DOUGLAS
BRISTOL

Vespa G.S.

OPERATION AND MAINTENANCE

FOR MODELS V.S.1, V.S.2, V.S.3, V.S.4, V.S.5. AND V.D.2T.S.

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In accordance with the Douglas policy of progressive improvement the right is reserved to alter any details of price, specification, accessories, and equipment, without notice, and without incurring any obligation.

This composite booklet covers 6 models:—V.S.1, V.S.2, V.S.3, V.S.4, V.S.5, and V.D.2T.S.

The main Section 1. Pages 3 to 37 inclusive covers the V.S.4. series.

Section 2. Pages 38 to 39 inclusive covers the variations applicable to the V.S.3 series.

Section 3. Page 40 covers the variations applicable to the V.D.2T.S. series.

Section 4. Pages 41 to 44 inclusive covers the variations applicable to V.S.2 series.

Section 5. Pages 45 to 49 inclusive covers the variations applicable to the V.S.1 series.

Section 6. Pages 50 to 53 inclusive covers the variations applicable to the V.S.5 series.

SERVICE EXCHANGE

Ask your Dealer for full particulars relating to the Service Exchange Scheme. The use of the facilities we offer through this medium ensures an economical, speedy, and reliable means of carrying out repairs when such become necessary.

SECTION I. V.S.4 SERIES

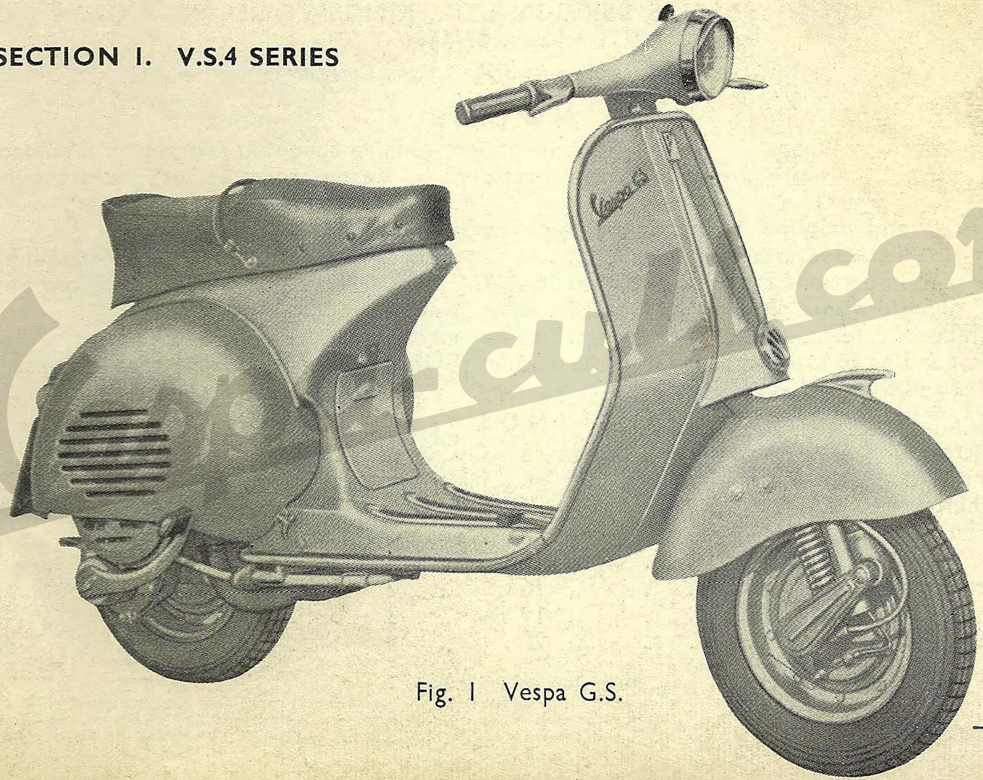

Fig. 1 Vespa G.S.

DOUGLAS (SALES & SERVICE) LTD., KINGSWOOD, BRISTOL
Telephone **67–1881**
Division of the Westinghouse Brake & Signal Company Limited.

NOTICE

In order to keep your **Vespa G. S.** in perfect running condition and not to invalidate the guarantee, always have your machines repaired by **Vespa** agents or authorized service stations.

Demand original Vespa spare parts exclusively.

All VESPA spares are made of the same material, have undergone the same machining steps and inspections as the components of your VESPA. This means a guarantee of long life, normal performance of your machine, and your personal safety.

Special care should be taken in regard to fuel mixture which should be of a good quality petrol and oil of make, grade and in the amount prescribed in this booklet, page 21. Avoid use of additives and vegetable oils.

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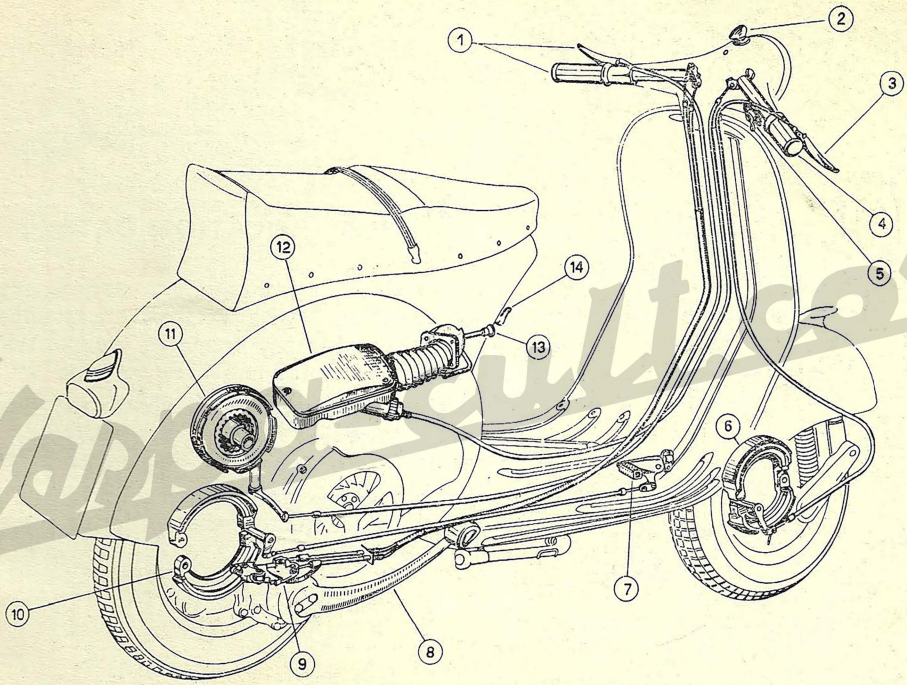


Fig. 2 – VESPA controls

1. Gear change twistgrip with clutch control lever – 2. Five-position switch and cut-out – 3. Front brake lever – 4. Throttle control grip – 5. Dip switch with horn button – 6. Front brake jaws – 7. Rear brake pedal – 8. Kickstarter – 9. Gear shifter – 10. Rear brake jaws – 11. Clutch – 12. Carburettor, air cleaner – 13. Choke control lever – 14. Fuel tap.

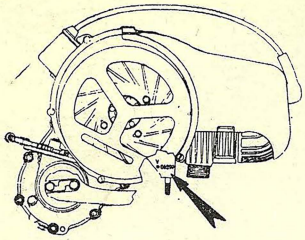


Fig. 3 – Stamping on engine

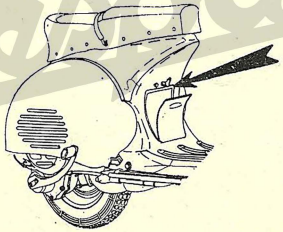


Fig. 4 – Stamping on frame

IDENTIFICATION DATA

Serial numbers with prefixes are stamped on both engine and frame in the positions indicated on Figs. 3 and 4 respectively.

Such numbers and prefixes identify the Vespa as prescribed by law and are repeated on the test card and other documents of the Vespa.

They must be quoted when ordering spares.

TECHNICAL DATA

Fuel consumption at economic speed	95 miles per imp. gal.
Max. speed	62 m.p.h.
Carrying capacity	Driver and passenger
Range	190 miles

Wheel base	46·5 in.
Handlebars width	27 in.
Max. length	67 in.
Max. height	41·3 in.
Min. height of floorboard	8·7 in.
Min. turning circle	55 in.
Weight (without fuel)	230 lbs.

ENGINE

Single horizontal cylinder, two stroke, with reverse flow scavenge.

Bore	57 mm. (2·24 in.)
Stroke	57 mm. (2·24 in.)
Displacement	145·45 cc. (8·88 cu.in.)

Compression ratio: 6·7 to 1.

Ignition by battery (see Fig. 7); ignition circuit controlled by means of a key in the switch on top of head lamp housing.

Sparkplug: K.L.G. FE.80; A.C. 44.XL; Lodge 2.HLN; Champion N.84.

Ignition timing with spark advance of 31°±1°.

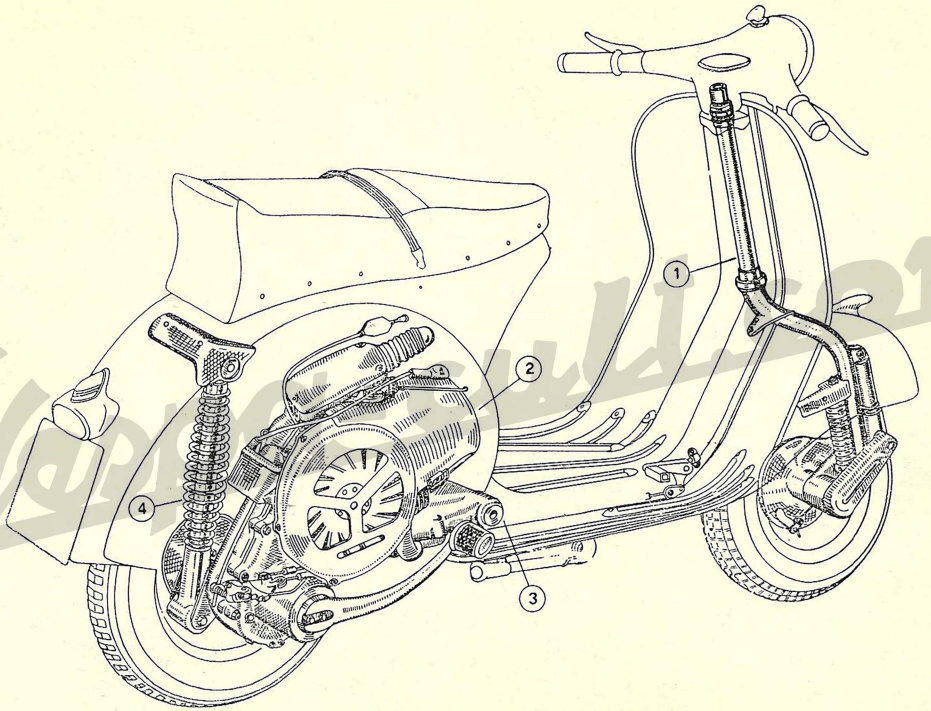


Fig. 5 – Engine installation and suspension

1. Steering column and front suspension – 2. Engine – 3. Engine bracket and rear wheel – 4. Rear suspension spring with hydraulic damper.

