

# B.S.A.

## Motor Cycle Instruction Book

*1937 Models*

250 c.c. S.V. Tourer	B 20
250 c.c. O.H.V. Sports	B 21
250 c.c. O.H.V. Empire Star	B 22
350 c.c. S.V. Tourer	B 23
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# **RIDERS' INSTRUCTIONS FOR B.S.A. MOTOR CYCLES.**

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**250 c.c. S.V. Tourer, 250 c.c. O.H.V. Sports, 250 c.c. O.H.V. Empire Star, 350 c.c. S.V. Tourer, 350 c.c. O.H.V. Empire Star, 350 c.c. O.H.V. Competition and 350 c.c. O.H.V. Sports.**

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## **FILLING UP.**

The petrol tank has a capacity of three gallons.

The oil tank is fitted to the seat tube under the saddle and holds four pints of oil.

**To obtain the most satisfactory service from your machine it is essential to use only high-quality lubricants. This point cannot be over-emphasized. It is most important also that one of the recommended grades of oil is used. For correct lubrication we strongly recommend the high-quality oils tabulated on page 26. It is not sufficient to specify the grade, the actual brand required should be stated.**

The use of an upper-cylinder lubricant is particularly advisable during the first 1,000 miles of a machine's life.

Check the oil in the gearbox (see page 8) and make certain that all other parts are adequately lubricated (page 8).

It is advisable before starting up a new machine to give the engine a small supply of extra oil. This is done by removing the sparking plug, and, after setting the piston at the bottom of its stroke, putting in about two teaspoonsful of oil.

Inflate tyres to the correct pressures (see chart on page 43).

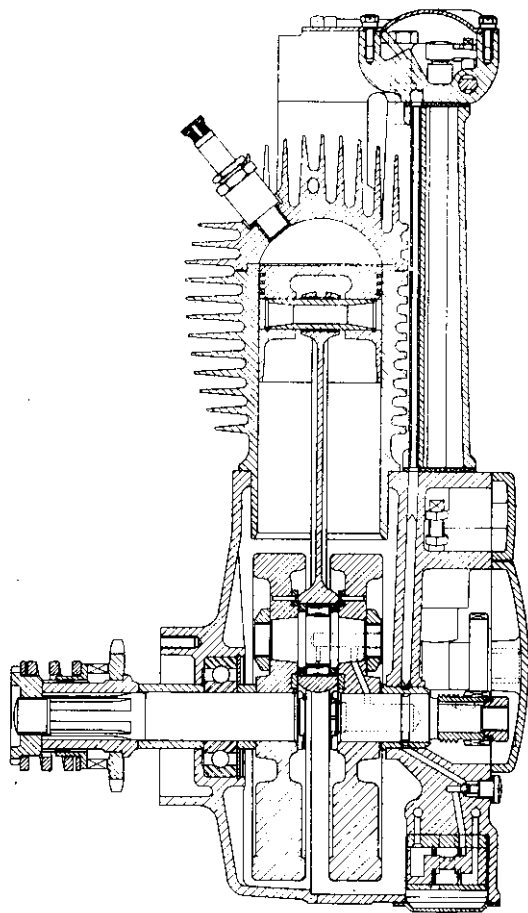
## CONTROLS.

The carburetter controls are on the right handlebar; the throttle control is by twist grip, which opens when turned towards the rider, and the air control is a short lever mounted above the front brake lever. The 250 c.c. S.V. is not fitted with an air lever. The ignition control advances inwards and is on the left bar. The front brake is operated by a lever on the right handlebar, and on the 250 c.c. O.H.V. Empire Star, 350 c.c. O.H.V. Empire Star, and 350 c.c. O.H.V. Competition models, incorporates a ratchet device, which is applied by pressing the small knob towards the lever when the latter is raised. The clutch and exhaust lifter levers are on the left bar. The latter control is not fitted on the 250 c.c. S.V.

The rear brake is operated by the left toe pedal. The positions of the foot and hand gear control levers are marked "1" for first, "N" for neutral, "2" for second, "3" for third, and "4" for fourth or top gear. The numbers on the foot control are on a disc attached to the lever, and are on the gate of the hand control.

## RUNNING-IN.

Do not overdrive the engine during the first 500—1,000 miles. Careful attention during this period will improve the machine considerably and greatly affect the subsequent performance during the rest of its life. The addition of a little engine oil to the fuel is to be advised if an upper cylinder lubricant is not used.



*Cross-section of the B.S.A. 250 c.c. O.H.V. engine.*

Fig. 1

## STARTING.

Set the throttle at about one-eighth open and the air lever shut. Move the ignition control to about one-half full advance. Raise the exhaust lifter and push the kickstarter down as smartly as possible with the foot. When the kickstarter is just over half-way down drop the exhaust lifter. Do not kick half-heartedly, or stop before the pedal is quite down, but make full use of the whole movement of the kickstarter.

In very cold weather it may be necessary to flood the carburetter. Do not depress the tickler for too long, as excessive flooding will make starting even more difficult. After depressing the tickler for a few seconds, open the throttle about one-eighth, and then depress the kickstarter till compression is felt. Raise the exhaust lifter, and as explained above depress the kickstarter a little more. Then gently push the pedal down again and the engine will be heard to draw in the rich mixture. If this is done two or three times, and then the starting procedure given above followed, a certain start should be made under the coldest conditions. For all normal running the ignition control should be moved to the fully advanced position.

## RIDING.

To obtain first or bottom gear, raise the clutch lever (on the left handlebar) fully, and push the gear lever into the forward position (or upwards with a foot gearchange). If this is not directly obtainable, do not exert excessive force, but gently press the lever while moving the machine a little backwards and forwards, with the clutch disengaged, of course. Engage the clutch gently, and at the same time gradually open the throttle.

To change gear perfectly it is necessary to accelerate the engine when changing down, and to slow

it down when changing up. This is due to the relative speeds of the engine and road wheels in the different gears. Changes can be effected, of course, by declutching and putting the lever into the required position. Nevertheless a little time spent in learning the correct method is distinctly advantageous. The throttle is left slightly open while the change is being effected when changing down; this allows the engine to increase its speed when the clutch is raised. When changing up, the throttle is closed during the operation.

Do not use an excessive opening of the throttle when starting, and do not allow the engine to "rev" unduly when stationary. Use the throttle control to govern the speed of the machine. Quite definite deceleration is obtained by merely closing the throttle. To lift the clutch and use the brakes, when sufficient retardation can be obtained with a closed throttle, is wasteful. On very greasy roads, the use of the engine as a brake is to be advocated, particularly in conjunction with a change to a lower gear. It is never advisable, except in cases of emergency, either to accelerate or brake fiercely; both are signs of an inconsiderate driver, and, when the roads are greasy, both are extremely dangerous.

A good driver is the most unobtrusive.

## LUBRICATION.

**ENGINE.** The lubrication system (see Fig. 3) is of the dry sump type, operated by a double gear pump, situated in the bottom of the crankcase on the right hand side, and the oilways are internal, except for the supply and return pipes from the tank.

The oil flows from the tank to the supply pump, and thence past a pressure valve to the big-end bearing. Partial failure of the oil supply may be due to the presence of a particle of foreign matter on the spring loaded ball in the pressure valve, and this should be cleared by removing screw *A*, when the spring and ball can be removed.

On the O.H.V. models only a branch feed to the rockers and valves is taken from the big-end supply via an oilway in the crankcase and a pipe cast integrally with the push rod casing. A metering pin is fitted in the crankcase oilway and should not be removed except for cleaning purposes. The oil is then returned to the crankcase through an external pipe connected to the side of the rocker box.

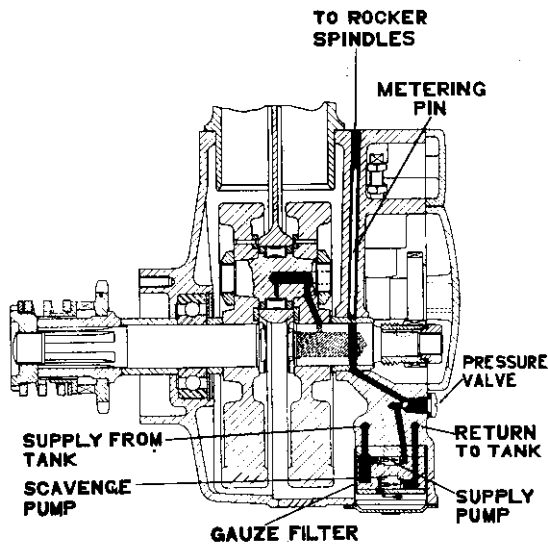


Fig. 2.

After lubricating the big-end, and circulating through the engine in the form of mist, the oil drains down into the bottom of the crankcase from which it is drawn through a filter by the return pump and delivered to the tank through a fine mesh filter in the tank itself.

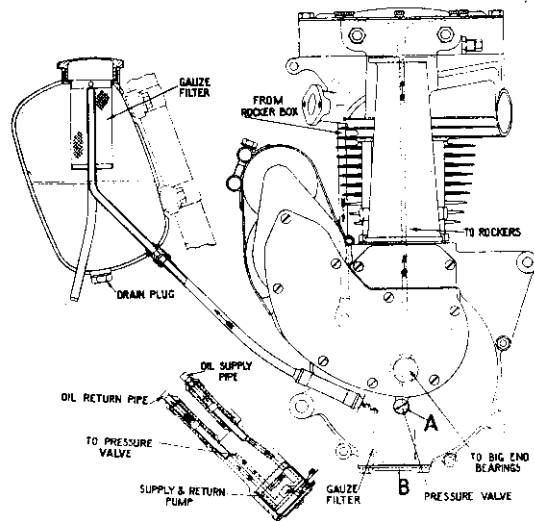


Fig. 3.

The two filters should be cleaned every 2,000 miles, the pump filter being withdrawn for the purpose by the removal of cover plate *B*. (Note.—The pump is independently mounted and should not be disturbed.)

To remove the filter in the oil tank, unscrew the filler cap, and lift the filter out. (Note.—When refilling with oil do not remove the filter.)

