

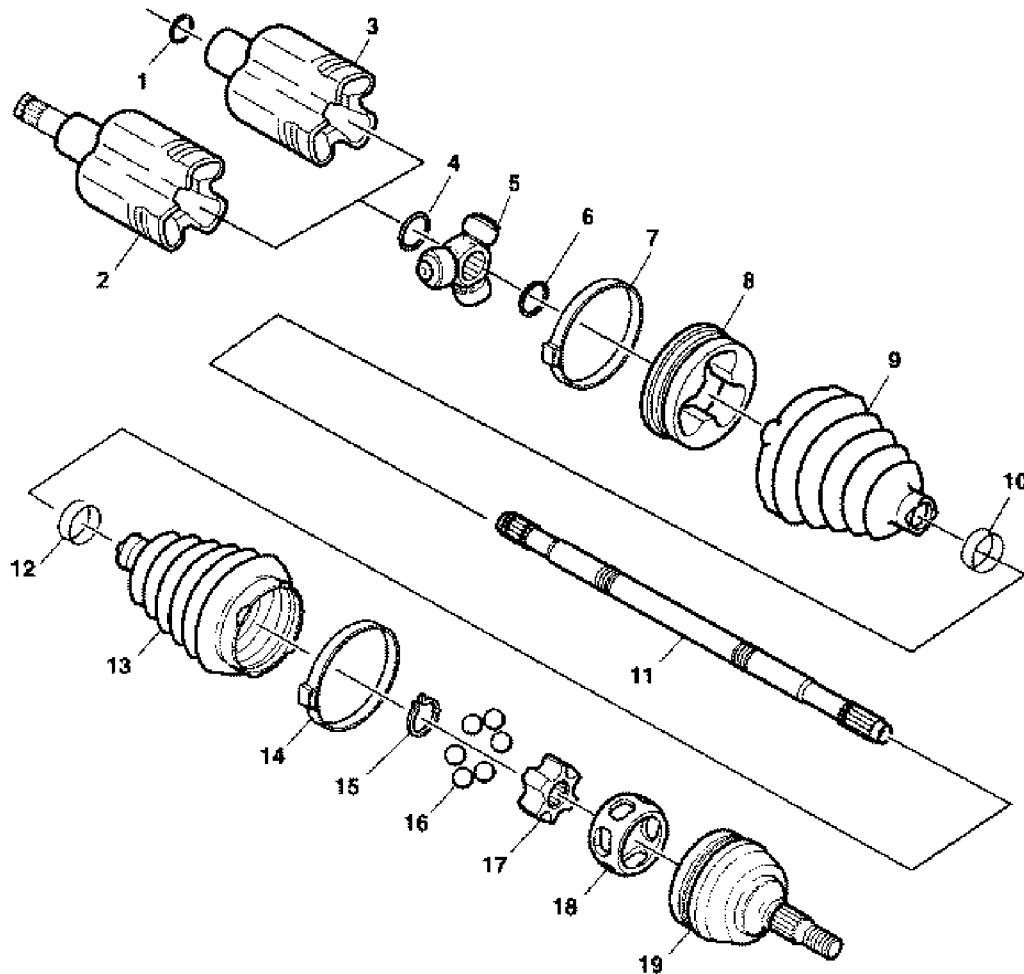
[2009 Chevrolet Impala](#) | [Impala \(VIN W\) Service Manual](#) | [Driveline/Axle](#) | [Wheel Drive Shafts](#) | [Specifications](#) |

Document ID: 848569

Fastener Tightening Specifications

Application	Specification	
	Metric	English
Front Wheel Drive Shaft Nut	160 N·m	118 lb ft
Drive Axle Seal Clamp	174 N·m	130 lb ft

Wheel Drive Shafts Disassembled Views



- (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

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- (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

Wheel Drive Shaft Replacement

Special Tools

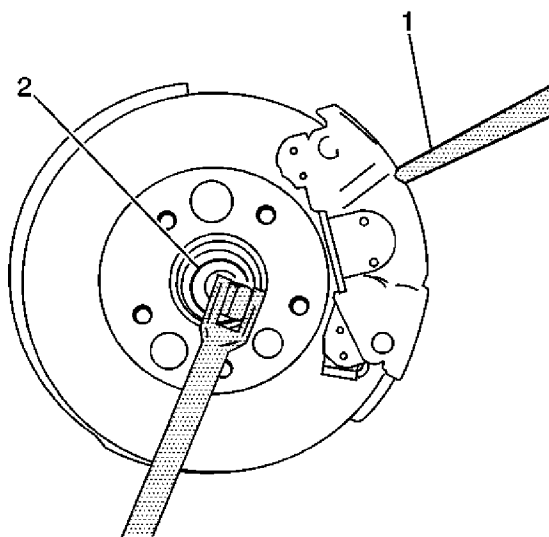
- [J 2619-01](#) Slide Hammer
- [J 29794](#) Axle Shaft Remover Extension
- [J 33008-A](#) Axle Shaft Remover
- [J 42129](#) Hub Spindle Remover

Removal Procedure

Warning: To prevent personal injury and/or component damage, do not allow the weight of the vehicle to load the front wheels, or attempt to operate the vehicle, when the wheel drive shaft(s) or wheel drive shaft nut(s) are removed. To do so may cause the inner bearing race to separate, resulting in damage to brake and suspension components and loss of vehicle control.

Caution: Wheel drive shaft boots, seals and clamps should be protected from sharp objects any time service is performed on or near the wheel drive shaft(s). Damage to the boot(s), the seal(s) or the clamp(s) may cause lubricant to leak from the joint and lead to increased noise and possible failure of the wheel drive shaft.

