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MODEL C15
DISMANTLING AND REASSEMBLING THE CLUTCH, GEARBOX AND GEARCHANGE

The gears are contained in a separate housing formed in the rear portion of the crankcase and become accessible after the inner and outer timing covers have been removed from the R/H side of the unit, so that the valve timing pinions are uncovered at the same time.

Parts such as the kickstart spring and pawl, cam plate and spring, selector forks and footchange return spring, can be replaced without removing any other parts but if the gears are to be removed then the whole of the primary drive must be dismantled first.

Primary Drive

Disconnect the alternator lead by pulling out the three connectors. Remove the left hand footrest, it is fitted to a taper shaft and will require a sharp blow with a mallet to release it after the nut which has a L/H thread, has been removed.

Place a large flat tin under the primary chain case to catch the oil, and take out the 10 screws holding the cover. The screws are of three different lengths and careful note should be taken of their respective positions to facilitate refitting, screw *M* (Fig. C5A) also serves as the level plug.

Depress the rear brake pedal and take off the primary chain case cover.

To remove the stator take off the three nuts and washers *E* (Fig. C6A) and pull the alternator lead through the rubber grommet in the back of the chain case.

Note carefully that the stator plate is fitted with the lead on the outside.

Bend back the tab of the lock washer *B* (Fig. C6A) under the engine main shaft nut and remove the nut *C* which has a R/H thread.

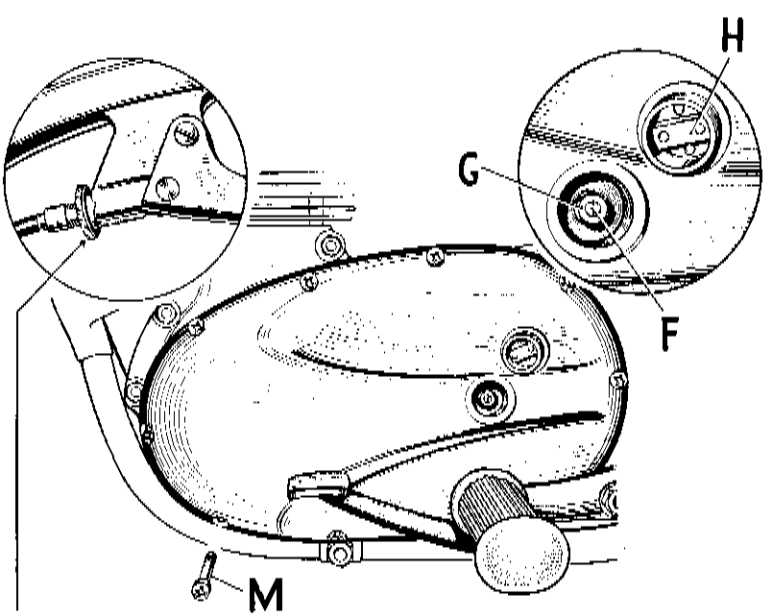

Fig. C5A. Clutch Adjustment

It will facilitate the removal of the nut if top gear is engaged and the rear brake applied.

Pull off the rotor and take out the Woodruff key to avoid it being lost.

Remove the four spring retaining nuts *P* (Fig. C6A) on the clutch, and withdraw the springs and cups. The pressure plate *L* (Fig. C6A) and the remaining clutch plates can now be removed but note should be made of the order in which they are fitted.

Bend back the tab of the lock washer and unscrew the gearbox main shaft nut. The lock washer has a special tongue which engages in the hub of the clutch and it must be refitted in the same way.

The thrust washer which will now be exposed is recessed on one side and must be fitted with the recess outwards.

Pull out the clutch push rod, engage top gear, apply the rear brake, and unscrew the gearbox main shaft nut.

