

RECORD MACHINE DETAILS

MODEL
SERIAL No.
DATE OF PURCHASE
VOLAGE
PHASE
CYCLES

**QUOTE THIS INFORMATION
WHEN REQUESTING SERVICE
OR SPARES.**

DISTRIBUTOR

This Bandsaw is engineered to a high standard of construction and performance. Attention to maintenance and service will be repaid by many years' trouble-free operating.

STARTRITE®

Model H225
**HORIZONTAL
BANDSAWING MACHINES**
HANDBOOK
26E

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SPECIFICATION:

Model H225

Cutting Capacity at 90°

Blade Speeds

Wheel Diameter

Saw Blade Size

Motor

Electric Supply

Gross Weight

- 5 Speed Manual Horizontal Bandsawing Machine

- 254mm x 10"
410mm x 254mm, 16½" x 10"

- 15, 24, 38, 61, & 92m/min.
50, 80, 125, 200 & 300ft/min.

- 355 mm, 14"

- 3353 mm x 25 mm x 0.9 mm
132" x 1" x .035"

- 1.1kW., 1½h.p., 1425r.p.m.

- 220/240 Volt 3 Phase 50Hz
380/440 Volt 3 Phase 50Hz
220/240 Volt 1 Phase 50Hz

- 304kg., 670 lbs.

FOR BEST RESULTS USE STARTRITE 'SUPAFLEX' BLADES.

WHEN ORDERING PARTS, PLEASE STATE :-

1. Quantity required.
2. Part No. (where applicable) and description.
Specify power supply for electrical components.
3. Machine Model and Serial No.

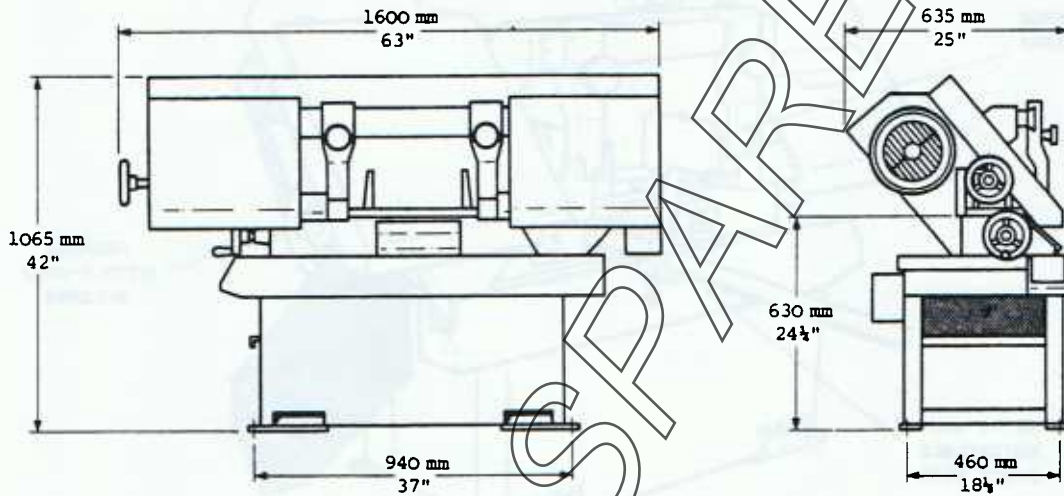
NOTE : ILLUSTRATIONS MAY VARY IN DETAIL, ACCORDING TO MODEL.

INSTALLATION / MAINTENANCE

SECTION 208

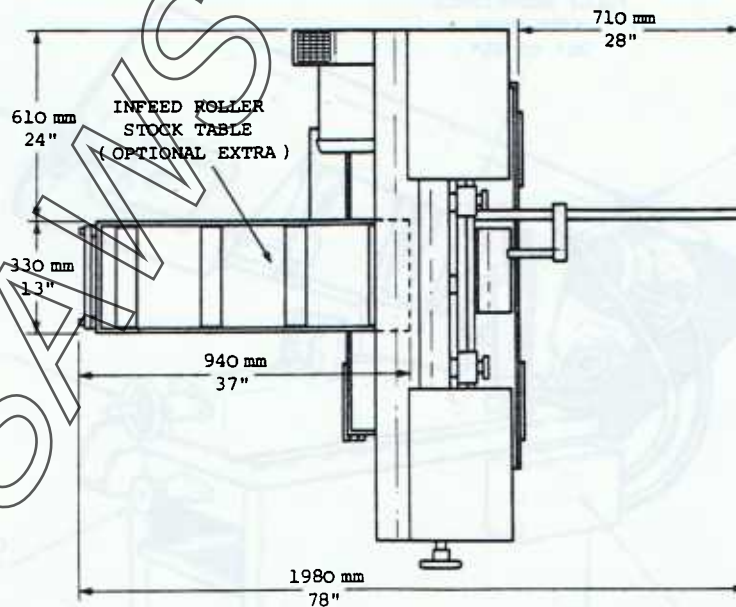
HEIGHT OF MACHINE WITH BOW
RAISED : 1730 mm, 68"

ALL DIMENSIONS APPROXIMATE.



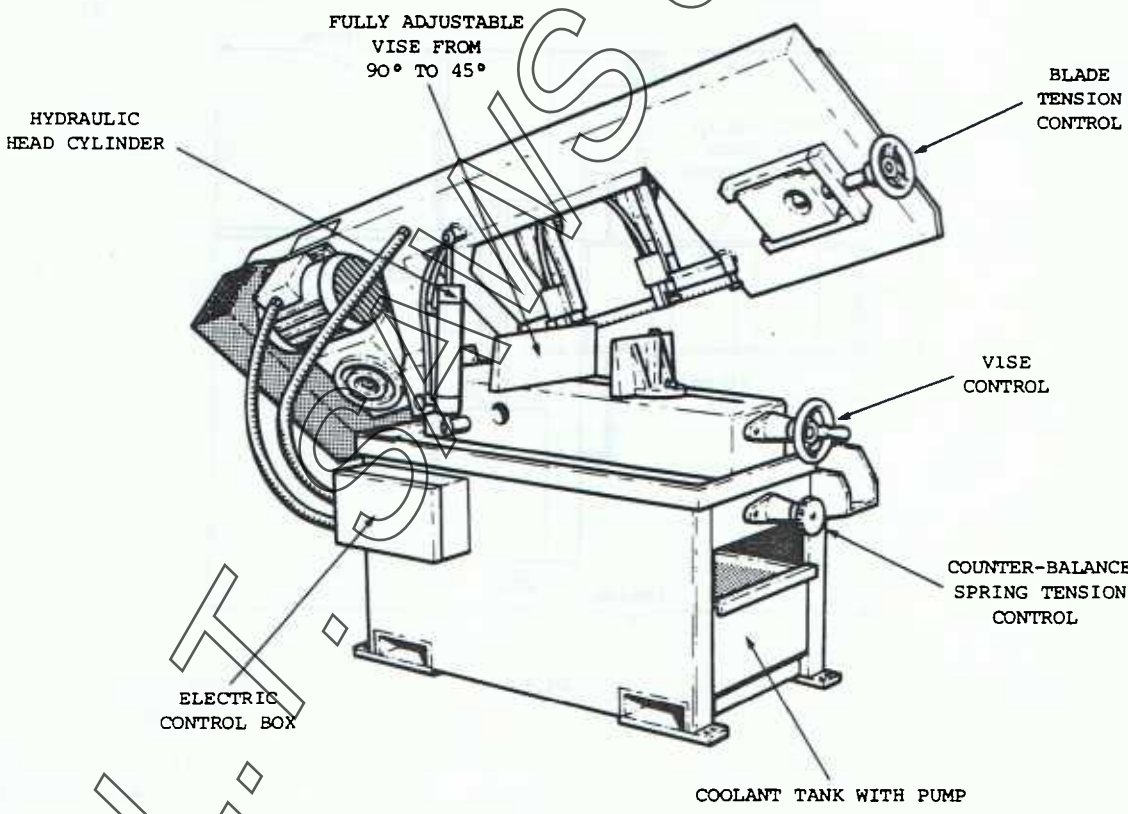
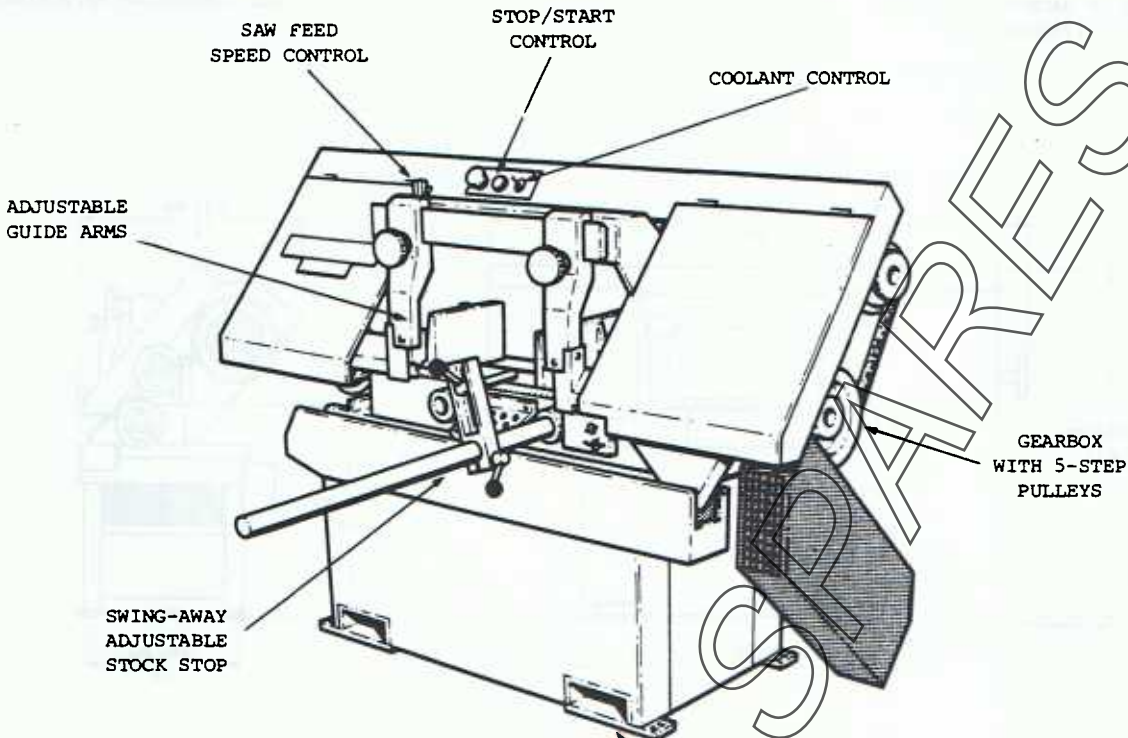
FRONT VIEW

SIDE VIEW



PLAN

FOUNDATION PLAN OF MODEL H225 HORIZONTAL BANDSAW.



GENERAL LAYOUT OF MODEL H225 HORIZONTAL BANDSAW.

OPERATING SAFETY PRECAUTIONS.

BEFORE ATTEMPTING TO OPERATE THE MACHINE, BECOME FAMILIAR WITH THE CONTROLS AND OPERATING INSTRUCTIONS.

NO PERSON SHOULD OPERATE THIS MACHINE WITHOUT SUFFICIENT TRAINING AS TO ITS SAFE AND PROPER OPERATION, OR WITHOUT SUCH SUPERVISION AS MAY BE NECESSARY.

This bandsaw has been equipped with guards and other devices to protect from moving parts wherever possible. However, remember that it is a machine tool designed to cut metal using a sharp cutting tool (saw blade) moving at high speed.

Never operate the machine unless all guards and covers supplied are in place and closed.

Always disconnect the power at source when performing maintenance work on the machine or making adjustments other than those necessary for the normal operation of the machine.

Never load machine while the saw blade is running.

Never adjust guide arms while the saw blade is running.

Always support long and heavy stock pieces behind and in front of the machine to prevent them falling and causing injury.

Use care in uncoiling and installing new bandsaw blades as the teeth are very sharp. It is advisable to wear gloves when handling saw blades.

Never leave tools or other objects on the bed or other surfaces of the machine while it is operating.

Accumulation of chips can create potentially dangerous situations, keep the machine clean.

The electrical circuit of this machine is designed to stop the blade drive motor at end of cycle. However, it is possible that a malfunction could prevent the motor from stopping. The operator should ascertain visually that the motor has in fact stopped before entering the cutting area for re-loading or performing other operations.

Always wear eye protection when operating or attending this machine.

SECTION 208

INSTALLATION.

To transport machine to site, use fork lift truck with forks placed in the slots provided in the base of the machine.

IMPORTANT : DO NOT LIFT THE MACHINE BY SLING FROM HEAD.

Site the machine with adequate working space around it for ease of use. Avoid siting the machine in a cramped corner where operation may prove difficult, or near a gangway where a long workpiece may cause an obstruction. The whole working area should be well illuminated and the floor around the machine provided with a level and non-slip surface.

The cabinet base is provided with four bolting down holes to accept 12mm ($\frac{1}{2}$ ") diameter bolts (not supplied). Where bolting down is required, ensure that the machine stands firm and level.

Remove the anti-rust protective coating where applied, and in particular from the working elements of the machine.

Remove the bracket clamping the head of the machine to the bed. This bracket is fitted to avoid damage during transit and is not required for the operation of the machine.

Fill coolant tank with approximately 6 U.S. gallons (23 litres) of a good grade of soluble oil diluted about 10 to 1.

IMPORTANT : DO NOT LET PUMP RUN DRY, OR DAMAGE MAY RESULT.

CONNECTION TO THE ELECTRICITY SUPPLY.

Before connecting to the electricity supply, see Section on Electrical System for full instructions.

OPERATING INSTRUCTIONS.

SETTING VISE JAWS :

Set fixed vise jaw to required angle by means of graduated scale (see Fig.1), making sure that workpiece clears right-hand guide assembly.

The moving vise jaw has a quick-release feature and can be pushed by hand against the workpiece. The vise jaw clamps and locks simply by turning the vise control handknob (see Fig.2) clockwise.

To release workpiece at end of cut turn vise control handknob anti-clockwise and pull vise jaw away from workpiece.

An adjustable stock stop is supplied for repetition sawing.

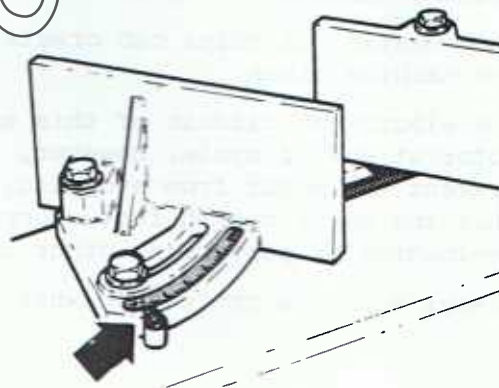


Fig.1.

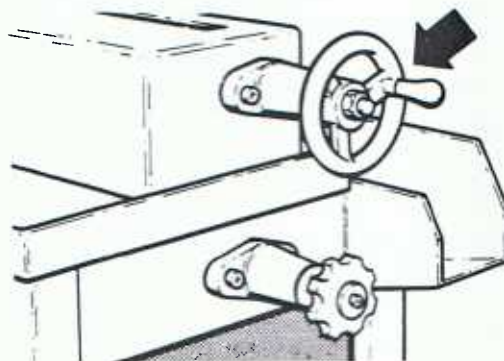


Fig.2.

OPERATING INSTRUCTIONS (CONTINUED).

BLADE GUIDES :

For straight (90°) cutting the right-hand guide assembly should be set as close as possible to the workpiece, but for angled cutting it may be found necessary to move the guide assembly to the right to enable the full capacity of the machine to be used.

The left-hand guide assembly should be set with the head raised so that the guide assembly just clears the moving vise jaw as shown in Fig.3.

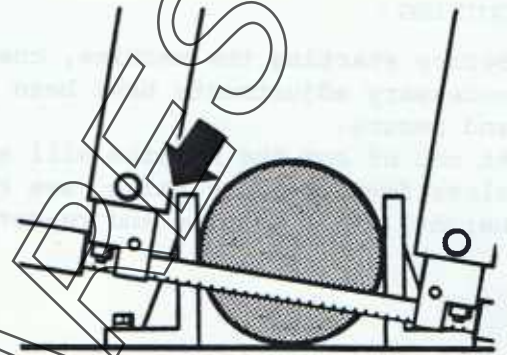


Fig.3.

SPEED SELECTION :

The 'Sawing Guide Chart' (see Section on Sawing Practice) gives a guide as to the speed required for different materials. The 5 speeds available on this machine are obtained by swinging aside the belt guard and pushing the motor towards the spring (see Fig.4). Place vee-belt in the appropriate pulley grooves (see speed plate on machine) and replace belt guard.

