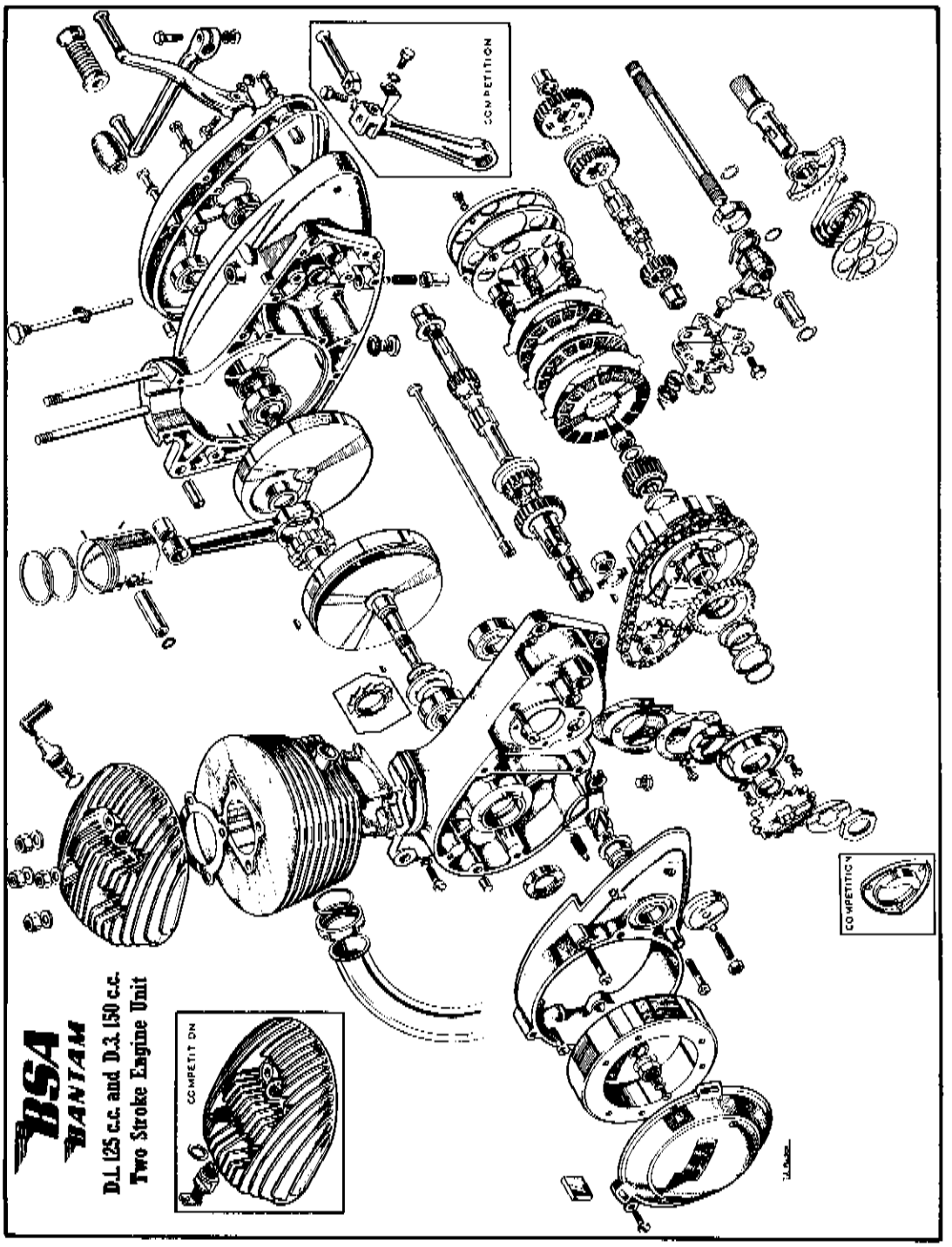
BSA SERVICE SHEET No. 501

Revised June, 1959.

"D" Group Engine and Gearbox (Exploded View)



NOTE.—On D1 engines after 1954, and all D3 engines, the offside Crankshaft Oil Seal is placed next to the flywheel instead of between the two bearings.

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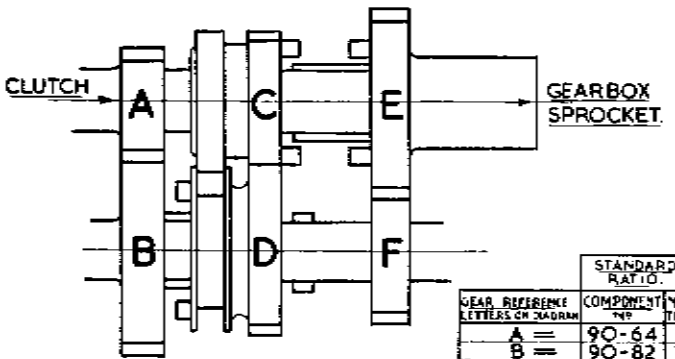

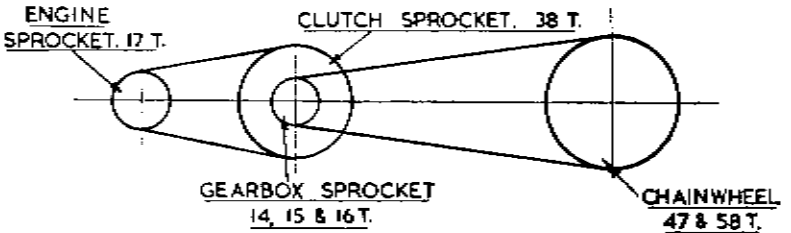

GEARBOX SPROCKET	CHAINWHEEL		STANDARD RATIO.		CLOSE RATIO.		WIDE RATIO		RATIOS OBTAINABLE BY VARYING INDIVIDUAL GEARS.					
		GEAR REFERENCE LETTERS ON DIAGRAM	COMPONENT No.	No. OF TEETH	COMPONENT No.	No. OF TEETH	COMPONENT No.	No. OF TEETH	COMPONENT No.	No. OF TEETH	COMPONENT No.	No. OF TEETH	COMPONENT No.	No. OF TEETH
		A =	90-64	15	90-445	19	90-64	15	90-64	15	90-445	19	90-64	15
		B =	90-82	32	90-448	28	90-82	32	90-82	32	90-448	28	90-82	32
		C =	90-74	22	90-74	22	90-458	21	90-458	21	90-74	22	90-74	22
		D =	90-81	25	90-449	25	90-457	26	90-457	26	90-449	25	90-81	25
		E =	90-65	28	90-474	24	90-65	28	90-474	24	90-65	28	90-474	24
		F =	90-351	19	90-476	23	90-351	19	90-476	23	90-351	19	90-476	23
16	47	TOP	6·58		6·58		6·58		6·58		6·58		6·58	
		SECOND	11		7·78		12		8·46		11		7·78	
		BOTTOM	20·65		10·1		20·65		14·62		14·3		14·62	
15	47	TOP	7		7		7		7		7		7	
		SECOND	11·75		8·3		12·8		9		11·75		8·3	
		BOTTOM	22		10·78		22		15·6		15·27		15·6	
14	47	TOP	7·52		7·52		7·52		7·52		7·52		7·52	
		SECOND	12·6		8·9		13·7		9·66		12·6		8·9	
		BOTTOM	23·6		11·53		23·6		16·7		16·33		16·7	
16	58	TOP	8·11		8·11		8·11		8·11		8·11		8·11	
		SECOND	13·58		9·6		14·8		10·43		13·58		9·6	
		BOTTOM	25·45		12·45		25·45		18		17·62		18·05	
15	58	TOP	8·66		8·66		8·66		8·66		8·66		8·66	
		SECOND	14·5		10·24		15·8		11·12		14·5		10·24	
		BOTTOM	27·2		13·3		27·2		19·22		18·8		19·22	
14	58	TOP	9·28		9·28		9·28		9·28		9·28		9·28	
		SECOND	15·5		10·98		16·9		11·9		15·5		10·98	
		BOTTOM	29·1		14·22		29·1		20·6		20·2		20·6	

'A' REFERS TO GEARBOX MAINSHAFT WITH GEAR CUT DIRECT ON TO SHAFT. LETTERS 'B', 'C' & 'D' REFER TO GEARS ONLY. 'E' IS PRIMARY GEAR COMPLETE WITH 2 BUSHES.

'F' IS THE LAYSHAFT COMPLETE WITH GEAR. GEARS 90-458 (21 TEETH) & 90-457 (26 TEETH) CAN ONLY BE USED IN CONJUNCTION WITH 90-64 (15 TEETH) & 90-82 (32 TEETH)

D Group Gear Ratios

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BSA SERVICE SHEET No. 502

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Models D1, D3, D5 & D7

THE PETROIL LUBRICATION SYSTEM

The correct lubrication of the two stroke engines fitted to these models depends upon a certain quantity of oil being mixed with the petrol. It is preferable for this to be done before the fuel is poured into the tank, and a number of filling stations now supply 'petroil' mixture ready for use. Failing this, the oil and petrol should be thoroughly mixed in a separate container. If this is not possible, the petrol should be put into the tank first and the oil added, after which the machine should be rocked to and fro.

The petrol tap must be turned off when the machine is parked. Failure to do this may result in the carburetter float chamber becoming filled with oil if allowed to stand for a long period.

While the engine is running, oil is induced into the crankcase through the carburetter in the form of oil mist mixed with the fuel supply. As the piston descends, compressing the charge in the crankcase, most of the oil mist separates out and is deposited in the crankcase as liquid oil which lubricates the big end and main bearings. The petrol and air mixture passes up through the transfer ports into the combustion chamber.

Surplus oil is carried by the action of the fuel transfer to the combustion chamber, where it serves as an upper cylinder lubricant, and is eventually burned by the heat of combustion.

There is no point in increasing the proportion of oil to petrol above that recommended, since any excess of oil is merely transferred to the combustion chamber where it is burnt. A higher proportion of oil in the charge means a lower proportion of petrol and therefore a less suitable combustible mixture.

A measure for oil is incorporated in the filler cap, that on earlier models being approximately 5" long while the later type is approximately 6¼" long. Two and a half of the former, or two of the latter measures must be used with each gallon of petrol. Both these quantities correspond to 1 part of oil to 20 parts of petrol and this will provide adequate lubrication throughout the life of the engine.

continued overleaf

If the special two-stroke self mixing oils are used, the proportion should be increased to 1 to 16, which equals half a pint to one gallon of petrol.

RECOMMENDED ENGINE OILS

CASTROL	XXL	or	TWO STROKE SELF-MIX OIL
MOBILOIL	BB	or	MOBILMIX TT
SHELL	X100 40	or	PETROLLER MIX No. 2T
B.P.	ENERGOL 40	or	ENERGOL TWO STROKE OIL
ESSO	ESSO EXTRA 40/50	or	ESSO TWO-STROKE MOTOR OIL

MODELS D5 & D7

On Models D5 & D7 the main engine bearings are lubricated by oil transfer from the gearbox. It is therefore essential that the following undiluted oils be used in the gearbox.

RECOMMENDED GEARBOX OILS.

CASTROL	XXL
SHELL X100	40
ESSO EXTRA	40/50
MOBILOIL	BB
ENERGOL	40

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Revised Sept., 1959

MODELS D1, D3, D5 and D7
ENGINE ADJUSTMENTS WHICH CAN BE CARRIED OUT WITHOUT DISMANTLING

Contact Breaker Points

Access to the contact breaker mechanism is obtained by removing the small cap in the centre of the generator cover. On early Wipac models this cap is retained by a spring clip as shown in Fig. D1, but on all other models two small retaining screws are used.

D7 MODELS

On D7 models, access to the contact breaker and clutch adjuster, can be obtained after the pear shaped cover on the left-hand side of the engine has been removed by taking out the three screws.

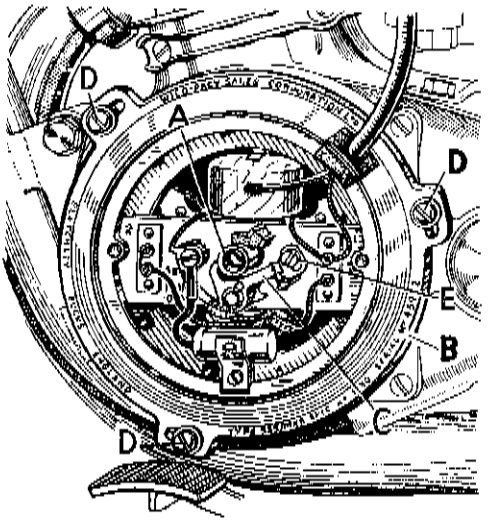

Fig. D.1.—Wipac Equipment

The contact points must be maintained in good condition and kept free from oil and dirt. They should be cleaned occasionally by passing a piece of smooth clean paper between the points and withdrawing it when the points are closed. If the points are burnt they should be cleaned with very fine emery cloth, and then wiped with a petrol soaked rag. This is easier carried out if the rocker arm complete is removed. On Wipac magnetos the spring clip on the end of the rocker arm spindle must be removed and the terminal at the end of the spring disconnected to allow the rocker arm to be detached. On Lucas generators the terminal post nuts should be slackened so that the slotted end of the spring can be removed from the post, thus permitting the rocker to be withdrawn from the spindle.

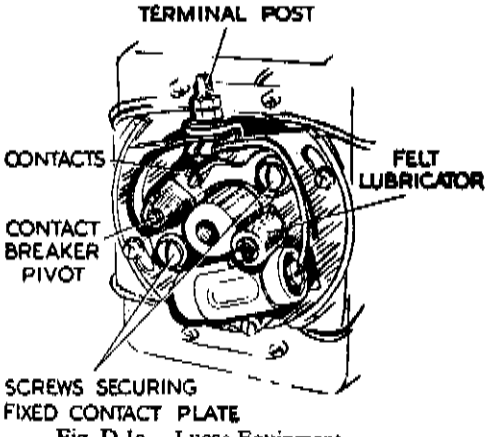

Fig. D.1a.—Lucas Equipment

It is most important that the correct contact breaker gap is maintained. Rotate the engine until the points are fully open and then check the gap with feeler gauges. The gap should be .015 in. for Wipac and .012 in. for Lucas equipment.

If the gap is incorrect the points must be re-adjusted. Slacken the screws securing the fixed contact plate E, Fig. D1, for Wipac, and Fig. D1a for Lucas equipment. Move the plate until the contact gap is correct then tighten the securing screws and re-check the gap. Early Wipac models have an eccentric headed screw at F, Fig. D1, to facilitate movement of the plate, but on all other models the plate is simply pushed backwards or forwards.

