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SERVICE SHEETS

BSA SERVICE SHEET No. 408

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C Group Models with 3 speed gear box.

(4 speed models use Service Sheet 209).

REMOVING, DISMANTLING AND RE-ASSEMBLING OF GEARBOX AND GEAR CHANGE

To remove the gearbox from the machine proceed as for engine dismantling up to removal of the clutch (Service Sheet No. 406). Unscrew the two nuts D (Fig. C.24.) and drive out the bolts. Slacken off the nuts clamping the rear engine plates and the chain stays. Take off the rear chain and guard, and the oil pipes.

It is not necessary to remove the oil tank and battery carrier, but if time permits removal of these fittings will enable the operator to raise the gearbox upwards and out of the plates more easily.

Dismantling the Gearbox

The operator should first consider carefully before attempting this operation as considerable trouble and damage can be caused by lack of experience. **If in doubt consult your dealer.**

To assist re-assembly, the positions of the various gears should be carefully studied (Fig. C.22).

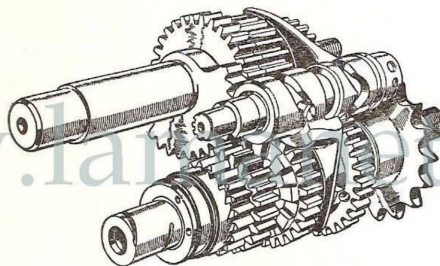


Fig. C.22. The gear cluster.

First of all secure the gearbox in a vice or suitable fixture, with clamps on the clamping lugs. Remove the kickstarter crank B and footchange pedal C (Fig. C.23). The former is removed by unscrewing the nut and extracting the cotter pin. The latter pedal can easily be taken off when the pinch bolt is released.

Next remove the outer cover by taking out the 3 screws and 7 nuts which hold the cover in position. Unscrew plunger housing underneath the outer cover, the housing will come away complete with the plunger E and the plunger spring. Tap off the outer cover with a wooden mallet, at the same time holding the gear control shaft with a tommy bar so that the gear selector mechanism is retained in position.

Next remove the control plunger housing O from the inner cover ; this will release the gear selector mechanism comprising footchange operating plate D, pawl plate and spring G and gear selector quadrant H. After dismantling these the inner cover is fully exposed and the 3- $\frac{1}{4}$ inch (21-2889) Whitworth bolts should be unscrewed. The inner cover may now be tapped off its seating on the 7 studs.

By means of a screwdriver undo the control shaft pin plug which is situated at the nearside end of the gearbox shell, and then insert a $\frac{1}{4}$ in. B.S.F. bolt or stud into the dowel to enable it to be drawn from its seating. The gear control shaft with operating forks, layshaft gear cluster, and mainshaft and sliding gear can now be taken out.

Next undo the tab washer which secures the sprocket locking nut, and remove the locking nut. Remove the locking washer and pull off the gearbox sprocket. Then tap the sleeve pinion from its seating in the bearing, using a hide or wooden mallet.

If it is necessary to remove the ballrace, a hand press is the best method, but if this is not available, warm the shell, and the ballrace can then be easily tapped from the housing.

Turn to the inner cover and the removing of the kickstarter quadrant. Unlock the quadrant from the kickstarter spring, and tap the quadrant from position through the two kickstarter return stops.

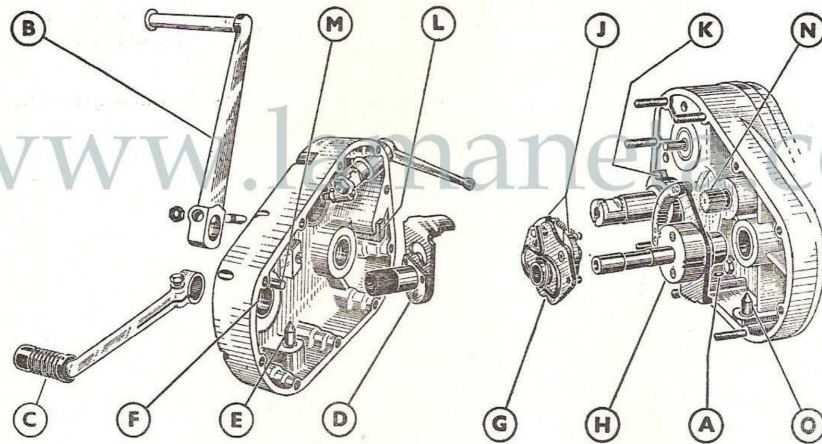


Fig. C.23. Foot gear change mechanism.

Dismantling the Gear Cluster

The sliding gear comes away easily from the mainshaft ; then remove the kickstarter ratchet pinion by unscrewing the left-hand kickstarter ratchet sleeve nut. The kickstarter ratchet and shim can then be removed.

