

THE

Villiers

MARK

1H

225 c.c. *CH5112*

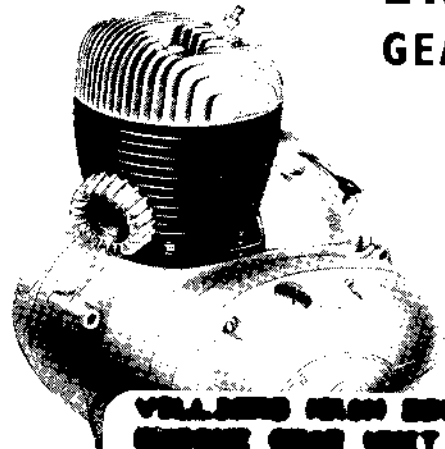
TWO-STROKE

MOTOR CYCLE *AKR281*

ENGINE

GEAR-UNIT

~~629.275~~
629.26



VILLIERS MARK 1H TWO-STROKE ENGINE GEAR UNIT

25-141576



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MARK 1H ENGINE-GEAR UNIT.

GENERAL DATA.

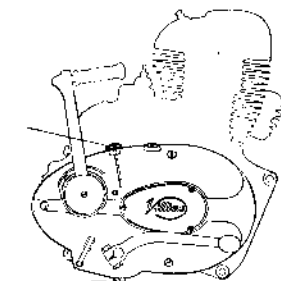
Bore	63 m.m. = 2.480"
Stroke	72 m.m. = 2.834"
Capacity	225 c.c. = 13.73 cu. in.
Engine Sprocket	20 teeth × $\frac{3}{8}$ " pitch.
Clutch Sprocket	43 teeth × $\frac{3}{8}$ " pitch
Primary Drive Ratio ...	2.15—1.
Gearbox Ratios	1—1, 1.32—1, 1.9—1, 3.06—1.
Final Drive Sprocket ...	18T × $\frac{1}{2}$ inch pitch × .295 inches wide.
Final Chain Line	2 $\frac{11}{16}$ "
Exhaust Pipe Diameter ...	1 $\frac{3}{4}$ " Outside Dia.
Carburetter	Villiers Type S.25.
Carburetter Needle	No. 3 $\frac{1}{2}$.
" " Setting ...	1.90" Out.
Throttle (Carburetter) ...	No. 3.
Sparking Plug	Lodge H.H.14.
Plug Gap018"/.025"
Spark Timing	$\frac{3}{16}$ "— $\frac{5}{32}$ " B.T.D.C. $\frac{3}{16}$ "— $\frac{5}{32}$ "
Contact Point Gap012"/015"
Lubrication, Engine ...	Petrol mixture. For the first 500 miles 1 part Castrol XL (SAE.30) oil to 16 parts petrol and subsequently 1 part to 20 parts.
Lubrication, Gearbox and Chaincase	Castrol XL (SAE.30) oil. Fill gear- box to mark on dipstick and chaincase to level plug.

OPERATING INSTRUCTIONS FOR THE MARK 1H-225 c.c. UNIT.

LUBRICATION.

Engine. Fill up the Tank with a mixture of $\frac{1}{2}$ -pint of "Castrol" 'XL' (SAE.30) Oil to one gallon of petrol, the mixture to be made and well stirred before being introduced into the Tank. If possible, pour the mixture through a wire gauze which will remove particles of foreign matter. After the first 500 miles 1 part of oil to 20 parts of petrol will be sufficient.

Gearbox. "Castrol" 'XL' (SAE.30) Oil is also recommended for the Gearbox, and this can be inserted after removal of the Dipstick. (See sketch below). The oil capacity of the Gearbox is approximately 1.2 pints, and the oil level should be maintained to the notch cut into the Dipstick. The level should be checked with the Dipstick resting on top of the Gearbox casing and not when screwed down. A Drain Plug is provided at the base of the Gearbox so that after every 5,000 miles the oil can be drained away and replaced by fresh oil.



Gearbox Drain Plug.

Chaincase. The same brand and grade of oil should be used, and reference to sketch on opposite page will show the location of both the Filler and Oil Level Plugs. When filling the Chaincase, both Plugs should be removed and oil fed in until it just commences to run out of the Level Plug Hole.

STARTING.

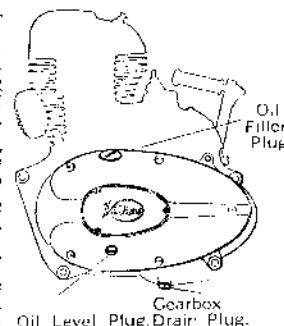
When Cold. Sit astride the motor-cycle with both wheels on the ground. Place the Petrol Tap in the 'ON' Position and flood the Carburetter by depressing the Tickler which protrudes from the Carburetter Cover.

The Carburetter fitted to this engine is the Villiers Type S.25 having a single cable controlling the position of the Throttle. To obtain a rich mixture for starting it is necessary to close the Strangler which is attached to the Carburetter Cover. Having done this, place the Gear Lever in the neutral position, open the Twist Grip about one third, then give one or two firm but sharp kicks on the Starter Pedal. The Strangler may be opened gradually as the engine warms up.

When Hot. There is no necessity for closing the Strangler or flooding the Carburetter.

Failure to Start. If repeated kicks fail to start after flooding (when cold), turn off fuel supply, open Throttle wide, and clear

cylinder of excessive mixture by giving a number of kicks to starter lever. Now turn on fuel supply, and after opening Throttle a little, try again. If not successful, the sparking plug will probably be found to be wet. If so dry out, and rotate engine quickly after having removed the drain plug situated at bottom of crankcase, so that accumulated mixture can be blown out. If still not successful after having replaced drain plug the trouble must be found elsewhere, and reference should be made to the "Fault Finding Chart."



Stopping the Engine. If the engine is stopped by turning off the fuel supply instead of closing Throttle, an easier start will be made if the machine has to stand a long time before again being required.

Running in. The useful life of your engine will depend a great deal upon the way in which it is treated during the first 500 miles. As a general rule it is not advisable to exceed 30 m.p.h. in top gear, 20 m.p.h. in third, 15 m.p.h. in second and 10 m.p.h. in bottom gear. After the running-in period is completed, do not throw caution to the winds and open up the engine to its full extent. The machine should be gradually brought up to its peak performance.

Gearbox. The gear ratios are selected by the foot operated lever having a positive stop for each gear position. A gear position indicator is provided on the Gearbox and Flywheel Cover. The "NEUTRAL" position is obtained by pressing down the gear lever from bottom or first gear. After starting the engine the gear lever should be moved upwards to obtain first or bottom gear. The higher gears are obtained by pressing the lever downwards. Remember that when in motion and changing to a higher gear the engine speed must be reduced by partially closing Throttle, but when selecting a lower gear the engine speed should be increased to obtain a smooth and silent change. When selecting any gear with the machine at rest or in motion, always fully de-clutch before operating the gear lever.

Do not allow the engine to race, or labour. Full use should be made of the Gearbox which is provided to enable the engine revolutions to be maintained under varying load conditions.

During the initial stages the operation of the Gearbox may be slightly stiff, but this condition will disappear as the engine is run-in.

Clutch and Primary Drive. The drive from the engine to the four plate clutch is by a pre-stretched endless chain running in the oil bath chain-case. Chain slack can be taken up by the tensioner, and no attention is necessary beyond that of lubrication, and occasional adjustment for push rod clearance to prevent clutch slip. Whilst the clutch is engaged, i.e. driving, there must be clearance between end of push rod located in the hollow gearbox mainshaft, and the clutch lever fitted to gearbox end cover. An adjuster having a slotted end is provided and this can be reached with a screwdriver through a hole in the outer casing, No. 67, Fig. 4. An adjuster is also provided for the inner clutch control cable. This is screwed into a lug of the gearbox casing in line with the bottom end of the clutch lever. To adjust the clutch control proceed as follows:—

First, slacken off the Cable Adjuster which is screwed into the lug at the bottom of Gearbox R.H. side.

The Magneto Cover, (Illus. 67, Fig. 4) shows a $\frac{1}{16}$ " hole situated between the Contact Breaker recess and the point where the Kick-starter Shaft emerges through the Cover (See Fig. 4). This hole enables a Screw Driver to be inserted, and after locating this in the slot of the Adjusting Screw the Adjuster should be positioned until there is about $\frac{1}{32}$ " of free movement at the bottom end of the Clutch Lever. Now take up any slack in the control cable, still leaving the free movement of the clutch lever before commencing to depress the clutch spring. Finally, tighten the adjuster locknut after making sure that there is no end pressure on the push rod whilst the clutch is engaged. Although the clutch runs in oil the corks may in time become worn on the driving faces, and it will be necessary from time to time to make use of the push rod adjuster to maintain the $\frac{1}{16}$ " movement previously referred to. Eventually, and after a considerable mileage has been covered, re-corking of the clutch plates may become necessary. Special equipment is required for the fitting and subsequent grinding of the corks, and we advise owners to take advantage of our Service Exchange Scheme.

Do not slip the clutch when in motion except when getting away from a standing start, otherwise rapid wear will take place. If stopping for any length of time at traffic lights, etc., move gear lever to "NEUTRAL" position. Do not stand in gear with clutch lever pulled up.

Decarbonising. The points at which carbon forms most rapidly are the Combustion Chamber, Piston Head, Exhaust Port and Silencer. It will be appreciated that excessive carbon in the Combustion Chamber reduces compression space and probably

cause pre-ignition and rough running. Heavy carbon deposits in the Exhaust Pipe and Silencer will cause back pressure coupled with heavy fuel consumption, loss of power and overheating.

In order to maintain engine efficiency it is advisable about every 2,000 miles to remove all carbon from inside the Cylinder Head, the top of the Piston and the edges of the ports. The Exhaust Pipe and Silencer should also be cleaned out. Before commencing to decarbonise, disconnect the Petrol Pipe and Carburettor and also remove Sparking Plug from Cylinder Head. Unscrew the 4 Cylinder Head fixing bolts. The Head can now be lifted clear of the Cylinder, and although the Gasket fitted between the Cylinder Head and Cylinder Barrel may not be damaged, it is advisable to fit a new one.

With a soft copper scraper, remove all deposit from the inside of the Head, taking care not to damage the joint faces. With the Piston at the top of the stroke, remove all carbon from the Piston top. Wipe off any loose carbon from around the edge of the Piston, then unscrew the Exhaust Pipe Nut and remove Silencer and Exhaust Pipe. Move the Piston to the bottom of its stroke and scrape out any carbon from Exhaust Stub and from the edges of the port in the Cylinder bore. This is best done from the outside of the Cylinder, taking care to avoid scratching the Cylinder bore. A piece of soft cloth placed in Cylinder bore will help to prevent the scraper causing damage and also prevent any particles of loose carbon from falling down through transfer passages. Make sure there is no loose carbon about before assembly. Remove any accumulation of mud or grit from the Cylinder fins.

