

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Battery Cable Nuts	4.5 N·m	40 lb in
Battery Carrier Tray Lower Bolts	20 N·m	15 lb ft
Battery Carrier Tray Upper Bolts	20 N·m	15 lb in
Battery Retainer Clamp-to-Battery Rod Nuts	4 N·m	35 lb in
Engine Mount Lower Bracket Bolts (1.2L)	41 N·m	30 lb ft
Front Bearing Plate Screws	8 N·m	71 lb in
Fuel Rail Retaining Bolts	20 N·m	15 lb in
Generator Adjusting Bolt (1.2L)	7 N·m	62 lb ft
Generator Battery Lead Nut	15 N·m	11 lb ft
Generator Brush Holder Screws	12 N·m	106 lb in
Generator Drive and End Bearing Nut	81 N·m	60 lb ft
Generator Drive End Bearing Nut	81 N·m	60 lb ft
Generator Lower Bracket Mounting Bolt (1.2L)	28 N·m	21 lb ft
Generator Lower Bracket-to-Generator Nuts	25 N·m	18 lb ft
Generator Pulley Nut (1.2L)	110 N·m	81 lb ft
Generator Shackle Bracket Bolt	25 N·m	18 lb ft
Generator Through-Bolts	10 N·m	89 lb in
Harness Ground Bolt	41 N·m	30 lb ft
Reaction Rod Bolt and Nut (1.2L)	83 N·m	61 lb ft
Starter Field Coil Connector Nut	8 N·m	71 lb in
Starter Mounting Bolts (1.2L)	23 N·m	17 lb ft
Starter Mounting Bolts (1.4L/1.5L SOHC and 1.4L/1.6L DOHC)	43 N·m	32 lb ft
Starter Solenoid Assembly Screws	8 N·m	71 lb in
Starter Solenoid Nuts	15 N·m	11 lb ft
Starter Through-Bolts	6 N·m	53 lb in

General Specifications

Application	Specification	
	Metric	English
Battery		
- Manual 1.2L SOHC 1.5L SOHC	410 Cold Cranking Amps	
- Automatic 1.4L SOHC/DOHC 1.5L SOHC	550 Cold Cranking Amps	
Alternator 1.4L SOHC/DOHC 1.5L SOHC, A/T	85 A	
Alternator 1.2L SOHC 1.5L SOHC, M/T	75 A	
Starter-Manual (No-Load Test Current Draw) 1.2L SOHC 1.5L SOHC	0.8 kW Maximum 53 A (Drive Pinion Speed at Minimum 5,000 RPM, 11.5 V)	
Starter-Automatic (No-Load Test Current Draw) 1.4L SOHC/DOHC 1.5L SOHC	1.2 kW Maximum 90 A (Drive Pinion Speed at Minimum 2,600 RPM, 11.5 V)	

Battery Usage

Table 1: [Battery Voltage Specifications](#)

Application	Description
L4 Engine	
Cold Cranking Amps	550 amps
Load Test	270 amps
RC - Minimum	90 minutes
Replacement	85B-60

Battery Voltage Specifications

Application	Specification	
	Metric	English
Minimum Voltage:		
• 9.6 V	21°C	70°F
• 9.4 V	20°C	68°F
• 9.1 V	0°C	32°F
• 8.8 V	-10°C	14°F
• 8.5 V	-18°C	0°F
• 8.0 V	Below -18°C	Below 0°F

[2009 Chevrolet Aveo](#) | [Aveo, Wave, G3, Barina \(VIN S/T\) Service Manual](#) | [Engine](#) | [Engine Electrical](#) | [Specifications](#) |

Document ID: 1303634

Starter Usage

Application	Description
Starter	
• No Load Test @ 12 volts (1.4L/1.5L SOHC and 1.4L/1.6L DOHC)	Maximum 90 amps
• Drive Pinion Speed (1.4L/1.5L SOHC and 1.4L/1.6L DOHC)	Minimum 2,600 RPM
• No Load Test 9 volts (1.2L)	Maximum 150 amps
• Drive Pinion Speed (1.2L)	Minimum 2,000 RPM
Solenoid	
• Hold-in Windings @ 12 volts	12-20 amps
• Pull-in Windings @ 12 volts	60-90 amps

[2009 Chevrolet Aveo](#) | [Aveo, Wave, G3, Barina \(VIN S/T\) Service Manual](#) | [Engine](#) | [Engine Electrical](#) | [Specifications](#) |

Document ID: 1303791

Generator Usage

Application	Description
Generator Types (1.4L/1.5L SOHC and 1.4L/1.6L DOHC)	CS-121D
Generator Types (1.2L)	SG7K

Battery Negative Cable Disconnection and Connection Removal Procedure

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.

