RECORD MACHINE DETAILS	DISTRIBUTOR
MODEL	
SERIAL No.	
DATE of PURCHASE	
VOLTAGE	
PHASE	
CYCLES	
QUOTE THIS INFORMATION WHEN REQUESTING SERVICE OR SPARES.	

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 H175

HORIZONTAL BANDSAWING MACHINES

HANDBOOK

23E

CONTENTS :

PARTS LISTS & ILLUSTRATIONS :

SPECIFICATION :

Model H175	-	4 Speed Manual (*Convertable) Horizontal Bandsawing Machine
Cutting Capacity at 90° (Horizontal Position)	-	178 mm, 7" Dia. 280 mm x 178 mm, 11" x 7"
* Capacity (Vertical Position)		
Max. Height Under Guides	-	320 mm, 12½"
Throat Depth	-	200 mm, 8"
Blade Speeds	-	18, 30, 49, & 69m/min 60, 100, 160 & 225ft/min.
Wheel Diameter	-	280 mm, 11"
Electric Supply	-	220/240 Volt 1 Phase 50Hz 380/415 Volt 3 Phase 50Hz
Gross Weight	-	117 kg., 257 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.

We reserve the right to change design and specification without notice.
Startrite Machine Tool Co. Ltd., Waterside Works, Gads Hill,
Gillingham, Kent, ME7 2SF, England.

HEALTH & SAFETY

Any machine can be dangerous if improperly used.

Your STARTRITE machine has been designed and manufactured in a way which will provide maximum safety if properly used. Safe working practice is the responsibility of the owner and user and the following rules should be adhered to:

INSTALLATION

The machine should be properly and safely installed, and the work carried out by a competent person in so far as both mechanical and electrical installation is concerned.

OPERATION

1. Safe working practices should be employed when using this machine in order to eliminate the possibility of personal injury.

2. Operators should be fully trained in the safe use of this machine.

3. All guards should be securely in position and doors closed before the machine is started.

4. The machine should be isolated and all movement ceased before making adjustments or removing swarf, etc. or before gaining access to electrical components.

5. Blades used should be those recommended by STARTRITE and should be properly fitted and run at the correct speed.
   Blades should be sharp and in good condition.

6. No modification to the machine should be made which will reduce safety.

7. The machine should only be used for the purpose for which it is intended.

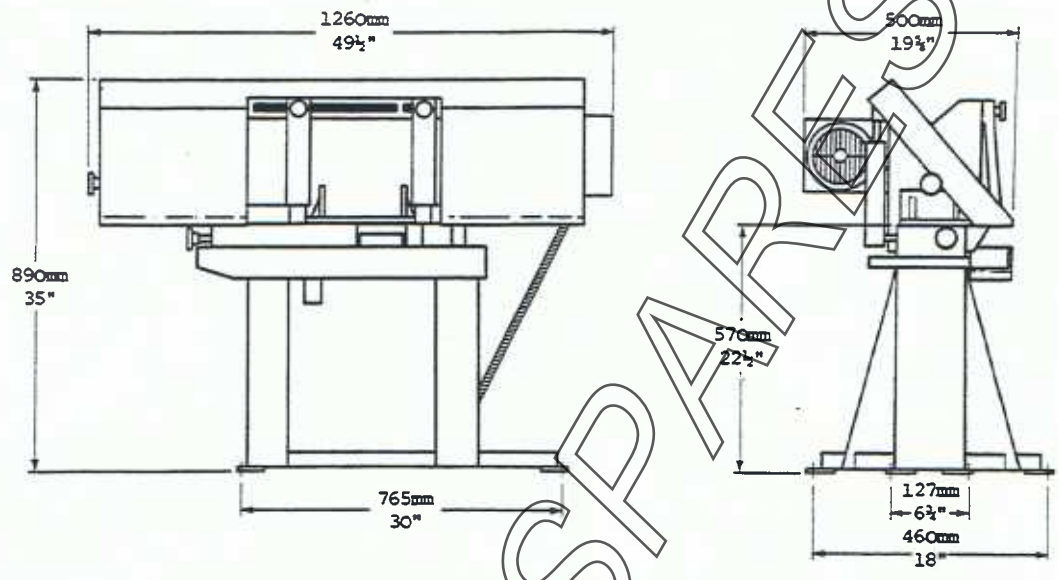
8. Appropriate protective clothing should be worn, for example, gloves should be worn when handling blades.

MAINTENANCE

For safe operation your STARTRITE machine should be properly maintained. Our Spares and Service Departments are always at your disposal.

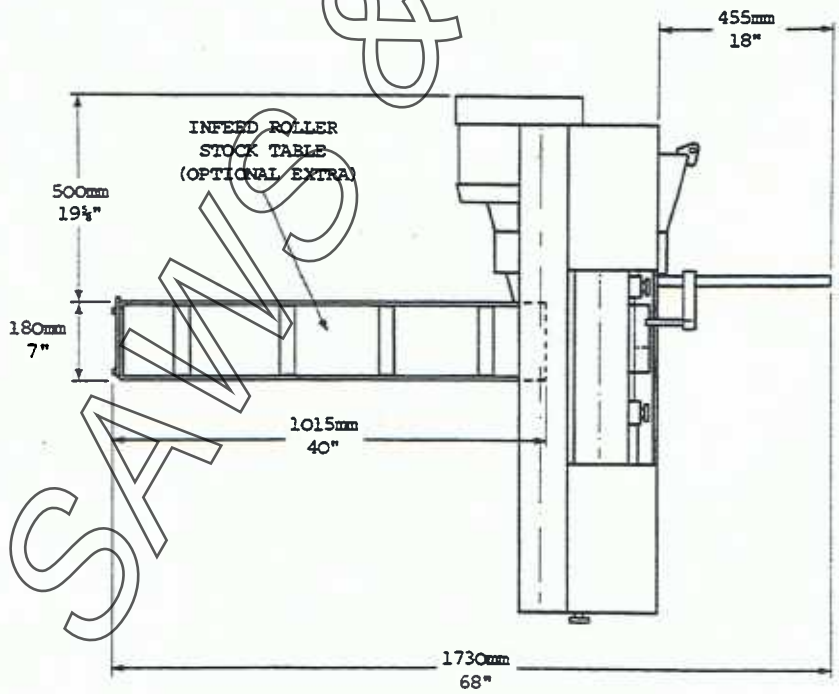
HEIGHT OF MACHINE WITH BOW VERTICAL : 1450 mm, 57"

ALL DIMENSIONS APPROXIMATE.



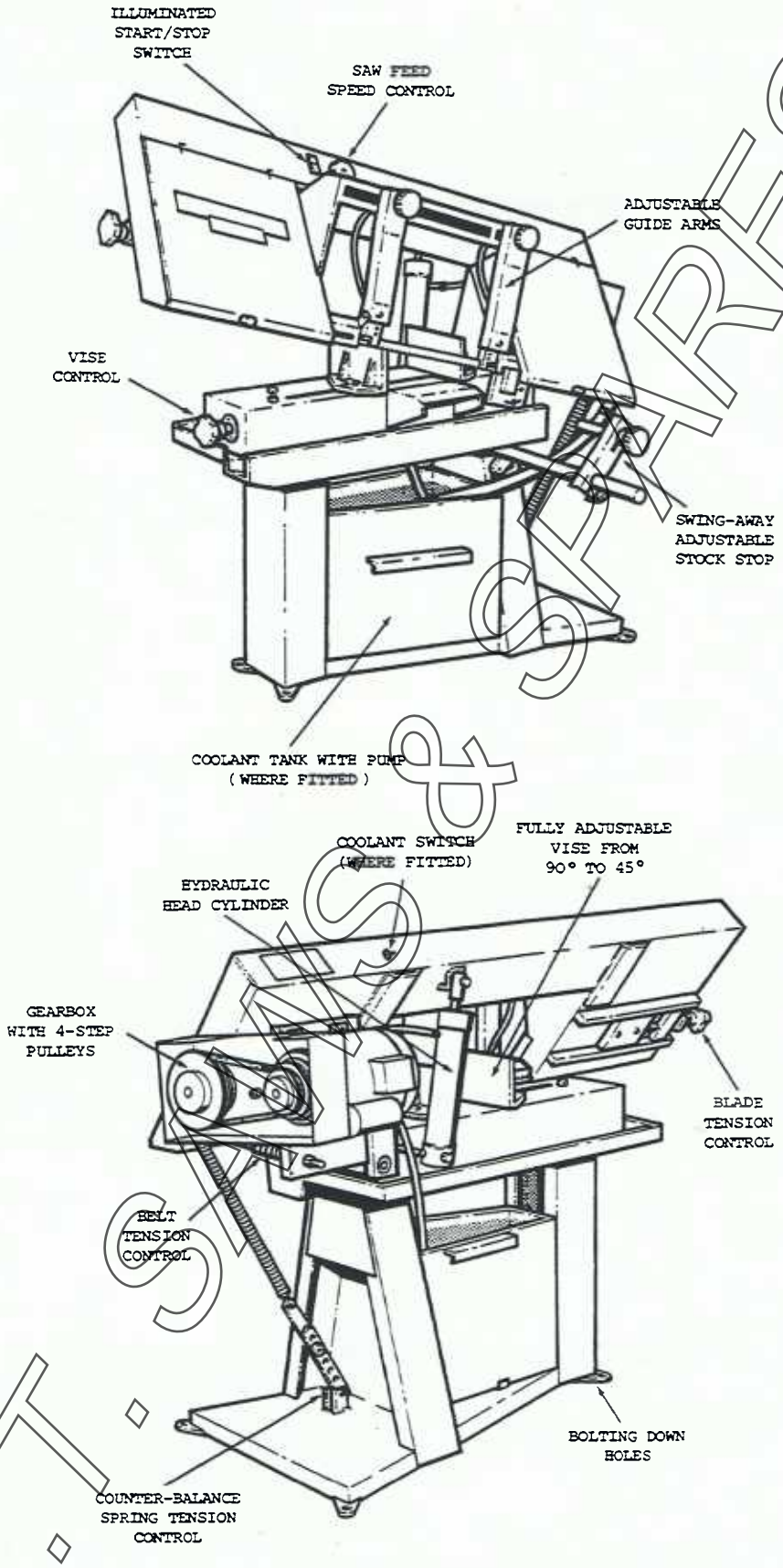
FRONT VIEW

SIDE VIEW



PLAN

FOUNDATION PLAN OF MODEL H175 HORIZONTAL BANDSAW.



GENERAL LAYOUT OF MODEL H175 (DETAILS VARY ACCORDING TO MODEL).

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.

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INSTALLATION.

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 10 mm ($\frac{3}{8}$") 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 (where fitted) with approximately 4.25 U.S. gallons (16 litres) of a good grade of soluble oil diluted about 10 to 1. If the machine is to be moved around on castors or wheels the coolant tank should be removed from the machine or emptied to avoid spillage.
IMPORTANT : DO NOT LET PUMP RUN DRY, OR DAMAGE MAY RESULT.

CONNECTION TO THE ELECTRICITY SUPPLY.

IMPORTANT : Check that the electricity supply voltage is suitable for operation of the machine. (Voltage stamped on Serial Plate).

The machine will operate on 220 - 240 volt single phase 50Hz. supply.

Connection can be made to a 13 amp ring main circuit by wiring the supply lead to a 13 amp fused plug as shown in Fig.1, taking care to protect the cable from mechanical damage.

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

COLOUR CODE :

LIVE	(L)	- BROWN
NEUTRAL	(N)	- BLUE
EARTH	(E)	- YELLOW/GREEN

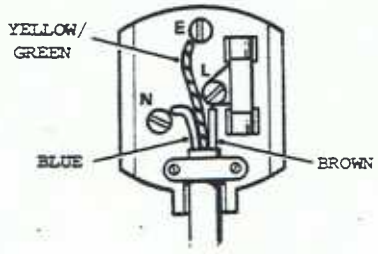

Fig.1.

OPERATING INSTRUCTIONS.

SETTING VISE JAWS :

Set fixed vise jaw to required angle, 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 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.

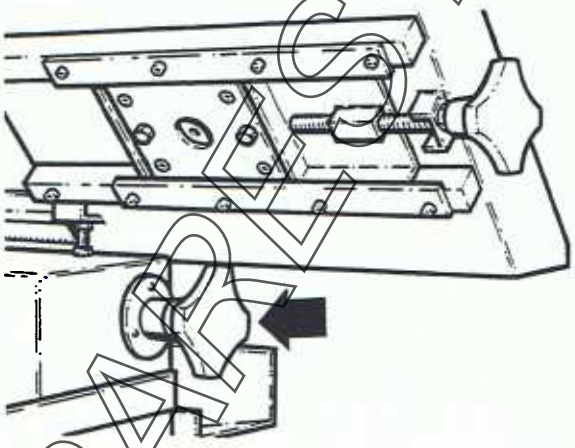

Fig.2.

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.

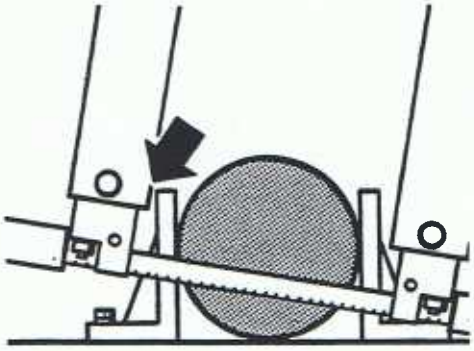

Fig.3.