The rubber sleeves on the supply and return pipes should be oil-tight and they should be replaced if they show any signs of leakage. This would be indicated in the case of the supply pipe, by partial failure of the oil supply to the engine, while leakage at the return pipe would be shown by the presence of oil at this point.

The oil tank and crankcase should be drained every 2,000 miles. **Do not use paraffin in the tank or crankcase**, but if necessary use a flushing oil or thin machine oil. The filters may be washed in petrol or paraffin but care must be taken to ensure that no paraffin remains in them before they are replaced.

Inspect the oil level in the tank every 200 miles at least and replenish if necessary. Recommended grades of oil will be found on the lubrication chart on page 26.

**CYCLE PARTS.** It is of the utmost importance that the hubs should be greased every 1,000 miles. Lubricate the steering head and front forks every 500 miles, and the brake operation and cams every 1,000 miles.

A few drops of oil should be given to the control levers, exposed cables, brake rod joints and gear change.

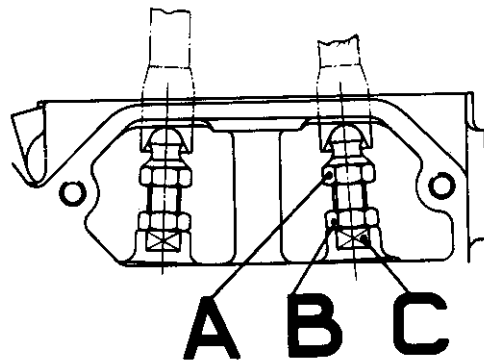
It is advisable to remove chains periodically and thoroughly lubricate them. Clean them in petrol or paraffin, and warm them gently in a mixture of grease and graphite. When cool, wipe off the excess lubricant and replace the chains, but clean the sprockets before doing this.

**GEARBOX.** To fill the gearbox with oil, remove the plug on the right-hand side. Fill only to the level of the bottom threads.

Inspect the oil level every 500 miles, and **after every 2,000 miles drain and flush the gearbox, and refill.** Engine oil is recommended for the gearbox (see chart on page 25).

## RUNNING ADJUSTMENTS.

**TAPPET CLEARANCES.** Particular attention should be paid to the tappet clearances, which should be checked periodically when the engine is cold.



*O.H.V. Tappet Adjustment.*

Fig. 4.

The best method is to set the piston at the top of the compression stroke. Check this by removing the sparking plug and with a pencil feel the position of the piston while rotating the engine a little in either direction. This can be done when the machine is on the stand, by engaging any gear and turning the back wheel. Note that when the piston is at the top, the valves are not open, and neither one nor the other is opened by a movement backwards or forwards.

**O.H.V. Models.** The adjustment should be made when the engine is cold. Remove the tappet cover which is situated on the right-hand side of the crankcase just below the cylinder and with a spanner on *A* (Fig. 4) hold the tappet head while turning *B* with another spanner to the right or anti-clockwise. Then turn the tappet foot by means of a spanner on the flats at *C*, obtain the required clearance, and then lock *B* against *A*.

**NOTE.-** The adjustment must be made so that the tappet can be rotated freely between finger and thumb and has just perceptible up and down movement.

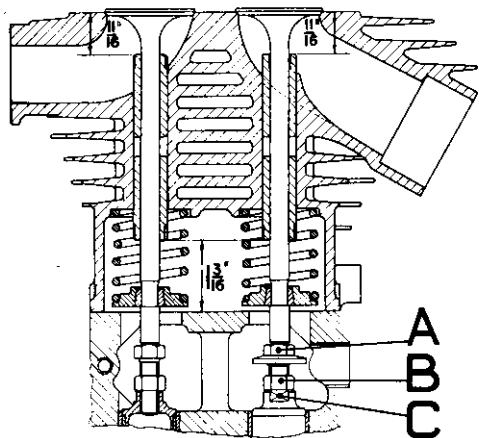


Fig. 5.

**S.V. Models.** The clearance between the tappet and the valve should be checked when the engine is cold. The correct clearance is .004in. for the

inlet and .006in. for the exhaust. Remove the tappet cover which is situated on the right-hand side of the crankcase just below the cylinder and with a spanner on *A* (Fig. 5) hold the tappet head while turning *B* with a spanner to the right or anti-clockwise. Then turn the tappet foot by means of a spanner on the flats at *C*, obtain the required clearance and then lock *B* against *A*. Again check the clearance.

**BRAKES.** A wing nut at the rear end of the brake rod effects the rear brake adjustment. The front brake is adjusted by a knurled thumb nut on the cable stop, fitted to the front forks.

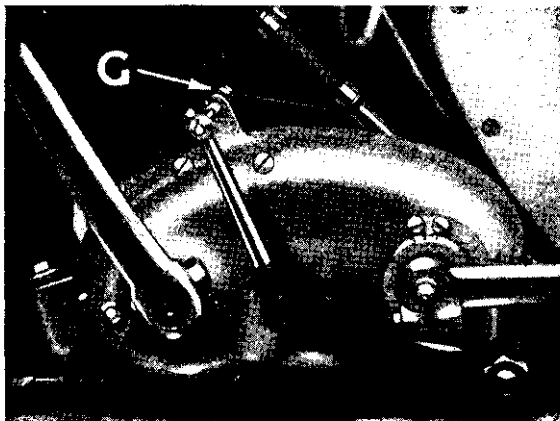
**CLUTCH ADJUSTMENT.** A knurled thumb nut (*G*, Fig. 6) is provided for the adjustment of the cable. Further adjustment can be made by adjusting the central grub screw after releasing the locknut, for which purpose the rubber cover must be moved up the control arm. There should always be a little clearance, so that there is no pressure on the operation when the control lever is released.

**FRONT FORKS.** Keep the link bolts just tight enough to eliminate side play. To adjust, release the locknuts, which are on the left-hand side on the front bolts and the right-hand side on the rear bolts, screw up the bolts, and re-tighten the nuts. Do not make the adjustment too close; it is better to release the shock absorber in order to be certain that the other joints are not binding. The shock absorber should be adjusted to suit road conditions.

To adjust the steering head, place a box underneath the engine and take off the steering damper knob. Loosen the clip nut under the handlebars, and then gently tighten the top adjusting nut until there is no perceptible shake in the head. **If over**

adjusted the ball races will be damaged. Tighten the clip nut and replace the damper knob.

Should it be necessary to remove or replace the fork spring, first place a box under the engine as



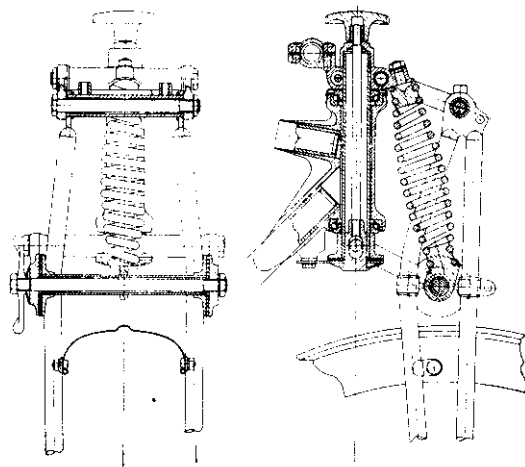
*Clutch Control Adjustment.*

Fig. 6.

above. Take off the nut on the top of the spring; remove the link bolts and the links. The spring will then be clear of the frame, and can be removed by unwinding from the bottom fixing.

To remove the top scroll, hold the bolt tightly in a vice, and punch the end of the spring to wind it off. When replacing, the spring can be wound on to the scroll by hand.

**HUBS.** Models 250 c.c. S.V., 250 c.c. O.H.V. 250 c.c. O.H.V. Empire Star, and 350 c.c. S.V. (Fig. 8) are fitted with ball bearings, but all other



*Front Forks (250 c.c. O.H.V. Empire Star).*

*(Other models similar except for details.)*

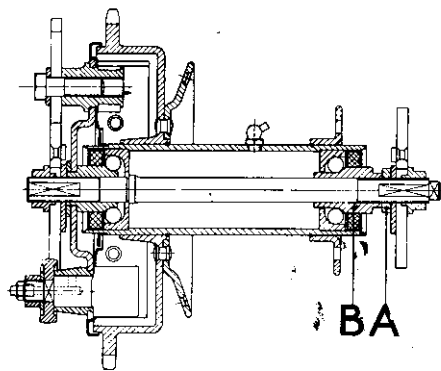
Fig. 7.

models with taper roller bearings. Adjustments must be made when the wheel is out of the forks and the following instructions for this procedure apply to both types of hub. The locknut *A* must be released and the adjusting sleeve *B* screwed in or out as required and *A* tightened again.

**It is most important that the wheels should have just perceptible side play at the rim when the adjustment is complete.**

A portion of the rear guard is detachable to give easy removal of the rear wheel, and this portion is held by the lower rear stays. Shouldered nuts are used on the studs attached to the mudguard at this point, and it is important to locate these and the

two registers in the mudguard near the joint correctly when replacing the tail.



Rear Hub (250 c.c. S.V., 250 c.c. O.H.V., 250 c.c. O.H.V. Empire Star, 350 c.c. S.V.).

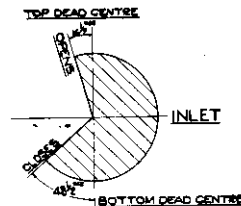
Fig. 8.

**FRONT CHAIN.** An inspection cover is fitted on the front chain case. After releasing the gearbox bolt nuts, move the gearbox by means of the screw adjuster. The gearbox bolts are both below the box, and the adjuster is at the rear, in the centre of the box. The chain should have  $\frac{1}{2}$  in. freedom up and down at the centre. Make sure that this is correct for all positions of the sprockets and that the nuts are well tightened after completing the adjustment. Remove the oil level plug and filler plug and fill with oil until it flows from the level plug hole. Replace both plugs. Replenish with oil at intervals of 2,000 miles and drain and refill as above every 5,000 miles.