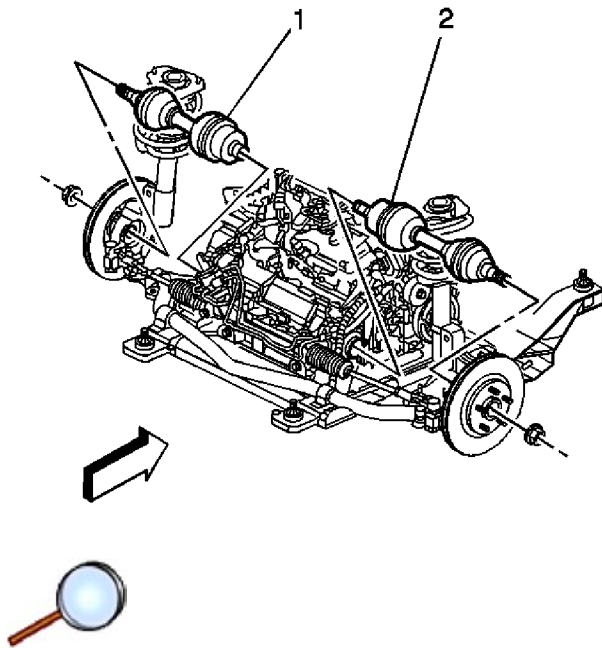
1. Raise and suitably support the vehicle. Refer to [Lifting and Jacking the Vehicle](#).
2. Remove the wheel and the tire. Refer to [Tire and Wheel Removal and Installation](#).
3. Remove the stabilizer shaft link. Refer to [Stabilizer Shaft Link Replacement](#).



4. Remove the front wheel drive shaft nut (2). Insert a drift or a flat-bladed tool (1) into the caliper and the rotor to prevent the rotor from turning.
5. Disconnect the outer tie rod assembly from the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#).

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6. Separate the ball joint from the steering knuckle. Refer to [Lower Control Arm Ball Joint Replacement](#).
7. Separate the front wheel drive axle from the front wheel drive shaft bearing using the [J 42129](#) . The nut can be partially re-installed to protect the threads.

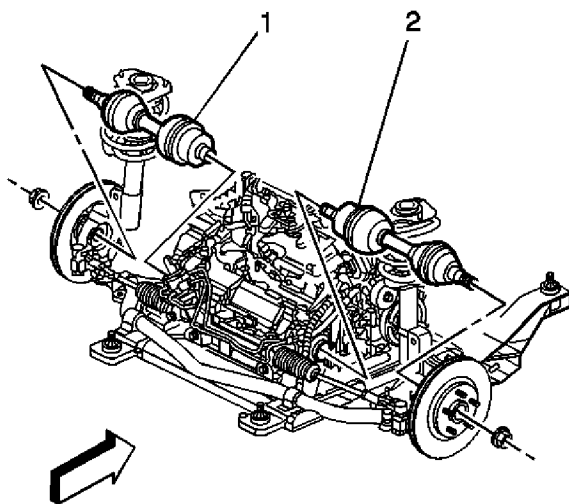


8. If necessary, remove the left front wheel drive axle (1) from the transaxle.

If necessary, remove the right front wheel drive axle (2) from the transaxle.

Use the [J 33008-A](#) , the [J 29794](#) and the [J 2619-01](#) to separate the axle from the transaxle.

Installation Procedure





1. Install the front wheel drive axle (1, 2) into the transaxle.
2. Verify that the front wheel drive shaft retaining ring is properly seated:
 - Grasp the inner housing and pull the inner housing outward. Do not pull on the front wheel drive axle shaft.
 - The front wheel drive axle will remain in place when the front wheel drive shaft retaining ring is properly seated.
3. Install the front wheel drive axle into the front wheel drive shaft bearing.
4. Connect the ball joint to the steering knuckle. Refer to [Lower Control Arm Ball Joint Replacement](#).
5. Connect the outer tie rod assembly to the steering knuckle. Refer to [Steering Linkage Outer Tie Rod Replacement](#).

Caution: Refer to [Fastener Caution](#) in the Preface section.

6. Install a new front wheel drive shaft nut. Insert a drift or a flat-bladed tool into the caliper and the rotor to prevent the rotor from turning.

Tighten

Tighten the nut to 160 N·m (118 lb ft).

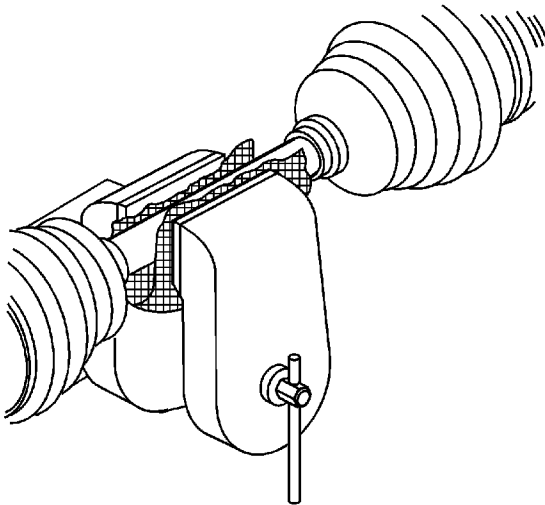
7. Install the stabilizer shaft link. Refer to [Stabilizer Shaft Link Replacement](#).
8. Install the wheel and the tire. Refer to [Tire and Wheel Removal and Installation](#).
9. Lower the vehicle.
10. Inspect the transaxle fluid level.
11. Inspect the wheel alignment. Refer to [Wheel Alignment Measurement](#).