1. Record all preset and theft codes, (if equipped), from the radio.
2. Turn the ignition switch to the OFF position.
3. Verify that all the electrical components are OFF such as interior lights, all doors are closed, the underhood lamp , etc.
4. Loosen the clamping bolt from the battery negative cable.
5. Remove the battery negative cable from the battery.
6. Position the battery negative cable away from any body ground.

Installation Procedure

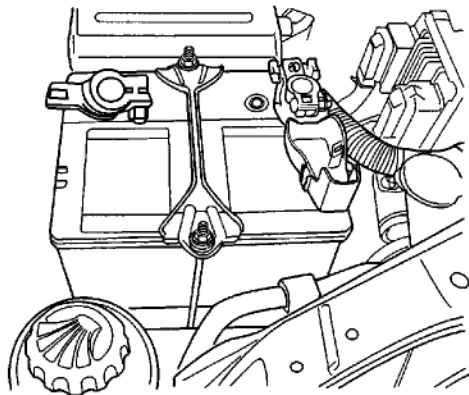
1. Verify that all the electrical components are OFF such as interior lights, all doors are closed, the underhood lamp , etc.
2. Clean corrosion from the negative battery cable using a metal brush.
3. Install the battery negative cable to the battery.

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

4. Install the clamping bolt to the negative cable and tighten to **4.5 N·m (40 lb in)**.
5. Reset the radio stations and the clock.

Battery Tray Replacement

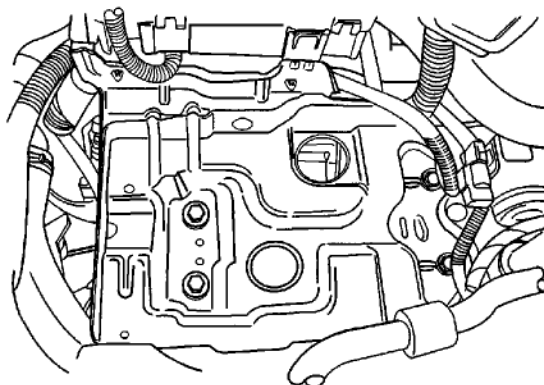
Removal Procedure



1. Disconnect the negative battery cable and then disconnect the positive battery cable.

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

2. Remove the nuts from the battery rods that fasten the battery hold-down bar clamp.

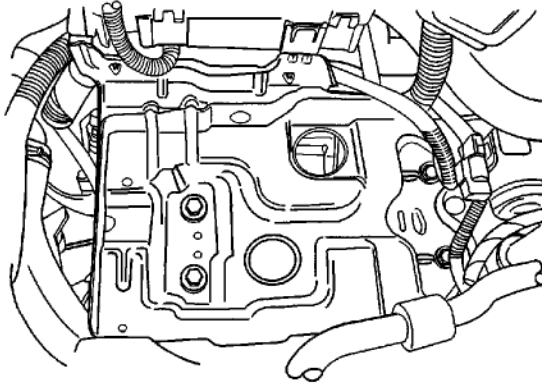


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3. Check the battery carrier tray for obvious cracks or damage. Detach the carrier tray if necessary by removing the upper and the lower bolts.

Installation Procedure

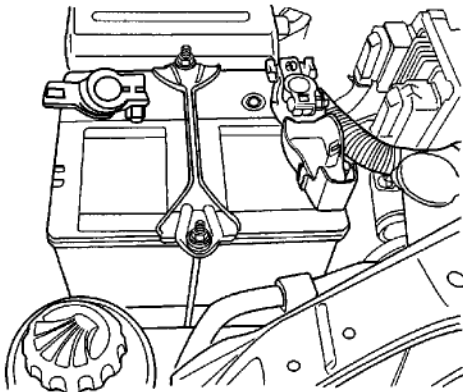
Caution: Refer to [Fastener Caution](#) in the Preface section.



1. Install the battery carrier by fastening the carrier tray upper and lower bolts.

Tighten

Tighten the battery carrier tray upper and the lower bolts to 20 N·m (15 lb ft).





2. Install the battery into the tray.
3. Fasten the bar clamp to the battery by loosely attaching the battery rods from the batter tray cutouts through the bar clamp holes, and loosely tightening the nuts.

Tighten

Tighten the battery retainer clamp-to-battery rod nuts to 4 N·m (35 lb in).

