



*By Appointment to  
Her Majesty the Queen  
Manufacturers of Motor Mowers  
Charles H. Pugh Ltd. Birmingham*

The

**ATCO**

Power Mowers

MANUAL

THE  
**ATCO**  
POWER MOWER  
MANUAL



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## HINTS ABOUT POWER MOWING

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Brought together in this form from conversations and correspondence with practical users of every description from 1921 onwards and blended with our own mowing experience and that of Atco Service Branches who are able to observe the behaviour of Atco Products on the lawns, playing fields and other areas throughout Great Britain.

The Hints are based on a paper written some years ago by a former Director who had been an enthusiastic motor mowing practitioner before the first Atco was made.

If, in printing a revised version, they appear old-fashioned here and there, it is probably due to our desire not to lose the atmosphere of enthusiasm and good sense which characterised his notes.

Charles H. Pugh Limited.

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## ABOUT POWER MOWING

I have motor-mowed lawns one way or another and with various machines for what seems ages: every growing season, including a little, as far as the ration permitted, each year of World War II.

That shows I am getting a lot older now and with it more inclined to be lazy and save myself toil and irritation. One difficulty about long experience is that some of the hints and things must have appealed to me differently when I was 21, 30, 40, and so on. However, that is inevitable in life and one can only hope that the principle of an ordered approach to the task may be helped by these notes. In any event, I admit that I often fail to do the things at all, let alone often enough: including witlessly forgetting on one occasion to mow before the Garden Fete!

I have also had to endure the calamitous hair raisers and disturbers of that much desired green sward tranquility, such as cows getting in, digging dogs, subterranean invasion by moles and so forth, just as we most of us experience. I have likewise failed my loving family and household on occasions in this matter: and more than once emptied grassful trouser turnups indoors, which is why if you ever saw me using my best garden ally, it would nearly always be with trousers tucked into socks! Well here goes—where do I start? Not with buying the machine of the right size, shape, style. That I assume has been done and, I hope, correctly, after weighing-up the lawns, the mowing job and the pros and cons generally. If not, somebody is going to be in the long grass in several senses.



No, I will start on the lawn itself by saying that, belonging to what is by far the greatest number of the motor mowing community, I am happy if my lawn area looks nice and green and

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*... instruction for his household some of them from an early age.*

*... prevents costly damage by using a mower carrier when traversing yards and paths.*



sheer after mowing and for several days thereafter. Down the years I have had several campaigns aimed at making and keeping them up to a perfectionist's standard, but I have always (such is human frailty) relapsed; and so we are dealing with an average greensward by no means inhabited exclusively by the finer or even passable grasses.

In any event the minority who are either rich enough or enthusiastic enough or are compelled to maintain bowling green/golf green standards (or similar) will certainly have to be more punctilious about my Hints than I could ever be. They will also have to have more time, more skill and more help than comes the way of most of us.

Well then we have a greensward of a kind and a motor mower to tend it with, quite the principal labour saving tool we shall employ in the garden.

Here follow some "articles of faith" which would have saved me, if meticulously followed down the years, most of the pitfalls which confront us all from time to time on the lawns.

### GENERAL

1. Uncharitable, but sound: don't lend it to anyone!
2. Get things right about the fuel, etc., from the start and secure continuity.
3. At the right age get your family keen on learning the proper management of the job. This for educational as well as home maintenance reasons.
4. House it under cover, reasonably dry, away from corrosion-causing chemicals; and as near the greensward as possible. Prevent costly damage by using a mower carrier

when traversing yards and paths. Try to prevent it being used as a shelf for old sacks and what not, or as a prop for spades and other implements. Also ensure if you can that its rightful place is respected and that you can always get it in and out without clearing a way for it.

5. Brush and wipe the bits off it in two or three minutes "after" use (not "before") and, supposing the actual mowing to be an hour or so a week (pro rata for the wrong sized equipment) use the oil can or grease gun every two or three times of using. Don't forget the front roller, which is so often left until it literally screams for oil in an alarmingly realistic imitation of some much worse trouble!
6. Prevent self-styled engineers with time on their hands from tampering with it, whatever their qualifications.
7. House any Lawn Edge Trimmer you use handy to the motor mower and treat it equally well.
8. Don't ever "savage" the machine as I confess that occasionally the years have seen me do — always disadvantageously and often painfully. There are many ways of "savaging" but I need only cite three:

(1) If you have a kickstart, engage the lever or striker first before "kicking". Anything more "savage" than to bash the thing into engagement all in one terrific kick is hard to imagine.



(2) If you have a *recoil* starter don't pull until you (likewise) have taken-up the play and don't "try" to pull it away from its anchorage at the finish of the pull.

*Prevent self-styled engineers with time on their hands from tampering with it.*

*... don't try to pull the recoil starter away from its anchorage.*



- (3) Don't go on at either when there is obviously "nil" result: seek the cause of not starting, using the process of elimination suggested in the instructions.
9. You ought to fill tanks through a funnel and filter and keep it with the machine; not only to filter fuel but to minimise spilling, even if you have a spout on your reservoir can. Some people use an old nylon stocking as a sieve in the funnel. If you (or the borrowing gang) decide you must do without, then refuel on a path or at least where some inevitable spill will not matter. Incidentally, if you are fairly conscientious about all these contributory matters, you need hardly fear carburetter flooding.
10. But if you get it, turn off petrol and stuff a rag under the overflow until you can move on to a non-lawn place to deal with the situation.
11. It generally pays to move the machine off the grass for adjustments. Although in this I have been at fault very often, you can spill fuel or oil by tipping the machine back on its handles for attention. Always turn off the petrol before tipping the machine in this way.
12. When you have got down to a "routine", subject to minor variants to suit varying conditions, a general rule of price-less value is "Let Well Alone".

## ME AND MY MOWING

I don't think the fact that everyone is so much more mechanically-minded in this second half of the twentieth century or the attitude that one knows the lot from experience at push mowing, are sufficient reasons for omitting the following items.

1. Vary the mowing plan, the depth of turning-headlands, and the directions of mowing because this will be good for

the lawns and for you, but do this as a variation on what you have established by experience as the standard cut for the shapes and slopes concerned.

There is often scope for some re-shaping of the lawns and mown area which alters and improves the garden's appearance as well as facilitating our work. This extends to the siting of new shrubs and bulb naturalising operations but perhaps not to moving well-established favourites.

2. No edge trimmer of my experience does well if the edges are not firm, sheer and sufficiently deep. Twice a year the special D-shaped tool should be used to help recover the required condition and thus ensure that the edges embellish the greensward.



3. Don't shave the lawns! It exhausts the sward, makes the job unnecessarily exacting on driver and machine, and is undesirable except for highly specialised requirements. It is better to mow more frequently and less closely. I would, from long experience, go further and say that nothing I know of benefits the conditions of the sward more than a "regime of frequent mowing but not so close as, for example, for a bowling green". Such a regime enabled the grass to battle with most obnoxious weeds and cultivate a beautiful "nap" long before the additional aid of selective and other weed killers appeared on the garden scene.



4. Carefully search for and remove all stones, sticks and other hard objects from the lawn area to be mown.
5. Do not hurry or race. Better do the job in two bites at the speed which gives the right feel. Speeding sets up all sorts of stresses in man and machine, spoils any gentle-smoothing effect, causes imperceptible bumping and "lift" or worse, and makes it difficult for the blades to gather their proper "mouthful". There exists — even in the best regulated establishments — the risk of loose or anchored hard objects which reach the blades despite the driver's undeviating vigilance. At slow and permissible speeds the danger of damage to properly made blades is slight, although the "cut" may require re-adjusting after a particularly unyielding thump or crack. At a jog trot the risk of damage is vastly increased. Flat out, sooner or later even the best machine is liable to shed some hard substances of its own to add to the menace and impair its efficiency. Which reminds me, a spanner around the nuts occasionally is a very worthwhile precaution.
6. Grass disposal gives great scope for personal taste and I will only venture some remarks compiled from my own preferences and those of some of my brother users in our numerous category. I have rotted it down for compost spread it thinly around shrubberies, given some to hens, etc. All these solutions have a place in the general scheme; none are completely proof against, for instance, the menace of straying hens or blackbirds, whose backheeling methods of foraging sprays grass and leaves over considerable distances.

Certainly the grass should not be "flown" unboxed by our category of user, when it is long enough or can become

moist enough to stick to the rollers, one's shoes or a rolling ball.

A hessian square laid out to plan is one good receptacle on which to empty the grass box provided it is "shouldered" and taken to the emptying place before being overfilled. The wheelbarrow with or without extensions is a time honoured maid of all work, and a routine worked out around it as the central piece in the transfer of grassbox contents to final destination is probably the most generally adopted plan.

There is a caveat here, that many may not agree with but I feel I would like to put it in. It is much more strain for me (and was even when young and very vigorous) to tip the wheelbarrow load into the main heap than to scoop the contents out with two suitably shaped boards or, failing this, both hands with fingers open.

7. One of the advantages of the power propelled machine is that you can mow in much wetter and more awkward conditions thus avoiding postponement and nervous irritation arising therefrom. This is equally true of mowing grass that has been recently sown as, provided the cutter is cutting cleanly along its whole length, there is very little tendency to drag the new grass up by its roots.
8. The amount of overlap of swathes comes with practice and is part of the general routine when established; so is the mowing of banks and undulations, the latter feature being incorporated in the writer's lawns wherever feasible, to give the effect of miniature downlands.

#### LASTLY

When the task is reduced to a routine which may be followed (with deviations) throughout the 30 or 40 mowings of the average



*Speeding can cause bumping and lift, or worse . . .*

English season, it has always been for this writer healthful exercise well within his capacity for these many years and likewise for his household, some of them from an early age.

It is rewarding work, for, if done nicely, the greensward, however heterogeneous in its botanical make-up, is a satisfying sight, and is and has been the basic feature of the garden from the day when "expert scythesmen cut it and huge stone or iron cylinders rolled it", as a 17th century continental visitor wrote.

It is an act of husbandry that should be good for the mind no less than the figure. If at times, it mortifies the flesh and the soul, it will, in my impartial experience, be due much more often than not to some oversight in our preparedness or some chance interruption.

To those few who have got as far as this, the opportunity now arises to say two things.

First, wish them as much pleasure as I derive from mowing. Second, to plead that I have tried hard not to dogmatise in a matter where dogmatism would not be tolerated anyhow.

#### CONCLUSION

We owe so much to the specialists and scientists, whether at Research Establishments or associated with firms of seedsmen and suppliers of garden requirements, as well as to private pioneers and travellers and the gardening journalists, that it would be ungrateful to conclude without referring to the advice and help which they can give in matters of the greensward and the garden.

We salute them for all they have done and continue to do over a vast field which we leave to them with a sense of confidence and considerable relief.

Theirs is a great part in securing for us and for posterity the beauty and the joy of the garden scene.

CHARLES H. PUGH LIMITED.

# LAWN CONSTRUCTION AND MAINTENANCE

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A well kept lawn is a feature of our gardens and helps to bring out the character and beauty of its surroundings. It is also a thing of beauty in itself if constructed and maintained in a proper manner.

It is a mistake to assume that “grass just grows” and that a good lawn can be made and maintained without any work. On the other hand the number of subjects covered in the following notes might suggest that an impossible task is being given. The reader will find, however, that intelligent application of suitable sections will produce results with much less trouble than might at first be anticipated.

## CONSTRUCTION OF NEW LAWNS

### 1. Levelling

Minor adjustments in existing levels can be accomplished by moving top soil or by importing additional top soil. However, it is important that no less than 4 in. of good top soil should remain on the surface so that major adjustments must be made in the sub-soil. This calls for the careful removal and preservation of the top soil, grading in the sub-soil and then returning the top soil evenly. At no time should top soil and sub-soil be mixed.

### 2. Drainage

It is difficult to give a general guide here. On many lawns drainage will not be required; on some, a simple rubble



drain terminating in a rubble filled sump or soak-away will be sufficient, whilst others may need a tile drain system possibly connected to the Local Authority's storm water drains (if permission can be obtained).

### 3. Preparation

The top soil should be well dug over and thoroughly cultivated. Ideally it should be left in a dug condition over winter and cultivated all the following summer at intervals as a fallowing operation to get rid of weeds. Ultimately we require a firm, fine seed bed as clean as possible of rubbish and, of course, during the work required all sizeable stones and roots of grasses and weeds should be got rid of.

### 4. Soil Improvement

On very heavy soils it is an advantage to cultivate into the soil coarse gritty material like sharp sand and organic matter such as well rotted farmyard manure or fine peat, leaf mould, etc. On light soils also organic matter is advantageous.

Chemical improvement of the soil may also be required. If it is acid, lime will be needed but this should be avoided unless proved necessary.

Fertilizer treatment will also be required, and a week or ten days before seeding a good general fertilizer should be applied, unless the ground is known to be rich.

(See MAINTENANCE No. 3—Fertilizer Treatment (Feeding). When turfing it is often sufficient to apply 1-2 ozs. of bone meal per square yard plus some potash fertilizer if the soil is light and sandy or known to be deficient in potash.

### 5. Seeding or Turfing

It can be taken that seeding is cheaper and more satisfactory in the long run if the preparatory work is efficient. Turfing, however, is quicker and will cover a multitude of sins. It is however, difficult to get hold of good turf. General preparation for turfing is the same as for seeding.

