BSA SERVICE SHEET No. 301

Reprinted November 1959

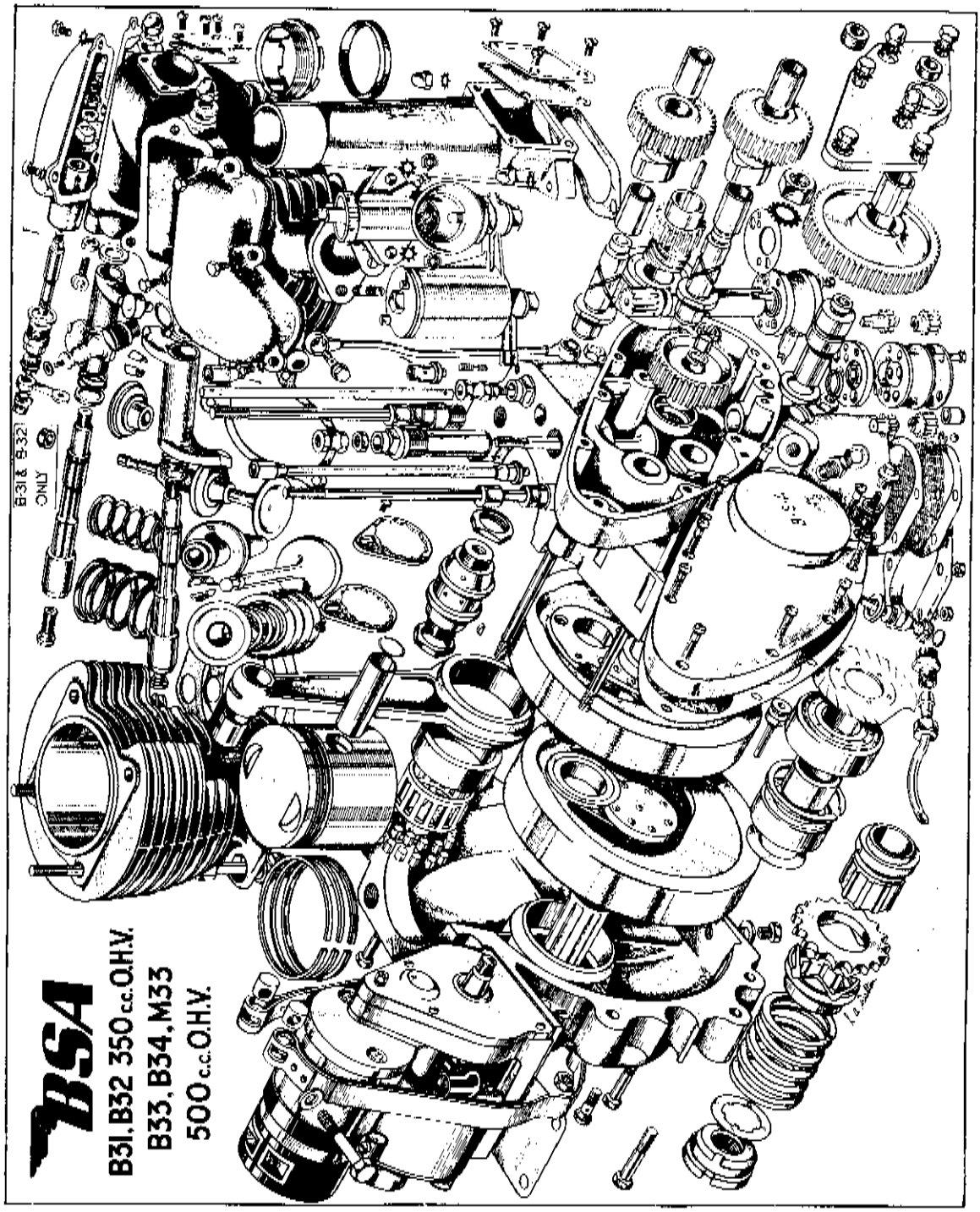

Fig. B1. The "B" Group Engine (Except "G.B." Series) (Exploded View)

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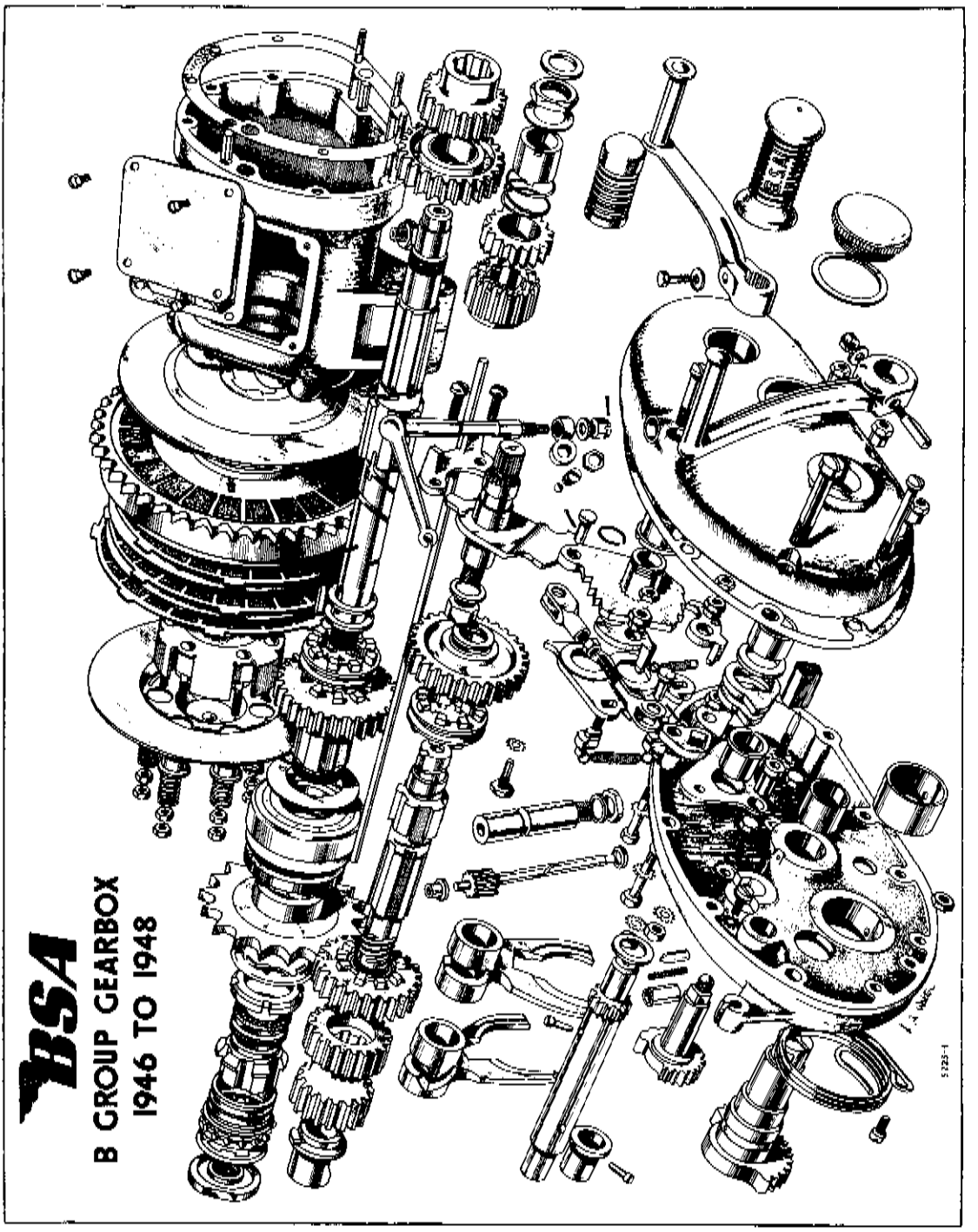


B.S.A. MOTOR CYCLES LIMITED, Service Dept., Birmingham, 11.
(PRINTED IN ENGLAND)

BSA SERVICE SHEET No. 302A

Reprinted December 1958

Four Speed Gearbox

(Swinging Arm Models)

BSA

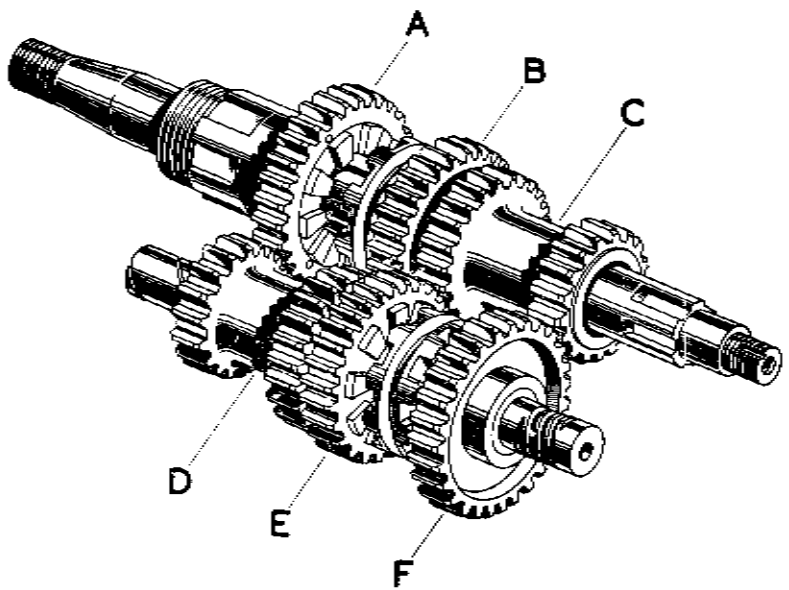
SERVICE DEPARTMENT, B.S.A. MOTOR CYCLES LTD., BIRMINGHAM 11. M.C. 527

GEAR RATIOS B and M GROUP (RIGID and PLUNGER)

MODELS B32 & B34		PART No.	No. of TEETH
MEDIUM CLOSE (Scrambles)	A	15—4165	23
	B	66—3312	25
	C	65—3435	18 x 22
	D	24—4221	17 x 20
	E	65—3437	23
	F	65—3439	27
MODEL		B32	B34
ENGINE SPROCKET	Part No.	15—1568	15—1567
	No. of Teeth	16	17
GEAR BOX SPROCKET	Part No.	65—3504	65—3504
	No. of Teeth	16	16
Gear Ratios with the Combination of Pinions and Sprockets above	Top	7.06	6.53
	Third	9.3	8.74
	Second	12.15	11.41
	First	17.44	16.33