4. Connect the negative battery cables.

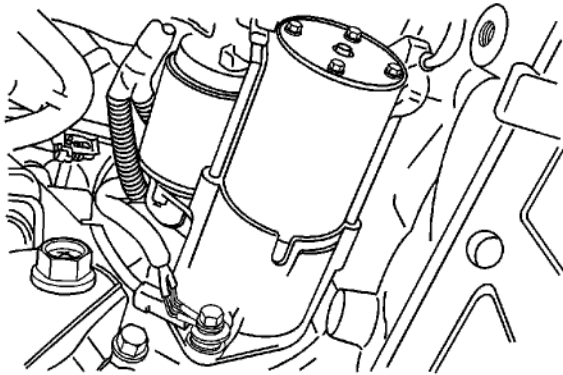
Tighten

Tighten the battery cable nuts to 4.5 N·m (40 lb in).

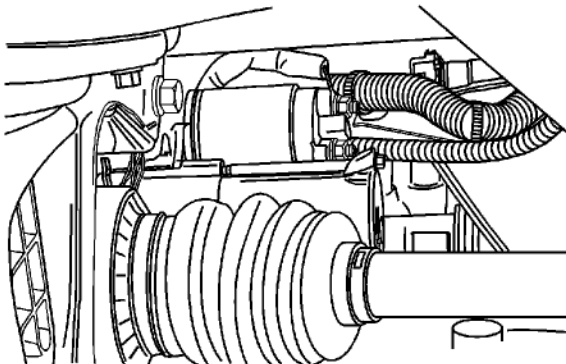
Starter Replacement (1.4L)

Removal Procedure

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



1. Disconnect the battery negative cable.
2. Remove the upper and the lower starter mounting bolts.

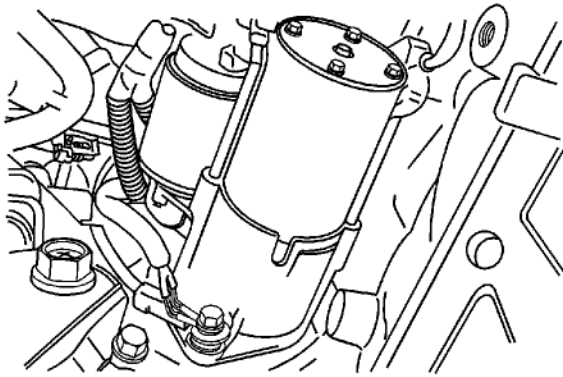


3. Remove the starter solenoid nuts to disconnect the electrical cable.

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4. Remove the starter assembly.

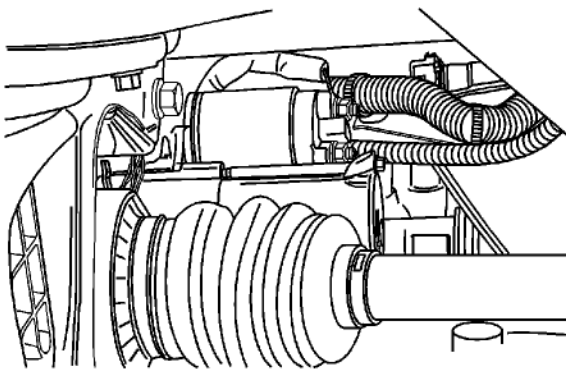
Installation Procedure



1. Place the starter assembly in position.

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

2. Install the upper and the lower starter mounting bolts and tighten to **43 N·m (32 lb ft)**.



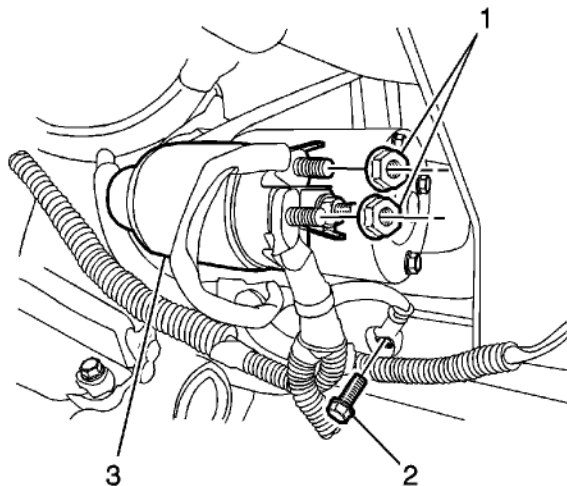
3. Position the starter electrical wire on the solenoid terminal.
4. Install the starter solenoid nuts and tighten to **15 N·m (11 lb ft)**.
5. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and](#)

[Connection.](#)

