Wheel Drive Shafts - Vue

SPECIFICATIONS

FASTENER TIGHTENING SPECIFICATIONS

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Lower Stabilizer Bar Link Nut	65 N.m	48 lb ft
Front Outer Tie Rod Stud Nut	50 N.m	37 lb ft
Front Wheel Drive Shaft Spindle Nut	205 N.m	151 lb ft
Intermediate Drive Shaft-to-Bracket Bolts	30 N.m	22 lb ft
Intermediate Drive Shaft Support Bracket Mounting Bolts (L61)	35 N.m	26 lb ft
Intermediate Drive Shaft Support Bracket Mounting Bolts (L66)	50 N.m	37 lb ft
J-44015 Steering Linkage Installer	40 N.m	30 lb ft
Lower Ball Joint Stud Nut	10 N.m + 150 Degrees	89 lb in + 150 Degrees
Rear Lower Control Arm-to-Suspension Knuckle Bolt and Nut	110 N.m	81 lb ft
Rear Lower Jounce Bumper Nut	63 N.m	46 lb ft
Rear Shock Absorber Lower Mounting Bolt	110 N.m	81 lb ft
Rear Stabilizer Link-to-Control Arm Nut	15 N.m	11 lb ft
Rear Wheel Drive Shaft Spindle Nut	110 N.m	81 lb ft

COMPONENT LOCATOR

WHEEL DRIVE SHAFTS DISASSEMBLED VIEWS

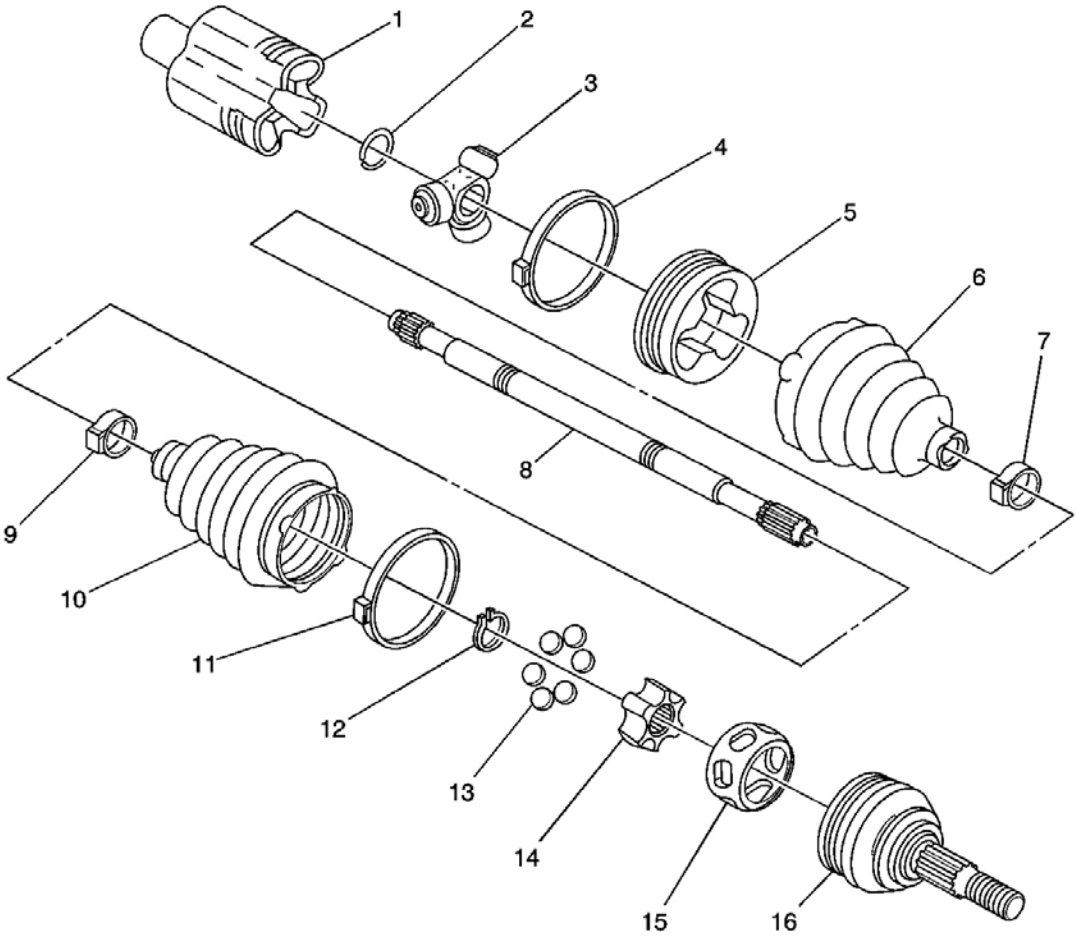

Fig. 1: Tripot Design Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

Callouts For Fig. 1

Callout	Component Name
1	Retainer and Housing Assembly
2	Retaining Ring
3	Tripot Joint Spider Assembly
4	Boot Retaining Clamp
5	Tripot Trilobal Bushing
6	Inboard Boot
7	Boot Retaining Clamp
8	Axle Shaft
9	Boot Retaining Clamp
10	Outboard Boot
11	Boot Retaining Clamp

12	Race Retaining Ring
13	Chrome Alloy Ball
14	CV Joint Inner Race
15	CV Joint Cage
16	CV Joint Outer Race

DIAGNOSTIC INFORMATION AND PROCEDURES

DIAGNOSTIC STARTING POINT - WHEEL DRIVE SHAFTS

Begin the wheel drive shaft system diagnosis with the **Diagnostic Starting Point - Vibration Diagnosis and Correction** in Vibration Diagnosis and Correction. The use of the Diagnostic Starting Point will help determine if the concern is wheel drive shaft related. When instructed to exit the Vibration Diagnosis and Correction diagnostic procedures, return to the Diagnostic Starting Point - Wheel Drive Shafts and proceed to **Wheel Drive Shafts Description and Operation** in order to become familiar with the design and function of the wheel drive shaft system. Reviewing the Description and Operation information will also help determine if the condition is a potential operating characteristic or not.

SYMPTOMS - WHEEL DRIVE SHAFTS

IMPORTANT: Complete the following steps prior to beginning the wheel drive shaft diagnosis.

1. Review the **Diagnostic Starting Point - Vibration Diagnosis and Correction** in Vibration Diagnosis and Correction.
2. Perform the **Vibration Analysis - Road Testing** in Vibration Diagnosis and Correction in order to effectively diagnose the concern.
3. Review the system operation in order to become familiar with the system function. Refer to **Wheel Drive Shafts Description and Operation** .

Visual/Physical Inspection

- Inspect for aftermarket equipment and modifications which could affect the operation of the wheel drive shafts or other rotating components.
- Inspect the easily accessible or visible system components for obvious damage or conditions which could cause the symptom.
- Thoroughly inspect the entire wheel drive shaft for visible damage, leaking joint seals, and missing seal clamps.
- Inspect the wheel drive shaft seals for cuts, tears, or other damage which may allow the loss of lubricant and the entry of contaminates.

Symptom List

After performing the Visual/Physical Inspection and no visual signs of damage or other interference impairing

the wheel drive shaft function is apparent, it may be necessary to remove the wheel drive shaft from the vehicle and manipulate the joints manually. Any binding or otherwise impeded movement of the joints may indicate damage which could contribute to the concern. Refer to the following:

- **Click Noise In Turns**
- **Clunk When Accelerating from Coast**
- **Clunk Noise When Accelerating During Turns**
- **Shudder or Vibration During Acceleration**

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 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.

After the inspection reveals no visual evidence of wear or damage, it may be necessary to remove the wheel drive shaft from the vehicle and manipulate the inner and outer joints manually. Any binding or impeded movement of the joints may indicate damage which could contribute to the concern.

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.

Carefully inspect the wheel drive shaft seal for cuts, tears or other damage that may allow the loss of the lubricating grease and/or the entry of contaminates.

After inspection reveals no visual evidence of wear or damage, it may be necessary to remove the wheel drive shaft from the vehicle and manipulate the joint manually. Do not allow the joint to separate from the wheel drive shaft bar. Any binding or impeded movement of the joints may indicate damage which could contribute to the concern.

CLUNK NOISE WHEN ACCELERATING DURING TURNS

A clunk noise that occurs while accelerating during turns may be caused by wear and/or damage to the inboard and the outboard joints in combination. The loss of lubricant and/or the presence of contaminates can cause damage to the internal components of the joints.

Carefully inspect the joint seals for cuts, tears or other damage. Joint seals that are damaged may allow lubricant

leakage and the entry of contaminates.

After inspection reveals no visual evidence of wear or damage, it may be necessary to remove the wheel drive shaft from the vehicle an manipulate the joints manually. Do not allow the joints to separate from the wheel drive shaft bar. Any binding or impeded movement of the joints may indicate damage which could contribute to the concern.

SHUDDER OR VIBRATION DURING ACCELERATION

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

REPAIR INSTRUCTIONS

INTERMEDIATE SHAFT REPLACEMENT (L61)

Tools Required

- **J 2619-01** Slide Hammer
- J 44394 Seal Protector
- J 44467 Output Shaft Assembly Remover and Installer

Removal Procedure

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the right tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the right front wheel drive shaft. Refer to **Wheel Drive Shaft Replacement - Front** .
4. Remove and discard the wheel drive shaft retaining ring.

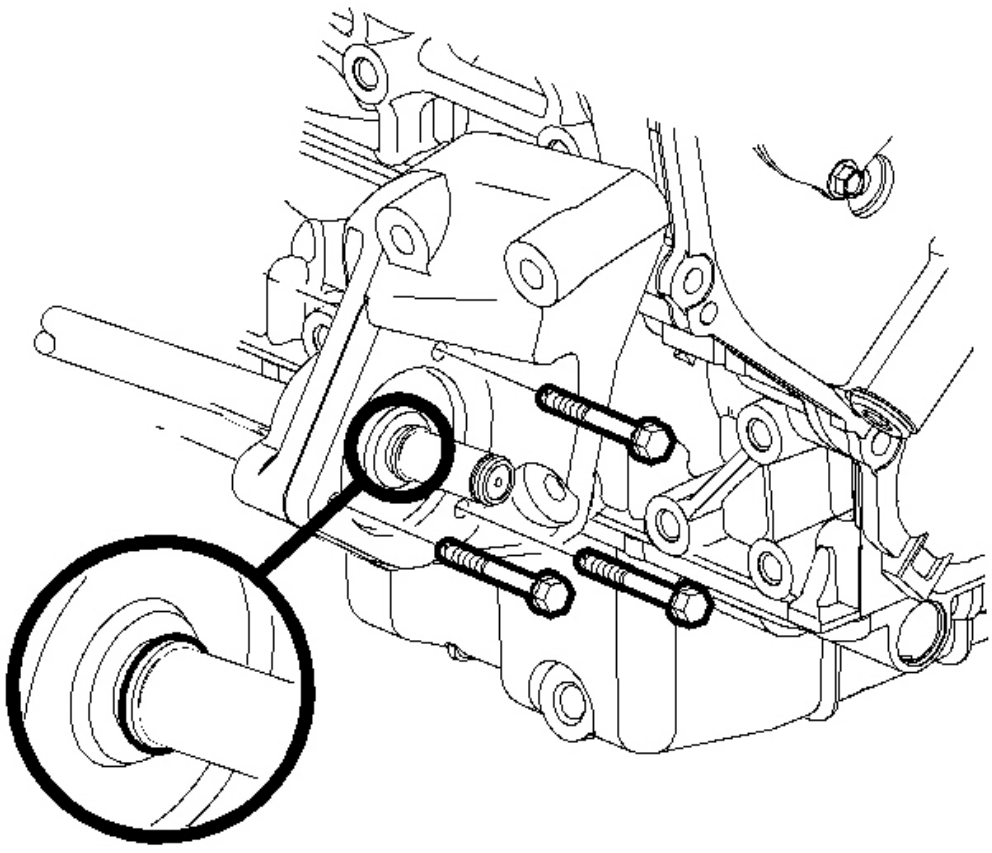

Fig. 2: Removing/Installing Intermediate Drive Shaft To The Bearing Retainer Bracket
Courtesy of GENERAL MOTORS CORP.

5. Remove the O-ring seal from the intermediate drive shaft at the bearing retainer.
6. Remove the bearing retainer-to-support bracket mounting bolts.
7. Remove the bearing retainer.

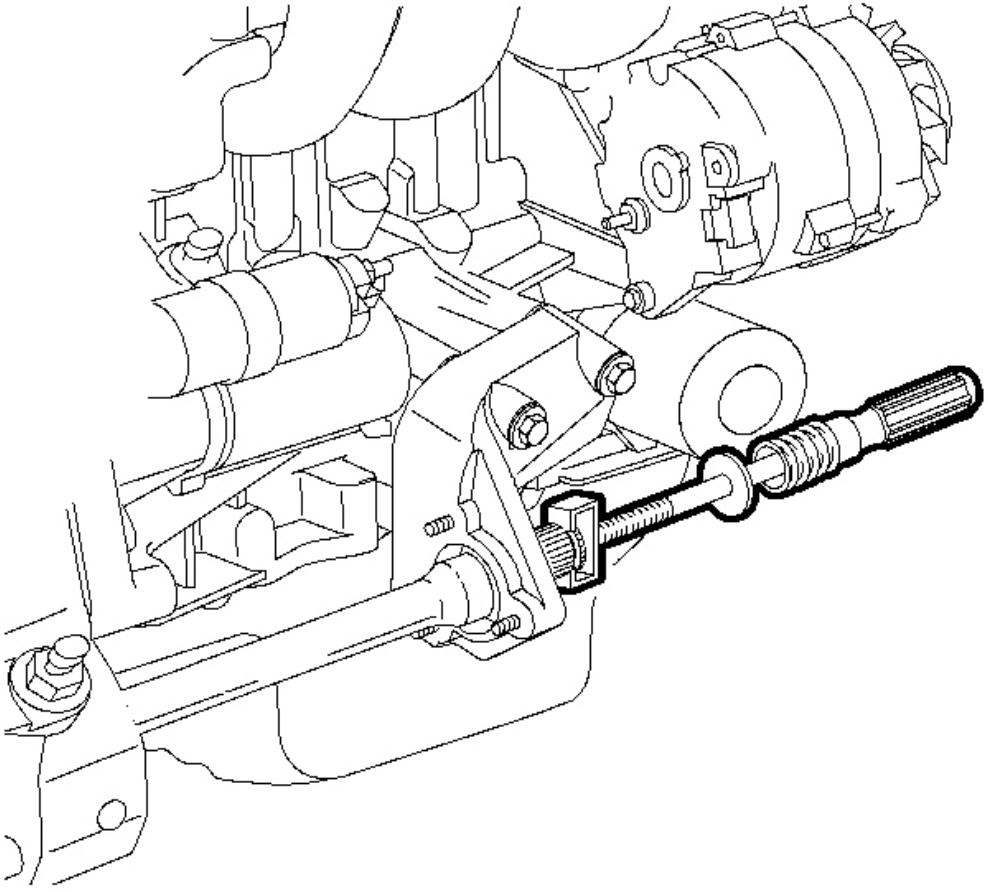

Fig. 3: Disengaging Intermediate Drive Shaft From The Transaxle
Courtesy of GENERAL MOTORS CORP.

8. Assemble the J 44467 and the **J 2619-01** to the intermediate drive shaft retainer ring groove.
9. Disengage the intermediate drive shaft from the transaxle.
10. Remove the intermediate drive shaft from the vehicle.

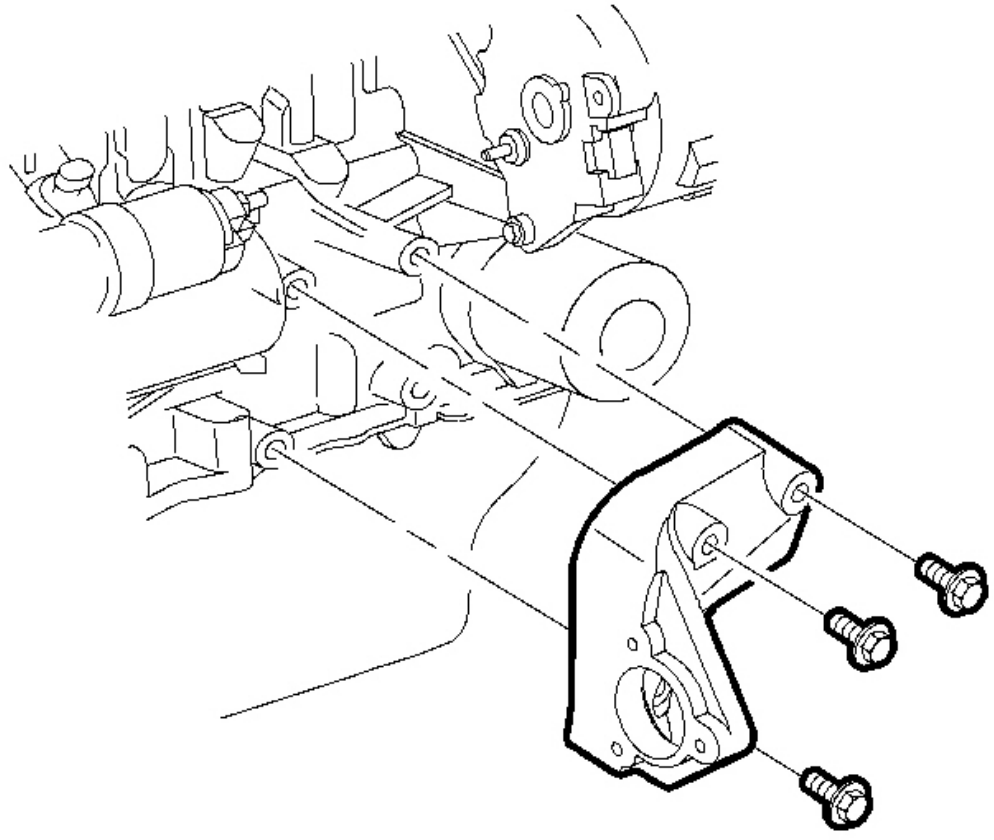

Fig. 4: Removing/Installing Intermediate Drive Shaft Support Bracket
Courtesy of GENERAL MOTORS CORP.

11. Remove the intermediate drive shaft support bracket mounting bolts.
12. Remove the support bracket from the engine.

Installation Procedure

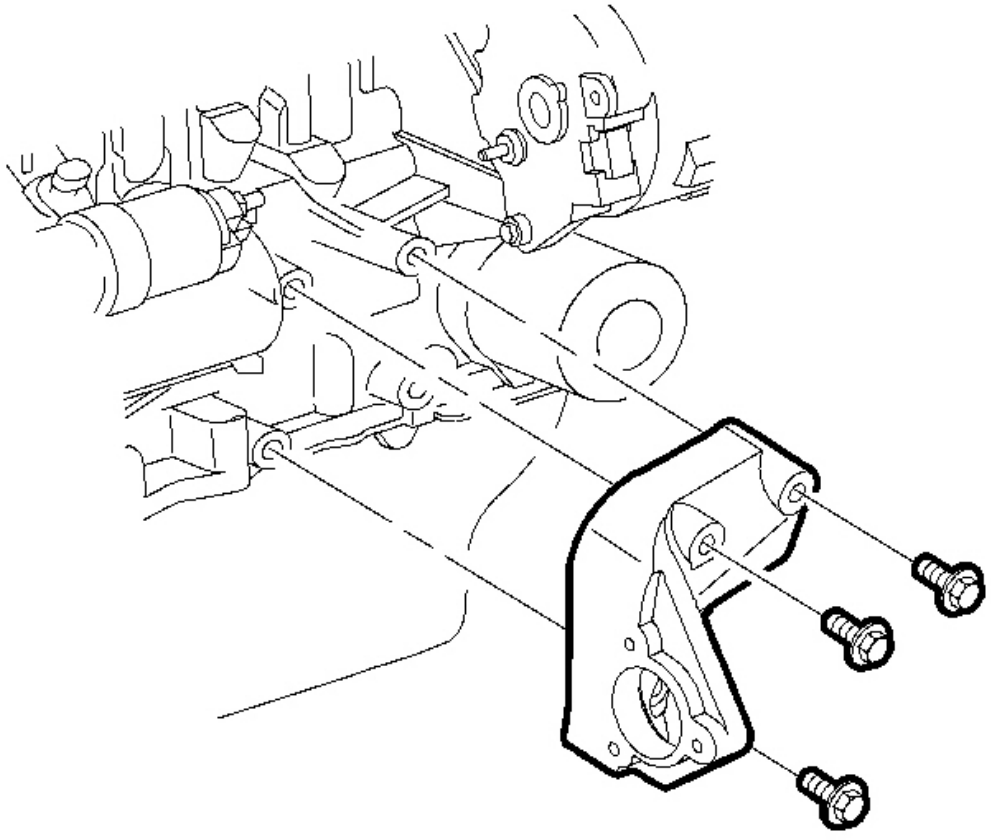

Fig. 5: Removing/Installing Intermediate Drive Shaft Support Bracket
Courtesy of GENERAL MOTORS CORP.

1. Install the intermediate drive shaft support bracket to the engine.

   NOTE: Refer to Fastener Notice in Cautions and Notices.

2. Install the support bracket mounting bolts.

   Tighten: Tighten the bolts to 35 N.m (26 lb ft).

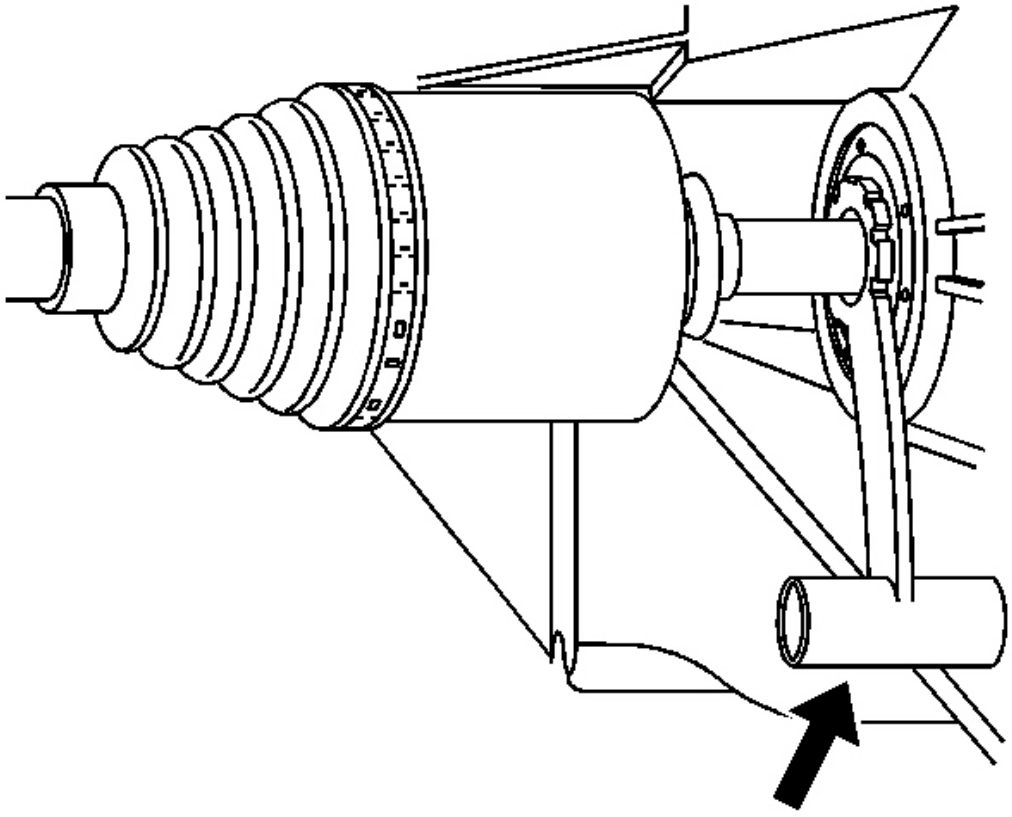

Fig. 6: Installing J44394 On The Transaxle Oil Seal
Courtesy of GENERAL MOTORS CORP.

3. Install the J 44394 to the transaxle oil seal.

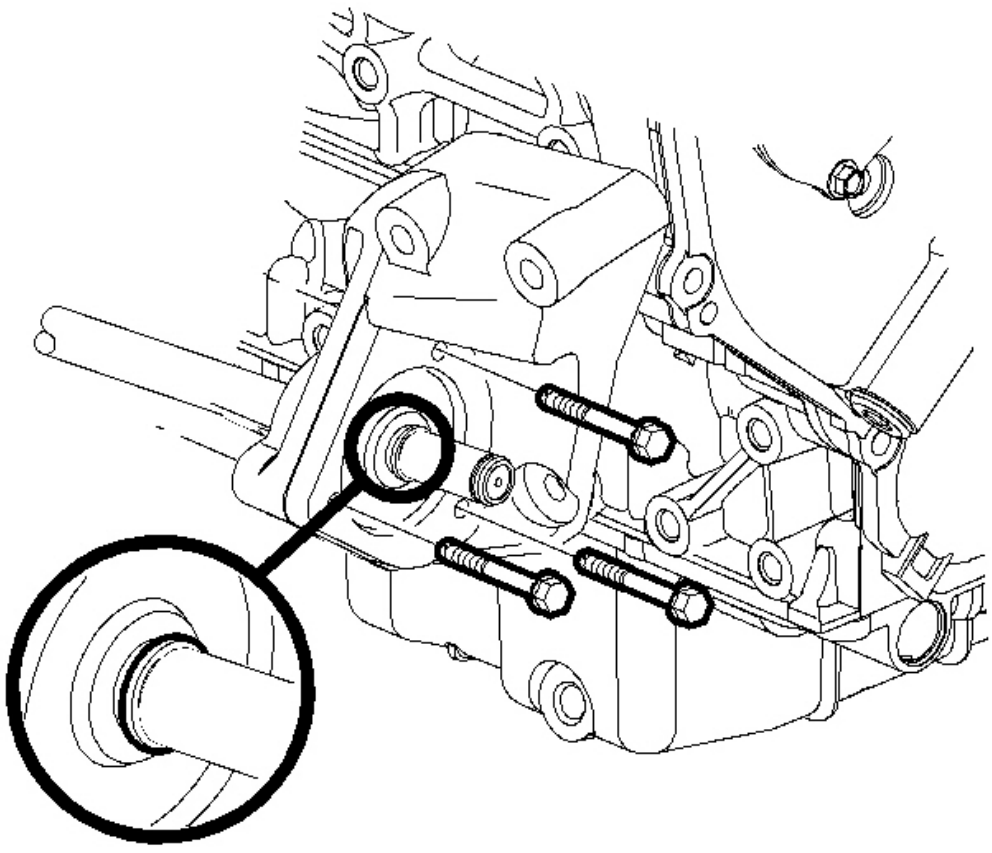

Fig. 7: Removing/Installing Intermediate Drive Shaft To The Bearing Retainer Bracket
Courtesy of GENERAL MOTORS CORP.

4. Install the intermediate drive shaft to the bearing retainer bracket and the transaxle.
5. Remove the J 44394 when the intermediate shaft splines pass the oil seal.
6. Ensure that the intermediate drive shaft is fully seated by grasping the intermediate drive shaft and attempting to pull free of the transaxle.
7. Position the bearing retainer to the support bracket.
8. Install the bearing retainer bolts.

Tighten: Tighten the bolts to 30 N.m (22 lb ft).

9. Install the O-ring seal to the intermediate drive shaft.
10. Install a new wheel drive shaft retaining ring to the intermediate drive shaft.
11. Install the right wheel drive shaft. Refer to **Wheel Drive Shaft Replacement - Front** .
12. Install the right tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
13. Lower the vehicle.

INTERMEDIATE SHAFT REPLACEMENT (L66)

Tools Required

- **J 2619-01** Slide Hammer
- J 44394 Seal Protector
- J 44467 Output Shaft Assembly Remover and Installer

Removal Procedure

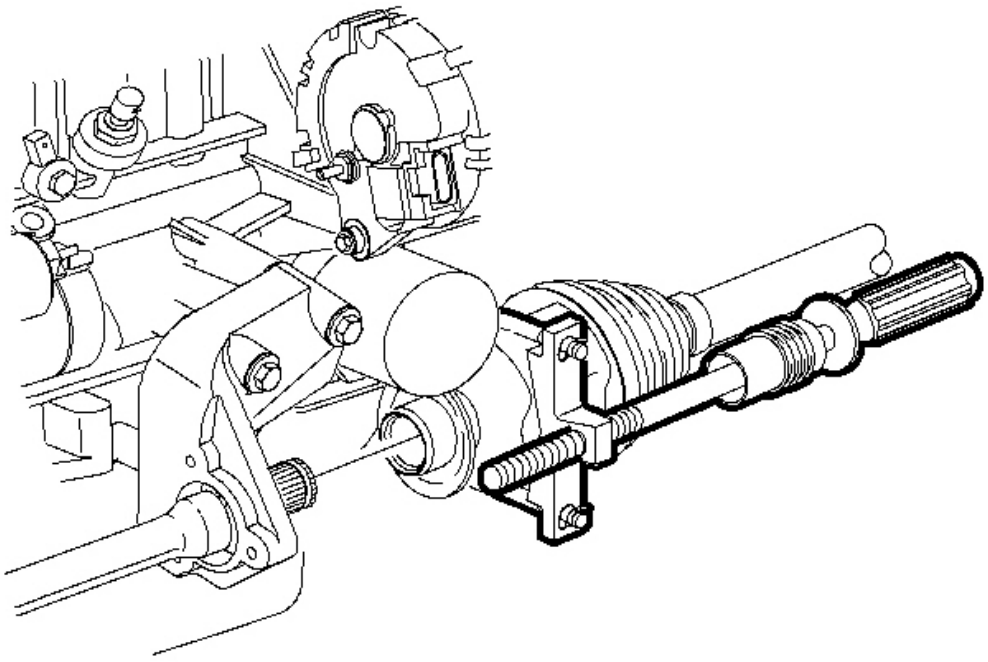

Fig. 8: View Of Intermediate Drive Shaft
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the right tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove the right front wheel drive shaft. Refer to **Wheel Drive Shaft Replacement - Front** .
4. Remove and discard the wheel drive shaft retaining ring.
5. Remove the O-ring seal from the intermediate drive shaft at the bearing retainer.
6. Remove the intermediate drive shaft support bracket bolts at the engine.