TAPPET CLEARANCE FOR RUNNING  
SET WHEN ENGINE IS COLD -005"

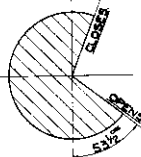
PISTON DISTANCE BEFORE T.D.C. =  $\frac{1}{32}$ " 249HP O.H.V. SPORTS (B1)

PISTON DISTANCE AFTER B.D.C. =  $\frac{1}{32}$ " 249HP O.H.V. SPORTS (B1)



TOP DEAD CENTRE

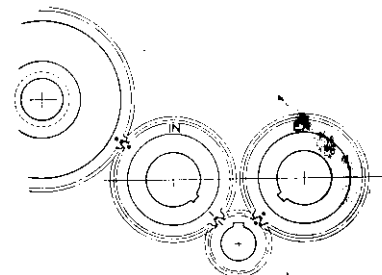
EXHAUST



BOTTOM DEAD CENTRE

PISTON DISTANCE AFTER T.D.C. =  $\frac{1}{64}$ " 249HP O.H.V. SPORTS (B2)

PISTON DISTANCE BEFORE B.D.C. =  $\frac{33}{64}$ " 249HP O.H.V. SPORTS (B2)

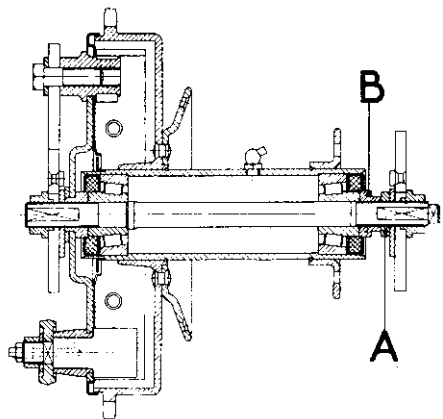


TOP DEAD CENTRE (END OF COMPRESSION STROKE)

DIAGRAM SHOWING TIMING MARKS ON CAM PINIONS & ALSO MARKING ON IDLER PINION. (TIMED CRANKCASE BREATHER)

Fig. 10.

Valve Timing Diagram (250 c.c. O.H.V. Sports).



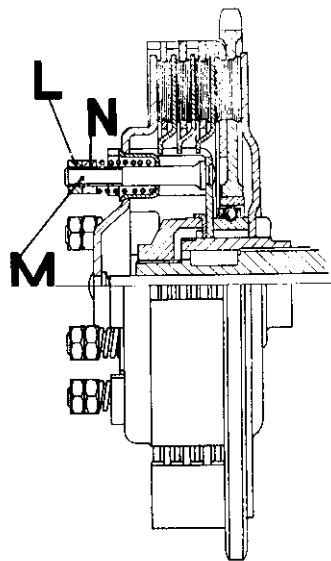
Rear Hub (350 c.c. O.H.V. Empire Star, 350 c.c. O.H.V. Competition, 350 c.c. O.H.V. Sports).

Fig. 9.

**CLUTCH.** The spring pressure is variable and the normal adjustment is arranged so that the face of the locknut *L*. (Fig. 11) is just flush with the bolt *M*. After considerable mileage has been covered it may be necessary to increase the spring pressure. To do this screw the two nuts *L* and *N* further along the bolt, but make sure that all nuts are adjusted the same amount. **It is important that the oil level in the chain-case is maintained otherwise damage to the clutch will result.**

**REAR CHAIN.** The rear chain adjustment is by means of cams on the rear spindle. Release the brake anchor pin and spindle nuts and turn the spindle on the left-hand side, by means of the

small square, until the correct tension is obtained. The chain should have  $\frac{1}{2}$  in. total movement up and down at the centre. Make sure that this is correct for all positions of the sprockets and



Clutch

250 c.c. O.H.V.  
Empire Star.

Other models  
similar except for  
number of plates.

Fig. 11.

that the cams are against the stops. Tighten the left-hand nut first and then the right-hand nut, and finally see that the wheel is correctly aligned. Do not forget to tighten the rear brake anchor pin.

**VALVE TIMING.** The engine shaft pinion and cams are marked to facilitate correct assembly. The timing is shown on pages 15, 44 and 45. The magdyno idler pinion is also marked and must be replaced correctly, otherwise the operation of the crankcase breather will be affected.

**IGNITION TIMING.** The magneto pinion is accessible when the timing cover is removed. Release the magneto pinion and set the piston at top dead centre on the compression stroke (see page 9). Then rotate the engine backwards, measuring the amount the piston descends from the top position. The correct distances for the different models are given on page 43. Then set the contact breaker points just opening (.002in. gap), with the control in the fully advanced position. The fully open gap should, of course, be correct to the gauge. The magneto pinion should be tightened at this setting, and **check the setting before replacing the cover.**

**AIR CLEANER.** This requires no attention other than the cleaning of the felt filter bag, which should be removed about every 2,000 miles. Pour petrol on the inside to wash away impurities, and when dry brush sharply with a small stiff brush and replace. In tropical climates it is advisable to clean the filter at least every 1,000 miles.

## GEARBOX.

This is of the constant mesh type, and the construction is shown in Fig. 12. The gear reductions are obtained by transmitting the drive through various trains of gears, and selecting these by means of the dogs *A* and *B*, which are coupled to the main and layshafts respectively, by splines on which they can be moved laterally. These dogs are moved by forks *E* and *F*, which are actuated by the rotation of the shaft *C*.

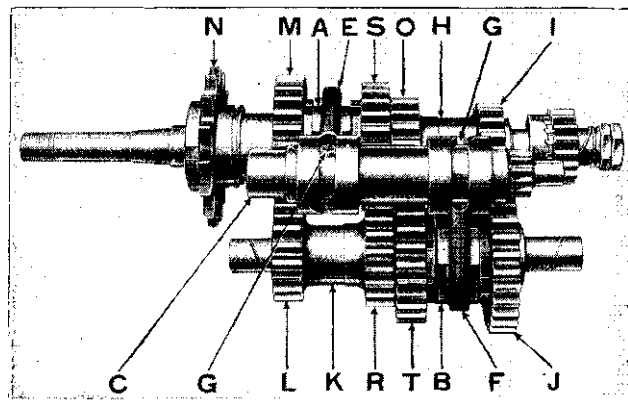
The first gear train is by pinions *I* and *J*, and the constant mesh pinions *L* and *M*, the latter being coupled to the final sprocket *N*. Second gear utilises *O* and *T* and *L* and *M*, and third gear *S* and

*R*, *L* and *M*. Top gear is direct by coupling *M* to the mainshaft by the dog *A*.

The selection mechanism is located by a spring loaded plunger inside the gearbox.

The kickstarter mechanism is contained in the first or outer end-cover, the gears being housed within the second cover.

A ball race located in the inner cover takes the thrust when declutching.



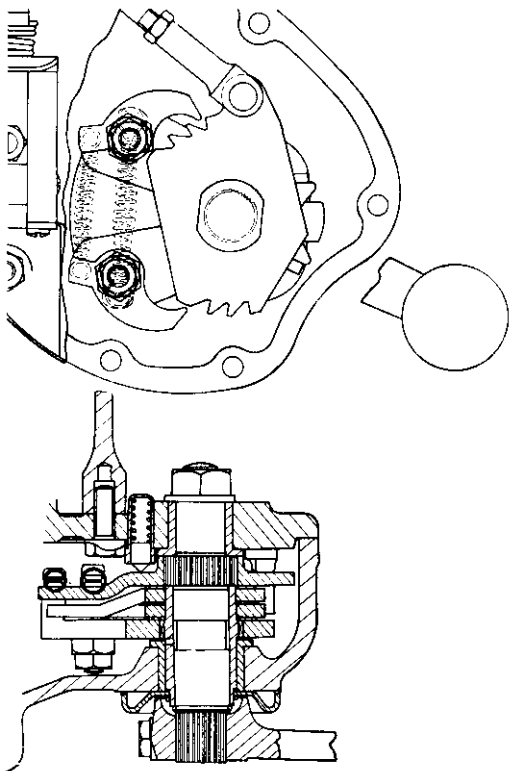
*Four-speed Gearbox Interior.*

Fig. 12.

## FOOT GEAR CHANGE.

In the ordinary course of events the only attention, apart from lubrication, that the gear change is likely to require is the replacement of a broken spring. For this reason it is advisable to carry a set of spare springs. To replace them in the event of a breakage (which is, however, a very rare occurrence) it is necessary to remove the outer cover to the gearbox. Release the pedal

from the splined shaft by slackening the pinch-bolt, and slide the pedal off the shaft. Detach the clutch operating cable. Undo the gearbox cover nuts, four of which are at the back of the casing. The



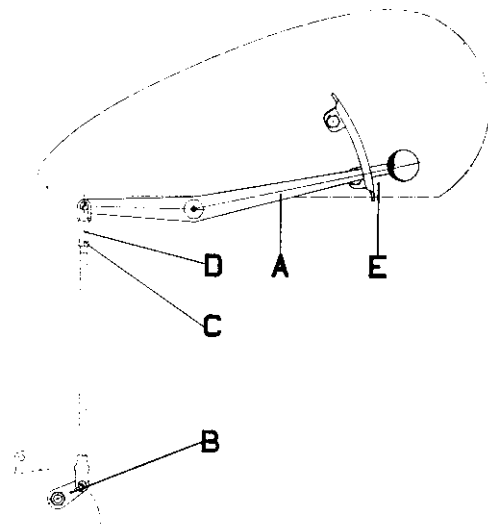
*Foot Gear-change arrangement.*

Fig. 13.

outer cover complete with kickstarter can then be drawn off, leaving the gearchange mechanism in position, and this is withdrawn complete after releasing the central spindle nut at the rear of the casing. Remove the broken spring and fix the new spring by pressing its eyes over the anchoring pegs. This can be done conveniently with a pair of pliers.

The parts should be carefully examined, and any showing signs of undue wear should be replaced by new ones.

Thoroughly clean and smear the parts with oil before re-assembling.



*Adjustment of Hand Gear-change.*

Fig. 14.

A careful study of the diagram will do much towards simplifying the above operations. The pedal may be replaced on the splines in a different position to suit the user's requirements.

