SECTION G

THE INTERMEDIATE DRIVING SHAFT
(1½ and 2½ LITRE)

GENERAL DESCRIPTION

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

Each universal joint consists of a centre spider, four needle bearing assemblies, and two yokes.

Section G.1

ATTENTION TO THE UNIVERSAL JOINTS

The intermediate 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 seals fitted.

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.

Section G.3

REMOVAL OF THE INTERMEDIATE SHAFT

Before removing the bolts and nuts securing the intermediate shaft universal joint flanges to the gearbox flange and the propeller shaft flange, carefully mark the flanges to assist in refitting them in their original positions.

Remove the bolts and nuts securing the propeller shaft to the intermediate shaft and then undo the bolts and nuts securing the shaft to the gearbox flange. The shaft can now be removed from the car.

The flange bolts are fitted with self-locking nuts.

Section G.4

DISMANTLING THE INTERMEDIATE SHAFT JOINTS

Remove the dirt and enamel 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 intermediate shaft 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 and finally remove with the fingers. If necessary, tap the bearing race from inside with a small diameter bar, taking care not to damage the bearing face. Alternatively, 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.

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.

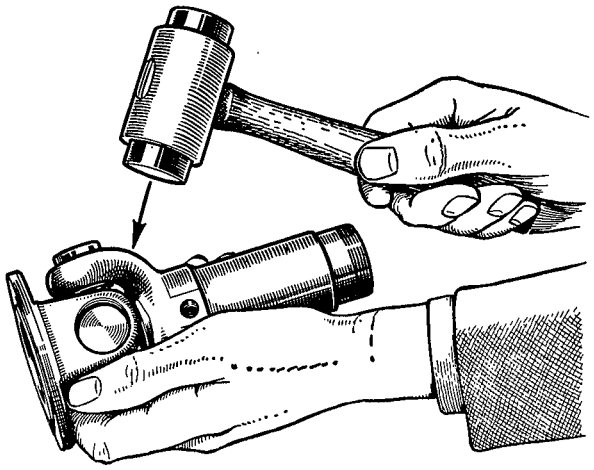

Fig. G.1.
Where to apply light blows to the yoke in the first stage of dismantling the universal joint after removing the retaining circlip.

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 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 replace this yoke.

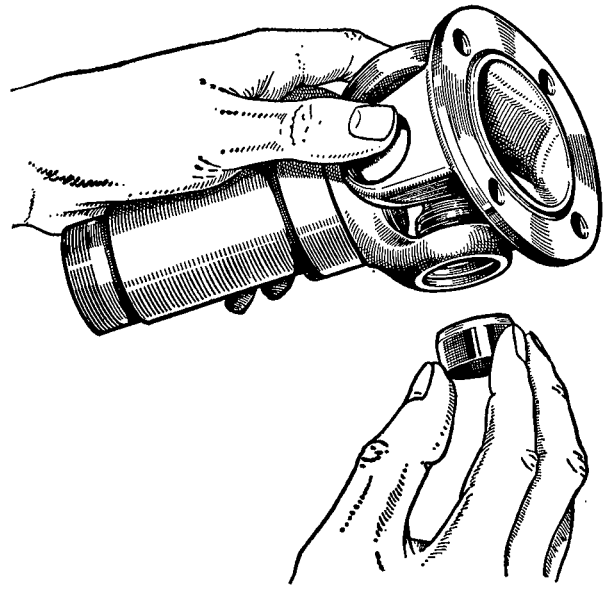

Fig. G.2.
Showing the manner of withdrawing the needle bearing after it has been partly withdrawn. When bearings are removed or replaced they should be held vertically to prevent the needle bearings from being displaced.

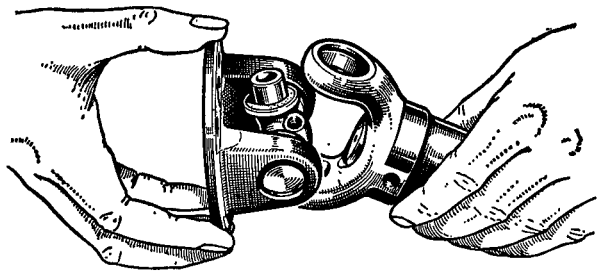

Fig. G.3.
When the needle roller bearings have been withdrawn from opposite sides of the spider the joint can be separated as shown.