Ignition Timing

Before checking the ignition timing the contact breaker gap must always be checked, as this affects the ignition setting. Rotate the engine until it is at Top Dead Centre, as ascertained by a suitable rod inserted through the plug hole. Turn the engine backwards until the piston has descended $\frac{5}{32}$ in. for D1 and D3 models, $\frac{1}{16}$ in. for D5 and D7 models and the contact points should then be just on the point of opening, i.e. not more than .002 in. apart. This is best determined by inserting a piece of very fine paper (such as cigarette paper) between the points. The paper will be only lightly gripped when the points are just on the point of opening.

If the setting is not correct the three screws in slotted holes (D, Fig. D1) should be slackened, thus permitting the complete contact breaker back plate to be rotated until the correct setting is obtained. Rotating the plate in a clockwise direction advances the ignition. On Lucas models the contact breaker back plate is retained by four screws in slotted holes, as shown in Fig. D1a, but the procedure is identical.

Sparking Plug

The sparking plug is of such importance in satisfactory engine performance that it is advantageous to give proper attention to this component. It is poor economy to use any but the most efficient plug. The better plug will soon pay for itself by effecting more complete combustion and loss of power due to partially unburned fuel will be eliminated. The plug most suited to the requirements of this engine is the Champion L10S. Remove the sparking plug every 1,000 miles (1,500 km.) or so, for inspection. If the carburation system is in correct adjustment the sparking plug points should remain clean almost indefinitely. An over-rich mixture will, however, cause the formation of a sooty deposit on the points and, later, outside the plug body (as upper view, Fig. D2). If therefore such a deposit is found, clean it off carefully and check your carburettor. Too large a proportion of oil in the petroil mixture will also cause plug fouling. The continued use of leaded fuel may also eventually produce a deposit on the plug — this time of a greyish colour.

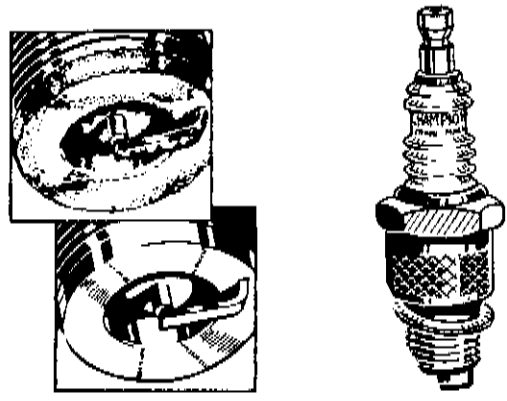

Fig. D2.—The sparking plug.

A light deposit due to any of these causes can easily be cleaned off, but if it is allowed to accumulate, particularly inside the body, the plug may spark internally with an adverse effect on engine performance — if, indeed, it does not stop the engine altogether — and the plug should be taken to a garage for cleaning. If eventually the cleaning process fails to restore the plug to its original condition of efficiency, it should be replaced by a new one.

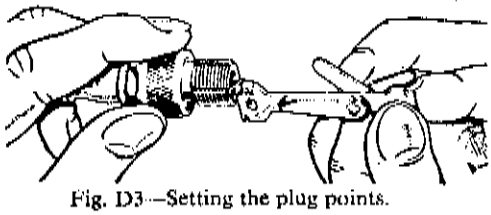

Fig. D3—Setting the plug points.

When inspecting a plug, also check the gap between the points. This should be .018 .020 - in. (.44 - .50 mm.), and adjustment should be made by bending the side wire. Never attempt to move the centre electrode.

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MODELS D1, D3, D5 and D7

ENGINE DISMANTLING FOR DECARBONISING

Decarbonising should be carried out at regular intervals of about three thousand miles (5,000 km.) if consistent results are to be expected. The symptoms indicating an excessive deposit of carbon are undue roughness of the engine and a tendency to pink under load, erratic running with excessive four and eight stroking, and an appreciable falling off in power. This latter item is particularly noticeable when the exhaust port becomes fouled with carbon as it causes an obstruction to the free escape of the exhaust gas, and interferes with the correct scavenging of the cylinder which is so necessary for the efficient transfer of combustible mixture from the crankcase.

Before commencing to decarbonise the engine it is necessary to slacken the two bolts holding the petrol tank to the steering head, and to remove entirely the rear petrol tank securing bolt which passes through the frame, and carries the earth wire of the electrical system. Disconnect the petrol pipe from the tank tap, after turning fuel off at tap and raise the rear of the tank about 1 in. to allow the removal of the cylinder barrel over the long securing studs.

Removal of Cylinder

First remove the carburetter from its stub at the rear of the cylinder by releasing the clip bolt by means of which it is attached. The exhaust pipe must also be disconnected by releasing the union nut at the front of the cylinder barrel by means of the special "C" spanner included in the tool kit. If this nut should prove unduly obstinate, a few drops of penetrating oil should be applied to the threaded portion immediately above the nut and a little time should be allowed for this to act before attempting to unscrew the nut. Disconnect the high tension lead from the sparking plug and unscrew the latter.

The cylinder head and barrel are attached to the crankcase by means of four long studs and when the four nuts on the top of the cylinder head are removed, the head can easily be lifted clear, followed by the cylinder barrel. Take care when removing the latter to support the piston as it emerges from the end of the bore in order that it may not be damaged as it falls clear.

Piston

Place the cylinder head and barrel on one side on a bench and examine the piston. It should not be necessary to remove this from the connecting rod, but if it should be desired to do this for any reason, first remove the circlip from one end of the gudgeon pin using a pair of pointed nose pliers or some suitable instrument to lever the circlip out. Then holding the piston firmly in the hand, tap the gudgeon pin out from the other end. If it is too tight to move, it can be released by warming the piston by means of a rag soaked in hot water and wrung out. Application of this rag will cause the aluminium alloy of the piston to expand more than the steel gudgeon pin, thus releasing the latter which can then be freely pushed or tapped out. Mark the inside of the piston skirt to indicate the front of the piston as originally fitted.

Scrape any carbon which has accumulated on the crown of the piston, taking care not to damage the relatively soft surface of the metal itself, and after removing all the carbon, polish lightly with fine emery cloth if desired and finally wipe clean with an oily rag.

Piston Rings

Now examine the piston rings noting that these are located in their grooves by means of pegs which engage in the piston ring gaps. If in good condition, the rings will be found to present a uniformly smooth metallic surface over their entire peripheries, and if they are in this condition and obviously have a certain amount of "springiness" as evidenced by the fact that their free gap is considerably greater than the closed gap when in the bore (*see Service Sheet* 506) they should not be disturbed. If, on the other hand, the rings shew signs of heat as evidenced by brown or more highly discoloured patches, they should be replaced by new rings, and in this case particular attention should be paid to the fit of the ends of the rings on their locating pegs in the piston ring grooves, and they should also be checked in the bore to ensure that they have an adequate gap. These points will not arise if genuine B.S.A. spares are fitted as the gaps on these are already correct when the rings are sent out, but if for any reason genuine B.S.A. spares are not obtainable, these points must receive careful attention. First place the ring in the cylinder bore in a position where it is clear of the ports and, making certain that it is square by pressing the skirt of the piston against it or a suitable bar of material of the correct diameter, examine the gap which should be not less than .008 in. (.2 mm.). Having satisfied yourself on this point, place the ring in its groove on the piston and make certain that it is free without perceptible up and down play. If it is not free and the groove itself is clean, rub the ring down on a piece of fine emery cloth laid on a dead flat surface, using a rotary motion of the arm to ensure uniform pressure on the ring. As soon as ring is found to be free in its groove, wipe it absolutely clean and fit it into position.

Check also that there is sufficient clearance between the inner portion of the gap and the locating peg in the groove. Do this by closing the ring in its groove by finger pressure until there is no gap, thus shewing that there is clearance at the peg underneath. If the gap will not close, indicating that the steps are binding on the peg, ease the steps gently with a dead smooth file. If the piston has been removed from the connecting rod refit it, first putting a smear of oil on the gudgeon pin, not forgetting a new circlip to replace the one which was removed. Note that the piston ring gaps should face towards the rear on D1 models and towards the front on D3, D5 and D7 models. Then put a piece of clean rag over the piston and crankcase mouth and turn your attention to the cylinder barrel and head.

Cylinder Head and Ports

Remove all carbon deposit from the cylinder head, bearing in mind again that the aluminium is soft and easily damaged if the decarbonising tool is carelessly applied, and carefully wipe clean to ensure the removal of all loose particles. Most of the carbon deposit likely to have accumulated in the cylinder will be in the exhaust port, and this is most important as explained above. Scrape this out carefully, taking care not to let the tool slip into the bore and damage the surface of the latter. Examine the transfer and inlet ports for the presence of carbon, although this is unlikely to be heavy, and finally wipe the ports and the cylinder bore absolutely clean.

Big-end Bearing

While the cylinder is off it is as well 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 assembly is not likely to require replacement, however, provided that the machine has been carefully used and adequately lubricated, for the big-end bearing 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.

Re-assembly

Before attempting to replace the cylinder barrel over the piston, smear the latter generously with engine oil and then place it over the piston, carefully manipulating the rings into the end of the bore and seeing that they enter freely without the application of force. As soon as the cylinder barrel is home, replace the cylinder head and put the washers and nuts on the four holding down bolts. Tighten the nuts in diagonal order so as to avoid distortion.

Examine the sparking plug (*see Service Sheet* 503) and refit if sound.

Before refitting, the exhaust pipe and silencer should be examined for freedom from carbon and cleaned if necessary. Refit the exhaust pipe and carburetter, lower the rear of the tank into position and insert the long securing bolt, after passing it through the earth connection tag attached to the electric wiring harness. Ensure that face of tag is clean and free from dirt or corrosion so that it makes a good contact.

Tighten up rear and front tank securing bolts.

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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.

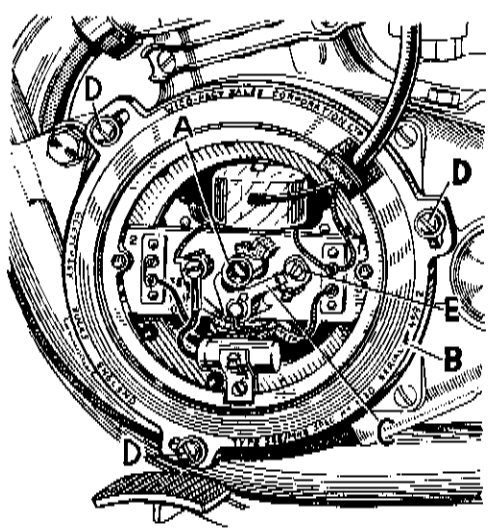

Fig. D4—The Contact Breaker Mechanism.

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.

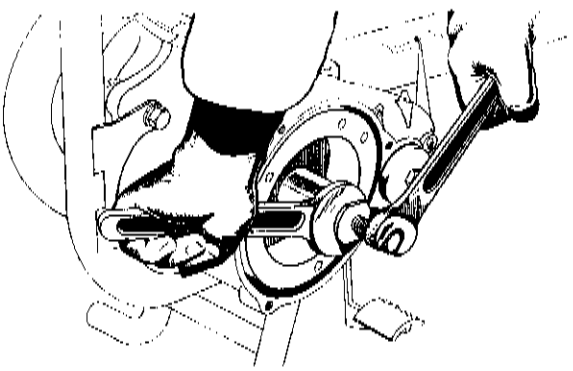

Fig. D5—Removing the Generator Flywheel with Service Tool 61-3188.

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).

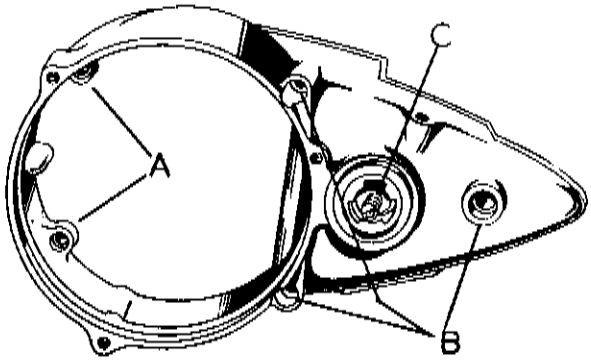

Fig. D6.

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.

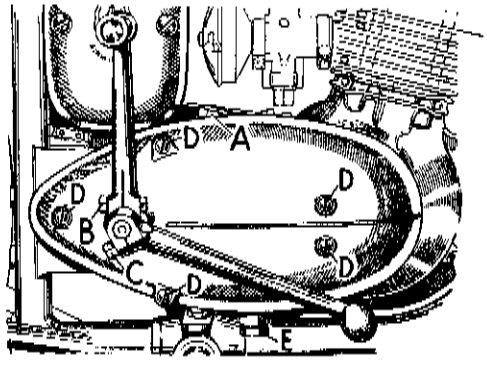

Fig. D7.

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.

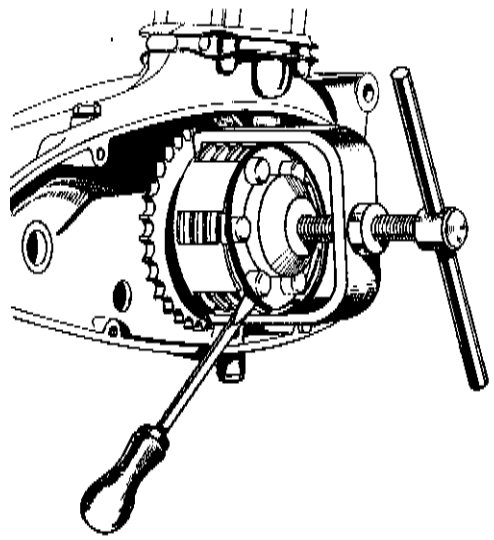

Fig. D8—Removing the Clutch Plate Circlip with Service Tool No. 61-3191.

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.

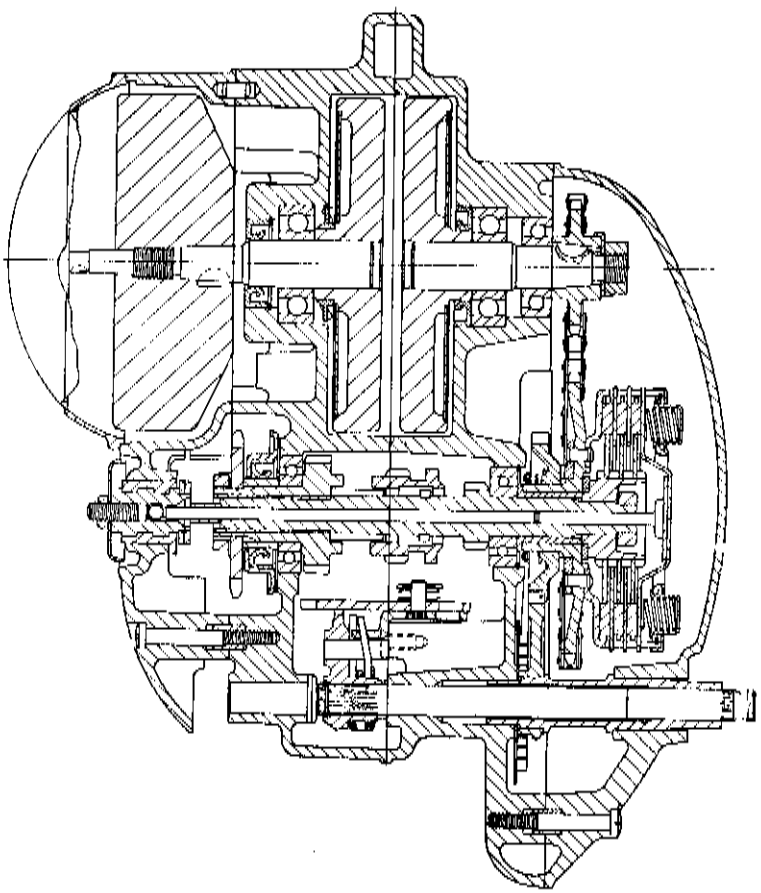

Fig. D8A—Horizontal Secton of Engine Unit.

