

## 2006 Buick Rainier

2006 SUSPENSION Rear Suspension - Ascender, Envoy, Rainier & TrailBlazer

### 2006 SUSPENSION

Rear Suspension - Ascender, Envoy, Rainier & TrailBlazer

## SPECIFICATIONS

### FASTENER TIGHTENING SPECIFICATIONS

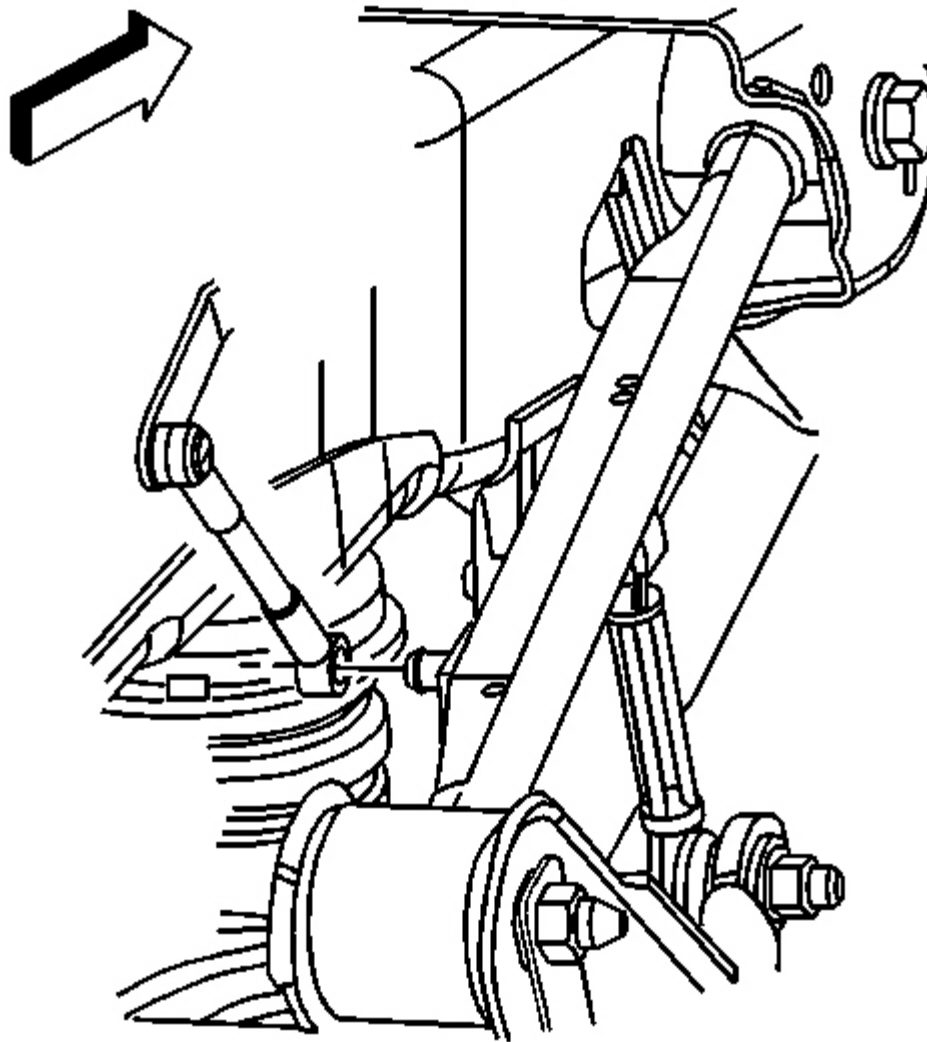
#### Fastener Tightening Specifications

Application	Specification	
	Metric	English
Rear Axle Brace and Rear Axle Tie Rod to Rear Axle Mounting Bolt	195 N.m	144 lb ft
Rear Axle Brace to the Frame Mounting Nut	95 N.m	70 lb ft
Rear Axle Lower Control Arm Mounting Nut	100 N.m	74 lb ft
Rear Axle Tie Rod Mounting Bolts	195 N.m	144 lb ft
Rear Axle Upper Control Arm Mounting Bolts	131 N.m	97 lb ft
Shock Absorber Lower Mounting Bolt	80 N.m	59 lb ft
Shock Absorber Upper Mounting Nut	85 N.m	63 lb ft
Stabilizer Shaft Insulator Clamp Mounting Nuts	75 N.m	55 lb ft
Stabilizer Shaft Link Retaining Nuts	90 N.m	66 lb ft

## REPAIR INSTRUCTIONS

### REAR AXLE UPPER CONTROL ARM REPLACEMENT

#### Removal Procedure

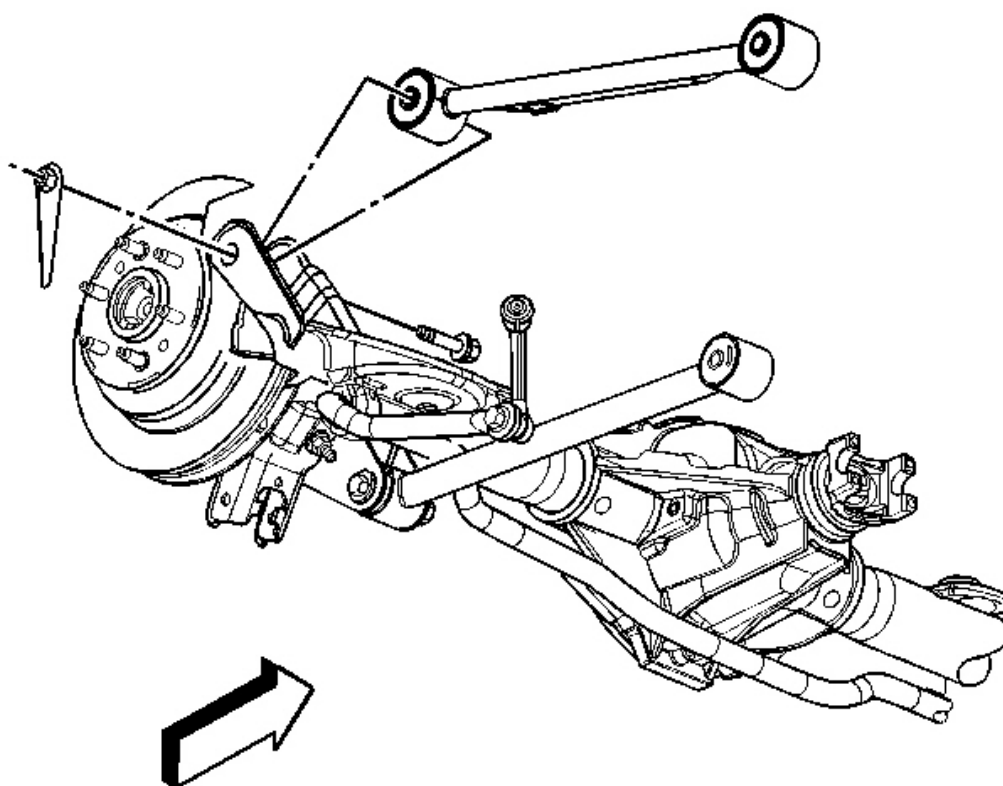


**Fig. 1: Removing Rear Axle Upper Control Arm**  
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the wheelhouse panel. Refer to **Wheelhouse Panel Replacement** in Body Rear

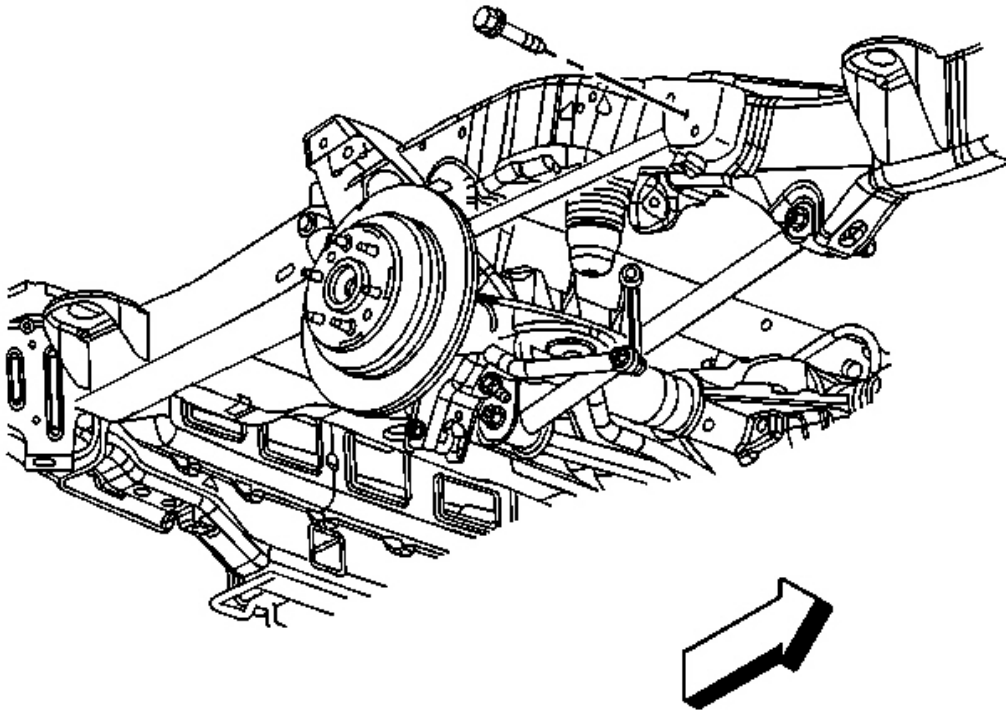
End.

4. Raise and support the rear axle at the designed D - height. Refer to **Trim Height Specifications** in Suspension General Diagnosis.
5. If equipped with air suspension, depressurize the air suspension system. Refer to **Air Suspension Depressurization Procedure** in Air Suspension.
6. If equipped with air suspension, disconnect the air suspension leveling sensor link from the rear axle upper control arm.



**Fig. 2: Removing/Installing Rear Axle Upper Control Arm-To-Axle Mounting Bolt & Nut**  
Courtesy of GENERAL MOTORS CORP.

