

# OWNER'S HANDBOOK

**Rocket** **3** **MODEL A75**  
750 cc

# OWNER'S HANDBOOK

for

# B.S.A. Rocket 3

Model A75

Western U.S.A.:

**B.S.A. MOTOR CYCLES—WESTERN,  
2745 E. HUNTINGDON DRIVE,  
DUARTE, CALIFORNIA 91010.**

Eastern U.S.A.:

**B.S.A. INCORPORATED,  
639 PASSAIC AVENUE,  
NUTLEY, NEW JERSEY 07110.**

**B.S.A. MOTOR CYCLES LIMITED**

**ARMOURY ROAD, BIRMINGHAM 11, ENGLAND**

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TELEGRAMS AND CABLES: "SELMOTO", BIRMINGHAM

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## INTRODUCTION

This booklet is intended to give the owner of a new B.S.A. Rocket 3 details of the general maintenance which is required for the normal operation of his motor-cycle. It should be studied carefully, together with the additional literature supplied by the manufacturers of proprietary components, to enable the owner to become fully conversant with all aspects of the adjustments, lubrication, etc., necessary to keep his motor-cycle in first-class condition.

The owner should remember that by taking a pride in the maintenance of his machine, it will give increased pleasure, retain its original superlative finish and especially its incomparable performance.

The handbook does not contain information necessary to carry out major overhauls, but if any owner feels he has sufficient mechanical knowledge and facilities for this type of work, a comprehensive Workshop Manual is available from his dealer, covering every aspect of dismantling and reassembly.

When applying for the manual, or when writing on any subject connected with the motor-cycle, always give the motor and frame numbers. This will enable the dealer to give prompt service.

The motor number will be found on the left side of the crankcase below the cylinder base and the frame number on the left side of the front motor mounting.



## TECHNICAL DATA—*continued*

### WHEELS, BRAKES & CLUTCH:

Front wheel—	
Hub ... ..	Full width
Brake diameter ... ..	8 in. (20.3 cm.)
Brake type ... ..	2 L.S. (specially ventilated)
Tire ... ..	3.25 × 19 Dunlop K70
Tire press ... ..	24 p.s.i. (1.7 kg/cm. <sup>2</sup> )
Rear wheel—	
Brake diameter ... ..	7 in. (17.8 cm.)
Brake type ... ..	1 L.S. — 1 T.S.
Tire ... ..	4.10 × 19 Dunlop K81
Tire press ... ..	28 p.s.i. (2 kg/cm. <sup>2</sup> )
Clutch ... ..	Single plate, dry

### CARBURETTERS:

Type ... ..	Amal "Concentric"
Choke size ... ..	27 mm.
Main jet ... ..	150
Pilot jet ... ..	622/107
Throttle valve ... ..	3
Needle position ... ..	2
Needle jet ... ..	.106 (622/122)

### GENERAL DIMENSIONS:

Wheelbase ... ..	56¼ in. (144 cm.)
Ground clearance ... ..	7 in. (17.8 cm.)
Seat height (unladen) ... ..	32 in. (81.3 cm.)
Overall height ... ..	45 in. (114.3 cm.)
Overall length ... ..	88 in. (223.5 cm.)
Overall width ... ..	32½ in. (82.5 cm.)
Dry weight ... ..	468 lbs. (212 kg.)

## BREAKING-IN A NEW ENGINE

Remember that your ROCKET 3 is as new inside as it is outside and must be well "broken-in" before the motor can be given any really hard work. **This is a most important part in the whole life of the motor** because the handling it receives during the first 1,500 miles determines the service it will provide in return. During this time, ride the motor-cycle with restraint for the first 500 miles and since the machine is fitted with a tachometer, do not exceed 3,500 r.p.m. in any gear. The throttle opening can then be increased progressively after the first 500 miles until, at 1,500 miles the breaking-in process is completed.

Remember also that your motor develops an enormous amount of power, runs at high speed, and handles a great deal of heat. Give it every opportunity to settle down.

As a further aid to the breaking-in process, ease the work of the motor by using the transmission to reduce the load on inclines and avoid violent acceleration. Make no attempt to ascertain the maximum speed of the motor-cycle, until the first 1,500 miles are completed. If the model is put through its paces too soon, there will be risk of piston seizure and other troubles, which may have a lasting effect on the motor and in any case it will not give its best performance until after it is properly broken-in.

Keep a careful check on the oil level. A new motor tends to run a little hotter than one which is well broken-in, and because the circulating oil not only lubricates but also cools, the additional heat absorbed by the oil may cause it to overheat **if the quantity is too small for safety. It must never be allowed to fall below the minimum level on the dipstick.**

After the first 250 miles, and again at 500 miles, drain and refill the oil tank with fresh oil and clean the filters. The oil in the transmission case should also be changed after the first 500 miles.

A motor-cycle as good as the ROCKET 3 deserves only the finest lubricants and details of the correct grades and brands of oil are given in the table of recommended lubricants on page 20.

NOTE:—It is important that after the specified mileage, the machine is returned to the B.S.A. dealer for inspection, in accordance with the details given on the Warranty Registration Card.

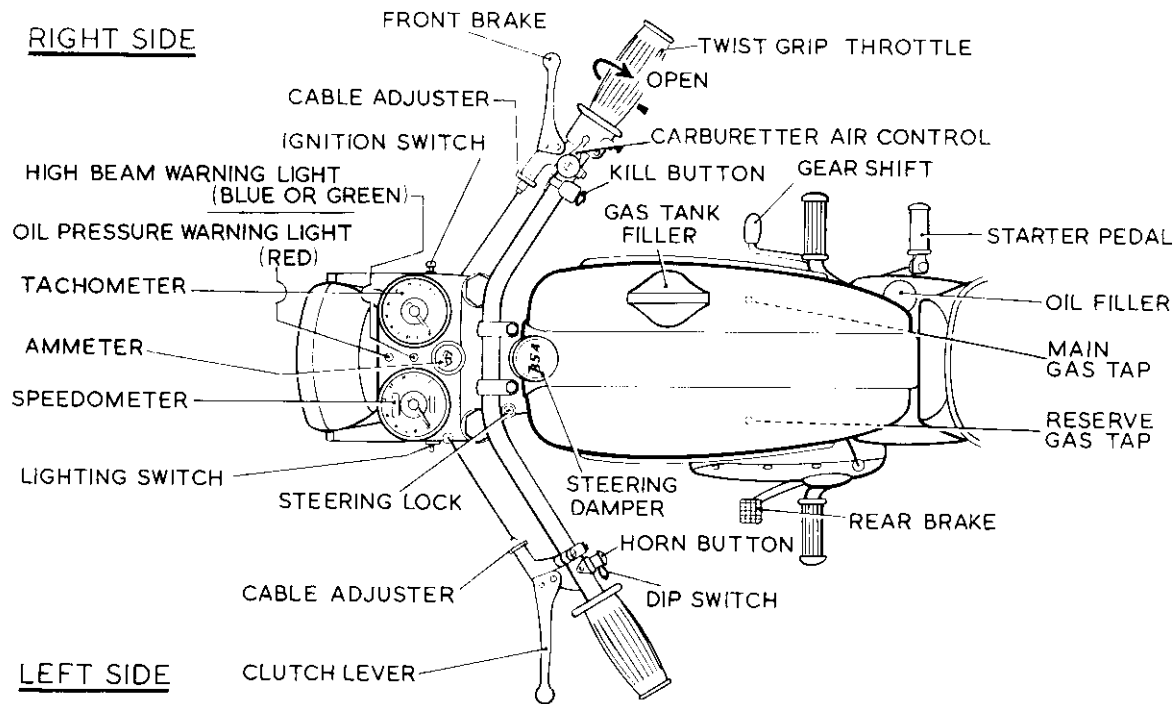


FIGURE 1. *The controls.*

## THE CONTROLS

### HANDLEBAR CONTROLS

**Twist-grip Throttle.**—To open the throttle (i.e., to increase motor speed) turn the grip so that the top moves towards the rider. A "stop" is provided by adjuster screw (*J*) and locknut (*K*), which should be set to avoid tension in the cable at full throttle, without effecting the maximum opening of the throttle valves in the carburetter (Fig. 6).

Excess slackness in the cable can be removed by means of an adjuster (*G*) and locknut (*F*) at the carburetter end of the cable, Fig. 28.

Rotary stiffness of the twist-grip can be varied by means of the adjuster screw (*D*) and locknut (*E*), Fig. 6.

The twist-grip body can be moved after slackening the screws (*H*) Fig. 6.

**Front Brake Lever.**—Finger adjustment is provided for the cable at the abutment on the lever, Fig. 1.

**Carburetter Air Control.**—On the right handlebar, mounted above the front brake lever (see Starting Instructions, page 12 and Fig. 6).

