



Instruction Manual

Model

B33 500 c.c. O.H.V.

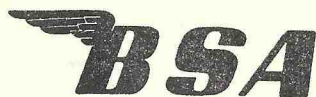
This Instruction Manual is intended to acquaint the B.S.A. owner with details of the controls, general maintenance and technical data which may be required for normal operation of the machine.

It does not contain the information necessary to carry out complete stripping for major overhauls, but if any owner feels he is competent to carry out this type of work a Service Manual and an illustrated, priced, Spares Catalogue for this machine can be obtained from your B.S.A. spares stockist or local distributor.

Owners in the British Isles can obtain these publications direct from B.S.A. Motor Cycles Ltd., Service Department, Waverley Works, Birmingham, 10. The Service Manual is priced at six shillings and sixpence, plus sixpence postage, and the Spares Catalogue is five shillings and sixpence, plus sixpence postage. Always quote full engine and frame numbers when ordering these publications.

Instruction Manual

for



B33 500 O.H.V.

B.S.A. MOTOR CYCLES LTD., BIRMINGHAM 11, ENGLAND.

Telephones: Birmingham VICToria 2381 (30 lines)

Telegrams and Cables: "SELMOTO," Birmingham

Service, Spares and Repairs Departments

WAVERLEY WORKS, BIRMINGHAM, 10

Telephones: Birmingham VICToria 3711 (6 lines)

Telegrams and Cables: "SELSERV," Birmingham

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B.S.A 350 O.H.V. MODEL B31

USEFUL DATA

AR 067

As model B33 except for the following:

Capacity	...	...	...	348 c.c.	
Cylinder bore	...	...	...	71 mm.	
Gear ratios:				Solo	Sidecar
top	...	...	...	5.6	6.25
third	...	...	...	6.77	7.58
second	...	...	...	9.82	11.0
bottom	...	...	...	14.42	16.15
Front chain length	...	...		67 pitches	
Teeth on:				Solo	Sidecar
engine sprocket	...	...		17	17
gearbox sprocket	...	...		19	17
clutch sprocket	...	...		43	43
rear chainwheel	...	...		42	42
Tyre size (rear)	...	...	...	3.25 in. x 19 in.	
Tyre pressure (rear)	...	...		23	
Carburation	...	...	...	Amal Monobloc	
Bore	...	...	...	1 in.	
Pilot jet	...	...	...	30	
Needle position	...	...	...	2	
Ignition timing (page 19)	...			7/16 in. B.T.D.C.	
Valve clearance (page 15)	...			Caps are fitted to B31 valve stems	

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TECHNICAL

Engine Number—on left side of the crankcase below the cylinder.

Frame Number—at top of steering head tube.

Engine:

Capacity: 499 c.c.

Cylinder Bore: 85 mm.

Stroke: 88 mm.

Compression ratio: 6.5-1

Valve timing: inlet—opens before T.D.C. 25°
closes after B.D.C. 65°

exhaust—opens before B.D.C. 65°
closes after T.D.C. 25°

Piston rings (compression): $.094 \times 145$ in.

(Scraper) $.156 \times .125$ in.

Piston ring gaps: .010 in.

Sparking plug: L10S.

Plug points gap: minimum. .018 in.
maximum. .020 in.

Transmission:

Gear ratios:				B33 Solo	B33 S'car
top	..	..	..	5.0	5.59
third	..	..	..	6.05	6.77
second	..	..	..	8.79	9.72
first	..	..	..	12.90	14.4

Clutch friction plates: 5.

Chain size and pitch: front $\frac{1}{2} \times .305$ in.
68 pitches.
rear $\frac{5}{8} \times \frac{3}{8}$ in.
98 pitches.

Teeth on:				B33 Solo	B33 S'car
engine sprocket	..	..	..	19	17
gearbox sprocket	..	..	..	19	19
clutch sprocket	..	..	..	43	43
rear chainwheel	..	..	..	42	42

Capacities:

Fuel tank: 2 or 4 gallons.

Oil tank: $5\frac{1}{2}$ pints.

Gearbox: 14 fl. oz. (400 c.c.)

Front forks: $7\frac{1}{2}$ fl. oz. (213 c.c.)

Primary chaincase: fl. oz. (225 c.c.)

DATA

Wheels

Rim size—front	..	..	WM2-19
rear	..	..	WM2-19
Tyre size—front	..	..	3.25-19
rear	..	..	3.50-19
*Tyre pressure—front	..	..	17
rear	..	..	19

Front brake size: 7 in. dia., $1\frac{1}{8}$ in. wide.

Rear brake size: 7 in. dia., $1\frac{1}{8}$ in. wide.

Carburation: Amal Monobloc.

Bore	..	..	..	$1\frac{1}{8}$ in.
Main jet	..	..	..	260
Main jet (with air cleaner)	..	..	..	210
Pilot jet	..	..	..	25
Throttle valve	..	..	..	$376/3\frac{1}{2}$
Needle position	..	..	..	3
Needle jet	..	..	..	.1065

General Details:

Front suspension movement	5 $\frac{1}{4}$ in.
Rear suspension movement	4 in.
Dynamo output	.. .. 60 watts.
Contact breaker gap	.. .. .012 in.
Battery capacity	.. .. 12 amp hr.
Overall length	.. .. 85 in.
Wheelbase	.. .. 56 in.
Ground clearance	.. .. 5 in.
Saddle height	.. .. 30 $\frac{1}{2}$ in.
Overall height	.. .. 40 in.
Handlebar width	.. .. 28 $\frac{1}{8}$ in. or 31 $\frac{3}{8}$ in.
Steering head angle	.. .. 61°
Steering lock angle	.. .. 45°

***Note:** The recommended tyre pressures are based on a rider's weight of 140 lb. If the rider is heavier, increase the pressures as follows:

Front tyre: Add one lb. per sq. in. for every 28 lb. increase above 140 lb.

Rear tyre: Add one lb. per sq. in. for every 14 lb. increase above 140 lb.

If additional load is carried in the form of a pillion passenger or luggage the actual load bearing upon each tyre should be determined and the pressures increased in accordance with the Dunlop Load and Pressure Schedule.

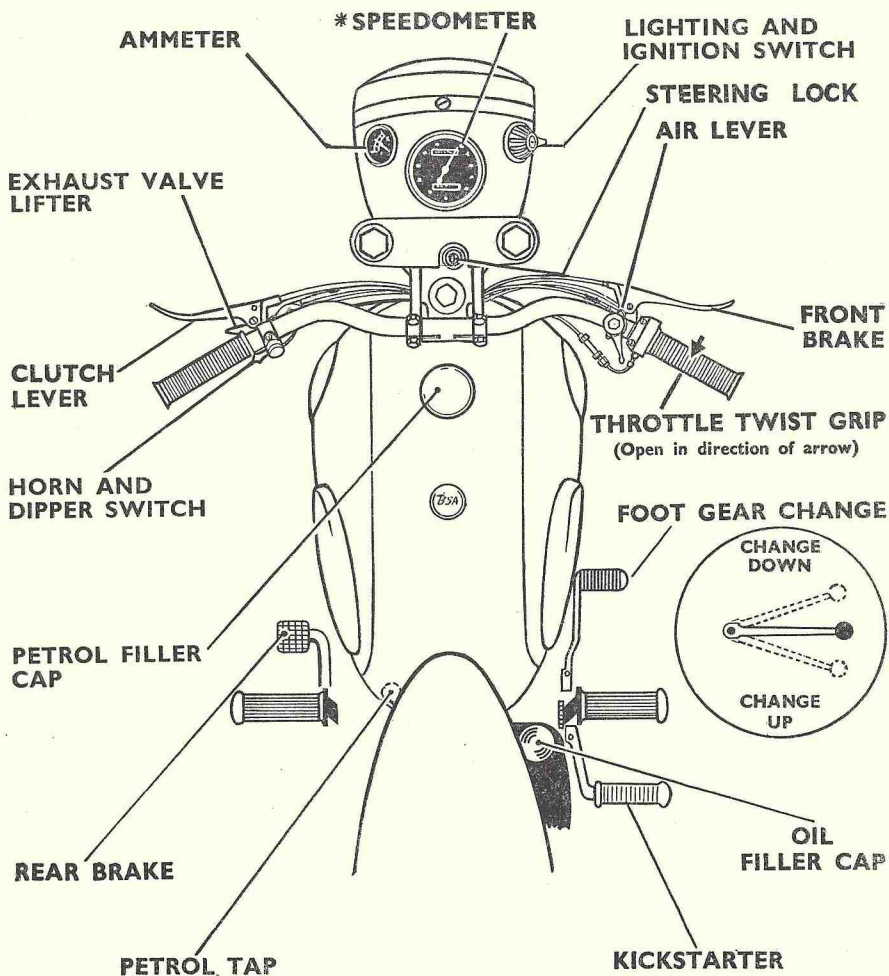


Fig. 1. The Controls

TAKING OVER THE MACHINE

Before running the machine make sure that the oil tank, gearbox, primary chain case and front forks are properly topped up with oil and that the battery is filled and charged. (See appropriate chapters for filling instructions). Normally these preparations will be carried out by the dealer who is selling the machine and the new owner has only to arrange the controls to his liking and the machine is ready for the road.

The Controls.

The new rider should make sure that he is quite familiar with all the controls before attempting to ride the machine. Most of the controls are adjustable and should be positioned so that they can be reached without moving the hands from the grips or the feet from the footrests. Handlebars and footrests should be adjusted so that a comfortable and natural riding position is achieved. Make sure that the bolts retaining the handlebar clamps are tight after completing any adjustment. Badly positioned controls cause poor control of the machine and will bring discomfort on long journeys.

Handlebar Controls.

Twist Grip.

Mounted on the right handlebar it controls the throttle opening. To open the throttle (i.e. to increase engine speed) turn the grip so that the top moves towards the rider. Full movement is about a quarter of a turn.

Front Brake.

Hand lever mounted on the right handlebar in front of the twist grip. Squeeze the lever towards the bar to operate the brake.

Clutch.

Hand lever mounted on the left handlebar in front of the grip. Squeeze the lever towards the bar to free the clutch, i.e. disengage the drive between the engine and the rear wheel.

Air Lever.

Mounted on the right handlebar attached to the rear of the brake lever it controls an air valve in the carburettor by means of a bowden cable. The air valve should be closed when starting with the engine cold.

Exhaust Valve Lifter.

A small trigger mounted beneath the left handlebar and operates, by means of a cable, a small cam which raises the exhaust valve from its seat. It is used to enable the engine to be rotated easily when starting and to stop the engine. It must not be operated when the engine is revving fast.

Horn.

The horn button is mounted on the left handlebar in a combined mounting with the headlamp dipper switch.

Headlamp Dipper Switch.

On the left handlebar attached to the rear of the clutch lever. It controls the switching from main to dipped headlamp bulb filaments.

Foot Controls.

Rear Brake Pedal.

On the left hand side of the machine and controls the rear brake only.

Gearchange Pedal

On the right hand side of the machine and effects the change from one gear to another. The lever is of the positive stop type and returns to the central position after each change. Upward movement of the lever selects the next lower gear, downward a higher gear. Neutral is between first and second gear.

Kickstarter.

The kickstarter is on the right hand side of the machine behind the footrest. Depression of the lever rotates the engine.

Other Controls.

Petrol Tap.

Under the left hand rear end of the petrol tank. To turn the petrol on pull out the round serrated button. To operate the reserve supply turn the button clockwise and pull it out again. To turn the petrol off reverse the procedure.

Lighting Switch.

Mounted on the right of the headlamp cowl and has three positions—OFF—all lights off but dynamo charging when the engine is running, L—pilot bulb, rear lamp and speedometer bulbs illuminated, H—headlamp bulb, rear lamp and speedometer bulbs illuminated and the switching from main to dipped beam controlled by the dip switch.

Ignition Switch.

In the centre of the lighting switch on the headlamp cowl. It has three positions: Off, Ignition and Emergency. Insert the ignition key and turn to the right before attempting to start the engine. If, for any reason, the battery is exhausted turn the switch to the left then start the engine in the normal way. As soon as the engine is running at a moderate speed rotate the switch rapidly to the normal ignition position when it should continue to run normally. Make sure that the switch is always returned to the central off position whenever the engine is stopped.

Ammeter.

Mounted on the left of the headlamp cowl and indicates the rate at which current flows into or out of the battery.

Speedometer.

Set in the centre of the headlamp cowl. The trip mileage recorder can be turned back to zero by pulling out the spring loaded flexible control under the cowl and turning it in a clockwise direction.

Carburettor Tickler.

This is a small plunger in the top of the carburettor float chamber. Pressing it down pushes down the float and frees the needle valve thus permitting the carburettor to receive excess petrol.

Steering Lock.

Mounted in the top fork yoke. To operate the lock turn the forks to the left, then turn the key in the lock to release the plunger. This prevents the machine being driven or wheeled.

To Start the Engine.

Stand astride the machine. Make sure that the gearbox is in neutral, i.e. between first and second gear. If the machine is in gear it will move forward as the kickstarter is pushed down.

If the engine is cold close the air lever and flood the carburetter slightly by depressing the tickler momentarily. Open the throttle very slightly as excessive throttle opening will prevent easy starting. Rotate the engine until stopped by the compression, then allow the kickstart lever to rise nearly to the top of its travel. Switch on the ignition. Pull up the exhaust valve lifter, give the kickstart lever a vigorous kick downwards, and at the same time release the exhaust valve lever. When starting with the engine warm there is no need to close the air lever or flood the carburetter.

To Stop the Engine.

Close the throttle and switch off the ignition.

To Engage First Gear.

With the engine idling slowly disengage the clutch by pulling in the handlebar lever and, after a moment, lift the gear lever as far as it will go so that first gear is selected. If the lever will not move through its full travel and the gear does not engage, move the machine backwards and forwards slightly maintaining a light pressure on the lever until the gear is felt to engage.

Open the throttle slightly and gently release the clutch lever until the clutch can be felt to take up the drive. Open the throttle a little more and very slowly release the clutch as the machine moves away. Do not rev the engine excessively or allow the clutch to slip for longer than is necessary to get the machine away in first gear.

To Change Gear (Up).

Close the throttle, disengage the clutch and press the gearchange pedal downwards as far as it will go. All these operations should be performed simultaneously. Immediately after changing gear, re-open the throttle and re-engage the clutch. Violent pressure on the gear lever is not desirable and a smooth firm movement of the pedal is most effective. After a little practice, smooth and quiet gearchanges will be possible at all times.

To Change Gear (Down).

Open the throttle slightly, disengage the clutch and draw the gearchange lever upwards to its limit, all these operations being performed simultaneously. Return the throttle to its original position and re-engage the clutch as soon as the gear change has been completed.

To Select Neutral.

Neutral is situated between first and second gear. To select neutral from first gear, with the clutch withdrawn push the gearchange pedal down gently until it is felt to click into position. If the lever is pushed down too far it will travel through to second gear. To select neutral from second gear, pull the lever up until it is felt to click into position.

Riding Hints.

Avoid violent acceleration and braking, particularly on wet roads. Always use both brakes together and apply them smoothly and progressively. Try to anticipate the need to change gear or brake, so that your riding is not jerky or untidy. Maintain a natural riding position as this provides maximum control and prevents discomfort on long journeys.

Running In.

The rider who has just purchased a new machine will do well to remember that all the internal parts are just as new as the enamel and plating which can be seen, and they must be well 'run-in' before the engine can be given any really hard work.

The 'running-in' process is the most important period in the life of the engine, and the handling it receives during the first 1,000 to 1,500 miles will determine the service it will provide in return.

It is advisable not to exceed one third throttle in any gear during the early stages. If excessive speeds are used there is risk of piston seizure and other troubles, and in any event until the machine has been 'run-in' it cannot be expected to give its best performance. In particular, avoid rapid acceleration, and do not allow the engine to labour on hills in a high gear when a change to a lower gear would ease the load.

As the mileage builds up the permitted throttle opening may be increased until, when the 'running-in' process has been completed, full throttle can be employed.