7. Remove the rear axle upper control arm to axle mounting bolt and nut.

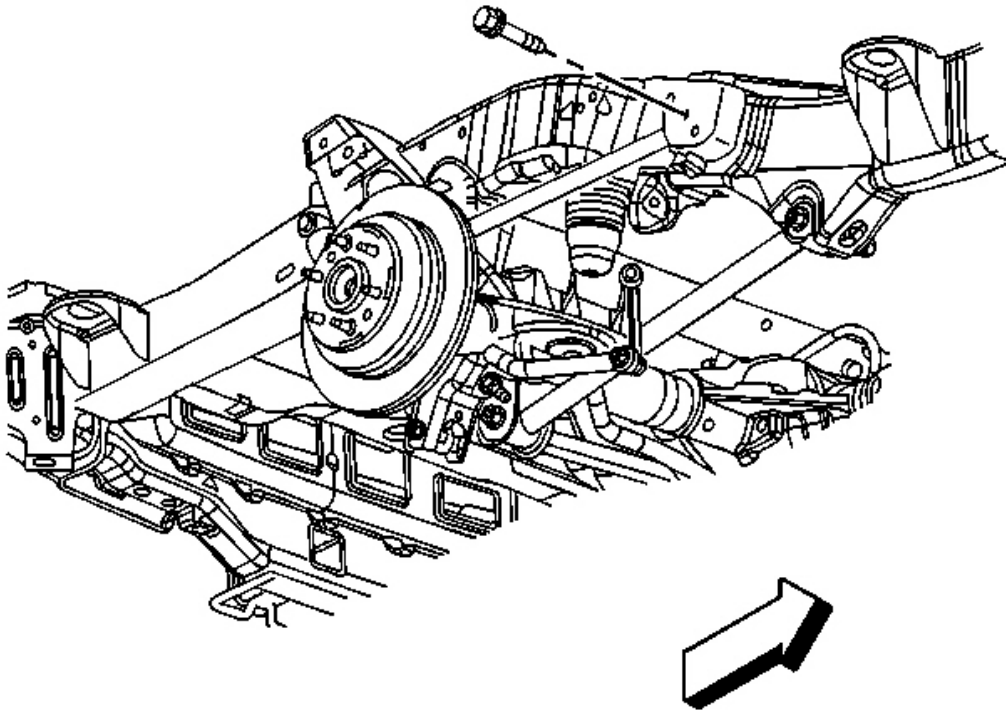


**Fig. 3: Removing/Installing Rear Axle Upper Control Arm-To-Frame Mounting Bolt**

**Courtesy of GENERAL MOTORS CORP.**

8. Remove the rear axle upper control arm to frame mounting bolt.
9. Remove the rear axle upper control arm.

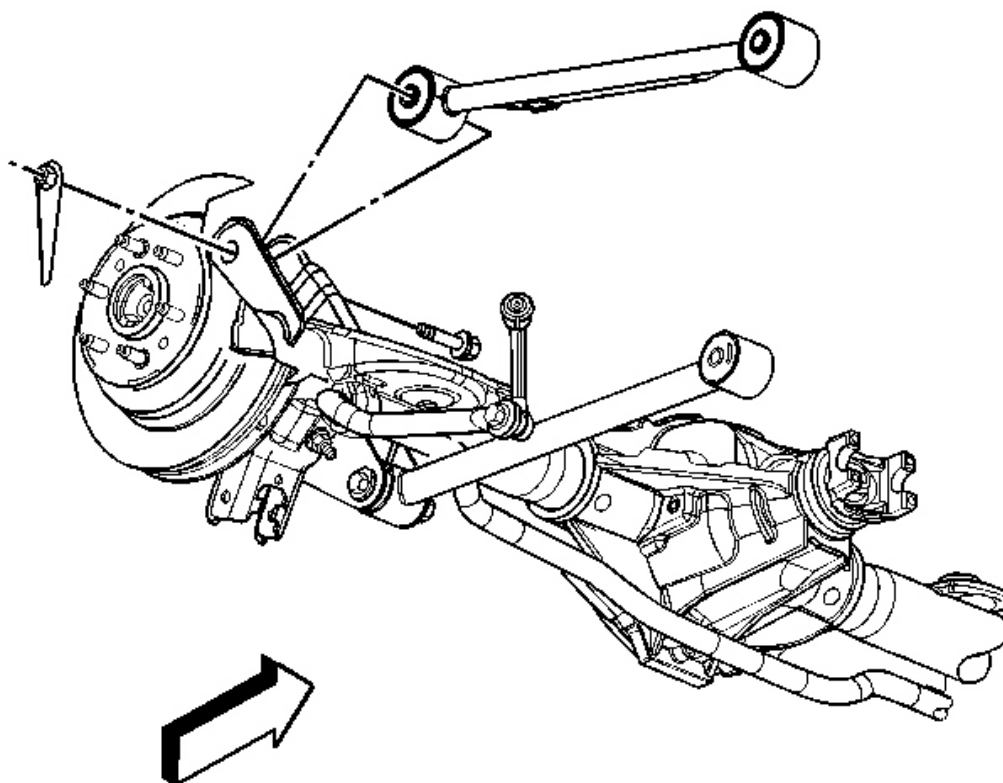
**Installation Procedure**



**Fig. 4: Removing/Installing Rear Axle Upper Control Arm-To-Frame Mounting Bolt**

**Courtesy of GENERAL MOTORS CORP.**

1. Install the rear axle upper control arm.
2. Install the rear axle upper control arm to frame mounting bolt.



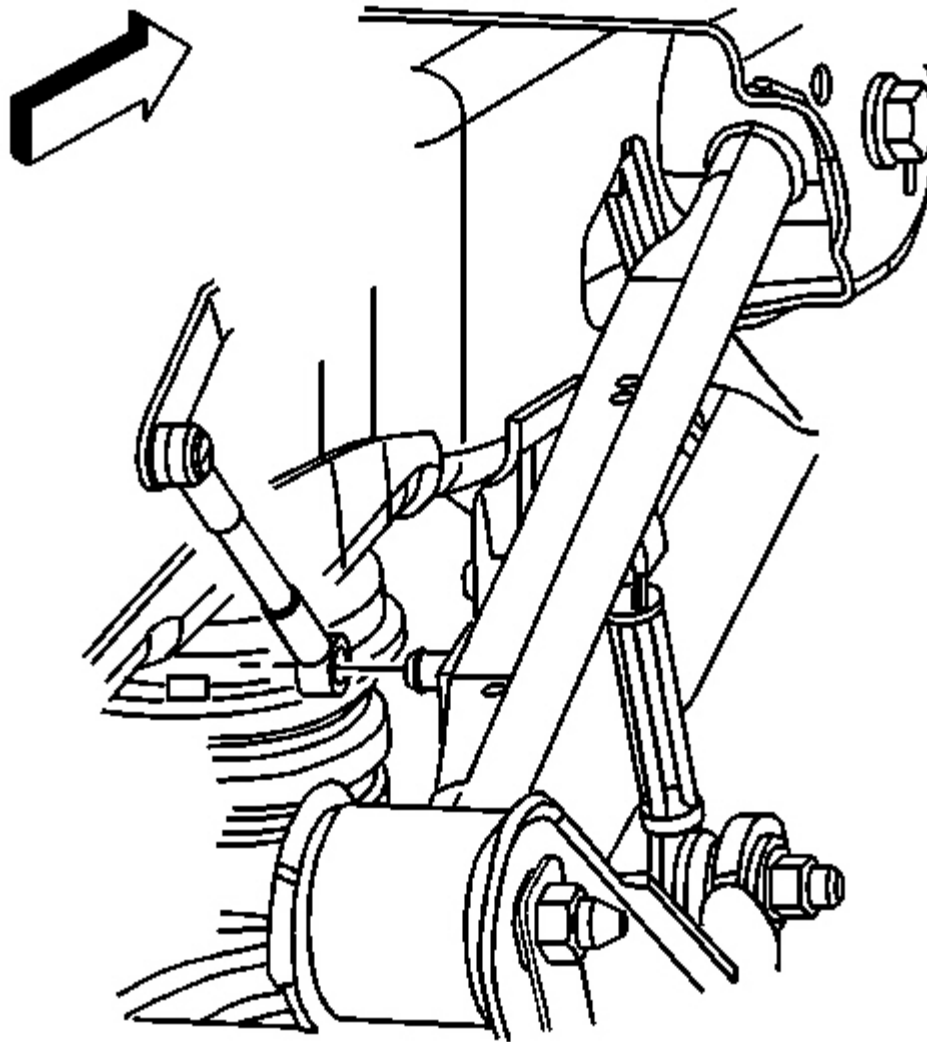
**Fig. 5: Removing/Installing Rear Axle Upper Control Arm-To-Axle Mounting Bolt & Nut**

Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

3. Install the rear axle upper control arm to axle mounting nut and bolt.

**Tighten:** Tighten the rear axle upper control arm mounting bolts to 131 N.m (97 lb ft).



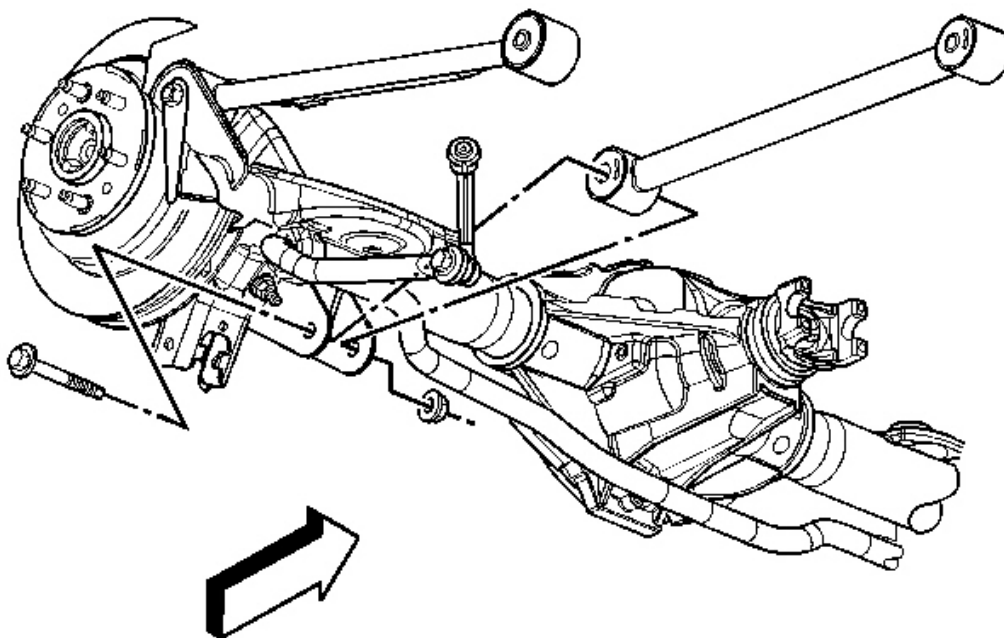
**Fig. 6: Removing Rear Axle Upper Control Arm**  
Courtesy of GENERAL MOTORS CORP.

4. If equipped with air suspension, connect the air suspension leveling sensor link to the rear axle upper control arm.
5. Remove the rear axle support.
6. Install the wheelhouse panel. Refer to **Wheelhouse Panel Replacement** in Body Rear End.

7. Install the tire and wheel. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
8. Lower the vehicle.

## REAR AXLE LOWER CONTROL ARM REPLACEMENT

### Removal Procedure



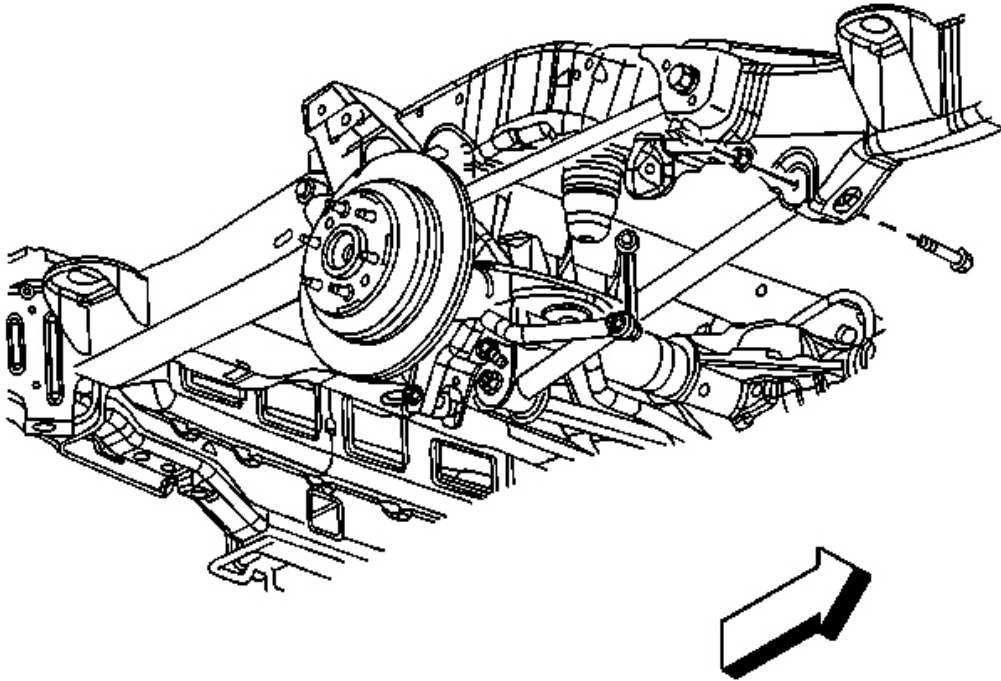
**Fig. 7: Removing/Installing Rear Axle Lower Control Arm-To-Axle Mounting Nut & Bolt**

Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Raise and support the rear axle at the designed D - height. Refer to **Trim Height Specifications** in Suspension General Diagnosis.
3. If equipped with air suspension, depressurize the air suspension system. Refer to **Air Suspension Depressurization Procedure** in Air Suspension.