**Clutch Lever.**—Finger adjustment is provided for the cable at the abutment on the lever, Fig. 1.

**Headlight Dip-switch.**—The housing is mounted on the left handlebar at (*D*), Fig. 2).

**Horn Push.**—This is combined in the same mounting as the dip-switch on the left handlebar at (*E*), Fig. 2.

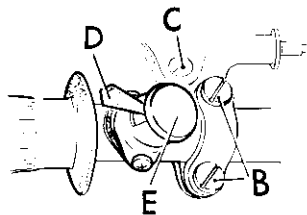


FIGURE 2.  
*Adjustment of the  
left handlebar  
control.*

**Kill Button.**—Press (*F*) Fig. 6, to stop the motor. Afterwards, switch off the ignition and remove the key if leaving the machine.

### OTHER HAND CONTROLS

**Gas Taps.**—Turn down the levers to open the taps. For normal running, open the right side tap only, when a reserve supply will be retained which can be fed to the carburetters after the left side tap is opened, Fig. 3. Always turn off the taps when parking. The taps can be removed as necessary, for cleaning of their filters. For sustained high speeds it may be found necessary to use both taps together.

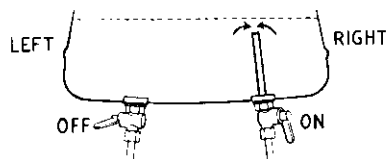


Fig. 3.  
*Using the  
reserve supply  
of gas.*

**Lighting Switch:**—Located on the left side of the instrument binnacle, the three positions of the switch are: (a) all lights off, (b) parking lights, (c) headlight, tail light and instrument lights, with separate switch on the handlebar controlling main and dipped headlight beams.

**Ignition Key.**—Turn clockwise to switch on and leave in this position when the motor is running. The key, located on the right side of the instrument binnacle, is detachable when in the “off”, or counter-clock position, and should be removed when leaving the machine.

**Carburettor “Tickler”.**—When depressed, this device prevents the float from rising thus raising the level of fuel in the float chamber (see also Starting Instructions, page 12).

**Steering Lock.**—To operate, turn the handlebars to the left, then turn the key counter-clock to release the plunger, which registers with a socket on the frame. Remove the key and keep in a safe place.

**Steering Damper.**—Turning clockwise increases the friction damping on the movement of the steering head. This device should be regarded as for use at very high speeds only.

## FOOT CONTROLS

**Gear-shift Lever:**—The mechanism is of the “positive-stop” type and following a gear shift, the lever returns to its central position as soon as foot pressure is released. Neutral position is between first and second gear and gear shifts are made by pressing the lever down to shift down, and raising it to shift up (Fig. 8).

**Starter Pedal.**—Depression of this pedal rotates the engine.

**Rear Brake Pedal.**—This is equipped with an adjustable stop and it should be set so that the pedal pad lies comfortably below the foot, ready for instant use. The method of adjustment is given on page 11 after which, re-adjustment of the rear brake may be required.

**Stop-light Switch.**—Whenever the brake pedal has been adjusted, check that this switch is still operative. If necessary, re-adjust as described on page 11.

## INSTRUMENTS

**The Speedometer** (Fig. 4).—The “trip” reading can be set to zero by turning the knob (*K*) in the direction of the arrow.

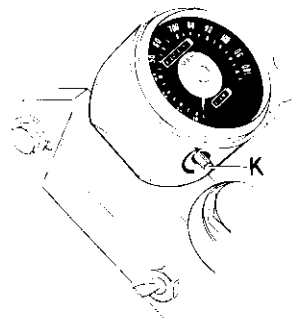


FIGURE 4.  
*Re-setting the  
speedometer trip  
reading to zero.*

**Tachometer.**—Driven from the exhaust camshaft, this instrument records motor revolutions per minute.

**Ammeter.**—This records the rate of charge (·|·) or discharge (—) of the battery.

**Headlight High Beam Warning.**—The blue (or green) light mounted between the speedometer and tachometer is illuminated only when the high beam is in use. It is extinguished under all other circumstances.

**Oil Warning Light.**—The red light mounted between the speedometer and tachometer is illuminated when the pressure

in the motor lubricating system is below a pre-determined figure. It will be visible when first switching on the ignition, but should be automatically extinguished a few seconds after the motor starts and remain extinguished while the motor is running. **If the red light becomes visible at any time other than with a stationary motor, stop immediately and investigate the cause. If this is not done, serious damage will be caused to the motor due to insufficient lubrication.**

#### ADJUSTMENTS TO THE CONTROLS

Most of the controls are adjustable and should be positioned so that they lie naturally for immediate action by hand or foot. Badly positioned controls cause discomfort when riding and poor control of the machine.

**Handlebars** (Fig. 5).—The position is adjusted after slackening the bolts (A). Tighten these securely after the adjustment is completed.

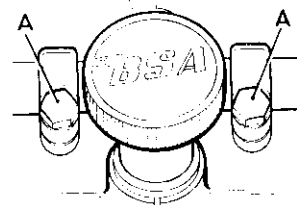


FIGURE 5.  
*The bolts securing  
the handlebars.*

**Handlebar Levers** (Figs. 2 & 6).—The levers can be moved after slackening the screws (B), which must be securely tightened afterwards. The looseness of the lever is adjusted by rotation of screw (C), after slackening of its locknut.

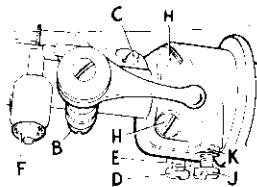
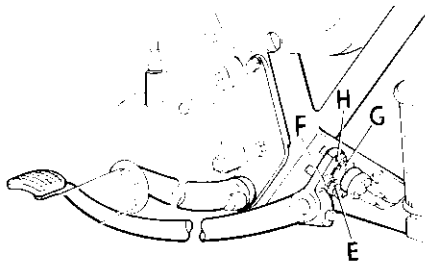


FIGURE 6.  
*Adjustment of the right handlebar control and twist grip.*

**Brake Pedal** (Fig. 7).—The pedal can be positioned by means of the adjuster pin (E) which is locked by nut (F), and its pad should be set just below the foot. This may then mean some attention to the adjuster at the end of the rod to avoid excessive slackness or, alternatively, binding of the brake.

FIGURE 7.  
*Adjustment of the brake pedal and stop-light switch.*



**Stop-light Switch** (Fig. 7).—Following any adjustment of the brake pedal, the stop light operation can be reset by the screw (G) after slackening its locknut (H).

With the switch plunger fully depressed and the brake pedal against its stop, there should be  $\frac{1}{2}$  in. gap between the screw (G) and the plunger.

The stop light is also operated by a non-adjustable switch (A) in the front brake cable (Fig. 29).

**Gear Shift Lever** (Fig. 8).—The lever can be moved to a new position after slackening the pinch bolt (H). Withdraw the lever from its shaft, replace on a new serration and firmly tighten the bolt.

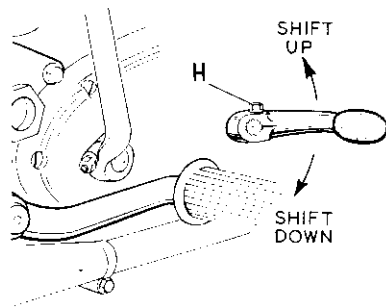


FIGURE 8.  
*Adjustment of the gear shift lever.*

## PREPARING FOR THE ROAD

Before using the machine make sure that the oil tank, transmission case, primary chaincase and front forks are filled

with oil to the correct levels, and that the battery is filled and charged. Normally these preparations will have been made by the dealer, but if there is any doubt, make certain that the levels are in accordance with the details given in the later chapters.

The new owner should familiarize himself with the action of all the operational controls **before attempting to ride the motor-cycle**—it is too late to learn the effect of using the various controls when the machine is on the move, and may even be dangerous.

### BRAKING

By merely closing the throttle, gentle but definite braking is obtained and the use of the motor as a brake is to be recommended for wet or icy roads, when a shift to a lower gear will increase the braking effect.

Endeavour always to apply the brakes when the machine is upright, but if it is necessary to use the brakes when cornering, then they must be applied gently. Always use both brakes together, apply them smoothly and progressively, and operate the front brake slightly before the rear one. Never brake or accelerate fiercely on bends or wet roads.

### LUBRICATION SYSTEM

The oil is contained in a separate compartment, from which it is fed to a double-gear pump. The oil is delivered under pressure via a ball valve, to the motor bearings etc., and

### STARTING

Stand astride the motor-cycle and before attempting to start, make sure that the gears are in the neutral position, which lies between first and second gears. (If the machine is in gear, it will move forward when the starter pedal is depressed).

