

DANARM

DD-8F Mk.IIA CHAIN SAW

INSTRUCTION BOOK

DANARM

DD-8F Mk.IIA CHAIN SAW

INSTRUCTION BOOK

(Date of Issue 1st March, 1965)

DANARM LTD.

SLAD WORKS, SLAD ROAD
STROUD, GLOUCESTERSHIRE
TELEPHONE: STROUD 2034/7

FOREWORD

You have purchased a precision machine so treat it with every care since it is liable to damage if misused or neglected. Its useful life is almost entirely dependent upon the methods of use and maintenance, especially when new.

It is delivered to you mechanically perfect and it is therefore imperative that you read carefully the instructions outlined in this manual.

If you require service or spare parts communicate with your nearest DANARM Distributor or Dealer,

LIST OF CONTENTS

OPERATION

General Data	4
Safety Precautions	6
Preparing Saw for Use	6
Fuel	7
Controls	7

RUNNING INSTRUCTIONS

Starting	9
Stopping	9

MAINTENANCE

Rewind Starter	11
Fault Finding	11
Chain Hints	14
Chain Adjustment	16
Cutter Bar	18
Chain Maintenance	19

REPAIRS

Estimates	6
Spares Orders	6

PARTS LIST

Engine Group	24
Magneto Group	26
Clutch and Drive Group	27
Cutter Bar Group	28
Starter Group	29
Pistol Grip and Carburettor Control Group	30
Petrol Tank Group	32
Oil Tank and Oil Pump Group	33
Cowl Group	34
Carburettor Group	35
Standard Tools (supplied with machine)	38
Special Tools available for the customer who wishes to carry out extensive maintenance on his machine	38

TO PREVENT TROUBLES EVERY DANARM OWNER SHOULD:

Read this instruction manual carefully and keep it available for ready reference; at the end of each work day, check mechanical equipment for loose or bare wires; for loose nuts and screws; for cracked and/or broken parts. Tighten, repair, or replace as required. Badly worn or broken parts should be replaced immediately to prevent greater possible damage to saw and engine.

CLEANING

Keep equipment clean. Do not allow dirt to accumulate on your chain saw, especially around the cylinder fins.

HANDLING

Your chain saw is a precision tool. Do not abuse it by rough handling. Protect it from the weather, and do not try to use it for work heavier than it was designed for.

INSPECTION

Establish the practice of periodic inspection. Check all operating controls, fuel lines, fuel tank, starter, ignition system components, chain oiler components, chain, and bar. To find minor trouble in time can prevent major trouble and costly repairs.

SERVICING

Keep your chain saw clean. Inspect regularly. Tighten any loose parts. Replace worn parts. Keep the chain sharp at all times. Use the proper fuel mixture and lubricants at all times, and always use clean containers for these. Keep equipment well-lubricated with the correct grease and/or oil as recommended.

Lubricating oil for this engine should be of a high quality, SAE 30 grade, such as the following:

SHELL X100	ENERGOL 30	ESSOLUBE 30
CASTROL XL (recommended)		MOBIL OIL A

DETERGENT OILS

Our experience with the above being limited, we are unable to give any recommendation regarding their use.

GENERAL DATA FOR SAW Type DD-8F MK.IIA.

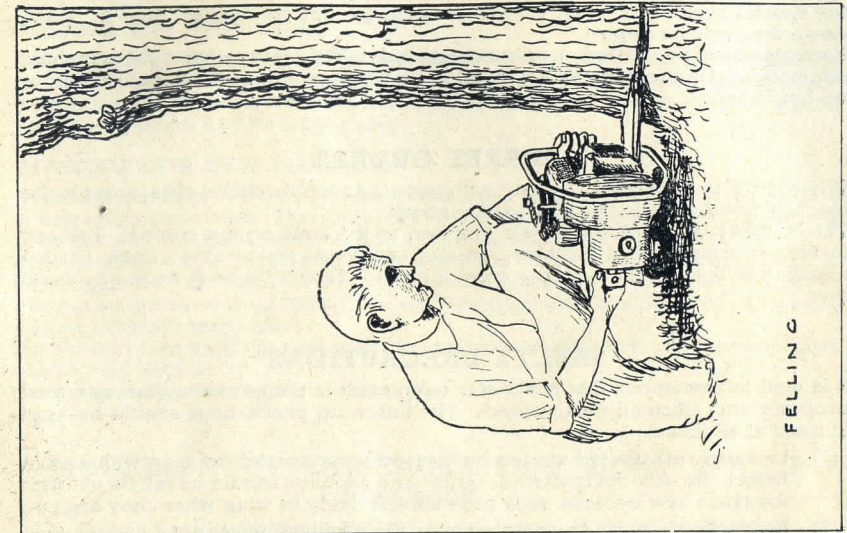
Cutting Chain	7/16" pitch Oregon Chipper Type or 1/2" pitch Oregon Chipper Type
Sharpening File Size	7/32" round parallel file (not rat tail) for 7/16" or 1/2" round parallel file (not rat tail) for 1/2"
Cutter Bar	Lengths 18", 23" or 28" as ordered
Engine Unit	"Danarm-Villiers" Type 8F/3
Capacity	98 c.c.
Peak Power	5 h.p.
Sparking Plug	Lodge HNX—Point Gap .018"-.020"
Carburettor	Diaphragm Type
Contact Breaker Points012" Gap
Rotation	Anti-Clockwise on Starter

LUBRICATION

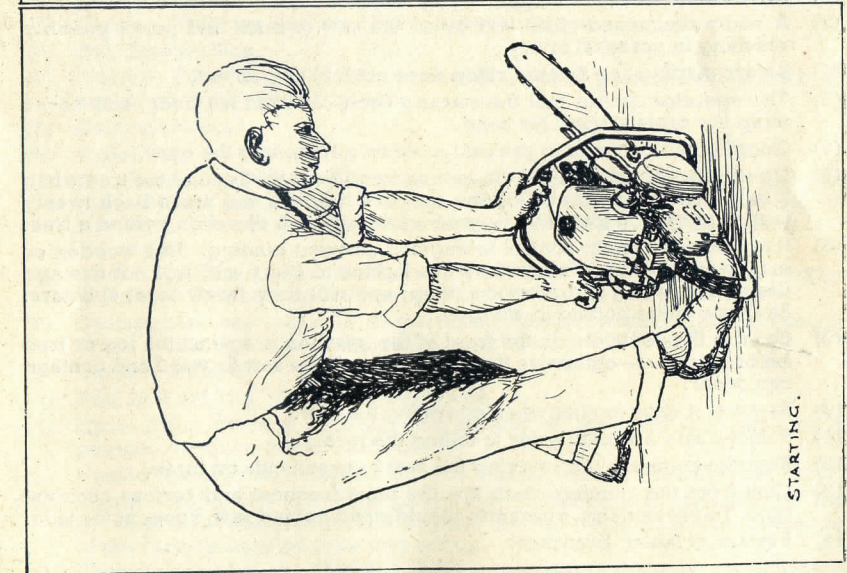
Engine	"Petroil" Mixture in Fuel Tank—1 1/2 pt. capacity
Cutting Chain	1/2 pint capacity contained in the forward part of engine. For normal timbers use engine oil only. For resinous timbers use a 50/50 mixture of engine and diesel oil.

Weight without Cutter Bar or Chain Approx. 23 1/2 lb.

Note—Saws are supplied with cutter bars for 23" cutting width as standard unless otherwise specified on order.



FELLING



STARTING.

ESTIMATES FOR REPAIRS

We are always prepared to give an estimate before proceeding with any repair. This entails a certain amount of labour in dismantling to ascertain what new parts will be required and, therefore, in the case of any estimate not being accepted for special reasons, a small charge is made for our mechanics' time in taking down the parts for report.

Estimates must be treated as approximate only. We reserve the right to include additional parts should these be found to be necessary on further examination or on bench test.

SPARES ORDERS

When ordering spares or writing with regard to the machine, always quote the machine number together with prefix letters.

This number is on the nameplate attached to the cowl on the engine. For any further information not contained in this handbook concerning repair or dismantling of this machine, please consult us and we will do what we can to assist you.

SAFETY PRECAUTIONS

It is well to remember that chain saw equipment is dangerous unless operated properly and efficiently maintained. The following precautions should be kept in mind at all times.

- (1) Undergrowth should always be cleared from around the tree with an axe before the saw cut is started. Brush and saplings should never be cut with the chain saw because such growths are likely to whip when they are cut.
- (2) Never touch or try to stop a moving chain with your hand.
- (3) A badly sharpened chain will cause the saw to buck and jump, possibly resulting in personal injury.
- (4) Before starting see that the chain does not foul any object.
- (5) The operator should pull the starting cable towards his body, and never wrap the cable around his hand.
- (6) Goggles can be worn to prevent sawdust getting into the eyes.
- (7) Operators should not hold the saw or stand near the base of the tree when it falls. They should shut off the saw, lay it down, and move back twenty feet or more at a forty-five degree angle from fall direction behind a tree.
- (8) Use wedges to help control felling and prevent binding. Use wooden or magnesium wedges, since they are lighter to carry and will not damage the cutting chain if driven too deep, nor will they throw steel splinters. Stop saw while putting in wedges.
- (9) Be sure the abutment on the front of the gearbox is against the log or tree before starting—otherwise the chain will jerk the saw forward and damage can occur.
- (10) Be sure of your footing when operating the saw.
- (11) Select a safe exit path prior to felling the tree.
- (12) Stop the engine when carrying the saw between cuts on trees.
- (13) Cuts from the running chain are the most frequent and serious accident type. To prevent this, operators should stand behind saw, never at the side.
- (14) Beware of falling branches.

INSTRUCTIONS FOR USING THE SAW

UNPACKING THE MACHINE

Take care when unpacking the saw that small parts are not lost. Keep the cases and packing materials until the machine is assembled and in working order. Place all parts on the floor or on any clear space, check according to the parts list, and clean thoroughly.

ASSEMBLING THE MACHINE

The machine is despatched with the cutter bar and saw chain detached from the engine unit. Assemble by reference to the illustrations in this book. The chain cutting teeth must point towards the machine on the bottom side of the cutter bar.

FILLING THE FUEL TANK

Use "petrol" mixture prepared as recommended and check that oil and gasoline are well mixed. Fill the tank, and replace filler cap immediately. Dust and dirt must not enter the fuel tank. Do not completely fill tank, leave small air space, otherwise engine may not start easily.

RUNNING IN A NEW MACHINE

Correct lubrication of the engine is essential, and preparation of "petrol" mixture is extremely important. The useful life of the machine depends almost entirely upon the way it is lubricated, especially during the early stages of its life.

When cutting is completed return the throttle lever to the slow running position to declutch the saw chain. It is important not to race the engine when the saw is not cutting but close the throttle lever until the engine is "ticking over", otherwise engine bearings may suffer.

Should fuel remain in the tank from the previous day's work, shake well before starting the engine.

Stop the engine when carrying the saw.