4. Remove the rear axle lower control arm to the axle mounting nut and bolt.

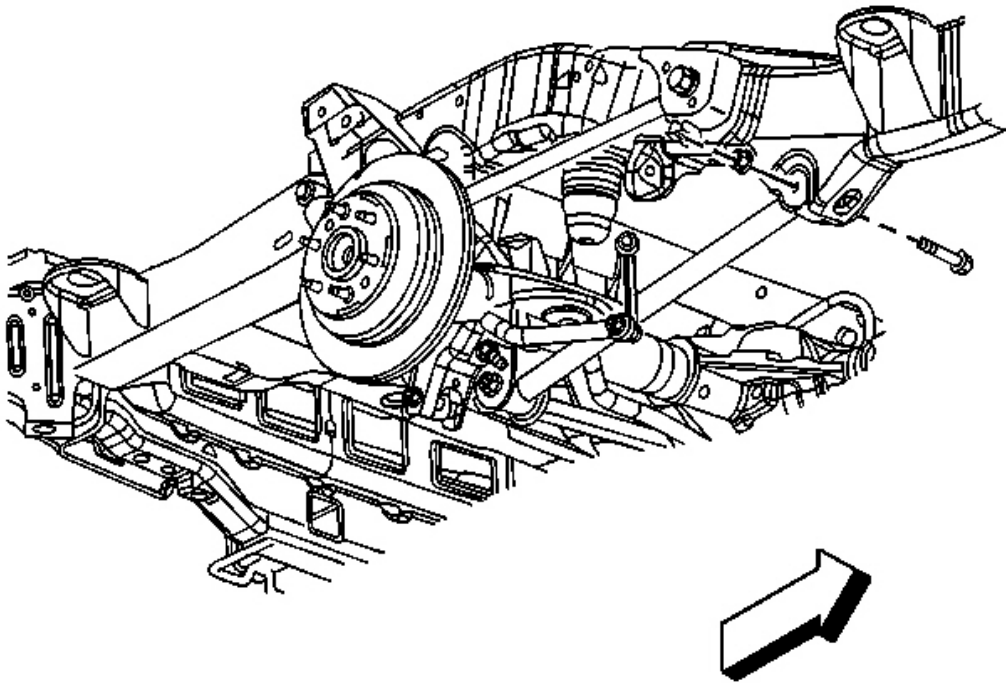


**Fig. 8: Removing/Installing Rear Axle Lower Control Arm-To-Frame Mounting Nut & Bolt**

**Courtesy of GENERAL MOTORS CORP.**

5. Remove the rear axle lower control arm to the frame mounting nut and bolt.
6. Remove the lower control arm.

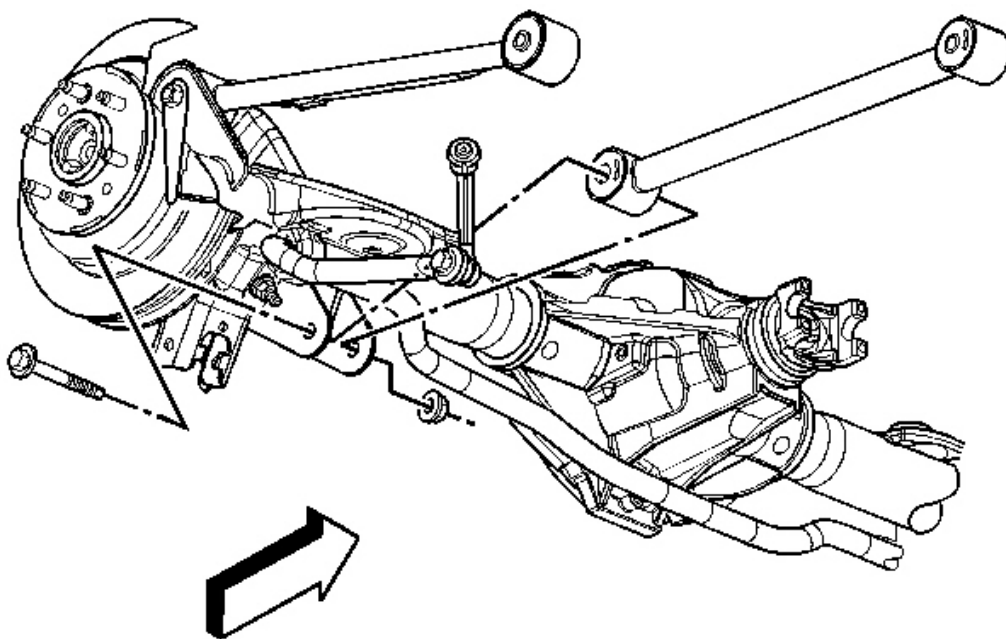
**Installation Procedure**



**Fig. 9: Removing/Installing Rear Axle Lower Control Arm-To-Frame Mounting Nut & Bolt**

**Courtesy of GENERAL MOTORS CORP.**

1. Install the lower control arm.
2. Install the rear axle lower control arm to the frame mounting nut and bolt.



**Fig. 10: Removing/Installing Rear Axle Lower Control Arm-To-Axle Mounting Nut & Bolt**

Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

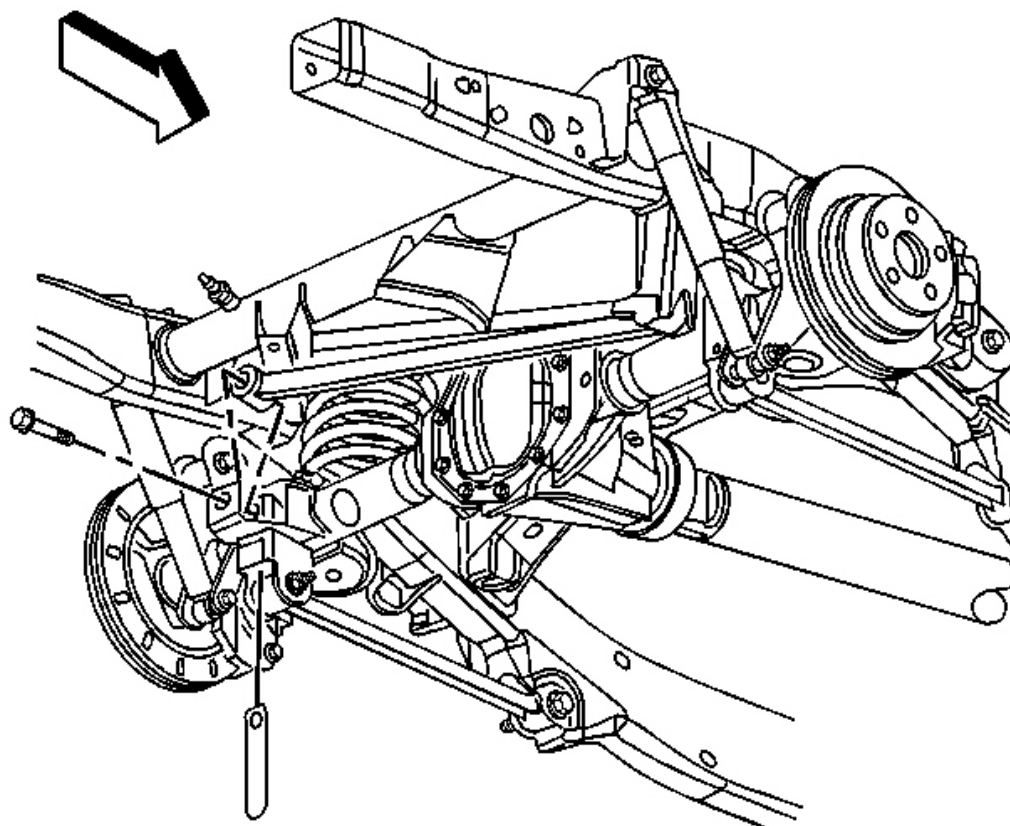
3. Install the rear axle lower control arm to the axle mounting bolt and nut.

**Tighten:** Tighten the lower control arm mounting bolts to 100 N.m (74 lb ft).

4. Remove the rear axle support.
5. Lower the vehicle.

## REAR AXLE TIE ROD REPLACEMENT

### Removal Procedure



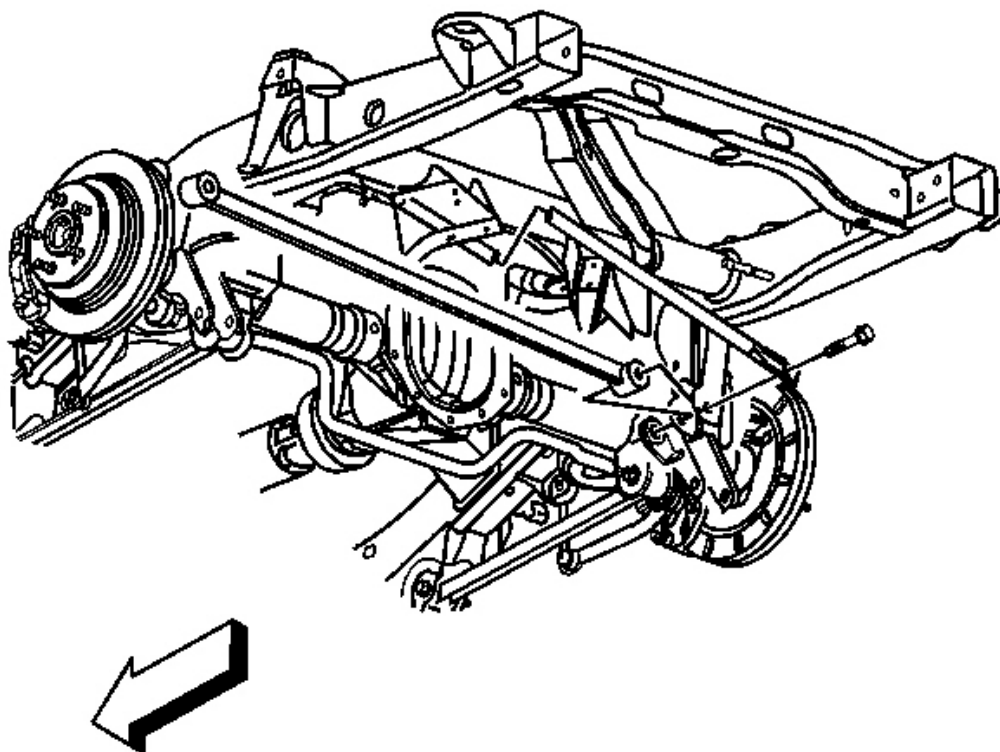
**Fig. 11: Removing/Installing Rear Axle-Tie Rod-To The Axle Mounting Bolt & Nut**  
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to Lifting and Jacking the Vehicle in General Information.
2. Raise and support the rear axle at the designed D - height. Refer to Trim Height Specifications in Suspension General Diagnosis.

**IMPORTANT:** When disconnecting the rear axle tie rod, the air suspension system must be depressurized or the body may shift during the repair.

3. If equipped with air suspension, depressurize the air suspension system. Refer to Air Suspension Depressurization Procedure in Air Suspension.

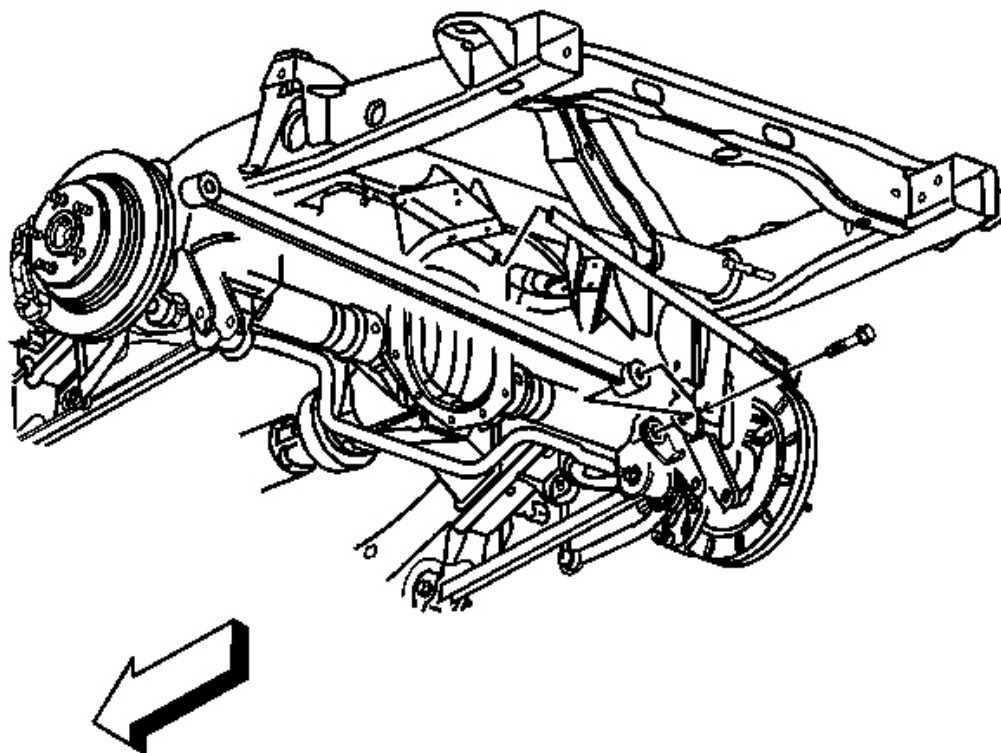
4. Remove the rear axle tie rod to the axle mounting bolt and nut.



**Fig. 12: View Of Rear Differential**  
**Courtesy of GENERAL MOTORS CORP.**

5. Remove the rear axle tie rod to frame mounting bolt and nut.
6. Remove the rear axle tie rod from the vehicle.

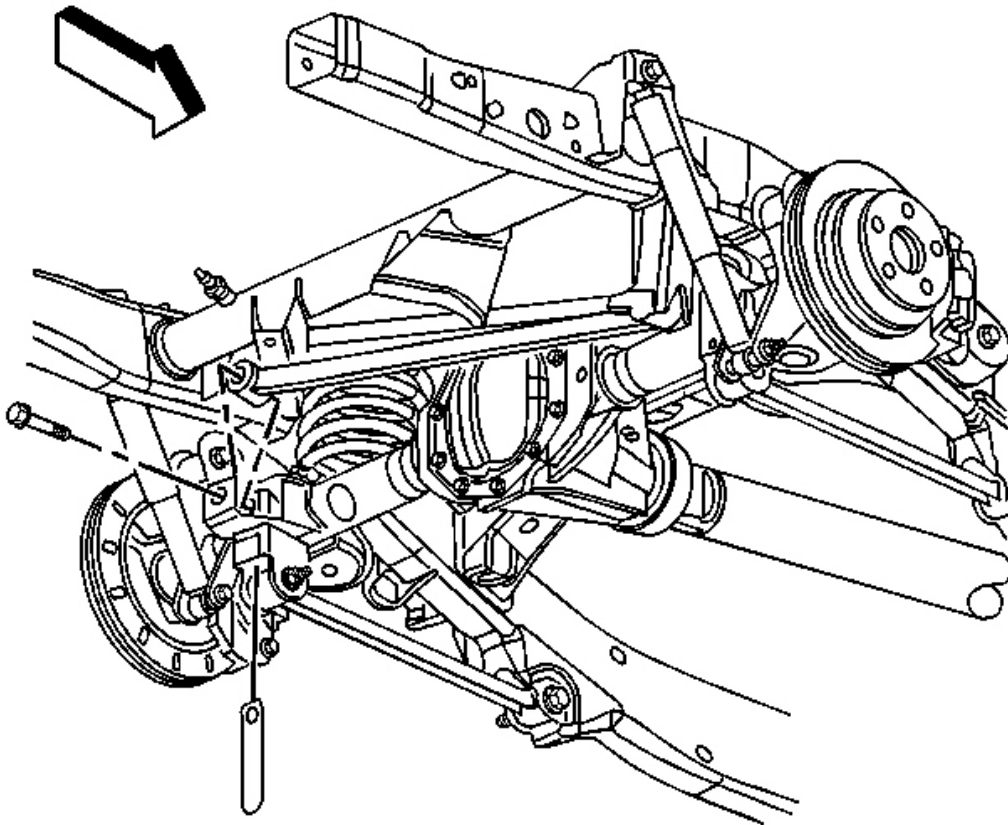
**Installation Procedure**



**Fig. 13: View Of Rear Differential**  
Courtesy of GENERAL MOTORS CORP.

**IMPORTANT:** When installing the rear axle tie rod the bushings inner sleeve off set (largest gap) is towards the rear axle.

1. Install the rear axle tie rod to the vehicle.
2. Install the rear axle tie rod to frame mounting bolt and nut.



**Fig. 14: Removing/Installing Rear Axle-Tie Rod-To The Axle Mounting Bolt & Nut**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

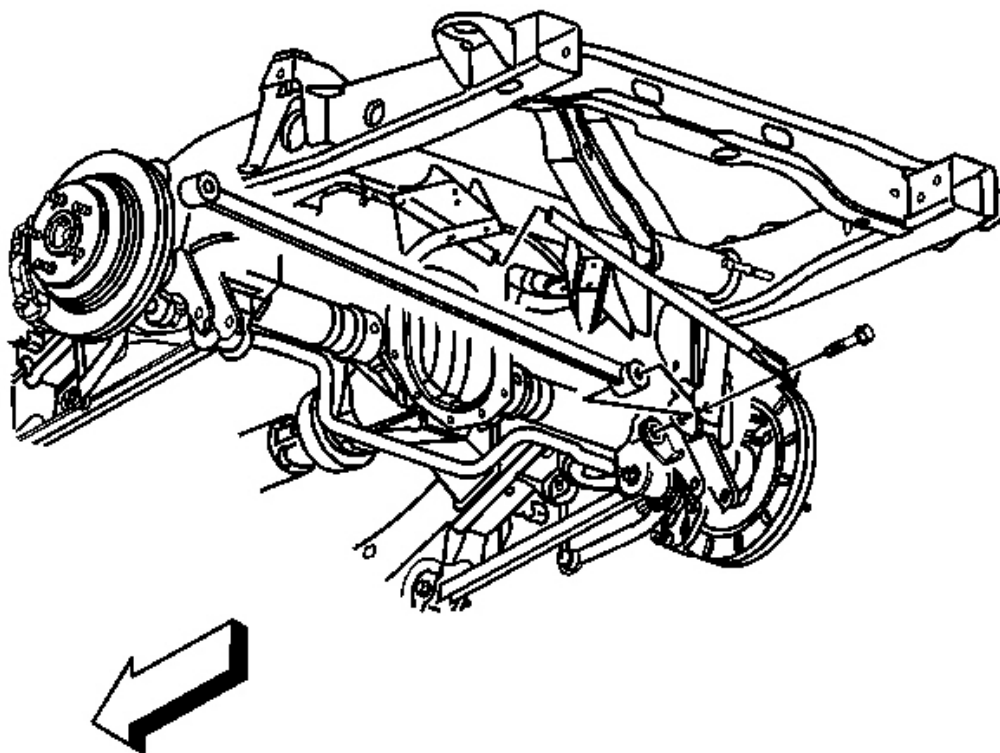
3. Install the rear axle tie rod to the axle mounting bolt and nut.

