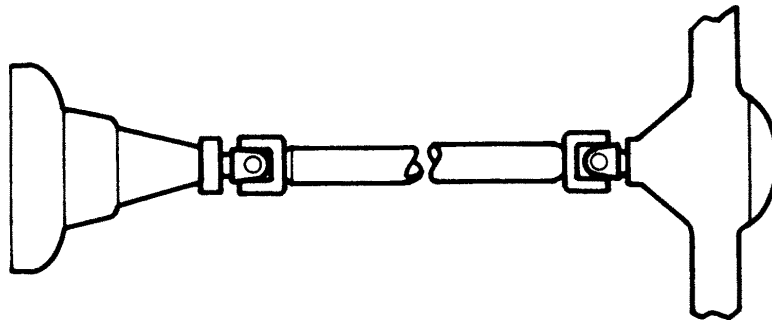




HOW - TO DRIVE-TRAIN SERVICE



Tool And Material Checklist

- | | |
|---|---|
| <input type="checkbox"/> Wheel Chocks | <input type="checkbox"/> Pipe Wrench |
| <input type="checkbox"/> Jack & Jack Stands | <input type="checkbox"/> Pry Bars |
| <input type="checkbox"/> Drain Pan | <input type="checkbox"/> Two or Three-Jaw Gear Puller |
| <input type="checkbox"/> Box Wrench | <input type="checkbox"/> Seal Driver |
| <input type="checkbox"/> Masking Tape | <input type="checkbox"/> Rear-End lube |
| <input type="checkbox"/> Bench Vise | <input type="checkbox"/> Transmission Fluid |
| <input type="checkbox"/> Grease | |
| <input type="checkbox"/> Inch-pound Torquing Wrench | |

** This How-To Guide is designed as a general overview of a vehicle repair procedure. You should always refer to a service manual designed for your vehicle for detailed instructions. Parts Plus assumes no liability for an incorrect procedure.*

In this booklet, two common drivetrain service procedures for rear-wheel-drive cars are discussed in detail. Although a number of drivetrain problems require professional service, both universal joint and pinion seal replacement can be handled by the willing do-it-yourselfer.

REPLACING A UNIVERSAL JOINT

After initial squeaking, the two main symptoms that indicate a universal joint might be worn are:

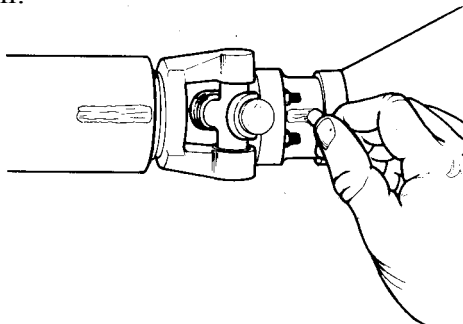
- A metallic knock when the car is put in gear
- A clunking noise when the accelerator is depressed and released at about 30 mph

To confirm that a joint is bad, grab the drive shaft and try to move it from side to side, then up and down. If you see any signs of looseness in the shaft and joint, the joint is worn and should be replaced.

REMOVING THE DRIVE SHAFT

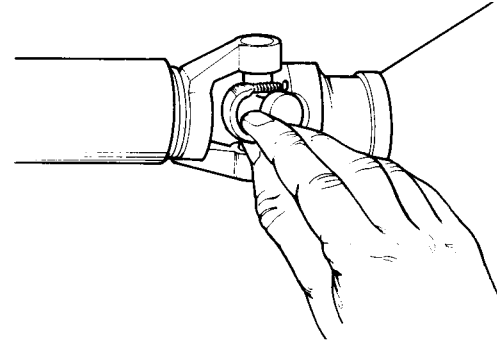
To replace a U-joint, the drive shaft must be removed first. To do this, proceed as follows:

1. Park the car on a level surface.
2. Place wheel chocks in front of the front tires.
3. Lift the rear of the car and place a pair of safety jack stands under the rear axle housing. Be sure that the stands are securely in place.
4. Place a drain pan under the transmission's rear seal.
5. Use chalk to mark the pinion flange location on the differential housing and the drive shaft. This will enable you to reinstall the shaft in the same position.



Use chalk to mark the pinion flange location.

