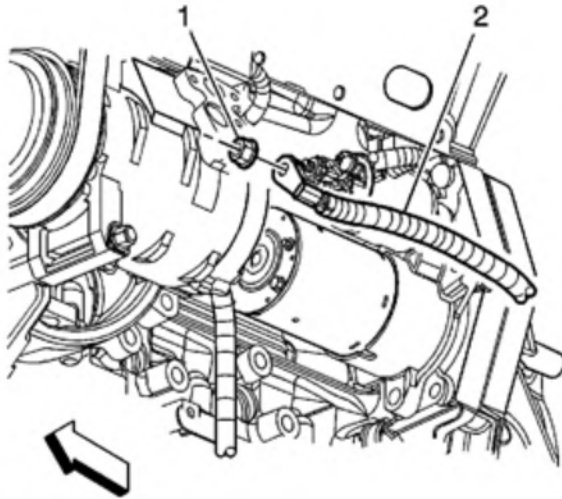
Installation Procedure



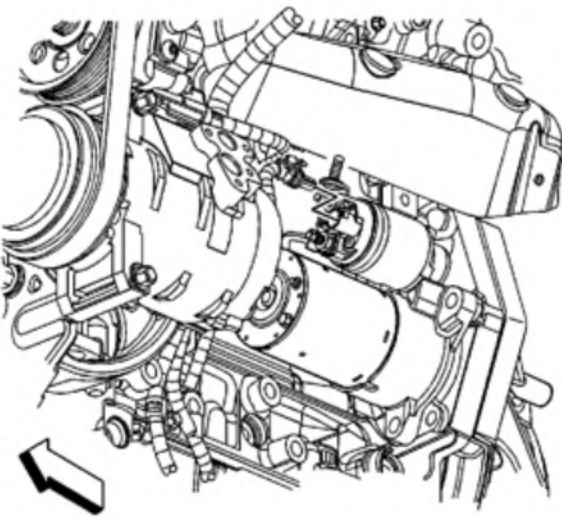
1. Install the starter motor.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the starter motor mounting bolts and tighten to **50 N·m (37 lb ft)**.



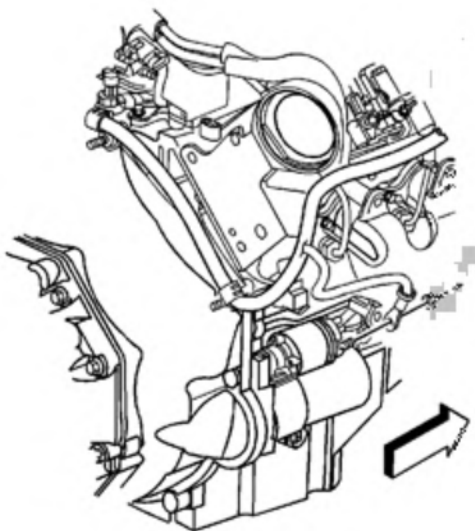
3. Install the battery positive cable (2) to the starter and install the starter terminal nut (1). Tighten the battery positive cable nut to **13 N·m (115 lb in)**.



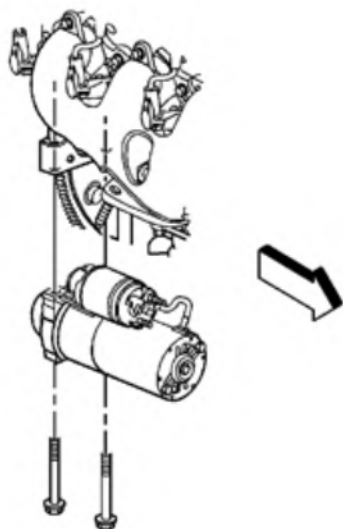
4. Install the electrical connector to the starter solenoid.
5. Install the left catalytic converter. Refer to [Catalytic Converter Replacement - Left Side](#).

