2007 Driveline/Axle

Wheel Drive Shafts - Outlook

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Large Seal Clamp	136 N.m	100 lb ft
Park Brake Cable Routing Bracket Nut	10 N.m	89 lb in
Rear Suspension Knuckle Bolt and Nut	85 N.m	63 lb ft
Rear Tie Rod Bolt	85 N.m	63 lb ft
Small Seal Clamp (Front and Rear Wheel Drive Shaft)	136 N.m	100 lb ft
Wheel Drive Shaft Spindle Nut	260 N.m	192 lb ft

COMPONENT LOCATOR

FRONT WHEEL DRIVE SHAFT DISASSEMBLED VIEWS

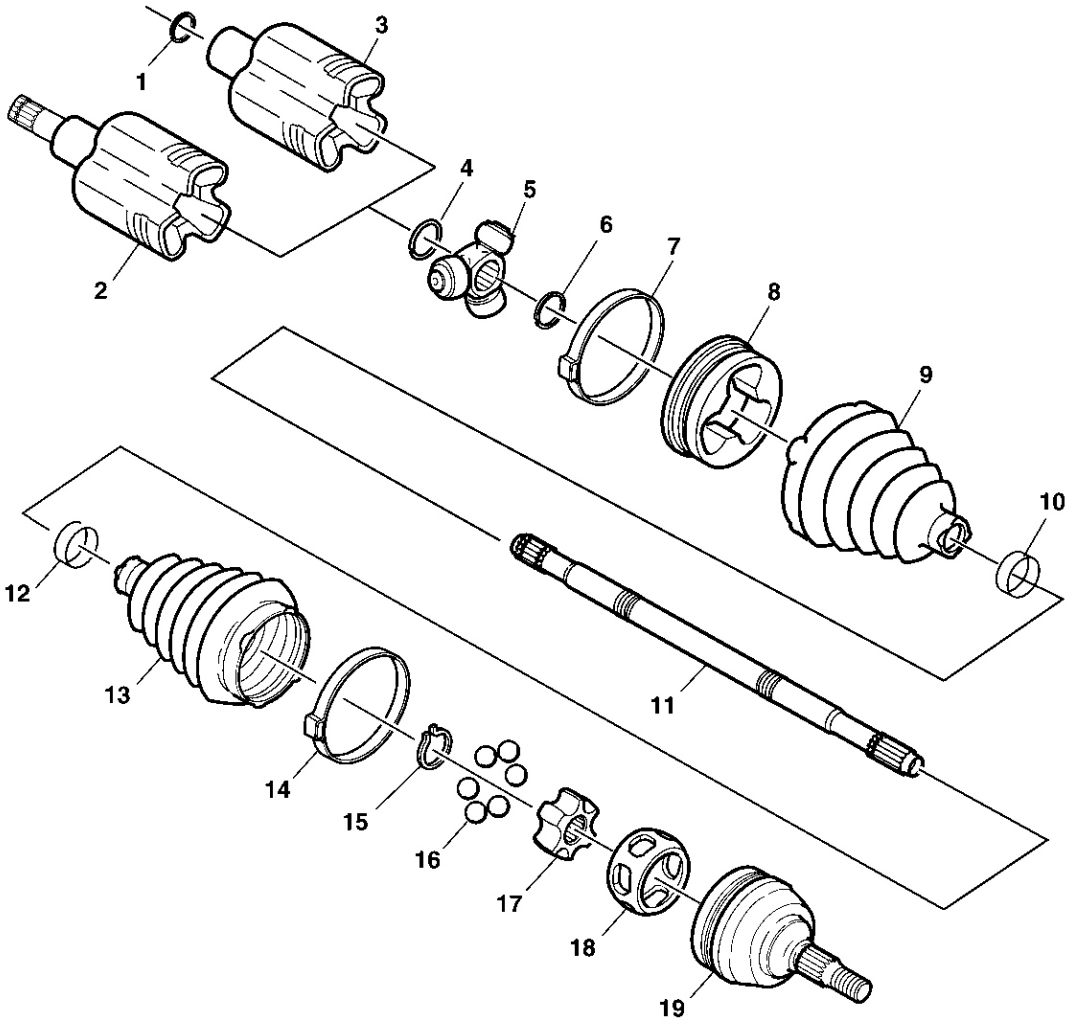


Fig. 1: Identifying Wheel Drive Shaft Components
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 1

Callout	Component Name
1	Retaining Ring
2	Housing Assembly
3	Retainer and Housing Assembly
4	Spacer Ring
5	Tripot Joint Spider Assembly
6	Spacer Ring (If Equipped)

7	Boot Retaining Clamp
8	Trilobal Tripot Bushing
9	Tripot Joint Boot
10	Swage Ring
11	Halfshaft Bar
12	Swage Ring
13	CV Joint Boot
14	Boot Retaining Clamp
15	Race Retaining Ring
16	Chrome Alloy Ball
17	CV Joint Inner Race
18	CV Joint Cage
19	CV Joint Outer Race

REAR WHEEL DRIVE SHAFT DISASSEMBLED VIEWS

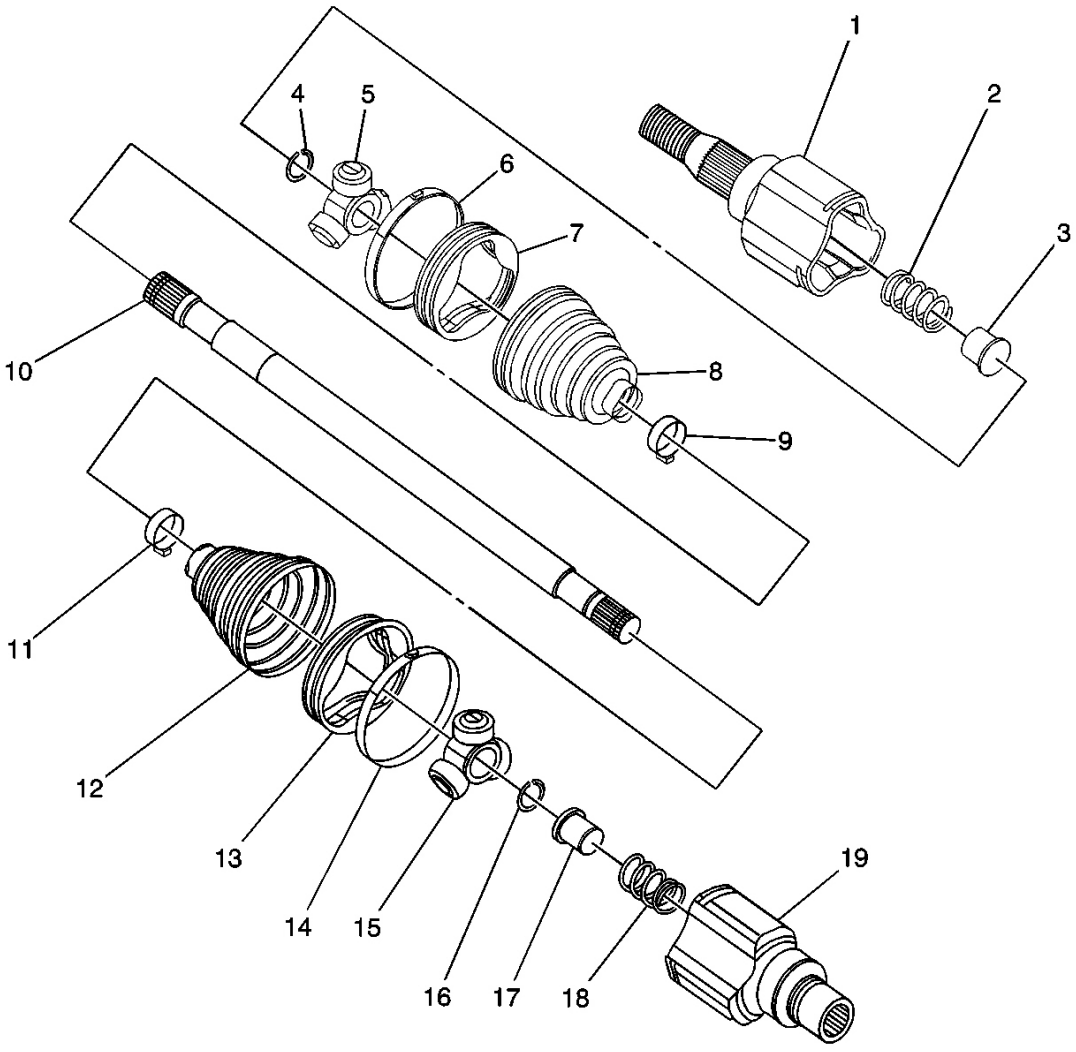


Fig. 2: Wheel Drive Shafts Disassembled Views (M76)
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 2

Callout	Component Name
1	Tripot Joint Race - Outboard
2	Spring
3	Guide
4	Retaining Ring, Outboard Tripot Joint Spider
5	Tripot Joint Spider - Outboard Tripot Joint
6	Clamp, Outboard Tripot Joint Seal - Outer

7	Bushing, Tripot Joint Race - Outboard
8	Tripot Joint Seal, Outboard
9	Clamp, Outboard Tripot Joint Seal - Inner
10	Bar, Wheel Drive Shaft
11	Clamp, Inboard Tripot Joint Seal - Inner
12	Tripot Joint Seal, Inboard
13	Bushing, Tripot Joint Race - Inboard
14	Clamp, Inboard Tripot Joint Seal - Outer
15	Tripot Joint Spider - Inboard Tripot Joint
16	Retaining Ring, Inboard Tripot Joint Spider
17	Guide
18	Spring
19	Tripot Joint Race - Inboard

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - WHEEL DRIVE SHAFTS

Begin the wheel drive shaft system diagnosis with **Diagnostic Starting Point - Vibration Diagnosis and Correction** . The use of the Diagnostic Starting Point will lead to the identification of the correct procedure for diagnosing the system and where the procedure is located.

CLICK NOISE IN TURNS

A constant velocity joint which is worn or damaged may cause a click noise during turns. This may be more apparent while simultaneously turning and accelerating. This click is caused by wear and/or damage to the constant velocity joint bearings and/or races. Commonly, this damage or wear is caused by the loss of lubricating grease from the constant velocity joint and the entry of foreign material or contaminates.

Carefully inspect the wheel drive shaft seals (boots) for cuts, tears or other damage which may allow the lubricating grease to escape. The loss of this grease will cause damage to the wheel drive shaft constant velocity joint in a very short period of time. If the seals (boots) do not exhibit evidence of lubricant loss or damage, remove the wheel drive shaft from the vehicle and rotate the constant velocity joint by rotating in a circular motion. The action of the constant velocity joint should be smooth and even. If any binding and/or roughness is felt while performing this inspection, the constant velocity joint requires replacement.

CLUNK WHEN ACCELERATING FROM COAST

A clunk noise occurring when accelerating from coast or a standing start may be caused by a worn or damaged wheel drive shaft cross groove joint. The common cause of wheel drive shaft cross groove damage is the loss of lubricating grease and/or the presence of foreign material and contaminates in the joint. This usually occurs as a result of a torn or damaged cross groove joint seal boot.

Carefully inspect the wheel drive shaft cross groove seal boot for cuts, tears or other signs of damage that may allow the loss of the lubricating grease and/or the entry of contaminates. If the seals appear intact, remove the wheel drive shaft from the vehicle and inspect the cross groove joint. Rotate the cross groove joint in a circular motion. Do not allow the cross groove spider to become disengaged from the race housing or damage to the cross groove joint will occur. The movement of the cross groove joint should be smooth and even. If any binding or impeded motion is felt, the cross groove joint requires replacement.

CLUNK NOISE WHEN ACCELERATING DURING TURNS

A clunk noise that occurs while accelerating during turning may be caused by wear and/or damage to the inboard and the outboard joints in combination. Carefully inspect the joint seals (boots) for cuts, tears or other damage. Joint seals that are damaged may allow lubricant leakage and the entry of foreign materials and contaminates. The loss of lubricant and/or the presence of contaminates can cause damage to the internal components of the joints.

If the seals (boots) are not damaged, remove the wheel drive shaft from the vehicle and rotate the joints in a circular motion. Do not allow the tripot spider to become disengaged from the housing (race). The movement of the joints should be smooth and even. If the joints exhibit any binding or inhibited movement, the joint requires replacement.

SHUDDER OR VIBRATION DURING ACCELERATION

In order to diagnose a shudder or vibration during acceleration, refer to **Diagnostic Starting Point - Vibration Diagnosis and Correction** .

REPAIR INSTRUCTIONS

INTERMEDIATE DRIVE SHAFT REPLACEMENT

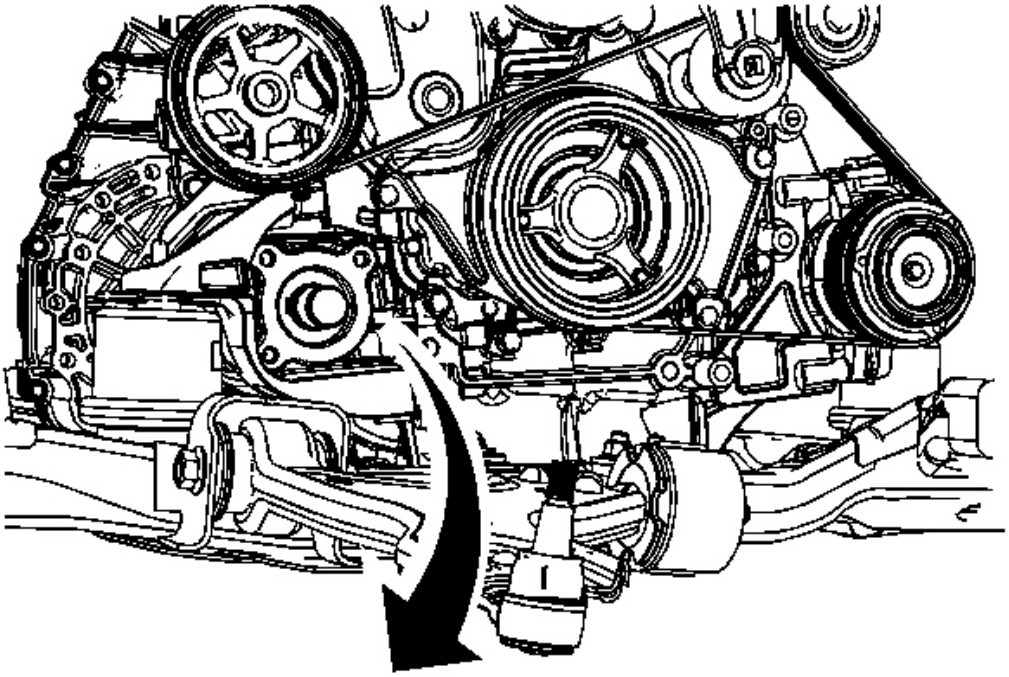
Tools Required

- **J 2619-01** Slide Hammer

- **J 44467** Output Shaft Assembly Remover and Installer

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the right front wheel drive shaft. Refer to **Front Wheel Drive Shaft Replacement**.



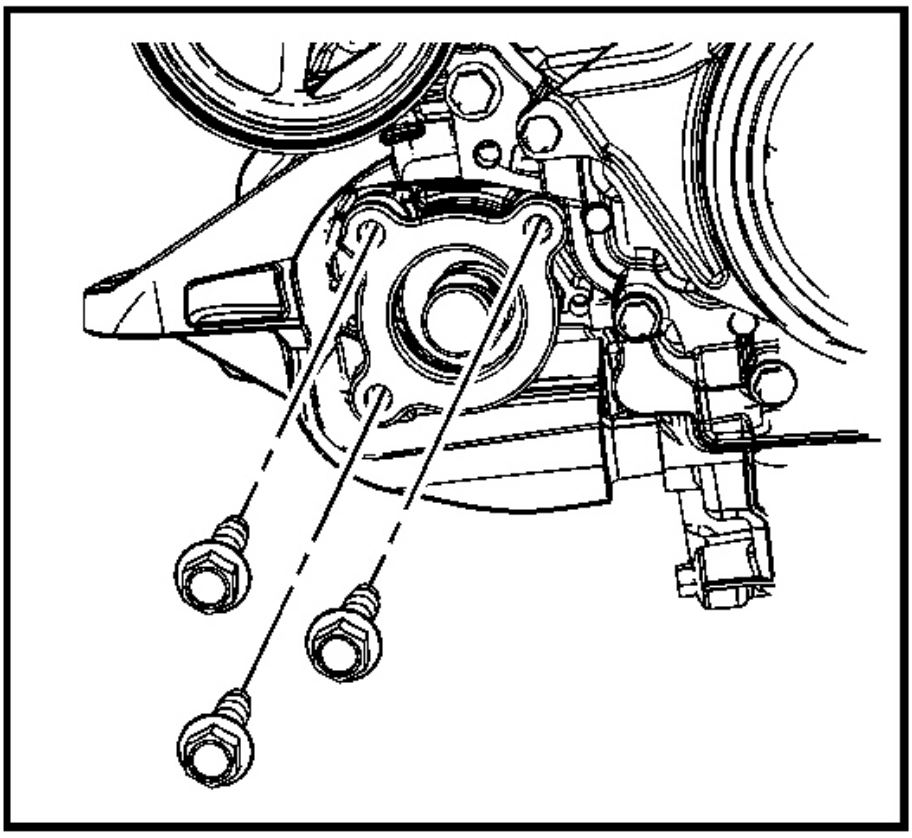


Fig. 3: View Of Intermediate Drive Shaft Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

3. Remove the intermediate drive shaft mounting bolts from the engine bracket.

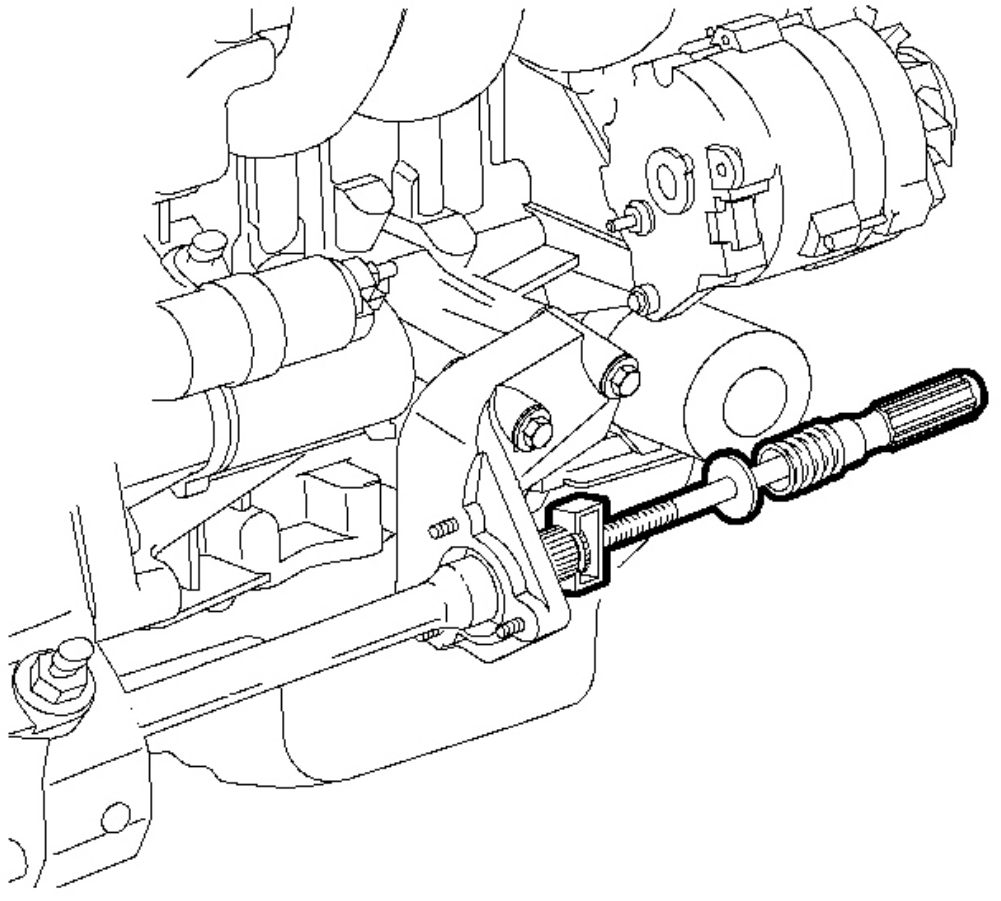


Fig. 4: Illustrating Disengagement Of Intermediate Drive Shaft From Transaxle
Courtesy of GENERAL MOTORS CORP.

4. Assemble the **J 44467** and the **J 2619-01** to the intermediate drive shaft retainer ring groove.

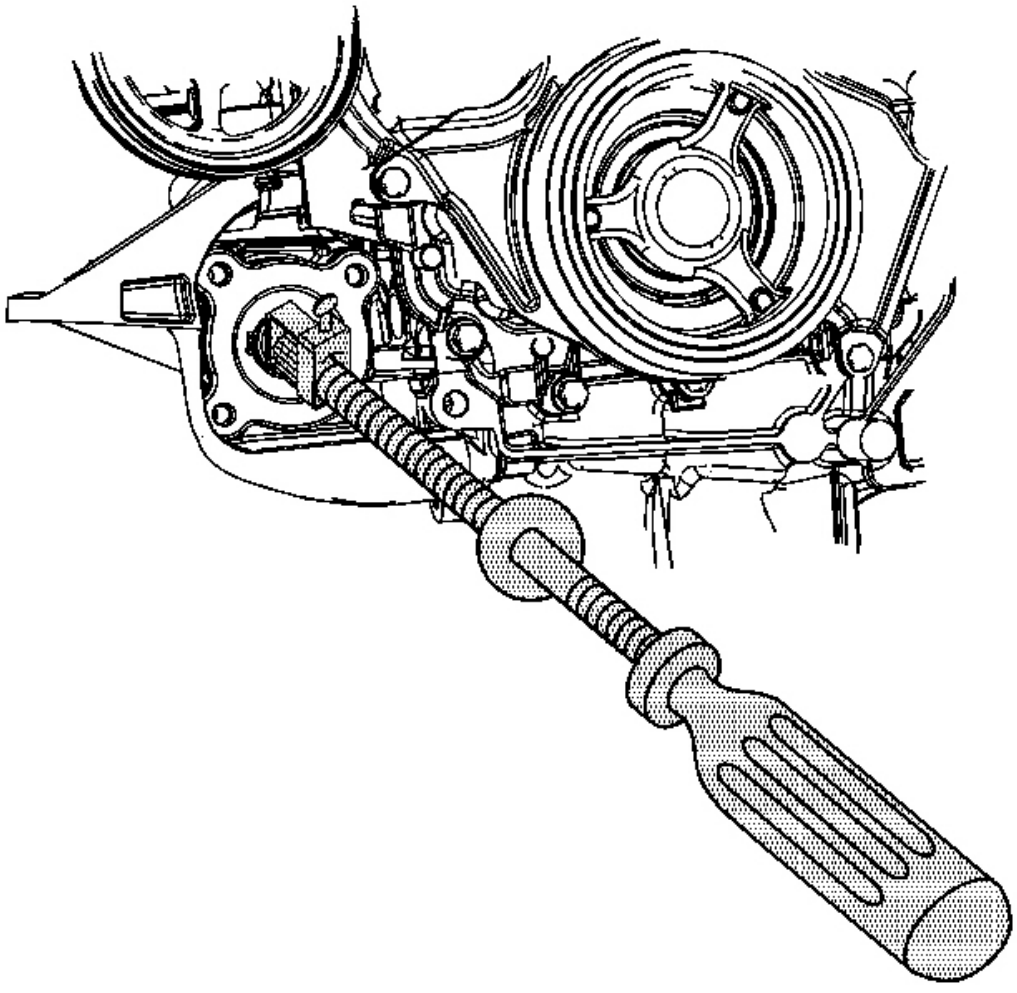


Fig. 5: Identifying Output Shaft Assembly Remover & Installer
Courtesy of GENERAL MOTORS CORP.