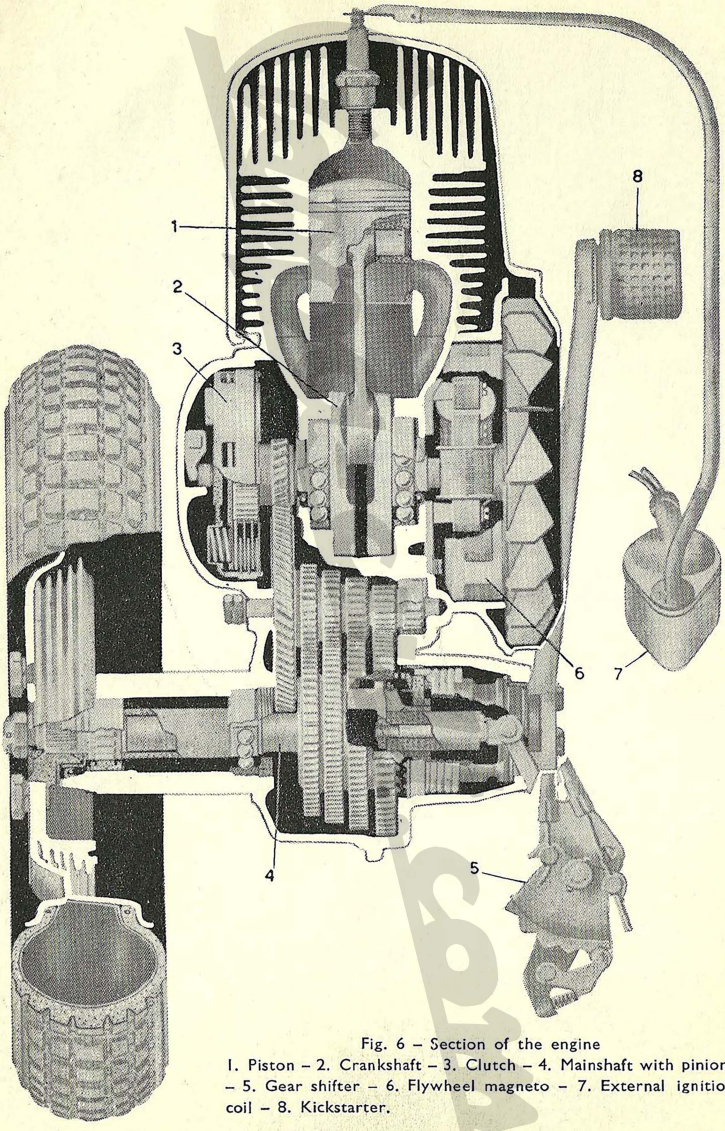


Fig. 6 – Section of the engine
1. Piston – 2. Crankshaft – 3. Clutch – 4. Mainshaft with pinions – 5. Gear shifter – 6. Flywheel magneto – 7. External ignition coil – 8. Kickstarter.

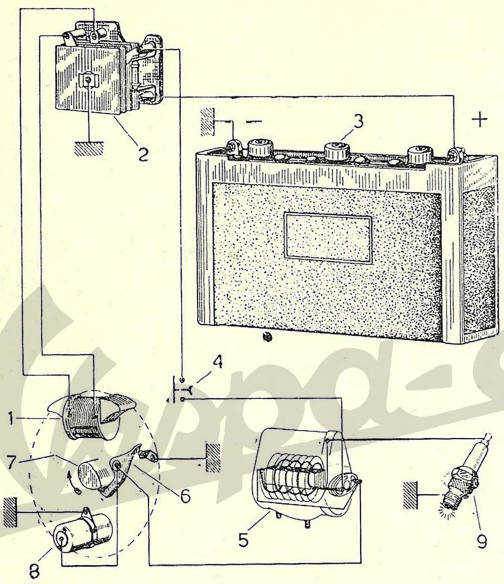


Fig. 7 – Ignition diagram
1. Coil feeding the battery – 2. Rectifier (2·5 A) – 3. Battery (6V – 12 Ah) – 4. Cut-out – 5. External ignition coil – 6. Breaker – 7. Rotor cam. – 8. Condenser – 9. Sparkplug.

Lubrication by the oil in the fuel mixture for piston, cylinder and gudgeon pin, con, rod, crankshaft, main bearings.

Both clutch and gear box operate in oil bath.

Feeding. Fuel feed to the carburettor (see Fig. 8) is provided for by gravity directly from the tank with petrol oil mixture.

Carburettor with float-chamber. Fuel tank with total capacity of 2·1 imp. gals and emergency reserve.

Three way tap (" on,"—" off,"—" reserve,") with sediment bowl.

Transmission. The engine is installed on the swinging bracket of the rear suspension and drives directly the rear wheel through clutch, cush drive and gear box.

Clutch. Wet type; steel plates with cork inserts.

Control by lever, on left hand side of handlebars (see Fig. 2) and adjustable cable.

Gear box. 4 speed drive with mesh gears in oil bath.

Its adjustable twistgrip control is coupled with that of the clutch, on left hand side of handlebars.

Engine to wheel transmission ratios:

First:	14·72 to 1
Second:	10·28 to 1
Third:	7·61 to 1
Fourth:	5·84 to 1

Starting by means of kickstarter, right hand side of scooter.

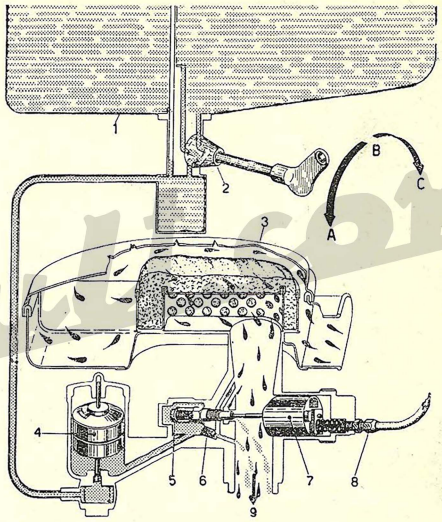


Fig. 8 – Feeding circuit

1. Fuel tank – 2. Fuel tap lever: A) Reserve, B) On, C) Off – 3. Air cleaner – 4. Float – 5. Main jet – 6. Idling jet – 7. Throttle slide – 8. Idling and throttle control adjuster – 9. To the cylinder.

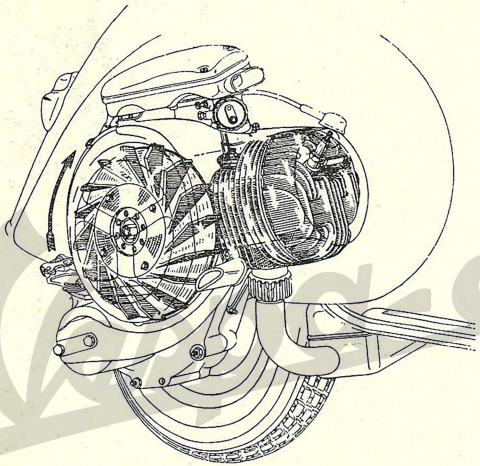


Fig. 9 – Cooling system

Cooling effected at all speeds by a centrifugal fan (see Fig. 9).

Silencer: Expansion and absorption combined type.

Air cleaner with silencing chamber and large intake tube.

Filter moistened by fuel mixture.

We recommend not to alter the air cleaner and the silencer but to keep them in perfect condition, in order to avoid an unnecessary noise.

FRAME

Stressed skin body of pressed steel sheet, with streamlined, monocoque type structure (see Fig. 1). It gives full protection to the driver, to the passenger and to the machine units; it is completed in this function by the

mudguard and, on the two sides, by the steel sheet engine cowling and tool box.

Handlebars in light alloy, with arrangement for head lamp and speedometer. All control cables and electric wires, to be connected to the handlebars, are concealed therein.

Steering column, suspension and wheels. The steering column bears the handlebars, clamped on its top end, and the front wheel swinging hub, pivoted at its bottom end through a stub axle.

Front suspension with coil spring and double action hydraulic damper.

Rear suspension: swinging bracket for engine and rear wheel, variable rate coil spring tapering at both ends and coaxial, double action hydraulic damper.

The wheels are interchangeable with 10" dia. rims of pressed steel sheet.
Tyre dia.: 3·50 : 10".

Central stand. A two-leg stand, easy to operate, is arranged under the floorboard. Two strong return springs hold it in contact with the floorboard and keep it from vibrating while the scooter is being ridden.

Saddle. Long dual seat which permits the driver to assume a crouched position and also provides ample and comfortable seating for a passenger. It gives remarkable comfort being packed with sponge rubber and having special steel springs. Access to the fuel tank filler cap is obtained by swinging the dual seat towards the front of the scooter (see Fig. 10).

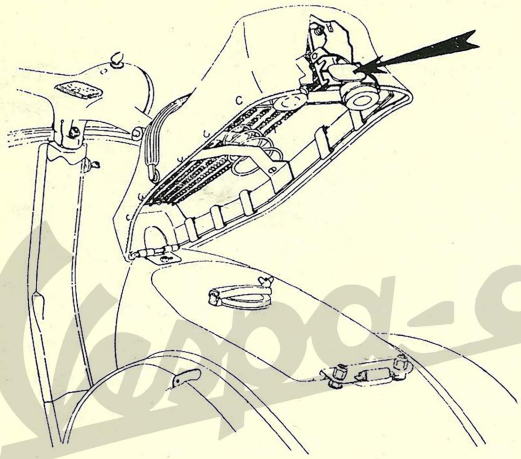


Fig. 10 – Access to the fuel tank

Brakes. Expanding type with cable control, Front: lever on right hand side of handlebars. Rear: control pedal on right hand side of floorboard. This pedal also operates, through a switch, the STOP light in the tail lamp.

The brake jaws pivot separately on two pins.