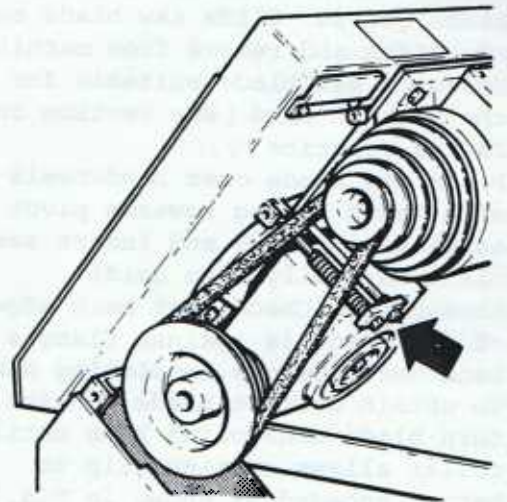


Fig.4.

SAW FEED PRESSURE :

The saw feed pressure (or head weight) is controlled by means of the counter-balance spring tension control knob (see Fig.5). The head weight is factory set on maximum. To reduce weight, raise head and turn knob clockwise. Feed speed is controlled by the hydraulic control valve (see Fig.6). The 'Guide To Using Sawing Controls' (see Section on Sawing Practice) gives a guide as to the use of these controls.

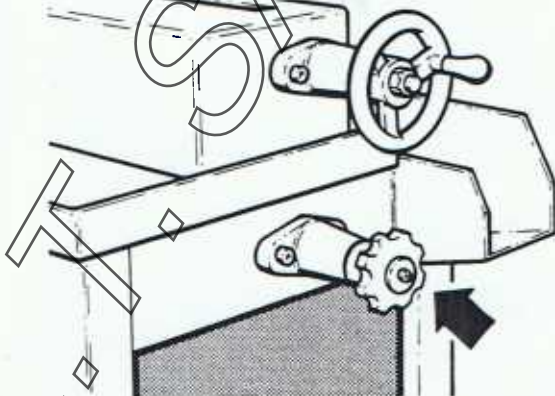


Fig.5.

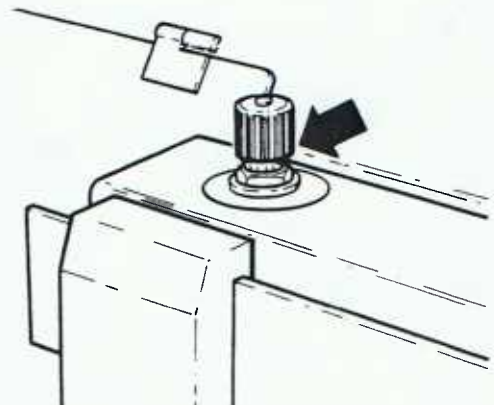


Fig.6.

OPERATING INSTRUCTIONS (CONTINUED).**CUTTING :**

Before starting the machine, check it is safe to do so. Make sure that all necessary adjustments have been completed and all guards are in position and secure.

At end of cut the machine will automatically stop. To re-start machine, close feed pressure valve (see Fig.6), lift up machine head to required height, start machine and re-set feed pressure valve.

BLADE TENSIONING/FITTING A NEW BLADE.

To remove saw blade, slacken off blade tension by means of blade tensioning knob (see Fig.7).

Raise bandwheel covers and remove blade guards. Slide saw blade out of guides and remove from machine. Select a saw blade suitable for the work in hand (see Section on Sawing Practice).

Place saw blade over bandwheels with teeth facing towards pivot as shown in Fig.8 and insert saw blade carefully into guide assemblies. Check that back edge of saw blade is against flanges of bandwheels before tensioning blade. To obtain correct blade tension, turn blade tensioning knob until collar allows setting slip to become engaged as shown in Fig.7.

NOTE : Check blade tension periodically as the saw blade may stretch.

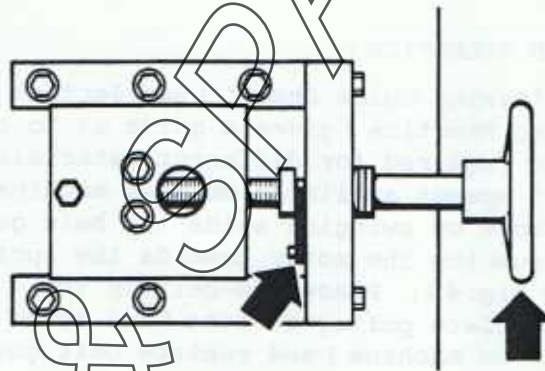


Fig.7.

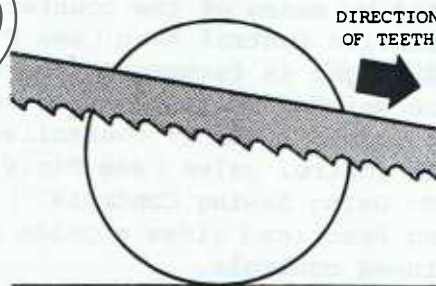


Fig.8.

MAINTENANCE.

NOTE : ATTENTION TO MAINTENANCE WILL BE REPAID BY MANY YEARS' TROUBLE-FREE OPERATING.

GENERAL :

Check blade tension frequently and adjust as necessary.
Clean out swarf chute frequently and keep coolant drain holes free.

WEEKLY MAINTENANCE :

Check level of coolant in coolant tank. If necessary top up with a good grade of soluble oil diluted about 10 to 1.
Apply oil to filler hole on vise control housing.
Clean and lubricate all miscellaneous moving parts.

MONTHLY MAINTENANCE :

Check blade guide assemblies for wear.
Check level of hydraulic cylinder and top up as necessary.
Check condition and tension of vee-belt, and replace or adjust as necessary.

YEARLY MAINTENANCE :

Drain coolant tank, clean tank and pump (see Section on Coolant System for Instructions). Refill with approximately 6 U.S. gallons (23 litres) of clean coolant diluted about 10 to 1.

NOTE : The gearbox is grease sealed for life and should not require further maintenance.

APPROVED LUBRICANTS	
GENERAL LUBRICATION	ESSO Esstic 50 Oil GULF Service 51 Oil MOBIL Vactra or D.T.E. Heavy Medium Oil TEXACO Ursa P20 Oil
GREASE POINTS	ESSO Beacon 3 Grease GULF Gulfcrown No.3 Grease MOBIL Mobilplex 48 Grease TEXACO Regal Starfax Premium 3 Grease
HYDRAULIC CYLINDER	STAR-DRAULIC Hydraulic oil B07023

SECTION 208

CHECKING & RE-CALIBRATING HEAD WEIGHT (SAW FEED PRESSURE).

1. Raise head and close 'Feed Speed' control valve. Turn control knob 'B' (see Fig.10) anti-clockwise until it is against retaining washer 'C'.
2. Lower head to within a few inches of the machine bed and close 'Feed Speed' control valve.
3. Place spring-balance scales over blade tension handle (see Fig.11). Hold spring-balance scales and open 'Feed Speed' control valve. A head weight reading of 17 lbs. (7.7 kg.) should be obtained.

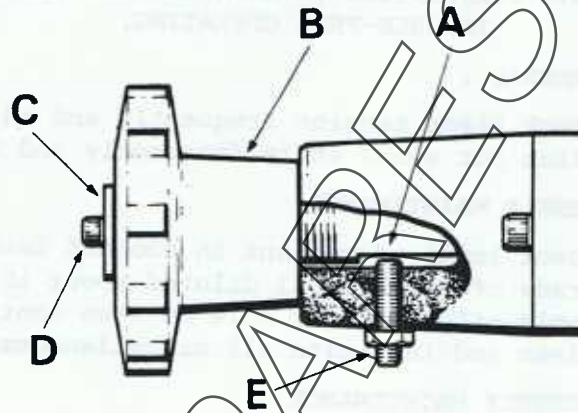


Fig.10.

4. If the head weight is incorrect, raise head, remove set screw and locking nut 'E' and proceed as follows :-
For HEAVIER head weight turn control knob 'B' ANTI-CLOCKWISE which will turn threaded shaft 'A' anti-clockwise and increase the head weight.
For LIGHTER head weight place a socket wrench into socket cap screw 'D' and turn CLOCKWISE to turn threaded shaft 'A' and decrease the head weight.

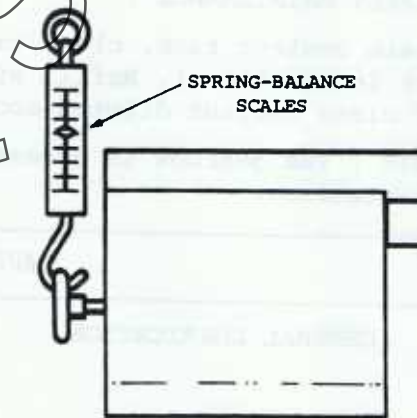
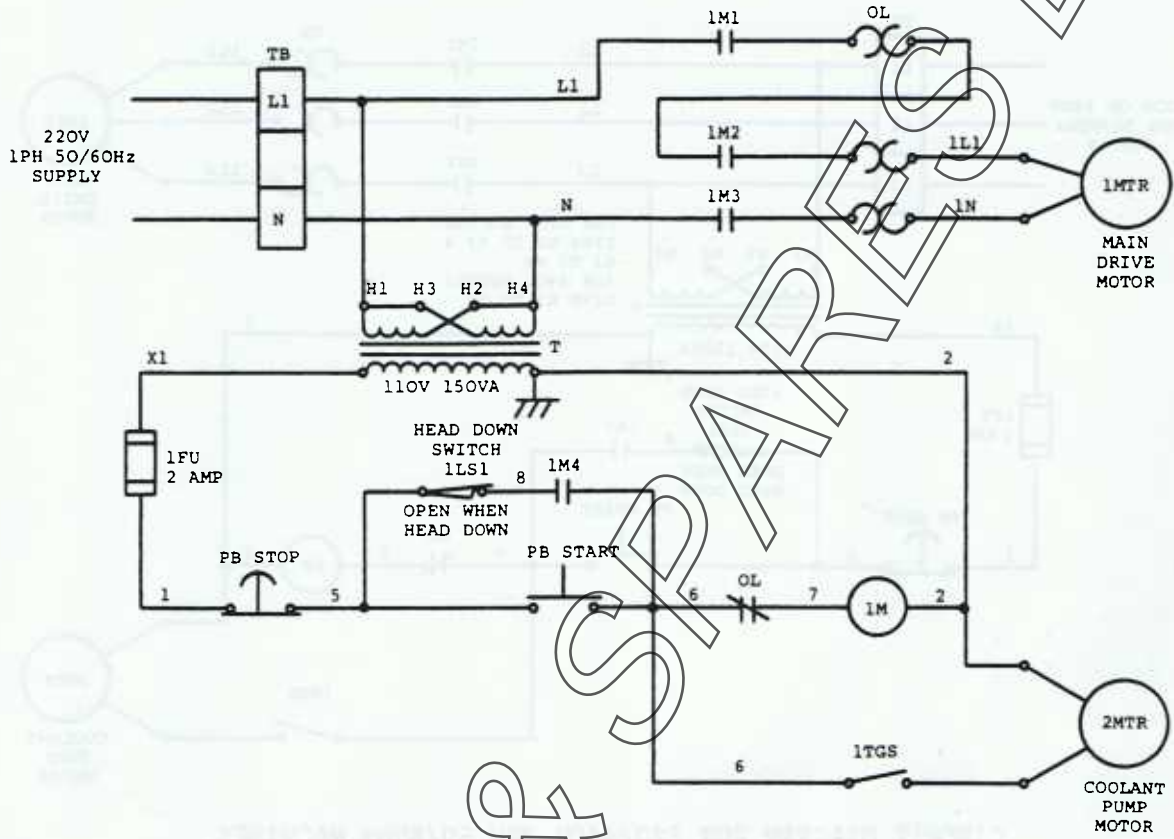


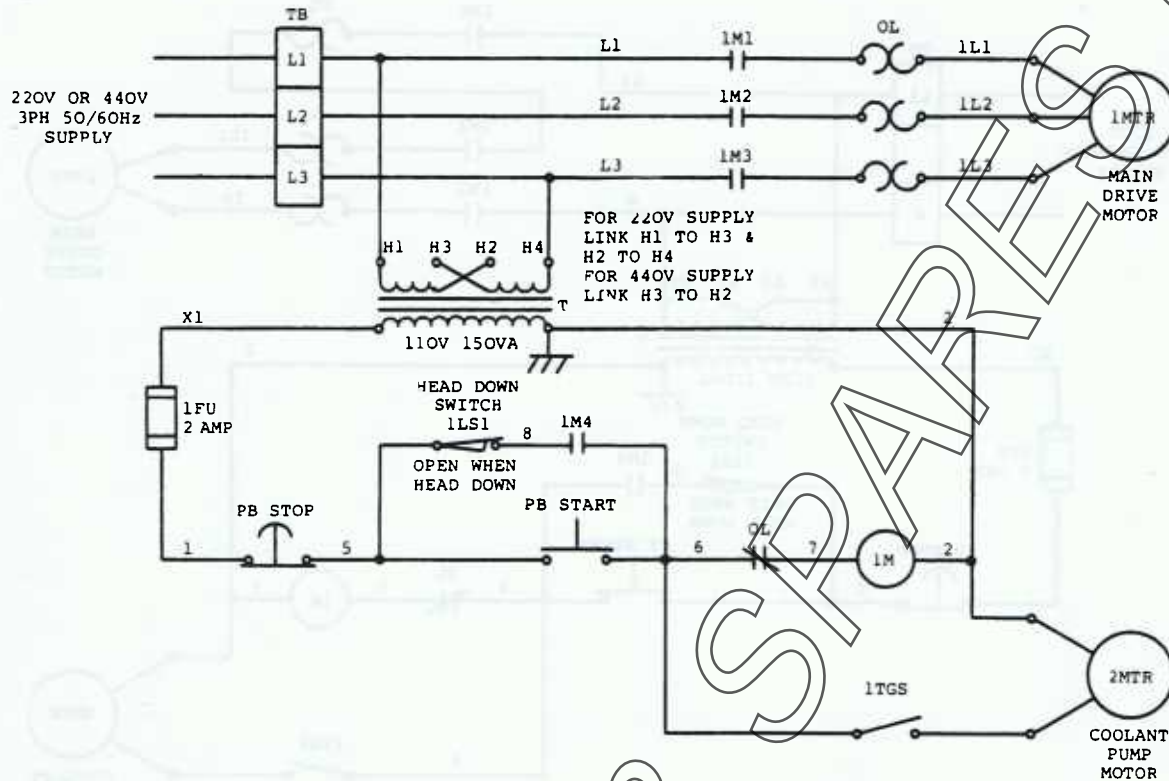
Fig.11.

5. Re-check head weight as before. If it is now correct, screw in set screw 'E' making sure it just locates into keyway in shaft (see Fig.10) and lock in place.
6. When correctly set the control knob 'B' should give a working range of approximately 8 lbs. (3.6 kg.) MINIMUM - 17 lbs. (7.7 kg.) MAXIMUM (12 FULL TURNS of control knob).
When no further adjustment of the spring is possible it should be replaced.



CIRCUIT DIAGRAM FOR 220V 1PH 50/60Hz MACHINES.

SECTION 212



CIRCUIT DIAGRAM FOR 220/440V 3PH 50/60Hz MACHINES.

KEY TO ELECTRICAL MANUFACTURERS

- 1 MTR - BROOK CROMPTON PARKINSON
(STARCRO 72 - 1PH 60HZ) (STARCRO 76 - 3PH 60HZ)
(STARCRO 78 - 1PH 50HZ) (STARCRO 77 - 3PH 50HZ)
- 2 MTR - LITTLE GIANT PUMP YYY CAT No.516907,
- 1M - DANFOSS TYPE CI12 37H0031 or DANFOSS TYPE CI25
37H0051 (110 VOLTS ONLY) WITH COIL(No.37H6465 60HZ)
(37H6466 50HZ) OVERLOAD SEE SECTION 210 (Page 4)
- T - MELLOR ELECTRICS LTD SCORPIO SERIES No.240300
- 1LS1 - BURGESS KB5F
- 1FU - BUSSMAN TYPE HKA WITH ¼" DIA X 1½" LG FUSE
- P.B. START - SIMPLEX CAT No.077EDI
- P.B. STOP - SIMPLEX CAT No.077PIO
- 1TGS - ARCOELECTRIC F600C

CONNECTION TO THE ELECTRICITY SUPPLY.

IMPORTANT : Check that the electricity supply is suitable for the machine, see data label inside electrical control box.

At all times ensure that the machine is isolated from the mains supply before making any electrical connections or adjustments.

At rear of machine, remove cover of electrical control box (four screws).

Pass supply leads through hole in underside of control box.

For single phase supply, connect supply leads to terminals L1 & N of terminal block and earth lead to earth terminal as shown in Fig.1.

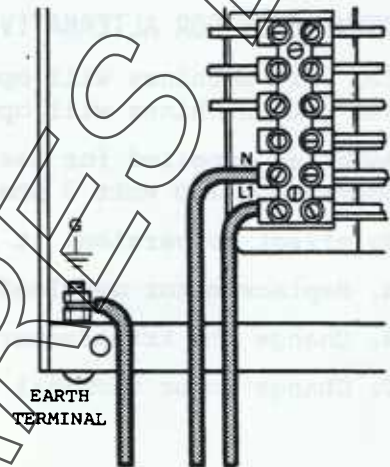
For three phase supply, connect supply leads to terminals L1, L2 & L3 of terminal block and earth lead to earth terminal as shown in Fig.2.

IMPORTANT : IN ALL CASES THE MACHINE MUST BE EFFECTIVELY EARTHED.