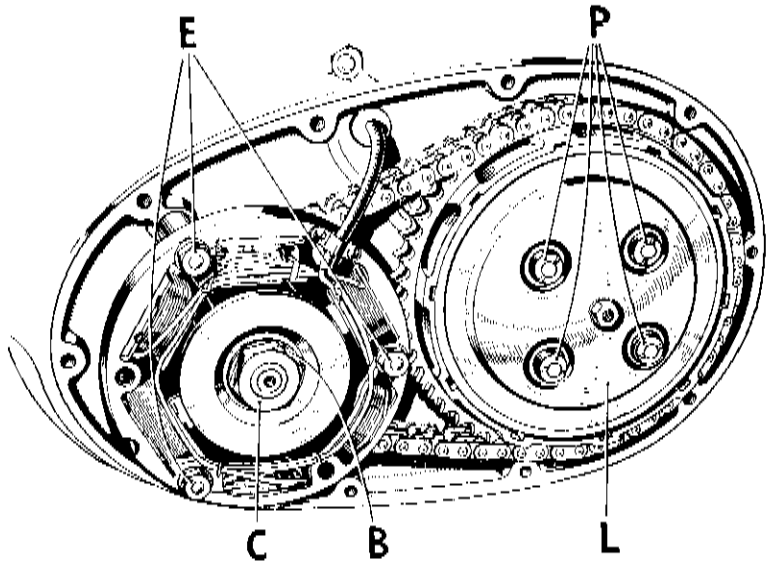

Fig. C6A. Clutch and Generator Removal.

With extractor number 61 3583 (Fig. C7A) the clutch sleeve can be freed from the tapered main shaft and the chainwheel, chain and engine sprocket withdrawn together and laid face down on the bench with the spring studs uppermost.

The clutch centre *B* (Fig. C8A) can be lifted out leaving the sleeve *C* and rollers in the chainwheel.

To examine the cush drive rubbers take out the four counter sunk head screws and lift off the front cover plate, unless wear or damage is suspected however the rubbers should not be disturbed.

New rubber inserts *E* (Fig. C8A) should be fitted as shown with the thicker segment being inserted first on the pressure or driven side of the vane and compressed by slightly rotating the vane, when the thinner segments can be pressed into position.

When reassembling the clutch, note that the plates are alternately plain and segmented, the first plate next to the chainwheel being plain.

With the clutch removed the detachable plate registered in the rear half of the chain case is now exposed.

Take out the six counter sunk head screws and remove the plate complete with the oil seal.

If the oil seal is suspected of being faulty or leakage has occurred it should be replaced, care being taken not to damage the outer surface of the bush on which the seal bears.

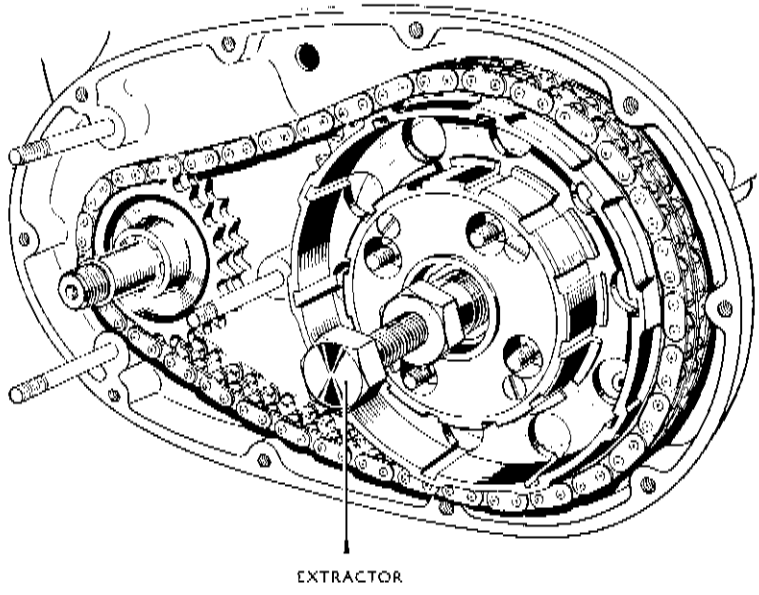

Fig. C7A. Removing the Clutch.

