

Flexible Discs for propeller shafts

The reduction in noise, vibration and harshness play a big part in vehicle design. Ironing out squeaks, rattles and vibrations throughout the vehicle, to increase driver and passenger comfort and to reduce stress on the vehicles components. This includes the vehicles drive train. Vehicles equipped with a rear wheel drive or four wheel drive train, transmit power from the engine through the transmission to the axles with a prop-shaft. During its operation this will alter in angle relative to the gearbox and final drive due to changes in the road surface that deflect the vehicles suspension system as it rotates. Unless a universal joint is fitted to each end of the prop-shaft the shaft will bend and fracture. (fig.1)



Figure 1

One solution is the flexible disc prop-shaft coupling (also known as a universal joint or giubo or giubo). It is a reinforced flexible rubber disc that connects the transmission output flange to the prop-shaft input flange, and in some designs due to high torsional demands another flexible rubber disc is fitted to the prop-shaft output flange that connects to the final drive flange. The flexible disc absorbs drive train vibration and backlash. All of the engine's torque must be transmitted through the flexible disc before it can run through the drive shaft, differentials axles and finally to the wheels. This design of a flexible coupling joint absorbs impact and shock forces to reduce drivetrain disturbances and prevent angular misalignment. This greatly reduces noise, vibration and harshness from the drive train.

The flexible disc endures a tough life, therefore it should be due be inspected during regular service intervals. If any deterioration of the flexible disc is noticed this could result in some common symptoms that include driveline vibration, which may increase in intensity under acceleration and/or drive-line thumping. On inspection, it should be checked for cracks, tears, missing pieces, or distortion of the flexible disc. Any cracking or bulging indicates a failing flexible disc and a replacement should be planned. When replacing any flexible disc, and especially one that has been driven to the point of destruction, you should inspect the prop-shaft centering guide bush, mating surfaces and the bolt hole bores and threads. If any of these are worn the shaft may still vibrate after replacing a new flexible disc. In view of a replacement of a failing prop-shaft coupling the design and construction of the replacement part needs to be considered.



A prop-shaft flexible disc is constructed of cord reinforced rubber with metal inserts for the retaining bolts to go through from either side of the mating flanges to create a very strong and flexible joint. The properties of this component must have good damping of torque peaks in the drivetrain and compensation of radial, axial and angular misalignment.

The benefits of this are stiffness that can be compensated in all directions and are resistant to shock-type stresses to give a long service life. (Fig.2)

A sectional view of a febi bilstein flexible disc shows a very high number of cords and consistent reinforcement in order to withstand the torsional stresses that this component has to endure. (Fig.3, 4, 5)



Figure 2

Sectional view of the cord reinforced rubber coupling, viewed on the drive section. It shows the compressed cord packages centred and aligned, making this a very strong and durable coupling. Section view of the cord reinforced rubber coupling, view on the overrun section. Sectional views from a competitor's product, showing very little cord reinforcement and inconsistent alignment, this would lead to a very short service life and the non-control of the high torsional stresses required of this component.(Fig.6, 7)

When replacing the flexible disc or discs (subject to vehicle application), they may have a marked alignment or have direction markings, please ensure correct fitment to ensure correct operation of the disc. It is also recommended that



Figure 3



Figure 4



Figure 5

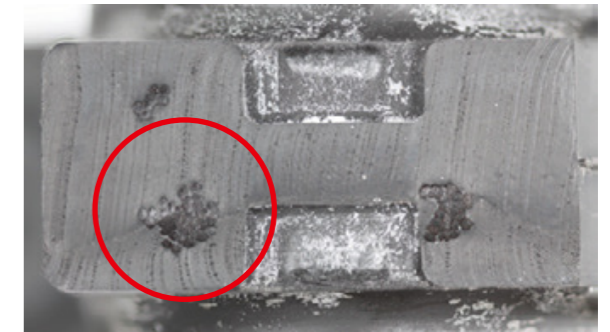


Figure 6

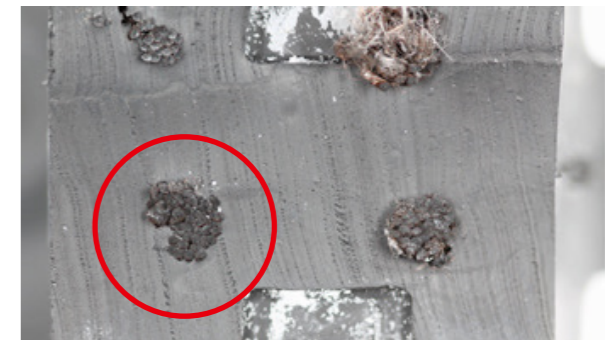


Figure 7

the fixing bolts are replaced subject to manufacturer's recommendation. Ensure all bolts are correctly tightened to the vehicle manufacturer's specification.

All febi flexible discs are manufactured by O.E. supplier SGF the global market leader in the automotive sector ensuring maximum reliability, comfort and first-time fit.

Rely on tested, OE-matching quality replacement parts from febi. The entire range of replacement flexible discs can be found at partsfinder.bilsteingroup.com.

The febi brand is part of the bilstein group, the umbrella organisation for several other strong brands. Further information is available at www.bilsteingroup.com.