Turn on the main gas tap (see page 8).

If the motor is cold, depress the carburetter ticklers (*P*) Fig. 27 momentarily, and close the air control lever, Fig. 1.

Fit the ignition key and turn clockwise to the "on" position.

Open the throttle slightly, Fig. 1, and slowly press down the starter pedal until resistance is felt; then, without releasing the pressure on the pedal, give a firm downward swing, which should start the motor.

Gradually open the air control as the motor warms up.

NOTE 1.—The spark timing is automatically retarded for starting and advances as the motor speed increases.

NOTE 2.—When starting with a warm motor, the air control lever should remain in the fully open position.

then drains down to the bottom of the crankcase to a small sump. It is then returned to the tank, via an oil cooler.

### Oil Flow

Returning oil can be seen if the tank filler cap is removed while the motor is running. **If there is no flow from the pipe, stop the motor immediately and investigate the cause.**

## CHANGING THE OIL

This should be carried out when the oil is warm and will flow more freely. All the filters must be cleaned at the same time.

### Draining the Oil Tank

Take off the side panel to expose the oil tank and then remove the gauze filter (*A*) Fig. 10, which also serves as a drain plug. Wash out the tank with clean kerosene, afterwards making sure that none is left inside. Replace the filter, using a new sealing washer if necessary.

### Draining the Oil Cooler

First take off the gasoline tank and then disconnect the oil lines to the top of the cooler. It is preferable to release the clips on the pipes and not the union nuts. Remove the side panels (*D*) Fig. 9, followed by the two bolts which attach the cooler carrier to the frame bracket and withdraw the cooler block and carrier complete. The bolts pass through rubber mountings which must be carefully retained.

Drain out all the oil and wash the interior thoroughly in clean kerosene, afterwards making sure that none is left inside.

When reassembling, note that the two bolts (*A*) and (*B*),

Fig. 9, are fitted in opposite directions (i.e. with their nuts at *C*).

### Draining the Primary Chaincase

The oil in the chaincase is complementary to the lubricating system and must be included in the oil changing routine. Details for draining are given on page 24.

### Refilling

Replenish the tank with one of the motor oils given in the table on page 20. The tank capacity is 6 U.S. pints (5 British pints) and "high" and "low" levels are shown on the dipstick.

Replenish the primary chaincase with motor oil as detailed on page 20.

Run the motor for a few moments, and then check the oil level, adding a sufficient quantity to restore the level to the "normal" mark. This is necessary because a quantity of oil will be retained in the cooler etc.

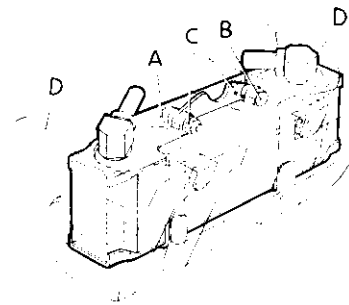


FIGURE 9.  
*The oil cooler  
and its  
connections.*

## THE OIL FILTERS

Three filters are included in the lubricating system, and these should be cleaned whenever the oil is changed.

### Tank Filter

The oil tank filter (*A*) Fig. 10, is of gauze and is unscrewed from the tank. Wash thoroughly in kerosene, make sure it is dry, and that the sealing washer is intact before replacing.

### Crankcase Filter

The full-flow filter (*B*) Fig. 10, is contained in the right side of the crankcase and can be withdrawn after unscrewing its retaining cap (*C*). **This filter must be replaced every 4,000 miles (6,000 Km.).** When fitting the new filter, make sure that the hole in the end and the rubber sealing washer are at the inner end of the filter chamber and that the spring is assembled with the cap. Also check the condition of the sealing washer beneath the cap, replacing if necessary.

### Crankcase Sump Filter

The crankcase filter (*D*) Fig. 10, is retained by the sump plate beneath the crankcase, and removal of the six bolts allows the filter to be withdrawn. Wash thoroughly in kerosene and dry before replacing. Check that the gaskets are in good condition, renewing if necessary to make an oil-tight joint. It is important to replace the sump plate the correct way round, i.e. with the deep portion beneath the pump scavenge pipe.

NOTE:—To ensure immediate lubrication of internal parts, add half a pint of motor oil to the crankcase and operate the starter pedal twenty or thirty times with the ig-

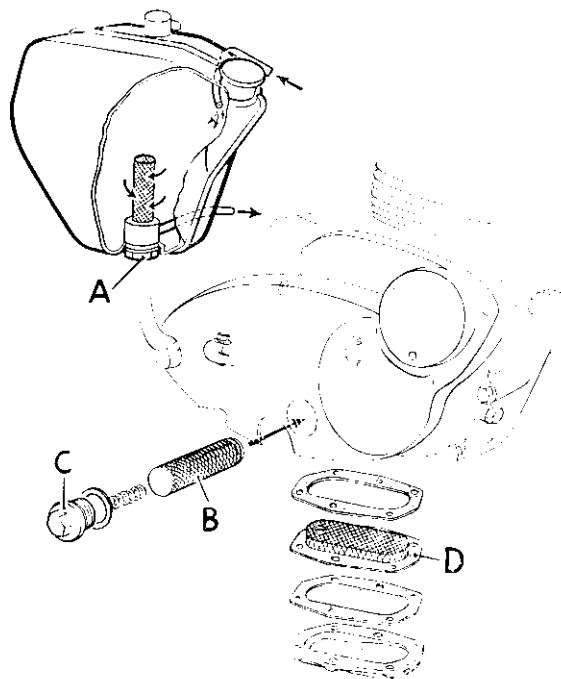


FIGURE 10. *The filters in the lubrication system.*

nition switched off, until oil is seen issuing from the return pipe in the tank, before starting the engine.

The oil can be inserted through the spark timing plug aperture in front of the crankcase (Fig. 17) or added to the rocker box (Fig. 12), in which case ample time must be allowed for the oil to drain down to the crankcase. It will also be necessary to allow sufficient space in the oil tank to receive the additional quantity of oil.

This procedure should also be followed when the motor cycle has not been used for an appreciable time.

#### Oil Pressure Control Valve

Mounted on the rear of the crankcase behind the primary chaincase, this valve (*N*) Fig. 11, is pre-set during manufacture and **does not need attention** until such time as the motor is dismantled for overhaul.

#### Delivery Ball Valve

This valve (*P*) Fig. 11, inserted in the oilway from the pump to the motor bearings, prevents oil flowing from the tank to the crankcase by gravity when the motor is stationary for

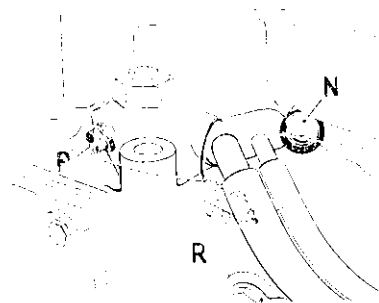


FIGURE 11.  
*View from below  
the crankcase with  
shield removed,  
showing the  
pressure control  
valve and the  
delivery ball valve.*

long intervals. **It does not need attention until** such time as the motor is dismantled for overhaul.

#### Oil Pressure Switch

The switch does not require any maintenance apart from ensuring that its electrical connections are clean and tight. It is located below the crankcase at (*R*) Fig. 11.

## MOTOR ADJUSTMENTS

#### Valve Clearances

To check the clearances, first take off the gasoline tank and side panels (*D*) Fig. 9. Then remove the rocker covers (*C*) Fig. 12. Sufficient clearance is provided for the exhaust rocker cover to be removed without disturbing the oil

cooler.

The adjusters are mounted on the rocker arms which are exposed after removal of the covers. A specially angled wrench is provided in the toolkit for use with the exhaust tappet adjusters. The correct clearances, which in all cases

should be checked or adjusted when the engine is cold are:—

Intake .006 in. (.15 mm.)

Exhaust .008 in. (.203 mm.)

Put the machine on its center stand, engage high gear and remove the spark plugs. Then, by rotation of the back wheel by hand in either direction, the valves can be set in the correct position for checking the clearances.

Each cylinder and its valves must be treated individually, but the procedure is the same for each.

Turn the motor in a forward direction until the intake valve of the selected cylinder has just closed (i.e. the push rod is just free to rotate) and check the exhaust valve clearance.

Rotate the motor in a forward direction again, until the

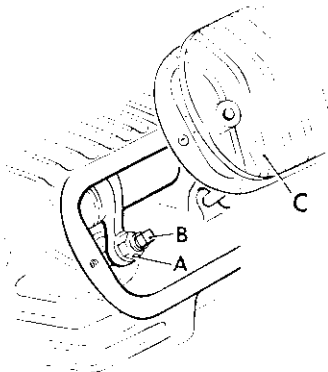
exhaust valve is just about to open, and check the intake valve clearance.

