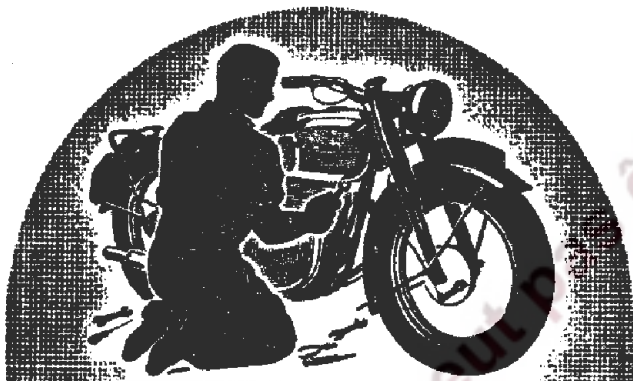
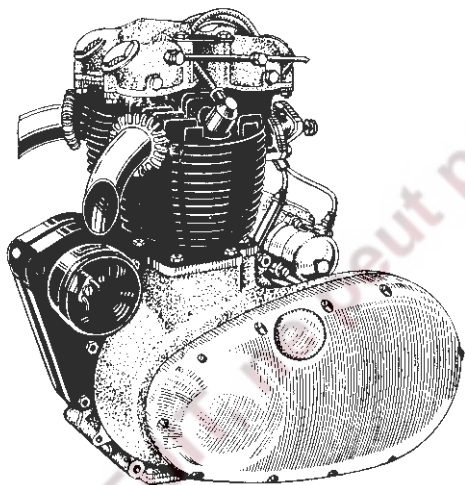




The **BSA**
Motorcycle Manual

**500 c.c. O.H.V.
Vertical Twin
Model A7 and
A7 Star Twin
1947-1950**

THE B.S.A. VERTICAL TWIN POWER UNIT.



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

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*B.S.A. Motor Cycles Ltd. reserve the right to alter the designs or any
constructional details of their manufactures at any time
without giving notice.*

USEFUL DATA

	Standard	Star Twin
Petrol tank capacity (approx.)	3½ galls.	3½ galls.
Oil tank capacity	½ gall.	½ gall.
Gearbox capacity	1 pint	1 pint
Bore (mm.)	62	62
Stroke (mm.)	82	82
Capacity (c.c.)	495	495
Tappet clearances (cold)—inlet and exhaust	.015in.	.015in.
*Compression ratio	6.6 to 1	7 to 1
Piston ring gaps—(mean) compression (see page 41)	.013in.	.013in.
Valve timing—inlet	Opens 24° before t.d.c. Closes 65° after b.d.c.	Opens 24° before t.d.c. Closes 65° after b.d.c.
exhaust	Opens 60° before b.d.c. Closes 21½° after t.d.c.	Opens 60° before b.d.c. Closes 21½° after t.d.c.
Ignition timing (see page 23)—piston distance before t.d.c. with points just opening	5/16in.	3/8in.
Plug points gap—maximum	.018in.	.018in.
minimum	.015in.	.015in.
Gear ratios—solo	Top 5.1 Third 6.2 Second 9.0	Top 5.1 Third 6.2 Second 9.0
with sidecar	First 13.2 Top 5.4 Third 6.6 Second 9.5	First 13.2 Top 5.4 Third 6.6 Second 9.5
Tyre sizes (inches)	Front 3.25 x 19 Rear 3.50 x 19	Front 3.25 x 19 Rear 3.50 x 19
Tyre pressures (p.s.i.) solo	Front 16 Rear 17	Front 17 Rear 18
with sidecar	Front 22 Rear 18 Sidecar 18	Front 22 Rear 18 Sidecar 18
Chain sizes—Front	½ in. Duplex	80 links
Rear (rigid frame) (solo)	½ in. x ½ in. 102 links	—
(sidecar)	½ in. x ½ in. 103 links	—
Rear (spring frame) (solo)	102	102
(sidecar)	103	104
Rear brake drum chainwheel—solo	46 teeth	46 teeth
with sidecar	49 teeth	49 teeth
Carburettor jet	140	110 (twin carbs)
Valves (inlet and exhaust)	Standard	Stellite tipped
Air cleaner	Vokes	Amal gauze traps

*A piston giving a compression ratio of 7.5 to 1 is available for both models and 8.6 to 1 for Standard A7 to special order.

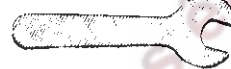
THE TOOLKIT.



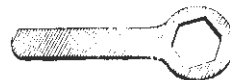
Spanner for general use



Adjustable spanner



Tappet spanner



Front fork top nut spanner



Carburettor spanner



Spanner for general use



Tyre lever



Lucas magneto spanner



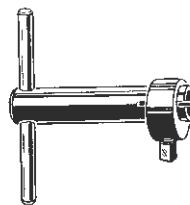
Screwdriver attachment



Sparking plug spanner



Tommy bar



Valve grinding tool



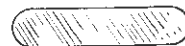
Cylinder head bolt spanner



Grease gun



Ring spanner (star twin only)



.015" Tappet clearance gauge

THE CONTROLS.

HANDLEBAR CONTROLS.

Twist Grip Throttle.

Controls engine speed. To open throttle (to increase engine speed) turn grip towards rider. Full movement is about one quarter of a turn.

Front Brake.

Hand lever on right bar, below twist grip throttle. Pull lever towards bar to apply brake and note that this operates front brake only.

Air Lever.

On the right handlebar. Controls the additional supply of air to carburetter, allowing the mixture of air and petrol to be varied as conditions require. Move clockwise to open (to increase supply of air). The normal running position is fully open.

Clutch Lever.

Hand lever below left bar. Pull towards bar to declutch, i.e., disengage the drive between the engine and the rear wheel. As the clutch lever is slowly released, the drive is restored gradually and without sudden jerks. Always declutch when changing gear.

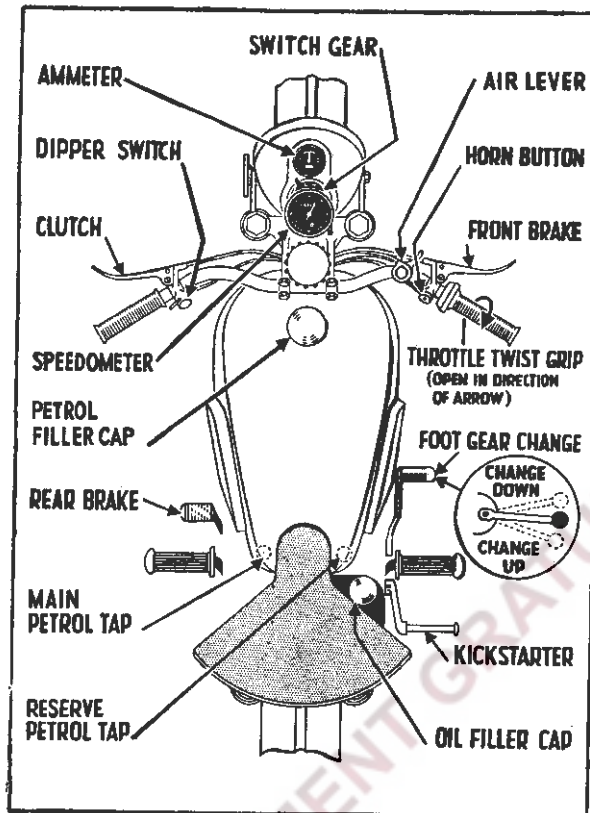


Fig. 1. The Controls.

FOOT CONTROLS.

Rear Brake Pedal.

On left-hand side. Operates rear brake only

Foot Gear Change Pedal.

On right-hand side. To engage first gear from the neutral position, the pedal is moved upwards. To change to a higher gear move the pedal downwards. To change to a lower gear raise the pedal. The pedal automatically returns to central position, ready for next gear change.

Kickstarter Pedal.

On right-hand side behind gear change pedal. Depression of this pedal rotates engine. See instructions on starting engine.

GENERAL

Petrol Taps.

Located under rear end of tank. They have one serrated knob and one hexagon knob. To turn petrol off, serrated knob is pushed in. To turn petrol on, hexagon knob is pushed in. Both taps communicate with the main supply in the petrol tank, but if one tap only is used and the other left in the "off" position, a reserve is left in the tank which can only be fed to the carburettor when the second tap is turned on.

Lighting Switch.

On panel at rear of headlamp. Controls lighting of lamps as indicated on markings.

Ignition Cut-out.

Situated on the magneto contact breaker cover, and quite conveniently placed for the rider's left hand, is the ignition cut-out button. Pressure on

this for a second stops the engine, and it is useful for stopping if the throttle is set for a reliable tick-over (see page 32).

Ammeter.

On top of headlamp. Enables rider to see at a glance whether dynamo is charging the battery, or whether battery is discharging.

DRIVING.

To Start the Engine.

Set gear control in neutral position, i.e., between first and second gear positions.

If cold, first depress carburettor tickler momentarily. Open twist grip control a small amount, close the air lever, and then give kickstarter a vigorous kick downwards.

Note that while it is necessary to close the air lever when starting from cold, this may not be necessary when the engine is warm, and should certainly not be so if a restart is made after a short wait only. On some occasions, such as when the engine is not fully warmed up, or when it has cooled down a little during a temporary halt, for instance, it may require the air lever to be partly closed for starting, and the rider is advised to study this point.

During normal running the air lever should always be kept fully open, although a slight gain in power at low speeds on hills may sometimes be obtained if the lever is closed a very small amount. This is another point for the rider's investigation.

To Engage First Gear.

Declutch and move gear change pedal *upwards* to its limit. If difficulty is experienced in engaging first gear when stationary, rock the machine backwards and forwards, maintaining slight pressure on the gear change pedal, until the gear is felt to engage.

To Move Off.

Open throttle slightly and gently release clutch lever. As clutch engages open throttle a little further.

To Change Gear (up).

Disengage clutch and press change pedal *downwards* to its limit, at the same time closing the throttle. Engage clutch and reopen throttle together immediately after changing. **Note.**—Violent pressure on the gearchange pedal is neither necessary nor desirable.

To Change Gear (down).

Disengage clutch, open throttle slightly, and raise gearchange pedal *upwards* to its limit, all these operations being performed simultaneously. Re-engage clutch immediately.

NOTE.—When changing gear, either up or down, it is preferable—after moving pedal—to hold it in position with the foot until after the clutch has been re-engaged, when the gears will be felt to engage.

HINTS ON "RUNNING-IN" A NEW MOTOR CYCLE.

The rider who has just purchased a new machine for the first time will do well to remember that all the hidden working parts are just as new as the enamel and plating which he can see, and that they must not be fully laden until they are well run-in.

This running-in is really the most important period in the life of the engine, and the handling you give it during the early part of its life will determine the sort of service it will give you later.

No matter what the maximum speed of your model may be, be content with a cruising speed of not more than 40-45 m.p.h. until you are satisfied that the engine is really run-in. Its maximum will then not disappoint you. If you try to put it through its paces too soon you will run the risk of seizure and other troubles which may have a lasting effect on the engine, and, in any case, until it is really run in it will not be at its best. A motor cycle engine is quite different from other types of machinery which give maximum service from the moment they are assembled. It is a power unit, relatively small and compact in size, running at very high speeds, handling a great deal of heat and developing an enormous amount of power. So give your engine a chance to settle down during the first 1,000 miles of its life.

Avoid sudden and sharp acceleration, especially when the engine is not pulling under load.