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.

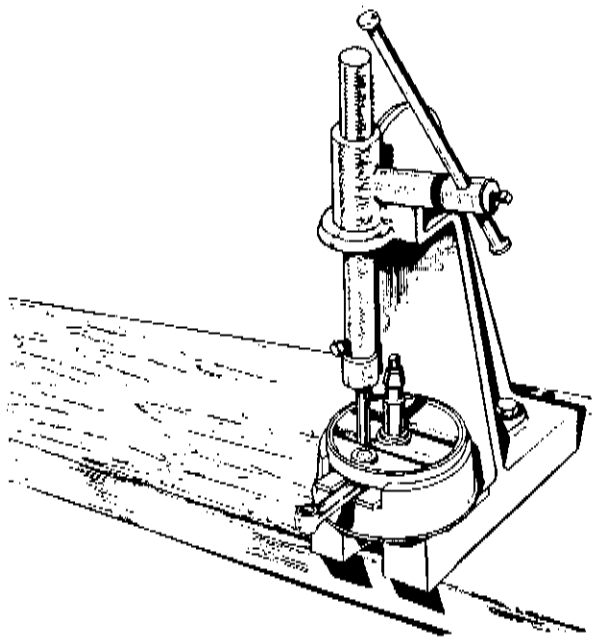

Fig. D9—Parting the Flywheels with Service Tool 61-3206.

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.

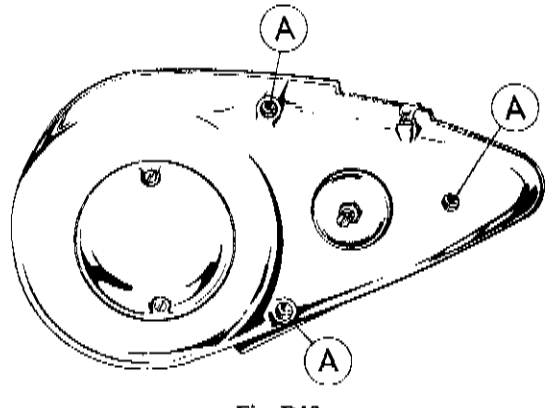

Fig. D10.

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.

B.S.A. MOTOR CYCLES LTD.
Service Dept., Waverley Works, Birmingham, 10
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BSA SERVICE SHEET No. 506

Revised Feb. 1959.

Models D1, D3 and D5

RE-ASSEMBLY OF THE ENGINE - GEARBOX UNIT

Crankcase

If new ball races and bushes are to be inserted, warm the two crankcase halves suitably support them to avoid damage, and press in the new parts in their appropriate positions. When dealing with a D1 engine manufactured before 1955, do not forget that the oil seal Part No. 90-284, is located between the two driveside main bearings. Later D1 and all D3 and D5 engines have a different oil seal Part No. 90-749, and this is placed next to the flywheels, inside both bearings.

On the generator side, the oil seal Part No. 90-147, should be fitted outside the main bearing. Care must be taken not to press in the seal too far, so as to obscure the oil passage to the main bearing. Engines after Nos. DD-101 and BD3-5138 have a circlip between the oil seal and bearing. This means that the oil seal is located approximately 0.10" further out, and the parallel portion of the flywheel spindle is extended by this amount. If the later type crankcase assembly Part No. 90-826, is used to replace a 1954 D3 crankcase assembly Part No. 90-777, the circlip should be removed and the oil seal placed closer to the bearing, unless a later type flywheel and con-rod assembly Part No. 90-823, or a flywheel spindle Part No. 90-821, is fitted at the same time.

Replace the spring loaded ball socket 'A' (Fig. D16) in its recess in the bottom of the offside crankcase.

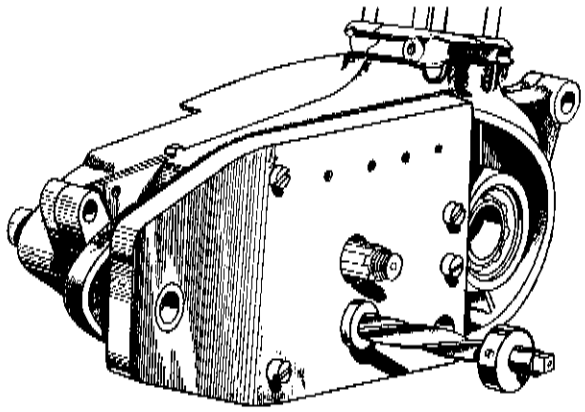


Fig. D11—Line Reaming the Gearbox Bushes with Service Tool 61-3199.

If the gearbox phosphor bronze bushes have been renewed, bolt the two crankcase halves together and line-ream the bushes, using Service Tool No. 61-3199 and Reamer No. 61-3205 (Fig. D11). Make sure that all swarf is removed after this operation.

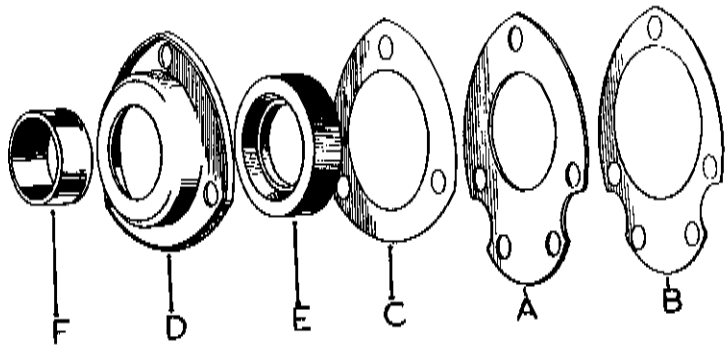


Fig. D11A—The Oil Seal Assembly

Next secure the gearbox mainshaft ballrace and layshaft bush retaining end plate 'A' (Fig. D11A), Part No. 90-133, on the nearside case with its two $\frac{5}{16}$ in. cheese-headed screws, followed by the triangular oil seal housing washer 'C', Part No. 90-73, the mainshaft oil seal housing 'D', Part No. 90-72, and the oil seal 'E', Part No. 89-3006, with the steel sleeve 'F', Part No. 90-71, in the centre of the assembly. Note that a gasket 'B' is fitted between the end plate and the crankcase.

The following details are intended to assist people who wish to complete their own flywheel repairs. Owners are reminded, however, that fully reconditioned and guaranteed flywheel assemblies are available through the B.S.A. Exchange Replacement Service and can be purchased from appointed B.S.A. Dealers or Stockists.

This Service is recommended in view of the skill and specialised equipment necessary to make a first-class job.

Flywheel Assembly

The 1955 pattern flywheel spindles 90-821 (nearside) and 90-505 (offside), can be used as replacements in all earlier engines having a Wipac generator. For Lucas equipment, flywheel spindles 90-605 (nearside) and 90-505 (offside) should be used. When fitted to

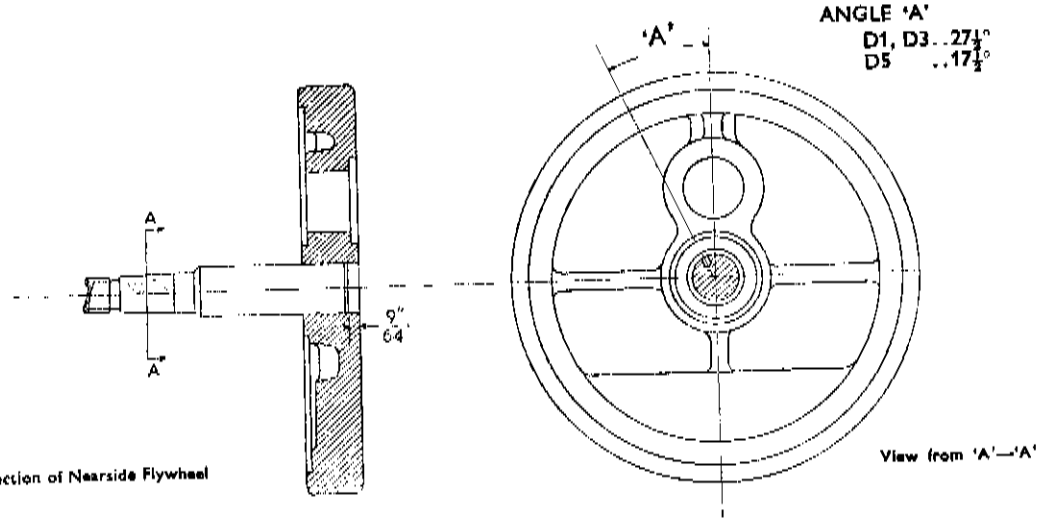


Fig. D12

flywheel assemblies which have the narrow type of big end bearing ($\frac{1}{4}$" x $\frac{1}{4}$" rollers), these spindles must be assembled so that they are recessed $\frac{3}{64}$" from the inside faces of the flywheels. With the wide big end bearing ($\frac{1}{4}$" x $\frac{3}{8}$" rollers), the spindles must be assembled flush with the faces of the big end recesses in the flywheels. The nearside spindle on all models must be located as shown in Fig. D12.

It is not advisable to attempt to take up wear in the big-end assembly by fitting oversize rollers, since the connecting rod, rollers, and crankpin are carefully matched before leaving the works. We strongly recommend that a complete replacement assembly be used.

To assemble place the nearside flywheel in bolster, Service Tool 61-3206, and using a suitable hand press insert one side of the new crankpin. Position the second flywheel over the crankpin and using bridge piece Service Tool 61-3210 press the flywheel on to the crankpin as illustrated in Fig. D13.

The flywheel will now be only approximately aligned and further steps must be taken to ensure that the wheels and shafts are brought within necessary limits. Two of the actual or similar bearings used in the engine should be fitted to the main shafts and the assembly mounted in Vee blocks as in Fig. D14.

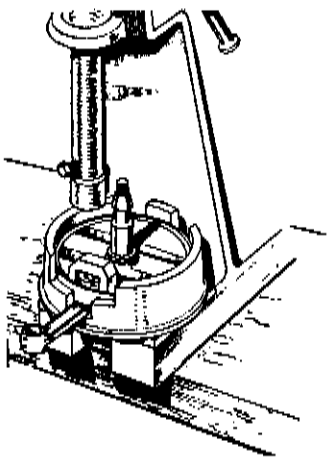


Fig. D13—Reassembly of the Flywheels.

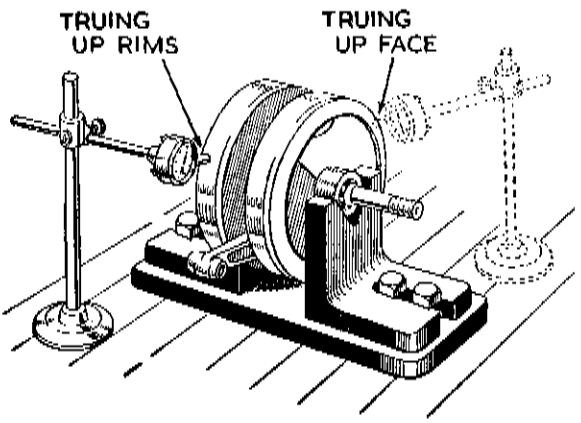


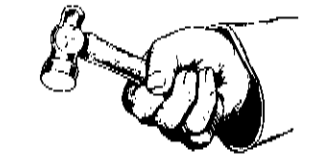
Fig. D14—Checking Flywheel Alignment.

Using a dial micrometer the accuracy of the assembly can be measured. Any necessary corrections should be done by the careful use of a mallet or lead hammer applied to the flywheels and the wheels should be brought within the limit of .004ins. on the rims and .006ins. on the inner faces. Shafts should be trued to within .002ins. maximum.

The big-end assembly having been renewed and the flywheels checked for balance and concentricity, replace the flywheel side plates into their recesses and secure by 'dot' punching the edge of the flywheels over the edges of the sheet metal plates (Fig. D15). *Note.* No side plates are used on the D5.

RE-CHECK THE FLYWHEELS FOR TRUTH.

The next step is to check the end float of the flywheel assembly in the crankcase, and adjust if necessary. Shim washers of various thicknesses are supplied for this purpose.



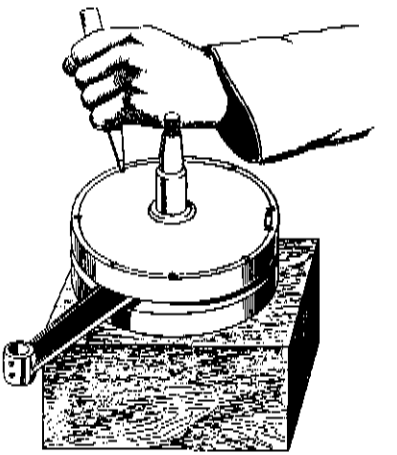


Fig. D15.

Place a .010" shim on the offside spindle, and insert the latter through the main bearings and oil seal in the offside crankcase. Fit the distance collar Part No. 90-243, or the oil drag fan Part No. 90-750, in position over the near-side spindle. The nearside crankcase should then be replaced, and the two halves screwed together temporarily. Measure the amount of end float on the flywheel assembly, which should be .004" to .006". Remove the nearside crankcase and fit any shims which may be required on the nearside spindle, next to the flywheel.

If the flywheel assembly has not been disturbed, replace the original shims in their original positions.

Later models with engine prefix letters DD, DDB or ED5, use shims only between the L/H flywheel and the bearing, these are available in sizes .003"/4"/5"/.010".

Gearbox

Now fit the gear quadrant selector mechanism to the off-side crankcase. Engage the quadrant with the spring-loaded locating plunger in the bottom of the case, 'A' (Fig. D16), the quadrant to be at its innermost position in relation to the plunger; this is bottom gear. Secure in position by fitting the two bolts 'B' with their tab locking washers, turning over the tabs to lock the bolts.