STANDARD (TRIALS)		PART No.	A	B	C	D	E	F
		No. of TEETH	28	25	22 x 16	20 x 17	25	29
MODEL		B31	B32 and Gold Star	B33	B34 and Gold Star	M20 Solo	M21, M22 Solo	M20, M21, M22 S Car	M33 S Car
ENGINE SPROCKET	Part No.	15—1569	15—1568	15—1565	15—1564	15—1566	15—1564	15—1568	15—1567
	No. of Teeth	17	16	15	20	18	20	16	17
GEARBOX SPROCKET	Part No.	65—3508	65—3504	65—3503	65—3504	65—3503	65—3503	65—3503	65—3503
	No. of Teeth	19	16	19	16	19	19	19	19
Gear Ratios with the Combination of Pinions and Sprockets above	Top	5.6	7.06	5.2	5.64	5.38	4.75	5.94	5.59
	Third	7.38	9.3	6.83	7.44	6.95	6.25	7.81	7.37
	Second	11.5	14.5	10.63	11.55	10.82	9.72	12.1	11.5
	First	16.7	21.1	14.9	16.81	15.76	14.15	17.7	16.72

MODELS B32 & B34		PART No.	No. of TEETH
EXTRA CLOSE (Road Racing)	A	66—3315	26
	B	66—3312	25
	C	65—3435	18 x 22
	D	66—3222	19 x 20
	E	66—3266	22
	F	65—3447	26
MODEL		B32	B34
ENGINE SPROCKET	Part No.	15—1568	15—1564
	No. of Teeth	18	20
GEAR BOX SPROCKET	Part No.	65—3503	65—3503
	No. of Teeth	19	19
GEAR RATIOS with the Combination of Pinions and Sprockets above.	Top	5.28	4.75
	Third	6.97	6.28
	Second	8.9	8.22
	First	9.86	8.88



BSA SERVICE SHEET No. 302C
Reprinted October 1958

BSA SERVICE SHEET No. 303

October, 1948
Reprinted May, 1958

B Group and M33 Models

ENGINE DISMANTLING FOR DECARBONISING

Symptoms which indicate that decarbonising is necessary

Decarbonising and "top overhaul" of an engine is extremely simple, but it should only be carried out when the engine really needs it, which normally should be only at periods over 2,000 miles. The usual symptoms are an increased inclination to "pink" (a metallic knocking when under heavy load) due to the building-up of carbon on the top of the piston and inside the cylinder head; a general falling-off of power noticeable mainly on hills, and a tendency for the engine to run hotter than usual.

The correct procedure for decarbonising is described by stages.

Removal of Petrol Tank, etc.

It is first necessary to remove the petrol tank. Turn off the petrol tap and detach the petrol pipe. If the speedometer is mounted in the tank, disconnect the speedometer drive by releasing the strainer bolt under the tank, raising the speedometer clear of the tank and unscrewing the knurled nut connecting the drive to the instrument. If the speedometer is mounted on the fork yoke it need not be disturbed. Remove the tank securing bolts and lift the tank from the frame top tube.

Next detach the high tension lead and remove the sparking plug. Disconnect the steady-stay from the rear of the cylinder to the frame, and then take off the carburetter by removing the flange bolts. Take care not to damage the carburetter flange washer. By unscrewing the ring nut at the top of the carburetter, the slide can be pulled right out and tied up to the top tube out of the way, while the main body of the instrument can be completely removed. By unscrewing the exhaust pipe and silencer clips to the frame, the pipe and silencer can be removed complete.

Removing Cylinder Head

Disconnect the oil feed pipe from the rocker spindles and the return pipe from the inlet rocker box. Note that the union screw plugs for the oil pipe to the rockers have a much smaller hole in the side than the union for the return pipe a point to remember when re-assembling.

The exhaust valve lifter cable can either be disconnected, or the exhaust rocker box cover removed leaving the cable intact. Remove the inlet valve rocker box cover. Slacken the castellated gland nut securing the push-rod cover tube to the cylinder head (a special C spanner is provided for this). Detach the tappet inspection cover at the base of the tube and undo the two acorn nuts clamping the base of the tube to the crankcase.

Lastly unscrew the four long bolts holding the cylinder head and barrel to the crankcase, applying the spanner to the top, or smaller diameter, hexagon. The larger diameter hexagon screws the bolt sockets into the crankcase and should not be touched unless it becomes necessary to replace a holding down bolt, when the complete assembly of bolt and socket must be fitted.

The cylinder head, complete with push-rod cover tube, should now be raised, the push-rods lifted off the tappets and dropped to the crankcase face. The head and push-rod cover tube can now be lifted upwards and forwards clear of the barrel. Note that the head has plain ground joint to the barrel, no gasket being used. If the head shows a tendency to stick, a few light taps with a wooden mallet under the exhaust port will loosen it. With the head clear of the machine, the push-rod cover tube can be detached.

Decarbonising

Rotate the engine by means of the kickstarter until the piston is at the top of its stroke, and scrape off the carbon deposit with an old penknife, taking care not to damage the piston crown.

All traces of carbon must be cleaned from the cylinder head in a similar manner. This is preferably done after the valves have been removed (see below) in which case care must be taken to avoid damaging the valve seats.

Grinding-in Valves

It is not necessary to remove the rockers in order to take out the valves and springs, but if it is decided to strip the head completely, it is only necessary to undo the acorn nuts on the rocker spindles and tap these out, preferably using a small centre punch so as not to damage the threads on the spindle ends. Careful note should be kept of the rocker assembly for replacement—i.e., the spring, followed by the steel washer, and finally the aluminium oil seal washer.

To remove the valves place a wooden block, of a size which will fit inside the cylinder head, on a bench, and then lay the head over the block with the valve heads resting on it. Lift off the hardened end caps if fitted from the valve ends, and then compress the valve springs until the split collets can be removed. When the collets are out, the valve springs and top collar can be lifted off.

Valve grinding should only be attempted if the seatings are not pitted. If badly pitted the seats must be re-cut, and a special tool 61-3305 is available for this operation Fig. B3. Attempts at grinding-in in this case will result in wear of the valve seats, and the valves may become pocketed.

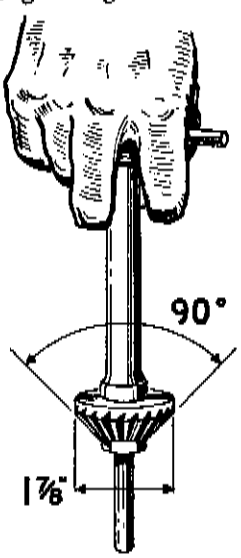


Fig. B3. The Valve Seat Cutter

Smear a small quantity of grinding compound (obtainable from any garage or accessory shop) over the face of the valve, and return the valve to its seat. Hold the valve with the special tool provided and rotate the valve backwards and forwards whilst maintaining a steady pressure. The valve should be raised and turned to a new position after every few strokes. Grinding should be continued until the valve seat and face show a uniformly polished surface all round. It is most important that valves should be ground-in on their correct seats. Both valves are marked, one "IN" and the other "EX", for identification purposes.

Before replacing the valves and springs, all traces of grinding compound must be removed from both faces and seats, and the valve stems smeared with engine oil.

Replacing Valve Guides

If new valve guides are to be fitted, the removal of the original ones is quite a simple operation, and necessitates the use of a valve guide punch (Fig. B4) and a hammer to drive the guides out of the cylinder head.

For B31, B32 and Gold Star inlet guides use Service Tool No. 61-3265, the dimensions of which are "A" ½" diameter, "B" .310" diameter.

Service Tool No. 61-3268, "A" ½" diameter, "B", .350" diameter should be used for B31, B32 and Gold Star exhaust valve guides and for inlet guides on models B33/34 and M33.

For exhaust guides on B33/34 and M33 use Service Tool No. 61-3263 "A" ½" diameter, "B" .370" diameter.

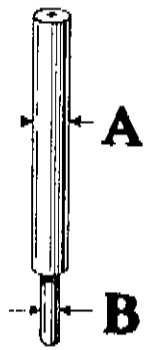


Fig. B4

Valve Springs

After a period of several thousand miles it may be desirable to renew the valve springs as these tend to lose their efficiency due to heat. If the springs are renewed while decarbonising, it will save dismantling specially to replace them at a later date.

Piston and Ring

While the engine is dismantled, it is advisable to examine the piston, rings and cylinder barrel. Lift the barrel upwards and forwards into the front angle of the frame, and as the piston emerges from the barrel it should be steadied to prevent possible damage. When the barrel is removed, cover the mouth of the crankcase with rag to prevent dust and grit falling in. To remove the piston from the connecting rod it is first necessary to take out one of the gudgeon pin circlips. This is best accomplished with a pointed instrument such as the tang of a file suitably ground.

Before the gudgeon pin can be withdrawn it may be necessary to heat the piston with the aid of rags immersed in hot water, wrung out, and held round the piston. Then, supporting the piston, tap the gudgeon pin through using a light hammer and a punch.

When the piston is free, mark the inside of the piston skirt at the back, so that it can be replaced the correct way.

If the rings are stuck in the grooves they will need to be carefully prised free and removed from the piston. All carbon deposit should be carefully scraped from the grooves and the inside edges of the rings. If either of the rings shows brown patches on the face, replace with a new ring.

Check the piston ring gap by inserting the piston in the barrel and sliding each ring independently up to the skirt of the piston. Check the gap with feeler gauges; this should not be less than .008" or more than .012". Fit new rings if the gap exceeds the figure stated. It is advisable to check the gap of new rings before fitting, and if the gap is less than .008" the ends of the rings should be carefully filed to the correct limit.

It should be noted that piston rings are very brittle, and unless handled very carefully are easily broken.

Re-assembly

Re-assembly is carried out in the reverse order and points to note are as follows:

When assembling the piston it is advisable to heat it as explained in 'dismantling' in order that the gudgeon pin can be fitted easily (if a degreaser is available the required temperature can be reached by a few seconds immersion). Make sure that the piston is fitted the correct way round and that the gudgeon pin circlips are firmly located. The piston ring gaps should be 'staggered' around the piston circumference and the piston oiled liberally before the barrel is fitted.

Remember that it is essential that the valves are fitted to their correct seats.

