

# HINTS AND TIPS

FOR



TWO-PORT OVERHEAD VALVE  
MOTOR CYCLES.

Nov. 1st, 1928.



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MOTOR CYCLES.

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# Hints and Tips for Royal Enfield

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## Two-Port Overhead Valve Motor Cycles.

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- 1 **Foreword.** The Royal Enfield two-port O.H.V. motor cycles have been introduced to meet the demand for fast powerful machines which are moderate in weight and adequately silenced. Both the 346 cc. and 488 cc. O.H.V. engines provide ample power for all needs, while the duplicated exhaust systems enable two large silencers to be used, which give a pleasantly quiet exhaust note without undue back pressure and its attendant evils of overheating, etc.

The 346 cc. engine will appeal to the rider who appreciates a high efficiency engine of relatively small capacity. It develops its power at a high speed and has a fairly high compression ratio. For the best results with this engine, we recommend the use of an "anti-knock" fuel such as benzole mixture or ethylised petrol.

The 488 cc. engine develops its power at a lower speed than does the 346 cc., and will therefore appeal to those who consider small high-speed engines to be "fussy," while its lower compression ratio enables it to run perfectly satisfactorily on No. 1 petrol.

Both models embody the results of many years' experience in competition and racing, backed by experimental work, and the resources of one of the best equipped motor cycle factories in the world.

### OPERATION OF THE MOTOR CYCLE.

- 2 **To Start up Engine.** Fill up with petrol and oil. Turn on the oil to the mechanical pump, and turn the adjusting wheel on the pump to the left as far as it will go. Turn on the petrol and depress the "tickler" of the carburettor once or twice. Place the gear control lever in the neutral position, close the air lever, open the throttle lever about one quarter, raise the exhaust valve lifter, and smartly depress the kick starter, allowing the exhaust valve to drop about half-way down the stroke of the kick starter lever. If the engine fails to fire first or second time, repeat with a slightly different throttle opening. The best position of the throttle lever for starting will soon be found from experience. When the engine is running, partly open the air lever.

The ignition lever should be slightly retarded for starting. In the case of a new machine, allow the engine to run gently for a few minutes with the oil turned full on in order to ensure that an adequate supply reaches the engine, then turn the oil indicator to position 2 or 3.