Do not force it up hills in top gear, when a change down would ease the load.

Carry out the periodical maintenance details described later with faithful regularity.

Do not let the oil level in the tank get too low. Economy in oil may prove very expensive at a later date. If you run consistently with the level too low the oil may overheat, for you must remember that the oil cools as well as lubricates, and a new engine tends to run a little hotter than one which is well run-in.

After the first 250 miles drain and refill the tank with fresh oil and clean the filter (Fig. 2, page 12). Do this again at 1,000 miles and thereafter every 2,000 miles.

Information regarding the correct grades of oil is given in the chart on page 34 and inside the back cover.

And one more tip that is worth while—have a small quantity of upper-cylinder lubricant added to the petrol each time you fill up—or if this is difficult to obtain, add about an egg-cup full of engine oil to every two gallons of petrol.

ENGINE LUBRICATION SYSTEM.

The engine lubrication system (see Fig. 3) is of the dry sump type operated by a double gear pump, situated in the bottom of the timing case.

The oil flows from the tank—through a filter in the tank—to the supply portion of the pump, which delivers it past an automatic valve to the timing side main bearing, and thence to the hollow crankshaft and the big-end bearings.

After lubricating the big-ends and circulating through the engine in the form of mist, the oil drains down through a filter in the bottom of the crankcase, from which it is drawn by the return portion of the pump past another ball valve and delivered up the return pipe to the tank.

An additional oil supply to the rocker box is taken from the pump return pipe, and this supply is fed through a vertical pipe at the rear to banjo unions at the nearside ends of the rocker spindles.

A pressure release valve (A, Fig. 3) is interposed between the delivery side of the pump and the big-end bearings. This is pre-set to control the pressure in the supply system, and it should be examined periodically—say every 1,000 miles—to ensure that it is operating freely and not impeded by the presence of even tiny particles of foreign matter. The construction of this valve is shewn in the exploded view in Fig. 3, and if it is dismantled, the parts should be thoroughly rinsed in petrol before reassembly. Note that both hexagons must be screwed right home and made really tight.

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 from the crankcase. The tank and crankcase should be drained periodically, and replenished with clean oil (see Periodical Maintenance, page 14).

Any restriction in the pressure release pipe in the tank will cause an increase in pressure inside the oil tank, and will result in leakage of oil at the filler cap. This can be put right by inserting a length of flexible wire into the pipe at its lower end (just in front of the rear mudguard) and pushing the wire right up the pipe, thus clearing any obstruction.

To remove the oil tank filter for cleaning, remove the oil pipe banjo union plug at the bottom of the tank. The filter will come out with the plug. The filter should be placed in a can large enough to

cover it with petrol, and thoroughly washed. Before replacing make sure that it is quite dry of petrol.

The crankcase filter can be withdrawn after removing the cover plate and should be thoroughly washed with petrol, dried and replaced.

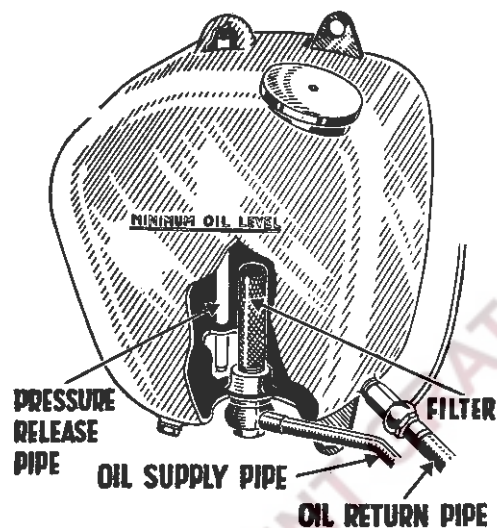


Fig. 2.

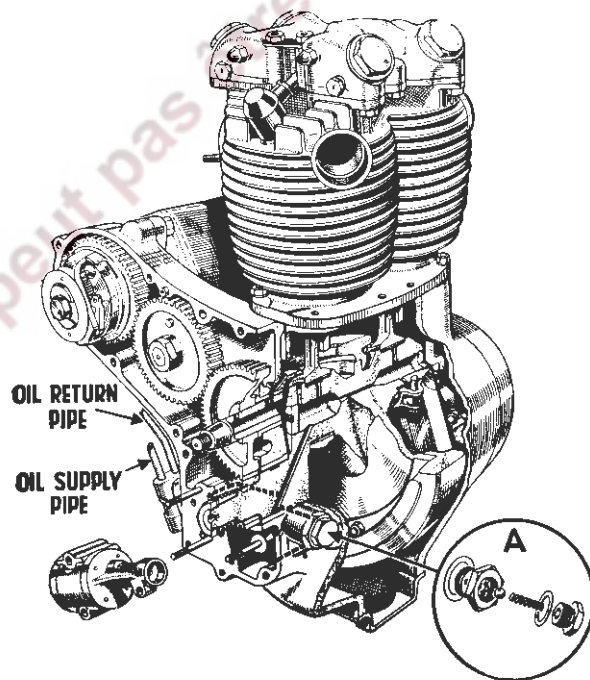


Fig. 3.

PERIODICAL MAINTENANCE.

WEEKLY.

Cleaning. Obviously regular and thorough cleaning will keep your machine looking smart and will help to retain both its new appearance and value. But it helps also to lengthen its life and maintain efficiency if the cleaning process is carried out correctly.

Take special care to prevent dust and grit from working into such parts as hubs, carburetter, magneto, dynamo, brakes and gearbox.

To rub dry and caked mud from the frame, tank and mudguards means that the enamel on these parts will be subjected to an abrasive action which will quickly destroy the polish. Soak the mud first, and then float it off with copious supplies of clean water supplied either with a hose or a sponge. If a hose is used, take care not to direct the stream of water directly on to the hub bearings, magneto, dynamo and carburetter.

When all dirt is removed, dry and polish off with a clean duster.

The engine and gearbox are best cleaned with a brush and paraffin, and then dried off with clean rag.

Oil Tank. Inspect level of oil at least once a week. Oil level should never be allowed to fall below the level mark on outside of tank. When topping-up do not fill the tank completely—leave about one inch margin between the oil and top of tank.

Tyres. Examine carefully for cuts and remove any flints or metallic scraps which may have become embedded in the rubber. Check pressures with a gauge, and rectify if necessary.

Steering Head. Give two or three strokes of the grease gun every week.

Brake Pedal. Give a few drops of oil weekly.

Saddle Nose Bolt. Give a few drops of oil weekly.

Control Rod Joints and Exposed Cables. Give a few drops of oil weekly.

Gearbox. Examine oil level and top-up if necessary to the level plug.

EVERY 1,000 MILES.

Hubs. Inject grease through nipples in centre of hub. Do not over-lubricate as grease may be forced on to the brake linings and cause ineffective brakes. Three or four strokes of the grease gun should be ample. DO NOT LUBRICATE WITH OIL.

Rear Suspension (when fitted). A few strokes of the grease gun.

Steering Head. Lift machine and place a box under the crankcase so that front wheel is clear of the ground. Test for play in the steering head by trying up-and-down movement. Check also that steering is free. If necessary, adjust as explained on page 20

Brake Cam Spindles. A few drops of oil.

Tappet Adjustment. See pages 20-22

Clutch Adjustment. There must always be a slight amount of play in the clutch control arm on the gearbox—or a short length of free cable at the

handlebar lever end. If the play becomes excessive difficulty will be experienced in changing gear, as the clutch may not fully disengage, in which case the control arm should be adjusted as explained on page 25.

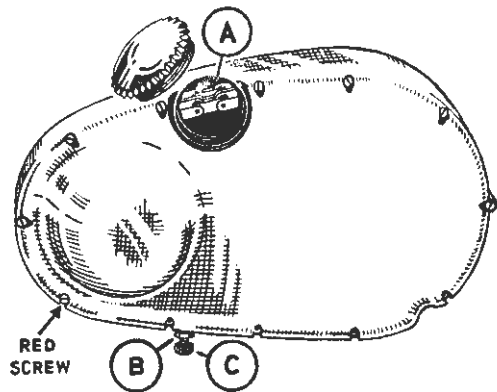


Fig. 4.

Chains. To check the front chain tension remove inspection plug A, Fig. 4, and feel the up and down play, which should be half-an-inch. To adjust the tensioner, if necessary, see page 27. Check that there is not more than three-quarters of an inch play in the rear chain. If excessive, adjust as explained on page 28.

EVERY 2,000 MILES.

Automatic Advance. Remove timing cover and examine advance mechanism; if necessary apply a few drops of thin machine oil.

Oil Tank. Drain out the old oil (preferably after a run while the engine is still warm), wash out with flushing oil or thin machine oil—NOT paraffin or petrol—and refill with new oil. Remove filter and

wash thoroughly in petrol or paraffin and make sure that it is absolutely dry before replacing.

Crankcase Filter. Remove plate below crankcase and wash the gauze filter in petrol, dry and replace it.

Gearbox. Remove drain plug at bottom of gearbox and drain out old oil. Wash out gearbox with flushing oil and refill with new oil through inspection hole (Fig. 9) to level of level plug.

Note.—In the case of new machines it is advisable to drain the oil tank and sump after the first 250 miles, and again after 1,000 miles. The gearbox should be drained after the first 500 miles. Thereafter these operations need only be carried out at 2,000 miles intervals.

Full details of lubrication points and correct grades of oil are given on the lubrication chart on pages 34 and 35 and inside the back cover.

Primary Chain Oilbath. This is provided with a supply of special lubricant before the machine leaves the factory, and topping up should only be required at infrequent intervals. Check level and top up if necessary with engine oil. One of the cover fixing screws is painted red and also serves as a level plug (see Fig. 4). Remove it to check level and replace afterwards.

Hubs. These are fitted with ball journal bearings, and no adjustment is either provided or required. So long as they are adequately lubricated as described on page 15 they will give faultless service throughout the life of the machine.

Dynamo and Magneto. See pages 55 and 56.

Central Stand Fulcrum. A few strokes of the grease gun.

**HOW TO CARRY OUT THE VARIOUS
ADJUSTMENTS CALLED FOR IN
THE PREVIOUS SECTION.**

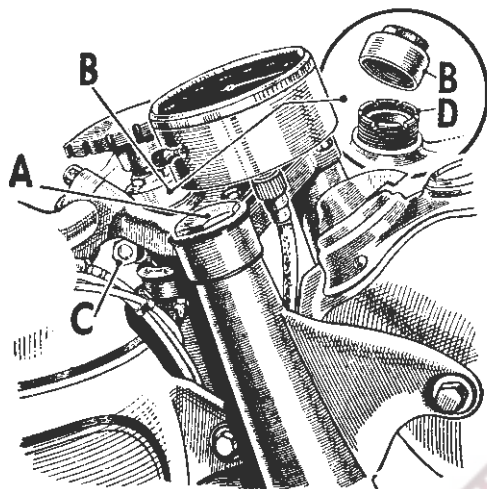


Fig. 5. Front fork and steering head.

Forks. There is no adjustment for the telescopic forks fitted to this model. The only maintenance likely to be required, apart from the routine check-up on the tightness of nuts and bolts, is if, after considerable mileage, the forks appear to develop excessive up-and-down movement. If this occurs remove the large hexagon headed cap (A, Fig. 5) at the top of each fork leg, and also the small drain plugs shewn in Fig. 6. After all the remaining oil

has drained out of each leg, replace the drain plugs and refill to the correct level, using a quarter-pint of oil to each leg for this purpose. Note the correct amount—a quarter of a pint. A little more than this will not be harmful, but on no account must the fork legs be filled right up to the top, or the forks will be unable to function.

