SUSPENSION

Front Suspension - Escalade, Suburban, Tahoe, Yukon

SPECIFICATIONS

FASTENER SPECIFICATIONS

Application	Specification	
	Metric	English
Front Lower Control Arm Ball Stud Nut (Heavy Duty)		
• First Pass:	50 N.m	37 lb ft
• Final Pass:	90-100 degrees	
Front Lower Control Arm Ball Stud Nut (Light Duty)		
• First Pass:	50 N.m	37 lb ft
• Final Pass:	125-135 degrees	
Front Lower Control Arm Front Nut (Heavy Duty) **(Requires a NEW bolt.)**		
• First Pass:	180 N.m	133 lb ft
• Final Pass:	45-75 degrees	
Front Lower Control Arm Nut (Light Duty)	175 N.m	129 lb ft
Front Lower Control Arm Rear Nut (Heavy Duty) **(Requires a NEW bolt.)**		
• First Pass:	180 N.m	133 lb ft
• Final Pass:	45-75 degrees	
Front Shock Absorber Bolt (Heavy Duty, Lower Bolt)	80 N.m	59 lb ft

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Application	Specification	
	Metric	English
Front Shock Absorber Bolt (Light Duty, Lower Bolt)	50 N.m	37 lb ft
Front Shock Absorber Nut (Heavy Duty, Upper Nut)	22 N.m	16 lb ft
Front Shock Absorber Nut (Light Duty, Upper Nut)	50 N.m	37 lb ft
Front Shock Absorber Nut (Light Duty, Upper Rod, With Z85/Z95)	75 N.m	55 lb ft
Front Shock Absorber Nut (Light Duty, Upper Rod, Without Z85/Z95)	50 N.m	37 lb ft
Front Stabilizer Shaft Clamp Bolt	50 N.m	37 lb ft
Front Stabilizer Shaft Link Nut	23 N.m	17 lb ft
Front Upper Control Arm Ball Stud Nut (Heavy Duty)	50 N.m	37 lb ft
Front Upper Control Arm Ball Stud Nut (Light Duty)		
• First Pass:	50 N.m	37 lb ft
• Final Pass:	90-110 degrees	
Front Upper Control Arm Nut (Heavy Duty)	260 N.m	192 lb ft
Front Upper Control Arm Nut (Light Duty)	190 N.m	140 lb ft
Front Wheel Hub and Bearing Assembly Bolt	180 N.m	133 lb ft
Torsion Bar Support Assembly Bolt	125 N.m	92 lb ft

ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS

Application	Type of Material	GM Part Number	
		US	Canada
Front Stabilizer Shaft Link Bolt	Threadlocker	12345382	10953489

REPAIR INSTRUCTIONS

STABILIZER SHAFT REPLACEMENT (LIGHT DUTY)

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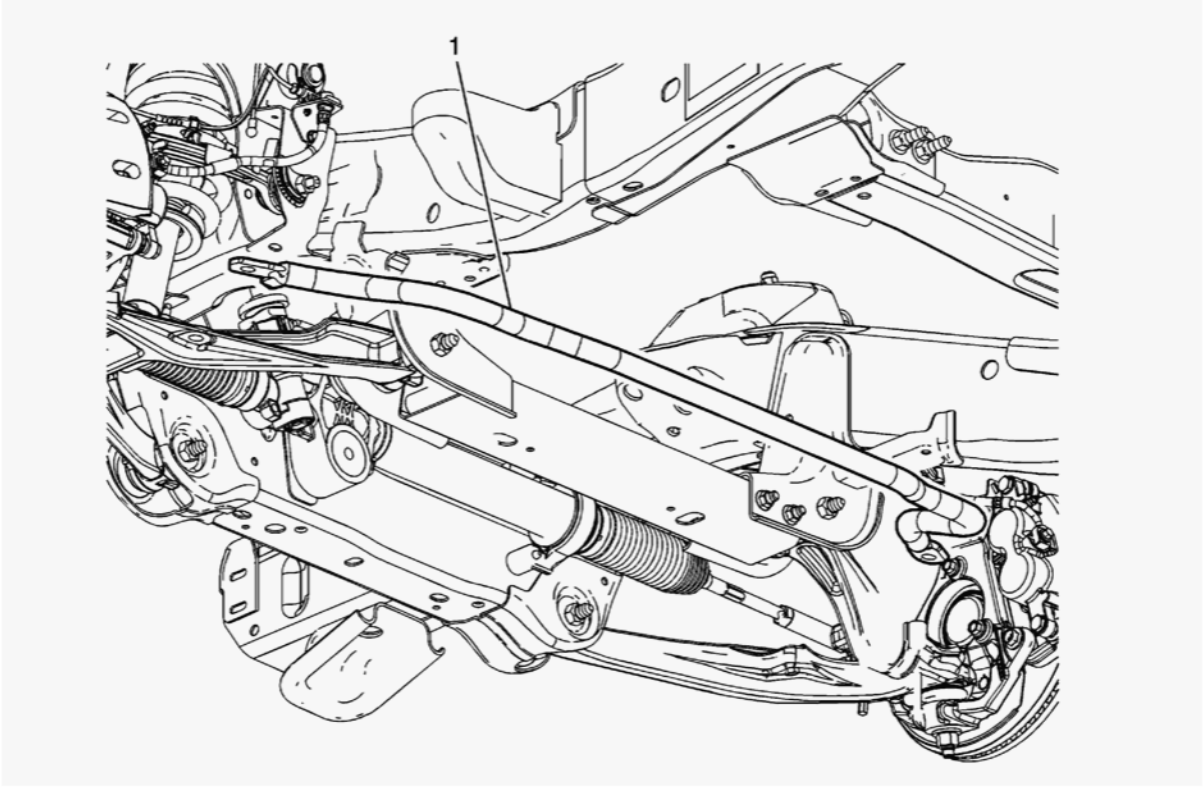


Fig. 1: Stabilizer Shaft
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Steering Gear Skid Shield Replacement 2. Stabilizer Shaft Link Replacement (Light Duty) 3. Stabilizer Shaft Insulator Replacement (Light Duty)	
1	Front Stabilizer Shaft

STABILIZER SHAFT REPLACEMENT (HEAVY DUTY)

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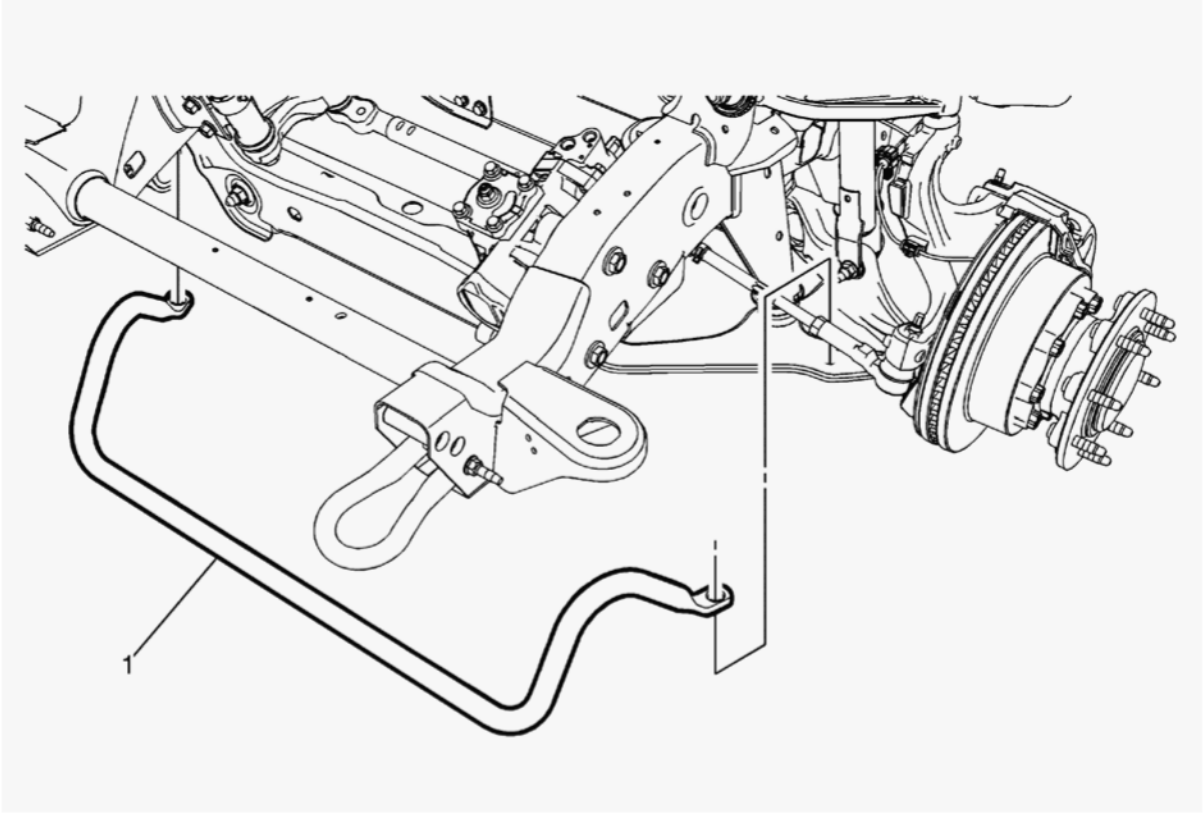


Fig. 2: View Of Stabilizer Shaft (2500, 3500)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Steering Gear Skid Shield Replacement 2. Stabilizer Shaft Link Replacement (Heavy Duty) 3. Stabilizer Shaft Insulator Replacement (Heavy Duty)	
1	Front Stabilizer Shaft

STABILIZER SHAFT LINK REPLACEMENT (LIGHT DUTY)

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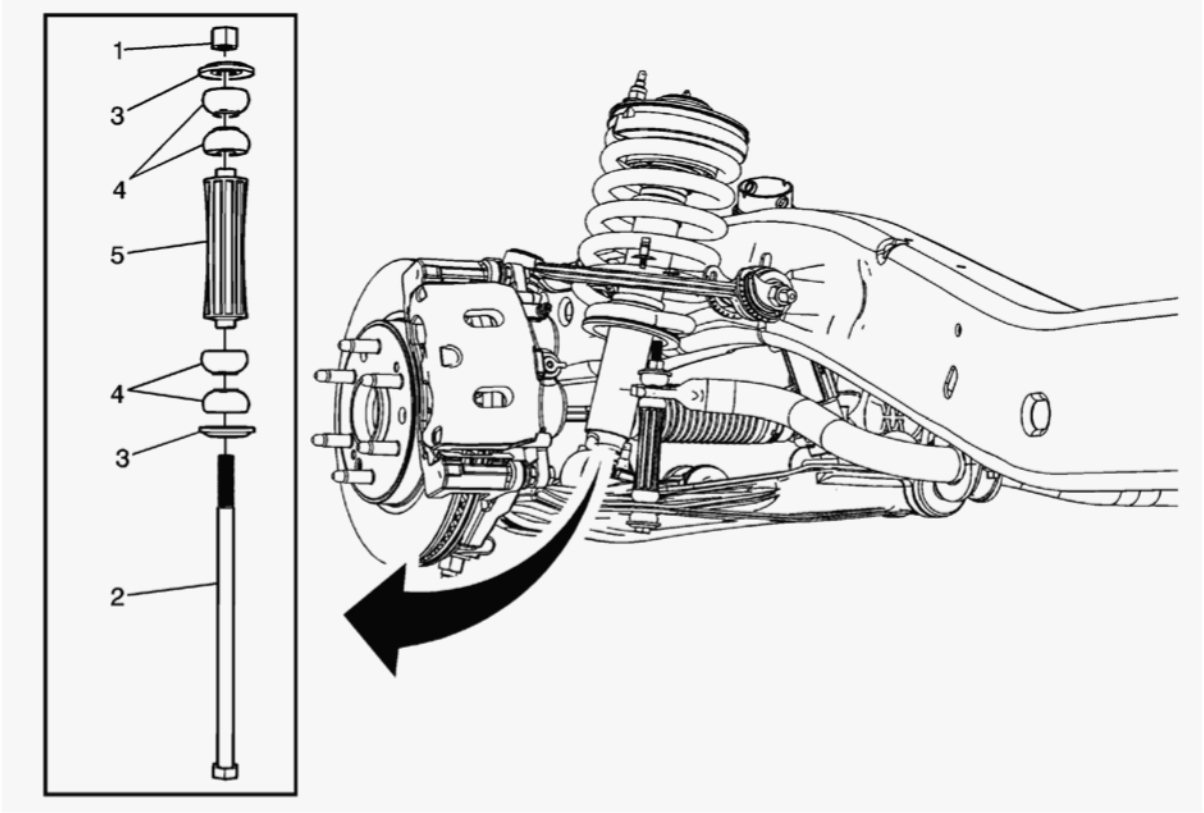


Fig. 3: View Of Stabilizer Shaft Link (1500)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Remove the front tire and wheel assembly. Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal and Installation (8-Lug Wheel)	
1	Front Stabilizer Shaft Link Nut **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Procedure Remove all traces of the original adhesive patch. **Tighten** 23 N.m (17 lb ft)
2	Front Stabilizer Shaft Link Bolt **Procedure** 1. Remove all traces of the original adhesive patch. 2. Apply thread locking adhesive to the bolt. **Adhesives, Fluids, Lubricants, and Sealers**
3	Front Stabilizer Shaft Link Washer (Qty: 2)
4	Front Stabilizer Shaft Link Insulator (Qty: 4)
5	Front Stabilizer Shaft Link Spacer

STABILIZER SHAFT LINK REPLACEMENT (HEAVY DUTY)

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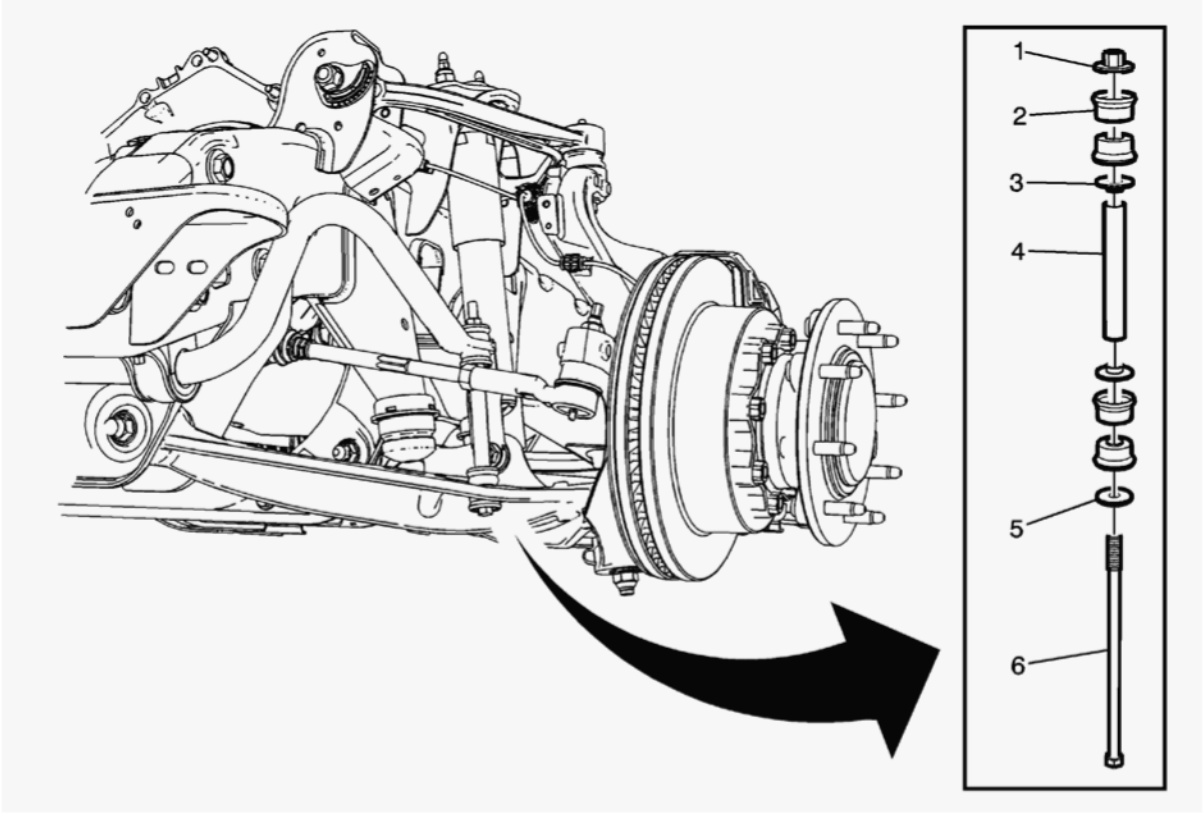


Fig. 4: View Of Stabilizer Shaft Link (2500, 3500)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. **Lifting and Jacking the Vehicle**	
1	Front Stabilizer Shaft Link Nut **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Procedure Remove all traces of the original adhesive patch. **Tighten** 23 N.m (17 lb ft)
2	Front Stabilizer Shaft Link Insulator (Qty: 4)
3	Front Stabilizer Shaft Link Washer (Qty: 2)
4	Front Stabilizer Shaft Link
5	Front Stabilizer Shaft Link Washer
6	Front Stabilizer Shaft Link Bolt **Procedure** 1. Remove all traces of the original adhesive patch. 2. Apply thread locking adhesive to the bolt. **Adhesives, Fluids, Lubricants, and Sealers**

STABILIZER SHAFT INSULATOR REPLACEMENT (LIGHT DUTY)

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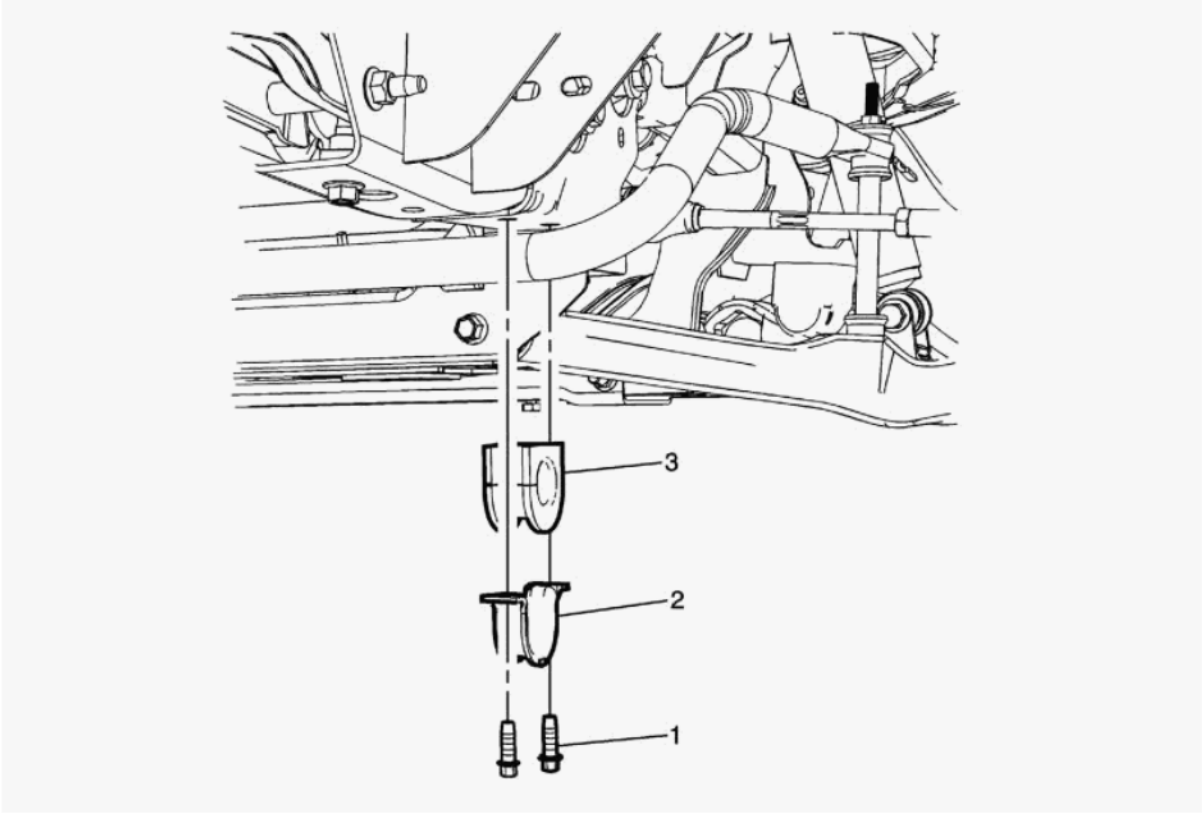


Fig. 5: Stabilizer Shaft Insulator
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Steering Gear Skid Shield Replacement	
1	Front Stabilizer Shaft Clamp Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 50 N.m (37 lb ft)
2	Front Stabilizer Shaft Clamp
3	Front Stabilizer Shaft Insulator **NOTE:** **Ensure the slit in the front stabilizer shaft insulator is facing toward the front of the vehicle when installed.**

STABILIZER SHAFT INSULATOR REPLACEMENT (HEAVY DUTY)

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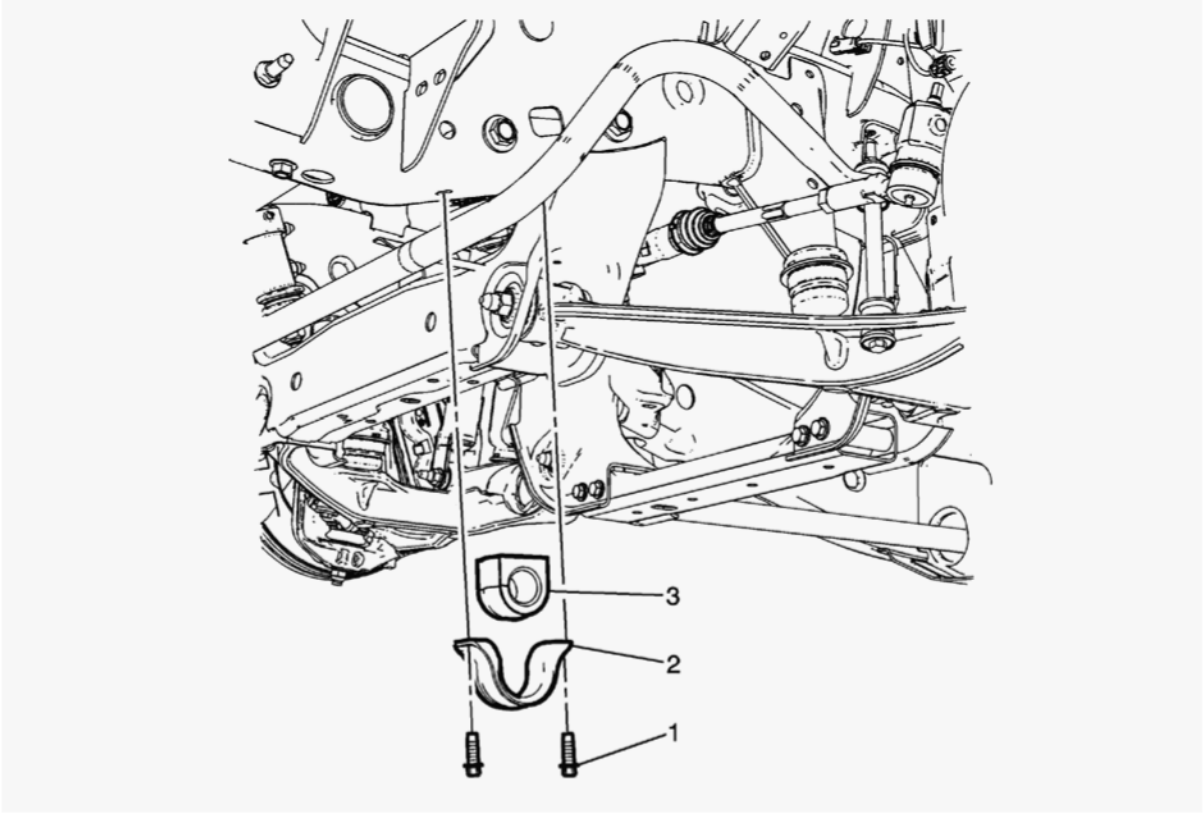


Fig. 6: Stabilizer Shaft Insulator (Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. **Lifting and Jacking the Vehicle**	
1	Front Stabilizer Shaft Clamp Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .**

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Callout	Component Name
	Tighten 50 N.m (37 lb ft)
2	Front Stabilizer Shaft Clamp
3	Front Stabilizer Shaft Insulator **NOTE:** **Ensure the slit in the front stabilizer shaft insulator is facing toward the front of the vehicle when installed.**

STEERING KNUCKLE REPLACEMENT (LIGHT DUTY)

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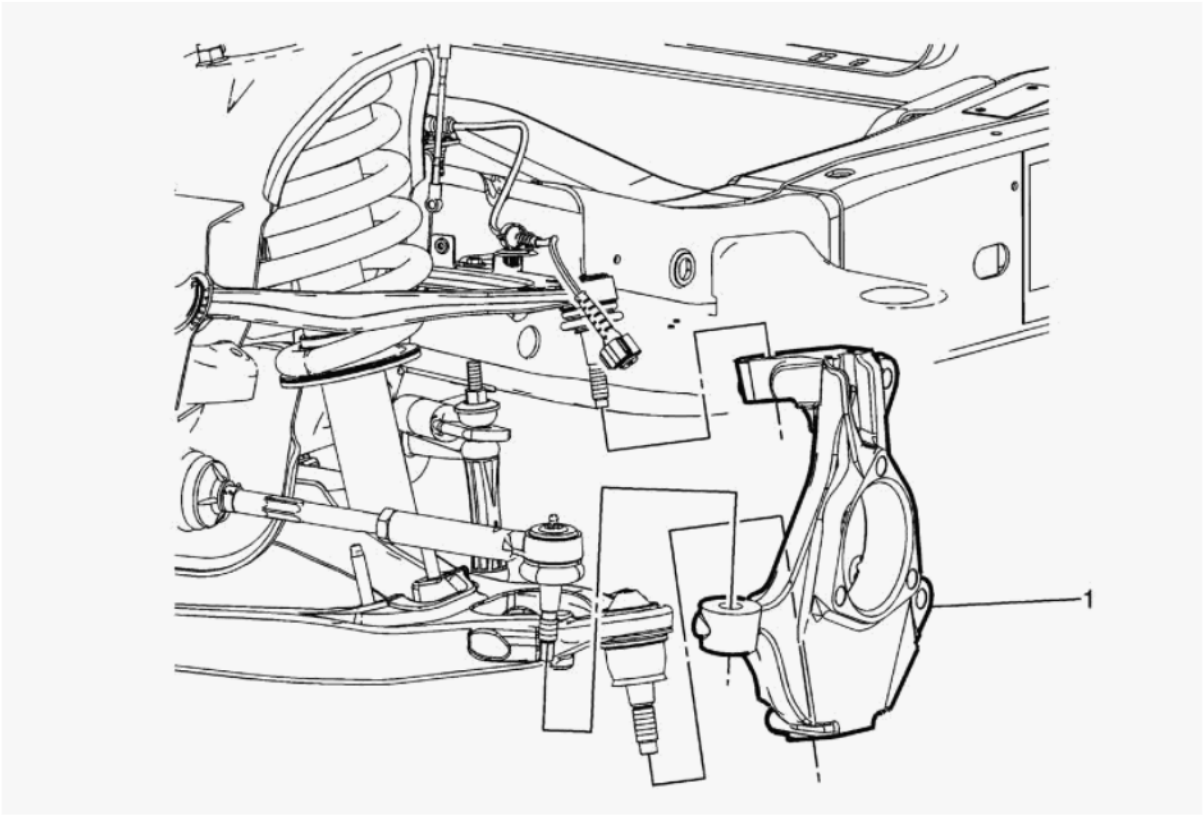


Fig. 7: Steering Knuckle (Light Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** 2. **Front Wheel Hub, Bearing, and Seal Replacement (Light Duty)**	
1	Steering Knuckle **Procedure** 1. Separate Steering Linkage Outer Tie Rod@Steering Knuckle **Steering Linkage Outer Tie Rod Replacement (Light**

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Callout	Component Name
	Duty) 2. Separate Front Upper Control Arm@Steering Knuckle Upper Control Arm Replacement (Light Duty) 3. Separate Front Lower Control Arm@Steering Knuckle Lower Control Arm Replacement (Light Duty) 4. Measure and adjust the wheel alignment. Wheel Alignment Measurement

STEERING KNUCKLE REPLACEMENT (HEAVY DUTY)

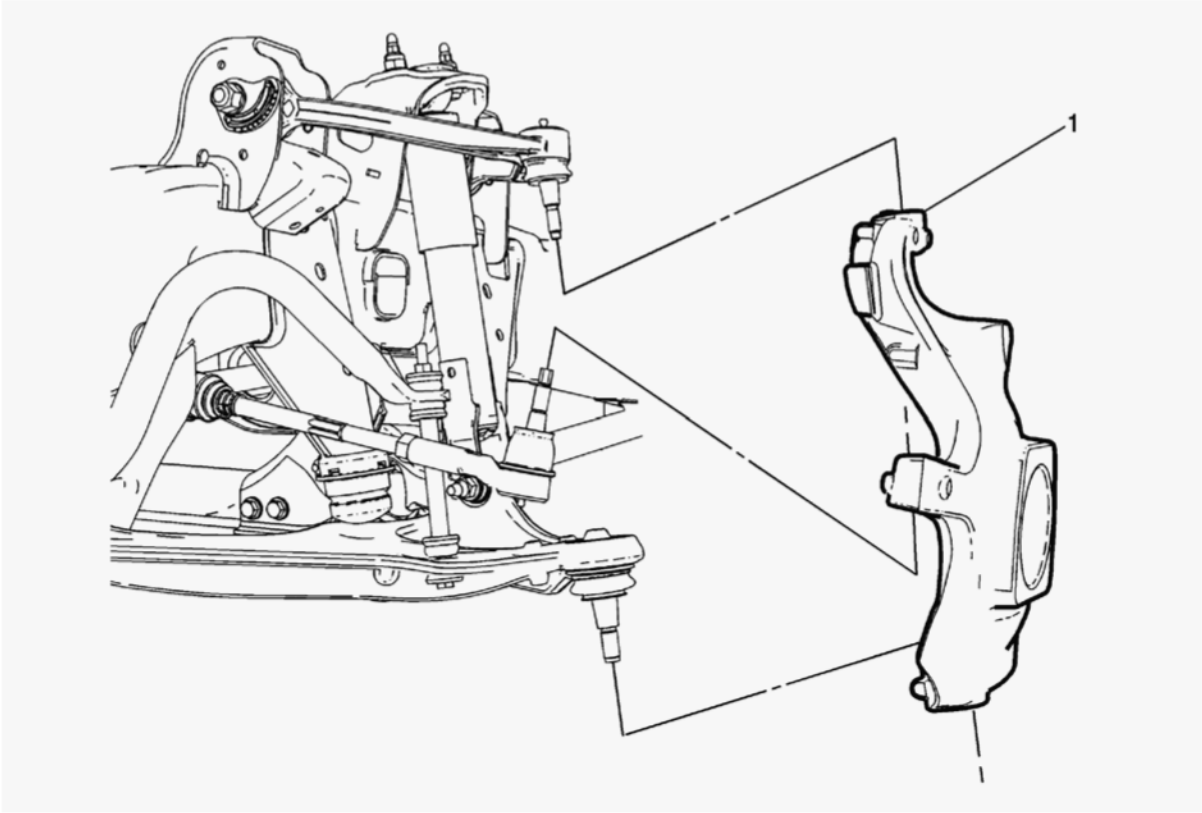


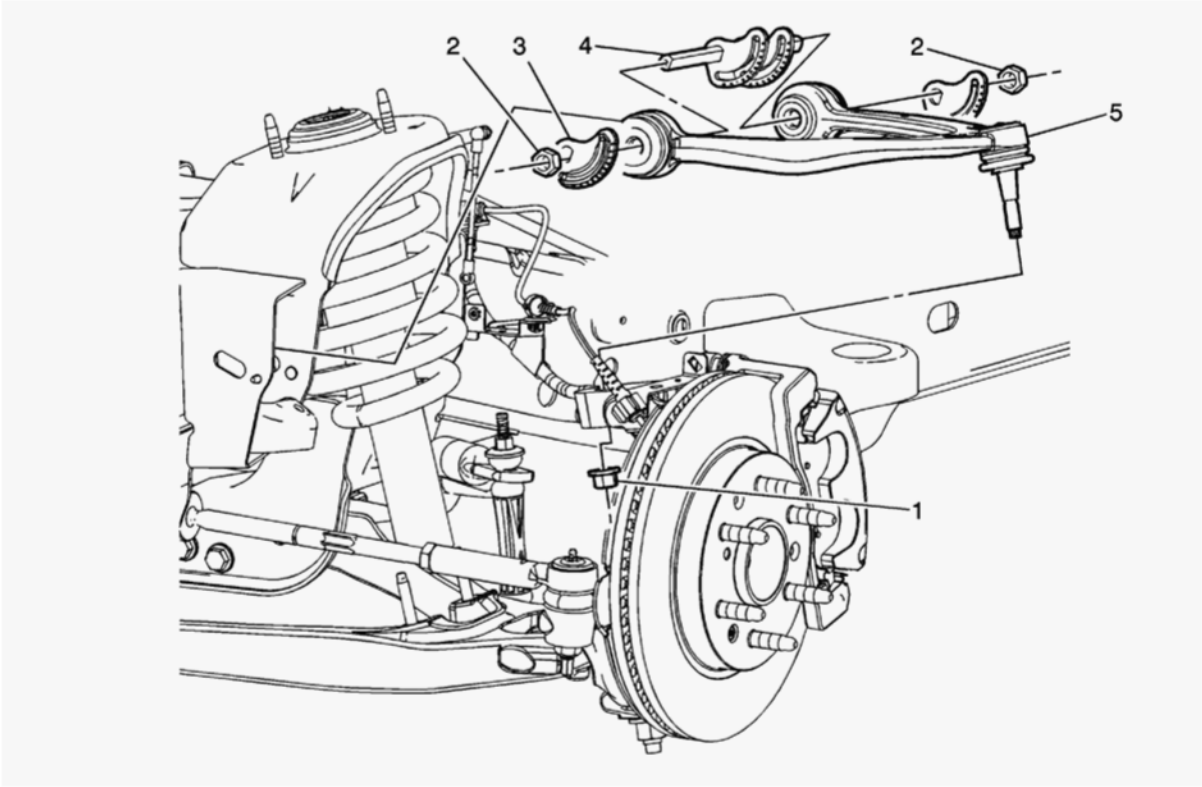
Fig. 8: Steering Knuckle (Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
1. **Front Wheel Hub, Bearing, and Seal Replacement (Heavy Duty)** 2. Separate Front Brake Hose Bracket @Steering Knuckle **Front Brake Hose Replacement (JD9)** **Front Brake Hose Replacement (J95)** 3. Separate Steering Linkage Outer Tie Rod@Steering Knuckle **Steering Linkage Outer Tie Rod Replacement** 4. Separate Front Upper Control Arm@Steering Knuckle **Upper Control Arm Replacement (Heavy Duty)** 5. Separate Front Lower Control Arm@Steering Knuckle **Lower Control Arm Replacement (Heavy Duty)**	
1	Steering Knuckle **Procedure** Measure and adjust the wheel alignment. **Wheel Alignment Measurement**

UPPER CONTROL ARM REPLACEMENT (LIGHT DUTY)



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Fig. 9: View Of Upper Control Arm & Components
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front wheel speed sensor wiring harness from the steering knuckle. **Front Wheel Speed Sensor Replacement (Without 9C1)** **Front Wheel Speed Sensor Replacement (With 9C1)** 2. Remove the front shock absorber nuts. **Shock Absorber and Spring Removal and Installation (Light Duty, With Z85/Z95)** **Shock Absorber and Spring Removal and Installation (Light Duty, Without Z85/Z95)**	
1	Front Upper Control Arm Ball Stud Nut **CAUTION:** **Refer to Fastener Caution .** **Procedure** 1. Use a suitable jack stand to support the front lower control arm. 2. Use the **CH-42188-B** separator to separate the front upper control arm from the steering knuckle. **Tighten** First Pass: 50 N.m (37 lb ft) Final Pass: (90-110 degrees) **Special Tools** **CH-42188-B** Ball Joint Separator Equivalent regional tools:**Special Tools**
2	Front Upper Control Arm Nut **Tighten** 190 N.m (140 lb ft)
3	Front Upper Control Arm Adjust Cam

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Callout	Component Name
4	Front Upper Control Arm Bolt **Procedure** Pull the front shock absorber assembly down and reposition as necessary to gain the clearance to remove the front upper control arm bolts.
5	Front Upper Control Arm **Procedure** Measure and adjust the wheel alignment. **Wheel Alignment Measurement**

UPPER CONTROL ARM REPLACEMENT (HEAVY DUTY)

Special Tools

CH-42188-B Ball Joint Separator

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
2. Separate Front Wheel Speed Sensor Bracket @Front Upper Control Arm **Front Wheel Speed Sensor Replacement**
3. Separate Front Brake Hose Bracket @Front Upper Control Arm **Front Brake Hose Replacement (JD9)** **Front Brake Hose Replacement (J95)**
4. Use a suitable jack stand to support the front lower control arm.

