

2006 ACCESSORIES & EQUIPMENT

Frame and Underbody - Impala

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Frame Support Bolt	20 N.m	15 lb ft
Frame Support Nut	20 N.m	15 lb ft
Front Frame Bolt	145 N.m	107 lb ft
Rear Frame Bolt	160 N.m	118 lb ft

REPAIR INSTRUCTIONS

FRAME REPLACEMENT

Tools Required

J 39580 Universal Engine Support Table

Removal Procedure

1. Install the engine support fixture to support the engine/transaxle assembly. Refer to **Engine Support Fixture** for the 3.5L engine, **Engine Support Fixture** for the 3.9L engine, **Engine Support Fixture** for the 5.3L engine.
2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle**.
3. Remove the front tires and wheels. Refer to **Tire and Wheel Removal and Installation**.
4. Remove the lower radiator air deflector. Refer to **Radiator Air Baffle and Deflector Replacement - Lower**.
5. Remove the positive battery cable retainers. Position the positive battery cable aside. Refer to **Battery Positive and Negative Cable Replacement (RPOs LZE/LZ4/LZ9)** or **Battery Positive and Negative Cable Replacement (RPO LS4)**.
6. Disconnect the power steering cooler pipe from the frame. Refer to **Power Steering Cooler Pipe/Hose Replacement**.
7. Secure the power steering cooler to the exhaust pipe.
8. Remove the stabilizer shaft links. Rotate the stabilizer shaft up to gain access to the mounting bolts for the power steering gear. Refer to **Stabilizer Shaft Link Replacement**.

9. Remove the mounting bolts for the power steering gear. Refer to **Power Steering Gear Replacement** .

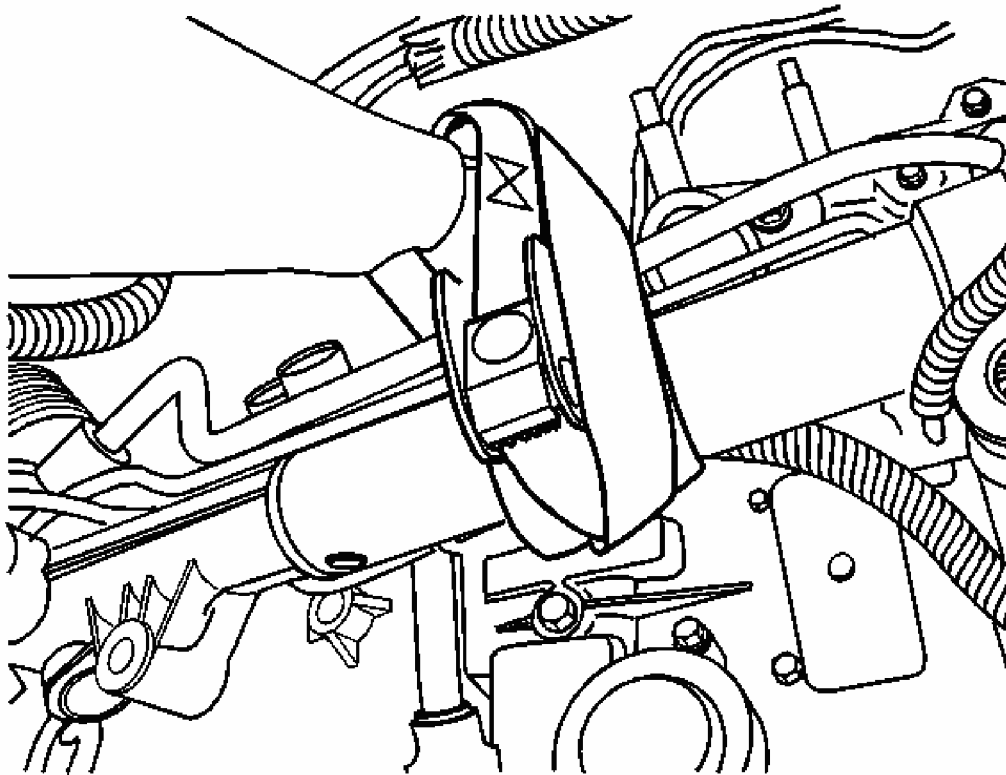


Fig. 1: Securing Power Steering Gear To Exhaust Manifold
Courtesy of GENERAL MOTORS CORP.

10. Secure the power steering gear.
11. Remove the nuts which secure the engine mount to the frame. Refer to **Engine Mount Replacement** for the 3.5L engine, **Engine Mount Replacement** for the 3.9L engine, **Engine Mount Replacement - Left** and **Engine Mount Replacement - Right** for the 5.3L engine.
12. Remove the nuts which secure the transaxle mount to the frame. Refer to **Transmission Mount Replacement - Left** for the 4T65-E transaxle.

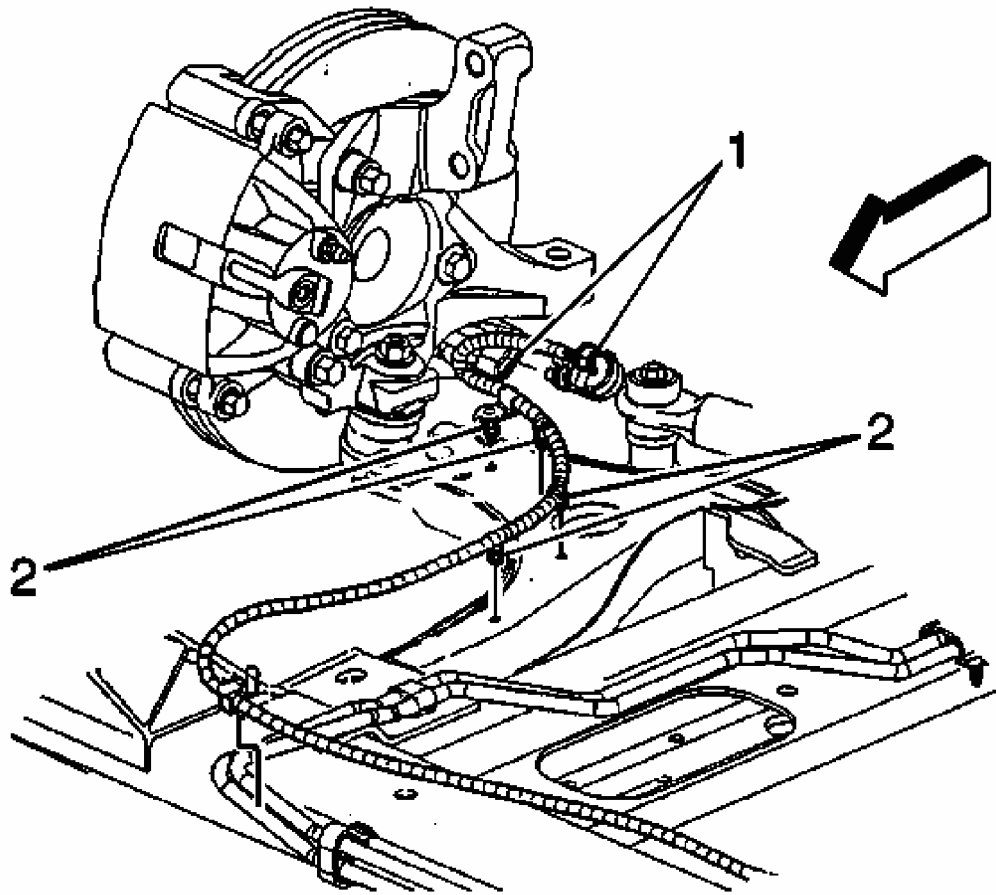


Fig. 2: Front Wheel Speed Sensor Connectors & Harness Retainers
Courtesy of GENERAL MOTORS CORP.

13. Disconnect both front wheel speed sensor connectors (1), if equipped.
14. Remove both front wheel speed harness retainers (2) from the frame and the lower control arms, if equipped.
15. Separate both of the lower ball joints from the steering knuckle. Refer to **Lower Ball Joint Replacement** .

