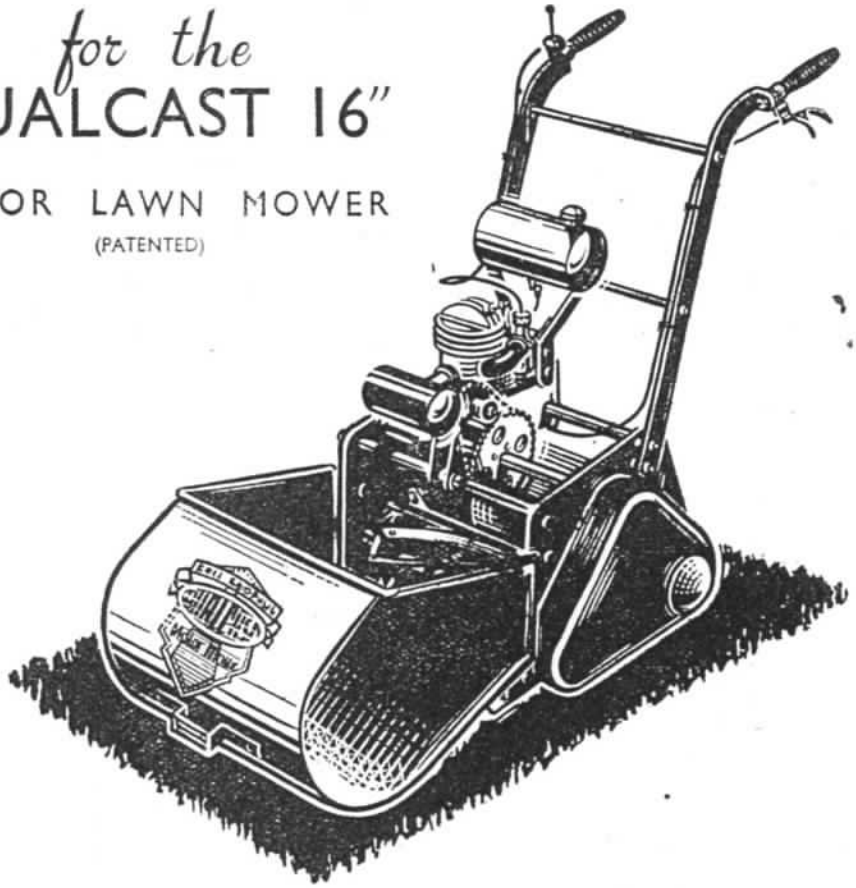
OPERATING MANUAL
and
SPARE PARTS LIST
for the
QUALCAST 16"
MOTOR LAWN MOWER
(PATENTED)



QUALCAST LIMITED
VICTORY ROAD • DERBY • ENGLAND

CABLES: QUALCAST DERBY · PHONE DERBY 2460 (8 LINES)

INSTRUCTIONS FOR USING

THE

"QUALCAST" 16" MOTOR LAWN MOWER

GENERAL ADVICE

THE "QUALCAST" MOTOR MOWER AND GRASS BOX are sent out from the Factory securely packed, and, when received, should be carefully examined to see that they have not been damaged in transit.

If damaged in any way, Carriers should be advised AT ONCE.

Before mowing, make sure that your lawn is quite free from stones, bones, wire, or other hard substances.

Never drive the machine over gravel paths without keeping the revolving cutting cylinder well clear of the ground.

If the grass is long, set the front wood roller carriers for high cutting at first, reducing the height once or twice until the minimum cut is attained. (See para. 16, fig. 9). Set the handles in the position most comfortable for your height. (See para 15, fig. 8). When mowing do not press down on the handles or uneven cutting may result.
Like all machinery, a mower beds down after use, and it is advisable to test the cutting cylinder, countershaft, and rear roller bearings from time to time to verify that there is no vertical or lateral play. (See pars. 12 and 13, figs. 5 and 6).

Do not race the engine. A speed of about 3½ miles per hour is recommended.

De-clutch when cornering and, if necessary, slightly close the throttle until you get used to the control, after which you can spin the mower round corners with the full drive engaged.