Drums, in light alloy with cooling fins.

Steering lock. A suitable security lock is arranged on the frame, near the handlebars. Turning the key anticlockwise and the handlebars to the left, the lock engages the lugs welded on the steering column, so that the machine can only turn around. Turn the key clockwise for releasing the steering system (see Fig. 11).

We recommend not lubricating the steering lock, even if it does not function properly.

Do not ride the machine unless the key is in, and remains in the lock and the handlebars move freely.

IMPORTANT

Please record the Serial Number of your Steering Lock Key as it is necessary to quote this if a replacement is required.

Speedometer. The speedometer has its housing in the middle of the handlebars (see Fig. 11).

It is driven by the front wheel, the flexible shaft being completely enclosed in the steering column.

The speedometer head is illuminated during rides at night by a bulb installed in suitable position in the head lamp. This applies to all models except V.S.1 Series.

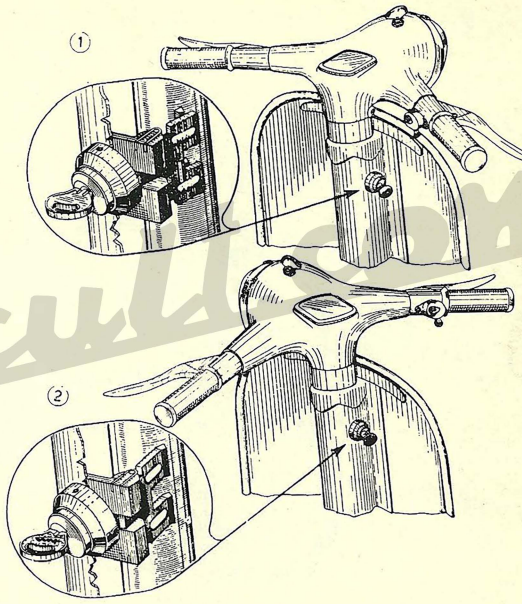


Fig. 11 – Security lock

1. Normal position – 2. Closed.

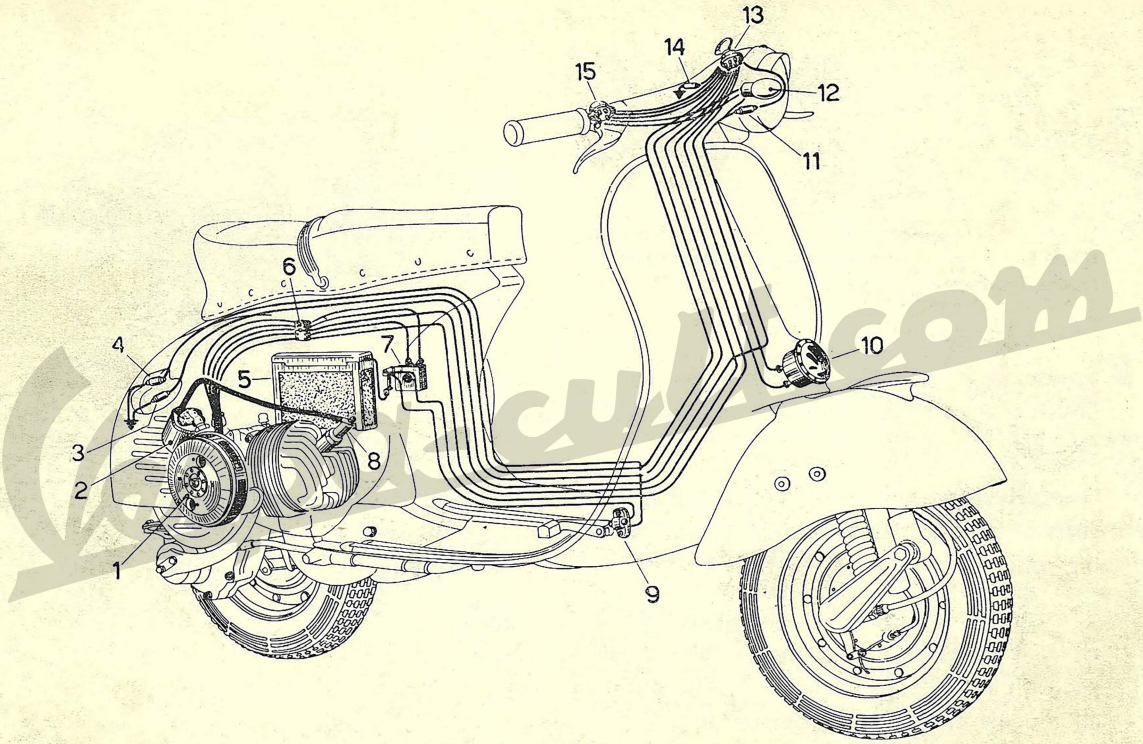
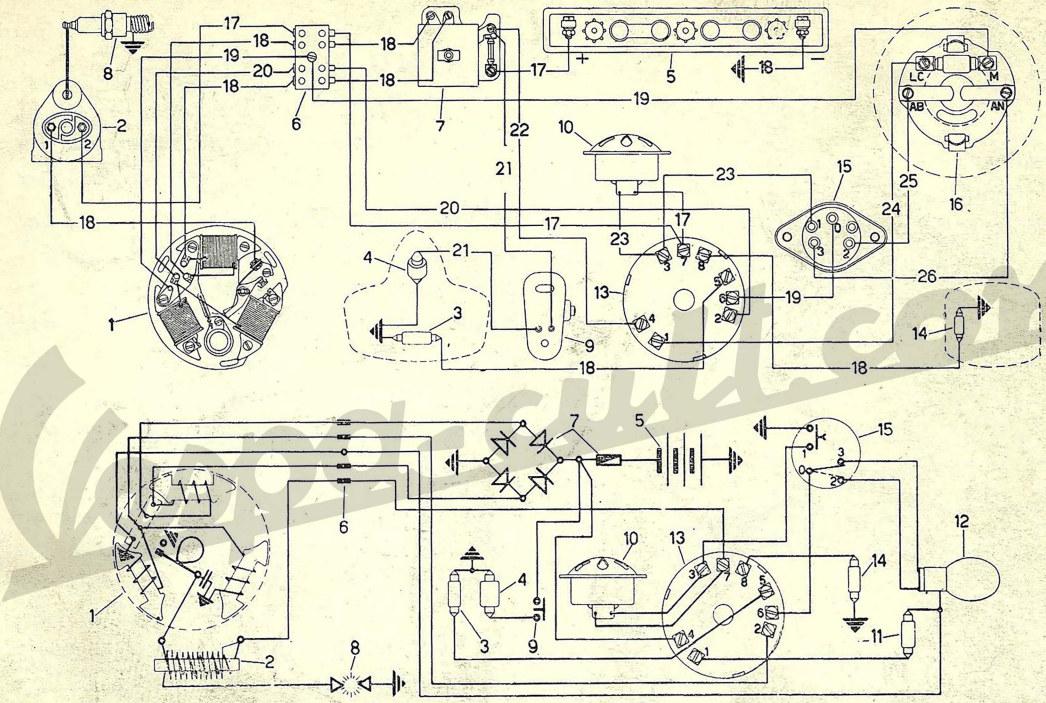


Fig. 12 – Cable harness

1. Flywheel magneto – 2. External ignition coil – 3. 6V-3W bulb for tail light – 4. 6V-10W bulb for STOP light – 5. 6V-12Ah battery – 6. Clamp board on the frame – 7. Rectifier with fuse – 8. Sparkplug – 9. STOP switch – 10. Horn – 11. Pilot light (6V-1·5W bulb) – 12. 6V-25/25W double filament bulb – 13. Switch – 14. 6V-1·5W bulb for speedometer light – 15. Dip switch with horn button – 16. Inside view of head lamp – 17. Red – 18. Black – 19. White – 20. Yellow – 21. Light blue – 22. Green – 23. Pink – 24. Blue – 25. Brown – 26. Violet.



P: contacts 4–1–5
0: contacts 1–5
1: contacts 4–7
2: contacts 4–1–5–7
3: contacts 4–7
contacts 2–5–6

connected to each other (See on Fig. 14 the switch positions P, O, 1, 2, 3)

Fig. 13 –Connections and electric wiring diagram

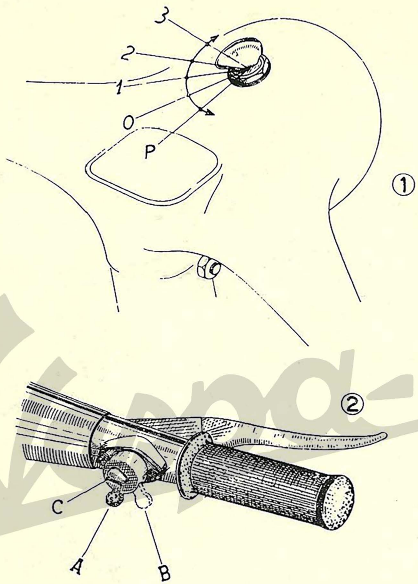


Fig. 14 – Light and dimmer switches
1. Main switch on head lamp
2. Dip switch

WIRING

Either alternating or direct current for both horn and lighting system is supplied as follows (see Figs. 12–13):

— dipped, main beam, and tail lamp are directly fed with a.c. by the 6-pole flywheel magneto (nominal voltage: 6V).

— horn, front and rear parking lights and STOP light are fed with d.c. by a 6V-12Ah battery which is re-charged by the flywheel magneto through a metallic rectifier.

— speedometer head is lit by a 6V-1·5W bulb fed either with alternating or direct current.

The **head lamp**, 115 mm. dia. arranged in the handlebars, is provided with a 25/25W double filament bulb (dipped and main

beam), and with a 1·5W bulb (pilot and parking light).

The **tail lamp** with red reflecting glass has a 3W bulb, which also lights the number plate, and a 10W bulb (STOP light) that is operated through a suitable switch when the rear brake pedal is depressed. The main switch, in which a key must be inserted completely (position 0), is placed on top of the head lamp.

The key can be turned into the following positions (see Fig. 14):

P) - parking lights on, ignition off

0) - lights and ignition off

1) - ignition circuit only connected

2) - riding at night with pilot light, tail lamp and bulb for speedometer on

3) - riding at night with head lamp, tail lamp and bulb for speedometer on.

The dip switch (main beam and dipped beam; see Fig. 14, positions "A" and " B ") with horn button (" C ") is installed on the right hand side of the handlebars.

TOOL KIT

2 double-ended box spanners (11–14 and 21–22 mm), 1 double open-ended spanner (11–14 mm), 3 single open-ended spanner (7–8–10 mm), 1 Tommy bar for box spanners, 1 screw-driver.

