

SECTION G

THE PROPELLER SHAFT

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GENERAL DESCRIPTION

The propeller shaft and universal joints are of the Hardy Spicer type with needle roller bearings.

A single shaft connects the rear axle and the gearbox.

To accommodate fore and aft movement of the axle, the shaft is provided with a splined sliding joint at the front end. Each universal joint consists of a centre spider, four needle roller bearing assemblies, and two yokes.

Section G.1

ATTENTION TO UNIVERSAL JOINTS

The propeller shaft has a lubricator fitted to the front and rear spiders which should be given three or four strokes with the grease gun every 1,000 miles (1600 km.). The correct lubricant is grease to Ref. D (page P.2).

If a large amount of grease exudes from the oil seal the joint should be dismantled and new oil seals fitted.

A lubricator is also provided on the sleeve yoke for the lubrication of the splines of the sliding joint. Lubrication in service is with grease to Ref. D (page P.2) every 1,000 miles (1600 km.). After dismantling, and before reassembling, the inside splines of the sleeve yoke should be smeared liberally with grease.

There are, therefore, three lubricators in all on the propeller shaft, one on each universal joint and one on the sliding joint.

Section G.2

TESTING FOR WEAR (In Position)

Wear on the thrust faces is ascertained by testing the lift in the joint, either by hand or with the aid of a length of wood, suitably pivoted.

Any circumferential movement of the shaft relative to the flange yokes indicates wear in the needle roller bearings or in the splined shaft.

Section G.3

REMOVAL OF THE PROPELLER SHAFT

Before removing the bolts and nuts securing the propeller shaft universal joint flanges to the gearbox flange and the rear axle flange, carefully mark the flanges to assist in refitting them in their original positions. **This is important.**

Remove the bolts and nuts securing the propeller shaft to the gearbox flange and carefully support it while removing the bolts and nuts securing the shaft to the rear axle flange. The shaft can now be removed from the car downwards and rearwards. Note that the flange bolt nuts are of the self-locking type.

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Section G.4

DISMANTLING THE PROPELLER SHAFT

Unscrew the dust cap at the rear end of the sliding joint and pull the joint off the splined shaft. Remove the enamel and dirt from the snap rings and bearing races. Remove all the snap rings by pinching their ears together with a pair of thin-nosed pliers and prising them out with a screwdriver.

If a ring does not slide out of its groove readily, tap the end of the bearing race slightly to relieve the pressure against the ring. Holding the joint in one hand with the splined sleeve yoke on the top, tap the radius of the yoke lightly with a copper hammer. The bearing should begin to emerge; turn the joint over

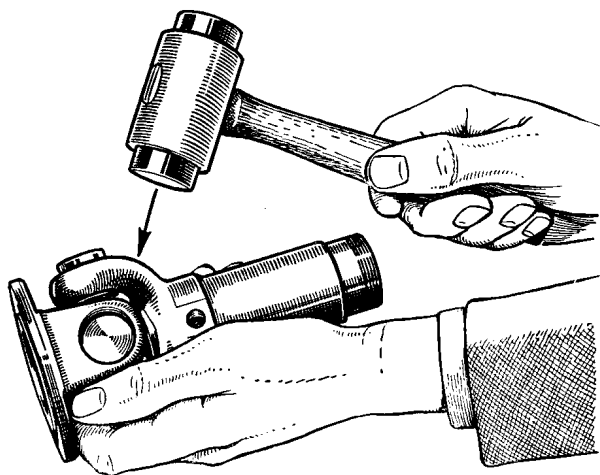


Fig. G.1.

Where to apply light blows to the yoke in the first stage of dismantling the universal joint after removing the retaining circlip.

and finally remove the bearing with the fingers. If necessary, tap the bearing race from inside with a small-diameter bar, taking care not to damage the bearing face, or grip the needle bearing race in a vice and tap the flange yoke clear.

Be sure to hold the bearing in a vertical position, and when free remove the race from the bottom side to avoid dropping the needle rollers.

Repeat this operation for the opposite bearing.

The splined sleeve yoke can now be removed. Rest the two exposed trunnions on wood or lead blocks to protect their ground surfaces, and tap the top lug of the flange yoke to remove the bearing race.

Turn the yoke over and repeat the operation.

