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

RWS/RWH series

INFINITELY VARIABLE SPEED

BANDSAWING MACHINES

HANDBOOK

1E

QUALITY BANDSAW BLADES

TO SUIT THE RWS / RWH MODELS

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SPECIFICATION :

Model - RWS/RWH	-	14R : 13½" Throat, 2 Wheel, Infinitely Variable Speed Machine. 20R : 20" Throat, 3 Wheel, Infinitely Variable Speed Machine. 30R : 30" Throat, 3 Wheel, Infinitely Variable Speed Machine.
Wheel Diameter	-	355 mm, 14"
Motor	-	1.1 kW., 1½ h.p., 750 r.p.m.
Electric Supply	-	220/240 Volt 3 Phase 50Hz. 380/440 Volt 3 Phase 50Hz.
Blade Lengths	-	14R : 2845 mm, 112" 20R : 3305 mm, 130" 30R : 2845 mm, 112" & 3735 mm, 147"
Max. Blade Width		15 mm, ⅝"
Max. Distributed Static Table Load	-	72 kg., 160 lbs.
Gross Weights	-	14R : 318 kg., 700 lbs. 20R : 363 kg., 800 lbs. 30R : 431 kg., 950 lbs.

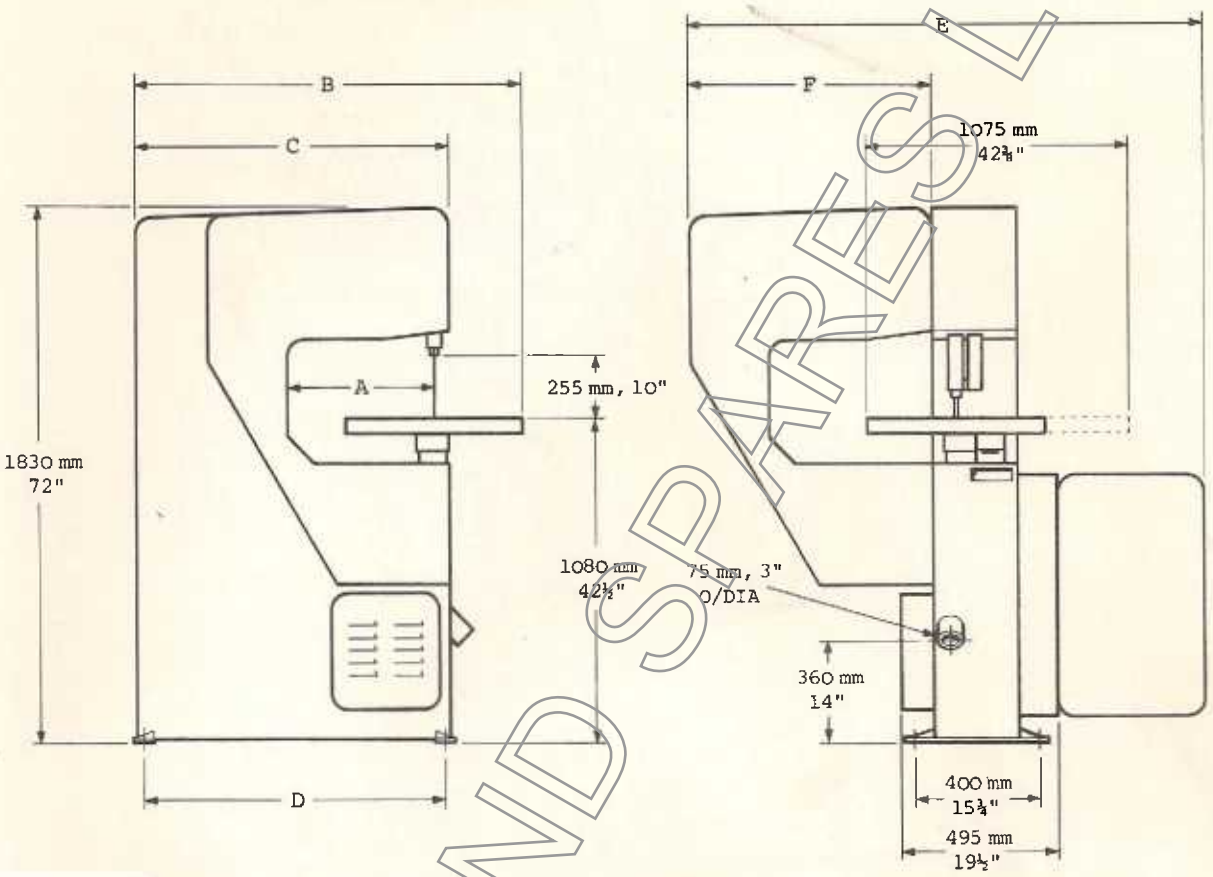
FOR BEST RESULTS USE STARTRITE 'SUPAFLEX' BLADES.

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.

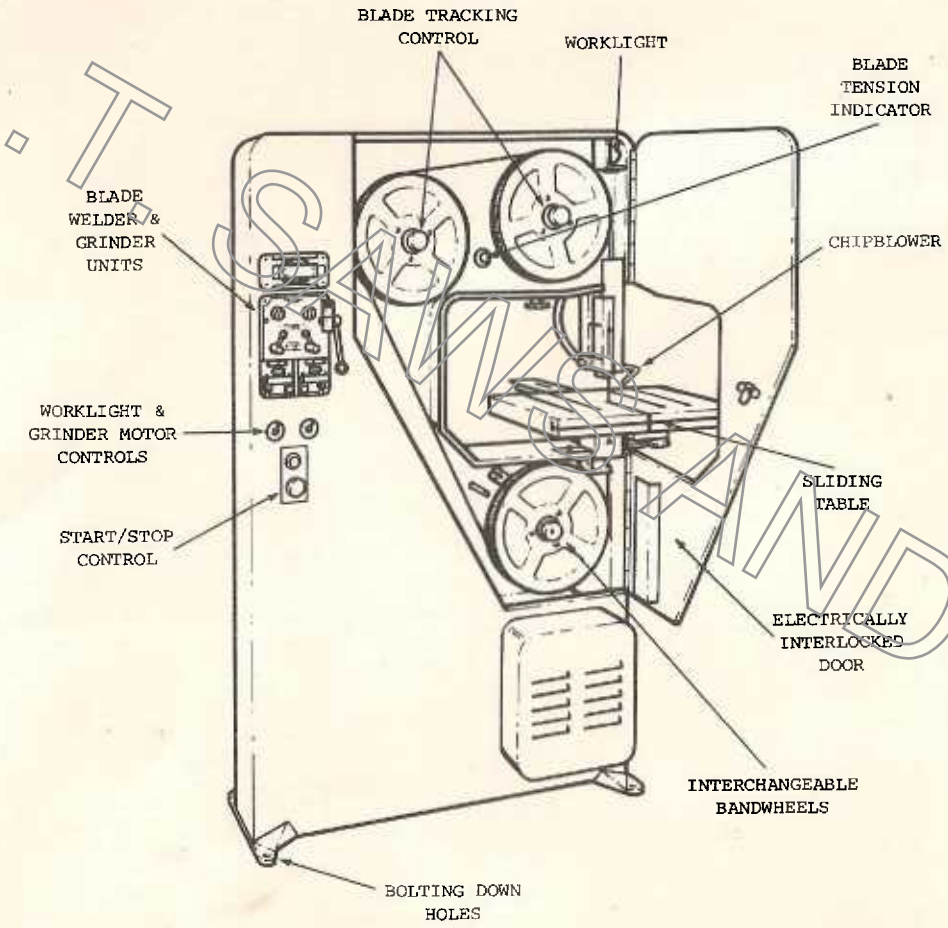
ALL DIMENSIONS APPROXIMATE.

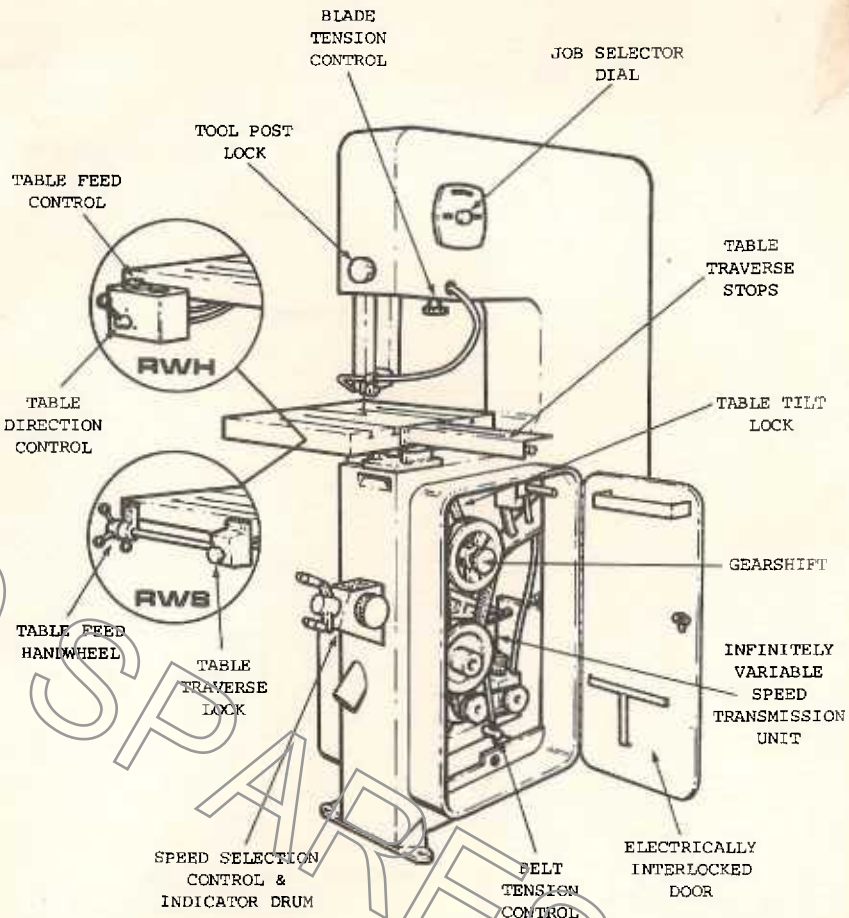


FOUNDATION PLAN

(DETAILS VARY ACCORDING TO MODEL)

MACHINE TYPE		14"		20"		30"	
PRINCIPAL DIMENSIONS		mm	ins	mm	ins	mm	ins
A	THROAT SIZE	345	13½	510	20	760	30
B	LENGTH OVERALL	1135	44⅝	1440	56⅝	1745	68¾
C	LENGTH OF BODY	770	30⅜	1075	42⅜	1380	54⅜
D	BOLTING DOWN HOLES	750	29½	1055	41½	1360	53½
E	WIDTH - DOORS OPEN	1390	54¾	1690	66½	1980	78
F	MAIN DOOR	525	20⅝	820	32¼	1115	43⅞





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Kent
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GENERAL LAYOUT OF BANDSAWING MACHINE.
(DETAILS VARY ACCORDING TO MODEL)

OPERATING SAFETY PRECAUTIONS.

Before attempting to operate machine, become familiar with the controls and operating instructions.

Do not start machine unless all guards are in place, keep guards in place when sawing.

Check that table direction control lever is at STOP position before starting machine (Machines fitted with Hydraulics).

Adjust and secure table before loading workpiece. (Do not exceed the maximum table load).

Position the top guides as close as possible to the workpiece.

Hold small or unstable workpieces by means of a clamp or other device. Keep hands clear of the saw blade at all times.

Keep the work area free of tools and off-cuts.

Stop the machine to make adjustments.

Stop the machine before leaving it unattended.

Wear eye protection.

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

Do not leave saw blades on the floor.

Machining some materials may create a hazard to health in the form of fumes, dust or the risk of fire or explosion. In such cases it is imperative that expert advice is obtained on the correct handling of such materials, and the fitting of additional equipment to the machine in order to achieve the required standard of safety.

INSTALLATION.

To transport machine to site, use fork lift truck with forks placed under base of machine (steady machine during transport), or use hoist with sling positioned as shown in Fig.1.

WARNING : ATTACHMENT OF SLING TO TABLE MAY DAMAGE THE MACHINE.

Adequate working and job lay off space is essential to efficient operation, so do not site the machine in a cramped position in the workshop.
Bandsaw blades tend to get tangled and damaged if hung from a hook or stacked on the floor, therefore cupboard space provided adjacent to the machine will protect saw

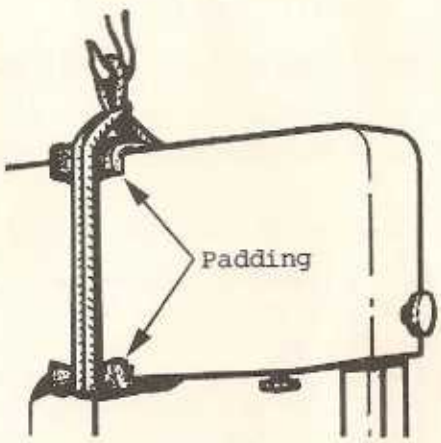


Fig.1.

INSTALLATION (CONTINUED).

blades in storage and encourage the operator to select a suitable saw blade for the job.
The base of the machine is provided with four fixing holes to accept ⅜" dia. anchor bolts (not supplied) but the machine may be fixed in position with resilient mounting pads secured by adhesive in order to avoid damage to the floor. Where necessary, the floor must be levelled so that the machine stands with equal firmness at all fixing points.
Remove the anti-rust protective coating where applied, and in particular from the working elements of the machine.

SLIDING TABLE :

Soak the table slideway wipers with oil.

IMPORTANT : The table slideway rollers and bearings are pre-loaded and adjusted for correct alignment. On no account should this setting be tampered with before the correct method of adjustment and re-assembly is fully understood, see Section on Sliding Table / Manual Feed (Parts Lists & Illustrations.)

If the machine has been shipped with the table as a separate item, re-assemble table to machine in the following manner :-

1. Place the intermediate cradle level upon the lower cradle with the slotted lug to the left hand side as seen from the operating position.
2. Lift the table into position allowing the trunnion to seat and the bolt to pass through the slots in both cradles. Where necessary, the bolt may be assembled into the trunnion by passing it through the table insert aperture.
3. From the underside of the cradle platform, assemble in bolt on order :-
   Spring Housing, spigot end first.
   Spring, into body of housing.
   Washer, plain face first.
   Nut, using wrench supplied.

HYDRAULIC SYSTEM (WHERE FITTED):

Machines require to have two hydraulic pipes connected from the control box to the pipe fittings at the side of the machine. Do not fill hydraulic tank until after connection to the electricity supply.

CONNECTION TO THE ELECTRICITY SUPPLY.

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

HYDRAULIC SYSTEM (WHERE FITTED) :

Fill hydraulic tank with recommended grade of hydraulic oil :-
ESSO Nuto H44 ; GULF Harmony 43AW ; MOBIL D.T.E. 24 ; TEXACO Rando HDA :
Start machine and check pipe fittings for leaks, When the machine has been running for approximately ten minutes, shift table control lever to 'TRAVERSE' and check pressure gage reading when the table has travelled the full extent of its stroke. If necessary, slacken knob at the front of the control box and turn the slotted screw to give an indicated pressure reading of 100 - 105 P.S.I., re-locking knob after adjustment.

HYDRAULIC SYSTEM (CONTINUED).

Set table feed control dial to maximum (mark 20) and operate the hydraulic table in each direction to the full extent of its stroke to disperse air locks so that the table moves with a smooth uniform motion.
The table must travel in the direction indicated by the operating lever or it will be impossible to obtain fine feed control on the forward stroke. Where this is the case, the two flexible hydraulic pipes from the control box must be interchanged at the point where they are fitted to the machine body.

INFINITELY VARIABLE SPEED TRANSMISSION :

If the machine has been shipped with the control assembly as a separate item, re-assemble to machine.

On Speed Control Assembly (see Fig.2), remove end locking collar (not illustrated) from control screw 'B'. Locate assembly to side of machine and place control screw through aperture in machine body. Support assembly and guide control screw into 'sleeve'. Wind handle clockwise until control screw can be seen to protrude from other end of 'sleeve'. Secure assembly to machine by means of three screws and washers provided.
With machine running, wind handle until locking collar 'C' is hard against face of 'sleeve'. Slacken off nut 'A' and align scale drum 'D' so that No.'300' is opposite pointer on plate and tighten nut. Wind handle back until low speed (No. '50') is opposite pointer. With machine set on low speed, switch off machine and replace end locking collar on control screw and set it hard against 'sleeve' and tighten set screws.

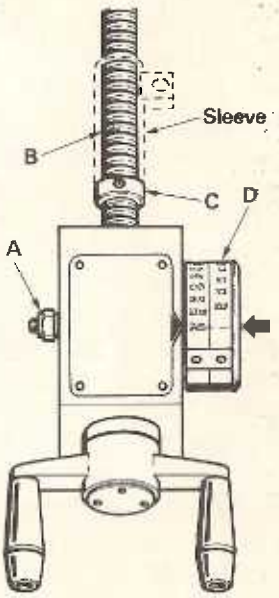


Fig.2.

