

INSTRUCTIONS

FOR THE

OPERATION AND MAINTENANCE

OF

Ransomes

MINOR MARK 6

MOTOR LAWN MOWER

RANSOMES SIMS & JEFFERIES, LIMITED

IPSWICH

OPERATING INSTRUCTIONS

Section 1.

BEFORE STARTING.

1. Make sure that the petrol tank is filled with the correct mixture of oil and petrol. (See instructions on tank.) $\frac{1}{2}$ pint of oil to 1 quart of petrol.
As the useful life and amount of good service the engine will give depends almost entirely upon the way it is lubricated, especially during the early stages of its life, it is advisable always to use one particular brand of oil. Ensure that the oil is thoroughly mixed with the petrol before putting into the fuel tank.

Recommended Lubricants for Engine.

SHELL	-	Tractor Oil 50 or Golden Shell
VACUUM	-	Mobiloil D
WAKEFIELD	-	Castrol XXL
PRICE'S	-	Engrol S.A.E. 60
ANGLO	-	Esolube 50

2. Lubricate the following:
 - (a) Land Rolls. A lubricator will be found in each roll below the surface through holes "N" (Fig. 1).
 - (b) Land Roll Spindle Bearings. Lubricator will be found on the underside of the bearings inside the main shell.
 - (c) Cutting Cylinder Bearings. Lubricators will be found on the underside of the bearings inside the main shell.
 - (d) Wood Rolls Spindle. This can be oiled in between the rolls and at each end.
 - (e) Starting Handle Axle, through a lubricator on the casting.
 - (f) Chains, Intermediate Chainwheel Bush and Top Bearing in Chaincase, can be lubricated occasionally when Chain Case Cover is removed. Also Sliding Clutch "G" (Fig. 4) should be lubricated occasionally.
3. Adjust the height of the handle to suit the operator by slackening off the two lower lock nuts on either side

- frame. When the correct height is found, tighten up the lock nuts.
4. Make sure the cutting cylinder is free, and correctly adjusted (see under "Cutting Adjustments") by turning over the clutch shaft once or twice with the hand.

TO START THE ENGINE WHEN COLD.

1. Disengage hand operated clutch "G" (Fig. 4.)
2. Pull on petrol tap beneath tank.
3. Close carburettor strangler by lifting end of lever.
4. Press tickler at side of carburettor body until petrol is seen to drip.
5. Open carburettor control lever on handle bar about one third of its full opening.
6. Engage starting handle and rotate briskly in a clockwise direction. As soon as the engine starts remove starting handle and return to holder.
7. After the engine has started, gradually open strangler as engine warms up.

TO START WHEN HOT.

The same procedure should be adopted except that it should not be necessary to close strangler or to flood carburettor 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.

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.

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 to 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.

RUNNING IN.

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

THE MACHINE AT WORK.

Section 2.

The machine is driven by the engine through a centrifugal clutch. This arrangement ensures that:—

- (a) The machine is automatically disengaged from the engine for starting.
- (b) The engine is automatically protected from overloads and thus prevented from stalling.
- (c) A single throttle lever gives the operator full command of the machine. If the throttle lever is fully closed, the engine should be idling and the machine should remain stationary. As the throttle is opened up the machine will automatically take up the drive. Should the machine at any time fail to take up the drive when the throttle is fully opened, close the throttle and free the cutting cylinder by turning the clutch shaft. Do not attempt to turn the cutting cylinder. When the obstruction is cleared, open up the throttle and continue cutting.

An additional hand operated clutch is incorporated with the automatic clutch to enable the engine to be entirely disconnected from the transmission should it be required to warm up or test the engine while the machine is stationary.

Before engaging the hand operated clutch, ensure that the throttle lever is closed and the engine idling. This will ensure that the automatic clutch is disengaged and that no shock will be incurred in the transmission by sudden engagement.

CUTTING ADJUSTMENTS.