**Tighten:** Tighten the rear axle tie rod mounting bolts to 195 N.m (144 lb ft).

4. Remove the rear axle support.
5. Lower the vehicle.

## REAR AXLE BRACE REPLACEMENT

### Removal Procedure



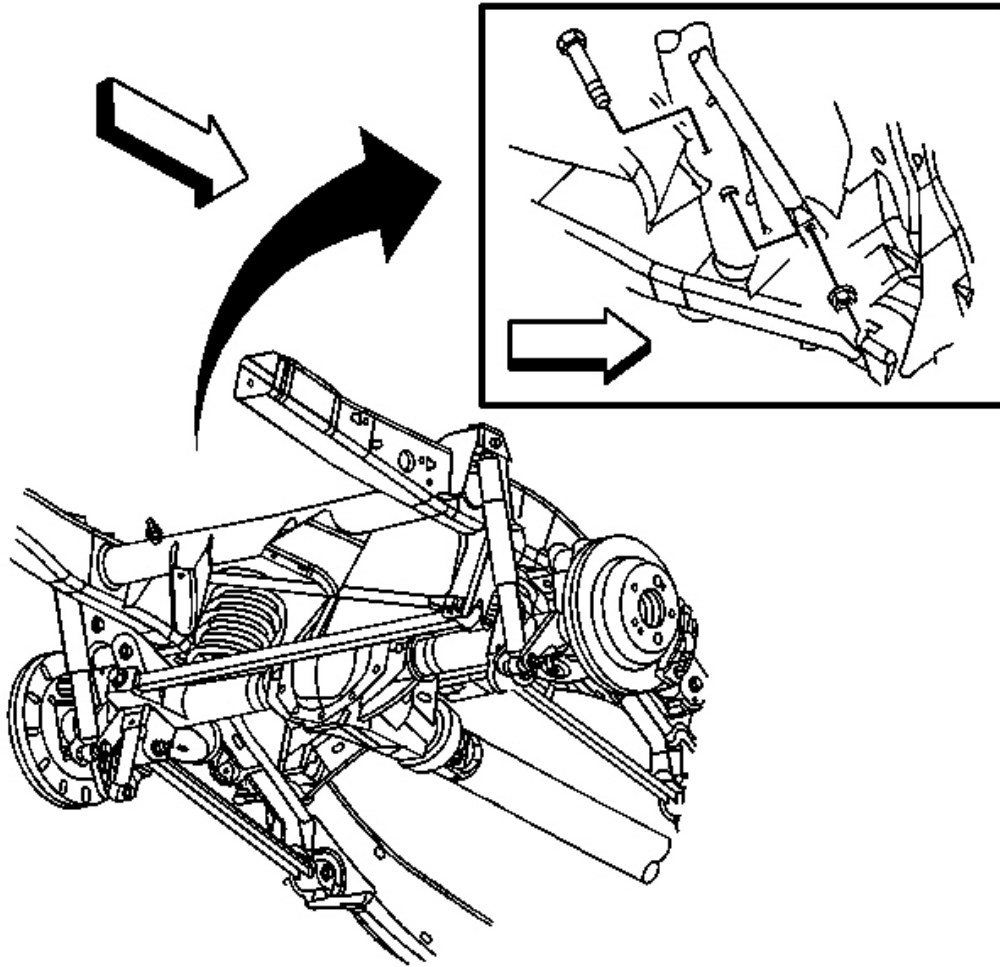
**Fig. 15: View Of Rear Differential**  
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Raise and support the rear axle at the designed D - height. Refer to **Trim Height Specifications** in Suspension General Diagnosis.

**IMPORTANT:** When disconnecting the rear axle tie rod, the air suspension system must be depressurized or the body may shift during the repair.

3. If equipped with air suspension, depressurize the air suspension system. Refer to **Air Suspension Depressurization Procedure** in Air Suspension.
4. Remove the rear axle brace and rear axle tie rod to the rear axle mounting bolt.

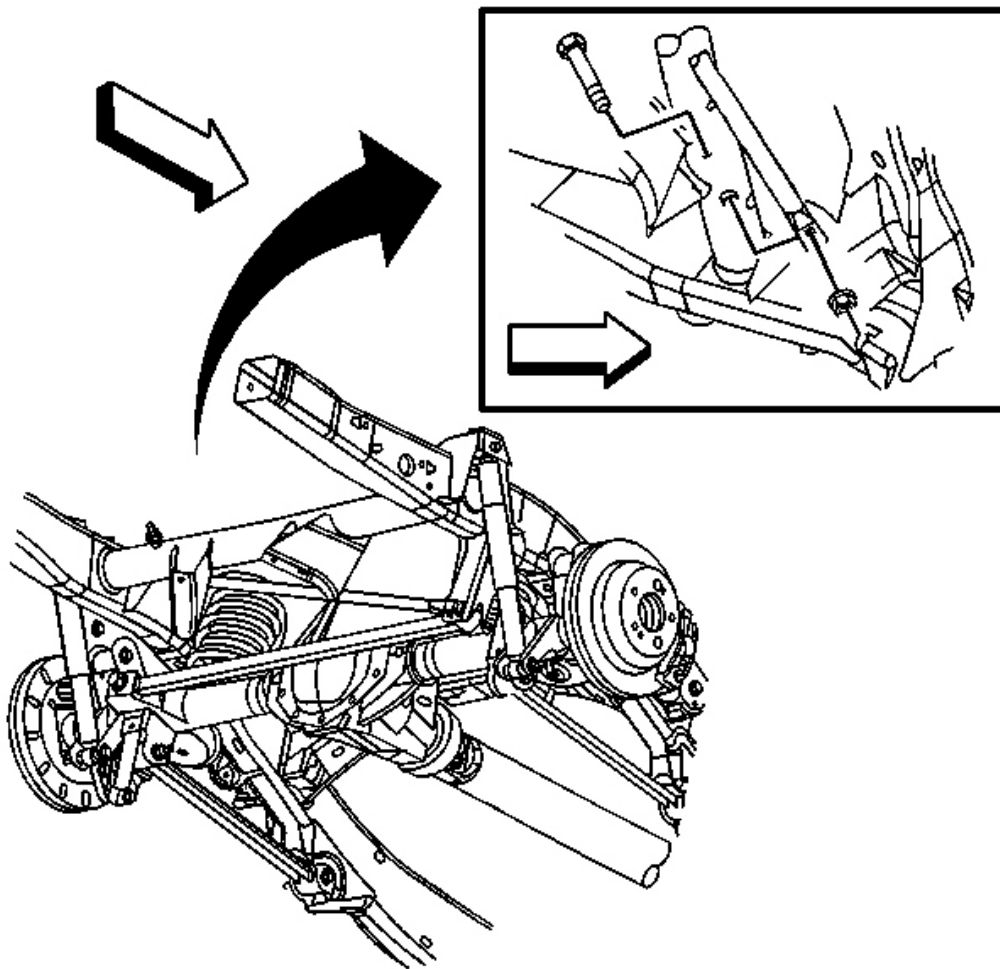




**Fig. 16: Removing/Installing Rear Axle Brace**  
Courtesy of GENERAL MOTORS CORP.

5. Remove the rear axle brace to frame mounting nut.
6. Remove the rear axle brace from the vehicle.

**Installation Procedure**



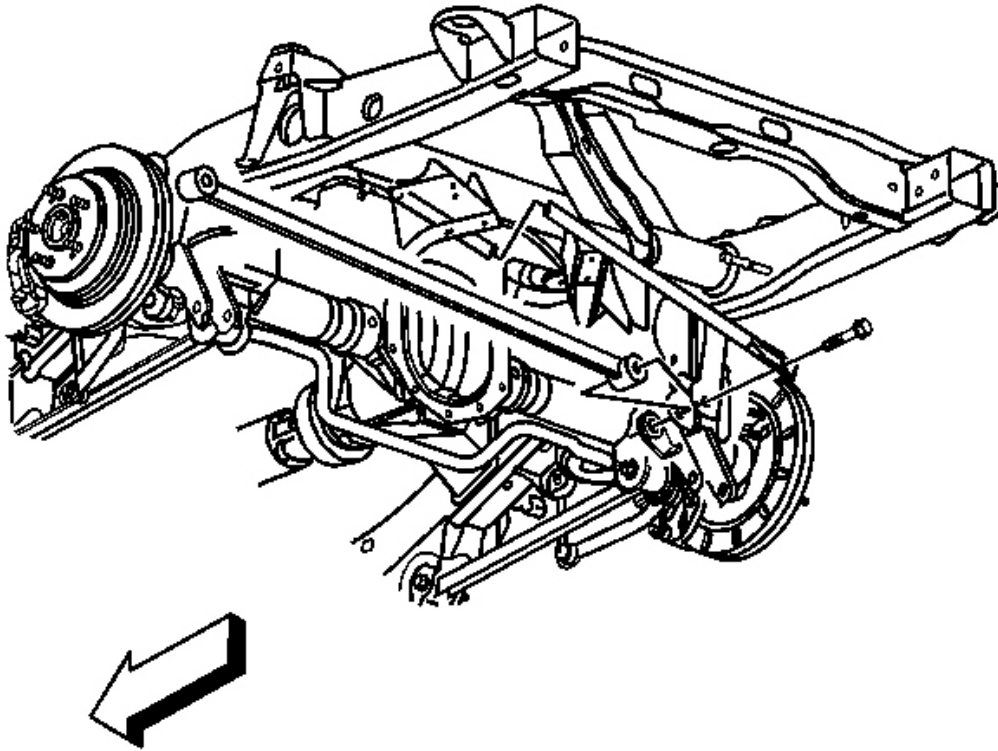
**Fig. 17: Removing/Installing Rear Axle Brace**  
Courtesy of GENERAL MOTORS CORP.

1. Install the rear axle brace to the vehicle.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

2. Install the rear axle brace to frame mounting nut.

**Tighten:** Tighten the rear axle brace to frame mounting nut to 95 N.m (70 lb ft).



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

3. Install the rear axle brace and rear axle tie rod to the rear axle mounting bolt.

**Tighten:** Tighten the rear axle brace and rear axle tie rod to the rear axle mounting bolt to 195 N.m (144 lb ft).

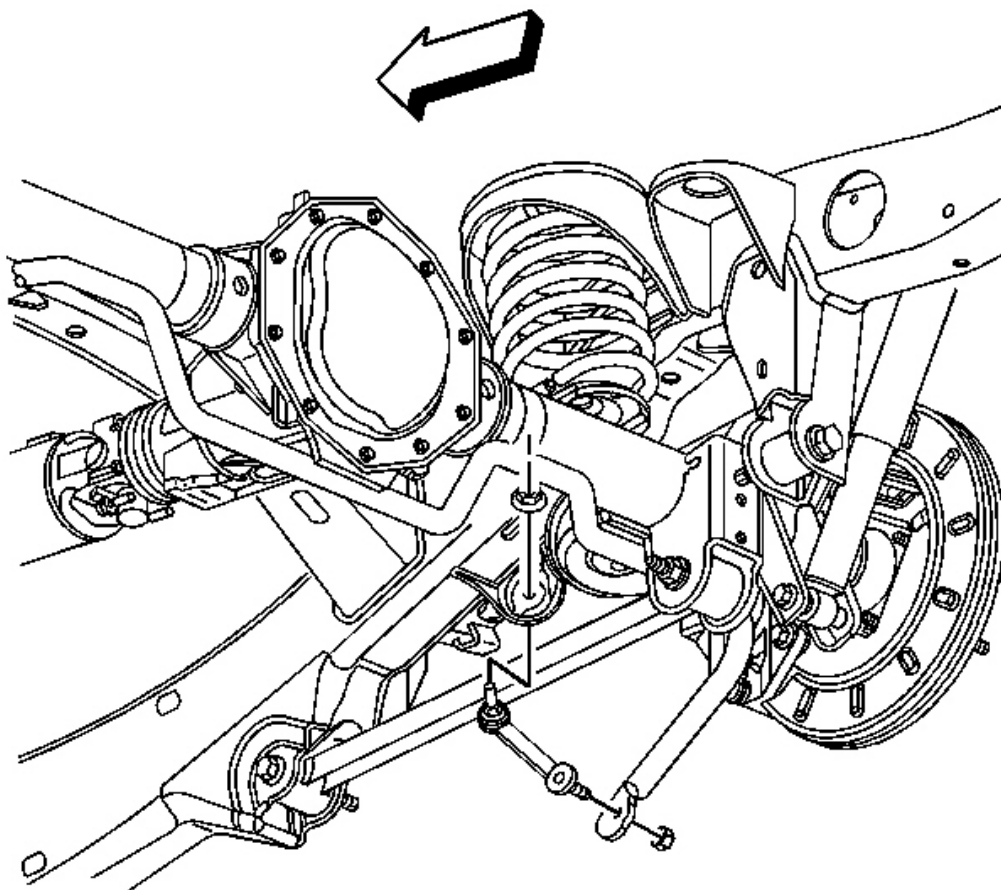
4. Remove the rear axle support.
5. Lower the vehicle.

## STABILIZER SHAFT REPLACEMENT

### Removal Procedure

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

2. Remove the tire and wheel. Refer to Tire and Wheel Removal and Installation .

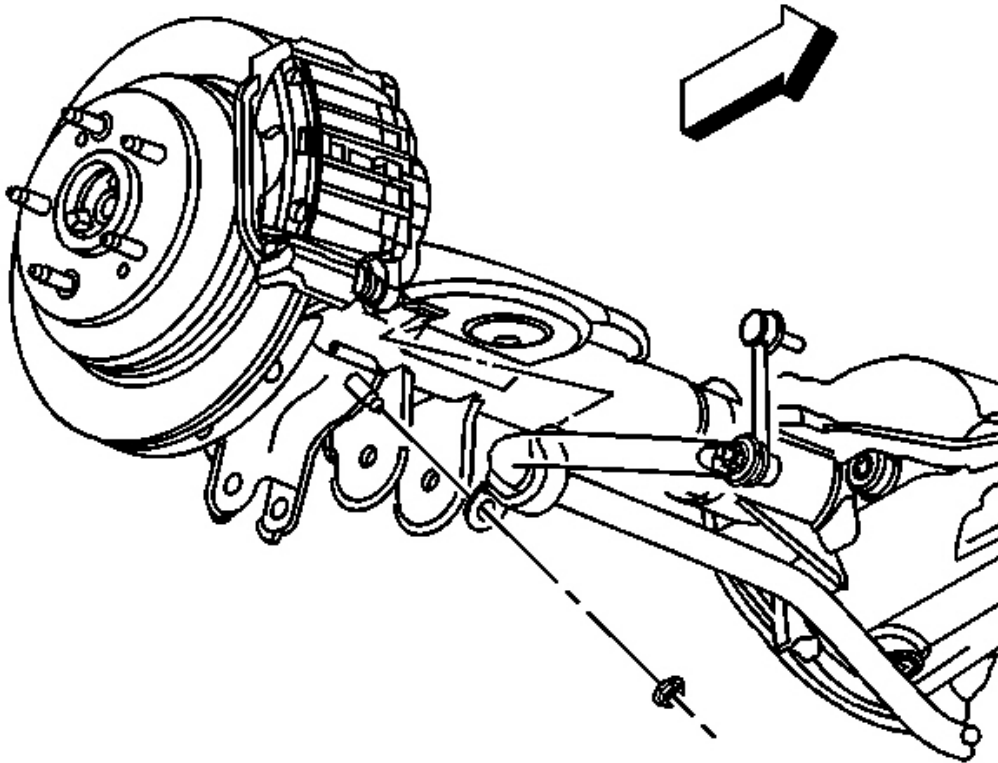


**Fig. 19: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the stabilizer shaft links to the stabilizer shaft retaining nuts.