A three phase motor may run in either direction, therefore, raise bandwheel covers and check that bandwheels run in an anti-clockwise direction. If necessary, interchange any two supply leads to reverse rotation.

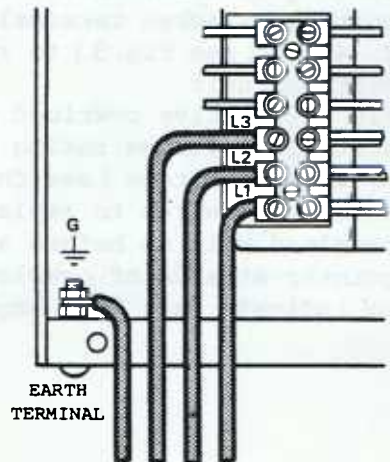
With all connections made, replace control box cover.

IMPORTANT : The service of a competent electrical engineer must be obtained if there is doubt on any point regarding electrical installation.



YELLOW BLUE BROWN
/GREEN
SINGLE PHASE
MAINS SUPPLY

Fig.1.



YELLOW BROWN
/GREEN
THREE PHASE
MAINS SUPPLY

Fig.2.

SECTION 212

CONVERSION FOR ALTERNATIVE VOLTAGE (3 PHASE SUPPLY).

220 volt machines will operate on 220/240 volt 3 phase supply.
440 volt machines will operate on 380/440 volt 3 phase supply.

Machines supplied for use on 440 volt 3 phase supply may be adapted to operate on 220 volt 3 phase supply and vice-versa.

To effect conversion, it is necessary to :-

- A. Replace motor overload unit with one of suitable rating.
- B. Change the transformer terminal connections.
- C. Change motor terminal connections.

A.

Inside electrical control box identify contactor and overload unit (see Fig.3).

Make a note of numbered wires leading to terminals of overload unit and slacken terminal screws 2, 4 & 6 (see Fig.3) to remove overload unit.

Fit alternative overload unit of suitable amperage rating according to supply voltage (see Chart below). Re-connect wires to replacement overload unit as before and set pointer at side of overload unit to indicate full load amps of motor.

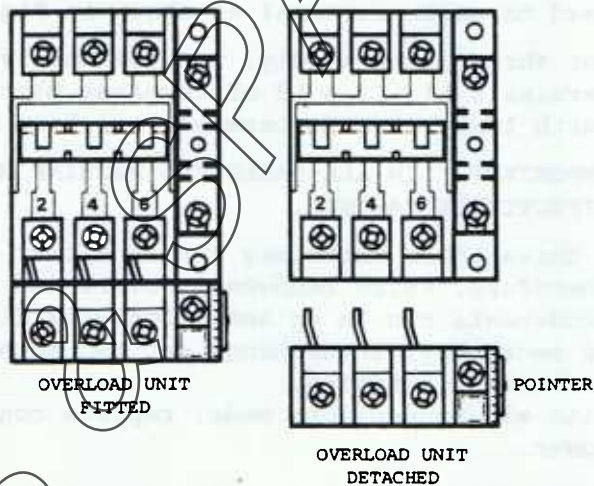


Fig.3.

CONVERSION FOR ALTERNATIVE VOLTAGE (3 PHASE SUPPLY) (CONTINUED)

B.

Inside electrical control box identify transformer change wire to suit required supply voltage as shown in Fig.4.

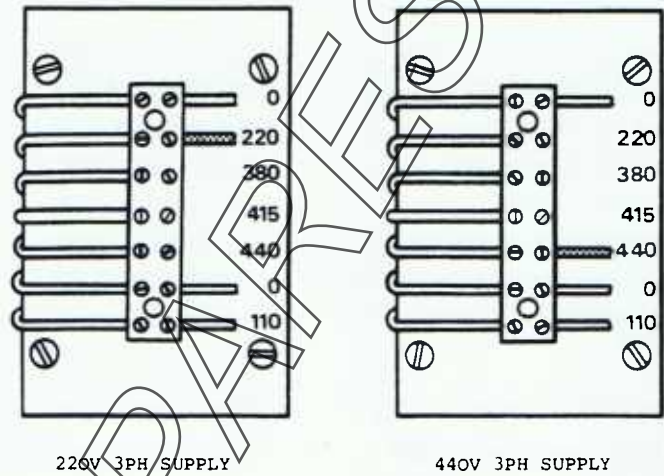


Fig.4.

C.

Remove motor terminal box cover from main drive motor.

Change the motor terminal linkage to suit appropriate supply voltage as shown in Fig.5 and replace cover.

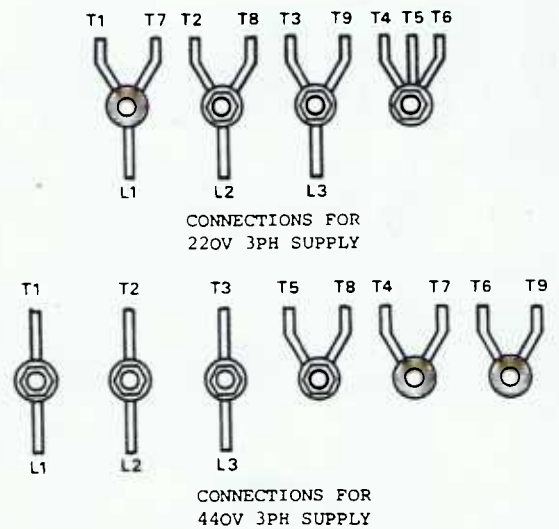


Fig.5.

BLADE SELECTION.

There are many types of saw blades available and each is superior in some way for specific applications. Selection of the correct blade for the job is a positive first step achieving economic cut-off production, for no machine tool can function more efficiently than its cutting tool will allow and the bandsawing machine is no exception to this rule. No one saw blade will cope with all the jobs satisfactorily, in fact in some cases an ill chosen blade will virtually not saw at all. The objective of this section of the handbook is to present the information necessary to select the correct saw blade for the job.

To fully describe any saw blade it is necessary to know not only its size, but its material composition and tooth form.

The cost of each type varies considerably and selection should be made according to duty as the lowest cost saw blade is not necessarily the more economic while the use of the more expensive types is often not justifiable.

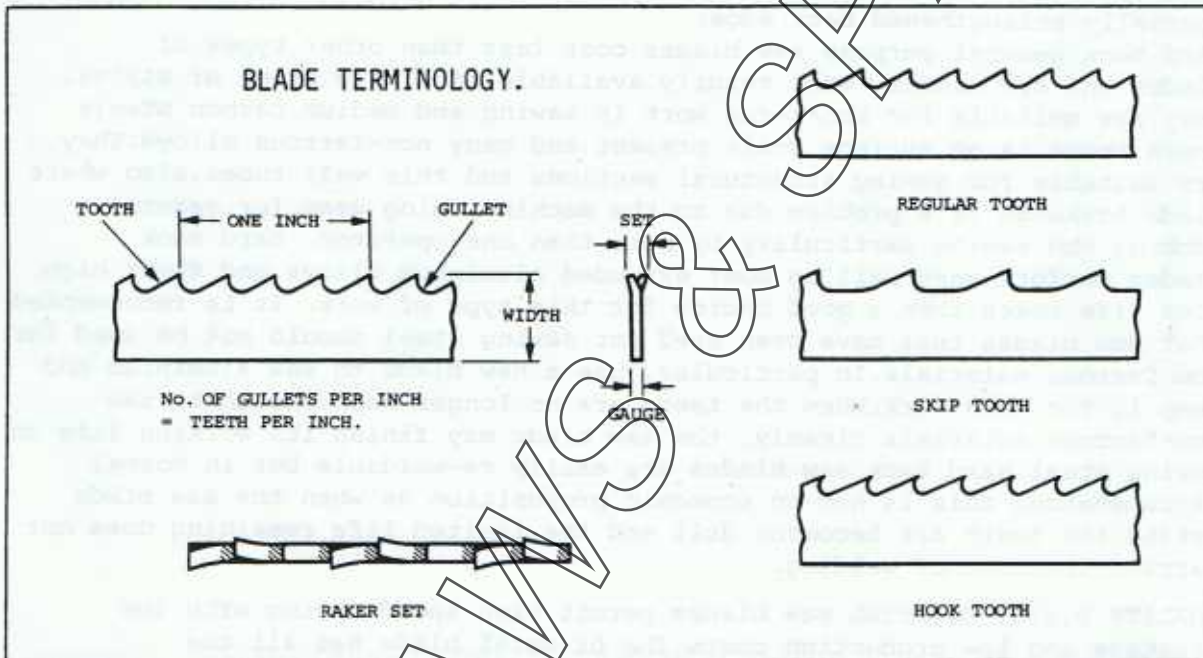
HARD BACK saw blades are made from high quality carbon steel and have a specially strengthened back edge.

Hard Back general purpose saw blades cost less than other types of blades and are usually most readily available in a wide range of styles. They are suitable for short-run work in sawing and medium carbon steels where there is no surface scale present and many non-ferrous alloys. They are suitable for sawing structural sections and thin wall tubes, also where blade brakedge is a problem due to the machine being used for general jobbing and sawing particularly by more than one operator. Hard Back blades perform very well on most extruded aluminium alloys and their high flex life makes them a good choice for this type of work. It is recommended that saw blades that have been used for sawing steel should not be used for non-ferrous materials. In particular, use a new blade to saw aluminium and keep it for this work. When the teeth are no longer keen enough to saw non-ferrous materials cleanly, the saw blade may finish its working life on sawing steel. Hard Back saw blades are easily re-weldable but in normal circumstances this is not an economic proposition as when the saw blade breaks the teeth are becoming dull and the limited life remaining does not warrant the cost of welding.

QUALITY H.S.S. BI-METAL saw blades permit high speed sawing with low breakage and low production costs. The bi-metal blade has all the resilience of a basically chrome vanadium alloy steel structure, electron beam welded to a quality high speed cutting edge, giving high speed steel performance and a tough flexible backing. The high speed section of the blade ends short of the gullet reducing shatter if a blade should snap on a really awkward cut. Built-in breakage resistance and tough enough to give a really fast and accurate cut time after time makes the use of bi-metal blades advantageous to all bandsaw operators. Re-welding these blades is possible on standard welding units.

SECTION 226

M42 COBALT H.S.S. BI-METAL saw blades offer all the advantages of the M2 quality bi-metal blade and has in addition, a higher quality, higher performance high speed steel for the cutting edge. The use of M42 Cobalt H.S.S. material for the cutting edge offers a balanced combination of superior hardness and toughness, making this blade ahead in performance on the most difficult or abrasive materials. The use of this type of blade is not restricted to the cutting of difficult materials, but can also be used on the more easily machined materials where greatly improved blade life can be expected. Heat treated to give high tooth hardness to resist abrasion, this blade has been specially developed for use on austenitic nickel chrome steels, nimonics, inconel, cobalt and nickel based alloys, heat resisting alloys and the space age exotic materials. Re-welding these blades is as for M2 blades.



Each of the types of saw blade are available in various tooth forms and tooth pitches. Here again selection is required to obtain the right blade to achieve optimum sawing performance. Metal cutting blades are generally manufactured in three basic tooth forms.

Namely :-

REGULAR TOOTH, SKIP TOOTH & HOOK TOOTH.

Terminology varies among saw blade manufacturers and these may be otherwise referred to as :-

PRECISION TOOTH, BUTTRESS TOOTH or CLAW TOOTH respectively.

REGULAR TOOTH saw blades are in most common use because the zero front rake and well rounded gullet present a robust tooth with good shock resistance and work penetration properties. It will produce firm accurate work on most ferrous materials and is recommended for most general cutting operations except soft and ductile materials where its teeth have a tendency to clog. Standard pitches are 6, 8, 10 & 14 teeth per inch.

SKIP TOOTH is characterised by the straight sided teeth, sharp root radius and long, flat gullet. Skip tooth saw blades are especially suitable for sawing soft non-ferrous materials as the tooth profile breaks up the large ductile chips which tend to clog regular teeth. Standard pitches are 3, 4 & 6 teeth per inch.

HOOK TOOTH form has a positive front rake which considerably assists in work penetration and hence produces better and faster cutting on the harder ferrous and non-ferrous materials, particularly when sawing large sections. This tooth form is not very suitable for use on abrasive materials and is not recommended for sawing thin wall tubing. Standard pitches are 2, 3, 4 & 6 teeth per inch.

VARIABLE TOOTH saw blades have both varying size teeth and cutting angles which are best used for sections, bundle cutting pipes, tubing etc. and reduces vibration.

TOOTH SET is the angling of the saw teeth so that the tips protrude beyond the body of the blade. The increased width of cut produced provides the working clearance necessary to prevent the saw blade binding in the work piece. There are several styles of tooth set, the most popular for general use being raker set, where one tooth is set to the left, one to the right, and one tooth unset in a repeat pattern.

SAW GAUGE is the actual thickness of the saw band, and for standard 1" (25 mm) wide saw blades is .035" (0.9 mm). The use of heavier gauge saw blades is not recommended.

Selection of blade tooth pitch will be determined by the length of the cut and the chemical composition of the material. In general terms, large sections need to be sawn with a coarse saw blade, and small sections with a fine saw blade, while tough materials require proportionately more teeth in engagement than do softer or ductile materials.

Since a saw blade can exert only a limited force without serious deflection, too many teeth in engagement will reduce the individual tooth loading to the point where they tend to skid across the face of the cut and produce only small powdery chips. This results in a very slow cutting rate and it is a common error to attempt to correct the situation by applying excessive feed pressure, thus producing a bowed and inaccurate cut. Too few teeth in engagement, particularly in conjunction with a heavy feed rate, cause each tooth to attempt to remove too much material. The stubby chips produced break away prematurely and cause vibrations in the form of blade chatter. Persistent sawing under these conditions rapidly dull the teeth by impact and in extreme cases overload the saw blade to the point where the teeth break away.

(CONTINUED.)

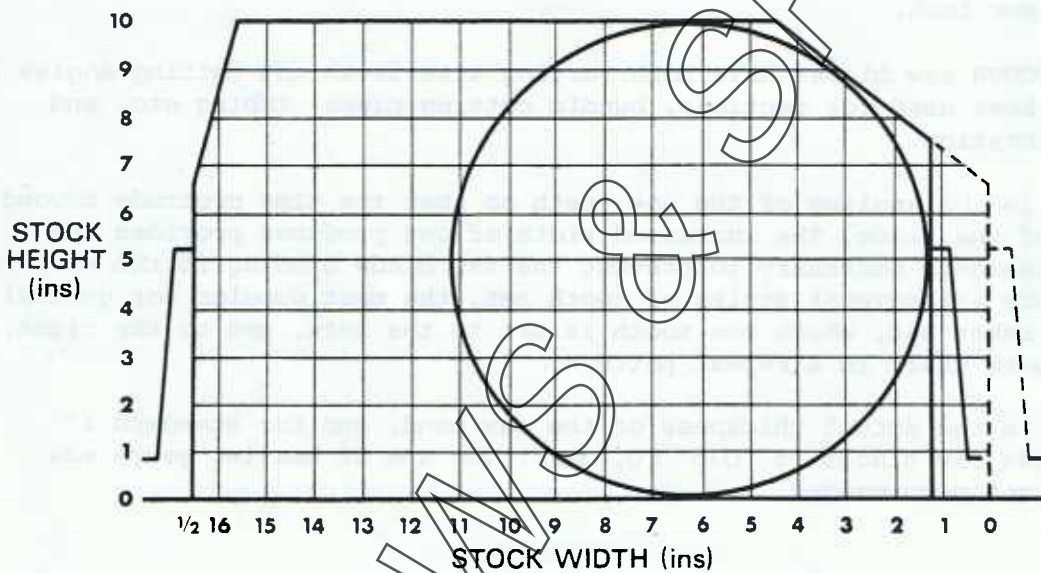
SECTION 226

As a general guide to selecting an appropriate tooth pitch, use ten to six teeth per inch on sawing solid sections up to one inch wide; eight to six teeth per inch on sections one to three inches wide; six to four teeth per inch on sections three to six inches wide; and three to two teeth per inch on sections over six inches wide.

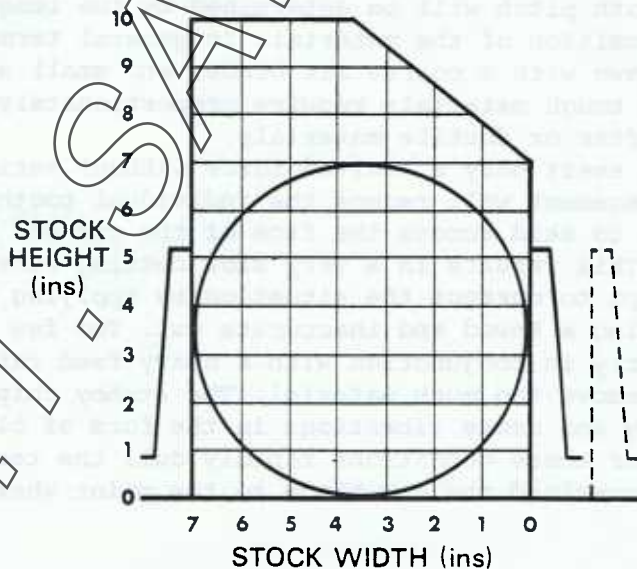
Steel tubes and structural sections sometimes present a problem as the actual length of the saw cut alters considerably due to changes in section. In these cases use a saw blade which allows two or three teeth in engagement at the thinnest section.