For setting the knives a simple method is used, viz.:- To set the cutting cylinder closer to the bottom blade, rotate Adjusting Screws "A" (Fig. 1) on either side of the cutting unit in a 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

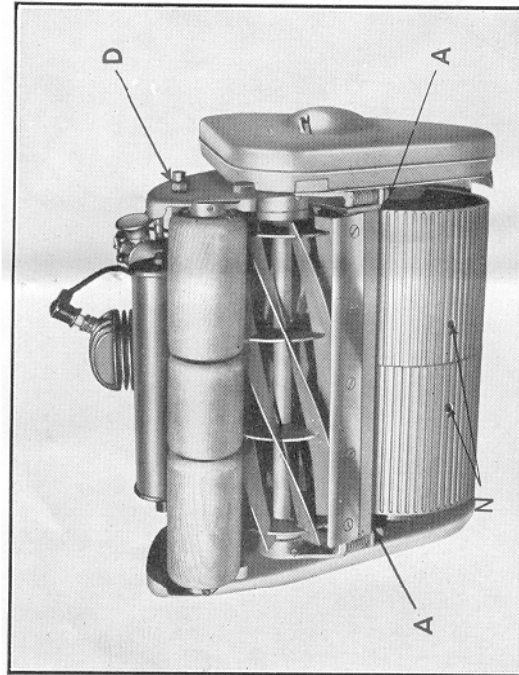


Figure 1

paper at the edge of the bottom blade. This test should be made over the entire width of the 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 the machine.

To alter height of cut. Slacken the nuts "D" (Fig. 1) and move the brackets up or down as required, care being taken to adjust both sides equally.

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 work heavily and the turf will be badly marked. It is a fallacy to think that grass can be cut shorter by having the blade hard on or touching the ground. If it is just clear of the ground it does not press the grass down and a cleaner cut is made.

To see if the machine is set correctly, tilt it 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 $\frac{3}{8}$ inch to $\frac{1}{2}$ inch and in wet weather $\frac{1}{4}$ inch to $\frac{3}{4}$ inch clearance should be allowed for the machine sinking into the turf.

MAINTENANCE AND REPAIRS.

Section 3.

PETROL FILTER.

A filter gauze is fitted to bolt connecting pipe to carburettor, and also to fuel tap in tank. These filters should be examined occasionally and cleaned by dipping in petrol.

CARBURETTOR.

This is the Villiers "Junior" type having a single control lever to throttle, and attached to the throttle is a taper needle which provides a correctly adjusted mixture at all throttle openings. The taper needle is correctly set before delivery, but if it is desired to make adjustments at any time, proceed as follows:—

First remove the throttle by unscrewing the top ring of the carburettor. At the top of the throttle there is a small screw: turning this in a clockwise direction—which lowers the needle—will give a weaker setting. For correct setting, screw down needle until the engine just begins to spit and



Figure 2.

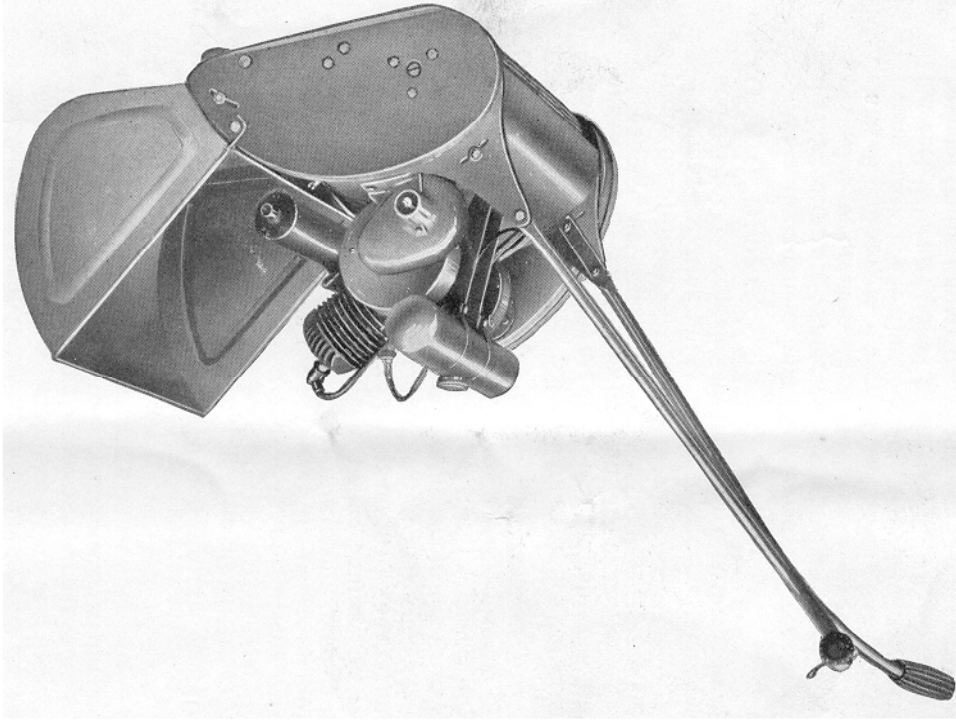


Figure 3

run unevenly, indicating too weak a mixture. Then raise needle just enough to ensure that the engine will run smoothly and evenly when warm by unscrewing the adjusting screws by approximately half a turn at a time.