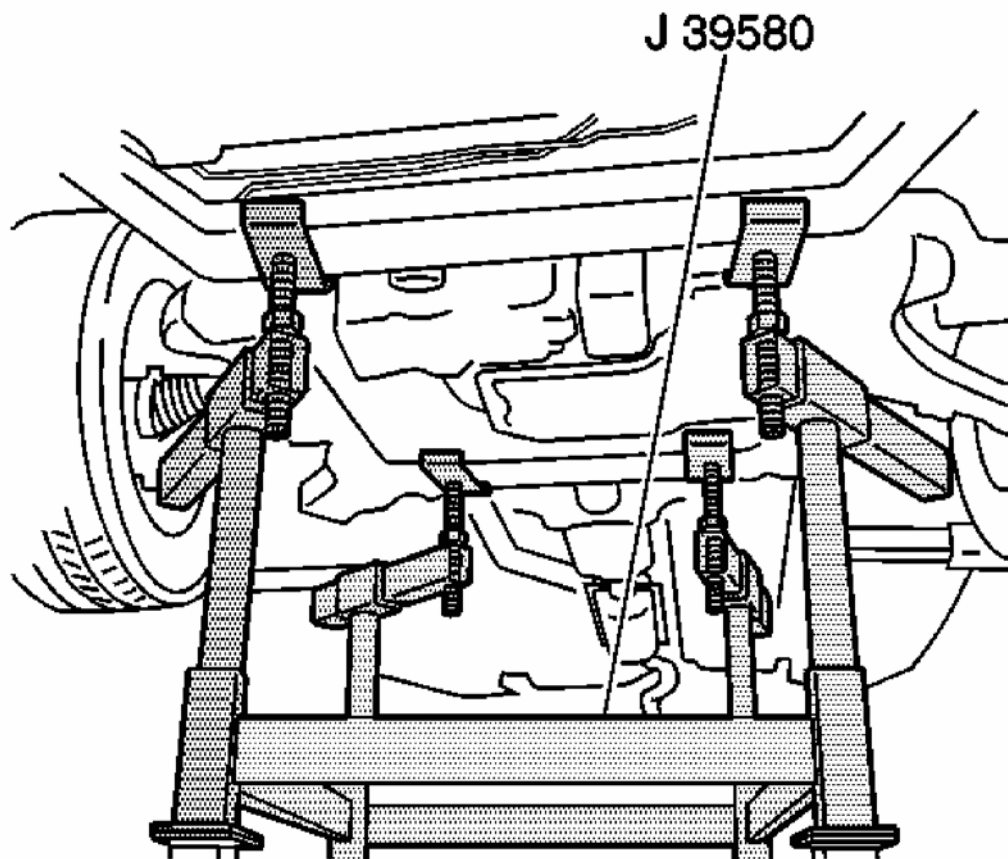


Fig. 3: Identifying Utility Stand
Courtesy of GENERAL MOTORS CORP.

16. Lower the vehicle until the frame contacts **J 39580** .

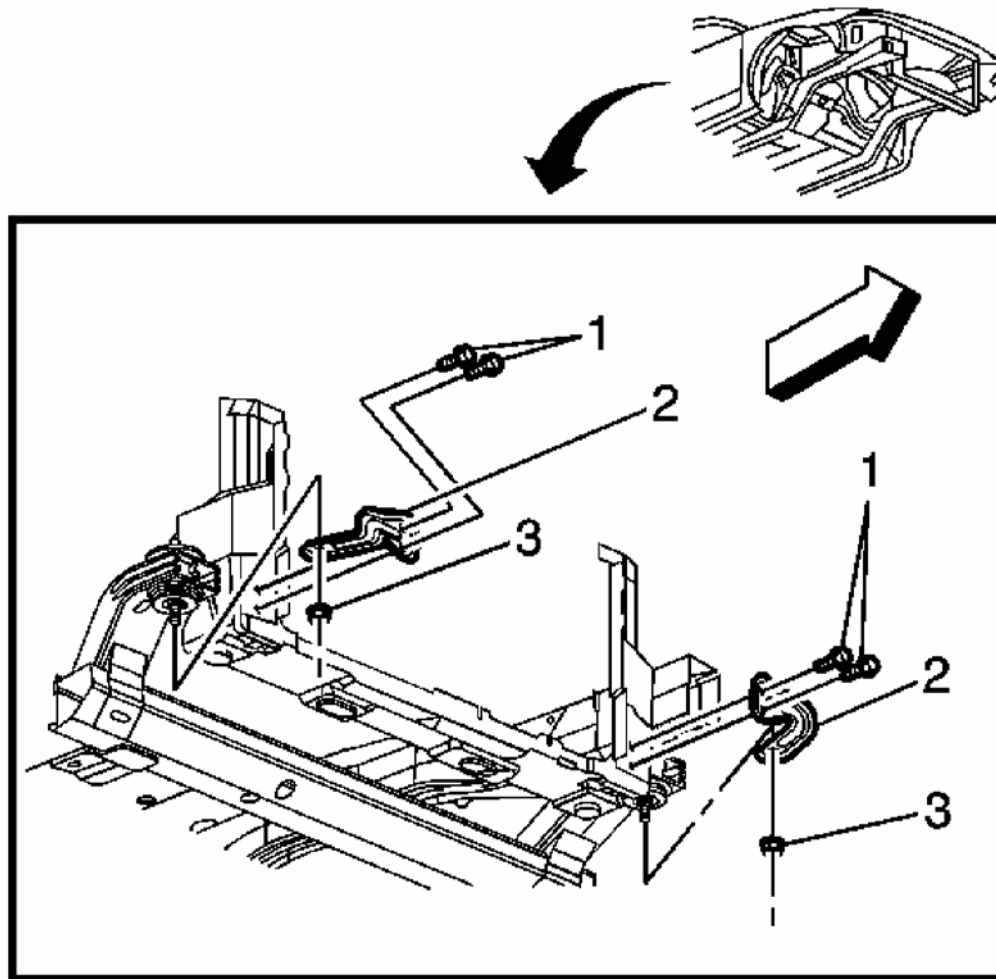


Fig. 4: Removing The Frame Reinforcement Nuts
Courtesy of GENERAL MOTORS CORP.

17. Remove the frame reinforcement nuts (3).
18. Remove the frame reinforcement bolts (1).
19. Remove the frame reinforcements (2).

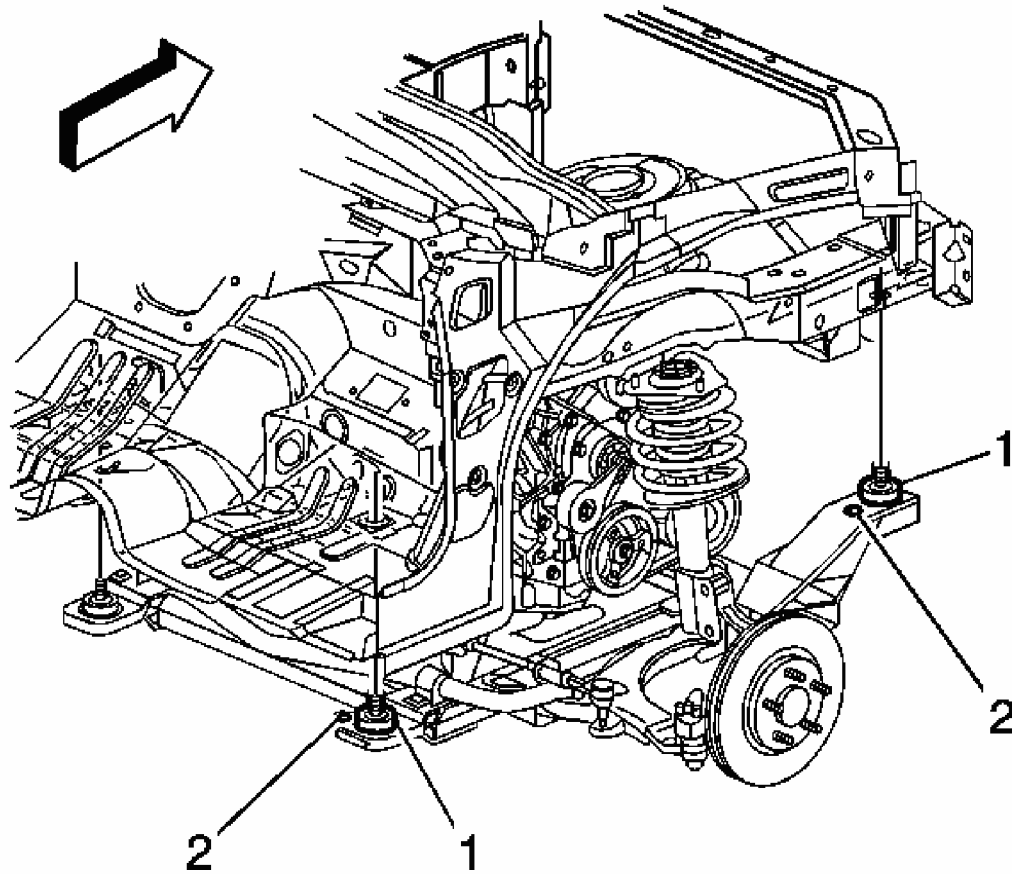


Fig. 5: Removing The Bolts Which Secure The Frame To The Body
Courtesy of GENERAL MOTORS CORP.