TENSIONING DRIVE BELTS :

The drive belts have been factory set and should not require tensioning. If however, the belts need re-tensioning proceed as follows :-
Set the machine to run at lowest speed and stop machine. On motor platform, release both nuts on tension control stud (see Fig.3 page 6) so that the trunnion is free to move. With trunnion freed the belt tension will be automatically re-set by the weight of the motor platform. With the belts correctly tensioned, tighten nuts against trunnion taking care not to alter its position. Start machine and check the belt tension throughout the entire speed range, and re-adjust if necessary as before.

SETTING UP THE MACHINE.

For full instructions on how to set up the machine for correct use, see Section on Setting Up/Blade Guides.

SECTION 1

MACHINE CONTROLS.

INFINITELY VARIABLE SPEED TRANSMISSION :

The drive transmission is by means of a two speed gearbox working in conjunction with an infinitely variable speed unit. The gearshift (accessible through the door at the rear of the machine, (see Fig.3), allows selection of either the low speed range of 50 - 300 ft/min. (16 - 90 m/min.), or the high speed range of 500 - 3000 ft/min. (160 - 900 m/min.).

To select the low speed range PUSH IN gearshift, to select the high speed range PULL OUT gearshift. Always ensure that the gearshift is fully engaged before starting the machine. Before changing gear, select the highest speed in the range (this will make it easier to turn the gearbox pulley). Turning gearbox pulley by hand and holding gearshift knob (making sure that gearshift knob does not rotate with pulley) will help it slide into mesh. It is important that the motor be allowed to stop before operating gearshift.

IMPORTANT : DO NOT SHIFT GEAR WHEN MOTOR IS RUNNING. SHIFTING GEAR WHEN MOTOR IS RUNNING WILL DAMAGE GEARBOX.

Precise speed adjustment throughout the two speed ranges is controlled by the handwheel situated at the side of the machine, the saw speed being indicated in both feet and meters per minute on the rotating scale.

IMPORTANT : OPERATING VARIABLE SPEED CONTROL HANDWHEEL WHEN MOTOR IS STOPPED WILL DAMAGE VARIABLE SPEED DRIVE.

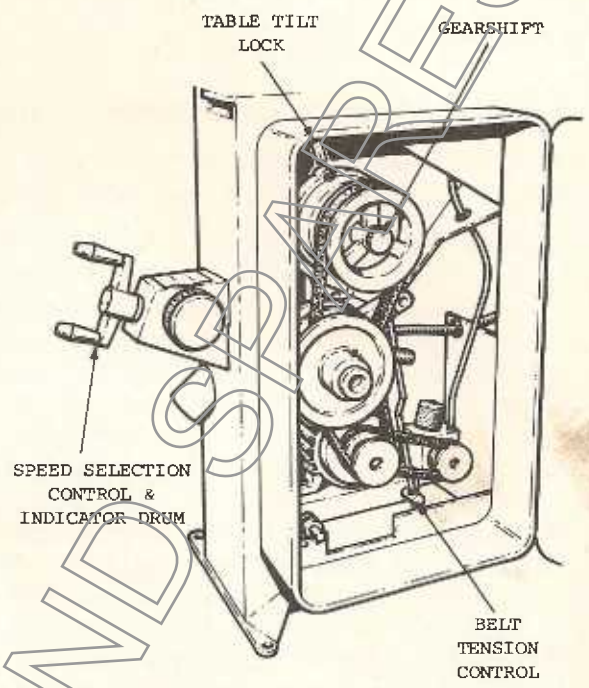


Fig.3.

SLIDING TABLE :

The table is secured in position by a single bolt passing through the tilting cradles with the table tilt locking nut accessible through the door at the rear of the machine, see Fig.3. Slackening the nut about one half turn will allow the table to be tilted. The table can be tilted 45° to the right. The table will also tilt 15° to the left, 5° forwards and 5° backwards if the zero stop pin is first removed from its position at the left hand side of the table mounting. A table traverse of 8½" (215 mm) can be obtained with both manual and hydraulic feed systems. When required, the length of stroke can be limited by means of stop collars mounted on the threaded shaft situated beneath the table.

MACHINE CONTROLS (CONTINUED).

HYDRAULIC SYSTEM (WHERE FITTED):

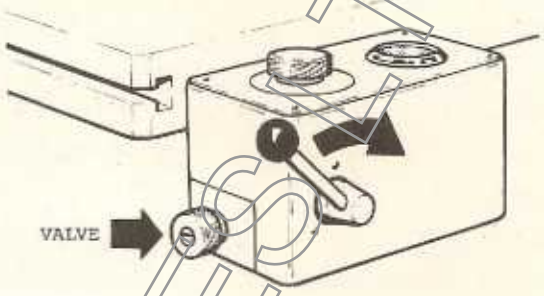


Fig.4.

Hydraulic pressure is generated by a pump driven from the main drive motor and therefore operates only when the motor is running. The working pressure is regulated by the valve situated on the front of the control box, see Fig.4, and is normally set at 100 P.S.I. but may be increased, if necessary, to 130 P.S.I. The four position lever controls the direction of the table traverse so that when the lever is moved away from the operator, the table also moves away from the operator and vice-versa. Shifting the lever to its central position will stop the table at any point of its stroke. The handknob controls the rate of feed from zero to a maximum of approximately 25 inches per minute. The greater the number on the dial setting, the faster the feed. Shifting the control lever to the extreme position will override the feed setting and provide fast traverse.

MAINTENANCE.

WEEKLY MAINTENANCE :

Remove embedded chips from bandwheel tires.
Clean upper and lower blade guide assemblies and check for wear.
Clean table slideways and charge felt wipers with a few drops of oil. Do not apply oil or grease to slideways as this may cause the adhesion of dirt.
Table roller bearings are pre-packed with grease and should not require further lubrication.
IMPORTANT : DO NOT USE COMPRESSED AIR JET TO CLEAN MACHINE AS CHIPS MAY BE BLOWN ONTO TABLE TRACKS, RESULTING IN ERRATIC OPERATION OF TABLE OR SEIZURE OF ROLLERS.

MONTHLY MAINTENANCE :

Remove air filter from top of air compressor (one screw) and insert a few drops of oil onto screw hole. Do not crush filter when replacing screw.
Check condition and tension of drive belts, see page 5 for instructions.
Lubricate table hand feed mechanism (where fitted).
Check level of hydraulic oil in tank (where fitted).

Every 3 months apply grease to grease nipple situated on Expanding Pulley Assembly (see Section on Infinitely Variable Speed Transmission).
DO NOT USE EXCESSIVE GREASE.

MAINTENANCE (CONTINUED).

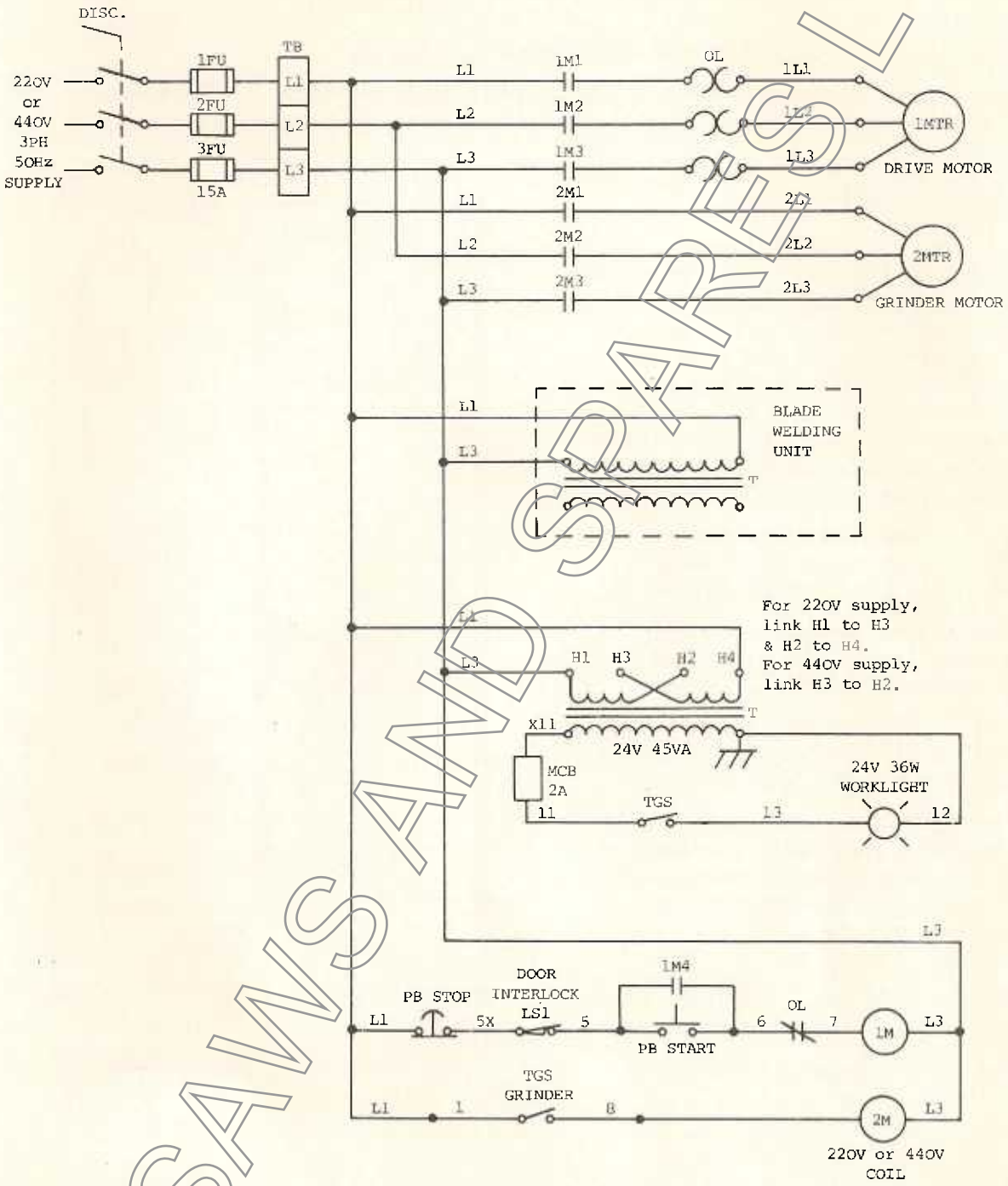
YEARLY MAINTENANCE :

Drain hydraulic system (where fitted), clean tank and replace filter (Part No.AC 33 B). Refill with 8 imperial pints (4.5 litres) of clean hydraulic oil and operate controls to remove air locks, see page 5.

GENERAL :

Otherwise than above, clean and lubricate working parts as required. The bandwheels and pumps have sealed-for-life bearings which do not require further lubrication.
Periodically inspect the welder and grinder units, see Section on Die Making/Welding for instructions.

APPROVED LUBRICANTS.	
GENERAL LUBRICATION TABLE SLIDEWAY WIPERS AIR COMPRESSOR	ESSO Esstic 50 Oil GULF Service 51 Oil MOBIL Mobilgear 629 Oil TEXACO Ursa P20 Oil
TABLE ROLLER BEARINGS MOTOR BEARINGS	ESSO Beacon 3 Grease GULF Gulfcrown No.3 Grease MOBIL Mobilplex 48 Grease TEXACO Regal Starfak Premium 3 Grease
GEARBOX	ESSO Pen-o-led EP2 Oil GULF EP65 Lubricant Oil MOBIL Mobilgear 629 Oil TEXACO Meropa 2 Lubricant Oil
HYDRAULIC SYSTEM (WHERE FITTED)	ESSO Nuto H44 Oil GULF Harmony 43AW Oil MOBIL D.T.E. 24 Oil TEXACO Rando HDA Oil



CIRCUIT DIAGRAM FOR 220V/440V 3PH 50Hz MACHINES WITH WELDER & GRINDER.

SECTION 8

WIRING INSTRUCTIONS.

If the machine is of the correct voltage, connect supply leads to terminals L1, L2 and L3 in terminal box (or disconnect switch if fitted) at rear of machine.

IMPORTANT : DO NOT SHIFT GEAR WHEN MOTOR IS RUNNING.

Check motor rotation, saw blade must pass downward through the table. If necessary interchange supply leads L1 and L3 to reverse rotation.

ELECTRIC CONTROL PANEL.

The electric control panel, see Fig.1, is located inside the machine body, and access is obtained by removing the panel cover situated at the rear of the machine. The complete panel may be removed from the machine by disconnecting the supply wires to the terminal block and securing nuts retaining the panel.

Item 1. Davenset transformer 220/440V primary, 110V 45VA secondary for control circuit.

Item 2. Dorman Smith circuit breaker 2 amp rating for 24V worklight circuit protection.

Item 3. Danfoss C10 contactor with 220V or 440V coil. Provides Start/ Stop control for main motor.

Item 4. Danfoss overload unit (see Chart on page 3 for part numbers and amperage ratings). Provides overload protection for main motor.

Item 5. Danfoss C10 contactor with 220V or 440V coil. Provides Start/ Stop control for grinder motor.

Items 6 & 7. Terminal blocks.

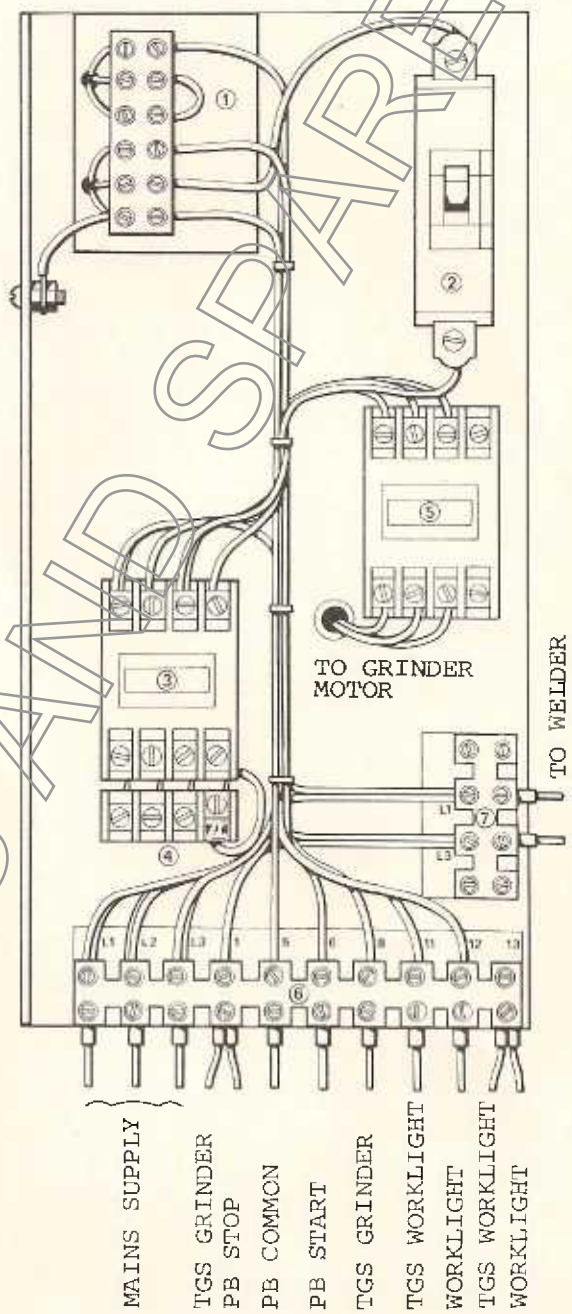


Fig.1.

CONVERSION FOR ALTERNATIVE SUPPLY VOLTAGE.

SECTION 8

220 Volt machines will operate on 220/240V 3PH 50Hz supply.
440 Volt machines will operate on 380/440V 3PH 50Hz supply.
Machines supplied for use on 440V 3PH 50Hz supply may be adapted to operate on 220V 3PH 50Hz supply and vice-versa.

To effect conversion, it is necessary :-

A. Replace the motor contactor coil and overload unit, and also the grinder motor contactor coil.
B. Change the worklight transformer terminal connections.
C. Replace the welder unit.
D. Change the grinder motor connections.
E. Change the main drive motor terminal connections.

Proceed as follows :-

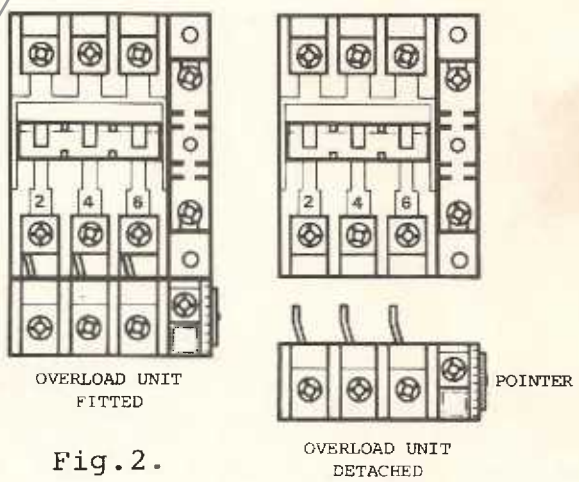
A.