Next pass the splined end of the gearbox mainshaft through the offside ballrace already placed in its recess, followed by the mainshaft sliding gear 'C', and then the mainshaft primary gear.

Now place the large layshaft gear 'D', (this is the gear having the centre machined to engage with the dogs of the selector gear) concave side downward against the phosphor bronze bush in the bottom of the case in mesh with the small main-shaft pinion.

Engage the two central selecting or sliding gears, one already in position on the main-shaft, so that the small dog on the gear selector arm 'E' enters the track machined on the side of the lower or layshaft gear 'F', the upperside of this gear track engaging with the solid machined ring on the mainshaft sliding gear 'C'.

Insert the layshaft through the lower gears and engage the gear train (see Fig. D16).

Next pass the footchange pedal lever shaft with its spring-loaded claw assembled 'G' through its bearing hole in the offside case. Engage the ends of the spring attached to the claw on either side of the projection on the gear selector mechanism, securing the bridge piece between the two bolts, the claw facing the gears.

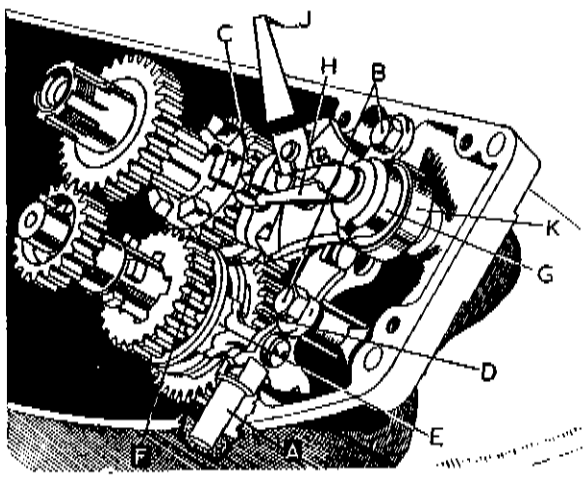


Fig. D16. The Gear Cluster.

Apply jointing compound evenly to the edge of one crankcase and allow it to become 'tacky'. Insert the gear position indicator spindle 'H', into its bearing hole in the nearside crankcase, and attach the indicator lever 'J', to the outer end of the spindle, pointing upwards. Place the nearside crankcase in position, passing the engine mainshaft and gearbox pinion sleeve through their respective races, taking care that the ball end of the inside gear indicator lever enters its recess on the gear selector arm. Later models do not have this indicator, its place being taken by a thrust pad.

Secure the two crankcase halves together by means of the eleven cheese-headed screws (thirteen on later models), tightening them evenly all round to avoid distortion. Note that a spring washer is fitted behind the head of each screw.

Place the kickstarter clock-type return spring, Part No. 90-89, in position on the kickstart quadrant shaft, then slide the circular distance plate, Part No. 90-90 on to the quadrant shaft against the spring between the spring and the alloy case. Insert the assembly on to the gear selector shaft, placing one end of the spring into the recess at the rear of the case above the dowel hole. Give one turn of tension to the spring and push the kickstart quadrant home into its recess in wall of alloy case with the quadrant against its stop below the dowel hole.

Clutch and Transmission

Enter the clutch chainwheel with its centre bush in position, flange at the rear, on to the splined end of the gearbox shaft, which is projecting through the case, having previously assembled the ratchet and spring on to the shaft. (See Fig. D.17).

Place the thrust washer into its recess on the inside of the clutch chain-wheel assembly, slide the clutch hub, Part No. 90-28, on to the splines and secure by the large nut, Part No. 21-7. Enter the mushroom-headed clutch push rod, Part No. 90-98, into the hole in the centre of the shaft.

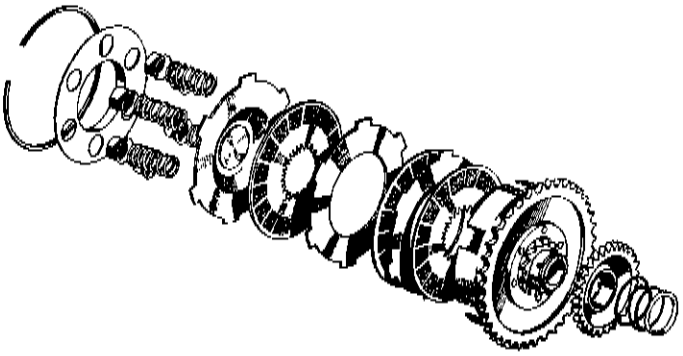


Fig. D17—The Clutch, Exploded View.

The clutch plates are now inserted into the centre of the chain-wheel assembly, cork plate first then steel plate in sequence, the last plate being the domed clutch actuating plate, Part No. 90-37 (Fig. D17).

Next insert the six springs into the spring cups and place them in the holes in the spring plate, Part No. 90-341, the raised centre of the plate outwards. Using Service Tool No. 61-3191, compress the springs, and place the large circlip, Part No. 90-27, into its groove on the inside of clutch plate housing (Fig. D8, Service Sheet No. 505).

The crankshaft sprocket should now be placed on its taper keyed engine shaft, followed by the double tab washer, Part No. 90-121, one tab resting on the flat on the engine sprocket. Screw the securing nut, up tightly, and turn the second tab over on to the nut face.

Place primary chain over the sprockets and fit the spring link. Now fit the dome-shaped alloy primary chain cover with a cemented paper washer on the jointing face, over the primary drive assembly, passing the kickstart quadrant shaft through its hole in rear of the cover. Secure with five cheese-headed screws, the two longest screws in the front holes in the cover. Note that each screw is fitted with a fibre washer.

Fit kickstart pedal and foot gear change lever to their respective shafts.

Now turn the unit round and insert the second clutch push rod, Part No. 90-99, into the hole in gearbox mainshaft. Slide the rubber oil seal washer, Part No. 90-132, on to the rod.

The gearbox sprocket, is pushed on to the splines projecting through the gearbox end of the nearside case, then secured by nut and splined washer, the edge of which is turned over on to the nut as a locking device.

The flywheel generator alloy cover carries the clutch actuating lever and quick-action mechanism, which is pressed into this cover from the inside when the cover has been warmed. A flat on the collar of the actuating screw positions this part in the cover (Fig. D18).

In the centre of the quick-action screw is a ball and adjusting screw, Part No. 90-105, with locknut, Part No. 89-366. The metal cover, Part No. 90-106, presses over the quick-action screw from the outside of the cover. Attach the extension spring, Part No. 90-122, to its hole in the lever and the hole in the inside of the cover.

Place the crankcase outer cover, in position on the nearside case. This cover carries the clutch operating lever and adjuster. Five cheese-headed screws, two inside and three outside, secure the cover to the crankcase.

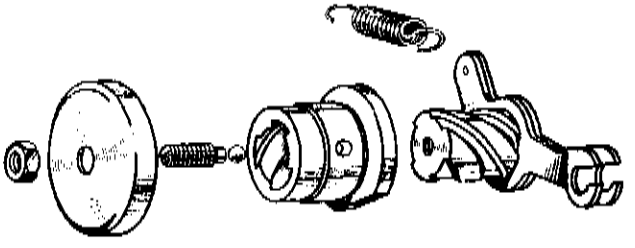


Fig. D18.—The Clutch Actuating Mechanism.

Flywheel Generator (Wico Pacy)

Place flywheel on the keyed taper of the engine mainshaft, followed by the large shakeproof washer, and tighten the nut. Make sure key has not fallen out.

Now insert the electrical ignition unit carrying the plug lead into its recess. Three elongated ears on the outside of this unit allow the screws to be passed through the unit securing it to the flywheel cover (Fig. D4.)

The 'make and break' cam is now inserted into the centre of this unit on to the keyed end of the engine mainshaft and secured by a $\frac{3}{8}$ in. screw and spring washer.

Variation of the ignition timing is obtained by moving the whole unit to and fro' on the elongated slots on the outside of the unit. Adjust 'make and break' points if necessary. See Service Sheet No. 503. Set the ignition timing so that the points are just breaking with the piston $\frac{5}{32}$ in. (3.75 mm.) before top dead centre.

The watertight cover is now placed in position and secured by the two screws.

The remainder of the unit is assembled as after decarbonisation. (See Service Sheet No. 504).

Place the thrust washer into its recess on the inside of the clutch chain-wheel assembly, slide the clutch hub, Part No. 90-28, on to the splines and secure by the large nut, Part No. 21-7. Enter the mushroom-headed clutch push rod, Part No. 90-98, into the hole in the centre of the shaft.

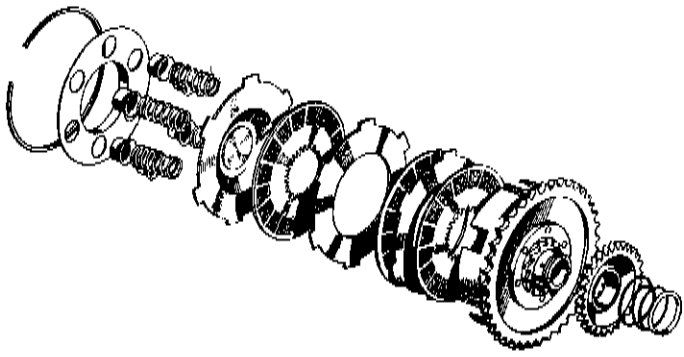


Fig. D17—The Clutch, Exploded View.

The clutch plates are now inserted into the centre of the chain-wheel assembly, cork plate first then steel plate in sequence, the last plate being the domed clutch actuating plate, Part No. 90-37 (Fig. D17).

Next insert the six springs into the spring cups and place them in the holes in the spring plate, Part No. 90-341, the raised centre of the plate outwards. Using Service Tool No. 61-3191, compress the springs, and place the large circlip, Part No. 90-27, into its groove on the inside of clutch plate housing (Fig. D8, Service Sheet No. 505).

The crankshaft sprocket should now be placed on its taper keyed engine shaft, followed by the double tab washer, Part No. 90-121, one tab resting on the flat on the engine sprocket. Screw the securing nut, up tightly, and turn the second tab over on to the nut face.

Place primary chain over the sprockets and fit the spring link. Now fit the dome-shaped alloy primary chain cover with a cemented paper washer on the jointing face, over the primary drive assembly, passing the kickstart quadrant shaft through its hole in rear of the cover. Secure with five cheese-headed screws, the two longest screws in the front holes in the cover. Note that each screw is fitted with a fibre washer.

Fit kickstart pedal and foot gear change lever to their respective shafts.

Now turn the unit round and insert the second clutch push rod, Part No. 90-99, into the hole in gearbox mainshaft. Slide the rubber oil seal washer, Part No. 90-132, on to the rod.

The gearbox sprocket, is pushed on to the splines projecting through the gearbox end of the nearside case, then secured by nut and splined washer, the edge of which is turned over on to the nut as a locking device.

BSA SERVICE SHEET No. 507

October, 1948
Revised—June, 1959

Models D1, D3, D5, and D7

PRIMARY TRANSMISSION

Clutch Adjustment

There must always be a slight amount of play in the clutch withdrawal mechanism in the gearbox, or a short length of free cable at the handlebar lever end. If the play becomes excessive, difficulty will be experienced in changing gear, as the clutch may not fully disengage, in which case the control should be adjusted.

The clutch adjustment will be found at the left-hand end of the gearbox mainshaft (Fig. D21) and it consists of an adjusting pin (A) screwed into the clutch withdrawal quick thread sleeve and a locknut (B) to secure it in position. This adjusting pin presses against the clutch withdrawal rod with a steel ball interposed. (On the model D.7. the adjuster is concealed underneath the pear shaped cover on the left-hand side of the engine.)

The withdrawal mechanism must at all times be so adjusted that there is a slight amount of play between the pin, the steel ball and the operating rod, in order to ensure that the clutch springs may exert their full pressure on the driving and driven plates. If there is not sufficient play there will be a tendency for the clutch to slip continually owing to reduced spring pressure, and this in turn will cause over-heating and serious damage to the clutch itself.

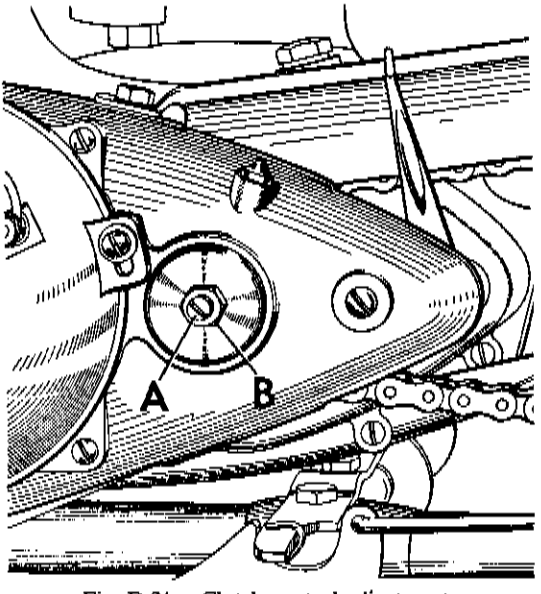


Fig. D 21.—Clutch control adjustment

To adjust, release the locknut and holding it with a spanner turn the adjusting pin back one or two turns with a screwdriver. Then, still holding the locknut with a spanner, screw the adjusting pin gently in until it is felt to meet some resistance. Then unscrew it half-a-turn and holding it in this position retighten the locknut. If the adjustment is correctly made in this manner, it will be found that there is a small amount of free play at the clutch lever on the left handlebar before this is felt to take up the spring pressure during the action of declutching.

Front Chain

The front chain runs on short fixed centres and adjustment for tension is neither required nor provided for.

This chain will run for many thousands of miles before examination is required. This operation involves the removal of the primary chain cover (Fig. D19) after the kick-starter and gear change pedals, both of which are mounted on splines and locked by pinch bolts ("B" and "C" respectively) have been removed together with the five securing screws ("D"). The normal up and down play on the front chain is up to $\frac{5}{8}$ in. (1 cm.) and the maximum permissible, indicating that the chain is unduly worn and requires replacement, is about $\frac{3}{4}$ in. (2 cm.).

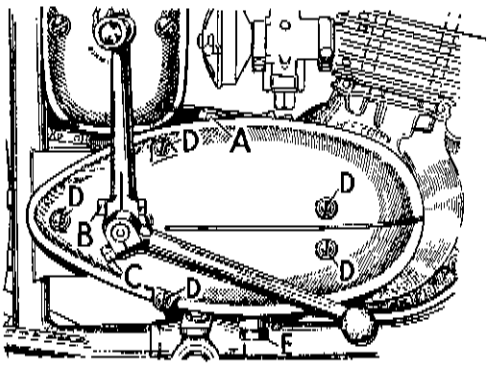


Fig D 19

Remember when replacing a chain fitted with a detachable connecting link, that the spring fastener must always be put on with the closed end facing the forward direction of travel i.e. on the top run of the chain.