These tools are contained in a canvas roll which is placed in the left wing together with this booklet.

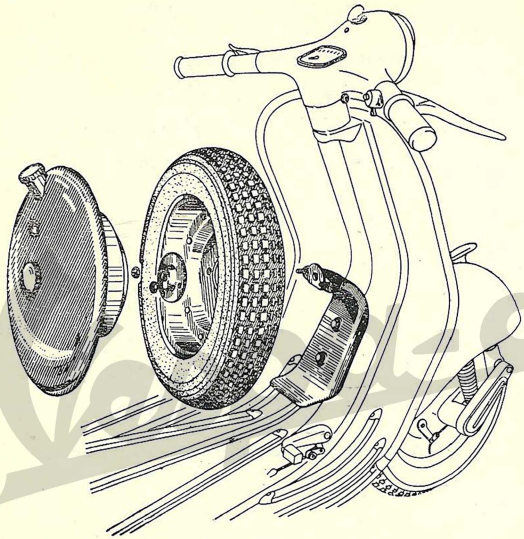


Fig. 15 – Spare wheel and auxiliary tank

A security lock is arranged on the lid of the tool box.

ACCESSORIES

On request the **Vespa G. S.** scooter can be equipped with:

— **Spare wheel and support.** The wheel support, with a packing in between, can be secured to the two holes in the middle of the longeron. It is very simple and holds the wheel in a vertical position, quite easy to reach (see Fig. 15).

— **Reserve tank.** It contains 1·15 imp. gals. and can be arranged into the recessed portion of the spare wheel (see Fig. 15).

OPERATION

Fuel mixture to be used during and after running-in should be composed of petrol and Oil, Grade SAE 30) in proportion of ½ pint per gallon. See chart on page 34.

We recommend the use of good quality, standard grade car petrol, and to mix oil with petrol thoroughly.

Keep the breather of filling cap clean.

Running-in. Important rules to be followed while running-in, 1800 miles.

— Do not exceed following speeds:

in 1st gear:	15.5 m.p.h.
in 2nd gear:	25 m.p.h.
in 3rd gear:	34 m.p.h.
in 4th gear:	44 m.p.h.*
	50 m.p.h.†

* For the first 1200 miles
† From 1200 to 1800 miles

— Do not hold these max speeds for long periods, neither use full throttle opening up-hill.
— Change oil in the gear box and check that nuts and bolts are not slack after the first 600 miles.

Starting the engine. See the fuel tap and main switch positions on Figs. 8 and 14 respectively.
Insert the key completely in the switch and turn it to the running position.
Open the fuel tap, put the gear box in neutral and the throttle in slow running position, depress the starting lever. With cold engine, pull the choke rod. Once the engine started, take care to push the choke rod back.

All these operations are clearly indicated on Fig. 16.

If trouble comes from the battery being discharged, disconnect the black earthing cable from the battery itself. The above procedure is to be followed in emergency cases only, and consequently the speed of 37 m.p.h. should not be exceeded. The owner should, however, have the wiring of his machine checked at once by a recognised Vespa Dealer.

Engine flooding can be overcome with the " push-start " procedure, or with the following method:

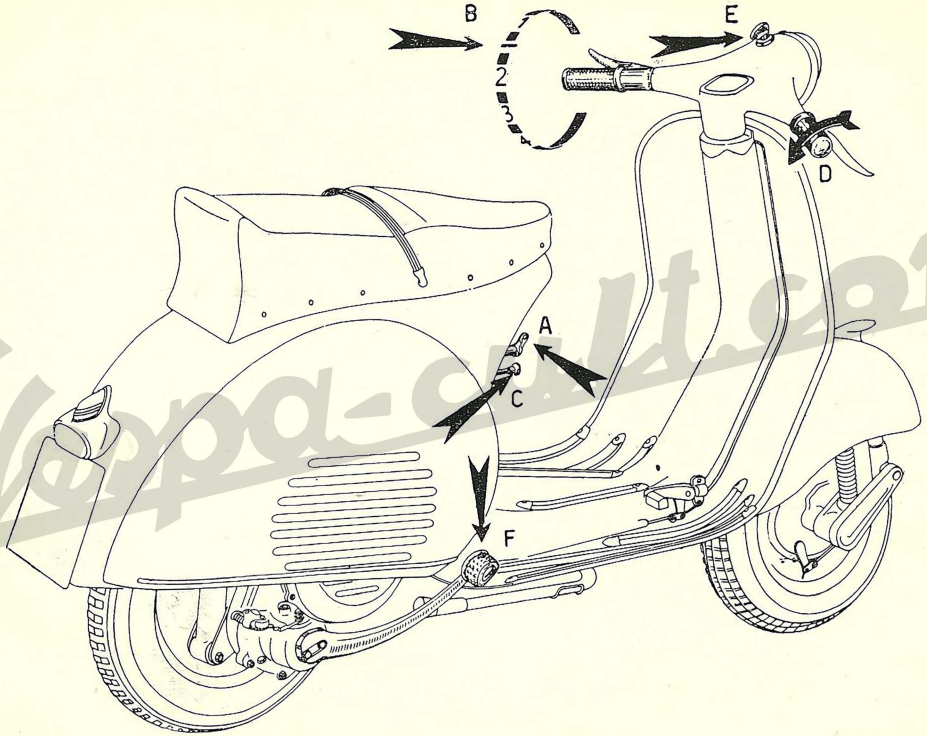


Fig. 16 – Operations to carry out for starting the engine.

A. Switch on Fuel – B. Select " neutral" – C. Choke (with cold engine) – D. Throttle control grip in idling position – E. Insert the key in the switch and turn it to the running position (see also Fig. 13).

— Close the fuel tap, remove the spark-plug and rotate the engine by means of the kickstarter, wipe the plug dry and screw it back. Open the fuel tap and depress the starting lever.

To avoid the battery becoming discharged when the engine is turned off, we recommend not leaving the key of the switch inserted in the running positions.

Setting the machine in motion. Let the engine idle, depress the clutch and turn the gear change twistgrip so that the line engraved on it coincides with the figure "1" (1st gear) engraved on handlebars (see Fig. 17). Now let in the clutch gently, while opening the throttle gradually to set the machine in motion.

Gear change. After reaching the required speed in 1st gear, close quickly the throttle, depress the clutch and turn the gear change twistgrip so that the engraved line is opposite figure "2" (2nd gear); let in the clutch and open the throttle.

Repeat this procedure for changing into 3rd and then into 4th gear, and for changing down (see the drive system on Fig. 17).

When you reduce the speed of your machine change down with no delay.

Do not turn the gear-change twistgrip while the engine is not running.

As soon as gear change troubles arise, particularly when the control becomes hard, customers should have their machines adjusted by a dealer or authorized service station.

Slow running adjustment. Idling revs can be raised or reduced respectively by simply

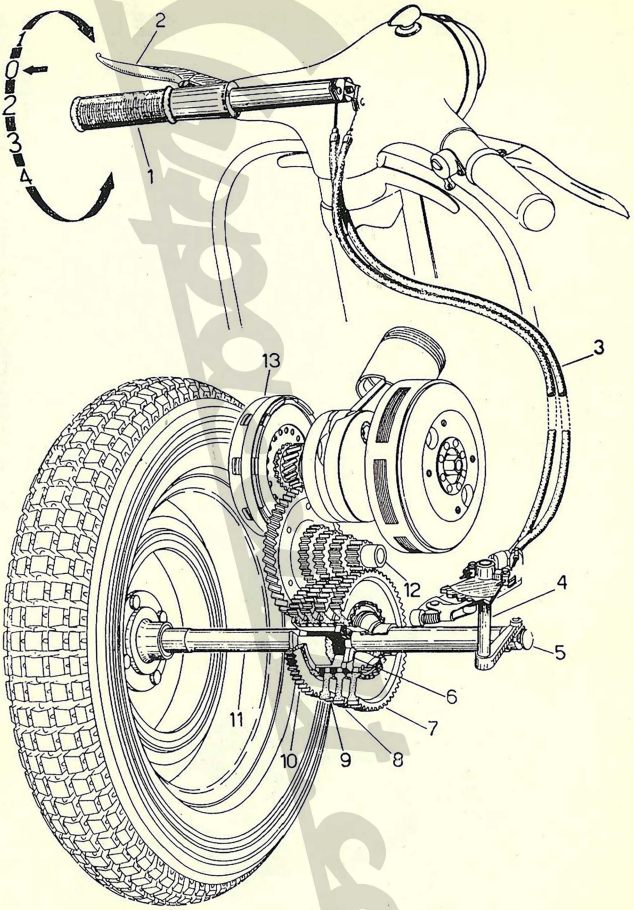


Fig. 17 – Drive system

1. Gear change twistgrip – 2. Clutch control lever – 3. Gear change control cables – 4. Gear shifter – 5. Selector rod – 6. Selector – 7. 1st gear pinion – 8. 2nd gear pinion – 9. 3rd gear pinion – 10. 4th gear pinion – 11. Mainshaft and wheel – 12. Cush gear – 13. Clutch.

N.B. – Positions 1, 2, 3, 4 of the gear change twistgrip correspond to 1st, 2nd, 3rd, and 4th gear respectively; "O" indicates the neutral position.

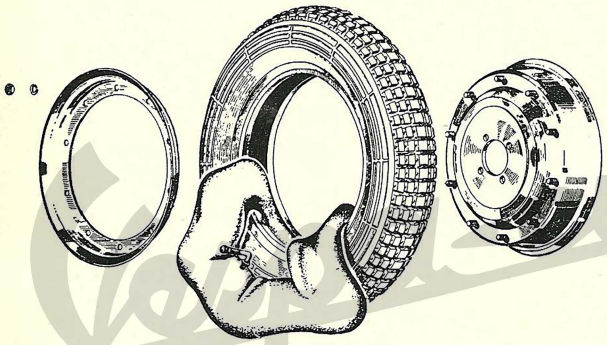


Fig. 18 – Removing the inner tube

slackening or tightening the screw on carburettor cover.

Stopping the engine. Turn the key in the switch on top of the head lamp to the position "0." This will leave the cylinder full of fuel vapours, and the next start will be much easier.

Tyres. The wheels are interchangeable, i.e. they can be assembled either in front or rear, provided, of course, that they are inflated to the pressures respectively prescribed below.

When a flat tyre is to be replaced, unscrew the four nuts which secure the wheel to the brake drum, pull the wheel sideways off the studs, repair it or fit the spare wheel on.