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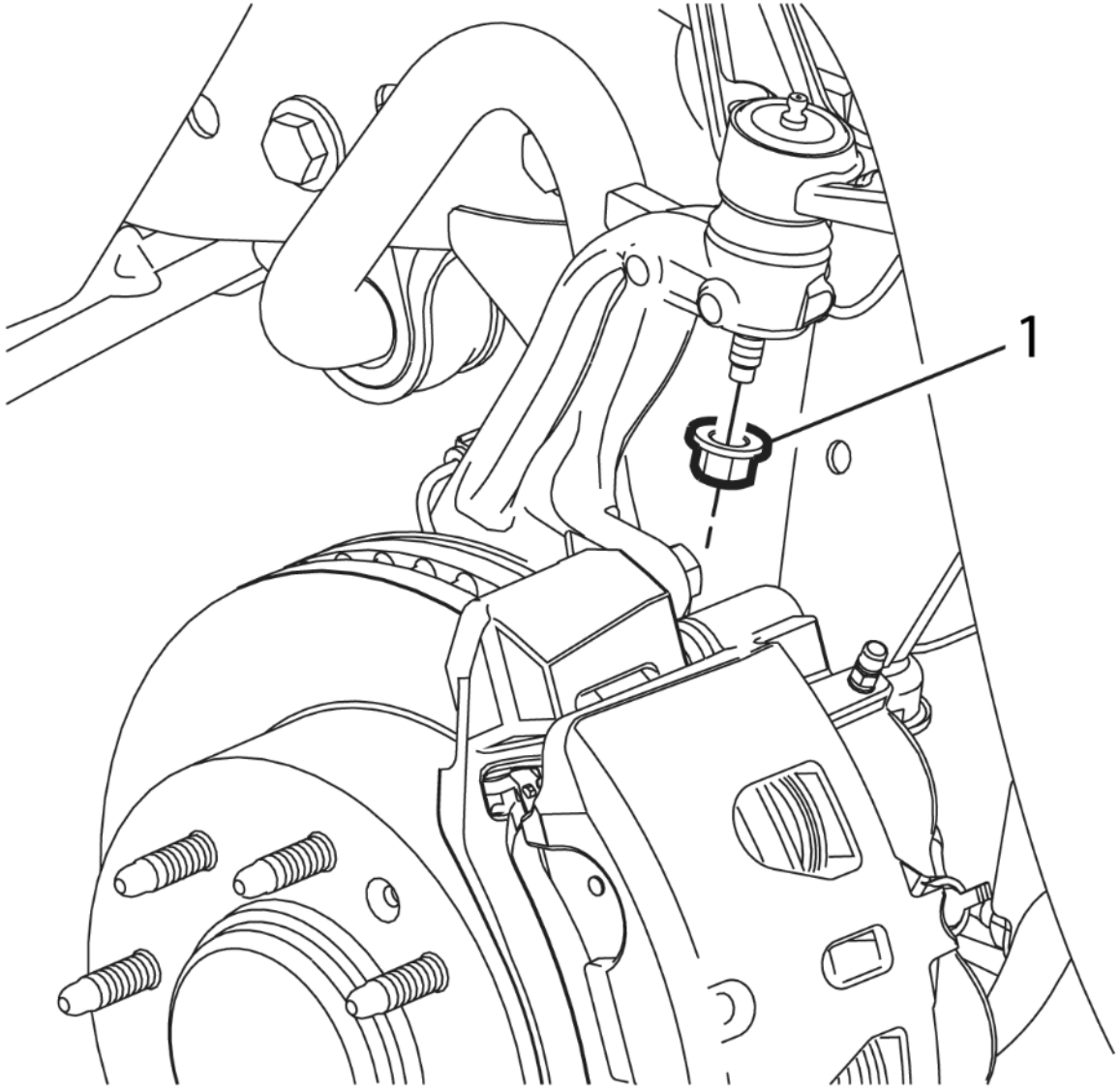


Fig. 10: Upper Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

5. Loosen Front Upper Control Arm Ball Stud Nut (1)

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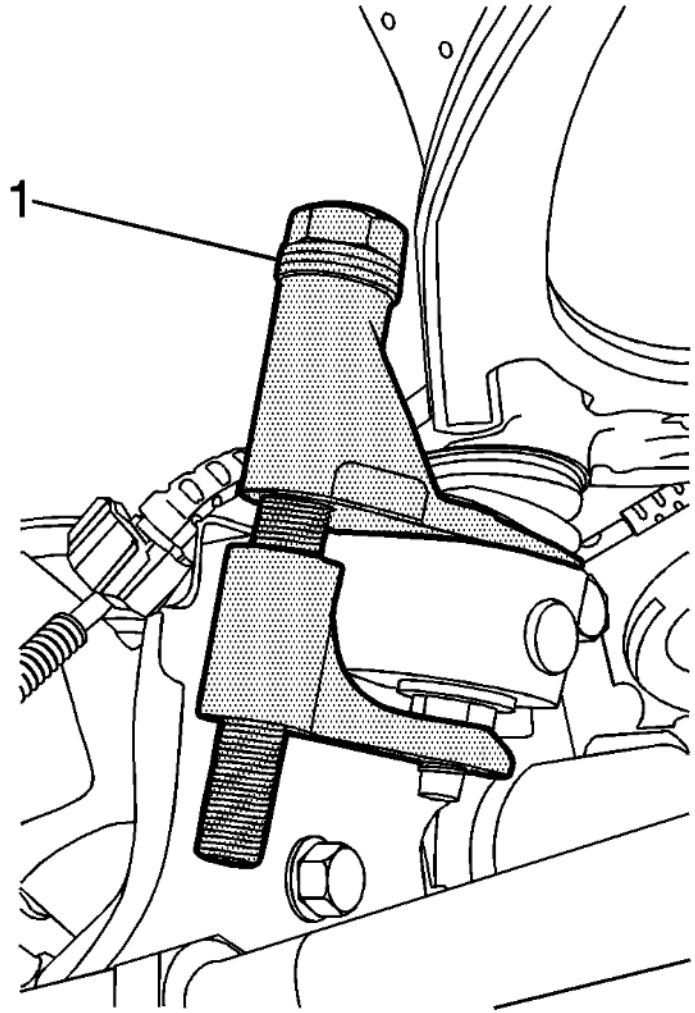


Fig. 11: Separating Front Upper Control Arm From Steering Knuckle
Courtesy of GENERAL MOTORS COMPANY

6. Use the **CH-42188-B** separator to separate the front upper control arm from the steering knuckle.

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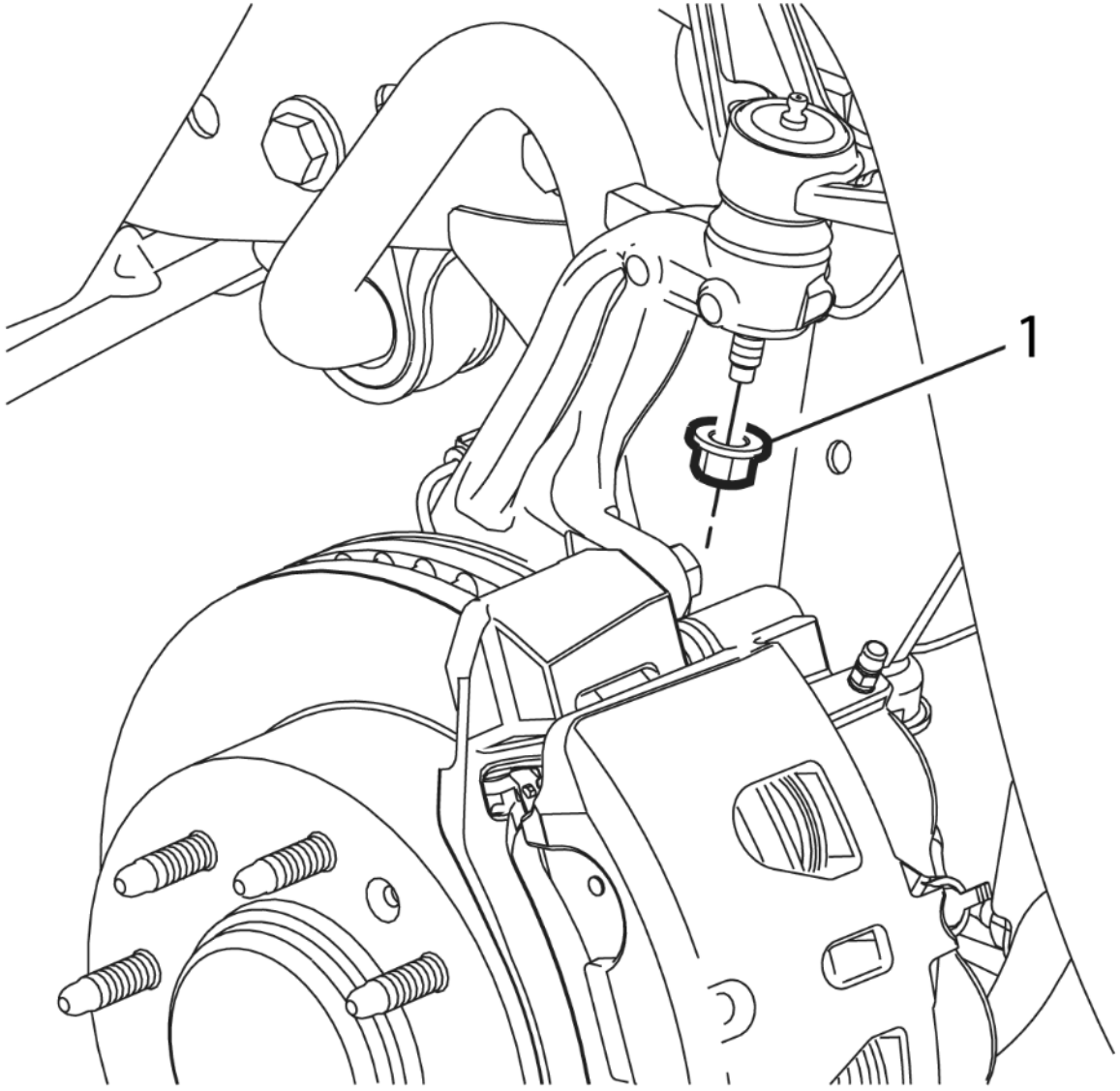


Fig. 12: Upper Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

7. Remove Front Upper Control Arm Ball Stud Nut (1)

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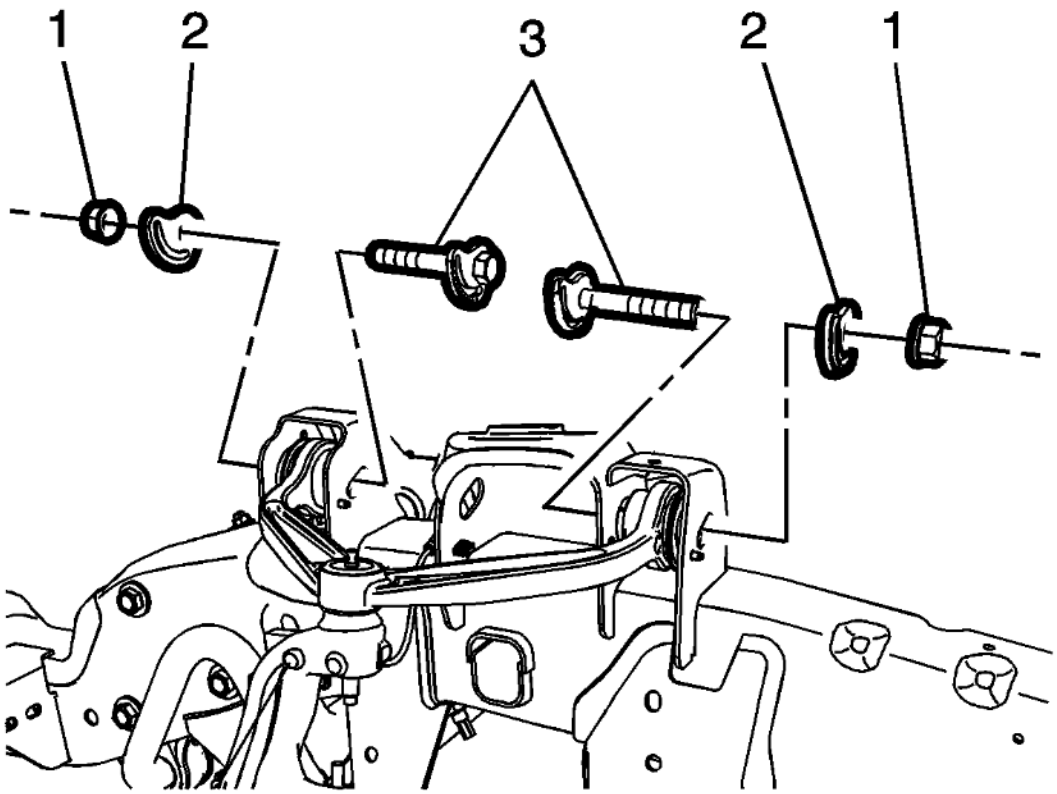


Fig. 13: Front Upper Control Arm Nut
Courtesy of GENERAL MOTORS COMPANY

8. Remove Front Upper Control Arm Nut (1)
9. Remove Front Upper Control Arm Adjust Cam (2)
10. Remove Front Upper Control Arm Bolt (3)

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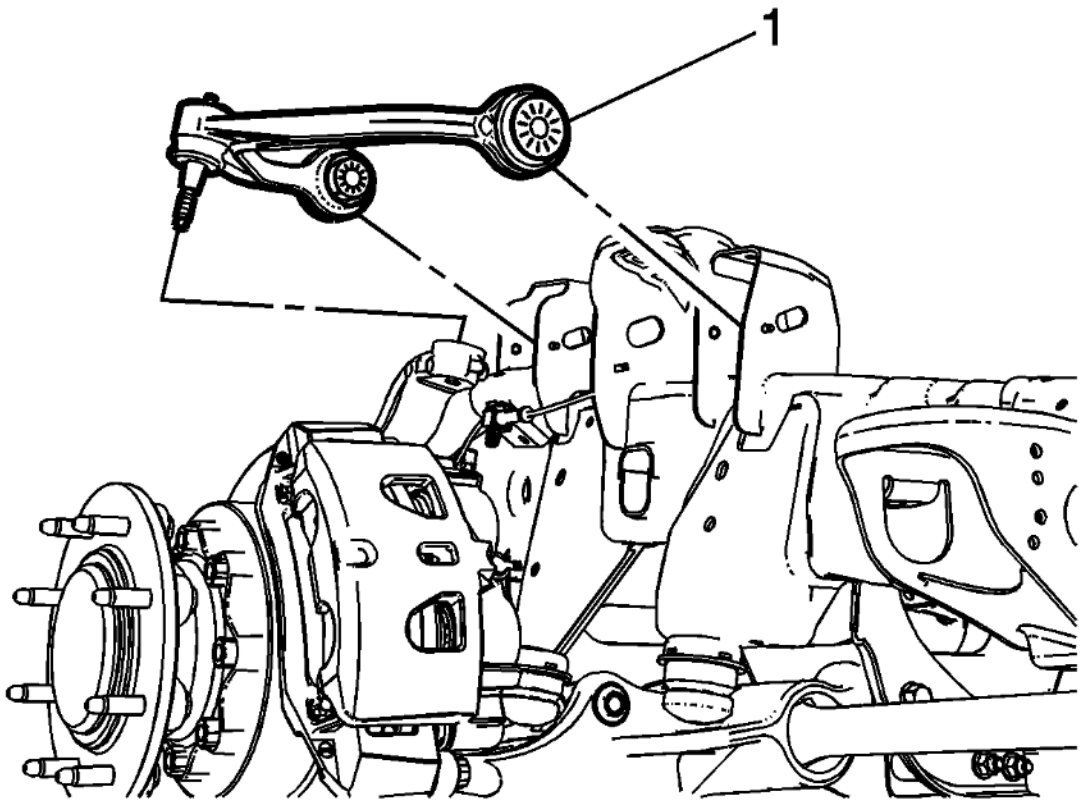


Fig. 14: Upper Control Arm
Courtesy of GENERAL MOTORS COMPANY

11. Remove the front upper control arm (1) from the vehicle.

Installation Procedure

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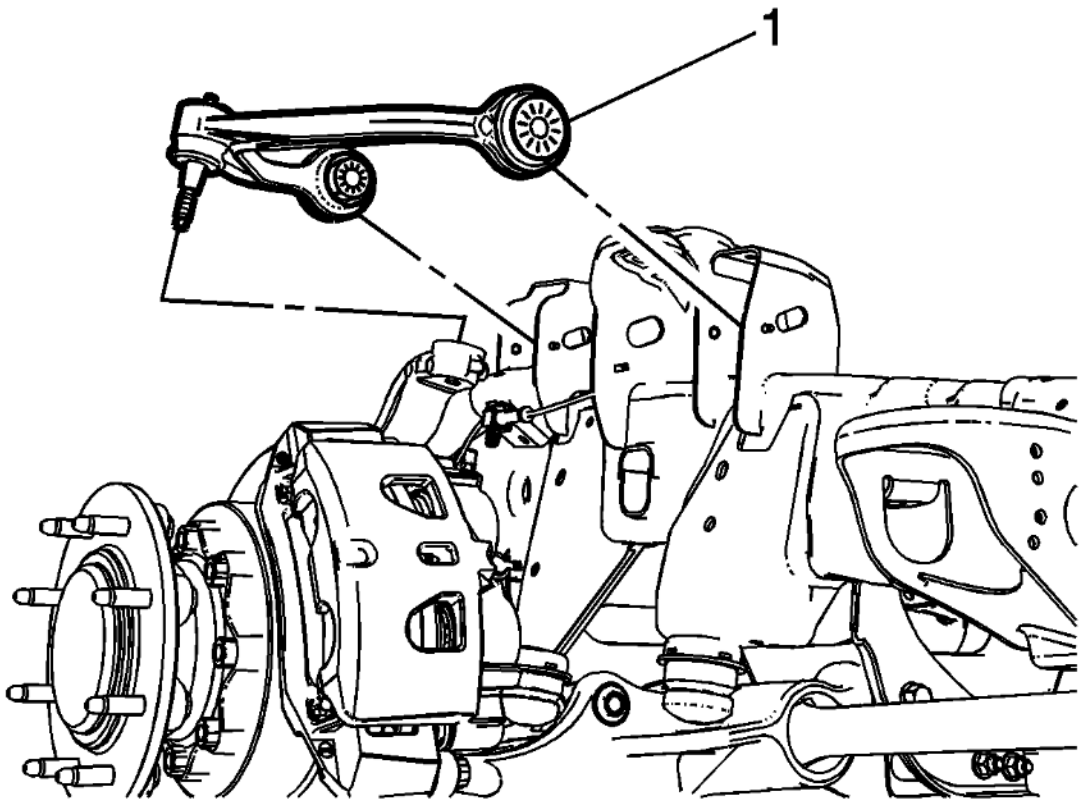


Fig. 15: Upper Control Arm
Courtesy of GENERAL MOTORS COMPANY

1. Position the front upper control arm (1) on the vehicle.

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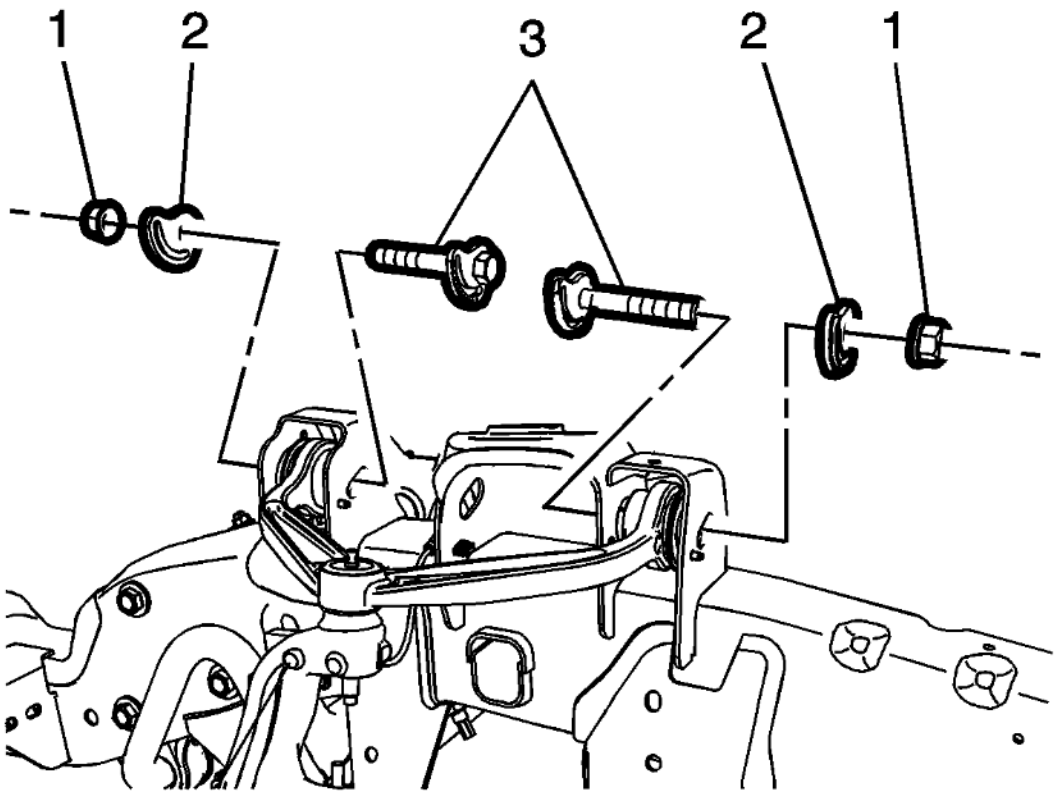


Fig. 16: Front Upper Control Arm Nut
Courtesy of GENERAL MOTORS COMPANY

2. Install Front Upper Control Arm Bolt (3)
3. Install Front Upper Control Arm Adjust Cam (2)

CAUTION: Refer to Fastener Caution .

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4. Install Front Upper Control Arm Nut (1) and tighten 260 N.m (192 lb ft)

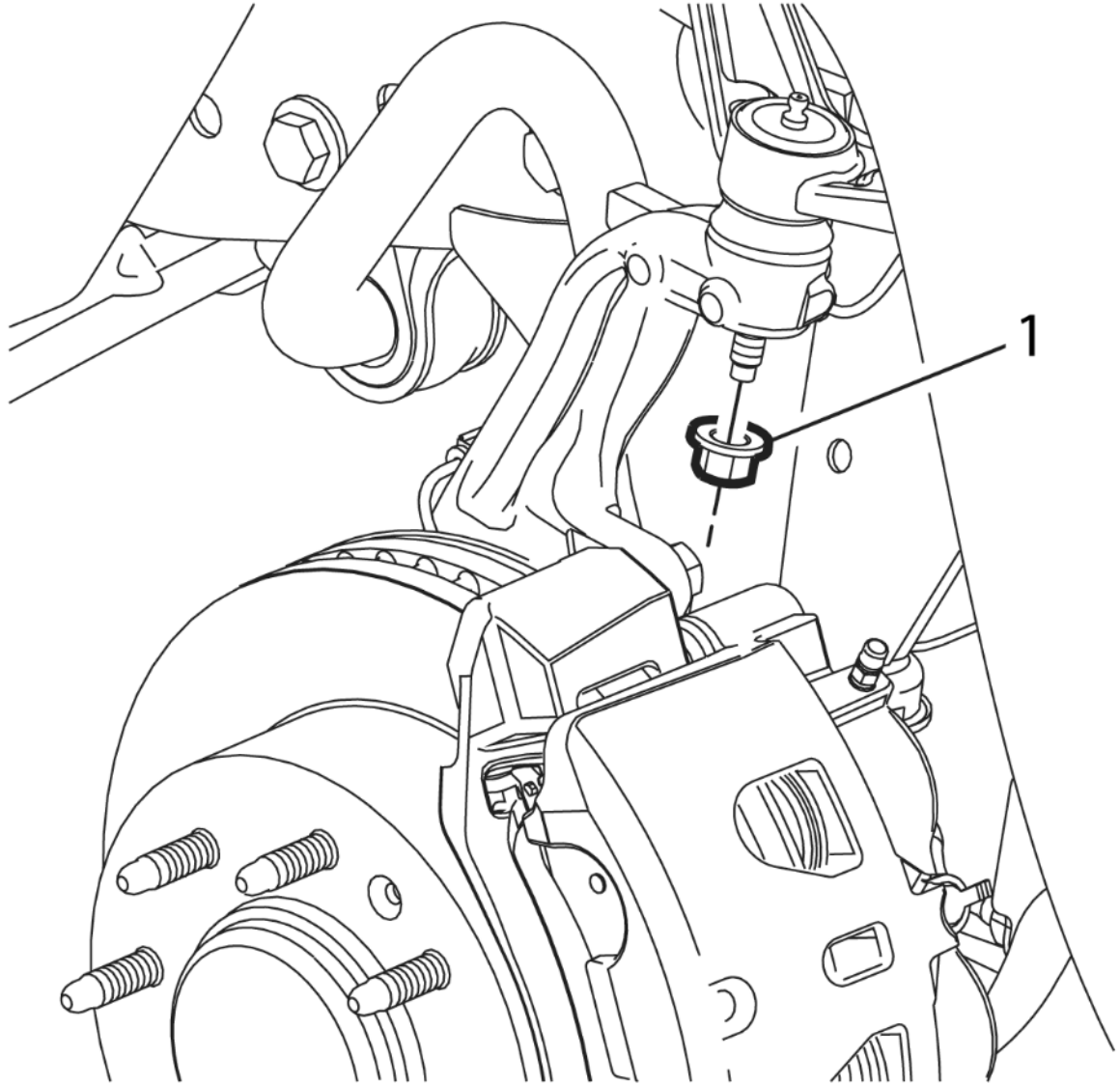


Fig. 17: Upper Control Arm Ball Stud Nut
Courtesy of GENERAL MOTORS COMPANY

5. Install Front Upper Control Arm Ball Stud Nut (1) and tighten 50 N.m (37 lb ft)

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6. Remove the jack stand from underneath the front lower control arm.
7. Install Front Brake Hose Bracket @Front Upper Control Arm **Front Brake Hose Replacement (JD9)** **Front Brake Hose Replacement (J95)**
8. Install Front Wheel Speed Sensor Bracket @Front Upper Control Arm **Front Wheel Speed Sensor Replacement**
9. Install the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
10. Measure and adjust the wheel alignment. **Wheel Alignment Measurement**

LOWER CONTROL ARM REPLACEMENT (LIGHT DUTY)

Special Tools

- **CH-43631** Ball Joint Separator
- **J-45851** Ball Joint Separator Protector Adapter(s)

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
2. Remove Front Stabilizer Shaft Link **Stabilizer Shaft Link Replacement (Light Duty)**
3. Separate Front Shock Absorber@Front Lower Control Arm **Shock Absorber and Spring Removal and Installation (Light Duty, With Z85/Z95)Shock Absorber and Spring Removal and Installation (Light Duty, Without Z85/Z95)**
4. { If equipped }Separate Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (1500)** , or **Front Wheel Drive Shaft Replacement - Right Side (1500)**
5. Use mechanic's wire or equivalent to support the steering knuckle and front upper control arm.

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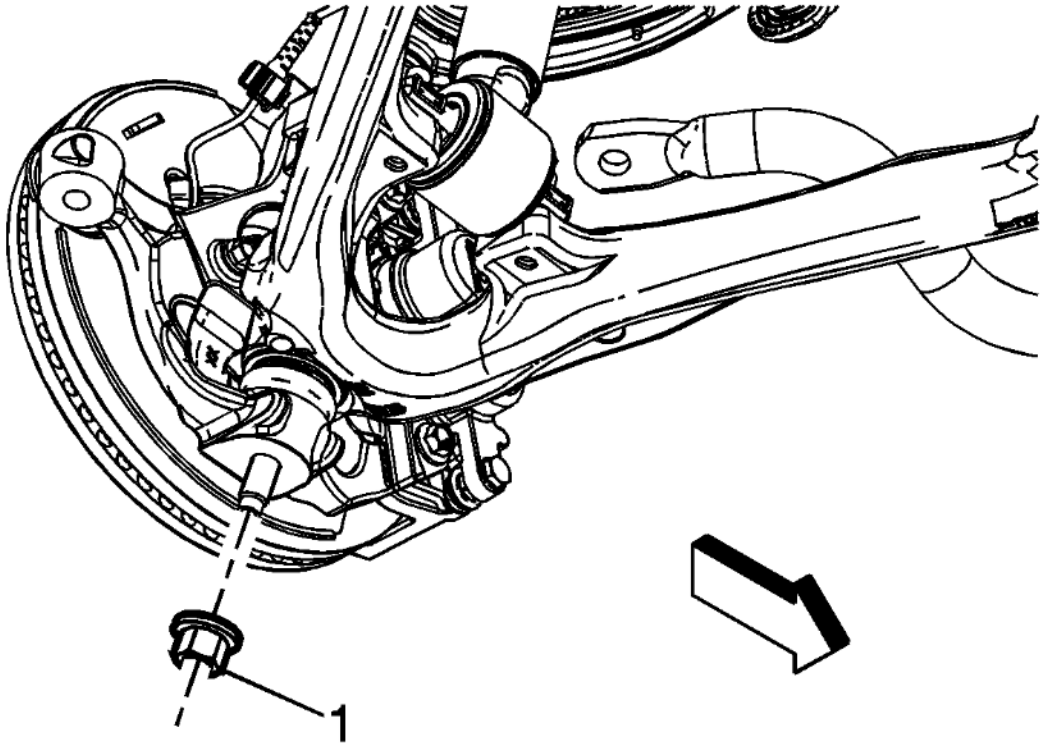


Fig. 18: View Of Lower Ball Joint Retaining Nut
Courtesy of GENERAL MOTORS COMPANY

6. Remove Front Lower Control Arm Ball Stud Nut (1).

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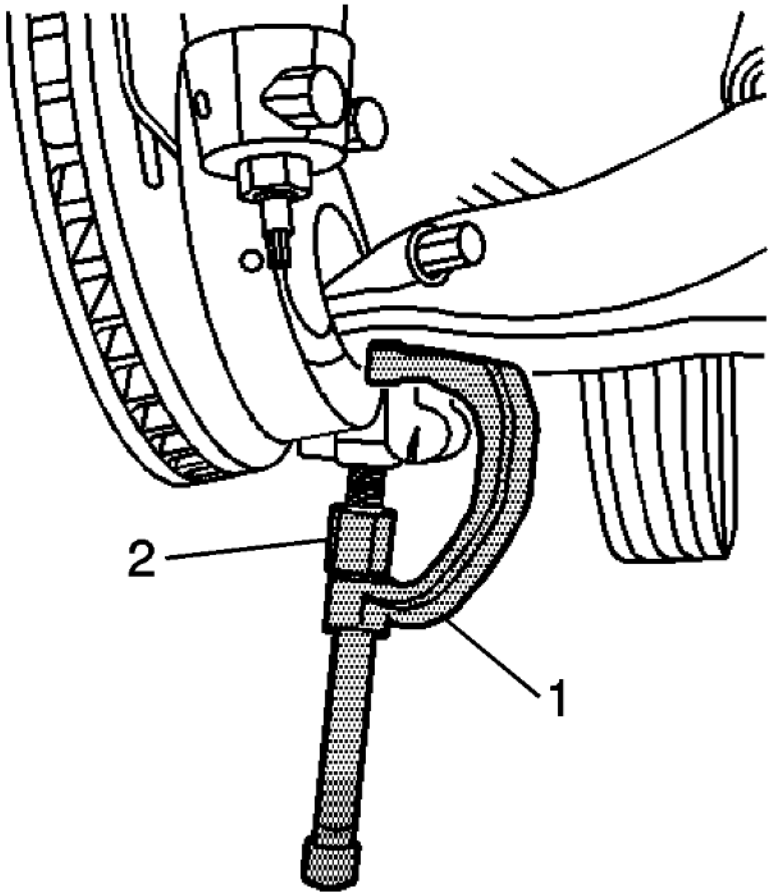


Fig. 19: View Of CH 43631 Separator And J 45851 Adapters
Courtesy of GENERAL MOTORS COMPANY

7. Use the **CH-43631** separator (1) and the **J-45851** adapter(s) (2) to separate the front lower control arm from the steering knuckle.

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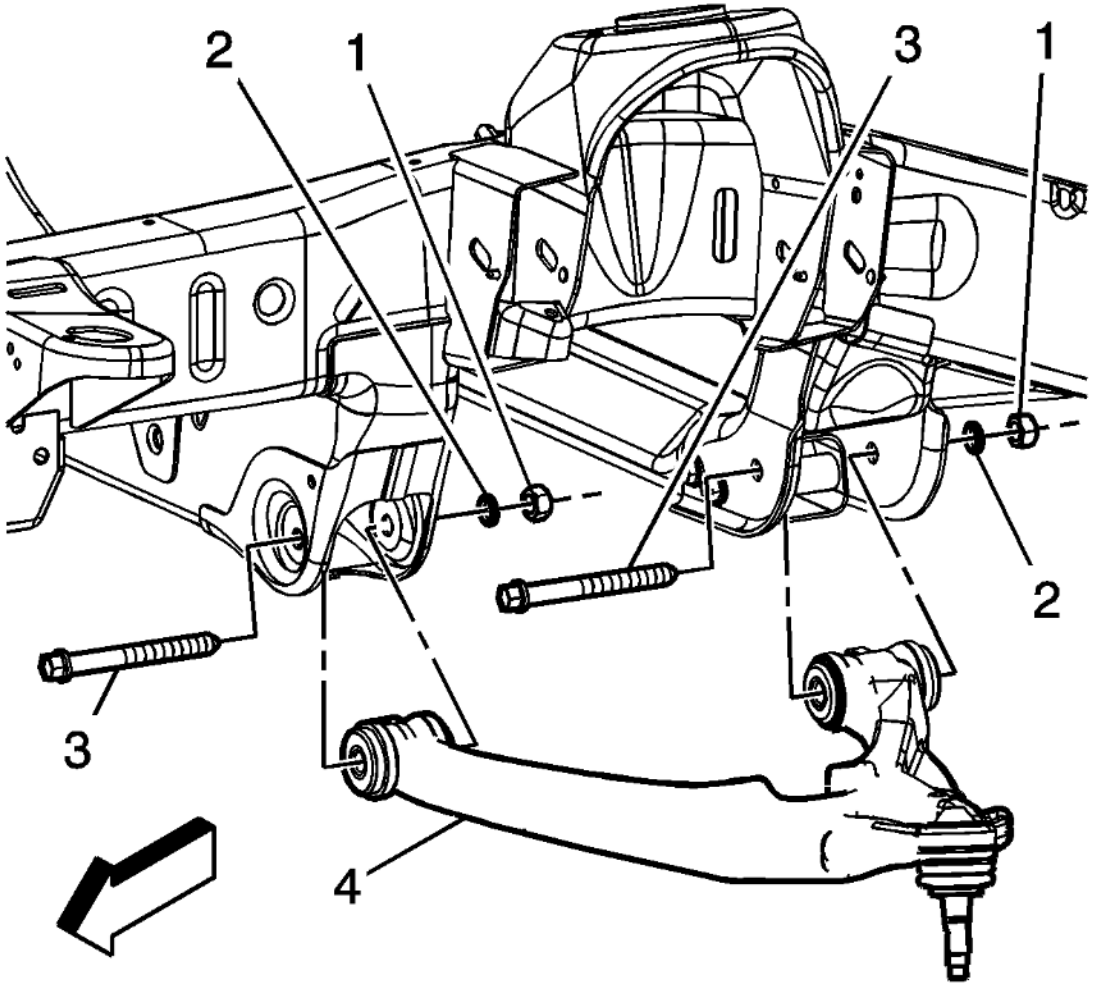


Fig. 20: Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

8. Remove Front Lower Control Arm Nut (1).

NOTE:

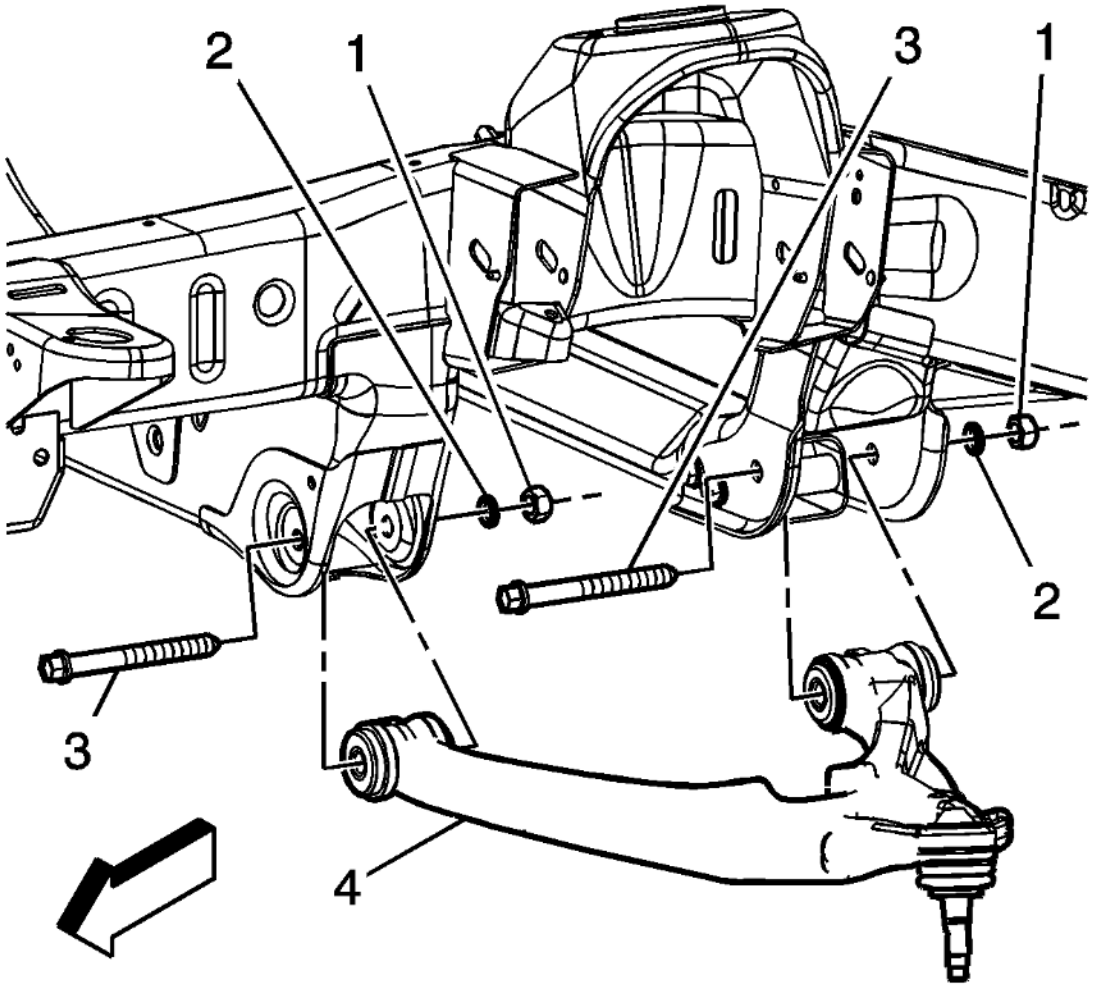
- **The front lower control arm washers are directional washers and MUST be installed in the same direction as when they were removed.**

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- **Note the direction of the front lower control arm washers during removal to assist in installation.**

9. Remove Front Lower Control Arm Washer (2).
10. Remove Front Lower Control Arm Bolt (3).
11. Remove Front Lower Control Arm (4).

Installation Procedure



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Fig. 21: Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

1. Install Front Lower Control Arm (4).
2. Install Front Lower Control Arm Bolt (3).

NOTE: **The front lower control arm washers are directional washers and MUST be installed in the same direction as when they were removed.**

3. Install Front Lower Control Arm Washer (2).

CAUTION: **Refer to Fastener Caution .**

4. Install Front Lower Control Arm Nut (1) and tighten 175 N.m (129 lb ft)
5. Install Front Lower Control Arm@Steering Knuckle

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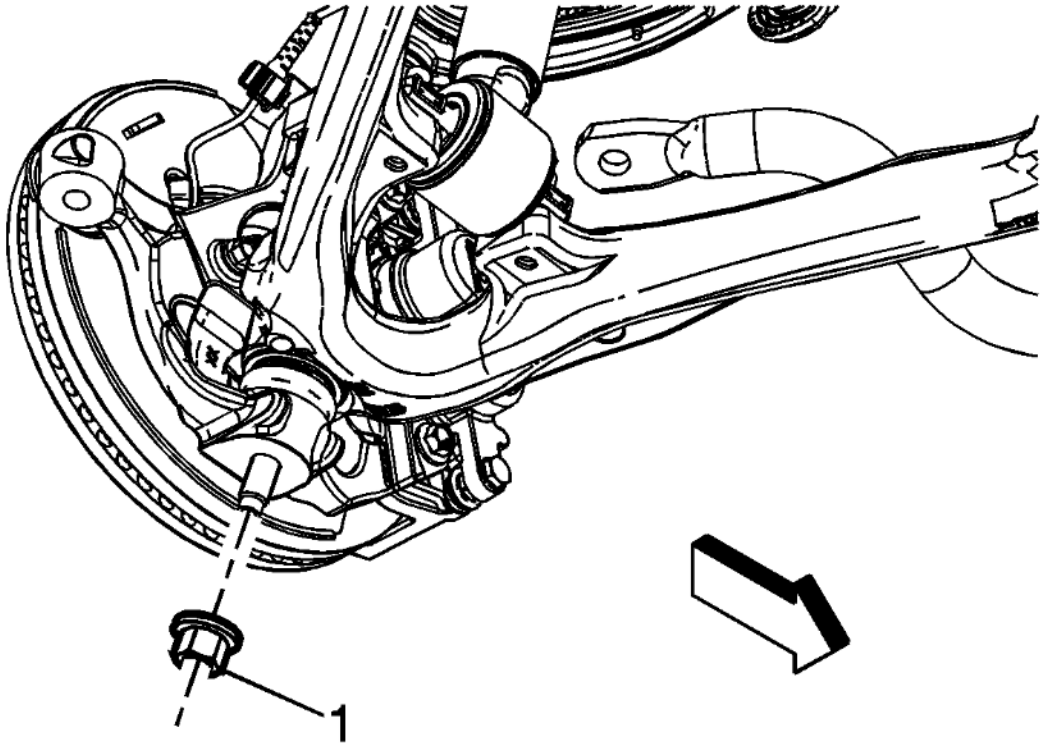


Fig. 22: View Of Lower Ball Joint Retaining Nut
Courtesy of GENERAL MOTORS COMPANY

6. Install Front Lower Control Arm Ball Stud Nut (1).

Tighten

1. First Pass: 50 N.m (37 lb ft)

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2. Final Pass: (125-135 degrees)

7. Remove the mechanic's wire or equivalent used to support the steering knuckle and front upper control arm.
8. { If equipped }Install Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (1500)** , or **Front Wheel Drive Shaft Replacement - Right Side (1500)**
9. Install Front Shock Absorber@Front Lower Control Arm **Shock Absorber and Spring Removal and Installation (Light Duty, With Z85/Z95)Shock Absorber and Spring Removal and Installation (Light Duty, Without Z85/Z95)**
10. Install Front Stabilizer Shaft Link **Stabilizer Shaft Link Replacement (Light Duty)**
11. Install the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
12. Measure and adjust the wheel alignment. **Wheel Alignment Measurement**

LOWER CONTROL ARM REPLACEMENT (HEAVY DUTY)

Special Tools

- **CH-43631** Ball Joint Separator
- **J-45851** Ball Joint Separator Protector Adapter(s)

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
2. Remove Front Torsion Bar **Torsion Bar and Support Assembly Replacement (Heavy Duty)**
3. Remove Front Stabilizer Shaft Link **Stabilizer Shaft Link Replacement (Heavy Duty)**
4. Separate Front Shock Absorber@Front Lower Control Arm **Shock Absorber Replacement (Heavy Duty)**
5. { If equipped }Separate Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (Heavy Duty)** , or **Front Wheel Drive Shaft Replacement - Right Side (Heavy Duty)**
6. Use mechanic's wire or equivalent to support the steering knuckle and front upper control arm.