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BSA SERVICE SHEET No. 508

Revised, Feb., 1959

Models D1, D3, D5 and C10L

DISMANTLING AND RE-ASSEMBLY OF THE HUBS AND BRAKES

FRONT WHEEL

To remove the front wheel from the forks, disconnect the brake cable at the brake arm on the cover plate, by removing the ¼ in. dia. round head bolt and nut holding the 'U' shaped cable clip. Unscrew the cable adjuster, withdraw the cable and place it out of the way.

Unscrew the two spindle nuts, using the plug spanner, and remove the three mudguard stay bolts on the left-hand fork end bracket. (The latter is not necessary on earlier models, where the mudguard is attached to the outer fork tubes). Lift the left-hand lower fork leg away from the spindle, and pull the wheel away from the right-hand leg, so that the brake anchor plate clears it. The wheel will then drop out.

FRONT BRAKE

Unscrew and remove the spindle nut securing the cover plate. The plate can now be withdrawn and the brake shoes examined. It is not advisable to remove the shoes from the cover plate unless the linings require renewal.

If it is necessary to remove the shoes, first take off the brake lever A, Fig. D.22, and tap in the cam B until the cam plate clears the shoes. Insert a screwdriver between the brake shoes adjacent to the fulcrum pin C and twist the screwdriver. Place a small lever, D between the shoe and the anchor plate and lever the shoe upwards until the spring tension is released. The shoes can then be lifted from the cover plate.

If the shoes require relining, see Service Sheet No. 612.

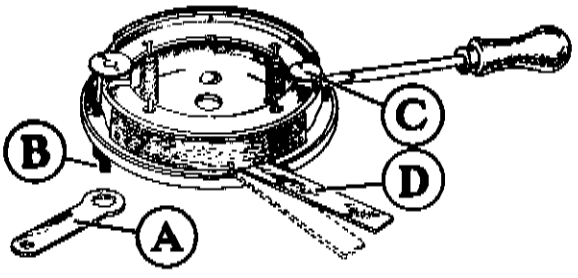

Fig. D22.

FRONT WHEEL BEARINGS. (STANDARD MODEL)

If it is necessary to remove the bearings for examination or cleaning, unscrew the locknut L and spindle nut A, Fig. D.23 and tap the spindle right through, using a hide mallet and soft drift to prevent damage to the threads.

The dust caps B can be prised off with the aid of a screwdriver between the cap and the edge of the spoke flange. Care should be taken to work the caps off a little at a time, to avoid distortion. Next unscrew the lock ring G securing the outer ring of the ball journal on the brake side. This ring has a left-hand thread.

Take out the felt washers C and H and the plain steel washers D.

The ball journals can now be inspected, but they should not be removed unless new ones are required.

If it is necessary to renew the journals the hub should be supported at the brake drum end. With the aid of a suitable soft drift applied to the inner ring of the ball journal, E, Fig. D23, drive the journal in towards the centre of the hub. This will cause the brake drum side journal to be driven out. When it is clear of the hub, take out the distance piece F and pass a drift through the hub until contact is made with the other journal, in order to drive it out.

NOTE :

This procedure is possible only on machines after Engine No. YD-2850. Earlier models have no deep counterbore in the hub and the journals must be driven out from opposite ends after the distance piece F has been displaced slightly to allow a soft drift to be applied to the inner ring of the race.

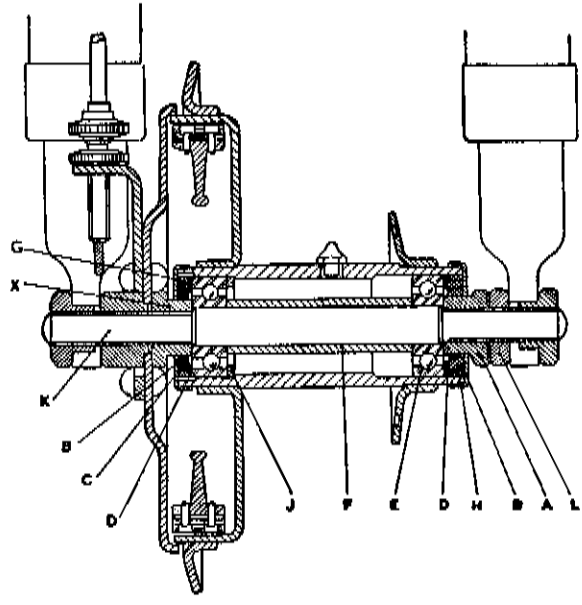

Fig. D.23

COMPETITION MODELS

The front hubs are fitted with adjustable taper-roller bearings as illustrated in Fig. D23A, but instructions for removing the wheel and dismantling the brake are identical with those for standard machines.

To dismantle the bearings, unscrew the two locknuts M and N, remove the brake plate washer P and bearing distance piece R, prise off the dust caps S, and take out the felt washers T. The spindle may now be withdrawn from the brake drum side, leaving only the bearings, felt retaining cups U and bearing abutment rings V and W in the hub. With

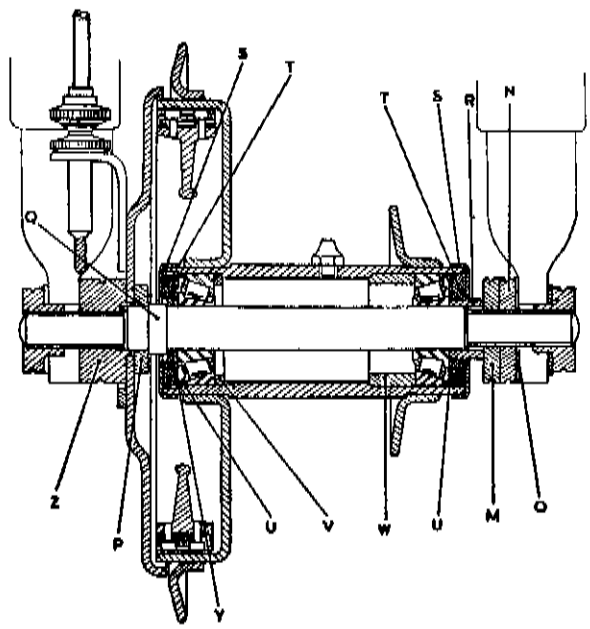

Fig. D23A

the hub suitably supported at the brake drum end and a soft drift applied against the abutment ring V, the ring itself, the bearing and the retaining cup U may be driven out in one operation, during which the drift should be moved around the circumference of the abutment ring to ensure even extraction. The hub may now be turned over and the same procedure adopted for removal of the corresponding parts in the other side of the hub.

NOTE:

The front spindle assembly of the early competition models differed slightly in that the spindle itself had no fixed collar Q, brake plate washer P or bearing thrust washer Y. These parts replace a shaped nut which was screwed along the brake drum side threaded end of the spindle, tight against the spindle shoulder. Also, a shaped nut was used in the place of the existing distance piece R and nut M. These points should be borne in mind when dismantling and re-assembling, but the procedure otherwise is the same as for the current type hub described.

REAR WHEEL

To remove the rear wheel from the frame, disconnect the brake rod by unscrewing the knurled adjusting nut and lift the rod out of the way.

Uncouple the chain at the connecting link, and run the chain off the sprockets after first placing a clean piece of paper or other suitable material underneath the machine to protect the chain from road or floor grit.

Disconnect the speedometer drive by unscrewing the locknut on the speedometer gearbox.

Slacken off the spindle nuts sufficiently to draw the wheel out of the fork ends. Lean the machine over and draw the wheel out under the left-hand chainstay.

REAR BRAKE

The brake cover plate and shoes are identical with those of the front wheel, and the instructions given for removal will apply equally to the rear brake.

REAR BEARINGS

The rear wheel hub is identical with that in the front wheel except that a speedometer drive gearbox is fitted to the offside. This is held in position by a plain washer and an additional locknut; after removing the locknut the gearbox can be drawn straight off the hub barrel. The instructions given for removal of the front hub bearings will apply equally to the rear hub, except that on spring frame models the inner locknut (corresponding to L on Fig. D23) is replaced with a plain distance collar.

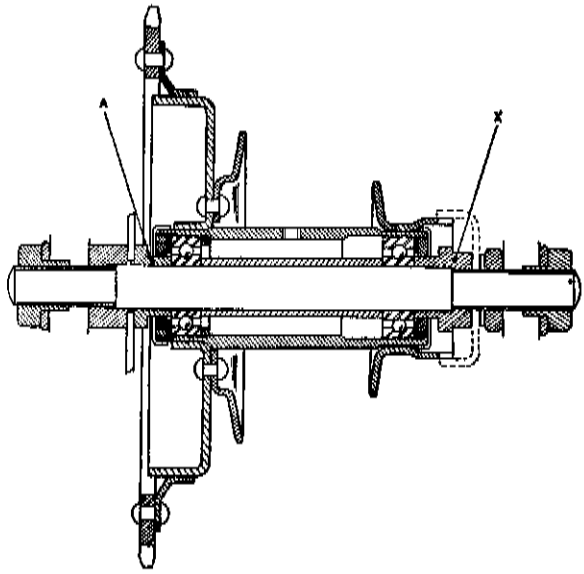

Fig. D23B

NOTE:

On later spring frame models (1953 onwards) the distance collar is omitted; correct positioning of the speedometer gearbox being allowed for by the shape of the spindle nut X, Fig. D23b.

The rear hub spindle assembly is also different in other respects, but removal of the wheel and dismantling of the brake is the same as for earlier models, as also is the procedure for removing the speedometer gearbox. After these operations have been carried out, the spindle can be tapped through from the brake drum side, as the part A, Fig. 23b, is merely a distance piece; which will then fall away. From this stage, dismantling is again the same as for earlier models.

RE-ASSEMBLY OF THE HUBS

The following applies to all hubs, except the front hub on competition models, and refers to the illustration Fig. D23, unless otherwise stated. If new ball journals are to be fitted, first place the distance piece J in position in the hub barrel, brake drum side, and press in the hub journal, taking care to see that it is square to the housing. Insert one plain steel washer D and then screw in the lock ring G. This has a left-hand thread. Reverse the hub, insert the inner distance sleeve F, and push the spindle K through the bearing and distance sleeve. At this stage, if the hub has been cleaned out, it should be repacked with grease. Place the second journal in position and press it into the housing until the inner distance sleeve is firmly gripped, and remove the spindle. Replace the other plain washer D, felt washers C and dust caps B, and re-insert the spindle so that the 'fixed' nut is on the brake-drum side, except on the rear hubs of the later spring frame models; where it should be on the opposite side.

The 'fixed' nut is marked X on both illustrations, Figs. D23 and D23b, and has been left undisturbed on the spindle throughout all the previously mentioned operations. If, for any reason, it has been slackened; it should be retightened firmly against the shoulder of the spindle. The 'fixed' nut is located on the longer-threaded end of the spindles fitted to all front wheels and the later type spring frame rear wheel. On the rear wheels fitted to pre-1953 spring frame models and all rigid-frame rear wheels the 'fixed' nut is located on the shorter-threaded end of the spindle.

The spindle nut A may now be replaced and thoroughly tightened, except on the later spring frame rear hub where it is necessary to replace the distance collar A, Fig. D23b, and the brake cover plate complete with shoes, before finally tightening down with the brake cover plate nut. In each case the tightening of the nut will lock together the spindle, the inner rings of the journals, and the sleeve F. This assembly should rotate freely in the ball races if the journals have been pressed in squarely. On the other wheels, the brake cover plate and its nut should now be replaced, and the nut securely tightened. It should be noted that in each case the brake cover plate nut has a spigot which must be correctly located in the centre hole of the brake plate before the nut is tightened. The locknut L should now be replaced and tightened against the spindle nut A (front hub and rigid frame rear hub only).

Re-fitting of the speedometer drive gearbox will now complete the re-assembly. This may be placed straight over the wheel spindle on the rigid frame models and on the later spring frame models, making sure that the driving dogs are located correctly in the recesses in the end of the hub barrel. The plain washer and the outer locknut should then be replaced and tightened securely. On earlier spring frame models the plain distance collar must be replaced before the speedometer drive gearbox is re-fitted.

Where a speedometer is not fitted, a plain hub-end cap (Part No. 90-6029) should be fitted in place of the speedo gearbox.

RE-ASSEMBLY. (COMPETITION FRONT HUB)

All references will be to Fig. D23A.

Place the distance piece V in position in the brake drum side of the hub barrel and press the outer ring only of the taper-roller race firmly and squarely up to it. Reverse the hub, place in the distance piece W and press in the outer ring of the other race in the same manner.

Take the hub bearing thrust-washer Y and slide it along almost the full length of the spindle, up to the spindle shoulder. Place the remainder of the brake drum side bearing (inner ring complete with cage and rollers) in position, backing it up to the thrust washer. Insert the spindle into the hub from the brake drum side, re-pack the hub with grease and slide into position the remainder of the other bearing. Press in the felt retainers U, followed by the felt grease seals T, and press on the dust caps S. Owing to the 'fixed' nut used on early spindles, the brake side bearing and oil seal assembly must be positioned in the hub before the spindle is inserted. Re-fit the bearing distance piece R and screw on to the spindle the nuts M and N, locking them together when the correct bearing adjustment is obtained. Over-tightening of the hub bearings will cause rapid wear and when the wheel is re-fitted into the forks, just perceptible play (about $\frac{1}{32}$ in.) should be felt at the rim.

Replace the brake plate washer P and the brake cover plate and its nut Z, the spigot of which must be correctly located through the hole in the centre of the brake cover plate, before tightening securely.

SPECIAL NOTE. (ALL FRONT WHEELS)

The dimension over the front hub locknuts, inside the fork ends, must be maintained between 4.910 ins.—4.920 ins. To adjust, use shims Part No. 90-5545 as required, between locknut and bearing abutment nut. On competition models the shims can be interposed at point O, Fig. D23A, to avoid disturbing the bearing adjustment. It will be necessary to add shims periodically, as bearing wear progresses, and after each re-adjustment.

REPLACING THE WHEELS

Re-assembly of the wheels is the reverse procedure to removal, except that care must be taken to locate the brake plate anchorages correctly, over the lower fork sliding member in the case of the front wheel, and over the fork end stud in the case of the rear wheel. Care must also be taken to see that the speedometer gearbox is lined up to the cable. Sharp bends in the cable will result in fracture of the inner wire.

Couple up the brakes and chain, adjust the wheels in the fork ends, lock securely, and finally adjust the brakes by means of their respective knurled thumb screws.