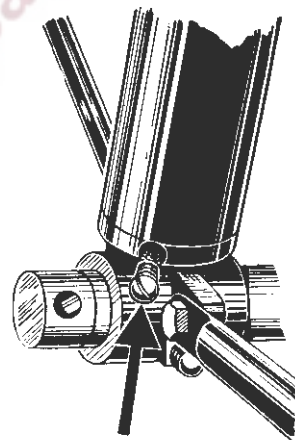


Fig. 6.

Use only the oils recommended in the chart on page 34 and inside the back cover.

(NOTE.—It helps to remove the last traces of oil from the forks when draining, if the rider stands astride the machine, grasps the handlebars, and works the forks up and down.)

Steering Head. Remove the steering damper knob with stem and then the steering head locknut (*B*, Fig. 5). Slacken the pinch bolt *C*. Turn the adjusting sleeve *D* until slackness has been taken up. Do not over tighten or steering will be stiff and the ball races may be damaged. Tighten pinch bolt after adjustment is complete and then replace the steering head locknut and damper knob.

Note.—It is advisable to re-check the adjustment after tightening the locknut *B*.

Tappet Adjustment. Tappet adjustment and checking must always be done **when the engine is stone cold**, and the operation is easily carried out when the four caps (*A*, Fig. 7) on the rocker boxes are removed, using the special spanner provided in the toolkit for this purpose (see page 3).

Place the machine on its stand and turn the engine by means of the kickstarter. This latter operation will be found easier if the sparking plugs are first removed. It is, of course, essential that any valve whose tappet clearance is being checked or adjusted should be closed, and its tappet on the base circle or neutral portion of the cam. To obtain this position for the nearside inlet valve turn the engine until the offside inlet valve is fully open. Similarly, to set the offside inlet valve in the correct position, turn the engine until the nearside inlet valve is fully open. Follow the same procedure exactly for the two exhaust valves.

The clearance should be .015in. This clearance is marked on the faces of the rocker box caps. Four small hexagonal plugs *D* (one for each valve rocker) are provided in addition to the four caps

previously described. Their removal facilitates easy access for checking adjustment with the feeler gauge provided.

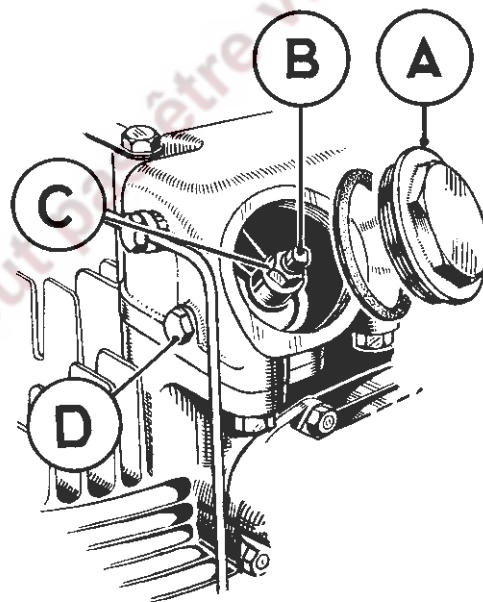


Fig. 7.

To adjust the clearance, if it is found to be incorrect, hold the pin with one of the tappet spanners shewn on page 3 and with the other tappet spanner also shewn on the same page, release the locknut *C*. Then, holding nut *C*, screw pin *B* up or down as required until the feeler gauge can just be removed. When this is obtained, hold *B* with its spanner and tighten nut *C* very securely. When *C* is properly tightened, check the play again, to make certain

that it has not been altered while tightening the nut. Check and adjust all four adjusters in the same manner, and do not forget that this must be done while the engine is quite cold. Finally, replace the four caps *A*, the screwed plugs *D*, and the sparking plugs.

Clearances tend to increase slightly when the engine warms up to its working temperature, and if an attempt is made to adjust clearances while the engine is warm there may be insufficient clearance when the engine is cold. Running an engine without enough tappet clearance is harmful to the valve seats, and is one of the commonest sources of trouble in this direction.

Ignition Timing. It is a rare occurrence for the magneto pinion to slacken off and disturb the ignition setting, and it is not advisable to interfere with the standard setting unless it is known to be at fault.

It is however advisable to check over the timing after carrying out any adjustment to the magneto contact points, as a slight variation of the points tends to advance or retard the timing. (Opening the points advances timing, closing them retards timing.)

If the timing requires re-setting, first check that the fully open gap at the points is between .010in. and .012in.

Then remove the rocker box caps and the sparking plug from the nearside cylinder, the timing cover and the magneto pinion, which is *self-extracting*. To remove the pinion it is only necessary to unscrew the hexagon head in an anti-clockwise direction. After a few turns it will become stiff, but after further turning in the same direction the pinion will come away from its taper.

To set the timing, turn the engine forward until the offside piston is at the top of its compression stroke. This can be checked by means of a rod inserted through the sparking plug hole and resting on the piston head. If, when the piston is in this position, either of the valves is found to be partly open, this means that the piston is at the top of the wrong stroke, and the engine must accordingly be turned through one complete revolution. If tappet clearance can be felt at both valves (see page 21) the piston will be at its correct top dead centre for ignition timing.

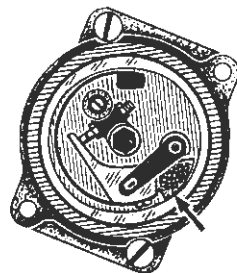


Fig. 8.

Having satisfied yourself that the piston is at the correct top dead centre, turn the engine back until the piston has descended exactly $\frac{5}{16}$ in. before t.d.c. ($\frac{1}{4}$ in. Star Twin model) This can easily be accomplished by engaging low gear and revolving the rear wheel backwards. Leaving the engine set in this position, turn the magneto shaft forward in advance of the pinion, (i.e. to operate the automatic advance mechanism by applying a spanner to the central hexagon and turning it anti-clockwise against the resistance of the springs).

Holding the mechanism in the fully advanced position with the points just beginning to open (not more than .002in.) by the action of the arm on the lower cam (see Fig. 8), lightly tap the magneto pinion on to its taper, tighten the bolt and carefully check the setting. If it is correct, finally tighten the magneto pinion bolt.

It cannot be too strongly emphasised that the ignition timing must be correctly set for satisfactory engine performance, and also that any temptation to improve upon the maker's setting should be avoided, as this setting has been found best after careful trial and experiment. The fact that this engine is fitted with automatic ignition advance makes it all the more necessary that the above timing instructions should be faithfully carried out.

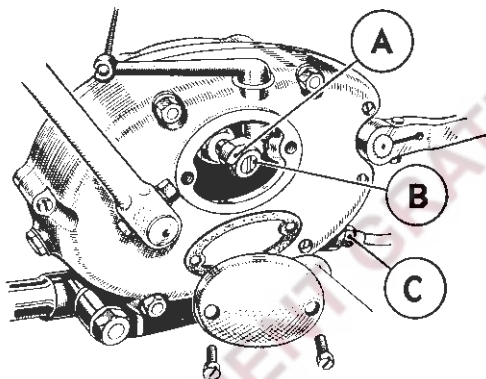


Fig. 9. Clutch control adjustment

Clutch Control. The main clutch adjustment is totally enclosed in the gearbox outer cover, and to

reach it it is first necessary to remove the inspection plate (Fig. 9). With the plate removed it will be seen that just inside the cover there is a nut *A*, which locks the adjusting screw *B* in position. Loosen the locknut and with the aid of a screw-driver, adjust the screw so that there is a little clearance between it and the ball which is located behind it. Then retighten the locknut and replace the filler plug.

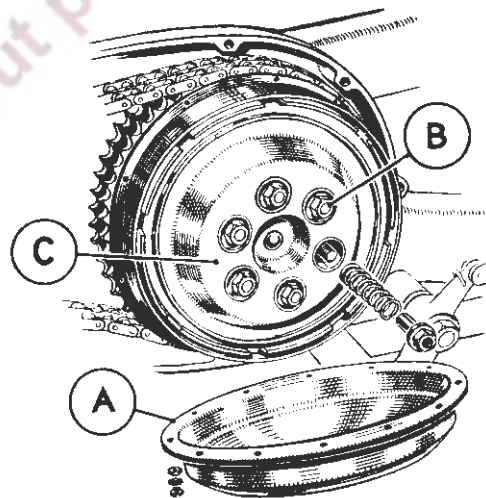


Fig. 10. Clutch spring adjustment.

Further adjustment, if necessary, is provided by the cable adjuster on top of the gearbox, just under the magneto. Remember, however, that some free movement in the control arm is necessary, as if the

adjustment is too tight there will be constant pressure on the clutch, with consequent wear and loss of efficiency.

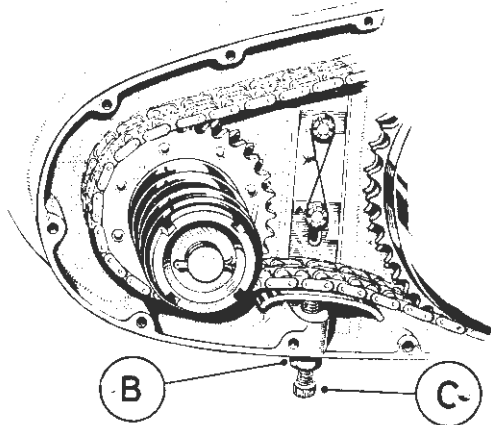


Fig. 11.

Clutch Spring Pressure. After a considerable mileage it may be desirable to increase the spring pressure a little. First remove the outer half of the primary chaincase, and then the domed clutch cover *A* (Fig. 10), which is secured by twelve screws to the clutch body. It will then be seen that the clutch plates are compressed by springs, the pressure of which is controlled by the nuts *B*. To increase the spring pressure tighten these nuts *B* slightly. It is important that each of the six adjusting nuts is tightened equally to ensure even pressure, otherwise the plates will slide unevenly and clutch drag may result.

After adjustment is completed, depress the clutch lever and spin the clutch by operating the kick-starter when the outer spring plate *C* should be seen to revolve parallel with the other plates. If not, adjust individual springs until the plates are true. Replace the cover and chaincase.

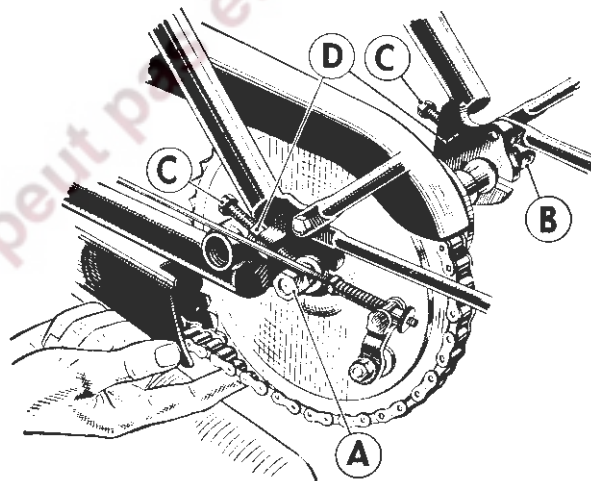


Fig. 12.