If it is necessary at any time to remove the Cylinder, the 4 Nuts and Spring Washers fitted to the Studs securing the Cylinder to the Crankcase must be removed. Rotate Crankshaft until Piston is at bottom of stroke. Following this, the Cylinder may be taken off, but it is important not to twist the Cylinder in relation to the Piston, otherwise there is a danger of the ends of the Piston Rings springing into the ports and consequent breakage.

To remove the Piston from the Connecting Rod a pair of thin nosed pliers should be used to take out one of the spring circlips which retain the Gudgeon Pin in position. When this has been done, the Gudgeon Pin can be pushed clear of the Small End Bush and the Piston lifted away. If carbon deposits prevent removal by hand, the use of an extractor of the band type is recommended, although it may be effected by tapping gently with a hammer. In that case, be sure to support the Piston to avoid any strain being placed upon the Connecting Rod. So that the Piston may be re-fitted in the same way it is marked "front."

Carbon will also form in the grooves behind the Piston Rings, and to remove this deposit it will be necessary to spring the rings out of the grooves. Rings may be removed without risk of damage by introducing behind the Ring 3 pieces of thin brass strip equally spaced around the Piston and then sliding off the Rings. It is desirable to ensure that each Ring is re-fitted in its original groove. Behind the lower Ring will be found an Expander Ring. This Ring is fitted to prevent noise due to 'Piston Slap' whilst the engine is cold. This Ring will have to be cleared of carbon and may, in time, possibly lose its "temper" because of the heat and therefore, it is advisable to renew the Expander Ring when decarbonising.

The Piston Rings should be bright all round and for the whole width indicating that the whole of the Piston Ring area is in contact with the Cylinder bore. If the gap between the ends of the Rings when in the Cylinder, exceeds .030", then they should be discarded and replaced. The amount of gap can be checked by placing the Ring inside the Cylinder bore and pushing in a little way with the skirt of the Piston. This ensures that the Ring is square to the bore, and the gap can then be checked by Feeler Gauges.

Where new Rings of the standard size are required it is necessary to check the gap before fitting to the Piston. Place the Ring square inside the Cylinder bore when the gap between the ends of the Ring should have a maximum gap of .011" and a minimum gap of .007".

Overhauling. After the machine has done a considerable mileage the Cylinder bore may become worn as indicated by a ridge at the top of the bore, and therefore, before fitting the Cylinder the bore should be checked by means of a dial gauge. If the bore is .008" or more, larger than the original size, the Cylinder should be returned to the Works for reboring and fitting of an oversize Piston with Rings.

When refitting the Cylinder, fit new Base Washer to Crankcase. Smear Cylinder bore and Piston surfaces with engine oil and fit Cylinder Barrel over Piston, taking every care not to twist the Cylinder. Ensure each Piston Ring is fully compressed in its groove with the ends correctly fitting on the Locating Pegs as the Barrel passes over it. Replace the 4 Nuts on Cylinder Base Studs and tighten equally until they are fully tight. Re-fit Cylinder Head with new Gasket in position. Tighten the 4 Bolts in diagonal rotation to prevent any possibility of Cylinder Head distortion. For advice with regard to method of cleaning internally the Exhaust Pipe and Silencer, apply to the manufacturer of your motor-cycle.

The Magneto. The construction of the Flywheel Magneto differs somewhat from the type fitted to previous Villiers models. The H.T. Ignition Coil is not now part of the Armature Plate Assembly but is fitted to some part of the Motor-Cycle and remote from the Magneto.

On the Armature Plate are mounted 4 Coils, 2 of which supply low tension current for ignition, the other 2 provide lighting current. The Contact Breaker is not now part of the Armature Plate and access to this component for Point adjustment is gained by removing the die-cast Nameplate attached to the Magneto Cover on the off-side of the engine.

The Contact Breaker Assembly is as illustrated in Fig. 1. The Cam (3), and the Magneto Flywheel are located by keys in the Crankshaft and it is not necessary to remove either component when checking timing of the spark. The socket-headed screw (6) is filled with solder before the engine leaves the Works to prevent inadvertent alteration to the timing position. If necessary to re-time the spark proceed as follows:—

First remove solder then loosen the socket-headed screw securing the Contact Breaker Base Plate, and swing the Plate to an average position, when the Screwdriver slot in the Plate will be in line with the left-hand side

of the slot (5) in the Magneto Cover. (On later engines the factory timing position is indicated by an indented line on the Plate and the Cover). Then, with the Piston set at top dead centre, release the Screw (1), and adjust the Point

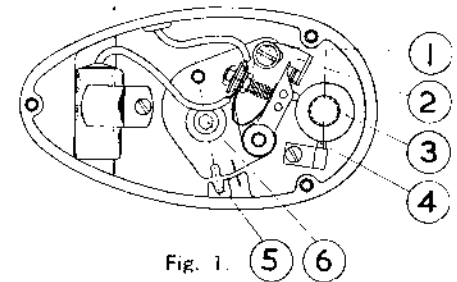


Fig. 1.

Bracket (2), to give a gap between the Contact Points of .012"—.015". Afterwards, tighten Screw (1). Rotate the engine until the Contact Breaker Points commence to open, and then check the Piston position. This should now be between $\frac{3}{32}$ " and $\frac{1}{16}$ " before the top dead centre position. If the Piston position comes outside these limits, the Base Plate should be swung to left or right to advance or retard the timing as required, and the Contact Breaker gap re-set.

Repeat both adjustments, if necessary, until Piston position and Point Gap are within the requisite limits.

A Felt Lubricating Pad (4) is provided for the Contact Breaker cam

which makes for silent operation and reduces the wear on the fibre heel of the Rocker Arm. The Pad should be removed periodically and soaked in a high melting point grease.

The ignition coil is mounted in a moulded case, and as there are several internal connections which are soldered, it is not intended to supply either the coil or the case separately. An ignition switch is mounted on the crankcase and this enables the owner to "earth" the ignition current to prevent the engine being started when the machine is left unattended.

The Carburettor. The Villiers type S.25 Carburettor is fitted to the Mark 1H Engine.

All air passing through the Carburettor is filtered, thus preventing particles of foreign matter reaching the engine.

During bench testing at our Works the Carburettor is carefully set and normally it will not be necessary to alter the setting until a considerable mileage has been completed. Means are, however, provided for adjustments to suit individual requirements, and before these can be made, the Carburettor Cover held in position by a single knurled screw, has to be removed

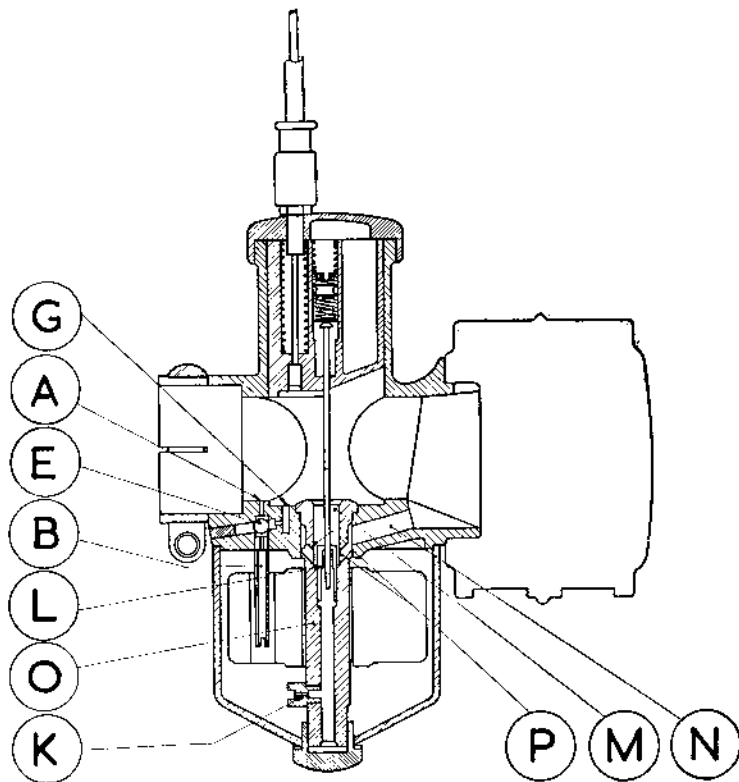


Fig. 2.

The nominal setting for the taper needle is 1.90", but it should be appreciated that this may have to be varied slightly to suit an individual engine.

Operation of Carburettor.

The handlebar twistgrip (or lever) control operates the throttle slide and thereby regulates the amount of mixture entering the engine, whilst the carburettor itself automatically meters and atomises the correct amount of fuel to give the necessary mixture strength. To achieve this automatic control of the mixture strength, two separate fuel systems are fitted, namely the main-jet and pilot-jet systems. At idling speeds the carburettor draws fuel from the pilot-jet and, as the throttle is gradually opened, the fuel is then drawn in turn from the pilot "progression" hole and the main-jet system. The operation of the two systems is given below:—

I(a) Pilot-Jet System. (See Figs. 2 and 3).

At idling speeds, when the throttle is nearly closed, the pilot outlet hole (A) Fig. 3 is subject to the very high engine suction, and petrol is, therefore, drawn from the float chamber through the pilot tube (B), and the pilot outlet hole. The calibrated pilot-jet is contained in the top of the pilot tube. At the same time, a filtered supply of air is drawn from the mouth of the carburettor through passage C, through the variable air-jet D, and is then pre-mixed with the fuel in the small chamber E. The pilot adjuster screw F varies the size of the pilot air jet, and therefore, the pilot mixture strength—to richen mixture, turn screw clockwise.

When the throttle slide is opened a small amount beyond that required for idling, the suction on the pilot outlet hole is reduced, but at the same time, the suction on the pilot "progression" hole (G) increases. A further supply of petrol is, therefore, drawn through the "progression" hole, and prevents the weak spot which would otherwise occur due to the fall off in supply from the pilot hole before the main jet comes into full operation.

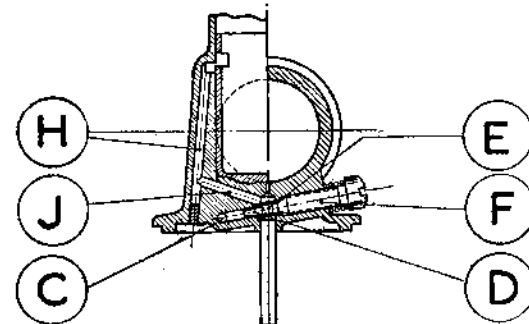


Fig. 3.