**TO ADJUST HAND GEAR CHANGE.** If a considerable movement has been made in the position of gearbox it will be necessary to readjust the gear control rod.

The adjusting piece is at the upper end of the rod. Disconnect the rod from the operating lever by removing the screw, and then move lever *B* (Fig. 14) towards the rear of the machine until the spring plunger inside the gearbox can be felt to have registered with its recess. Move the operating lever *A* until it is just clear from the end of its slot, as at *E*. Adjust the sleeve *D*, after loosening the locknut *C*, until the screw can be replaced without altering the positions of *B* or *A*, and tighten nut *C*.

### **DECARBONIZING THE ENGINE.**

The need for this operation is a tendency to "pink" and a falling off in performance, and should be carried out every 3,000 miles at least.

**DECARBONIZING AND TOP OVERHAUL (S.V. models).** On these models decarbonization and "top overhaul" is extremely simple. By the removal of the cylinder head bolts the head can be taken off, exposing the piston, which should be set at top dead centre, and the valves. The head and piston can easily be cleared of carbon. If the valve seats are suspected these can be remedied, and if care is taken to keep all grinding compound away from piston, valve guides, and carburetter (which latter should be removed), the cylinder need not be removed from the engine, a procedure necessary only when the rings require renewal.

To take off the cylinder after having detached the carburetter and exhaust pipe, remove the four nuts which hold the cylinder to the crankcase. Lift the cylinder up and forwards into the front angle of the frame, and then turn the engine forwards until the piston comes out of the bottom of the cylinder, steadying the piston as it emerges so that it does not fall over and get damaged, when it comes clear of the cylinder. Cover up the piston and the top of the crankcase carefully with a rag to prevent dust and grit falling in. Remove the valves from the cylinder and carefully chip out all the carbon from the valve pockets and passages with a long-handled screwdriver. Check the valve guides for wear, replacing them if necessary. See "Valve Guides," page 28.

After all the carbon has been removed wipe the cylinder and head thoroughly with a clean but oily rag, so as to remove all traces of carbon. Then swill out with paraffin and finally wipe clean.

**O.H.V. models.** Unscrew the petrol pipe at the tank end and remove the carburetter by undoing the two nuts on the flange and tie this up on the machine out of the way. Remove the exhaust pipe and the engine steady arm. Detach the high tension lead from the sparking plug and remove the latter.

Release the petrol tank fixing bolts but do not remove the tank from the frame. Set the exhaust valve open (exhaust tappet raised to fullest extent), slacken off the locknut on the Bowden wire adjuster and unscrew the latter from the rocker box, thus allowing the exhaust valve lifter to be detached complete.

Now unscrew the four cylinder holding down bolts at the hexagon portion near the cylinder bottom fins, and by sharply tapping the underside of the cylinder head with a mallet or similar tool, the head can be freed from the barrel. Lift the petrol tank and withdraw the cylinder head complete with rocker box and cover. The push rods, casing and gaskets may now be removed. To detach the rocker box from the cylinder head, first remove the cover by undoing the six screws and four bolts and then unscrew the two bolts situated between the rockers.

Lift the cylinder up and forwards into the front angle of the frame and then turn the engine forward until the piston comes out of the bottom of its cylinder, steadying the piston as it emerges so that it does not fall over and get damaged when it comes clear of the cylinder. Cover the top of the crankcase with a rag to prevent dust and grit falling in.

On the 250 c.c. O.H.V. models the rocker box and cylinder head, etc., can be removed without disturbing the petrol tank.

**GRINDING-IN VALVES.** If either of the valves is slightly pitted on its seat it may be ground in by the following method:—

Valve grinding compound (obtainable at any garage or accessory shop) is smeared lightly on the face of the valve, which is then returned to its seating.

Hold the end of the valve stem by means of the special tool supplied in the kit and rotate the valve backwards and forwards by a turn of the wrist.

Every few strokes the valve should be lifted slightly off its seat and moved to a different position.

This operation should be continued until an inspection of the valve face shows a smooth surface all the way round.

If it is badly pitted, however, it should be sent to the B.S.A. works at Small Heath to be refaced. On its return a very slight amount of grinding-in will be sufficient to make a good face. Never attempt to grind in a badly pitted valve, as excessive valve grinding wears away the valve seat in the cylinder and causes the valve to become pocketed, with consequent loss of power. After grinding-in be careful to wipe away all traces of the grinding material both on the valve and in the cylinder head. Before replacing the valves smear their stems with a little oil.

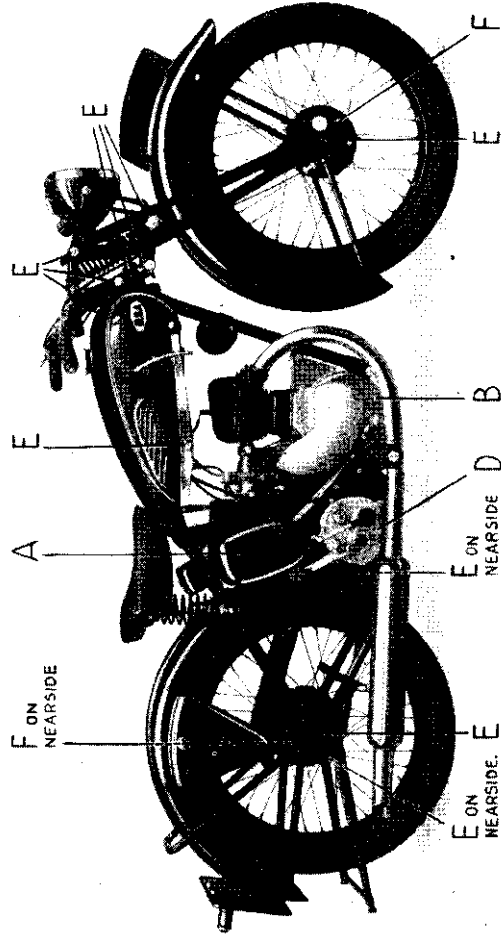
**PISTON AND RINGS.** The gudgeon pin holding the piston, is located by means of wire circlips, one of which must be removed with a very small screwdriver or similar tool. Take particular care when replacing the circlip that it fits firmly into its groove. If it should be loose, expand it slightly so that it springs into position when fitted.

Mark the piston on the inside of the skirt to enable it to be re-assembled in the original position. Scrape all carbon off the top of the piston by means of a short screwdriver or old pocket knife. Finish by polishing the top of the piston lightly with fine emery paper.

Now examine the piston rings. If they are bright and quite free in their grooves it is better to leave them alone, as they are brittle and there is a considerable risk of breaking them during removal. If the rings are stuck in their grooves prise them out very carefully and clean them. Scrape any carbon from the grooves and from the inside and edges of the rings and then replace, providing they are otherwise in order.

## LUBRICATION CHART.

See Page	Component	See Diagram	Attention Required	Wakefield	Vacuum	Shell
5	Engine Oil Tank	A	Inspect level every 200 miles. Drain and refill, clean filter every 2,000 miles.	Patent Castrol XXL	Mobiloil Clearosol D	Aeroshell
5	Engine Crankcase	B	Drain and clean pump filter every 2,000 miles.	Patent Castrol Xt.	Mobiloil Clearosol D	Aeroshell
8	Gearbox Primary Chain Oilbath	D	Inspect every 500 miles. Drain and refill every 2,000 miles. Replenish every 2,000 miles.	As for Engine	As for Engine	
8	Hubs Front Forks Steering Head Rear Brake Cam Lever Rear Brake Pedal Hand Gearcase Sprudle Front Brake & Clutch Cables (E, mp, Star & Comp. models).	E	Several strokes of gun every 500 miles	Castrolase Heavy	Mobilgrease No. 2	Shell Retimax
8	Brake Cams	F	One stroke of gun every 1,000 miles	Castrolase Heavy	Mobilgrease No. 2	Shell Retimax
8	Control Rod Joints Brake Operation Exposed Cables	G	A few drops of oil every 500 miles	As for Engine	As for Engine	



After several thousand miles have been covered the gap between the ends of the rings should be checked with ring in cylinder. The ring may be positioned correctly by first inserting the piston and then sliding the ring up to the piston skirt. If the gap is excessive a new ring should be fitted (see chart on page 43).

After cleaning the piston make sure that the slots in the piston rings are on the opposite sides of the piston and then smear the sides of the piston generously with engine oil to obviate any risk of damage when first running after assembly.

**VALVE GUIDES (S.V. models).** There are two guides per valve, one at the port and the other projecting into the tappet chest, the upper one being inserted and withdrawn from above and the lower one from below (see Fig. 5). Remove the lower guide first by applying a withdrawal tool to the thread on its outside diameter and then drive out the upper guide with a hammer and drift.

To fit new guides drive them in from above and below respectively using a soft copper drift. Insert the guides to the depths shown in Fig. 5. (Note.—The upper exhaust valve guide differs from the others in having its upper end counterbored, and a plain guide must not be fitted in this position.)

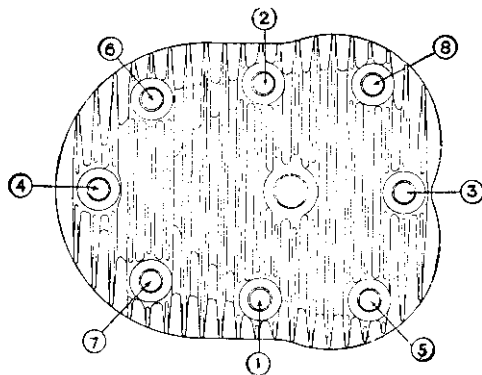
**O.H.V. models.** The valve guides on these models are removed or inserted by using a soft copper drift and hammer. When replacing make certain that the collar formed on the guide is in contact with the cylinder head.

**VALVE SPRINGS.** These have a tendency to lose their efficiency after a period of use, due to heat, etc. It is advisable, therefore, to replace them periodically, *e.g.*, when the engine is dismantled for decarbonizing.

### ASSEMBLING AFTER DECARBONIZATION.

Before replacing the cylinder pour a small quantity of engine oil into the crankcase, and smear the cylinder walls with oil. Replace the valves and springs and then replace the piston and gudgeon pin on the connecting rod, having previously oiled the various parts, and make sure that the piston is the correct way round.