Starter Replacement (V8)

Removal Procedure



1. Disconnect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Remove the right side catalytic converter. Refer to [Catalytic Converter Replacement - Right Side](#).
3. Remove the inboard exhaust manifold to catalytic converter stud.
4. Remove the positive battery cable nut.
5. Remove the positive battery cable terminal and the engine harness leads from the solenoid.
6. Remove the positive assurance pin and disconnect the wire lead from the starter solenoid.

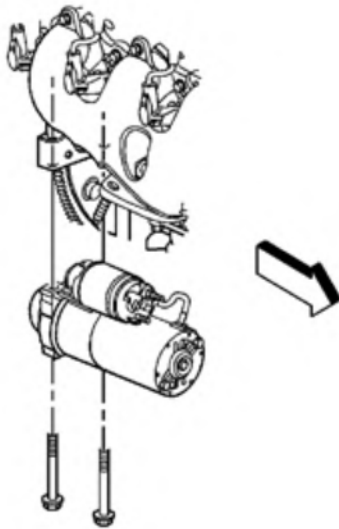




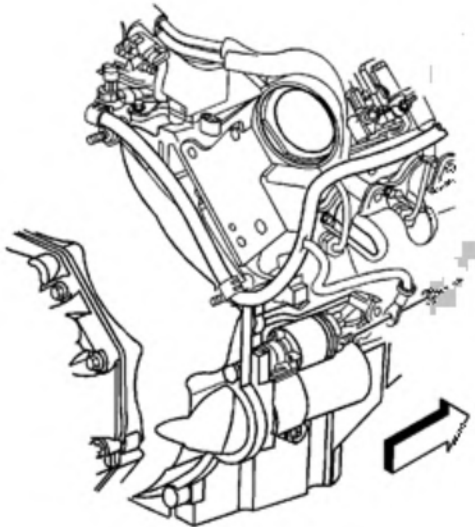
7. Support the starter motor.
8. Remove the starter motor bolts.
9. Remove the starter motor.

Installation Procedure

Caution: Refer to [Fastener Caution](#) in the Preface section.



1. Position the starter motor to the block.
2. Install the starter motor bolts and tighten to 50 N·m (37 lb ft).



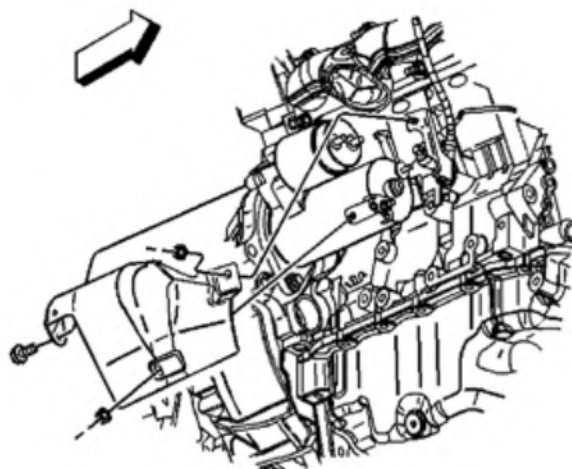


3. Install the wire and positive assurance pin to the starter solenoid.
4. Install the battery positive cable to the starter terminal.
5. Install the battery positive cable to starter terminal nut and tighten to **10 N·m (89 lb in)**.
6. Install the inboard exhaust manifold to catalytic converter stud and tighten to **25 N·m (18 lb ft)**.
7. Install the right side catalytic converter. Refer to [Catalytic Converter Replacement - Right Side](#).
8. Connect the negative battery cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