### 6. Seeding

Whilst a spring sowing is reasonable, particularly if it is possible to water, best results are usually obtained from a sowing at the end of the summer, say the last week in August. Seed sown at this time is sown in warm soil and once there is sufficient water for it to germinate and establish, there is usually little risk of drought and the grass gets well away before any severe winter weather. A sowing at this time is also less likely to be adversely affected by weeds. With a spring sowing one is liable to run into a dry May just when the grass is most susceptible and, of course, weeds generally get away vigorously.

A suitable seeds mixture for a really fine lawn for ornamental purposes or for first class tennis, etc., consists of:

8 parts Chewings' fescue  
2 parts Browntop

to be sown at the rate of 1 oz. per square yard. For second quality lawns, other grasses such as Crested dogstail can be added. One can also buy a proprietary mixture when roughly speaking, the more one pays the better the mixture.

The seed should be spread as carefully as possible by hand dividing it into small portions to cover measured areas evenly.

7. Immediate after care of sown turf

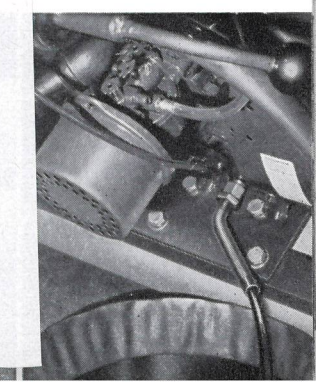
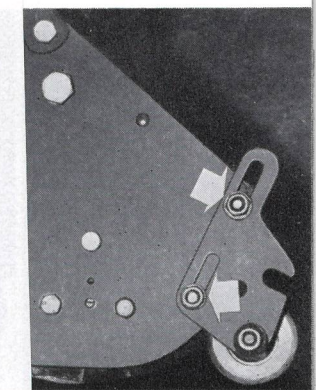
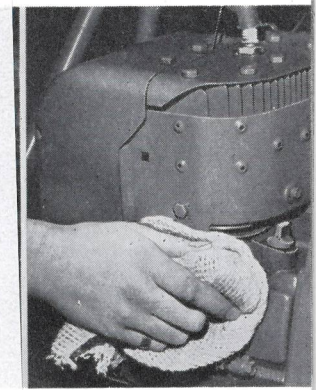
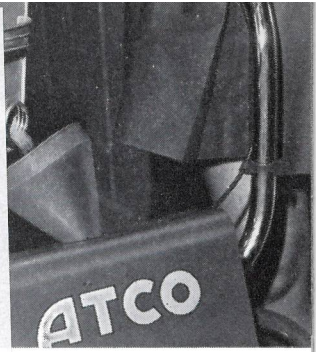
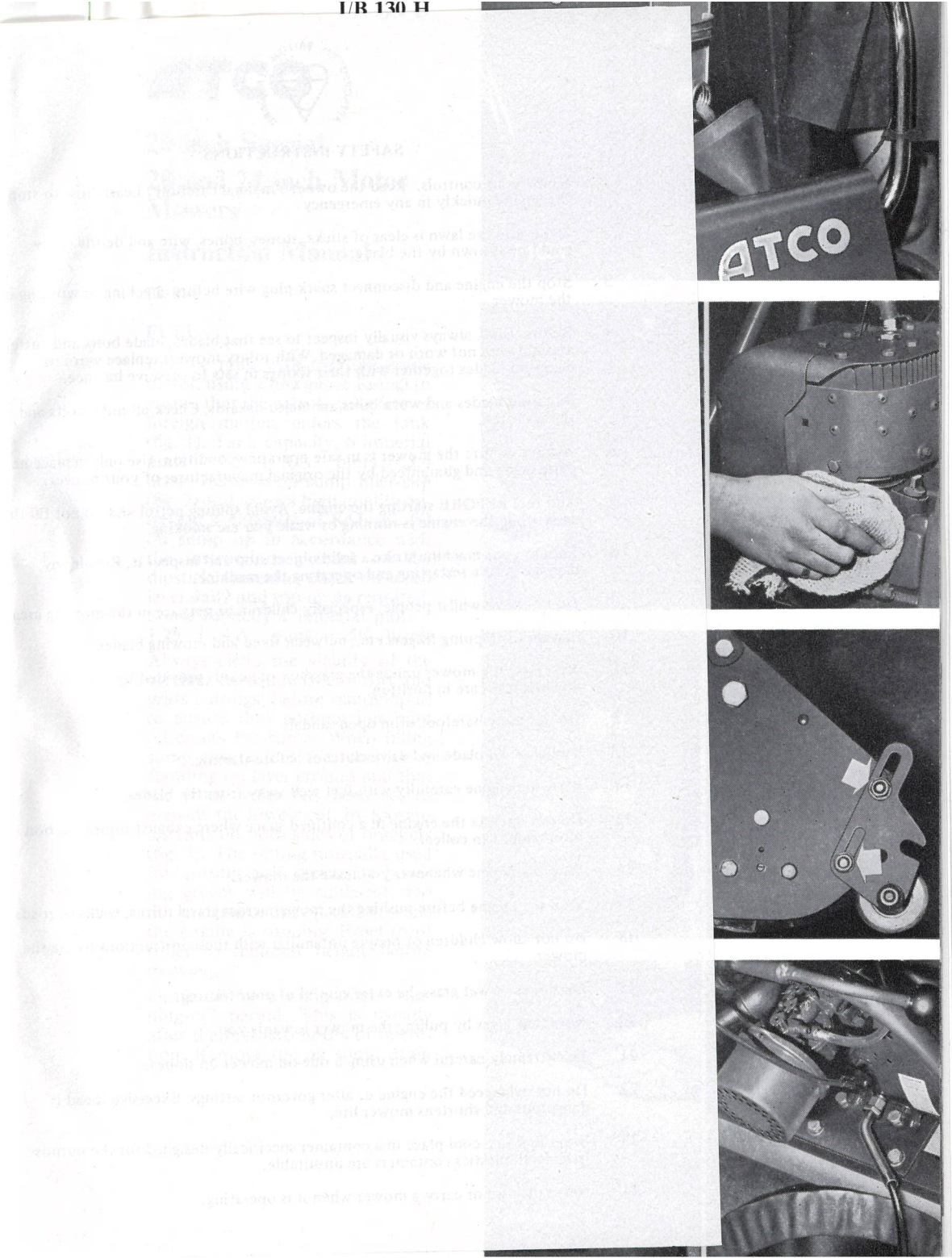
When the seedings are about 2 in. high any surface stones should be picked up and the lawn carefully rolled. When the grass regains the vertical it should be topped with a sharp mower. If further cutting is required before the following spring (assuming an August sowing), care should be taken not to cut very short. A further light rolling will be required when the surface is dry in the spring and in order to get a smooth surface, top dressing with screened top soil or compost is advantageous. (See MAINTENANCE, No. 7). In the first complete year it is important to keep the grass growing by applying light dressings of nitrogenous fertilizer if there are any signs of the growth falling off. Suitable treatment would be two or three dressings in the year of sulphate of ammonia (1/2 oz. per square yard) mixed with screened top soil (8 oz. per square yard).

8. Turfing

The preparation of the soil bed is fairly similar to that for seeding. The difficulty starts when one tries to get good turf. The chosen turf should be of suitable fine grasses and weed free but it should not be too fibrous. The sods should be of uniform thickness (say 1 1/2 in.) and should be laid with joints closely butted and alternating in a manner similar to bricks in a wall.

When laying has been completed, careful rolling with a light roller is required. The next operation is to spread over the surface, by means of a shovel, a liberal top dressing (say 5 lbs. per square yard) of a mixture of sharp sand (lime free) and screened soil brushing it well into the joints and generally trying to produce a smooth surface.

continued on page 42





### SAFETY INSTRUCTIONS

- 1 Know your controls. Read the owner's manual carefully. Learn how to stop the engine quickly in any emergency.
- 2 Make sure the lawn is clear of sticks, stones, bones, wire and debris. They could be thrown by the blade.
- 3 Stop the engine and disconnect spark plug wire before checking or working on the mower.
- 4 Before using, always visually inspect to see that blades, blade bolts and cutter assembly are not worn or damaged. With rotary mowers replace worn or damaged blades together with their fixings in sets to preserve balance.
- 5 Damaged blades and worn bolts are major hazards. Check all nuts, bolts and screws often.
- 6 Always be sure the mower is in safe operating condition. Use only replacement parts made and guaranteed by the original manufacturer of your mower.
- 7 Add fuel BEFORE starting the engine. Avoid spilling petrol and do not fill the tank while the engine is running or while you are smoking.
- 8 Should your machine strike a solid object stop and inspect it. Repair any damage before restarting and operating the machine.
- 9 Do not mow whilst people, especially children or pets are in the mowing area.
- 10 Beware of trapping fingers etc., between fixed and mowing blades.
- 11 Never use the mower unless the grassbox or guards provided by the manufacturer are in position.
- 12 Do not mow barefoot or in open sandals.
- 13 Disengage all blade and drive clutches before starting.
- 14 Start the engine carefully with feet well away from the blades.
- 15 Do not operate the engine in a confined space where exhaust fumes (carbon monoxide) can collect.
- 16 Stop the engine whenever you leave the mower.
- 17 Stop the engine before pushing the mower across gravel drives, walks or roads.
- 18 Do not allow children or people unfamiliar with these instructions to use the mower.
- 19 On slopes or wet grass, be extra careful of your footing.
- 20 Never cut grass by pulling the mower towards you.
- 21 Be extremely careful when using a ride-on mower on slopes.
- 22 Do not overspeed the engine or alter governor settings. Excessive speed is dangerous and shortens mower life.
- 23 Store fuel in a cool place in a container specifically designed for the purpose. In general, plastics containers are unsuitable.
- 24 Never pick up or carry a mower when it is operating.

# ATCO

## 20 inch Special 20 and 24 inch Motor Mowers

### Instruction Manual

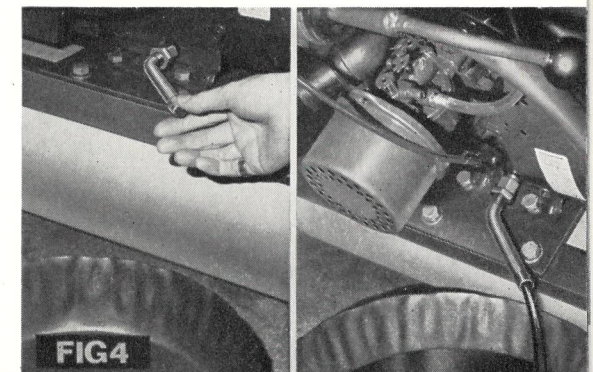
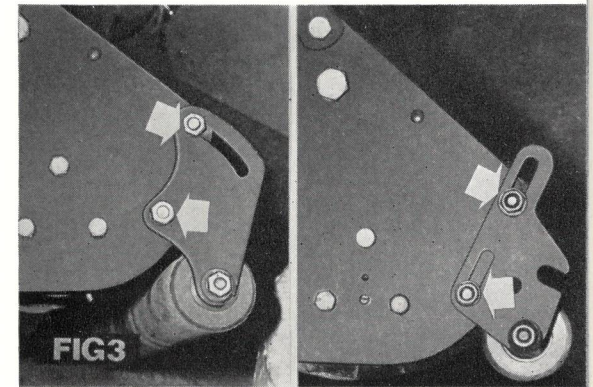
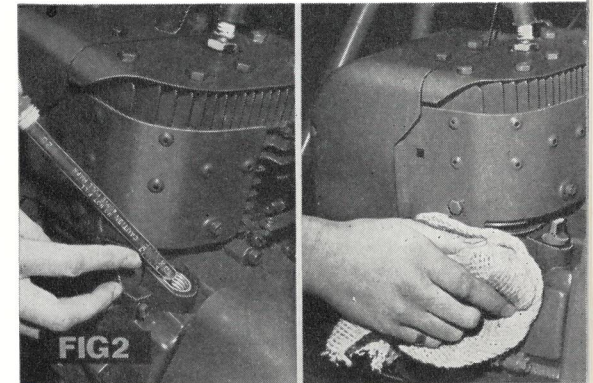
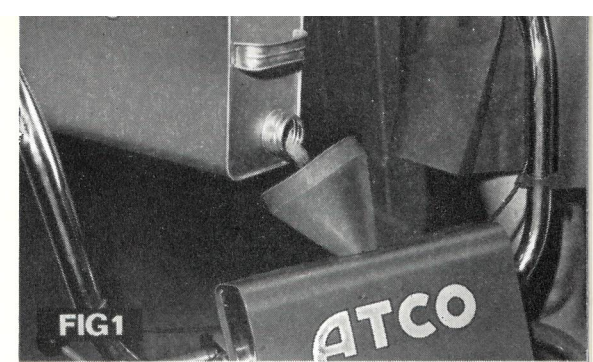
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#### FUEL

Fill the tank with medium-grade petrol, using a fine gauze funnel to ensure that the petrol, quite free of foreign matter, enters the tank (fig. 1). Tank capacity, 6 imperial pints = 7.5 U.S.A. pints = 3.4 litres. Remove oil sump filler-cap (fig. 2) and using a high quality oil, having a viscosity of SAE 30, fill oil sump up in accordance with the instructions printed on the dipstick, thereafter check oil sump level daily and top up as required. Sump capacity 1 imperial pint = 1.25 U.S.A. pints = .56 litres.

Always clean the vicinity of the oil filler cap quite free of dirt and grass cuttings, before removing it, to ensure that nothing but pure oil enters the sump. When filling sump ensure that the machine is standing on level ground and that the front roller has been set to provide the lowest cut, by loosening nuts on both sides of brackets (fig. 3). The setting normally used for cutting golf greens or bowling greens will be sufficient. Do not undertake this operation while the engine is running. Reset front roller to required height before mowing.