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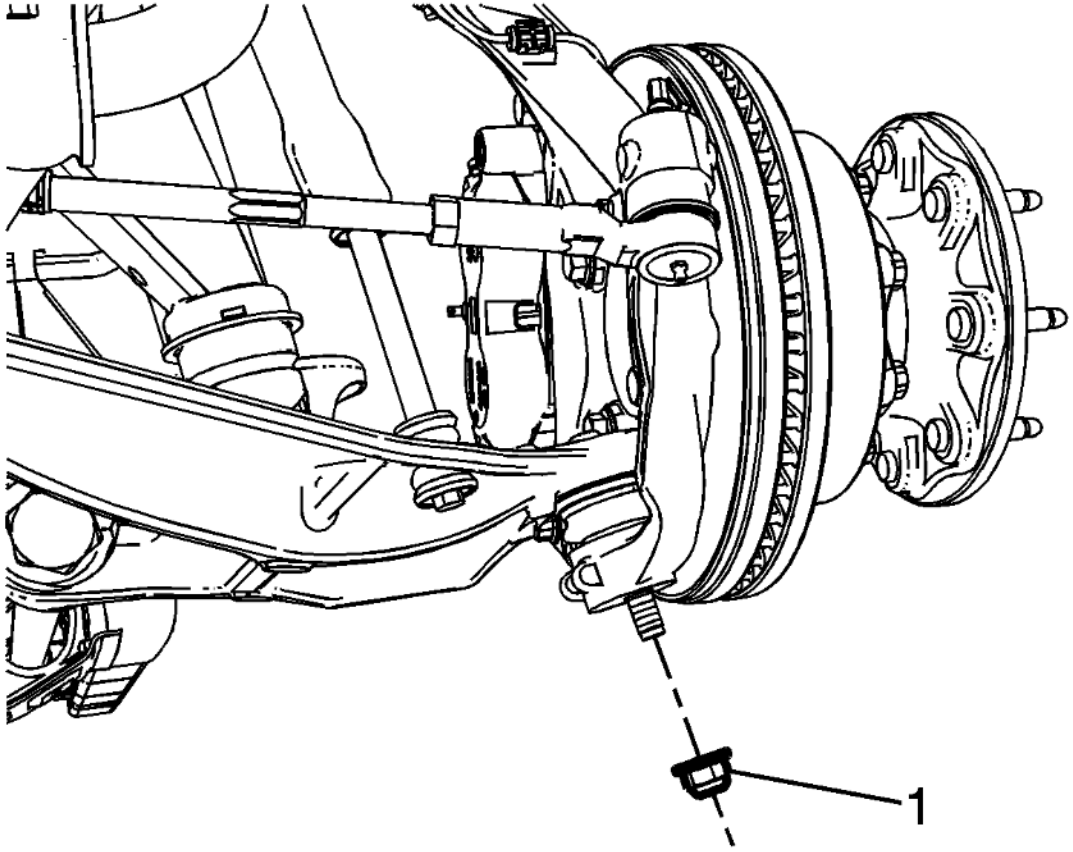


Fig. 23: Lower Ball Joint Retaining Nut
Courtesy of GENERAL MOTORS COMPANY

7. Remove Front Lower Control Arm Ball Stud Nut (1).

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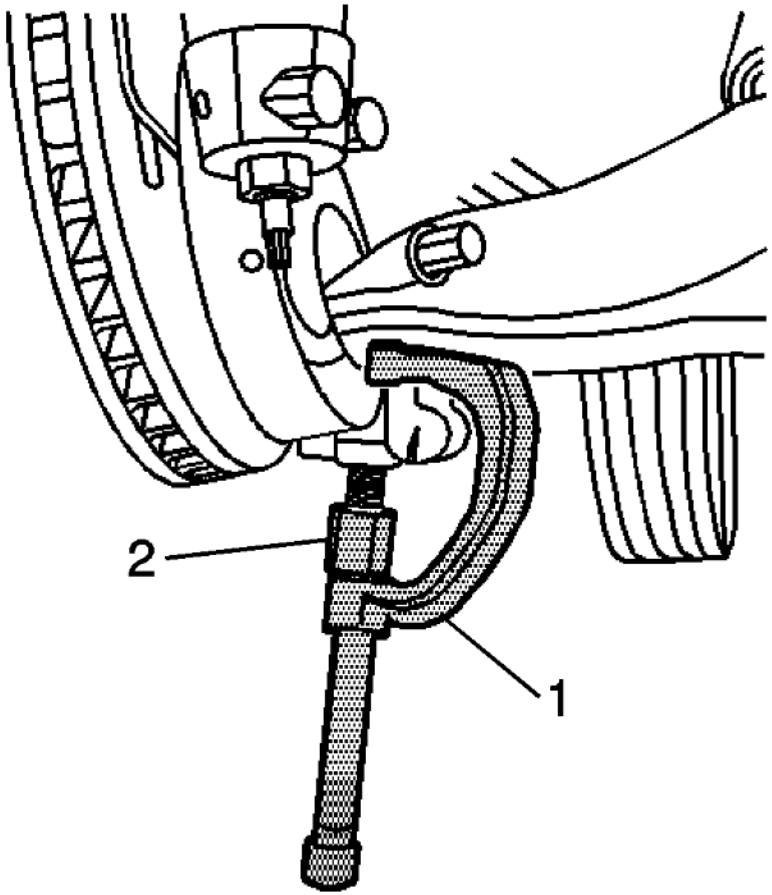


Fig. 24: View Of CH 43631 Separator And J 45851 Adapters
Courtesy of GENERAL MOTORS COMPANY

8. Use the **CH-43631** separator (1) and the **J-45851** adapter(s) (2) to separate the front lower control arm from the steering knuckle.

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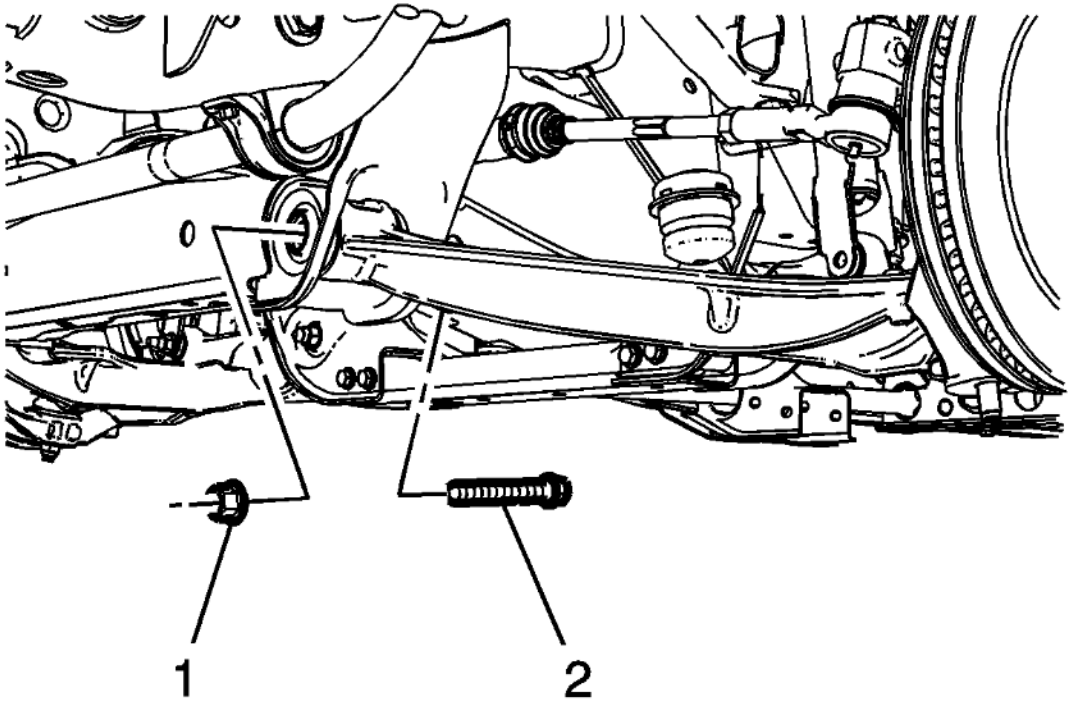


Fig. 25: Identifying Front Lower Control Arm Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

9. Remove Front Lower Control Arm Front Nut (1).
10. Remove Front Lower Control Arm Front Bolt (2).

DISCARD the bolt.

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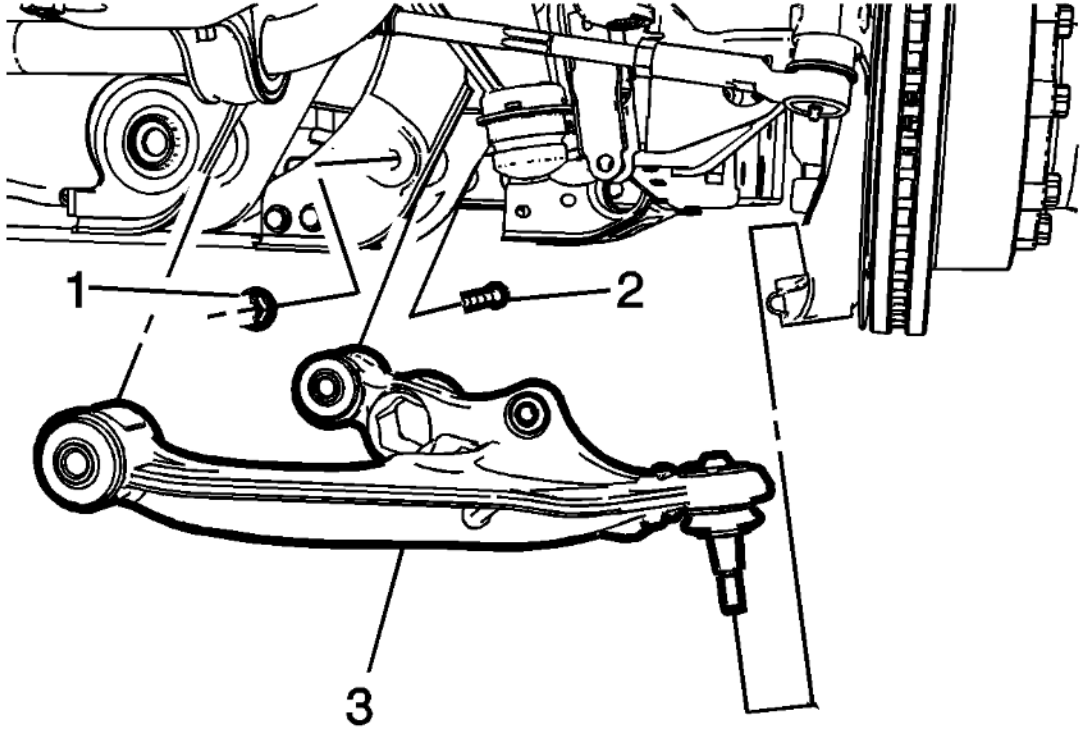


Fig. 26: Lower Control Rear Nut, Control Arm And Bolt
Courtesy of GENERAL MOTORS COMPANY

11. Remove Front Lower Control Arm Rear Nut (1).
12. Remove Front Lower Control Arm Rear Bolt (2).

DISCARD the bolt.

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13. Remove Front Lower Control Arm (3).

Installation Procedure

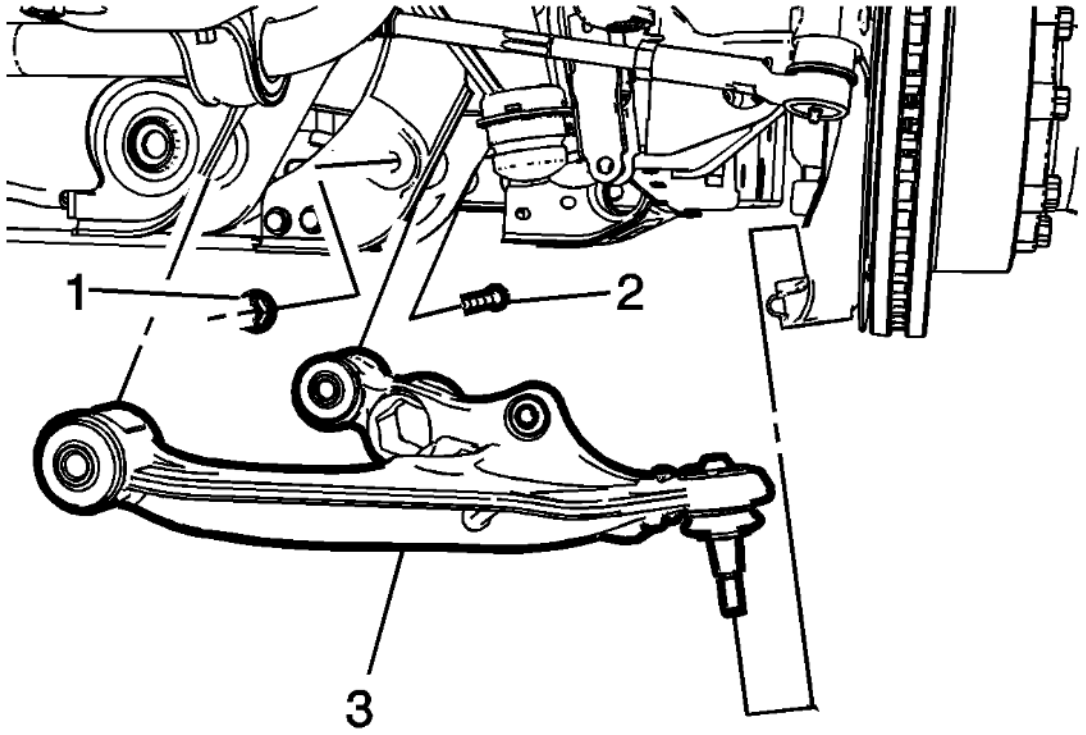


Fig. 27: Lower Control Rear Nut, Control Arm And Bolt
Courtesy of GENERAL MOTORS COMPANY

1. Install Front Lower Control Arm (3).

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CAUTION: This vehicle is equipped with torque-to-yield or single use fasteners. Install a NEW torque-to-yield or single use fastener when installing this component. Failure to replace the torque-to-yield or single use fastener could cause damage to the vehicle or component.

2. Install Front Lower Control Arm Rear Bolt (2).

   Install a NEW bolt.

3. Install Front Lower Control Arm Rear Nut (1), but do NOT tighten

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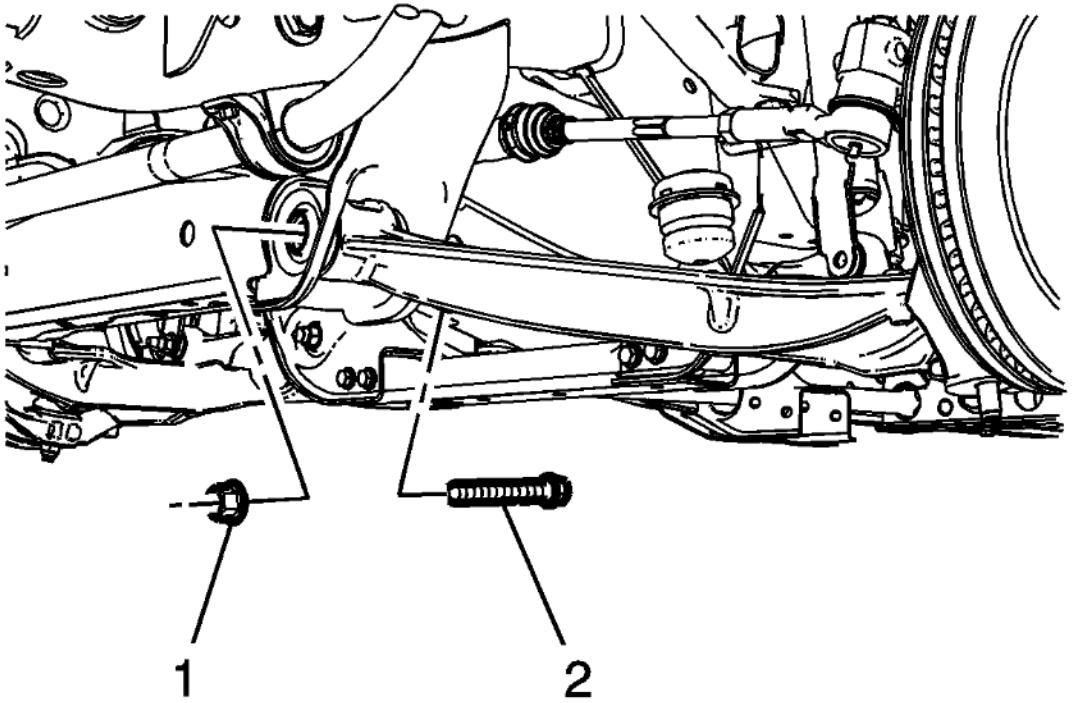


Fig. 28: Identifying Front Lower Control Arm Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

4. Install Front Lower Control Arm Front Bolt (2).

   Install a NEW bolt.

5. Install Front Lower Control Arm Front Nut (1), but do NOT tighten

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6. Use an adjustable jack to raise the front lower control arm until it barely contacts both front lower control arm bumpers.

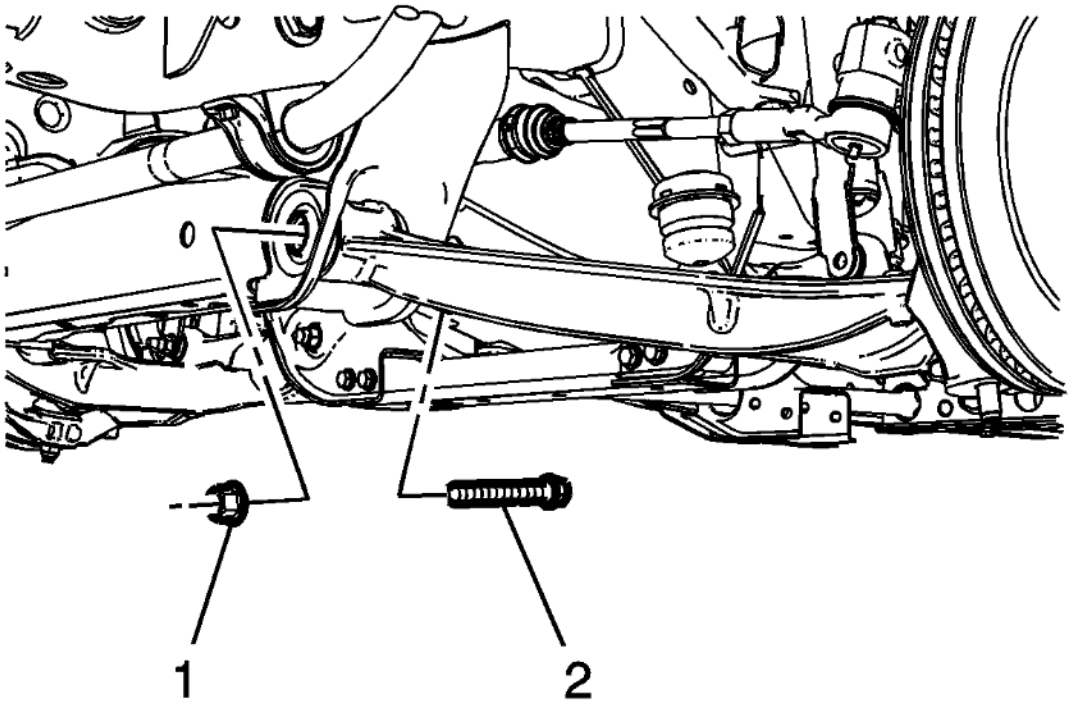


Fig. 29: Identifying Front Lower Control Arm Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: Refer to Fastener Caution .

7. Tighten Front Lower Control Arm Front Nut (1).

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Tighten

1. First Pass: 180 N.m (133 lb ft)
2. Final Pass: (45-75 degrees)

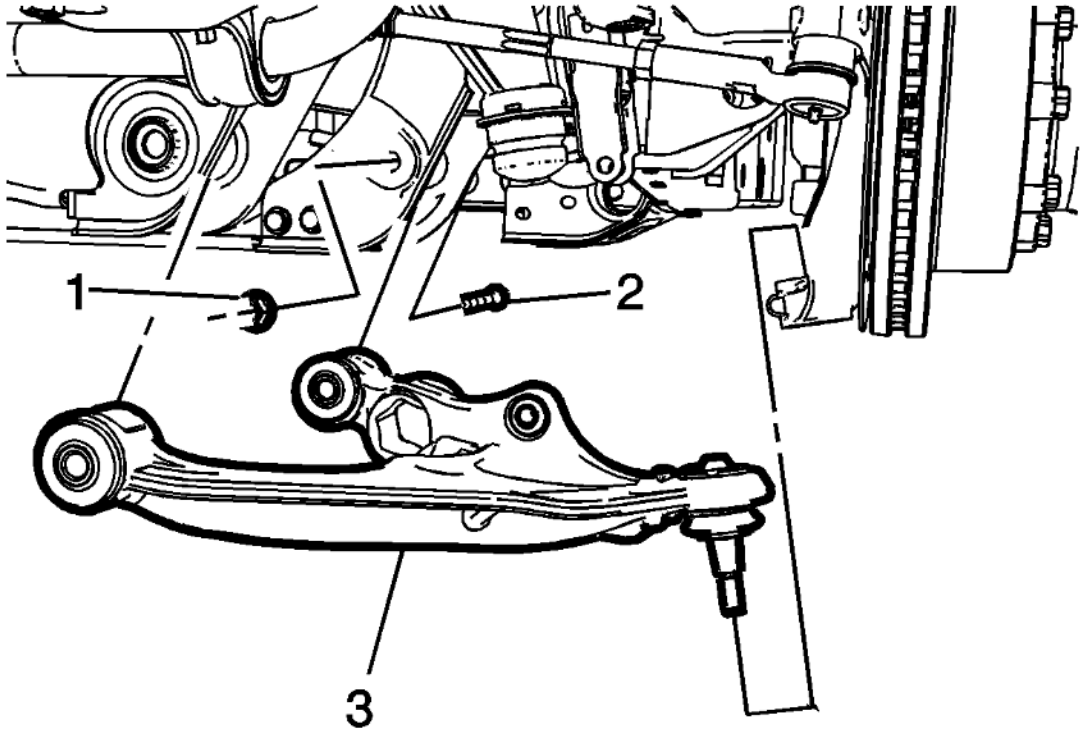


Fig. 30: Lower Control Rear Nut, Control Arm And Bolt
Courtesy of GENERAL MOTORS COMPANY

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8. Tighten Front Lower Control Arm Rear Nut (1).

Tighten

1. First Pass: 180 N.m (133 lb ft)
2. Final Pass: (45-75 degrees)

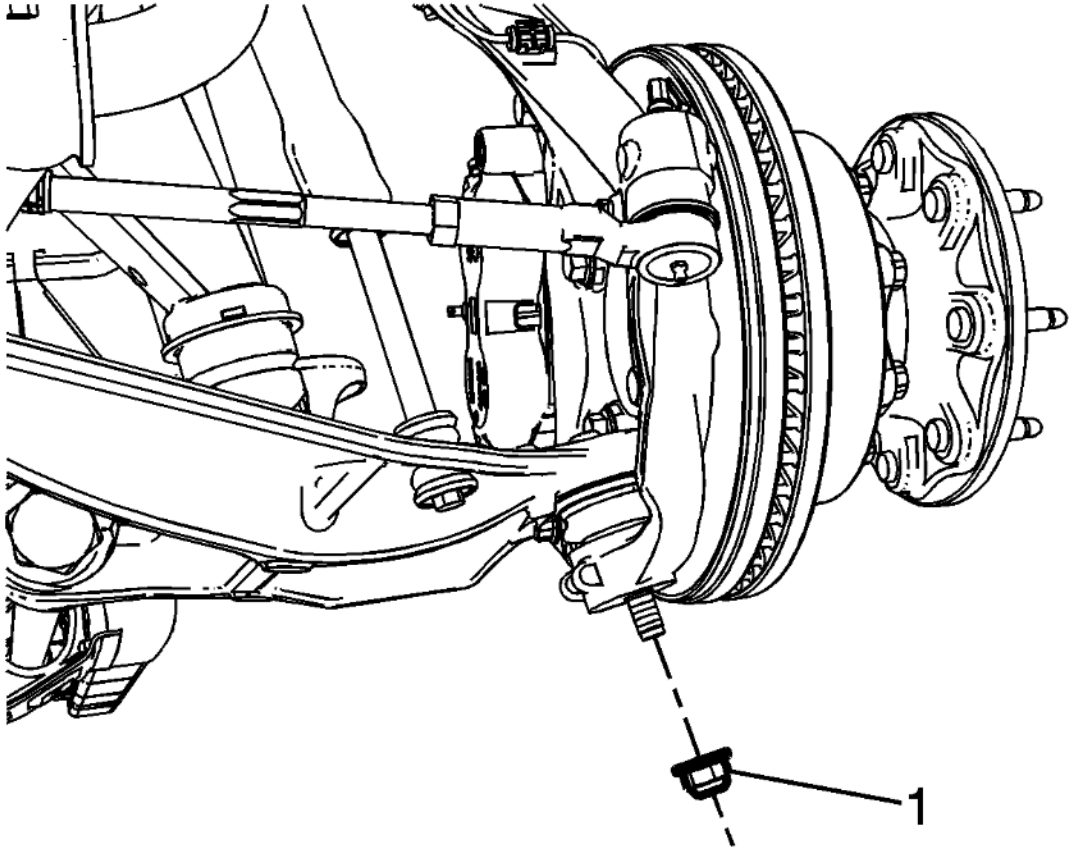


Fig. 31: Lower Ball Joint Retaining Nut

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Courtesy of GENERAL MOTORS COMPANY

9. Install Front Lower Control Arm Ball Stud Nut (1).

   Tighten

   1. First Pass: 50 N.m (37 lb ft)
   2. Final Pass: (90-100 degrees)
10. Remove the mechanic's wire or equivalent used to support the steering knuckle and front upper control arm.
11. { If equipped }Install Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (Heavy Duty)** , or **Front Wheel Drive Shaft Replacement - Right Side (Heavy Duty)**
12. Install Front Shock Absorber@Front Lower Control Arm **Shock Absorber Replacement (Heavy Duty)**
13. Install Front Stabilizer Shaft Link **Stabilizer Shaft Link Replacement (Heavy Duty)**
14. Install Front Torsion Bar **Torsion Bar and Support Assembly Replacement (Heavy Duty)**
15. Install the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**
16. Measure and adjust the wheel alignment. **Wheel Alignment Measurement**

FRONT LOWER CONTROL ARM BALL STUD REPLACEMENT (LIGHT DUTY, WITHOUT AVV ONLY)

Special Tools

- **CH-41805** Ball Joint Replacer
- **CH-49240** Ball Joint Installer

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove Steering Knuckle **Steering Knuckle Replacement (Light Duty)**

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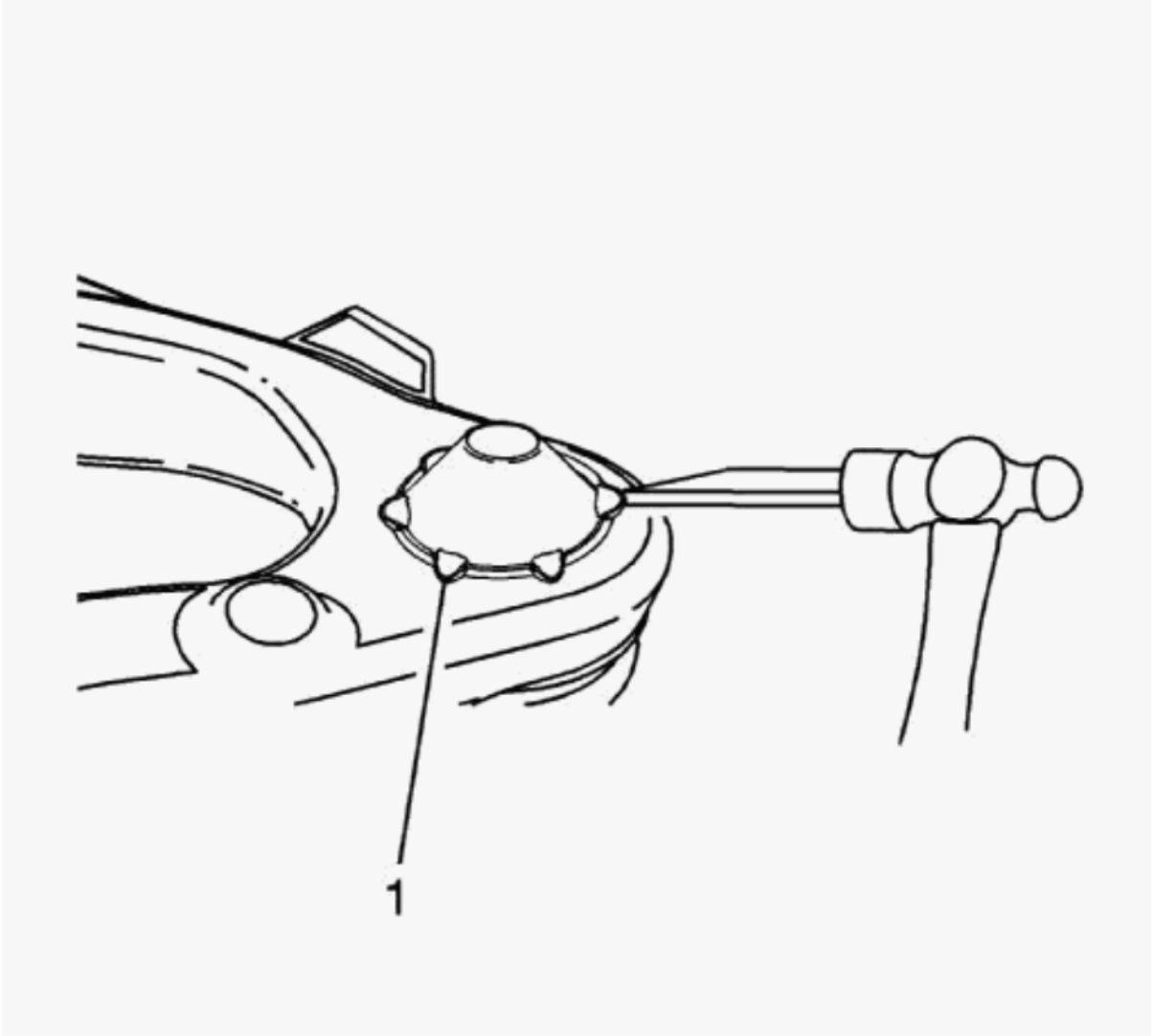


Fig. 32: Locking Tabs
Courtesy of GENERAL MOTORS COMPANY

2. Use the appropriate tools to remove the locking tabs (1) from the front lower control arm ball stud body.

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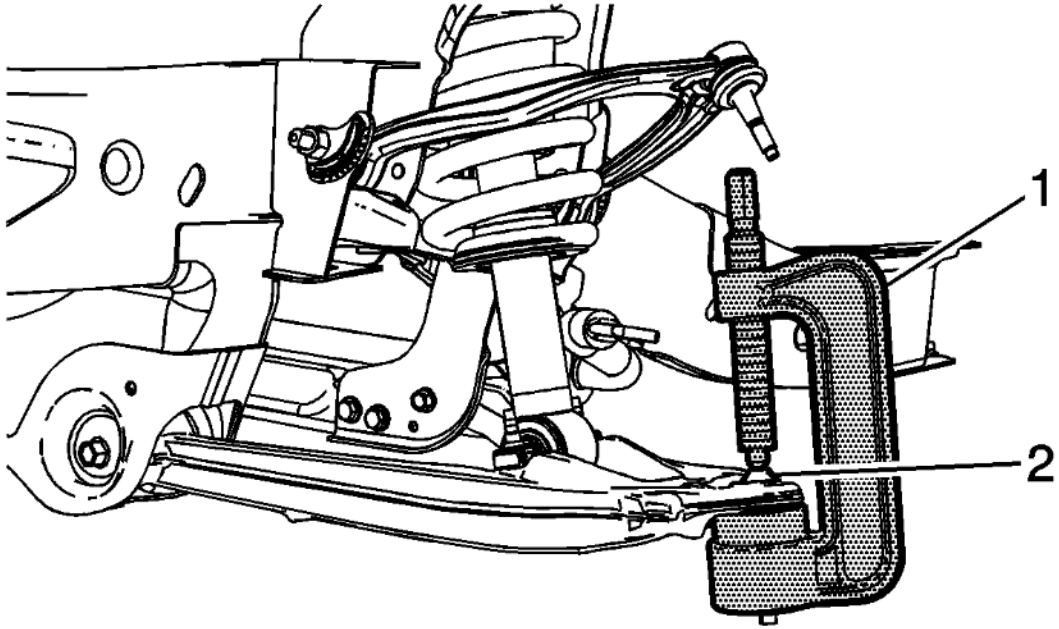


Fig. 33: Removing Lower Ball Joint From Control Arm
Courtesy of GENERAL MOTORS COMPANY

3. Use the **CH-41805** replacer (1) and a shallow socket to remove the front lower control arm ball stud (2) from the front lower control arm.

Installation Procedure

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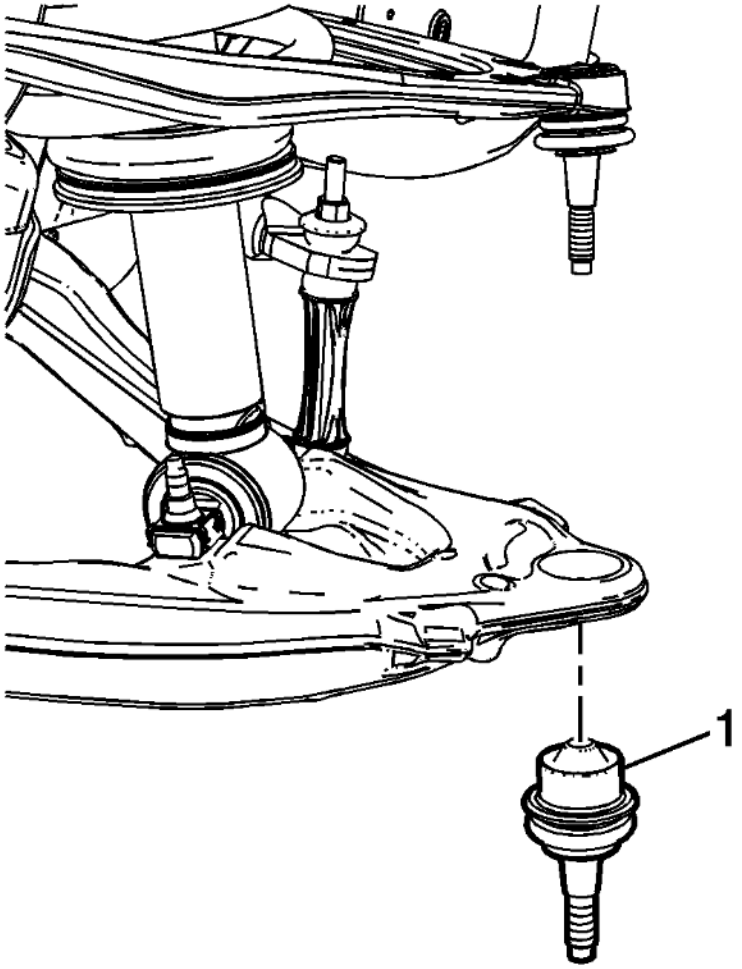


Fig. 34: Identifying Lower Control Arm Ball Joint
Courtesy of GENERAL MOTORS COMPANY

1. Position the front lower control arm ball stud (1) in the front lower control arm.

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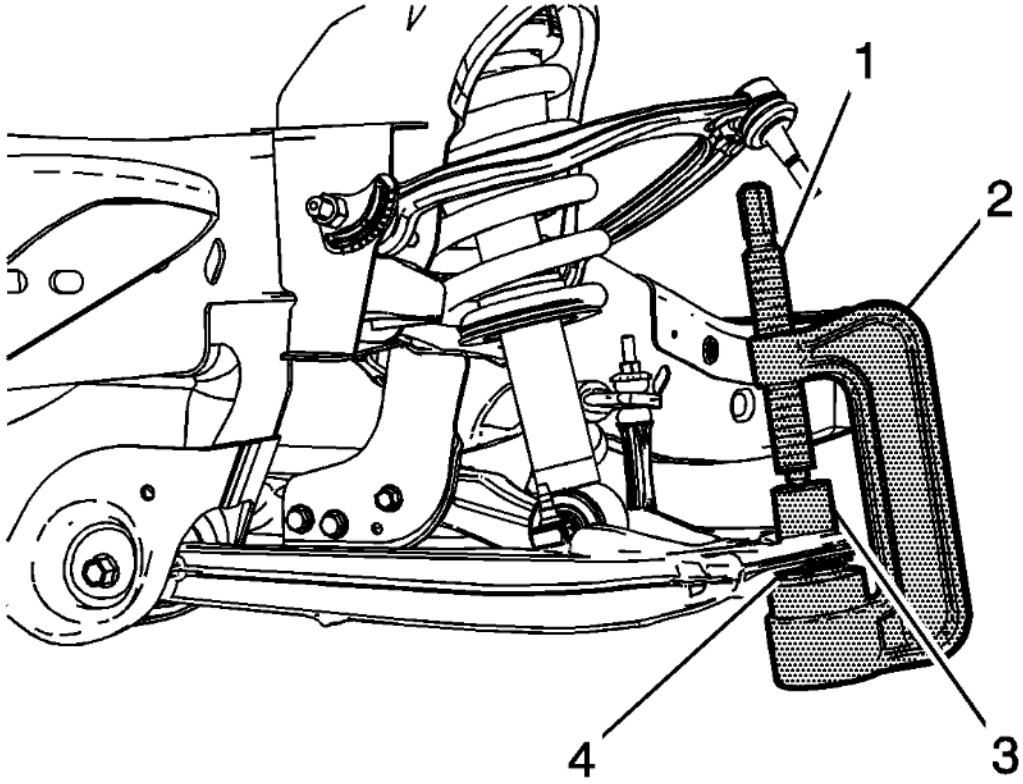
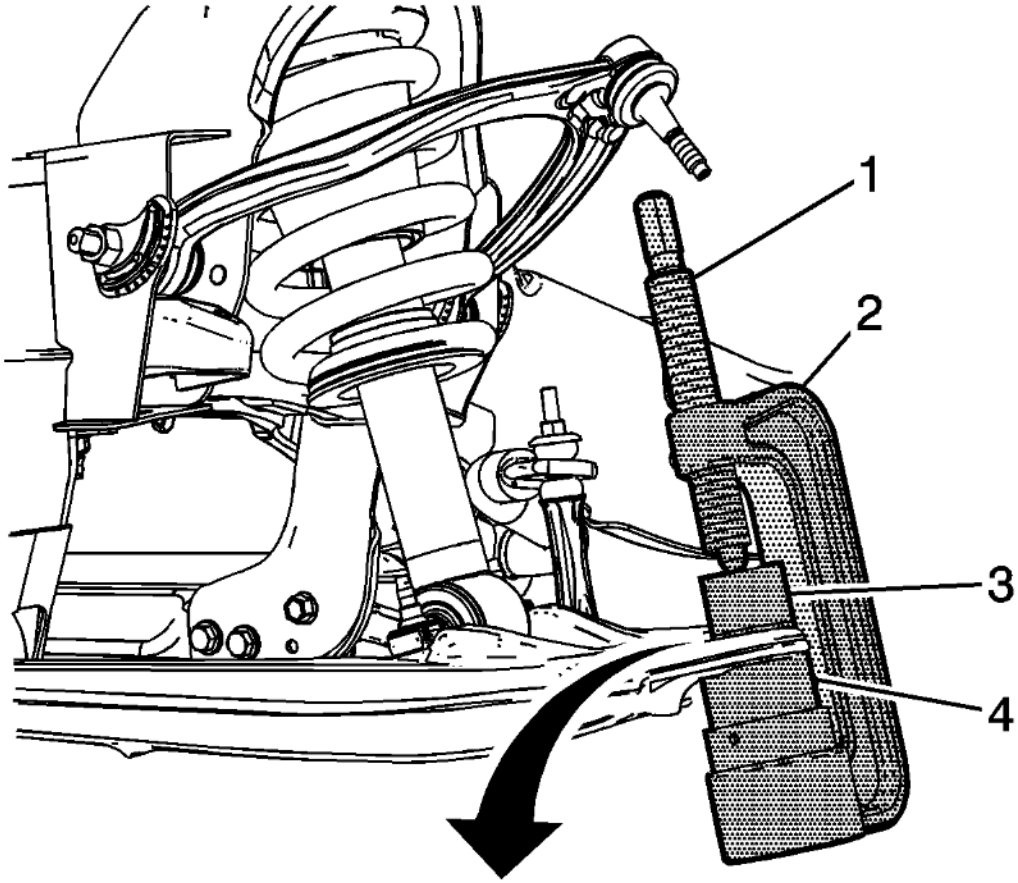


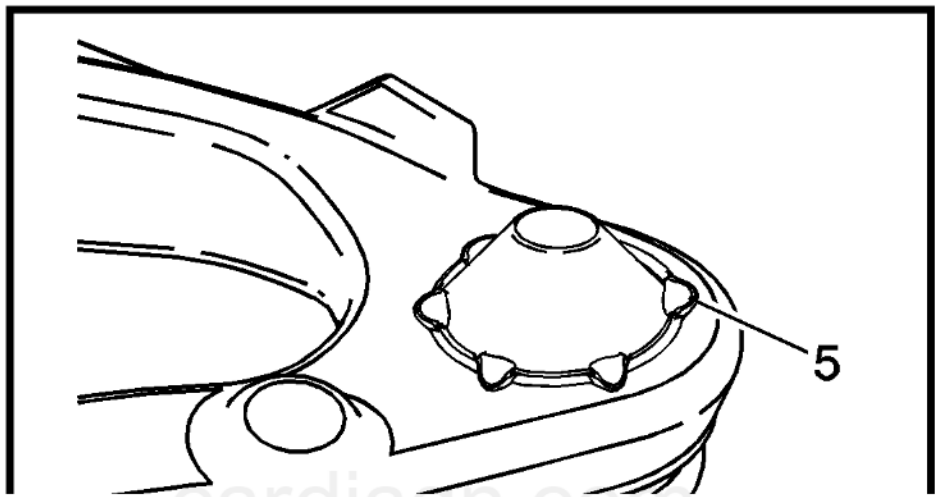
Fig. 35: Ball Joint And Installer
Courtesy of GENERAL MOTORS COMPANY

NOTE: **When using the CH-49240-2 installer, ensure the teeth for the locking tabs are facing upwards.**

2. Use the **CH-41805** replacer (2), **CH-49240-3** installer (1), **CH-49240-1** installer (4) and **CH-49240-2** installer (3) to install the front lower control arm ball stud in the front lower control arm.

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Fig. 36: View Of Ball Joint Special Tools And Locking Tabs
Courtesy of GENERAL MOTORS COMPANY

3. Reverse the **CH-49240-2** installer (3).
4. Use the **CH-41805** replacer (2), **CH-49240-3** installer (1), **CH-49240-1** installer (4) and **CH-49240-2** installer (3) to collapse the edge of the ball joint and create the new locking tabs (5).

CAUTION: Refer to Fastener Caution .

5. Tighten the **CH-49240-3** installer (1) to 250 N.m (185 lb ft).
6. Repeat steps 3, 4 and 5 to ensure that all of the locking tabs are the same depth and size.
7. Install Steering Knuckle **Steering Knuckle Replacement (Light Duty)**

FRONT LOWER CONTROL ARM BALL STUD REPLACEMENT (HEAVY DUTY)

Special Tools

- **CH-41805** Ball Joint Replacer
- **CH-49240** Ball Joint Installer

Equivalent regional tools:**Special Tools**

Removal Procedure

NOTE: When removing the steering knuckle, Do NOT remove any of the brake or electrical components from the knuckle. Secure the knuckle assembly to the side.

