2007 SUSPENSION

Front Suspension - Outlook

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Ball Joint to Lower Control Arm Mounting Nuts and Bolts	568 N.m	50 lb ft
Front Frame Reinforcement Mounting Bolts	50 N.m	37 lb ft
Front Frame to Body Bolts		
• First Pass	100 N.m	74 lb ft
• Final Pass	+ 90 degrees	
Front Wheel Bearing and Hub to Knuckle Bolts	120 N.m	88 lb ft
Lower Control Arm Ball Stud Nuts		
• First Pass	40 N.m	144 lb ft
• Final Pass	+ 120 degrees	
Lower Control Arm Front Bushing Nuts	150 N.m	111 lb ft
Lower Control Arm Rear Bushings Bolts	195 N.m	144 lb ft
Lower Control Arm to Frame Nuts	150 N.m	111 lb ft
Stabilizer Shaft Clamp to Frame Bolts	50 N.m	37 lb ft
Stabilizer Link to Stabilizer Shaft Nuts	75 N.m	55 lb ft
Stabilizer Link to Strut Nuts	70 N.m	52 lb ft
Steering Knuckle to Strut Bolts	147 N.m	108 lb ft
Strut to Knuckle Nuts	195 N.m	144 lb ft
Strut Top Mount to Body Nuts	45 N.m	33 lb ft
Upper Strut Mounting Nuts	83 N.m	61 lb in
Wheel Bearing Hub Retaining Bolts	120 N.m	89 lb in

REPAIR INSTRUCTIONS

STABILIZER SHAFT REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the front tires and wheels. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the bolt from the intermediate shaft bracket to the front cradle. Refer to **Intermediate Drive Shaft Replacement** .
4. Remove the rear propeller shaft, if equipped. Refer to **Propeller Shaft Replacement** .
5. Remove the outer tie rod ends from the steering knuckle. Refer to **Steering Linkage Outer Tie Rod Replacement** .
6. Remove the stabilizer shaft links at the stabilizer bar. Refer to **Stabilizer Shaft Link Replacement**.
7. Position adjustable jack stand underneath the left and right side at the rear of the front cradle.

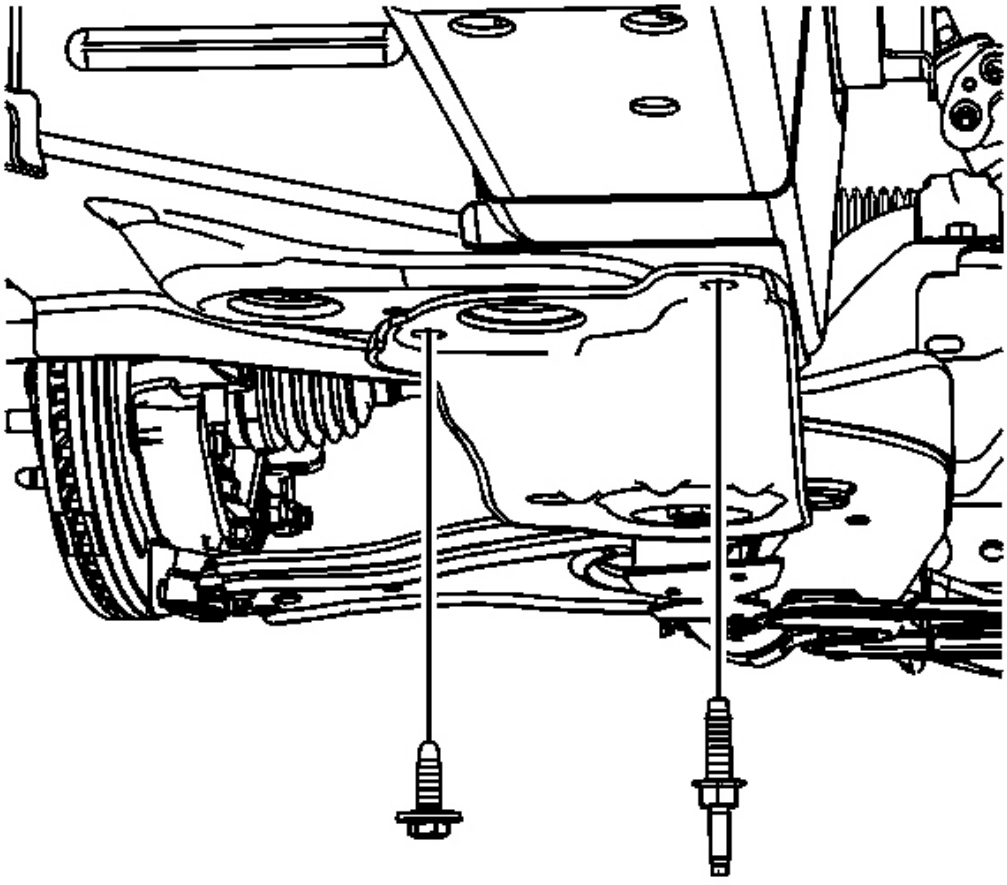


Fig. 1: Identifying Frame Reinforcement Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

8. Remove the left and right frame reinforcement mounting bolts. Left side shown, right side similar.

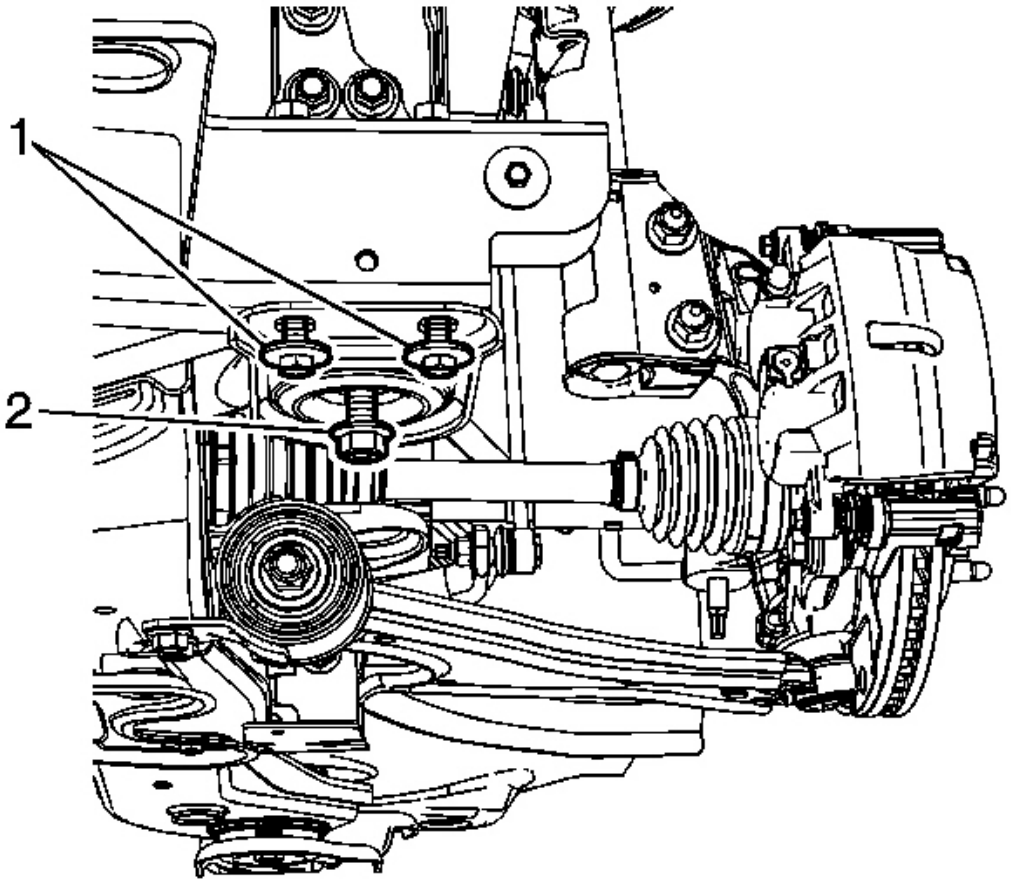


Fig. 2: Identifying Front Frame Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

9. Loosen the front frame reinforcement mounting bolts (1). Left side shown, right side similar.
10. Loosen the front frame mounting bolts (2). Left side shown, right side similar.

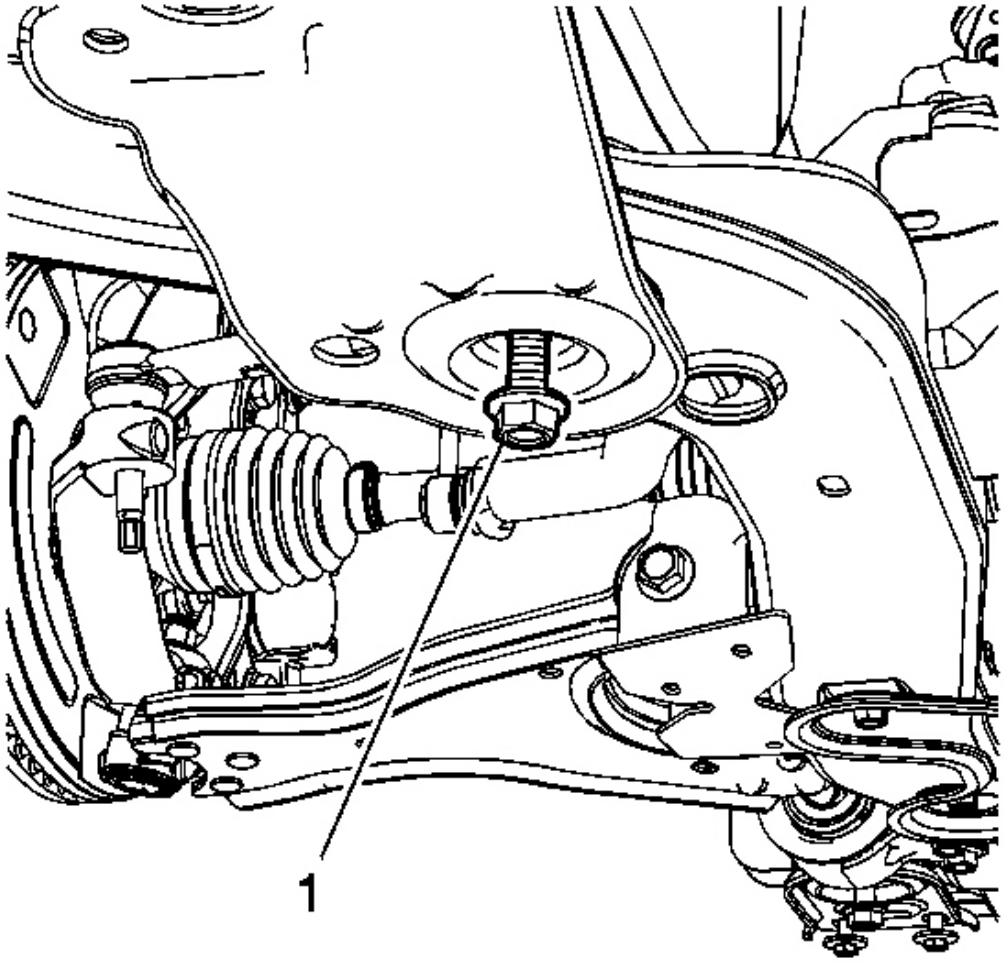


Fig. 3: Identifying Rear Frame Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

11. Loosen the rear frame mounting bolts (1).

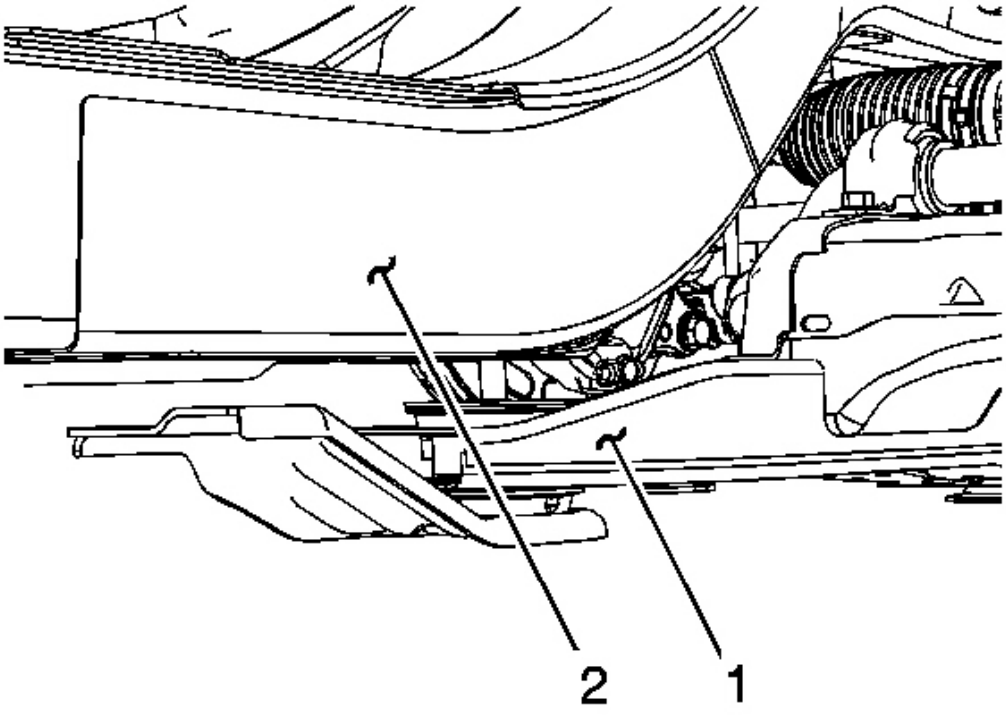


Fig. 4: Identifying Frame & Frame Rail
Courtesy of GENERAL MOTORS CORP.

12. Lower the frame (1) from the frame rail (2) until enough clearance is gained to remove the stabilizer shaft.

IMPORTANT: If replacing the stabilizer shaft, use NEW insulators.

13. Remove both left and right stabilizer shaft insulators. Refer to **Stabilizer Shaft Insulator Replacement**.

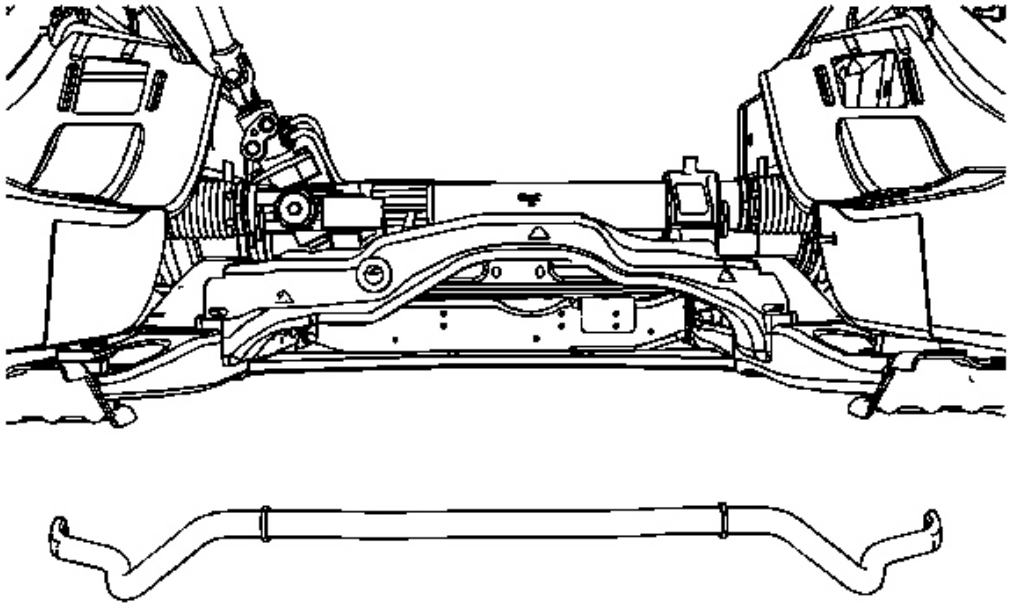


Fig. 5: Identifying Stabilizer Shaft
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: It maybe necessary to maneuver the stabilizer shaft in such a way to remove it from the front cradle.

14. Remove the stabilizer shaft from the vehicle.

Installation Procedure

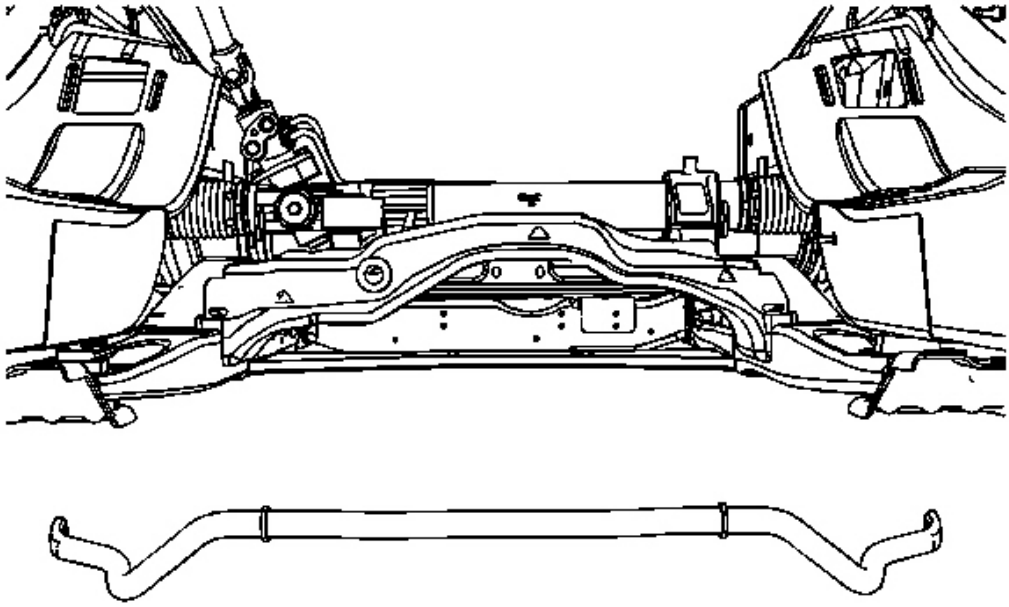


Fig. 6: Identifying Stabilizer Shaft
Courtesy of GENERAL MOTORS CORP.

1. Position the stabilizer shaft on the frame.
2. Install the left and right stabilizer shaft insulators and brackets. Refer to **Stabilizer Shaft Insulator Replacement**.
3. Install the stabilizer shaft links to the stabilizer shaft. Refer to **Stabilizer Shaft Link Replacement**.
4. Using the jack stands, raise the front cradle into position.

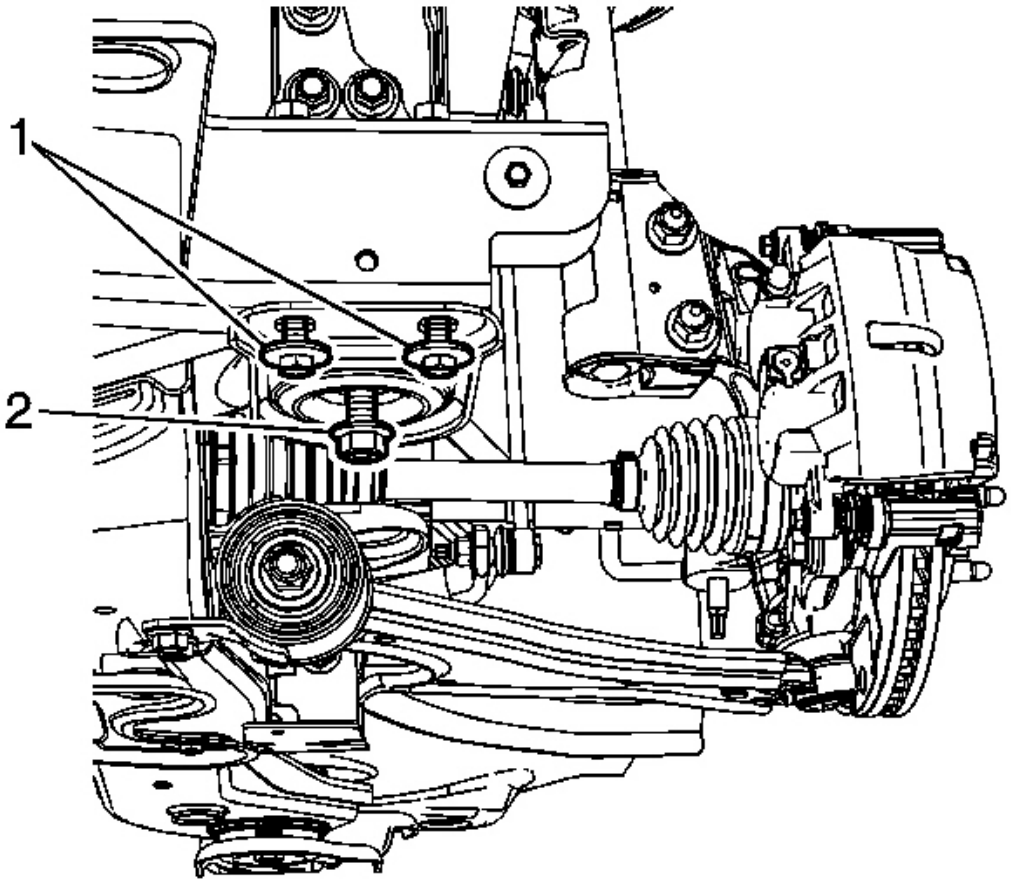


Fig. 7: Identifying Front Frame Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

5. Tighten the front frame (2) bolts.

   Tighten: Tighten the frame to body bolts to 100 N.m (74 lb ft) plus 90 degrees.

