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Operation and Maintenance

ERRATA

The weight shown on page 8 should read 170 lbs approximately.

The dimension of the contact breaker gap shown on pages 9, 30, and 31 should read 0.012" and not $\frac{1}{8}$ ".

On the Lubrication Chart on page 23:

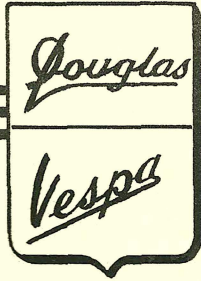
(a) The lubrication of the Front Hub under Wakefield should read Castrolase Heavy and not Castrolase Light, and under Esso the item should read 'High temperature grease' and not bearing grease.

(b) The felt of the flywheel magneto cam should be lubricated by two or three drops of light oil, and not by grease.

(c) The lubrication of the Hydraulic Damper (Esso) should read Hydraulic Oil Light.

Page 16. Only one carburetter spanner size $\frac{1}{4}$ " x $\frac{5}{16}$ " is necessary and is supplied in the tool kit.

Pages 8 and 16. No inflator is supplied with the machine.



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Operation and Maintenance

INTRODUCTORY NOTE

BE VESPA-WISE

Now that you own a DOUGLAS-VESPA, which we trust will afford you great satisfaction, may we ask you to treat it with pride, and thus, by following a few simple rules of maintenance, help it to work for you efficiently?

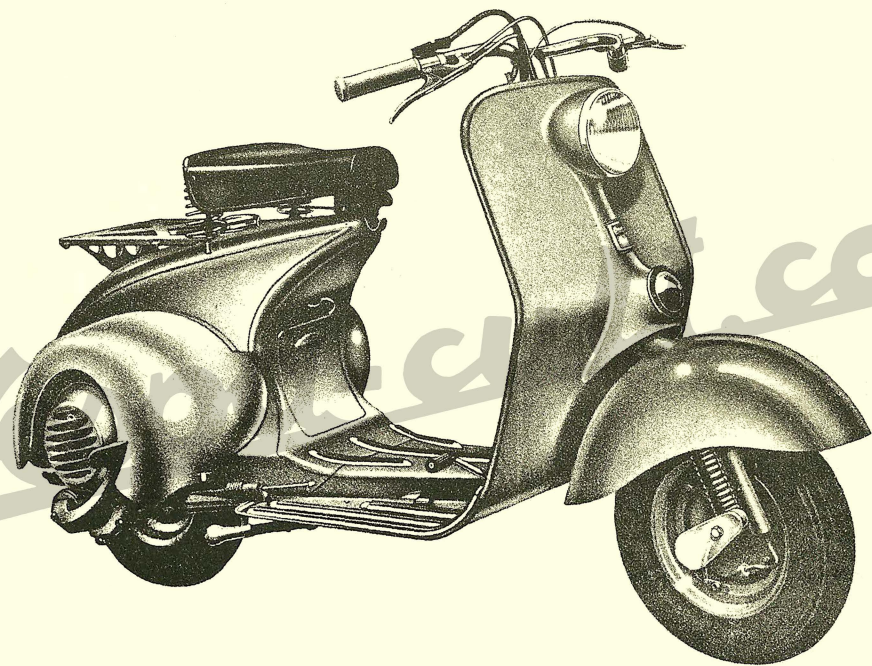
In this booklet we have tried to set out the principal maintenance operations and procedures for carrying out minor overhauls. We feel, however, that major servicing and particularly overhauls to the Engine and Gearbox should, whenever possible, be entrusted to Service Agents who have the necessary facilities to undertake this work.

Whilst the instructions herein are as clear and simple as possible, we realise that at times you may find yourself in difficulties. We have, therefore, made arrangements with our Service Agents to handle and answer any queries which may be causing you trouble. They only ask that you let them have the fullest possible information and detail regarding your problem, with particular mention of the Engine and Frame numbers of your machine.

DOUGLAS (SALES & SERVICE) LTD · KINGSWOOD · BRISTOL · TELEPHONE 73013/8

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THROTTLE CONTROL GRIP

FRONT BRAKE LEVER

CHOKE LEVER

FUEL COCK

KICKSTART

CARBURETTOR HOUSING COVER

LIGHT SWITCH, HORN BUTTON
& CUT-OUT

GEAR SHIFT CONTROL GRIP
& CLUTCH CONTROL LEVER

HORN

REAR BRAKE PEDAL

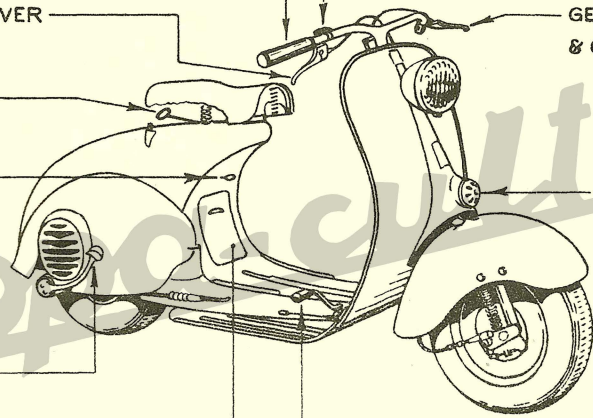


Fig 1

List of illustrations

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General description of Machine and summarised data

The VESPA has a two-stroke horizontal single-cylinder engine of 125 c.c. capacity.

Engine and Gearbox are in a single unit, with direct drive on the rear wheel.

Ignition and lighting are from flywheel magneto supplying H.T. current to the sparking plug, and L.T. current for lighting and horn, in conjunction with selenium rectifier and battery.

Cooling is ensured at all speeds by centrifugal fan fitted on flywheel.