The working life of a saw blade can be extended by using only a light feed pressure during its first few minutes of sawing. Care must be taken when running in a new saw blade on work hardening materials as any tendency for the teeth to rub will rapidly burnish the cut and make further sawing impossible.

CUTTING CAPACITY AT 90°



CUTTING CAPACITY AT 45°



SAWING GUIDE CHART.							
MATERIAL	BLADE T.P.I.		BLADE SPEED F.P.M.	MATERIAL	BLADE T.P.I.		BLADE SPEED F.P.M.
	OVER 2"	UP TO 2"			OVER 2"	UP TO 2"	
Aluminium Alloys	6	8	300	I Beams	8	12	125
Aluminium Castings	6	10	200	Machine Steel	8	12	125
Angle Iron - Light	-	14	125	Malleable Iron	8	12	125
Angle Iron - Heavy	8	10	125	Monel Metal	10	14	50
Brass Sheets - Rods	10	12	125	Nickel Steel	10	14	50
Brass Castings - Soft	12	14	125	Pipe Iron Soil	8	12	125
Brass Castings - Hard	12	14	80	Pipe Steel	8	12	125
Bronze	8	10	80	Pipe Galvanized	10	14	125
Bakelite	8	10	200	Plastics	8	10	300
Boiler Tubes	10	12	125	Slate	10	14	50
Cast Iron Pipe - Solids	8	12	125	Steel under 50 Carbon (same for Low Alloy)	8	12	125
Channel Iron	8	12	125	Steel over 50 Carbon (same for High Alloy)	10	14	80
Cold Rolled Steel	8	10	125	Structural Steel	8	12	125
Copper	6	8	300	Tubing Steel Light	12	14	200
Drill Rod	10	14	80	Tubing Seamless Heavy	8	12	125
Fibre	8	12	200	Zinc	8	12	125
High Chrome Steels	8	12	80				
High Speed Steels	8	12	80				

NOTE: SAWING GUIDE FOR MATERIALS USING HARD BACK SAW BLADES.

SAWING GUIDE.

The above Chart is intended as a guide only.

In general blade speeds listed should not be exceeded. However, it is a serious mistake to use blade speeds which are too low, particularly with finer pitch saw blades, unless feed pressure is reduced also. This can cause overloading of the teeth and inaccurate cuts or blade breakage.

Higher blade speeds are possible in most materials when using Bi-Metal saw blades.

GUIDE TO USING SAWING CONTROLS.

FEED PRESSURE :

Required to move saw frame and remove chips.

Should be set 'HEAVIER' on materials with low machinability rating and 'LIGHTER' on materials that are more easily machined. Excessive feed pressure leads to premature blade breakage and/or crooked cuts.

Insufficient feed pressure dulls the saw blade as it tends to rub rather than cut.

Increases in feed pressure normally require corresponding increases in blade speed especially in less hard materials.

FEED SPEED :

Controls the rate at which the saw frame moves.

The speed should be set so that the saw frame moves only as fast as the material is being removed.

The speed should be set slow enough to approach the workpiece without damaging the saw blade upon contact with the workpiece.

Can be set to control the sawing with precision, especially while cutting thinner portions of light tubing or structurals and helps to avoid plunging.

If the speed is too slow the chip load will be less than optimum.

BLADE SPEED :

Controls how quickly the material is being removed.

Should be set fast enough to stop teeth becoming overloaded.

If the speed is set too fast the chip load will be less than optimum and/or the saw blade may dull prematurely.

Increases in blade speed require corresponding increases in feed pressure especially in less hard materials.

CHIP LOAD :

Careful observation of the chip load is very important when sawing.

Chips should be curled as shown in the illustration.

Excessively tight curling indicates too much feed pressure, and a lack of any curl indicates feed pressure is too light.

Chips that are blue in color indicate blade speed is too fast and/or too much feed pressure leading to premature blade breakage.

DIRECTION OF
BLADE TRAVEL

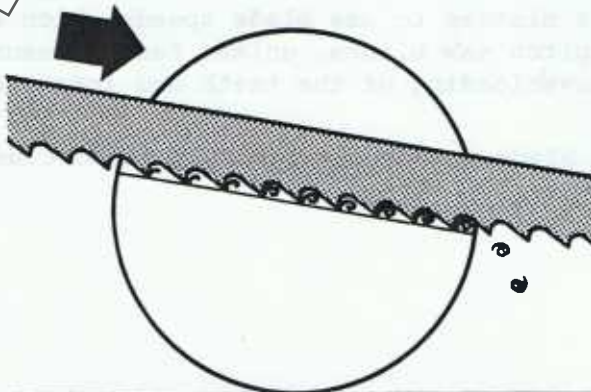


Illustration showing desirable chip form.

COMMON SAWING PROBLEMS.

SAW BLADE WILL NOT CUT :

Drive motor running in wrong direction, bandwheels should run in an anti-clockwise direction.
Blade teeth facing in wrong direction, teeth must point in direction of blade travel.
Material far too hard for type of saw blade being used.

BLADE VIBRATES IN CUT :

Workpiece not properly seated or securely held.
Guides set too close on small diameter workpieces.
Blade speed too fast and/or blade pitch too coarse.
Insufficient blade tension.

PREMATURE BLADE BREAKAGE :

Excessive feed pressure.
Incorrect blade speed and/or incorrect blade selection.
Incorrect blade tension and/or incorrect tracking.
Feed speed too fast.
Worn or incorrectly set guides.
Blade joint improperly welded and annealed.
Workpiece not firmly clamped in vise jaws.
Cut-off piece binding between blade and stock stop.
Blade overheating due to cutting without coolant.
Chips and swarf building up on bandwheels.

TEETH TORN FROM BLADE :

Excessive feed pressure.
Blade speed too slow.
Gullets of teeth overloading, blade pitch too fine.
Blade pitch too coarse.
Feed speed incorrectly set.
Workpiece not firmly clamped in vise jaws.
Workpiece too wide, where possible cut rectangular pieces up on side.

CROOKED CUTS :

Excessive feed pressure.
Incorrect blade tension.
Blade speed too slow.
Feed speed incorrectly set.
Guides not controlling blade correctly through wear or incorrect adjustment and/or guides set too far from workpiece.
Blade teeth dull or of too fine pitch.
Vise jaws not set square to saw blade.
Bandwheel flanges worn causing loss of set to one side of saw teeth.

COMMON SAWING PROBLEMS.

BLADE TEETH DULL RAPIDLY :

Blade overheating due to cutting without coolant.
Blade speed too fast.
Feed speed too slow.
Blade pitch too coarse.
Feed pressure too light.
Material too hard for type of saw blade being used.

SAW BLADE BACK DAMAGED :

Material too hard for type of saw blade being used.
Tracking incorrect, blade set too hard against bandwheel flanges.
Carbide back-up insert missing from one guide assembly.

SAW BLADE STALLS IN CUT :

Excessive feed pressure.
Feed speed too fast.
Incorrect belt tension and/or worn belt or worn pulleys.
Incorrect blade speed and/or incorrect blade selection.

HEAD BOUNCES DURING CUT :

Blade joint improperly welded and annealed.
Teeth missing from saw blade.
Feed pressure set too light.
Bandwheels or pulleys loose.

CUTTING TIME INCREASES :

Blade teeth have become dull.
Feed pressure set too light.
Incorrect blade speed.

OPTIONAL EXTRA EQUIPMENT

SECTION 238

INFEED ROLLER STOCK TABLE (PART No.SM1287).

Complete with tail end stop, rollers and adjustable feet (see Fig.1), this unit can be bolted to the rear of the machine when cutting long or heavy materials.

To level unit place only outboard roller in position and with a straight-edge laid off the machine bed, align roller for height by adjusting feet. More than one infeed roller stock table can be used by simply bolting units end to end and level as before.

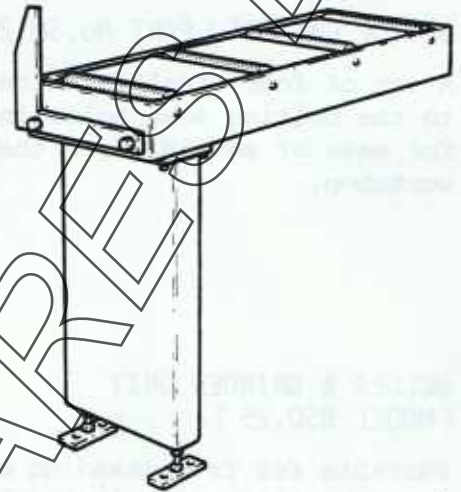


Fig.1.

DISCHARGE TRAY (PART No.SM1365).

The discharge tray (see Fig.2) utilises the bracket and support bar from the stock stop assembly (supplied as standard with machine).

The support bar supplied locates into hole in the machine bed, and a sturdy leg complete with adjustable feet is secured to outboard ends of both support bars.

The feed off plate must be removed to allow the tray to be fitted. The tray locates over both support bars and is secured in place using location holes from feed off plate.

The standard stop pin from the stock stop bracket should be replaced with one supplied which can be set to allow for all sizes of material, and is fully adjustable up to a maximum cutting length of 23" (585 mm).

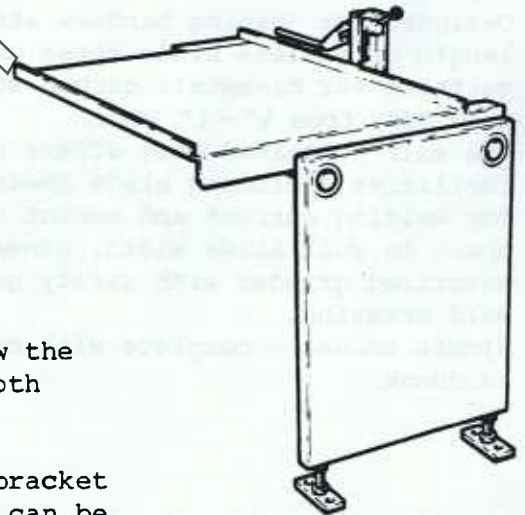


Fig.2.

STOCK STAND (PART No.SP559).

A fully adjustable sturdy stock stand (see Fig.3) is available for use at the front or rear of the machine when cutting long or heavy materials.

NOTE : Stock Stand Part No.SP561 should be used when machine is mounted on casters.

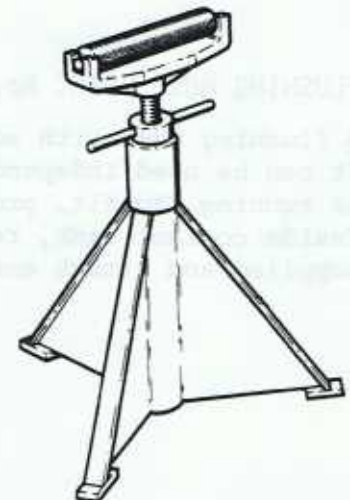


Fig.3.

SECTION 238

SET OF CASTERS (PART No.SM1281) - NOT ILLUSTRATED.

A set of four steel-faced casters are available which can be quickly secured to the bolting down holes in the base of the machine. This may be required for ease of moving where the machine may need to be moved around the workshop.

WELDER & GRINDER UNIT (MODEL BSO.25).

Suitable for free-standing operation (see Fig.4). Alternatively brackets are supplied for fixing units to vertical or horizontal structure.

Designed for joining bandsaw strip into any length of endless blade these units are suitable for bi-metal, carbon steel and Hard Back from $\frac{1}{8}$ " - 1" wide.

The self contained unit offers complete facilities including blade shear, controls for welding current and amount of material upset to suit blade width, annealing and motorised grinder with safety guard for weld dressing.

Simple to use - complete with operating handbook.

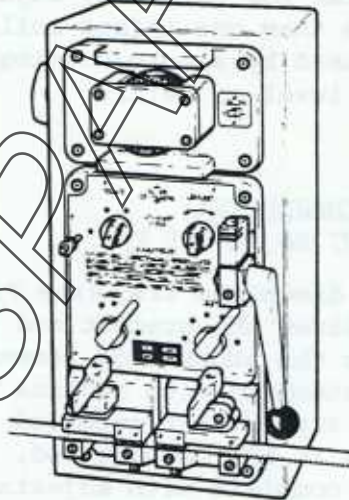


Fig. 4.

SWarf RAKE(PART No.SM.1379) - NOT ILLUSTRATED.

A purpose made swarf rake is available for keeping the coolant tray free from swarf.

FLUSHING HOSE (PART No.SM1269) - NOT ILLUSTRATED.

A flushing hose with adjustable nozzle is available complete with fittings. It can be used independently from the coolant jets when the coolant pump is running. To fit, proceed as follows :-

Inside coolant tank, remove stem adaptor and replace with T-stem adaptor supplied and attach end of flexible tube from flushing hose.

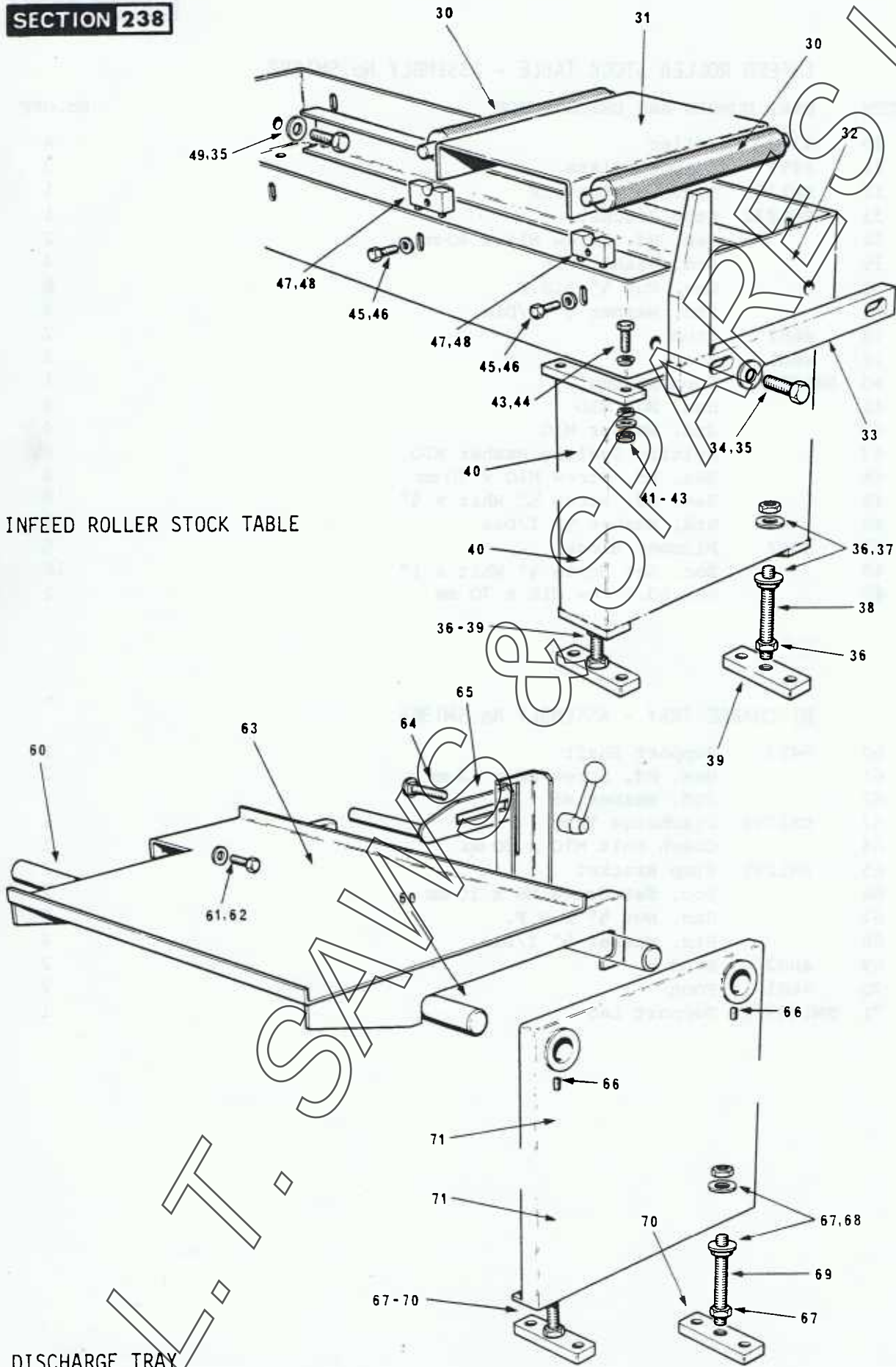
INFEED ROLLER STOCK TABLE - ASSEMBLY No.SM1287