Wheel Drive Shaft Inner Joint and Boot Replacement

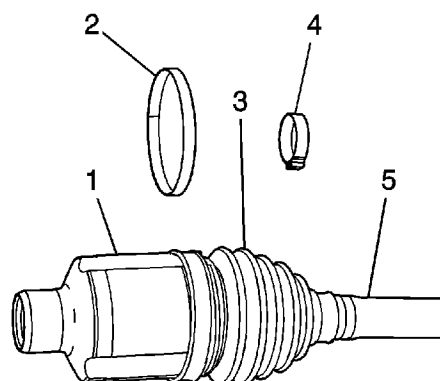
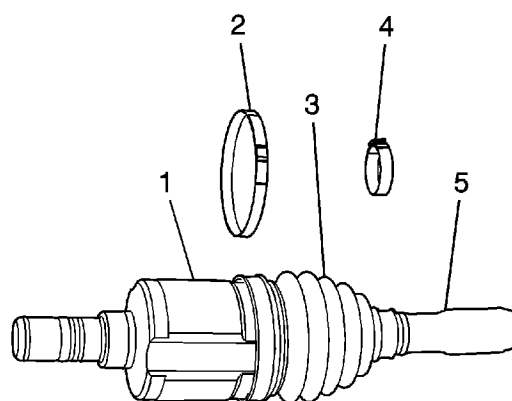
Special Tools

- [J 35910](#) Drive Axle Seal Clamp Pliers
- [J 41048](#) Drive Axle Swage Ring Clamp

Disassemble Procedure



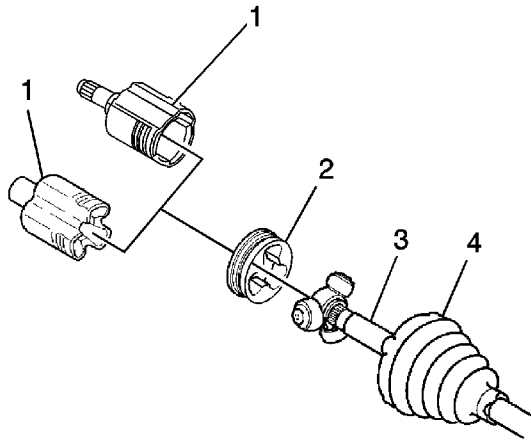
1. Clamp the wheel drive shaft in a soft jawed vise.



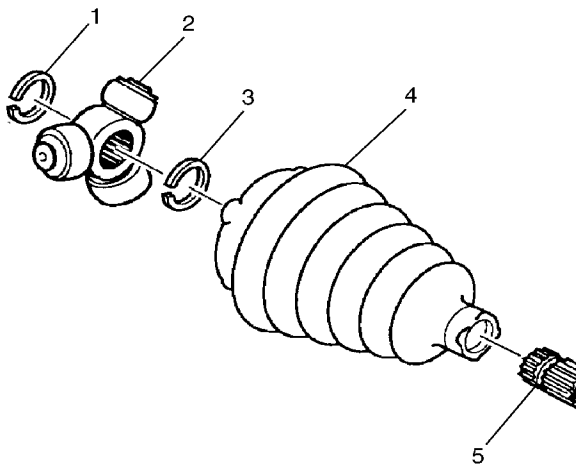
Caution: Do not cut through the wheel drive shaft inboard or outboard boot during service. Cutting through the boot may damage the sealing surface of the housing and the tripot or the constant velocity joint bushing. Damage to the sealing surface may lead to water and dirt intrusion and premature wear of the constant velocity joint.

Note: The following service procedure is for those vehicles equipped a swage style boot clamp. For all others, proceed to step 3.

2. Using a hand grinder, remove the boot retaining clamp (4) and discard the clamp.
3. Using a pair of side cutters, remove the boot clamp (4) and discard the clamp.
4. Using the appropriate tool, remove the large boot retaining clamp (2) and discard the retaining clamp.



5. Remove the boot (4) from the tripod bushing (2).
6. Remove the inner tripod housing (1) and the tripod bushing (2) from the wheel drive shaft (3).



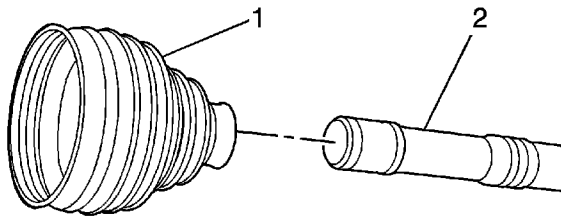
7. Using the appropriate tool, remove the outer retaining ring (1) from the wheel drive shaft (5).
8. Remove the tripod (2) from the wheel drive shaft (5).

Note: If the tripod has a retaining ring located after it, proceed to step 9. If not, skip step 9 and proceed to step 10.

9. Using the appropriate tool, remove the inner retaining ring (1) from the wheel drive shaft (5).
10. Remove the boot (4) from the wheel drive shaft (5).

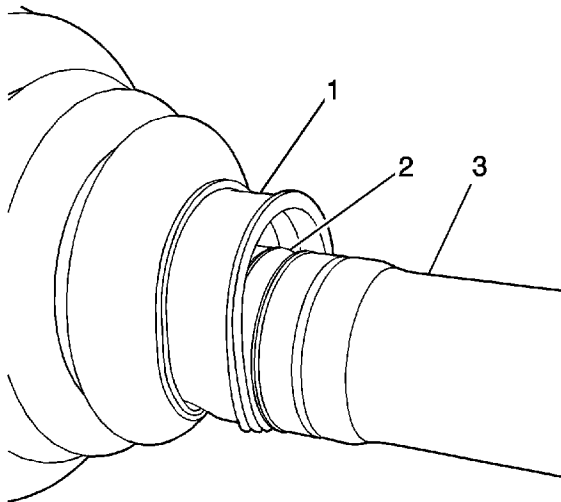
11. Inspect the inner wheel drive shaft joint. Refer to [Wheel Drive Shaft Inner Joint Inspection](#).