Remove control panel cover situated at rear of machine. Identify motor starter and overload unit, see Fig.2. Disconnect external wires to terminal block at bottom of control panel, and wires 1L1, 1L2 & 1L3 from overload unit. Also wires 2L1, 2L2 & 2L3 from grinder contactor, and L1 & L3 to welder at terminal block on side of panel. Remove nuts securing the panel to the machine body and withdraw the complete panel from the machine. Disconnect wires to motor conector and remove from panel. Remove overload unit from contactor after slackening screws 2, 4, 6 and disconnecting wire 7. Remove two screws securing two halves of contactor together, and seperate halves of contactor casing. Note disposition of various parts. Replace the coil with one of suitable rating.

220/240V - Coil No. 37H 6473

380/440V - Coil No. 37H 6479

Assemble in reverse order, making sure springs in top halve of contactor case are located over pins on coil. When the contactor is assembled check action of solenoid by depressing top bar several times. Repeat this operation for the grinder motor contactor coil. Replace overload unit with one of a suitable rating according to the supply voltage (see Chart below). Set pointer at side of overload unit to indicate full load amps of motor.



OVERLOAD UNIT FITTED

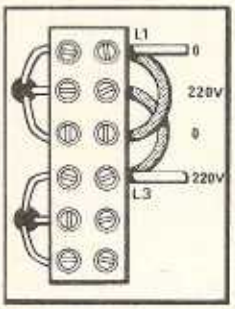
OVERLOAD UNIT DETACHED

Fig.2.

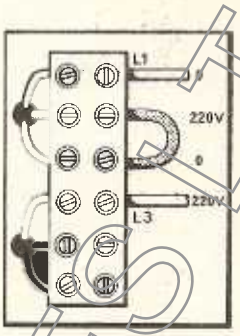
MACHINE SERIES	MOTOR 3 PHASE 50Hz.					OVERLOAD UNIT	
	HP.	RPM.	VOLTS	F/L AMPS	STARTING AMPS	PART No.	AMPS RANGE
RWF, RWS RWH	1½	750	380 - 440 220 - 240	3.4 5.9	17 29	47H0108 47H0109	2.7 - 4.2 4.0 - 6.2
V10	1½	960	380 - 440 220 - 240	2.7 5.3	13 26	47H0108 47H0109	2.7 - 4.2 4.0 - 6.2

B.

On control panel, identify transformer and substitute links to suit supply voltage, as shown in Fig.3. (Split primary coil transformers only).



2 LINKS FOR
220V 3PH SUPPLY



1 LINK FOR
440V 3PH SUPPLY

Fig.3.

C.

The blade welding unit cannot be used on an alternative voltage to that for which it is supplied and must be replaced as follows :- Disconnect the welder leads (marked L1 & L3, see Fig.4) from the terminal block at the side of the control panel. From the front of the machine remove the welder unit. Install the replacement welder unit in reverse order using the same electrical connections as before.

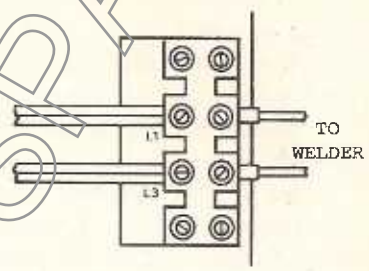


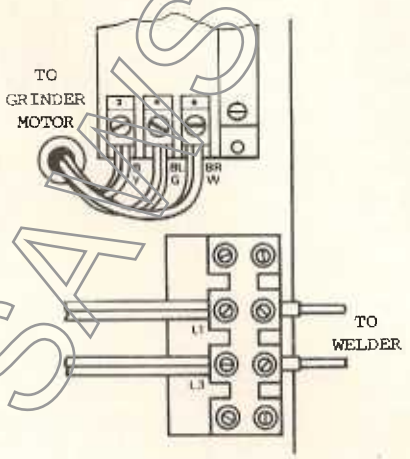
Fig.4.

D.

On control.panel, identify contactor on right of panel (see Fig.5). Change the grinder motor wires to suit supply voltage as shown.

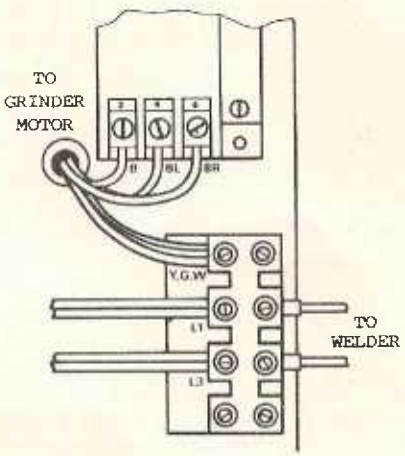
COLOUR CODE :

B - BLACK BR - BROWN Y - YELLOW
G - GREEN BL - BLUE W - WHITE



CONNECTIONS FOR
220V 3PH SUPPLY.

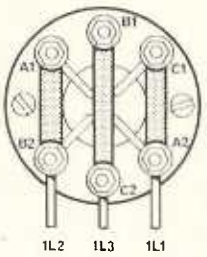
Fig.5.



CONNECTIONS FOR
440V 3PH SUPPLY.

E.

Remove cover of motor terminal box. Identify main drive motor terminal arrangements, see Figs.6, 7,8 & 9. Change the motor terminal linkage to suit appropriate voltage as shown, using correct method of connection.



3 LINKS FOR 220V 3PH SUPPLY.
2 LINKS FOR 440V 3PH SUPPLY.

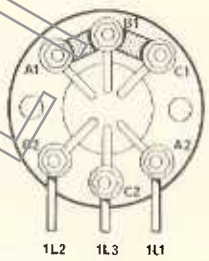
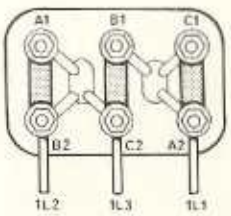


Fig.6.



3 LINKS FOR 220V 3PH SUPPLY.
2 LINKS FOR 440V 3PH SUPPLY.

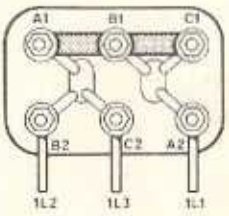
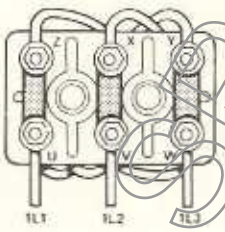


Fig.7.



3 LINKS FOR 220V 3PH SUPPLY.
2 LINKS FOR 440V 3PH SUPPLY.

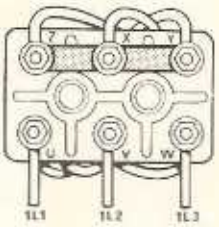
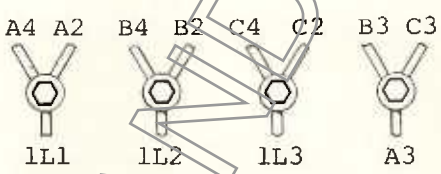
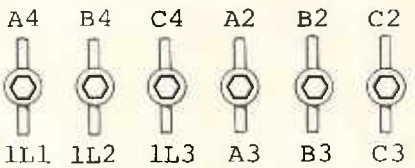


Fig.8.

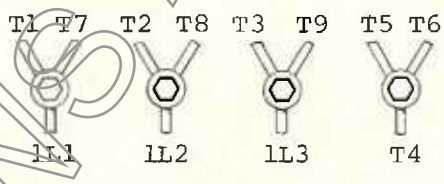
Connections to be made by nut, bolt and washers, and to be wrapped with adhesive p.v.c. insulating tape.



CONNECTIONS FOR 220V 3PH SUPPLY.



CONNECTIONS FOR 440V 3PH SUPPLY.



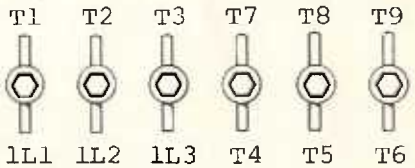


Fig.9.

SETTING UP THE MACHINE.

Select a saw blade suitable for the work in hand, see Section on Sawing Practice.
If the work involves internal contour sawing, or the blade is to be made up from bulk strip, refer to Section on Welder & Grinder Units (where applicable).

Lower the top bandwheel by turning the blade tension control knob and remove saw blade. Place selected saw blade over bandwheels with the teeth facing forward and downward through the table (see Fig.1), and apply sufficient blade tension to remove slack. It is important that both the top and bottom guide assemblies are set back clear of the saw blade so that it is not deflected and follows a true path between the bandwheels. Rotate the bandwheels by hand to establish the path of the saw blade. Adjust the tracking control knob to position the saw blade approximately central on the bandwheels as shown in Fig.2.

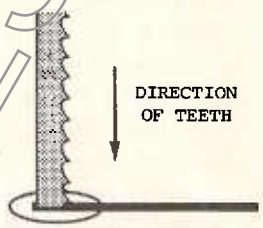
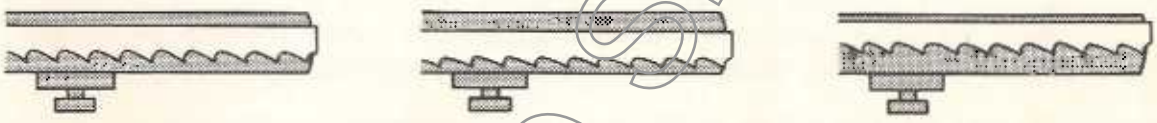


Fig.1.



TRACKING CORRECT
Blade runs approximately central on bandwheel.

TRACKING INCORRECT
Blade runs toward front edge of bandwheel.

TRACKING INCORRECT
Blade runs toward back edge of bandwheel.

Fig.2.

NOTE : 30" Throat Models have a tracking control fitted to both the top and third bandwheels. Care must be taken when setting these machines in order to avoid conflicting settings between the tracking controls. For this reason, the top bandwheel should be set in the mean position and the tracking controlled from the third bandwheel. After this procedure has been completed, a small final adjustment may be necessary to the top bandwheel control. This point does not arise of course when the machine is to be used on two wheel operation as the tracking procedure is carried out solely by the top bandwheel control.

When the saw blade tracks in a satisfactory manner, apply the appropriate blade tension as shown by the tension indicator, see Fig.3. The tension scale registers tension applied in terms of saw blade width, thus a reading of '½' indicates that tension to suit a ½" wide saw blade has been applied. The saw blade length, provided that it is acceptable to the machine, does not affect the indicated tension. The indicator will give a fair guide as to the correct tension required, but it may be necessary to vary this slightly according to circumstances.

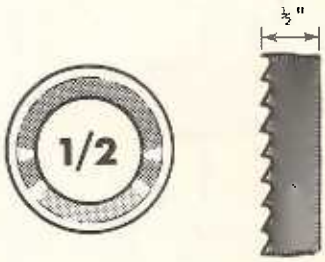


Fig.3.

SOLID INSERT BLADE GUIDES.

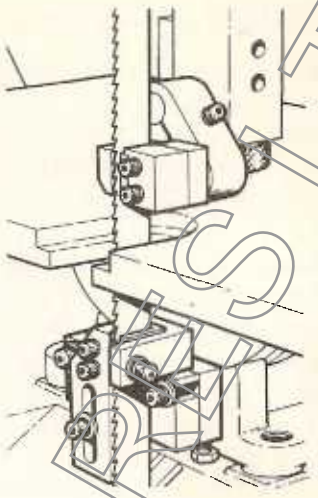


Fig.4.

These guides (fitted as standard on all machines) give the greatest possible support to the saw blade and are therefore most suitable for precision sawing. In most cases greater working life of the saw blade can be obtained than is possible with other types of guides. Solid insert guides (see Fig.4) as the name implies, have the guiding faces machined into a solid block, thereby eliminating the need for individual adjustment to separate controlling elements. The guide inserts are made in a range of sizes to suit blade widths (see Parts List on page 3). After initial setting each size of insert is automatically positioned when fitted into the guide holder.
Check each new saw blade before use for smoothness on sides and back edge at welded joint.
New guide inserts should be allowed to bed in by being subjected only to light feed pressure during the first few minutes of use.
An occasional small application of saw wax or tallow to the saw blade will generally improve performance and prolong working life of both saw blade and guide inserts. Remove and clean the guide inserts at each blade change, or more frequently if necessary. Do not allow the guide inserts to become seized in the holders so that the self aligning action is inhibited.

Initial setting of the guide holders is best accomplished by fitting a wide saw blade. Fit guide inserts to suit width of blade to be used. Slacken securing screws (Items 1 & 19) and position the insert locators to hold the guide inserts with minimum side clearance but free enough to pivot under finger pressure.
The correct size guide inserts should always be used as they offer maximum support to the saw blade (see Fig.5).
Position guide holders so that guide inserts support the saw blade without deflecting it from a straight line (see Fig.6).
After adjusting the guides, rotate bandwheels by hand to ensure that the saw blade runs free. The top guides should be set as close as possible to the workpiece to offer maximum support to the saw blade in its working condition. Incorrectly set guides can only result in poor quality work and short blade life.

Fig.5.

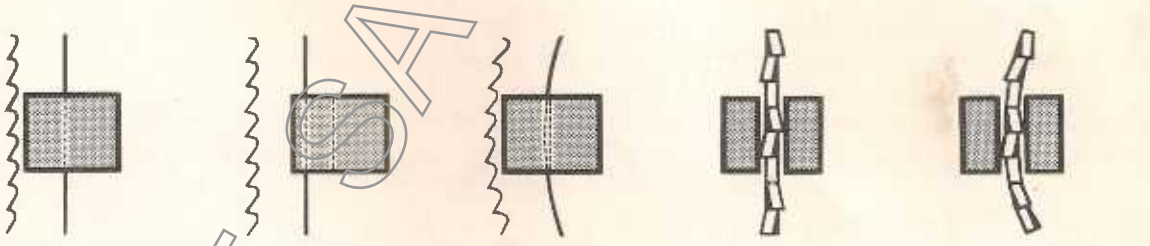
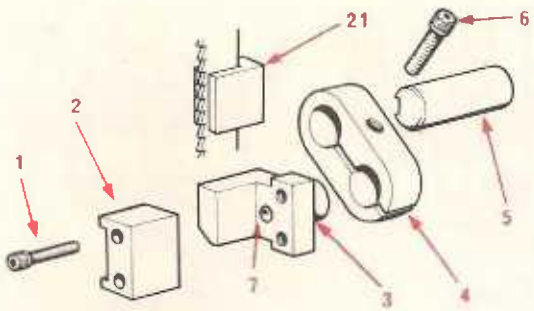
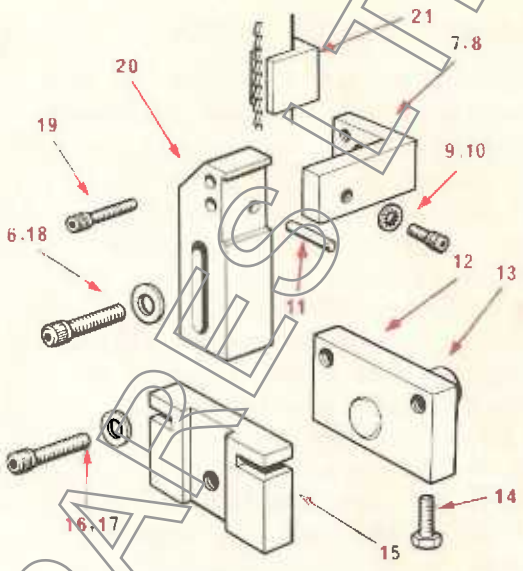


Fig.6.





SOLID INSERT BLADE GUIDES
- UPPER & LOWER

SOLID INSERT BLADE GUIDES (UPPER) - ASSEMBLY No.SP624

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
1		Soc. Hd. Cap Screw	2
2	4157	Insert Locator	1
3	4158	Stem	1
4	4156	Guide Arm	1
5	4154	Spigot	1
6		Soc. Hd. Cap Screw	1
7		Drive Screw	1

SOLID INSERT BLADE GUIDES (LOWER) - ASSEMBLY No.SP712

6		Soc. Hd. Cap Screw	1
7		Drive Screw Type	1
8	4326	Insert Locator	1
9		Shakeproof Washer	1
10		Soc. Hd. Cap Screw	1
11		Mills Pin	1
12	4324	Back Plate	1
13	4327	Spigot	1
14		Hex. Hd. Screw	2
15	4325	Stem Holder	1
16		Std. Washer	2
17		Soc. Hd. Cap Screw	2
18		Std. Washer	1
19		Soc. Hd. Cap Screw	2
20	4323	Stem	1

SOLID GUIDE INSERTS

21	4146	Guide Inserts for $\frac{1}{8}$" wide blade	2
	4147	" " " $\frac{3}{16}$" " "	2
	4148	" " " $\frac{1}{4}$" " "	2
	4149	" " " $\frac{3}{8}$" " "	2
	4150	" " " $\frac{1}{2}$" " "	2
	4151	" " " $\frac{5}{8}$" " "	2

13/14/15.3

COMBINATION BLADE GUIDES.

Combination blade guides, as the name implies, have two different functions. They can be set in the normal position (see Fig.7) and used for continuous high speed sawing, or they can be set at an angle (see Fig.8) and used for angled sawing. Combination blade guides will accept either guide inserts or side rollers (see Parts List on page 5). The guides, which are available as an optional extra, utilise standard location points on the machine, and are therefore fully interchangeable with all other blade guides and attachments on all models.