1. Remove Steering Knuckle **Steering Knuckle Replacement (Heavy Duty)**

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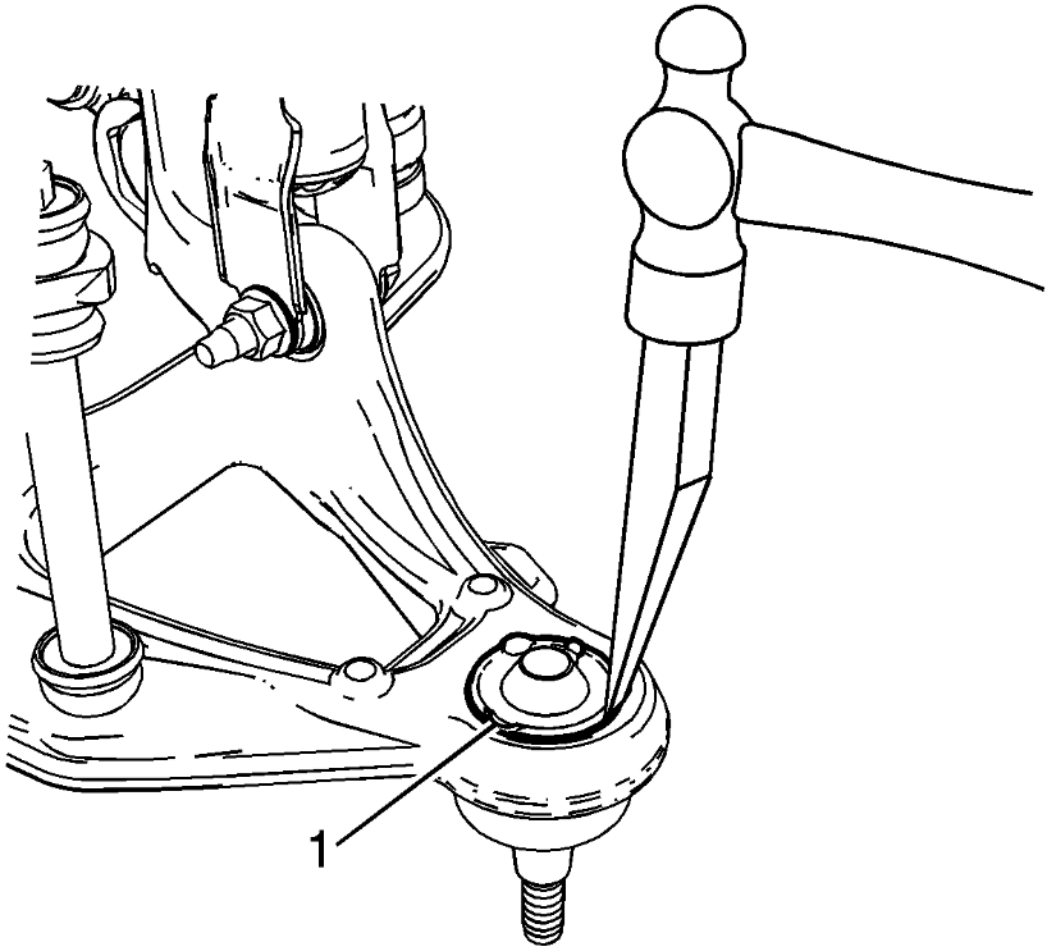


Fig. 37: View Of Hammer And Chisel At Lower Ball Joint
Courtesy of GENERAL MOTORS COMPANY

2. Use the appropriate tools to remove the locking tabs (1) from the front lower control arm ball stud body.

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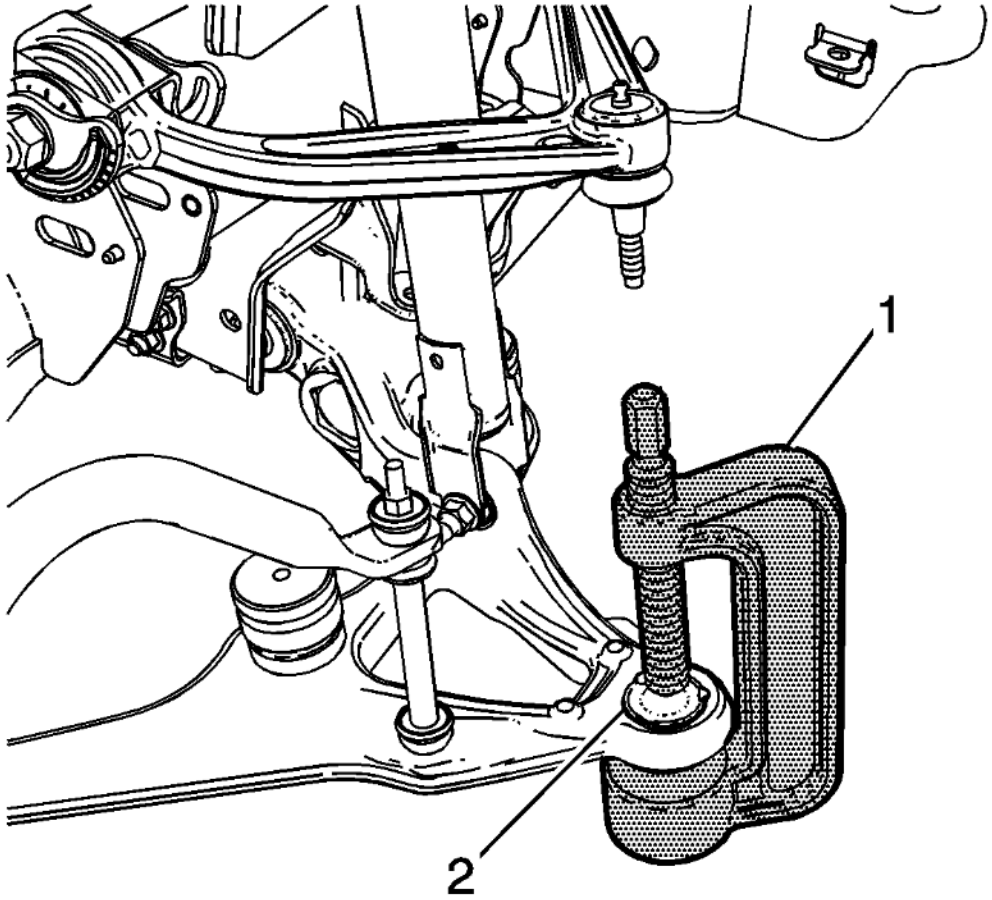


Fig. 38: View Of CH 41805 Remover/Installer And Lower Ball Joint
Courtesy of GENERAL MOTORS COMPANY

3. Use the **CH-41805** replacer (1) and the appropriate adapter to remove the front lower control arm ball stud (2) from the front lower control arm.

Installation Procedure

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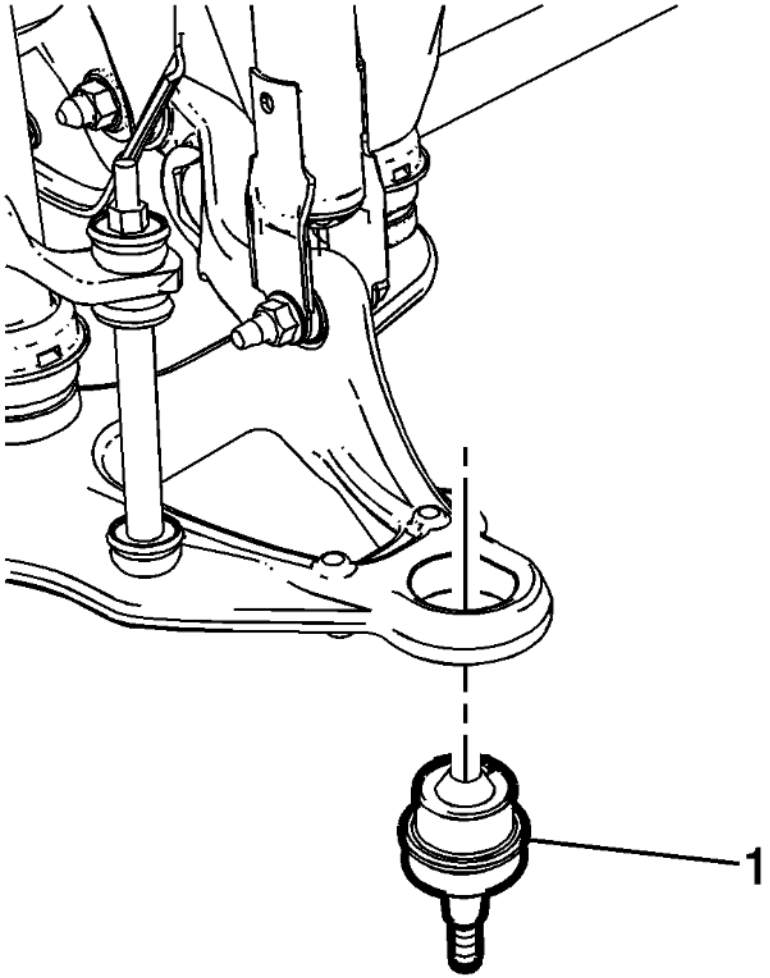


Fig. 39: View Of Lower Ball Joint At Lower Control Arm
Courtesy of GENERAL MOTORS COMPANY

1. Position the front lower control arm ball stud (1) in the front lower control arm.

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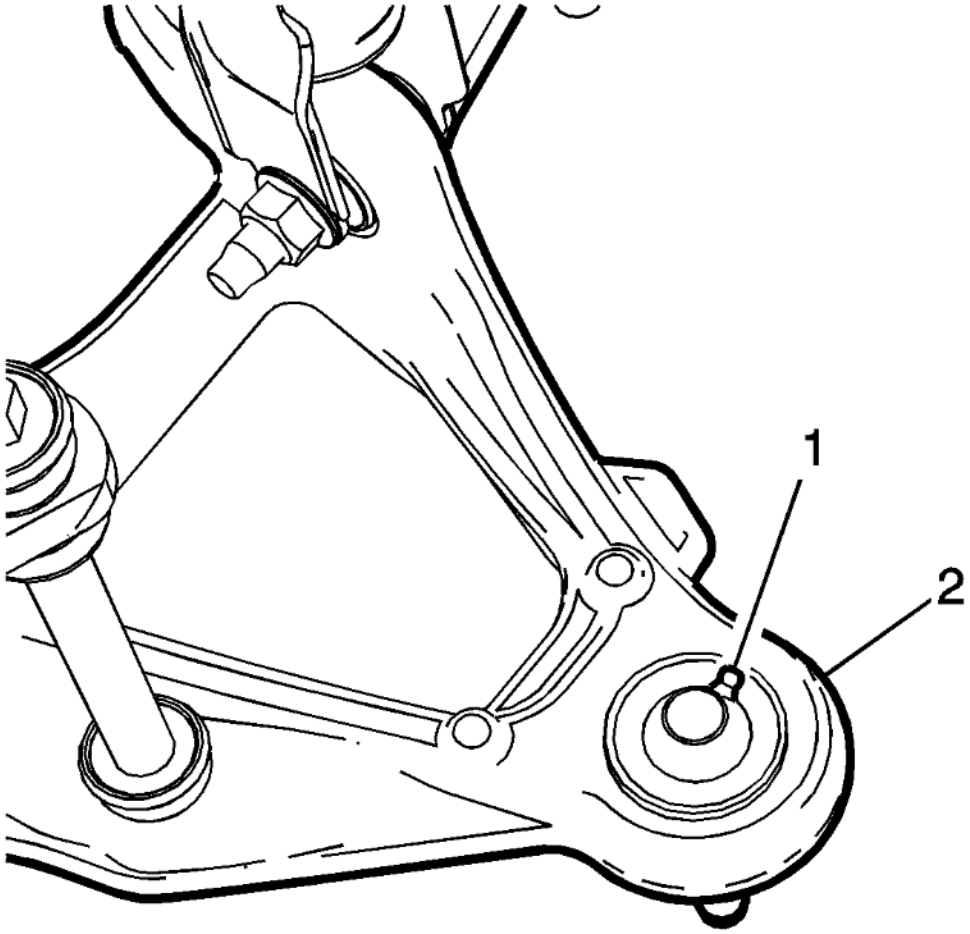


Fig. 40: Lower Ball Joint Grease Fitting And Channel
Courtesy of GENERAL MOTORS COMPANY

2. Align the front lower control arm ball stud grease fitting (1) with the channel (2) in the front lower control arm.

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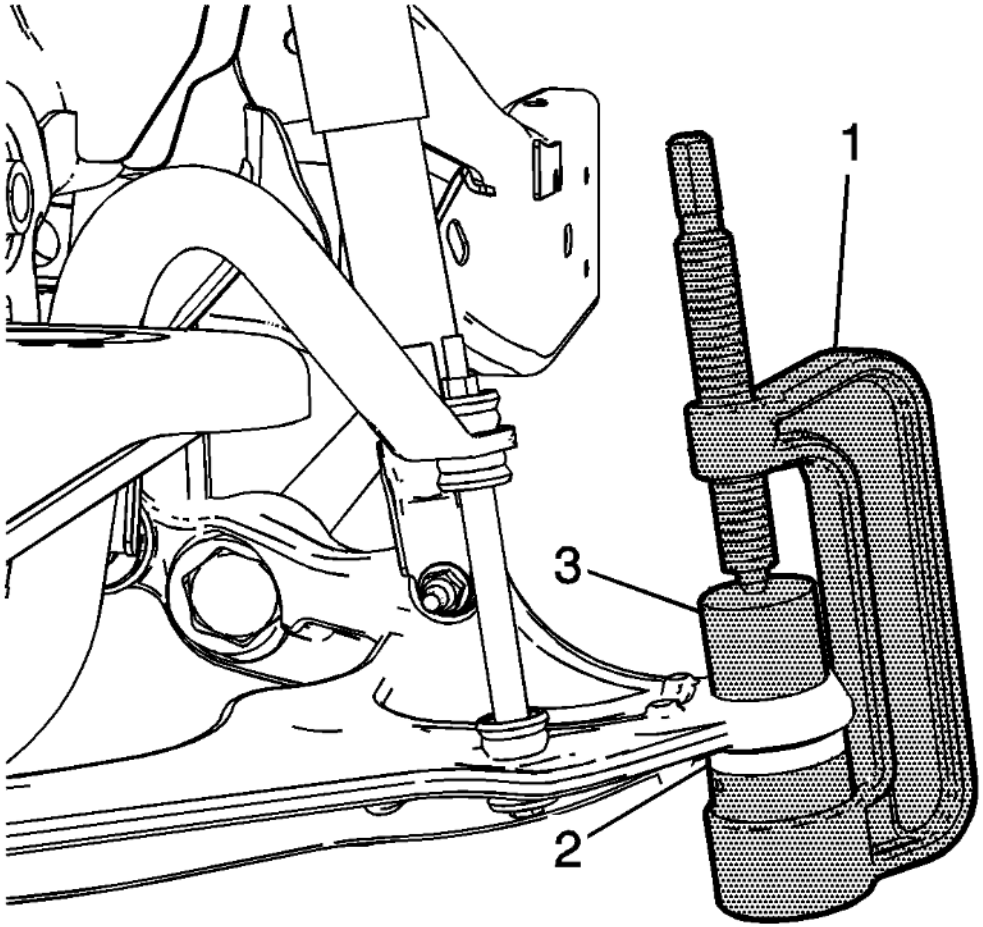


Fig. 41: View Of CH 41805 Remover/Installer, CH 49240 Install Kit And Adapter
Courtesy of GENERAL MOTORS COMPANY

3. Use the **CH-41805** replacer (1), appropriate adapter (3) and **CH-49240** installer (2) to install the front lower control arm ball stud in the front lower control arm.

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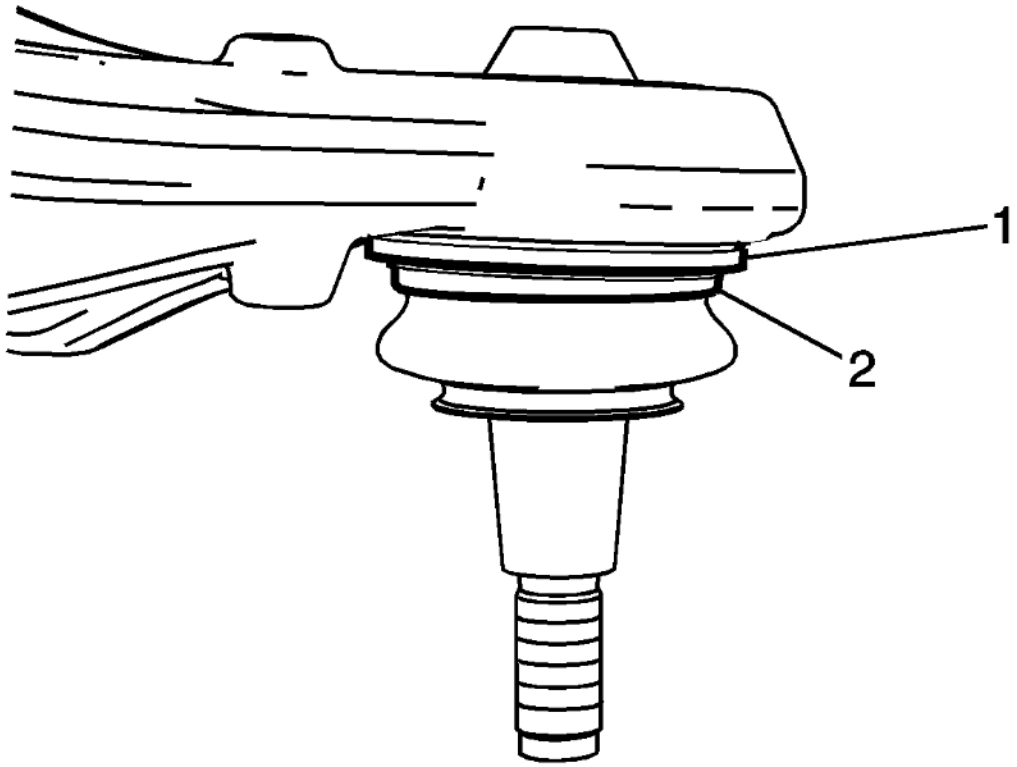


Fig. 42: Lower Control Arm And Ball Joint
Courtesy of GENERAL MOTORS COMPANY

4. Ensure the front lower control arm ball stud (2) is fully seated against the front lower control arm (1).

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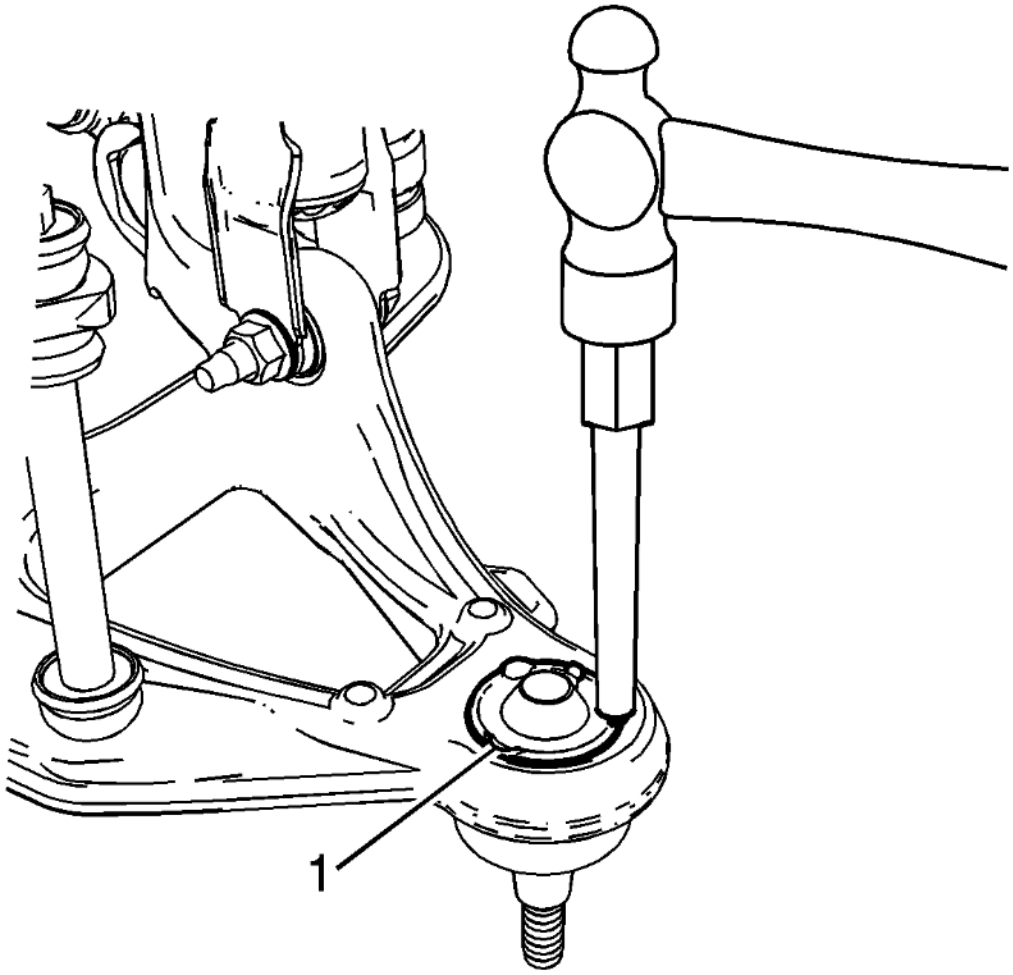


Fig. 43: View Of Lock Tab Creation Procedure
Courtesy of GENERAL MOTORS COMPANY

5. Use the appropriate tools to create new locking tabs (1) for the front lower control arm ball stud.
6. Install Steering Knuckle **Steering Knuckle Replacement (Heavy Duty)**

FRONT LOWER CONTROL ARM BUMPER REPLACEMENT (HEAVY DUTY)

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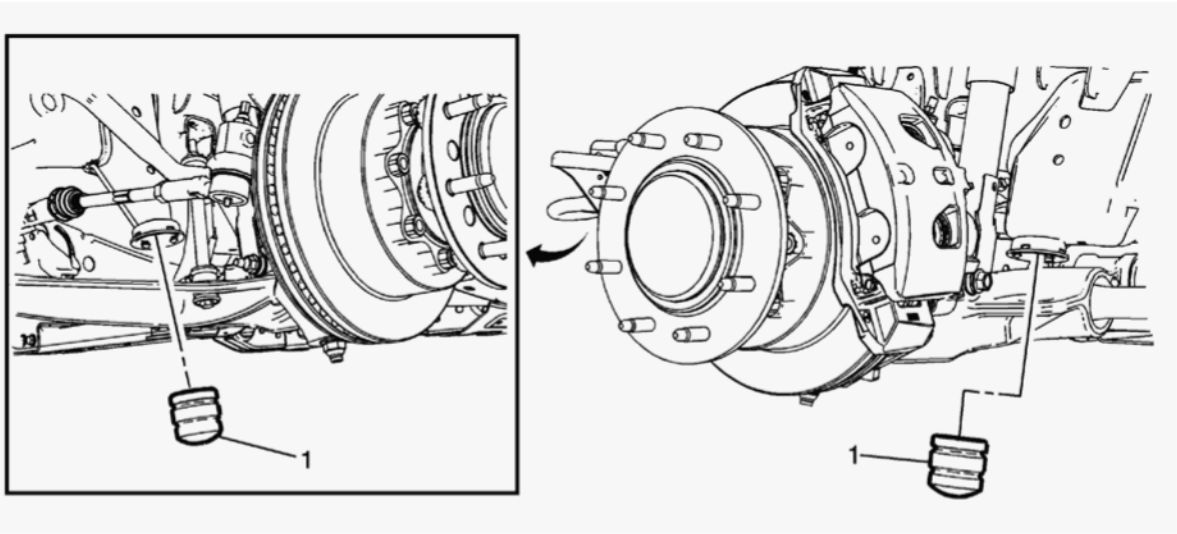


Fig. 44: Identifying Front Lower Control Arm Bumpers
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure Raise and support the vehicle. **Lifting and Jacking the Vehicle**	
1	Front Lower Control Arm Bumper

WHEEL STUD REPLACEMENT (LIGHT DUTY)

Special Tools

CH-43631 Ball Joint Separator

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove Front Brake Rotor **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)**

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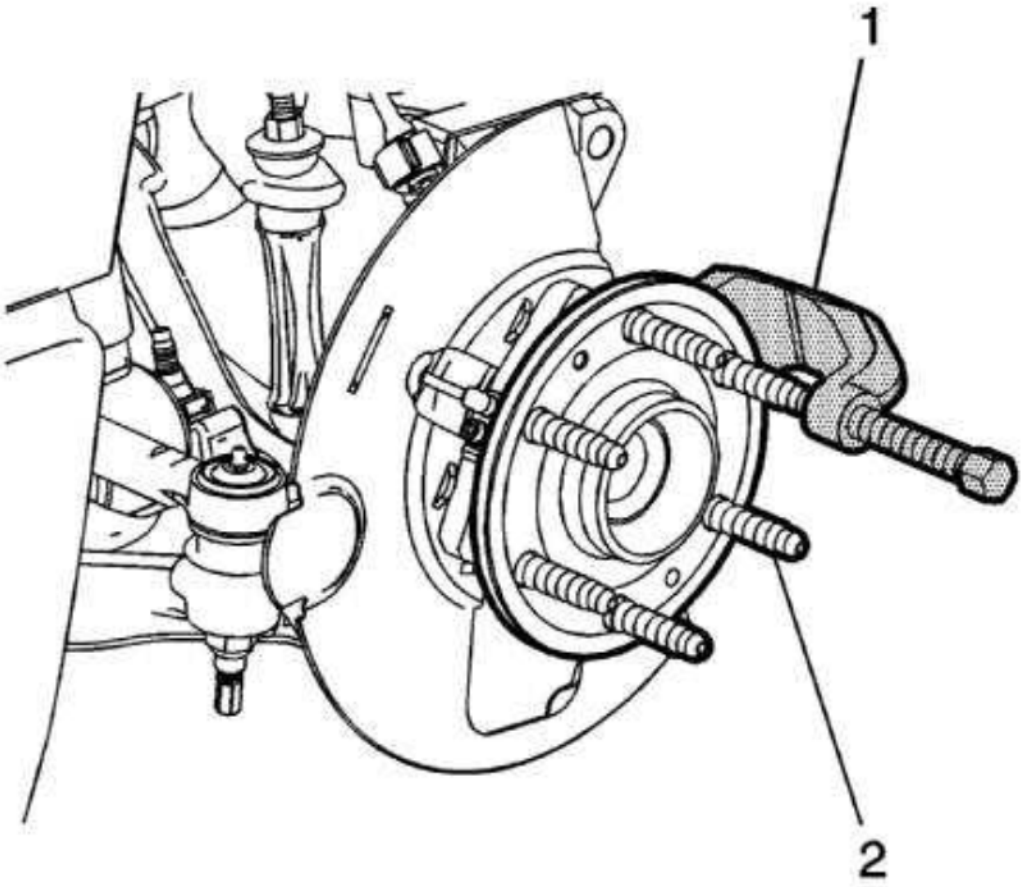


Fig. 45: J-43631 Separator
Courtesy of GENERAL MOTORS COMPANY

2. Use the **CH-43631** separator (1) to remove the wheel stud (2) from the flange on the hub assembly.

   DISCARD the stud.

Installation Procedure

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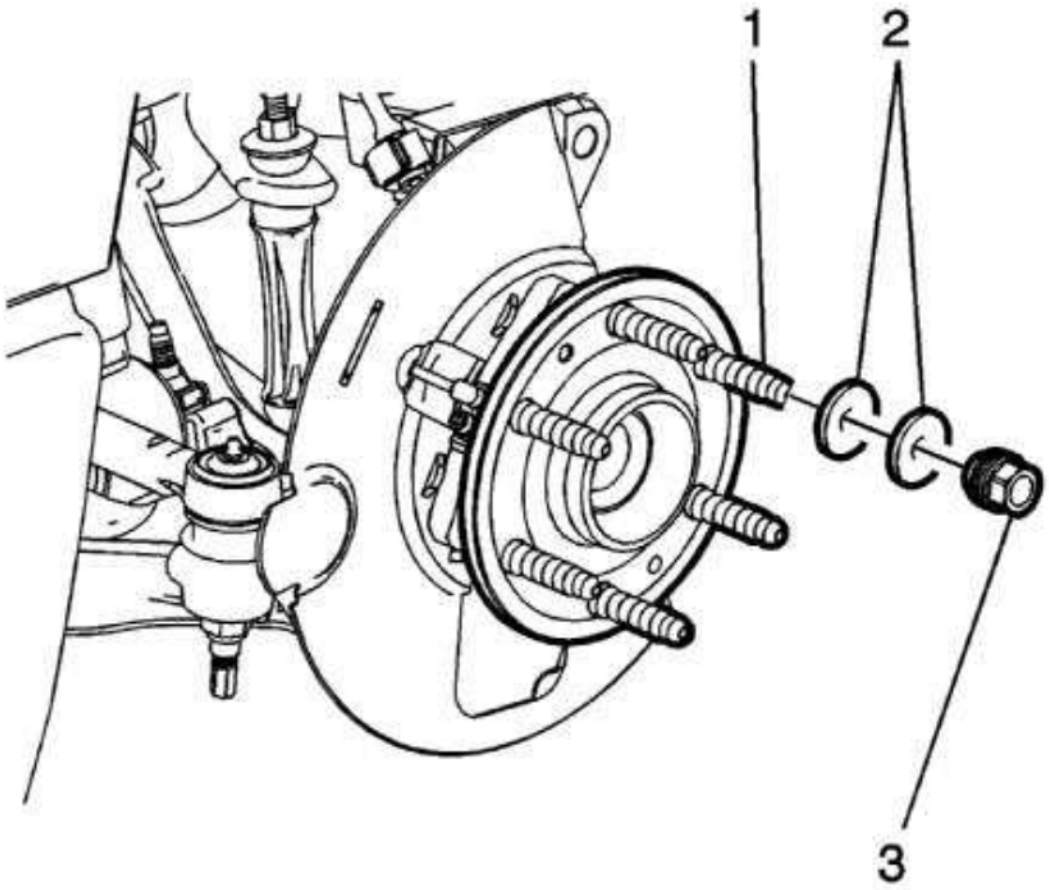


Fig. 46: NEW Wheel Stud
Courtesy of GENERAL MOTORS COMPANY

1. Position the NEW wheel stud (1) in the flange on the hub assembly.
2. Install flat washers (2) and an OLD wheel nut (3) on the wheel stud.
3. Use a suitable tool to prevent the flange on the hub assembly from rotating.
4. Tighten the wheel nut until the wheel stud is firmly seated.

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5. Remove the wheel nut and flat washers.
6. Install Front Brake Rotor **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)**

WHEEL STUD REPLACEMENT (HEAVY DUTY)

Special Tools

CH-43631 Ball Joint Separator

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove Front Brake Rotor **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)**

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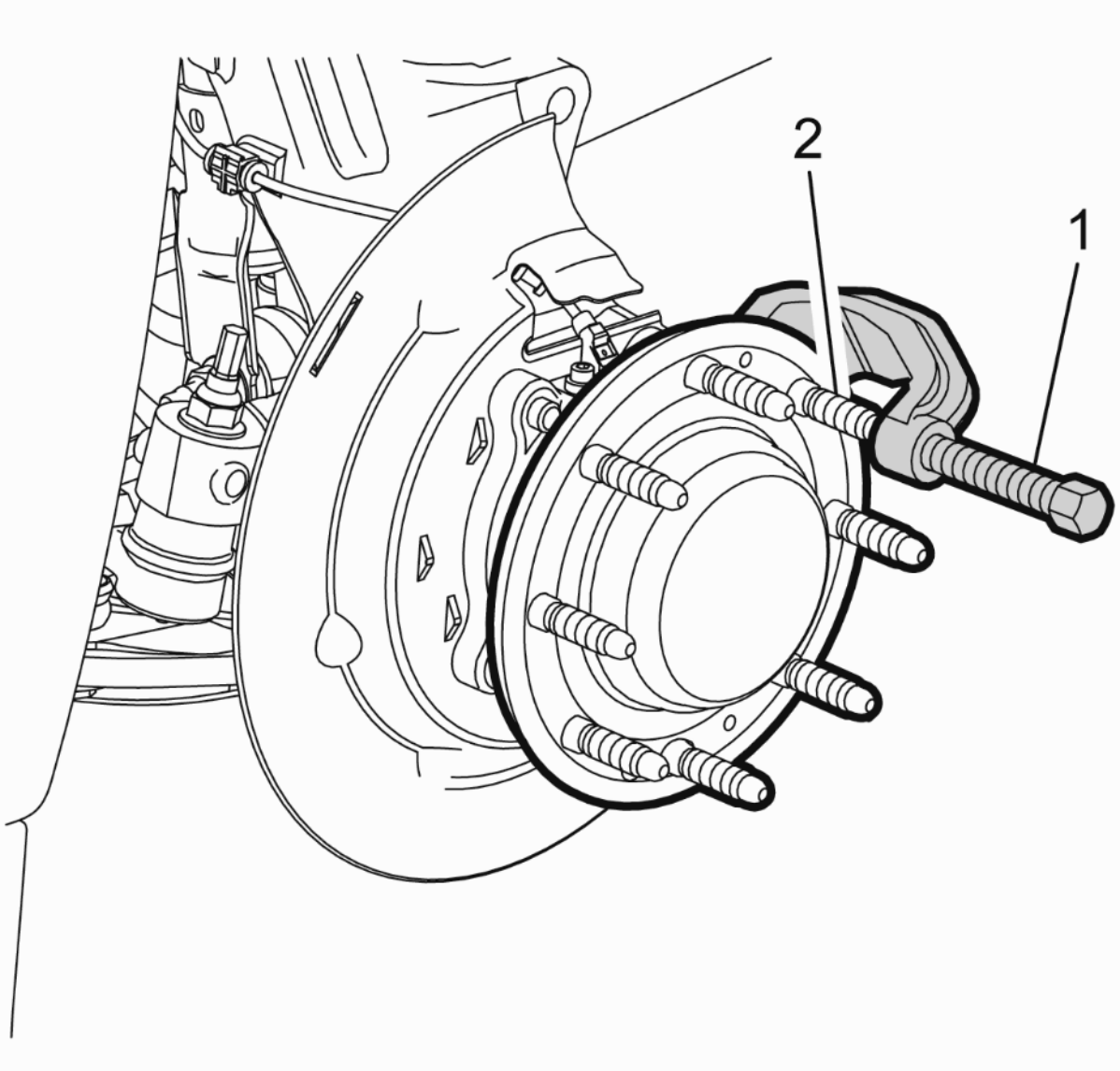


Fig. 47: Removing Wheel Stud From Flange On Hub Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Use the **CH-43631** separator (1) to remove the wheel stud (2) from the flange on the hub assembly.

   DISCARD the stud.

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Installation Procedure

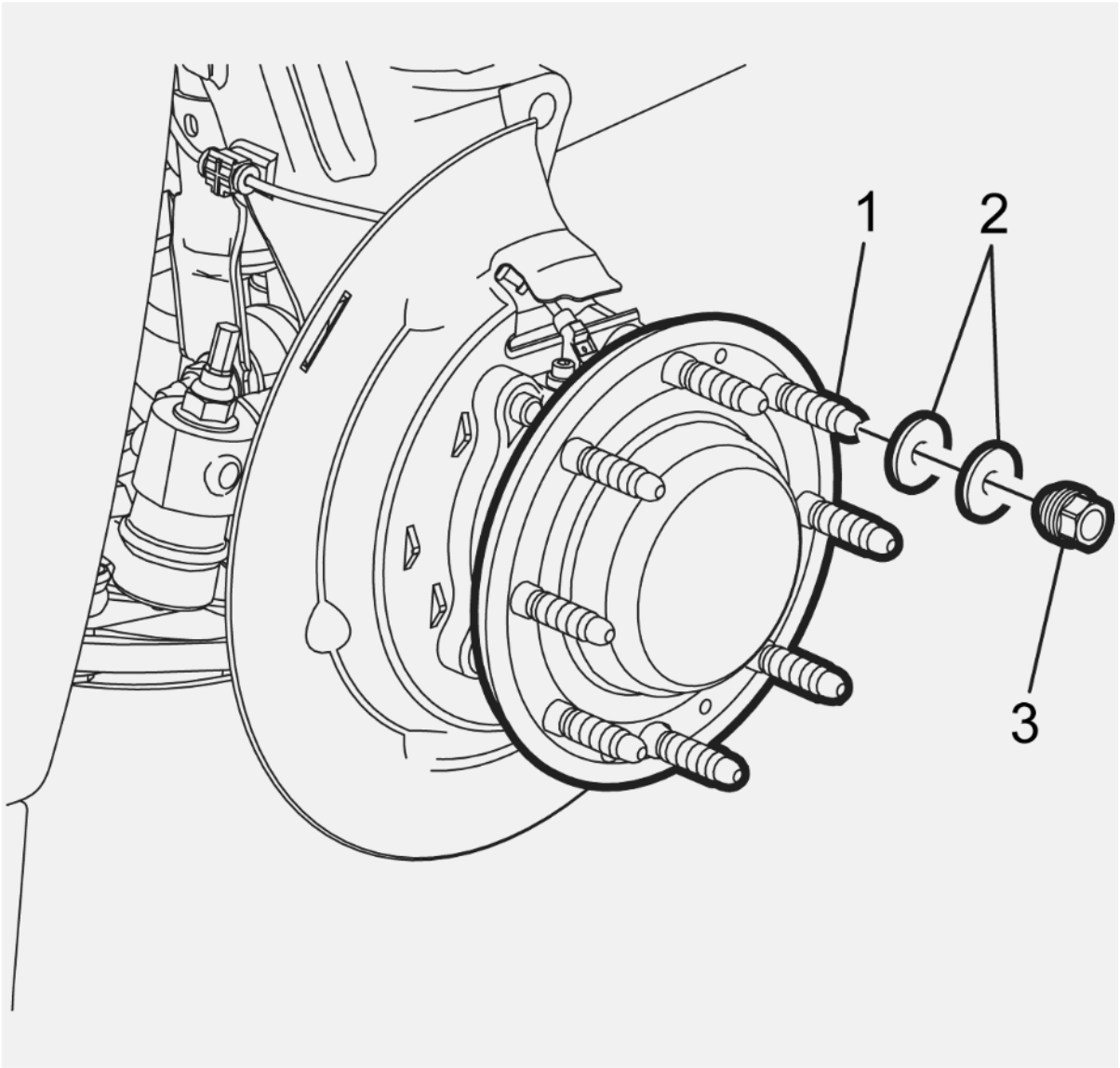


Fig. 48: Wheel Stud
Courtesy of GENERAL MOTORS COMPANY

1. Position the NEW wheel stud (1) in the flange on the hub assembly.

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2. Install flat washers (2) and an OLD wheel nut (3) on the wheel stud.
3. Use a suitable tool to prevent the flange on the hub assembly from rotating.
4. Tighten the wheel nut until the wheel stud is firmly seated.
5. Remove the wheel nut and flat washers.
6. Install Front Brake Rotor **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)**

FRONT WHEEL HUB, BEARING, AND SEAL REPLACEMENT (LIGHT DUTY)

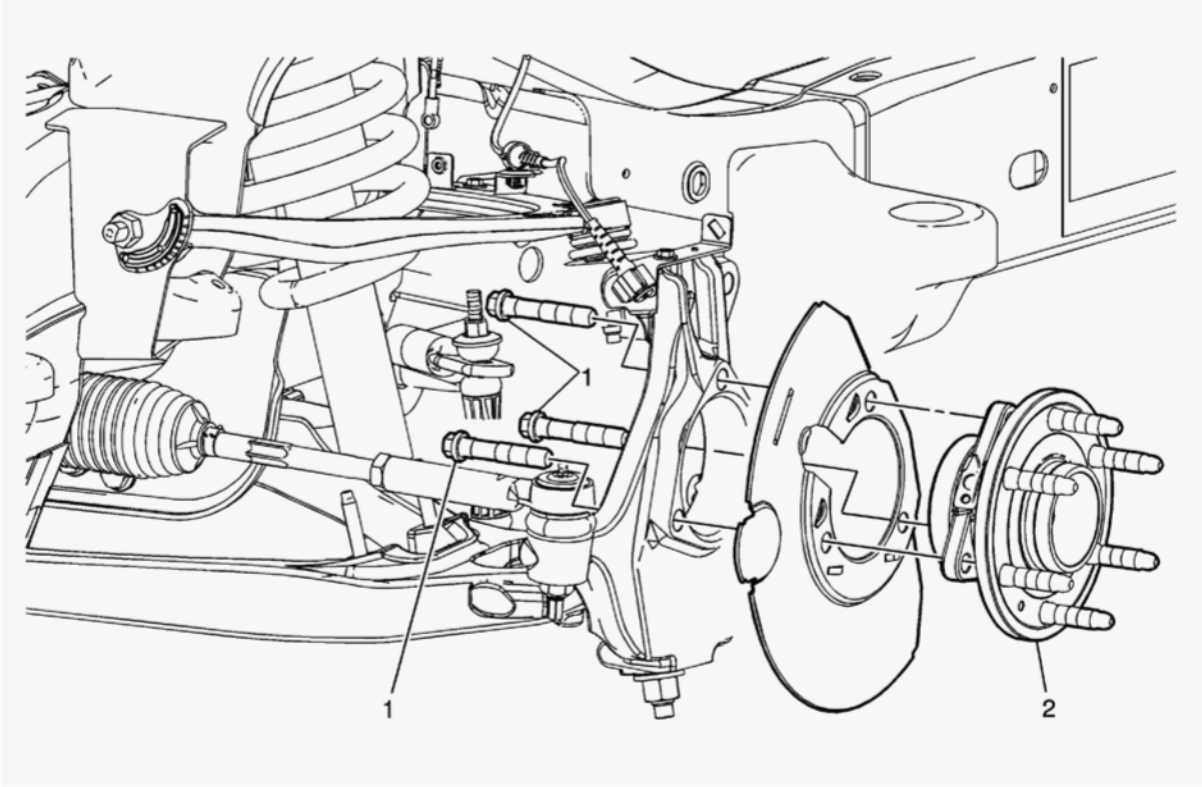


Fig. 49: View Of Wheel/Bearing Hub Assembly & Components
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	