**S.V. models.** Turn the engine until the crank is slightly past bottom dead centre. The top piston ring should now be compressed by the fingers, while the cylinder barrel, held in the front angle of the frame, is slid on to the piston. The lower ring may now be compressed until it enters the barrel, which may then be slid home and bolted to the crankcase by gradually and alternately tightening down the nuts. The cylinder head bolts should be tightened down in the proper order as shown in the diagram (Fig. 15).



*Cylinder Head Bolts.*

Fig. 15.

**O.H.V. models.** The cylinder barrel is fitted on to the piston as described above. Place the cylinder head on the barrel and fasten the whole assembly to the crankcase by screwing up the four cylinder holding down bolts in to the head. Make certain that the barrel is positioned correctly. Tighten the bolts gradually and alternately; do not tighten any particular one first.

Now turn the engine until the piston is at top dead centre of the compression stroke and replace the push rod cover and push rods, followed by the rocker box, complete with exhaust valve lifter, and then carburetter, sparking plug and exhaust pipe.

Check the clearance between the valves and rockers and adjust if necessary.

Replenish the rocker box with engine oil to the level determined by the oil return pipe.

### **CLEANING.**

The life of a machine is increased, and its appearance and value greatly improved by regular and careful attention to cleaning. Special care should be taken to prevent grit working into the moving parts and causing undue wear and other troubles. Particularly is this the case round the front, rear, and sidecar hubs, carburetter, magneto, brakes, and gearbox.

Never rub dry and caked mud from the frame, mudguards, etc. To do so means that the enamel will be subjected to the abrasive action of the grit and the polish will soon be destroyed. Thoroughly soak the dirt first, then wash it off and wipe the parts dry. If a hose is available this will be found the most satisfactory way of removing dirt. Direct the stream of water on the portion being cleaned, taking care to avoid playing direct on to the hub bearings, etc. Afterwards brush lightly with a soft brush, finally drying and polishing with a smooth

cloth. To remove dirt from the engine soak it well with paraffin, cleanse with a fresh supply, then wipe dry. An occasional coating of a cylinder paint should be given to prevent rusting of the cylinder, or a solution of lampblack in paraffin to which a small quantity of gold size has been added may be used. This will also be found to assist the radiation of heat.

### **SPARKING PLUG.**

The plug with which this engine was originally equipped was selected only after the most protracted and stringent tests. It will be observed it is K.L.G. type L777 (except on the Empire Star and Competition models, in which case it is K.L.G. type 831), and any replacements must be of this make and type to secure the best performance and reliability of the engine.

**Gap-setting.** The gaps of these plugs are set at fifteen to eighteen thousandths of an inch (.015in. —.018in.) and they should be maintained at this distance to ensure even running.

**Cleaning.** After the first thousand miles, including the "running-in" period, it may be necessary to clean the sparking plug because when an excess of oil is used it causes a deposit of carbon on the internal insulation of the plug. After the initial cleaning and readjustment of the gap setting it should then be only necessary for periodic inspection and cleaning to be undertaken.

**Method of cleaning.** To clean the plug it must first be removed from the engine and then dismantled. All K.L.G. plugs are detachable and they are either of two or three piece construction. In the two-

piece types the gland nut is integral with the insulated centre electrode and **on no account must any attempt be made to separate this gland nut from the insulation.** In the three-piece types the gland nut is a separate unit which is immediately apparent as the plug is loosened.

The procedure for cleaning both the two- and three-piece types is identical. The insulated centre electrode *A* must be removed from the plug body *C* by unscrewing the gland nut *B*. This is best accomplished with the K.L.G. combined detacher and plug box spanner as illustrated, which sell at 5s. 6d., or, alternatively, the plug should be inverted and held in a vice by the gland nut hexagon *B*. This will permit a box spanner of a suitable size to be used on the hexagon of the plug body *C*.

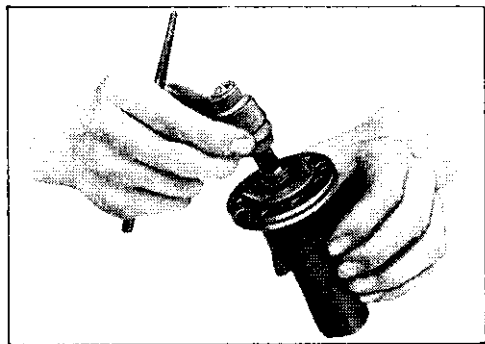


Fig. 16.

When *B* is unscrewed the centre electrode may then be withdrawn. The lower mica insulation *D* should now be carefully wiped with a rag soaked in petrol. If any carbon deposit is caked so hard

on to the insulation that the application of the rag soaked in petrol will not remove it, the centre electrode should be left steeped in petrol when after an hour or so it will be found that the carbon deposit can be easily dispersed.

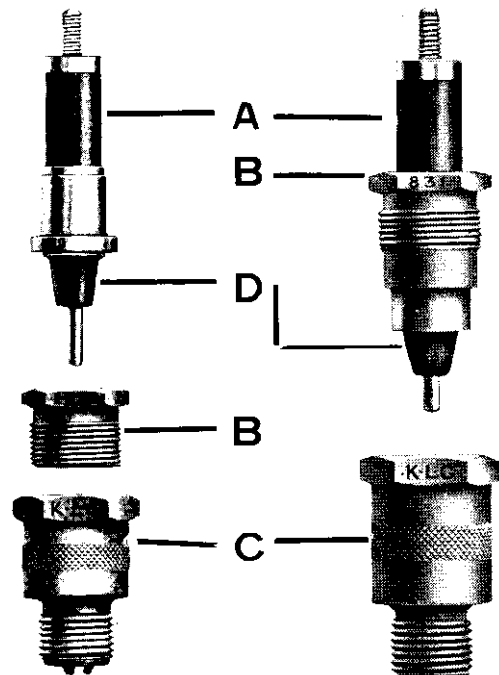


Fig. 17.

The mica insulation *D* should then be polished with a dry rag until the mica attains a high polish,

in which condition it offers the greatest resistance to any accumulation of soot, oil or carbon.

Whilst it is permissible to scrape the actual firing point (i.e., the extremity of the centre electrode) with a knife or small file, **an abrasive must not be used on the mica insulation in any circumstances whatever.** The body C should now receive attention. The inside of the body should be well scraped out with either a penknife or small file and the earth points cleaned with a wire brush, finally washing out the body in petrol and then drying it.

To re-assemble, verify that the internal washer is in place before inserting the electrode. Having tightened the gland nut B to secure gas tightness, the earth point or points (according to whether the plug is fitted with one or three points) should then be re-set to fifteen to eighteen thousandths of an inch (.015in.—.018in.). This will probably necessitate bending each earth point towards the firing point of the centre electrode, or if the gap is too narrow, prising the earth points outwards. The centre electrode **must not be levered towards the earth points.** If the external washer has been completely flattened or is cracked or broken it is advisable to replace with a new one.

**Symptoms of minor plug troubles.** Misfiring, especially at high speeds and under heavy pulling at lower speeds, invariably indicates that the gap setting of the plug is too wide, whilst erratic slow running can be accounted for by too narrow a gap setting.

Excessive flooding of the carburettor or an over-rich mixture will have a detrimental effect on the plug, resulting in, or ultimately leading to, trouble

in the form of an excess deposit of soot on the internal insulation and a consequent "short" inside the plug.

Faulty high tension cables from the distributor to the sparking plug terminal and the distributor points being out of adjustment can also account for the plug misfiring. Sparking plug trouble frequently reflects some other fault or failure of the ignition or carburation system. The booklet: "The care and maintenance of K.L.G. Plugs" issued with this Instruction Manual should be retained for reference.

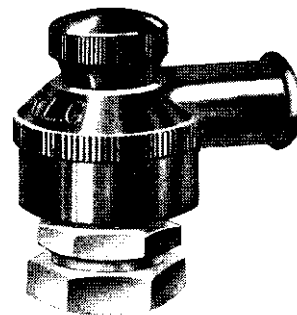


Fig. 18.

The K.L.G. waterproof terminal (Fig. 18) is indispensable for motor cycle engines. It is made of finest Bakelite. There are no loose pieces and the screw down fixing makes it impossible to fall off. Size 3BA to fit K.L.G. types 831 and L777.

Any information concerning K.L.G.'s, particularly for racing or competition work, is readily available on request to the Technical Department of K.L.G. Sparking Plugs Limited, Putney Vale, London, S.W.15.

## GENERAL MAINTENANCE AND RUNNING HINTS.

A good rider will occasionally go over all the nuts on his motor cycle with a spanner, to see that they are kept tight, and will carefully look round his machine to ensure that everything is in order.

There are so many factors governing the satisfactory running of an engine that the importance of giving attention to all the following points must be emphasized if the best all-round results are to be obtained.

Poor compression may be due either to the need for valve grinding, tappet adjustment not in accordance with the instructions given earlier in this book, or, in the case of an engine which has covered a considerable mileage, piston ring wear and consequent leakage. Choking of the exhaust system, due to carbon, may cause overheating and consequent loss of power.

The actual timing of the ignition should be verified, and it may be possible in certain cases, dependent upon local conditions (including the type of fuel used) to make an advance on the standard setting (see page 18).

When driving the ignition should invariably be kept advanced as much as is possible under the conditions obtaining. In this connection it must be stressed that a dirty engine—*i.e.*, one that is carbonized up badly by the use of unsuitable fuel (we recommend for normal purposes either a good brand of No 1 spirit or one of the petrol-benzole or Ethyl mixtures) or sparking plugs out of order—may render it impossible to make full use of the ignition advance.

Under certain conditions the carburetter jet may be reduced by one size, but, generally, this is not desirable, and an endeavour should be made to obtain the required petrol consumption

without this alteration by following out the suggestions above and below. The adjustable screw controlling the starting and slow-running setting should be kept out—*i.e.*, unscrewed—as far as may be without prejudicing starting. Although it is claimed that this setting has little effect upon the petrol consumption, this is not necessarily the case under conditions where there may be a fair amount of engine idling or running, say, downhill, against the engine with the throttle closed. The weaker the mixture under these conditions the less will be the waste of petrol.