Between the circular plate and the end of the pinion sleeve is a felt washer, the purpose of this washer is to prevent grit damaging the oil seal.

At this stage the gearbox can be dismantled providing the main shaft high gear (or pinion sleeve) is not being disturbed, but if complete dismantling is required the tab washer under the sprocket nut should be turned back and the nut slackened off while it is still possible to engage the gears.

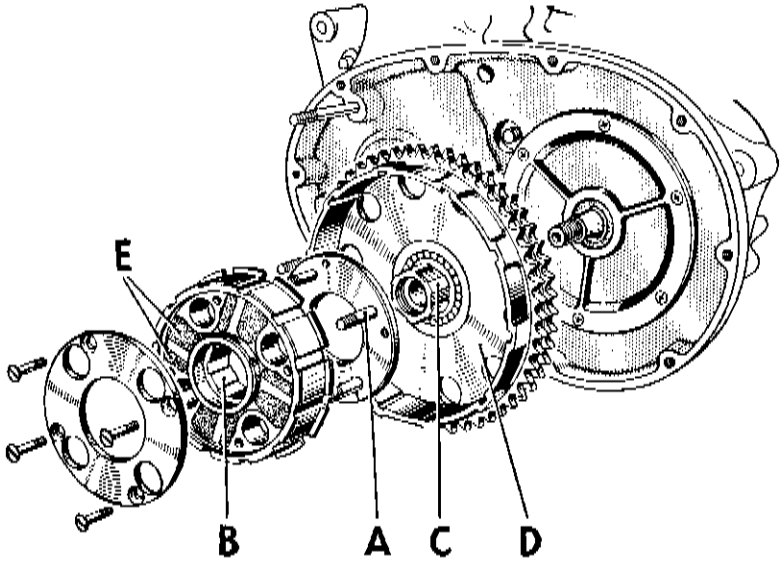

Fig. C8A. Cush Drive Unit.

It is now necessary to turn to the other side of the engine unit to remove the inner and outer timing covers.

Take off the exhaust system by slackening the pinch bolt in the finned collar and removing the bolts securing the pipe and silencer to the frame.

Scribe a pencil mark across the body of the distributor and the top of the crankcase to assist in resetting the ignition timing.

Release the pinch bolts in the kickstart and foot change levers and remove the levers, slacken the R/H footrest nut and tap the footrest down out of the way.

Unscrew the seven outer cover retaining screws, noting their respective locations, particularly the long small headed screw which also clamps the contact breaker unit.

With the outer cover removed disconnect the clutch cable and withdraw it through the back of the inner cover, being careful not to lose the ball located in the thrust button on the clutch actuating lever.

Prise the kickstart return spring anchor plate (Fig. C9A) off the two flats on the spindle and remove the plate and spring.

Turn back the tab on the lock washer under the cam shaft nut and remove the nut, lock washer, thrust washer and the small locating peg for the thrust washer.