It follows from the preceding remarks that whenever the throttle is shut off whilst the engine speed is high (such as on long downhill sections), the pilot system is subject to the full engine suction, and petrol will flow into the engine from the pilot outlet hole. As the engine is not firing under these conditions, this fuel supply will tend to build up in the crankcase and cylinder and cause severe "four-stroking" or "eight-stroking" when the throttle is opened again. To overcome this fault in the present range of Villiers Carburetters, an automatic air bleed to the pilot has been incorporated, which relies upon the matching of two slots, one in the throttle slide and the other in the carburetter body. When the throttle slide is shut, these two slots line up and air can flow from the front of the Carburetter through the throttle slide and down passages H and J into the pilot system. The high depression on the pilot system is then destroyed. In all other throttle positions, the two slots do not line up, and no air can pass to the pilot system through these passages.

1(b) Main Jet System.

As the throttle slide is opened further beyond the idling and progression positions, the engine suction has its effect upon the main-jet system, and petrol is drawn from the float chamber through the calibrated main jet (K) and the needle-jet (L) and into the small pre-mixing chamber (M). There the petrol is atomised by the filtered secondary air which is drawn from the mouth of the carburetter along passage (N), and which enters the centre-piece (O) through four small holes (P). The rich petrol-air mixture then flows from the pre-mixing chamber into the main mixing chamber, where it meets the main air stream. The effective size of the needle-jet (L) depends upon the throttle slide position (as the taper needle is fixed to the slide), and the sizes of the needle-jet and the needle are chosen to give correct carburation over the range.

Tuning Carburetter. Before any attempt is made to tune the Carburetter it is essential that the engine is in a good mechanical condition.

This means that there should be no air leaks at any of the joints, there should be a good spark at the plug points and also that there is no restriction in the fuel supply. It is also important, of course, that the carburetter is clean internally, and that the air filter is not obstructed.

There are four adjustments for tuning the carburetter, but each of these has its full effect at a particular part of the throttle range, and should, therefore, only be used for tuning that particular part of the range. There is also a definite sequence for the tuning, and this also must be adhered to in order that the results achieved with one adjustment are not upset by the next adjustment.

The sequence of tuning with the necessary adjustments is given below:—

(1) Main Jet. Size 120 c.c. Throttle Range $\frac{1}{2}$ to Full.

In order to obtain the correct main jet size, the engine must be tested at full throttle in top gear. If the engine lacks power, detonates badly or runs better with the strangler slightly closed, a larger main jet is required. Should the engine "four-stroke" or improve momentarily after the petrol has been switched off, a smaller jet is required. After de-clutching and stopping the engine quickly the sparking plug should have a shiny black appearance if the correct main-jet is fitted. As an additional guide the engine should tend to "four-stroke" at full throttle in bottom gear on level ground (or high engine speeds in neutral), but not in any higher gears.

(2) Pilot Jet. Size—35 c.c. Throttle Range—Closed to $\frac{1}{2}$ open.

The pilot jet must be set when the machine is stationary with the engine running at the required idling speed. To richen mixture, screw in the pilot adjuster screw, and to weaken, unscrew pilot adjuster. The mixture strength must be set as weak as possible consistent with a steady reliable idling speed and good engine acceleration from this throttle position. If the mixture strength is set too rich, trouble will be experienced with the fuel build-up in the crankcase when the throttle is shut with the engine still running fast. Should this latter fault be present after adjusting the pilot, unscrew pilot a further half a turn. Any weakness on acceleration can be cured by throttle cut away as given below:—

(3) Throttle, Std. No. 3 Cut-Away. Throttle Range— $\frac{1}{2}$ to $\frac{1}{2}$ Open.

The throttle slide is made with a cut-away on the carburetter inlet side which influences the depression on the main-jet system. The throttles are marked with a number which represents, in sixteenths of an inch, the amount of cut-away. A throttle with more cut-away will give weaker mixtures (over the particular throttle range) and vice-versa. If the acceleration is weak, fit throttle with smaller cut-away, e.g. change from 3 to 2 $\frac{1}{2}$. If there are signs that the mixture is too rich, e.g., four-stroking; which cannot be cured by normal adjustments, it may be advantageous to fit a throttle having a larger cut-away.

(4) Needle Adjustment:— Throttle Range— $\frac{1}{2}$ to $\frac{1}{2}$ Open.

The needle is adjusted by the grub screw in the top of the throttle—screw down to weaken mixture, and vice-versa. The needle controls the mixture strength over most of the "cruising range" and must be correct for good fuel consumption and acceleration. After carrying out the above adjustments, it is wise to go back and re-check the pilot adjustment to see that this has not been affected by other adjustments.

To Change the Taper Needle. Remove throttle from body after unscrewing the top ring, and in the centre at top of throttle will be found a small slotted screw. This is the adjuster referred to in the previous paragraph, and when this is removed by unscrewing, the needle, with spring and collar, can be pushed up from underneath. When reassembling ensure that the needle collar is in position and that the taper needle "floats" freely in the throttle.

To Change the Fuel Needle. To obtain access to the fuel needle it is first necessary to remove the bottom nut and fibre washer, holding the float chamber in position.

Before the float can be taken off, the main jet should be unscrewed from the side of the centrepiece. The pilot jet tube which is fixed to the underside of the carburetter body, should not be disturbed. The forked lever retaining the fuel needle is split so that this may be sprung free from the pin holding it in position. Following this, the fuel needle is free to be taken out. The shape of the forked lever should not be altered.

Important. The only time when it will be necessary to remove the Centrepiece from the Carburetter Body is when the hole in the Centrepiece is badly worn and when the correct mixture strength cannot be obtained. The Centrepiece may be pushed up through the Carburetter Body, but when replacing the Jet in the Body, it is very important to ensure that this is pressed in squarely, otherwise the Carburetter Body will be damaged.

To Reassemble Carburetter. Clean the various components and make sure that the tickler vent holes are clear. Insert the centrepiece making sure that the forked fuel needle lever and fuel needle are in position. Place float in position, this is marked top, and replace main jet in side of centrepiece. Clean out the float cup and replace with large fibre joint washer at top. Replace bottom nut and fibre washer, but do not use too much force, otherwise there is the danger of stripping the thread of centrepiece. Replace throttle in body at the same time guiding the taper needle into hole in top of centrepiece. A guide screw in the carburetter body will prevent the throttle being replaced unless it is correctly positioned. Locate top disc in top of body and screw on top ring. If the carburetter has been removed from the engine, make sure when refitting that the body is pushed on to the inlet pipe as far as possible, and that it is set upright. There are four narrow slots in the body to allow the securing clip to function, and if the inlet pipe stub does not extend past the end of the slots, air will be sucked in causing hard starting and erratic running.

The carburetter has a banjo petrol pipe fitting inside of which is a fine mesh filter gauze which should be periodically cleaned by dipping in petrol. Be sure that when replacing the petrol pipe the fibre washers make a petrol tight joint, otherwise fuel will be wasted.

The carburetter air filter should be periodically cleaned. The filter is retained in the carburetter cover by means of a metal plate and circlip. When these have been removed the filter can be taken out and dipped in petrol.

Lighting Set. The A.C. current from the Magneto is passed through a Selenium type Rectifier to convert to D.C. current for charging the battery which is part of the Lighting Equipment.

At higher engine speeds the 2 Coils which normally provide current for ignition also serves to augment the battery charging current owing to the method in which the rectifier and battery are coupled. The circuit is in "parallel" with the ignition coil so that when the voltage from this pair of coils exceeds that of the battery, part of the current is by-passed from the ignition coil, thereby maintaining a constant voltage control to the ignition coil, and which would otherwise build up to a greater extent than is necessary. The following Bulbs should be used:—

Headlamp: - - - 6v—30/24 Watt. Pre-Focus Type.

Parking: (Headlamp) - 6v—3 Watt.

Tail Lamp, Stop Light - 6v—3/18 Watt.

Speedo: - - - 6v—1.8 Watt.

A copy of the Wiring Diagram is provided on page 37.

Rectifier. The casing of the rectifier must not make contact with any portion of the cycle frame. Various methods of insulating the rectifier are adopted by the Motor-Cycle Manufacturers, and any insulating material must be replaced in position if the rectifier is removed.

Battery. The battery is 6—volt and should have a capacity of not less than 10 amp/hour. Note that the negative side of battery is earthed. About once a month the filler cap of each cell should be unscrewed so that distilled water can be added to bring the acid level to the top of the separator. **DO NOT ADD TAP WATER AS THIS CONTAINS IMPURITIES.** Acid should not be added unless this is accidentally spilled out of the battery. This should be replaced by diluted sulphuric acid of the same specific gravity as in the cells. Keep the battery terminals clean. Many lighting troubles can be traced to unseen corrosion between the surfaces of a perfectly tight joint, and in the case of the battery, this corrosion takes place much more frequently than at other electrical contacts.

Important. The machine should not be used with the battery disconnected except in an emergency, when the maximum road speed should then not exceed 35 m.p.h. The battery when in the circuit controls the maximum voltage from the magneto coils, and pre-ignition is likely to occur at high speeds due to the voltage rise if the battery is disconnected. There is no necessity to disconnect the rectifier when the battery is removed.

TRACING TROUBLES.

For the satisfactory running of any Villiers Engine it is essential that three main conditions are fulfilled, and by making a systematic and intelligent investigation the faults can usually be located. If the engine stops, symptoms will generally give a clue to the cause, but where this is not the case, the trouble can be more easily traced by following a definite method of investigation. The three conditions mentioned above are as follows:—

(1) The required quantity of petrol-and-air mixture must enter the engine, which means that a proper supply of fuel has to be available from the carburetter, and that the throttle should open and close freely.

(2) The sparking plug must give a good spark, at the right time in relation to the position of the piston on its upward stroke.

(3) The engine must be in good mechanical condition, with no air leaks at the various joints.

There must also be no loss of compression either in the cylinder head or crankcase. This can be easily checked by putting the gears into the neutral position and rotating the engine by means of the kickstarter. The throttle, of course, must be open so as to allow air to enter the crankcase. On every revolution a definite resistance should be felt by the air being compressed in the cylinder head.

Making a Preliminary Check.

When the cause of the trouble is not evident, carry out a preliminary check covering the following points. If this fails to trace the cause, reference should be made to the Fault Finding Chart:—

Having made sure that there is "petrol" in the tank, and that the tap is in the "ON" position, depress the tickler on the carburetter cover to ensure that there is no blockage in the fuel supply, either in the tap, banjo union or fuel needle seating.

Being satisfied that fuel is reaching the carburetter, next unscrew the sparking plug, and with the high tension lead still attached, lay the plug on the cylinder head. Turn the engine by means of the kickstarter, and if the magneto and high tension lead are in order, there should be a good spark at the plug electrodes.

Finally, examine the carburetter controls to make certain that the throttle is actually opening when the control lever is moved.