6. Using a box wrench, remove the four bolts and retaining straps (or the two U-bolts) that secure the shaft to the pinion flange. To reach all the bolts, shift the transmission into neutral and rotate the shaft with your hands.



Removing the U-bolts

7. In some cases, the nuts are locked in place with metal tabs. These tabs must be pried away from the nuts before a wrench can be placed over them.

8. Use a large screwdriver to pry the U-joint away from the pinion flange.

9. Wrap masking tape around the U-joint to hold the bearing caps in place.

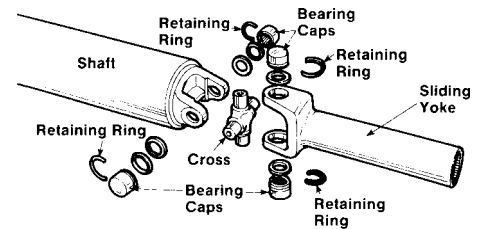
10. Pull the drive shaft straight back until the slip yoke on the front end of the drive shaft disengages from the transmission's output shaft.

REMOVING THE FRONT JOINT

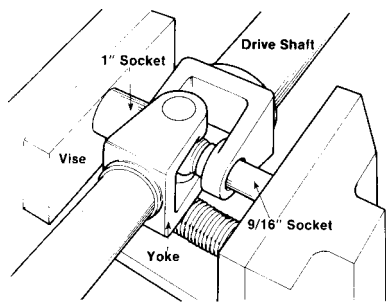
1. Clamp the slip yoke in a vise and support the other end of the drive shaft.

NOTE: Never clamp the drive shaft's tubing in a vise. This could distort the tubing and throw the drive shaft out of balance.

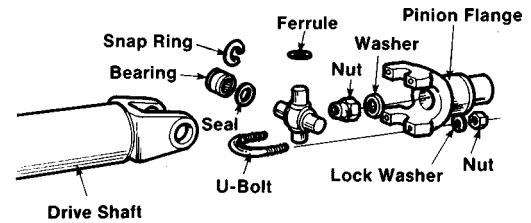
2. Remove the four retaining rings that hold the U-joint cross in the yoke and drive shaft ears. The rings can be located on either the inside or outside of the bearing caps.



Removing the four retaining rings



Removing the bearing caps



Rear joint assembly

INSTALLING THE NEW JOINT

Before installing the new joint, remove any burrs or rough spots from the inside of the holes in the yoke and drive shaft ears. Also, be sure to clean the retaining ring grooves so the rings seat properly.

1. Carefully remove all the bearing caps from the new U-joint.

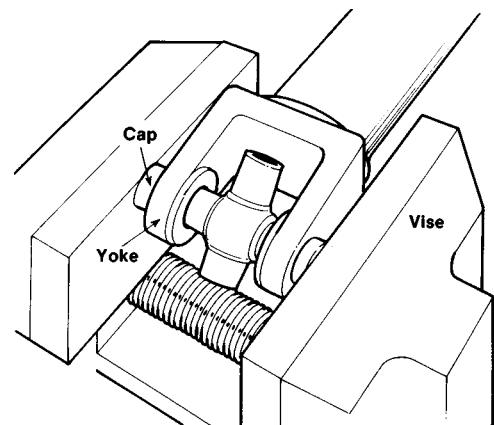
2. Put some grease inside each of the bearing caps to hold the needle bearings in place during the installation. If the needle bearings are knocked over inside the caps, you will not be able to install the new joint.

3. Position the new U-joint cross inside the slip yoke so that it extends out of one of the bearing holes in the yoke.

4. Start one new bearing cap on the U-joint cross and guide it into the yoke. Be sure the U-joint cross and bearing cap are not cocked to one side.

5. Carefully place the assembly in a vise. Use the vise to press the bearing cap partially into the yoke ear.

6. Remove the yoke from the vise.



Press the bearing cap partially into the yoke ear.

3. Some U-joint bearing caps have plastic retainers. To disassemble the U-joint, these retainers must be broken when the bearing caps are removed. This type of joint cannot be reassembled, so the entire assembly will have to be replaced.

4. Open the vise wide enough to accommodate the width of the drive shaft plus the length of a socket on either side of the drive shaft.