The clearances can be measured with the aid of 'feeler' gauges of the thickness given above.

If adjustment is necessary, first slacken locknut (A) Fig. 12, and reset the pin (B) until the clearance is correct. Hold the pin in this position and retighten the locknut. Check the clearance again to ensure that the adjustment has not altered.

Repeat this procedure for the remaining cylinders and valves. When replacing the rocker cover examine the gasket, renewing if necessary to ensure an oil-tight joint. Note that the intake and exhaust covers are not interchangeable.

FIGURE 12.  
*Adjustment of the  
valve clearances.  
An intake valve is  
shown but the method  
is the same for all  
valves.*



### Spark Plugs

The spark plugs recommended for the ROCKET 3 are Champion type N3.

At intervals of 4,000 miles (6,000 Km.) remove the plugs and have them cleaned on an abrasive blast machine. The sparking surfaces of the electrodes should then be dressed with a fine file in order to restore clean, flat and parallel surfaces.

Reset the gap to .020 in. to .025 in., making the adjustment by bending the side electrode only.

The gaskets fitted to Champion spark plugs are designed to last for the life of the plug, which should be replaced every 10,000 miles.

When refitting the plugs, screw in as far as possible by hand, using a socket wrench for the final tightening.

The firing order of the cylinders is 1, 3, 2 (No. 1 is the cylinder on the right side, No. 3 on the left), and the high-tension cables to the spark plugs are fitted with numbered sleeves to ensure correct connections.

#### Air Filter (Fig. 13)

The filter element must be removed and cleaned at intervals of 4,000 miles (6,000 Km.).

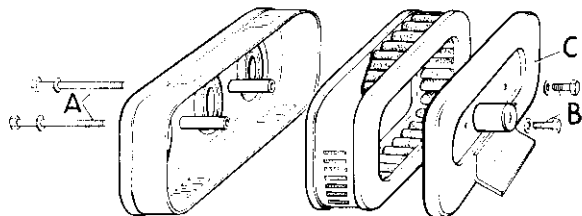


FIGURE 13. Access to the air filter.

First remove the left side panel to expose the filter unit and disconnect the breather pipe on the filter cover.

Two long bolts (A) retain the filter unit and when these are unscrewed it can be taken off the machine for dismantling.

Remove the two short bolts (B), lift off the cover (C), and withdraw the filter element. This is of felt which should first be washed in gasoline and then thoroughly dried before replacing.

#### Contact Breaker (Fig. 14)

Check each pair of contact breaker points after the first 500 miles and thereafter in accordance with the details given under Routine Maintenance, page 21.

Remove the spark plugs and turn the motor until the selected pair of points are wide open.

Check the gap with a .015 in. (0.38 mm.) gauge. If, for example, No. 1 is incorrect, slacken the fixing screw (D) and adjust the fixed contact point by means of the eccentric pin (E) until the gap is correct. Retighten the screw (D) and check for adjustment.

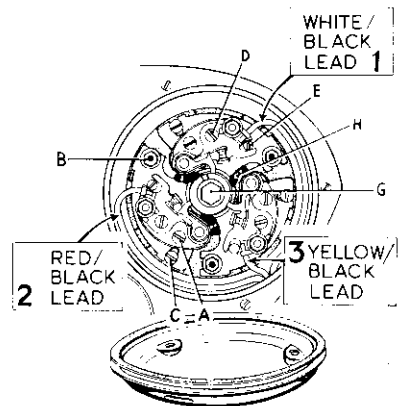


FIGURE 14.  
The contact  
breaker unit.

Repeat this procedure for the remaining two sets of contact points.

#### *Cleaning*

The points must always be kept clean. If burned or blackened, clean with fine carborundum stone or very fine emery cloth, afterwards wiping with a cloth moistened with clean gasoline.

#### *Lubrication*

Apply a **very small amount** of thin grease to the felt pads (*H*) which lubricates the cam (see table of Lubricants, page 20). Do not use an excessive quantity because the contact points must be kept free from contamination, otherwise difficult starting and misfiring may occur. At the same time turn the motor until the cam slot (*J*) is uppermost and apply **one spot** of clean motor oil to lubricate the cam spindle.

**Auto-advance Mechanism.**—This is concealed behind the contact breaker back plate. Unscrew the three pillars (*B*), securing the plate and lift off, complete with the three sets of contact points.

Check that the governor weights move freely and that, if the cam is turned by hand against the spring tension and then released, the weights are seen to open and close. Lubricate their pivots with **one spot** of clean engine oil.

**Spark Timing.**—This is best checked by the use of a "Strobelite", for which there is a special aperture on the motor timing cover and marker lines on the alternator rotor but

before making any check or adjustment allow several minutes to elapse for the oil in the timing case to return to the crankcase, otherwise the marks may become obscured. Repeat this operation as required. Owners without a strobelite are advised to take their machines to a B.S.A. dealer, but for those who possess such an instrument, timing is carried out as follows:—

First make sure that all the contact breaker gaps are correctly set to .015 in. (0.38 mm.) when fully open, as described on page 17, and reset if necessary.

The spark timing for each cylinder is checked and adjusted separately, that for the right side cylinder being controlled by the contact breaker assembly No. 1, Fig. 14, for the left side cylinder by assembly No. 3, and for the center cylinder by assembly No. 2. To avoid incorrect assembly, the leads are colored to suit the different contact breakers as indicated in the illustration.

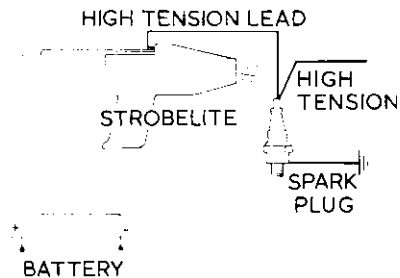


FIGURE 15.  
*The Strobelite connections.*

Remove the top screw from the inspection cap on the timing cover, slacken the lower screw (with pointed end) and allow the cap to swing down to the position shown in Fig. 16. Re-tighten the pointed screw.

Now connect the strobelite to the spark plug in, say, the center cylinder in accordance with the diagram, Fig. 15, which includes the use of an independent battery—not the one on the machine.

Start the motor and run it at a speed of not less than 3,250 revs-per-minute to ensure that the spark is fully advanced.

With the strobelite beam projected through the inspection aperture, the marker line on the rotor will appear to become stationary and if the timing is correct, will be exactly opposite to the pointer.

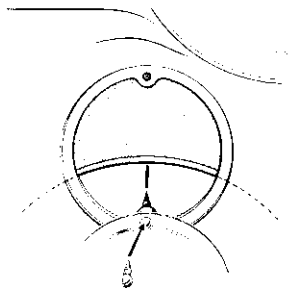


FIGURE 16.  
*Timing the spark  
by Strobelite.*

If incorrect, the contact breaker assembly must be moved round slightly (either clockwise or counter-clock until the correct condition is obtained).

To adjust the contact breaker assembly for, say, the center cylinder, slacken the screw (A) and pillar bolt (B) Fig. 14, which secure the assembly to the back plate, and adjust the eccentric pin (C).

Retighten (A) and (B) firmly when the adjustment is completed.

Repeat this procedure for the two remaining cylinders and corresponding contact breaker assemblies.

#### **Spark Timing (manual method)**

Alternative provision is made for checking the spark timing for owners who do not possess a strobelite. First check, and reset if necessary, that the contact breaker points are set to

*(continued on page 22)*

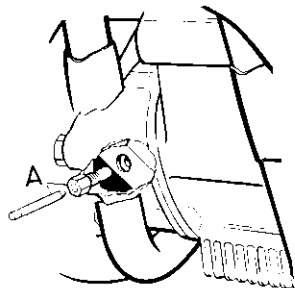


FIGURE 17.  
*Setting the crank-  
shaft for spark  
timing by the  
manual method.*

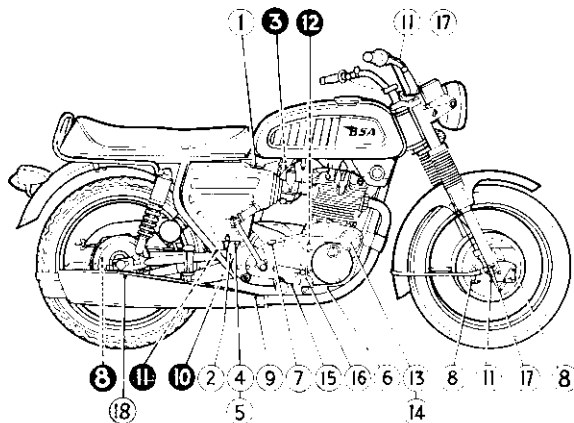
## ROUTINE MAINTENANCE

### LUBRICANTS

B.S.A. motor oil is specially blended in U.S.A. for B.S.A. motor-cycles and whenever this oil is available, its use is to be preferred.