The frame, of distinctive design, is pressed steel, electrically welded on a central longeron.

Front and rear wheels have spring suspension, while in addition the rear wheel has a hydraulic damper.

The wheels themselves are each composed of two flanges of pressed sheet steel, with integral brake drums. They are interchangeable, and being

cantilever mounted, are easily removable, in the same manner as those of a motor car.

The tyres are low pressure and interchangeable, giving long service; they are removable with unusual simplicity, owing to the form of the wheels themselves.

A pump and tool kit neatly stowed away in one of the rear wings, are supplied as standard equipment. A luggage carrier is fitted, as well as a speedometer. Two keys are issued, their serial number being clearly stated on your Guarantee card.

ACCESSORIES are not sold with the machine as standard equipment but you may consider their usefulness merits the addition expenditure:-

Pillion seat, windshield, spare wheel (which provides for an extra reserve of petrol), bracket for spare wheel, bumpers, seat cover.

Petrol tank capacity	1.1. Imperial Gallons
Emergency reserve	-.2. Imperial Gallons
Bore	2.22 inches 56.5 mm.
Stroke	1.97 inches 49.8 mm.
Capacity	7.65 cu.ins.124.858 c.c.
Compression ratio	6.4 to 1.

SECTION TWO

ON THE ROAD

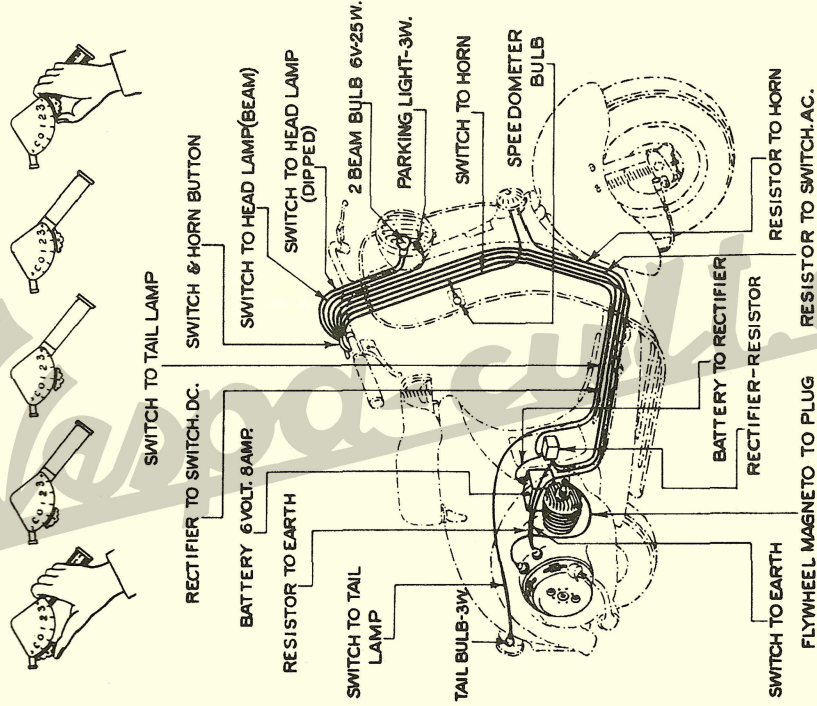
FILLING UP

On the chassis just behind the saddle you will find the fuel-tank cap. This is fitted with a wing-nut, which opens in an anti-clockwise direction. Inside the cap there is a filter: we recommend you not to remove this, otherwise you may allow impurities to enter the petrol system, and thence possibly incur difficulties, but you must remove the oil measure before allowing petrol in the tank.

The fuel tank holds slightly more than a gallon, and you must remember never to fill with petrol alone, but always with the addition of oil in the fuel tank at the same time as the petrol.

It is very important that the correct quantity of lubricating oil should be added. This differs according to whether the engine has been run-in or not. For the first 600 miles, the mixture should contain a quarter of a pint of oil for each half-gallon of petrol. Afterwards the quantity of oil for each half-gallon of petrol can be reduced to one fifth of a pint.

ELECTRICAL WIRING DIAGRAM.



SWITCH POSITIONS

Fig 2

- | | | |
|----------|----|---|
| POSITION | G. | - EARTH |
| " | O. | " OFF " |
| " | 1. | - TAIL LAMP, SPEEDOMETER LIGHT, & HEAD LAMP
DIPPED, "ON." (P) (S) (M) CONTACTS CONTACTED |
| " | 2. | - TAIL LAMP SPEEDOMETER LIGHT & HEAD LAMP
BEAM, "ON." (P) (S) (L) CONTACTS CONTACTED |
| " | 3. | - TAIL LAMP, SPEEDOMETER LIGHT & HEAD LAMP
PARKING LIGHT, "ON." (P) (S) (F) CONTACTS CONTACTED |