6. Tighten the front frame reinforcement mounting bolts (1). Left side shown, right side similar.

   Tighten: Tighten the reinforcement bolts to 50 N.m (37 lb ft).

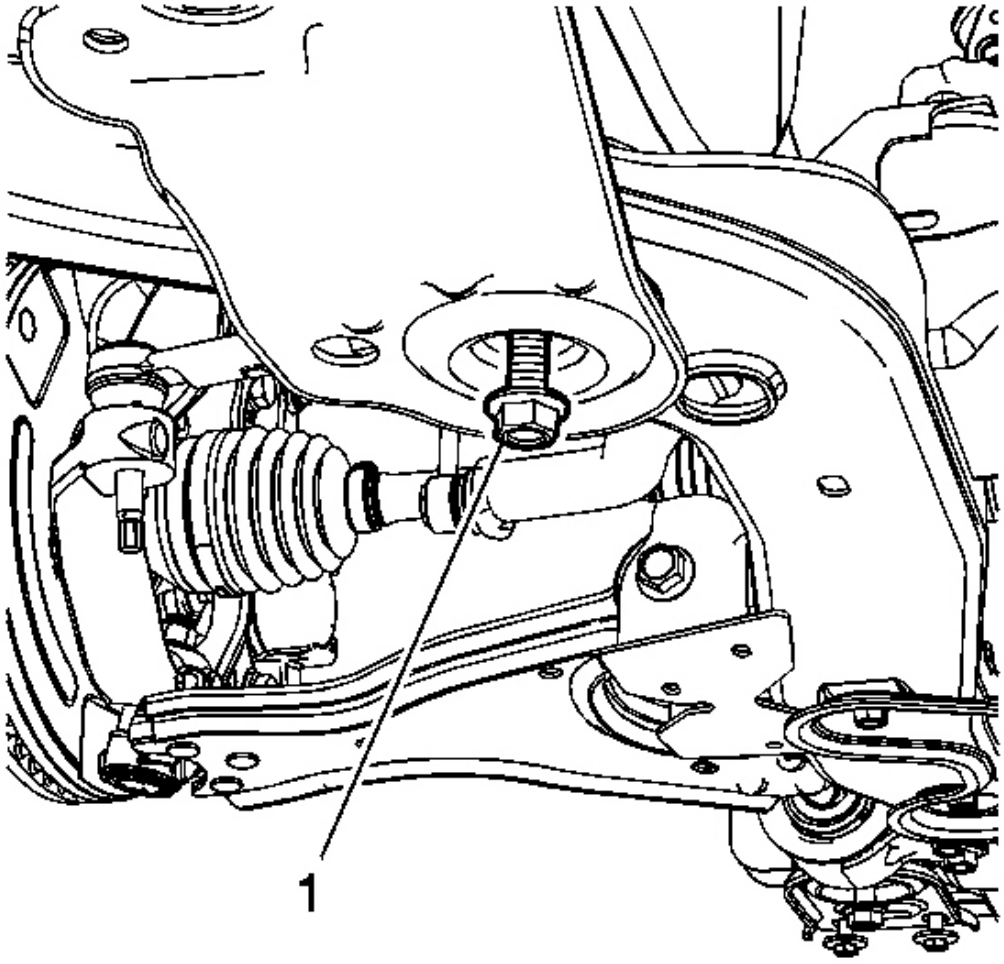


Fig. 8: Identifying Rear Frame Mounting Bolt
Courtesy of GENERAL MOTORS CORP.

7. Tighten the rear frame mounting bolts (1). Left side shown, right side similar.

   Tighten: Tighten the frame to body bolts to 100 N.m (74 lb ft) plus 90 degrees.

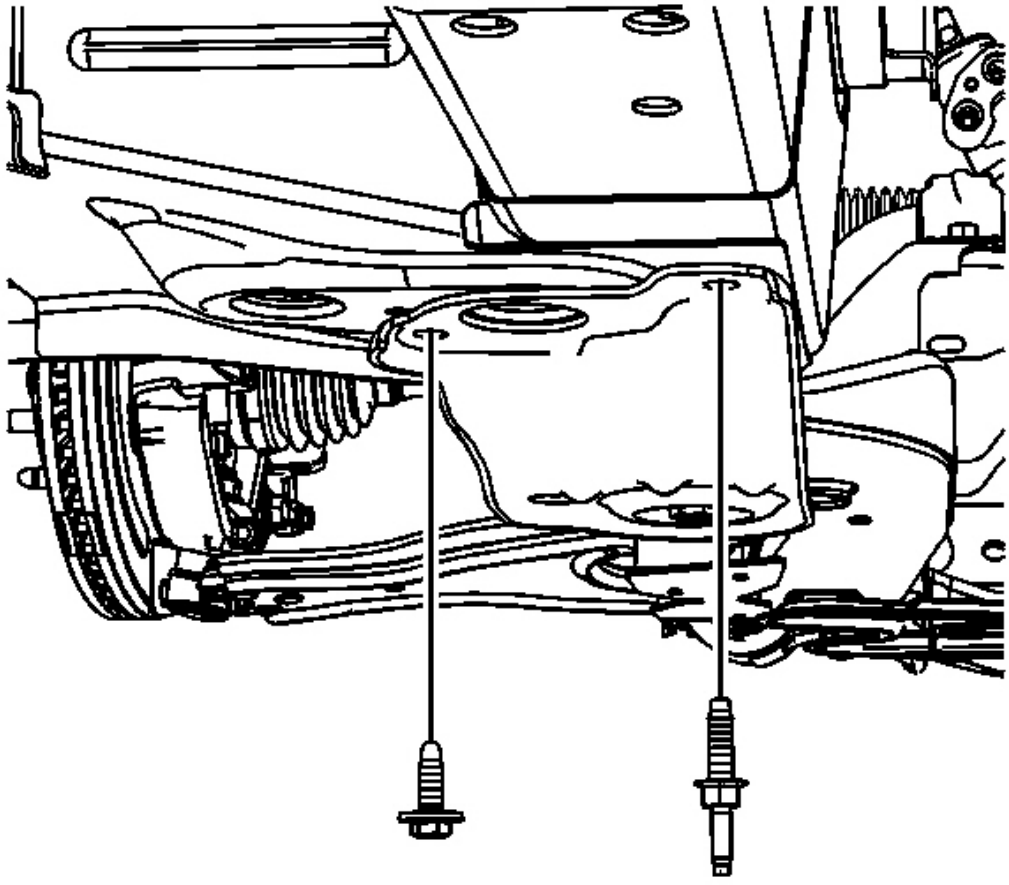


Fig. 9: Identifying Frame Reinforcement Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

8. Tighten the rear reinforcement bolts. Left side shown, right side similar.

   Tighten: Tighten the reinforcement bolts to 50 N.m (37 lb ft).

9. Remove the adjustable jack stands.
10. Install the bolt from the intermediate shaft bracket to the front cradle. Refer to **Intermediate Drive Shaft Replacement** .
11. Install the outer tie rod ends to the knuckle. Refer to **Steering Linkage Outer Tie Rod Replacement** .

12. Install the rear propeller shaft, if equipped. Refer to **Propeller Shaft Replacement** .
13. Install the front tires and wheels. Refer to **Tire and Wheel Removal and Installation** .
14. Remove the support and lower the vehicle.

STABILIZER SHAFT LINK REPLACEMENT

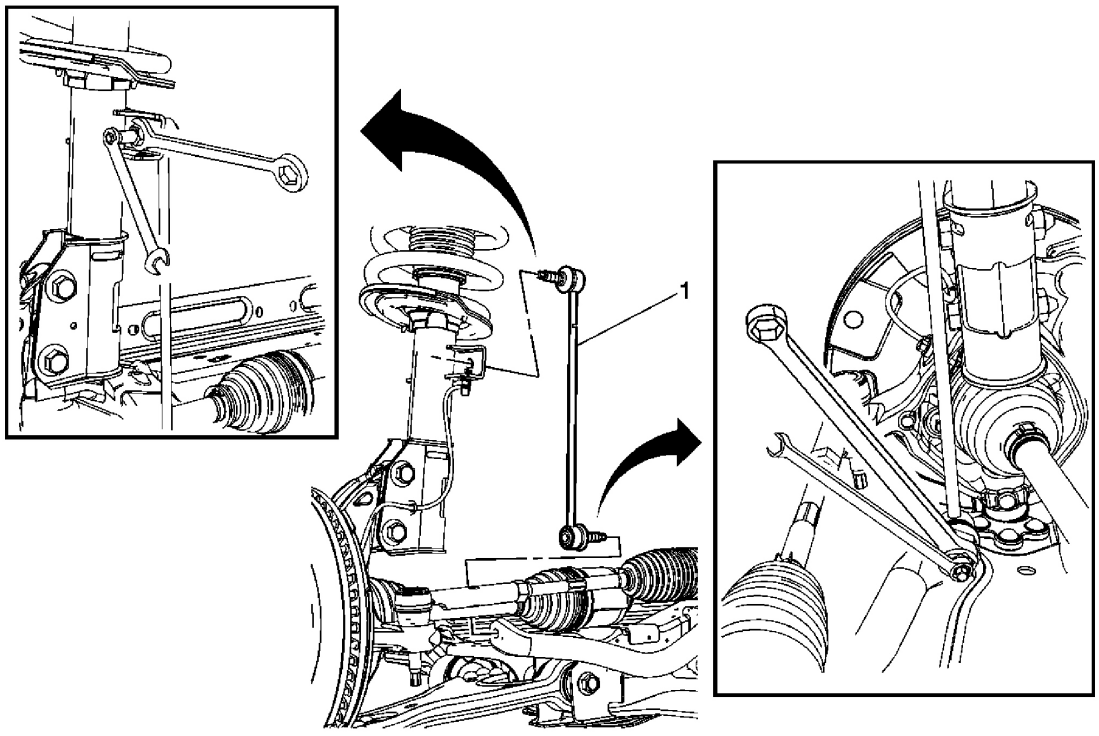


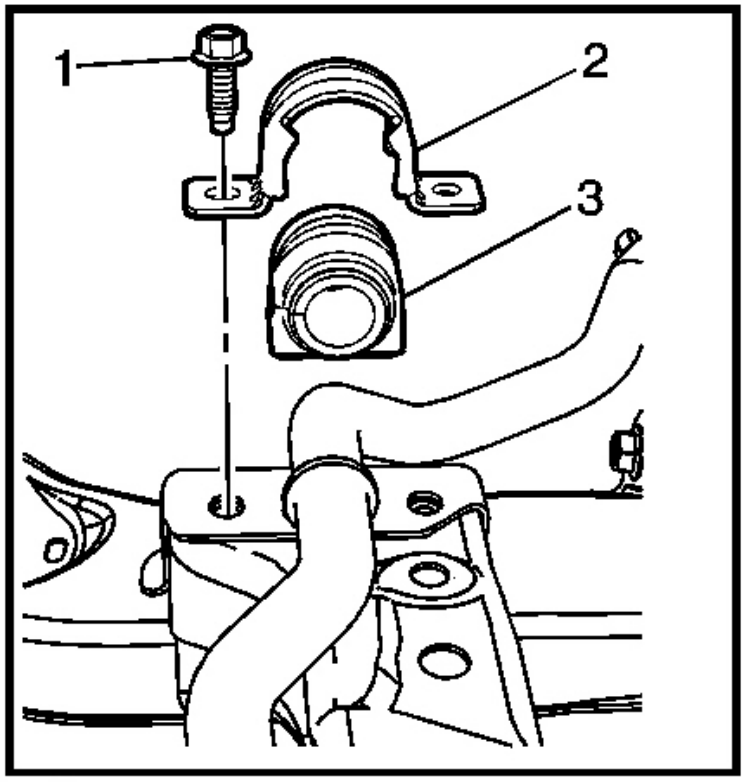
Fig. 10: Identifying Stabilizer Shaft Link
Courtesy of GENERAL MOTORS CORP.

Stabilizer Shaft Link Replacement

Callout	Component Name
Preliminary Procedures 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** .	
	Stabilizer Shaft Link (left side shown, right side similar). **NOTE:** **Refer to Fastener Notice .**

1	**Procedure** 1. Use a wrench to prevent the stub link from rotating. 2. Using the proper size wrench, remove the retaining nut for the upper stabilizer shaft link stub link. 3. Repeat the previous steps to remove the lower stabilizer shaft stub link retaining nut. 4. Remove the stabilizer shaft link from the vehicle. **Tip:** Use the wrench to hold the stabilizer shaft stub link while torquing to the specified torque. **Tighten:** • Tighten the stabilizer link to strut nut to 70 N.m (52 lb ft) • Tighten the stabilizer link to stabilizer shaft nut to 75 N.m (55 lb ft)

STABILIZER SHAFT INSULATOR REPLACEMENT


1
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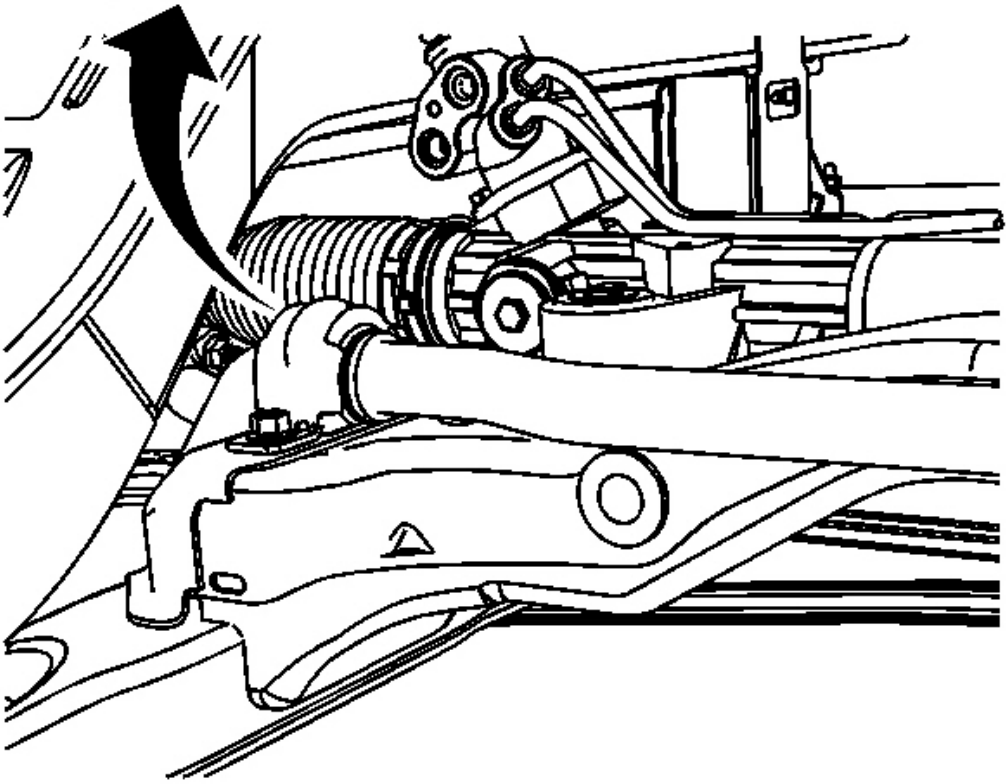


Fig. 11: Identifying Stabilizer Shaft Insulator
Courtesy of GENERAL MOTORS CORP.

Stabilizer Shaft Insulator Replacement

Callout	Component Name
Preliminary Procedure: Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .	
1	Stabilizer Shaft Clamp Bolt (Qty: 4) **NOTE:** **Refer to Fastener Notice .** **Tighten:** 50 N.m (37 lb ft)
2	Stabilizer Shaft Insulator Clamp (Qty: 2)
3	Stabilizer Shaft Insulator (Qty: 2) **Tip:** Lift up on the stabilizer shaft to gain enough clearance to remove the insulator.

LOWER BALL JOINT REPLACEMENT

Removal Procedure

1. Remove the lower control arm assembly. Refer to **Lower Control Arm Replacement**.
2. Install the lower control arm in a vise.

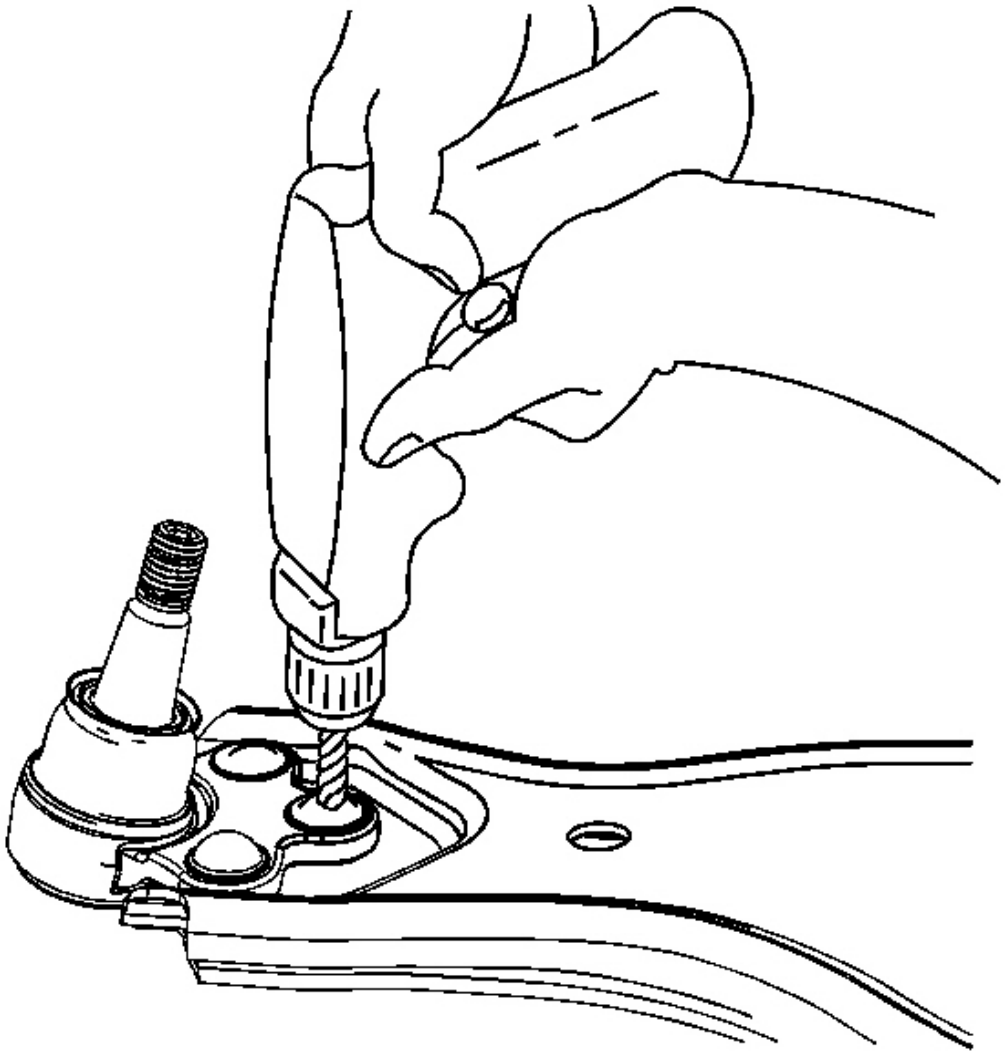


Fig. 12: Drilling Off Head Of Rivet
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Use a center punch to aid in starting the drill if drilling the rivet.

3. Drill or grind off the head of the rivet.

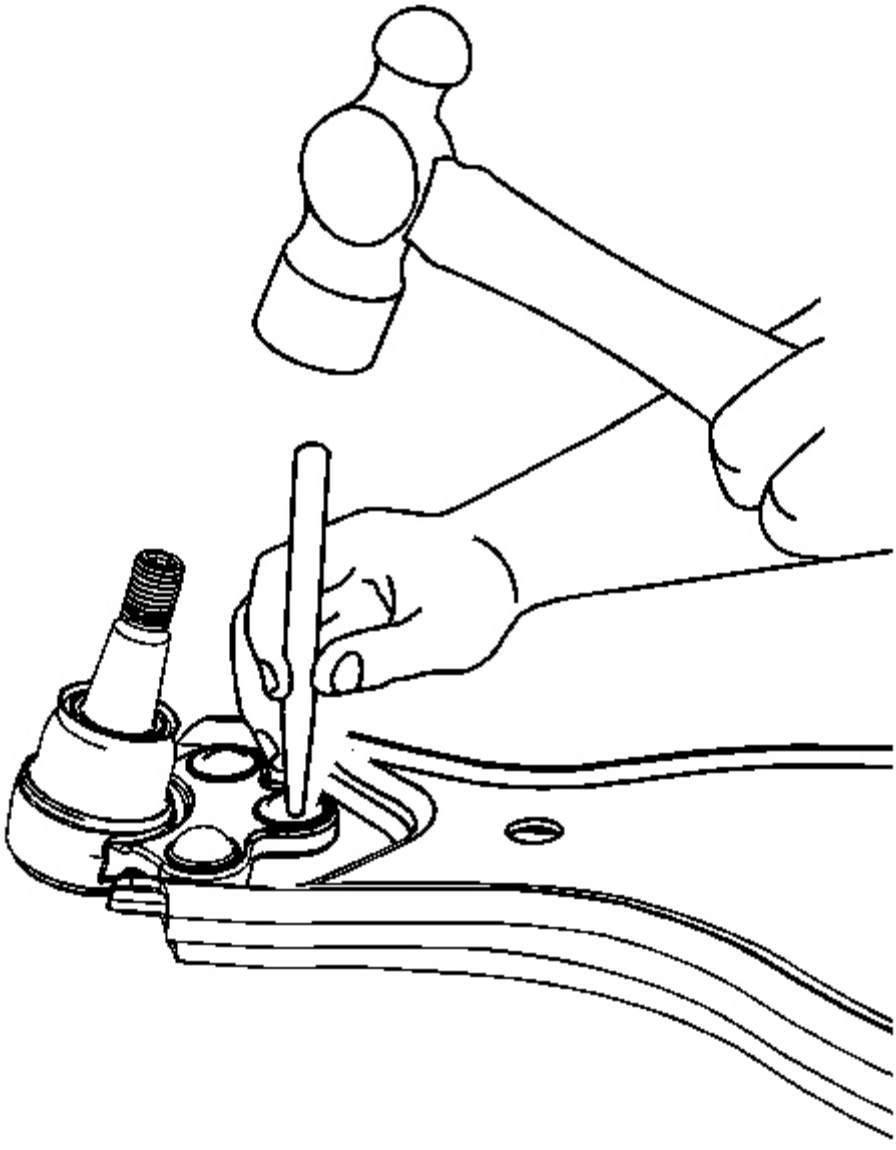


Fig. 13: View Of Rivets Removal With Punch & Hammer
Courtesy of GENERAL MOTORS CORP.

