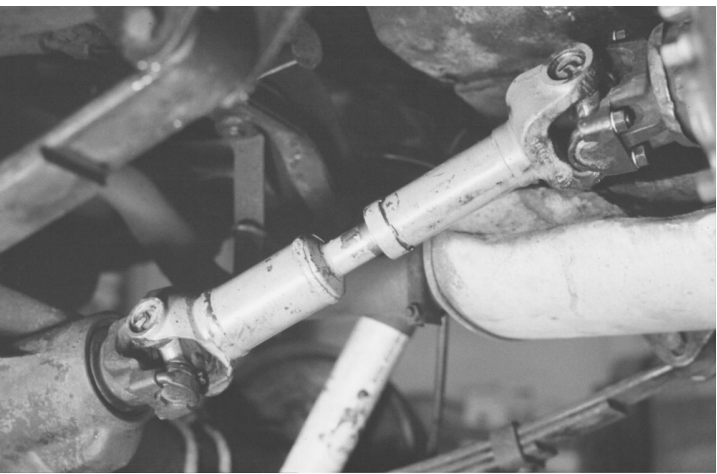


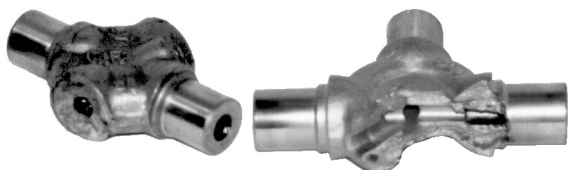
# Drive Shaft Maintenance



It is important to make sure that the drive shaft in your vehicle is in sound working order. This is for your own safety and comfort, as well as for the safety of the guy following you (at a nice safe distance of 15 feet) down the freeway at 70 MPH. It certainly is no fun to have your weekend outing or the trip to the corner market interrupted with a drive shaft failure that can be an inconvenience at best or deadly at worst!

Drive shaft and U-joint failures can be attributed to one, or a combination of a few limited factors. Those factors are maintenance, driver abuse, external damage, Improper installation, poor drive line geometry, or quality and strength of components.

number one killer of drive shafts. Unfortunately for us, most domestic stock drive shafts have little or no provision for lubrication. The vehicle manufacturers are saving a couple of bucks per vehicle by not putting grease fittings on the wearing components. Because of this, there is not much that can be done to prevent a stock drive shaft from wearing out. We can give the drive shaft a quick visual checkup to ensure our safety, though. It doesn't take much time and will never hurt to check things out any time you're under the vehicle.



**Broken U-Joints**

Inspection of the drive shaft will require the vehicle's transmission or transfer case to be placed into neutral. Be sure to set the parking brake. This is important because if there is any pressure on the drive shaft, you will not be able to detect the minimal clearances that will be the first indicators of an impending problem.

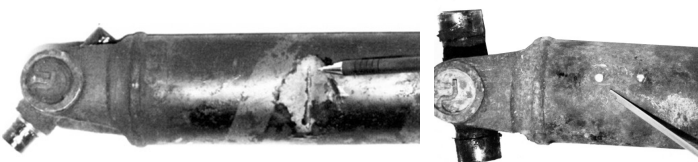


Try twisting each of the yokes that attach to the U joint in opposite directions and attempt to move them side to side, checking for movement independent of the U joints. If you have any detectable play, in any direction, you have too much.

Check the slip yoke & spline stub for excessive lateral play. A general recommendation is to allow no more than .007". If you have a dial indicator and a vice, this is an easy at-home check to perform. The wear pattern left by the dust cap of the slip yoke on the spline stub will usually be a good indicator of whether the shaft is running in the proper position and the extent of travel from compression to extension.

Many times you can have a U joint that is beginning to seize up and you'll not be able to observe any play in the joint. When this happens, you may be able to see a rusty oxidization on the U joint around the bearing cap seals. You might also be able to hear a squeaking noise while driving the vehicle that will start out slow and cycle faster as the vehicle moves faster. The squeaking may also disappear at a high speed. Check to make sure the U bolts or strap and bolts are tight. Look also to see that the bearing caps have retained a tight fit into their respective yokes on the drive shaft. A cap that has lost its press fit will typically have a clean, polished area on the end from spinning in the bore of the yoke.

This is also a good time to look for things like a dented or twisted tube, missing balance weights, crud on the drive shaft and anything else that could cause a vibration problem.