Drain oil from sump after "run-in" period. This is usually after the first two hours of operation. Remove the oil sump drain



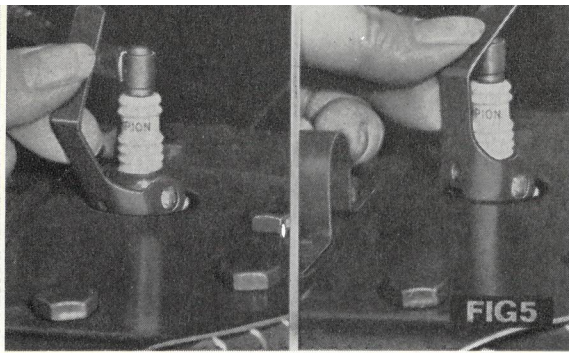


FIG5

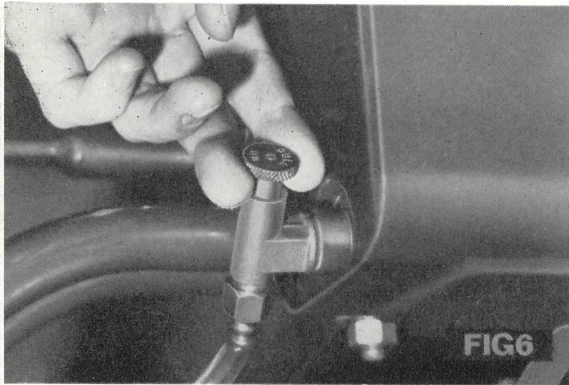


FIG6



FIG7a

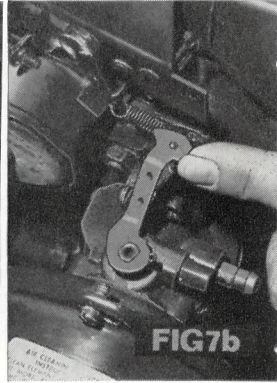


FIG7b

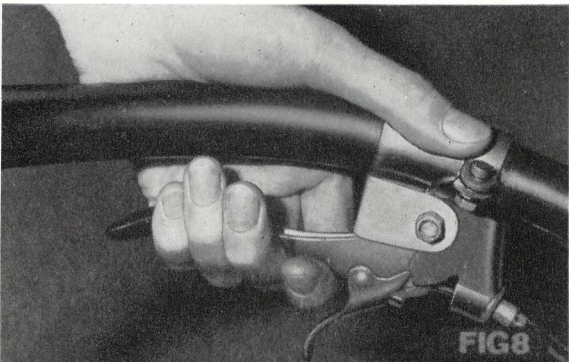


FIG8

tube cap (fig. 4) and allow the old oil to drain away into a suitable container, to prevent it spilling onto the ground. Tip the machine backwards by pressing down on the handles to ensure that the old oil drains away completely. Undertake this operation whilst the engine is warm as the old oil will then run out freely. Replace the drain tube cap and refill with clean new oil of the correct grade. Sump capacity as shown over. Thereafter the oil sump should be similarly drained and replenished every 25 hours of use or at least twice during the mowing season, whichever comes first. In really dusty conditions the sump oil should be changed more frequently.

### STARTING

Starting from Cold.

1. Ensure that the petrol tank and engine oil sump have been filled with the correct grade of their respective fuels as referred to on the previous page and also note that the air filter needs attention from time to time in accordance with the instructions printed on page 24. Make sure that the shorting strip (fig. 5) is clear of the sparking plug.

2. Open petrol tap (fig. 6).

3. Open throttle lever (fig. 7A) to approximately half its travel.

4. Close choke by moving choke lever (fig. 7B) fully in the direction of the arrow. The position of this setting may vary according to

variations in temperature and mechanical tolerances. Experience in use will show the degree of choking necessary to suit a particular engine. Likewise, a setting will be found between a "little" or "no choking" at all for starting when the engine is warm.

5. See that the clutch lever (fig. 8) is in the "OUT" position. To achieve this, raise the long clutch lever upwards to the handle until it 'clicks' into position. Do not touch the short lever during this operation.

6. Start engine by using the recoil starter. Note: starting by recoil starter is an easy and simple operation if undertaken correctly.

Hold the recoil starter grip (fig. 9) and with a smooth pull the engine should start. It is quite unnecessary and undesirable to "Snatch" or to withdraw the cord to full extension in order to start the engine.

Finally, allow the starter cord to recoil, under control, until the grip reaches its normal position of rest.

7. Open the choke slightly by moving the choke lever in the reverse direction whilst the engine is warming up (fig. 10). When the engine has run for a moment or two, open the choke fully.

### TO SET THE MOWER IN MOTION

To set the mower in motion raise both the long and short clutch control levers slightly (fig. 11) and thus held, lower them slowly, at the same time gradually open the

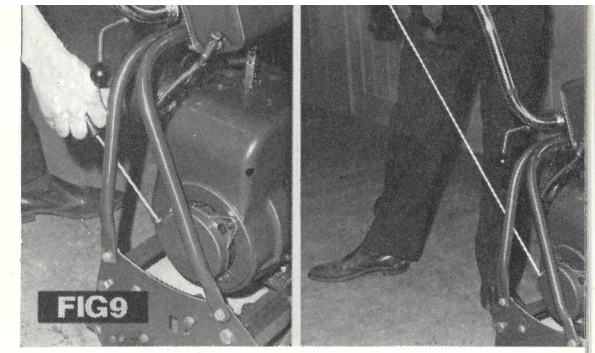


FIG9

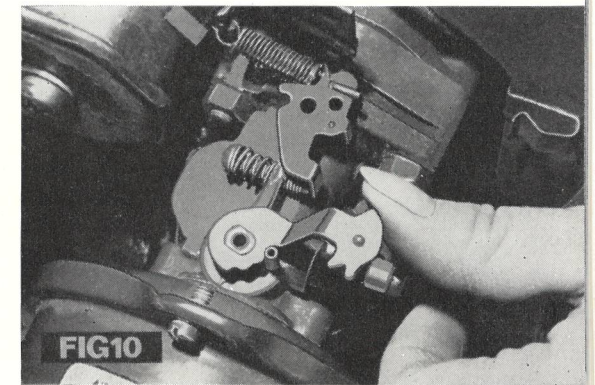


FIG10

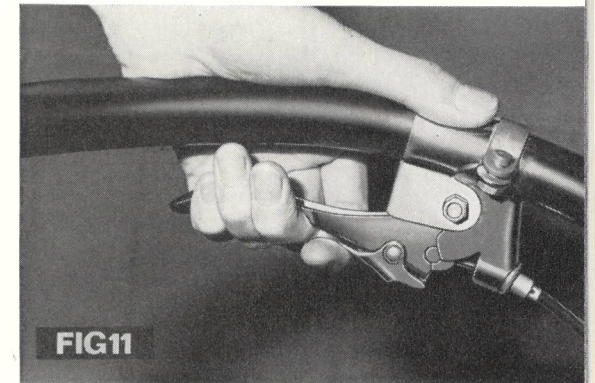


FIG11

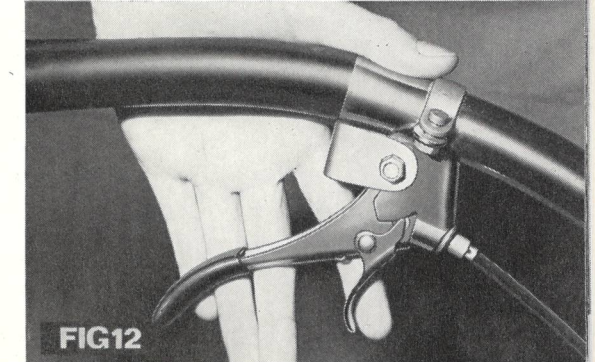


FIG12

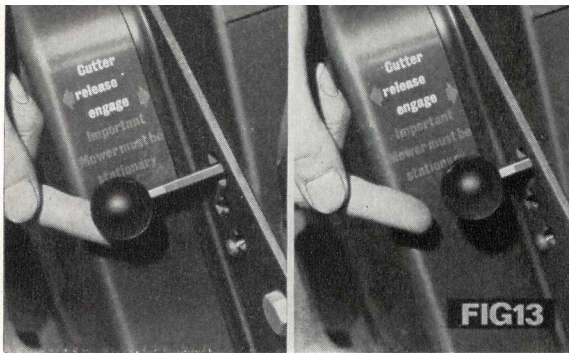


FIG13

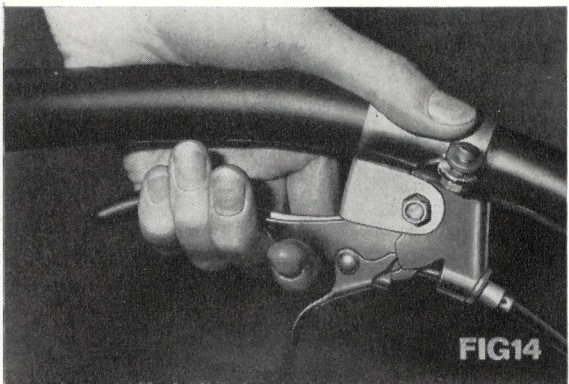


FIG14

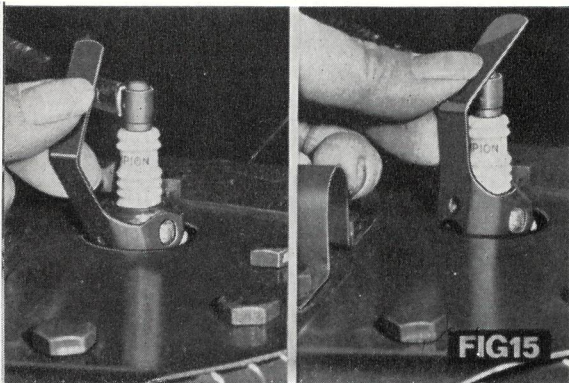


FIG15

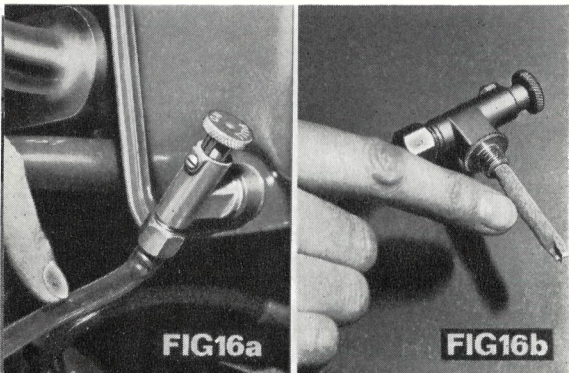


FIG16a

FIG16b

throttle. When the drive has picked up the clutch levers can be released completely. (fig. 12) It is important to check before each mowing that the cutters are properly adjusted, and that the height of cut has been set to suit the conditions. Both sets of instructions are to be found under "Adjustments" in the appropriate part of this manual. If it is found that though the machine itself is under power, the cutters are stationary, re-engage the cutters as described below under "Cutter Release".

#### CUTTER RELEASE (fig. 13)

To avoid wear and tear on the cutting cylinder and bottom blade, the machine can be driven with the cutters stationary. This is achieved by withdrawing control lever fully. To engage cutter, raise control lever (fig. 13) until it 'clicks' home.

To stop the machine, raise the clutch control lever (fig. 14) until it 'clicks' out of engagement and at the same time reduce the throttle setting to a "tick over".

#### STARTING FROM HOT

Little or no choking is necessary, otherwise follow instructions for starting from cold.

#### TO STOP ENGINE

The engine should be allowed to idle a while before stopping. To stop the engine, press cut-out strip against sparking plug (fig. 15) until the engine has completely stopped.

#### ENGINE WILL NOT START

Should the engine fail to start it will be due probably to one of the following reasons:

1. Petrol tank empty—petrol not turned on.

2. Petrol supply line (fig. 16A) or fuel filter (fig. 16B) blocked or water in the fuel.

Remedy: clean out fuel supply line and fuel filter, and if water is present, also drain and clean out the petrol tank and carburetter. See Carburetter on page 22. Replenish tank with fresh fuel.

3. Mixture too rich due to unnecessary use of choke when engine is warm.

Remedy: remove the sparking plug (fig. 17) and rotate the engine slowly by the recoil starter. Replace the plug and start engine.

NOTE: Before removing the sparking plug it will be necessary to prise off the shorting strip from the plug body. Replace shorting strip after refitting plug.

4. Defective sparking plug (see Sparking Plug below). Shorting strip still in contact with sparking plug.

5. Air filter blocked by dirt or grass cuttings (see air filter page 24).

#### SPARKING PLUG

The satisfactory running of the engine depends upon, among other things, the correct functioning of the sparking plug. It is therefore, essential to examine it periodically, clean it when necessary and to maintain the gap between the points at .020 in. to .025 in.