Assemble Procedure

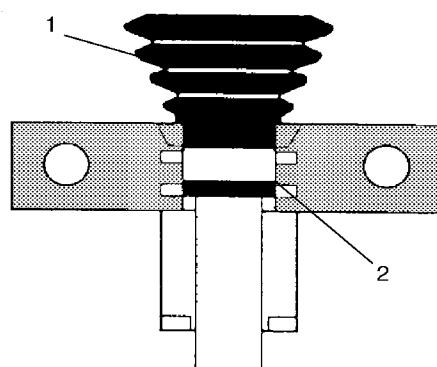


Note: Steps 1 thru 8 are is for those vehicles equipped a swage style boot clamp. For all others, proceed to step 9.

1. Install the swage clamp and boot (1) on to the wheel drive shaft (2).



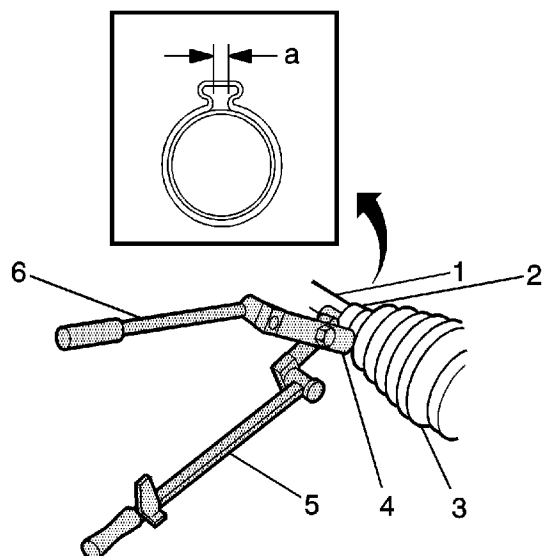
2. Ensure that the boot (1) is properly seated in the groove (2) in the wheel drive shaft (3).



3. Install the [J 41048](#) in a vise.
4. Position the swage clamp (2) so that it is properly seated on the boot (1).
5. Align the boot with the indicator on the bottom die.
6. Position the upper die and bolts (2) on the wheel drive shaft (1).
7. Hand tighten the bolts (2) until the gap between the upper and lower die are the same.

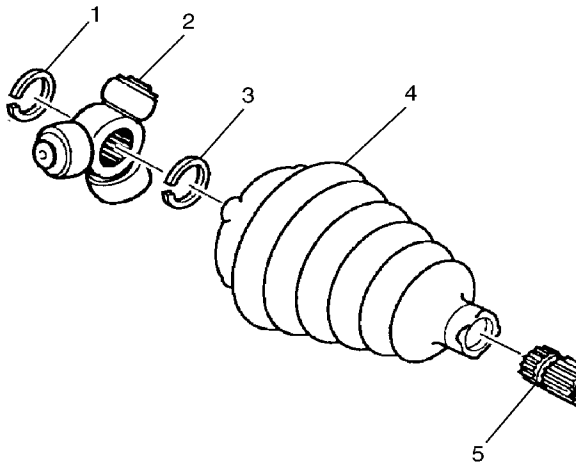
Note: Before tightening the swage clamp, ensure that the swage clamp is seated properly so that it will not distort or damage the boot.

8. Tighten the bolts (2) equally one at a time until both of the bolts have bottom out.

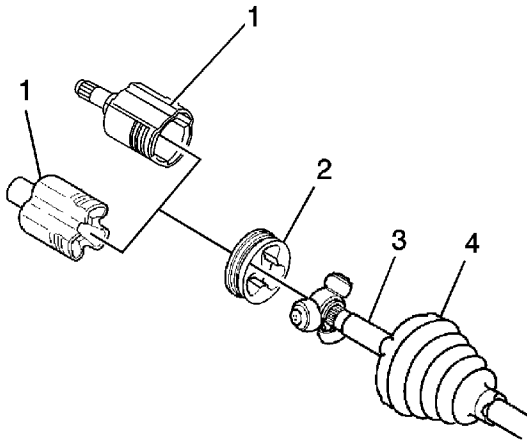


9. Install the boot clamp on the boot.
10. Install the boot (3) and the clamp (2) on the wheel drive shaft (1).
11. Using the [J 35910](#) (4), torque wrench (5) and the breaker bar (6), tighten the clamp until

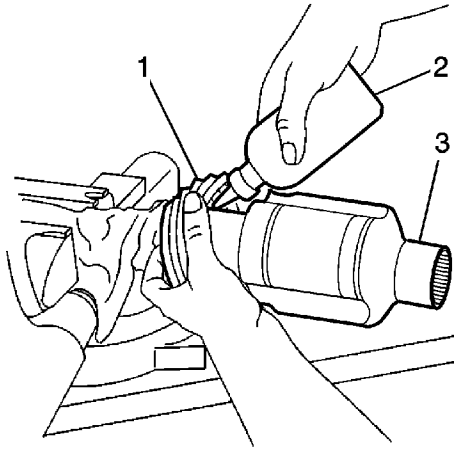
the gap (A) in the clamp reaches 2.15 mm (.085 inch).



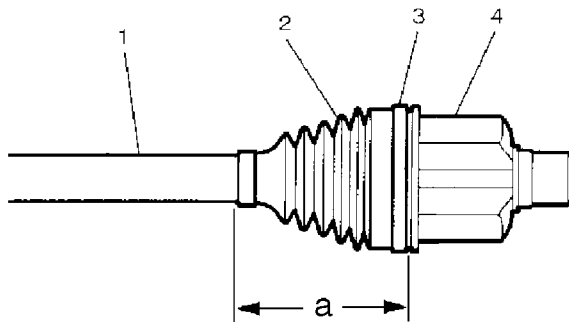
12. Using the appropriate tool, install the inner retaining ring (3), if equipped.
13. Install the tripod (2) on the wheel drive shaft (5).
14. Using the appropriate tool, install the outer retaining ring (1).