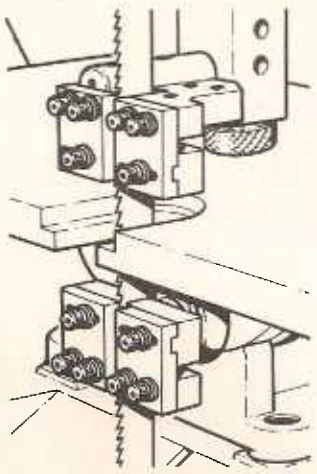


Fig.7.

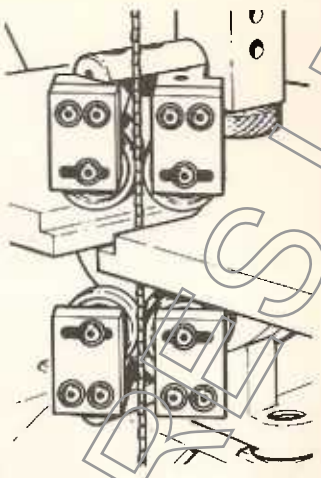


Fig.8.

Assemble the blade guides to the machine using the standard location points. Fit guide inserts (Item 39) or side rollers (Item 38) to suit width of blade to be used (see Parts List on page 5). Slacken securing screws (Item 36) and position the guide inserts so that they support the saw blade without deflecting it from a straight line. The arm (Item 30) may be set an angle to the guide body (Item 32). By this means the saw blade is twisted at an angle of 40° to the axis of the table, so as to overcome the limited capacity of the throat size when sawing across a long narrow workpiece, see Figs.9 & 10. When the guides are used in the angled position, side rollers must be fitted and the blade speed should not exceed 300 ft/min. (91 meters /min.).

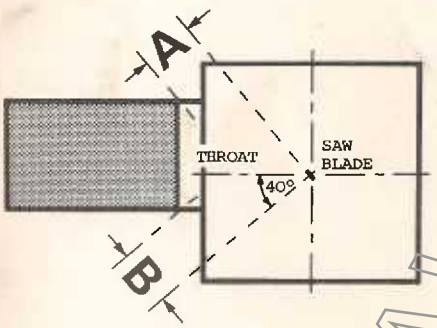


Fig.9.

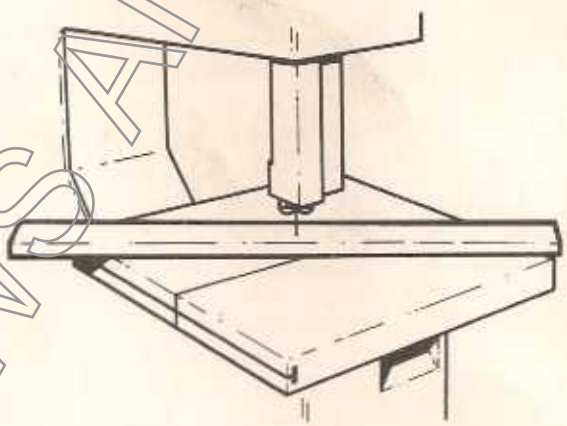
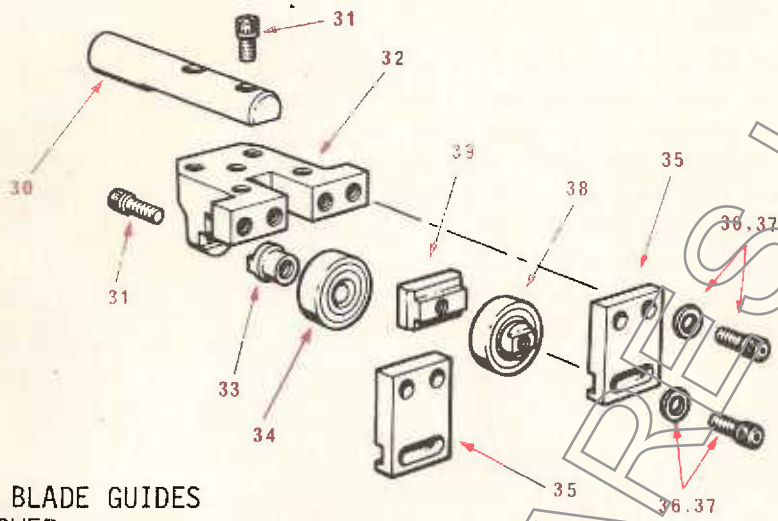


Fig.10.

APPROXIMATE THROAT CAPACITIES WITH SAW BLADE TWISTED AT 40° :-										
MACHINE TYPE	14"		18"		20"		24"		30"	
	ins	mm	ins	mm	ins	mm	ins	mm	ins	mm
DIMENSION 'A'	5⅞	150	9½	240	11	280	14	355	18⅝	475
DIMENSION 'B'	7	175	10	255	11¼	285	13¾	350	17⅝	450



COMBINATION BLADE GUIDES
- UPPER & LOWER

COMBINATION BLADE GUIDES (UPPER & LOWER) - ASSEMBLY No.SP290

NOTE : TWO - SP290 Combination Blade Guide Assemblies required per machine. Quantities shown below are for TWO assemblies.

ITEM	PART NUMBER	DESCRIPTION	No.OFF
30	2563	Arm	2
31		Soc. Hd. Cap Screw	6
32	2562	Guide Body	2
33	2565	Bearing Bush	2
34		Ball Bearing	2
35	2564	Guide Bracket	4
36		Soc. Hd. Cap Screw	8
37		Std. Washer	8
		SIDE ROLLERS	
38	SP306	Side Rollers for $\frac{5}{8}$" wide blade	4
	SP307	" " " $\frac{1}{2}$" " "	4
		GUIDE INSERTS	
39	SP316	Guide Inserts for $\frac{5}{32}$" - $\frac{1}{8}$" wide blade	4
	SP317	" " " $\frac{1}{4}$" - $\frac{1}{16}$" " "	4
	SP318	" " " $\frac{1}{2}$" - $\frac{3}{8}$" " "	4
	SP319	" " " $\frac{5}{8}$" " "	4

UNIVERSAL BLADE GUIDES.

The universal blade guides (see Fig.11) are most suitable for high speed sawing and general cut-off work where sawing accuracy is not very important. These blade guides use the same size inserts for all widths of saw blades (see Parts List below). The guides, which are available as an optional extra, utilise standard location points on the machine, and are therefore fully interchangeable with all other blade guides and attachments on all models.

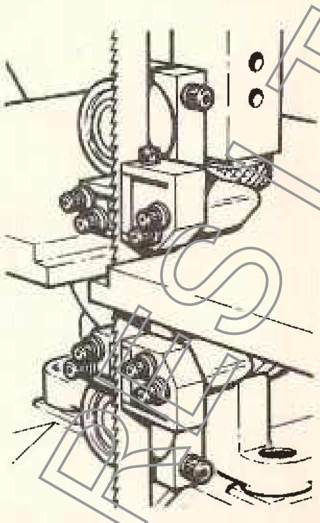
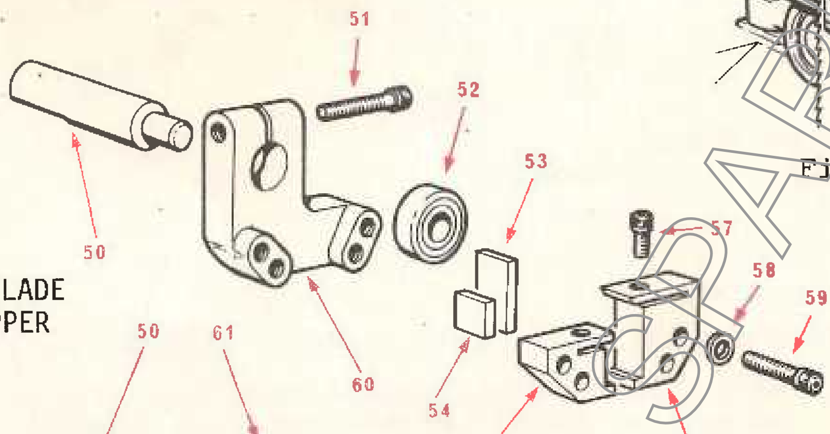
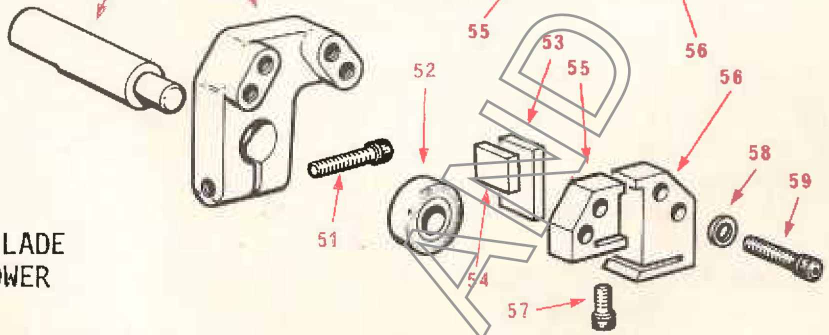


Fig.11.



UNIVERSAL BLADE GUIDES - UPPER



UNIVERSAL BLADE GUIDES - LOWER

UNIVERSAL BLADE GUIDES (UPPER) - ASSEMBLY No.SP454
UNIVERSAL BLADE GUIDES (LOWER) - ASSEMBLY No.SP455

NOTE : Items 50 to 59 common to both SP454 & SP455.
Quantities shown below are for BOTH assemblies.

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
50	3504	Support Arm	2
51		Soc. Hd. Cap Screw	2
52		Ball Bearing	2
53	3512	Guide Insert - Large	2
54	3513	Guide Insert - Small	2
55	3505	Guide Holder - Small	2
56	3506	Guide Holder - Large	2
57		Soc. Hd. Cap Screw	4
58		Std. Washer	8
59		Soc. Hd. Cap Screw	8
60	3507	Guide Body - Upper (SP454 ONLY)	1
61	3508	Guide Body - Lower (SP455 ONLY)	1

13/14/15·6

UNIVERSAL ROLLER BLADE GUIDES.

The universal roller blade guides (see Fig.12) are most suitable for high speed sawing with light feed pressure and can be used with various widths of saw blades. To set guides, adjust thrust rollers (Item 78) to touch back edge of blade. Slacken off thumb screws (Item 71) and adjust rollers (Item 73) so they are set back clear of the saw teeth, and turn eccentric bushes (Item 74) so the rollers support the saw blade. The guides, which are available as an optional extra, utilise standard location points on the machine, and are therefore fully interchangeable with all other blade guides and attachments on all models.

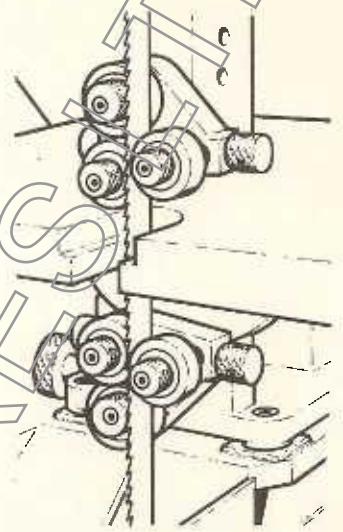
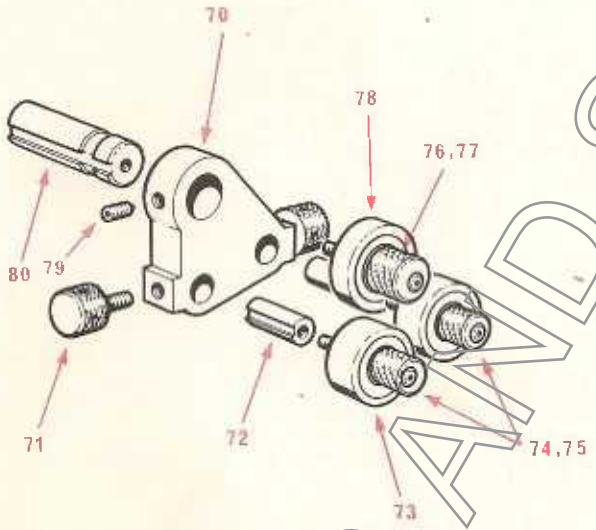
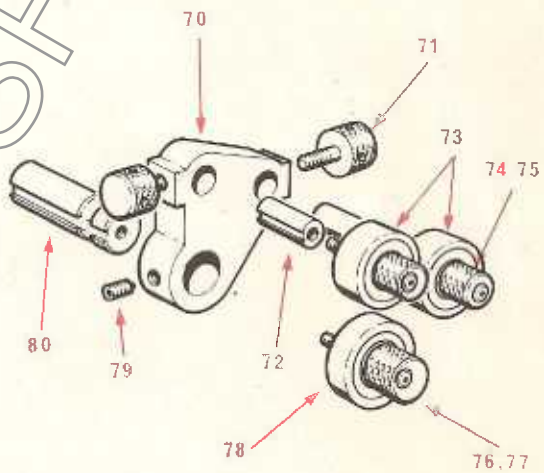


Fig.12.



UNIVERSAL ROLLER BLADE GUIDES - UPPER



UNIVERSAL ROLLER BLADE GUIDES - LOWER

UNIVERSAL ROLLER BLADE GUIDES (UPPER) - ASSEMBLY No.SM1559A
UNIVERSAL ROLLER BLADE GUIDES (LOWER) - ASSEMBLY No.SM1559B

NOTE : Quantities shown below are for BOTH assemblies.

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
70	7467	Guide Body	2
71	2535	Thumb Screw	4
72	7466	Guide Roller Spindle	4
73		Ball Bearing	4
74	2458	Eccentric Guide Roller Bush	4
75		Soc. Hd. Cap Screw	4
76	2459	Eccentric Thrust Roller Bush	2
77		Soc. Hd. Cap Screw	2
78		Ball Bearing No.110 PP	2
79		Soc. Set Screw	2
80	2456	Thrust Roller Spindle	2

SAW AND SPEED SELECTION CHART.

MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
ANALINE FORMALDEHYDE	-	FPM TPI	3500 18	3200 14	3000 10	2900 3S
ALUMINIUM - Die Casting	20	FPM TPI	1500 18	1200 10	900 8	750 6S
ALUMINIUM - Sand Cast Alloy	20	FPM TPI	1200 18	1000 14	800 10	600 6S
ALUMINIUM - Rolled & Extruded Sections	20	FPM TPI	2500 18	2000 10	1500 8	1400 6S
ASBESTOS - Corrugated	-	FPM TPI	3000 14	3000 10	3000 6	3000 3S
ASBESTOS - Paper	-	FPM TPI	3000 10	3000 8	3000 6	2800 3S
ASBESTOS - Wall Board	-	FPM TPI	150 14	100 10	100 6	100 3S
BABBIT	20	FPM TPI	2500 18	2000 14	1500 8	1200 6
BAKELITE	-	FPM TPI	2500 14	2300 10	2000 8	1500 6S
BERYLLIUM	-	FPM TPI	175 18	150 14	100 10	75 8
BONE	-	FPM TPI	3500 10	3200 8	3000 6	3000 3S
BRAKE LINING	-	FPM TPI	300 14	250 10	200 8	200 6
BRASS - Cast	-	FPM TPI	350 18	300 14	200 6	150 3S
BRASS - Hard Drawn	-	FPM TPI	360 18	330 14	300 8	280 6
BRASS - Soft Commercial	-	FPM TPI	2500 18	2000 14	1500 8	1300 6
BRONZE - Aluminium	-	FPM TPI	330 18	320 14	300 10	250 6
BRONZE - Manganese	-	FPM TPI	800 18	600 14	350 8	300 6
BRONZE - Phosphor	-	FPM TPI	500 18	350 14	300 8	250 6

Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.

MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
BRONZE - Silicon	-	FPM TPI	1200 18	900 14	600 10	400 6
CADMIUM	-	FPM TPI	3500 10	3200 8	3000 6H	2800 4H
CARBON	-	FPM TPI	3600 18	3600 14	3600 6	3000 3S
CARDBOARD - Corrugated	-	FPM TPI	3500 SC	3500 SC	3000 SC	3000 SC
CARDBOARD - Sheet	-	FPM TPI	3000 14	3000 10	3000 8	2500 6H
CELLULOSE ACETATE	20	FPM TPI	3500 14	3500 10	3000 8	2500 3S
CELLULOSE NITRATE	W	FPM TPI	1500 10	1200 8	1100 6S	1000 3S
COPPER - Beryllium	20	FPM TPI	2500 14	2500 10	1600 6	1200 3S
COPPER - Hard Drawn	20	FPM TPI	800 18	700 14	550 10	400 6H
COPPER - Commercial Pure	20	FPM TPI	3200 18	3000 14	2700 6	2500 3S
CORK	-	FPM TPI	3500 14	3500 10	3500 6H	3500 4H
ETHYL CELLULOSE	W	FPM TPI	3500 10	3000 8	2500 6	2000 3S
FIBER BOARD	-	FPM TPI	2500 18	1500 14	1100 10	1000 6
FORMICA	-	FPM TPI	3500 18			
FRONTIER METAL	20	FPM TPI	800 18	750 14	700 8	600 3S
GLASS BONDED MICA	-	FPM TPI	75 18	75 14	50 10	50 8
GLASS FIBER	-	FPM TPI	1000 18	1000 14	1000 10	1000 6H
GRAPHITE	-	FPM TPI	3000 18	3000 14	3000 10	2500 4H

Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.

MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
HORN - Animal	-	FPM	2500	2000	1500	1200
		TPI	24	18	14	10
IRON - Grey Cast	-	FPM	200	150	125	100
		TPI	24	18	14	10
IRON - Malleable	-	FPM	275	260	230	200
		TPI	18	14	10	6
IRON - Meehanite	-	FPM	150	130	120	110
		TPI	18	14	10	6
LEAD	20	FPM	3000	2500	1800	1200
		TPI	18	14	10	6S
LEATHER	-	FPM	3500	3200	3000	2800
		TPI	14	10	6	3S
LINEN	-	FPM	3500	3500	3500	3500
		TPI	KN	KN	SC	SC
MAGNESIUM	W	FPM	3500	3300	3200	3000
		TPI	14	10	6H	4H
MICA	-	FPM	225	225	200	200
		TPI	18	14	10	8
MONEL	-	FPM	150	125	50	50
		TPI	18	14	8	6H
NEOPRENE	-	FPM	3000	2800	2500	2300
		TPI	10	8	6	4H
NICKEL SILVER	20	FPM	300	250	200	180
		TPI	18	14	10	6
PAPER - Sheet	-	FPM	3000	3000	2500	2500
		TPI	18	14	10	6H
PAPER - Tissue	-	FPM	3500	3500	3500	3000
		TPI	SC	SC	SC	SC
PAPIER MACHE	-	FPM	3500	3500	3000	3000
		TPI	KN	10	6H	4H
PERSPEX	20	FPM	3500	3500	3000	2500
		TPI	14	10	6	3S
PHENOL FORMALDEHYDE	-	FPM	3500	3500	3000	3000
		TPI	14	10	6	3S
PLEXIGLASS	-	FPM	3500	3500	3000	2500
		TPI	14	10	6	3S

Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.

MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
POLYSTYRENE	-	FPM	3000	2500	2000	2000
		TPI	10	8	6	3S
RUBBER - Crepe	-	FPM	3500	3500	3500	3000
		TPI	10	8	6	6S
RUBBER - Hard	-	FPM	3000	2800	2500	2300
		TPI	10	8	6	4H
SILVER	20	FPM	2800	2400	2200	2000
		TPI	18	14	10	6
SLATE	-	FPM	750	700	600	500
		TPI	18	14	10	6
STEEL - Carbon Case Hardening SAE 1010 1012 1016 EN32A/B	20	FPM	180	160	150	140
		TPI	24	14	10	6H
STEEL - 0.2% Carbon SAE 1018 - 1023 EN3	20	FPM	240	210	180	160
		TPI	24	14	10	6H
STEEL - Carbon Manganese SAE 1024 1027 EN14	20	FPM	240	220	200	175
		TPI	18	14	10	6
STEEL - 0.3% Carbon SAE 1029 1030 EN5	20	FPM	230	200	180	160
		TPI	24	14	10	6
STEEL - 0.4% Carbon SAE 1037 - 1040 EN8	20	FPM	200	150	125	100
		TPI	24	14	10	6
STEEL - 0.55% Carbon SAE 1054 1055 EN9	20	FPM	200	150	125	100
		TPI	24	14	10	6H
STEEL - Low Carbon Free Cutting SAE 1111-1113 1211-1213 1215 EN1	20	FPM	250	220	200	180
		TPI	18	14	10	6H
STEEL - Case Hard Free Cutting SAE 1115 1117 EN32M,202	20	FPM	200	190	180	160
		TPI	24	14	10	6
STEEL - 0.4% Carbon Free Cutting SAE 1137-1141 EN8M	20	FPM	230	200	180	160
		TPI	24	14	10	6
STEEL - 3% Nickel SAE 2317 2330-2345 EN33,51	20	FPM	150	125	100	90
		TPI	18	14	10	6H
STEEL - 1% Chrome Molybdenum SAE 4130-4140 EN19,20	20	FPM	150	100	90	60
		TPI	18	14	10	6H
STEEL - 1½% Nickel Chrome Moly SAE 4340 EN24	15	FPM	150	125	100	75
		TPI	18	14	10	6H
STEEL - 2% Nickel Molybdenum SAE 4640 EN160	15	FPM	150	125	100	75
		TPI	18	14	10	6H

Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.

MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
STEEL - 1% Chrome Vanadium SAE 6150 EN47	15	FPM TPI	175 18	125 14	100 10	75 6H
STEEL - Nickel Chrome Moly SAE 8616-8645 EN100	20	FPM TPI	140 18	110 14	90 10	70 6H
STEEL - Silicon Manganese SAE 9255 EN45	20	FPM TPI	160 18	140 14	125 10	100 6H
STEEL - 3% Nickel Chrome SAE 9310-9217 EN36	15	FPM TPI	125 18	100 14	80 10	60 6H
STEEL - 1% Carbon Chrome SAE 50100-52100 EN31	15	FPM TPI	160 24	130 14	100 10	75 6H
STEEL - Die D-2 D-3	15	FPM TPI	125 18	100 14	80 10	60 6H
STEEL - Die D-7	15	FPM TPI	100 24	80 18	65 10	60 6H
STEEL - Hot Working H-12 H-13 H-21	15	FPM TPI	125 18	100 14	75 10	60 6H
STEEL - Tool L-6 L-7	15	FPM TPI	115 18	95 14	80 10	65 8
STEEL - High Speed M-1	20	FPM TPI	185 18	150 14	125 10	90 6H
STEEL - High Speed M-2 M-3 M-4 M-5 M-10	15	FPM TPU	130 18	100 14	80 10	60 6H
STEEL - Die O-1 O-2	20	FPM TPI	175 18	150 14	125 10	100 6H
STEEL - Die O-6	20	FPM TPI	210 18	180 14	150 10	120 6H
STEEL - Shock Resisting S-1	15	FPM TPI	125 18	100 14	80 10	65 6H
STEEL - Shock Resisting S-2 S-5	15	FPM TPI	100 18	80 14	60 10	55 6H
STEEL - High Speed T-1 T-2	15	FPM TPI	140 18	110 14	90 10	70 6H
STEEL - High Speed T-4 T-5 T-6 T-8	15	FPM TPI	115 18	95 14	85 10	70 6H
STEEL - Water Hardening	20	FPM TPI	175 18	150 14	125 10	100 6H

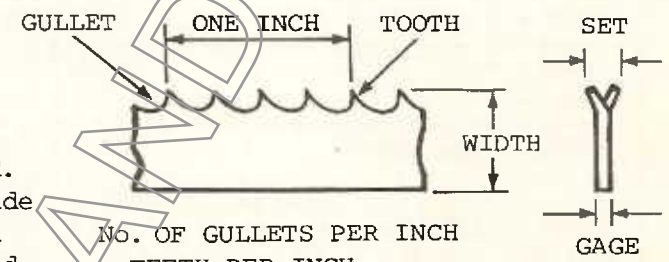
Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.						
MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS			
			UNDER ¼"	¼"-½"	½"-1"	OVER 1"
STRAW BOARD	-	FPM TPI	3500 14	3500 10	3000 8	3000 6S
STRING	-	FPM TPI	3500 SC			
TUFNOL	-	FPM TPI	2500 14	2300 10	2000 6H	1500 6H
WOOD	-	FPM TPI	3600 14	3600 10	3600 6H	3600 4H
ZINC	20	FPM TPI	2500 14	2300 10	2000 6H	1500 6H

Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW TERMINOLOGY.

An understanding of the design and application of the various types of saw blades obtainable is essential if the bandsawing technique is to be fully exploited. Selection of the most suitable blade for the job is very important as a poor choice can lead to much wasted time and money.



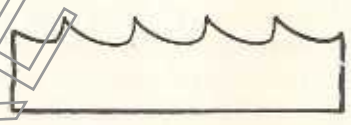
NO. OF GULLETS PER INCH = TEETH PER INCH.

TOOTH PITCH is important if optimum blade performance is to be obtained. Tooth pitch is determined mainly on the basis of material thickness and to some extent on material hardness. For a given material thickness, a tough or abrasive material will require more teeth in engagement than a soft ductile one. Too many teeth in engagement will decrease the tooth loading to the point where the teeth cannot penetrate the material and so skid across the cutting face. The heat generated by friction due to this rubbing action will cause the cutting edges to break down. It is a common error, especially where work hardening materials are concerned, to increase feed pressure so as to make the saw teeth bite under these conditions. This practice will produce a ragged inaccurate cut and rapidly destroy the saw blade. Where there are insufficient teeth in engagement however, they can penetrate the material too quickly to produce a well formed chip. The stubby chip so produced leaves an inclined face where it breaks away from the cutting face and so causes the succeeding tooth to bounce. When this condition is reached, the uneven penetration of the teeth set up periodic vibrations in the form of saw blade chatter. Persistant sawing under these conditions can dull the teeth by impact and in extreme cases, cause the tips of the teeth to break away. The chip produced by each tooth remains trapped in the gullet until it emerges from the underside of the workpiece, therefore as the material thickness

increases, the gullet must accommodate a larger chip. Considerable heat is generated if the chip is compressed into insufficient gullet space and with ductile materials, such chips tend to become welded to the teeth resulting in seizure or breakage of the saw blade.

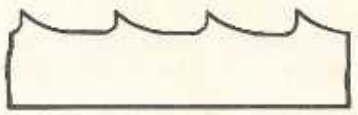
TOOTH FORM refers to the profile of the tooth. Metal cutting bandsaw blades are generally manufactured with one of three basic forms, namely, Regular, Skip, or Hook tooth form. Terminology varies among saw blade manufacturers and these may be otherwise referred to as Precision, Buttress, and Claw tooth respectively.

REGULAR TOOTH saw blades are the most common in 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 accurate fine finish work in steel and most medium hard materials but tend to clog when used on soft or ductile alloys. Standard pitches are 6,8,10,14,18,24 & 32 teeth per inch.

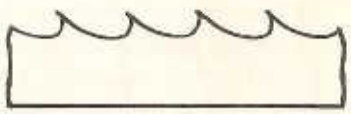


REGULAR TOOTH

SKIP TOOTH form is similar to the regular tooth form but alternate teeth are omitted, a design which allows greater gullet capacity without unduly weakening the body of the blade. Providing the thickness of the material permits, a skip tooth saw blade will give best performance on aluminium and copper alloys. Fast economical sawing of hardwoods and plastics are possible with this type of saw blade. Standard pitches are 3,4 & 6 teeth per inch.



SKIP TOOTH



HOOK TOOTH

HOOK TOOTH form has positive front rake which considerably assists work penetration and hence produces faster cutting times on harder materials. The coarse pitch and large gullets associated with this type of saw blade make it particularly suitable for sawing deep sections. It is not recommended for use on abrasive materials. Standard pitches are 2,3,4 & 6 teeth per inch.

TOOTH SET is the angling of the saw teeth so that the tips protrude beyond the body of the saw blade. The width of the saw cut produced provides the working clearance necessary for the body of the saw blade and permits some degree of steering to negotiate curves.

STANDARD SET teeth are set alternately to the left and to the right, a style which is popular for cutting soft materials and wood.

RAKER SET saw blades have one tooth set to the left and one tooth set to the right followed by one unset tooth. This style of set is widely used and is to be preferred for contour sawing.

RAKER SET

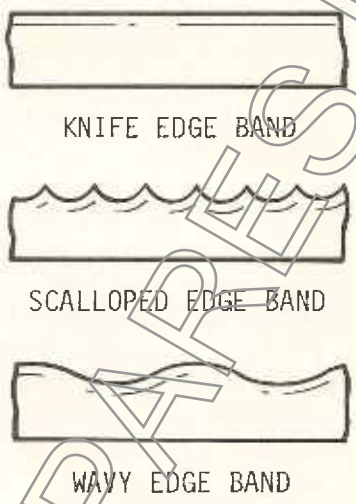
WAVY SET blades have the teeth alternately set to the left and right in groups or waves. With this formation of tooth set, relatively few teeth are cutting at the side of the kerf and therefore there is some tendency for the saw blade to jam when sawing abrasive materials.

WAVY SET

SECTION 16

SAW GAGE is the actual thickness of the body of the saw blade. Some makers produce special gage saw blades for specific purposes but generally saw blades up to and including ½" wide are .025", ⅝" and ¾" wide are .032", and 1" wide are .035" gage thickness.

Knife edge bands are suitable for cutting soft material such as woven fabrics, sponge, rubber, and corrugated cardboard. Where the nature of the material is fibrous and difficult to sever, wavy or scalloped edge blades are better as the teeth provide a more positive cutting action. Typical applications are cutting cork, filter elements, felt and composite materials such as transformer coils. Because these bands separate the material, no dust or swarf is produced and a smooth finish is usually obtained.
Most plastics can be sawn with a metal cutting saw blade. Very little difficulty should be experienced in sawing thermosetting materials, although some have an abrasive nature which shortens the life of a saw blade.



BLADE WIDTH FOR CONTOUR SAWING.

For contour sawing the width of the saw blade must be chosen with regard to the smallest radius to be sawn, thus a small radius will demand the use of a narrow saw blade. The beam strength and permissible tension decreases rapidly for narrow saw blades and it therefore follows that narrow saw blades are particularly sensitive to excessive stress which will cause stretching and deformation at low speed or premature breakage through fatigue at high speed. Saw blades which fail through abuse of this kind are useless and must be discarded although the teeth may be still in good condition. It is impossible to be precise as to the smallest radius any given saw blade will cut as so much depends on job conditions and the skill of the operator.
The Saw Blade Width Selection Chart below offers a basic guide on this point. Several drilled holes at strategic points around the contour may be necessary to negotiate small radii or cut to a sharp corner.

SAW BLADE WIDTH	⅛"	3/16"	¼"	⅜"	½"	⅝"	¾"
MINIMUM SAWING RADIUS	5/16"	5/8"	1"	1½"	2½"	4"	5¾"

NOTE : Blade width capacity of machines vary according to model.

BANDSAWING PRACTICE.

For straight sawing use the widest saw blade the machine will accept.
The success of a bandsawing operation is determined by the accuracy, finish, blade cost and operating time involved. It is usually possible to improve on one of these factors at the expense of the others, and this may be expressed in general terms as follows :-

Maximum saw blade life : Medium saw blade tooth pitch, speed and feed.
Minimum sawing time : Coarse tooth pitch, fast speed and heavy feed.
Fine accurate finish : Fine tooth pitch, fast speed and light feed.

COMMON SAWING PROBLEMS.

BLADE WANDERS FROM TRUE LINE :

Excessive feed pressure.
Blade teeth dull or of too fine pitch.
Guide inserts not controlling blade through wear or incorrect adjustment.
Blade tracking incorrect.
Loss of set to one side of saw teeth.

PREMATURE BLADE BREAKAGE :

Excessive feed pressure, and/or too much blade tension.
Worn or incorrectly set guides.
Joint improperly welded and annealed.
Blade too wide for curved cut.
Bandwheels worn.
Blade teeth of too fine pitch.

BLADE BOWS IN DEEP CUT :

Excessive feed pressure.
Blade teeth dull or of too fine pitch.
Insufficient blade tension, and/or blade too narrow for depth of cut.
Blade running off at start of cut.

BLADE TEETH DULL RAPIDLY :

Insufficient feed pressure.
Blade pitch too fine.
Guide inserts snagging set of teeth.
Speed too fast.

TEETH TORN FROM BLADE :

Excessive feed pressure.
Gullets of teeth loading.
Pitch of teeth too coarse.
Blade speed too fast.

BLADE DEVELOPING TWIST :

Excessive feed pressure.
Guide inserts snagging blade.
Blade too wide for radius of cut.
Excessive blade tension.
Blade not tracking correctly.
Loss of set to one side of saw teeth.

BLADE VIBRATES IN CUT :

Workpiece not properly seated or securely held.
Blade speed too fast, and/or blade pitch too coarse.
Insufficient blade tension.

DIE MAKING.

By careful drilling it is possible to produce a punch and die from one piece of material, the waste from the die aperture forming the punch, see Fig.1. The chart gives recommended saw blade width, hole sizes, and angles for die thickness of ½" - 3".

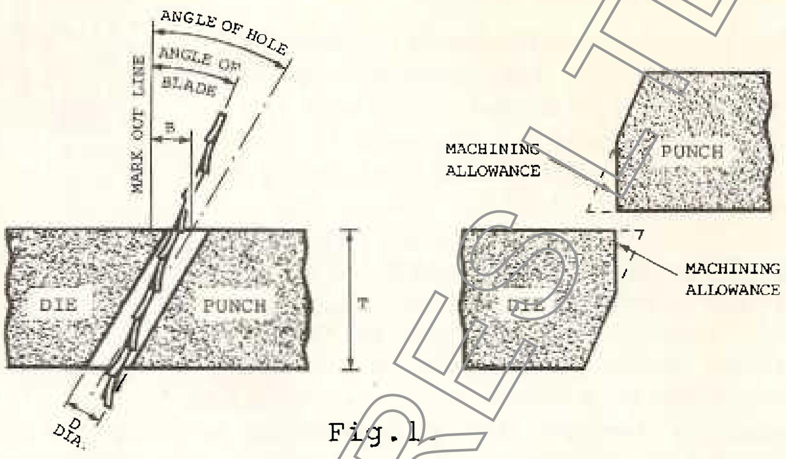


Fig.1.

