

**2017 Driveline/Axle**  
**Wheel Drive Shafts - Sierra, Silverado**

## **SPECIFICATIONS**

### **FASTENER SPECIFICATIONS**

#### **Single Use Non-Threaded Fasteners/Components**

|                                                                                                                             |  |
|-----------------------------------------------------------------------------------------------------------------------------|--|
| <b>NOTE:</b><br><i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i> |  |
| <b>Application</b>                                                                                                          |  |
| Boot Clamp                                                                                                                  |  |
| Swage Ring                                                                                                                  |  |

#### **Single Use Threaded Fastener/Component Tightening Specifications**

| <b>NOTE:</b><br><i>All fasteners/components listed in this table MUST BE DISCARDED and replaced with NEW after removal.</i> |                         |
|-----------------------------------------------------------------------------------------------------------------------------|-------------------------|
| <b>Application</b>                                                                                                          | <b>Specification</b>    |
|                                                                                                                             | <b>Metric (English)</b> |
| Wheel Drive Shaft Retaining Nut                                                                                             | 255 N.m (188 lb ft)     |

#### **Reusable Threaded Fastener Tightening Specifications**

| <b>NOTE:</b><br><i>All fasteners listed in this table can be reused after removal.</i> |                         |
|----------------------------------------------------------------------------------------|-------------------------|
| <b>Application</b>                                                                     | <b>Specification</b>    |
|                                                                                        | <b>Metric (English)</b> |
| Wheel Drive Shaft Flange Retaining Bolt                                                | 79 N.m (58 lb ft)       |

### **ADHESIVES, FLUIDS, LUBRICANTS, AND SEALERS**

| Application                          | Type of Material | GM Part Number |          |
|--------------------------------------|------------------|----------------|----------|
|                                      |                  | United States  | Canada   |
| Wheel Drive Shaft/Intermediate Shaft | Grease           | 1051344        | 993037   |
| Output Shaft Splines                 | Grease           | 12345879       | 10953511 |

## DIAGNOSTIC INFORMATION AND PROCEDURES

### CLICK NOISE IN TURNS

| Step                                                          | Action                                                                                                                                            | Yes                 | No        |
|---------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|-----------|
| DEFINITION: Clicking noise while turning in drive under load. |                                                                                                                                                   |                     |           |
| 1                                                             | Check for worn or damaged outer CV joints.<br>Are the outer CV joints/seals worn?                                                                 | Go to <b>Step 2</b> | System OK |
| 2                                                             | Replace the outer CV joints/seals. Refer to <a href="#">Front Wheel Drive Shaft Outer Joint and Boot Replacement</a> .<br>Is the repair complete? | System OK           | -         |

### CLUNK WHEN ACCELERATING FROM COAST

| Step                                                                                   | Action                                                                                                                                                                                                                                 | Value(s)               | Yes                 | No                  |
|----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|---------------------|---------------------|
| DEFINITION: A chunking noise present when accelerating from coast to drive under load. |                                                                                                                                                                                                                                        |                        |                     |                     |
| 1                                                                                      | Check for a loose wheel drive shaft to hub assembly nut.<br>Is the wheel drive shaft nut loose?                                                                                                                                        | -                      | Go to <b>Step 2</b> | Go to <b>Step 3</b> |
| 2                                                                                      | Tighten the wheel drive shaft to hub assembly nut to specification.<br>Is the repair complete?                                                                                                                                         | 240 N.m<br>(177 lb ft) | System OK           | -                   |
| 3                                                                                      | Check for a damaged inner CV joint.<br>Is the inner CV joint damaged?                                                                                                                                                                  | -                      | Go to <b>Step 4</b> | System OK           |
| 4                                                                                      | Replace the inner CV joint. Refer to <a href="#">Front Wheel Drive Shaft Inner Joint and Boot Replacement (1500)</a> <a href="#">Front Wheel Drive Shaft Inner Joint and Boot Replacement (2500/3500)</a> .<br>Is the repair complete? | -                      | System OK           | -                   |

## REPAIR INSTRUCTIONS

### FRONT WHEEL DRIVE SHAFT REPLACEMENT - LEFT SIDE

#### Special Tools

J-45859 Axle Remover

#### Removal Procedure

**WARNING:** Do not attempt to move vehicle with drive axle(s) removed from wheel bearing. Wheel(s) could fall off, dropping vehicle to the ground and causing personal

**injury or damage to the vehicle.**

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 \(6-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(8-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(Dual Rear Wheels\)](#) .
3. Remove the front axle hub cap from the wheel bearing, if equipped.

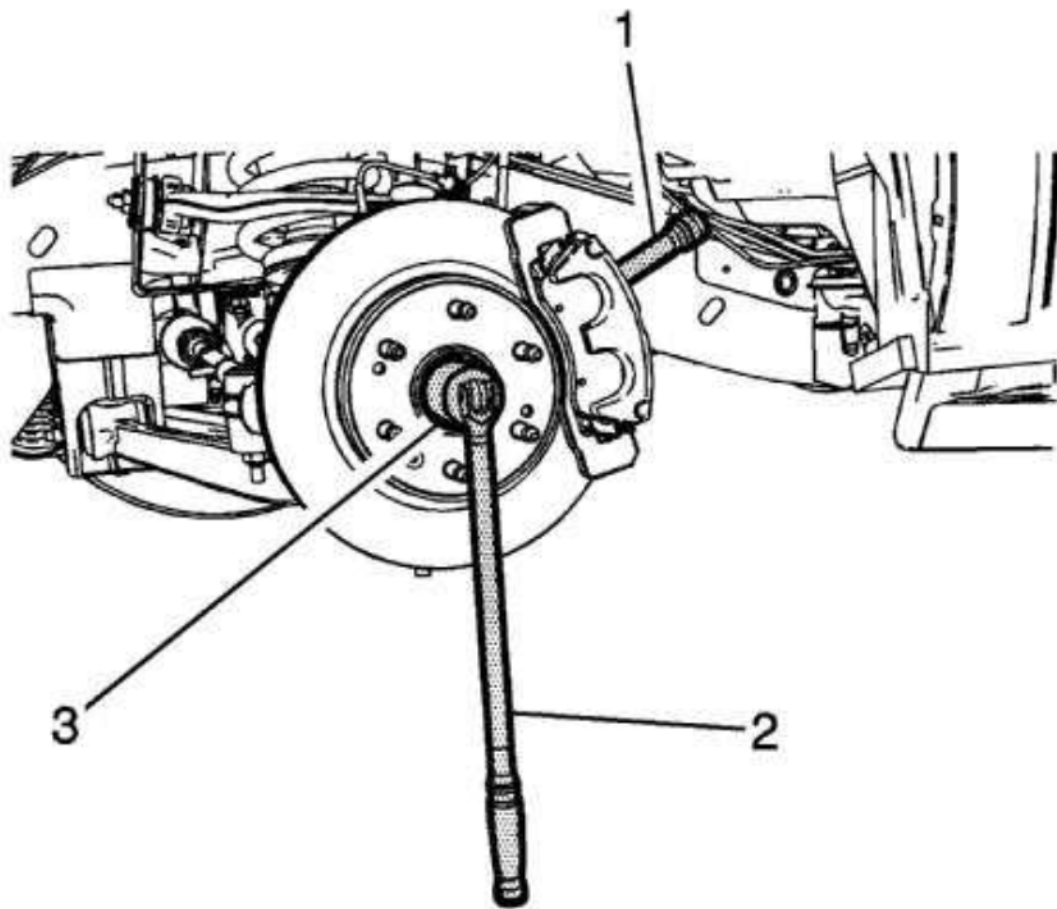


**Fig. 1: Axle Retaining Nut, Breaker Bar And Correct Sized Socket**

**Courtesy of GENERAL MOTORS COMPANY**

4. Insert a drift (1) through the brake caliper into one of the brake rotor vanes in order to prevent the wheel drive shaft from turning and loosen the axle retaining nut with a breaker bar (2) and correct sized socket (3).

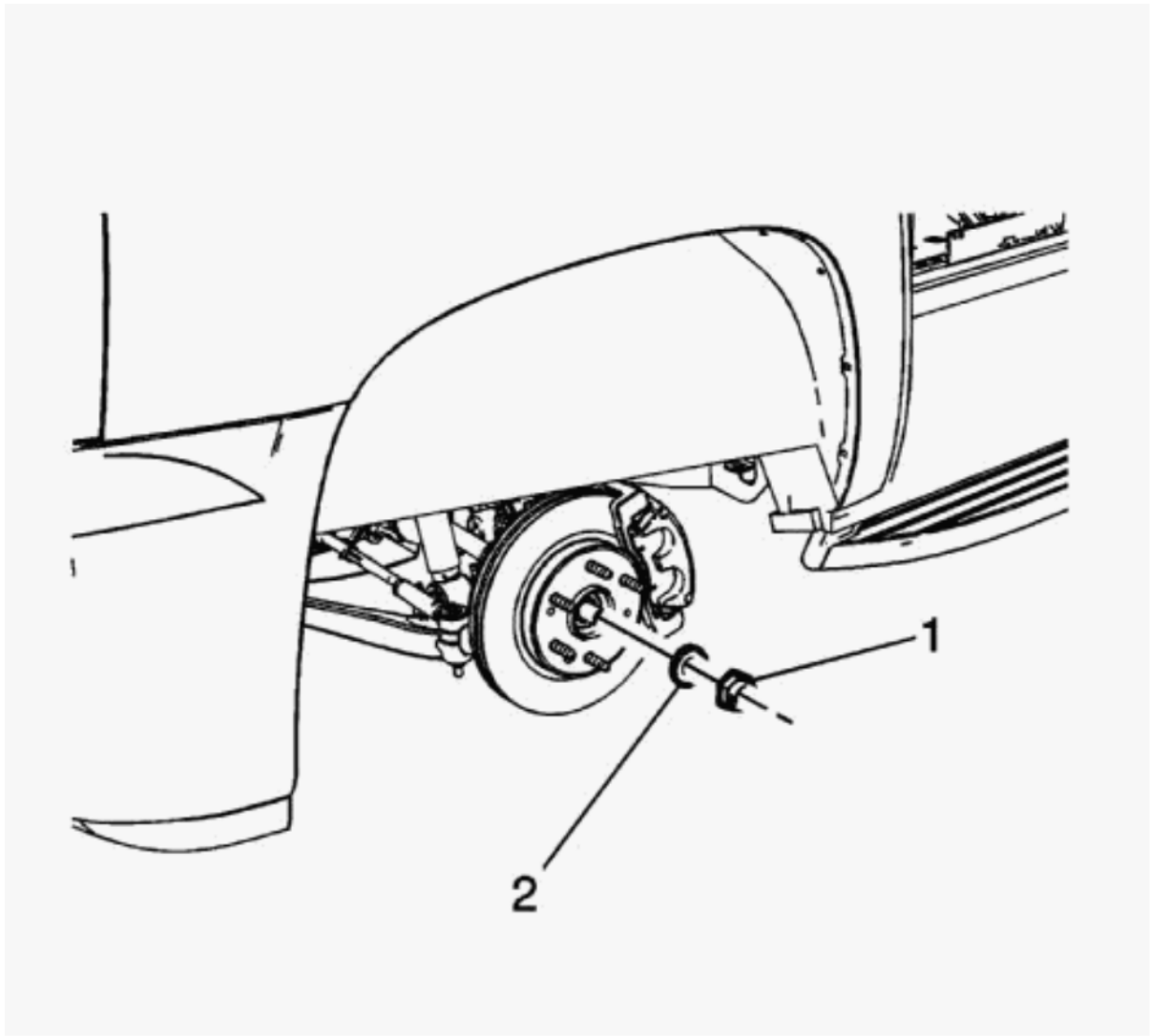


**Fig. 2: View Of Nut And Hub**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** DO NOT reuse the wheel drive shaft nut, use a NEW nut only.

5. Remove the nut (1) and washer (2) from the hub.

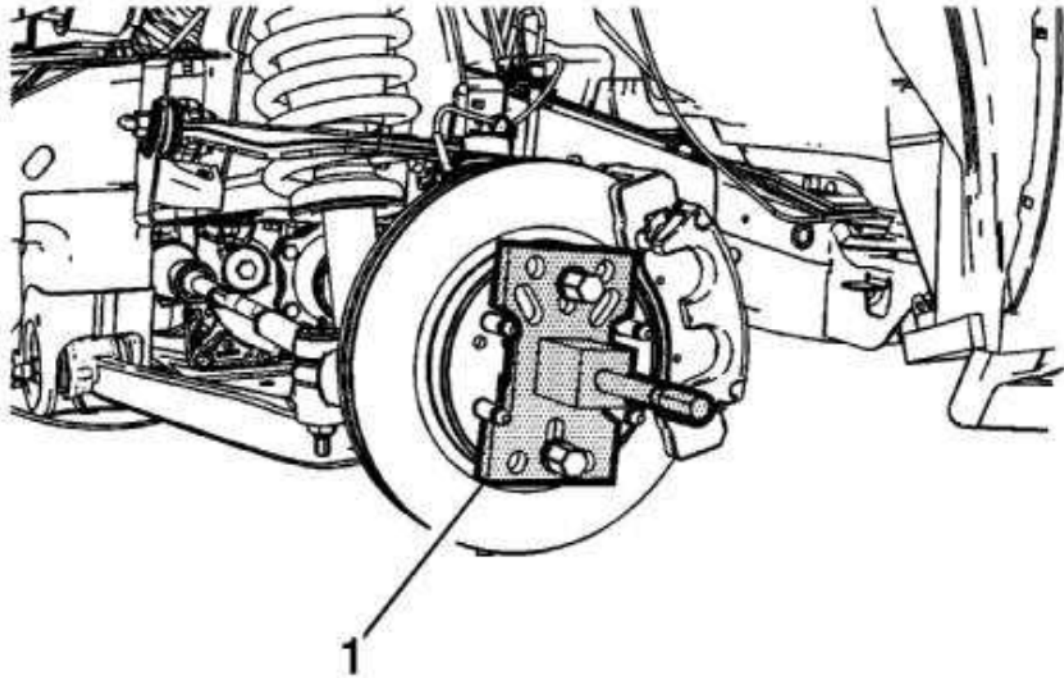


**Fig. 3: Axle Remover**

Courtesy of GENERAL MOTORS COMPANY

6. Using the **J-45859** axle remover , remove the wheel drive shaft from the hub.

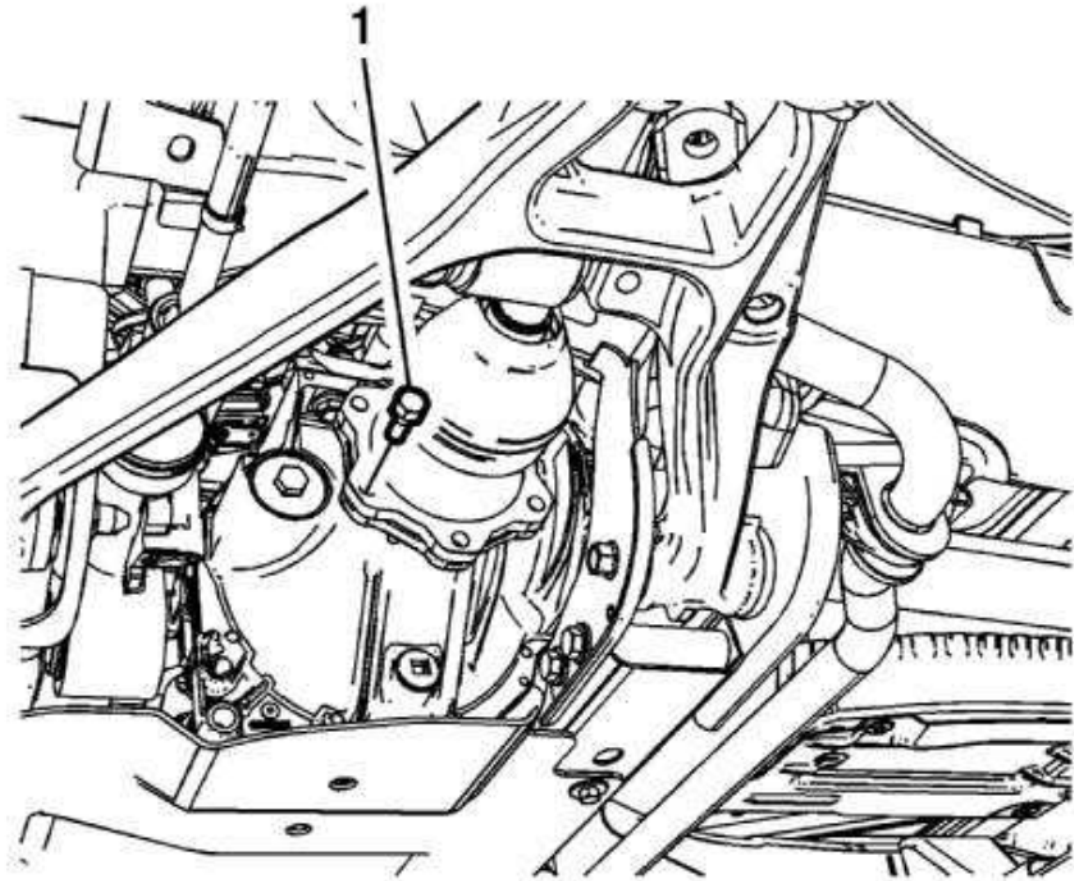


**Fig. 4: Wheel Driver Shaft Retaining Bolts And Drive Flange**

Courtesy of GENERAL MOTORS COMPANY

7. Remove the (QTY 6) wheel driver shaft retaining bolts (1) from the drive flange.
8. Remove both stabilizer shaft links from the lower control arm. Refer to [\*\*Stabilizer Shaft Replacement \(Heavy Duty\)\*\*](#) [\*\*Stabilizer Shaft Replacement \(Light Duty\)\*\*](#) .
9. Remove the lower shock bolt on the side of vehicle the wheel drive shaft replacement is occurring. Refer to [\*\*Shock Absorber and Spring Removal and Installation \(Light Duty, Without Z85/Z95\)\*\*](#) [\*\*Shock Absorber and Spring Removal and Installation \(Light Duty, With Z85/Z95\)\*\*](#) .

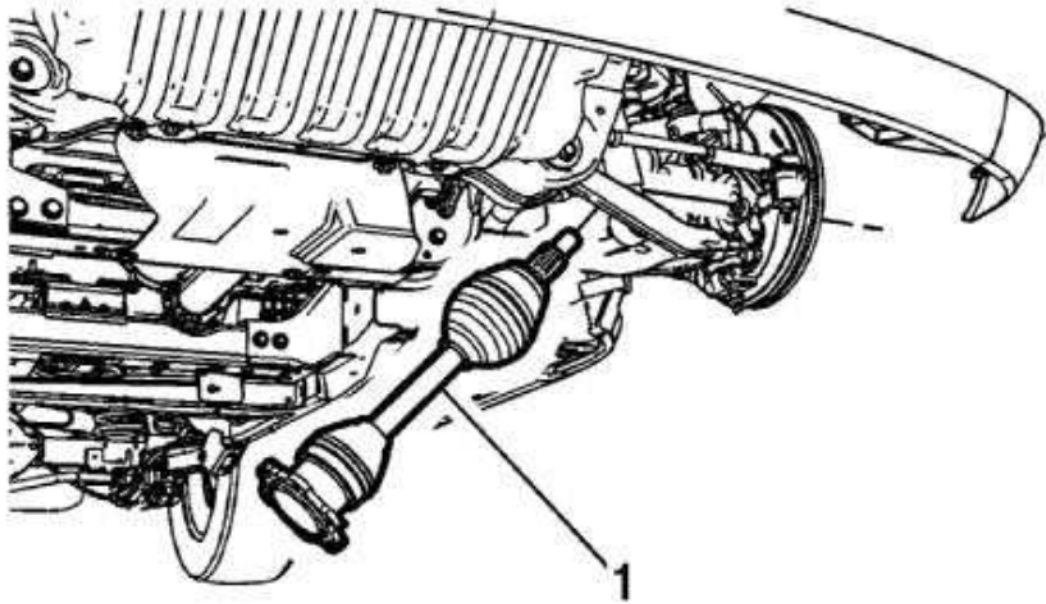


**Fig. 5: Wheel Drive Shaft Through Lower Control Arm Opening**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Wrap a shop towel around the wheel drive shaft to protect the joint boots.  
Do not remove the shop towel until the shaft is reinstalled.

10. Remove the wheel drive shaft through the lower control arm opening.
11. Remove all dirt and debris from the splines on the wheel hub/bearing.

#### **Installation Procedure**

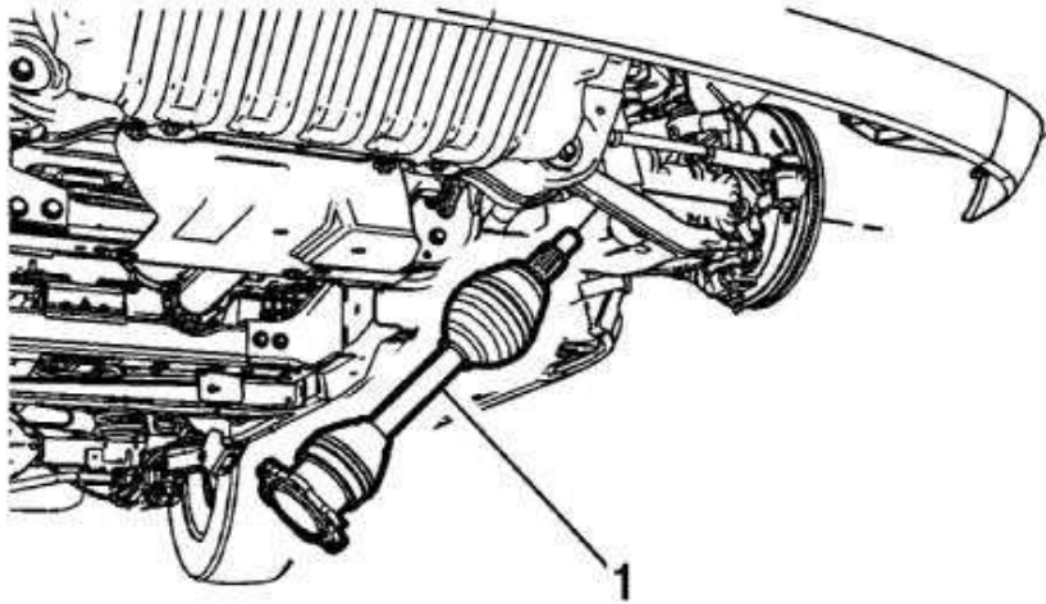


**Fig. 6: Wheel Drive Shaft Through Lower Control Arm Opening**  
Courtesy of GENERAL MOTORS COMPANY

1. Install the wheel drive shaft (1) in the steering knuckle.

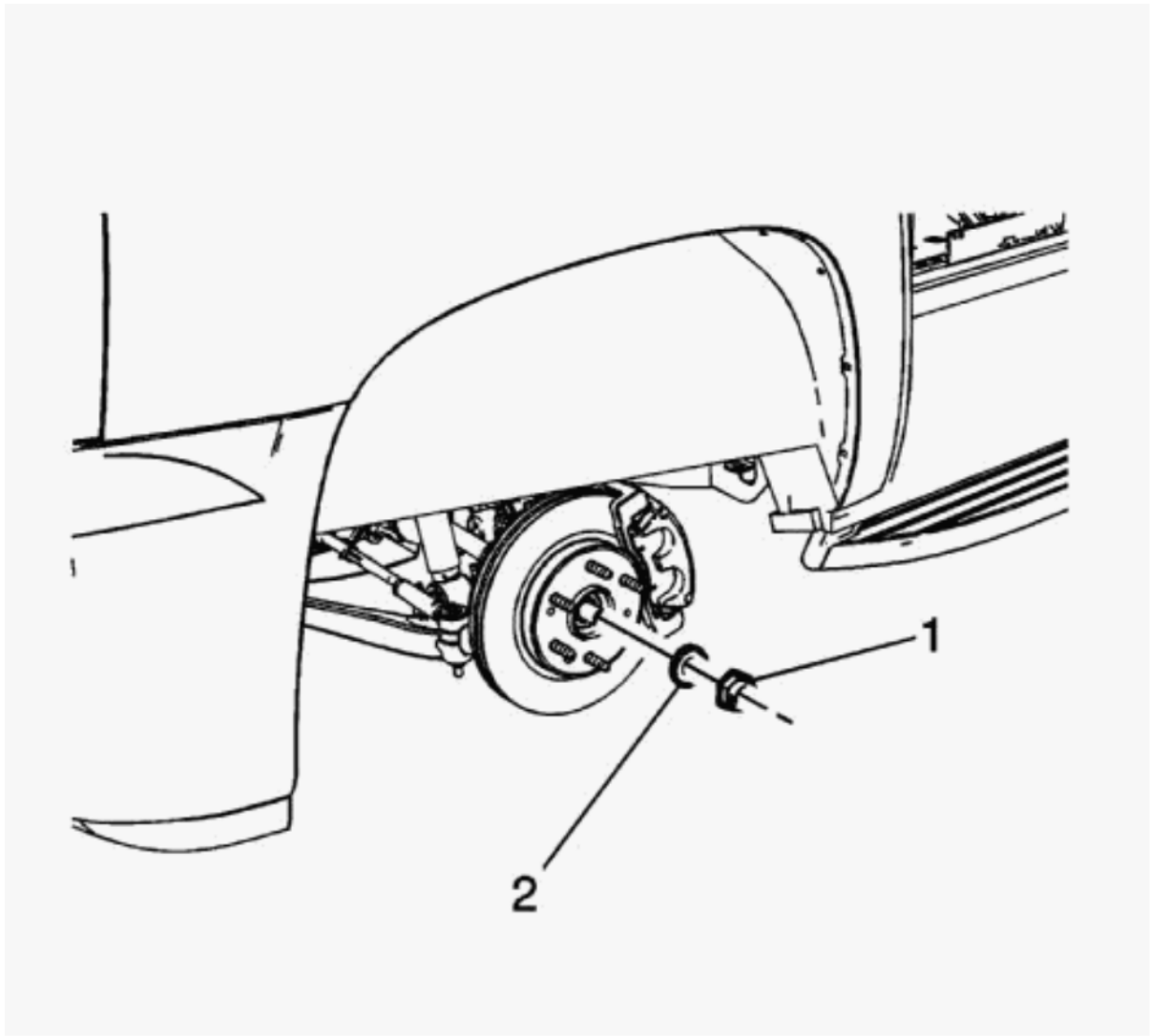


**Fig. 7: View Of Nut And Hub**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Install the NEW nut and washer, but DO NOT tighten at this time.