Oil and grease the working parts regularly. A grease gun is provided in the tool kit. (See para. 10, fig. 2).

When you have finished mowing, run the engine to a standstill with the petrol turned off. This drains the carburettor bowl and prevents the oil separating from the petrol and causing difficulty in starting the engine the next time the machine is used.

NEVER ATTEMPT TO REVOLVE THE CUTTING CYLINDER BY HAND UNLESS THE CLUTCH IS DISENGAGED OR THE PLUG LEAD IS DISCONNECTED.

In any communication re the "QUALCAST" MOTOR MOWER, always refer to the Machine number, which is stamped on the top of the right-hand side plate. Do not hesitate to approach your dealer if you are in any difficulty.

TO START.

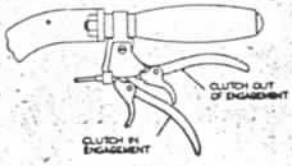


FIG. 1

Turn on the petrol, close the strangler, prime by tickler on top of the float chamber until the petrol just commences to overflow. Open the control lever about one quarter. See that the clutch is out of engagement (Fig. 1). Turn starting handle smartly.

After engine has started, gradually open strangler as engine warms up. Do not flood the carburettor or close the strangler when warm. When running normally, gently release the clutch lever.

FAILURE TO START.

This may be due to one or more of several causes, such as :—

(a) Lack of petrol supply, tap not being turned on, failure to flood the carburettor, obstructed pipe, choked jet.

(b) Too much petrol through excessive flooding, causing liquid petrol to accumulate in the crank case. If so, remove drain plug and turn starting handle smartly with throttle closed.

(c) Throttle open too wide. One quarter to one third is correct.

(d) Oil in jet or on the sparking plug points through oil settling at bottom of float chamber or tank. After use, always run engine to a standstill with petrol tap closed and shake main tank before starting up.

(e) Plug points foul or oiled up.

(f) No spark. Place plug body on top of cylinder with lead attached, but terminal clear and turn starting handle. There should be a spark at the points, but if not, inspect the contact points, clean or adjust if necessary to between .012" to .016" when fully open.

Also see if the rubber covering of the ignition lead is chafed or burnt. Alternatively, fit new plug or hold the end of the plug lead 1/8 in. from any clean metal part of the engine and turn the starting handle.

THE VILLIERS "MIDGET" ENGINE

The internal combustion engine in its simplest form.

This coupled with the fact that it is made by the largest makers of two-stroke engines in the World, means that it can be relied upon to give long and continuous service with an absolute minimum of trouble or attention.

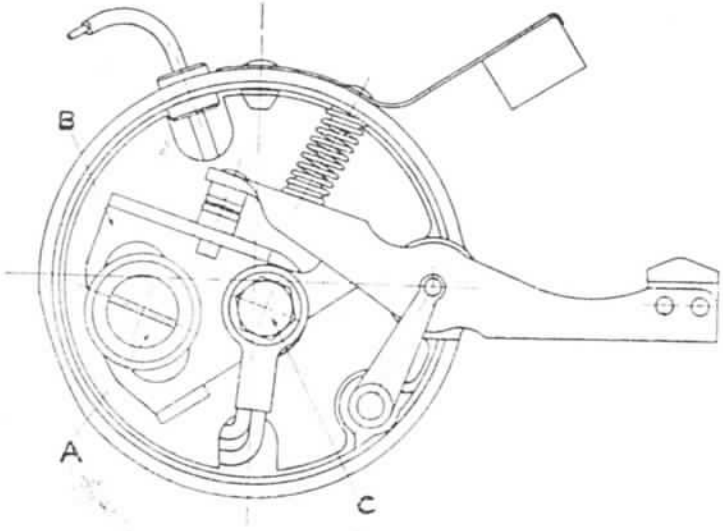
The following may, however, occur after extended usage :—

(a) Dirty plug (see Sparking Plug). Para. 9.

(b) Dirt in filters (see Filters). Para. 8.

Magneto—*contd.*

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 in. 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 pad moist give a drop of oil occasionally. A drop of petrol applied to the points will remove any oil.

