Service Bulletin No. 3.

Free Service Scheme

for

ROYAL ENFIELD
Motor Cycles

MODELS R.E. and G.

Issued by

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INTRODUCTION.

The following is a list of the items which need inspection under the Free Service Scheme for Royal Enfield Motor Cycles :

1. Check and, if necessary, adjust :—
   - (a) Valve Clearances.*
   - (b) Contact Breaker Points.
   - (c) Magneto Timing.
   - (d) Sparking Plug.
   - (e) Clutch.
   - (f) All Chains.
   - (g) Wheel Bearings.
   - (h) Brakes.
   - (i) Forks and Steering Head.
   - (j) Alignment of Wheels.
   - (k) Tyre Pressures.
   - (l) Gear Rod (Model RE).
2. Tighten all external Nuts and Bolts including Cylinder Bolts.
3. Top up Battery* and check all Electrical Equipment and Horn.
4. Clean Carburetter and adjust mixture.
5. Adjust and lubricate all Cables.
6. Grease all Nipples.
7. Drain Oil System, Clean Filter and replenish.*
8. Check oil level in front Chain Case.
9. Top up Gear Box.
10. Test machine on road.

* Model G only.

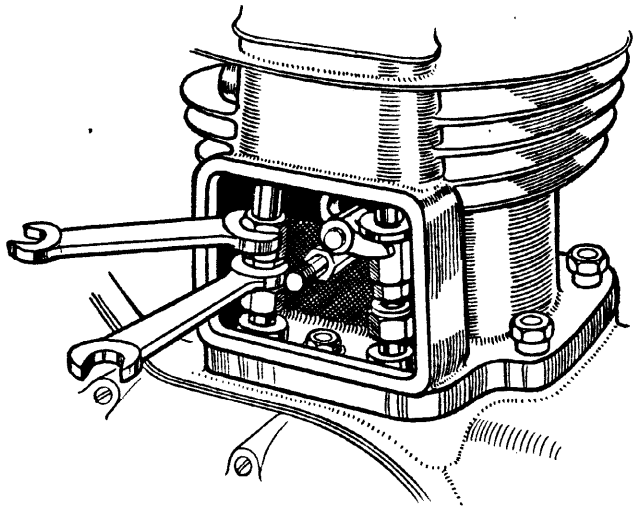
Details of the method of carrying out the inspection and adjustments are given below :—

1 (a) Valve Clearances (Model G only).

Remove the tappet inspection cover and check the valve clearances while the engine is cold. Owing to the ball ends at the bottom of the push rods it is not possible to use feeler gauges unless the petrol tank and valve rocker gear cover are removed. It is, however, quite possible for anyone with a little experience to ascertain whether or not the valve adjustment is correct. The inlet push rod should be free to spin but without perceptible up and down clearance, this corresponding to a valve clearance of ·002in.

The exhaust valve must have a little more clearance (i.e. ·004in.) and up and down play in the push rod should be just perceptible. If in any doubt as to the exhaust valve adjustment, run the machine for about five minutes on the road. This initial warming up period will tend to reduce the clearance, and if this is all taken up, more clearance must be provided by adjustment.

When checking clearances, remove the sparking plug and rotate the engine until the piston is at the top of the compression stroke. Both valves will then be fully closed. Make sure that the exhaust lifter is not interfering with the operation of the exhaust tappet.



ADJUSTING TAPPETS.
Fig. 1.

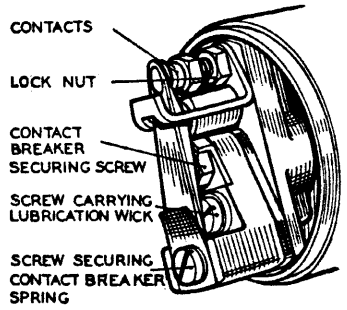
To make the adjustment, hold the push rod bottom end (top hexagon) and the lock nut (middle hexagon) (see Fig. 1). Unlock by turning the lock nut to the left and make the adjustment by screwing the push rod cup (bottom hexagon) to the left to take up clearance, or to the right to give more clearance, at the same time holding the push rod bottom end (top hexagon). Finally lock up the lock nut against the push rod end and check the clearance after finally tightening the lock nut.