Front Chain. To adjust remove the inspection plug *A* (Fig. 4), and then slacken off locknut *B* (Fig. 11) on the chain tensioner adjuster. Turn the adjuster *C*, screwing it up to reduce the slack in the chain, and down to increase it. Feel the tension by inserting the fingers through the inspection plug hole. The correct amount of slack, or up and down movement, on the front chain, is

not less than half-an-inch. If the play is being increased, pressure on the kickstarter will help to move the tensioner plate down. This is, of course, unnecessary when the play is being reduced.

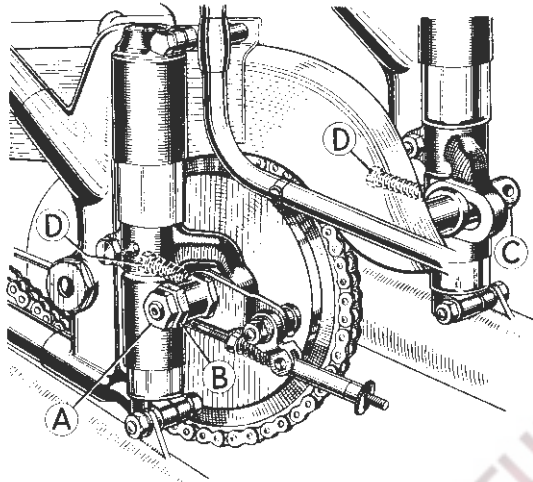


Fig. 13.

Rear Chain Adjustment (rigid frame). This is adjusted by means of screw adjusters in the fork ends in front of the wheel spindle. Slacken off nut *A* (Fig. 12) and then unscrew the spindle a little by means of a tommy bar inserted in the hole in the spindle end *B*. Screw the adjusters *C* in or out until the chain tension is correct with an up and down movement of three quarters of an inch.

Rear Chain Adjustment (spring frame). Slacken off the two hexagons *A* and *B* (Fig. 13) on the near-side spindle end and the bolt head *C* on the offside by

means of a tommy bar, and then screw the chain adjusters *D* in or out as the case may be, until the chain tension is correct, with an up and down movement of **not less than half-an-inch** with the machine on its central stand, so that the rear wheel is in its lowest position.

Wheel Alignment. Make sure that the wheel is hard up against the adjusters when checking, and also that the adjustment is equal on both sides of the wheel so that the latter is in correct alignment in the frame. This can be done either by glancing along the line of both wheels when the front wheel is set straight, or by means of a long straight-edge or the edge of a plank placed along the sides of the wheels. The straight-edge should touch both walls of both tyres.

After adjusting, re-tighten *A* and *B* and also the locknuts *D*.

It is a good plan periodically to remove both chains, clean thoroughly in petrol or paraffin and then gently warm in a mixture of grease and graphite. When cool wipe off excess grease, clean sprockets and replace chains. Remember when replacing a chain fitted with detachable connecting link that the spring fastener must always be put on with the closed end facing the forward direction of travel (i.e., on the top run) of the chain.

OTHER PERIODICAL ADJUSTMENTS

Brakes. In the case of the rear brake a knurled nut on the brake rod effects any adjustment necessary, and a few turns are all that is required to improve braking efficiency. The front brake is adjusted by means of the knurled thumb nut on the cable stop at the lower end of the forks.

Sparkling Plugs. The sparking plug is of such importance in satisfactory engine performance that it is advantageous to give proper attention to this component. It is poor economy to use any but the most efficient plug. The better plug will soon pay for itself by effecting more complete combustion and maximum development of power from the fuel supply. Reduced power due to partially

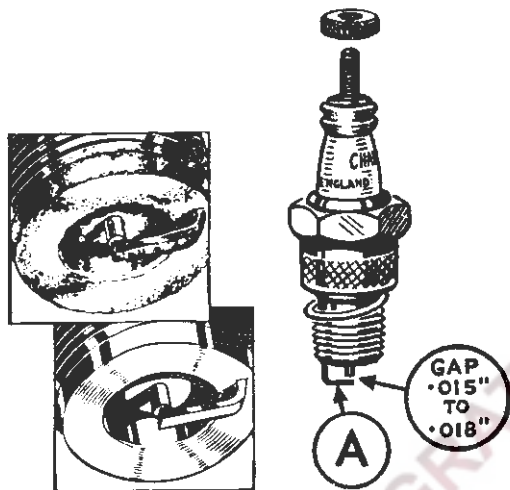


Fig. 14.

unburned fuel will be eliminated. Tests show that the plug most suited to the requirements of this engine is the Champion J.10S. Remove the sparking plugs every 1,000 miles or so for inspection. If the carburation system is in correct adjustment and the air lever is at all times kept as far open as circumstances permit (see "Driving,"

page 7) the sparking plug points should remain clean almost indefinitely. An over-rich mixture from the carburettor will, however, cause the formation of a sooty deposit on the points and, later, outside the plug body (as upper view Fig. 14). If therefore such a deposit is found, clean it off carefully and check your use of the air lever. Too much oil getting past the piston and into the combustion chamber will also foul the plug points with carbon

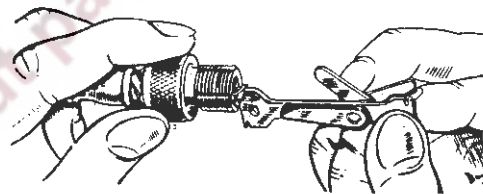


Fig. 15.

deposit, but this should not be possible unless the piston, rings and cylinder bore are worn beyond the stage at which a re-bore is usually considered necessary. A worn or defective oil control ring on a piston might, however, produce such over-oiling symptoms. The continued use of leaded fuel may also eventually produce a deposit on the plug—this time of a greyish colour.

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

When inspecting a plug, also check the gap between the points. This should be .015in.—.018in. and adjustment should be made by bending the side wire *A* (Fig. 14). Never attempt to move the centre electrode, and it is always advisable to use a special plug gap tool (Fig. 15) obtainable at 6d. from any Champion Plug stockist or from the Champion Sparking Plug Co. Ltd., Feltham, Middlesex. Feeler gauges are attached to verify correct gap.

Air Cleaner. (A7 Standard). The air cleaner needs to be dismantled and cleaned periodically. The filter element should be washed thoroughly in petrol, allowed to dry, and then reassembled.

Cylinder Head Unit. After the machine has covered its first 250 miles from new or after de-carbonising, check the tightness of the cylinder head bolts. If they need to be tightened, work in a diagonal order, and leave the central bolt to the last in order to ensure even distribution of pressure, with consequent freedom from distortion.

Carburettor. So long as the engine continues to perform satisfactorily, the carburettor is best left alone, particularly by the inexperienced rider. The only adjustment in which the owner is likely to be interested is the pilot air screw (Fig. 16) which controls the slow running mixture. This is set before the machine leaves the works, but the best setting may vary slightly to suit riders' requirements, or different localities. Turning the pilot air screw inwards enriches the mixture, and unscrewing weakens it. A richer mixture gives a slower and more reliable tick-over, but it is naturally undesirable to have the mixture too rich, even with the

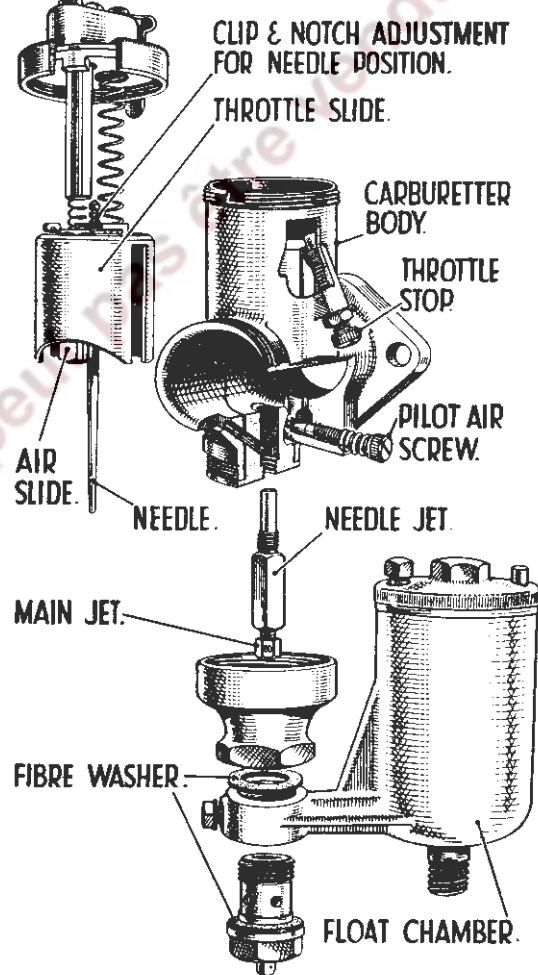
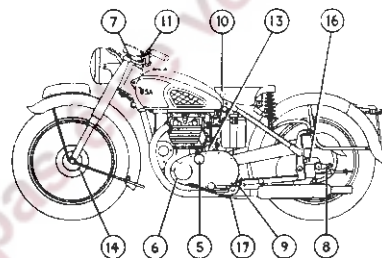
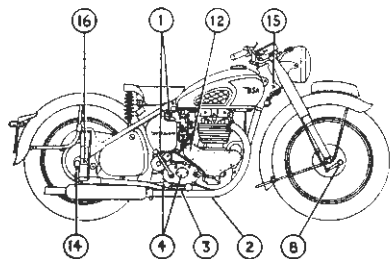


Fig. 16 The carburettor dismantled.



ENGINE OIL.

No.	Part.	Pages.
1	Oil tank and filter	11 12
2	Crankcase and filter	12 17
3-4	Gearbox oil level	15 17
5-6	Primary chain oil level	17
7	Front forks (see table, opposite page)	18

THIN MACHINE OIL.

No.	Part.	Pages.
8	Brake cam spindles	15
9	Rear brake pedal	15
10	Saddle nose bolt	15
11	Control levers, etc.	15
12	Automatic advance mechanism	16
13	Magneto	56

GREASE.

No.	Part.	Pages.
14	Wheel hubs	15
15	Steering head	15
16	Rear suspension (when fitted)	50
17	Central stand fulcrum	17

BRAND.	OIL.		Front Forks only	GREASE.
	Summer	Winter		
Mobiloil	D	BB	Arctic	Mobil-Grease No. 2
Castrol	Grand Prix	XXI	Castrolite	Castrolase Heavy
Essolube	50	40	20	Esso Grease
Price's Energol	SAE40	SAE30	SAE20	Belmoline D
Shell	Triple	Double	Single	Retinax CD

throttle practically closed—which is, of course, the throttle position for tick-over—so the best way to set the pilot air screw is to screw it in until the mixture is obviously too rich, and then unscrew it until the setting is just right, and further unscrewing increases the tick-over speed unduly. This may seem complicated, but the effect of altering the setting is very noticeable and the rider will easily detect the symptoms.

It is doubly important to avoid over-richness of the tick-over setting if much riding is done on small throttle openings for this is what is known as running on the pilot, and if the pilot is too rich the general petrol consumption will be adversely affected.

The running mixture can only be altered by adjusting the height of the needle in the throttle valve or by fitting a main jet of different size. Such alterations should not be made except for very special purposes, as dictated by abnormal requirements, and only then on expert advice.

DECARBONISING THE ENGINE.