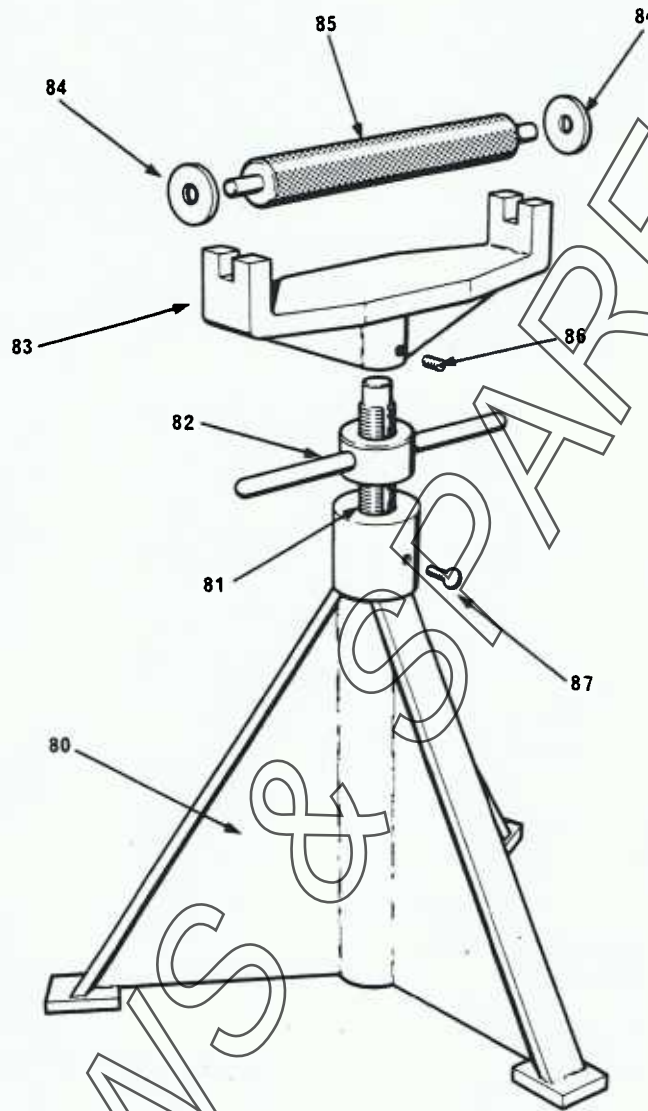
ITEM	PART NUMBER AND DESCRIPTION	No. OFF
30	4389 Roller	4
31	4497 Support Plate	3
32	SM1363 Conveyor Chassis	1
33	SM1232 Stop Bracket	1
34	Hex. Hd. Screw	2
35	Std. Washer	4
36	Hex. Nut	6
37	Std. Washer	4
38	4682 Stud	2
39	4681 Foot	2
40	SM1364/1 Support Leg	1
41	Hex. Nut	4
42	Std. Washer	4
43	Nyltite Sealing Washer	8
44	Hex. Hd. Screw	4
45	Hex. Hd. Screw	8
46	Std. Washer	8
47	4387 Plummer Block	8
48	Soc. Set Screw	16
49	Hex.Hd.Screw	2

DISCHARGE TRAY - ASSEMBLY No.SM1365

60	6453 Support Shaft	1
61	Hex. Hd. Screw	2
62	Std. Washer	2
63	SM1294 Discharge Tray	1
64	Coach Bolt	1
65	SM1295 Stop Bracket	1
66	Soc. Set Screw	2
67	Std. Nut	6
68	Std. Washer	4
69	4682 Stud	2
70	4681 Foot	2
71	SM1293/1 Support Leg	1

SECTION 238





STOCK STAND

STOCK STAND - ASSEMBLY Nos.SP559/SP561

NOTE : All items except for stand (Item 80) common to both SP559 & SP561.

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
80	SP558 Stand (Assembly No.SP559)	1
	SP560 Stand (Assembly No.SP561)	1
81	3869 Jacking Screw	1
82	SP557 Adjuster	1
83	3867 Roller Bracket	1
84	6553 Stop Plate	2
85	3866 Roller	1
86	Soc. Set Screw	1
87	Thumb Screw	1

TRANSMISSION

SECTION 252

GEARBOX - ASSEMBLY No.SM1256/1

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
1	6300/1 Gearbox Housing	1
2	6303 Worm Shaft	1
3	<i>B02039</i> Taper Roller Bearing	2
4	6308 Seal Plate	1
5	'O' Ring	2
6	Oil Seal	1
7	Circlip Internal	2
8	Hex. Hd. Screw	4
9	Std. Washer	4
10	Soc. Set Screw	4
11	Hex. Nut	4
12	<i>B02040</i> Taper Roller Bearing	2
13	6310 Seal Plate	1
14	<i>B051183</i> - 'O' Ring	2
15	Circlip Internal	2
16	6304 Drive Shaft	1
17	Woodruff Key	1
18	Oil Seal	1
19	6312 Spacer	1
20	6311 Spacer	1
21	Circlip External	1
22	6762 Felt Sealing Washer	1
23	6302 Worm Wheel	1
24	6307 Seal Plate	1
25	6305/1 Stop Plate	1
26	Soc. Set Screw	4
27	7642 Soc. Set Screw	2
29	6301 Bearing Housing	1
30	Circlip Internal	1
31	'O' Ring	1
32	6306/1 Stop Plate	1
33	6309 Seal Plate	1
34	Hex. Hd. Screw	4
35	Std. Washer	4
36	6539 Bracket L.H.	1
37	6540 Bracket R.H.	1

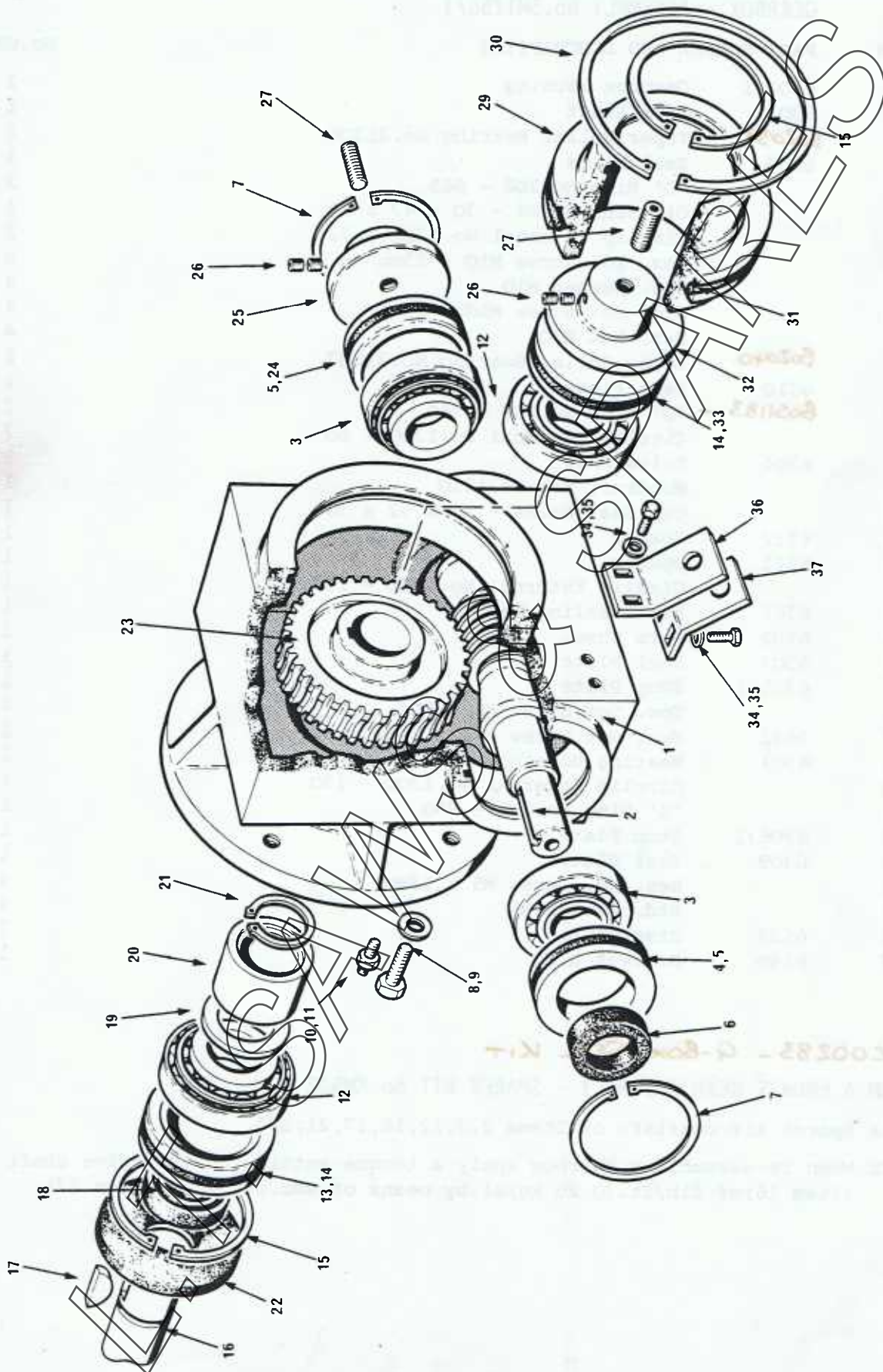
PC00283 - G-Box SEAL KIT

WORM & BRONZE GEAR ASSEMBLY - SPARES KIT No.KM502

This Spares Kit consists of Items 2,3,12,16,17,21,&23.

NOTE: When re-assembling gearbox apply a torque setting on the drive shaft (Item 16) of 21lb/ft. (0.28 kg/m). by means of soc.set screw (Item 27).

ALTSAWS LTD



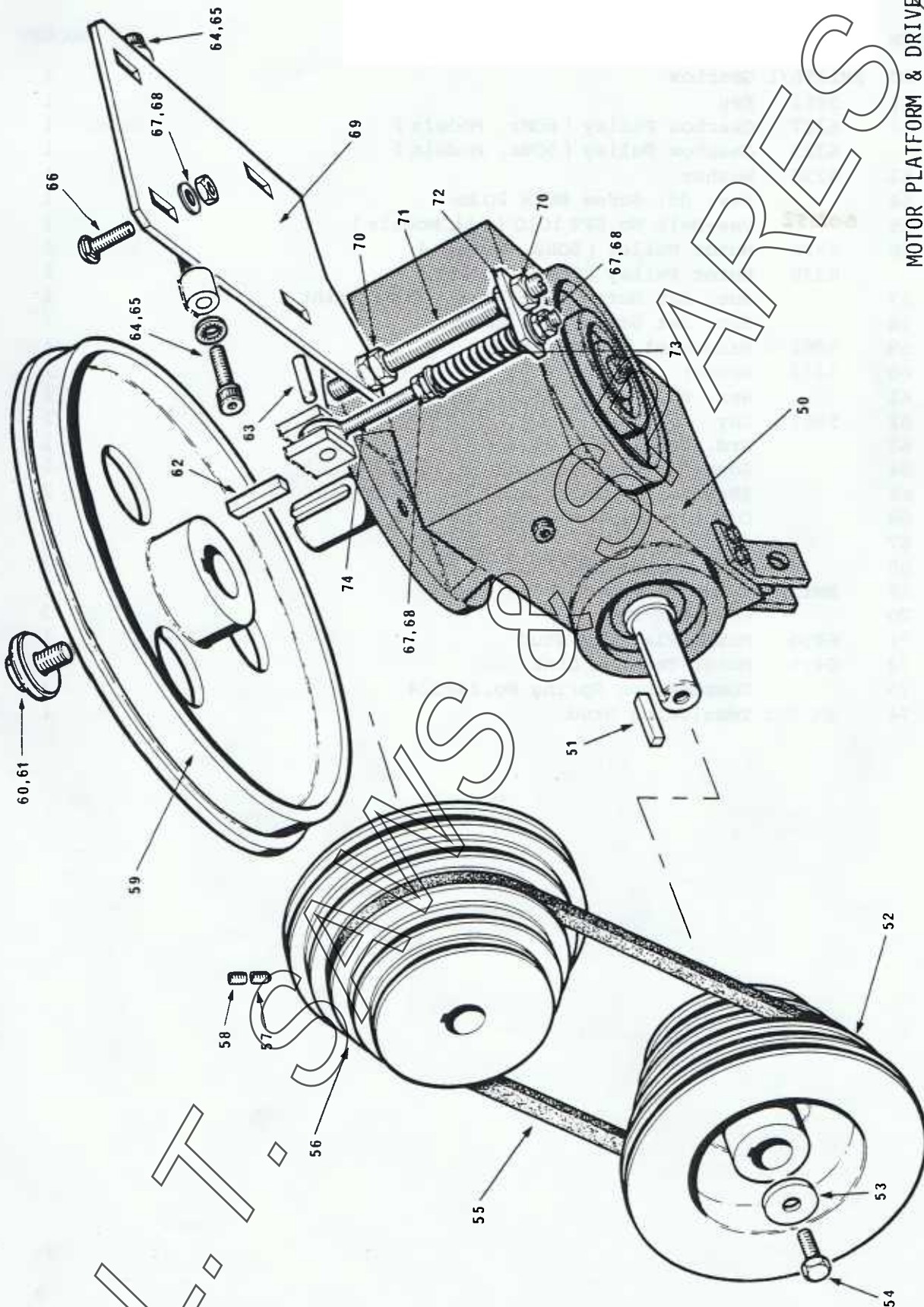
GEARBOX

A.

MOTOR PLATFORM & DRIVE ASSEMBLY

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
50	SM1256/1 Gearbox	1
51	5952 Key	1
52	6327 Gearbox Pulley (60Hz. Models)	1
	6323 Gearbox Pulley (50Hz. Models)	1
53	4238 Washer	1
54	Hex. Hd. Screw	1
55	602152 Vee-Belt	1
56	6326 Motor Pulley (60Hz. Models)	1
	6328 Motor Pulley (50Hz. Models)	1
57	Soc. Set Screw	1
58	Soc. Set Screw	1
59	5961 Bandwheel (Drive End)	1
60	4333 Washer	1
61	Hex. Hd. Screw	1
62	5962 Key	1
63	Std. Dowel	1
64	Soc. Hd. Cap Screw	2
65	Shakeproof Washer	2
66	Coach Bolt	4
67	Hex. Nut	8
68	Std. Washer	7
69	SM1199 Motor Platform	1
70	Hex. Nut	3
71	6430 Motor Platform Stud	1
72	6429 Motor Tension Link	1
73	Compression Spring	1
74	SM1202 Tensioning Stud	1

SECTION 252



MOTOR PLATFORM & DRIVE

GUIDES/BANDWHEEL MOUNTINGS

SECTION 257

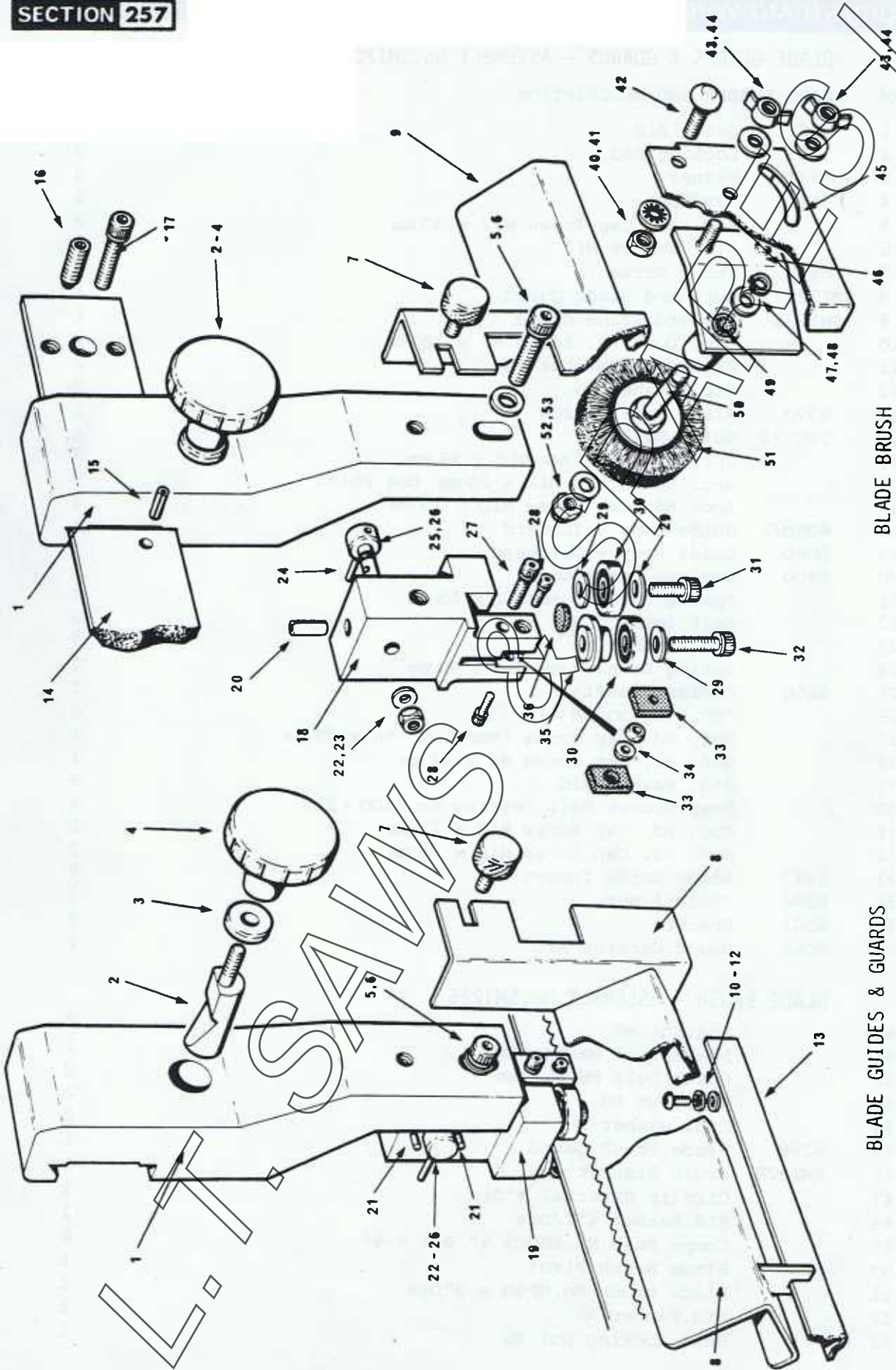
BLADE GUIDES & GUARDS - ASSEMBLY No. SM1200