## ROYAL ENFIELD TWO-PORT MOTOR CYCLES.

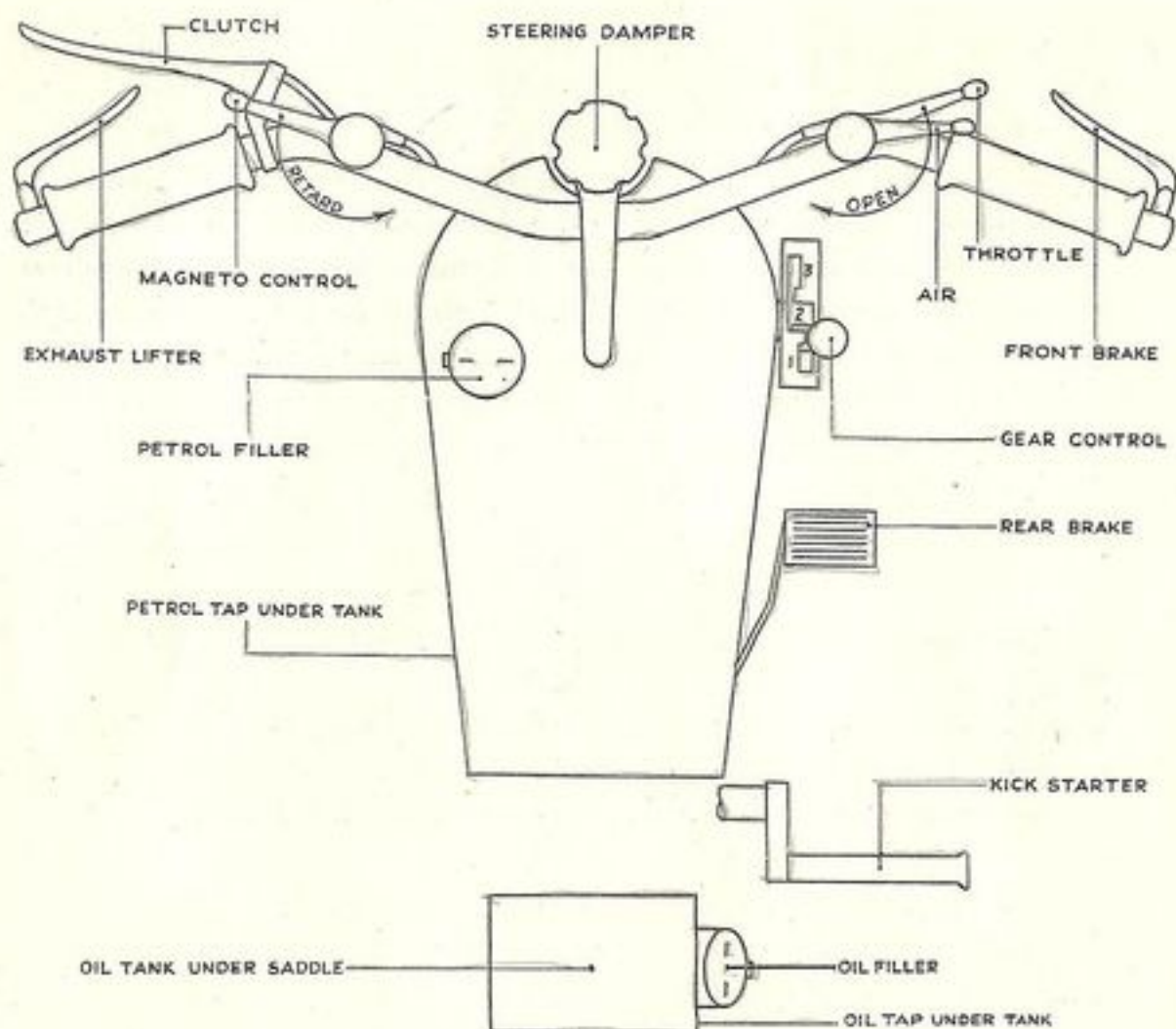


Diagram of Controls.

- 3 To Start the Machine.** Pull up the clutch lever and engage the lowest gear by pulling the gear control lever smartly back into the low gear position. Slowly release the clutch lever ; at the same time accelerate the engine by opening the throttle slightly and the machine will move away without jar or jerk. When the machine has attained sufficient speed, partly close the throttle, de-clutch and move the gear control lever into the second position. Let the clutch in gradually and open the throttle again until the speed of the machine is sufficient to require a change into top, when the foregoing operations are repeated. Having attained the desired speed in top gear the air lever can be fully opened and the ignition advanced.

In the case of Four-Speed Models an additional gear change is, of course, necessary to get into top gear. Under favourable conditions there is, however, no objection to starting in the second gear of the Four-Speed box.

- 4 **When Running.** For normal running on the level the air lever can be left fully open and the spark fully advanced, the speed being controlled by the throttle, but when accelerating after slowing down, or when climbing a hill it will be necessary to close the air lever and retard the ignition slightly. If this does not enable the machine to climb the hill without labouring, a lower gear must be used. If a hill is long enough and steep enough to necessitate a change to a lower gear, it always pays to make this change before the engine has commenced to labour. One change low down on the hill may save two higher up, and at the same time enable a faster climb to be made. To come to rest, close the throttle and apply the brakes. Immediately before stopping, de-clutch and put the gear lever in the neutral position.

## LUBRICATION.

- 5 **Lubrication of the Engine.** We advise the use of "Castrol (XL)" Oil as being the most suitable for use in these engines under normal conditions. With this oil the overhead rockers and push rod ends are adequately lubricated by oil mist blown up the telescopic tubes enclosing the push-rods. If conditions are exceptionally arduous and call for long periods at full throttle (as in some trials work, racing, etc.) it is preferable to use "Castrol (R)" as this has superior heat-resisting properties. This oil, however, does not vaporise so readily as "Castrol (XL)" and it may be found that, when using it, the overhead rockers do not receive sufficient lubricant. For this reason, grease nipples are fitted on the rockers, and a removable plug is fitted in the side of the rocker housing so that access to the top push rod ends can be obtained.

"Castrol (R)" must not be mixed with "Castrol (XL)" or any similar oil having a mineral base.

Whatever oil is used, buy it from a sealed oil cabinet or in a sealed tin, and do not allow your tank to be filled up from an open tin or drum.

All Royal Enfield O.H.V. engines are fitted with aluminium alloy pistons, and the engines require special attention until they have become properly "run in." A new machine should not be driven at a speed exceeding 25 m.p.h. for the first 200 miles; at the same time it should be freely lubricated. If in doubt at any time as to whether the engine requires more oil, give it the benefit of the doubt. The worst that can happen is an oiled plug and a smoky exhaust, whereas the consequences of insufficient oil are far more serious.

Stale oil should be drained from the crankcase whenever the engine is dismantled for decarbonisation (see paragraph 13), and the engine flushed out with paraffin or petrol. Before replacing the cylinder, pour some fresh oil into the crankcase.

- 6 **Mechanical Oil Pump.** The Oil Pump (Patent No. 162123/21), fitted to Royal Enfield engines supplies a continuous and certain supply of oil to the engine, varying in amount according to the speed at which the machine is running.

The pump consists of an oscillating plunger driven by a spiral gear from the timing wheel shaft. The supply of oil can be varied by means of the milled adjusting wheel on the side of the pump. When this is turned as far to the right as possible the pump will deliver sufficient oil for normal running.

When "running in" a new engine or when conditions prevail calling for greater power from the engine, as when ascending long hills or when travelling at high speeds, the supply of oil from the pump should be increased by turning the adjusting wheel to the left. When turned to the left as far as possible the pump will deliver approximately three times the minimum supply.

A fine mesh gauze is fitted in the tank to prevent foreign matter getting into the supply pipe or into the mechanical pump, so that there is no likelihood whatever of the supply of oil from the mechanical pump being interrupted, and the pump should not be interfered with unless the engine is being dismantled.

- 7 **Lubrication of the Gear Box.** The gear box is charged with lubricant before leaving the Works, and will not require attention for at least 1,000 miles. For replenishment of the three-speed box, we recommend "Castrolase (Light)." This is obtainable in collapsible tubes suitable for this purpose. Do not overfill.