REAR CHAIN ADJUSTMENT

The rear chain is adjusted by means of screw adjusters in the fork ends behind the wheel spindle. Slacken off the nuts ('A', Fig. D23C) and screw the adjusters ('B') in or out until the chain tension is correct with an up and down movement of three-quarters of an inch (2 cm.). Make sure that the adjustment is equal on both sides of the wheel so that the latter is in correct alignment in the frame. This can be done either by glancing along the line of both wheels when the front wheel is set straight, or by means of a long

straight-edge or the edge of a plank placed along the sides of the wheels. The straight-edge should touch both walls of both tyres.

After adjusting retighten the nuts ('A').

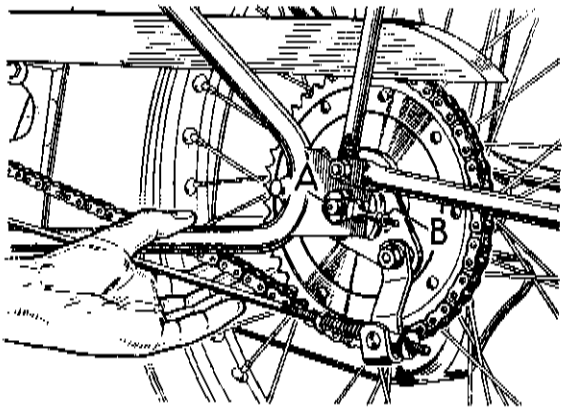

Fig. D23C

On spring frame machines the rear chain should be adjusted when the machine is on its stand and the rear wheel in its lowest position. The adjustment should then be made so that the chain has a total up and down movement of $\frac{1}{2}$ in. in the centre of the chain run at its tightest point.

In the case of the D3 and D5 swinging arm models, the movement should be $\frac{3}{4}$ in. (2 c.m.) again with the machine on its stand.

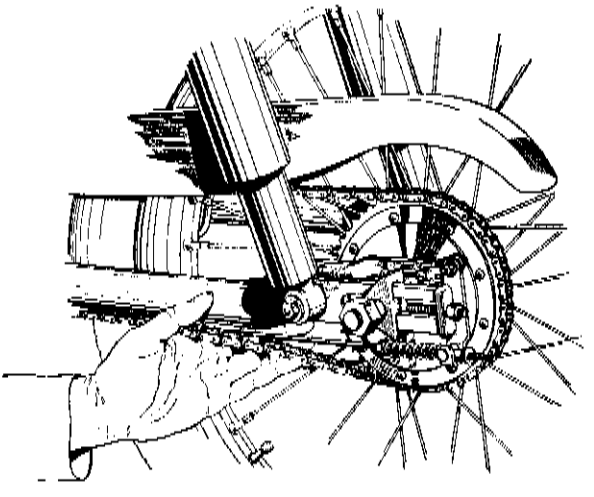

Fig. D23D

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BSA SERVICE SHEET No. 509

December, 1948
Reprinted July, 1956

Models D1, D3 and C10L (up to 1956)

For 1956 C10L please see Service Sheet No. 706

REMOVAL AND DISMANTLING OF THE FRONT FORKS AND STEERING HEAD

Remove the front wheel as described in Service Sheet No. 508.

If only attention to the sliding members and bushes is required it is not necessary to dismantle the top part of the fork assembly but the mudguard must be unbolted from the lower fork members. On early D1 models the mudguard is attached to the upper fork tubes and removal is only necessary if the forks are to be completely dismantled.

Free the top end of the telescopic gaiters from the oil seal holders B (Fig. D25) and slide the gaiters down the lower tubes. Remove the locking clips engaging in the top groove of the oil seal holders, which can then be unscrewed. On early models these clips are secured by the mudguard stay studs and later by the grease nipples which are screwed into the outer fork tube. Very early D1 models have no locking clips and the fork bushes on these models are non-detachable.

Remove the two small nuts A (Fig. D25) from the top of the two large nuts in the top yoke. On D3 and C10L models the small domed caps must first be removed. They should be levered up with the tang of a file inserted in the small hole in the edge of the dome. The sliding members complete with their springs can then be withdrawn from the bottom of the fixed tubes.

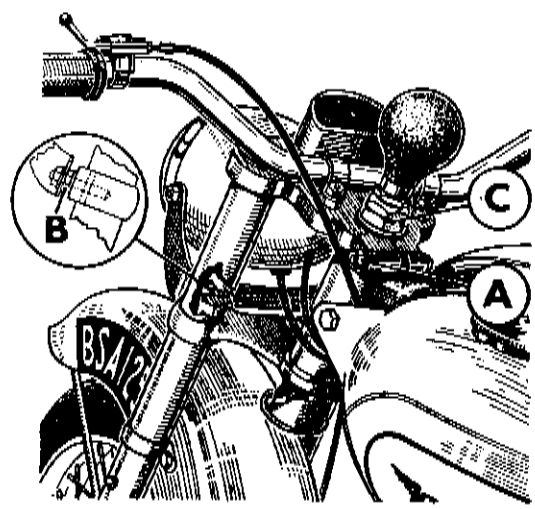

Fig. D24. Front fork and steering head.

To detach the springs, hold the lower leg in a vice, as shown in Fig. D26, and using a small punch tap the spring from its thread. The spring can be removed from its upper end housing in a similar manner. Some models have a rubber tube fitted inside the spring to increase the resistance of the fork, and this can only be removed if one end of the spring is detached.

With the sliding tubes removed the lower fork bushes can be withdrawn. Removal of the grease nipples in the side of the outer legs will allow the fork bush distance piece

and top bush to be pulled out of the fork outer tube with the aid of a spoke or other similar tool. On D1 models before Frame No. YD1-57331 the fork bushes are non-detachable and if they show signs of wear then the fork outer tubes complete must be replaced by the later type.

Detach the clutch cable from the handlebar lever and remove the headlamp switch handlebar lever, when fitted. Removal of the four nuts beneath the fork top yoke which retain the handlebar clips or aluminium cover plate will allow the handlebars to be lifted away from the top yoke. If a bulb type horn is fitted in the steering head this should be removed before the handlebars.

From this point onwards the dismantling procedure for the D1 fork is slightly different from that for the other models and will be described first.

Remove the two nuts D (Fig. D27) together with washers E and the two locknuts C. Remove the headlamp from its bracket and lower it to the full extent of the wiring harness. This will allow access to the underside of the top yoke so that the speedometer cables can be disconnected and the instrument removed.

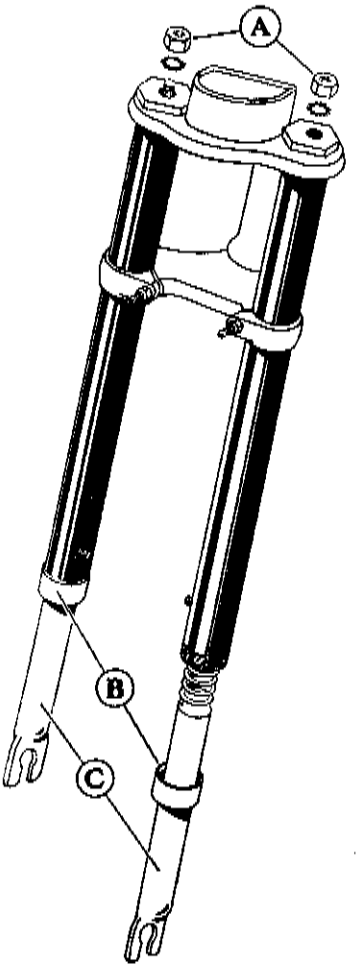

Fig. D25.

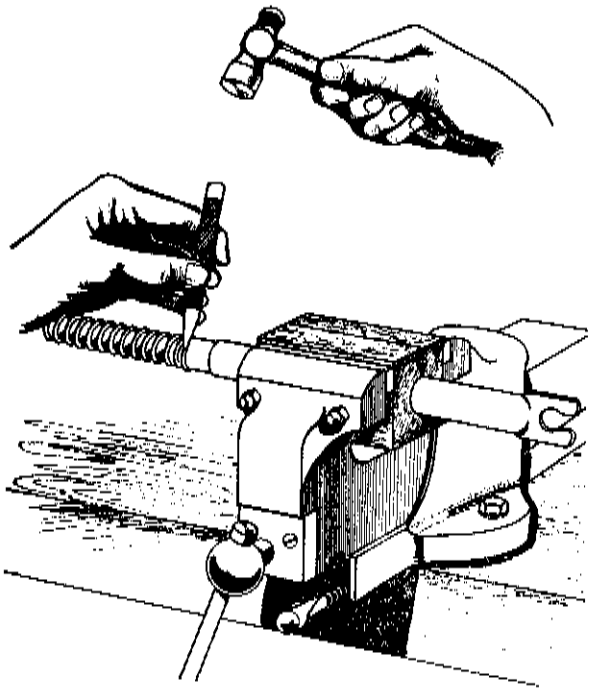

Fig. D26. Removing the front fork springs.

Slackening off the pinch bolt at the back of the top yoke will permit the yoke to be removed and placed aside, noting that it will be necessary to hold the lower part of the fork in position to prevent the balls of the lower head bearing dropping away. Pull the headlamp cowl assembly (when fitted) off the fork outer tubes and lift the headlamp over the forks so that it is resting securely on the petrol tank. As the remainder of the fork is withdrawn from the frame head a piece of clean rag should be held underneath the bottom yoke to catch any ball bearings which may escape.

To remove the outer fork tubes place the assembly on a bench and slacken the pinch nuts A (Fig. D28) in the bottom yoke. Expand the slots in the yoke by inserting a screwdriver as shown in Fig. D28 and draw the tubes down until they are resting on the large washers. Replace the nuts D and tap gently to remove the washers. The fork outer tubes can now be withdrawn.

The trumpet part of the horn (when fitted) can be removed by unscrewing the slotted collar B (Fig. D28).

On D3 and C10L models the outer tubes are a taper fit in the top yoke and they should be freed by undoing the pinch nuts A (Fig. D28) in the lower yoke and slackening the top nuts D (Fig. D27) by about two turns. A sharp tap on the head of the nut with a hide mallet will free the tube and dismantling can then proceed as for the D1.

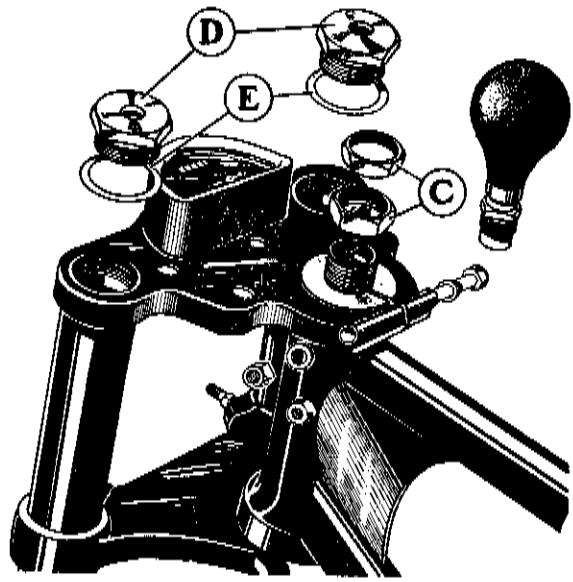

Fig. D27.

To remove the top yoke it is not necessary to undo the castellated sleeve nut on the fork stem and this will hold the lower part of the fork in position until it is ready to be removed.

When the forks have been dismantled the bearing cups can be removed from the frame head by screwing in Service Tool 61-3060 and driving them out from the opposite end with a suitable punch. Do not disturb the cups unless they are pitted or otherwise damaged.

Re-Assembly

New cups in the steering head should be driven in carefully and squarely to avoid damage and obtain correct alignment. This can best be done with a hide mallet. Grease the cups and place twenty-four $\frac{3}{16}$ in. balls in each cup.

Assembly can then be carried out in the reverse order to dismantling. Do not forget the rubber washers at the bottom of the headlamp cowl tubes (when fitted), the washers on top of the main fork tubes (D1 Models), and the dust cover over the top bearing.

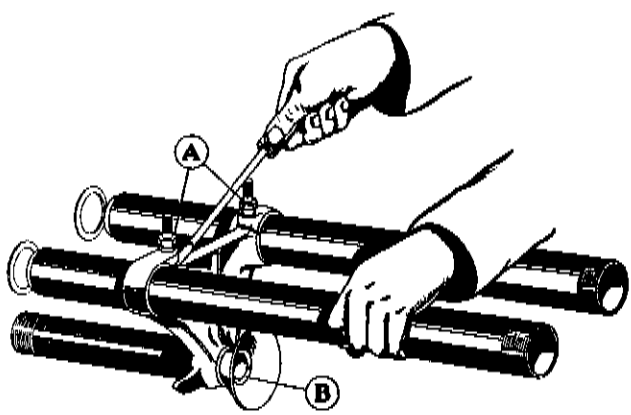

Fig. D28.

On D1 Models, when replacing the nuts C (Fig. D27) ensure that the thicker of the two nuts is at the bottom with its recess facing downwards.

D1. Steering Head Adjustment.

The method of adjusting the steering head bearings on the D1 Model is different to that for the other models. The forks should be completely assembled but only the large nuts D (Fig. D27) should be tightened, after ensuring that the mudguard stay studs on the fork outer tubes are facing each other and in line. Where the mudguard is attached to the sliding tubes, the two grease nipples should be facing outwards. Tighten down the lower of the two nuts C (Fig. D24) until the forks rotate freely but have no up and down play. Secure the lower nut by means of the locknut and then check to ensure that the bearing is not over-tightened. A "lumpy" feeling as the forks are turned indicates that the adjustment is too tight. When this adjustment is completed the top yoke clamp nut A (Fig. D24) and the lower clamp nuts B should be tightened securely.

D3 and C10L Steering Head Adjustment.

The fork can be completely assembled and all the nuts fully tightened before the steering head adjustment is carried out. The fork should be assembled so that the headlamp cowl tubes are held firmly between the top and bottom fork yokes, with the rubber washers at the lower end of the tubes and the steel washers on top. The fork nuts can then be fully tightened with the exception of the stem nuts and the pinch bolt at the rear of the top yoke. The castellated sleeve nut B (Fig. D29) should then be screwed down with the aid of Service Tool, Part No. 61-3002, or other similar tool until the forks rotate freely but without up and down play. Tighten the pinch bolt nut C to secure the sleeve nut and replace the top cap A. Check that the bearing adjustment is still correct and replace the handlebar assembly.

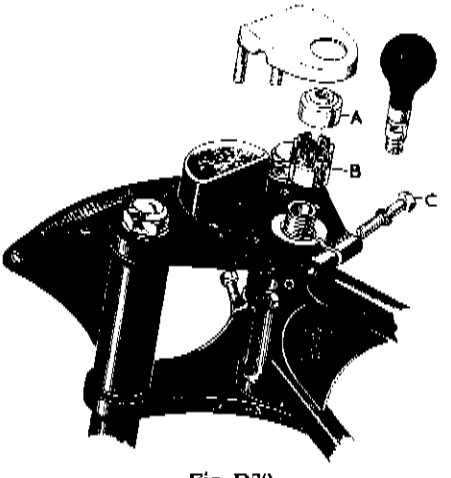

Fig. D29.