4. Use a punch and a hammer to loosen the rivets from the lower control arm.

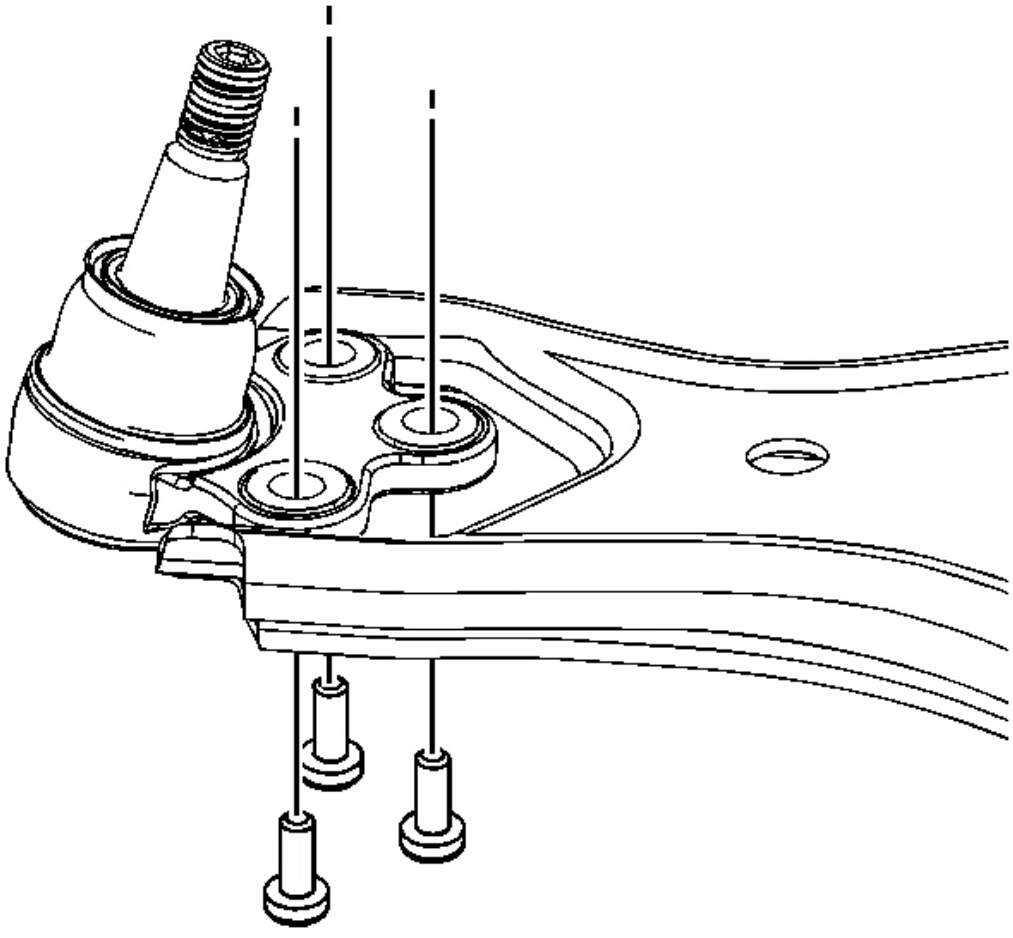


Fig. 14: Identifying Rivets
Courtesy of GENERAL MOTORS CORP.

5. Remove the rivets from the lower control arm.

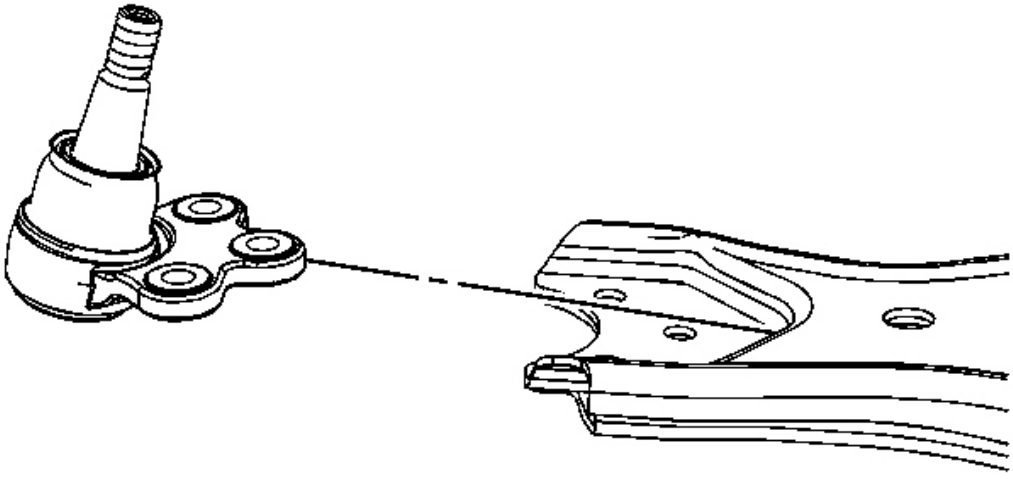


Fig. 15: View Of Ball Joint At Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

6. Remove the ball joint from the lower control arm.

Installation Procedure

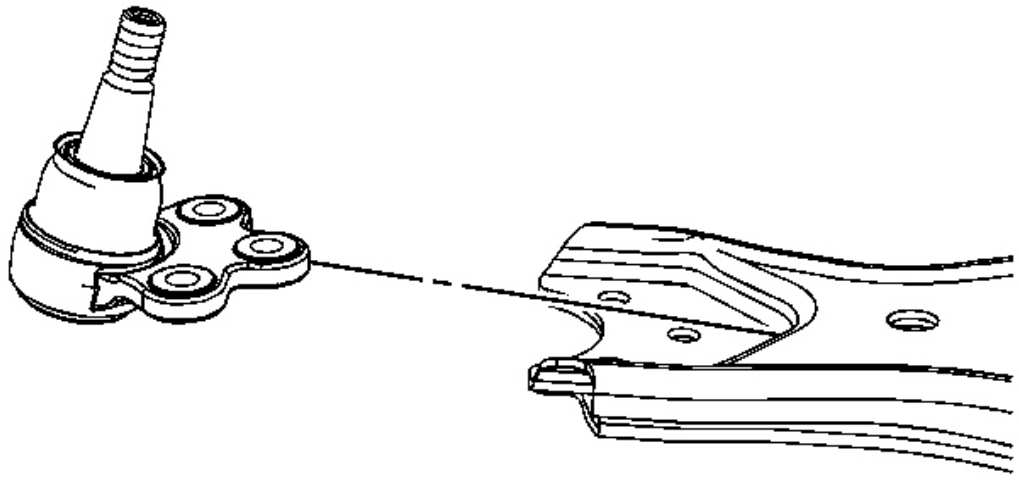


Fig. 16: View Of Ball Joint At Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

1. Position the ball joint on the lower control arm.

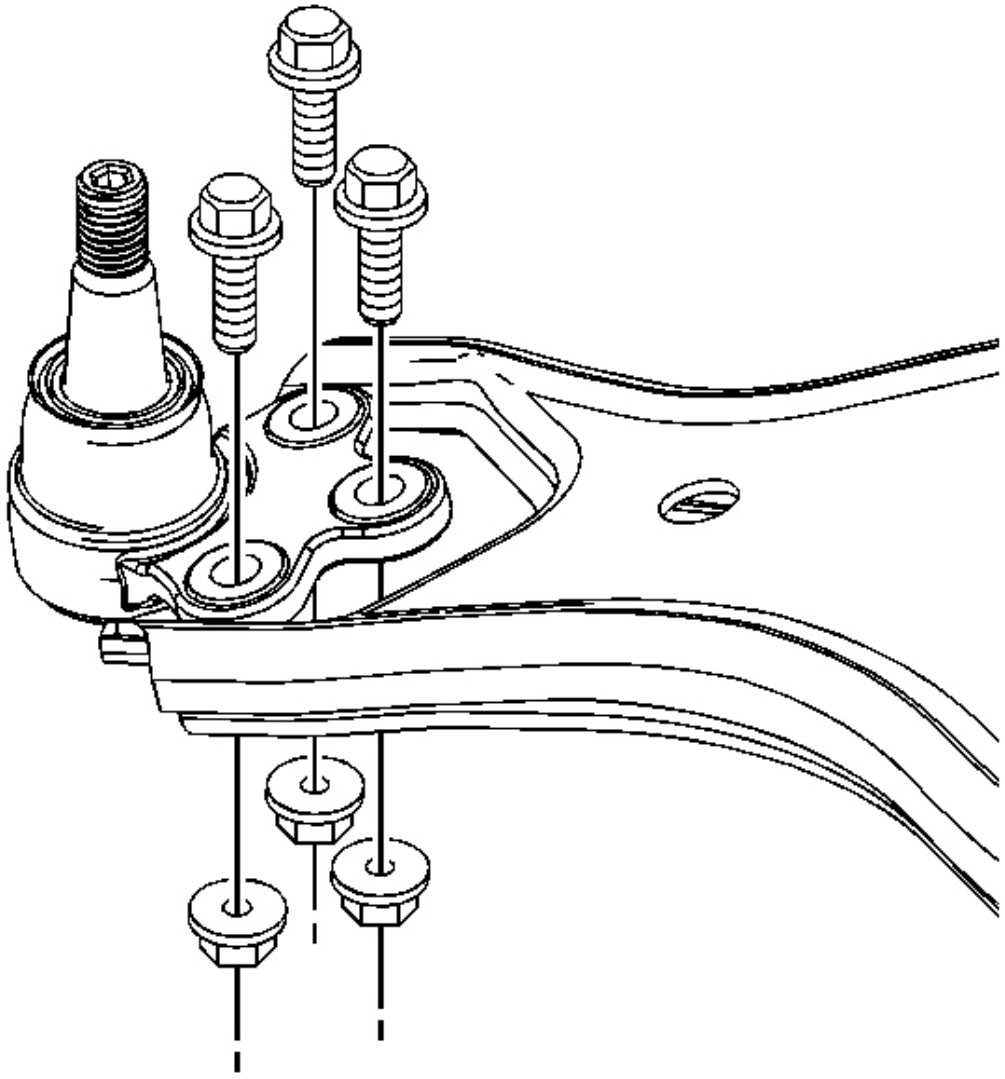


Fig. 17: View Of Ball Joint Mounting Nuts & Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: When tightening the mounting nuts and bolts for the ball joint, hold the bolt and torque the nut for the proper torque

measure.

2. Install the ball joint mounting nuts and bolts.

   Tighten: Tighten the mounting nuts to 68 N.m (50 lb ft).

3. Remove the lower control arm assembly from the vise.
4. Install the lower control arm. Refer to **Lower Control Arm Replacement**.
5. Check the front end alignment of the vehicle. Refer to **Wheel Alignment Specifications** .

FRONT WHEEL BEARING AND HUB REPLACEMENT

Tools Required

J 45859 Axle Remover

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** .
3. Remove the front brake rotor. Refer to **Front Brake Rotor Replacement** .
4. Remove the speed sensor from the wheel bearing and hub. Refer to **Front Wheel Speed Sensor Replacement** .
5. Remove the wheel drive shaft retaining nut and washer. Refer to **Front Wheel Drive Shaft Replacement** .

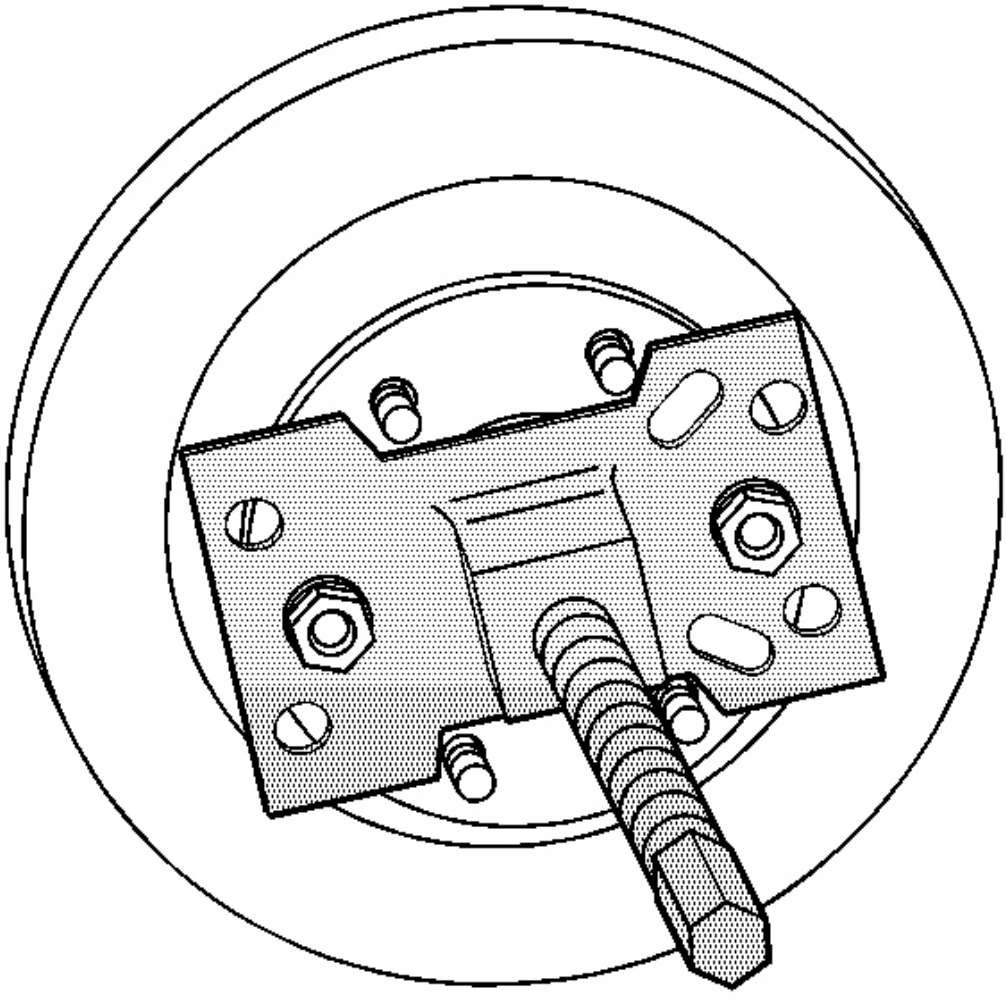


Fig. 18: View Of J 45859 Installed Onto Wheel Hub
Courtesy of GENERAL MOTORS CORP.

6. Install the **J 45859** to the wheel bearing and hub.
7. Using the **Camshaft and cylinder head inspection (SOHC)** , separate the wheel drive shaft from the wheel bearing and hub.
8. Remove the J 45859 from the wheel bearing and hub assembly.

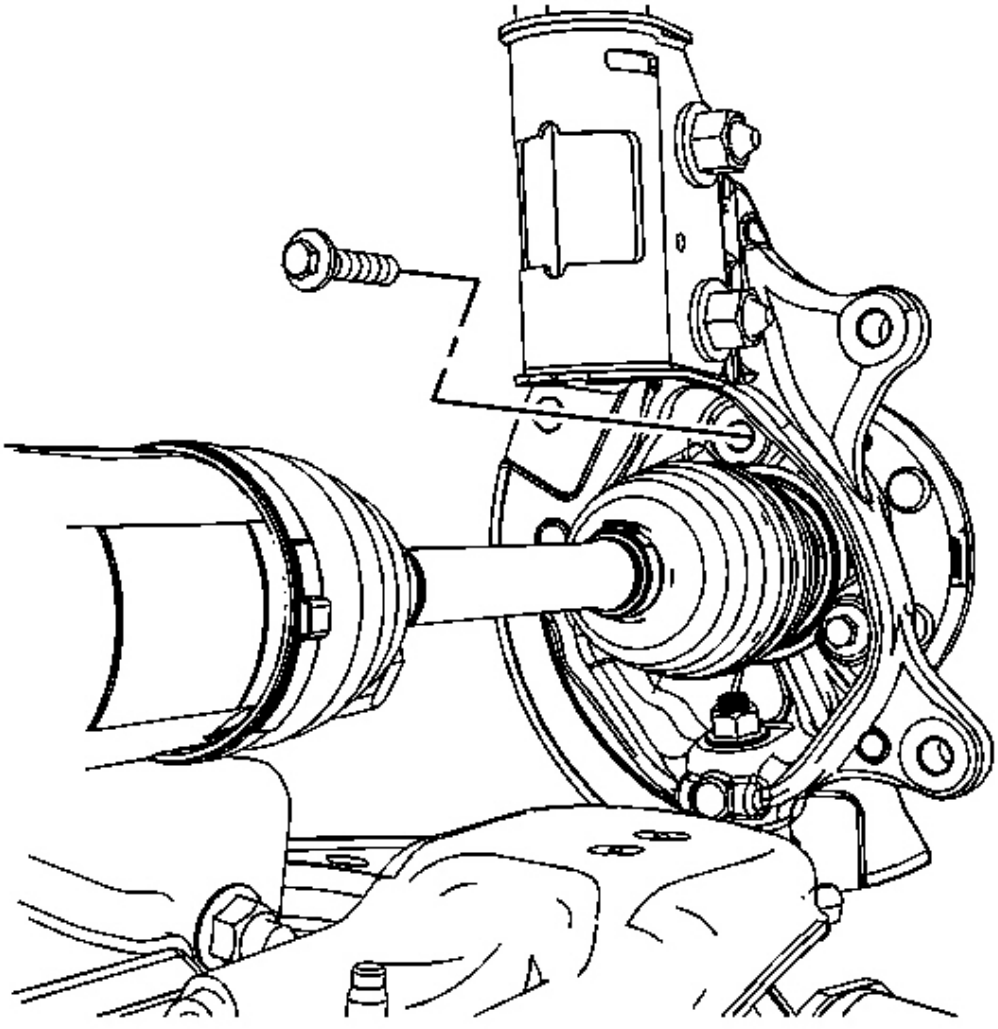


Fig. 19: View Of J 28733-B Installed Onto Wheel Hub
Courtesy of GENERAL MOTORS CORP.

9. Remove the retaining bolts for the wheel bearing and hub.

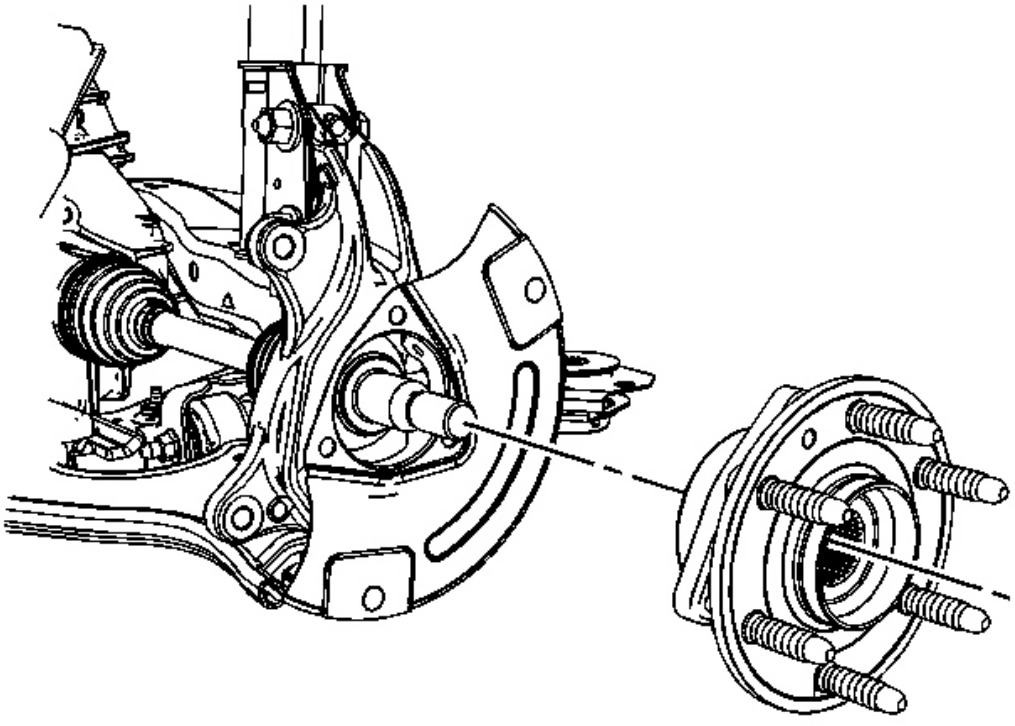


Fig. 20: Identifying Wheel Bearing & Hub Assembly
Courtesy of GENERAL MOTORS CORP.