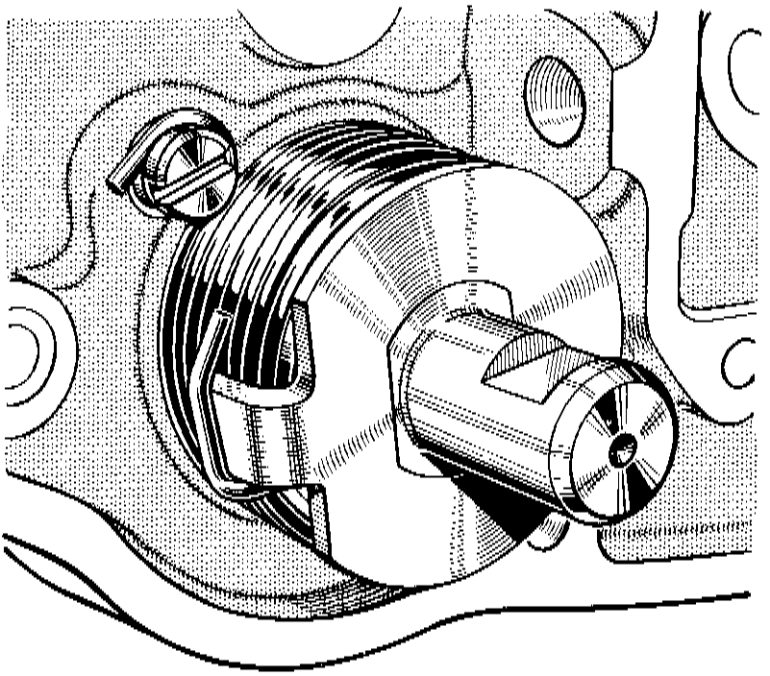

Fig. C9A. Fitting the Kickstarter Spring.

Take off the cover plate adjacent to the gear change spindle by removing the two screws and remove the split pin from the cam plate pivot.

The pivot pin can now be withdrawn towards the L/H side leaving the cam plate in the gearbox.

After removing the eight recessed screws the inner cover joint can be broken by tapping the kickstart spindle boss with a mallet. Ease the cover off gently, applying finger pressure to the spindle ends to avoid displacing other components.

The gear cluster, shafts and actuating parts are now exposed together with the valve timing gears and dismantling on the R/H side is therefore the same as for exposing the valve timing pinions.

Unscrew the fulcrum bolt *E* (Fig. C10A) carrying the return spring when the plunger quadrant, shaft and spring can be removed. The cam plate can now be taken away from the selector forks.

If the cam plate spring blade *B* (Fig. C11A) attached to the rear wall of the gearbox is satisfactory it need not be disturbed.

The gear cluster together with the main shaft, lay shaft and selector forks can now be withdrawn leaving the selector fork shaft and pinion sleeve in position in the box.

While the gears can be removed from the shafts it should be noted that the smallest gear on the mainshaft is a press fit, thus retaining the adjacent gear, similarly the inner most gear on the lay shaft is a press fit also retaining the adjacent gear.

Note position of thrust washers.

Do not disturb the high gear (or pinion sleeve unless it is known that the bearing or oil seal is faulty, but if it is to be removed, take off the rear chain, sprocket, locknut and tab washer.

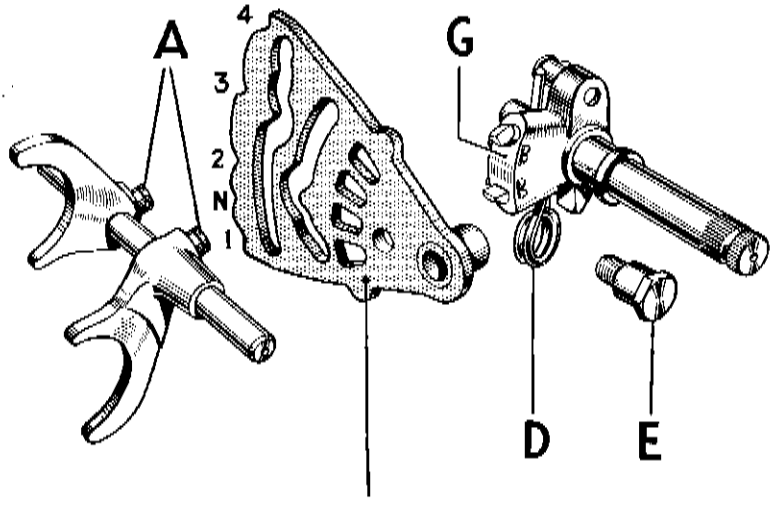

Fig. C10A. Gearchange Mechanism.

Heat the portion of the gearbox round the pinion sleeve by applying rag dipped in boiling water and tap the bearing and pinion into the gearbox shell. The replacement should be inserted while the gearbox is still warm and driven well home.

