

INSTRUCTIONS
FOR THE
OPERATION AND MAINTENANCE
OF



MINOR MK. 7
MOTOR LAWN MOWERS

RANSOMES SIMS & JEFFERIES (AUSTRALIA) PTY. LTD.
CLAYTON VICTORIA

GENERAL DESCRIPTION

ENGINE.

This model is equipped with the Villiers 98 cc. two-stroke engine, fitted with a kickstart.

Maintenance of Engine. If trouble is experienced when starting the engine through the sparking plug becoming wet and oily, the crank case should be drained by taking out the small plug which will be found at the base on the left-hand side of the crank case. This trouble occurs through overflowing of carburettor or by leaving the petrol turned on when the machine is not in use, allowing the oil to settle in the carburettor.

The engine should be decarbonised at the end of each season. All carbon should be thoroughly cleaned off piston, cylinder head and exhaust port. When replacing, care should be taken to replace the piston correctly, i.e., the sloping side of top towards the exhaust port or front of engine. The silencer and exhaust system should also be cleaned out.

CLUTCHES.

All models are fitted with a centrifugal clutch in the engine shaft and a friction plate land roll clutch controlled from the handles.

Main Driving Clutch (see illustration page 14): This clutch is of the automatic type and comes into operation as the engine speed increases. To delay the action of the centrifugal clutch shoes (P), springs (Q) are fitted which allow an engine speed of up to 500 r.p.m. without engagement. As the speed increases from this, the clutch shoes gradually take up the drive. Should an overload be put on the clutch, the tendency will be for the clutch to pull the engine speed down and then slip without stalling the engine. The clutch shoes are lined with bonded ferodo lining and can be easily detached when relining is necessary. It is essential to use the correct lining and method of riveting for this purpose. When replacing the shoes, care must be taken to see that the hinged ends of the shoes point towards the direction of running.

- **Land Roll Plate Clutch** (see illustration page 3): This clutch will allow the cutting cylinder to remain under power whilst the land roll is disengaged from the engine. The land roll clutch should always be disengaged when starting the engine or when leaving the machine with the engine running.

Note: Clutch life will be prolonged if plates are kept slightly oily.