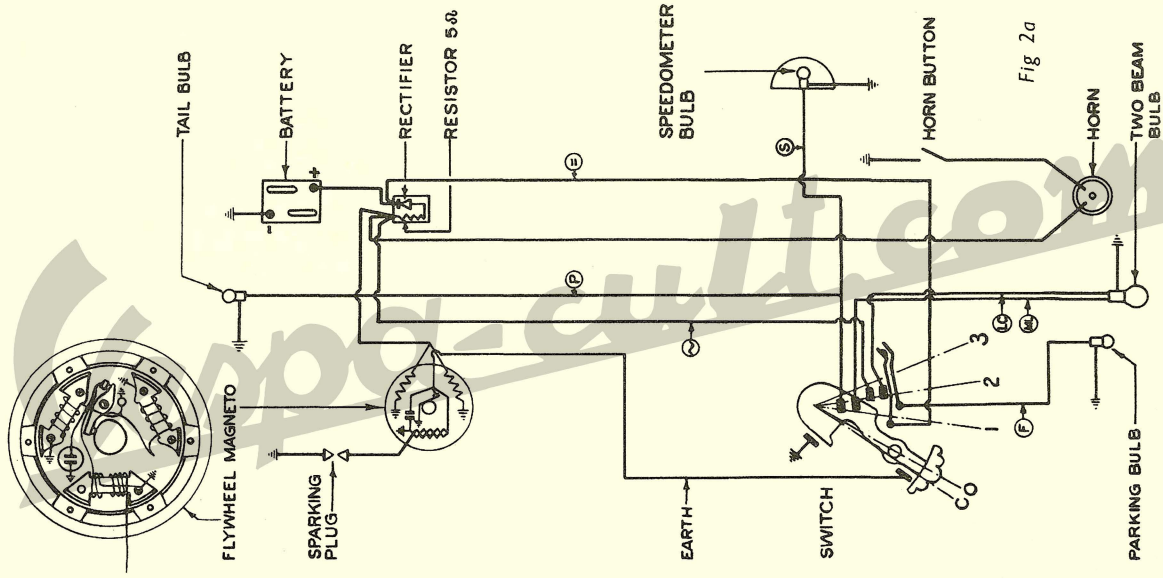


Fig 2a

To facilitate the correct proportioning of oil, a special measure is supplied, which fits inside the filter in the fuel tank. There is a line inside at about two-thirds of the depth. On the lip of the measure the following instructions are shown: "Normal run - 2 full to half gallon. Run-in 2 full plus 1 part." The "part" referred to is, of course, up to the level of the line inside.

Details of lubricating oils suitable are given in the lubrication chart on page 23.

CONTROLS

(See figs 1, 2 and 2a.)

It is advisable before starting the machine to spend some time sitting in the saddle to familiarise yourself with the position and operation of the various controls and the "feel" of the machine.

The THROTTLE control is the twist grip on the right handlebar, and operates through cable controls. To open the throttle turn the grip towards you.

Also on the right handlebar is the control lever for the FRONT BRAKE, which operates the brake by cable control.

Near the right hand twist grip there is the lighting switch incorporating cut-out (see fig 2) and horn push button.

On the left handlebar are the CLUTCH lever and the GEAR CHANGE CONTROL, which is fitted into the twist grip (see fig 3). This shows figures corresponding to the three gears, and a line indicating neutral. On the handlebar, at the edge of the twist grip, there is an arrow. To change gear depress the clutch lever and turn the twist grip until the number of the gear to be selected is opposite the arrow. Then slowly release the clutch lever. After a while you will find that you are able to change gear while running without using the clutch lever at all. This is quite permissible, as exhaustive tests have shown that this method does not damage the gearbox, and is of course much easier. The clutch, however, must be used when starting or stopping.

On the right hand portion of the footplate is situated the REAR BRAKE CONTROL PEDAL. Accustom yourself to operating this pedal.

In the concave surface of the chassis just

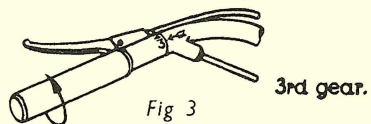
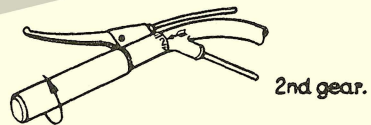
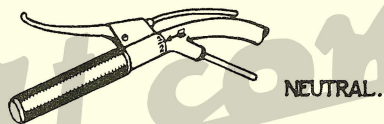
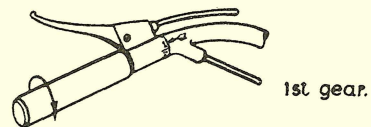


Fig 3

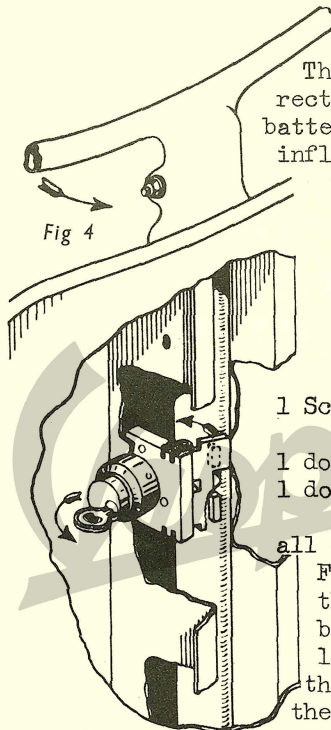
below and in front of the saddle you will find the FUEL COCK CONTROL ROD. When this rod is depressed to its fullest extent the fuel cock is closed. To turn on the supply, pull the rod out to its fullest extent.

You will notice that on this rod is cut the letter "R". This refers to the EMERGENCY FUEL SUPPLY, of about one fifth of a gallon. To release this emergency fuel supply to the carburetter, push the rod in until the letter "R" is level with the chassis panel.

The control for the choke is situated under and to the rear of the saddle, and consists of a rod which on being lifted closes the choke valve of the carburetter. It is not recommended that this should be used unless difficulties are encountered in starting.

On the right hand side of the rear part of the chassis is the kickstart.

You will observe that the engine is covered by a wing panel. If you have occasion to examine the engine, place the machine on the stand, then, with the gear control twist grip at neutral, and the fuel cock closed, gently depress the kickstart and keep it depressed. (This is important, because if you release it, you will most probably scratch the panel of the engine cowl). By releasing a catch in the front of the engine cowl you will then be able to lift this cowl up, and it will fix in the open position by a spring.