Misfiring may sometimes be traced to the high tension cable becoming burned through being in contact with the hot cylinder and causing a short circuit.

To test the strength of the spark, place the body of the plug on the top of the cylinder with the terminal clear, and turn the starting handle.

5. 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 in. before top dead centre. An arrow is then stamped on the face of flywheel boss in line with the timing mark cut in end of driving shaft, and the flywheel securely fixed to taper shaft by using a hammer on the end of the "HAMMERTIGHT" spanner which can be obtained direct from Messrs. Villiers Eng. Co.

Subsequent timing is simplified by placing the timing marks opposite, but it is advisable to check before finally tightening flywheel.

6. 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 "HAMMERTIGHT" spanner mentioned above. This nut has a right-hand thread and is imprisoned in the flywheel,

Flywheel Removal—*contd.*

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 box spanner. The taper 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.

7. CARBURETTOR.

The carburettor is properly adjusted before leaving the Works, and should not need attention for some considerable time. If, however, there is back firing through the gauze air intake, this is caused by the mixture being too weak. The most likely cause may be a partially choked petrol supply.

Verify that the filters and petrol pipe are clear. If the trouble persists, remove the top ring cap and take out the brass slide.

With a small screwdriver inserted in the small screw head in the centre, unscrew half a turn, testing between each alteration, until the engine fires evenly, and without backfiring under load.

If the engine fires every alternate revolution, the mixture is too strong. Turn screw in top of throttle slide clockwise, half a turn, testing between each alteration until correct.

Should the float stick and the carburettor persist in flooding with the petrol tap open, a few light taps with a spanner on the bowl will usually effect a cure.

A rare cause of flooding is that the square float needle under the forked brass float toggle is not seated properly. The needle may be removed after the brass jet is taken out, first unscrewing the small round headed locking screw. After blowing through the orifice to remove any small particle of grit, tap the needle with a spanner to re-seat it, at the same time turning it round.

8. FILTERS.

There are two. One spear head shape, fitted into the petrol tap and inside the tank, and the other (tubular shape) in the bottom end of the petrol pipe where the petrol enters the carburettor.

If the pipe is removed from the carburrettor, see that the two thin fibre washers each side of the union are not lost, but replaced in the same order.

9. SPARKING PLUG.

Do not disturb the sparking plug unless you have reason to suspect it.

If cleaning is necessary, the central insulator may be removed by unscrewing the inside nut next to the porcelain. The former should then be cleaned with a little petrol. Do not use any sharp instrument on the surface of the porcelain.

Sparking Plug—*contd.*

Scrape carbon from the points, or if oily, clean with a little petrol, also see that the gap between the points and the central electrode is equal to the thickness of an ordinary visiting card (about 25 thousandths of an inch).

The adjustment of these points is quite easily effected by gently tapping towards the central electrode, being careful not to damage the insulation.

If the gap is too small, prise the points open with the blade of a penknife.

10. LUBRICATION (CHASSIS).

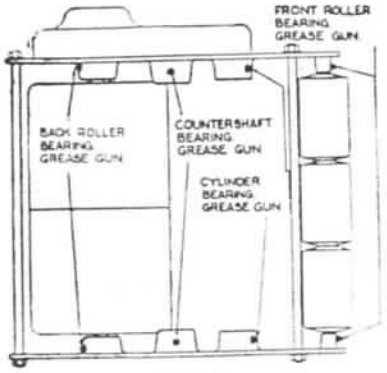


FIG. 2

A grease gun is supplied with every mower and, after filling with grease as per instructions attached, it should be applied to the six grease nipples. (See fig. 2).

After some time it is advisable to remove the bearing covers, pack the bearings with grease, and then use the grease nipples for "topping up."

The main driving and cylinder driving chains can be oiled direct by removing chain case. As an alternative lubricant, black graphite grease may be used.

11. ADJUSTMENT OF THE BOTTOM BLADE.

No attempt should be made to adjust the bottom blade until you are satisfied that the cylinder bearings are O.K., and that the blade and cutters are correctly lined up.

If the bottom blade is not in line with the edges of the spiral cutters, correction can be made by means of the two screws, N.124. (See fig. 4).