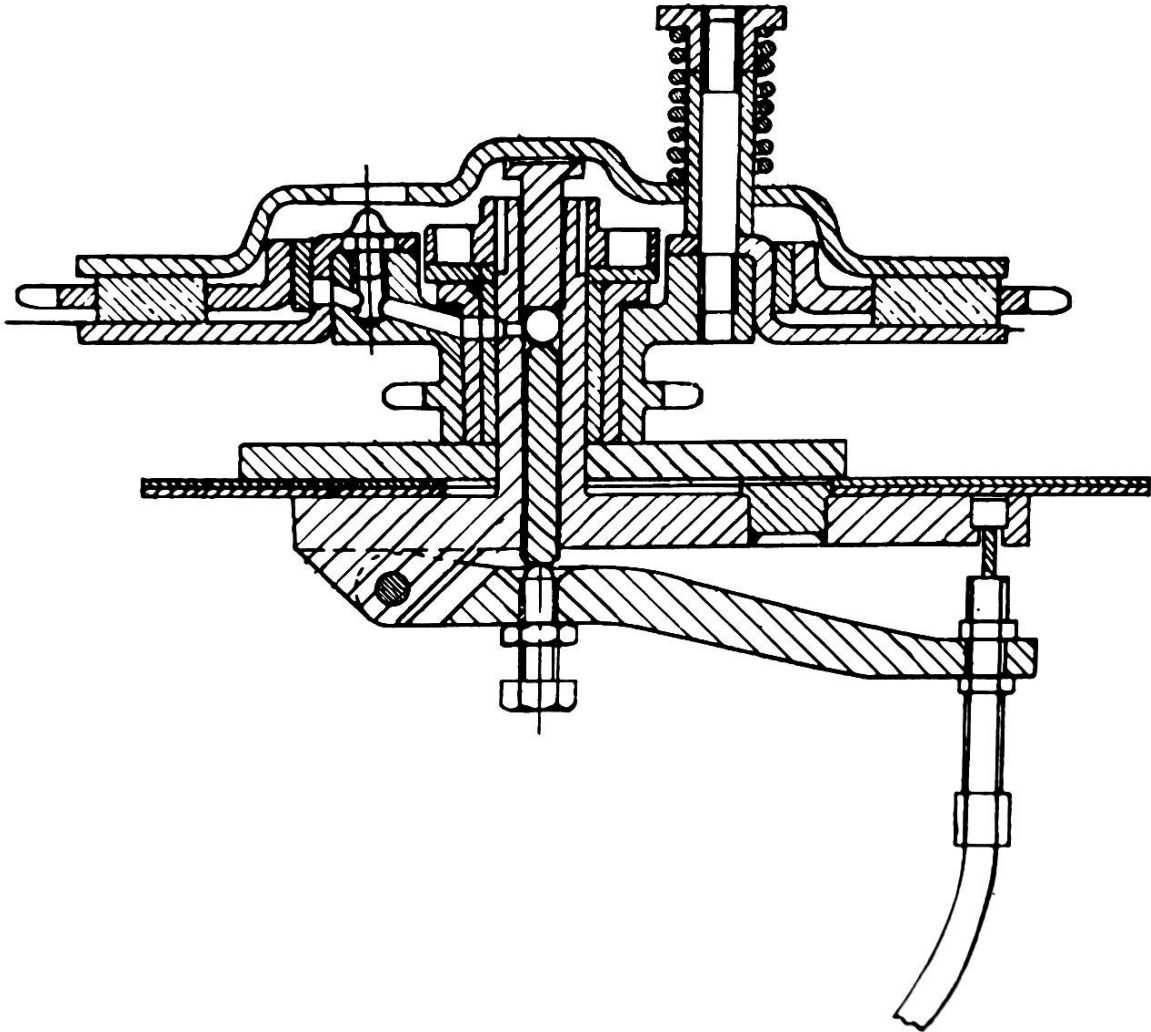


Figure 1 - Land Roll Plate Clutch

LUBRICATION.

RECOMMENDED LUBRICANTS.

SHELL	Two Stroke Motor Oil
VACUUM	Mobil Mix TT
WAKEFIELD	Castrol XL
C.O.R	Energol Motor Oil SAE30
CALTEX	Two Stroke Motor Oil, Medium
AMPOL	Two Stroke Oil

LUBRICATION OF ENGINE.

All lubrication to the engine is provided by mixing the lubricating oil with the petrol, and this is taken in through the carburettor to the crank case, from which the main bearings, piston and cylinder walls are all automatically lubricated. The mixture we advise as most suitable is 20 parts of petrol to 1 part of the best oil suitable for air-cooled engines, i.e., 1 measure of oil to 1 pint of petrol. With a new engine the ratio should be increased to approx. 16 to 1 for the first 25 working hours, i.e., approx. 11 measures to 1 pint.

It is important that oil and petrol in the correct proportions should be mixed in a separate container or petrol can before pouring into the fuel tank. Just sufficient fuel for immediate use should be mixed, as stale mixture is liable to make it difficult to start the engine.

LUBRICATION OF MACHINE.

(Illustrations pages 7, 8, 9).

Parts to be oiled each time the machine is used.

1. Clutch shaft bearing through nipple (A).
2. Land roll spindle bearings through nipples (B) in housings.
3. Land rolls, through nipples (C) which will be found through surface of each roll.
4. Cutting cylinder bearings through nipples (D).
5. Land roll clutch through nipple (G) in outer plate. Remove the chain cover to expose this nipple.
6. Starting free wheel. A LITTLE oil through the nipple in flywheel.
7. Kickstart Spindles.
8. Wood Rolls can be oiled between the rolls and at each end.

All other oiling points such as chains and kickstart bearings should be oiled weekly.

OPERATION

TO START ENGINE.

1. Fill up with correct mixture (see above). It is best to mix the petrol just before using, and not more than is required for immediate use. An old petrol tin will be found useful for mixing purposes. On no account should the mixture be made up in the tank.
2. See that the land roll drive clutch is disengaged.
3. Pull out petrol cock at underside of tank and flood the carburettor by depressing the tickler.
4. The position of control lever on right handle of machine for starting should be slightly open.
 - To open throttle or admit gas to the engine, the control lever should be moved in a clockwise direction; the reverse direction closes the throttle.
5. Close choke on cold days, kick engine over smartly when the engine should start in two or three turns.
6. After the engine is running, the position of control lever can be adjusted to give required speed of engine and 'the choke opened.

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.

FUEL SUPPLY.

Depress tickler at side of carburettor body. If fuel is reaching float chamber it will spurt out of vent at top of tickler. It is important that the ventilating hole in the filler cap of the fuel tank should not be allowed to become choked up.

IGNITION SYSTEM.

Unscrew sparking plug from cylinder head and place it, with ignition cable attached, on a metal portion of the engine. A spark should be visible at the plug points when the engine is rotated 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.

If the engine will not start after these preliminary tests tilt the machine back on its handles so that the drain plug on the engine crankcase is directly under the crankshaft. Remove drain plug and drain off any oil which may have accumulated in the crankcase.

If after this the engine will not start, a more detailed examination will be required.

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

TO OPERATE MACHINE.

The machine can be operated either by driving on the land roll clutch, or by leaving the clutch engaged and driving with the throttle lever over the centrifugal clutch. The latter method is most convenient for straightforward cutting and the former method for difficult conditions, involving blind ends, etc.