LOCATION OF CONTROLS Type DD-8F MK.IIA (see page 8)

- (1) Engine Cut Out switch—attached to Pistol grip. Forward for "off".
- (2) Choke—"Pull" for starting, "Push" when running.
- (3) Half Throttle Stop.
- (4) "Petrol" Filler Cap. Fill Container with about $1\frac{1}{2}$ pints of Fuel mixture—1 part of oil to 12 parts of gasoline.
- (5) Cutting chain.
- (6) Cutter Bar.
- (7) Air Cleaner or Filter. This is contained within the pistol grip. Remove twice daily if the saw is in regular use, and thoroughly clean it before replacing. Do not damage the rubbers otherwise dirt will be sucked into the engine.
- (8) Centrifugal Clutch. Clutch engages when Throttle is opened. When engine is "idling" the clutch is disengaged, and cutting chain is stationary.
- (9) Carburettor—see separate instructions. Normal setting: idler adjusting screw $\frac{1}{2}$ turn open; main needle $1\frac{1}{4}$ turns open.
- (10) Throttle Trigger.
- (11) Fuel Shut Off Tap. Push "ON/OFF" type.
- (12) Chain Oiler. This is controlled by a lever on the pistol grip working a plunger pump on the oil container.
- (13) Contact Breaker and condenser. For access remove retainer and cover.
- (14) Starter. Pull gently to engage pawls, then pull smartly to start engine. Do not extend the pull starter rope beyond the red mark otherwise breakage of the recoil spring or rope may occur.
- (15) Chain Tension Screw. This is situated at the front of abutment. First unlock hexagon nuts on chain guard cover, and using the combination tool turn clockwise to tighten chain, anticlockwise to slacken. Take care to lock the nuts after satisfactory adjustment of chain. (See illustration on page 16.)
- (16) Oil Filler Cap (see illustration on page 16). Fill container with about $\frac{1}{2}$ pint of engine oil. Always refill oil container when Fuel Tank is replenished. When cutting resinous timber a 50/50 mixture of Engine and Diesel oil should be used.

ENGINE RUNNING INSTRUCTIONS

STARTING THE ENGINE WHEN COLD

- (1) After filling fuel tank push gasoline tap to "ON" position and push ignition switch lever back towards guard.
- (2) Pull choke out.
- (3) Open engine throttle and retain with stop.
- (4) Steady machine and gripping the rubber starter handle give a sharp steady pull upward. The engine should start after one or two pulls. Do not extend the pull-starter rope beyond the red mark otherwise breakage of the recoil spring or rope may occur.
- (5) Open the choke gradually as the engine warms up, until it is fully open after the engine has been running for a minute or two.
- (6) After engine starts, press chain oiler several times until a quantity of oil flows into the chain saw groove sufficient to start a cut. Oil frequently during cutting.
- (7) For easier starting see page 38 on procedure when using the decompression valve.

STARTING WHEN HOT

Starting as above but see that the choke is in the "open" position (i.e., pushed down).

STOPPING THE ENGINE

To stop the engine:

- (1) Release the throttle trigger and the engine will decelerate.
- (2) Put ignition switch to "off".
- (3) When the engine is stopped at the end of the day's work or other long intervals, close gasoline tap on fuel tank.

CLUTCH

The clutch is an automatic centrifugal type with lined shoes and runs dry. When worn out it can be renovated by fitting new shoe units. Always replace broken springs or other damaged parts.

ENGINE CYLINDER

The cylinder is made in high grade heat-treated aluminium alloy with sleeved bore. A long life to the cylinder is assured if proper lubrication is given. The cylinder must not be rebored but re-sleeved cylinders can be supplied upon return of your original unit. New pistons of standard size are to be fitted when required.

CARBURETTOR

(1) Carburettor Adjustments

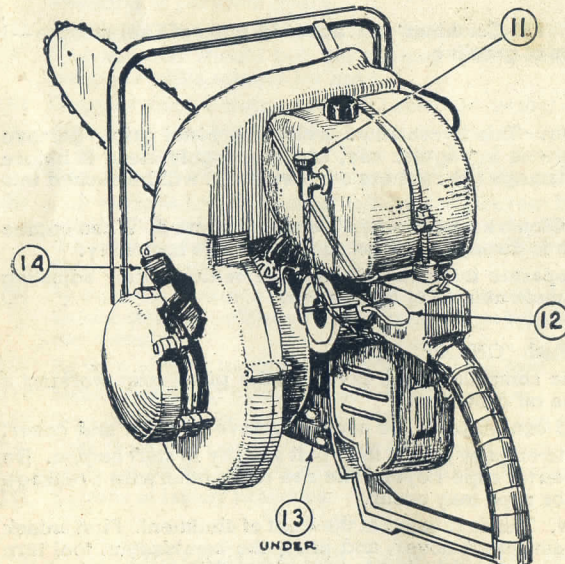
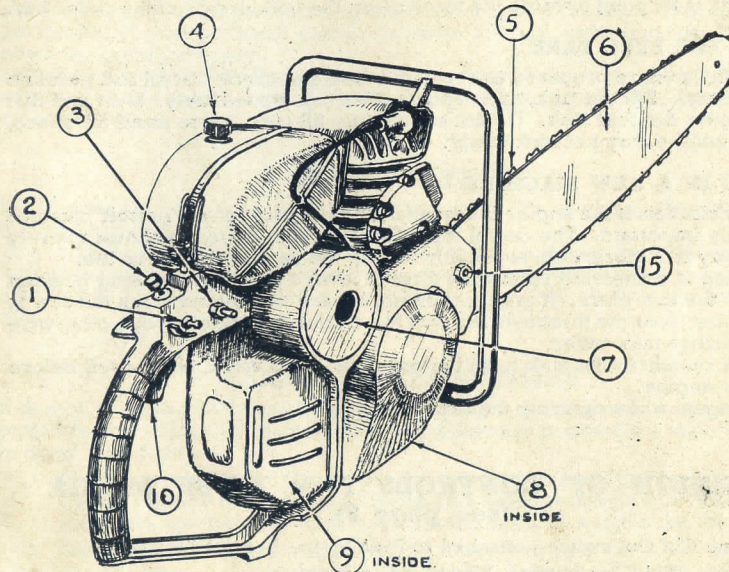
(a) There are only three adjustments on this carburettor:

Adjustment	Control and Approximate Setting
Main (or high) Speed Adjustment	HIGH-SPEED NEEDLE 1 1/4 turns open (counterclockwise) from closed position.
Idle Mixture Adjustment	LOW-SPEED NEEDLE 1/2 turn open (counterclockwise) from closed position.

- (b) For easy carburettor adjustment, first set all adjustments as given above. Start engine and let it warm up. Release throttle lock so engine idles, then set the LOW-SPEED NEEDLE so the engine idles smoothly. Set the IDLE STOP SCREW so the chain does not rotate. Try to accelerate. If the engine falters, open the LOW-SPEED NEEDLE a little more counterclockwise until the engine accelerates properly.

The main adjustment should be set as follows:

If the engine smokes and shows a reluctance to get up to speed and to fire regularly after cutting has started, it is probably getting too much fuel, so close the adjustment slightly by rotating it clockwise a little—no more than 1/8 of a turn.



LOCATION OF CONTROLS

If the engine tends to stall in the cut, although the speed comes up easily and it fires evenly when starting to cut, then it is not getting enough fuel, so rotate the adjustment slightly in the other (counter-clockwise) direction.

All carburettor adjustments must be very slight.

(2) Changing Carburettor Fuel Filter

Should the saw start to run lean, a dirty fuel filter may be the cause. With clean fuel, a filter will last a long time, but dirty fuel may clog the filter quickly. Replace the dirty fuel filter with a clean one.

NEVER OPERATE A SAW WITHOUT A FUEL FILTER.

(3) WOBBLE PIPE HEAD FILTER

Inspect this filter at intervals, or when saw runs lean. Replace felt filter if it is clogged.

(4) Clearing Dirt From Fuel Inlet Needle

Flooding is often caused by dirt which prevents the inlet needle from seating properly. To flush the carburettor, proceed as follows:

- (a) Close fuel shut-off tap; turn toggle switch on and crank engine until it starts. Then open the fuel shut-off valve.
- (b) If the unit starts to run rich (smokes and slows down), close off the fuel shut-off tap until engine speed picks up, and then reopen. Repeat several times, if necessary, until the dirt has been removed.
- (c) If the carburettor cannot be flushed clear in this way, it should be dis-assembled and thoroughly cleaned by a Danarm serviceman.

SPARK PLUG

It is good practice to carry a spare spark plug of the recommended type in the tool kit. For satisfactory engine performance, regular cleaning of the engine spark plug is essential. Clean away carbon deposits from around the insulation and central electrode. Assemble parts together carefully and adjust the gap to .018"-.020" by bending the side electrode only. If the electrodes are burnt replace the spark plug.

CONTACT BREAKER ASSEMBLY (WITH CONDENSER)

To adjust the contact points proceed as follows: rotate the engine until the breaker points are fully open and measure with a .012" feeler gauge. If points require any adjustment release locking screw and alter to the correct gap. Check the point gap after tightening.

When closed the points should make perfect contact and they should be cleaned if oxidation or blackening has taken place. Badly pitted or oxidised points should be replaced not individually but as a complete set. Slight burning or pitting can be removed by cleaning with a fine carborundum stone or fine emery cloth, afterwards wiping with a cloth moistened with gasoline to remove metal or emery dust.

A faulty condenser is indicated by constant and intense blue arcing between the contact points, but there may always be a small amount of sparking when the condenser is satisfactory. Condenser or ignition coil breakdowns are rare and troubles are usually due to dirt or damaged insulation.

STORING THE MACHINE

All bright parts on the machine should occasionally be given a thin coating of oil or grease to prevent corrosion.

FOR THE SATISFACTORY RUNNING OF THE DANARM SAW ENGINE IT IS ESSENTIAL THAT THREE MAIN CONDITIONS ARE FULFILLED AS FOLLOWS:

- (1) The required quantity of combustible mixture (gasoline and air) must enter the engine, which means that a sufficient supply of fuel must be available at the carburettor and that the throttle should open and close freely. A clean air filter is also vital.

- (2) There must be a good spark at the plug points, when under compression, and at the correct time in relation to the position of piston on its upward stroke.
- (3) The engine must be in good mechanical condition. There must be good compression in cylinder and crankcase, and no air leaks at the various joints.

Make sure there is "petrol" in the tank, and fuel tap and ignition switch are "ON". To trace the cause of engine troubles refer to the Fault Finding Charts in this manual.

REWIND STARTER

CORD REPLACEMENT

When installing new cord in Pulley DD202 thread cord through pulley hole, tie double knot in end, then wind rope on pulley. Replace handle and washer: tie a double knot in the end of the cord.

REWIND SPRING REPLACEMENT

- (1) Starting with the inside loop, remove spring X902 carefully from Body DD201 by pulling out one loop at a time, holding back rest of turns. When replacing with new spring, note the position of spring loop.
- (2) Place spring in proper position as mentioned above with the outside loop engaged in the body seat. Then wind spring into body cavity. A few drops of SAE 20 or 30 oil should then be applied to spring.

ASSEMBLY

- (1) Place Pulley (complete with cord and handle) into Body and hook inside loop of spring to pulley with the aid of a screwdriver.
- (2) Replace the following parts and assemble in this order:

Washer	Part No. DD209	Friction Washer	Part No. DD219
Friction Washer	" " DD219	Washer	" " DD209
Dog Arm	" " DD204	Spring	" " DD216
(To which should be sub-assembled: Dogs—Part No. DD205—2		Large Washer	" " DD210
Springs—Part No. DD206—2		Retainer	" " DD218
Spring Retainers—Part No. DD207—2)		Pulley	" " DD226
- (3) Starter cord must now be completely wound on pulley in correct direction. IMPORTANT: Two additional turns should then be added in the same direction for pre-tension.
- (4) When assembling the starter to your saw ensure that the centralising pin locates the hole in the end of the crankshaft.