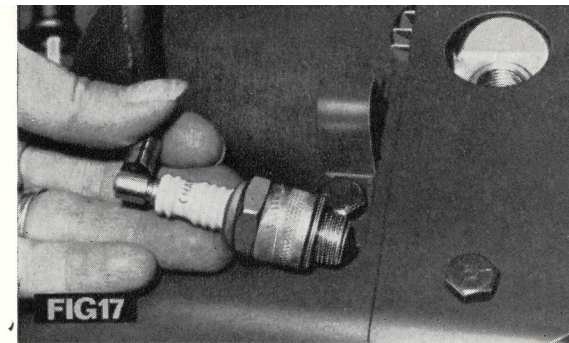


FIG17

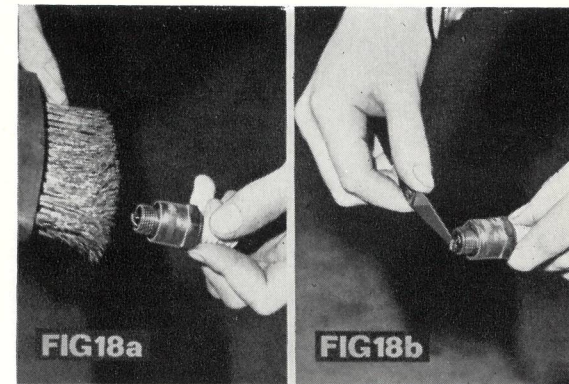


FIG18a

FIG18b

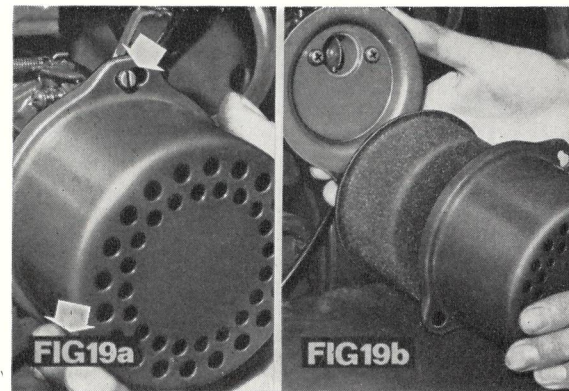


FIG19a

FIG19b

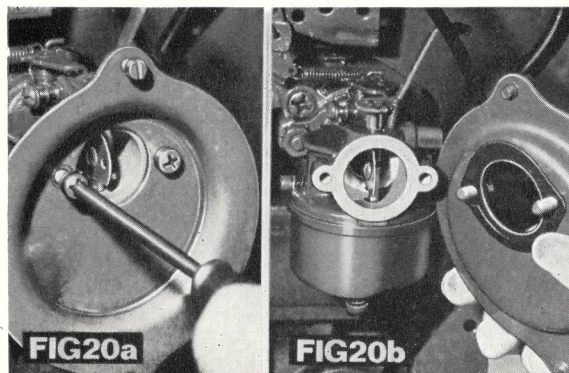
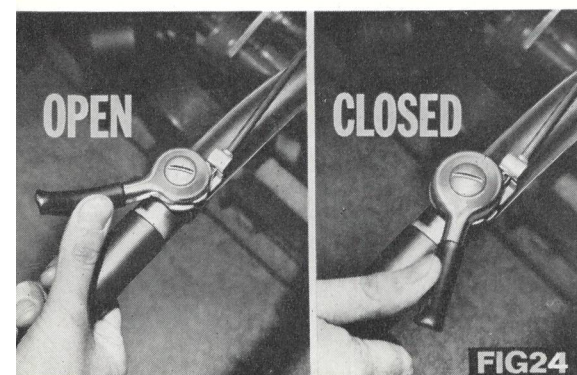
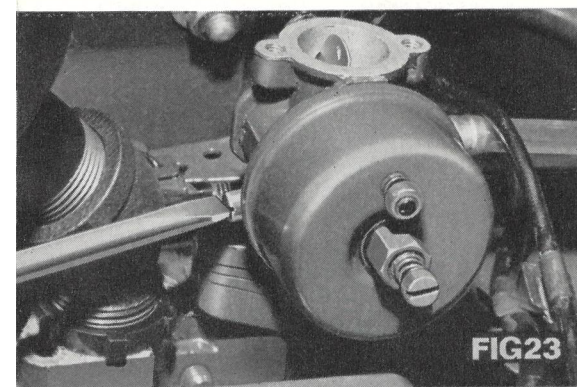
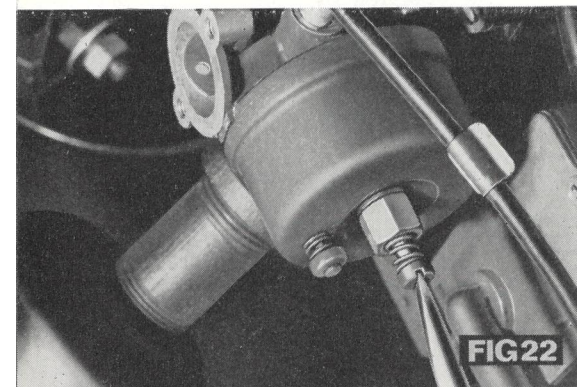
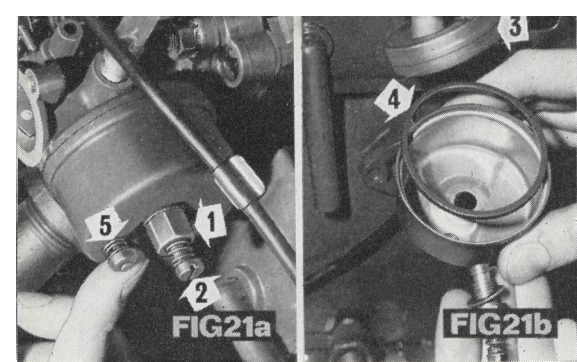


FIG20a

FIG20b



**To Test Plug:** With high-tension lead attached, lay plug on engine cowl as shown in (fig. 17) and turn engine over by means of the recoil starter. If the plug fails to spark, clean the plug (fig. 18A). Should the plug be heavily coated with carbon deposits it should be cleaned, preferably by sand blasting at a local garage. Check the plug gap (fig. 18B) and refit the plug. If the engine still fails to start, replace plug (Champion J.8).

*Important:* The cylinder head has been cast from an alloy to provide lightness and additional cooling for the engine. It is therefore most important that the plug is not over-tightened otherwise stripping of the thread in the sparking plug hole may result.

#### CARBURETTER

The function of the carburetter is to meter a supply of fuel and air to the engine mixed in certain definite proportions at all engine speeds and under varying loads. The carburetter is correctly adjusted when the machine leaves the works and should not normally require adjustment for some little time provided the adjustments have not been disturbed.

To clean out carburetter float chamber, it would be helpful, though not essential, to remove the air cleaner to provide suitable access. To remove the air cleaner, loosen the two screws (fig. 19A) after which an anti-clockwise turn will enable the outer casing and filter to be withdrawn (fig. 19B). Remove the air cleaner back plate by undoing two additional screws (fig. 20A) and the carburetter bowl (fig. 20B) is

brought into full view. Remove the large central securing bolt and washer (1. fig. 21A) taking care not to disturb the adjustment of the variable jet (2. fig. 21A) and the bowl can be lowered for inspection. When re-assembling after the cleaning operation, ensure that the float (3. fig. 21B) is not perforated or damaged and that the rubber gasket (4. fig. 21B) is in position. The spring loaded button (5. fig. 21A) allows the petrol to be drained from the carburetter bowl, when depressed. If adjustment is necessary to the carburetter itself, proceed as follows:

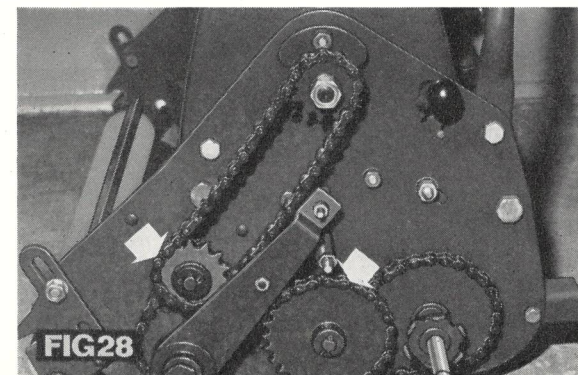
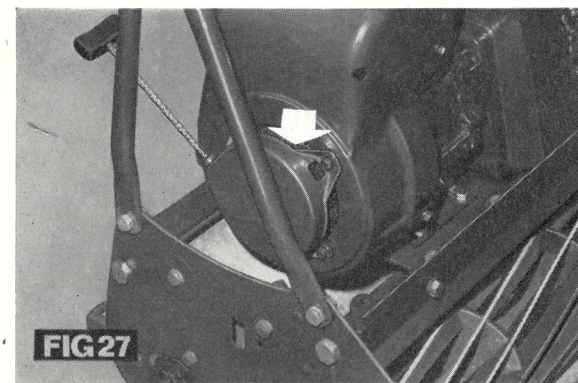
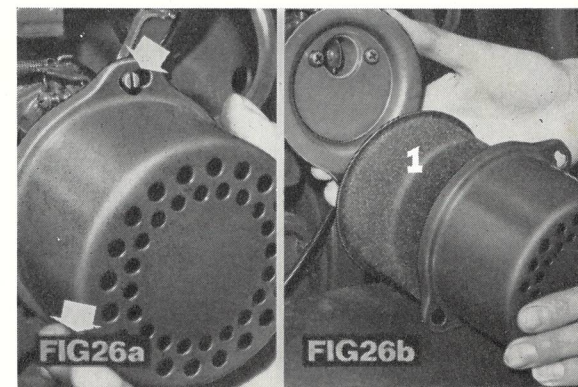
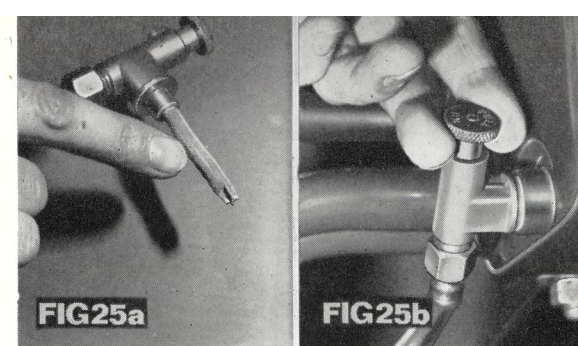
Close main jet by turning adjuster clockwise (fig. 22). Close finger-tight only. Forcing will cause damage. Then open one turn in an anti-clockwise direction.

Close idle adjusting needle by turning adjuster (fig. 23) clockwise.

Do not adjust up more than finger tight or damage will be caused. Open  $1\frac{1}{2}$  turns in an anti-clockwise direction.

Now start engine. With the throttle open fully, adjust main jet adjuster  $\frac{1}{2}$  of a turn, clockwise or anti-clockwise until the engine runs smoothly. If the engine tends to stall under load, enrich the mixture slightly by turning the same adjuster in an anti-clockwise direction. Now close the throttle lever (fig. 24) and adjust idle adjusting needle by rotating it  $\frac{1}{2}$  of a turn in either direction until the engine runs smoothly.

Allow a moment or two between each adjustment so that its effect may be noted.



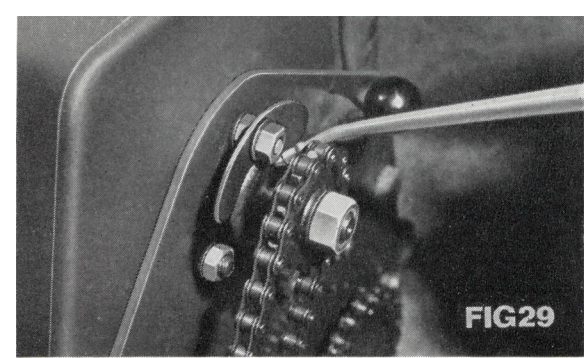


FIG29

### TO LOCATE FUEL GAUZE FILTER

The fuel gauze filter (fig. 25A) is attached to the petrol tap stem, the part which is screwed into the petrol tank. To gain access to it, first empty the petrol into a container by removing the fuel line and pulling on petrol tap (fig. 25B). The tap may now be removed and the fuel gauze filter cleaned. When replacing petrol tap remember to replace washer also.

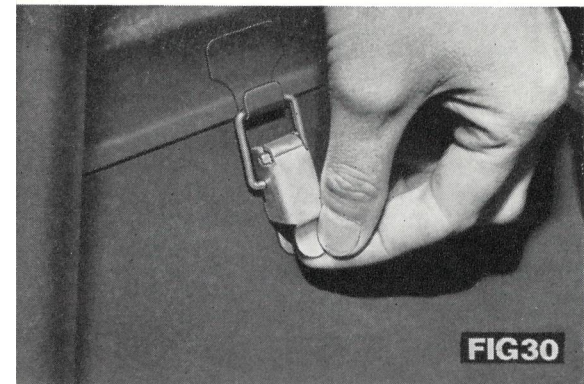


FIG30

### AIR FILTER

The air filter is one of the most important parts of the engine and should be maintained carefully to ensure long engine life. To clean the air filter, first remove the outer cover as described on page 22 and illustrated in (figs. 26A & 26B), but do not remove the back plate. Remove the polyurethane element and wash it in petrol (1. fig. 26B). Dry element by squeezing, or by use of air line, if available. Coat face of element with approximately two teaspoons full of lubricating oil and knead into element to obtain an even coating. Clean out the outer casing and make sure that the holes in the front face of the outer casing are open and not blocked with dirt. Replace element and outer casing in the reverse order and secure in position. This operation should be undertaken regularly and more often if the engine runs rich and emits black smoke from the exhaust.