Reassembly

Pick up the main shaft and lay shaft complete with the gear cluster and the selector forks as shown in Fig. C11A.

The selector forks are interchangeable but it is advisable to replace them in their respective positions.

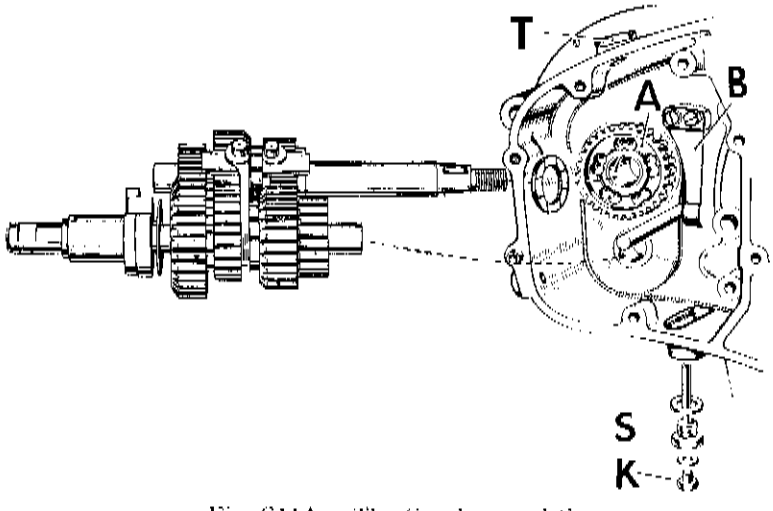

Fig. C11A. The Gearbox and Gears.

Now slide the whole assembly carefully into position locating the selector forks over the spindle as the assembly enters. Engage the cam plate in the 2nd gear notch (Fig. C10A) on the leaf spring at the back of the box and over the rollers on the selector fork pegs.

Replacing the Footchange Return Spring

Hold the shaft in a vice using soft clamps, with the short end and the peg uppermost, then with two substantial tools such

as screwdrivers, one through the loop and the other between the prongs twixt the spring *D* (Fig. C10A) and force it over the short end of the shaft so that the prongs lie in the position shown in Fig. C12A. The spring will be squared up when the pivot bolt *E* is screwed home.

Insert the footchange lever quadrant shaft into the box and start the bolt *E* (Fig. C10A) with the fingers, twisting the spring slightly at the same time, finally locking the bolt securely.

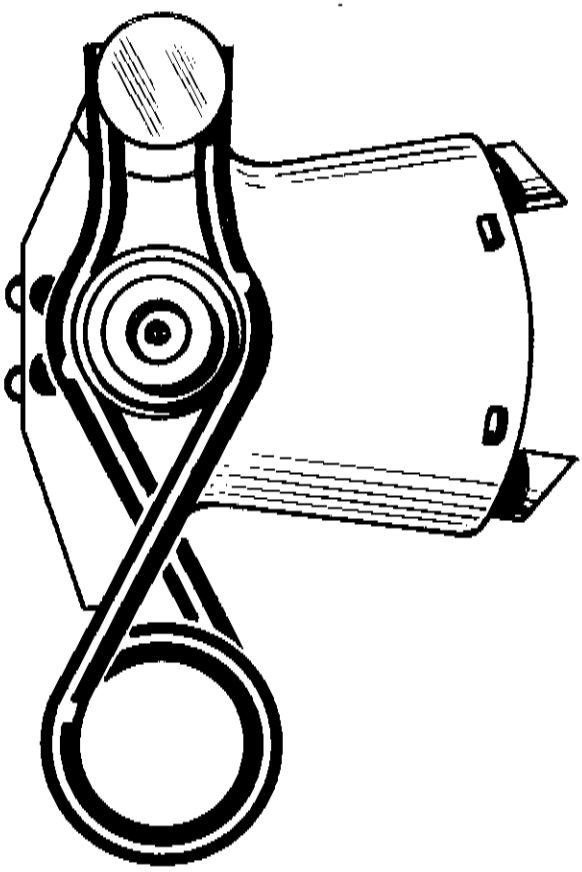

Fig. C12A. Fitting Footchange Return Spring.