ENGINE FAULT FINDING CHART

TROUBLE	REMEDY
(1) Engine will not start	
(a) Fuel Trouble	Inspect petrol pipe to check whether fuel is reaching carburettor. Turn tap to ON, refill tank. If no fuel, even when tap is on and fuel is in tank, remove and clean fuel pipes and wobble pipe head filter. Mixture may be too rich due to use of strangler, or incorrect setting of adjusting screw. Open throttle wide and pull starter several times to clear engine of "petrol" mixture, adjust screws, drain crankcase. Air leaks at carburettor joints. Fit new joints. Dismantle carburettor and clean.
(b) Ignition trouble	Test for spark by holding sparking plug body on cylinder head, check for leak along insulation of plug or high tension

TROUBLE**REMEDY**

- lead. Try a new plug of the type recommended and/or new H.T. lead.
Test for spark at end of H.T. lead held $\frac{1}{8}$ " from cylinder fins. Plug points may be oily or sooted up—clean plug or fit new one. If no spark at the end of H.T. lead, contact breaker point gap may be too narrow or points pitted or dirty or oily—adjust point gap to .012" and clean points.
Moisture on insulation of condenser box—clean and dry out.
High tension pick-up not making good contact on ignition coil due to corrosion or misplacement—clean and correct.
Cracked insulation of adjustable contact breaker points—renew.
Damaged insulating sleeving on wires connecting contact breaker to coil or condenser—replace with new sleeving.
Faulty connection to low tension wire of ignition coil—correct.
Faulty condenser—replace.
Faulty ignition coil—replace.
- (2) **Engine Four or Eight Strokes**
(a) **Mixture Wrong**
Choke may not be fully open or adjusting screws set to "RICH". Air filter may need cleaning (see page 7).
(b) **Over Oiling**
Check by watching for excessive smoke from exhaust pipe. Engine may four-stroke for a little while after standing due to accumulation of oil in crankcase. Usually ceases when engine has been running for a few minutes unless too much oil has been mixed with the gasoline.
(c) **Flooding of carburettor**
Flooding of carburettor. Persistent flooding is usually due to dirt under fuel needle seating, or sticking fuel needle, or damaged seatings or diaphragm.
- (3) **Engine Lacks Power**
Engine out of tune, bearings worn, unsuitable sparking plug. Overhaul, replace with recommended type of plug.
Loss of compression—tighten cylinder head bolts or replace worn piston rings.
Excessive carbon deposit on piston head—decarbonise.
Exhaust system choked with carbon—clean.
Incorrect carburettor setting—check setting.
Air cleaner choked—clean thoroughly.
Obstruction in fuel supply—clean out tap, fuel pipe and filters.
Incorrect ignition timing—check cause.
Cutting chain too tight—adjust.
- (4) **Engine will not run slowly**
Weak mixture due to air leaks at carburettor joint, crankcase, and cylinder base joints—tighten all joints.

TROUBLE**REMEDY**

- Crankcase drain screw loose or missing—tighten or renew.
Worn crankshaft bearings, or leaking compression seal—renew.
Ignition timing needs attention.
- (5) **Engine suddenly stops firing**
Spark plug lead detached—replace and tighten nut.
Plug points bridged by oil, carbon, or deposit caused by use of leaded gasoline—clean or renew.
Short circuit of high tension current by water on H.T. lead—dry out.

OPERATING THE SAW**CUTTING CHAIN LUBRICATION**

To ensure oil reaches the bottom edge of the cutter bar it is desirable to occasionally hold the saw nearly vertical with the cutter bar pointing downwards whilst chain is stationary. In this position operate the oil lever vigorously until oil is overflowing from the top groove and flowing down the outside of the cutter bar to the bottom groove. Then accelerate the engine to revolve the chain and distribute the oil round the cutter bar. Repeat this procedure from time to time. (See page 15.)

TREE FELLING

Always use the Falling-Dog when tree felling (but not for other operations). Preparations for tree felling with the Danarm saw are the same as those for hand felling. Large diameter trunks must be notched and "wedged up" as for hand sawing. Cut a notch on the side of the tree to face the direction in which it is desired to fall and saw through from the opposite side. This will prevent any possibility of the tree falling towards the operator, particularly if a strong wind is blowing. The "notch" or "sink" should be cut as near the ground level as conditions will allow.

CROSS-CUTTING LOGS

Preparations for cross-cutting logs are as for hand sawing. Wedging may be necessary, dependent upon circumstances. Should the saw jam, the log should either be raised immediately below the cut, or a wedge driven into the cut from above.

Place the machine against the log so that the cutter bar clamp touches and takes the thrust of the saw.

Hold the machine with the left hand on the top of the handle frame and with the right hand on the pistol grip. Pull the throttle trigger with the index finger to the fully open position.

It will be found that, especially with big trees, a slow see-sawing movement will ensure fast cutting.

Direct drive saws do not require you to force the saw—its weight alone will be enough to cut through the log.

CUTTING FROM BELOW OR INVERTED CUTTING

Sometimes after trees have been cut down they are in such a position that one end may be supported at a considerable height above the ground or may be resting against another standing tree. In such a position the tree cannot be cut up into sections from the top side because as the saw penetrates the log the tendency would be for the tree to sag thereby pinching the saw. It is therefore necessary to turn the saw upside down and to feed the saw upwards from underneath the log.

TRIMMING

The saw can be used to strip a tree of its branches and also to make a log rest in a more favourable position.

“MORTICING”

Morticing can be applied in the case of timber larger in diameter than the cutter bar length. Cut from both sides of the log.

INSTRUCTIONAL HINTS FOR THE DANARM OREGON CHAIN

(a) BREAKING-IN A NEW SAW CHAIN MEANS LONGER CHAIN LIFE

Your new, high-speed chain needs to flex its muscles before you start cutting with it. Field tests prove that a new high-speed chain can be ruined in the first five minutes if not properly broken in. Five minutes of proper breaking-in will add weeks to the life of your chain.

Follow these simple directions:

- (1) Be sure your new chain is properly lubricated. The oily substance on new saw chain is a rust preventative, not a lubricant. Pour oil on your new chain, or soak in a pan of oil.
- (2) Always install a new sprocket with a new chain. This ensures you of proper sprocket fit, especially on direct-drive saws.
- (3) Adjust for proper chain tension (see Section c).
- (4) Start engine. Run chain slowly (without cutting) for at least five minutes, while your saw is warming up. Do not exceed half throttle.
- (5) Make a few initial cuts . . . use plenty of oil after each cut . . . stop the engine. Check proper chain tension.
- (6) Watch chain tension very carefully for the first half-hour of cutting.

Hints:

- (1) NEVER run your saw at top speed when it isn't cutting wood.
- (2) ALWAYS lubricate your chain whether in or out of the cut. By oiling properly you won't waste oil.

(b) LUBRICATION

How To Lubricate Your Chain Properly

- (1) Every day, before starting your engine, be sure your oiler is working. Oil should flow freely on to the chain. If necessary, pour oil over the chain.
- (2) Use your oiler all the time while cutting. In addition, for best results, stop the saw and push the oiler while pulling the chain slowly around the bar by hand.

Why Proper Lubrication is Important

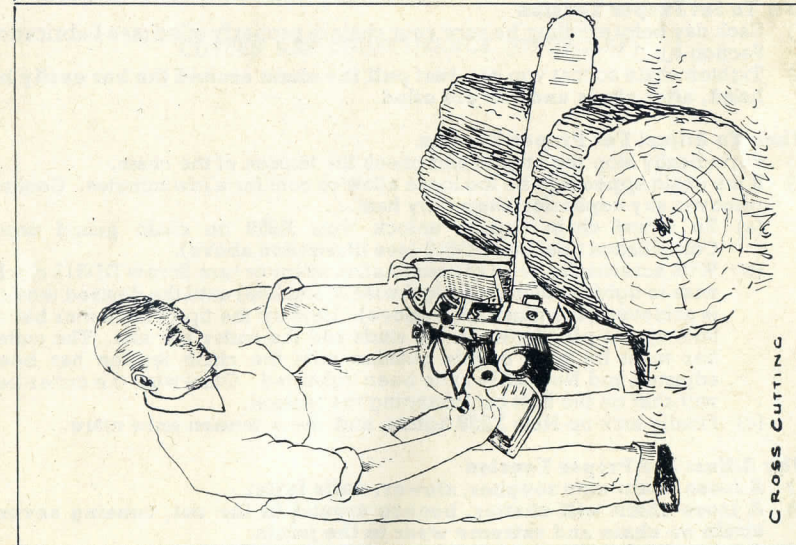
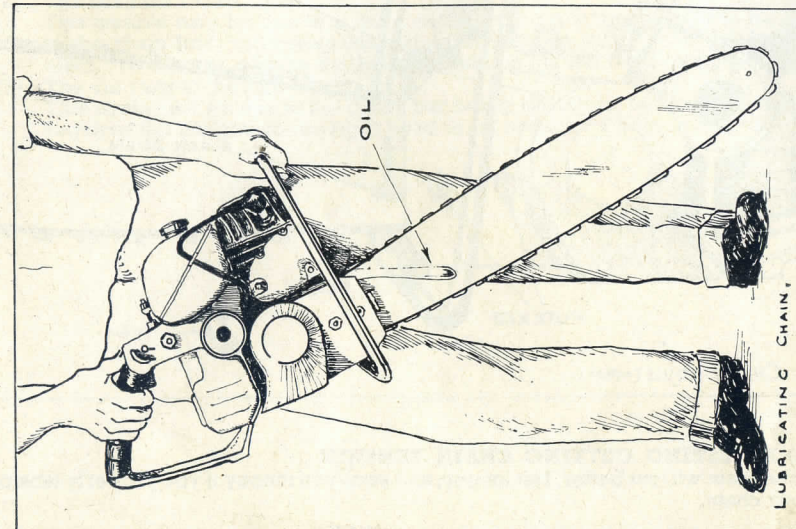
- (1) High chain speeds throw off 95% of the oil you use. To get sufficient lubrication you must apply more oil at the right time.
- (2) Saw chain must be lubricated at two places:
 - (a) In the bar groove—where chain contacts the bar.
 - (b) Inside the chain itself—in the rivets and rivet holes.
- (3) Oiling your chain at high speed lubricates the bar groove only.
- (4) Oiling your chain while idling, or stopped, permits oil to lubricate the rivet and rivet hole. Proper oiling will practically eliminate chain stretch.

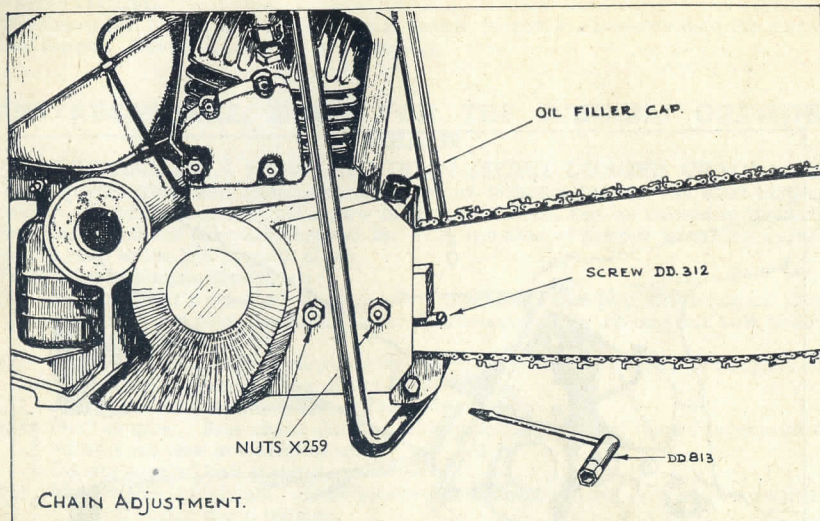
Helpful Hints

- (1) Always use a good grade of oil—and lots of it.
- (2) If possible, soak your chain in oil overnight. When cutting resinous woods it is sometimes desirable to use an oil mixture on the chain consisting of 50% diesel and engine oil. This helps to prevent binding in the cut and keeps the chain clean.
- (3) Check your oil supply each time you refuel your engine.