All joints in the carburation system and the petrol pipe line should be kept tight, and to avoid waste the petrol tap should be turned off whenever the vehicle is left standing for more than a few hours. There may be no definite leak, but the rate of evaporation in the float chamber is, under certain conditions, relatively high, and the amount of petrol wasted in this way over a period may be quite appreciable. Excessive flooding when starting is productive of petrol waste and should be avoided at all times, since it prejudices easy starting and tends to wash away the oil from the cylinder walls of a cold engine.

The air holes in the filler cap of the petrol tank should be cleaned out from time to time. Occasionally these get choked and float chamber starvation at high speeds will result.

Also, the petrol tap in the tank should be removed periodically. The tap screws into a plug, to which is attached a filter; this should be cleaned occasionally when the tank is empty or nearly so, and any collection of dirt or water at the bottom of the tank carefully removed by washing out with petrol. The tap itself should be blown through in both the normal and the reserve position.

Occasionally dirt or water may lodge in the body of the tap, causing a restriction in the petrol supply.

What are called "floating" obstructions in the carburetter jet are sometimes difficult to locate, and indicate their presence by causing partial choking at irregular intervals. Any restriction of the petrol supply due to the foregoing can obviously be remedied by cleaning the jet.

## DRIVING.

Violent acceleration, either on the top or lower gears, should be avoided, as should an undue amount of running on the latter.

The petrol consumption on the lower gears is, for obvious reasons, very much heavier than on top gear, and experience with the vehicle will show that it is possible to use top gear to a greater extent by careful spark manipulation than would perhaps be realised during the early period of running.

In connection with the ignition control, it is perhaps advisable again to stress the need for making full use of the advance. Apart from increasing the petrol consumption, driving on retarded or partially retarded ignition will cause engine overheating in addition to giving unsatisfactory running.

## TROUBLE AND HOW TO LOCATE IT.

To meet any emergency likely to arise through trouble on the road it is advisable to carry the following spares: Spare valve, complete with springs, cup, and cotter; sparking plug, spare links

and fasteners for chain, chain rivet extractor, and tyre repair outfit, together with the kit of tools supplied with the machine. The points most likely to cause trouble are the petrol supply and the sparking plug.

Should the engine develop misfiring or stop firing altogether first ascertain that there is petrol in the tank and that the petrol tap is turned on to carburetter. Depress the tickler on the float chamber to see that petrol is reaching the jet. If not see whether the petrol pipe is clear, detaching it by unscrewing the union nuts from the petrol tap and underside of the carburetter float chamber. Then examine the jet, which is removed by unscrewing the hexagon-headed nut at the base of the carburetter body. The jet will then be exposed and can readily be screwed out. If the machine still refuses to fire after correcting these faults examine the sparking plug to see whether the points are fouled with charred oil; if so, clean the plug in accordance with the instructions given on page 30. Having cleaned the plug connect it to high-tension cable, lay plug on top of cylinder, noting that only the metal body of plug makes contact with this. Rotate engine a few times by means of kickstarter. A spark should occur at intervals at the plug points unless the plug is defective. If so fit in a spare plug. Of course if the engine stops and over-oiling is suspected—in this case the exhaust will have previously had a bluish tinge—remove the plug and clean in the first place; then, if engine still refuses to run, examine the other points likely to cause trouble.

## TUNING FOR SPEED.

In order that maximum speed may be obtained it is essential that everything should be in perfect adjustment and that all moving parts of engine, gearbox, and machine should be free. The following notes indicate briefly those points to which attention should be paid.

**ENGINE.** A high-compression piston should be used without a shim. Ease the piston, if necessary.

If the cylinder bore is at all rough lap it out with metal-polish or jewellers' rouge. The actual piston rings should be used for this, but not the piston which is to be run in the engine.

Examine the head joint washer and replace if there are any signs of leakage.

Check the gap of each piston ring (see chart on page 43). The rings should be free in their grooves but without side play.

Polish the valve stems and necks and valve ports.

The exhaust valve in a high duty engine is very severely stressed and heated when racing. If high-speed work is done to a large extent the exhaust valve should be replaced by a new one every 2,000 miles.

Adjust the rockers carefully for end-play and set the valve clearances when the engine is cold.

Check the alignment of piston, connecting-rod, crankpin, and mainshaft. The gudgeon-pin, when fitted to the small end, should be parallel to the face on which the cylinder rests.

Examine the big-end carefully. This should be free but without more than the slightest amount of up-and-down play. If there is any discolouration in the rollers, or on the roller tracks on crankpin or connecting rod, new parts should be fitted and subsequently well run-in.

Check the mainshaft and flywheels for truth before and after assembly.

The mainshaft bearings should be free but without play.

Polish all bearing surfaces in the timing gear if there are signs of roughness.

In addition to the recommendations on page 26, Patent Castrol "R" may be used for sports purposes. **This oil must not be mixed with any other grade.**

**GEARBOX.** All the bearings should be free. Be careful to replace the pen-steel washers fitted at each side of the mainshaft ballrace

**TRANSMISSION.** Remove both chains and grease them as described on page 8. When re-fitting make certain that they are not tight at any portion of the drive. With the chains in position turn the engine slowly, at the same time testing the sag in the chain until the whole of the latter has passed the point at which it is being tested. In this way any tight portion will be detected. The correct total up-and-down movement for the tightest portion of the drive is  $\frac{1}{16}$  in. for the front chain and  $\frac{1}{8}$  in. for the rear

Make certain that the engine, gearbox, and rear wheel sprockets are correctly lined up.

**CYCLE PARTS.** Slacken off the steering damper and adjust the head carefully. Then adjust the damper to suit requirements.

Test the frame for alignment by means of a straightedge or string laid against the wheels.

Remove all grease from the hubs, adjust them carefully, and lubricate with thin cycle oil.

Make certain that the brakes are not binding when in the "off" position.

Inflate the tyres to the correct pressures given in the chart on page 43.

It pays to put high-quality  
Spares into a high-quality  
machine.

Insist on genuine  
**B.S.A. Spares.**

**B.S.A. CYCLES LTD., Birmingham, 11.**

Directors: J. W. BRYAN, GEOFFREY D. BURTON,  
W. F. JANES, J. LEEK, A. H. POLLEN.

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

**USEFUL DATA.**

	B20	B21	B22	B23	B24	B25	B26
Tank capacity (gallons)	3	3	3	3	3	3	3
Bore (mm.)	63	63	63	71	71	71	71
Stroke (mm.)	80	80	80	88	88	88	88
Capacity (c.c.)	249	249	249	348	348	348	348
Compression ratio	5	6.7	7.5	5	6.7	7.5	6.7
Tyre size (front)	3.00-19	3.00-19	3.00-20	3.25-19	3.00-20	2.75-21	3.25-19
Tyre size (rear)	3.00-19	3.00-19	3.25-19	3.25-19	3.25-19	4.00-18	3.25-19
Tyre pressures (lbs. per square inch)							
Solo (front)	18	18	18	16	18	20	16
(rear)	22	22	18	18	18	16	18
Piston ring gap (min.)	.007	.007	.007	.008	.008	.008	.008
(max.)	.011	.011	.011	.012	.012	.012	.012
Gear ratio (top)	4	6.6	6.6	6.2	5.5	6.0	5.7
2	8.6	8.1	8.2	8.1	7.1	7.8	7.3
1	13.2	12.4	13.2	12.4	10.9	12.0	11.4
Ignition setting (ins. before T.D.C.)	19.4	18.2	19.4	18.2	15.5	17.0	16.2
Standard jet	16	16	16	16	16	16	16
Chain sizes (front)	80	80	120	80	80	80	80
(rear)	3/8" x .305	3/8" x .305	3/8" x .305	3/8" x .305	3/8" x .305	3/8" x .305	3/8" x .305

TAPPET CLEARANCE FOR RUNNING  
SET WHEN ENGINE IS COLD .003"

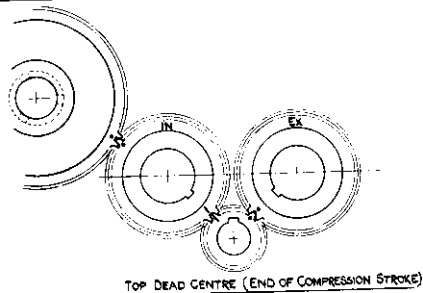
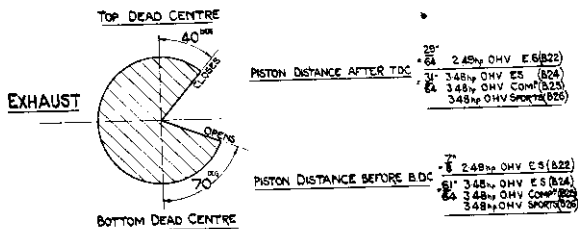
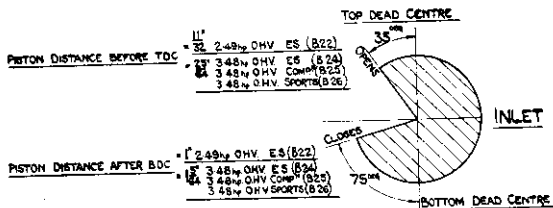


DIAGRAM SHOWING TIMING MARKS ON CAM PINIONS & ALSO MARKING  
ON IDLER PINION (TIMED CRANKCASE BREATHER).

### Valve Timing Diagram

(250 c.c. O.H.V. Empire Star, 350 c.c. O.H.V. Empire Star, 350 c.c. O.H.V. Competitions, 350 c.c. O.H.V. Sports).