Section G.6

REASSEMBLING THE INTERMEDIATE SHAFT JOINTS

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 fill with grease. Should difficulty be experienced in retaining the rollers under control, smear the walls of the races with grease to Ref. D (page P.2) to retain the needle rollers in position while reassembling.

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 with a wooden mallet, this will relieve any pressure of the bearings on the end of the journals.

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.

Section G.7

REPLACEMENT OF THE INTERMEDIATE SHAFT

Wipe the faces of the flanges clean, and place the shaft in position on the chassis. 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 nuts are evenly tightened.

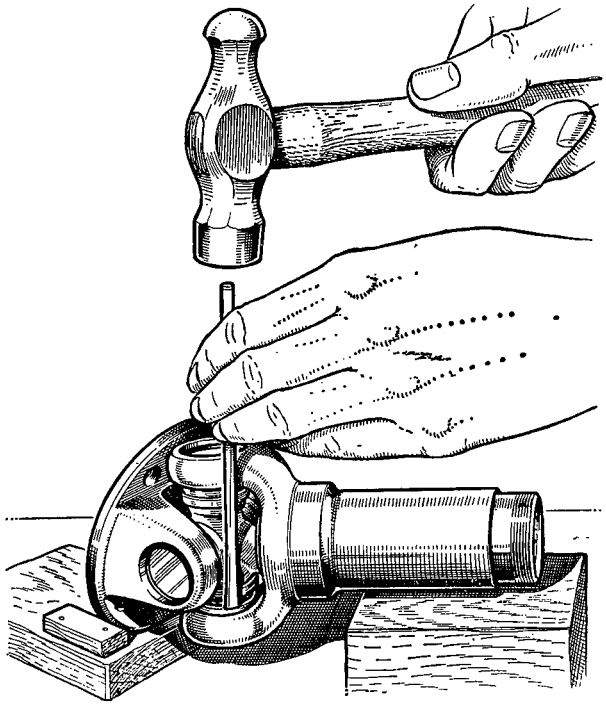

Fig. G.4.
When dismantling the universal joint it is permissible to tap out the bearings with a small diameter rod from the inside as shown, provided care is taken not to damage the roller race.

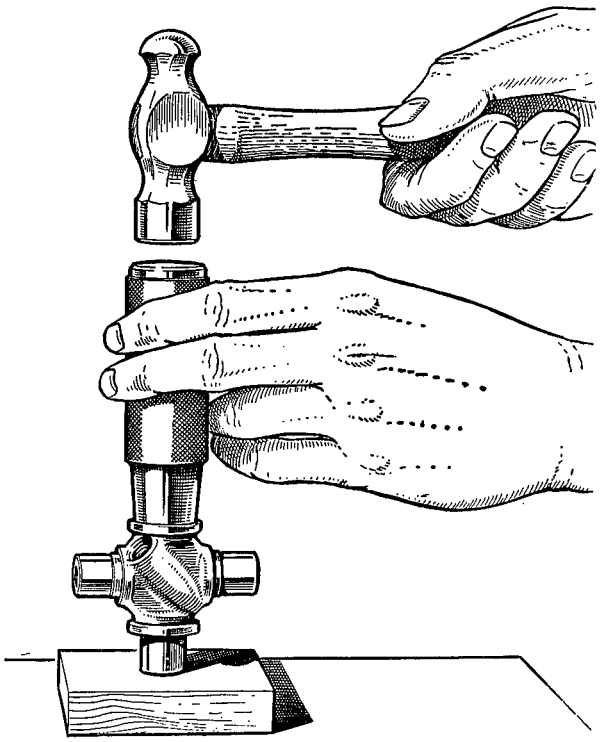

Fig. G.5.
When replacing the gasket retainer, use should be made of a hollow drift to tap it into place without damage.

SECTION GG

THE INTERMEDIATE DRIVING SHAFT AND PROPELLER SHAFT

(Series RME and RMF)

GENERAL DESCRIPTION

On the 1½ litre Series RME and 2½ litre Series RMF an open propeller shaft transmission system is used. Three universal joints are employed, one at the gearbox end of a short intermediate shaft, and one at each end of the propeller shaft. A sliding joint is incorporated in the forward end of the propeller shaft.