2. Install the NEW nut (1) and washer (2).

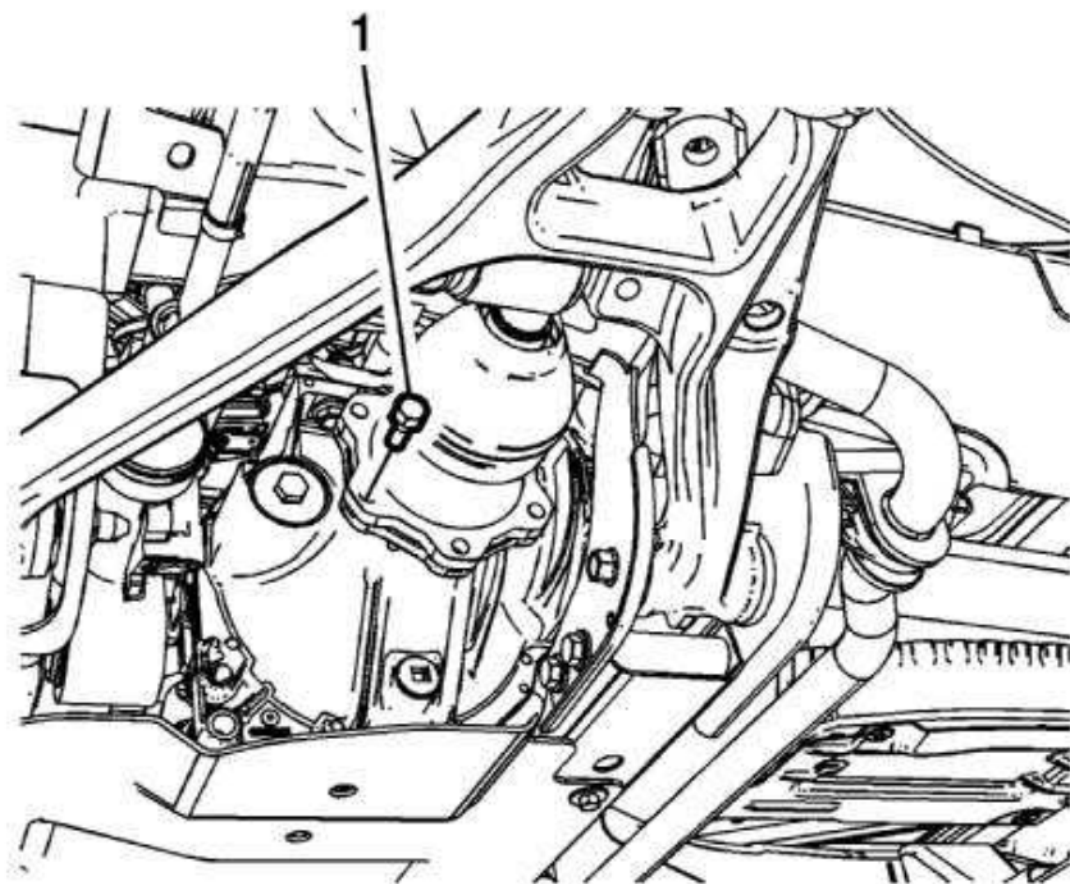


**Fig. 8: Wheel Driver Shaft Retaining Bolts And Drive Flange**

Courtesy of GENERAL MOTORS COMPANY

3. Install the (QTY 6) wheel driver shaft flange retaining bolts (1) and finger tighten.

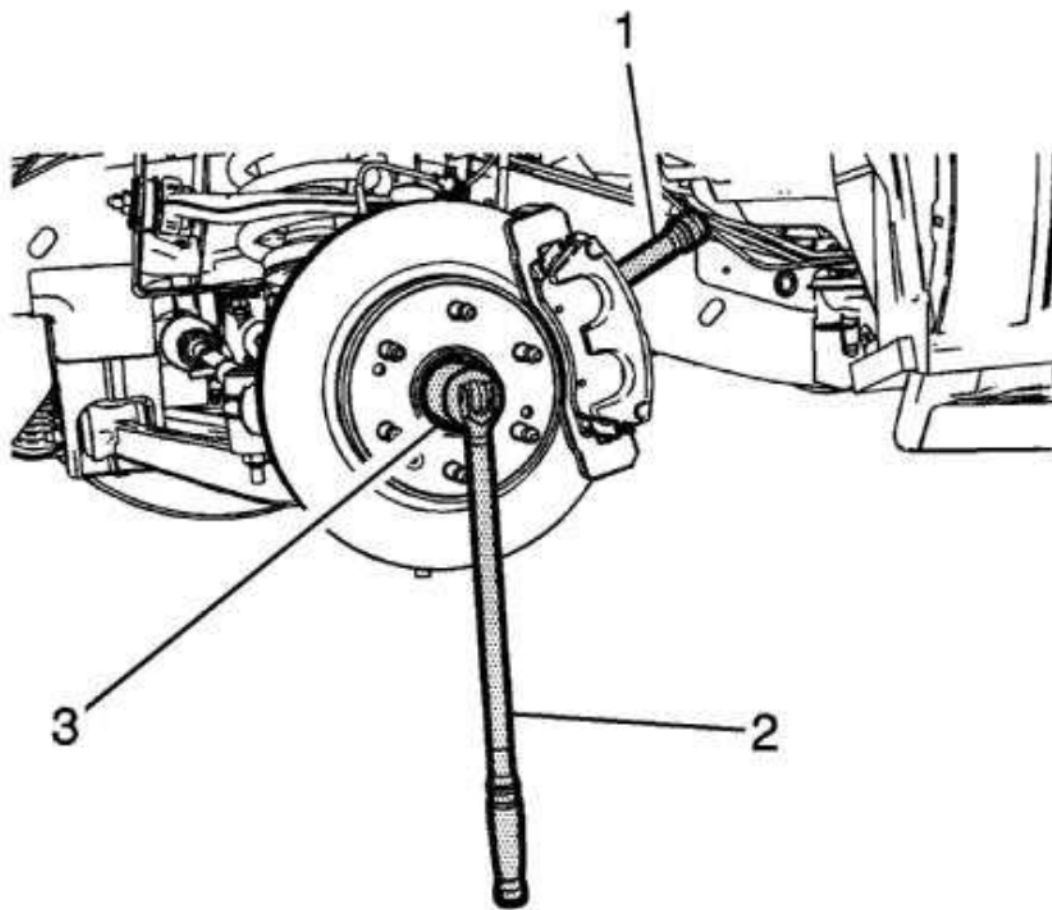


**Fig. 9: Axle Retaining Nut, Breaker Bar And Correct Sized Socket**

Courtesy of GENERAL MOTORS COMPANY

4. Insert a drift (1) through the brake caliper into one of the brake rotor vanes in order to prevent the wheel drive shaft from turning.

**CAUTION:** Refer to [Fastener Caution](#) .

5. Tighten the wheel driver shaft flange retaining bolts and tighten to 79 N.m (58 lb ft).
6. Tighten the wheel drive shaft retaining nut and tighten to 255 N.m (188 lb ft).
7. Install the shock lower bolt. Refer to [Shock Absorber and Spring Removal and Installation \(Light Duty, Without Z85/Z95\)](#) [Shock Absorber and Spring Removal and Installation \(Light Duty, With Z85/Z95\)](#) .
8. Install the stabilizer shaft links to the lower control arms. Refer to [Stabilizer Shaft Replacement \(Heavy Duty\)](#) [Stabilizer Shaft Replacement \(Light Duty\)](#) .
9. Install the front axle hub cap to the wheel bearing, if equipped.
10. Install the tire and wheel. Refer to [Tire and Wheel Removal and Installation \(6-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(8-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(Dual Rear Wheels\)](#) .
11. Lower the vehicle.

## FRONT WHEEL DRIVE SHAFT REPLACEMENT - RIGHT SIDE

### Special Tools

J-45859 Axle Remover

### Removal Procedure

**WARNING:** Do not attempt to move vehicle with drive axle(s) removed from wheel bearing. Wheel(s) could fall off, dropping vehicle to the ground and causing personal injury or damage to the vehicle.

1. Raise the vehicle. Refer to [Lifting and Jacking the Vehicle](#) .
2. Remove the wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation \(6-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(8-Lug Wheel\)](#) [Tire and Wheel Removal and Installation \(Dual Rear Wheels\)](#) .
3. Remove the drive axle center cap.

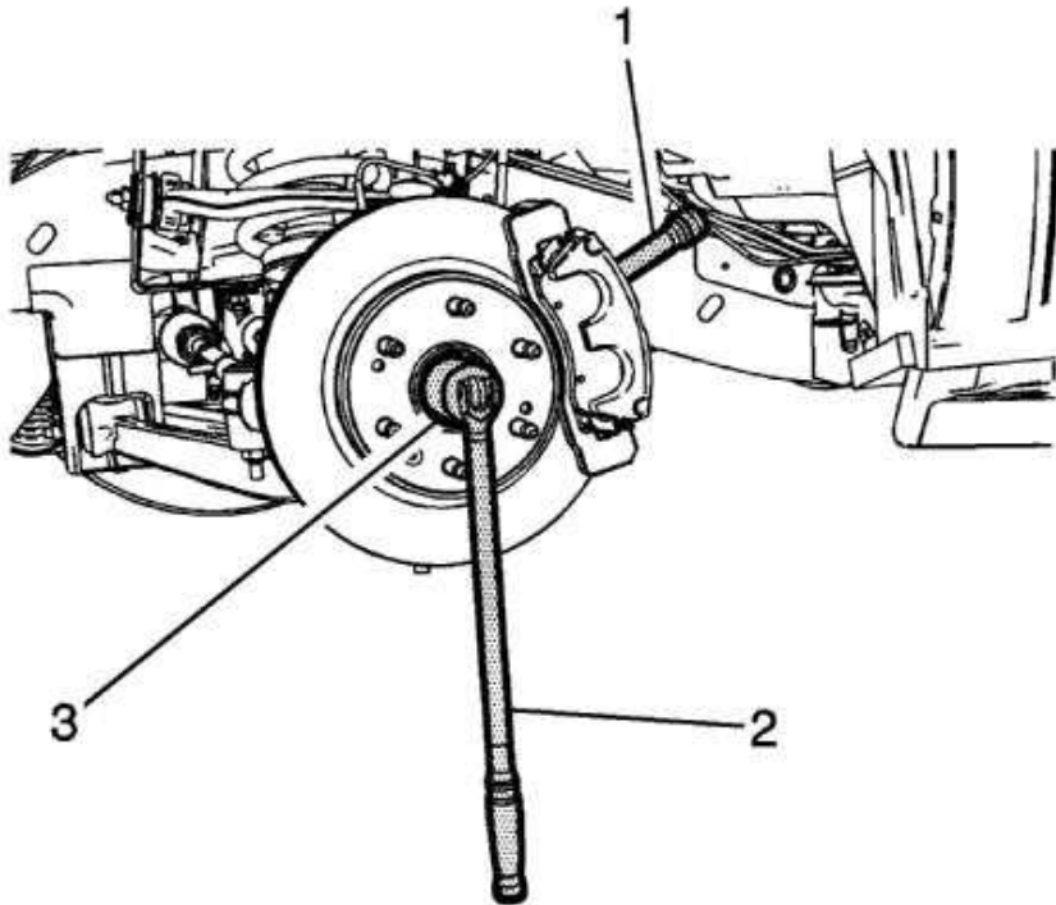


**Fig. 10: Axle Retaining Nut, Breaker Bar And Correct Sized Socket**

Courtesy of GENERAL MOTORS COMPANY

4. Insert a drift or a large screwdriver (1) into the webbing of the brake rotor to prevent the axle from spinning. Loosen the wheel driveshaft nut using a breaker bar (2) and proper size socket (3).

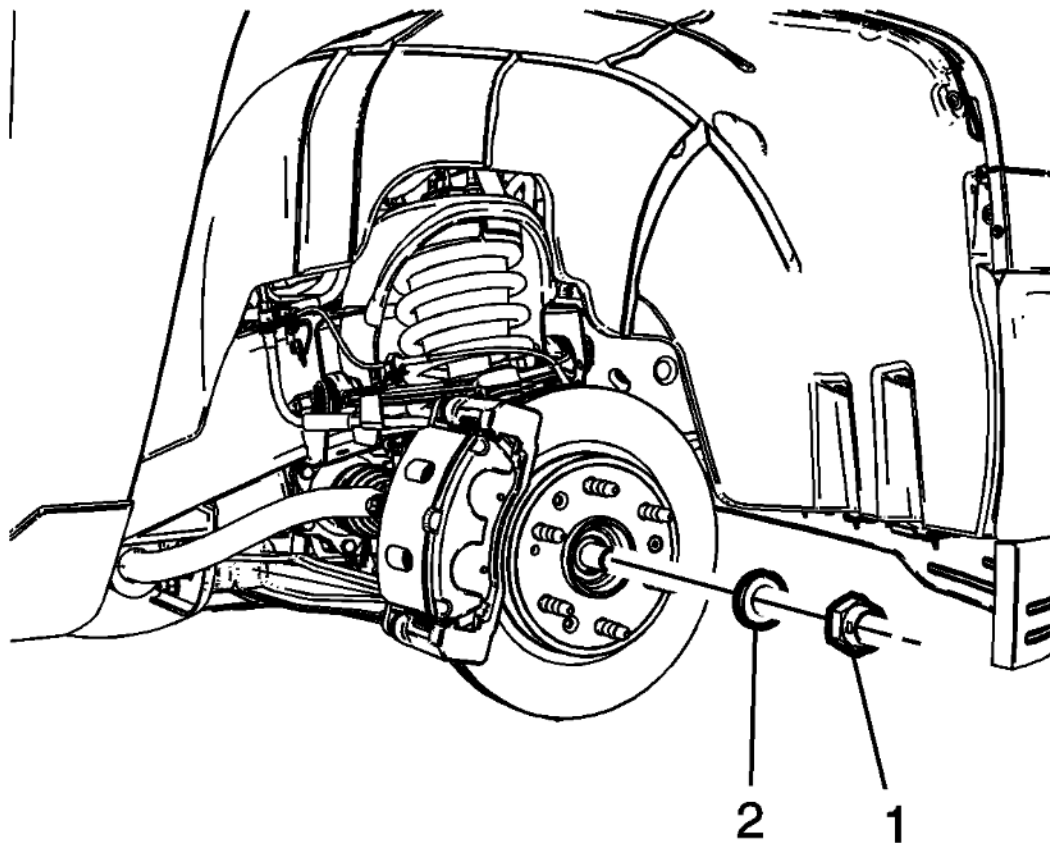


**Fig. 11: Wheel Drive Shaft Nut And Washer**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** DO NOT reuse the wheel drive shaft nut. Discard and replace with new.

5. Remove the nut (1) and the washer (2) from the wheel drive shaft.

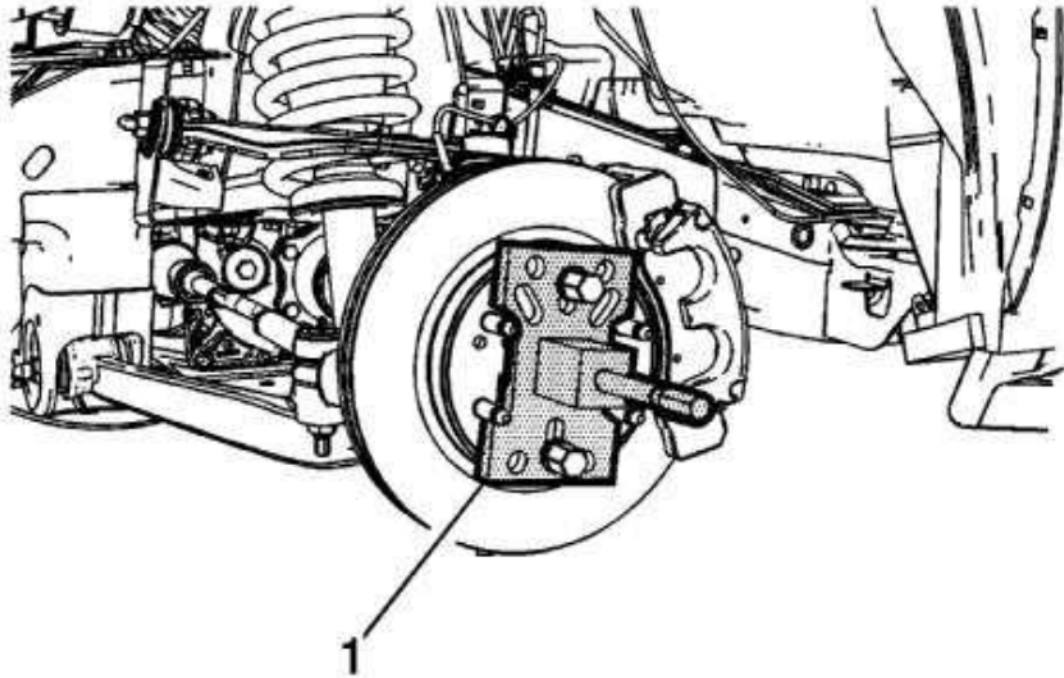


**Fig. 12: Axle Remover**

Courtesy of GENERAL MOTORS COMPANY

6. Using **J-45859** Axle Remover (1), remove the wheel drive shaft from the hub.
7. Remove the steering gear skid shield. Refer to [\*\*Steering Gear Skid Shield Replacement\*\*](#) .

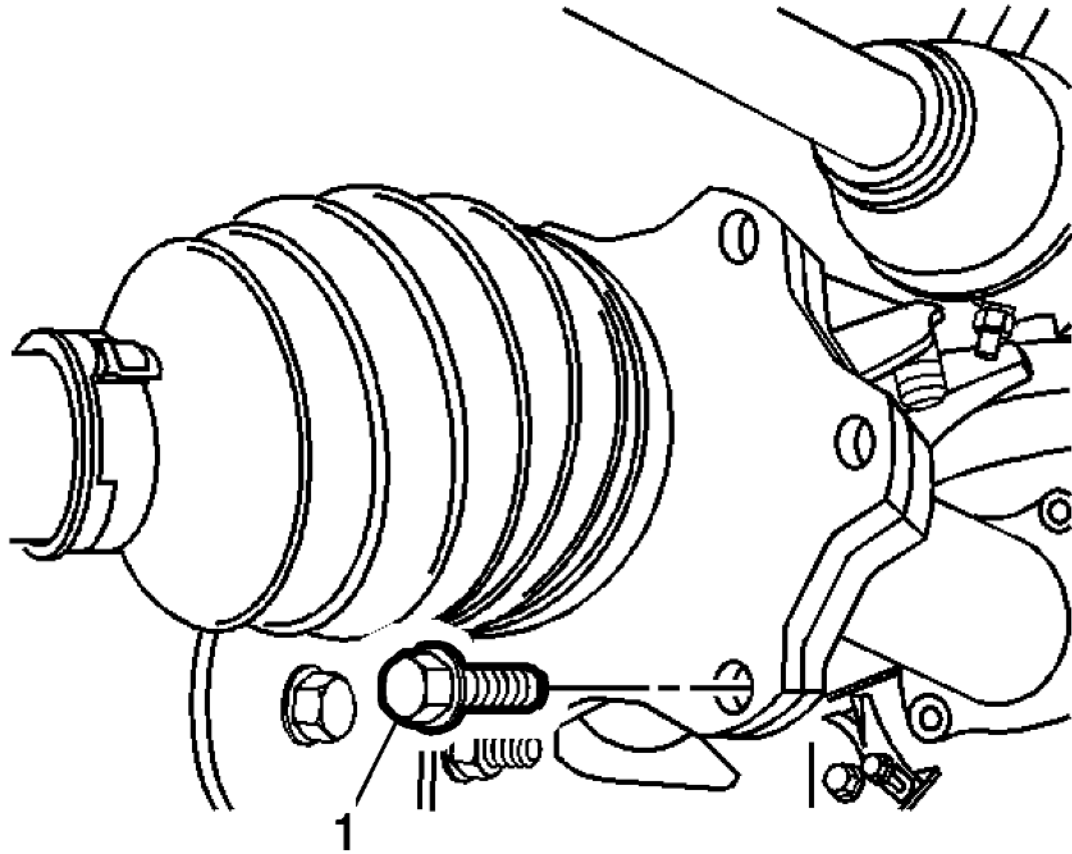


**Fig. 13: View Of Wheel Drive Shaft Inboard Flange Bolt - Front Drive Axle**

Courtesy of GENERAL MOTORS COMPANY

8. Remove the (Qty 6) flange bolts (1) securing the wheel drive shaft inboard flange to the output shaft flange.
9. Remove both of the stabilizer shaft links from the lower control arms. Refer to [\*\*Stabilizer Shaft Replacement \(Heavy Duty\)\*\*](#) [\*\*Stabilizer Shaft Replacement \(Light Duty\)\*\*](#) .
10. Remove the lower shock bolts on the side of the vehicle the wheel drive shaft replacement is occurring. Refer to [\*\*Shock Absorber and Spring Removal and Installation \(Light Duty, Without Z85/Z95\)\*\*](#) [\*\*Shock Absorber and Spring Removal and Installation \(Light Duty, With Z85/Z95\)\*\*](#) .

**NOTE:**      **DO NOT** remove the shop towel from the wheel drive shaft boots until the wheel drive shaft has been re-installed in the vehicle.

11. Wrap shop towels around both the inner and the outer wheel drive shaft boots in order to avoid damage to the boots during removal and installation.

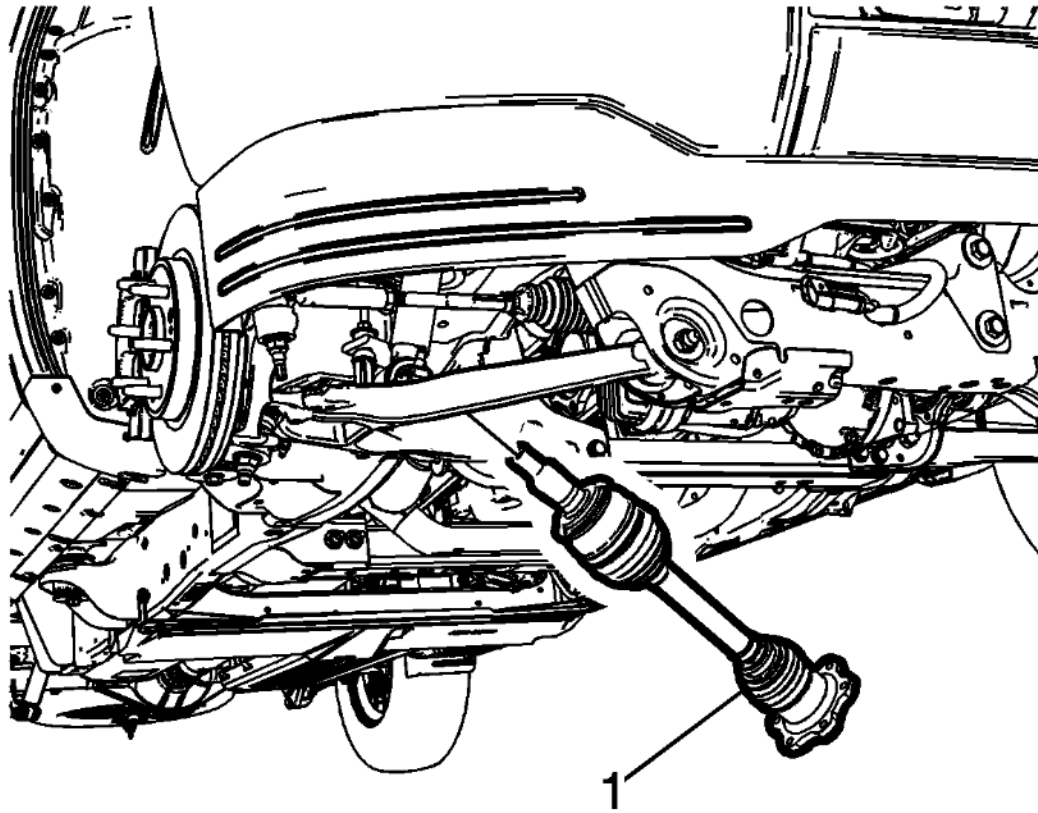


**Fig. 14: Wheel Drive Shaft**

Courtesy of GENERAL MOTORS COMPANY

12. Pull the wheel drive shaft (1) through the lower control arm opening.

#### **Installation Procedure**

1. Wrap shop towels around both the inner and the outer wheel drive shaft boots in order to avoid damage to the boots during removal and installation.

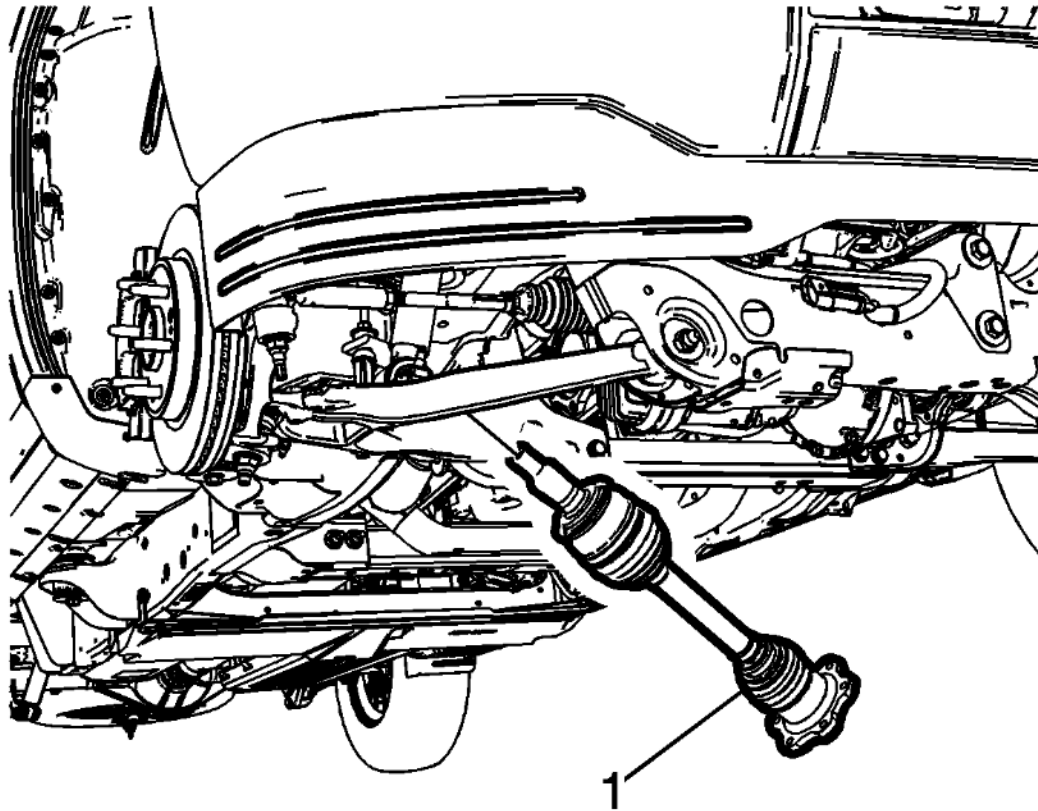


**Fig. 15: Wheel Drive Shaft**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Clean the steering knuckle and the wheel drive shaft splines and threads. These areas must be dry and free of grease, dirt, and contamination.

2. Insert the wheel drive shaft (1) into the knuckle.

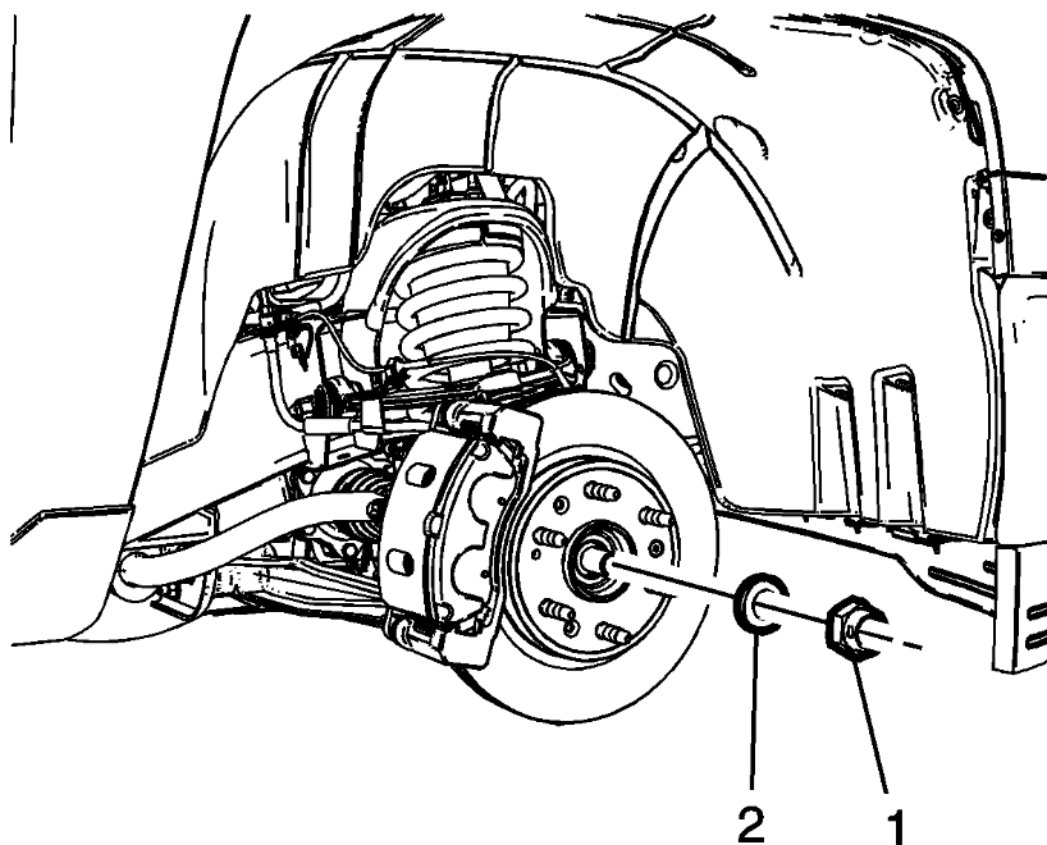


**Fig. 16: Wheel Drive Shaft Nut And Washer**

Courtesy of GENERAL MOTORS COMPANY

**CAUTION:** Use only a genuine GM front wheel drive shaft nut. Installation of anything but an OEM front wheel drive shaft nut could cause damage to the vehicle.