To drive on land roll clutch, allow engine to warm up, increase engine speed, then engage clutch slowly at the same time opening throttle. Let clutch fully in and the machine should glide forward. Open or close the throttle to achieve a comfortable walking speed. To stop the machine, disengage the clutch and close throttle. When leaving the machine with the engine running, in order to empty the grass box or for any other reason, throttle down until the cutting cylinder stops revolving, otherwise the rotating cylinder will tend to bruise the grass.

To drive on the centrifugal clutch and throttle, allow the engine to warm up, then reduce engine speed until the clutch shaft stops revolving. Engage the land roll clutch and the machine can then be controlled solely by the throttle lever.

Speeding up of the engine will bring the centrifugal clutch into action and consequently the machine will move off. By reducing engine speed, the machine will come to a standstill. With a very little practice it will be found that manipulation of machines with this self-energising clutch becomes very simple with an exceptionally smooth take-off, especially when stopping and starting in long grass.

For safety purposes, the land roll clutch should be disengaged if the machine is to be left standing for such things as emptying of the grassbox, etc. The machine should be driven at a comfortable walking pace and can be operated and adjusted entirely to suit the individual requirements for all classes of cutting. Do not try to help the machine to do its work, but simply hold it steady and watch the cutting to get a regular and even cut.

ADJUSTMENTS.

ADJUSTING THE KNIVES.

Each machine is sent away with the cutting cylinders properly set to the bottom blade, but it is possible they may be upset during transit to the user. When the machine does not cut perfectly, set the cutting cylinder carefully to the bottom blade, so that the revolving cutters just touch the bottom blade throughout the whole length and without causing any frictional pressure.

For setting the knives a simple method is used, viz.: —adjusting screws (K) (see illustration page 9) on either side of machine.

To set cutting cylinder closer to bottom blade, turn in clockwise direction. It is advisable when adjusting to make a small adjustment to each screw alternately.

When correctly set, the knives should revolve freely and at the same time be able to cut a leaf or piece of writing-paper held at edge of the bottom blade. This test should be made over the entire width of blade.

If the cutting cylinder is set hard on to the bottom blade no cleaner cut is obtained, but extra work and undue wear is put on to the machine.

After adjustments make sure that the cutting cylinder chain is not too tight.

CAUTION. Never touch the cutting cylinder or chains when the engine is running.

TO ALTER THE HEIGHT OF CUT.

Slacken the nuts (H) (see illustration below) and move brackets up or down as required lining up the pointer on the brackets with the dimples in the side frame.

CAUTION. The machine should never be used with 'the bottom blade pressing on the lawn. If it does, the spiral cutters are liable to be damaged by the bottom blade being forced upwards; the machine will also work heavily, and the turf will be badly marked. It is a fallacy to think that grass is cut shorter by having the blade hard on or touching the ground. If the blade is just clear of the ground, it does not press the grass down and a cleaner cut is made.