In the case of the four-speed box, the use of a grease such as "Castrolase" tends to make the gear change rather difficult, especially in cold weather. This box, therefore, should be filled up to the level of the filling plug with engine oil every 1,000 miles.

- 8 **Lubrication of Chains.** The aluminium front chain case may be kept filled with oil up to the level of the lower run of the chain which will then require no further lubricant. The rear chain should be constantly lubricated with engine oil or Price's "Rangraphine," and should occasionally be removed and, after being washed in paraffin, be soaked in melted tallow.

- 9 **Lubrication of Bicycle Parts.** Bicycle bearings, particularly the hubs, fork joints, and steering head should be greased regularly with the grease gun provided, and at the same time it is a good practice to go over all nuts, and see that

they are tight. When using the grease gun, lubricate the inlet valve guide through the nipple provided. The grease will go in more easily if the valve is open.

### ENGINE TROUBLES.

- 10 **Engine Stops owing to lack of Petrol.** This is the commonest form of engine stoppage. The first symptoms are irregular firing which is temporarily cured by closing the air lever. Make sure that there is plenty of petrol in the tank. If so, disconnect the petrol pipe at the carburettor end and turn on the tap. If a good flow of petrol occurs, the stoppage may be in the fine gauze in the carburettor union or in the jet itself. If the flow from the petrol pipe is restricted, the stoppage lies either in the petrol tap, the large filter, or the pipe itself.
- 11 **Engine Misfires owing to faulty Ignition.** The symptoms in this case are usually that the engine will not run at low speeds and is very hard to start. Remove the sparking plug and lay the body on some metal part of the machine with the high tension lead connected and the terminal clear of the machine. Turn the engine round by the kick starter. If a good spark is obtained at the plug points, the ignition is in order and the trouble lies elsewhere. If no spark, or a very weak spark, is obtained, remove the plug and hold the end of the high tension wire about  $\frac{1}{8}$  in. from a metal part of the machine and rotate the engine. If a spark is obtained, the fault lies with the sparking plug. If this is oily or sooty it can be taken apart and cleaned, but if the points are red and burnt the plug has been too hot and a new one should be fitted, preferably of a type with a thicker central electrode. The gap between the plug points should not exceed  $\frac{1}{16}$  in. If no spark can be obtained from the high tension wire, examine the insulation of this and make sure that it is not worn through and allowing the metal wire to touch the machine. If this is satisfactory the trouble lies in the magneto. See that the contact breaker points are clean and that they open and close properly. These should not open more than the thickness of the gauge supplied on the magneto spanner. If necessary, remove the contact breaker by unscrewing the centre hexagon screw and clean out the housing behind it. This should be free from oil or damp. Also remove the carbon brush holder at the end of the high tension lead and clean the slip ring with rag pushed down with a piece of wood.
- 12 **Other Causes of Engine Stoppage.** Other possible causes of an engine stoppage are :—
- (1) **Water in Carburettor.** Remedy, clean out float chamber.



- (2) **No clearance at tappets.** This is evidenced by an entire lack of compression when turning over with the kick starter. The remedy is to adjust the tappets.
- (3) **Sticking Valve.** In this case there is no compression and excessive tappet clearance, the valve remaining partly open.

## OVERHAULING THE ENGINE.

- 13 **Cylinders and Pistons.** When an engine has been in use for a certain time, carbon deposit forms on the piston and cylinder head, and the cylinders should be removed every 1,500—2,000 miles, the carbon deposit scraped off, and the valves re-ground.

To take off the cylinder, it is not necessary to remove the tank but doing so renders the other parts much more accessible and is well worth the few minutes' work entailed.

First remove the sparking plug, carburettor, petrol and oil pipes, exhaust pipes and silencers, and in the case of the 488 cc. engine disconnect the exhaust lifter cable. Unscrew the top and bottom telescopic push rod tubes and take out the four pins holding down the overhead rocker housing which will then slide off to one side. Unscrew the four rocker housing support posts and lift the cylinder head off the barrel. Remove the four nuts securing the cylinder base to the crankcase, place the piston at the bottom of its stroke, lift the cylinder barrel clear of the studs, incline it forwards, and lift it off the piston.

The piston is removed by pushing out the gudgeon pin which is a push fit both in the connecting rod and the piston bosses. It is as well to mark the piston so as to ensure replacing it the same way round.

The carbon deposit can be scraped off the piston and cylinder head with a screwdriver or other suitable implement, followed by a rub with very smooth emery cloth.

- 14 **Grinding in Valves.** The valves are removed from the head by compressing the spring and removing the split conical collars. As O.H.V. engines necessarily require rather strong valve springs, it is recommended that one of the many valve spring compressors on the market should be used.

Having removed the valve, scrape off all carbon deposit, and smear the seat with a little grinding compound or fine emery and oil. Replace the valve in

position, and rotate it with a screwdriver, frequently lifting the valve off its seat, until a bright ring is obtained on the face of the valve, and also on the seating. Before replacing the valve be perfectly sure that all trace of grinding compound or emery has been thoroughly washed out of the ports.

After re-assembling the valves and springs it is an excellent plan to test the valves by pouring clean petrol into the ports and watching for leakage past the heads. No more than the slightest sign of moisture should be permitted.

