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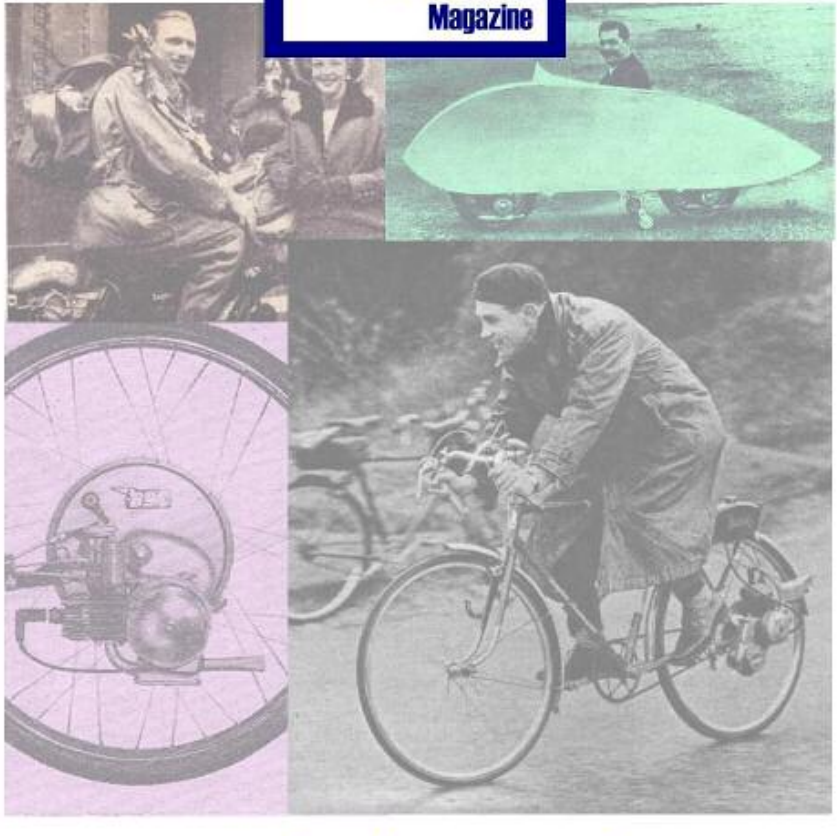

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JAMES

INSTRUCTION BOOK

for

"SUPERLUX" AUTOCYCLE

Model J/1

98 cc.

Manufactured by :

THE JAMES CYCLE CO. LTD.

GOUGH ROAD,

BIRMINGHAM 11 - ENGLAND

Price 1/6

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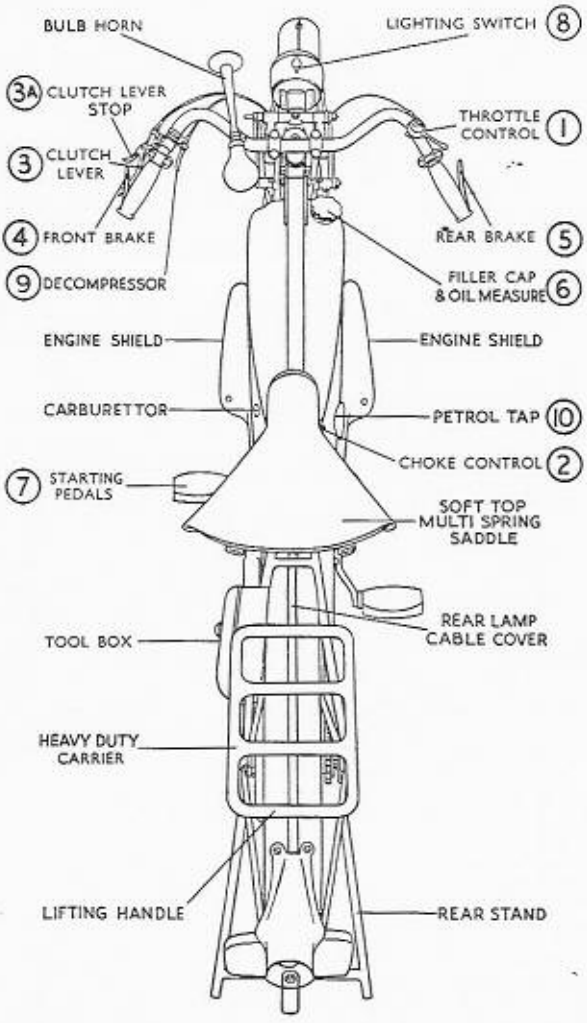
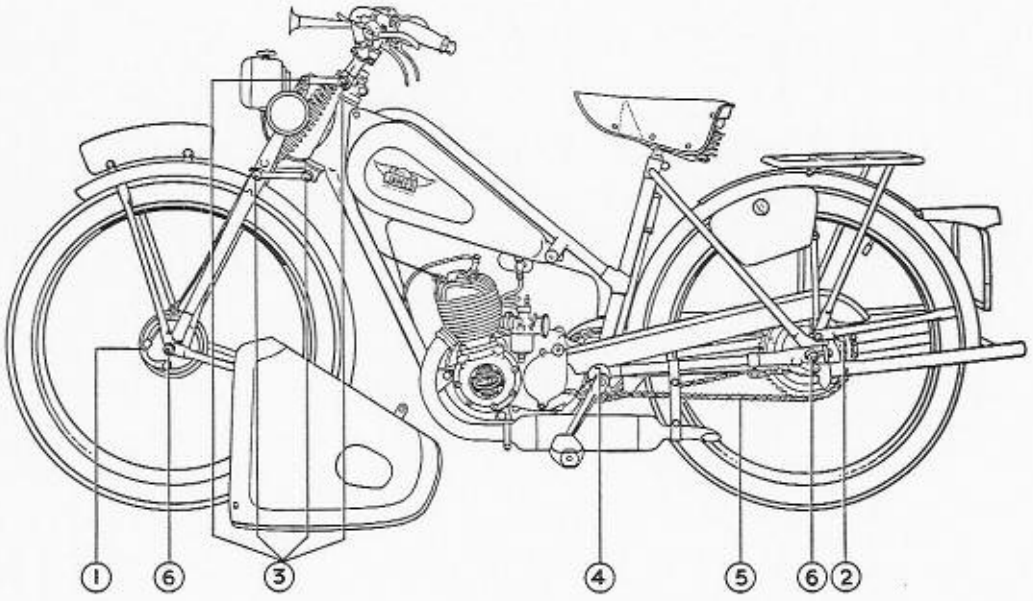
THE "JAMES"

SUPERLUX AUTOCYCLE

CONTROLS.