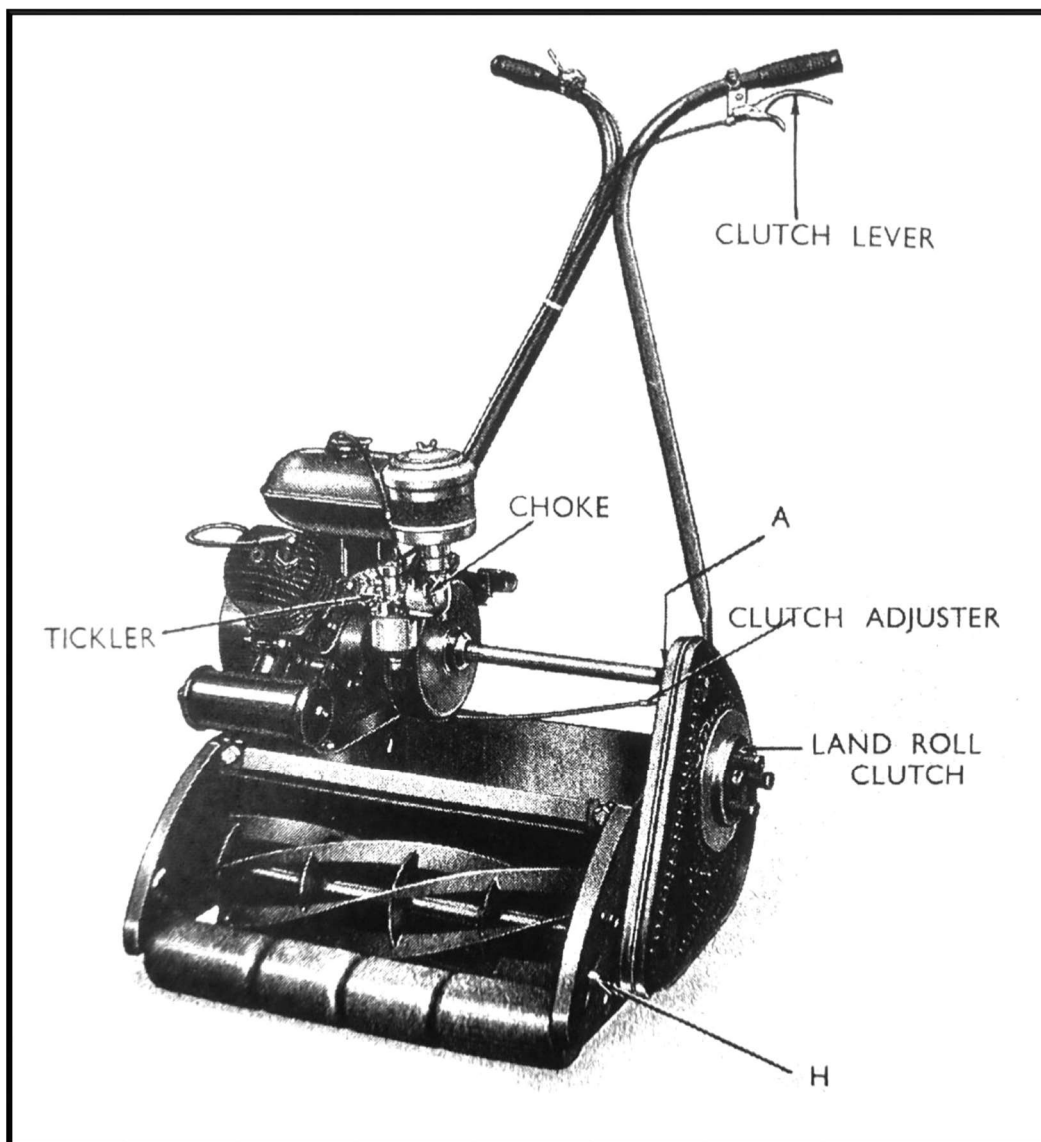


Figure 2

To check that the height is correctly set, tilt the machine backwards until it rests on its handles, place a straight edge across the land and front rolls; the bottom blade should then be clear of the straight edge. In dry weather, in. to in. and in wet weather, in. to in. clearance should be allowed for the machine sinking into the turf.

HANDLE ADJUSTMENT.

The height of the handles can be adjusted to suit the user. Slacken the bolts at the bottom of the handles, alter the height of handles as necessary and re-tighten bolts.

