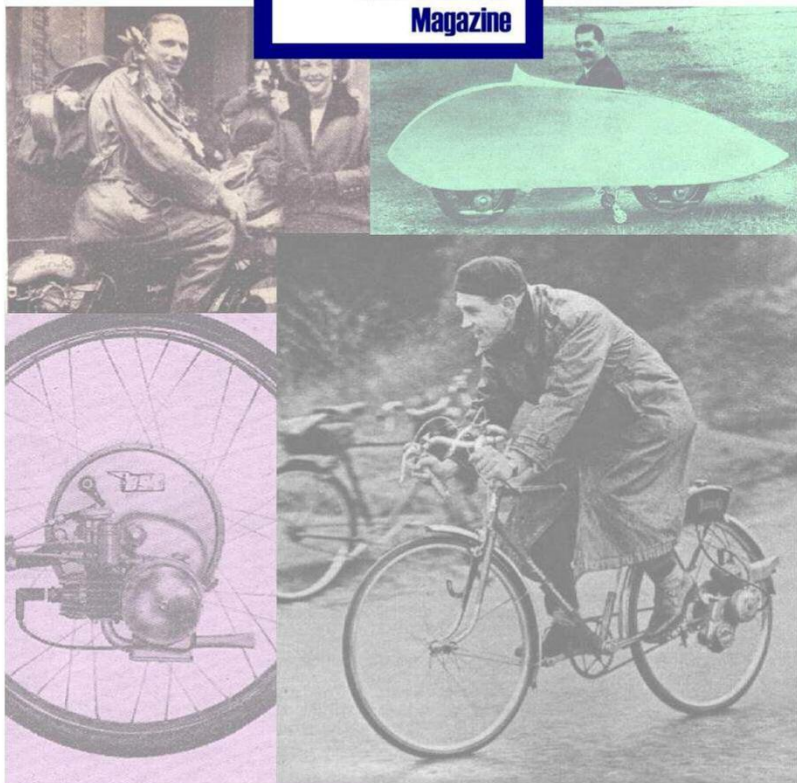


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Price 1/- post free
including diagram

SERVICE GUIDE
and
FAULT-FINDING CHART
for the

VINCENT
Firefly

ALL-WEATHER CYCLE MOTOR

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VINCENT ENGINEERS (STEVENAGE) LTD.
STEVENAGE · · HERTS · · ENGLAND

Telephone : STEVENAGE 375-6

INTRODUCTION

THIS Service Guide has been compiled in the form of a fault-finding chart to enable those interested in the servicing of the "Firefly" to locate and rectify any faults which may arise.

Great accessibility of all component parts is amongst the outstanding features of the design but owners who are not familiar with i.c. engine maintenance are strongly advised to obtain assistance from an experienced cycle motor dealer.

Built to the highest standards of material and workmanship the "Firefly" is, furthermore, backed by a first-class Spares and Service organisation with a view to ensuring that the unit will give the utmost satisfaction under the most arduous conditions.

VINCENT "FIREFLY" SERVICE GUIDE AND FAULT-FINDING CHART

SYMPTOM	CAUSE	HOW TO RECTIFY
ENGINE WILL NOT START	Lack of fuel. Engine cold. Neat oil in carburettor due to oil and petrol not having been pre-mixed.	Open petrol tap. Shut choke in cold weather. Dismantle carburettor and fuel line, remove all traces of neat oil, re-assemble and make sure that oil and petrol are correctly mixed.
	Main jet blocked. NOTE : This may easily happen when riding until the last drop of fuel from the tank is used.	Remove jet and clean by sucking through from both ends. Do not use wire to clear jet as this is bound to lead to enlargement of the calibrated jet orifice.
Poor Carburation	Air leak at crankcase drain plug.	Whilst engine may run, starting will be extremely difficult or impossible if the crankcase drain plug is loose or the washer defective. Fit new washer if necessary and tighten, taking care not to damage the washer through over-tightening. Normally there is no need to disturb the crankcase drainplug which is only provided in order that the crankcase may be flushed should the need arise.

SYMPTOM
Ignition Faults

CAUSE

HOW TO RECTIFY

H.T. lead or coil wiring connections adrift or shorting.