Decarbonising and "top overhaul" of an engine is extremely simple, **but it should only be carried out when the engine really needs it.** The usual symptoms are an increased tendency to "pink" (a metallic knocking when under heavy load) due to the building-up of carbon on the tops of the pistons and inside the cylinder heads, a general falling-off of power noticeable mainly on hills, and a tendency for the engine to run hotter than usual.

It is first necessary to remove the petrol tank. Turn off the petrol taps and detach petrol pipes. The tank is secured to the frame by a bolt

through the steering head lug and another through the seat lug at the rear of the frame top tube. The saddle nose bolt should also be taken out. When these bolts are removed, the tank can be taken off.

Next detach the high tension leads and remove the sparking plugs. Disconnect the steady stays from the rocker box to the frame, in the case of the Standard A7, take off the carburetter by removing the flange bolts and sliding it off sideways to disconnect the rubber sleeve at the junction of the air cleaner. By unscrewing the ring nut at the top of the carburetter, the slide can be pulled right out and tied up to the top tube out of the way, while the main body of the instrument can be completely removed. The A7 Star Twin is not fitted with an air cleaner, but has a gauze trap on each carburetter intake. The twin carburetters are bolted on to a spigotted aluminium manifold. Studs in the cylinder head inlet flanges locate the manifold, which is held in position by four nuts. By unscrewing the exhaust pipe and silencer brackets to the frame, the pipes and silencers can be removed complete. Note that the silencer brackets are attached by means of the pillion footrest bolts. Remove the rocker box connecting links, oil supply pipe banjos and the rocker boxes themselves, noting that these are fixed to the cylinder heads by bolts above and nuts and bolts under the box. The cylinder head holding-down bolts can now be removed. There are seven of these, including the central one which is inclined at an angle, and which should be removed first, and replaced last. The head unit is attached to the cylinder block at the rear by means of two inverted studs, and the nuts must naturally be removed from these before the heads can be lifted off. These nuts are situated between the fins, adjacent to the inlet manifold.

The cylinder head unit can now be removed. If it shows a tendency to stick, a few light taps with a wooden mallet under the exhaust ports will loosen it.

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

All traces of carbon must be cleaned from the cylinder heads.

Grinding-in Valves. To remove the valves place a wooden block, which will fit inside the cylinder head, on a bench, and then lay the head over the block with the valve heads resting on it. Lift off the hardened end caps from the valve ends (Standard model only), then compress the valve springs until the split collets can be removed. When the collets are out, the valve springs and top collar can be lifted out.

Valve grinding should only be attempted if pitting is not deep. If deep pit marks appear, return the valve to B.S.A. Repair Dept. at Montgomery Street, Sparkbrook, Birmingham, for refacing, as attempts at grinding-in in this case will result in wear of the valve seats, and the valve may become pocketed.

Smear a small quantity of grinding compound (obtainable from any garage or accessory shop) over the face of the valve, and return the valve to its seat. Note that a light spring inserted under the valve head greatly facilitates the grinding-in operation, allowing the valve to lift and be rotated to a new position periodically. Hold the valve stem with the special tool provided and rotate the valve backwards and forwards whilst maintaining a steady pull. The valve should be raised and turned

to a new position after every few strokes. Grinding should be continued until the valve seat and face show a uniformly polished surface all round. It is most important that each valve should be ground in on its own seat.

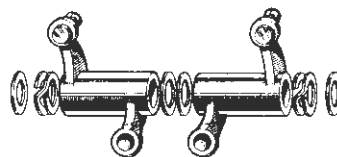
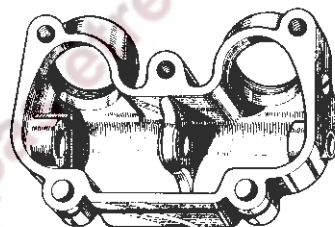


Fig. 17.

Should the valve seats in the head be badly pitted, the latter should be returned to B.S.A. for recutting, and this may necessitate the fitting of new valves.

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

Valve Springs. After a period of several thousand miles it may be desirable to renew the valve springs

as these tend ultimately to lose their efficiency due to heat. If the springs are renewed whilst decarbonising, it will save dismantling specially to replace them at a later date.

Valve Rockers. To remove the rockers from the rocker boxes, if this should be required for any reason, remove the oil supply pipe banjos and the acorn nuts on the rocker spindles, and tap the latter out, applying a small centre punch to the threaded ends exposed when the nuts are removed, so as to avoid damaging the threads. Careful note should be kept of the rocker assembly for replacement, as the various washers must obviously be inserted in the correct order (see Fig. 17).

Cylinder Block. In the ordinary course of events it should rarely be necessary to remove the cylinder block, since top overhaul, already described, usually suffices to keep the machine in first-class working condition. In any case, this operation is difficult to carry out without the help of an assistant, and unless the condition of the engine indicates that the pistons, rings or cylinder bores require attention, the owner will be well advised not to disturb the cylinder block.

Symptoms indicating faulty piston rings might include heavy oil consumption, poor compression (but only if the valves are in good order; otherwise they are much more likely to be the cause) and excessive piston slap when warm. This latter might be due to worn bores, which could be checked without removing the block, if the pistons were moved to bottom dead centre, thus exposing the bores for examination and measurement.

To remove the cylinder block, undo the cylinder base nuts, turn the engine until the pistons are at bottom dead centre, and then, preferably getting

astride the machine, carefully lift the block up until the pistons are clear of the bores. While this is being done, get an assistant to steady the pistons as they emerge and to relieve you of the weight of the block, so that it may be lifted clear. When the block is removed, cover the mouth of the crankcase with rag to prevent dust and grit falling in. To remove a piston from its connecting rod it is first necessary to take out one of the gudgeon pin circlips. This is best accomplished with a pointed instrument such as the tang of a file suitably ground.

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

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

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

Check the piston ring gaps by inserting each piston in its bore and sliding each ring independently up to the skirt of the piston. Check the gap with feeler gauges. This should not be less than .010in. or more than .015in. for the two upper rings, and .009in. and .013in. respectively for the bottom ring, which is the slotted scraper ring. These are the correct gaps for new rings. Fit new rings if the gap greatly exceeds the figure stated, although a few thousandths of an inch extra gap are not

serious. It is advisable to check the gap of new rings before fitting, and if the gap is less than .008in. the ends of the rings should be carefully filed to the correct limit.

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

Reassembling. When the rings are refitted, replace the pistons on their connecting rods (see that they are the right way round), smear the gudgeon pins liberally with engine oil, and tap into position. Then refit the gudgeon pin circlips.

Smear the pistons liberally with clean engine oil; turn the rings so that the gaps are on the opposite sides of the pistons; fit a new cylinder base washer on the crankcase; liberally coat the inside of the cylinder bores with clean engine oil and then, with the help of your assistant, slide the cylinder block over the two pistons.

This operation will be simplified if the piston rings are compressed into their grooves by means of metal clips, such as can be obtained from accessory suppliers, and two strips of wood are prepared of such a size that they can be laid across the mouth of the crankcase under the pistons, one in front and one behind, so as to hold the pistons square and steady while the cylinder block is being lowered.

As soon as the pistons enter the bores the piston ring clips will be automatically pushed off and they, together with the strips of wood, can be slid out before the block is finally lowered into position.

Next replace the valves into their respective ports, place the springs over the stems with the top collar in position, and with the head resting on wooden block as before, compress the springs until the split collets can be inserted. A dab of grease on the inside of the collets will serve to hold them

in position, until the spring is released. Make quite sure that the collets are correctly located. **Do not forget to replace the caps on the ends of the valve stems (Standard model only).**

Place the push rods on to their respective tappets and then lift the cylinder head into position. Replace the seven cylinder head bolts and the nuts on the two inverted studs at the rear, and make them all really tight, working diagonally in order to secure even tightness, and leaving the central inclined bolt to the last. When they are all right down give them a final wrench to make certain that they really are tight.

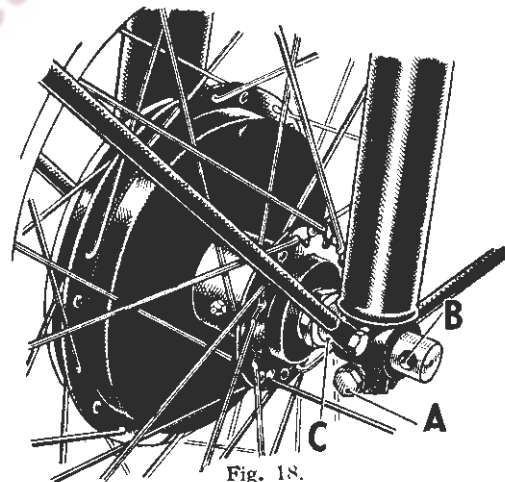


Fig. 18.

Now replace the two rocker boxes making sure that the push rods are correctly inserted into the rocker ends and thoroughly tighten the various nuts and bolts.

Before replacing the rocker box caps, check the tappet clearances as described on page 20, and adjust if necessary, which will be quite likely if the valves have been ground in

Replace the rocker box connecting links, oil supply pipe banjos, and the steady stays, then the carburetter, the exhaust pipes and silencers, and the petrol tank and pipe. It is advisable to examine the sparking plugs and clean them before replacing. Check that the gaps between the points are correct and adjust if necessary (see page 31).

Removal of Front Wheel. To remove front wheel from forks, detach brake cable, then slacken the pinch bolt (A, Fig. 18) at the front of the nearside fork end. Insert tommy bar in the hole in the spindle end B and unscrew. Note that this has a left-hand thread and unscrews clockwise. Spindle can then be pulled out, and by sliding distance bush C in fork end outwards to its fullest extent, the wheel will drop out. In replacing wheel, it is most important that when the spindle is replaced, and before pinch bolt is tightened, the forks must be depressed once or twice to enable the nearside fork end to position itself on the distance bush. If this precaution is not observed, the fork leg may be clipped out of position and will not function correctly. **Do not forget finally to tighten the pinch bolt A.**

Detachable Rear Wheel. Before attempting to take out the wheel loosen the two nuts holding the mudguard to the rear stays, when the rear portion of the guard can be lifted upwards on its hinge clear of the wheel. **On models fitted with rigid frame** insert a tommy bar in the hole in the spindle end (A, Fig. 19) and unscrew. The

spindle has a right-hand thread, and therefore unscrews anti-clockwise. **On spring frame models** remove the small outer nut at C (Fig. 20) and pull out the spindle. The distance bush is removed, or of the machine when the spindle is removed, or

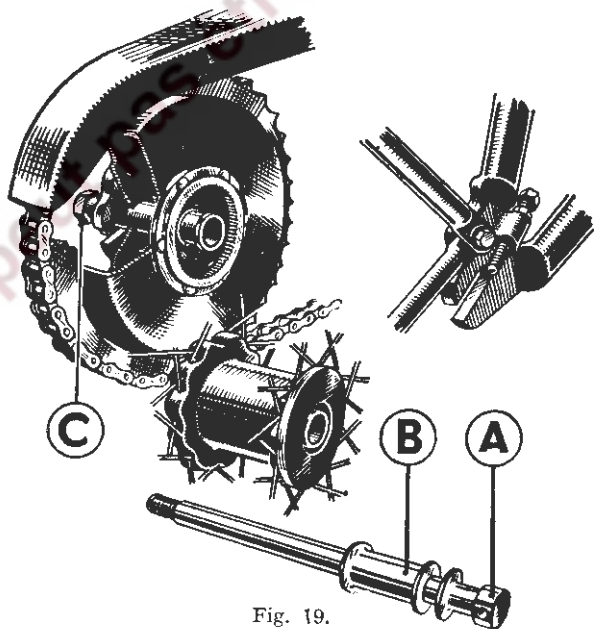


Fig. 19.

alternatively the spindle can be pulled out until it is clear of the hub and then slid backwards out of the slotted chainstay end, carrying the bush with it. The wheel should then be pulled sideways towards the offside of the machine, so as to disengage the coupling splines on the hub from the brake. When the hub is clear of the brake the wheel can be dropped out.