10. Remove the wheel bearing and hub assembly.

Installation Procedure

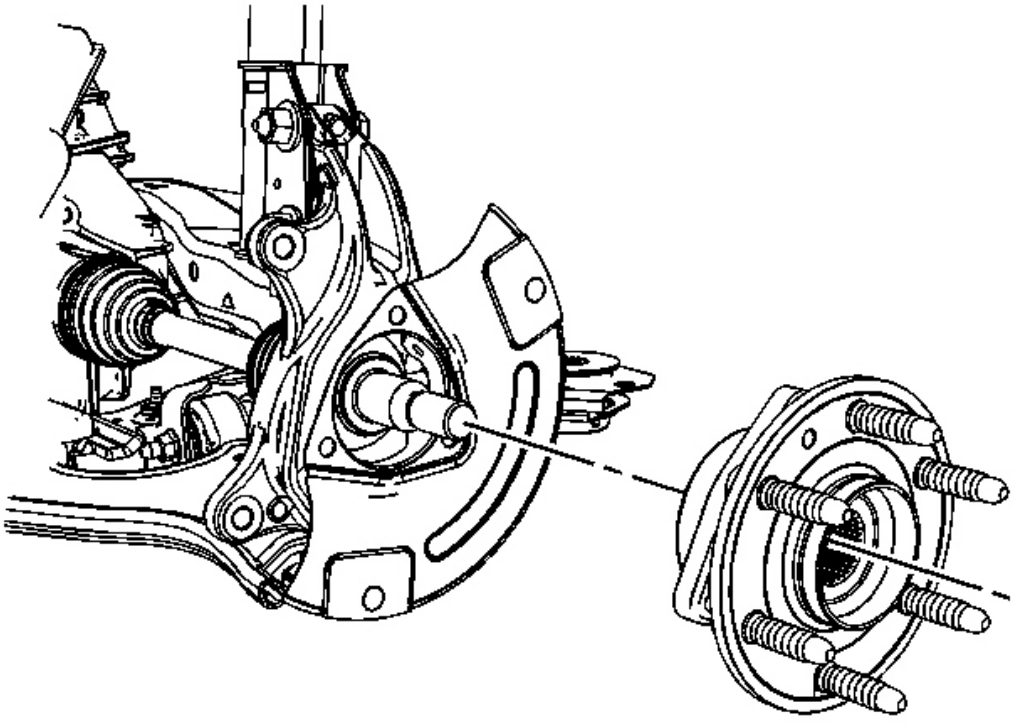


Fig. 21: Identifying Wheel Bearing & Hub Assembly
Courtesy of GENERAL MOTORS CORP.

1. Position the wheel bearing and hub assembly in the knuckle.

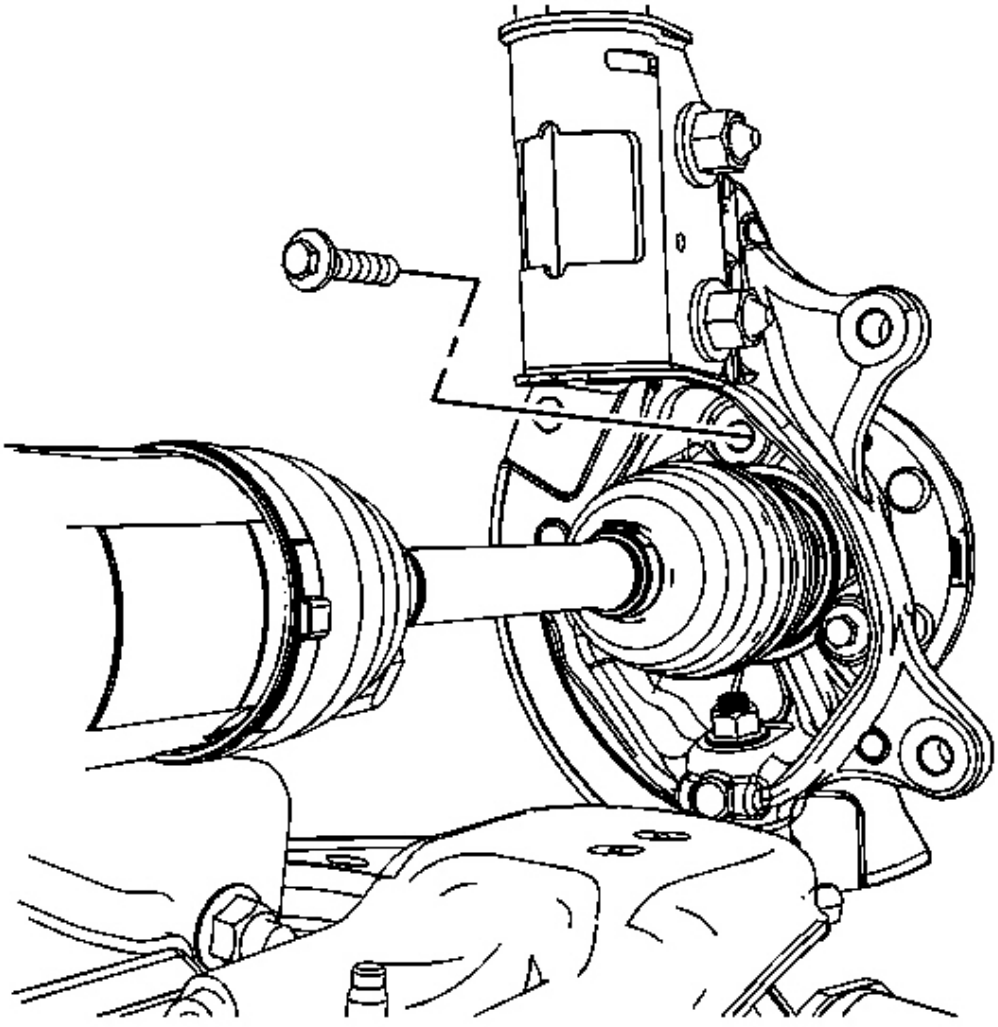


Fig. 22: View Of J 28733-B Installed Onto Wheel Hub
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

2. Install the retaining bolts for the wheel bearing and hub.

   Tighten: Tighten the bolts to 120 N.m (88 lb ft).

3. Install the front brake rotor. Refer to **Front Brake Rotor Replacement** .
4. Install the speed sensor to the wheel bearing and hub. Refer to **Front Wheel Speed Sensor Replacement** .
5. Install the wheel drive shaft retaining nut and washer. Refer to **Front Wheel Drive Shaft Replacement** .
6. Install the tire and wheel. Refer to **Tire and Wheel Removal and Installation** .
7. Remove the support and lower the vehicle.

STEERING KNUCKLE REPLACEMENT

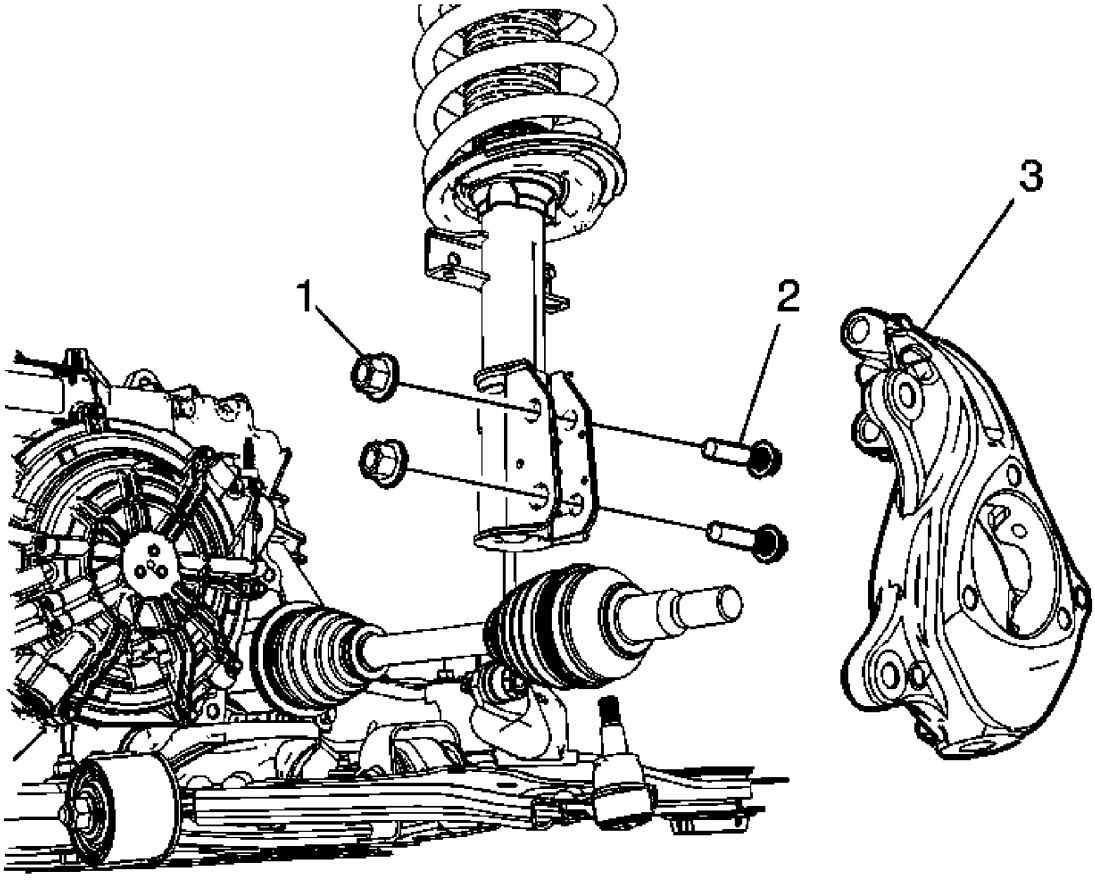


Fig. 23: Identifying Steering Knuckle
Courtesy of GENERAL MOTORS CORP.

Steering Knuckle Replacement

Callout	Component Name
Preliminary Procedures	

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the wheel bearing/hub assembly. Refer to **Front Wheel Bearing and Hub Replacement**.
3. Remove the outer tie rod end from the steering knuckle. Refer to **Steering Linkage Outer Tie Rod Replacement** .
4. Separate the lower ball joint from the steering knuckle. Refer to **Lower Ball Joint Replacement**.

1	Front Strut Suspension Nut (Qty: 2)
2	Front Strut Suspension Bolt (Qty: 2) **NOTE:** **Refer to Fastener Notice .** **Tip:** Support the wheel drive shaft with mechanics wire after the knuckle has been removed. **Tighten:** 147 N.m (108 lb ft)
3	Steering Knuckle

LOWER CONTROL ARM REPLACEMENT

Tools Required

J 41820 Ball Joint Separator. See **Special Tools**.

Removal Procedure

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

IMPORTANT: In the following service procedure, it is not necessary to remove the entire tie rod end from the power steering rack. Only remove the tie rod end from the steering knuckle.

2. Remove the outer steering tie rod end. Refer to **Steering Linkage Outer Tie Rod Replacement** .
3. Remove the wheel bearing/hub assembly. Refer to **Front Wheel Bearing and Hub Replacement**.

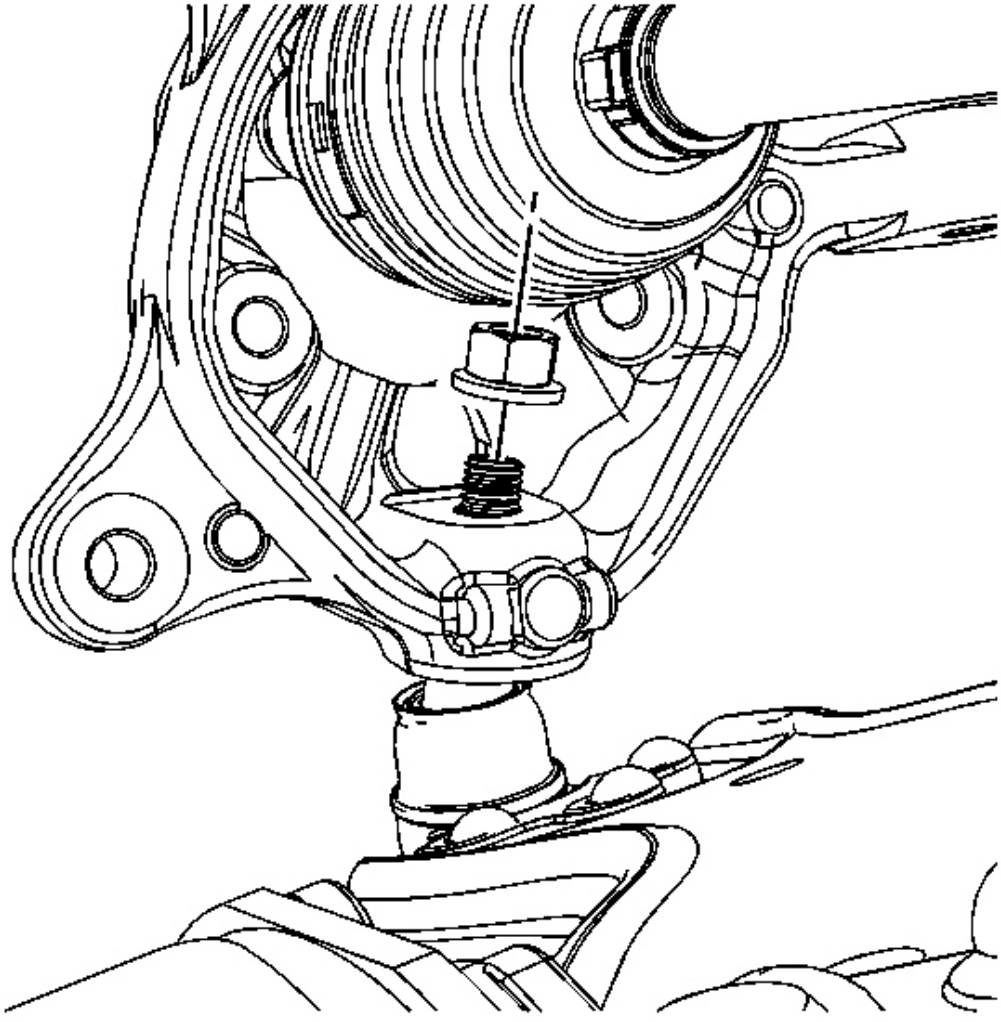


Fig. 24: Identifying Lower Ball Joint Retaining Nut
Courtesy of GENERAL MOTORS CORP.

4. Using a Allen wrench and the proper size wrench, remove the lower ball joint retaining nut.
5. Using the **J 41820** remove the lower ball joint from the control arm. See **Special Tools**.

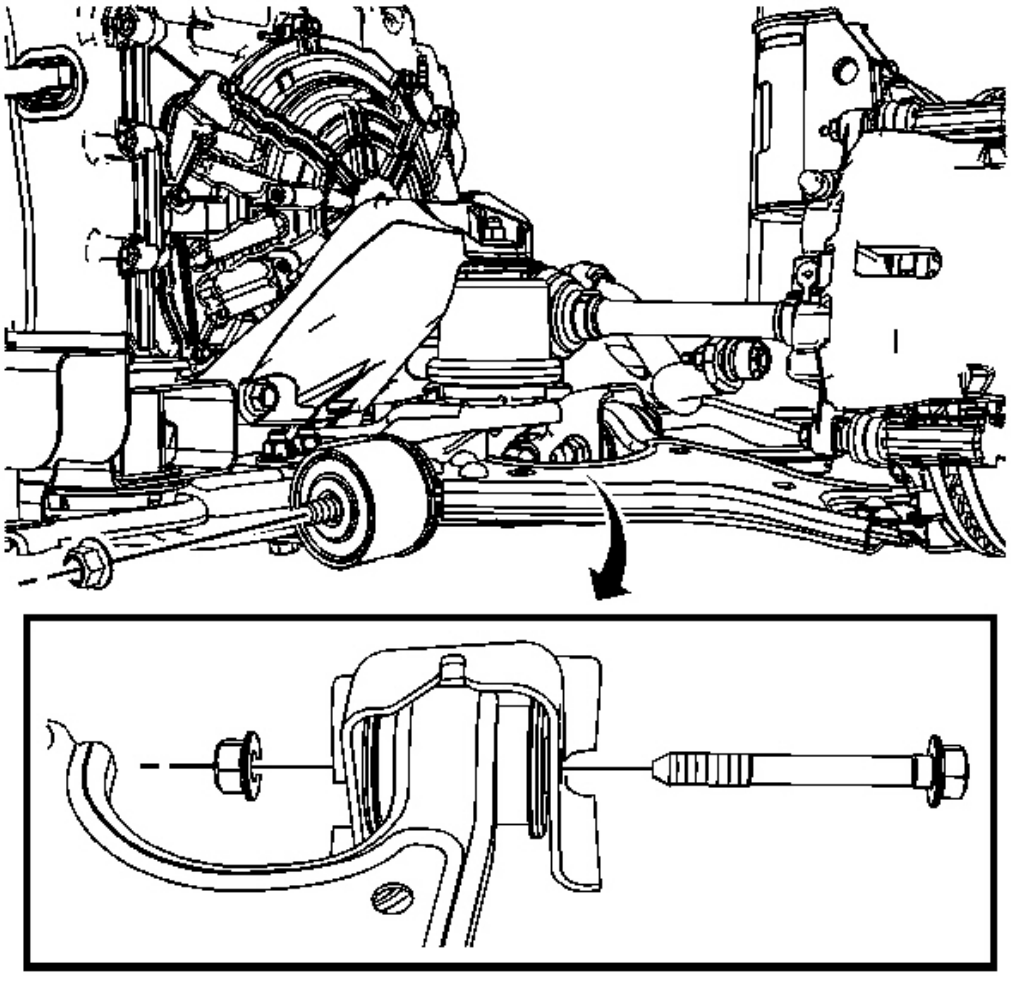


Fig. 25: Identifying Front Lower Control Arm Nut
Courtesy of GENERAL MOTORS CORP.

6. Remove the front control arm mounting nut.
7. Remove the rear control arm mounting bolt and nut.

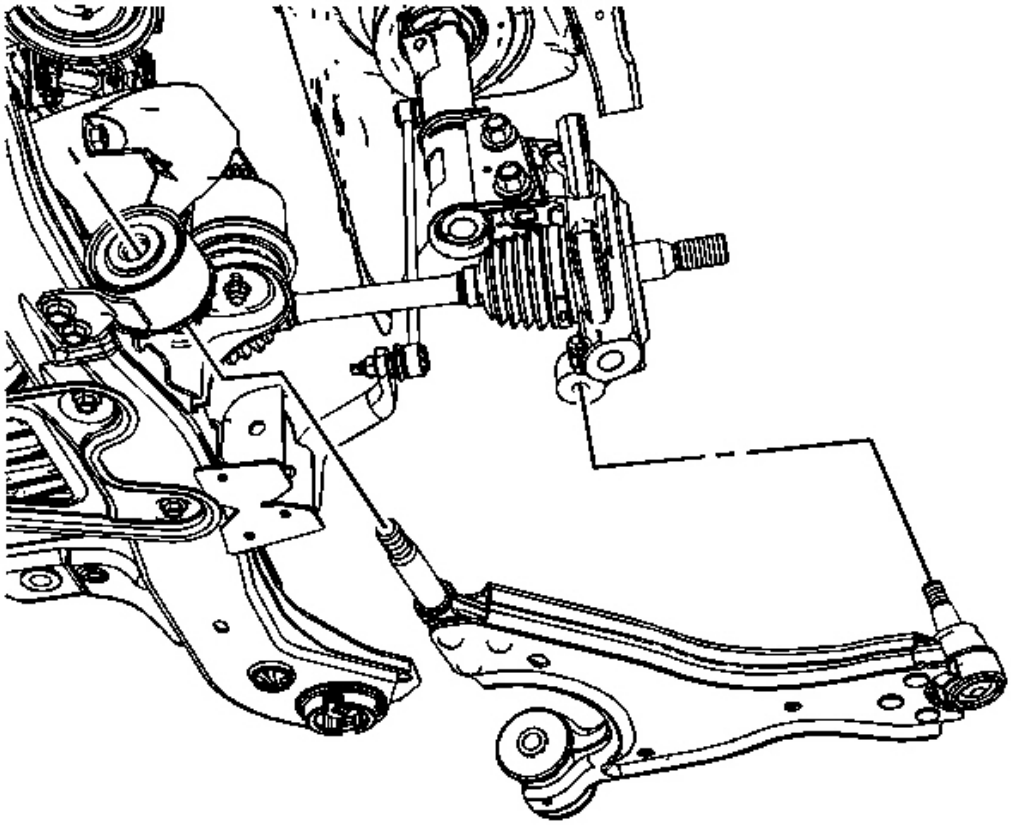


Fig. 26: Identifying Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

8. Remove the lower control arm from the vehicle.

Installation Procedure

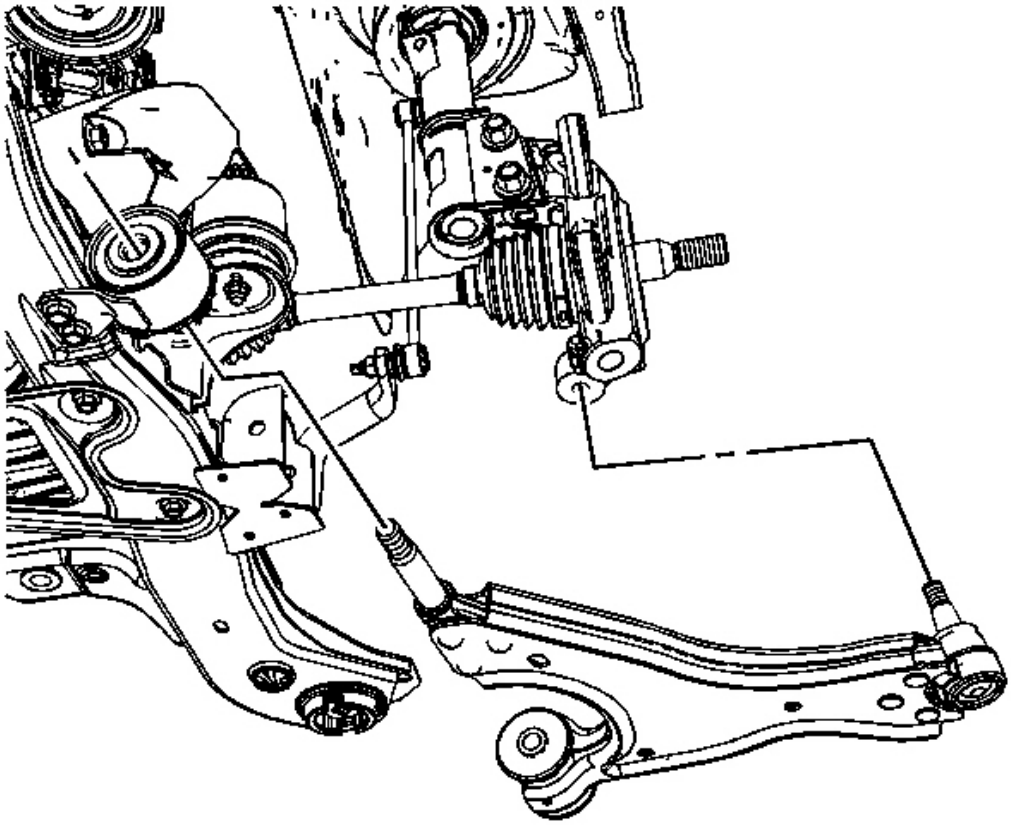


Fig. 27: Identifying Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

1. Position the lower control arm in the front bushing and the rear mounting bracket.
2. Install and hand tighten the rear lower control arm mounting bolt and nut.