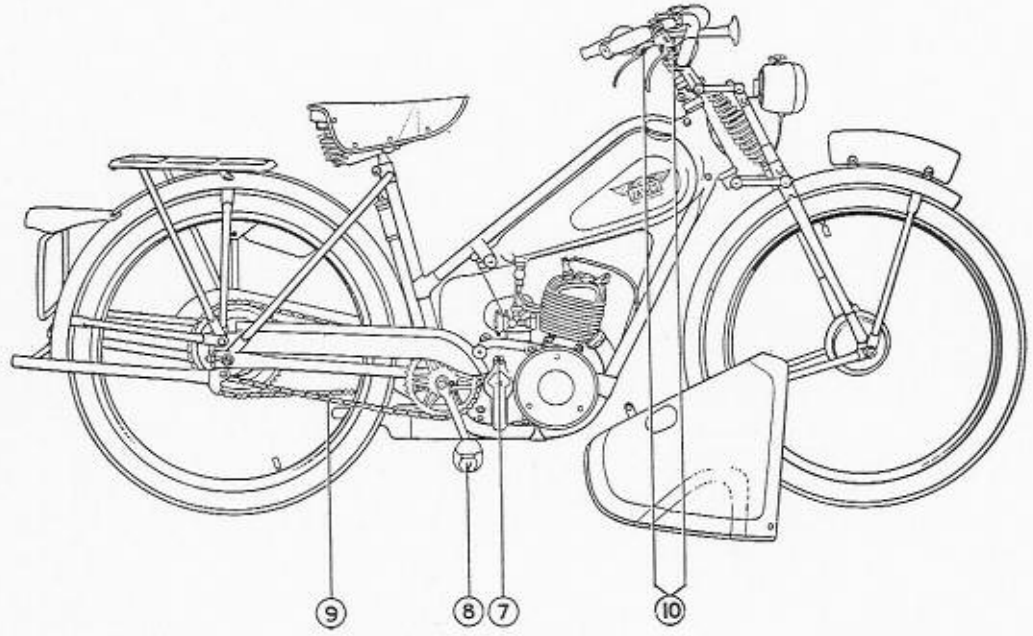




OILING AND GREASING POINTS ON SUPER-LUX AUTO

Key No.	PART	
1	Front Hub	Light Grease
2	Rear Hub	Light Grease
3	Fork Shafts	Light Grease
4	Bottom Bracket	Light Grease
5	Chain (Driving)	Oil
6	Brake Cams and Rollers (Front and Rear)	Oil
7	Clutch Case	Heavy Oil
8	Pedals	Oil
9	Chain (Pedal)	Oil
10	Clutch and Brake Levers	Oil

FOR RECOMMENDED LUBRICANTS SEE PAGE 16



GENERAL DATA

Model	Mk. 2.F.
Bore	47 mm. (1.8504").
Stroke	57 mm. (2,244").
Capacity	98 cc. (6 cu. ins.).
Horse Power, Maximum ...	2.0 at 3,750 r.p.m.
Engine Sprocket	17 Teeth.
Clutch Sprocket	42 Teeth.
Ratio, Engine to Clutch ...	2.47.
Final Drive Sprocket	11 Teeth, $\frac{1}{2}$" pitch for " COVENTRY " Chain No. 112045.
Rear Chain Wheel	48 Teeth.
Rear Chain	114 Pitch, $\frac{1}{2}$" x $\frac{5}{16}$".
Chain Line, Final Drive ...	$1\frac{7}{8}$".
Final Gear Ratio	10.76—1 with rear wheel sprocket having 48 Teeth.
Exhaust Pipe	$1\frac{1}{4}$" external dia.
Sparking Plug	14 mm. Lodge H14, Point Gap .018" to .025".
Carburetter	Villiers " Junior " Type.
Carburetter Jet Size	Marked J8.
Carburetter Taper Needle ...	No. $2\frac{1}{2}$. Setting $\frac{22}{32}$" out.
Ignition Timing...	$\frac{1}{8}$" before Top Dead Centre.
Contact Breaker	Point Gap .015" maximum.
Lubrication, Engine	Petroil mixture in fuel tank Recommended Oil see oiling chart page 38.
Lubrication, Chaincase ...	Recommended Oil (see page 38) filled to level plug. See Fig. 4.
Lighting Set	Head Lamp Bulb, 6 volt 12 watt S.B.C. Head Lamp Pilot Bulb, 4 volt .3 amp. M.E.S. Tail Lamp Bulb, 4 volt .3 amp. M.E.S. Parking, Battery, Ever-Ready No. 1289.
Tyre Size...	2.25 x 21"
Tyre Pressures	Front, 17lbs.—Rear, 32lbs.

LIGHTING SET

The head and tail lamps are fitted with single pole, single contact bulbs, and it is essential that both lamp bodies make metal to metal contact with the cycle frame to ensure a good EARTH for the lighting circuit.