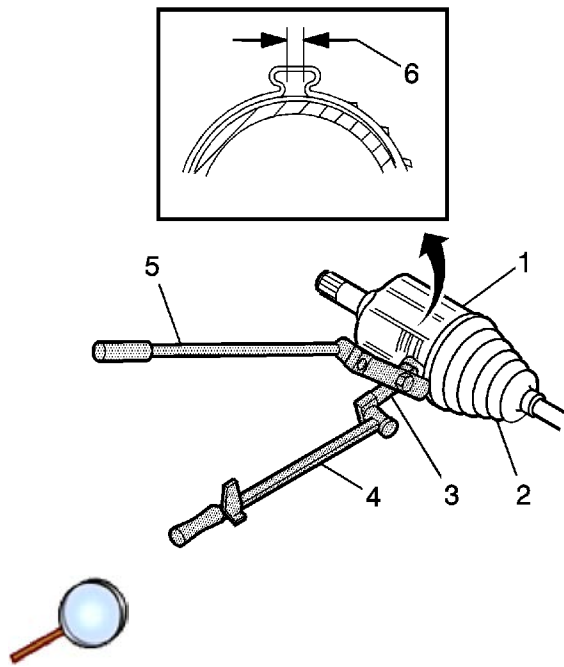
15. Install the tripod bushing (2), the tripod housing (1) on to the wheel drive shaft (3).
16. Install the tripod housing (1) on the boot (4).



17. Place approximately half the container of grease from the service kit in the boot and the half in the tripod housing.
18. Install the outer boot clamp (3) on the boot (2) and the tripod housing and the bushing (4).



19. Measure the distance from the rear of the boot to the front of the boot clamp (a).
 - For vehicles equipped with the 3.8L supercharged V 6 engines, distance a will equal 111 mm (4.75 inch)
 - For all others, distance a will equal 95 mm (3.75 inch)



20. Using the [J 35910](#) (3), torque wrench (4), and the breaker bar (5), tighten the clamp (2).

Tighten

Tighten the clamp (2) to 176 N·m (130 lb ft).

Note: If the gap dimension is larger than the given specification, continue to tighten the clamp until the specification is reached.

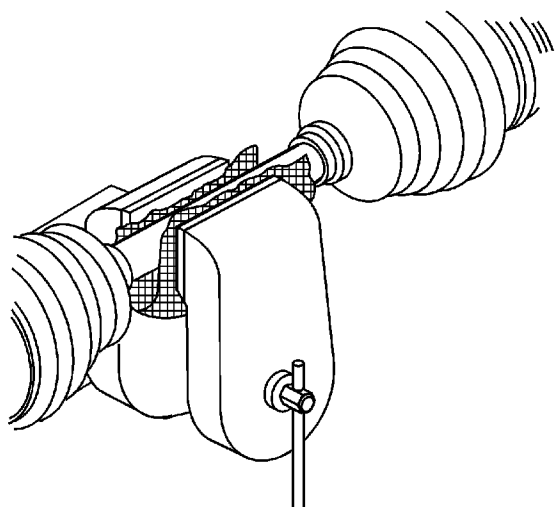
21. The gap of (A) should be 2.60 mm (0.102 inch).
22. Remove the wheel drive shaft from the [J 41048](#) and rotate the tripod housing several times to distribute the grease.

Wheel Drive Shaft Outer Joint and Boot Replacement

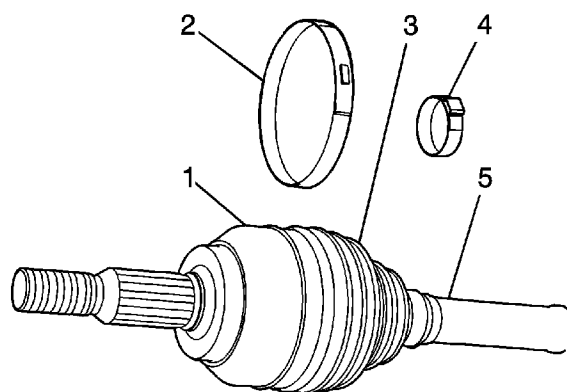
Special Tools

- [CH-48894](#) Wheel Drive Shaft Boot Clamp Pliers
- [J 35910](#) Drive Axle Seal Clamp Pliers

Removal Procedure

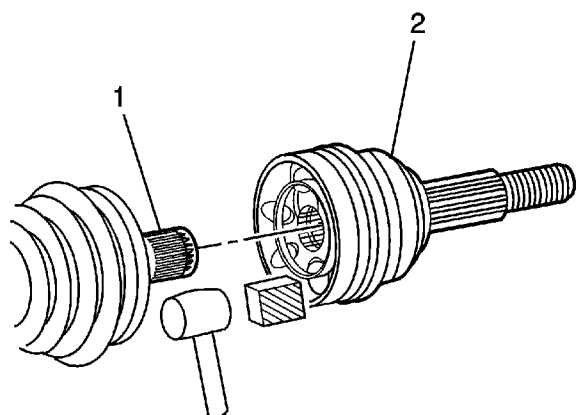


1. Clamp the drive axle shaft in a soft jawed vice.

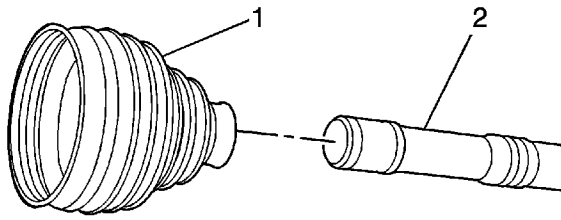


Caution: Do not cut through the wheel drive shaft inboard or outboard boot during service. Cutting through the boot may damage the sealing surface of the housing and the tripot or the constant velocity joint bushing. Damage to the sealing surface may lead to water and dirt intrusion and premature wear of the constant velocity joint.