When replacing the tappet inspection cover make sure that it is the right way up so that the exhaust lifter fulcrum pin fits in the recess in the cover. See also that the gasket beneath the cover is in good condition and that the correct washers are fitted beneath the dumb-bell nut. These consist of one fibre washer followed by one plain steel washer. Tighten the nut by means of a light tap with a hammer.

1 (b) **Contact Breaker Points.**

Check the gap between the contact breaker points when this is fully open. The recommended clearance is ·012in. for Model G and ·015in. for Model R.E. It is very important to check the contact breaker setting **before** checking the ignition timing.

To adjust the points on the Lucas Magdyno fitted to Model G, loosen the lock nut and turn the contact screw by its hexagon head (see Fig. 2). Finally tighten the lock nut.

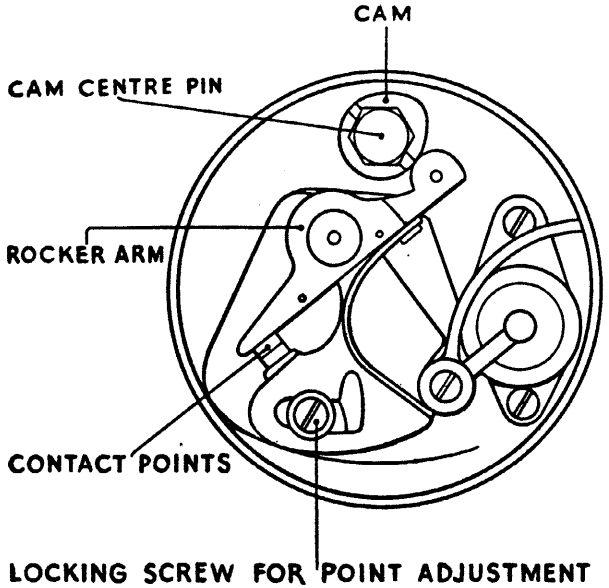


CONTACT BREAKER MECHANISM, MODEL G.
Fig. 2.

On the 125 c.c. Model R.E. the plate carrying the fixed point can be adjusted after loosening the locking screw (see Fig. 3).

1 (c) **Ignition Timing.**

The recommended timing for Model G is as follows :— Control fully advanced. Contact points just about to open when the piston is $\frac{3}{8}$in. before T.D.C. The piston position



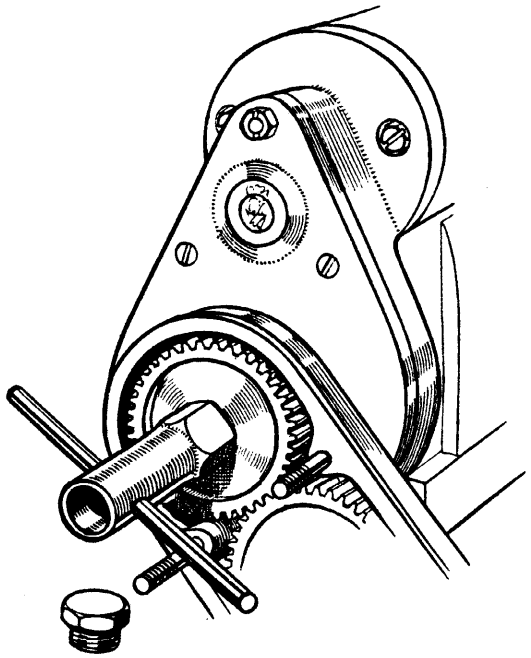
CONTACT BREAKER MECHANISM, MODEL R.E.
Fig. 3.

can be gauged by means of a piece of rod about $\frac{1}{4}$in. diameter inserted vertically through the plug hole and marked in $\frac{1}{16}$in. The position when the contact points are just about to break can be judged by eye or with a piece of thin tissue paper. If judging by eye it is best to place the machine on the stand, engage top gear and turn the engine round slowly by means of the back wheel. When the points have broken, turn backwards a few degrees until they have just closed again. When using paper make sure that this is **thin** (e.g., cigarette paper) and adjust the engine position so that the paper can **just** be withdrawn from the points, **not** pulled out freely. The need for accurate timing at the **point of opening** is stressed since it is a very common fault to time magnetos with the points well broken.