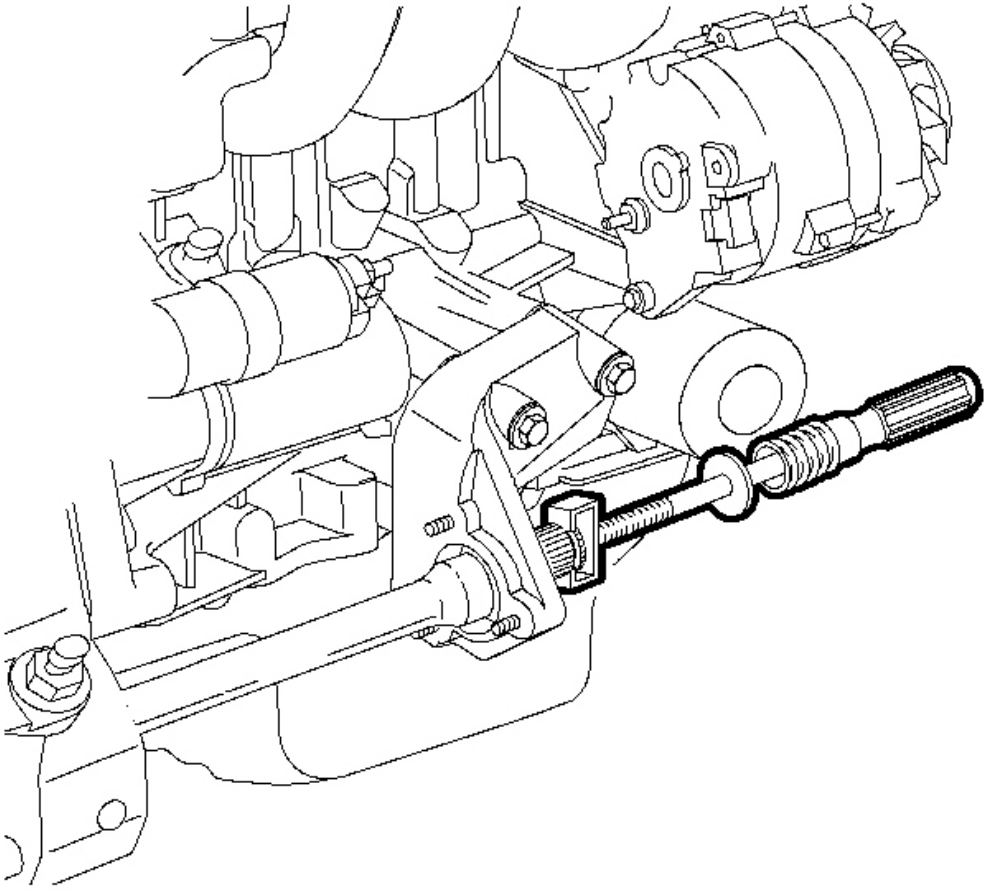

Fig. 9: Disengaging Intermediate Drive Shaft From The Transaxle
Courtesy of GENERAL MOTORS CORP.

7. Assemble the J 44467 and the **J 2619-01** to the intermediate drive shaft retainer ring groove.
8. Disengage the intermediate drive shaft from the transaxle.
9. Remove the intermediate drive shaft from the vehicle.
10. Remove the J 44467 and the **J 2619-01** from the intermediate drive shaft.

Installation Procedure

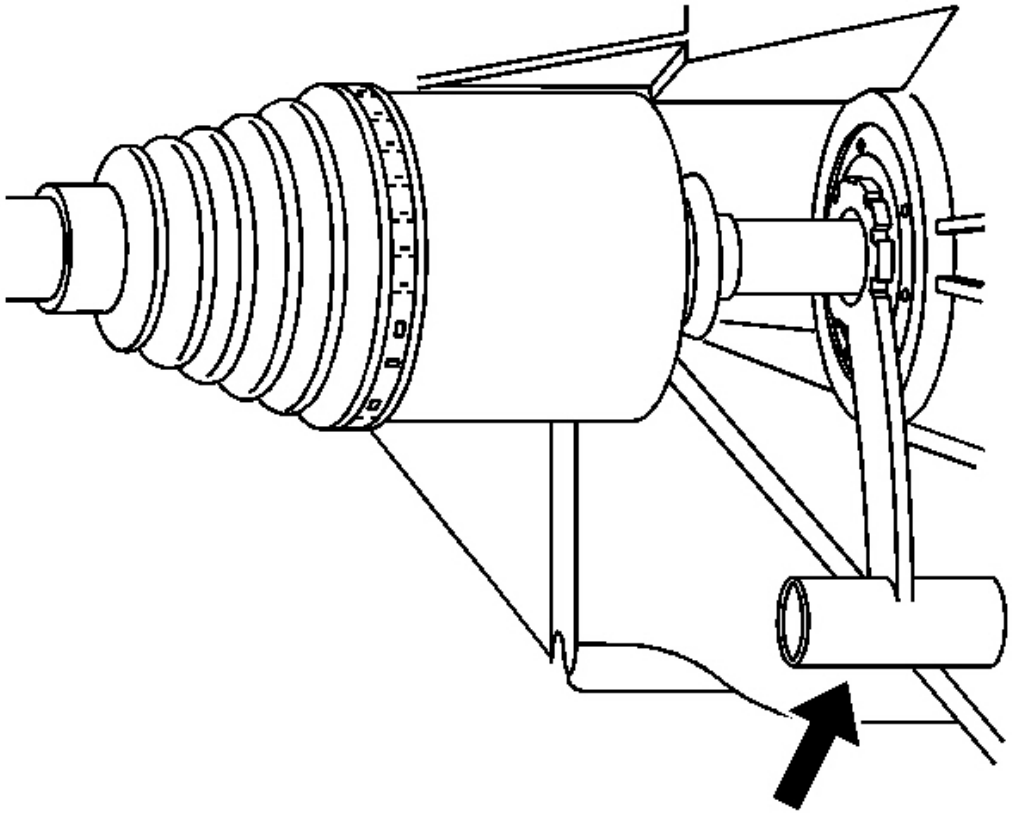

Fig. 10: Installing J44394 On The Transaxle Oil Seal
Courtesy of GENERAL MOTORS CORP.

1. Install the J 44394 to the transaxle oil seal.
2. Install the intermediate drive shaft to the transaxle.
3. Remove the J 44394 when the intermediate shaft splines pass the oil seal.
4. Ensure that the intermediate drive shaft is fully seated by grasping the intermediate drive shaft and attempting to pull free of the transaxle.
5. Position the support bracket to the engine.

NOTE: Refer to Fastener Notice in Cautions and Notices.

6. Install the support bracket bolts.

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

7. Install the O-ring seal to the intermediate drive shaft.
8. Install a new wheel drive shaft retaining ring to the intermediate drive shaft.
9. Install the right wheel drive shaft. Refer to **Wheel Drive Shaft Replacement - Front** .
10. Install the right tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
11. Lower the vehicle.

WHEEL DRIVE SHAFT REPLACEMENT - FRONT

Tools Required

- **J 43828** Ball Joint Separator
- **J 44015** Steering Linkage Installer. See **Special Tools and Equipment** .
- **J 45341** Rear Wheel Drive Shaft Removal Tool. See **Special Tools and Equipment** .
- **SA91100C** Tie Rod Separator. See **Special Tools and Equipment** .
- **SA91112T** Axle Seal Protector. See **Special Tools and Equipment** .
- **SA9173G** Slide Hammer. See **Special Tools and Equipment** .

Removal Procedure

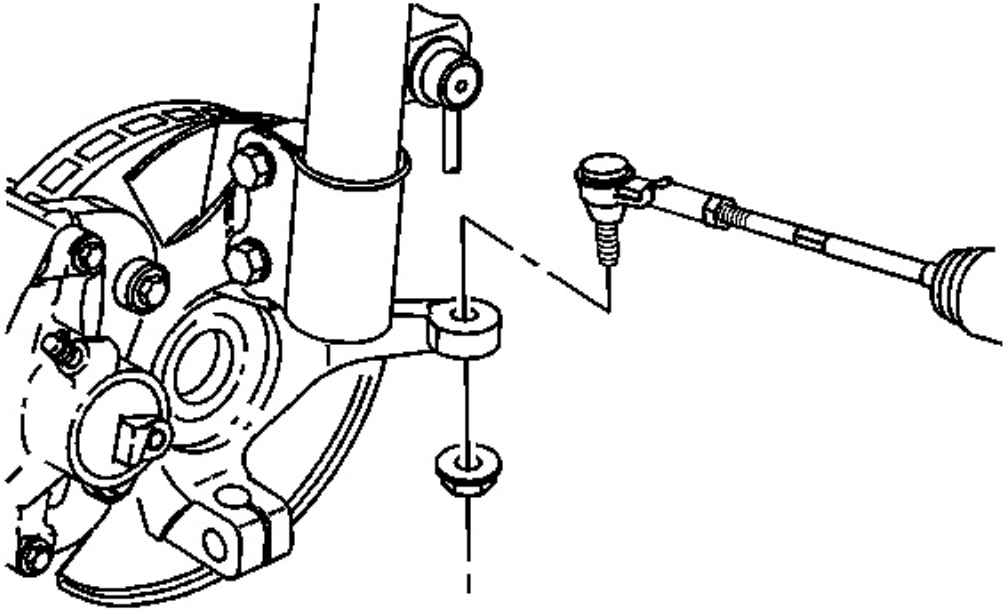

Fig. 11: Tie Rod To Knuckle View
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
3. Remove and discard the wheel drive shaft spindle nut.

NOTE: Hold the ball stud from turning when removing/installing the nut. The boot can become torn and damaged if the ball stud turns.

4. Remove the outer tie rod end-to-steering knuckle nut. Do not loosen the tie rod end jam nut.

IMPORTANT: Do not use a wedge type tool to separate the tie rod end from the steering knuckle.

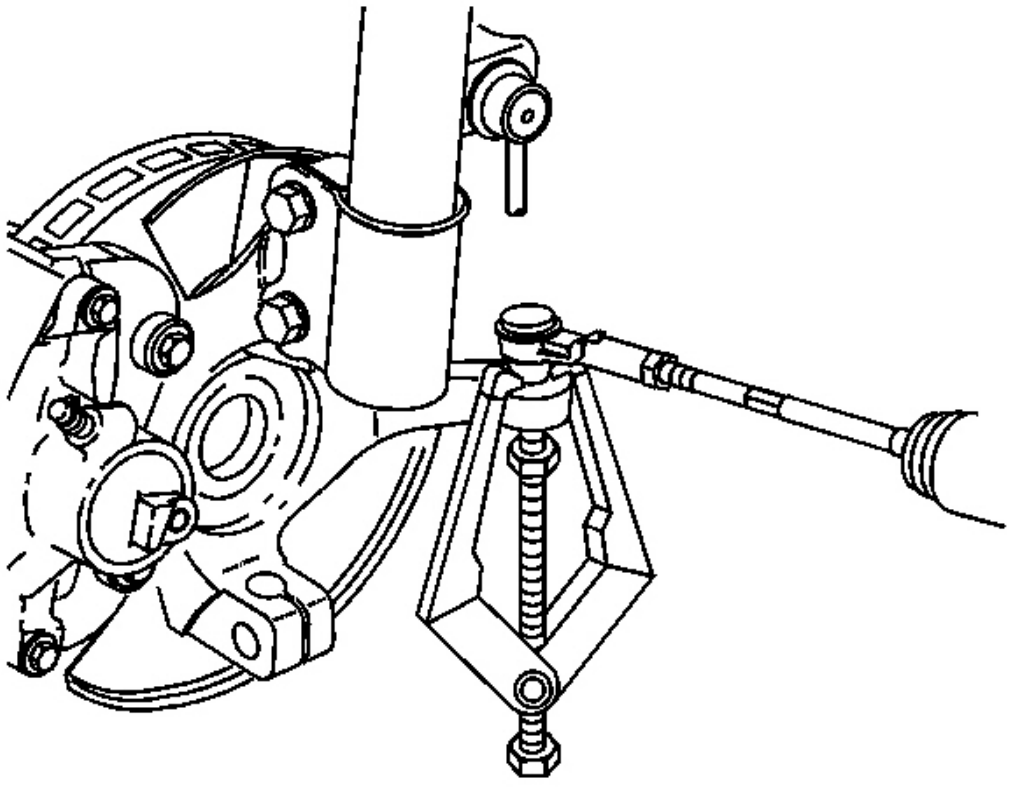

Fig. 12: Separating Tie Rod End From The Steering Knuckle Using SA91100C

Courtesy of GENERAL MOTORS CORP.

5. Using the **SA91100C** separate the tie rod end from the steering knuckle. See **Special Tools and Equipment** .

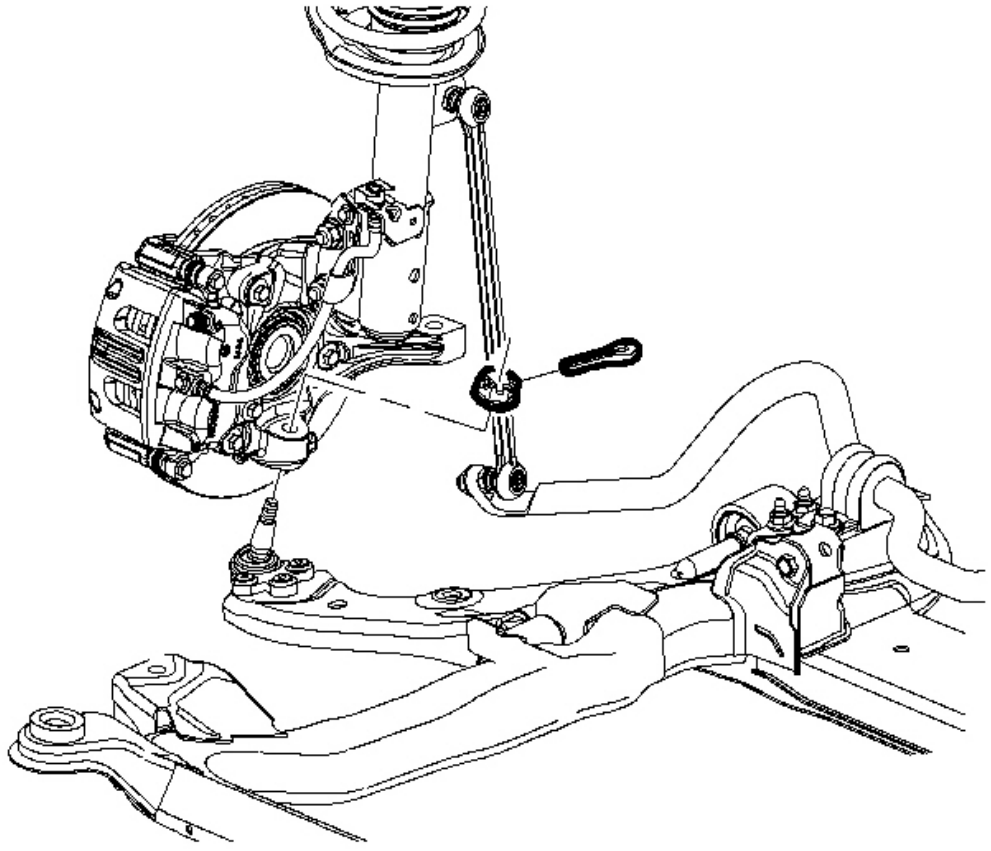

Fig. 13: Removing/Installing Lower Ball Joint Stud On The Steering Knuckle
Courtesy of GENERAL MOTORS CORP.

6. Remove and discard the cotter pin from the lower ball joint stud.
7. Remove the ball joint stud nut.

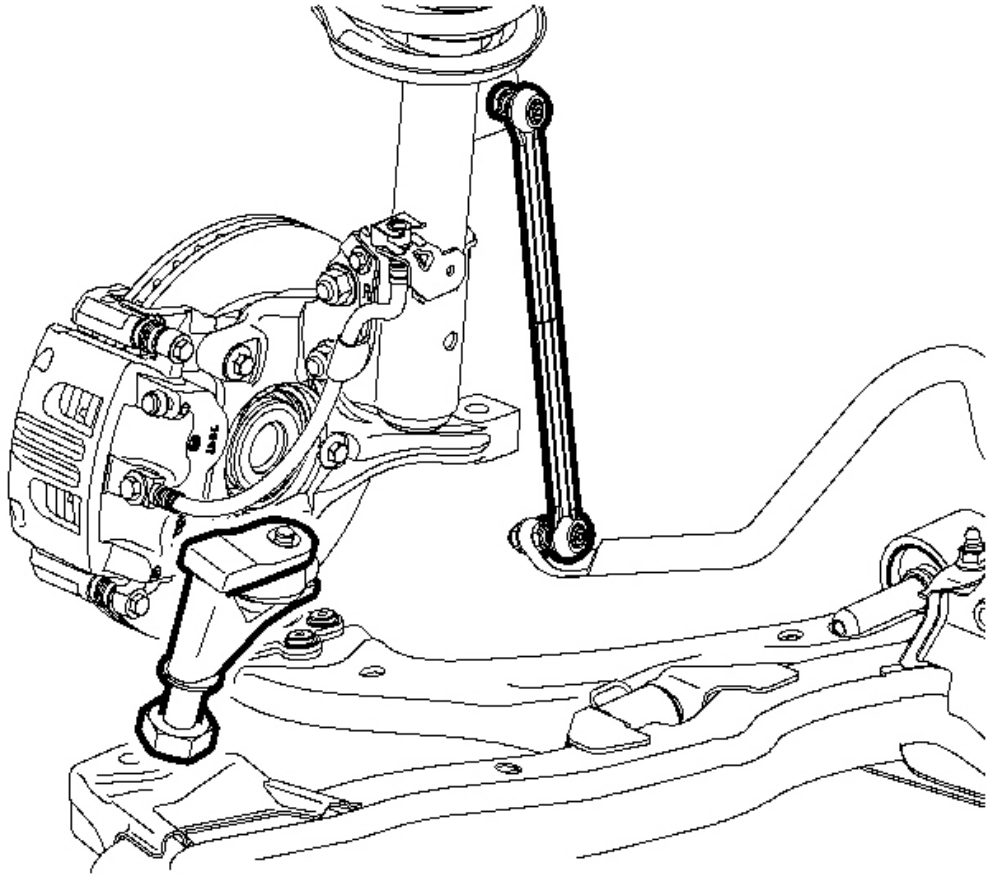

Fig. 14: Separating Lower Ball Joint Stud Using J43828
Courtesy of GENERAL MOTORS CORP.

8. Using the **J 43828** separate the lower ball joint stud from the steering knuckle.

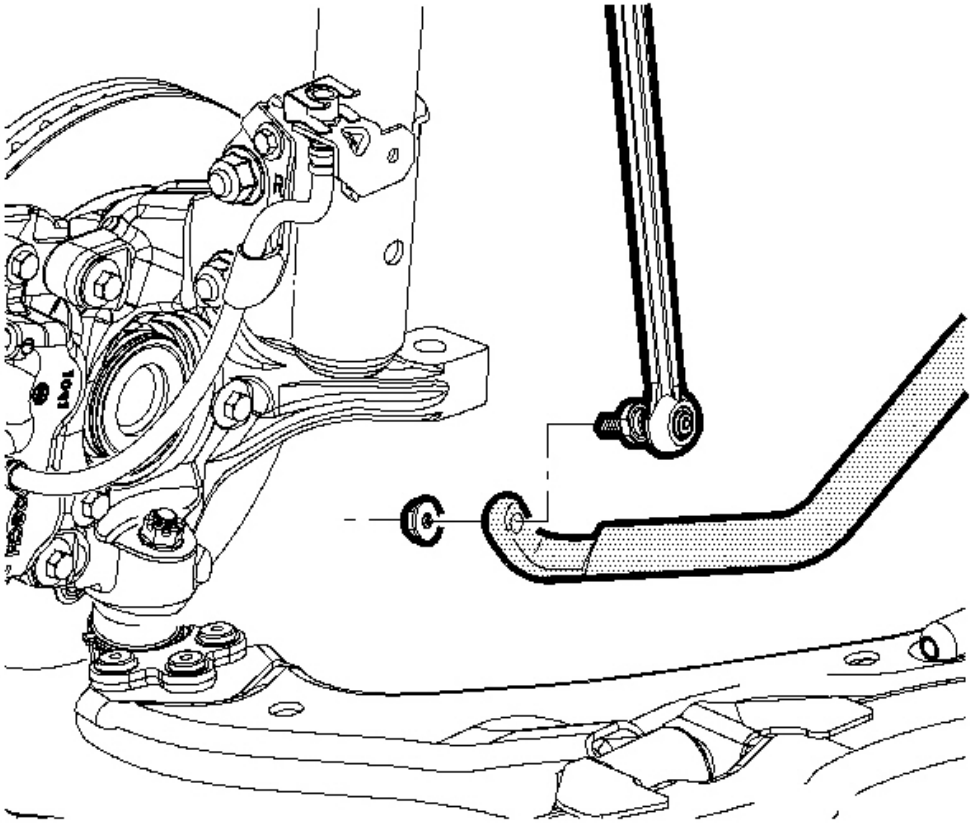

Fig. 15: Locating Rod & Bar
Courtesy of GENERAL MOTORS CORP.

9. Using a backup wrench on the stud, remove the nut securing the lower stabilizer bar link and disengage the link.
10. Disengage the wheel drive shaft spindle from the wheel hub assembly. If necessary, place a wood block against the end of the wheel drive shaft spindle and tap with a hammer to aid removal.

IMPORTANT: Use care not to damage the joint seal when removing the wheel drive shaft.

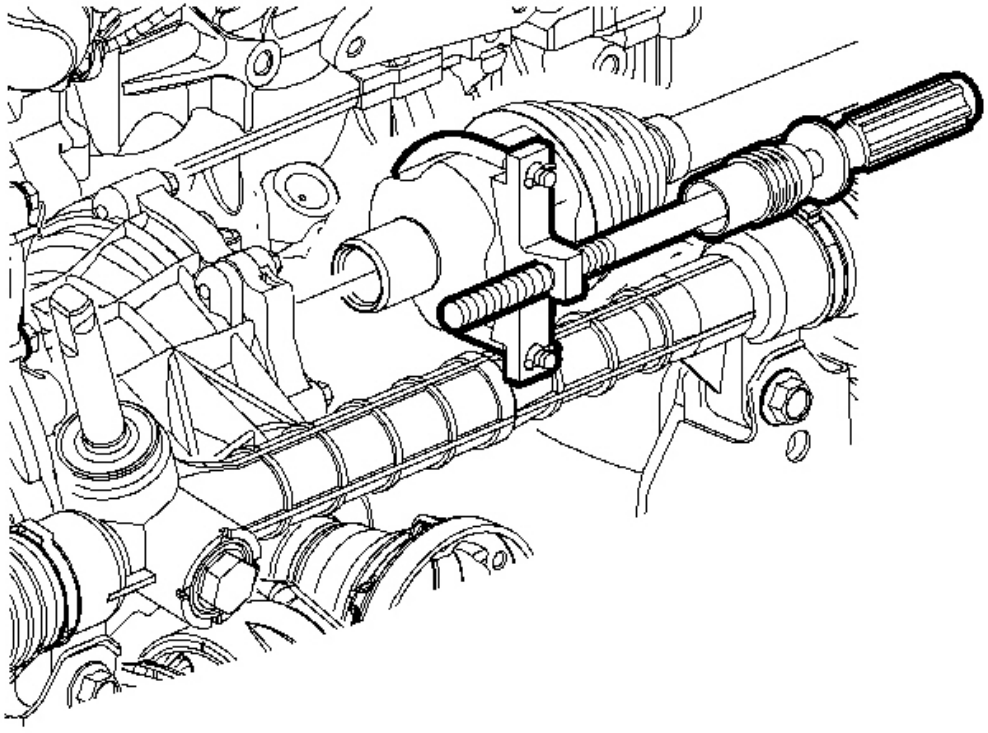

Fig. 16: Disengaging Wheel Drive Shaft From The Transmission or Power Takeoff Unit (PTU)
Courtesy of GENERAL MOTORS CORP.

11. Assemble the **J 45341** and the **SA9173G** to the wheel drive shaft inner tripot joint. See **Special Tools and Equipment** .

IMPORTANT: On vehicles equipped with all-wheel drive (AWD), the stub shaft may disengage from the power takeoff unit (PTU). If necessary, cap the opening in the PTU to prevent fluid loss.

12. Disengage the wheel drive shaft from the transmission or power takeoff unit (PTU), if equipped.
13. Remove the wheel drive shaft from the vehicle.

Installation Procedure

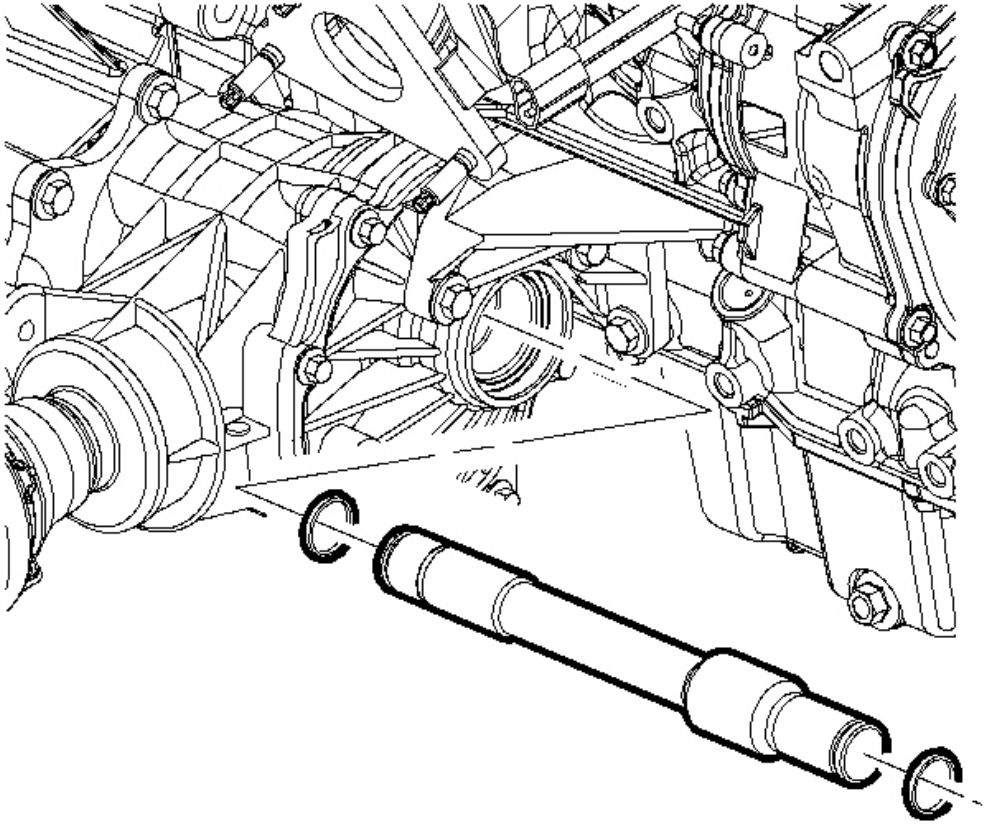

Fig. 17: Installing Wheel Drive Shaft Retaining Ring
Courtesy of GENERAL MOTORS CORP.

1. Install a new wheel drive shaft retaining ring to the output shaft.

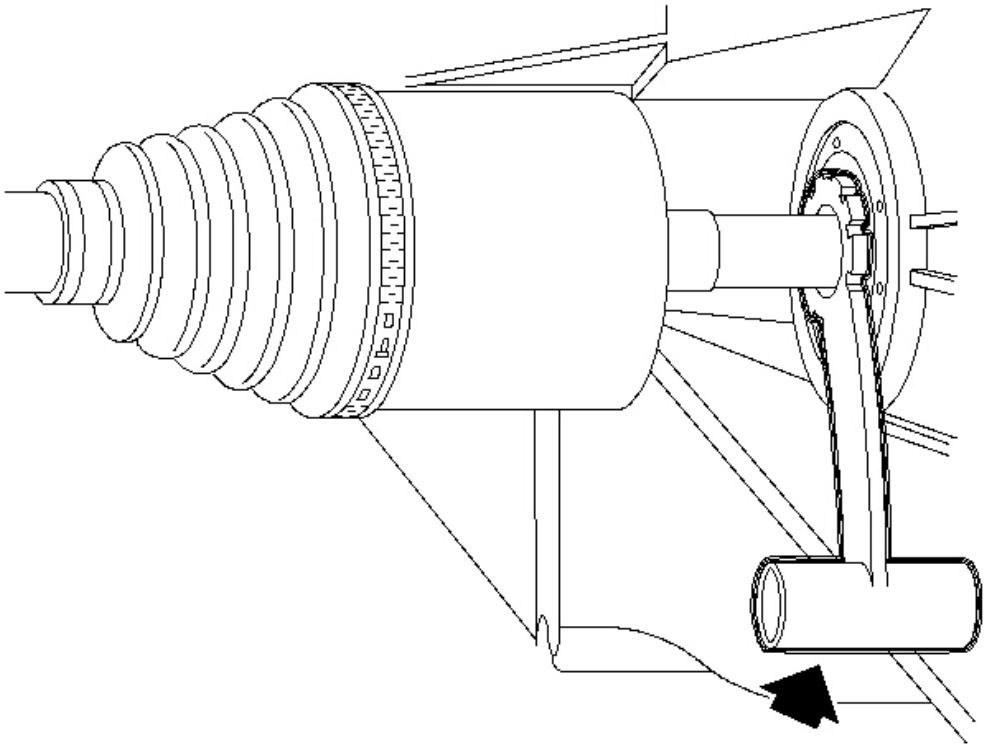

Fig. 18: Installing SA91112T On The Wheel Drive Shaft Oil Seal
Courtesy of GENERAL MOTORS CORP.

2. Install the **SA91112T** to the wheel drive shaft oil seal. See **Special Tools and Equipment** .

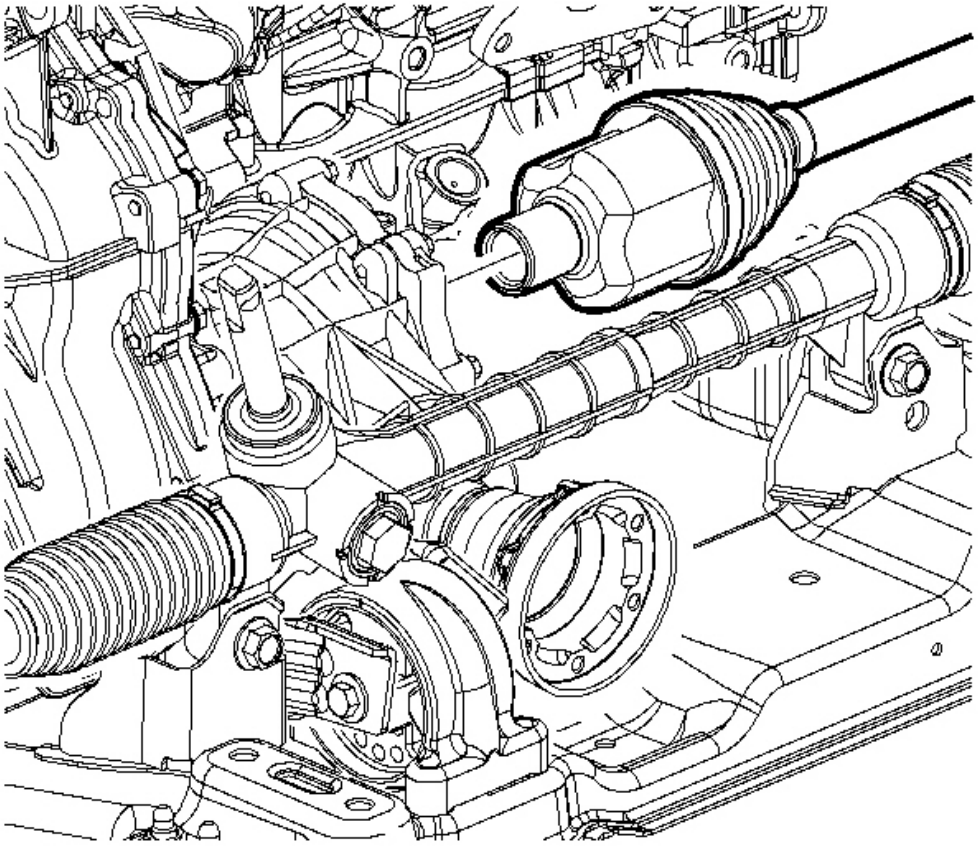

Fig. 19: Installing Wheel Drive Shaft On The Output Shaft
Courtesy of GENERAL MOTORS CORP.