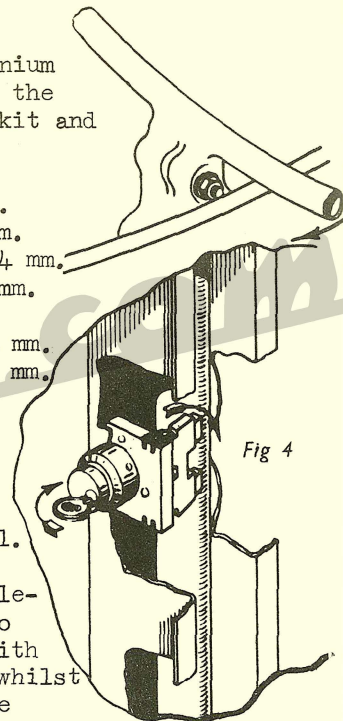
The left hand rear wing holds the selenium rectifier and provides accommodation for the battery, but has space also for the tool kit and inflator.

The tool kit consists of:-

- 1 single ended flat spanner 9 mm.
- 1 single ended flat spanner 10 mm.
- 1 double ended flat spanner 11 and 14 mm.
- 1 double ended flat spanner 7 and 8 mm.
- Tommy Bar.
- 1 double ended box spanner 11 and 14 mm.
- 1 double ended box spanner 21 and 22 mm.
- 1 Screwdriver, also, special carburetter spanners:-
- 1 double ended flat spanner $\frac{1}{4}$ " x $\frac{1}{8}$ "
- 1 double ended flat spanner $\frac{5}{16}$ " and 0.281".

all contained in a black canvas tool-roll.

Finally, you have a SECURITY LOCK on the main Longeron just below the handlebar (see fig 4). This enables you to lock the machine up when necessary, with the handlebar in such a position that whilst the lock functions the machine cannot be



moved in a straight line. DO NOT ATTEMPT TO RIDE THE MACHINE UNLESS THE KEY IS IN, AND REMAINS IN, THE LOCK, AND THE HANDLEBAR IS MOVING FREELY.

STARTING

First ensure that the gear change twist grip shows neutral. Pull out the fuel cock control rod to its fullest extent. (If your fuel tank is nearly empty, it may be necessary to switch the rod to the Emergency Supply Position).

We also recommend you to shake the machine gently, which will assist in mixing the oil with the petrol in the tank; otherwise, there is danger that the oil being heavier, will sink to the bottom of the tank.

Then kick the starter, with the twist grip throttle control slightly open.

You will find it most convenient to stand facing the right hand side of the machine, holding the throttle twist grip in your right hand, and operating the kickstart with your left foot, whilst the machine is on its stand, the whole time steadying the machine by holding the saddle with your left hand.

Do not close the choke valve (by lifting the rod beneath the saddle) unless you have difficulty in starting in the normal way.

If the carburetter is flooded to such an extent that the engine cannot be started, it will be necessary for you to empty the fuel out of the engine and

the carburetter. In this case, first close the fuel cock, then unscrew the outlet plug at the base of the crankcase, as shown in fig 5, using the 11 mm box spanner. (If you have fitted your machine with a TAP in place of this outlet plug, you will of course, merely have to turn it on).

Rotate the engine slowly by hand to drain the fuel out thoroughly.

When it has drained, replace the outlet plug and washer in the crankcase, or close the tap as the case may be. Then operate again on the kickstart, keeping the fuel cock closed, but remember to open the cock immediately the engine starts.

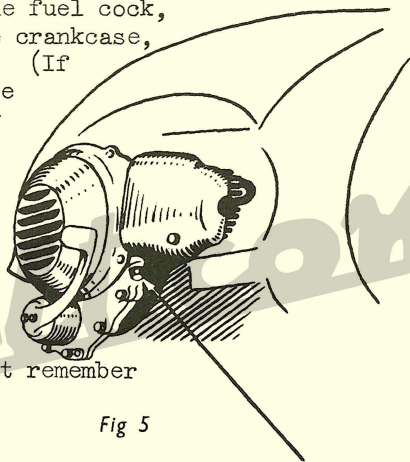


Fig 5

RIDING TECHNIQUE

To set the machine in motion, engage first gear. To do this pull the clutch lever on the left handlebar towards you to its fullest extent, and turn the gear control twist grip upwards and towards you so that the arrow is opposite the figure 1. (See fig 3.) Now let in the clutch very gently by gradually releasing the lever. At the same time increase the engine speed by gradually opening the throttle, when the machine will pass smoothly into motion.

For the best results it is necessary for all these movements to be carried out firmly and gradually.

N.B. THE THROTTLE SHOULD NOT BE OPENED TO ITS FULLEST EXTENT UNTIL THE MACHINE HAS COMPLETED 600 MILES. (See Section on Running In).

Once having satisfactorily set the machine in motion for the first time, we urge you to stay in bottom gear for at least ten minutes, to give yourself confidence in balancing the machine, before attempting to change into a higher gear.

To develop a neat gear change technique may take you, if you are a beginner, some little time. To change up into a higher gear, accelerate until the required speed is reached. As a guide only to the beginner, the following speeds are suggested for changing up:-

First to second gear	10 m.p.h.
Second to third gear	20 m.p.h.

The throttle should then be partially closed simultaneously with the depression of the clutch; if this is not done, immediately the load is taken off the engine by operation of the clutch, the engine speed will tend to rise, whereas to change to a higher gear it is necessary for the engine to run slower. Then turn the gear change twist grip so that the arrow is opposite figure 2, and let in the clutch very gently by gradually releasing the lever.

The machine will now be in second gear. Repeat this procedure for changing into third gear.

The suggested speeds for gear changing given above are of course only approximate, and after a time experience will tell you the speeds at which changes should be effected.