The correct bulbs are listed in the DATA above, and the dry battery fitted in the head lamp is the EVER-READY No. 1289, or one of similar size and capacity.

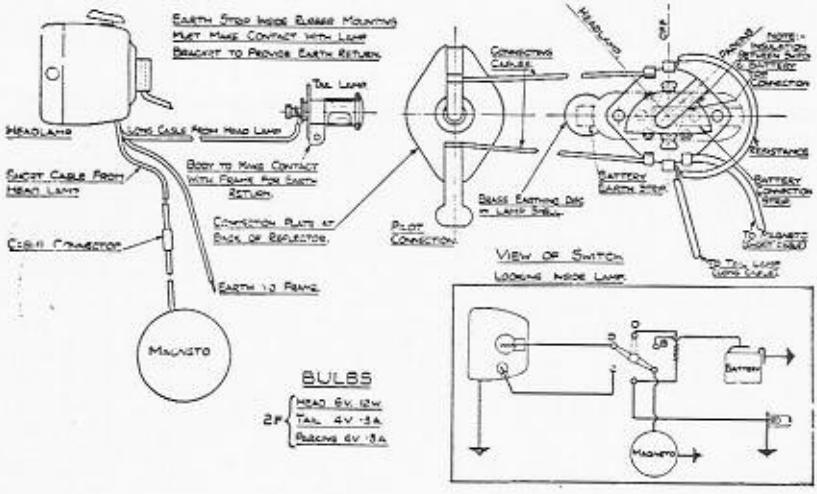


Fig. 3.
WIRING DIAGRAM Mk. 2.F.

THE " JAMES "
SUPERLUX AUTOCYCLE

SPECIFICATION

Fitted with the Mark 2.F. Engine, has built in unit with a countershaft clutch, the drive from engine crankshaft being by an endless roller type chain running in an oil bath case.

A deeply finned cast iron cylinder with one exhaust and two transfer ports of unique design is used, the carburetter being mounted on a stub at the rear.

Secured to the cylinder by four bolts is an aluminium alloy head in which is. fitted a 14 mm. sparking plug (Lodge H14). The aluminium flat topped piston carries a floating gudgeon pin located endways by circlips. The " big end " bearing consists of two rows of steel rollers running on a crankpin fitted in double crankwebs carried by a large ball journal bearing on each side.

Power is taken through a two plate cork insert clutch, control being by Bowden cable and lever fitted on handlebar.

Final drive to rear wheel is by a roller chain. A Villiers Junior pattern carburetter is fitted at the rear of cylinder, control being by a single lever. A strangler for easy starting, and within the reach of the rider, is provided, and a gauze type air filter prevents the entry of dirt and water.

A decompressor to assist in starting the engine is fitted in the cylinder head, control being by Bowden cable and lever fitted on the handlebar.

The ignition and lighting current is provided by the Villiers flywheel magneto, a special model giving increased output having been developed. The headlamp now carries a 6 volt 12 watt bulb.

INSTRUCTIONS FOR USING THE "JAMES" SUPERLUX AUTOCYCLE FITTED WITH VILLIERS MARK 2.F. UNIT

BEFORE USE

CHAINCASE. Remove the chaincase oil filler and oil level plugs, see Fig. 1, and with the cycle off the stand, pour in recommended Oil (see page 38) until it runs out at the level plug hole. Refit plugs securely. Examine every 500 miles and top up if necessary.

ENGINE LUBRICATION AND FUEL SUPPLY SYSTEM

FUEL TANK. Capacity 1½ gallons approximately. Fill up tank with "Petroil" mixture made by mixing thoroughly half a pint recommended Oil (see page 38) with one gallon of Petrol, or four measures of Oil to one gallon of Petrol (measure incorporated in filler cap). On no account must the oil be put into the tank before mixing, and it is advisable to pour the mixture through a fine mesh gauze when putting into tank.

If these instructions are followed, lubrication of all parts of the engine is automatic and efficient.

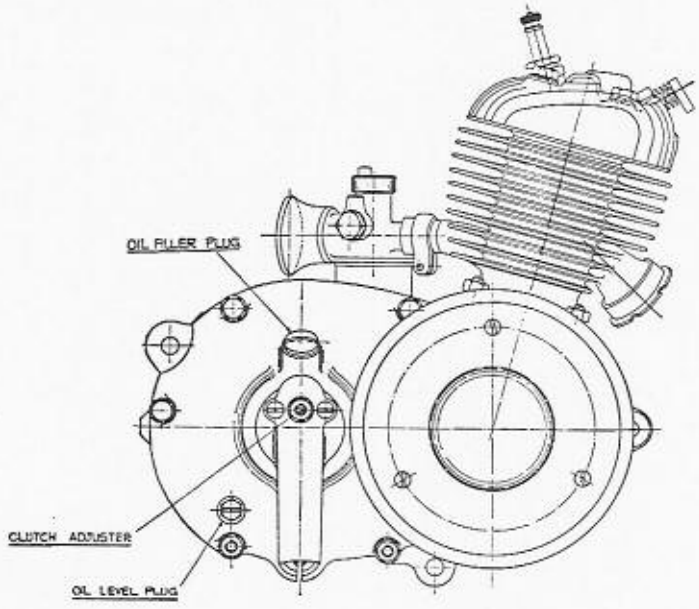


Fig. 1.

STARTING THE ENGINE

Where the owner has had no previous experience of driving it is advisable to become accustomed to the use of the various controls and, therefore, before attempting to start the engine, the cycle should be put on its stand, the rear wheel being off the ground.

The carburetter control lever is moved by the right hand and opens inwards to increase the speed of the engine.

The decompressor or compression release valve, as it is sometimes called, is controlled by a small lever usually fixed on the underside of the left handlebar and immediately in front of the clutch control lever.