Before fitting the cylinder head place the push rod cover tube in position, but do not screw up the gland nut. Place the push rods inside the tube and lift the head into position, keeping the head raised until the rods are located on the tappet, then position them on the rockers. Lower the head into position and replace the acorn nuts securing the push rod tube. Screw up the long cylinder head and barrel bolts in diagonal order until they are tight. The push rod cover gland nut can now be tightened up and the tappets adjusted as described in Service Sheet No. 604. Connect up the oil feed pipes to the rockers and replace the engine steady stay.

The fitting of the exhaust pipe, valve lifter cable and fuel tank are perfectly straightforward and should present no difficulty.

B.S.A. MOTOR CYCLES LTD.
Service Dept., Birmingham, 11
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BSA SERVICE SHEET No. 304

Revised March, 1958

B Group Models

REMOVING ENGINE FROM FRAME AND COMPLETE DISMANTLING

Procedure for removal of the engine from the frame will commence from the point reached on Service Sheet No. 303 where the cylinder head and barrel had been removed.

Drain the oil tank, and disconnect the oil pipes. Detach the leads to the dynamo, and the earth wires situated on the magneto near the contact breaker housing. Then disconnect the ignition control cable at the handlebar end.

Models with Engine Prefix Letters G.B.

After draining the oil tank disconnect the leads to the ALTERNATOR and the Contact Breaker.

Chaincase Removal

The chaincase and primary transmission should be removed as described in Service Sheets 307 or 310 on Primary Transmission (on models fitted with alternator refer to Service Sheet No. 315.)

Engine Removal

Remove the bolts securing the engine plates to the crankcase and then unbolt and remove the front engine plates. Slacken the gearbox bolts as these tend to clamp the rear engine plates together. The engine is now ready to be lifted from the frame.

Dismantling the Engine

It is advisable, before commencing to dismantle the engine, to construct a simple jig as shown in the accompanying diagram, on which the engine can be mounted (see Fig. B.5.) Alternatively one of the crankcase lugs can be clamped in a vice, with the weight of the crankcase being taken by a suitable support.

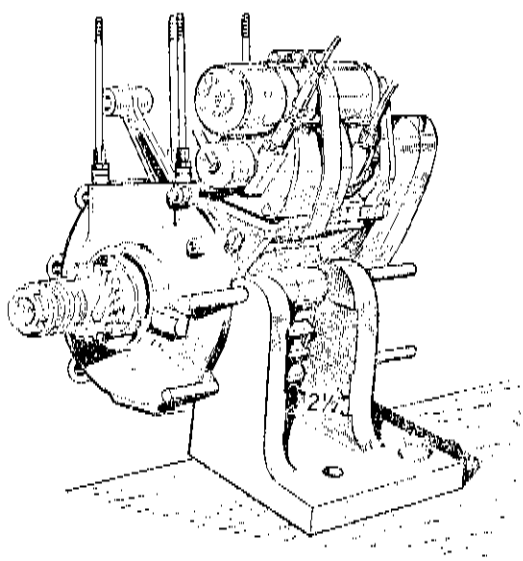

Fig. B.5. Angle Bracket for Mounting Engine

Place a tray underneath the engine to catch any oil which may drip, and then remove the timing cover. Removal of the timing cover screws will be greatly facilitated if a comparatively large screwdriver is used.

Some difficulty may be experienced in removing the timing cover owing to the adhesion of the sealing compound, and in this case the lugs at the end of the cover should be tapped gently to break the joint.

Care should be taken to ensure that the small nozzle in the timing cover which feeds oil to the big-end is not damaged or distorted in any way, as it may subsequently foul the mainshaft and get broken off, and thus starve the big-end and cylinder barrel of lubrication.

Removing Magneto Pinion

This pinion locked on to the magneto shaft by its taper, and after removing the nut, an extractor (61-1903) must be applied to the threads on the inside of the pinion to withdraw the pinion. Next slacken off the magdyno strap bolt, and remove the magdyno as a complete unit.

Note.—There is a composition oil seal washer behind the magneto pinion, and there may be shims fitted to the base of the magneto. These items must be replaced when rebuilding.

Models with Engine Prefix Letters G.B.

The Contact Breaker pinion is secured to its shaft by a pin and circlip and need not be disturbed unless the pinion is to be replaced, the unit can be withdrawn complete with the pinion after the 3 nuts have been removed. A paper gasket is used between the back of the timing case and the Contact Breaker.

Out-rigger Plate

Remove the engine mainshaft nut, and the six bolts which hold the plate in position. It will be noted that all these bolts are not alike, and they must be replaced in the same position as prior to removal. The plate and all the pinions with the exception of the timing pinion can now be removed, and to withdraw this pinion an extractor (61-3256) should be applied. (See Fig. B.6.)

To obviate the possibility of damage to the mainshaft, a plug of suitable dimensions should be placed in the oil hole of the mainshaft. If the pinions are rebushed they should

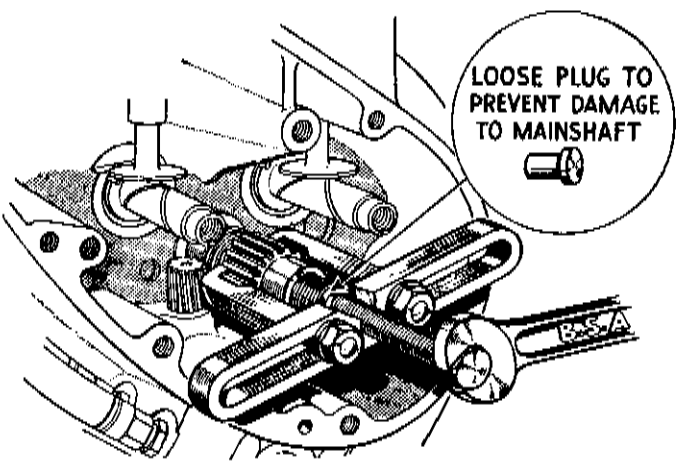

Fig. B.6. Engine Shaft Pinion Extractor 61-3256

be reamed out to .6255 in.-.6250 in. for the cams, and .7505 in.-.7495 in. for the idler pinion. The correct size for the bearing in the out-rigger plate is .815 in.-.814 in.

Before the oil pump spindle is released it is necessary to remove the locating plunger which is situated in the timing case. This plunger has an internal thread, and a timing cover screw can be inserted and used to pull out the plunger once the washer has been removed. (See Fig. B.7.)

Pump Removal

Unscrew the four nuts in the base of the crankcase, and remove the pump cover plate with the filter and joint washers. Now the two bolts holding the pump in position can be removed and the pump, together with the spindle, withdrawn from the crankcase.

Note.—The bolts holding the pump on to its seating can be identified by the spring washers under the heads of the bolts. The other bolts, which do not have washers under the head, serve to hold the pump together, and these should not be touched unless the pump is faulty and it is necessary to replace the internal parts.

If it is necessary to replace the cylinder holding-down bolts, the originals should now be removed, and the crankcase will be ready for splitting.

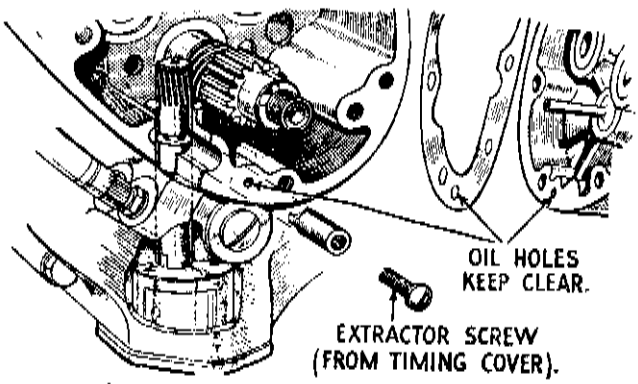

Fig. B.7. Oil Pump Spindle Locking Plunger

Splitting the Crankcase

Remove all the bolts around the crankcase joint, and draw each half of the crankcase from the flywheels. It will be noted that the outer races of the drive and gear-side roller bearings will stay in the crankcase. The ball race in the drive-side crankcase half is held in position by a spring ring, and this ring must be removed before any attempt is made to press out the bearing.

To remove the outer race of the roller bearings, a punch must be applied, as shown in Fig. B.8, and the removal of these races will be greatly facilitated if the crankcase is first heated by immersion in boiling water.

To remove the drive-side ball bearing, take out the distance piece which is normally positioned between the ball and roller bearings, remove the spring ring and use a press tool to press the bearing from its housing.

If it is desired to remove the cam pinion spindles they can easily be withdrawn by means of an extractor (61-691), but do not remove these spindles unless it is absolutely necessary. If it is necessary to replace a tappet, of course, the cam spindles must be removed so that the tappets can be drawn out downwards into the timing cover. When removing tappets it is necessary to unscrew the tappet guides in addition to withdrawing the cam spindles, and in the case of the exhaust guide the timing pinion must also be removed.

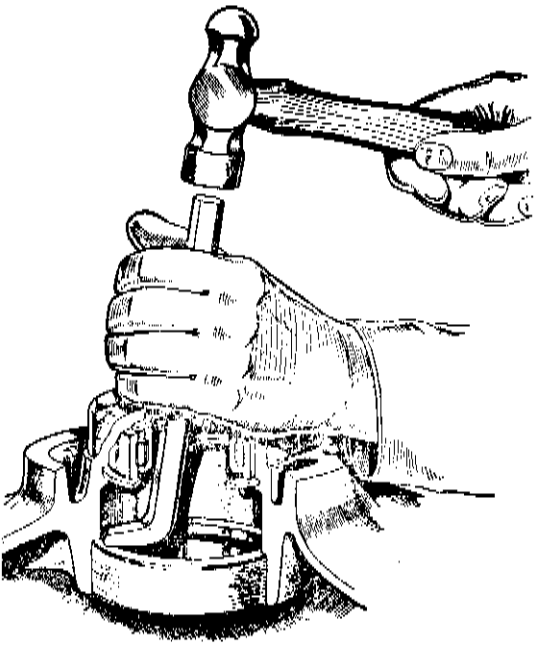

Fig. B.8. Roller-race extraction (driveside).

Parting the Flywheels

Remove the locking plates holding the crankpin nuts, and unscrew the nuts. It will be found that considerable leverage is necessary to unscrew these, and it is suggested that a length of strong tubing of suitable size be applied to the spanner so that the desired leverage may be obtained.

