

SERVICE SERIES No. 17

Gearbox Restoration Routine for the MODEL M23 "EMPIRE STAR" B.S.A.

THOSE owners of M23 "Empire Star" B.S.A. motorcycles who became acquainted with the M20 side-valve machines of B.S.A. manufacture that were issued to the Services during the war may recognize a similarity between the gearboxes of the two machines.

This is in fact so, for the W.D. gearbox was identical with the pre-war M23 and its components are interchangeable. No difficulty exists with spare parts, and all items likely to be required to bring the earlier gearbox to first-class standard can be obtained from the Service Dept. of B.S.A. Cycles, Ltd., at Small Heath, Birmingham.

No specific difficulties exist with regard to the dismantling procedure, and no contingency is likely to arise that can only be dealt with by the use of factory jigs. Such jigs do exist but are hardly necessary where one unit is under consideration and have been evolved on a basis of expediency rather than of necessity.

Two small extractors will obviate the necessity for the use of tyre levers; one can be obtained from the Service Department of the factory and the other assembled from a suitable bolt, nut and washer. This latter tool makes light of the otherwise difficult job of replacing the single, heavy clutch spring and should be made up before the overhaul is attempted.

Keeping in Tune the Transmission of a Popular Series of Motorcycle

by
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A new set of gaskets and seals should be obtained before the work of stripping is commenced.

The gearbox is extremely robust and, during the war, gave long service under the most arduous conditions. Except for the bearings and bushes that, after a considerable mileage, may need attention, the most likely items that will require replacement are the foot-change pawl carrier springs, the yokes of the selector connecting rod and the kickstarter components.

The Clutch

An extractor is required to remove the clutch body from the mainshaft taper; it screws into the sleeve onto which the clutch spring ring nut is fitted, and has a centre bolt that presses onto the end of the mainshaft. When the tab washer and mainshaft nut have been taken off, the complete clutch can be withdrawn with this extractor.

If it is thought that the clutch plates may require new inserts, it is preferable to remove the plates before the clutch is taken off, for the gearbox mainshaft is

useful as a mandrel while the pressure ring nut is being undone. A suitable "C" spanner is the tool for the job, although a stout piece of tube, with an internal diameter just large enough to fit over the nut can be turred into a professional-looking workshop tool. Drill one end of the tube to take a serviceable tommy bar and weld a spline inside the tube that will just fit into one of the serrations on the ring. This is suitable only as a key to reduce the laborious business of unscrewing and screwing back the serrated ring which may be tight enough to require "starting" with a soft drift and hammer.

Kickstarter and Foot-change Gear

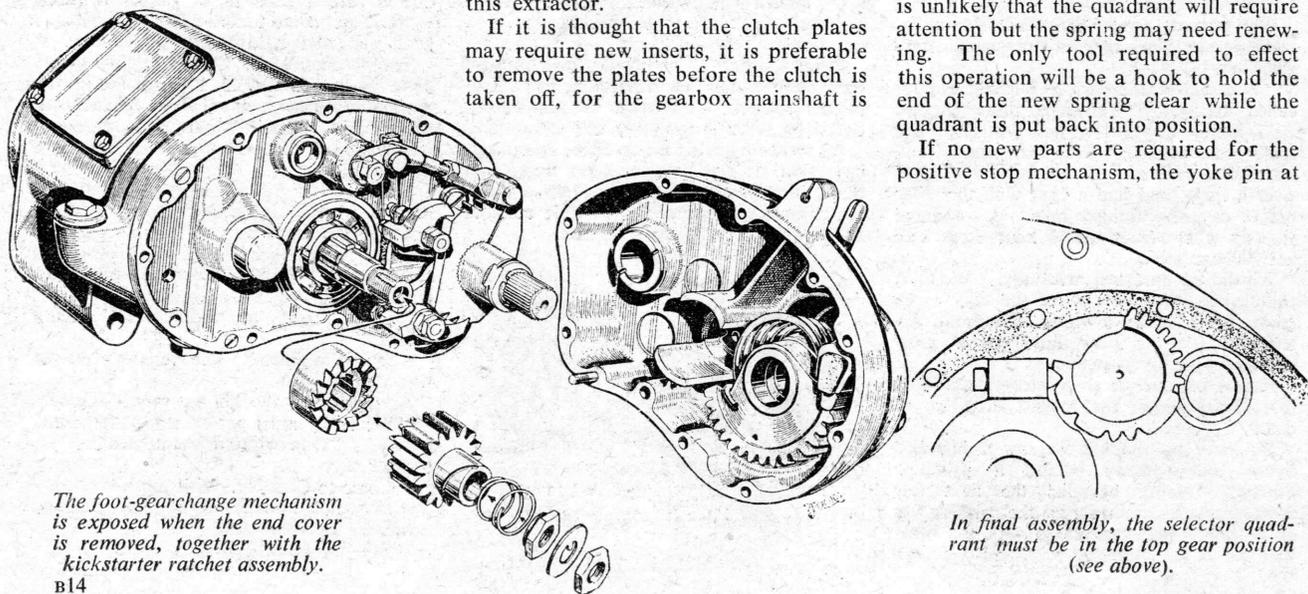
Before continuing with details of dismantling, it may be advisable to state that all threads in the gearbox are "right-hand."

Engage top gear before removing the kickstart and gear-change pedals, remembering that a circlip behind the splined portion of the gear-change lever spindle must also be prised off. The indicator disc will slip off when the circlip is removed.

Undo the 1/4-in. Whitworth set screws—seven at the front, three at the back of the end cover—and take off the two nuts—one in the front, one at the rear—noting that the thin nut goes back on the front. Push the clutch withdrawal lever as far as it will go and, holding this lever to the cable stop lug on the alloy casting, tap the end of the withdrawal rod, which now protrudes from the clutch end of the mainshaft, with a block of wood or a mallet.

The cover will come away without damage to the mating faces and, as it does so, oil which is trapped in the end cover will fall out—have a tray or tin handy. Remaining in the end plate will be the kickstart quadrant and spring. It is unlikely that the quadrant will require attention but the spring may need renewing. The only tool required to effect this operation will be a hook to hold the end of the new spring clear while the quadrant is put back into position.

If no new parts are required for the positive stop mechanism, the yoke pin at



The foot-gearchange mechanism is exposed when the end cover is removed, together with the kickstarter ratchet assembly.

In final assembly, the selector quadrant must be in the top gear position (see above).