TAPPET CLEARANCE FOR RUNNING  
SET WHEN ENGINE IS COLD .004" INLET .006" EXHAUST

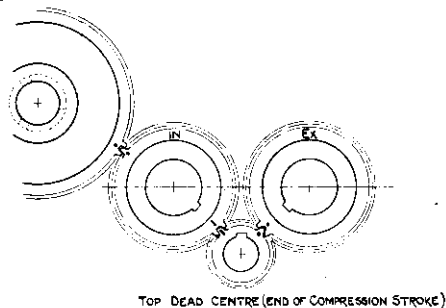
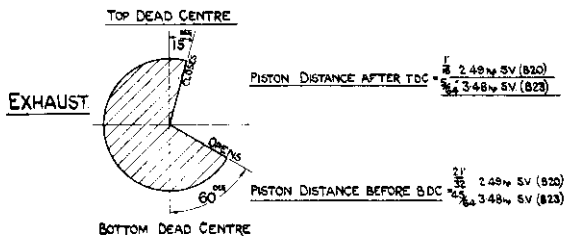
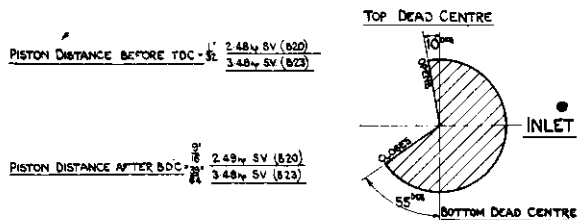


DIAGRAM SHOWING TIMING MARKS ON CAM PINIONS & ALSO MARKING  
ON IDLER PINION (TIMED CRANKCASE BREATHER).

### Valve Timing Diagram

(250 c.c. S.V. Tower, 350 c.c. S.V. Tower).

## LUCAS SERVICE DEPOTS

### 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:

**Tyres:** Messrs. Dunlop Rubber Co. Ltd., Fort Dunlop, Birmingham.

**Saddles:** Messrs. Herbert Terry & Sons Ltd. Redditch.

**Electrical Equipment:** Messrs. Joseph Lucas Ltd., Birmingham.

**Electric Horns:** Messrs. Joseph Lucas Ltd., Birmingham.

**Speedometers and Clocks:** Messrs. S. Smith and Sons (M.A.) Ltd., Cricklewood, London.

**Carburettors and Twist Grips:** Messrs. Amalgamated Carburettors Ltd., Perry Barr, Birmingham.

**Tell-tale Buttons:** Messrs. Rotherham & Sons Ltd., Coventry.

**Grease Guns:** Messrs. Tecalemit Ltd., Great West Road, Brentford, Middlesex.

#### SPECIAL NOTE.

Prompt attention to all claims under guarantee will be ensured if your covering letter gives—

- (1) Make, year, and model of motor cycle.
- (2) Date of purchase and name of Dealer from whom obtained.

In the event of any difficulty with any part of the equipment, no matter how trivial, we shall be only too pleased to give every assistance possible. The best course to adopt is to call at the nearest Lucas Service Depot (the addresses of which are given below), when the equipment can be examined as a whole. The depots are not only at your disposal for repairs, overhauls and adjustments, but to give free advice. If it is necessary, however, to communicate, or when ordering spare parts, always give the type and number of the unit in question, the make, and if possible, the date of the Motor Cycle on which it is fitted.

**BELFAST** ... .. 3/5, Calvin Street, Mountpottinger  
Telephone: Belfast 57291 (3 lines)      Telegrams: "Servdep, Belfast."

**BIRMINGHAM**, 18 ... .. Great Hampton Street  
Telephone: Central 8401 (10 lines).      Telegrams: Lucas, Birmingham."

**BRIGHTON**, 4 ... .. 85, Old Shoreham Road, Hove  
Telephone: Hove 1146 (4 lines).      Telegrams: "Luserv, Brighton."

**BRISTOL** ... .. 345, Bath Road  
Telephone: Bristol 76001 (4 lines).      Telegrams: "Kingly, Bristol."

**CARDIFF** ... .. 54a, Penarth Road  
Telephone: Cardiff 4603 (4 lines).      Telegrams: "Lucas, Cardiff."

**COVENTRY** ... .. Priors Street  
Telephone: Coventry 3068      Telegrams: "Lucas, Coventry."

**DUBLIN** Portland Street North, North Circular Road  
Telephone: Drumcondra 434 (4 lines).      Telegrams: Luserv, Dublin."

**EDINBURGH**, 11 ... .. 60, Stevenson Road, Gorgie  
Telephone: Edinburgh 62921 (4 lines).      Telegrams: Luserv, Edinburgh."

**GLASGOW** ... .. 227/229, St. George's Road  
Telephone: Douglas 3075 (5 lines).      Telegrams: "Lucas, Glasgow."

**LEEDS** ... .. 64, Roseville Road  
Telephone: Leeds 28591 (5 lines).      Telegrams: "Luserdep, Leeds."

**LIVERPOOL**, 13 ... .. 450/456, Edge Lane  
Telephone: Old Swan 1408 (3 lines).      Telegrams: "Luserv, Liverpool."

**LONDON** ... .. Dordrecht Road, Acton Vale, W.3  
Telephone: Shepherds Bush 3160 (10 lines). Grams: "Dynomagna, Act, London."

**LONDON** ... .. 757/759, High Road, Leyton, E.10  
Telephone: Leytonstone 3361 (3 lines).      Grams: 'Luserdep, Walt, London."

**LONDON** ... .. 155, Merton Road, Wandsworth, S.W.18  
Telephone: Putney 5131 (5 lines)      Telegrams: "Luserv, Put, London."

**MANCHESTER** ... .. Talbot Road, Stretford  
Telephone: Longford 1101 (5 lines).      Telegrams: "Lucas, Stretford."

**NEWCASTLE-ON-TYNE**, 2 ... .. 64/66, St. Mary's Place  
Telephone: Newcastle 25571 (3 lines). Telegrams: "Motoite, Newcastle-on-Tyne."

## LIST OF B.S.A. STOCKISTS.

FOR SERVICE APPLY EITHER WHERE THE VEHICLE WAS PURCHASED OR TO THE LOCAL B.S.A. DEALER, OR TO ANY OF THE FOLLOWING B.S.A. MOTOR CYCLE SPARE PARTS STOCKISTS.

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Aberdeen	J. Dawson	24-26, Thistle Street	1272	
Aldershot	Phillips Bros.	Birchett Road and Cranmore Lane.	300	Phillips, Cycles, Aldershot.
Banbury	Trinder Bros.	3, Broad Street	146	Trinder, 146, Banbury.
Bedford	The Imperial Cycle Co.	58, St. Loyes	2374	
Belfast	W. J. Chambers	106, Donegall Pass	2263	Fastnote, Belfast.
Berwick-on-Tweed.	Lion Garages Ltd.	Lion Garage	15	
Biggleswade	Bryants	72, Shortmead Street	108	
Birkenhead	H. J. Marston	50, Argyle Street	2213	Notstram, Birkenhead.
Birmingham	County Cycle & Motor Co. Ltd.	301, Broad Street	2670	Midland Cornocyc, Birmingham.
" (Aston)	Falcon Cycle & Motor Depot (E. Newell).	54, Lozells Road	505	Northern
" (Edgbaston)	Chas. E. Cope & Sons Ltd.	15, Upper Hagley Road	1943	Bearwood
" (Hay Mills)	H. Bird & Sons	1045, Coventry Road	651	Victoria
" (Rubery)	Owen's Garage	New Road	3	Rubery Owen, Rubery, Birmingham.
" (Small Heath).	Scotts	545, Coventry Road	372	Victoria
" (Sparkhill).	A. Watkins	550 & 565, Stratford Rd.	946	Victoria
Blackburn	Shuttleworth & Geldart	15, Great Bolton Street	6678	
Blackpool	J. Hall	143, Church Street	795	
Blandford	Fianders' Garage	White Cliff Mill Street	57	Fianders' Garage, Blandford.
Bournemouth	Craze Bros.	475, Christchurch Rd., Boscombe.	63	Boscombe
"	S. Priestley	35, Seamoor Road	834	Priestley, Bournemouth.
Bradford	C. Sidney Ltd.	Blind Institute Buildings, Upper Piccadilly.	3116	
Bridgwater	Anderson & Wall.	18, St. Mary Street	116	Service, Bridgwater.
Brighton	Bridgers	20, Gloucester Place	5281	Brighton
Bristol	S. J. Fair	201, Cheltenham Road	2238	
Bury	Arthur Coyle	30-32, Walmersley Road	714	
Cambridge	King & Harper	6 and 7, Bridge Street.	1600	Motors, Cambridge.
Canterbury	G. R. Barrett & Son	30, St. Peter Street	386	Barrett Motors, Canterbury.
Cardiff	CarDistributors(Cardiff) Ltd.	155, City Road	3422	
Carlisle	W. T. Tiffen	Irishgate Brow	314	Tiffen, Irishgate, Carlisle.
Carmarthen	W. Edwards & Sons	Towy Garage	82	Edwards' Garage, Carmarthen.