SPEED SELECTION :

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

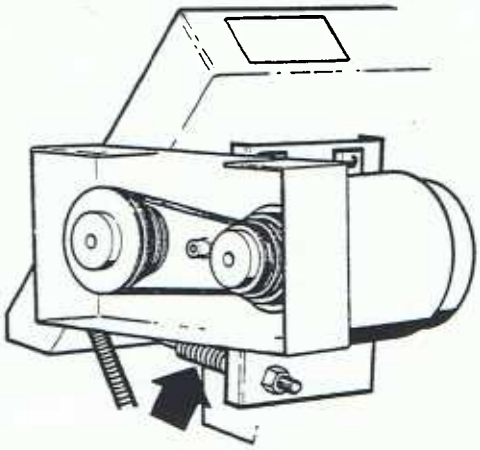

Fig.4.

OPERATING INSTRUCTIONS (CONTINUED).

SAW FEED PRESSURE :

The saw feed pressure (or head weight) is controlled by means of the counter-balance spring. To adjust head weight raise head, remove knurled knob and place link in appropriate hole (see Fig.5). 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.

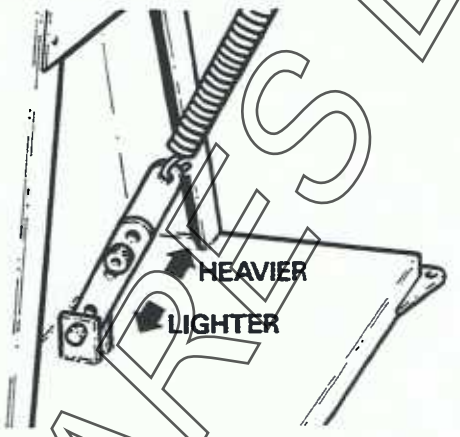

Fig.5.

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.

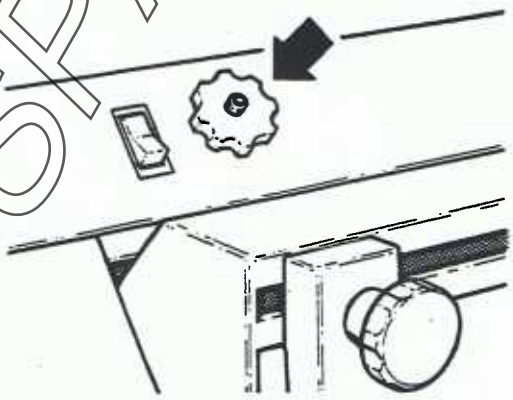

Fig.6.

TABLE (FOR VERTICAL SAWING) :

The machine can be converted for use as a vertical bandsaw in a few minutes. Before doing so, check that blade speed is suitable for the job in hand.

To convert machine, proceed as follows :-
Remove screw securing cylinder to head and place cylinder on its side.
Lift the head into the vertical position.
Place table in position over lower guide arm (see Fig.7) and secure in place with screw provided into threaded hole in bed, and clamp to guide arm using thumb screw.
Before cutting, the upper guide assembly should be positioned as close as possible to the workpiece.
When converting the machine back for horizontal sawing, make sure to re-connect the cylinder to the head.

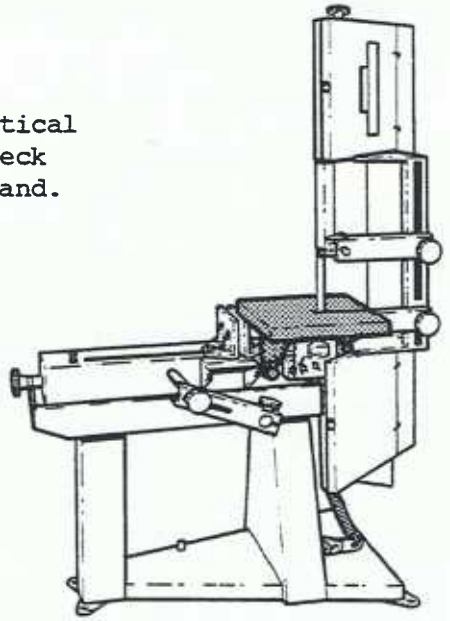

Fig.7.

BLADE TENSIONING/ FITTING A NEW BLADE.

To remove saw blade, slacken off blade tension by means of blade tensioning knob (see Fig.8). 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.9 and insert saw blade carefully into guide assemblies. Check that back edge of saw blade is against flanges of bandwheels and tighten blade until it is taut and then add 1½ FULL TURNS of tension knob.

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

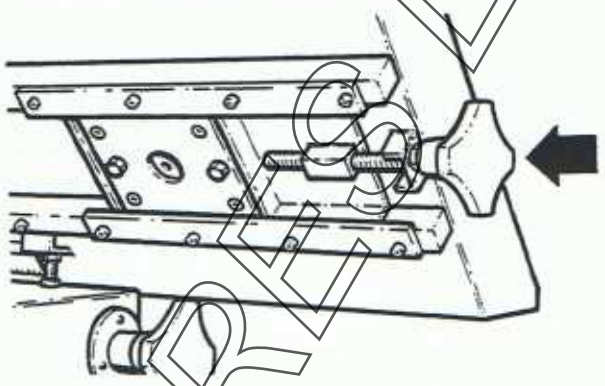

Fig.8.

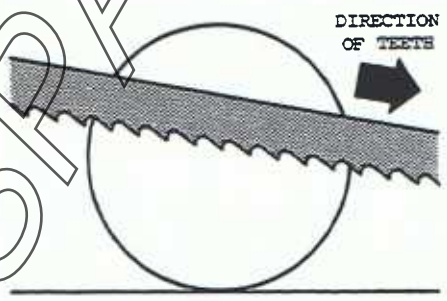

Fig.9.

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 coolant drain pipe and swarf chute frequently and keep coolant drain holes free (if fitted with coolant).

WEEKLY MAINTENANCE :

Check level of coolant in coolant tank (where fitted). If necessary top up with a good grade of soluble oil diluted about 10 to 1.
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 (where fitted), clean tank and pump (see Section on Optional Extra Equipment for instructions).
Refill with approximately 4.25 U.S. gallons (16 litres) of clean coolant diluted about 10 to 1.

(CONTINUED).

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NOTE : The main drive 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
HYDRAULIC CYLINDER	ESSO Nuto H44 Oil GULF Harmony 43AW Oil MOBIL D.T.E. 24 Oil TEXACO Rando HDA or HD32 Oil

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

1.
Before checking the head weight, adjuster 'A' should be in the appropriate hole as shown in Fig. 11 and knurled knob 'B' secured in place.

2.
Raise head so it is approximately one inch off the machine bed and close 'Feed Speed' control valve.

3.
Place spring-balance scales over blade tension handle (see Fig.12). Hold spring-balance and open 'Feed Speed' control valve. A head weight reading of approximately 6 lbs. (2.7 kg.) should be obtained.

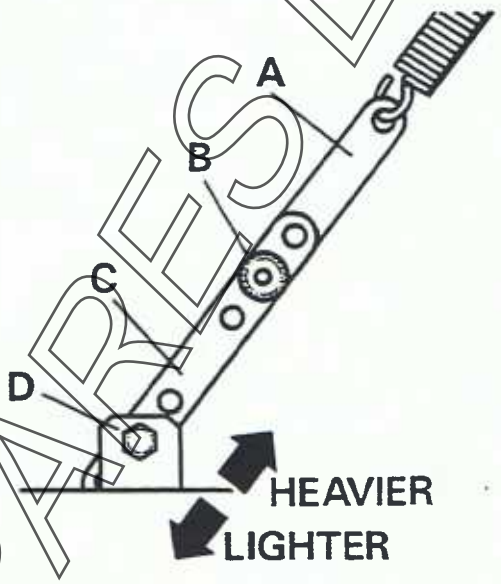


Fig.11.

4.
If the head weight is incorrect, proceed as follows :-
Raise head and close 'Feed Speed' control valve. Remove hex. screw 'D' and replace into the appropriate hole in link 'C' (see fig.11). *

5.
Re-check head weight as before. If it is now approximately correct tighten screw 'D'.

6.
By selecting one of the top three holes in link 'C', a working range of approximately 4 lbs. (1.8 kg.) MINIMUM - 9 lbs. (4.1 kg.) MAXIMUM should be obtained. When no further adjustment of the spring is possible it should be replaced.

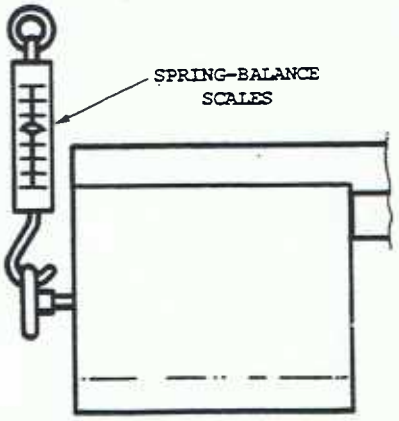
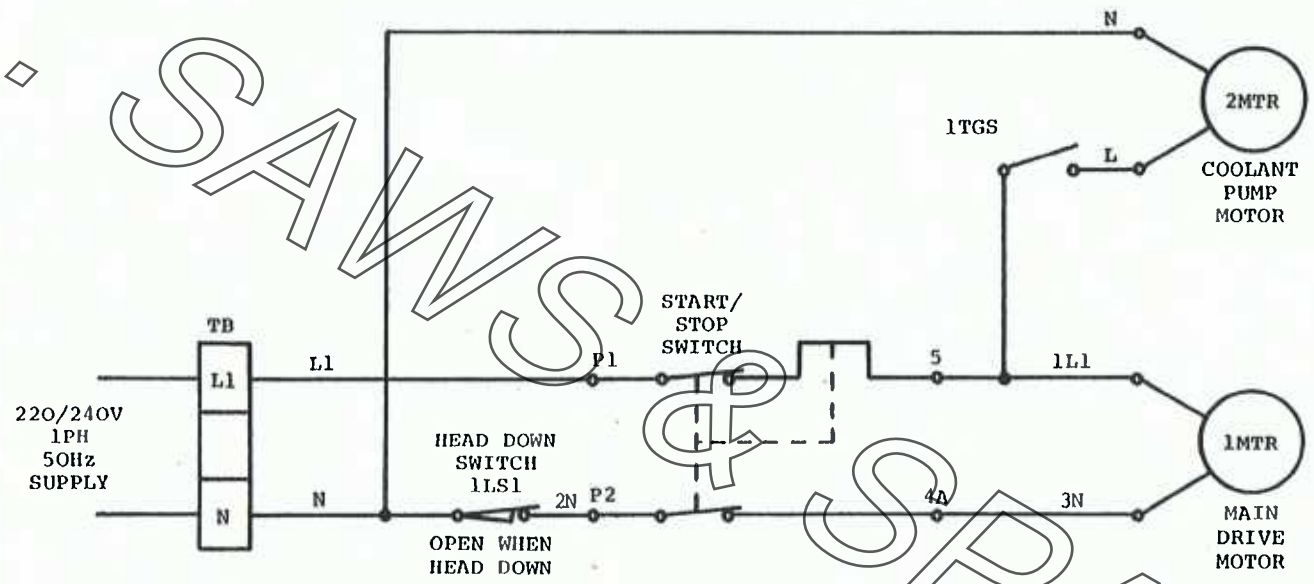


Fig.12.

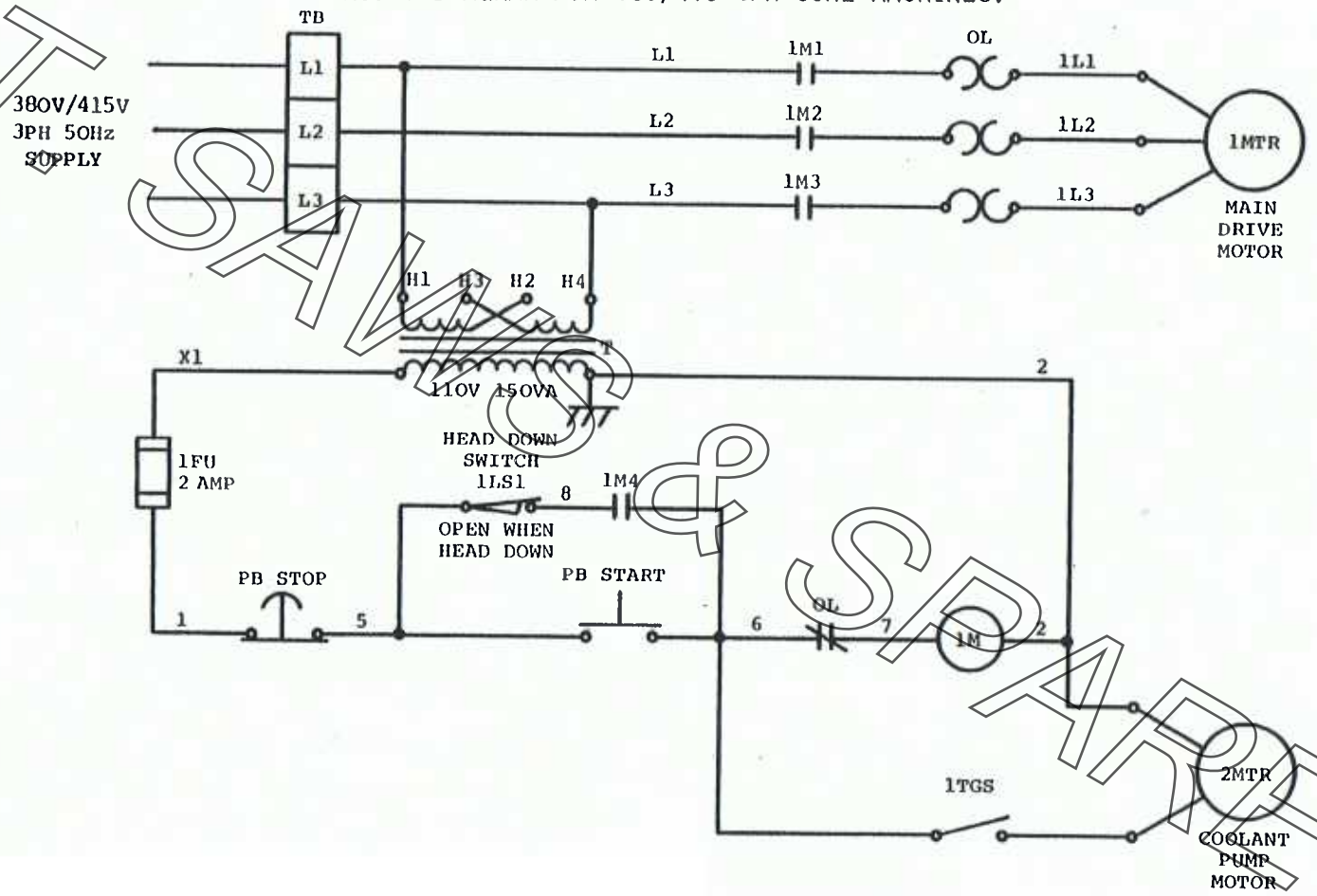
* NOTE : The top three holes in the link are for working adjustment, and the lower three holes are for re-calibration (when necessary).