The function of the decompressor is to release the pressure in the cylinder head so making it possible to rotate the engine by means of the pedalling gear when starting by this method.

The fuel tap can now be turned to the ON position, and the strangler closed by lifting the lever at rear of carburetter. Open the carburetter control lever about one third its total movement, and flood the float chamber by depressing tickler. Rotate engine by pedalling whilst sitting on the saddle, and the engine should start when the decompressor lever is released. As the engine warms up after running for half a minute or so, the strangler can be gradually moved to the fully open position. In very cold weather it may not be possible to do this immediately, in which case leave strangler partly closed until engine is warmed up, if opened up too quickly spitting back through carburetter will occur. When the engine is warm from previous running, it should not be necessary to either flood the carburetter or use strangler when restarting.

Having started the engine by the pedals, the machine still being on the stand, withdraw clutch by pulling up the clutch control lever.

The lever is held in the " OUT " position by a spring loaded trigger. The machine can now be pushed off the stand, the rider still being astride the saddle, and a get away can be made by gently letting in the clutch at the same time opening the throttle to take the load.

An alternative method of starting is by pushing the machine. Flood the carburetter, open the throttle and depress the compression release valve as before, wheel the machine forward a couple of yards and release the valve control lever, and then as the engine fires, pull up the clutch control lever. With the clutch disengaged and the engine running, the rider can then mount the machine and move off by clutch and carburetter control.

STOPPING THE ENGINE

The engine is stopped by moving the control lever to the closed position, and just before coming to rest the release valve should be used to prevent the engine jerking over compression.

FAILURE TO START

FAILURE TO START. If the engine will not start after a reasonable number of attempts, ascertain if this is due to lack of compression, no fuel or faulty ignition. COMPRESSION should be felt whilst rotating the engine by the pedalling gear, with the throttle partly open.

FUEL SUPPLY. Depress tickler at side of carburetter body. If fuel is reaching float chamber, it will spurt from vent hole in tickler cap.

FAULTY IGNITION. Unscrew spark plug from cylinder head and with the ignition cable attached place on a flat metal part of engine. When the engine is rotated a spark should be visible at the points. If no spark, detach cable and hold end $\frac{1}{8}$" from cylinder whilst rotating engine.

If these preliminary tests prove negative a more detailed examination will have to be made, and reference should be made to " Tracing Engine Troubles " on pages 14—15.

RUNNING IN

For the first 500 miles the engine must not be over-driven, and during this period the throttle should not be fully opened. The engine must not be allowed to race, or run at a high speed under a light load. Do not exceed 20 m.p.h. during the running-in period, and after covering about 500 miles it will very likely be necessary to weaken off the mixture by lowering slightly the taper needle in carburetter. How to do this is explained in the section dealing with the carburetter.

CHAIN LUBRICATION

The primary chain runs in an oil bath case. See page 4 chaincase. The rear chain is not automatically lubricated, and should be removed occasionally for lubrication ; a graphited oil is recommended.

PERIODICAL ATTENTIONS

WEEKLY

TYRES. Check pressures frequently, and keep inflated to 17 pounds for the front and 32 pounds for the rear. When using the machine on wet or greasy roads, it is better to apply BOTH brakes together, because sudden or harsh application of either brake only, under such conditions, may result in a skid.

SPARKING PLUG. Clean once a week.

MONTHLY

Clean carburetter pipe and filter.

Check rear chain for adjustment. Normal slack $\frac{3}{8}$" to $\frac{1}{2}$" at tightest place.

EVERY 1,000 MILES

BRAKE CAMS. Lubricate with oil can. An excessive quantity of oil should not be used, otherwise this may get through to the brake linings.

FORKS. Check adjustment of fork links and spindles. To adjust the fork shafts, release the nuts at each end, and turn shaft by the square end anti-clockwise to take out play caused by wear ; afterwards tighten locknuts securely. A knurled washer is placed on each fork shaft, and it should just be possible to revolve this when the adjustment is correct.

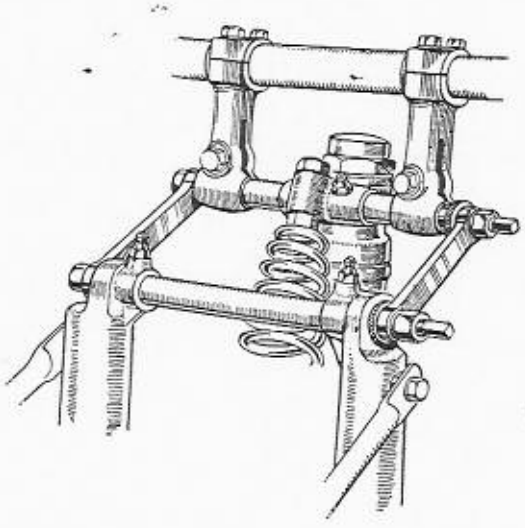


Fig. 2

EVERY 5,000 MILES (or more frequently under extremely wet or muddy conditions)

HUBS. The hubs are packed with grease during assembly, to lubricate the bearings and prevent the entry of mud and water. A grease nipple on the hub is provided for the periodical injection of fresh grease. The quantity injected must not be excessive—one or two shots of the grease gun will be sufficient—or there will be a tendency for the surplus to work into the brake drum and so cause inefficiency.

It is advisable, in order to enjoy trouble-free riding, that the engine and machine should have periodical attention, and the following hints will help to keep the engine in good running order :—

Every 500 miles inspect level of oil in clutchcase by removing level screw. (See Fig. 1). Top up if necessary with grade of oil previously recommended.

Examine the contact breaker points after the first 500 miles have been completed as the points may require slight adjustment after initial bedding in. The correct gap when points are fully open is .015". They should also be kept free from oil.

Every 2,000 miles remove cylinder head and scrape out carbon. The edges of the exhaust port in the cylinder can be cleaned when the piston is at the bottom of the stroke. Clean piston top.