3. Install the washer (2) and the NEW wheel drive shaft nut (1) and hand tighten ONLY.

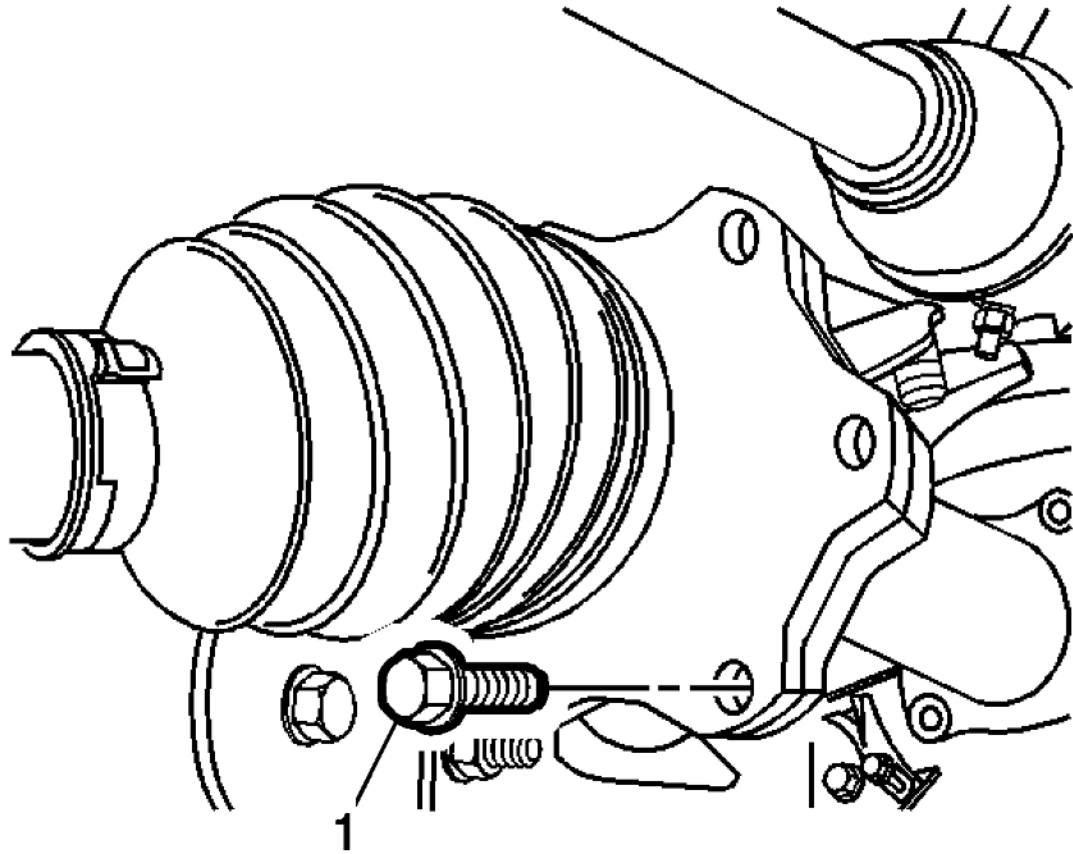


**Fig. 17: View Of Wheel Drive Shaft Inboard Flange Bolt - Front Drive Axle**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Hand tighten the flange bolts **ONLY** at this time.

4. Install the (Qty 6) flange bolts (1) into the flange.
5. Install the steering gear skid shield. Refer to [Steering Gear Skid Shield Replacement](#) .

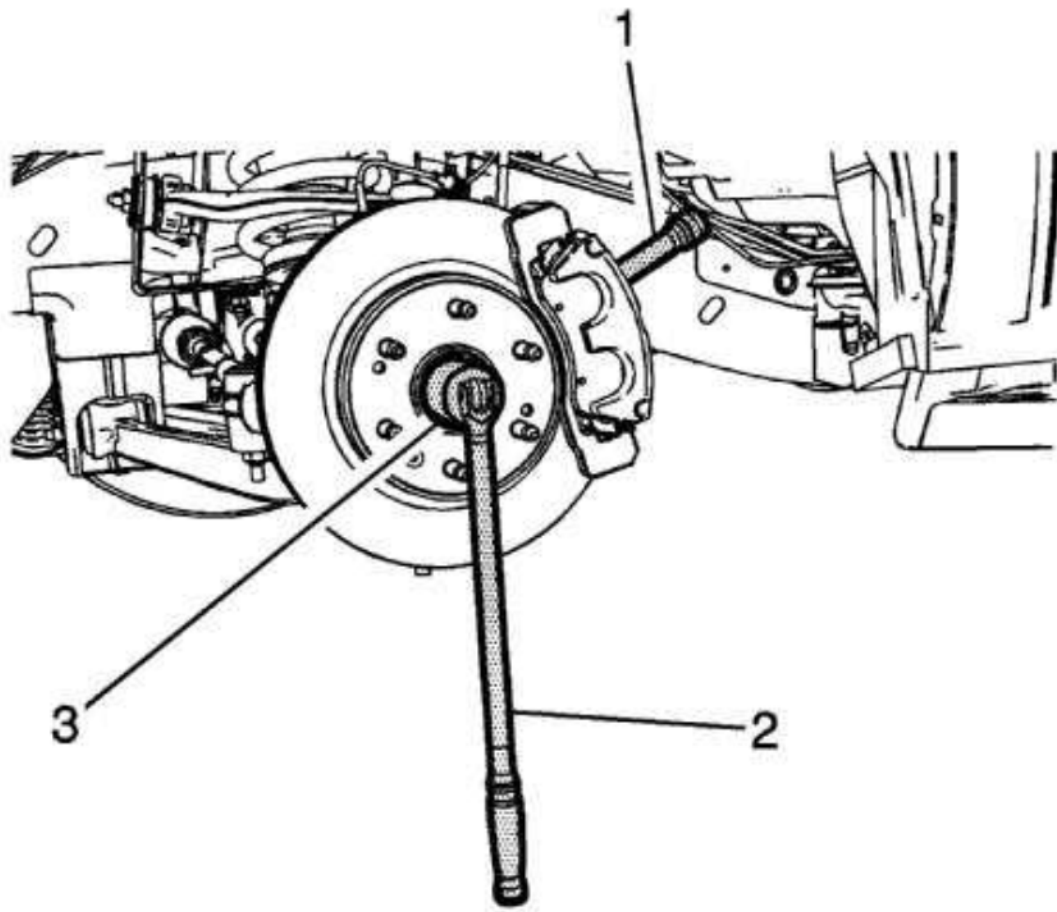


**Fig. 18: Axle Retaining Nut, Breaker Bar And Correct Sized Socket**

Courtesy of GENERAL MOTORS COMPANY

**CAUTION:** Refer to [Fastener Caution](#) .

6. Insert a drift or a large screwdriver (1) into the webbing of the brake rotor to prevent the axle from spinning.

**Tighten:**

- Tighten the inboard flange bolts to 79 N.m (58 lb ft).
- Tighten the wheel drive shaft nut to 255 N.m (188 lb ft).

7. Install the drive axle center cap.
8. Install both of the stabilizer shaft links. Refer to [Stabilizer Shaft Replacement \(Heavy Duty\) Stabilizer Shaft Replacement \(Light Duty\)](#) .
9. Install the lower shock bolts on the side of the vehicle the wheel drive shaft replacement is occurring. Refer to [Shock Absorber and Spring Removal and Installation \(Light Duty, Without Z85/Z95\) Shock Absorber and Spring Removal and Installation \(Light Duty, With Z85/Z95\)](#) .
10. Install the wheel and tire assembly. Refer to [Tire and Wheel Removal and Installation \(6-Lug Wheel\) Tire and Wheel Removal and Installation \(8-Lug Wheel\) Tire and Wheel Removal and Installation](#)

**(Dual Rear Wheels) .**

11. Lower the vehicle.

**FRONT WHEEL DRIVE SHAFT INNER JOINT AND BOOT REPLACEMENT (1500)**

**Special Tools**

- J-35910 Drive Axle Seal Clamp Pliers
- J-36652-98 Drive Axle Clamp Swage Tool

**Disassemble Procedure**

1. Remove the wheel drive shaft. Refer to **Front Wheel Drive Shaft Replacement - Left Side**, or refer to **Front Wheel Drive Shaft Replacement - Right Side**.

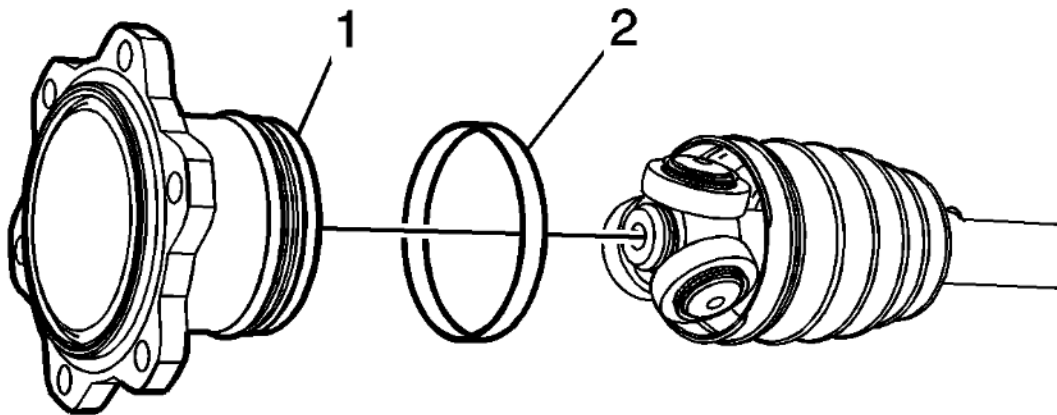


**Fig. 19: View Of Tripot Housing, Boot & Clamp**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Use caution when removing the tripot housing (1).

2. Using the appropriate tool, remove the boot clamp (2).

3. Remove the tripot housing (1).

**NOTE:** If using denatured alcohol or any other recommend cleaning solvent, allow the tripot housing to air dry.

4. Remove any grease from of the housing (1).

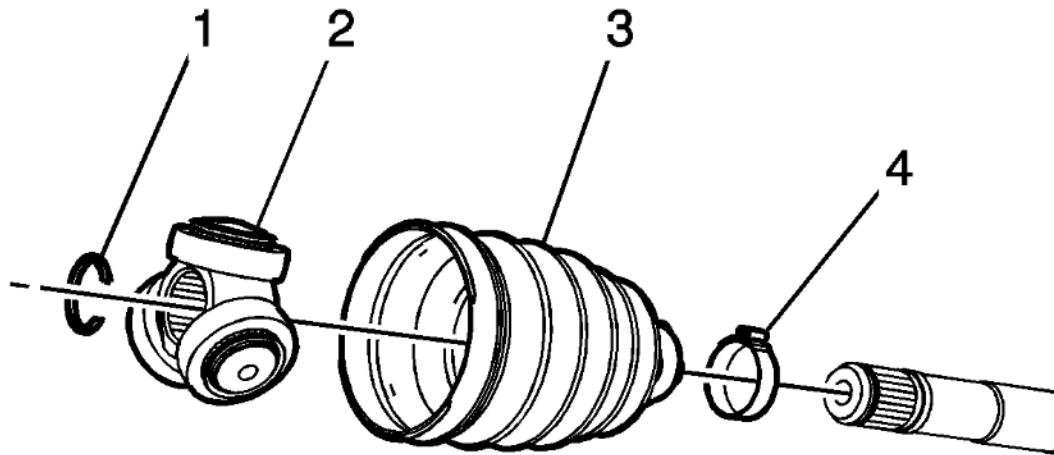


**Fig. 20: View Of Spider Assembly, Boot & Retaining Ring**

Courtesy of GENERAL MOTORS COMPANY

5. Using side cutters, remove the small boot retaining clamp (4).

6. Using the appropriate tool, remove the retaining ring (1), then the spider assembly (2), and the boot (3).

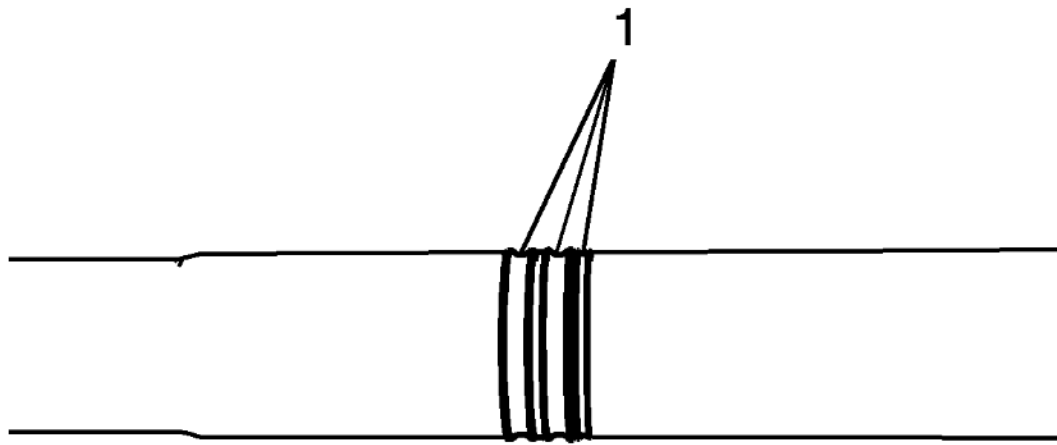


**Fig. 21: Identifying Seal Area Mounting Grooves**

**Courtesy of GENERAL MOTORS COMPANY**

7. Using the appropriate tool, remove the any rust in the seal mounting area (grooves) (1).
8. If any of the internal components of the tripot assembly are found to be damaged or have excessive wear, replace the tripot as an assembly.

#### **Assemble Procedure**

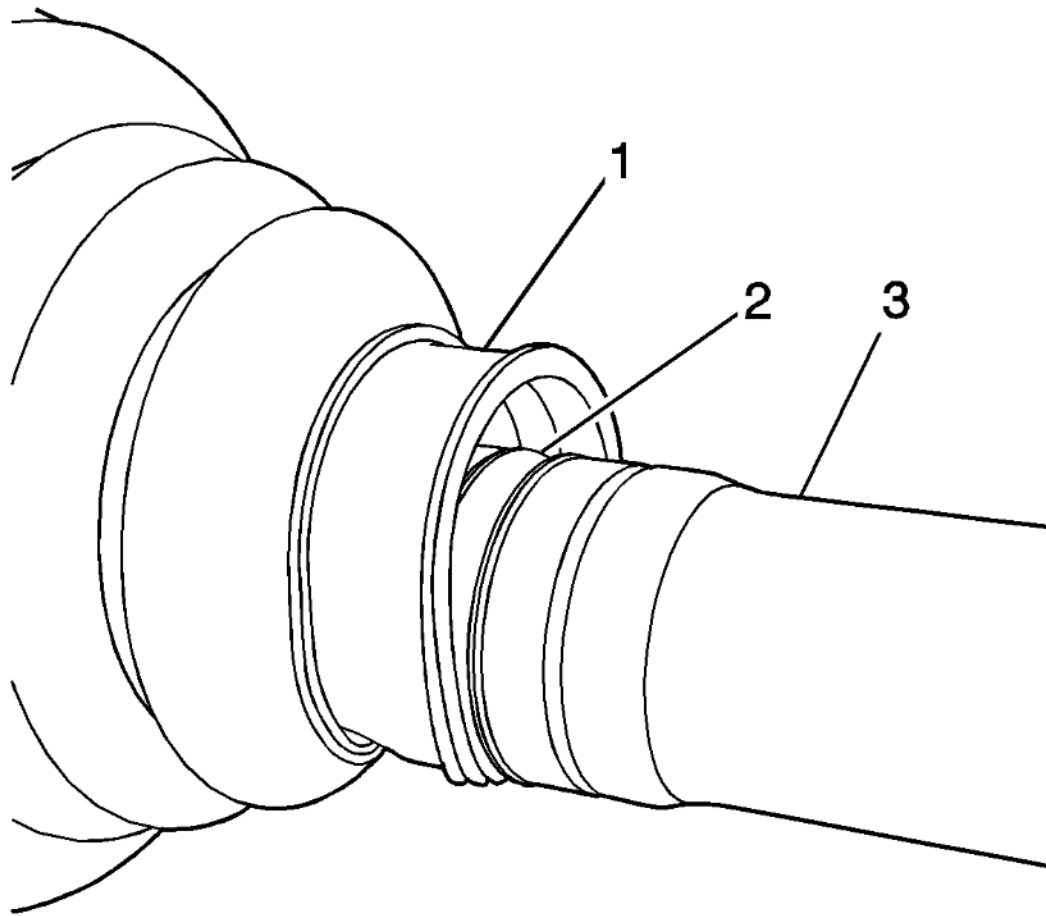


**Fig. 22: Identifying Groove In Wheel Drive Shaft**

Courtesy of GENERAL MOTORS COMPANY

1. Position the boot (1) so that it is seated properly in the groove (2) in the wheel drive shaft (3).

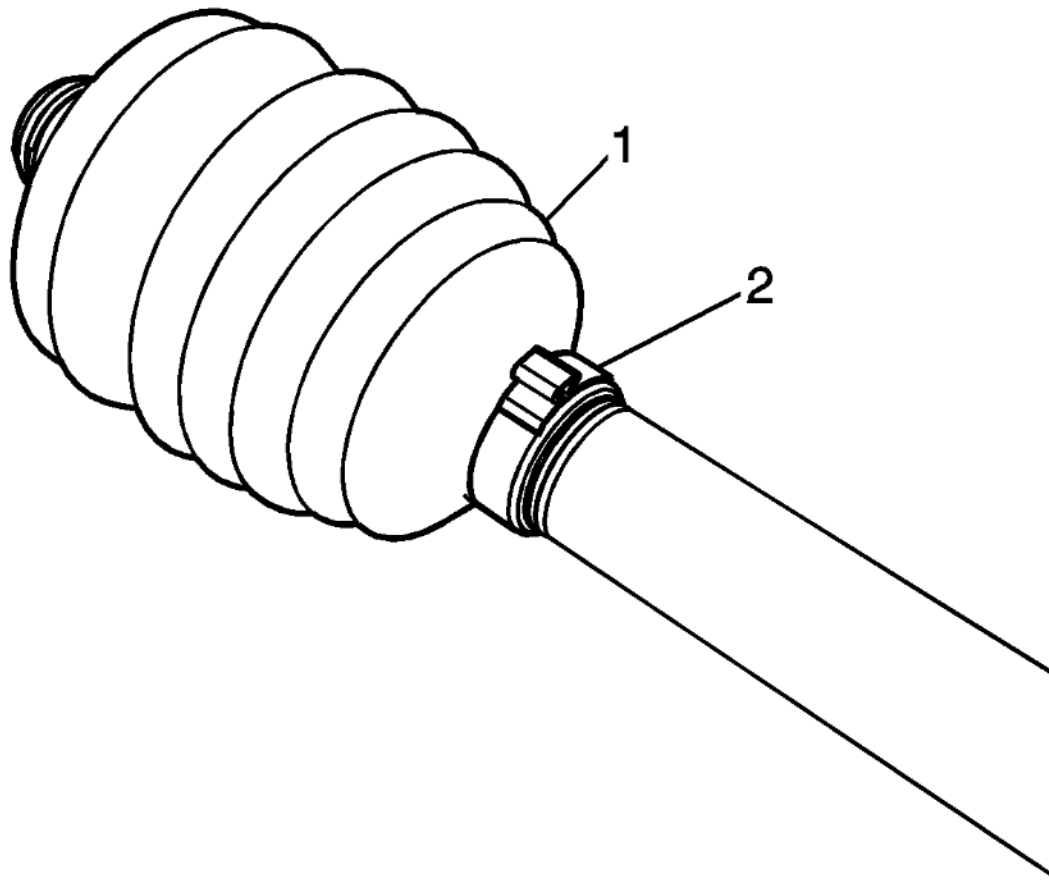


**Fig. 23: Identifying Boot & Small Clamp**

Courtesy of GENERAL MOTORS COMPANY

2. Install the small boot clamp (2) on the boot (1).

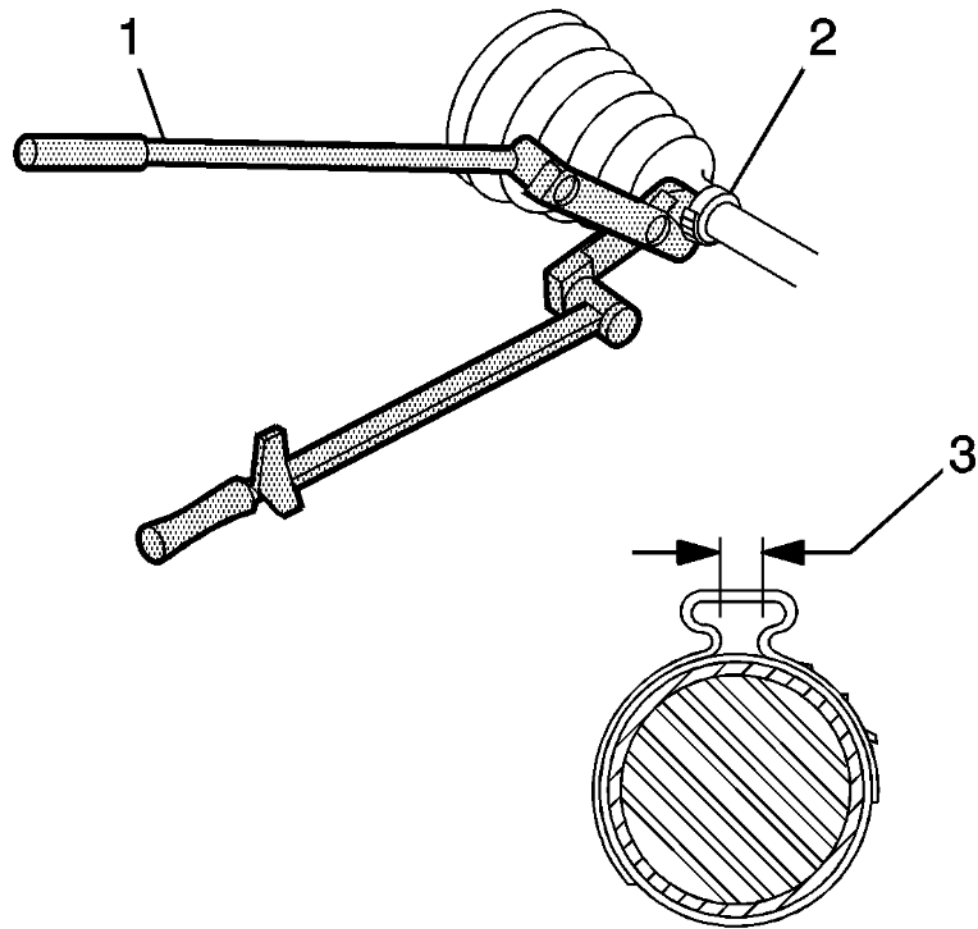


**Fig. 24: Identifying Pliers Breaker Bar, Torque Wrench, Ratchet & Gap Measurement**  
Courtesy of GENERAL MOTORS COMPANY

3. Using the **J-35910** pliers , a breaker bar, and a torque wrench (1), close the boot clamp (2) until the gap (3) measures 2.15 mm (0.085 inch).

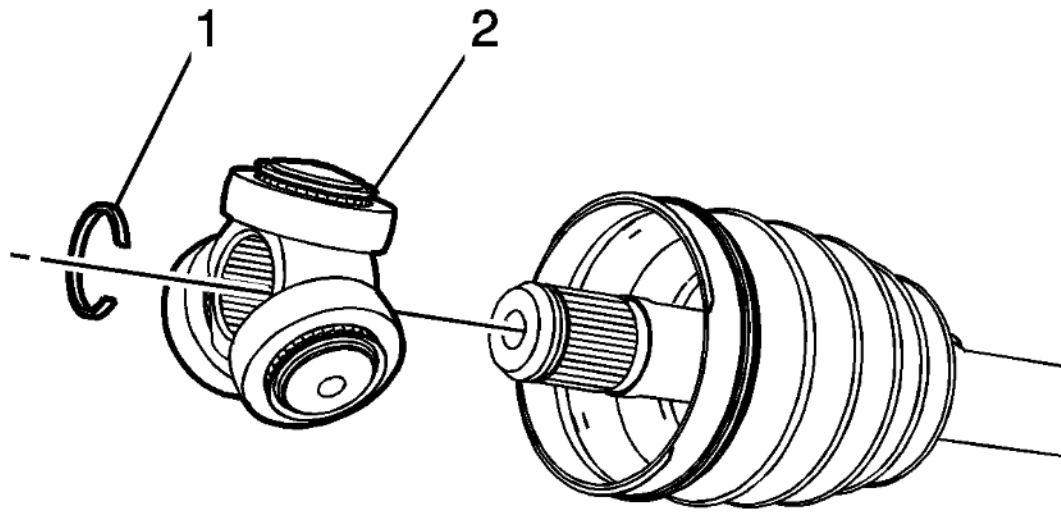


**Fig. 25: View Of Spider Assembly & Retaining Ring**  
Courtesy of GENERAL MOTORS COMPANY

4. Install the spider assembly (2).
5. Using the appropriate tool, install the retaining ring (1).

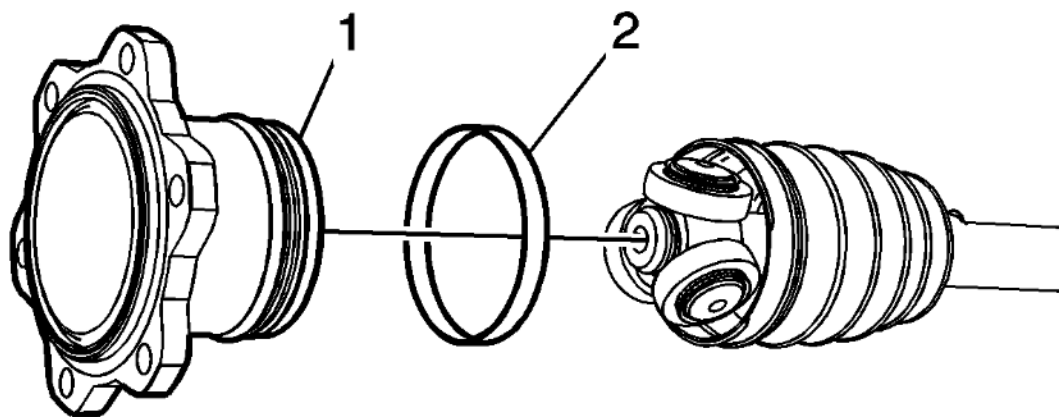


**Fig. 26: View Of Tripot Housing, Boot & Clamp**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Position the boot clamp so that it is at the small end of the boot.