See that the crankcase and inner cover joint faces are clean, apply a thin film of jointing compound and slide the inner cover over the various spindles at the same time carefully guiding the cam plate into the slot in the inner cover. Make sure that the cover is close up to the crankcase, replace the eight screws, the cam plate pivot pin, split pin, the washer and cover over the pivot and the two screws.

Before proceeding further check the gear selection.

Place the kickstart spring in position with hook over the stop plate screw, engage the tag on the anchor plate in the outer end of the spring and turn the plate anti clockwise approximately 180° to engage the plate over the two flats on the spindle as shown in (Fig. C9A).

Pass the clutch cable through the back of the inner cover, apply a dab of grease to the pad on the clutch thrust arm and insert the small steel ball, then connect the cable to the arm.

Replace the thrust washer on the cam shaft with counter sunk face outwards and insert the small peg in the shaft, fit the tab washer and nut, tighten securely and turn the tab over.

Now replace the outer cover being careful to screw the small headed screw into the distributor clip.

Fit the remaining screws and the kickstart and foot change levers.

Primary Case

If the gearbox sprocket has been removed it must now be replaced with the boss inwards, then the tab washer and nut.

Thread the rear chain over the sprocket and couple up the ends, select top gear, apply the rear brake then tighten the sprocket nut securely, finally turning over the tab washer.

Where the oil seal is being replaced in the chain case back, it should be pressed in from the gearbox side flush with the cover and the lip inwards.

Place the felt grit protection washer in position over the bronze bush and against the end of the pinion sleeve.

Refit the cover with a paper gasket which need only be jointed on one side and screw in the six counter sunk head screws. Place the felt washer over the gearbox main shaft next to the cover. Replace clutch push rod.

Smear the clutch sleeve *C* (Fig. C8A) with grease and place the 24 rollers in position. Next slide the chain wheel over the rollers and the clutch centre *B* (Fig. C8A) over the splines of the clutch sleeve. Place the engine sprocket on the bench alongside with the boss upwards and thread the primary chain over both the sprocket and chain wheel pulling the chain taunt.

The engine main shaft distance piece should not have been disturbed but if it was removed for any reason it must now be replaced with the chamfered side inwards.

See that the Woodruff keys are fitted to both main shafts and that they are a good fit in the keyways.

Pick up the engine sprocket, chain and chain wheel in both hands and slide them over their respective shafts. Place the thick washer with the recess outwards in position against the clutch sleeve then the tab washer which has a special tongue fitting into the clutch centre, then the lock nut. Turn the tab washer over the nut after tightening.

Now place the clutch plates in position starting with one plain plate then one segmented plate and so on alternately, there being five plain plates and four segmented plates.

Place the pressure plate in position then the four spring cups and springs which should be of equal length. If there is any doubt about the condition of the springs, replace them since they are quite cheap to buy.

Screw on the four spring nuts until the underside of each head is approximately 1/8 in. from the face of each cup.

If the springs are compressed excessively, the handlebar lever will be stiff to operate, alternatively, if the spring pressure is insufficient the clutch will tend to slip. Adjust for true running of the plates by declutching and depressing the kickstart lever, when it will be seen if the plates are running true or not. If necessary, adjust the nuts individually to correct any run out.

Replace the rotor with the recessed face outwards, fit the tab washer and nut, turning the tab over the nut after tightening securely.

Place the three distance pieces on the stator plate studs and replace the stator with the lead wires on the outside and at the top.

Screw on the three nuts and spring washers and tighten evenly.

The air gap between the rotor and stator should be equal all round, when correct thread the lead wires through the rubber grommet in the back of the case.

Refit the primary case and the 10 screws, shortest at the rear and longest at the front.

Connect up the lead wires, check the ignition timing, and finally tighten the distributor clamp screw and replace the exhaust system.

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