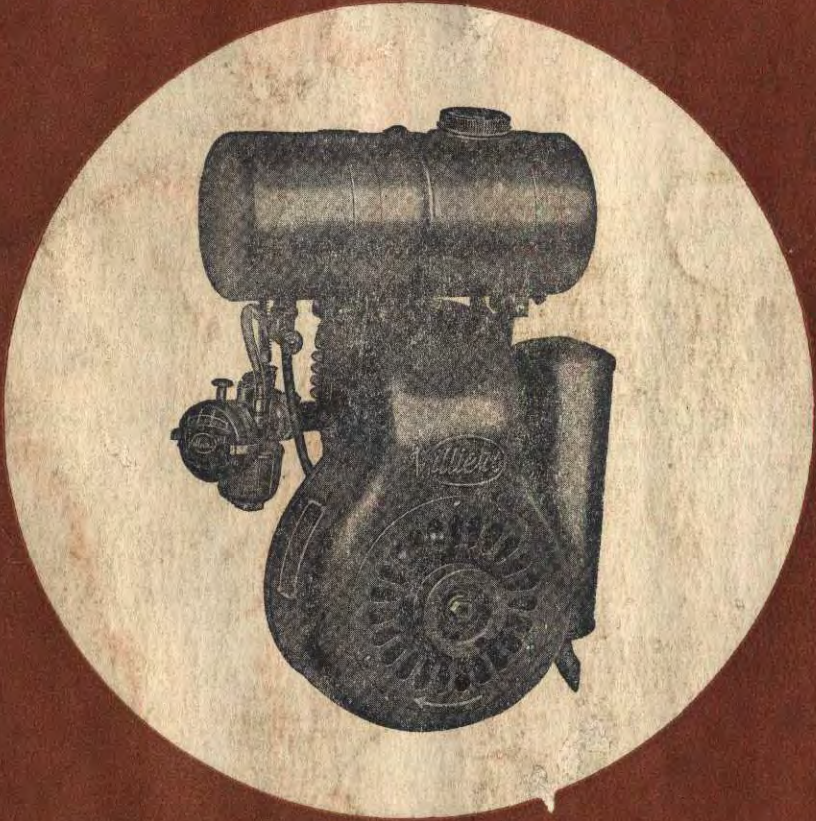


Villiers

Mark 2 & Mark 3 "Midget"



TWO-STROKE ENGINES

★

OPERATING INSTRUCTIONS

AND

SPARE PARTS LIST



*Engines are backed by
a Spare Parts Service
that has no equal anywhere in the World.*

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"It's the experience behind that keeps Villiers in front."



TWO-STROKE MARK 2 & 3 MIDGET ENGINES.



THESE ENGINES have been especially produced to enable power to be applied economically to the smallest type of agricultural and industrial equipment.

Small, simple and inexpensive without sacrificing any of the traditional Villiers standards of quality and dependability, the layout has been adopted to ensure that the least possible space is taken up.

So that the owner may carry out normal adjustments without difficulty, the usual points which need periodical attention have been made easily accessible.

Villiers two-stroke engines are as simple and efficient as it is possible to make them, but they cannot give the service of which they are capable if certain routine attention is not given. Study this booklet carefully before starting the engine, so that you are familiar with the attention needed to give long and trouble-free service.



VILLIERS AUSTRALIA PTY. LTD.

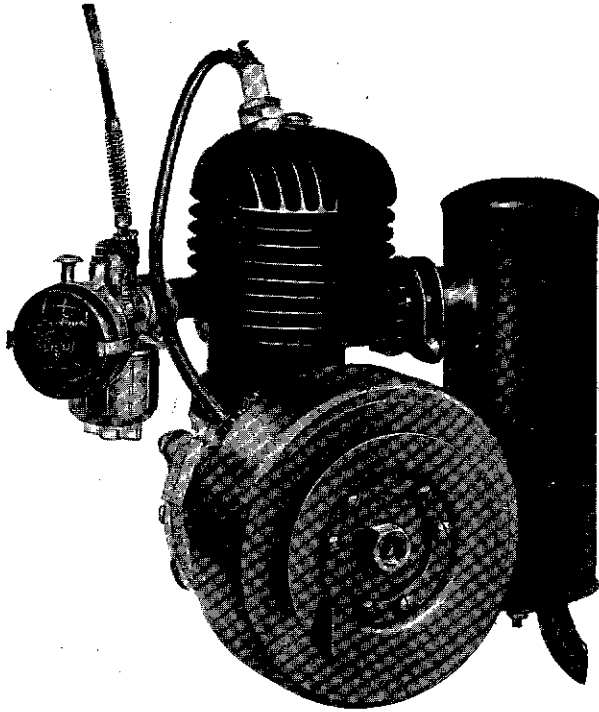
BALLAARAT, VICTORIA.

TELEPHONE :

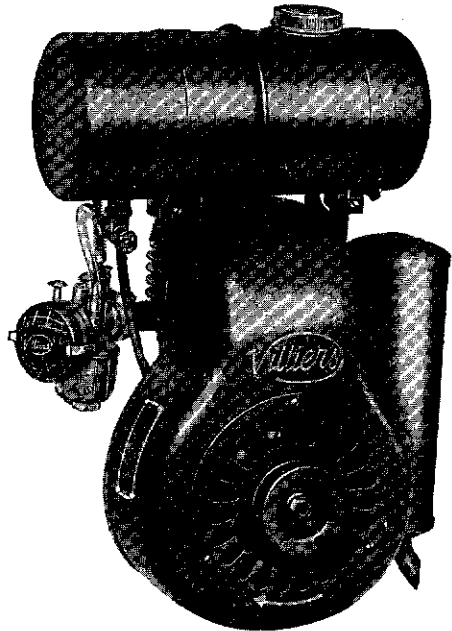
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P.O. BOX 237

BALLAARAT.



Mark 2



Mark 3

BEFORE STARTING ENGINE FOR THE FIRST TIME
READ OPERATING INSTRUCTIONS CAREFULLY

TECHNICAL DATA

★

Bore	50 m.m.
Stroke	50 m.m.
Capacity	98 c.c. = 5.98 cu. ins.
Power Output :	
Continuous Running	.75 b.h.p. at 3,000 r.p.m.
Sparking Plug	18 m/m. Recommended type Lodge B.L.18 .018"/.025".
Ignition Timing	5/32". Refer Par. 6. Page 7.
Point Gap—Contact Breaker	.015 maximum. Refer Page 7.
Carburetter, Jet Size	No. 8.
Carburetter Taper Needle	No. 2.
Lubrication	Petrol. Refer Par. 2, Page 4.

INSIST ON GENUINE VILLIERS REPLACEMENT PARTS.

