BSA SERVICE SHEET No. 311

Reprinted Feb., 1959

A and B Group Models
with Swinging Arm Frame

DISMANTLING AND RE-ASSEMBLY OF GEARBOX AND GEARCHANGE

Gearbox Removal

In most cases it will be found convenient to dismantle the gearbox while it is still in position. However, if attention to the final drive pinion sleeve bearing is required it may be advisable to remove the complete gearbox. The primary transmission, clutch and chaincase must be removed in either case and this should be carried out as described in Service Sheet 310.

To remove the gearbox from the frame, slacken the retaining bolts and remove the two right hand rear engine plates. The gearbox is then free to be withdrawn from the right hand side of the machine.

Dismantling

Remove the clutch and speedometer cables. Move the gears to the neutral position between first and second. Undo the four nuts and three screws round the rim of the outer cover but do not slacken the screw and nut which are not on the edge of the cover as these do not prevent its removal. The outer cover can then be removed complete with the kickstarter, gearchange and clutch lever. As the cover is withdrawn the kickstarter lever will tend to rotate under the action of the return spring and the clutch lever should be pulled out to the fullest extent so that the kickstarter lever may be rested against it, thus preventing the complete release of the spring.

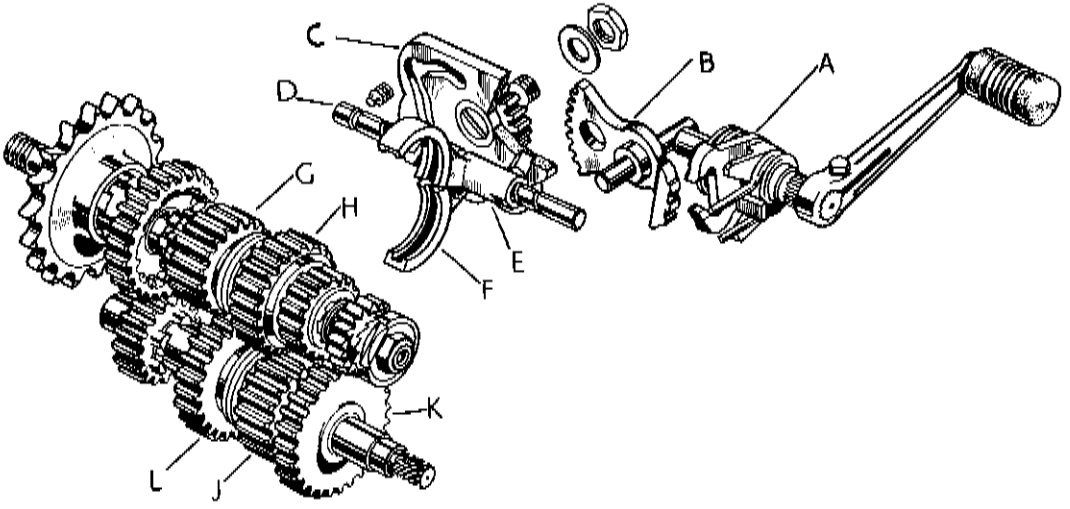
The gearchange mechanism can be dismantled by removing the gearchange lever and the circlip which retains the gearchange spindle in the outer cover. Withdraw the spindle complete with change mechanism which can then be completely dismantled after removing the split pin. Examine the operating claw '*A*' for wear and if the ends are no longer well formed the claw should be replaced.

Before the inner cover is removed the clutch push rod should be withdrawn and the single screw to the left of the top right stud, must be undone. The inner cover together with the mainshaft and gearchange rocking lever '*B*' can then be withdrawn, leaving the gear cluster in position. To remove the rocking lever the gear lever spindle bush must first be pushed out of the inner cover. This will reveal the end of the rocking lever spindle which is threaded internally $\frac{1}{4}$ in. C.E.I. Screw in a suitable screw or bolt, then use this to pull out the spindle.