Sliding Tube Re-assembly. (All models).

Place the upper bushes in the outer tubes and push them up as far as they will go with the aid of the distance tube. Line up the holes in the distance tubes with the grease nipple holes in the outer tubes and screw in the nipples. Position the telescopic gaiters on the lower tubes together with the oil seal holders and lower fork bushes. Take care that the oil seals are not damaged as they pass over the springs. Grease the springs and sliding members, then pass them up into the outer tubes. Position the lower bushes and screw up the oil seal holders. Secure the upper end of the springs in position by means of the nuts A (Fig. D25), making sure that the fork ends are correctly positioned to receive the wheel spindle, before tightening the nuts. When the oil seal holders are fully tightened they should be secured by the small locking tabs which engage in the top groove of the holders. Make sure that the curved portion of the tab engages properly in the groove before it is tightened down.

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October, 1948.
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MODELS D1, D3 and D5 and D7
USEFUL DATA

Petrol tank capacity (approx.) ...	1¾ galls. (8 litres). D5 and D7 2 galls.
"Petroil" mixture	2 filler cap measures per gallon petrol with 6¼" filler. 2½ filler cap measures per gallon petrol with 5" filler.
Gearbox capacity	¾ pint (425 c.c.).
Bore	D1 - 52 mm. D3 57 mm. D5 and D7 61.5 mm.
Stroke	58 mm.
Capacity (swept volume) ...	D1 123 c.c. D3 148 c.c. D5 and D7 174 c.c.
Piston ring gap	Max. .013 in. (.325 mm.). Min. .009 in. (.225 mm.).
Ignition timing	Piston distance before t.d.c. with points just opening, 5/32 in. (3.75 mm.). D1 and D3 $\frac{1}{16}$" (1.587 m.m.) D5 and D7
Plug point gap	.015 in. to .018 in. (.38 to .45 mm.).

Gear ratios	Standard	Competition	D5 and D7
Top ...	7.0 to 1.	8.64 to 1.	6.48
Second ...	11.7 to 1.	14.45 to 1.	10.74
First ...	22.0 to 1.	27.1 to 1.	20.2

Tyre size, Front	2.75 × 19. D5 and D7, 3.00 × 18.
Rear	Standard 2.75 × 19; Comp., 3.25 × 19; D5 and D7, 3.00 × 18.
Tyre pressures, Front ...	16 lbs. sq. in. (1.125 kg. per sq. cm.). D5 and D7, 16 lbs. p.s.i.
(Standard Model) Rear ...	20-22 lbs. sq. in. (1.55 kg. per sq. cm.). D5 and D7, 24 lbs. p.s.i.
Front chain (.375in. × .225in.) ...	50 Links.
Rear chain (½ in. × .205 in.)	
Standard, Rigid Frame ...	116 Links.
Spring Frame ...	117 Links (D3, D5 and D7 S/Arm 121 Links.
Comp., Rigid Frame	122 Links.
Spring Frame	123 Links.
Standard carburetter jet	D1 - 75, D3 90, D5 and D7 - 140.
Jet needle position	2nd notch from top. D5 and D7, 4th.

B.S.A. MOTOR CYCLES LTD.,
Service Dept., Waverley Works, Birmingham, 10.
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October, 1948.
Reprinted June, 1959.

MODELS D1 AND D3
WORKSHOP DATA

All Dimensions in Inches, finished size

	Max.	*Min.*
Cylinder bore D1	2.048	2.047
Cylinder bore D3	2.245	2.244
Con Rod little end bore	.4693	.469
Con Rod big end bore	1.3487	1.3484
Crankpin diameter	.7968	.7965
Chainwheel bush	.8135	.8125
Primary Drive Gear bore	.501	.500
Mainshaft diameter	.499	.498
Layshaft Bush bore	.501	.500
Layshaft Bearing diameter	.4995	.4990
Kickstart Spindle diameter (large)	.7793	.7788
Bore for Kickstart Spindle in Primary Chain Cover	.7815	.7805
Kickstart Sleeve diameter (small)	.6858	.6853
Bore in Crankcase for Kickstart Sleeve	.688	.687
Gear Change Shaft diameter (outer end)	.497	.496
Kickstart Sleeve bore	.5005	.4995
Gear Change Shaft diameter (inner end)	.499	.498
Bore in Crankcase for Gear Change Shaft	.5005	.4995
Bore in Crankcase for Gear Indicator Spindle	.502	.500
Kickstart Ratchet Pinion bore	1.063	1.062
Chainwheel Bearing diameter for Ratchet Pinion	1.060	1.059
Layshaft Bearing diameter for 32 Tooth Gear	.5935	.593

BEARINGS

Location	Crankshaft (2)	Crankshaft (1)	Gearbox	Gearbox Mainshaft
B.S.A. Part No.	89 3023	90 10	90 12	90 11
Hoffman No.	LS.8	117	S.9	LS.7
Skefco No.	RLS.6	6203	EE.8	RLS.5
Ransome & Marles No.	LJ.3/4	LJ.17	KLNJ$\frac{7}{8}$"	LJ$\frac{5}{8}$"
British Timkin No.				
Fischer No.	LS.8	6203	EE.8	LS.7

B.S.A. MOTOR CYCLES LTD., Service Dept.,
Waverley Works, Birmingham, 10.
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BSA SERVICE SHEET No. 514

This sheet supersedes No. 814
Reprinted June 1959

"D" and "C" Group Models

PLUNGER TYPE REAR SUSPENSION

DISMANTLING.

First remove the rear wheel, see Service Sheet No. 410 for "C" Group Models and No. 508 for "D" Group Models. "C" Group Part Nos. are shown in brackets where they differ from "D" Group Part Numbers.

Disconnect the rear mudguard stays, and take out the pinch bolts at the top and bottom of the rear suspension columns. The centre column, Part No. 90-4117, Fig. D27, can now be driven out using a soft drift so as to avoid damage to the end of the column.

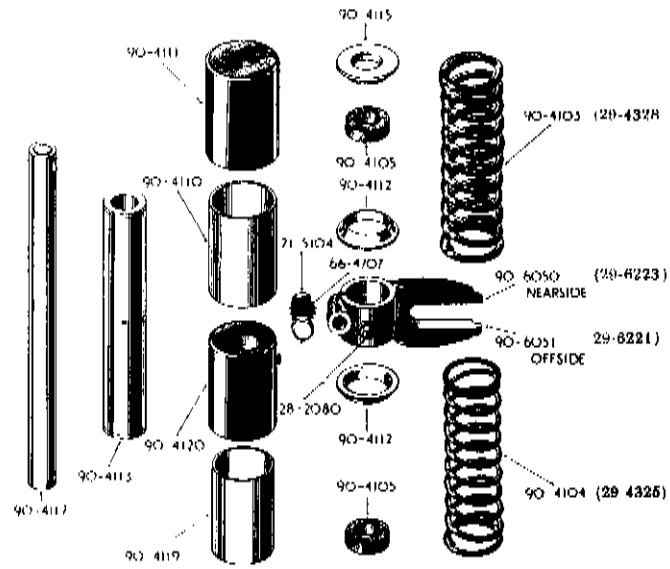

Fig. D27.

Grip the upper and lower shrouds firmly with both hands, compress the springs and lift out the suspension assembly.

Remove the shroud and springs from the sliding member, Part No. 90-4113. Carefully note the position of the steel washers and rubber bushes for subsequent assembly.

The bushes in the sliding member can now be examined for wear. If they require renewal, the tube complete with bushes must be replaced.

Unscrew the pinch bolt locknut, Part No. 21-5104, and take out the bolt. Insert a screwdriver into the slot, in the fork end 90-6051 (29-6221), the tube can then be withdrawn.

When replacing the tube ensure that the hole in the side of the tube lines up with the grease nipple in the fork end.

Note that the nearside fork end carries an anchor lug for the brake cover plate. On "C" Group Models the head of the right hand fork end clamping bolt is employed to secure the brake cover plate.

REASSEMBLY.

Replace the shroud and springs on the sliding member in the reverse order to that of dismantling.

Take up the assembly and place the lower shroud in the frame lug. Press down on the upper shroud to compress the springs, and slide the assembly between the lugs (Fig. D28)

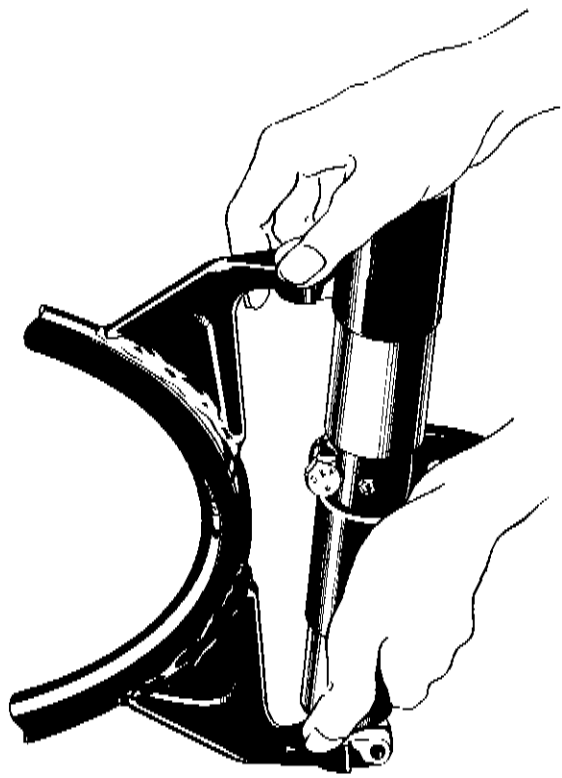

Fig. D28.

Use the Champher on the lower end of the centre column to locate the assembly correctly in the frame top and bottom lugs. Insert the column from the top, ensuring that the slots are in line with the pinch bolt hole.

Replace the pinch bolts mudguard stays and rear wheel, couple up the brake and adjust.

Finally check over all nuts and bolts for tightness.

B.S.A. MOTOR CYCLES LIMITED,
Service Dept., Waverley Works, Birmingham, 10
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BSA SERVICE SHEET No. 515

October, 1959

Model D7

DISMANTLING AND REASSEMBLY OF HUBS AND BRAKES

Both wheels are fitted with ball journal bearings which do not require adjustment. The bearings are packed with grease during assembly and this should last until the machine is in need of a major overhaul.

Front Wheel Removal

With the machine on its centre stand place a box or small wooden trestle underneath the crankcase so that the front wheel is clear of the ground.

Disconnect the brake cable by removing the nut (A) and the screw (B) Fig. D29 at the brake drum end. Slacken the torque arm nut (C) on the cover plate and remove the end caps (D) by unscrewing the four bolts (two in each cap) and as the last bolt is removed support the wheel to avoid damage to the screw threads on the bolt or the screwed sockets. The wheel will now be free.

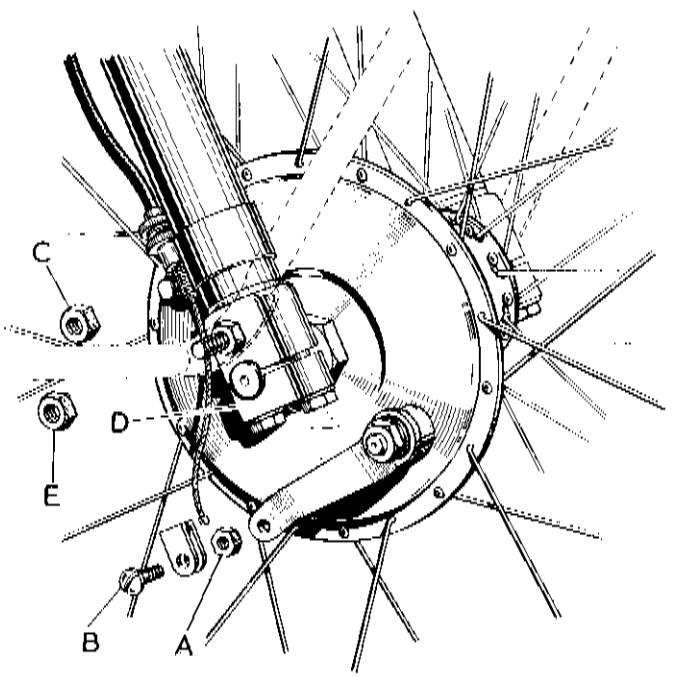


Fig. D29. Front Wheel Removal.

Front Hub Dismantling

Unscrew the large nut (F) Fig. D30 on the spindle. This will be facilitated if the brake is applied by using a short length of tubing, such as a box spanner, over the brake arm.

Take off the cover plate complete with the brake shoes, cam and fulcrum pin.

The bearing retainer (G) which is now exposed has a left-hand thread and can be removed by unscrewing in a clockwise direction with a peg spanner, Part No. 61 3644.

Drive out the right-hand or brake side bearing by striking the left-hand side of the spindle with a mallet or copper hammer. If neither of these is available the bearing can be driven out with an ordinary hammer if a piece of hard wood is placed against the end of the spindle to protect it.

To remove the left hand side bearing prise out the circlip (H) and, using a suitable piece of tube, drive out the bearing and dust cover from the right hand side.

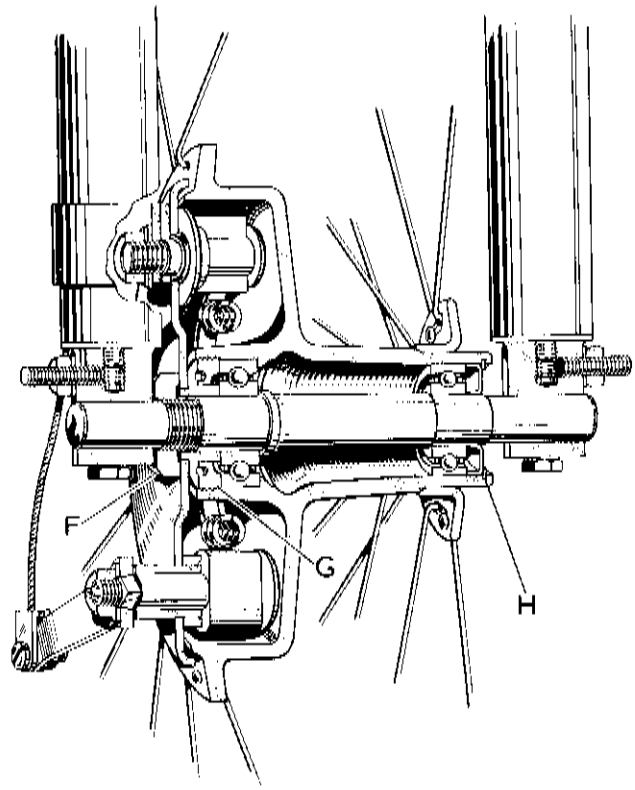


Fig. D30.