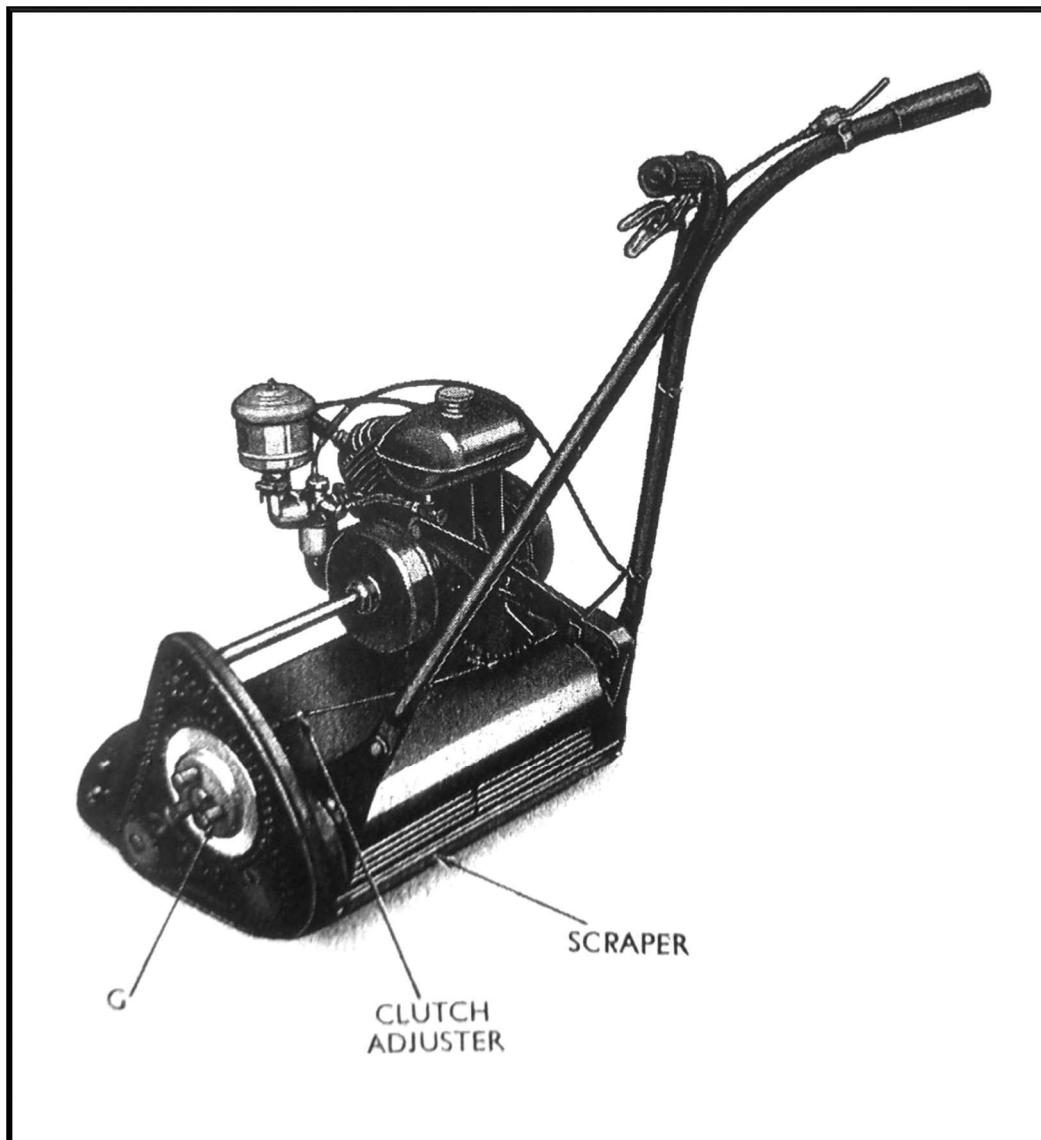


Figure 3

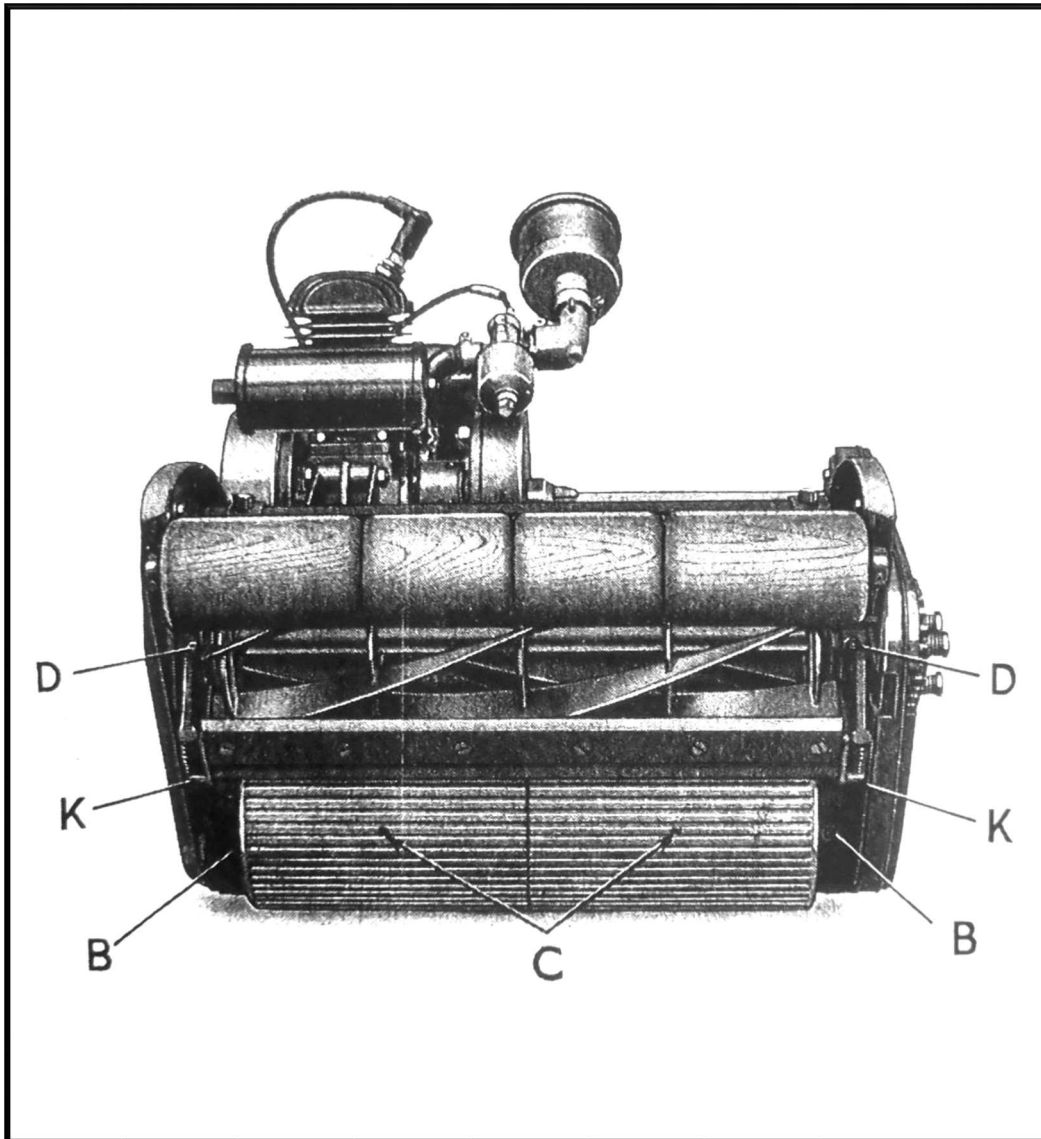


Figure 4

TRANSMISSION CHAINS.