**15 Piston Rings.** The rings should be bright all round in which case it is best not to disturb them. Should a ring be broken or show a brown patch, it must be replaced. Be sure to obtain genuine "Enfield" rings as these have the correct gap and tension.

**16 Replacing the Cylinder.** Care should be taken that all parts are scrupulously clean before re-assembling. To replace the cylinder, proceed in the reverse order to that employed in taking it off. Smear the cylinder wall and piston with oil before replacing cylinder. When tightening down the cylinder base nuts, give each a successive turn, otherwise, by screwing one home by itself the cylinder is liable to be damaged or distorted and will not bed accurately on the crankcase. This also applies to the bolts holding down the cylinder head and valve gear housing.

**17 Clearance of Valve Stems.** The valve stems should just clear the rocker arms when the valves are closed. If there is an appreciable distance between them, or the stems and rockers are in actual contact, proceed as follows :—

Unscrew the lower push rod sleeves and raise them to obtain access to the adjustable tappet heads. Hold the tappet by means of the lowest of the three hexagons, unlock the locknut (middle hexagon) and screw the tappet head (top hexagon) to the right or left to lengthen or shorten as required. Lock up the lock nut and replace the push rod sleeves.

**18 Engine Bearings.** Roller bearings are fitted to the big end and driving shaft of Royal Enfield two-port O.H.V. engines. They allow the engine to revolve much more freely, and last much longer than the ordinary type of plain bearing. If, after considerable use, up and down play should develop in these bearings, it is advisable to send the crankcase, flywheels and connecting rod back to the Works, for the worn parts to be renewed, as special appliances are used to ensure the most accurate assembly of the flywheels and shafts. The camshaft bearings are adequately lubricated by oil, which passes from the crankcase into the timing gear case.

- 19 **Dismantling the Crankcase.** This should only be necessary in cases where it is required to send the flywheel assembly to the Works for new big end bearings.

After removal of the engine from the frame, remove the cylinder and piston, if not already done. Take out the three screws securing the mechanical pump and lift this off. Remove the magneto chain cover, the magneto chain and both sprockets. Remove the nuts and screws round the edge of the timing cover, when the cover can be lifted off. Care should be taken not to damage the surfaces of the joint between the cover and the crankcase.

When removing the cover, do not allow the cam wheels to come away with it, but after removal wipe the oil from the timing gears and mark the teeth so as to mesh them correctly when re-assembling. Remove the cam wheels (and, in the case of the 346 cc. engine, the rockers).

To remove the tappets from the 488 cc. engine, pull the adjustable heads off the tappet rods, remove the tappet guide securing clamp, tap the tappet guides gently upwards using a brass or aluminium drift, when the tappets can be withdrawn from the lower ends.

It is now necessary to remove the small timing pinion and the engine sprocket. Insert a  $\frac{3}{8}$  in. rod through the hole in the cam wheel bush. This will engage against the crank pin boss and prevent the flywheels from turning. Remove the timing pinion and engine sprocket nuts (that for the timing pinion has a left-hand thread.) The pinion and sprocket can now be drawn off the taper shafts, preferably using a sprocket drawer. If one is not available, wedge a screwdriver behind the pinion or sprocket and tap the end of the shaft, but take great care not to damage the shaft. Notice which of the three keyways in the timing pinion was in use and mark it. It is now only necessary to remove the bolts holding the two halves of the crankcase together, when these can be separated. Do not lose the rollers from the main bearings as these fall out. Do not attempt to separate the flywheels.

- 20 **Re-assembly of Crankcase. Valve Timing.** No difficulty should be experienced with this. It will be found best to fit the cylinder and piston before re-assembling the timing gear so that the valve timing can be checked.

If the marks made when stripping down the timing gear have become obliterated the correct valve timing can be obtained as follows :—

**346 cc. Engine.** The inlet and exhaust valves should be open an equal amount when the piston is at the top of the exhaust stroke.

**488 cc. Engine.** Set the piston to the top of the stroke and then replace the two cam wheels so that the marks stamped on them are in line. If the engine is then turned round one revolution, the inlet and exhaust valves will be open an equal amount with the piston at the top of the exhaust stroke.

- 21 **Magneto Timing.** To time the magneto, turn the engine until the piston is at the top of its compression stroke (both valves closed), and, with the magneto lever fully retarded, turn the armature in the direction in which it normally runs until the contact breaker points are just beginning to break on the cam. Lock up the magneto sprocket on to its taper with the armature in this position and the magneto will be correctly timed. The magneto is fully described in a booklet issued by the manufacturers, a copy of which will be sent on request.

- 22 **Carburettor.** The carburettors fitted to these machines are the well-known "AMAL" Sports type, which combines excellent power and acceleration with economy. There are in effect three jets.

(a) The Pilot Jet. This controls the mixture at very small throttle openings, and is mainly used to obtain a good "tick-over." It is adjusted by means of a small milled-headed screw on the side of the carburettor. Turning this screw to the right gives a richer mixture from the pilot jet.

(b) The Secondary Jet. This is the jet in which the taper needle works. It controls the mixture strength at medium throttle openings. The jet itself is fixed in size, but the taper needle can be raised or lowered in the throttle slide. Raising the needle gives a richer mixture.