The crankpin is a taper fit in the flywheels, and can be released by being tapped smartly with a mallet.

In the event of big-end wear we do not advise the fitting of oversize rollers, and the whole big-end assembly should be replaced. When a new big-end bearing has been inserted it is necessary for it to be ground out to 1.7702/1.7704 in., as a slight distortion is liable to occur when the bearing is pressed in.

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Service Dept., Birmingham, 11
Printed in England.

BSA SERVICE SHEET No. 305

Revised March, 1958

B Group Models

RE-ASSEMBLING THE ENGINE

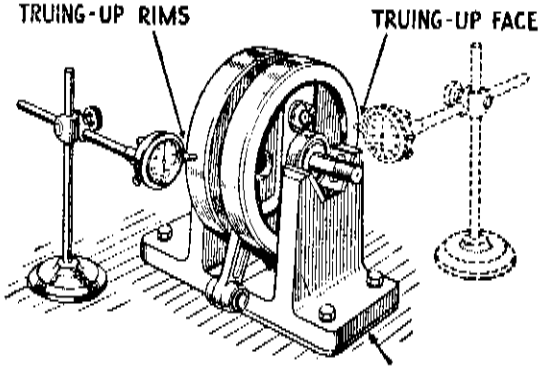
The need for extreme cleanliness cannot be over-emphasized.

Parts should be thoroughly cleaned and all trace of any anti-rust preparations with which new parts may be coated must be removed.

All bearing surfaces should be liberally smeared with engine oil when assembling.

Flywheels

If the big-end assembly is to be renewed it is as well to check the weight of the new components against those which have been removed. A slight variation in the weights is inevitable, but provided that the discrepancy does not exceed 1½ ozs. no further action need be taken. This tolerance should not be exceeded, since in the first instance the flywheels have been balanced to suit the original parts, and the balance may be adversely affected if the weight of the new components varies considerably from that of the original ones.



Suitable packing under timing side "vee" block to compensate for smaller diameter bearing

Fig. B.9

The driving side flywheel should now be fitted to the crankpin (this is the side with the keyway) and the nut tightened up by hand. Fit the timing side flywheel and again tighten the crankpin nut by hand.

In order to tighten the crankpin nuts properly, the whole flywheel assembly must be held rigidly. For this purpose, it should be mounted in a large vice (fitted with lead clamps) with the driving side flywheel uppermost. If a large enough vice is not readily available an alternative method is to fix rigidly to the bench in a vertical position, two 1 1/16 in. diameter posts, the distance between their centres being 3⅞ in. Midway between the posts a hole of 1 in. diameter should be bored in the bench to receive the mainshaft. The flywheel assembly is mounted on these posts so that they pass through the holes bored

The magdyno can now be fitted to the crankcase and its straps loosely coupled up. Make sure that the dowels in the base engage properly in their holes in the platform, and that any packing shims are refitted. Refit the idler pinion between the inlet cam pinion and the magdyno pinion, but do not replace the pinion retaining plate at this stage.

Models fitted with Alternator

Replace the Contact Breaker using a new paper gasket, if the old one is damaged, no shims are required.

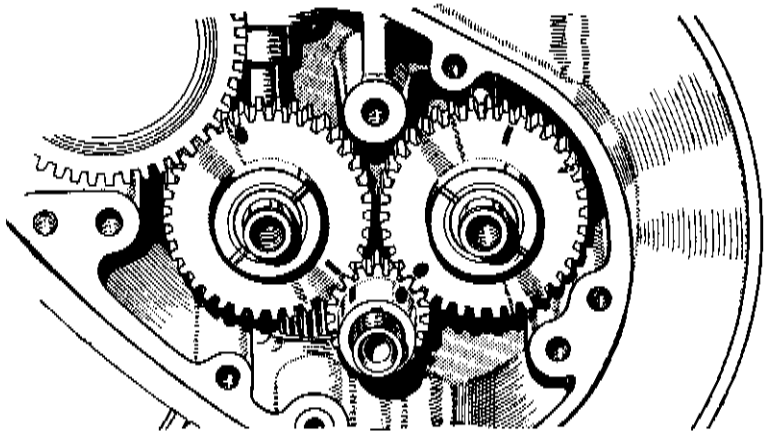


Fig. B.11. Valve Timing

An oil sealing washer is fitted behind the magdyno pinion, and this should be temporarily removed. Replace the magdyno pinion on its taper; it need not be driven on very firmly, but just tight enough to prevent slip. Check the backlash between this pinion and the idler. If excessive, the gear will be noisy; if insufficient, a whining noise will result.

In order to adjust the backlash, shims are fitted under the magdyno if necessary, when the engine is first built. If a different magdyno is being fitted, it is essential this backlash be checked carefully, shims of a different thickness being used as required.

Remove the magdyno pinion once more, replace the oil sealing washer and again fit the magdyno pinion loosely in position. It is preferable to leave the setting of the ignition until the barrel and piston are in position, and for this reason the magdyno pinion should not be tightened up. The valve timing can now be set. Replace the pinion retaining plate, noting that the coarse threaded bolts screw into the crankcase bosses, and then fit the lockwasher and nut on the engine mainshaft. Play between the pinions and the retaining plate should be .002 in./.003 in.

ASSEMBLY FROM THIS POINT WILL BE THE SAME AS AFTER DECARBONISING. (SERVICE SHEET No. 303).

B.S.A. MOTOR CYCLES LTD.
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BSA SERVICE SHEET No. 306

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B Group Models
(Up to 1948)
REMOVAL, DISMANTLING AND RE-ASSEMBLY OF GEARBOX

The Gearbox described in this sheet is fitted to models up to Engine No. ZB——101. The Gearbox fitted after this number is described in Service Sheet No. 608.

Removal from Frame

To remove the gearbox from the frame the primary chaincase, clutch and cush drive must be removed as described on Service Sheet No. 304 under the heading of Removal of Engine from Frame. The clutch cable rear chain and speedometer drive must also be disconnected.

Withdraw the gearbox bolts and when removing the box from the frame note that the gearbox adjustment bolt which is situated in the rear of the gearbox shell, and moves the gearbox backward or forward to adjust the tension of the primary chain, must be disengaged from the frame lug.

Before dismantling remove the gearbox drain plug so that any oil in the gearbox can be run off.

Disconnect the foot change lever and kick starter lever, and then unscrew the four bolts in the rear of the gearbox cover behind the foot change mechanism, and the screws in the gearbox end cover. The end cover can now be withdrawn, permitting access to the foot change mechanism.

Next remove the pin from the link mechanism, and unscrew the large nut in the rear of the gearbox inner cover, which holds the foot change spindle in position. The gear-change mechanism can now be taken off as a complete unit. Take care not to lose the small plunger which is revealed when the mechanism is withdrawn.

The gearbox inner cover bolts may now be withdrawn, and the inner cover removed, complete with kick starter, quadrant spring, and foot change selector quadrant.

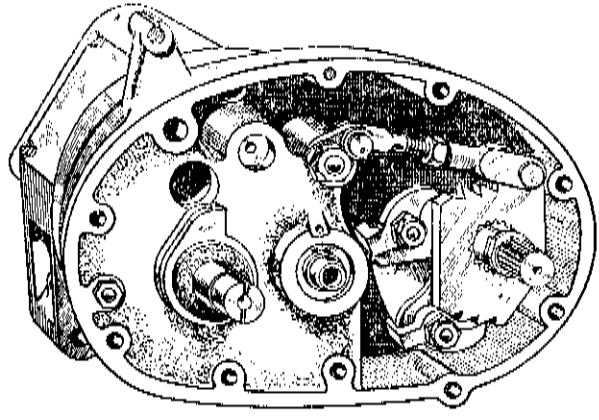

Fig. B.12. Gearbox shewing F/Change mechanism

When removing the gearbox inner cover careful note should be made of the positions of the various distance washers on the shafts, as these washers are of varying thickness and are fitted to allow the correct amount of end play in the shafts. This end play should be evident with the end cover bolted in position, but should not exceed .001 in. to .002 in.

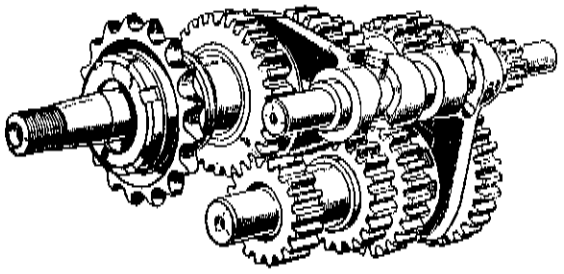

Fig. B.13. Four-speed gearbox interior

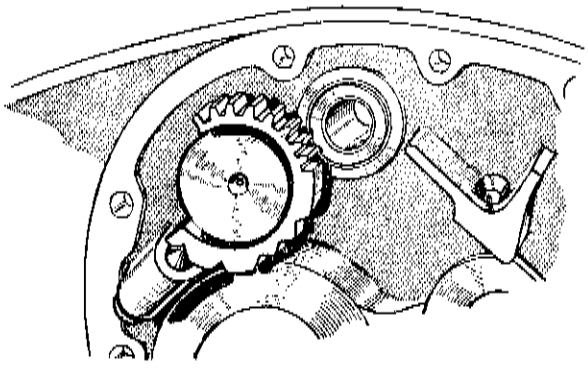

Fig. B.14. Selector quadrant

Replacing the Kickstarter return Spring

Should it be necessary to replace the Kickstarter return Spring, remove the screw retaining the Spring and rotate the Kickstarter quadrant to disengage it from the loop in the Spring. The quadrant can now be driven out with a copper hammer and the Spring removed. Note the position of the return stops on the quadrant shaft so that they may be replaced correctly.

If the gear selector quadrant is removed from the inner cover, care must be taken to ensure that the plunger is in position when re-fitting (Fig. B.14).

The gear cluster can now be removed from the gearbox shell, leaving only the pinion sleeve, mainshaft ballrace, and gearbox sprocket in position. These parts should not be removed unless they definitely require attention.

In the event of one of the above mentioned parts needing replacement, the sprocket ring nut washer must be flattened, and if difficulty is experienced in preventing the pinion sleeve from rotating, a piece of wood can be placed under the teeth of the sprocket, and a punch used to tap the ring nut loose.