ABOVE ALL, TRY TO AVOID PLACING UNDUE STRAIN ON THE ENGINE DURING ITS FIRST 300 MILES.

When changing to a lower gear, withdraw the clutch, accelerate the engine by opening the throttle a little, and turn the gear change twist grip back to the lower gear.

You will find that a little trouble taken in perfecting your gear changing technique will be amply repaid by greater riding comfort and longer machine life. Use the throttle to govern the speed of the machine; to lift the clutch and apply the brakes to slow the machine is wasteful when the same braking effect could be obtained by closing the throttle. On greasy roads the use of the engine as a brake is very much to be recommended, especially by effecting a smooth change to a lower gear.

RUNNING IN

To ensure the best service and length of life from your machine, care should

be taken with the running in. The engine should never be allowed to labour, or over rev, and for the first 600 miles it is recommended that the throttle should never be completely open.

ENGINE CUT OUT

To stop the engine, the switch on the handlebar must be put at the earth position marked "C". Incidentally, this will leave the cylinder full of fuel vapour, facilitating easy starting on the next occasion.

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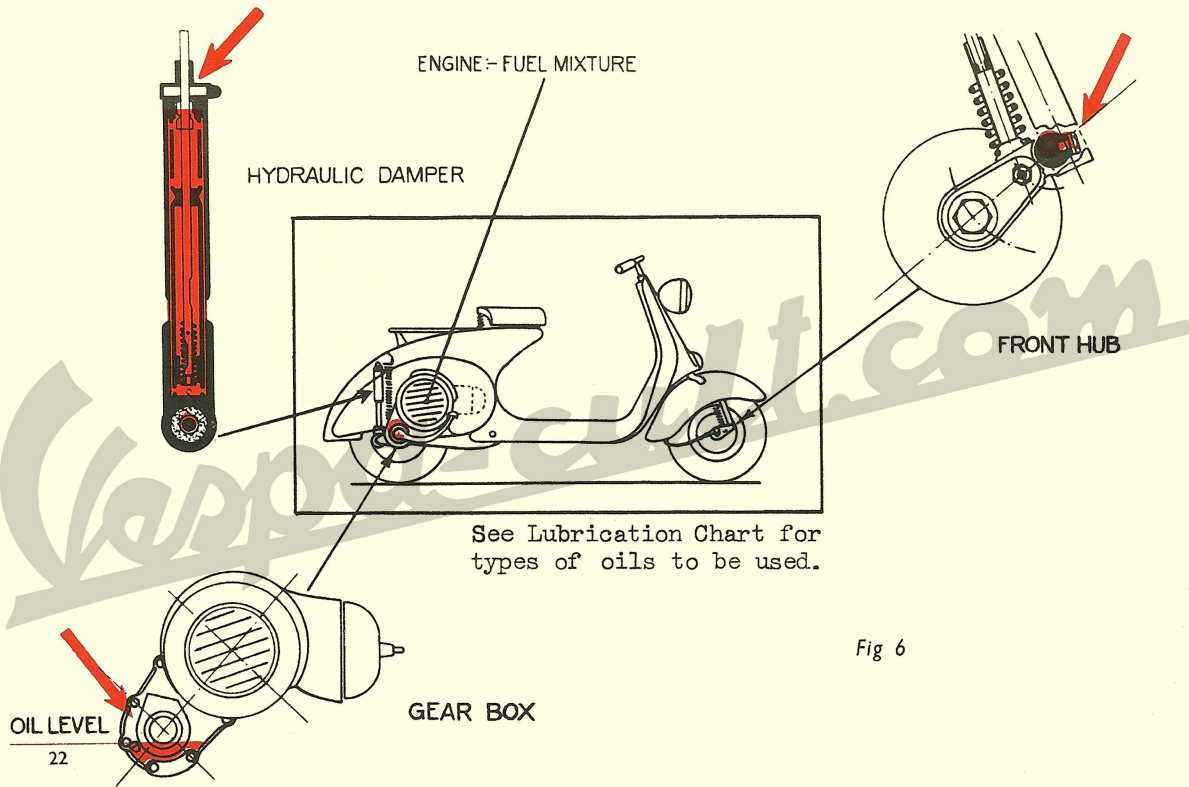


Fig 6

LUBRICATION CHART

Part to be lubricated	When to be lubricated	Lubrication Instructions.	Type of Oil to be used.				
			Shell	Vacuum	Esso	Wakefield	Price's
ENGINE	At every refuelling	Petrol-oil mixture During first 600 miles: 1/4 pint of oil per 1/2 gallon petrol. After first 600 miles: 1/5 pint of oil per 1/2 gallon petrol.	Double	Mobil-oil 'A'	30	XL	Energol SAE 30
GEARBOX	Immediately after first 600 miles Every subsequent 600 miles.	Drain off all oil while engine is warm; rinse thoroughly with paraffin; refill with clean oil. Replenish oil level	Double	Mobil-oil 'A'	30	XL	Energol SAE 30
FRONT HUB	Every 600 miles	Lubricate with pressure gun	Revinax RB	Mobil-Hub Grease	Bearing Grease	Castrol- ease. Light	Belmol- ine C.
LUBRICATION FELT OF FLY-WHEEL MAGNETO CAM	Every 1,200 miles	Small spot of grease on the lubrication felt.	ditto	ditto	ditto	ditto	ditto
HYDRAULIC DAMPER	If damper is not functioning freely.	Drain completely and refill	Donax A1	Mobiloil Shock Absorber oil Light		Castrol Shockol	Energol SA Light

SECTION THREE

LUBRICATION

ENGINE LUBRICATION

This is attended to by the oil content of the fuel mixture in the tank. No additional lubrication is necessary, but it is of course essential that you never omit to add the necessary quantity of lubricating oil to the petrol when filling up. (See page 23.)