3. Install the wheel drive shaft to the output shaft:
    - Guide the wheel drive shaft tripot joint squarely onto the output shaft.
    - After the splined end of the wheel drive shaft passes the oil seal, remove the **SA91112T** from the oil seal. See **Special Tools and Equipment** .
    - Firmly engage the wheel drive shaft to the output shaft.
    - Ensure that the tripot joint is fully seated on the output shaft by grasping the tripot joint and attempting to pull free of the output shaft.

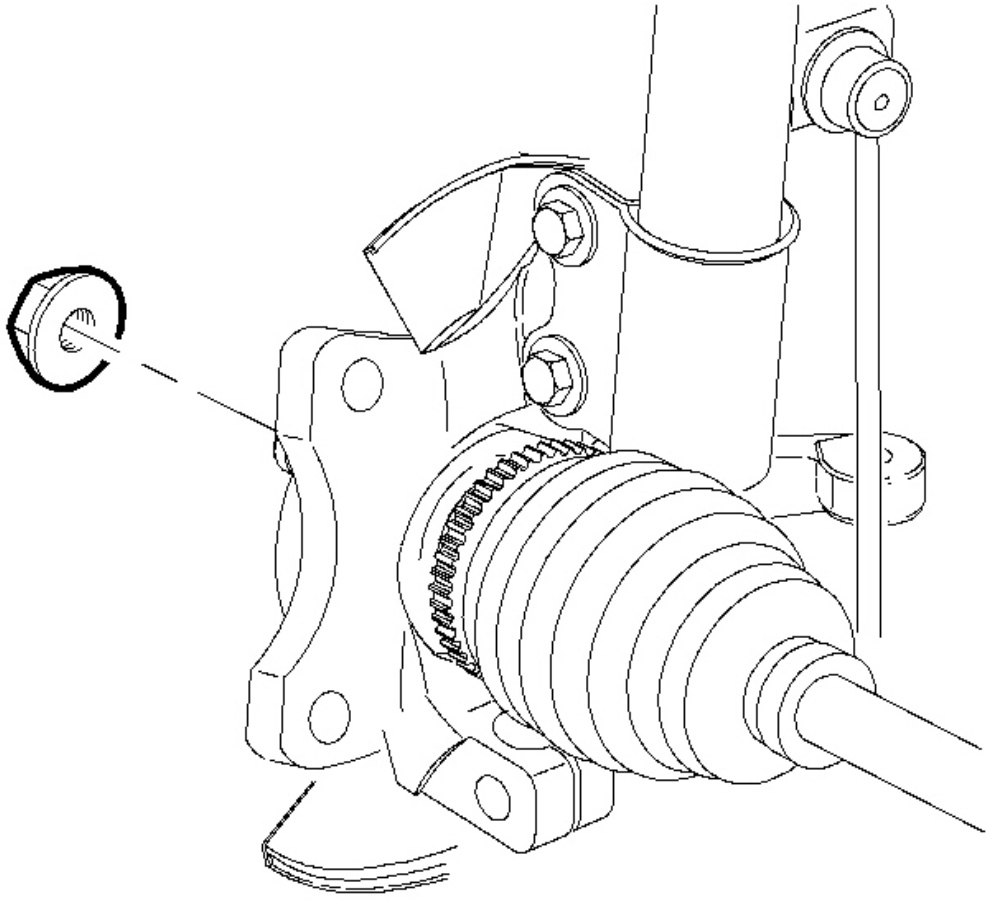

Fig. 20: Inserting Constant Velocity (CV) Joint Spindle On The Wheel Hub/Bearing Assembly
Courtesy of GENERAL MOTORS CORP.

4. Insert the constant velocity (CV) joint spindle to the wheel hub/bearing assembly of the steering knuckle.
5. Hand install a new wheel drive shaft spindle nut.

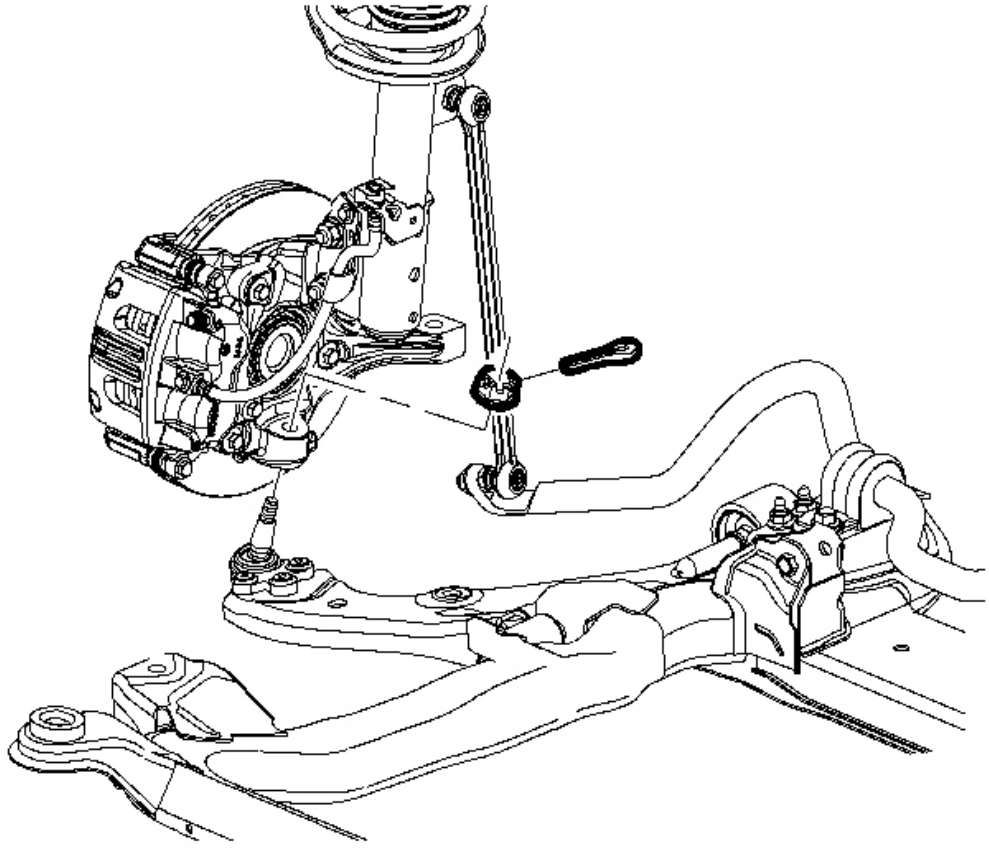

Fig. 21: Removing/Installing Lower Ball Joint Stud On The Steering Knuckle
Courtesy of GENERAL MOTORS CORP.

6. Install the lower ball joint stud to the steering knuckle.

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

7. Install the lower ball joint castle nut to the stud.

Tighten:

- Tighten the nut to 10 N.m (89 lb in).
- Tighten the nut an additional 150 degrees.

8. Install the cotter pin to the ball joint stud.
9. If necessary, tighten the nut one additional flat at a time until the castle nut aligns with the hole in the ball joint stud.
10. Secure the cotter pin to the ball joint stud by folding one tine over the end of the ball joint stud.
11. Cut off any excess length of the cotter pin tines.

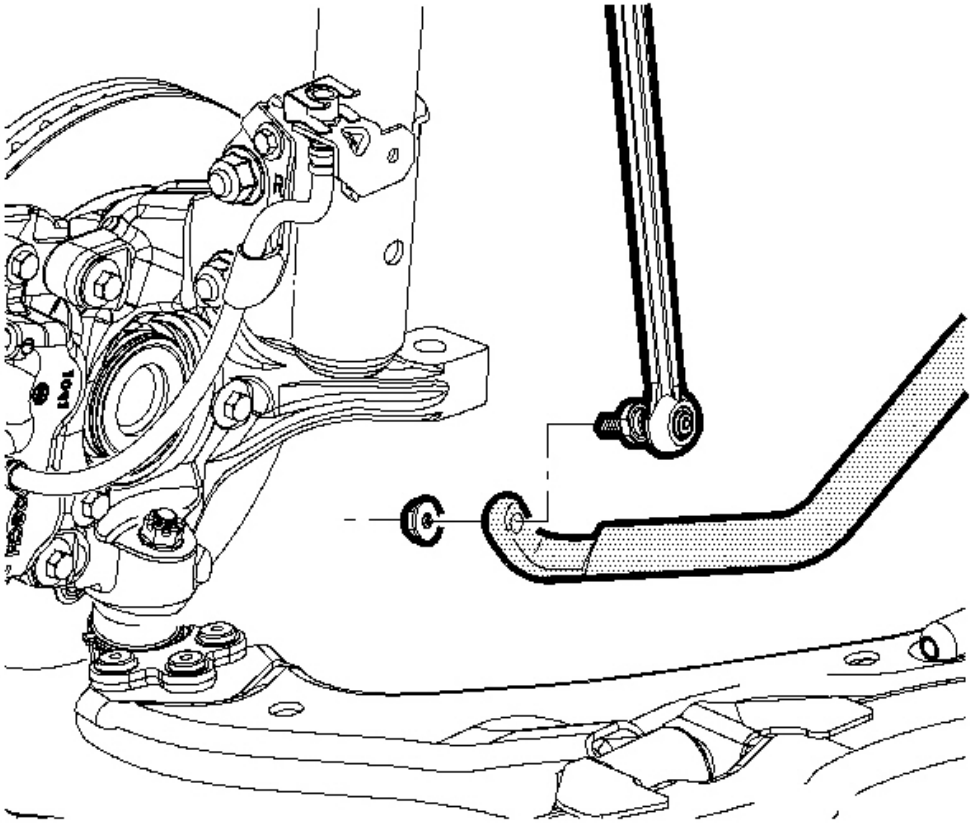

Fig. 22: Locating Rod & Bar
Courtesy of GENERAL MOTORS CORP.

12. Install the lower link to the stabilizer bar.
13. Install a new nut to the stabilizer bar link stud.

IMPORTANT: In order to prevent damaging the stabilizer bar link stud seal, do not allow the stud to rotate while tightening the nut.

14. Use a back up wrench on the stud and tighten the nut.

    Tighten: Tighten the nut to 65 N.m (48 lb ft).

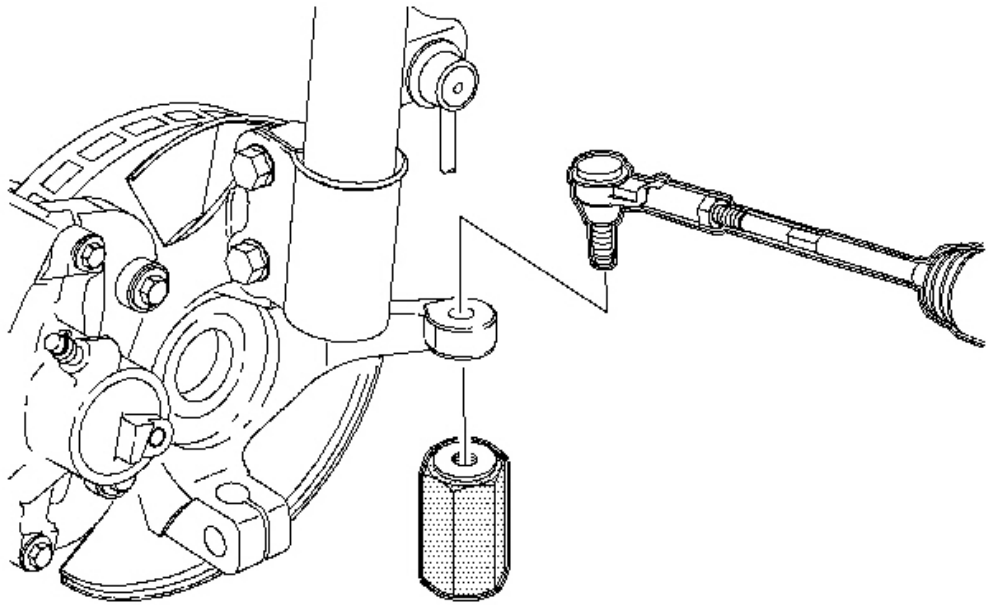

Fig. 23: Installing Tie Rod End On The Steering Knuckle
Courtesy of GENERAL MOTORS CORP.

15. Install the tie rod end to the steering knuckle.
16. Using the **J 44015** , pull the stud into steering knuckle. See **Special Tools and Equipment** .

Tighten: Tighten the **J 44015** to 40 N.m (30 lb ft). See **Special Tools and Equipment** .

17. Remove the **J 44015** from the tie rod end stud. See **Special Tools and Equipment** .

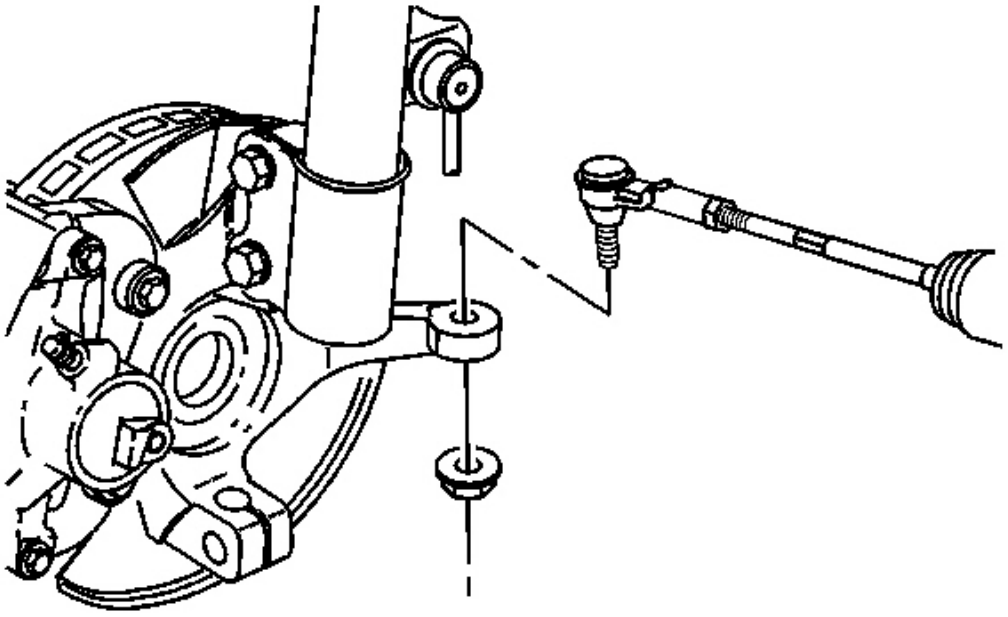

Fig. 24: Tie Rod To Knuckle View
Courtesy of GENERAL MOTORS CORP.

18. Install a new nut to the tie rod end stud.

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

19. Tighten the wheel drive shaft spindle nut.

    Tighten: Tighten the nut to 205 N.m (151 lb ft).

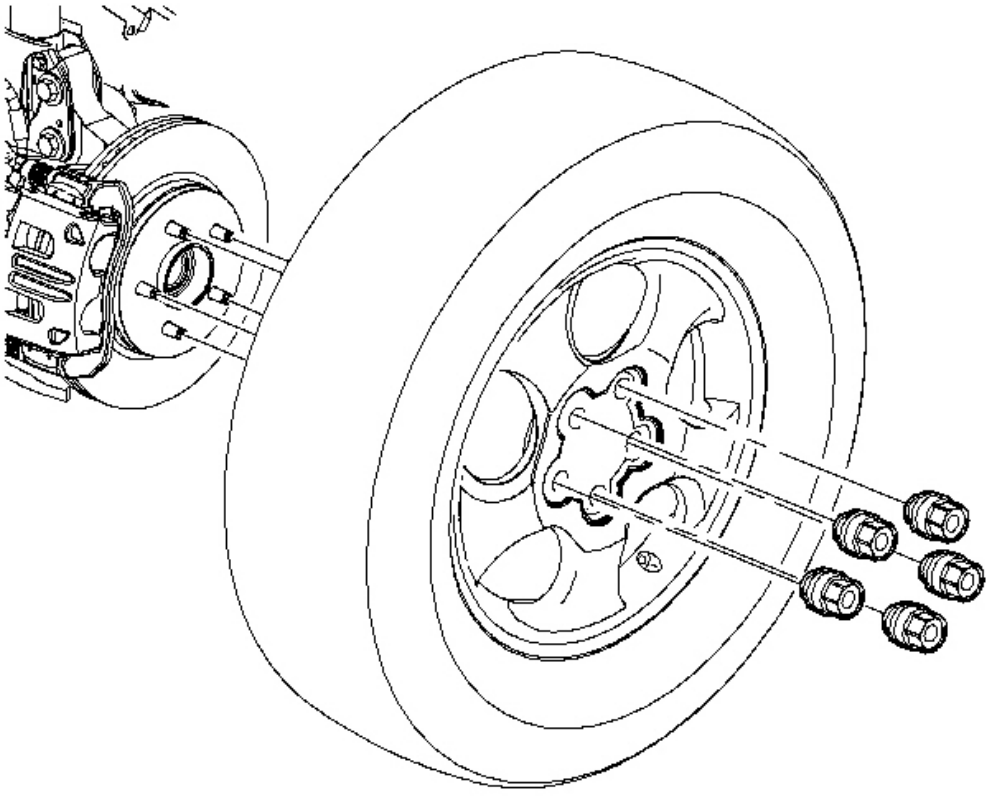

Fig. 25: Installing Tire & Wheel Assembly
Courtesy of GENERAL MOTORS CORP.

20. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
21. Lower the vehicle.
22. Inspect the transmission fluid level. Refer to **Transmission Fluid Checking Procedure** in Manual Transmission - Getrag 5 Speed or **Transmission Fluid Checking Procedure** in Automatic Transmission - 5AT or **Transmission Fluid Checking Procedure** in Automatic Transmission - VT25-E.

WHEEL DRIVE SHAFT REPLACEMENT - REAR

Tools Required

- **J 45341** Rear Wheel Drive Shaft Removal Tool. See **Special Tools and Equipment** .
- J 44394 Seal Protector
- J-2619-A Slide Hammer w/Adapter

Removal Procedure

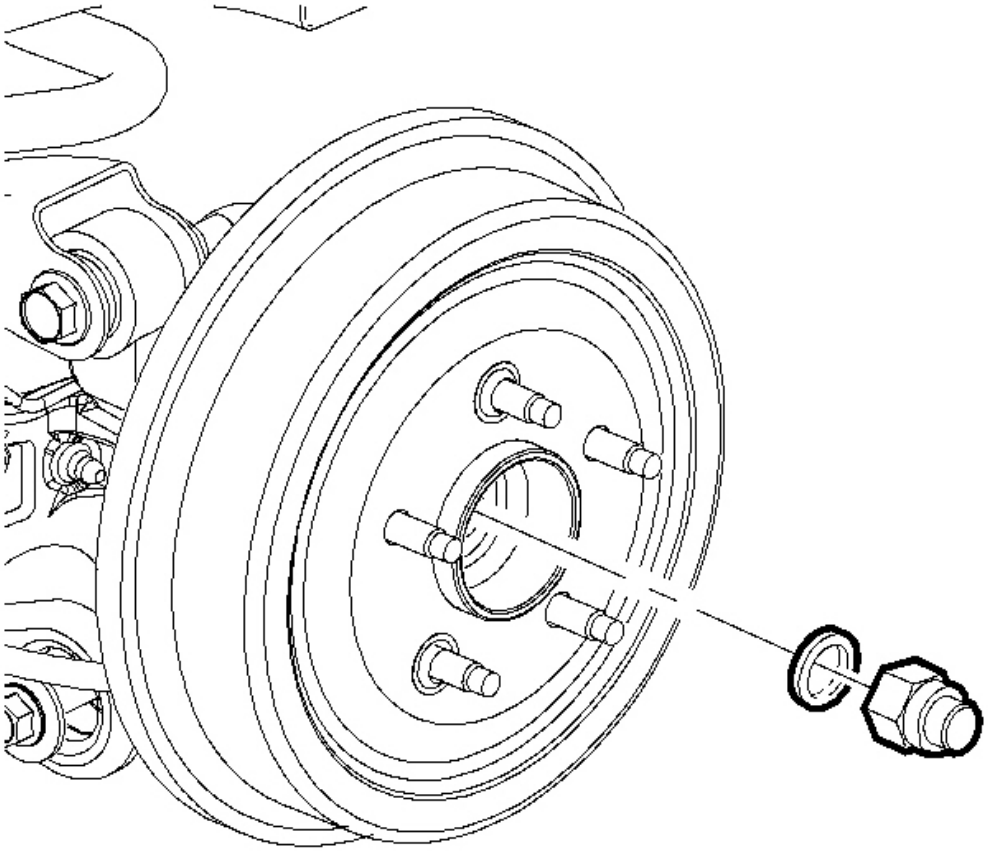

Fig. 26: View Of Rear Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

1. Raise and support the vehicle. Refer to **Lifting and Jacking the Vehicle** in General Information.
2. Remove the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.

3. Remove and discard the wheel drive shaft spindle nut.

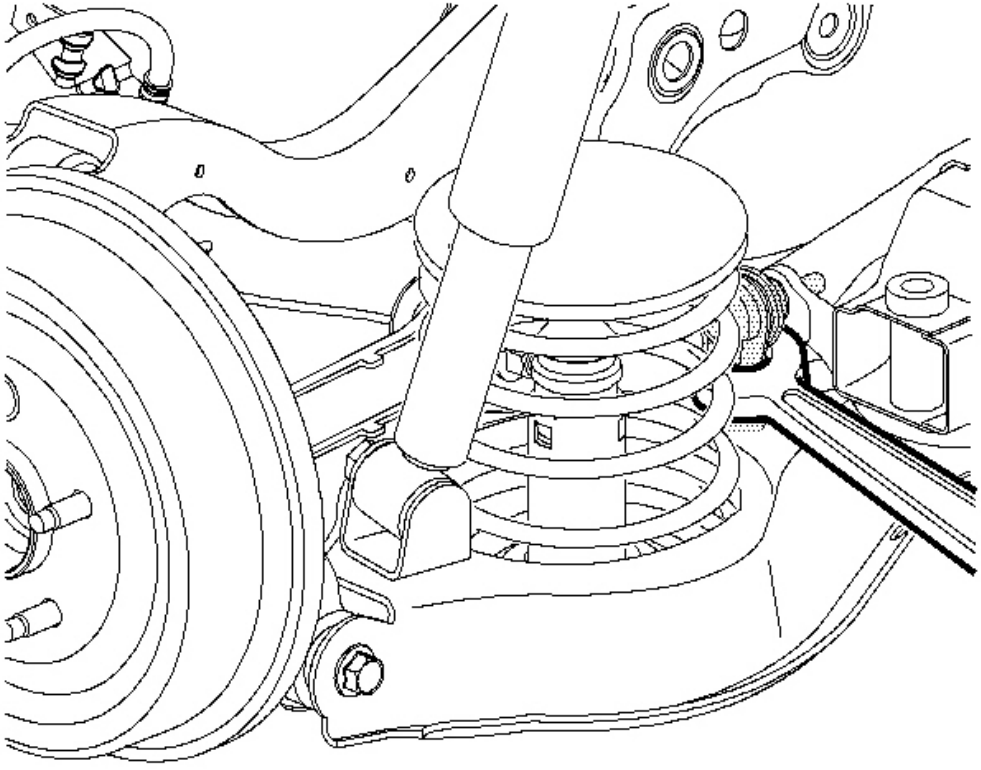

Fig. 27: Removing Stabilizer Link With A Wrench
Courtesy of GENERAL MOTORS CORP.

4. While holding the stabilizer link with a wrench, remove the stabilizer link-to-lower control arm nut.
5. Disconnect the link from the control arm.

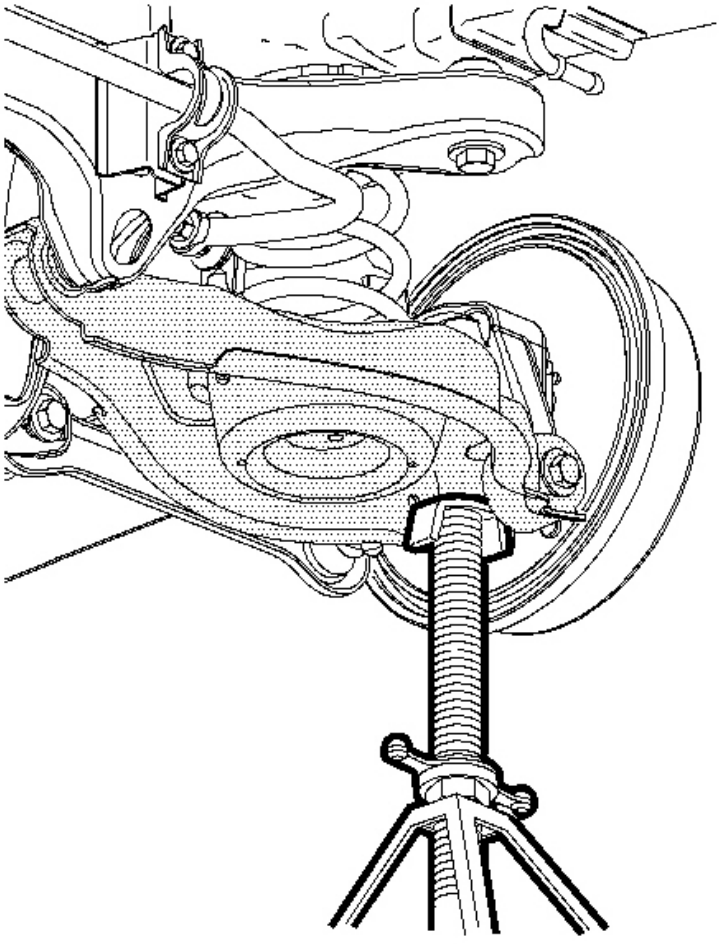

Fig. 28: Positioning Support Stand Under The Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

6. Place a stand under the lower control arm and support the control arm.

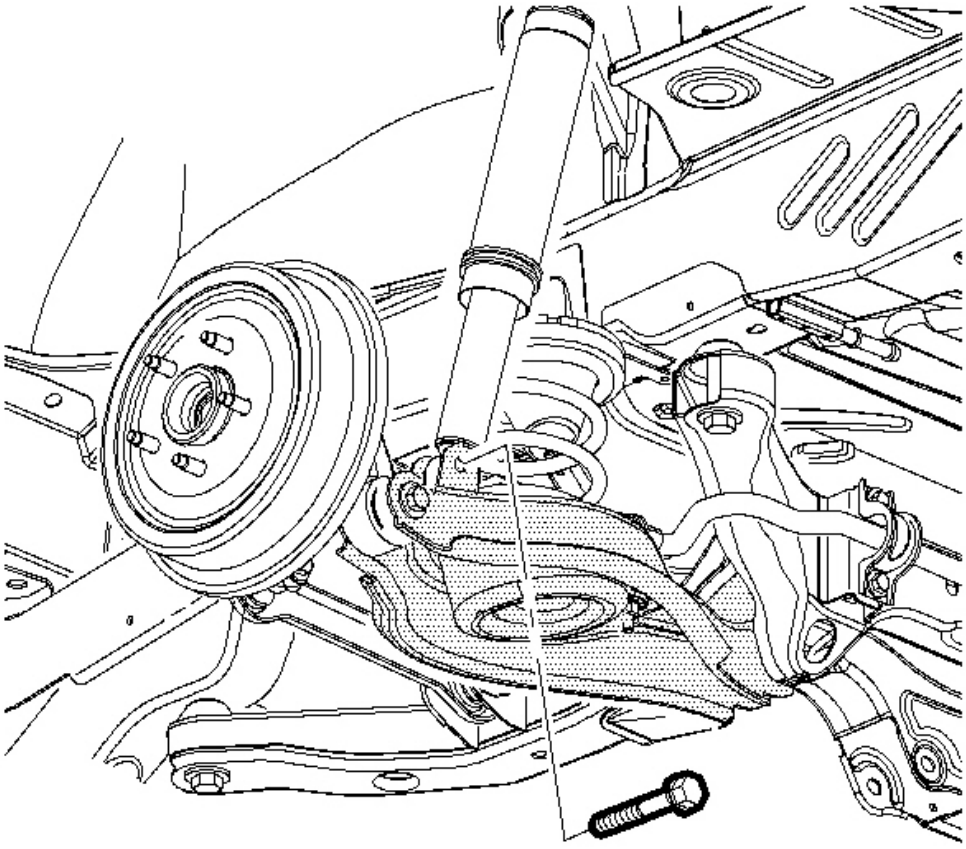

Fig. 29: Removing/Installing Lower Shock Absorber Mounting Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

7. Remove the lower shock absorber mounting bolt and nut.

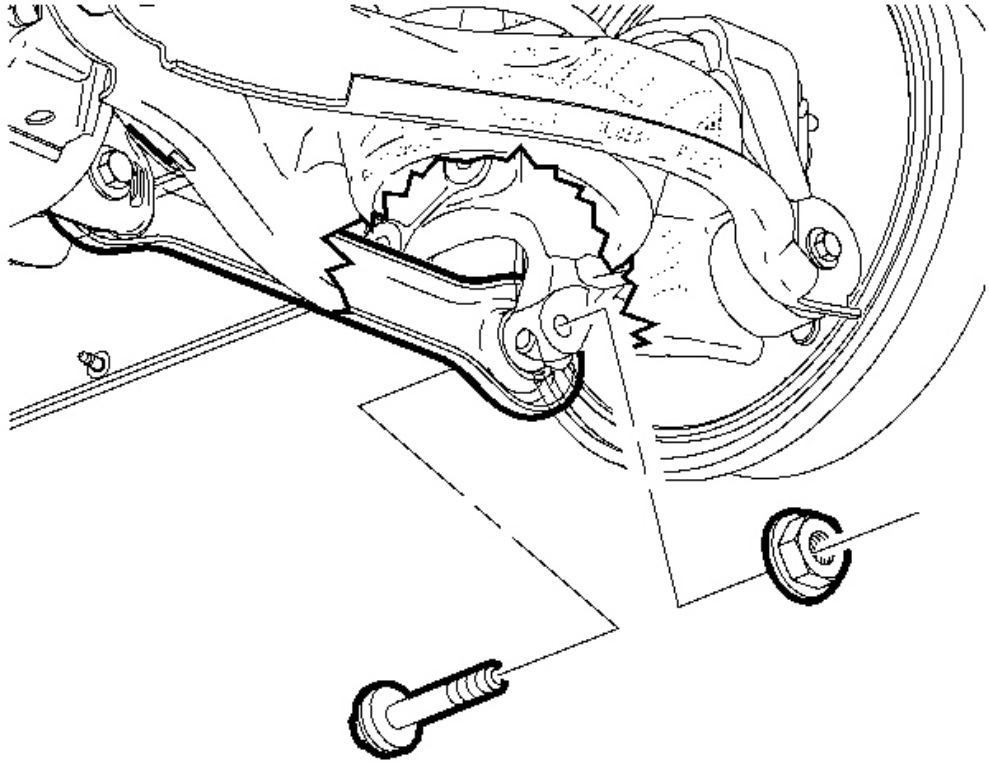

Fig. 30: Removing/Installing Washer, Bolt & Nut On The Suspension Knuckle
Courtesy of GENERAL MOTORS CORP.

