BSA SERVICE SHEET No. 505

Revised Feb., 1960.

Models D1, D3 Plunger, D3, D5 and D7. Swinging Arm

REMOVING ENGINE - GEAR UNIT FROM FRAME AND COMPLETE DISMANTLING

Removing the Unit

Disconnect the clutch and carburetter controls, the petrol pipe, plug lead, and the electrical connections from the flywheel generator. Take off the rear chain and chainguard. In the case of the D.3 Swinging Arm Model with battery lighting, the rectifier is bolted to the chainguard, but there is no need to remove the guard completely. After the front and rear fixing bolts have been removed it can be suspended out of the way by means of a stout wire hooked over the top frame member.

Using the 'C' spanner provided in the tool kit; unscrew the exhaust pipe union nut and remove the pipe.

Take off the nuts on the engine bolts and withdraw the bolts. The engine can now be lifted from the frame.

Dismantling

Drain off the oil from both the engine and gearbox units by removing the large hexagonal nut under the gearbox, adjacent to the domed primary chaincase cover and the smaller hexagon nut on the nearside front underside of the engine. The gearbox oil also serves the oilbath for the primary chain and the primary chaincase is drained automatically by the removal of the gearbox drain plug.

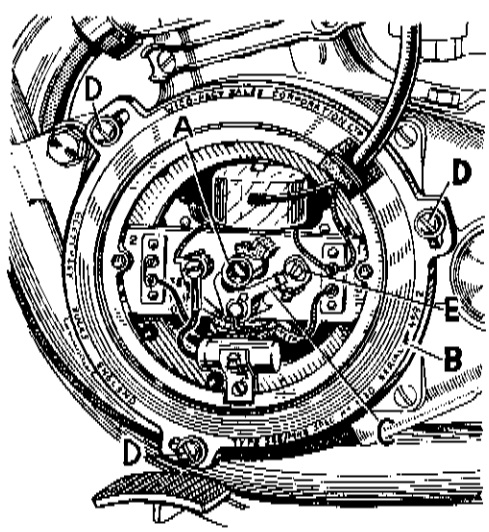

Fig. D4—The Contact Breaker Mechanism.

Flywheel Generator (Wico Pacy)

On the nearside of the engine, three cheese-headed screws 'D' (Fig. D4) slotted for withdrawal with a screwdriver and located in elongated slots, and one screw 'A' in the centre of the contact breaker mechanism, hold the ignition coil and contact breaker assembly cover in position.

Model D.7.

The model D.7 differs slightly from the other D group machines in that to obtain access to the generator, the pear shaped cover on the left hand side of the unit must be removed by taking out the three screws, after this, the procedure for dismantling is identical.

Note that the screw 'A' (Fig. D4) in the centre of the contact breaker mechanism also secures the contact breaker cam which is keyed on to the mainshaft. The cam will fall from the shaft as the large alloy cover is withdrawn, and care must be taken to see that neither the cam nor its key is lost during this operation.

The right-hand threaded nut holding the flywheel must now be unscrewed to allow the withdrawal of the flywheel. Service Tool No. 61-3188 is used for this operation (Fig. D5). Note that a large shakeproof washer is fitted between the nut and flywheel boss.

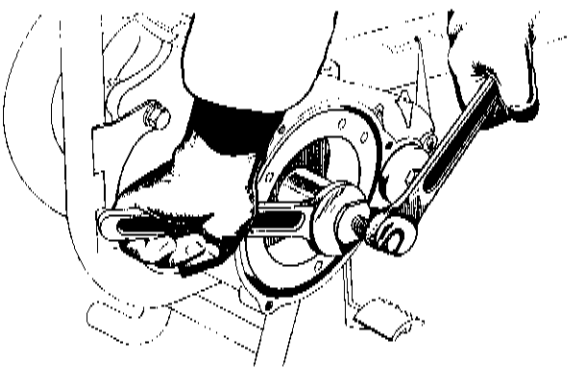

Fig. D5—Removing the Generator Flywheel with Service Tool 61-3188.

When the flywheel is withdrawn it should be placed in its correct position in the ignition assembly unit to ensure that the magnetic properties of the flywheel are retained, or alternatively place a circular steel plate to cover all the magnets in the wheel for the same purpose. **Failure to do so may entail loss of electrical efficiency.**

On machines with Wico-Pacy equipment, two short screws inside at 'A', and three long screws outside at 'B' (Fig. D6) secure the alloy flywheel housing cover in position.

When Lucas equipment is fitted, the cover is retained by three long screws only.

With the cover removed, the rear drive sprocket and gear position indicator are revealed. This indicator is not fitted to later models, its place being taken by a thrust pad, Part No. 90-759. On the inside of the cover is the clutch push rod operating lever, mounted behind the adjusting screw 'C' (Fig. D6).