ITEM	PART NUMBER AND DESCRIPTION	Q. OFF
1	5981 Guide Arm	2
2	3743 Locking Pad	2
3	4537 Washer	2
4	5130 Handknob	2
5	Soc. Hd. Cap Screw	2
6	Std. Washer	2
7	6638 Thumb Screw	2
8	SM1223/2 Outboard Blade Guard	1
9	SM1226 Inboard Blade Guard	1
10	Soc. Dome Hd. Screw	2
11	Shakeproof Washer	2
12	Std. Washer	2
13	6370 Blade Guard Slide	1
14	5997/2 Guide Rail	1
15	Spring Dowel	2
16	Soc. Set Screw	8
17	Soc. Hd. Cap Screw	4
18	6060/1 Guide Body - Inboard	1
19	6060 Guide Body - Outboard	1
20	6400 Coolant Connector	2
21	Spring Dowel	4
22	Self Locking Nut	2
23	Std. Washer	2
24	Spring Dowel	2
25	6650 Coolant Nozzle	2
26	'O' Ring	4
27	Soc. Hd. Cap Screw	2
28	Soc. Hd. Cap Screw	4
29	Std. Washer	6
30	Deep Groove Ball Bearing	4
31	Soc. Hd. Cap Screw	2
32	Soc. Hd. Cap Screw	2
33	6393 Blade Guide Insert	4
34	6394 Conical Nut	4
35	6062 Spacer	2
36	6068 Round Carbide Pad	2

BLADE BRUSH - ASSEMBLY No. SM1225

40	Std. Nut	2
41	Shakeproof Washer	2
42	Coach Bolt	2
43	Wing Nut	2
44	Std. Washer	2
45	6396 Blade Brush Guard	1
46	SM1228 Brush Bracket	1
47	Circlip External	1
48	Std. Washer	1
49	Compo Bush	2
50	6399 Blade Brush Pivot	1
51	Blade Brush	1
52	Std. Washer	1
53	Self Locking Nut	1

SECTION 257



BLADE BRUSH

BLADE GUIDES & GUARDS

OUTBOARD BLADE GUIDE ASSEMBLY - SPARES KIT No.KM11 KM511

This Spares Kit consists of items 5 & 6, Items 19 to 36 inclusive, fully assembled.

INBOARD BLADE GUIDE ASSEMBLY - SPARES KIT No.KM511/1

This Spares Kit consists of Items 5,6 & 18, & Items 20 to 36 inclusive, fully assembled.

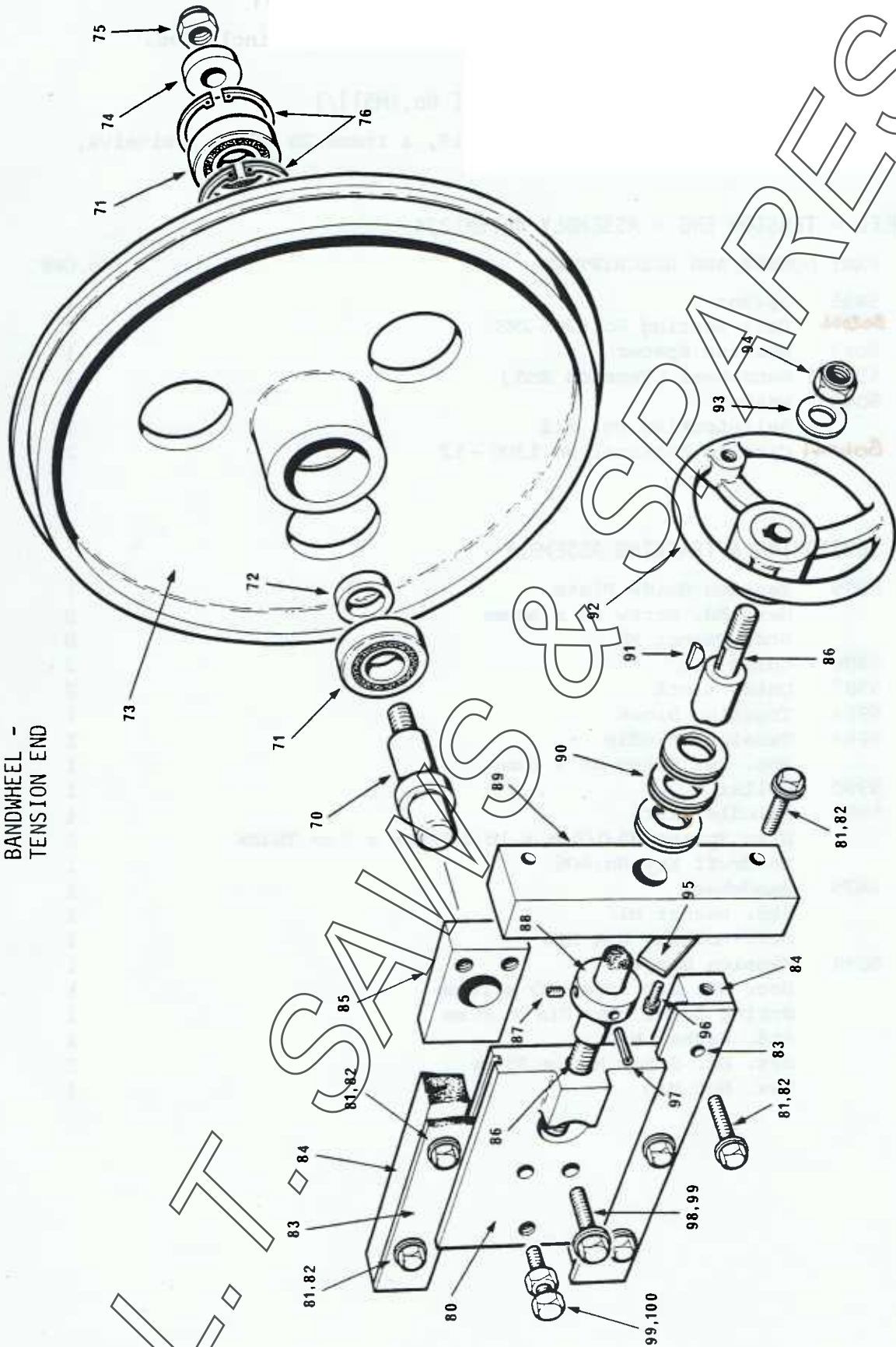
BANDWHEEL - TENSION END - ASSEMBLY No.SM1234

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
70	5985 Spigot	1
71	302006 Ball Bearing	2
72	6047 Bearing Spacer	1
73	5961/1 Bandwheel (Tension End)	1
74	6048 Washer	1
75	Self-Locking Nut	1
76	306041 Circlip Internal	2

TENSIONING & TRACKING ASSEMBLY

80	5979 Tension Guide Plate	1
81	Hex. Hd. Screw	8
82	Std. Washer	8
83	5986 Guide Gib	2
84	5987 Guide Block	2
85	5984 Tracking Block	1
86	5989 Tension Spindle	1
87	Soc. Set Screw	1
88	5990 Collar	1
89	5988 Spindle Plate	1
90	Disc Spring	6
91	Woodruff Key	1
92	6679 Handwheel	1
93	Std. Washer	1
94	Self-Locking Nut	1
95	6098 Tension Gauge	1
96	Soc. Hd. Cap Screw	1
97	Spring Dowel	1
98	Std. Washer	2
99	Hex. Hd. Screw	3
100	Hex. Nut	1

SECTION 257



BANDWHEEL -
TENSION END

TENSIONING & TRACKING

INSTRUCTIONS FOR TRACKING THE SAW BLADE.

The twisting of the saw blade as it passes through the blade guides sets up an effect which causes the saw blade to run-off the bandwheels. This is counteracted by inclining both bandwheels inwards towards each other, this inclining of the bandwheels to align the saw blade is known as 'tracking' (see Fig.1).

When the machine is tracking correctly the back of the saw blade should run .010"/.030" clear of the bandwheel flanges.

All machines are correctly tracked before leaving the factory and should not require further adjustment. If however, the tracking is disturbed, proceed as follows :-

At front of machine, remove blade guards, and inboard and outboard guide assemblies and over arms as complete units.

NOTE : Do not disturb the setting of the blade guides relative to the over arms.

Place saw blade on bandwheels with edge of saw blade $\frac{1}{8}$ " clear of bandwheel flange. Run machine at lowest speed for a few minutes, and then check the position of the saw blade on the bandwheel.

If the saw blade has moved up hard against the flanges of the bandwheel this will produce undue wear on the bandwheel flange, and burr the edge of the saw blade. To overcome this the bandwheel must be inclined to a lesser degree. At rear of machine slacken off both locking screws (see Fig.2) and locking nut on jacking screw. Turn jacking screw clockwise until bandwheel moves slightly.

If the saw blade has moved towards the rear edge of the bandwheel the saw blade will tend to run-off the bandwheel. To overcome this the bandwheel must be inclined more. Slacken off both locking screws and locking nut on jacking screw. Turn jacking screw anti-clockwise until bandwheel moves slightly.

After completing the adjustments, place the saw blade $\frac{1}{8}$ " clear of flange and run machine for a few minutes. Check the position of the saw blade and if it is still not correct carry out adjustments again. With saw blade tracking correctly, fully tighten locking nut and locking screws. Replace over arms and guide assemblies complete, and blade guards.

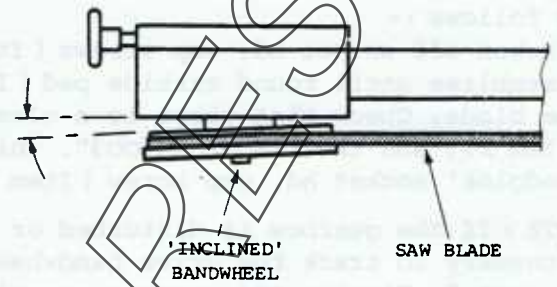


Fig.1: Diagrammatic plan of machine.

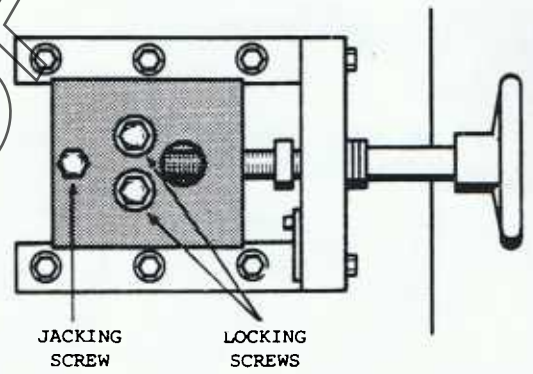


Fig.2.

(CONTINUED).

SECTION 257

INSTRUCTIONS FOR TRACKING THE SAW BLADE (CONTINUED).

If the setting of the blade guide assemblies have been disturbed, proceed as follows :-

Slacken off socket hd. cap screws (Item 5 - see page 2) and lower guide assemblies until round carbide pad (Item 30) just touches the top edge of the blade. Check that there is a clearance between the guide inserts (Item 27) and the blade of .003". This can be adjusted by means of the 'wedglok' socket hd. cap screw (Item 21).

NOTE : If the gearbox is disturbed or replaced for any reason it may be necessary to track the drive bandwheel. This is carried out as described on page 5. Slacken off gearbox securing screws (Item 8 - see Section on Transmission) and adjust either inboard or outboard jacking screws (Items 10 & 11) as required and tighten securing screws. However, unless the gearbox has been disturbed it should not be necessary to alter this setting under normal circumstances.

WISE ASSEMBLY

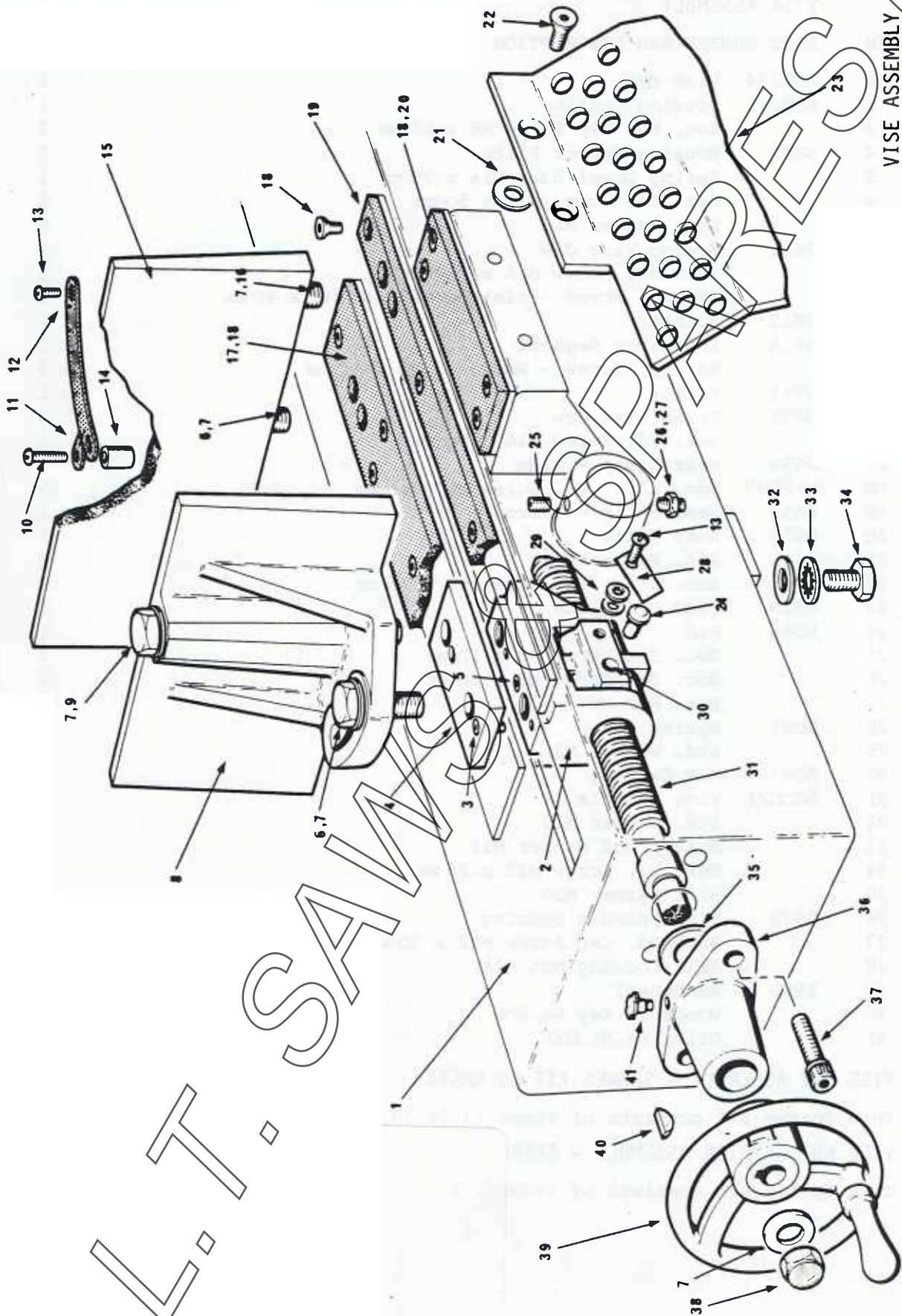
ITEM	PART NUMBER AND DESCRIPTION	No.OFF
1	SM1284 Vise Bed	1
2	6082/1 Housing Casting	1
3	Soc. Hd. Cap Screw	2
4	6652 Housing Spacer Plate	1
5	Spring Dowel	1
6	Hex. Hd. Screw	2
7	Std. Washer	5
8	6491 Moving Vise Jaw	1
9	Hex. Hd. Screw	1
10	Rd. Hd. Screw - Slotted	1
11	2812 Pointer	1
12	5916 Indicator Segment	1
13	Rd. Hd. Screw - Recessed	3
14	5959 Pillar	1
15	6492 Fixed Vise Jaw	1
16	Hex. Hd. Screw	1
17	6654 Wear Strip - Wide	1
18	805267 Soc. C'sk. Hd. Screw	15
19	6653 Wear Strip - Narrow	1
20	6659 Wear Plate	1
21	Std. Washer	2
22	Soc. C'sk. Hd. Screw	2
23	6529 Feed Off Plate	1
24	6084 Pin	1
25	Soc. Set Screw	2
26	Soc. Set Screw	2
27	Hex. Nut	2
28	6085 Spring	1
29	Std. Washer	2
30	6083 Nut Casting	1
31	6000/1 Vise Spindle	1
32	Std. Washer	4
33	Shakeproof Washer	4
34	Hex. Hd. Screw	4
35	Std. Washer	1
36	5978 Vise Spindle Housing	1
37	Soc. Hd. Cap Screw	2
38	Self-Locking Nut	1
39	5966 Handwheel	1
40	Woodruff Key	1
41	Oiler	1

WISE NUT ASSEMBLY - SPARES KIT No.KM514

This Spares Kit consists of Items 13,24,28,29,&30

VICE NUT CARRIER ASSEMBLY - SPARES KIT No.KM515/1

This Spares Kit consists of Items 2 & 5.