GEARBOX LUBRICATION

At the rear of the engine, (see arrow in fig 7), is a nut marked OIL. Unscrew this and pour in about one sixth of a pint of Oil, until the oil level is just up to the inlet hole.

After the first 600 miles, drain out this oil by leaning the machine over on its right hand side, with the engine

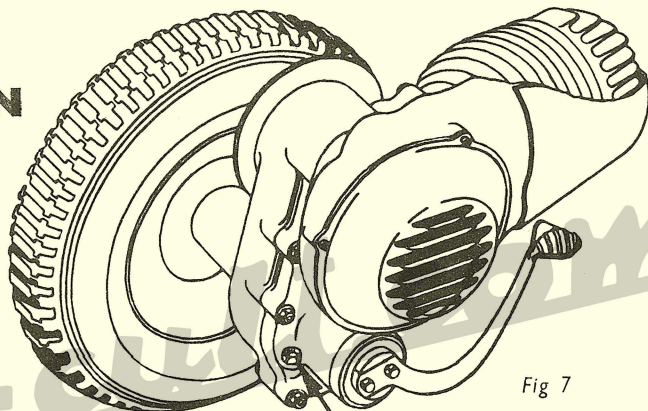
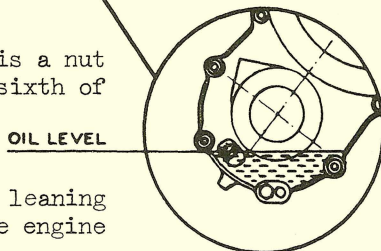


Fig 7



warm, and before refilling rinse the gearbox thoroughly with paraffin. After refilling ensure that the nut and rubber washer are secure.

Every 600 miles check the level of the oil, and replenish as may be necessary.

FRONT HUB

At the completion of every 600 miles, lubricate the front hub bearing, by a pressure gun. You will find the greasing point at the base of the steering tube, where it is joined to the front links; it is protected by a screw cap.

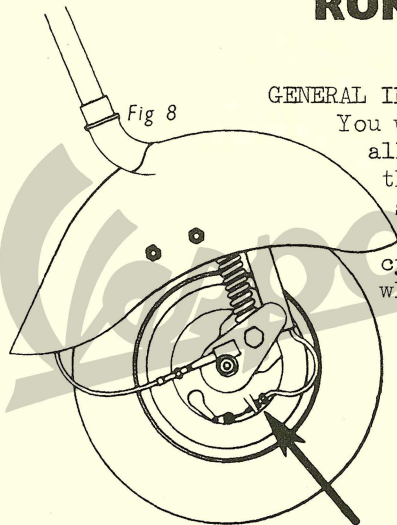
HYDRAULIC DAMPER

If you have trouble through the hydraulic damper not functioning properly, you should drain it completely and refill. This, however, is really a job for a Service Station, as it involves the removal of the damper from under the rear part of the chassis, an operation which may be beyond your scope unless you have special workshop facilities,

ON PAGE 23 THERE IS A LUBRICATION CHART COVERING ALL THESE POINTS IN SIMPLE FORM.

SECTION FOUR

RUNNING ADJUSTMENTS



GENERAL INSPECTION

You would be well advised from time to time to check that all essential nuts are tightly fitting, as of course there is normally a tendency when a machine is in constant use for some to be loosened by vibrations. Certainly after a thousand miles all nuts, especially cylinder head nuts, should be checked and tightened where necessary.

BRAKE ADJUSTMENT

Before attempting to adjust brakes, ensure that both wheels are off the ground.

FRONT BRAKE

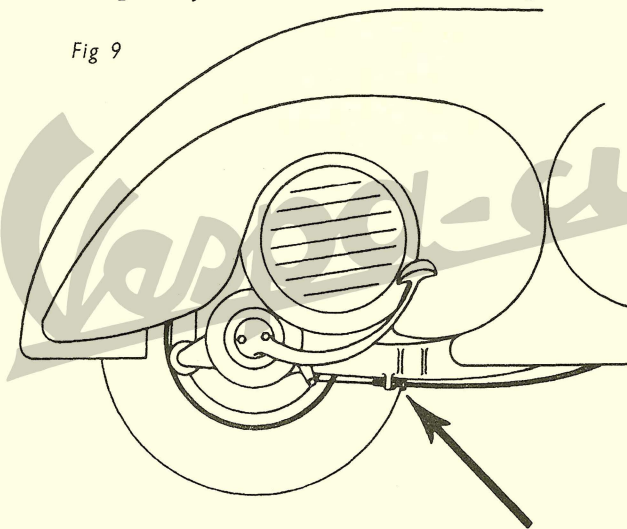
On the right hand side of the front wheel there is an adjusting screw (See fig 8.)

REAR BRAKE

The adjusting screw is under the main arm of the engine bearing. (See fig 9.)

Correct adjustment of either brake necessitates play of about four tenths of an inch at the tip of the hand lever (on the right handlebar) or of the foot-brake pedal, before the brake lining comes into contact with the brake drum. Ensure that the brakes are not binding, but that the wheels are perfectly free.

Fig 9



CLUTCH

The clutch control operates from the hand lever on the left handlebar, by a cable to the lever outside the clutch cover under the engine. At this point there is an adjustment nut, which will allow you to correct either excessive tautness of the cable, or excessive play.

Dirty, oily or greasy clutch plates should be washed clean in paraffin. Bent or badly worn plates should be replaced.

WHEEL REMOVAL

The wheels are made out of sheet steel pressings, and are fitted to the hubs by four nuts. When these four nuts are unscrewed the wheel can be lifted off in the same manner as a car wheel.