Insufficient or No Oil at Cutter Bar

- (1) Oil container may be empty—refill.
- (2) Oil holes may be blocked—clean with wire.
- (3) Faulty or damaged oil pump—overhaul or replace.





(c) ADJUSTING CUTTING CHAIN TENSION

Your chain will cut better, last longer, and save you money if you properly tension your chain.

How To Set Proper Tension

- (1) Each day before cutting be sure your chain is properly oiled (see Lubrication Section b).
- (2) Tighten chain so that you can just pull the chain around the bar easily by hand, after chain and bar are oiled.

When To Adjust For Proper Tension

- (1) Periodically stop the engine and check the tension of the chain.
- (2) If the chain appears to be too loose allow to cool for a few minutes. Cooling removes any expansion caused by heat.
 - (a) To adjust chain tension unlock Nuts X259 on chain guard using Combination Spanner DD813 (see illustration above).
 - (b) With screwdriver end of combination spanner turn Screw DD312 clockwise to tighten chain (anti-clockwise to slacken) until the desired tension is achieved (see illustration above). Hold up the tip of the cutter bar to take up the play between the studs and the cutter bar slot. The cutter bar must be held in this position until the chain tension has been adjusted and Nuts X259 have been tightened. Otherwise the cutter bar will shift on the first cut, changing the tension.
 - (c) Finally lock up Nuts X259 tightly, and check tension once more.

Why Adjust For Proper Tension

- (1) A loose chain cuts rougher, slower, dulls faster.
- (2) A loose chain will chatter, bounce around in the cut, causing severe strain on chain and extreme wear in the joints.
- (3) A loose chain will not drive properly, will climb the sprocket, will often jump off the bar, lead to excessive drive link breakage.

(d) TRACING TROUBLES ON CHAIN

Difficulties experienced with cutting are generally of three types:

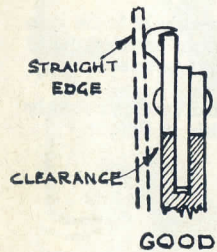
- (1) The cutting chain refuses to cut, or cuts too slowly.
This may be due to the chain being too blunt and in this connection it is often

found chains are running too long between re-sharpening. Another cause of trouble may be that the set on the chain has worn down, and is not sufficient to clear the width of the cutter bar, in which case the chain should either be fitted with new cutters, or may require replacement. A third possibility is that the height gauges are incorrectly adjusted.

- (2) The cut runs to the right.
This trouble may be due to a worn cutter bar, but is more likely to be due to the chain links not being sharpened equally on the right and left hand teeth. To correct, reduce the height a little on the left hand gauges.
- (3) The cut runs to the left.
This again may be due to the cutter bar being defective, but more probably requires the gauges on the right hand to be reduced a little in height.

CUTTER BAR MAINTENANCE (OVERLEAF)

CUTTER BAR MAINTENANCE



CHECK YOUR CUTTER BAR

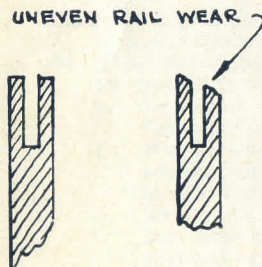
Worn bars with spread or uneven rails and shallow grooves cause the chain to lean away from the cut, giving a kerf narrower than the bar. This, in turn, causes the saw to bind in the cut.



It is simple to check the bar for such conditions. Place a straightedge against the bar and one cutter. Force the cutter over as far as possible. There should still be clearance between the straightedge and the edge of the bar. If so, the bar rails and groove are all right. If there is no clearance, then the cause must be located and corrected.

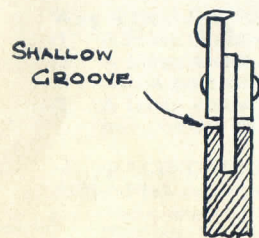
FAULT

REMEDY



UNEVEN RAILS

One rail is worn down more than the other and lets the chain lean to the low side. To correct: file the rails so they are of equal height. Check groove depth after filing.

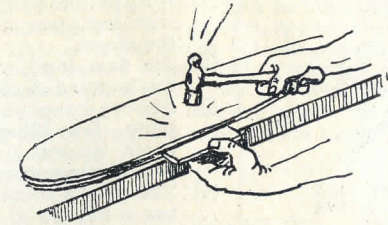


SHALLOW GROOVE

The drive links ride on the bottom of the shallow bar groove so the rails do not support the side links, allowing the chain to lean over and wear insides of rails. To correct: have grooves reground to proper depth.



SPREAD RAILS—
ALLOW CHAIN TO
LEAN AND DO NOT
GIVE PROPER SUPPORT



SPREAD RAILS

- (1) Place a groove gauge (a piece of steel about 6" long and approx. .004" thicker than the drive links) in the groove and lay bar on an anvil.
- (2) Use a 3lb. hammer and close thin rail snugly down on the groove gauge.
- (3) After each section is closed, drive the groove gauge forward its entire length and repeat the operation until the groove is to proper gauge throughout the bar.

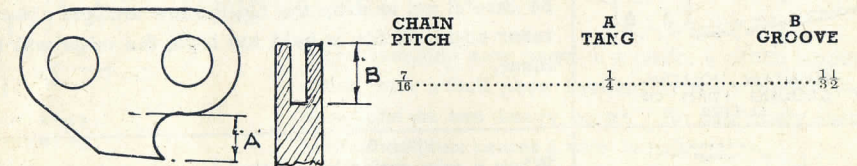


SIDE GROOVE WEAR—
CAUSES FRICTION
AND HEAT, BINDING
AND GENERAL
INEFFICIENCY

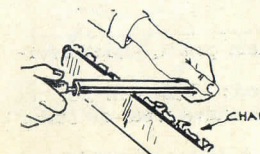
HARDENED RAILS

If there is no clearance and none of the three other causes are present, the bar may have hardened rails which wear a notch in the drive links. The bottoms of the drive links then wear into the sides of the bar groove, permitting the chain to lean. Proper filing will prevent this condition. If there is sufficient crown left in the bar, the rails can be ground and the slot regrooved to proper depth.

RECOMMENDED BAR GROOVE DEPTH

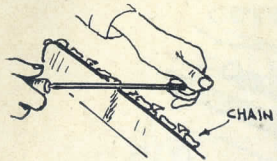


CHAIN MAINTENANCE



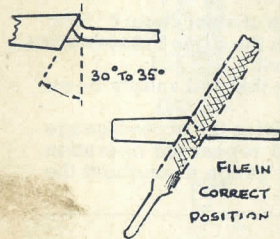
WHEN FILING WITH
A FILE HOLDER

- (1) Press flat side of file holder firmly against top of cutter, holding file parallel with top plate of cutter and with one-fifth of its diameter above top plate.
- (2) Line up notched angle guides on file holder frame parallel to chain. Maintain these notches in parallel position and you are filing the cutting edge close to the recommended angle (see page 20).
- (3) A few firm strokes will put a keen cutting edge on each "Fast-File" tooth. Always apply pressure on the forward stroke away from you.
- (4) Occasionally rotate file in the holder to get maximum use from file.



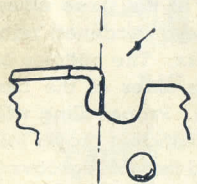
WHEN FILING WITHOUT A FILE HOLDER

- (1) Always hold your file in one position, that is, parallel with top plate of cutter and at a 30° to 35° angle to the chain.
- (2) Use firm, long, even strokes, applying pressure on the forward stroke away from you.
- (3) Always keep your file well up against the cutter plate. Low filing undercuts side of cutter, causing chain to grab. About one-fifth of file diameter should show above cutter plate.
- (4) Use only a round straight (not rat-tail) file. Never use a flat file to sharpen top edge of cutter plate. The correct file size is $\frac{7}{32}$ " diameter.



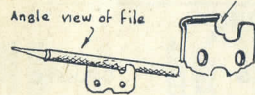
KEEP TOP OF CUTTING EDGE AT 30°-35° ANGLE

Be sure to maintain this angle on both left and right hand cutters, otherwise saw will lead off to one side.



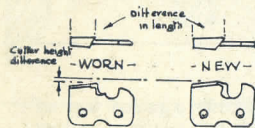
KEEP SIDE OF CUTTING EDGE VERTICAL

To obtain this vertical edge, hold the file parallel with top plate of cutter and with one-fifth of its diameter above top plate.



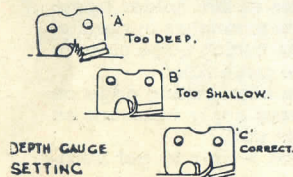
MAINTAIN HOLLOW-GROUND FORM OF CUTTER

Be careful not to drop the file too low and get a weak razor edge. If file is held too high, the edge will be blunt.



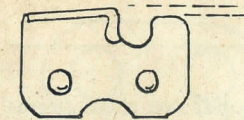
FILING NEW CUTTERS

When a new cutter is installed in a chain it should be filed back to correspond with the top plates of the other cutters. Also be sure that the depth gauge is set to match the others.



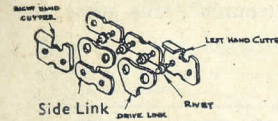
DEPTH GAUGE SETTING

- (a) Cutter bites too deeply; chain grabs, jerks, overloads motor.
- (b) Cutter cannot bite into wood; chain will not cut efficiently or to capacity; excessive wear on cutter and tie strap bottoms.
- (c) Cutter bites just deep enough to cut smoothly and efficiently. No grab, jerk or engine strain. Minimum loss of power resulting from friction. Longer, trouble-free chain life.



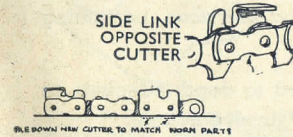
DEPTH GAUGE SETTING

Correct depth gauge setting on your chain depends on the horsepower of your saw, speed of chain travel, and the type of wood being cut. Depth gauges should be lowered to the point where pressure to force cutting will cause the clutch to slip. By setting depth gauges to this depth you will use the maximum power of your saw and at the same time reduce friction, vibration and chain chatter.



Side Link DRIVE LINK RIVET

ORDER OF ASSEMBLY



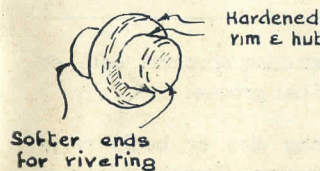
INSTALLING NEW CUTTERS

When replacing a cutter, it is recommended that the side link opposing the cutter be replaced with a new one if it is at all worn. Otherwise the worn side link will be low and not properly support the cutter. When installing a new cutter in a used chain, it is important to file off the bottom to match the wear on the worn cutters and side links.