Examine the various parts for wear, and if the sliding dogs show signs of seizure it is best to replace them. Attempts to erase the seizure marks will result in excessive side-play.

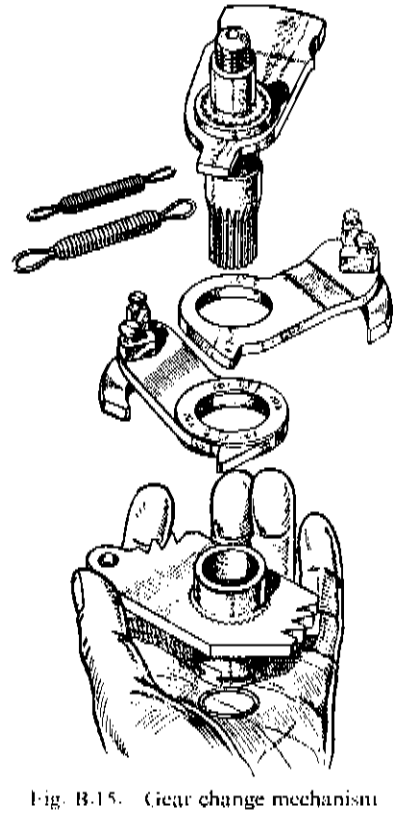

Fig. B.15. Gear change mechanism

Dismantling gear change mechanism

It is only necessary to prise the pawl springs off their pegs, and to remove the circlip, then the whole unit can be stripped into its separate components. The only parts likely to show signs of excessive wear are the pawls and the ratchet plate, and these should be replaced as necessary. If the pawl springs show signs of stretching they too, should be replaced.

Removing the Speedometer drive

This should rarely be necessary and the Speedometer drive should not be removed unless obviously needing attention.

Slack off the large nut on the drive and give the end of the drive a tap with a hide mallet. Remove the locating screw.

The large nut can now be used to withdraw the drive, distance pieces being built up behind the nut until the drive is fully withdrawn.

When replacing, after fitting the locating screw, fully tighten the large nut. Do not omit the fibre washer behind the nut or oil leaks may result.

Re-assembly

If it has been decided to fit a new ballrace to the pinion sleeve, make sure that the oil retainer washers are correctly replaced. The flat washer fits between the pinion and ballrace, and the remaining washer fits behind the ballrace, with its face against the bearing.

If the sprocket teeth are worn hook-shaped, a new sprocket must be fitted or rapid chain wear will take place. When the sprocket locknut has been tightened the locking washer must be knocked over into the grooves machined in the nut.

It is only possible to fit the gear cluster into the box when the shafts are assembled (with pinions in top gear position) outside the gearbox, and all inserted together.

Commencing with the layshafts, remove the bottom gear pinion, which is the large one fitted to the kickstarter end of the shaft, and hold the shaft with the left hand. Take the selector shaft and lift the fork at the kick starter end to the dog on the layshaft. Pick up the mainshaft complete, and engage the selector fork at the sprocket end of the shaft with the mainshaft dog. Slide the assembly into the gearbox shell and place the layshaft bottom gear pinion on its shaft. Verify through the inspection cover that the assembly is still in top gear, and replace the various packing washers on their shafts.

The shell is now ready to receive the gearbox inner cover, and after making sure that the kickstarter quadrant and selector quadrant are correctly positioned, a paper washer should be fitted to the cover joint, and the cover replaced. If difficulty is experienced in pushing the cover right home, a *slight* movement of the selector will permit the teeth to mesh. Fitting of the cover will also be simplified if the selector shaft distance washer is liberally coated with grease and positioned around the selector shaft bush on the inside of the cover *before* attempting to replace the cover.

The foot change mechanism may now be re-fitted, and the ratchet plates should be held in the left hand with the shortest length of the sleeve uppermost. Fit the pawl carriers and the spindle in the sequence as shown in the diagram so that the pawls engage with the teeth of the ratchet plate. Fig. B.15.

With the aid of a pair of pliers replace the springs on the pawls, and then fit the spindle circlip which holds the ratchet plate in position.

The unit is now ready for re-assembly in the gearbox. Make sure that the spring loaded plunger is in position in the inner cover before the unit is replaced. Couple the link arm to the ratchet plate, and take care to replace the split pin. Before proceeding with the assembly it is advisable to fit the foot change pedal loosely to its operating shaft, and by looking through the inspection hole, check that all the gears are being properly selected. At the same time the foot change mechanism can be tested to ensure that the springs return the pedal to the neutral position after each gear has been selected. If the selector dogs do not appear to go right home when the box is in top or bottom gear a slight adjustment to the length of the foot change link arm will cure this. It is necessary of course, to rotate the gearbox sprocket by hand while operating the gear change lever.

When all is found to be correct remove the gear change pedal while the gear cluster is in the top gear position, replace the clutch push rod, and finally put back the gearbox and cover with a new paper washer in position, and bolt into position. Next fit the foot change and kick starter levers to their shafts. Replace the gearbox in the frame, and loosely attach the fixing bolts. Reconnect the speedometer drive. Reassemble the primary chaincase inner half, cush drive, chain, and clutch. Rotate the gearbox adjusting bolt to give the correct tension to the primary chain, and then firmly tighten the gearbox holding bolts.

Note

The primary chain is correctly adjusted when it has ½ in. up and down play midway between the two sprockets.

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U/B2769

BSA SERVICE SHEET No. 307

Revised March, 1958

"B" Group Models

(Except those with engine prefix letters G.B.)

TRANSMISSION

Clutch Adjustment

The main clutch adjustment is enclosed inside the gearbox inner cover, and access is gained by the removal of the knurled oil filler cap.

The nut 'A' locks the adjusting screw 'B' in position, and to adjust the clearance between the ball and the end of the clutch push rod nut 'A' must be unscrewed, and screw 'B' rotated by means of a screwdriver until the necessary clearance is obtained.

Note. It is essential that a very slight clearance is permitted between the ball and the push rod at all times when the clutch is not being operated.

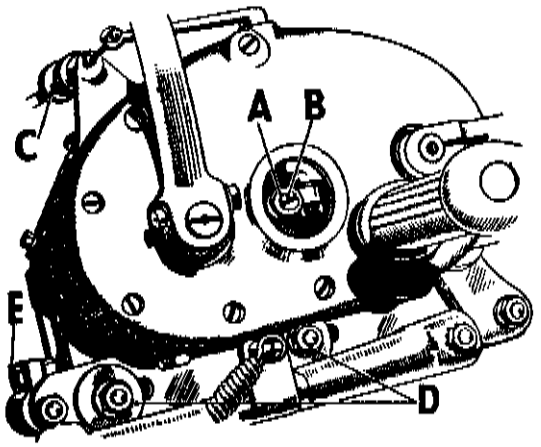

Fig. B16. Clutch adjustment

Further adjustment is provided by the knurled nut 'C' on the top of the gearbox. Remember, however, that some free movement in the control arm is necessary, for if the adjustment is too tight there will be a constant pressure on the clutch, with consequent wear and loss of efficiency.

Primary Chain Adjustment

The front chain tension is adjusted by moving the gearbox backwards or forwards in the frame, and this movement is carried out by slacking off the two large nuts D which attach the gearbox to the rear of the engine plates, and then screwing the adjuster bolt E which is attached to the rear of the gearbox shell either in or out. When the chain is at the correct tension, that is, with ½in. up and down play at the tightest part of the chain, tighten the nuts on the gearbox bolts and re-check the adjustment. Note that after tightening the primary chain the rear chain will be in need of adjustment.

Chain Case Removal

Drain off the oil in the case by removing the drain plug in the rear half. Remove the left hand footrest. The footrests are mounted on splines and may be rather tight. However, a few light blows on the front of the footrest will allow it to be worked clear. Remove the small screws round the rim of the chaincase and pull off the outer half, taking careful note of the positioning of the cork washers and distance pieces to facilitate re-assembly.

To dismantle the cush drive assembly, bend back the cush drive nut locking washer by inserting a small screwdriver through the coils of the spring, and remove the nut. With-

draw the locking washer, the spring, and the cush drive sliding sleeve. If any difficulty is experienced in unscrewing the cush drive nut due to the engine rotating, place the machine in gear and apply the back brake.

Remove the clutch in the manner described in Service Sheet 308.

Remove the engine sprocket and pull the cush drive bearing off the mainshaft. Unscrew the three bolts which hold the inner half of the chain case to the crankcase, after breaking the locking wire which passes through the heads of the bolts. There now remains only one nut which holds the rear chainguard to the primary chaincase, and this nut can quite easily be removed if the chaincase is pulled off the crankcase register.

Re-assembly of the primary transmission and chain case should be carried out in the reverse order to dismantling.

Rear Chain Adjustment (Rigid Frame)

The rear chain is adjusted by means of cams on the rear spindle, which operate against stops on the frame stays (see Fig. B17). To adjust, loosen the spindle nuts, and with a spanner on the end of the spindle, rotate the spindle. The wheel will then slide backwards, increasing the tension on the chain. Rotate the wheel slowly, and check chain tension. This tension is correct when there is $\frac{1}{2}$ in. up and down play in the chain at its tightest point. Make sure that both cams are held against their stops, and then tighten up the spindle nuts—first the left hand nut, and then the right hand one. Now check the wheel alignment by means of a straightedge placed alongside the wheels. This straightedge should touch both walls of each tyre if the tyres are the same size.

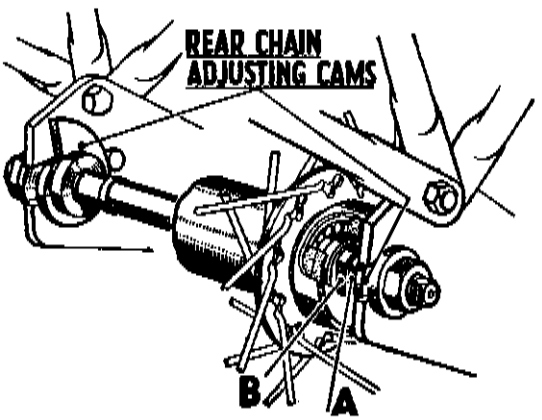

Fig. B17. Chain adjustment

It is a good plan to remove each chain periodically, thoroughly clean them in paraffin, and then gently warm them in a mixture of grease and graphite. When cool, wipe off excess grease, clean sprockets, and replace chains. Remember when fitting spring links that the closed end of the spring fastener must always face in the direction of travel.