Pull out the clutch push rod, Part No. 90-99 and the rubber oil seal washer, Part No. 90-132, from the centre, of the sprocket. Unscrew the sprocket securing nut, first bending back the tab of the locking washer. This nut is left-hand threaded. Remove the nut, washer and sprocket, and take off the gear indicator lever (if fitted).

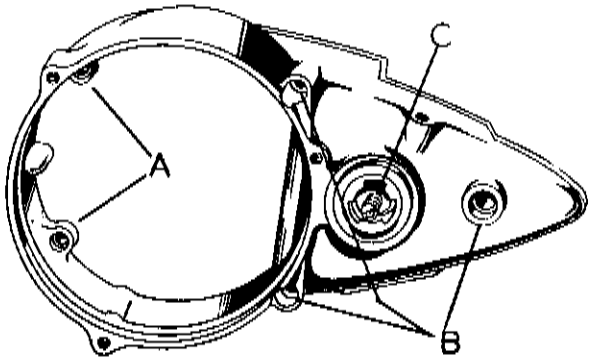

Fig. D6.

Primary Drive Cover

On the offside of the engine the change-speed foot pedal is splined on its shaft and held in position by a pinch bolt 'C' (Fig. D7). Unscrew and withdraw the pinch bolt and take off the pedal. Now take off the kickstart pedal, this also is fitted to a splined shaft and held in position by a pinch bolt 'B' (Fig. D7).

By unscrewing the five cheese-headed screws 'D', two long ones at the front of the alloy primary drive cover, and three at the rear, this cover can be taken off, revealing the engine sprocket, non-adjustable primary chain, clutch assembly, kickstarter quadrant and clock-type spring.

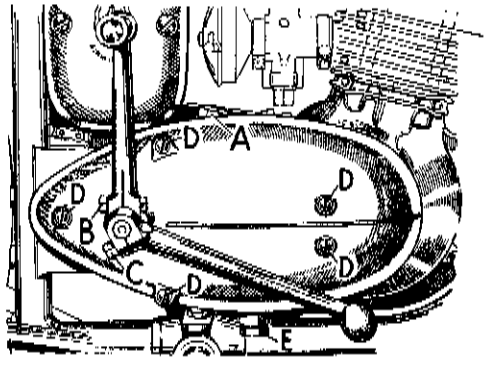

Fig. D7.

The keyed engine sprocket, Part No. 90-120, is held on its taper shaft by means of a right-hand threaded nut and double tab washer, one tab of which must be turned back from the engine sprocket securing nut before unscrewing. The second tab is turned over on to a flat on the engine sprocket and need not be touched. Unscrew the nut and take off the tab washer.

Now remove the primary chain by releasing its spring link and using Service Tool No. 61-3198, pull the engine sprocket from its tapered keyed shaft. Take care not to lose the key as the sprocket is withdrawn.

Clutch

Using Service Tool No. 61-3191 compress the clutch springs to allow the large plate retaining circlip and the clutch plate assembly to be removed (Fig. D8). Take out the clutch plates and withdraw the mushroom headed clutch push rod, Part No. 90-98, from the centre of the mainshaft.

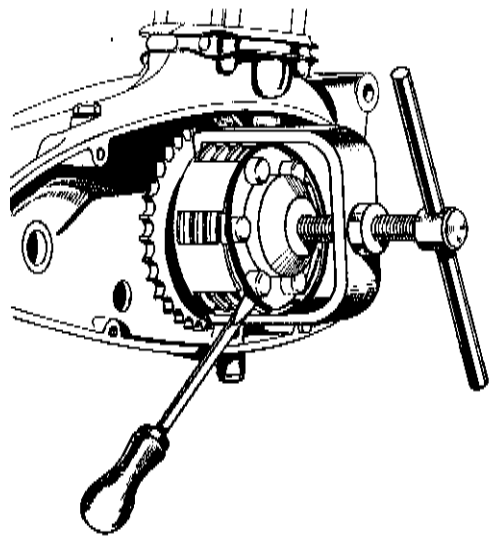

Fig. D8—Removing the Clutch Plate Circlip with Service Tool No. 61-3191.

The Clutch hub nut has a right-hand thread and its removal allows Service Tool No. 61-3256 to be used to draw the clutch hub from the splined mainshaft. The centre of the hub has a brass thrust washer, Part No. 90-283, in a recess, and the whole hub revolves on a central brass bush, Part No. 90-76, which is a sliding fit on the mainshaft and is inserted from the rear, or kickstart ratchet side of the assembly.

Crankcase

Before the crankcase halves can be parted the cylinder and piston must be removed. The procedure is detailed under Engine Dismantling for Decarbonising, Service Sheet No. 504.