DIE THICKNESS T.	½"	¾"	1"	1¼"	1½"	1¾"	2"	2½"	3"
BLADE WIDTH B.	⅛"	⅛"	⅛"	3/16"	3/16"	3/16"	3/16"	¼"	¼"
ANGLE OF HOLE	37°	26½°	20½°	24°	20½°	18°	15½°	16½°	14°
HOLE DIA. D.	3/16"	3/16"	3/16"	9/32"	9/32"	9/32"	9/32"	⅜"	⅜"
ANGLE OF BLADE	26½°	18½°	14°	16½°	14°	12°	10½°	11½°	9½°

For other combinations of die thickness and saw blade width calculate the machining geometry as follows :-

Let T = Die Thickness
B = Width of selected saw blade
Then :- Starting hole diameter = $\frac{3B}{T}$
Starting hole center to mark out line = B
Tangent of starting hole angle = $\frac{3B}{T}$
Tangent of saw blade angle = $\frac{2B}{T}$

By following the foregoing formulae, a machining allowance equal to 75% of the saw blade width will be obtained. This allowance may be reduced by slight alteration of the drilling and sawing angles.

TANGENTS OF ANGLES.											
TANGENT	.017	.035	.052	.070	.087	.105	.123	.140	.158	.176	.194
ANGLE	1°	2°	3°	4°	5°	6°	7°	8°	9°	10°	11°
TANGENT	.213	.231	.249	.268	.287	.306	.325	.344	.364	.384	.404
ANGLE	12°	13°	14°	15°	16°	17°	18°	19°	20°	21°	22°
TANGENT	.424	.445	.466	.488	.510	.532	.554	.577	.601	.625	.649
ANGLE	23°	24°	25°	26°	27°	28°	29°	30°	31°	32°	33°
TANGENT	.675	.700	.727	.754	.781	.810	.839	.869	.900	.933	.966
ANGLE	34°	35°	36°	37°	38°	39°	40°	41°	42°	43°	44°

SECTION 17

BUTT - WELDING SAW BLADES.

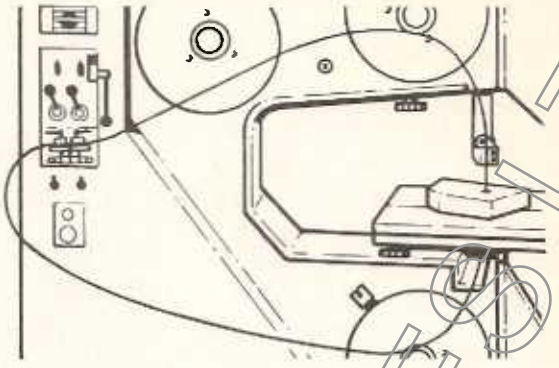


Fig.2.

The process of butt-welding consists of clamping the saw blade between two sets of jaws, one set fixed and the other set moveable. The ends of the blade are heated by the passage of a heavy electric current and at the same time, they are forced together by a pre-determined amount under spring pressure. The blade welding unit enables the operator to rejoin broken blades or to produce new bands from bulk coil blade strip as required. Internal contours may be sawn after passing one end of the blade strip through a starting hole, then making the joining weld, see Fig.2.

PREPARING THE SAW BLADE.

Cut the saw blade to length using the blade shear attached to the front of the welder. The shear is operated by moving the handle upwards. With coarse pitch blades, the blade should be sheared in line with the tooth point in order to maintain a uniform tooth pitch after welding. It is important that the ends of the blade are sheared square in both planes. To achieve this the blade is to be inserted in the shears with the teeth facing to the front. The back edge of the blade must seat against the back of the shears and against the alignment stop. Thoroughly clean each end of the blade with emery for a distance of 1½" until bright metal shows over the whole width of the blade. Make sure the clamping jaws of the welder are free from dirt and grease.

WELDING.

A diagram of the butt-welder is given in Fig.3. Adjust the welding current, up-set way and up-set pressure according to saw blade width. Place the prepared ends of the blade into position by means of the clamping screws, making sure that the two ends of the blade butt together at a point mid-way between the jaws. In order to avoid damage to both jaws and blade, it is important that the blade teeth face forward against the front stops. Turn the up-set way lever to the position marked WELD and hold it there until the weld is finished. The current is switched off automatically at the completion of the welding operation. After welding, slacken the clamping screws.

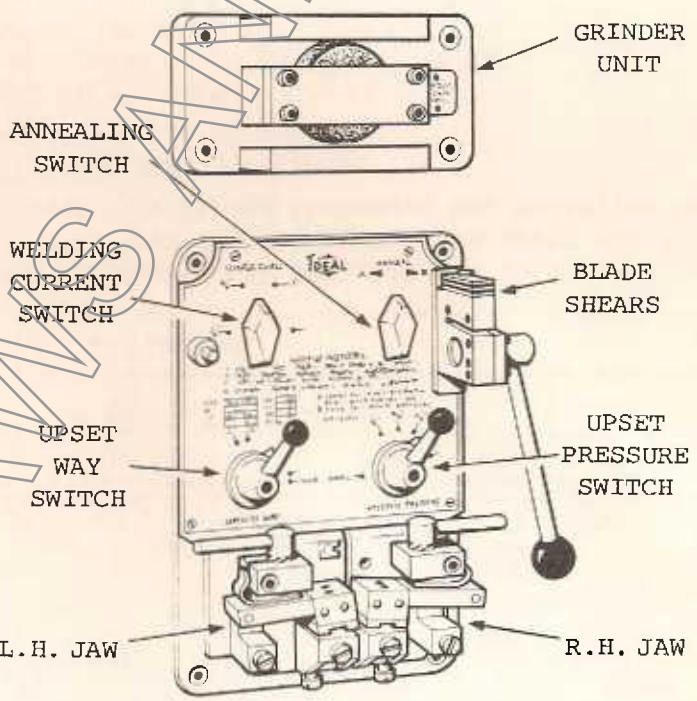


Fig.3.

CAUTION :
Sparks may fly during welding, therefore it is advisable to protect the face.

ANNEALING.

A join produced by welding alone is brittle and would break after very little service. In order to overcome this the blade join must be annealed by a second operation. Set the up-set way swich to the ANNEAL position. Re-clamp the blade with the weld midway between the jaws. Press the anneal button continuously until the weld is a dark cherry red. This process should be repeated a few seconds at a time letting the heat go slowly. Gradually reduce the length of time that the button is depressed as the process proceeds.

FINISHING.

The excess weld flash must be removed by grinding, some care being taken to maintain a uniform blade thickness.
The gullets of the teeth adjacent to the weld should be cleaned out as necessary. After the weld has been dressed in this fashion, anneal the joint to a pale blue color.

POSSIBLE FAULTS.

If the weld has run too much or even shows holes, then the proportion of up-set pressure to welding is incorrect. In such a case increase the up-set pressure or decrease the welding current, it may be necessary to do both. If however, the up-set pressure is too great and the welding current too small, the weld will have the appearance of loose layers.

NOTE : Operating characteristics may vary slightly according to supply voltage therefore it may be necessary to use an alternative setting in order to achieve optimum results.

CARE OF THE BUTT - WELDING UNIT.

The most important part of the care of the welder is the careful handling of the bronze jaws. It is impossible to obtain satisfactory welds with dirty or uneven jaws. Any drops of weld, or dirt which may have entered the jaws should be removed immediately. From time to time check the clamps for uniform clamping pressure as follows :- Place in position as for annealing, a clean smooth band (blade with set of teeth removed) as wide as the jaws. Upon operation of the annealing button, the band should become simultaneously and uniformly red over the whole width. If this is not the case, inspect the clamps for any foreign matter which may have entered. If the jaws and pressure faces appear clean, it will be necessary to dress the pressure faces where the band heats most quickly bearing in mind that the band heats less quickly where the clamping pressure is least. The pressure faces should be dressed in line with fine emery wrapped around a piece of wood. Take care to thoroughly clean away emery dust. The bronze jaws should not be filed. The moving jaws are mounted on a sensative ball bearing track and therefore should not be forced in any way.

CARE OF THE GRINDING UNIT.

The grinding motor will produce excessive whine if allowed to run with an unbalanced wheel. Dress new wheel upon replacement and if necessary, adjust wheel clamping washer to run eccentric in order to improve dynamic balance. Dress periphery of wheel occasionally to remove embedded swarf.

Wheel size : 63 mm. Dia. x 15 mm. Wide x 10 mm. Bore
Grade : A 46 PV
Max. speed : 3000 r.p.m. Synchronous

GRAVITY FEED MIST SPRAY

Fig.1 shows the Gravity Feed Mist Spray kit(part No.PK115) fitted to a machine. The coolant is delivered through a drip feed system, which works in conjunction with an air pump driven from the main motor. The spray nozzle should be positioned as close as is convenient to the saw blade with the air jet impinging on the teeth at the point of entry into the workpiece. Apart from cooling and lubricating the saw teeth, the air/spray assists in cleaning the saw gullets and removes swarf ahead of the saw cut to facilitate following a marked line. A solution of one part STARCOOL soluble cutting oil with twenty parts water will prove suitable for machining most materials where a coolant is required. The necessary quantity to be applied is quite small and generally be no more than can be evaporated and carried away by the chips. Pools of coolant forming on the job and table serve no useful purpose and usually indicate that excessive coolant is being used.

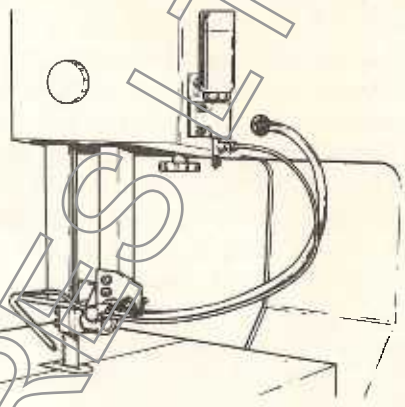


Fig.1.

NOTE : DILUTED STARCOOL SOLUBLE CUTTING OIL IS THE ONLY RECOMMENDED COOLANT. USE OF OTHER OILS MAY CAUSE DIFFICULTY IN OPERATION, AND IN SOME CASES, DAMAGE TO PARTS OF THE MACHINE.

CIRCLE CUTTING ATTACHMENT.

Fig.2 shows the circle cutting attachment (Part No.SP260) in use on a machine, which facilitates the production sawing of circular blanks up to 18" dia. The unit is easily fitted to the tool post and thus may be raised and lowered when feeding blanks without disturbing the setting of the location pin. A drilled or punched location point will be required in each blank, the location being positioned at a distance equal to the sawing radius from one edge. Sufficient material should be allowed on the other sides of the blank to prevent the blade emerging from the cut until the full circle has been completed. Select the blade width according to the radius to be sawn. The location pin must be set to lie tangential to the blade otherwise blade wander will result. If the blade tends to cut away from a true circle, the pin position is incorrect, or possibly the blade is too wide.

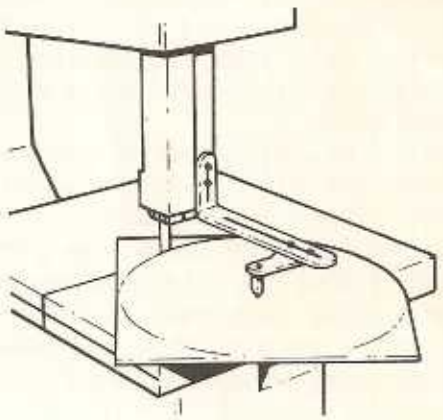


Fig.2.

RIP FENCE.

Fig.3 shows the rip fence (Part No. SP302) in use on a machine. It can be used for making accurate parallel cuts using hand feed, or as a work stop using power feed.

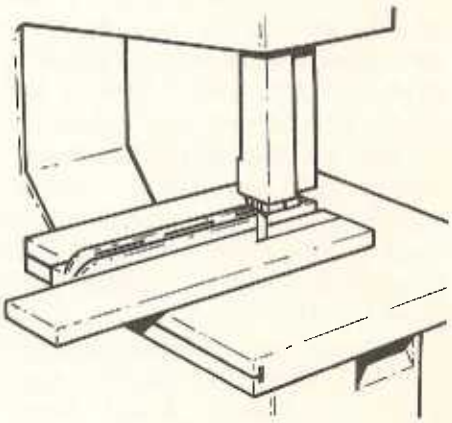


Fig.3.

SECTION 20

BANDFILE GUIDE.

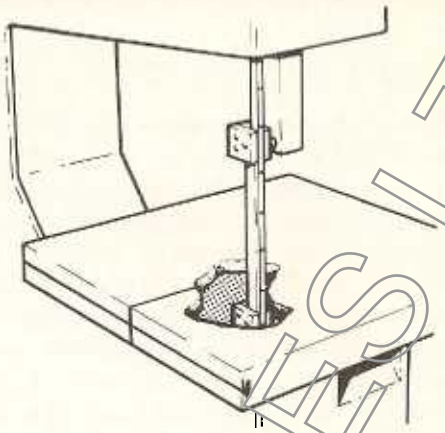


Fig.4.

Fig.4 shows the bandfile guide (Part No. SP287) in position on a machine, which adapts the machine for power filing. Band filing presents an economic method of production machining straight and contour faces. Because there is no tendency for the file to rock, wide faces can be finished to fairly close tolerances. Bandfiles consist of short lengths of file sections attached to a flexible steel band which has a joint for unlocking and re-joining, thus permitting the filing of internal contours. The guides will accommodate standard files of ¼", ⅜", or ½" width.

To set up the machine for bandfiling :-

Remove the saw blade, blade guides, blade guard and table insert. Assemble back guide and spacers to suit width of file to be used. Insert the support arms into the same holes as used to locate the blade guides. Mount the band file on the bandwheels with the teeth facing downwards through the table, and track in a similar way to a saw blade. Apply only sufficient tension to keep the fileband on the bandwheels without it slipping. NOTE : EXCESSIVE TENSION WILL DAMAGE THE BAND. Position the bandfile back guide just clear of the back fence of the band. Fit special table insert provided.

WARNING : An incorrectly adjusted file guide may prevent the file segments from interlocking in the correct manner and thus result in the segments being torn from the backing band. It is important that a new bandfile is only lightly loaded when first used in order to allow the file segments to bed down.

Use a filing speed of around 60 feet per minute for die steel, and up to 120 feet per minute for mild steel. Speeds in excess of 300 feet per minute may damage the bandfile.

Embedded swarf should be periodically removed to prevent the workpiece being scored. This problem can be reduced by a light application of tallow or chalk. Care must be taken to avoid kinking the backing band in storage and for this reason, the bandfile should be stored in its original container when not in use.

ABRASIVE BAND GUIDE.

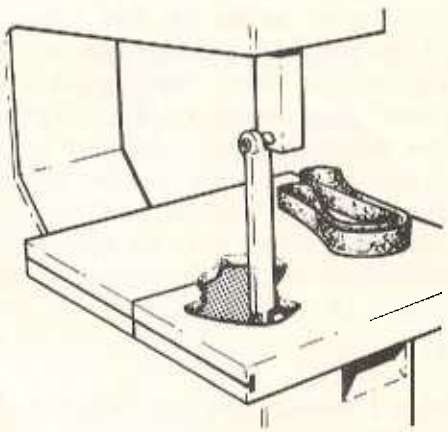


Fig.5.

Fig.5 shows the abrasive band guide (Part No. SP298) set up on a machine. One inch wide abrasive bands are available in 40,80 or 120 grit and are ideal for a large variety of small finishing and deburring operations.

To set up the abrasive band guide :-

Remove the saw blade, blade guides, blade guard and table insert. Assemble abrasive band guide into the same holes as used to locate the blade guides. Mount the abrasive band on the bandwheels, with the joint of band overlap (on the abrasive side) to face upwards from the table. Apply tension as for a ¼" wide blade. Align face of guide to back of band. Use highest blade speed available.

PUSHER ATTACHMENT.

Fig.6 shows the pusher attachment (Part No. SP358) in use on a machine. The pusher provides an easy means of feeding and controlling the workpiece.

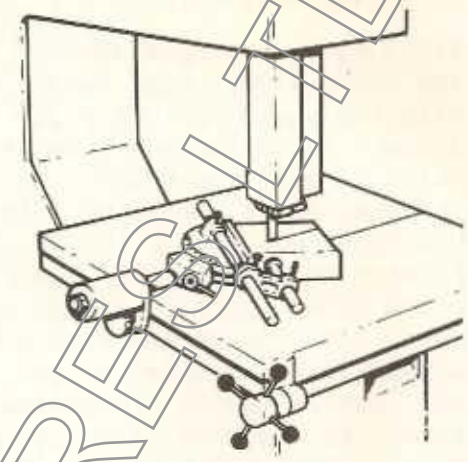


Fig.6.