2. Use a flat-bladed tool, remove the boot clamp (2) from the constant velocity (CV) joint (1) and the boot (3).
3. Using a pair of side cutters, remove the boot clamp (4) from the boot (3) and the wheel drive shaft (5).
4. Discard the boot clamps (2) and (4). Use NEW clamps only.

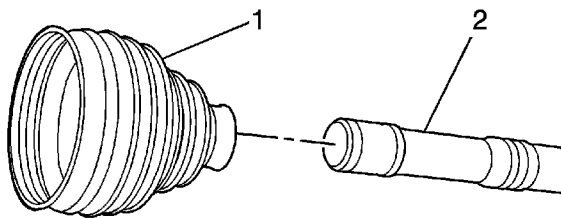


5. Using a block of wood and a hammer, remove the CV joint (2) from the wheel drive shaft (1).

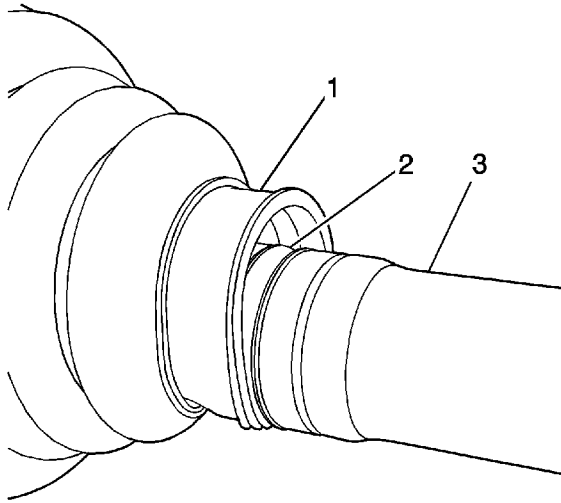


6. Remove the boot (1) from the wheel drive shaft (2).
7. Inspect the outer CV joint for damage and wear. Refer to [Wheel Drive Shaft Outer Joint Inspection](#).

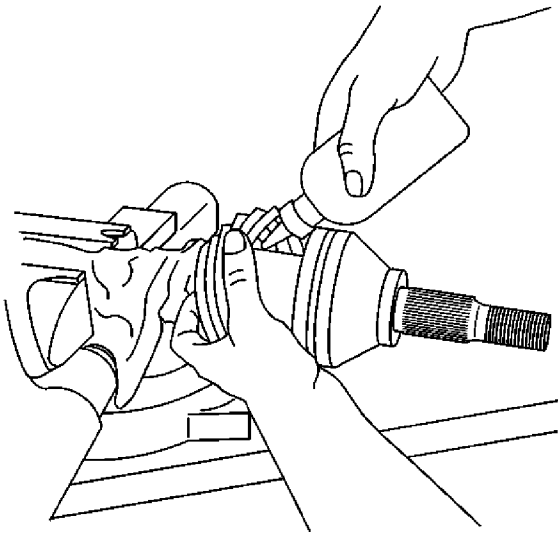
Installation Procedure



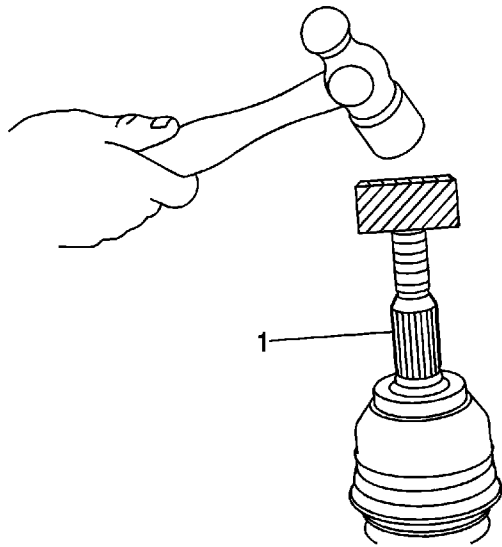
1. Position the boot (1) on the wheel drive shaft (2).



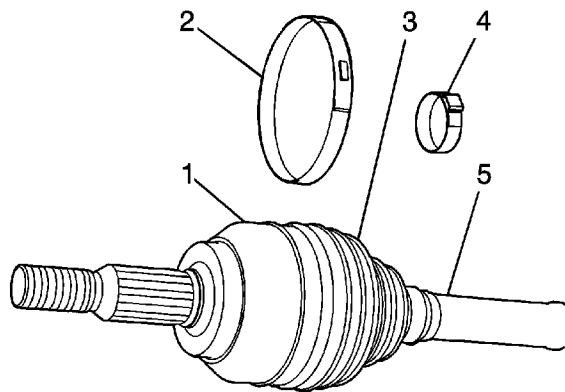
2. Ensure that the boot (1) is properly seated in the groove (2) in the wheel drive shaft (3).



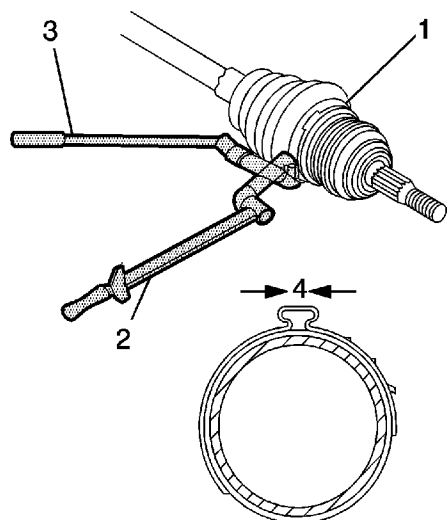
3. Place approximately half the grease from the service kit inside the outboard boot and pack the CV joint with the remaining grease.