20. Remove the bolts (1) which secure the frame to the body.
21. Raise the vehicle in order to separate the frame from the body.
22. If you are replacing the frame, remove the following components:
 - Both of the lower control arms-Refer to **Lower Control Arm Replacement** .
 - The stabilizer shaft-Refer to **Stabilizer Shaft Replacement** .
 - The spacers, the upper insulator, the lower insulator, and the retainers-Refer to **Frame Cushion or Insulator Replacement - Front** and to **Frame Cushion or Insulator Replacement - Rear**.

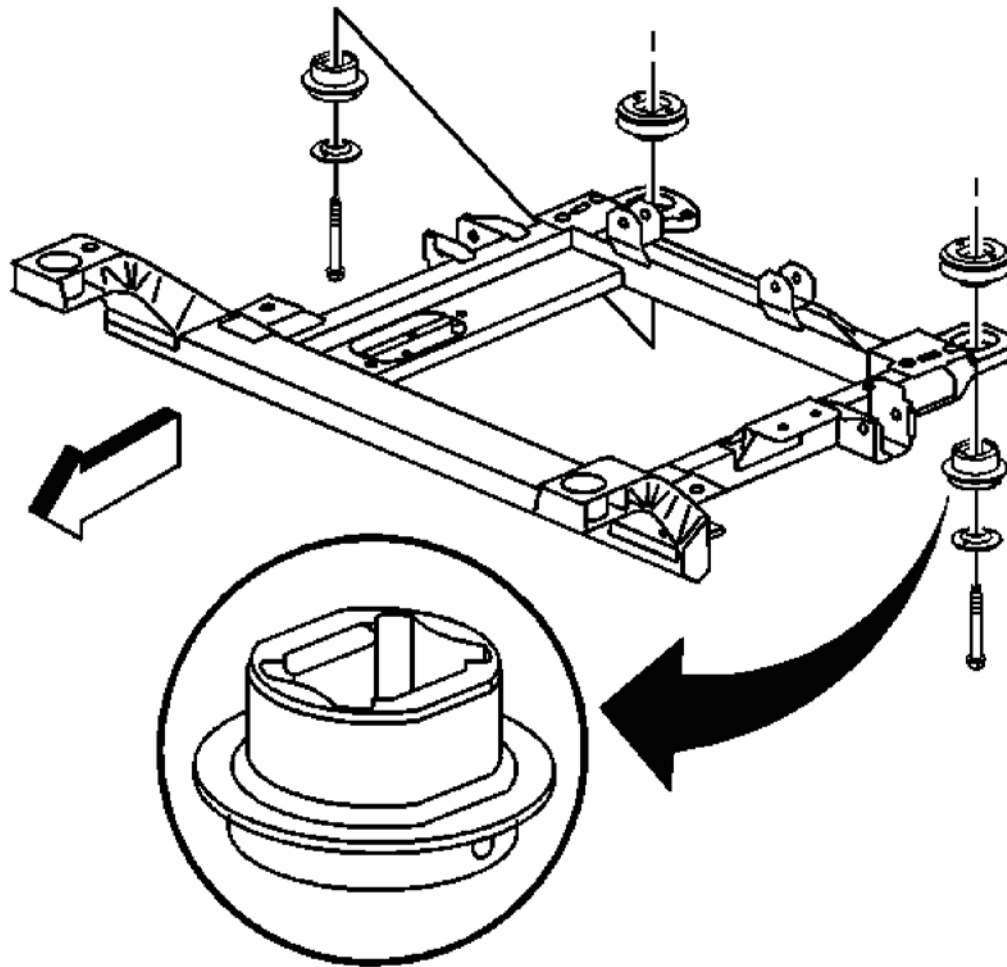


Fig. 6: Rear Frame To Body Bolts
Courtesy of GENERAL MOTORS CORP.

1. If you are replacing the frame, install the following components:
 - Both of the lower control arms-Refer to **Lower Control Arm Replacement** .
 - The stabilizer shaft-Refer to **Stabilizer Shaft Replacement** .
 - The spacers, the upper insulator, the lower insulator, and the retainers-Refer to **Frame Cushion or Insulator Replacement - Front** and to **Frame Cushion or Insulator Replacement - Rear**.

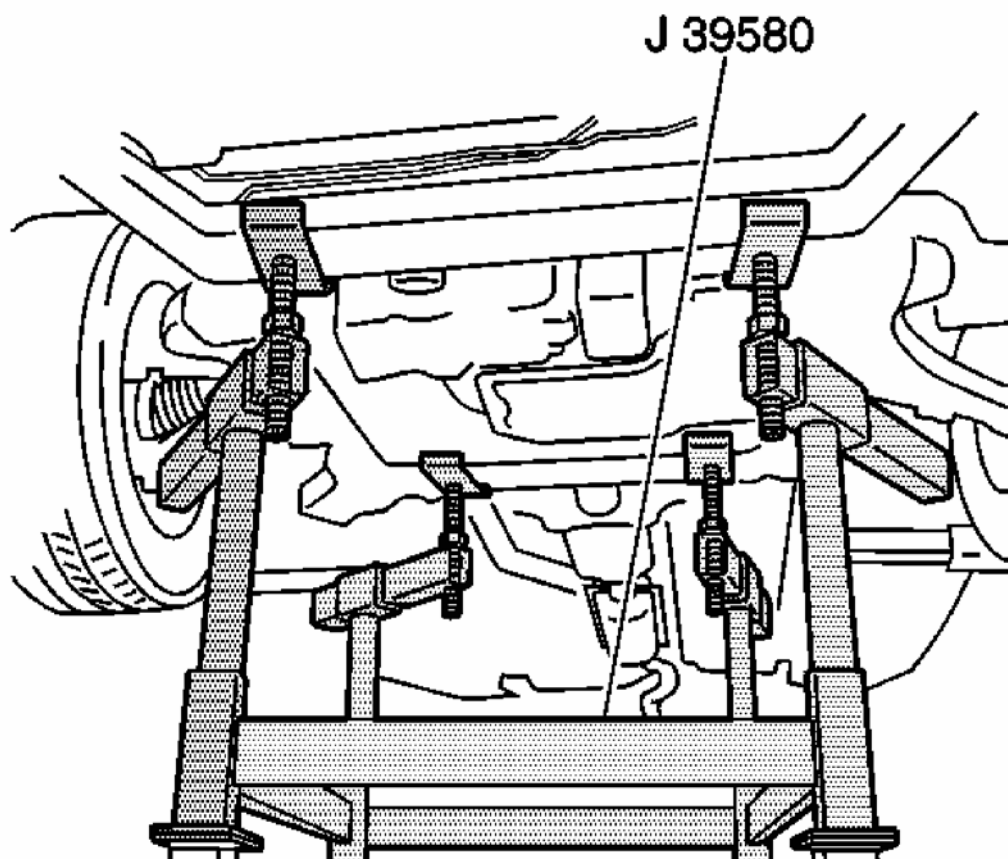


Fig. 7: Identifying Utility Stand
Courtesy of GENERAL MOTORS CORP.