8. Remove the toe link nut, bolt, and washer.

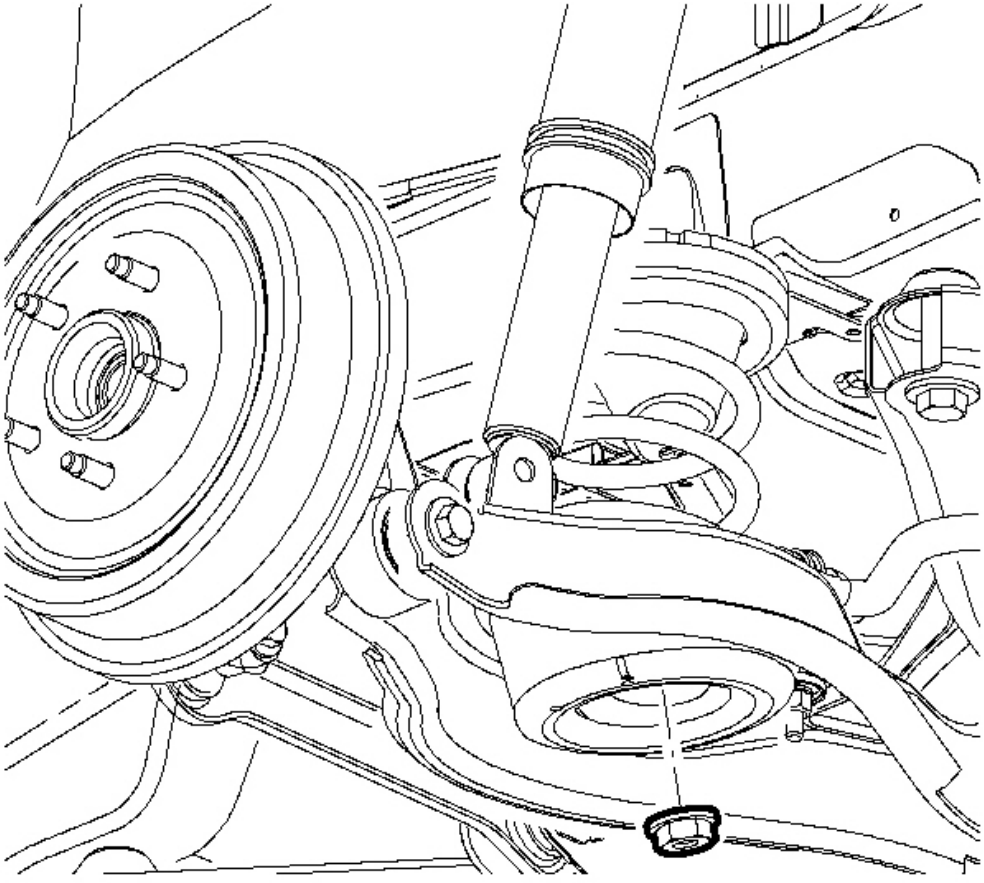

Fig. 31: Loosening Lower Suspension Jounce Bumper Nut
Courtesy of GENERAL MOTORS CORP.

9. Loosen, but do not remove, the lower suspension jounce bumper nut.

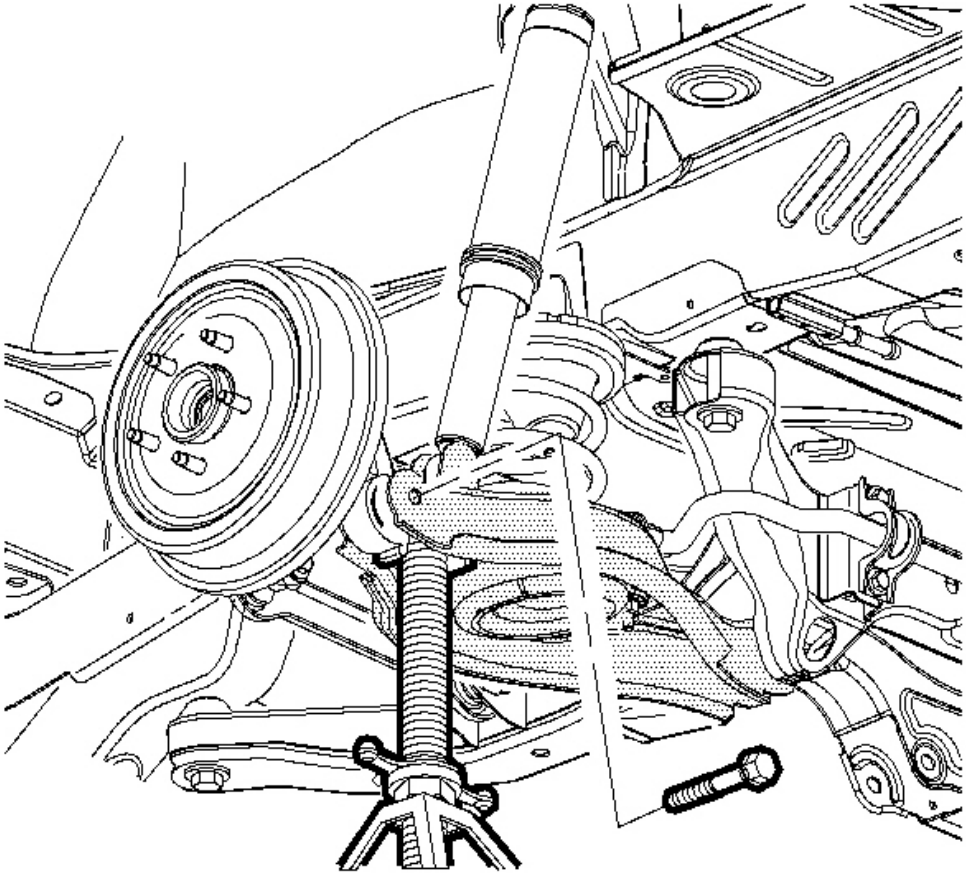

Fig. 32: Removing/Installing Lower Control Arm On The Suspension Knuckle Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

10. Remove the lower control arm-to-suspension knuckle bolt and nut.

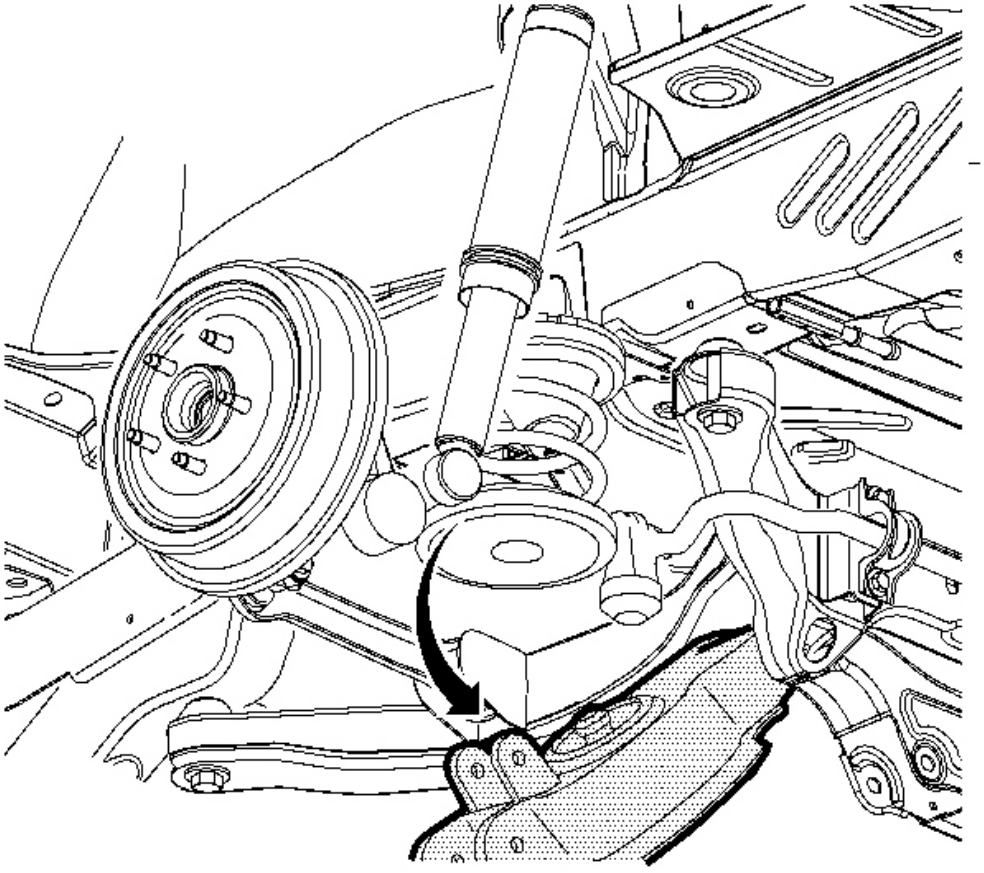

Fig. 33: Lowering Support Stand Slowly Until Coil Spring Tension Relieved
Courtesy of GENERAL MOTORS CORP.

IMPORTANT: Relieve spring tension slowly in order to avoid sudden release of the coil spring.

11. Slowly lower support stand until coil spring tension is relieved and remove coil spring.

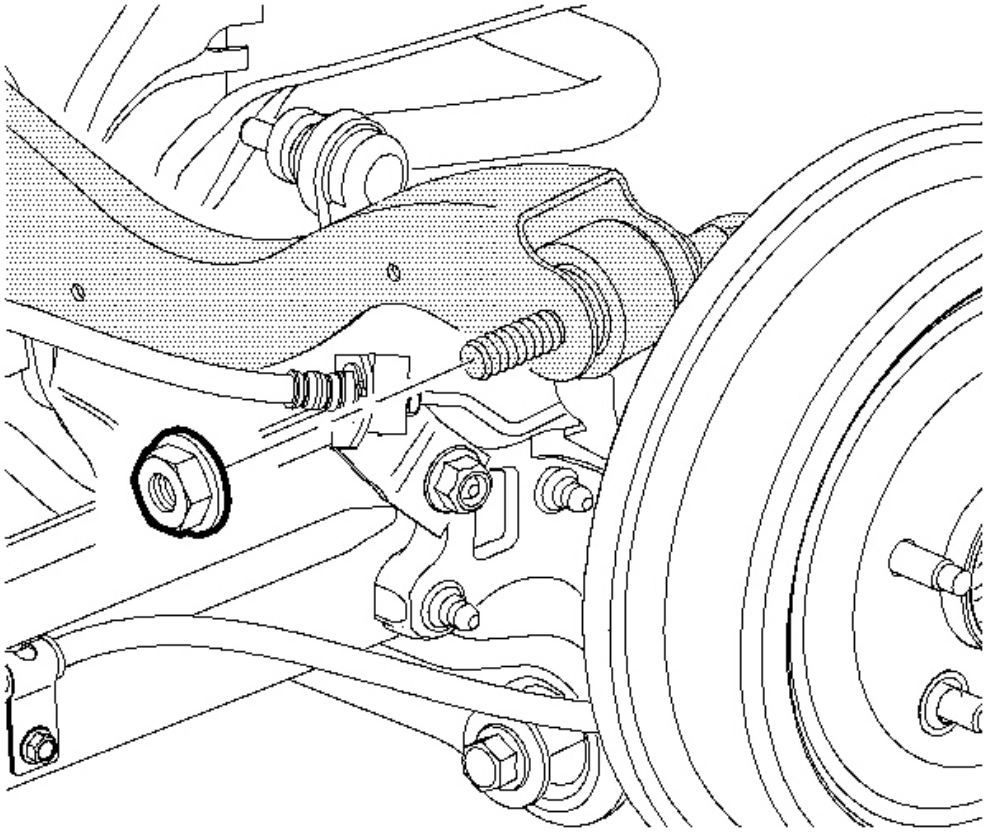

Fig. 34: Tightening Upper Control Arm On The Suspension Knuckle Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

12. Loosen, but do not remove, the upper control arm-to-suspension knuckle nut.

IMPORTANT: Support the wheel drive shaft while it is disengaged from the wheel hub and bearing assembly in order to avoid damaging the wheel drive shaft seals.

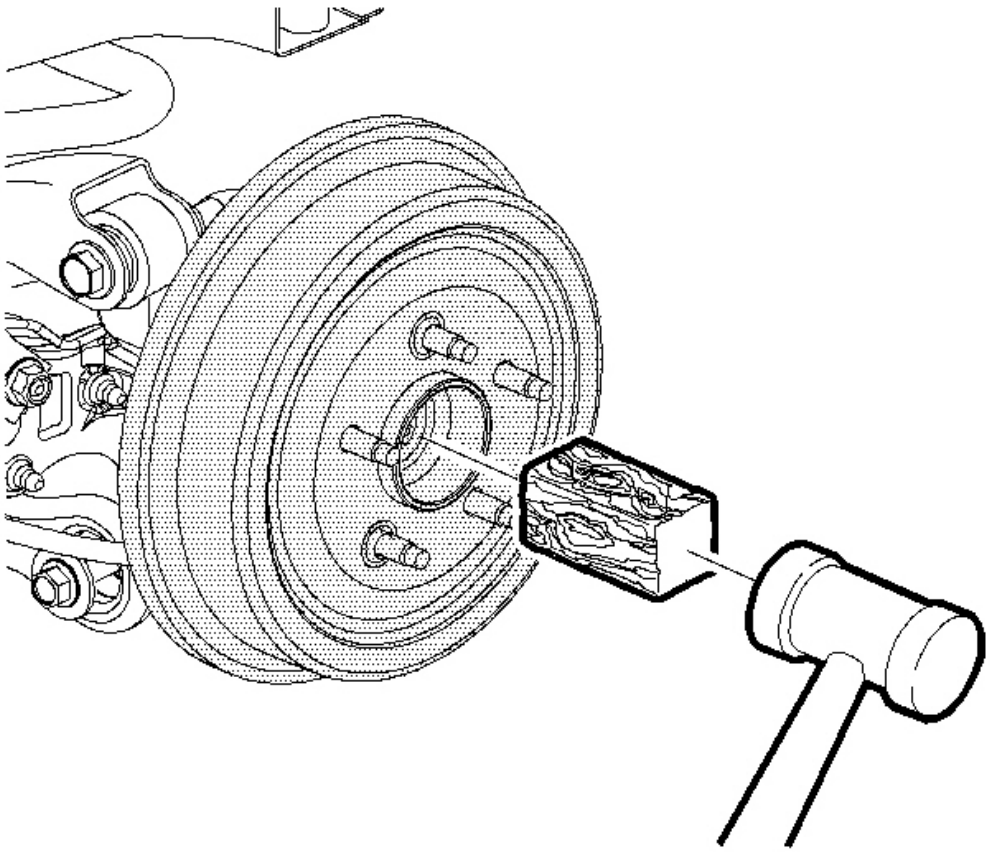

Fig. 35: Placing Block Of Wood Against Wheel Drive Shaft Spindle & Tap With Hammer
Courtesy of GENERAL MOTORS CORP.

13. Place a block of wood against the wheel drive shaft spindle and tap with a hammer to release the spindle from the wheel hub and bearing assembly.

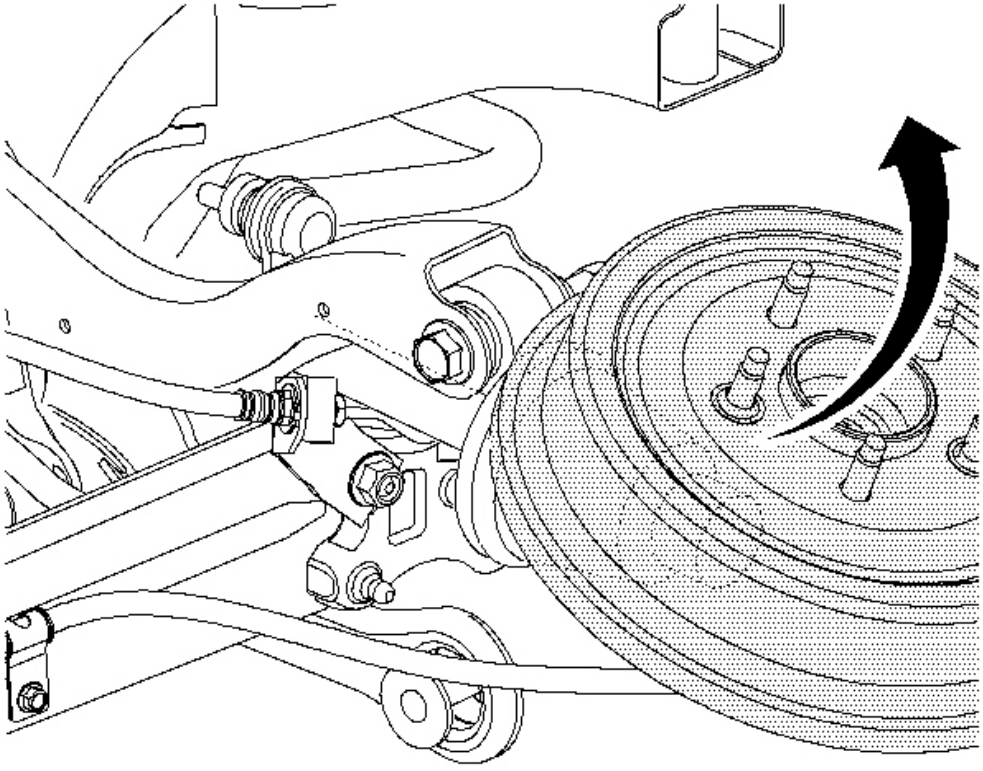

Fig. 36: Rotating Suspension Knuckle Upward & Secure With Heavy Mechanics Wire
Courtesy of GENERAL MOTORS CORP.

14. Rotate the suspension knuckle upward and secure with heavy mechanics wire, or equivalent.

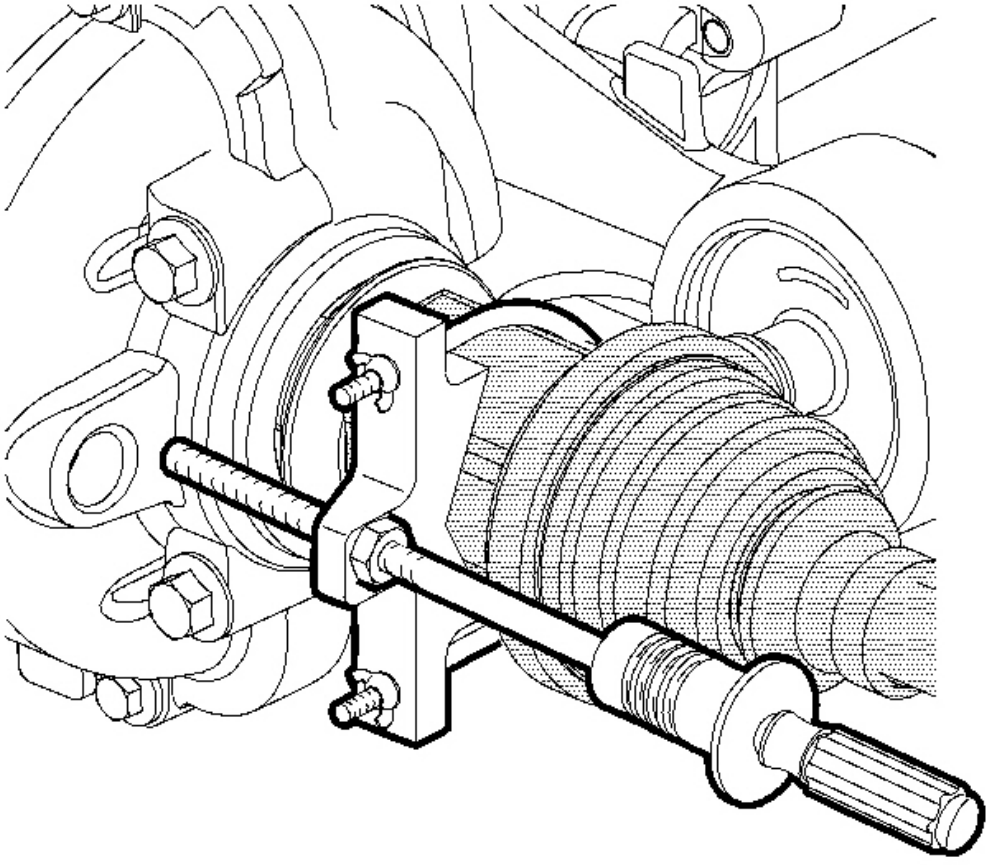

Fig. 37: Removing Wheel Drive Shaft From The Vehicle
Courtesy of GENERAL MOTORS CORP.

15. Assemble the **J 45341** and the J-2619-A to the wheel drive shaft inner tripot joint. See **Special Tools and Equipment** .
16. Disengage the tripot joint from the rear drive module (RDM).
17. Remove the wheel drive shaft from the vehicle.

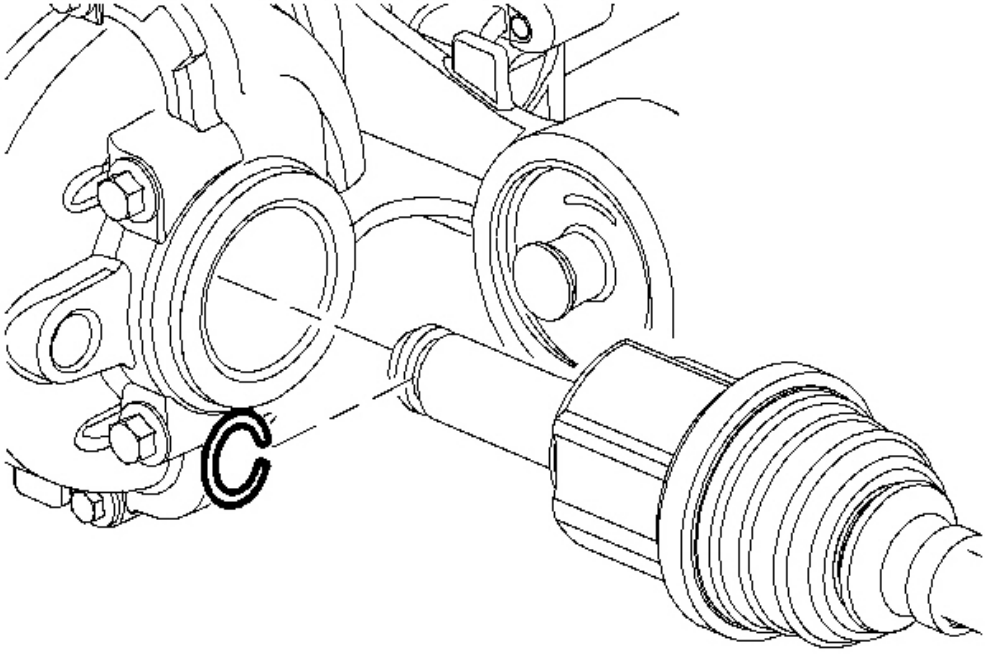

Fig. 38: Removing/Installing Wheel Drive Shaft Retaining Ring
Courtesy of GENERAL MOTORS CORP.

18. Remove and discard the wheel drive shaft retaining ring.

Installation Procedure

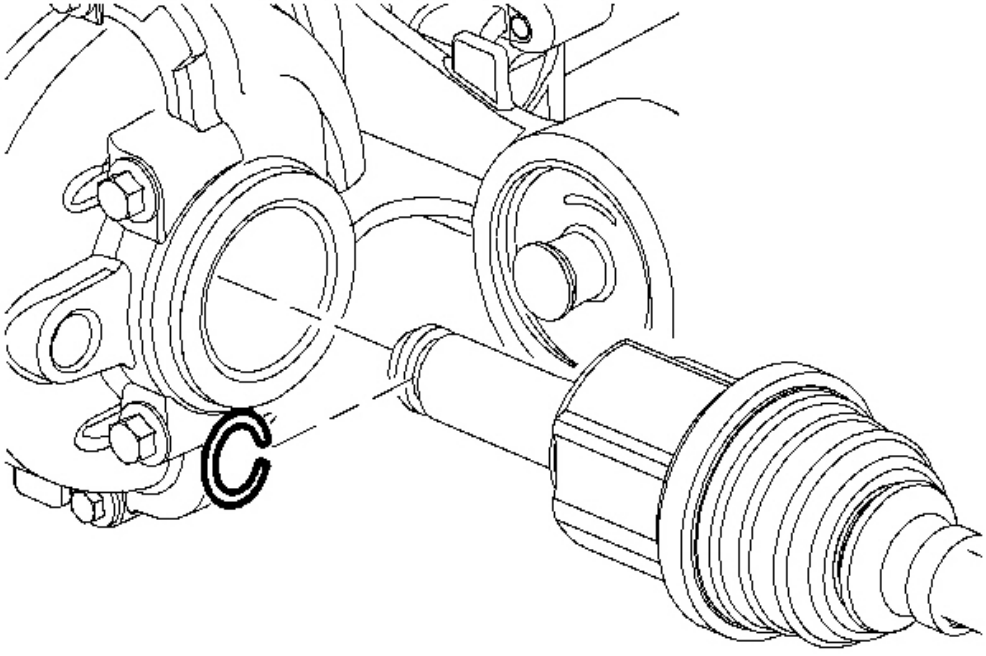

Fig. 39: Removing/Installing Wheel Drive Shaft Retaining Ring
Courtesy of GENERAL MOTORS CORP.

1. Install a new wheel drive shaft retaining ring to the inner tripot joint.

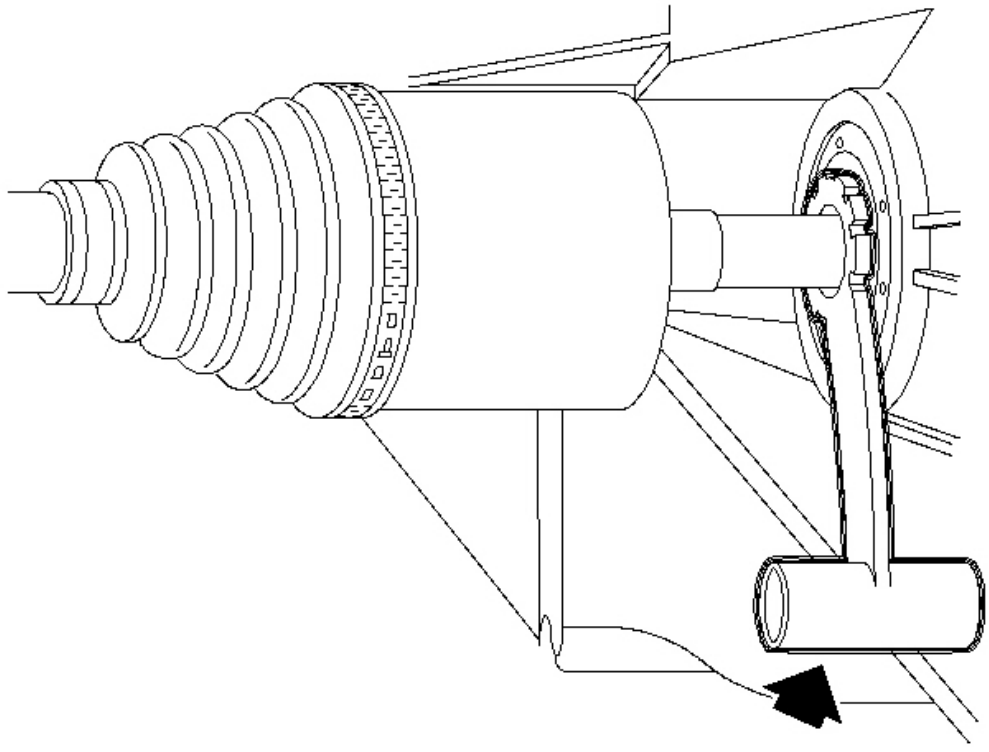

Fig. 40: Installing SA91112T On The Wheel Drive Shaft Oil Seal
Courtesy of GENERAL MOTORS CORP.

2. Install the J 44394 to the wheel drive shaft oil seal.
3. Align the splines of the inner tripot joint to the output shaft of the RDM.

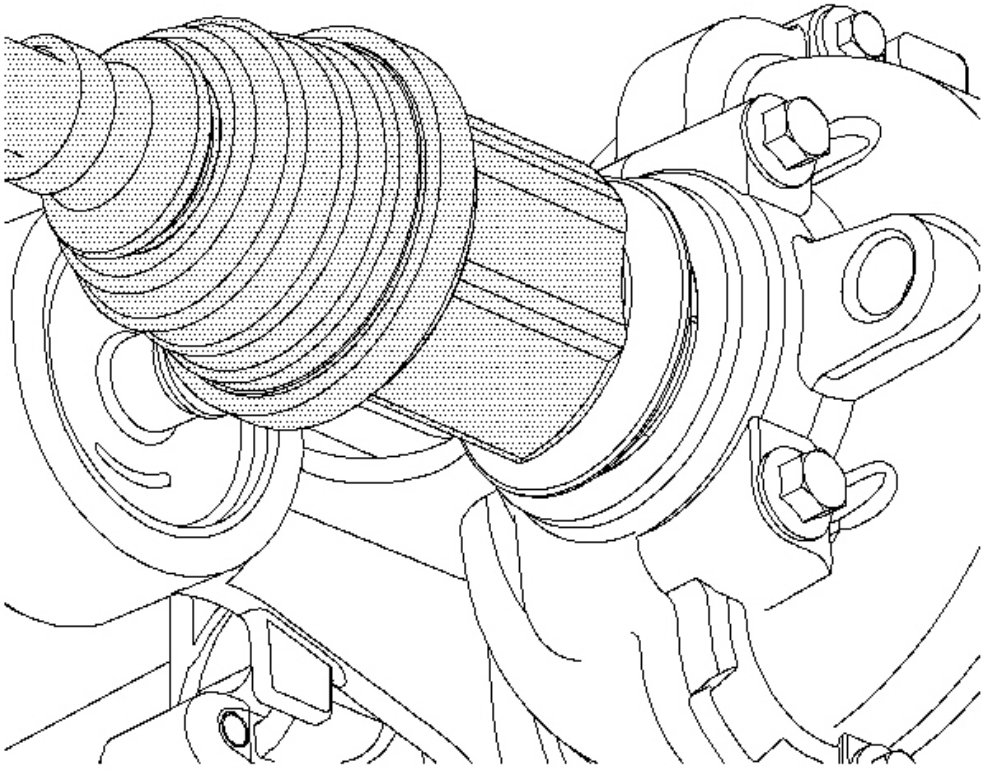

Fig. 41: Installing Wheel Drive Shaft On The Output Shaft
Courtesy of GENERAL MOTORS CORP.