Bear in mind that the wheels are interchangeable, and that if you find one tyre is showing more signs of wear than the other you can switch them over. Do not, however, forget that in this event you must modify the tyre pressures.

TYRE REMOVAL

To remove a tyre, first remove the wheel as described in the preceding paragraph. Let the air out of the tyre, then unscrew the six nuts on the wheel, nearest the circumference, which will allow the two halves of the wheel to fall apart. Take care to extract the valve of the inner tube from the hole in one of the wheel halves, so that the outer cover and the inner tube are freed completely.

SPARKING PLUG

You will find it advantageous to carry out an inspection of your sparking plug approximately every 600 miles. Disconnect the H.T. lead from the plug itself by pulling off the bakelite waterproof cover, and remove the plug from the cylinder by using a box spanner on the hexagon of the body of the plug and not on the gland nut.

Check the plug for cracks in the insulation; if these are apparent you need a new plug. Clean the electrodes with petrol, and check the gap. This should be .018 ins.

CARBURETTER FILTER

In the union joint where the fuel pipe connects with the carburetter there is a small gauze filter. From time to time it is recommended that this be cleaned. First remove the large nut at the top of the carburetter, slip the union joint, which is fixed to the fuel pipe, off the carburetter; the filter is fitted inside the union, easily accessible. Remove all impurities which may be clogging the meshes, and wash with clean petrol before replacing. Take care to screw the nut on the carburetter tightly. Mind you do not lose the fibre washers.

DECARBONISATION

Every 1,200 miles clean the cylinder exhaust port. Remove the exhaust pipe and the cylinder head, and bring piston to dead bottom centre. When cleaning the exhaust port to take great care that no carbon deposit falls into the cylinder. (See fig 10.)

N.B. THIS OPERATION IS ONE
OF THOSE WE RECOMMEND
YOU TO HAVE DONE BY
A SERVICE AGENT.

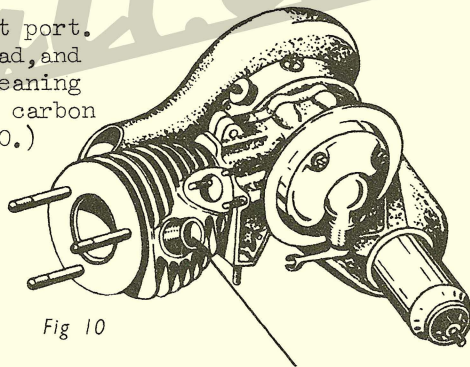
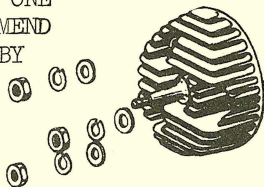


Fig 10

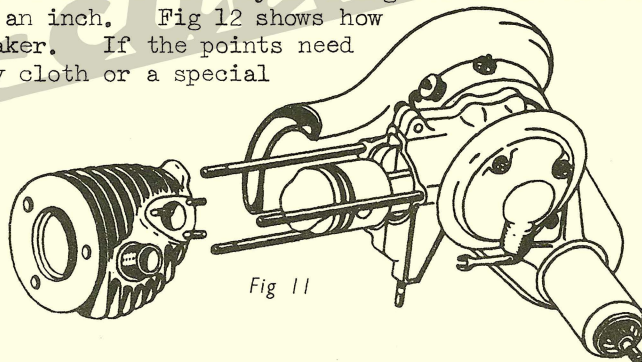
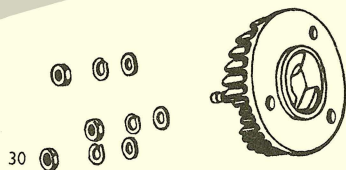
Every 3,500 miles, decarbonise the cylinder head, the cylinder and the piston.

Dismantle the exhaust pipe, remove the cylinder head and the cylinder. When cleaning take great care that no carbon deposit enters the engine. When reassembling, remember to replace the gasket between the cylinder and the Cylinder Head by a new one. (See fig 11).

N.B. THIS, ALSO, IS AN OPERATION, WE RECOMMEND YOU TO HAVE DONE BY A SERVICE AGENT.

ADJUSTMENT OF IGNITION

The gap between the contact breaker of the flywheel magneto should not be more or less than one eighth of an inch. Fig 12 shows how you can locate the contact breaker. If the points need reducing, use a very fine emery cloth or a special file for the purpose.



CLEANING DETAILS

In general, to keep your machine spick and span, first remove all dust and mud, then wash all unpainted surfaces with paraffin.

DISUSE

If for any reason you decide to lay your Vespa up for a while, we recommend you to raise it off the ground, resting the foot-plate on wooden blocks to take the weight off the tyres. Empty the petrol tank and the emergency reserve, clear the engine and lubricate it by dropping oil through the Sparking plug hole of the cylinder head; then turn the engine over a few times to ensure that a thin film of oil spreads all over the internal surfaces to prevent rusting.