Do not let the oil level in the tank get too low, as economy in oil may prove very expensive at a later date. Running consistently with the oil level too low may cause the oil to become unduly hot. It must be remembered that the oil cools as well as lubricates, and a new engine tends to run a little hotter than one that is well 'run-in'. After the first 250 miles, drain and refill the oil tank with fresh oil and clean the filters. Repeat this process after 1,000 miles, and thereafter every 2,000 miles. The correct grades of oil are given in the lubrication chart. The oil in the gearbox should also be changed at 500 miles and further changes made every 2,000 miles.

During the 'running-in' period it is advisable to check the various adjustments such as tappet clearances, contact breaker gap, clutch adjustment, etc., rather more frequently than usual, and to check the tightness of all nuts and bolts to make sure that the initial bedding down does not loosen any components.

It is a good idea to add a small quantity of upper cylinder lubricant to the petrol each time the tank is replenished. If this is difficult to obtain, add about an eggcupful of engine oil to every two gallons of petrol.

Routine Maintenance.

To keep the machine in good condition and provide trouble-free running, maintenance must be regularly carried out. The following list of items requiring regular attention will serve as a guide to the periods between servicing and the method of carrying out the various adjustments will be found under the appropriate headings in the later chapters.

Weekly.

Check tyre pressures and remove any embedded stones or pieces of metal. Oil all exposed joints and cables.

Monthly.

Examine the battery and top up if necessary. More frequent examination is advisable in a hot climate.

Every 300 Miles.

Check oil levels in oil tank, gearbox and primary chaincase and top up if necessary.

Every 1,000 Miles.

Grease steering head, clutch arm, central stand.

Grease brake cam spindles.

Check rear chain adjustment.

Every 2,000 Miles.

Change the engine oil and clean the filters.

Change the oil in the gearbox.

Check primary chain adjustment.

Check tightness of all nuts and bolts.

Every 3,000 Miles.

Check contact breaker adjustment.

Cleaning.

Take care when cleaning the machine that dirt is not introduced into the carburetter, hubs, magneto, etc. Do not attempt to rub off dry dirt or mud as this will damage the enamel. Wash off any dry dirt with a copious supply of clean water, preferably from a hose. Any oily areas should be treated with a detergent before being hosed down. Dry the machine with a piece of clean rag and, if possible, clean it on a warm dry day so that all moisture is removed before polishing with a good wax polish. Exposed threads and controls which might suffer from rusting should receive a smear of oil to protect them.

Maintenance and Overhaul.

Whenever any work is carried out on the machine attention to detail and scrupulous cleanliness must be observed. All joints must be clean and gaskets in good condition before re-assembly. Threads must be kept clean and free from grit, and exposed threads should be oiled or greased before assembly. Good fitting spanners should be used at all times and nuts must be done up quite tight, but spanners of greater than standard length should not be employed as they may cause failure through overtightening.

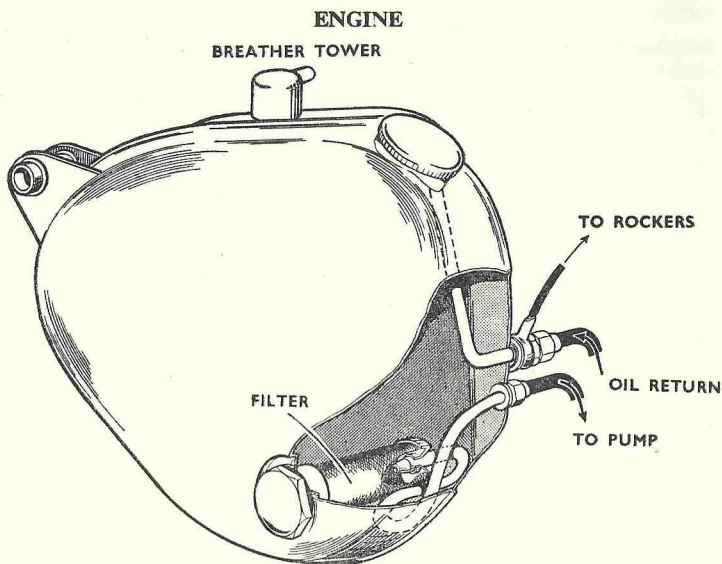


Fig. 2. The Oil Tank

Lubricating System

The lubrication system is of the dry sump type and is operated by a double gear pump situated in the bottom of the crankcase on the right hand side (see Fig. 3.) The oil tank capacity is $5\frac{1}{2}$ pints. Oil is drawn from the oil tank, through the wire mesh filter illustrated, to the supply pump (top set of gears). It is then pumped past the non-return valve A to the camshaft spindles and along the hollow mainshaft to the big end.

After lubricating the engine the oil drains down through a filter to the bottom of the crankcase, from which it is drawn by the return pump (lower pair of gears) past the non-return ball valve C and delivered up the return pipe to the tank. At the junction of the return pipe with the tank a by-pass pipe leads a supply of oil to the rocker gear. The surplus oil from the rockers flows down the push rod tunnel back into the crankcase.

If the ball valve at A does not seat properly oil may transfer from the tank to the crankcase while the machine is standing. In this event remove the valve and thoroughly clean the ball and its seat. If this does not prove effective replace the ball on its seat and give it a sharp tap with a light hammer and suitable punch to ensure that it has properly bedded down.

If the ball valve C should get stuck in its seating, there will be no return of oil to the tank. To correct, remove the cover plate B below the pump, insert a piece of wire into the valve orifice, and lift the ball off its seating to free it. To check the flow of oil in the lubricating system, remove the tank filler cap whilst the engine is running. Oil should be seen issuing from the return pipe just inside the filler cap.

The oil tank filter is attached to the large chromium plated nut screwed into the outside of the oil tank (Fig. 2). When the filter requires cleaning this nut should be unscrewed and the filter washed in petrol. Make sure that all the petrol has evaporated from the filter before replacing.

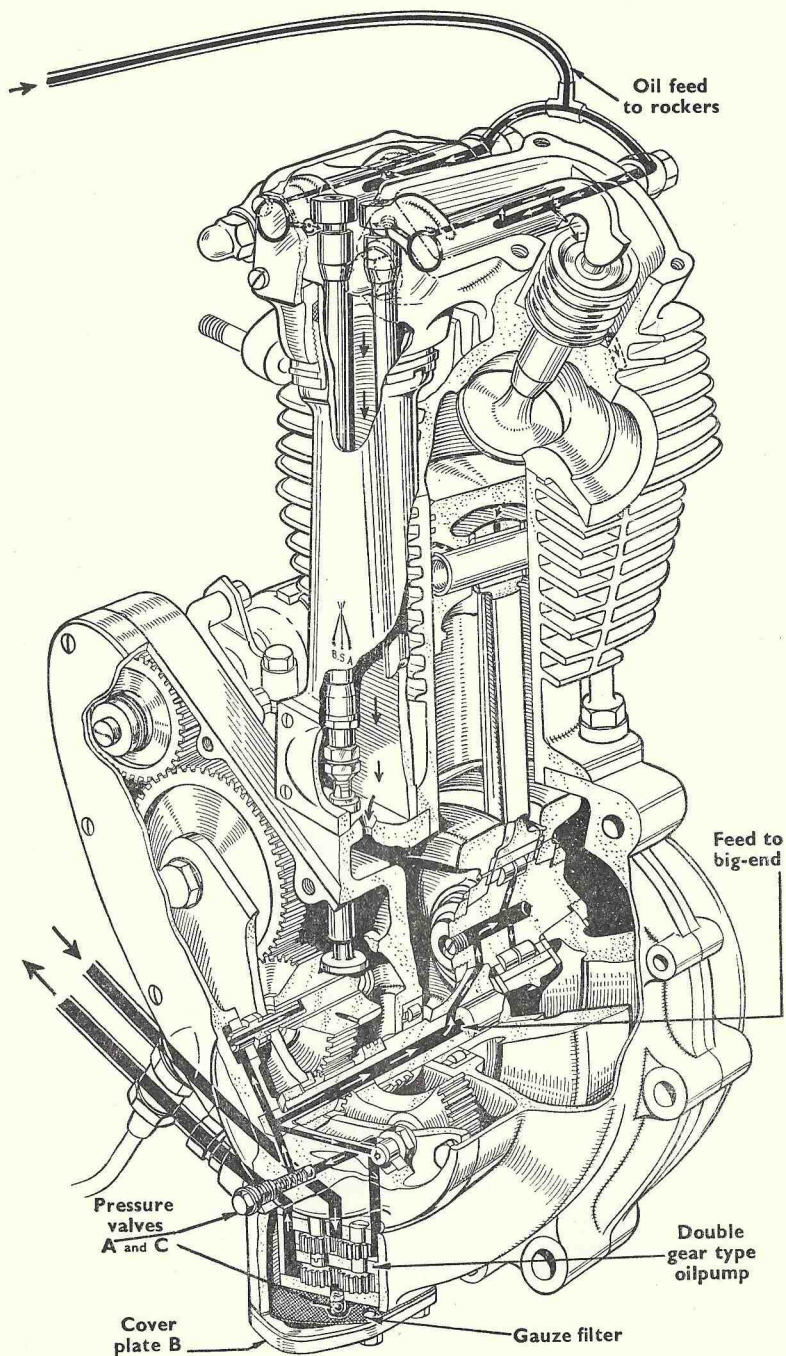


Fig. 3. Lubrication System

The pump filter can be withdrawn after removing the crankcase cover plate and should be thoroughly washed with petrol, dried and replaced. The oil pump is extremely reliable and it is most unlikely that it will give trouble, therefore it should not be distributed unnecessarily. The pump is held in position by the two bolts with spring washers under their heads. The two other bolts hold the sections of the pump together.

Oil Changes.

The oil should be changed every 2,000 miles. To drain the oil, remove the filter in the side of the oil tank by unscrewing the large hexagonal cap. The oil remaining in the crankcase can be drained by removing the small hexagonal headed drain plug or the crankcase bottom cover plate which is retained by four studs. Removal of this cover plate allows access to the crankcase filter which can be withdrawn for cleaning. The filters should be washed thoroughly in petrol and allowed to dry completely before being replaced. When replacing the filters make sure that they engage correctly with the feed pipes which pass through them. Whenever possible the oil should be drained when the engine is warm, as the oil with then flow more freely.

Exhaust Valve Lifter.

Before checking the valve clearance make sure that the exhaust valve lifter, inside the rocker box, is well clear of the exhaust valve rocker. The lever on the outside of the rocker box should have appreciable free movement before it starts to open the valve and the return spring must retain it firmly in the off position. Adjustment is normally carried out by means of the cable adjustment on the rocker box cover, but the actuating arm can be removed and reset to any position on its serrated shaft. (See Fig. 4.)

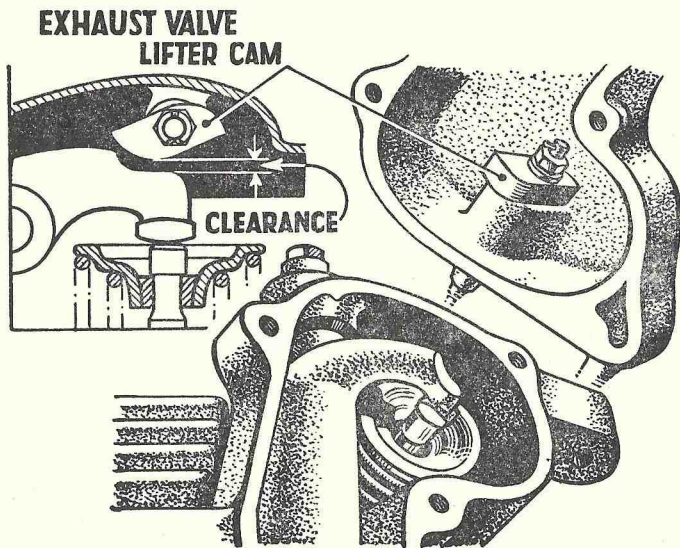
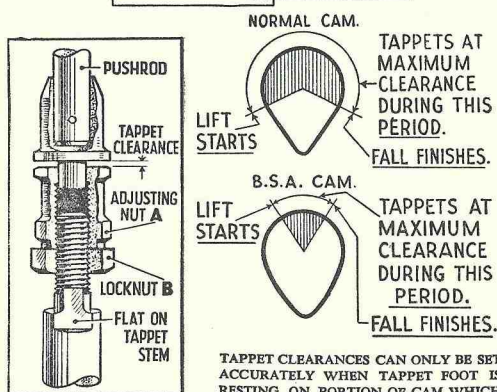
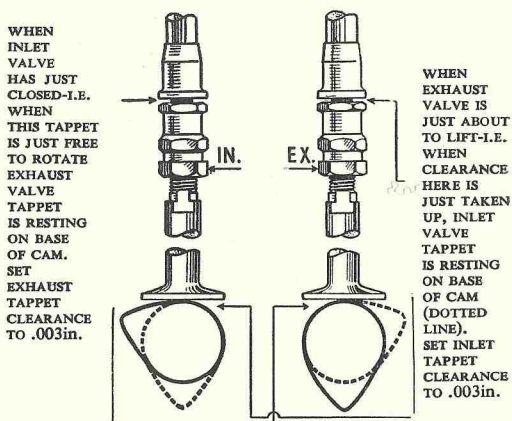


Fig. 4. Exhaust Valve Lifter Adjustment.

Valve Clearances.

Owing to the quietening ramps fitted to all B.S.A. cams a special procedure must be followed when checking or adjusting the valve clearances.

Remove the cover at the bottom of the push rod tunnel, rotate the engine forward until the inlet valve has just closed, *i.e.*, the push rod is just free to rotate. This is the correct engine position for adjusting the exhaust valve clearance.



BE SEEN ON ABOVE DIAGRAMS, THIS PERIOD IS RELATIVELY SMALL ON A B.S.A. MAKE QUITE CERTAIN THAT CAM POSITIONS ARE CORRECT WHEN ADJUSTING TAPPETS.

Fig. 5. Tappet Adjustment

Turn the engine forward again until the exhaust valve clearance is just taken up but before the valve actually starts to lift. This is the correct engine position for checking or adjusting the inlet valve clearance.

The valve clearances must only be checked or adjusted when the engine is quite cold. The clearances are critical and no attempt should be made to experiment with different settings as damage to the engine may result.

Valve Clearance Adjustment.

The adjuster, which is of the screwed type, is at the top of the tappet. The correct clearance is obtained when the push rod is just free to rotate. It is advisable to lift the push rod with the fingers when checking the clearance as otherwise the weight of the push rod may give a false impression of reduced clearance.

If adjustment is necessary, i.e. the push rod will not rotate or, on the other hand, can be lifted up and down easily, hold the tappet head A, Fig. 5, and undo locknut B. Then hold the tappet by means of the flats on its stem and screw the tappet head up or down until the clearance is correct. Tighten the locknut B and re-check the adjustment. The correct valve clearance is .003 in. for both inlet and exhaust.

Sparking Plug.

Adequate attention to the sparking plug is of great importance in obtaining satisfactory engine performance. The Champion type L7, formerly designated L10S Sparking Plug fitted by the factory has been adopted after careful tests and nothing will be gained by fitting any alternative type of plug.

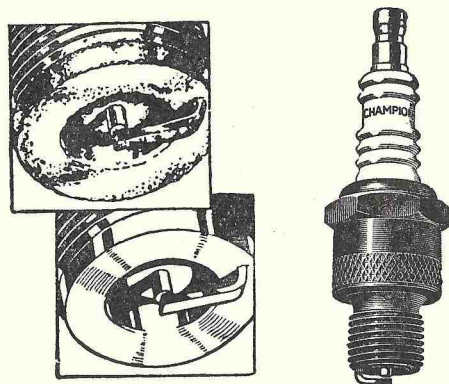


Fig. 6. The Sparking Plug

Remove the plug every 1,000 miles (1,500 kms.) or so, for inspection. Providing that the carburation is correct the sparking plug points should remain clean almost indefinitely and should appear as shown in the lower view, Fig. 6. The bottom of the plug body should remain a smooth black and the central insulation should retain its natural colour. If the mixture is too rich, a sooty deposit will form on the body of the plug as in the upper view of Fig. 6, but a

weak mixture will cause the end of the plug to go white. A heavily leaded fuel may cause a greyish deposit to form on the plug and excess oil will show its presence by a shiny black deposit and gum.