For rear chain adjustment on spring frame models see Service Sheet 212C.

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BSA SERVICE SHEET No. 308

Revised Nov., 1959

M Group, C 10, C 11, A Group (S.A.), and B Group

(Except those with engine prefix letters G.B.)

DISMANTLING AND RE-ASSEMBLING THE CLUTCH

Take off the nearside footrest and then undo all the screws round the rim of the chaincase. As the outer half of the chaincase cover is taken off, careful note should be made of the positioning of the washers, etc., for replacement purposes. The joint washer should be carefully preserved.

Remove the six adjusting nuts, the springs and spring cups, and take off the clutch pressure plate so exposing the mainshaft nut which holds the clutch body in position.

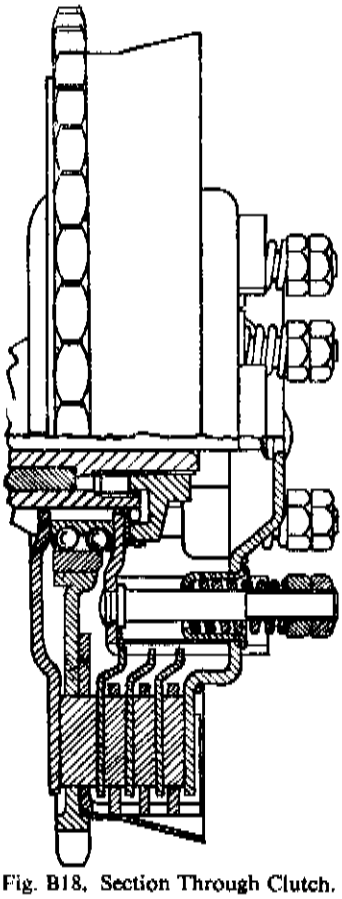

Fig. B18. Section Through Clutch.

The mainshaft nut is prevented from undoing by a locking washer which is turned over a flat on the nut. Flatten out the turned over edge of the washer and remove the nut. The clutch centre can now be withdrawn from the taper on the mainshaft using an extractor (Part No. 61—3362). Take care that the mainshaft key is not mislaid.

When the clutch is removed from the mainshaft it can be completely dismantled and the various components examined for wear. Special attention should be paid to the slots in which the clutch plates slide and any grooves should be removed with the aid of a fine file. If the grooves are very deep their removal will mean that the plates have excessive clearance and rapid wear will ensue. If the sprocket teeth are worn to a hook shape the sprocket must be replaced, otherwise rapid chain wear will result.

The steel plates should be smooth and if badly scored they should be replaced, while the fabric and cork inserts will require a thorough washing in petrol if there is any trace of oil on them. If the inserts are glazed or saturated in oil they should be replaced.

Finally, examine the balls, ball cages and tracks. If wear on the chainwheel bush or on the bearing boss of the clutch centre exceeds .0015in. the bush or centre should be replaced (see Service Sheet No. 702 for correct dimensions).

Note: When fitted to certain models this clutch is provided with additional plates, thus necessitating the use of a wider chain wheel and clutch centre, but the method of dismantling and re-assembly is unaltered. C10 and C11 Models have less plates than shown in the diagram but dismantling and assembly remain the same.

Re-Assembly of the Clutch

The clutch is of straightforward construction and a study of Fig. B18 will show how the parts are assembled. Do not forget the mainshaft key when replacing the clutch centre.

The plates must be fitted in their proper order as follows: Drive plate (tongues on inner diameter), fabric insert plate, drive plate, etc. Before re-fitting the pressure plate it is advisable to smear a small quantity of grease on the centre button at the point of contact with the clutch push rod.

The clutch springs should be replaced if they have shortened appreciably. The spring retaining nuts should be tightened initially until the outer nut 'A' (Fig. B19) is just fully engaged on its thread.

It is most important that the clutch spring pressure is evenly distributed, and this should be checked by ensuring that the clutch pressure plate does not tilt when the clutch is withdrawn. If the plate does tilt the nuts should be adjusted until the spring pressure is even. Unequal spring pressure may cause clutch drag and noisy gear change. When the adjustment is complete tighten the locknuts firmly.

Clutch Re-Adjustment

After a considerable mileage has been covered it may be necessary to screw the spring retaining nuts in further to allow for wear on the clutch inserts. Release the locknuts 'A', and tighten the nuts 'B' by a few turns. After the adjustment has been carried out, check that the clutch lifts evenly and then tighten the locknuts.

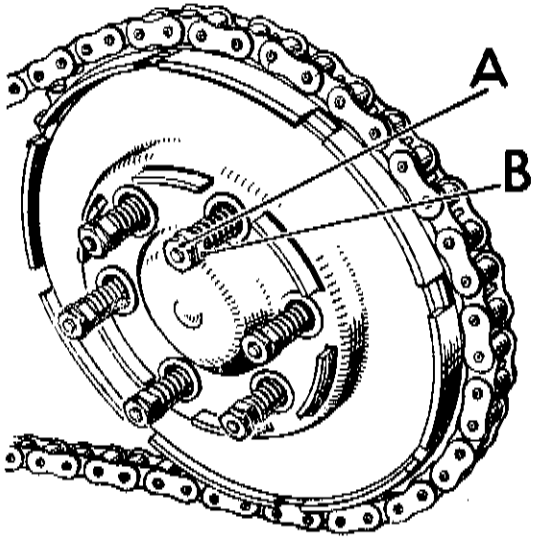

Fig. B19. Clutch spring adjustment.

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B and M Group Models

RIGID FRAME MODELS FITTED WITH TELESCOPIC FORKS

ADJUSTMENT, DISMANTLING and RE-ASSEMBLY OF THE REAR HUB AND BRAKE

Rear Wheel Removal.

The rear wheel is not of the quickly detachable type, and has a riveted up brake drum. To remove the wheel it is necessary to disconnect the rear chain and the rear brake-rod and release the spindle nuts. Next disconnect the tail lamp wire, and remove the detachable portion of the rear mudguard by unscrewing the two bolts adjacent to the rear lifting handle. The wheel can now be pulled out. If a rear wheel drive speedometer is fitted the cable must be disconnected before the wheel can be removed.

Rear Hub.

Taper roller bearings are fitted to the rear hub, and these can be adjusted by loosening the locknut A (Fig. B.21) and tightening or loosening the nut B as required. Both nuts are on the opposite side to the brake drum. Do not overtighten the adjusting nut for it is most important that a very slight amount of side play is permitted in the wheel rim, or very

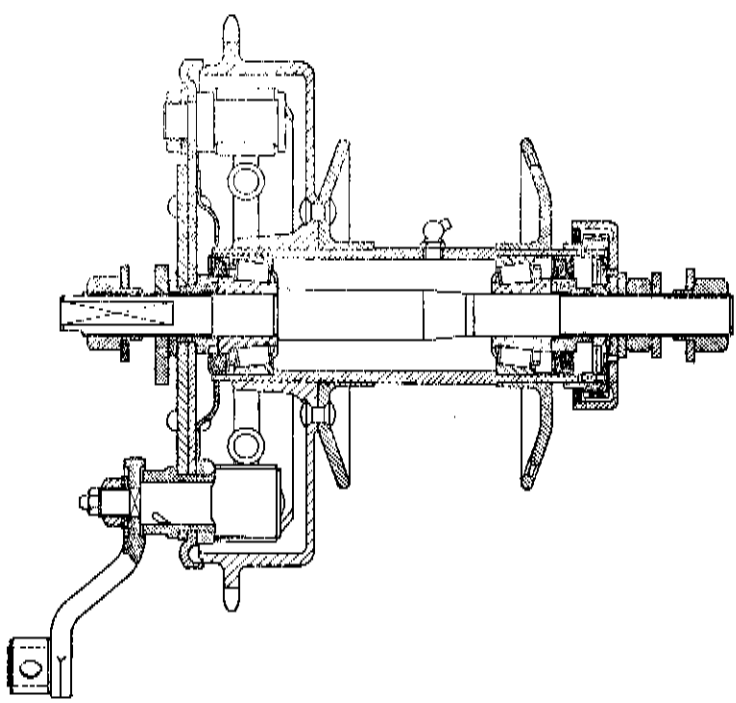

Fig. B20. Section of Rear Hub

rapid wear will take place. Adjustment should be made so that $\frac{1}{64}$in. side play is apparent at the rim after the locknut has been finally tightened. It will be noted that, when fitted, the speedometer drive must be removed in order to gain access to the adjusting nut. Some M Group machines have a dust cover fitted in place of the speedometer drive gearbox.

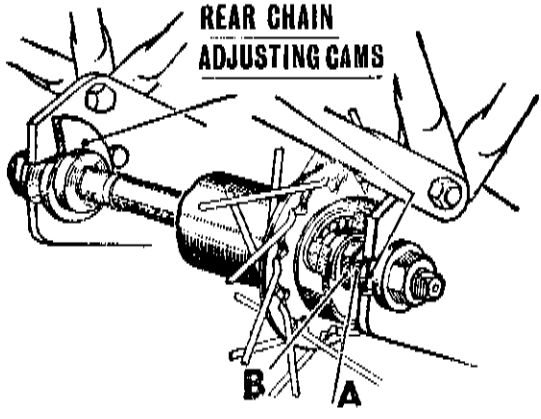

Fig. B21. Hub adjustment.

Hub Dismantling.

Remove the bearing adjusting nut and locknut. Tap the spindle out of the hub, towards the brake drum side, with a hide or copper mallet. The outer bearings may then be removed with the aid of a suitable soft drift.

Hub assembly is carried out in the reverse order to the dismantling. Care should be taken, when replacing the outer bearings to ensure that they are tapped quite home so that they are square in the hub.

Full details of brake adjustment and dismantling are given in Service Sheet 212A.

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J.U. B3437

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A and B Group Models

(With Welded Type Frame)

(Except those with Engine prefix letters GB)

PRIMARY TRANSMISSION

Clutch Adjustment

Two adjustments are provided for the clutch control arm on the gearbox outer cover. The first of these is at the clutch push rod and is exposed when the inspection plate is removed. It consists of a grub screw *H* (Fig. B22) and locknut *G*. Between the inner end of the screw and the clutch push rod a steel ball is inserted, and the grub screw must be adjusted so that there is just a little clearance between the ball and push rod.