The Mk. 2 and Mk. 3 "MIDGET" Engines



OPERATING INSTRUCTIONS

1. FIXING.

The engine should be securely fixed and stand reasonably upright, otherwise lubrication and carburation will be adversely affected.

2. BEFORE STARTING.

This engine is lubricated by petroil, which is a mixture of oil and petrol. The useful life and amount of good service the engine will give depend almost entirely upon the way it is lubricated, especially during the early stages of its life.

For the first 25 working hours of the engine's life we recommend that $\frac{1}{2}$ pint of Castrol XL (S.A.E. 30) Oil is thoroughly mixed with each gallon of petrol. Subsequently 1 part of Oil to 20 parts of petrol will be sufficient, or $\frac{1}{2}$ pint of oil to 10 pints of petrol. This oil can be obtained from most garages, and it is strongly recommended that Villiers users keep to this one brand. Mixing different brands of oil in the engine can be harmful.

NOTE: It is very important that the lubricating oil is thoroughly mixed with the petrol **before** the mixture is put into the fuel tank. To ensure absolute cleanliness of the fuel, it is best to pour it into the tank through a fine wire mesh strainer.

The fuel tank fitted to the Mark 3 Engine has a filler cap to which is attached an oil measure, the number of measures required being given on cap.

3. TO START—WHEN COLD.

After putting petroil mixture in fuel tank, turn petroil on by pulling tap knob (Mark 3). Close carburetter strangler by lifting end of lever.

Press tickler at side of carburetter body until petroil is seen to drip. There is no need to allow fuel to run to waste.

Open carburetter control lever about one-third of its full opening. Wind starting rope (Mark 3) or strap (when pulley is fitted to Mark 2) around pulley on flywheel magneto in a clockwise direction, one end in the pulley notch, the other end being gripped in, but not round the hand. Then give a brisk pull to rotate the engine, pulling the rope or strap clear of starting Pulley.

After engine has started, gradually open strangler as engine warms up.

4. TO START—WHEN HOT.

The same procedure should be adopted, except that it should not be necessary to close strangler or to flood carburetter by pressing tickler.

FAILURE TO START.

If the engine will not start after a reasonable number of trials, ascertain whether this is due to lack of compression, faulty fuel supply, or faulty ignition.

COMPRESSION should be felt when engine is rotated at normal starting speeds with throttle partly open.

FUEL SUPPLY.

Depress tickler at side of carburetter body. If fuel is reaching float chamber it will spurt out of vent at top of tickler.

IGNITION SYSTEM.

Unscrew sparking plug from cylinder head and place it with ignition cable attached, on a metal portion of the engine. When the engine is rotated a spark should be visible at the plug points, if the plug and ignition system are in order. If there is no spark, try a new plug or alternatively check whether a spark occurs at the end of the ignition cable when this is held about one-eighth inch away from a clean metal part of the engine.

After these preliminary tests it will be clear where a more detailed examination may be required.

5. RUNNING IN.

Whilst the engine is new, it is advisable to add a little extra oil to the petrol.

MAINTENANCE AND REPAIRS



1. DECARBONISING.

Decarbonising the Villiers Two-Stroke Engine is quite straightforward, because of the simplicity of this type of unit, the following points, however, are worth special attention.

When removing and replacing the cylinder, care should be taken not to twist it round the piston—it should be pulled off or pushed on straight so that the rings cannot catch in any of the ports and break.

All carbon should be removed from inside the piston head, as well as from the top of the piston and from the cylinder head.

The ports in the cylinder—particularly the exhaust port, should receive careful attention, and should be kept clean, but on no account must the size or shape of these ports be altered by filing.

Piston ring grooves must be kept free from carbon in order to leave the rings quite free. Piston rings should be bright round their surface which makes contact with the cylinder bore. Should wear cause the joint gap to exceed 1/32-in. when in the cylinder, the piston ring should be replaced.

Carbon will form on the gudgeon pin at either side of the small end bush, and this should be carefully removed, otherwise difficulty will be experienced in removing the pin from the piston. The small end bush and the piston bosses should be kept quite free from carbon.

It is of the utmost importance that silencers and exhaust pipes are kept quite clean internally, and that a heavy deposit of carbon is not allowed to accumulate. This would cause back pressure and loss of power.

It is important that air leaks should be avoided.

The connection between carburetter and induction pipe must be absolutely airtight, and after dismantling an engine, new washers should always be fitted at the induction pipe joint, and cylinder base joint, if the original ones have been disturbed.

2. SPARKING PLUG.

The type recommended is the **Lodge B.L.13**, 18 mm.

Clean and reset the points .018-in. gap after each 100 hours operation.

Adjustment of the gap should be done by moving the points attached to the outer body of the plug. **Never bend the centre pin.** Keep the outside of the plug insulation free from water and dirt. When screwing the plug in the cylinder head, should any undue stiffness be experienced, do not use force but examine the thread for any articles of grit or carbon which may be present. These must be removed, otherwise the threads in the cylinder head may be damaged. It is a good plan to smear a little graphite grease on the plug threads before replacing.

3. PETROIL FILTER.

A filter gauze is fitted to bolt connecting pipe to carburetter, and also to fuel tap in tank of the Mark 3 "Midget" Engine. These filters should be examined occasionally and cleaned by dipping in petrol.

4. AIR FILTER.

This must be removed every 100 hours, or more frequently

under very dusty conditions, and washed in petrol, then dip in **thin oil**, and allow surplus to drain off before refitting. Oil bath filters should be dismantled and the old oil drained away, the filter should then be washed and refilled with oil to level indicated on container.

5. CONTACT BREAKER.

The contact breaker points should be checked occasionally to see that they are clean, and that the gap when fully opened is between .012-in. and .016-in., and that they open and close properly; to obtain access to points proceed as follows:—

Mark 2 Engine—Remove flywheel cover, which is secured by 3 screws.

Mark 3 Engine—Remove the 3 screws securing cowl front, then the starter pulley centre bolt, the contact points can then be adjusted by the spanner supplied with engine using the attached gauge to check the gap.

6. MAGNETO TIMING.

When the engine is built the magneto is timed so that the contact points commence to open when the piston is $5/32$ " before top dead centre. A timing mark is stamped on the small boss on rim of armature plate, which coincides with a similar mark stamped on the flywheel rim when the piston is at the top of the stroke. On checking timing it is only necessary to remove sparking plug; turn flywheel until the two marks are opposite, when the piston should be at the top of stroke.

7. FLYWHEEL REMOVAL.

The cam operating the contact breaker is rivetted to the flywheel which is driven by a taper on the crankshaft, and if alteration to magneto timing is necessary, the flywheel must be released, by unscrewing the centre nut with the box spanner provided in the tool kit. This **nut** has a right hand thread and is imprisoned in the flywheel and it should be unscrewed until the flywheel is just free to revolve on the crankshaft. With the piston in its correct position, the flywheel should then be moved round until the points commence to open, then tighten up the nut firmly and re-check timing. This nut must be tightened up hard by hitting with a hammer on the end of the tommy bar.