A light deposit due to any of these causes can easily be removed by cleaning the plug on a proper air blast unit such as is to be found at most garages, but if it is found necessary to clean the plug frequently the cause should be investigated. If the deposit is allowed to accumulate, particularly inside the plug body, the plug may spark internally with an adverse affect on performance and it may even stop the engine altogether. If eventually the cleaning process fails to restore the plug to its original efficiency, then a new one should be fitted.

It is most important that the plug gap is kept correct. Whenever the plug is removed for inspection, the gap should be tested and if necessary, re-set. The correct gap is .018-.020 inches (.45-.50 mm.) and it should be measured by means of feeler gauges inserted between the side wire and the central electrode. If the gap is not correct it should be adjusted by bending the side wire, but in no circumstances must any attempt be made to bend the central electrode as this will damage the insulation and make the plug ineffective.

The gap is most easily adjusted with the aid of the special tool illustrated in Fig. 7, which also has feeler gauges attached to assist in measuring the plug gap. This tool is obtainable, priced 2/-, from any Champion Plug stockist or from the Champion Sparking Plug Co. Ltd., Feltham, Middlesex.

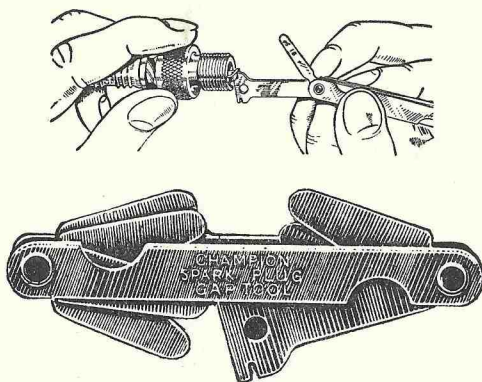


Fig. 7. Setting the Plug Points

Before replacing the plug make sure that the threads are clean and that the copper washer is in good condition. If it has become worn or badly flattened a new one must be fitted to ensure a gastight seal. Screw the plug in as far as possible by hand, then use a tubular box spanner for final tightening, to avoid the possibility of damage to the insulator. In no circumstances should an adjustable spanner be used.

The insulation on the top of the plug should be wiped quite clean before replacing the cap, and then finally, the cap itself should be wiped to remove dirt and grease.

Ignition Timing.

It is unlikely that the ignition timing will alter, but if, for any reason, it is found necessary to check or re-set the ignition timing it is advisable first to check the contact breaker points and if necessary, re-adjust as described under the next heading.

To check the timing, remove the sparking plug and the contact breaker cover. Insert a slim rod through the sparking plug hole to feel the top of the piston, then rotate the engine until the piston is at top dead centre on the compression stroke (i.e. with both valves closed). Keep the rod as vertical as possible and mark the T.D.C. position on it. The best way of rotating the engine is to engage top gear and turn the rear wheel.

Turn the engine backwards through about 45° then bring it forward again until the contact breaker points are just on the point of opening. When the cam is moved to the fully advanced position as shown in the unit (Fig. 8) the position of the points is best determined by inserting a piece of fine paper, (such as cigarette paper) between the points. The points are just about to open when the paper is only lightly gripped and can be withdrawn with a gentle pull.

The piston should then be $\frac{3}{8}$ inch before T.D.C. as measured by the rod through the plug hole.

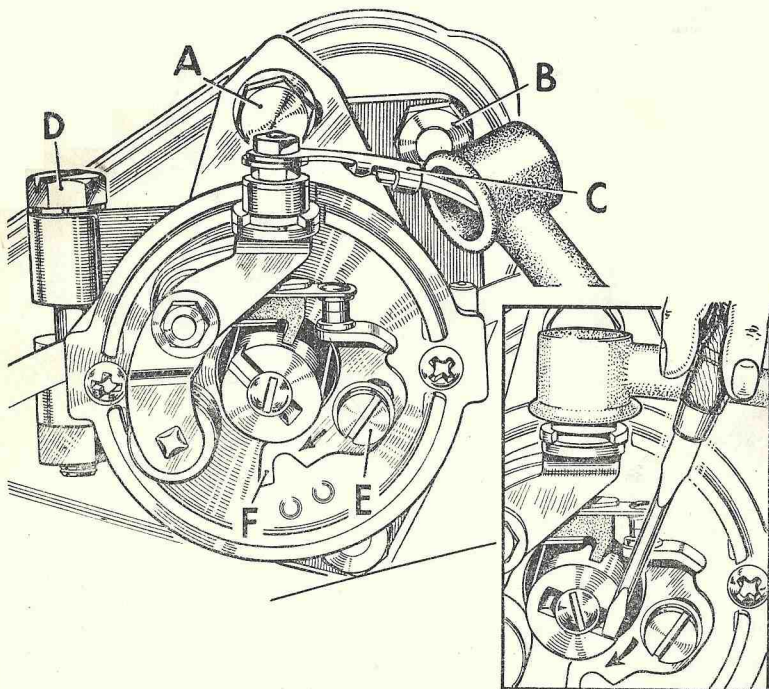


Fig. 8. The Contact Breaker

If the timing is slightly out it can be set by slackening bolt A Fig. 8 and rotating the contact breaker a degree or two either way as required until the points are in position as described above. Then re-tighten bolt A.

To re-time the ignition if this becomes necessary remove the contact breaker complete with housing by taking out the 3 top timing cover screws (i.e. the one at the top of the timing cover, and the one on each side of it). These are longer than the other timing cover screws, which need not be disturbed, and are provided with nuts B at the back. When they are taken out the contact breaker with housing can be drawn out as a complete unit together with its driving pinion still in position. Disconnect the low tension cable C from its terminal.

Rotate the engine until the piston is in the correct position as described above (i.e. $\frac{3}{8}$ in. before T.D.C. at the end of the compression stroke). Now take the contact breaker unit, remove the cap, and turn the driving pinion until the points are just on the point of opening with the cam held in the fully advanced position as already described for checking the timing. Release the cam and hold the unit in such a position that the nut A and terminal C are vertical. (These two should be in line. If they are not, then slacken pinch bolt D and turn the housing until A comes into line with C. Then re-tighten pinch bolt D).

Holding the unit in this position, gently insert it into its register at the back of the timing cover. If it will not go right home withdraw it and turn the pinion the least fraction of a tooth to enable it to mesh with the idler pinion which drives it and re-insert. When it is fully home re-fit the three screws, and check the timing, making any necessary adjustment at bolt A.

To adjust the Contact Breaker Points.

Turn the engine until the points are fully open and check with a set of feeler gauges. The correct gap is .012—.015 inches. If incorrect slacken screw E and move plate F gently with a screw-driver until the correct gap is obtained. Then tighten screw E and re-check the gap.

Cams.

Access to the cams is gained by removing the timing cover as described above under Ignition Timing. This exposes the cam pinion outrigger plate which can be pulled away after removing the retaining bolts, including the nipple-headed bolts which screw into the cam spindles.

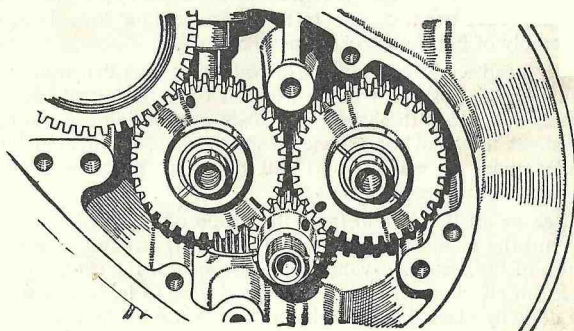


Fig. 9. Cam Pinion Markings

If the cams are removed for any reason, note that the engine shaft pinion and cam pinions are marked to facilitate assembly. As the cams are interchangeable the timing marks are duplicated on both pinions. The 'dash' mark only is used for the inlet cam, and the 'dot' for the exhaust cam. (See Fig. 9.)

Decarbonisation.

Decarbonisation should only be carried out when there are definite symptoms that excessive carbon build up inside the engine is interfering with performance. The usual symptoms are an increased tendency to pink (a metallic knocking when under load) and a general falling off in performance with a tendency for the engine to run hotter than usual.

It is customary to attend to the valves during decarbonisation as this provides a reasonable interval between valve overhaul and avoids the necessity for dismantling the engine especially for this purpose at a later date.

It is necessary to remove the petrol tank in order to carry out decarbonisation. Turn off the petrol tap and detach the petrol pipe. Remove the petrol tank strap which is located under the front of the tank, and is held in position by two nuts. The central tank locking bolt can then be removed when the rubber plug on top of the tank is pulled off. Before commencing general dismantling, rotate the engine until the piston is at t.d.c. on the compression stroke, *i.e.* with both valves closed. This will prevent any pressure on the valves during the operation.

The exhaust pipe is a push fit in the head and can be pulled away when the nuts holding the exhaust system to the frame are released. Detach the carburettor and tie it back out of the way. Remove the sparking plug and detach the stay to the cylinder head. Disconnect the oil feed pipe to the rockers and the oil return pipe from the rocker box to the crankcase. The exhaust valve lifter can either be disconnected, or the exhaust rocker cover can be removed, leaving the cable intact. Remove the inlet rocker box cover. Slacken the castellated gland nut securing the push rod cover tube to the cylinder head (using the special 'C' spanner provided in the tool kit) and remove the two acorn nuts clamping the base of the tube to the crankcase.

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

The cylinder head, complete with push rod cover tube can now be raised a little, this enables the push rods to be lifted off the tappets and lowered to the crankcase face. Note that the head has a plain ground joint at the barrel—no gasket is used. If the head shows a tendency to stick, a few light taps with a wooden mallet under the exhaust port will loosen it. With the head clear the push rod cover tube can be detached.

Carefully scrape all the carbon from the inside of the head, then rotate the kickstarter until the piston is nearly at the top of its stroke and scrape off the carbon on top of the piston. As the carbon deposit at the extreme edge of the piston acts as an effective oil seal, it is a good idea to leave this undisturbed. This can be done by placing an old piston ring on top of the piston, just inside the top of the bore and, using this as a guide, remove all the carbon not covered by the ring. Take great care that the soft aluminium surface of the piston is not

scored. The best tool for the job is an old screwdriver, the edges of which have been rounded by wear, and provided that a little patience is employed all traces of carbon can be removed to leave the surface smooth and unmarked.

It is unlikely that any attention to the rockers will be required, but if it is desired to remove them, the acorn nuts should be removed from the ends of the spindles. The spindles should then be tapped out from the threaded end using a soft punch to avoid damaging the threads. Take careful note of the rocker assembly for replacement—the spring, followed by the steel washer, and finally the aluminium oil seal washer.

To remove the valves, place a wooden block which will fit inside the cylinder head, on a bench and then lay the head on to the block with the valve heads resting on it. Lift off the hardened end caps from the valve ends (B31 only). Compress the valve springs until the split collets can be lifted out. When the collets are out, valve springs and top collar can be removed. Examine the valve springs and if they have shortened appreciably they should be replaced. Valve springs are not expensive items and it is false economy to continue to use them when their useful life is exhausted. The correct free length of these springs when new is: Inner spring— $1\frac{1}{8}$ inches; Outer spring— $2\frac{1}{2}$ inches.

The inside of the valve ports must be carefully scraped free of carbon. Take care not to damage the valve seat faces with the decarbonising tool. If any carbon falls into the valve guides, it must be carefully removed with a piece of clean rag.

If the valves and their seats are only discoloured or lightly pitted, then it will be sufficient merely to grind them in with a little grinding paste, but if there is considerable evidence of pitting, then the faces must be re-cut with proper equipment. If the valve is pitted it should be returned to a dealer for re-grinding, as attempts to grind the valve in with grinding paste will only cause excessive wear of the valve seat in the cylinder head. The latter may be in good condition, but if it is pitted the head must be removed and sent to your dealer for re-facing with a proper valve seat cutting tool. The valve seat angle is 45° .

With the valves and seats in good condition or if they have been refaced then they will require lightly grinding in to ensure that a good gas seal is created. Smear a small quantity of fine grinding paste onto the face of the valve head and return the valve to its seat. A light spring inserted under the valve head greatly facilitates the grinding operation as it assists in raising the valve so that it can be rotated to a new position. Hold the valve head with the special tool provided in the kit, and rotate the valve backwards and forwards whilst maintaining light pressure. Raise the valve and turn it to a new position after every few movements. Grinding should be continued until the mating surface of the valve and seat show uniform metallic surfaces all round.

If the valve guides are worn the old ones can be driven out by means of a single punch applied from inside the cylinder head. New guides should be driven in from the top as far as they will go. Whenever new guides have been fitted the valve seats must be refaced with a proper valve seat cutter to ensure that the seat is concentric with the guide bore.

Before re-assembling the valves and springs all traces of grinding paste must be removed from both the valve seat and the valve stem, smear the latter with

clean engine oil. Replace the valve, then compress the valve springs with the aid of a suitable tool until the collets can be inserted. A blob of grease on the valve stem will assist in keeping the collets in position as the valve spring is released. Make sure that the split collet retaining the valve spring collar is correctly seated in the recess on the valve guide.

Removing the Cylinder Barrel

It should not be necessary to remove the cylinder barrel unless it is felt that the piston rings require attention. This may be shown by such symptoms as excessive blue smoke in the exhaust and by lack of compression, although if the valves are not in good condition this is more likely to be the cause of the latter symptom.

Lift the barrel upwards and forwards into the front angle of the frame and as the piston emerges from the barrel be steadied to prevent possible damage. As soon as the cylinder has been withdrawn, cover the crankcase with a clean piece of rag to prevent the entry of foreign matter.

Examine the cylinder carefully for wear and if a deep ridge has formed at the top of the bore then a rebore may be necessary and you should consult your dealer for confirmation. Pistons $\frac{1}{32}$ mm. and 1 mm. oversize are available for rebore purposes but owners in Great Britain can take advantage of the Exchange Replacement System to obtain a rebored barrel with matched piston through their local B.S.A. spares stockist. The barrel will also require a rebore if there are any deep scores as this will cause loss of compression and excessive oil consumption. Any shiny marks on the bore are indications of seizure and the cause of this should be determined and rectified.

The outside face of the piston rings should possess a smooth metallic surface and any signs of discolouration or shiny portions mean that the rings must be replaced. The rings must also possess a certain amount of springiness so that the ends lie at least $\frac{3}{16}$ inch apart when released from the barrel.

The rings should be free in their grooves but with a minimum side clearance. If the rings are stuck in the grooves remove them and clean out all the carbon from the groove and the inside face of the ring. Care is necessary when removing the rings as they are brittle and only permit a minimum amount of movement. A suitable tool for removing the carbon from the ring grooves is a piece of old piston ring ground as a chisel.

To check the piston ring gaps place each ring in the least worn part of the cylinder bore and make sure that it is square in the bore by locating it with the top of the piston. Measure the gap between the end of the ring with a feeler gauge. The correct gap when new is .008-.012 inches and although an increase of a few thousandths of an inch is not important, any large increase to say, 25 thou. means that the ring should be replaced. If a new ring is being measured the gap may be less than the amount specified and in this case the ends of the ring must be opened out with careful use of a very fine file. Take care that no ridge is left on the edges of the ring which could score the barrel.

It is not necessary to remove the piston unless it requires replacement or further dismantling of the engine is to be carried out. If removal is necessary first prise out one of the wire gudgeon pin circlips by inserting a suitable pointed instrument in one of the two notches provided. Before the gudgeon pin can be withdrawn the piston must be warmed by wrapping it in rag that has been soaked in boiling water and wrung out. Alternatively, an electric iron can be applied

to the crown of the piston until it is thoroughly warmed. When the piston is warm withdraw the gudgeon pin with the suitable extractor. If an extractor is not available the gudgeon pin can be driven out with a good fitting drift but the piston must be carefully supported to avoid any side strain on the connecting rod. As soon as the piston is removed mark the inside of the skirt so that it can be replaced the correct way round.

While the cylinder barrel is off the crankcase is a good opportunity to try the connecting rod for signs of wear. The rod should revolve freely without any signs of up and down movement at the big end. Rotate the flywheel until the crankpin is uppermost with the connecting rod vertical. Grasp the rod firmly and try to move it up and down. If any play can be detected the big end and connecting rod assembly will require replacement. Do not confuse sideways movement at the little end with up and down play. The big end should have approximately 10 thou. side play and this permits some sideways movement at the other end of the connecting rod.