CIRCUIT DIAGRAM FOR 220V/240V 1PH 50Hz MACHINES.

(COOLANT - WHERE FITTED)



CIRCUIT DIAGRAM FOR 380/415 3PH 50Hz MACHINES.



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 justifable.

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 breakage is a problem due to the machine being used for general jobbing and sawing particulary be 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 basicalally 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 advatageous to all bandsaw operators. Re-welding these blades is possible on standard welding units.

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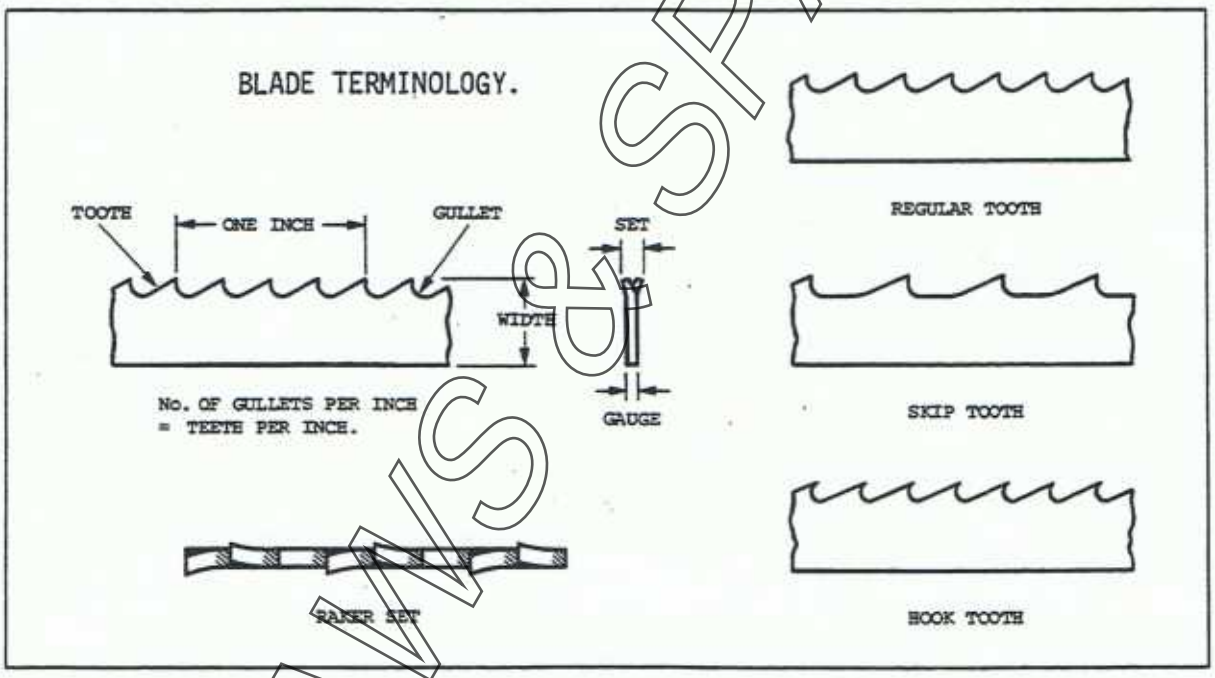
M42 COBALT H.S.S. BI-METAL saw blades offer all the advantages of the M2 quality bi-metal blade and has in addition, a higher quality, higher performance high speed steel for the cutting edge. The use of M42 Cobalt H.S.S. material for the cutting edge offers a balanced combination of superior hardness 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.

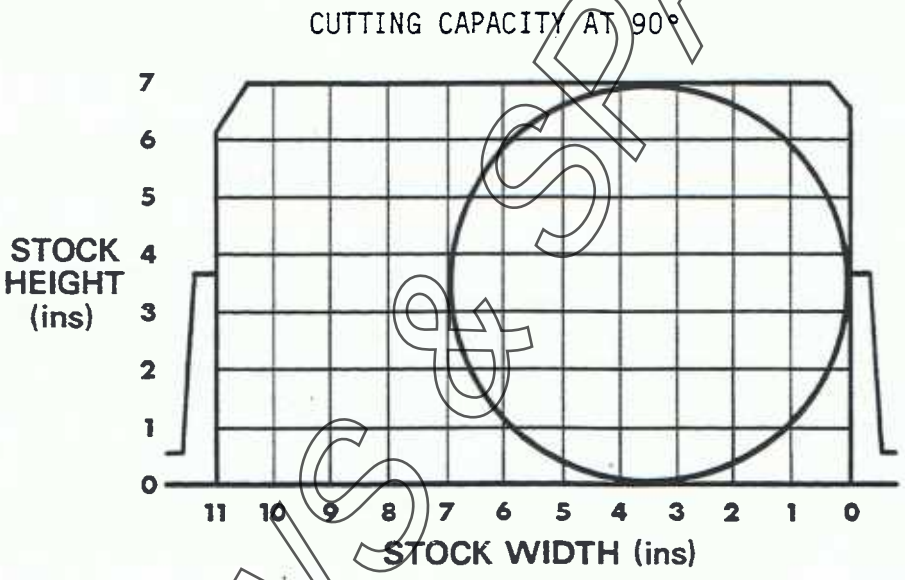
SAW GAUGE is the actual thickness of the saw band, and for standard ¾" (20 mm) wide saw blades is .035" (0.9 mm). The use of heavier gauge saw blades is not recommended.

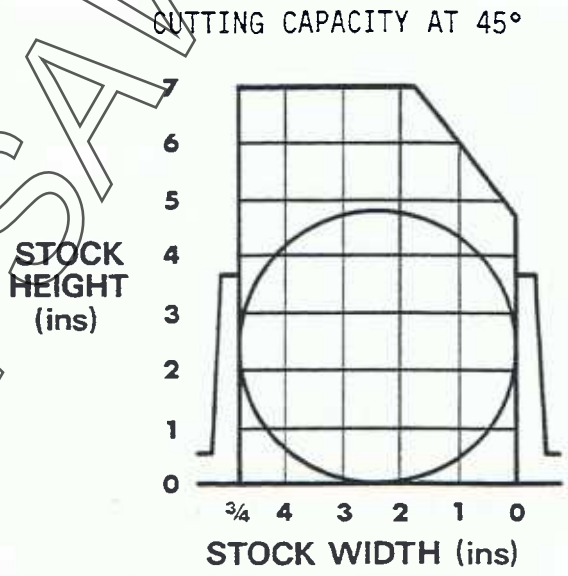
Selection of blade tooth pitch will be determined by the length of the cut and the chemical composition of the material. In general terms, large sections need to be sawn with a coarse saw blade, and small sections with a fine saw blade, while tough materials require proportionately more teeth in engagement 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 174

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.





SAWING GUIDE CHART.					
MATERIAL	BLADE T.P.I.	BLADE SPEED F.P.M.	MATERIAL	BLADE T.P.I.	BLADE SPEED F.P.M.
Aluminium Alloys	6	225	High Chrome Steels	10-14	100
Aluminium Castings	6	160	High Speed Steels	10-14	160
Angle Iron - Light	14	160	I Beams	10-14	160
Angle Iron - Heavy	10	160	Machine Steel	10-14	160
Brass Sheets - Rods	10	160	Malleable Iron	10-14	160
Brass Castings - Soft	10	160	Monel Metal	10-14	60
Brass Castings - Hard	10	100	Nickel Steel	10-14	60
Bronze	10	100	Pipe Iron Soil	10-14	160
Bakelite	10	225	Pipe Steel	10-14	160
Boiler Tubes	10	160	Pipe Galvanized	10-14	100
Cast Iron Pipe - Solids	6-10	160	Plastics	10-14	225
Channel Iron	6-10	160	Steel under 50 Carbon	10-14	160
Cold Rolled Steel	10	160	Steel over 50 Carbon	10-14	100
Copper	10	160	Structural Steel	10-14	160
Drill Rod	10	100	Tubing Steel Light	14-18	160
Fibre	10	100	Tubing Seamless Heavy	10-14	160
NOTE : SAWING GUIDE FOR MATERIALS USING CARBON STEEL 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.

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.

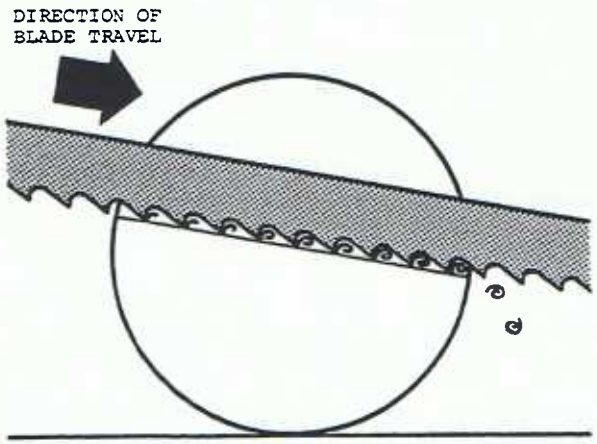


Illustration showing desirable chip form.

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.

SECTION 174

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.

COLOANT ATTACHMENT
(PART No.SM1273).

This comprises of a 4.25 U.S. gallons (16 litres) capacity tank with submergable electric pump, complete with fittings and switch which supply coolant to both guide units (see Fig.1).

NOTE : If the machine is to be moved around on casters or wheels it is recommended that the coolant tank should be removed from the machine or emptied to avoid spillage.

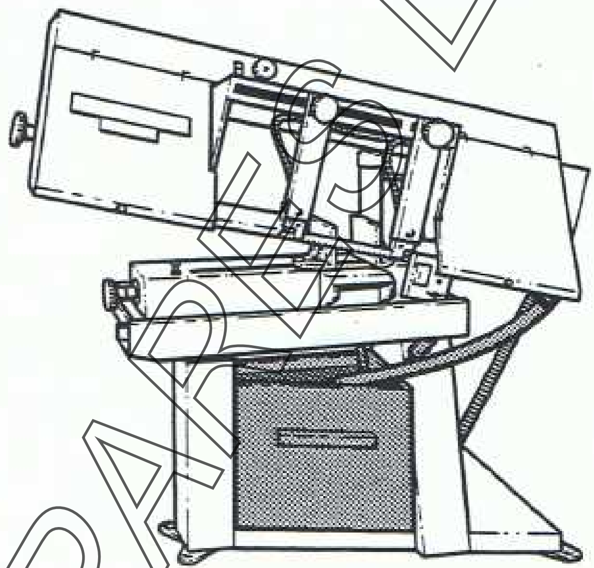


Fig.1.

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.2.
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.2), 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.

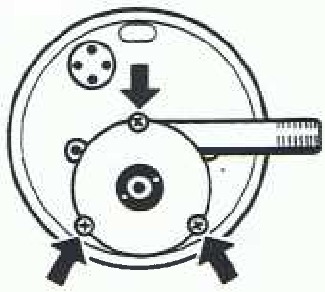


Fig.2.

FLUSHING HOSE (PART No.SM1283) - 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.

MOBILISATION KIT (PART No.SM1272).

Where the machine is likely to be moved from one location to another, the mobilisation kit complete with extending handle (see Fig.3) is a necessary extra.
The rear wheel assembly is simply attached to the base of the machine using hex. screws provided.
The front wheel assembly locates into a hole provided in the base of the machine under the front leg and is secured using washers and nut provided.
The front wheel assembly pivots to allow the machine to be steered. The extending handle can be removed when not in use.

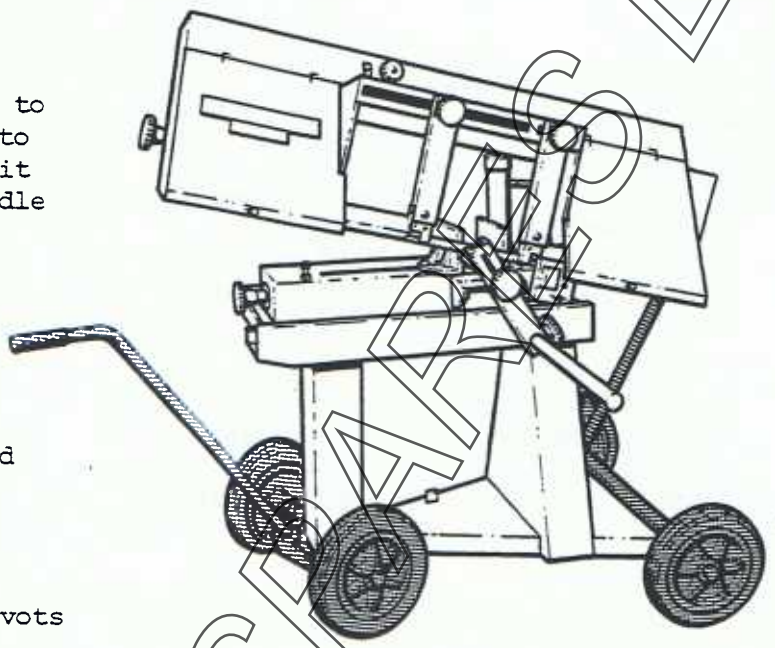


Fig.3.