In the case of the 125 c.c. Model R.E. the magneto must be timed so that the points are just about to open when the

piston is $\frac{3}{16}$in. to $\frac{5}{32}$in. before T.D.C. with the magneto cover plate **central on its slots.** This can be checked in the same way as with the O.H.V. engines but it is particularly important in the case of the two-stroke engine that the timing is not set too early, as the quality of the spark suffers considerably if the timing is earlier than is recommended. This is fully dealt with in **Service Bulletin No. 1.**

To adjust the ignition timing in the case of Model G the timing cover must be removed, after which the nut securing the driving pinion to the magneto shaft should be removed. This pinion is threaded for a small extractor which is included in the tool-kit of the motor cycle. The method of using this is shown in the accompanying illustration (Fig. 4).



LOOSENING MAGNETO PINION
MODEL G.
Fig. 4.

Having loosened the pinion on its shaft, set the engine in the firing position, turn the contact breaker forward until the

points are just about to open with the magneto control fully advanced and secure the pinion to the magneto shaft in this position. Check the timing after finally tightening the nut.

To adjust the timing in the case of the 125 c.c. Model R.E. unscrew the hexagon headed screw which secures the cam to the shaft and withdraw the cam by screwing into it a $\frac{5}{16}$in. B.S.F. bolt which will act as an extractor. Now set the engine in the firing position, and with the magneto cover plate central on its slots turn the cam forward until the contact points are just about to open. Tap the cam on the shaft to secure it, tighten up the centre screw and finally check the adjustment.

N.B. The practice of correcting small errors in timing by altering the contact breaker gap is not recommended. In the case of the Magdyno fitted to Model G the electrical timing and, therefore, the strength of the spark is affected if the standard gap of ·012in. is departed from. In the case of the flywheel magneto fitted to model R.E. the electrical timing and strength of spark are not directly dependent on the gap but even so this should not be more than ·015in. or less than ·012in. Note that in this model it is very important to have the cover plate central on its slots when checking the timing. This ensures that the standard engine timing of $\frac{3}{16}$in. to $\frac{5}{32}$in. advance corresponds to the best electrical timing. Once the cam and contact breaker have been correctly adjusted the engine timing can be advanced or retarded a few degrees by turning the cover plate backwards or forwards on its slots. It is unlikely that this adjustment will be required except possibly in the case of machines required for competitive events.

1 (d) Sparking Plugs.

The gap between the plug points tends to get wider with use. The three point plug fitted to the O.H.V. engines should be set to ·018in./·020in., taking care to set the side points and not the centre one. The single point plug fitted to the 125 c.c. engine should be set to ·015in. so as to ensure a long period of use before the gap becomes too wide to permit easy starting.

1 (e) Clutch.

Check the clutch to see that it lifts freely and has about $\frac{1}{16}$in. clearance in the control. If the clutch has any tendency to drag or slip adjust the control in the following way :—

Model G, disconnect the control cable from the clutch lever M on the gear box and hinge this lever back to expose the adjusting screw A and the sleeve B (see Fig. 5). Remember

that turning this screw to the right takes up clearance in the control, turning it to the left gives more clearance. It is unlikely that the screw will require turning more than one or two flats after which the lever can be hinged back to lock the adjustment and the cable reconnected.