4. Install the wheel drive shaft to the output shaft:
    - Guide the wheel drive shaft tripot joint squarely onto the output shaft.
    - After the splined end of the wheel drive shaft passes the oil seal, remove the J 44394 from the oil seal.
    - Firmly engage the wheel drive shaft to the output shaft.
    - Ensure that the tripot joint is fully seated on the output shaft by grasping the tripot joint and attempting to pull free of the output shaft.
    - Ensure that the tripot slinger does not become damaged.

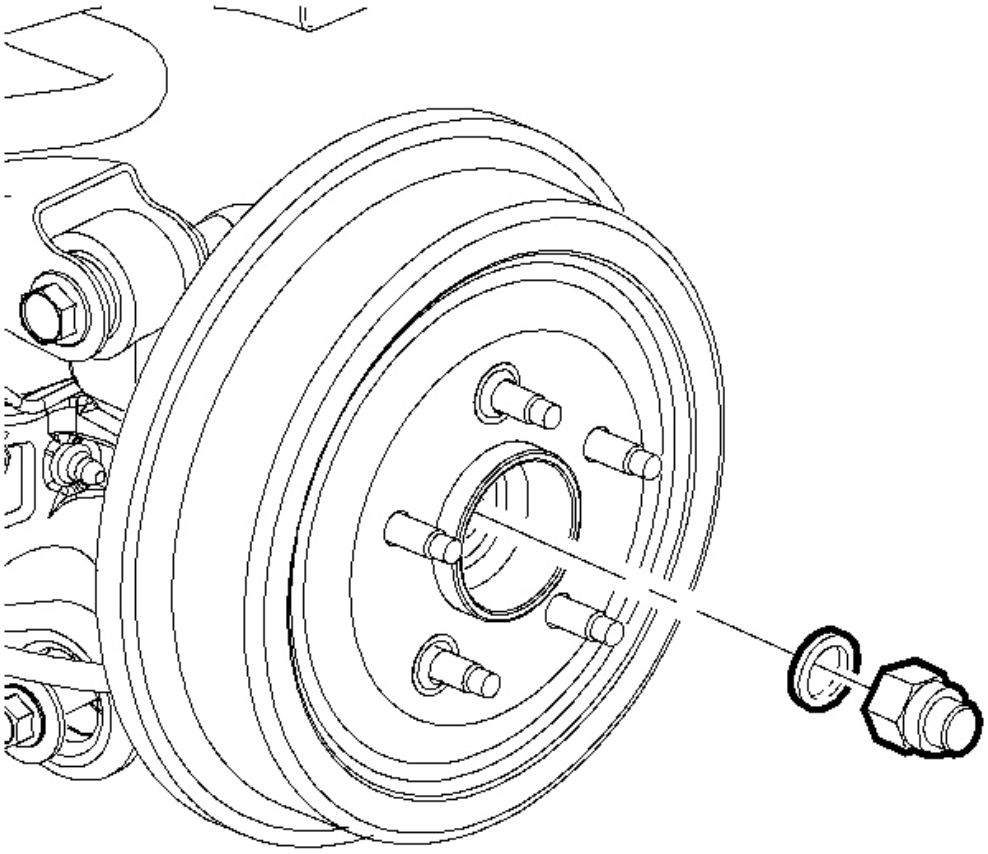

Fig. 42: View Of Rear Wheel Drive Shaft
Courtesy of GENERAL MOTORS CORP.

5. Rotate the suspension knuckle downward while simultaneously guiding the constant velocity (CV) joint spindle to the wheel hub and bearing assembly of the suspension knuckle.
6. Hand install a new wheel drive shaft spindle nut.

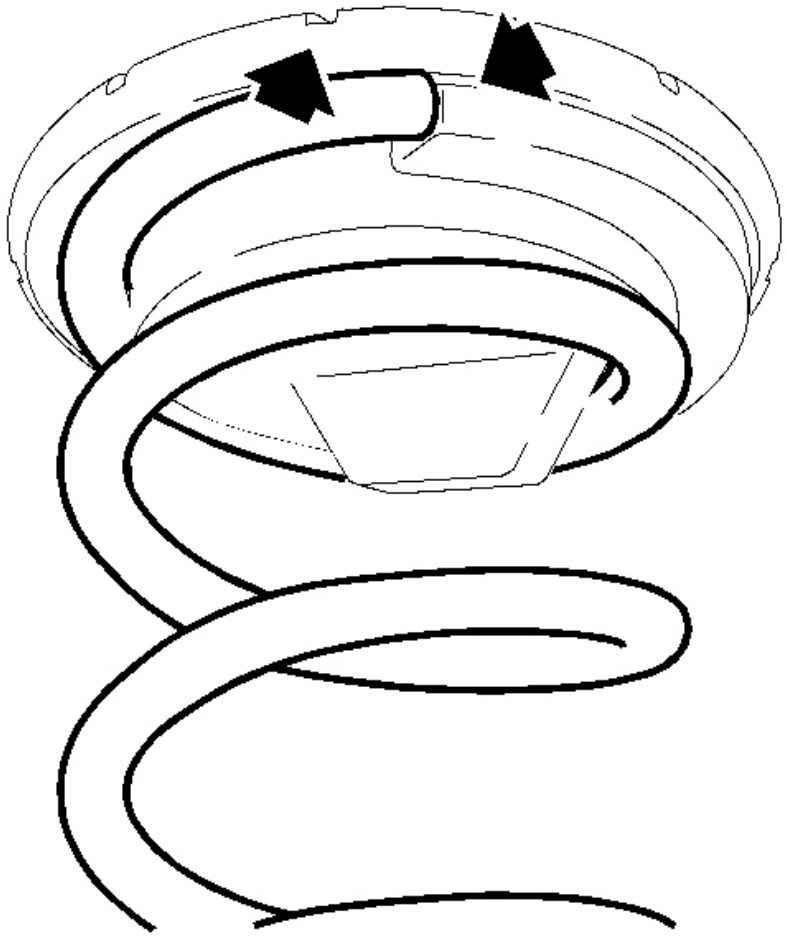

Fig. 43: Aligning Coil Spring With The Abutments Of The Insulators
Courtesy of GENERAL MOTORS CORP.

7. Position the insulators to the coil spring and align the ends of the coil spring with the abutments of the insulators.

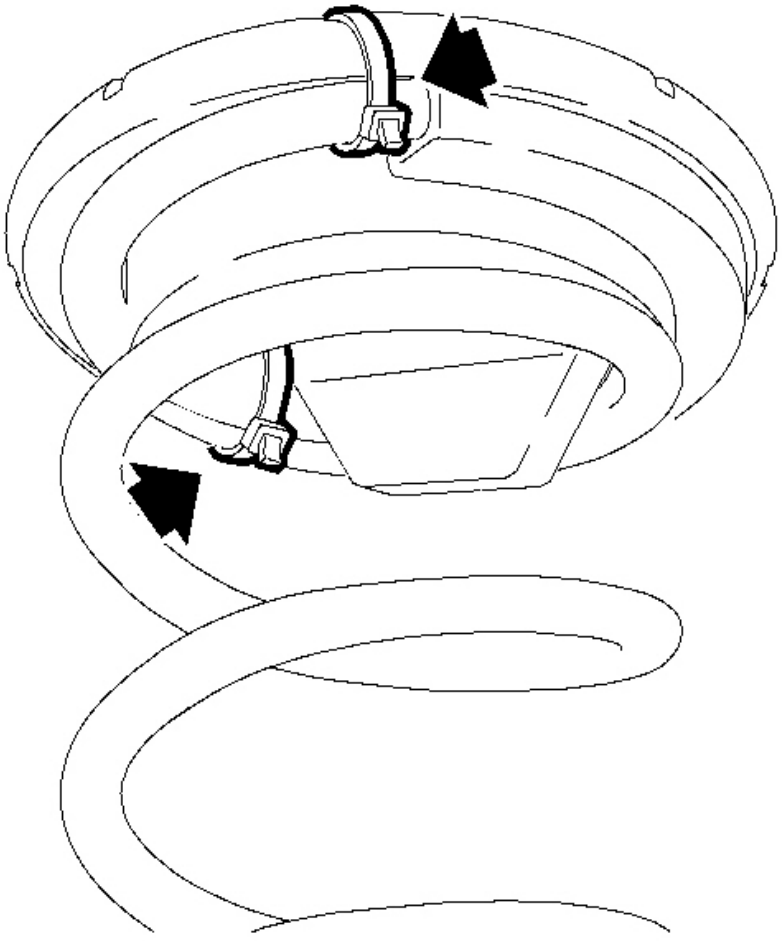

Fig. 44: Securing Insulators To The Coil Spring Using 2 Plastic Tie Straps
Courtesy of GENERAL MOTORS CORP.

8. Secure each of the insulators to the coil spring using 2 plastic tie straps positioned 180 degrees apart and through the reliefs molded into the insulators.
9. Cut off any excess length of the tie straps.
10. Position the coil spring assembly to the lower control arm.

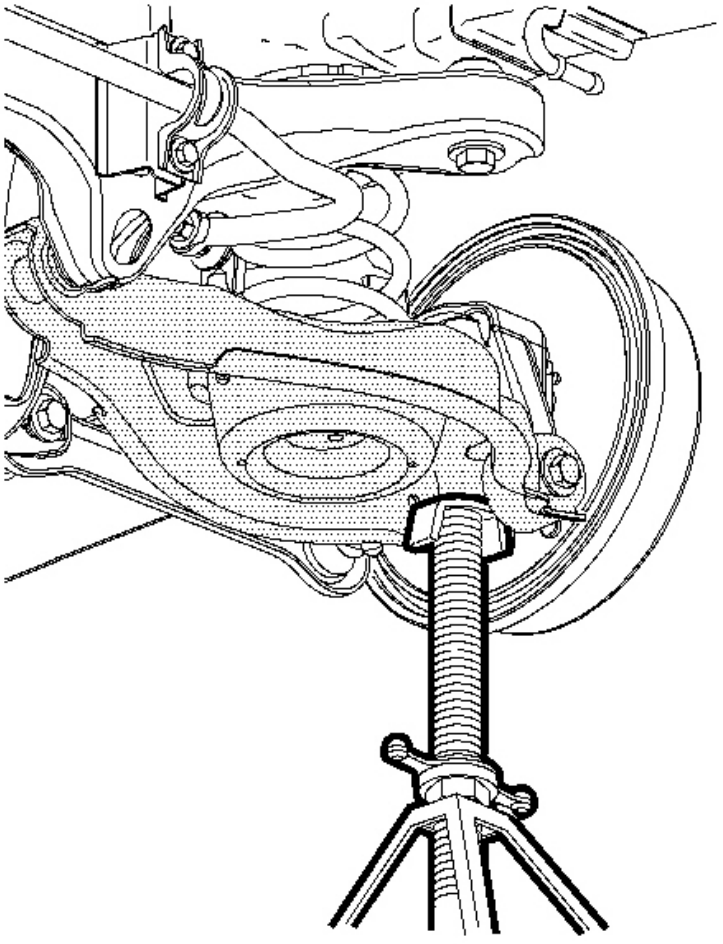

Fig. 45: Positioning Support Stand Under The Lower Control Arm
Courtesy of GENERAL MOTORS CORP.

11. Position a support stand under the lower control arm.
12. Carefully raise the lower control arm while simultaneously guiding the coil spring assembly into the rear suspension cradle.

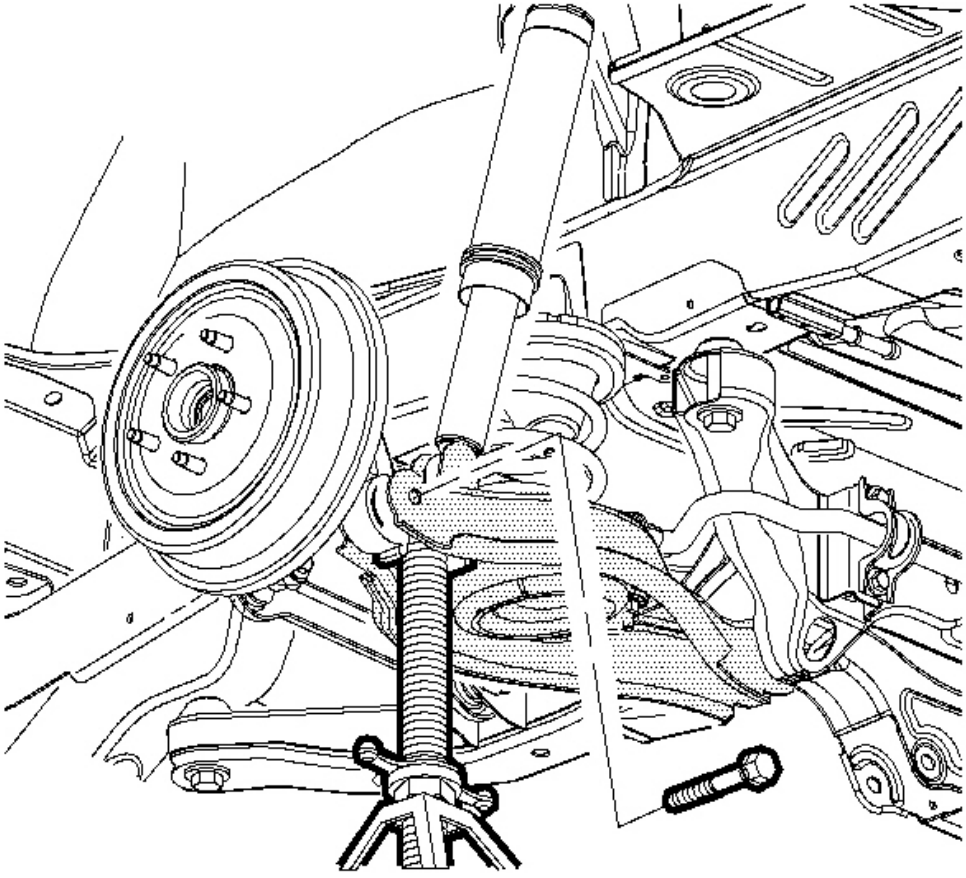

Fig. 46: Removing/Installing Lower Control Arm On The Suspension Knuckle Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

13. Position the suspension knuckle to the lower control arm.

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

IMPORTANT: Ensure that the hex head of the suspension knuckle bolt faces the rear of the vehicle.

14. Install the lower control arm-to-suspension knuckle bolt and nut.

Tighten: Tighten the bolt and nut to 160 N.m (118 lb ft).

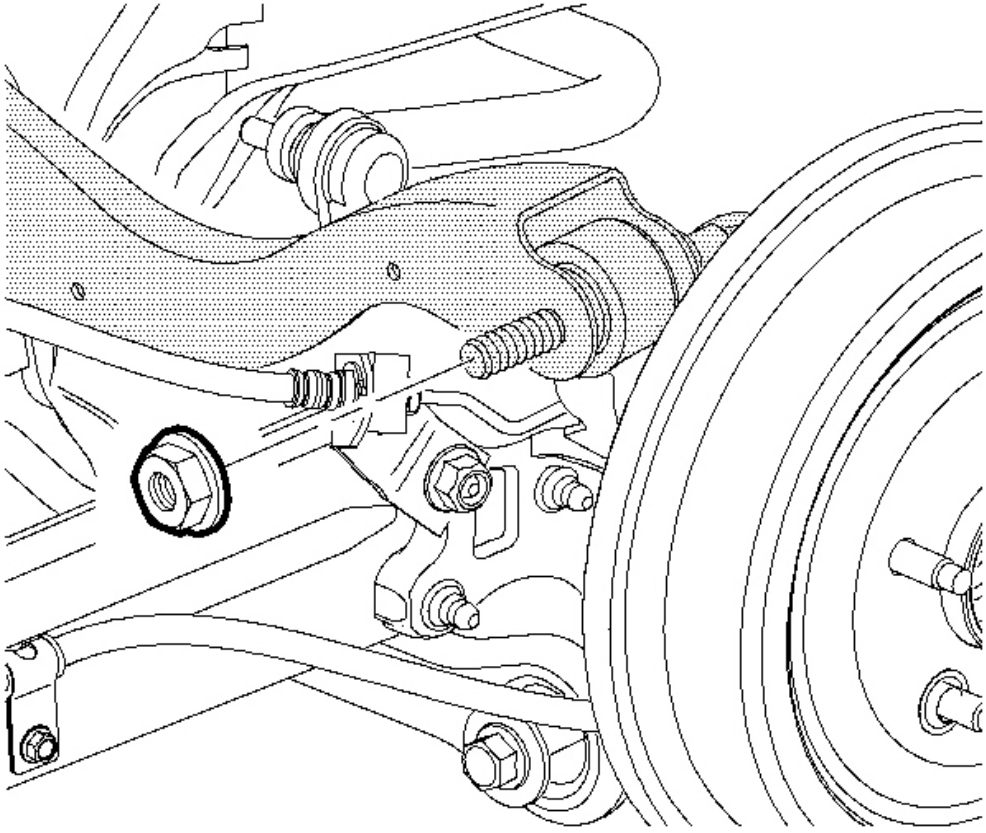

Fig. 47: Tightening Upper Control Arm On The Suspension Knuckle Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

15. Tighten the upper control arm-to-suspension knuckle bolt and nut.

    Tighten: Tighten the bolt and nut to 135 N.m (100 lb ft).

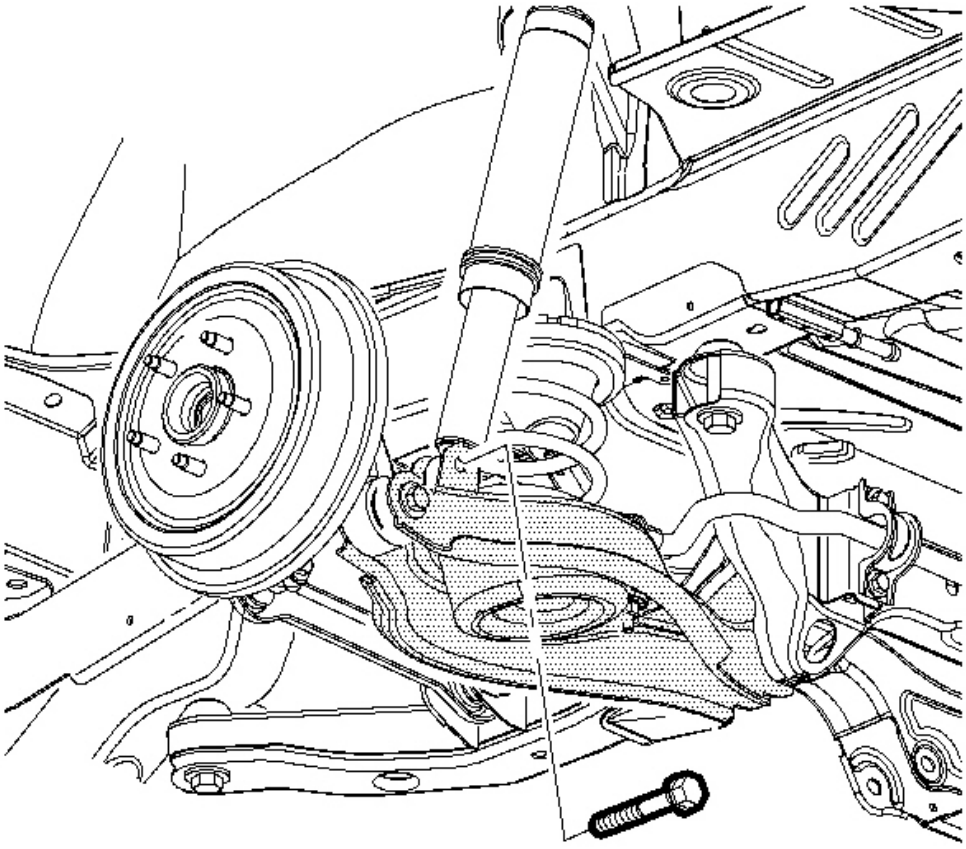

Fig. 48: Removing/Installing Lower Shock Absorber Mounting Bolt & Nut
Courtesy of GENERAL MOTORS CORP.

16. Install the lower shock absorber mounting bolt and nut.

    Tighten: Tighten the bolt and nut to 110 N.m (81 lb ft).

17. Slowly lower and remove the support stand.
18. Tighten the lower jounce bumper nut.

    Tighten: Tighten the nut to 63 N.m (46 lb ft).

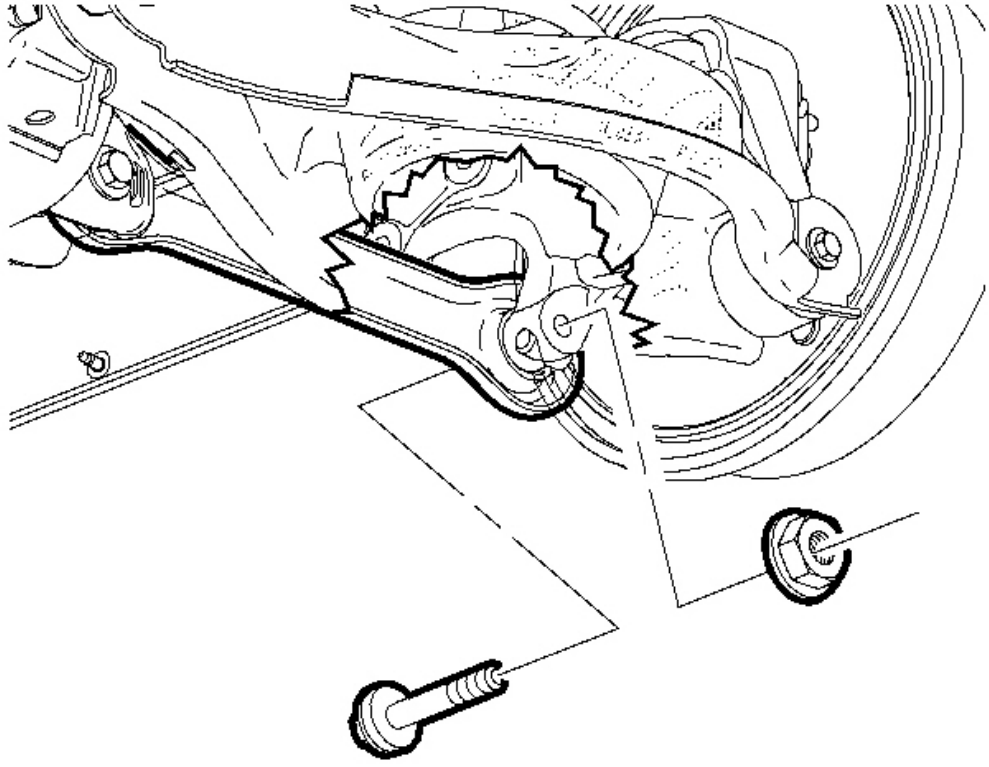

Fig. 49: Removing/Installing Washer, Bolt & Nut On The Suspension Knuckle
Courtesy of GENERAL MOTORS CORP.

19. Position the rear toe link to the suspension knuckle.
20. Install the washer, bolt, and nut to the suspension knuckle and the toe link assembly.

    Tighten: Tighten the bolt and nut to 110 N.m (81 lb ft).

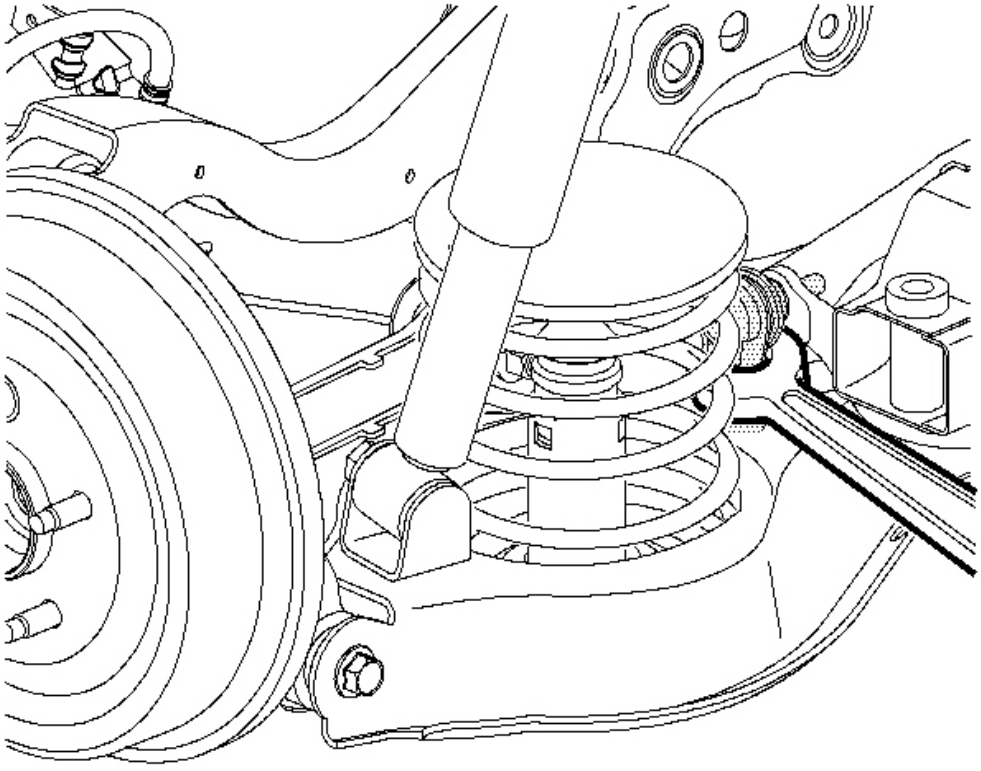

Fig. 50: Removing Stabilizer Link With A Wrench
Courtesy of GENERAL MOTORS CORP.

21. Position the stabilizer bar link to the lower control arm.
22. Install the nut to the stabilizer bar link.
23. While holding the stabilizer bar link stationary with a wrench, tighten the nut.

    Tighten: Tighten the nut to 15 N.m (11 lb ft).

24. Tighten the wheel drive shaft spindle nut.

    Tighten: Tighten the nut to 110 N.m (81 lb ft).

25. Install the tire and wheel assembly. Refer to **Tire and Wheel Removal and Installation** in Tires and Wheels.
26. Lower the vehicle.

WHEEL DRIVE SHAFT INNER JOINT AND SEAL REPLACEMENT - FRONT

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

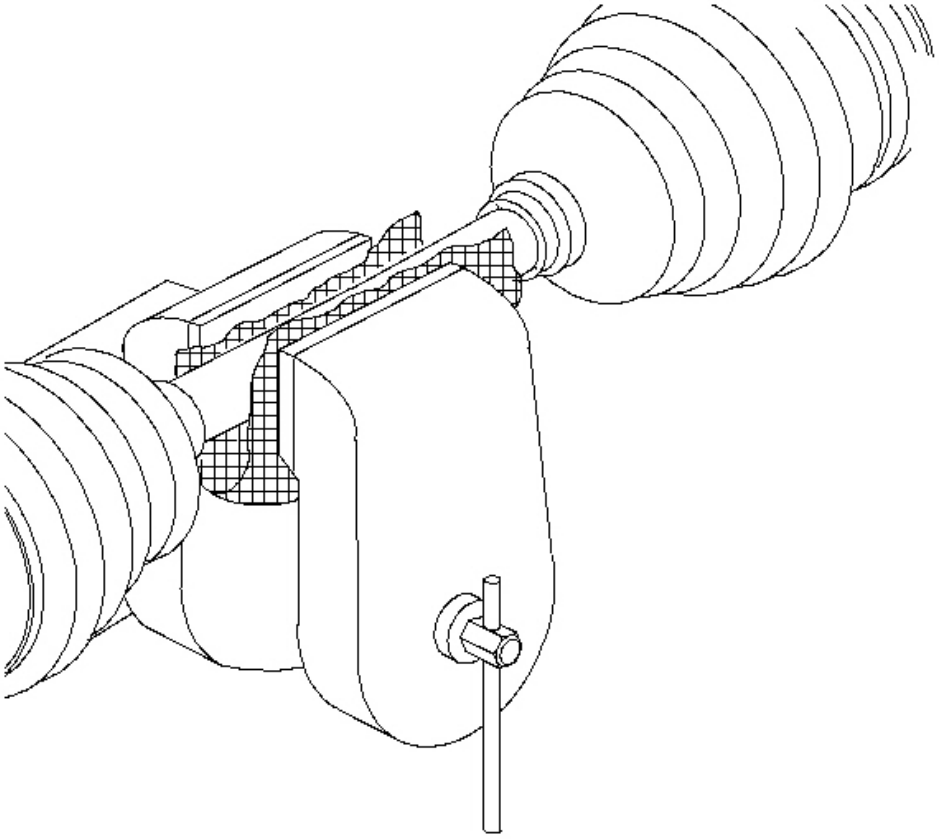

Fig. 51: View Of Front Wheel Drive Shaft Inner Joint

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.

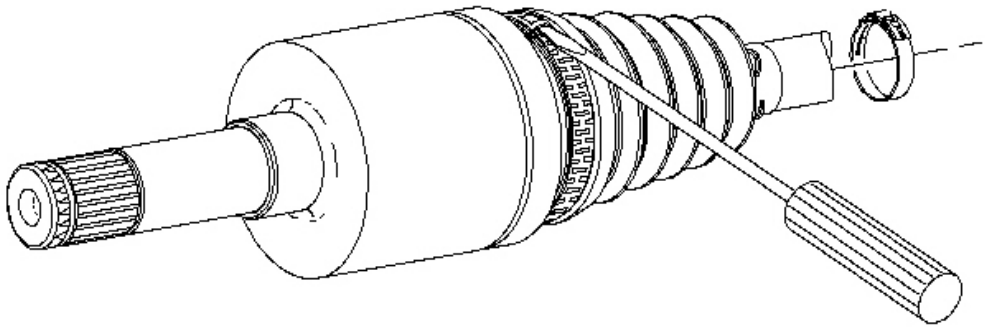

Fig. 52: Removing Large Seal Retaining Clamp Using A Flat-Bladed Tool
Courtesy of GENERAL MOTORS CORP.