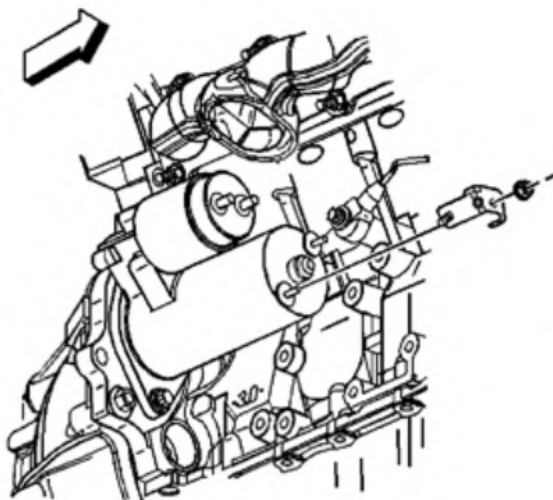
Starter Shield Replacement (LP1, LY7)

Removal Procedure

1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Remove the right catalytic converter. Refer to [Catalytic Converter Replacement - Right Side](#).

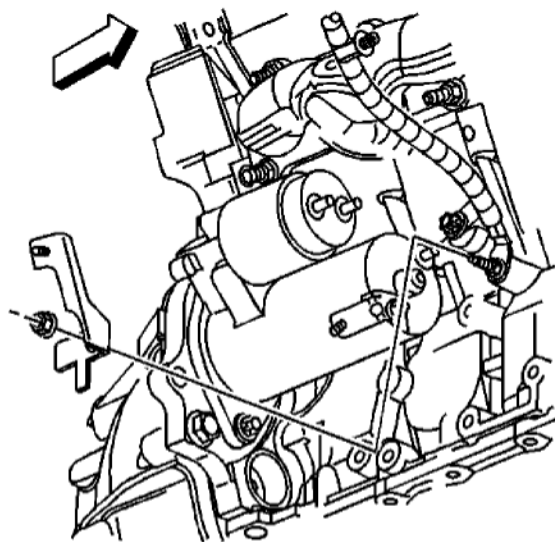


3. Remove the fasteners securing the starter heat shield to the starter.
4. Remove the starter heat shield.



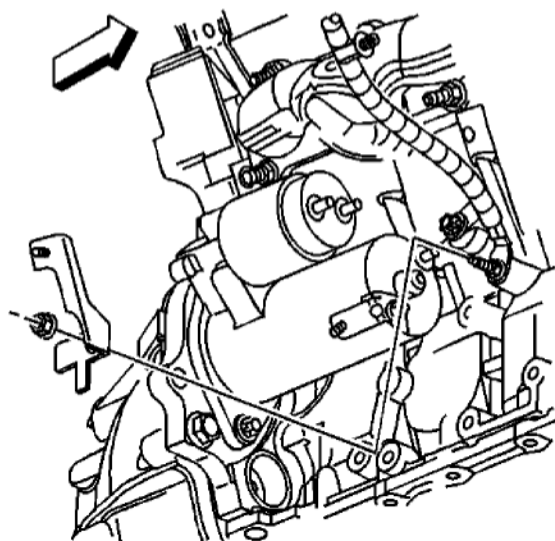
5. Remove the nut securing the starter heat shield bracket to the starter.

6. Remove the starter heat shield bracket.



7. Remove the nut securing the starter heat shield bracket to the engine block.
8. Remove the starter heat shield bracket.