5. Using the **J 44467** and the **J 2619-01** , remove the intermediate shaft from the transmission.

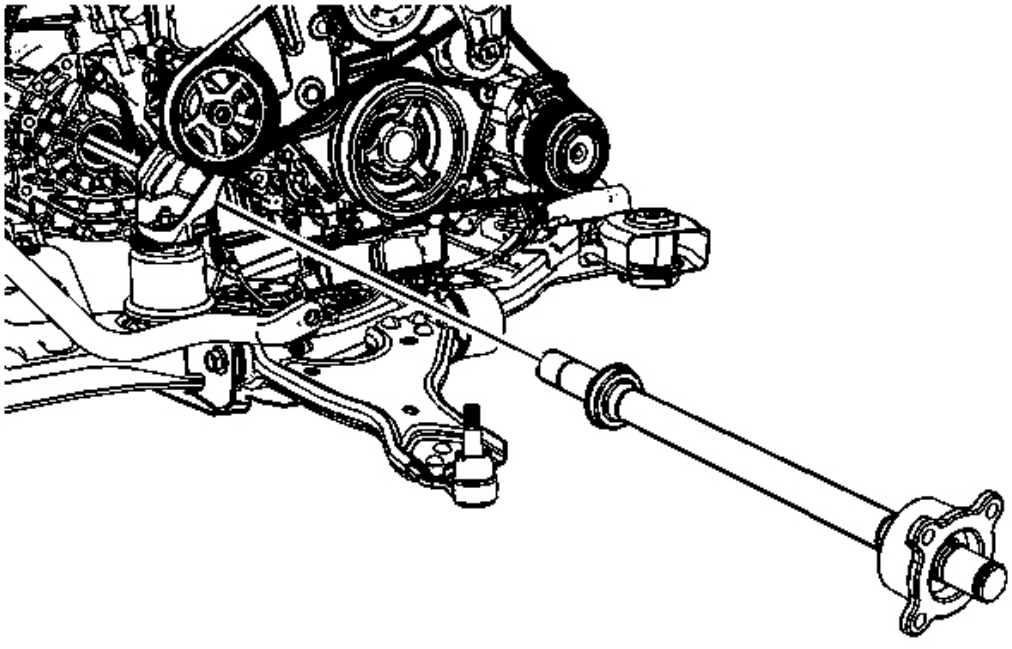


Fig. 6: View Of Intermediate Drive Shaft
Courtesy of GENERAL MOTORS CORP.

6. Remove the **J 44467** and the **J 2619-01** from the intermediate drive shaft from the vehicle.

Installation Procedure

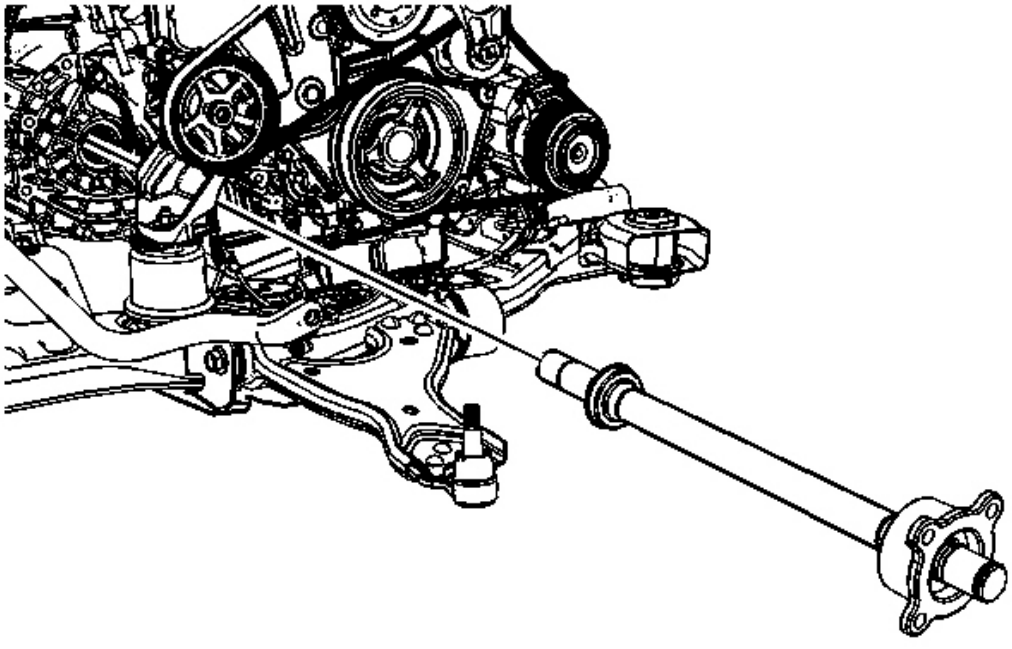
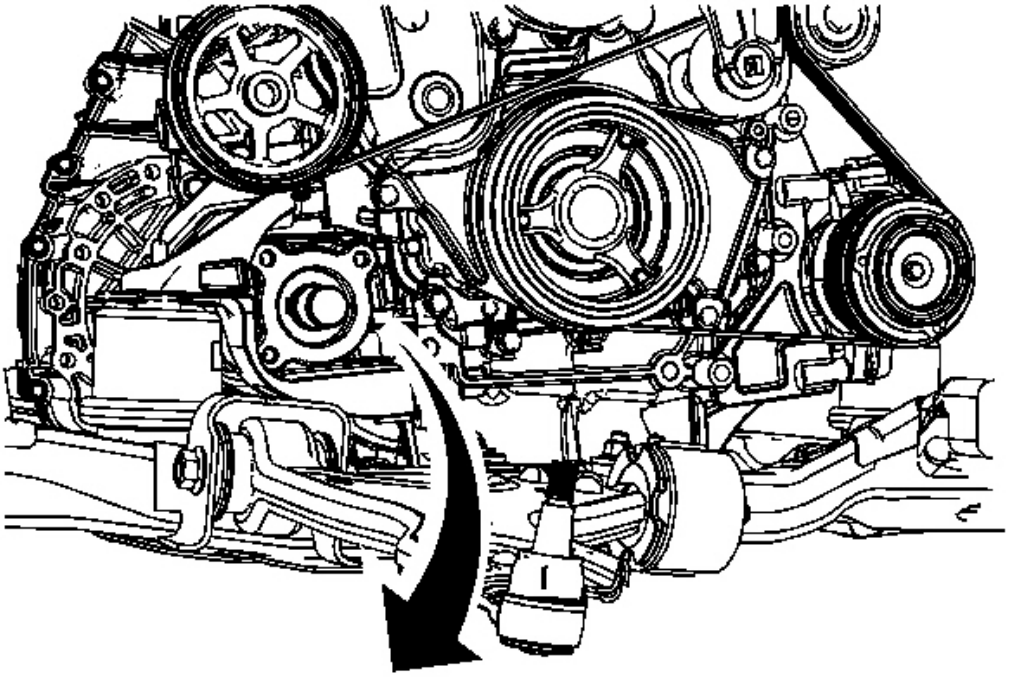


Fig. 7: View Of Intermediate Drive Shaft
Courtesy of GENERAL MOTORS CORP.

1. Install the intermediate drive shaft to the transaxle.
2. Ensure that the intermediate drive shaft is fully seated by grasping the intermediate drive shaft and attempting to pull free of the transaxle.
3. Position the intermediate shaft support bracket to the engine.



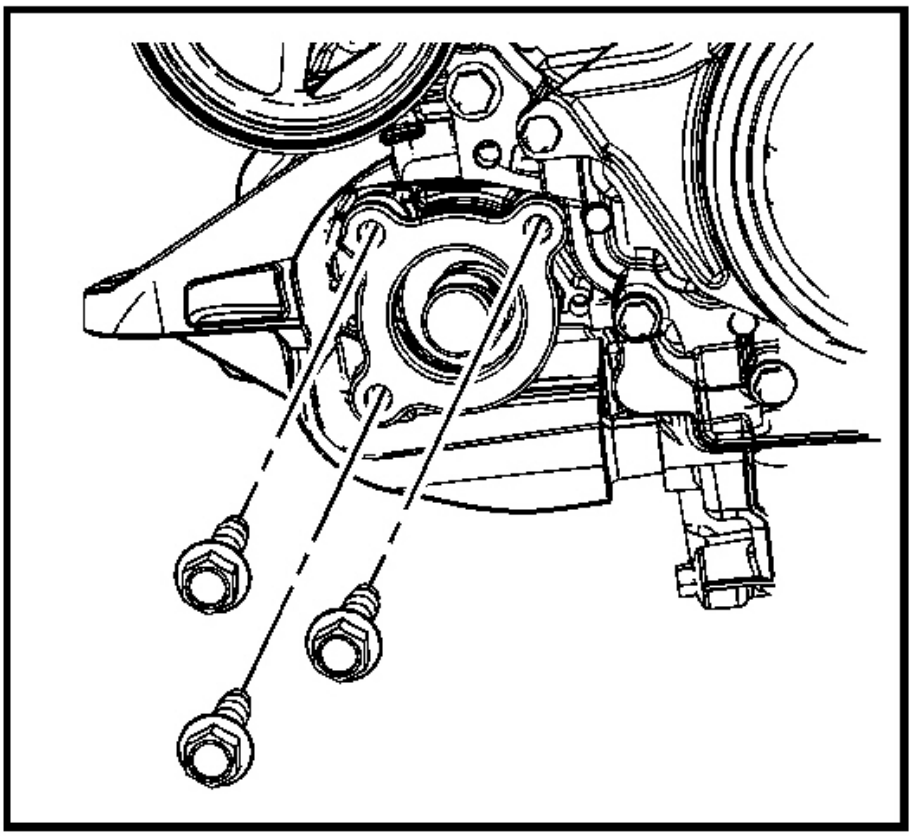


Fig. 8: View Of Intermediate Drive Shaft Mounting Bolts
Courtesy of GENERAL MOTORS CORP.

NOTE: Refer to Fastener Notice .

4. Install the support bracket bolts.

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

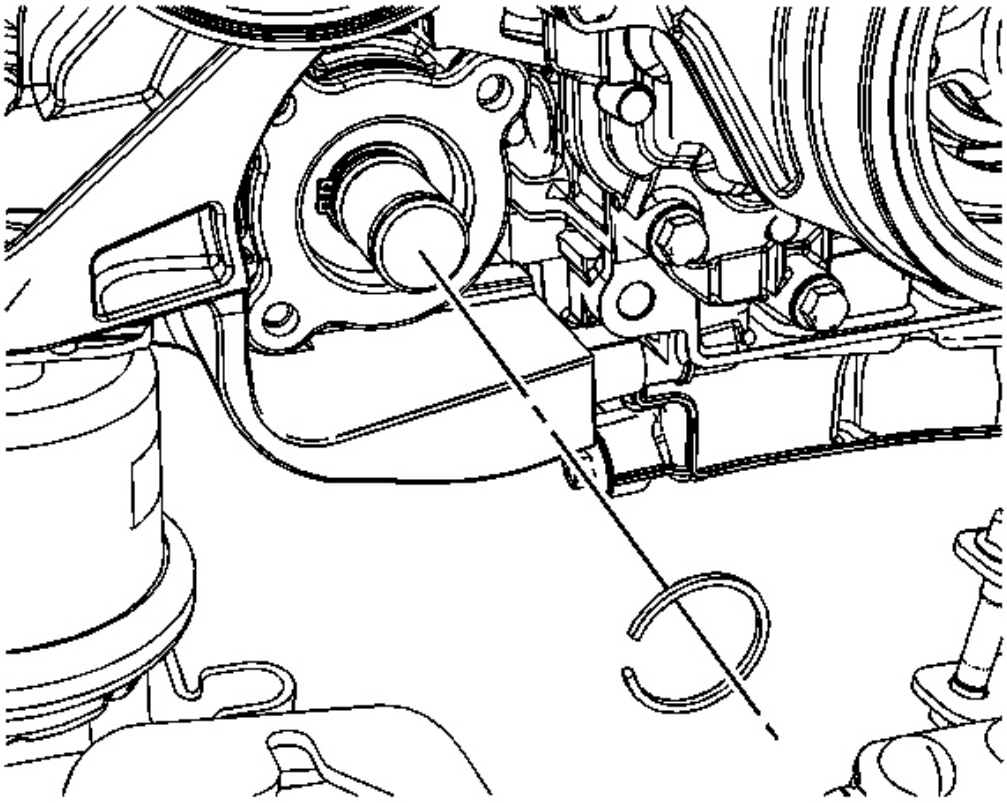


Fig. 9: Identifying Wheel Drive Shaft Retaining Ring
Courtesy of GENERAL MOTORS CORP.

5. Install a new wheel drive shaft retaining ring.
6. Install the right wheel drive shaft. Refer to **Front Wheel Drive Shaft Replacement**.
7. Remove the support and lower the vehicle.

FRONT WHEEL DRIVE SHAFT REPLACEMENT

Removal Procedure

IMPORTANT: The following service procedure can be used for both left and right front wheel drive shafts.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** .
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .
3. Remove the wheelhouse panel from the vehicle. Refer to **Rear Wheelhouse Liner Panel Replacement**

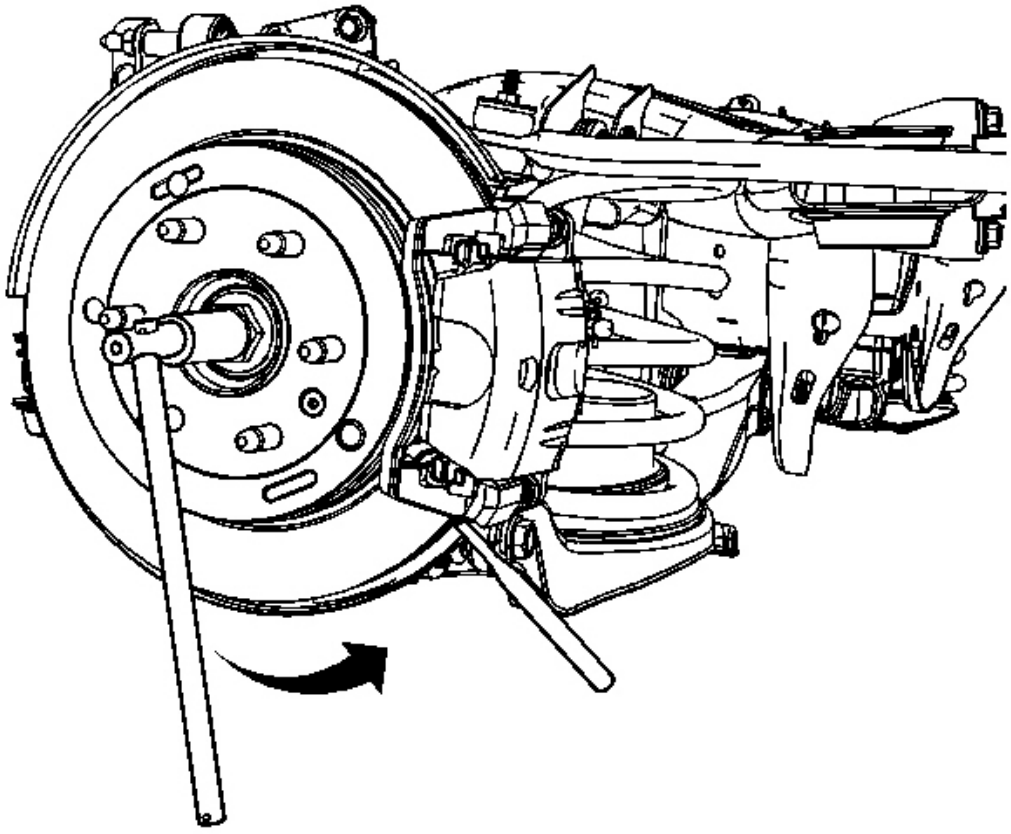


Fig. 10: View Of Tightening/Loosening The Wheel Drive Shaft Nut

Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The following procedure is to ensure that the wheel drive shaft assembly does not rotate while the nut is being removed.

4. Insert a punch or brass drift in the brake rotor so that the brass drift or punch rest against the brake caliper mounting bracket
5. Using a breaker bar and socket, loosen the wheel drive shaft nut.

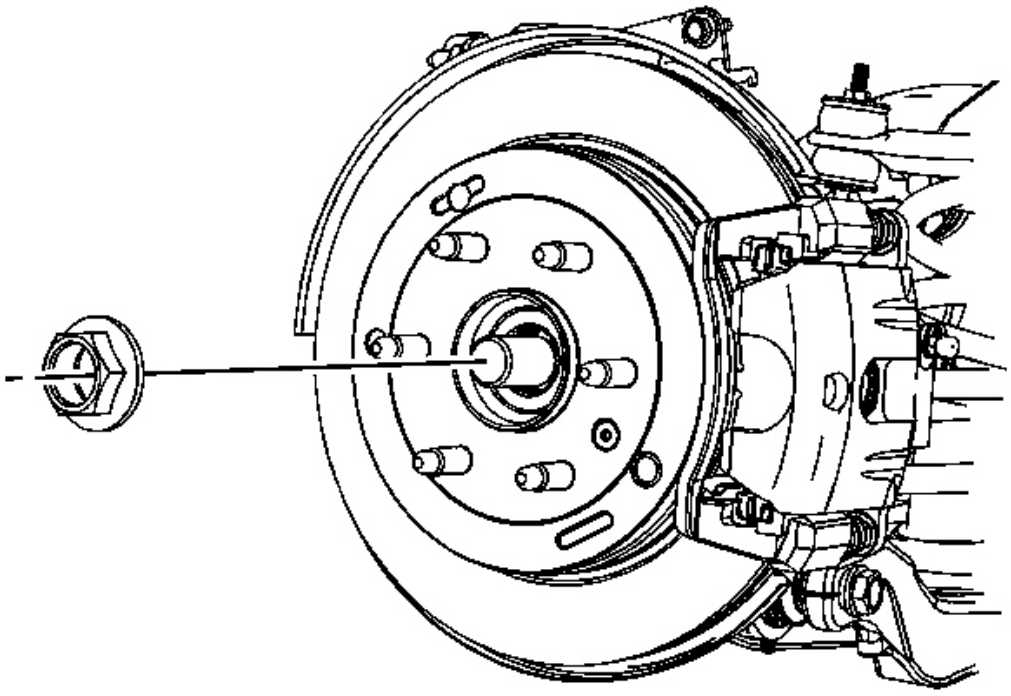


Fig. 11: Identifying Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: DO NOT re-use the wheel drive shaft nut, discard and use NEW.

6. Remove the wheel drive shaft nut.

7. Using the appropriate tool, remove the wheel drive shaft from the steering knuckle.

IMPORTANT: In the following service procedure, it is NOT necessary to completely remove the tie rod end. Only remove the tie rod end form the steering knuckle ONLY.

8. Remove the outer tie rod end from the steering knuckle. Refer to **Steering Linkage Outer Tie Rod Replacement** .
9. Remove the stabilizer shaft link at the stabilizer bar and secure. Refer to **Stabilizer Shaft Link Replacement** .
10. Remove the lower ball joint from the steering to **Lower Ball Joint Replacement**
11. Remove and relocate the suspension module to the side and secure.
12. Assemble the **J 2619-01** , **J 29794** and the **J 33008-A** . See **Special Tools**.

IMPORTANT: The following service procedure can be used on vehicles that are Front Wheel Drive (FWD) as well as vehicles equipped with All Wheel Drive (AWD).

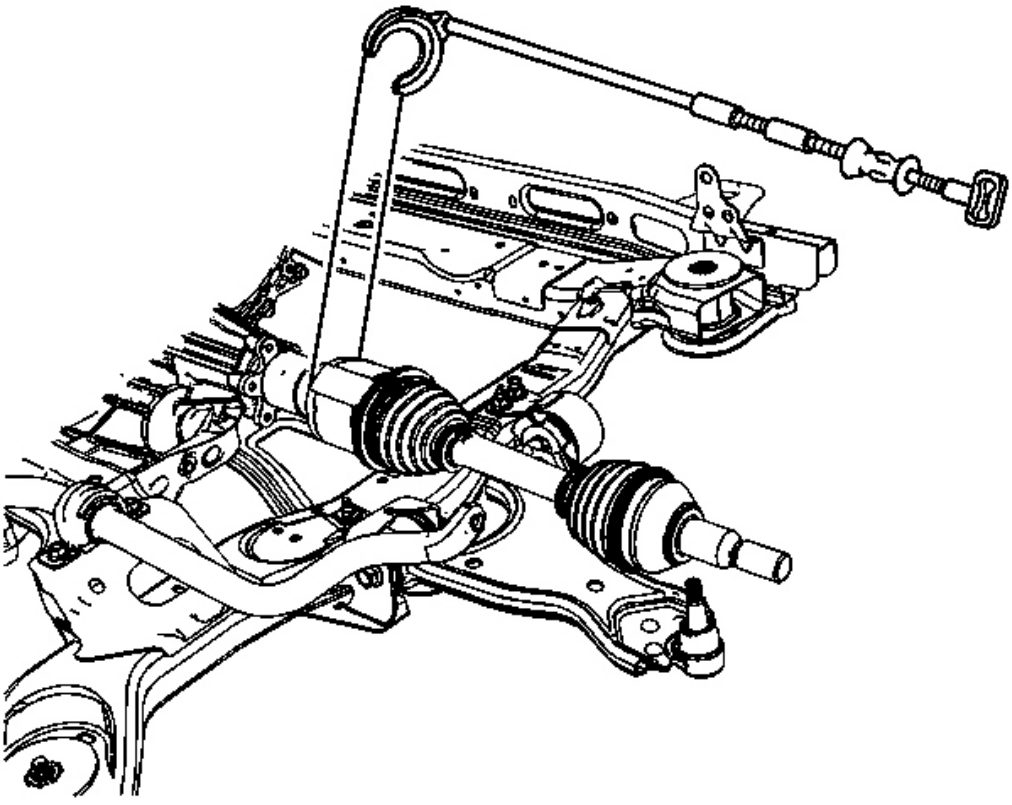


Fig. 12: Identifying Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

13. Using the **J 2619-01** , **J 29794** and the **J 33008-A** , remove the wheel drive shaft from the transaxle. See **Special Tools**.