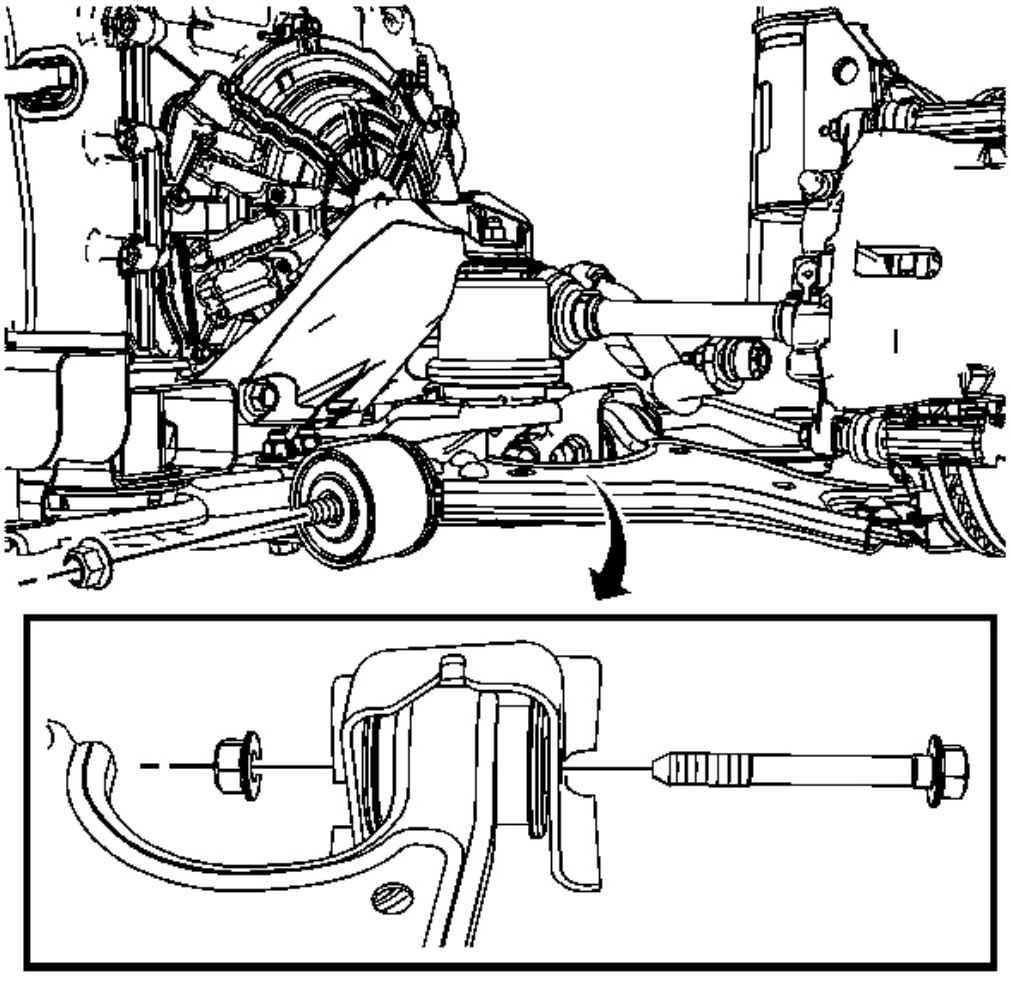


Fig. 28: Identifying Front Lower Control Arm Nut
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

IMPORTANT: When tightening the rear control arm nut and bolt, hold the bolt and torque the nut. This will give you the proper torque.

3. Install the front lower control arm nut.

Tighten: Tighten the lower control arm to frame nuts to 150 N.m (110 lb ft).

4. Install the lower ball joint in the steering knuckle.

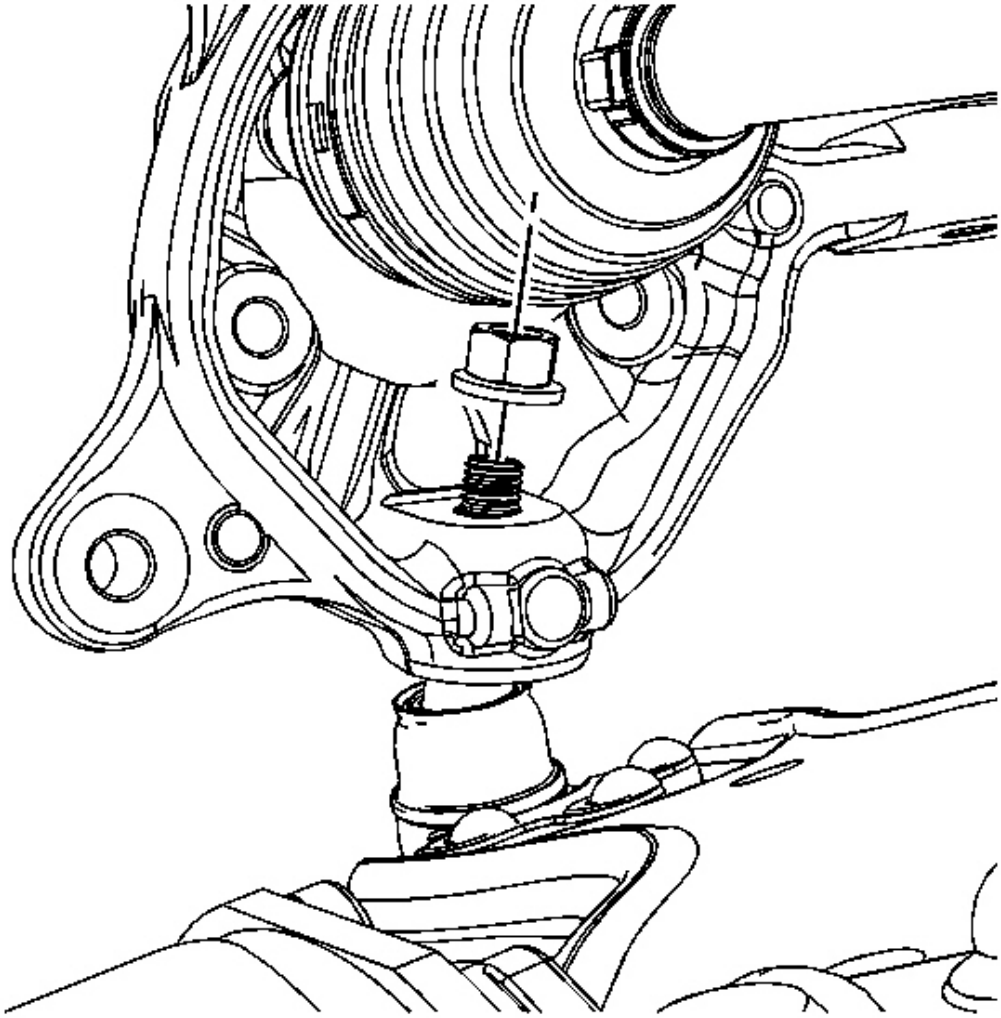


Fig. 29: Identifying Lower Ball Joint Retaining Nut
Courtesy of GENERAL MOTORS CORP.

5. Install the ball joint mounting nut.
6. Using an Allen wrench with the proper size wrench, tighten the mounting nut.

Tighten: Tighten the mounting nut to 40 N.m (30 lb ft) plus 120 degrees.

7. Install the wheel bearing/hub assembly. Refer to **Front Wheel Bearing and Hub Replacement**.
8. Install the outer steering tie rod end. Refer to **Steering Linkage Outer Tie Rod Replacement** .
9. Remove the support and lower the vehicle

LOWER CONTROL ARM BRACKET REPLACEMENT

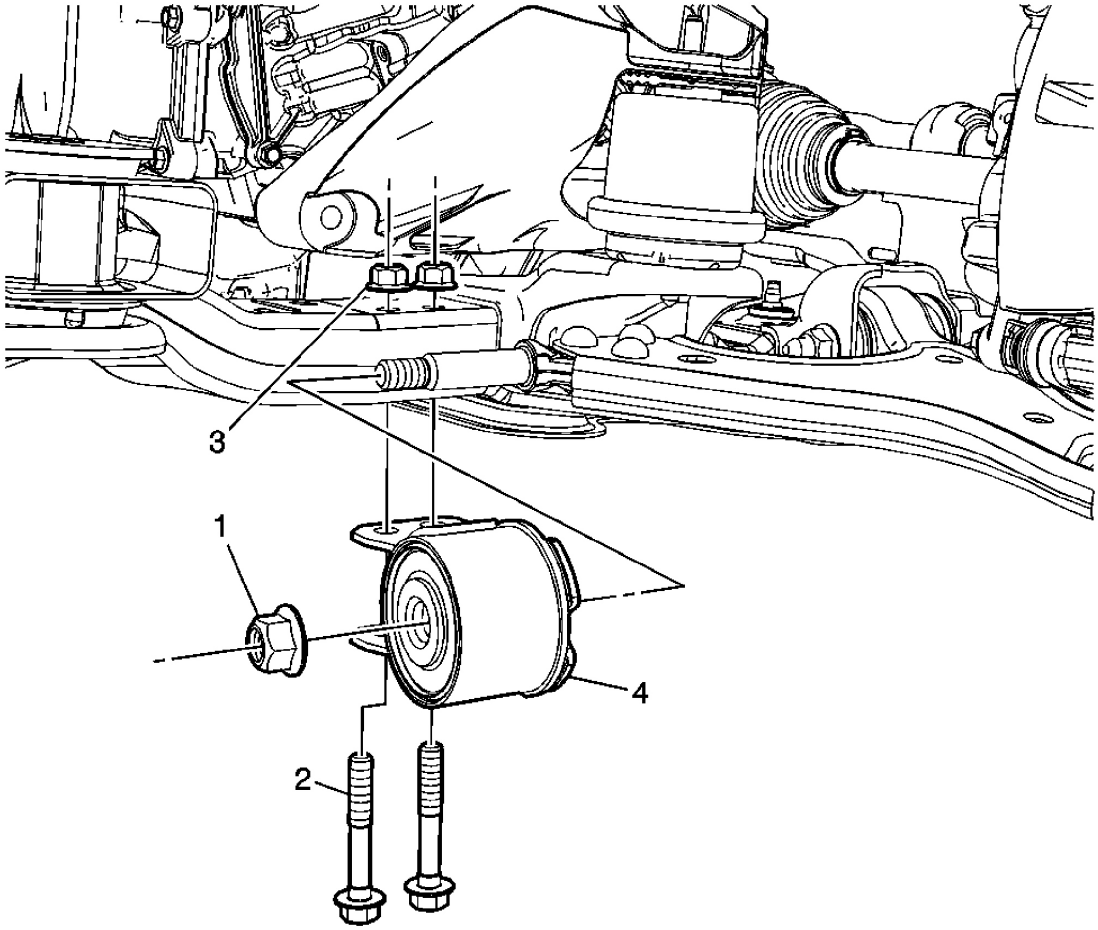


Fig. 30: Identifying Lower Control Arm Bracket
Courtesy of GENERAL MOTORS CORP.

Lower Control Arm Bracket Replacement

Callout	Component Name
Preliminary Procedures	

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** .

1	Front Lower Control Arm Bushing Nut **NOTE:** **Refer to Fastener Notice .** **Tighten:** 150 N.m (110 lb ft)
2	Front Lower Control Arm Bushing Bolt (Qty: 2) **IMPORTANT:** **When tightening the bolt to specifications, hold the bolt and torque the nut for the proper torque.**
3	Front Lower Control Arm Bushing Nut (Qty: 2) **Tighten:** 195 N.m (144 lb ft)
4	Front Lower Control Arm Bushing **Tip:** The control arm bushing is NOT serviced separately, but with the mounting bracket.

FRONT LOWER CONTROL ARM BUSHING REPLACEMENT

Tools Required

- **J 5590** Installer and Remover
- **J 2619-01** Slide Hammer and Adapter. See **Special Tools**.
- **CH-48107** Bushing Remover and Installer

Removal Procedure

1. Remove the front lower control arm assembly. Refer to **Lower Control Arm Replacement**.

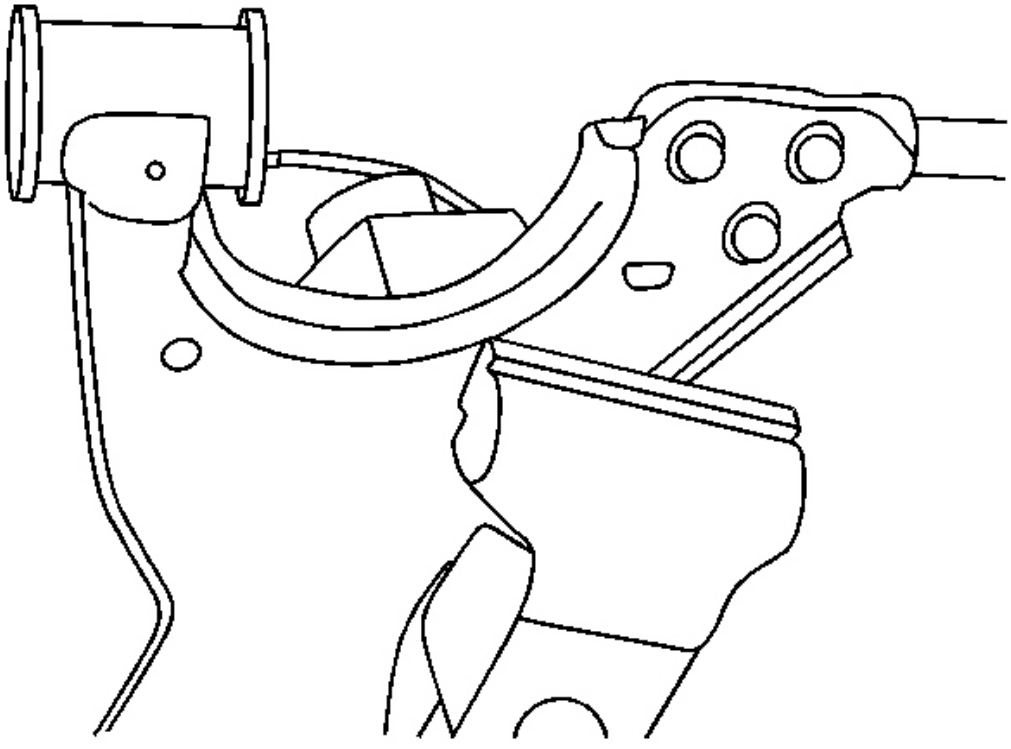


Fig. 31: View Of Lower Control Arm In A Soft Jawed Vise
Courtesy of GENERAL MOTORS CORP.

2. Install the lower control arm in a soft jawed vise.

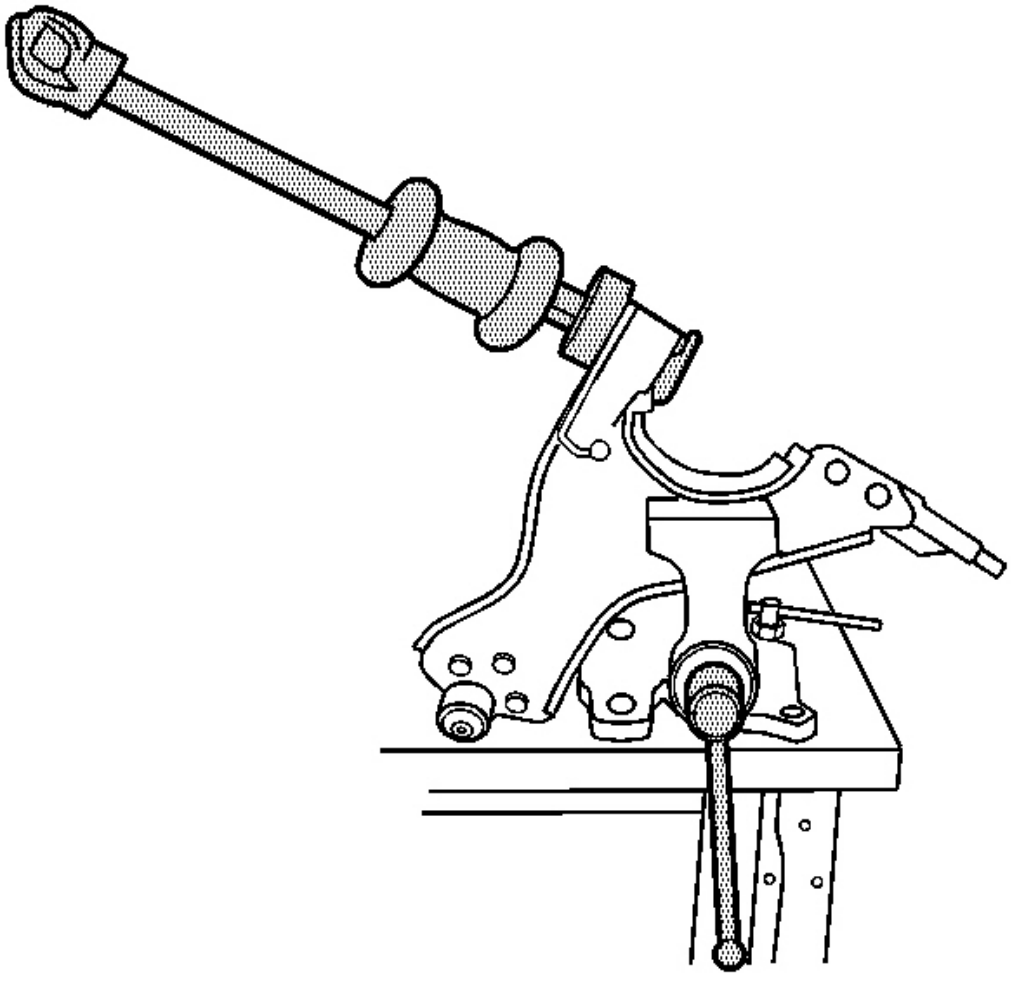


Fig. 32: Identifying Special Tools J 2619-01 & CH-48107
Courtesy of GENERAL MOTORS CORP.

3. Assemble the **J 2619-01** and the **CH-48107** . See **Special Tools**.
4. Position the **J 2619-01** and the **CH-48107** lower control arm bushing. See **Special Tools**.
5. Using the **J 2619-01** and the **CH-48107** , remove the front lower control arm bushing. See **Special Tools**.