Where this oil is not obtainable, the following excellent brands of lubricants are recommended for use both Summer & Winter. Suitable lubricants are also given for other parts of the machine.

Alternative Recommended Lubricants				Grease
Brand	Motor & Primary Chaincase	Transmission Case	Front Forks	
Castrol	XL or GTX	Hypoy 90 E.P.	Castrolite	Castrolcase L.M.
Shell	Super Motor Oil 100	Spirax 90 E.P.	Super Motor Oil 101	Retinax A
Mobil	Super	Mobilube GX.90	Super	Mobilgrease MP or special
Regent	Havoline 20W/50	Multigear 90 E.P.	Havoline 10W/30	Marfak All Purpose
Esso	Motor Oil 20W/50	Gear Oil 90 F.P.	Motor Oil 10W/30	Multi-purpose H
B.P. Energol	Super ViscoStatic 20W/50	Gear Oil 90 E.P.	Super ViscoStatic 10W/40	Energrease L2



Lubrication Diagram

(Black circles refer to the left side of the machine, clear circles refer to the right side of the machine.)

The lubricants shown on the chart are those suitable for temperate countries, such as North America, Europe etc. Where climatic conditions are extreme, some alteration may be necessary bearing in mind the higher the temperature, the higher is the S.A.E. number required.

It is always advisable to make sure that the oil is warm before driving at high speed.

When taking part in competitive events advantage should be taken of any warming-up period, to get the motor warm and the oil circulated.

NOTE:—All the motor oils (including B.S.A. oil) are of the multigrade type and all transmission case oils are "extreme pressure" lubricants.

## ROUTINE MAINTENANCE

ADJUSTMENTS ETC.	Page	Ref. No.	LUBRICATION	Page
<b>Every Week</b>			<b>Every 250 Miles</b>	
Examine battery acid level ... ..	35	1	Check level in oil tank ... ..	13
Check tire pressures ... ..	5			
<b>Every 2,000 Miles</b>			<b>Every Week</b>	
Check all nuts and bolts, tighten if necessary ...		3	Oil carburettor control linkage ...	
Clean and check contact breaker points gap ...	17			
Check action of auto-advance mechanism ...	18		<b>Every 2,000 Miles</b>	
Check adjustment of rear chain ... ..	25	13	Lubricate contact breaker cam ...	18
Check brake adjustment ... ..	30	14	Lubricate auto-advance mechanism ...	18
Check spark timing ... ..	18	7	Check oil level in transmission case ...	23
		10	Grease brake pedal pivot ... ..	
<b>Every 4,000 Miles</b>		11	Lubricate exposed cables and joints ...	
Check valve clearances ... ..	15	2	Grease rear swinging fork pivot ...	33
Clean and adjust spark plugs ... ..	16	9	Grease central stand (2) ... ..	
Clean air filter ... ..	17	18	Grease speedometer drive ... ..	30
Check adjustment of primary chain ... ..	24	11	Grease clutch cable ... ..	
Check clutch operation ... ..	26			
Check wheel alignment ... ..	25		<b>Every 4,000 Miles</b>	
Check adjustment of steering head ... ..	32	4, 1	Drain and refill the oil tank ... ..	13
Check headlight beam ... ..		5	Clean oil tank filter ... ..	14
		6	Clean crankcase filter ... ..	14
<b>Every 10,000 Miles</b>		15	Drain and refill transmission case ...	23
Examine brake linings, clean brake drums ...		8	Grease brake cam spindles ... ..	30
Drain and re-fill front forks ... ..	32	16	Replace full-flow oil filter cartridge ...	14
Examine rear suspension for correct action ...	34	12	Drain and refill primary chaincase ...	24
Clean and re-pack wheel bearings with grease ...	30			
<b>As Required</b>			<b>Every 10,000 Miles</b>	
Gas tap filters ... ..	8	17	Drain and refill front forks ... ..	32

.015 in. (0.38 mm.) when fully open, as described on page 17.

Next, fix the auto-advance mechanism in the fully advanced position, as follows: Remove the center bolt (G) Fig. 14, and replace its washer with another having a hole just large enough to fit over the cam bearing, to allow the washer to press against the side of the cam. Replace the bolt, but before tightening, rotate the cam to its limit in a clockwise direction, hold in position and tighten the bolt.

Remove the timing plug from the front of the crankcase, Fig. 17, and slowly rotate the motor until say, the center piston is at the top of its compression stroke, when both valves will be closed. If the valves are partly open the piston is on the wrong stroke and the motor must be rotated through one complete turn. Now rotate the motor **backwards** very slowly until a small hole in the crankshaft web is in line with the hole in the crankcase. Insert the special service tool (A), Fig. 17, into the crankcase and locate the plunger in the crankshaft hole. The center piston is now correctly positioned for spark timing.

Check that the contact points in the No. 2 assembly, Fig. 14, are just opening. If incorrect, slacken the screw (A) and pillar bolt (B) and adjust the eccentric pin (C) until this condition is obtained. Firmly retighten (A) and (B).

The best way of determining the precise instant of opening of the contact breaker points is to connect a small battery and bulb in series with the points, Fig. 18.

Repeat this procedure for the two remaining cylinders and note that the spark timing for the right side cylinder is controlled by the contact points assembly No. 1 and that for the left side cylinder by assembly No. 3.

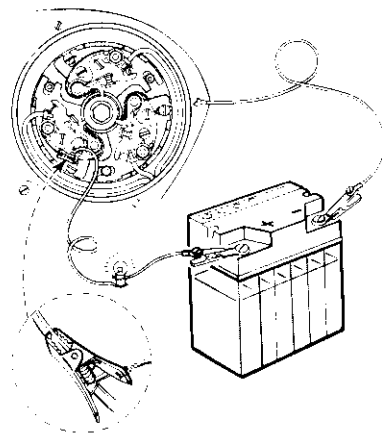


FIGURE 18.  
*The connections for checking the opening of the contact breaker points.*

## TRANSMISSION (GEARBOX)

### Lubrication

The level of the oil in the case is given on the dipstick attached to the filler cap.

To drain, remove the plug (*S*) Fig. 19, and also the filler plug (*T*).

To refill, replace the drain plug and add approx. 2½ U.S. pints (2 British pints) of gear oil (see Lubricants, page 20) through the filler aperture.

Temporarily replace the filler cap, then withdraw it and

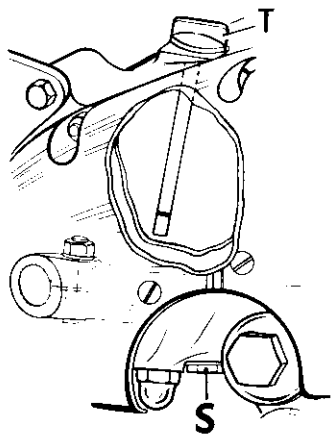


FIGURE 19.  
*The transmission case oil level.*

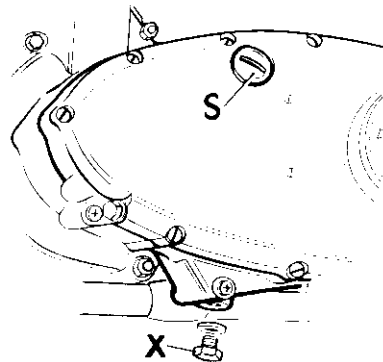


FIGURE 20.  
*Lubrication of the primary chain.*

check that the quantity of oil agrees with the level shown on the dipstick, adding or draining oil as necessary to give the correct level. Replace the filler cap firmly.

The drain plug sealing washer must be in good order to prevent oil leaks.

NOTE:—For the oil level to be correct, the motor-cycle must be standing on its wheels on level ground.

### Ratios

Overall ratios (see page 4) are changed by changing the rear wheel sprocket.

## THE CHAINS

The triple-row primary chain runs on fixed centers and is not fitted with detachable links.

### Primary Chain Lubrication

To drain the oil, remove the plug (*X*) Fig. 20, and the filler cap (*S*).

Replace the drain plug and add  $\frac{3}{4}$  U.S. pint ( $\frac{1}{2}$  British pint) of motor oil through the filler aperture.

The chaincase forms part of the lubrication system and after filling, there will be no need for further attention until the case has to be drained again.