If it is necessary to remove the mainshaft from the inner cover the shaft should be held in a soft jawed vice so that the kickstart ratchet nut can be undone after its locking washer has been bent back. The kickstart ratchet, ratchet pinion, spring and bush should

then be removed, leaving the shaft free to be pushed from its bearing. This bearing can be removed by pulling out the retaining circlip and then warming the cover in hot water before tapping the bearing from its housing with a suitable soft drift.

The rod '*D*' on which the two gear operating claws slide is pressed into the gearbox shell at the clutch end and is secured by a small grub screw on the outside of the case. Release the grub screw and pull out the rod. It is then possible to withdraw the gear cluster and operating claws together with the layshaft so that the only components remaining in the gearbox shell are the final drive pinion sleeve assembly and cam plate '*C*.'



Unscrew the selector plunger housing locknut and remove the plunger housing from the gearbox shell. The gear selector cam plate will now slide from its pivot and the latter can also be removed after unscrewing the retaining nut and warming the case. The layshaft bearings are a press fit in the gearbox and if necessary can be driven out with the aid of a soft punch.

Run a length of old chain round the gearbox sprocket and hold the chain in a vice to prevent the sprocket rotating. Flatten the locking tab washer and undo the retaining nut. Withdraw the sprocket from its spline, then tap the pinion into the gearbox with a soft mallet. To remove the pinion sleeve bearing, prise out the retaining circlip, withdraw the oil seal, then warm the case in hot water before tapping the bearing out of the case. Do not disturb the ballrace unless it is suspected of being faulty. Wash it thoroughly in petrol to remove all traces of oil and any play will then be immediately detected.

Examine the various parts for wear, and if the forks which actuate the sliding pinions show signs of seizure it will be advisable to replace them. Attempts to erase the seizure marks will result in excessive side play.

The fixed pinions on the layshaft and mainshaft are pressed on, and new components must be a tight fit. Examine the selector plate for worn cam grooves, and replace if necessary. The rocking arm should be replaced if the teeth show signs of wear as, of course, should pinions with damaged or worn teeth.

Re-assembly

Re-assembly is carried out in the reverse order to dismantling. The aluminium case should always be warmed before a bearing is pressed in. When replacing the gearbox sprocket ensure that the oil seal is in good condition and that the retaining nut locking washer is correctly seated in the spline. Tighten the nut fully and turn the lockwasher over into the slots on the nut. If the teeth on the sprocket are worn to a hook shape a new sprocket must be fitted otherwise rapid chain wear will result.

Replace the cam plate and selector plunger making sure that the plunger is in the neutral position between first and second gear. Place the layshaft in position and then feed in the first pair of gears '*J*' and '*I*.' together with their selector claw '*F*.' These claws are interchangeable but if the original components are to be used then they should be replaced in their original positions. Replace the second pair of gear wheels '*G*' and '*H*' together with selector claw '*E*' and make sure that the guide pins of both selector claws are correctly engaged in the cam groove. Replace the selector claw rod and secure it in position by means of its grub screw. Position the spacing washer and the large pinion on the layshaft. Assemble the mainshaft, kickstart ratchet mechanism and rocking lever into the inner cover. The mainshaft and inner cover can then be pushed into the gearbox, but before they are completely home the rocking lever must be correctly set so that the red dots on the lever and on the cover are in line. Replace the single inner cover retaining screw.

Note that when a reverse cam plate 42 3001 is fitted the red dots will not coincide as described above. Correct meshing of the rocking lever must be obtained by trial and error.

Assemble the gearchange and kickstarter mechanism in the outer cover, then push the latter on to the four studs, rotating the kickstarter slightly so that the quadrant does not jam on its stop.

Replace the four nuts and three screws in the outer cover. The gearbox is now completely re-assembled.

B.S.A. MOTOR CYCLES LTD.,
Service Dept., Birmingham, 10.
Printed in England.