Removal of the eleven cheese-headed countersunk screws, seven short ones along the bottom and rear of crankcase, two long screws and two further screws on the cylinder base will allow the crankcase to be parted. Later models have two additional screws which must also be removed. One is situated just below the rear drive sprocket and the other on the drive side of the crankcase behind the top run of the primary chain.

The front and top rear frame bolt holes in the crankcase are dowelled and great care must be taken in parting the cases to ensure that damage does not occur to either case if leverage is applied at any point by means of a screwdriver or lever.

The mainshaft runs on three ball races, two on the driveside, Part No. 89-3023 (inner), and Part No. 90-10 (outer), and one on the timing or generator side, Part No. 89-3023. The two larger races may be pressed out to the inside of the cases, after these have been

warmed, and the small race to the outside. Note that on engines after DD.101 and BD.3-5138 a circlip has been incorporated between the oil seal, Part No. 90-147, and the main bearing on the generator side, the oil seal being outside the bearing.

On the driveside, the oil seal, Part No. 90-749, is located inside both bearings on D.1 engines after 1954 and all D.3 engines. Earlier models have the oil seal, Part No. 90-284, between the two main bearings. Take note of the number and thickness of any shims fitted either side of the flywheel assembly; and also of the crankshaft distance collar between the flywheels and bearing on the generator side. This collar has been replaced by an oil drag fan on later models.

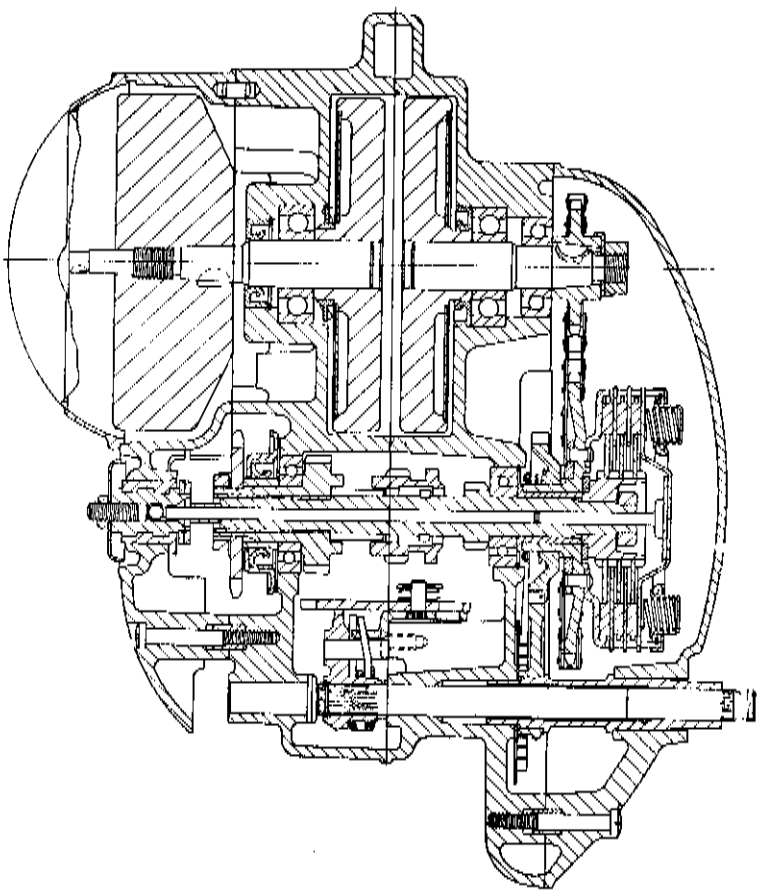

Fig. D8A—Horizontal Secton of Engine Unit.

Flywheel Assembly

It is advisable at this stage to test the big-end bearing for wear. This is done by taking hold of the connecting rod stem and pulling it upwards until the crank is at top dead centre. Then holding it in this position try gently but firmly to pull and push the connecting rod in the direction of its travel in order to feel whether there is any play.

If the big-end is in a sound condition there should be no play in this direction, although it may be possible to rock the rod sideways, *i.e.*, at right angles to the axis of the machine. If vertical play is perceptible in the big-end it must be decided whether the amount in

evidence is permissible or not. The bearing is not likely to need replacing however, provided that the machine has been carefully used and adequately lubricated, for it is of ample dimensions for the work it has to do. But if for any reason the big-end bearing has deteriorated as the result of neglect or abuse, it should be replaced.

If it has been decided that the big-end bearing must be replaced the flywheels should now be parted, using Service Tool No. 61-3206 (Fig. D9). Place the flywheels in the bolster and position the stripping bars ,Service Tool No. 61-3208. Use the punch Service Tool No. 61-3209 to drive out the crankpin. Take off the uppermost flywheel and reverse the lower one in the bolster. Again using Service Tool No. 61-3209 drive out the crankpin.