This Booklet is not intended to contain full details for carrying out major repairs to your engine. In our opinion, it is inadvisable for the owner to attempt full dismantling of his engine, since without proper tools and facilities, damage may be caused to parts which are machined and assembled within very fine limits.

If your Unit needs expert attention you will be wise to contact your nearest Dealer, or you may approach us direct. Our fully-equipped Service Department is at your disposal to give you any help which you may need.

FAULT FINDING CHART.

Sequence of Testing.	Possible Trouble.	Remedy.
Engine will not start.		
Depress tickler on carburetter cover to check whether fuel is reaching carburetter.	No fuel reaching carburetter. Air lock in petrol pipe.	Turn tap to ON, refill tank, clear air vent in filler cap. Turn on reserve tap where fitted.
If no fuel, even when tap is on and fuel is in tank.	Choked petrol pipe, filter on tap, filter in banjo. Fuel needle sticking in seating.	Remove and clean out. Dismantle carburetter and fit new needle.
Test for spark by holding sparking plug body on cylinder head.	Leak along insulation of plug or high tension lead.	Ensure that ignition is switched on. Try a new plug of the type recommended and/or new H.T. lead.
If still no spark: Test for spark at end of H.T. lead held $\frac{1}{8}$ " from cylinder fins.	Plug points may be oily or sooted up. If no spark at end of H.T. lead, contact breaker point gap may be too narrow, or points pitted or dirty or oily.	Clean plug or fit new one. Adjust point gap to .015". Clean.
	Moisture on insulation of condenser.	Clean and dry out.
	Damaged insulation on wires connecting contact breaker to coil or condenser.	Replace.
	2-Pin plug fitted or connected in reversed position or bad contact for pins in sockets.	Rectify.
	Faulty Condenser.	Replace.
	Damaged insulation of lead from large dia. pin on twin plug to coil or rectifier causing short to earth, making coil inoperative.	Correct.
	Faulty ignition coil.	Replace Coil Unit.

FAULT FINDING CHART—(continued).

Sequence of Testing.	Possible Trouble.	Remedy.
If above tests are satisfactory, but engine will not start.	Mixture may be too rich due to use of strangler, or incorrect setting of taper needle.	Open throttle wide and depress kickstarter several times to clear engine of petrol, adjust taper needle, drain crankcase.
	Air leaks at carburetter stub or inlet pipe joint, causing weak mixture.	Correct.
	Incorrect ignition timing.	Check, following instructions given.
Engine four or eight strokes.		
Strangler may not be fully open or taper needle in a too high position. Air filter may need cleaning.	Mixture too rich.	Lower taper needle by adjuster screw fitted in throttle.
Check by watching for excessive smoke from exhaust pipe or silencer.	Engine may fourstroke for a little while after standing due to accumulation of oil in crankcase.	Usually ceases when engine has been running for a few minutes unless too much oil has been mixed with the petrol.
	Flooding of carburetter.	Persistent flooding is usually due to dirt under fuel needle seating, or sticking fuel needle, damaged seating or punctured float.
	Engine Lacks Power.	Engine out of tune, bearings worn. Unsuitable sparking plug. Loss of compression.
	Incorrect "petrol" mixture.	Correct mixture is 1 part oil, 20 parts petrol.

FAULT FINDING CHART—(continued).

Sequence of Testing.	Possible Trouble.	Remedy.
	Excessive carbon deposit on piston crown and cylinder head.	Decarbonize.
	Exhaust system choked with carbon.	Clean out silencer and exhaust pipes.
	Incorrect carburetter setting.	Check and adjust.
	Air Cleaner choked.	Wash in petrol, drain and dip in thin oil.
	Obstruction in fuel supply.	Clean out tap, fuel pipe and filters.
	Incorrect ignition timing.	Check and adjust.
	Faulty ammeter (wire broken inside) Battery disconnected or un-serviceable.	Check and repair or replace as necessary.
	Brakes binding	Adjust.
	Driving chains too tight.	Adjust.
Engine will not run Slowly.	Weak mixture due to air leaks at carburetter stub or inlet pipe, crankcase and cylinder base joints.	Tighten all joints.
	Crankcase drain screw loose or missing.	Tighten or replace.
	Worn crankshaft bearings or leaking oil seals.	Replace.
	Ignition timing too far advanced.	Correct, following instructions given
Engine Suddenly Stops Firing.	Sparking plug lead detached.	Replace and tighten nut.
	Plug points bridged by oil, carbon, or deposit caused by use of leaded petrol.	Clean or replace.
	Short circuit of high tension current by water on H.T. lead.	Dry out.

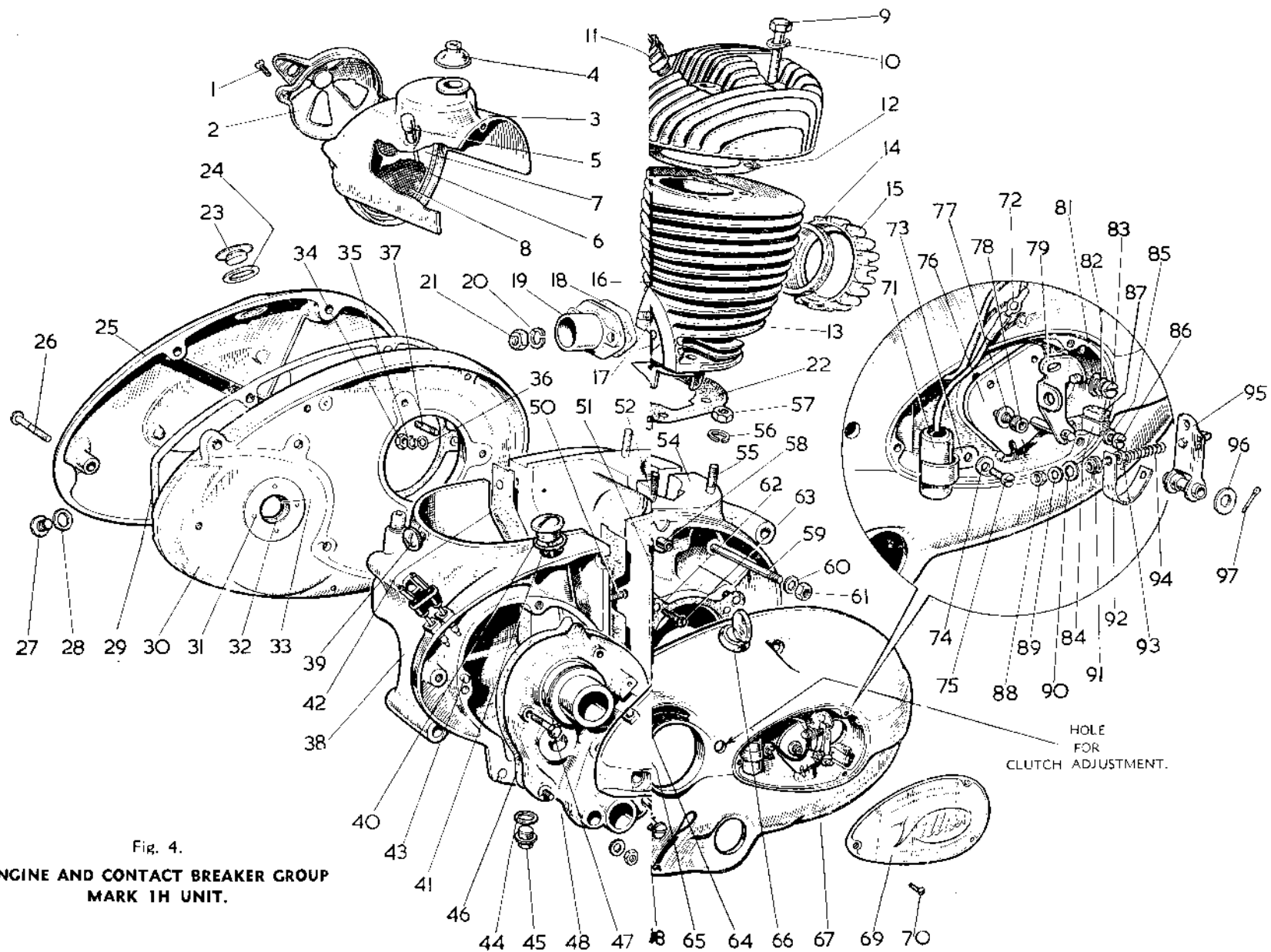


Fig. 4.
ENGINE AND CONTACT BREAKER GROUP
MARK 1H UNIT.

SPARE PARTS LIST FOR VILLIERS Mk. 1H ENGINE

ENGINE AND CONTACT BREAKER GROUP.

Fig. 4.

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Strangler Fixing Screws ...	E.5197	2			2
2	Plate and Cover ...	V.793/4	1		4	0
3	Carburettor Cover ...	B.8069	1		17	6
4	Waterproof Cover for Carb. Cable...	V.910E	1			6
5	Tickler ...	V.912E	1			6
—	Spring ...	V.369	1			2
—	Split Pin ...	V.111×2E	1			1
6	Circlip for Gauze ...	V.847E	1			6
7	Plate for Carburettor Cover ...	V.796E	1			6
8	Air Filter Gauze ...	V.795	1		6	0
9	Cylinder Head Bolt ...	E.1897	4		1	0
10	Washer ...	E.1898	4			1
11	Cylinder Head ...	B.8601	1	2	0	0
12	Gasket ...	D.8306	1			6
13	Cylinder ...	A.8651	1	5	0	0
14	Exhaust Nut Washer ...	E.8750	1			4
15	Pipe Nut ...	E.8654	1		4	0
16	Carburettor Cover Dowel ...	E.8015	1			2
17	Inlet Pipe Studs ...	E.363	2			3
18	Joint Washer ...	E.8197	1			2
19	Inlet Pipe ...	D.8070	1		7	6
20	Washer for Inlet Pipe Studs ...	E.1050	2			1
21	Nut for Inlet Pipe Studs ...	E.364	2			2
22	Cylinder Base Joint Washer ...	D.8194	1			2
23	Chaincase Filler Cap ...	E.8260	1		1	3
24	Washer ...	E.8261	1			2
25	Chaincase Front ...	A.8061	1	1	0	0
—	Nameplate ...	C.8482	1		2	0
—	Fixing Screw ...	E.8670	3			2
26	Cover Screw ...	E.7129	1			6
—	Level Screw ...	E.7326	3			3
27	Level Screw Washer ...	E.8275	1			3
28	Level Screw Washer ...	E.1905	1			1
29	Chaincase Joint Washer ...	C.8196	1		1	3
30	Chaincase Back ...	A.8060	1	1	10	0
—	Fixing Screw, Back Half...	E.8185	2			2
31	Gland Plate Rivets ...	E.4083	4	Per Set		3
32	Washer ...	E.8122	1			6
33	Gland Plate ...	E.8121	1			6
34	Fixing Stud Nut ...	E.401	2			2
35	Spring Washer for Stud ...	E.1430	2			1
36	Plain ...	E.2924	2			1
37	Chaincase Fixing Stud ...	E.5146	2			3
38	Gearbox Body ...	A.8067	1	3	0	0
39	Carburettor Cover Screw ...	E.8456	1			9
40	Dipstick Complete ...	E.8192/3	1		2	0
41	Gearbox Filler Plug Washer ...	E.6593	1			1
42	Joint Washer ...	C.8927	1			3
43	Dowel ...	E.7619	4			3
44	Drain Plug Washer ...	V.107×3	1			1
45	Plug ...	E.6292	1		1	3