INSTALLING NEW SIDE LINKS

When putting new side links on a chain, you will note that the side links are slightly countersunk on one side, and that the edges on that side are slightly rounded. This countersunk side with the rounded edges must always be toward the outside of the chain as the countersunk hole is additional space for the rivet to seat in. It is important to file the bottoms of new side links installed in a used chain to match the wear on the bottoms of worn side links in the chain, thereby preventing the chain from tilting to one side.



INSTALLING NEW RIVETS

When installing new rivets in a chain, a gentle lapping action with a ball peen hammer is much better than using one or two heavy blows. An extremely sharp blow sometimes causes a rivet to split.



INSTALLING NEW DRIVE LINKS

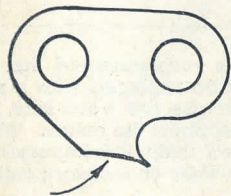
The most common places of wear on drive links are the front corner and bottom of the tang. To overcome this condition, use $\frac{1}{4}$ " round file as indicated in the illustration. If the bottom of the drive link tang is worn a shallow bar groove is indicated. Such a groove allows the drive link to wear on the bottom of the bar channel, and prevents the bottoms of the cutters and the side links from being properly supported by the bar rails. To correct this condition, have your dealer deepen your bar channel. When installing drive links be sure to use correct parts and be careful not to install parts backwards.

DRIVE LINK MAINTENANCE



CORRECT SHAPE

Many signs of inefficient or improper saw chain operation, which sooner or later will result in costly or annoying trouble, can be detected by the chain saw operator who carefully inspects his chain drive links. When you see these "signs of trouble", take steps to reduce or eliminate them.



TANG BOTTOM CONCAVE

CAUSE: Groove shallow around bar nose, permitting tangs to ride on bottom.

REMEDY: Have bar regrooved to depth adequate to permit drive link tangs to clear groove bottom.



TANG BOTTOMS ARE SHARP, FLAT, WORN PARALLEL TO BAR

CAUSE: Groove shallow along length of bar, permitting tangs to ride on bottom.

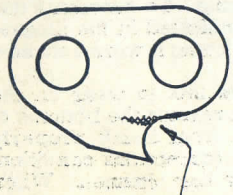
REMEDY: Have bar regrooved to depth adequate to permit drive link tangs to clear groove bottom.



TANGS HAVE ROUNDED, OR DULLED FRONT CORNERS

CAUSE: Tangs have been striking sprocket teeth, or end of saw bar as they enter bar groove.

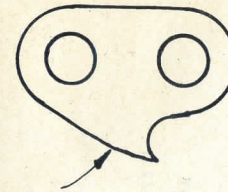
REMEDY: Check for wrong size or badly worn sprocket, and replace if necessary. Funnel (widen and deepen) bar groove at motor end to permit free, unobstructed chain entry.



SCAR ON SIDE OF TANG

CAUSE: Chain has jumped bar at point where scar or scars appear.

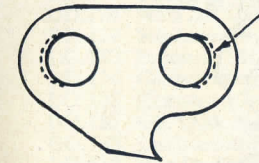
REMEDY: Adjust chain tension to correct point where four or five tangs show when chain is lifted from bar.



BACK OF TANG ROUNDED

CAUSE: Chain out of pitch with sprocket, and sprocket badly worn.

REMEDY: Install new sprocket of correct pitch.



EXCESSIVELY WORN, OR ELONGATED RIVET HOLES

CAUSE: Dull cutters, incorrect depth gauge setting, excessive pressure on bar, generally inefficient cutting, lack of oil.

REMEDY: Sharpen cutters and set depth gauges correctly. Check for matching sprocket and chain pitch.

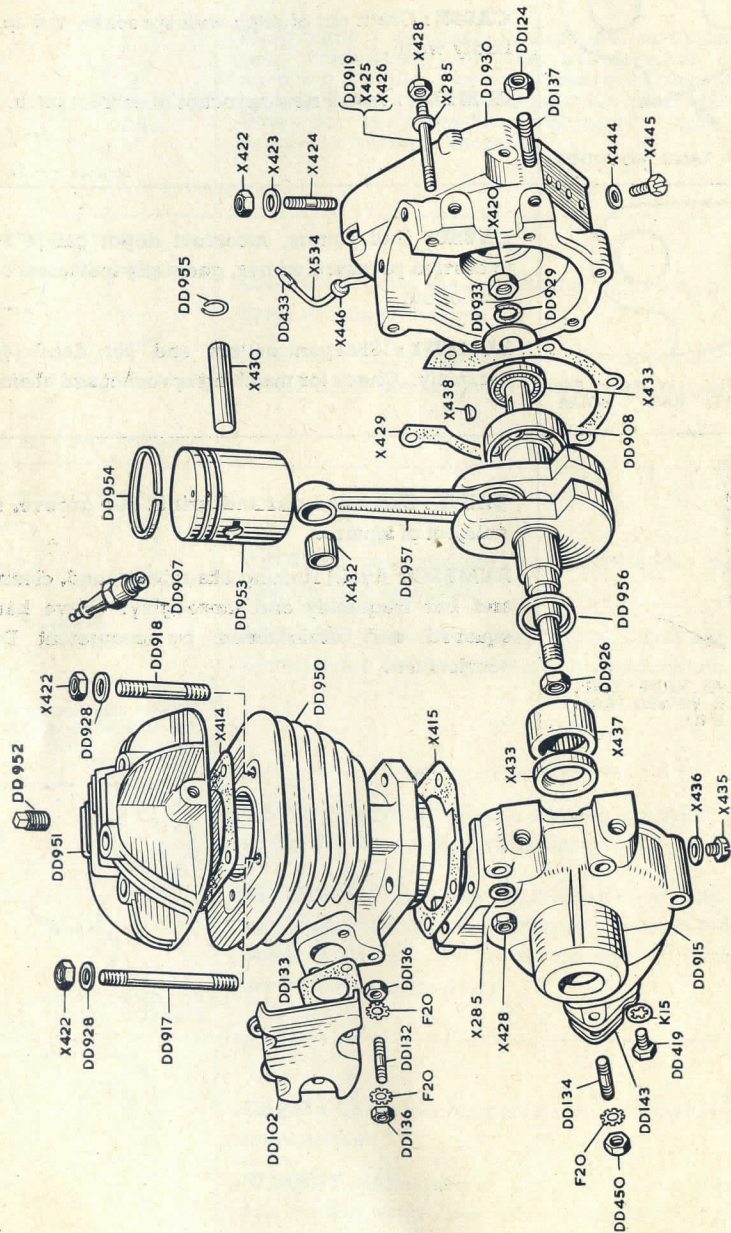


TANGS HAVE KNIFE EDGE APPEARANCE, VIEWED FROM END

CAUSE: Excessive dirt and grit in bar groove, or bar rails out of square.

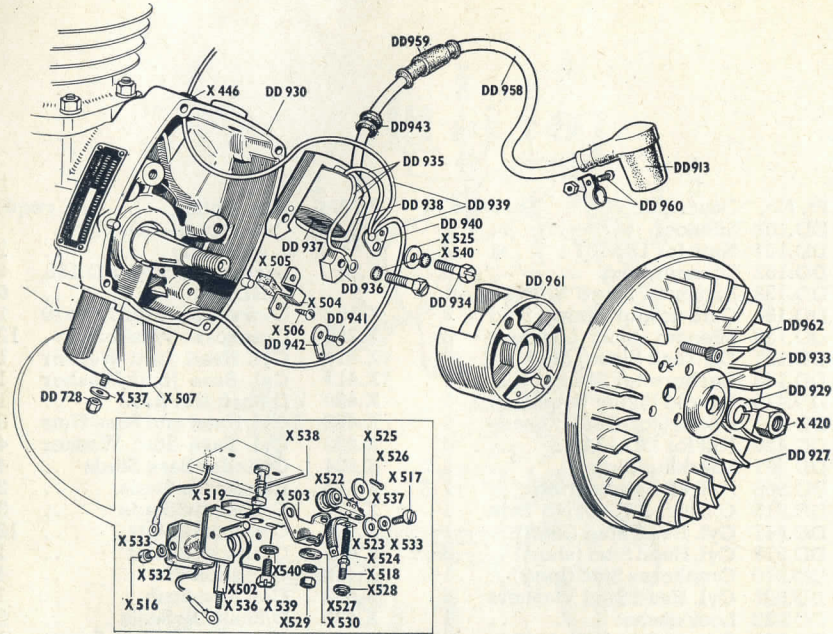
REMEDY: Avoid running chain in ground, clean chain and bar frequently and thoroughly. Have bar rails squared and straightened by competent Danarm servicemen.

ENGINE GROUP



Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.102	Silencer	1	DD.957	Crankshaft—complete assembly	1
DD.124	Nuts for DD.137	2	F.20	Lockwashers for DD.132, DD.134	6
DD.132	Silencer Stud	2	K.15	Lockwashers for DD.419	1
DD.133	Exhaust Flange Washer	1	X.285	Crankcase Washers	12
DD.134	Carburettor Fixing Stud	2	X.414	Cyl. Head Joint Washer	1
DD.136	Silencer Stud Locknuts	2	X.415	Cyl. Base Joint Washer	1
DD.137	Oil Tank Fixing Stud	4	X.420	D/Shaft Nut R.H.	1
DD.143	Carburettor Gasket	1	X.422	Cyl. Head and Base Nuts	8
DD.419	Handle Fixing Setpin	1	X.423	Cyl. Base Stud Washer	4
DD.433	Connector-Cutout Lead	1	X.424	Cylinder Base Studs	4
DD.450	Nut for DD.134	2	X.425	Crankcase Studs	2
DD.907	Sparking Plug	1	X.426	Crankcase Studs	3
DD.908	D/Shaft Ball Bearing	1	X.428	Crankcase Nuts	12
DD.915	C/case, L.H. Drive Side	1	X.429	Crankcase Joint	1
DD.917	Cyl. Head Stud (long)	1	X.430	Gudgeon Pin	1
DD.918	Cyl. Head Stud (short)	3	X.432	Con Rod Bush	1
DD.919	Crankcase Stud (long)	1	X.433	D/Shaft Oil Seals	2
DD.928	Cyl. Head Stud Washers	4	X.435	Crankcase Drain Screw	1
DD.929	Lockwasher	1	X.436	Washer for X.435	1
DD.930	C/case RH Magneto Side	1	X.437	D/Shaft Roller Bearing	1
DD.933	Pressure Washer	1	X.438	Key for Magneto Rotor	1
DD.950	Cylinder	1	X.444	Washer for X.445	2
DD.951	Cylinder Head	1	X.445	Points Bracket Screw	2
DD.952	Cylinder Head Plug	1	X.446	Grommet for Cutout Lead	1
DD.953	Piston	1	X.534	Cutout Lead	1
DD.954	Piston Rings	2			
DD.955	Gudgeon Pin Circlips	2			
DD.956	Driveshaft Washer	1			

