

# Driveshaft inspection

Driveshafts and constant velocity (CV) joints are bespoke components for which high quality, proper installation and handling is critical. They transfer torque from the differential or gearbox to the wheels and are constantly subjected to extremely high stresses. GKN gives some tips about driveline removal and installation, along with a refresher on best practices.

Age-related wear is among the most commonly occurring cause of damage to the outboard (wheel side) and inboard (transmission side) joints, closely followed by damage resulting from defective boots, the use of inferior quality grease, and unfortunately, improper handling frequently occurring during installation and removal. Since it is inherently difficult for customers to identify problems with driveshafts or to describe these problems accurately. Mechanics have much to gain in terms of maximizing customer satisfaction by recognizing damage to the driveshaft early on and informing the customer. However, how can damage to driveshafts and CV joints be detected with certainty and without error?

## Test drive

While cornering pay attention to noises. Clicking or knocking when cornering is caused by the drifting of the balls over a pit worn in the joint. Grinding noises may be the result of excessive rotational play between the joint and the shaft. Pay attention to vibrations in the steering wheel. Vibrations that intensify with increasing speed can be caused by excessive play in the joints or by a bent or damaged shaft.

## Inspection

Driveshaft inspection should be performed as part of a regular maintenance routine. Normal vehicle maintenance and recognition of component deficiencies is necessary to prevent serious mechanical problems, as well as driver discomfort. Failure to perform normal maintenance may also void the vehicle warranty.

## Routine inspection - driveshaft installed

- Check the driveshaft for a tight fit at each end.
- Check cleanliness of the driveshaft, CV joint and boots. Grease contamination is a clear sign of a problem.
- Check the shaft for damage and for bent or missing parts.
- Check the boots and clamps: torn, slipped and porous boots are the most frequent cause of failures
- Check the slip spline for excessive radial movement
- Check the joints for excessive radial movement
- Check the joints in all possible steering angles

## Routine inspection - driveshaft removed

Proper fault recognition can only be complete if the

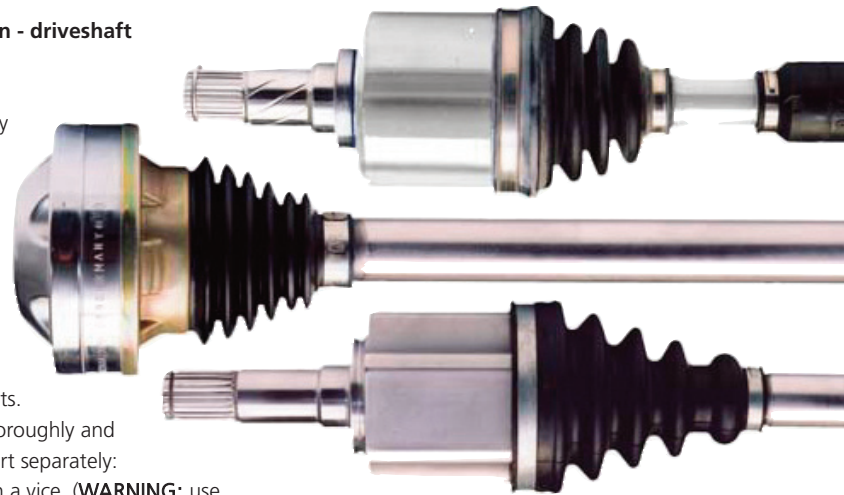
driveshaft is checked while off the vehicle.

- Dismount both driveshafts and joints.
- Clean all parts thoroughly and then check each part separately:
- Place driveshaft in a vice. (**WARNING:** use aluminium or soft jaws only! Steel jaws will cause damage to the shaft)
- Both joints must rotate smoothly without any binding and must not have excess radial movement.

Fault recognition can only be complete if the driveshaft is checked while off the vehicle. Dismount both driveshaft and joints. Clean all parts thoroughly and then check each part separately.

## Driveshaft removal

- Raise the car on a lift up to working level and remove the wheel.
- Apply the brakes and unscrew the bolts from the differential side joint if present.
- Remove drive shaft nut, loosen the wheel carrier and pull the driveshaft out of the wheel hub. If required, use special tools recommended by the car manufacturer.
- Pull out driveshaft. Clean wheel hub housing and differential flange surface. For driveshafts with integrated transmission journal, pull the driveshaft with reinforcing rod out of the gearbox housing. Some oil may drain when the driveshaft is removed.
- Avoid overstretching the plunging joint by leaving the shaft hanging down while still fixed to the gearbox housing. This may cause extreme pressure on the ball cage in the CV joint, which is likely to cause a break or damage.



## Driveshaft installation

- Clean wheel hub housing and differential flange surfaces. Surfaces must be free of dirt.
- Centre the joint on the differential flange and fit/fix into place. Driveshafts with reinforcing rods must be inserted in gearbox housing until they lock. For gearboxes with a lock ring on the spline, the lock ring has to be fully engaged. Use any special feed tools recommended by the car manufacturer. Comply with the indicated tightening torques and sequence specified by the car manufacturer.
- Insert driveshaft into wheel hub. Always remember to use all new parts provided. Use any special tools recommended by the car manufacturer as required.
- Tighten the wheel carrier. Use new bolts and tighten to the manufacturers specification. Consider any security measures used by the manufacturer, such as shear pins, etc.
- Check the driveshaft after installation by pulling the joint. and driveshaft.
- Apply washer on outer end of the CV joint. Apply and torque driveshaft nut according to specifications of the car manufacturer. Only a new nut should be used! Never re-use the old nut.
- Mount the wheel and test drive the vehicle.