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
46	Gearbox End Plate Joint Washer ...	D.8929	1			2
47	Cover Bolt ...	E.783	2			7
48	Stud, Short ...	E.5107	2			3
49	Stud, Long ...	E.8440	2			6
—	Nut 1" ...	E.401	4			2
—	Washer 1" ...	E.2924	6			1
50	Fixing Stud ...	E.2152	4			3
51	Washer ...	E.1050	4			1
52	Nut ...	E.3961	4			2
53	Crankcase, Left Hand ...	A.8057	1	2	10	0
54	Right Hand ...	A.8058	1	2	10	0
—	Drain Screw ...	E.1962	1			3
—	Washer ...	E.1905	1			1
55	Cylinder Base Stud ...	E.2152	4			3
56	Washer ...	E.1050	4			1
57	Nut ...	E.364	4			2
58	R.H. Crankcase Dowel ...	E.8250	2			3
59	Crankcase Fixing Stud ...	E.8183	4			6
60	Washer ...	E.2924	8			1
61	Nut ...	E.401	8			2
—	Fitting Stud ...	E.8199	2			6
—	Washer ...	E.2924	4			1
—	Nut ...	E.401	4			2
62	Armature Plate Joint Washer ...	E.8928	1			2
63	Fixing Screw ...	E.4934	4			3
64	Plate for Gear Indicator ...	E.8667	1			3
65	Fixing Screw for Plate ...	7/8"×No. 0	2			2
66	Ignition Switch Complete ...		1		12	0
67	Magneto Cover ...	A.8062	1	1	5	0
68	Screw ...	E.7129	1			6
69	Contact Breaker Cover ...	C.8481	1		2	0
70	Fixing Screw ...	E.8670	3			2
71	Condenser ...	M.2143E	1		5	0
72	Lead Shoe ...	M.1291	1			1
73	Clip ...	M.2342E	1			2
74	Screw Washer ...	1113×5	1			1
75	Screw ...	4 BA×1/4	1			2
76	Contact Breaker Base Plate ...	M.2331E	1		1	6
—	Cam for Contact Breaker ...	M.2277E	1		3	0
—	Key for Cam ...	M.2333E	1			4
—	Circlip for Ignition Cam ...	12 M.M.	1			3
77	Washer for C.B. Base Plate Screw ...	E.5584	1			1
78	Screw ...	7/8"×1/2"	1			6
79	Point Bracket ...	M.2993E	1		2	3
81	Lock Screw Washer ...	M.1802	1			1
82	Adj. Plate Clamp ...	E.5257	1			1
83	Point Bracket Screw ...	M.1801E	1			2
84	Oil Pad Clip ...	M.2294E	1			3
85	Washer for Oil Pad Clip Screw ...	1113×5	1			1
86	Screw ...	4 BA×1/4	1			2
87	Oil Pad ...	E.8181	1			2
88	L.T. Terminal Nut ...	EM.1001	1			2
89	Washer ...	M.1805	1			1
90	Screw Washer ...	M.1802	1			1
91	Bush ...	M.2138E	1			4
92	Rocker Arm Earthing Strip ...	M.2365E	1			2
93	Point Bracket Pin ...	M.2120E	1			2
94	Rocker Arm Spring ...	1047×3	1			0
95	Rocker Arm ...	M.2141D/1	1		5	0
96	Washer for Rocker Arm Pivot Pin ...	E.5257	1			1
97	Split Pin for Rocker Arm Pivot Pin...	V.111×2E	1			1

GEARBOX GROUP.

Fig. 5.

(For Gearbox Casing See Fig. 4).

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.
				E s. d.
1	Final Drive Sprocket Nut ...	E.8161	1	1 3
2	Final Drive Sprocket Lockwasher ...	E.8162	1	1 3
3	Final Drive Sprocket ...	E.9106	1	8 0
4	Gearbox Oil Seal ...	MIM.3245	1	4 0
5	Thrust Washer for Mainshaft Bearing ...	E.8153	2	1 3
6	Mainshaft Bearing Outer Race ...	E.8152	1	5 0
7	Rollers for High Gear Wheel Bearing $\frac{1}{4}'' \times \frac{1}{4}''$ 38 per Set		10	3 6
8	Mainshaft c/w Integral Pinion ...	C.8078/1	1	2 0 0
9	High Gear Pinion, 27 Teeth ...	D.8080	1	12 6
10	Mainshaft Pressure Washer ...	E.8101	1	1 0
11	Ball for High Gear Thrust Race $\frac{3}{8}''$ dia.		16	Per Set 6 6
12	Sliding Gear with Dogs, 24 Teeth ...	D.8081	2	12 6
13	" " without Dogs, 20 Teeth ...	E.8469	2	10 0
14	Mainshaft Bush ...	E.8158	1	8 6
15	" Rubber Washer ...	E.8478	1	3 3
16	Clutch Push Rods ...	E.8236	3	6 6
17	Roller for Clutch $\frac{3}{16}'' \times \frac{3}{16}''$...	E.8100	1	3 3
18	Kickstart Ratchet Stop ...	E.8100	1	5 0
19	K.S. Stop/Clutch Bridge Stud ...	E.8624	1	3 3
20	Washer for " " " " ...	E.1430	1	1 1
21	Nut " " " " ...	E.2539	1	2 2
22	Clutch Lever ...	D.8346	1	3 0
23	" Bridge ...	E.8435	1	4 0
24	" Adjuster Locking Plate ...	E.6829	1	3 3
25	Locking Plate Screws $\frac{1}{4}''$ No. 4 ...		2	1 1
26	Clutch Adj. Screw Assy., External ...	E.8503	1	1 0
27	" Bridge Screw ...	EG.527	1	3 3
28	Layshaft Bush ...	E.8157	1	6 0
29	Worm Gear for Speedometer Drive ...	E.8622	1	4 0
30	Layshaft c/w Integral Pinion ...	C.8079/1	1	1 5 0
31	Kickstart Ratchet Pinion, 29 Teeth ...	D.8085	1	10 0
32	" Ratchet ...	D.8086	1	15 0
33	" Shaft ...	D.8087	1	10 6
34	" Ratchet Spring ...	E.8177	1	4 4
35	" Housing Bush ...	E.8159	1	10 0
36	Stop for Gear Change Return Spring ...	E.8198	1	2 0
37	Stop Pin ...	E.6545	1	2 0
38	Gearbox End Cover ...	B.8066	1	2 0 0
39	Gear Change Spring Retainer Nut ...	E.6627	1	4 4
40	Ring for Gear Indicator ...	E.8421	1	1 6
41	Pointer for Gear Indicator ...	E.8422	1	3 3
42	Screw for " " Pointer $1'' \times 4$ BA ...		1	2 2
43	Circlip for " " " " ...	E.8424	1	3 3
44	Kickstart Shaft "O" Ring ...	R.132	1	1 0
45	" Return Spring ...	E.8175	1	1 0
46	" Spring Cover ...	E.8174	1	1 3
47	" Lever ...	D.8176	1	12 0
48	" Bolt ...	E.4251	1	8 8
49	" Nut ...	E.4252	1	4 4
50	Cover for Kickstart Spring Cap ...	E.8265	1	1 6
	Screw " " " " ...	EG.527	1	3 3

ILLUS. No.	DESCRIPTION	PART No.	Qty.	PRICE EACH.
				E s. d.
51	Kickstart Pedal ...	E.4096	1	5 0
52	" Lever Rubber ...	E.8467	1	1 3
53	" Pedal Pivot Pin ...	E.4098	1	7 7
54	" Spring ...	E.4270	1	1 1
55	Ball for Spring $\frac{1}{4}''$ dia.		1	1 1
56	Bush for Speedometer Drive ...	E.8171	1	5 0
57	Worm Wheel for Speedometer Drive ...	E.8621	1	4 0
58	Speedometer Drive Plug Washer ...	E.8195	1	2 2
59	Plug for Speedometer Housing ...	E.8172	1	1 0
60	End Plug for Plunger ...	E.8537	1	6 6
61	Plunger Spring ...	E.8783	1	2 2
62	" Bush ...	E.8540	1	1 6
63	Plunger for Cam ...	E.8539	1	9 9
63A	Sliding Gear Fork ...	C.8090	2	12 6
64	Cam Barrel ...	C.8089	1	1 2 6
	Thrust Washer for Cam Barrel ...	E.8097	1	6 6
65	Split Pin for Sliding Gear Fork Guide Peg ...	E.8393	2	1 1
	Bearing Pin for Cam Barrel ...	E.8096	1	1 0
66	Guide Peg for Sliding Gear Fork ...	E.8095	2	6 6
67	Thrust Washer for Cam Bearing ...	E.8155	2	1 0
68	Cam Barrel Bearing Outer Race ...	E.8154	1	2 6
69	Rollers for Cam Barrel Bearing $\frac{1}{8}'' \times \frac{3}{16}''$ 24 Per Set		6	0 0
70	Cam Barrel "O" Ring ...	E.9257	1	8 8
71	Pinion for Cam Barrel (Gear Indicator) ...	E.8423	1	1 0
72	Split Pin for Gear Indicator Pinion $1\frac{1}{8}'' \times \frac{3}{32}''$...		1	1 1
73	Op. Spindle Bush Gearbox Body ...	E.6595	1	1 0
74	" Nut ...	E.6627	1	4 4
75	" Lock Washer ...	E.6544	1	2 2
76	" Shim ...	E.7228	As reqd.	2 2
77	Quadrant for Gear Operation ...	C.8099	1	8 0
78	Distance Piece ...	E.6542	1	5 5
79	Op. Spindle Plate ...	D.6541	1	2 0
80	" Spindle ...	D.6536	1	14 0
81	Operating Pawl ...	D.6539	1	10 0
82	" Spring ...	E.7437	1	1 0
83	Gear Change Lever ...	D.8103	1	8 0
84	Foot Change Gear Lever Rubber ...	D.6861	1	1 6
85	" Bolt ...	E.4251	1	8 8
86	" Nut ...	E.4252	1	4 4
87	" Ratchet Spring ...	E.6543	1	6 6
88	Op. Spindle Bush G. Box End Plate ...	E.6537/1	1	4 0
89	Gear Change "O" Ring ...	E.8776	1	8 8
90	Op. Spindle Washer ...	E.6573	1	1 1
91	" Circlip ...	E.6552	1	2 2