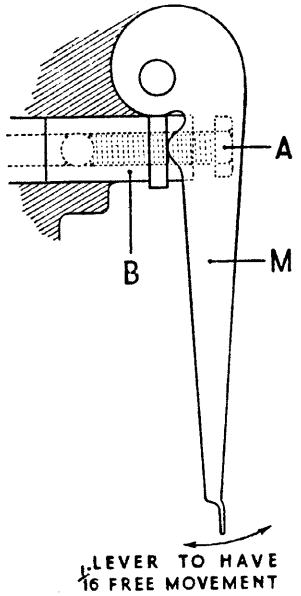


Fig. 5.

Model R.E., adjust the control by means of the adjusting screw and lock nut in the clutch control lever on the gearbox (see Fig. 6).

Note that on no account must all the clearance be taken out of the control cable otherwise clutch slip will result. Too much clearance is likely to result in clutch drag.

If adjustment as described above results in the clutch control lever on the gearbox being badly positioned (i.e., too far out so that it is likely to catch the rider's foot or too close in so that full movement of the clutch control is impossible) reset the lever to its correct position (i.e., approximately square with the push rod when the clutch is fully lifted) and make the necessary adjustment to the clutch control by means of the adjusting bush and lock nut through which the control cable passes in the case of Model G, or the adjusting nipple on the end of the control cable in the case of Model R.E. (see Fig. 6).

1 (f) **Chains.**

The tension of the primary chain on Model G can be felt through the inspection hole after removal of the cap which is secured by a spring clip. There is no inspection cover on the Model R.E. and in view of the fact that this chain is not adjustable it is not considered necessary to remove the chain cover to inspect the tension of the chain unless the latter is running noisily.

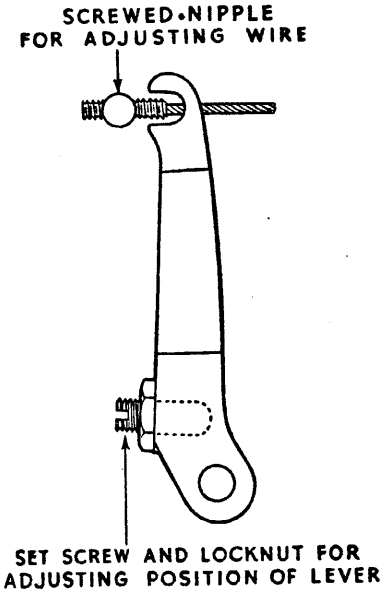


Fig. 6.

To adjust the primary chain on Model G slacken the nut at one end of the bolt securing the top of the gearbox to the engine plates. If the chain requires slackening, loosen the lock nut on the adjusting screw which bears against the back of the top gear box attachment lug and turn this screw in a clockwise direction until the chain tension is correct. If the chain is already too slack, loosen the lock nut on the adjusting screw and turn this in an anti-clockwise direction for two or three turns. Now lever the gearbox backwards to tighten the chain. Tighten the nut on the end of the attachment bolt and then screw up the adjusting screw hard against the gearbox attachment lug. Finally, tighten the lock nut on the adjusting screw.

Note that the tendency is for the gearbox to work backwards in use, thus tightening the front chain and slackening the rear one. It is for this reason that the adjusting screw is placed behind the attachment lug on the gearbox and this is also the reason for tightening the nut on the attachment bolt and then locking the adjusting screw hard against the gearbox attachment lug. By this means any clearance between the attachment lug and the bolt is taken up and the possibility of the gearbox moving in use is obviated.

The rear chain on Model G is tensioned by loosening the nuts at the end of the rear wheel spindle and adjusting by means of the chain adjusting screws and lock nuts. The rear chain on the 125 c.c. Model R.E. is adjusted by loosening the rear spindle nuts and adjusting by means of the self locking nuts on the ends of the chain adjusters. Take care to adjust both sides equally and do not forget to tighten the spindle nuts after making the adjustment.

The following are the correct adjustments for chains on both models :—

Front Chain—about ¼in. up and down movement.
Rear Chain—about ½in. up and down movement.

Turn the engine by means of the kickstarter and the rear wheel by hand and check the chain tension in several positions. If it varies, adjust to the above figures at the tightest point.

1 (g) **Wheel Bearings.**

These are non-adjustable and it is only necessary to make sure that the wheels spin freely and that there is no play in the bearings.