The taper of shaft and cam must be clean and dry; if any oil is present on the surfaces it will be impossible to secure an effective drive.

8. COOLING SYSTEM (Mark 3 Engine)

It is most important that the complete cowling and fan should be in position when this engine is running.

9. CARBURETTER.

The Villiers "Junior" type carburetter is fitted to the Mark 2 and 3 Midget engines. It has a single control lever to the throttle. Attached to the throttle is a taper needle, which works inside the carburetter to provide a correctly-proportion mixture of petrol and air at all throttle openings.

The taper needle is set at the works to give the best possible performance, and it is not normally necessary to alter this setting.

If it is desired to make an alteration, however, do it in the following way:

Open the throttle to its fullest extent by means of the lever, and unscrew the knurled ring on top of the carburetter body.

The throttle can now be withdrawn, but take care not to damage or bend the taper needle.

To detach the throttle from the cable, return the lever to the fully closed position, and compress the throttle spring. The inner cable wire can now be lifted out of its slot.

The adjusting screw 1009, page 19, for the taper needle is in the top of the throttle. Turn it clockwise to lower the taper needle and thus weaken the mixture delivered by the carburetter, and anti-clockwise to enrich the mixture.

Test the setting by reassembling the carburetter and running the engine after every half-turn of the screw.

The best setting of the screw is that which gives the most even two-stroking of the engine when it is running at normal loads and speeds.

The adjusting screw is split to make it grip the hole into which it fits. Take care that it does not become loose through unnecessary adjustments. If this happens, remove the screw and prise the split portion apart **very gently**, a little at a time, until it is tight enough to grip properly.

If the float chamber is removed, when replacing it do not over-tighten the bottom nut; use sufficient force to make a petrol tight joint.

OPERATING INSTRUCTIONS (for S.12 CARBURETTER).

STARTING FROM COLD.

Turn on petrol and pull strangler knob (35) up to close strangler slide (29).

Open throttle fully and start the engine by the means provided.

Open strangler fully as engine warms up and adjust throttle to give required engine speed.

In cold weather it may also be necessary to flood the carburetter by means of the tickler (25).

STARTING FROM HOT.

Turn on petrol, open throttle 1/3 and start engine. If engine has stopped through shortage of petrol it may be necessary to close the strangler, but it should be opened fully as soon as the engine fires.

AIR FILTER.

The oil-wetted air filter (32) should be removed from the carburetter for cleaning at frequent intervals. Wash in petrol or paraffin and then dip in petroil and allow to drain before re-fitting.

Oil bath air filters should be replenished as necessary to maintain correct oil level. Clean out bowl and refill with new oil according to instructions on filter. More frequent cleaning will be required under very dusty conditions.

If the engine runs rich, the filter probably requires cleaning as above.

PETROL FILTER.

A gauze filter (38) is fitted to the petrol inlet banjo bolt or union (39 or 40). Remove filter occasionally and clean by dipping in petrol. Make sure fibre washer(s) is in good condition before replacing petrol union or banjo fittings. Do not over-tighten.

FLOODING OF CARBURETTER.

The carburetter can be flooded by means of the tickler (25), but under normal running conditions the petrol level in the float chamber is controlled by the float and fuel needle assembly.

If flooding of the carburetter occurs when the tickler is not depressed, turn off petrol, remove carburetter from engine, and unscrew the float chamber (23) allowing float (21) to be removed. Check float for leaks.

Remove and replace float chamber by hand. Do not use spanner, etc.

If float is satisfactory, the fuel needle (16) and fuel bush (15) can be inspected for foreign matter after pin (18) and lever (17) have been removed. If flooding still persists, the fuel needle

can be re-seated in the bush by tapping lightly on the square end of the fuel needle. If needle is worn, replace with new component.

When re-assembling carburetter ensure that the float is clear of the tickler when fuel needle lever is fully raised and that the float chamber sealing washer (19) lies squarely in the groove in the carburetter body.

MAIN, NEEDLE AND AIR COMPENSATING JETS.

The main jet (22) is screwed into the bottom of the float chamber, and is easily removed for cleaning.

The air compensating jet (26) screws into the carburetter body inside the air filter shroud, and, if the air filter is correctly maintained, should not require cleaning.

The needle jet (13) screws into the carburetter body, a special tool being required for this operation. The jet may be cleaned by blowing compressed air through the bottom of the centre stem of the carburetter body after float chamber and throttle have been removed. (Use tyre pump if air line is not available). To clear the air compensating passages, place the finger over the hole in the top of the needle jet, and continue blowing from the bottom of the carburetter.

RE-SETTING CARBURETTER.

The main, air compensating and needle jets, and the taper needle, fitted to each carburetter have been selected to give optimum results, for each particular engine, and, therefore, it is recommended that adjustments to the taper needle setting and air by-pass screw only are carried out by the owner.

The air by-pass screw enables the mixture to be adjusted between the closed and $\frac{1}{4}$ open position of the throttle. Screw in to richen mixture, and vice-versa.

The taper needle (43) position governs the mixture strength between $\frac{1}{4}$ and $\frac{3}{4}$ throttle. The nominal position is with the needle locating clip (5) in groove No. 3. Groove No. 1 is the weakest position. The speed of tickover can be adjusted by the screw (44). In cold weather, the taper needle may be set one groove richer (one number higher) than standard.

FITTING OF REPLACEMENT PARTS.

As stated above, certain components are selected to give the best performance for each particular engine application, therefore, the correct replacement parts must be fitted.

HINTS AND TIPS

1. Always thoroughly mix the oil and petrol before putting in tank.
2. It is wise to filter your petrol mixture through a fine wire gauze when putting in tank.
3. Do not flood carburetter before starting when engine is warm.

4. Stop engine by turning off fuel tap if engine is not to be used for several days.
5. Do not experiment with cheap sparking plugs, use type recommended.
6. Always quote engine number when ordering spares or asking for advice. The number with prefix letters and/or numbers is stamped on crankcase below cylinder base, at rear of engine.
7. Driving shafts should only be taken apart by a skilled mechanic. Special tools are required for ensuring alignment when re-assembling, and as the makers have these facilities, repairs can be undertaken by them at the lowest cost.
8. It is important that air leaks should be avoided at the following points :—
 - (a) Between inlet pipe and cylinder.
 - (b) Between inlet pipe and carburetter.
 - (c) Between cylinder base and crankcase.
 - (d) Between the two halves of crankcase.
9. When decarbonising the engine it is very important that silencers and exhaust pipes are also cleaned out.
10. Avoid all sharp bends in the carburetter control cables.

TRACING TROUBLES.