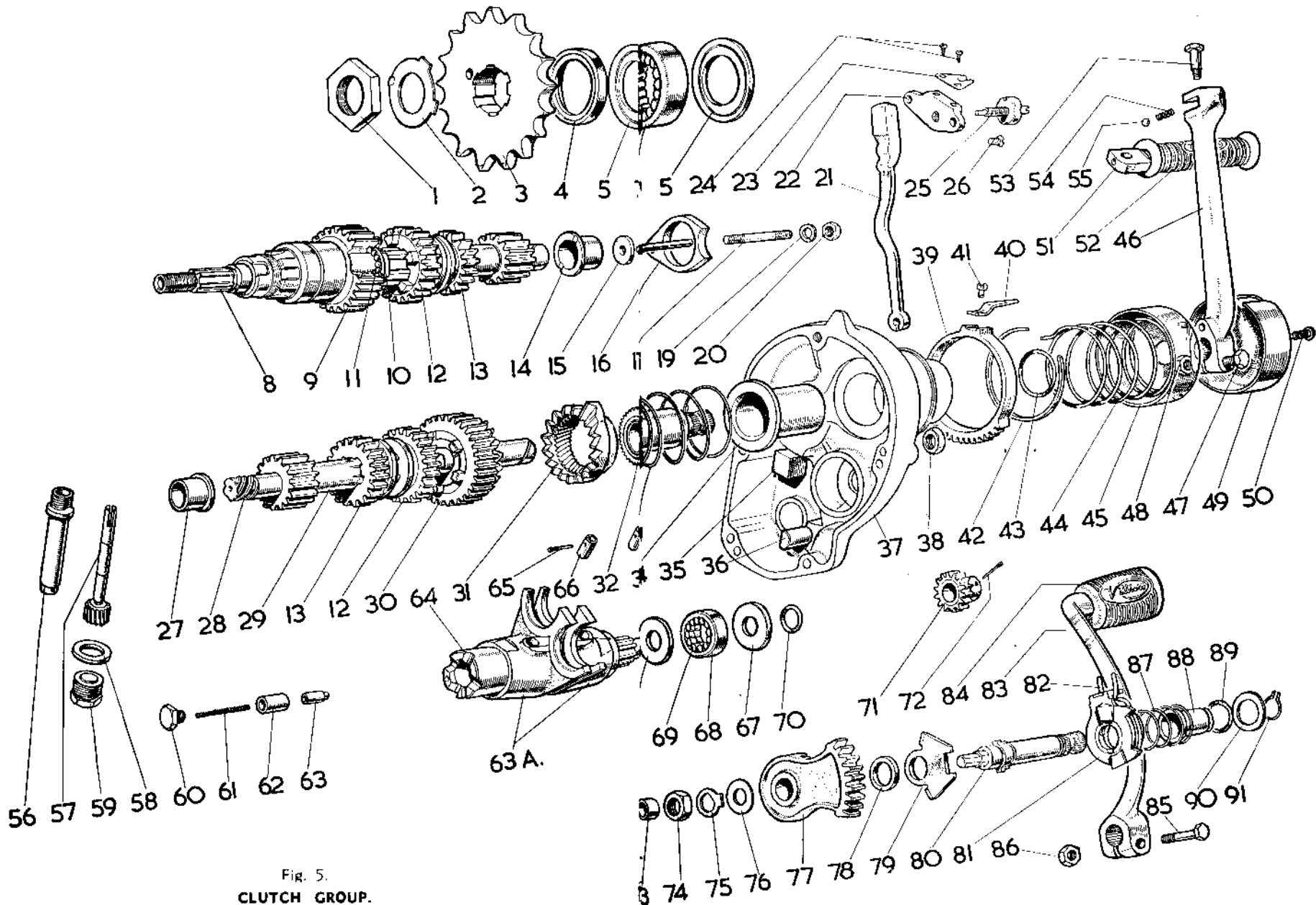


Fig. 5.
CLUTCH GROUP.

CLUTCH GROUP.

Fig. 6.

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Internal Clutch Adjuster Lock Nut...	E.8473	1			4
2	Clutch Adjuster Screw Internal ...	E.8472	1			3
3	.. Cap Nut	E.8359	1	6	0	0
4	.. Centre Nut	E.8356	1	4	0	0
5	.. Inner Spring	E.8732	1		6	0
6	.. Spring	E.8358	1	1	6	0
7	.. Hub	E.8354	1	6	0	0
8	.. Sliding Sleeve	E.8357	1	18	0	0
9	.. Pressure Plate	D.8352	1	3	6	0
10	.. Driving Plate	D.8348	4	6	0	0
11	.. Intermediate Plate	D.8462	3	3	6	0
12	.. Corks	E.8144	80	Per Set 5 0		
13	.. Back Plate	D.8459	1	6	0	0
14	.. Chainwheel Assembly	E.8347	1	1	0	0
15	P.D. Chain	66P	1			*
16	Balls for Roller Ball Track	$\frac{3}{16}$ " dia.	24	Per Set 9 0		
17	Clutch Chainwheel Ball Track	E.8353	1	3	0	0

CHAIN TENSIONER GROUP.

Fig. 7.

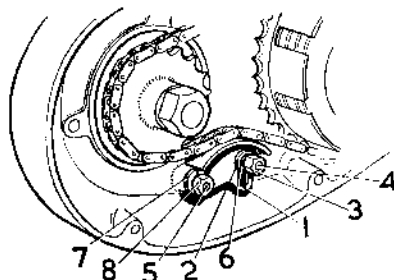


Fig. 7.

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Chain Tensioner	E.8924	1	2	0	0
2	$\frac{1}{16}$ " Flat Washer	E.2667	1		1	0
3	Nut for Chain Tensioner	E.3961	1		2	0
4	Stud for " "	E.4956	1		3	0
5	" " " Washer	E.5148	1		3	0
6	$\frac{5}{16}$ " Spring Washer	E.1050	1		1	0
7	Washer for Chain Tensioner Stud	E.1430	1		1	0
8	Nut for Stud	E.401	1		2	0

MISCELLANEOUS.

---	Lighting Lead Plug	L.1286	1	3	0	0
---	H.T. Lead Plug	L.378/3	1	2	0	0

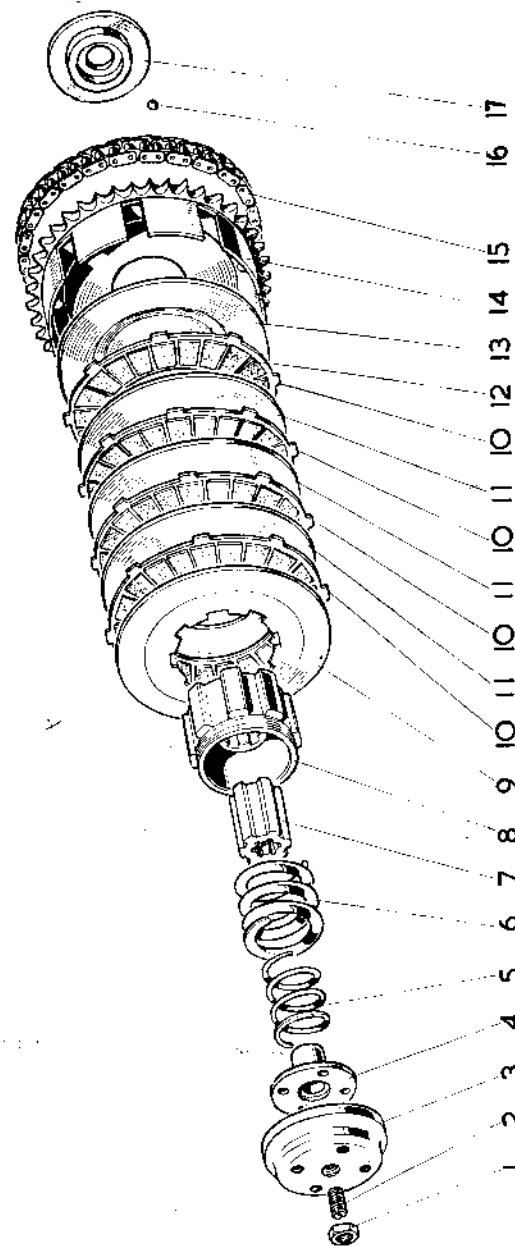


Fig. 6.
CLUTCH GROUP.

PISTON AND CRANKSHAFT GROUP.

Fig. 8.

ILLUS. No.	DESCRIPTION	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Piston Rings	E.3714	2	1	9	
1A	Expander Ring	E.8904	1	1	0	
2	Piston with Bushes	C.8602	1	10	0	
3	Gudgeon Pin	E.8778	1	3	6	
4	" Circlips	E.4047	2		3	
5	Connecting Rod with Bush .001" O/S	D.9136	1	1	0	0
6	" Bush	E.1547/1	1	2	0	
7	Crankpin .001" O/S	E.9137	1	5	0	
8	" Plugs	E.5593	2		3	
9	Rollers for Crankpin	$\frac{1}{4}'' \times \frac{1}{4}''$	26 Per set	7	0	0
10	Engine Sprocket Nut	E.3931	1		6	
11	" Washer	E.5706	1		1	
12	Engine Sprocket, 20 Teeth	E.8361	1	9	0	
13	Ball Bearing for Crankshaft	6305	4		*	
14	Driveshaft Ball Bearing Distance Piece	E.8120	2	1	3	
15	Driving Shaft, Left Hand	C.8064	1	2	2	0
16	Cover Plate for Drive Shaft Balance Weight	D.8244/1	2	1	0	
17	Drive Shaft, Right Hand	C.8065	1	2	2	0
18	Engine Sprocket and Flywheel Key...	E.5581	2		3	

* Manufacturers' Current Price.

NOTE: Items 15 and 17 are not supplied separately.

★ Insist on
GENUINE *Villiers* SPARE PARTS.