Check all connections for tightness.

Sparking plug defective or fouled.

Dismantle plug, clean thoroughly (also inside of body !), re-assemble, re-gap to .018" (.45 mm.) and refit. Note that this plug gap differs from the one given in the Instruction Book, and is recommended in the light of later experience. Alternatively fit spare plug KLG.F20 or equivalent. Always fit *new* plug washer if available.

Wiring failure.

To test the stator coil a 6 volt bulb can be used, and an easy method is to propel the cycle by hand with the sparking plug removed. The 6 volt bulb connected to the wire with the red sleeve will not light up if the stator coil or wire are shorting inside or outside the crankcase. The lead is provided near its junction with the stator with an insulating sleeve, and for the remainder of its length with normal black insulation. The crankcase at the back of the stator is provided with a groove in which this lead must lay snugly without being in any way distorted or deformed by the stator when it is screwed down or fouled by the rotor gear. No tension must be applied to the insulation when the lead is pulled through the crankcase hole as this may expose a length of bare wire which will short on the crankcase internally.

Defective Interference Suppressor.

To locate fault, run the engine temporarily without. Renew the suppressor if necessary.

Defective coil.

When the cycle rear wheel is propelled by hand the spark should bridge a gap of approximately $\frac{1}{8}$ " when the H.T. terminal is held that distance away from earth, i.e., any metal part of the engine. If failure of the coil is suspected, remove the component from the tank by detaching the lipped retaining ring and have the coil tested by an electrical expert. Coil failure is, however, very rare.

Contact breaker sticks on pivot ; points oily, dirty or not seating squarely ; spring fractured.

Remove contact breaker cover, remove contact breaker arm, clean points, oil pivot, re-assemble and re-gap to .018". If spring fractured renew contact breaker arm as springs are not supplied loose.

Contact breaker arm, or condenser wire where soldered to fixed point, fouls cover.

If cover damaged, remove dents and ensure that clearance exists.

SYMPTOM	CAUSE	HOW TO RECTIFY
Ignition Faults (contd.)	Generator rotor incor- rectly timed.	The timing is correct when the engine leaves the Works but may have been deranged after the rotor gear has been removed at a later date. To re-time place the piston at Top Dead Centre and turn the large light alloy rotor gear until the punchmark is at the 9 o'clock position with the engine viewed as illustrated on page 4 of the Instruction Book, i.e. with the piston at T.D.C. this punchmark should be positioned nearest to the small pinion directly in line with the axis of the cylinder barrel. For rotor gear removal use simple extractor with O.B.A. screws.
ENGINE RUNS ERRATICALLY	Obstruction in fuel supply.	Dismantle fuel line and/or carburettor and clean thoroughly. Sometimes it is sufficient to merely clean the plug at the bottom of the mixing chamber as this plug traps most of the sediment.
Spits through car- burettor, mixture weak, air leaks.	Jet needle incorrectly positioned.	Place spring clip in the middle groove of the needle but sometimes the needle positioned in the second groove from top (i.e. half weak) will give better low speed running and all-round results.
	Carburettor loose on adaptor.	Tighten up as required, making sure that the carburettor is not tilted over to one side.
	Carburettor adaptor loose.	Tighten retaining screws. Renew gasket if necessary. There is only one correct position for the gasket, the orifice of which should line up with the port.
	Crankcase air leaks.	Tighten the nuts on crankcase and cylinder barrel studs periodically, taking care not to damage the threads by over-tightening. Tighten the crankcase drain plug, fit new washer if necessary, do not over-tighten. In the unlikely event of a transfer port plug being loose, re-fit using some "Osotite" or similar jointing compound on the thread of the plug. The checking of screws, plugs and nuts for tightness is especially important on a new engine after some mileage has been covered. If air leaks are due to failure of a mainshaft oil seal, renew the seal, also renew the seal if damaged due to displacement as a result of failure of the retaining circlip. For renewal of a seal, the crankcase need not be split. On the gear side take off the gearcase cover, mark the relative setting of the two

SYMPTOM

Spits through carburettor, mixture weak, air leaks.