If the engine will not start after a reasonable number of trials, a preliminary check must be made to decide whether this is due to lack of compression, faulty fuel supply, or faulty ignition.

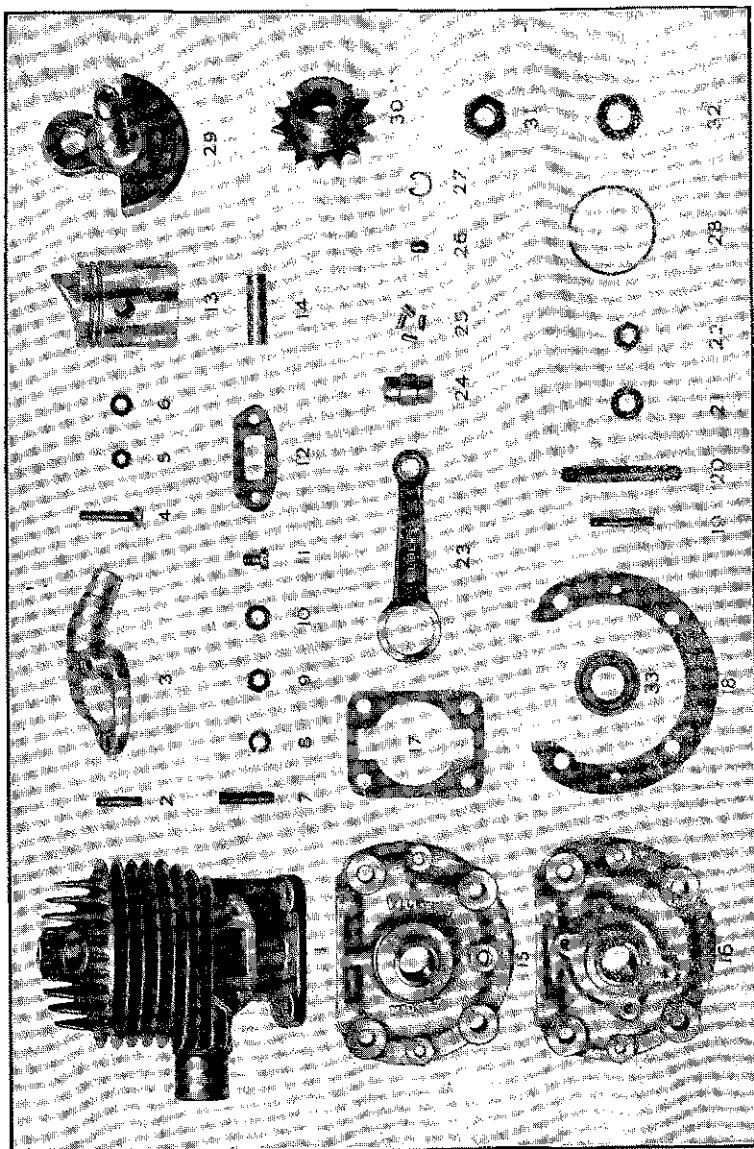
Compression. This should be left when the engine is rotated at normal starting speeds with the throttle partly open. A definite resistance must be presented to every revolution of the engine crankshaft.

Fuel Supply. Depress the tickler at the side of the carburetter body. If fuel is reaching the float chamber it will spurt out of the vent at the top of the tickler cap.

Ignition System. Unscrew the sparking plug from the cylinder head and place it with the ignition cable attached, on a metal portion of the engine. When the engine crankshaft is rotated, a spark will be visible at the points of the plug, if the plug and the ignition system are in order. If there is no spark, a new plug may be needed. Alternatively, check the ignition lead by removing the plug and holding the end of the lead about $\frac{1}{8}$ inch away from a clean metal part of the engine.

NOTE: If the above examination is properly carried out, it will be clear whether a more detailed check is required. For this refer to the fault-finding chart.

VILLIERS Mk. 2 and Mk. 3 MIDGET.



This Spare Parts List contains information of the engines at present in production and is compiled primarily to accompany engines leaving our works, therefore components and numbers may differ from that of earlier models. It is therefore strongly advised when ordering parts to quote engine number.

Always quote Engine No. when ordering spares.

ENGINE.