CONTOUR WORK HOLDING KIT.

Fig.7 shows the contour work holding kit (Part No. PK64A) in use on a machine. The mechanical advantages offered by the hand feed mechanism of the sliding table can be used to some advantage in die making. The die block cannot be clamped to the work table in the usual way if contour sawing is involved as manipulation of the workpiece is necessary. In this instance, the table motion can be transferred by roller chain passing both around the workpiece and a jockey wheel attached to the rack cover at the rear of the table. By this method, the workpiece is steered by one hand and feed applied by the other. Hold circular work-piece by wrapping the chain directly around the job. To prevent the chain slipping, saw a small slot in the periphery of the work-piece and insert a small piece of saw blade so as to engage with the chain.

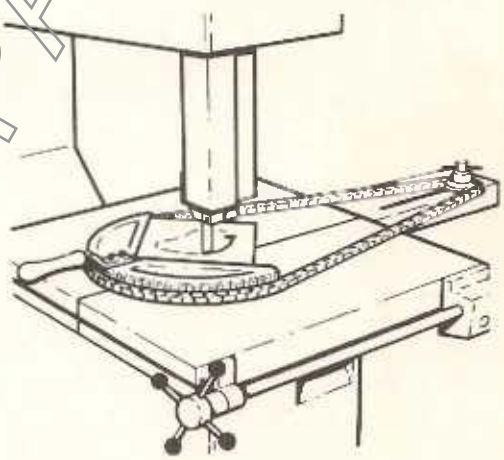


Fig.7.

UNIVERSAL WORK HOLDING KIT.

For dealing with standard shapes and sections, a universal work holding kit (Part No. PK64) is available for use on a sliding table. Fig.8 shows a typical set-up constructed from standard parts of the kit to hold round bar. This type of fixture will accomodate bars from ¼" to 5" dia. for either square or angled cutting. The kit provides a flexible system of construction whereby a variety of work table fixtures can be rapidly devised and assembled by the operator. By this method, many production notching, splitting and trimming jobs can be tackled with negligible tooling costs. A typical example of this is the slicing and trimming of thin wall tubing which presents both a location and clamping problem. If the clamping pressure is too great, the tube will be deformed. Should the clamping pressure be insufficient, however, the tube will slip under cutting pressure and probably damage the saw blade.

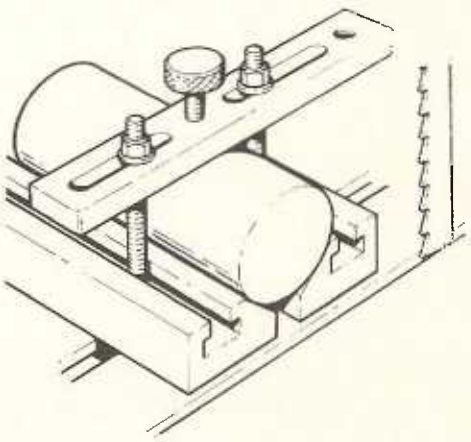
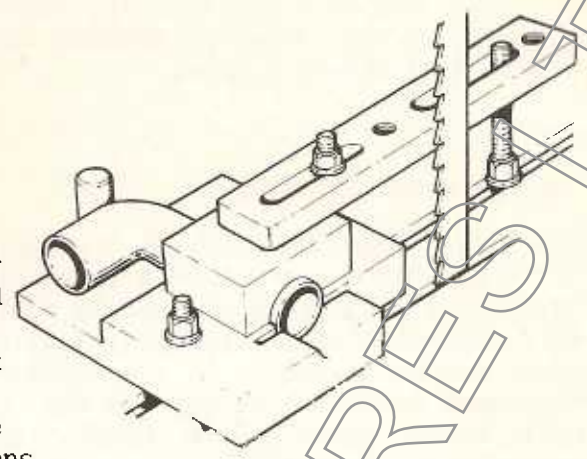


Fig.8.

UNIVERSAL WORK HOLDING KIT (CONT.)

Fig.9 shows a simple fixture to locate and clamp formed pipe bends for an end trimming operation. This low cost fixture was made from a hardwood block bored to suit the outside of the tube and then split across the center of the hole. One of the halves is reduced in size to form a clamp pad. The larger piece forms the base of the fixture and is fitted with an end stop pin to determine the trimmed length. The break off burr is almost eliminated by extending the base so as to support the tube on both sides of the cut. Variations of this type of fixture will eliminate distortion when sawing irregular extruded sections.



PARTS LISTS & ILLUSTRATIONS
FOR OPTIONAL EXTRA EQUIPMENT.

CIRCLE CUTTING ATTACHMENT - ASSEMBLY No.SP260

ITEM	PART NUMBER	DESCRIPTION	No.OFF
20	2545	Arm	1
21		Soc. Hd. Cap Screw	5
22		Std. Washer	5
23	2544	Bracket	1
24	2543	Location Pin	1

GRAVITY FEED MIST SPRAY - PART No.PK115

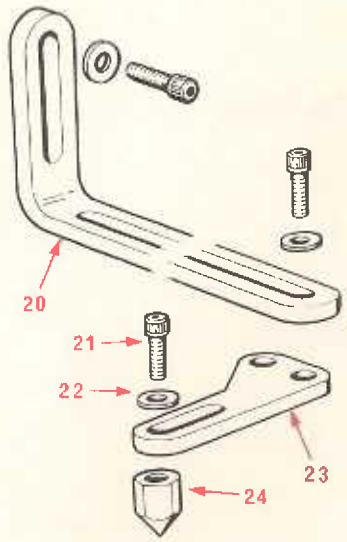
40	SP679	Coolant Tube	1
41		Nylon Tube	1
42		Nut	1
43		Ferrule	1
44		Metering Valve	1
45		Soc. Hd. Cap Screw	4
46		Shakeproof Washer	4
47		Mills Pin	1
48	4202	Valve Stem	1
49	4200	Valve Body	1
50	1209	Sealing Washer	1
51	4203	Screw Cap	1
52		Polypropylene Bottle	1
53		Tap Washer Neoprene	1
54	4201	Bush	1
55	4204	Instruction Plate	1
56	4199	Mounting Bracket	1

GRAVITY FEED MIST SPRAY - SPARES KIT No.KM519

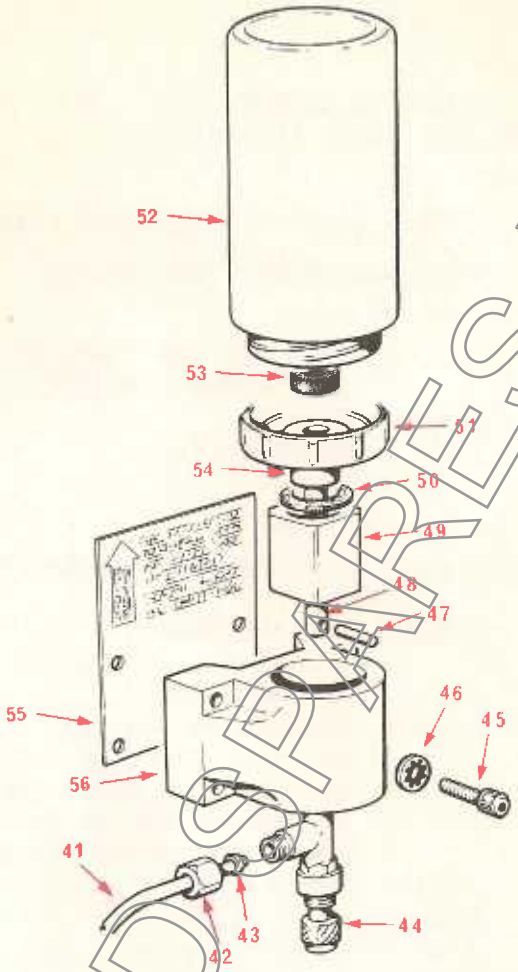
This Spares Kit consists of Items 47 to 51 & 53 to 55.

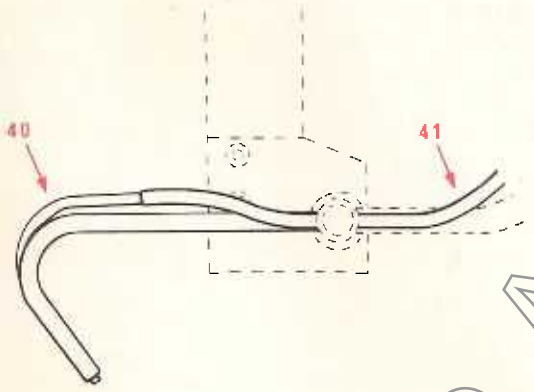
RIP FENCE - ASSEMBLY No.SP302

60	1205	Fence	1
61	2575	Spring	1
62	1114	Special Washer	1
63	1143	Locking Handle	1
64		Mills Pin	1
65	1112	Adjustment Collar	1
66	1111	Locking Handle	1
67	1206	Bracket	1
68	3229	Stud	1
69	2842	Tenon Nut - Small	2
70	2841	Stud	1
71	1113	Adjustment Screw	1

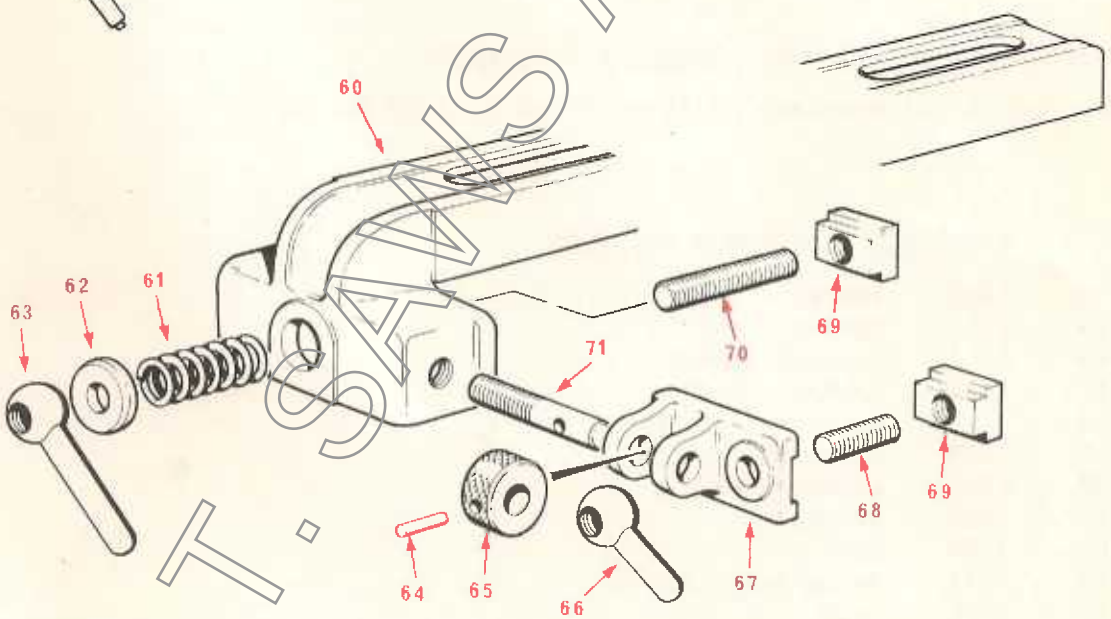


CIRCLE CUTTING
ATTACHMENT





GRAVITY FEED MIST SPRAY



RIP FENCE

20/21-6

PUSHER ATTACHMENT - ASSEMBLY No.SP358

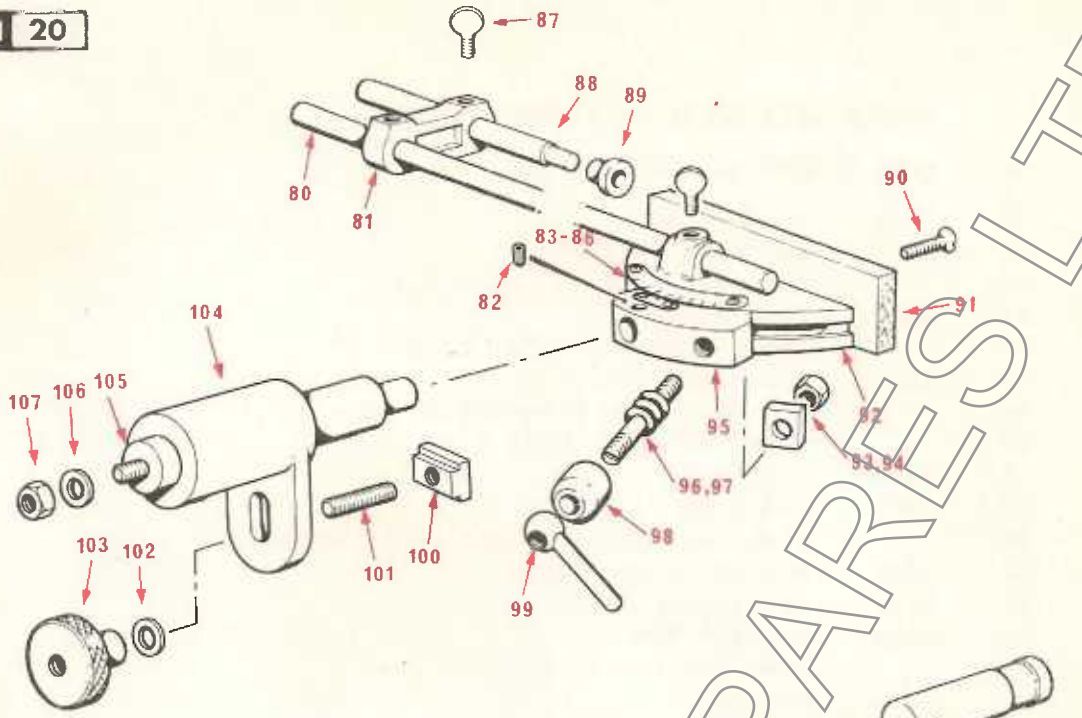
ITEM	PART NUMBER	DESCRIPTION	No.OFF
80	1822	Slide Shaft	1
81	1507	End Stop Bracket	1
82		Soc. Set Screw	1
83	1388	Zero Plate	1
84		Drive Screw Type	2
85	1513	Indicator Scale	1
86		Rd. Hd. Screw - Recessed	2
87		Thumb Screw	3
88	1526	Stop Rod	1
89	1837	End Stop	1
90		C'sk. Hd. Screw - Slotted	2
91	1821	Wooden Facing Plate	1
92	1511	Protractor Body	1
93	1820	Special Nut	1
94		Hex. Locknut	1
95	1514	Cradle	1
96	1499	Compression Spring	1
97	1516	Stud	1
98	1515	Sleeve	1
99	1143	Locking Handle	1
100	2842	Tenon Nut - Small	1
101	3229	Stud	1
102		Std. Washer	1
103	2513	Thumb Knob	1
104	2512	Housing	1
105	2975	Shaft	1
106	2447	Special Washer	1
107		Hex. Nut	1

ABRASIVE BAND GUIDE - ASSEMBLY No.SP298

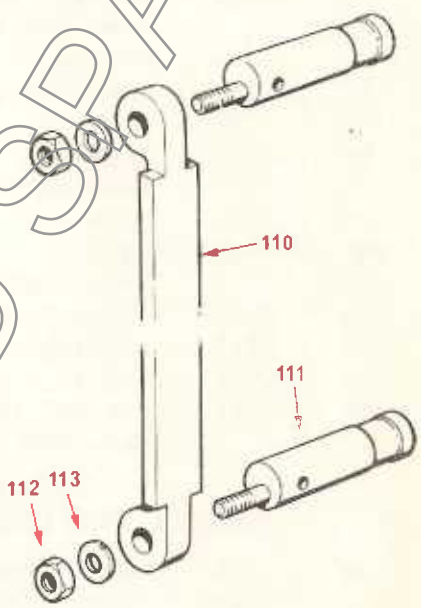
110	2426	Back Guide	1
111	2425	Support Arm	2
112		Hex. Nut	2
113		Std. Washer	2

BANDFILE GUIDE - ASSEMBLY No.SP287

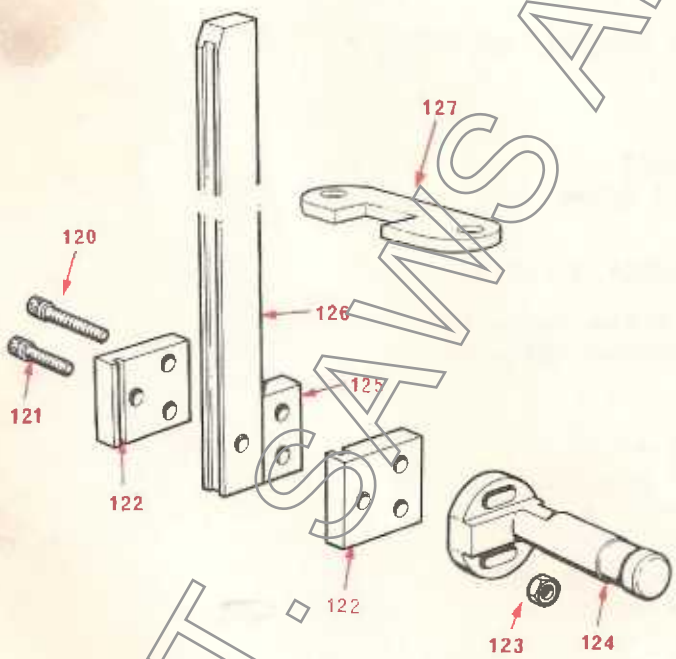
120		Soc. Hd. Cap Screw	4
121		Soc. Hd. Cap Screw	1
122	1984	Edge Guide	4
123		Hex. Nut	4
124	2377	Guide Bracket	2
125	1990A	Spacer for ¼" Bandfile	2
	1990B	" " ⅜" "	2
	1990C	" " ½" "	2
126	1989A	Back Guide for ¼" Bandfile	1
	1989B	" " " ⅜" "	1
	1989C	" " " ½" "	1
127	3613	Special Table Insert (Sliding Tables)	1