WISE ASSEMBLY

A.L.T. SAWSPARES LTD

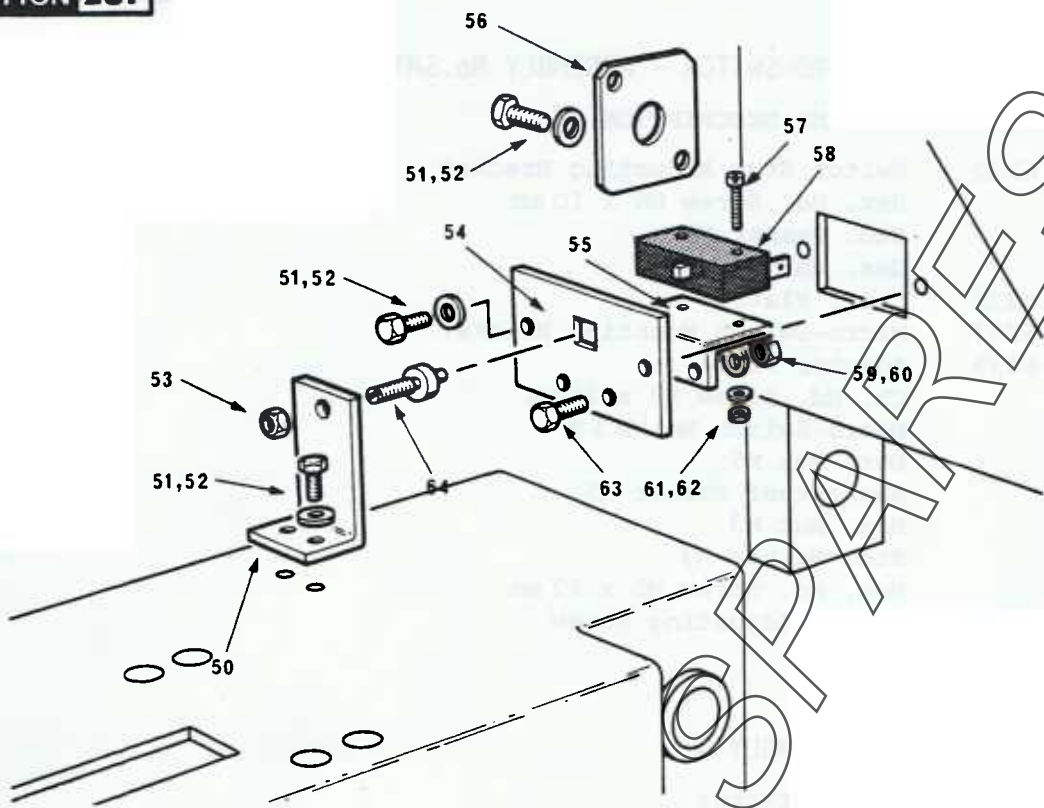
HEAD DOWN MICRO-SWITCH - ASSEMBLY No.SM1282

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
50	6530 Switch Stop Adjusting Bracket	1
51	Hex. Hd. Screw	6
52	Std. Washer	6
53	Hex. Nut	1
54	6238 Cover Plate	1
55	6237 Micro-Switch Mounting Bracket	1
56	6439 Adaptor Plate	1
57	Ch. Hd. Screw	2
58	Micro-Switch	1
59	Hex. Nut	2
60	Shakeproof Washer	2
61	Hex. Nut	2
62	Std. Washer	2
63	Hex. Hd. Screw	2
64	6239 Switch Adjusting Screw	1

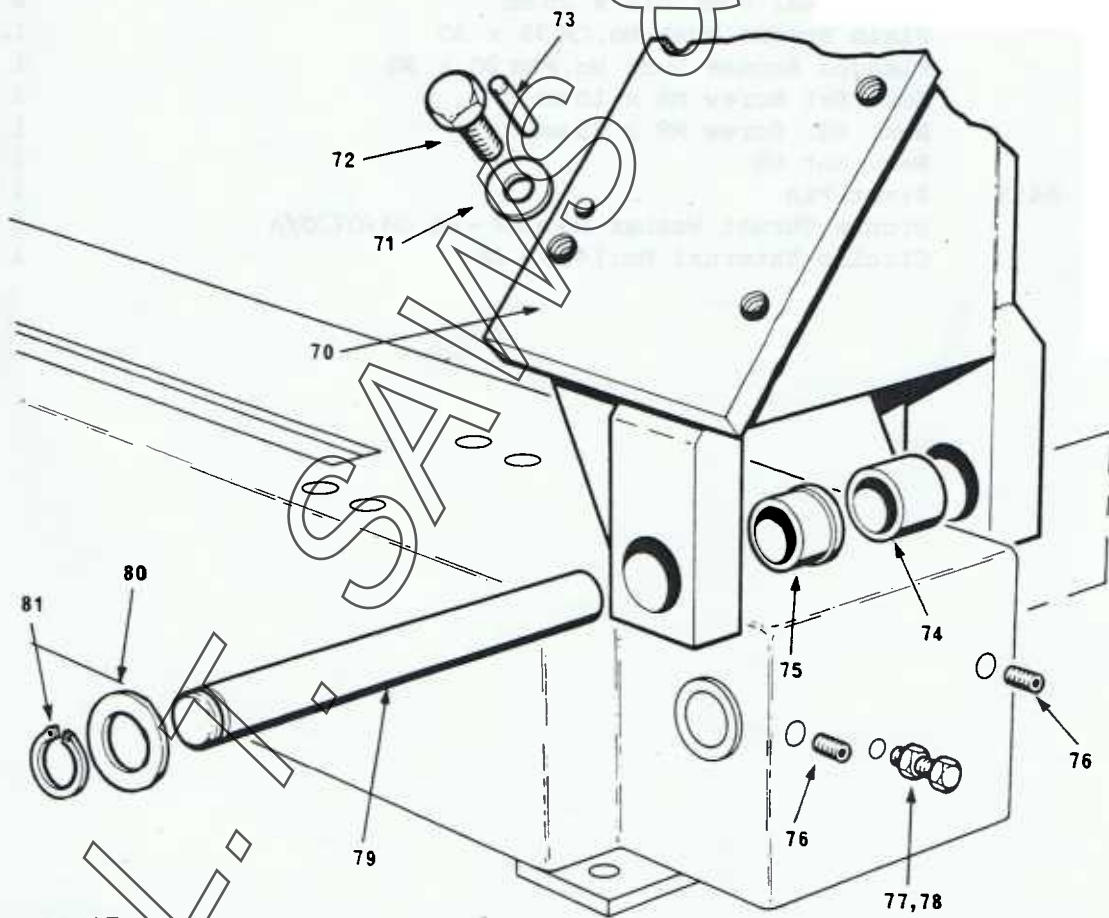
HEAD PIVOT ASSEMBLY

70	SM1286 Pivot Bracket	1
71	Std. Washer	6
72	Hex. Hd. Screw	6
73	Std. Dowel	2
74	Plain Bronze Bush	1
75	Flanged Bronze Bush	1
76	Soc. Set Screw	2
77	Hex. Hd. Screw	1
78	Hex. Nut	1
79	6455 Pivot Pin	1
80	Bronze Thrust Washer	1
81	Circlip External	1

SECTION 261



HEAD DOWN MICRO-SWITCH



HEAD PIVOT

HYDRAULIC CYLINDER**SECTION 268****HYDRAULIC CYLINDER - ASSEMBLY No.SM1211**

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
1	5980 Cylinder Cap	1
2	'O' Ring	1
3	6024 Piston Rod	1
4	Hex. Locknut	3
5	Rose Bearing	1
6	Std. Washer	4
7	Soc. Hd. Cap Screw	2
8	Soc. C'sk. Hd. Screw	2
9	SM1206 Cylinder Body	1
10	Hardened Steel Ball	1
11	5826 Compression Spring	1
12	'U' Ring	1
13	6288 Piston Nut	1
14	Rose Bearing	1
15	Male Stud Elbow	2
16	6287 Piston	1
NOT ILLUSTRATED :		
	Feed Speed Control Valve	1
	Male Stud Elbow	2

DISMANTLING INSTRUCTIONS.

If the head fails to stay up when the control valve is closed it is possible the 'U' ring or non-return valve assembly may need replacing.

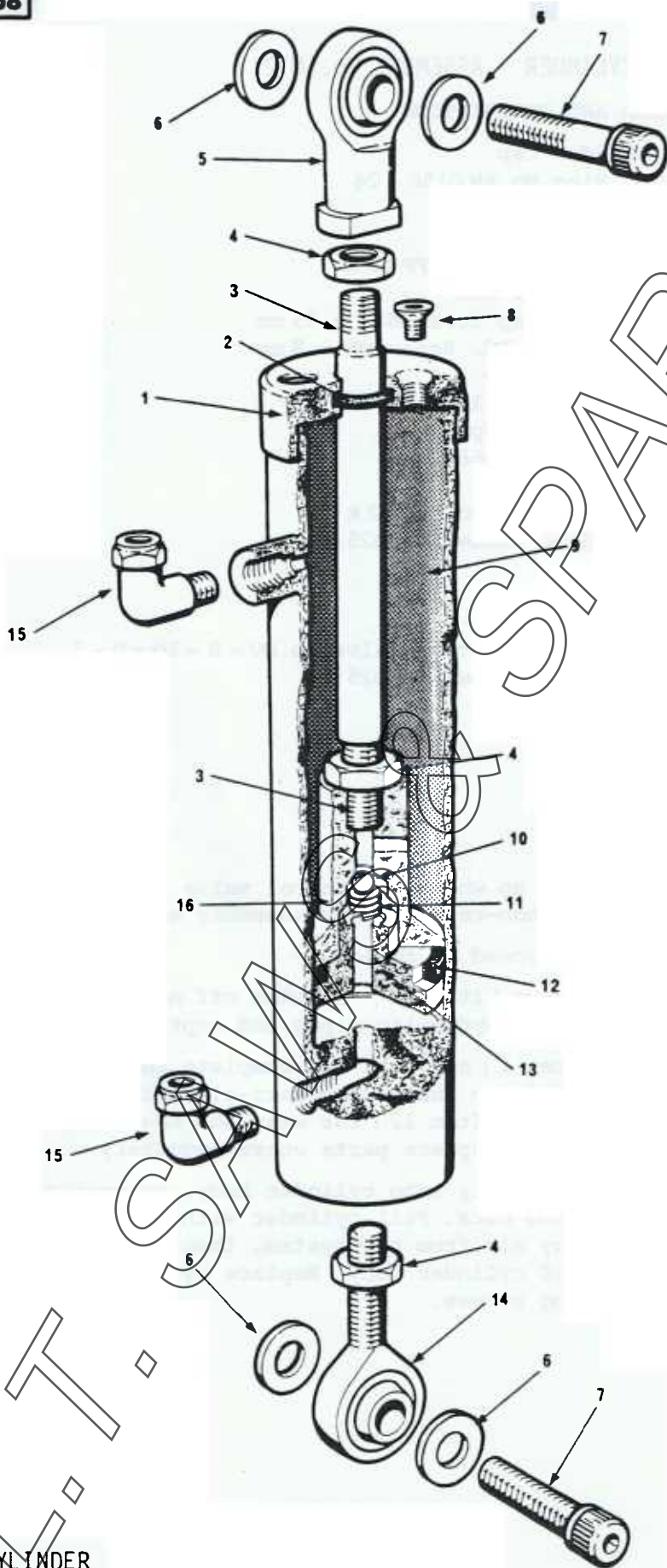
To dismantle cylinder, proceed as follows :-

Remove both securing screws (Item 7), slacken off nuts on stud elbows (Item 15), disconnect both hydraulic pipes and empty cylinder of oil.

Unscrew cylinder cap (Item 1) and pull out complete inner assembly. Remove piston nut (Item 13) by unscrewing anti-clockwise. With piston nut removed, check 'U' ring (Item 12) for wear and check that steel ball (Item 10) seats cleanly and replace parts where necessary.

Replace complete inner assembly into cylinder body, re-connect hydraulic pipes and tighten coupling nuts. Fill cylinder with oil and pump piston a few times to remove any air from the system, then top up with oil to within $\frac{1}{4}$ " from the top of cylinder body. Replace cylinder cap and secure to machine using securing screws.

SECTION 268



HYDRAULIC CYLINDER

COOLANT SYSTEM

SECTION 273

COOLANT ATTACHMENT - ASSEMBLY NO. SM1366

ITEM	PART NUMBER AND DESCRIPTION	NO.OFF
1	SM1368 Coolant Tank	1
2	Clear Flexible Plastic Tube	1
3	Clear Flexible Plastic Tube	1
4	Clear Flexible Plastic Tube	1
5	Tubing Clip	2
6	Soc. Dome Hd. Screw	2
7	'Y' Stem Adapter No.	1
8	6505 Pump Bracket	1
9	Coolant Pump	1
10	Pipe Clip	1
11	Clear Flexible Plastic Tube	1
12	Stem Adapter	1

NOTE: Coolant control valves are part of the guide assemblies, see Section on Guides/Bandwheel Mountings for Part Nos.

COOLANT PUMP MAINTENANCE INSTRUCTIONS.

This pump is designed to circulate mild liquids, and is cooled by either sitting in liquid (submerged), or circulating liquid through the head. **IMPORTANT : DO NOT LET PUMP RUN DRY, OR DAMAGE MAY RESULT.**

This pump is a sealed unit, factory serviced with oil and should not require further lubrication.

IMPORTANT : DO NOT OPEN THE SEALED PORTION OF THE UNIT, OR REMOVE ANY SCREWS OTHER THAN INDICATED IN FIG.1.

The only maintenance needed on the pump may be that from time to time the pump may become clogged by swarf or chips.

To clean out pump, proceed as follows:-

DISCONNECT PUMP FROM MAINS SUPPLY.

Remove plastic screen at front of pump, then remove three screws (indicated in Fig.1), and take off pump head.

IMPORTANT : DO NOT REMOVE ANY OTHER SCREWS WHICH MAY BE EXPOSED.

Clean out any swarf or chips which may have clogged the impeller, taking care to avoid the painted surface.

Turn the impeller by hand to make sure it is free.

Re-connect the pump to the mains supply to make sure the impeller turns freely. If it does, disconnect pump from mains supply and replace pump head, three screws and plastic screen. Re-connect pump to mains supply.