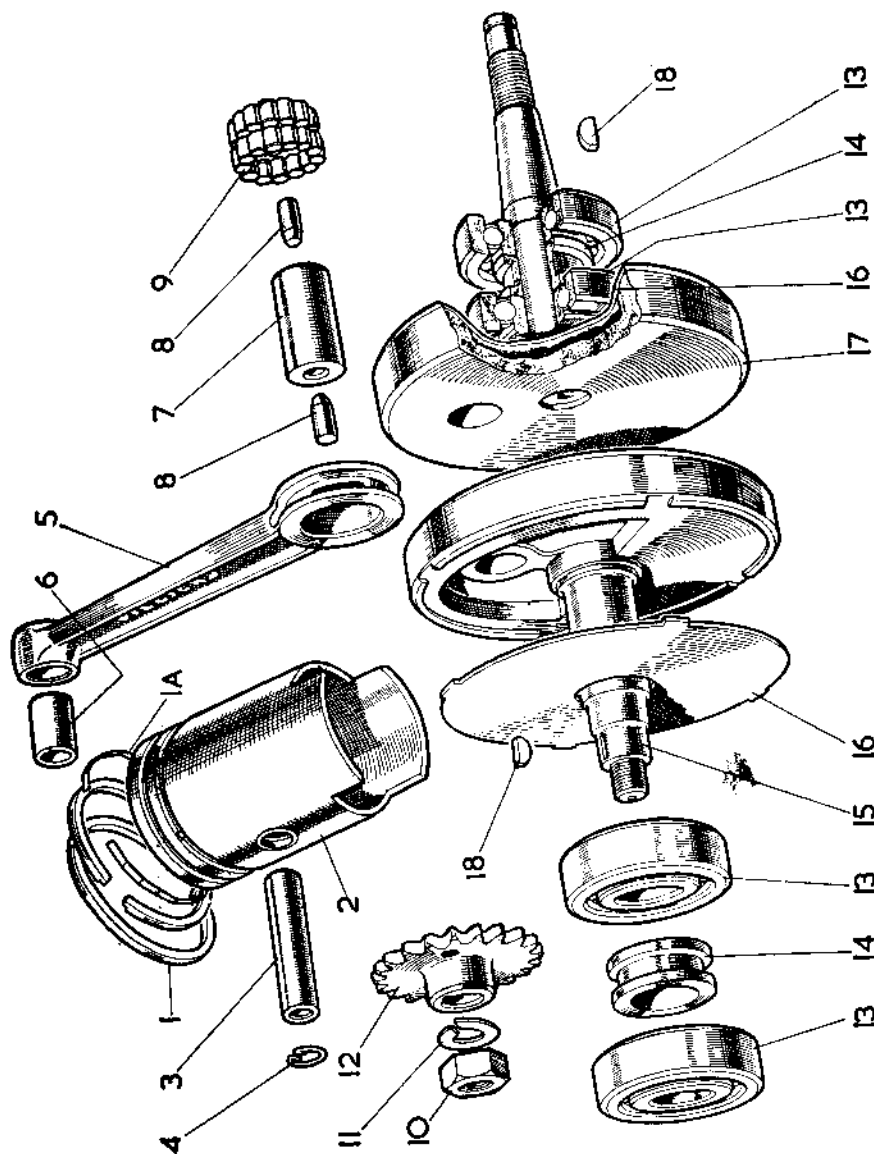


FIG. 8. PISTON AND CRANKSHAFT GROUP.

CARBURETTER TYPE S25.

Fig. 9.

ILLUS. No.	DESCRIPTION.	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Throttle Cable Complete	—	1	5	0	0
2	Mid. Cable Adj. Sleeve	E.8098	1		9	
3	Mid. Cable Adj. Screw	V.683E	1		7	
3A	Mid. Cable Adj. Nuts	V.105×2E	1		1	
4	Top Ring	V.815E	1	1	3	
6	Cable Nipple	V.108×15	1		1	
7	Top Disc	V.1052E	1		6	
8	" " Fibre Washer	V.828E	1		1	
9	Needle Adjusting Screw	V.786E	1		6	
10	Throttle Spring	V.107×8	1		3	
11	Needle	V.748E	1		9	
12	" Collar	V.787E	1		2	
13	" Spring	V.801E	1		3	
14	Throttle	V.725D	1	4	0	
15	Carburetter Body	V.928D	1	15	0	
16	Cup Washer	V.125×8	1		3	
17	Banjo Washer—Small Hole	V.383E	1		1	
18	Petrol Filter	V.404E	1		8	
19	Banjo Washer—Large Hole	H.104×8E	1		1	
20	Banjo Bolt	V.382E	1	1	3	
—	" Union	V.381E	1	2	0	
21	Body Clip Screw	V.754E	1		5	
22	Body Clip	V.818E	1	2	6	
23	Tickler	V.742E	1		6	
24	Guide Screw (Throttle)	V.829E	1		2	
25	Centrepiece	V.822	1	5	0	
26	Spring for Pilot Needle	V.749E	1		2	
27	Pilot Jet Needle	V.775E	1		10	
28	Tickler Spring	V.830E	1		2	
29	Screw for Tickler Spring	¼" No. 4	1		1	
30	Pilot Jet	V.717E	1	1	0	
31	Main Jet	V.1151	1		6	
32	Float	V.777E	1	5	0	
33	" Cup	V.773E	1	3	0	
34	Bottom Nut Washer	V.107×3E	1		1	
35	Bottom Nut	V.361E	1		9	
36	Fuel Needle	V.355	1		10	
37	" " Lever	V.738E	1		8	
38	" " Pin	V.375E	1		2	

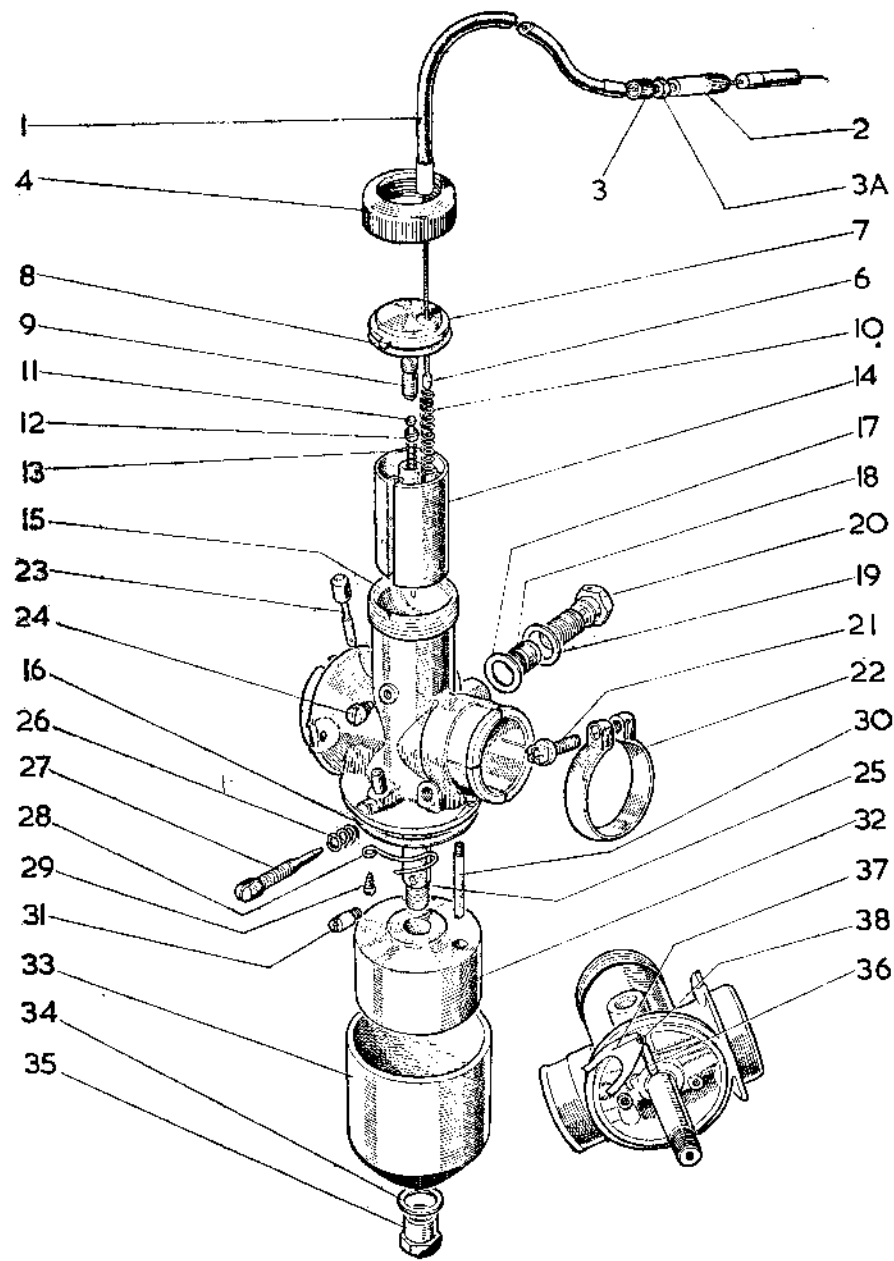


Fig. 9.
TYPE S.25 CARBURETTER.
35

VILLIERS AC/DC LIGHTING SET WITH RECTIFIER.

Wiring Diagram M.2336D.

Fig. 10.
COMPONENT. PART No. PRICE EACH.
l s. d.

Headlamp Complete, without Underslung Switch and Harness	Pilot-Less	51005A	
Headlamp Complete, with Underslung Switch and Harness	Pilot-Less	51032A	
Headlamp Rim Assembly		534343	
Rim Fixing Wire		504665	
Light Unit		552507	
.. .. Underslung		552495	
.. .. Adaptor		860360	
.. .. Underslung		859598	
Main Bulb, 6V.—24/24 Watt		No. 166	
Pilot Bulb, 6V.—3 Watt		No. 988	
Ammeter		36084	
.. Rubber Ring		523986	
Screw, Panel Fixing		186128	
Rubber Seal, Panel		516442	
Switchbox		31461A	
Spring, Switchbox Fixing		308234	
Rubber Ring		523986	
Lamp Fixing Screw		112201	
Washer for Screw		137141	
Bulb Holder		553780	
Lens	Underslung Pilot Only	516386	
Rubber Bead		516395	
Lens Fixing Wire		516393	
Tail Lamp, Standard Type 529		53256	
529 TAIL LAMP, 53256.			
Lens		526404	
Window		526406	
Screw, Lens Fixing		133551	
Bulb Holder Assembly		554719	
Base, Rubber		526408	
Screw, Base Fixing		526410	
Bulb, 6V.—3 Watt		988	
Tail Lamp, Stop Light, Type 525		53269	
525 STOP TAIL LAMP, 53269.			
Lens Assembly		573819	
Gasket, Rubber		573814	
Screw, Lens Fixing		572072	
Interior		860428	
Grommet		573825	
Bulb, 6V.—18/3 Watt		352	
Rectifier		2L985	
Harness		836241	