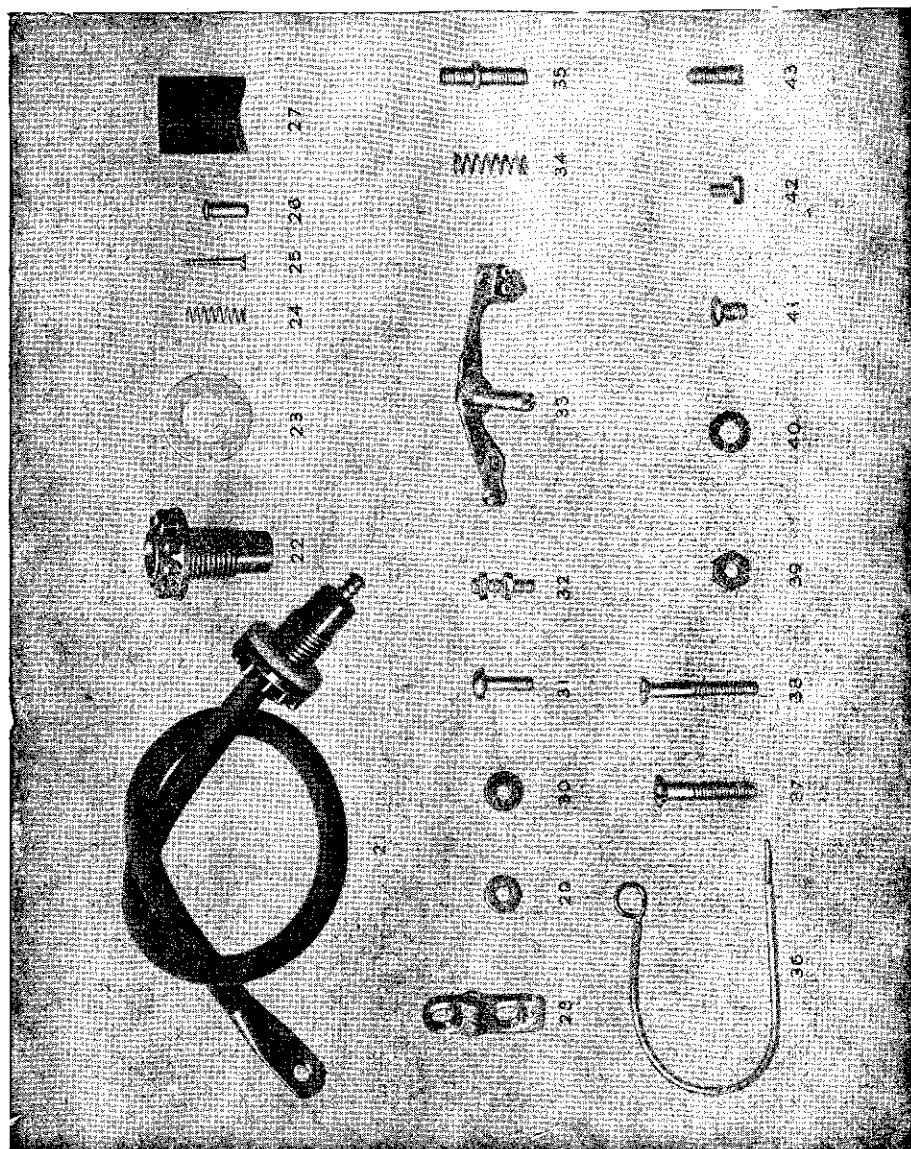
Component	Illus. No.	No. per Engine	Mk.	Mk.
			2 Part No.	3 Part No.
Cylinder, less Studs	1	1	B6698	B6698
Stud Inlet Manifold	2	2	E6902	E6902
Bolt	4	1	E6764	E6764
½" Nut for Studs	5	5	E2539	E2539
½" Plain Washer	6	6	E2924	E2924
*Inlet Manifold, Standard	3	1	D6746/1	D6746/1
Inlet Manifold Joint Washer	12	1	E6700	E6700
Crankcase with Bush, L. hand	15	1	B6689	B6689
Crankcase with Bush, R. hand	16	1	B6690	B6690
Crankcase Joint Washer	18	1	D7172	D7172
Crankcase Joint Stud	19	2	E3392	E3392
Crankcase Bush, Left hand		1	D2775	D2775
Crankcase Bush, Right hand		1	E7539	E7539
Engine Fixing Stud	20	4	Z1010×5	Z1010×5
¾" Nut for Stud	22	8	E834	E834
¾" Plain Washer	21	8	E373	E373
Cylinder Base Stud	7	4	E363	E363
5/16" Nut for Stud	9	4	E364	E364
5/16" Spring Washer	8	4	E1050	E1050
Cylinder Joint Washer	17	1	E6699	E6699
Crankcase Drain Screw	11	1	E1962	E1962
Crankcase Drain Screw Washer	10	1	E1905	E1905
Piston (Aluminium) Bushed	13	1	C6752	C6752
Piston (Aluminium) .015" O/S.	13	1	D7397	D7397
Piston (Aluminium) .030" O/S.	13	1	D7398	D7398
Piston (Cast Iron) Bushed	13	1	C6697	C6697
Piston (Cast Iron) .015" O/S.	13	1	D7928	D7928
Piston (Cast Iron) .030" O/S.	13	1	D7927	D7927
Gudgeon Pin	14	1	E3903	E3903
Gudgeon Pin Circlip	27	2	E4047	E4047
Piston Ring	28	2	E1725	E1725
Piston Ring .015" O/S.	28	2	E4480	E4480
Piston Ring .030" O/S.	28	2	E4582	E4582
Connecting Rod, Bushed	23	1	D6693	D6693
Con. Rod Bush, small end		1	E6696	E6696
Crankpin	24	1	E6695	E6695
Crankpin Oversize .001"	24	1	E7578	E7578
Crankpin Plug	26	2	E5488	E5488
Crankpin Roller, Steel	25	8	E2677	E2677
Crankpin Roller, Bronze	25	8	E2825	E2825
Driving Shaft	29	2	D6691	D6691
Driving Shaft Assembly	—	1	C7389	C7389
Driving Sprocket				
Teeth. Pitch. Width. Roller Dia. Chainline				
14 .5" .195" .335" 2.406"	30	1	E6701	E6701
14 .5" .176" .305" 2.406"		1	E7175	E7175
10 .5" .176" .305" 3.375"		1	E5303	E5303
14 .5" .176" .305" 2.156"		1	D7033	D7033
12 .5" .176" .305" 2.406"		1	E7368	E7368
Sprocket Nut, Standard	31	1	E422	E422
Ditto, Thin, for Sprocket D7033	31	1	FG152	FG152
Spring Washer	32	1	E424	E424
Oil Seal, Magneto Slide	33	1	MIS,012	MIS,012

* Not as illustrated.

Component	Illus. No.	No. per Engine	Mk.	Mk.
			2 Part No.	3 Part No.
MAGNETO.				
Armature Plate Assem. complete	1	1	A66	
Armature Plate Assem. complete	17	1		A67
Armature Plate Fixing Screw	37	4	1140×1	1140×1
High Tension Coil	10	1	M1634	M1634
Condenser Box Assem. complete	5	1	M1715	M1715
Condenser Box Fixing Stud	35	2	1053×1	1053×1
Con. Box with Condenser & Studs	6	1	M1776	M1776
Condenser only	8	1	M1750	M1750
Clamp Screw, Con. Box	31	2	1013×3	1013×3
Clamp Screw Bush, top	30	2	1013×13	1013×13
Clamp Screw Bush, bottom	29	2	1013×12	1013×12
Clamp	28	1	1022×7	1022×7
Con. Box only	7	1	1012×2	1012×2
Rocker Arm with Point and Pad	33	1	M1714	M1714
Rocker Arm Spring	34	1	1047×3	1047×3
Adjustable Point with Lock Nut	32	1	487	487
H.T. Cable Complete	21	1	1148×4	1148×4
H.T. Terminal	22	1	1124×8	1124×8
H.T. Terminal Felt Washer	23	1	E869	E869
H.T. Terminal Woodscrew	25	1	491	491
H.T. Terminal Spring	24	1	1010×11	1010×11
H.T. Terminal Pad	26	1	1046×13	1046×13
H.T. Terminal Rubber Sleeve	27	1	M1673	M1673
L.T. Lead with Sleevng	36	1	482	482