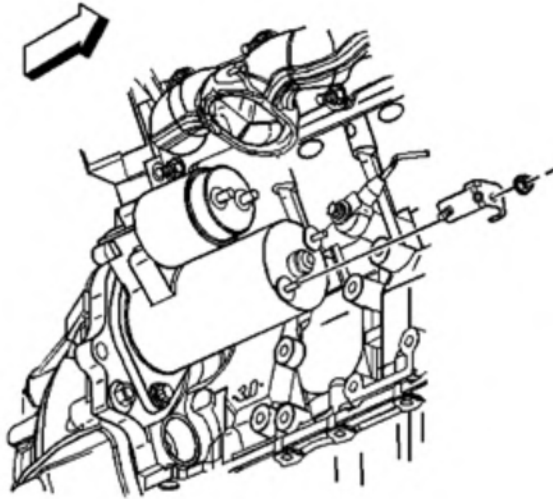
Installation Procedure



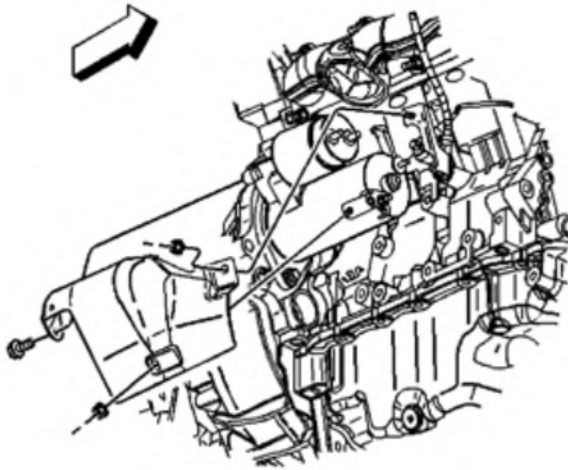
1. Install the starter heat shield bracket to the stud located at the engine block.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the nut securing the starter heat shield bracket to the engine block and tighten to 8 N·m (71 lb in).



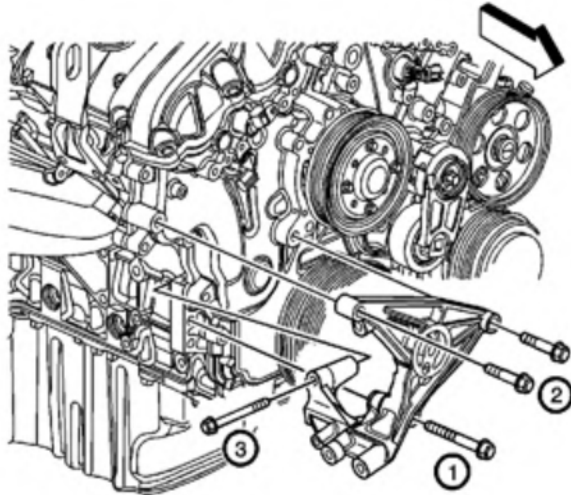
3. Install the starter heat shield bracket to the stud located at the rear of the starter motor.
4. Install the nut securing the starter heat shield bracket to the starter and tighten to **8 N·m (71 lb in)**.



5. Position the starter heat shield to the starter motor and brackets.
6. Install the bolt/nuts securing the starter heat shield to the starter motor and brackets and tighten to **8 N·m (71 lb in)**.
7. Install the right catalytic converter. Refer to [Catalytic Converter Replacement - Right Side](#).
8. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

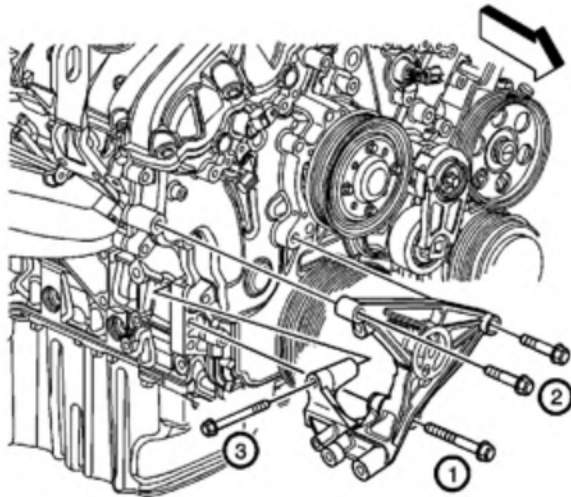
Generator Bracket Replacement (LY7)

Removal Procedure



1. Turn the ignition OFF.
2. Remove the generator. Refer to [Generator Replacement](#).
3. Remove the coolant inlet pipe lower bolt from the generator bracket.
4. Remove the belt tensioner. Refer to [Water Pump and Generator Belt Tensioner Replacement](#).
5. Remove the generator bracket bolts.
6. Remove the generator bracket.

