

Drive shaft

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Function

The function of the drive shaft is to transfer the engine torque from the gearbox or differential to the wheels. It must also compensate for all variations in angle or length resulting from manoeuvring and deflection for perfect synchronisation between joints.



Drive shafts for cars with front wheel drive consist of the outboard fixed joint, the inboard constant velocity joint and the connecting shaft. They also include elements such as the anti-lock system ring and the torsion damper. The basic design of the outboard fixed ball joint, the constant velocity joint, dates from the 1930s.

In most cases the inboard CVJ takes the form of a slip joint to allow the drive shaft to follow the movements of the wheel suspension. At the front axle (leading axle) the outboard joint must transfer the torque effectively through a large angle (up to 52 degrees). At the rear axle the angles of the outboard joints are considerably smaller.

Constant velocity drive shafts are exposed to maximum stress all the time that the vehicle is in operation. Alongside the extremely significant displacement angles and translational movement, the joints and bellows must be able to withstand temperatures of between minus 40 and plus 120 °C as well as speeds of up to 2800 rpm. In order to transmit the required torque in all engine speed and velocity ranges with reliable constancy (ideally throughout the entire service life of the vehicle), all components must be maintenance-free.

Safety

Drive shafts and constant velocity joints are components of modern cars, which demand maximum

safety.

Most problems with the drive shaft manifest themselves in the form of knocking noises when driving round tight corners, accelerating, or when the suspension is being compressed and extended. To avoid putting the safety of the vehicle at risk, make an appointment with a specialist garage if any of these symptoms occur. Specialists can be relied upon to detect damage to the drive shaft and provide the necessary assistance in good time.

Causes of damage

Wear over time is one of the most frequent causes of damage to outboard and inboard joints. Damage can also be caused by faulty sleeves, by use of low-quality grease and in many cases by not following the correct procedures for installation and removal.

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Environmental protection

Both brand new replacement drive shafts for passenger vehicles and professionally reconditioned drive shafts are available on the market. When used drive shafts (most of which will have been damaged) are reconditioned, the old parts are taken back from vehicle garages for professional recycling in special production plants in accordance with the standards set for original equipment.

As part of this process, all usable steel parts are reused. The old shafts are inspected, taken apart, cleaned, remachined and then put back together for the car repairs market. Other materials resulting from the reconditioning process (old grease, metal chips or worn steel parts, for example) are disposed of in the correct and proper way in accordance with applicable environmental guidelines. Recycling significantly reduces the consumption of both raw materials and energy and makes a significant contribution to active protection of the environment.

Depreciation

To maximise their service lives, drive shafts must be inspected regularly at a specialist garage. Such inspections are carried out as part of the regular service checks prescribed by vehicle manufacturers. Another good time to check the condition of drive shafts is when switching from summer to winter tyres or vice versa.

Damaged sleeves

The specialist checks that the drive shaft is seated firmly and is clean and that the sleeves are in good order. Damaged sleeves must be replaced immediately to prevent damage to the joint caused by dirt penetration or grease escaping. If sleeves are loose or worn, there is a risk that dirt or moisture will already have penetrated into the joint. If in doubt, both the damaged sleeve and the entire joint should be replaced for safety reasons.

TPE sleeve

Most joint sleeves on newer vehicles are made from TPE. As a general rule: A TPE sleeve must not be replaced with a rubber sleeve. The relevant specification must also be complied with when topping up with grease. High-performance greases are able to withstand temperatures up to 160 °C for short periods; standard joint lubricants are designed to withstand only 110 °C for short periods. Use of a standard grease in a high-performance application can cause gas evolution from the grease and ultimately lead to the total failure of the joint.

Bilder



Drive shaft

Hersteller



NTN SNR



GKN_EN



Herth+Buss



SKF_EN

Quelle: <http://www.my-cardictionary.com/drive-train/drive-shaft.html>