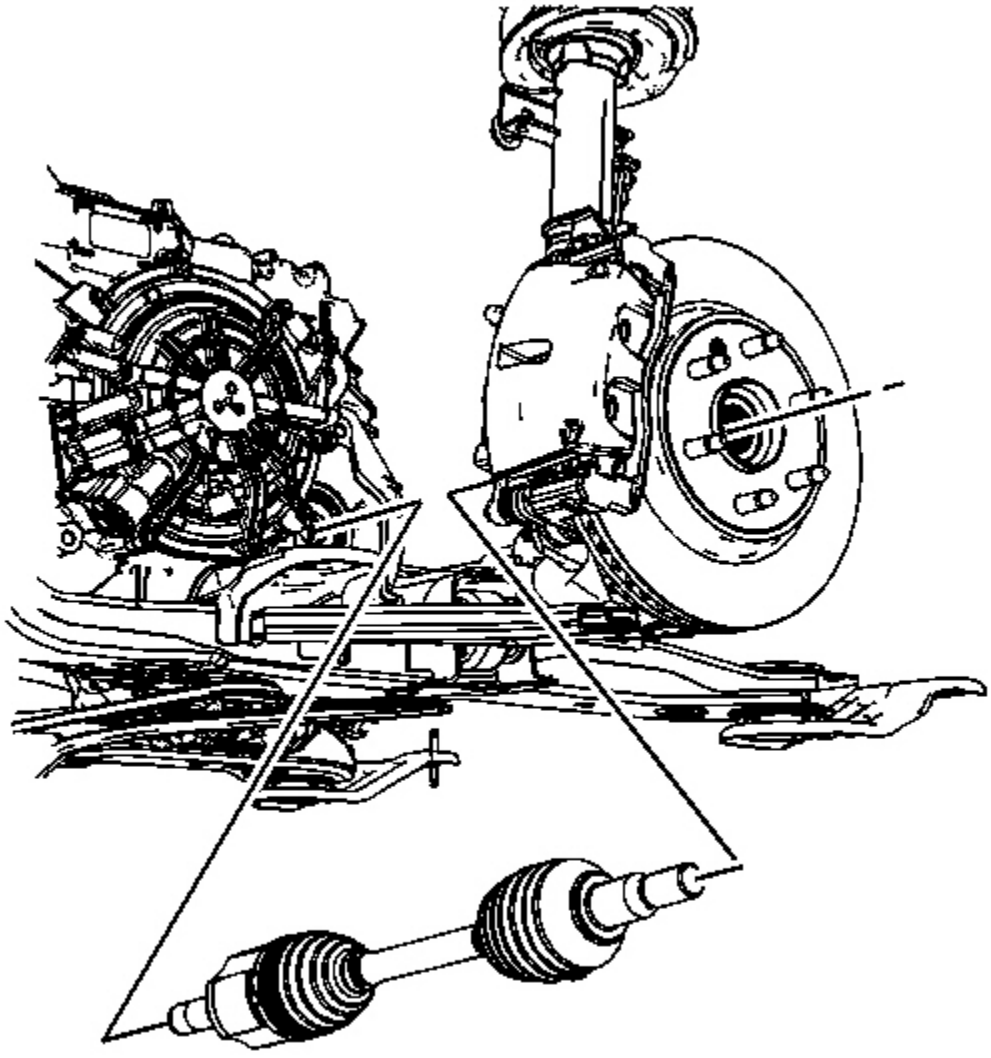


Fig. 13: View Of Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

14. Remove the wheel drive shaft from the vehicle.

Installation Procedure

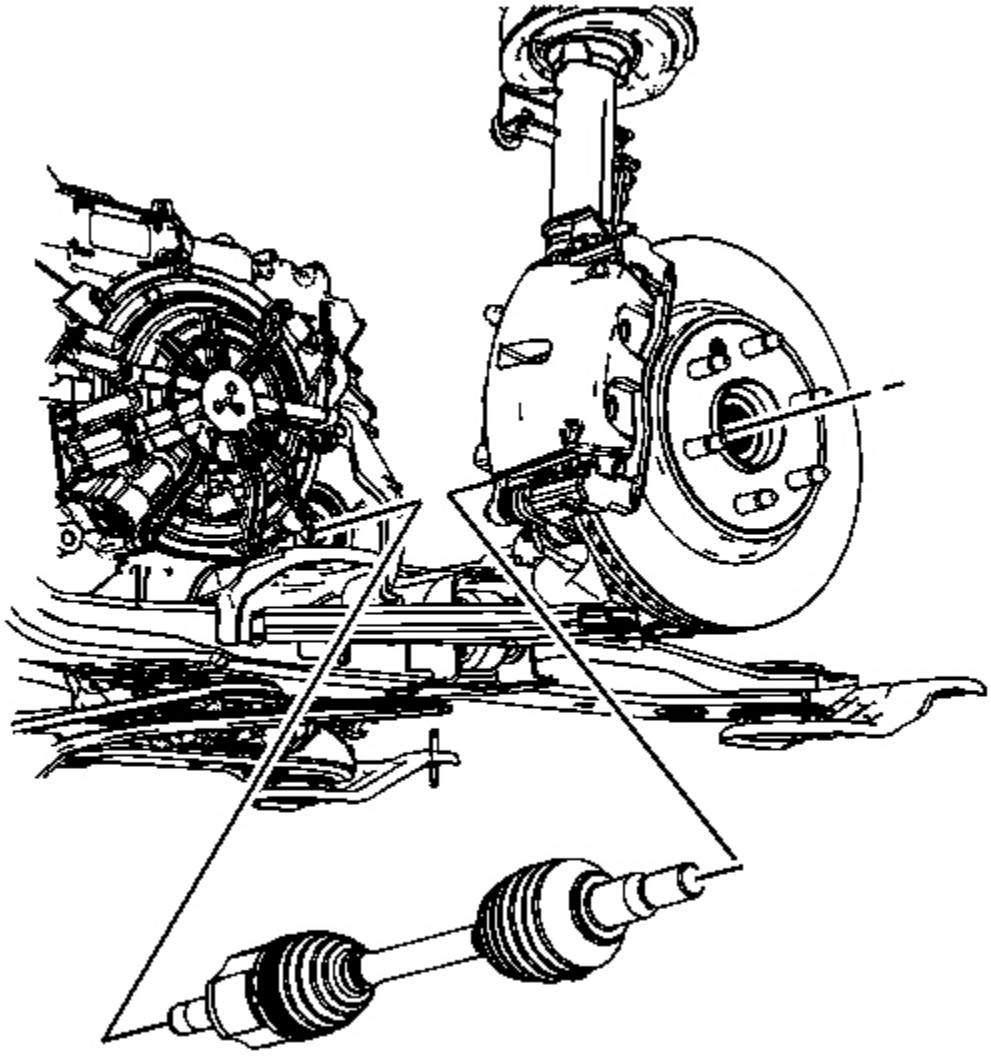


Fig. 14: View Of Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

1. Install the wheel drive shaft into the transfer case.
2. Install the wheel drive shaft into suspension module.
3. Install the lower ball joint in the steering knuckle. Refer to **Lower Ball Joint Replacement** .

4. Install the outer tie rod end to the steering knuckle. Refer to **Steering Linkage Outer Tie Rod Replacement** .
5. Install the stabilizer link to the stabilizer bar. Refer to **Stabilizer Shaft Link Replacement** .

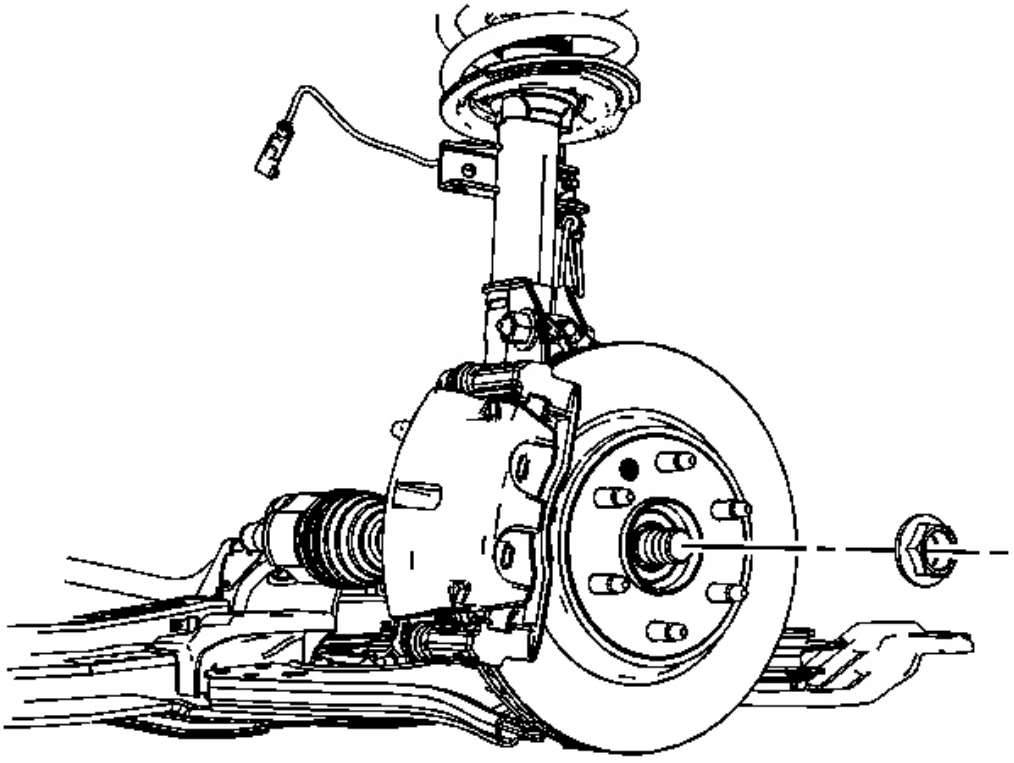


Fig. 15: Identifying Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

6. Install the wheel drive shaft nut, tighten by hand.

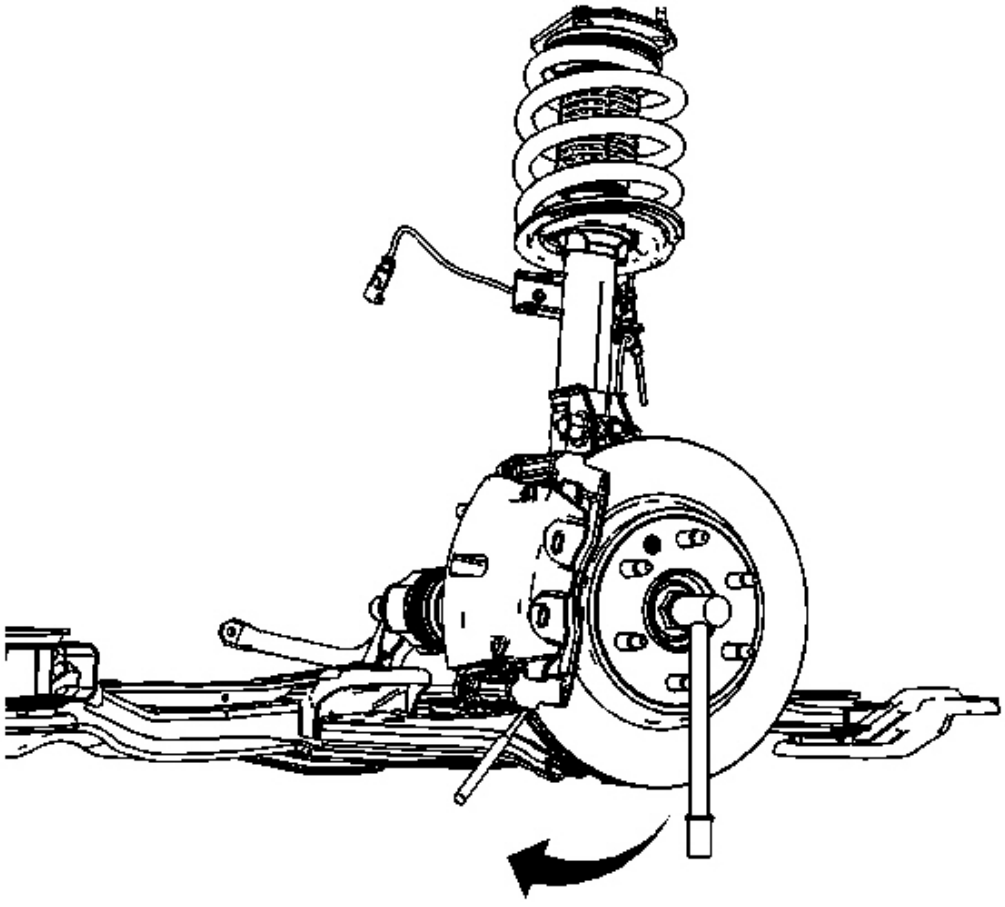


Fig. 16: Illustrating Tightening Of Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

7. Insert a brass drift or punch in the brake rotor so that it rest against the brake caliper mounting bracket.

NOTE: Refer to Fastener Notice .

8. Using a torque wrench and socket, tighten the wheel drive shaft nut.

Tighten: Tighten to 260 N.m (192 lb ft).

9. Install the wheel house panel on the vehicle. Refer to **Rear Wheelhouse Liner Panel Replacement** .
10. Install the tire and wheel. Refer to **Lifting and Jacking the Vehicle** .
11. Remove the support and lower the vehicle.

REAR WHEEL DRIVE SHAFT AND REAR AXLE SHAFT SEAL REPLACEMENT

Tools Required

- **J 2619-O1** Slide Hammer. See **Special Tools**.
- **J 29794** Axle Shaft Remover Extension. See **Special Tools**.
- **J 33008-A** Axle Shaft Puller. See **Special Tools**.
- **J 33832** Installer
- **J 8092** Handle

Removal Procedure

IMPORTANT: Both the right and left wheel drive shafts are serviced the same.

1. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

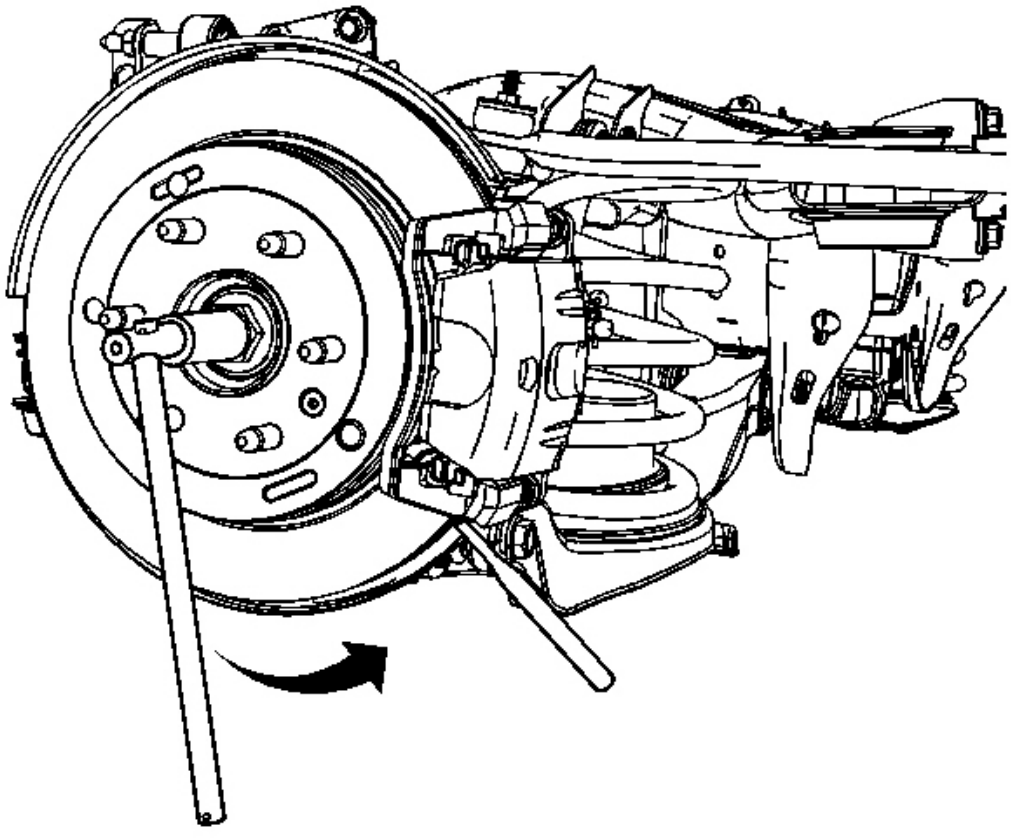


Fig. 17: View Of Tightening/Loosening The Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: The following procedure is to ensure that the wheel drive shaft assembly does not rotate while the nut is being removed or tighten.

2. Insert a brass drift or punch in the brake rotor so that the brass drift or punch rest against the brake caliper mounting bracket.
3. Using the breaker bar and socket, loosen the wheel drive shaft nut.

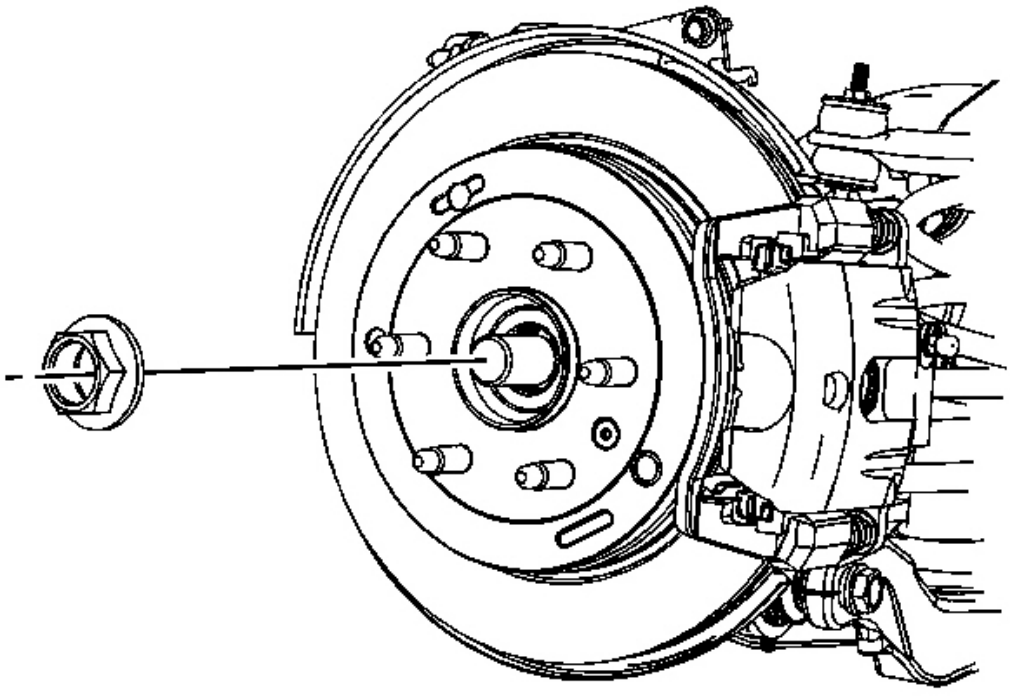


Fig. 18: Identifying Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: DO NOT re-use the wheel drive shaft nut, discard and use NEW.

4. Remove the wheel drive shaft nut.
5. Remove the wheel bearing/hub assembly. Refer to **Rear Wheel Bearing and Hub Replacement (AWD)** or **Rear Wheel Bearing and Hub Replacement (FWD)** .
6. Assemble the **J 33008-A** , **J 29794** and **J 2619-01** . See **Special Tools**.

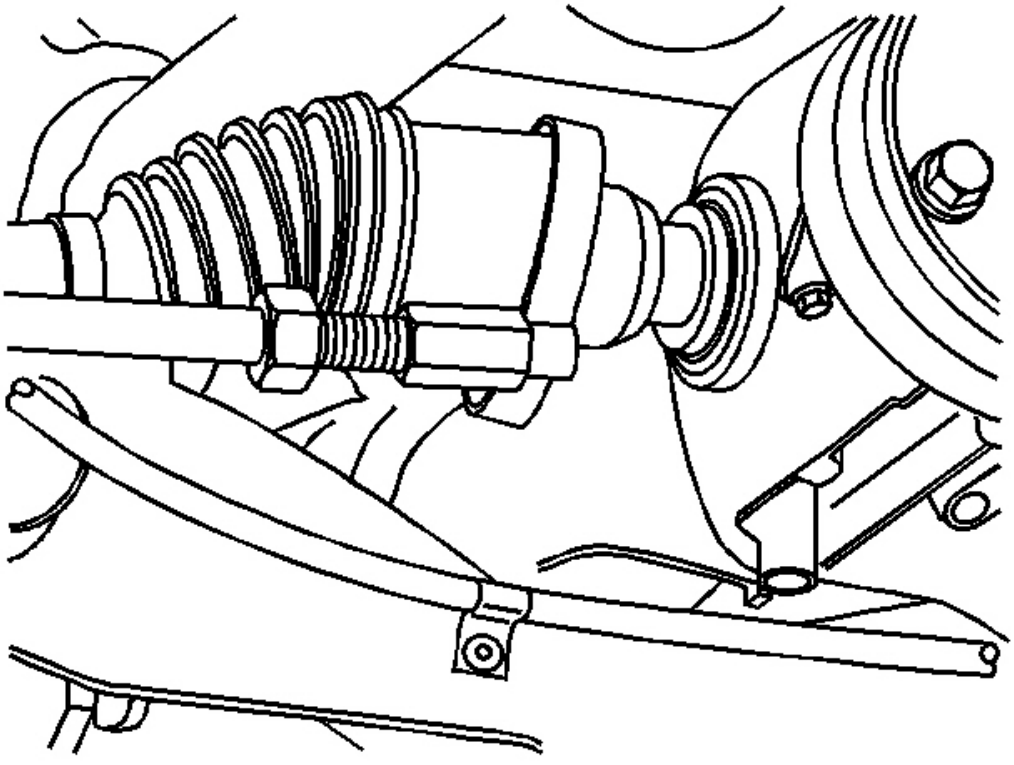


Fig. 19: View Of Wheel Drive Shaft Inner Joint Housing
Courtesy of GENERAL MOTORS CORP.

7. Assemble the **J 33008-A** , **J 29794** and **J 2619-01** and position on the wheel drive shaft. See **Special Tools**.

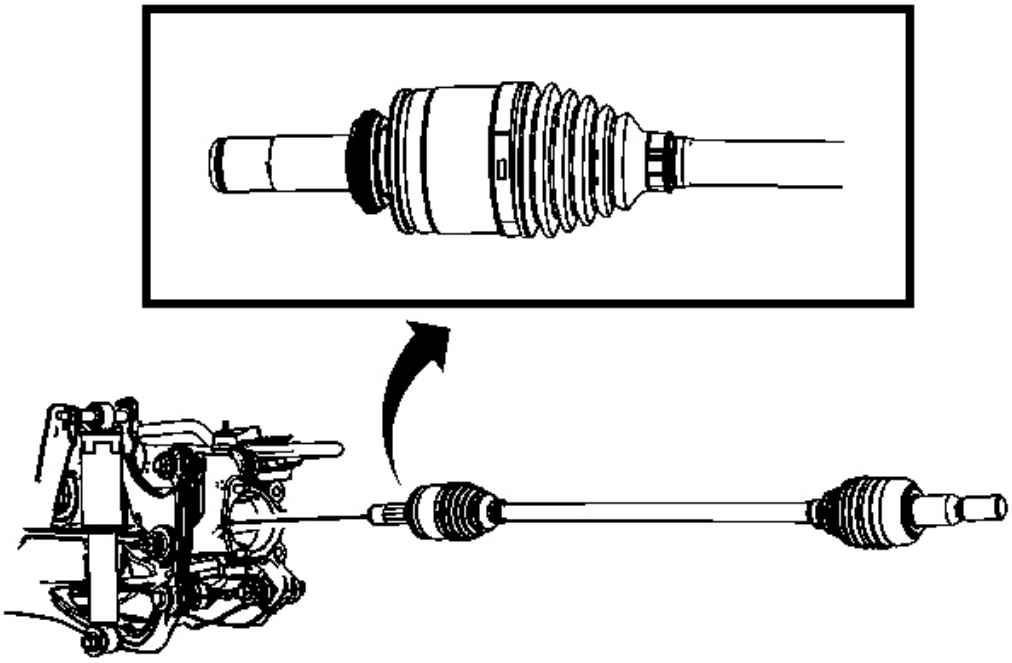


Fig. 20: View Of Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Because of the design of the wheel drive shaft inner seal, the seal will be removed at the same time the wheel drive shaft is removed. Replace the seal, DO NOT re-use the seal. Replace with NEW.

8. Using the **J 33008-A** , **J 29794** and **J 2619-01** , remove the wheel drive shaft. Left side shown, right side similar. See **Special Tools**.

IMPORTANT: The rear knuckle does not have to be removed in order to service either the right or left rear the wheel drive shaft. The opening in the knuckle is large enough to allow the wheel drive shaft to pass through.

9. Remove the wheel drive shaft through the knuckle.
10. If servicing the right wheel drive shaft, remove the muffler assembly. Refer to **Muffler**

Replacement (NB5) or **Muffler Replacement (NEA/NEB)** .

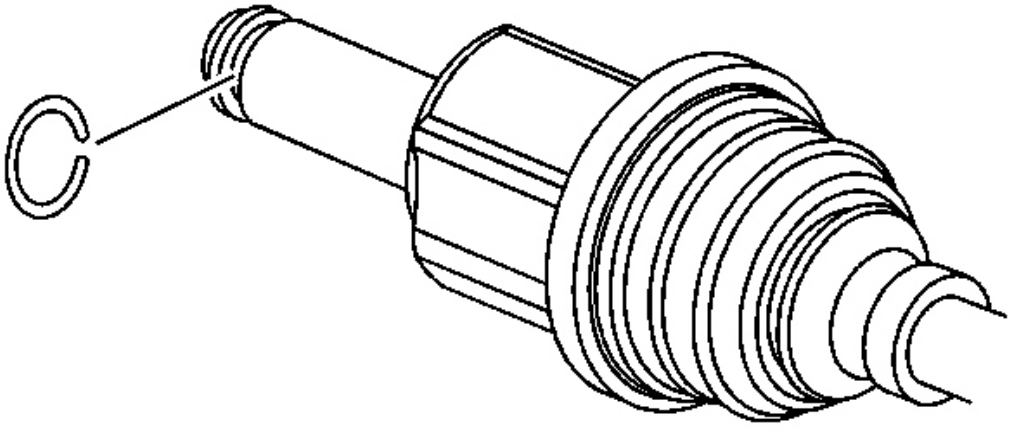


Fig. 21: Identifying Retaining Ring
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: DO NOT re-use the retaining clip, replace with NEW.