### Primary Chain Adjustment

Check the slackness of the primary chain through the filling

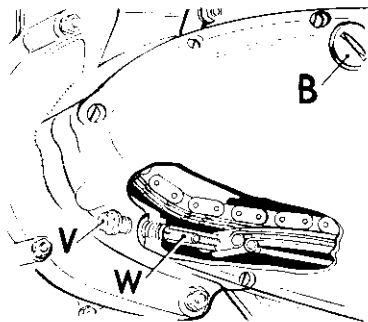
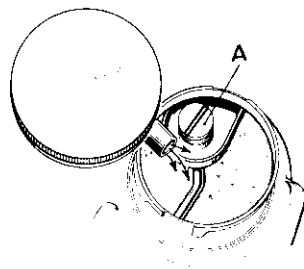


FIGURE 21.  
*The primary chain tensioner.*

FIGURE 22.  
*Regulation of the oil supply to the rear chain.*



aperture at (*B*) Fig. 21.

This should be approximately  $\frac{3}{16}$  in. total up and down movement and to adjust remove the cap screw (*V*) Fig. 21, bring a cylinder on to its compression stroke and hold it there with the kickstarter pedal. This removes slackness from the lower run of the chain. Retaining the pedal in this position, the slackness in the top run of the chain can be adjusted by application of a screwdriver to the sleeve (*W*) until the correct free movement is obtained.

Before replacing the cap, make sure that the sealing washer is in good condition, replacing if necessary.

### Rear Chain Lubrication

An adjustable supply of oil is fed from the tank on to the lower run of the rear chain.

The screw adjuster (A) Fig. 22 is located inside the oil tank filler neck and after removal of the cap, adjust the screw clockwise to reduce the oil flow and counter-clock to increase it.

#### Rear Chain Adjustment (Fig. 23)

Place the machine on its center stand, and rotate the rear wheel until the position is found where the chain has its smallest amount of play.

The total up and down play in the chain at this point must be  $1\frac{1}{2}$  in.

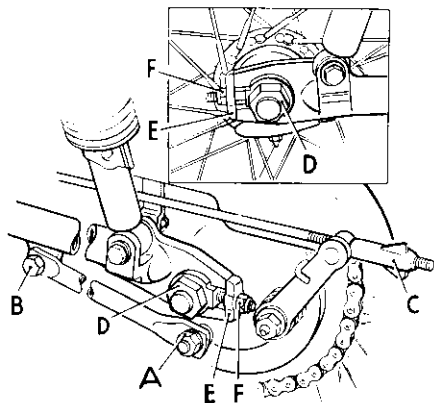


FIGURE 23.  
*Adjustment  
of the  
rear chain.*

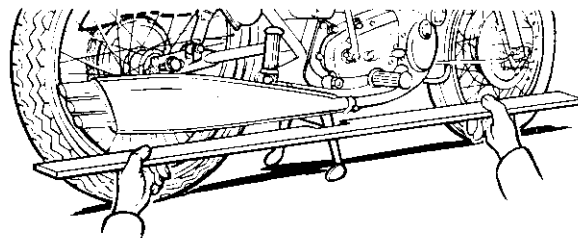


FIGURE 24.

*Applying the straight-edge to check wheel alignment.  
(A step of .42 ins. is necessary to suit difference in tire sizes.)*

If adjustment is required, first slacken the torque arm connections (a nut A at the brake plate and a nut and bolt B at the opposite end) and then the brake adjuster (C) by a few turns. Loosen the wheel spindle nuts (D).

Draw bolt chain adjusters (E) are used at both sides of the wheel and their nuts (F) must be **tightened by the same amount** until the chain slackness is as given above.

Tighten the spindle nuts and check the chain adjustment.

Retighten the torque arm connections and adjust the brake as required.

#### Wheel Alignment

If the wheel alignment was satisfactory before the adjust-

ment was made and the adjuster nuts were tightened equally, then the wheels should remain in alignment. If in any doubt, the alignment must be checked for accuracy, correction being made as required at the adjuster on the right side of the wheel.

To check, use a straight-edge, Fig. 24, modified to accommodate the center stand, difference in tire sizes etc.,

and apply as high above ground level as possible, at the same time keeping it horizontal.

For the wheels to be in line, the straight-edge must touch both tire walls at two points.

NOTE:—Misalignment of the wheels will cause poor steering, and rapid wear of the chain and sprockets.

## THE CLUTCH

### Clutch Control Lever Adjustment

Removal of the cover (*N*) Fig. 25, exposes the clutch operating lever.

Screw in the cable adjusters at the handlebar, Fig. 1, and above the transmission at (*A*) Fig. 25, to allow the cable to become slack.

Release the locknut (*R*), then, holding the sleeve nut (*M*) stationary, unscrew the operating rod (*P*) with a screwdriver until the clearance between the sleeve nut and the thrust bearing behind it is taken up, **without the use of force**. Then slacken the operating rod back by a quarter of a turn. **It is important that this figure is not exceeded, but it is equally important that a small amount of end-float is present.** Tighten the locknut securely, and re-adjust the cable length in accordance with the instructions in the next section.

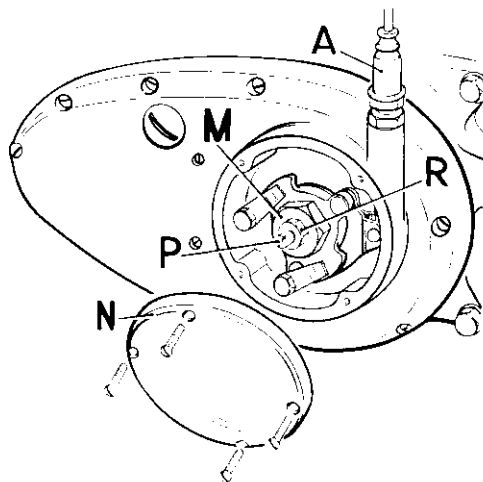
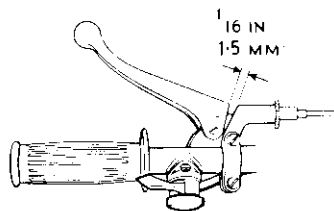


FIGURE 25.

*The clutch control lever and its operating cable.*

FIGURE 26.  
*Adjustment of the  
clutch lever at the  
handlebar.*



### Clutch Lever Clearance

Slackness in the cable can be taken up at the adjusters but a small amount of free play must be left in the cable, Fig. 26, otherwise there is risk that the clutch may not fully engage. Grease the cable at regular intervals (see page 21).

## THE CARBURETTORS

Each carburetter supplies a mixture of air and gasoline in four stages according to the throttle opening and operates automatically.

The control of the mixture at idling and low speeds is by the pilot jet which has an adjustable air supply (*J*) (Fig. 27). Both the pilot air screw and the throttle stop screw have "O" rings to retain the adjustment.

At moderate speeds the mixture is adjusted between the pilot and needle jet range of throttle opening by the amount of "cut-away" in the throttle slide.

For higher speeds, the taper needle which passes through the needle jet provides a metering effect for the flow of fuel and because the needle is attached to the throttle slide, a balanced mixture is always provided as the throttle opens.

The main jet controls the fuel supply at speeds above that controlled by the taper needle and its jets.

To remove either the pilot jet (*L*) Fig. 27, or the main jet (*M*), first remove the float bowl retained by screws (*N*). A wrench is required for the main jet and a screwdriver for the pilot jet.

The air slide is required for use only when starting or when running with a cold motor. It should be opened gradually as the motor warms up and at normal motor temperatures it should remain wide open.

Comprehensive tuning details are given in the Workshop Manual.

### Running Adjustments

The main jet, throttle valve, needle and needle jet sizes are selected by the factory to give the best results and should not be altered without expert advice. It may, however, be necessary to make small adjustments to the pilot mixture to suit different climatic conditions and give good idling.

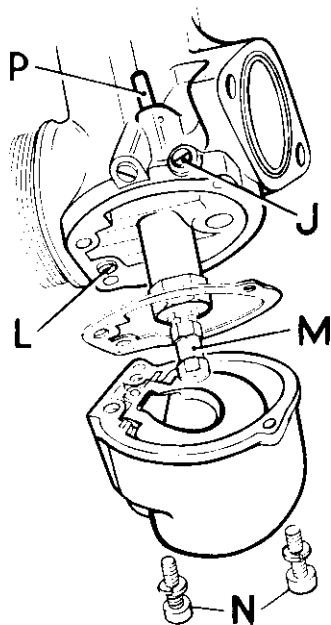


FIGURE 27.  
 The carburetter  
 "exploded" to show  
 access to the jets,  
 pilot adjuster, tickler  
 and float bowl screws.  
 All carburetters are  
 the same except for  
 left- or right-hand  
 construction.

Always make any carburetter adjustments with the engine at its normal running temperature.