6. Install the tripot assembly (1) and the boot clamp (2)

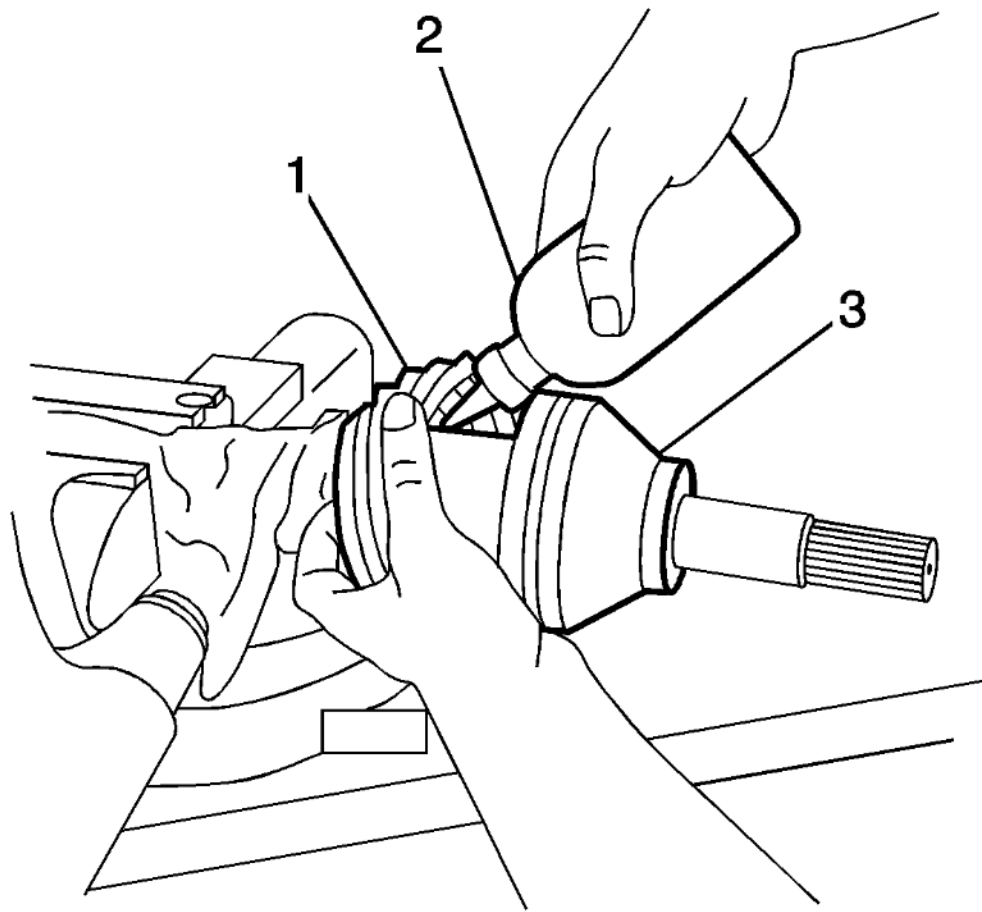


**Fig. 27: Adding Lubricant Into Axle Boot**

**Courtesy of GENERAL MOTORS COMPANY**

7. Place approximately half of the lubricant (2) in the boot (1) and the remaining half in the tripot housing (3).

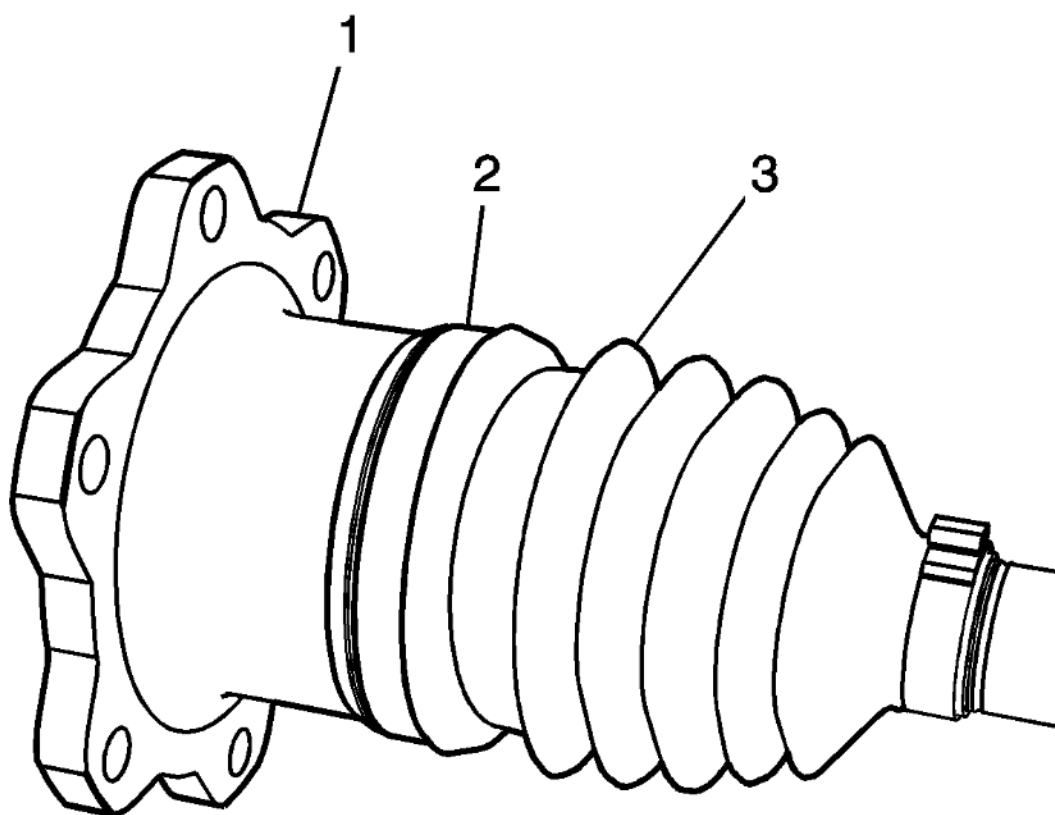


**Fig. 28: View Of Tripot Housing, Boot & Clamp**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Pinch the slightly by hand in order to distort it into an oval shape.

8. Install the boot (1) and the boot clamp (2) on the tripot housing (3).

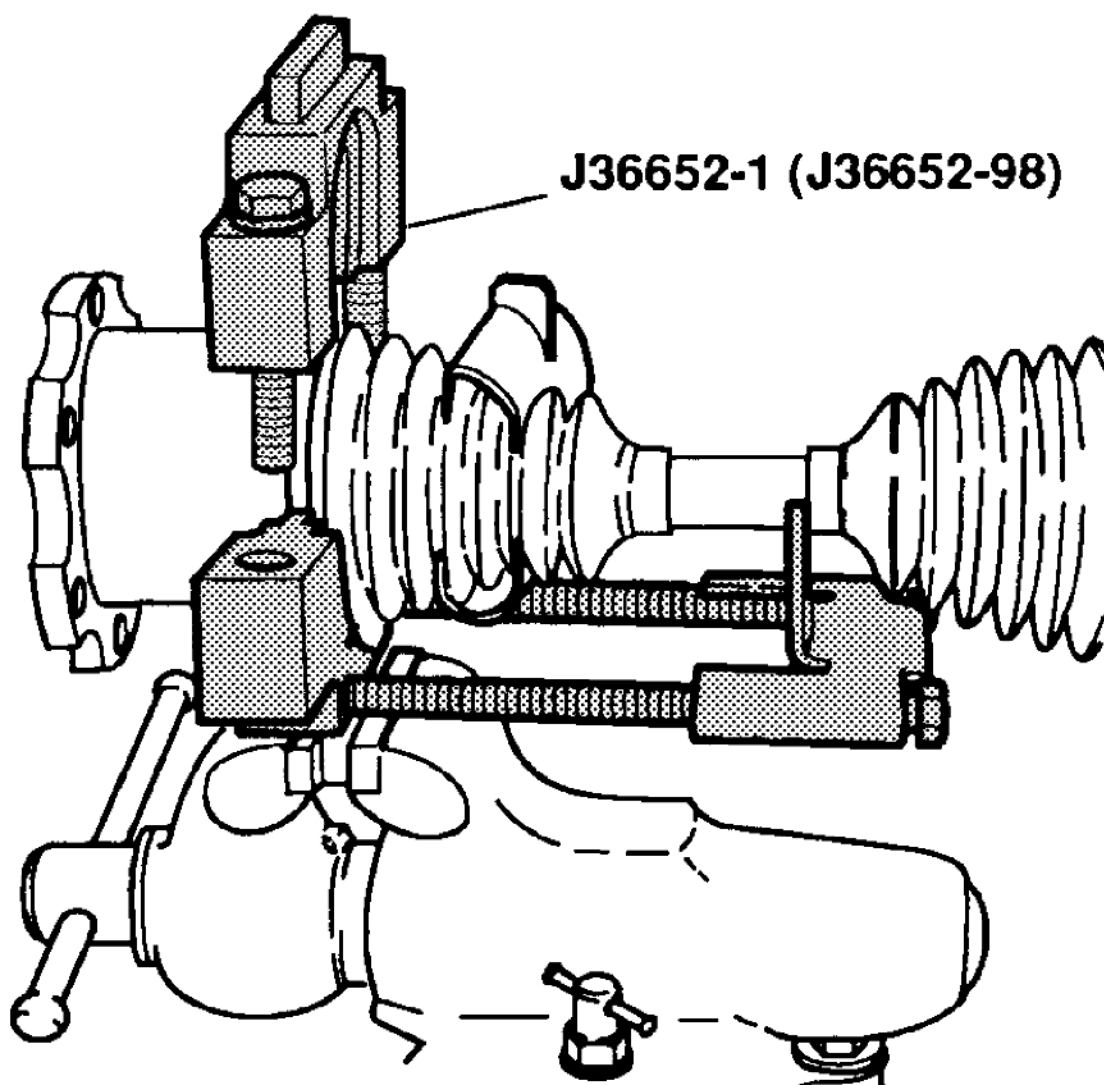


**Fig. 29: Assembling Bolts & Support Plate To Base Of Special Tool**  
Courtesy of GENERAL MOTORS COMPANY

9. Assemble the bolts and the support plate to the base of the **J-36652-98** tool and secure the base in a vise.

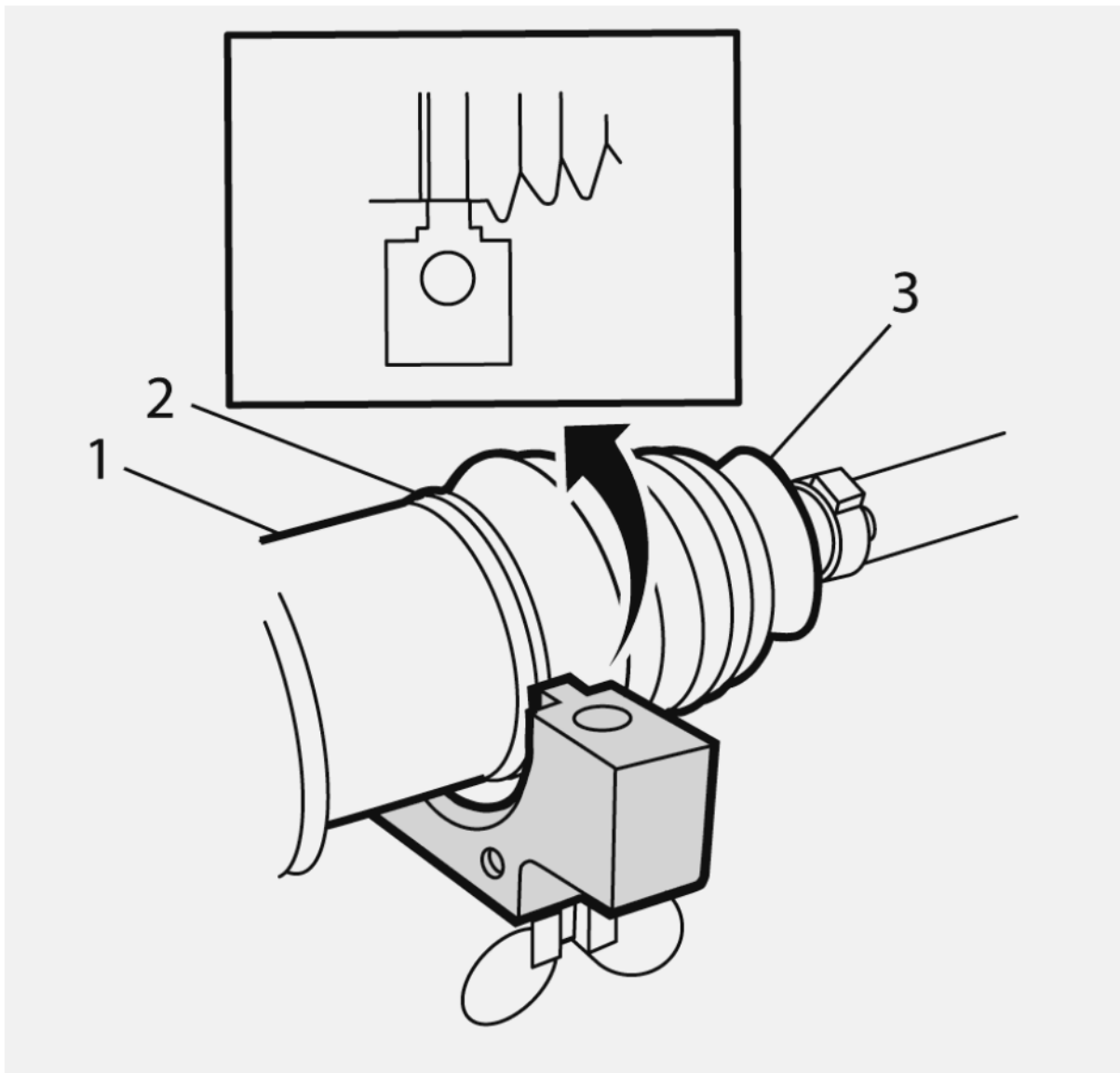


**Fig. 30: Swage Ring**

Courtesy of GENERAL MOTORS COMPANY

10. Position the tripot end of the wheel drive shaft assembly into the base of the **J-36652-98** tool.
11. Install the top half of the **J-36652-98** tool.
12. Align the boot clamp (2) and the clamp.

**NOTE:** Hand tighten the bolts until the bolts are snug.

13. Insert the bolts.
14. Align the tripot boot, tripot housing, and the boot clamp.

**NOTE:** Alternate between the bolts until both sides of the top half of the tool touch the bottom half .

15. Tighten each bolt 180 degrees at a time.
16. Loosen the bolts and remove the halfshaft assembly from the tool.

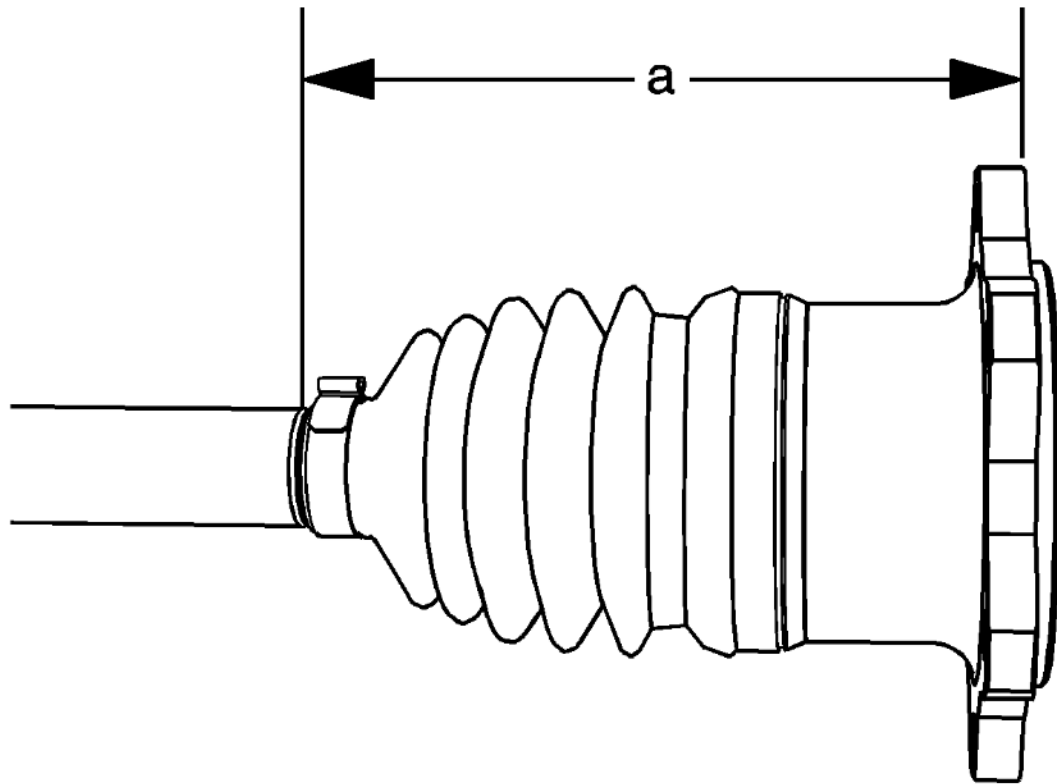


**Fig. 31: Measuring Axle, Boot & Tripot Housing Length**

Courtesy of GENERAL MOTORS COMPANY

17. Inspect the inboard stroke position. Measurement (a) should be 178 mm (7.01 in).
18. Install the wheel drive shaft. Refer to [Front Wheel Drive Shaft Replacement - Left Side](#), or refer to [Front Wheel Drive Shaft Replacement - Right Side](#).

### **FRONT WHEEL DRIVE SHAFT INNER JOINT AND BOOT REPLACEMENT (2500/3500)**

#### **Special Tools**

- **J-35910** Drive Axle Seal Clamp Pliers
- **J-36652-1** Drive Axle Clamp Swage Tool

#### **Disassemble Procedure**

1. Remove the wheel drive shaft. [Front Wheel Drive Shaft Replacement - Left Side](#), or [Front Wheel Drive Shaft Replacement - Right Side](#)

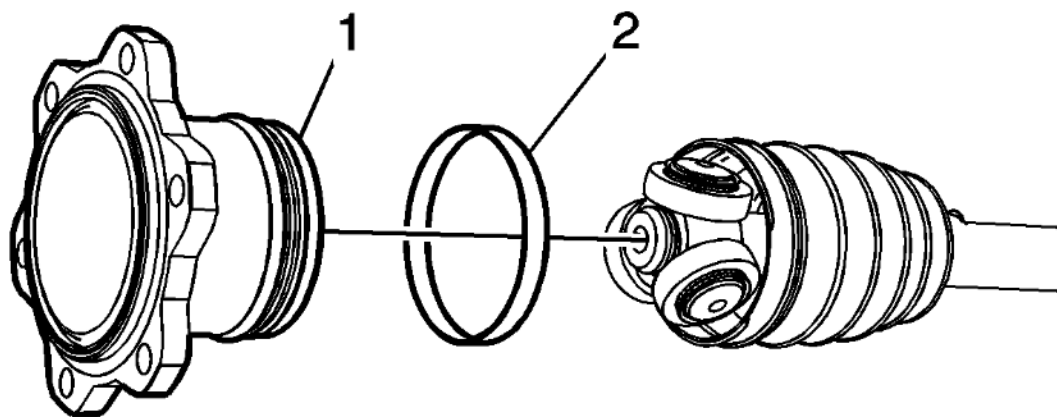


**Fig. 32: View Of Tripot Housing, Boot & Clamp**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Use caution when removing the tripot housing (1).

2. Using the appropriate tool, remove the boot clamp (2).
3. Remove the tripot housing (1).

**NOTE:** If using denatured alcohol or any other recommend cleaning solvent, allow the tripot housing to air dry.

4. Remove any grease from of the housing (1).

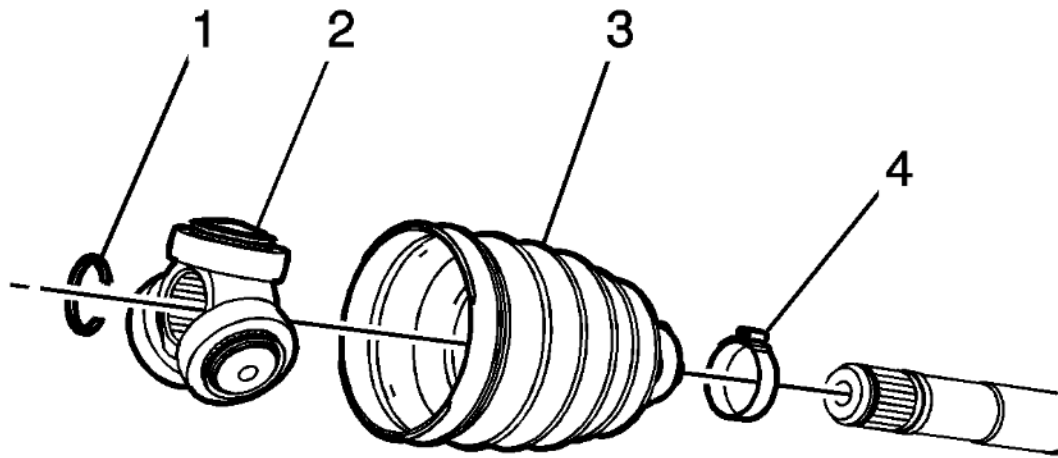


**Fig. 33: View Of Spider Assembly, Boot & Retaining Ring**  
Courtesy of GENERAL MOTORS COMPANY

5. Using side cutters, remove the small boot retaining clamp (4).
6. Using the appropriate tool, remove the retaining ring (1), then the spider assembly (2), and the boot (3).

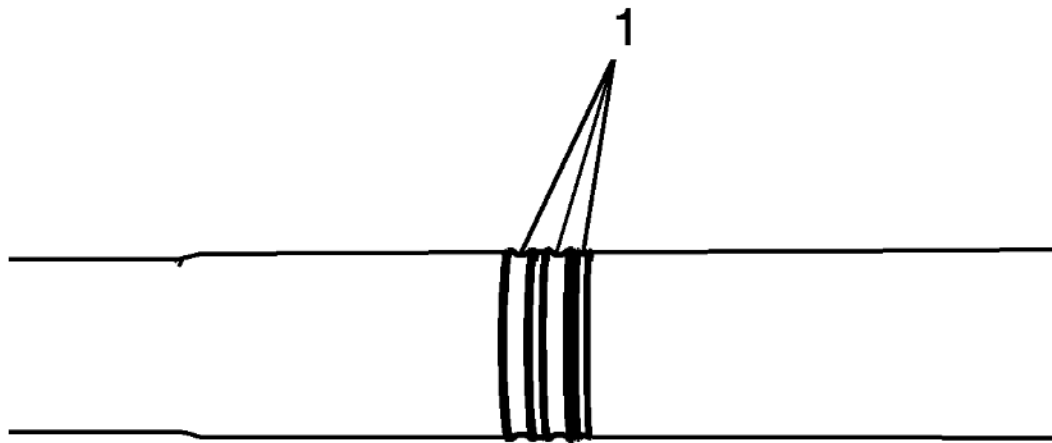


**Fig. 34: Identifying Seal Area Mounting Grooves**

**Courtesy of GENERAL MOTORS COMPANY**

7. Using the appropriate tool, remove the any rust in the seal mounting area (grooves) (1).
8. If any of the internal components of the tripot assembly are found to be damaged or have excessive wear, replace the tripot as an assembly.

#### **Assemble Procedure**

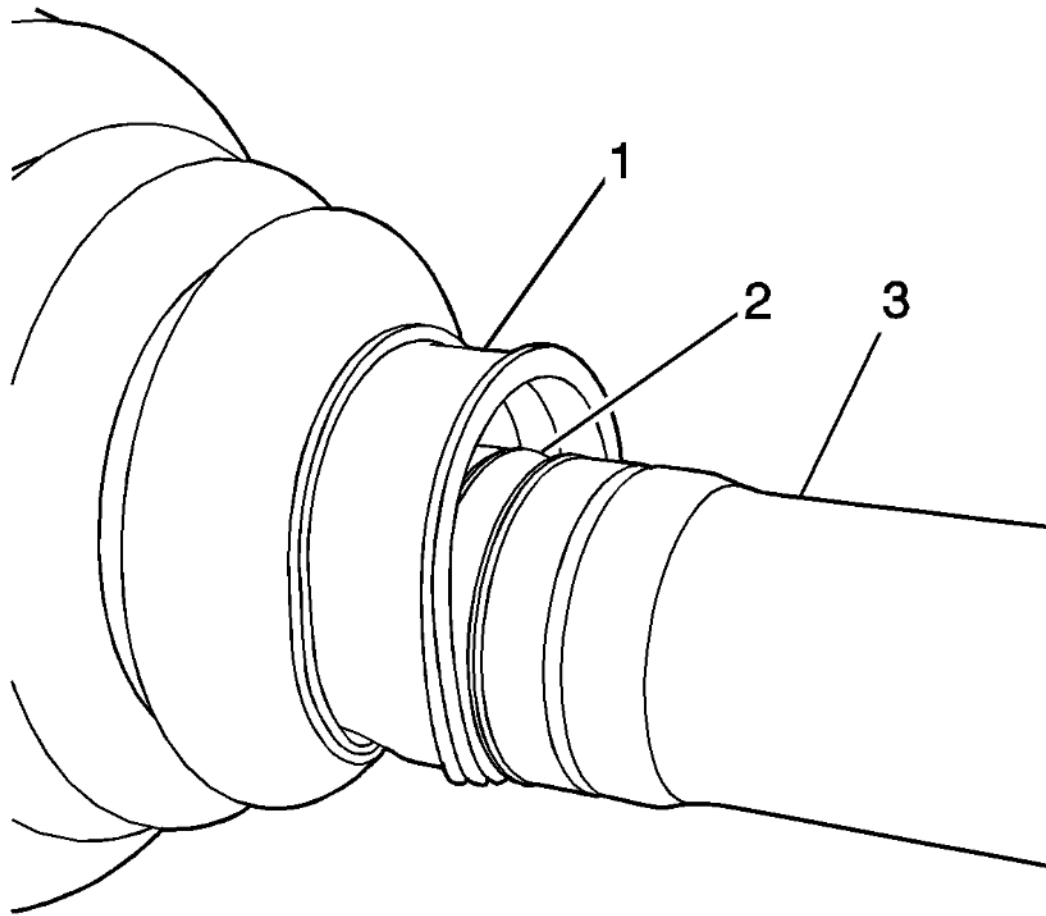


**Fig. 35: Identifying Groove In Wheel Drive Shaft**

Courtesy of GENERAL MOTORS COMPANY

1. Position the boot (1) so that it is seated properly in the groove (2) in the wheel drive shaft (3).

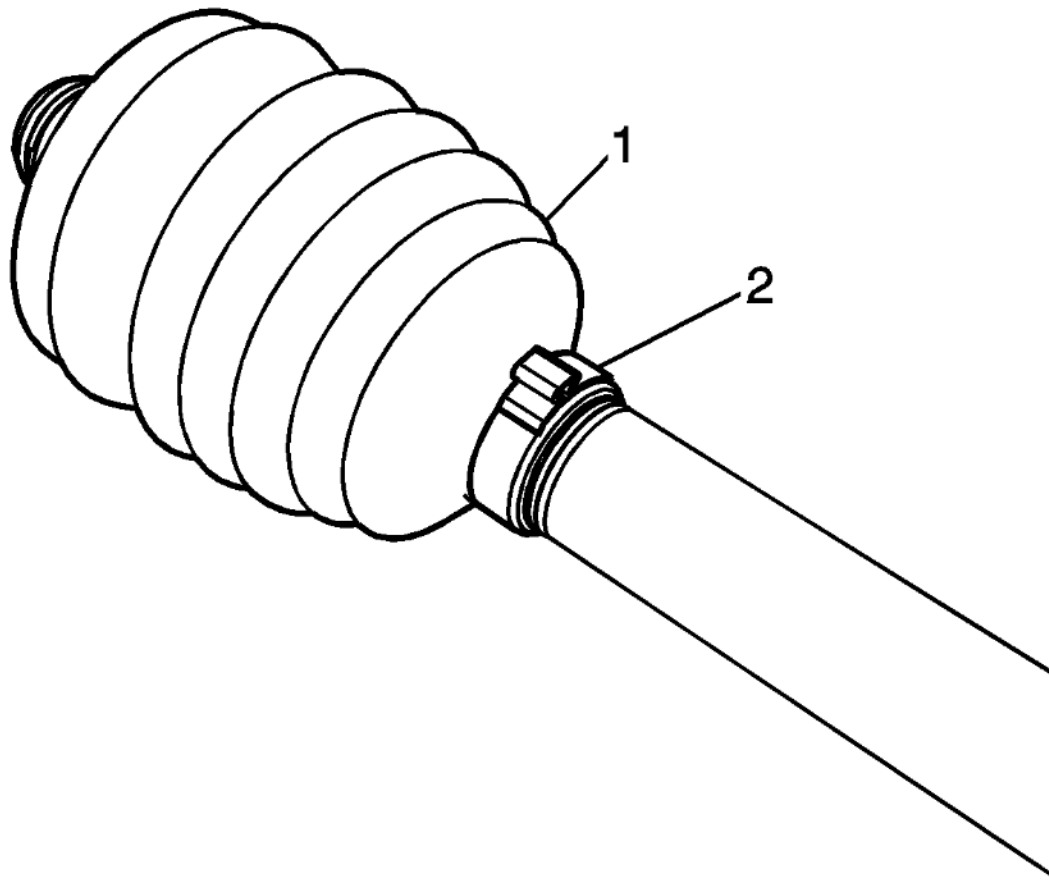


**Fig. 36: Identifying Boot & Small Clamp**

Courtesy of GENERAL MOTORS COMPANY

2. Install the small boot clamp (2) on the boot (1).

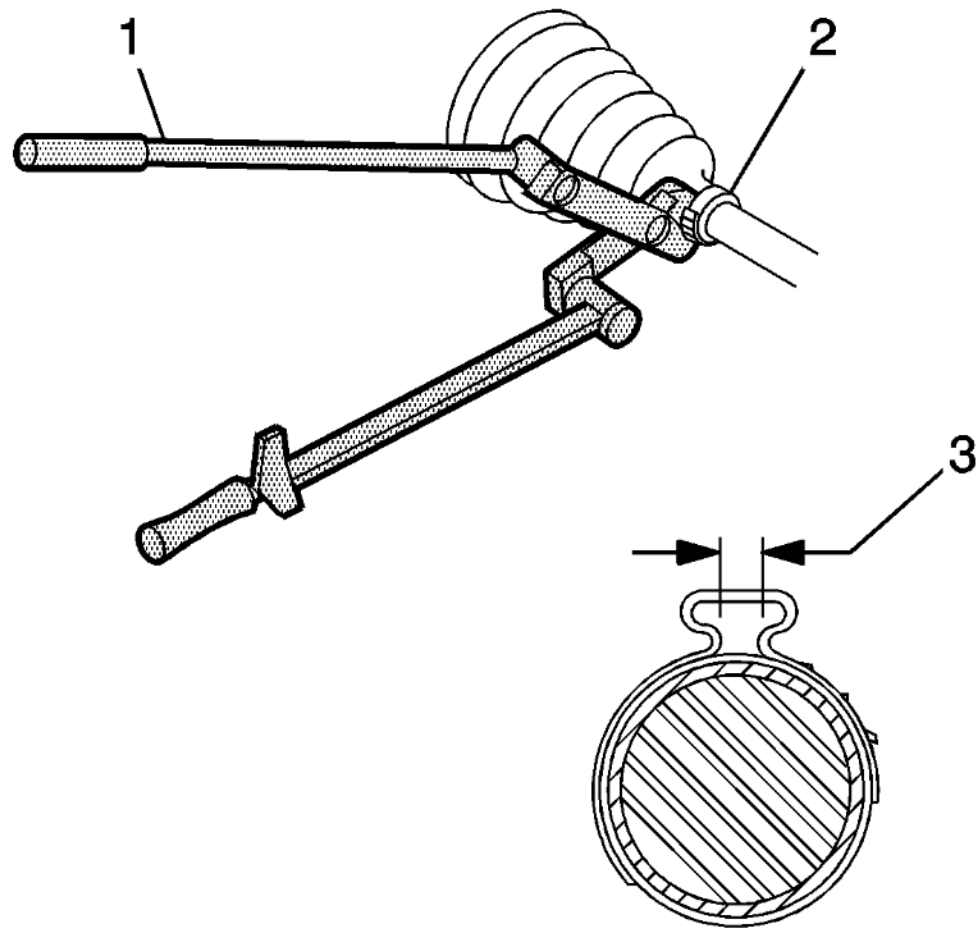


**Fig. 37: Identifying Pliers Breaker Bar, Torque Wrench, Ratchet & Gap Measurement**  
Courtesy of GENERAL MOTORS COMPANY

3. Using the **J-35910** pliers , a breaker bar, and a torque wrench (1), close the boot clamp (2) until the gap (3) measures 2.15 mm (0.085 inch).