Re-assembly is carried out in the reverse order to dismantling. Scrupulous cleanliness must be observed and the components should be smeared with fresh oil before replacing. Warm the piston before inserting the gudgeon pin and make sure that the new circlip is correctly located in its groove. Slide each piston ring carefully over the piston, until it reaches its groove. The barrel should be slid over the piston, at the same time compressing the rings so that they pass smoothly into the lower end of the bore. Take great care that the rings are not trapped or damaged and if the job is being done single-handed a band for compressing the piston rings will facilitate the operation.

Insert the push rod cover tube into position in the cylinder head, but do not screw up the gland nut. Place the push rods inside the tubes and then lift the cylinder head into position. It will be necessary to keep the head raised whilst the push rods are positioned on the tappets, and then the rods must be correctly located on the rockers. Lower the head into position, replace the acorn nuts securing the push rod tube and then screw up the long cylinder head and barrel bolts, working in a diagonal order until they are dead tight. The push rod gland nut can now be tightened up. Before replacing the inspection and tappet covers, check the tappet clearances as described on page 16. Connect up the oil feed and return pipes to the rockers, replace engine steadying stay.

Replace the rocker box covers, the carburetter, the sparking plug, the exhaust system, and finally, the petrol tank and petrol pipe.

CARBURATION

The carburetter is of simple and robust construction and the only attention that may be required is adjustment of the pilot jet and throttle stop.

An exploded view of the carburetter is shown in Fig. 10. Opening the twist grip throttle control raises the throttle slide thus controlling the supply of air to the engine. The tapered needle controlling the supply of fuel is attached to the throttle slide so that a balanced mixture is always provided. The needle has five notches at its upper end and it is secured in the throttle slide by a spring clip which locates in one of these notches. The throttle valve size and the needle

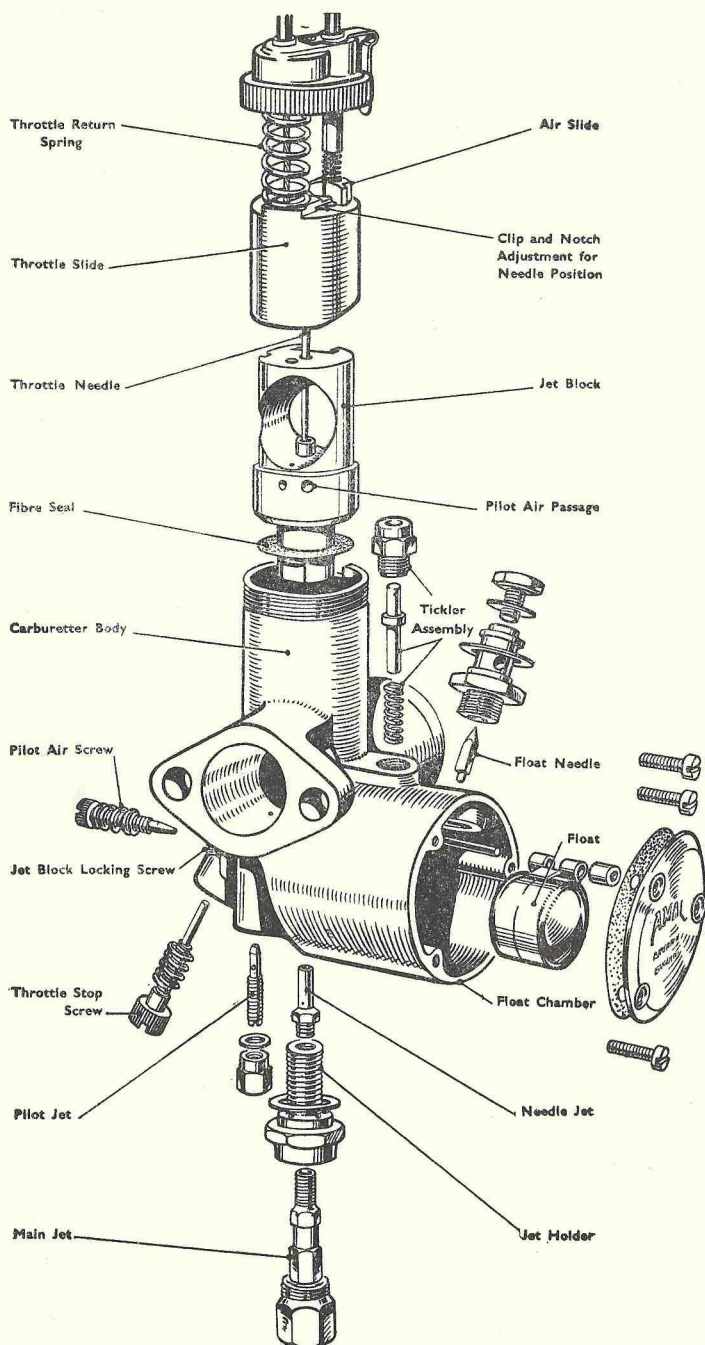
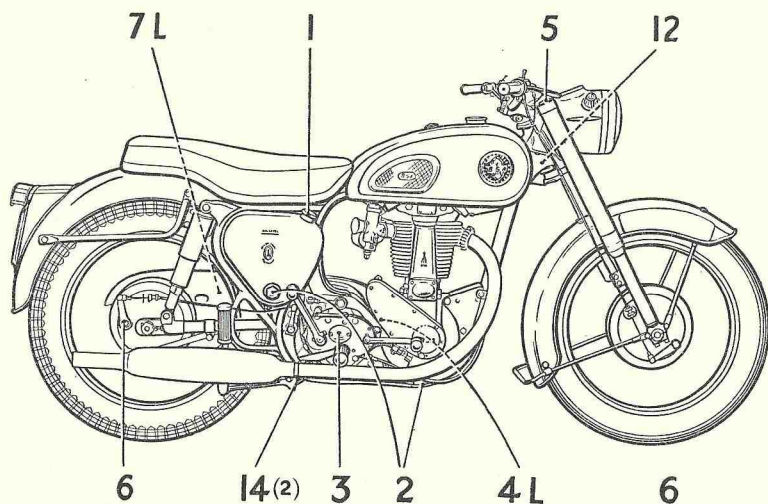


Fig. 10. The Carburettor.



KEY LUBRICATION POINTS.

(L indicates left-hand side, remainder right-hand or both sides.)

RECOMMENDED LUBRICANTS

OILS Engine and Gearbox			Front Forks and Front Chain	GREASE
Brand	Summer	Winter		
Mobiloil	D	A	Arctic	Mobilgrease MP
Shell	X100-50	X100-30	X100-20	Retinax A
Wakefield	Castrol Grand Prix	Castrol XL	Castrolite	Castrolase Heavy
Esso Extra	40/50	20w/30	20w/30	Esso High Tem- perature Grease
B.P. Energol	S.A.E. 50	S.A.E. 30	S.A.E. 20	Energrease C.3
Havoline	S.A.E. 50	S.A.E. 30	S.A.E. 20W	Marfak Multipurpose 2

FOR OVERSEAS. Recommendations as above if obtainable.

Engine and Gearbox:	above 90°F	32°-90°F	below 32°F
	SAE.50	SAE.50	SAE.30
Front Forks:	SAE.20	SAE.20	SAE.20

LUBRICATION CHART

							Ref.	Page
Oil Every Week								
Replenish Oil Tank ..	..	..	..	..	..	..	1	11
Check Gearbox Level ..	..	..	..	..	..	..	3	11
Control Rods and Joints ..	..	..	..	..	..	..	—	10
Exposed Cables ..	..	..	..	..	..	..	—	10
Oil Every 1,000 Miles								
Rear Chain ..	..	..	..	..	..	..	7	28
Grease Every 1,000 Miles								
Steering Head ..	..	..	..	..	..	..	12	11
Clutch Control Arm ..	..	..	..	..	..	..	—	11
Central Stand ..	..	..	..	..	..	..	14	11
Brake Cam Spindle ..	..	..	..	..	..	..	6	11
Oil Every 2,000 Miles								
Drain and Refill Oil Tank ..	..	..	..	..	..	..	1	11
Drain and Refill Gearbox ..	..	..	..	..	..	..	3	11
Primary Chain Oilbath ..	..	..	..	..	..	..	4	29

Special Notes

- Examine Engine Pressure Valve at 1,000 miles. (See 'A' page 13).
- 2. Clean Oil Tank and Crankcase Filters at 2,000 miles.
- 1 and 3. Drain and Refill Oil Tank and Gearbox at 2,000 miles
- 5. Check Front Fork Oil Level at 10,000 miles.

position are carefully set before despatch from the factory and no alteration to these settings is necessary or desirable. An air valve controlled by the lever on the handlebar is used to restrict the air supply when starting the engine from cold.

Mixture control at tickover and low speeds is controlled by the pilot jet which has an adjustable air supply. An adjustable throttle stop is also provided to regulate the slow running speed.

To achieve good petrol economy accurate adjustment of the pilot jet and throttle stop is important. These are adjusted before the machine leaves the Works, but the best setting may vary slightly to suit riders requirements or particular localities. The adjustment should be made with the engine warm.

Screwing in the pilot air screw restricts the air supply thus giving a richer mixture, and unscrewing it weakens the mixture. The best way to adjust is to screw in the pilot air screw until the mixture is obviously too rich and the engine starts to run irregularly, and then unscrew the adjuster until the engine runs evenly. If it is unscrewed too far the engine may cut-out or may spit back through the carburetter when the throttle is opened. When the proper adjustment has been determined, the engine may be running too fast and in this case the throttle stop should be unscrewed until a steady and even tickover is achieved. If considerable alteration to the throttle stop has been made, the pilot air screw should be re-adjusted. Do not attempt to obtain an excessively slow tickover as it will probably become unreliable under different atmospheric conditions. In the case of blockage, the jets are easily exposed for cleaning by simply removing the covering caps. The main jet can then be unscrewed with a suitable spanner and the pilot jet with a screwdriver. No advantage will be gained by altering the jet sizes from those recommended.

Air Cleaner (when fitted).

The air cleaner should be removed occasionally for cleaning. Every 5,000 miles should be sufficient in the British Isles, but more frequent attention is necessary in dustier regions. Uncouple the rubber connection at the air filter end, then undo the two bolts in slotted holes which secure the filter body and lift it out sideways.

The filter is secured in the body by a wire circlip which can be prised out with a screwdriver. Wash the filter thoroughly in petrol to remove all embedded dirt, then allow it to dry thoroughly. Finally, immerse the filter in a thin oil (S.A.E. 20), allow the surplus to drain off, then re-assemble.

TRANSMISSION

Primary Chain Adjustment.

Adjustment of the primary chain is effected by pivoting the gearbox about its lower support bolt. The chain is correctly adjusted when it has $\frac{1}{2}$ in. total up and down movement in the centre of the chain span and at its tightest point. This can be gauged by removing the primary chain case inspection cover and moving the chain up and down. Make sure that the chain is at its tightest spot. If the chain requires adjustment slacken the two nuts A and B (Fig. 11). Slacken the locknut C and screw the adjuster D backwards or forwards as necessary until the adjustment is correct. Tighten the locknut C and the two clamping nuts A and B, then re-check the adjustment. Whenever the primary chain adjustment has been altered, the rear chain must be re-adjusted (see page 36).

Care of the Rear Chain.

To maintain the rear chain in good condition it must be lubricated regularly. Every 1,000 miles or so remove the chain and wash it thoroughly in petrol to remove all dirt and grease. Allow the chain to dry completely, then immerse it in a tray containing warm graphited grease. Allow the mixture to cool, then remove the chain and wipe off all surplus grease. When replacing the chain make sure that the spring clip of the connecting link has its closed end pointing in the direction of travel of the chain (i.e. forwards on the top run). On machines fitted with a rear chain guard this attention is not necessary.

Rear chain adjustment involves moving the rear wheel and is described on page 36.

Clutch Adjustment.

The main clutch adjustment is inside the inspection cover on the gearbox. Remove the two screws and lift the cover away. Slacken the locking nut G (Fig. 11) to free the adjusting screw H. The adjustment should be made so that when the clutch is fully withdrawn the lever on top of the cover is at right angles to the clutch push rod. This ensures that the minimum side thrust is imposed

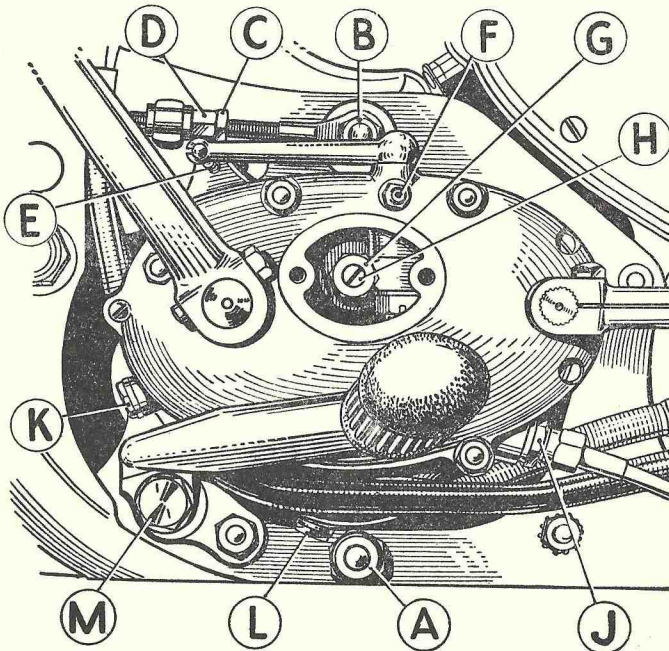


Fig. 11. Clutch and Front Chain Adjustment

on the push rod. When this adjustment has been completed the cable should be adjusted by means of the adjuster at E until it has approximately $\frac{1}{4}$ in. free play at the handlebar end.

Primary Chain Case

Two of the screws retaining the primary chaincase outer cover have red painted heads and these are employed as oil level and oil drain screws. Make sure that the screws are in the correct holes, as shown in Fig. 12.

When topping up the primary chaincase remove the inspection cover and pour oil in until it flows from the oil level hole. Allow any surplus oil to escape before replacing the level screw. Mineral base S.A.E. 20 engine oil should be used in the primary chaincase (see page 25). The chaincase oil capacity is half a pint (284 c.c.).

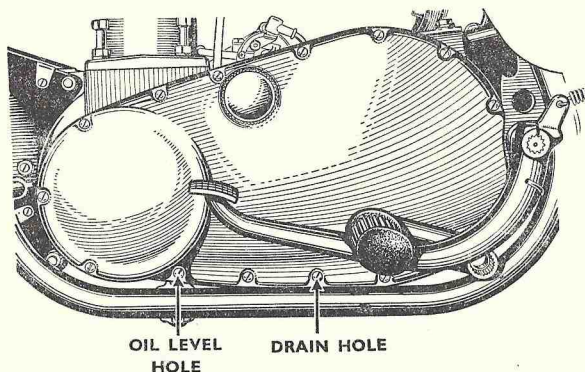


Fig. 12. *The Primary Chaincase*

Primary Chain Case Removal

Removal of the retaining screws and the left-hand footrest will permit the primary chaincase outer cover to be withdrawn. The engine sprocket and clutch must be removed to allow further dismantling. The rear of the chaincase is secured to the crankcase by three bolts behind the engine sprocket and these can be undone after breaking the locking wire through the head of the bolts. A single bolt at its lower rear end secures the rear of the chaincase to the frame.

Mainshaft Dismantling.

This is normally only necessary for complete dismantling. The alternator stator is held in position by three nuts A, Fig. 13, and after their removal it can be drawn from its studs. If this proves difficult, a screwdriver should be inserted in the small slots on each side of the aluminium back plate so that it can be prised free.

Bend back the tab of the lockwasher and undo the mainshaft nut. If difficulty is experienced through the engine rotating, engage top gear and apply the back brake. The rotor and its locating key can then be pulled from the mainshaft followed by the dished oil flinger washer.

Rotate the engine by means of the kickstarter until the spring link is on the top run of the chain and is in line with the recess in the back of the chaincase. Remove the spring link. The engine sprocket can then be withdrawn from the mainshaft.

