THE CHAIN SAW

A Power Saw Association Publication

MAY 1970

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No. 2

A few cutting remarks to power saw owners.

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Vol. 1, No. 2 May, 1970

The Editor welcomes contributions to this JOURNAL.

All contributions should be addressed to the Association offices (address below), and material requiring return should be accompanied by a stamped and addressed envelope *of adequate size*. All material is publishable at the Editor's discretion, and the Editor reserves the right to amend or abridge material submitted unless the contributor plainly indicates a wish to the contrary. The Editor does not necessarily agree with views expressed by contributors.

Readers' letters must contain sender's name and address, but this need not be published if a contributor wishes to remain anonymous.

Address for all communications:— The Secretary, Power Saw Association of Great Britain, 21 Wellington Square, London, S.W.3. Telephone 01-730-1675.

Chain-Saw Prices—Cause for Concern

By The Editor

The chain-saw is an essential tool for the majority of its users. That is to say, most people who use or own a chain-saw do so because it would not be economical for them to do otherwise. Take away the chain-saw from a professional timber feller, and he will be out of business in a very short time. Take away the chain-saw from the occasional user, and he will have to employ outside labour—using a chain-saw. The portable, power-driven, wood-cutting tool—i.e. the chain-saw—is a tool of necessity, and without it's help there would be, under modern conditions and costs of labour, no means of efficient sylviculture, from pruning and trimming right through to felling, conversion and disposal.

A tool in such common usage must plainly be required in sufficient quantities to justify its mass-production; and, of course, this is so. Our own market is one of the smallest in the world, yet it absorbs some 15,000-20,000 new units each year. Several major chain-saw manufacturers are currently producing more than 100,000 units a year, and few produce less than 20,000.

With this scale of production, costs to the user might be expected to have dropped drastically over the past decade, and to be at least approaching parity with other products of the class known as "consumer durables" (such as lawn mowers). In fact, in this country, they have not; and a comparison with any parallel product in the horticultural field shows the chain-saw, at its average recommended retail price of £80-£90, as apparently being grossly over-priced.

In analysing the retail price of a product, two broad sections in the costing must be scrutinised. The first is the intial, or ex-works, cost, which is governed by the quality of the product (mainly) and the scale of production (secondarily). The second is the total of distributive costs. In the U.K. chain-saw market, these are divided between the importing concessionaire and his network of dealers.

The first of these costs is not readily reducible below a certain level because of quality requirements. In fact, the manufacture of chain-saws being as competitive as it is, the present level of ex-works costs must be regarded as satisfactory. Not so satisfactory, however, is the second section —the costs and profit incurred through distribution. When it is realised that these not infrequently account for over half of the final retail price (which currently averages somewhat over £80), it is plain that a review might well be thought desirable.

It should be said at once that we make no suggestion that either concessionaires or dealers are making improper profits in the chain-saw market. In fact, the profit element in the distributive mark-up is far too small—fairly convincing proof of this being the disturbing number of old-established names who have recently pulled out of the business. The costs which push the price up to present retail levels are perfectly genuine —but our argument is that their scale, in relation to the product and its market, is mistakenly inflated.

One might instance the spares and specialist servicing facilities, of which the trade is justly proud, but which can really only be described as Rolls-Roycian". A well-known dealer has stated that, in selling a chain-saw to a new customer, he reckons on spending at least an hour of his personal time in customer-instruction at the time of sale, and a further time expenditure, probably of at least twice this amount, in after-sales service. He also maintains a spares stock of every part for every make and model of saw he is currently selling, plus nearly the same coverage for all the saws he has sold in the past. What other comparable product gets this sort of service—*and is it really necessary?*

If large distributive costs are essential today, we suggest that this does not mean that they must continue to be so forever. Their reduction will need the co-operation of manufacturers, concessionaires, local dealers, **AND** the users. The manufacturer must try to improve product reliability, thus reducing the spares and service burden; the concessionaire and dealer between them must prune their selling costs and achieve a greater efficiency in distribution; and the user must accept a standard of service which, although it can still be first-class, can be more reasonable than that currently demanded.

One thing is certain—chain-saws are at present pricing themselves out of the market in which they belong. This is a process which will benefit nobody, and it must be stopped.

Vibration

Documents recently circulated by the British Standards Institution give details of the investigations and discussions which are currently in progress on the effects of vibration on the human frame.