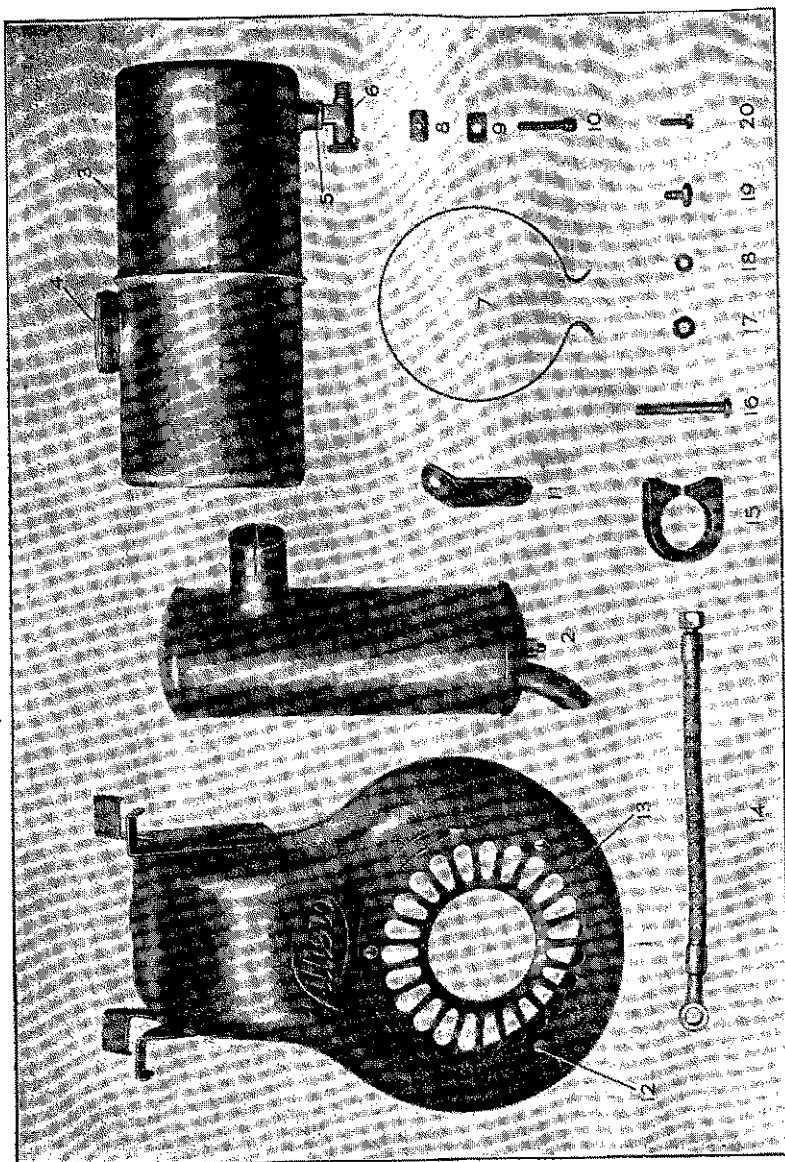
(Coil to Condenser Box)

VILLIERS Mk. 2 and Mk. 3 MIDGET.



See page 25 for later type Condenser Box Assembly.

VILLIERS Mk. 2 and Mk. 3 MIDGET.



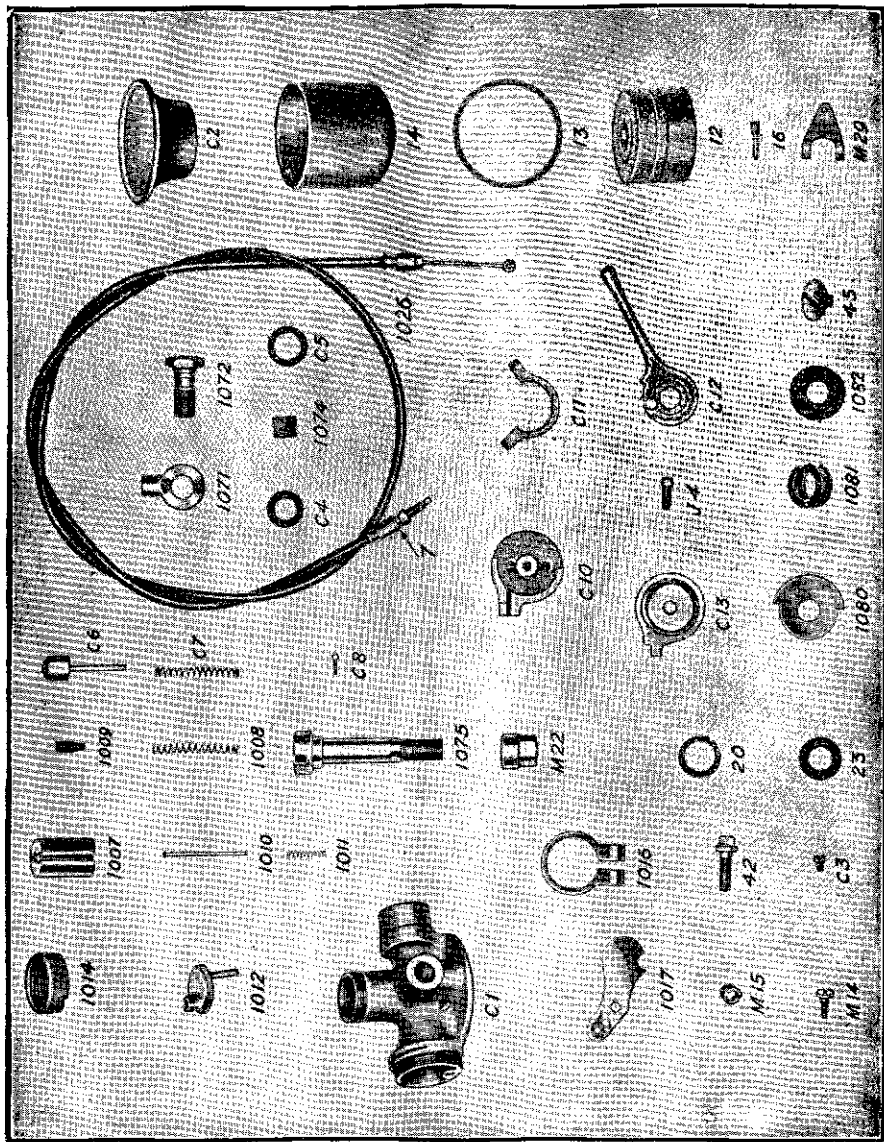
Always quote Engine No. when ordering spares.

Component	No.	Engine	Mk.	Mk.
			2 Part No.	3 Part No.
Cowling (less Tank Brackets)		1		B118AU
Cowling (with Tank Brackets)	1	1		B125AU
Cowl Fixing Screw Top	19	1		EM539
Cowl Fixing Screw Washer	18	1		E2924
Cowl Fixing Screw Sides	20	2		E6849
†Cowl Front	13	1		D6598
†Cowl Front Screw	12	3		M1228
H.T. Cut Out Strip	11	1		E6743
Fuel Tank (½ gallon) with cap	3	1		C5946
Fuel Tank Strap	7	2		DG513
Trunnion, Plain Hole	9	2		EM276
Trunnion, Tapped Hole	8	2		EG532
Trunnion, Screw	10	2		E781
Filler Cap with Oil Measure	4	1		E7502
Fuel Tap	6	1		468
Fuel Tap Washer	5	1		VI07X4
*Fuel Pipe	14	1		VI181E
Silencer	2	1	C6723	C6723
Silencer Clip, to Cylinder	15	1	E462	E462
Silencer Clip Bolt	16	1	E435	E435
Silencer Clip Bolt Nut	17	1	E364	E364

† Not on current models. Complete component now.

* Not as illustrated.