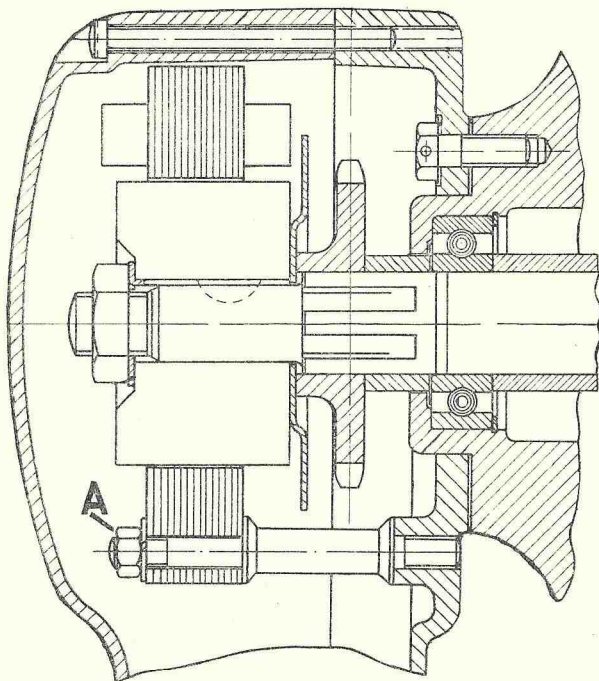


Fig. 13

Re-assembly is carried out in the reverse order to dismantling. Make sure that the oil flinger washer is replaced with its dished side facing inwards.

Clutch Spring Adjustment.

After considerable use it may be necessary to increase the spring pressure a little. To do this screw the adjusters A. (Fig. 14) one or two turns. Withdraw the clutch to ensure that it frees properly and that the end plate does not tilt. If the plate does tilt the clutch will not free properly and the springs should therefore be readjusted until the plate remains square when the clutch is withdrawn.

Clutch Dismantling.

Removal of the four spring retaining nuts will allow the clutch end plate to be withdrawn. Bend back the locking washer and undo the large central nut. To prevent the shaft turning, engage top gear and apply the back brake. With this nut removed the complete clutch, with the exception of the central splined sleeve, can be withdrawn. Wash the plates in petrol to remove any surplus oil, and examine them carefully. If obvious signs of glazing are present the friction plates must be replaced. Replacements must also be made if any of the plain plates are scored.

The chain wheel and central cage must be examined for burrs which might prevent the plates sliding freely. If these are not serious they can be removed with a smooth file. In the case of a machine which has seen considerable service the sprocket teeth should be examined for wear, as worn teeth cause the chain to deteriorate very rapidly. The roller race must not possess more than .0015 in. diametral play, as wear in this bearing may provoke clutch slip.

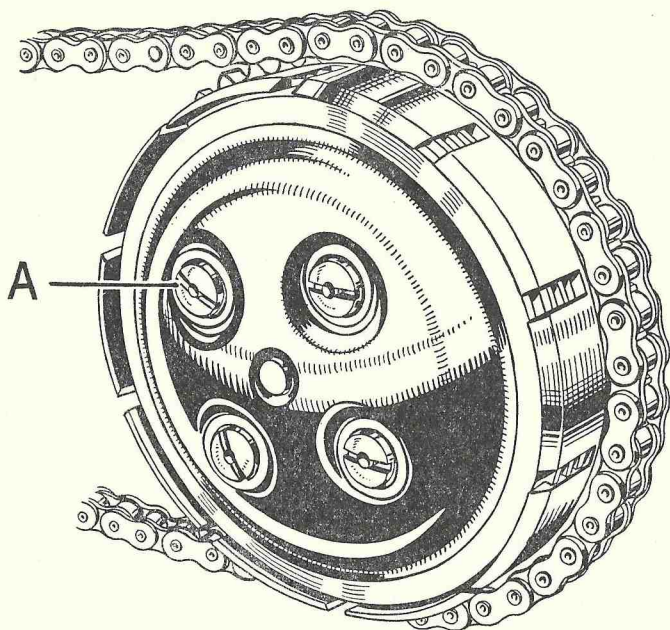


Fig. 14. Clutch Spring Pressure

The central splined sleeve engages on a taper on the gearbox mainshaft, and can only be removed with the aid of a special screwed extractor, Part No. 61-3362, which can be obtained from a B.S.A. spares stockist. A key also serves to locate the sleeve, and this must be replaced correctly during re-assembly. The order for re-assembly is seen in Fig. 15. Take particular care that the large central nut is done up quite tight after the locking washer has been correctly located on the splined sleeve. Turn the washer down over the flat on the outside of the nut.

Gearbox.

The gear box is of straightforward design employing constant mesh gears. Apart from occasionally topping up or changing the oil, very little maintenance should normally be required.

When topping up with oil, remove the level plug at K (Fig. 11) and pour oil in the clutch adjustment inspection cover. The oil level must not be above the plug hole, and if the gearbox is overfilled the surplus must be allowed to drain

away before the plug is replaced. Removal of the plug L allows all the oil contained in the gearbox to drain out. Whenever possible the gearbox should be drained immediately after a run when the oil is warm. A mineral type of oil should be used, of the same grade as that specified for the engine (see page 25). The gearbox capacity is 14 fluid ozs. (400 c.c.).

Access to the gear change and kickstarter mechanism inside the outer cover is simply obtained. Move the gears to neutral then remove the four stud nuts and three screws round the outside edge of the gearbox outer cover. Do not touch the screw and nut which are not on the edge of the cover as these do not prevent its removal. The outer cover will come away complete with kickstarter gear change and clutch levers. As the cover is withdrawn the kickstarter lever will tend to rotate under the pressure of the spring, and the clutch lever should be used as a stop to prevent the complete release of the spring.

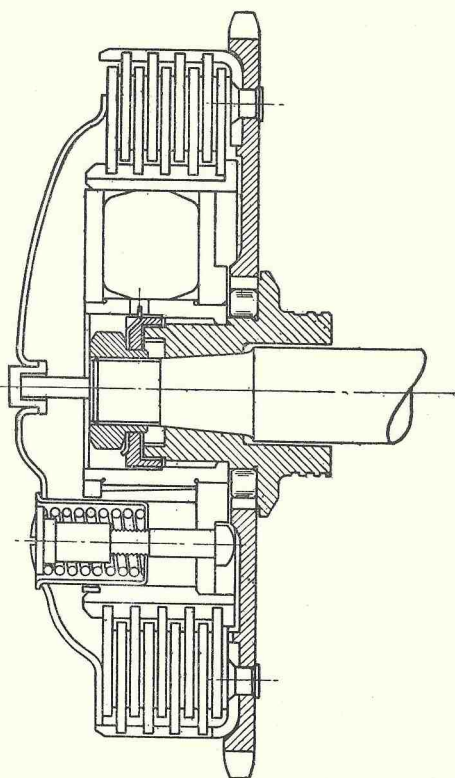


Fig. 15. Section of Clutch

If the gear change mechanism requires attention, remove the gear lever and the small circlip which lies behind it to permit the complete spindle and gear change mechanism to be withdrawn. Examine the operating claw A (Fig. 16) to ensure that the ends of the claw are still well formed. With the outer cover removed the kickstarter spring or any other parts of the kickstarter mechanism can be attended to.

Unless it is necessary to replace the ball bearing carrying the final drive pinion sleeve, the gearbox can be completely dismantled while still in the frame, although the clutch and primary chain case must be removed. If it is necessary to remove the gearbox, both the right-hand rear engine plates should be detached. Detach the speedometer and clutch cables. Before the inner cover can be withdrawn the single screw to the left of the top right stud must be undone. The inner cover together with the mainshaft and gearchange rocking lever B can then be withdrawn, leaving the gear cluster in position. If it is required to remove the rocking lever the gearchange spindle bush must first be pushed out of the inner cover, to expose the end of the rocking lever spindle, which is threaded $\frac{1}{4}$ in. B.S.C. Screw in a suitable bolt then use this to pull out the spindle.

If it is necessary to remove the mainshaft from the inner cover, the shaft should be held in a soft jawed vice so that the kickstart ratchet nut can be undone, after the locking washer has been bent back. The shaft can then be withdrawn from the bearing. This bearing can be removed by pulling out the retaining circlip and then warming the cover in boiling water before pressing or tapping the bearing from its housing with a suitable drift.

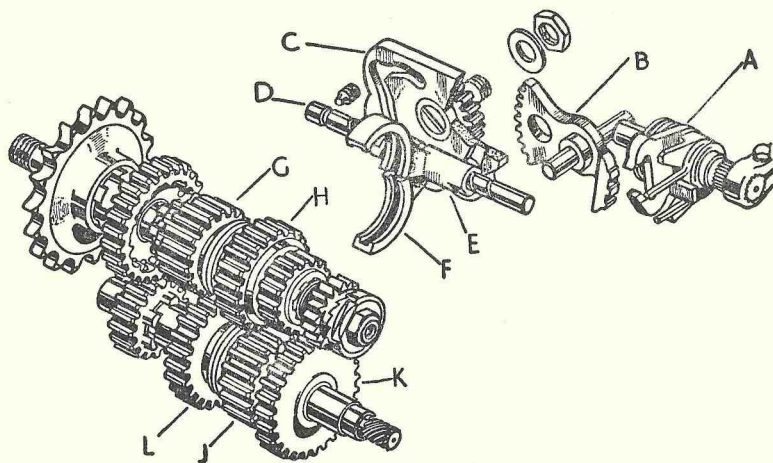


Fig. 16. Gearchange Mechanism

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

The cam plate selector plunger is screwed into the bottom of the gearbox. Undo the locknut and unscrew the plunger housing. The cam plate can then be pulled from its pivot.

Bend back the lock washer and undo the large gearbox sprocket retaining nut. If the gearbox is still in the frame and the rear chain in position, application of the rear brake will serve to prevent the sprocket turning as the nut is undone. Otherwise wrap a length of old chain round the sprocket and hold the ends of the chain in a vice. With the sprocket removed from its spline the pinion sleeve can be driven into the gearbox with a mallet.

Do not disturb the ball race unless it is faulty. Wash it in petrol to remove all traces of oil before testing for play. If it must be removed, prise out the retaining circlip, withdraw the oil seal and warm the case before tapping out the bearing with a suitable drift.

Any faulty components must be renewed and in particular if the forks which operate the sliding pinions show signs of seizure they must be replaced.

Re-assembly.

If new gears are to be fitted make sure that the fixed pinions on the layshaft and mainshaft are a tight fit, and that they are pressed right up to their locating circlips.

Re-assembly generally is carried out in the reverse order to dismantling. When the cam plate has been replaced, locate it in the neutral position, between first and second gears, with the selector plunger. Screw the plunger housing in until, with the locknut tightened, one complete thread is still visible. Place the layshaft in position then feed in the first pair of gears J and L (Fig. 16) together with their selector claw F. These claws are interchangeable, but if the original components are to be used they should be replaced in their original positions. Replace the second pair of gears G and H, together with the selector claw E, and make sure that the guide pins of both selector claws are correctly engaged in their cam grooves.

Before the inner cover is quite home the rocking lever B must be set so that the red dots on the lever and the cover are in line. Push the cover right home and check that the two dots remain correctly positioned. Replace the single inner cover retaining screw. As the outer cover is pushed on, the kickstarter must be lifted slightly so that the kickstarter quadrant can engage.

WHEELS

Both wheels are fitted with ball journal bearings and adjustment is not necessary. These bearings are packed with grease during assembly which will last until the machine is in need of a complete overhaul.

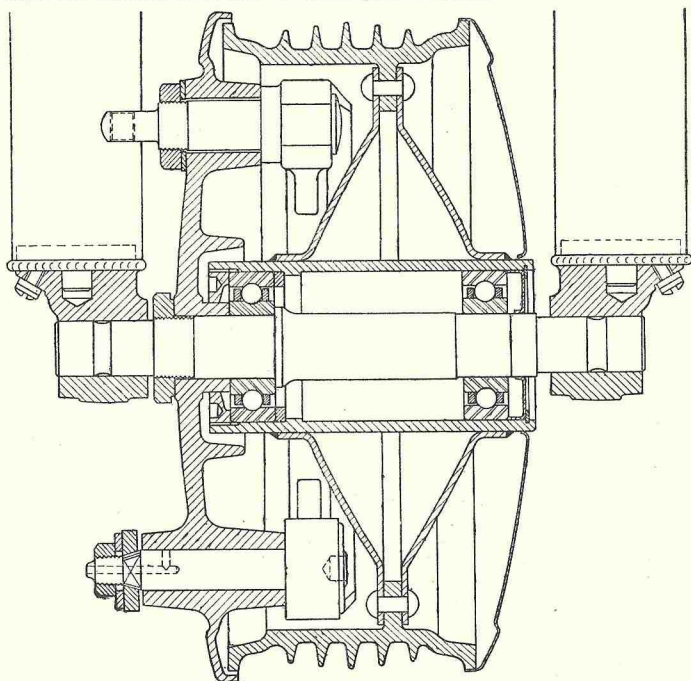


Fig. 17. Front Hub Arrangement

Brake Adjustment.

Both brakes are provided with knurled finger adjusters. The brakes should not be adjusted too closely, as, if they should rub, the heat generated may distort the brake drum and melt the grease in the hub.

The Rear Brake Cross-over Shaft.

The rear brake cross-over shaft is smeared with grease during assembly, and after a considerable mileage it should be removed and re-greased.

Before the cross shaft can be removed, the brake pedal and the cross shaft lever must be disconnected. Slacken the pinch bolts, and pull the levers away from the shaft, noting their respective positions for re-assembly. If this instruction is not observed there is a possibility that the levers will be replaced in an incorrect position, causing the brake to function inefficiently. When this operation is completed, the cross-over shaft can be pulled out of the swinging arm. The shaft should then be wiped clean, smeared with new grease and re-assembled.

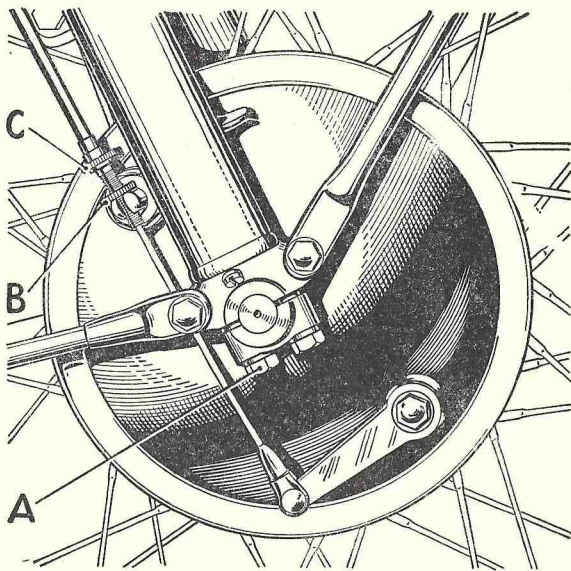


Fig. 18. Front Wheel Removal

Front Wheel Removal.

To remove the front wheel from the forks, disconnect the brake cable, then remove the four bolts A, Fig. 18. The wheel can be pulled away from the machine.

The wheel is replaced in the reverse order to that for removal. It is most important that the brake anchorage peg on the right hand fork leg should engage correctly in the slot in the cover plate.

Rear Wheel Removal and Replacement.

To remove the rear wheel, place the machine on its stand. Take off the nut A (Fig. 19), to free the brake anchor strap; and disconnect the brake cable. Unscrew the four retaining nuts B (Fig. 20) locking the wheel on the chainwheel. On machines fitted with a fully enclosed chainguard, this operation is carried out after removing the rubber plug D (Fig. 20). Next, place a spanner on to the spindle end at B (Fig. 19), and unscrew in an anti-clockwise direction until it can be withdrawn. The distance piece C can then be removed and the wheel can be withdrawn to the right, when it can be taken downwards and rearwards. Note that the large nut A (Fig. 20) on the left-hand end of the spindle retains the chainwheel and should not be disturbed.

Re-assembly is carried out in the reverse order, but it is most important that the four retaining nuts are screwed up tight when the wheel is replaced.