It should not be necesasry to remove barrel and piston every 2,000 miles, every 4,000 miles should be sufficient.

Every 2,000 miles remove and clean silencer, exhaust pipe, and carburetter air filter.

Occasionally check clutch control cable adjustment. There should be a very small amount of slack in the clutch cable when clutch is engaged. Adjust clutch cable by means of adjustment screw on clutch bridge casting (see Fig. 1). Screw adjuster in until there is just a trace of slack in the cable ; this is essential, otherwise the clutch may be slightly disengaged and cause slipping. Tighten locknut after adjustment.

Periodically examine joints, cylinder head, cylinder base, crankcase and clutchcase for gas or oil leaks, and tighten if necessary. Examine all visible nuts, bolts and screws for looseness.

Check tyre pressure weekly and keep inflated at 17 pounds front, 32 pounds rear.

Clean plug weekly.

Clean petrol pipe and filter monthly.

Check rear chain adjustment monthly.

GENERAL ATTENTION TO MAINTAIN ENGINE EFFICIENCY

INSPECT ENGINE MOUNTING, AND TIGHTEN IF NECESSARY

1. Engine frame bolts (3).
2. Crank case bolts.

ENGINE LUBRICATION AND FUEL SYSTEM

ENGINE "PETROIL" LUBRICATING AND FUEL SYSTEM

1. Check quantity of fuel in tank. Do not forget that the fuel also serves the purpose of lubricating all internal parts of the engine, and always remember to replenish the fuel tank with the correct mixture of oil and petrol, which should be mixed before putting it into the tank if possible. See page 5.
2. Security of tank fixing bolts (2).
3. Leaks at taps and unions. Do not over-tighten where fibre washers are fitted. Tighten petrol tap. If petrol tap is loose, slacken petrol pipe before tightening. Check banjo union at carburetter end of pipe. Check nut on base of float chamber.
4. Throttle cable frayed or sharp bends in cable run. Alter position of clips if necessary.

STEERING, BRAKES, WHEELS AND TYRES

EXAMINE CONTROLS

1. Examine handlebar control levers for tightness on handlebar, freedom of operation of clutch, brake.
2. Put a spot of oil on the end of each control wire and on the pivot pins for clutch and brake.
3. See that there is a small amount of slack in the clutch control, when in the off position. Adjust if necessary. Do not take adjuster screw out of casting.

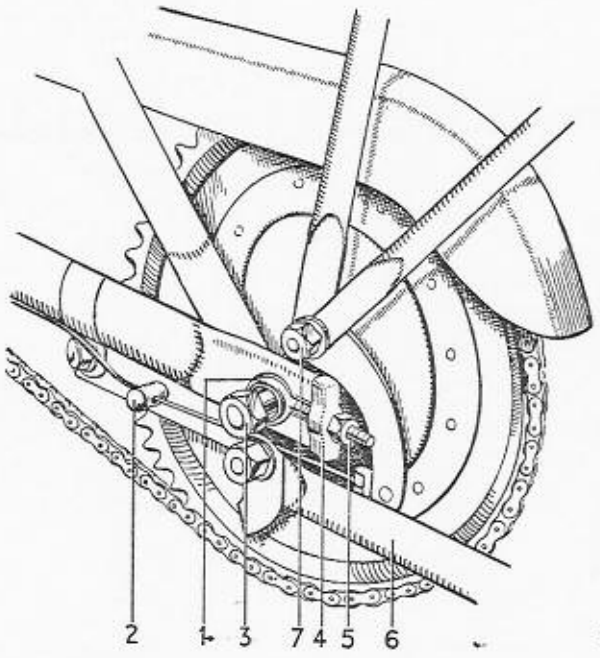


Fig. 3

TO ADJUST CHAIN

Release nut holding Brake Anchor Bolt, slack off spindle nuts (3), both sides. To tighten chain, draw wheel back by means of nut 5, an equal turn on each to keep the wheel central. After the adjustment has been carried out tighten nuts (3), check position of the rim. This should be central, in the chain stays. Do not forget to secure Rear Brake anchorage.

TO ADJUST TENSION AND PEDAL CHAIN

1. Release the 2 cotters by unscrewing the $2\frac{3}{16}$" nuts found on the underside of the bottom bracket.
2. Turn the eccentric bracket, by means of the flats milled on the left hand side, clockwise to tighten the tension on the chain and vice versa.
3. Re-tighten nuts when the correct tension is obtained.

SECURITY

1. Examine each control cable inner wire for fraying.
2. Examine each control outer cable and see that there are no sharp bends, and cables are not kinked or chafed.
3. Wheel mounting nuts (2 on front axle, 2 on rear axle).

LUBRICATION

Before applying gun, carefully clean exterior of nipples. Wipe off all excess lubricant when finished.

1. Wheel hubs (1 nipple on each hub). Periodical attention only. See page 7.
2. Grease fork shafts (2 nipples).
3. Moving parts—Oilcan—
   Brake levers, front and rear.
   Rear brake joint.
   Rear stand.
   Brake cams. Periodical attention only. See page 7.

WEAR AND ADJUSTMENT

1. Test for up and down play in steering head.
   (*a*) Grip the handlebar head clip lug where it meets the main frame head lug with the fingers of the left hand, and at the same time hold the forward end of the front mudguard with the right hand and lift. Movement of the head clip lug felt with the left hand indicates slackness.
   (*b*) Adjust if necessary by releasing head clip nut, and screwing down the large head locknut. Do not use excessive force. Finally, tighten head clip pin locknut.