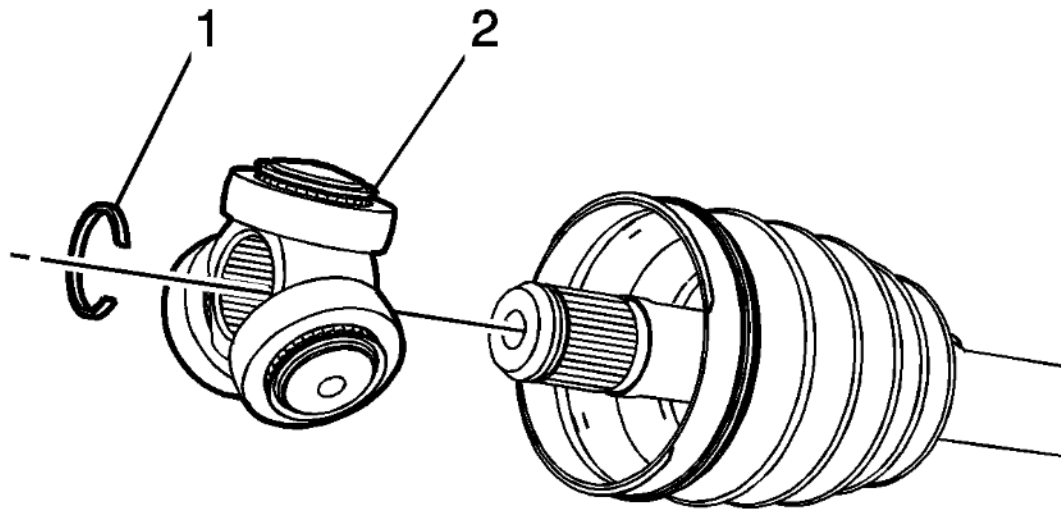


**Fig. 38: View Of Spider Assembly & Retaining Ring**  
Courtesy of GENERAL MOTORS COMPANY

4. Install the spider assembly (2).
5. Using the appropriate tool, install the retaining ring (1).

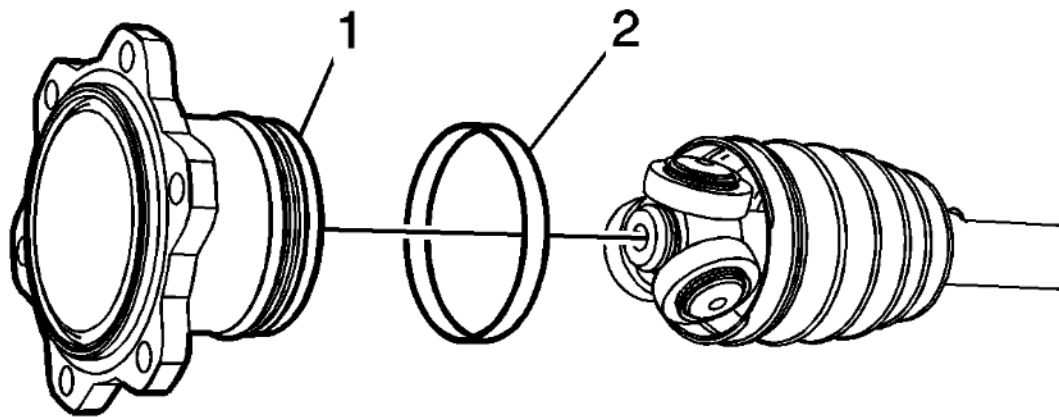


**Fig. 39: View Of Tripot Housing, Boot & Clamp**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Position the boot clamp so that it is at the small end of the boot.

6. Install the tripot assembly (1) and the boot clamp (2)

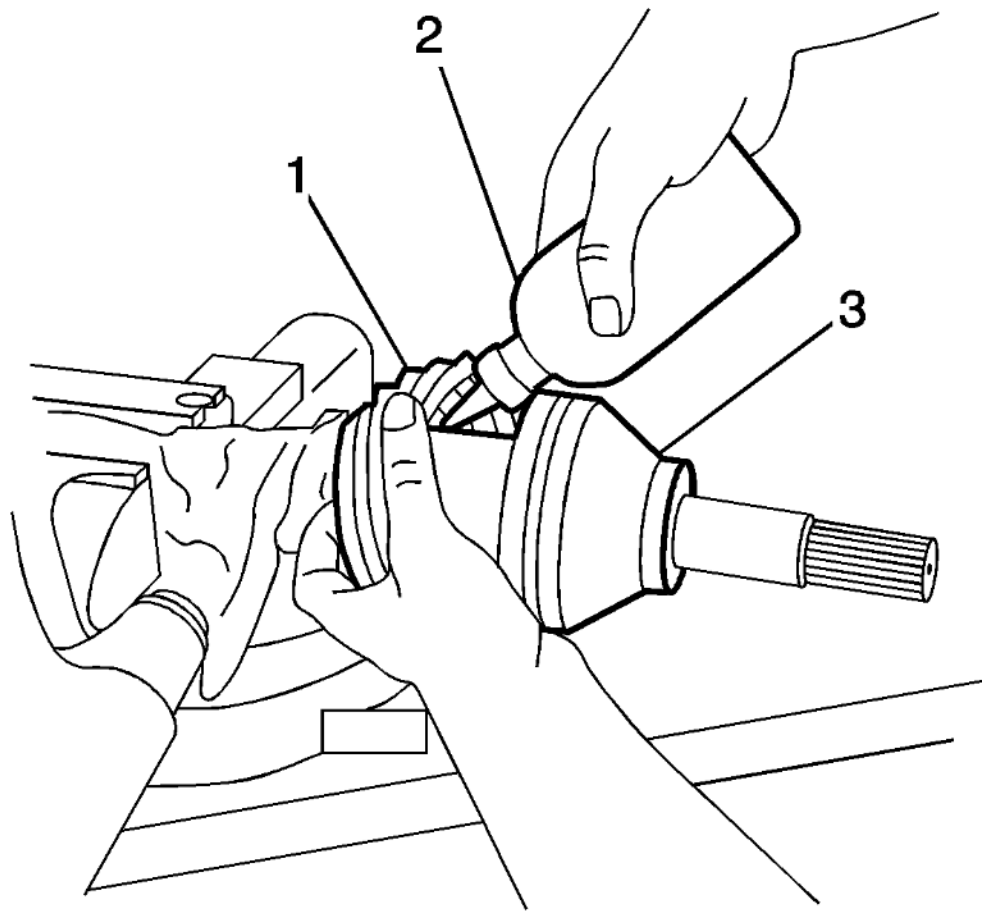


**Fig. 40: Adding Lubricant Into Axle Boot**

Courtesy of GENERAL MOTORS COMPANY

7. Place approximately half of the lubricant (2) in the boot (1) and the remaining half in the tripot housing (3).

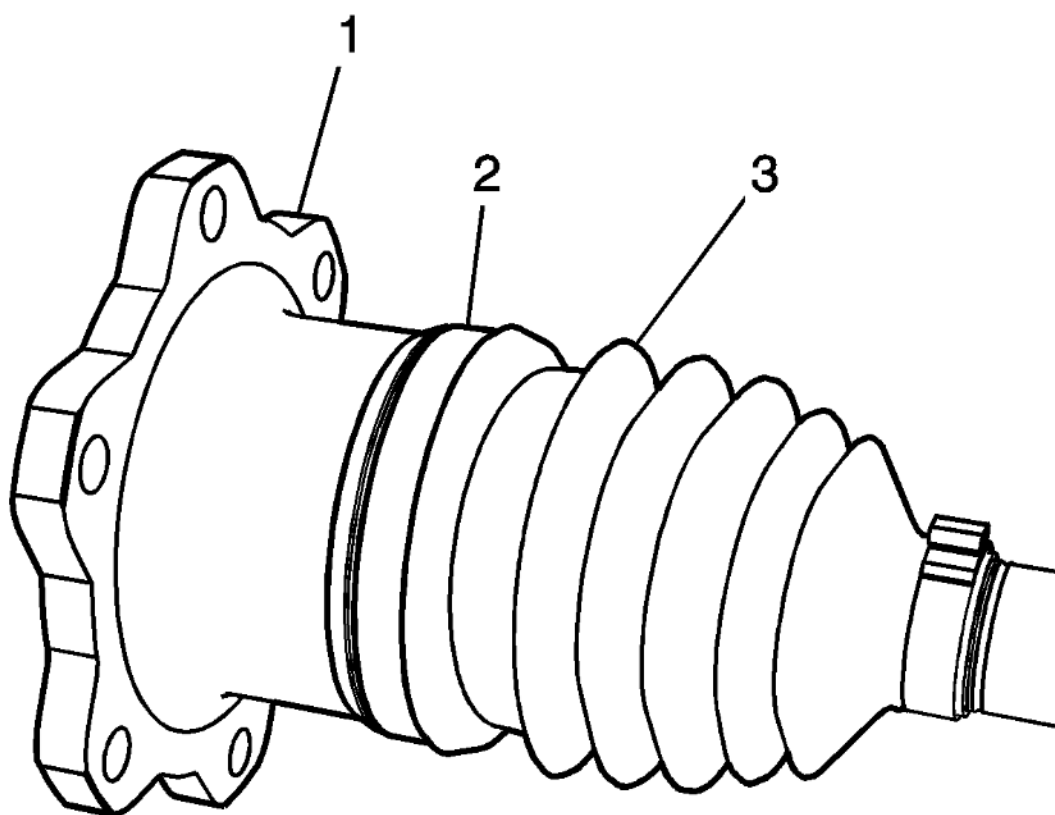


**Fig. 41: View Of Tripot Housing, Boot & Clamp**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Pinch the boot slightly by hand in order to distort it into an oval shape.

8. Install the boot (3) and the boot clamp (2) on the tripot housing (1).

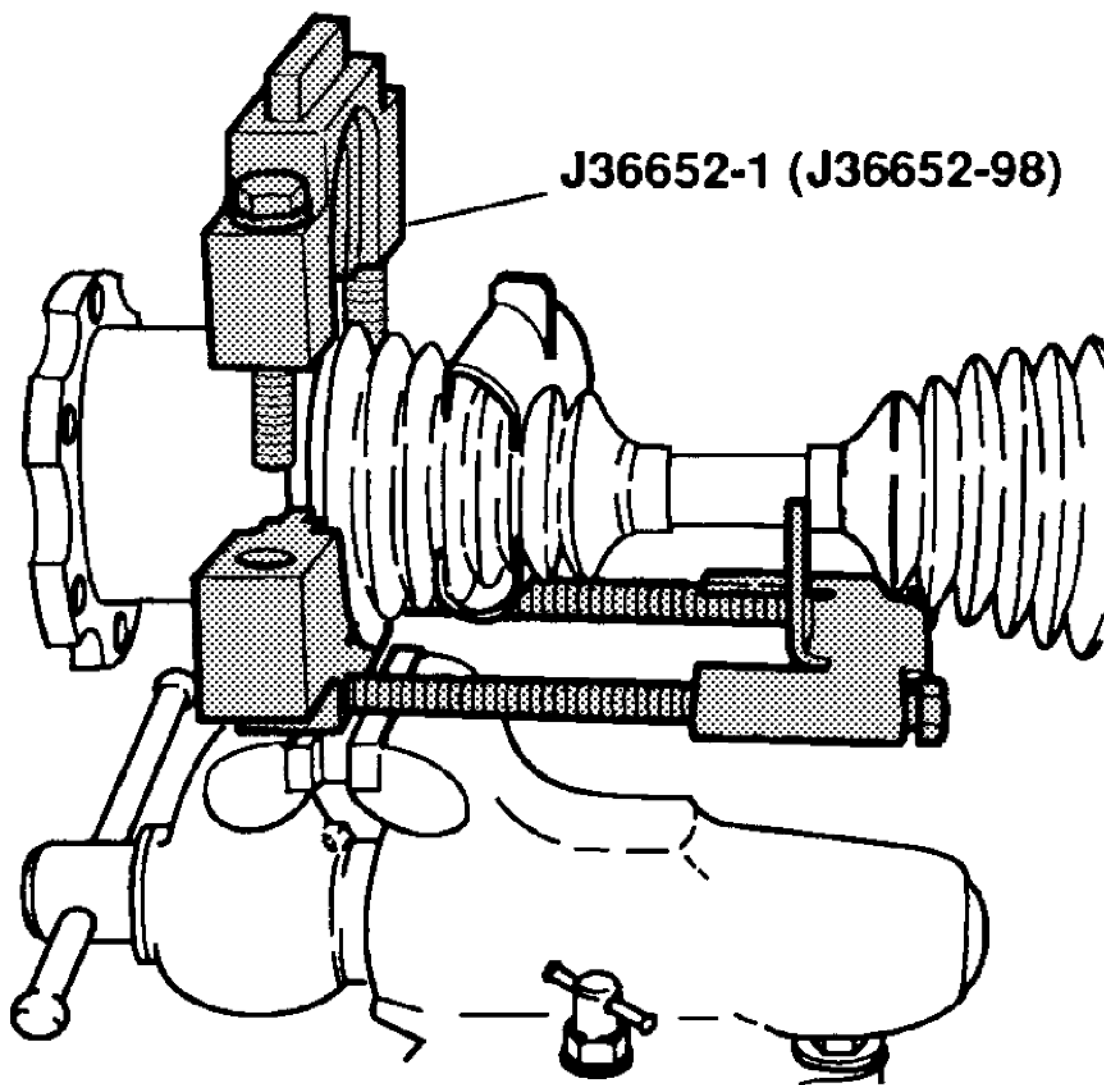


**Fig. 42: Assembling Bolts & Support Plate To Base Of Special Tool**

Courtesy of GENERAL MOTORS COMPANY

9. Assemble the bolts and the support plate to the base of the **J-36652-1** tool and secure the base in a vise.

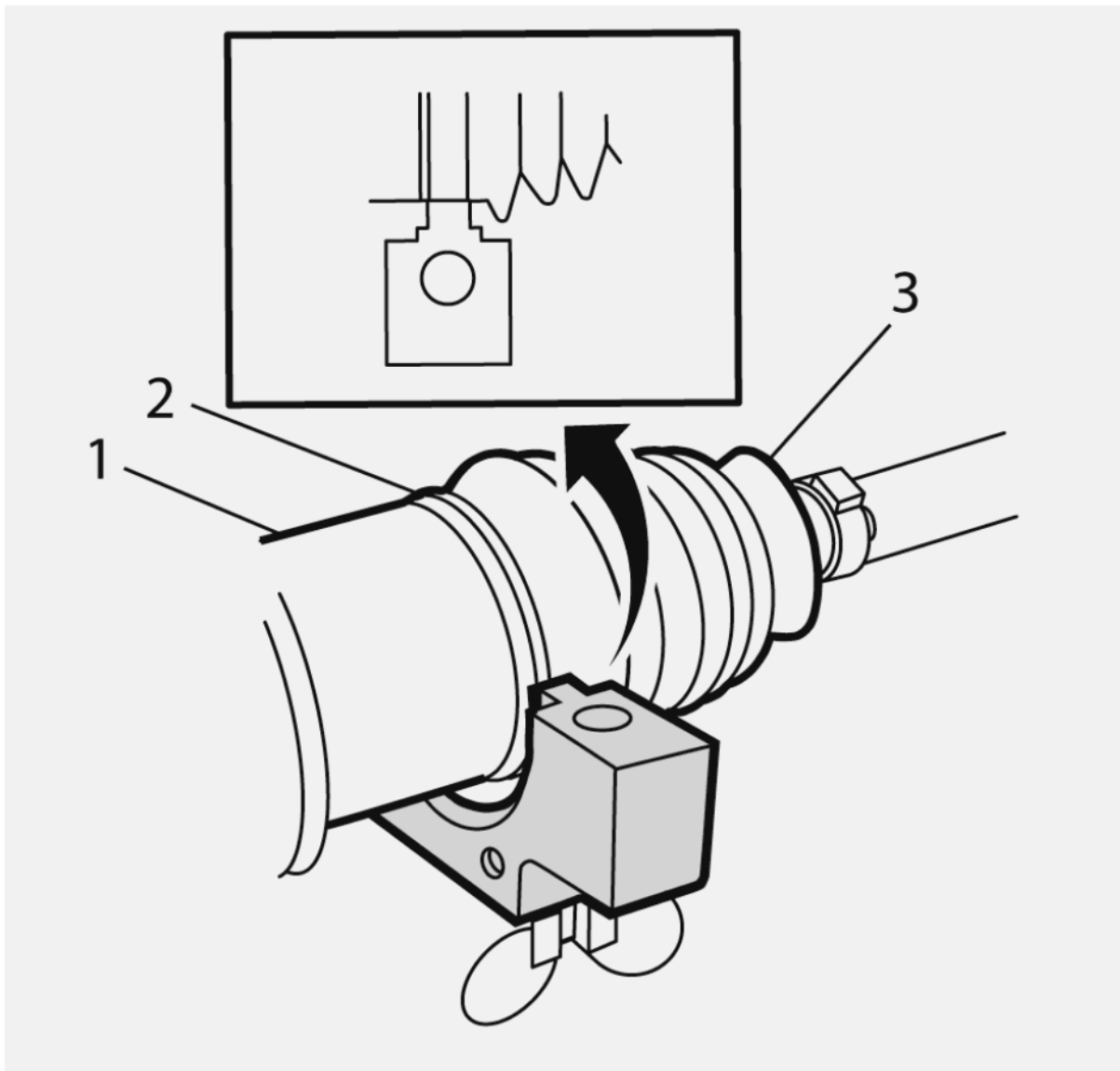


**Fig. 43: Swage Ring**

Courtesy of GENERAL MOTORS COMPANY

10. Position the tripot end of the wheel drive shaft assembly into the base of the **J-36652-1** tool.
11. Install the top half of the **J-36652-1** Tool.
12. Align the boot clamp (2) and the clamp.

**NOTE:** Hand tighten the bolts until the bolts are snug.

13. Insert the bolts.
14. Align the tripot boot, tripot housing, and the boot clamp.

**NOTE:** Alternate between the bolts until both sides of the top half of the tool touch the bottom half .

15. Tighten each bolt 180 degrees at a time.
16. Loosen the bolts and remove the halfshaft assembly from the tool.

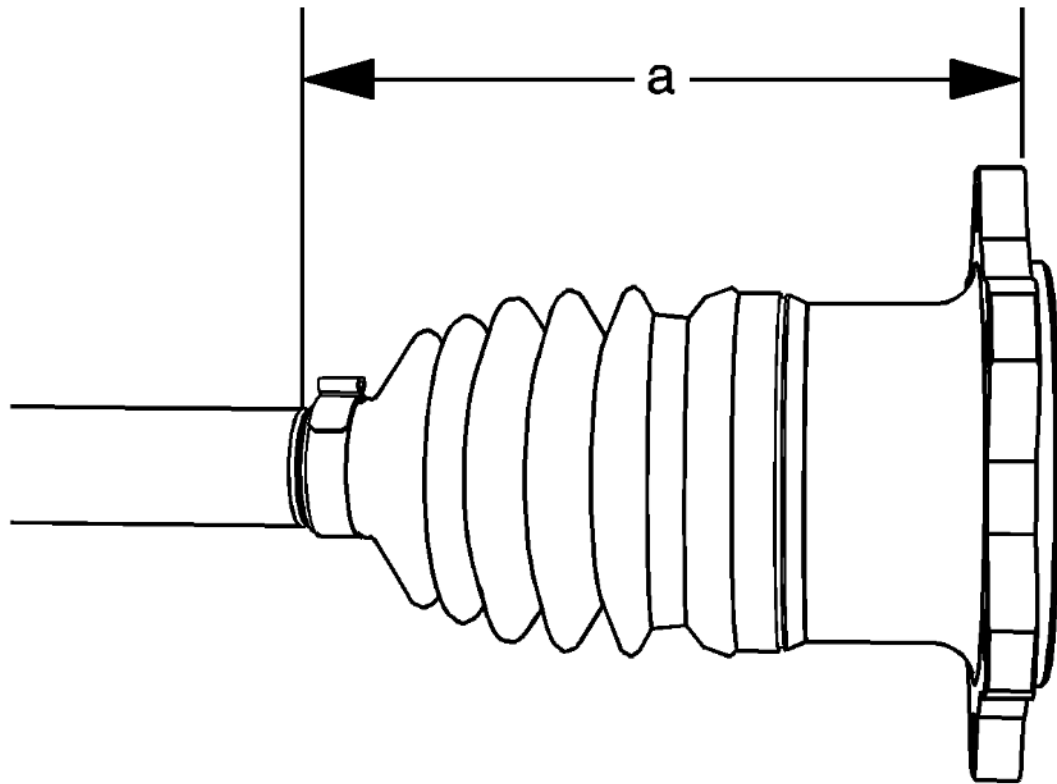


**Fig. 44: Measuring Axle, Boot & Tripot Housing Length**

Courtesy of GENERAL MOTORS COMPANY

17. Inspect the inboard stroke position. Measurement (a) should be 170 mm (6.69 in).
18. Install the wheel drive shaft. [Front Wheel Drive Shaft Replacement - Left Side](#), or [Front Wheel Drive Shaft Replacement - Right Side](#)

## **FRONT WHEEL DRIVE SHAFT OUTER JOINT AND BOOT REPLACEMENT**

### **Special Tools**

- **J-8059** Snap Ring Pliers
- **J-35910** Drive Axle Seal Clamp Pliers
- **J-36652-1** Drive Axle Clamp Swage Tool
- **J-36652-2** Axle Swage Tool

### **Removal Procedure**

1. Remove the wheel drive shaft. Refer to [Front Wheel Drive Shaft Replacement - Left Side](#), refer to [Front Wheel Drive Shaft Replacement - Right Side](#).

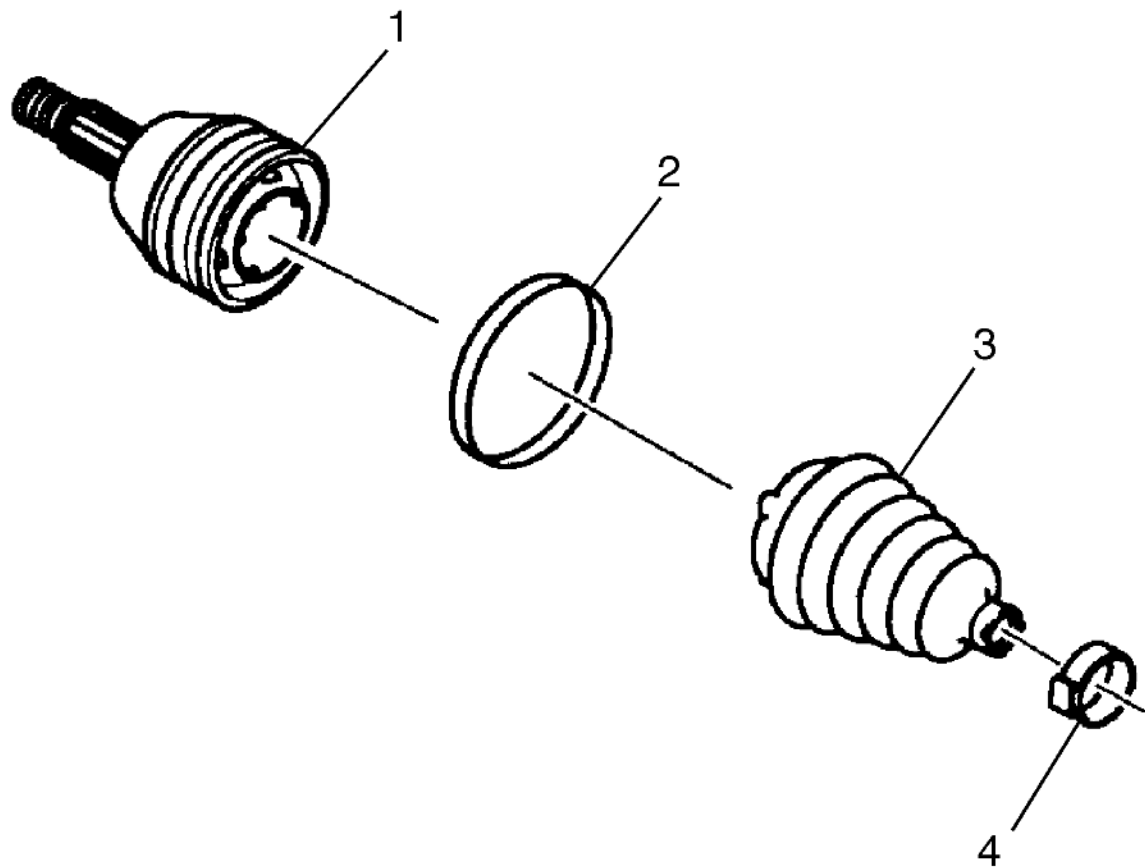


**Fig. 45: CV Joint Outer Race, Swage Ring, Boot & Small Boot Clamp**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Use caution when using the hand grinder by the CV joint outer race (1).

2. Use a hand grinder to cut through the swage ring (2).
3. Use side cutters to cut off the small boot clamp (4).

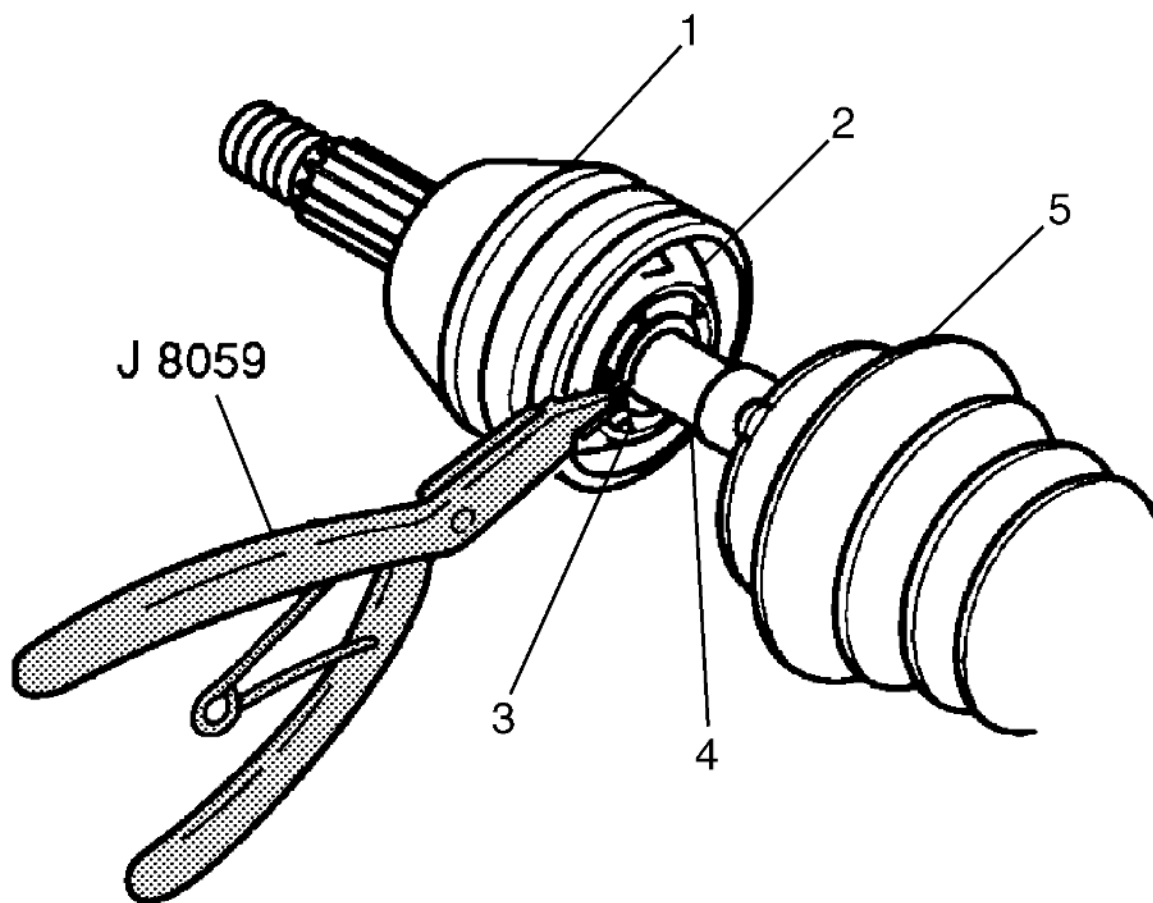


**Fig. 46: Spreading Snap Ring Ears Apart**

Courtesy of GENERAL MOTORS COMPANY

4. Slide the boot (5) down the halfshaft bar (4) and away from the CV joint outer race (1).
5. Wipe all grease away from the face of the CV joint.
6. Find the halfshaft bar retaining snap ring (3), which is located in the inner race (2).
7. Spread the snap ring ears apart using **J-8059** snap ring pliers (or equivalent).
8. Pull the CV joint (1) and the CV joint boot (5) from the halfshaft bar (4).
9. Discard the old CV joint boot (5).