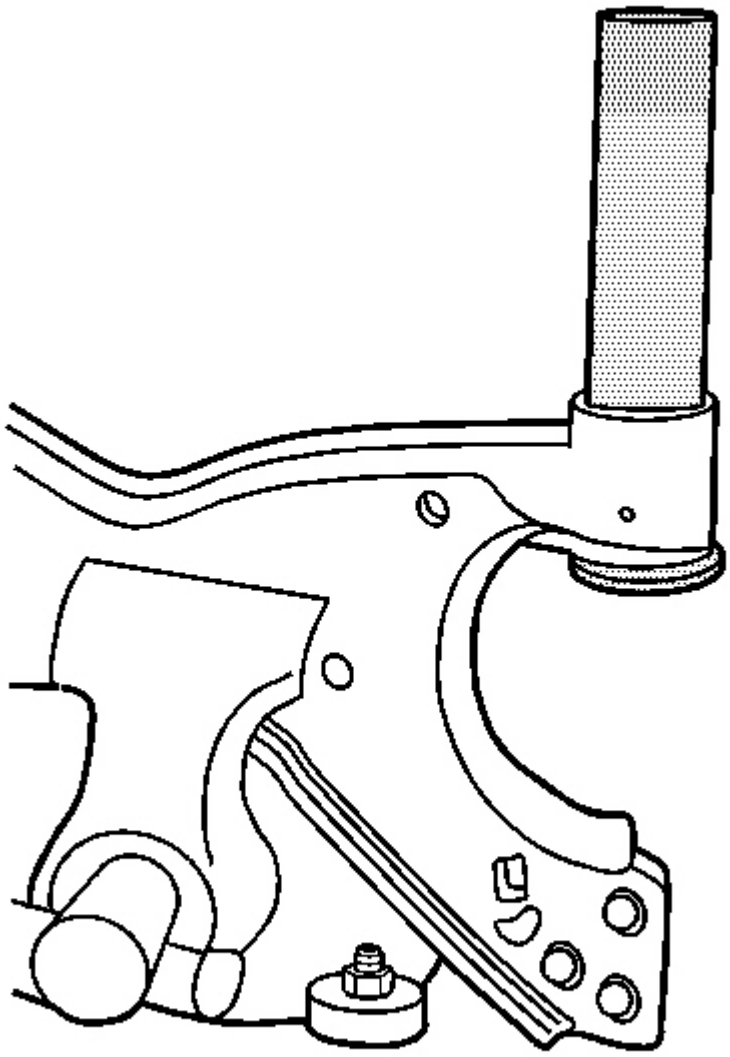


Fig. 33: Identifying Special Tool J 5590
Courtesy of GENERAL MOTORS CORP.

6. Using the **J 5590** , remove the rear lower control arm bushing.

Installation Procedure

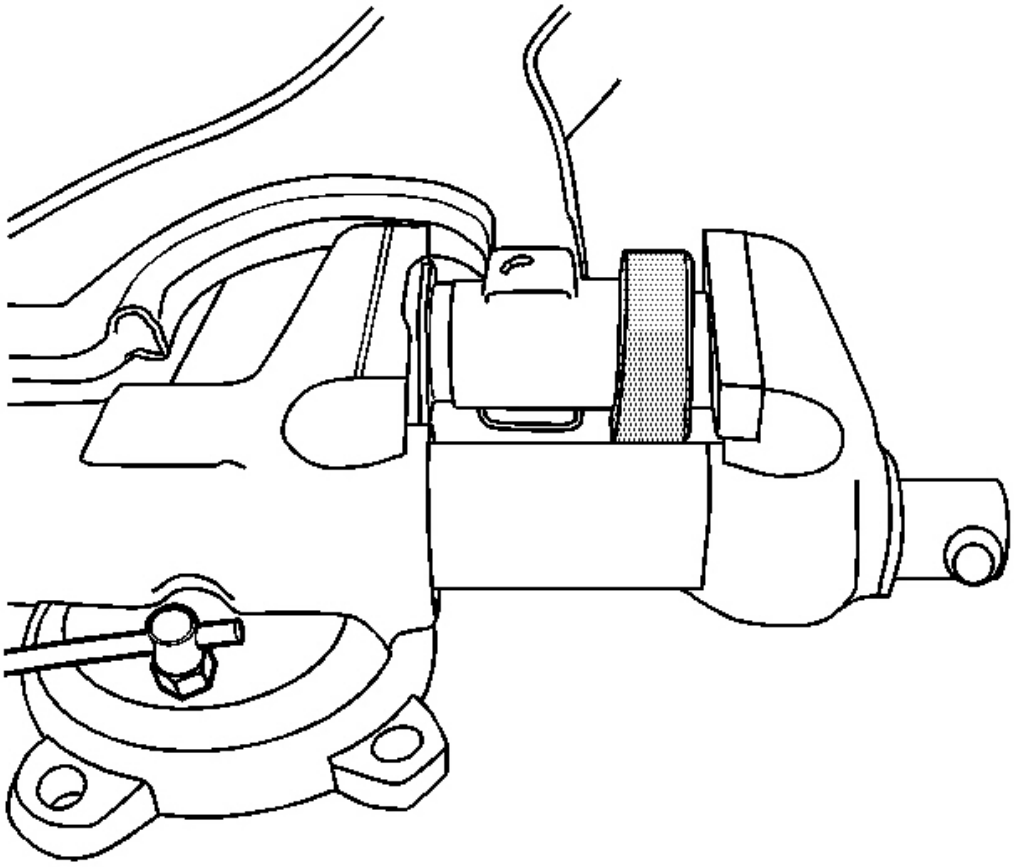


Fig. 34: Identifying Front & Rear Bushings
Courtesy of GENERAL MOTORS CORP.

1. Position the front and rear bushings so that they are equally in the control arm.
2. Position the **CH-48107** on the front bushing.
3. Using the vise, compress the front and rear bushings until they are seated.
4. Remove the lower control arm from the vise.
5. Remove the **CH-48107** from the front bushing.
6. Install the lower control arm in the vehicle. Refer to **Lower Control Arm Replacement**.

WHEEL STUD REPLACEMENT

Tools Required

J 35917 Ball Joint Remover

Removal Procedure

CAUTION: If you are replacing the wheel(s), the wheel stud(s), the wheel nut(s) or the wheel bolt(s), install only new GM original equipment parts. Installation of used parts or non-GM original equipment parts may cause the wheel to loosen, loss of tire air pressure, poor vehicle handling and loss of vehicle control resulting in personal injury.

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** .
3. Remove the brake rotor. Refer to **Front Brake Rotor Replacement** .

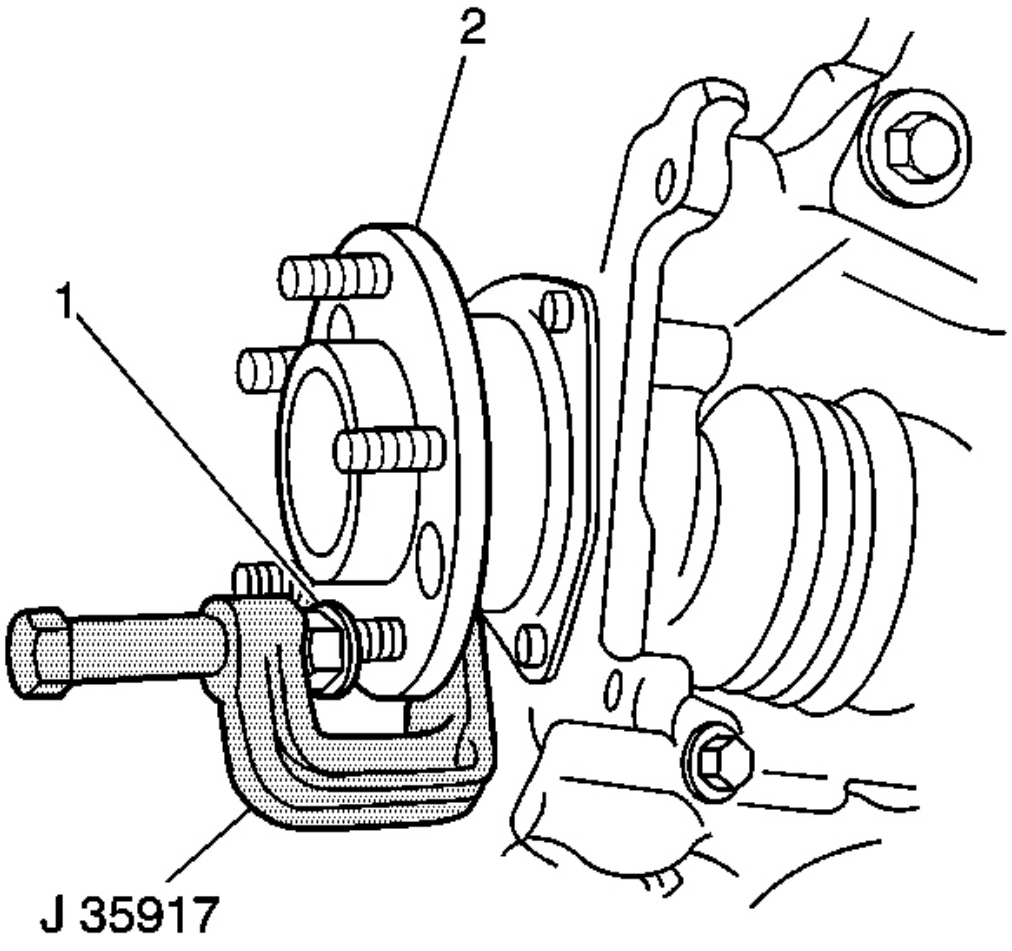


Fig. 35: Identifying Special Tool J 35917
Courtesy of GENERAL MOTORS CORP.

4. Use the **J 35917** in order to press the wheel stud (1) from the bearing/hub (2).

Installation Procedure

1. Install a new wheel stud from the back side of the bearing/hub.

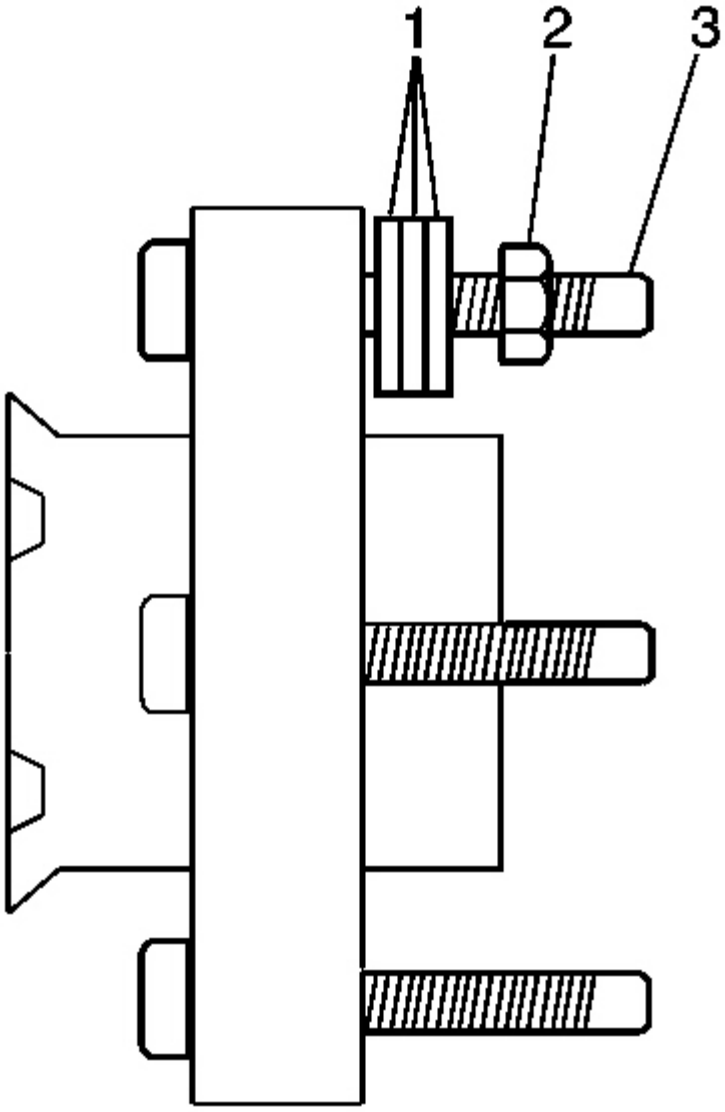


Fig. 36: Identifying Washers, Wheel Stud & Hex Nut
Courtesy of GENERAL MOTORS CORP.

2. Install 3 flat washers (1) to the wheel stud (3).
3. Install a hex nut (2) to the wheel stud (3).

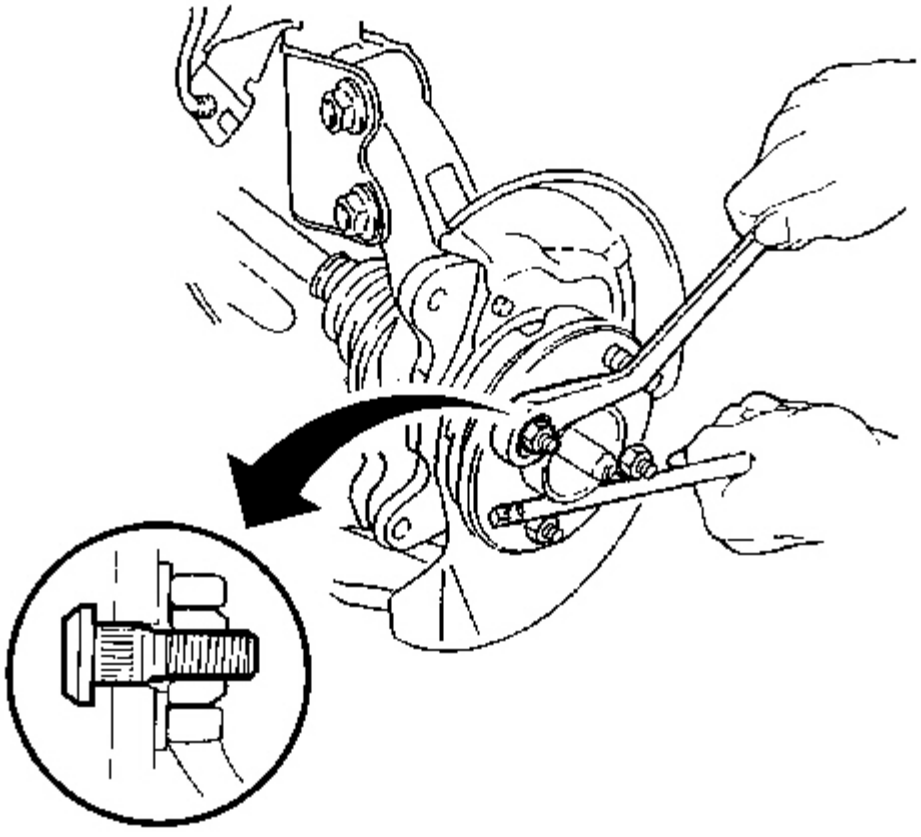


Fig. 37: Seating Stud Head In Wheel Bearing/Hub Flange
Courtesy of GENERAL MOTORS CORP.

4. Tighten the hex nut until the stud head is fully seated in the bearing/hub flange.
5. Remove the hex nut and the washers from the wheel stud.
6. Install the brake rotor. Refer to **Front Brake Rotor Replacement** .
7. Install the tire and wheel. Refer to **Tire and Wheel Removal and Installation** .
8. Lower the vehicle.

STRUT ASSEMBLY REPLACEMENT

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the stabilizer link at the front strut. Refer to **Stabilizer Shaft Link Replacement**.

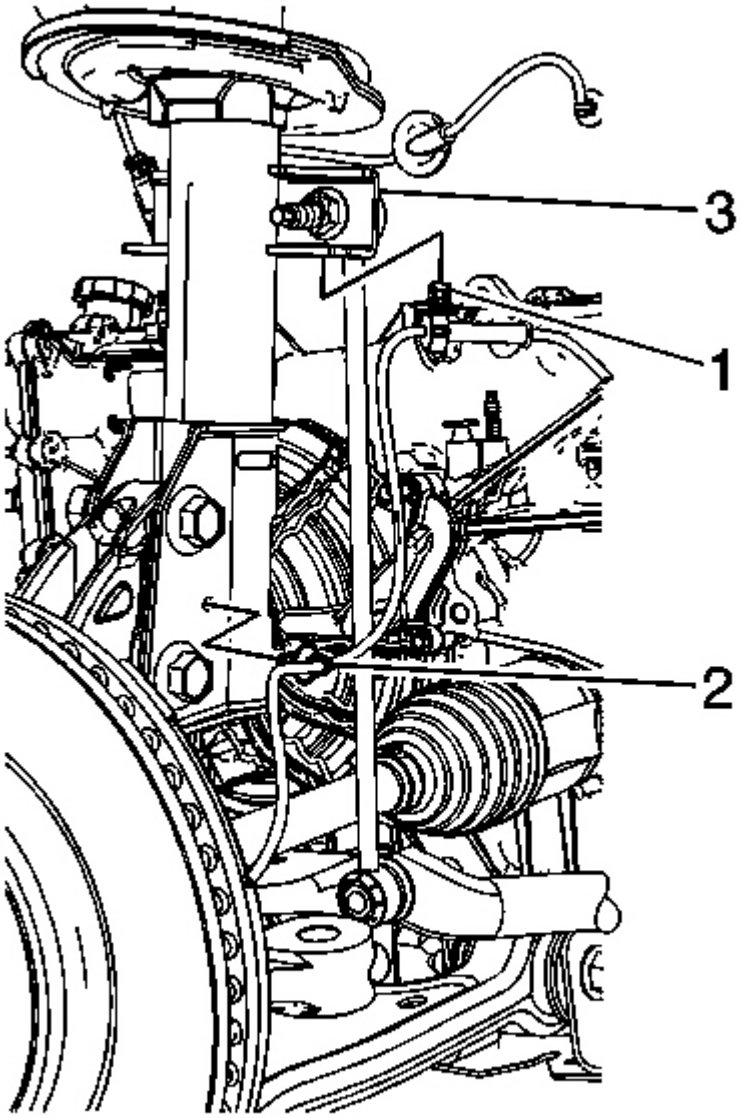


Fig. 38: Identifying Wheel Speed Sensor Wiring Harness & Front Strut
Courtesy of GENERAL MOTORS CORP.

3. Remove the wheel speed sensor wiring harness (1) and (2) from the front strut (3).

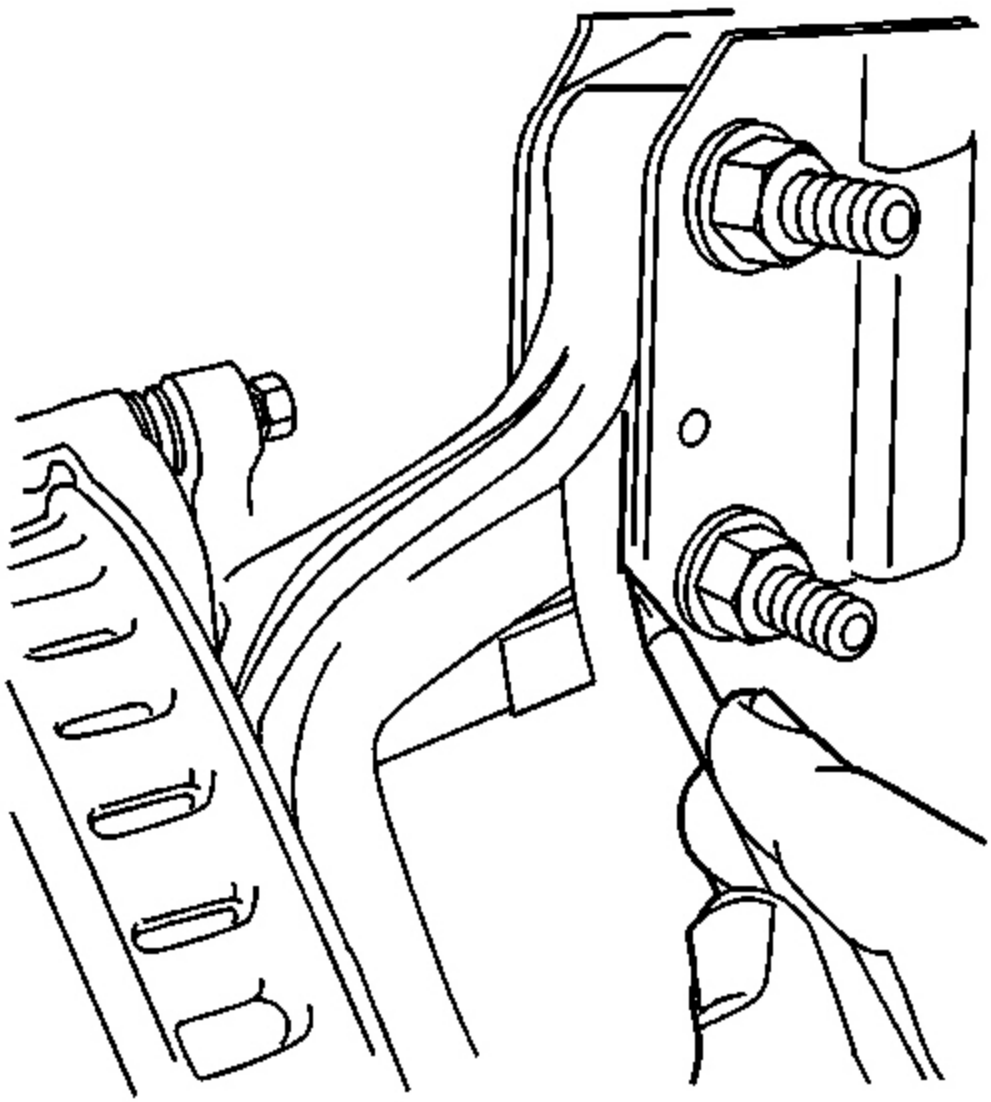


Fig. 39: Scribing Strut To Knuckle
Courtesy of GENERAL MOTORS CORP.

4. If removing the front strut to service any other suspension or steering component, scribe a line in the steering knuckle against the front strut. This will aid in the realigning the front

suspension.