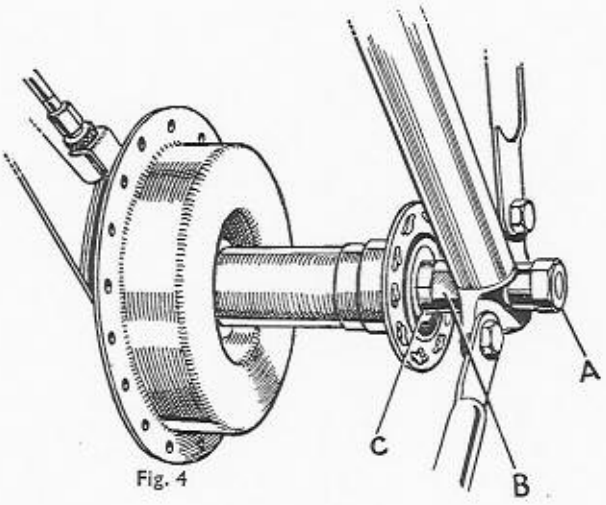


Fig. 4

TO ADJUST FRONT WHEEL

First slacken nuts A, then nut B and the adjustment is quite easily made by the adjusting cone C. When the correct adjustment is obtained no side play should be felt, but the wheel should revolve quite freely.

Brake adjustment. Tighten by screwing knurled adjuster clockwise on brake plate.

SILENCER

The silencer fitted on this machine provides for a clear passage of the exhaust gas and is designed to give the utmost power output from the engine ; it should not be interferred with in any way with the exception of an occasional clean, say every 2,000 miles. To do this first undo the screw which holds the collar, then detach the complete silencer from the frame of the machine. Afterwards undo the three small screws at the tail pipe end of the silencer, pull apart and take off the old glass wool and replace with either glass wool or if this is not available, wire wool, which should be wrapped round the interior of the silencer so that no holes are exposed. Replace this by pushing it back into the body making sure that the screw holes in the end cap correspond with the small holes in the body of the silencer. Re-insert the three small screws and assemble on to the machine.

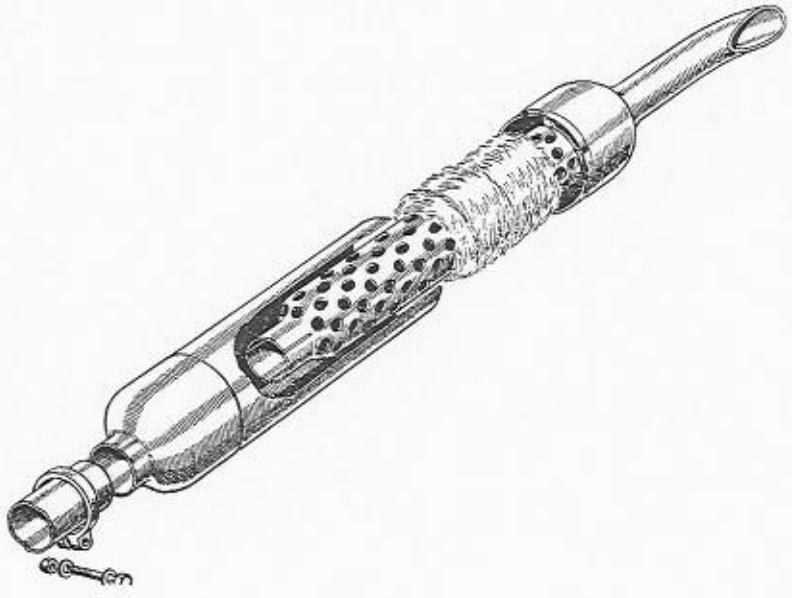


Fig. 5

CARBURETTER

The Villiers Junior Carburetter is used with the Mark 2.F. Engine, and it should not be necessary to alter the setting obtained by the maker (except for needle adjustment), after road testing the machine.

OPERATION OF CARBURETTER

The function of the carburetter is to supply a mixture of petrol and air in correct proportion under all conditions. In the Villiers carburetter the float chamber surrounds the jet and centrepiece, and in the chamber an annular float rises as the fuel enters the chamber until the correct level is obtained, then the forked lever which rests on the top of the float lifts the fuel needle which has a conical end and shuts off the fuel supply by closing the hole in the bush fitted in carburetter body.

Fuel enters the centrepeice through a hole in the side and passes through the calibrated jet fitted in the bottom of centrepiece.

The throttle operated by the cable is fitted with a taper needle which extends below the throttle and into the centrepiece. When the throttle slide closes the air supply the largest diameter of the needle nearly closes the fuel outlet, but when the slide is lifted admitting more air, the smaller diameter of the needle now in the centrepiece allows more fuel to pass. A suitable combination jet size, needle position and taper will give a correct mixture strength on all throttle openings.

The fuel level is maintained by a float and needle valve, and under no circumstances should any alteration be made either to the above or to the float lever.

The amount of fuel supplied to the engine is controlled by one jet which is fixed in the bottom of the centrepiece, and by the taper needle which is carried in the throttle and operates in the top end of the centrepiece.

The jet is not detachable from the centrepiece and is not supplied separately.

The carburetter is automatic in action and gives a correct mixture over the whole range of throttle openings, the only available adjustment being the position of the taper needle in the throttle (which controls the size of the jet orifice), and is necessary to suit individual engines.

The needle controls the mixture strength from tickover to approximately two-thirds throttle, the jet controls the remainder.

The position of the taper needle in the throttle is determined during testing at the works, but should it be necessary to alter the setting this is done by the needle adjusting screw situated in the centre and top of throttle. Screw in to weaken mixture, (i.e. lower needle), the screw should not be loose in the throttle slide as it is likely to move and alter the setting. It is split to make it grip the hole. should the screw be loose the split portion should be gently prised apart before fitting.

NOTE.—The taper needle spring should be fitted with the small coil under the head of needle.