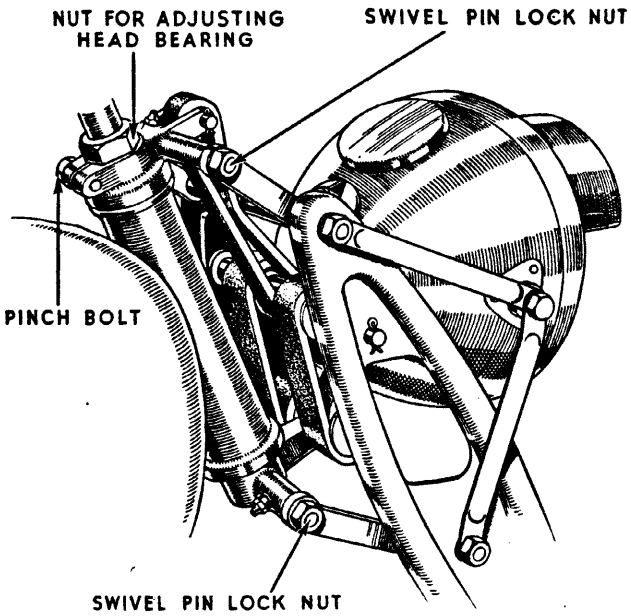
1 (h) **Brakes.**

Make any necessary adjustment to the brakes by means of the finger nuts provided.

1 (i) **Forks and Steering Head.**

Test for play in the steering head by placing a box under the engine so as to take the weight off the front wheel and then lift the fork ends, at the same time placing one finger over the joint between the two halves of the top steering head race. If there is play, loosen the clamp bolt through the ball head clip, and in the case of Model G the two clamp bolts which secure the telescopic forks to the fork crown (see **Service Bulletin No. 2**). Take up play by adjusting the large plated nut on the top of the steering stem. (Note :—In the case of Model R.E. the adjusting nut is the large one through which the handlebar

stem passes (see Fig. 7). Do not confuse this with the head of the expander bolt on top of the handlebar stem). Take up all play but do not adjust so tightly that the steering will not fall to full lock on either side when giving the handlebars a light tap in either direction. After making this adjustment do not forget to tighten the clamp bolts.



STEERING HEAD, MODEL R.E.
Fig. 7.

In the case of the 125 c.c. Model R.E., check the adjustment of the fork links. These must be free to move but should not have unnecessary side play. Adjustment is provided at the rear spindles only. Take up play by loosening the lock nut on the right hand side of the spindle (see Fig. 7), and turning the head of the spindle, finally tightening the lock nut.

In the case of Model G, the level of oil in the telescopic fork should be checked by removing the small drain plug at the bottom of each fork end (see **Service Bulletin No. 2**). If the forks are over full, oil will run out until it has reached its correct level. If no oil runs out, remove the domed covers

which are sprung over the nuts at the top end of the fork, and remove the top cap nut, pour oil in slowly until it commences to run out at the drain plug at the bottom of the fork. Allow the oil to reach its level and then replace the drain plug, cap nut and domed cover. Use only one of the following light engine oils :—

Vacuum Arctic ; Essolube 20 ;
Castrolite ; Motorine E ;
Single Shell.

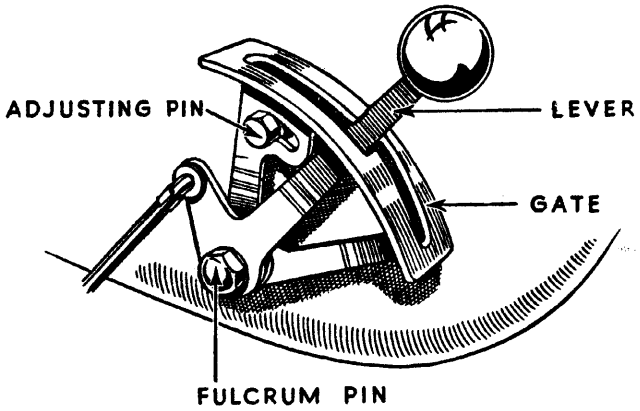
1 (j) **Alignment of Wheels.**

The only satisfactory way to check alignment is by means of straight edge or a length of taut string. Since these machines have equal size tyres on both wheels, it should be possible for the straight edge or string to touch both front and rear tyres at two points. If necessary, set the rear wheel over in the forks by adjusting one chain adjuster more than the other. As this will probably upset the chain adjustment this must then be rechecked. In special cases where the machine has a larger section tyre on the rear wheel, allowance must be made for this.