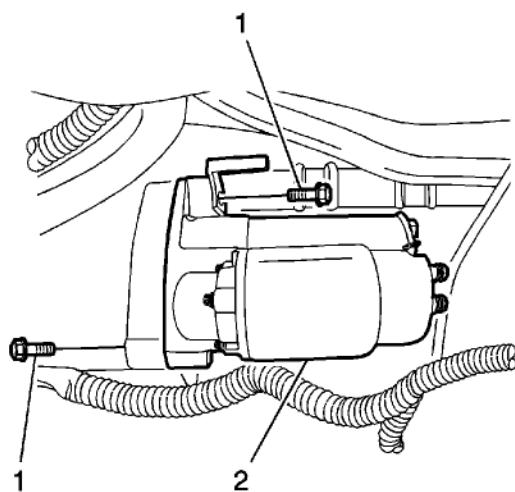
Starter Replacement (1.2L DOHC)

Removal Procedure

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



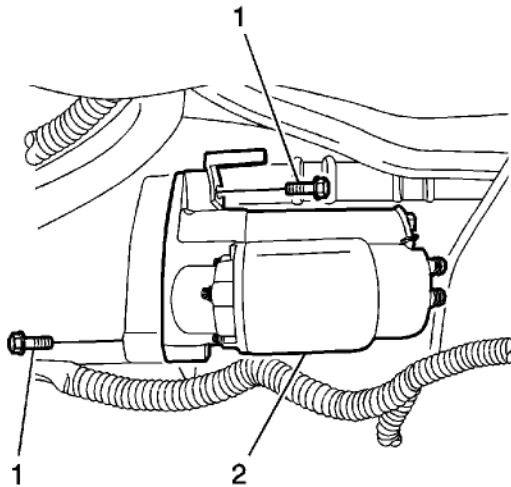
1. Disconnect the battery negative cable.
2. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the starter solenoid nut (1) to disconnect the starter harness.
4. Remove the starter solenoid nut (1) to disconnect the battery positive connector.
5. Remove the ground bolt (21) from the engine block.





6. Remove the starter retaining bolts (1).
7. Remove the starter (2).

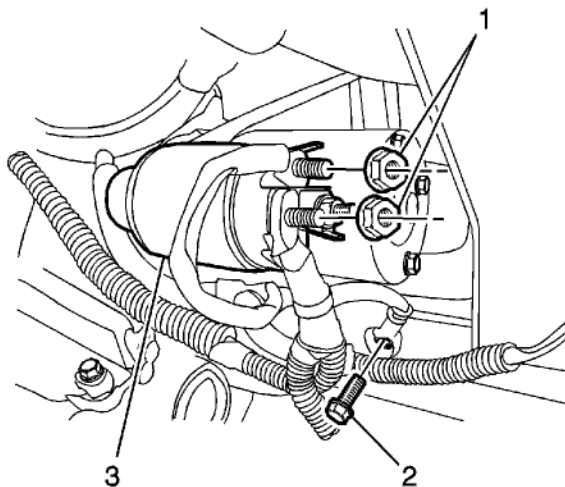
Installation Procedure



1. Install the starter (2).

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

2. Install the starter retaining bolts (1) and tighten to **23 N·m (16.9 lb ft)**.



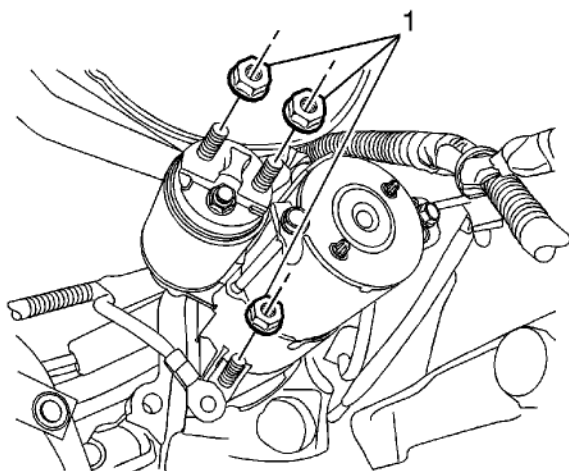


3. Install the ground bolt (2) from the engine block.
4. Install the starter solenoid nut (1) to connect the battery positive connector.
5. Install the starter solenoid nut (1) to connect the starter harness and tighten.
 - The engine ground bolt to **38 N·m (28.0 lb ft)**.
 - The starter solenoid harness connector nut to **10.5 N·m (7.7 lb ft)**.
 - The starter solenoid battery positive connector nut to **10.5 N·m (7.7 lb ft)**.
6. Lower the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
7. Connect the battery negative cable.