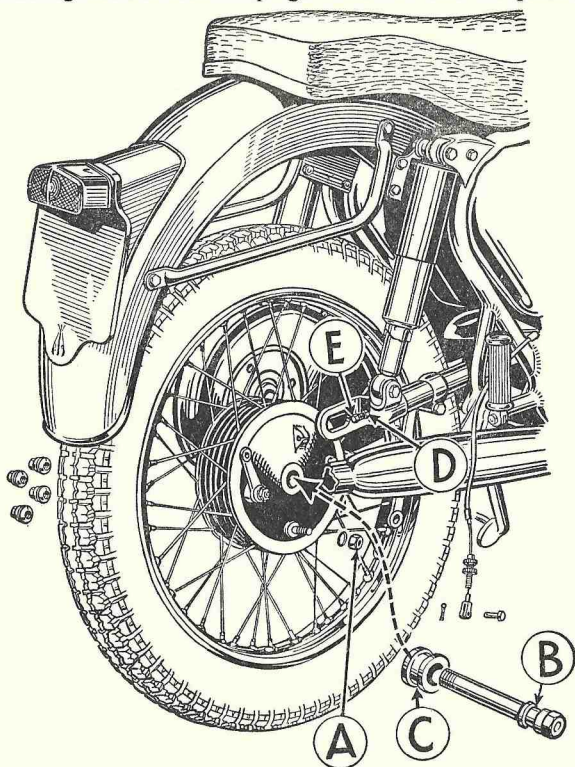


Fig. 19. Rear Wheel Removal and Rear Chain Adjustment

Rear Chain Adjustment.

The rear chain must be adjusted when the machine is on its stand and the wheel is at the lowest point in the suspension. Rotate the wheel slowly until the tightest point on the chain is found, then check its up and down movement in the centre

of the chain span. On machines fitted with a fully enclosed chainguard the rubber plug C (Fig. 20) should be removed to test the chain tension. The total movement should be $1\frac{1}{4}$ inches and if it varies from this setting then the chain must be adjusted by moving the rear wheel. Unscrew the spindle B (Fig. 19) slightly, then slacken off the hexagon A on the left-hand side of the hub. Release the locknuts D and screw the adjusters E in or out as the case may be, until the chain tension is correct. Re-tighten in the reverse order.

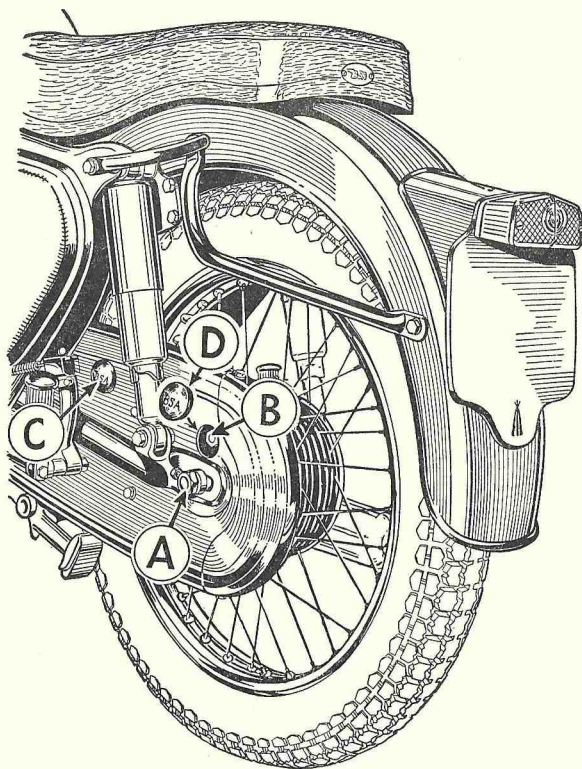


Fig. 20

Wheel Alignment.

It is advisable to check the wheel alignment whenever the rear chain is adjusted, although if it is known that the previous adjustment was satisfactory and the adjuster nuts E are moved by an equal amount, then the alignment should remain correct. The wheel alignment can be checked by glancing along the line of both wheels when the front wheel is set straight, or by means of a long straight edge placed along the sides of the wheels. On the B33 the front tyre is of a smaller section than the rear and due allowance will have to be made.

Brake Shoe Removal and Replacement.

Slacken the brake shoe adjuster fully, and remove the brake plate from the wheel. Then grasp the shoes firmly, pulling outwards enabling the shoes to clear the fulcrums and lift. Both shoes will then come away from the brake cover plate.

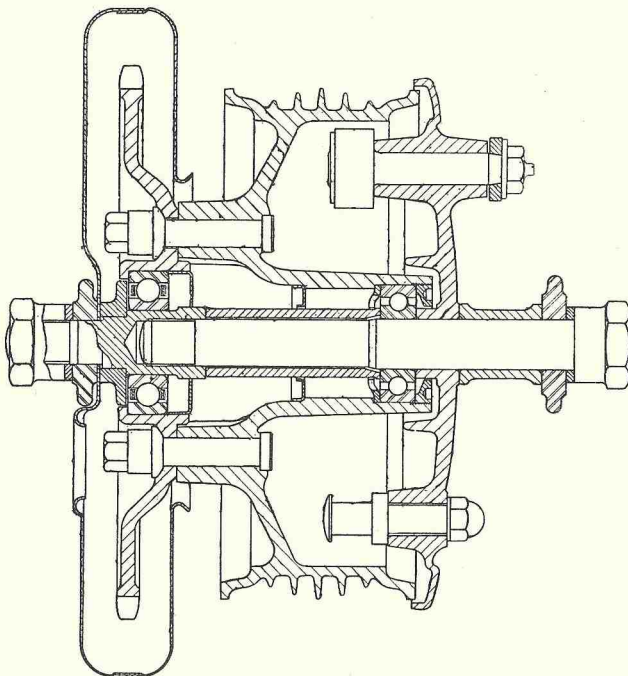


Fig. 21. Rear Hub Arrangement

The shoes can be replaced by the reverse procedure. Hook the springs on to the shoes and place the ends of the shoes in position on the fulcrum pins, pushing the shoes outwards until the springs pull them into their correct position.

Note: The brake shoe springs are quite strong and care should be taken that the fingers are not trapped by the brake shoes during these operations.

Brake Shoe Re-lining.

With the shoes removed the linings can best be removed by drilling away the heads of the rivets and punching the shanks out to the inside of the shoe with a suitable drift.

New linings are die pressed to suit the curvature of the shoes, but will require drilling and counter-boring for the rivets. Position the lining and hold it in place at one end by means of clamps. Using the holes in the shoes as guides, drill holes of the correct size for the rivets adjacent to the clamp. Turn the shoe over and counterbore the holes just drilled deep enough to allow the rivet heads to stand below the lining surface; this is important, since the rivets will otherwise score the brake drum.

Insert the rivets into the holes and rivet them over on the inside of the shoe. This is easily accomplished by holding in a vice a short length of rod, whose diameter is equal to that of the rivet head, and using it as an anvil upon which to rest the rivet head while hammering the shank over. This will also make sure that the rivets do not stand proud of the linings.

Move the clamps to the next pair of holes, taking care that the lining is kept in firm contact with the shoe the whole time, and repeat the above procedure. When the lining is finally riveted down, bevel off the ends of the linings and file off any local high spots.

Complete relined brake shoes are available through the Exchange Replacement service which operates in the British Isles only.

FRAME AND FORKS

Front Forks.

Under normal conditions the only servicing which the front forks require is occasional renewal of the oil. The need for this may be indicated by excessive movement of the forks but it should only be necessary after considerable mileage.

Remove the plug A (Fig. 22) and the drain plug in the lower end of the fork sliding member (see Fig. 18).

Allow all the oil to drain out, then apply the front brake and depress the forks a few times to drive out any oil remaining in the system.

Replace the drain plugs and pour $7\frac{1}{2}$ fl. oz. (213 c.c.) of an S.A.E.20 oil into each leg. Replace the top plug and tighten it firmly.

The following oils are recommended for use in the front forks: Mobiloil Arctic, Shell X100-20, Wakefield Castrolite, Esso Extra 20W/30, B.P. Energol S.A.E.20, Havoline S.A.E. 20W.

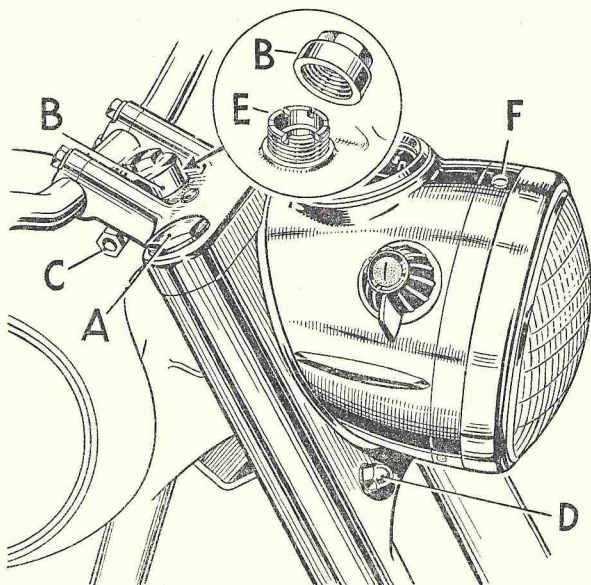


Fig. 22. Front Fork and Steering Head

Steering Head Adjustment.

The steering head should be tested occasionally for play and to ensure that it rotates freely. Support the crankcase on a box so that the front wheel is clear of the ground, then grasp the front fork legs and attempt to push them backwards and forwards. If any play is detected the steering head must be adjusted.

Unscrew the steering damper (if fitted) and remove the chromium plated top cap B (Fig. 22). Slacken the clamping nut C, then tighten down the sleeve E until the adjustment is correct. Hold the handlebars lightly and move them round slowly. The steering should be free, and the forks must rotate smoothly. If the movement is 'lumpy' it is a sign that the adjustment is too tight, or that the ball races are damaged. When the adjustment is correct tighten the clamping nut C, replace the cap B and the steering damper.

Fork Dismantling.

Complete dismantling of the forks should not be attempted without two special tools, Part Nos. 61-3350 and 61-3005.

Remove the front wheel and front mudguard. Remove the cap A (Fig. 25) and screw tool 61-3350 into the thread in the top of the main fork shaft. Slacken the pinch bolt B. By striking the top of the tool smartly with a hammer the fork shaft will be freed from its taper in the top fork yoke and the complete fork leg can be pulled out from the bottom of the fork. Repeat the operation for the other leg. Note that the smaller of the two fine threads on the extractor tool is used for dismantling the forks on another model and will therefore not be used. In an emergency the chromium plated cap can be used in place of the extractor, but it is likely to be damaged.

Hold the bottom of the sliding member by gripping the wheel spindle lug in a soft jawed vice and lift off the spring (see Fig. 24). The special unscrewing tool 61-3005 consists of a tubular member with two dogs which engage in slots cut in the bottom spring seating. Engage the tool and unscrew the chromium plated spring shroud. The oil seal is contained in the bottom of the spring shroud and can be pressed out with a drift passed through the two slots. Do not remove the oil seal unless it requires replacing.

The top bearing of the sliding member is now retained only by a circlip which can be prised out with a suitable sharp tool. Note that a number of shims may be fitted between the circlip and the top of the bearing. These must be replaced during re-assembly and if any movement of the bearing is still apparent when the circlip has been replaced additional shims should be used. If there is any play at this point a clicking noise may be heard when the forks are operating.

With the circlip removed the complete fork shaft and bushes can be withdrawn from the sliding member.

The bottom nut retaining the bronze bushes can be unscrewed with the fork shaft gripped in a soft jawed vice to prevent it turning

To remove the two yokes and the steering stem from the frame, undo the clamping nut C (Fig. 22). Remove the steering damper knob and the cap B. Unscrew the sleeve E until it comes free, and then lift off the top yoke. Take care that the balls from the head bearings are not lost when the head is loosened.

The bearing cups which remain in the head can be withdrawn with the aid of a screwed extractor, Part No. 61-3063. This should be screwed firmly into the threaded centre of the cup, then extractor and cup can be driven out from the opposite end with a suitable punch. The races must be replaced if they show any signs of pitting, as damaged head races will affect steering.

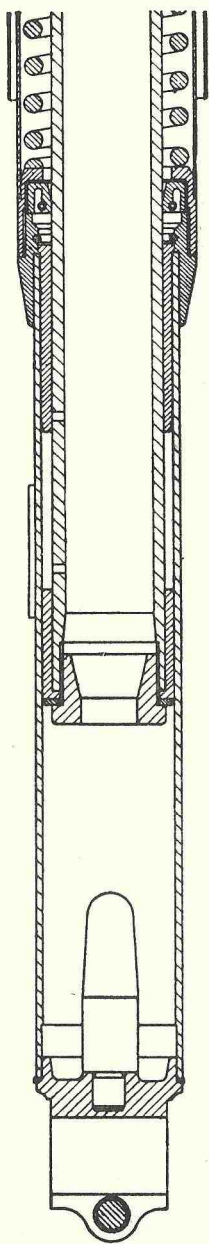


Fig. 23. Fork Section

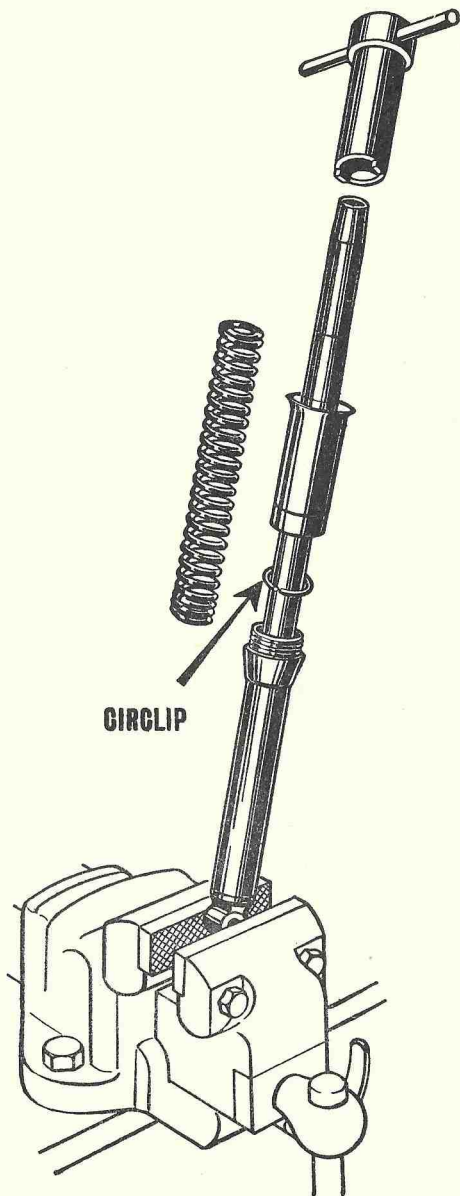


Fig. 24. Fork Dismantling

If the forks have been damaged in any way the shafts must be checked to ensure that they are perfectly straight. It is also possible to twist the yokes so that even if new shafts are used they will not be in line. This can be checked by clamping the new shafts into the lower yoke, then check that the shafts are not twisted by placing them on a surface plate or on two parallel straight edges. Also check that when the top yoke is slid down the head stem sleeve on to the shafts, the tapers meet squarely. If they are only slightly twisted it is possible to reset the yokes, but replacements are preferable.

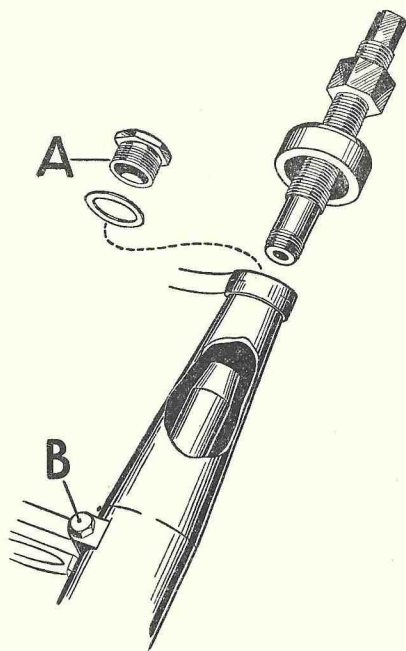


Fig. 25. Fork Assembly

Re-assembly is carried out in the reverse order to dismantling. Make sure the oil seal lip is facing downwards. Before screwing down the oil seal holder pass one turn of medium twine round the undercut at the base of the thread to provide an additional seal. When replacing the legs pass the main fork shaft up through the bottom yoke as far as it will go, then pass the tool 61-3350 down through the top yoke and screw it into the top of the shaft (Fig 25). Do up the nut on the tool to pull the shaft up into the top yoke. Tighten the clamp B in the bottom yoke while the tool is removed and the top plug A replaced. Slacken the lower clamp, tighten the top plug firmly, then do up the clamp again. If the clip-on type of handlebars are fitted they can be used to pull the fork shaft up into the top yoke. Alternatively, in an emergency, a suitable sized length of wood, cut to a taper at the end, can be screwed into the top of the shaft.