Make sure that the spring washers are in position when re-assembling the wheel; tighten the nuts diagonally and evenly.

For removing the inner tube, deflate it first, then unscrew the ten nuts on the wheel, so that the two halves of the rim will fall apart (see Fig. 18).

Tyre pressure should be 20 psi on rear wheel and 16 psi on front wheel.

When the Vespa is ridden by both driver and passenger, the pressure of rear tyre should be increased to 32 psi.

Brake adjustment. Brakes are properly adjusted if :

— the wheel rotates freely when respective control lever or pedal are in resting position.
— the braking action starts as soon as respective controls are operated.

These conditions are achieved adjusting the cables by means of screws indicated with an arrow in Fig. 19.

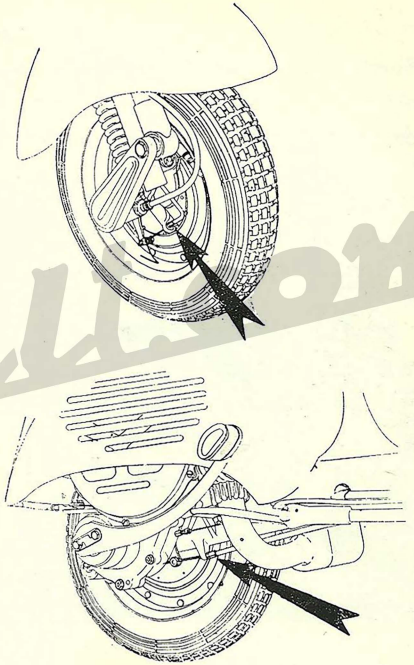


Fig. 19 – Brake adjustment

Setting the head lamp. The correct orientation of the main beam can be obtained on both vertical and horizontal planes, as follows.

— Make sure that front and rear tyres are inflated to 17 and 35·5 psi respectively.

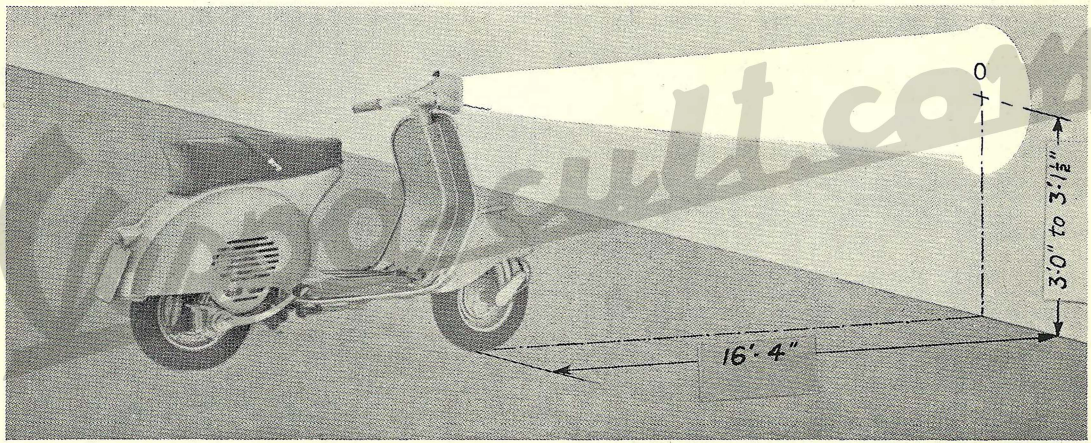


Fig. 20 – Head lamp adjustment

N. B. – The adjustment must be carried out with driver and passenger on the machine.

— Place the scooter on a level floor in front of a white wall where a point " O " has been marked as seen on Fig. 20.

— Start the engine, hold the throttle control twistgrip at about 1/3 and switch on " main beam."

With two persons on the Vespa, the beam axis should coincide with point "O" on the wall. If not, slacken the three screws which secure the head lamp, then move the latter as required. Tighten the three screws again.

This operation can be carried out also with driver only sitting on the saddle. In such a case, of course, the beam alignment should be altered whenever the scooter is being ridden by both driver and passenger.

Cleaning the scooter. Brushing with paraffin and wiping dry with clean rags is advisable for outside cleaning of engine. All painted surfaces should be washed with water, deterged by means of a sponge and wiped dry with chamois leather. Do not use paraffin on such surfaces, since it damages paint and turns it dull.

If necessary, blow the head lamp reflector clean or wipe off dust with a very soft feather. Do not use a cloth and keep your fingers off the reflector surface.

Before setting the machine in motion. Check oil level in gear box by unscrewing from the crankcase the level screw marked " OLIO " (see Fig. 22). The scooter standing upright, oil should just be about to flow out.

Be sure that the positive pole (+) of the battery is connected to the red cable and the negative pole (—) is connected to the black cable.

A wrong connection will readily make the rectifier inefficient and damage the battery.

Screw down the cell caps firmly to avoid entrance of impurities.

After the first 600 miles. Warm up the engine and drain off all oil through the hole provided (see Fig. 22). Pour some fresh oil in and run the engine for a few seconds; drain again and refill with new oil.

See also page 21.

Every 1200 miles

1) - Remove the air cleaner from the carburettor and shake it in a 30% oil-petrol bath.

2) - Check oil level in the gear box.

3) - Clean the lubricators of front wheel hub and refill them by means of a grease gun.

4) - Grease all joints on the brake controls and the ratchet quadrant of the gear shifter.

5) - Clean the sparkplug electrodes with very fine emery cloth or suitable files and adjust the gap to 0·023″.

Inspect the insulation material of sparkplug; replace if the porcelain is cracked.

Wash with neat petrol.

Use the sparkplug type prescribed by the Firm. We remind customers that using

the proper type of sparkplug constantly will eliminate many an engine trouble.

The operation indicated hereunder and those in the next paragraphs should be carried out by authorized Service Stations.

6) - Clean and adjust the breaker points of the flywheel magneto (see Fig. 21) to 0·4 mm. gap (0·015 in.).

Every 1800 miles

1) - Clean the silencer and decarbonize the engine as explained hereunder. Remove the silencer, the colling hood, the cylinder head and the cylinder. Decarbonize the piston crown and the cylinder ports. Carefully remove all carbon deposits from cylinder.

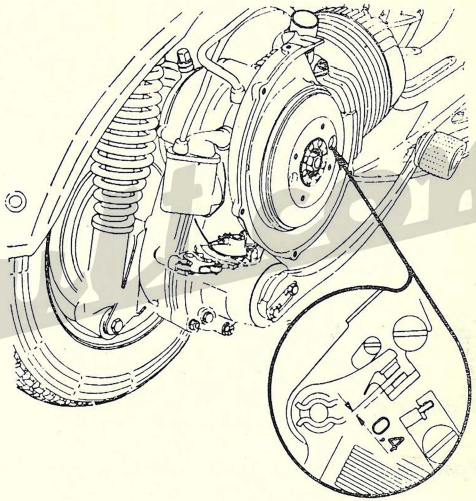


Fig. 21 – Breaker points

Heat and clean the exhaust pipe of the silencer, either by scratching it inside with a hook wire or blowing air through from the other orifice, in both cases the silencer should be held so that the exhaust pipe is turned downwards.

2) - Grease the felt which lubricates the cam of flywheel magneto.

Every 3600 miles

Lubricate the speedometer drive pinion and flex drive.

Visit your Agent in case of damper troubles.

Battery service. Follow the directions on the card accompanying each battery for service and normal re-charge.

Top up every month with distilled water, maintaining the correct level of electrolyte.

The battery terminals must always be kept thoroughly clean and should be greased with Lanoline.

During a long period of disuse the battery should be given a booster charge once a month for a period of three hours at 0·7 amps.

Laying-up. In such a case, proceed as follows.

1. Clean the scooter thoroughly (see page 29).

2. Start the engine and run it at low revs. in neutral. Pump 60 cc. of Motor Oil SAE 30 into the carburettor intake through the hole on the air cleaner cover by means of an oil can.

3. Rest the floorboard on two wooden blocks in order to take weight off the tyres.

4. Drain all fuel from both tank and carburettor.

5. Grease all unpainted metal parts.

6. Disconnect the cables from the battery; clean the terminals of the latter and wipe dry.

IMPORTANT. - In case of long storage or Lay-up the carburation may become faulty, though said above precautions have been taken, because of oil deposits in the pilot jet due to the evaporation of the petrol contained in the fuel mixture. You should then visit your Agent.

LUBRICATION CHART

Part to be lubricated		Lubrication				
Every 2,500	*Every* 5,000	**Shell*	**B.P.*	*Esso*	*Wakefield*	*Mobil*
Gear-box topping-up	Gear-box change oil	Shell 2T Two-Stroke Oil or Shell X-100 30	Energol Two-Stroke Oil or Energol SAE. 30	Esso Extra Motor Oil 20W/30	Castrol XL	Mobiloil A
Front suspension Felt pad on fly-wheel cam Joints on brake control Speedo flexible drive	Control cables Gear change quadrant	Retinax A	Energrease L.2	Esso Multi-Purpose Grease H	Castrolease L.M.	Mobilgrease M.P.
Engine at each re-fuelling		Shell 2T Two-Stroke Oil in ratio of 6% or ½-pint to 1 gall. petrol	Energol Two-Stroke Oil in ratio of 6% or ½-pint to 1 gall. petrol	Essolube 30 in ratio of 6% or ½-pint to 1 gall. petrol. Esso Two-Stroke Motor Oil in ratio of ¾-pint to 1 gall. petrol	Castrol XL in ratio of 6% or ½-pint to 1 gall. petrol. Castrol Two-Stroke Motor Oil in ratio of ¾-pint to 1 gall. petrol	Mobiloil A in ratio of 6% or ½-pint to 1 gall. petrol. Mobil-Mix in ratio of ¾-pint to 1 gall. petrol

* Marketed also by National Benzole Co. Ltd., by arrangement with Shell-Mex & B.P. Ltd.