To bring the cutting edge of the bottom blade up closer to the cylinder, slacken wheels "A" anti-clockwise and tighten wheels "B" using the small tommy bar (provided with the tool kit) until thick paper can be cut. Lock in position by re-tightening wheels "A." (See fig. 3).

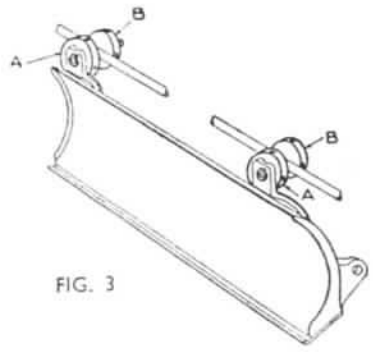


FIG. 3

Adjustment of the Bottom Blade—*contd.*

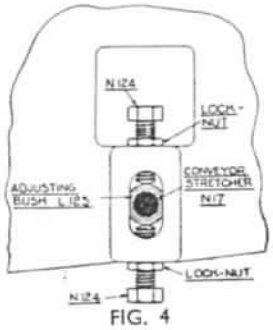


FIG. 4

On no account should the bottom blade be allowed to press too heavily on the cutter blades.

The adjustment is simplified if the machine is tilted backwards with the handles resting on the ground.

12. ADJUSTMENT OF CYLINDER BEARINGS.

Remove cover plate "A" and, after loosening locknut " C," slacken bolt " B " very slightly. Then, slacken locknut " F " and tighten adjusting nut " G " until all play is taken up, and, at the same time the cylinder can be turned freely. Lock into position with nut " F." Tighten set screw " B " firmly and lock with nut " C," When tightening screw " B " see that it is exactly in line with flat " H " on spindle. (See fig. 5).

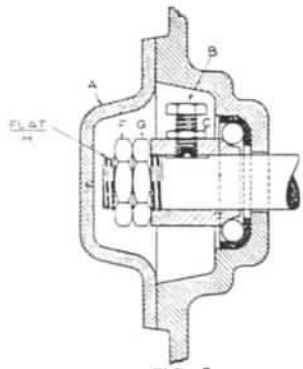


FIG. 5

13. ADJUSTMENT OF COUNTERSHAFT AND ROLLER BEARINGS.

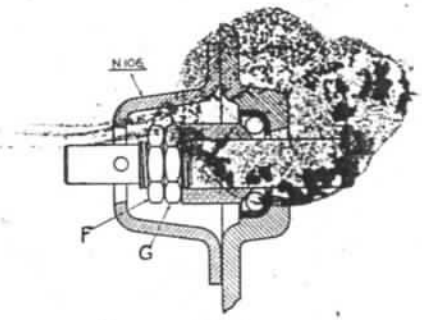


FIG. 6

The adjustment is similar to the above, except that set screws are not fitted to the cones. (See fig. 6).

14. ADJUSTING CLUTCH PUSH ROD.

Normally there should be about 1/8" slack between the nipple at the end of the clutch wire and the fork at the end of the clutch operating arm. If, through the clutch wire stretching or wear of the cork inserts, the back lash increases to the point where the clutch cannot be entirely freed even with the hand lever up and the trigger home, adjustment is necessary. A small amount of adjustment may be made by means of the cable adjustment screw, N.95A in the side plate.

A larger range of adjustment is available as follows :—

Press the clutch lever P.38 inwards towards the side plate and remove the cable.
Swing the clutch lever outwards and turn adjusting screw T.38B clockwise as required to effect adjustment, afterwards replacing the cable nipple in the forked end of the clutch lever. (See fig. 7).