11. Remove the retaining ring from the tripod.

Installation Procedure

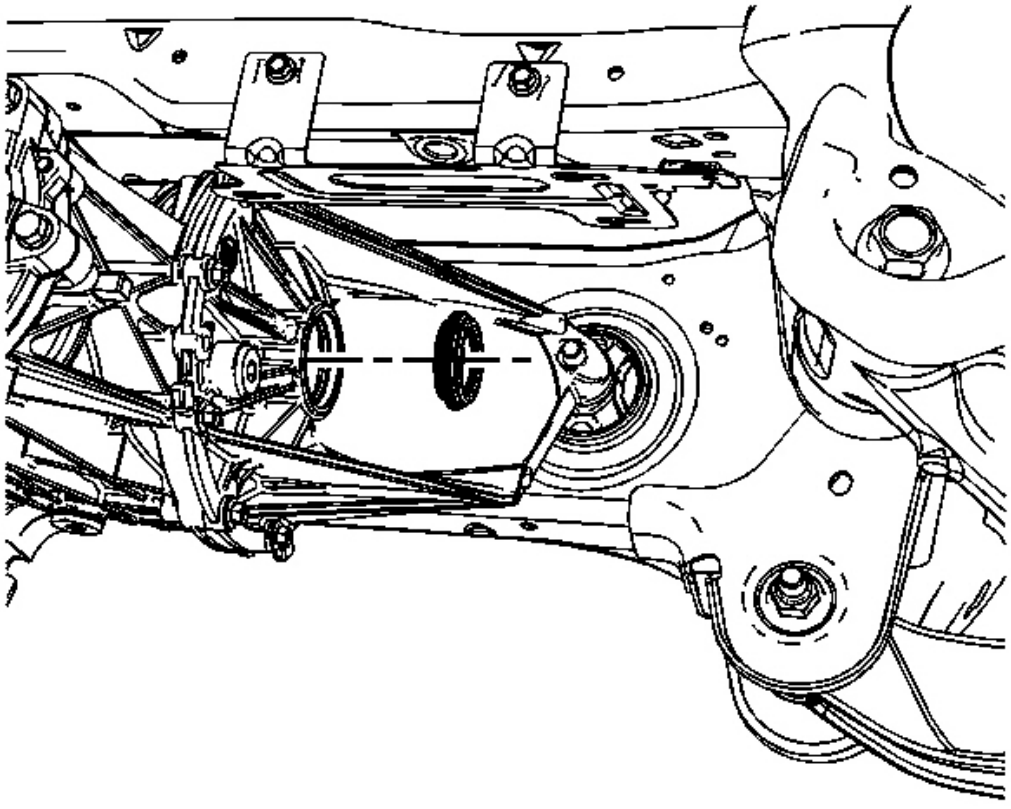


Fig. 22: Identifying Wheel Drive Shaft Seal
Courtesy of GENERAL MOTORS CORP.

1. Position the new seal in the wheel drive shaft seal. Left side shown, right similar.
2. Assemble the **J 33832** and the **J 8092** .

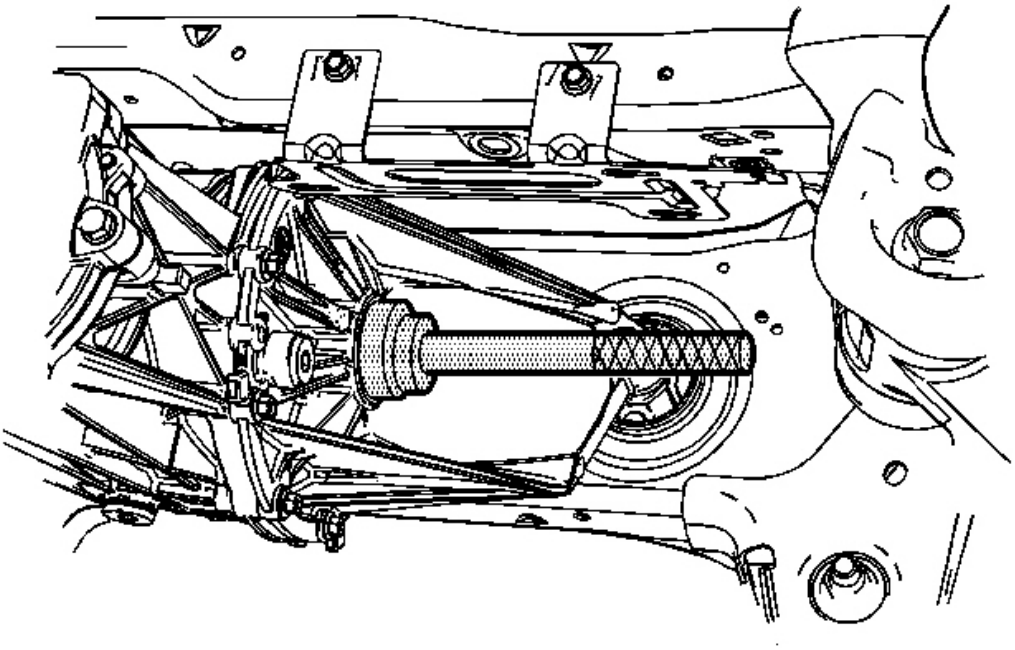


Fig. 23: View Of J 33832 And J 8092
Courtesy of GENERAL MOTORS CORP.

3. Using the **J 33832** and the **J 8092** , install the wheel drive shaft seal.

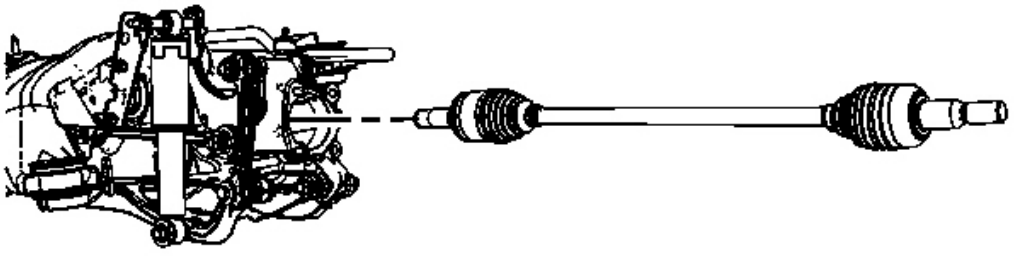


Fig. 24: Identifying Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

4. Install the wheel drive shaft through the knuckle.
5. Install the wheel bearing/hub assembly. Refer to **Rear Wheel Bearing and Hub Replacement (AWD)** or **Rear Wheel Bearing and Hub Replacement (FWD)** .

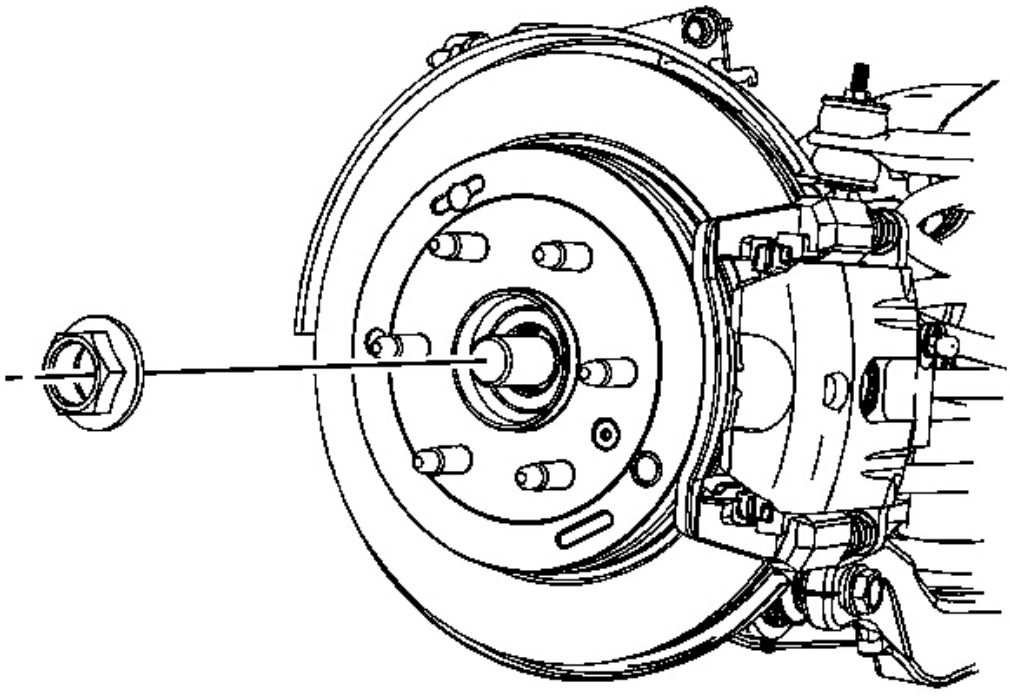


Fig. 25: Identifying Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

6. Install the wheel drive shaft nut.
7. Install the muffler assembly, if removed. Refer to **Muffler Replacement (NB5)** or **Muffler Replacement (NEA/NEB)** .

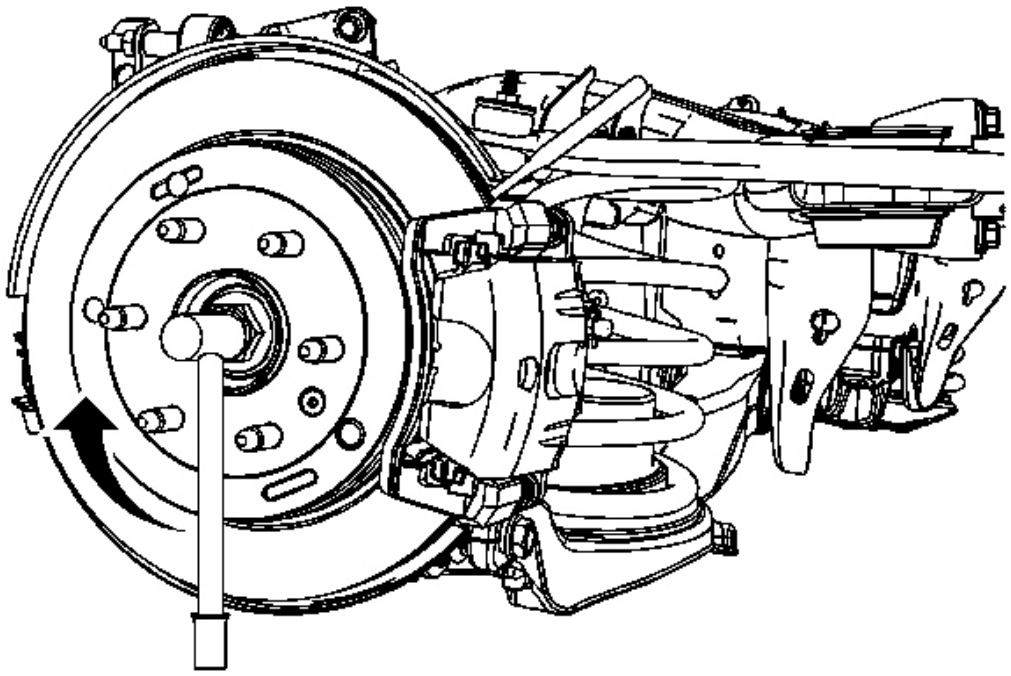


Fig. 26: View Of Tightening Procedure For New Wheel Drive Shaft Nut
Courtesy of GENERAL MOTORS CORP.

8. Insert a brass drift or punch in the brake rotor so that the brass drift or punch rest against the brake caliper mounting bracket.

NOTE: Refer to Fastener Notice .

9. Using a torque wrench and socket, tighten the new wheel drive shaft nut.

   Tighten: Tighten the nut to 260 N.m (192 lb ft).

10. Check the fluid level in the rear differential for any fluid loss during the service procedure. Refer to **Rear Axle Lubricant Level Inspection** .
11. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** .

FRONT WHEEL DRIVE SHAFT INNER JOINT AND SEAL REPLACEMENT

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

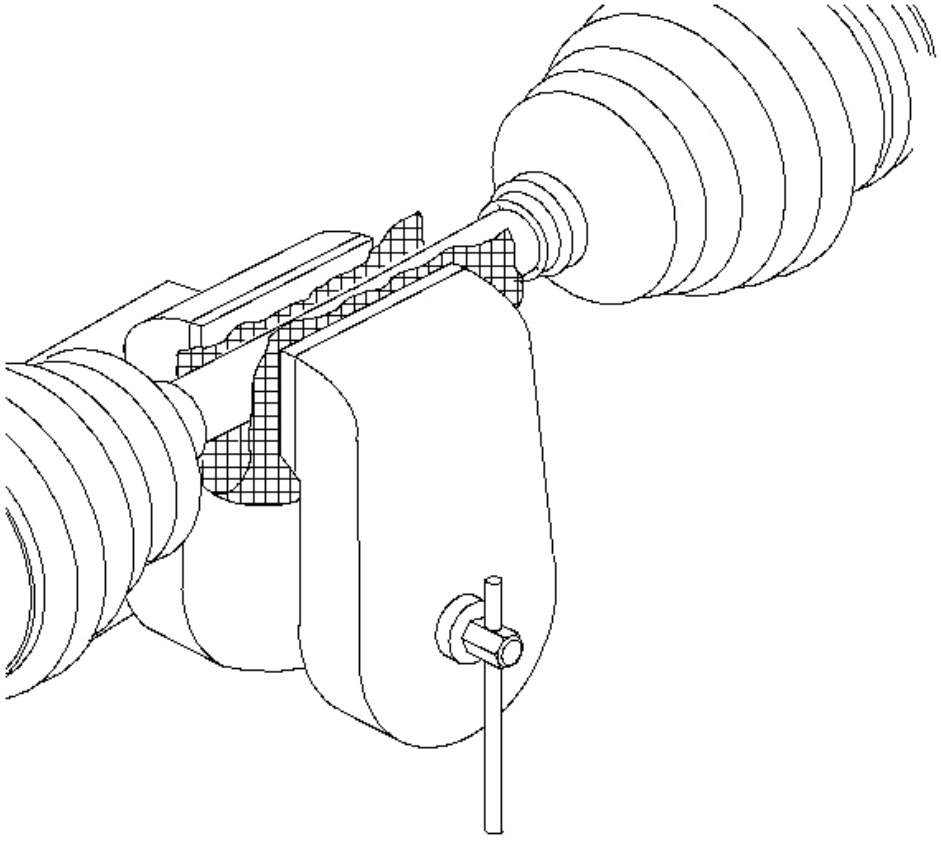


Fig. 27: View Of Front Wheel Drive Shaft Inner Joint
Courtesy of GENERAL MOTORS CORP.

1. Position wheel drive shaft bar in a soft jawed vise and clamp securely.
2. Using side cutters, remove and discard the small seal clamp.

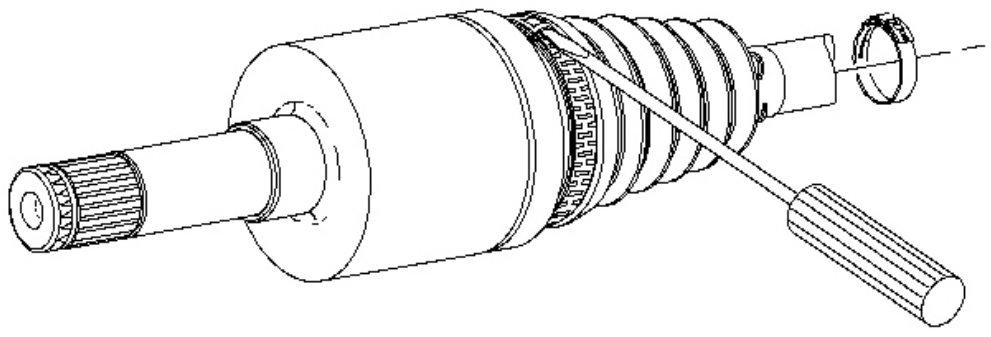


Fig. 28: Identifying Large Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

3. Remove large seal retaining clamp using a flat-bladed tool and discard the clamp.

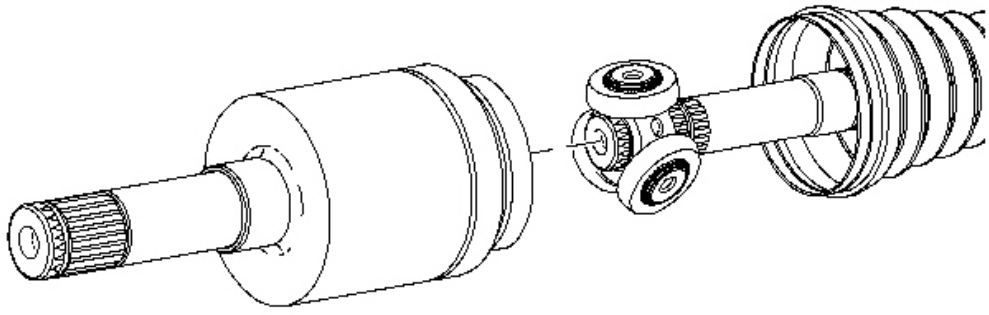


Fig. 29: Illustrating Separating Boot From Tri-Pot Housing At Large Diameter End
Courtesy of GENERAL MOTORS CORP.

4. Separate the seal from the tripot housing at the large diameter and slide the seal away from the joint along the axle shaft.
5. Wipe the excess grease from the face of the tripot spider and the inside of the tripot housing.
6. Remove the tripot housing from the spider and shaft.

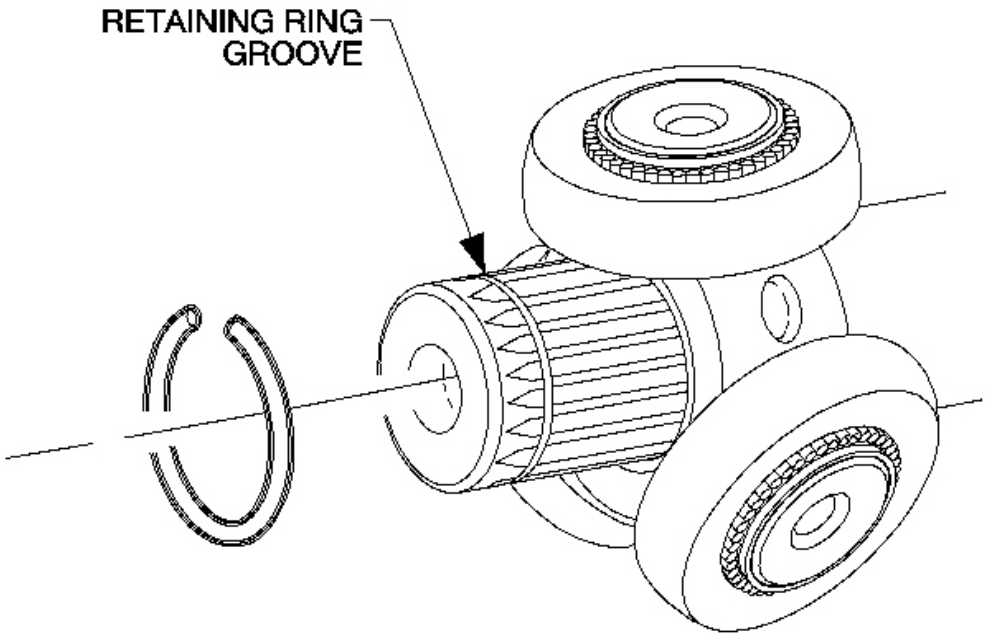


Fig. 30: View Of Spider Assembly & Retaining Ring
Courtesy of GENERAL MOTORS CORP.

7. Remove the retaining ring from the groove on the wheel drive shaft bar and remove the spider assembly.
8. Remove the seal from the wheel drive shaft bar.
9. Thoroughly clean all parts with a suitable solvent, removing all traces of grease and contaminants.
10. Dry all parts with compressed air.
11. Inspect the tripot joint components for unusual wear, cracks and other damage. Replace any

damaged components.

Assembly Procedure

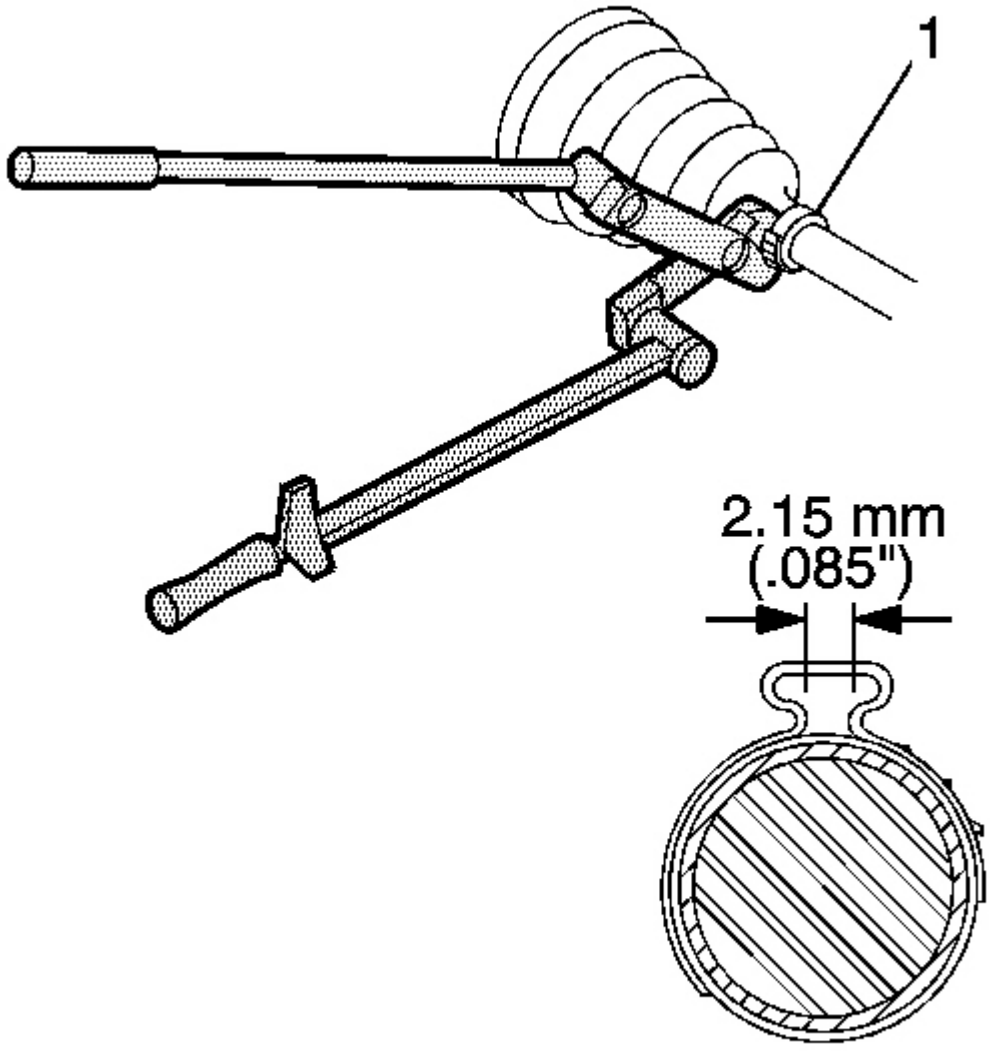


Fig. 31: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

1. Install the small seal clamp (1) to the seal. Do not crimp the clamp.
2. Slide the inner seal onto the wheel drive shaft bar and locate the lip of the seal groove on

the wheel drive shaft bar.

IMPORTANT: Ensure the seal clamp is positioned correctly in the seal groove.

3. Using the **J 35910** , crimp the small seal clamp.
4. Measure the clamp gap width.

Specification: Clamp gap width should not exceed 2.15 mm (0.85 in).

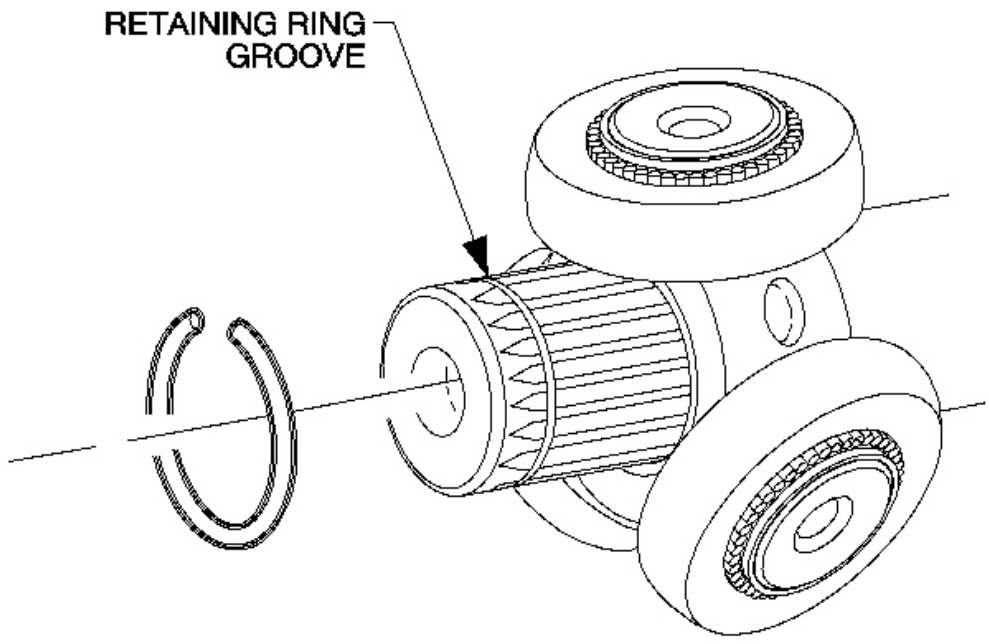


Fig. 32: View Of Spider Assembly & Retaining Ring

Courtesy of GENERAL MOTORS CORP.