4. Using a block of wood and a hammer, install the CV joint on the wheel drive shaft (1).



5. Install the boot clamp (4) on the boot (3) and the wheel drive shaft (5).
6. Install the boot clamp (2) on the boot (3) and the CV joint housing (1).

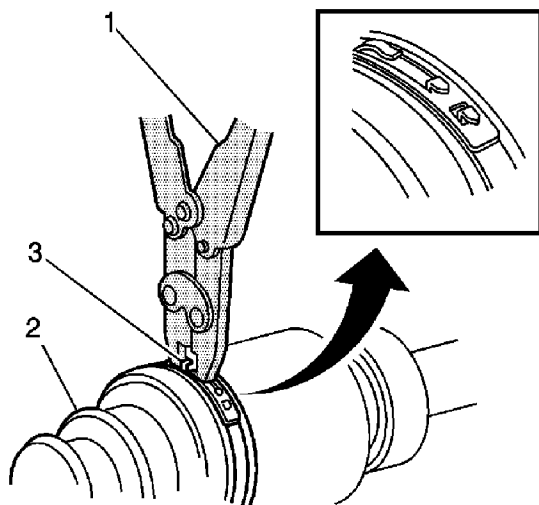


Note: Ensure that the boot clamp is properly positioned around the entire circumference of the boot.

7. Using the [J 35910](#) (3), crimp the boot clamp (1).
8. Tighten the boot clamp.

Tighten

Tighten the boot clamp to 174 N·m (130 lb ft).



9. Using the [CH-48894](#) (1), close the boot clamp (3). Ensure the boot clamp (3) is securely closed and seated properly on the boot (2).

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

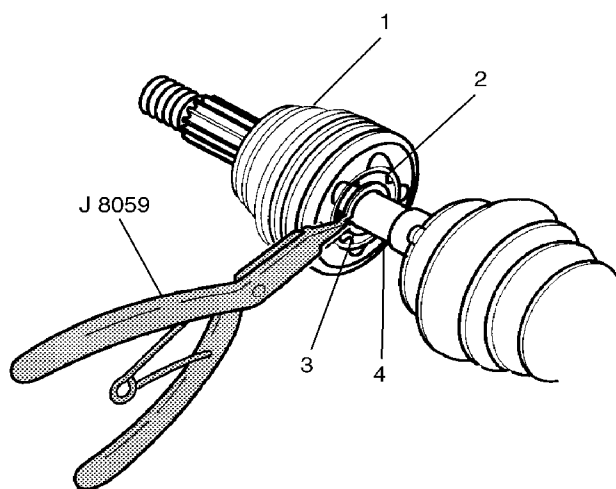
Wheel Drive Shaft Outer Joint Inspection

Special Tools

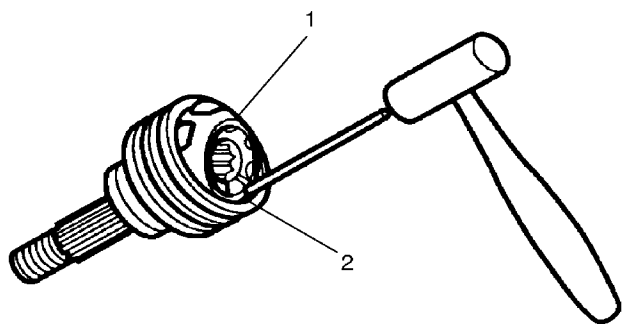
[J 8059](#) Snap Ring Pliers

Disassembly Procedure

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



3. Using the [J 8059](#) , remove the retaining ring (3) from the wheel drive shaft (4).

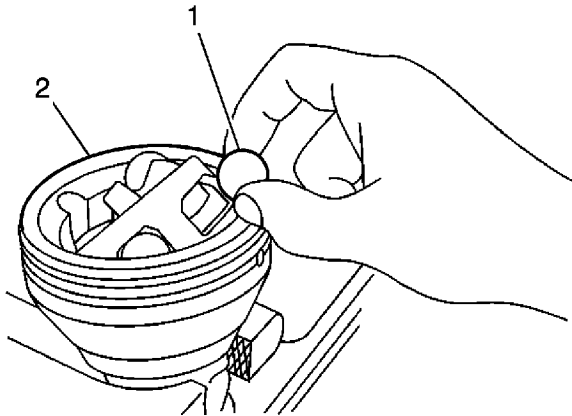




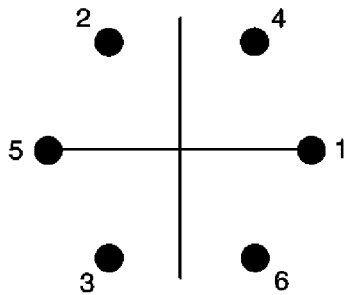
4. Install the outer CV joint assembly in a vise.

Important: The following procedure will have to be repeated until all the ball bearing are removed form the cage.

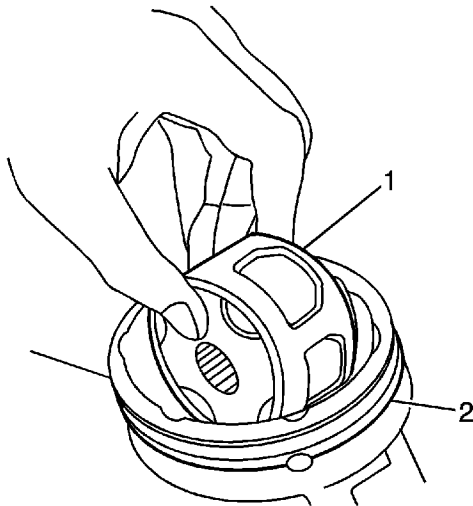
5. Using a brass drift (1), gentle tap the cage until the ball bearing can be removed from the cage.



6. Using a small screwdriver, remove the ball bearings from the CV joint.
7. Position the CV joint housing (2) so they are level.