These are both adjusted by positioning the land roll plate clutch. To adjust, disengage the clutch by lifting the clutch lever, rotate the outer plate until the two holes line up with the two holes in the nut beneath, insert pin spanner provided and turn anti-clockwise to slacken nut, slide the clutch bodily to tighten chains and then re-tighten nut. When adjusted the chains should be slightly slack in all positions.

If at any time a chain is removed, take care when replacing that the gap in the spring clip points away from the direction of rotation.

LAND ROLL CLUTCH.

Adjustment is provided at the lower end of the Bowden cable. When adjusted correctly there should be a small amount of play between the end of the operating pin and lever when the clutch is disengaged, i.e., the clutch should drive firmly when engaged and be completely free when disengaged.

MAINTENANCE.

ENGINE.

If trouble is experienced when starting the engine through the sparking plug becoming wet and oily, the crank case should be drained by taking out the small plug which will be found at the base on the left-hand side of the crankcase. This trouble occurs through over-flooding of the carburettor or by leaving the petrol turned on when the machine is not in use, allowing the oil to settle in the carburettor.

DECARBONISING.

Decarbonising the Villiers Two-Stroke Engine is quite straight forward, 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 the cylinder head.

The ports in the cylinder, particularly the exhaust port, should receive careful 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 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 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 of power.

It is important that air leaks should be avoided. The connection between carburettor and induction pipe must be absolutely airtight and after dismantling the engine, new washers should be fitted at the induction pipe joint and cylinder base joint if the original ones have been disturbed.

The engine should be decarbonised at the end of each season.

VILLIERS JUNIOR CARBURETTOR.

This is of the concentric float chamber type, allowing the machine to be worked on undulating grounds without affecting the running of the engine.

In this carburettor, a taper needle is attached to the throttle and provides a correctly adjusted mixture at all throttle openings.

The carburettor is set at the Works before delivery, but if it is desired to make adjustment at any time, proceed as follows:

1. First remove the throttle by unscrewing the top ring of the carburettor.
2. At the top of the throttle there is a small screw. Turning this in a clockwise direction lowers the needle and will give a weaker setting. Turning the screw in an anti-clockwise direction will give a richer setting.
3. For adjustment give approximately half a turn at a time until a correct setting is found.

If the float cup has to be removed at any time for cleaning, etc., do not use too much force in tightening the bottom nut when re-assembling.

Periodically see that the gauze in the petrol connection is free from dirt. This gauze is fitted to the bolt which attaches the petrol pipe to the carburettor.

IGNITION.

MAGNETO TIMING

If at any time the flywheel magneto is removed from the end of the crankshaft, care must be taken when replacing to check the relative position of the flywheel to the piston position.

The back or armature plate is held by two screws and the drain hole should be at the bottom. Great care must be taken in positioning the flywheel itself. The magneto is timed to give a spark when the piston is in. before top dead centre with the points commencing to open. When building the engine, the timing is set as shown, flywheel tightened on shaft, then rotated until piston is at top of stroke. Two timing marks are then punched directly opposite one another, one on the boss on the armature plate and the other on the flywheel rim.

FLYWHEEL REMOVAL.

The cam operating the contact breaker is riveted 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 a special hammertight spanner which can be supplied. 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 at top of stroke the flywheel should then be moved round until the timing marks are in line, 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 spanner.

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.

MAGNETO ADJUSTMENTS.

The magneto is built into the flywheel. To adjust the contact breaker points (H) (see illustration page 12), the cover must be removed. Having removed the cover rotate the flywheel to see if the points open and close correctly.

If the rocker arm (K) appears to be tight, remove it from its bearing and thoroughly clean the pin. A little oil should be smeared on the bearing when re-assembling. Providing the contact breaker points are kept clean, and above all, free from oil, they will probably need adjustment only at long intervals. When the points are fully open, the gap should be .015-inch. If adjustment is necessary, slacken locknut (M) and turn the contact screw (N) until the gap is set to the thickness of the gauge attached to the magneto spanner; then screw up the locknut again until it is firmly locked.