5. Install the tripot spider assembly to the wheel drive shaft bar, until seated against shoulder.
6. Install the retaining ring in the groove of the wheel drive shaft bar with suitable pliers.
7. Place approximately half of the grease in the kit to the seal and place the remainder in the tripot housing.

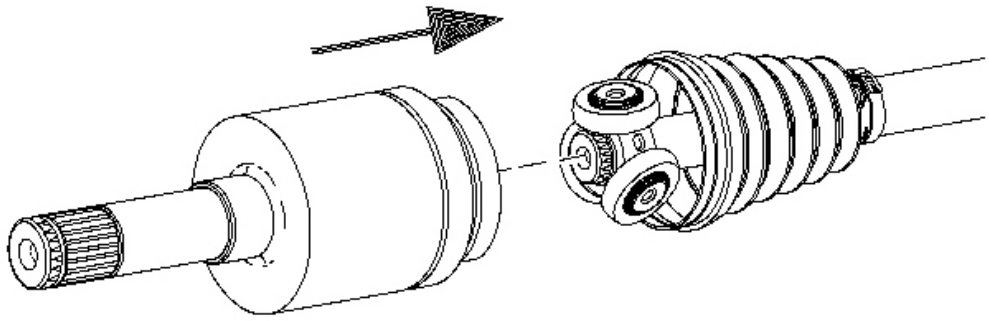


Fig. 33: Sliding Tri-Pot Housing Over Tri-Pot Spider Assembly On Shaft
Courtesy of GENERAL MOTORS CORP.

8. Install the large clamp over the large diameter of the seal.

9. Install the tripot housing to the tripot spider assembly on the wheel drive shaft bar.
10. Slide the large diameter of the seal over the outside of the tripot housing and position the lip of the seal in the housing groove.

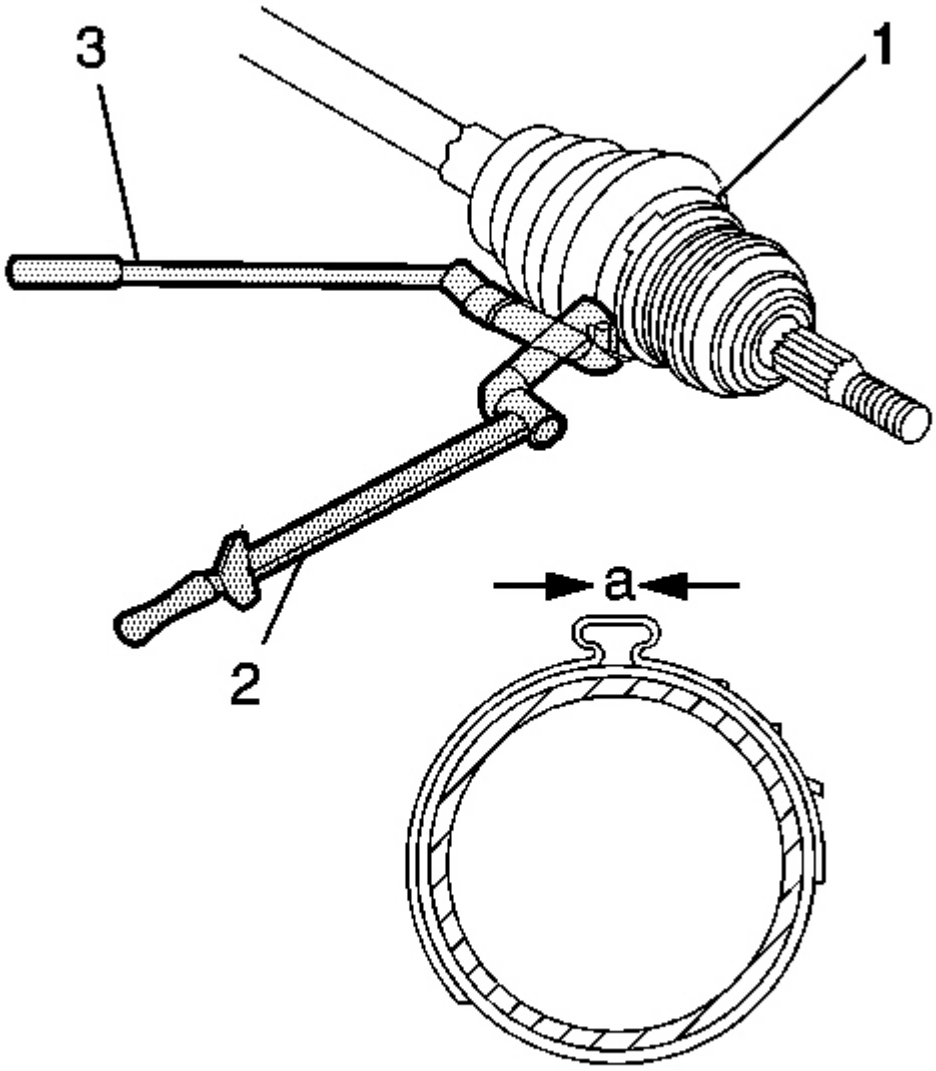


Fig. 34: View Of Outboard Seal, Large Seal Retaining Clamp & CV Joint Outer Race
Courtesy of GENERAL MOTORS CORP.

11. Place the large seal retaining clamp (1) around the seal and close using **J 35910** (2-3).
12. Inspect the gap dimension on the clamp ear (a). Continue tightening until the gap dimension is reached.

    Specification: Dimension equals 1.9 mm (5/64 in).

13. Rotate the housing in a circular motion to distribute the grease in the tripot joint.

REAR WHEEL DRIVE SHAFT INNER JOINT AND SEAL REPLACEMENT

Tools Required

- **J 35566** Drive Axle Seal Clamp Pliers. See **Special Tools**.
- **J 42572** Drive Shaft Seal Clamp Pliers. See **Special Tools**.

Disassembly Procedure

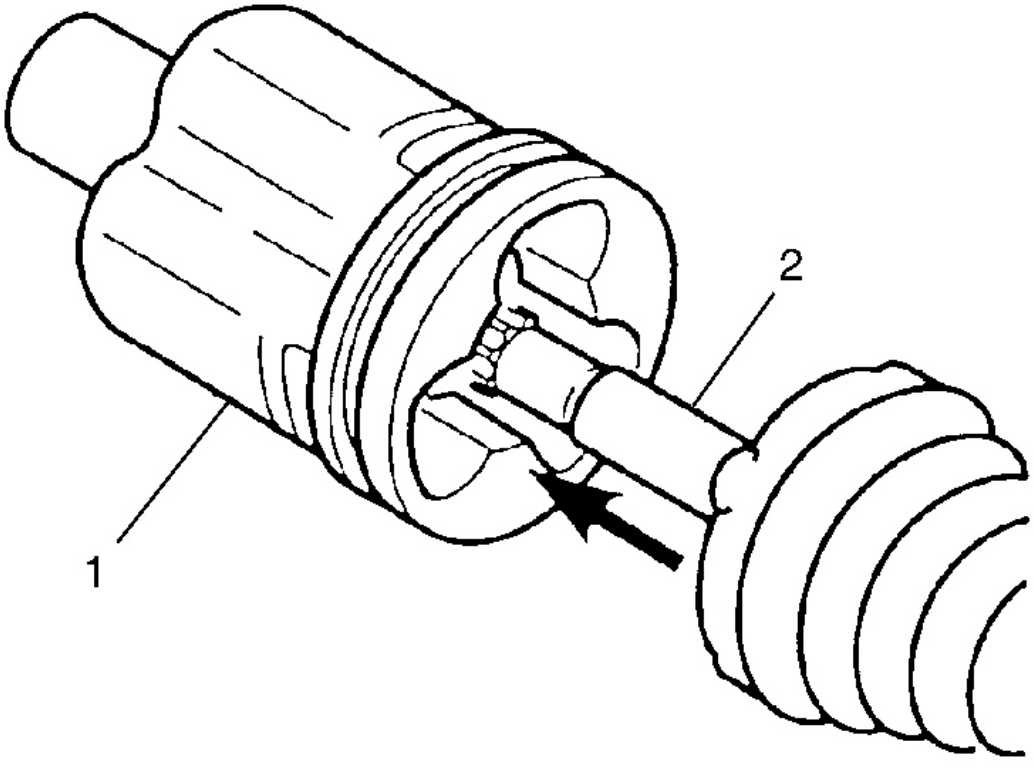


Fig. 35: View Of Housing, Tripot Joint Spider & Halfshaft Bar

Courtesy of GENERAL MOTORS CORP.

1. Remove the small seal clamp from the wheel drive shaft bar using side cutters and discard the clamp.

IMPORTANT: Do not cut into the wheel drive shaft trilobal tripot bushing.

2. Remove the large seal clamp from the tripot joint with side cutters and discard the clamp.
3. Separate the wheel drive shaft inboard seal from the trilobal tripot bushing.
4. Slide the seal away from the joint along the wheel drive shaft bar.
5. Remove the housing (1) from the tripot joint spider and the wheel drive shaft bar (2).

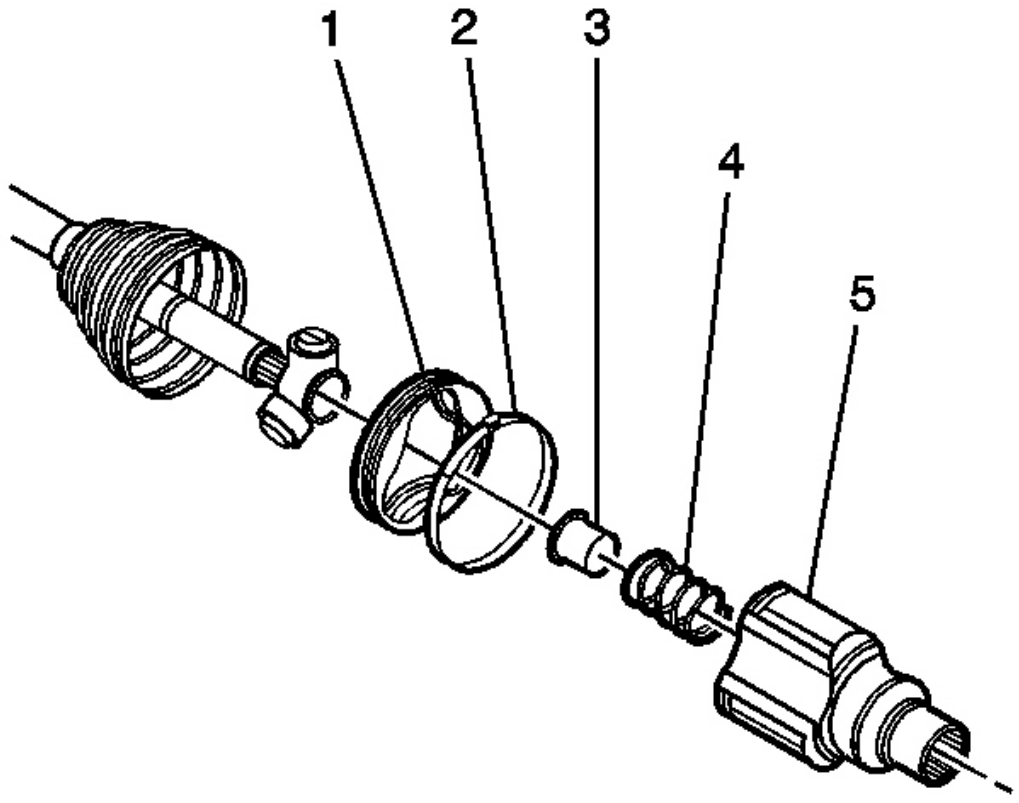


Fig. 36: View Of Wheel Drive Shaft Inner Joint Components
Courtesy of GENERAL MOTORS CORP.

6. Remove the guide (3) from the spring.
7. Remove the spring (4) from the tripot housing.

IMPORTANT: The correct 60 degree offset relationship between the inner and outer tripot spiders must be maintained. Accurately reference mark the tripot spider position on the wheel drive shaft bar before disassembly.

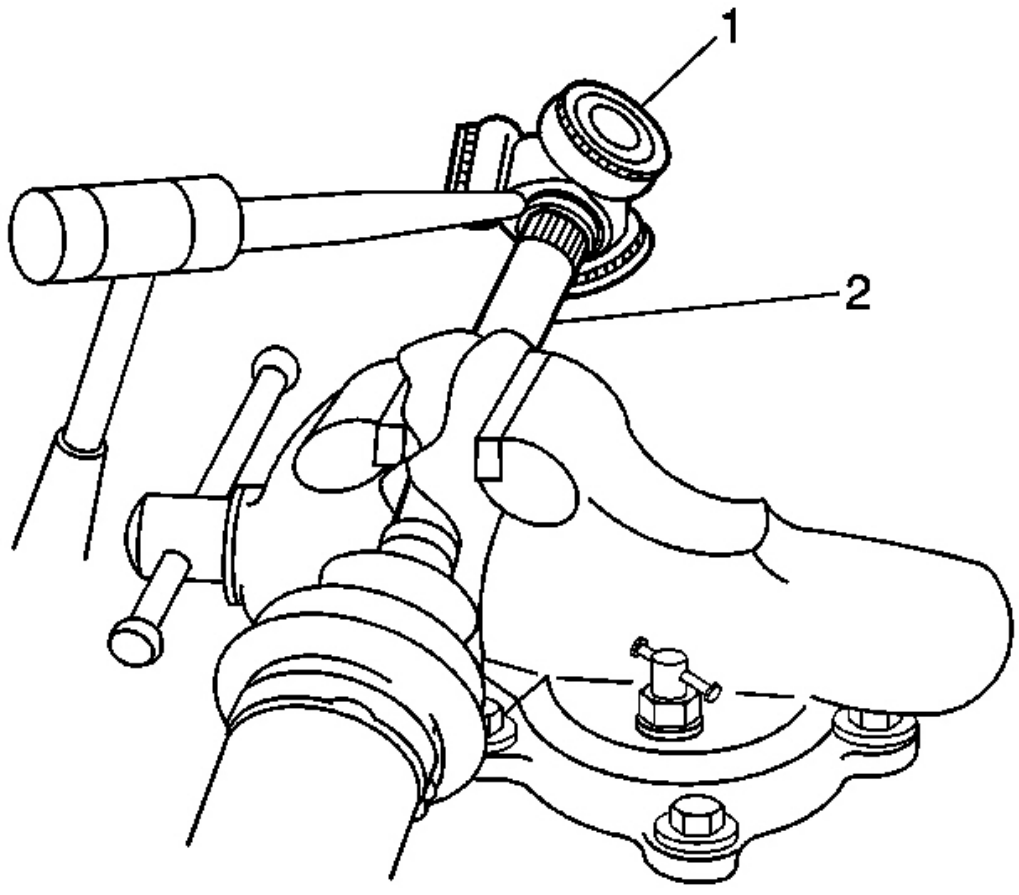


Fig. 37: View Of Tripot Spider & Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

8. Reference mark the position of the tripot spider (1) on the wheel drive shaft bar (2).

9. Using a brass drift and hammer, carefully tap around the tripot spider face in order to compress the barrel retaining ring on the wheel drive shaft bar.
10. Remove the tripot spider from the wheel drive shaft bar.
11. Remove and discard the barrel retaining ring from the wheel drive shaft bar.
12. Remove the joint seal from the wheel drive shaft bar.
13. Inspect the following parts for damage or wear:
    - The wheel drive shaft inboard seal
    - The tripot joint spider assembly
    - The housing
    - The trilobal tripot bushing

Assembly Procedure

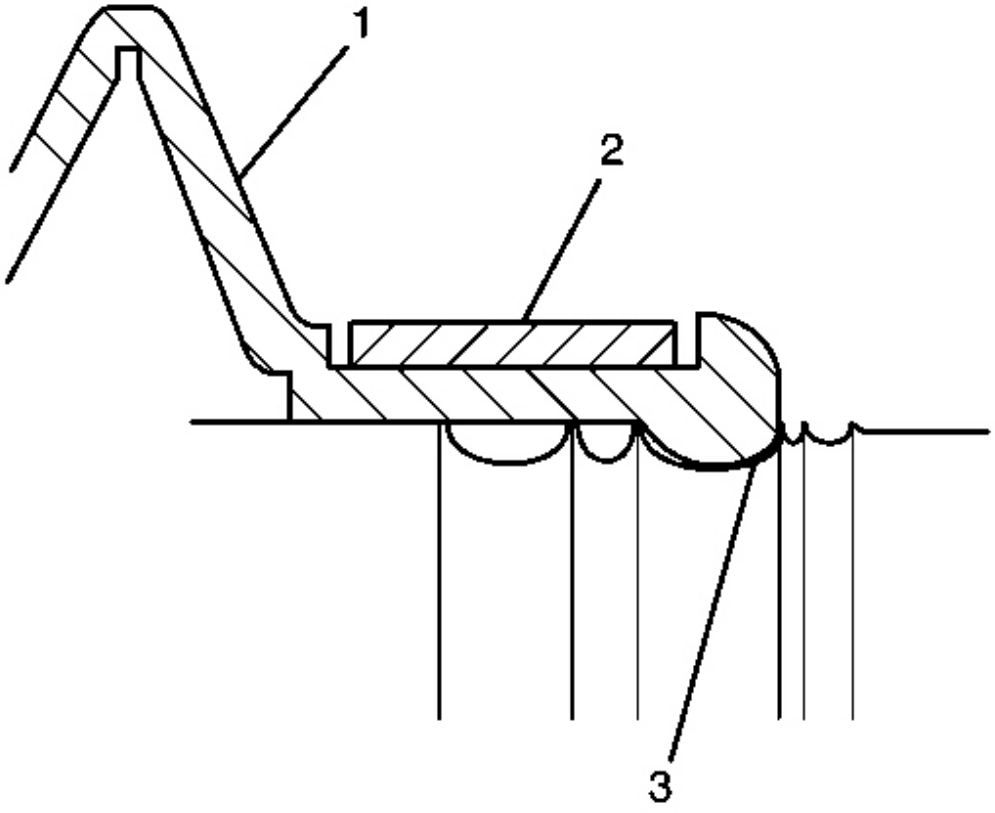


Fig. 38: View Of Swage Ring, Joint Boot & Boot Groove
Courtesy of GENERAL MOTORS CORP.

1. Place the new small seal clamp (2) onto the small end of the joint seal (1). Slide the joint seal and the small seal clamp onto the wheel drive shaft bar.
2. Position the small end of the joint seal into the joint seal groove (3) on the wheel drive shaft bar.

NOTE: Refer to Fastener Notice.

3. Using the **J 42572** , crimp the small seal retaining clamp. See **Special Tools**.

   Tighten: Tighten the clamp to 136 N.m (100 lb ft).

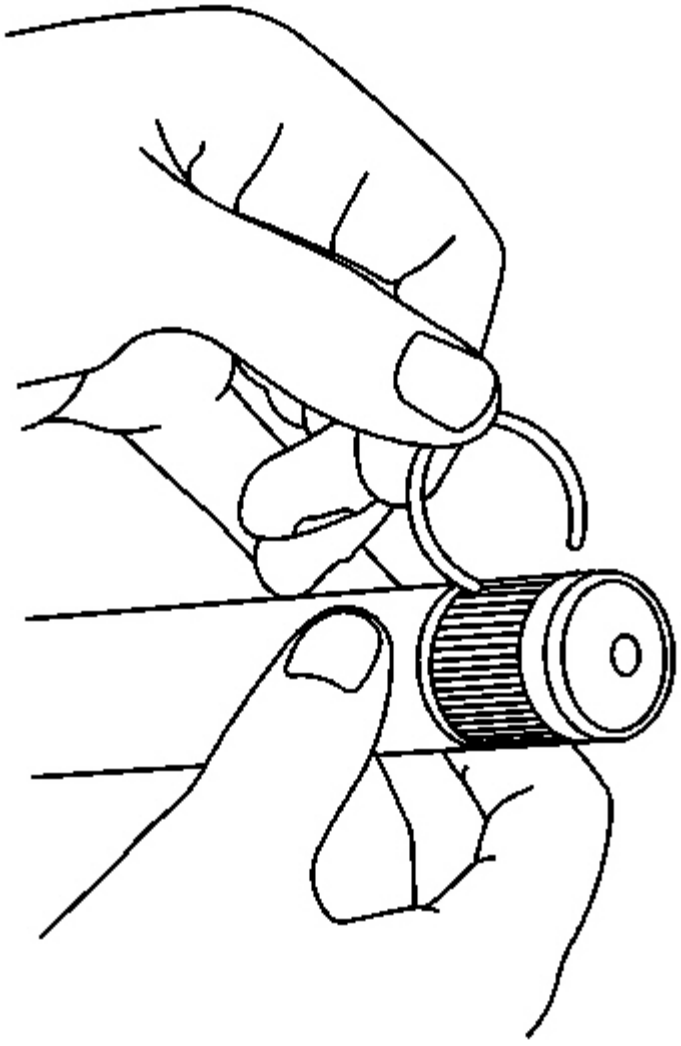


Fig. 39: View Of Axle Shaft Retaining Ring
Courtesy of GENERAL MOTORS CORP.

4. Install a new barrel retaining ring to the wheel drive shaft bar.

IMPORTANT: The proper 60 degree offset relationship between the inner and outer tripot spiders must be maintained.

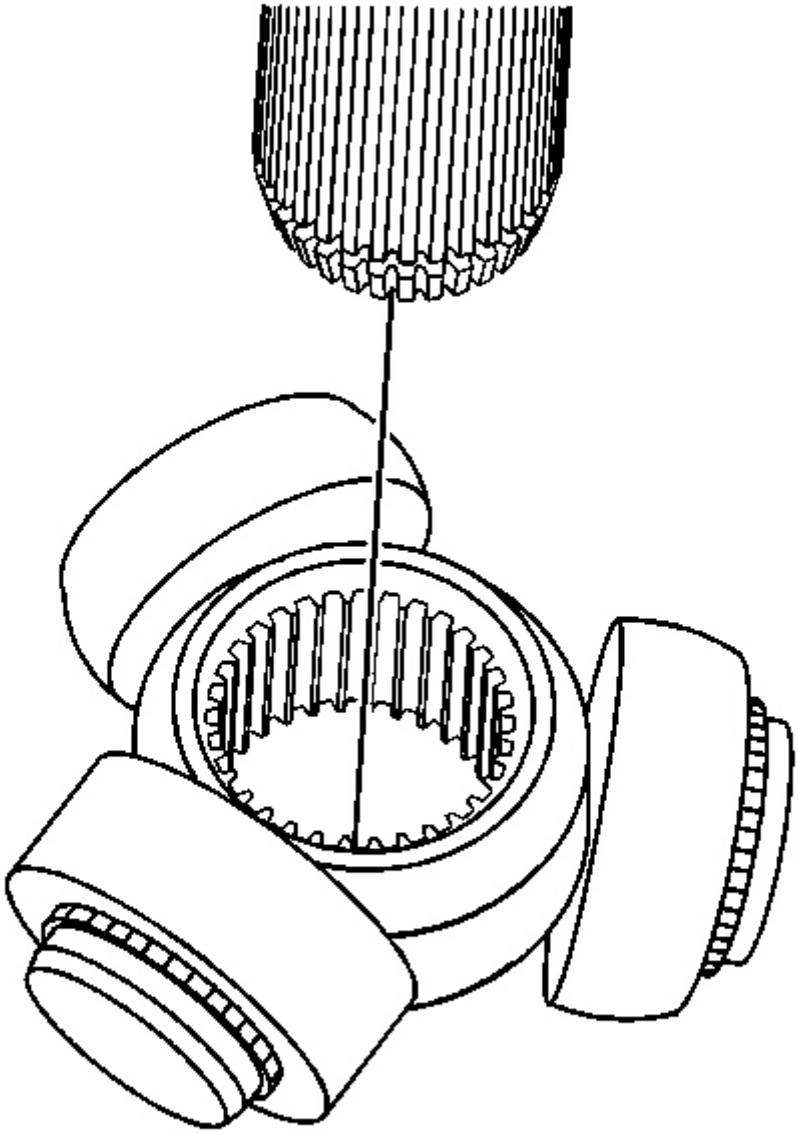


Fig. 40: View Of Tripot Spider & Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

5. Align the reference mark on the tripot spider and the wheel drive shaft bar.

IMPORTANT: Ensure that the beveled edge of the tripot spider faces the

wheel drive shaft bar during reassembly.

6. Install the tripot spider to the wheel drive shaft bar, while compressing the barrel retaining ring with a flat-bladed tool.
7. Verify positive engagement of the tripot spider to the wheel drive shaft bar by grasping the tripot spider and attempting to pull free from the wheel drive shaft bar.