Hydraulic Dampers	When not working efficiently consult your Dealer. If servicing is required, they should always be returned to the Works

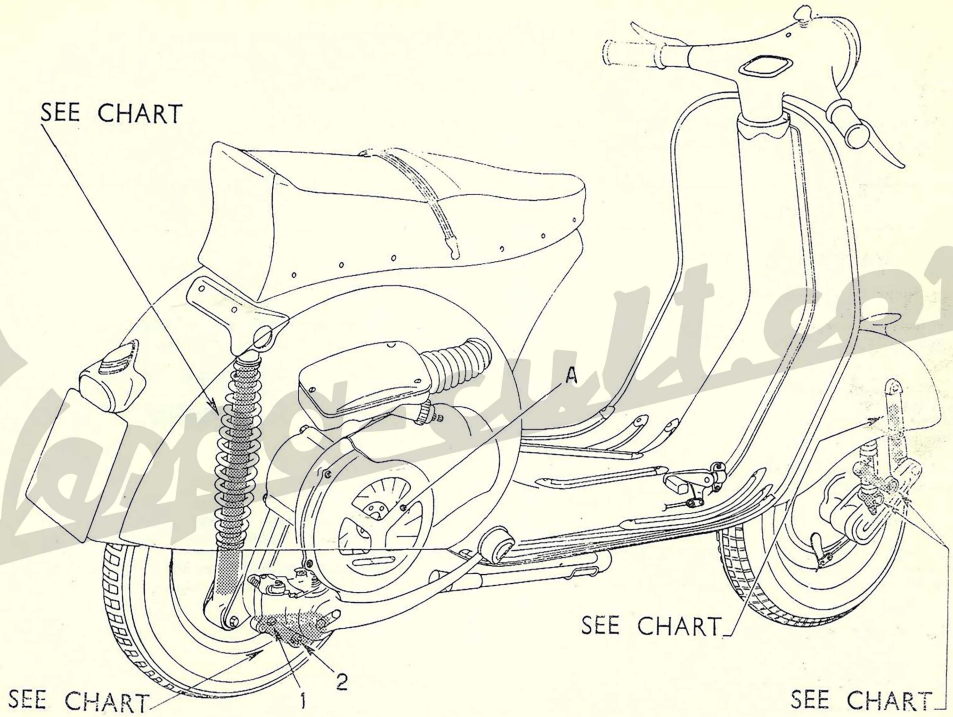


Fig. 22 – Lubrication scheme
A: engine lubricated by the fuel mixture – 1: filling hole – 2: draining hole.

FAULT FINDING

When the machine does not run properly, make all inspections and rectifications as explained below.

If the suggested remedies are not sufficient to eliminate the trouble, the customer should not try to carry out operations pertaining to the dealers, who have the necessary facilities to undertake this work.

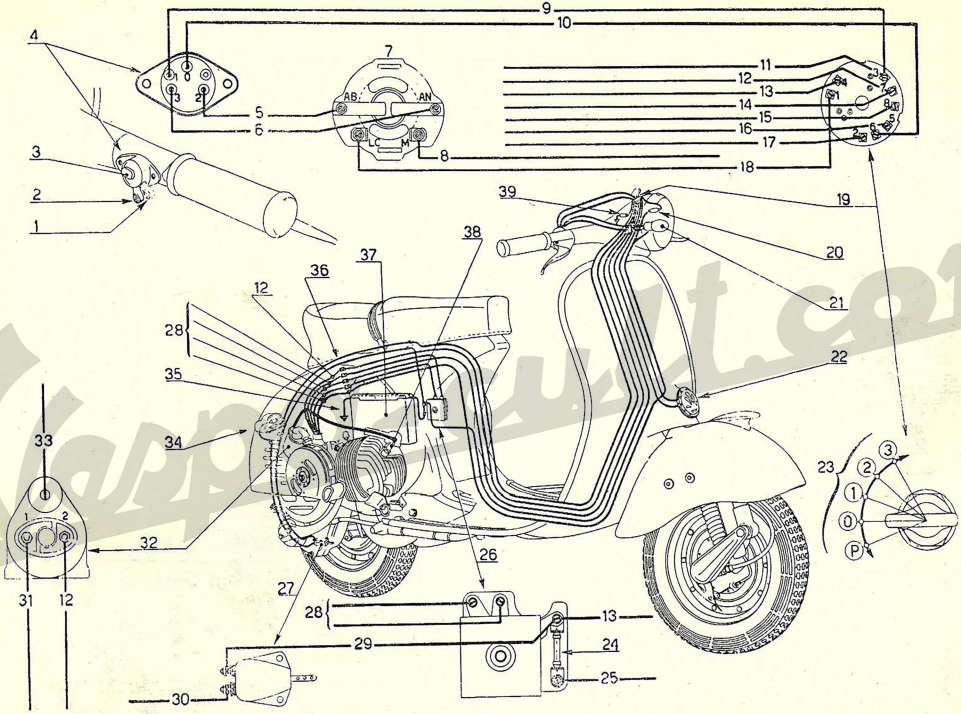
Locating the trouble	Remedies
HARD STARTING	
1. – Fuel system – Carburation	
Fuel tank empty	
Fuel does not flow to the carburettor although the fuel tap is open or in position " reserve "	Turn to " reserve." Refill as soon as possible a) Unscrew and remove the main jey. If the fuel system is efficient, fuel will come out b) Blow through jet orifice to ensure that it is clear.
Filter on carburettor Fuel tap body } clogged Carburettor body } dirty Main jet and atomizer	Remove and wash in petrol – Blow dry
Float needle valve sticking in its seating Engine flooding; air cleaner choked or dirty	Release See pages 22 and 30.
2. – Ignition	
Sparking plug dirty; porcelain of sparking plug cracked	Disconnect the plug lead. Check if sparking occurs between lead and crankcase when the kickstarter is operated. See page 30
Breaker points dirty, worn or pitted Gap between breaker points incorrect	Have the points cleaned (with very fine emery paper or suitable files), or replaced, or the gap adjusted to 0·4 mm (0·015″) by a dealer.
INCORRECT RUNNING	
1. – Lack of power	
Silencer exhaust pipe carbonized	Clean (see page 31).

Locating the trouble	Remedies
Sparkplug not tightly screwed into cylinder head.	Tighten with 21 mm box spanner.
Cylinder head not fitting properly on top of cylinder	Set the head properly and tighten the nuts.
2. – Explosions at silencer and carburettor	Replace or clean the plug and correct the gap to 0·6 mm (0.023 in) see page 30.
3. – High fuel consumption	
a) Air cleaner choked or dirty. Flap of coke valve sticking in closed or partially closed position	Clean with pure petrol and blow dry; dip the gauze into a 30% petrol-oil bath. Release operating and lubricating the choke lever.
b) Other troubles (faulty carburettor, poor compression, etc.)	Consult your dealer.
4. – Engine noisy - Clutch troubles - Gear pinions disengage of own accord - Starter assembly not engaging - Controls not operating properly - Steering column becomes stiff - Inefficiency of suspension	Consult your dealer.
5. – Poor braking	
Stroke of pedal or lever too long	Adjust (See Fig. 19)
Brake linings oily or worn down	Wash with petrol and dry in air, or replace Consult the sale agent about oil leakage.
Brake drums and linings scratched	Replace.
6. – Faulty electric wiring	
Lead terminals loose or wrongly connected	Re-connect properly (See Fig. 12–13) or replace and tighten the screws.
Fuse of rectifier burnt	
Incorrect adjustment of the headlamp	Re-set properly (See pages 28–29).

SECTION 2

VARIATIONS ON V.S.3 SERIES

1. Main beam - 2. Dipped beam - 3. Horn button - 4. Dip switch with horn button - 5. From dip switch to head lamp (brown) - 6. From dip switch to head lamp (violet) - 7. Inside view of the head lamp - 8. Earthing cable from head lamp to the stator (white) - 9. From main to dip switch (pink) - 10. From main switch to dip switch (white) - 11. From main switch to horn (pink) - 12. From main switch to ignition coil (red) - 13. From main switch (green) to rectifier - 14. From main switch to horn (red) - 15. From main switch to speedometer bulb (black) - 16. From main switch to tail lamp (black) - 17. From main switch to flywheel magneto (yellow) 18. From main switch to head lamp (blue) - 19. Five-position main switch - 20. 6V - 1·5W bulb for pilot light - 21. 6V - 25/25W double filament bulb - 22. Horn - 23. Main switch positions. P: parking lights on, ignition off; 0: lights and ignition off; 1: riding during the day; 2: riding at night with speedometer bulb, pilot light and tail lamp on; 3: riding at night with speedometer bulb, ead and tail lamps on - 24. 10A fuse - 25. From rectifier to battery (red) - 26. 6V - 2·5A rectifier - 27. STOP switch - 28. Cables connected to the stator - 29. From rectifier to STOP switch (sky blue) - 30. From STOP switch to STOP bulb in the tail lamp (sky blue) - 31. From ignition coil to the contact breaker (black) - 32. Ignition coil - 33. Plug lead from ignition coil to sparkplug - 34. Tail lamp with 6V - 3W bulb (which lights the licence plate as well) and 6V - 15W bulb for STOP light - 35. Battery earthing cable (black) - 36. Terminal board - 37. 6V - 12Ah battery - 38. Sparkplug - 39. 6V - 1·5W speedometer bulb.

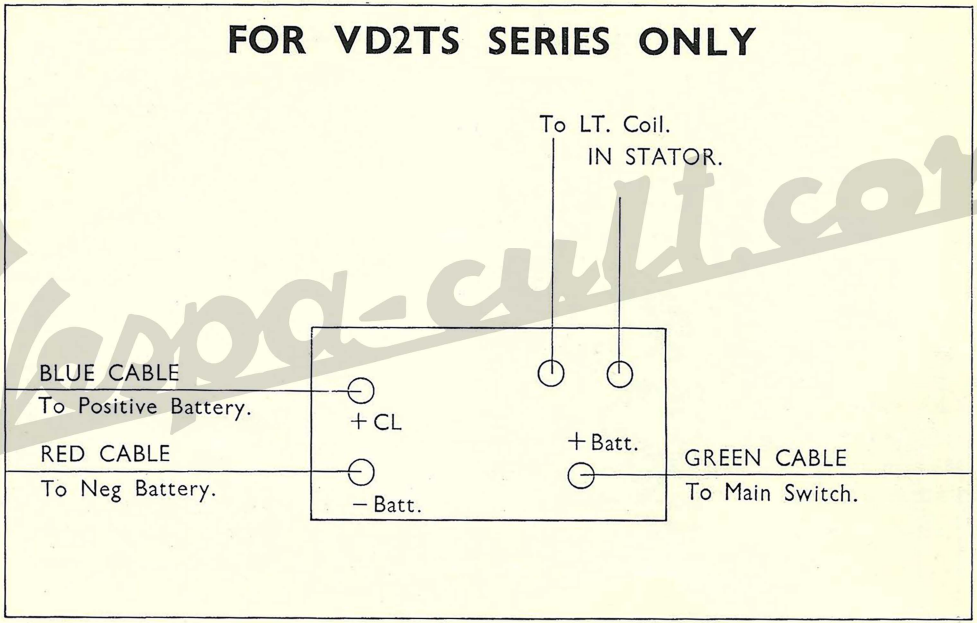


Electric wiring diagram

SECTION 3

VARIATION ON V.D.2T.S.