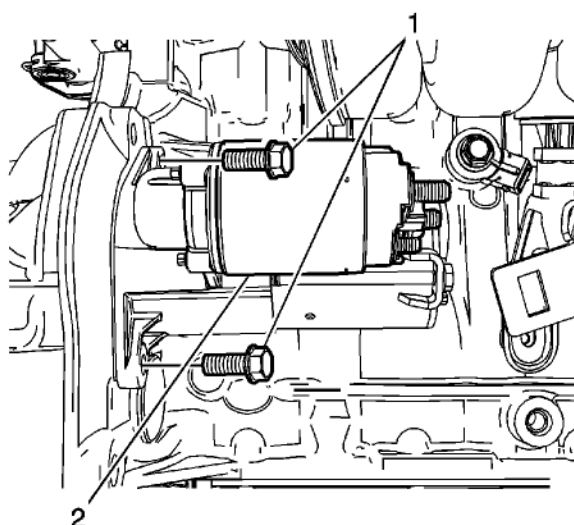
Starter Replacement (1.4L LDT, 1.6 LXV)

Removal Procedure

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



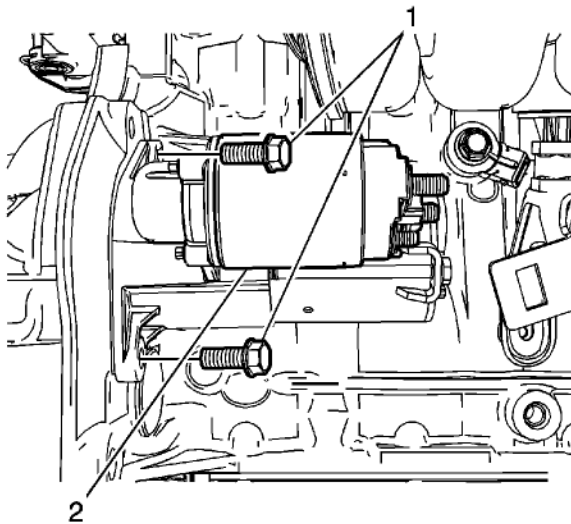
1. Disconnect the negative battery cable.
2. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the starter solenoid nut (1) to disconnect the starter harness.
4. Remove the starter solenoid nut (1) to disconnect the battery positive connector.
5. Remove the ground bolt from the engine block.





6. Remove the starter mounting bolts (1).
7. Remove the starter (2).

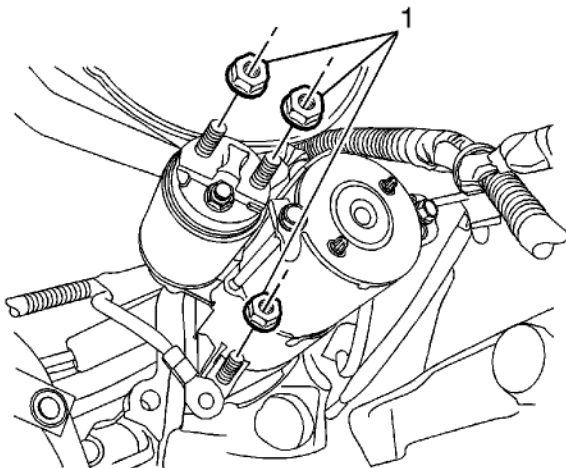
Installation Procedure



1. Install the starter (2).

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

2. Install the starter mounting bolts (1) and tighten to 25 N·m (18.4 lb ft).



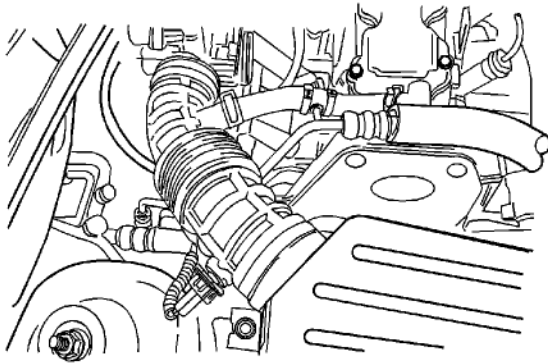


3. Install the ground bolt to the engine block.
4. Install the starter solenoid nut (1) to connect the battery positive connector.
5. Install the starter solenoid nut (1) to connect the starter harness and tighten.
 - The engine ground bolt to **38 N·m (28.0 lb ft)**.
 - The starter solenoid harness connector nut to **10.5 N·m (7.7 lb ft)**.
 - The starter solenoid battery positive connector nut to **10.5 N·m (7.7 lb ft)**.
6. Lower the vehicle.
7. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#)