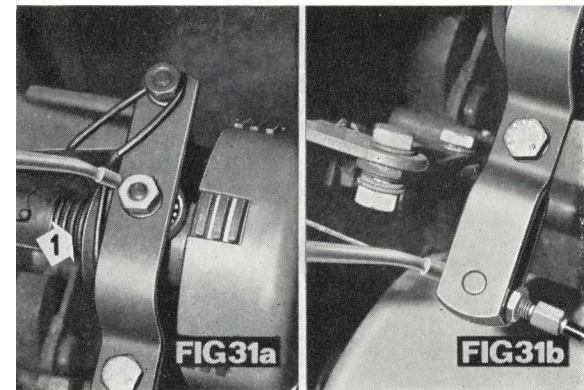


FIG31a

FIG31b

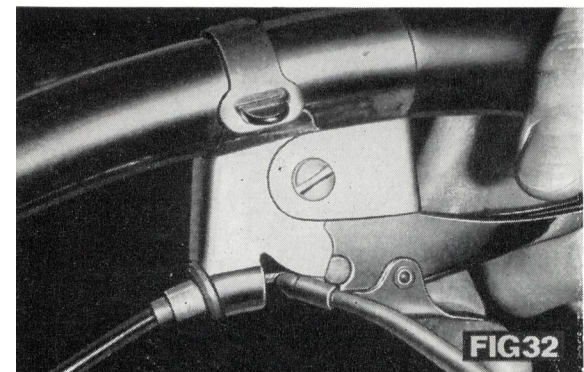


FIG32

### GOVERNOR

The engine is fitted with an over speed control which is pre-set at the works and should not need further adjustment between servicing periods.

### MAGNETO

The magneto is correctly adjusted when leaving the works, and will subsequently be cleaned, tested and re-adjusted during complete overhauls at the local Atco Branch. In the unlikely event of magneto failure occurring between servicing periods, it is recommended that it receives the attention of an expert from your local Atco Branch.

### T.V. SUPPRESSOR

A suppressor against T.V. interference is fitted in the high tension lead.

### LUBRICATION AND GENERAL MAINTENANCE

It is important that the air cooled engine has an uninterrupted flow of cool air passing around it to prevent it from over-heating. It is important therefore, to keep the air intake screen (fig. 27), fan cowling and engine cooling fins free from grass cuttings and other foreign matter. Check the sump level, before each mowing, frequently inspect your air filter element in accordance with instructions under Air Filter (page 24), give care to the various important adjustments and generally keep the machine clean and lubricated if it is to serve you well over the years. An oily rag over the 'shiny' parts at the end of the day's mowing is rewarding practice.

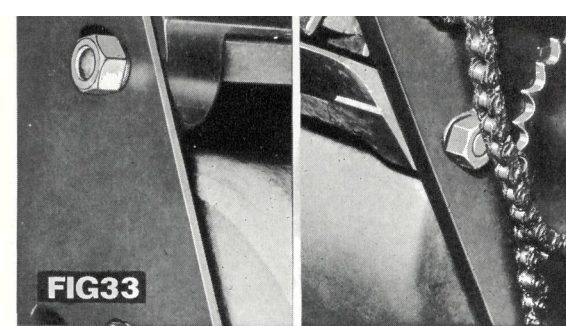


FIG33

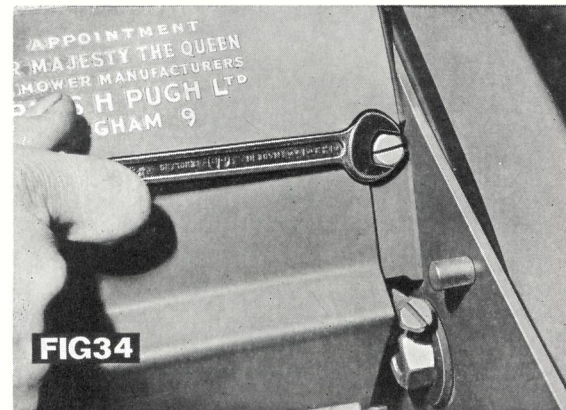


FIG34

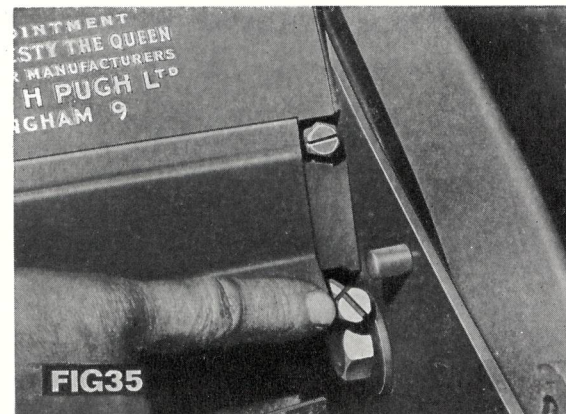


FIG35

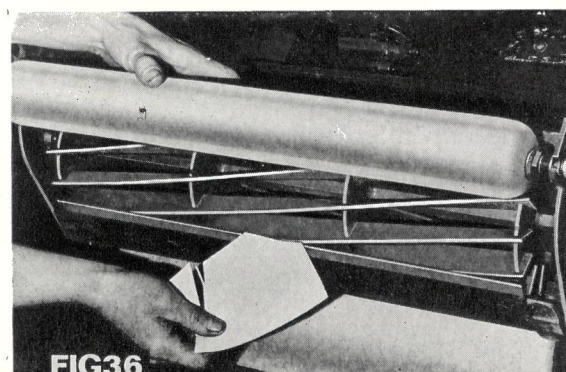
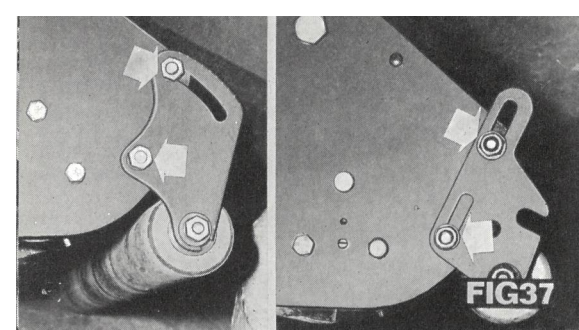


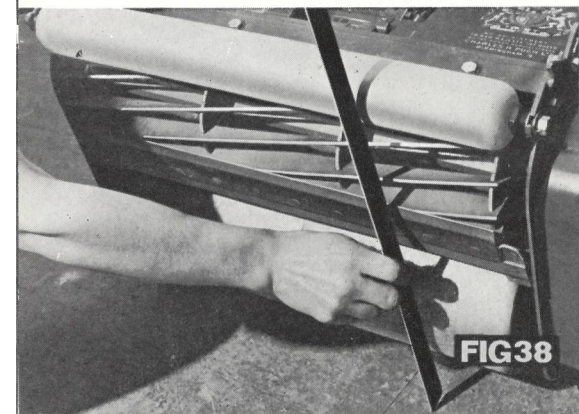
FIG36



Lubrication has been reduced to a minimum. The cutter shaft, rear roller shaft and front roller run on sealed bearings which will not require lubrication between servicing periods. However, the following points do require lubrication and the same oil as that used in the engine may be used or grease, as instructed.

#### Driving Side of Machine

Remove chain cover. A few drops of oil on each chain and on each side of both intermediate chain wheels (fig. 28) every 16-20 hours use. A few drops of oil into the self-aligning clutch shaft bearing (fig. 29). Replace chain cover.



#### Clutch

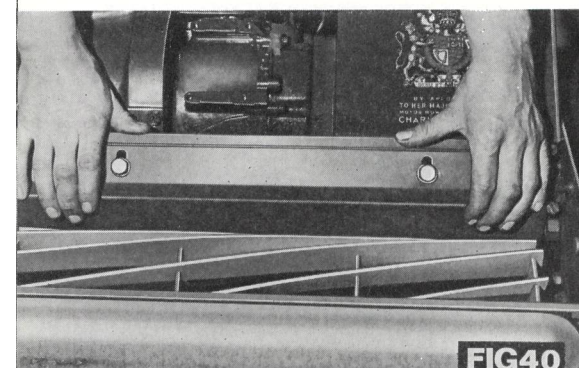
Remove clutch cover back plate, (fig. 30). Apply oil to the upper and lower clutch fork bearings (fig. 31A) and clutch control pivot points.

Also oil the clutch spring (1. fig. 31A) and the inner cable at each end of the control cables (figs. 31B & 32).



#### Front Roller

The continuous metal front roller runs on sealed grease packed bearings and will not normally need attention between servicing periods.



#### ADJUSTMENTS.

##### Cutters

(Bottom blade to Cutting Cylinder).

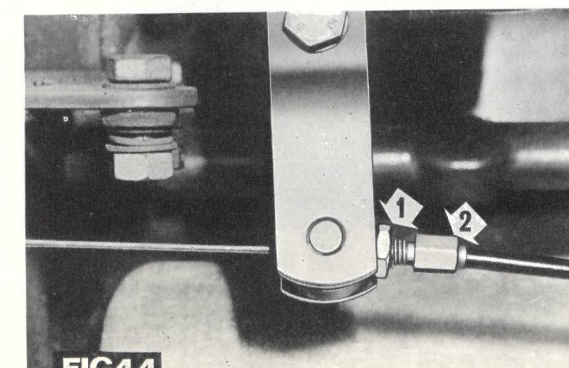
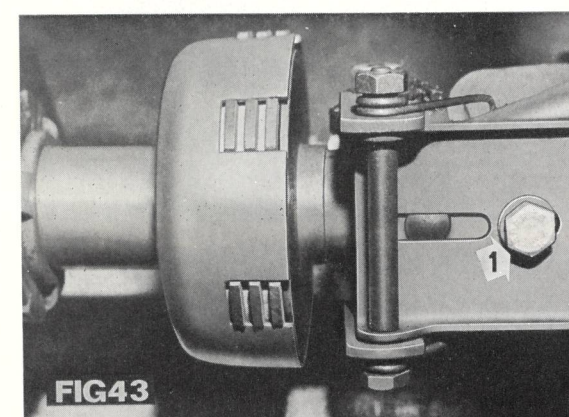
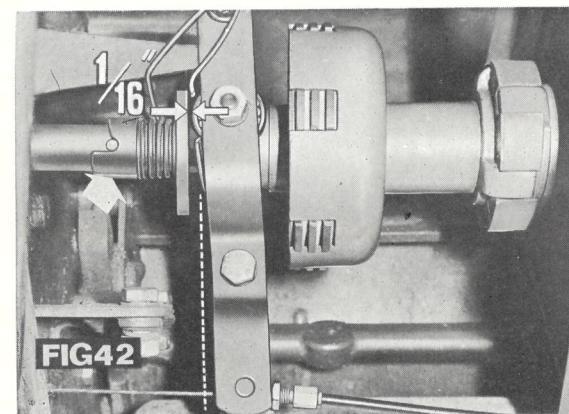
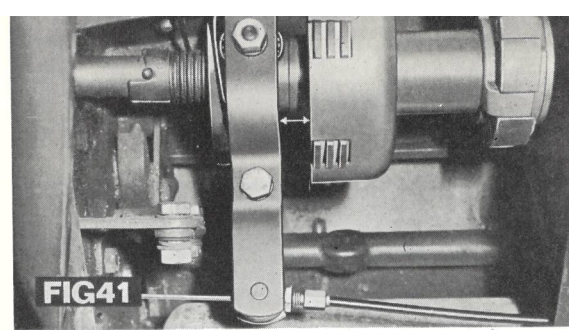
NOTE: It is unnecessary and also undesirable to slack off the main nuts, one on either side of machine (fig. 33), which form the pivot to the bottom blade bearer.

As wear takes place, the bottom blade has to be brought up to the cutters. To do this, slacken off the two top adjusters (fig. 34), one on either side of the machine.

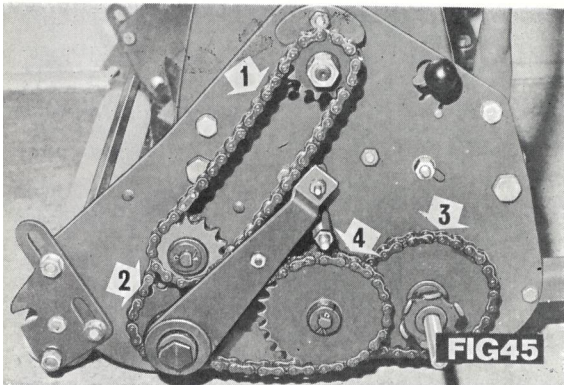
Then turn the lower adjuster (fig. 35) in a clockwise direction, a little at a time at each end until each blade of the cutting cylinder just brushes the bottom blade along its full length. Try the "cut" with a piece of stiff paper at intervals along the bottom blade (fig. 36), rotating the cutting cylinder by hand. Do not adjust cutters too hard against bottom blade, or undue wear will result and remember to tighten firmly but gently the two top adjusters to lock the adjustment into place.

##### Front Roller

Height of cut; slacken off nuts (fig. 37) on either side and raise front rollers slightly for a shorter cut, or lower it for a longer cut, depending on the need. Front Roller brackets have graduated marks to ensure uniform adjustment on either side. An accurate assessment of the distance the bottom blade is above the ground when the machine is in the mowing position may be assessed by







placing a straight edge from front to rear roller as shown in (fig. 38).