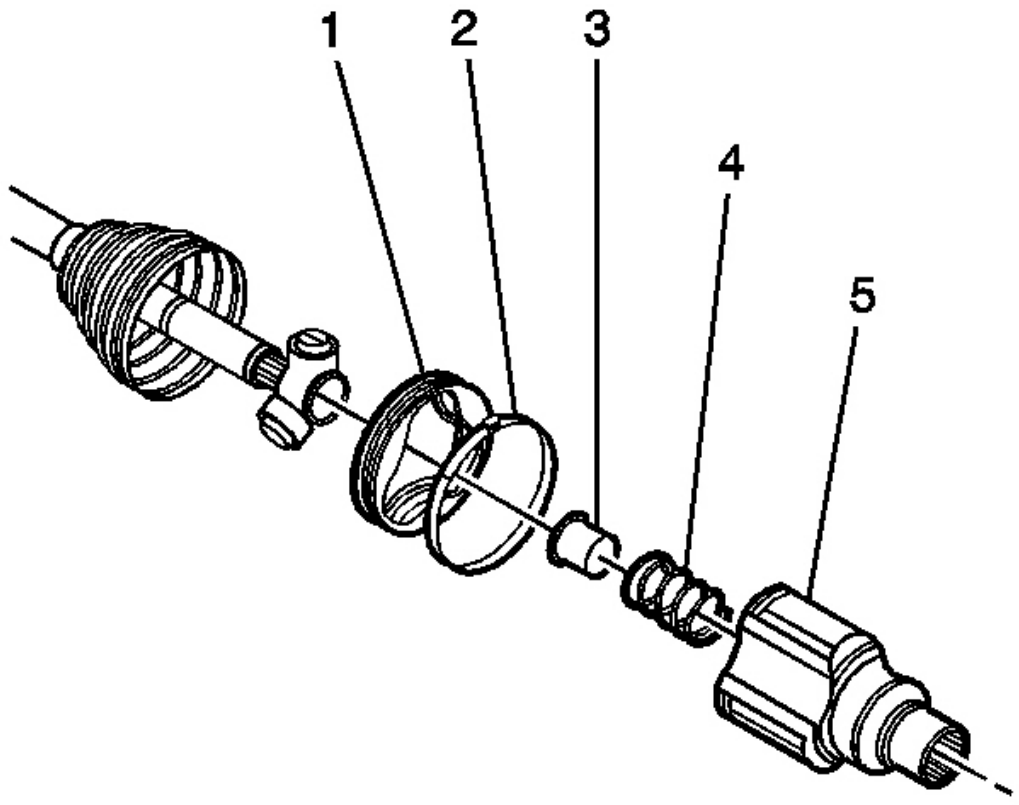


Fig. 41: View Of Wheel Drive Shaft Inner Joint Components
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure the trilobal tripot bushing is flush with the face of the housing.

8. Place approximately 1/2 of the grease from the service kit in the wheel drive shaft inboard seal. Use the remainder of the grease to repack the housing.

9. Install the spring (4) to the tripot housing.

   Use grease from the housing in order to retain the spring.

10. Install the guide (3) to the spring.

    Use grease from the housing in order to retain the guide.

11. Install the trilobal tripot bushing (1) to the housing.
12. Position the larger new seal retaining clamp (2) on the wheel drive shaft inboard seal.
13. Slide the housing over the tripot joint spider assembly on the wheel drive shaft bar.

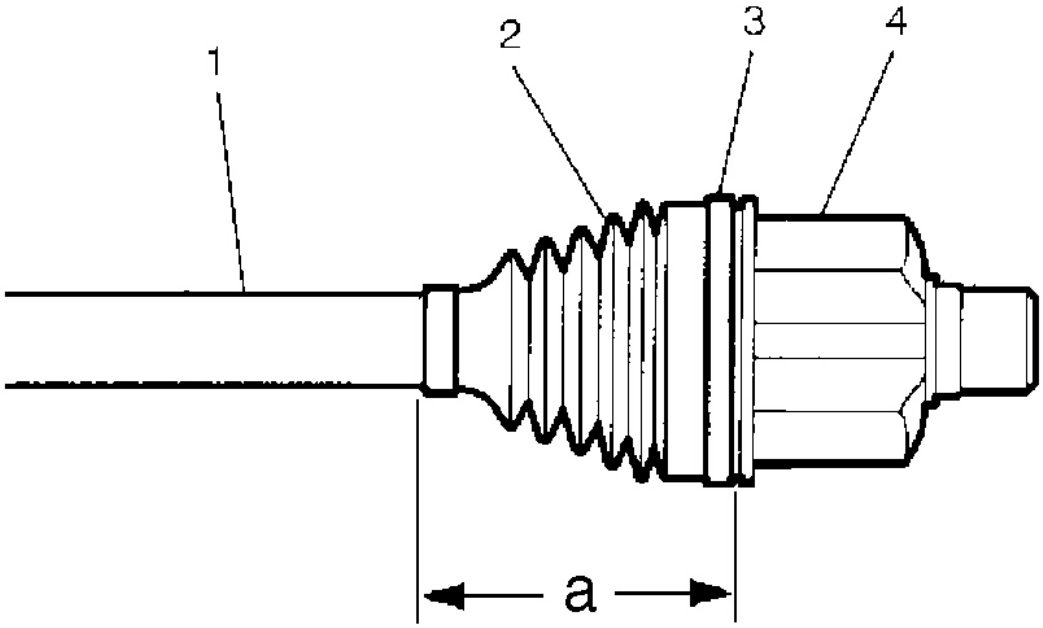


Fig. 42: Identifying Axle Shaft/CV Joint Assembly Components & Installed Boot Measurement Dimension
Courtesy of GENERAL MOTORS CORP.

14. Slide the large diameter of the wheel drive shaft inboard seal (2), with the larger clamp (3) in place, over the outside of the trilobal tripot bushing and locate the lip of the seal in the groove.

IMPORTANT: The seal must not be dimpled, stretched or otherwise deformed.

15. Inspect the seal for proper shape.

    If the seal is not shaped correctly, equalize the pressure in the seal by lifting the seal edge slightly and shape the seal properly by hand.

16. Position the joint assembly at the proper vehicle dimension.

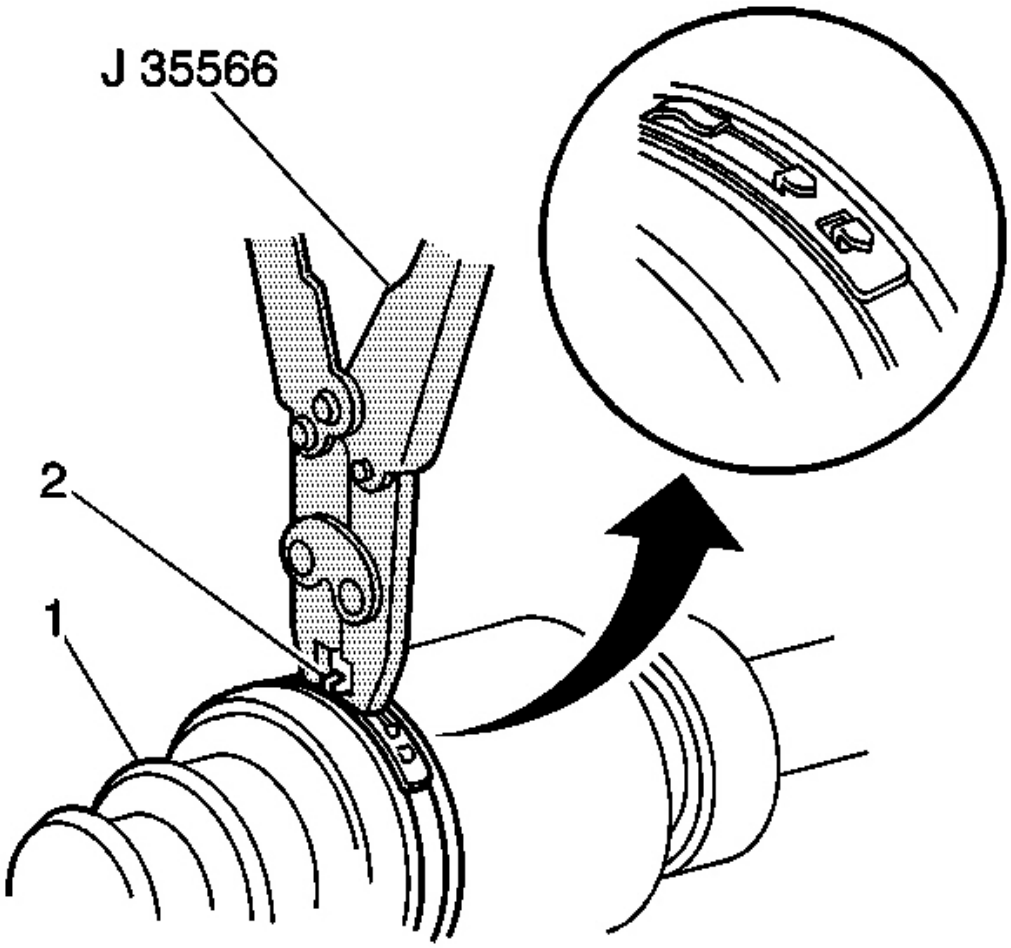


Fig. 43: View Of J 35566 & Large Seal Clamp Band
Courtesy of GENERAL MOTORS CORP.

17. Align the following items while latching:
    - The wheel drive shaft inboard seal (1)
    - The tripot housing
    - The large seal retaining clamp (2)
18. Using the **J 35566** , latch the large seal retaining clamp. See **Special Tools**. Ensure that the latching tangs are fully engaged in the large seal clamp band.
19. Rotate the inner tripot housing 4 or 5 times in order to distribute the grease throughout the tripot spider bearings.

FRONT WHEEL DRIVE SHAFT OUTER JOINT AND SEAL REPLACEMENT

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

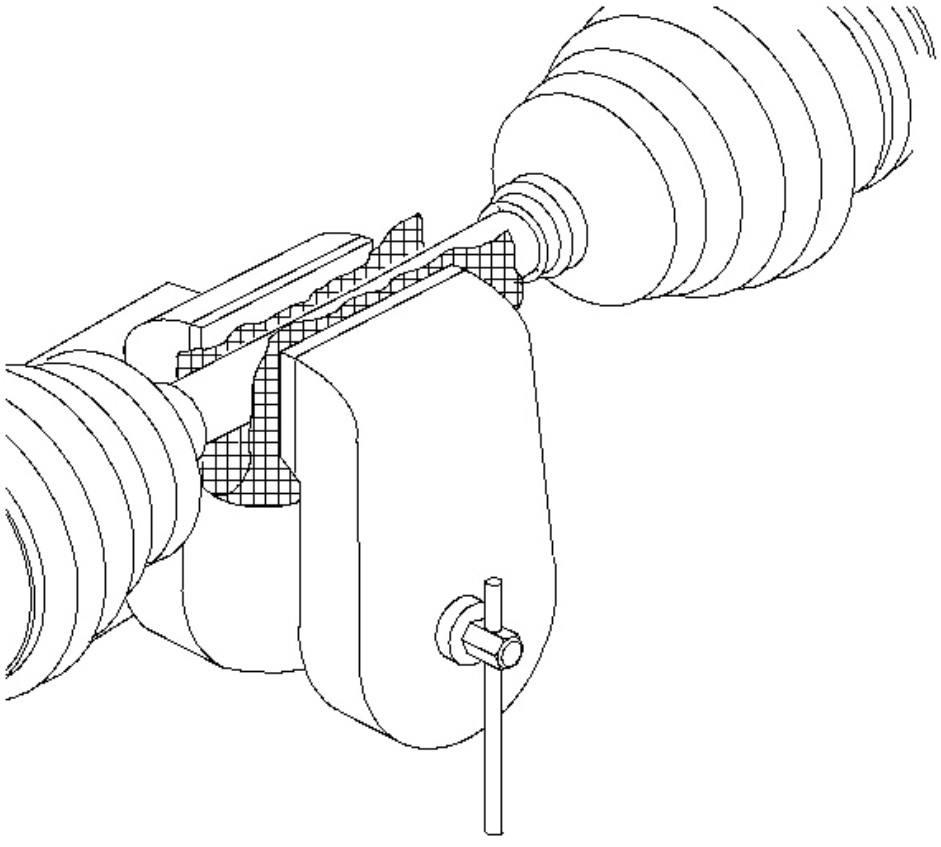


Fig. 44: View Of Front Wheel Drive Shaft Inner Joint
Courtesy of GENERAL MOTORS CORP.

1. Clamp the drive axle shaft in a soft jawed vice.

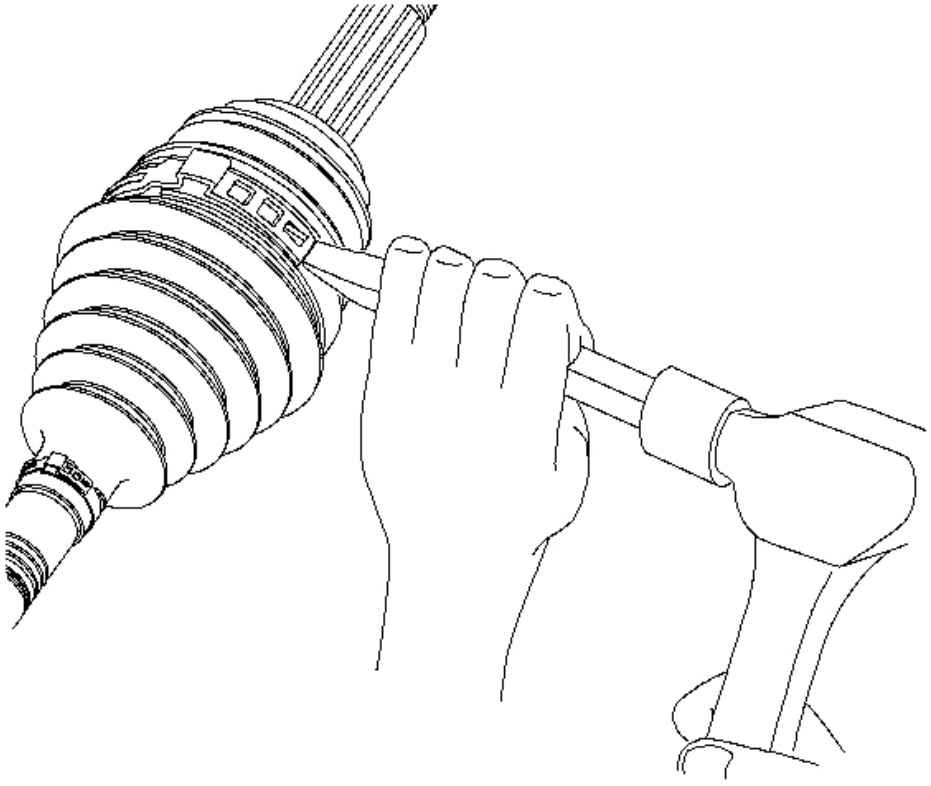


Fig. 45: Using Hammer & Chisel To Disengage Outer Band From Inner Band
Courtesy of GENERAL MOTORS CORP.

2. Use a flat-bladed tool and disengage the retaining tabs of the large seal clamp.
3. Discard the clamp.
4. Remove the small seal clamp using side cutters and discard the clamp.
5. Separate the constant velocity (CV) joint boot from the CV joint race at the large diameter.
6. Slide the boot away from the joint along the wheel drive shaft bar.
7. Wipe the excess grease from the face of the CV inner race.

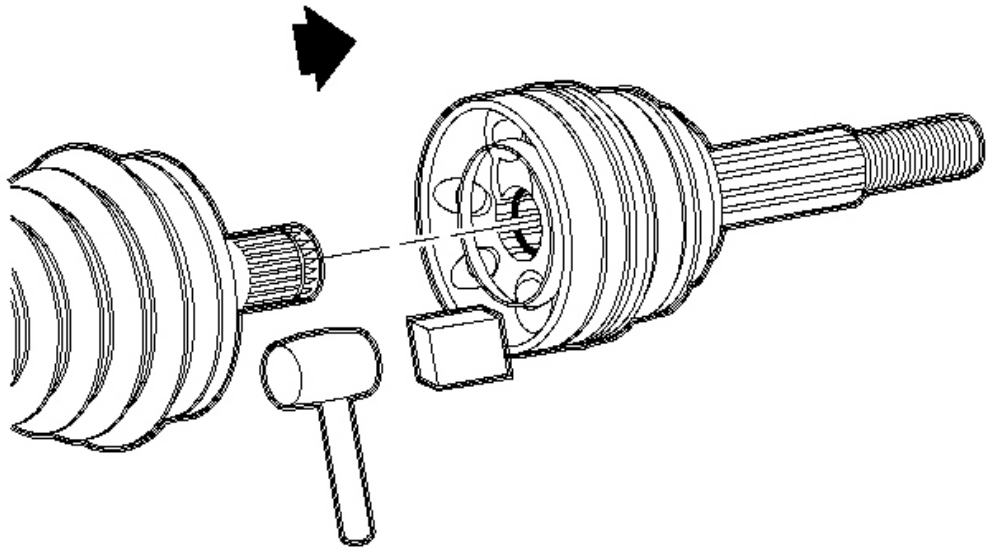


Fig. 46: Separating CV Joint From Axle Shaft
Courtesy of GENERAL MOTORS CORP.

8. Place a block of wood against the CV joint outer race and carefully tap on the CV joint to remove it from the wheel drive shaft bar.
9. Remove the seal from the wheel drive shaft bar.
10. Remove the CV joint retaining ring from the wheel drive shaft bar.

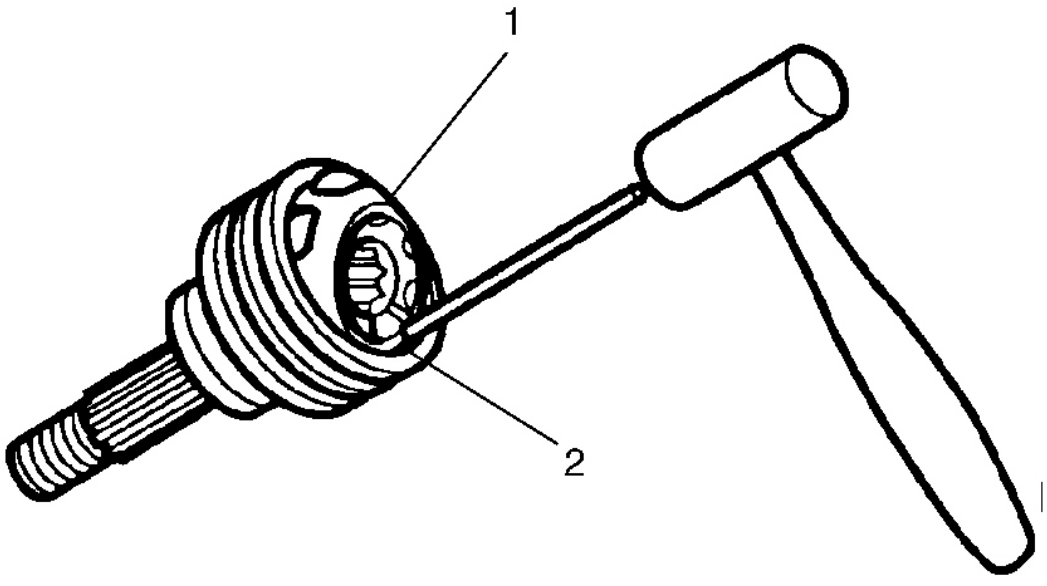


Fig. 47: Illustrating Tapping Gently On Brass Drift With Hammer To Tilt Cage
Courtesy of GENERAL MOTORS CORP.

11. Place a brass drift against the CV joint inner race (1).
12. Tap gently on the brass drift with a hammer in order to tilt the joint race.
13. Remove the first bearing roller (2) when the CV race tilts.
14. Tilt the CV joint inner race in the opposite direction to remove the opposing bearing roller.
15. Repeat the process to remove all 6 of the bearing rollers.

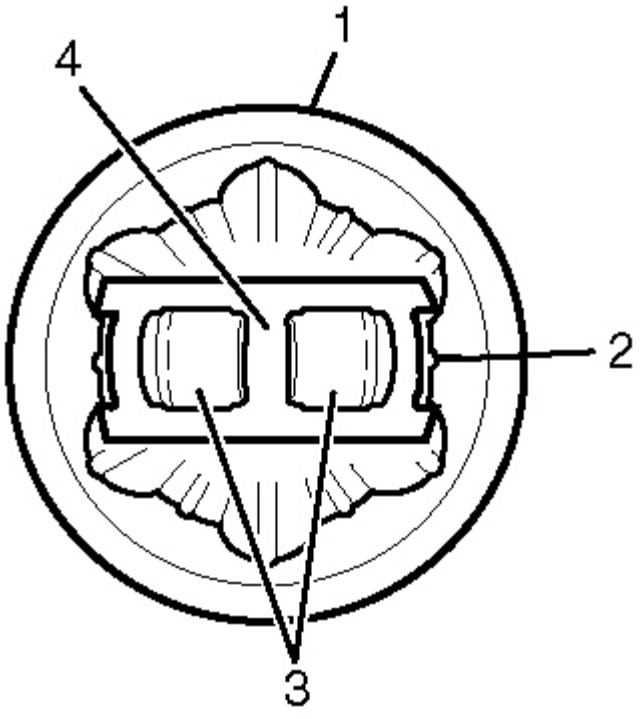


Fig. 48: View Of Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

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

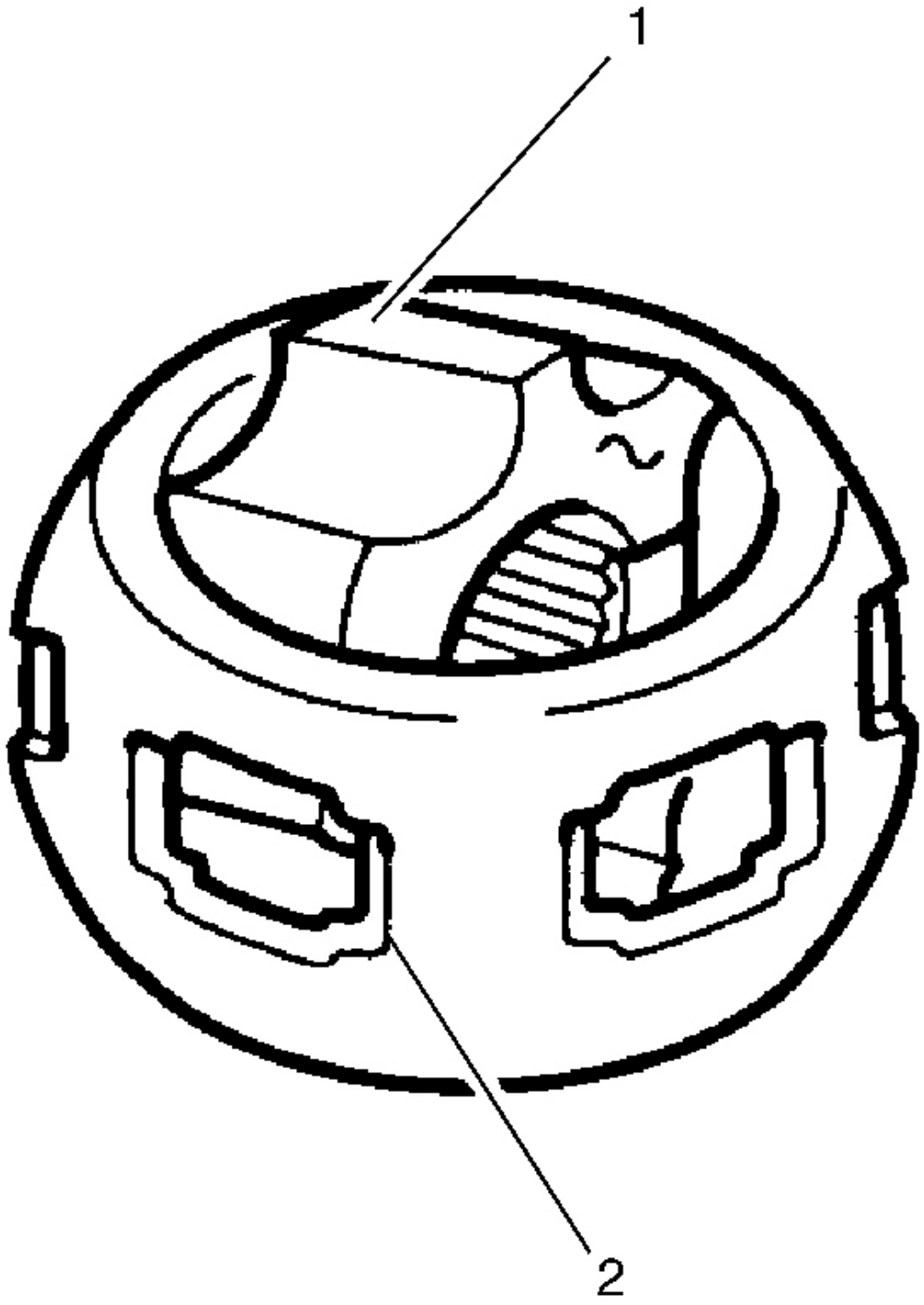

1
2

Fig. 49: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

18. Remove the inner race (1) from the cage (2) by rotating the inner race upward.
19. Clean the following items thoroughly with a suitable solvent. Remove all traces of grease and contaminants.
    - The inner and outer race assemblies.
    - The CV joint cage.
    - The bearing rollers.
20. Dry all the parts with compressed air.
21. Inspect the CV joint assembly for the following:
    - Unusual wear
    - Cracks
    - Damage
22. Replace any damaged parts.
23. Clean the wheel drive shaft bar. Use a wire brush to remove any rust in the seal mounting grooves.