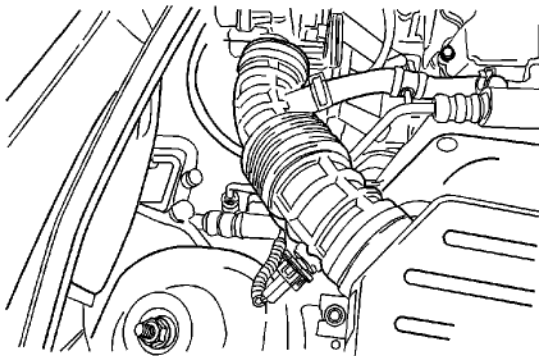
Generator Replacement (1.4L)

Removal Procedure

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

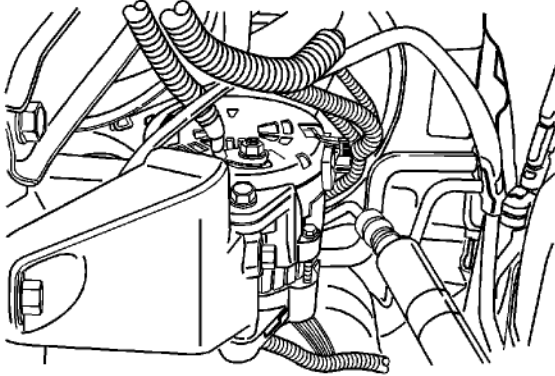


1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Disconnect the intake air temperature (IAT) sensor electrical connector from the air intake tube.

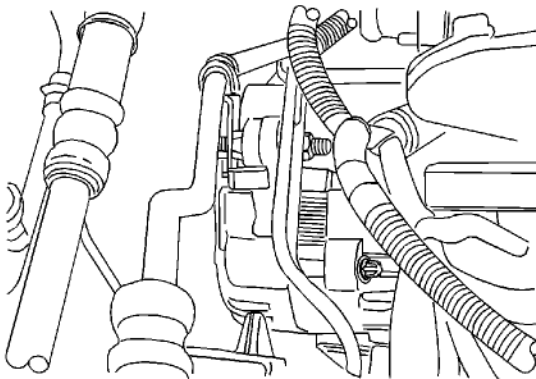




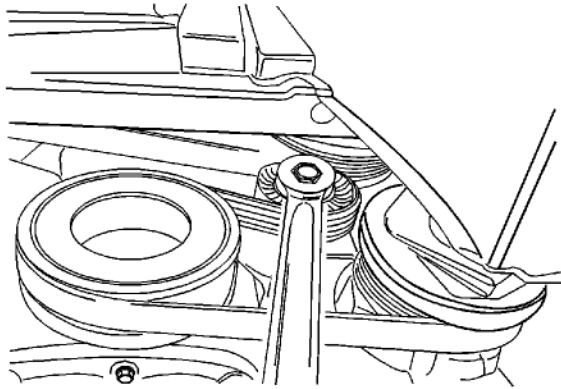
3. Remove the breather tube clamp and all other clamps to remove the air intake tube.



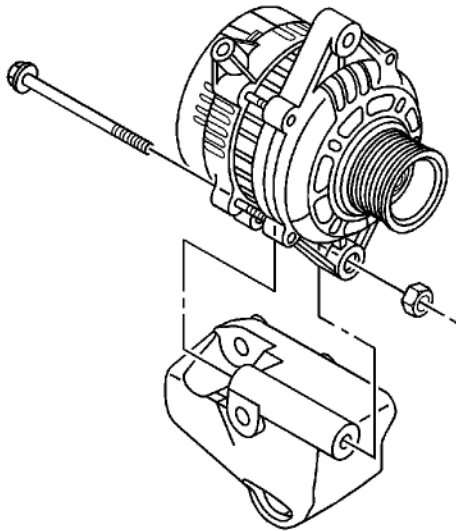
4. Remove the battery harness connector nut from the generator.