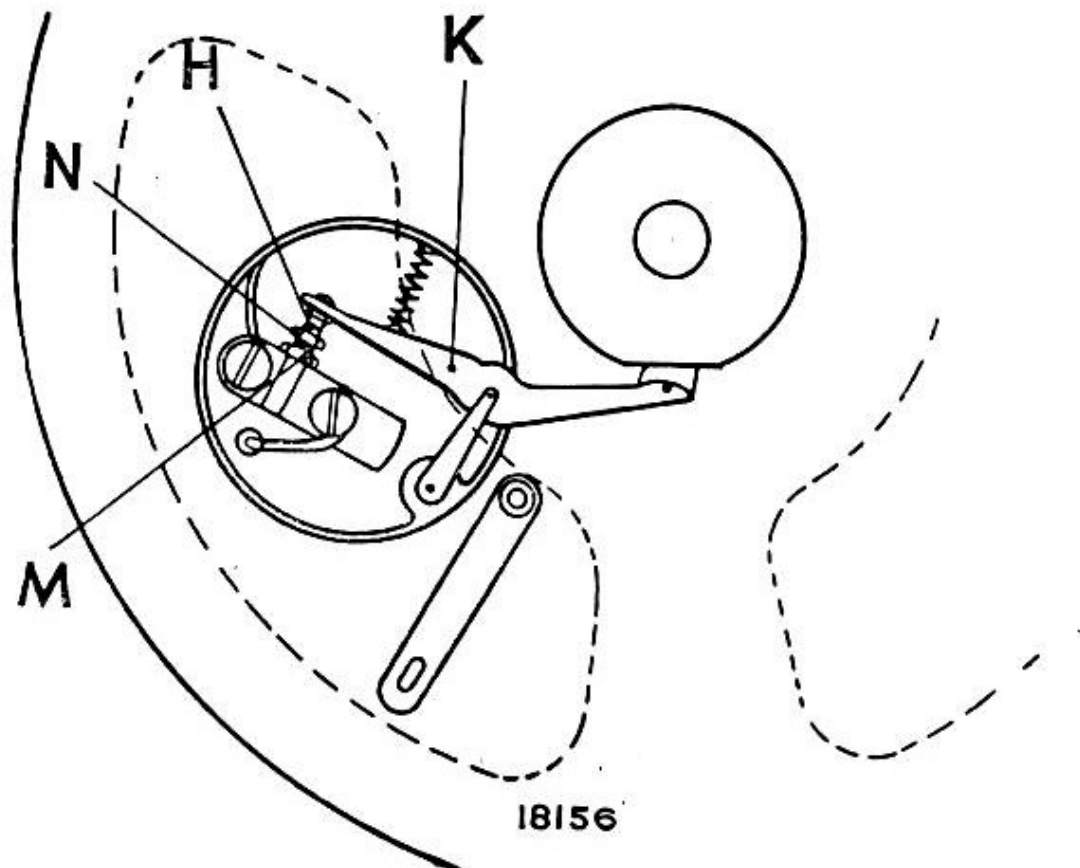


Figure 5 - Contact Breaker

H. Contact Breaker Points.

K. Rocker Arm.

M. Contact Screw Locknut.

N. Contact Screw.

SPARKING PLUG.

Clean and reset the points .025-inch 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 force but examine thread for any particles 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.

AIR CLEANER.

The air cleaner should be periodically examined and cleaned; when used under very dusty conditions frequent inspection is necessary. Running the engine with a choked air cleaner causes a very rich mixture to be drawn into the cylinder.

The cleaner should be washed every 100 hours or sooner, depending on dust conditions. To do this remove and submerge in petrol. Rinse and then dip c in engine oil.

HINTS AND TIPS.

1. Always thoroughly mix the oil and petrol before putting in tank.
1. 2. It is wise to filter your petrol mixture through a fine wire gauze when putting in tank.
2. Do not flood carburettor before starting when the engine is warm.
3. Stop engine by turning off fuel tap if engine is not to be used for several days.
4. Do not experiment with cheap sparking plugs—use type recommended.
5. Crank 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.
6. It is important that air leaks should be avoided at the following points :—
 - (a) Between inlet pipe and cylinder.
 - (b) Between inlet pipe and carburettor.
 - (c) Between cylinder base and crankcase.
 - (d) Between the two halves of crankcase.
7. When decarbonising the engine it is very important that silencers and exhaust pipes are also cleaned out.
8. Avoid all sharp bends in the carburettor control cables.

TO REMOVE LAND ROLL ASSEMBLY.

Remove chain case cover, remove land roll clutch assembly complete with chains. Unscrew chainwheel on land roll spindle (note—Left Hand Thread). To prevent the land roll spindle turning with the chainwheel, engage a key, Whig) can be provided, in the slot at the opposite end of the spindle. After removing the six setscrews (three on either side of the machine) which secure the land roll spindle bearing, the entire assembly may be dropped out of the main shell. Assemble in the reverse order.

TO REMOVE WOOD ROLL ASSEMBLY.