TO DISMANTLE CARBURETTER

TO REMOVE THROTTLE FROM BODY

Open throttle to full open, undo top ring, throttle can now be withdrawn. Take care not to damage or bend the taper needle. Return throttle to fully closed position, the guide peg attached to top disc will then be exposed and, if necessary, the control cable can be detached by compressing throttle spring, the inner cable then being lifted out through the slot.

TO REMOVE CENTREPIECE AND FUEL NEEDLE

Unscrew the bottom nut underneath the float chamber cup. Next remove the fibre washer, the cup with float inside, and if loose, the fibre washer between cup and carburetter body. Then remove the small centrepiece locking screw situated below and to the rear of the banjo petrol pipe union, the centrepiece with fibre washer under head can now be pushed up through the throttle bore.

When the centrepiece is removed the fuel needle lever can swing round and will thus allow the fuel needle to drop out of its seating ; the needle should therefore be removed at the same time as the centrepiece and kept in a safe place until required for reassembly. No attempt should be made to remove the fuel needle lever from the carburetter body.

TO REMOVE TICKLER

This should not be necessary unless the vent hole in base of body is blocked, in which case remove the split cotter pin at end of tickler which will release the tickler and its spring. One vent hole is at the bottom of the hole where the spring fits, the other being in the side of the tickler cap.

CARBURETTER SETTING

The carburetter is fitted with a taper needle marked 2½ on the parallel portion under the head, a centrepiece marked J8 on the head, and the jet (which is not detachable) marked 8 on the hexagon portion. The normal taper needle setting is $\frac{20}{32}$" from the bottom of the throttle to the end of the needle, but this is usually a matter of individual adjustment to suit each engine.

REASSEMBLY OF CARBURETTER

This, of course, is the reverse process to that already described ; the fuel needle should be fitted point first, the fuel needle lever should then be placed so that it holds the needle in position whilst the centrepiece is replaced. Care should be taken to see that the centrepiece complete with fibre washer is fitted so that the locking screw locates in the slot in the head of the centrepiece. When refitting float do not overtighten bottom nut as this may distort the jet.

FLYWHEEL MAGNETO

The Villiers 6-Pole Flywheel Magneto provides alternating current for both ignition and lighting. A connector is fitted to the lighting cable and this must be unscrewed should the engine be removed. Keep the rubber sleeve in position over the connector, otherwise a short circuit may occur.

The armature plate which carries the ignition coil, lighting coils, and contact breaker mechanism is secured to the engine crankcase by four screws. The H.T. lead from ignition coil to sparking plug is detachable by unscrewing from armature plate and when refitting it is important to make sure that the brass pad carried by the spring and secured to the terminal makes contact with the soldered disc on the outside of the ignition coil.

In the magneto flywheel are fitted four permanent magnets and two dummies, and it is very important should these be removed at any time that they are replaced in the original position in relation to the peak of the cam profile ground on the centre boss which is rivetted to the arms of the flywheel.

CONTACT BREAKER ASSEMBLY

This is of the latest improved type requiring a screwdriver only to adjust the contact points. To adjust the contact points proceed as follows :—

Turn flywheel until rocker pad is on top of cam profile of flywheel boss. Release the screw " A," see illustration, Fig. 6.

Position Bracket " B " with .015" feeler gauge between contact points, tighten screw, taking care not to use too much force. It is not necessary to disturb screw " C " when adjusting point gap.

A felt pad is used to keep the cam in a slightly oily condition, and is impregnated when new with grease. This can, if visibly dry, be oiled with a small amount of the heaviest oil available. It is better, however, to soak the pad in a molten high temperature grease if it is convenient to detach the box itself for this operation. If too much oil is put on the felt pad it may creep along the Rocker Arm, get on the contact points and so cause ignition trouble.

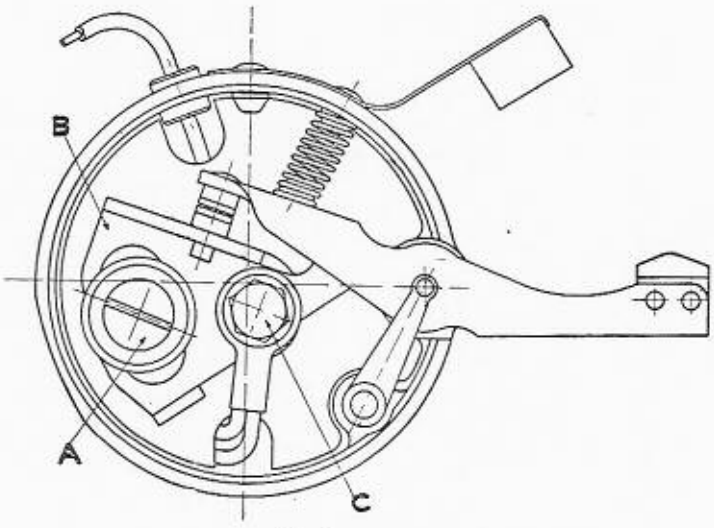


Fig. 6.

CONTACT BREAKER ASSEMBLY

The flywheel should not be removed unless absolutely necessary, and then it is advisable to use a Villiers hammer-tight spanner for the centre nut. The nut is imprisoned in the flywheel and acts as an extractor when turned anti-clockwise looking at the magneto.

Before access can be made to the nut, of course, the flywheel cover has first to be removed by releasing the three screws holding cover to flywheel.

TIMING OF THE MAGNETO

The contact breaker points should commence to open when the piston is $\frac{1}{8}$" before top of stroke. Timing marks are stamped on both the armature plate and flywheel rim.

The mark on the armature plate is stamped on a small boss on the rim of the armature plate, and the mark on the flywheel rim coincides with this mark when the piston is at the top of the stroke. On checking timing it is only necessary to remove the sparking plug ; turn flywheel until the two marks are opposite when the piston should be at top of stroke.