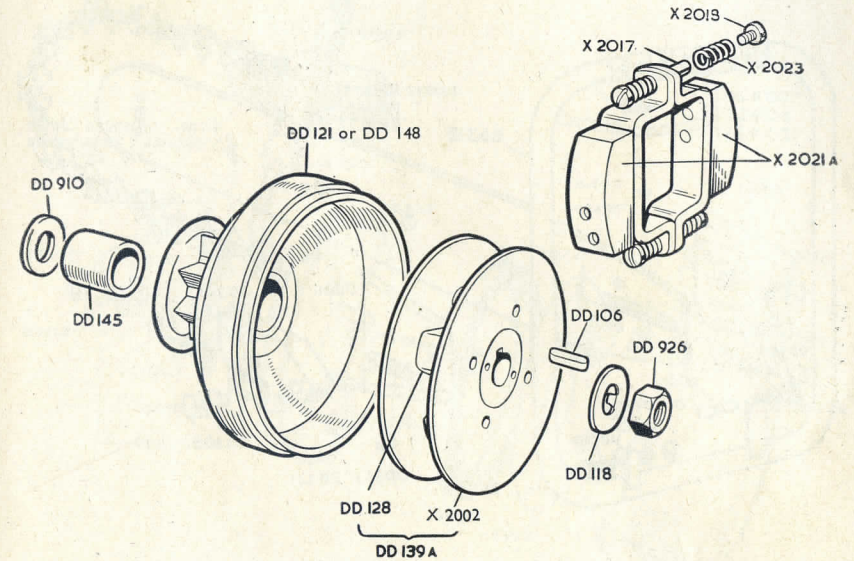
MAGNETO GROUP



Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.728	Contact Bkr. Cover Nut	1	X.505	Oil Pad	1
DD.913	Waterproof Cover R.90	1	X.506	Screw for Oil Pad Clip	2
DD.927	Fan	1	X.507	Contact Breaker Cover	1
DD.929	Lockwasher for X.420	1	X.516	Condenser Fixing Screw	2
DD.930	C/case R.H. (inc. dowels)	1	X.517	Point Bracket Lockscrew	1
DD.933	Pressure Washer	1	X.518	L.T. Terminal Screw	1
DD.934	Coil Core Screws	2	X.519	Push Rod	1
DD.935	H.T. Coil c/w leads	1	X.522	Rocker Arm	1
DD.936	Coil Core	1	X.523	Rkr. Arm Earthing Strip	1
DD.937	Coil Securing Strip	1	X.524	Rocker Spring	1
DD.938	H.T. Insulating Strip	1	X.525	Pivot Pin Washer	2
DD.939	Cutout Lead	1	X.526	Split Pin	1
DD.940	Primary Junction Plate c/w eyelet	1	X.527	Washer for L.T. Terminal	1
DD.941	Lead Clip Screw	1	X.528	Bush for L.T. Terminal	1
DD.942	Lead Clip	1	X.529	Nut for L.T. Terminal	1
DD.943	H.T. Lead Grommet	1	X.530	4 B.A. Washer	1
DD.958	H.T. Lead Complete	1	X.532	Condenser	1
DD.959	H.T. Lead Connector	1	X.533	Washer for X.516 and X.517	3
DD.960	Clip c/w Screw and Nut	1	X.535A	Contact Breaker Assem.	1
DD.961	Rotor Unit	1	X.536	Contact Bkr. Cover Bolt	1
DD.962	Rotor Capscrews	2	X.537	Contact Breaker Cover Nut Washer	2
X.420	Driveshaft Nut R.H.	1	X.538	Push Rod Spring	1
X.446	Cutout Lead Grommet	1	X.539	C'tact Bkr. Fixing Screw	2
X.502	Contact Breaker Bracket	1	X.540	Washer for X.539 and DD.940	3
X.503	Point Bracket	1			
X.504	Clip for Oil Pad	1			

(DD.935-940 not supplied separately)

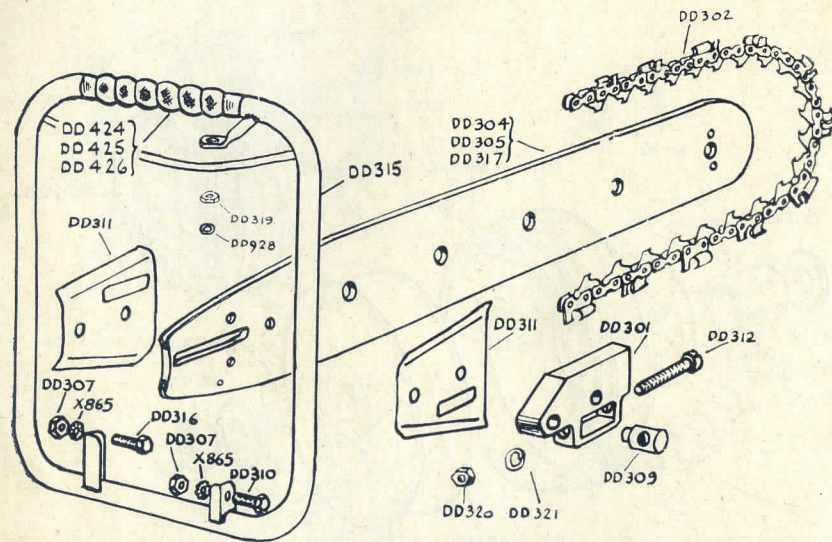
CLUTCH and DRIVE GROUP



Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.106	Taper Key	1	DD.910	D/Shaft Thrust Washer	1
DD.128	Block	1	X.2002	Side Plate	2
DD.118	Tab Washer	1	X.2017	Clutch Pillar	2
DD.121	Sprocket and Housing Assembly (c/w bearing) $\frac{7}{16}$ " pitch	1	X.2018	Locking Screw	4
DD.148	Sprocket and Housing Assembly (c/w bearing) $\frac{1}{2}$ " pitch	1	X.2023	Clutch Spring	4
DD.145	Bearing	1	X.2021A	Clutch Shoe Assembly	2
			DD.139A	Blk. and Side Plate Assy (supplied together)	1
			DD.926	Drive Shaft Nut (also shown in Engine Grp)	1

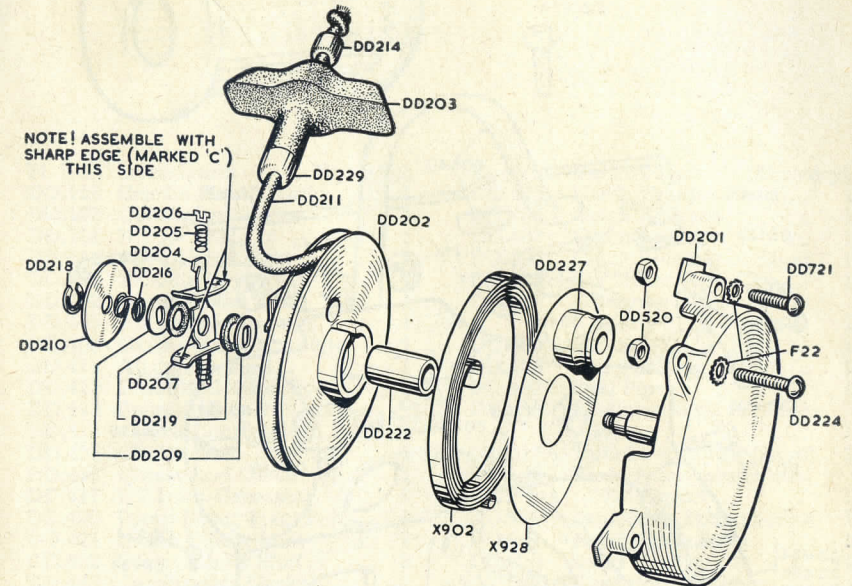
DD.129A	Part No.	Description	No. reqd.
CLUTCH COMPLETE COMPRISING:	DD.128	Clutch Block	1
	X.2002	Side Plate	2
	X.2017	Clutch Pillar	2
	X.2018	Locking Screw	4
	X.2023	Clutch Spring	4
	X.2021A	Clutch Shoe Assembly	2

CUTTER BAR GROUP



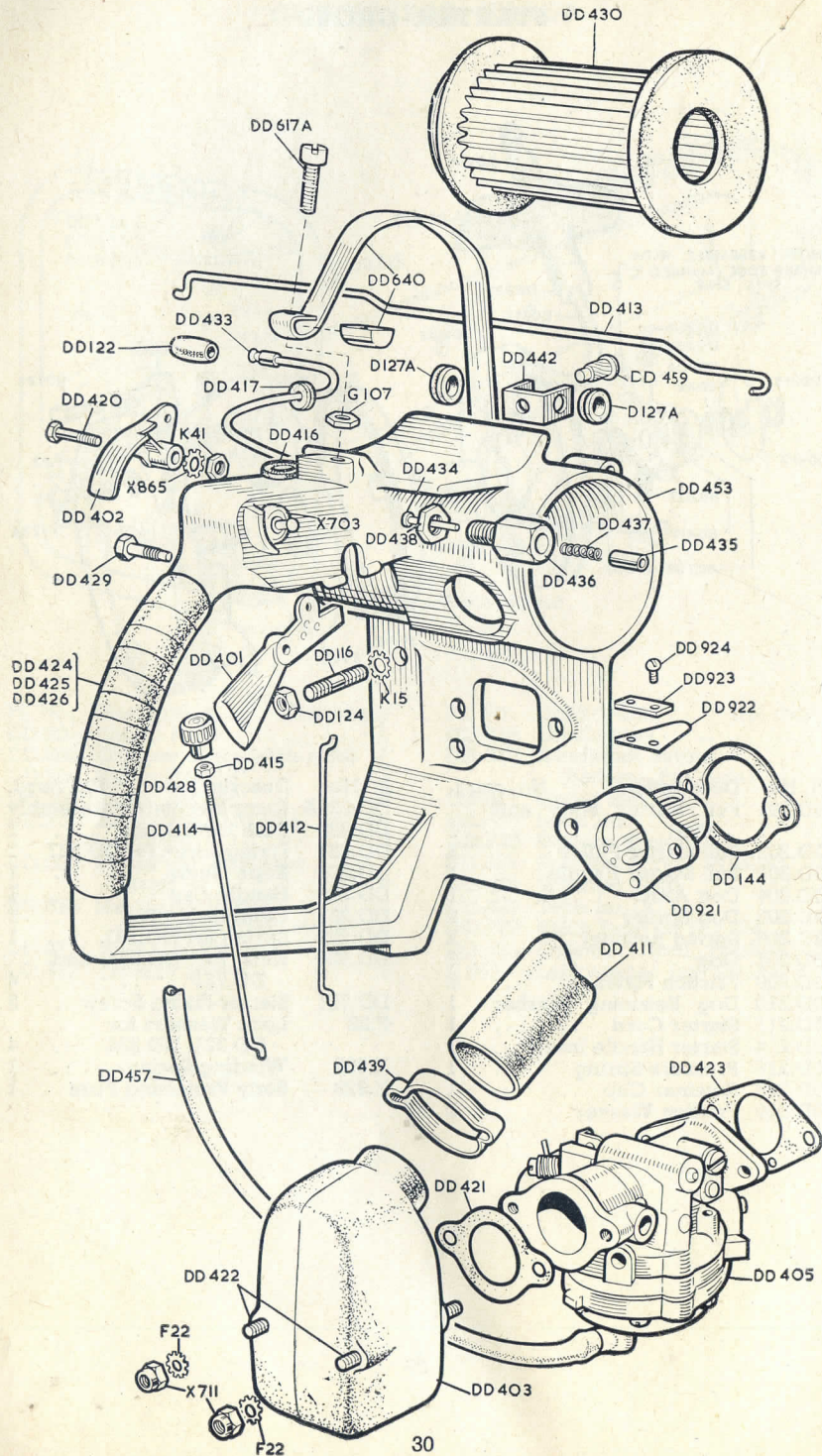
Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.301	Clamp Plate	1	DD.315	Handlebars	1
DD.302	Chipper Chain (state size)	1	DD.316	Handlebar Setpin (Bottom—Fan Side)	1
DD.304	Cutter Bar, 18"	1	DD.317	Cutter Bar, 28"	1
DD.305	Cutter Bar, 23"	1	DD.319	Lock Nut	1
DD.307	Nut for DD.310 and DD.316	2	DD.320	Tension Screw Nut	1
DD.309	Cutter Bar Adjusting Block	1	DD.321	Tension Screw Washer	1
DD.310	Handlebar Setpin (Bottom—Drive Side)	1	DD.424	Weather Grip	1
DD.311	Well Side Plates	2	DD.425	Tape for DD.424	1
DD.312	Tension Screw	1	DD.426	Black Tape for DD.424	1
			DD.928	Cylinder Head Washer	1
			X.865	Lockwasher for DD.307	2