Loosen off height adjusting nuts and drop wood roll spindle until clear of the main shell. Loosen socket screws in both adjusting brackets and draw out wood roll spindle. If it is desired to remove the adjusting brackets, undo the height adjusting nuts and withdraw the brackets from their pivot pins. Assemble in the reverse order.

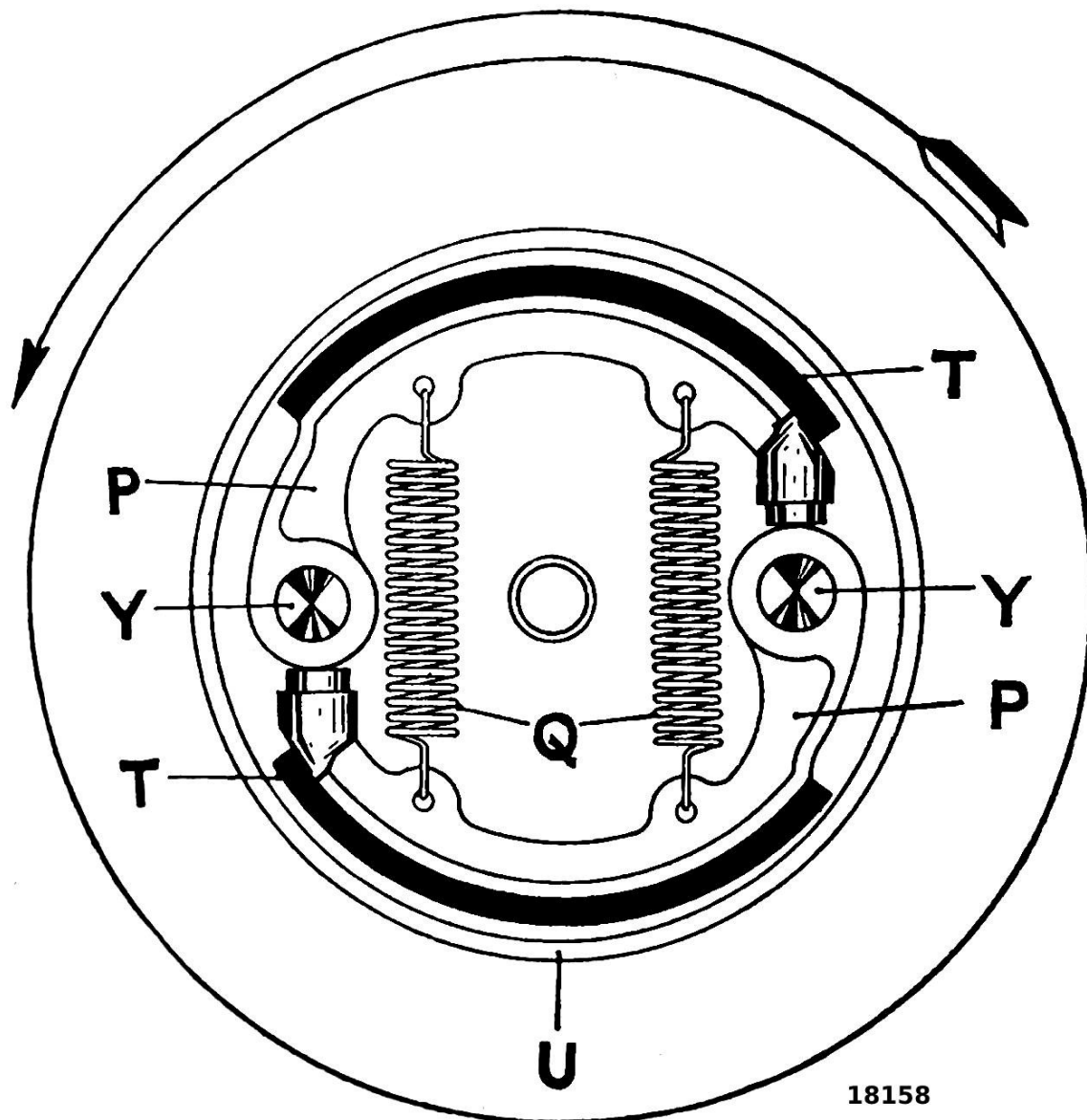


Figure 6 - Main Driving Clutch

TO TAKE CUTTING CYLINDER AND BOTTOM BLADE UNIT OUT OF MACHINE.

Remove chain case cover, concave, and chains. Unscrew the pinion securing screw by turning clockwise. Prevent the cylinder turning by placing a piece of wood in cutters and unscrew the pinion (L.H. thread). Remove the two screws on each side securing the cutting unit and the entire assembly can be dropped out of the machine.

WRITE TO THE MAKERS.

If anything goes wrong that you cannot correct, communicate at once with the Distributors who supplied the machine or with Ransomes Sims & Jefferies (Australia) Pty. Ltd., Clayton, Victoria.

Note. When ordering spares always quote registered number of the machine.