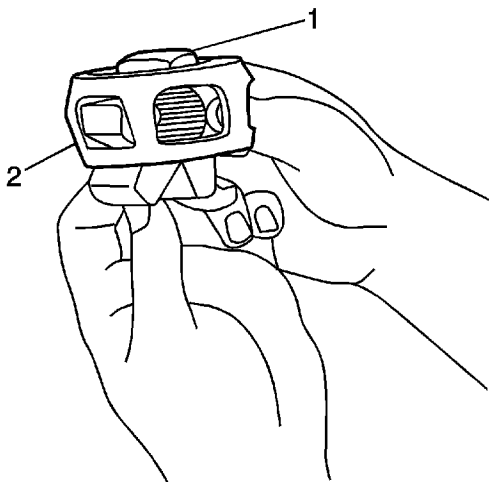


8. Remove the ball bearings from the CV joint in sequence.



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

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



12. Position the cage (2) and the inner race (1) so that the larger radius corners of the cage windows are up.
13. Rotate the inner race 90 degrees to the center line of the cage.
14. Align the lands of the inner race with the windows of the cage.
15. Move the inner race land into the cage window.
16. Rotate the inner race down and remove it from the cage.

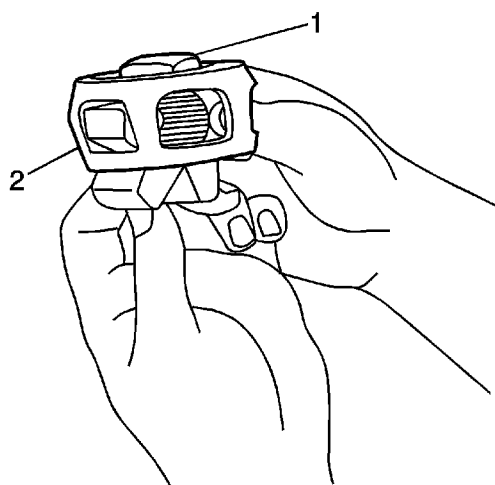
17. Clean the following items thoroughly with the proper cleaning solvent:

- The inner race
- The outer race
- The cage
- The ball bearings
- The exposed end of the wheel drive shaft

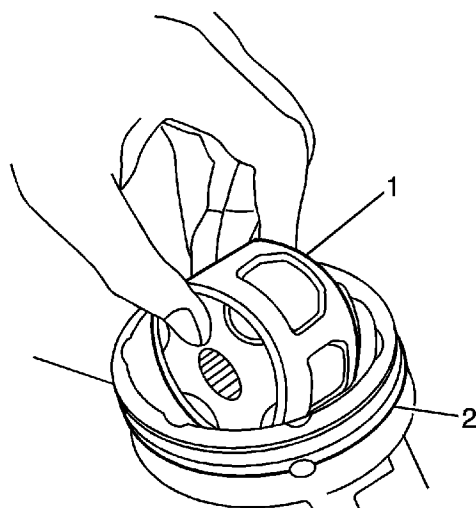
Important: The internal parts of the CV joint are NOT SERVICED separately. The outer CV joint is serviced as an assembly.

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

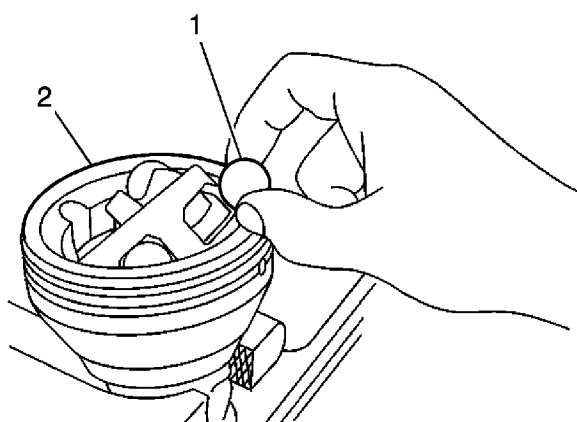
Assembly Procedure



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



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



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

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

Important: When performing the following procedure, the opposing cage window and the inner ball bearing track will be accessible for the ball bearing installation.

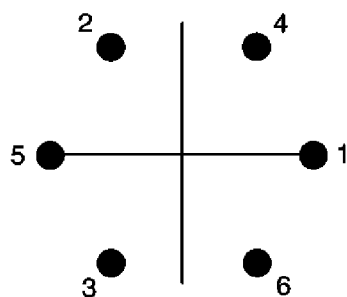
16. Press down on the cage following one of the outer race ball bearing tracks.
17. Install the ball bearing through the cage window onto the inner race ball bearing track.

Important: The following service procedure will have to be performed after each ball bearing has been installed.

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

Important: After the ball bearing has been installed, there should be NO GAP between the ball bearing and the inner race.

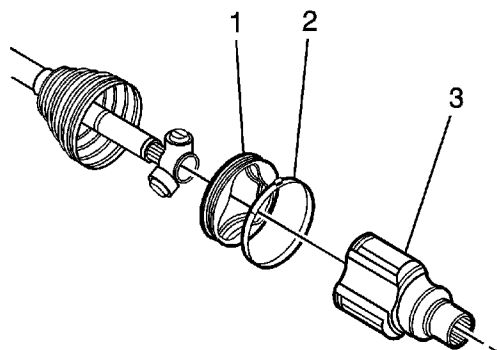
19. Position the cage and the inner race so that they are level.
20. Using a plastic hammer, lightly tap the ball bearing into place.



21. Install the ball bearings in sequence.
22. Repeat steps 18-20 until all the ball bearings are installed.
23. If any of the internal parts are found to be defective, replace the outer joint. Refer to [Wheel Drive Shaft Outer Joint and Boot Replacement](#).

Wheel Drive Shaft Inner Joint Inspection

Inspection Procedure



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