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Callout	Component Name
	1. { If equipped }Separate Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (1500)** , or **Front Wheel Drive Shaft Replacement - Right Side (1500)** 2. **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)** 3. Disconnect the front wheel speed sensor electrical connector and detach the sensor retainers from the steering knuckle. **Front Wheel Speed Sensor Replacement (Without 9C1)** **Front Wheel Speed Sensor Replacement (With 9C1)**
1	Front Wheel Hub and Bearing Assembly Bolt (Qty: 3) **CAUTION:** **Refer to Fastener Caution .** **NOTE:** • **Vehicles equipped with aluminum steering knuckles come equipped with hardened steel washers located between the steering knuckle and the front wheel hub and bearing assembly**

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Callout	Component Name
	bolts. • **The hardened steel washers MUST be reinstalled or the fastener tightening measurement may be inaccurate.** **Tighten** 180 N.m (133 lb ft)
2	Front Wheel Hub and Bearing Assembly **Procedure** Lubricate the steering knuckle bore with wheel bearing grease or equivalent before reinstalling the front wheel hub and bearing assembly. Repeat the lubrication any time the assembly is removed. **NOTE:** **The NEW front wheel hub and bearing assembly comes with a NEW front wheel speed sensor already installed.**

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FRONT WHEEL HUB, BEARING, AND SEAL REPLACEMENT (HEAVY DUTY)

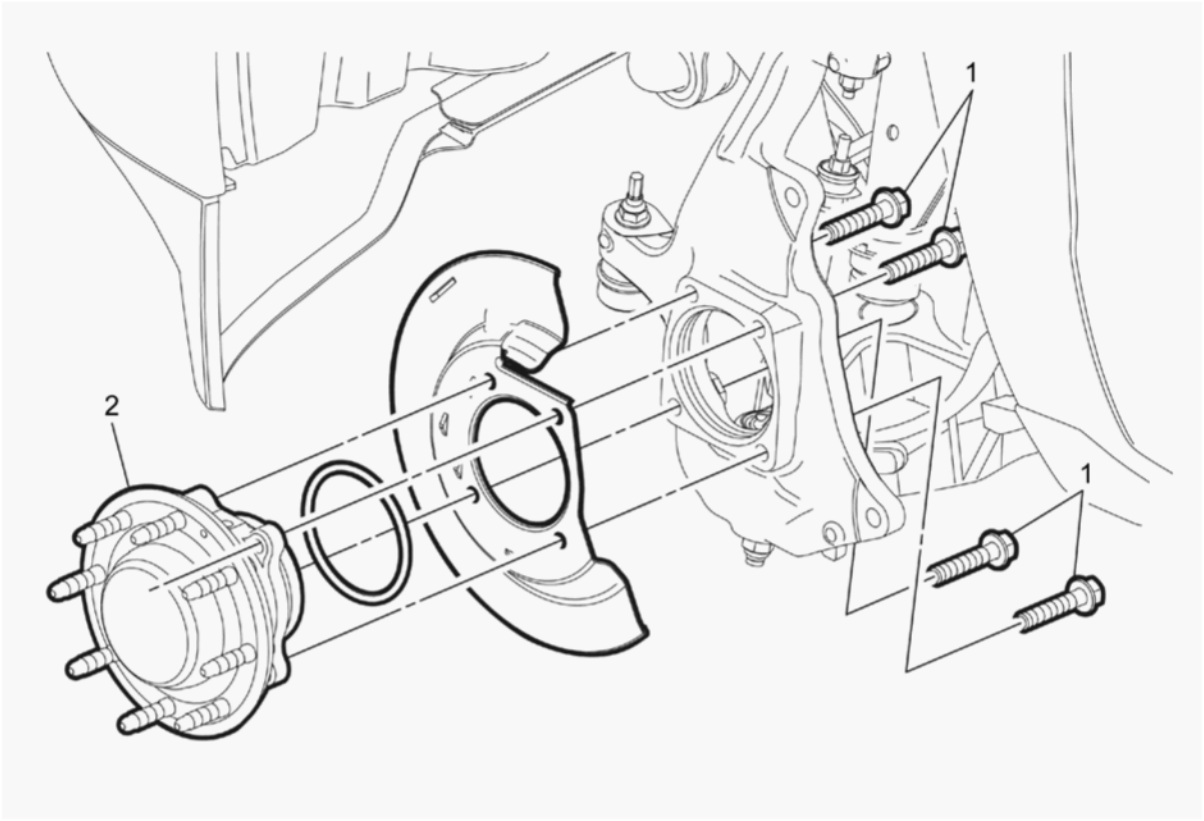


Fig. 50: Front Wheel Hub, Bearing, And Seal (Heavy Duty)
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. { If equipped }Separate Front Wheel Drive Shaft@Front Wheel Bearing and Hub Assembly **Front Wheel Drive Shaft Replacement - Left Side (1500)** , or **Front Wheel Drive Shaft Replacement - Right Side (1500)**	
2. **Front Brake Rotor Replacement (JD9)** **Front Brake Rotor Replacement (J95)**	
3. Disconnect the front wheel speed sensor electrical connector and detach the sensor retainers from the steering knuckle. **Front Wheel Speed Sensor Replacement (Without 9C1)** **Front Wheel Speed Sensor Replacement (With 9C1)**	

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Callout	Component Name
1	Front Wheel Hub and Bearing Assembly Bolt (Qty: 4) **CAUTION:** **Refer to Fastener Caution .** **Tighten** 180 N.m (133 lb ft) **NOTE:** • **Vehicles equipped with aluminum steering knuckles come equipped with hardened steel washers located between the steering knuckle and the front wheel hub and bearing assembly bolts.** • **The**

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Callout	Component Name
	hardened steel washers MUST be reinstalled or the fastener tightening measurement may be inaccurate.
2	Front Wheel Hub and Bearing Assembly **Procedure** 1. Remove the O-ring seal from the steering knuckle bore. 2. Clean and inspect the O-ring seal and replace the seal if the following conditions exist: nicks, cuts, dry or brittle, compression set. 3. Lubricate the steering knuckle bore with wheel bearing grease or equivalent before reinstalling the front wheel hub and bearing assembly. Repeat the lubrication any time the assembly is removed. **NOTE:** **The NEW front wheel hub and bearing assembly comes with a NEW front wheel speed sensor already installed.**

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TORSION BAR SUPPORT INSULATOR REPLACEMENT (HEAVY DUTY)

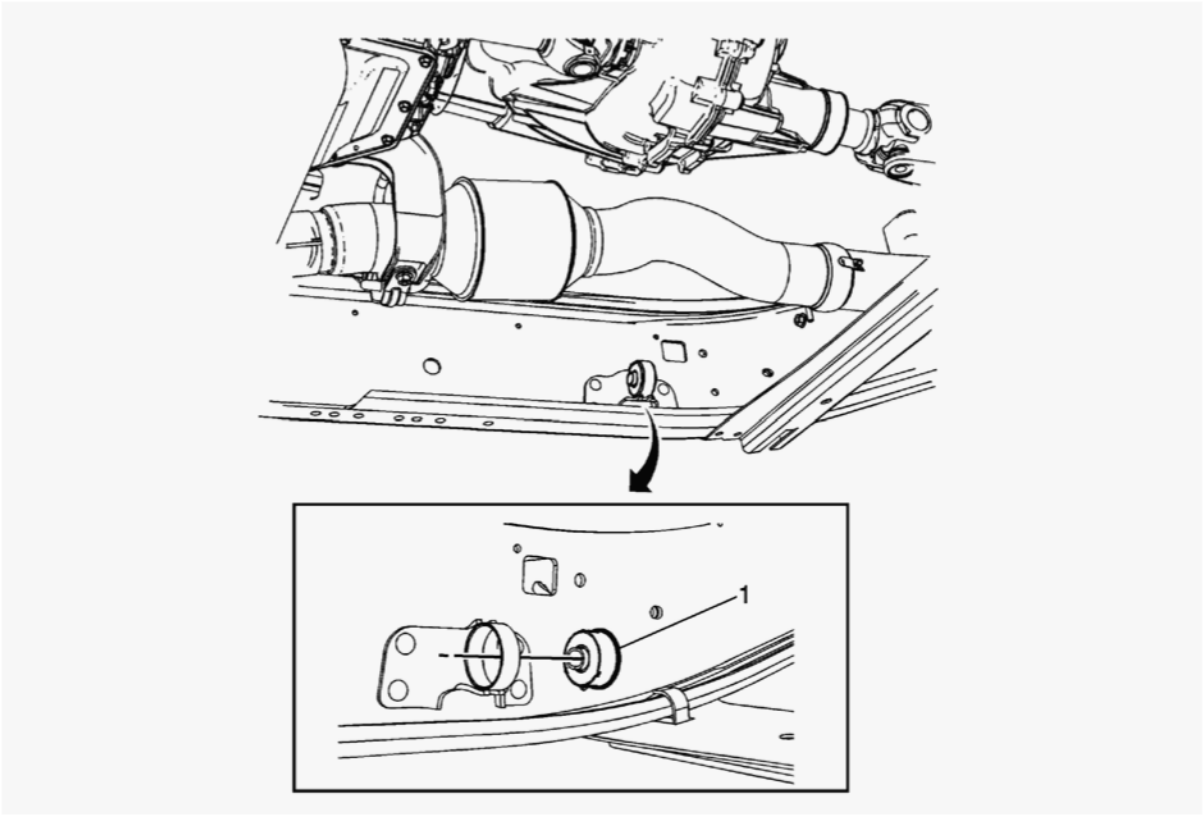


Fig. 51: Torsion Bars Bushing
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedure **Torsion Bar and Support Assembly Replacement (Heavy Duty)**	
1	Torsion Bar Support Insulator **Procedure** 1. When installing the torsion bar support insulator, ensure the inner slot is horizontal. 2. After installing the torsion bar support insulator, peen the insulator in three places 120 degrees apart from each other.

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Callout	Component Name
	3. Measure and adjust the trim height. **Trim Height Inspection** **NOTE:** **Note the orientation of the OLD torsion bar support insulator before removing to aid in the installation of the NEW insulator.**

TORSION BAR AND SUPPORT ASSEMBLY REPLACEMENT (HEAVY DUTY)

Special Tools

CH-48809 Torsion Bar Unloader

Equivalent regional tools:**Special Tools**

Removal Procedure

CAUTION: **Use care when handling the torsion bars in order to avoid chipping or scratching the coating. Damage to the coating will result in premature failure of the torsion bars.**

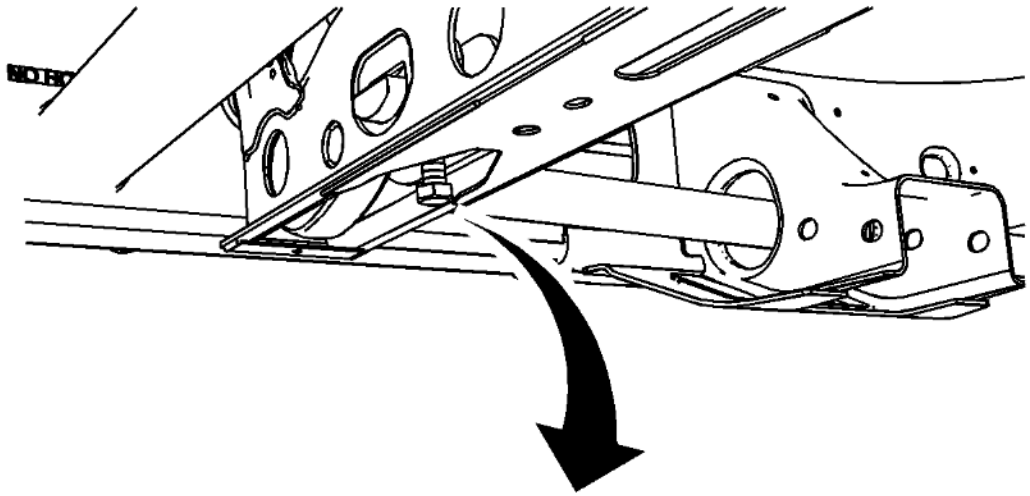
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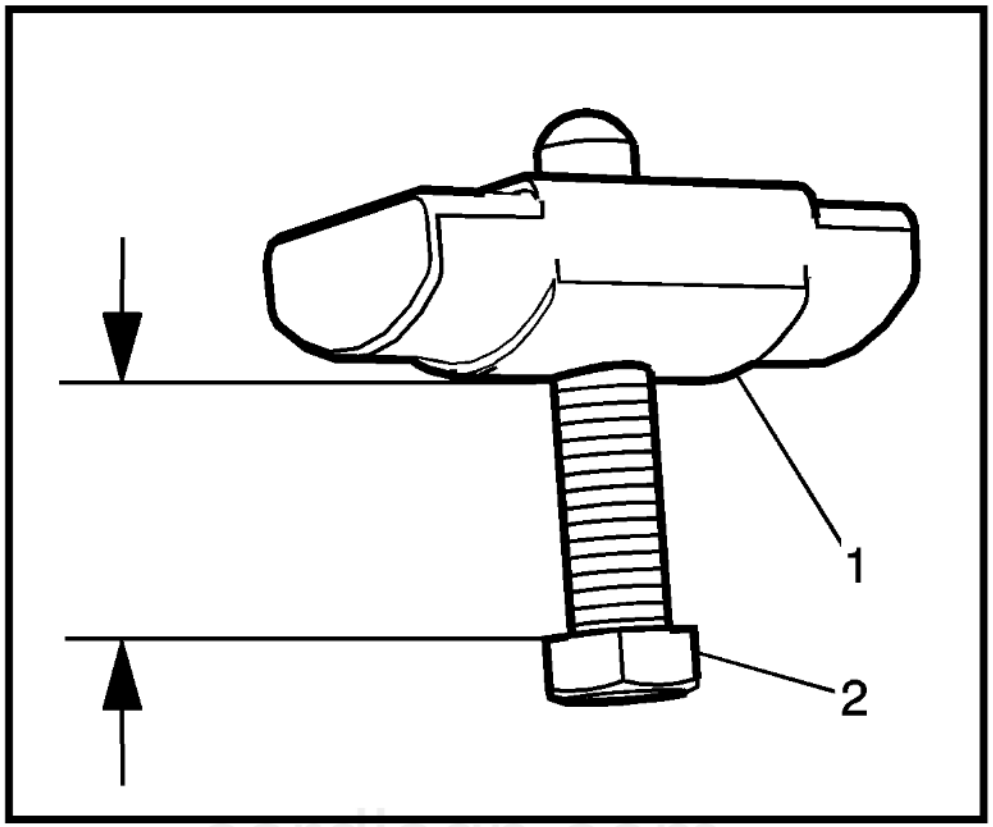
- **When lifting the vehicle to service the torsion bars or related components, Do NOT lift the vehicle by the front suspension.**
- **Use the appropriate hoist to lift the vehicle by the frame.**

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

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Fig. 52: Measuring Distance From Adjuster Nut To Adjuster Bolt
Courtesy of GENERAL MOTORS COMPANY

NOTE: This measurement step MUST be performed before removing or loosening any components or the measurement(s) will be inaccurate.

2. Measure and record the distance between the torsion bar adjuster nut (1) and the head of the torsion bar adjuster bolt (2) at both ends of the torsion bar support assembly.
3. Remove the torsion bar adjuster bolt (2) from the torsion bar adjuster nut (1) and allow the torsion bar adjuster arm to rest in the torsion bar support assembly.

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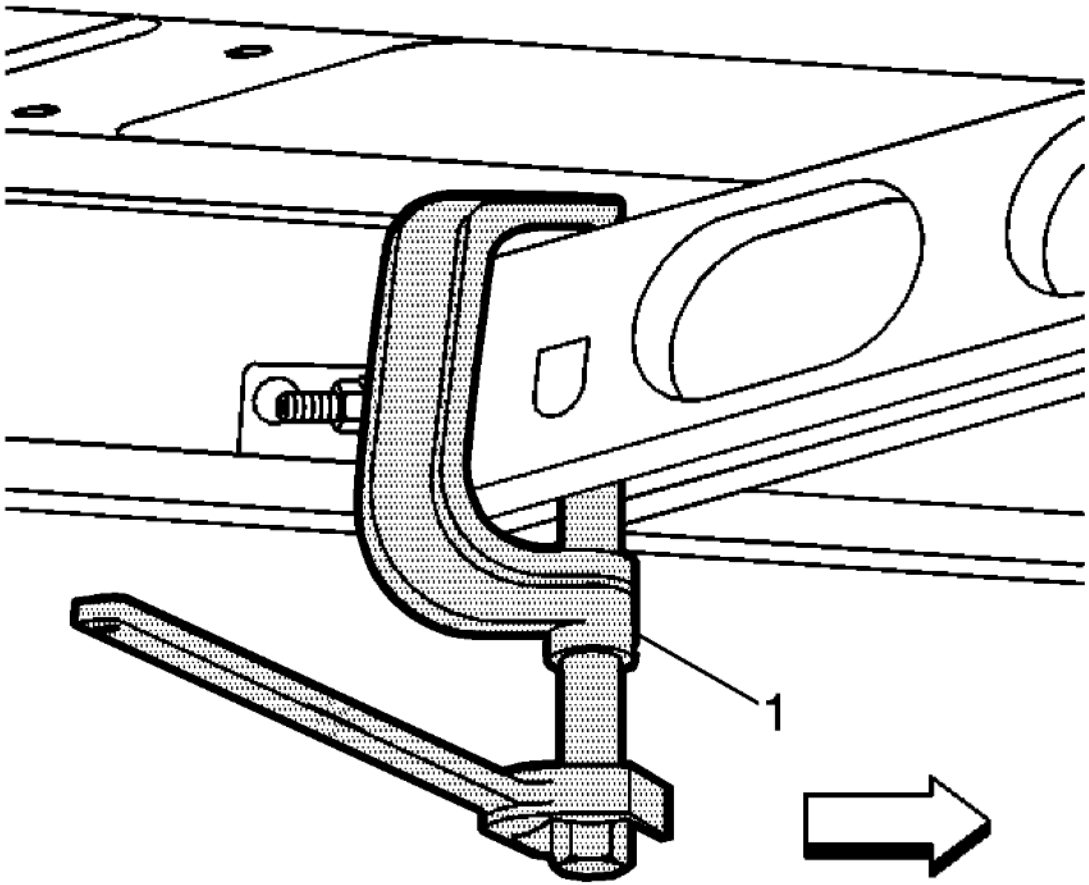


Fig. 53: View Of CH 48809
Courtesy of GENERAL MOTORS COMPANY

4. Use the **CH-48809** unloader (1) to increase the tension on the torsion bar adjustment arm until the load is removed from the torsion bar adjuster nut.

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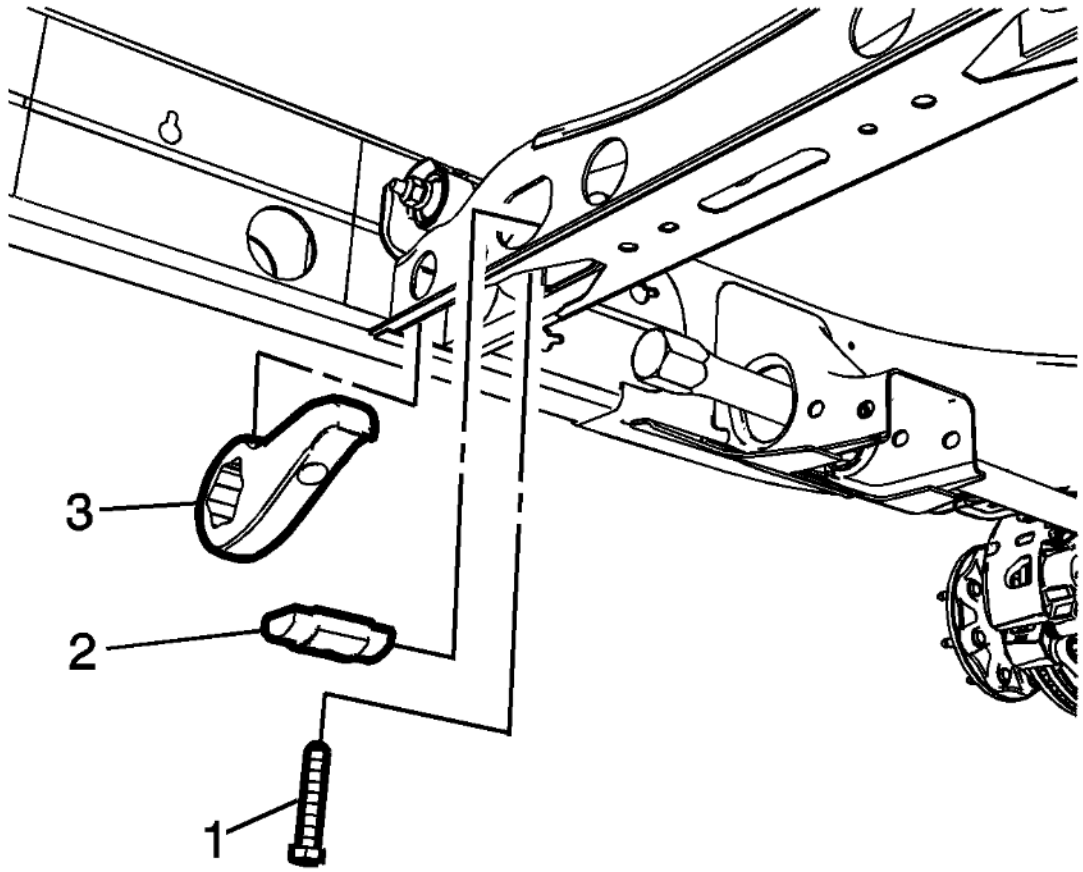


Fig. 54: Identifying Adjustment Arm, Bolt And Nut
Courtesy of GENERAL MOTORS COMPANY

5. Remove the torsion bar adjuster nut (2) from the torsion bar support assembly.
6. Remove the **CH-48809** unloader to unload the front torsion bar.
7. Slide the front torsion bar forward and remove the torsion bar adjustment arm (3) from the torsion bar support assembly.
8. Repeat the process for the other torsion bar adjustment arm.

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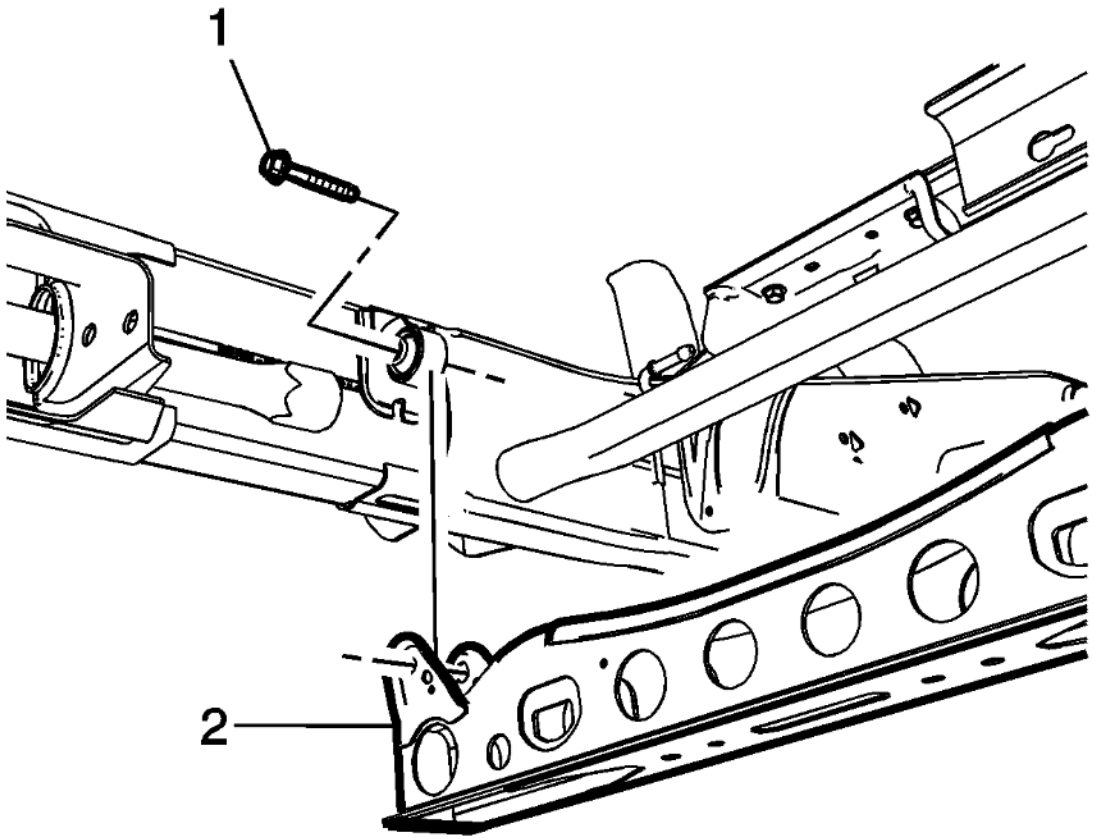


Fig. 55: View Of Torsion Bar And Crossmember Bolt
Courtesy of GENERAL MOTORS COMPANY

9. Remove the torsion bar support assembly bolts (1).

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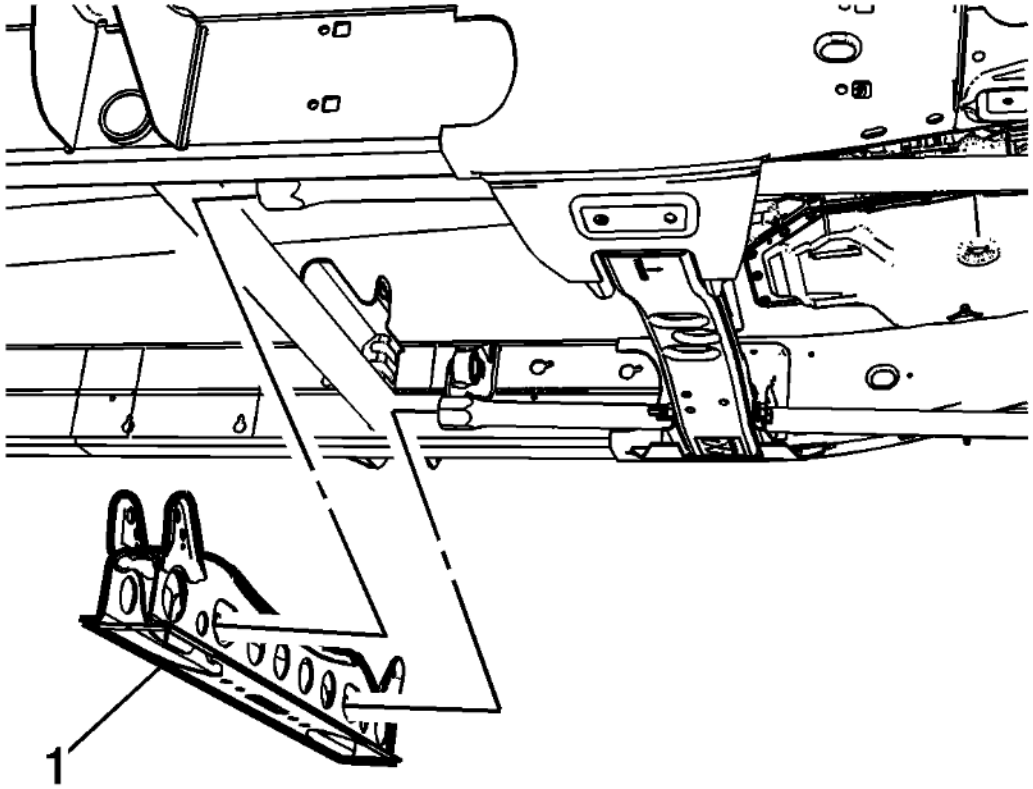


Fig. 56: View Of Torsion Bar Support
Courtesy of GENERAL MOTORS COMPANY

10. Remove the torsion bar support assembly (1) from the frame.

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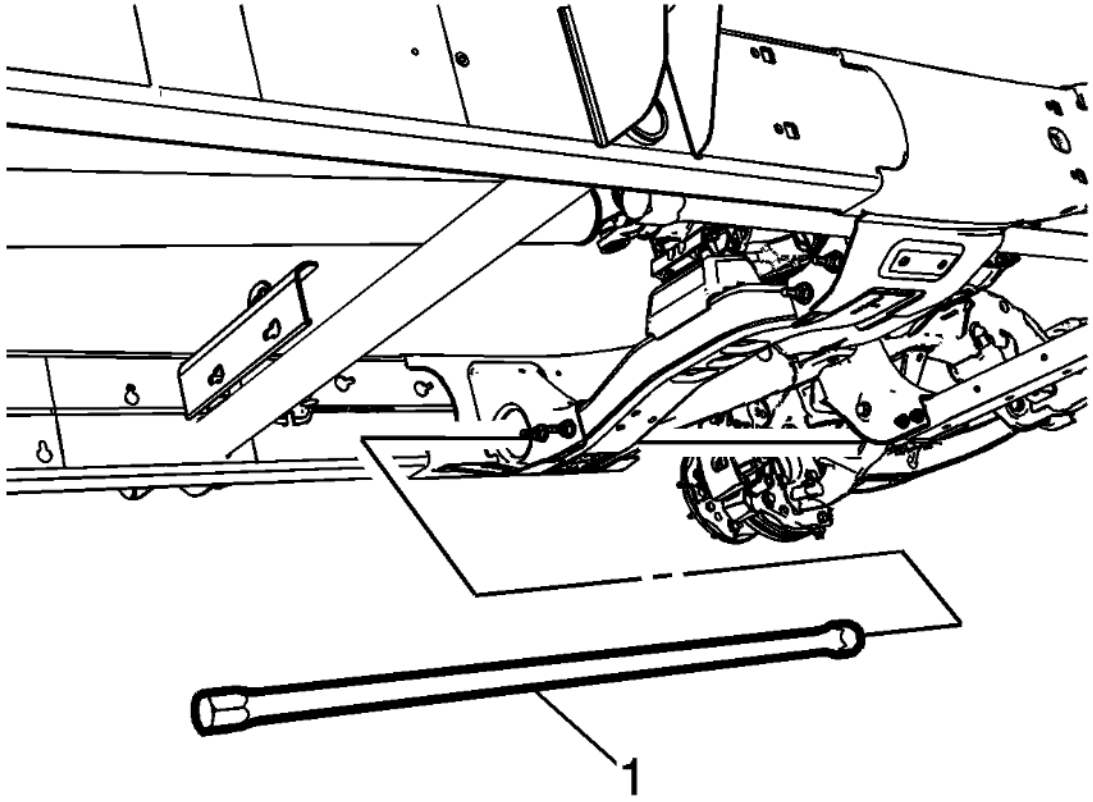


Fig. 57: Torsion Bar
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- **The left and right torsion bars are NOT interchangeable.**
- **Ensure a NEW torsion bar is installed in the same direction as the OLD torsion bar.**
- **The torsion bars are only designed to be torqued in one direction.**
- **The correct direction for each torsion bar is marked on the bar.**

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11. Remove the front torsion bars (1) from the front lower control arms.

Installation Procedure

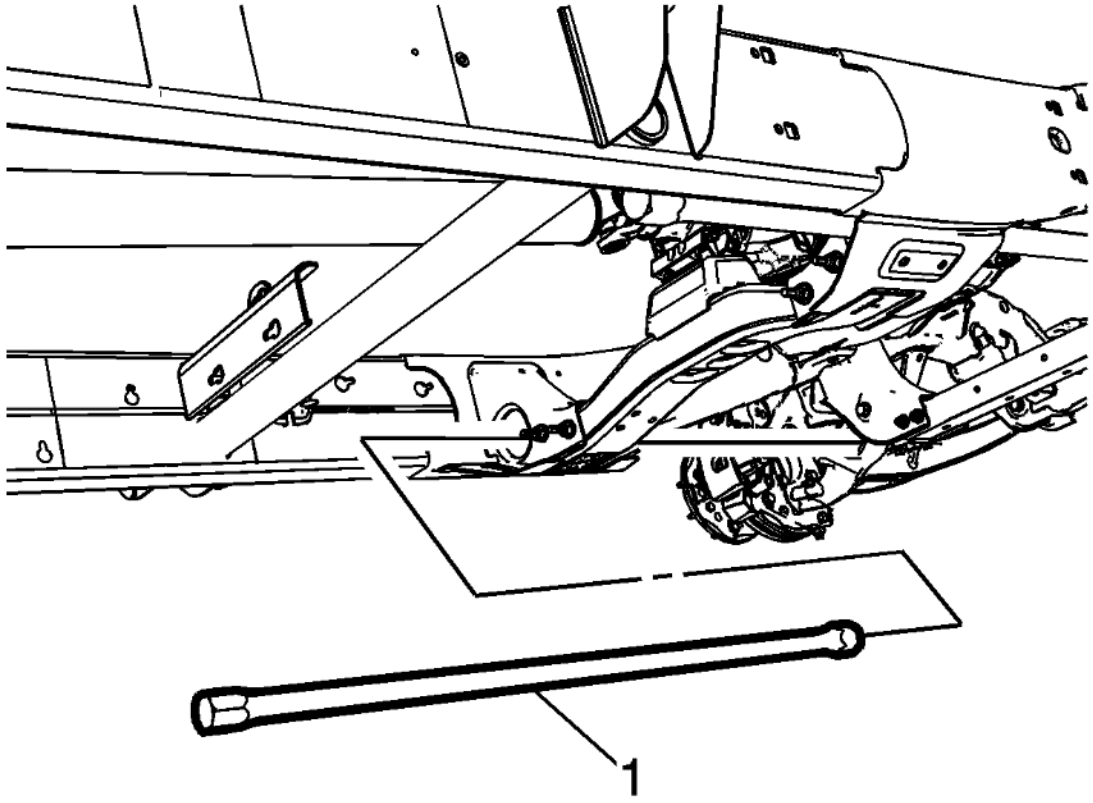


Fig. 58: Torsion Bar
Courtesy of GENERAL MOTORS COMPANY

1. Position the front torsion bars (1) in the front lower control arms.

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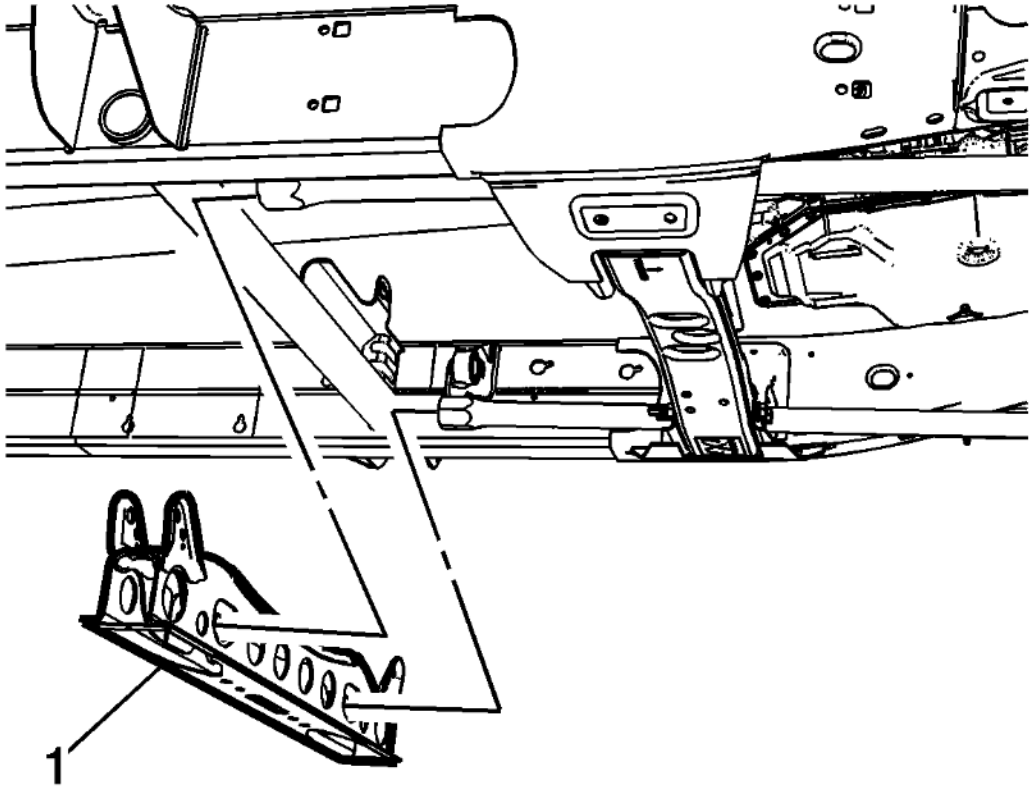


Fig. 59: View Of Torsion Bar Support
Courtesy of GENERAL MOTORS COMPANY

2. Position the torsion bar support assembly (1) on the frame.

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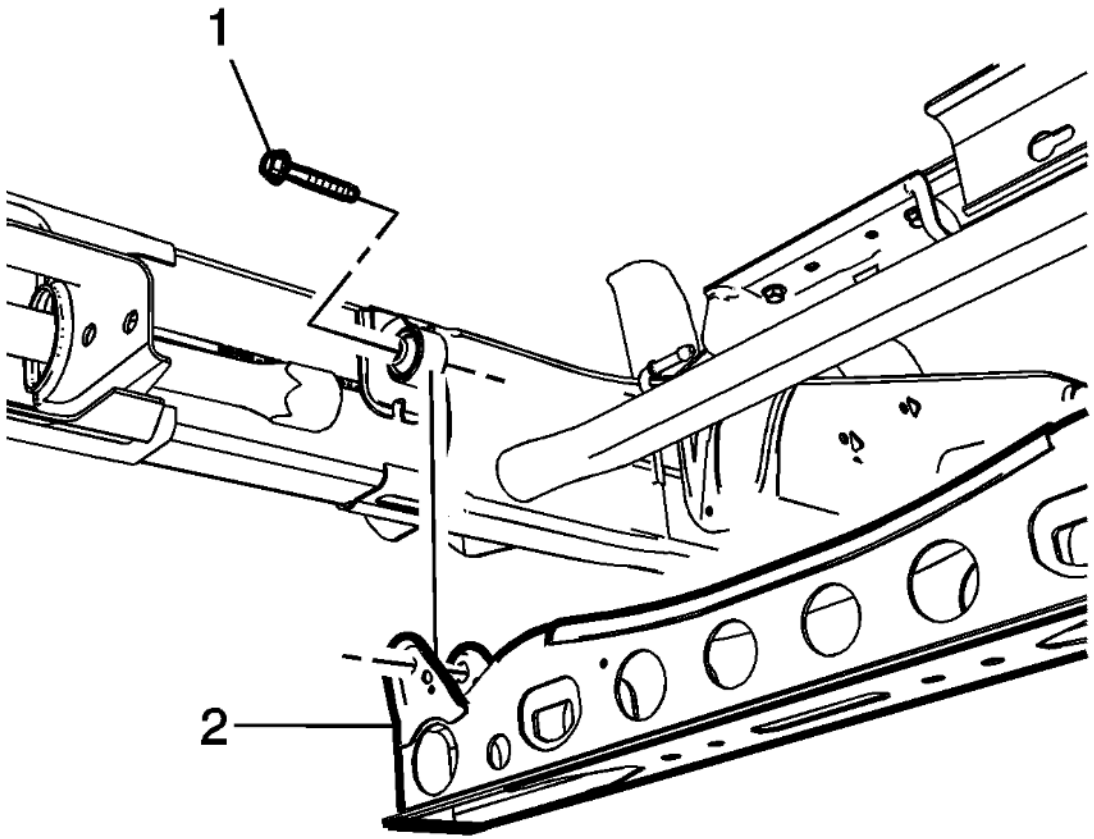


Fig. 60: View Of Torsion Bar And Crossmember Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

3. Install the torsion bar support assembly bolts (1) and tighten to 125 N.m (92 lb ft).

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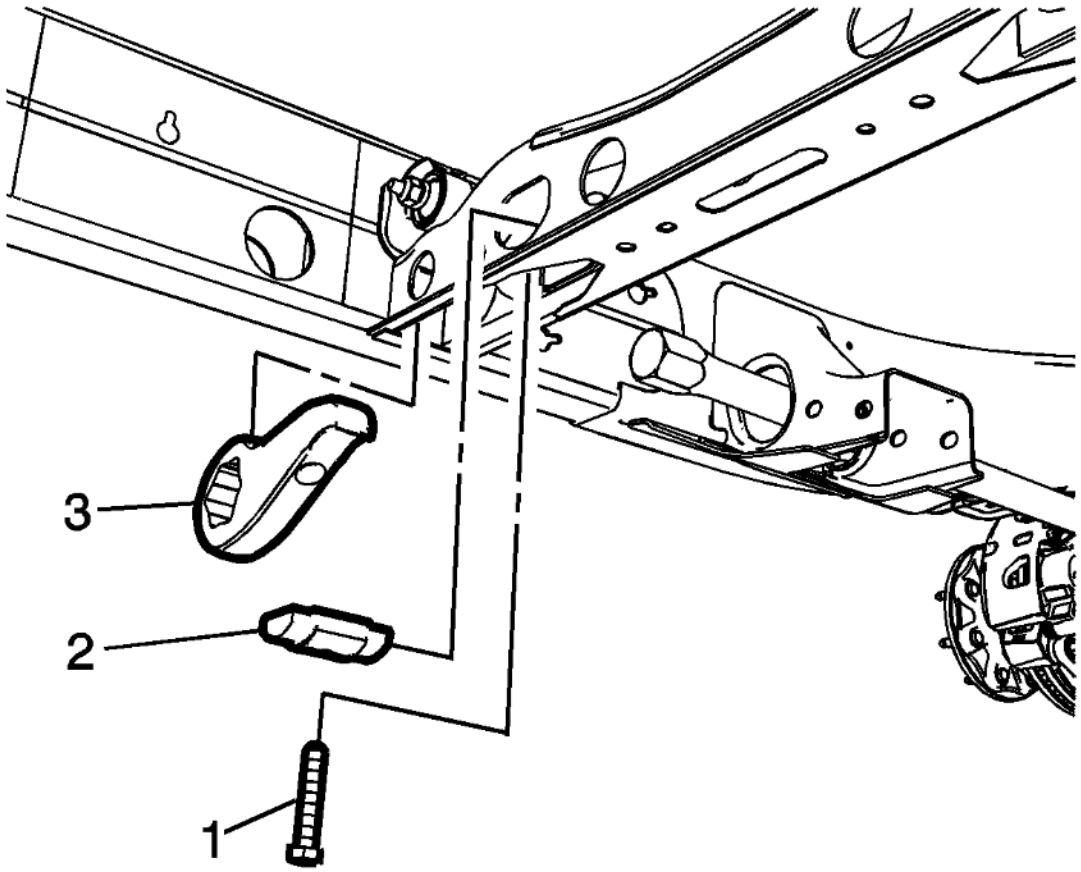


Fig. 61: Identifying Adjustment Arm, Bolt And Nut
Courtesy of GENERAL MOTORS COMPANY

4. Install the torsion bar adjustment arm (3) in the torsion bar support assembly.
5. Slide the front torsion bar rearward into the torsion bar adjustment arm until the bar is fully seated.