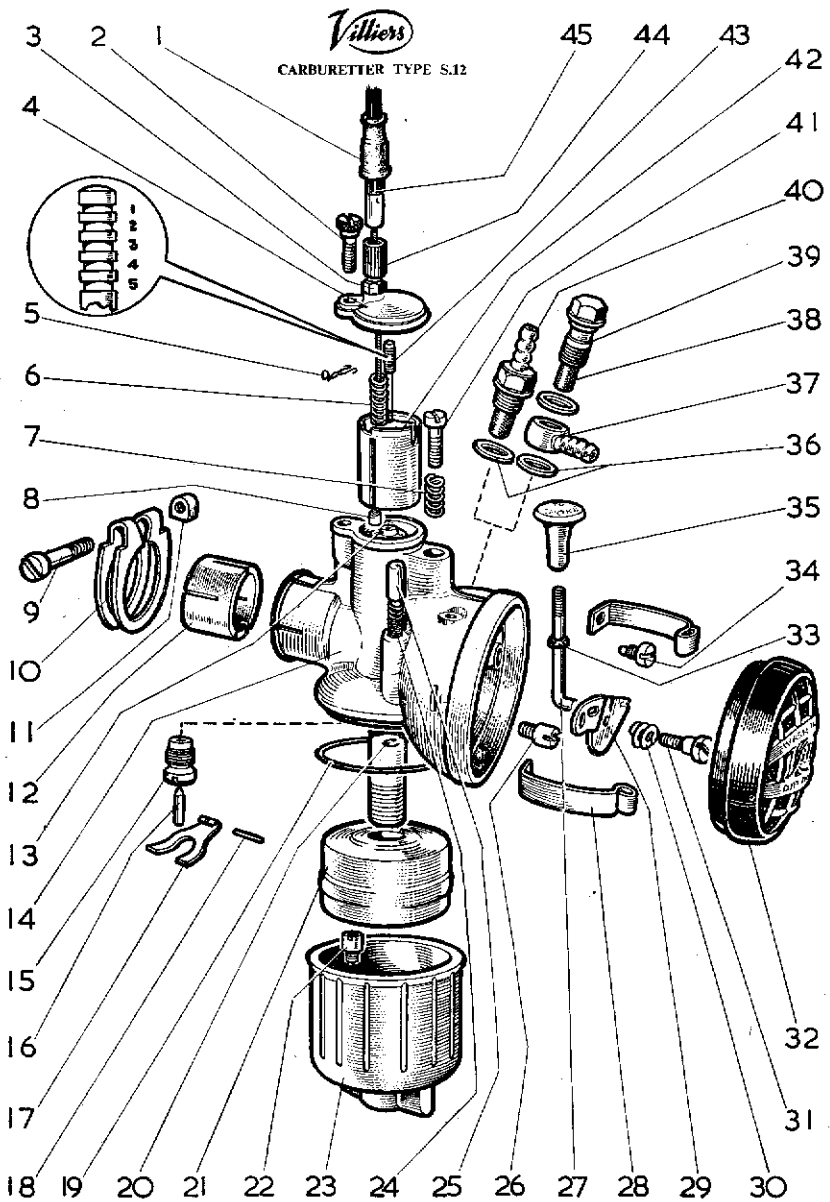
VILLIERS Mk. 2 and Mk. 3 MIDGET.



Always quote Engine No. when ordering spares.

CARBURETTER : VILLIERS JUNIOR

Component	Illus. No.	No. per Engine	Mk.	Mk.
			2	3
			Part No.	Part No.
Carburetter Body	C1	1	V508/C1	V508/C1
Top Ring	1014	1	V367	V367
Top Disc	1012	1	V368	V368
Throttle	1007	1	V365	V365
Throttle Spring	1008	1	V369	V369
Taper Needle	1010	1	V651	V514
Taper Needle Adjuster	1009	1	V413	V413
Taper Needle Spring	1011	1	V107×7	V107×7
Centre Piece and Jet	1075	1	M7J	M8J
Centre Piece Washer	20	1	V107×3	V107×3
Centre Piece Locating Screw	C3	1	V424	V424
Bottom Nut	M22	1	V581	V581
Bottom Nut Washer	23	1	V107×4	V107×4
Float	12	1	V107×1	V107×1
Float Cup	14	1	V146×6	V146×6
Float Cup Washer	13	1	V107×2	V107×2
Fuel Needle	16	1	V355	V355
Fuel Needle Lever and Pin	M29	1	V257	V257
Body Clip	1016	1	V922	V922
Body Clip Screw	42	1	V754E	V754E
Strangler Plate	1017	1	V373	V373
Strangler Knob	—	1	1030×12E	1030×12E
Strangler Knob Screw	—	1	1006×3E	1006×3E
Strangler Plate Screw	M14	1	V626	V626
Strangler Plate Spring Washer	M15	1	V146×2	V146×2
Air Cleaner	C2	1	V148×3	V148×3
Banjo Union	1071	1	V381	V381
Banjo Union Bolt	1072	1	V382	V382
Banjo Filter Gauze	1074	1	V404	V404
Fibre Washer (large hole)	C4	1	H104×8	H104×8
Fibre Washer (small hole)	C5	1	V383	V383
Tickler	C6	1	V207	V207
Tickler Spring	C7	1	V369	V369
Tickler Split Pin	C8	1	V111×2	V111×2
Control Cable complete	1026	1		
<i>(Quote Length when ordering)</i>				
Cable Adjuster and Locknut	7	1	V105×½	V105×½
Control Body	C10	1	V405	V405
Control Body H'bar Clip	C11	1	V142×7	V142×7
Control Body H'bar Clip Screw	J4	2	V142×5	V142×5
Control Lever	C12	1	V406	V406
Control Top Cover	C13	1	V387	V387
Control Body Friction Plate	1080	1	V429	V429
Control Body Spring Washer	1081	1	V142×11	V142×11
Control Body Fibre Washer	1082	2	V142×10	V142×10
Control Body Top Screw	45	1	V117×5	V117×5
Control Cable Sleeve	—	1	V123×15	V123×15
Control Cable Nipple	—	1	V145×16	V145×16
Control Cable Nipple Throttle	—	1	V108×4	V108×4



CARBURETTER, TYPE S.12.

(The Control used with this Carburettor is shown on page 18.)

CARBURETTER, TYPE S.12.

SPARE PARTS LIST.