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

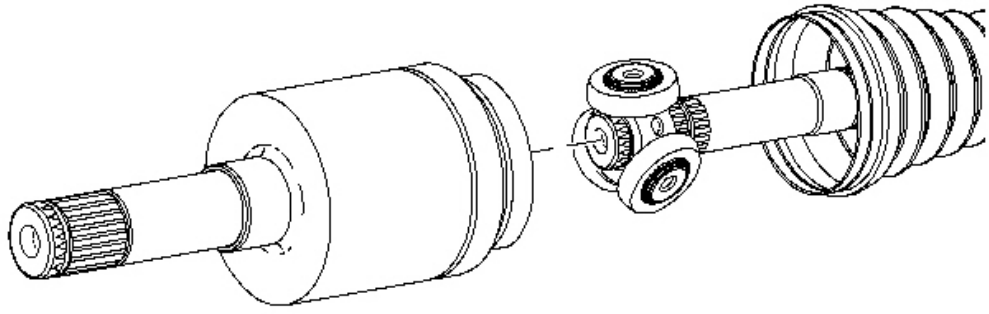

Fig. 53: Removing Tripot Housing From The Spider & Shaft
Courtesy of GENERAL MOTORS CORP.

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.

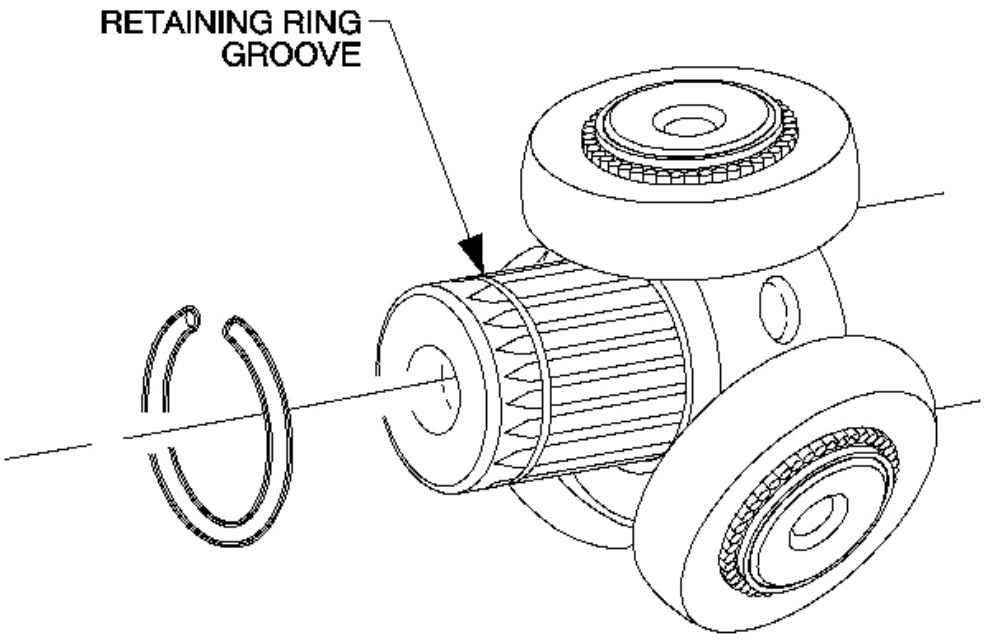

Fig. 54: Removing/Installing Retaining Ring Groove On The Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

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

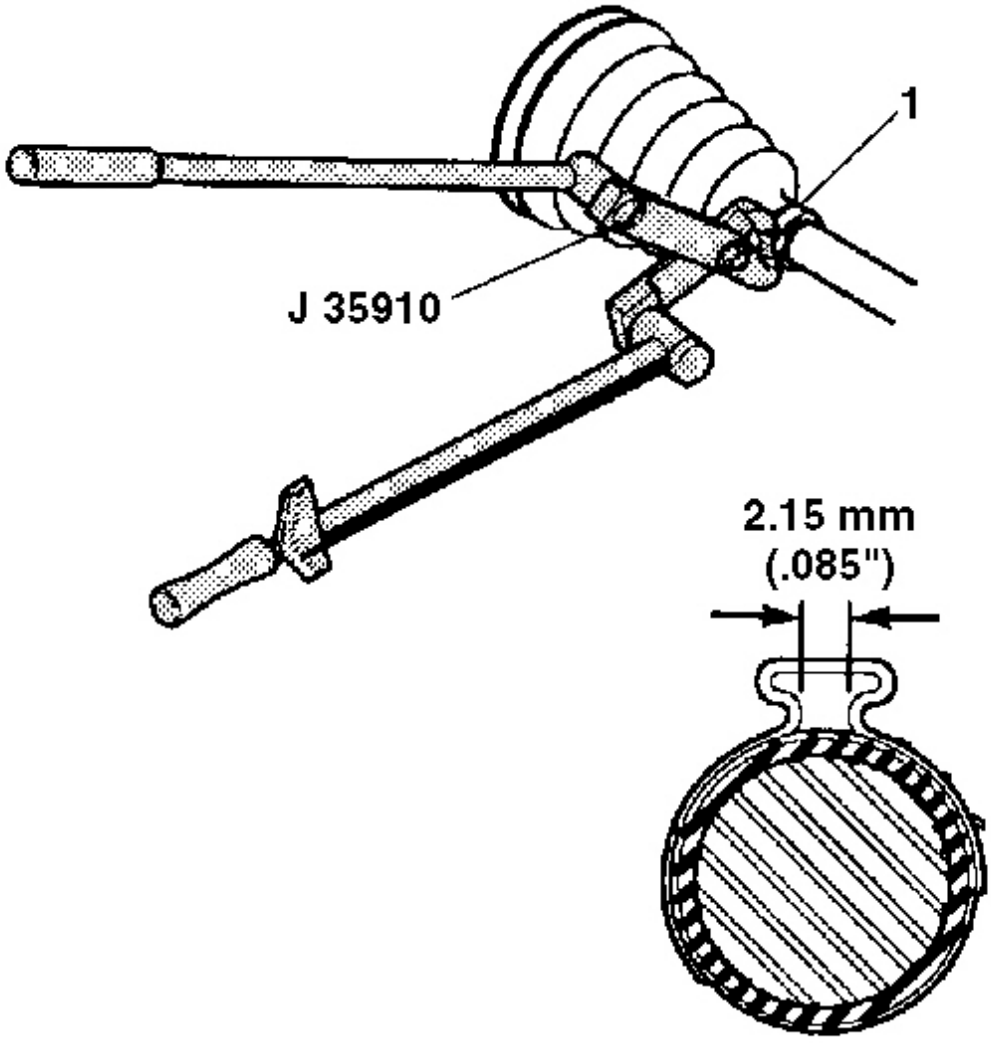

Fig. 55: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

1. Install the small seal clamp 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).

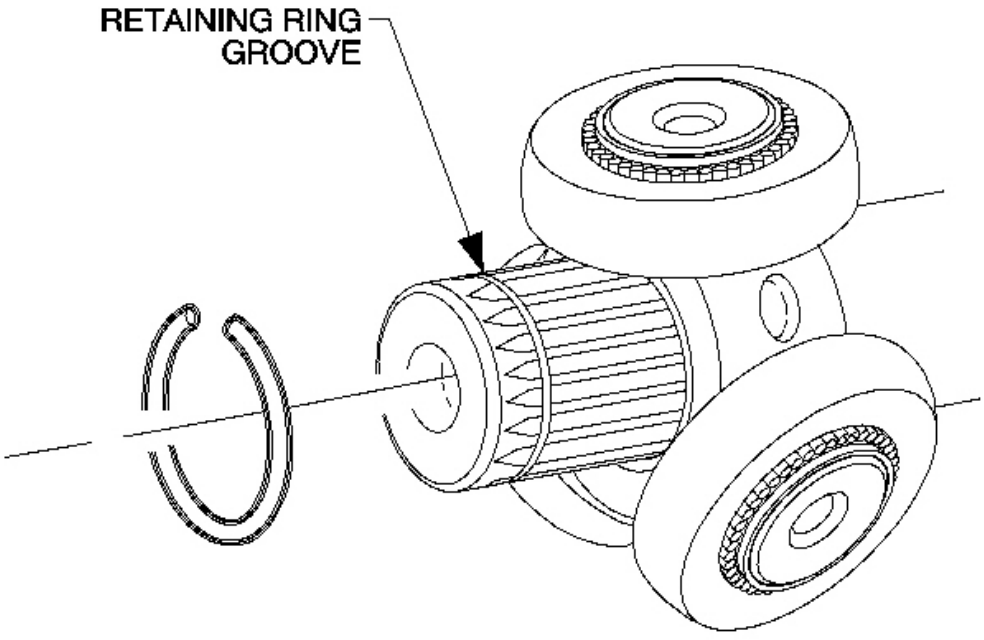

Fig. 56: Removing/Installing Retaining Ring Groove On The Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

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.

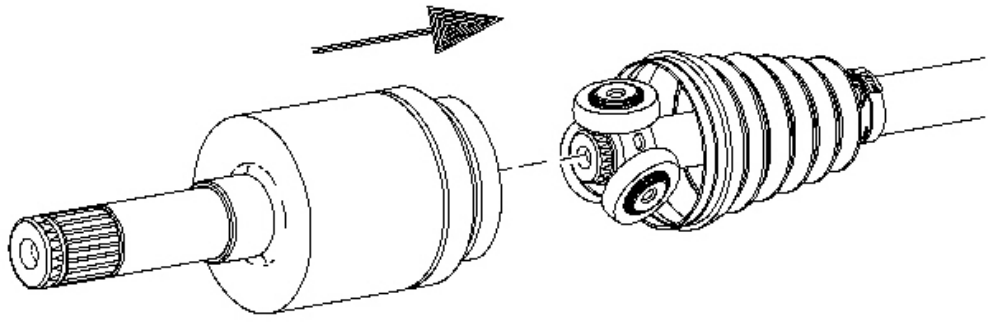

Fig. 57: Installing Tripot Housing On The Tripot Spider Assembly
Courtesy of GENERAL MOTORS CORP.

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.

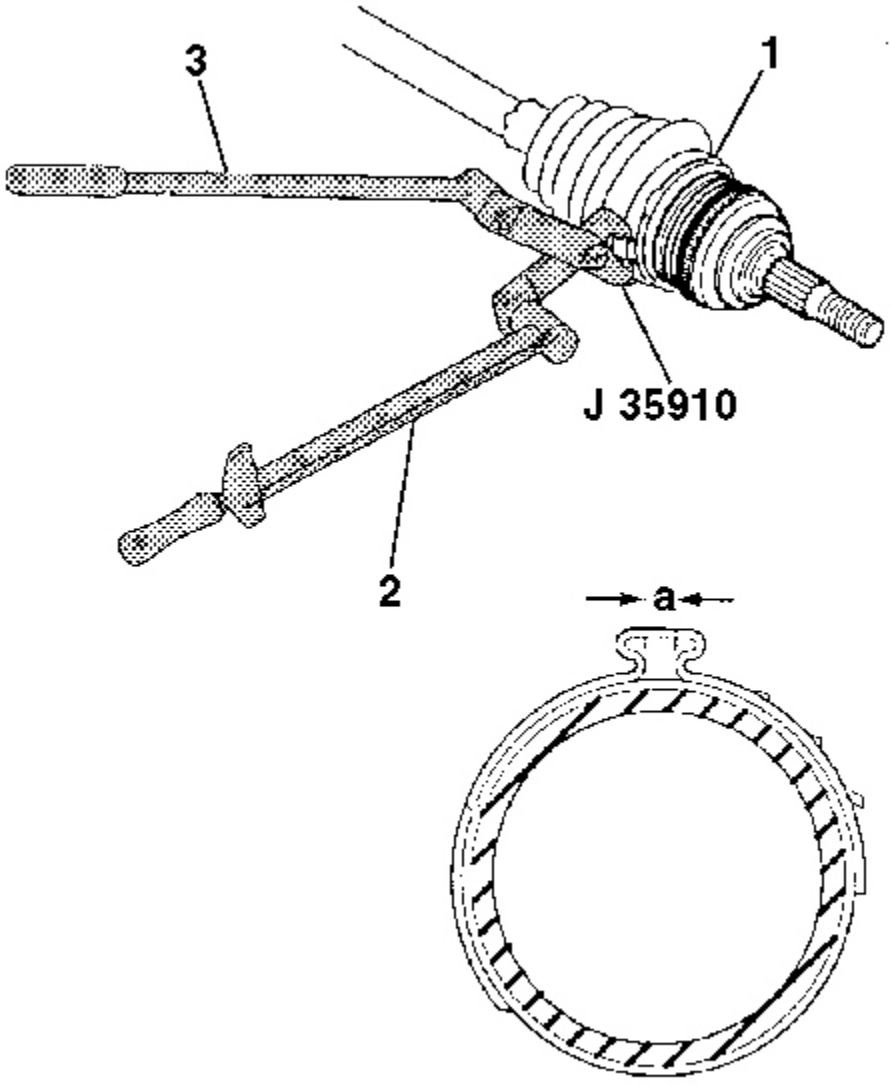

Fig. 58: Crimping Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

11. Place the large seal retaining clamp around the seal and close using J 35910 .
12. 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).

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

WHEEL DRIVE SHAFT INNER JOINT AND SEAL REPLACEMENT - REAR

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

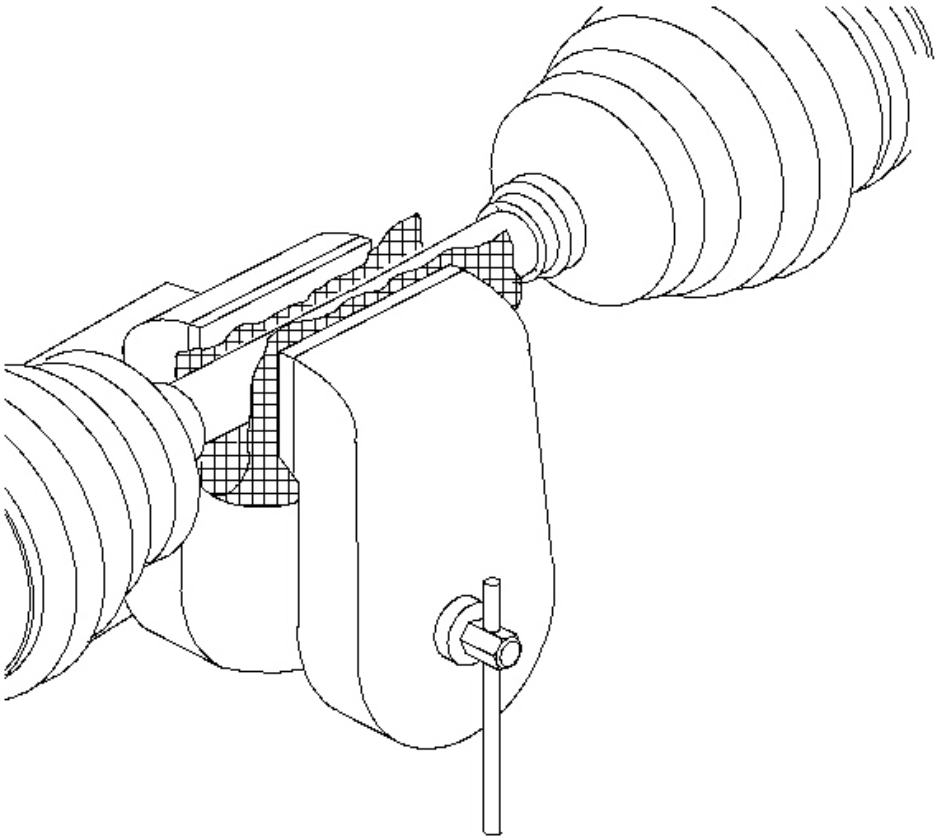

Fig. 59: View Of Front Wheel Drive Shaft Inner Joint
Courtesy of GENERAL MOTORS CORP.

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.

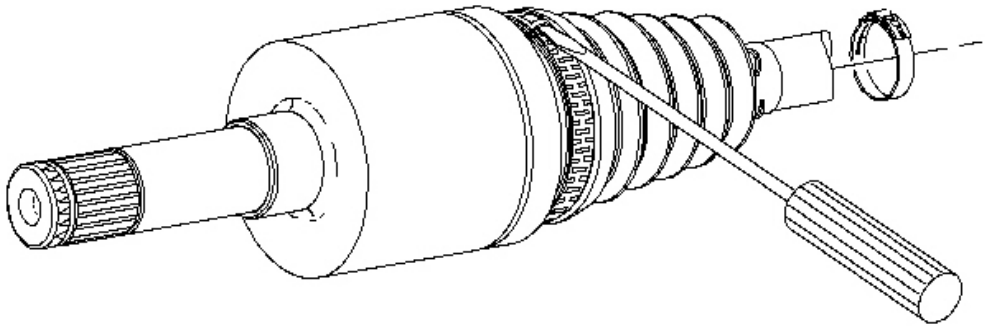

Fig. 60: Removing Large Seal Retaining Clamp Using A Flat-Bladed Tool
Courtesy of GENERAL MOTORS CORP.

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

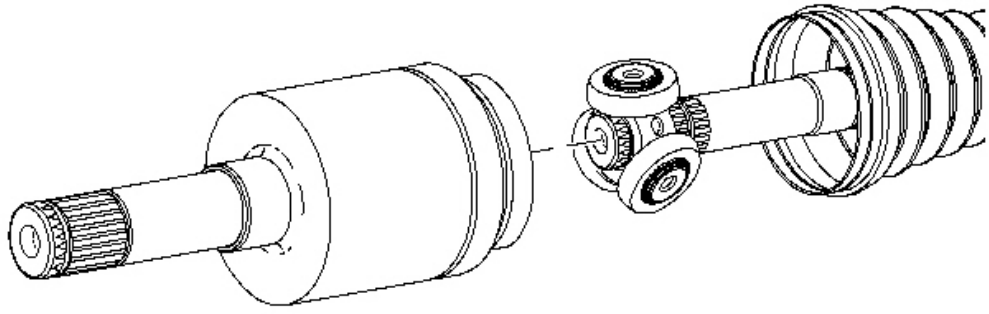

Fig. 61: Removing Tripot Housing From The Spider & Shaft
Courtesy of GENERAL MOTORS CORP.

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.

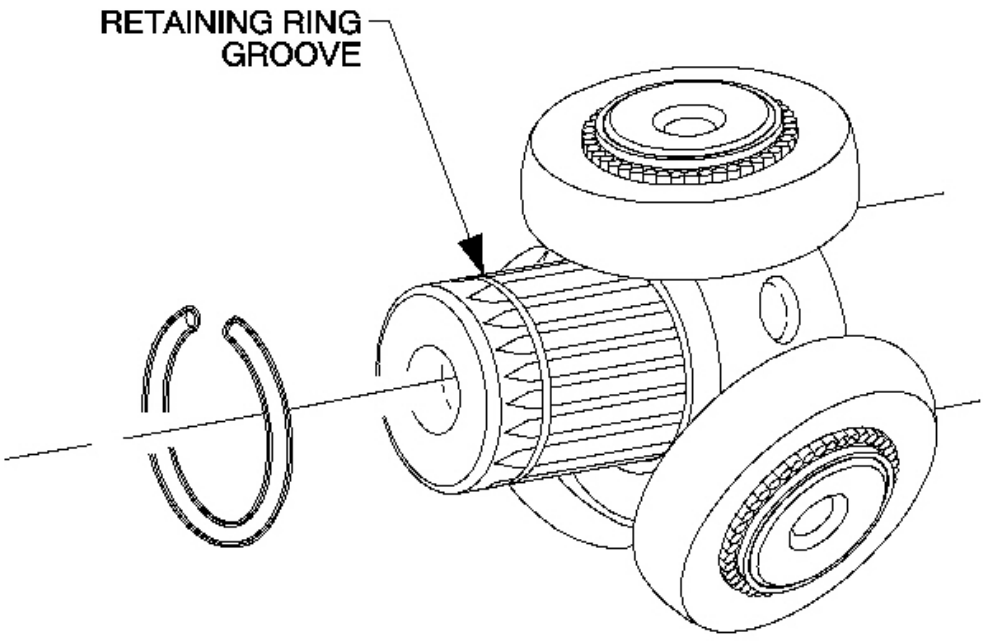

Fig. 62: Removing/Installing Retaining Ring Groove On The Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

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

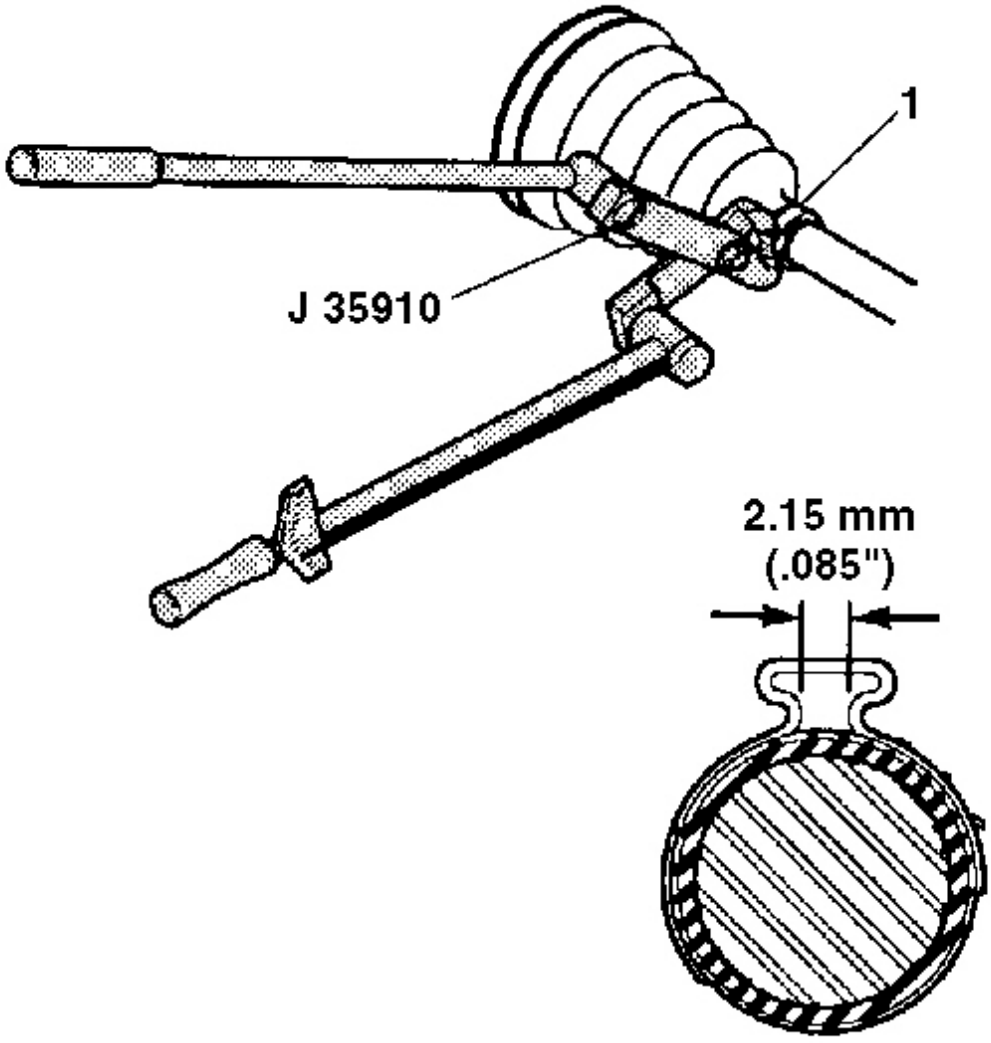

Fig. 63: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

1. Install the small seal clamp 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).

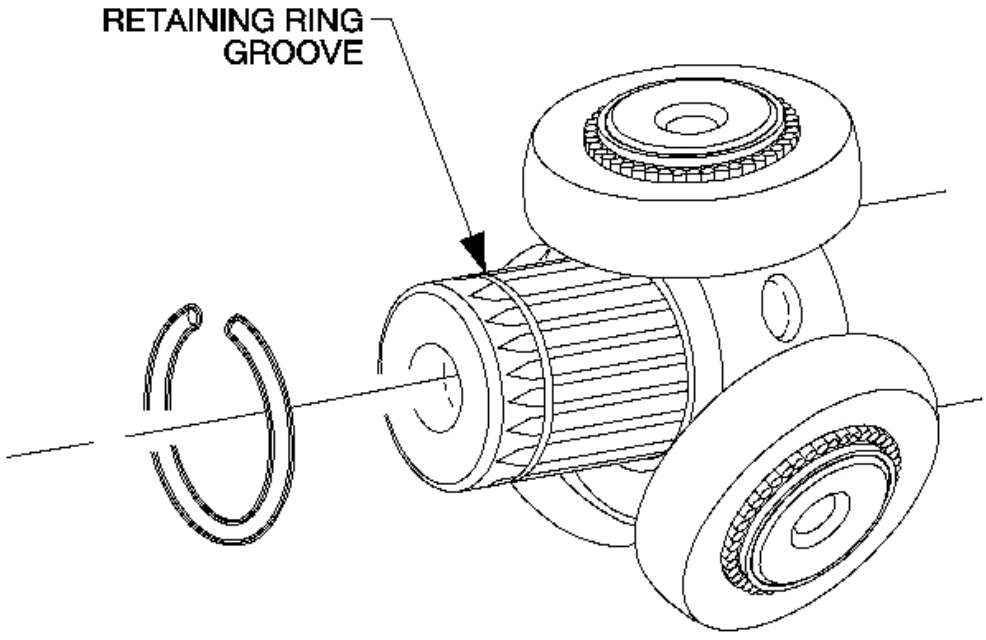

Fig. 64: Removing/Installing Retaining Ring Groove On The Wheel Drive Shaft Bar
Courtesy of GENERAL MOTORS CORP.

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.
7. Place approximately half of the grease in the kit to the seal and place the remainder in the tripot housing.

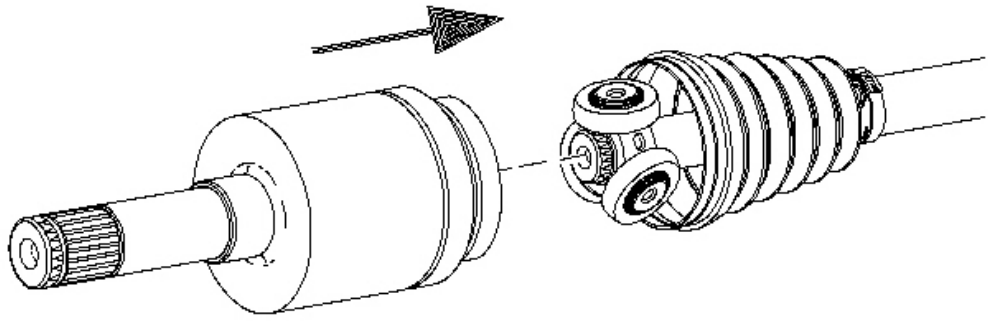

Fig. 65: Installing Tripot Housing On The Tripot Spider Assembly
Courtesy of GENERAL MOTORS CORP.

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.

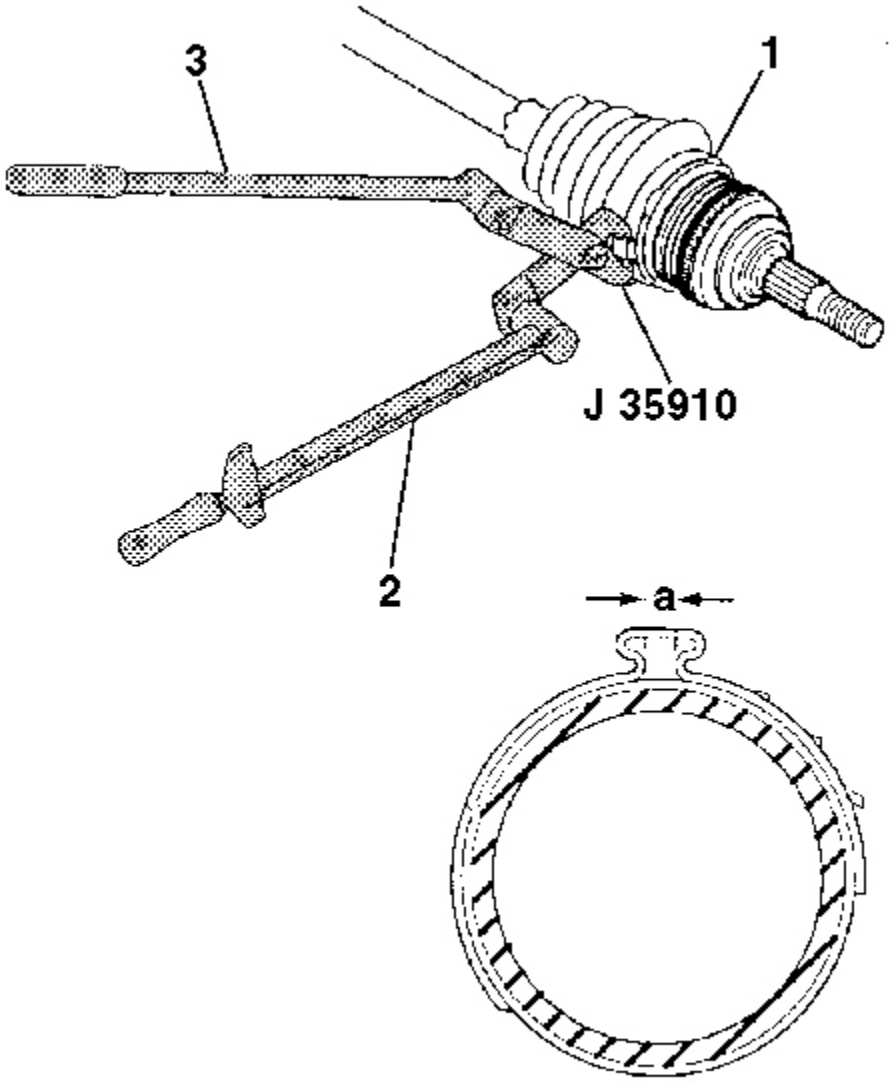

Fig. 66: Crimping Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

11. Place the large seal retaining clamp around the seal and close using J 35910 .
12. 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).