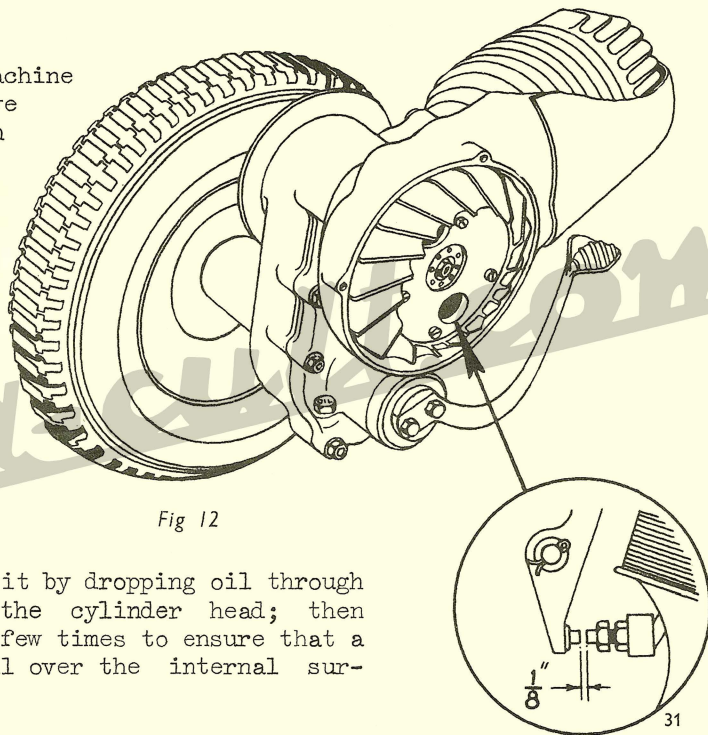


Fig 12

SECTION FIVE

FAULT FINDING

ENGINE STOPS OF OWN ACCORD

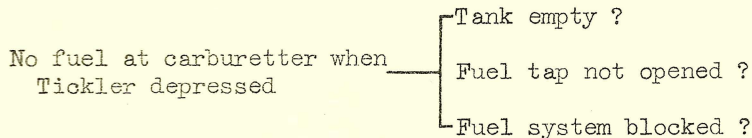
No fuel at Carburetter

- Fuel cock control rod should be at "R" ?
- Fuel Tank quite empty ?
- Fuel cock control rod accidently closed?
- Air hole in fuel tank cap blocked?

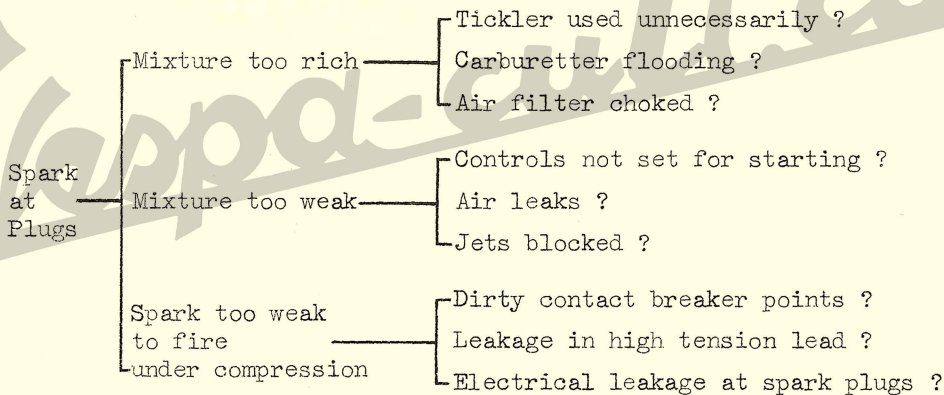
Fuel at carburetter

- Air holes in top of carburetter float chamber blocked ?
- Air leak in induction system ?
- Choked main jet ?
- Excessive fuel - (see final paragraph on section re Starting)
- Spark plug not firing ?
- Contact breaker arm sticking or points require attention ?
- Internal failure in flywheel magneto ?

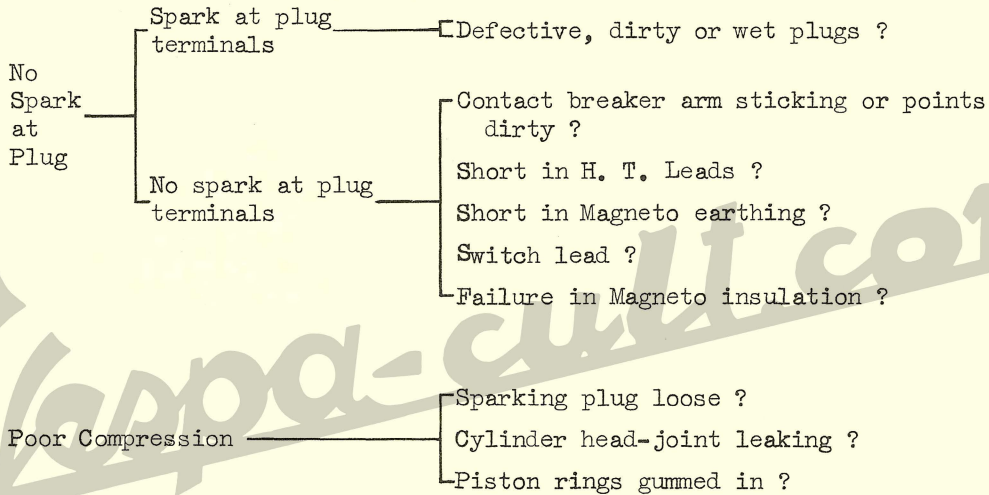
ENGINE WILL NOT START



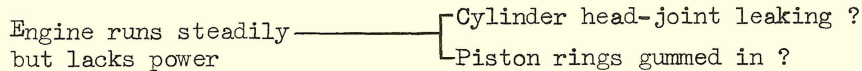
FUEL REACHING CARBURETTER



FUEL REACHING CARBURETTER (contd)



ENGINE RUNNING INCORRECTLY



ENGINE RUNS ERRATICALLY

Engine hunts ————— [Weak mixture ?

Engine pinks or knocks ————— [Spark plug sooted ?
Weak mixture ?
Engine overheating requires
decarbonising ?

Engine misfires ————— [Starved carburetter ?
Air vent in fuel tank cap blocked ?
Obstruction in fuel system ?
Faulty spark plug ?
Weak mixture ?
Contact breaker points, in flywheel
magneto, dirty or incorrect gap ?
Occasional short in H.T. Leads ?

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