2. Position the engine support table with the frame under the vehicle.
3. Lower the vehicle to the frame.

NOTE: Refer to Fastener Notice .

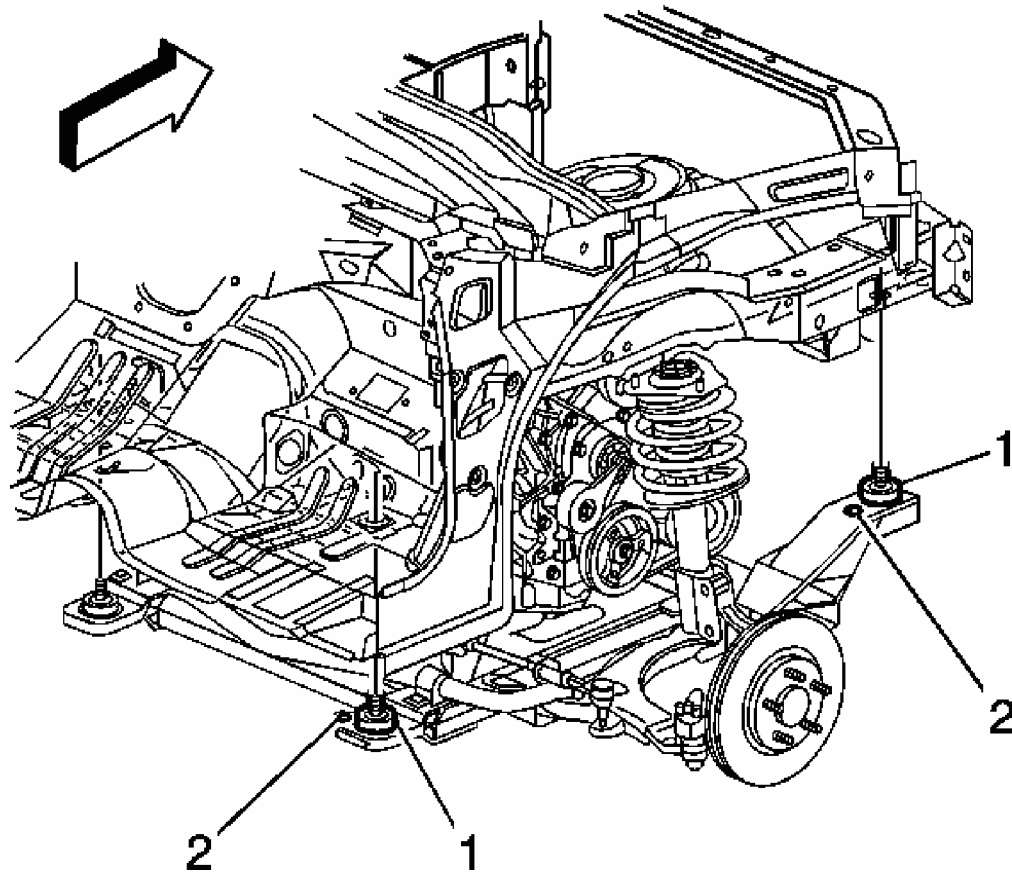


Fig. 8: Installing The Bolts To Secure The Frame To The Body
Courtesy of GENERAL MOTORS CORP.

4. Loosely install the bolts (1) to secure the frame to the body.
5. Align the frame to the body by inserting two 19X203 mm (0.74X8.0 in) pins in the alignment holes (2) on the right side of the frame.

Tighten:

- Tighten the new front frame bolts to 145 N.m (107 lb ft).
- Tighten the new rear frame bolts to 160 N.m (118 lb ft).

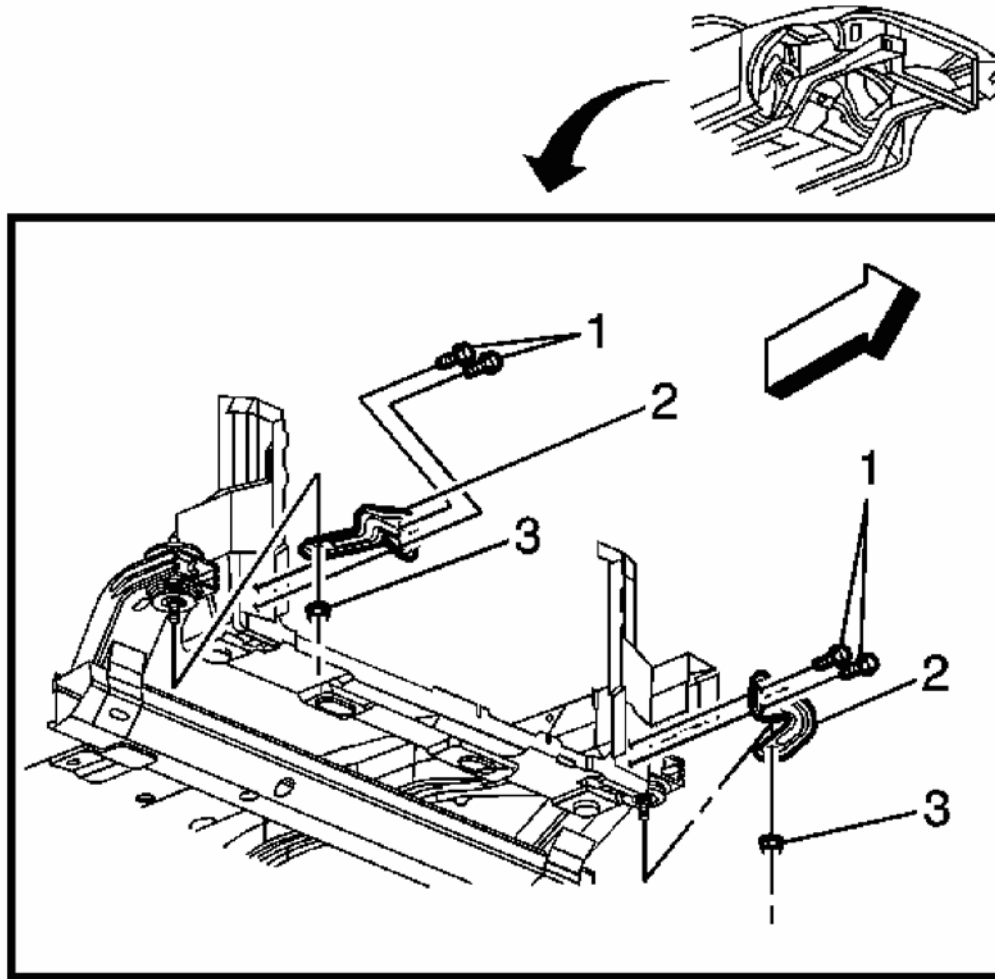


Fig. 9: Installing The Frame Reinforcements
Courtesy of GENERAL MOTORS CORP.

6. Install the frame reinforcements (2).
7. Install the frame reinforcement bolts (1).

Tighten: Tighten the bolts to 20 N.m (15 lb ft).

8. Install the frame reinforcement nuts (3).

Tighten: Tighten the nuts to 20 N.m (15 lb ft).

9. Connect both the lower ball joints to the steering knuckle. Refer to **Lower Ball Joint Replacement**.

10. Install the nuts which secure the engine mount to the frame. Refer to **Engine Mount Replacement** for the 3.5L engine, **Engine Mount Replacement** for the 3.9L engine, **Engine Mount Replacement - Left** and **Engine Mount Replacement - Right** for the 5.3L engine.
11. Install the nuts which secure the transaxle mount to the frame. Refer to **Transmission Mount Replacement - Left** for the 4T65-E transaxle.
12. Remove the power steering gear from the exhaust pipe. Position to the frame.
13. Install the steering gear mounting bolts. Refer to **Power Steering Gear Replacement**.
14. Install the stabilizer shaft links. Refer to **Stabilizer Shaft Link Replacement**.