To remove the bottom gear pinion, the outer retaining ring has to be split by means of a chisel, so that the ring may be removed in two portions. Extract the two portions of the inner retaining ring with the tang end of a file, the pinion will then slide off the shaft.

B.S.A. Service Sheet No. 408 (cont.)

To dismantle the layshaft gear cluster remove the 1st gear pinion. This is pressed on to the layshaft pinion sleeve and can be removed by holding the gear in a vice and tapping from position with a piece of hard wood a shade larger in diameter than the phosphor bronze bearing.

To dismantle the operating forks, hold the shaft in a vice and tap out the central shaft pegs with a punch. The forks can then be removed from the shaft, but careful note should be taken of the position of the forks on the shaft before taking them off.

Re-assembling

Hold the shell in a vice or suitable fixture. First of all fit the oil seal with recess inwards, the oil seal shim and the roller bearing. If the case is first warmed, the bearing can easily be pressed into its seating. Fit the sleeve pinion, ensuring that the oil retaining washer is fitted between the sleeve pinion and the ballrace. Then tap the sprocket into the splines in the sleeve pinion, securing by means of the tab washer and locknut. Ensure that the tab washer is turned over into the recesses in the locknut.

Fitting the selector forks to the shaft is the reverse operation to that for dismantling. Use new control shaft pegs.

Next replace the low gear pinion on the mainshaft, and fit the inner and outer rings to secure the pinion on the shaft. The outer ring is tapped into position and the pinion should then revolve easily on the shaft. Fit the kickstarter pinion 27-4106, and then the ratchet 27-4112, following that, the ratchet spring 27-4447. Then fit the kickstarter sleeve nut 15-267 (left-hand thread).

Fit the mainshaft sliding pinion, ensuring that the fork track is nearest the sleeve pinion. Next fit the layshaft sliding pinion on the sleeve pinion and press the layshaft first gear pinion on to the sleeve pinion (hexagon end).

Pair the layshaft and mainshaft gear clusters together, fit the operating forks, ensuring that one fork is engaging in the mainshaft sliding pinion and the other fork in the layshaft sliding pinion. Ensure that the teeth on the gear control shaft are at the reverse end to the threads on the mainshaft end.

Before entering the mainshaft and gear clusters into the G/B shell, lubricate the gears and both shafts. Enter the clusters, locate the selector shaft and enter the retaining pin in the groove in the selector shaft. Then fit control pin plug 29-3243 and secure with the locking tab washer.

Next fit the inner cover using a new joint washer coated with jointing cement and tap into position with a wooden mallet. Secure the cover by a bolt either side, check for end-play in the layshaft and mainshaft, and if there is end-play in the former, fit shims underneath the kickstarter quadrant (.005 clearance). If there is play in the mainshaft, fit shims underneath the mainshaft bush (inner cover) 15-268. The mainshaft must be free without end-play.

Fit the remaining $\frac{1}{4}$ in. Whitworth cover bolt.

Next fit the gear control quadrant 29-3298, ensuring that the mark on the foot gear change selector shaft is lined up with the mark cut on the quadrant.

With the aid of a screwdriver, fit the spring to the pawl carrier plate, with the end of the right-hand coil to the left of the stud, and the end of the left-hand coil to the right of the stud.

B.S.A. Service Sheet No. 408 (cont.)

Fit the pawl carrier plate G, (Fig. C.23) to the gear control quadrant, followed by the operating plate and sleeve complete, D.

The action of the footchange pedal return spring tends to throw off the operating plate, to prevent this happening a small clip should be made up from light strip and placed in position over the assembly.

Replace the two return stops on the Kickstart Quadrant Stem followed by the cork washer.

Take up the outer cover, place a tommy bar through the operating plate sleeve bush and hold the operating plate in position as the cover is entered on it's studs. Remove the clip which was placed over the footchange mechanism and, still holding the operating plate with the tommy bar, push the outer cover home.

Ensure that the dowel peg in the outer cover is located between the ends of the spring on the pawl carrier plate. If this is not so positioned the footchange pedal will not return to neutral.

Secure the outer cover with fixing screws and nuts, and fit the footchange pedal C and kickstarter crank B. Replace filler cap and inspection cover.

Replacement of Gearbox

The replacement of the box should not present any difficulties. When the box is in position and the fixing bolts are ready to be tightened up, make sure that the flats on the heads of the bolts register in the slots of the yoke plates, and that the chain is correctly tensioned. There should be about $\frac{3}{8}$ inches up and down play in one run of the chain when the other run is taut.

Make sure that the gearbox bolts are finally tightened before readjusting the rear chain, and refill the gearbox with oil to the correct level.