Illus. No.	PART No.	DESCRIPTION.	QTY.
1	V.826E	Cover, cable	1
2	V.1400E	Screw, top cap	1
3	V.105x2E	Nut, cable adjuster locking	1
4	V.1317E	Cap, carburetter top	1
5	V.1301E/1	Circlip, needle locating	1
6	V.369E	Spring, throttle	1
7	V.1402E	Spring, air adjusting screw	1
8	V.145x16E	Nipple, cable, throttle end	1
9	V.1440E	Bolt, carburetter body clip	1
10	V.1426E	Clip, carburetter body	1
11	V.1436E	Nut, carburetter body clip bot	1
12	V.1343E	Bush, heat insulating	1
† 13	V.1602D	Jet block, needle	1
14	V.1267C	Body, carburetter, 7/16-inch choke	1
15	V.1180E	Bush, fuel	1
16	V.1179E	Needle, fuel	1
17	V.1396E	Lever, fuel needle	1
18	V.1237E	Pin, fuel needle lever hinge	1
19	V.1386E	Washer, float chamber sealing	1
20	V.1590E	Circlip, tickler	1
21	V.1419E	Float	1
† 22	V.1628E	Jet, main, 75 c.c.	1
23	V.1356D	Chamber, float	1
24	V.801E	Spring, tickler	1
25	V.1398E	Tickler	1
† 26	V.1592E	Jet, air compensating, 300 c.c.	1
27	V.1338E	Spindle, strangler	1
28	V.1349D	Clip, filter	2
29	V.1337E	Plate, strangler	1
30	V.1F88E	Washer, strangler screw	1
31	V.626E	Screw, strangler plate	1
32	V.1383D	Filter assembly	1
33	V.1589E	Seal, strangler spindle	1
34	V.829E/1	Screw, clip fixing	2
or 34	V.1684E	Screw, clip fixing (self-tapping)	2
35	V.1339E	Knob, strangler spindle	1
36	V.1397E	Washer, fibre	1 or 2
37	V.1341E	Union, banjo (for item 39)	1
38	V.1387E	Gauze, filter	1
39	V.1342E	Bolt, banjo	1
or 40	V.986E	Union, petrol feed	1
41	V.1401E	Screw, air adjustment	1
42	V.1248E	Throttle	1
† 43	V.1428E	Needle, tap, No. 2 set in groove 2	1
44	V.105x1E	Adjuster, cable	1
45	Quote Eng. No.	Cable, throttle, complete	1
—	Quote Eng. No.	Carburetter complete with throttle cable, less air filter and control	1

For Carburetter having an oil bath air filter the following parts are used:—

V.1615D	Body, carburetter (stamped S.12/2)	1
V.1548E	Rod, air filter fixing	1
V.1610E	Nut, wing	1
V.1F26C	Elbow assembly (less filter)	1
1124x9E	Screw, elbow fixing	2
Cooper 4289	Air cleaner	1

† If components other than listed are fitted, quote number stamped on component

VILLIERS FLYWHEEL MAGNETO

We are now fitting a new and improved condenser box assembly.

The condenser box is made in a new light alloy, the rocker arm being pivotted in a graphited bronze bearing, ensuring long life.

It is now not necessary to use a spanner for contact point adjustment, a small screwdriver being the only tool necessary.

To adjust the point gap proceed as follows:—

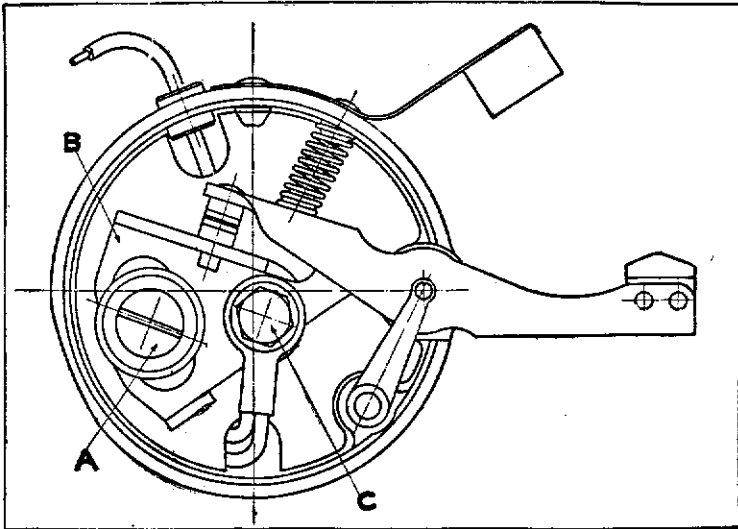
Turn flywheel until rocker pad is on top of cam profile of flywheel boss.

Release the screw "A" see illustration.

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 the point gap.

To keep the felt moist, give a drop of oil occasionally.

The complete condenser box assembly is interchangeable with the type previously fitted, but when ordering, the number of the engine for which it is required should be stated.



FAULT FINDING CHART

Sequence of Testing.	Possible Trouble.	Remedy.
Engine will not start.		
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 connection. 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 $\frac{1}{8}$ " 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 .018 inches. Clean.
	Moisture on insulation of condenser box.	Clean and dry out.
	High tension pickup 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.

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 rotate engine several times to clear engine of petrol mixture. Adjust taper needle, drain crankcase.
	Air leak at carburettor stub causing weak mixture.	Correct.
	Incorrect ignition timing.	Check following instructions given on page 8.
Engine Four or Eight Strokes.		
Strangler may not be fully open or taper needle in a too high position. Air filter where fitted may need cleaning.	Mixture too rich.	Lower needle by adjuster 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 carburettor.	Persistent flooding is usually due to dirt under fuel needle seating, sticking fuel needle, damaged seating or punctured float.
Engine Lacks Power.		
	Engine out of tune, bearings worn. Un-suitable sparking plug.	Overhaul. Replace with recommended type.
	Loss of compression. Worn piston rings.	Tighten sparking plug. Replace piston rings.
	Incorrect "petrol" mixture.	Correct mixture for first 25 hours; 1 part Oil — 16 parts petrol and subsequently 1 part — 20 parts.

FAULT FINDING CHART—continued

Sequence of Testing.	Possible Trouble.	Remedy.
Engine will not run Slowly.	Excessive carbon deposit on piston crown and cylinder head.	Decarbonize.
	Exhaust system choked with carbon.	Clean out silencer and exhaust pipe.
	Incorrect carburetter setting.	Check and adjust.
	Air cleaner choked.	Refer page 5.
	Obstruction in fuel supply.	Clean out tap, fuel pipe and filters.
	Driving chains too tight.	Adjust.
	Incorrect ignition timing.	Check and adjust.
	Weak mixture due to air leaks at carburetter stub, crankcase and cylinder base joints.	Tighten all joints.
	Crankcase drain screw(s) loose or missing.	Tighten or replace.
	Leaking crankcase oil seal.	Replace.
Engine Suddenly Stops Firing.	Worn crankshaft bearings or leaking seals.	Replace.
	Ignition timing too far advanced.	Correct, following instructions given.
	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.

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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 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 cannot accept responsibility for the replacement of any proprietary articles or parts not manufactured by us, unless the makers of these parts agree to replacement.

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.

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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 representation on our behalf or sell subject to or with any conditions other than those contained in the above guarantee.