As V.S.3 Model except for this diagram.



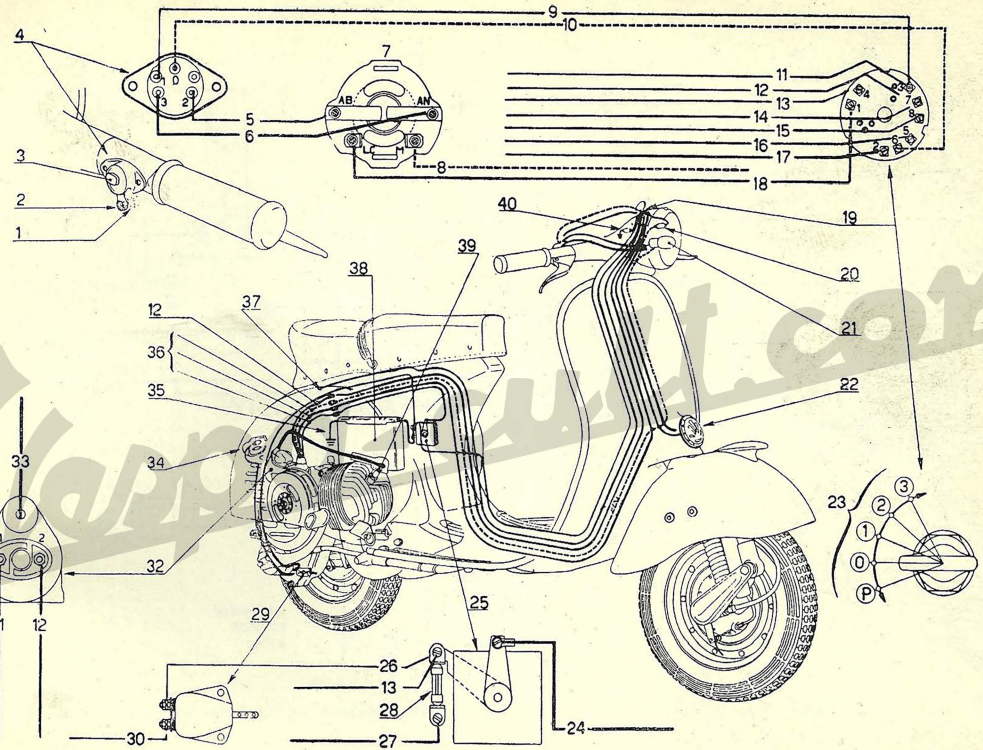
Note:—For V.D.2T.S. series the paragraph in column 1 page 30 beginning "Be sure that the positive pole" should be as follows:—"Be sure that the positive pole (+) of the battery is connected to the blue cable and the negative pole (—) is connected to the red cable and attached to the chassis."

SECTION 4

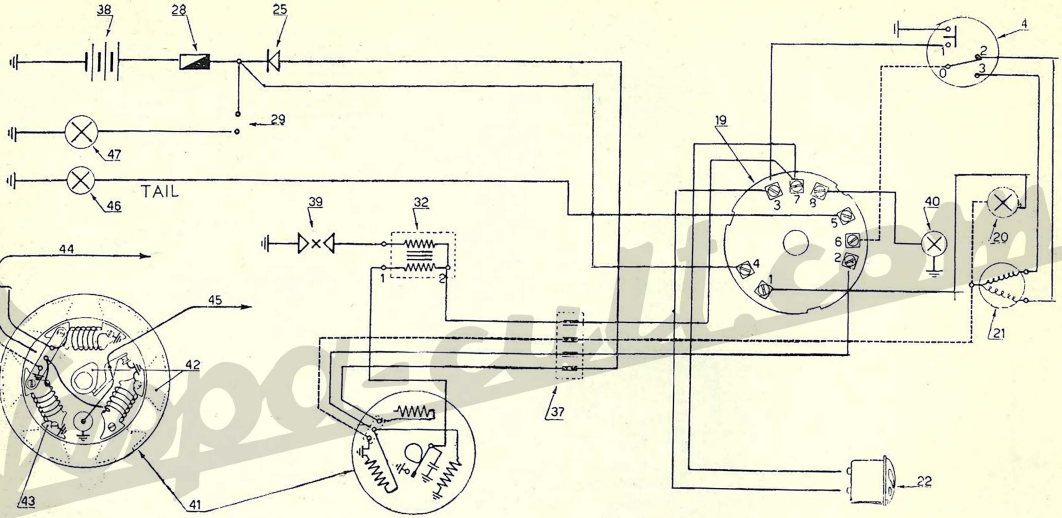
WITH VARIATIONS FOR V.S.2 SERIES

Note: COMPRESSION RATIO IS 6·5: 1

1. Main beam
2. Dipped beam
3. Horn button
4. Dip switch with horn button
5. From dip switch (clamp 3) to head lamp (main beam)
6. From dip switch (clamp 2) to head lamp (dipped beam)
7. Inside view of the head lamp
8. From head lamp to flywheel magneto (white)
9. From main switch (clamp 3) to dip switch (clamp 1)
10. From main switch (clamp 6) to dip switch (clamp 0), white
11. From main switch (clamp 3) to horn
12. From main switch (clamp 7) to ignition coil (clamp 2)
13. From rectifier to main switch (clamp 4)
14. From main switch (clamp 7) to horn
15. From main switch (clamp 8) to speedometer bulb
16. From main switch (clamp 5) to tail lamp
17. From flywheel magneto to main switch (clamp 2)
18. From main switch (clamp 1) to pilot light
19. Five position main switch
20. Bulb for pilot and parking light, 6V - 3W
21. 6V - 25/25W double filament bulb (main and dipped beam)
22. Horn
23. Switch positions. P: parking lights on, ignition off; 0: lights and ignition off; 1: riding during the day; 2: riding at night with speedometer light, pilot light and tail lamp on; 3: riding at night with speedometer light, head and tail lamp on.
24. From flywheel magneto to rectifier
25. Rectifier
26. From rectifier to STOP switch
27. From rectifier to positive pole of battery
28. Fuse
29. STOP switch
30. From STOP switch to respective bulb in the tail lamp housing
31. From ignition coil to breaker in flywheel magneto
32. Ignition coil
33. Plug lead (from ignition coil to sparkplug)
34. Tail lamp
35. Earthing cable for battery
36. To flywheel magneto
37. Clamp board
38. Battery 6V - 12Ah
39. Sparkplug
40. Speedometer bulb, 6V - 1·5W
41. Flywheel magneto
42. Flywheel rotor
43. Stator
44. To the clamp board
45. To the ignition coil (clamp 1)
46. Bulb for number plate light, 6V - 5W
47. Bulb for STOP light, 6V - 15W



Electric wiring installation, for diagram see page 44



P: contacts 4–1–5
0: contacts 1–5
1: contacts 4–7
contacts 1–5
2: contacts 4–1–5–7
3: contacts 4–7
2–5–6

} connected to each other

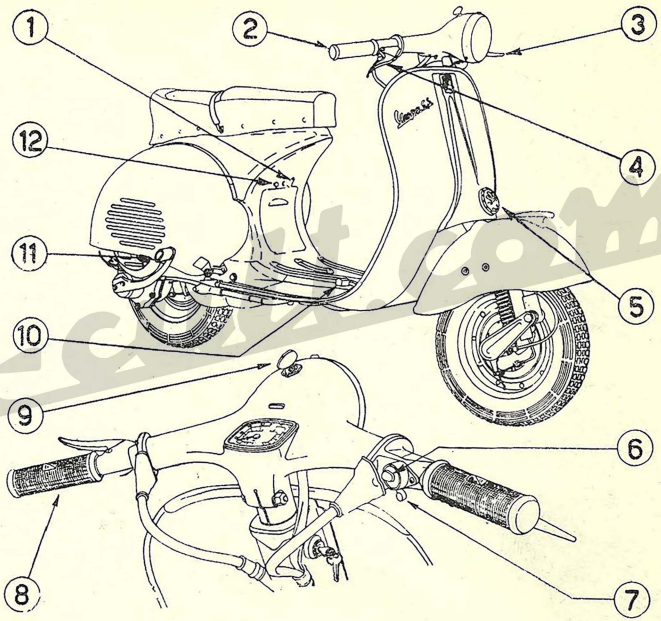
V.S.2 Series

Wiring diagram for Installation see page 43

SECTION 5

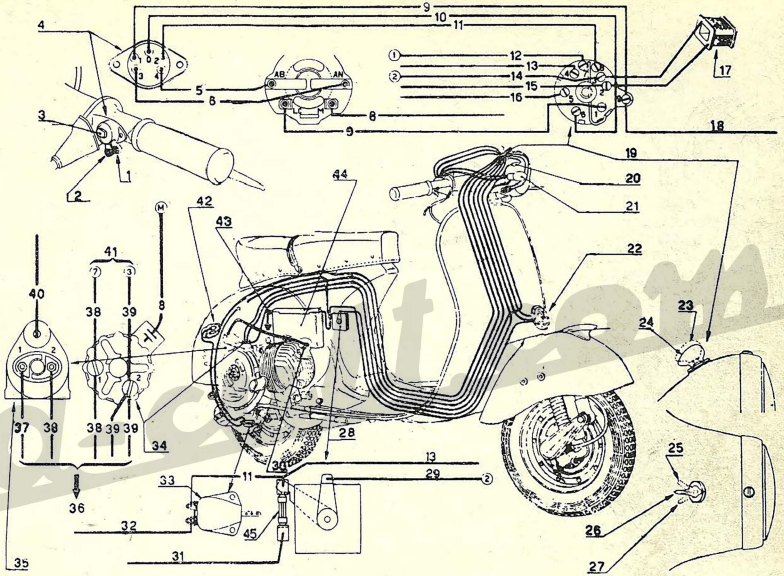
WITH VARIATIONS FOR V.S.I SERIES

1. Fuel tap
2. Throttle control grip
3. Clutch control lever
4. Front brake lever
5. Horn
6. Horn button
7. Dip switch
8. Gear change twistgrip
9. Three position switch
10. Rear brake pedal
11. Kickstarter
12. Choke rod



V.S.1 Series—Controls

1. Main beam
2. Dipped beam
3. Horn button
4. Dip switch with horn button
5. Violet
6. Brown
7. Inside view of head lamp
8. Head lamp earthing cable (white)
9. Pink
10. White
11. Blue
12. To the low tension socket (red)
13. To the horn (green)
14. To the low tension socket (yellow)
15. To the rectifier (violet)
16. To the tail lamp (black)
17. Impedance 1·8-1·85 Ohm at 1 A. 50 Hz.
18. To the horn (pink)
19. Three position main switch
20. Pilot light, 6v, 3w
21. Double filament bulb, 6v. 25/25w
22. Horn
23. Cut-out, earth
24. Running position
25. Head lamp and tail lamp
26. Lights off
27. Pilot light and tail lamp
28. Rectifier, 6v, 2A
29. To the main switch (violet)
30. Sparkplug
31. From positive pole of battery (red)
32. To the STOP light (blue)
33. STOP switch



V.S.1 Series—Electrical Layout

34. Low tension socket and earthing tag
35. Ignition coil
36. To the flywheel magneto
37. Black
38. Red
39. Yellow
40. To the sparkplug
41. To the main switch
42. Tail lamp 6v, 5w, with STOP light 6v, 15w
43. Negative pole of battery (black)
44. Battery, 6v, 12 Ah
45. Fuse

Compression Ratio: 6.5 to 1

Ignition. By 6-pole flywheel magneto. Separate Ignition Coil with primary circuit feed by another coil inside the flywheel magneto.