Installation Procedure



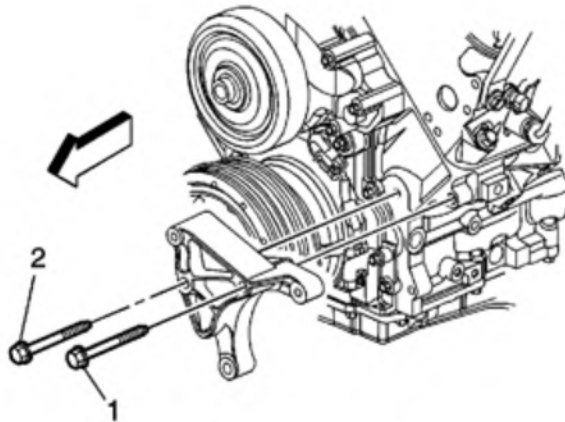
1. Install the generator bracket.

Caution: Refer to [Fastener Caution](#) in the Preface section.

2. Install the generator bracket bolts and tighten in the sequence shown.
 - 2.1. Tighten the generator bracket bolts (1, 2) to **50 N·m (37 lb ft)**.
 - 2.2. Tighten the generator bracket bolt (3) to **23 N·m (17 lb ft)**.
3. Install the belt tensioner. Refer to [Water Pump and Generator Belt Tensioner Replacement](#).
4. Install the coolant inlet pipe lower bolt from the generator bracket.
5. Install the generator. Refer to [Generator Replacement](#).

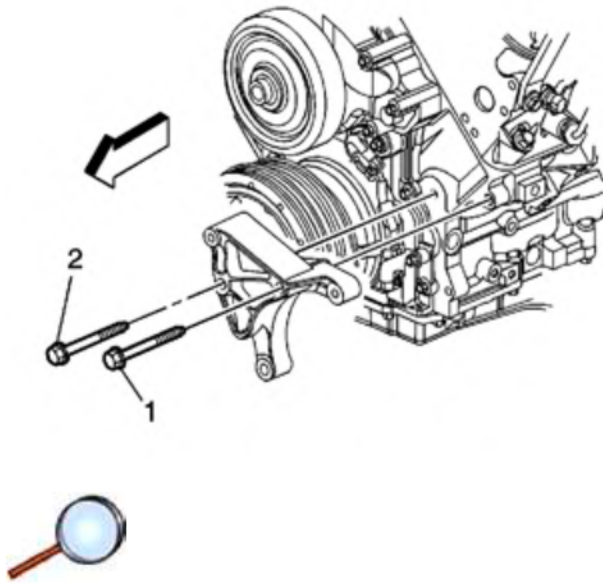
Generator Bracket Replacement (V8)

Removal Procedure



1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Remove the generator. Refer to [Generator Replacement](#).
3. Remove the accessory drive belt idler pulley. Refer to [Drive Belt Idler Pulley Replacement](#).
4. Remove the generator bracket bolts (1, and 2).
5. Remove the generator bracket from the engine.

Installation Procedure



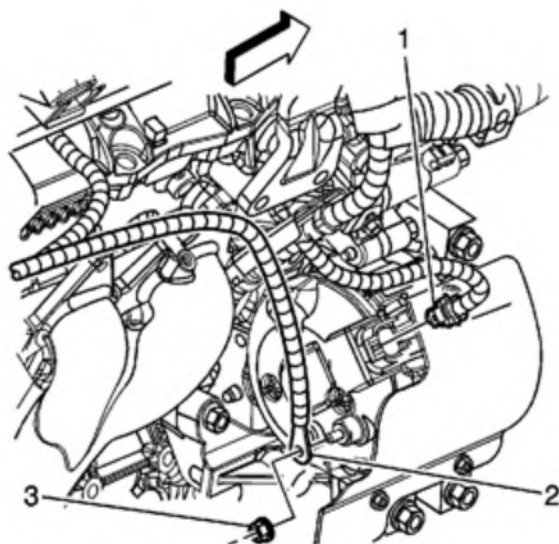
1. Install the generator bracket to the engine.