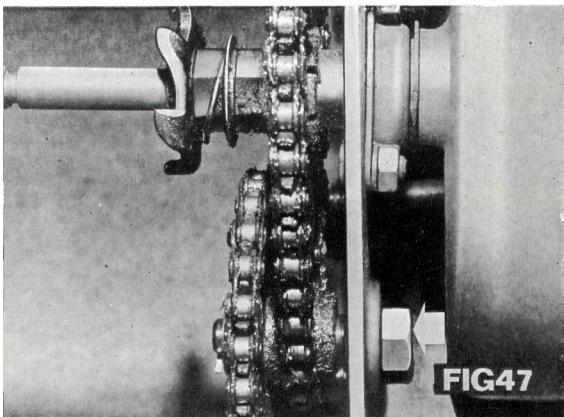
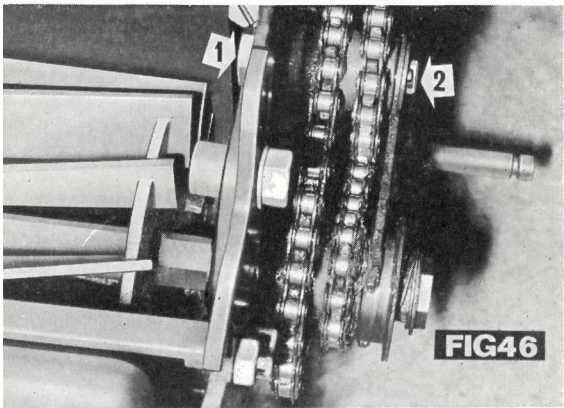
#### Grass Delivery Plate

To improve the throw of grass into the grassbox it is necessary to adjust the delivery plate closer to the cutters. In order to do this, undo the two bolts (fig. 39) one on either side, and press the plate (fig. 40) downwards towards the cutters, evenly on both sides and tighten the bolts when the desired position is reached. Do not however allow the plate to come into contact with the cutters.

#### Clutch

The clutch is in proper adjustment when the clutch forks are parallel to the clutch housing (fig. 41) when it is in the DISENGAGED position and when in the ENGAGED position the lower end of the clutch forks will be nearer the clutch housing (fig. 42) and there then should be approximately 1/16 in. clearance between the clutch fork bearings and the clutch withdrawal collar (fig. 42).

The main clutch adjustment is at the back of the clutch forks. (fig. 43). By loosening bolt (1. fig. 43) the forks can be moved at the top end, either to the right or to the left. Roughly set forks to the position thought to be required and make the final, fine adjustment at the cable end of the clutch forks (fig. 44). To operate this adjustment first slacken off the lock nut (1. fig. 44), and turn the adjuster (2. fig. 44) clockwise or anti-clockwise, depending on the need. Care should be taken not to make it necessary for too much adjustment to be carried out at this end otherwise the proper



operation of the control lever on the handles may be affected.

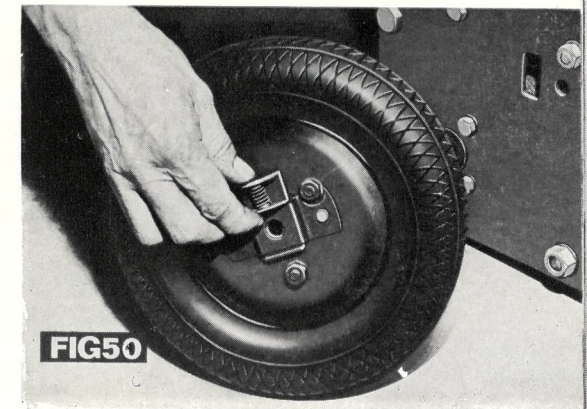
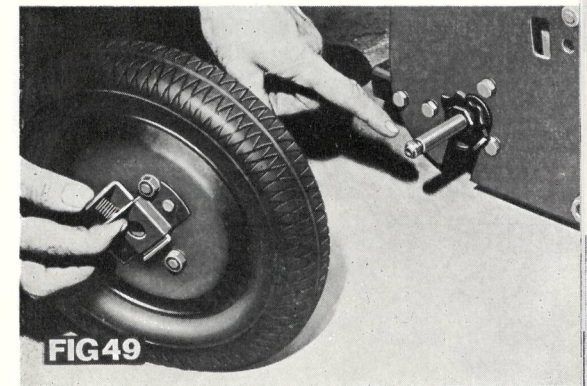
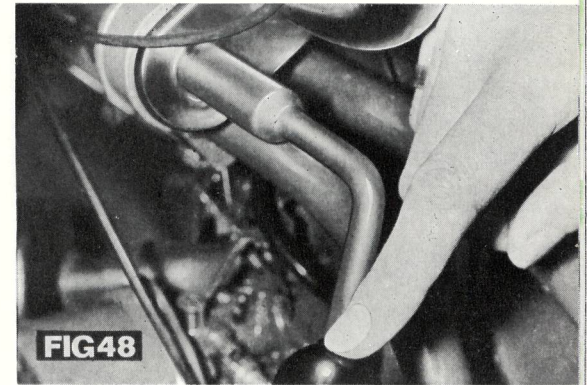
Should the clutch "slip" after prolonged use, and providing the clutch is correctly adjusted as above, the notched collar (fig. 42) behind the clutch spring should be turned to the next notch to increase the spring pressure.

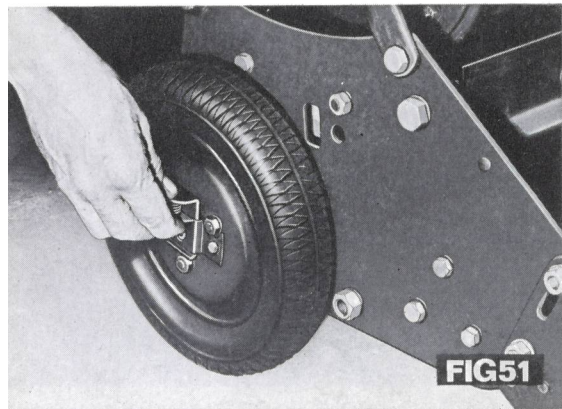
#### Chains

To adjust the tension of the chains from clutch shaft to intermediate shaft (1. fig. 45) and intermediate shaft to cutter (2. fig. 45) slacken the intermediate shaft nut (1. fig. 46), and raise intermediate shaft (2. fig. 46) slightly to tighten chains, and lower slightly to slacken chains. Lock up nut tightly. To adjust the tension of the chains from rear roller to intermediate shaft (3. fig. 45) and from intermediate shaft to cutter (4. fig. 45), slacken the intermediate shaft nut (fig. 47), and raise intermediate shaft slightly to tighten chains and lower slightly to slacken chains. Lock up nut tightly.

#### Handles

The upper handle section is readily adjustable to suit the height of the operator by loosening the cranked locking lever (fig. 48). The handles may also be folded down for storage purposes, if required.





**FIG51**

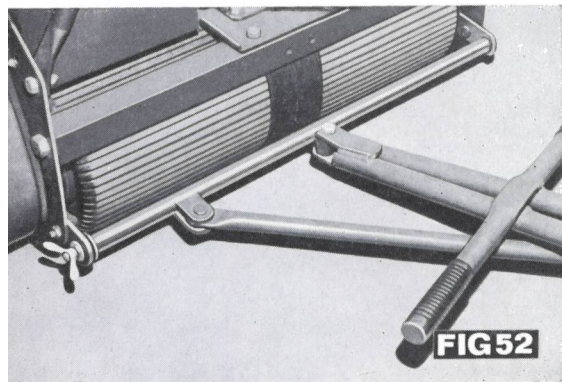
#### AUTO-STEER SEAT

To remove the Auto Steer Seat from the towing machine, first remove the wing nut and washer from the left-hand end of the towing bar (fig. 52).

Slide the towing bar a little way to the right (further into the right-hand bracket) until the screwed end is clear then lift and withdraw towards the left.

**NOTE:** Though fitted with oil retaining bushes, an occasional oiling of the rollers, in the centre between the two sections of roller and at each end, is beneficial.

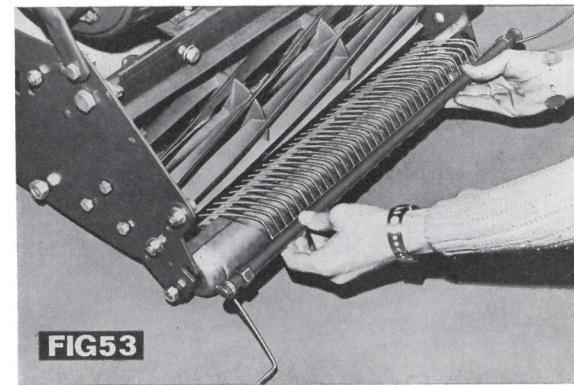
Regular oiling however, is recommended at the points on either side where the towing bar pivots in the brackets on the mower frame.



**FIG52**

#### Fitting the Grass-Comb to the 20 inch Special

The grass-comb supplied with the machine is fitted between the front roller and the cutters. Tip the machine back onto its handles and place the comb behind the front roller as shown in Fig. 53, locating the comb shaft screwed extensions between the nut and the spring, in the slot provided in each front roller bracket.



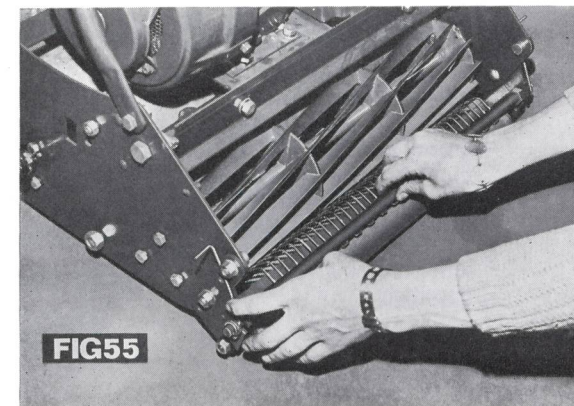
**FIG53**

Loosen the locknut at each end of the comb (Fig. 54), the left-hand one has a left-hand thread. The spring arm, on either side, may then be rotated away from the machine or towards the machine either to increase or reduce the raking pressure before re-tightening the locknuts. Make sure that each spring arm is held in position whilst the nut nearest to it is tightened.



**FIG54**

The spring arms can now be pressed forward and located against the underside of the upper front roller bracket securing nut as shown in Fig. 55.



**FIG55**

**NOTE:** With the grass-comb in position care should be taken to press down on the handles *before* drawing the machine backwards and do not use the machine over an edge or border where disproportionate flexing of the tines may cause them to be damaged.

## THE TRANSPORT WHEELS

(20 in. "Special" only)

When the machine has to be moved from mowing site to mowing site, transport wheels are provided which fit on the rear roller shaft extensions (fig. 49) where they are power-driven.

When fitting, it may be necessary to rotate them slightly until the ratchets engage and the spring-loaded latches (fig. 50) click into position. The wheels are not interchangeable with each other.

To remove the wheels depress the locking latch (fig. 51) and withdraw the wheel. Keep these components well lubricated.

## IMPORTANT

To the owner—it should be particularly noted that items such as the cleaning of sparking plugs and jets, the adjustment of chains, cutters, etc., do not come under the Guarantee. While the services of our representatives are available for the carrying out of minor adjustments, a charge would be required to be made to defray times and journey expenses.

Full particulars of all such adjustments and the necessary information in regard to plug cleaning, etc., are clearly set out in this Instruction book, and are capable of being attended to from the information given, without special mechanical knowledge.

## WINTER STORAGE

Before putting the machine away for storage during the winter months, it is very necessary to carry out the following procedure:

To avoid the risk of sticking valves and other starting problems in the spring, the ideal solution is that the engine should be run for a few minutes, two or three times during the winter. If this is not possible, remove the sparking plug, squirt one teaspoonful of engine oil into the sparking plug hole. Turn the engine over gently a few times to spread the oil.

Then replace plug and turn engine over until resistance is felt which will leave the engine with valves closed throughout the winter months.

Remove all dirt and dust. Lubricate all moving parts, smear grease over cutting faces of knives and bottom blade. Ensure that the petrol tank and carburetter are empty. Swill out tank with petrol mixture so that a protective film of oil is present inside.

**NOTE:** It is unwise to use "stale" petrol which has been in store in your shed through the winter months. The container may not be air tight and the resultant steady evaporation of the volatile content of the petrol is a condition which is often a contributory factor in cases of bad starting at the beginning of a mowing season.

Wrap brown paper around engine.

