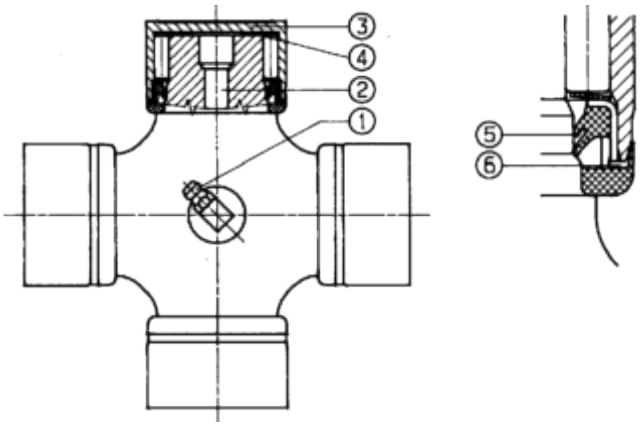
Maintenance of Propeller Shafts and Double Jointed Shafts

Propeller shafts are supplied maintenance-free or suitable for lubrication.

In the lubrication design (Fig. 5), the four bearings of a joint are lubricated via a tapered lubricating nipple to DIN 7 3 412 in the center of the joint. In special designs, the lubricating nipple may be placed on the base of the bearing bush.

The lubricating nipples must be cleaned before lubricating.

Fig.5:



The grease is forced into the distribution channel 2 via the tapered lubricating nipple 1 and transferred to the universal joint bushes. The grease penetrates between the roller bodies via the channels 3 of the pressure plate and edge 4 of the universal joint pin. When further grease is added, the grease penetrates through the valve-like opening gap of the seal lips 5 and the labyrinth. Excess grease emerges from gap 6 of the labyrinth.

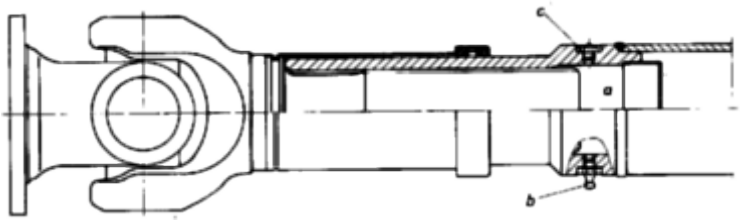
Apply lubrication until grease is exuded from all four bearing bushes.

⚠If it is not possible to lubricate all four bearings fully, the shaft must be dismantled.

In standard designs, the length extension is maintenance-free as shown in the drawings in the table part.

For special lubrication designs, the sliding profile (Fig. 6) is greased from a storage chamber (a) which is filled via pressure lubricating head (b). The storage chamber (a) should preferably be lubricated with the shaft retracted (vehicle loaded) so that an air cushion can form when the shaft is extended. To prevent damage to the cardan shaft or bearings of attached assemblies due to incorrect excess greasing (a) when the springs are compressed, if requested an excess pressure valve (c) can be installed which prevents an unacceptable pressure rise in this chamber.

Fig. 6:



2.1. Lubrication Intervals

Unless specified particularly by the vehicle or system manufacturer, we recommend the following maintenance intervals. The data in the tables refers to European and comparable conditions.

Other operating conditions may require lubrication at shorter intervals. If propeller shafts are cleaned with pressurized water or vapour jets, lubrication must be applied after every cleaning.

Lubricating Interval for Joints

Usage	Lubricating Interval
Goods vehicles in long distance	Every 50.000 km or max after 1 year
Goods vehicles in mixed road and private land use, urban traffic and similar vehicles	Every 25.000 km or max after 6 months
Buses on long distance routes	Every 50.000 km or max after 6 months
Buses in urban use	Every 25.000 km or max after 3 months
Goods vehicles in site use community service vehicles building machines crane vehicles forestry and agricultural tractors military vehicles * and similar vehicles	Every 12.500 km or max after 3 months
Industrial plant	Every month but at the latest after 500 operating hours

* After travelling through water, shorter lubricating intervals are required.

Lubricating Intervals for sliding joints and centre bearing assemblies

The sliding joints and centre bearing assemblies are maintenance-free as standard.

For versions intended to the lubricated by the manufacturer, the same lubrication intervals apply as for universal joints.

2.2 Lubricating Grease

The recommended lubricants are lithium complex greased with a consistency to NLGI-class 2 to DIN 51818.

In particular we recommend the products listed in our leaflet TM 150.

⚠It must be ensured that greases with a different type of saponification are never used, because lithium and sodium greased for example are incompatible.

KLEIN-propeller shafts in normal design are suitable for operating use at ambient temperatures from -35°C to +60°C (for short periods and only occasionally, up to +80°C).

⚠If Propeller shafts are to be used outside this temperature range or in ambient conditions deviating from the norm, please contact us.

2.3 Checking intervals

So long the vehicle and trailer manufacturer does not specify otherwise, we recommend the control of several factors. We have two classifications for checks “built-in” and “built-out”.

The given data in the table are mainly for the European market.

Control interval for commercial vehicles

Vehicle use	Control by “built-in“ state	Control by “built-out“ state
Commercial		
Long distance or similar	every **100.000 km** or max. after **1 year**	every **500.000 km** or max. after **5 years**
Mixed street and country, city or similar	every **50.000 km** or max. after **1 year**	every **300.000 km** or max. after **5 years**
Building site, urban, building machine, crane, forestry or countryside hauler , Military vehicle or similar	every **25.000 km** or max. after **1/2 year**	every **100.000 km** or max. after **2 years**

Bus

Long distance	every **100.000 km** or max. after **1 year**	every **300.000 km** or max. after **3 years**
City	every **50.000 km** or max. after **1/2 year**	every **200.000 km** or max. after **2 years**

Checking “built-in” state

By this “built-in” state we recommend the following checks:

- check the tightness and position of the bolts between the flange and intermediate bearing. It could be that the screws require tightening with a torque wrench according to the vehicle or trailer manufacturer.