Section GG.1

LUBRICATION OF THE UNIVERSAL AND SLIDING JOINTS

Grease nipples are fitted to all three spiders, and they 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.3). If a large amount of grease exudes from the oil seal, the joint should be dismantled and new seals fitted.

The sliding joint also has a grease nipple which should receive three or four strokes with the grease gun filled with grease to Ref. D (page P.3) every 1,000 miles (1600 km.).

Section GG.2

REMOVAL OF THE INTERMEDIATE SHAFT

Before removing the bolts and nuts securing the intermediate shaft universal joint flanges to the gearbox flange and the propeller shaft flange, carefully mark the flanges to assist in refitting them in their original positions.

Remove the bolts and nuts securing the propeller shaft to the intermediate shaft, and then undo the bolts and nuts securing the intermediate shaft to the gearbox flange. Remove the two stud nuts, spring washers and rubber mounting cushions which attach the intermediate shaft bearing housing to the chassis, noting that the hole in the mounting flange is positioned at the bottom.

The shaft may now be lowered out of the car.

Section GG.3

DISMANTLING THE INTERMEDIATE SHAFT

Remove the split pin and large nut from the rear end of the intermediate shaft, and remove the flange, using a suitable extractor. Take out the two Woodruff keys. The shaft may be removed from the bearing housing by tapping the rear end of the shaft with a hide mallet, holding the shaft by the bearing housing.

If the ball race remains within the housing, it may be removed through the front end of the housing by means of an extractor. This ball race is of the sealed type, and requires no lubrication or adjustment.

Section GG.4

REMOVAL AND REPLACEMENT OF THE PROPELLER SHAFT

Mark the universal joint flanges so that they will be replaced in the same positions. Remove the bolts and nuts from the flanges at the front end of the propeller shaft. Carefully support the shaft, and remove the nuts and bolts from the rear axle flange.

The shaft can now be withdrawn from the car downwards and rearwards.

Before replacing the propeller shaft in the car, the splines of the sliding joint must be liberally smeared with grease if the shaft has been dismantled. When replacing the propeller shaft, ensure that the markings made on the flanges on removal coincide. The sliding joint is always placed at the forward end, and it is essential that the axis of each forked yoke is in the same plane, or parallel to the other, as shown in Fig. GG.1.

When the splined shaft is assembled it is essential to see that the axis of each forked yoke is parallel to the other. In other words, the yoke axis "A" must be in alignment with the yoke axis "B," and the flange yoke axis "C" must be in alignment with the flange yoke axis "D."

Section GG.5

MAINTENANCE ATTENTION TO THE UNIVERSAL JOINTS

The universal joints may be dismantled, examined for wear and reassembled as described in Sections G.4, G.5 and G.6.

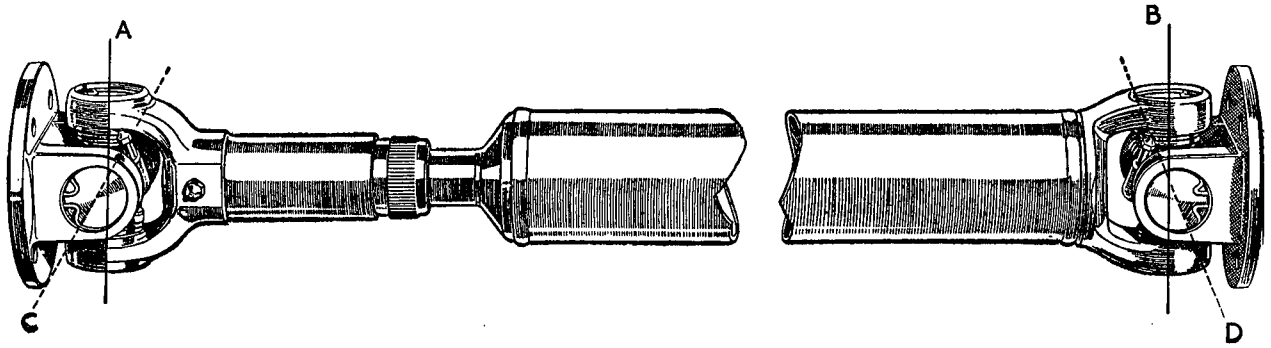

Fig. GG.1.
The correct method of assembling the universal joint.