Cover machine up and *store in a dry place.*

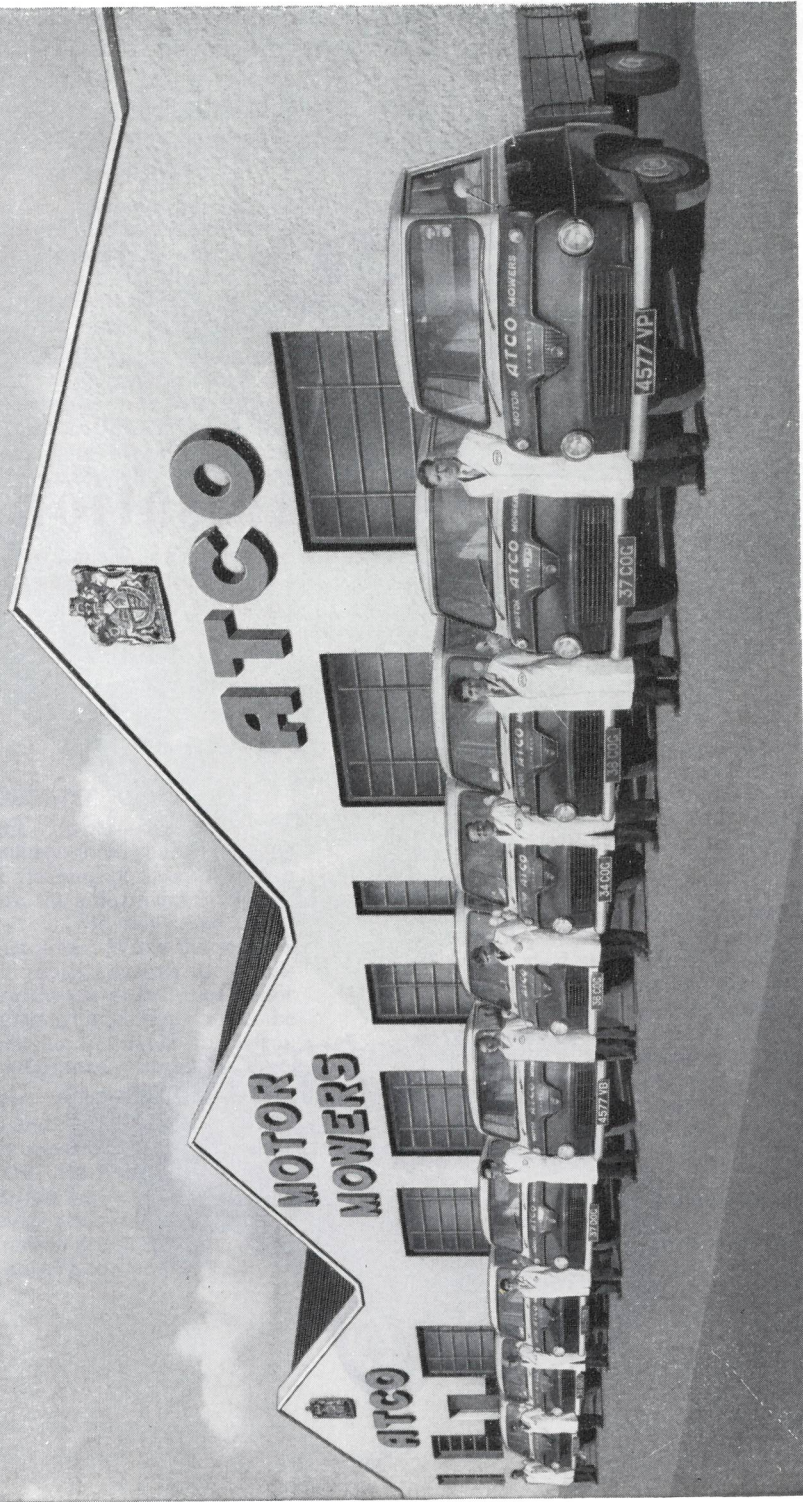
The

# ATCO

## Service

## Organisation





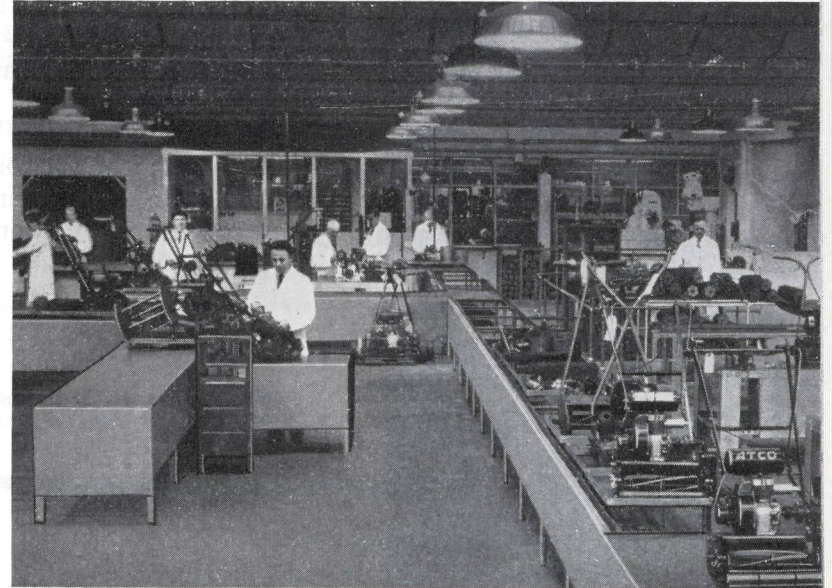
A typical Atco Branch. Standing in front of it is part of its modern fleet of Atco vehicles. Similar fleets are attached to each of Atco's ten Service Branches.

## The Modern Power Mower . . .

. . . is such a reliable, willing and commonplace piece of equipment that it is easy to overlook that all too often its working life is spent in conditions that, from a mechanical point of view, make very heavy demands upon it. These conditions can vary from rock-hard surfaces producing an all enveloping dust cloud, to the mud and slime of the Spring and Autumn crop of worm casts. Add the hazards of the unsuspected stone or, from the cutting blades point of view, similar "hard objects" and the need for Service immediately becomes apparent.

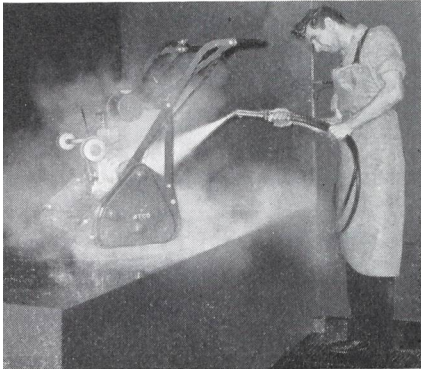
Whether that need is brought about prematurely by misadventure or as a result of normal usage, it is prudent to get into touch with a reliable firm of specialists — and who more qualified than those intimately concerned with its design and production — the manufacturers themselves!

*Clean assembly is a special feature throughout the Atco Organisation. These pleasant working conditions have promoted excellent relations between staff and management and have raised efficiency to a high level.*



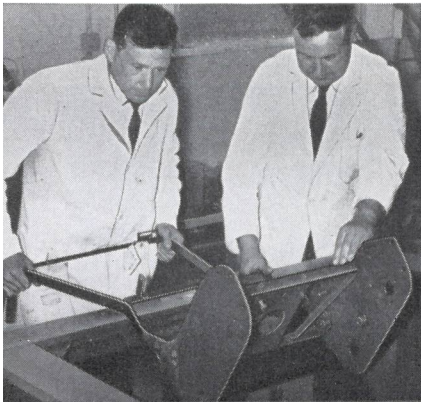


*Similar Atco vehicles to this one are bringing in Service work daily to their respective Branches. The one illustrated is delivering a load of new machines to the trade.*



*A high pressure jet cleans off all the caked oil, grease and dirt prior to the machine being dismantled for overhaul.*

*All the old painted parts are cleaned down to the bare metal in a chemical bath in preparation for repainting. Extractor fans are used to exhaust fumes out of the factory.*

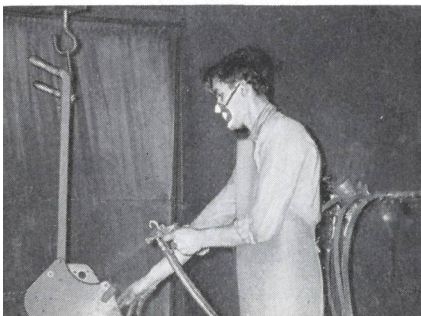


### **The Service Which Backs Your Purchase**

We, at Atco, realised the need for such a Service Organisation as far back as 1921, when we launched our first Motor Mower, and in 1922, the first of our Company - owned and fully maintained Sales/Service Branches came into being.

Our Service Organisation has no parallel in the entire industry. Each Branch is equipped with the most up - to - date machinery and is manned by skilled, Atco - trained personnel while production methods and general layout conform to a uniform pattern throughout the whole organisation.

*After cleaning and drying, the parts are restored to their former glory in the paint spray booth.*



*Meanwhile a careful examination to determine the replacement parts needed is carried out by a specialist on the line.*

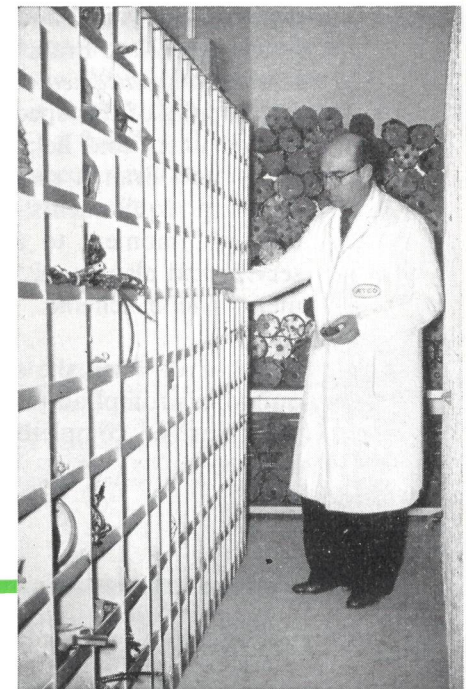
### **On the Mainland of Great Britain . . .**

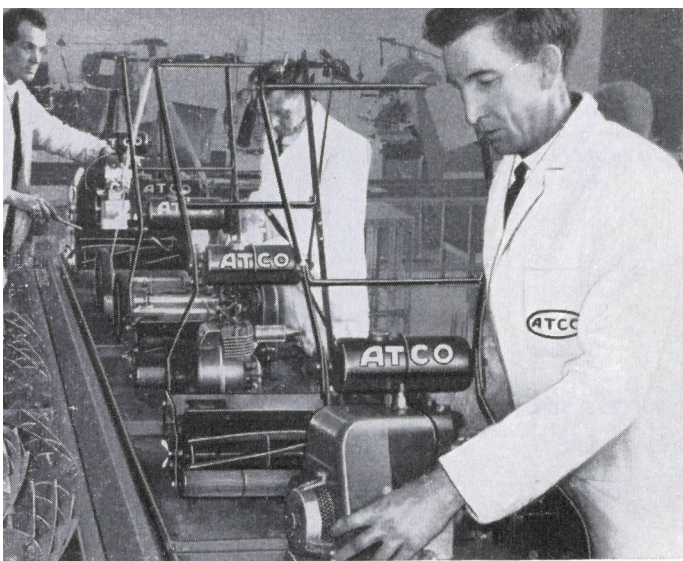
. . . Atco service is not very far away. In most cases there is an experienced Atco Service Engineer based relatively near at hand to take appropriate action whether the trouble is capable of simple remedy on the spot or the machine requires part or full service treatment at a Branch Workshop.

Each branch also maintains a large fleet of modern vehicles, which is mainly engaged in the collection and re-delivery of service undertakings.



*Spares are the "life-blood" of the Atco Service Organisation and modern binning systems have been installed at each Branch.*



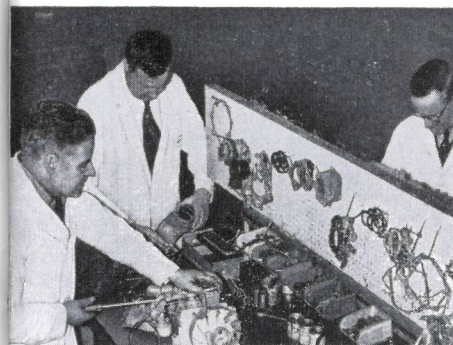


*Each machine, with its works order label attached, is rebuilt on the modern assembly lines by experienced Atco trained technicians.*

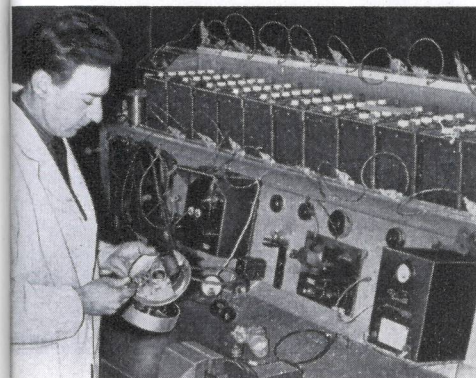
### Quick Summer Service

No amount of building and output planning can effectively deal with the vast influx of service work which, from experience, floods into Atco Branches in a very short space of time prior to the commencement of each mowing season. To enjoy the full benefits of this specialised service organisation, it would be both prudent and helpful if Users would kindly consult their local Atco Branch during the midsummer months about their servicing requirements. The branch will be able to recommend the right moment to allow their machines to be collected for service and also supply information about Atco's quick summer servicing scheme.

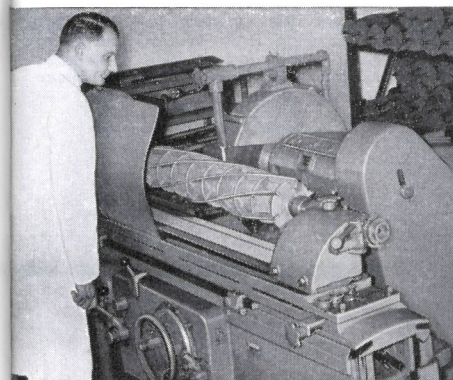
If, however when the summer ends, a winter overhaul is required, a prompt autumnal request for service ensures that the work can be completed in good time for the next mowing season.



*Specialists stripping down engines—under the complete reconditioning scheme.*



*A technician prepares to check the efficiency of a flywheel magneto on a special test rig.*



### A Special Reconditioning Scheme

The photographs supporting this introduction to the Atco Service Organisation tell their own story and illustrate important facets of the work that takes place at each and every one of their Branches.

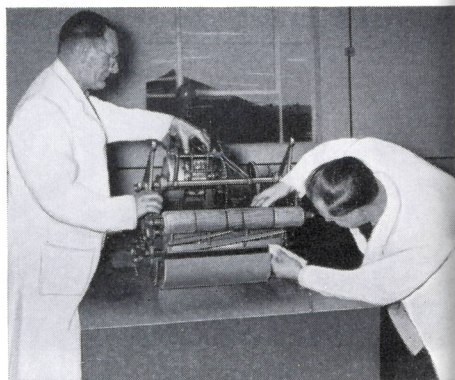
One of the special features of the services offered is the complete reconditioning scheme, the subject dealt with by many of the photographs. It consists of stripping the product down to its smallest components, all of which are carefully examined and replaced where necessary, while the painted parts are chemically treated to remove old paint and grease and are resprayed to a high standard of finish. When the whole machine is rebuilt, it is in appearance and functionally, a showroom specimen and a credit to men who take pride in their work.