IMPORTANT. When detaching the rear wheel, it is quite unnecessary to touch the hexagon nut C remaining on the nearside. This should only be removed when it is desired to dismantle the brake gear, or slackened off when the rear chain tension is adjusted (see page 28).

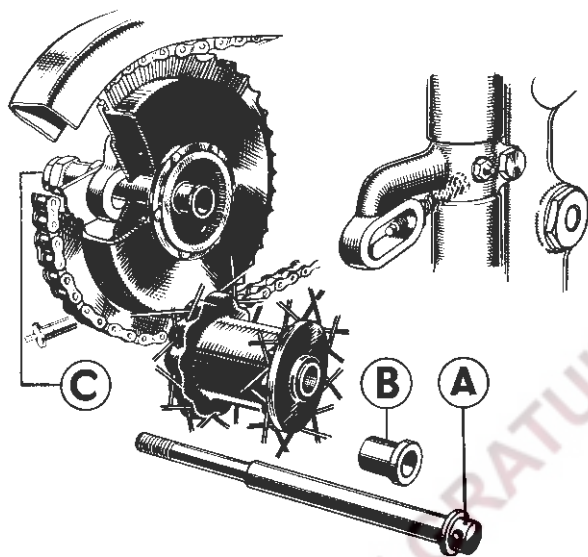


Fig. 20.

Gearbox. The four-speed gearbox fitted to this model is of the constant-mesh sliding pinion type with internal dog engagement. The sliding pinions incorporating the gear engagement dogs are mounted, one pair (A and B, Fig. 21) on the mainshaft and one pair (C and D) on the layshaft, and each pair is operated by a separate sliding fork (E

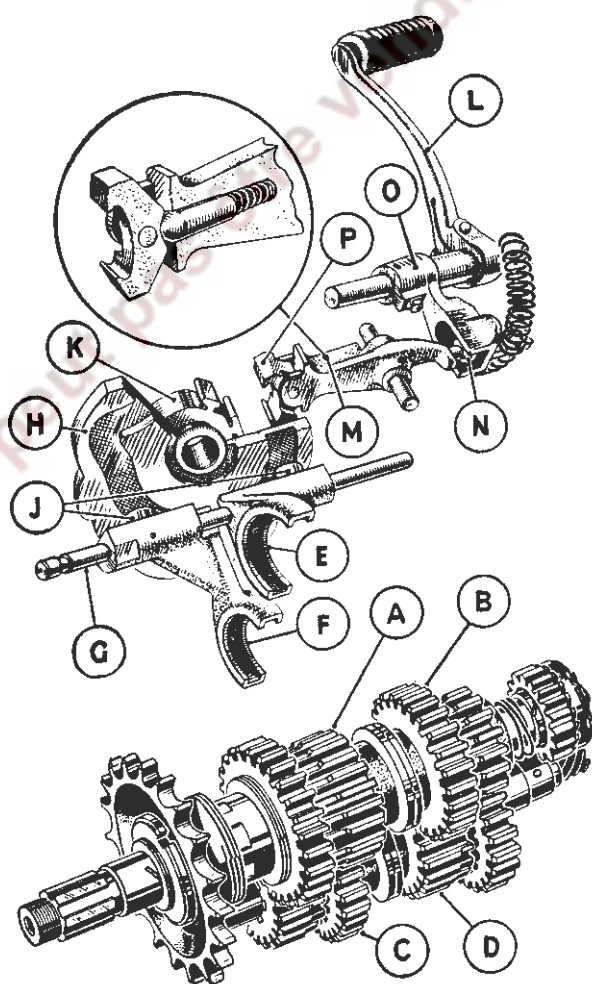


Fig. 21.

and *F*) specially designed to couple together the individual members of each pair. These forks slide on a common axis, provided by a horizontal rod *G*, and their respective motions, by which the various gear engagements are secured, are determined by the rotation of a cam plate *H* in which are machined two special cam grooves, one for each fork, and in which the operating pegs *J* formed on the forks engage

Foot Gear-change. The cam plate, which operates the sliding forks, is caused to rotate by the foot gear-change mechanism through the intermediary of a sleeve *K* to which the plate is fixed, and on which double-acting ratchet teeth are formed. When the foot gear-change pedal *L* is raised or depressed the rocking lever *M* is rocked on its fulcrum (mounted in the gearbox partition which is not illustrated) by means of a ball-end *N* engaging in the slotted lever *O*, coupled to the pedal and the spring-loaded ratchet pawl *P* at the other end of the rocking lever imparts the appropriate movement to the sleeve *K*.

Dismantling. This is a job which is only undertaken by the experienced owner as a rule, and one which in the ordinary course of events should never be necessary. Before carrying out this work the clutch must first be taken off bodily by removing the domed cap *A*, the six spring nuts *B*, and then the spring plate *C* (Fig. 10, page 23), whereupon the central fixing nut can be unscrewed and the clutch withdrawn from the splines on the gearbox mainshaft. Then disconnect the speedometer drive under the outer cover at the front (*C*, Fig. 9, page 24).

Move the gears to the neutral position, and then remove the gearbox outer cover, which will come away with the kickstarter and gear-change pedals and the clutch lever (first release the clutch cable) still in position. Note that as the cover is withdrawn the spring pressure on the kickstarter pedal is released. This point must be watched when reassembling.

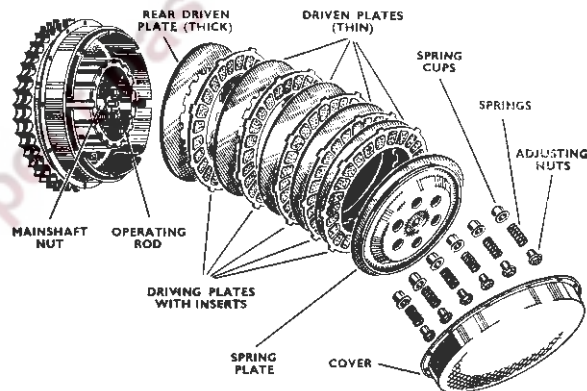


Fig. 22.

Pull out the clutch operating rod which passes through the centre of the mainshaft, and then release the nut on the mainshaft which holds the kickstarter ratchet pinion and spring, laying these latter aside. The gearbox partition can then be removed, together with the foot gear-change rocking lever *M*.

The rod *G* is pressed into the gearbox shell at the clutch end and secured by a grub screw which is accessible under the gearbox. Release this grub screw and then pull out the rod. It should then be

possible to withdraw the entire gear cluster complete with shafts and the two sliding forks bodily from the gearbox, although, if preferred, the components may be withdrawn separately. This may call for a certain amount of manoeuvring, but the experienced owner will have no difficulty.

Reassembly. This is carried out in precisely the reverse order, first making certain that the cam plate is in the neutral position as described above.

Rear Suspension (if fitted). To dismantle the rear suspension, first detach the rear wheel.

Next detach the silencers by removing the nuts and bolts (*A*, Fig. 23). Then release pinch bolts *B* and remove plugs *C*.

The central columns of the suspension units can then be tapped out from underneath and withdrawn through the top lugs. When this is done the remainder of each unit can be slid off sideways from the bottom lug, and laid on a bench for complete dismantling, which consists merely of taking the various pieces apart, carefully noting their respective positions for subsequent reassembly. The wheel spindle brackets which, together with the bearing sleeves to which they are attached, form the spring plungers, can be separated from the sleeves when the pinch bolts *D* are withdrawn. Note that each of these engages in a notch in its bearing sleeve and also that the bottom studs at *A* similarly engage in notches in the central columns. These are essential for correct engagement and locking, and particular attention must be paid to their proper alignment on reassembly.

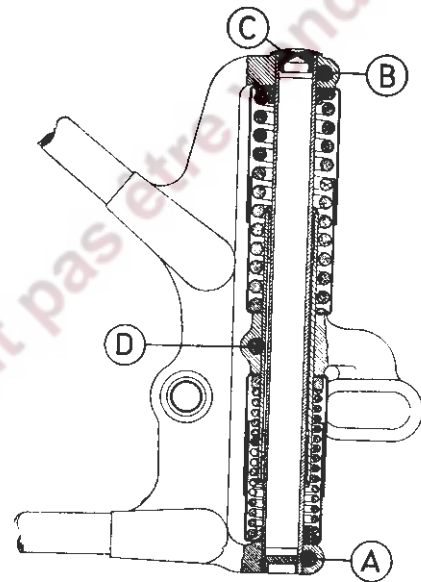


Fig. 23.

SOME GENERAL HINTS.

A good rider periodically checks all nuts and bolts with a spanner to see that they are tight.

Poor compression may indicate either that tapets are badly out of adjustment, that valves need grinding-in, or in the case of a machine which has covered a very big mileage, that piston rings are badly worn and need replacement.

It is advisable occasionally to clean the air holes in the petrol tank filler cap, as if these get choked, petrol starvation may cause engine stoppage.

At intervals of several thousand miles, it is advisable—when tank is almost empty—to remove the petrol taps, clean the filter above the tap, and drain the tank and wash out with petrol to remove any collection of dirt or water which may have accumulated. Blow through the taps before replacing.

Difficult starting or engine stoppage is usually due to faults in either the carburation or ignition system, and in the event of these troubles arising, the following checks will enable the cause to be located.

Make sure that there is petrol in the tank, and that it is reaching the carburetter by depressing the tickler and flooding the float chamber.

Examine main jet which can be reached by unscrewing the hexagon at the base of the carburetter body. Removing jet and blowing through it will clear any obstruction.

See that the high-tension leads to the sparking plug are connected. Remove plugs, and if oily or sooted, clean them. Check that plugs are sparking correctly by connecting high-tension lead and laying each plug on its side on top of cylinder; then turn the engine over several times by means of the kickstarter, when the plug should spark intermittently.

ELECTRICAL SECTION.

Instructions for the Maintenance of LUCAS ELECTRICAL EQUIPMENT fitted to B.S.A. 500cc. O.H.V. Vertical Twin Models A7 and A7 Star Twin

The electrical equipment is designed and manufactured to give long periods of service without any need for adjustment or cleaning. The small amount of attention which is required is described below and we advise riders to carry out the procedure outlined in order to ensure that the best service is obtained.

BATTERY.

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 in each cell. If necessary, add sufficient distilled water to bring the electrolyte level with 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. Readings should be taken after the motor cycle has been out for a run when the electrolyte is thoroughly mixed. The specific gravity readings and their indications are as follows:—

1.280-1.300	Battery fully charged.
About 1.210	Battery about half discharged.
Below 1.150	Battery fully discharged.

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. In this case the battery must be examined by a Lucas Service Depot or Agent.

Finally never leave the battery in a discharged condition for any length of time, wipe away all moisture and dirt from the top of the battery and keep the terminals clean and smeared with petroleum jelly to prevent corrosion.

DYNAMO.