The settings given on page 5, are those normally recommended and will be suitable for most atmospheric conditions. They are intended for altitudes of 0—3,000 feet. Above this height some reduction in main jet size is necessary to provide a balanced mixture. At altitudes of 3,000—6,000 feet a reduction in main jet size by 5% is usually necessary, and for every 3,000 feet increase over 6,000 feet a further 4% reduction is required.

#### Pilot Mixture Adjustment

Screwing in the pilot air screw (*J*) Fig. 27, restricts the air supply, thus giving a richer mixture, and unscrewing it gives a lean mixture. Whenever adjustment is made to the pilot air screw on one carburetter, it must be accurately repeated on the remaining carburetters.

Alternatively, to ensure equal settings, the air screw may be adjusted inwards as far as possible **without the use of force**, and then unscrewed again by approx.  $\frac{3}{4}$  turn, the same setting being adopted for each carburetter. The amount by which the air screw is unscrewed can be varied to suit requirements.

If the motor runs too fast, it may be necessary to adjust the master slow-running screw (*H*) Fig. 28.

#### Throttle Cable

Excessive slackness in the cable can be taken up by adjustment of the sleeve screw (*G*) after releasing its locknut (*F*).

Individual setting of the throttle slides is by means of adjusters (*D*) Fig. 28, after releasing the locknut (*A*). They are correctly set at the factory but, if adjustment is made, it must be identical on each carburetter.

#### **Slow Running**

The motor idling speed can be increased or decreased by adjustment of the master screw (*H*) Fig. 28, which controls all the carburetters simultaneously.

#### **Air Valve Control Cables**

The cable abutment (*B*), and locknut (*C*) Fig. 28, at each of the carburetters is adjustable to allow the cable lengths to be varied individually as necessary to ensure equal opening of the air valves.

The single cable between the handlebar control lever and the junction box is fitted with a sleeve adjuster which serves as a master adjustment for the simultaneous opening of the air valves.

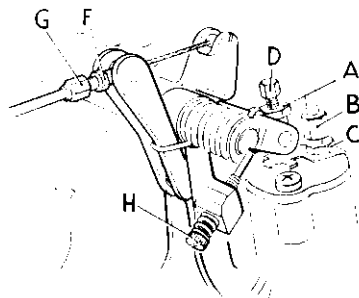


FIGURE 28.  
*The throttle control linkage for the carburetters.*

## **WHEELS**

#### **Tires**

At weekly intervals, the inflation pressures should be checked carefully. Under-inflation will not only seriously effect the life of the tire, but will also effect the steering.

The pressures recommended in the Technical Data pages are for a rider of 170 lbs. weight. If the riders weight or additional load due to luggage or a pillion passenger exceeds 170 lbs., increase the tire pressures as follows:—

#### **FRONT TIRE:**

Add 1 p.s.i. for every 28 lbs. increase above 170 lbs.

#### **REAR TIRE:**

Add 1 p.s.i. for every 14 lbs. increase above 170 lbs.

Removing a tire from the rim is a straightforward task, provided that a simple sequence of operations is followed

and these are fully described in the booklet issued by the Dunlop Company, a copy of which is supplied with this handbook.

Tires are marked with one or more white spots on the wall, and if the tire is removed, it must be replaced with the spot in the same place, i.e., at the valve in the case of the front wheel, and between the security bolts in the case of the rear wheel.

### Hubs

Both hubs are fitted with ball journals which do not require adjustment. The bearings are packed with grease during assembly and no further greasing is required until the hubs are dismantled for complete overhaul (see page 21). Details of this operation are given in the Workshop Manual.

### Speedometer Drive

The unit requires no attention apart from lubrication at intervals (see page 21). Grease with **two applications from a hand grease gun only.**

### Brake Cam Lubrication

Grease with a **single application from a hand grease gun** at regular intervals (see pages 20 and 21).

### Brake Adjustment

The brakes should be adjusted whenever the hand lever or foot pedal movement has become excessive.

A finger adjuster (*B*) is provided at the end of the operating rod for adjustment of the rear brake, Fig. 30, and another at the handlebar lever, Fig. 1, for adjustment of the

front brake cable. Further adjustment is provided for the front brake mid-way in the cable at (*B*), Fig. 29.

A two-leading-shoe brake is used in the front wheel and the shoes are correctly set before leaving the factory. It should not be necessary to adjust the coupling rod (*C*), Fig. 29, until such time as the shoes are replaced. Details of this operation are given in the Workshop Manual.

### Front Wheel Removal and Replacement

Place the motor-cycle on its center stand. Slacken the brake cable at its handlebar adjuster, and uncouple the cable from the brake by removing the spring clip from the clevis (*E*)

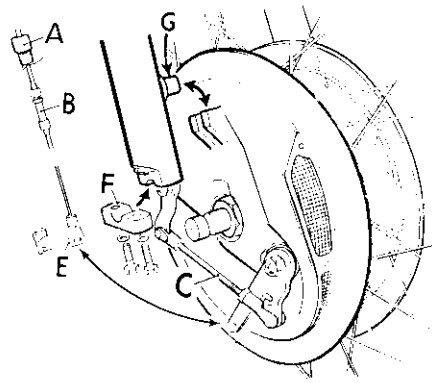


FIGURE 29.  
*Removal of  
the front  
wheel.*

Fig. 29, on the brake lever.

Remove the fork leg end caps (*F*) and as the bolts are removed, support the wheel in order to avoid damage either to the bolts or their threads.

Lower the wheel to the ground and when the brake plate is clear of the tongue (*G*) on the fork leg, the wheel can be removed.

When replacing the wheel, first engage the brake plate slot with the fork leg tongue and then raise the wheel spindle into position in the forks. Replace the caps (*F*) and insert the bolts, locating these in the grooves in the wheel spindle. Tighten the bolts equally on each side, finally tightening securely in position.

### Rear Wheel Removal

To facilitate removal of the wheel, uncouple the chain connecting link and unwind the chain from the wheel sprocket only, but leave it in position on the transmission sprocket.

Unscrew the brake adjuster (*B*) from its rod and the nut (*C*) locking the torque arm to the brake plate. Disconnect the speedometer drive cable at its union nut (*D*) Fig. 30.

Finally, unscrew the wheel spindle nuts (*E*) and slide the wheel rearwards out of the fork ends and on to the ground. Stand at the left side of the rear wheel facing across the machine and incline it towards the rider; then reach over the seat and take the wheel out rearwards and to the right of the machine.

When the wheel is out of the frame, take every care to ensure that the setting of the chain adjusters (*F*) is not

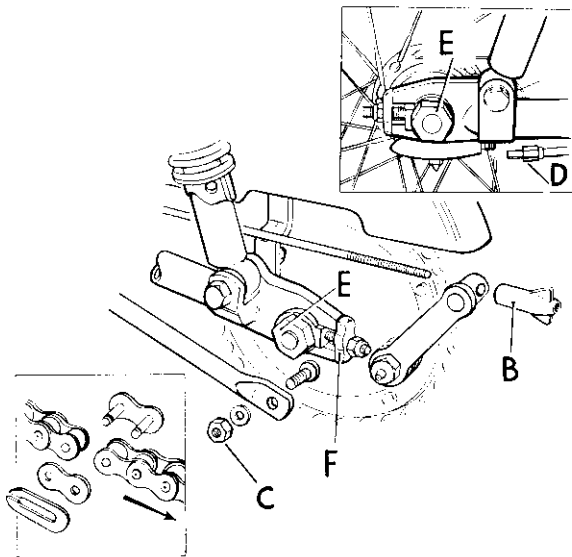


FIGURE 30.  
*Removal of the rear wheel.*

disturbed.

After the wheel is replaced make certain that the chain adjusters are pressed firmly against the fork ends. It is also

advisable to check the chain adjustment and wheel alignment.

**Important:**—When replacing the connecting link, make sure that the closed end of the “hairpin” spring clip is pointing in the direction of travel of the chain (i.e., forwards on the top run).

### Wheel Balancing

Front wheels are balanced before the machine leaves the factory by means of special weights attached to the spokes.

As soon as the machine is broken-in and the initial stiffness has been eliminated, check that the wheel is still in balance.

The wheel is in balance when, if it is turned gently and released, it shows no tendency to stop in any particular position.

If the wheel always stops in the same position it is unbalanced and weights must be added to the appropriate spokes until correct balance is obtained.

When balancing the rear wheel, disconnect the chain and remove from the wheel sprocket.

**Important:**—When replacing the connecting link, make sure that the closed end of the “hairpin” spring clip is pointing in the direction of travel of the chain (i.e., forwards on the top run).

## FRONT AND REAR SUSPENSION

### Front Fork Damping

The only servicing required by the front forks is the changing of the oil at the specified intervals (see page 21).

Unscrew the cap nuts (*A*) Fig. 31, at the top of each fork leg and the drain screw (*B*) at the bottom of the sliding member.