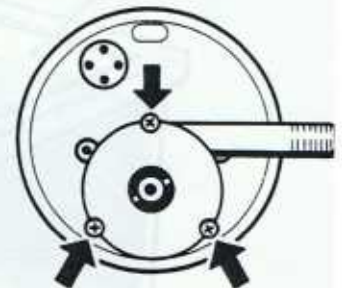
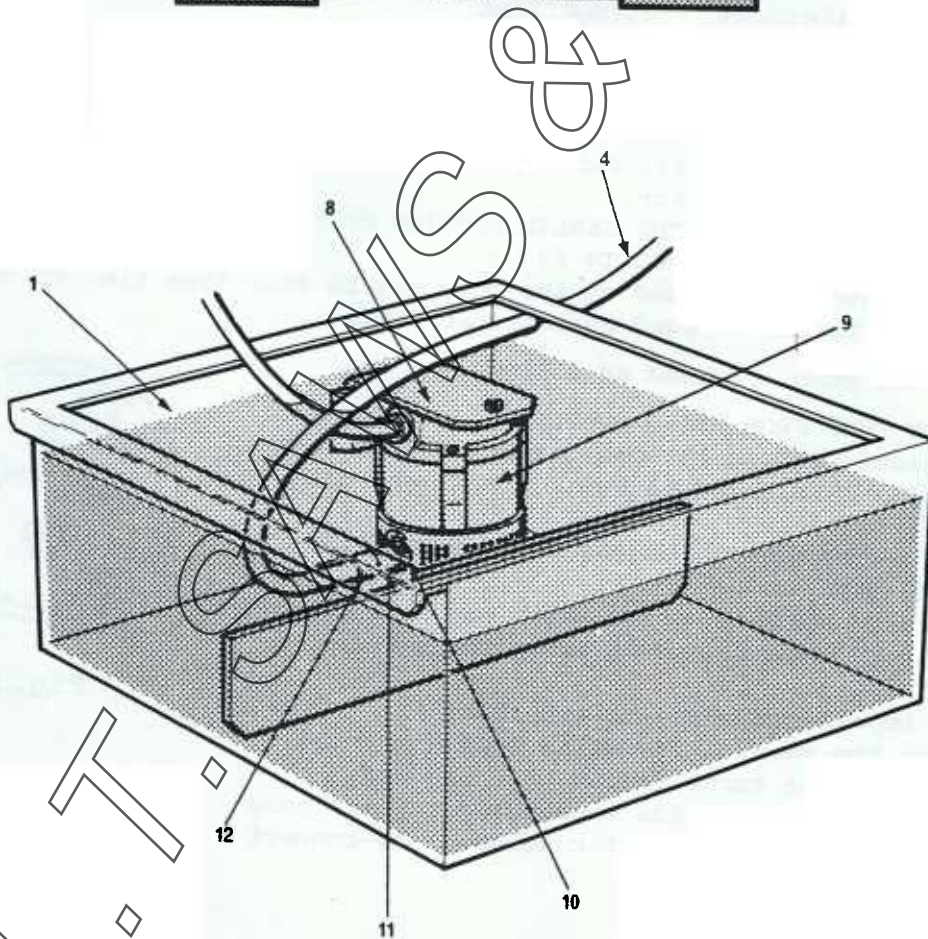
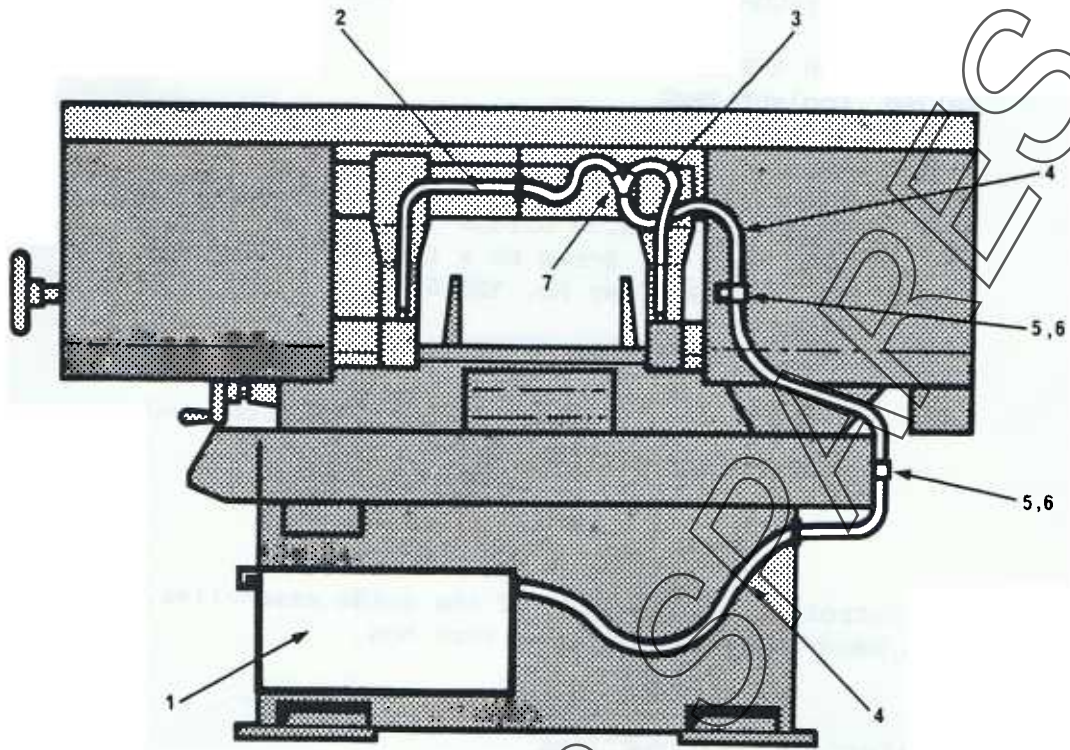


Fig.1.

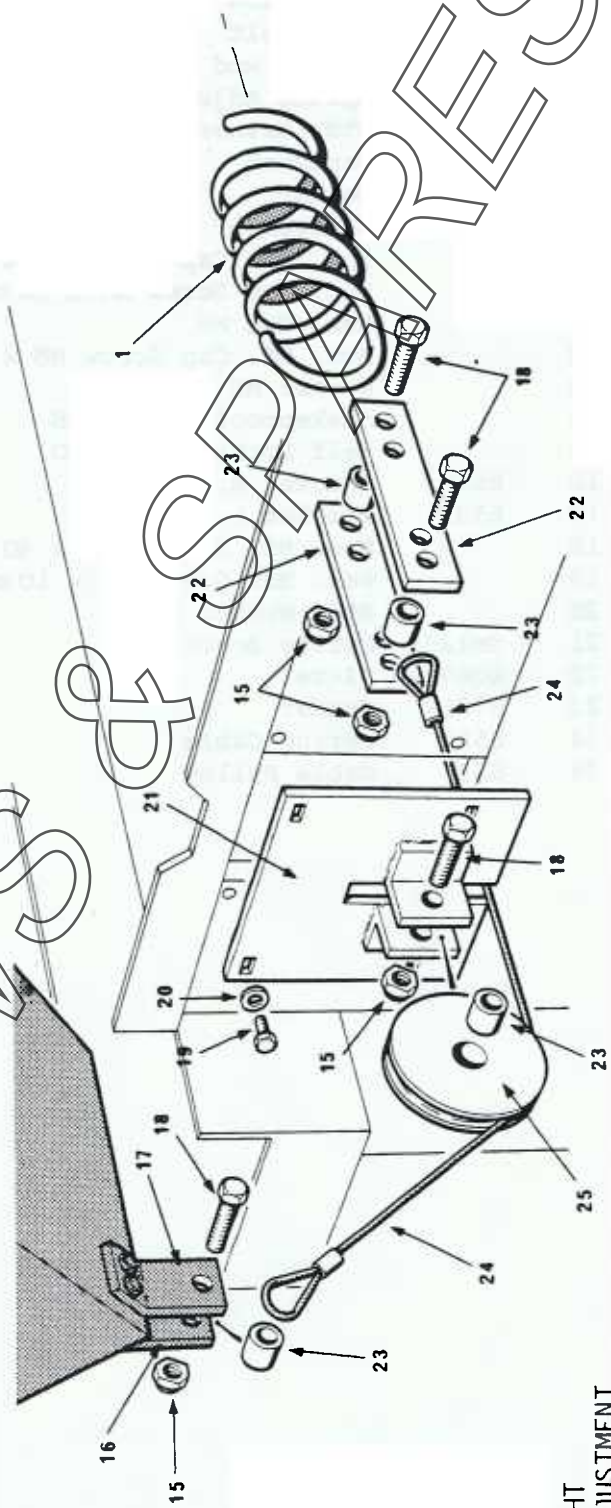
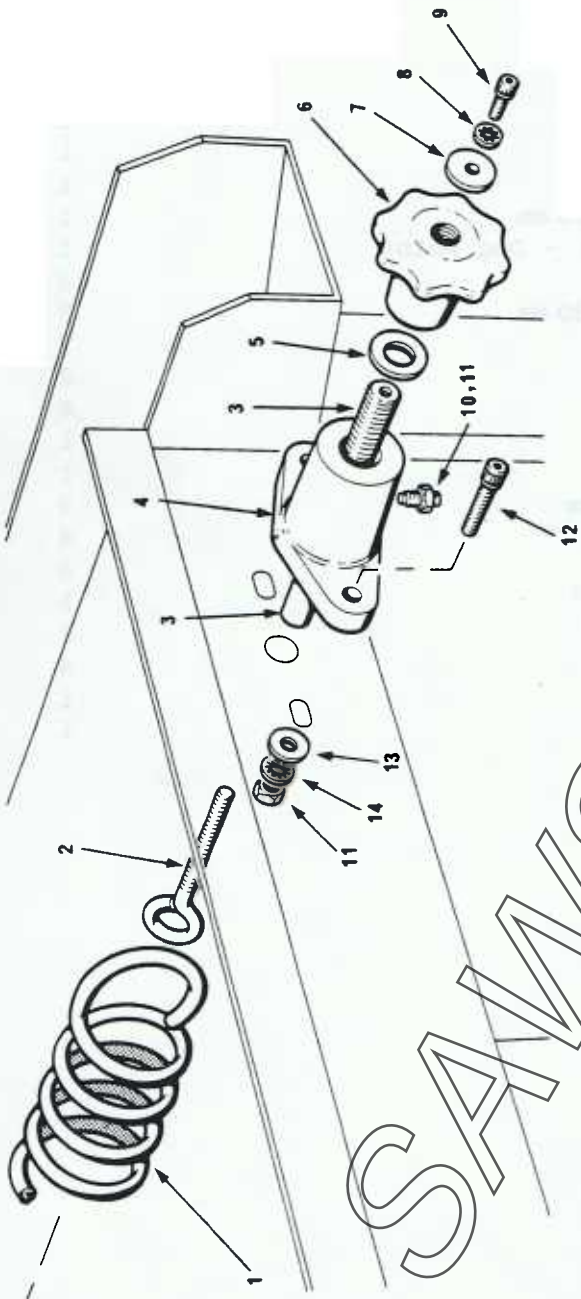
SECTION 273



COOLANT ASSEMBLY

MISCELLANEOUS**SECTION 283****HEAD WEIGHT SPRING ADJUSTMENT ASSEMBLY**

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
1	5973 Extension Spring	1
2	6071 Hook Bolt	1
3	5957/1 Spring Rod	1
4	6531 Spring Adjuster Housing	1
5	Std. Washer	1
6	6402 Handknob	1
7	6403 Washer	1
8	Shakeproof Washer	1
9	Soc. Hd. Cap Screw	1
10	Soc. Set Screw	1
11	Hex. Nut	3
12	Soc. Hd. Cap Screw	2
13	Washer	2
14	Shakeproof Washer	2
15	Self Locking Nut	4
16	6540 Bracket R.H.	1
17	6539 Bracket L.H.	1
18	Hex. Hd. Screw	4
19	Hex. Hd. Screw	4
20	Std. Washer	4
21	SML288 Pulley Bracket	1
22	6069 Plate	2
23	6538 Spacer	4
24	6557 Spring Cable	1
25	6537 Cable Pulley	1



HEAD WEIGHT
SPRING ADJUSTMENT

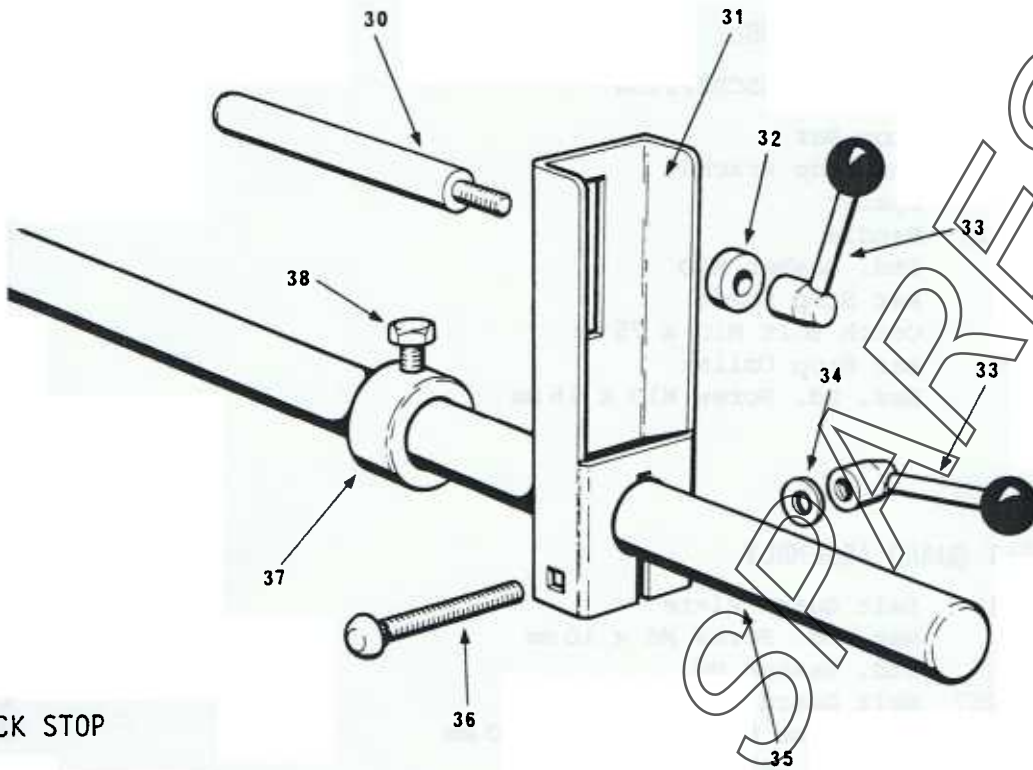
STOCK STOP - ASSEMBLY No.SM1241

ITEM	PART NUMBER AND DESCRIPTION	No. OFF
30	6419 Stop Bar	1
31	SM1367 Bar Stop Bracket	1
32	6313 Spacer	1
33	SM1261 Handle	2
34	Std. Washer	1
35	6392 Bar Stop Shaft	1
36	Coach Bolt	1
37	6626 Bar Stop Collar	1
38	Hex. Hd. Screw	1

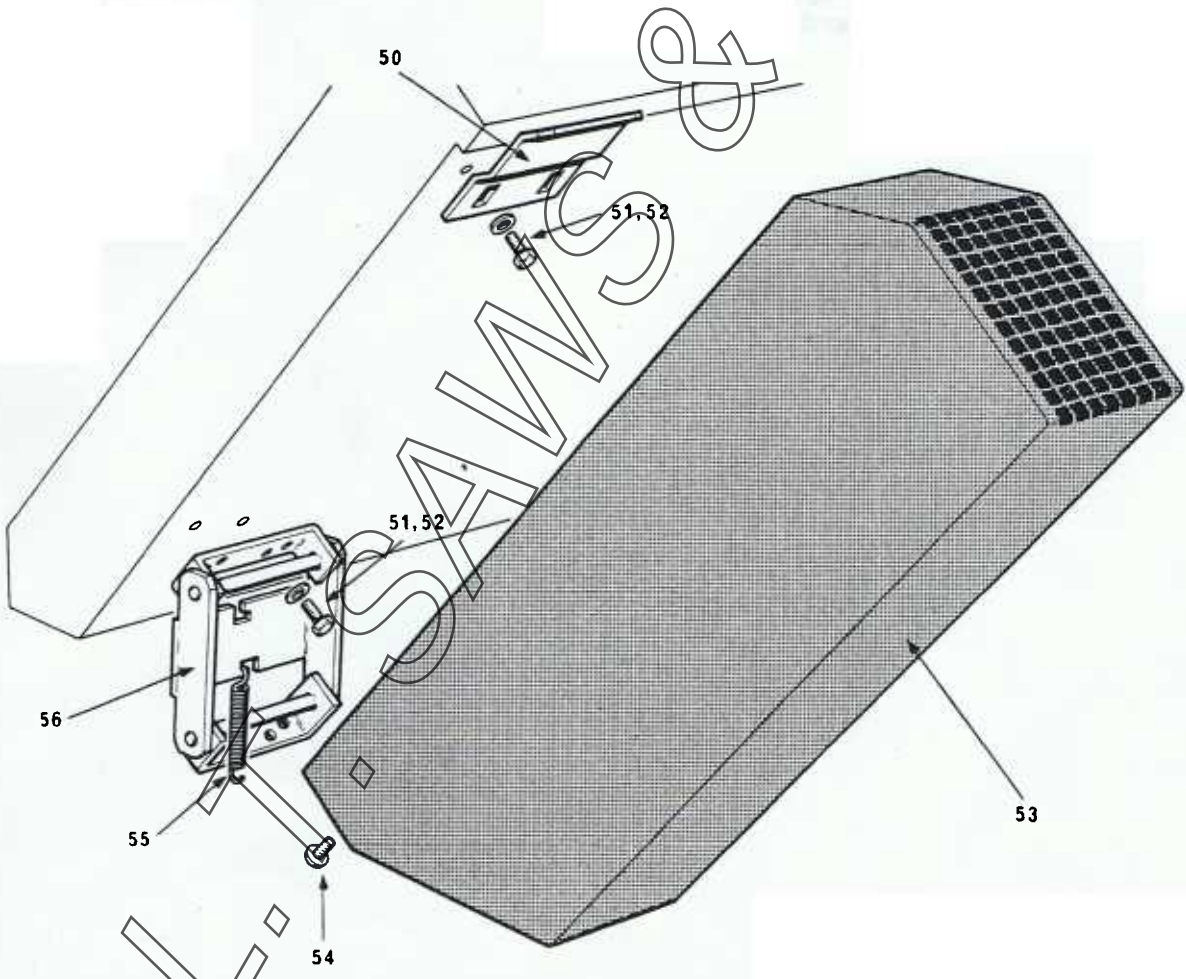
BELT GUARD ASSEMBLY

50	6351 Belt Guard Plate	1
51	Hex. Hd. Screw	4
52	Std. Washer	4
53	SM1217 Belt Guard	1
54	Soc. Dome Hd. Screw	2
55	Tension Spring	1
56	SM1218 Belt Guard Hinge Assembly	1

SECTION 283



STOCK STOP



BELT GUARD