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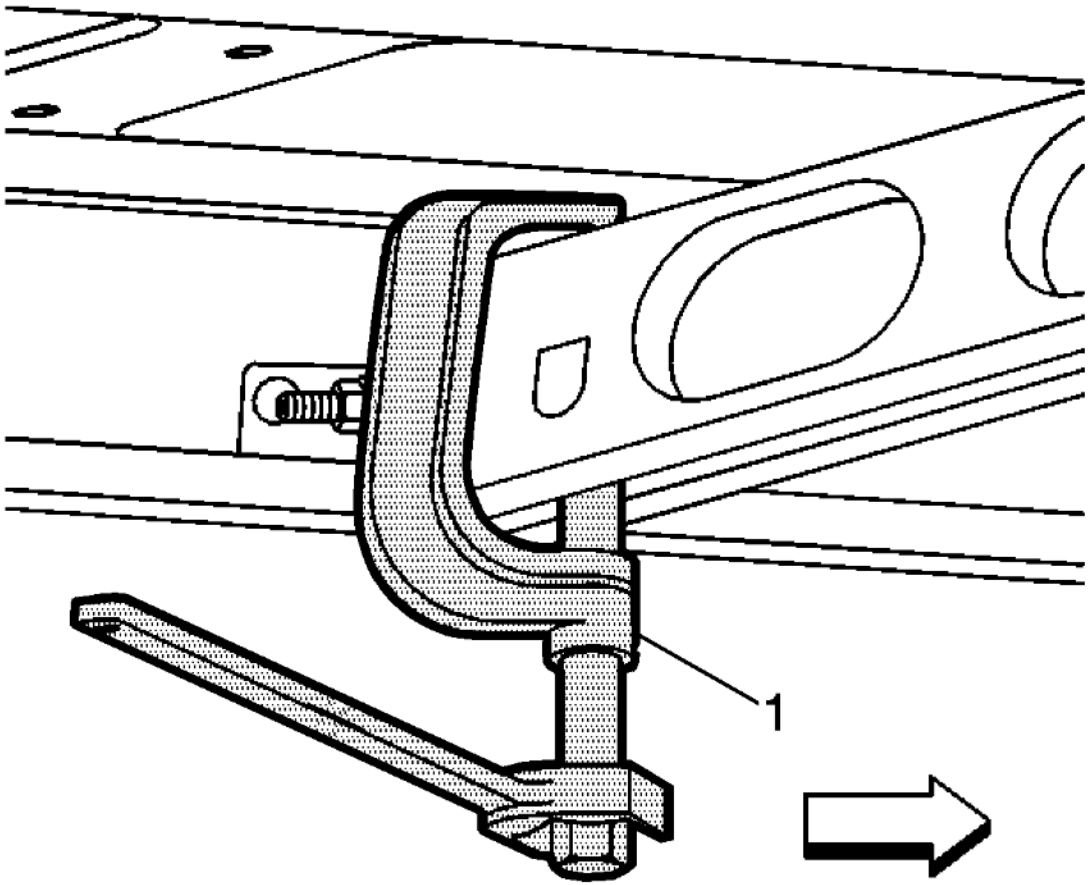
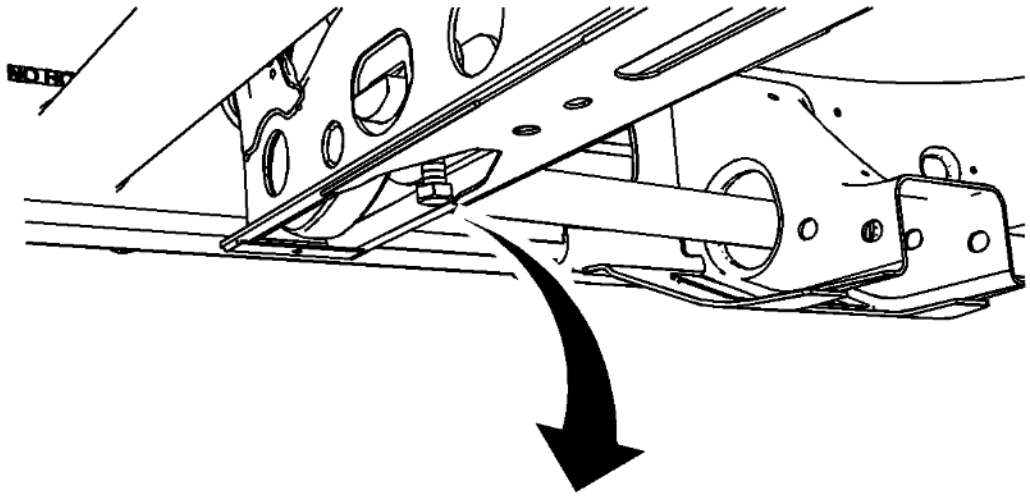
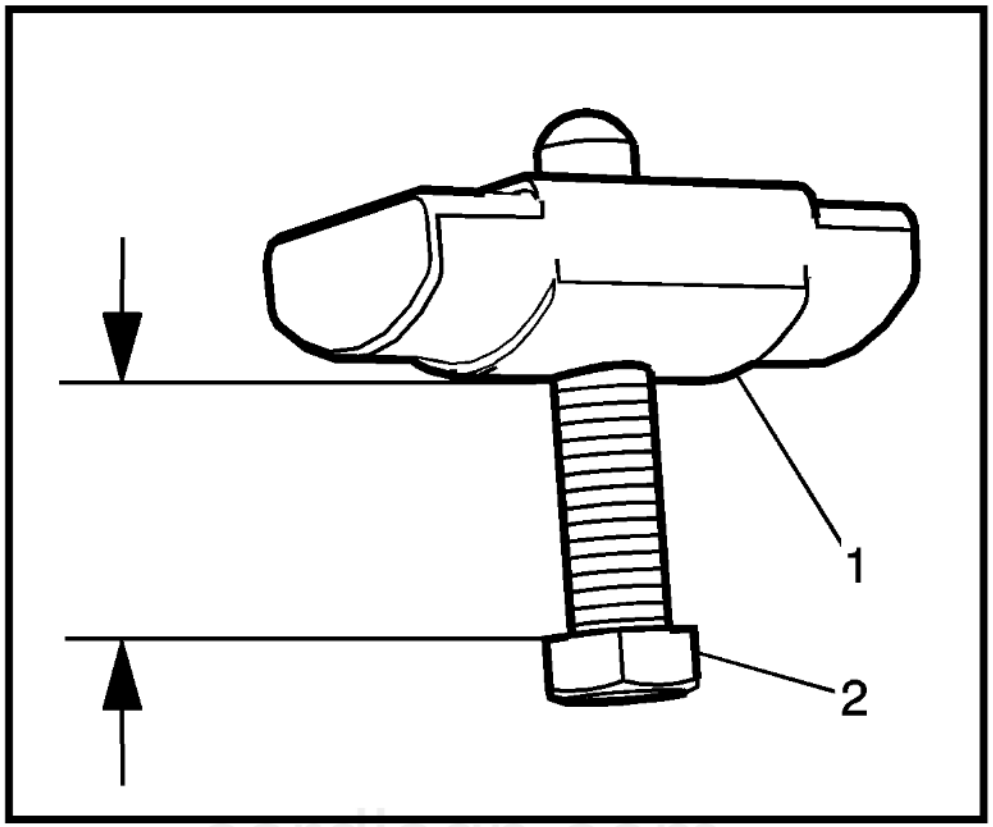


Fig. 62: View Of CH 48809
Courtesy of GENERAL MOTORS COMPANY

6. Use the **CH-48809** unloader (1) to increase the load on the torsion bar adjustment arm.
7. Install the torsion bar adjuster nut in the torsion bar support assembly.
8. Remove the **CH-48809** unloader and allow the torsion bar adjuster arm to rest on the torsion bar adjuster nut.

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Fig. 63: Measuring Distance From Adjuster Nut To Adjuster Bolt
Courtesy of GENERAL MOTORS COMPANY

9. Install the torsion bar adjuster bolt (2) in the torsion bar adjuster nut (1) and turn the bolt until it contacts the torsion bar adjuster arm.
10. Turn the torsion bar adjuster bolt until the previously recorded distance is achieved.
11. Repeat the process for the other torsion bar adjustment arm.
12. Measure the Z height and adjust as necessary. **Trim Height Inspection**

STRUT AND SHOCK ABSORBER INSPECTION (LIGHT DUTY)

NOTE: **The coil over shock assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.**

NOTE: **A light film of oil on the top portion of the shock absorber tube is normal. DO NOT replace the shock absorber for this condition.**

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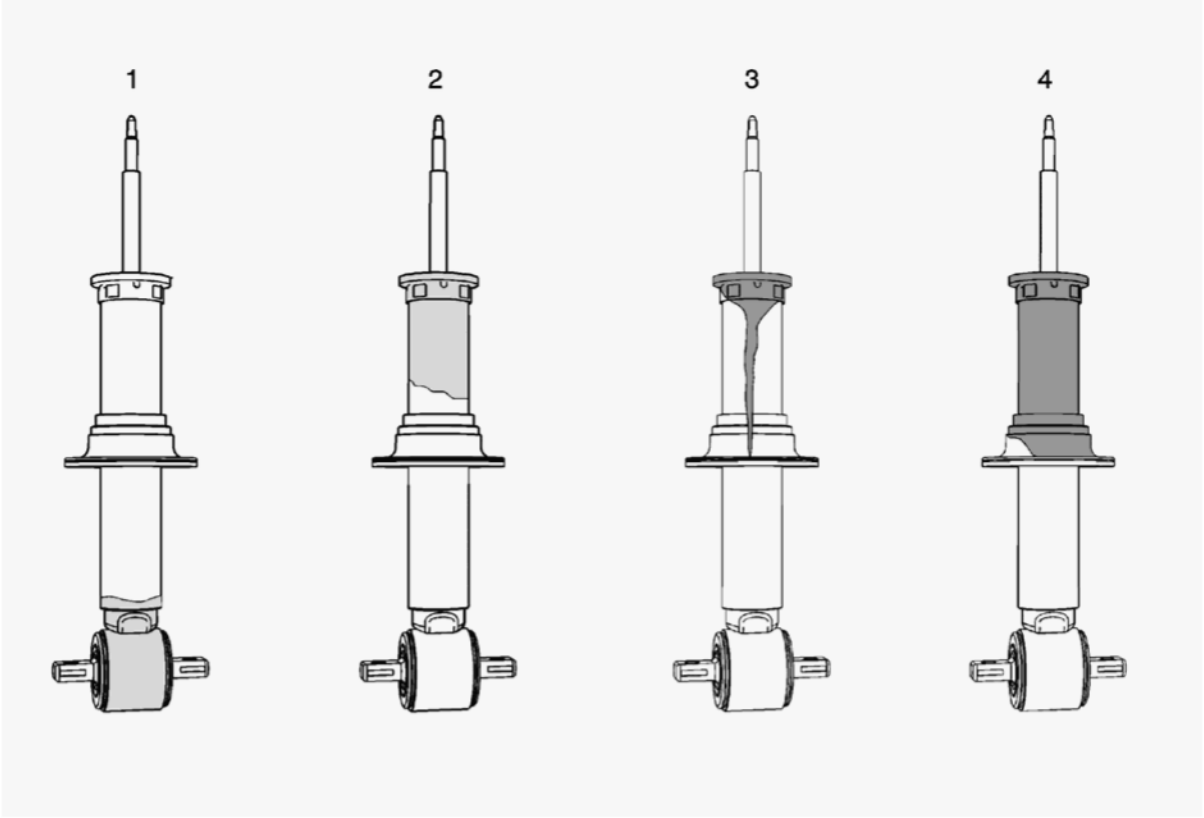


Fig. 64: Strut And Shock Absorber Inspection (Coil Over Shock)
Courtesy of GENERAL MOTORS COMPANY

Condition 1

Oil or fluid residue only on the bottom of the lower shock absorber tube or other coil over shock absorber and originating from the shaft seal, is not a shock absorber related problem. DO NOT replace the shock absorber, look for other external leaks.

Condition 2

Light film/residue on the shock absorber tube, but not on the spring seat and originating from the shaft seal, is a NORMAL condition. DO NOT replace the shock absorber.

Condition 3

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Oil drip or trail down the shock absorber tube and originating from the shaft seal, is an ABNORMAL condition. Replace the shock absorber.

Condition 4

An extreme wet film of oil covering the shock absorber tube and pooling in the spring seat and originating from the shaft seal, is an ABNORMAL condition. Replace the shock absorber.

Inspection

1. Verify the customer's concern is present. If the concern is present, continue to the next step. If the concern is not present, then the vehicle is operating normally.

   NOTE: The shock assembly DOES NOT have to be removed from the vehicle to perform the following inspection procedure.

2. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
3. Visually inspect each of the shock absorbers for external fluid leaks. Refer to the following conditions 1, 2, 3, and 4 for visual inspection.
   - If conditions 1 or 2 are found, continue to step 4.
   - If conditions 3 or 4 are found, replace shock absorber. Refer to Shock Absorber Replacement.
4. If equipped with electronic suspension control system, ensure that the system is working properly. Refer to Diagnostic Starting Point-Electronic Suspension Control.
5. Use your hands in order to lift up and push down on each corner of the vehicle 3 times. Remove your hands from the vehicle. If the corner motion exceeds 2 cycles, replace the shock absorber. If the shock absorber does not exceed 2 cycles, NO repair is necessary.

SHOCK ABSORBER AND SPRING REMOVAL AND INSTALLATION (LIGHT DUTY, WITH Z85/Z95)

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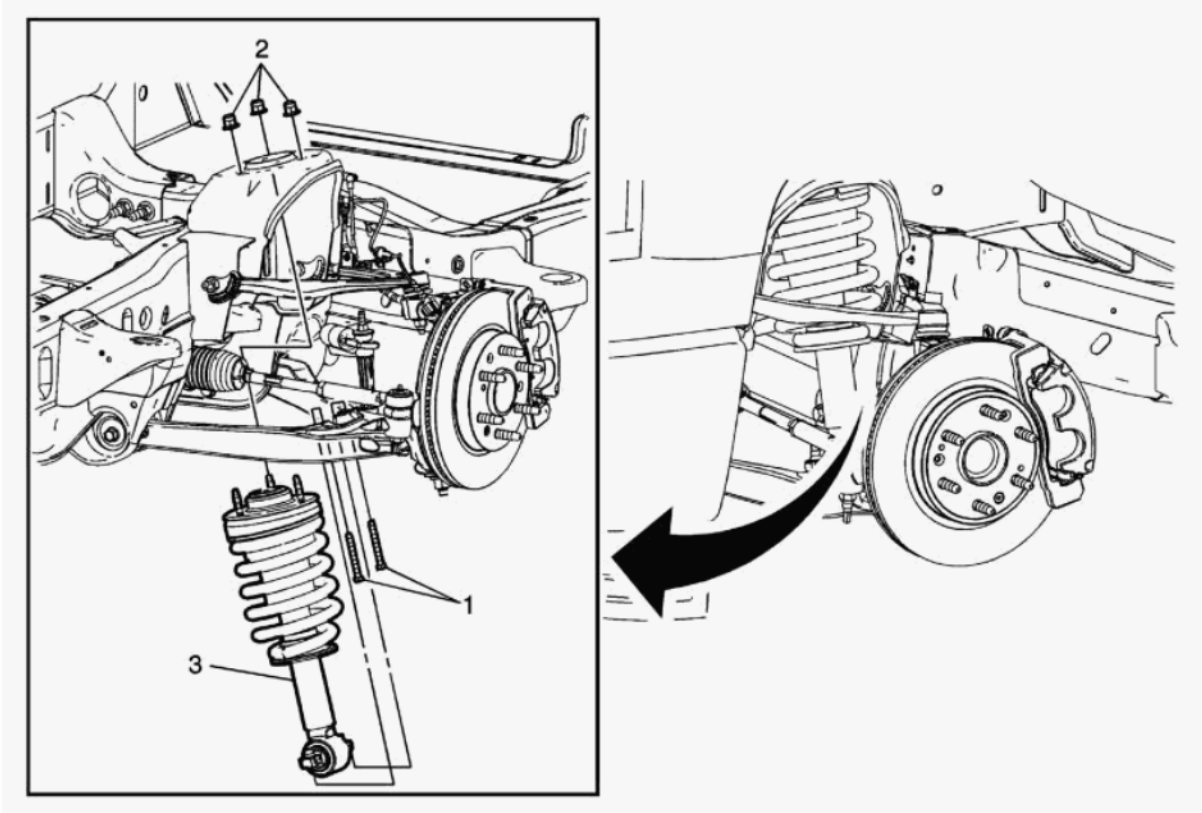


Fig. 65: Shock Absorber and Spring
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures 1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)** 2. Support the front lower control arm.	
1	Front Shock Absorber Bolt (Qty: 2) **CAUTION:**

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Callout	Component Name
	Refer to Fastener Caution . **CAUTION:** **Do not use air powered tools in order to disassemble or assemble any vehicle component. Bolt torques are vital to diagnosis. You can detect bolt torques only when using hand tools. Improper bolt torques can contribute to vehicle repair problems.** **Tighten** 50 N.m (37 lb ft)
2	Front Shock Absorber Nut (Qty: 3) **Tighten**

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Callout	Component Name
	50 N.m (37 lb ft)
3	Front Shock Absorber Assembly **Procedure** If removing the front shock absorber assembly to service the components, refer to **Shock Absorber, Shock Absorber Component, or Spring Replacement (Light Duty, With Z85/Z95)**. **NOTE:** • **On 2WD vehicles, the front shock absorber assembly can be removed by bringing the assembly downwards through the opening in the front lower control arm.** • **On 4WD vehicles, the front shock absorber assembly can be removed**

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Callout	Component Name
	by bringing the assembly downwards as far as possible into the opening in the front lower control arm and then tilting the assembly clear of the front upper control arm. After clearing the front upper control arm, the assembly can then be lifted back upwards and outwards to clear the front lower control arm and

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Callout	Component Name
	front wheel drive shaft.

SHOCK ABSORBER AND SPRING REMOVAL AND INSTALLATION (LIGHT DUTY, WITHOUT Z85/Z95)

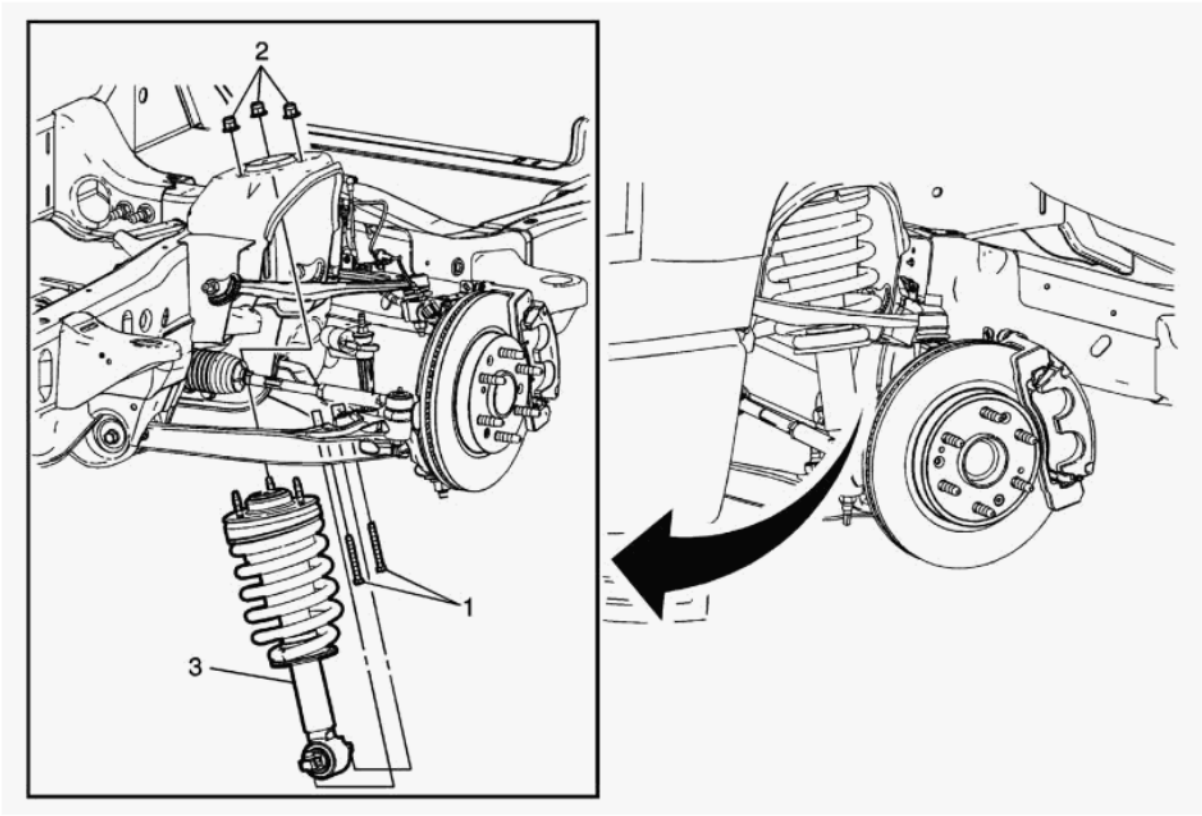


Fig. 66: Shock Absorber and Spring
Courtesy of GENERAL MOTORS COMPANY

Callout	Component Name
Preliminary Procedures	
1. Remove the front tire and wheel assembly. Tire and Wheel Removal and Installation (6-Lug Wheel) Tire and Wheel Removal	

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Callout	Component Name
	and Installation (8-Lug Wheel) 2. Support the front lower control arm. 3. Disconnect the electrical connector from the front shock absorber assembly. 4. Disconnect the wiring harness from the front shock absorber studs and set aside.
1	Front Shock Absorber Bolt (Qty: 2) **CAUTION:** **Refer to Fastener Caution .** **CAUTION:** **Do not use air powered tools in order to disassemble or assemble any vehicle component. Bolt torques are vital to diagnosis. You can detect bolt torques only when using hand tools. Improper bolt torques can contribute to vehicle**

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Callout	Component Name
	repair problems. **Tighten** 50 N.m (37 lb ft)
2	Front Shock Absorber Nut (Qty: 3) **Tighten** 50 N.m (37 lb ft)
3	Front Shock Absorber Assembly **Procedure** If removing the front shock absorber assembly to service the components, refer to **Shock Absorber, Shock Absorber Component, or Spring Replacement (Light Duty, Without Z85/Z95)**. **NOTE:** • **On 2WD vehicles, the front shock absorber assembly can be removed by bringing the assembly downwards through the opening in the front lower control arm.**

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Callout	Component Name
	• On 4WD vehicles, the front shock absorber assembly can be removed by bringing the assembly downwards as far as possible into the opening in the front lower control arm and then tilting the assembly clear of the front upper control arm. After clearing the front upper control arm, the assembly can then be lifted

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Callout	Component Name
	back upwards and outwards to clear the front lower control arm and front wheel drive shaft.

SHOCK ABSORBER, SHOCK ABSORBER COMPONENT, OR SPRING REPLACEMENT (LIGHT DUTY, WITHOUT Z85/Z95)

Special Tools

CH-48845 Strut Spring Compressor

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove Front Shock Absorber and Spring Assembly **Shock Absorber and Spring Removal and Installation (Light Duty, Without Z85/Z95)**

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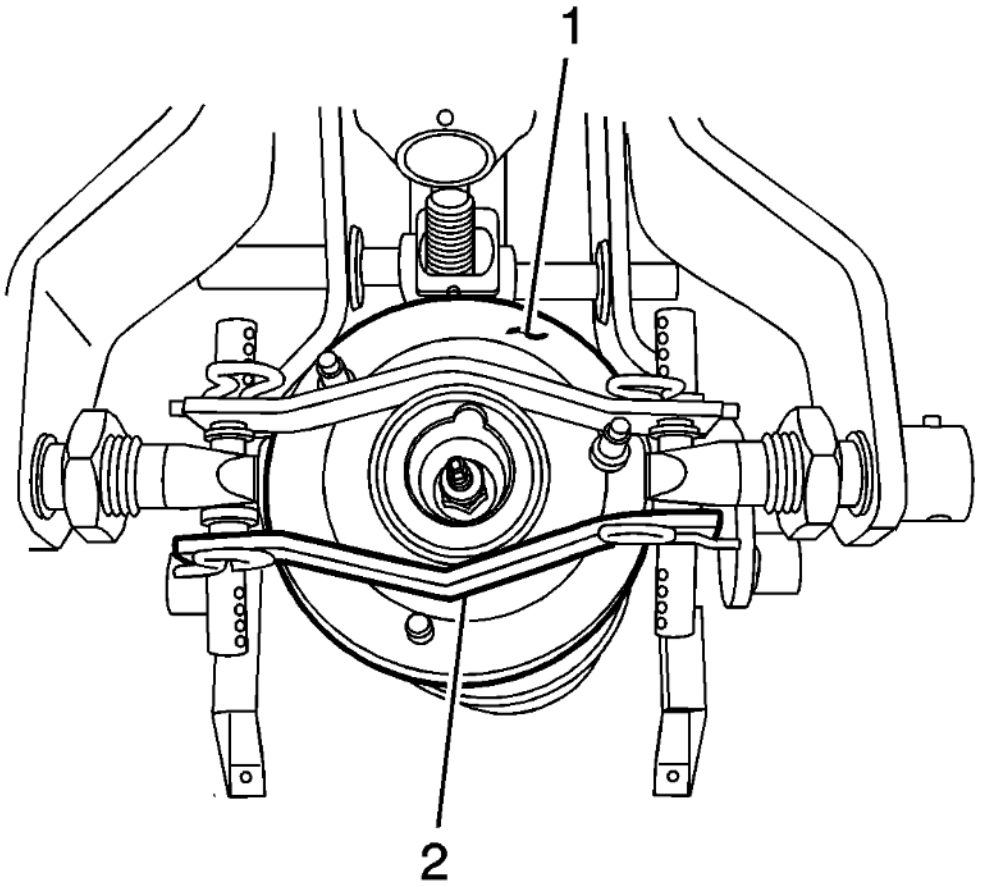


Fig. 67: Identifying Shock Absorber & Upper Retaining Bracket
Courtesy of GENERAL MOTORS COMPANY

WARNING: **Use only the CH-48845 Spring Compressor when servicing suspension components on this vehicle. Other tools may not be strong enough for the springs on this vehicle and you could be injured if you do not use Special Tool CH-48845. Failure to do so could result in serious personal injury.**

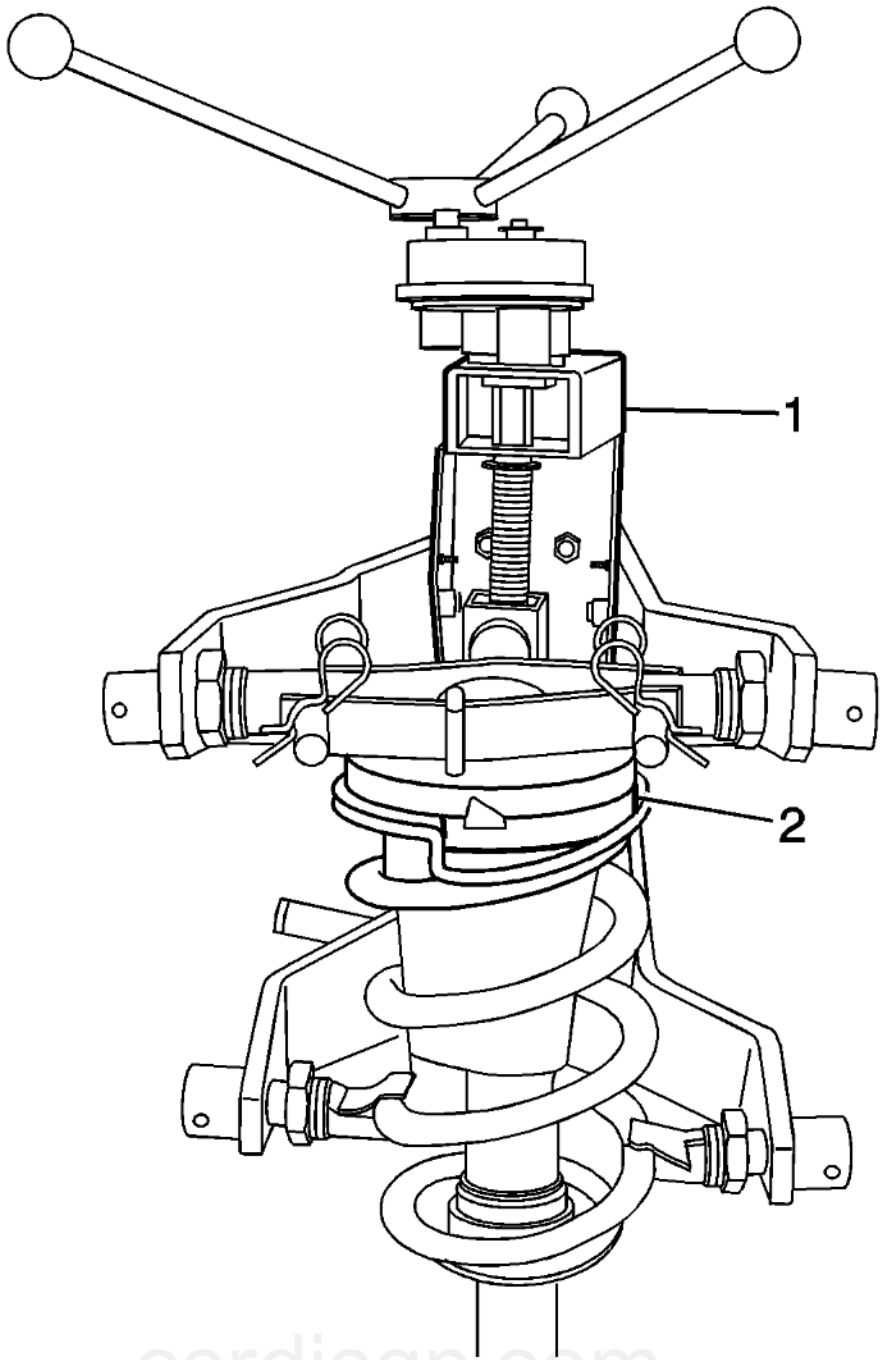
NOTE: **ONLY use hand tools to perform the following service procedure.**

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2. Position the front shock absorber assembly (1) in the upper retaining bracket of the **CH-48845** compressor (2).

   Ensure the front shock absorber assembly is centered.

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Fig. 68: Compressing Front Spring
Courtesy of GENERAL MOTORS COMPANY

3. Use the **CH-48845** compressor (1) to compress the front spring (2).
4. Use the appropriate size wrench to hold the front shock absorber shaft.

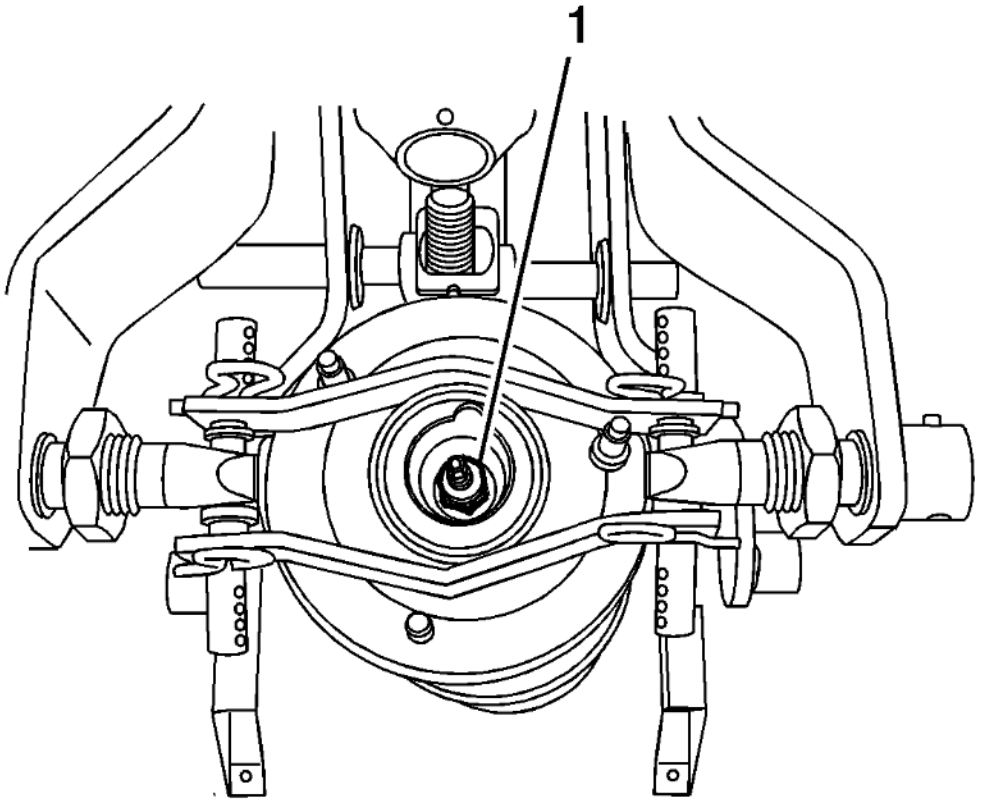


Fig. 69: Identifying Shock Absorber Nut
Courtesy of GENERAL MOTORS COMPANY

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5. Use the appropriate tools to remove the front shock absorber stud nut (1).

   DISCARD the nut.

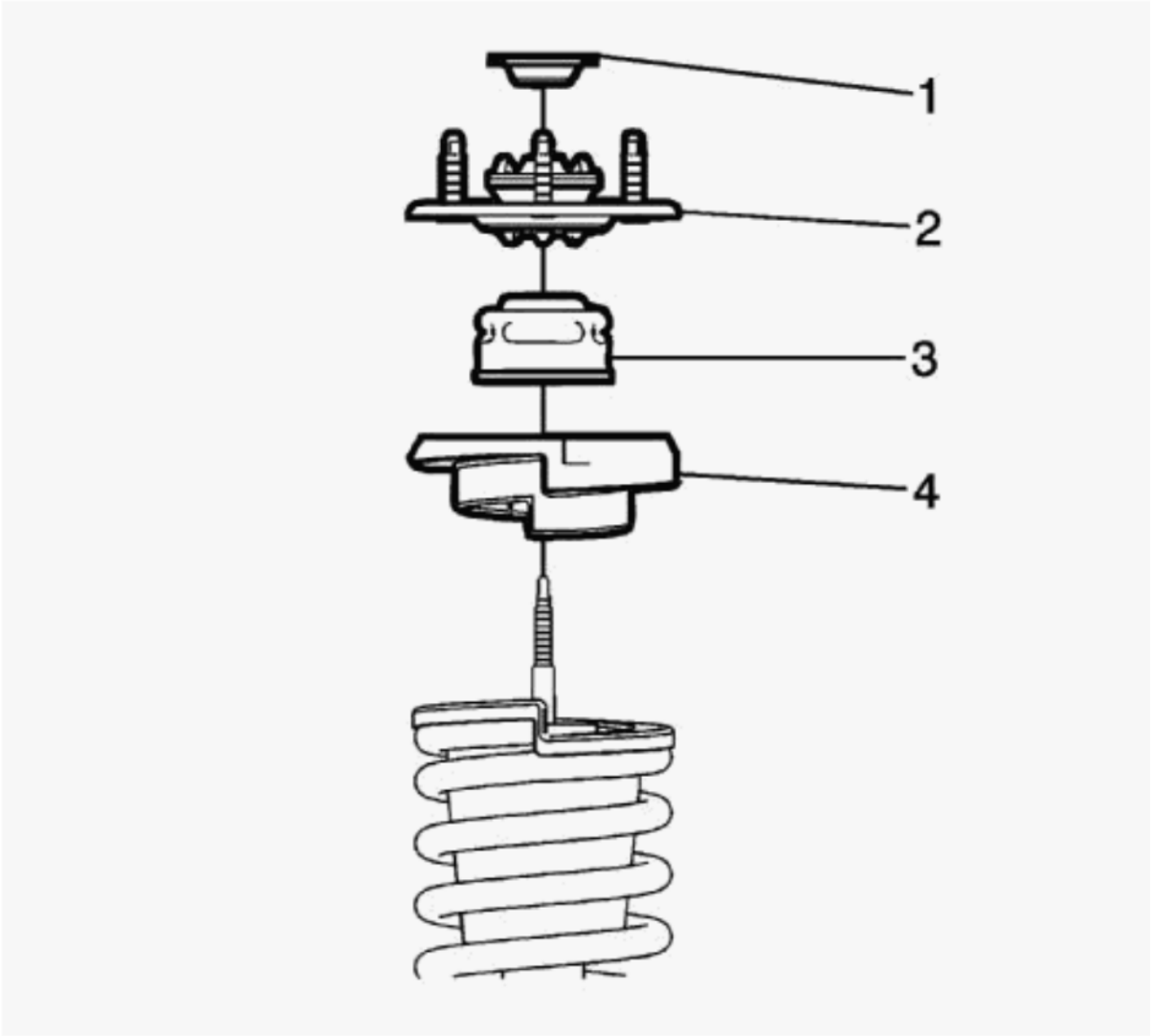


Fig. 70: Front Spring Upper Seat And Strut Bumper Upper Mount Cup
Courtesy of GENERAL MOTORS COMPANY

6. Remove the front shock absorber upper mount washer (1), front shock absorber upper mount (2), strut bumper upper mount cup (3) and front

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spring upper seat (4).