A draft standard has been submitted by the Czechoslovakian delegation to the International Organisation for Standardisation (I.S.O.) for acceptable limits of vibration caused to the human hand-and-arm system through the use of power tools. Acceptable limits are defined in terms of: amplitude, along appropriate co-ordinates; frequency, with upper and lower recommended cut-off limits; exposure duration; periodicity of exposure. Limits proposed would exclude from use nearly all chain-saws currently manufactured.

It was stated at the I.S.O. meeting at which the draft was discussed that 65% of all power-saw users in forestry in Czechoslovakia had been found to be suffering, to a greater or lesser extent, from "vasoneurosis" (vibration disease), and that in about 35% of users this had advanced to a serious extent. Sweden gave a comparable figure of 50% for the total of Swedish forestry workers affected.

The Czechoslovakian draft has been accepted as a provisional working proposal by all the countries concerned, on which further work will be based with a view to formulating a standard. It is expected that we shall be able to report further on the subject in our next issue.

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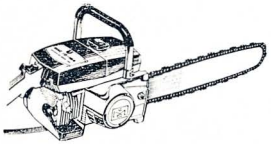

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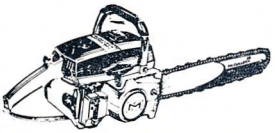

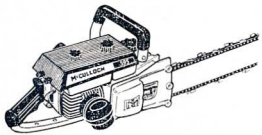

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Chain Saw Felling Techniques for Conifers

By A. R. DUNNING

(Technical Training Service, Forestry Commission)

This article is written to assist the chain-saw operator engaged on felling and snedding conifer trees within a forest environment.

In order to make the snedding operation safer a relatively short guide bar of 12 to 16 inches is used. Where the tree diameter is less than this no serious felling problems exist. However, in most even aged crops, there can be a large variation in butt diameters which inevitably presents the problem to the chain-saw operator of having to fell trees with diameters which are greater than the length of his guide bar.

The following notes are intended to provide some of the answers to this problem using a relationship between the guide bar length and tree diameter. It should be emphasised that this article does not constitute a complete manual of felling and consequently no reference is made to such technical points as variations in hinge thickness and wedging sequence to control the felling of leaning trees.

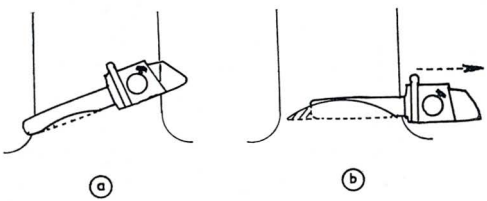
1. Tree Diameters ¾-1½ Guide Bar Lengths

Sink

The sink is produced with the operator standing on the right-hand side of the tree.

It is likely that the width of the sink will be greater than the guide bar length and because of this the saw must be entered on the far side (a) and drawn across to complete the top sink cut at (b).

The bottom cut is produced by turning the saw engine up and presenting it to the tree as in (c). Care must be taken at this stage not to overcut and destroy the hinge. The cut is completed by drawing the saw backwards and inwards until it is possible to join this cut completely with the top cut.

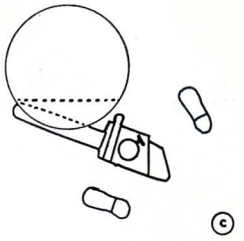


Sink Top Cut

Made with bottom of bar. Standing on right of tree.
Start from far side (a) and travel across (b).

Sink Bottom Cut

Made with top of bar.
Start from far side and travel across.



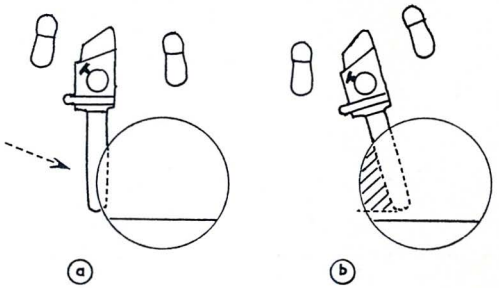
Main Cut

The felling cut can be made in one of two ways by either :— (a) starting from behind the tree or (b) starting the cut by boring into the left-hand side.

(a) Starting from behind the tree

With the saw held level, engine up, the guide bar is presented to the tree (a) at a point slightly above the level of the sink. It is important that the operator knows precisely the position of the sink cut in relation to his guide bar tip. An error of judgement at this stage could result in either an overcut into the sink or an undercut producing a hinge too thick to allow the tree to fall without splitting.