(c) The Main Jet. This is at the base of the secondary jet and controls the mixture strength at wide throttle openings.

The carburettor is correctly set at the Works, and it is unlikely that any adjustment will be necessary, though a modification of the pilot jet setting is sometimes advisable as the machine becomes well run in.

Full particulars of the carburettor are given in a booklet issued by the makers, copies of which we can supply on request.

### TRANSMISSION.

- 23 **Three-Speed Gear Box.** A booklet giving full instructions regarding the Sturmey-Archer Three-Speed Gear Box will be forwarded on request.
- 24 **Four-Speed Gear Box.** This gear box, which is of Royal Enfield design and manufacture, combines the advantages of "close ratio" and "wide ratio"

boxes. The three higher gears are fairly close together and enable the most suitable gear to be used for all ordinary main road work, while the low bottom gear enables the machine to climb any hill on which wheel-grip can be obtained.

25 As will be seen from the illustrations on pages 12 and 13, the box is of simple and sturdy construction, the four speeds being obtained by the use of four pairs of wheels and two shafts only, besides the cam shaft C and operating quadrant Q. As shown the gears are in neutral position. The clutch is keyed to the taper on the end of the main shaft A. On this shaft, the pinion sleeve S is free to rotate, the pinion T can slide endways, U can both slide and rotate, and V is firmly held. On the layshaft B, the pinion W is free to rotate, X is free to slide, Y can slide and rotate, and Z is firmly held. The rear chain sprocket E is keyed to the pinion sleeve S.

26 To obtain first gear, the pinions U and X slide to the right until the dog-teeth on X engage with those on W, thus in effect clutching W on to the layshaft B, so that the drive is taken from A through V and W to B, and then through Z and S to the sprocket E.

To obtain second gear, the pinions U and X slide to the left until the dog teeth on U engage with the splined portion of A, the drive being now taken from the main shaft A through U and X to the layshaft B and then through Z and S to the sprocket E.

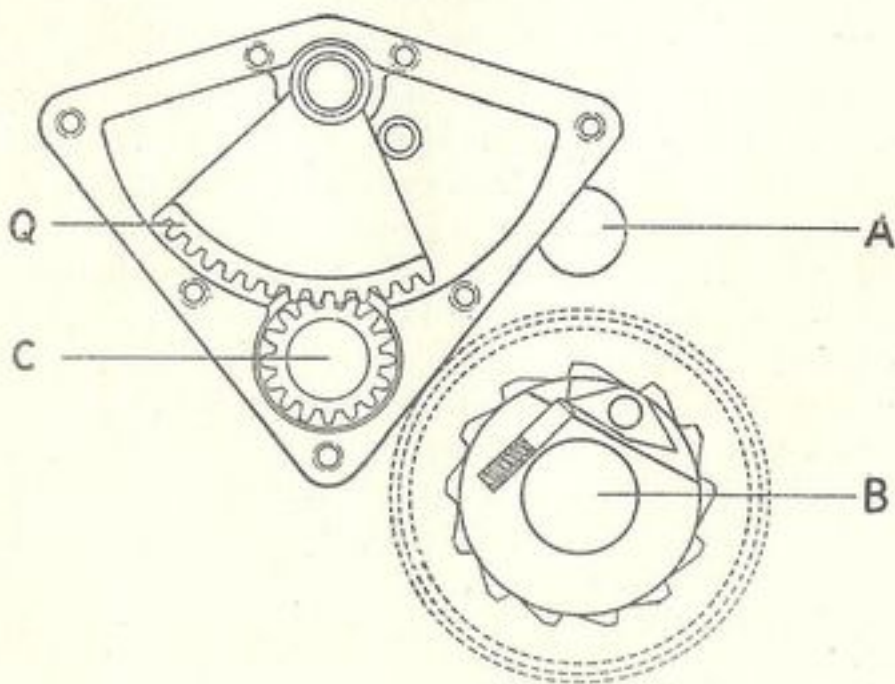
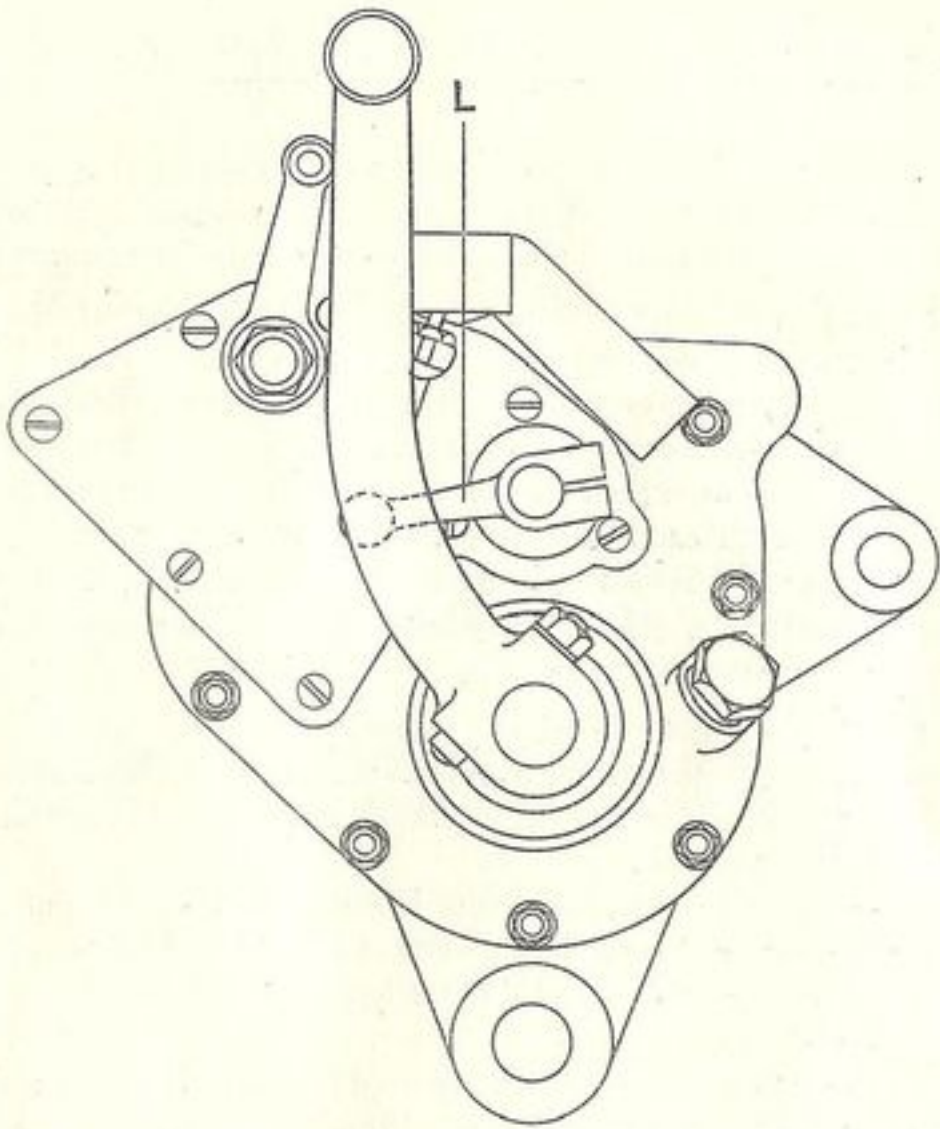
To obtain third gear, U and X are moved back to their neutral position, and T and Y slide to the right until the dog-teeth on Y engage with the splined portion of the layshaft B, so that the drive is taken through T and Y to B and through Z and S to E.