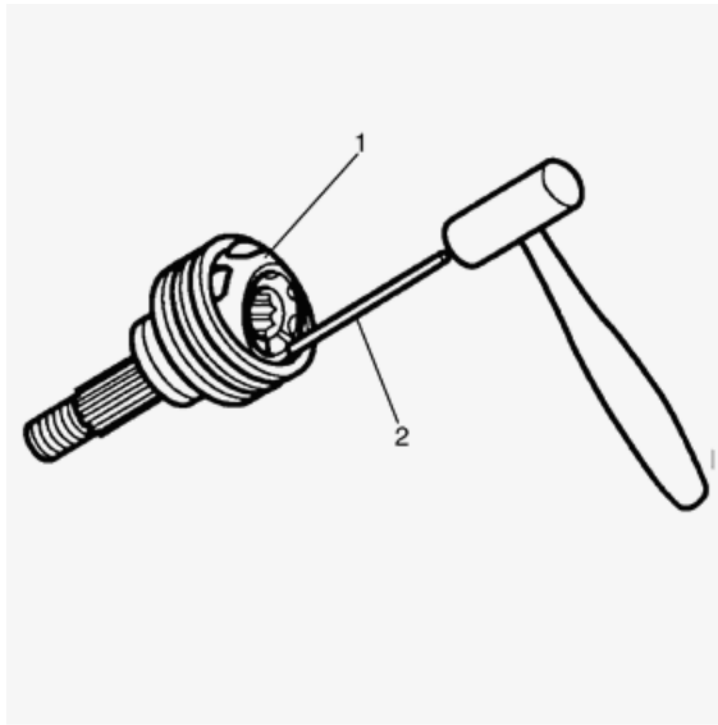


**Fig. 47: Tapping Gently On Brass Drift With A Hammer In Order To Tilt Cage**  
**Courtesy of GENERAL MOTORS COMPANY**

10. Place a brass drift against the CV joint cage (1).
11. Tap gently on the brass drift with a hammer in order to tilt the cage (1).
12. Remove the first chrome alloy ball (2) when the CV joint cage (1) tilts.
13. Tilt the CV joint cage (1) in the opposite direction to remove the opposing chrome alloy ball (2).
14. Repeat this process to remove all six of the balls.

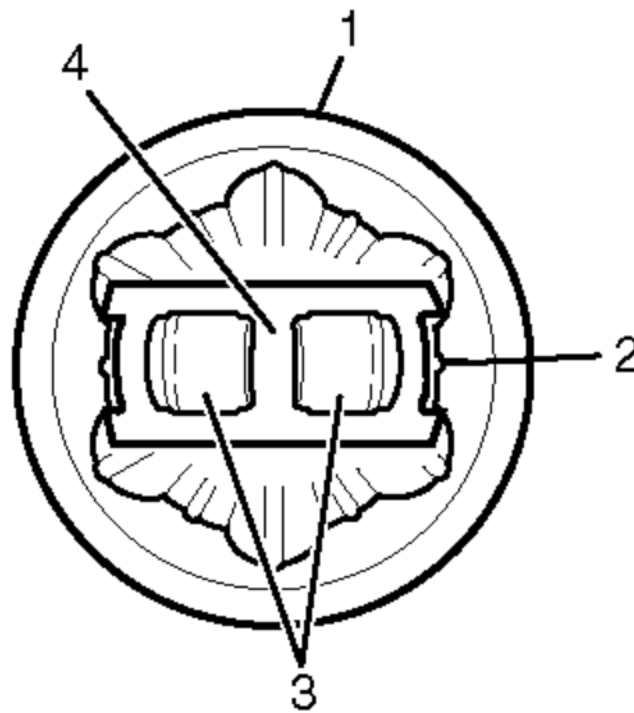


**Fig. 48: View Of Outer Race, Inner Race, Cage Window & CV Joint Cage**  
**Courtesy of GENERAL MOTORS COMPANY**

15. Pivot the CV joint cage (4) and the inner race 90 degrees to the center line of the outer race (1). At the same time, align the cage windows (3) with the lands of the outer race (2).
16. Lift out the cage (4) and the inner race.

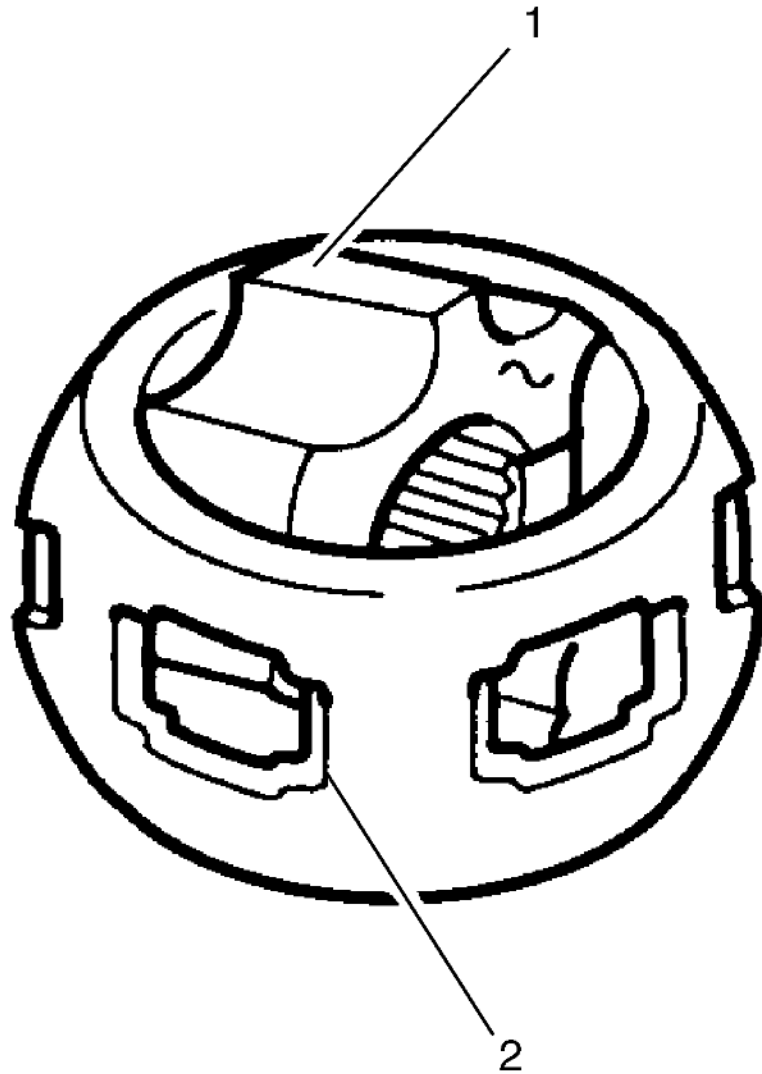


**Fig. 49: View Of Inner Race & Cage**

**Courtesy of GENERAL MOTORS COMPANY**

17. Remove the inner race (1) from the cage (2) by rotating the inner race (1) upward.
18. Clean the following items thoroughly with cleaning solvent. Remove all traces of old grease and any contaminates.
  1. The inner and outer race assemblies
  2. The CV joint cage
  3. The chrome alloy balls
19. Dry all the parts.
20. Check the CV joint assembly for unusual wear, cracks, or other damage.
21. Replace any damaged parts.
22. Clean the halfshaft bar. Use a wire brush to remove any rust in the seal mounting area (grooves).

#### **Installation Procedure**

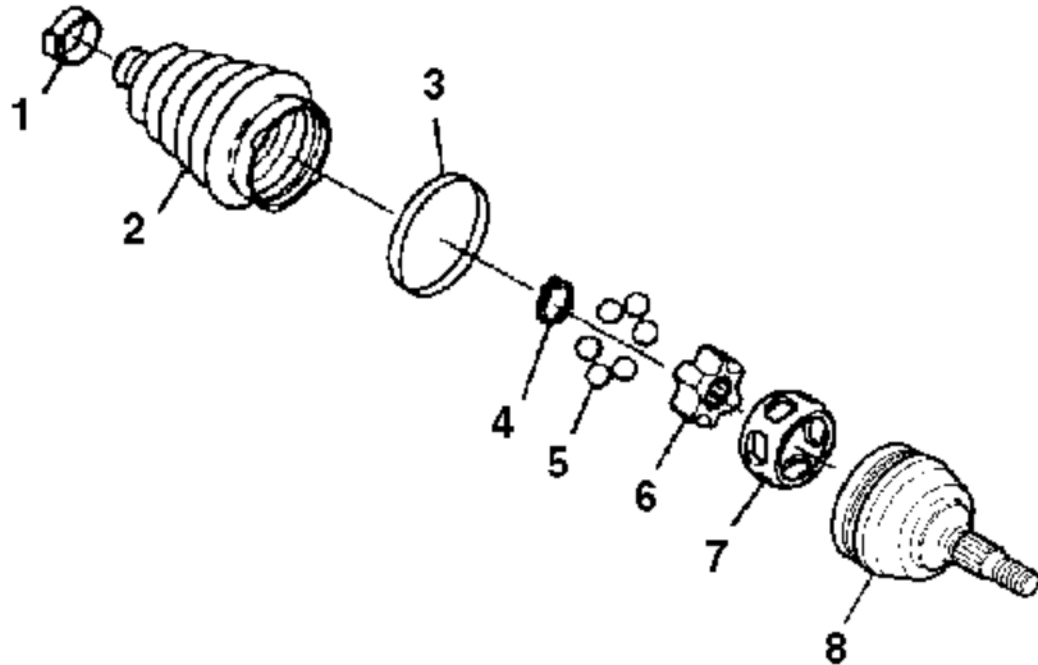


**Fig. 50: Exploded View Of Wheel Drive Shaft Outer Joint**

**Courtesy of GENERAL MOTORS COMPANY**

1. Inspect all of the parts for unusual wear, cracks, or other damage. Replace the CV joint assembly if necessary.
2. Put a light coat of the recommended grease on the inner (6) and the outer race (8) grooves.

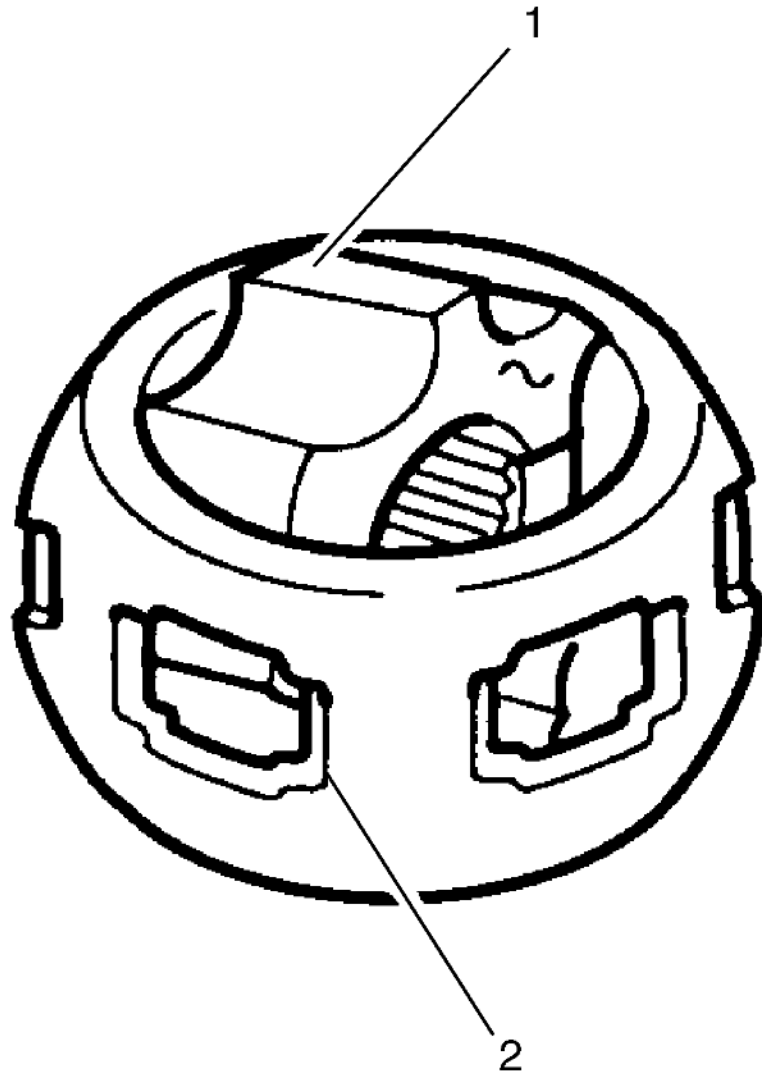


**Fig. 51: View Of Inner Race & Cage**

**Courtesy of GENERAL MOTORS COMPANY**

3. Hold the inner race (1) at 90 degrees to the centerline of the cage (2).
4. Align the lands of the inner race (1) with the windows of the cage (2).
5. Insert the inner race (1) into the cage (2), by rotating the inner race (1) downward.

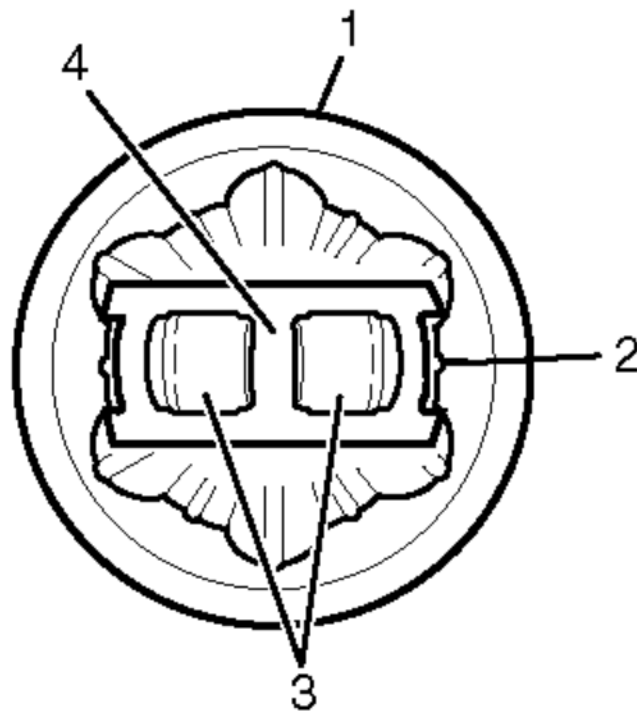


**Fig. 52: View Of Outer Race, Inner Race, Cage Window & CV Joint Cage**  
Courtesy of GENERAL MOTORS COMPANY

6. Insert the cage (4) and inner race into the outer race (1).

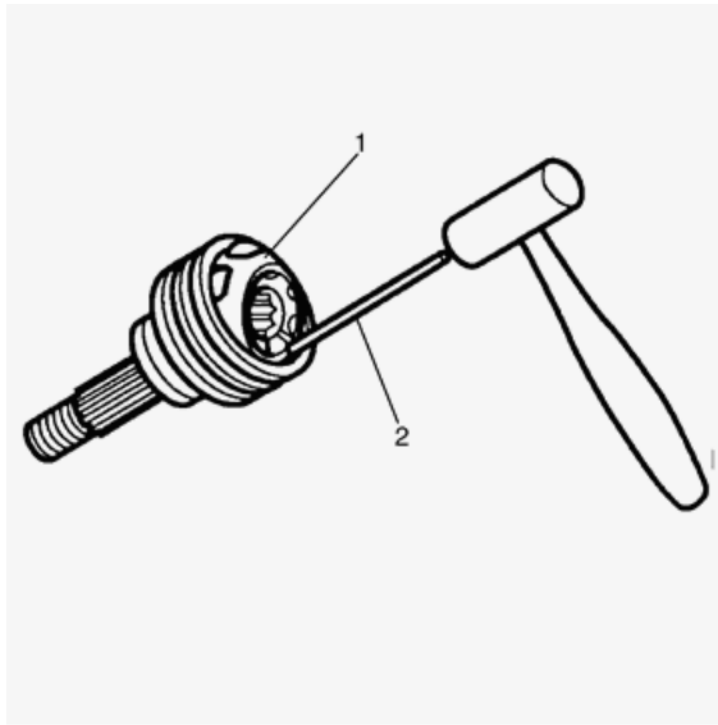


**Fig. 53: Tapping Gently On Brass Drift With A Hammer In Order To Tilt Cage**  
**Courtesy of GENERAL MOTORS COMPANY**

7. Place a brass drift against the CV joint cage (1).
8. Tap gently on the brass drift with a hammer in order to tilt the cage (1).
9. Install the first chrome alloy ball (2) when the CV joint cage (1) tilts.
10. Tilt the CV joint cage (1) in the opposite direction to install the opposing chrome alloy ball (2).
11. Repeat this process in order to install all six of the balls.

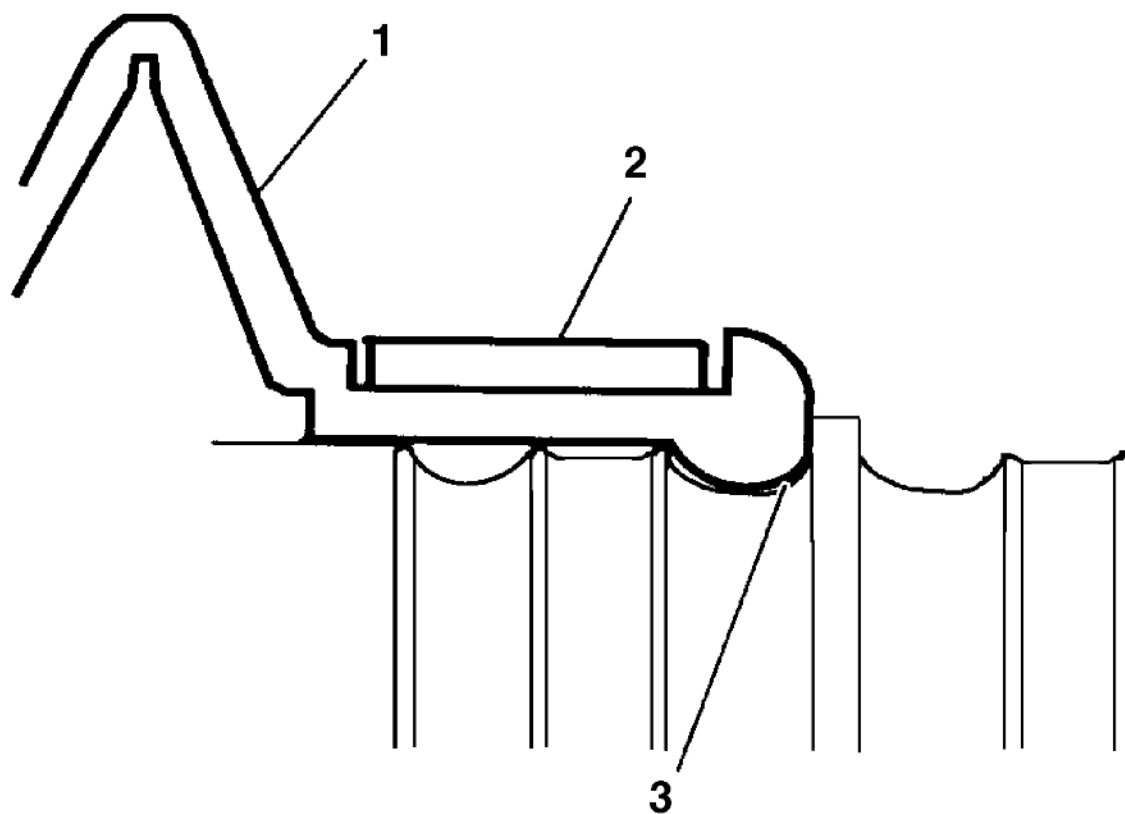


**Fig. 54: Positioning Small End Of Joint Seal Into Joint Seal Groove**

**Courtesy of GENERAL MOTORS COMPANY**

12. Pack the CV joint boot (1) and the CV joint assembly with the grease supplied in the kit. The amount of grease supplied in this kit has been pre-measured for this application.
13. Place the new small boot clamp (2) onto the CV joint seal (1).
14. Slide the CV joint boot (1) onto the halfshaft bar.
15. Position the small end of the CV joint boot (1) into the joint boot groove (3) on the halfshaft bar.

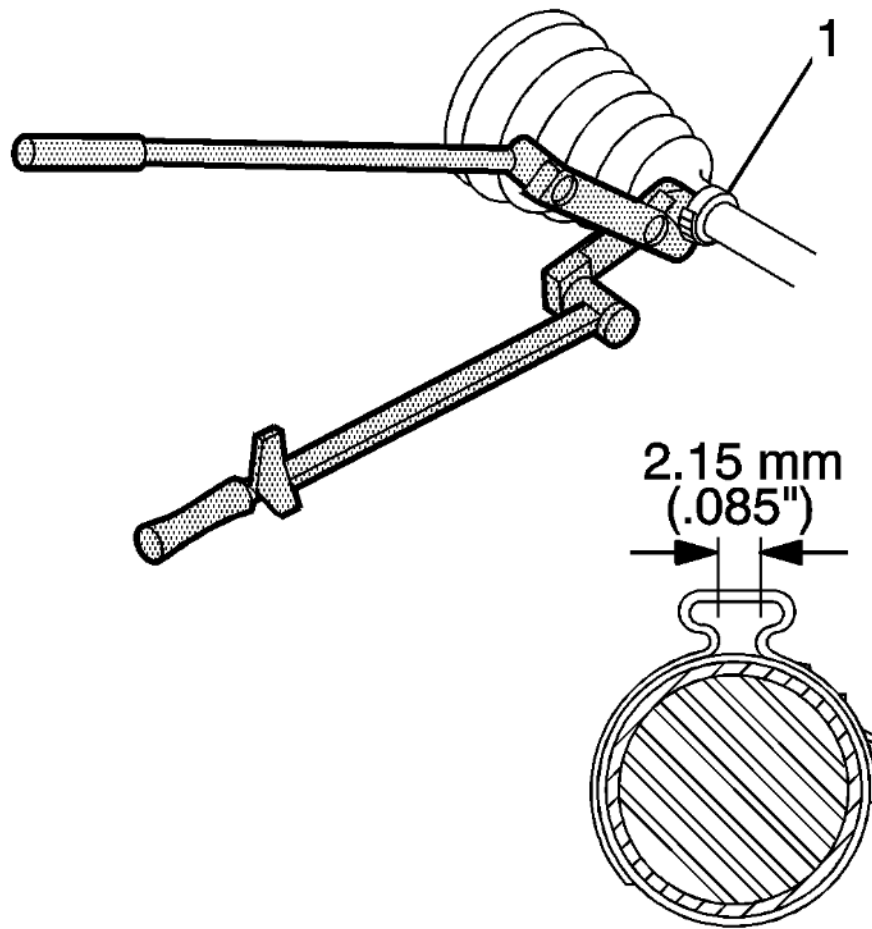


**Fig. 55: View Of CV Joint Seal Retaining Clamp**

Courtesy of GENERAL MOTORS COMPANY

**CAUTION:** Refer to [Fastener Caution](#) .

16. Secure the small boot clamp (1) using **J-35910** drive axle seal clamp pliers (or equivalent), a breaker bar, and a torque wrench.
17. Crimp the boot clamp to the gap of 2.15 mm (.085 in).
18. Check the gap dimension on the clamp ear. Continue tightening until the gap dimension is reached.

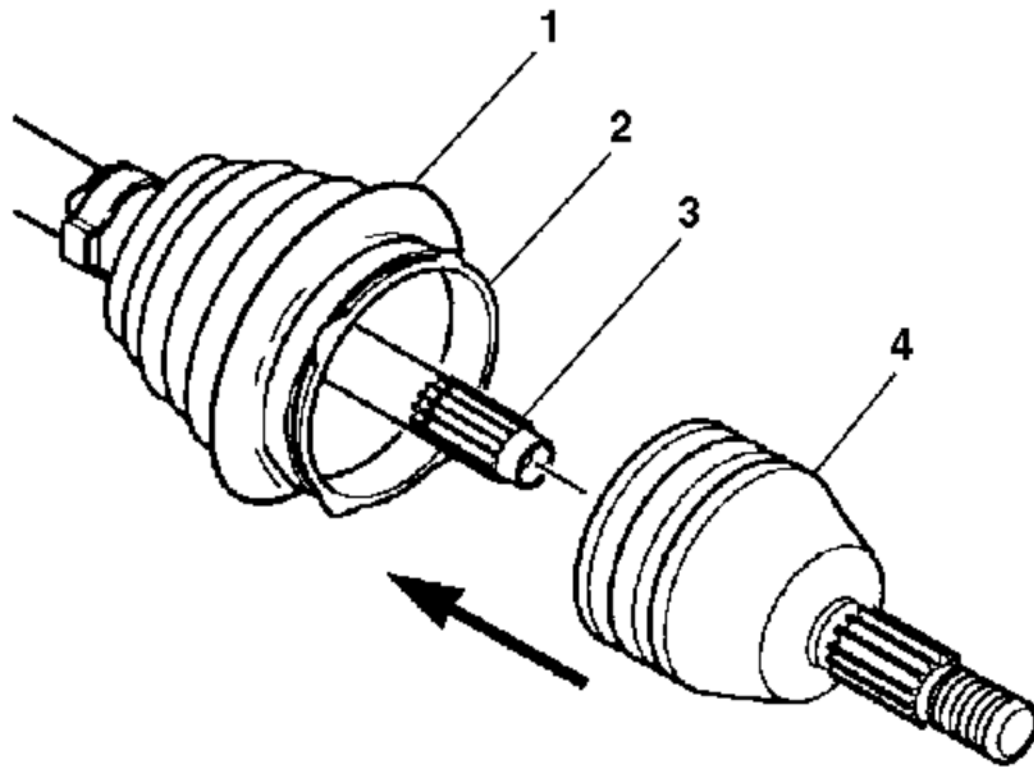


**Fig. 56: CV Boot, Swage Ring, Halfshaft Bar & CV Joint**

Courtesy of GENERAL MOTORS COMPANY

19. Pinch the new swage ring (2) slightly by hand to distort it into an oval shape.
20. Slide the distorted swage ring (2) over the large diameter of the boot (1).

**NOTE:** Be sure that the retaining ring side of the CV joint inner race faces the halfshaft bar (3) before installation.

21. Slide the CV joint (4) onto the halfshaft bar (3). The retaining snap ring inside of the inner race engages in the halfshaft bar groove with a click when the CV joint (4) is in the proper position.
22. Pull on the CV joint (4) to verify engagement.
23. Slide the large diameter of the CV joint boot (1), with the large swage ring (2) in place, over the outside edge of the CV joint outer race (4).