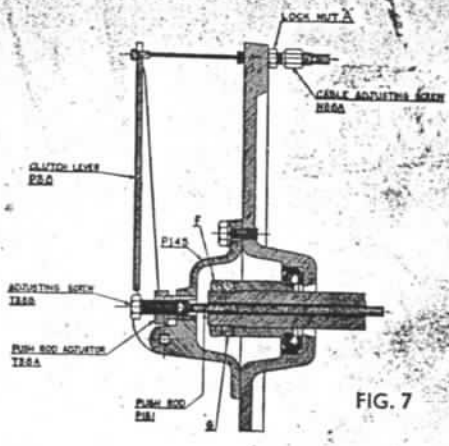


FIG. 7

15. ADJUSTMENT FOR HEIGHT OF USER.

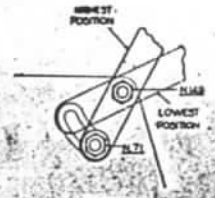


FIG. 8

Loosen the two nuts at the bottom of the handle arms and move through quadrant to required height, then re-tighten nuts. (See fig. 8).

16. ADJUSTMENT FOR HEIGHT OF CUT.

This is done by raising or lowering, as required, the front roller.

Loosen the nuts which secure the roller carriers, adjust the rollers to the required height, and re-tighten the nuts. (See fig. 9).

Note.—See that the wooden roller is parallel to the rear roller.

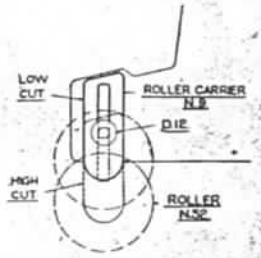


FIG. 9

17. TENSION OF CHAINS.

This should be such that one side, at a point equi-distant from the sprockets, may be moved transversely with the fingers about 3/4".

18. TO ADJUST PRIMARY CHAIN.

Slacken nut N.149 at end of stretcher, and nut N.83 bearing on small engine plate stretcher. By turning screw N.83 anti-clockwise, you lower the engine and slacken the chain.

When the chain is at the correct tension, re-tighten the lock nut N.83 and the nuts on the end of the rear stretcher. (See fig 10).