Installation Procedure

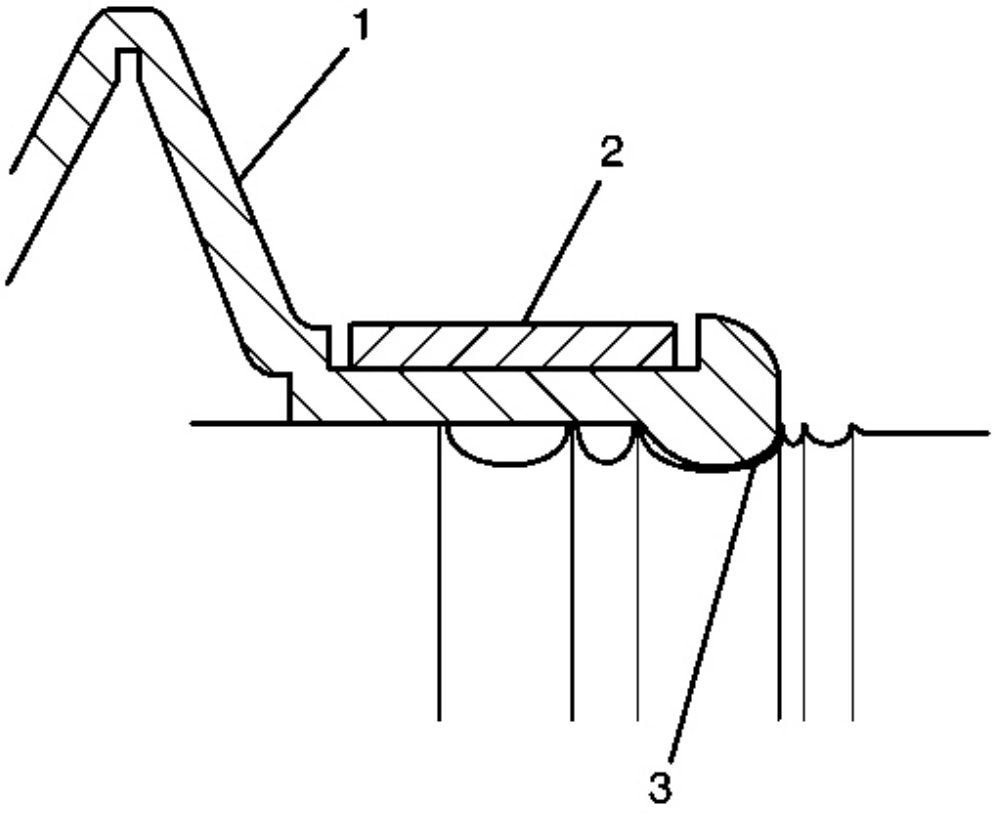


Fig. 50: View Of Swage Ring, Joint Boot & Boot Groove
Courtesy of GENERAL MOTORS CORP.

1. Install the new small seal clamp (2) on the neck of the outboard seal (1). Do not clamp.
2. Slide the outboard seal onto the wheel drive shaft bar and position the neck of the outboard seal in the seal groove on the bar. The largest groove below the sight groove on the wheel drive shaft bar is the seal groove seal (3).

IMPORTANT: Ensure that the seal clamp is properly positioned around the entire circumference of the seal.

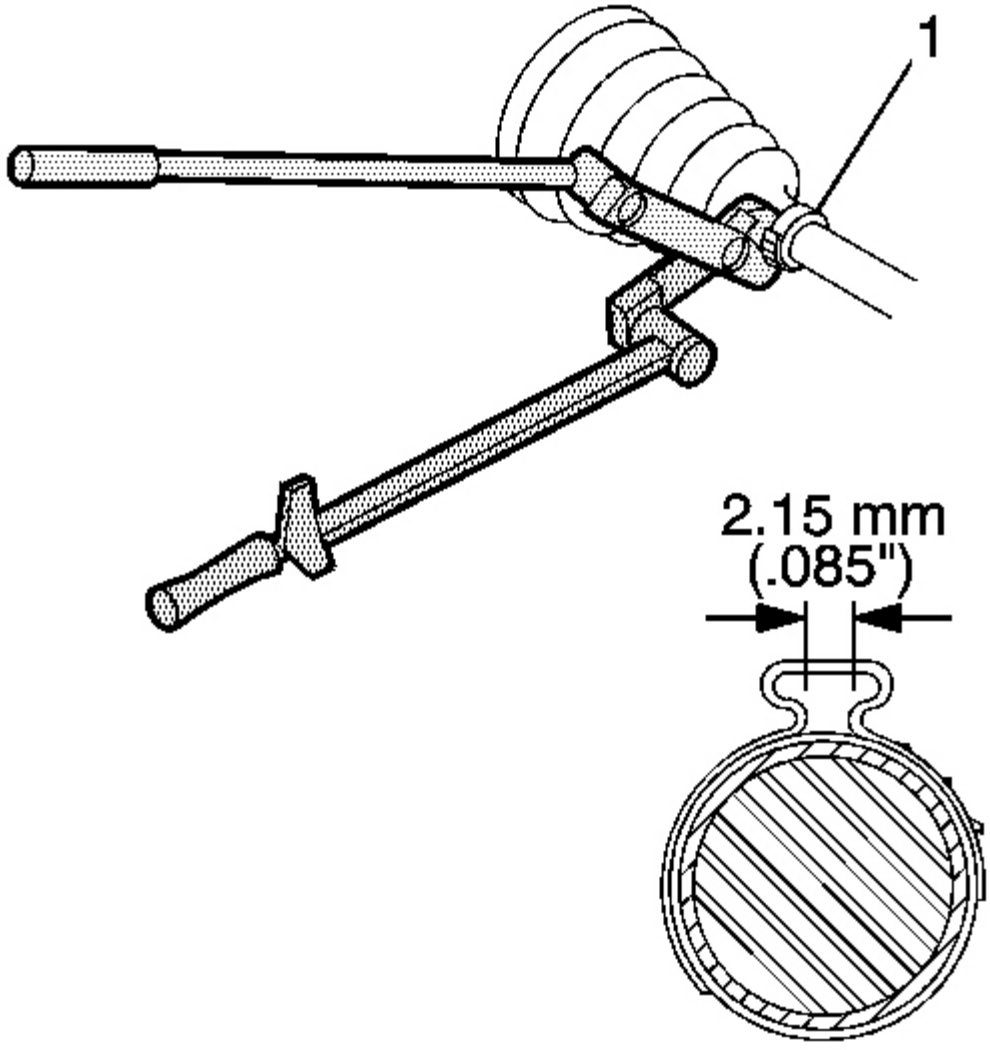


Fig. 51: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

3. Crimp the seal clamp (1) using the **J 35910** .
4. Measure the clamp end gap dimension. The gap should not exceed 2.15 mm (0.85 in).

Specification: The gap should not exceed 2.15 mm (0.85 in).

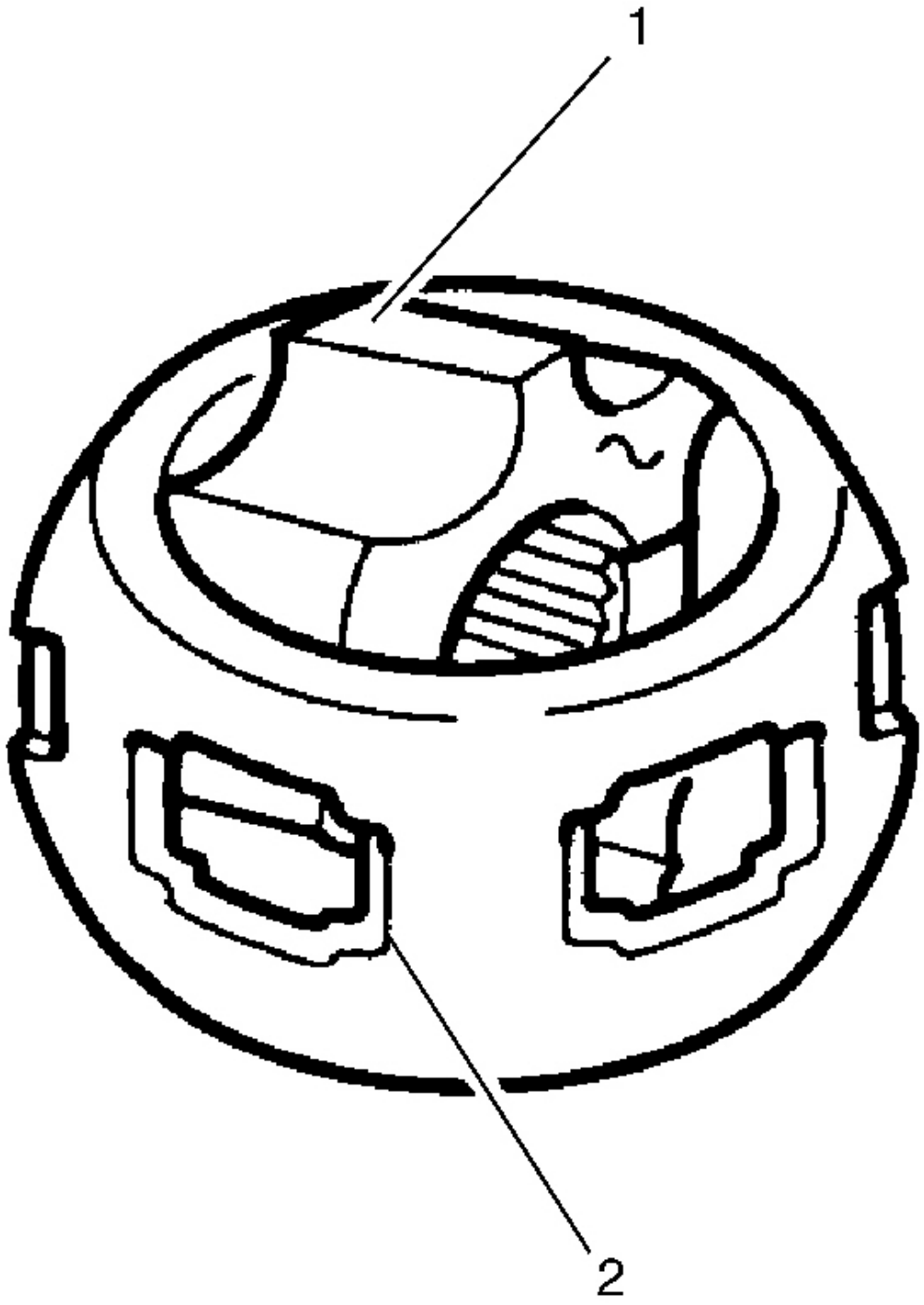

1
2

Fig. 52: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

5. Put a light coat of grease from the service kit on the bearing roller grooves of the inner race and outer race.
6. Hold the inner race 90 degrees to centerline of cage with the lands of the inner race (1) aligned with the windows of the cage (2) and insert the inner race into the cage.

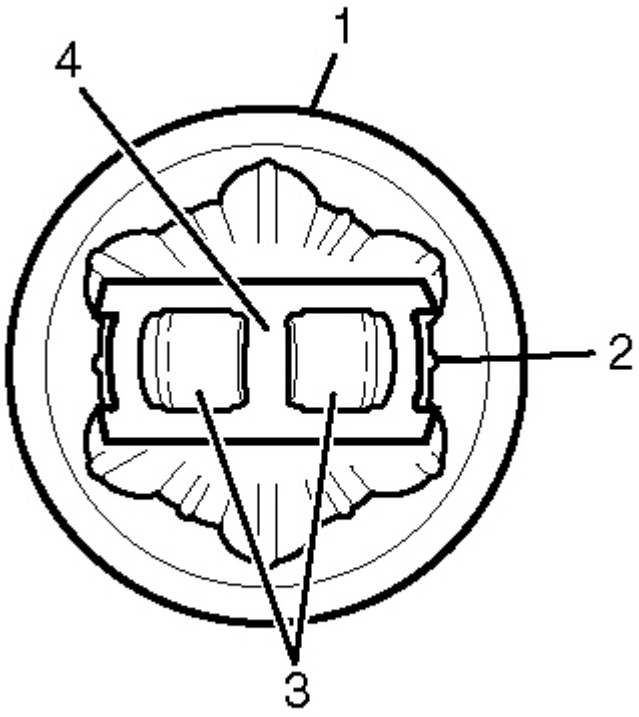


Fig. 53: View Of Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

7. Hold the cage and inner race 90 degrees to the center line of the outer race (1) and align the cage windows (3) with the lands of the outer race.

IMPORTANT: Be sure that the retaining ring side of the inner race faces the wheel drive shaft bar.

8. Place the cage and the inner race into the outer race.
9. Insert the first bearing roller, then tilt the cage in the opposite direction to insert the opposing bearing roller.
10. Repeat this process until all 6 bearing rollers are in place.
11. Install the CV joint retaining ring to the wheel drive shaft bar.
12. Place approximately half the grease from the service kit inside the outboard seal and pack the CV joint with the remaining grease.

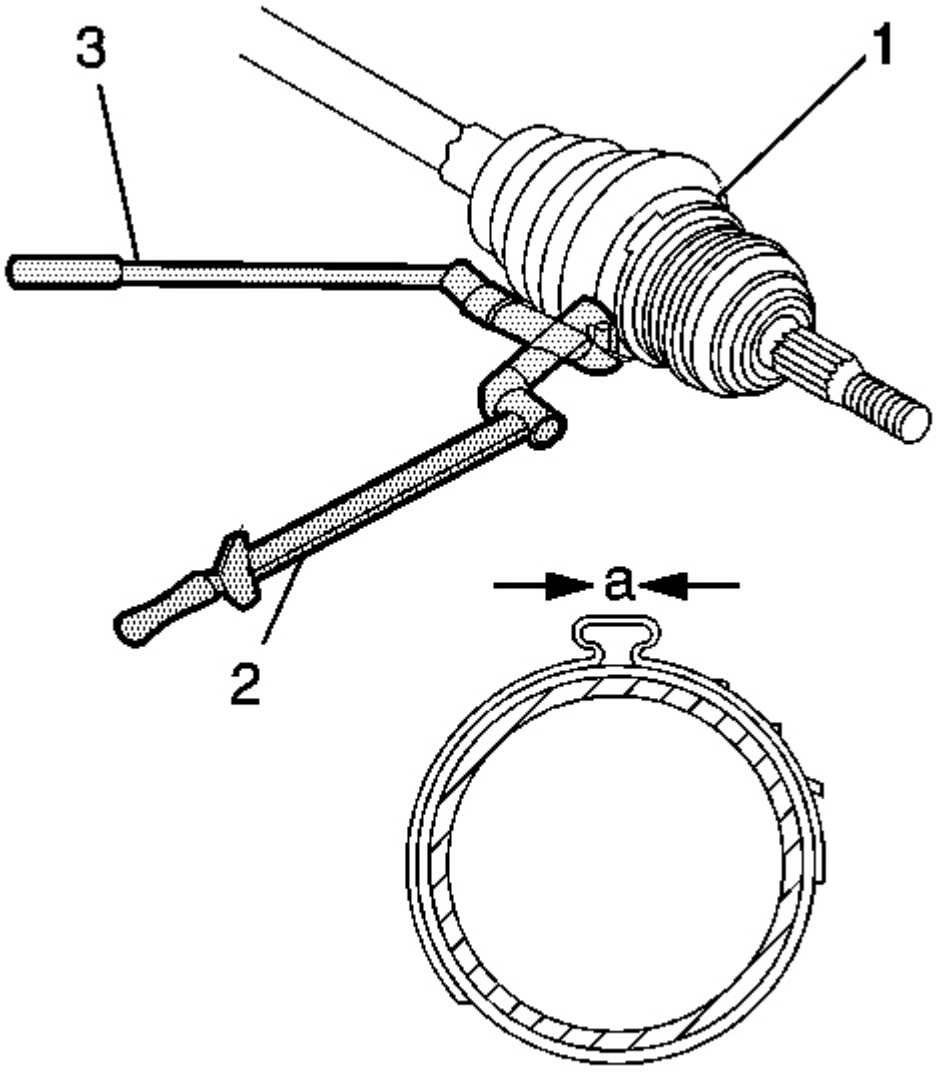


Fig. 54: View Of Outboard Seal, Large Seal Retaining Clamp & CV Joint Outer Race
Courtesy of GENERAL MOTORS CORP.

13. Place a block of wood against the CV joint spindle and tap on the block of wood until the CV joint inner race engages the retaining ring.
14. Slide the large diameter of the seal over the outside of the CV race and locate the lip of the seal in the housing groove.

15. Install the large seal retaining clamp (1) over the seal and close using the **J 35910** (2-3).
16. Inspect the gap dimension on the clamp ear. Continue tightening until the gap dimension is reached.

    Specification: Dimension equals 1.9 mm (5/64 in).

17. Remove the wheel drive shaft from the bench vise.
18. Distribute the grease within the outer CV joint by rotating the joint in a circular motion four to five times.

REAR WHEEL DRIVE SHAFT OUTER JOINT AND SEAL REPLACEMENT

Tools Required

- **J 35566** Drive Axle Seal Clamp Pliers. See **Special Tools**.
- **J 42572** Drive Shaft Seal Clamp Pliers. See **Special Tools**.

Disassembly Procedure

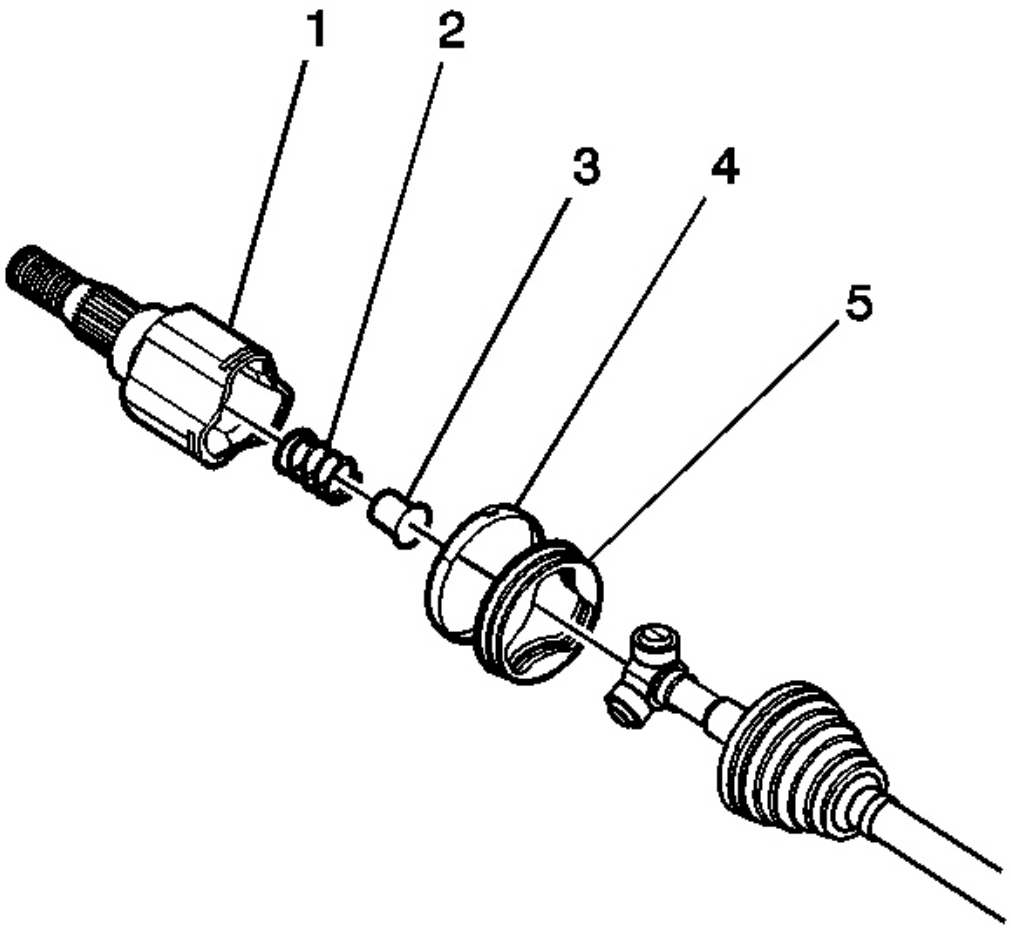


Fig. 55: View Of Tripot Joint
Courtesy of GENERAL MOTORS CORP.

1. Remove the small seal clamp from the wheel drive shaft bar using side cutters and discard the clamp.

IMPORTANT: Do not cut into the wheel drive shaft trilobal tripot bushing.

2. Remove the large seal clamp (4) from the tripot joint with side cutters and discard the clamp.
3. Separate the wheel drive shaft outboard seal from the trilobal tripot bushing (5).
4. Slide the seal away from the joint along the wheel drive shaft bar.

5. Remove the housing from the tripot joint spider and the wheel drive shaft bar.

IMPORTANT: The correct 60 degree offset relationship between the inner and outer tripot spiders must be maintained. Accurately reference mark the tripot spider position on the wheel drive shaft bar before disassembly.

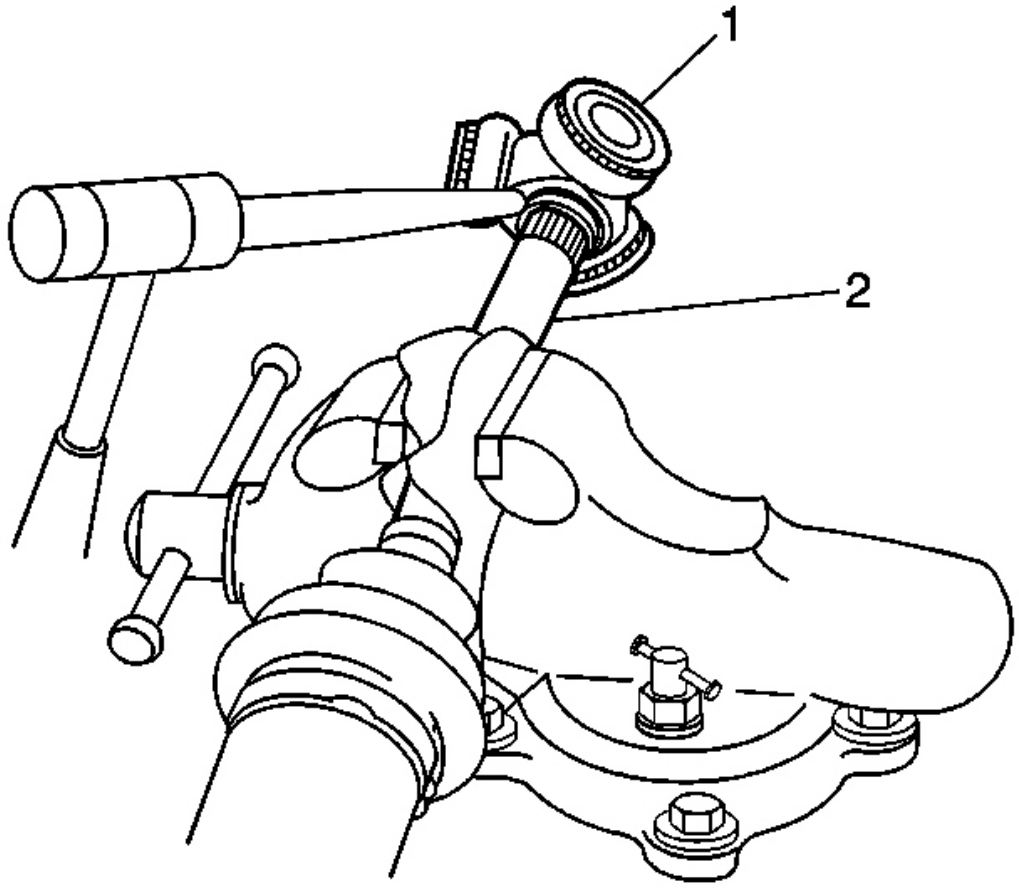


Fig. 56: View Of Tripot Spider & Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

6. Reference mark the position of the tripot spider (1) on the wheel drive shaft bar (2).
7. Using a brass drift and hammer, carefully tap around the tripot spider face in order to compress the barrel retaining ring on the wheel drive shaft bar.