G.2

Section G.5

TO EXAMINE AND CHECK FOR WEAR

The parts most likely to show signs of wear after long usage are the bearing races and the spider journals. Should looseness, load markings, or distortion

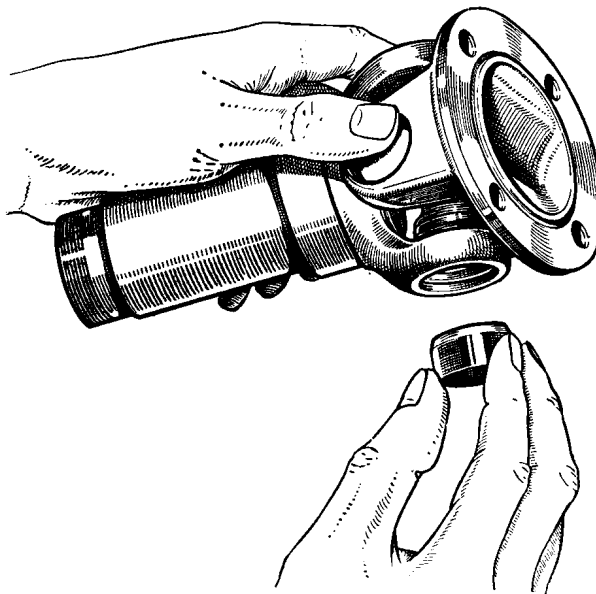


Fig. G.2.

Showing the manner of withdrawing the needle bearing after it has been partly withdrawn. When bearings are removed or replaced they should be held vertically to prevent the needle bearings from being displaced.

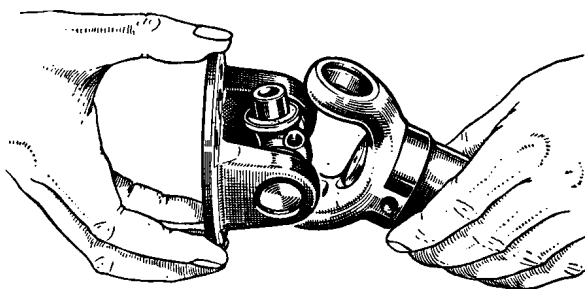


Fig. G.3.

When the needle roller bearings have been withdrawn from opposite sides of the spider the joint can be separated as shown.

be observed, the affected part must be renewed complete, since no oversized journals or bearing races are provided.

It is essential that the bearing races are a light drive fit in the yoke trunnions. In the event of wear taking

place in the yoke cross-holes, rendering them oval, the yokes must be renewed. In case of wear in the cross-holes in the fixed yoke, which is part of the tubular shaft assembly, it should normally be replaced by a complete tubular shaft assembly. Only in the case of emergency should any attempt be made to renew this yoke.

Section G.6

REASSEMBLING THE PROPELLER SHAFT

See that all the drilled holes in the journals are thoroughly cleaned out and free from grease. Assemble the needle rollers in the bearing races and

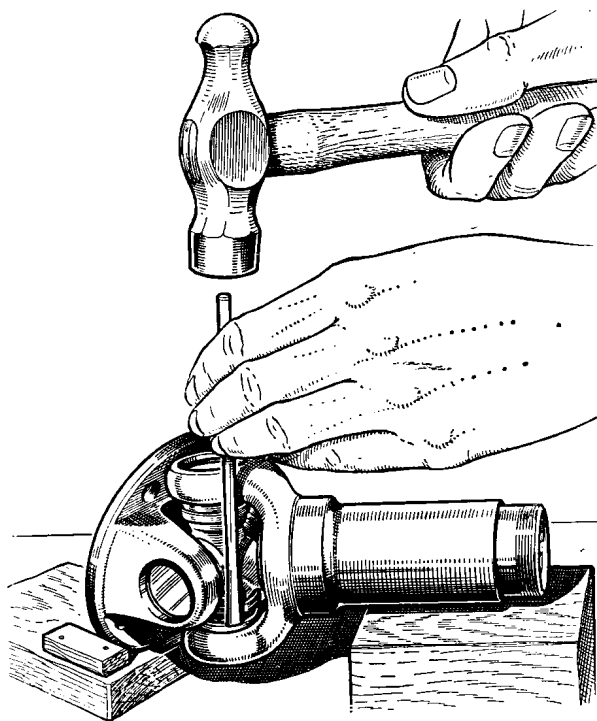


Fig. G.4.

When dismantling the universal joint it is permissible to tap out the bearings with a small-diameter rod from the inside as shown, provided care is taken not to damage the roller race.

fill with grease. Should difficulty be experienced in retaining the rollers under control, smear the walls of the races with petroleum jelly to retain the needle rollers in position while assembling.