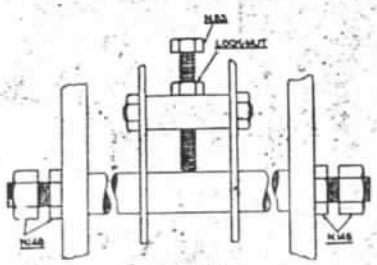


FIG. 10

19. TO ADJUST CYLINDER DRIVING CHAINS.

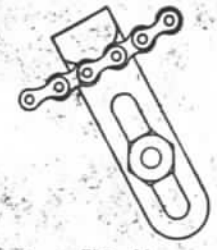
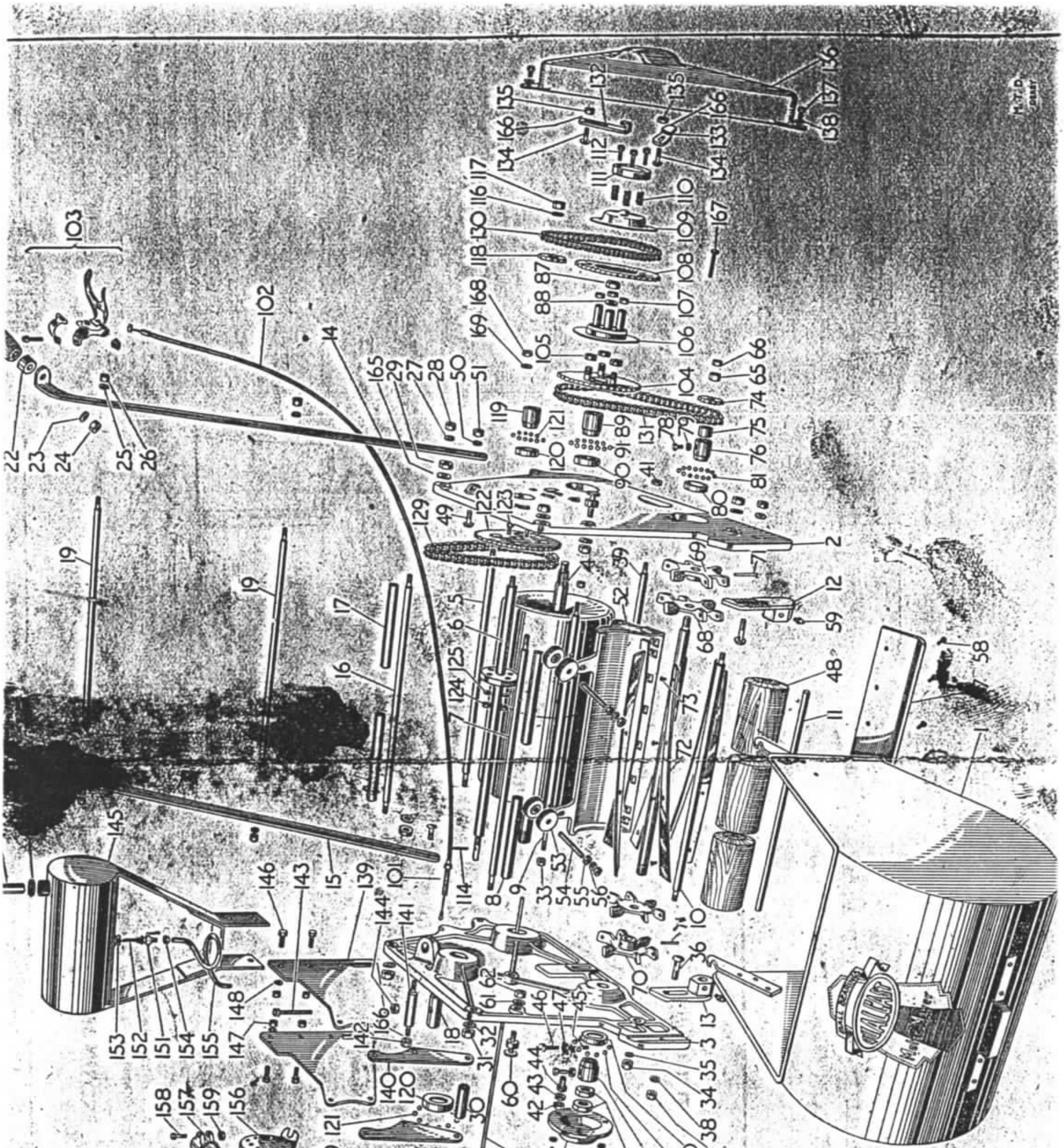


FIG. 11


FIG. 12

Remove chain case cover and take up any slack by adjusting either or both of the chain tensioners allowing 3/4" of transverse movement of the chains. (See figs. 11 and 12).

IF YOU WANT A SMALL HAND MACHINE FOR CUTTING NARROW BORDERS, APPLY TO QUALCAST LIMITED, WHO CAN SUPPLY A SUITABLE MOWER FOR THE PURPOSE.