To carry out this adjustment loosen the locknut and with the aid of a screwdriver adjust the grub screw. Then retighten the locknut.

The other adjustment is provided by the cable adjuster on top of the gearbox. Remember that some free movement in the control arm is necessary as, if the adjustment is too tight, there will be constant pressure on the clutch with consequent wear and loss of efficiency. The control arm pivot should be greased occasionally by means of the grease nipple *F*.

Primary Chain Adjustment

Adjustment of the front chain is achieved by pivoting the gearbox backwards and forwards on the bottom support bolt. To adjust the chain, remove the knurled inspection cover on the primary chaincase and slacken the nuts *A* and *B* (Fig. B22) which clamp the top and bottom gearbox lugs in the rear engine plates. An adjuster is attached to the right hand side of the top gearbox bolt. Slacken the locknut *C* and screw the

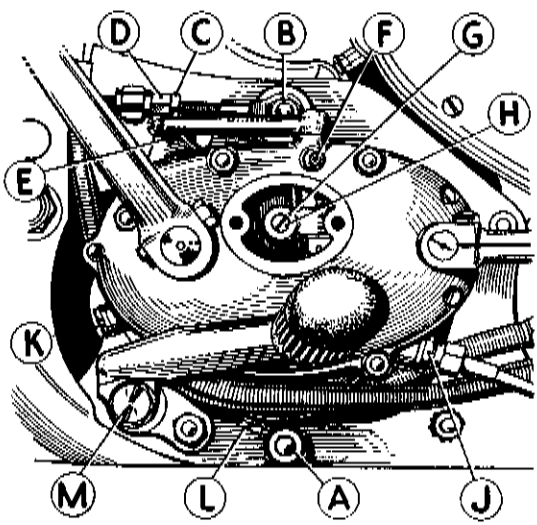

Fig. B22

adjuster *D* backwards or forwards until the chain tension is correct. This is when the maximum up and down movement of the chain at the tightest point is ½ in. Tighten the gearbox bolt nuts *A* and *B*, also the adjuster locknut, and re-check the adjustment. Note that after re-adjusting the primary chain, the rear chain will be in need of adjustment.

Chaincase Removal

Drain off the oil in the case by removing the drain screw in the lower edge of the primary chaincase. Two of the screws retaining the primary chaincase outer cover have red painted heads. The front one of these is the chaincase oil level screw, and the rear one the drain screw. Remove the left hand footrest. This may be rather tight, but a few light blows on the front of the footrest should free it. Undo the small screws round the rim of the chaincase and pull off the outer half.

To dismantle the cush drive assembly, bend back the cush drive nut locking washer by inserting a small screwdriver through the coils of the spring, and remove the nut. Withdraw the locking washer, the spring and the cush drive sliding sleeve. If any difficulty is experienced in unscrewing the cush drive nut due to the engine rotating, place the machine in gear and apply the back brake.

Remove the clutch in the manner described in Service Sheet 308.

Remove the engine sprocket and pull the cush drive bearing off the mainshaft. Unscrew the bolts which hold the inner half of the chaincase to the crankcase, after breaking the locking wire which passes through the heads of the bolts. There now remains only one bolt which secures the rear of the chaincase to the frame, and its removal will allow the chaincase to be detached.

Re-assembly of the primary transmission and chaincase should be carried out in the reverse order to dismantling.

Before replacing the cush drive nut ensure that the lock washer is correctly located in the splines on the mainshaft.

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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.

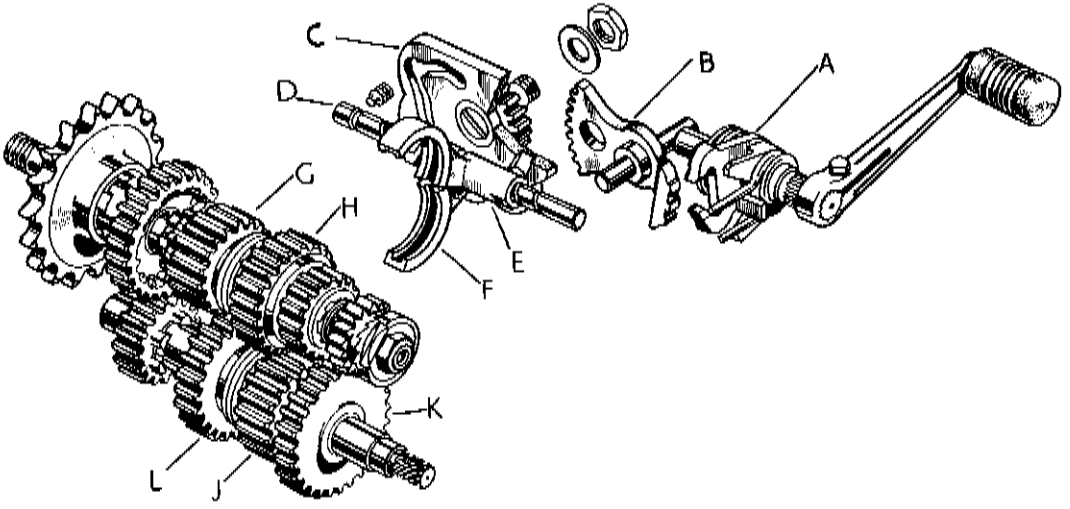
The gearchange mechanism can be dismantled by removing the gearchange lever and the circlip which retains the gearchange spindle in the outer cover. Withdraw the spindle complete with change mechanism which can then be completely dismantled after removing the split pin. Examine the operating claw '*A*' 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.

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BSA SERVICE SHEET No. 312

Revised October 1955

B Group (Swinging Arm Frame)

USEFUL DATA

Engine stroke		88 mm.			
Engine bore		B31—71 mm.		B33—85 mm.	
Engine capacity		B31—348 c.c.		B33—499 c.c.	
Petrol tank capacity		3½ gallons.			
Oil tank capacity		5 pints.			
Gearbox capacity		1 pint.			
Front fork capacity (each leg)		¾ pint (212 c.c.)			
Chain case capacity		1/7 pint (80 c.c.).			
Tappet clearance (engine cold)		.003 in. inlet and exhaust.			
Piston ring gap		.010 in.			
Piston ring side clearance		.002 in.			
Piston clearance (bottom of skirt)		B31—.0005 in. to .0016 in., B33—.0006 in. to .00275 in.			
Ignition setting (fully advanced)		7/16 in. before T.D.C. (¾ in. B33 model).			
Contact breaker gap		.012 in.			
Compression ratio		B31—6.5 : 1.		B33—6.8 : 1.	
Sparking plug		Champion. L10S.			
Sparking plug gap		.018 to .020 in.			
Valve timing	Inlet	Opens 25° before T.D.C.		Closes 65° after B.D.C.	
	Exhaust	Opens 65° before B.D.C.		Closes 25° after T.D.C.	
Carburettor.		B31 (Monobloc).		B33 (Monobloc).	
Bore		1 in.	1 in.	1⅛ in.	1 ⅛ in.
Main jet		150	260	200	260
Throttle valve		6/4	376/3½	29/4	376/3½
Needle position		3	2	3	3
Needle jet		.1065	.1065	.1065	.1065
Gear ratios		B31		B33	
Top		5.6		5.0	
3rd		6.77		6.05	
2nd		9.86		8.79	
1st		14.42		12.90	
Front chain.	½ × .305 in.	B31. (67 pitches).		B33. (68 pitches).	
Rear chain.	⅝ × ¼ in.	B31. (98 pitches).		B33. (98 pitches).	
Tyres	Front	B31. 3.25 × 19.		B33. 3.25 × 19.	
	Rear	B31. 3.25 × 19.		B33. 3.50 × 19.	
Tyre pressure (solo)		Front. 16 lbs. per sq. in.		Rear. 18 lbs. per sq. in.	
Total front fork movement		5¾ ins.			
Rear suspension movement		4 ins.			
Brake dimension.	Front	B31. 7 × 1¼ ins.		B33. 8 × 1¾ ins.	
	Rear	7 × 1¼ ins.			

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BSA SERVICE SHEET No. 313

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A and B Group Models with Swinging Arm Frame

REAR SUSPENSION

REMOVING AND DISMANTLING THE SUSPENSION UNITS

Support the machine on the central stand. Take out the top and bottom bolts securing the suspension units and pull them away from the mounting lugs.

The upper shroud is retained by split collets, and the spring must be compressed before the collets can be removed. The assistance of a second person may be necessary for this operation. Alternatively, Service Tool No. 61-3503 can be used, as shown in Fig. B24.

Place the tool in position on the shroud, insert the pin through the top lug and turn the handle until the shroud has been pressed down far enough to allow the collets to be withdrawn. After the tool has been released, the spring and both shrouds can be removed.

No further dismantling is possible, and if the damper units are damaged, they must be replaced.

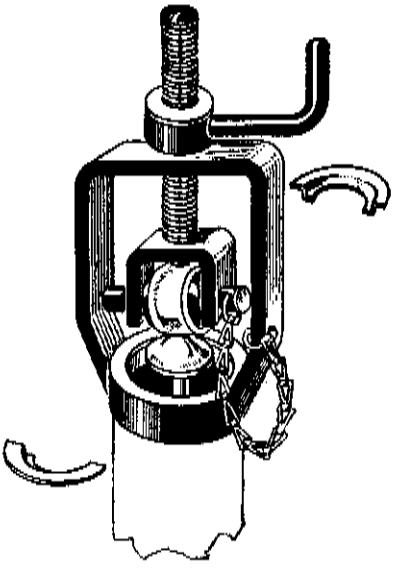

Fig. B24.

REMOVING AND REPLACING THE SWINGING ARM FORK

With the machine on the centre stand, take out the rear wheel in the normal manner. Detach the chainguard, or chaincase, and remove the chain and sprocket assembly. Remove the brake pedal and, on 1956 models, withdraw the crossover shaft. Take out the two bottom bolts from the suspension units, and pull these clear of the mounting lugs. Unscrew the large nut on the offside end of the fork spindle, and also the small bolt from the spindle locking plate on the nearside. Drive out the spindle with a suitable drift, taking care not to damage the threaded end.

Now take hold of the two fork ends and twist the whole fork in a clockwise direction. It can then be drawn away towards the rear.

On some models, the rear mudguard extends down between the arms of the fork, behind the pivot. In this case, the mudguard also must be removed before the fork can be taken out.