Allow all the oil to drain out, then apply the front brake and compress-and-release the forks a few times to drive out any oil which may remain in the system.

Replace the drain screws, after making sure that their sealing washers are in good condition, raise the cap nuts (*A*) a few inches and pour  $\frac{3}{8}$  U.S. pint ( $\frac{1}{2}$  British pint) of oil

into each fork leg (see Lubricants, page 20). Replace the cap nuts and tighten firmly.

### Steering Head Adjustment

Check the steering head bearings for looseness after the first 500 miles. Stand astride the machine, and place the fingers of the left hand on the joint between the steering head and the top bearing cover, Fig. 32. Apply the front brake and rock the machine backwards and forwards when any play will be felt immediately.

To adjust, place the machine on its center stand and unscrew the steering damper knob to expose the head nut (*C*), Fig. 31. Slacken the top yoke pinch bolt (*D*) and bottom

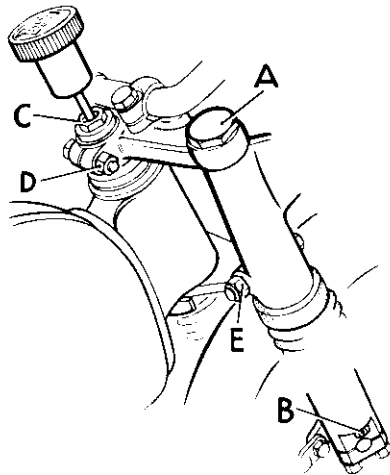


FIGURE 31.

*The front forks showing the adjustment for the steering head. Filling and draining screws for the damping fluid are also shown.*

yoke clamp bolts (*E*)—one on each leg of the forks.

Tighten the head nut (*C*) until the play is only just taken up.

Hold the handlebars lightly and move them round slowly, when the steering should feel free, and the forks turn smoothly. If the movement is rough, it is an indication that the adjustment is too tight or that the bearings are damaged.

When the adjustment is correct, **firmly tighten the clamp and pinch bolts** and replace the steering damper knob.

#### Rear Swinging Fork Pivot

The pivot bushes require greasing at maximum intervals of 2,000 miles. One greasing point is provided and grease should be applied until it exudes from both pivots.

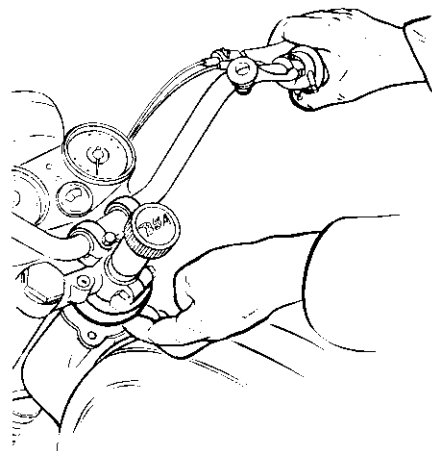
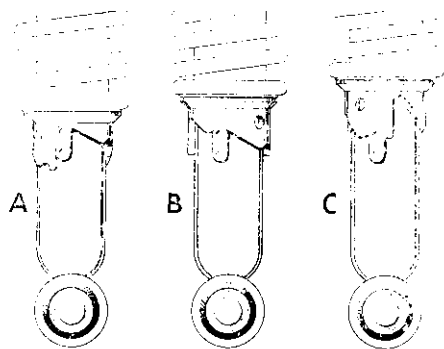


FIGURE 32.  
*Checking for play in the steering head.*

FIGURE 33.  
*Varying the  
rear suspension  
spring  
loading.*



### Rear Suspension Dampers

The two suspension damper units comprise an enclosed coil spring with its movement hydraulically damped. The damper is completely sealed during manufacture and does not require any attention.

Static loading on the spring can be varied by a three-position ring cam adjuster, Fig. 33. Position "A" is for the lightest loading, position "B" for medium loads, and position "C" for heavy loads.

A special wrench is provided in the toolkit for this adjustment and the cams on both units must be set in the same notches to ensure balanced loading.

## ELECTRICAL EQUIPMENT

Electrical energy in the form of rectified alternating current passes to the battery from a 6-pole A.C. generator which is mounted on the crankshaft. The rectifier converts the alternating current output of the generator to uni-directional current which is essential for battery charging and the zener-diode varies the charging rate according to the state of the battery.

All electrical connections must be clean and tight.

### Rectifier

The nuts clamping the rectifier plates together must not under any circumstances be slackened, because the pressure

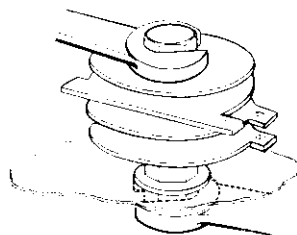


FIGURE 34.  
*The correct  
method of  
tightening the  
rectifier to its  
mounting.*

has been carefully set during manufacture to give correct rectifier performance. A separate nut secures the rectifier to the toolbox and when tightening the rectifier, apply the wrenches as shown in the illustration.

### Battery

Access to the battery is obtained by removal of the left side panel. The battery can be withdrawn after releasing its retaining strap.

At weekly intervals and at more frequent intervals in hot climates, check the level of the electrolyte in each of the cells. If necessary, add distilled water to the level given by the line on the battery casing.

Never leave the battery in a discharged condition. If it is to be out of use for a time, have it fully charged, and every two weeks give it a short refreshing charge at .7 ampere to prevent any sulphation of the plates.

The system is designed for use with positive (+) earth connections and if the battery connections are reversed, the equipment will be damaged.

It is most important that, whenever the battery leads are being attached, the **positive (+) lead must be connected to the frame.**

### Zener-Diode

This device is mounted behind the finned carrier beneath the headlight. It controls the rate at which the battery is charged and does not normally require attention apart from being kept clean. If it is disturbed at any time the fixing nut must be tightened with a torque of not more than 28 lb.in. (.32kg.M) or less than 24 lb.in. (.276 kg.M).

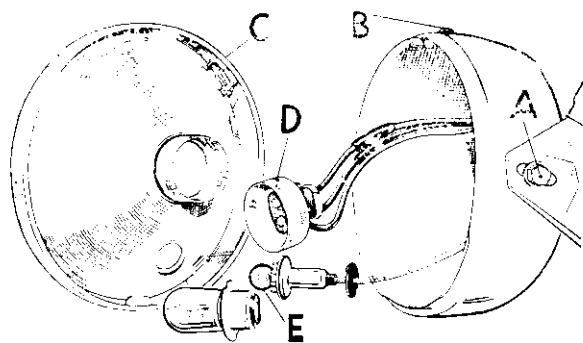


FIGURE 35.

*The dismantled headlight showing the adjustable mountings.*

### Condensers

These are in a pack mounted in front of the battery platform. They do not need any attention other than ensuring that their connections are clean and tight.

### Contact Breaker

Check the gaps after the first 500 miles and thereafter in accordance with the details in Routine Maintenance, pages 17 and 21.

### Headlight

The light is adjustable at its side mountings (A) Fig. 35, and

can be set to meet various lighting regulations.

In addition to carrying the main bulb, the headlight also carries the parking light and both are accessible after slackening the front rim retaining screw (*B*). Disengage and withdraw the front rim and light unit assembly (*C*), removing the upper edge first. To remove the main bulb, press the adapter (*D*) inwards and turn counter-clock.

### Parking Light

The bulb holder (*E*) Fig. 35, is a push-fit in the reflector (see notes under Headlight).

### Oil Pressure and High Beam Warning Lights

The bulbs are accessible from inside the binnacle and are a pushfit in their housings. It will simplify this operation if the headlight is first dismantled.

### Bulbs

The list of bulbs is as follows:—

Head	...	...	...	12 volt, 50/40 watts
Parking	...	...	...	12 volt, 6 watts
Main Beam Warning	...	...	...	24 volt, 2.2 watts
Instruments	...	...	...	12 volt, 2.2 watts
Oil Pressure	...	...	...	24 volt, 2.2 watts
Rear	...	...	...	12 volt, 5/21 watts

### Fuse

An in-line fuse is inserted in the feed cable (—) from the battery. The container carries a spring-loaded 35 ampere fuse retained by a bayonet cap (Fig. 36).

If the fuse fails, it indicates a fault in the electrical circuit which must be rectified before the fuse is replaced. **Spare fuses should always be carried.**

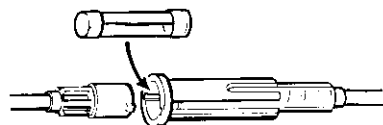


FIGURE 36.  
*The in-line fuse dismantled.*

### Wiring Diagram

This is shown in Fig. 37. The insulation of the wires is individually colored as given in the table.



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