Replacing the insulator for the drive-end bearing outer race and/or the oil seal

Special tools/materials required

- Suitable diameter drift if the outer race has not fallen out
- Oil seal (not used with MO1)
- Insulator
- Contact adhesive (e.g. Evo-Stik, or similar)
- Possibly masking tape

Procedure

The outer race of the drive-end bearing and a disc-shaped oil seal are fitted in a recess in the main housing. A thick paper insulator has a central annular portion, which fits between the outer race and the oil seal, and a number of radiating fingers which are gripped between the edge of the outer race and the housing. The insulator prevents any HT current passing through the bearing. As far as we are aware, none of the versions of the MO1 and MN2 had an oil seal.

It is not unusual for the insulator to disintegrate after many years of service, in which case the outer race and oil seal (if present) may have fallen out when the armature was removed from the housing (although they may still be inside the housing, stuck to the magnetic pole pieces). However, if still in place, warm the housing in recently boiled water. Then insert a snugly fitting drift from the outside through the drive-end hole of the housing against the oil seal and tap it with a hammer or mallet. For the K-series magnetos, a 1 inch or 25mm diameter drift may be used, and an 11/16"AF 1/2"-drive socket may well do the trick. The race, insulator and oil seal will usually fall out. If not, then you will need to try the method shown in Fig. 7 of the relevant Lucas Workshop Instructions.

We strongly recommend always using a new insulator and never re-fitting an old one. Also, oil seals do not last forever. Having got this far, there is a lot to be said for fitting a new oil seal, whether or not the old one seems good.

The different bearings have different sizes of insulator. Ensure you have the correct one. The standard thickness for the insulator is 0.010". Oversize insulators are available, for example with a thickness of 0.013", for use in the case where the recess in the housing has become oversize due to a loose outer race. However, it is perfectly acceptable to make do with a standard thickness insulator and masking tape, as described below.

Fit the outer race to the balls and inner race to check which is the outboard face of the outer race that will take the insulator. Remove, and then carefully glue the insulator to that face of the outer race using the thinnest of smears of an adhesive such as Evo-Stik. If the insulator has one shiny side, it should be outermost, i.e. the non-glued side.

Once the glue is dry, fold the fingers of the insulator over the outer edge of the outer race. Then replace the outer race on the inner race and balls, followed by the oil seal, if used, with its lip spring outermost.

Ensure that the bearing recess in the housing is clean. Then warm the housing in recently boiled water. With the armature vertical and the drive-end uppermost, lower the housing over the armature so that the outer race starts in its recess. Invert the whole thing and, with the housing supported over an open vice, push the outer race home

using a block of wood over the CB-end of the armature. It should go with a hard push by hand, or with a few moderate taps with a mallet.

If moderate taps aren't sufficient, do not hit harder - you don't want to damage the drive-end bearing races or the armature - but instead remove the armature, and drive the outer race home with a drift (a 5/8" Whitworth, 1-3/16" AF or 26 mm 1/2"-drive socket on a 6" extension bar should do the trick), while at the same time ensuring that the oil seal stays on-centre. It should not take much effort to drive the race home, and care needs to be taken not the break away the lip of the main body of the magneto behind the race.

If the outer race slides home freely or with only the lightest of taps, it will be necessary to pack out the insulator. To do this, remove the outer race, insulator (and oil seal). Flatten out the fingers of the insulator. Stick one turn of masking tape neatly to the outer edge of the outer race, and trim it in width. Then repeat the previous steps. Depending on the thickness of your masking tape and the amount of oversize of the recess, you may need to do this more than once to achieve a nice fit.

Once the outer race is home, the oil seal, if present, should be firmly gripped between the outer race and the housing. Also, looking inside the housing, you may be able to see the tips of the fingers of the insulator, but none of the fingers should be sticking out more than the rest. If it does, the insulator has got torn, and you will need to repeat the whole process with another insulator.