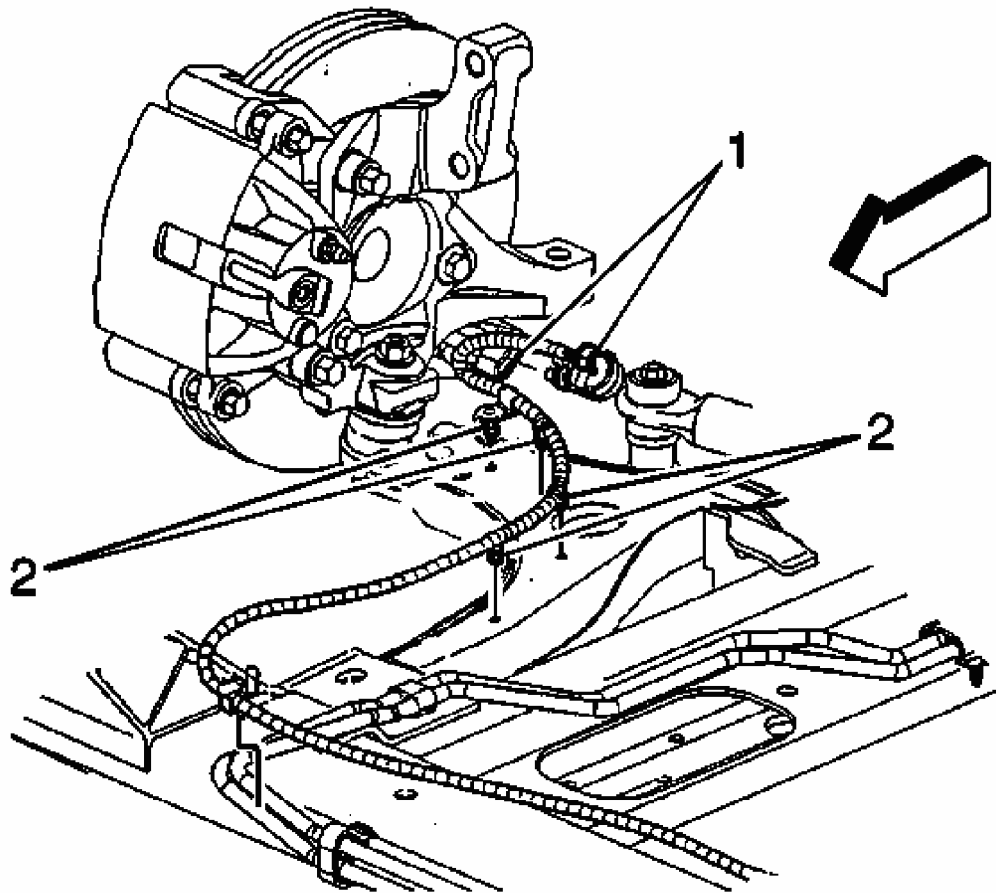


Fig. 10: Front Wheel Speed Sensor Connectors & Harness Retainers
Courtesy of GENERAL MOTORS CORP.

15. Connect both front wheel speed sensor connectors (1), if equipped.
16. Install both front wheel speed harness retainers (2) to the frame and to the lower control

arm, if equipped.

17. Install the positive battery cable. Refer to **Battery Positive and Negative Cable Replacement (RPOs LZE/LZ4/LZ9)** or **Battery Positive and Negative Cable Replacement (RPO LS4)** .
18. Install the power steering cooler pipe. Refer to **Power Steering Cooler Pipe/Hose Replacement** .
19. Install the radiator lower air deflector. Refer to **Radiator Air Baffle and Deflector Replacement - Lower** .
20. Install the front tires and wheels. Refer to **Tire and Wheel Removal and Installation** .
21. Lower the vehicle.
22. Remove the engine support fixture. Refer to **Engine Support Fixture** for the 3.5L engine, **Engine Support Fixture** for the 3.9L engine, **Engine Support Fixture** for the 5.3L engine.
23. Inspect the front wheel alignment. Refer to **Measuring Wheel Alignment** .

FRONT FRAME CUSHION OR INSULATOR REPLACEMENT

Tools Required

J 45296 Frame Insulator Remover/Installer. See **Special Tools**.

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Disconnect the steering intermediate shaft. Refer to **Intermediate Steering Shaft Replacement** .
3. Disconnect the fog lamp electrical connectors from the fog lamps.

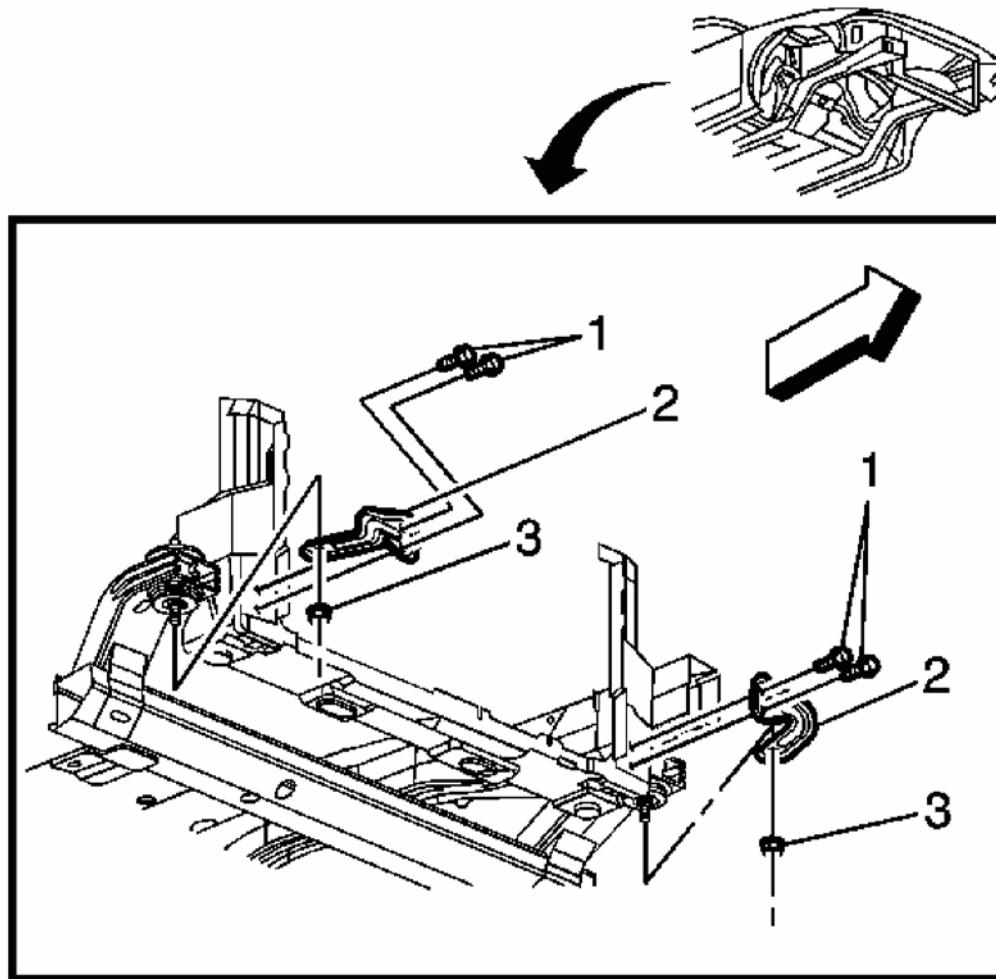


Fig. 11: Remove The Frame Reinforcement Nuts
Courtesy of GENERAL MOTORS CORP.

4. Remove the frame reinforcement nuts (3).
5. Remove the frame reinforcement bolts (1).
6. Remove the frame reinforcements (2).
7. Install a jackstand under the center of the frame, between the front frame insulators.