5. Remove the generator shackle bracket bolt.

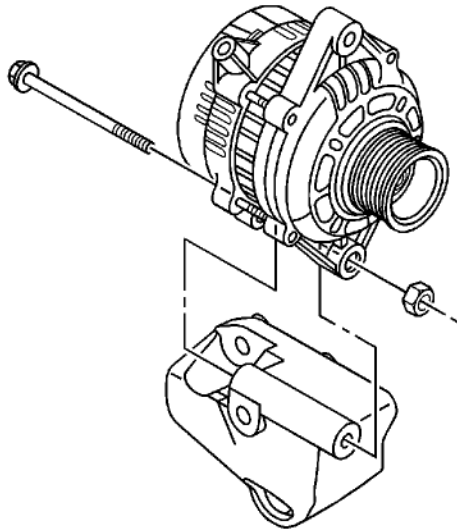


6. Remove the serpentine accessory drive belt. For vehicles equipped with power steering and air conditioning.



7. Remove the nuts which hold the generator lower bracket-to-generator bolts.
8. Carefully remove the generator.

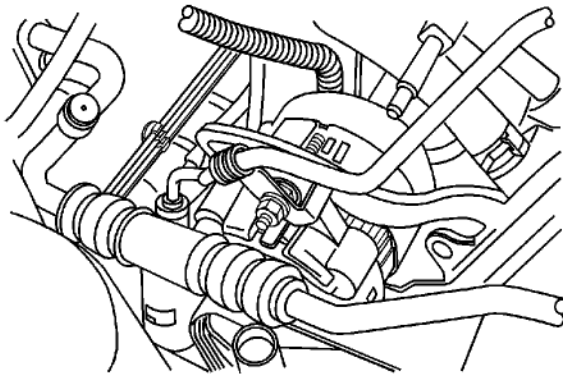
Installation Procedure



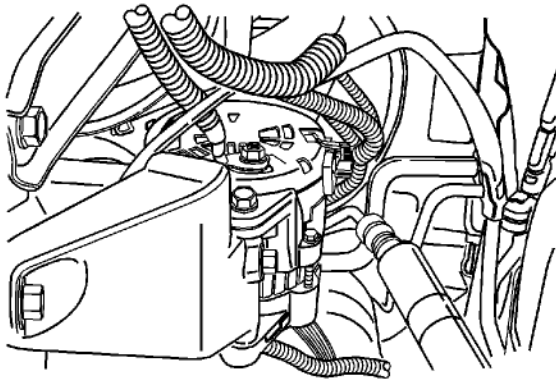
1. Install the generator at the generator lower bracket and insert the generator bolts.

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

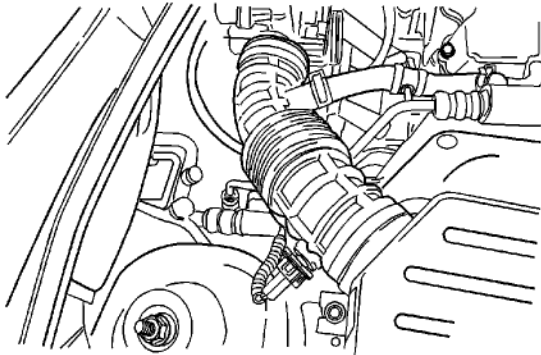
2. Install the nut and the washers on the generator lower bracket-to-generator bolts and tighten to 25 N·m (18 lb ft).



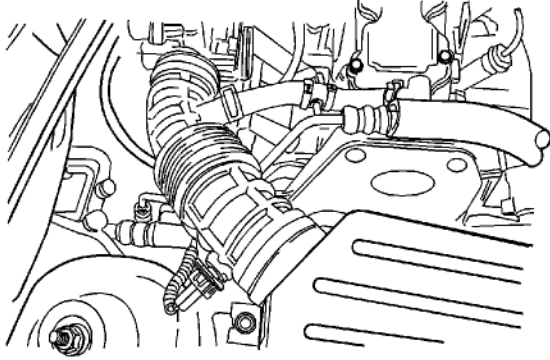
3. Install the generator and the lower support bracket assembly to the engine block with the bolts.
4. Secure the generator to the shackle bracket with the bolt and tighten to 25 N·m (18 lb ft).



5. Connect the harness connector to the back of the generator.
6. Install the generator lead to the battery and fasten the lead with the nut and tighten to **15 N·m (11 lb ft)**.



7. Install the air intake tube and the connector.



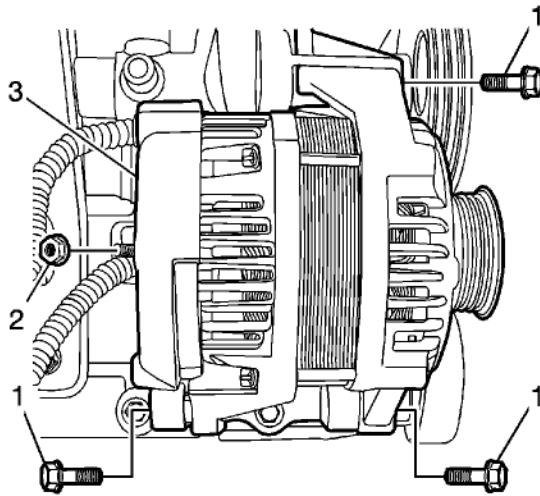
8. Install the IAT electrical connector to the air intake tube.
9. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).