Now, you'll want to check the attaching yokes. Are they securely attached to the transfer case or differential? Often, the nut on either of these yokes will begin to back off. If this is the case, you will be able to see the yoke move independently of the output shaft or the pinion shaft. Be careful in your diagnosis here, though, as the symptoms may be a result of bearing wear. To arbitrarily tighten the nut will usually accelerate the failure of a worn bearing. If you discover the yoke is loose, it may be a good time to drain the gearbox for a thorough inspection of the oil to look for excessive metal contamination. In the event of a

If you are lucky enough to have grease fittings in your U joints, use them! You should grease until you see clean grease coming out of all four of the seals on the Universal joint. It is an urban myth that this purging will damage the seal. They are designed to purge. I recommend that you do this every time you change your oil and when you get back from that wet, muddy four-wheeling adventure. You'll be flushing the water and grit out of the bearings.

Other than that, there may be a grease fitting on the slip yoke (female sliding component) of the drive shaft. The slip yoke and spline stub are a couple of the more expensive components in a drive shaft. We don't believe that you can ever grease it too much (the EPA may disagree) and grease is a lot cheaper than finish-machined steel parts.

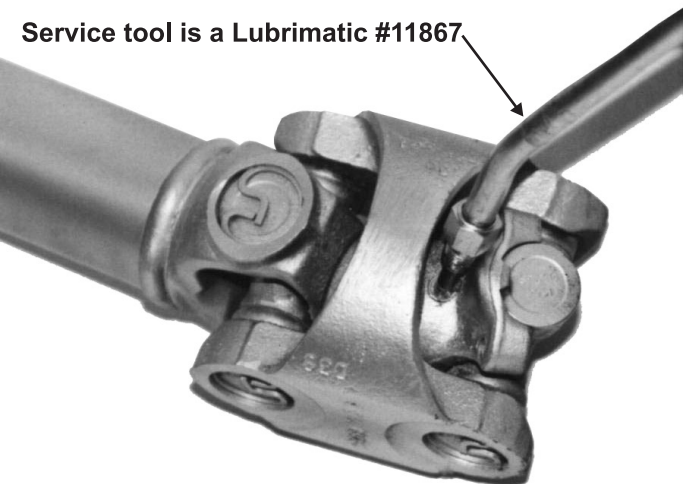
Proper greasing of the slip yoke will depend on the location of the grease fitting. On most older applications, the grease fitting is in the body of the slip yoke near the area that accepts the U joint. On many newer applications or reworked drive shafts, the grease fitting is in the dust cap at the end opposite the U joint (on either type of slip yoke you will find a relief hole in a plug that is in the end of the yoke under the U joint).



With the first type you need to put your finger over this hole and pump grease until you see clean grease coming out past the dust cap on the opposite end. Unless you do this, grease will simply fill the cavity in the slip yoke that is not filled with the spline stub and any excess will come out of the relief hole. With the second type, pump grease until you see clean grease coming out this relief hole. The object here is to make sure that clean grease will completely coat the wearing areas of the slip yoke and spline stub.

is especially important on the front drive shaft. That is because every time you hit a bump in the road, your drive shaft will compress and extend. This is a lot like a sawing motion. On your rear shaft the drive shaft is always turning and circulating the grease around. But on the front shaft, because it is seldom used at high speed, this sawing motion will wipe out the grease film, allowing for metal to metal contact and accelerated wear as compared to the rear shaft. Many people complain to drive line shops of the short life of their front drive shaft even though they "hardly ever use four-wheel drive."

Hardly ever using four-wheel drive is, in fact, a big part of the problem. We suggest that you periodically engage the front hubs or put the transfer case into four-wheel drive mode without the hubs engaged and drive for about 30 minutes at a relatively high speed. By doing this on a regular basis, you should also be able to notice any problems that may be in their infancy on the front shaft.



On a Spicer type of C.V. drive shaft, there will usually be a flush type grease fitting for lubrication of the center pivot point. The problem is, when the C.V. is opened where it would be accessible, this fitting is at the top of the shaft where you can't see it. If you turn the shaft until the fitting is at the bottom, the knuckle closes up and you can't get to it. The only viable solution I know of is to disconnect the drive shaft at the transfer case end, drop it down and grease it then. This should be done at least twice a year.

Of course, most of us use our vehicles for much more than the occasional trip to the ski lodge. We continually build problems into our vehicle while trying to improve its performance in other areas. Taller tires, differential changes, higher horsepower engines, suspension lifts and transmission swaps will all effect the life of the U joints and drive shaft. With many of these modifications, there is no "factory approved" solution.

Suspension lifts are probably the single biggest factor in unacceptable drive shaft and U joint life or performance. Most lift kits only address the issue of elevation. The truth is, most suspension lifts adversely effect proper drive line geometry especially on short wheelbase vehicles. We need that lift, though, to upgrade our suspension and to get the clearance required to accommodate taller tires. Please refer to geometry 101 To insure that your drive train is properly designed around allowable parameters.