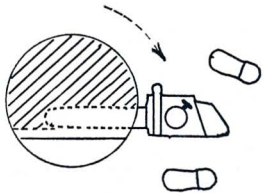
The felling cut is continued until the operator is sure that the area of tree left uncut (unshaded in b.) is accessible to the guide bar when he is operating in the final felling position (c).



Must be level with bottom cut of sink or slightly above.

Made with bottom of bar.

Utmost care must be taken in positioning bar tip and controlling its path across back of hinge.

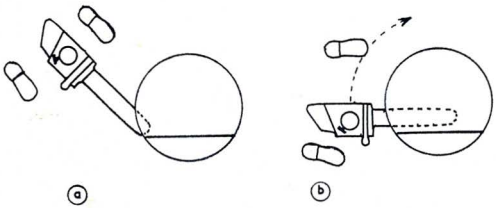


(c)

(b) Boring into the cut from the left-hand side

The felling cut is started by boring into the tree a calculated distance behind the sink (a and b). This distance will vary according to thickness of hinge required, width of guide bar and expertise of operator. It is very important that during this operation the saw is held level as any deviation will become very pronounced as the felling cut is completed.

The depth of bore will depend on tree diameter and the operator must be sure that it is of sufficient penetration so that it will eventually meet up with the final felling cut. When sufficient boring has been carried out the saw is traversed around the tree in a clockwise direction (b) until the cut is complete (c).



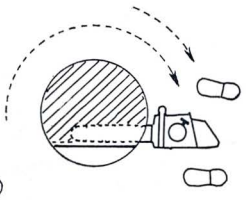
(a) (b)

Must be level with bottom cut of sink or slightly above.

Bore in behind hinge taking care that bar is parallel with sink.

Prevent top of bar from cutting into hinge. Cut must remain level.

Control this on front handle—hand position at centre of balance.



(c)

2. Tree Diameter 1½-2½ Guide Bar Lengths

Sink

The previous techniques for producing the sink cuts cannot be applied to this size of tree simply because the guide bar is too short.

To form the top sink cut the saw is held firmly by both hands, bar down, braced by both legs and presented to the front of the tree so as to give the desired angle of sink. Starting from the right-hand side the saw is drawn across the tree ensuring that the tip of the guide bar maintains a level and constant cut (a). Since this cutting is being done by the top of the guide bar there is a tendency for the chain to push against the operator. There is also a tendency for the chips to be directed away from the operator's face. Extra care must be given on completion of this top cut as the saw has the tendency to kick out on the left-hand side.

(continued on facing page)

Forthcoming Events

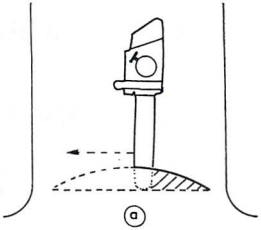
The following Shows all feature a forestry section:

June 3-6	BATH AND WEST AND SOUTHERN COUNTIES, Shepton Mallet, Somerset.
June 3-4	SUFFOLK, Bucklesham Road, Ipswich.
June 7	LEICESTERSHIRE, Market Bosworth.
June 9-10	ROYAL CORNWALL, Wadebridge.
June 11-13	SOUTH OF ENGLAND, Ardingly, Sussex.
June 13	ABERYSTWYTH AND DISTRICT, Aberystwyth.
June 13	SCOTTISH CENTRAL SUMMER SHOW, Kildean, Stirling.
June 16-18	THREE COUNTIES, Malvern, Worcs.
June 20	NORTHUMBERLAND COUNTY, Hulne Park, Alnwick.
June 23-26	ROYAL HIGHLAND, Edinburgh.
July 1-2	ROYAL NORFOLK, Norwich.
July 7-10	ROYAL SHOW (R.A.S.E.), *National Agriculture Centre*, Kenilworth.
July 14-16	**Great Yorkshire, Harrogate***
July 15-16	KENT COUNTY, Detling, Nr. Maidstone.
July 21-23	ROYAL WELSH, Llanelwedd, Builth Wells.
July 29	NEW FOREST, New Park, Brockenhurst.
August 2	RUTLAND COUNTY, Oakham.
August 3	TYNESIDE, Tynedale Park, Corbridge-on-Tyne.