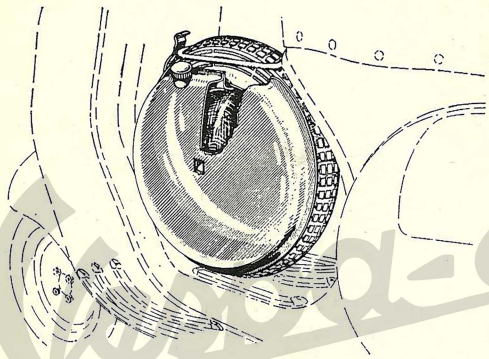
Lighting and Horn. By flywheel magneto with a.c. directly feeding the 115 mm. dia. three position head lamp (double filament bulb, 6V, 25/25W) and tail lamp (6V, 5W.), when the switch is in position "2". The pilot light (6V, 3W) tail lamp, STOP light and horn are fed by the 12 Ah dry lead battery which is constantly re-charged through a metallic rectifier (with fuse) and impedance when the key of the switch is in either position "0" or "1" (see page 47).

Fuel tank. With sediment bowl and three way tap:—open—closed—reserve. Total capacity 2·64 imp. gals. Emergency reserve: ·26 imp. gals.

Brakes. Expanding type with cooling ribs; cable control. Front: lever on right hand side of handlebars. Rear: pedal on right hand side of floor board.

Note: On this series the brakes pivot on a single pin not on separate pins as on other models.

Speedometer. The speedometer on this model has a luminous face and is not illuminated by a bulb as on other models.



Spare wheel and tank

Accessories: On request the **Vespa G. S.** scooter can be equipped with:

— **Spare wheel and support.** The wheel support can be secured to the hole in the middle of the longeron. It is very simple and holds the wheel in a vertical position, quite easy to reach (see fig. on left).

— **Reserve tank.** It contains 1·1 imp. gal., and can be arranged into the recess portion of the spare wheel.

ONCE AGAIN WE STRESS TO ALL OWNERS THE NECESSITY TO QUOTE FRAME AND/OR ENGINE SERIAL NUMBERS TOGETHER WITH ANY PREFIXES WHEN ORDERING SPARES FOR THIS OR ANY OTHER MODEL

VARIATIONS FOR 5 SERIES

The Speedo Bulb is 6V. O.6W.

Champion N.A.8. Sparking Plugs are now approved.

The Wheels different in design are now secured to a Light Alloy Brake Drum by Five Studs.

A new type Spare Wheel Bracket and Spare Petrol Tank must be used.

The Driving Flange and Rear Brake Drum is now one single unit and as a result the 4-wheel Nuts are no longer fitted.

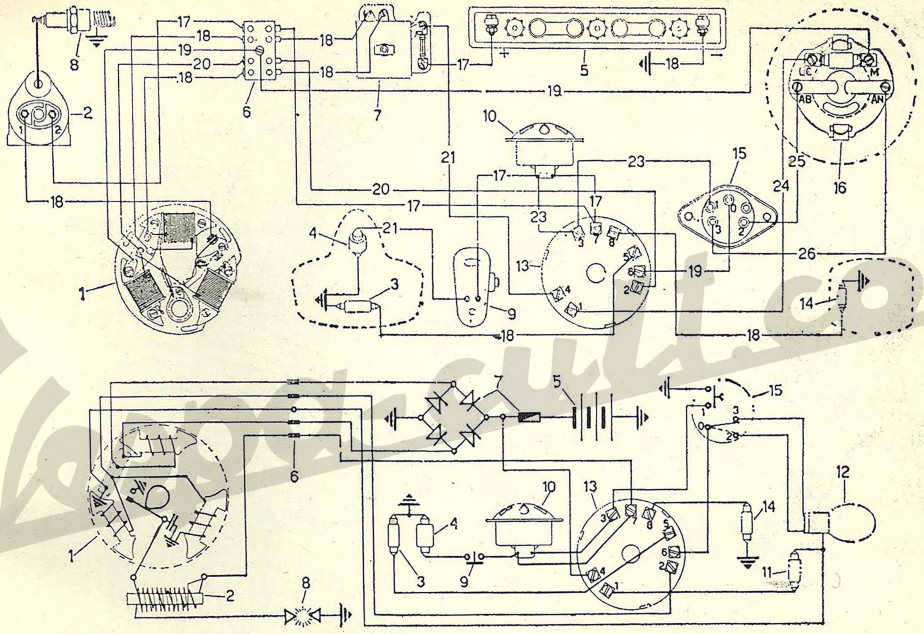
The Dual seat has been altered at the front End and a new type hook has been fitted.

Rubber Feet for the C/Stand have been altered.

A new Front Axle Shaft and Brake Drum have been fitted.

A New Handlebar Centre Casting has also been fitted.

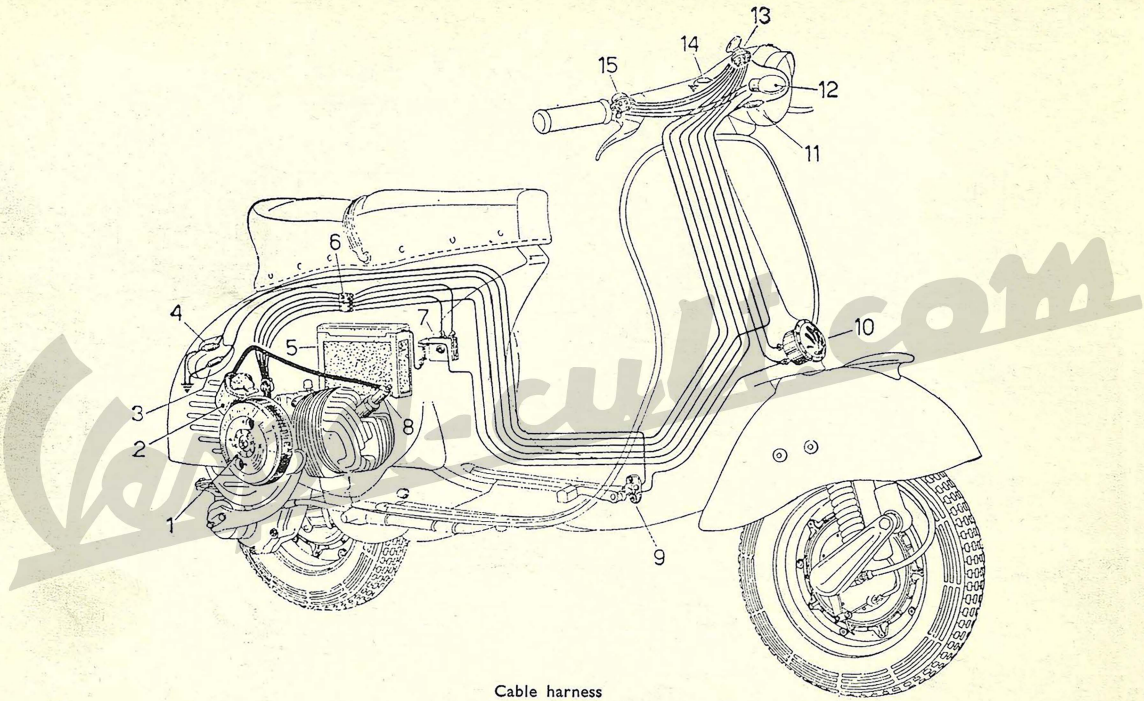
A New Speedometer has been incorporated.



P: contacts 4–1–5
O: contacts 1–5
1: contacts 4–7
2: contacts 4–1–5–7–8
3: contacts 4–7
contacts 2–5–6–8

} connected to each other (see the switch positions P, 0, 1, 2, 3 on Fig. 14)

Connections and electric wiring diagram



Cable harness

1. Flywheel magneto – 2. External ignition coil – 3. 6V-3W bulb for tail light – 4. 6V-10W bulb for STOP light – 5. 6V-12Ah battery – 6. Clamp board on the frame – 7. Rectifier with fuse – 8. Sparkplug – 9. STOP switch – 10. Horn. – 11. Pilot light (6V-1·5W bulb) 12. 6V-25 25W double filament bulb – 13. Switch – 14. 6V-0·6W bulb for speedometer light – 15. Dimmer switch with horn button – 16. Inside view of head lamp. – 17. Red – 18. Black – 19. White – 20. Yellow – 21. Light Blue – 22. Green. – 23. Pink – 24. Blue – 25. Brown – 26. Violet.

CYLINDER HEAD MODIFICATION, VESPA G.S.

We would inform you that as from Vespa G.S. Serial No. V.S. 5T.0069272, a new cylinder head has been fitted, raising the compression ratio from 6·7 : 1 to 7·2 : 1.

In consequence of this modification, the ignition timing has been altered from 31°±1° to 27°±1° and carburettor main jet from 103 to 105.

Finally, the needle valve part number 24633 is fixed to the throttle at the centre groove.

Old No.	New No.	Description
26100	58022	Cylinder Head
24649	87701	Main Jet
84805	87700	Carburettor Assy.
86480	87705	Complete Engine

The new carburettor assembly can be easily identified in that the letter "1" is stamped on the surface adjacent to the regulation screw.

When referring to this Publication it is essential to quote this reference:
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