Caution: Refer to [Fastener Caution](#) in the Preface section.

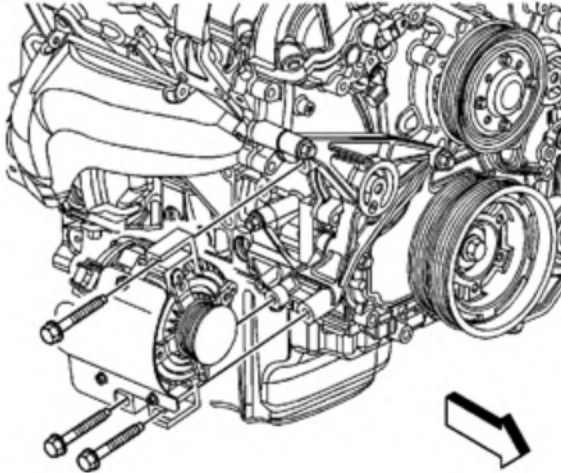
2. Install the generator bracket bolts (1, and 2) and tighten to **50 N·m (37 lb ft)**.
3. Install the accessory drive belt idler pulley. Refer to [Drive Belt Idler Pulley Replacement](#).
4. Install the generator. Refer to [Generator Replacement](#).
5. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

Generator Replacement (V6)

Removal Procedure



1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Remove the drive belt from the generator. Refer to [Water Pump and Generator Belt Replacement](#).
3. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
4. Disconnect the electrical connector (1) from the generator.
5. Reposition the protective boot from the generator output BAT terminal for access.
6. Remove the generator output BAT terminal nut (3) and disconnect the battery positive lead (2) from the generator.

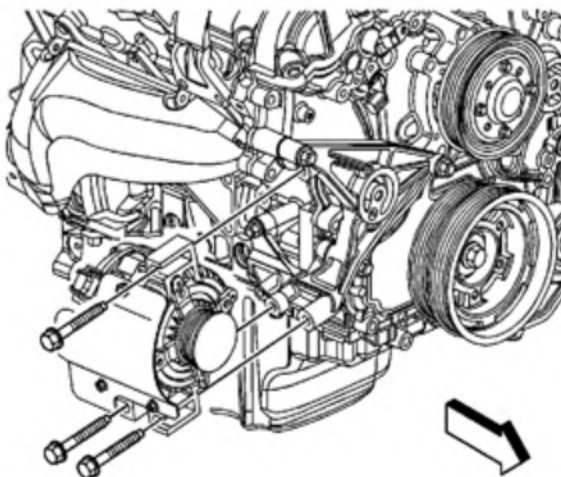


7. Remove the generator lower bolts.
8. Lower the vehicle.
9. Remove the generator upper bolt.
10. Remove the generator from the engine.

Installation Procedure

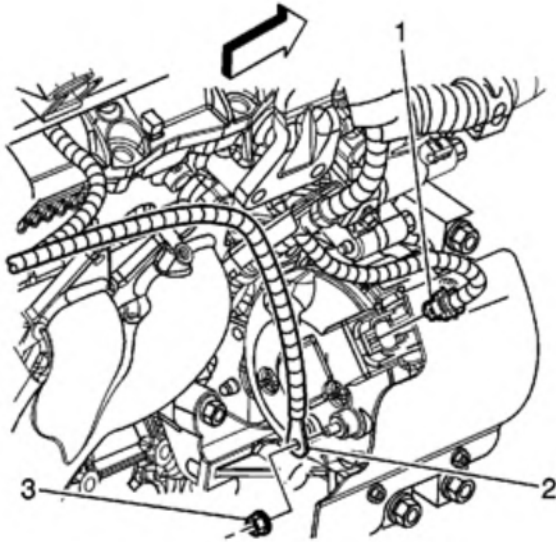
1. Install the generator to the engine.
2. Install the generator upper bolt.
3. Raise and support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).