5. Lower the vehicle to gain access to the upper strut mounting bolts.

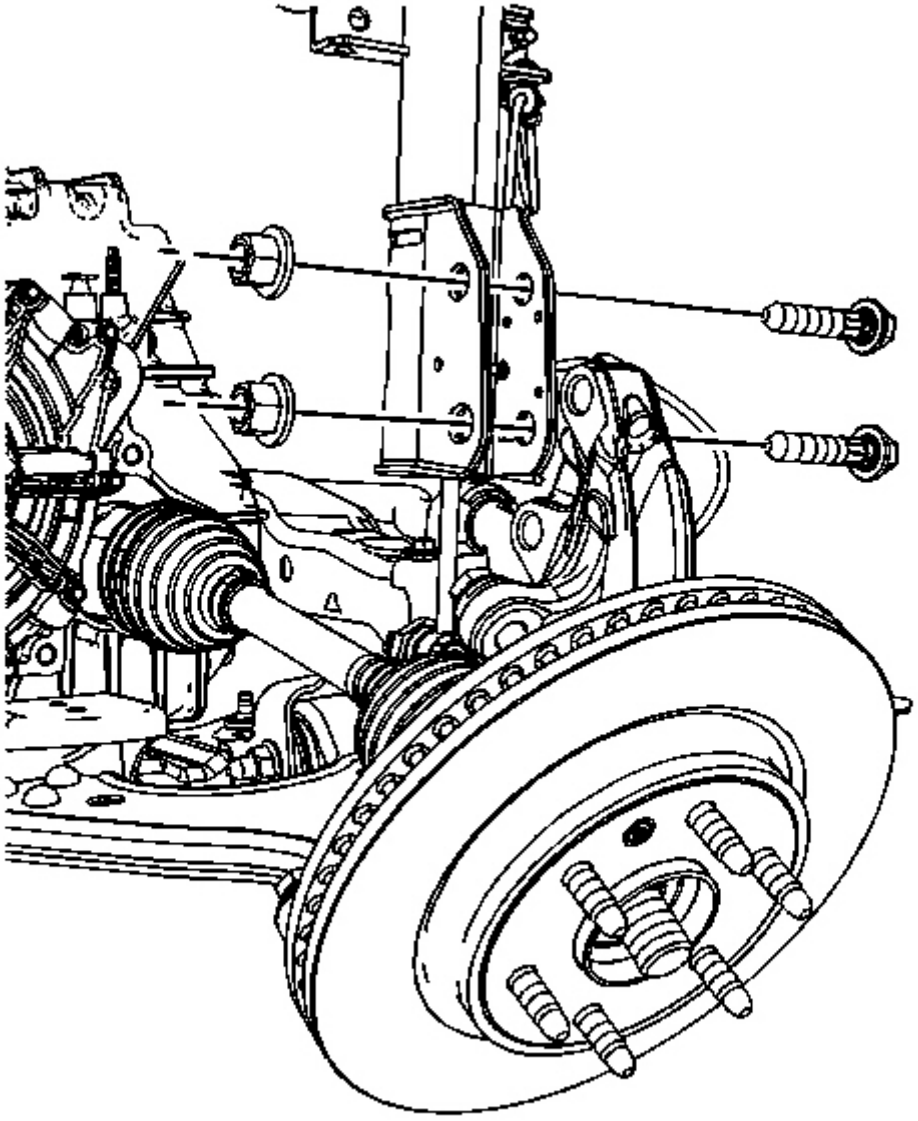


Fig. 40: Identifying Front Strut Mounting Bolts & Nuts
Courtesy of GENERAL MOTORS CORP.

6. Remove the front strut mounting bolts and nuts.

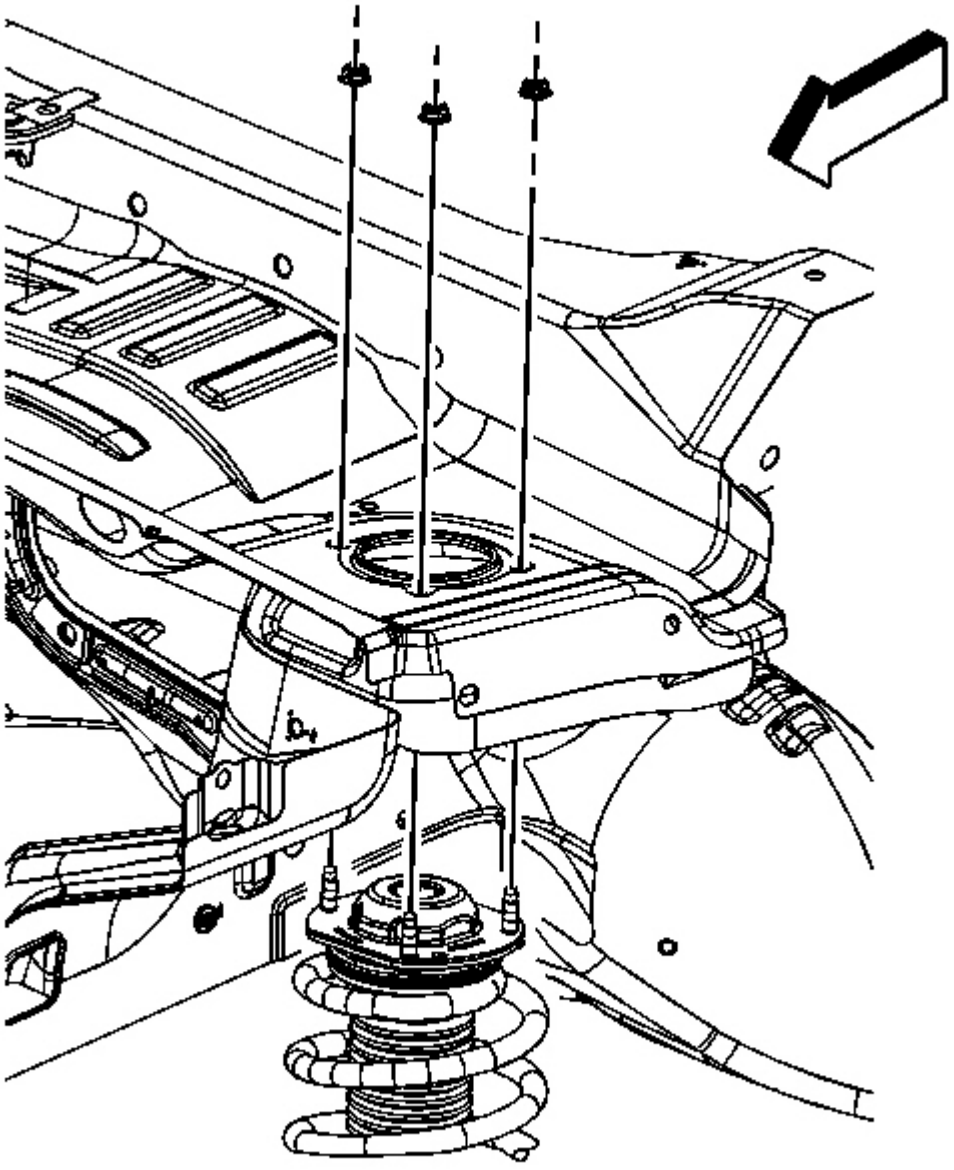


Fig. 41: Identifying Upper Strut Mounting Nuts
Courtesy of GENERAL MOTORS CORP.

7. Remove the upper strut mounting nuts.

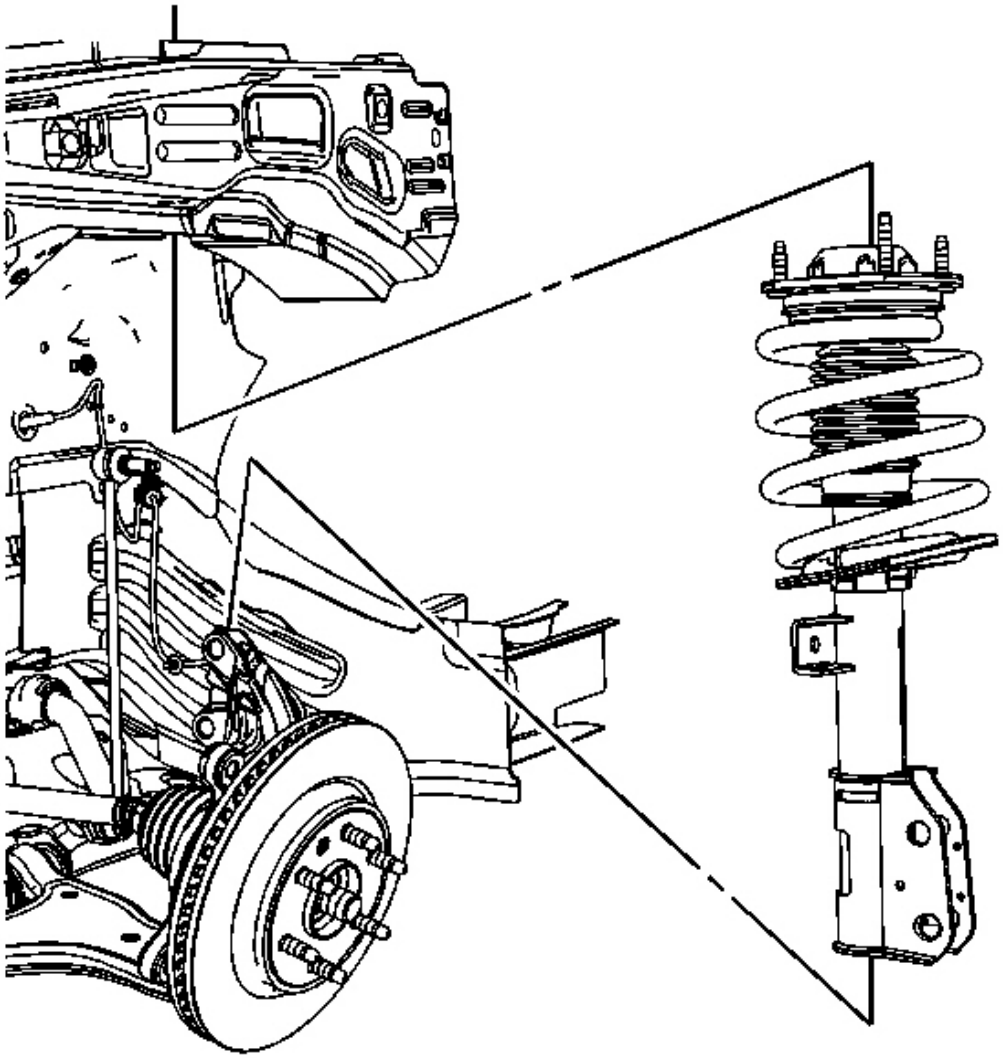


Fig. 42: Identifying Front Strut Assembly
Courtesy of GENERAL MOTORS CORP.

8. Separate the front strut from the steering knuckle.
9. Remove the front strut assembly from the vehicle.
10. If replacing the strut or the spring, refer to **Strut, Strut Component and/or Spring**

Replacement.

Installation Procedure

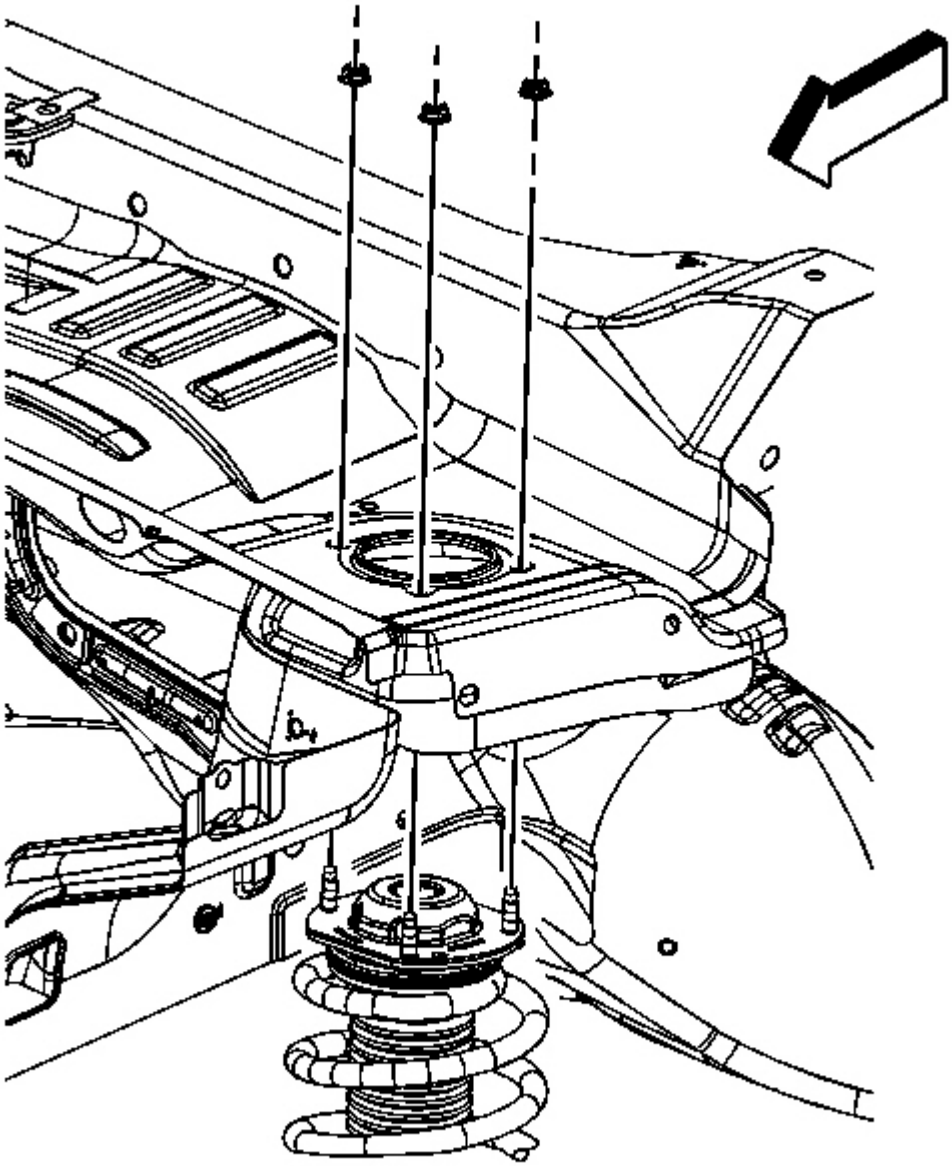


Fig. 43: Identifying Upper Strut Mounting Nuts
Courtesy of GENERAL MOTORS CORP.

1. Position the front strut in the strut tower.

   NOTE: Refer to Fastener Notice .

2. Install the upper strut mounting nuts.

   Tighten: Tighten the mounting nut to 83 N.m (61 lb ft).

3. Raise the vehicle.

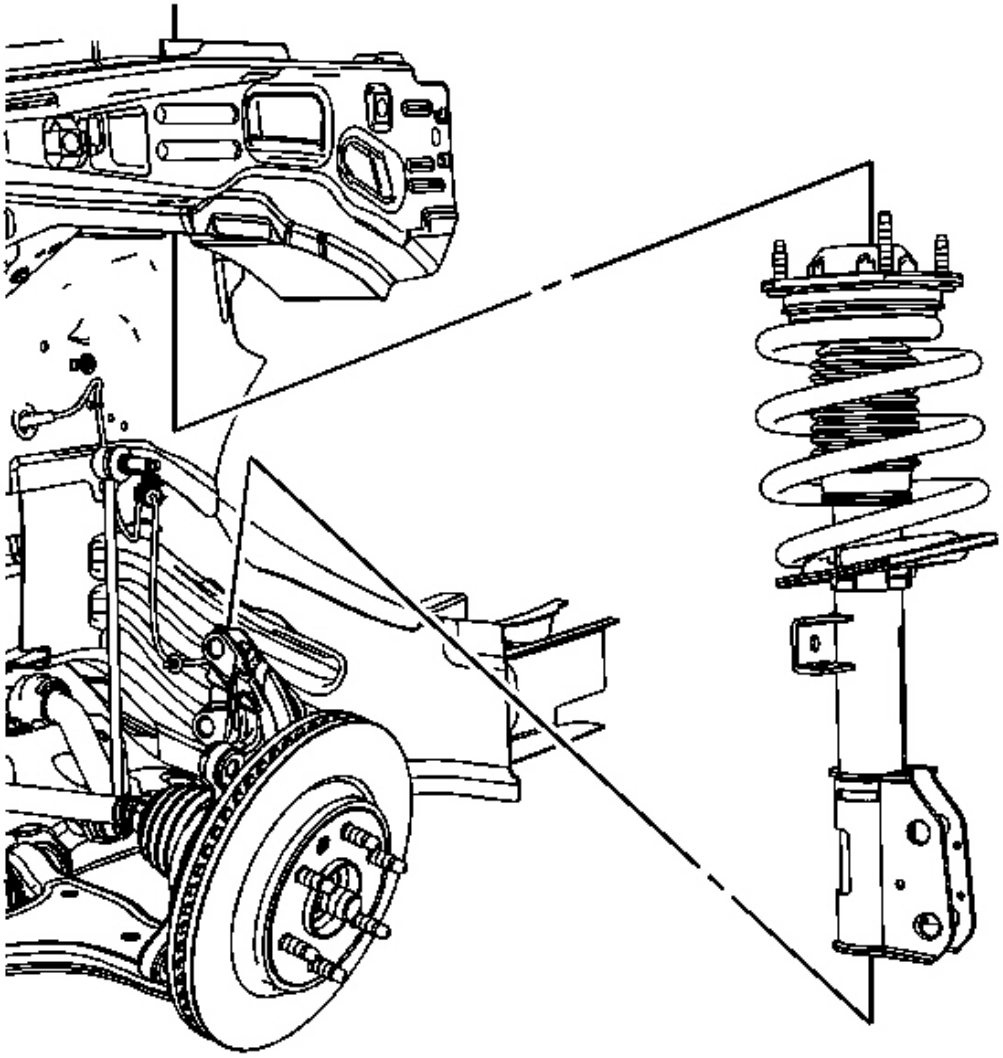


Fig. 44: Identifying Front Strut Assembly
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: If installing the front strut after servicing another steering or suspension component, align the front strut to the scribe mark on the steering knuckle.

4. Position the front strut on the steering knuckle.

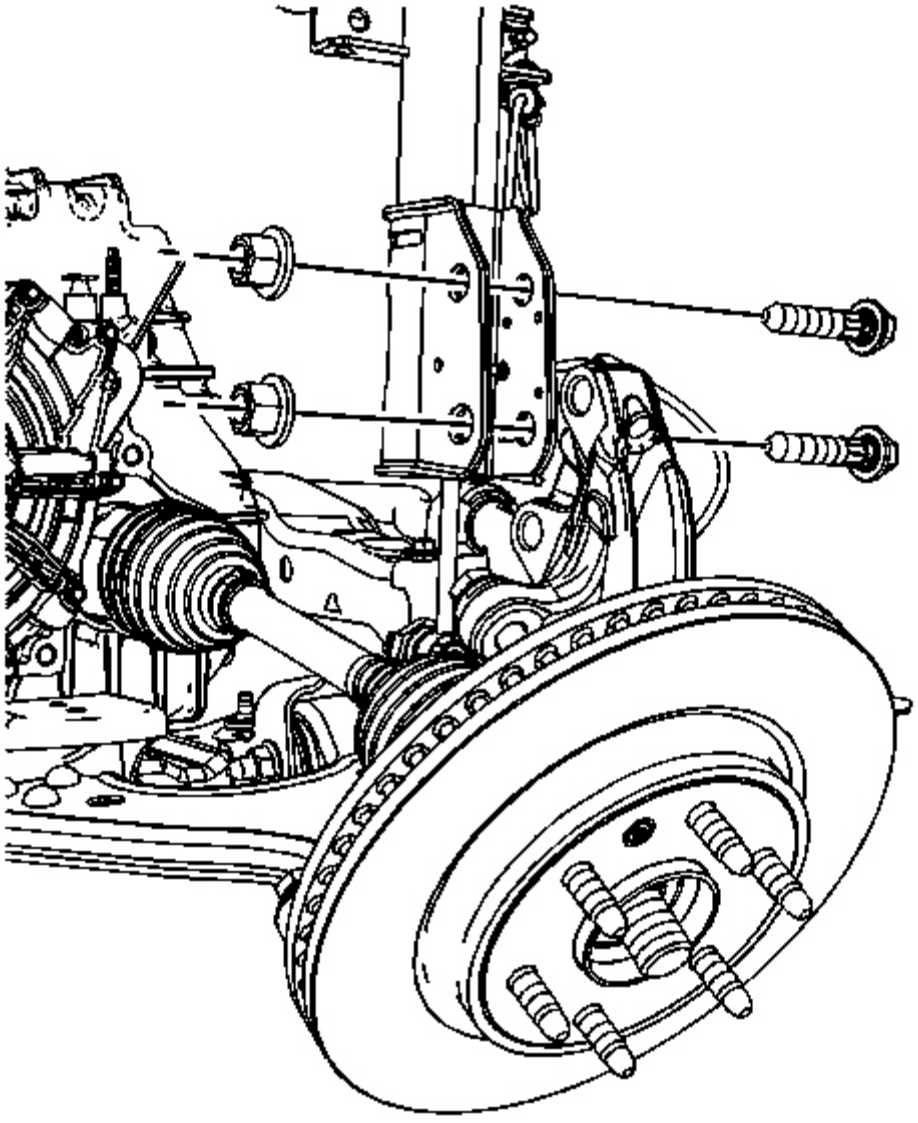


Fig. 45: Identifying Front Strut Mounting Bolts & Nuts
Courtesy of GENERAL MOTORS CORP.

5. Install the front strut to steering knuckle mounting nuts and bolts.

   Tighten: Tighten the mounting nut to 147 N.m (108 lb ft).