Insert the spider in the flange yoke, ensuring that **the lubricator boss is fitted away from the yoke**. Using a soft-nosed drift, about $\frac{1}{32}$ in. (.8 mm.) smaller

in diameter than the hole in the yoke, tap the bearing into position. It is essential that the bearing races are a light drive fit in the yoke trunnions. Repeat this operation for the other three bearings. Replace the circlips and be sure that these are firmly located in their grooves. If the joint appears to bind, tap lightly

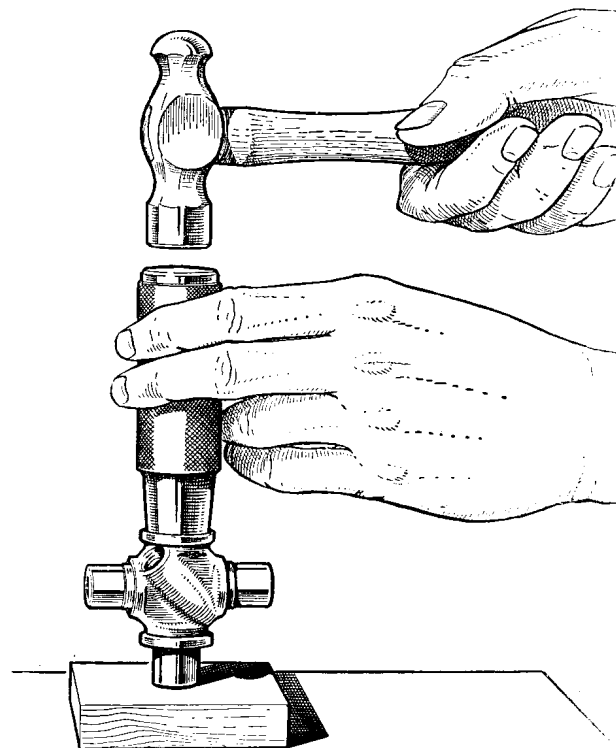


Fig. G.5.

When replacing the gasket retainer, use should be made of a hollow drift to tap it into place without damage.

with a wooden mallet ; this will relieve any pressure of the bearings on the end of the journals. Before replacing the sliding joint on the shaft, thread onto the splined shaft the dust cover, the steel washer and the felt washer. When assembling the sliding joint be sure that the trunnions in the sliding and fixed joints are in line. That is to say, the axis of the forked yoke "A" must be parallel to that of the forked yoke "B" and the axis of forked yoke "C" must be parallel to the axis of forked yoke "D" as shown in Fig. G.6. This can be checked by observing that the arrows marked on the splined sleeve yoke and the splined shaft are in line.

It is always advisable to replace the cork gasket and the gasket retainers on the spider journals by means of the tubular drift shown in Fig. G.5. The spider journal shoulders should be shellacked prior to fitting the retainers, to ensure a good oil seal.

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Section G.7

REPLACEMENT OF THE PROPELLER SHAFT

Wipe the faces of the flanges clean, and place the propeller shaft in position on the car. Ensure that

the flange registers engage correctly and that the joint faces bed down evenly all round, also that the markings, made on the flanges on removal, coincide. Insert the bolts and see that all the nuts, which are of the self-locking type, are evenly and securely tightened. The sliding joint is always placed at the gearbox end.

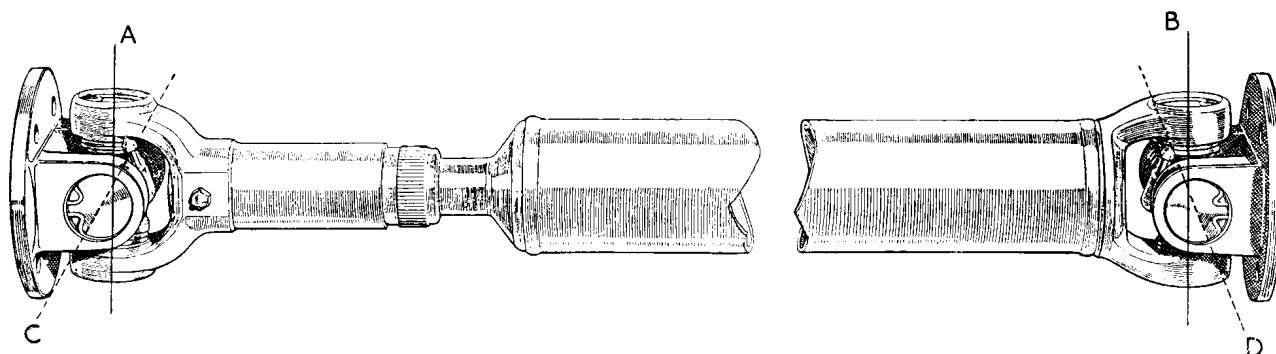


Fig. G.6.

The correct method of assembling the universal joints.

When the splined shaft is assembled to the drive shaft it is essential to see that the forked yokes on both shafts have their axes parallel to each other. In other words, the yoke (A) must be in alignment with the yoke (B), and the flange yoke (C) must be in alignment with the flange yoke (D).

Note.—On later models the thread of the grease nipples has been changed from $\frac{1}{8}$ in. B.S.P. to $\frac{1}{4}$ in. A.N.F. Care must therefore be taken to ensure that correct replacement nipples are fitted if the occasion for their renewal arises.