When timing ignition after dismantling loosely fit the flywheel to shaft and, having set piston $\frac{1}{8}$" from top of stroke, rotate flywheel without turning the crankshaft until the contact points commence to open. Tighten up flywheel centre nut sufficiently tight for crankshaft to be rotated. Check to see that the flywheel has not slipped. Finally tighten the centre nut with the special hammer tight spanner, refit cover and screws.

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 and rectified. Usually when the engine stops, symptoms give a clue to the cause, but where this is not the case, the trouble can be more easily diagnosed by following a definite method of investigation.

The three conditions mentioned above are as follows :—

1. The required quantity of combustible mixture (petrol and air) must enter the engine, which means that a sufficient supply of fuel must be available at the carburetter and that the throttle should open and close freely.
2. There must be a good spark at the plug points, when under compression, and at the correct time in relation to the position of piston on its upward stroke.
3. The engine must be in good mechanical condition, there must be good compression in cylinder and crankcase, and no air leaks at the various joints.

When cause of the trouble is not evident carry out a preliminary examination covering the following points, but if this fails to trace the cause reference should be made to the Fault Finding Charts.

Having made sure that there is "petroil" in the tank, and tap is in the ON position, depress tickler to check if there is any stoppage or obstruction in the fuel supply either in the tap, fuel pipe, banjo union or fuel needle seating. Being satisfied that fuel is reaching the carburetter, next unscrew sparking plug and with high tension lead attached lay on cylinder head. Test by turning engine by pedals with cycle on stand, and if the spark is satisfactory it is possible that the timing is incorrect. Finally examine the carburetter controls to make certain the throttle is actually opening when the control lever is moved.

ENGINE WILL NOT START

Sequence of Testing.	Possible Touble.	Remedy.
Depress tickler on carburetter 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.	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 ¼" 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 .105" Clean.
	Moisture on insulation of condenser box.	Clean and dry out.
	High tension pick-up not making good contact on ignition coil due to corrosion or misplacement.	Clean and correct.
	Cracked insulation of adjustable contact breaker point.	Renew.
	Damaged insulating sleeving on wires connecting contact breaker to coil or condenser.	Replace with new sleeving.
	Faulty connection to low tension wire of ignition coil.	Correct.
	Faulty condenser.	Replace.
	Faulty ignition coil.	Replace.
If above tests are O.K. 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 petroil mixture, adjust taper needle, drain crankcase.

	Air leaks at carburetter stub or manifold joint, causing weak mixture.	Correct.
	Incorrect ignition timing due to flywheel having slipped on driving shaft taper.	Check, following instructions given for respective type of engine.

ENGINE FOUR OR EIGHT STROKES

Strangler may not be fully open or taper needle in the " RICH " position. Air filter where fitted may need cleaning.	Mixture too rich.	Lower taper needle by moving to " WEAK " position. Lower needle by adjuster screw fitted in throttle.
Check by watching for excessive smoke from exhaust pipe or silencers.	Engine may four stroke 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, or damaged seating or punctured float.

ENGINE LACKS POWER

Engine out of tune, bearings worn. Unsuitable sparking plug. Loss of compression.	Overhaul. Replace with recommended type. Tighten cylinder head bolts. Renew piston rings.
Incorrect " Petroil " mixture.	Correct mixture is 1 part oil, 16 parts petrol.
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 with setting chart.
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 against timing chart.
Brakes binding.	Adjust.
Driving chains too tight.	Adjust.

ENGINE WILL NOT RUN SLOWLY

Weak mixture due to air leaks at carburetter stub or manifold joint, crankcase and cylinder base joints.	Tighten all joints.
Crankcase drain screw loose or missing.	Tighten or replace.
Worn crankshaft bearing or leaking compression gland.	Replace.
Ignition timing too far advanced.	Correct.

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.

RECOMMENDED LUBRICANTS

(U.K.) A.C.

	SHELL	WAKEFIELD	VACUUM	PRICE'S	ESSO
ENGINE ... (All Seasons)	Double Shell	Castrol XL	Mobiloil A	Energol SAE 40	Essolube 40
CLUTCH UNIT	Shell Dentax 140	Castrol D	Mobilube C	Energol SAE 140	Esso Gear Oil 140
EXPOSED CHAINS ...	Shell Retinax CD	Castrolease Graphited	Mobilgrease No. 2	Belmoline C	Esso Grease
GREASE GUN	Shell Retinax CD	Castrolease CL	Mobilgrease No. 2	Belmoline C	Esso Grease
WHEEL HUBS	Shell Retinax RB	Castrolease Heavy	Mobil Hub Grease	Belmoline C	Esso Grease
OIL CAN ...	Double Shell	Castrol XL	Mobiloil A	Energol SAE 40	Essolube 40

(OVERSEAS)

	SHELL	WAKEFIELD	VACUUM	ENERGOL	ESSO
ENGINE ... (All Seasons)	Shell X-100 SAE 30	Castrol XL	Mobiloil A	Energol Motor Oil SAE 40	Essolube 40
CLUTCH UNIT	Shell Dentax 140	Castrol D	Mobilube C	Energol Transmission SAE 140	Esso Gear Oil 140
EXPOSED CHAINS ...	Shell Retinax CD	Castrolease Graphited	Mobilgrease No. 2	Energrease C3	Esso Chassis Grease
GREASE GUN	Shell Retinax CD	Castrolease CL	Mobilgrease No. 2	Energrease C3	Esso Chassis Grease
WHEEL HUBS	Shell Retinax RB	Castrolease Heavy	Mobil Hub Grease	Energrease C3	Esso Bearing Grease
OIL CAN ...	Shell X-100 SAE 30	Castrol XL	Mobiloil A	Energol Motor Oil SAE 40	Essolube 40

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