Caution: Refer to [Fastener Caution](#) in the Preface section.



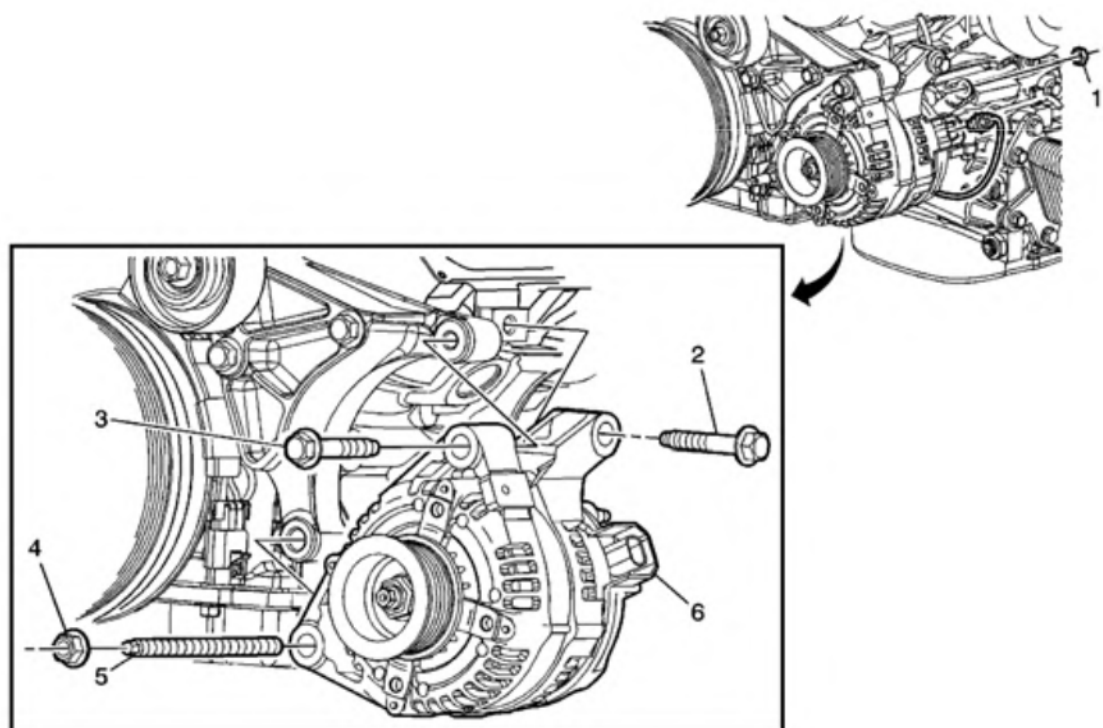


4. Install the generator lower bolts and tighten to **50 N·m (37 lb ft)**.



5. Install the battery positive lead (2) and the generator BAT terminal nut (3) to the generator and tighten the nut to **13 N·m (115 lb in)**.
6. Install the BAT terminal boot.
7. Connect the electrical connector (1) to the generator.
8. Lower the vehicle.
9. Install the drive belt to the generator. Refer to [Water Pump and Generator Belt Replacement](#).
10. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

Generator Replacement (V8)



Callout	Component Name
Preliminary 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 radiator fan assembly. Refer to Engine Coolant Fan Replacement. 4. Remove the drive belt. Refer to Air Conditioning Compressor and Power Steering Pump Belt Replacement.	
1	Generator Battery Terminal Nut Caution: Refer to Fastener Caution in the Preface section. Tighten 10 N·m (89 lb in)
2	Fastener Tighten 50 N·m (37 lb ft)
	Fastener

3	Tighten 50 N·m (37 lb ft)
4	Fastener Tighten 50 N·m (37 lb ft)
5	Fastener Tighten 20 N·m (15 lb ft)
6	Generator Procedure 1. Remove the power steering pressure hose to generator bolt. 2. Disconnect the generator harness connector. Tighten 9 N·m (80 lb in)