STARTER GROUP



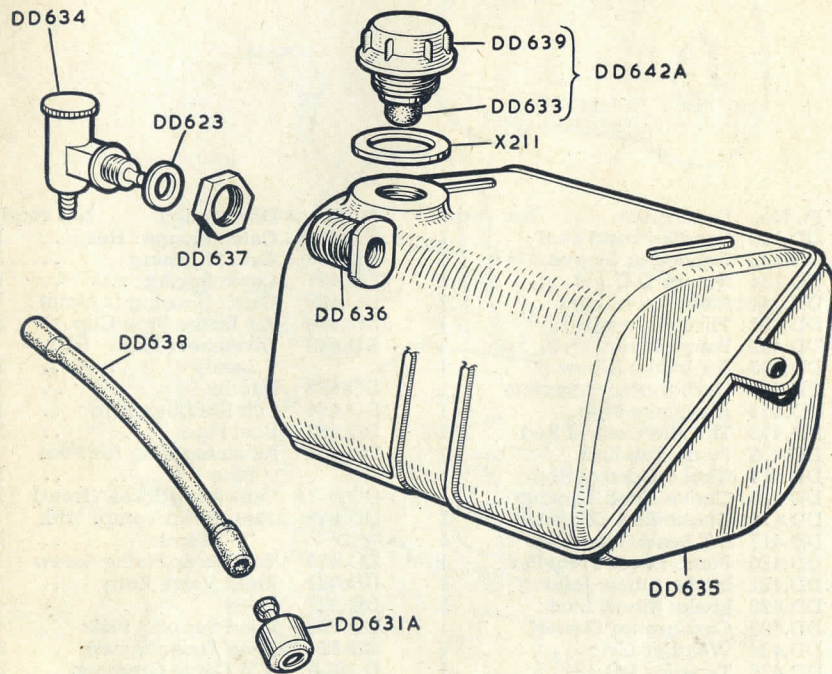
Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.201	Pull Starter Body and Shaft	1	DD.221A	Complete Starter Assembly	1
DD.202	Pull Starter Pulley	1	DD.222	Bush for DD.202	1
DD.203	Pull Starter Handle	1	DD.224	Fixing Screw for DD.227	1
DD.204	Dog Arm	1	DD.227	Rope Guide	1
DD.205	Dog Spring	2	DD.229	Handle Cap	1
DD.206	Spring Retainer	2	DD.231	Centralising Pin	1
DD.207	Dog	2	DD.232	Spring for DD.231	1
DD.209	Friction Plates	2	DD.520	Nuts for DD.224 and DD.721	4
DD.210	Dog Retaining Washer	1	DD.721	Starter Fixing Screw	3
DD.211	Starter Cord	1	F.22	Lock Washers for DD.721, DD.224	4
DD.214	Starter Handle Insert	1	X.902	Winding Spring	1
DD.216	Pressure Spring	1	X.928	Body Protecting Plate	1
DD.218	Retainer Clip	1			
DD.219	Friction Washer	2			

PISTOL GRIP and CARBURETTOR CONTROL GROUP



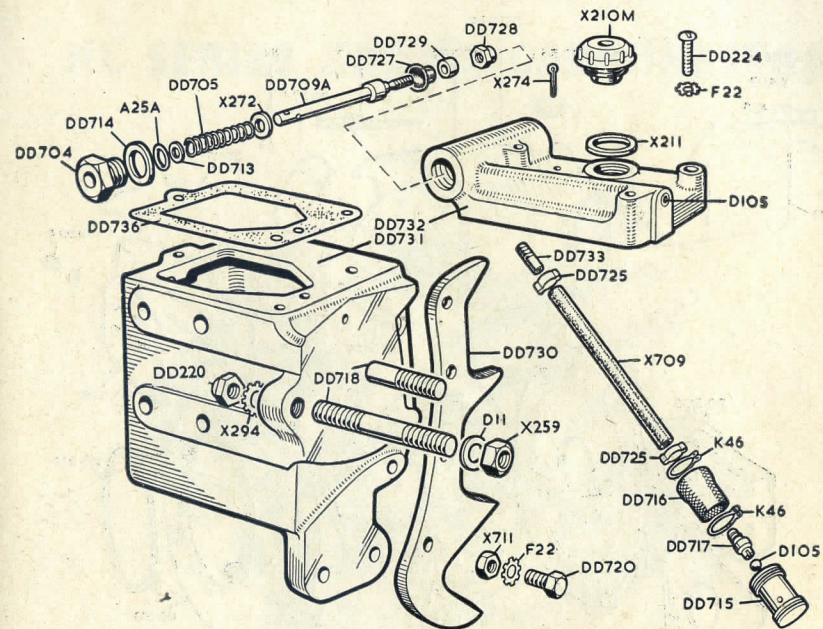
Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.116	Handle Fixing Stud	1	DD.435	Catch Plunger Head	1
DD.122	Connector Sleeve	1	DD.436	Catch Housing	1
DD.124	Nut for D.D.116	1	DD.437	Catch Spring	1
DD.144	Reed Valve Joint	1	DD.438	Catch Housing Locknut	1
DD.401	Throttle Lever	1	DD.439	Air Intake Pipe Clip	1
DD.402	Pump Lever	1	DD.442	Grommet Plate (H.T. Lead)	1
DD.403	Air Intake Elbow	1	DD.453	Handle	1
DD.405	Carburettor Complete	1	DD.454	Felt Rubbing Strip	1
DD.411	Air Intake Pipe	1	DD.457	Fuel Pipe	1
DD.412	Throttle Control Rod	1	DD.458	Retaining Ring for Fuel Pipe	1
DD.413	Pump Pull Rod	1	DD.617A	Tank Strap Screw (front)	1
DD.414	Choke Control Rod	1	DD.640	Tank Strap comp. with "D" Block	1
DD.415	Choke Knob Locknut	1	DD.459	Tank Strap Fixing Screw	1
DD.416	Choke Rod Grommet	1	DD.921	Reed Valve Body	1
DD.417	L.T. Lead Grommet	1	DD.922	Reed	4
DD.420	Pump Lever Pivot Pin	1	DD.923	Reed Support Plate	4
DD.421	Intake Elbow Joint	1	DD.924	Reed Fixing Screw	8
DD.422	Intake Elbow Stud	2	D.127A	H.T. Cable Grommet	2
DD.423	Carburettor Gasket	1	F.22	Lock Washer for DD.422	2
DD.424	Weather Grip	1	G.107	Locknut for DD.617A	1
DD.425	Tape for DD.424	1	K.15	Lockwasher for DD.116	1
DD.426	Black Tape for DD.424	1	K.41	Nut for DD.420	1
DD.428	Choke Control Knob	1	X.703	"On-Off" Switch	1
DD.429	Throttle Lever Pivot	1	X.711	Nut for DD.422	2
DD.430	Air Filter Complete	1	X.865	Lockwasher for DD.420	1
DD.433	Connector for Cut-out Lead (L.T.)	1			
DD.434	Catch Plunger	1			

PETROL TANK GROUP



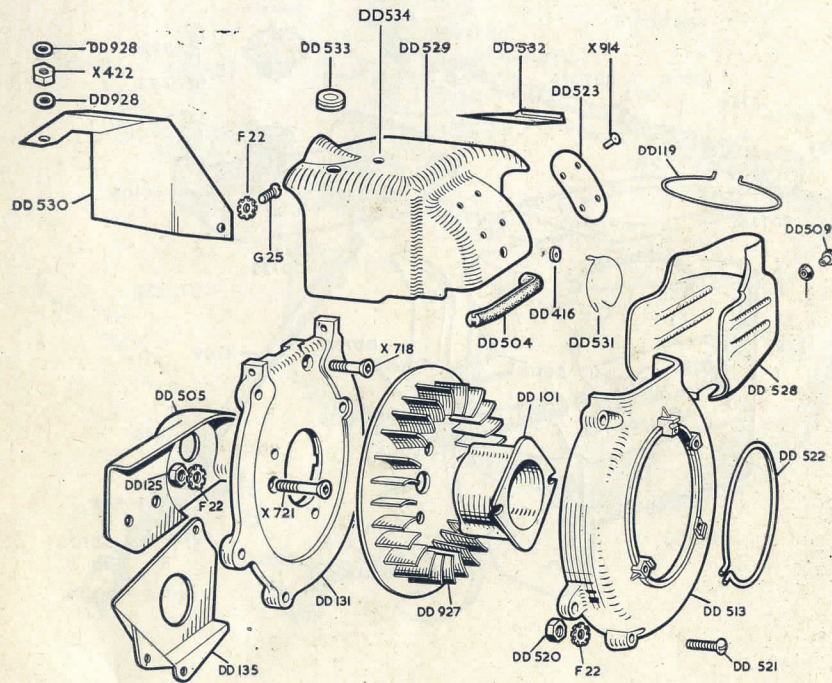
Pt. No.	Description	No. reqd.
DD.623	Petrol Tap Joint	1 or 2
DD.631A	Wobble Pipe Filter Head	1
DD.633	Air Inlet Valve	1
DD.634	Petrol Tap	1
DD.635	Petrol Tank	1
DD.636	Petrol Tank Bush	1
DD.637	Nut for DD.636	1
DD.638	Wobble Pipe	1
DD.639	Petrol Filler Cap	1
DD.642A	Filler Cap DD.639 and Valve DD.633 Assembly (supplied together)	1
X.211	Gasket for DD.642A	1

OIL TANK and OIL PUMP GROUP



Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
A.25A	"O"-Ring	1	DD.730	Felling Spike	1
D.11	Plain Washers for DD.718	2	DD.731	Oil Tank	1
D.105	Valve Ball or Oilway Plug	2	DD.732	Oil Tank Cover	1
DD.220	Nuts for DD.718	2	DD.733	Top Connector	1
DD.224	Tank Cover Screws	3	DD.735	Guard Bar Bracket (not illustrated)	1
DD.704	Oil Pump Gland	1	DD.736	Oil Tank Joint	1
DD.705	Pump Return Spring	1	F.22	Lockwashers for DD.720, DD.224	9
DD.709A	Pump Spindle	1	K.46	Filter Circlip	2
DD.713	Washer	1	X.210M	Oil Tank Filler Cap	1
DD.714	Joint Washer	1	X.211	Filler Cap Gasket	1
DD.715	Valve and Filter Body	1	X.259	Nuts for DD.718	2
DD.716	Filter Gauze	1	X.268	Guard Bar (not illustrated)	1
DD.717	Bottom Connector	1	X.272	Spring Backing Washer	1
DD.718	Cutter Bar Studs	2	X.274	Air Vent Splitpin	1
DD.720	Felling Spike and Guard Bar Setpins	6	X.294	Lockwasher for DD.718	2
DD.725	Oil Pipe Clips	2	X.709	Oil Pipe	1
DD.727	Pump Piston Cup	1	X.711	Nuts for DD.720	6
DD.728	Pump Spindle Nut	1			
DD.729	Piston Backing Washer	1			