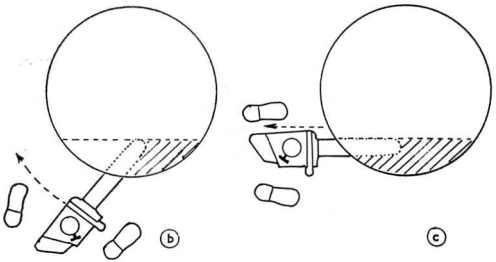
*Featuring the National Chain Saw Competition. Details and entry forms from The Secretary General, Yorkshire Agricultural Society, Cliftonfield, Shipton Road, York. Tel. York 23166. Entries close 1st June.

Sink Top Cut

Saw supported on knee.
Made by drawing saw from right to left.
Extra control needed as saw comes out of cut on left.



On completion of the top cut the operator is standing on the left-hand side of the sink. By adjusting his feet position he is ready to carry out the bottom sink cut. The saw is held level, engine up, guide bar entered at right-hand side (b). The saw is drawn across the tree until a point is reached where the cut can be completed by an inward movement of the saw (b and c). It is important that the operator knows precisely the position of his guide bar tip as any inaccuracy here will either overcut into the hinge or undercut and prevent the sink from falling out.



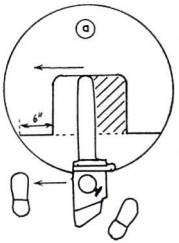
Sink Bottom Cut

Made with bottom of bar. Sawn drawn across from right to left.
Cut may be sloping upwards.

Main Cut

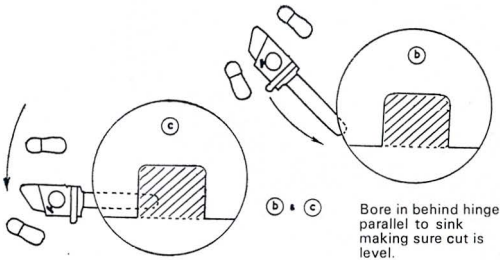
The most inaccessible part of a tree of 2 ft. 6 in. diameter being cut by a chain saw with a 12 in. guide bar is a six inch circle exactly in the centre. This must be the starting point for the felling cut.

A boring cut is made into the face of the sink, saw level, engine up. This cut is increased in area by cutting left and right. In order to control the tree a hinge of at least 6 in. must be left on either side of this bore (a).



(a) Bore into centre and level with sink and main cut.
Cut right and left, but take care not to reduce hinges to less than 6" width.

The operator next bores into the left-hand side of the tree behind the sink, saw held level, engine up (b) and (c). It is not absolutely essential that these two boring cuts should meet vertically as any fibre remaining between them would be so short as to be unable to withstand the tension exerted by the tree in falling. It is important, however, that the cuts overlap horizontally.



(b) & (c) Bore in behind hinge parallel to sink making sure cut is level.

On completion of the boring cut the saw is traversed around the tree in a clockwise direction until the final felling position (d) is reached.

Timber . . . ! !

The most massive living thing on earth is a California big tree (*sequoia gigantea*) named the "General Sherman", standing 272 ft. 4 in. tall in the Sequoia National Park, California, U.S.A. It has a base circumference of 101 ft. 7 in., requiring 17 men to encircle it with outstretched arms. Its mean base diameter is 32 ft. 3 in., with a maximum of 34 ft. The tan bark may be up to 24 in. thick in places. Total weight of the tree, including the root system, has been estimated at 1,180 tons.

(EDITORIAL ADVICE: In felling a tree of this size, a bar length slightly longer than the 12-16 in. recommended by the Forestry Commission should preferably be employed).

* * * *

The tallest tree in the world is a coast redwood (*sequoia sempervirens*) in California, U.S.A. This is a forked tree measuring 367·8 feet, with a girth of 44 feet at 4 ft. 6 in. above the ground.

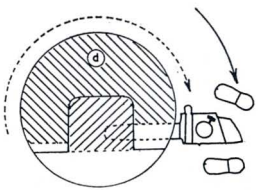
(EDITORIAL ADVICE: If you are called upon to fell a tree of this height, be sure to run very hard in the opposite direction as it starts to fall).

* * * *

The oldest tree in Great Britain is the Fortingall Yew (*taxus baccata*) in Glen Lyon, Pershire. Its age is estimated at 1,500 years.