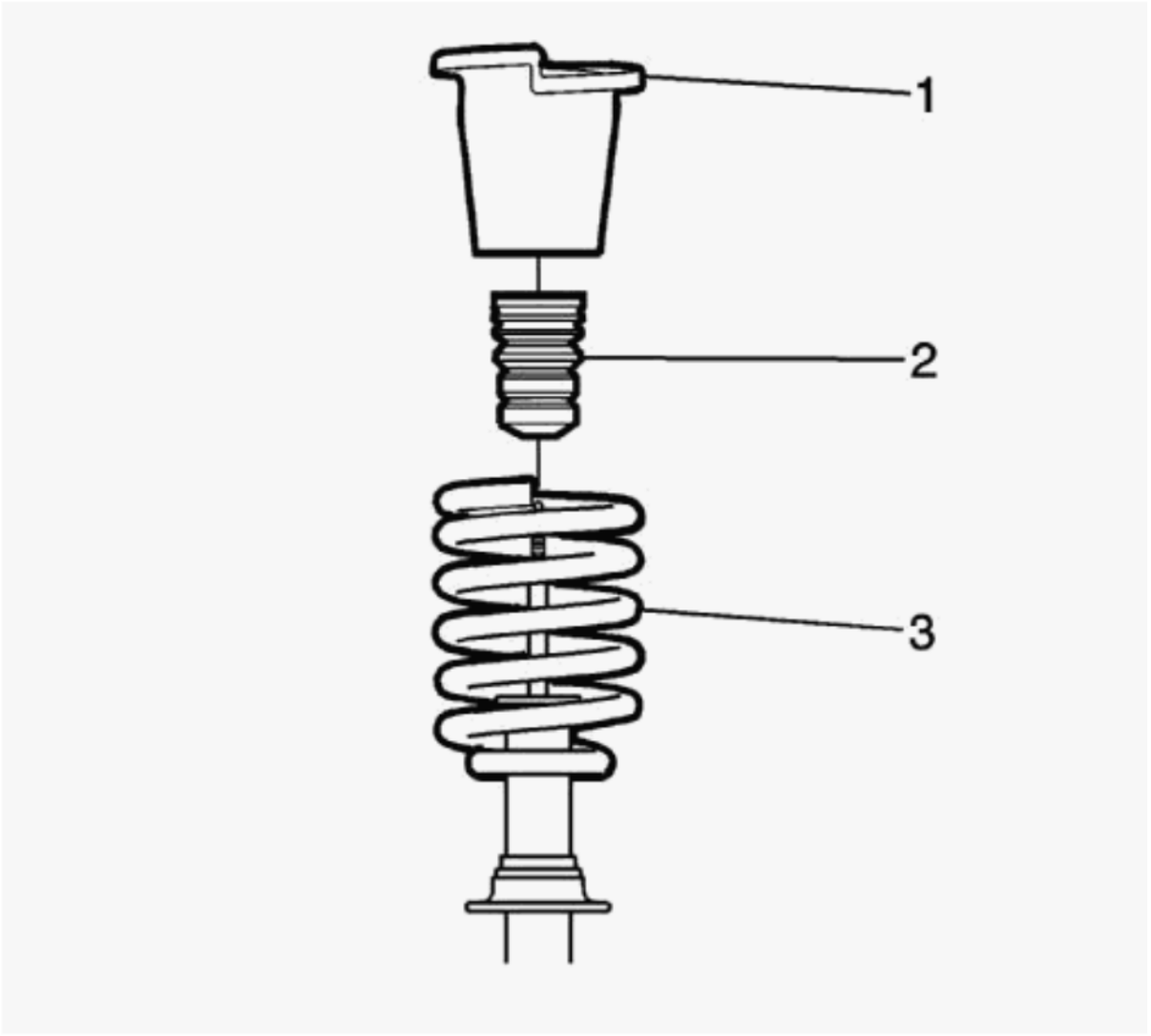


Fig. 71: Front Spring Upper Insulator And Front Suspension Strut Bumper
Courtesy of GENERAL MOTORS COMPANY

7. Remove the front spring upper insulator (1) and front spring (2).

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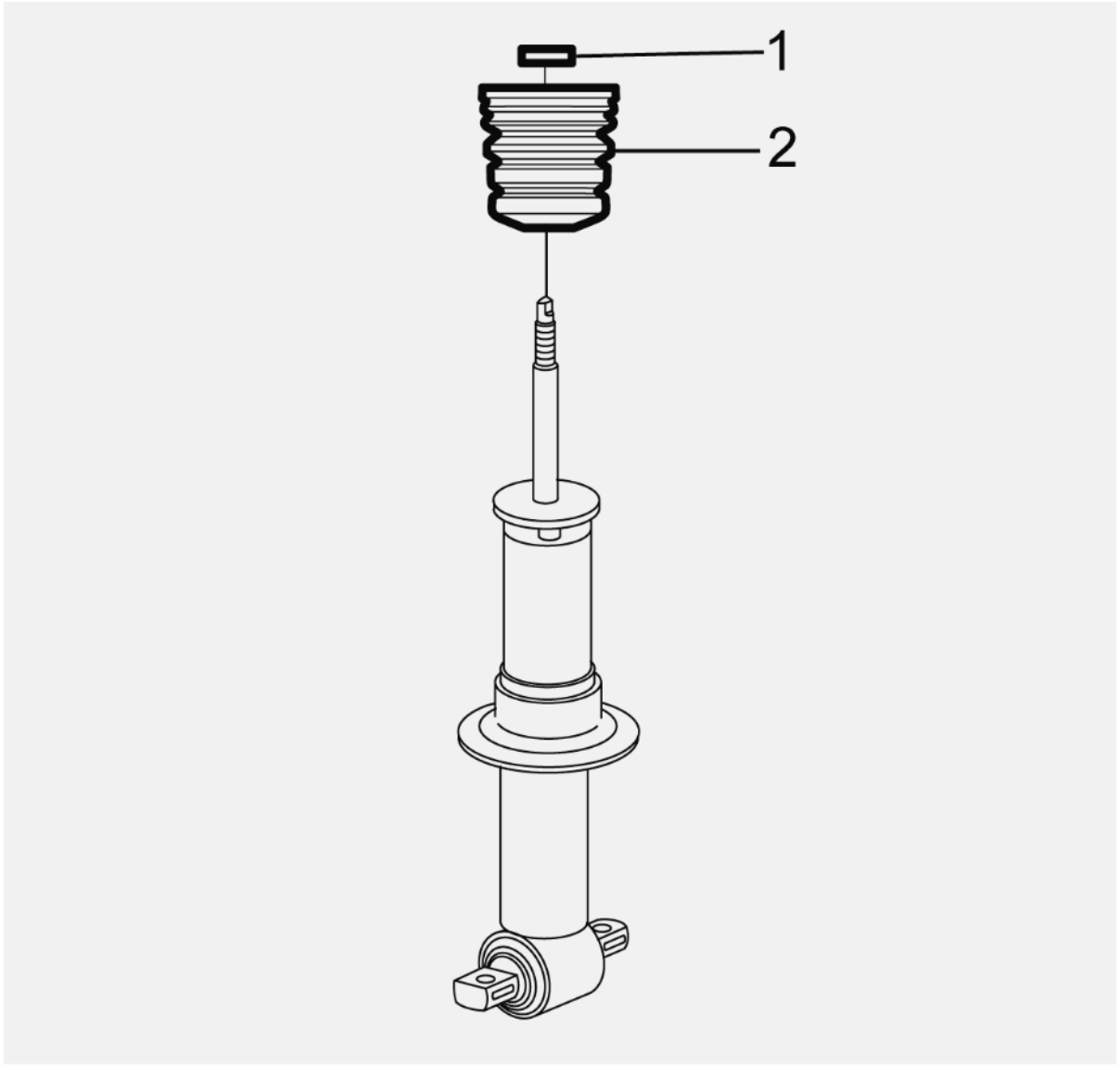


Fig. 72: Spacer And Front Suspension Strut Bumper
Courtesy of GENERAL MOTORS COMPANY

8. Remove the spacer (1) and front suspension strut bumper (2).

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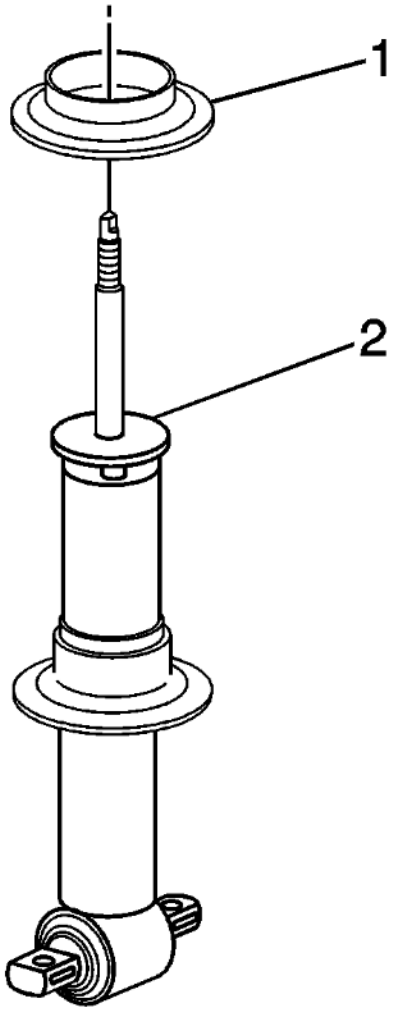


Fig. 73: Locating Front Suspension Shock Absorber And Front Spring Lower Insulator
Courtesy of GENERAL MOTORS COMPANY

9. Remove the front spring lower insulator (1) and front shock absorber (2) from the spring compressor.

Installation Procedure

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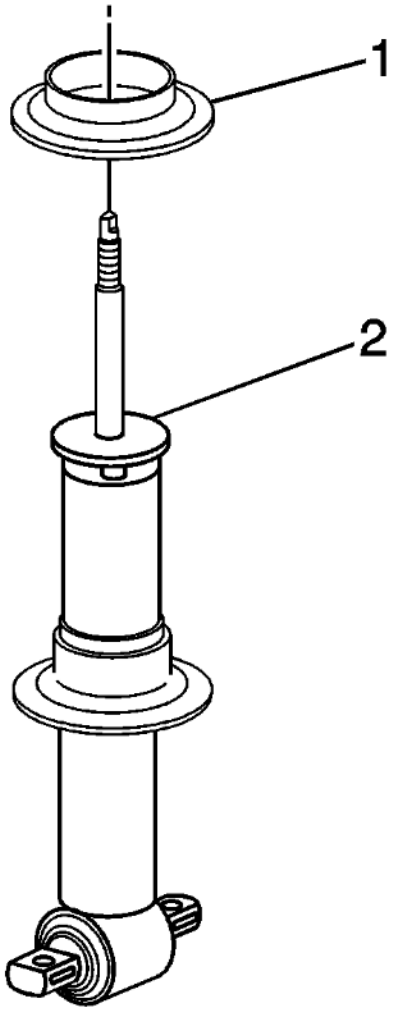


Fig. 74: Locating Front Suspension Shock Absorber And Front Spring Lower Insulator
Courtesy of GENERAL MOTORS COMPANY

1. Place the front shock absorber (2) and the front spring lower insulator (1) in the spring compressor.

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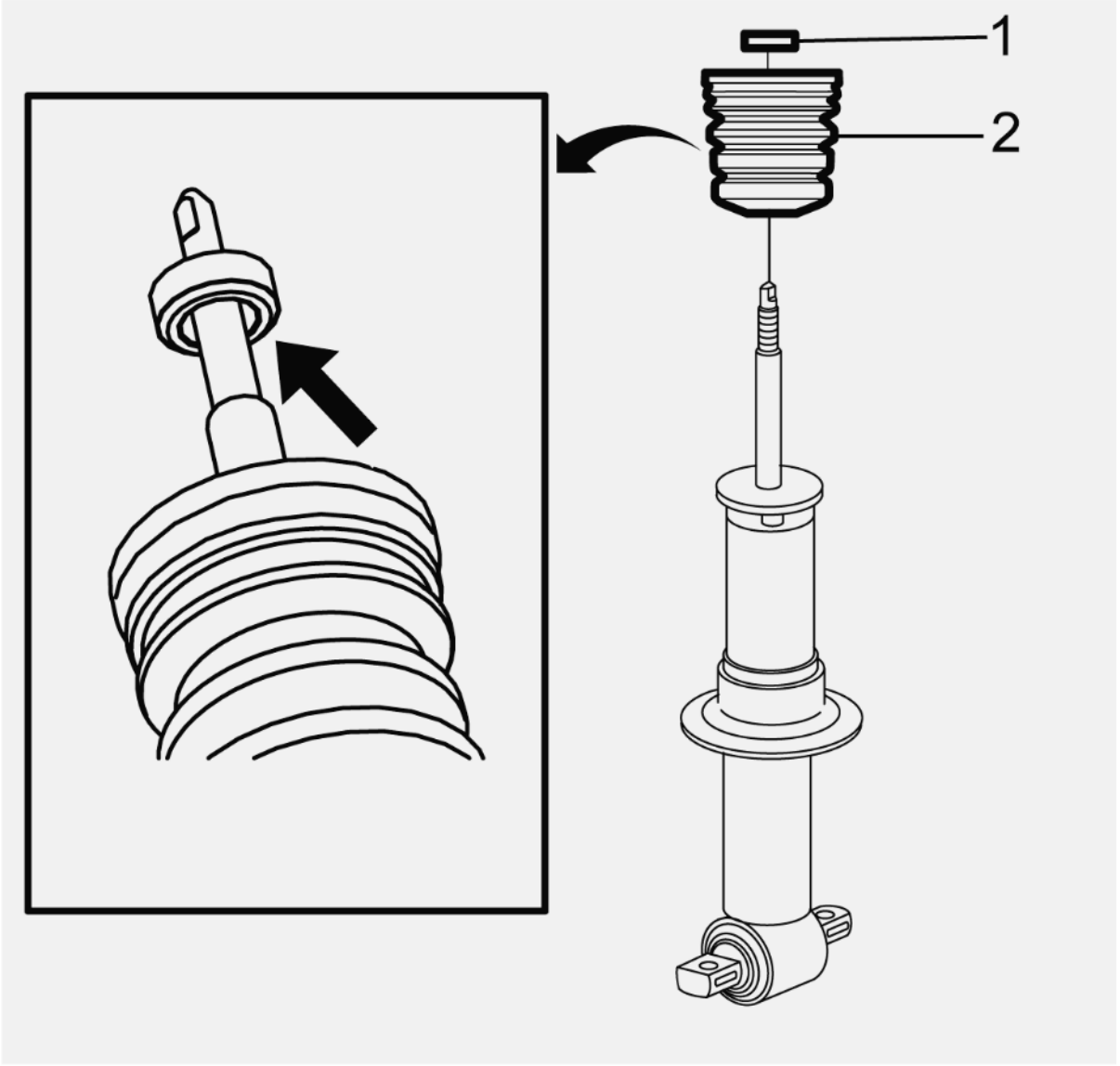


Fig. 75: Spacer And Front Suspension Strut Bumper
Courtesy of GENERAL MOTORS COMPANY

2. Install the front suspension strut bumper (2) and spacer (1).

   Ensure the spacer is installed with the beveled edge facing downwards or the spacer will catch on the bumper stop ring.

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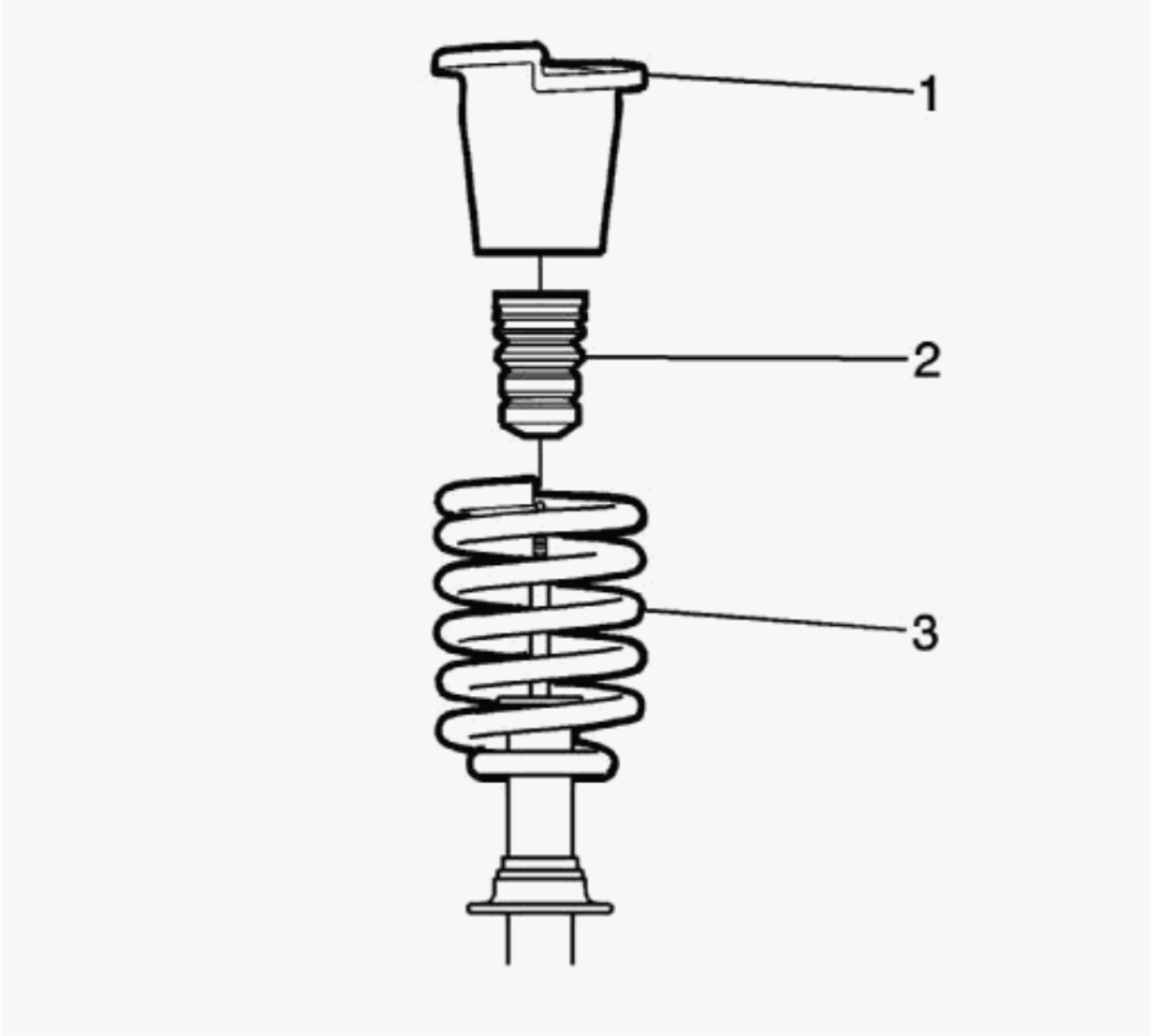


Fig. 76: Front Spring Upper Insulator And Front Suspension Strut Bumper
Courtesy of GENERAL MOTORS COMPANY

3. Install the front spring (2) and front spring upper insulator (1).

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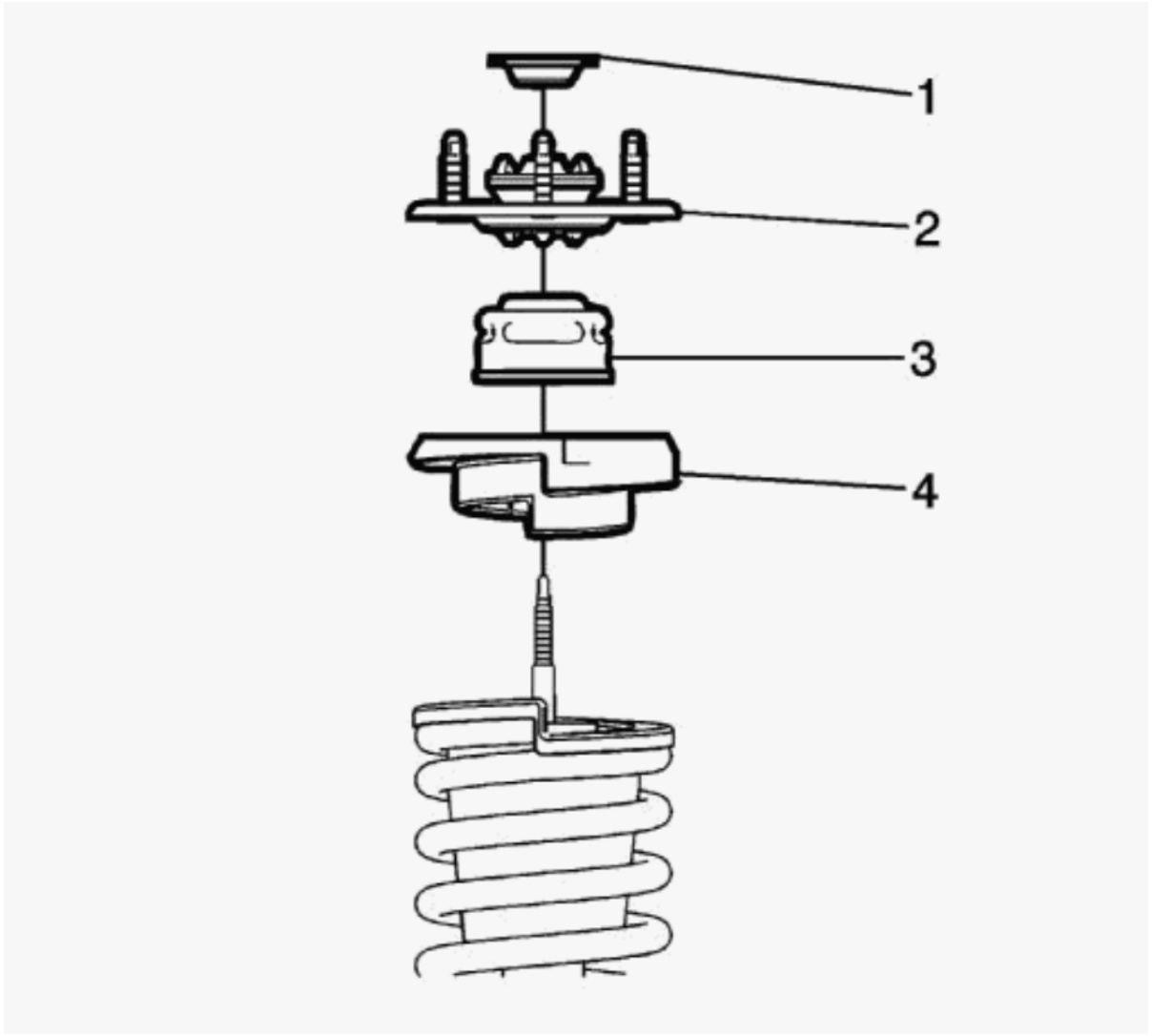


Fig. 77: Front Spring Upper Seat And Strut Bumper Upper Mount Cup
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- **The inboard strut mounting studs are spaced closer together than the outboard stud.**
- **The outboard stud should be facing toward the outside (closest to the technician) for proper alignment.**

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4. Install the front spring upper seat (4), strut bumper upper mount cup (3), front shock absorber upper mount (2) and front shock absorber upper mount washer (1).

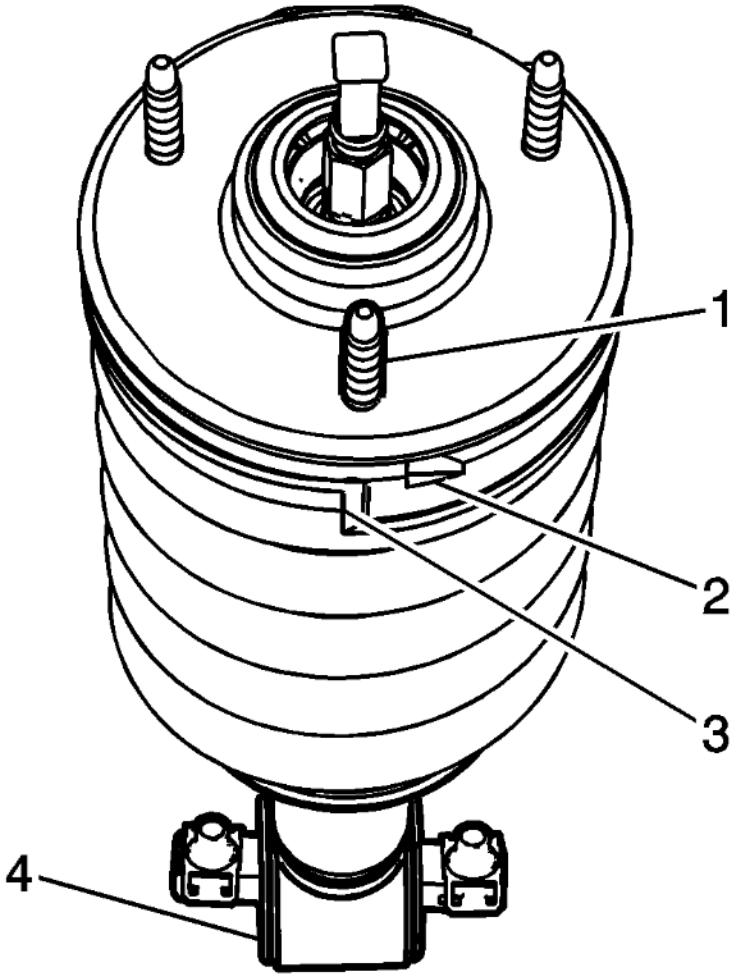


Fig. 78: Identifying Spring Seat Components
Courtesy of GENERAL MOTORS COMPANY

5. Align the spring seat stop (3), the outboard stud (1) and the center of the lower front shock absorber (4).

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The notch in the spring seat (2) should be just to the right of the outboard stud.

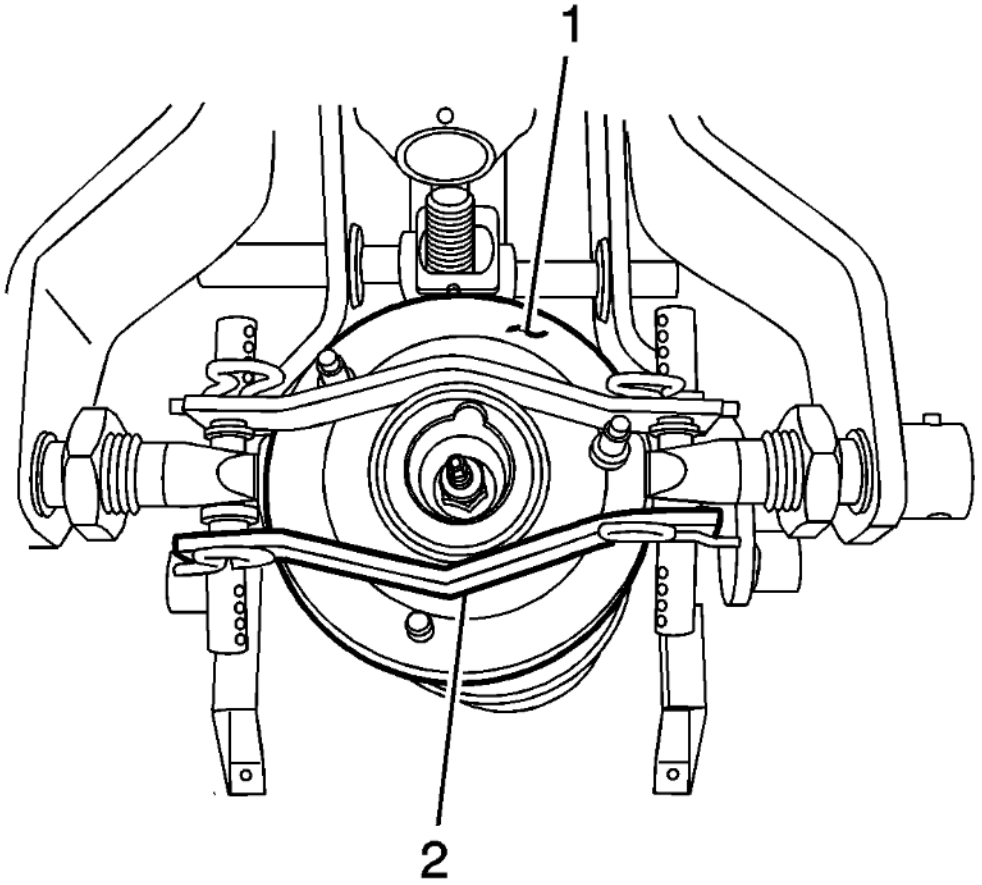
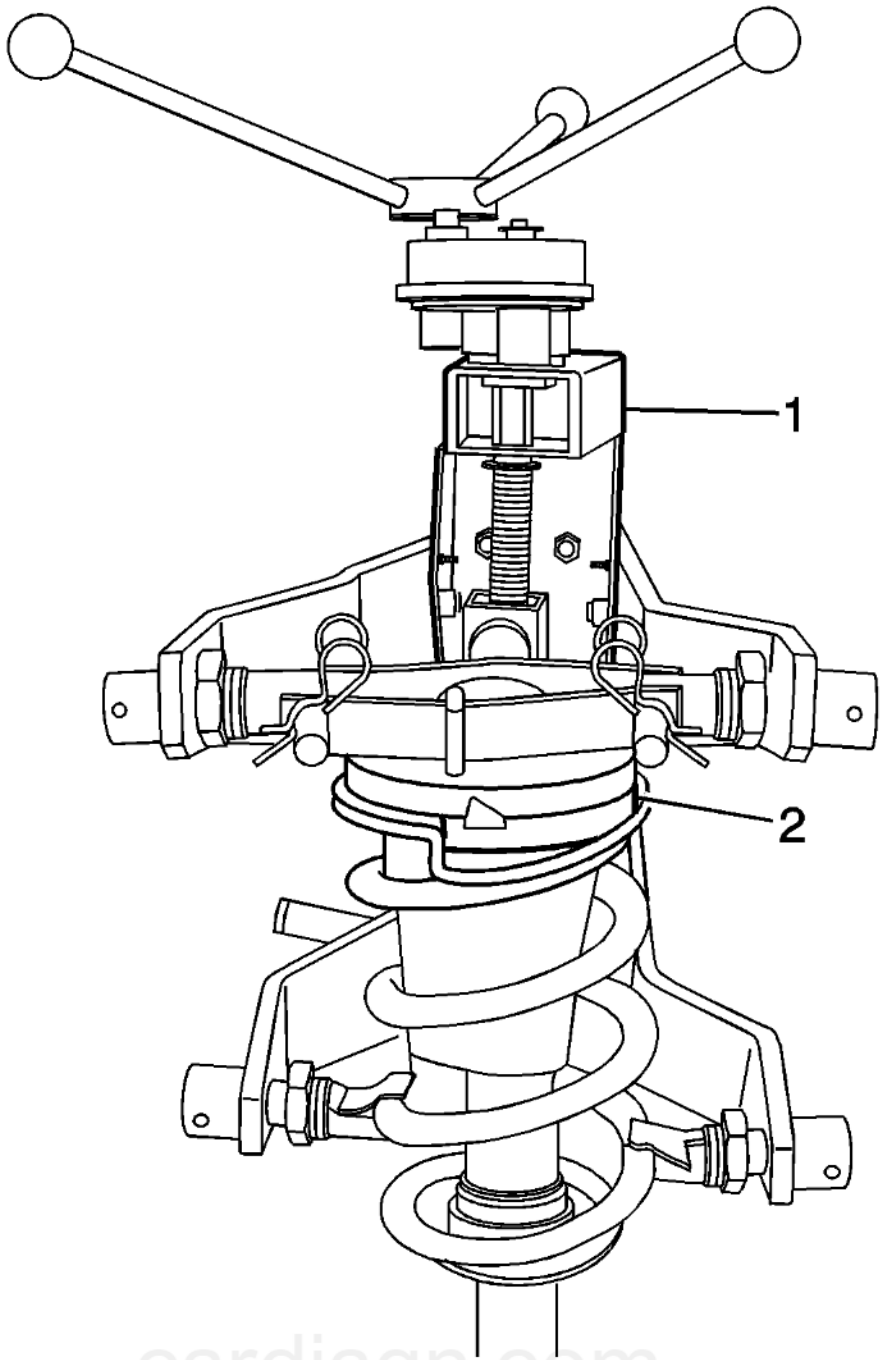


Fig. 79: Identifying Shock Absorber & Upper Retaining Bracket
Courtesy of GENERAL MOTORS COMPANY

6. Position the front shock absorber (1) in the upper retaining bracket of the **CH-48845** compressor (2).

   Ensure the front shock absorber assembly is centered.

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Fig. 80: Compressing Front Spring
Courtesy of GENERAL MOTORS COMPANY

7. Use the **CH-48845** compressor (1) to compress the front spring (2).
8. Use the appropriate size wrench to hold the front shock absorber shaft.

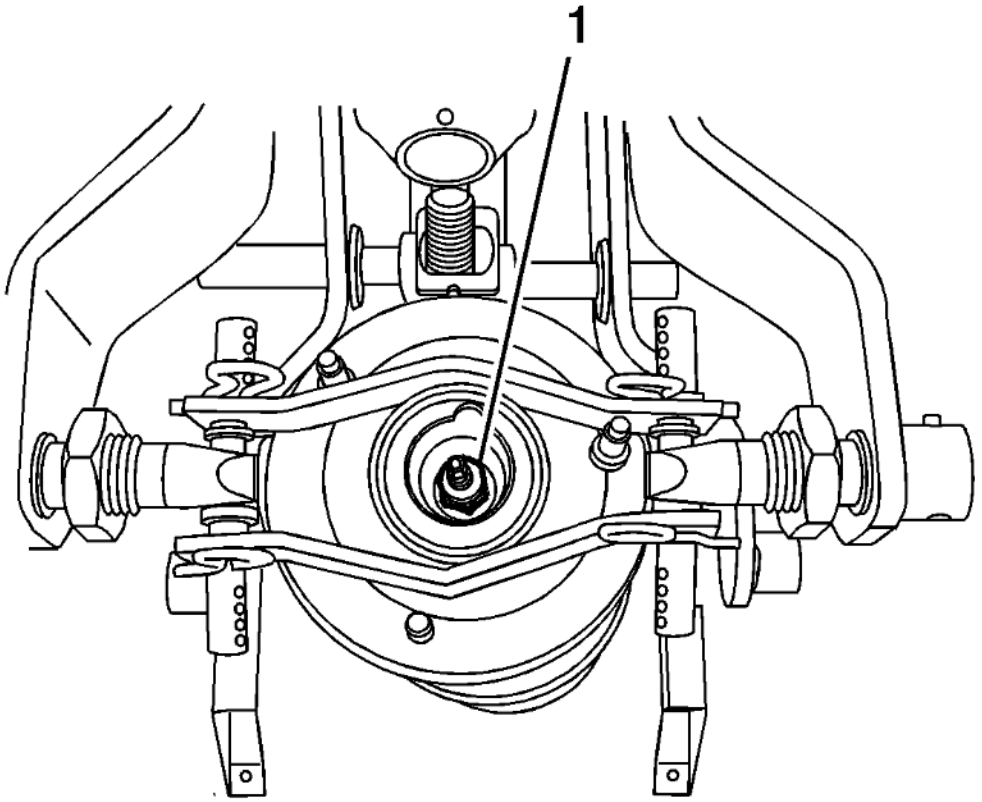


Fig. 81: Identifying Shock Absorber Nut
Courtesy of GENERAL MOTORS COMPANY

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CAUTION: **Refer to Fastener Caution .**

9. Use the appropriate tools to install the NEW front shock absorber stud nut (1) and tighten to 50 N.m (37 lb ft).

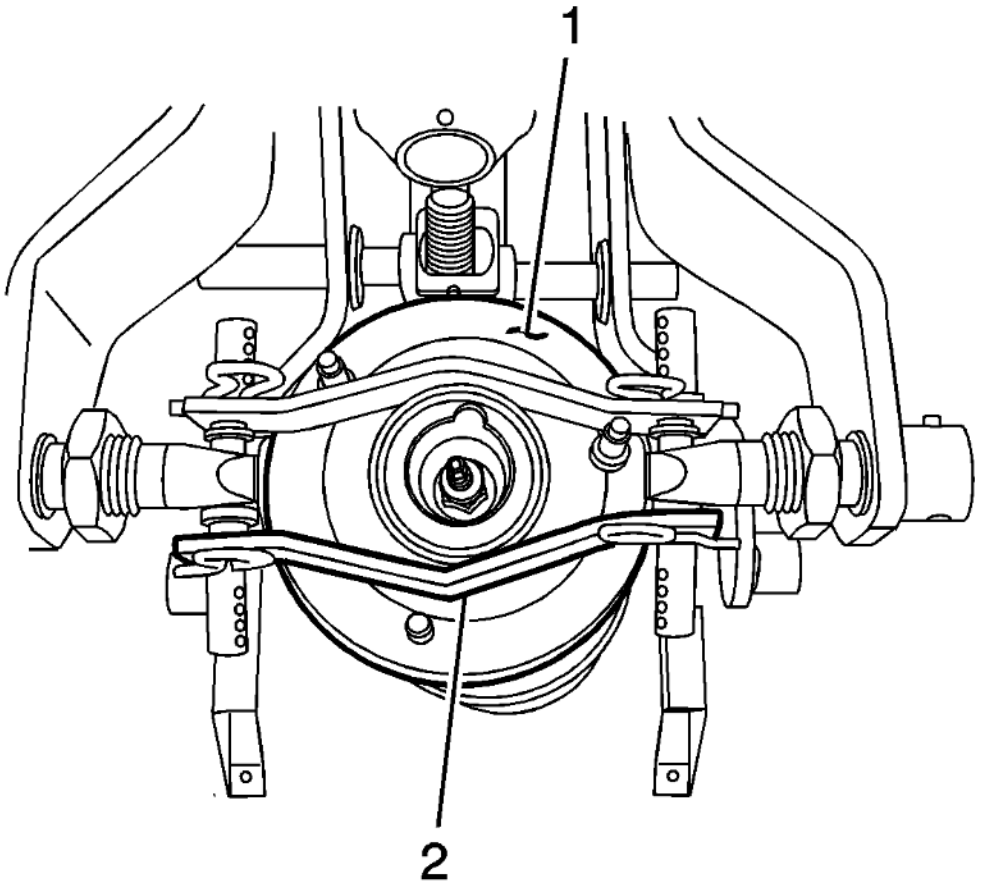


Fig. 82: Identifying Shock Absorber & Upper Retaining Bracket
Courtesy of GENERAL MOTORS COMPANY

10. Remove the front shock absorber assembly (1) from the **CH-48845** compressor (2).

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11. Install Front Shock Absorber and Spring Assembly **Shock Absorber and Spring Removal and Installation (Light Duty, Without Z85/Z95)**

SHOCK ABSORBER, SHOCK ABSORBER COMPONENT, OR SPRING REPLACEMENT (LIGHT DUTY, WITH Z85/Z95)

Special Tools

CH-48845 Strut Spring Compressor

Equivalent regional tools:**Special Tools**

Removal Procedure

1. Remove Front Shock Absorber and Spring Assembly **Shock Absorber and Spring Removal and Installation (Light Duty, With Z85/Z95)**
2. Disassemble the front shock absorber electrical connector. **Terminal Removal**

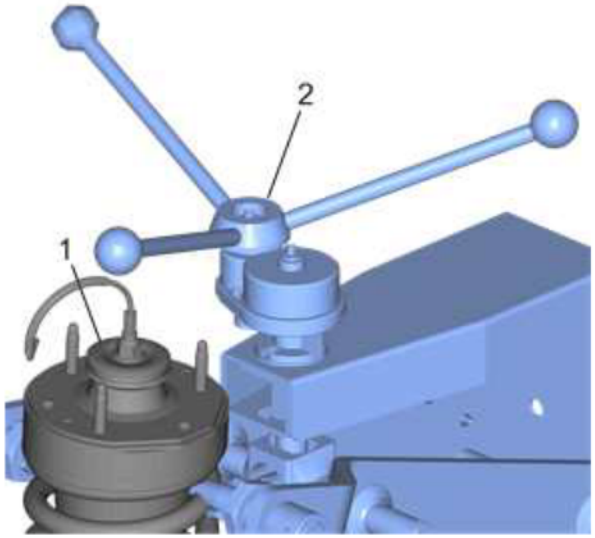


Fig. 83: Front Shock Absorber Assembly
Courtesy of GENERAL MOTORS COMPANY

WARNING: Use only the CH-48845 Spring Compressor when servicing suspension components on this vehicle. Other tools may not be strong enough for the springs on this vehicle and you could be injured if you do not use Special Tool CH-48845. Failure to do so could result in serious personal injury.

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NOTE: **ONLY use hand tools to perform the following service procedure.**

3. Position the front shock absorber assembly (1) in the upper retaining bracket of the **CH-48845** compressor (2).

   Ensure the front shock absorber assembly is centered and compress the front spring.

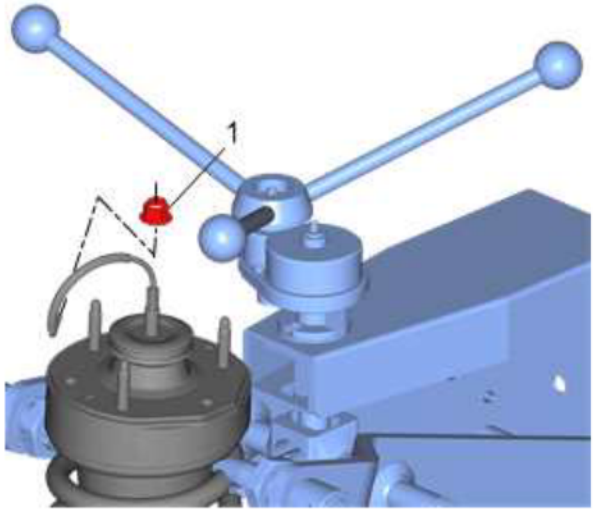


Fig. 84: Front Shock Absorber Stud Nut
Courtesy of GENERAL MOTORS COMPANY

4. Use the appropriate tools to remove the front shock absorber stud nut (1).

   DISCARD the nut.

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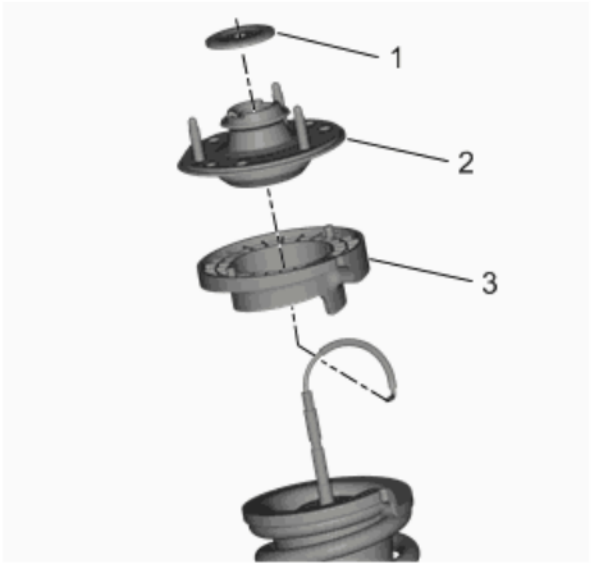


Fig. 85: Front Shock Absorber Upper Mount Washer And Mount
Courtesy of GENERAL MOTORS COMPANY

5. Remove the front shock absorber upper mount washer (1), front shock absorber mount (2) and front spring upper seat (3).



Fig. 86: Front Suspension Strut Bumper And Front Shock Absorber Boot

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Courtesy of GENERAL MOTORS COMPANY

6. Remove the front suspension strut bumper (1) and front shock absorber boot (2).

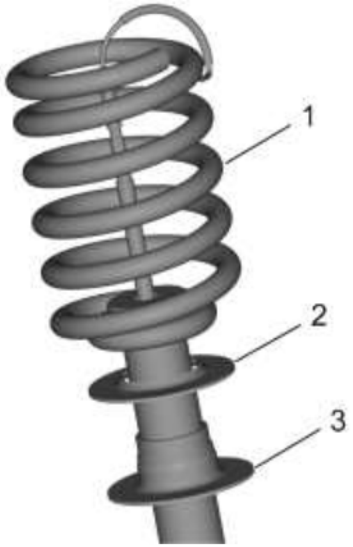


Fig. 87: Front Spring, Front Spring Lower Insulator And Front Shock Absorber
Courtesy of GENERAL MOTORS COMPANY

7. Remove the front spring (1), front spring lower insulator (2) and front shock absorber (3) from the spring compressor.