5. Find a socket that is wide enough for a bearing cap to slide into it (usually 1") and place it over one of the caps. On the opposite cap, place another socket that is small enough to slide into the drive shaft's bearing cap hole (usually 9/16").

6. Tighten the vise so that the 9/16" socket pushes the bearing cap on the opposite side into the 1" socket.

7. Loosen the vise and remove the sockets and the protruding bearing cap. If necessary, use vise grips.

8. Turn the drive shaft over in the vise and remove the opposite bearing cap in the same manner.

9. Remove the remaining bearing caps, then remove the U-joint cross from the slip yoke.

10. Inspect the old U-joint to see if one or more of the caps is loose or galling on the cross. If so, the needle bearings within have failed and must be replaced.

REMOVING THE REAR JOINT

The rear joint is removed in basically the same manner as the front joint. However, the cross U-joint is usually bolted directly to the pinion flange, so all you have to do is press the joint out of the drive shaft.

7. Push the U-joint cross so that it protrudes from the other side of the yoke.

8. Install a bearing cap over the protruding U-joint cross.

9. Place the assembly in the vise and tighten the jaws so that the bearing caps are pressed into the slip yoke. To ensure that the U-joint cross moves freely in the bearings, turn it as you tighten the jaws. If any resistance is encountered, stop tightening the vise and check to see if the needle rollers have tipped under the end of the U-joint cross.

10. Install the new retaining rings. To do this, bearing caps might have to be pressed in further. Place a 9/16" socket on each cap; press until one retainer groove appears above the bearing cap or inside the yoke. Install the retainer ring, and then remove the socket on the side where the ring was installed. Continue to press until the opposite ring can be snapped into place.

11. Install the U-joint cross in the drive shaft ears in the manner described above.

INSTALLING THE DRIVE SHAFT

1. Slide the slip yoke into the transmission output shaft splines, pushing forward on the shaft until the yoke is seated firmly.

2. At the rear of the car, line up the chalk marks on the drive shaft and pinion flange.

3. Connect the rear U-joint to the pinion flange yoke. Be sure that the bearing caps are fully seated in the pinion flange.

4. Install the U-bolts or retaining straps. Use a box wrench to tighten the retaining nuts or bolts.

5. Remove the safety jack stands and lower the car.

REPLACING A PINION SEAL

The pinion seal of a rear-drive car encircles the pinion shaft. If it is defective, gear lube will leak from the front of the differential.

REMOVING THE OLD SEAL

1. Park the car on a level surface and place wheel chocks in front of the front tires.

2. Lift the rear of the car and place a pair of safety jack stands under the rear axle housing. Be sure that the stands are securely in place.

3. Place a drain pan under the transmission slip yoke seal.

4. Use chalk to mark the drive shaft, the pinion flange, and the end of the pinion stem to which the pinion flange is attached. This will ensure that the drive shaft and flange can be reinstalled in the same position.

5. Use a box wrench to remove the four bolts and retaining straps (or the two U-bolts) that secure the shaft to the pinion flange. To reach all the bolts, shift the transmission into neutral and rotate the shaft with your hands.

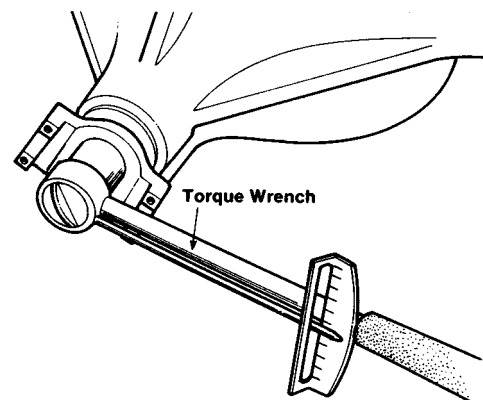
6. In some cases, the nuts are locked in place with metal tabs. These tabs must be pried away from the nuts before a wrench can be placed over them.