- check the balance plates are attached and in good condition.

- check that all circ-clips are present for each of the bearing cups.

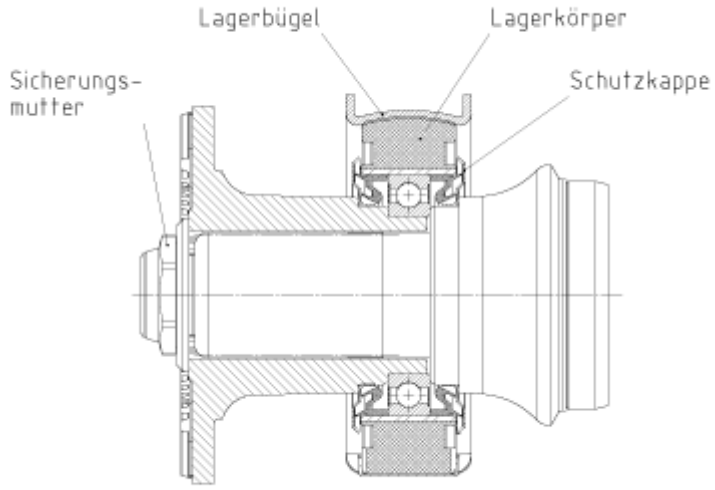
- check that the grease nipples are present and in good condition on all universal joints.

- check the bearing cups for colour or form changes that may indicate extreme temperature.

- check the seals from the bearing cup and sliding assembly. Damaged seals lead to component failure.

- check for wear and damage of the rilsan protected profile parts of the sliding assembly.

- check the position and condition of the centre bearing on intermediate shafts and long shafts, in particular the protection cap, seals, bearing bracket and bearing body. Movement in an axial position between the components may be due to the safety nut becoming loose. Control in „built-out“ state



required.

- visual control for any type of possible damage i.e. cracks, deformation, eccentricity, paint damaged etc.

- test for play of parts

- The measurement dial is attached in the same way as in the built-out state but this time it is held in place by hand.

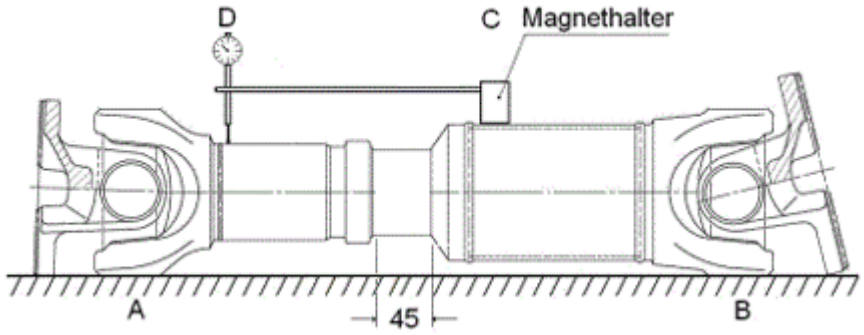
Checking “built-out” state:
All checks for the „built-in“ state should also be carried out.

Checking “built-out” state

All checks for the „built-in“ state should also be carried out.

We also recommend that the following is controlled:

- bending and any play of the shaft should measured in both directions.
- grease all bearing cups until the grease starts to protrude out the seals. If this doesn’t happen or there is rust, dirt or water in the bearing then it should be repaired by an authorised mechanic’s workshop. Grease according to 2.2
- controlling the play and sliding assembly.



The propeller shaft should be pulled out by ca. 45 mm and placed on the two fork sockets „A“ & „B“ as shown on the sketch above. The measuring dial holder is fixed in place on the tube next to the weld at point “C”. The measuring dials directly position next to the weld at point “D”

The propeller shaft is then raise in the middle until is hangs freely. The dial will then now measure any play in the shaft, 0.25 mm is allowed.

- when fully pulled out the shaft should be visually checked for any damage on the inner and outer profile.
- check the seals are not damaged. Dirt and old grease should be removed.

If the sliding assembly is failure free it must be freshly greased. We recommend "Fuchs Renolit Duraplex EP3". The shaft can then be reassembled, VERY IMPORTMANT!! .. make sure the two arrow markings are aligned.

- the joint should be controlled on the intermediate shaft in the same way a with the propeller shaft
- the intermediate bearing should be controlled for damage of the rubber body and the bearing ring should be checked that it is secure.
- The safety rings should be tested that they have at least the following screwing torque:

M24x1,5: > 250 Nm
M40x1,5: > 350 Nm
M55x1,5: > 380 Nm

Should any damage be found to the parts then take them to an authorised mechanics workshop.

The vehicle or assembly must be immediately turned off if there are any strange sounds or vibrations this also goes for anything uncommon with the normal running.

Before building in the new shaft, it should be balanced and assembled according to our recommendations (See point 1.2). Before using a newly built in shaft make sure you follow all of the „built-in“ checks.

If there is some form of elastic deformation to the shaft then this cannot be repaired, it must be replaced.

We would also recommend that a complete “built-out” check is performed if the vehicle changes owners as well as checked that the vehicle is accident free.