MODEL "P" 1947 MOWER

Part No.	Description.	No. off	Plate ref.
P.39	Box, Grass Assy.	1	1
P.6	Sideplate, L.H.	1	2
P.5	Sideplate, R.H.	1	3
N.24	Stretcher, Rear, Bottom	1	5
	Nut (for Bottom Rear Stretcher)	2	168
N.118.B	Washer, Spring (for Bottom Rear Stretcher)	2	169
N.148	Stretcher, Top Front	1	7
	Nut (for Top Front Stretcher)	2	31
N.118.C	Washer (for Top Front Stretcher)	2	32
P.80.B	Tube, Distance Outer, Front	2	8
P.78	Tube, Distance Centre, Front	1	30
P.103	Stretcher, Conveyor Adjusting	1	9
	Nut (for Conveyor Adjusting Stretcher)	2	33
N.24	Stretcher, Front	1	10
	Nut (for Front Stretcher)	1	34
N.118.B	Washer (for Front Stretcher)	1	35
P.33	Spindle, Front Roller	1	11
P.32.A	Roller, Front	3	48
P.9	Carrier Roller, L.H.	1	12
P.56	Carrier Roller, R.H.	1	13
N.157	Greaser	2	59
D.12	Bolt (for Roller Carrier)	2	36
	Nut (for Roller Carrier Bolt)	2	37
E.88	Washer (for Roller Carrier Bolt)	2	38
P.17	Stretcher, Conveyor Bottom	1	39
	Nut (for Conveyor Bottom Stretcher)	1	41
	Nut (for Conveyor Bottom Stretcher)	1	42
N.118.B	Washer (for Conveyor Bottom Stretcher)	2	43
L.123	Bush, Bottom Blade Aligning	1	44
N.124.A	Screw, Set, Headless (for Bottom Blade Aligning Bush)	1	45
N.124	Screw, Set (for Bottom Blade Aligning Bush)	1	46
	Nut, Lock (for Bottom Blade Aligning Bush)	2	47
N.149	Stretcher, Top, Rear	1	16
	Nut, Lock (for Top Rear Stretcher)	2	29
M.13	Nut (for Top Rear Stretcher)	2	28
P.80.C	Washer (for Top Rear Stretcher)	2	27
P.78.A	Tube, Distance, Outer, Rear	2	17
N.90	Tube, Distance, Centre, Rear	1	18
P.57	Arm, Handle, L.H.	1	14
N.73	Arm, Handle, R.H.	1	15
N.118.B	Stretcher, Handle Arm	2	19
P.58	Nut (for Handle Arm Stretcher)	4	26
P.110	Washer (for Handle Arm Stretcher)	4	25
N.85	Handle	2	20
L.88	Ferrule	2	22
N.71	Bolt (for Handle)	2	21
M.13	Nut (for Handle Bolt)	2	24
P.15.C	Washer (for Handle Bolt)	2	23
N.69	Bolt (Handle Arm Adjusting)	2	49
N.11	Nut (Handle Arm Adjusting)	3	51
L.118	Washer (for Handle Arm Adjusting Bolt)	3	50
P.23	Conveyor	1	52
N.16	Handwheel	1	53
N.119	Screw, Conveyor Adjusting	2	54
	Nut (for Conveyor Adjusting Screw)	4	55
	Washer (for Conveyor Adjusting Screw)	2	56
	Blade, Bottom	1	57
	Screw (for Bottom Blade)	6	58
	Stop, Grass Box	2	60
	Nut (for Grass Box Stop)	2	62

Part No.	*Description*	*No. off*	*Plate ref.*
N.118.B	Washer (for Grass Box Stop)	2	61
P.19.B	Spindle, Cylinder	1	64
	Nut (for Cylinder Spindle)	1	65
	Nut, Lock (for Cylinder Spindle)	1	66
	Nut (for Cylinder Spindle Adjusting Bearing)	2	67
N.52	Spider, Centre	2	68
N.75	Spider, L.H.	1	69
N.20	Spider, R.H.	1	70
Q.21	Pin, Taper	2	71
N.18	Blade, Spiral	6	72
Q.22	Rivet (for Blades)	24	73
P.18.A	Cylinder Assembly (comprises Items 64—73)	1	—
P.67	Sprocket, Cylinder, 8 Teeth	1	74
P.197	Piece, Distance, Cylinder Cone	1	75
P.184	Cone, Cylinder, L.H.	1	76
P.182	Cone, Cylinder, R.H.	1	77
P.187	Setscrew (for Cylinder Cones)	2	78
	Nut (for Cylinder Cone Setscrew)	2	79
P.185	Cup, Cylinder Bearing	2	80
P.186.A	Balls, Cylinder Bearings	24	81
P.107	Cover, Cylinder Spindle End	1	82
L.124	Setscrew (for Cylinder Spindle End Cover)	3	83
	Washer (for Cylinder Spindle End Cover Setscrew)	3	84
P.1.A	Roller, Back Assembly	1	4
P.63	Nut (for Back Roller Shaft Adjusting Bearing)	2	86
	Nut (for Back Roller Shaft Adjusting Bearing)	1	87
N.118.C	Washer (for Back Roller Shaft)	1	88
P.183	Cone, Back Roller Bearing	2	89
P.185	Cup, Back Roller Bearing	2	90
P.186.A	Balls, Back Roller Bearings	24	91
P.151.A	Rod, Push, Clutch	1	92
T.38.A	Adjuster, Push Rod	1	93
T.38.B	Screw, Adjuster	1	94
P. 38	Lever, Clutch	1	95
T.98.A	Bolt, Hinge, Clutch Lever	1	96
	Nut (for Clutch Lever Hinge Bolt)	1	97
P.143	Bracket, Clutch Lever	1	98
L.124	Screw (for Clutch Lever Bracket)	3	99
N.118.A	Washer (for Clutch Lever Bracket	3	100
N.96.A	Screw, Cable Adjusting	1	101
N.95	Cable, Clutch	1	102
N.24	Lever, Hand, Clutch Assembly	1	103
P.74–1	Sprocket, 42 Teeth	1	104
P.74–2	Piece, Distance	3	105
P.74–3	Plate, Driven	1	106
P.74–4	Nut	3	107
P.74–5	Sprocket, Cork Centre, 42 Teeth	1	108
P.74–6	Plate, Driving	1	109
P.74–7	Spring, Clutch	3	110
P.74–8	Cap, End	1	111
P.74–9	Screw	3	112
P.74	Clutch Assembly (comprises Items 104—112)	1	—
P.128	Countershaft	1	6
	Nut (for Countershaft Adjusting Bearing)	2	115
	Nut (for Countershaft Adjusting Bearing)	1	117
N.155	Pin, Taper	1	114
	Washer (for Countershaft)	1	116
P.190	Sprocket, Small, Countershaft, 10 Teeth	1	118
P.183	Cone, Countershaft Bearing	2	119
P.185	Cup, Countershaft Bearing	2	120
P.186.A	Balls, Countershaft Bearing	24	121