SET OF CASTORS (PART No.SM1274) - NOT ILLUSTRATED.

A set of four steel-faced castors 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.

INFEED ROLLER STOCK TABLE (PART No.SM1271).

Complete with tail end stop, rollers and adjustable feet (see Fig.4), this unit can be bolted to the rear of the machine when cutting long or heavy materials.
To level unit place only the 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.

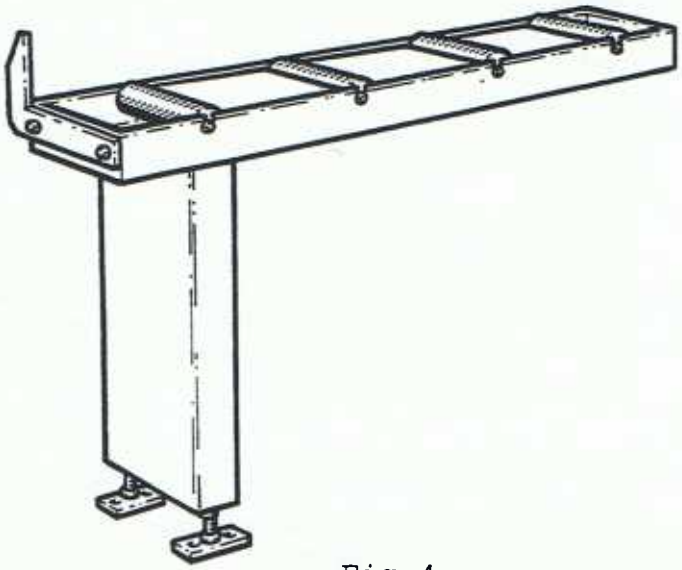


Fig.4.

STOCK STAND
(PART No.SP559).

A fully adjustable sturdy stock stand (see Fig.5) is available for use at the front or rear of the machine when cutting long or heavy materials.

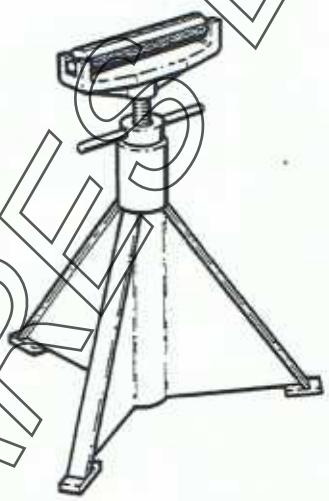


Fig.5.

WELDER & GRINDER UNIT
(MODEL BS0.25).

Suitable for free-standing operation (see Fig.6). 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 premium quality from ⅛" - 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.

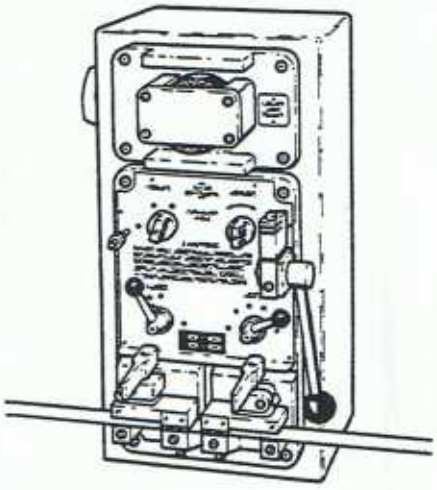
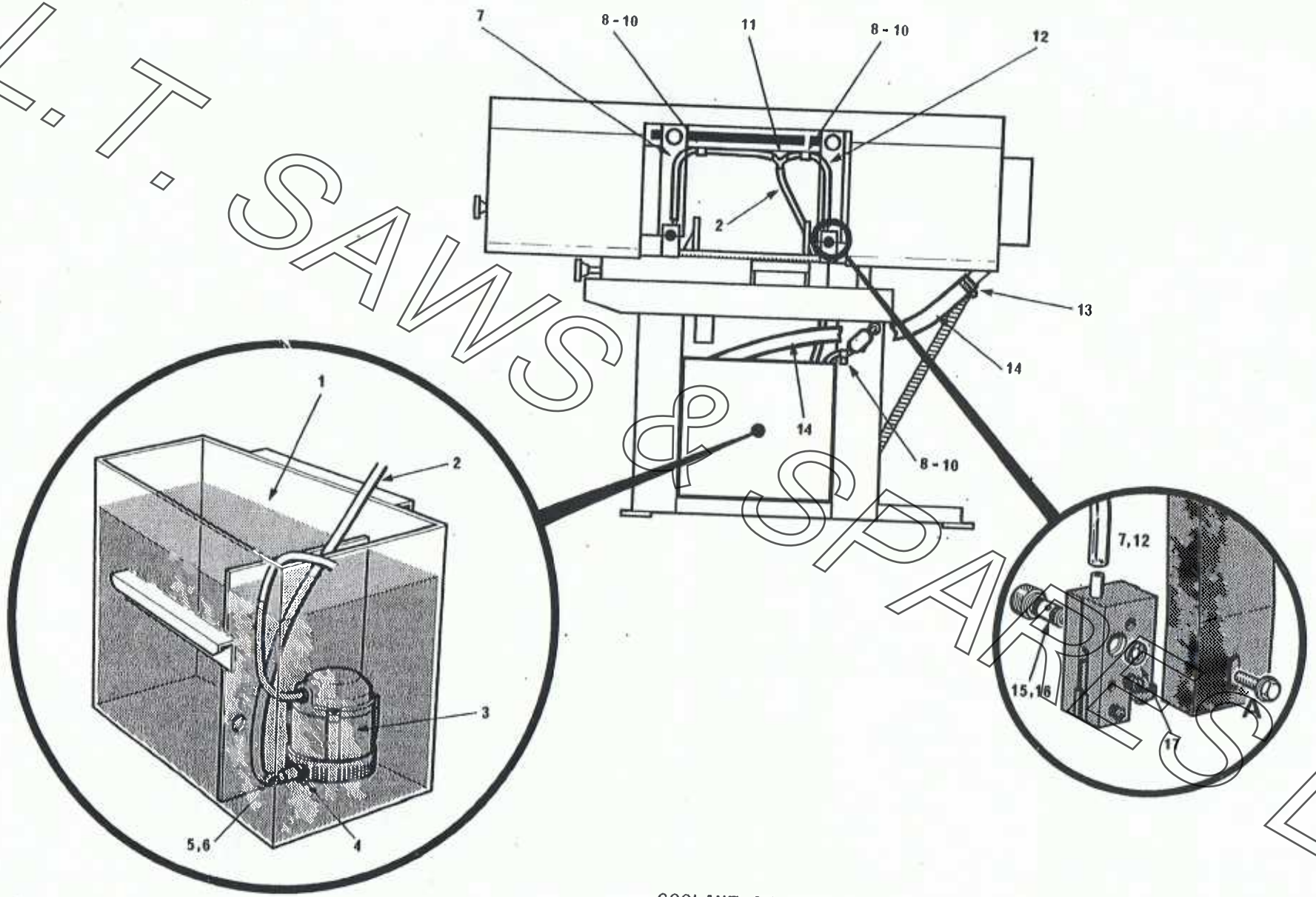


Fig.6.

SWARF RAKE (PART No.SM1379) - NOT ILLUSTRATED.

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



COOLANT ATTACHMENT

COOLANT ATTACHMENT - ASSEMBLY No.SM1273/1

FITTED TO MACHINES FROM SERIAL No.84479 ONWARDS.

ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	SM1359	Coolant Tank	1
2		Clear Flexible Plastic Tube	1
3		Coolant Pump	1
4		Pipe Clip	1
5		Clear Flexible Pastic Tube	1
6		Stem Adapter	1
7		Clear Flexible Plastic Tube	1
8		Plastic Tubing Clip	3
9		Hex.Hd,Screw	3
10		Std. Washer	3
11		'Y' Stem Adapter	1
12		Clear Flexible Plastic Tube	1
14		Pipe Clip	1
15		Clear Flexible Plastic Tube	1
16	6646	Coolant Nozzle	2
17		'O' Ring	4
18		Starlock Washer	2

The tank assembly (Item 1 - see page 4) slides between the support legs. The supply cable from the coolant pump should be passed through the grommet in the rear leg, the electrical access cover removed and the three leads connected to the appropriate terminals of the terminal block - BROWN lead to terminal 'L1', BLUE lead to terminal 'N' and YELLOW/GREEN lead to terminal 'E'. The switch and supply cable should be secured in place by using clip, screw and washer (Items 8 - 10) in tapped hole provided in rear leg.

On guide arms, slacken off screws 'A' (see page 4) and remove guide assemblies. Insert coolant nozzle complete with 'O' rings (Items 15 & 16) into hole provided in guide body and secure and place using starlock washer (Item 17).

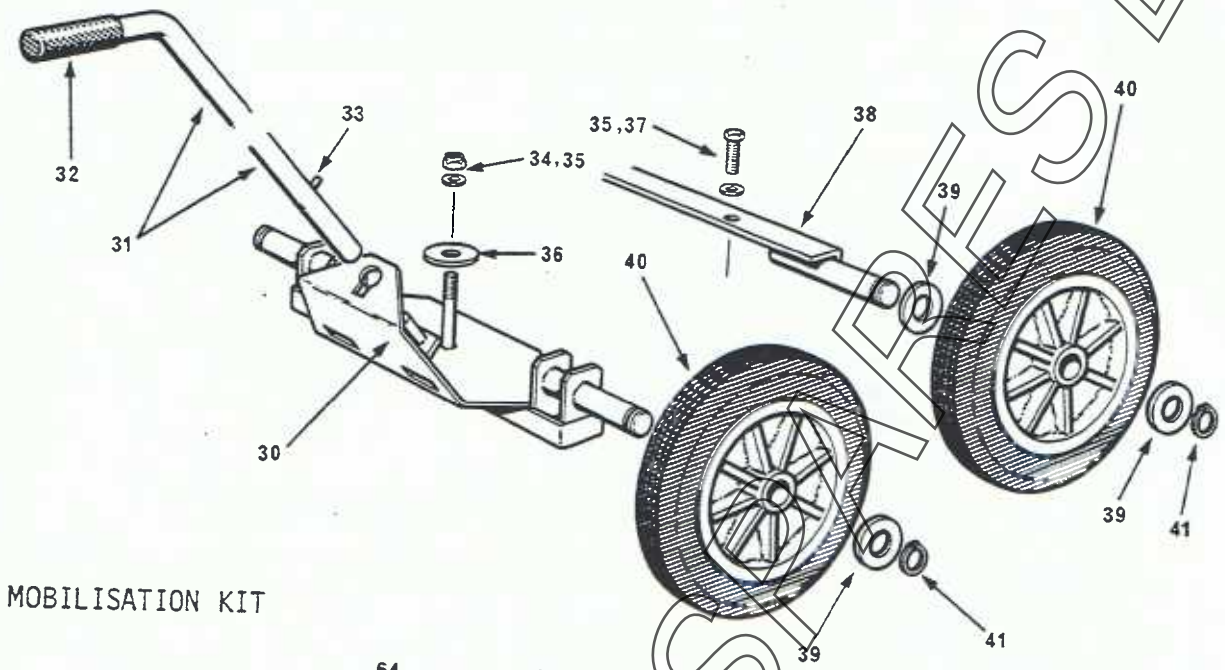
Carefully replace guide assemblies making sure that blade support insert just touches the top edge of blade and secure in place.

The large diameter pipe (Item 14) is secured to the spigot on underside of head using pipe clip supplied (Item 13).