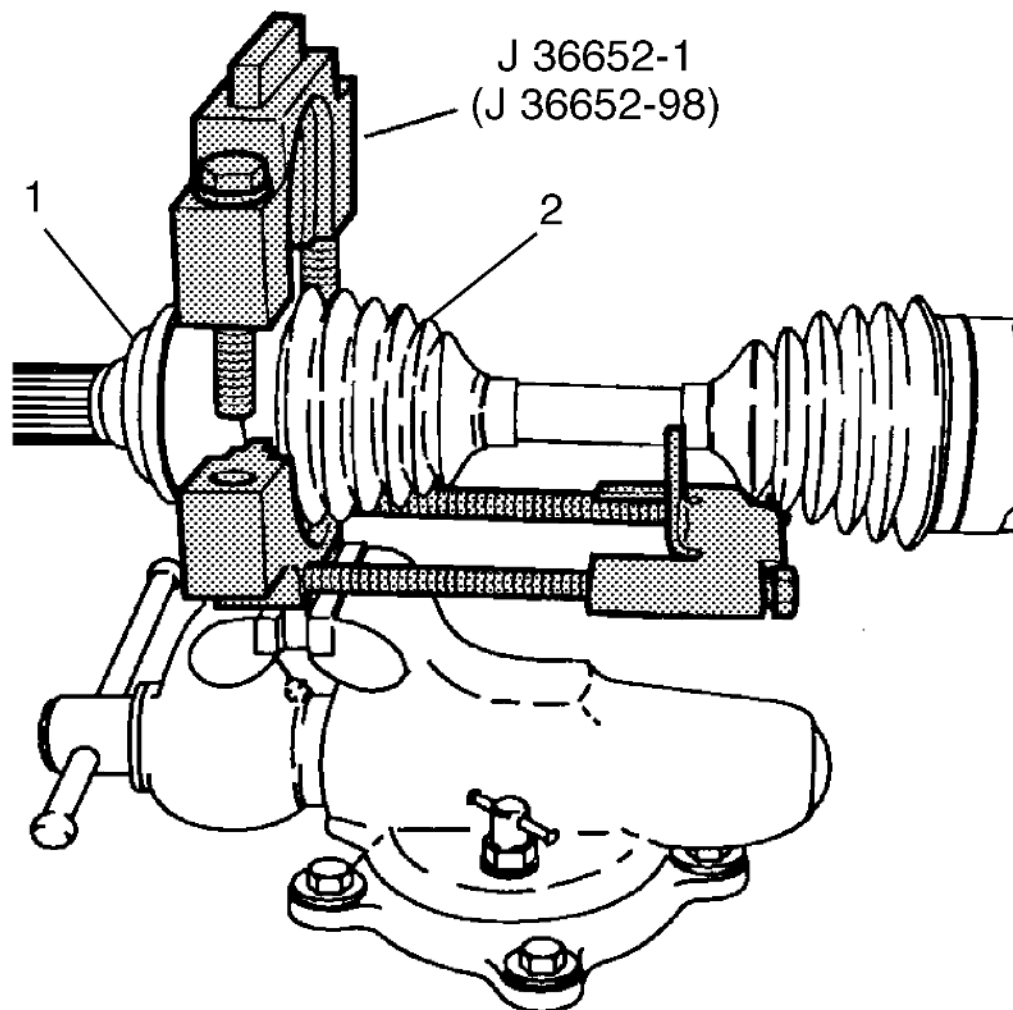


**Fig. 57: Clamping CV Joint Boot**

Courtesy of GENERAL MOTORS COMPANY

24. Clamp the CV joint boot (2) tightly to the CV joint outer race (1) with the large swage ring (4), using the following procedure:
25. For the 1500 models, assemble the bolts and the support plate to the base of the **J-36652-1** drive axle clamp swage tool and secure the base in a vise. For the 2500 and 3500 models, use the **J-36652-2** axle swage tool.
26. Position the CV joint end (outboard end) of the halfshaft assembly in the bottom half of **J-36652-1** drive axle clamp swage tool or **J-36652-2** axle swage tool.

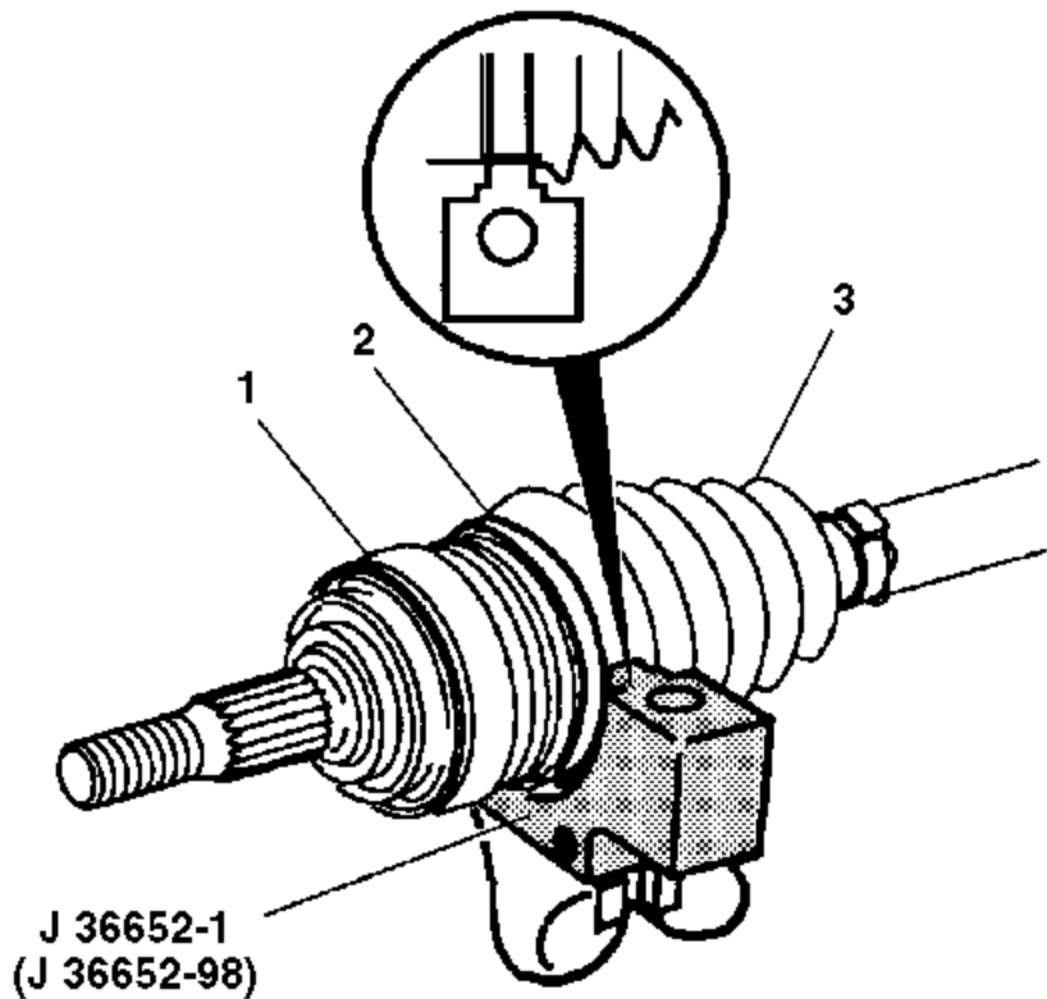


**Fig. 58: Aligning Swage Ring And Swage Ring Clamp**

Courtesy of GENERAL MOTORS COMPANY

27. Align the following during this procedure:

- The CV joint boot (3)
- The CV joint assembly (1)
- The swage ring (2)

28. Install the top half of **J-36652-1** drive axle clamp swage tool or **J-36652-2** axle swage tool onto the lower half of the tool, over the CV joint boot (3) and the CV joint assembly (1).

29. Align the swage ring (2) and the swage ring clamp.

30. Insert the bolts into **J-36652-1** drive axle clamp swage tool or **J-36652-2** axle swage tool. Hand tighten the bolts until the bolts are snug.

### **Tighten**

Tighten each bolt 180 degrees at a time. Alternate between the bolts until both sides of the top half of the tool touch the bottom half of the tool.

31. Loosen the bolts and remove the halfshaft assembly from the tool.
32. Install the wheel drive shaft. Refer to [Front Wheel Drive Shaft Replacement - Left Side](#), or refer to [Front Wheel Drive Shaft Replacement - Right Side](#).

## WHEEL DRIVE SHAFT OUTER JOINT INSPECTION

### Disassembly Procedure

1. Remove the outer constant velocity (CV) joint and boot from the wheel drive shaft. Refer to [Front Wheel Drive Shaft Outer Joint and Boot Replacement](#).
2. Remove any lubricant from the CV joint.

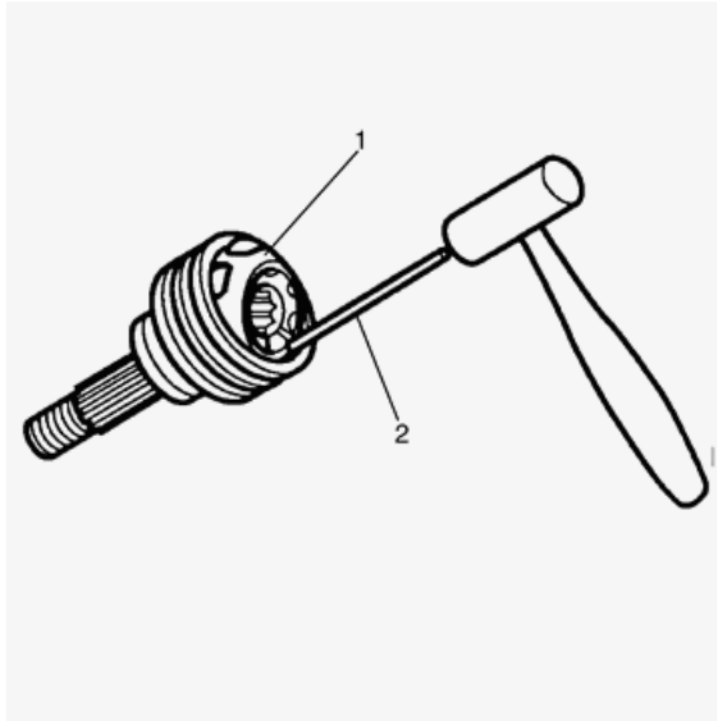


**Fig. 59: Tapping Gently On Brass Drift With A Hammer In Order To Tilt Cage**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Position the cage and the inner race so they are level.

3. Install the outer CV joint assembly in a soft jawed vise.

**NOTE:** The following procedure will have to be repeated until all the ball bearing are removed from the cage.

4. Using a brass drift (1), gentle tap the cage until the ball bearing can be removed from the cage.

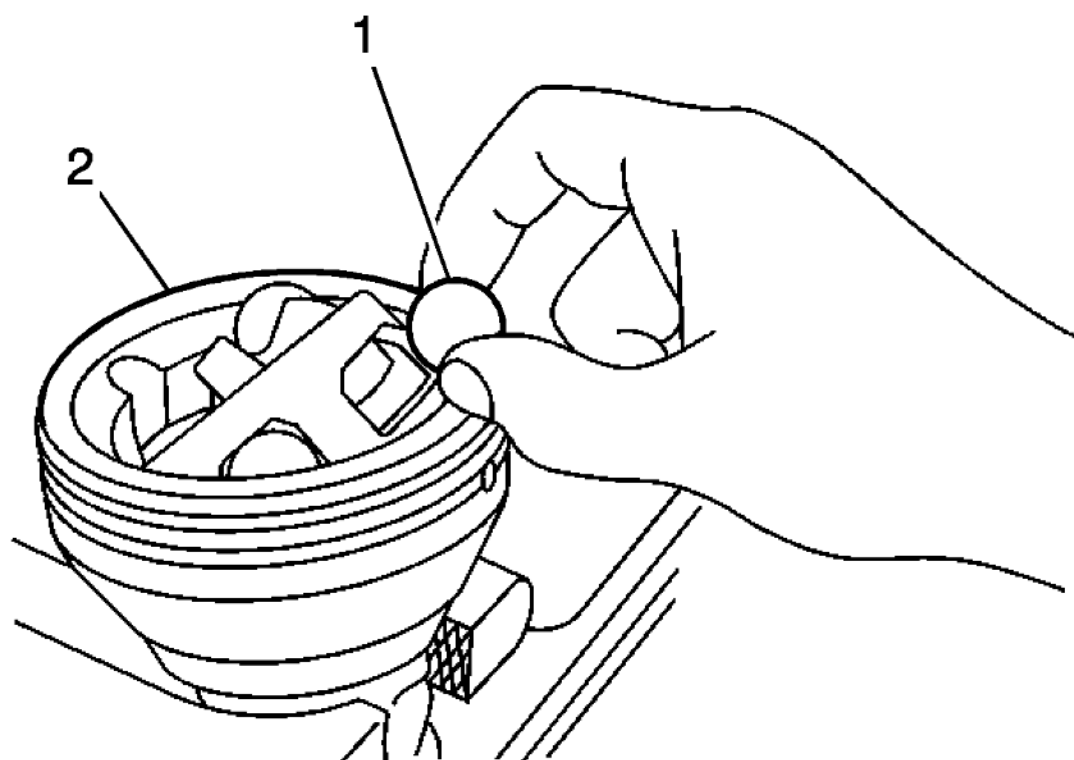


**Fig. 60: Removing/Install Ball From Cage & Inner Race**  
Courtesy of GENERAL MOTORS COMPANY

5. Using a small screwdriver, remove the ball bearings (1) from the CV joint (2).

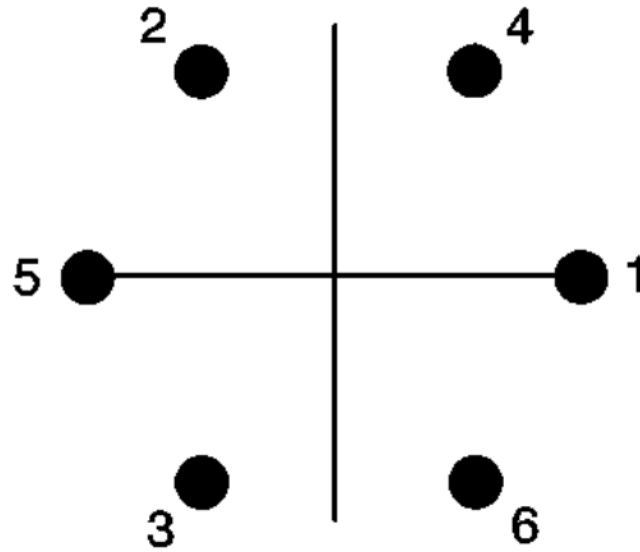


**Fig. 61: View Of Ball Removal/Installation Sequence**  
Courtesy of GENERAL MOTORS COMPANY

6. Remove the ball bearings from the CV joint in sequence.

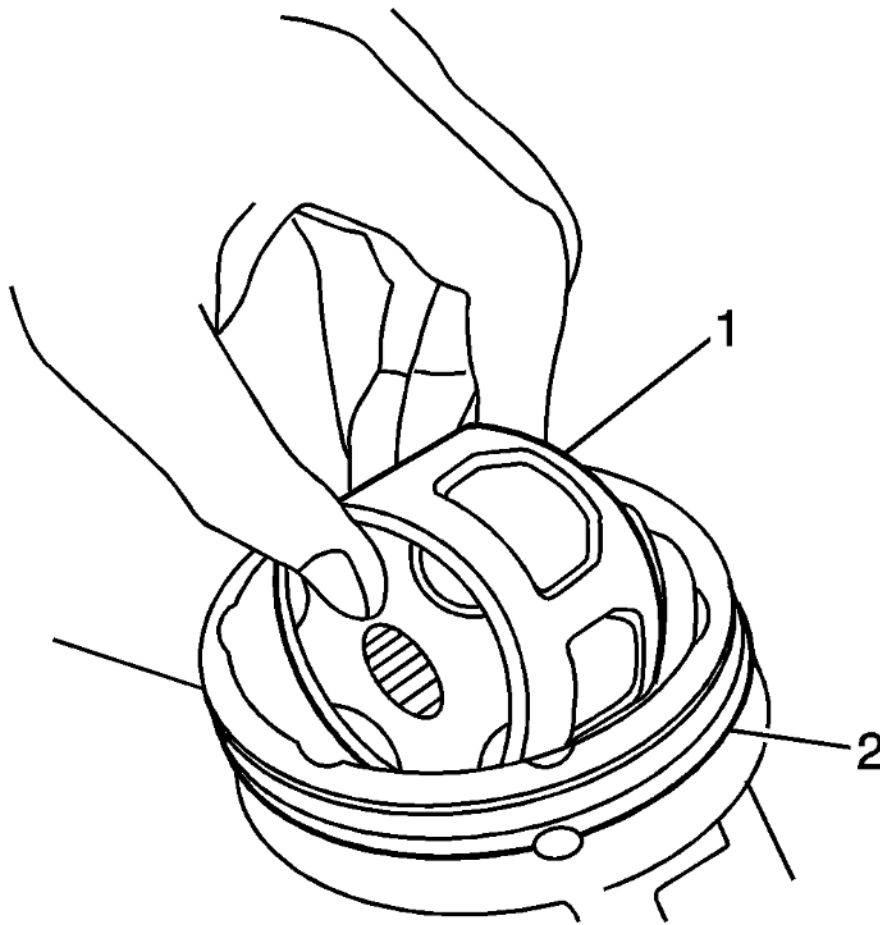


**Fig. 62: Positioning Cage & Inner Race 90 Degrees To Centerline Of Outer Race**  
Courtesy of GENERAL MOTORS COMPANY

**NOTE:** Position the cage so that the larger radius corners of the cage windows are facing up.

7. Position the cage (1) at a 90 degrees to the centerline of the outer race (2).
8. Align the cage windows with the lands of the outer race (2).
9. Lift and remove the cage (1) and the inner race from the outer race (2).

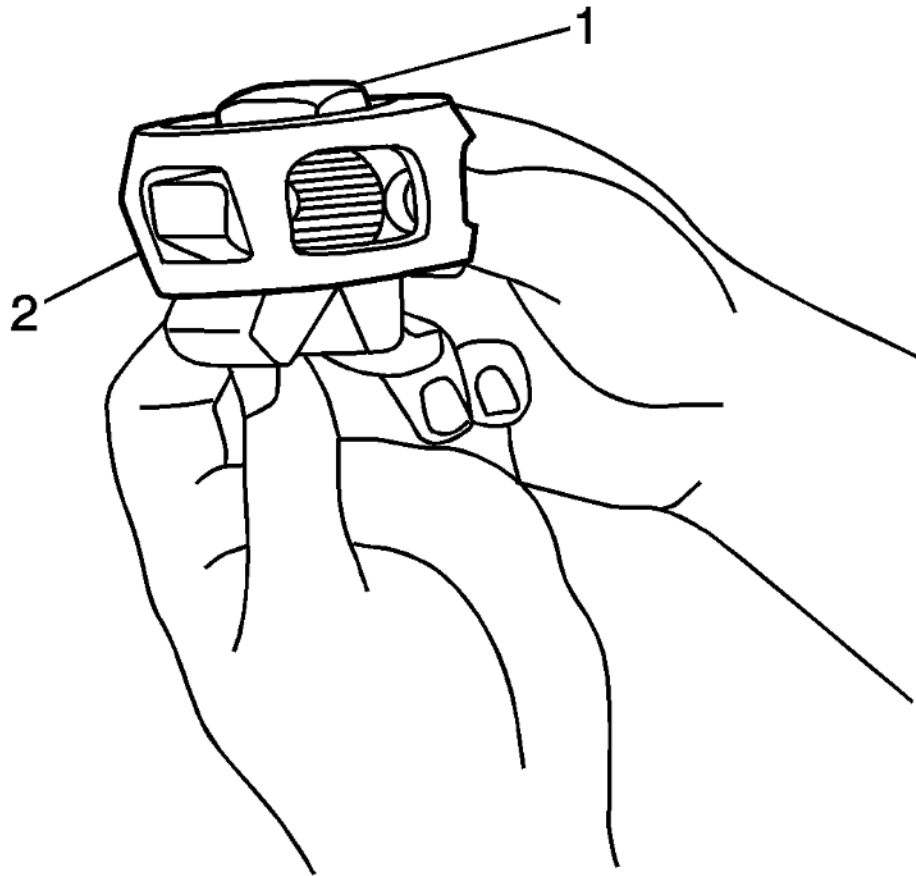


**Fig. 63: Positioning Cage So Larger Radius Corners Of Cage Windows Are Up**  
Courtesy of GENERAL MOTORS COMPANY

10. Position the cage (2) and the inner race (1) so that the larger radius corners of the cage windows are up.
11. Rotate the inner race (1) 90 degrees to the center line of the cage (2).
12. Align the lands of the inner race (1) with the windows of the cage (2).
13. Move the inner race (1) land into the cage window (2).
14. Rotate the inner race (1) down and remove it from the cage (2).
15. Clean the following items thoroughly with the proper cleaning solvent:
  - The inner race
  - The outer race
  - The cage
  - The ball bearings
  - The exposed end of the wheel drive shaft

**NOTE:** The internal parts of the CV joint are **NOT SERVICED** separately. The outer CV joint is serviced as an assembly.

16. If any of the above items are found to have excessive wear or are damaged, replace the outer CV joint as

an assembly.

### Assembly Procedure

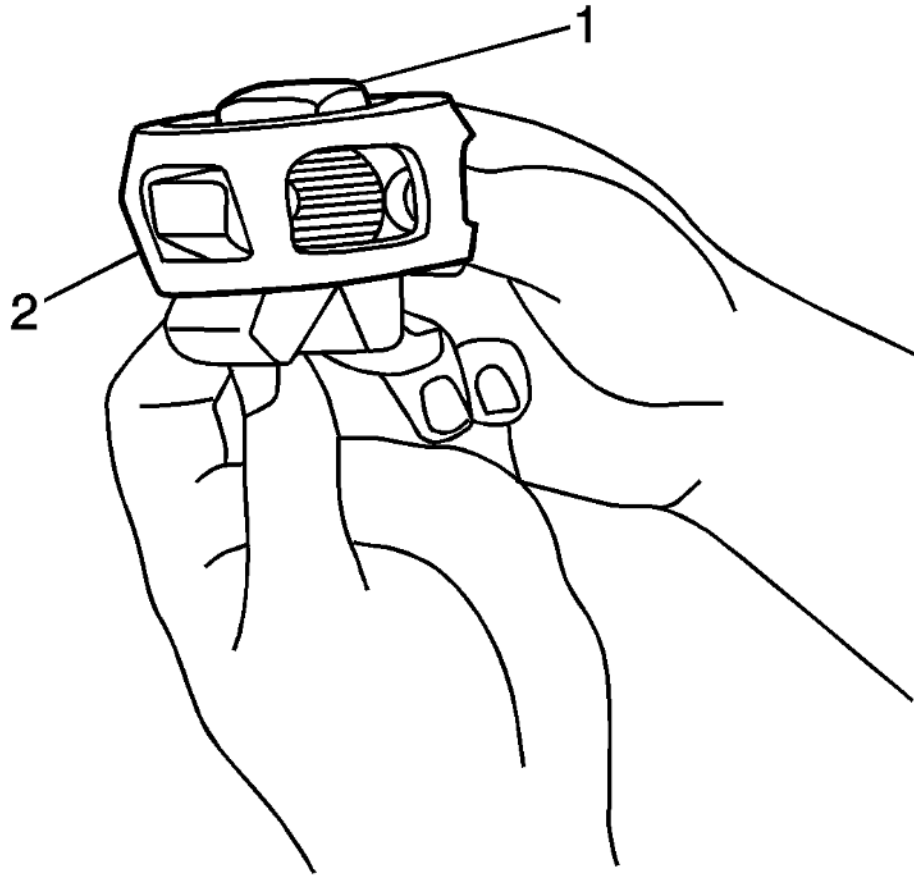


**Fig. 64: Positioning Cage So Larger Radius Corners Of Cage Windows Are Up**  
**Courtesy of GENERAL MOTORS COMPANY**

1. Position the cage (2) so that the larger radius corners of the cage windows are up.
2. Position the inner race (1) 90 degrees to the centerline of the cage (2).
3. Insert the inner race (1) through the bottom of the cage (2).
4. Align the lands of the inner race (1) with the windows of the cage (2).
5. Move the inner race (1) land into the cage window (2).
6. Rotate the inner race (1) down and remove it from the cage (2).
7. Rotate the inner race (1) within the cage (2) so that the grooved surface of the inner race (1) is facing up.
8. Align the inner race (1) ball bearing tracks with the cage (2) windows.

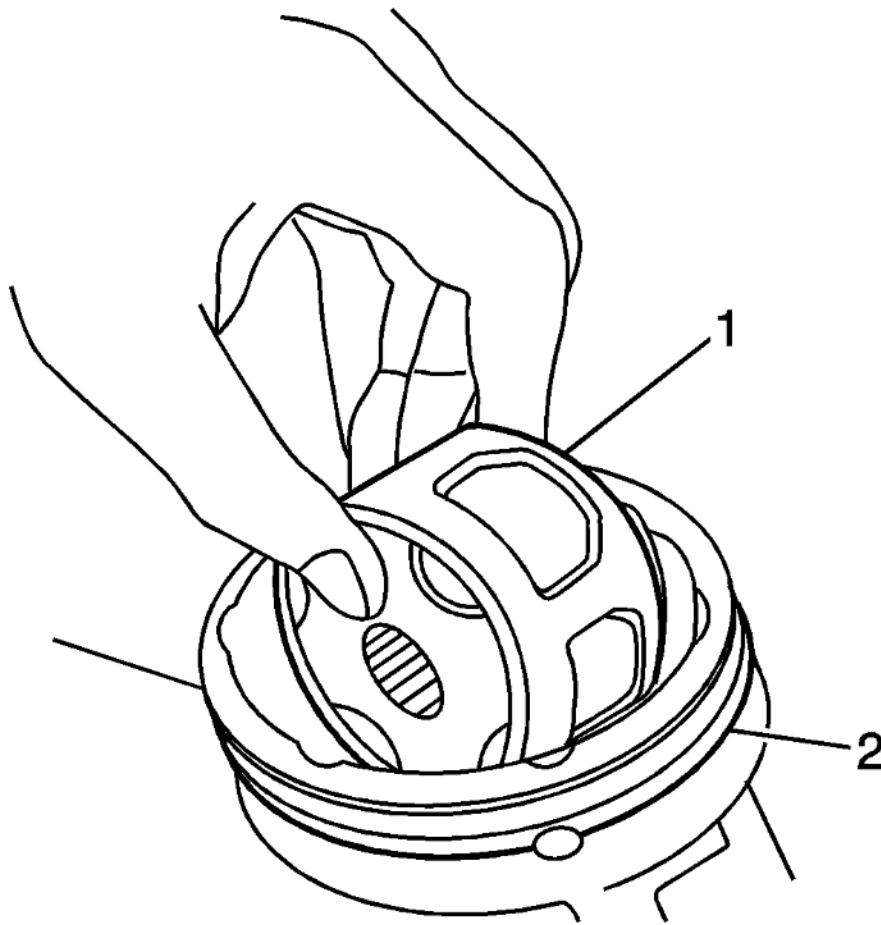


**Fig. 65: Positioning Cage & Inner Race 90 Degrees To Centerline Of Outer Race**  
Courtesy of GENERAL MOTORS COMPANY

9. Wrap a clean shop towel around the CV joint outer race splined shaft.
10. Place the outer race (2) vertically in a bench vise.
11. Position the cage (1) and the inner race at a 90 degrees to the centerline of the outer race (2).
12. With the inner race and the cage (1) assembly in a vertical position, insert the cage and the inner race into the outer race (2).

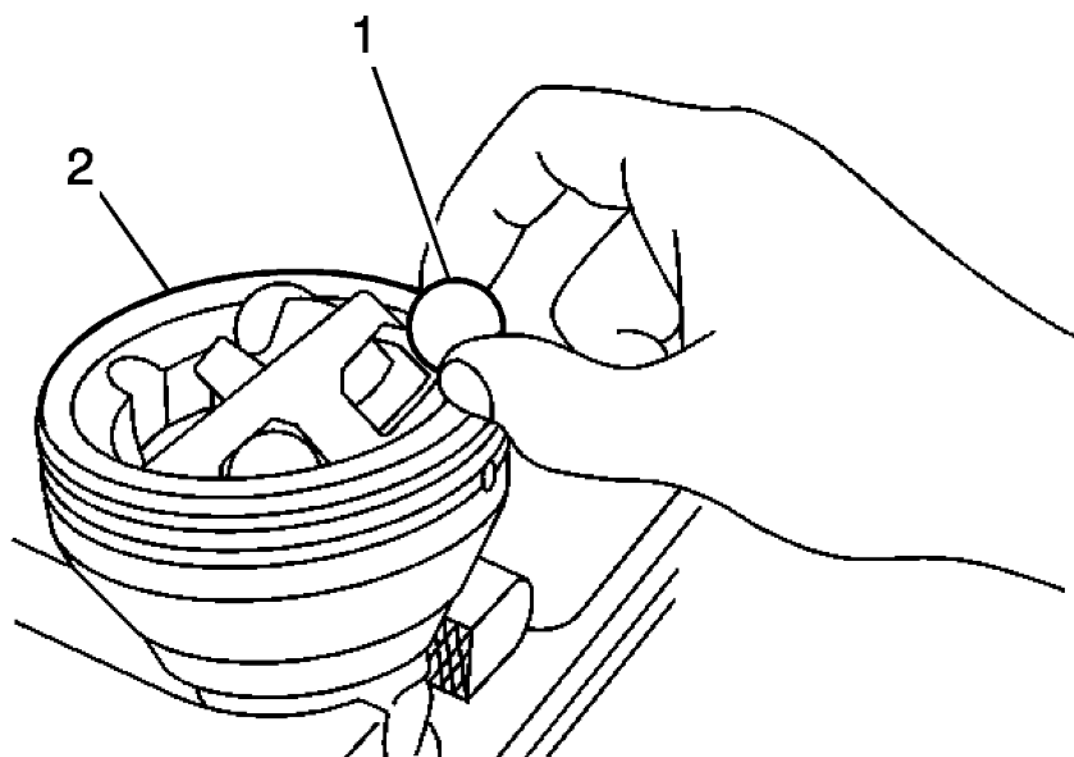


**Fig. 66: Removing/Install Ball From Cage & Inner Race**

Courtesy of GENERAL MOTORS COMPANY

**NOTE:** The larger radius corners of the cage windows should be positioned up and the grooved surface of the inner race should be visible.