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.

SPARKING PLUG.

Clean and reset the points .020 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 unscrewing the plug in the cylinder head, should any undue stiffness be experienced do not use 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.

CONTACT BREAKER.

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

Remove starting pulley (unscrew the central screw) and flywheel cover plate which is secured by three screws.

MAGNETO TIMING.

When the engine is built the magneto is timed so that the contact points commence to open when the piston is $\frac{3}{8}$ inches before top dead centre. An arrow is then stamped on the face of the flywheel boss in line with the timing mark cut in the end of the driving shaft. The flywheel is securely fixed to the taper shaft by using a hammer on the tommy bar of the box spanner provided with the engine.

Subsequent timing is simplified by placing the timing

marks opposite each other, but it is advisable to check before finally tightening flywheel.

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 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. When re-assembling, check the timing (see "Magneto Timing") both before and after tightening up the flywheel securing nut. This nut must be tightened up hard by hitting with a hammer on the end of the tommy bar.

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

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 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

$\frac{3}{8}$ inch 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 loss 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.

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 carburettor before starting when the 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 Reg. No. of machine when ordering spares or asking for advice. The number with prefix letters and/or numbers is stamped on the brass plate at rear of machine.
7. 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.

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 carburettor.
 - (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 carburettor control cables.

TRANSMISSION.

Chain Drives.

Adjustment of Cylinder and Land Roll Chain.

Remove wing nut and Chaincase cover. Slacken large hexagonal nut "C" (Fig. 4). Take hold of nut and

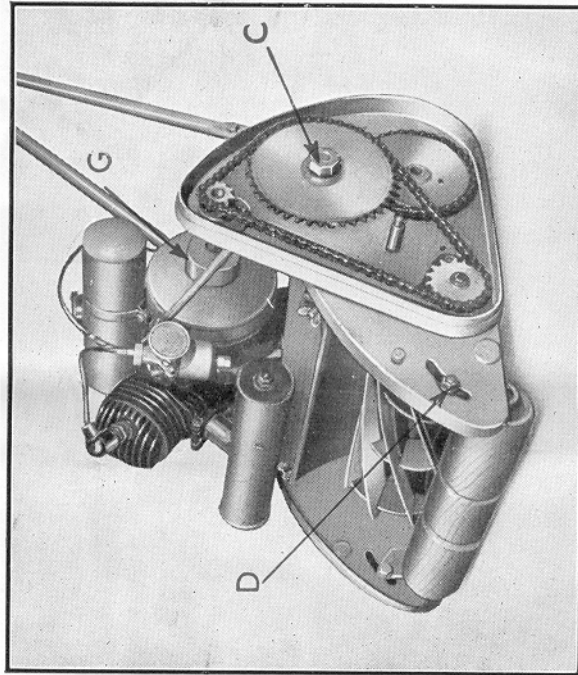


Figure 4.

large chainwheel and move the whole assembly in an upward direction to tighten the land roll drive chain. When chain becomes tight move whole assembly to the right to tighten the cutting cylinder chain while still maintaining the tension on the land roll chain. When both chains are adjusted to their correct tension tighten up the hex. nut "C" (Fig. 4).

Adjustment of Starting Chain.

Slacken the three setscrews securing the hand start casting to the top of machine. Slide the casting towards the rear of the machine. When the correct chain tension is obtained tighten up the three setscrews.

To Remove Cutting Unit.

Remove Chaincase cover, remove concave. Remove Cutting Cylinder Sprocket securing screw. Prevent Cutting Cylinder from turning by placing a piece of wood between the cutters and unscrew the Cutting Cylinder Sprocket. Note—Left Hand Thread on Cutting Cylinder Sprocket.

Take out the 4 screws (2 each side) securing the Cutting Unit and the entire assembly can be dropped clear of the machine.

To Remove Land Roll Assembly.

Remove Chaincase cover, remove chain adjusting nut and intermediate chainwheel 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 the key, provided in the tool kit, 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.