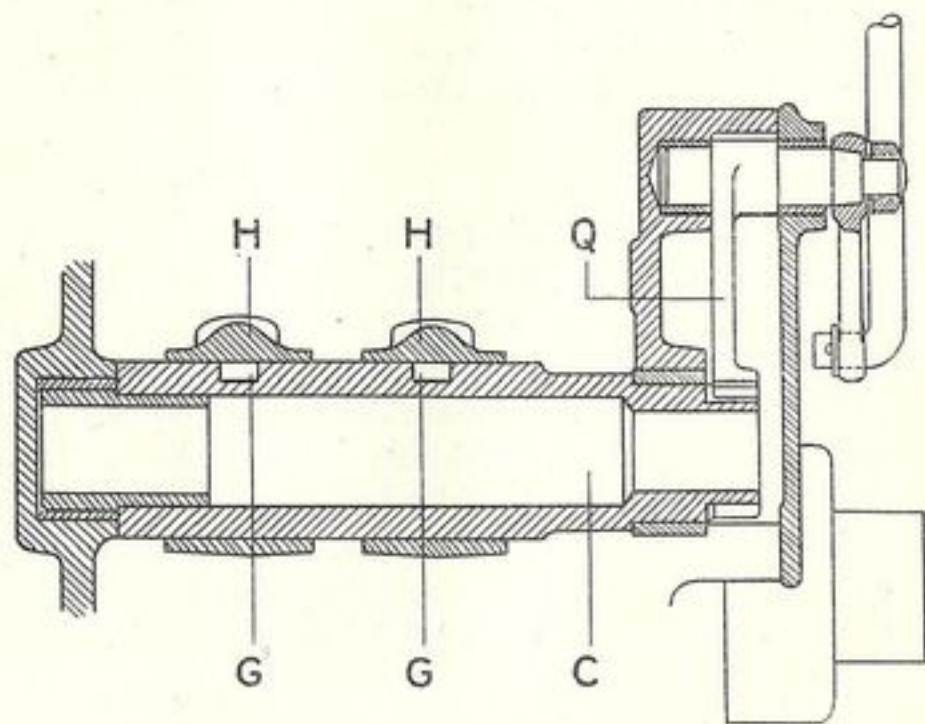
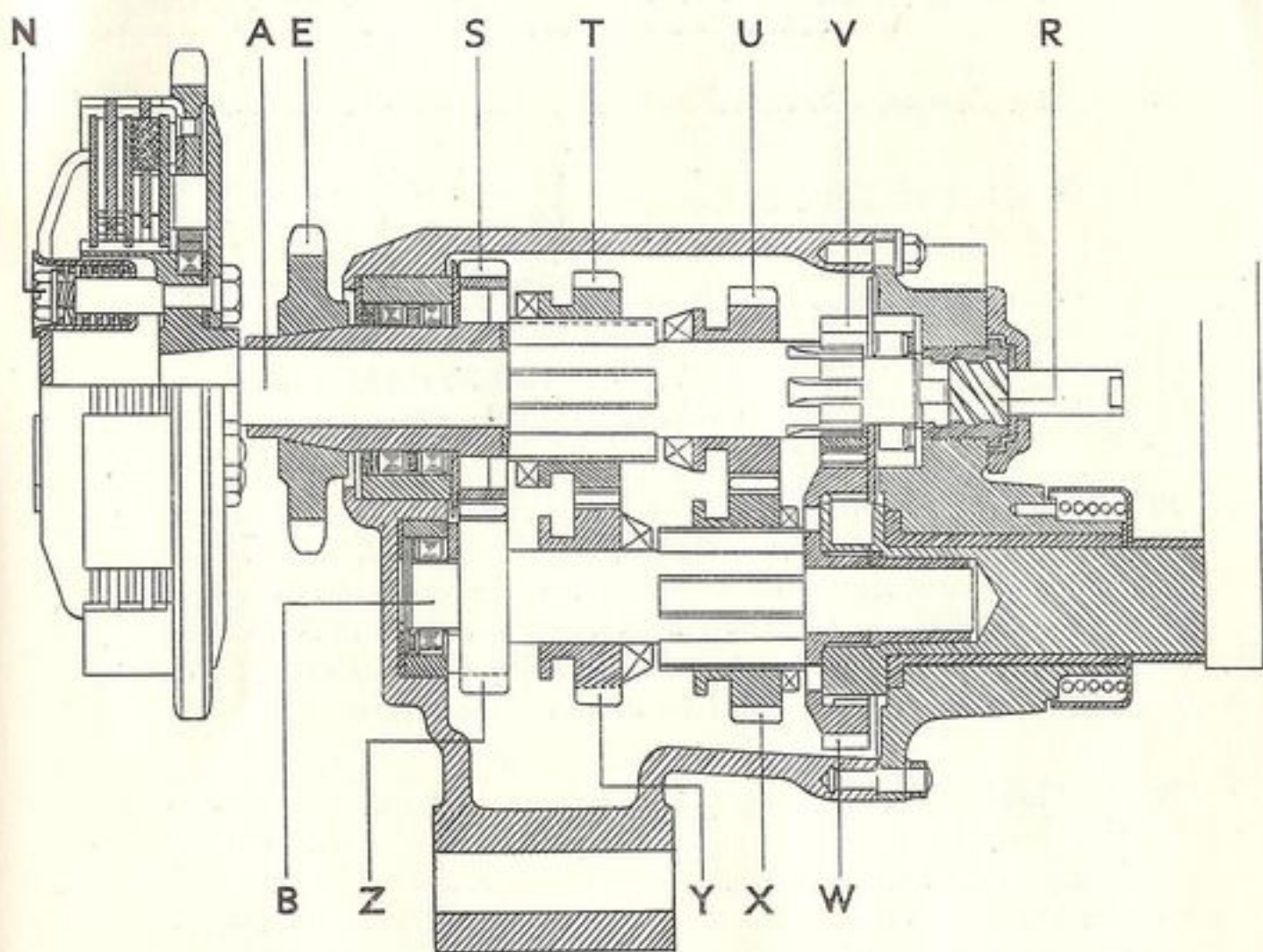
To obtain top gear, T and Y slide to the left until the dog-teeth on T engage with those on S, thus clutching S to A and so giving a direct drive.