(contd.)

CAUSE

HOW TO RECTIFY

gears, unscrew the nut retaining the smaller gear and withdraw this, using a simple extractor with O.B.A. screws. Prise the wire circlip out of its groove with a sharp-pointed instrument and remove the old seal with the aid of a screwdriver. Gently press in the new seal taking care to avoid damage to the lip or outer edge and complete the assembly in the reverse order of dismantling. NOTE : It is advisable to renew the crankshaft rubber ring whenever a new seal is fitted.

Seal failure on the contact breaker side is rare, but should renewal of this seal prove necessary, remove the contact breaker assembly and proceed in a similar manner as described for the gear side.

Engine "four-strokes" under load.
Mixture rich.

Choke closed.

Open fully when engine warm, turning lever clockwise as viewed by the rider astride.

Needle position too high for the fuel used, or needle and jet worn after prolonged service.

Try second needle groove from top. Needle and jet may require renewal after 6,000 miles (10,000 km.) approximately.

Carburettor floods.

Renew float if punctured or needle clip loose. Verify that clip is correctly positioned in the float needle groove. Renew needle if bent by careless fitting or worn. When, after long service, the taper seating is worn, replace.

Air bleed hole in carburettor adaptor obstructed.

Carefully clean with copper wire.

Air cleaner clogged.

Rinse element in clean petrol or renew element.

Ignition over-advanced or too far retarded.

Re-time ignition as indicated in Instruction Book but note that all engines after No. 51370 are sent out with an ignition advance of 4.2 mm. (.165").

Engine misfires when warm

Excessive sparking at contact breaker points due to defective condenser.

Renew condenser. Failure of this part is rare and a weak condenser will get one home if the lighting is switched on as the wiring tends to add to the capacity of the weak condenser.

SYMPTOM	CAUSE	HOW TO RECTIFY
Engine misfires when warm (contd.)	Stator or wire shorting on crankcase due to damaged wire insulation. Alternatively, wires slack on ignition coil terminals or wires of the cycle lighting set shorting.	Renew stator or wiring as indicated above under "Wiring Failure". For access, remove gearcase cover and rotor gear. Tighten ignition coil terminals as required; renew any damaged wiring of the cycle lighting set.
ENGINE LACKS POWER Compression poor	Cylinder head loose.	Tighten cylinder head nuts taking care to prevent over-tightening. Renew cylinder head gasket and cylinder base washer if necessary.
	Decompressor leaks.	If slack in cable insufficient, readjust. Tighten the decompressor body in the head but take care not to over-tighten. If the valve leaks, dismantle the decompressor and grind the valve with very fine emery paste. Always fit new washer under decompressor body if available.
	Piston rings worn, fractured or stuck in the grooves.	Renew rings.
	Piston scuffed or seized.	Remove slight signs of scuffing with a smooth file dipped in methylated spirit. Never use emery paper or emery cloth. Renew piston if damaged or badly scored. Oversize pistons are available, but if these are fitted the barrel must be bored.
ENGINE OVER-HEATS	Piston, exhaust port, pipe or silencer badly carboned.	Decarbonize engine and exhaust system. Do not omit to clean thoroughly the exhaust port every 1,200-1,500 miles (2,000-2,500 km.).
	Ignition timing deranged due to cam having slipped in mainshaft (rare) or contact breaker arm pad worn due to lack of lubrication.	Re-time ignition, as indicated in the Instruction Book, to 4.2 mm. advance before T.D.C. For certain fuels and conditions ignition advance up to 4.5 or even 5 mm. is permissible. Note that this ignition advance differs from the one given in the Instruction Book and is recommended in the light of later experience.
	Rotor gear fouls gearcase cover.	Remove gearcase cover, rectify any signs of accidental damage and tighten drum retaining nut with 14 mm. sparking plug spanner. Punchlock retaining nut and refit gearcase cover, taking care not to over-tighten the screws as this may lead to distortion of the cover and subsequent oil leaks.