Rear Suspension.

The two suspension units comprise a telescopic damper unit and a totally enclosed coil spring. The pressure on the spring can be varied by means of a three position cam adjuster at the lower end of the unit. The springs can therefore be adjusted to suit the load conditions or nature of the ground. A 'C' spanner in the tool kit is used to rotate the cam ring.

The hydraulic dampers require no attention whatsoever. They are sealed during manufacture and if they suffer damage or become ineffective they must be replaced.

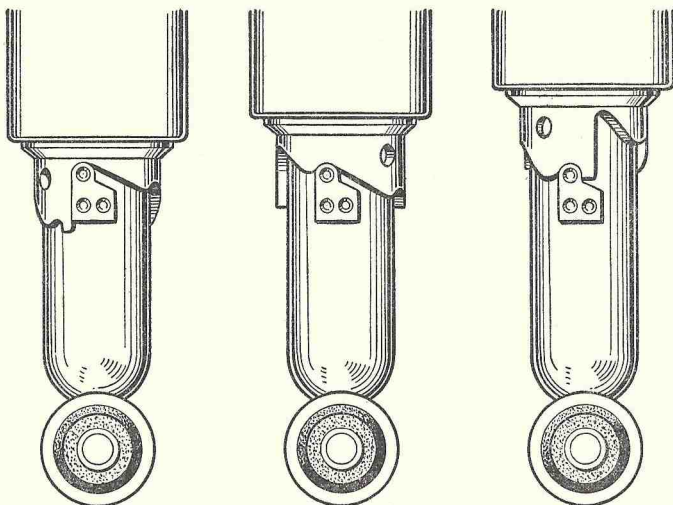


Fig. 26. The Rear Suspension

The complete suspension units can be removed from the frame after detaching the two pivot bolts. The top spring housing is retained by two collets and the spring must be compressed before they can be removed. In some instances, the assistance of a second person may be necessary to compress the spring.

Frame.

The frame will not require any attention unless the machine has been involved in an accident. It should then be inspected very carefully and the wheel alignment checked. If the frame is damaged or distorted it must be replaced, or taken to your B.S.A. dealer for rectification if feasible.

To remove the rear swinging arm from the frame front, detach the rear brake cross shaft lever (see Page 35), remove the suspension units, the rear wheel complete and the rear chain guard. Then undo the nut on the end of the fulcrum spindle and the bolt which locates its steel end plate. The spindle can then be tapped out with the aid of a suitable punch. As the spindle is hollow, care must be taken, as its inside may be burred. Move the fork forward until it is free of the side plates, so that it can be twisted and pulled away to the rear.

The rear fork silentbloc bushes have a very long life, and replacement will rarely be necessary.

The fork cross tube is counter-bored at each end to accept the bushes so that it is not possible to tap them right through the tube. In order to effect their removal, tap the inner alloy portion of the bearing with a $\frac{13}{16}$ in. ($\frac{11}{16}$ in. B32, B34) B.S.F. tap and screw in a suitable bolt. The complete bearing can then be tapped out from the other end of the tube with aid of a long drill.

Replacement bushes should be pressed in until their inner tubes meet at the centre. Ensure that the inner tubes project by an equal amount at each end of the fork cross tube.

Re-assembly of the fork into the frame is carried out in the reverse order to that for dismantling, but the final tightening of the spindle nut should be left until all other items have been replaced. Load the machine until the rear suspension is in the centre of its travel, then tighten the spindle nut firmly. This procedure ensures that the bush centres are clamped into the correct position.

ELECTRICAL EQUIPMENT

The electrical equipment fitted requires very little attention, but the few instructions given in this chapter should be followed carefully to provide maximum life and reliability.

Battery.

Access to the battery is obtained by removing the two retaining bolts under the rear of the dual seat so that the seat can be lifted and pulled away to the rear. Remove the two small bolts securing the top strap to gain access to the top of the battery, and by merely unscrewing the two battery terminals the battery is left free to be lifted out.

About once a month take off the battery lid, remove the filler plugs from each of the cells and examine the level of the electrolyte. If necessary add sufficient distilled water to bring the level of the electrolyte up to the top of the separators. Do not use tap water and do not use a naked light when examining the condition of the cells.

The condition of the battery should occasionally be checked by taking hydrometer readings of the specific gravity of the electrolyte. If distilled water has been added a reading should not be taken until after the machine has been used, to ensure that the electrolyte is thoroughly mixed. The specific gravity readings should be as follows:

Temp.	Fully Charged	Requires Charging
120°F.	1.270	1.220
100°F.	1.280	1.230
80°F.	1.285	1.235
60°F.	1.295	1.245
40°F.	1.305	1.255
20°F.	1.310	1.260
0°F.	1.320	1.270
-20°F.	1.325	1.275

The readings for each of the three cells should be approximately the same. If one cell gives a reading very different from the others it may be that electrolyte has been spilled or has leaked from this particular cell or there may be a short circuit between the plates. If leakage from the top of the battery is known to

have occurred, due to a spill, the battery should be topped up with battery acid of suitable specific gravity.

Never leave the battery in a discharged condition as it will suffer permanent damage. Keep the top of the battery clean and smear the terminals with vaseline to prevent corrosion.

All models employ a positive earth wiring system. Make sure that the battery is connected correctly.

Electric Horn.

The horn is adjusted at the works to give its best performance and will give a long period of service without any attention. If it becomes uncertain in action, giving only a choking sound, or does not vibrate, it does not follow that it has broken down. First ascertain that the trouble is not due to some outside source such as a discharged battery, or a loose connection or short circuit in the wiring.

If none of the previous suggestions proves successful, the horn may be re-adjusted as follows:

Turn the adjusting screw in the rear of the horn body slightly to left or right while depressing the horn button until the best note is obtained.

If the horn still gives trouble it should be removed and returned to the manufacturers.

Headlamp.

The headlamp is of the sealed unit type employing a pre-focus bulb. To gain access to the bulbs, the headlamp rim complete with light unit must be removed by slackening the screw on top of the headlamp shell and pulling the rim away at the top. The headlamp bulb is retained by a bayonet fitting cap. Push on the cap, turn it to the left, and then withdraw. The bulb is located by a flange which has a notch engaging with a projection inside the holder to ensure that it is correctly positioned. Note that the prongs of the bayonet fitting cap are not symmetrical so that it can only be replaced in the correct position.

The headlamp requires no maintenance except to ensure that the contacts are kept clean and tight. The reflector is sealed to the glass and in the event of either becoming damaged the complete unit must be replaced.

The best way to obtain the initial setting of the main headlamp beam is to stand the machine about 25 feet away from a wall and move the headlamp until the beam is parallel to the ground and strikes the wall at the same height off the ground as the centre of the headlamp. A final check should be made on the road to ensure that the beam strikes the road as far away as possible but in no circumstances must the beam point above the horizontal.

Stop Light Switch.

This is operated by the brake pedal through a spring. Keep the switch free from grit and water and occasionally apply a little thin oil to the operating mechanism.

Tail Lamp.

Access to the tail lamp is obtained by removing the two screws securing the red transparent plastic cover. Note that the locating prongs of the bulb are offset so that it can only be replaced one way round.

Bulbs.

The correct replacement bulbs are as follows:—

Head	..	..	..	..	..	Lucas No. 312	30/24 watts
Pilot	..	..	..	..	..	Lucas No. 988	3 watts
Stop/Tail	..	..	..	..	..	Lucas No. 384	6/18 watts
Speedometer	..	..	..	..	..		6.5v. .3 amp.

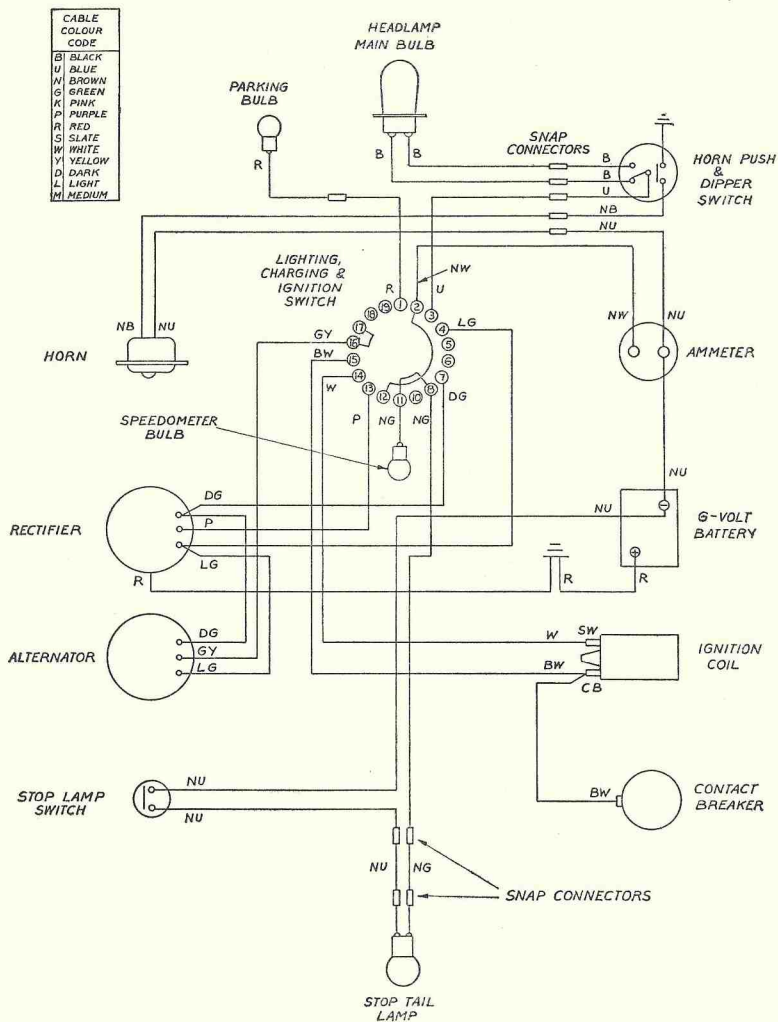
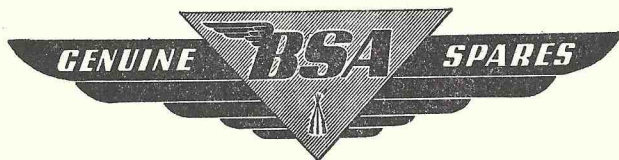


Fig. 27. Wiring Diagram

B.S.A. MOTOR CYCLE SPARES STOCKISTS



Save time and postage by contacting your nearest B.S.A. Stockist for B.S.A. Spare Parts, Spare Parts Catalogues, Instruction Books, Transfers, etc.

All B.S.A. Dealers carry stocks of B.S.A. Spare Parts but the following appointed Stockists maintain a comprehensive range.

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Aberdeen	... J. Dawson ...	... 24-26 Thistle Street ...	25556	
"	... George Cheyne (Cycles) Ltd.	147/149 Holburn St.	50341/2	Motobike, Aberdeen.
Aberystwyth	Gwalia Motor Co. ...	North Parade ...	525	
Accrington	... Bill Snape Ltd. ...	... 379 Blackburn Road	4724	
Aldershot	... Phillips Bros. (Aldershot) Ltd.	Birchett Road ...	1111/2	Phillips, Cycles, Aldershot.
Alloa ...	... J. G. Robertson ...	... 55-57 High Street ...	193	
Andover	... Corbett & Ellis (Andover) Ltd.	Weyhill Road ...	2991	
Ashington	... Mains of Ashington ...	Laburnum Terrace ...	3204	
Aylesbury	... Eborn's Garage ...	... 44 Walton Street ...	3150	Eborn's, Aylesbury.
Banbury	... Trinder Bros. ...	... 2 & 3 Broad Street ...	2546	
Barnsley	... T. Garner & Son ...	... Sheffield Road ...	2866	
Barnstaple	... Bob Ray Ltd. ...	... 43 High Street ...	4266	
Bath ...	... R. U. Holway & Son ...	... 32-33-34 St. John's Road Bathwick	5084/64101	
Bedford	... The Imperial Cycle Co. ...	58 St Loyes ...	2374	
Belfast	... W. J. Chambers & Co. ...	106 and 108, Donegall Pass	27253/4	Fastmote, Belfast.
Biggleswade	... Bryants ...	... 25, 27, 72 and 74 Shortmead Street	3108	
Birkenhead	... Bob Simister Ltd. ...	... 540 New Chester Rd., Rock Ferry.	1452	
Birmingham	County Cycle & Motor Co. Ltd.	266 Broad Street ... 104 Bath Row (Repairs) (closed Saturday 1 p.m.)	Mid. 2671 Mid. 2817	
"	... C. E. Cope & Sons Ltd.	481-487 Hagley Road, Bearwood Edgbaston 17	2246/7	
"	... Shovelbottom's Ltd. ...	376 Ladypool Road, Sparkbrook 12	South 2212	
"	... Aston Auto Motors ...	172 Aston Road 6	Aston Cross 3201/2	
Blackburn	... S. & G. Motor Cycles (Blackburn) Ltd. ...	15-17 Great Bolton St.	6678	
Blackpool	... J. Hall & Son ...	... 102-6 Devonshire Rd.,	22130	
Blandford	... Badger Garages Ltd. ...	Salisbury Road ...	615	
Bolton...	... Charlie Robinson ...	... 119 and 121 Higher Bridge Street	3931	
Boscombe, Bournemouth	... Craze Bros. ...	... 473 and 475 Christchurch Road	Boscombe 33231/2	
Bradford	... C. Sidney Ltd. ...	... 107 Manningham Lane	29889	
"	... J. K. Hurst ...	... 41 Wakefield Rd.	22543	
Bridgwater	Anderson & Wall	... 18 St. Mary Street ...	2416	Anderson & Wall, Bridgwater.
Brighton	... Redhill Motors (Brighton) Ltd.	104 North Road ...	5281	
Bristol	... S. J. Fair Motors Ltd. ...	201-3 Cheltenham Rd.	4-6238/4-1015	

B.S.A. Motor Cycle Spares Stockists—continued

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Bromsgrove ...	Harold Tozer (Broms- grove) Ltd.	110 Birmingham Road	3228	
Bury St. Edmunds	Barclay Motors ...	... Kings Road Corner	2345/9	
Cambridge ...	King & Harper Ltd. ...	Milton Road Corner...	3201	Motors, Cambridge.
Canterbury ...	Hallets of Canterbury ...	St. Dunstan's Street ...	2275/6	
Cardiff ...	Car Distributors (Car- diff) Ltd.	134-140 City Road ...	30022	
"	Robert Bevan & Son ...	29-35 Castle Street ...	27477/8	
Carlisle ...	W. T. Tiffin & Son ...	Irishgate Brow ...	25024	Tiffin, Irishgate, Carlisle.
Carmathen ...	Eddie Stephens (Motors)	22-23 Water Street ...	6233	
Castleford ...	Barrett's Motor Cycles	27-35 Aire Street ...	2983	
Chapel-en-le Frith.	E. W. Bowers ...	129 Town End ...	144	
Chatham ...	Grays of Chatham Ltd.	11-19 High Street ...	4005	
Chelmsford ...	Hadlers Garage Ltd. ...	New Street ...	4844/5	Hadlers, Chelmsford.
Cheltenham ...	Leslie Paynter ...	Bath Street ...	2887	
Chester ...	Davies Bros. ...	34 Bridge Street ...	25510	
Chichester ...	W. Goodridge & Co. Ltd.	East Street ...	2033	
Clydebank ...	John A. Weddell ...	72-114 Dumbarton Rd.	1429	
Colchester ...	G.B.R. Motors Ltd. ...	1-2 East Hill ...	6131/2	
Colne ...	C. H. Scholfield (Motors) Ltd.	Market Place ...	859	
Coventry ...	Coventry Motor Mart ...	86 London Road ...	22146/7	Coventry Motor Mart.
Crewe ...	Cooke's Garages (Crewe Ltd.)	10-20 Nantwich Road	2011	Cookes Motors, Crewe.
Croydon ...	Godfreys Ltd. ...	228-234 London Road	Croydon 3641/2	Gofrabike, Croydon.
Dagenham, Essex	Reginald Smith ...	Imperial House, New Road	Rainham 3284/2786	
Dalton-in-Furness	H. Hume ...	24/26 Ulverston Rd. ...	25	
Darlington ...	The Duplex Motor and Cycle Co. Ltd.	10-16 Grange Road ...	Darlington 2071	Duplex, Darlington.
"	White Bros. ...	201/205-9 Northgate...	67757	
Dartford	Schweizo Bros. ...	177 Lowfield Street ...	4279	
Derby ...	Ingle's Provincial Garages Ltd.	Walbrook Road ...	45289	
Doncaster ...	W. Cusworth (Doncas- ter) Ltd.	7 Hall Gate ...	4594	
Douglas, I.O.M.	Gilbert Harding ...	18 Duke Street ...	Douglas 170	
Dudley ...	Chas. E. Cope & Sons Ltd.	193 High Street ...	Dudley 3464/5/6	
Dundee ...	George McLean Ltd.	Ward Rd., Riverside Drive	5087	Vehicles, Dundee.
Dunstable ...	B. G. England (Dun- stable) Ltd.	Half Moon Hill, London Road	843/4	
Eastbourne	Jempsons Ltd. ...	118 Seaside ...	756	Jempsons, Eastbourne.
Edinburgh ...	J. R. Alexander & Co. Ltd.	10-14 Lothian Road	4455	Motorcycles, Edinburgh.