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

WHEEL DRIVE SHAFT OUTER JOINT AND SEAL REPLACEMENT - FRONT

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

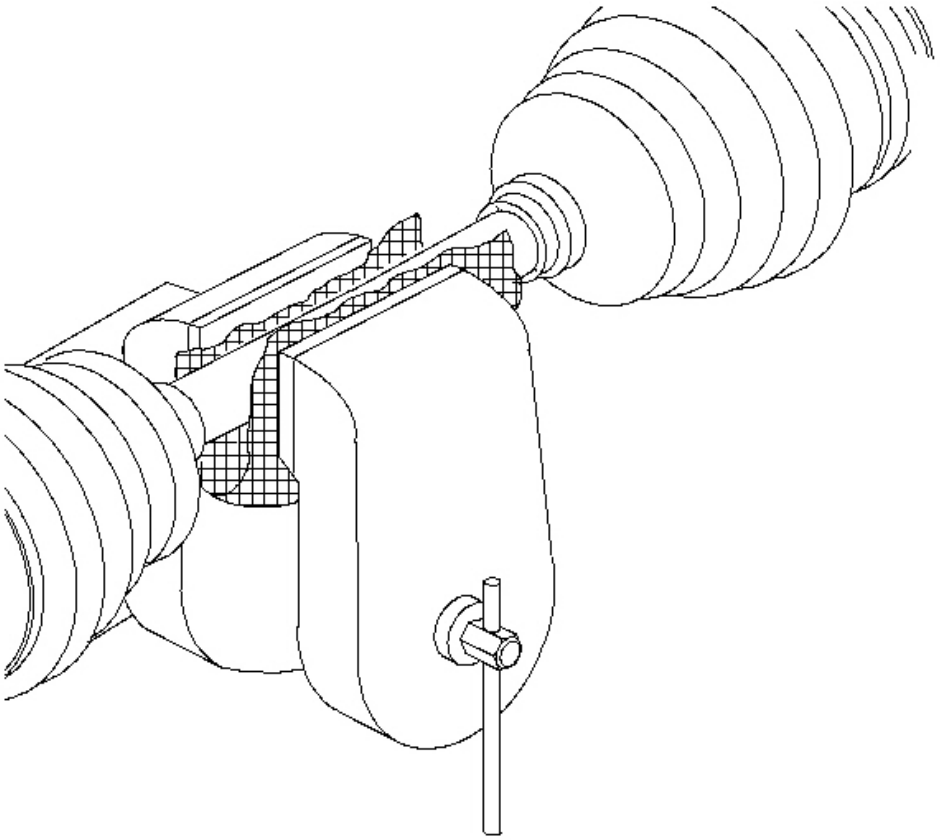

Fig. 67: View Of Front Wheel Drive Shaft Inner Joint
Courtesy of GENERAL MOTORS CORP.

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

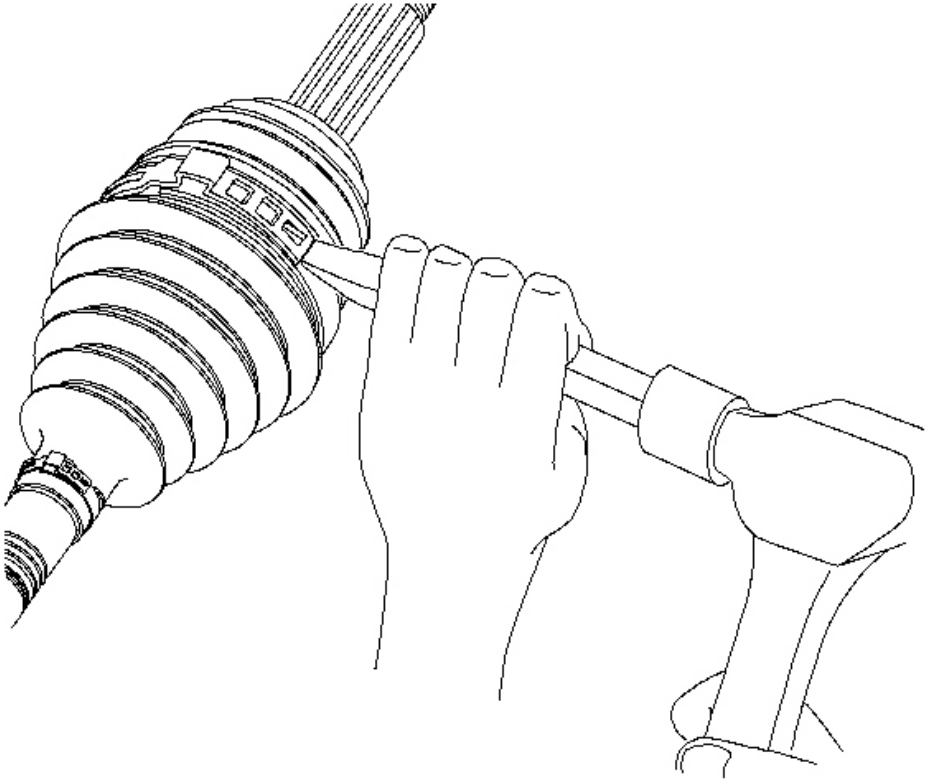

Fig. 68: Disengaging Retaining Tabs Of The Large Seal Clamp Using A Flat-Bladed Tool
Courtesy of GENERAL MOTORS CORP.

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.

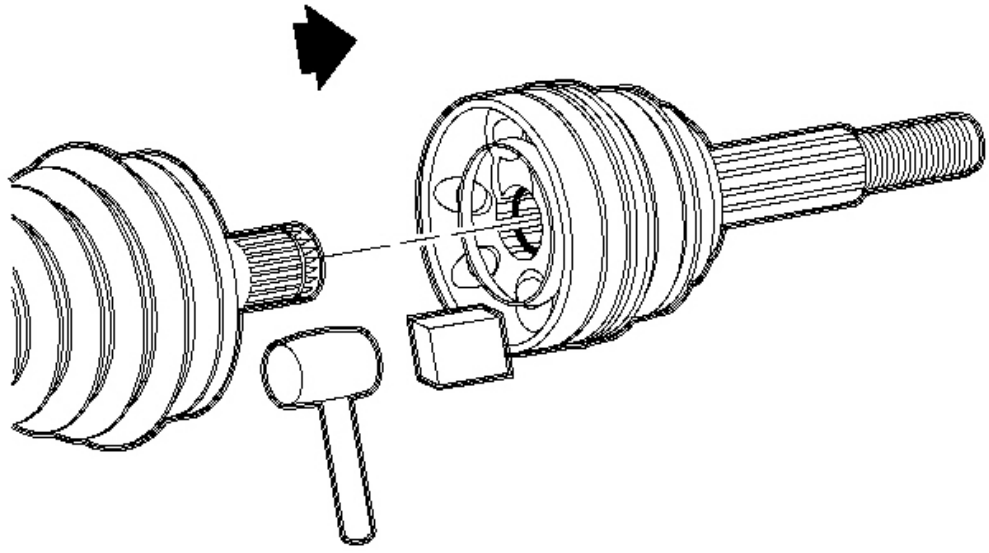

Fig. 69: Placing Block Of Wood Against The CV Joint Outer Race
Courtesy of GENERAL MOTORS CORP.

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.

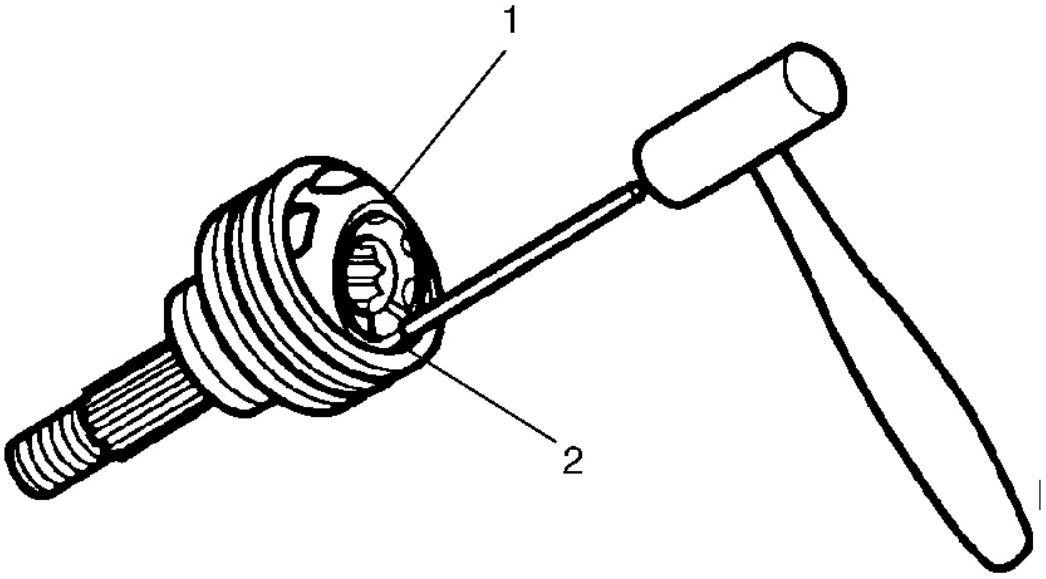

Fig. 70: Tapping Gently On The Brass Drift With A Hammer In Order To Tilt The Cage
Courtesy of GENERAL MOTORS CORP.

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.

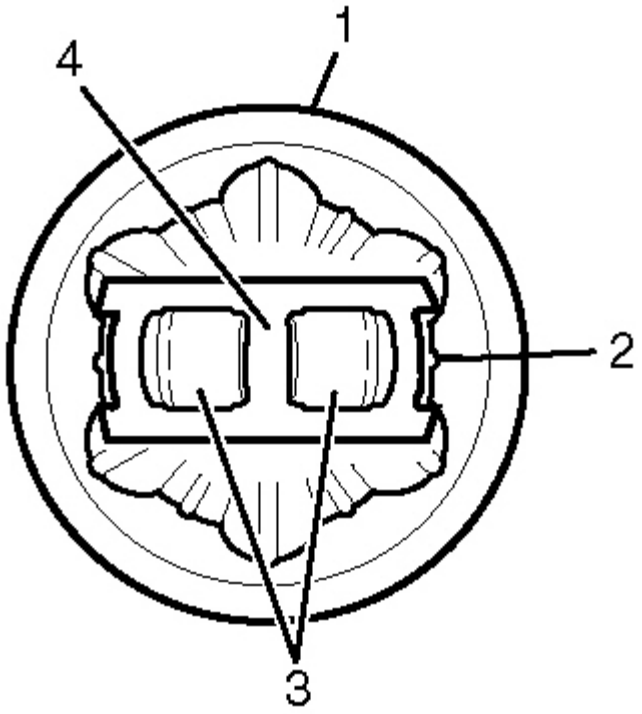

Fig. 71: Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

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.

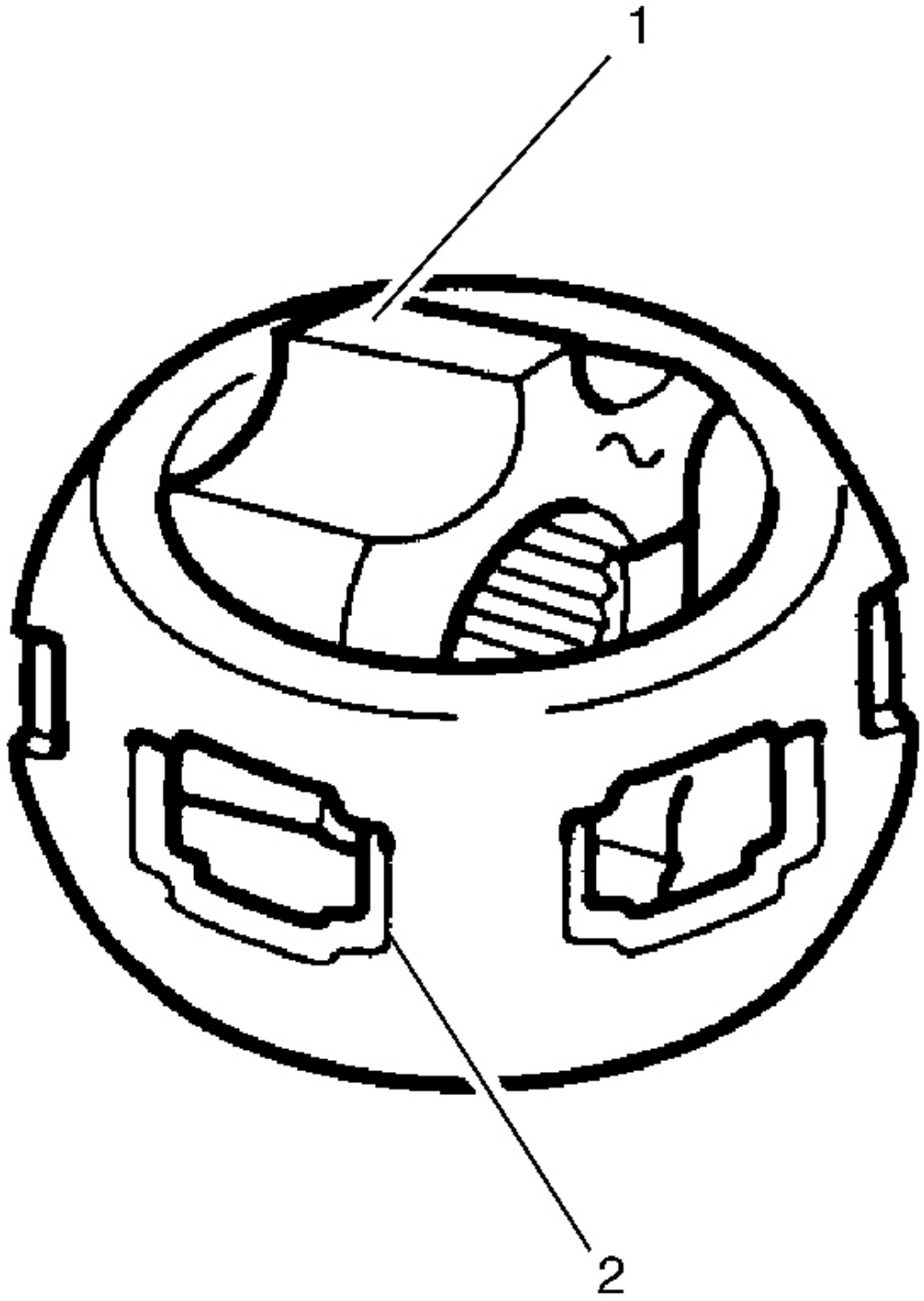
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Fig. 72: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

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

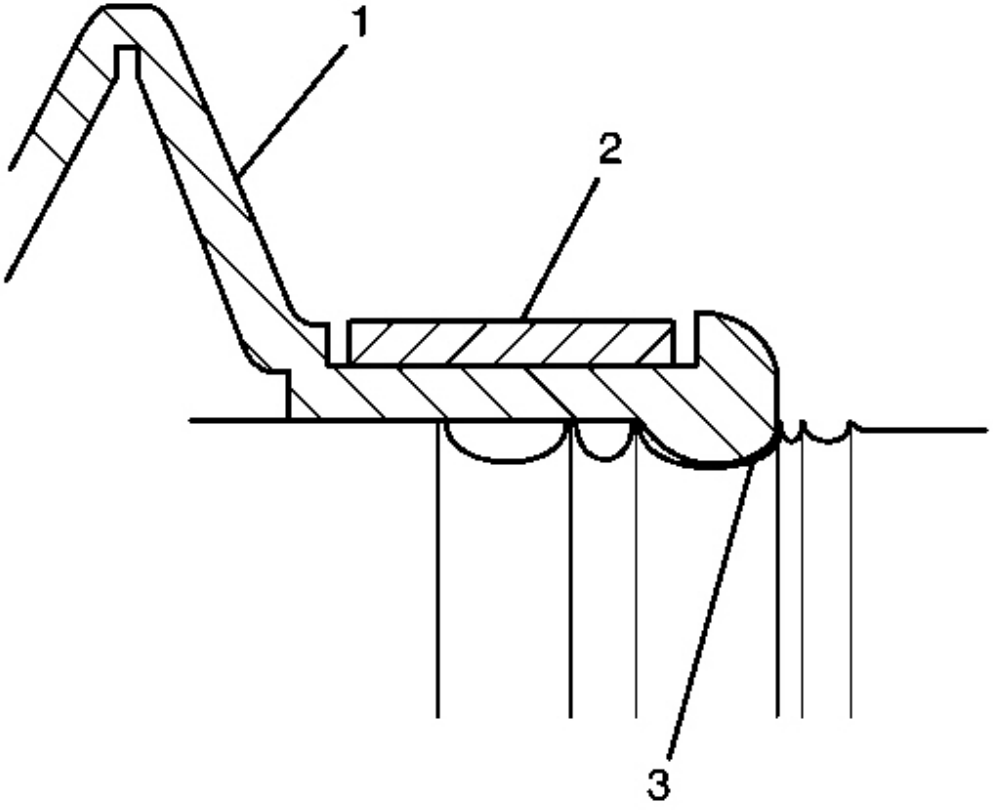

Fig. 73: Sliding Outboard Seal Onto Halfshaft Bar
Courtesy of GENERAL MOTORS CORP.

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.

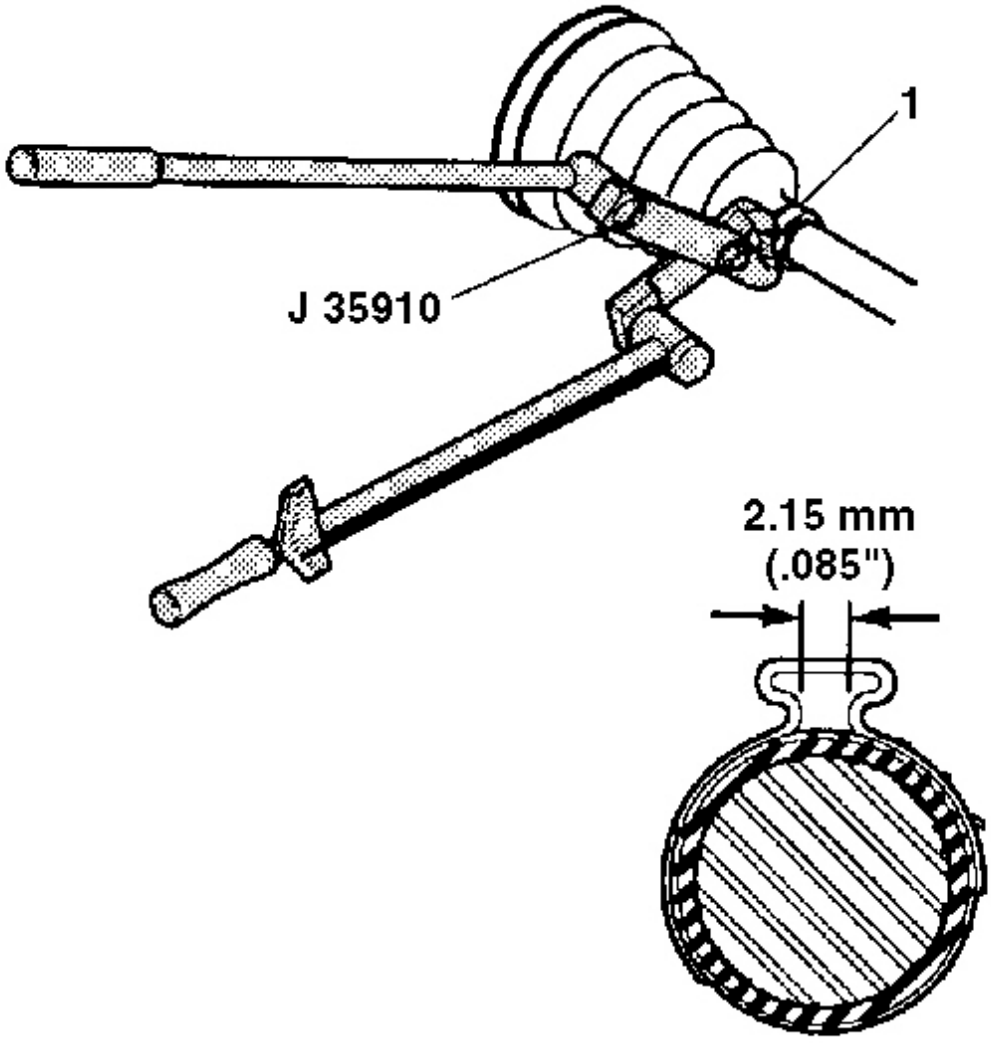

Fig. 74: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

3. Crimp the seal clamp 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).

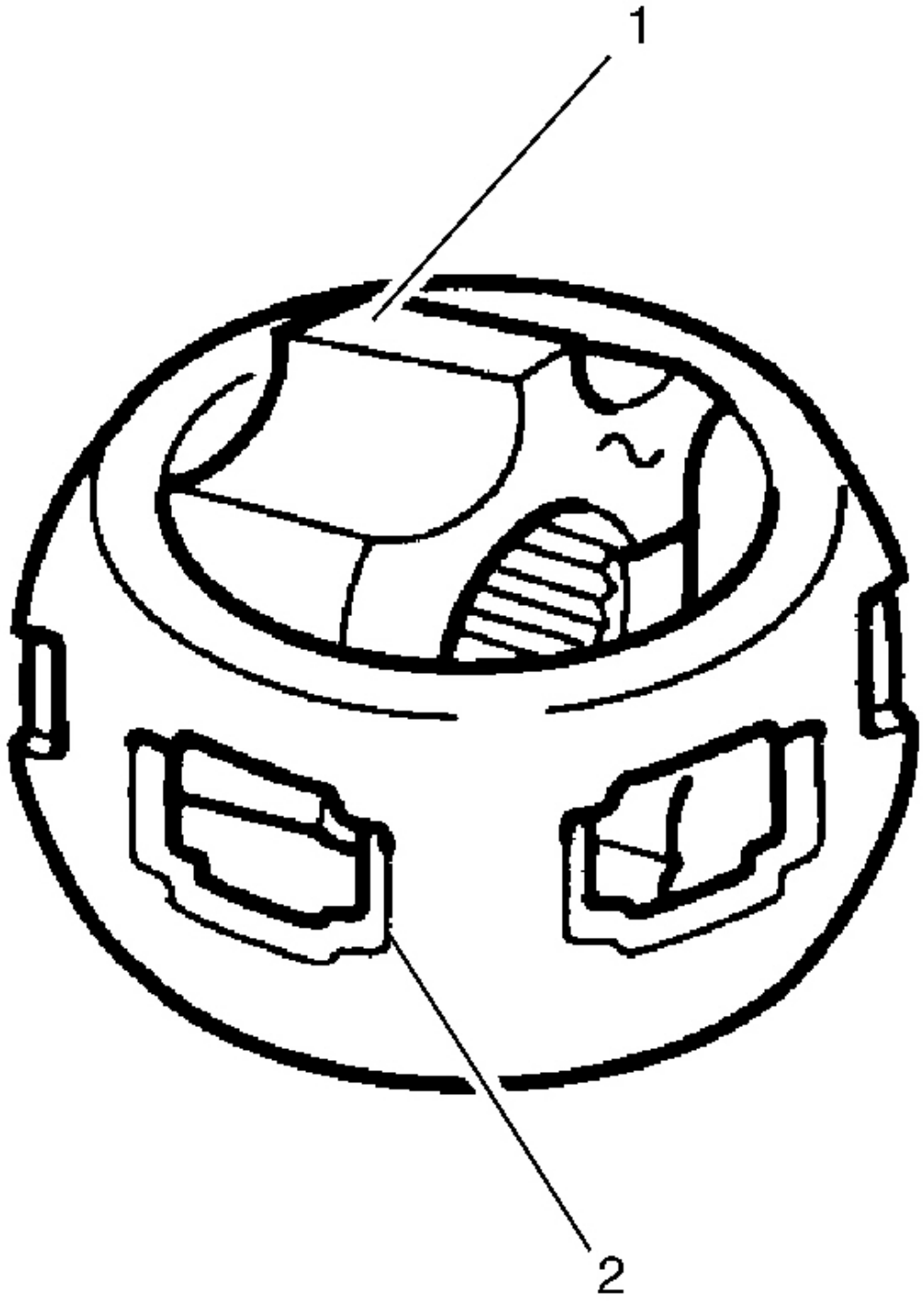
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Fig. 75: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

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.

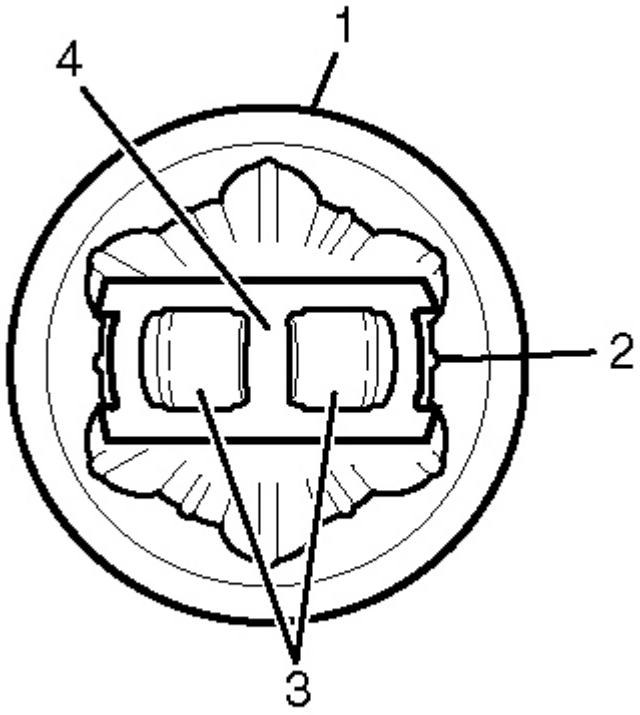

Fig. 76: Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

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.

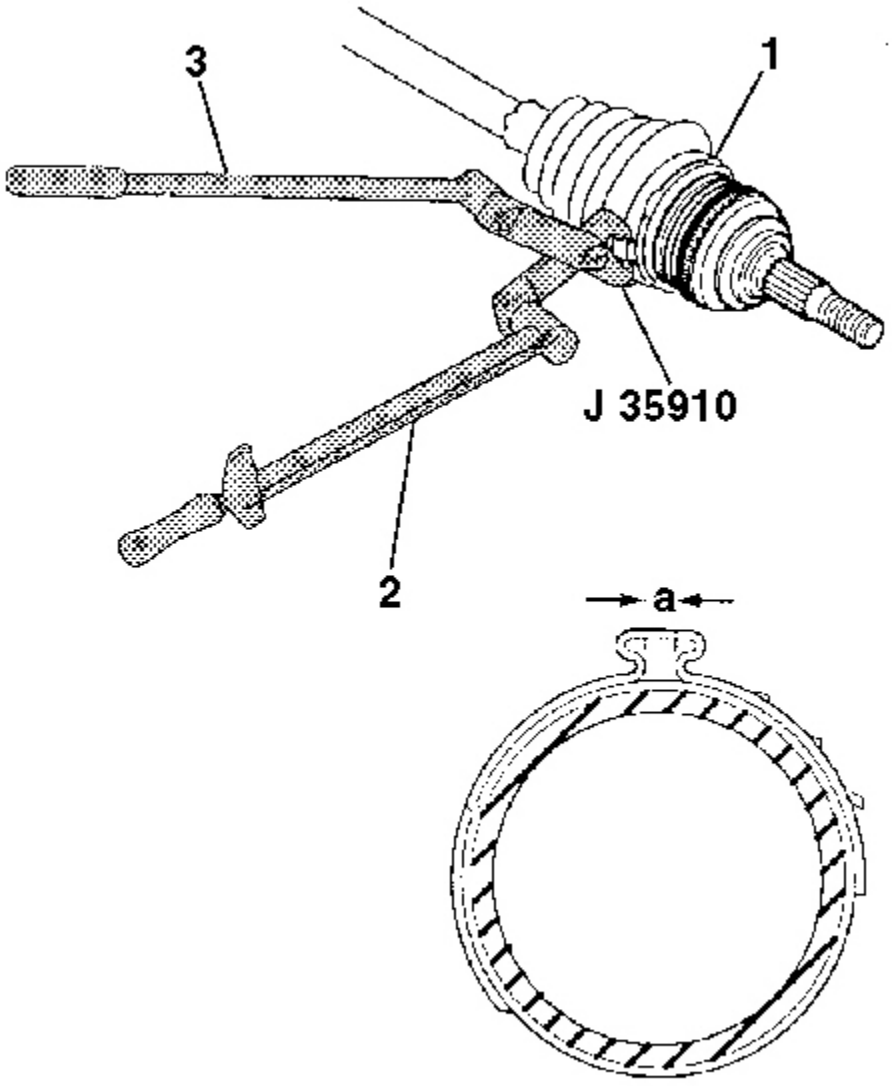

Fig. 77: Crimping Seal Retaining Clamp

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 over the seal and close using the J 35910
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.

WHEEL DRIVE SHAFT OUTER JOINT AND SEAL REPLACEMENT - REAR

Tools Required

J 35910 Drive Axle Seal Clamp Pliers

Disassembly Procedure

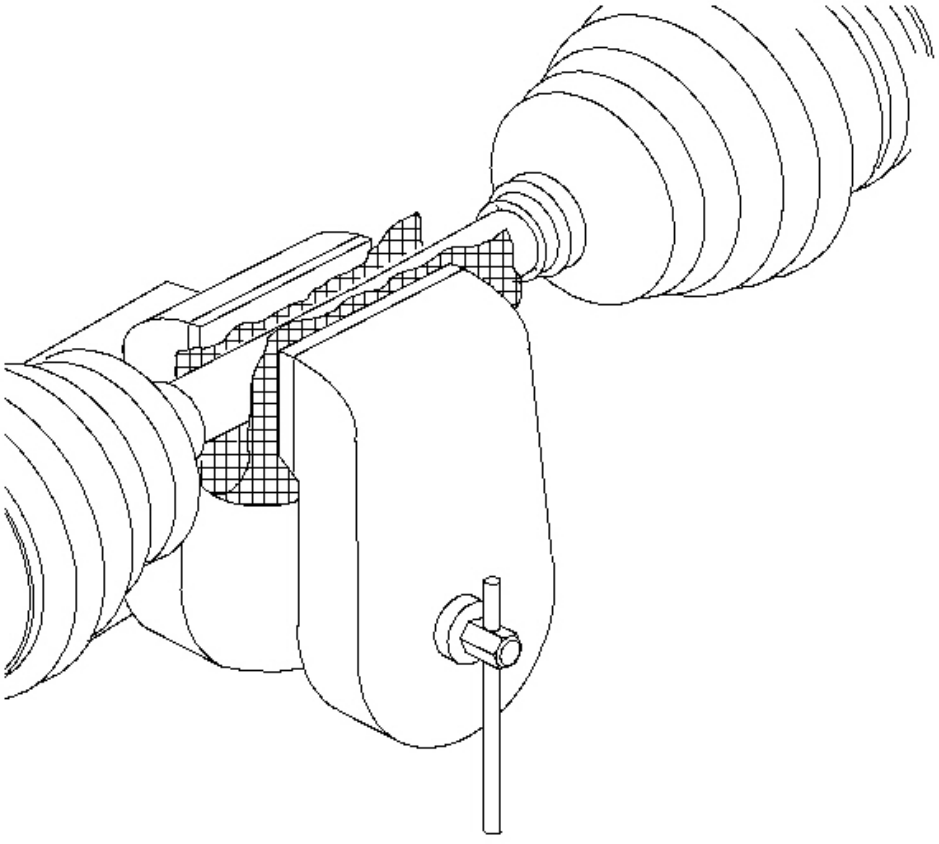

Fig. 78: View Of Front Wheel Drive Shaft Inner Joint
Courtesy of GENERAL MOTORS CORP.