27 The movement of the sliding pinions is obtained as follows :—The operating quadrant Q is moved by the gear control lever and rod and meshes with a pinion cut on the end of the cam shaft C, giving it a total movement of three-quarters of a revolution. This cam shaft has two cam grooves G, G cut in it, in which work pegs carried on the striking arms H, H. The grooves are so formed that the required endways movement is given to H, H, suitably shaped extensions to which bear in the grooves formed in the pinions T, U, X and Y.

The pegs operating in G, G are free to move endways in H, H and are spring-loaded so as always to bear on the bottom of G, G. The ends of the pegs are rounded off and fit into suitable recesses in the bottom of the grooves corresponding to the different positions of the gears, thus eliminating any possibility of the gears jumping out of engagement.

It will be seen that the operating mechanism is simple and robust and dispenses entirely with levers or toggles with their attendant small bearings, etc.





28 **Gear Ratios.** The standard gear ratios of these machines are as follows :—

3.46 h.p. Three-Speed. Close ratio { Solo, 5.3 ; 7.05 ; 12.7 to 1.  
 { Sidecar, 5.9 ; 7.8 ; 14.2 to 1.

4.88 h.p. Three-Speed. Close ratio { Solo, 4.7 ; 6.3 ; 11.3 to 1.  
 { Sidecar, 5.3 ; 7.05 ; 12.7 to 1.

4.88 h.p. Four-Speed. { Solo, 4.7 ; 6.1 ; 7.9 ; 14.5 to 1.  
 { Sidecar, 5.3 ; 6.9 ; 8.9 ; 16.4 to 1.

29 **Adjusting Gear Control.** Should this be necessary, proceed as follows:—  
 Place rear wheel on stand, disconnect top end of control rod, place lever on gear box in the neutral position (between second and third gears in the case of the Four-Speed box) place gear control lever into corresponding neutral notch and lengthen or shorten the control rod by loosening the lock nut and turning the top forked end. Connect up to the control lever and tighten the lock nut.