8. Remove the tripot spider from the wheel drive shaft bar (2).
9. Remove and discard the barrel retaining ring from the wheel drive shaft bar.
10. Remove the joint seal from the wheel drive shaft bar.
11. Inspect the following parts for damage or wear:
    - The wheel drive shaft outboard seal
    - The tripot joint spider assembly (1)
    - The housing
    - The trilobal tripot bushing

Assembly Procedure

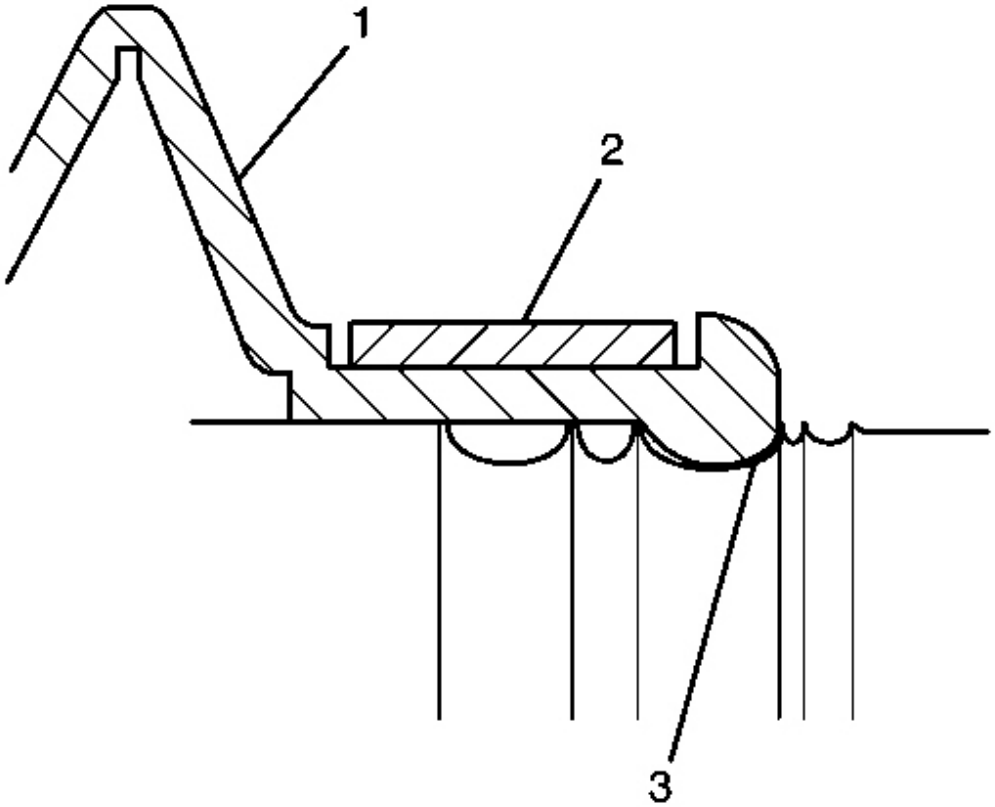


Fig. 57: View Of Swage Ring, Joint Boot & Boot Groove
Courtesy of GENERAL MOTORS CORP.

1. Place the new small seal clamp (2) onto the small end of the joint seal (1). Slide the joint seal (1) and the small seal clamp (2) onto the wheel drive shaft bar.
2. Position the small end of the joint seal (1) into the joint seal groove (3) on the wheel drive shaft bar.

NOTE: Refer to Fastener Notice .

3. Using the **J 42572** , crimp the small seal retaining clamp. See **Special Tools**.

   Tighten: Tighten the clamp to 136 N.m (100 lb ft).

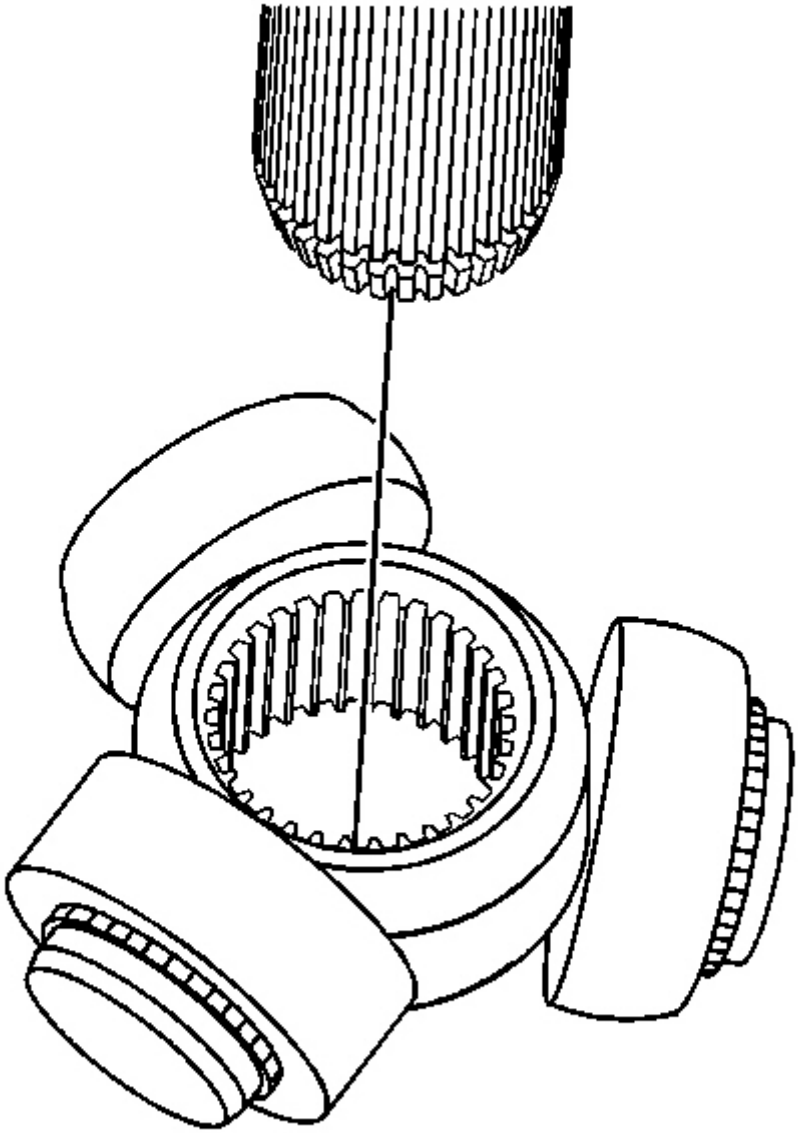


Fig. 58: View Of Tripot Spider & Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

4. Install a new barrel retaining ring to the wheel drive shaft bar.

IMPORTANT: The proper 60 degree offset relationship between the inner

and outer tripot spiders must be maintained.

5. Align the reference mark on the tripot spider and the wheel drive shaft bar.

IMPORTANT: Ensure that the beveled edge of the tripot spider faces the wheel drive shaft bar during reassembly.

6. Install the tripot spider to the wheel drive shaft bar, while compressing the barrel retaining ring with a flat-bladed tool.
7. Verify positive engagement of the tripot spider to the wheel drive shaft bar by grasping the tripot spider and attempting to pull free from the wheel drive shaft bar.

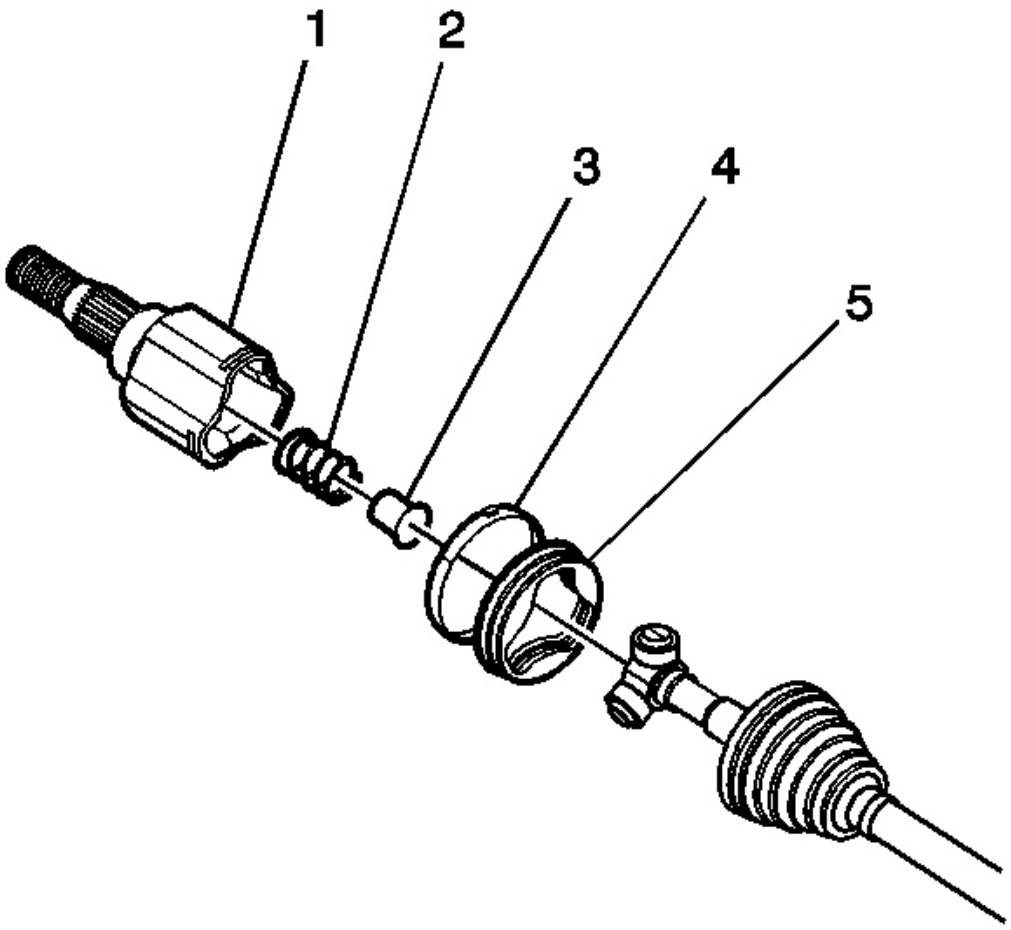


Fig. 59: View Of Tripot Joint
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Ensure the trilobal tripot bushing is flush with the face of the housing.

8. Place approximately half of the grease from the service kit in the wheel drive shaft outboard seal. Use the remainder of the grease to repack the housing.
9. Install the trilobal tripot bushing (5) to the housing (1).
10. Install the spring (2) to the tripot housing.

    Use grease from the housing in order to retain the spring.

11. Install the guide (3) to the spring.

    Use grease from the housing in order to retain the guide.

12. Position the larger new seal retaining clamp (4) on the wheel drive shaft outboard seal.
13. Slide the housing over the tripot joint spider assembly on the wheel drive shaft bar.

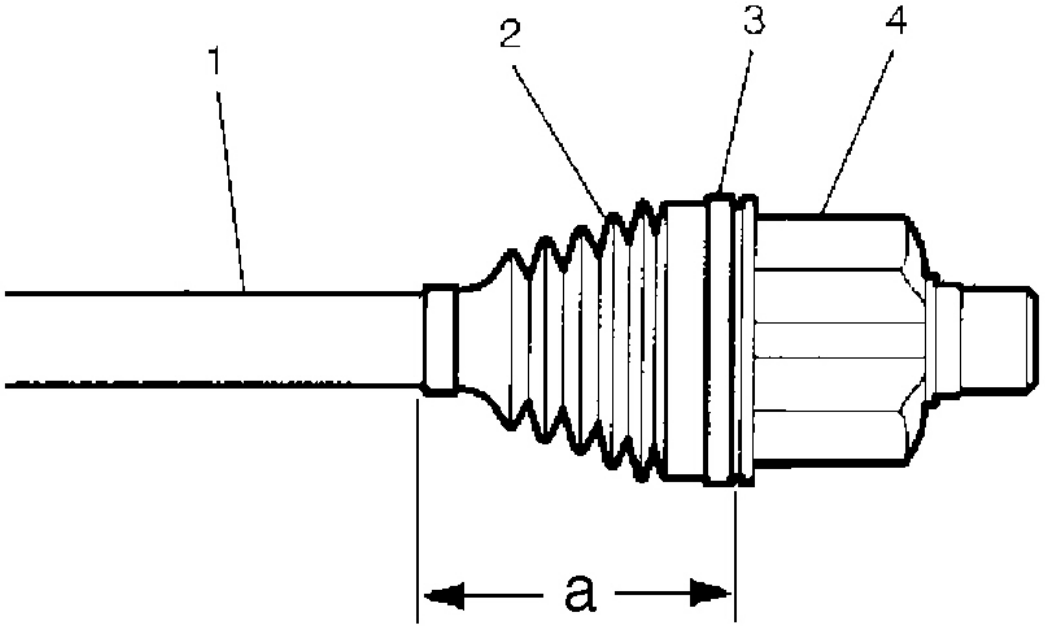


Fig. 60: Identifying Axle Shaft/CV Joint Assembly Components And Installed Boot Measurement Dimension
Courtesy of GENERAL MOTORS CORP.

14. Slide the large diameter of the wheel drive shaft outboard seal (2), with the larger clamp (3) in place, over the outside of the trilobal tripot bushing and locate the lip of the seal in the groove.

IMPORTANT: The seal must not be dimpled, stretched or otherwise deformed.

15. Inspect the seal for proper shape.

    If the seal is not shaped correctly, equalize the pressure in the seal by lifting the seal edge slightly and shape the seal properly by hand.

16. Position the joint assembly at the proper vehicle dimension.

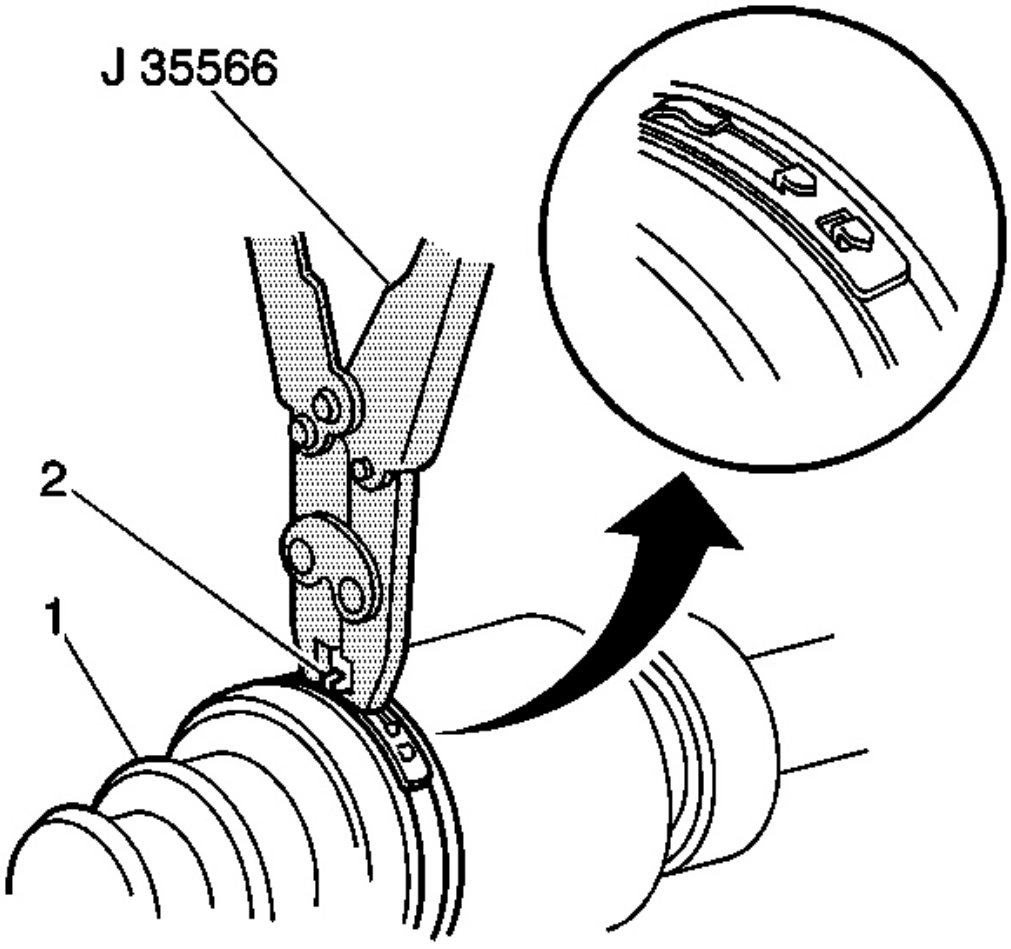


Fig. 61: View Of J 35566 & Large Seal Clamp Band
Courtesy of GENERAL MOTORS CORP.

17. Align the following items while latching:
    - The wheel drive shaft outboard seal (1)
    - The tripot housing
    - The large seal retaining clamp (2)
18. Using the **J 35566** , latch the large seal retaining clamp. See **Special Tools**. Ensure that the latching tangs are fully engaged in the large seal clamp band.
19. Rotate the outer tripot housing four or five times in order to distribute the grease throughout

the tripot spider bearings.

DESCRIPTION AND OPERATION

WHEEL DRIVE SHAFTS DESCRIPTION AND OPERATION (M76)

The rear wheel drive axles are flexible assemblies.

The rear wheel drive axles consist of the following components:

- 2 wheel drive inner and outer shaft tri-pot joints.
- A wheel drive shaft bar.

  The wheel drive shaft bar connects the wheel drive shaft tri-pot joints.

The wheel drive shaft tri-pot joints are completely flexible. Both wheel drive shaft tri-pot joints can move in and out.

Seals And Clamps

The rear wheel drive shaft tri-pot joint seals on the wheel drive axle are made of a thermoplastic material.

The clamps on the rear wheel drive axle seals are made of stainless steel.

The seals provide the following functions:

- Protection of the internal parts of the wheel drive shaft tri-pot joints.

  The seals protect the grease from the following sources of damage:

  - Harmful atmospheric conditions, such as extreme temperatures or ozone gas.
  - Foreign material, such as dirt or water.
- Allows the angular and the axial movement of the rear wheel drive shaft tri-pot joints.

IMPORTANT: Protect the seals from sharp tools and from the sharp edges of the surrounding components.
Any damage to the seals or the clamps will result in leakage. Leakage will allow water to leak into the rear wheel drive shaft tri-pot joints. Damage will also allow grease to leak out of the wheel drive shaft tri-pot joints.

Leakage and the loss to grease may cause noisy wheel drive shaft tri-pot operation and eventual failure of the internal components.

The clamps provide a leak proof connection for the wheel drive shaft tri-pot joints at the following locations:

- The tri-pot housing.
- The wheel drive shaft bar.

The thermoplastic material performs well under normal conditions and normal operation. However, the material is not strong enough to withstand the following conditions:

- Abusive handling.
- Damage from sharp objects, such as tools or sharp edges of the surrounding vehicle components.

Rear Wheel Drive Shaft Tri-pot Joints

The rear wheel drive shaft tri-pot joints are made without an over-extension limitation retainer. Care must be exercised when removing and installing the rear wheel drive shafts in order not to over-extend the tri-pot joints. Damage and tri-pot failure may result.

The joint is constructed as follows:

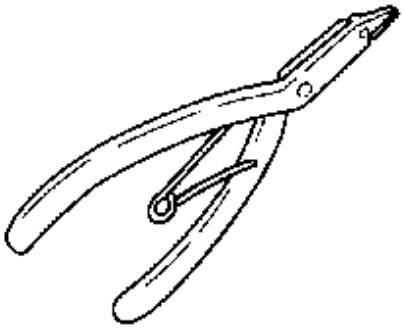
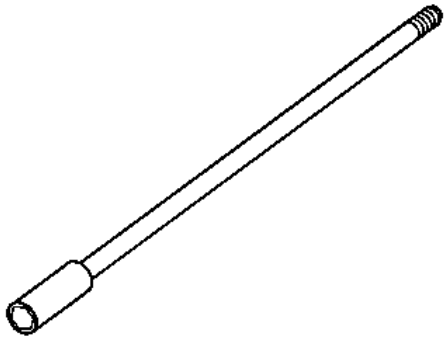
- The wheel drive axle has a female spline. The female spline installs over an axle shaft that protrudes from the rear differential.
- The wheel drive axle utilizes a barrel-type retaining ring in order to positively secure the inner tri-pot joint to the rear differential axle shaft.

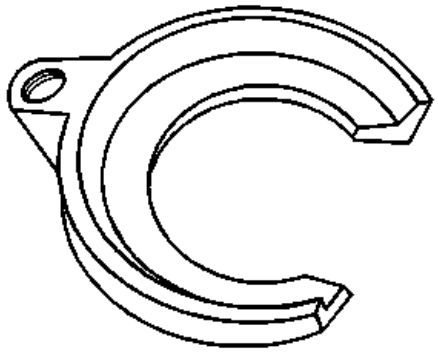
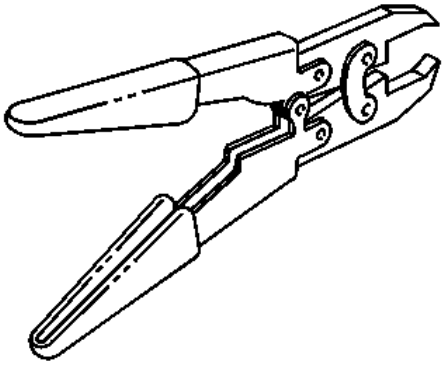
SPECIAL TOOLS AND EQUIPMENT

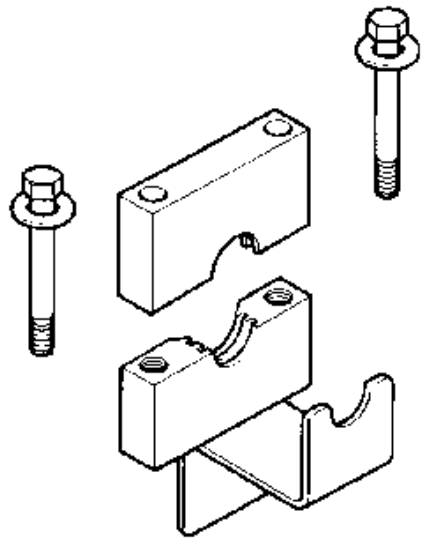
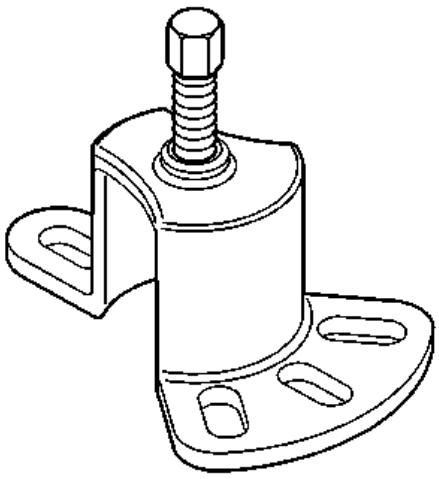
SPECIAL TOOLS

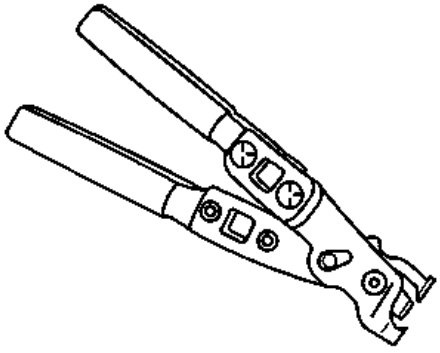
Special Tools

Illustration	Tool Number/Description
	J 2619-O1

	Slide Hammer
	J 8059 Snap Ring Pliers
	J 29794 Axle Shaft Remover Extension

	J 33008-A Axle Shaft Puller
	J 35566 Drive Axle Seal Clamp Pliers
	J 41048 Drive Axle Swage Ring Clamp

	
	J 42129 Wheel Hub Remover

	J 42572 Drive Shaft Seal Clamp Pliers