6. Install the stabilizer link at the front strut. Refer to **Stabilizer Shaft Link Replacement**.

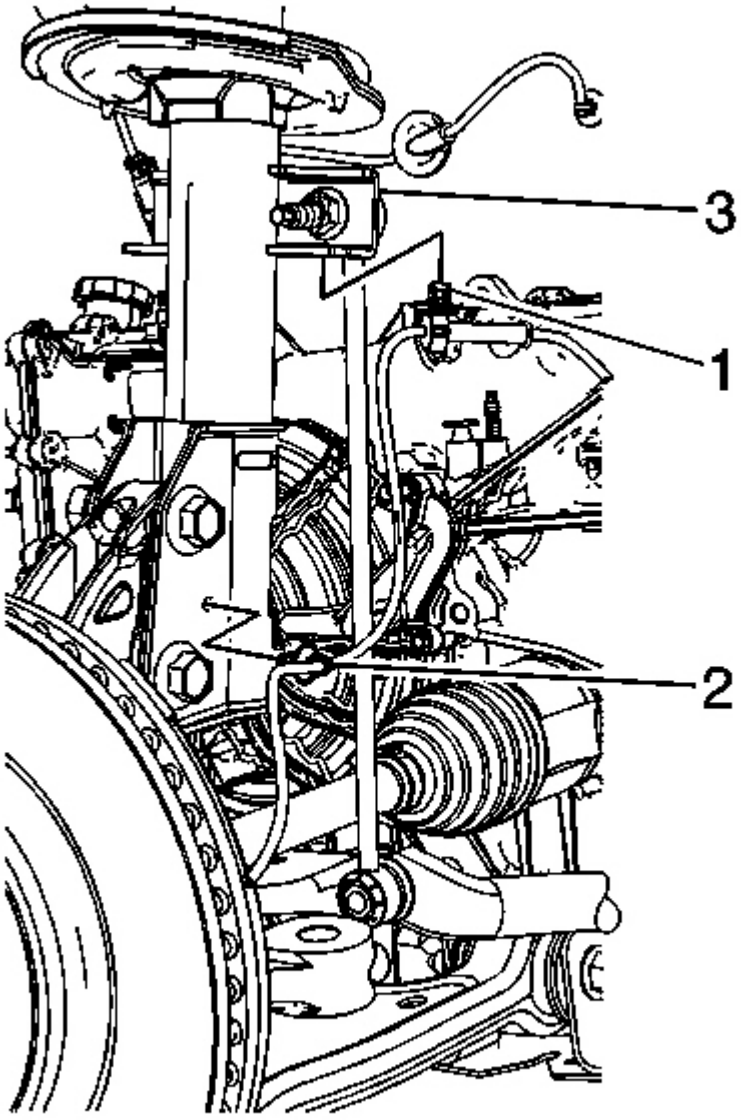


Fig. 46: Identifying Wheel Speed Sensor Wiring Harness & Front Strut
Courtesy of GENERAL MOTORS CORP.

7. Install the wheel speed sensor wiring harness (1) and (2) on the front strut (3).

8. Align the front end. Refer to **Measuring Wheel Alignment** .

SUSPENSION SHOCK/STRUT DISPOSAL

CAUTION: Use the proper eye protection when drilling to prevent metal chips from causing physical injury.

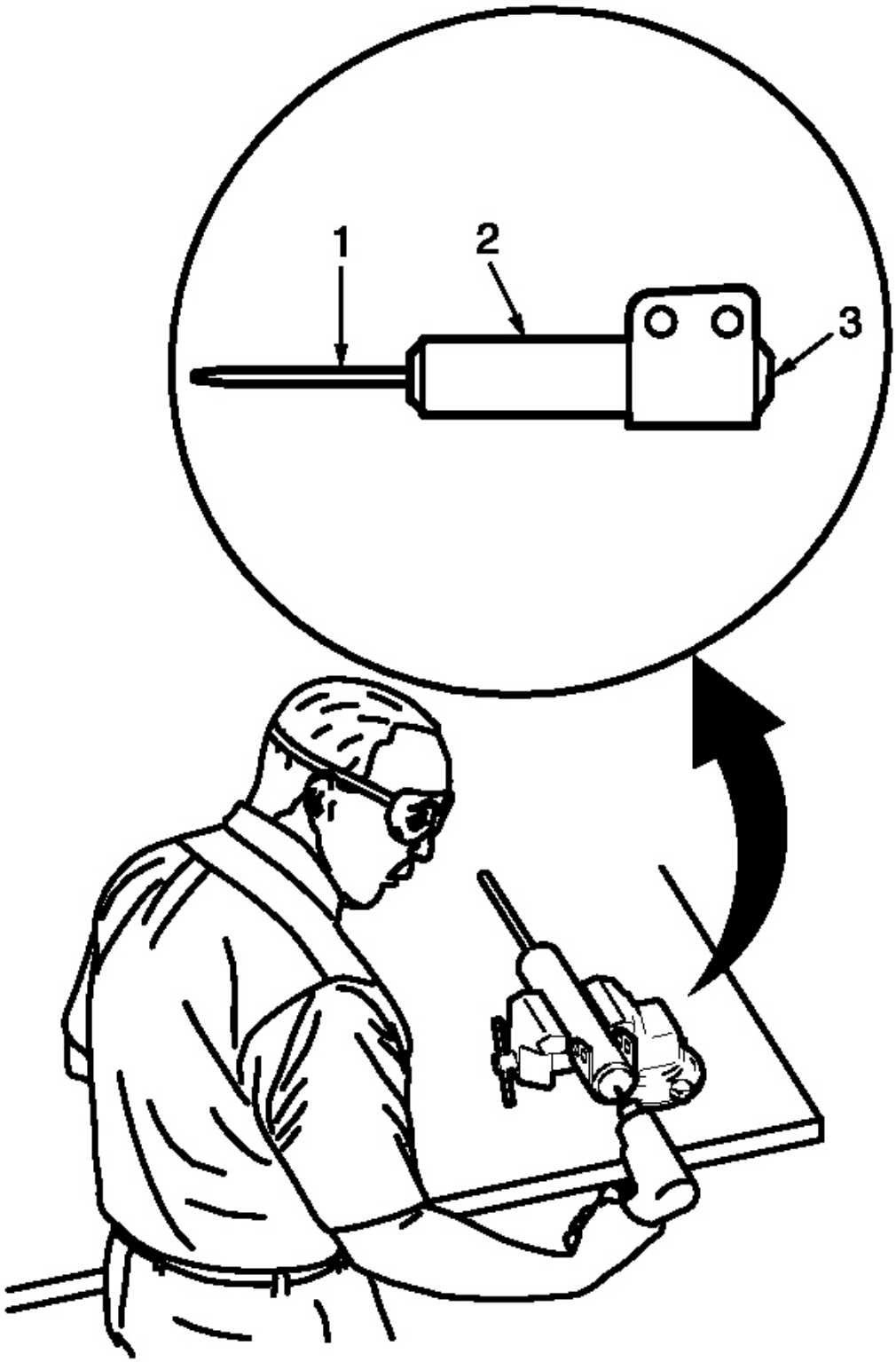

1
2
3

Fig. 47: Drilling Hole In Strut At Center Of End Cap
Courtesy of GENERAL MOTORS CORP.

1. Clamp the strut in a vise horizontally with the rod (1) completely extended.
2. Drill a hole in the strut at the center of the end cap (3) using a 5 mm (3/16 in) drill bit. Gas or a gas/oil mixture will exhaust when the drill bit penetrates the strut. Use shop towels in order to contain the escaping oil.
3. Remove the strut from the vise.
4. Hold the strut over a drain pan vertically with the hole down.
5. Move the rod (1) in and out of the tube (2) to completely drain the oil from the strut.

STRUT, STRUT COMPONENT AND/OR SPRING REPLACEMENT

Tools Required

- **J 42991** Strut Rod Nut Socket
- **J 45400** Strut Spring Compressor

Disassembly Procedure

1. Remove the strut from the vehicle. Refer to **Strut Assembly Replacement**.

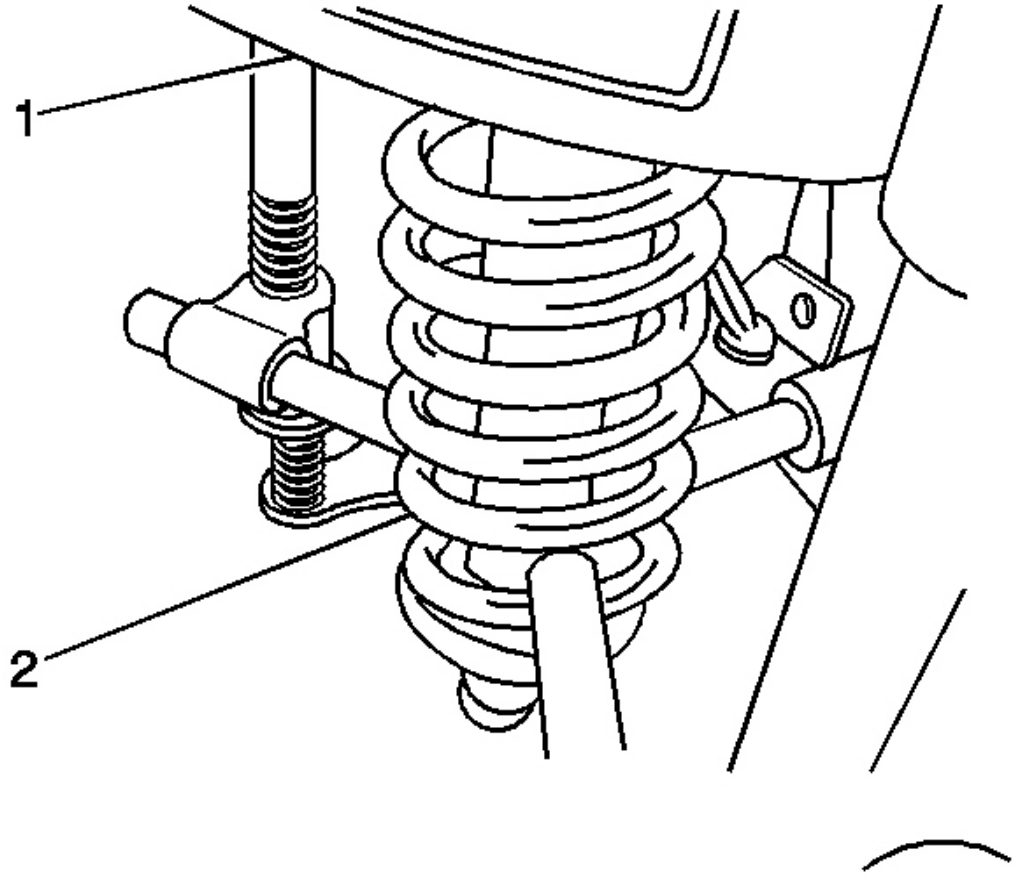


Fig. 48: Compressing/Releasing Lower Part Of Shock Spring
Courtesy of GENERAL MOTORS CORP.

2. Install the strut (2) in the **J 45400** (1).

IMPORTANT: The spring is compressed when the strut moves freely.

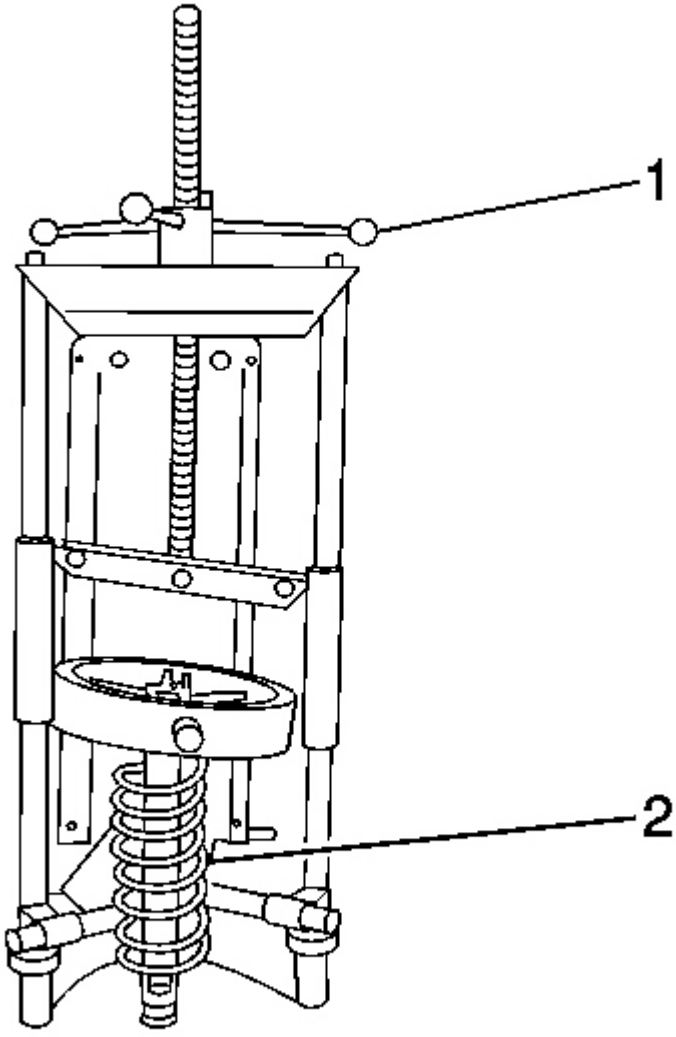


Fig. 49: View Of Compressor Forcing Screw & Coil Spring
Courtesy of GENERAL MOTORS CORP.

3. Turn the spring compressor forcing screw (1) until the coil spring (2) is compressed.
4. Use a 45 TORX® socket in order to hold the strut shaft. Use the **J 42991** to remove the upper strut mount nut.
5. Remove the strut from the **J 45400** .
6. Loosen the compressor forcing screw (1) until the upper strut mount and coil spring (2) may

be removed.

7. Remove the upper strut mount and the coil spring from the **J 45400** .

Assembly Procedure

1. Install the coil spring and upper strut mount to the **J 45400** .

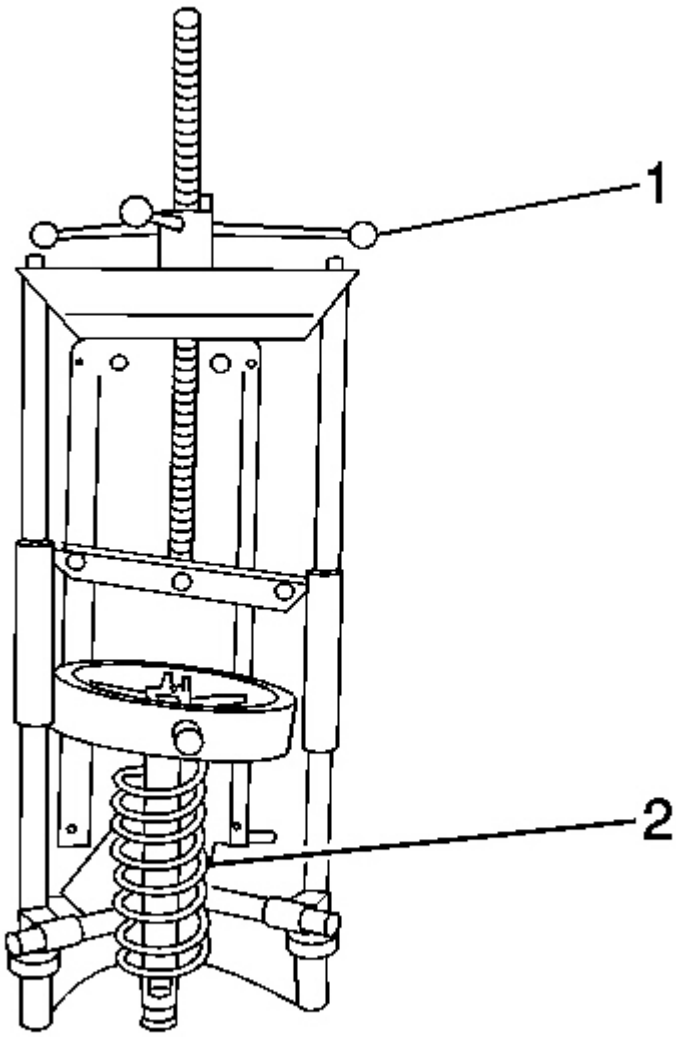


Fig. 50: View Of Compressor Forcing Screw & Coil Spring
Courtesy of GENERAL MOTORS CORP.

2. Turn the spring compressor forcing screw (1) until the coil spring is compressed.
3. Install the strut to the coil spring and upper strut mount.
4. Loosely install the strut retaining nut.

NOTE: Refer to Fastener Notice .

5. Use a 45 TORX® socket in order to hold the strut shaft. Use the **J 42991** to install the upper strut mount nut.

   Tighten: Tighten the strut mount nut to 85 N.m (63 lb ft).

6. Remove the strut from the **J 45400** .
7. Install the strut to the vehicle. Refer to **Strut Assembly Replacement**.

DESCRIPTION AND OPERATION

FRONT SUSPENSION DESCRIPTION AND OPERATION

The front suspension has 2 primary purposes:

- Isolate the driver from irregularities in the road surface.
- Define the ride and handling characteristics of the vehicle.

The front suspension absorbs the impact of the tires travelling over irregular road surfaces and dissipates this energy throughout the suspension system. This process isolates the vehicle occupants from the road surface. The rate at which the suspension dissipates the energy and the amount of energy that is absorbed is how the suspension defines the vehicles ride characteristics. Ride characteristics are designed into the suspension system and are not adjustable. The ride characteristics are mentioned in this description in order to aid in the understanding of the functions of the suspension system. The suspension system must allow for the vertical movement of the tire and wheel assembly as the vehicle travels over irregular road surfaces while maintaining the tire's horizontal relationship to the road.

This requires that the steering knuckle be suspended between a lower control arm and a strut assembly. The lower control arm attaches from the steering knuckle at the outermost point of the control arm. The attachment is through a ball and socket type joint. The innermost end of the control arm attached at 2 points to the vehicle frame through semi-rigid bushings. The upper portion of the steering knuckle is attached to a strut assembly. The strut assembly then connects to the vehicle body by way of an upper bearing. The steering knuckle is allowed to travel up and down independent of the vehicle body structure and frame.

This up and down motion of the steering knuckle as the vehicle travels over bumps is absorbed predominantly by the coil spring. This spring is retained under tension over the strut assembly. A strut is used in conjunction with this system in order to dampen out the oscillations of the coil spring. A strut is a basic hydraulic cylinder. The strut is filled with oil and has a moveable shaft that connects to a piston inside the strut. Valves inside the shock absorber offer resistance to oil flow and consequently inhibit rapid movement of the piston and shaft. Each end of the shock absorber is connected in such a fashion to utilize this recoil action of a spring alone. Each end of the strut is designed as the connection point of the suspension system to the vehicle and acts as the coil spring seat. This allows the strut to utilize the dampening action to reduce the recoil of a spring alone. The lower control arm is allowed to pivot at the vehicle frame in a vertical fashion. The ball joint allows the steering knuckle to maintain the perpendicular relationship to the road surface.

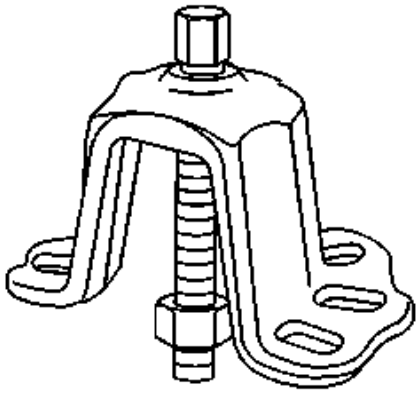
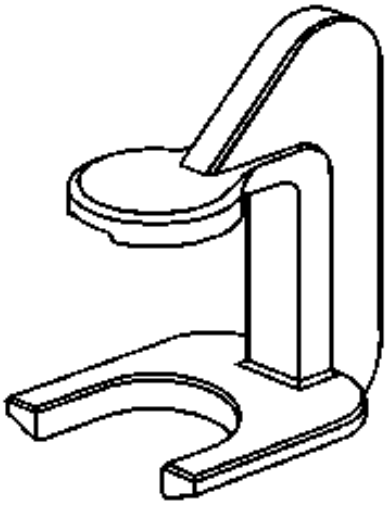
Front suspensions systems utilize a stabilizer shaft. The stabilizer bar connects between the left and right lower control arm assemblies through the stabilizer link and stabilizer shaft insulators. This bar controls the amount of independent movement of the suspension when the vehicle turns. Limiting the independent movement defines the vehicles handling characteristics on turns.

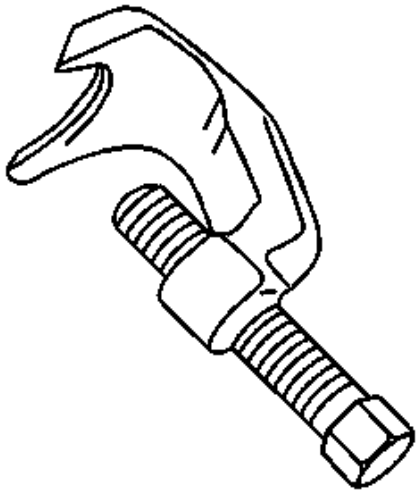
SPECIAL TOOLS AND EQUIPMENT

SPECIAL TOOLS

Special Tools

Illustration	Tool Number/Description
	J 2619-01 Slide Hammer
	J 28733-B

	Front/Rear Spindle Remover
	J 41820 Ball Joint Separator

	J 43631 Ball Joint Operator