**NOTE:** Do not pry on the stabilizer shaft link. Use care when removing or installing the stabilizer shaft link in order to avoid tearing or puncturing the stabilizer shaft link boot. Damage to the stabilizer shaft link boot will lead to damage to the stabilizer shaft link.

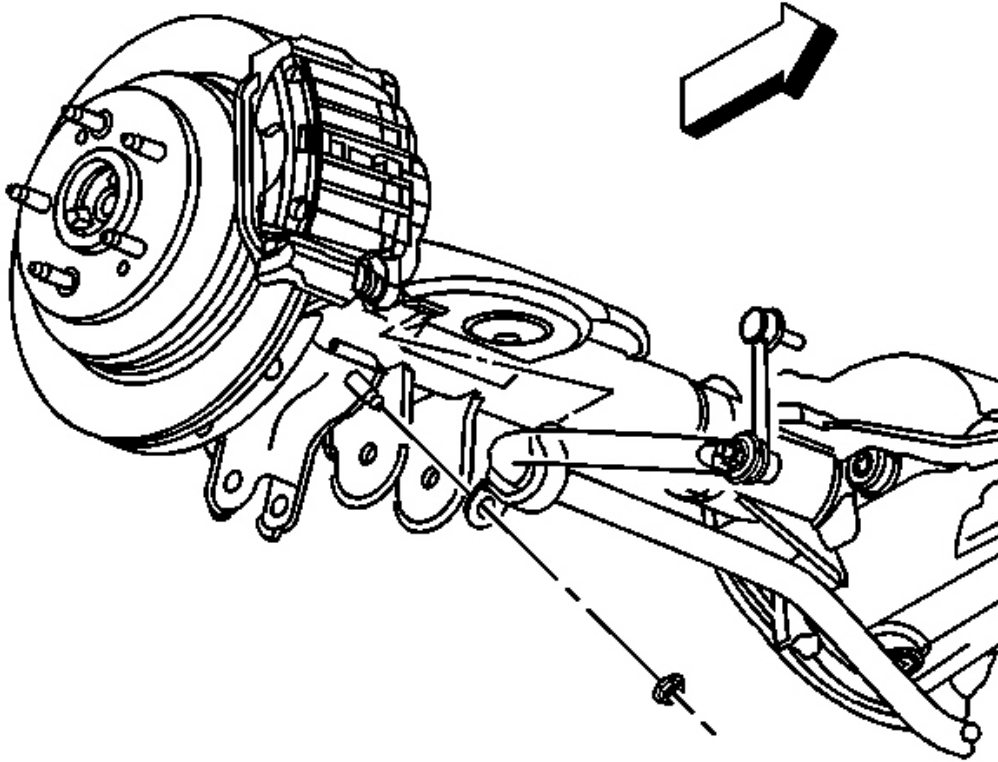
4. Disconnect the stabilizer shaft links from the stabilizer shaft.



**Fig. 20: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

5. Remove the stabilizer shaft insulator clamp mounting nuts.
6. Remove the stabilizer shaft.
7. Remove the stabilizer shaft insulators.

**Installation Procedure**



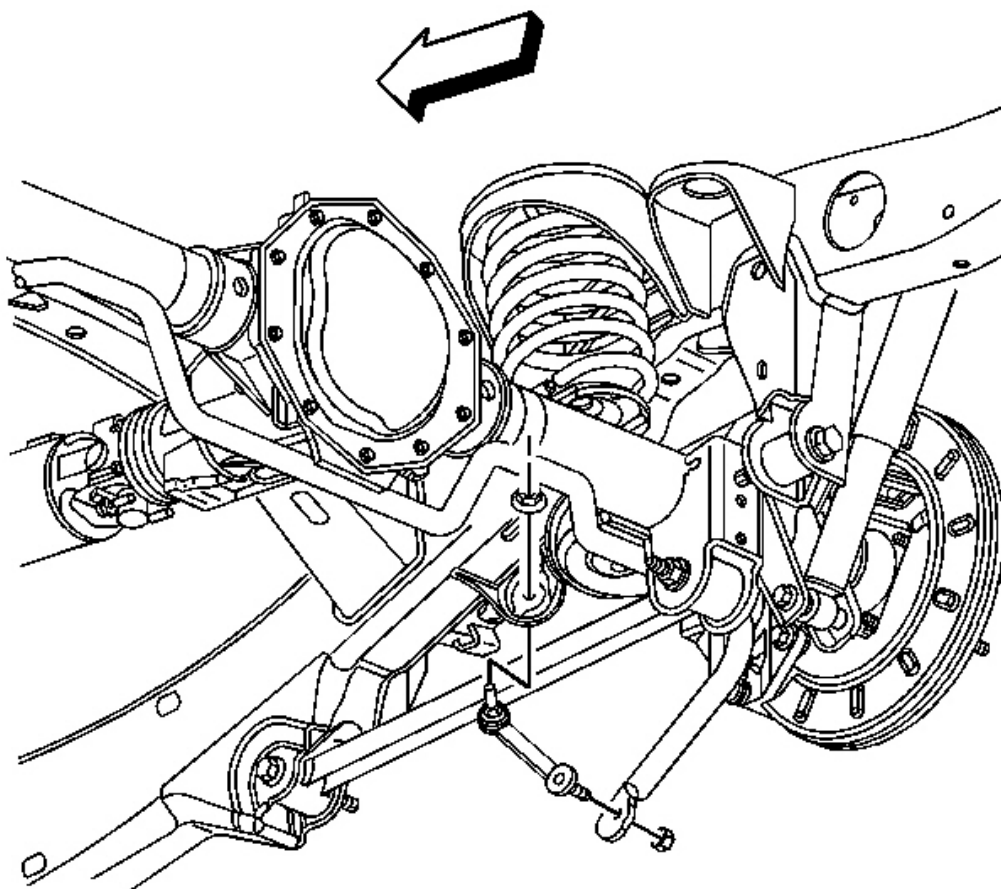
**Fig. 21: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

1. Install the stabilizer shaft insulators.
2. Install the stabilizer shaft.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

3. Install the stabilizer shaft insulator clamp mounting nuts.

**Tighten:** Tighten the stabilizer shaft insulator clamp mounting nuts to 75 N.m (55 lb ft).



**Fig. 22: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

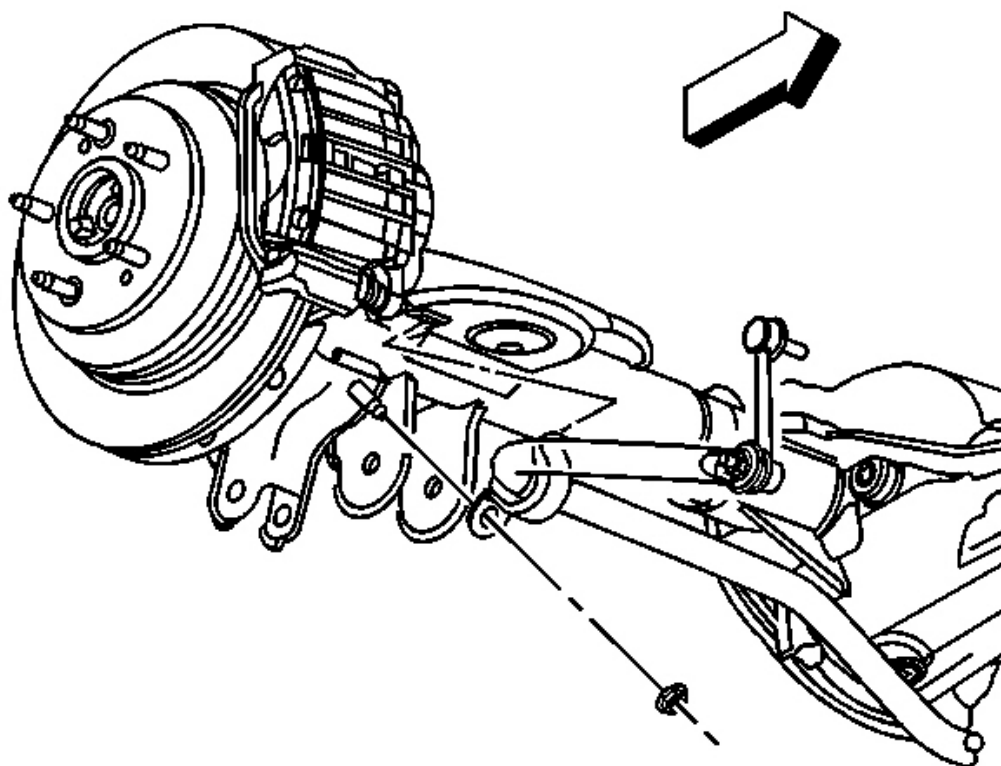
4. Connect the stabilizer shaft links to the stabilizer shaft. Hand tighten only.
5. Install the stabilizer shaft links to stabilizer shaft retaining nuts.

**Tighten:** Tighten the stabilizer shaft links to stabilizer shaft retaining nuts to 90 N.m (66 lb ft).

6. Install the tire and wheel. Refer to **Tire and Wheel Removal and Installation** .
7. Lower the vehicle.

**Removal Procedure**

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

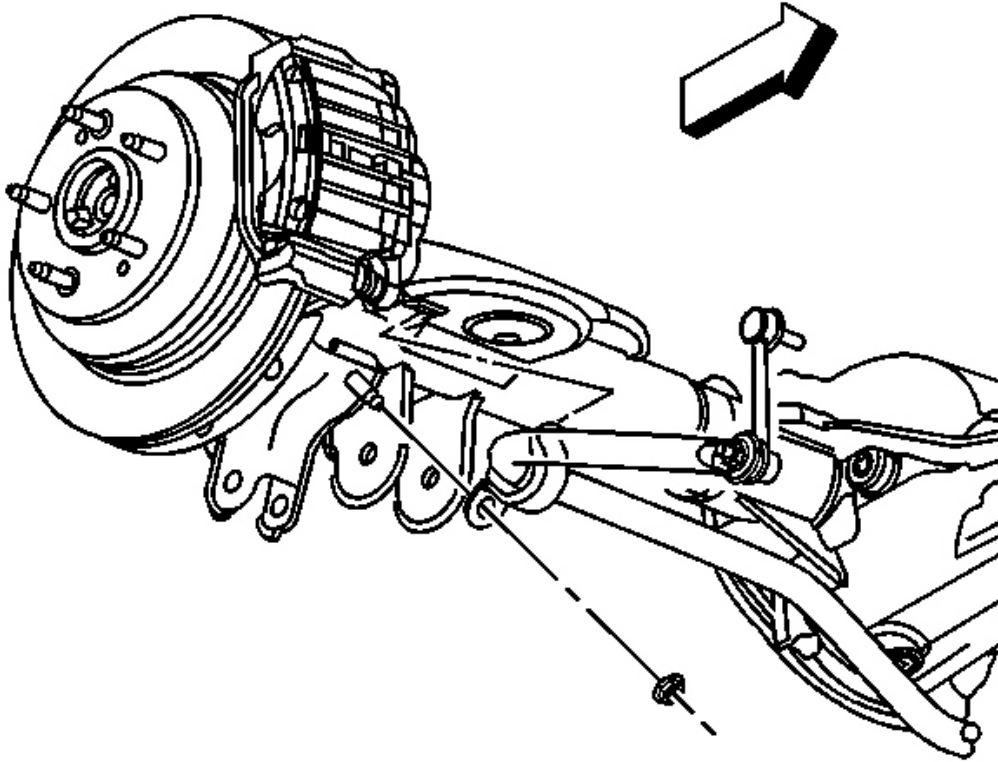


**Fig. 23: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

2. Remove the stabilizer shaft insulator clamp mounting nut.
3. Remove the stabilizer shaft insulator clamp.
4. Remove the stabilizer shaft insulator from the stabilizer shaft.

**Installation Procedure**





**Fig. 24: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

1. Install the stabilizer shaft insulator to the stabilizer shaft.
2. Install the stabilizer shaft insulator clamp.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

3. Install the stabilizer shaft insulator clamp mounting nut.

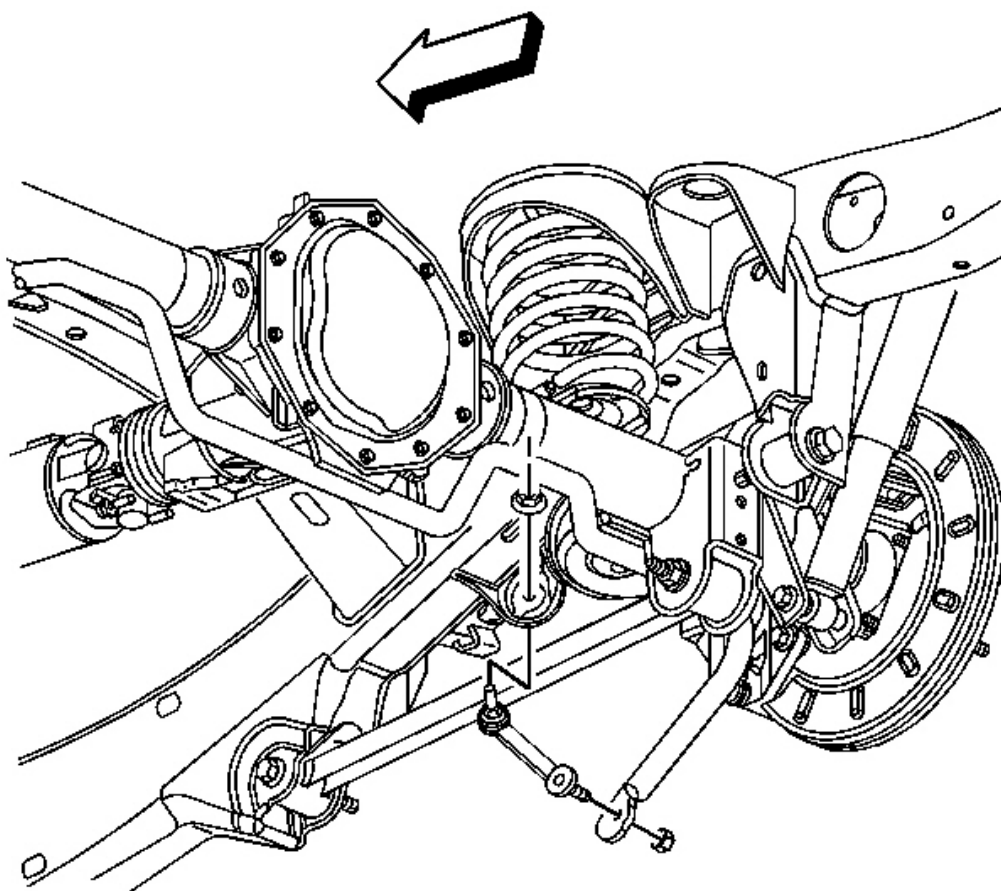
**Tighten:** Tighten the stabilizer shaft insulator clamp mounting nut to 75 N.m (55 lb ft).