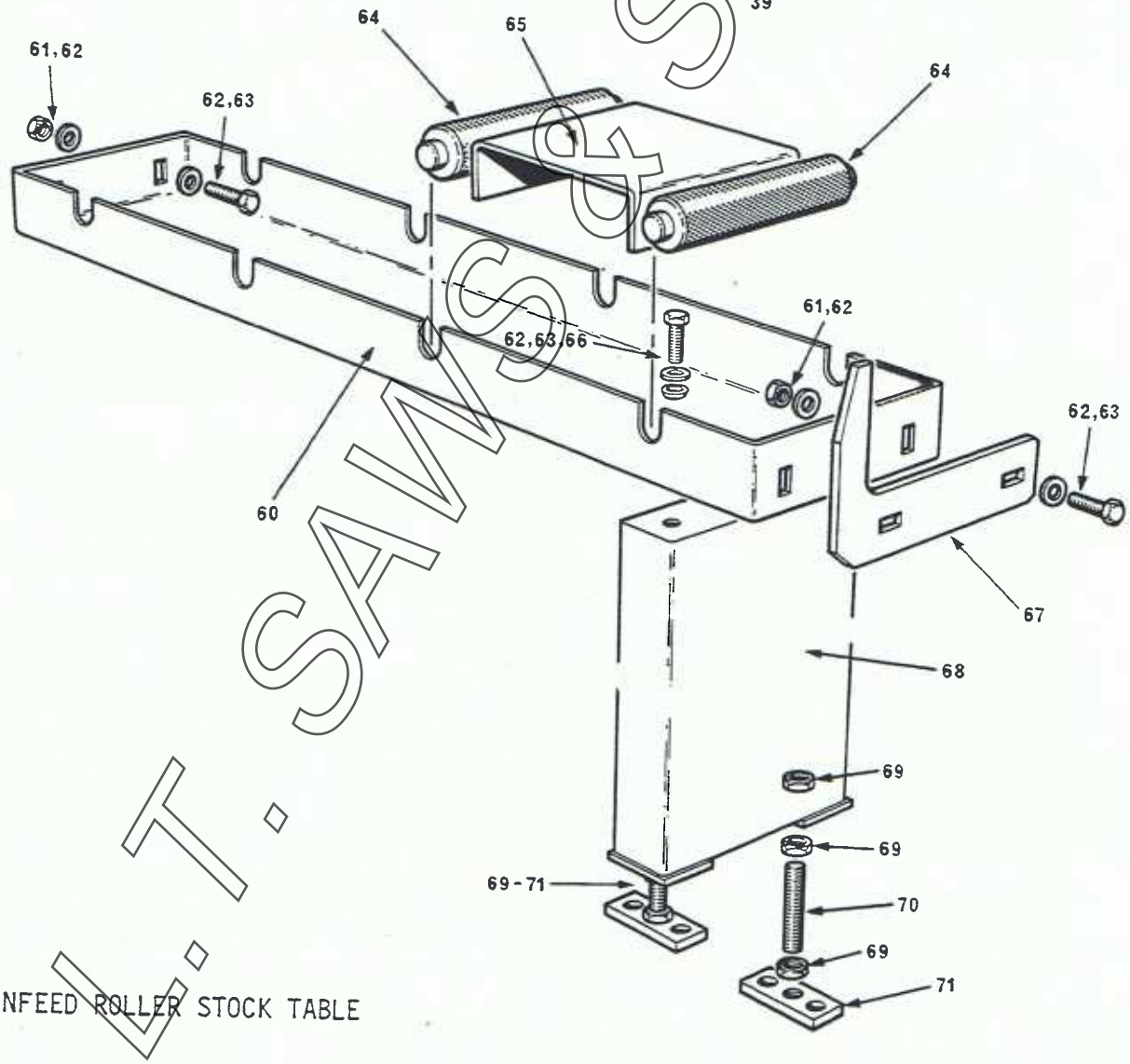
The coolant supply pipe (Item 2) should be attached to stem adaptor (Item 6) and fed to the rear of the machine keeping it clear of the vice jaws and attach 'Y' stem adaptor (Item 11) to other end of pipe. The two short supply pipes (Items 7 & 12) should be attached to 'Y' stem adaptor and the other ends to the spigots on both guide assemblies. Two tapped holes are provided for securing pipes in place using clips etc, (Items 8 - 10).

NOTE: If a flushing hose (not illustrated) is to be fitted, simply remove stem adaptor (Item 6) and replace with 'Y' stem adaptor supplied and connect end of pipe from flushing hose.

SECTION 177



MOBILISATION KIT



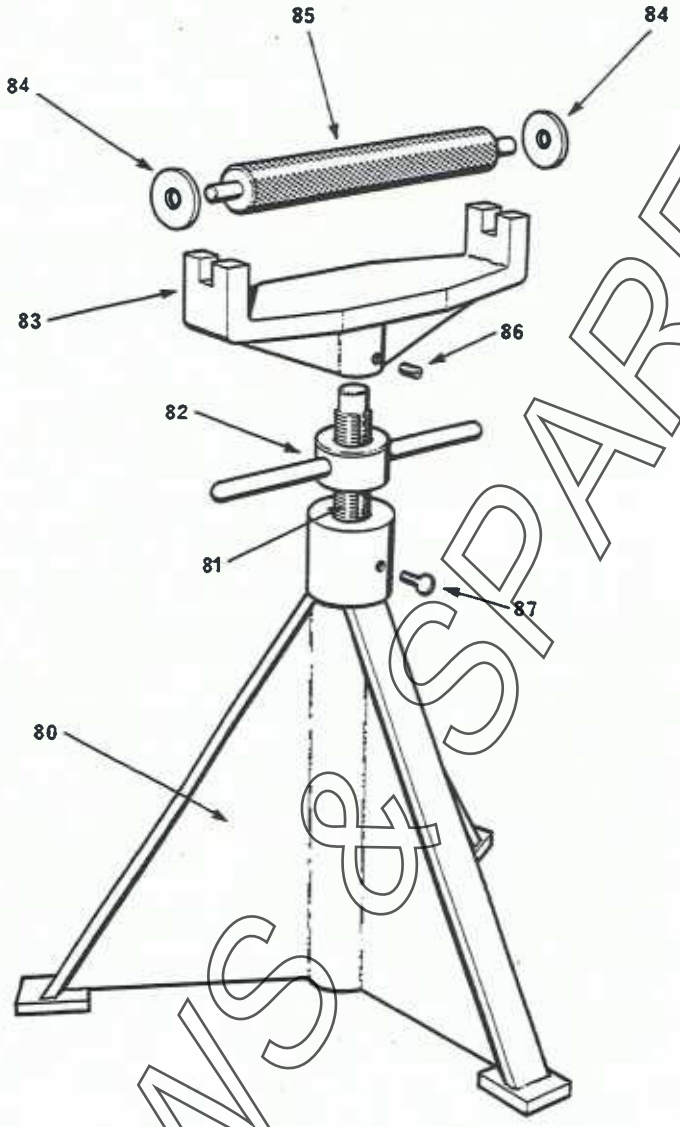
INFEED ROLLER STOCK TABLE

MOBILISATION KIT - ASSEMBLY No.SM1272

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
30	SM1297	Front Axle Assembly	1
31	6493	Handle	1
32		Plastic Handle	1
33		Spring Dowel	1
34		Self-Locking Nut	1
35		Std. Washer	3
36	6550	Washer	1
37		Hex. Hd. Screw	2
38	SM1296	Rear Axle Assembly	1
39	6484	M25 Washer	6
40		10" Dia Nylon Wheel	4
41		Circlip External	4

INFEED ROLLER STOCK TABLE - ASSEMBLY No.SM1271

60	6514	Roller Support Tray	1
61		Hex. Nut	4
62		Std. Washer	10
63		Hex. Hd. Screw	6
64	6515	Roller	4
65	6523	Support Plate	3
66		Nyltite Sealing Washer	2
67	6517	Conveyor End Stop	1
68	SM1362	Roller Support Leg	1
69		Hex. Nut	6
70	6359	Stud	2
71	6516	Support Foot	2



STOCK STAND

STOCK STAND - ASSEMBLY No.SP559

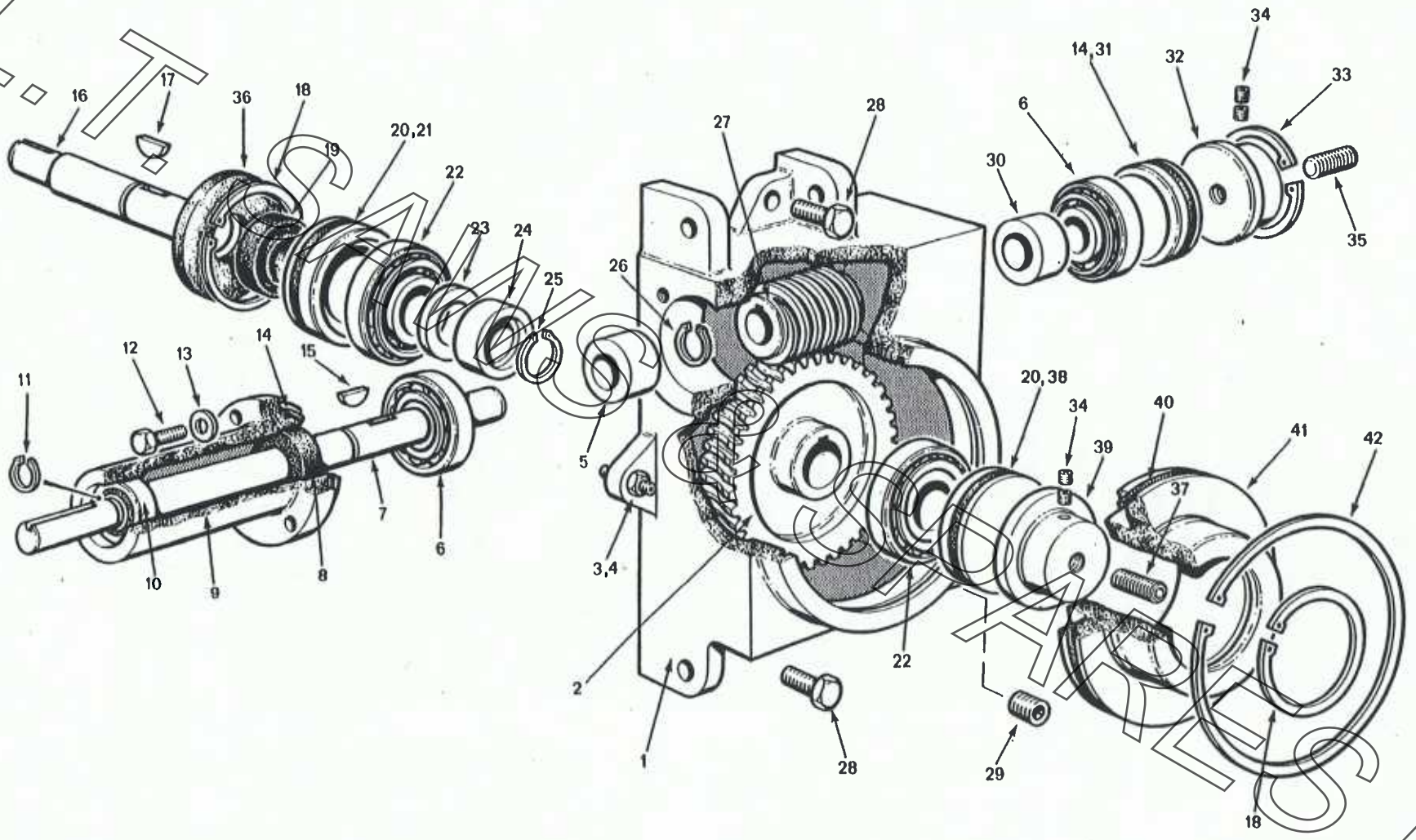
ITEM	PART NUMBER AND DESCRIPTION		No.OFF
80	SP558	Stand	1
81	3869	Jacking Screw	1
82	SP557	Adjuster	1
83	3867	Roller Bracket	1
84	6553	Stop Plate	2
85	3866	Roller	1
86		Soc. Set Screw	1
87		Thumb Screw	1

GEARBOX - ASSEMBLY No.SM1254/1

ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	6261	Gearbox Housing	1
2	6269	Worm Wheel	1
3		Soc. Set Screw	2
4		Hex. Nut	2
5	8013	Sleeve - Flanged	1
6		Angular Contact Bearing	2
7	6277	Pulley Drive Shaft	1
8		Oil Seal	1
9	6263	Extension Housing	1
10		Ball Bearing	1
11		Circlip External	1
12		Soc. Hd. Cap Screw	4
13		Shakeproof Washer	4
14		'O' Ring	2
15		Woodruff Key	1
16	6276	Bandwheel Drive Shaft	1
17		Woodruff Key	1
18		Circlip Internal	2
19		Oil Seal	1
20		'O' Ring	2
21	6266	Seal Plate	1
22		Taper Roller Bearing	2
23	6275	Spacer	1
24	6274	Sleeve - Flanged	1
25		Circlip External	1
26		Circlip External	1
27	6260	Worm	1
28		Hex. Hd. Screw	2
29		Taper Preasure Plug	1
30	8012	Sleeve - Plain	1
31	6268	Seal Plate	1
32	6267/1	Stop Plate	1
33		Circlip Internal	1
34		Soc. Set Screw	4
35	7641	Soc. Set Screw - Modified	1
36	5861	Sealing Washer	1
37	7640	Soc. Set Screw - Modified	1
38	6265	Seal Plate	1
39	6264/1	Stop Plate	1
40		'O' Ring	1
41	6262	Bearing Housing	1
42		Circlip Internal	1

WORM & BRONZE GEAR ASSEMBLY SPARES KIT KM500

Consists of items:2,5,6,7,15,16,17,22,25,26,27,30.