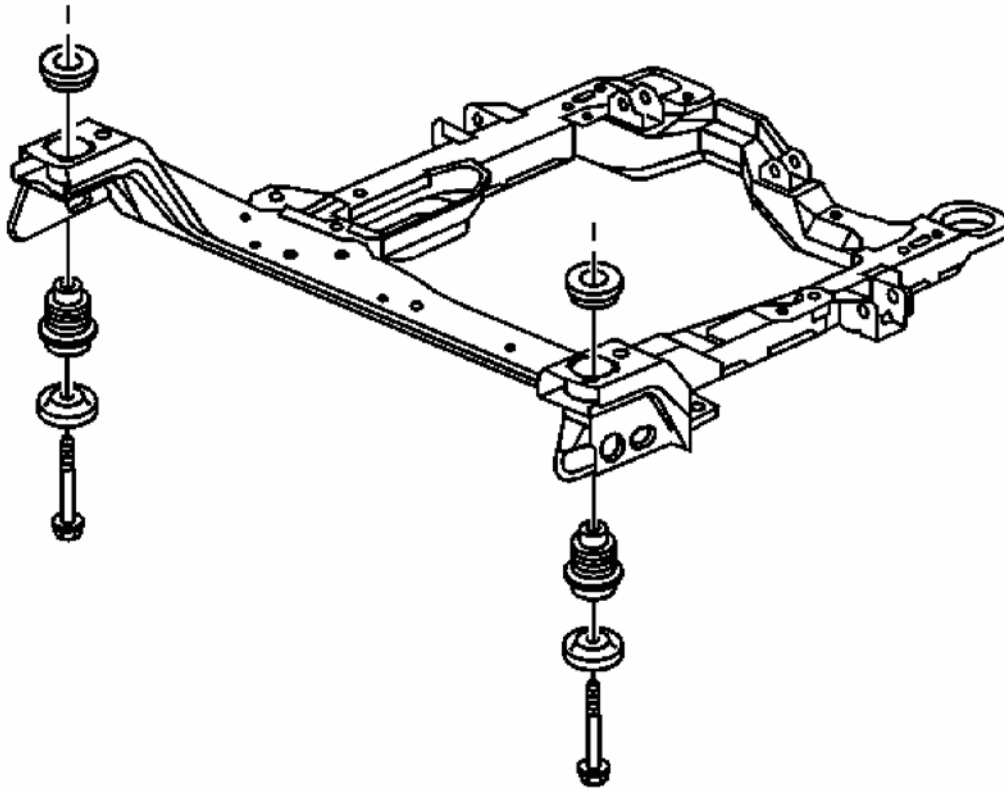


Fig. 12: View Of Front Frame Bolts And Retainers
Courtesy of GENERAL MOTORS CORP.

8. Remove the front frame bolts and retainers.
9. Lower the front of the frame.
10. Remove the frame front upper insulators.

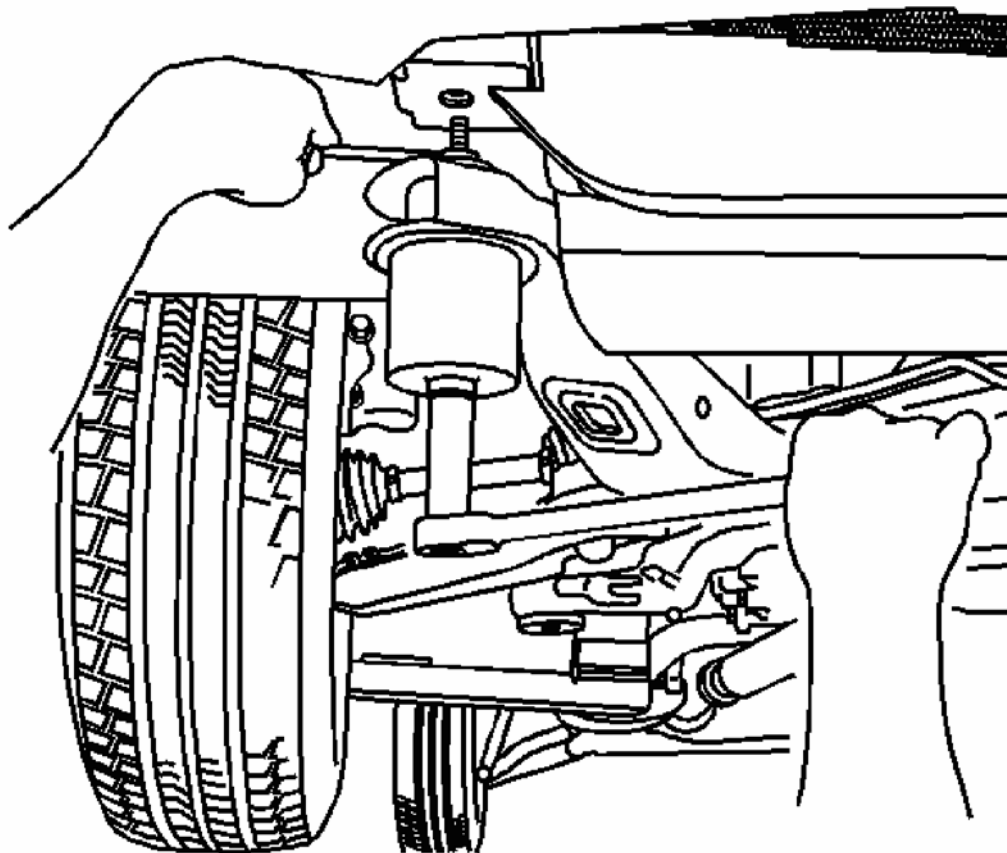


Fig. 13: View Of Frame Front Upper Insulators
Courtesy of GENERAL MOTORS CORP.

11. Install the **J 45296** , or equivalent to the front frame insulator you are removing. See **Special Tools**.
12. Using the **J 45296** , or equivalent remove the front frame insulator from the frame. See **Special Tools**.

Installation Procedure

1. Clean the front frame insulator opening.
2. Apply a thin coat of rubber lubricant GM P/N 01051717 (Canadian P/N 12345884) or equivalent to the inside of the front frame insulator opening.
3. Apply a thin coat of rubber lubricant GM P/N 01051717 (Canadian P/N 12345884) or equivalent to the front frame insulator.