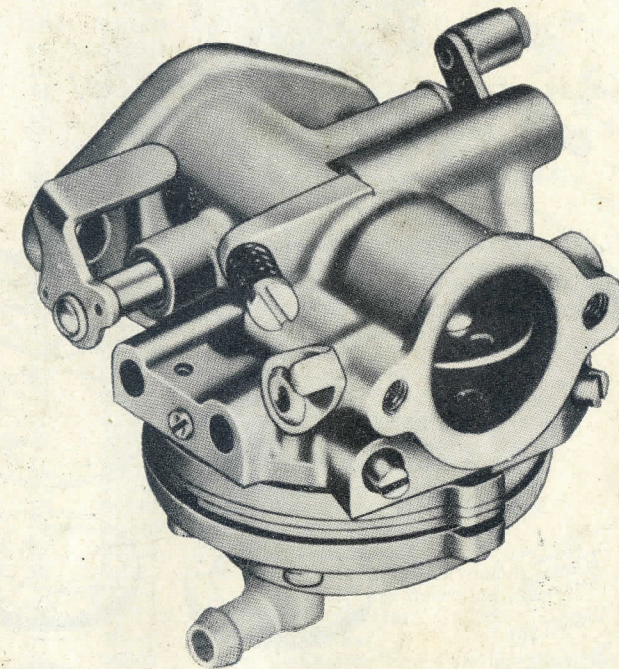
COWL GROUP



Pt. No.	Description	No. reqd.	Pt. No.	Description	No. reqd.
DD.101	Auxiliary Rope Pulley	1	DD.529	Machine Cowling	1
DD.119	Locking Wire	1	DD.530	Inner Shield	1
DD.125	Nuts for X.721 and X.718	4	DD.531	Wire Clip	1
DD.131	Engine Backplate	1	DD.532	Spring Clip	1
DD.135	Sawdust Guard	1	DD.533	Grommet	1
DD.318	Clamping Strip for DD.505	1	DD.534	Grommet	1
DD.416	Grommet	1	DD.927	Fan	1
DD.504	Cowling Air Seal	1	DD.928	Washer	2
DD.505	Abutment Cover	1	F.22	Lockwashers for DD.520, DD.125, G.25	8
DD.509	Carburettor Cover Nut	2	G.25	Inner Shield Fixing Screw	1
DD.513	Fan Cover	1	X.272	Carburettor Cover Nut Washer	2
DD.520	Nuts for DD.521	3	X.718	Engine Backplate Screws	2
DD.521	Fan Cover Fixing Screws	3	X.721	Engine Backplate Screws	2
DD.522	Guard Ring	1	X.914	Pop Rivets for Nameplate	4
DD.523	Nameplate	1			
DD.528	Carburettor Cover	1			

TILLOTSON

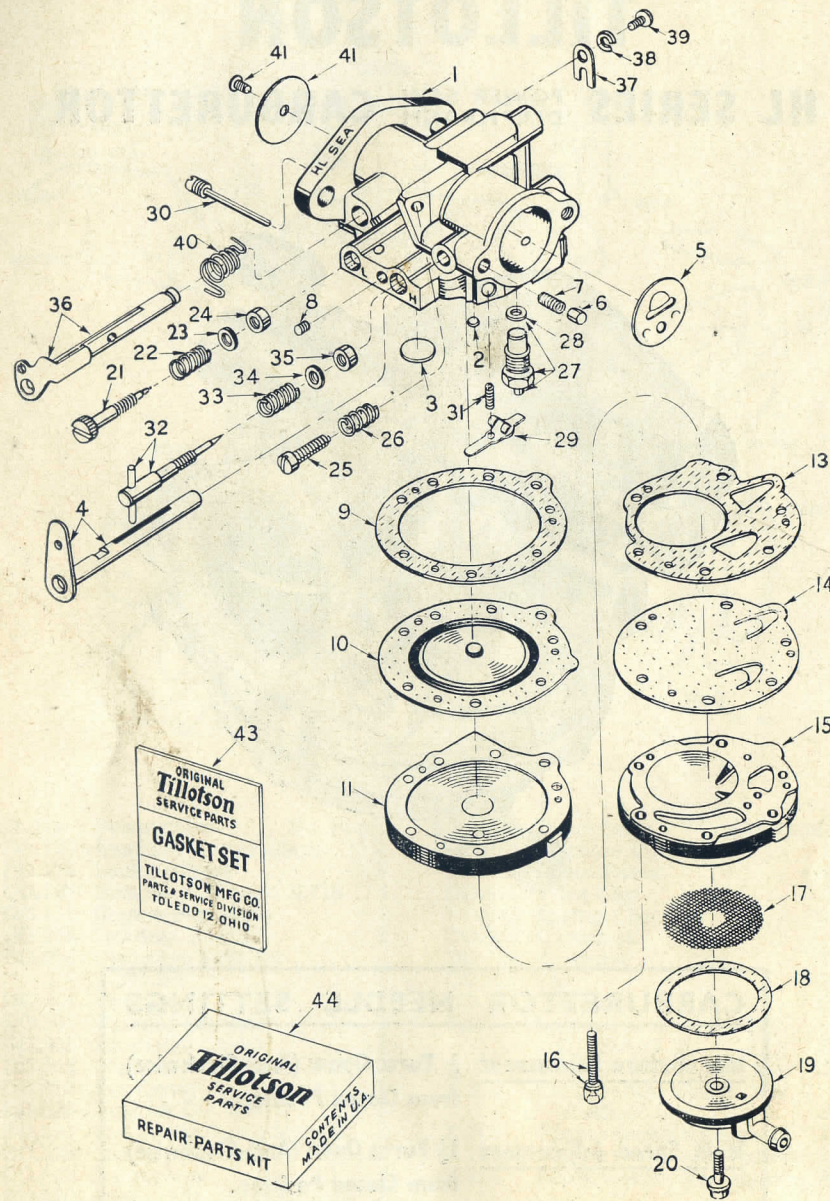
HL SERIES POWER SAW DIAPHRAGM CARBURETTOR



CARBURETTOR NEEDLE SETTINGS

Idle Mixture Adjustment $\frac{1}{2}$ Turn Open (Anti-Clockwise) from Closed Position.

Main Speed Adjustment $1\frac{1}{4}$ Turns Open (Anti-Clockwise) from Closed Position.



Ref. No.	HL85A Part No.	Part Name
1	012068	Body (Service)
2	010588	*Body Channel Cup Plug
3	02531	*Body Channel Welch Plug
4	012065	Choke Shaft and Lever
5	011883	†Choke Shutter
6	05454	Choke Friction Pin
7	08805	Choke Friction Pin Spring
8	02232	Diaphragm Chamber Drain Screw
9	010542	Diaphragm Gasket
10	010579	*Diaphragm
11	010526	Diaphragm Cover
13	010880	Fuel Pump Gasket
14	010531	*Fuel Pump Diaphragm
15	010525	Fuel Pump Body
16	010098	Fuel Pump Body Screw and Lockwasher (6)
17	010530	*Fuel Strainer Screen
18	010529	Fuel Strainer Cover Gasket
19	010527	Fuel Strainer Cover
20	010571	*Fuel Strainer Cover Retaining Screw
21	011498	*Idle Adjustment Screw
22	08793	*Idle Adjustment Screw Spring
23	011428	*Idle Adjustment Screw Washer
24	011401	Idle Adjustment Screw Packing
25	05095	*Idle Speed Regulating Screw
26	0788	*Idle Speed Regulating Screw Spring
27	010580	*Inlet Needle, Seat and Gasket
28	010165	Inlet Seat Gasket
29	010513	*Inlet Control Lever
30	010581	*Inlet Control Lever Pinion Screw
31	010578	*Inlet Tension Spring
32	011751	*Main Adjustment Screw
33	08793	*Main Adjustment Screw Spring
34	011428	*Main Adjustment Screw Washer
35	011401	Main Adjustment Screw Packing
36	012066	Throttle Shaft and Lever
37	09678	Throttle Shaft Clip
38	0992	Throttle Shaft Clip Lockwasher
39	01974	Throttle Shaft Clip Retaining Screw
40	010775	*Throttle Shaft Return Spring
41	08646	Throttle Shutter
42	08942	*Throttle Shutter Screw and Lockwasher
43	GS-145	*GASKET AND PACKING SET
44	RK-440	REPAIR PARTS KIT

(* Indicates contents of Repair Parts Kit.

(†) 011883 Choke Shutter is of new snap fit permanent installation type (without use of retaining screw). It can only be correctly removed, if and when extremely necessary, by holding choke shutter mechanism in fully closed position, then placement of a screwdriver bit against the small convex portion of shutter which can be flattened by two or three light downward taps on screwdriver. Shutter can then be pulled out of shaft slot with pliers but must be replaced with new shutter carefully inserted with convex portion again on right side.

TOOLS (Standard Issue)

AT3	Plug Spanner	1
M2715	Screwdriver	1
	Magneto Feeler Gauge	1
DD806	Chainsaw File $\frac{3}{8}$ " diameter	1
DD807	File Holder for $\frac{3}{8}$ " diameter File	1
B6	Chainsaw File $\frac{1}{2}$ " diameter	1
T407	File Holder for $\frac{1}{2}$ " diameter File	1
DD816	Depth Gauge File	1
DD817	Depth Gauge Filing Jig	1
DD813	Combination Screwdriver / Box Spanner	1
DD818	Instruction Book	1
DD819	Plastic Tool Wallet	1

} $\frac{7}{16}$ " pitch
only
} $\frac{1}{2}$ " pitch
only

SPARE PARTS

(Free issue included in Toolkit)

DD211	Starter Cord	1
DD907	Sparking Plug Lodge HNX	1
DD632	Wobble Pipe Filter Felts	2
DD423	Carburettor Gasket	1
DD144	Reed Valve Joint	1
DD106	Clutch Key	1
DD118	Tab Washer	1
X438	Rotor Key	1
X259	Nuts for DD718	2
DD224	Starter Fixing Screw	1
DD721	" " "	3
X711	Locknuts	4
DD520	Nuts for DD224 and DD721	3
X272	$\frac{3}{16}$ " Plain Washers	2
DD527	$\frac{5}{16}$ " " " "	2
F22	$\frac{3}{16}$ " Shakeproof Washers	6
F20	$\frac{1}{4}$ " " " "	3
DD136	Silencer Nuts	2

SPECIAL TOOLS

For the Customer who wishes to fully maintain his own saw, the following tools can be supplied to separate order:

DD802/803	Peening Tool Clamp complete	1
DD804	Clutch Cover Removal Tool	1
DD805	Clutch Removal Tool	1
AT7	Anvil Block	1
AT8	Chisel	1
AT9	Rivet Punch	1
AT19	Type 4 Groove Gauge	1
T13	Contact Points Spanner	1
C27754	Flywheel Rotor Extractor	1
	$\frac{1}{2}$ " x $\frac{9}{16}$ " A/F Obstruction Spanner (for Cylinder Base and Oil Tank Nuts)	1
	$\frac{5}{16}$ " x $\frac{3}{8}$ " A/F Ring Spanner (for Cowling Nuts)	1
	$\frac{1}{2}$ " x $\frac{9}{16}$ " A/F Ring Spanner (for Cylinder Head Nuts)	1