1 (k) **Tyre Pressures.**

Check pressures with a gauge and inflate to the following figures :—

Front tyre	(Model R.E.)	...16lb.	per sq. in.
,, ,,	(Model G.)	...18lb.	,, ,, ,,
Rear ,,	(Model R.E.)	...20lb.	,, ,, ,,
,, ,,	(Model G)	...22lb.	,, ,, ,,



GEAR CONTROL QUADRANT, MODEL R.E.
Fig. 8.

1 (l) **Gear Control Rod (Model R.E. only).**

See that the gear control on Model R.E. is correctly adjusted. When in second gear the lever should lie freely in the notch in the centre of the gate. It should, however, be set so as to lie against the back of the slot in the gate, i.e., the side nearest the tank. This effectively prevents any possibility of the gear jumping out of engagement when using second. When in top or bottom gear the lever should not quite reach the end of the slot in the gate. Adjustment is made by moving the gear quadrant after slackening the adjusting pin which secures it to the tank (see Fig. 8).

2. Security of Nuts and Bolts.

Tighten all external nuts and bolts working systematically from one end of the machine to the other and not forgetting the cylinder base nuts, cylinder head nuts, and the nuts securing the sprocket to the rear wheel.

3. Electrical Equipment.

Check the electrical lighting equipment and make sure that there are no loose or chafed leads. Start the engine and make sure that the lights work correctly and in the case of Model G see that the dynamo will balance the lamp load. The ammeter should show a small charge with all lights on and the engine running at a fair speed. In the case of Model G top up the battery with distilled water to ¼in. above the plates and make sure that the electric horn functions correctly and that the lights work while the engine is not running. (The lights on Model R.E. will work only when the engine is running unless a dry battery has been fitted in the clip provided inside the headlamp).

4. Carburettor.

Remove the float chamber top and float from the carburettor, also the screwed plug at the bottom of the mixing chamber and clean out any sediment from this and the bottom of the float chamber. When reassembling make sure that the spring clip on the float engages correctly with the groove in the fuel needle.

In the case of Model G adjust the slow running by means of the air screw on the side of the carburettor which should be set to give the **maximum** R.P.M. for a given small throttle opening with the ignition about half retarded. If the tick-over is too fast it can then be slowed down by unscrewing the throttle stop slightly, afterwards locking this with the lock nut provided.

In the case of the 125 c.c. two-stroke model, if the Customer has complained of excessive four-stroking set the taper needle one notch lower in the throttle slide. To do this unscrew the knurled ring at the top of the mixing chamber, remove the throttle slide and disconnect it from the control wire. The needle with its clip can then be withdrawn from the slide, the clip removed and replaced one notch higher on the needle.

5. Cables and Controls.

Adjust and lubricate all cables and controls. The front brake and clutch controls will already have been adjusted (see above) but the exhaust lifter (or decompressor), ignition, throttle and air controls should be checked for correct adjustment. All these should have a little slack when in the "closed" position. Adjusting bushes are provided for these on the cylinder, magneto and carburettor respectively. See that all control levers are tight on the handlebar and make sure that the twist grip is not in a position such that any part of it, or the throttle wire, interferes with the correct action of the front brake lever. Make sure that the twist grip works freely, but does not shake closed from any position. On Model G this is provided with a set screw which passes through the flange at the inner end of the grip. To tighten the friction in the grip, loosen the lock nut and tighten the screw, finally tightening the lock nut. In the case of the 125 c.c. Model R.E. the twist grip is adjusted by loosening the clip which secures it to the handlebar and pushing the grip on to the bar as far as the brake lever will allow. This will expose the adjusting screw at the outer end of the bar.