13. Position the cage (2) and the inner race so that they are level in the vise.
14. Rotate the appropriate component(s), and align the cage windows and the inner race ball bearing (1) tracks with the outer race ball bearing tracks.
15. Position a cage window and the inner race ball bearing track for the ball bearing installation.

**NOTE:** When performing the following procedure, the opposing cage (2) window and the inner ball bearing (1) track will be accessible for the ball bearing installation.

16. Press down on the cage following one of the outer race ball bearing (1) tracks.
17. Install the ball bearing through the cage window onto the inner race ball bearing (1) track.

**NOTE:** The following service procedure will have to be performed after each ball bearing (1) has been installed.

18. After the first ball bearing (1) has been installed, use a brass drift and a hammer and gently tap the cage in order to drive the cage and the inner race down completely in the outer race.

**NOTE:** After the ball bearing (1) has been installed, there should be **NO GAP** between the ball bearing and the inner race.

19. Position the cage and the inner race so that they are level.

20. Using a plastic hammer, lightly tap the ball bearing (1) into place.

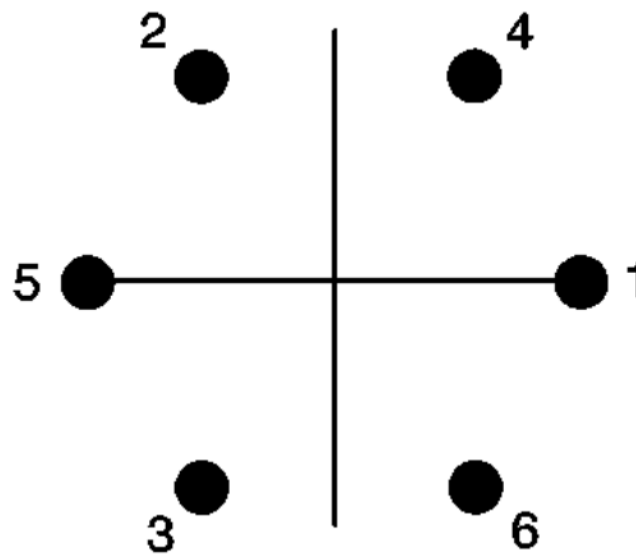


**Fig. 67: View Of Ball Removal/Installation Sequence**  
Courtesy of GENERAL MOTORS COMPANY

21. Install the ball bearings in sequence.

22. Repeat steps 18 thru 20 until all the ball bearings are installed.

23. Install the outer CV joint and boot on the wheel drive shaft. Refer to **Front Wheel Drive Shaft Outer Joint and Boot Replacement**.

## **WHEEL DRIVE SHAFT INNER JOINT INSPECTION**

### **Inspection Procedure**

1. Remove the front wheel drive shaft inner joint and boot. Refer to [\*\*Front Wheel Drive Shaft Inner Joint and Boot Replacement \(1500\)\*\*](#)[\*\*Front Wheel Drive Shaft Inner Joint and Boot Replacement \(2500/3500\)\*\*](#).

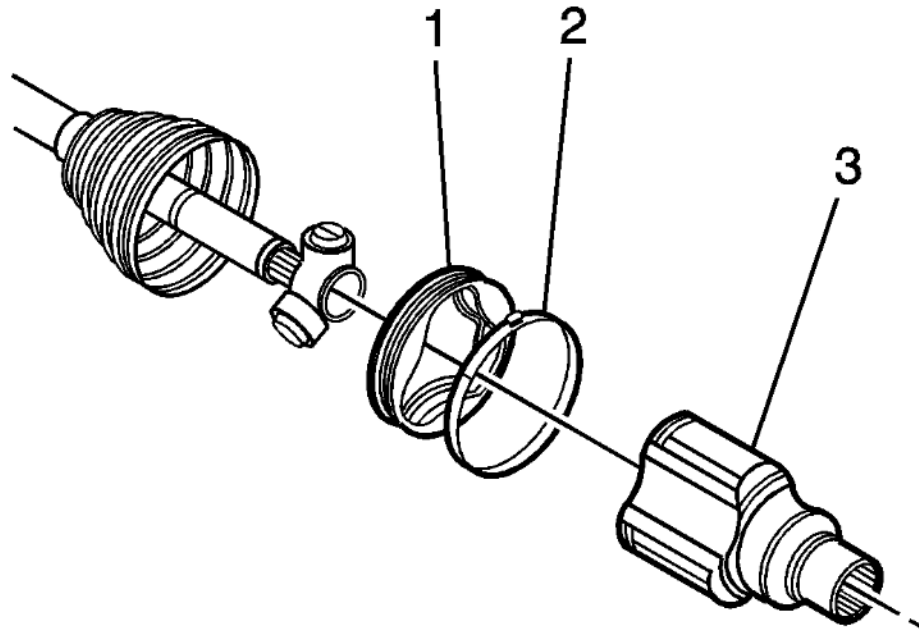


**Fig. 68: Identifying Wheel Drive Shaft Inner Joint Inspection Areas**

Courtesy of GENERAL MOTORS COMPANY

2. Remove the wheel drive shaft tripod bushing (1) from the tripod housing (3).
3. Remove the wheel drive shaft tripod housing (3) from the wheel drive shaft.
4. Remove the wheel drive shaft tripod joint boot bushing (1).
5. Using a suitable cleaner, remove the excess grease from the tripod assembly.
6. Inspect the following items for damage or excessive wear:
  - The wheel drive shaft tripod boot
  - The wheel drive shaft tripod assembly
  - The wheel drive shaft tripod joint housing
  - The wheel drive shaft tripod joint bushing
  - The wheel drive shaft
7. If any of the internal parts are found to be excessively worn or damaged, replace the wheel drive shaft inner joint and boot. Refer to [\*\*Front Wheel Drive Shaft Inner Joint and Boot Replacement\*\*](#)

## **DESCRIPTION AND OPERATION**

### **WHEEL DRIVE SHAFTS DESCRIPTION AND OPERATION**

Front Wheel Drive Shafts are flexible assemblies which consist of the following components:

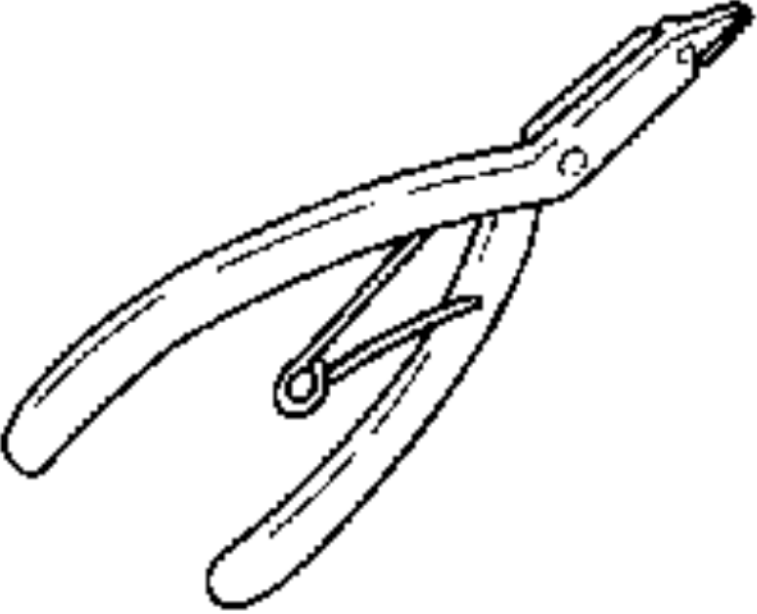
- Front wheel drive shaft constant velocity joint outer joint.
- Front wheel drive shaft tri-pot joint inner joint.
- The front wheel drive shaft connects the front wheel drive shaft tri-pot joint and the front wheel drive shaft constant velocity joint.
- Wheel Drive Shaft Seal Cover 15 Series
- The front wheel drive shaft tri-pot joint is completely flexible, and moves with an in and out motion.
- The front wheel drive shaft constant velocity joint is flexible but can not move in and out.

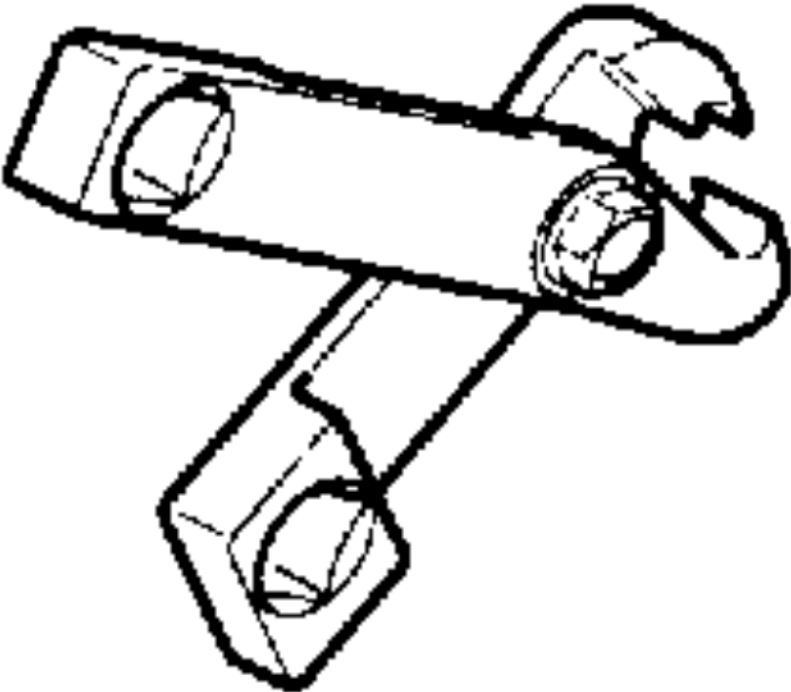
The Wheel Drive Shaft is a balanced shaft that transmits rotational force from the front differential to the front wheels when the transfer case is engaged. The wheel drive shaft is mounted to the front differential by bolting the flange of the wheel drive shaft to the flange on the inner output shaft of the front differential. The other end of the wheel drive shaft is splined to fit into and drive the hub assembly when the transfer case is engaged. The tri-pot joint and constant velocity joint on the wheel drive shaft allows the shaft to be flexible to move with the suspension travel of the vehicle.

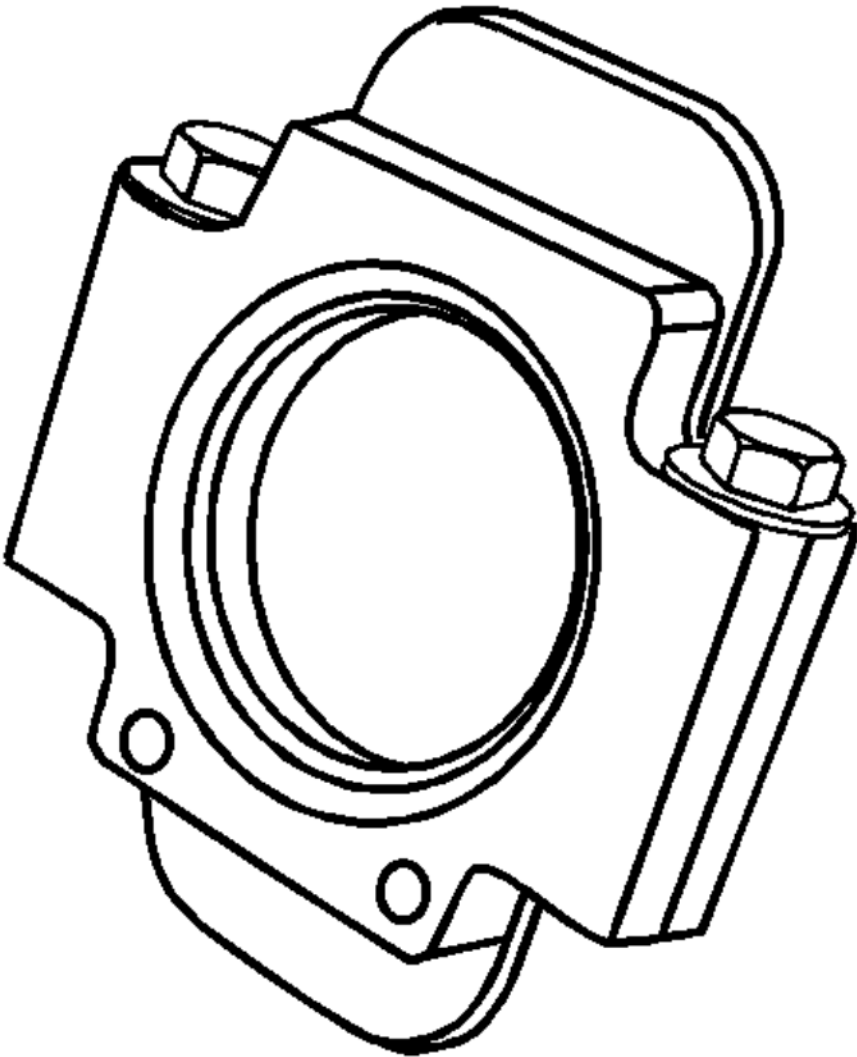
## **SPECIAL TOOLS AND EQUIPMENT**

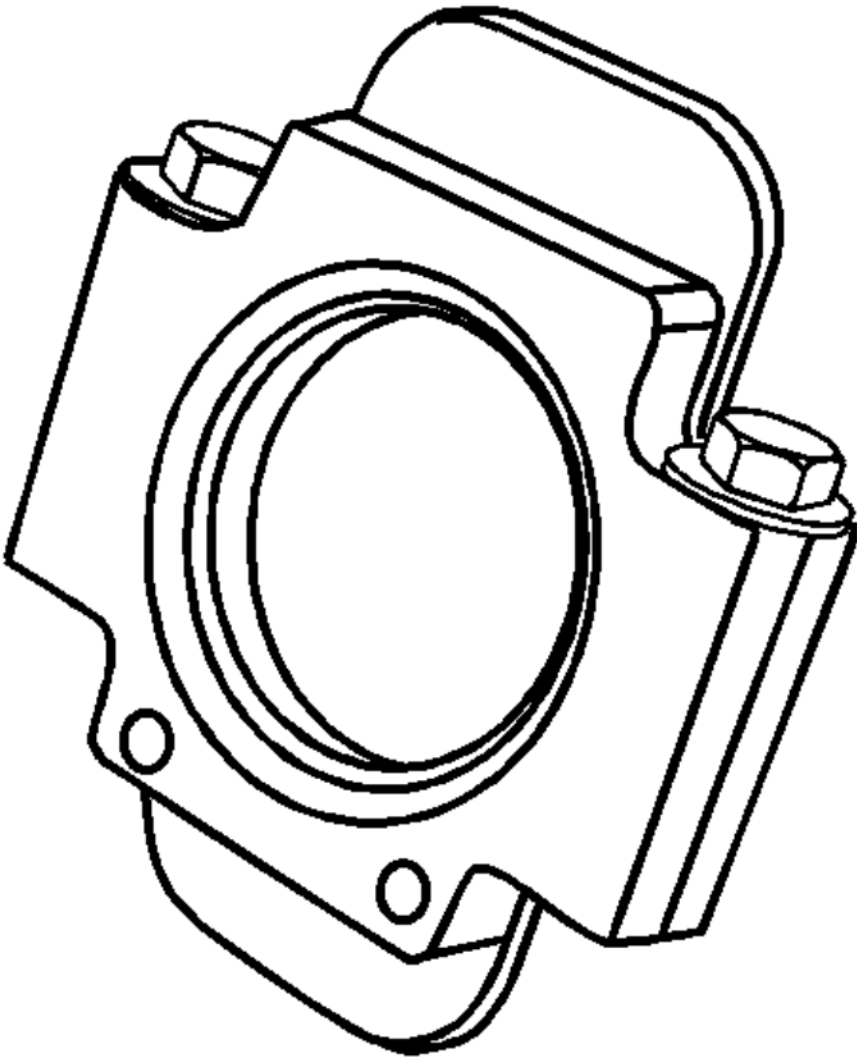
### **SPECIAL TOOLS**

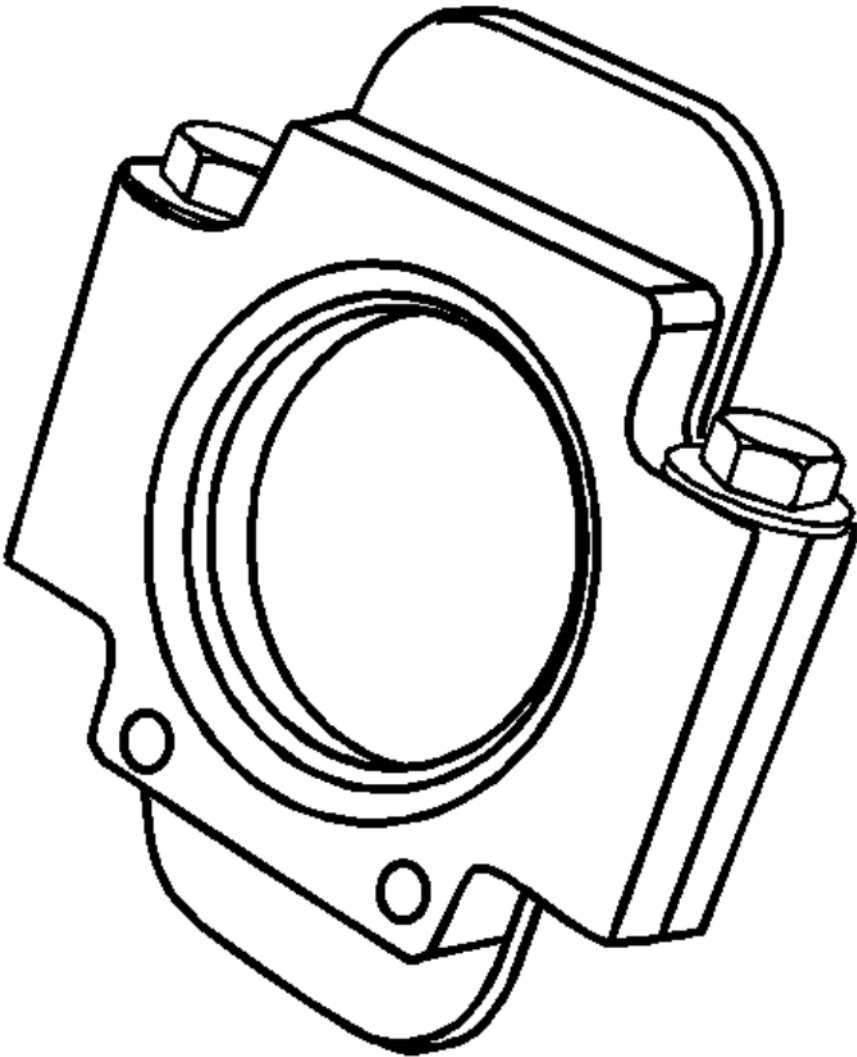
| Illustration | Tool<br>Number/<br>Description |
|--------------|--------------------------------|
|--------------|--------------------------------|

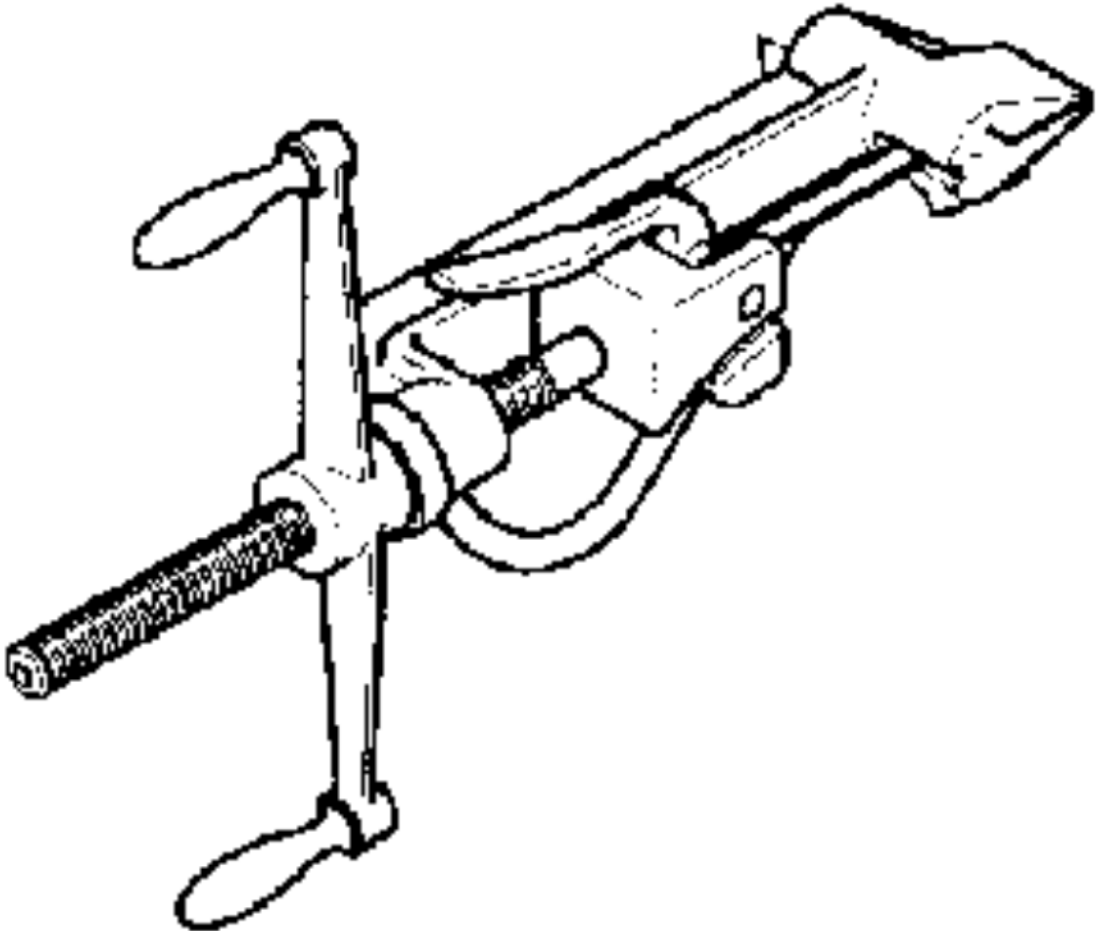
| Illustration                                                                        | Tool<br>Number/<br>Description |
|-------------------------------------------------------------------------------------|--------------------------------|
|  | J 8059<br>Snap Ring<br>Pliers  |

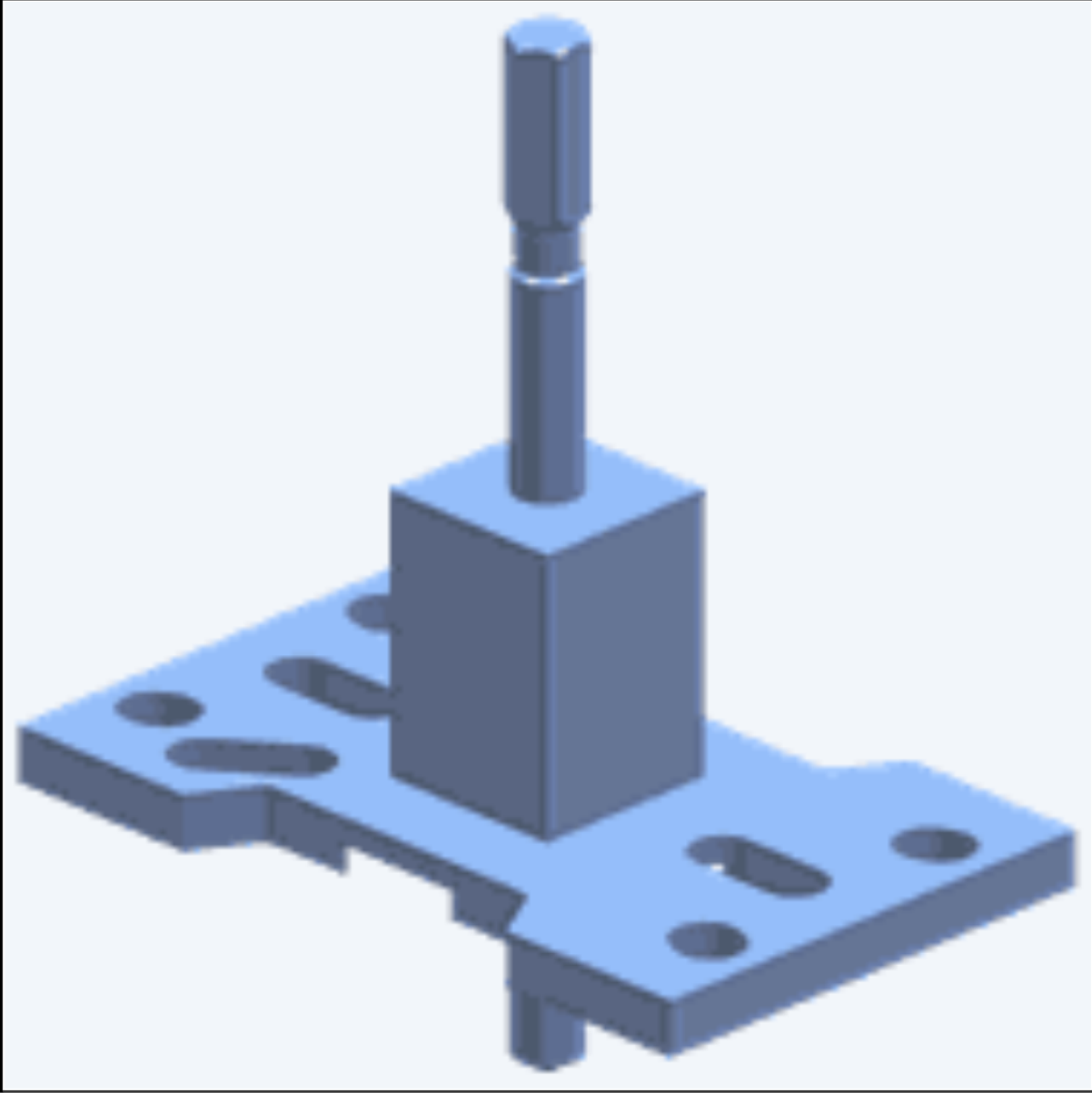
| Illustration                                                                        | Tool<br>Number/<br>Description                          |
|-------------------------------------------------------------------------------------|---------------------------------------------------------|
|  | <p>J 35910<br/>Drive Axle<br/>Seal Clamp<br/>Pliers</p> |

| Illustration                                                                        | Tool<br>Number/<br>Description                 |
|-------------------------------------------------------------------------------------|------------------------------------------------|
|  | J 36652-1<br>Drive Axle<br>Clamp<br>Swage Tool |

| Illustration                                                                        | Tool<br>Number/<br>Description                 |
|-------------------------------------------------------------------------------------|------------------------------------------------|
|  | J 36652-2<br>Drive Axle<br>Clamp<br>Swage Tool |

| Illustration                                                                        | Tool<br>Number/<br>Description   |
|-------------------------------------------------------------------------------------|----------------------------------|
|  | J 36652-98<br>Axle Swage<br>Tool |

| Illustration                                                                        | Tool<br>Number/<br>Description |
|-------------------------------------------------------------------------------------|--------------------------------|
|  | J 41187<br>Banding<br>Tool     |

| Illustration                                                                       | Tool<br>Number/<br>Description |
|------------------------------------------------------------------------------------|--------------------------------|
|  | J 45859<br>Axle<br>Remover     |

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