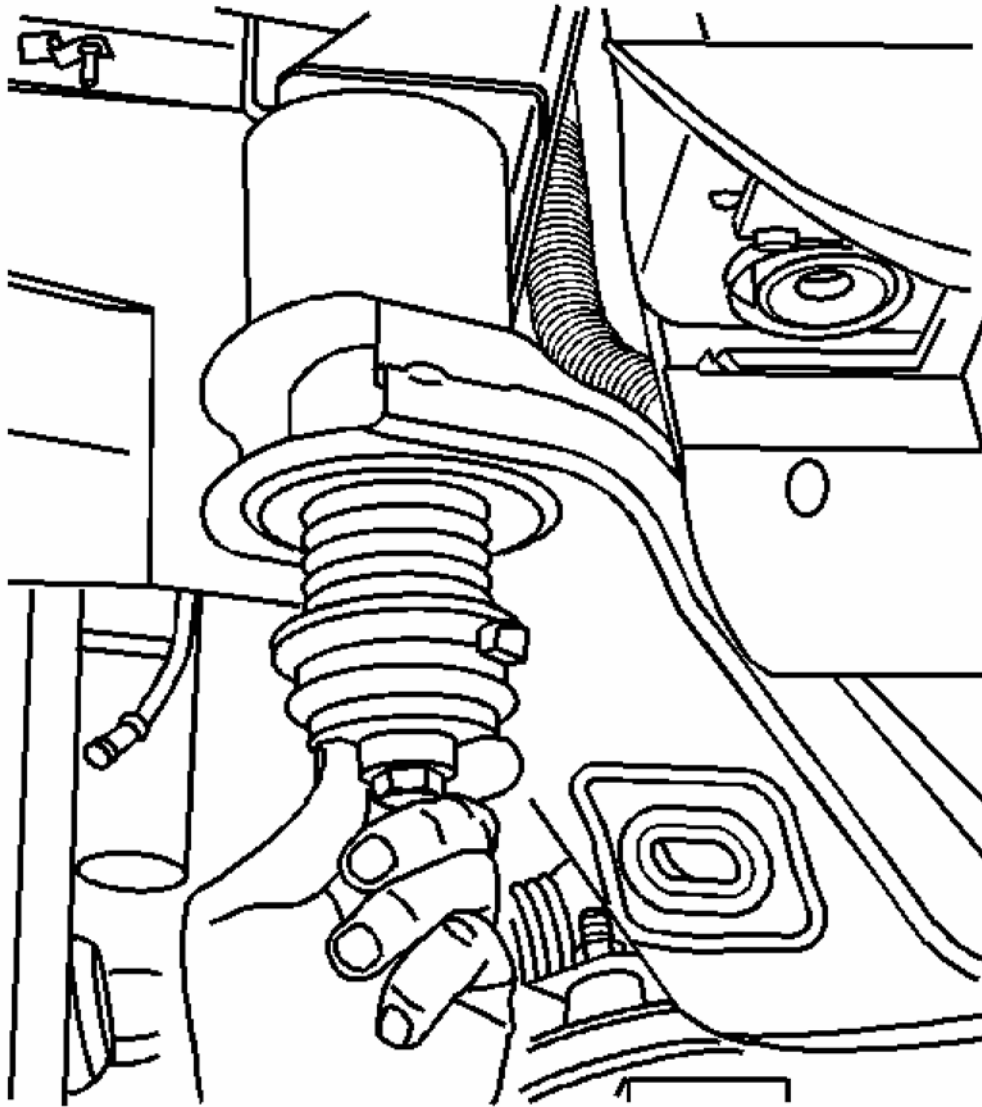


Fig. 14: Aligning The Front Frame Insulator
Courtesy of GENERAL MOTORS CORP.

4. Align the front frame insulator to the front frame opening with the front frame alignment tabs facing to the front.
5. Using the **J 45296** , or equivalent install the front frame insulator to the front frame. See **Special Tools**.

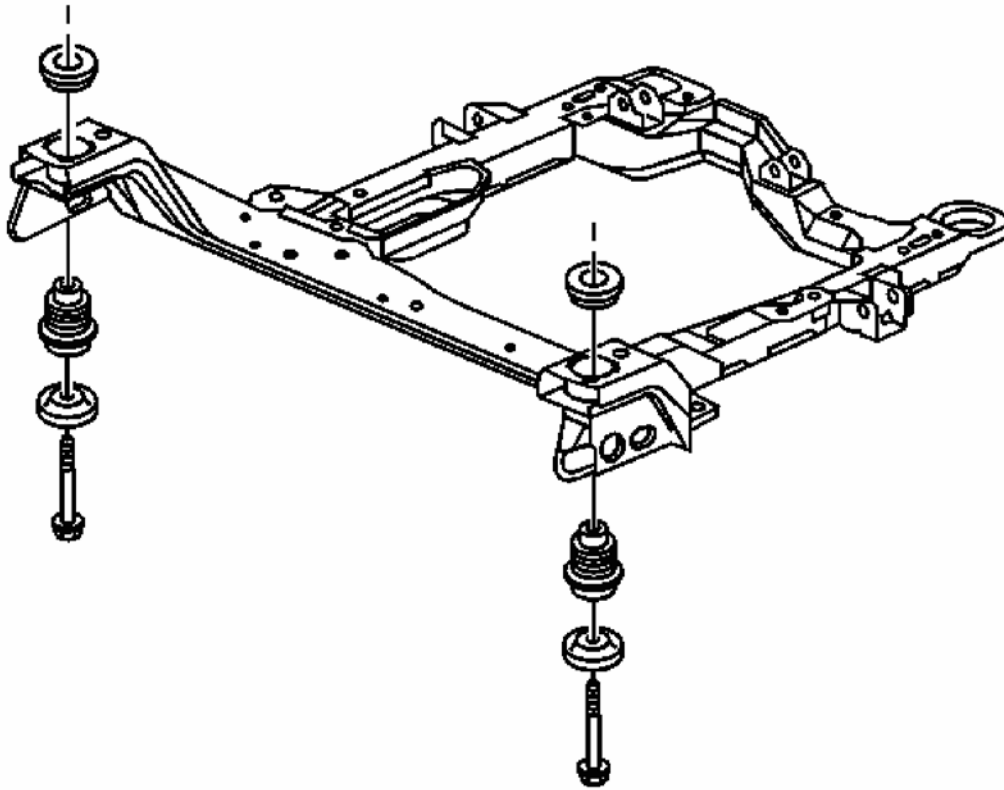


Fig. 15: View Of Front Frame Bolts And Retainers
Courtesy of GENERAL MOTORS CORP.

6. Install the frame front upper insulators.
7. Raise the front of the frame.

NOTE: Refer to Fastener Notice .

8. Install the front frame bolts and retainers.

Tighten: Tighten the front frame bolts to 145 N.m (107 lb ft).

9. Remove the jackstand.

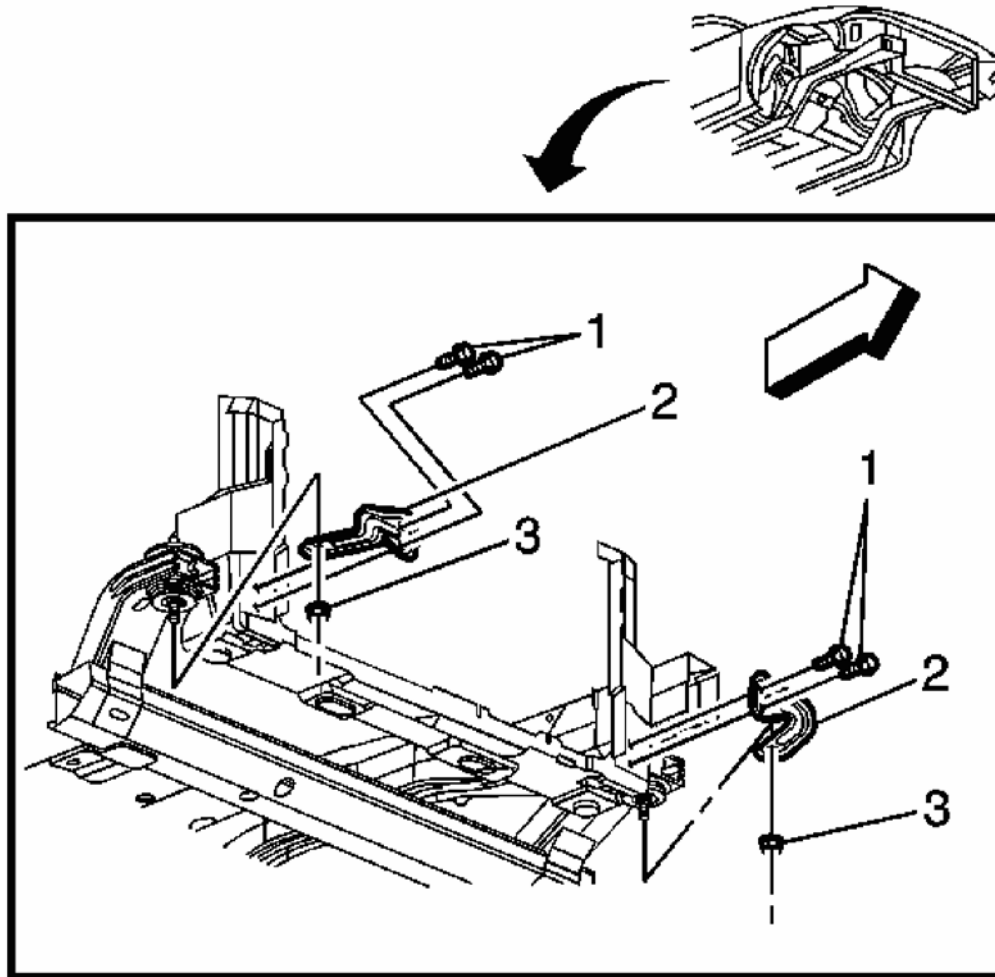


Fig. 16: Installing The Frame Reinforcements
Courtesy of GENERAL MOTORS CORP.

10. Install the frame reinforcements (2).
11. Install the frame reinforcement bolts (1).

Tighten: Tighten the bolts to 20 N.m (15 lb ft).

12. Install the frame reinforcement nuts (3).

Tighten: Tighten the nuts to 20 N.m (15 lb ft).

13. Connect the fog lamp electrical connectors to the fog lamps.
14. Connect the steering intermediate shaft. Refer to **Intermediate Steering Shaft**

Replacement .