4. Lower the vehicle.

#### STABILIZER SHAFT LINK REPLACEMENT

**Removal Procedure**

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



**Fig. 25: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

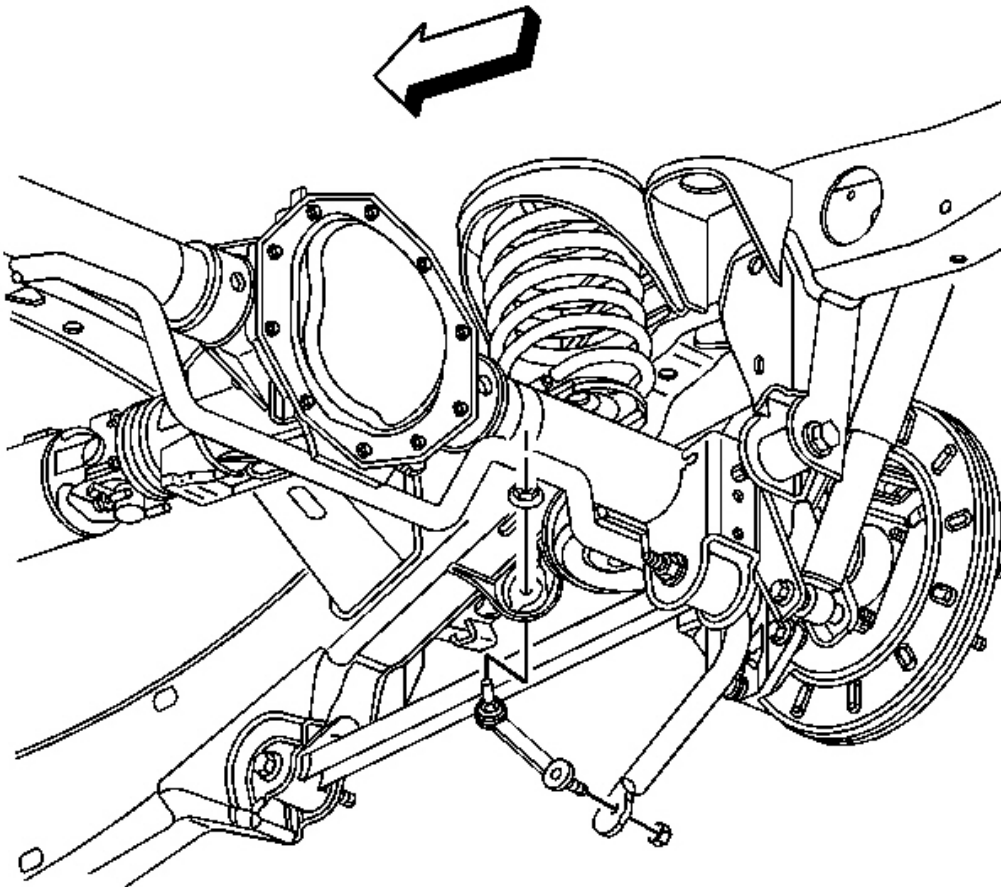
2. Remove the stabilizer shaft link retaining nuts.

**NOTE:** Do not pry on the stabilizer shaft link. Use care when removing or installing the stabilizer shaft link in order to avoid tearing or puncturing the stabilizer shaft link boot. Damage to the stabilizer shaft link boot will lead to damage to the stabilizer

**shaft link.**

3. Disconnect the stabilizer shaft link from the frame.
4. Disconnect the stabilizer shaft link from the stabilizer shaft and remove the stabilizer shaft link.

**Installation Procedure**



**Fig. 26: View Of Stabilizer Shaft Links & Stabilizer Shaft**  
Courtesy of GENERAL MOTORS CORP.

1. Connect the stabilizer shaft link to the stabilizer shaft and to the frame.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

2. Install the stabilizer shaft link retaining nuts.

**Tighten:** Tighten the stabilizer shaft nuts to 90 N.m (66 lb ft).

3. Lower the vehicle.

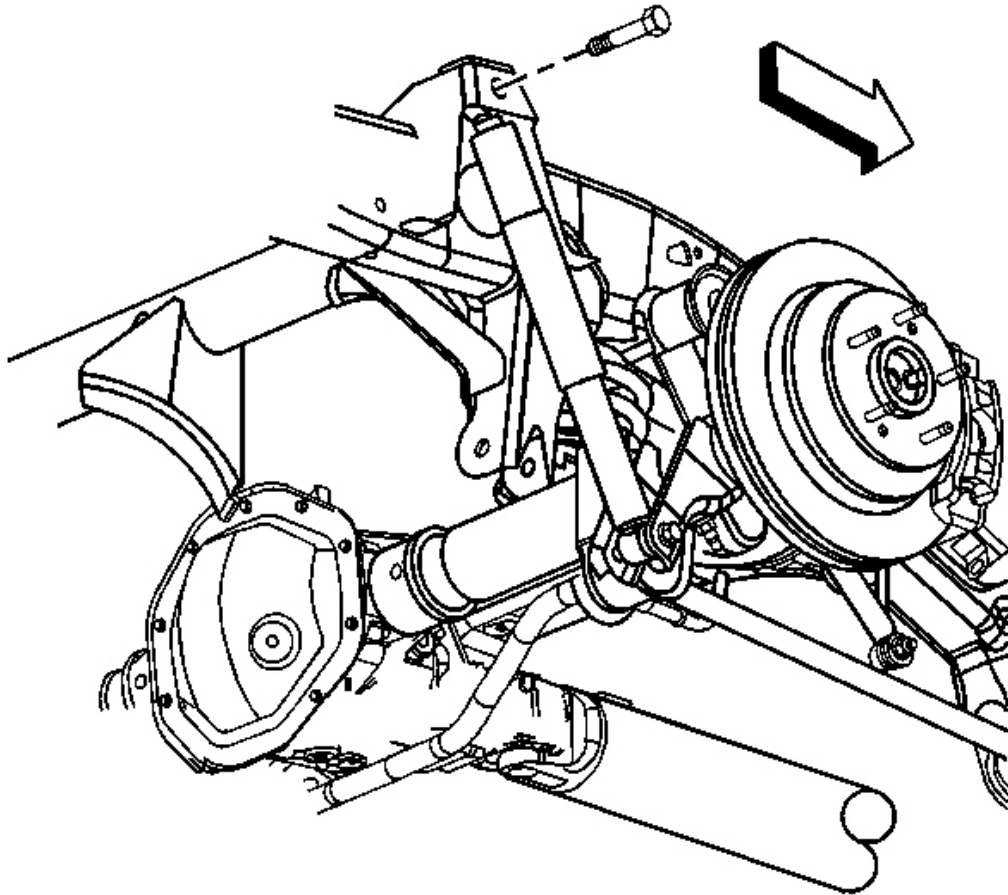
## SHOCK ABSORBER REPLACEMENT

### Removal Procedure

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

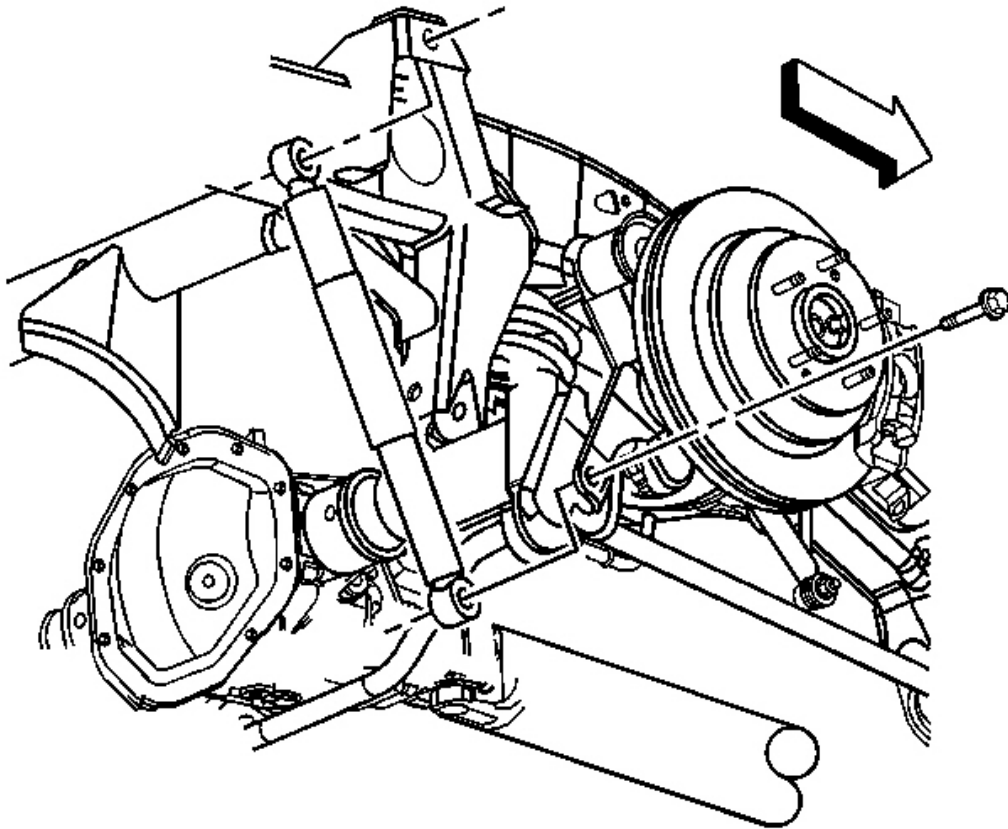
**NOTE:** The rear axle must not be allowed to hang freely while servicing rear suspension components. Not supporting the rear axle will result in damage to the upper control arm and/or to the air suspension components.

2. Support the rear axle.



**Fig. 27: Removing/Installing Upper Shock Absorber Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

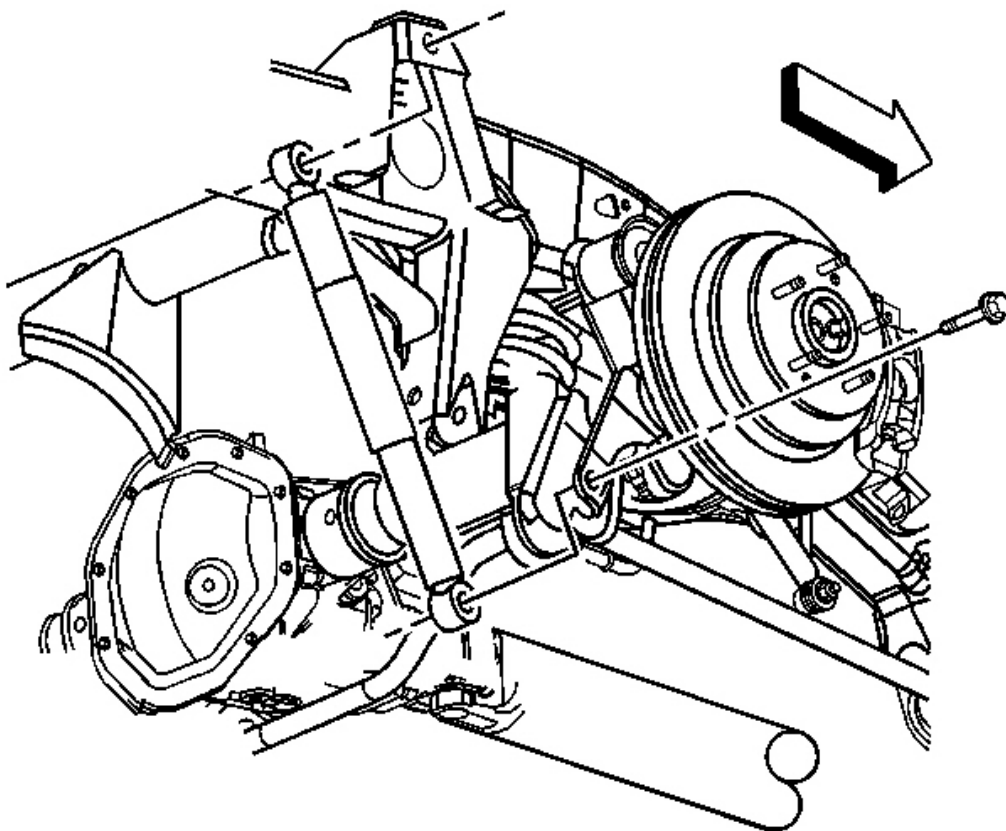
3. Remove the shock absorber upper mounting bolt.