Output Control. The dynamo is of the compensated voltage control type and is arranged to work in conjunction with a regulator unit which is fitted alongside the cutout. The regulator causes the dynamo to give an output which varies according to the load on the battery and its state of charge. The dynamo also gives an increase of output to balance the current taken by the lamps whenever they are switched on. It will be noted that during daytime running when the battery is in good condition the dynamo gives only a trickle charge so that ammeter readings will seldom be more than one or two amperes. A discharge reading may be observed immediately after switching on the headlamp, but after a short time the battery voltage will fall and the regulator will respond causing the dynamo output to balance the lamp load.

Maintenance. About every 10,000 miles, take off the cover band and check the brushes and commutator. See that the brushes move freely in their holders by holding back the brush springs and pulling gently on the flexible connectors. If a brush is inclined to stick, remove it from its holder and clean its sides with a petrol moistened cloth. Be careful to replace brushes in their original positions in order to retain bedding.

The commutator should be clean, free from oil or dirt and should have a polished appearance. If it is dirty, clean with a dry duster while the engine is slowly turned over. If the commutator is very dirty, moisten the cloth with petrol.

Lubrication. No lubrication is required to the dynamo as ball bearings are fitted to both the commutator and driving end bracket. These bearings are packed with grease during assembly and will last until the machine is in need of a complete overhaul.

MAGNETO.

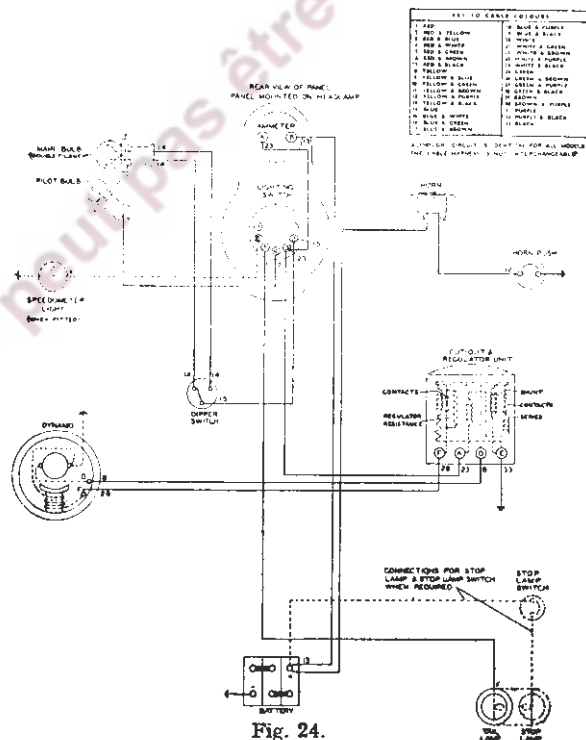
Cleaning and Adjustment. About every 3,000 miles remove the contact breaker cover and examine the contact breaker. If the contacts are burned or blackened, clean them with fine carborundum stone or fine emery cloth and afterwards wipe away dust or dirt with a petrol moistened cloth. Check the contact breaker setting after cleaning.

To check the contact breaker setting, turn the engine until the contacts are fully opened and insert the gauge provided on the ignition spanner. If the setting is correct the gauge should be a sliding fit. If, however, the gap varies appreciably from the gauge, slacken the locknut on the fixed contact and turn the contact screw until the gap is set to the gauge. Finally tighten the locknut.

Next examine the pick-ups which can be removed when the fixing arms are moved aside. See that the brush in each pick-up moves freely and while the pick-ups are removed, clean the slip ring track and flanges with a soft dry cloth.

Lubrication. About every 3,000 miles take off the contact breaker cover. Turn the engine over until the small hole in the cam can be seen. This

hole is fitted with a wick which enables the oil to reach the pad and cam face. A few drops of thin machine oil will be adequate. *Take care that no oil gets on to the contacts.*



Renewing High Tension Cable. A high tension cable showing signs of cracking or perishing must be replaced by 7mm. rubber covered ignition cable. To make the connection to the pick-up terminal,

thread the moulded terminal nut over the cable, bare the end of the cable for about $\frac{1}{4}$ in., thread the wire through the washer removed from the original cable and bend back the wire strands. Screw the nut into its terminal.

LAMPS.

Headlamp. This is of the sealed beam type. To remove the lamp front, slacken back the fixing screw at the top of the lamp. Note that the glass is sealed to the reflector body and cannot be separated. This unit is clipped to the lamp rim in the usual way for easy replacement. To replace the front, locate the metal tongue in the slot at the bottom of the lamp, press the front on and secure by retightening the fixing screw.

The headlamp must be set so that the main driving light beam is parallel with the road surface. If necessary adjust the headlamp by slackening the two fixing bolts.

The driving light filament of the main bulb must also be correctly focused in the reflector. To focus remove the lamp front and reflector and slacken the clamping clip which secures the bulb holder and move the bulb holder backwards or forwards until the best results are achieved. Finally tighten the clamping screw.

Tail Lamp. The portion of the lamp carrying the red glass can be removed by pushing in and turning to the left. When refitting, engage the bayonet fixing, push in and turn to the right to secure the body in position.

Replacement Bulbs.	Lucas No.	Watts.
Headlamp (Main) ...	169 ...	30/30
Headlamp (Pilot and Tail Lamp) 200 ...	3	

PROPRIETARY INSTRUMENTS FITTINGS AND ACCESSORIES.

Carburettors:

Messrs. Amalgamated Carburettors Ltd., Perry Barr, Birmingham.

Electrical Equipment:

Messrs. Joseph Lucas Ltd., Birmingham.

Grease Guns:

Messrs. Tecalemit Ltd., Great West Road, Brentford, Middlesex.

Saddles:

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

Speedometers:

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

Tyres:

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

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 PART 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..	26027	Motobike, Aberdeen
Aberystwyth	Gwalia Motors Ltd.	North Parade ..	525	
Accrington	W. Snape	396, 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	
Aylesbury	Eborn's Garage	44, Walton Street ..	150	Eborn's, Aylesbury
Banbury	Trinder Bros.	2a and 3 Broad Street	2546	
Barnaley	T. Garner & Son	Sheffield Road ..	2866	
Barnstaple (N'th Devon)	Bob Ray	43, High Street ..		
Bedford	The Imperial Cycle Co.	58, St. Loyes Street	2374	
Belfast	W. J. Chambers	106 and 108, Donegal Pass.	27253/4	Fastmote, Belfast
Biggleswade	Bryants	25, 27, 72 and 74, Shortmead Street.	3108	
Birkenhead	Bob Simister Ltd.	540/544, New Chester Rd., Rock Ferry.	1452	Rock Ferry
Birmingham	County Cycle and Motor Co. Ltd.	266, Broad Street	Mid. 2671	
Birmingham	C. E. Cope & Sons Ltd.	104, Bath Row (Repairs) (closed Sat. 1 p.m.)	Mid. 2817	
"	Shovelbottom's Ltd.	481-487, Hagley Road, Edgbaston 17.	2246/7	
"		376, Ladypool Road..	South 2212	
Blackburn	Shuttleworth & Geldart	15/17, Great Bolton St.	6678	

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

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Blackpool	J. Hall & Son	143, Church Street ..	20795	
Bolton	Charlie Robinson	119 and 121, Higher Bridge Street.	3931	
Boscombe	Craze Bros.	473 and 475, Christchurch Road.	34063	Boscombe
Bournemouth	C. Sidney Ltd.	107, Manningham Lane	29889	
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.	46238	
Bromsgrove	Messrs. Harold Tozer (Bromsgrove) Ltd.	110, Birmingham Road	3228	
Brynmaur	Jayne's Motors	Cwmbach Garage	Brynmaur 271	
Bury	Arthur Covle (Prop. W. Hudson).	30/32, Walmersley Road	714	Covle Motors, Bury.
Bury St Edmunds	Barclay Motors	Kings Road Corner..	2345	
Cambridge	King & Harper Ltd.	Milton Road Corner..	55201	Motors, Cambridge
Canterbury	Marcel Hallet	St. Dunstan's Street..	3046	
Cardiff	Car Distributors (Cardiff) Ltd.	134-140, City Road ..	30022	
"	Robert Bevan & Son	29/35, Castle Street..	1808	
Carlisle	W. T. Tiffin & Son	Caldew Bridge, Irish-gate Brow.	25024	Tiffin, Irishgate, Carlisle
Carmarthen	W. Edwards & Sons (Carmarthen) Ltd.	Towry Garage	482/3	Edwards Garage, Carmarthen
Castleford	Barretts Motor Cycles	35a Aire Street ..	2983	
Chapel-en-le-Frith	E. W. Bowers	129, Town End ..	144	
Chatham	Grays	11-16, High Street ..	4005	
Chelmsford	Hadlers Garage Ltd.	New Street ..	4844/5	Hadler, Chelmsford
Cheltenham	Leslie Paynter	Bath Street ..	2887	Paynter's Garage, Bath St., Cheltenham
Chester	Davies Bros.	34, Bridge Street ..	510	
Chichester	W Goodridge & Co. Ltd.	East Street ..	2033	
Colchester	G.B.R. Motors Ltd.	63a, 64, 64a, High Street	2632	
Colwyn Bay	Gibert Emery	70/72, Abergele Road.	2151	
Coventry	Coventry Motor Mart Ltd.	86, London Road ..	2146/7	Coventry Motor Mart
Croydon	Godfreys Ltd.	228/234, London Road	3641/2	Croydon Gofrabike, Croydon
Dagenham (Essex)	Smith & Double (Dagenham)	New Road ..	284/2786	Rainham

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

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Dalton-in-Furness	H. Holme	24/26, Ulverstone Rd.	25	
Darlington	The Duplex Motor and Cycle Co.	10/16, Grange Road.	D'ton 2071	Duplex, Darlington
"	White Bros.	205/9, Northgate	2379	
Dartford (Kent)	Schwies Bros.	177, Lowfield Street	4279	
Derby	Ingle's Provincial Garage Ltd.	Walbrook Road.	45289	
Doncaster	W. Cusworth (Doncaster) Ltd.	7, Hall Gate	4594	
Dorchester	Tilley's (Dorchester)	31, South Street	367	Motors, Dorchester
Douglas, I.O.M.	Gilbert Harding	18, Duke Street	Douglas 170	
Dudley	Chas. E. Cope & Sons Ltd.	193, High Street	Dudley 3464/5/6	
"	James Parkes & Sons ..	7, King Street	Dudley 2889	
Dundee	G. McLean Ltd.	Ward Road	5087	Vehicles, Dundee
Dunstable	B. G. England (Dunstable) Ltd.	Half Moon Hill, London Road	843/4	
Eastbourne	Hurry Woodham	118, Seaside, Eastbourne	756	Jemptions Eastbourne
Edinburgh	J. R. Alexander & Co., Ltd.	10/14 Lothian Road	21176	Motorcycles, Edinburgh
Elgin (Morayshire)	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	Difazio & Bishop	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
"	C4 .. J. R. Alexander & Co.	264-280, Gt. Western Road	Douglas Alex. Moto 3802/3/4	Glasgow
Gloucester	Harpers Garage	23a, Worcester Street	23187	Gloucester 23187
Grimsby	H. J. Gresswell & Sons Ltd.	13/15, Osborne St.	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. Acland (Prop. H. Baynes)	11, Bower Road	5125	
Harrow	E. T. Pin. (Harrow) Ltd.	Station Road	0044/5	Pink, Harrow
Haywards Heath	Dinnages Garages Ltd.	Wivelsfield Road	1146	
Hareford	A. Kear & Co.	52b, Commercial Street	2239	Kear, Hereford