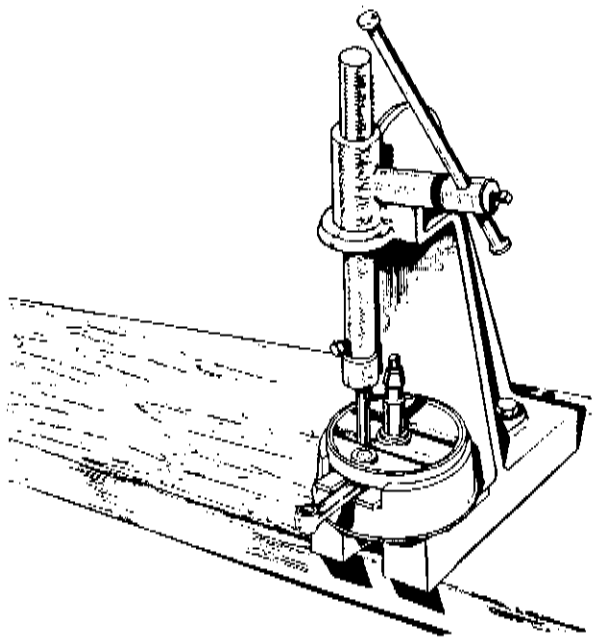

Fig. D9—Parting the Flywheels with Service Tool 61-3206.

Kickstarter Mechanism

The kickstart ratchet spring, Part No. 90-39, is secured in position by a circlip and pressed metal collar. Take off the circlip and collar and remove the kickstarter ratchet pinion.

Gearbox (See also Service Sheet No. 506)

The gearbox control shaft carries on its serrated end inside the case a gear selector claw 'G' (Fig. D16), Part No. 90-190. This is held in position by a circlip, Part No. 90-51, and fitted around the boss of this claw is a double ended coil spring. This is housed inside a metal cover 'K', Part No. 90-54. The two ends of the spring fit one either side of a peg driven into the claw, and also pass over a projection on the bridge piece of the gear selector mechanism, thus acting as a centralising device for the claw.

The bridge piece, Part No. 90-56, is secured by two ¼-in. bolts 'B' and locking washers to the alloy case, and carries the gear selector quadrant, on a central pin positioned by a spring and plate.

The end of the gear selector quadrant is located in a spring loaded plunger, Part No. 90-47, pressed into the bottom of the alloy case 'A' (Fig. D16).

The mainshaft oil seal housing 'D' (Fig. D12), Part No. 90-72, is held in position on the gearbox end of the drive side crankcase half by three $\frac{5}{16}$ in. screws and shakeproof washers, which, when removed, reveal a plate 'A', Part No. 90-133, held by two $\frac{3}{16}$ in. screws and washers. This plate functions as a positioning plate for the gearbox mainshaft ball race and layshaft phosphor bronze bush.

The mainshaft oil seal housing contains the gearbox sprocket distance sleeve, Part No. 90-71, 'F', and an oil seal of the spring loaded type, Part No. 89-3006, 'E'.

Clutch Control

The flywheel generator alloy cover (Fig. D6), carries the clutch actuating lever and quick-action screw, Part No. 90-180. If this mechanism needs attention, remove the metal cover, Part No. 90-106, which acts as a dust cover to the clutch lever actuating screw, then remove the extension spring, Part No. 19-122, from the actuating lever and press out the lever and screw from the case. In the centre of the screw is a steel ball, adjusting screw, Part No. 90-105, and Locknut, Part No. 89-366.

This completes the dismantling of the Engine and Gearbox Unit.

Removal of Lucas Generator

The dismantling of the engine unit is identical with the exception of the removal of the Generator.

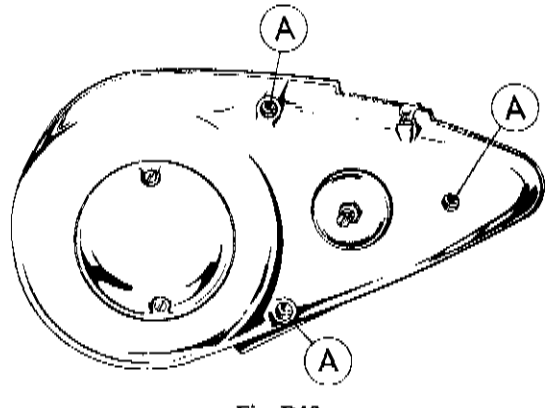

Fig. D10.

Remover the 3 screws ('A' Fig. D10) and take off the cover.

Take off the 4-$\frac{1}{4}$in. nuts holding the Stator and remove the centre bolt securing the cam and rotor.

Insert the extractor tool No. 90-297, screw up tight to remove the rotor from the mainshaft.

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