The 'Silentbloc' spindle bushes have a very long life, and replacement is rarely necessary.

Reassembly of the fork into the frame is carried out in the reverse order to dismantling, except that the final tightening of the spindle nut should be left until all other parts have been refitted. Then, take the machine off the stand and load it with the weight normally carried. Tighten the spindle nut fully so as to clamp the centre sleeves of the bushes to the frame members in the correct position.

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BSA SERVICE SHEET No. 314

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B GROUP MODELS,

(with Engine Prefix Letters GB)

PRIMARY TRANSMISSION

Clutch Adjustment.

Two adjustments are provided for the clutch control arm on the gearbox outer cover. The first of these is at the clutch push rod and is exposed when the inspection plate is removed. It consists of a grub screw *H* (Fig. B25) and locknut *G*. Between the inner end of the screw and the clutch push rod a steel ball is inserted, and the grub screw must be adjusted so that there is just a little clearance between the ball and push rod.

To carry out this adjustment loosen the locknut and with the aid of a screwdriver adjust the grub screw. Then retighten the locknut.

The other adjustment is provided by the cable adjuster on top of the gearbox. Remember that some free movement in the control arm is necessary as, if the adjustment is too tight, there will be constant pressure on the clutch with consequent wear and loss of efficiency. The control arm pivot should be greased occasionally by means of the grease nipple *F*.

Primary Chain Adjustment.

Adjustment of the front chain is achieved by pivoting the gearbox backwards and forwards on the bottom support bolt. To adjust the chain, remove the knurled inspection cover on the primary chaincase and slacken the nuts *A* and *B* (Fig. B25) which clamp the top and bottom gearbox lugs in the rear engine plates. An adjuster is attached to the right hand side of the top gearbox bolt. Slacken the locknut *C* and screw the adjuster *D* backwards or forwards until the chain tension is correct. This is when the

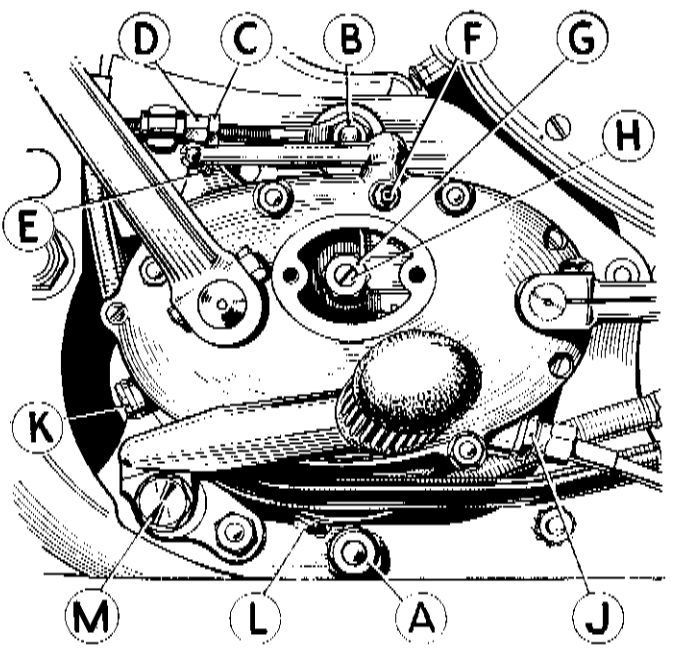

Fig. B25.

maximum up and down movement of the chain at the tighest point is ½in. Tighten the gearbox bolt nuts *A* and *B*, also the adjuster locknut, and re-check the adjustment. Note that after re adjusting the primary chain, the rear chain will be in need of adjustment.

Chaincase Removal.

Drain off the oil in the case by removing the drain screw in the lower edge of the primary chaincase. Two of the screws retaining the primary chaincase outer cover have red painted heads. The front one of these is the chaincase oil level screw, and the rear one the drain screw. Remove the left hand footrest. This may be rather tight, but a few light blows on the front of the footrest should free it. Undo the small screws round the edge of the chaincase and pull off the outer half.

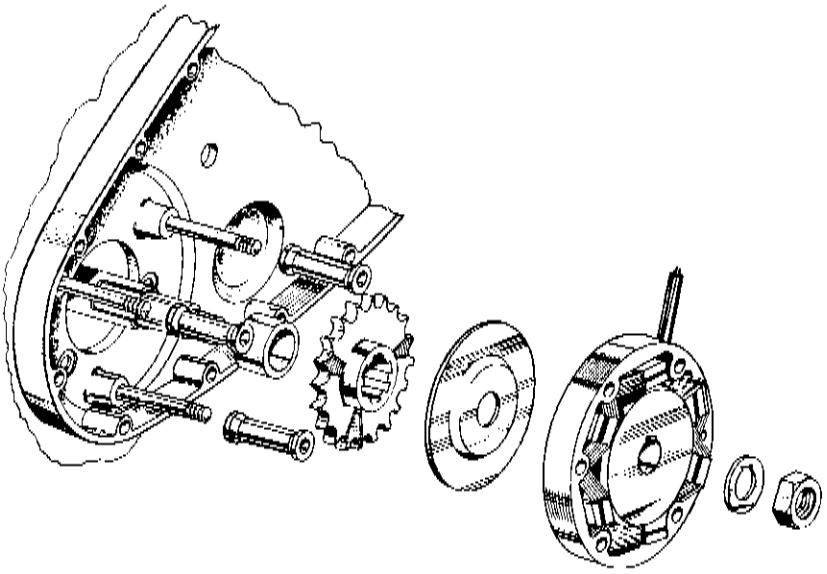

Fig. B26. Alternator Assembly.

The alternator assembly is dismantled by prising back the tab on the lock washer and unscrewing the large nut on the end of the engine shaft. If the nut is very tight, engage top gear and apply the rear brake to prevent the engine turning. Next take off the three nuts which retain the coil assembly. Lift this off the studs and withdraw the rotor, which is keyed to the shaft, also the spinner. Should the coil assembly prove difficult to remove, it may be gently prised off with a screwdriver, taking great care not to damage the windings.

Remove the clutch in the manner described in Service Sheet No. 315.

Remove the engine sprocket from the mainshaft. Unscrew the bolts which hold the inner half of the chaincase to the crankcase, after breaking the locking wire which passes through the heads of the bolts. There now remains only one bolt which secures the rear of the chaincase to the frame, and its removal will allow the chaincase to be detached.

Re-assembly of the primary transmission and chaincase should be carried out in the reverse order to dismantling.

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BSA SERVICE SHEET No. 315

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B GROUP MODELS
(with Engine Prefix Letters GB)

CLUTCH

Dismantling.

Remove the chaincase as described in Service Sheet No. 314. Remove the four spring retaining nuts and withdraw the springs and spring cups. The spring pressure plate and other clutch plates can then be removed, and if only attention to these items is required the clutch need not be dismantled further. The steel plates should be smooth, and if badly scored must be replaced, while the cork inserts may require washing in petrol if the oil on them is thick and gummy. If the inserts are burnt or glazed they should be replaced.

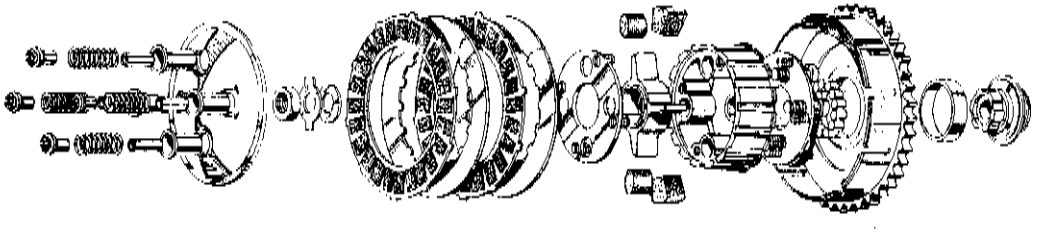

Fig. B27. Exploded View of Clutch.

To dismantle the remainder of the clutch, turn back the tab washer on the main shaft and take off the nut which has a right-hand thread, note the position of the plain washer. The complete clutch can now be withdrawn from the mainshaft, making sure that the rollers do not fall out from between the clutch centre and the chainwheel.

Lift the chainwheel from the clutch centre and remove the 20 rollers. The four bolts, eight screws and the two cover plates from the clutch centre can also be removed to expose the vane and shock absorber rubbers. If the rubbers require attention, the vane must be pushed out with the aid of a suitable drift.

Re-assembly.

Before commencing re-assembly examine the roller tracks on the chainwheel bush and clutch centre, and if the wear on either of these components exceeds .0015 in. it should be replaced.

If the chainwheel teeth are worn to a hook shape, the chainwheel must be replaced or rapid wear on the chain will result.

To re assemble the vane into the clutch centre, first replace the vane and the four thicker rubbers which should be on the left-hand side of each vane arm. (Fig. B28). Hold an old gearbox mainshaft in a vice and position the vane centre on it to prevent it rotating. Rotate the clutch centre so as to compress the rubbers and slip the remaining four rubbers into position. The clutch centre can best be gripped with the aid of a plain clutch plate. Replace the clutch centre cover plates and the four bolts and eight retaining screws.

The remainder of the clutch assembly is quite straightforward. Position the 20 rollers carefully on the clutch centre before sliding the chainwheel over them. Reposition the remainder of the clutch on the shaft and replace the nut and washer. Make sure that the nut is fully tightened before the tab washer is turned over.

Replace the clutch plates ensuring that the thick plain back plate is put in first. When the spring assemblies have been replaced the retaining nuts should be tightened down firmly on to the distance pieces.

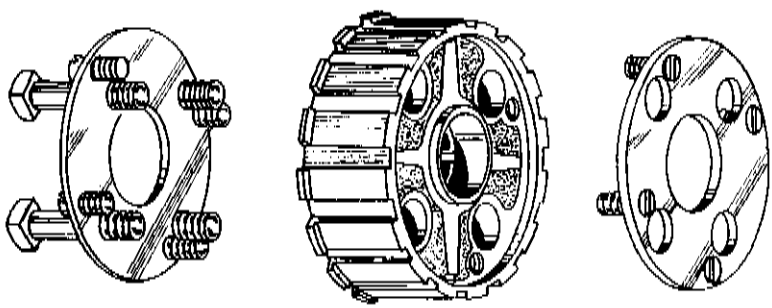

Fig. B28. Vane Assembly.

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