

Fig. 6. Driving out the first motion shaft with a drift acting through the housing for the third motion shaft front bush bearing. Take care not to damage this housing.

EXAMINATION FOR WEAR

Clutch Cross Shaft Bushes

It is unlikely that these bushes should have worn, but should the cross shaft appear excessively loose in the bushes, new ones must be fitted. These bushes are fitted in two parts with a gap left between the parts, thus providing an oil channel for lubrication via the oiling nipples.

Bearings

The first and third motion shaft ball bearings may become worn after a considerable length of service and should be renewed if there are signs of looseness between inner and outer races.

First and Third Motion Shaft Bush

This bush is fitted with a maximum permissible internal clearance of .003 in. for the third motion shaft. When any appreciable wear above this figure occurs, the bush and shaft should be examined and renewed where necessary.

Third Motion Shaft Sleeve

The phosphor bronze sleeve which carries the first and second (actual) speed gear assemblies must be replaced if the wear between the shaft and sleeve appears excessive. The fitted clearance in a new gearbox is between .00025 and .00175 in.

Laygear Thrust Washers

These washers are designed to permit an end float for the layshaft cluster gears between .001 and .003 in. If the end float exceeds this tolerance, the thrust washers must be renewed. The smaller thrust washer, positioned at the rear, is made in varying thicknesses to allow for correct end float to be obtained.



Fig. 7. Synchronising cone.
1. Chamfer to be machined after cone is shrunk into position. 2. Cone. 3. Coupling adapter. 4. Constant mesh gear.

Layshaft and Bushes

The layshaft and layshaft bushes, in the cluster gear assembly, may become worn and need renewal. Both the front and rear bushes have an internal clearance of .002 in.—.003 in. These bushes are a press fit in the laygear.

Gear Synchronising Cones

These cones are “shrunk on” to the first, second and third speed gears (actual), which are normally supplied as a complete unit for spares purposes. Where facilities exist for shrinking on and final machining, cones can be supplied separately. However, care must be taken in fitting if the gear is to operate satisfactorily.

The internal broaching of the cone is calculated to allow for a shrinkage fit on to the gear serrations, and the cone must be heat-expanded before it can be fitted.

When heated to approximately 250 degrees Fahrenheit, expansion will allow the cone to be pressed home on to the gear without damaging the broaching and will

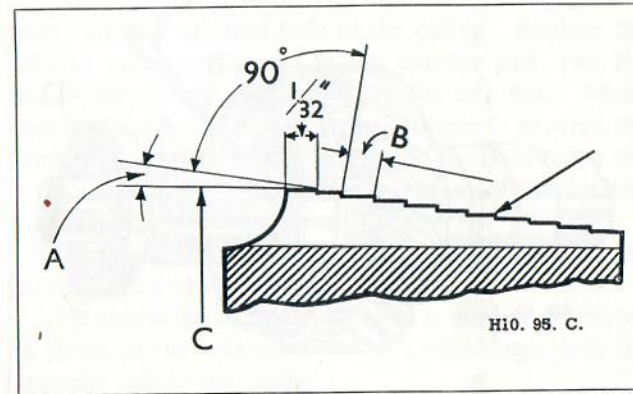


Fig. 8. Cone dimensions.
A. Cone angle $5^{\circ} 10'$. B. Coarse thread turned with .015 in. lead. C. Cone diameter 2.5 in.

the cold state. There is a shoulder on the coupling adapter, and this must be facing the cone.

When the cone is in position, the cone can be done in accordance with the drawing in fig. 8. The taper of the cone must be concentric with the bore to .001 in.

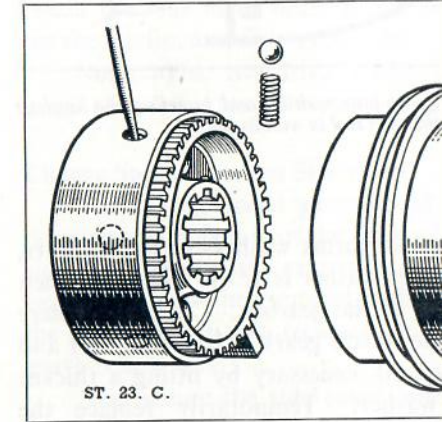


Fig. 9. Using Service Tool GT.40 to assemble balls to a coupling sleeve and synchroniser.

ASSEMBLING THE GEARBOX

Perfect cleanliness of the gearbox is essential before commencing assembly. Although the complete assembly operation has been described, it is advisable for the operator to read the instructions before commencing any work. The various parts are so interlaced with each other that it is difficult to describe the assembly process.

To reassemble the gearbox proceed as follows:

Synchromesh Sub-Assembly

During manufacture both the second and 3rd (actual) speed coupling sleeves are assembled with their respective synchronisers. The assembly of these parts should therefore be fitted to the gearbox.

Special guides are available to assist in the assembling of the three balls and synchronisers. The guide is of the same design as the coupling sleeve, see fig. 9.