Installation Procedure

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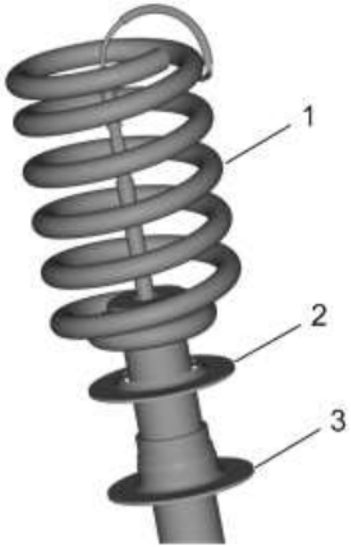


Fig. 88: Front Spring, Front Spring Lower Insulator And Front Shock Absorber
Courtesy of GENERAL MOTORS COMPANY

1. Place the front shock absorber (3), front spring lower insulator (2) and front spring (1) in the spring compressor.



Fig. 89: Front Suspension Strut Bumper And Front Shock Absorber Boot

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Courtesy of GENERAL MOTORS COMPANY

2. Install the front shock absorber boot (2) and front suspension strut bumper (1).

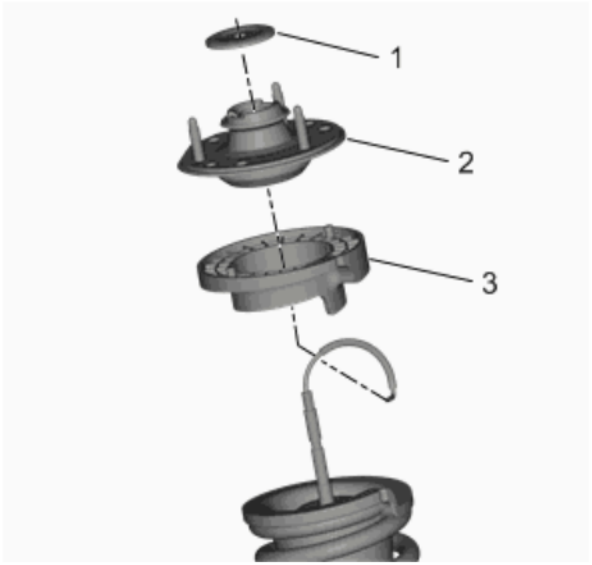


Fig. 90: Front Shock Absorber Upper Mount Washer And Mount
Courtesy of GENERAL MOTORS COMPANY

NOTE:

- **The inboard strut mounting studs are spaced closer together than the outboard stud.**
- **The outboard stud should be facing toward the outside (closest to the technician) for proper alignment.**

3. Install the front spring upper seat (3), front shock absorber mount (2) and front shock absorber upper mount washer (1).

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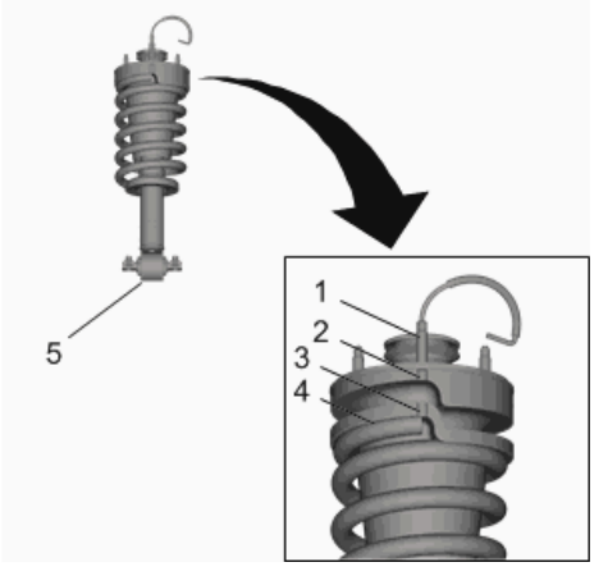
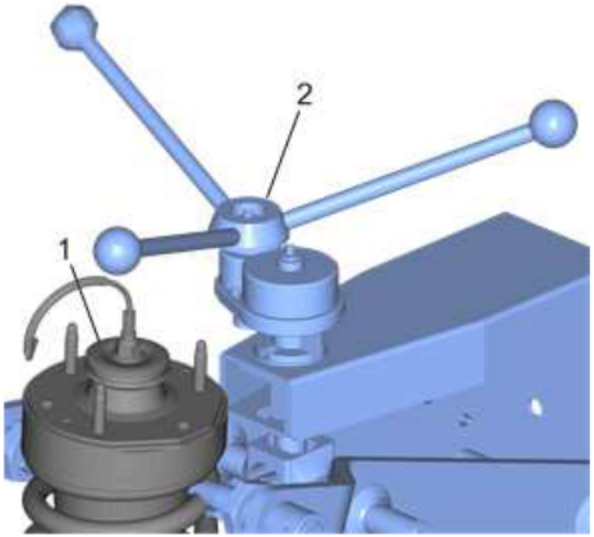


Fig. 91: Outboard Stud
Courtesy of GENERAL MOTORS COMPANY

4. Align the outboard stud (1), the notch in the front spring upper seat (2), the notch in the front shock absorber boot (3), the front spring (4) and the center of the lower front shock absorber (5).



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Fig. 92: Front Shock Absorber Assembly
Courtesy of GENERAL MOTORS COMPANY

NOTE: **For vehicles equipped with electronic suspension control, ensure the upper retaining bracket of the CH-48845 compressor is adjusted properly so that it does not damage the front shock absorber upper mount.**

5. Ensure the front shock absorber assembly (1) is centered in the **CH-48845** compressor (2) and compress the front spring.

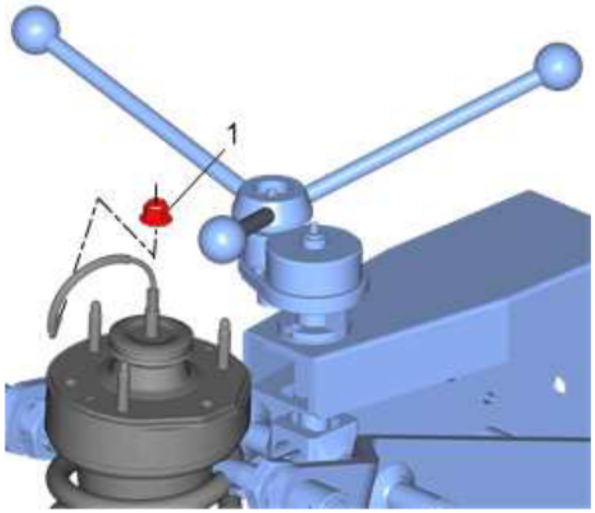


Fig. 93: Front Shock Absorber Stud Nut
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

6. Use the appropriate tools to install the NEW front shock absorber stud nut (1) and tighten to 75 N.m (55 lb ft).
7. Assemble the front shock absorber electrical connector. **Terminal Removal**
8. Install Front Shock Absorber and Spring Assembly **Shock Absorber and Spring Removal and Installation (Light Duty, With Z85/Z95)**

SHOCK ABSORBER REPLACEMENT (HEAVY DUTY)

Removal Procedure

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1. Remove the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**

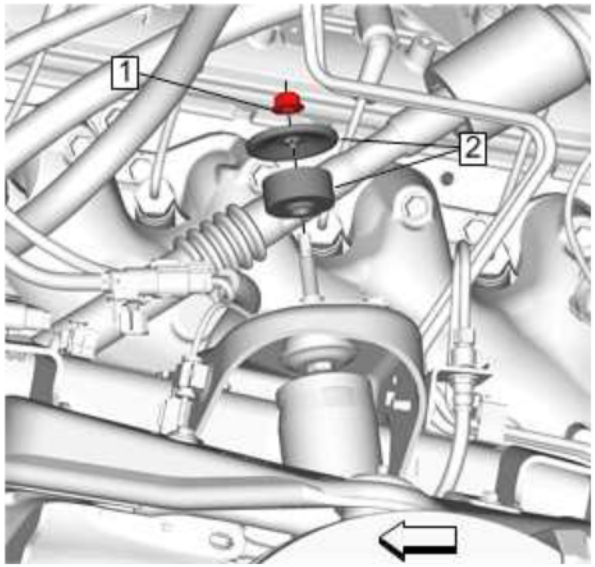


Fig. 94: Upper Front Shock Absorber Nut And Front Shock Absorber Insulator Assembly
Courtesy of GENERAL MOTORS COMPANY

2. Remove the upper front shock absorber nut (1) and the front shock absorber insulator assembly (2).

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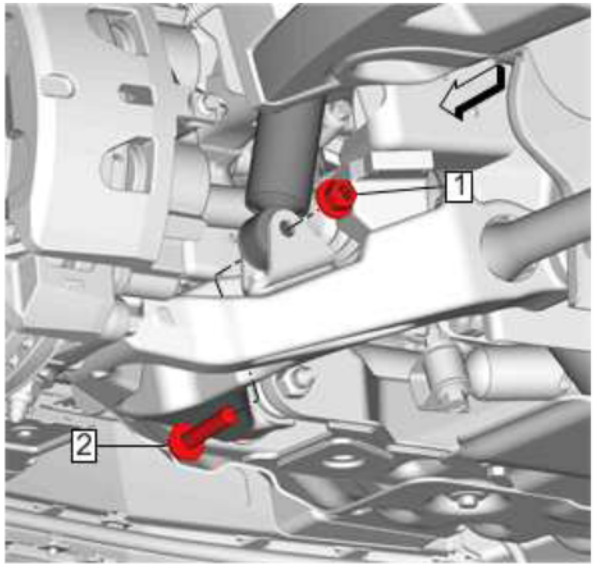


Fig. 95: Lower Front Shock Absorber Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

3. Remove the lower front shock absorber nut (1) and bolt (2).

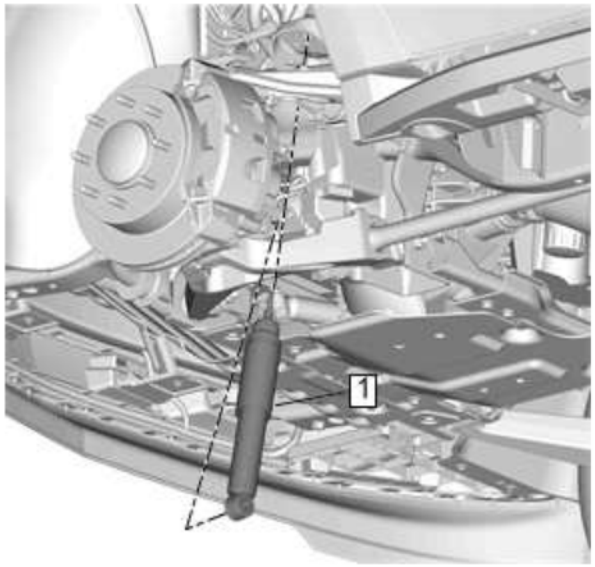


Fig. 96: Front Shock Absorber

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Courtesy of GENERAL MOTORS COMPANY

4. Remove the front shock absorber (1) from the vehicle.

Installation Procedure

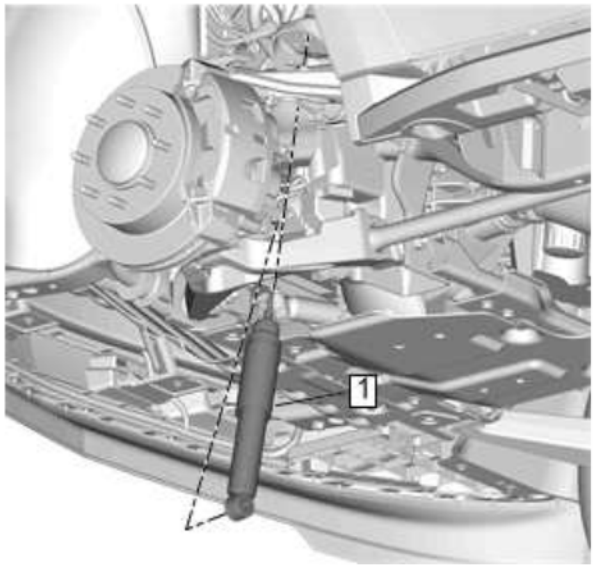


Fig. 97: Front Shock Absorber
Courtesy of GENERAL MOTORS COMPANY

1. Position the front shock absorber (1) on the vehicle.

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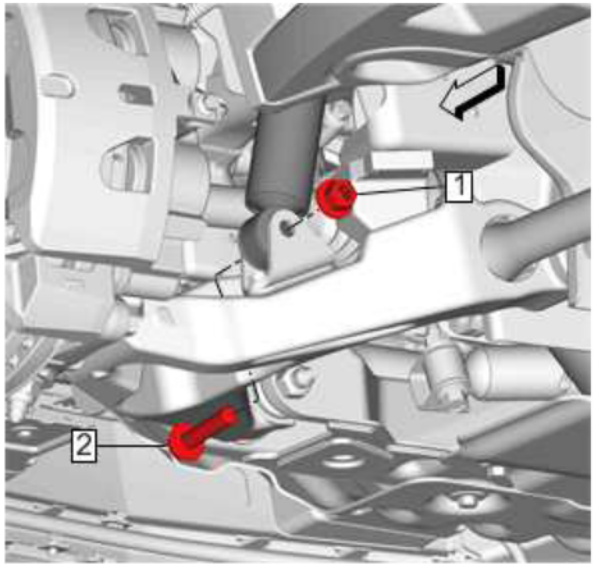
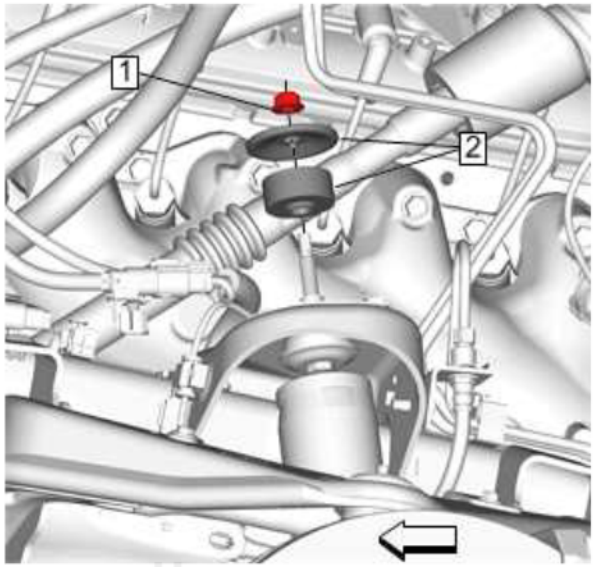


Fig. 98: Lower Front Shock Absorber Nut And Bolt
Courtesy of GENERAL MOTORS COMPANY

CAUTION: **Refer to Fastener Caution .**

2. Install the lower front shock absorber bolt (2) and nut (1) and tighten the nut to 80 N.m (59 lb ft).



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Fig. 99: Upper Front Shock Absorber Nut And Front Shock Absorber Insulator Assembly
Courtesy of GENERAL MOTORS COMPANY

3. Install the front shock absorber insulator assembly (2) and the upper front shock absorber nut (1) and tighten the nut to 22 N.m (16 lb ft).
4. Install the front tire and wheel assembly. **Tire and Wheel Removal and Installation (6-Lug Wheel)** **Tire and Wheel Removal and Installation (8-Lug Wheel)**

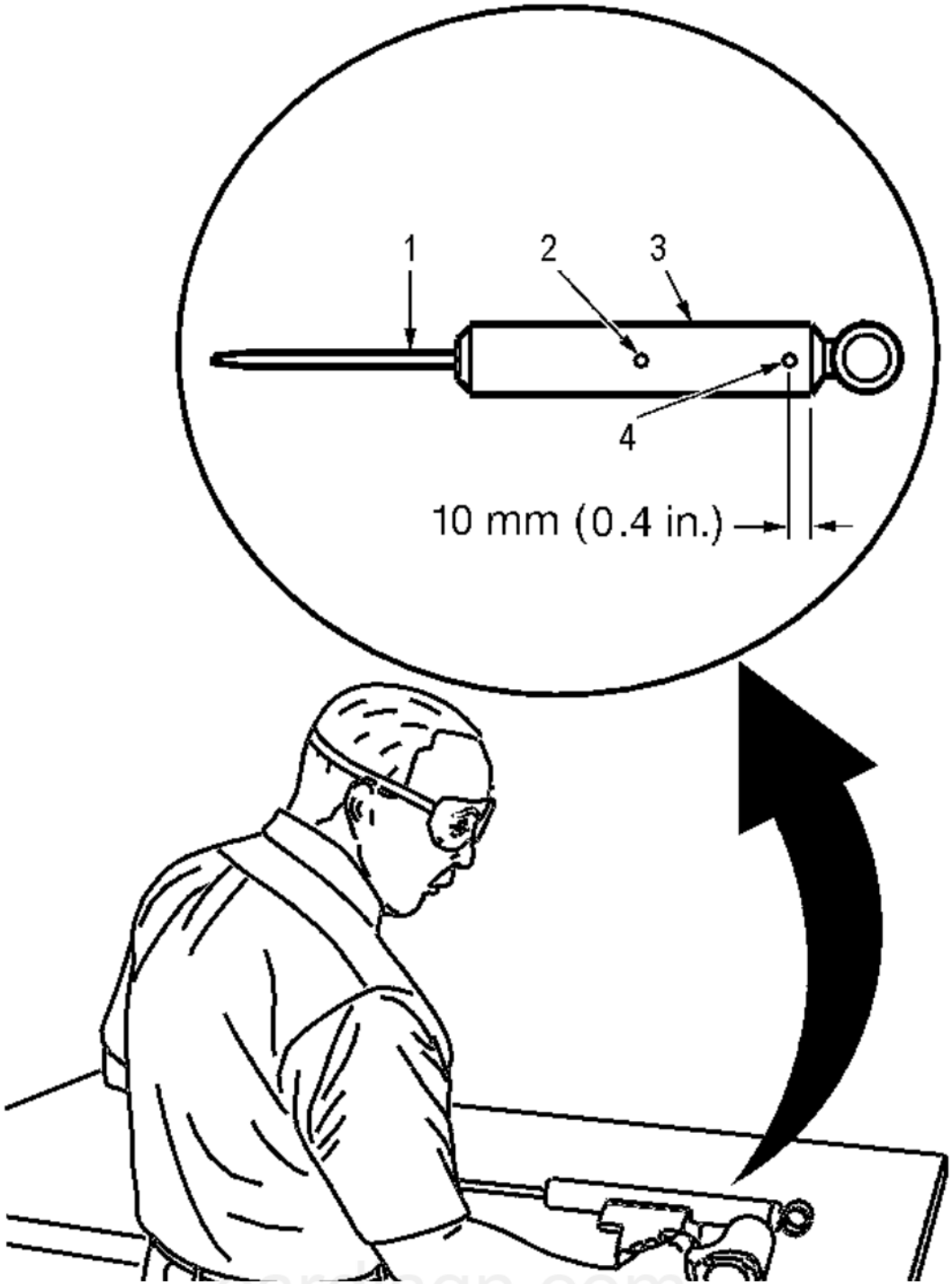
SHOCK ABSORBER DISPOSAL

WARNING: Gas charged shock absorbers contain high pressure gas. Do 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.

WARNING: To prevent personal injury, wear safety glasses when centerpunching and drilling the shock absorber. Use care not to puncture the shock absorber tube with the centerpunch.

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Fig. 100: Drilling Hole In Shock Absorber At Centerpunched Locations
Courtesy of GENERAL MOTORS COMPANY

1. Make an indentation 10 mm (0.4 in) from the bottom (4) of the tube (3) using a centerpunch.
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 centerpunch (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 centerpunch.
5. Drill a second hole in the shock absorber at the centerpunch (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.

DESCRIPTION AND OPERATION

FRONT SUSPENSION DESCRIPTION AND OPERATION

The front suspension allows each wheel to compensate for changes in the road surface without affecting the opposite wheel. Each wheel independently connects to the frame with a steering knuckle, ball joint assemblies, and upper and lower control arms.

Two tie rods connect to the steering arms on the knuckles and to a steering gear.

Rear wheel drive models have a front suspension that consists of the following components:

- Control arms
- Stabilizer shaft
- Shock/Coil spring modules

The upper part of each Shock/Coil spring module bolts to the frame. Three insulators, a mounting plate and a nut secure the coil spring to the shock housing. Two bolts secure the lower part of the shock module to the lower control arm.

A spring steel stabilizer shaft controls the side roll of the front suspension. This shaft is mounted in rubber insulators that are held by clamps to the frame side rails. The ends of the stabilizer shaft connect to the lower control arms with link assemblies.

The upper ball joint assembly is integrated into the upper control arm. The assembly attaches to the steering knuckle with a prevailing torque nut.

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The lower ball joint assembly is integrated into the control arm. The assembly attaches to the steering knuckle with a prevailing torque nut.

The upper and the lower control arms have pressed-in bushings. The bolts pass through the bushings and join the arms to the frame.

Ball joint assemblies have rubber grease seals. These seals prevent the entry of moisture and dirt. This prevents damage to the bearing surfaces.

Four-wheel drive models have a front suspension that consists of the following components:

- Control arms
- Stabilizer shaft
- Shock module/Shock absorbers
- Coil Springs (1500 series)
- Torsion bars (2500, 3500 series)

The upper part of each shock absorber (2500, 3500 series) extends through a frame bracket. Two insulators and a nut secure the upper part of the shock to the frame. A through bolt secures the lower part of the shock to the lower control arm.

The upper part of each shock module (1500 series) attaches to the frame by 3 nuts. The lower part of the shock module attaches to the lower control arm by 2 bolts.

A spring steel stabilizer shaft controls the side roll of the front suspension. This shaft is mounted in rubber insulators that are held by clamps to the frame side rails. The ends of the stabilizer shaft connect to the lower control arms with link assemblies.

The front end of the torsion bar attaches to the lower control arm. The rear of the torsion bar mounts into an adjustable arm at the torsion bar crossmember. This arm adjustment controls the vehicle trim height.

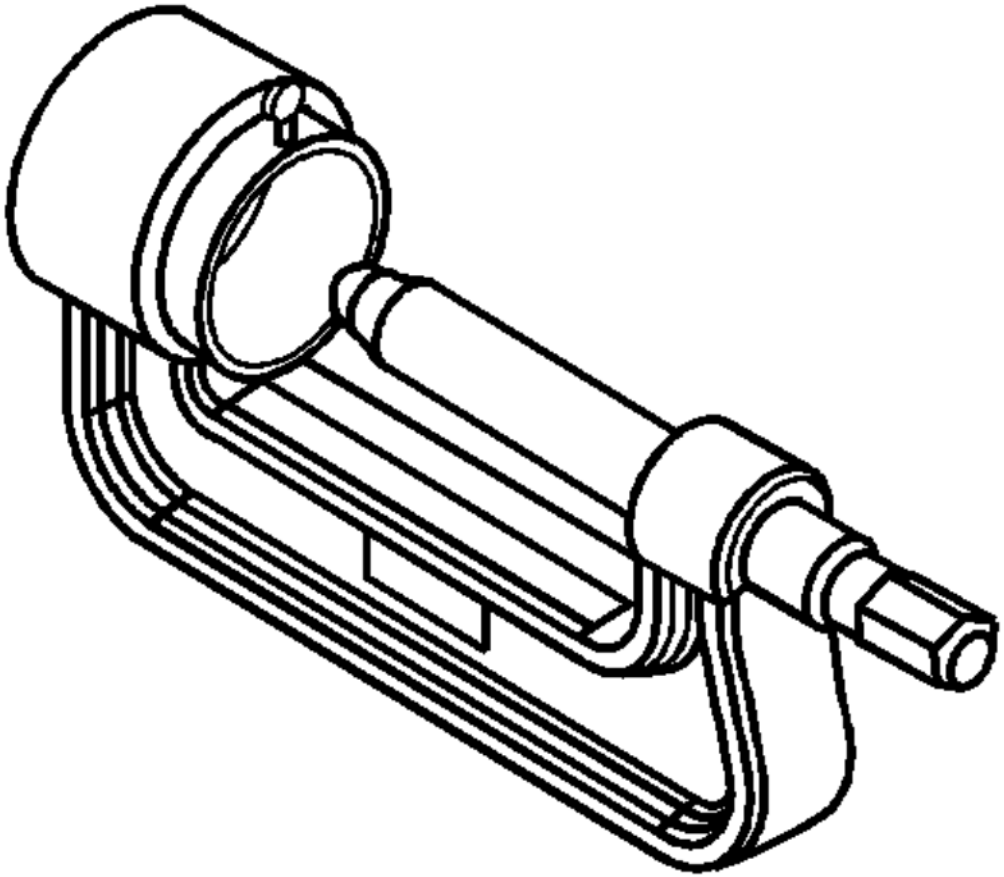
Both RWD and 4WD models have sealed front wheel bearings. These bearings are pre-adjusted and need no lubrication.

SPECIAL TOOLS AND EQUIPMENT

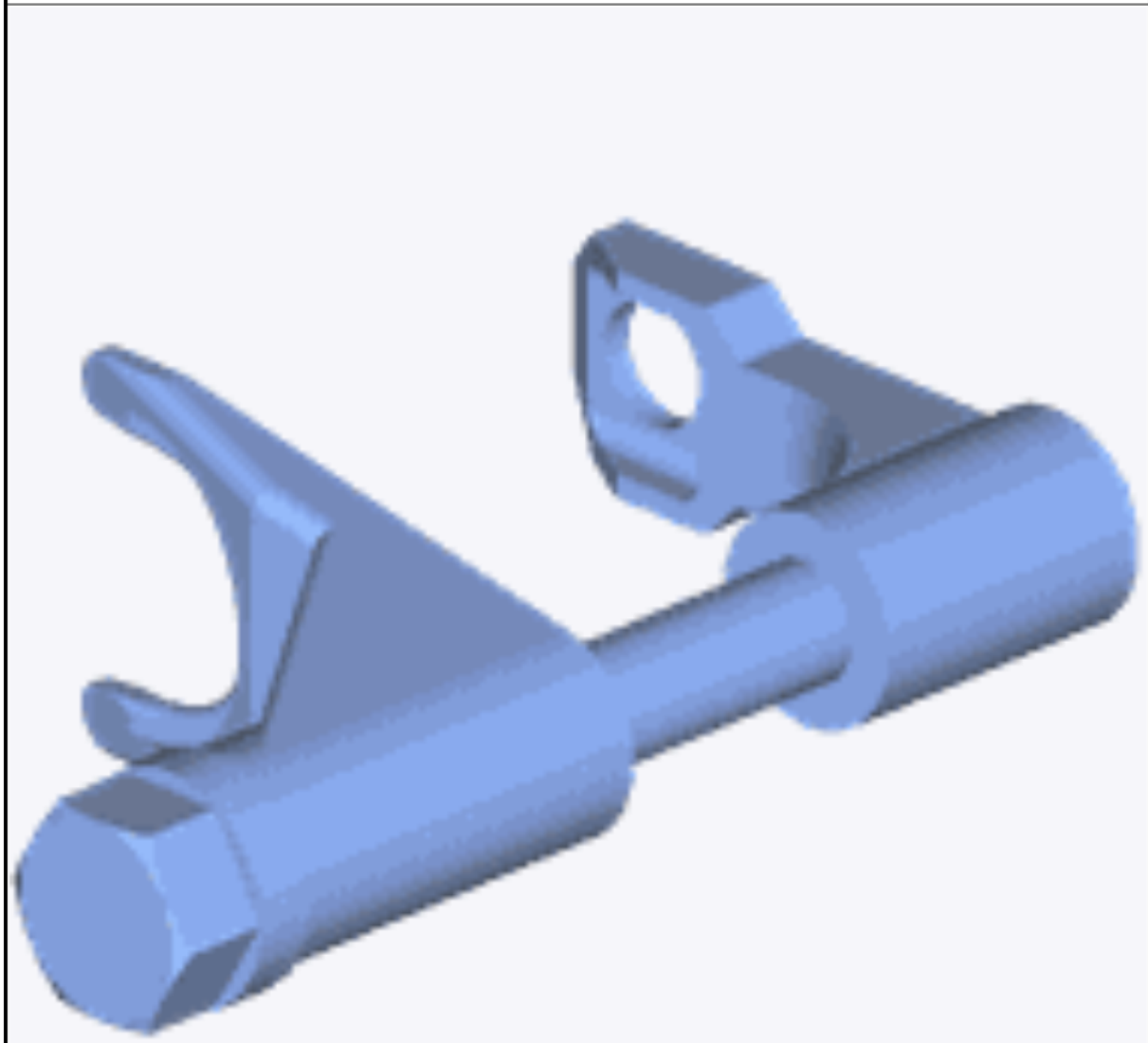
SPECIAL TOOLS

Illustration	Tool Number/ Description

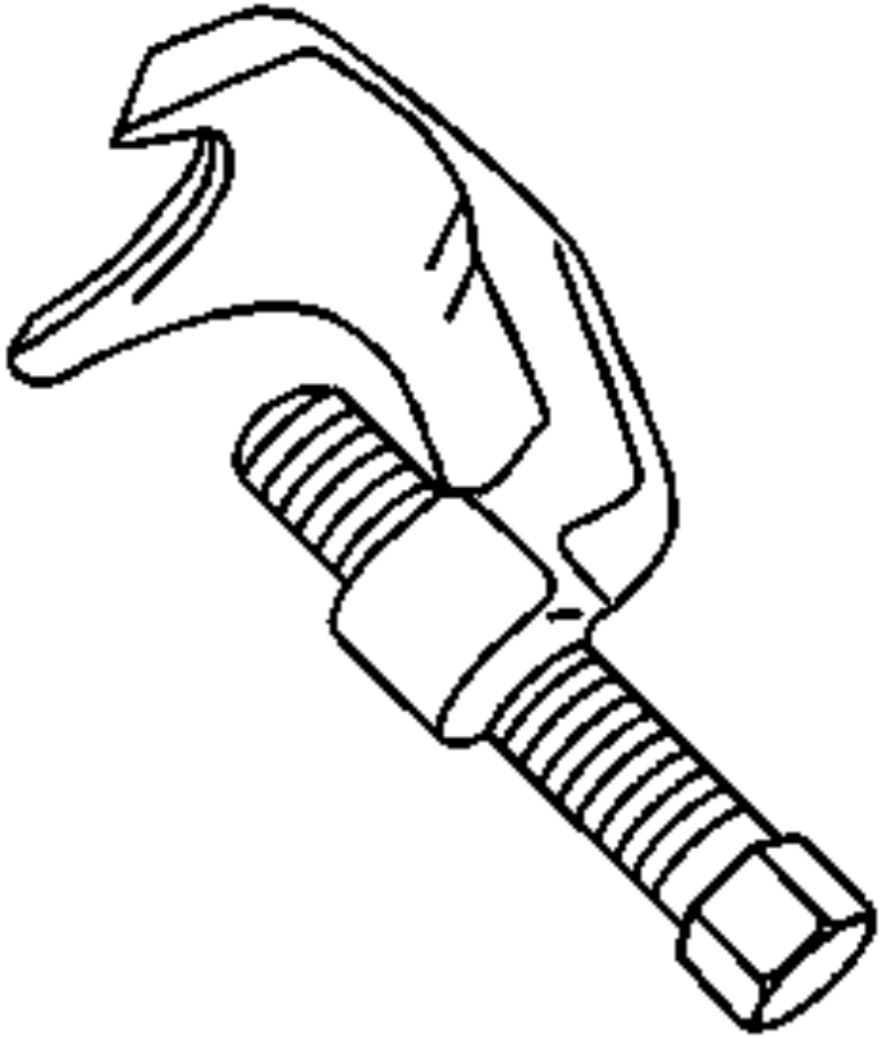
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Illustration	Tool Number/ Description
	CH-41805 J-41805 Lower Ball Joint Remover/Installer

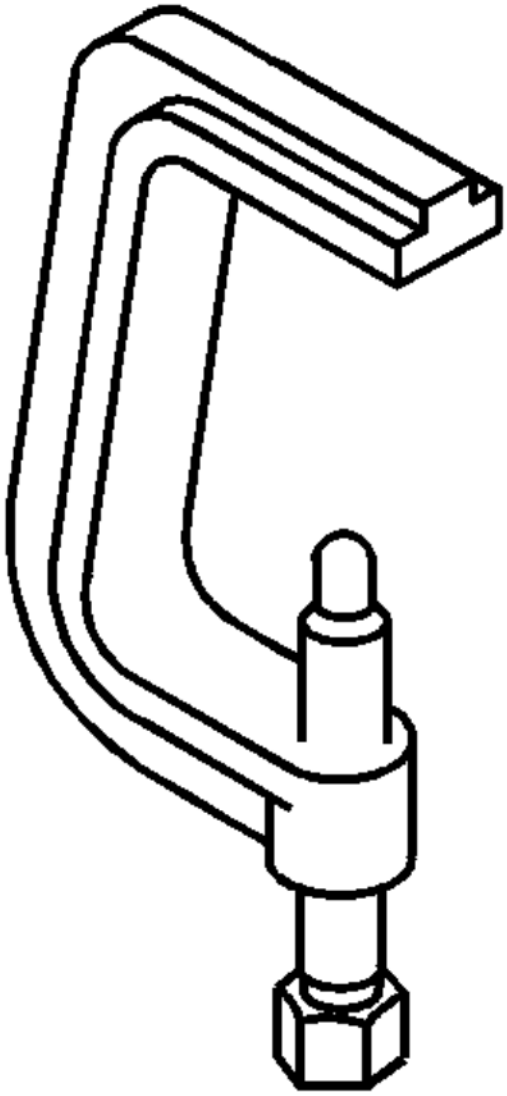
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Illustration	Tool Number/ Description
	CH-42188-B J-42188-B Ball Joint Separator

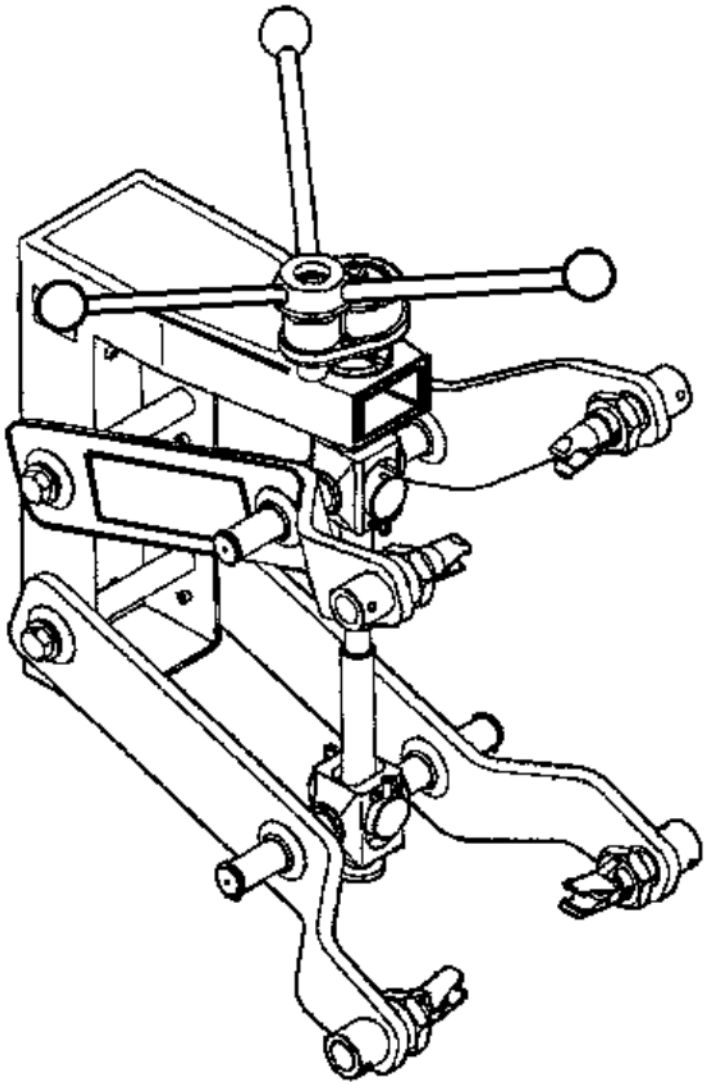
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Illustration	Tool Number/ Description
	CH-43631 CH-49455 J-43631 Ball Joint Separator

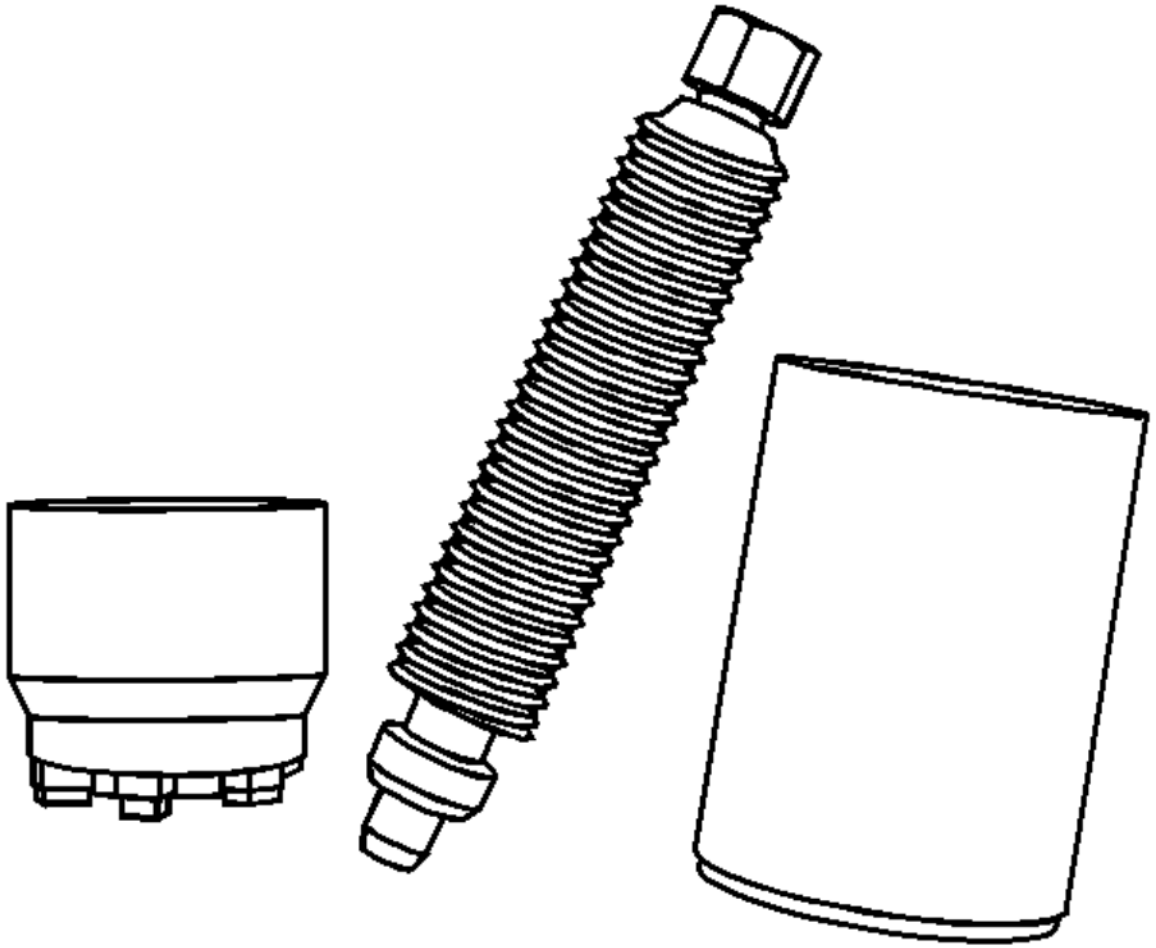
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Illustration	Tool Number/ Description
	CH-48809 Torsion Bar Unloader

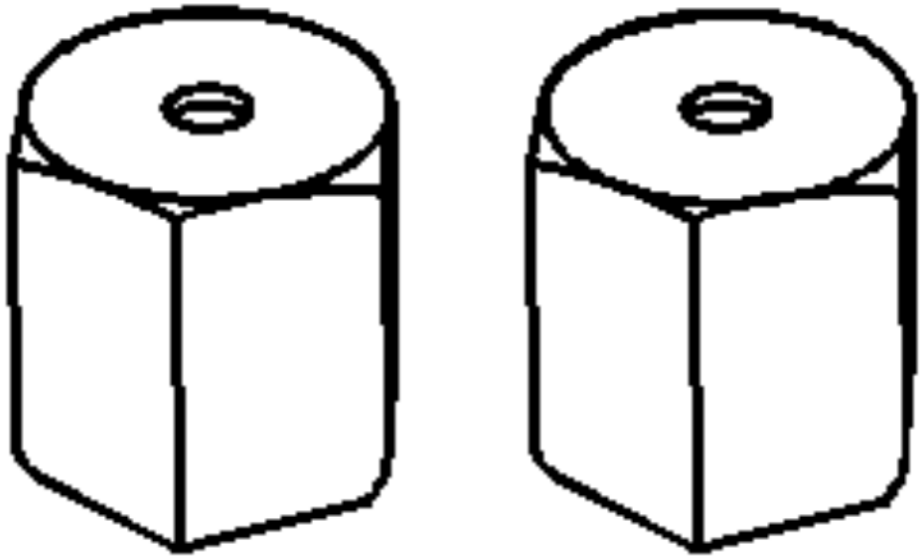
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Illustration	Tool Number/ Description
	CH-48845 Strut Spring Compressor

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Illustration	Tool Number/ Description
	CH-49240 Ball Joint Installer

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Illustration	Tool Number/ Description
	J-45851 Ball Joint Separator Protector Adapter(s)

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