Part No.	Description	No. off	Plate ref.
P.146	Sprocket, Large, Countershaft, 42 Teeth	1	122
N.109	Bolt (for Large Countershaft Sprocket)	4	123
	Nut (for Large Countershaft Sprocket Bolt)	4	124
N.118.A	Washer (for Large Countershaft Sprocket Bolt)	4	125
N.106	Cover, Countershaft Bearing	1	126
L.124	Setscrew (for Countershaft Bearing Cover)	3	127
N.118.A	Washer (for Countershaft Bearing Cover Setscrew)	3	128
P.70	Chain, Primary	1	129
P.68	Chain, Secondary	1	130
P.68	Chain, Secondary	1	131
P.144.A	Skate, Chain	1	132
P.191	Skate, Chain	1	133
L.118	Washer (for Chain Skates)	2	166
D.12	Bolt (for Chain Skates)	2	134
	Nut (for Chain Skates Bolt)	2	135
P.105.B	Cover, Chain	1	136
L.124	Setscrew (for Chain Cover)	3	137
N.118.A	Washer (for Chain Cover Setscrew)	3	138
P.66.A	Plate, Engine, Rear	2	139
P.65.A	Plate, Engine, Front	2	140
P.82	Stretcher, Countershaft Chain Adjusting	1	141
	Nut (for Countershaft Adjusting Chain Stretcher)	2	142
N.83	Setscrew, Adjusting	1	143
	Nut (for Adjusting Setscrew)	1	144
T.41.B	Tank, Petrol	1	145
N.109	Bolt (Petrol Tank to Engine Plate)	4	146
	Nut (Petrol Tank to Engine Plate Bolt)	4	147
N.118.A	Washer (Petrol Tank to Engine Plate Bolt)	4	148
P.210	Cap, Filler, with Oil Measure	1	149
N.211	Washer, Joint	1	150
N.177	Tap, Petrol	1	151
	Nut (for Petrol Tap)	1	154
N.176	Filter	1	152
T.309	Washer, Joint	1	153
P.152.B	Pipe, Petrol	1	155
T.62	Silencer	1	156
T.198	Clip, Silencer	1	157
N.166	Bolt (for Silencer Clip)	1	158
	Nut (for Silencer Clip Bolt)	1	159
P.142	Handle, Starting	1	160
P.129	Bar, Tommy	1	161
N.34	Spanner	1	162
N.111	Spanner, Movable	1	163
N.118.B	Washer (for Conveyor Adjusting Stretcher)	2	164
N.118.C	Washer (for Top Rear Stretcher)	2	165
L.118	Washer (for Contershaft Adjusting Chain Stretcher)	2	166
P.151.B	Rod, Push, Flat Headed (for Clutch)	1	167