SYMPTOM	CAUSE	HOW TO RECTIFY
ENGINE FAILS TO RESPOND TO THROTTLE, i.e. runs satisfactorily on half throttle but fails to pull when throttle is fully opened.	Throttle cable stretched.	Take up cable adjuster on carburettor mixing chamber top. Remove air cleaner and make sure throttle slide is fully lifted when the throttle lever is open.
	Jet partly blocked.	Blow out with tyre pump or suck through from both ends. Never use wire when cleaning jet, but the use of a stiff brush hair is permissible.
	Contact breaker points burnt or incorrectly gapped.	Reface points or re-set gap to .018" (.45 mm.). The gap tends to decrease with mileage and <i>must</i> be re-set if smaller than .016" (.40 mm.).
ENGINE LOSES OIL	Leakage through breather if gear case over-filled.	Drain off to the level of the filling screw as indicated on the gear case cover. When filling gear case from empty, remember that approximately 15 pumps of a pint-size "Wesco" type oil can are required. Use S.A.E. 30 engine oil.
	Gearcase cover washer damaged or cover distorted due to over-tightening.	Renew washer and refit with jointing compound.
	Gearcase breathing deranged due to blockage in breather orifice.	This may occur if the oil in the gearcase turns into sludge due to neglect in periodic changes. Flush gearcase with clean petrol by means of the filling and drain plugs provided. Fill up with fresh oil to the level indicated.
	Leakage from gearcase into crankcase due to failure of left-hand mainshaft seal.	Renew seal. See "Crankcase Air Leaks".
ROLLER DRIVE SLIPS	Tyre under-inflated or tread worn.	Inflate to 60 lbs. sq. in. ; renew tyre if tread badly worn.
	Pull bar unit maladjustment.	Readjust for depth of roller engagement as recommended in Instruction Book.
	Control cable stretched.	Take up cable adjuster on pull bar unit.
	Friction in slides and roller engaging mechanism.	Lubricate. Renew sliding block rubber rings if badly worn. Straighten or renew engine rear hangers if bent.
	Driving roller rubber fractured.	When renewing roller it is not necessary to remove the gearcase cover and rotor gear. Proceed as follows :— 1. Remove roller support cover retained by four 4BA screws. 2. Unscrew retaining nut, using 14 mm. sparking plug spanner.

SYMPTOM	CAUSE	HOW TO RECTIFY
		3. Withdraw lipped tab washer $\frac{1}{8}$ " dia. 4. Carefully remove roller support retained by four nuts, complete with bearing. 5. Withdraw roller from shaft, using simple extractor with 2BA screws. 6. Fit new roller and complete the assembly in the reverse order of dismantling.
ENGINE NOISES	Drain plugs incorrectly fitted or washer omitted.	The two plugs in the gearcase are $\frac{3}{8}$ " long but the crankcase plug is $\frac{1}{4}$ " long. If these plugs have been mixed up, the washers omitted or replaced in non-standard thickness, the plugs may easily foul a flywheel or gear.
	Pinion retaining nut loose.	This may produce a knocking noise accompanied by a scraping sound if the light alloy rotor gear fouls the gearcase cover. Tighten nuts with 14 mm. sparking plug spanner and punchlock as indicated above.
	Stator loose on crankcase.	Tighten all four stator retaining screws.
	Lack of oil in gearcase.	This will be evident by a ringing sound. Flush out thoroughly and top up gearcase to the level of the filling screw.
	Decompressor or cylinder head joint leaking.	This will produce a whistling noise. Rectify as indicated above.
CYCLE MAINTENANCE	The engine cannot work properly if mounted to a cycle which is insufficiently lubricated or poorly maintained. Points to watch in this respect are the hubs which should be well lubricated and not too tightly adjusted. Brakes should not be binding and tyres must be correctly inflated. Care should be taken to ensure that no mudguard stays are fouling the tyres, and wheels must run true so that they will not foul the fork tubes. It is again emphasized that the wiring of the cycle lighting set must be in good condition throughout as any short circuit in this wiring may well affect the ignition circuit of the engine.	
FUEL	As delivered from the Works the engine is tuned for commercial grade petrol. Premium grade fuels can be used but for optimum results, adjustments, particularly to the carburettor jet needle position, may be necessary.	

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