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

Town	Name of Stockist.	Address	Telephone No.	Telegraphic Address.
Holbeach, Linc.	G. Woodman Ltd.	34, Fleet Street	3221	
Hounslow	Stanley's Motors	46-48, Lampton Road	Hounslow 1949	
Hove	George Bradshaw	5/6, Western Road	Hove 35252/3	
Huddersfield	Earnshaw	Manchester Road	1232	
Hull	Browns (Witham) Ltd.	47/49, Witham	33990/9	
Hull	Jordan & Co. (Hull) Ltd.	Storey Street	36809	Cumpton, Hull
Ilford	Smith & Double	Cranbrook Road	Valentine 3109	
Ilkston (Derbyshire)	Roy Gamble	Station Road		
Ipswich	Revetts Ltd.	Clarkson Street	2822	
Jersey	Colebrooks (Peter Perrio)	1 & 11, New Street	Central Colebrooks, Jersey 642	
Keighley	Dick Ratcliffe	Coldshaw Garage, Haworth	3133	
Kendal	Tom O'Loughlin	66, Stricklandgate	315	
Kirkcaldy	County Motors Ltd.	Junction Road	Dysart 5631	
Lancaster	Pye Motors Ltd.	Parliament Street	828	
Launceston	J. Wooldridge & Son ..	Western Road	21	Wooldridge Launceston
Leeds, 1	Watson-Cairns & Co. Ltd.	157/8, Lower Briggate	23379	Watson-Cairns, Briggate, Leeds
Leicester	E. W. Campion & Son Ltd.	Welford Place	58054	
Lincoln	West's (Lincoln) Ltd. ..	116, High Street	10762-3-4	
Liverpool, 7	Bee Cycle & Motor Co. Ltd.	17-19, Renshaw Street	Royal Bee Cycles, 6375/6	Liverpool
"	3 .. Cundles	41-61, Byrom Street	Central Cundles, 4148	Central 4148
Llawhaden	James Bowen & Sons ..	Llawhaden nr. Narberth	6	Llawhaden
London, N.W.1	Godfey's Ltd.	208, Gt. Portland St.	Euston Gofrabike, 4632/4	London
"	N.W.1 J. Grose Ltd. ..	379-381, Euston Road	Euston 5231	
"	W.5 .. Kays of Ealing Ltd.	8-10, Bond Street	Ealing Sparesokay, 2813	Ealux, London
"	S.E.13 F. Parkes & Son Ltd.	404, Lewisham High Street	Lee Green 0535	
"	E6 .. Godfrey's (Prop. of Lovett's)	220, Barking Road	Gofrabike, East Ham	Forgate.
"	E.8 .. Eleanor Motors ..	265/7/9, Mare Street	Amherst 5134	
"	E.7 .. Lovett's Ltd.	418, Romford Road	Grangewood Gofrabike, 1234/5	Forgate.
"	N.12 .. George Grose Ltd.	834, High Road	Hillside 2149	
"	S.E.11 Writers Ltd.	161/5, Kennington Lane	Reliance 1362	

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

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
London	S.W.11 Owen Bros.	19, Battersea Rise, Clapham Junction	Battersea 7816/7	
"	S.W.6 Claude Rye Ltd.	895/921, Fulham Road, Fulham	Renown 4246/7/8	Ryebikes, Wal-green, London
"	S.W.9. Pride & Clarke Ltd.	Stockwell Road	Brixton 6251	
"	S.W.7 Elite Motors (Tooting) Ltd.	951-961, Garratt Lane, Tooting, Broadway	Balham 1200	
"	W.12. Turners Stores	81-83, Goldhawk Rd., Shepherd's Bush	Sh. Bush 2436	
"	W.3.. Whitby's of Acton Ltd.	273, The Vale, Acton	Sh. Bush 5355/6	
"	S.E.18 Cleares & Co. Ltd.	1 & 125, High Street, Woolwich	Woolwich 0174	
"	N.12. Glanfield Lawrence Ltd.	Junc. Gt. North Rd. & N. Circular Road	0091	Glanfin, Norphone, London
"	N15.. Godfrey's Ltd.	94-96, High Rd., St. Tottenham		Gofrabike, Londo
"	S.E.15 West End Motors Ltd.	117, High Street, Peckham	New Cross 2589	
"	(N.W.10) Slorcombe Ltd.	269, Neasden Lane, Neasden	Gladstone 2088 & 0508	
Lowestoft	R. Wright	67-69, London Rd. S'th	645	
Maidstone	Redhill Motors (Maidstone) Ltd.	The Broadway	3096	
Manchester, 3	Colmore Depot, Ltd.	17-18, Watson Street	Blackfriars 3322	
"	Tom Davies (Motors) Ltd.	233, Deansgate	Blackfriars 0681	
"	Fred Fearnley Ltd.	692-4, Ashton Old Rd., East Manchester	1445/6	Fernbike
Manchester, 3	Webb & Waitt Ltd., Stretford Garage	Chester Rd., Stretford	Longford 2223	Courteous
Mansfield	W. Henstock	128, Chesterfield Road North	329	Hemstock 329 Mansfield
Middlesbrough	J. T. Dickinson (Middlesbrough) Ltd.	160-162, Lindthorpe Road	3861	
Neath	Fred Rist	16, Windsor Road	Neath 780	
Newcastle-on-Tyne	Dene (Newcastle) Motor Co. Ltd.	Haymarket	21337	Ened, New'tle, on-Tyne
Newport (Mon.)	R. J. Ware & Sons	69, Commercial Street	65206	
Newton Abbot	J. E. Green & Co.	87, Queen Street	653	
Newton Stewart	Associated Car Sales Co. Ltd.	Albert Street	Newton Stewart 134	
Northampton	P. C. Spokes & Son Ltd.	1, Henry Street	1160	
Norwich	Chapmans (Norwich) Ltd.	38-42, Duke Street	24727	
Nottingham	E. W. Campion & Son Ltd.	Station Street	52961	
Oswestry	Roy Evans	Willow Street	201	
Oxford	H F. Temple	69, High Street, St. Thomas	2485	

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

Town	Name of Stockist	Address	Telephone No.	Telegraphic Address
Parkstone	Bob Foster	472/4, Ashley Road	68	
Perth	M. Shaw & Sons	143, High Street	483	
Peterborough	Burrows Bros.	55-57, Westgate	2154	
Plymouth	P. Pike & Co. Ltd.	46, Union Street	Plymouth Piko, 3108	
Pontardulais (Glam.)	T. Griffiths	Forest Garage	Pontardulais 323	
Portsmouth	Percy Kiln Ltd.	65/67 Elm Grove, Southsea	P'mouth 4793	
"	Jenkin & Purser	148, Lake Road	73002/3	
"	Glanfield Lawrence	147/157, Fratton Road	74331	
Preston	Loxhams Garages Ltd.	Central Garage, Charnley St., Fishergate	4242	Sales Dept. Loxhams, Preston
Pulborough	Gray & Rowell	Bury Gate	4243	
Ramsgate (Kent)	Philpott's Garage	Canterbury Road	35	
Radcliffe	Will Lord	115, Blackburn Street	2002	
Reading	Fortescue Bros. Ltd.	1-2, West Street	4143	4143 Reading
"	Phillips & Bloomfield Motors Ltd.	10/24, South Street	2635	
Redhill	The Redhill Motor and Cycle Works Ltd.	50/54, Brighton Road	327	
Romford	G. H. Wilson	George Street	2660	
Rotherham	Ernest Cross	55, Drummond Street	Rotherham 3967	
Salisbury	Pankhurst (Weymouth) Ltd.	78-79, Exeter Street	Salisbury 5222/3	
St. Helens	Geoff Duke Ltd.	Greenfield Road	3918	
St. Ives (Hunts.)	Hallens (Hunts) Ltd.	The Broadway	St. Ives 3071	
Scarborough	E. Andrew	Roscoe Street	Scarborough 1857	
Sevenoaks	Angus Motor Cycles	Station Parade	3338	
Sheffield, 1	Walter Wragg Ltd.	Stanley Works, Welington Street	26098	26098 Sheffield.
Shetland	Thomson's Motor Garage	Esplanade, Lerwick	85	Thomson's Garage, Lerwick
Shrewsbury	J. R. Meredith	Coleham Head	4533	
Sittingbourne	Scoones' Garage	9, West Street	66	Scoones, Sittingbourne
Skipton (Yorks)	The Craven Motor Co. Ltd.	Caroline Square	Skipton 221	
Slough	Sid Moram	Wexham Corner, High Street	23767	

<i>Town.</i>	<i>Name of Stockist.</i>	<i>Address.</i>	<i>Telephone No.</i>	<i>Telegraphic Address.</i>
Southampton	Alec Bennett Ltd.	152, Portawood Road	54081-2-3	
Southport	H. F. Brockbank	62, King Street	5054	
Stockport	Theobald & Coppack	6, Cheestergate	2843	Theobald, Coppack, S port
Stoke-on-Trent	J. & N. Bassett	Howard Place, Shelton	2890	
Stourbridge	Pearson's Cycle Depot	31, Market Street		
Sunderland	Dunns Garage (Sunderland) Ltd.	Wheatshaf Corner	4994	
Sutton-in-Ashfield	W. Henstock	Forest Street Garage	90	Henstock, 90, Sutton-in-Ashfield
Swansea	Handel Davies Ltd.	230 Oxford Street	2956	
Swindon	Easters Garage	73-75, Cricklade Road	4149	
Taunton	W. P. Edwards (Motors) Ltd.	58, East Street	2943	Edwards, Motor Cycles, Taunton
Thames Ditton	Comerfords Ltd.	Oxford House, Portsmouth Road	2323/4	Emberbrook
Thetford	W. & G. Lambert Ltd.	Castle Street	2217	
Torquay	P. H. Sharam Ltd.	244/6, Union Street	4184	
Tunbridge Wells	G. E. Tunbridge	21, London Road	7255	
Twickenham	Blay's of Twickenham	192/9, Heath Road	416	T'bridge Motor Tunbridge Wells
Uxbridge	Miles Motors Ltd.	60, High Street	2103 & 1435	Popesgrove
Wakefield	Parkinsons (Wakefield) Ltd.	Ings Road	2087	Uxbridge 125
Walsall	Cycle Mart (Walsall) Ltd.	12, Ablewell Street	3363	
Watford	Lloyd Cooper & Co.	61, Queen's Road	2125	Lloyd Cooper, Watford
Warrington	Jack Frodham Ltd.	37a, Winwick Street	471	
Westcliff-on-Sea	J. Costin & Sons	233-5-7, London Road	2215	Southend
Weston-super-Mare	Wyvern's of Weston Ltd.	47, Drove Road	3409	Wyvern's, Weston-super-Mare
Weybridge	W. L. Lewis & Sons	51, Church Street	210	
Weymouth	Tilleys	9, Frederick Place	72	
Winchester	Winchester Motor Co.	Cycle and Jewry Street	2728	
Wolverhampton	C. E. Cope & Sons Ltd.	168-9, Stafford Street	24605/6	
Worcester	W. J. Bladder & Son	52, Sidbury	2438	Bladder, Sidbury, Worcester
Worthing	Wheatlands	56, Broadwater Street	1224	
Yeovil	The Yeovil Motor Mart	West. Hendford	267	Motor Mart, Yeovil
York	C. S. Russell (York) Ltd.	Lawrence Street	3793	Russell, Lawrence St., York

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