7. Use a large screwdriver to pry the U-joint away from the pinion flange.

8. Tie the drive shaft to the exhaust pipe or chassis.

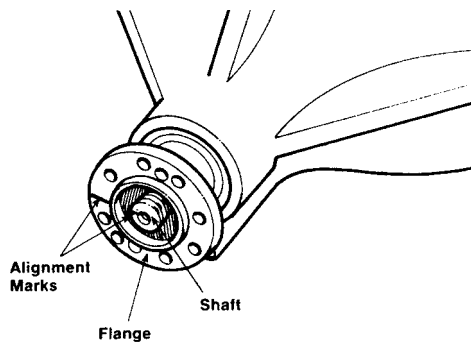
9. Wrap masking tape around the U-joint to hold the bearing caps in place.

10. Remove the rear wheels and brake drums to determine how much the pinion bearing is pre-loaded. You must know this to reassemble the unit.



Determining the extent of the pinion bearing preload

INSTALLING THE NEW SEAL



Mark the pinion flange and pinion shaft.

11. Using an inch-pound torque wrench, turn the pinion shaft nut. Record how much force is needed through several complete rotations.

12. Hold the pinion flange with a large pipe wrench so that it won't turn; then remove the pinion flange nut. On some cars the pinion flange can be held in place by screwing a couple of bolts into the companion flange and wedging a pry bar between them.

13. Clean the area around the pinion flange and seal.

14. Place a drain pan under the flange.

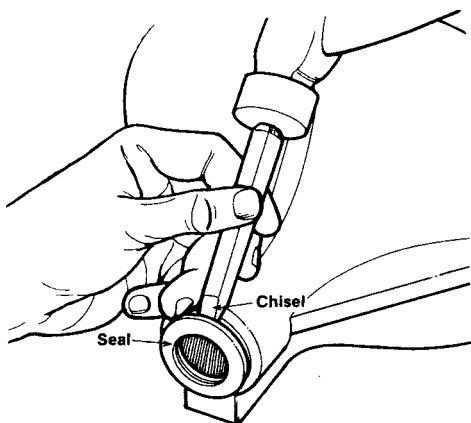
15. Use chalk to mark the pinion flange and pinion shaft in relation to one another.

16. Remove the pinion flange using a two-jaw gear puller.

17. Check the pinion flange for a seal groove, nicks, or other marks. If the seal surface is damaged, the pinion flange must be replaced; otherwise, the new seal will leak.

18. Use a small pry bar or a blunt chisel to remove the seal from the carrier.

19. Remove any burrs from around the carrier bore to prevent leaks around the seal.



Removing the seal from the carrier

To install the new seal, use a driver with a diameter that matches that of the seal. Although there are special tools available for installing seals, a smooth piece of pipe backed by a piece of wood can be used in most instances.

1. Apply a small amount of rear-end lube to the pinion-flange area and splines.

2. Use the alignment marks on the pinion shaft and flange to install the flange in its original position.

3. Install a new nut on the pinion shaft and tighten it while holding the pinion flange. Occasionally rotate the pinion while tightening the nut and take frequent preload readings, turning the pinion nut and shaft with the inch-pound torque wrench.

NOTE: If the torque readings vary during a complete revolution, something is binding and must be corrected.

4. Stop tightening the nut and taking readings when the recommended preload reading for your vehicle is obtained. It is important to keep in mind that you cannot reduce preload by backing off the pinion nut. If the desired preload is exceeded, a specialist will have to finish the job.

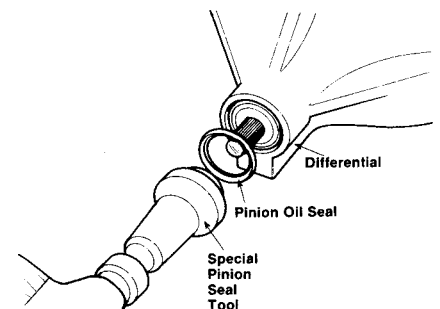
5. To reinstall the drive shaft, line up the chalk marks on the drive shaft and the pinion flange.

6. Connect the rear U-joint to the pinion flange yoke. Be sure that the bearing caps are completely seated in the pinion flange.

7. Install the U-bolts or retaining straps. Use a box wrench to tighten the retaining nuts or bolts securely.

8. Remove the safety jack stands and lower the car.

9. Add lubricant to the differential to bring it to the proper level. If necessary, add transmission fluid.



Installing the new seal