(EDITORIAL ADVICE: Don't fell this tree, you'll be unpopular).

(Facts by kind permission of the publishers of *The Guinness Book of Records*)



(d) Main cut is made by moving saw around tree, taking care that the saw does not cut its way forward into the back of the hinge.

Letter to the Editor

From Major G. T. Blundell Brown, O.B.E., Felton, Northumberland.

Sir—The efficiency and capital cost of a power saw must be judged by its smooth running and high output at its place of operation, i.e. most probably in the middle of a wood.

In operation, strenuous demands are made on the engine of a power saw; and if the unit is to continue to function efficiently proper maintenance becomes a vital necessity. Unfortunately, however, this requirement is militated against by the conditions of usage of the tool—the middle of the wood is not the best of places in which to rectify engine faults or carry out delicate adjustments, nor possibly is the chain-saw operator—skilled though he is at using the tool—the best man to do the maintenance.

When one starts to look for professional maintenance facilities, however, one is faced with difficulties. Local garages certainly do not provide a satisfactory answer—they have neither time nor the necessary skills to deal with small engines of this nature. The local chain-saw distributor has, of course, but he is liable to be too far away to be of practical day-to-day use.

An answer would appear to lie in a more intensive cultivation by the manufacturers of chain-saws of the large number of 2-stroke engine dealers that exist in all parts of the country. Most of these at present are unwilling to undertake the servicing of chain-saw engines, although this should be a task perfectly within their province. It has to be presumed, therefore, that their co-operation for this purpose has not been sought by the chain-saw manufacturers, and I suggest that this should be done.

G. T. BLUNDELL BROWN, O.B.E., *Major*

Chain-Saw Servicing

By J. F. K. NOSWORTHY, M.A., Grad.I.E.E...

PART 1—THE MAGNETO

The magneto of a chain-saw is the component which, for some reason, many users are unwilling to service. How many times has one not heard the plaintive wail ". . . I've pulled the starter at least fifty times, and I still can't get a spark!" In fact, of course, the only logical comment which can be applied to this statement is that a magneto which failed to function on its first turn would be no more likely (and indeed even less so) to function on its fiftieth. Forty-nine pulls of the starter have therefore been wasted, and the time and energy could have been much better employed in a little service work.

Some understanding of how the component works is, of course, essential Briefly, the principle of operation is that a strong magnet which is cast

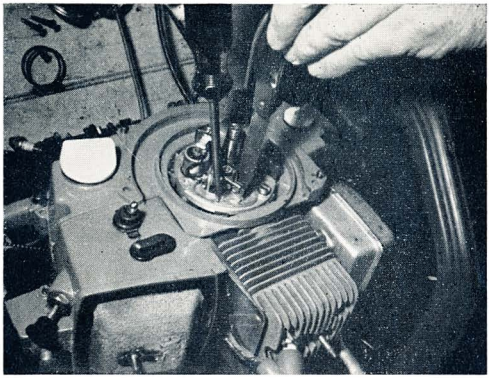


Fig. 3. Setting the breaker points.

should be set to ·020 in., and any adjustment must be done by bending the earth electrode (*never* bend the central electrode, or use it to lever against). Reconnect the stop-switch.

Total time of the job: 1 hour assuming moderate skill, reducing to ½-¾ hour with familiarity. Work saved; all those pulls on the starter rope, plus all that wear on the starter!

R. A. BUTLER
Chairman of the P.S.A. Associate Members' Committee

New Products

NEW OREGON CHAIN—Series 80 Oregon chain was launched on the U.K. market in September of last year, and represents a completely new development in cutting chain design. Although the cutting teeth are superficially of the conventional hooded chipper shape, there is a major difference from all previous designs in that the cutting edge of the top plate is bevelled on the outside—not on the inside of the tooth, as with a chipper chain—and the tooth is raked backwards at an overall angle of approximately 40°. The presentation of the cutting edge to the wood is therefore closely similar to a plane.

Sharpening of the top plate is carried out with a flat file; and a special filing jig enables this operation to be combined with the dressing of the depth-gauges (which fulfil their conventional function). The automatic combination of these two operations ensures that the cutting clearance remains constant without special care on the part of the operator. The gullets, which must be sharpened at about every fifth sharpening of the top plates, are cleared with a 5 mm. round file; and a gauge is available to ensure correct gullet clearance and side-plate cutting angle. The setting and operation of both gauges can be carried out by relatively unskilled labour.