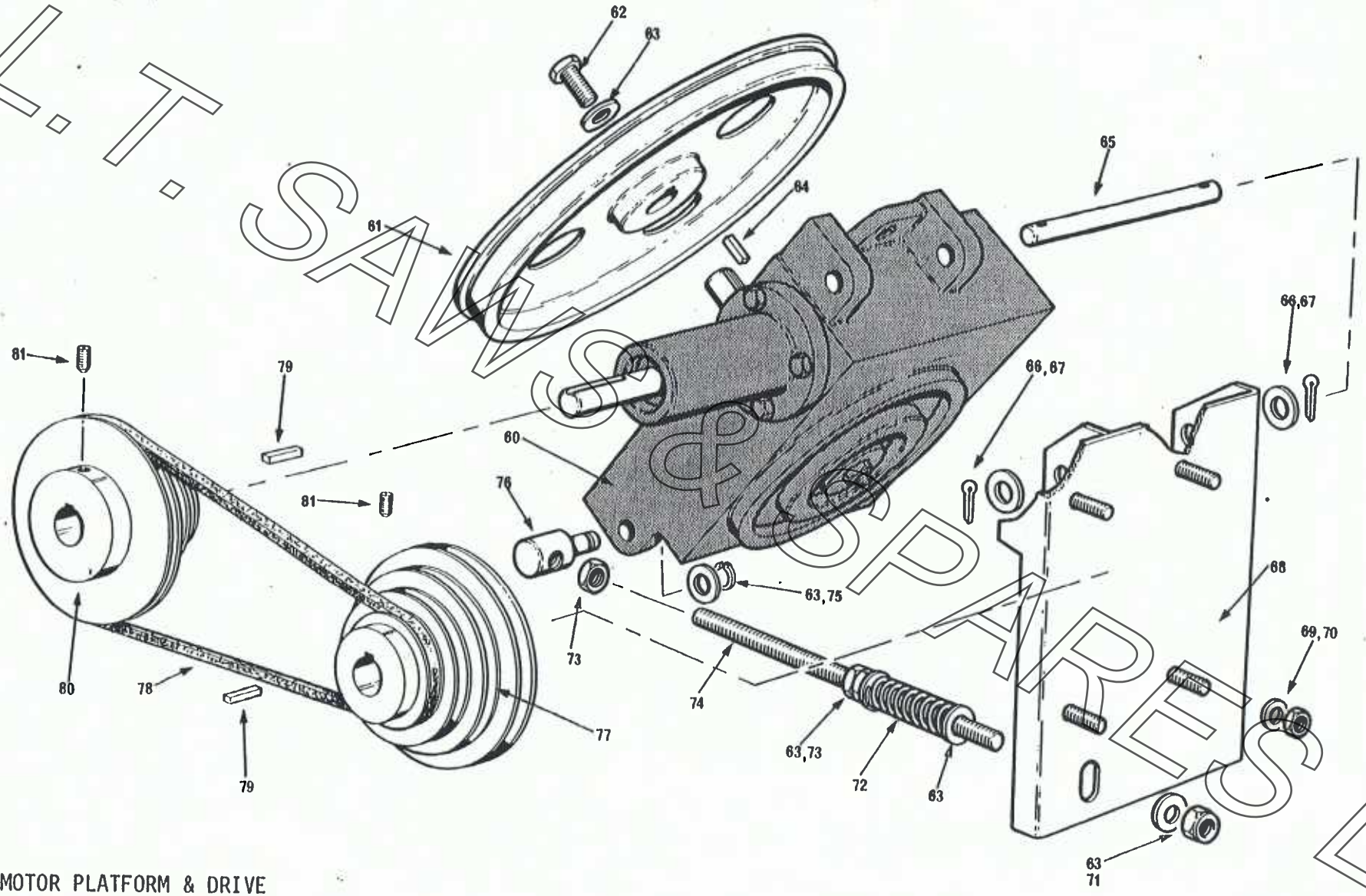
GEARBOX

MOTOR PLATFORM & DRIVE ASSEMBLY

ITEM	PART NUMBER	DESCRIPTION	NO.OFF
60	SM1254	Gearbox	1
61	6240/1	Bandwheel (Drive End)	1
62		Hex. Hd. Screw	1
63		Std. Washer	4
64	6405	Key	1
65	6280	Pivot Rod	1
66		Std. Washer	4
67		Split Pin	2
68	SM1249	Motor Platform	1
69		Hex. Nut	4
70		Shakeproof Washer	4
71		Self Locking Nut	1
72		Compression Spring	1
73		Hex. Nut	3
74	6295	Belt Tension Stud	1
75		Circlip External	1
76	6278	Pivot Pin	1
77	7497	Motor Pulley (50Hz Machines)	1
	7322	Motor Pulley (60Hz Machines)	1
78		Belt	1
79	5920	Key	2
80	7498	Gearbox Pulley (50Hz Machines)	1
	7421	Gearbox Pulley (60Hz Machines)	1
81		Soc. Set Screw	2
82	7734	Special Washer	1

NOT ILLUSTRATED:

SM1557	Belt Guard	1
7464	Lid	1
7974	Motor Cover	1



MOTOR PLATFORM & DRIVE

BLADE GUIDES & GUARDS - ASSEMBLY No.SM1251

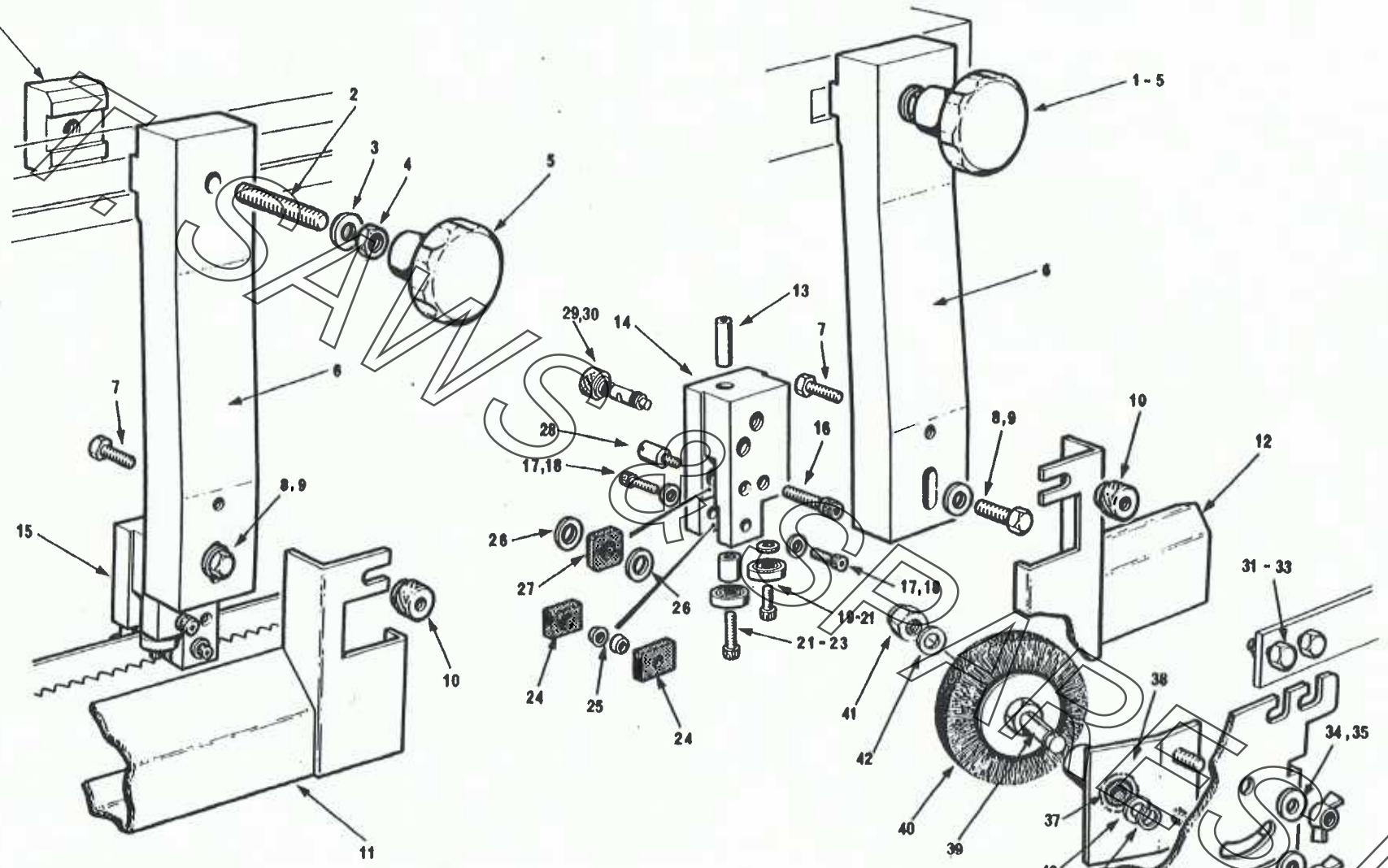
ITEM	PART NUMBER	AND DESCRIPTION	NO.OFF
1	6291	Retaining Nut	2
2	6426	Stud	2
3		Std. Washer	2
4		Hex. Hd.	2
5		Handknob	2
6	6241	Blade Guide Arm	2
7		Hex. Hd. Screw	2
8		Hex. Hd. Screw	2
9		Std. Washer	2
10	6443	Thumb Nut	2
11	SM1298	Outboard Blade Guard	2
12	SM1299	Inboard Blade Guard	1
13	6400	Coolant Connector	2
14	6258	Guide Body R.H.	1
15	6258/1	Guide Body L.H.	1
16		Soc. Hd. Cap Screw	2
17		Soc. Hd. Cap Screw	4
18		Large Washer	4
19		Soc. Hd. Cap Screw	2
20		Std. Washer	2
21		Deep Groove Row Ball Bearing	4
22	6259	Spacer	2
23		Soc. Hd. Cap Screw	2
24	6393	Guide Insert	4
25	6394	Conical Nut	4
26	6376	Washer	4
27	6409	Blade Support Insert	2
28	6410	Location Pin	2
29	6646	Coolant Nozzle	1
30		'O' Ring	2

BLADE GUIDE SPARES KITS:

KM513,Inboard.Items:8,9,13,14,16,17,19,20,21,22,23,24,25,26,27,28,29,30.
KM513/1,Outboard.Items:8,9,13,15,16,17,19,20,21,22,23,24,25,26,27,28,29,30.

BLADE BRUSH - ASSEMBLY No.SM1354

31		Hex. Hd. Screw	2
32		Hex. Locknut	2
33		Shakeproof Washer	2
34		Wing Nut	2
35		Std. Washer	2
36	6483	Blade Brush Guard	1
37		Oilite Bush	1
38	SM1352	Brush Bracket	1
39	6480	Blade Brush Pivot	1
40		M6 Phillidas Nut	1
41		Plain Washer	1
42		Plain Washer	1
43		Circlip	1



BLADE GUIDES & GUARDS

BLADE BRUSH

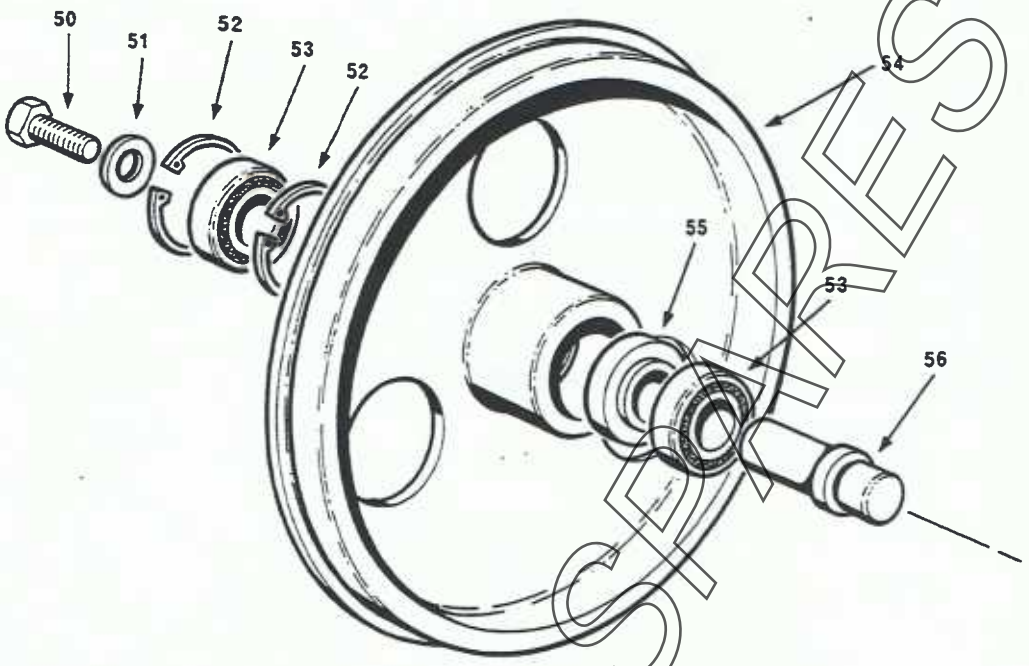
BANDWHEEL - TENSION END - ASSEMBLY No.SM1264

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
50		Hex. Hd. Screw	1
51		Washer	1
52		Circlip Internal	2
53		Ball Bearing	2
54	6240	Bandwheel (Tension End)	1
55	4434	Spacer	1
56	6242	Bandwheel Spigot	1