30 **Clutch.** The clutch is of the dry plate type and requires no lubrication. It is operated by a push rod running through the hollow main shaft of the gear box, and a quick thread screw and nut mechanism R actuated by a short lever L. Should the clutch slip, see that there is a small amount of backlash at the quick thread mechanism. If there is none, it can be obtained by loosening the lever on the quick-threaded shaft and turning it slightly forward. Additional spring pressure can be obtained by screwing up the six nuts N in the clutch cover plate a turn or so each. These must be adjusted equally or the clutch will not disengage properly.

31 **Patent Cush Drive Rear Hub.** All Royal Enfield motor cycles are fitted with a Patent Cush Drive Rear Hub, which takes up the drive from the countershaft to the rear wheel with great flexibility and smoothness. This hub has a marked effect on the running of the machine, absorbing all engine shocks, and preventing any snatching of the driving chain, and consequently minimising the wear on the rear tyre. The drum on the driving side of the rear hub is provided with three metal vanes, and the inside of the driving sprocket has three similar vanes. On each side of the vanes in the hub is placed a block of solid rubber, and the vanes on the inside of the driving sprocket fit between these blocks. When in position there is a block of rubber and a metal vane alternately.

This cush drive hub is so simple that adjustment is seldom necessary. The only parts likely to wear are the rubber blocks, which, however, will last a considerable time.



- 32 Adjustment of Chains.** The front chain is adjusted by pivoting the gearbox about the lower of the two bolts holding it to the rear engine plates, after first slackening the nuts securing the chain stays and brake pedal to the rear engine plates.

The rear chain is adjusted by slackening the wheel spindle nuts and the nut retaining the brake anchor arm, then adjusting the set pins in the rear fork ends, which vary the position of the wheel spindle. Take care to adjust the two set pins equally.

The magneto chain is adjusted by tilting the magneto base plate after loosening the two bolts securing it to the engine plates.

On no account should a chain be run quite tight. The magneto and primary chains should have about  $\frac{1}{4}$  in. up and down movement ; the rear chain about  $\frac{1}{2}$  in. at the tightest place.

After adjusting the rear chain, the rear brake operating rod may also require adjustment, as may the gear control rod after adjusting the primary chain. Should it be necessary to remove either of the chains, it is important that, when replacing the connecting link, the spring fastening is so fitted that the split end is behind the direction in which the chain travels.

### MISCELLANEOUS.

- 33 Expanding Hub Brakes.** All Royal Enfield expanding hub brakes are fitted with brake shoes lined with a compressed asbestos fabric, which it will be found has long-wearing qualities, and will seldom require renewing. Should an excess of grease find its way from the hub bearings on to the brake linings, the brake will lose a certain amount of its efficiency. In this case the shoes and linings should be taken out and washed in petrol to remove the grease. The rear brake is adjusted by a wing nut at the end of the brake rod, while the front brake adjustment is by means of a draw bolt in the lever on the brake.
- 34 Wheel Bearings.** The bearings of both wheels are single row, deep groove journal races. These have been proved by extensive tests to be superior to cup and cone bearings, and are adequate to deal with both radial and thrust loads. They require no adjustment.

- 35 **Detachable Rear Mudguard.** To facilitate tyre repairs, and the removal of the rear wheel, the rear mudguard of all Royal Enfield motor cycles is made quickly detachable. To do this, slacken the two nuts on the rear fork ends, which retain the mudguard supports, tap the supports sharply upwards until their hooked ends are disengaged from the sockets on the fork sides, and the whole assembly of mudguard supports and back stand clip may be lifted away.
- 36 **Front Forks.** Side play in the front fork links is taken up as follows :— Release the nuts on the fork spindles, and adjust the latter with the squares provided on their ends. Each spindle is provided with a right and left-hand thread, which will open or close the fork links as required. The left-hand threads are on the off-side of the machine, and the locknuts are loosened by turning in the direction of the arrows on the fork links.
- 37 **Shock Absorbers.** The shock absorbers on the front forks of the 3.46 h.p. machine are adjusted by tightening the fork links as described above. On the 4.88 h.p. machine a separate adjusting nut is provided outside the star washer. The nut on the off-side of the machine has a left-hand thread. These nuts and the star washers can readily be removed to obtain access to the lock nuts on the fork links. The shock absorbers should be so adjusted that they have little effect when weight is applied to the handlebars, yet exert a marked slowing action on the rebound when the weight is released.
- 38 **Ball Head.** All Royal Enfield motor cycles are designed with ball heads of ample dimensions, which will rarely require attention. If on inspection, however, it is found, when lifting at the handlebars, that a small amount of play has developed, this should immediately be taken up. To adjust the ball head, release the pin through the ball head clip, and adjust the nut on the top of the steering stem, which holds the ball head clip in position until all play has disappeared. When testing for play in the head it is best to take the weight off the front wheel by placing a suitable box under the crankcase.
39. **Steering Damper.** A steering damper is fitted to these models. By turning the ebonite knob to the right the steering can be tightened to any desired degree. This will be found advantageous on sidecar machines or on solo machines at high speeds. When riding solo, the damper should not be tightened down too far at low speeds.