Advantages claimed for Series 80 chain are that the chain stays sharper longer; that impact damage from nails, etc., is much less severe (the rake of the tooth prevents scoring along top or sides); that sharpening requires less skill; and that the cut is both smoother and faster (20% increase in cutting speed over chipper design is claimed). The chain is currently available in drive-link thicknesses of ·050 in., ·058 in. and ·063 in., but only in one pitch (·404 in.). A rim-drive (Oregon Power-Mate) sprocket is necessary, as the tie-straps are not notched for a spur sprocket, and the interchangeable rims of the Power-Mate series allow the one pitch to be used on most makes of saw.

Oregon Series 80 chains, and all other Oregon products, are distributed in the U.K. by Spear & Jackson Ltd., Aetna Works, Savile Street, Sheffield through an extensive network of local agents. A catalogue is available on request.

CHAIN COVER—R. C. Stevens, Rodmersham Green, Sittingbourne, Kent, make a very practical design of chain safety-cover (see illustration). The material of the cover is hard plastic (the manufacturers claim "unbreakable"), and the fastener of Velcro tape is both simple and virtually indestructible. Unlike slide-on covers, the design of the Stevens cover allows it to be closed onto the chain without a sliding action, so that the chain cutters do not damage the cover each time the latter is fitted. Colour is a bright red, for easy location in undergrowth; weight is less than 4 ounces; recommended retail price is 11s., either from local agent or direct from the manufacturers.

The Power Saw Association has always strongly recommended the use of a chain cover, both on grounds of safety and as protection for the chain against damage. The Stevens cover can certainly be recommended as a practical design and good value for the price.

into the rim of the flywheel (hence the proper description "flywheel magneto") is brought closely past the iron pole-pieces of the coil as the flywheel rotates. The coil is wound with two windings, called the primary (or low-tension) and secondary (high tension) windings. The movement of the magnet induces an electric current in the primary winding, which circulates through the contact-breaker points which are closed at this stage. At the appropriate moment in the engine cycle, a cam on the crankshaft opens the points, and the sharp interruption of the primary current causes the condenser to be charged. This causes a rapid rise in the voltage across the primary winding, which in turn induces a current in the secondary winding. Since the secondary winding comprises many more turns than the primary winding, the voltage which it produces is, by transformer action, greatly magnified; and the resulting high voltage is sufficient to jump across the air-gap of the sparking plug in the form of a spark. The electrical circuit of the magneto is shown in Fig. 1.

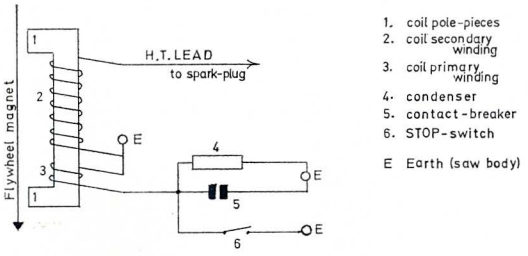


Fig. 1. Electrical circuit of flywheel magneto.

Separate from the magneto, but forming an electrical part of it, is the stop switch. This is connected so as to short-circuit the primary winding when switched "off", thus preventing the build-up of magneto voltage. It is therefore worth observing that, contrary to conventional electrical practice, the switch is "off" when its contacts are closed, and "on" when they are opened. A faulty stop switch can therefore be disconnected or removed without affecting the operation of the magneto, although of course an alternative method of stopping the engine will have to be used (e.g. use of the choke).

Fault-finding in a magneto is a logical sequence, and the above may be taken as the first step. Disconnect the stop-switch (often made intentionally easy by a snap-connector in the lead), and leave it disconnected until servicing is completed. This will save the annoyance of looking for trouble in a perfectly healthy magneto when the trouble, in fact, lies only in the stop switch.

One more external check should be made before stripping is commenced. It is assumed that the absence of a spark has been checked by observing the plug points (with the spark plug removed and laid against the cylinder fins); but the plug itself may be faulty. Make a final check therefore at the end of the H.T. lead, which should be bared and held about 1/32 in. off the cylinder fins whilst the engine is cranked. If the connection to the spark plug is through a rubber cap with an internal spring connector (as is common) this should be removed for this check. If a good spark is now found, the spark plug and its connector must be checked for faults, and the obvious remedial procedure taken.