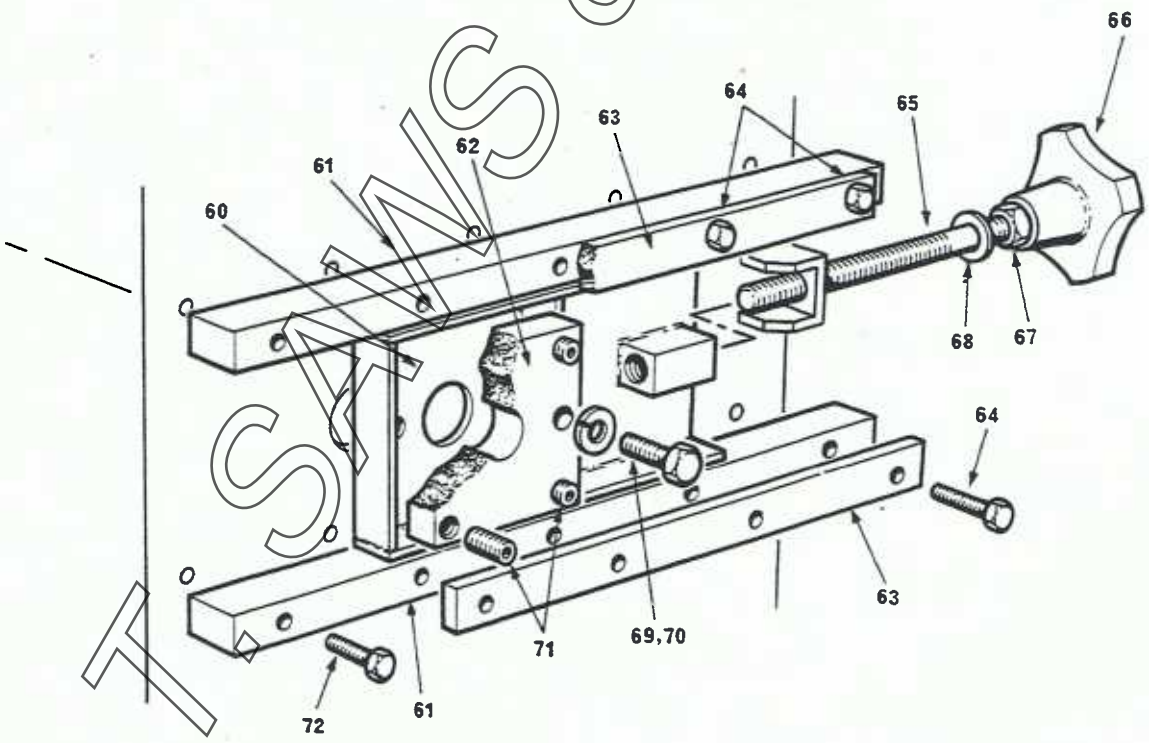
TENSIONING & TRACKING ASSEMBLY

60	SM1257	Tracking Plate	1
61	6251	Tracking Plate Guide	2
62	6243	Tracking Block	1
63	6254	Tracking Plate Retainer	2
64		Hex. Hd. Screw	8
65	6245	Tensioning Screw	1
66		Handknob	1
67		Hex. Lock Nut	1
68		Std. Washer	1
69		Hex. Hd. Screw	2
70		Shakeproof Washer	2
71		Soc. Set Screw	4
72		Hex. Hd. Screw	2

SECTION 182



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).

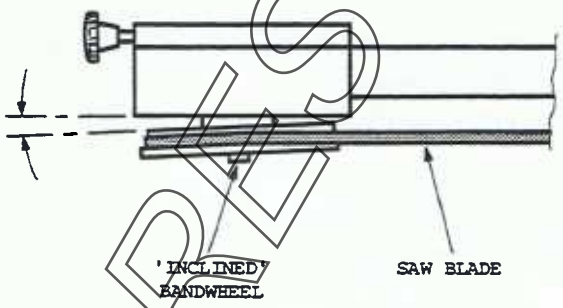


Fig.1 : Diagramatic plan of machine.

When the machine is tracking correctly the back of the 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.

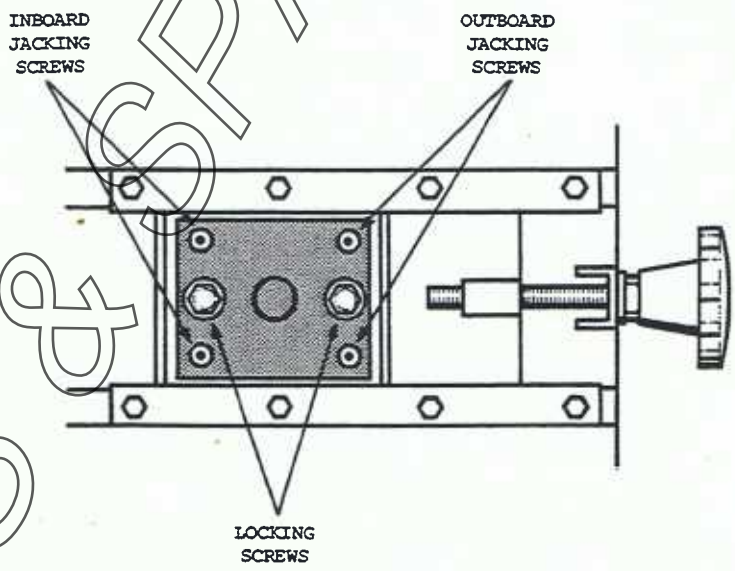


Fig.2.

Place saw blade on bandwheels with edge of saw blade ⅛" 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 turn both inboard jacking screws clockwise until tensioning assembly moves slightly.
If the saw blade has moved towards the rear adge 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 turn both outboard jacking screws clockwise until tensioning assembly moves slightly.
After completing the adjustments, place the saw blade ⅛" 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 screws, replace over arms and guide assemblies complete, and blade guards.

(CONTINUED).

SECTION 182

INSTRUCTIONS FOR TRACKING THE SAW BLADE (CONTINUED).

If the setting of the blade guide assemblies have been disturbed, proceed as follows :-
Slacken off hex. hd. screws (Item 8 - see page 2) and lower guide assemblies until blade support insert (Item 27) just touches the top edge of blade. Check that there is a clearance between the guide inserts (Item 24) and the blade of .003". This can be adjusted by means of the 'wedglok soc. hd. cap screw (Item 16).

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 28 - see Section on Transmission) and adjust either inboard or outboard jacking screws (Items 3 & 4) 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.

VISE ASSEMBLY

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
1	SM1247	Vise Bed	1
2		Hex. Hd. Screw	1
3		Hex. Nut	1
4	6248	Vise Nut Carrier	1
5		Spring Dowel	1
6		Hex. Hd. Screw	4
7		Std. Washer	4
8	6256	Moving Vise Jaw	1
9	6257	Fixed Vise Jaw	1
10	6255	Fixed Vise Nut	1
11		Std. Washer	8
12		Nyltite Sealing Washer	4
13		Hex. Hd. Screw	4
14	6247	Vise Screw	1
15	6084	Pin	1
16	6085	Spring	1
17		Hex. Hd. Screw	4
18		Std. Washer	1
19	6249	Moving Vise Nut	1
20	6246	Vise Thrust Plate	1
21	6253	Spacer	1
22		Spring Dowel	1
23		Handknob	1

NOT ILLUSTRATED :

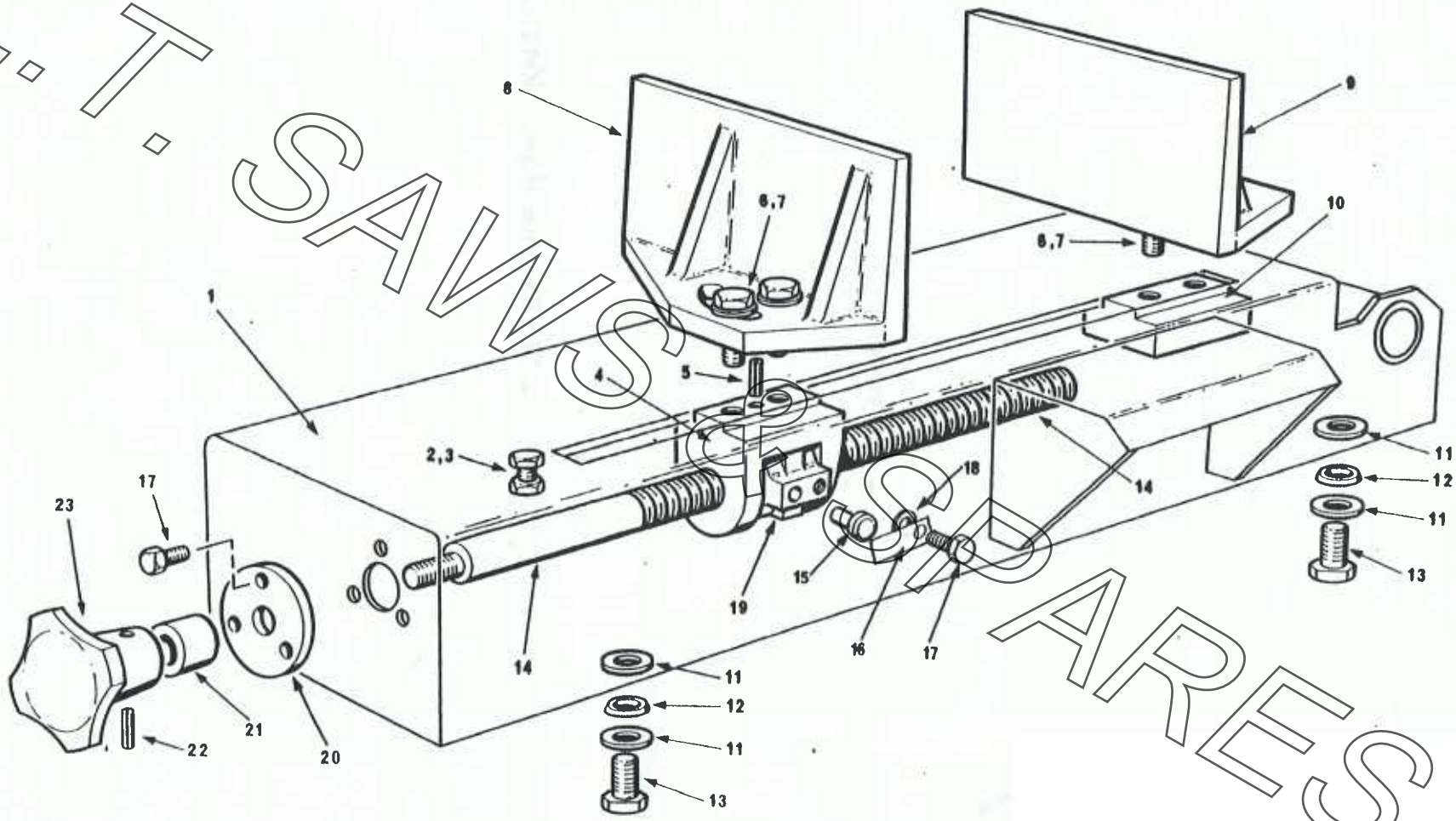
SM1369	Splash Guard	1

VISE NUT ASSEMBLY,SPARES KIT No.KM516

Consists of items 15,16,17,18,19.

VISE NUT CARRIER ASSEMBLY,SPARES KIT No.KM517

Consists of items 4 & 5.



VISE ASSEMBLY

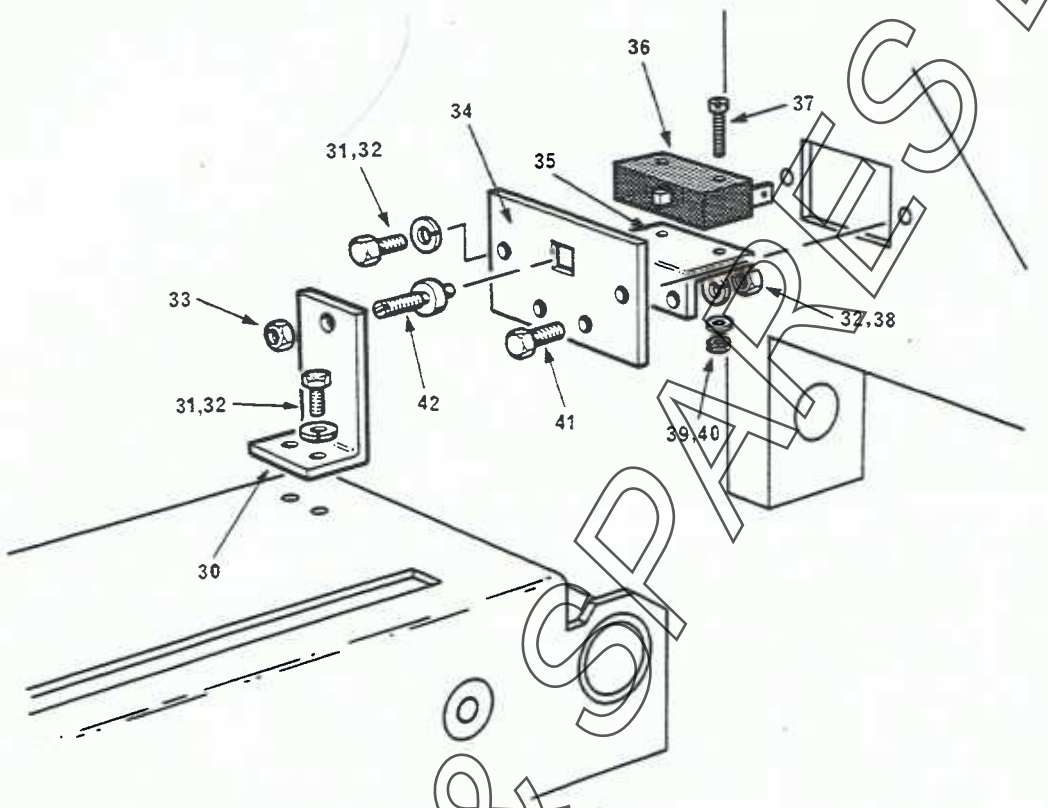
HEAD DOWN MICRO-SWITCH ASSEMBLY

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
30	6236	Switch Stop Adjusting Bracket	1
31		Hex. Hd. Screw	4
32		Shakeproof Washer	6
33		Hex. Nut	1
34	6238	Cover Plate	1
35	6237	Micro-Switch Mounting Bracket	1
36		Micro-Switch	1
37		Ch. Hd. Screw	2
38		Hex. Nut	2
39		Std. Washer	2
40		Hex. Nut	2
41		Hex. Hd. Screw	2
42	6239	Switch Adjusting Screw	1