Fitting New Bearings

Place the bearing squarely in position on the right hand side and drive in using a piece of tubing on the outer ring of the bearing. When it is resting on the abutment face in the hub, screw in the lockring using a peg spanner and turning anti clockwise (left-hand thread).

Insert the spindle, screwed end first from the left hand side, and tap it gently home so that the bearing inner ring is seated against the shoulder on the spindle.

Place the left hand bearing over the spindle and drive it into the housing until the dust cap just clears the circlip groove, and replace the dust cap and circlip.

Brake Shoes

Before replacing the cover plate make sure that the brake linings are fit for further use and that cam spindle is quite free in the cover plate.

Replacement shoes may be obtained through the medium of your Dealer from the B.S.A. Exchange Replacement Service, and can be fitted by springing the old ones off the fulcrum and cam spindles then springing the new ones on in like manner.

Replacing the Wheel

Make sure that the cover plate nut (F) Fig. D30 is securely tightened, engage the torque arm bolt of the cover plate in the clip on the right-hand fork leg and replace the fork end clips. Before finally tightening the clip bolts pull the wheel towards the right hand fork leg.

Replace the brake cable adjuster, clevis pin and split pin and check over the bolts for tightness.

Rear Wheel Removal

With the machine on its stand, disconnect the rear chain at the spring link, place a sheet of paper on the ground under the run of the chain and wind the chain off the rear sprocket on to the paper but leaving it over the gearbox sprocket.

Take off the brake rod adjusting nut (A) Fig. D31 and remove the torque arm bolt (B). Disconnect the speedometer cable by unscrewing the union nut at the end of the cable. The inner cable can then be lifted out of the gearbox drive.

Unscrew the spindle nuts (C) Fig. D31 and pull the wheel out of the fork ends, at the same time freeing the brake rod from the swivel pin on the lever. Tilt the machine over slightly towards the left hand side and remove the wheel from the right-hand side.

Rear Wheel Dismantling

Unscrew the large nuts (A) Fig. D32 on the spindle, locking the spindle in the same way as described for the front wheel. Remove the brake cover plate complete with shoes and then the speedometer drive gearbox from the right-hand side. (Note the distance piece and driving dogs).

Next unscrew the bearing retainer (B) which has a right hand thread and is therefore removed by using a peg spanner in an anti-clockwise direction.

Drive the spindle through the bearing on the brake side so driving out the right-hand bearing.

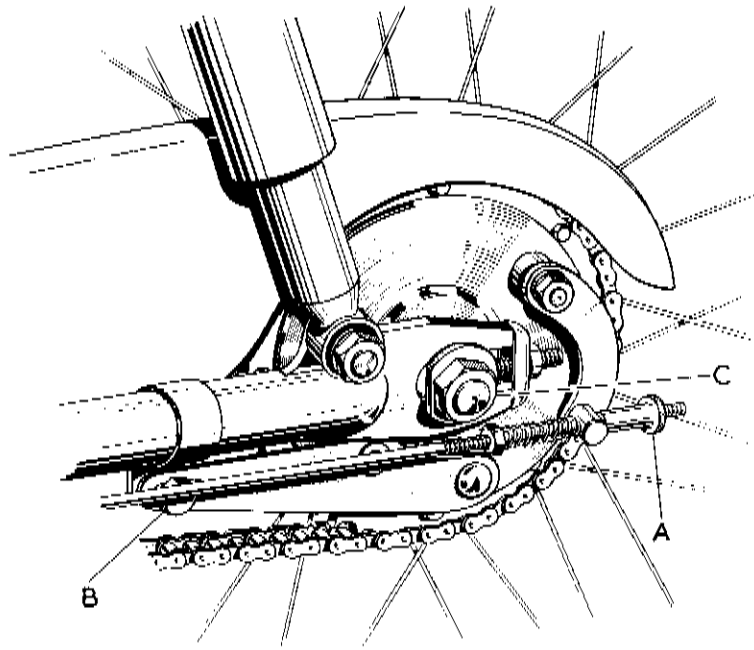


Fig. D31.

The brake-side bearing can now be driven out from the opposite side using a drift against the outer race of the bearing.

Fitting New Bearings

New bearings can be fitted in the reverse order but care must be taken to see that the locking washer is in place behind the drive side bearing and that the bearing is seated well up to the abutment in the hub shell and the shoulder on the spindle.

After fitting the drive side bearing and its retainer, insert the spindle from the right hand side, drive in the right hand bearing to the shoulder on the spindle, slide the distance piece (C) Fig. D32 over the right-hand side of the spindle, then the speedometer gearbox taking care to mesh the driving dogs and screw on the spindle locknut. This nut can be finally tightened after the brake cover plate is fitted.

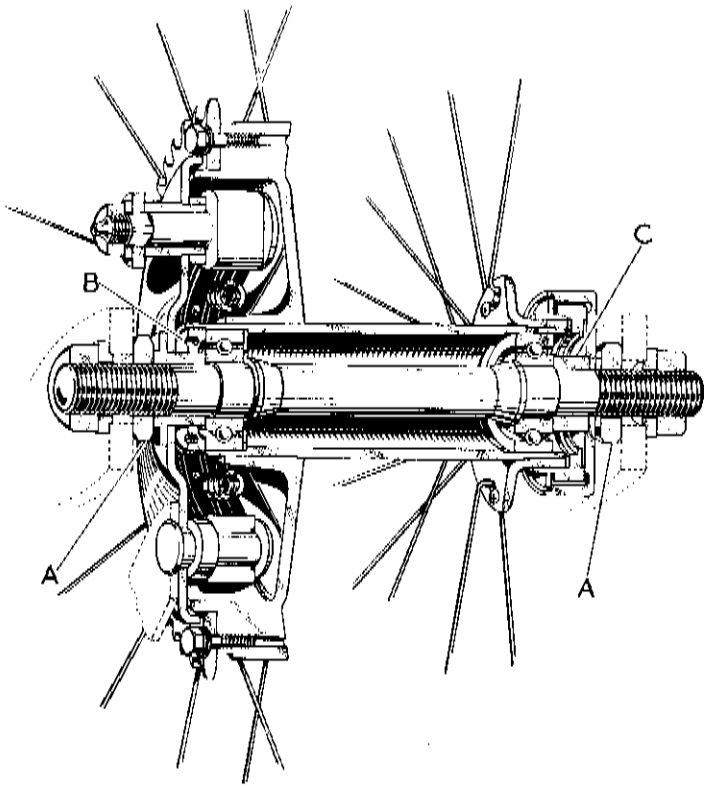


Fig. D32.

Brake Shoes

These are dealt with in the same manner as described for the front wheel and are interchangeable with the front shoes. After replacing the cover plate and nut, tighten the locknut on the speedometer drive.

Chainwheel

This is registered on to the brake drum and secured by eight bolts and spring washers.

Rear Wheel Replacement

Procedure is the reverse of that for removal, but care should be taken to see that the wheel is in alignment with the front. This is done by placing a straight edge against the wheels which must touch the front and rear of both tyres. The spring on the chain connecting link must also be fitted with the open end towards the rear wheel when on the top run of the chain. All nuts must be securely tightened.

Front Mudguard

If the front forks or steering head is to be dismantled, it will be necessary to remove the front mudguard. This is done by taking out the two bolts and nuts on the bridge piece midway up the fork legs, and then the two nuts (E) Fig. D29 on each side of the fork ends holding the stays. Spring the stays over the studs and drop the guard down out of the forks.

Rear Chain

The rear chain should be adjusted when the machine is on its stand and the rear wheel in its lowest position.

Adjustment should then be made so that the chain has a total up and down movement of $\frac{3}{4}$ inch in the centre of the chain run at its tightest point.

To carry out the adjustment slacken off the outer spindle nuts and the nut securing the brake torque arm to the frame. Screwing the adjuster nut in will tighten the chain but it is essential that both adjusters are screwed in or out the same amount in order to maintain correct wheel alignment.

When the chain adjustment has been corrected, care should be taken to see that all the nuts and bolts are securely tightened.

BSA SERVICE SHEET No. 516

MODEL D7 *Nov.* 1959

FRONT FORKS AND STEERING HEAD

Remove the front wheel and mudguard as described in Service Sheet No. 515.

Prise out the top cap (A) Fig. D33 and unscrew the $\frac{3}{8}$ in. nut holding the top spring scroll.

Place a suitable tin underneath the fork end, take out the drain plug (B) and slacken the pinch bolt (C) in the bottom fork yoke.

To release the main tube from the taper in the top yoke pull the lower sliding member out to its fullest extent, unscrew and take out the top nut and screw in Service Tool No. 61 3350. Give the end of the tool a sharp blow with a hammer and draw the leg down through the bottom yoke.

Repeat for the other leg.

Place each leg in turn in a vice, gripping it on the flats of the fork end, and unscrew the oil seal holder with Service Tool No. 61 3633.

The main tube can now be drawn upwards from the sliding member complete with the two bearing bushes, leaving the restrictor rod and spring still attached to the lower member. These need not be disturbed unless they are to be replaced.

Replacing Bushes

The lower bush is a press fit on to the main tube and the replacement must be fitted with the chamfered holes in line with the holes in the tube.

To remove the old bush, prise open the joint in the bush with a thin chisel or screwdriver and then tap the bush off.

The upper bush is a push fit in the lower sliding member and is retained in place by a washer and the top oil seal holder.

No difficulty will be experienced in replacing the top bush.

Reassembly

After fitting the new lower bush, slide the upper bush over the main tube with the flange uppermost, and apply a light coating of oil. Pass the tube over the spring and restrictor rod and slide into the lower member.

Holding the assembly in the vice by the fork ends, place the large washer in position over the flange on the top bush and screw on the oil seal holder with Service Tool No. 61 3633.

Take the assembly out of the vice and pass it up through the bottom

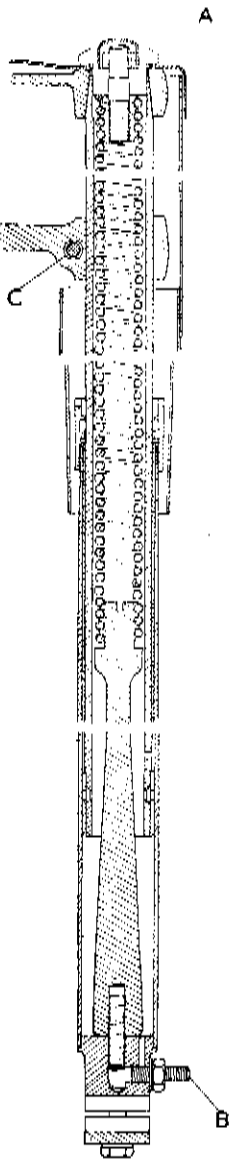


Fig. D33.
Front Fork Section

fork yoke, place the top washer in position then screw on the large top nut and secure over the stud of the spring scroll.

The $\frac{3}{8}$ in. nut can now be refitted together with the top cap. Repeat the operation for the other leg.

Finally replace the mudguard and front wheel.

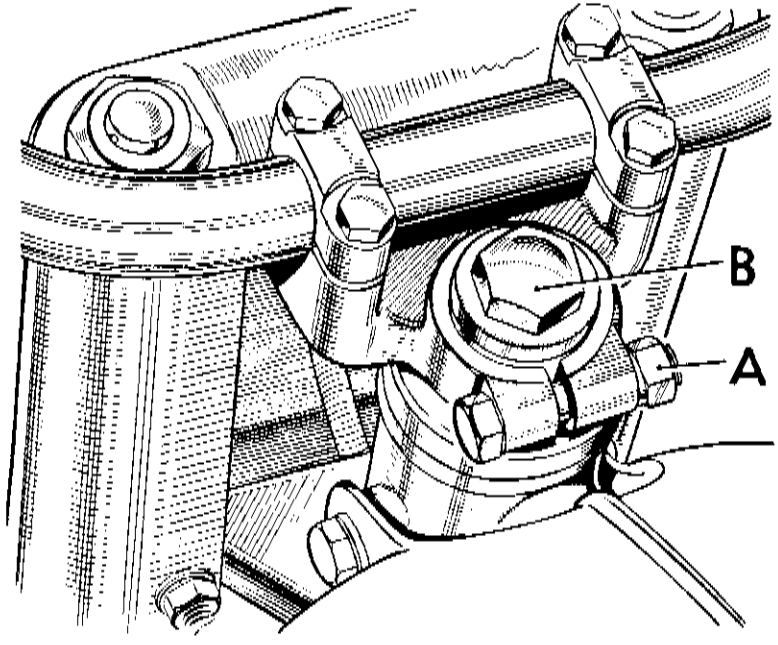
Steering Head

To adjust the steering head bearings place a weight on the saddle so that the front wheel is clear of the ground when the machine is on its stand.

Slacken the pinch bolt (A) Fig. D34 and adjust the nut (B) until the forks move freely from side to side without evidence of play in the bearings.

Take great care not to over tighten the nut (B) as this is liable to indent the bearings in the races.

When the adjustment is correct tighten the pinch bolt (A) securely and re check the adjustment.



Model D7. Front Fork and steering head

Fig. D34.

Dismantle the Steering Head

If the only attention required is examination or replacement of the head bearings there is no need to dismantle the forks completely, but the lighting cables to the headlamp will have to be broken at the couplings or sufficient slack obtained to move the forks away from the frame.

Remove the top caps from the forks, unscrew the $\frac{3}{8}$ in. nut and the large nuts holding the main tubes.

Slacken the pinch bolt (A) Fig. D34 and take off the nut (B).

Undo the four bolts holding the handlebar clips, place a piece of cloth on the tank, remove the handlebar from the clips and lay it on the cloth.

Take off the top yoke cover, support the forks underneath and remove the top yoke by striking alternately each side underneath the handlebar clips.

After the top yoke has been removed, the steering column and forks can be drawn out of the frame but a suitable tray or container should be held underneath the column to catch the ball bearings which will be released.

The cups, cones and balls should be clean and free from indentations or pitting. The top and bottom cups are identical, Part No. 65-4465, the bottom cone or crown race is Part No. 40-5027, and the top cone is Part No. 65-5319.

If new cups are fitted care must be taken to see that they are seated well down and square with the housing.

Reassembly

Apply a coating of grease to the steering head cups and insert 24 balls, 3/16 in. dia. in each cup.

Slide the column up through the steering head tube, being careful not to displace the balls, place the top cone in position, then the top yoke, and screw on the nut (B) Fig. D34.

Replace the top yoke cover, the $\frac{3}{8}$ in. nuts and the large nuts and washers and the handlebar, adjusting the steering head as previously described.

Finally recouple the headlamp wiring and check the lighting.