B.S.A. Motor Cycle Spares Stockists—continued

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Elgin	Farquharsons ...	55-57 High Street ...	7188	Elgin 7188.
Enfield	... D. J. Shepherd & Co. (Enfield) Ltd.	434-6 Hertford Road, Enfield Highway.	Howard 1631	
Exeter	... P. Pike & Co. Ltd.	Alphington Street ...	58241	Piko, Exeter.
Frome	... J. Difazio ...	25 Catherine Street	2913	
Gateshead, 8	O. Carmichael & Son ...	75, 83 and 87 High Street West	71815	
Glasgow, C3	... Bell Bros. (H.P.) Ltd. ...	215-233 St. George Rd.	Douglas 6414	Douglas 6414 Glasgow.
"	... J. R. Alexander & Co. Ltd.	264-280 Great Wes- tern Road	Douglas 3802/3/4	Alex Moto, Glasgow.
Gloucester	... Harpers of Gloucester ...	23a Worcester St. ...	23187	Gloucester 23187
Grimsby	... H. J. Gresswell & Sons Ltd.	13-15 Osborne Street	2202	
Guernsey	... Millard & Co. Ltd. ...	Victoria Road ...	777	Millard Motors, Guernsey.
Guildford	... E. Pascall (Guildford) Ltd.	11-12 Woodbridge Rd.	Guildford 2274/5/6	
Harrogate	... H. Aclam (Prop. H. Baynes)	11 Bower Road ...	5125	
Harrow	... Pinks of Harrow ...	Station Road ...	0044/5 Spares 3328	Pink, Harrow.
Hatfield	... W. Waters & Sons Ltd.	32 Gt. North Rd. ...	2255	
Hereford	... A. Kear & Co. ...	52b Commercial St.	2239	Kear, Hereford.
Holbeach	G. Woodman Ltd. ...	34 Fleet Street ...	3221	
Hornchurch	... T. W. Kirby Ltd. ...	10 Roneo Corner ...	8785	
Hounslow	Stanley's Motors ...	46-8 Lampton Road	Hounslow 1949	
Huddersfield	Earnshaw ...	Manchester Road ...	1232	
Hull	... Browns (Witham) Ltd....	47-49 Witham ...	29802/33990	
"	Jordans of Hull ...	Story Street ...	16131	Gumpton, Hull.
Ilford	... J. J. Double ...	14 Mildmay Parade, Cranbrook Road	3621 Valentine	
Ilkeston	Ray Gamble ...	Pelham Street ...	873	
Ipswich	... Revetts Ltd. ...	Clarkson Street ...	53726/7	
Jersey	... Colebrooks ... (J. O. Poingestre)	22½ New St. John's Rd. St. Helier	Central 642	Colebrooks, Jersey.
Keighley	... Dick Ratcliffe ...	Coldshaw Garage, Haworth	Haworth 3133	
Kendal	... Tom O'Loughlin ...	66 Stricklandgate ...	315	
Kings Lynn	... Peter Guest Ltd. ...	123/5 Wooton Rd. ...		
Kirkcaldy	... County Motors (Kirk- caldy) Ltd.	Junction Road ...	Dysart 5631	
Lancaster	... Pye Motors Ltd. ...	Parliament Street ...	3553	
Launceston	J. Wooldridge & Son ...	Western Road ...	21	Wooldridge, Launceston.
Leeds	... Watson-Cairns & Co. ...	157/8 Lower Briggate Ltd.	33024/5	Watson-Cairns, Briggate, Leeds.
Leicester	... E. W. Campion & Son Ltd.	Welford Place ...	58054	
Lincoln	... Wests (Lincoln) Ltd. ...	116 High Street ...	21262	
Liverpool	... Bee Cycle & Motor Co. Ltd.	17-19 Renshaw Street	Royal 6375/6	Bee Cycles, Liverpool
"	... Cundles Ltd. ...	41 and 61 Byrom St....	Central 4148	Cundles, Central 4148.
Llawhaden	... James Bowen & Sons	Llawhaden, near Nar- berth, Pem.	Llawhaden 6	

B.S.A. Motor Cycle Spares Stockists—continued

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
London, E.6	Godfrey's Ltd.	220 Barking Road, East Ham.	Grangewood 8088	Gofrabike, Forgate.
" E.6	Glanfield Lawrence (High-bury) Ltd.	28-32 Highbury Corner	North 2791	
" E.7	Godfrey's Ltd.	418 Romford Road, Forest Gate	Grangewood 1234-5	Gofrabike, Forgate.
" E.8	Eleanor Motors	265/7/9 Mare Street Hackney	Amherst 5134-3923	
" N.12	George Grose Ltd.	834 High Rd., Finchley	Hillside 2149	
" N.12	Glanfield Lawrence	Junction Great North Road and North Circular Road	Finchley 0091	Glanfin, Norphone,
" N.15	Godfreys Ltd.	94-96 High Road, Sch. Tottenham.	Sta. 9960	Gofrabike, London.
" N.W.1	J. Grose Ltd.	379-381 Euston Road	Euston 5231	
" N.W.10	Slocombes Ltd.	269 Neasden Lane, Neasden.	Gladstone 3355	
" S.E.11	Writers Ltd.	161-5 Kennington Ln.	Reliance 1362	
" S.E. 13	F. Parks & Son Ltd.	404 Lewisham High St.	Lea Green 0535	
" S.E.15	West End Motors Ltd....	171 High St., Peckham	Newcross 2589	
" S.E.18	Cleare & Co. Ltd.	1 & 125 High Street	Woolwich 0174	
" S.W.6	Claude Rye Ltd.	897-921 Fulham Road, Fulham	Renown 6174	Ryebikes, Walgreen, London.
" S.W.9	Pride & Clarke Ltd.	Stockwell Road	Brixton 6251	
" S.W.11	Owen Bros.	19 Battersea Rise, Clapham Junction	Battersea 7816/7	
" S.W.17	Elite Motors (Tooting) Ltd.	951-961 Garratt Lane, Tooting Broadway	Balham 1200	Elite Motor Toot London
" W.1	Godfreys Ltd.	208 Great Portland Street.	Euston 4632/4	Gofrabike, London
" W.3	Whitby's of Acton Ltd.	273 The Vale, Acton	Sh. Bush 5355/6	
" W.5	Kays of Ealing Ltd.	8-10 Bond Street	Ealing 2387	Sparesokay, Ealux, London.
" W.12	Turners Stores	81-83 Goldhawk Road, Shepherd's Bush	Sh. Bush 2436	
Lowestoft	R. Wright	67-69 London Rd., Sth	645	
Macclesfield	A. Watling	49 Buxton Road	3592	
Maidstone	Redhill Motors (Maidstone) Ltd.	The Broadway...	3096	
Manchester	Tom Davies (Motors) Ltd.	233 Deansgate	Blackfriars 0681	
"	Fred Fearnley Ltd.	692-4 Ashton Old Rd.	East 1445/6	Fernbike, Manchester.
"	Alex Parker	31/33 Palatine Road Northenden	Wythenshaw 2062	
Mansfield	Henstocks	128 Chesterfield Rd.	329	Henstock 329 Mansfield
Middlesbrough	J. T. Dickinson (Middlesbrough) Ltd.	150-162 Lindthorpe Road	3861	Payacob. Middlesbrough.
Neath	Fred Rist	16 Windsor Road	Neath 780	
Newcastle-on-Tyne	Dene (Newcastle) Motor Co. Ltd.	Haymarket	2-9165/6	Ened, Newcastle-on-Tyne.
Newton Abbot	J. E. Green & Co.	87 Queen Street	653	
Newport, Mon.	R. J. Ware & Sons	69 Commercial St.	66206	
Norwich	Chapmans (Norwich) Ltd.	38-42 Duke Street	24727	

B.S.A. Motor Cycle Spares Stockists—*continued*

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Nottingham	E. W. Campion & Son Ltd.	Arkwright Street and Queen's Road	83444	
Oldham	Alan Taylor (Northern) Ltd.	192 Manchester St. ...	Main 4456	
Oswestry	Roy Evans	Willow Street	1144/5	
Oxford	H. F. Temple	69 High St., St. Thomas	2485	
"	John Avery	228/230 Banbury Road	57362/3	
"	Faulkner & Son	12 Cardigan St.	57279	
Parkstone	Bob Foster	472-4 Ashley Road	3500	
Perth	M. Shaw & Sons	143 High Street	483	
Peterborough	Burrows Bros.	55-57 Westgate	2154	
Plymouth	P. Pike & Co. Ltd	Millbay Road	Plymouth 63018	Piko, Plymouth.
Pontardulais, Glam.	T. Griffiths	Forest Garage	Pontardulais 323	
Portsmouth	Jenkins & Purser Ltd.	277-281 Copnor Rd.	2339	
"	Glanfield Lawrence	147-157 Fratton Rd.	74331	
Preston	Loxham's Garages Ltd.	Central Garage Charnley Street Fishergate.	Sales Dept. Loxham's, Preston, 4242 Service Dept. 4243	
Pulborough	Gray & Rowsell...	Bury Gate	Bury 4	
Radcliffe	Will Lord	115 Blackburn Street	2002	
Reading	Phillips & Bloomfield Motors Ltd.	10-24 South Street	2635	
"	Stocker & Shepherd Ltd.	131 Oxford Road and Weyland Street	2212-3983	
Redhill	The Redhill Motor and Cycle Works Ltd.	50/54 Brighton Road...	327	
Rotherham	Ernest Cross	55-59 Drummond St.	Rotherham 3987	
Salisbury	Pankhurst (Weymouth) Ltd.	78 Exeter Street	Salisbury 5222/3	
Scarborough	E. Andrew	Roscoe Street	Scarborough 1857	
Sevenoaks	Angus Motor Cycles	Station Parade	3338	
Sheffield, I	Walter Wrang Ltd.	Stanley Works, Wellington Street	26098	26098 Sheffield.
Shrewsbury	J. R. Meredith	Coleham Head	6529	
Sittingbourne	Scoones' Garage	9 West Street	66	Scoones, Sitting-bourne.
Slough...	Sid Moram	Wexham Corner, High Street	Slough 23767	
Southampton	Alec Bennett Ltd.	152 Portswood Road	54081/2/3	
Southport	H. F. Brockbank	62 King Street	5054	
Southsea	Percy Kiln	65-67 Elmgrove	P'mouth 23734	
St. Helens, Lancs	Geoff Duke Ltd.	Greenfield Rd. Garage	3918	
St. Ives, Hunts.	Hallens (Hunts.) Ltd.	The Broadway	St. Ives 3071	Hallens, St. Ives.
Stockport	Theobald & Coppack	6 Chestergate	2843	Theobald Coppack, Stockport.
Stockton-on-Tees	T. Cowie Ltd.	49-50 Brunswick St.	67534	
Stoke-on-Trent	J. & N. Bassett	Howards Place, Shelton	2890	
Stourbridge	Pearson's Cycle Depot...	31 Market Street	5677	
Sunderland	Dunns Garage (Sunderland) Ltd.	Wheatshaf Corner, North Bridge St.	57666	
Swansea	Handel Davies Ltd.	230 Oxford Street	50311	
Swindon	Easters of Swindon	73-75 Cricklade Road	4196	
Taunton	W. P. Edwards (Motors) Ltd.	Station Road	2943	Edwards, Motor Cycles, Taunton.
Thames Ditton	Comerfords Ltd.	Oxford House, Portsmouth Road	Emberbrook 5531	

B.S.A. Motor Cycle Spares Stockists—continued

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Torquay ...	P. H. Sharam Ltd.	... 244-6 Union Street ...	4184 & 7255	
Troon, Ayrshire.	Cooper Bros.	... 125-129 Templehill ...	925	
Truro,	W. H. Collins	... Kenwyn Mews	Truro 2168	
Tunbridge Wells	G. E. Tunbridge Ltd.	... 21 London Road	416	Motors, Tunbridge Wells.
Twickenham...	C. A. Blay	... 192-9 Heath Road	Popesgrove 2103 & 1435	
Uxbridge ...	J. H. Miles Ltd.	... 60 High Street	Uxbridge 6000	
Wakefield ...	Parkinsons (Wakefield) Ltd.	38-40 Ings Road	2087	
Walsall ...	The Motor Cycle Mart (Walsall) Ltd.	12 Ablewell Street	3363	
Warrington	Jack Frodsham Ltd.	... 37a Winwick Street	34713	
Watford ...	Lloyd Cooper & Co.	... 61 Queen's Road	2125	Lloyd Cooper, Watford.
Westcliff-on-Sea.	J. Costin & Sons	... 233-5-7 London Rd.	Southend 42215	
Weston-super-Mare	Wyvern's of Weston Ltd.	3 Locking Road	524	Wyvern's, Weston-super-Mare
Weybridge ...	W. L. Lewis & Sons	... 51 Church Street	2210	
Weymouth ...	Tilleys	... 9 Frederick Place	72	
Whitehaven,	Mark Taylor	... 21 King's Street	252	
Wolverhampton	C. E. Cope & Sons Ltd.	168-9 Stafford St.	24605/6	
Worcester ...	W. J. Bladder & Son	... 52 Sidbury	2438	Bladder, Sidbury, Worcester.
Worksop ...	Ezra Sugden Ltd.	... 109 Gateford Rd.	3053	
Yeovil ...	The Yeovil Motor Mart	Hendford	267	Motor Mart, Yeovil.
York ...	C. S. Russell (York) Ltd.	Lawrence Street	23793	Russell, Lawrence Street. York.

PROPRIETARY INSTRUMENTS FITTINGS AND ACCESSORIES

No expense is spared to secure as standard equipment the most suitable and highest quality instruments and accessories. Nevertheless, the Company's guarantee does not cover such parts, and in the event of trouble being experienced the parts in question should be returned to and claims made direct on the actual manufacturers, who will deal with them on the terms of their respective guarantees, as follows:

Carburettors:

Amal Ltd., Holford Works, Perry Barr, Birmingham.

Dual Seats:

Motoplas Ltd., Armoury Road, Birmingham, 11.

Electrical Equipment:

Joseph Lucas Ltd., Birmingham.

Spring Seat Saddles:

Herbert Terry & Sons Ltd., 210 Corporation Street, Birmingham.

Speedometers and Rev. Counters:

Smiths Motor Accessories Ltd., Cricklewood, London, N.W.2.

Tyres:

Dunlop Rubber Co. Ltd., Fort Dunlop, Birmingham.

SPECIAL NOTE

Claims under guarantee, whether to B.S.A. Motor Cycles Ltd., or any of the manufactures listed above, should be submitted through the B.S.A. dealer from whom the machine was purchased.