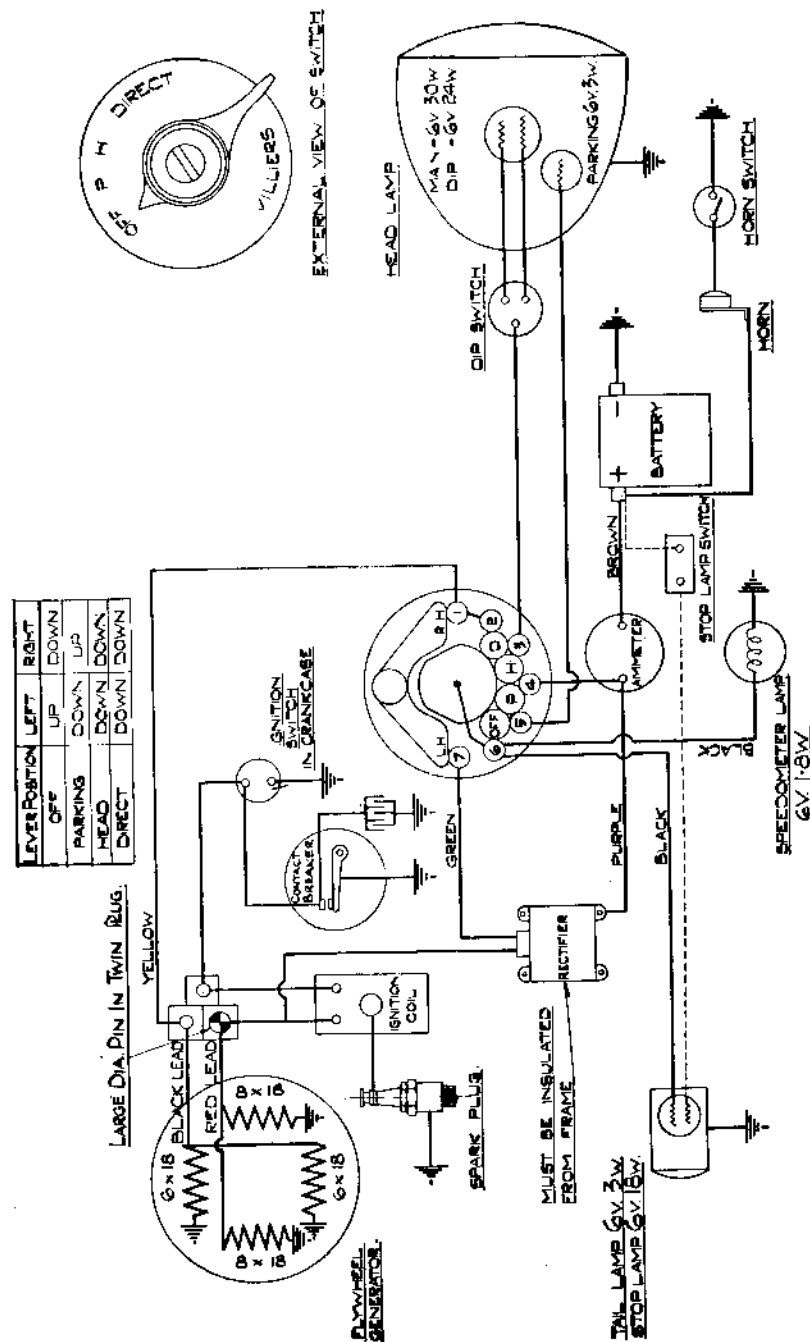
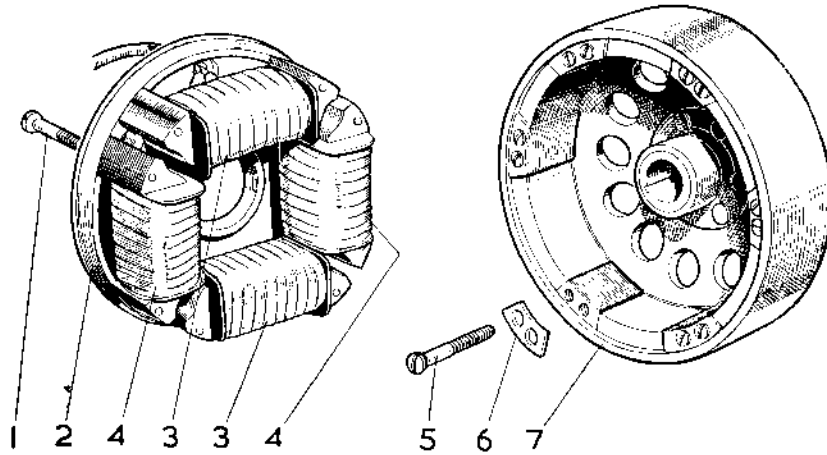


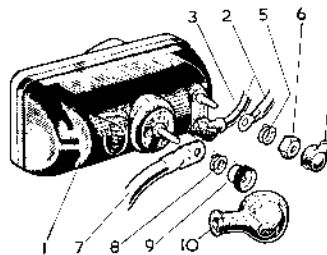
Fig. 10. WIRING DIAGRAM.

MAGNETO GROUP.



ILLUS. No.	DESCRIPTION	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	Coil Cheek Screws	1140×1E	8			3
2	Armature Plate Assembly Complete	A.131	1	3	10	0
3	Lighting Coils		1 pr.	1	10	0
4	Ignition Coils—Armature Plate		1 pr.	1	5	0
5	Pole Screws	M.1797E	12			3
6	Shoe Top Plates	M.1822	6			3
7	Flywheel Assembly Complete ...	R.127	1	6	10	0

IGNITION COIL GROUP.



ILLUS. No.	DESCRIPTION	PART No.	Qty.	PRICE EACH.		
				£	s.	d.
1	* Ignition Coil Assembly, Complete, comprising Coil, Base Plate and Cover		1	3	0	0
2	L.T. Lead	4 m.m	2		1	6
3	L.T. Lead Shoe	M.2369	2			2
4	L.T. Terminal Cover	SIC 3844	2			3
5	L.T. Washer	V.146×2	2			1
6	L.T. Nut	M 2054E	2			4
7	H.T. Lead, 7 m.m.	18"	1		2	6
8	H.T. Terminal Washer	V.146×2	1			1
9	H.T. Nut	1069×3	1			3
10	H.T. Cover	M.2356E	1		1	3

* Not supplied Separately.

* State whether required for Tank or Frame Fitting.

IMPORTANT.

1.—When sending parts for replacement, repair, or as pattern, the name and address of the sender should always be securely attached. Full instructions explaining what is required should be sent separately by post. Duplicate instructions should ALWAYS be enclosed with the parts.

2. If an engine is sent for repair, it should be well packed in a strong box. Cardboard or a sack is insufficient, and engines so packed are liable to get seriously damaged in transit. Packing cases are not returnable unless specially asked for by the owner at the time of sending to us.

3. All goods must be consigned to us carriage paid, addressed to "Service Dept." Goods returned by rail are consigned carriage paid.

4. In correspondence, always quote the engine number, found on the crankcase front lug.

5.—We prefer to bench test every repaired engine before returning it to its owner. It is, therefore, always advisable to send the engine complete with its magneto, sparking plug, and carburettor.

6. When forwarding a flywheel magneto for overhaul, send the armature plate and the flywheel complete, as we prefer to bench test after repairing.

7.—Always quote the magneto number and letter(s) (if any) stamped on the face of the flywheel, when corresponding about your flywheel magneto.

8.—OLD OR WORN-OUT PARTS SENT AS PATTERNS, WHICH WE CONSIDER UNSERVICEABLE ARE NOT RETURNED UNLESS SPECIALLY ASKED FOR AT THE TIME OF SENDING THEM TO US.

9. Any engines or parts sent to our Works for repair, and not paid for within six months from the date of our estimate, will be offered for sale by us elsewhere to defray expenses.

ESTIMATES.

If required, we are always prepared to give an estimate before proceeding with any repair. This entails a certain amount of labour in dismantling to ascertain what new parts will be required, and therefore, in the case of any estimate not being accepted for special reasons, a small charge is made for our mechanics' time in taking down the parts for report.

Estimates must be treated as approximate only. We reserve the right to include additional parts should these be found, on further examination or on bench test, to be necessary, to make the repair satisfactory.

We do not undertake to fit to engines sent to us for overhaul, any parts specified by the customer when we consider that other parts are necessary to make an efficient repair. In such cases, we are prepared to supply the customers' requirements in spares, but we do not undertake to fit them.

TERMS OF BUSINESS.

Repairs and spares must always be treated on a cash basis. Ledger accounts will be opened for items of £5 (five pounds) and upwards for approved accounts.

AN EXTRA AMOUNT MUST ALWAYS BE INCLUDED IN REMITTANCES TO COVER THE COST OF POSTAGE OR CARRIAGE AND PACKING ON SPARE PARTS. THIS IS 5% EXTRA UP TO £5 VALUE. MINIMUM EXTRA IS 6d. Stamps cannot be accepted for items over 1/- (one shilling) in value.

When making remittances by telegraph money order, the name and address of the sender must be included in the space provided on the Post Office Requisition Form for a private message from remitter to payee. Unless this is done, the Post Office does not give this information upon the telegram.

GUARANTEE.

WE give the following guarantee with VILLIERS Engines and Accessories in place of any implied guarantee by statute or otherwise, all such guarantees being in all cases excluded. No statement or representation contained in this catalogue shall be construed as enlarging or varying this guarantee. In the case of engines and accessories which have been used for "hiring out" purposes, or from which our trade mark, name, or manufacturing number has been removed, no guarantee of any kind is given or is to be implied.

We guarantee, subject to the conditions mentioned below, that all precautions which are usual and reasonable have been taken by us to secure excellence of materials and workmanship, but this guarantee is to extend and to be in force for six months only from the date the engines or accessories are despatched by us, and the damages for which we make ourselves responsible under this guarantee are limited to the replacement of a part manufactured by us which may have proved defective.

We do not undertake to refit or bear the cost of replacement or refitting such new part. We guarantee, subject to the conditions mentioned below, to make good at any time within six months any defects in these respects. As VILLIERS Engines and Accessories are liable to derangement by neglect or misuse, this guarantee does not apply to defects caused by wear and tear, misuse and neglect.

CONDITIONS OF GUARANTEE.

If a defective part should be found in our engines or accessories, it must be sent to us carriage paid and accompanied by an intimation from the sender that he desires to have it repaired free of charge, under our guarantee, and he must also furnish us at the same time with the number of the engine, and full particulars of purchase. Failing compliance with the above, no notice will be taken of anything that may arrive, but such articles will lie here at the risk of the sender, and this guarantee or any implied guarantee shall not be enforceable.

THE TERM "AGENT" is used in a complimentary sense only, and those firms whom we style our agents are not authorised to advertise, incur any debts, or transact any business whatsoever on our account other than the sale of goods which they may purchase from us, nor are they authorised to give any warranty or make any representations on our behalf or sell subject to or with any conditions other than those contained in the above guarantee.

The guarantee becomes void if any parts not made or supplied by THE VILLIERS ENGINEERING COMPANY, LTD., are fitted to a VILLIERS engine. To safeguard his own interests, the owner should always insist upon genuine VILLIERS parts.