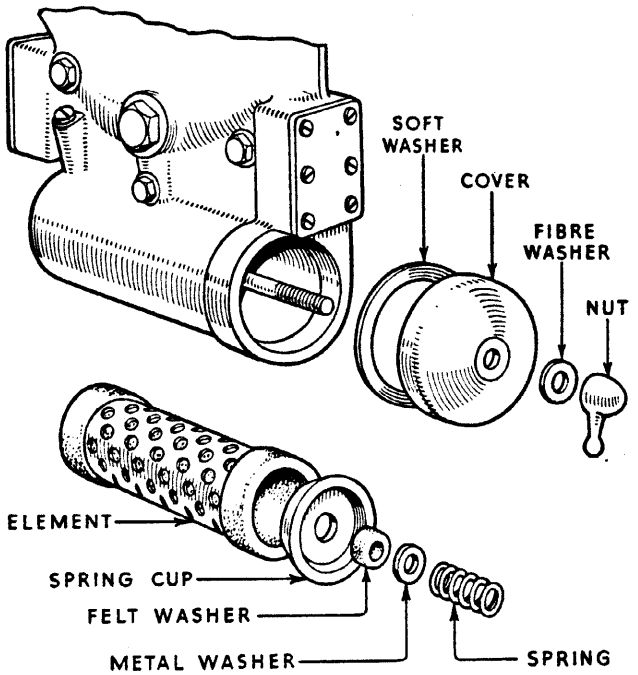
On Model G the ignition and air levers are adjustable for friction. See that these are adjusted so that they move freely, but do not close under vibration. On both models the clutch and brake levers are adjustable for "shake." If these are too loose unscrew the lock nut on the pivot pin, tighten the pivot and lock up the nut.

Put a few drops of engine oil on the exposed ends of all control cables, also on the clutch and brake lever pivots, and in the case of the Model G into the joint between the two halves of the flange at the inner end of the twist grip.

6. Grease Nipples.

Grease all nipples with one of the recommended grades of medium grease, i.e., Castrolease (Medium); Mobilgrease No. 2; Shell Retinax C.D.; Belmoline D.; Esso Grease.

We do not advise greasing the hub nipples at this stage so that there remain three nipples* on Model G and eight† on Model R.E.



DETAIL OF FELT OIL CLEANER
MODEL G.
Fig. 9.

7. Draining Oil System.

In the case of the Model G engine, drain the oil tank and sump by removing the two drain plugs from beneath the crankcase. Drain the timing case by removing the oil feed plug (plated hexagon in timing cover) and leaning the machine to the right. Remove also the felt oil filter from below the timing cover (see Fig. 9). Wash all filters in petrol, replace them and the oil feed plug, and replenish the crankcase with one of the recommended grades of oil, i.e. :

Castrol Grand Prix ; Golden Shell ;
Essolube Racer ; Motorine B de Luxe ;
Mobiloil D.

* Brake Pedal, Gear Pedal and Speedometer Drive.
† Front Forks (5), Brake Pedal (2) and Speedometer Drive.

Start engine and allow it to tick-over for about 5 to 10 minutes to replenish the oil in the felt filter chamber and in the timing case. This will result in a reduction in the level of oil in the tank which should then be replenished to within 1in. of the top.

8. Lubrication of Chains.

Check the oil level in primary chain case. This should be up to the level of the drain plug. Add engine oil if necessary. If the rear chain is dry, apply engine oil or soft grease.

9. Lubrication of Gear Box.

Check the oil level in the gearbox. In the case of Model G this should be filled up to the level of the filler plug. In the case of Model R.E. the oil level should be about half way up the box and can be gauged by inserting a piece of wire through the filling orifice. Use engine oil for topping-up.

10. Final Test.

Test machine on road and make any further adjustment which may be necessary.