**Fig. 28: View Of Shock Absorber Lower Mounting Bolt**  
**Courtesy of GENERAL MOTORS CORP.**

4. Remove the shock absorber lower mounting bolt.
5. Remove the shock absorber from the vehicle.

**Installation Procedure**



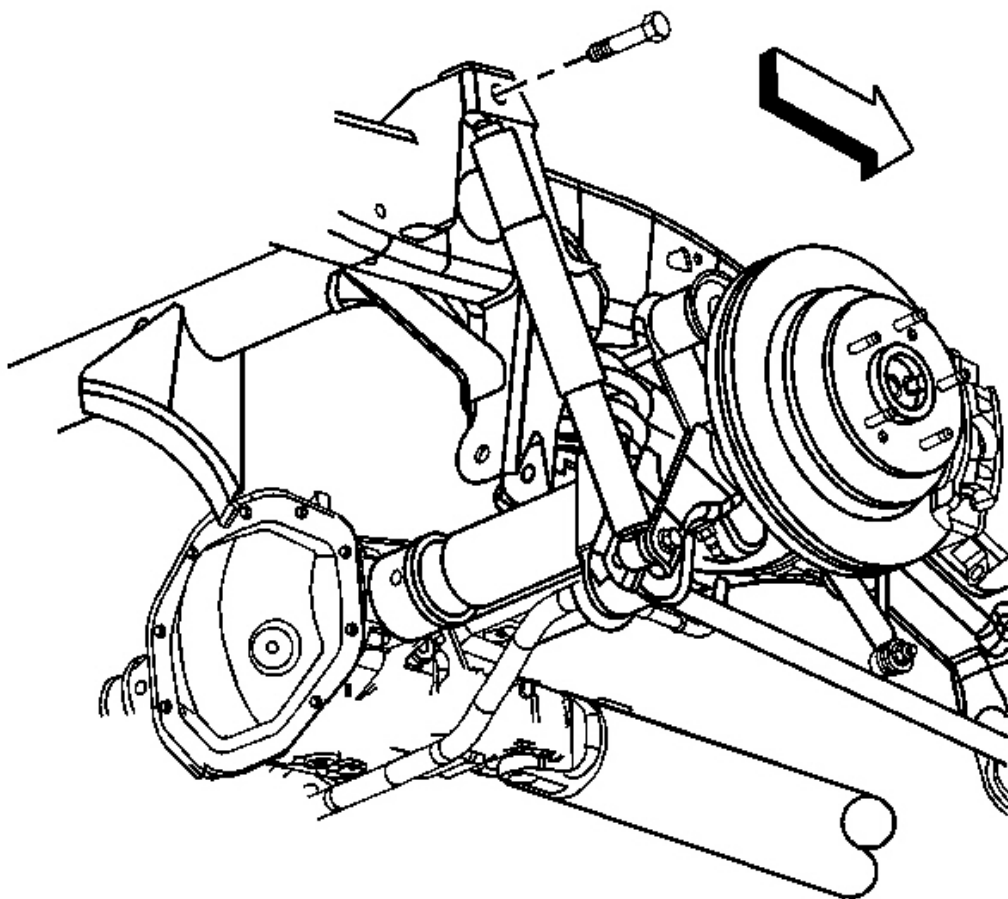
**Fig. 29: View Of Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

1. Install the shock absorber to the vehicle.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

2. Install the shock absorber lower mounting bolt.

**Tighten:** Tighten the shock absorber lower mounting bolt to 80 N.m (59 lb ft).



**Fig. 30: Removing/Installing Upper Shock Absorber Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

3. Install the shock absorber upper mounting bolt.

**Tighten:** Tighten the shock absorber upper mounting nut to 85 N.m (63 lb ft).

4. Remove the support from the rear axle.
5. Lower the vehicle.

#### SHOCK ABSORBER DISPOSAL

**CAUTION:** Gas charged shock absorbers contain high pressure gas. Do



## 2006 Buick Rainier

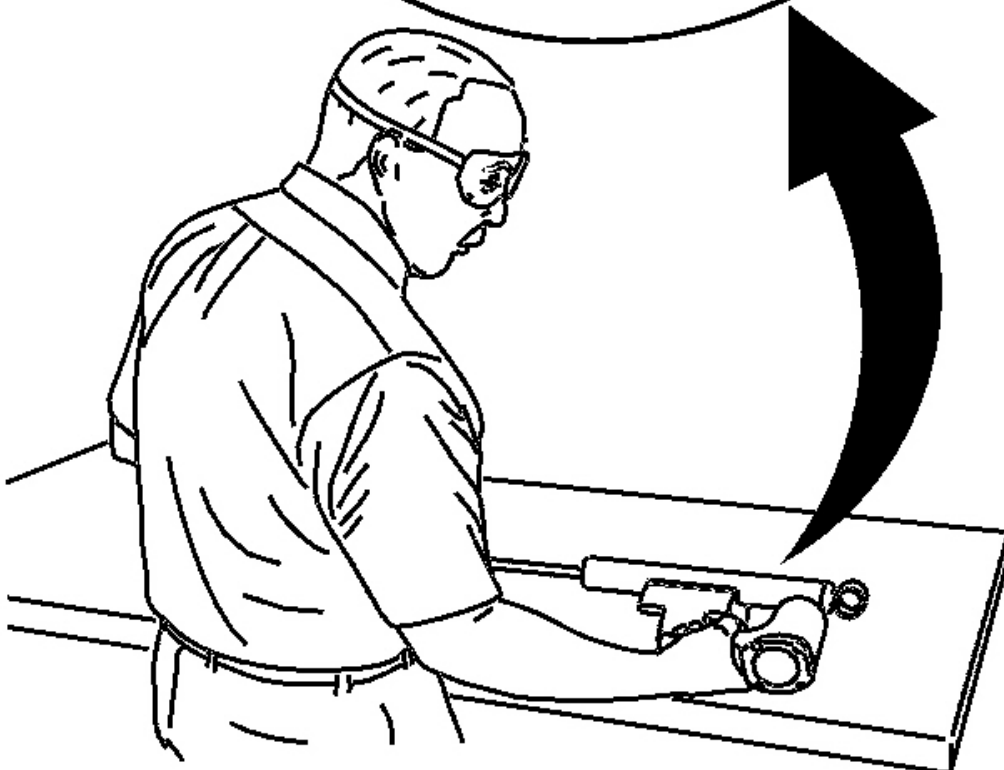
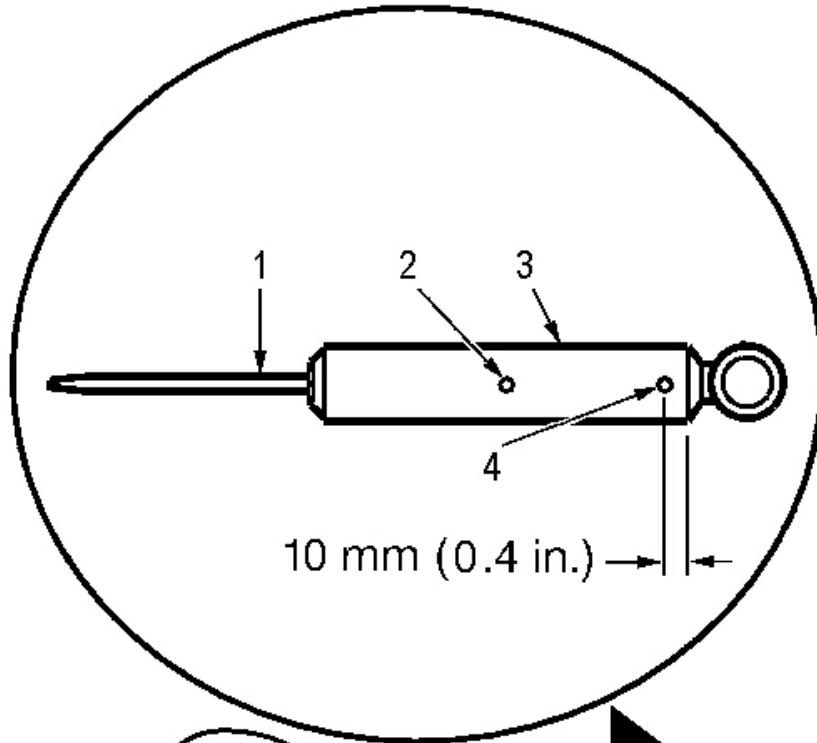
2006 SUSPENSION Rear Suspension - Ascender, Envoy, Rainier & TrailBlazer

**not remove the snap ring from inside the top of the tube. If the snap ring is removed, the contents of the shock absorber will come out with extreme force which may result in personal injury.**

**CAUTION: To prevent personal injury, wear safety glasses when center punching and drilling the shock absorber. Use care not to puncture the shock absorber tube with the center punch.**

2006 Buick Rainier

2006 SUSPENSION Rear Suspension - Ascender, Envoy, Rainier & TrailBlazer



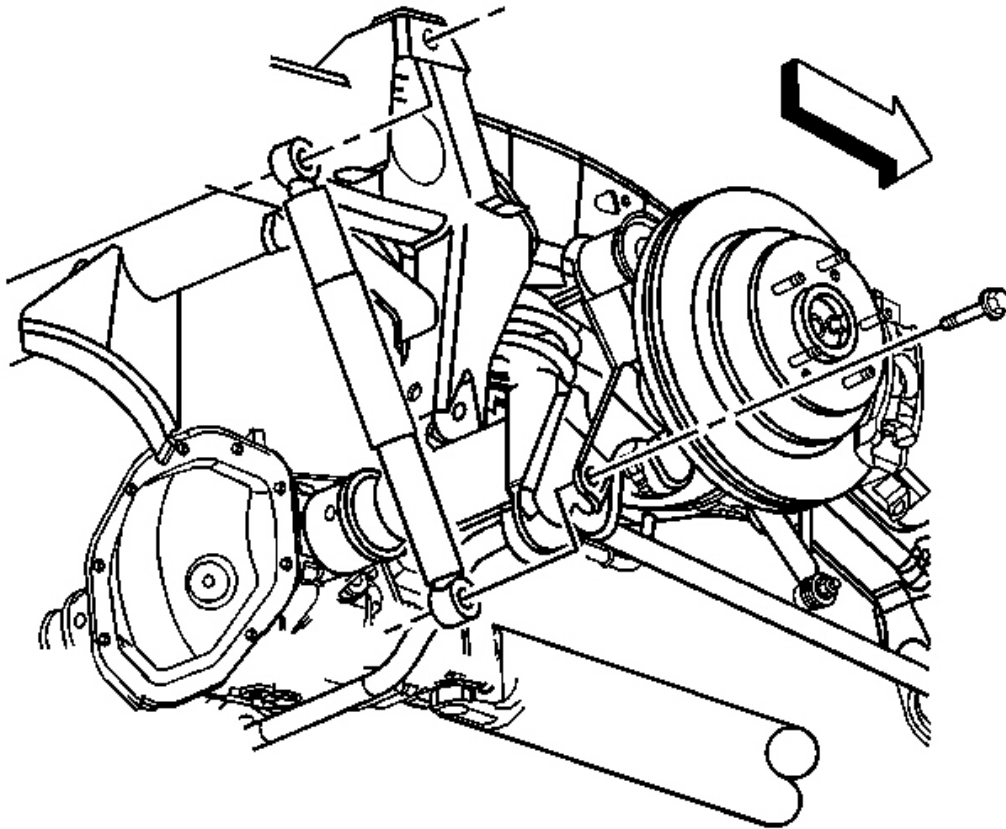
**Fig. 31: Drilling Hole In Shock Absorber At Centerpunched Locations**  
**Courtesy of GENERAL MOTORS CORP.**

1. Make an indentation 10 mm (0.4 in) from the bottom (4) of the tube (3) using a center punch.
2. Clamp the shock absorber in a vise horizontally with the shock absorber rod (1) completely extended.
3. Drill a hole in the shock absorber at the center punch (4) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
4. Make an indentation in the middle (2) of the tube (3) with a center punch.
5. Drill a second hole in the shock absorber at the center punch (2) using a 5 mm (3/16 in) drill bit. Oil will exhaust when the drill bit penetrates the shock absorber. Use shop towels in order to contain the escaping oil.
6. Remove the shock absorber from the vise. Hold the shock absorber over a drain pan horizontally with the holes down. Move the rod (1) in and out of the tube (3) to completely drain the oil from the shock absorber.

**COIL SPRING REPLACEMENT**

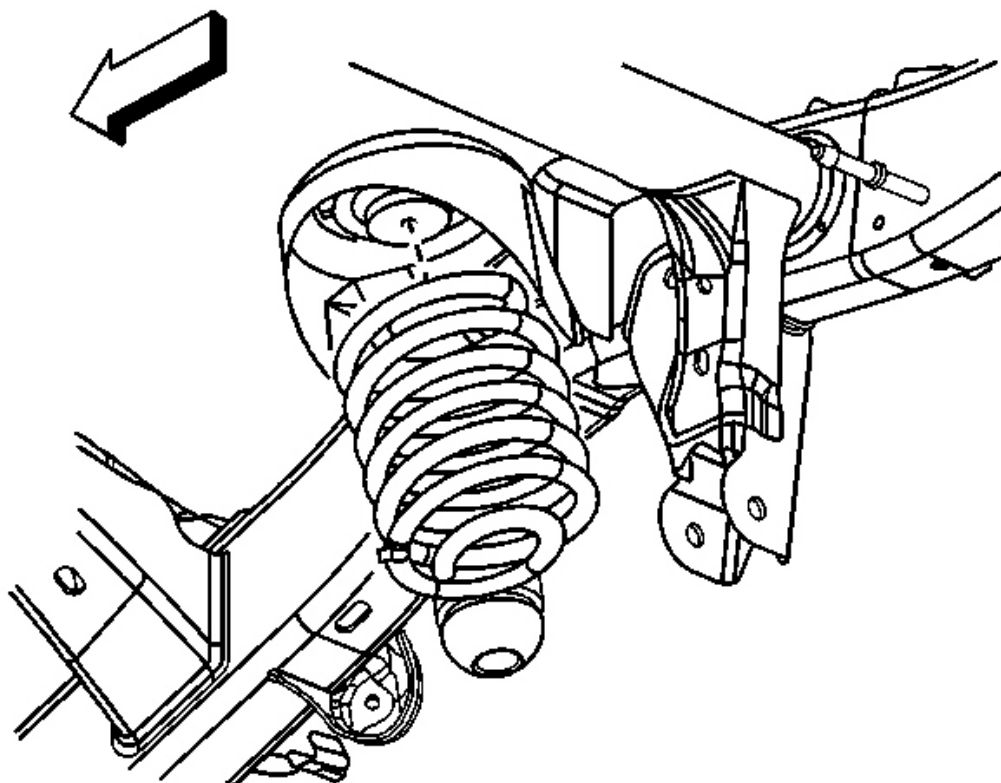
**Removal Procedure**

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Install the rear axle support.



**Fig. 32: View Of Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

3. Remove the shock absorber lower mounting bolts.



**Fig. 33: Installing/Installing Rear Coil Springs**

Courtesy of GENERAL MOTORS CORP.