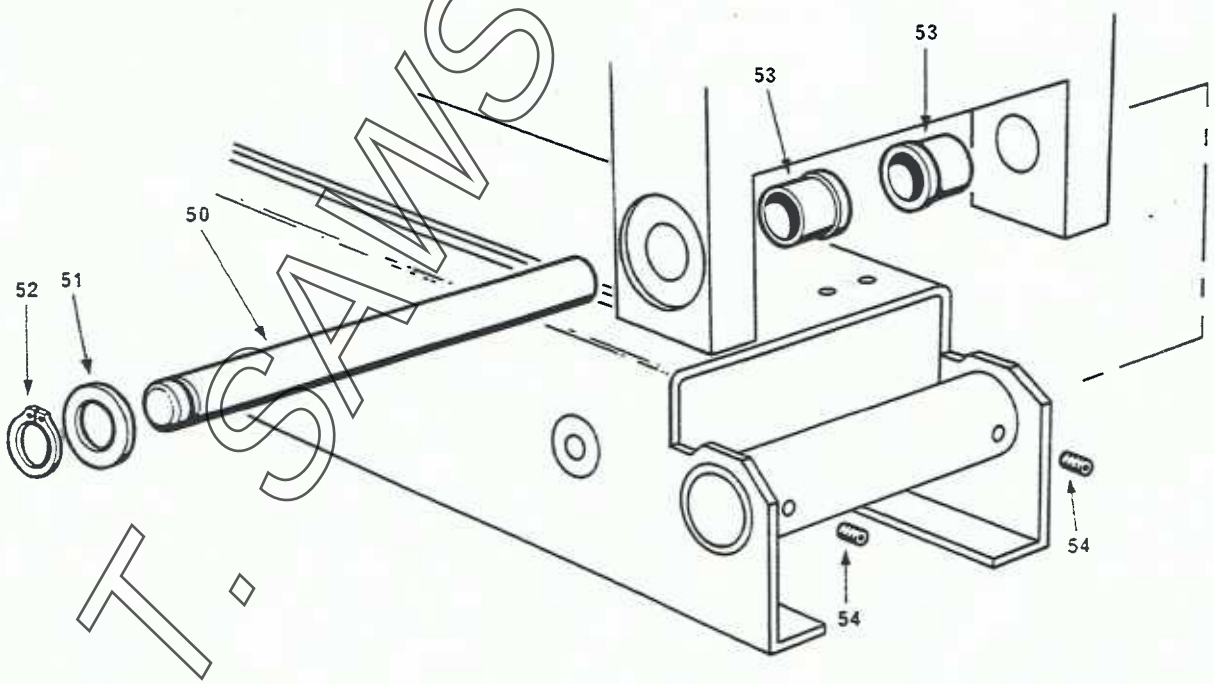
HEAD PIVOT ASSEMBLY

50	6252	Pivot Pin	1
51		Std. Washer	1
52		Circlip External	1
53		Flanged Bronze Bush	2
54		Soc. Set Screw	2

SECTION 185



HEAD DOWN MICRO-SWITCH



HEAD PIVOT

HYDRAULIC CYLINDER - ASSEMBLY No.SM1253/1

FITTED TO MACHINES FROM SERIAL No.83979 ONWARDS.

ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	5980	Cylinder Cap	1
2		'O' Ring	1
3	6286/1	Piston Rod	1
4		Rose Bearing	1
5	6292	Shoulder Screw - Upper	1
6		Soc. C'sk. Hd. Screw	2
7		Compression Spring	1
8	SM1252	Cylinder Body	1
9	6025	Washer	1
10		Hex. Locknut	1
11		Hardened Steel Ball	1
12	5826	Compression Spring	1
13		'U' Ring	1
14	6288	Piston Nut	1
15	6293	Shoulder Screw - Lower	1
16		Male Stud Coupling	2
17	6287	Piston	1
18	6322	Collar	1
	NOT ILLUSTRATED:		
		Feed Speed Control Valve	1
		Standpipe Elbow	1

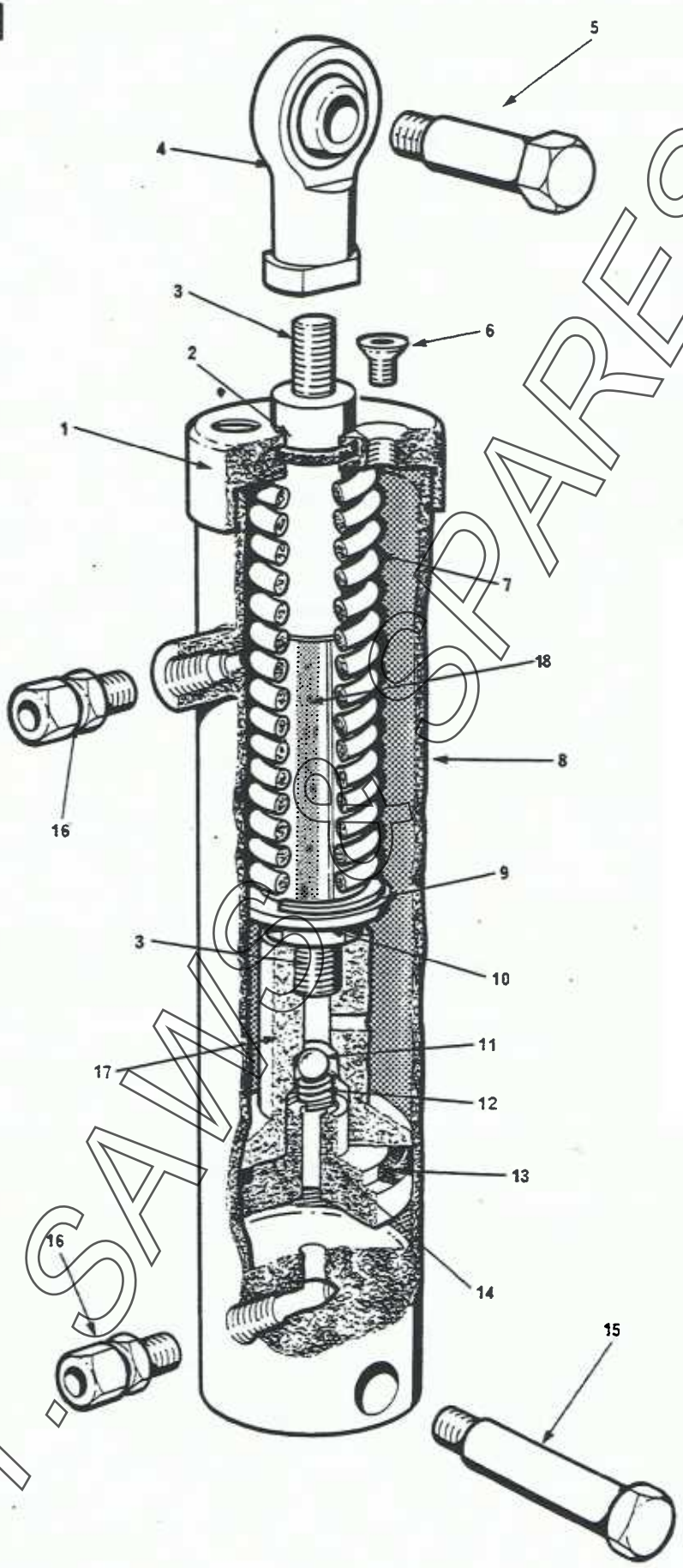
DISMANTLING INSTRUCTIONS.

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 :-

IMPORTANT : Do not remove rose bearing (Item 4) as this will disturb the setting of the compression spring.

Remove both shoulder screws (Items 5 & 15), slacken off nuts on stud couplings (Item 16), disconnect both hydraulic pipes and empty cylinder of oil.
Unscrew cylinder cap (Item 1) and pull out complete inner assembly.
Remove piston nut (Item 14) by unscrewing anti-clockwise. With piston nut removed, check 'U' ring (Item 13) for wear and check that steel ball (Item 11) 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 ¼" from the top of cylinder body. Replace cylinder cap and secure to machine using shoulder screws.



HYDRAULIC CYLINDER

STOCK STOP - ASSEMBLY No.SM1263

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
1	6419	Bar Stop	1
2	SM1262	Bar Stop Bracket	1
3		Handknob	2
4		Std. Washer	2
5	6318	Bar Stop Shaft	1
6		Coachbolt	1
7	6627	Bar Stop Collar	1
8		Hex. Hd. Screw	1
9		Hex. Hd. Screw	2
10		Std. Washer	2

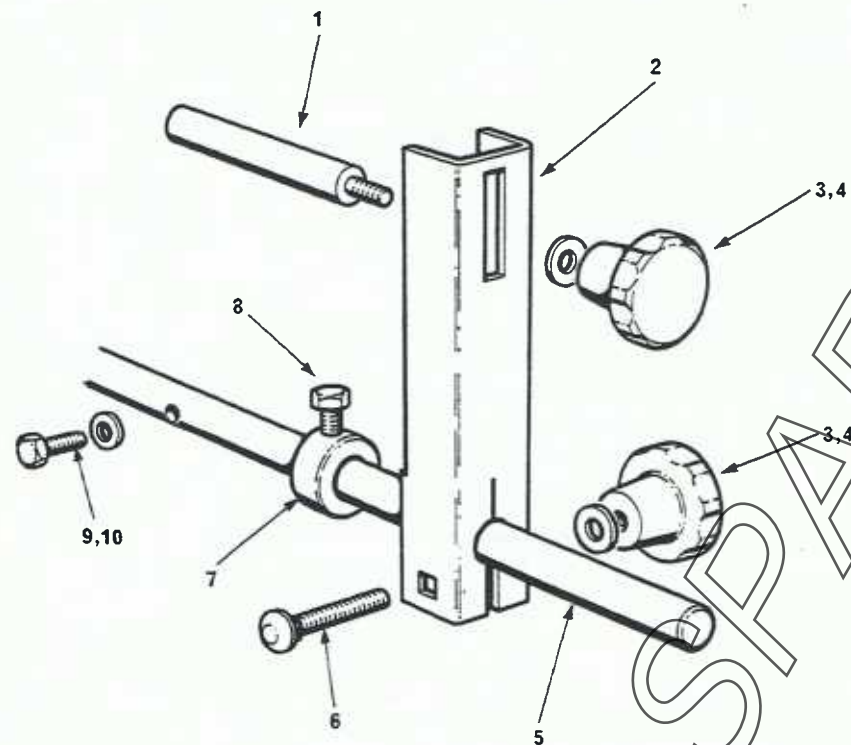
HEAD WEIGHT SPRING ADJUSTMENT ASSEMBLY

20		Tension Spring	1
21	SM1370	Spring Adjuster	1
22	6460	Adjustment Plate	1
23		Hex. Nut	1
24		Hex. Hd. Screw	1
25	6444	Thumb Nut	1

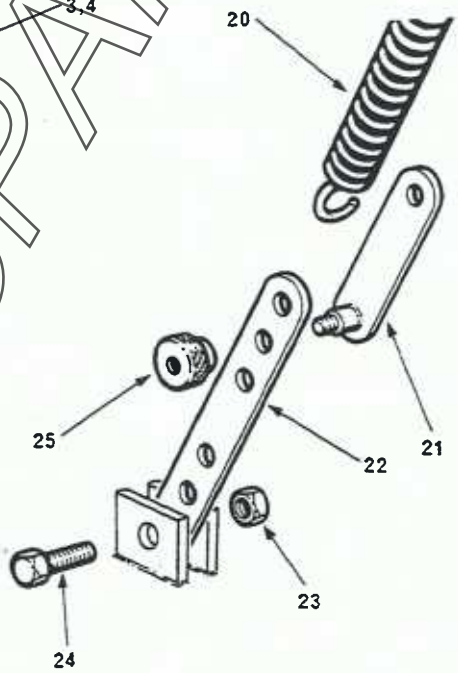
VERTICAL SAWING TABLE ASSEMBLY

30	SM1270	Vertical Sawing Table	1
31		Hex. Hd. Screw	1
32		Hex. Nut	1
33		Hex. Hd. Screw	1
34		Std. Washer	1

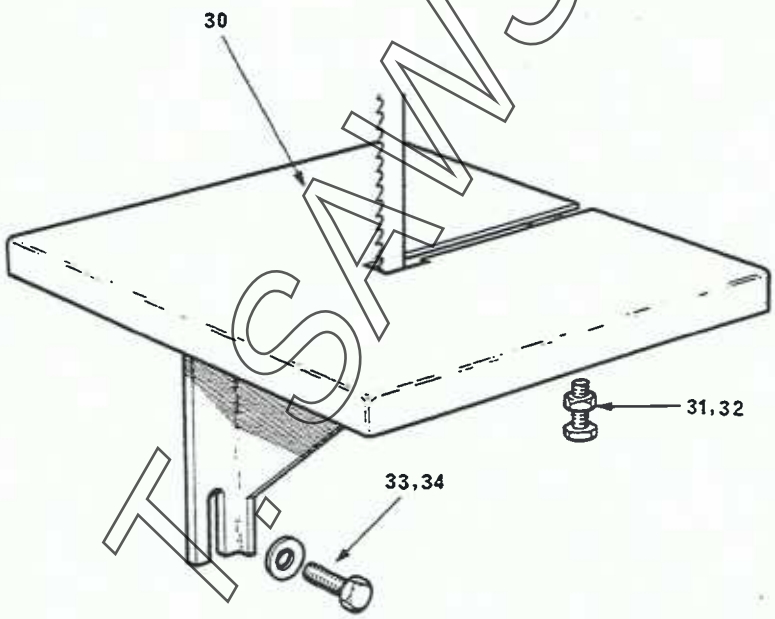
SECTION 190



STOCK STOP



HEAD WEIGHT
SPRING ADJUSTMENT



VERTICAL SAWING TABLE