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

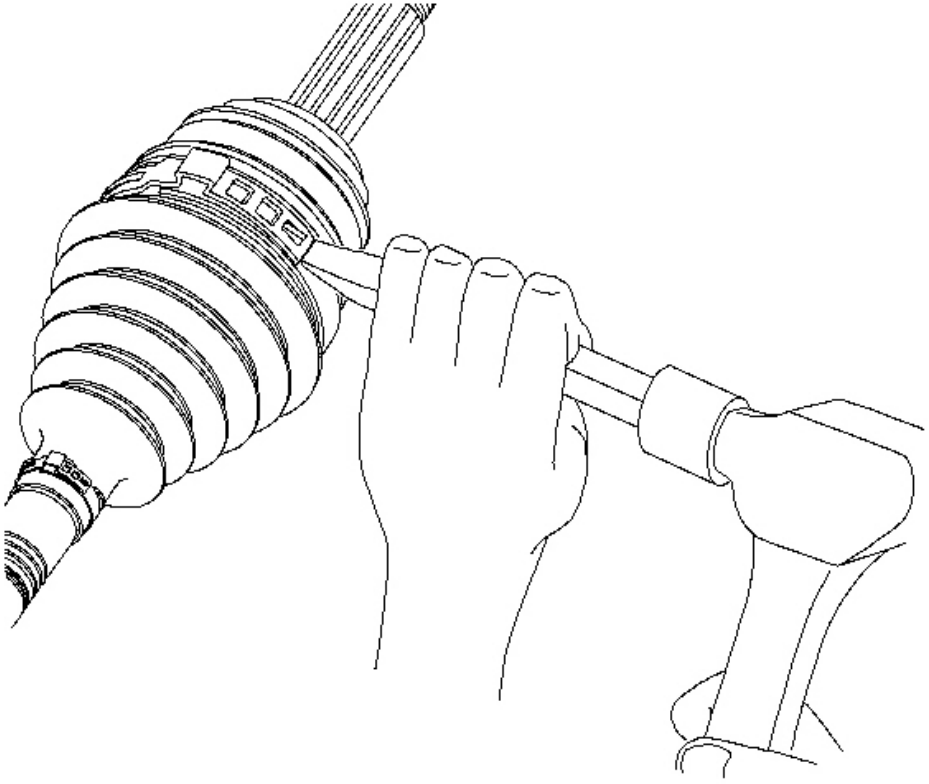

Fig. 79: Disengaging Retaining Tabs Of The Large Seal Clamp Using A Flat-Bladed Tool
Courtesy of GENERAL MOTORS CORP.

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.

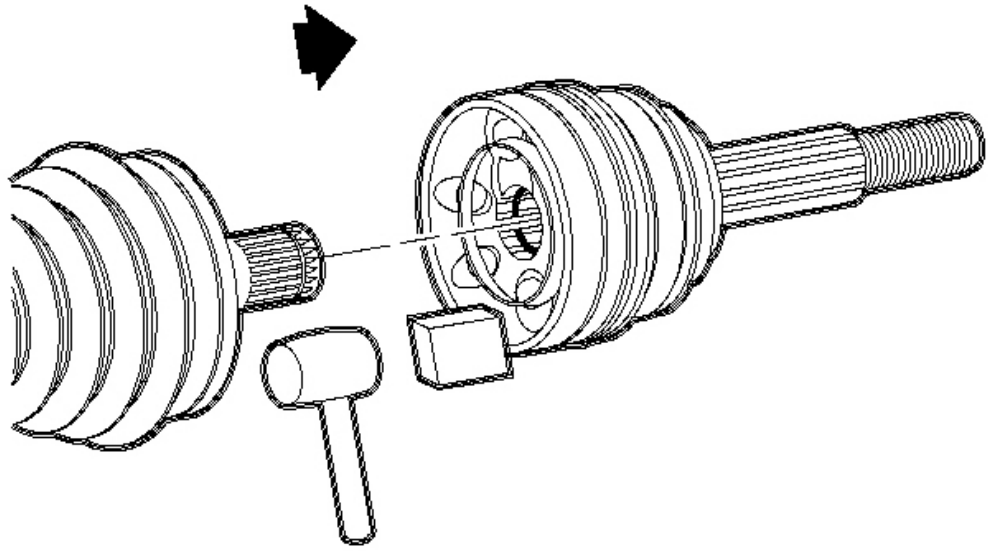

Fig. 80: Placing Block Of Wood Against The CV Joint Outer Race
Courtesy of GENERAL MOTORS CORP.

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.

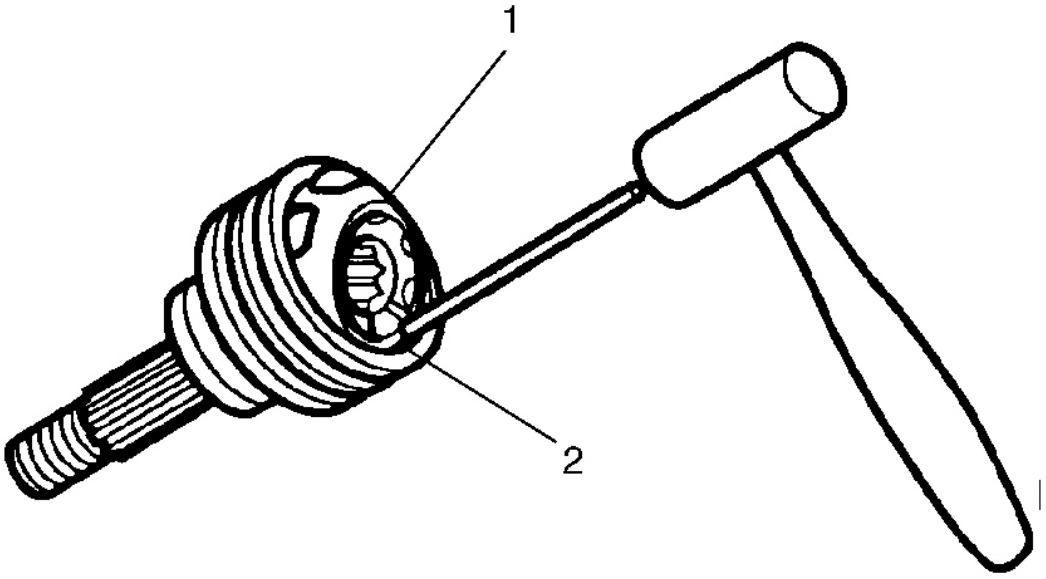

Fig. 81: Tapping Gently On The Brass Drift With A Hammer In Order To Tilt The Cage
Courtesy of GENERAL MOTORS CORP.

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.

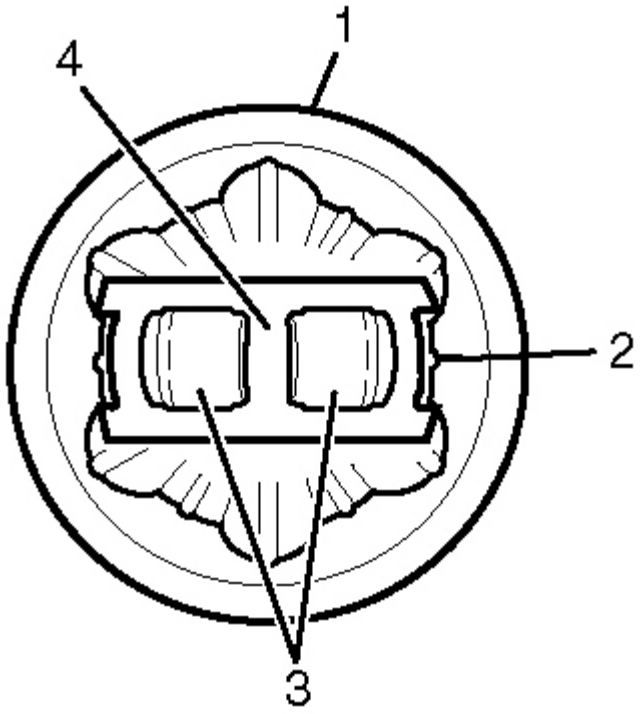

Fig. 82: Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

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.

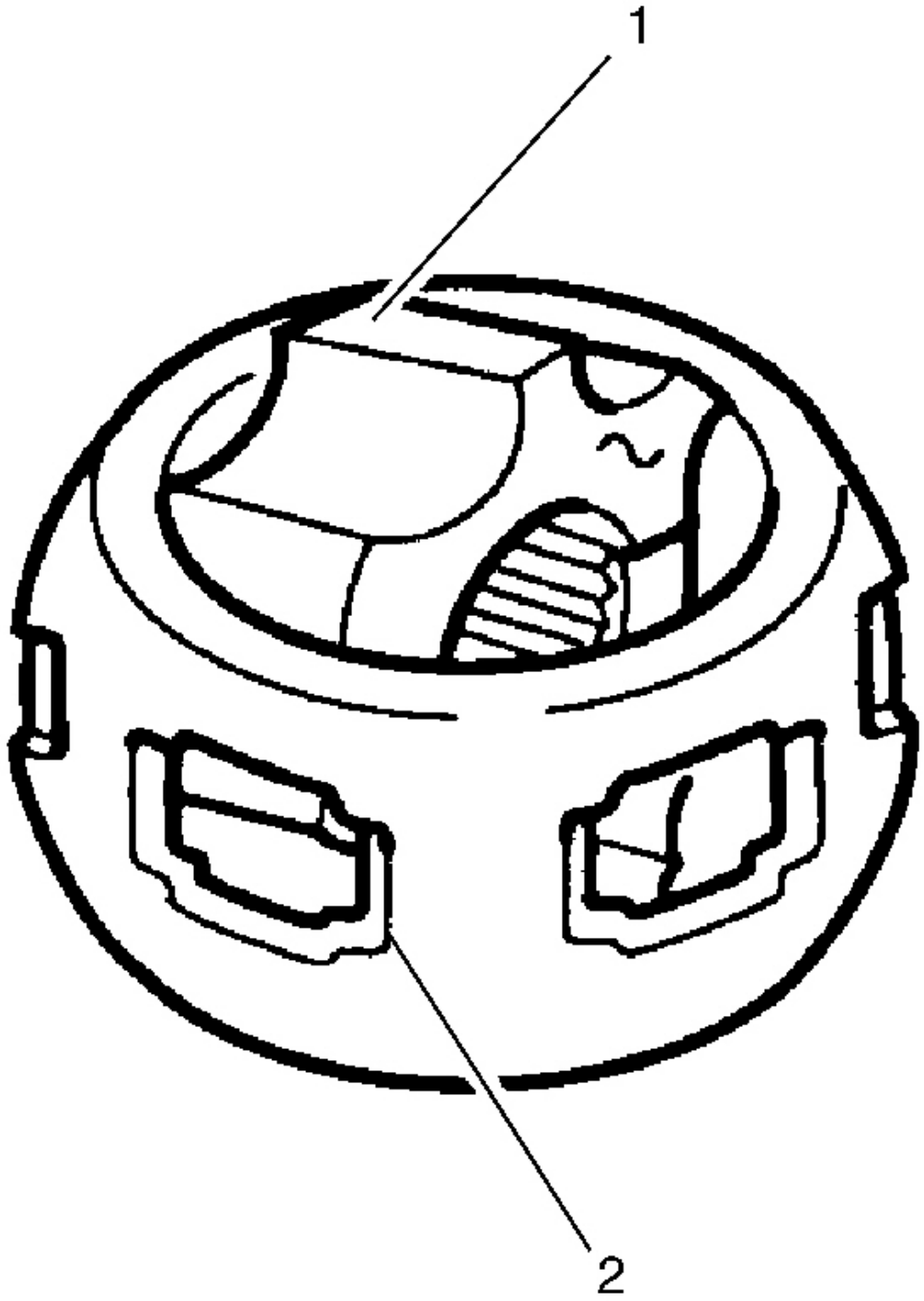
1
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Fig. 83: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

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

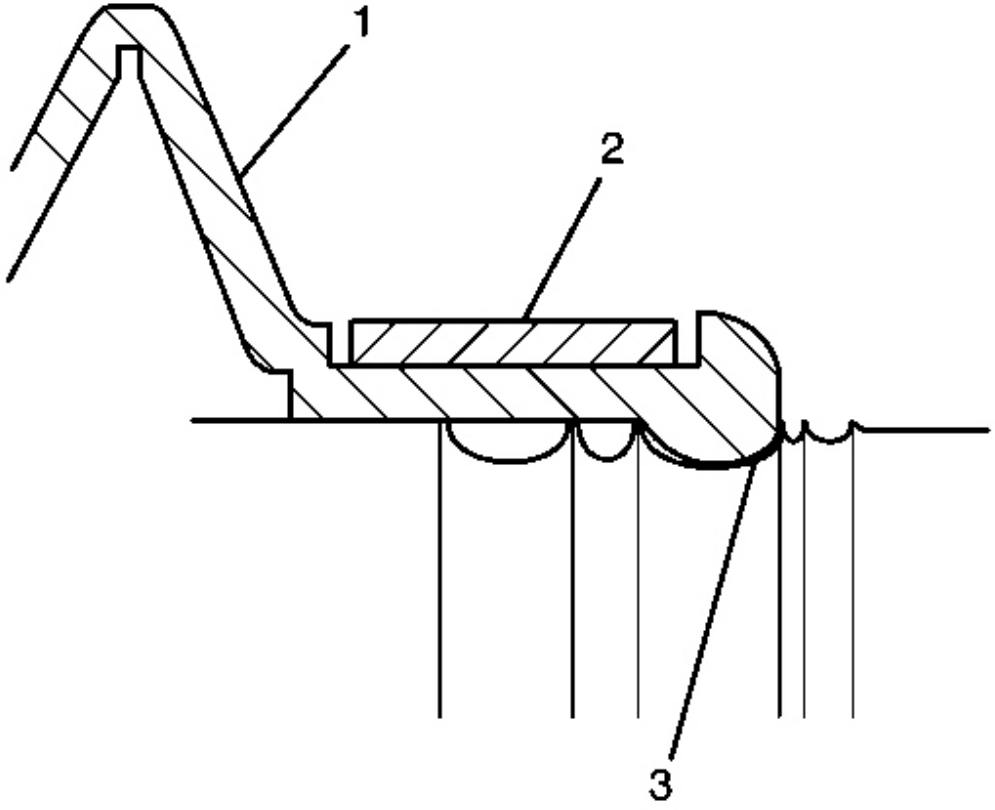

Fig. 84: Sliding Outboard Seal Onto Halfshaft Bar
Courtesy of GENERAL MOTORS CORP.

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.

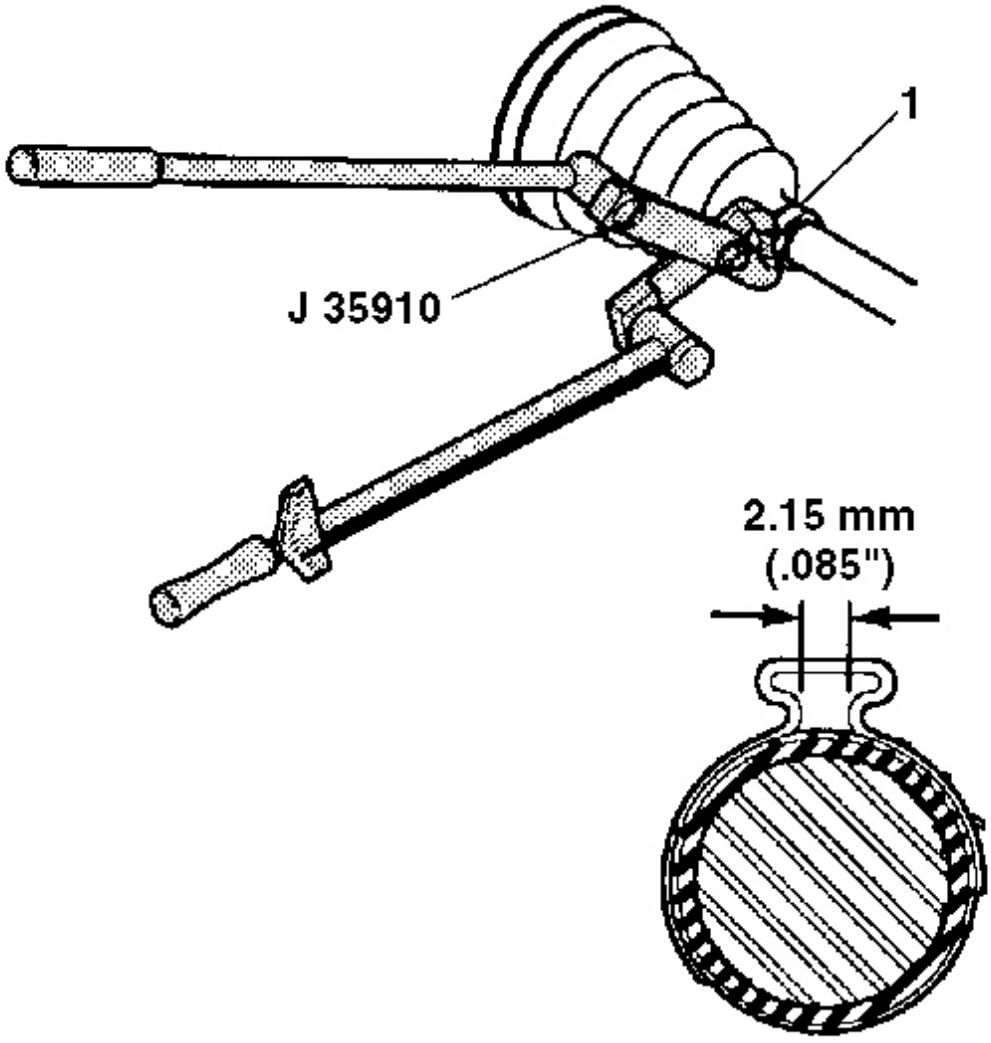

Fig. 85: View Of CV Joint Seal Retaining Clamp
Courtesy of GENERAL MOTORS CORP.

3. Crimp the seal clamp 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).

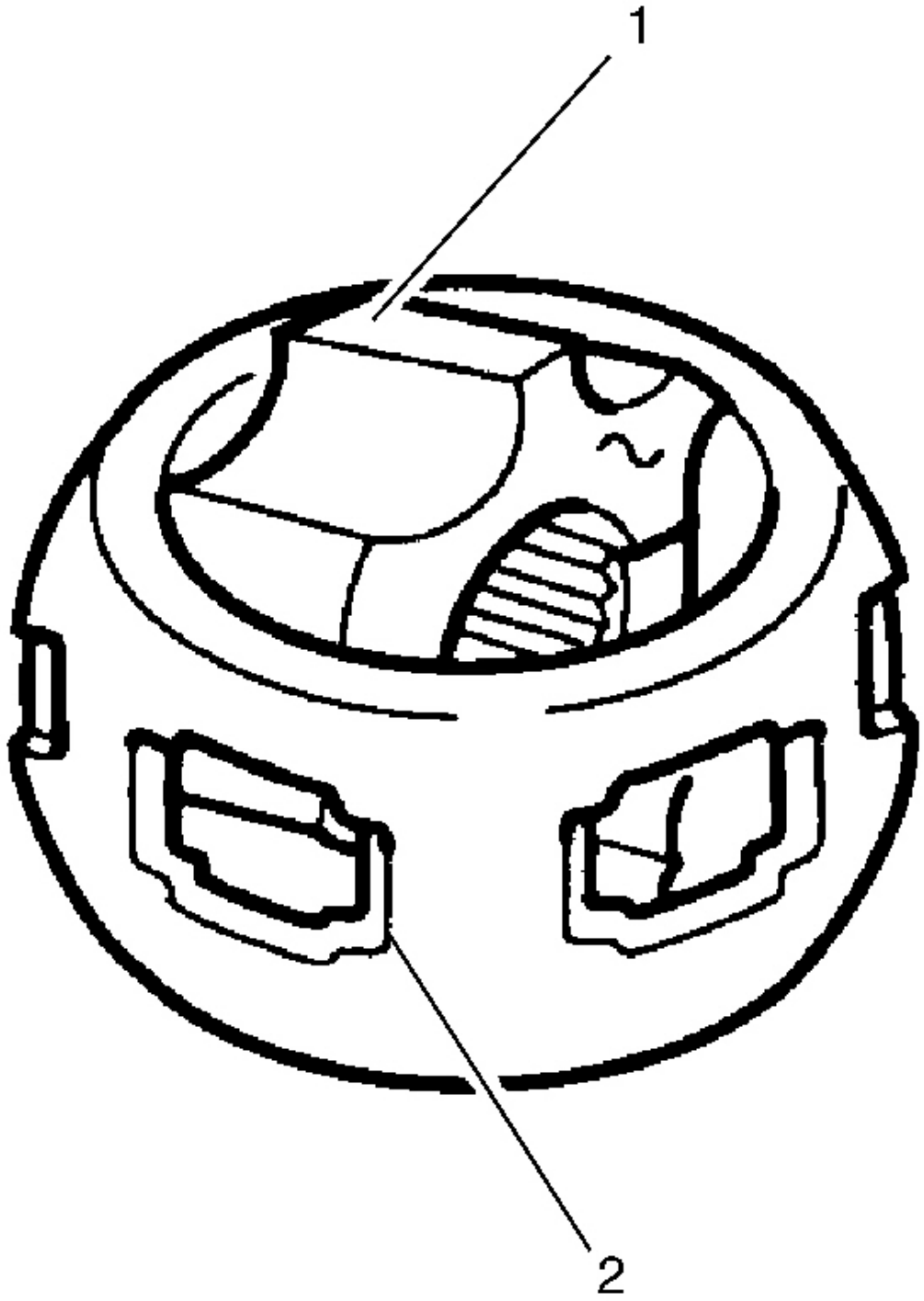
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Fig. 86: View Of Inner Race & Cage
Courtesy of GENERAL MOTORS CORP.

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.

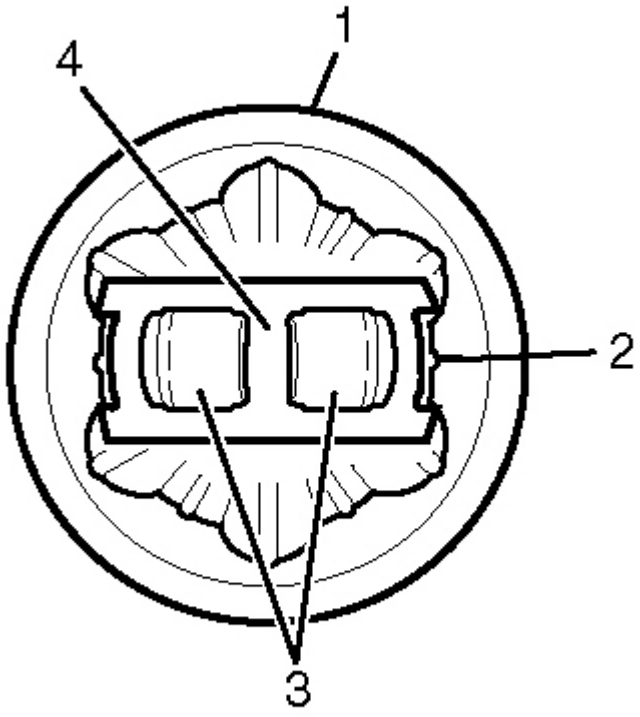


Fig. 87: Outer Race, Inner Race, Cage Window & CV Joint Cage
Courtesy of GENERAL MOTORS CORP.

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. Using pliers, 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.

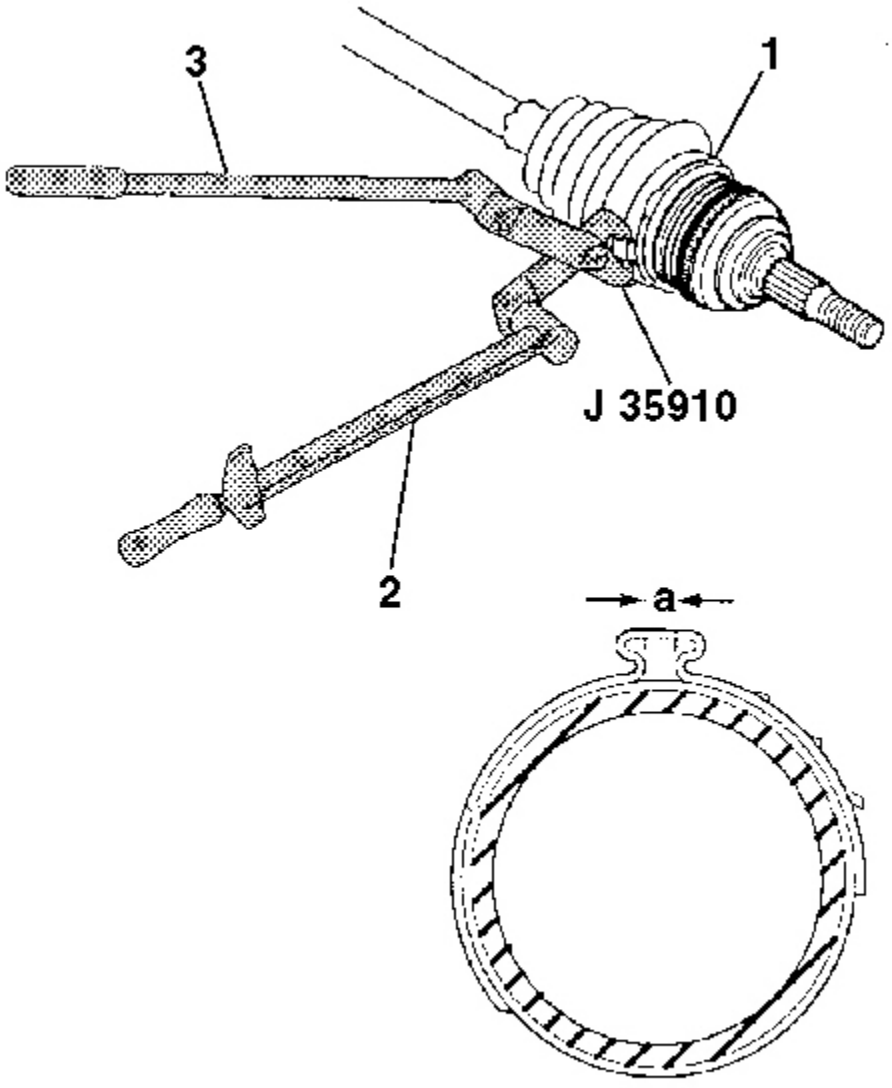


Fig. 88: Crimping Seal Retaining Clamp

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. Instal the large seal retaining clamp over the seal and close using the J 35910 .
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 4 to 5 times.

DESCRIPTION AND OPERATION

WHEEL DRIVE SHAFTS DESCRIPTION AND OPERATION

Wheel drive shafts are flexible assemblies consisting of an inner tripot joint and an outer constant velocity joint connected by an axle shaft. The inner joint is completely flexible, and can plunge in and out. The outer joint is also flexible, but cannot plunge in and out. These drive axles are used to transmit rotational force from the transaxle to the front tire and wheel assemblies.

Seal and Clamp

The wheel drive shafts use inboard and outboard joint seals made of thermoplastic material, and clamps made of stainless steel. The functions of the seals are as follows:

- The seals protect the internal parts of the inboard and outboard joints.
  - They protect the joint lubricating grease from surrounding detrimental atmospheric conditions; such as extreme temperatures, ozone gas, etc.
  - They protect the joint lubricating grease from foreign materials; such as stones, dirt, water, salt, etc.
- The seals facilitate angular and axial movement of the inboard joint.
- The seals facilitate angular movement of the outboard joint.

The function of the clamps is as follows:

Provide a leak proof connection at both the housing and the axle shaft for the inboard and outboard joints.

The thermoplastic material performs well against normal handing, operational wear and conditions. This material however, is not strong enough to withstand abusive handling or damage due to objects such as sharp tools or the sharp edge of any other surrounding component on the vehicle.

Inner Joint

The inner joints are of the tripot design without an over-extension limitation retainer. The inner joints incorporate a male spline which interlocks with the transaxle using snap rings.

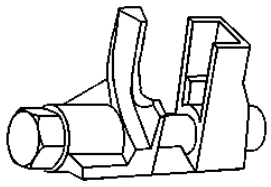
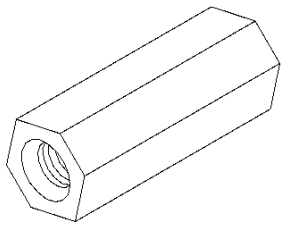
Outer Joint

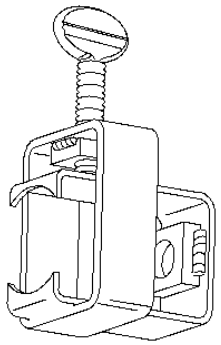
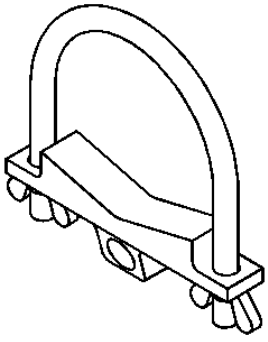
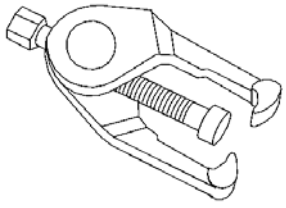
The outer joints are of the Rzeppa, constant velocity joint design. The shaft end which mates with the wheel bearing and hub assembly, incorporates a helical spline to assure a tight, press-type fit. This design assures that no end play will exist between the hub bearing and the drive shaft assembly for added durability and reduced bearing noise.

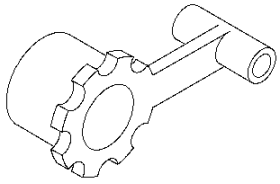
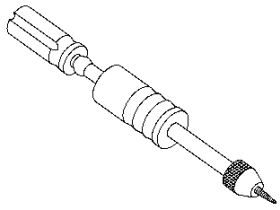
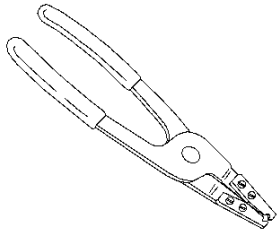
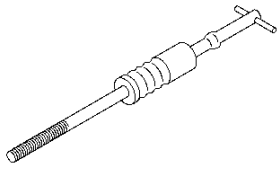
SPECIAL TOOLS AND EQUIPMENT

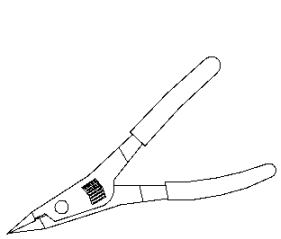
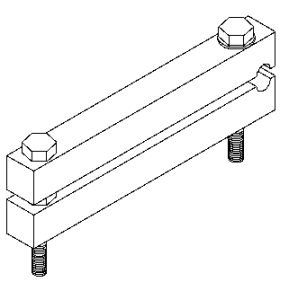
SPECIAL TOOLS

Special Tools

Illustration	Tool Number/ Description
	J 43828 Ball Joint Separator
	J 44015 Steering Linkage Installer
	J 44017 Stub Shaft Assembly Remover

	
	J 45341 Rear Wheel Drive Shaft Removal Tool
	SA91100C Tie Rod Separator
	SA91112T Axle Seal Protector

	
	SA9133T Axle Seal Puller
	SA9161C Axle Boot Clamp Installer
	SA9173G Slide Hammer
	SA9198C

	Snap Ring Pliers (Constant Velocity Joint)
	SA9203C Axle Clamp Installer