To gain access to the magneto components, after removal of the necessary external cowlings (and probably the recoil starter assembly), the flywheel must first be removed. This can be an awkward job unless the two essential tools required for it are available—viz., a holding tool and an extractor. The holding tool is needed to hold the flywheel against rotation whilst its retaining nut (which will be tight) is undone. The extractor is needed to pull the flywheel off its tapered seat on the crankshaft. The extractor is usually available as an accessory tool from the engine manufacturer, and is a "must" for the maintenance tool kit. For the holding tool, a strap-spanner is most handy, and this can be either bought or made up. Fig. 2 shows the strap-spanner in use whilst the flywheel securing nut is loosened.

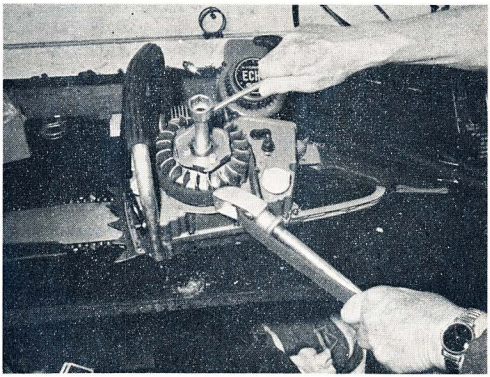


Fig. 2. Using the strap-spanner.

With the flywheel nut (and washer, if fitted) removed, the flywheel may be pulled off its taper with the aid of the extractor. Again, it is necessary to hold the flywheel against rotation while the extractor is screwed in;

and this may either be done with a strap-spanner or, on some extractors, provision is made for gripping the body of the tool which attaches to the flywheel boss whilst the central screw is turned. If no extractor is available or can be readily made, there is an alternative procedure which involves cautious leverage under the rim of the flywheel (in at least two places) whilst the end of the crankshaft, suitably protected by a nut or dummy, is tapped smartly with a copper hammer. This method should, however, be used in emergency only, as expensive damage can easily result. On only a few saw engines (the Danarm 55 is one) the flywheel taper is exceptionally steep, so that the end-wise grip is small and the flywheel may be simply removed by pulling with the fingers whilst the crankshaft is lightly rapped.

After checking the taper and key-way for wear or damage (which if present will necessitate replacing not only these components but almost certainly the crankshaft as well), wrap the flywheel to prevent its magnet picking up filings and lay it aside. Avoid loss of the securing nut and washer by sticking these to the magnet. Next, before checking individual components, check the general internal condition of the magneto. Check for presence of oil—if this is present in any quantity there is a leakage through the crankshaft oil seal, and it is useless to continue with magneto servicing until this has been renewed. Check for rubbing marks around the saw body, stator plate and coil pole pieces—these will be present if the flywheel has been rubbing as it rotates, and their cause must be investigated and rectified. All electrical leads should be inspected for signs of abrasion.

Next, remove the cover from the contact-breaker points (if fitted) and separate the point faces for examination by pressing the heel of the rocker-arm outwards from the crankshaft. The faces should be clean, shiny, and free from pitting. If this is the case, the only attention required is the application between them of a piece of clean white card (e.g. the corner of a visiting card), drawing it out whilst the points are allowed to close against it under light pressure. If the card comes out marked or dirty, repeat until entirely clean. If dirt or pitting is present, however, the points must be removed for servicing. One screw, washer and lock-washer, plus electrical connections, will be found holding the complete assembly.

With the points assembly removed, the faces if lightly marked only may be cleaned up by passing fine emery paper between them, again allowing the spring of the points to apply the necessary pressure. If the marking is too heavy for this to succeed, the points must be separated and rubbed down on a carbide stone, or on emery paper on a flat plate; taking care that a true and square face is maintained. In either case, after rubbing down, all traces of abrasive must be removed by meticulous washing in petrol. If the pitting is so deep that it goes below the platinum facing of the points, or if the facing has been worn thin by previous servicings, cleaning will be useless and the points must be replaced.