15. Lower the vehicle.

REAR FRAME CUSHION OR INSULATOR REPLACEMENT**Removal Procedure**

IMPORTANT: In order to remove any frame insulator, loosen the adjacent frame insulators to permit the frame to separate from the body. Do not break the fan shroud or damage the frame attachments, such as steering hoses and brake pipes during the replacement of body mounts.

When installing a body mount, ensure the lower insulator is seated into the frame. The lower insulator should not be loose. The spacer and the corresponding upper insulator is pressed into the lower insulator thus squeezing the frame. The bolt is then inserted through the mount, capturing the lower retainer. The body mount components prevent contact of the frame to the body.

Do not over tighten the body mount. Over tightening may collapse a spacer or strip a bolt. When the frame insulator bolts are removed, always discard the bolts and replace with new bolts.

When clamping by the mount, ensure the surfaces are clean and dry. If the frame insulator bolt does not screw in smoothly, run a tap through the frame crossmember nut in the body in order to remove foreign material. Ensure the tap does not punch through the underbody.

Whenever the body is moved in relation to the frame, disconnect the intermediate shaft from the rack and pinion steering gear and stub shaft.

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

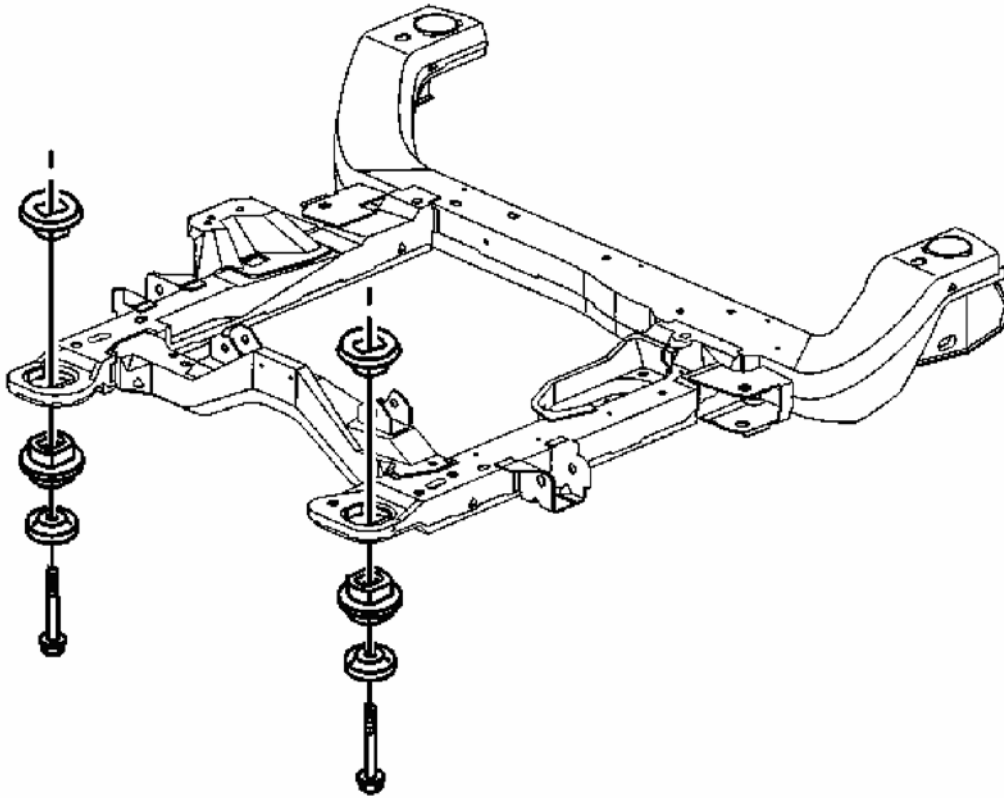


Fig. 17: View Of Rear Frame
Courtesy of GENERAL MOTORS CORP.

2. Remove the intermediate shaft from the steering gear stub shaft. Refer to **Intermediate Steering Shaft Replacement** .
3. Install a utility stand to the rear of the frame.
4. Remove the rear frame bolts.
5. Lower the rear of the frame.
6. Remove the upper and lower insulators from the rear of the frame as a set.

Installation Procedure

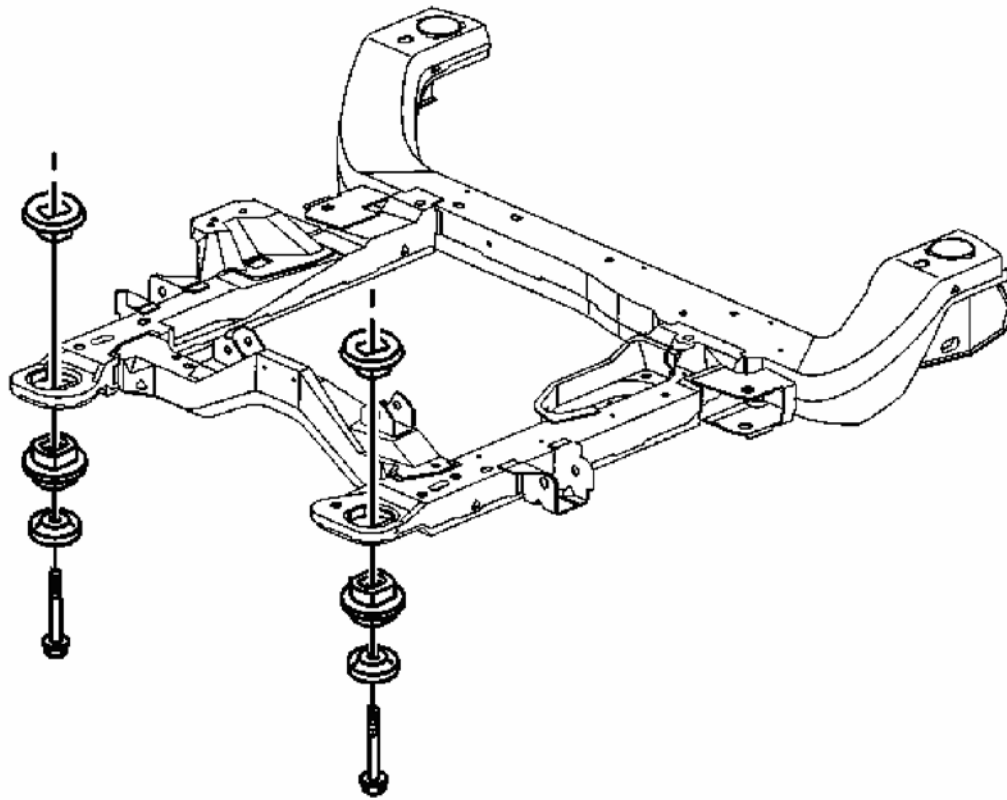


Fig. 18: View Of Rear Frame
Courtesy of GENERAL MOTORS CORP.

1. Apply lube to inside surface of lower insulator and to top surface of upper insulator.
2. Install the upper and lower insulators to the rear of the frame as a set.
3. Raise the rear of the frame.

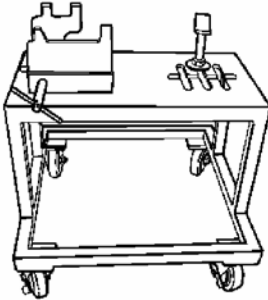
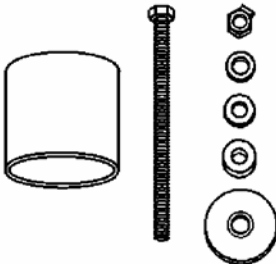
NOTE: **Refer to Fastener Notice .**

4. Install the rear frame bolts.

Tighten: Tighten the rear frame bolts to 160 N.m (118 lb ft).

5. Remove the utility stand.
6. Install the intermediate shaft to the steering gear stub shaft. Refer to **Intermediate Steering Shaft Replacement** .
7. Lower the vehicle.

SPECIAL TOOLS AND EQUIPMENT**SPECIAL TOOLS****Special Tools**

Illustration	Tool Number/ Description
	J 39580 Power Pack Stand Engine And Transaxle Assembly Support Remove/Installer
	J 45296 Frame Insulator Remover/Installer