## List of B.S.A. Stockists—continued.

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Chapel-on-le-Frith.	Lomas Bros.	Newfield Garage	2609	Whaley Bridge 100 [Tel.: Lomas Bros., Chapel-on-le-Frith.
Chatham	H. G. Russell	Medway Garage, Medway Street.		
Chelmsford	H. T. Hadler	New Street	227	Hadler, Chelmsford.
Cheltenham	Leslie Paynter	Bath Street	2887	Paynter's Garage, Bath Street, Cheltenham.
Chester	Davies Bros.	34, Bridge Street	510	
Colchester	The Motor Cycle and Light Car Depot.	119, High Street	2632	Medcalf, Colchester.
Coventry	Coventry Motor Mart Ltd.	London Road	3200	Coventry Motor Mart.
Croydon(West)	Godfreys Ltd.	228/234, London Road.	1214	Croydon Gofrable, London.
Darlington	Duplex Motor & Cycle Co	8-13, Grange Road	2071	Duplex, Darlington.
Derby	Kay & Scampton	14, Sadlergate	1131	Derby Kay, Sadlergate, Derby.
Doncaster	W. E. Clark & Co.	27 & 29, Station Road.	176	Cars, Doncaster.
Dorchester	Tilley's	31, South Street	14	Motors, Dorchester.
Dunstable	B. G. England	Half Moon Hill, Watling Street.	207	
Eastbourne	Bradshaw's	10, Terminus Road	1292	
East Grinstead	Fosters (East Grinstead) Ltd.	79, London Road	131	
Edinburgh	Alexander & Co.	113-115, Lothian Road	21176	Motorcycles, Edinburgh.
Evesham	Frank Morrall Ltd.	Central Garage, 20, Port Street.	54	
Exeter	Wessex Garage Co.	18-22, Longbrook Street.	2342	Wessex Garage, Exeter.
Frome	P. Difazio	25, Catherine Street	2121	Difazio, Frome
Gateshead	O. Carmichael & Son	81-83, High West Street	15	
Glasgow	Bell Bros.	223, St. George's Road	258	Douglas Motobike, Glasgow.
"	Alexander & Co.	272-280, Great Western Road.	3880	Douglas Alexmoto, Glasgow.
Gloucester	T. E. Harper	1, Worcester Street	1187	
Guildford	E. Pascall	107, Woodbridge Road	255	Guildford
Halifax	Halifax Motor Exchange	25, Horton Street	1400	Perfection, Halifax.
Hampton-in-Arden.	J. Pearson	Barston	5125	Hampton-in-Arden 30
Harrrogate	H. Acklam	11, Bower Road	5125	
Hawick, N.B.	Milligan & Bell	7, Bridge Street	179	
Haywards H'th	J. W. Dinnage	Wivesfield Road	294	
Hereford	A. Kear & Co.	52b, Commercial Street.	7239	Kear, Hereford

List of B.S.A. Stockists—continued.

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Hitchin	J. Chalkley & Sons	Brand Street	44	Chalkley's, Hitchin.
Horsham	Jackson Bros.	London Road	12	
Hove	Bradshaws	6, Western Road		Hove 4124
Huddersfield	Earnshaws	Manchester Road	1232	
Hull	A. E. Brown	474-48, Witham		Central 4162
Inverness	Alex Munro	40, Baron Taylor's Street	98	Munro, Iron-monger, Inverness.
Ipswich	Revet's	Barrack Corner Garage and St. Matthew's St.	2822	Revetts, Motors Ipswich.
Kingston-on-Thames	H. Taylor & Co.	135/7, London Road	1263/4	Dynametro, Kingston.
Launceston	J. Wooldridge & Son	Western Road	21	Wooldridge, Launceston.
Leeds	Watson, Cairns & Co. Ltd.	Lower Briggate	23379	Watson Cairns, Briggate, Leeds.
Leicester	E. W. Campion & Sons	Welford Place	58054	
Lincoln	West's (Lincoln) Ltd.	115c, High Street	762	West's Garage, Lincoln.
Liverpool	Cundle's	41, Byrom Street	Bank 6160	Seldnuv, Liverpool.
London, S.E.15	Boyer & Bentley	118, Peckham Rye	New Cross 3032	
"	W.1 . . . Godfrey's Ltd.	366-368, Euston Road	Museum 1402	Gofrabike, London
"	E.C.2 . . . J. Grose Ltd.	4, Old Jewry, Cheapside	Central 0166	Jogrospur, Phone, London
"	N.7 . . . J. Grose Ltd.	255-257, Holloway Rd.	Northern 1297	
"	S.E.6. . . E. Parks & Son	5 and 6, Central Parade, Catford.	Lee Green 2011	Mocycparts, Catgreen, London.
"	S.E.18. . . Cleare & Co. Ltd.	125, Woolwich High Street	Woolwich 174	
"	W.12. . . Turner's Stores	81-83, Goldhawk Road	Shepherd's Bush 2436	
"	E.7 . . . Lovett's Ltd.	418, Romford Road, Forest Gate.	Grangewood 1234	Lovettnoto, London
"	S.W.11 . . . Owen Bros.	19, Battersea Rise, Clapham Common.	Battersea 1299	
(Twickenham)	C.A. Blay	192, Heath Road	Popesgrove 2103	
Lowestoft	Taylor Bros.	75, London Road	510	
Luton	F. H. Moss	Park Street	1792	
Maidstone	Anstey Ltd.	30-34, Stone Street	432	Anstey 432, Maidstone.

List of B.S.A. Stockists—continued.

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Manchester	W. H. Jones	415, Bury New Road, Market Place, Higher B'ton.	2978	Hr. B'ton.
"	Colmore Depot	17, Watson Street		Coldep, Manchester.
"	Tom Davies	229, Deansgate		B'kfrsra 0536
"	Stretford Garage	1073, Chester Road, Stretford.		Longford 1998
Middlesbrough	Pallister, Yare & Cobb, Ltd.	134, Marton Road	2873	Payacob, Middlesbrough.
Nelson	Wilde & Co.	95 & 97, Manchester Rd.	524	
Newcastle-on-Tyne	Dene (Newcastle) Motor Co. Ltd.	Haymarket	21837	N'castle Ened, Newcastle-on-Tyne.
"	Kirsop, Murray & Co. Ltd.	12, Hood Street	1566	
Newport(Mon)	V. T. Waite	79, Commercial Street	2716	Wamobike, Newport (Mon.)
Northampton	P. C. Spokes	1, Henry Street	1160	
Norton (Malton, Yorks.)	Bower's Motor Exchange	Church Street		Malton Bower, Malton.
Norwich	H. Chapman	42, Duke Street	921	Chapman, Duke Street, Norwich.
Nottingham	E. W. Campion & Sons	Station Street	2961	
Oxford	Laytons of Oxford	New Road	3381	Integrity, Oxford.
Perth	M. Shaw & Sons	22, Mill Street, and 137-143, High Street.	483	Shaw's Garage Perth.
Peterborough	Burrows Bros.	57, Westgate	154	
Peterhead	J. Campbell & Sons	344-38, St. Peter's Street	172	Campbell, Peterhead.
Plymouth	A. E. Snell (Mrs.)	95/7, Old Town Street	1706	Tyres, Plymouth.
Portsmouth	G. E. Minnell	Russell Street		
Preston	Loxham's Garages Ltd.	Charnley Street, Fishergate.	4242	Loxham's, Preston.
Pulborough (Sussex)	Gray & Rowsell	Fittleworth Station, Burygate.	Bury 4 (Sussex) 1143	
Reading	Fortescue Bros. Ltd.	1 and 2, West Street	1143	
Redhill	The Redhill Motor and Cycle Works.	50, Brighton Road	327	
Rhyl	Nelson's	39, Queen Street	130	Nelson's Garage, Rhyl.
St. Austell	S. H. Kellaway & Sons	South Street Garage	102	
Salisbury	W. Rowland & Sons	86-106, Castle Street	170	Motors, Salisbury
Sheffield	Walter Wragg Ltd.	Wellington Street	26098	Wragg, Sheffield 26098.
Sherborne	Sheppard's Garage (Sherborne) Ltd.	Sherborne Garage, South Street.	85	Dyer, Sherborns.
Shetland	Thomson's Motor Garage & Marine Engine Works.	Eplandae, Lerwick	85	Thomson's Garage, Lerwick.
Shrewsbury	J. C. Pickering	49, Mardol and Smithfield Road.	2730	

# List of B.S.A. Stockists—continued.

Town.	Name of Stockist.	Address.	Telephone No.	Telegraphic Address.
Southampton	Alec Bennett	Broadway Garage, Portswood.	S'hampton. 74081	
Southport	H. F. Brockbank	62, King Street	5054	
Southsea	Percy Kiln Ltd.	Elm Grove	Portsmouth 4793	Percy Kiln, Southsea.
Stirling	Westfield Autocar Co., Ltd. (Inc. George Owen)	69 & 81, Port Street	66179	
Stockton-on-Tees.	S. Jones, Motor Eng.	Bridge Road	66179	
Stoke-on-Trent.	J. & N. Bassett	Howard Place, Shelton	Harley 2890	
Stratford-on-Avon.	A. Bolland & Co.	Guild Street	14	Bolland, Stratford-on-Avon.
Sunderland	Dunn & Jameson	100-106, Hylton Road	4088	Motors, Sunderland.
Sutton-in-Ashfield.	W. Henstock	29-43, Forest Street	90	Henstock, 90, Sutton-in-Ashfield.
Swadlincote	S. W. Wroughton	High Street Garage	114	Wroughton's Garage, Swadlincote.
Swindon	J. Easter & Sons	8-10, King Street	Swindon 786	
Taplow (Bucks.)	H. E. West	Bath Road	270	Burnham West, Taplow.
Taunton	W. P. Edwards	58, East Street	243	Edwards, Motorcycles, Taunton.
Thetford	W. & G. Lambert Ltd.	Cycle & Motor Works	17	Lambert's, Thetford.
Tunbridge Wells	G. E. Tunbridge	2, Vale Road	416	Tunbridge Motors, Tunbridge Wells.
Warsop (Notts)	E. Poynton	Central Garage, Market Place	21	
Watford (Herts.)	Lloyd Cooper & Co. Ltd.	61, Queen's Road	2125	
Wednesfield	Wednesfield Motor and Cycle Garage.	Wolverhampton Road	Fallings Park 31372	
Wellingborough	H. V. Briggs Ltd.	High Street	163	Briggs Motors, Wellingborough.
Westcliff-on-Sea.	J. Costin & Son	237, London Road, Southend.	1095	
Weston-super-Mare.	W. Driver & Co.	20, Waterloo Street		
Weybridge	W. L. Lewis & Son	51, Church Street	210	
Weymouth	Tilley's	The Esplanade	72	Motors, Weymouth.
Winchester	Winchester Cycle and Motor Co.	Jewry Street	728	
Windsor	S. A. Surplice	37 and 39, Sheet Street	200	
Workington	J. Wilkinson	43, Washington Street	166	Wilkinson's Garage, Workington.
Worthing	F. Wheatland	56, Broadwater Street (West).	Worthing 1224	
Yarm-on-Tees	T. B. Dobson & Sons	High Street	Eaglescliffe 118	
Yeovil	The Yeovil Motor Mart	Hendford	267	Motor Mart, Yeovil
York	C. S. Russell	32, Lawrence Street	744	Russell, Lawrence Street, York

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