With the points serviced, check the external condition and electrical connections of the other magneto components (coil and condenser). Pay particular attention to the two wires leading from the coil to the saw body, i.e. the earth ends of the two windings. It is quite common to find one of these wires either completely broken or nearly so. Prise all wires

gently with a screwdriver to check for breakages, which may be hidden by insulating sleeves. Prise all soldered joints—"dry" soldered joints seem to be a favourite pastime with at least one saw manufacturer—and don't be afraid to prise these quite hard. If the joint is good, it will be as strong as the metals it is joining—if it is bad, you want to ensure that you find it so. Check the tightness of all screws, particularly those serving an electrical function (e.g. clamping screw on the condenser body). Check the H.T. lead carefully. It must be sound in insulation, as it carries a high voltage which will leak through any defective patch—for this reason, if there is any insulation damage, the lead must be replaced, since a taped repair will not be satisfactory. The connection between the H.T. lead and the coil should be pulled to see if it comes away freely—if it does, the spark current will have caused corrosion at this point and the contact will be poor.

If it is possible to have the internal condition of the coil and condenser checked on a magneto analyser, this should be done; but if this is not possible, these components must be taken on trust, and the only remedy, if a fault in them is suspected, is to replace them. Unfortunately, since most internal failures of either component result in loss of spark, there is no means of telling which of the two is the faulty one. Temporary substitution procedure may be employed if spares are available in order to localise the fault.

Reassembly may now be commenced, starting with the breaker points. Place the assembly in position, tighten the clamping screw lightly. Take a feeler gauge of the correct size (usually ·016-·018 in.), and ensure, by wiping it that it is clean and free from oil. (Cleanliness of the point faces is absolutely essential—they must on no account be touched with the fingers after cleaning, and any gauge used between them must be cleaned *each time* before it is used). Rotate the engine (easiest done by screwing the flywheel nut on and applying a spanner) anti-clockwise until the heel of the rocker arm rests on the highest point of the crankshaft cam, so that the points are open to their maximum. Insert the feeler in the points gap and, using a screwdriver as a lever against the base-plate, move the fixed point in its adjusting slot until the gap closes against the feeler (Fig. 3). Slide the feeler in and out to check it for a snug fit. When satisfied, tighten the clamp screw—and re-check the gap afterwards in case it has moved in the tightening. Finish by passing a clean card through the points, as previously described. Replace the breaker cover, taking care to check that it does not trap or short-circuit any leads or terminals.

Now slide the flywheel back on to the crankshaft (after checking that the key is still in position) and secure it temporarily by its nut and washer. Before finally tightening down, check again for a spark at the end of the H.T. lead by a swift twist of the flywheel by the fingers over the firing point (which occurs as the magnet leaves the coil). Remember that rotation is anti-clockwise! If all is well—as it should be—tighten down the flywheel nut; and since this must be tight, again use the strap-spanner to hold the flywheel against rotation.

Finally, replace cowlings and recoil starter; replace (preferably with new) the spark-plug cap; replace the spark-plug, either with a new one or with the old one sand-blasted and re-gapped. The gap in the spark-plug

NEWS ITEMS

United Kingdom sawmill output of home grown timber was 1,706,000 cubic feet in January of this year. This shows a drop of 13 per cent on the January, 1969 figure, and is comprised of a 12% drop in hardwood and a 15% drop in softwood.

* * *

Echo Concessionaires and their associated company High Performance Outboards have anounced their intention to discontinue business. The concession for *Kyoritsu-Echo* chain-saws has been taken over by *Mitsui & Co. Ltd.*, Camberwell Trading Estate, Denmark Road, London S.E.5. Tel. 01-733-3321, to whom all enquiries should therefore be addressed.

* * *

A most successful "open evening" was held on March 20th at the premises of R. A. & M. D. Butler, Murrays Service Station, Ashford Hill, Newbury. Over 200 chain-saw users attended, and the programme included films, demonstrations, and a question-and-answer session. Lively competitions were held for prizes presented by a number of chain-saw manufacturers.

Messrs. Butler have recently completed a large felling contract in Berkshire. A film of this was shown, and was particularly interesting in its showing of some of the unusual problems encountered—including extraction of the timber over a lake.

A dashing young man from the Border
Said, "A chain saw I think I will order".
He enquired: "Does it buzz?"
They replied: "Yes, it does—
But only if kept in good order!"

(F. D. BINGHAM)

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DENNIS PREMIER 36 in. mower, with reverse gear. Condition as new. Transport arranged if required. £275 o.n.o. Nosworthy, Abingdon Lodge, Nr. Cambridge, Tel. Linton 746 (evenings).

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Printed by The Friary Press, Dorchester.