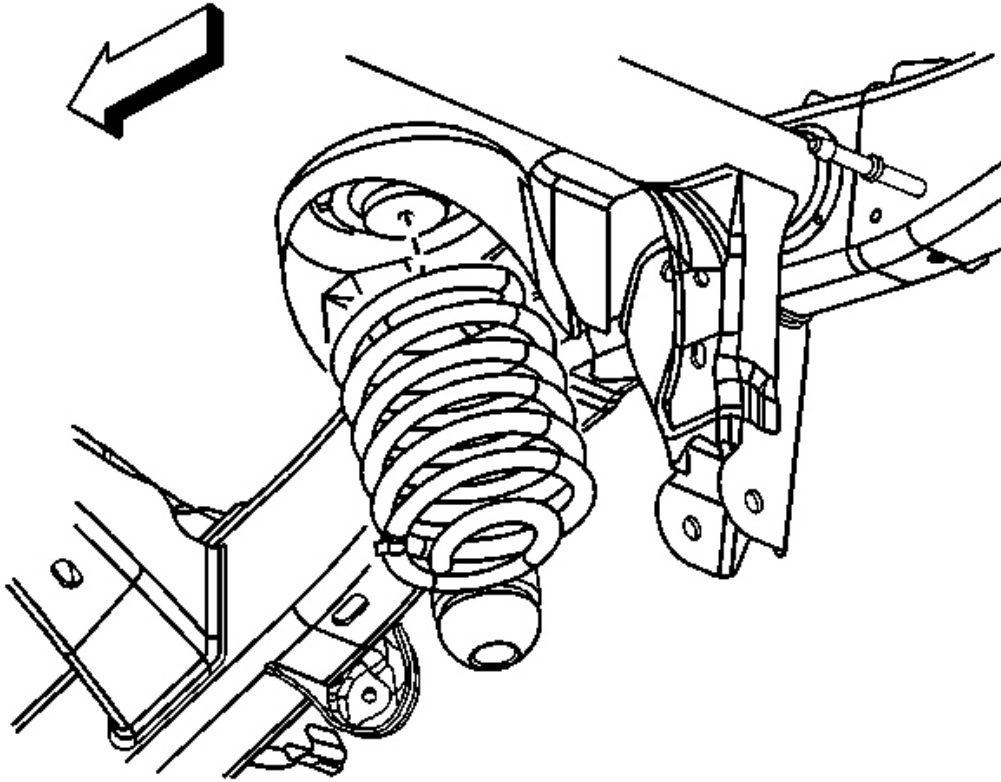
**NOTE:** Do not lower the rear axle so that the upper control arms contact the frame. Damage to the upper control arms will result.

4. Lower the rear axle.

**NOTE:** Use care when handling the coil springs in order to avoid chipping or scratching the coating. Damage to the coating will result in premature failure of the coil springs.

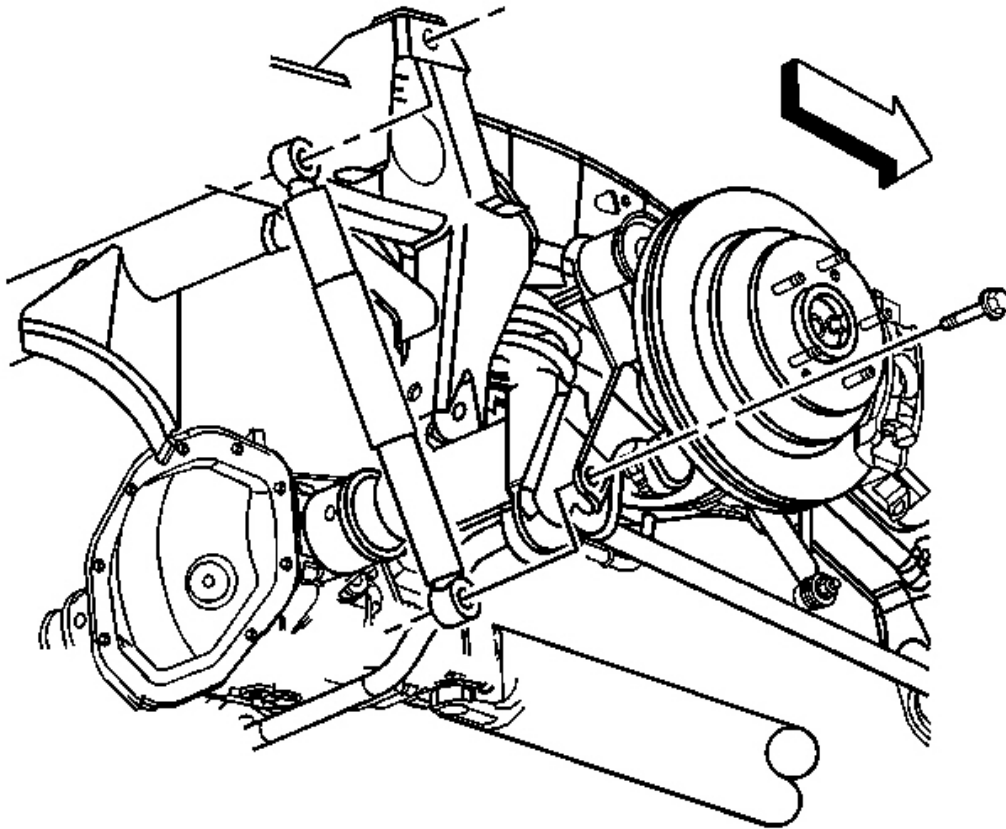
5. Remove the rear coil springs.

Installation Procedure



**Fig. 34: Installing/Installing Rear Coil Springs**  
Courtesy of GENERAL MOTORS CORP.

1. Install the rear coil springs.
2. Raise the rear axle.



**Fig. 35: View Of Shock Absorber Lower Mounting Bolt**  
Courtesy of GENERAL MOTORS CORP.

**NOTE:** Refer to Fastener Notice in Cautions and Notices.

3. Install the shock absorber lower mounting bolts.

**Tighten:** Tighten the shock absorber lower mounting bolts to 80 N.m (59 lb ft).

4. Remove the rear axle support.
5. Lower the vehicle

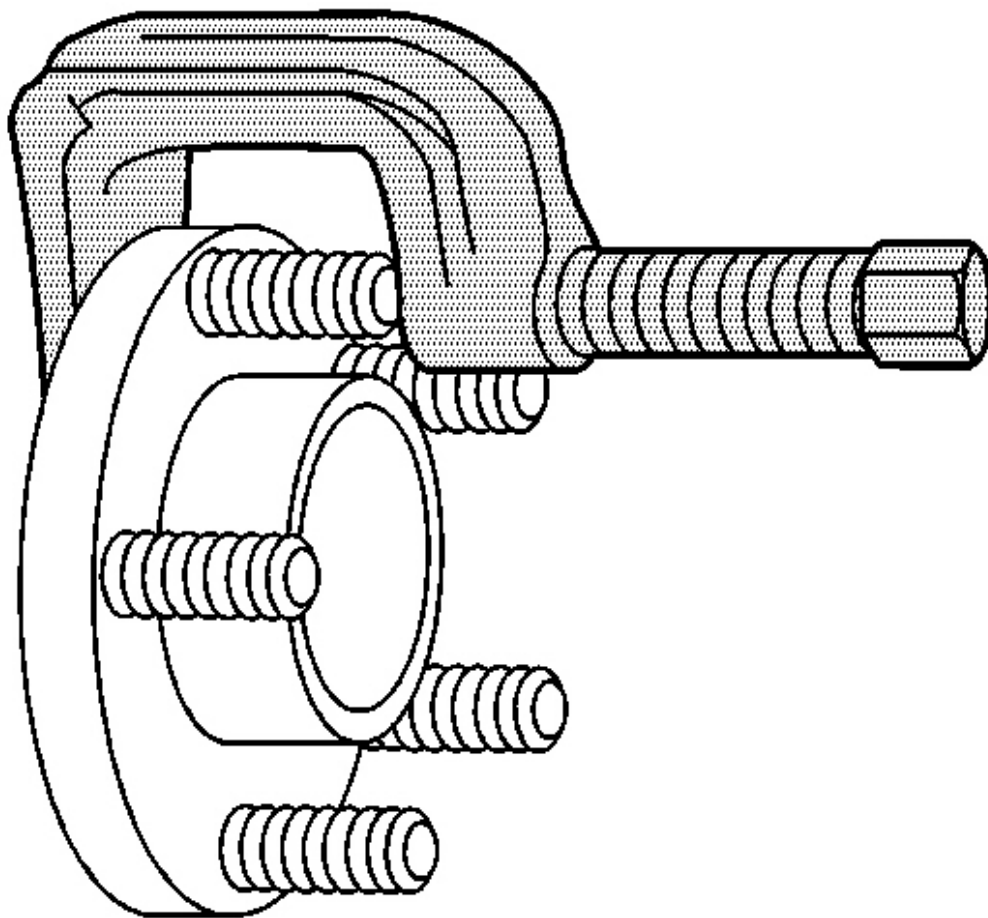
## WHEEL STUD REPLACEMENT

Tools Required

## J 43631 Ball Joint Separator

### Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the rotor. Refer to **Brake Rotor Replacement - Rear** in Disc Brakes.



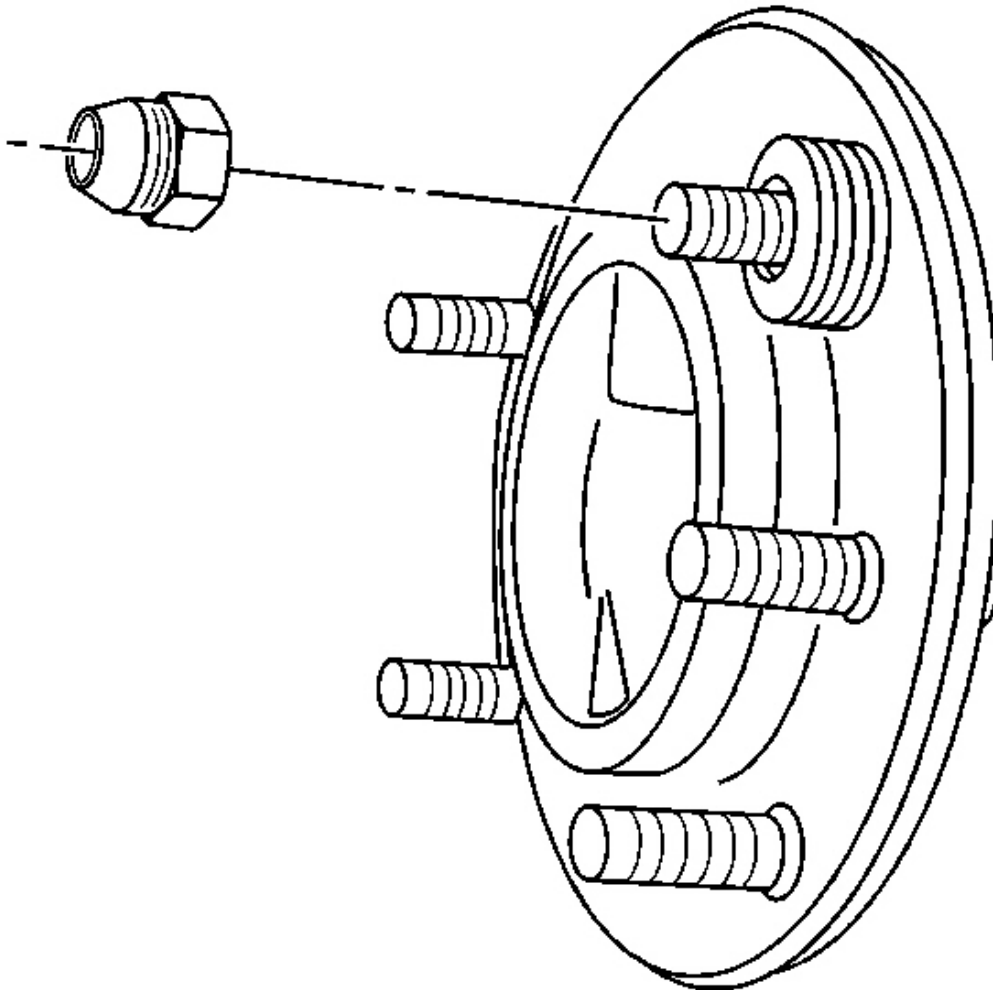
**Fig. 36: Removing Wheel Stud From Axle Flange**



Courtesy of GENERAL MOTORS CORP.

4. Remove the wheel stud from the axle flange using the J 43631 .

Installation Procedure



**Fig. 37: Installing Lug Nut**  
Courtesy of GENERAL MOTORS CORP.

1. Install the stud into the axle flange.

2. Install the 4 washers and the lug nut to the stud.
3. Tighten the lug nut in order to draw the stud into the flange until the stud fully seats.
4. Remove the lug nut and the washers.
5. Install the rotor. Refer to **Brake Rotor Replacement - Rear** in Disc Brakes.
6. Install the tire and wheel. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
7. Lower the vehicle.

## **DESCRIPTION AND OPERATION**

### **GENERAL DESCRIPTION**

These vehicles use either a coil spring suspension or an air suspension configuration that utilizes two air springs. On vehicles equipped with the air springs, two separate height sensors control the air springs, one for the left spring and one for the right spring.

A separate air compressor is used to inflate the air springs and maintain proper ride height.

Two direct double-acting shock absorbers provide ride control. The shock absorbers are angle-mounted between the frame. The shock absorbers are attached with brackets. The brackets are attached to the anchor plate.

The rear spring steel stabilizing bar helps minimize body roll and sway during cornering. The rear stabilizer shaft is connected to the rear axle and the frame.

The rear suspension system on this vehicle consists of the following components:

- The rear axle
- Two coil springs or two air springs
- Two height sensors, air suspension only
- Air compressor, air suspension only
- Air supply lines, air suspension only
- Two shock absorbers
- The rear axle tie rod
- Two upper control arms
- Two lower control arms

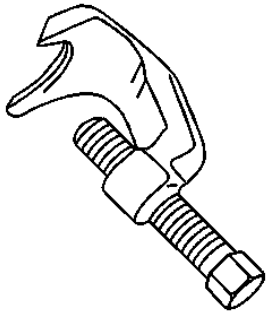
### **SPECIAL TOOLS AND EQUIPMENT**

**2006 Buick Rainier**

2006 SUSPENSION Rear Suspension - Ascender, Envoy, Rainier & TrailBlazer

**SPECIAL TOOLS**

**Special Tools**

<b>Illustration</b>	<b>Tool Number/Description</b>
	<p>J 43631 Ball Joint Remover</p>