*A 34 in. cutting cylinder being trued up on a grinding machine, which is an essential part of the modern plant at each Atco Branch machine shop. Complete exchange regrind sets of cutting cylinders and bottom blade are a special feature of Atco Service.*

**The Important Thing  
To Remember . . .**

. . . about Atco is that the manufacture and subsequent servicing of power mowers are not just sidelines for them but a full time occupation. Their interest does not end with a sale: they want to, and do ensure, wherever permitted, that every Atco not only gives a good account of itself, but that it continues to do so for many years.

Furthermore, this close association with their products in the field provides Atco with a flow of information about design improvements which enables them to set a standard for the Power Mower Industry.



*An Atco model receiving a final check at the end of the Assembly line.*



*The final running tests are carried out in an air conditioned cubicle where an extractor fan carries the harmful exhaust fumes beyond the factory walls. From here the passed out machine is loaded on to Atco transport for delivery to the User.*

*The spacious, modern general office at a typical Atco Branch; the nerve centre of its administration. Here also, are kept the history cards of many thousands of Atcos in the field.*

**ATCO SERVICE BRANCHES**

**DARLINGTON**  
(Co. Durham)  
McMullen Road Darlington,  
Co. Durham DL1 1XZ  
Telephone: 0325-2671/66939

**SCOTLAND**  
Industrial Estate  
Larkhall, Lanarks ML9 2PF  
Telephone: 0698-882370

**SHEFFIELD** (Yorks)  
Rotherham Road,  
Eckington, Sheffield S31 9FH  
Telephone: 024683-2373/4

**PRESTON** (Lancs.)  
School Lane, Longton,  
Preston PR4 4SA  
Telephone: 0772-612451/2

**BIRMINGHAM** (Warks.)  
P.O. Box 256,  
Tilton Road, Small Heath,  
Birmingham B9 4PR  
Telephone: 021-773 1441/3

**NEWMARKET** (Suffolk)  
176 Exning Road,  
Newmarket,  
Suffolk CB8 0AG  
Telephone: 0638-4418/9

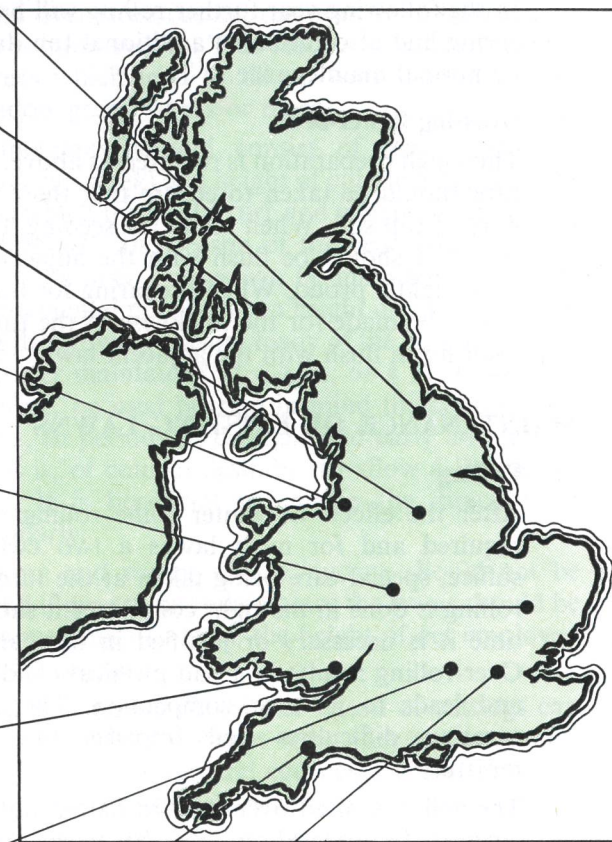
**CHEPSTOW** (Mon.)  
Castleford, Tutshill,  
Chepstow NP6 7YJ.  
Telephone: 02912-2732/2114

**READING** (Berks.)  
7-9 Boulton Road,  
Reading RG2 0ND  
Telephone: 0734-84258/9

**EXETER** (Devon)  
14 Marsh Green Road,  
Marsh Barton,  
Exeter EX2 8PG  
Telephone: 0392-73882/54017

**LONDON**  
61 Albert Road North,  
Reigate, Surrey, RH2 9EP  
Telephone: 07372-45731/5

**NORTHERN IRELAND**  
Rugby Engineering Works,  
101 Rugby Avenue,  
Belfast BT7 1RF  
Telephone: 0232-36488/9



**If you would like winter service for your mower, please let us know EARLY to avoid the inevitable last minute rush.**

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Turfing is a job for the late autumn or early winter months and it is worth trying to finish before Christmas.

In the following year further rolling will be required in the spring and also probably additional top dressing followed by normal maintenance.

#### 9. **Grassing flower-beds**

Thorough preparation is required as above. When levelling, care should be taken to ensure that there is not less than 4 in. of top soil. When ready for seeding, the finished firm seed bed should be flush with the adjacent lawn or only very slightly proud. When preparing for turfing, allowance has to be made for the thickness of the turf which should itself finish flush with the adjacent lawn.

### **MAINTENANCE OF EXISTING LAWNS**

#### 1. **Rolling**

After the effects of winter some rolling in the spring is required and for most lawns a two cwt. roller should suffice, special care being taken at the turns. If the spring rolling is done in the right conditions it should be the only time it is necessary or justified in normal circumstances. Over-rolling results in a bad physical condition of the soil and leads to its over compaction. This in turn creates aeration difficulties and impedes the percolation of moisture.

The roller is often over used to flatten out surface irregularities. The operation may be fairly successful but is costly in terms of turf quality, vigour, etc. It is better to use repeated top dressings to fill up depressions.

#### 2. **Mowing**

Frequency and height of cut influence greatly the characteristic of turf. Vigour, composition and quality of a

sward are governed to a large extent by the mower and how it is used.

Irregular and over close cutting removes more leafage and impairs the rooting system. This leads to the development of weak areas which tend to fill up with shallow rooted annual meadow-grass, weeds or moss.

Sound maintenance should consist of regular mowing (once or twice per week) at a height of cut most appropriate for the grass which forms the turf and which is suitable for the state of growth and season of the year. Whilst lawns composed of the finer grasses can be maintained satisfactorily for ornamental purposes at a height of approximately  $\frac{1}{4}$  in. during the growing season, many of the coarser species would be better maintained at a  $\frac{1}{2}$  in. or  $\frac{3}{4}$  in. Discretion must, therefore, be used bearing in mind the composition of the sward. In periods of drought and early and late in the season it is, of course, desirable to allow a little extra grass cover. It is beneficial to change the direction of mowing regularly.

In the autumn and winter period, cutting should not be neglected and if growth has taken place the lawns should be topped at something like twice the height of cut employed in the growing season.

If the sward is clean the occasional return of cuttings can be helpful in periods of drought when they act as surface mulch. Generally, however, the cuttings are best removed for their constant return will provide ideal condition for earthworm activity, tend to increase annual meadow-grass and produce a soft spongy surface condition which makes the turf more susceptible to disease.

#### 3. **Fertilizer Treatment (Feeding)**

Discretion is needed here since a lawn can be spoiled either



by starvation or by over-feeding, especially if the wrong kind of fertilizer is used.

A good lawn may need a complete fertilizer in the spring. A reliable proprietary mixture may be used or a mixture made to a formula such as:

2 lbs. sulphate of ammonia	} per 100 square yards
1 lb. dried blood	
4 lbs. superphosphate	
1 lb. fine bone meal	
1 lb. sulphate of potash	
1 lb. calcined sulphate of iron	

A mixture such as this should be well mixed with about 28 lbs. of screened sandy soil or compost per 100 square yards to facilitate uniform distribution and minimise scorch risk. Showery weather in the spring should be chosen.

If further fertilizer is required then it should be mainly nitrogenous, e.g.

2 lbs. sulphate of ammonia	} per 100 square yards
1 lb. dried blood, with	
28 lbs. screened sandy soil	

If dry weather follows fertilizer application it is wise to water in carefully before two or three days have elapsed.

Usually no fertilizer is desirable between the end of August and the following spring.

#### 4. Watering

The effects of watering are not all good but in dry weather it may well be necessary to water to keep the lawn alive, especially if it is of high quality. The rules are simple—water early (before the lawn has started to suffer), water adequately and water often (whilst the dry weather lasts).

#### 5. Scarification

Scarification in spring and on occasions throughout the season is an important factor in keeping the sward healthy. This operation is best carried out when growing conditions are good. A wire rake is a suitable implement. Its object is to remove the accumulation of dead grass leaves and superfluous fibrous matter and to reduce the “nap” caused by creeping types of grasses. It also assists the entrance of air and moisture and produces a quicker reaction from feeding.

#### 6. Aeration

Air is required for the grass roots to function properly and to aid the chemical and biological processes in the soil. Some form of spiking is, therefore, often useful to let air into the soil, to let moisture through the surface and also to relieve soil compaction created by mowing implements, treading and the (usually unnecessary) use of the garden roller.

Thorough aeration is best carried out in the autumn when conditions are most suitable for obtaining maximum penetration. The job can be done by means of a special fork or a machine. Whichever implement is used solid tines are usually most appropriate but on heavy soils, or where the sward is excessively matted, hollow tines can be used to advantage at this time. Deep forking is not necessarily an annual job — every two or three years is probably adequate.

Comparatively shallow spiking (as with a spiked roller) throughout the growing season will assist the penetration of moisture (natural or artificial) and produce better results from fertilizer application.

## 7. Top Dressing

This is an essential operation for the maintenance and improvement of existing surfaces and also for improving the physical condition of the surface soil.

The best top dressing material is derived from a compost heap produced by rotted organic material and top soil, made friable by the addition of sharp lime-free sand and suitably screened before application. It is not always possible to produce a natural compost like this but a substitute mixture can be made from, for example, soil sand and peat mixed together in proportions which are suitable for local requirements and conditions, e.g.

10 parts screened top soil  
10 parts sharp sand  
1 part granulated peat

Top dressing material can be spread by hand or shovel. It should be applied to a dry surface fairly evenly and then smoothed out with the best means available. A proper drag mat or drag brush is best but quite good results can be obtained with the back of a wooden rake or even a door mat. The idea is to smooth out the loose material we have just applied so that more is left in the hollows than on the bumps, care being taken to avoid smothering of the grass nevertheless.

Heavy applications for surface improvements (from 1-7 lbs. per square yard) are best made in the autumn or early spring. Avoid applying more material in any one dressing than can be comfortably worked through the sward as smothering of the sward will weaken the grass and may lead to an outbreak of disease.

Light top dressings during the growing season are also beneficial particularly in periods of drought when they act as a useful surface mulch. Top dressing is without doubt

the most effective way of building up a true surface which is necessary for uniform mowing and a really good looking lawn.

## 8. Weeds

Most lawn weeds can be effectively controlled by selective weed-killers purchased in proprietary form if these are used efficiently. They should be applied during a spell of fine weather but when there is sufficient moisture in the soil to ensure good growing conditions. Selective weed-killers are bought in liquid form usually and applied by means of a watering can or fine spray. Flowers and shrubs are very susceptible to these chemicals so great care is necessary. With a sprayer there may be risk of drift on to the flower beds and so it is usually wise, except on very large lawns, to apply the weed-killer with a watering can which must be thoroughly rinsed out after use.

## 9. Moss

Usually the presence of moss is an indication that there is some restriction on the growth of grass. Removing the restriction is then the best way of curing moss. Moss may be caused by bad drainage, shading by trees, over acidity, shortage of plant foods or other factors and attention to such of these points as apply is most important if the moss is to be eliminated.

Moss is resistant to selective weed-killers but can be tackled by means of a "lawn sand" mixture such as:

3 lbs. sulphate of ammonia	} per 100	
1 lb. calcined sulphate of iron, with		square
28 lbs. screened sandy soil		yards

This mixture also should be applied during the growing season but it is meant to scorch; so a few days sunny

weather will help it to work. Watering should, however, follow before too long.

#### 10. Earthworms

Earthworms lead to a bumpy surface and encourage weeds and weed grasses. Avoid treatments which encourage earthworms, e.g., unnecessary liming and excess of organic fertilizers. Earthworm control can be effected by using one of a number of materials available for the purpose e.g., a Derris Dust or best of all, where it is considered safe to use, lead arsenate powder at  $1\frac{1}{2}$ -2 ozs. per square yard. Whatever material is used to control the earthworms it is usually best to carry out the operation in warm damp weather when the worms are working near the surface, usually in autumn or possibly spring.

#### 11. Disease

There are quite a few turf diseases but the most common one found on lawns is Fusarium Patch disease which thrives particularly in mild periods in autumn and spring but is also found after snow has laid on the ground for some time. The first symptoms are small brown or yellow patches which may increase in size and if unchecked coalesce and continue to increase in size, the grass dying off. Disease prevention involves avoiding excessive fertilizer treatment, particularly over late applications of nitrogenous fertilizer; keeping the sward clean and never smothering with top dressing, etc.

For control of Fusarium Patch disease, there are a number of reliable proprietary fungicides and usually it is worthwhile treating the whole lawn once the trouble starts.