Generator Replacement (1.2L)

Removal Procedure

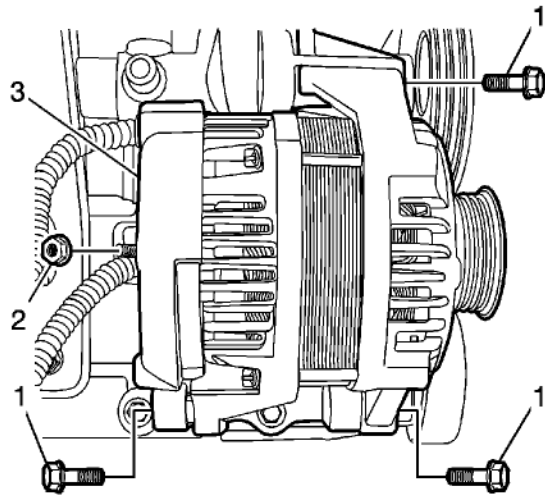
Warning: Refer to [Battery Disconnect Warning](#) in the Preface section.

1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the accessory belt. Refer to [Drive Belt Replacement](#).



4. Disconnect the harness connector.
5. Remove the battery harness connector nut (2) to disconnect the battery positive connector.
6. Disconnect the generator harness connector.
7. Remove the generator retaining bolts (1) and nuts.
8. Remove the generator (3).

Installation Procedure



1. Install the generator (3).

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

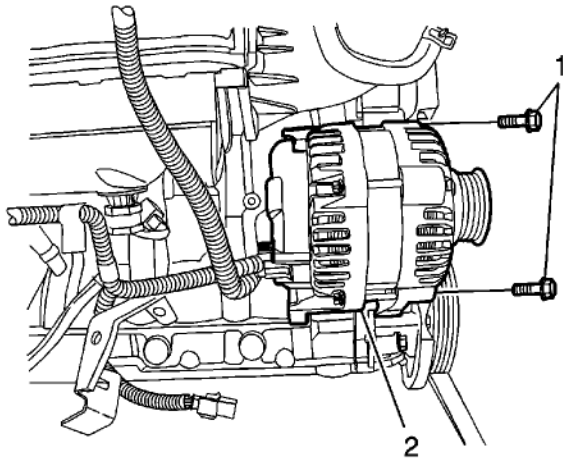
2. Install the generator retaining bolt (1) and nut. Tighten to **4.75 N·m (3.5 lb ft)**.
3. Install the battery harness connector nut (2) to connect the battery positive connector.
4. Connect the harness connector.
5. Install the accessory belt. Refer to [Drive Belt Replacement](#).
6. Lower the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
7. Connect the battery negative cable Refer to [Battery Negative Cable Disconnection and Connection](#).

Generator Replacement (1.4L LDT, 1.6L LXV)

Removal Procedure

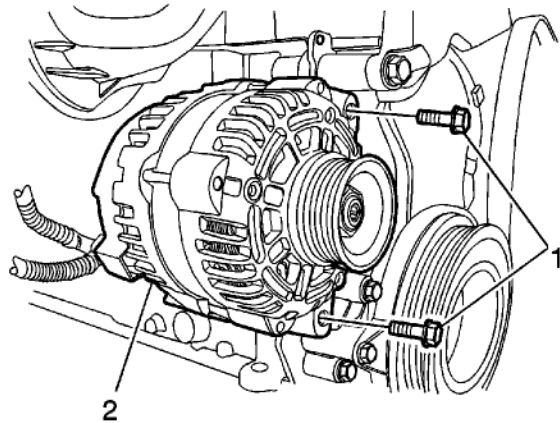
Warning: Refer to [Battery Disconnect Warning](#) in the Preface section.

1. Disconnect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).
2. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
3. Remove the accessory belt. Refer to [Drive Belt Replacement](#) and [Drive Belt Replacement](#).



4. Disconnect the harness connector.
 - Remove the battery harness connector nut to disconnect the battery positive connector.
 - Disconnect the generator harness connector.
5. Remove the generator retaining bolts/nuts (1).
6. Remove the generator (2).

Installation Procedure



1. Install the generator (2).

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

2. Install the generator retaining bolt/nut (1) and tighten to **25 N·m (18.4 lb ft)**.
3. Install the battery harness connector nut to connect the battery positive connector.
4. Connect the harness connector.
5. Install the accessory belt. Refer to [Drive Belt Replacement](#) and [Drive Belt Replacement](#).
6. Lower the vehicle.
7. Connect the battery negative cable. Refer to [Battery Negative Cable Disconnection and Connection](#).