PUSHER ATTACHMENT



ABRASIVE BAND GUIDE



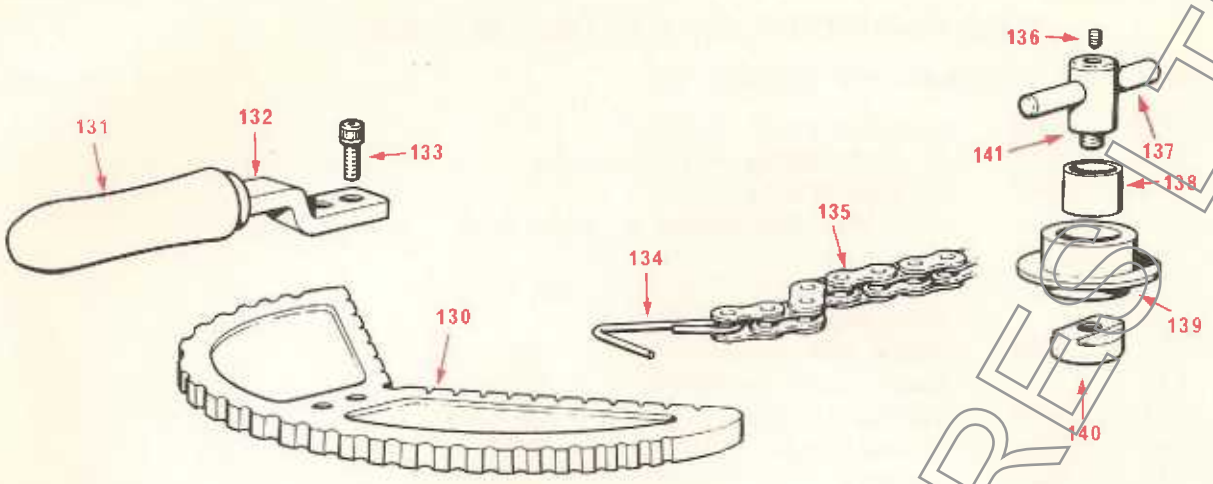
BANDFILE GUIDE

CONTOUR WORK HOLDING KIT - ASSEMBLY No.PK64A

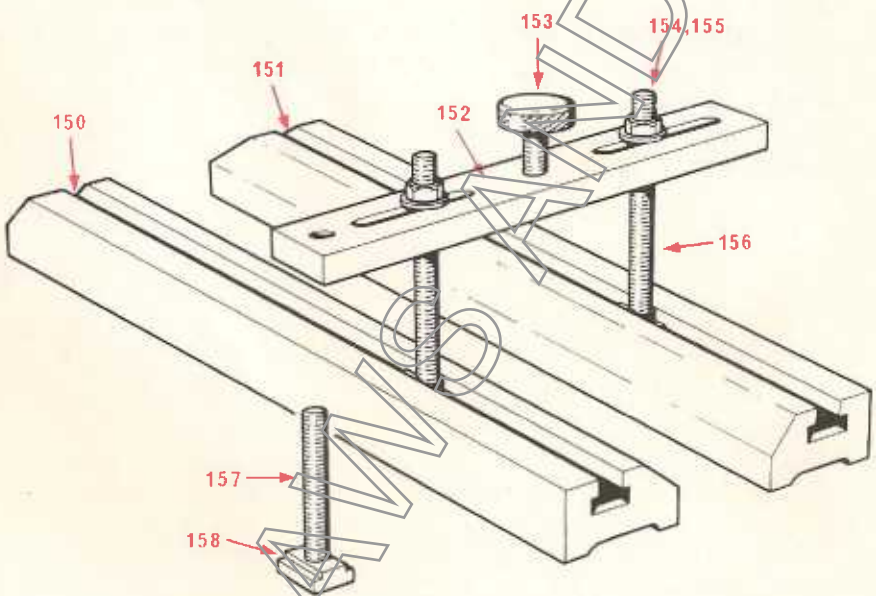
ITEM	PART NUMBER	DESCRIPTION	No.OFF
130	2008	Notched Work Holder	1
131		5" Pad Handle with Ferrule	1
132	2862	Handle Bracket	1
133		Soc. Hd. Cap Screw	2
134	2863	Hook	1
135		Roller Chain	1
136		Soc. Set Screw	1
137	2864	Tommy Bar	1
138		Compo Bush	1
139	2865	Flanged Pulley	1
140	2866	Spindle Nut	1
141	2867	Spindle	1

UNIVERSAL WORK HOLDING KIT - ASSEMBLY No.PK64

150	2837	Work Holder - L.H.	1
151	2838	Work Holder - R.H.	1
152	2839	Clamp Bar	2
153	2843	Thumb Screw	2
154		Hex. Nut	12
155		Std. Washer	12
156	2840	Stud	4
157	2841	Stud	6
158	2842	Tenon Nut - Small	8



CONTOUR WORK
HOLDING KIT



20-10

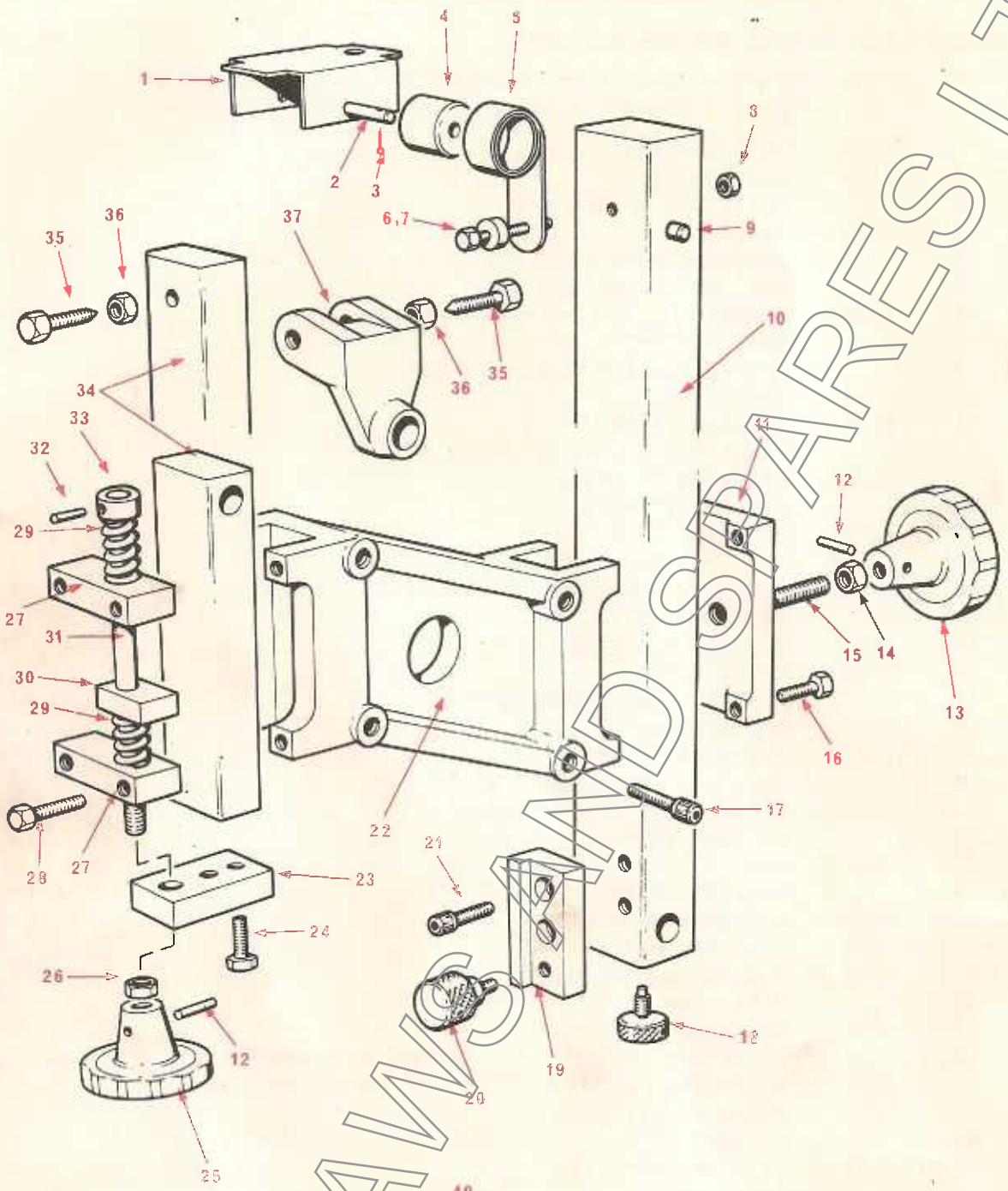
UNIVERSAL WORK
HOLDING KIT

TOP BRACKET - ASSEMBLY Nos.SP598/SP599

ITEM	PART NUMBER	DESCRIPTION	No.OFF
		NOTE : SP598 - Items 1 to 34 ONLY (20" Throat Machines) SP599 - Items 1 to 37 (14" & 30" Throat Machines)	
1	2378	Reel Bracket	1
2	2379	Reel Spindle	1
3		Split Pin	2
4	4105	Reel	1
5		Tensator Spring	1
6		Hex. Hd. Screw	1
7	4104	Washer	1
8		Hex. Nut	1
9		Spring Dowel	1
10	4106	Tool Post	1
11	4108	Capping Plate	1
12		Mills Pin	2
13	5130	Handknob	1
14		Locknut	1
15	2339	Clamping Stud	1
16		Hex. Hd. Screw	4
17		Soc. Hd. Cap Screw	4
18	2501	Thumb Screw	1
19	2453	Top Guard Bracket	1
20	2338	Thumb Screw	1
21		Soc. Hd. Cap Screw	2
22	4103	Top Bracket	1
23	2345	Threaded Block	1
24		Hex. Hd. Screw	2
25	5132	Handknob	1
26		Locknut	1
27	3258	Cap	2
28		Hex. Hd. Screw	4
29	2490	Compression Spring	2
30	2341	Register Block	1
31	3260	Tensioning Screw	1
32		Mills Pin	1
33	2520	Threaded Collar	1
34	4107	Guide Bar (SP598 - 20" Throat Machines)	1
	3259	Guide Bar (SP599 - 14" & 30" Throat Machines)	1
35	5682	Pivot Screw	2
36		Locknut	2
37	5681	Tilt Bracket	1

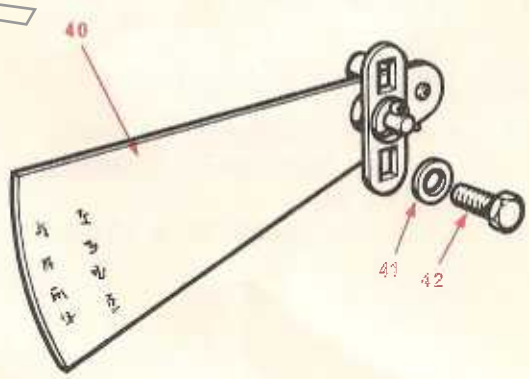
TENSION INDICATOR ASSEMBLY

40	SM963	Tension Indicator Assembly	1
	SM963/1	Tension Indicator Assembly (U.S.A. ONLY)	1
41		Washer	2
42		Hex. Hd. Screw	2



TOP BRACKET

32/33·2



TENSION INDICATOR

FIXED BANDWHEEL HUB - ASSEMBLY No.SM213

ITEM	PART NUMBER	DESCRIPTION	No.OFF
		NOTE : Fitted to all machines from Serial No.56399 onwards. Identified by 'grooved ring' on bandwheel hub.	
60	5134	Spindle	1
61	5115	Bandwheel Hub	1
62		Circlip Internal	2
63		Ball Bearing	2
64	5116	Spacer	1
65	4941	Washer	1
66		Hex. Hd. Screw	4
67		Washer	3

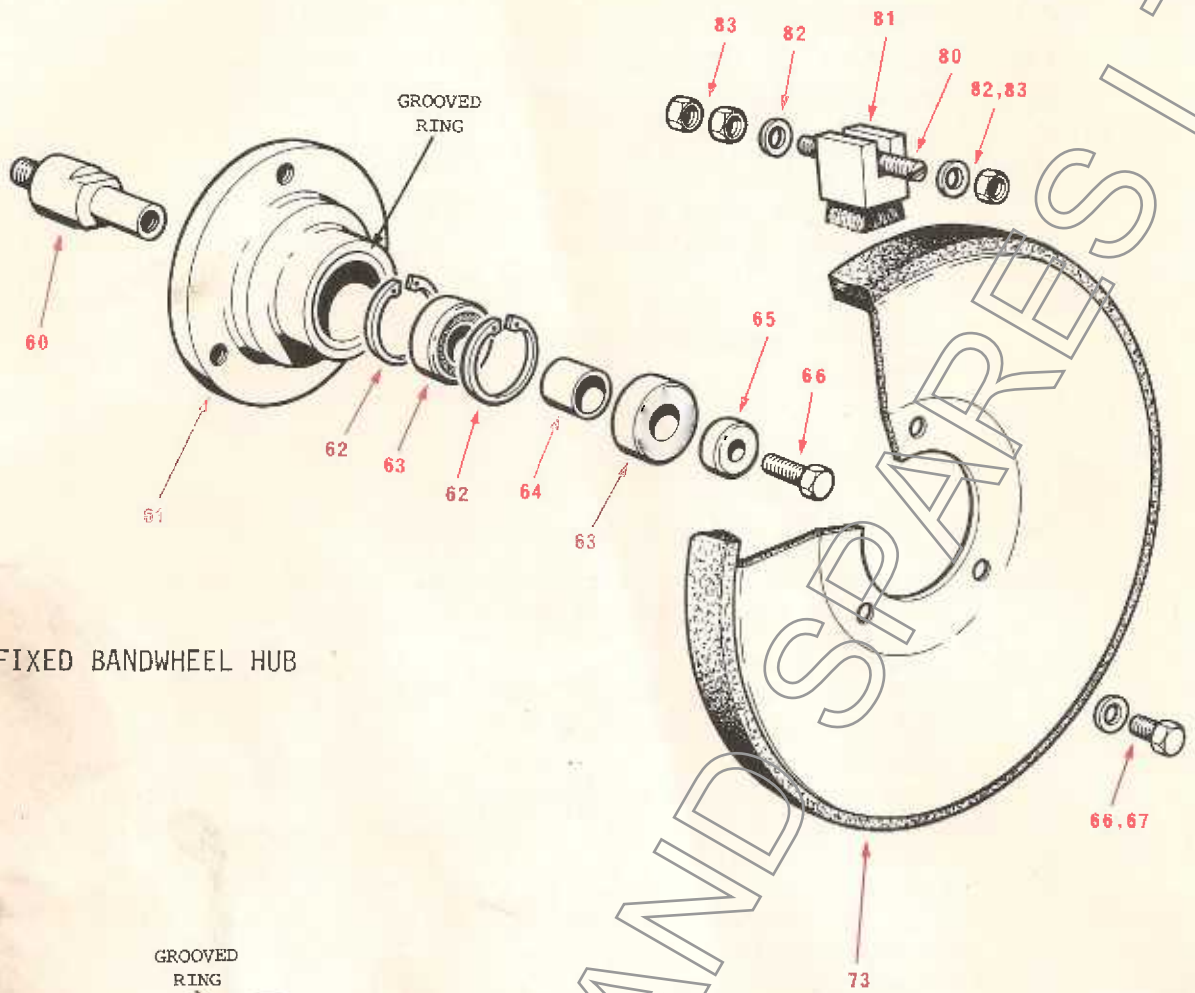
TRACKING BANDWHEEL HUB - ASSEMBLY No.SM284

		NOTE : Fitted to all machines from Serial No.56399 onwards. Identified by 'grooved ring' on bandwheel hub.	
61	5115	Bandwheel Hub	1
62		Circlip Internal	2
63		Ball Bearing	2
64	5116	Spacer	1
66		Hex. Hd. Screw	3
67		Washer	3
68	5117	Jacking Screw	1
69	5114	Spindle	1
70		Soc. Set Screw	2
71	5118	Control Knob	1
72	2466	Instruction Label	1
73	2473	Bandwheel 14" Dia	

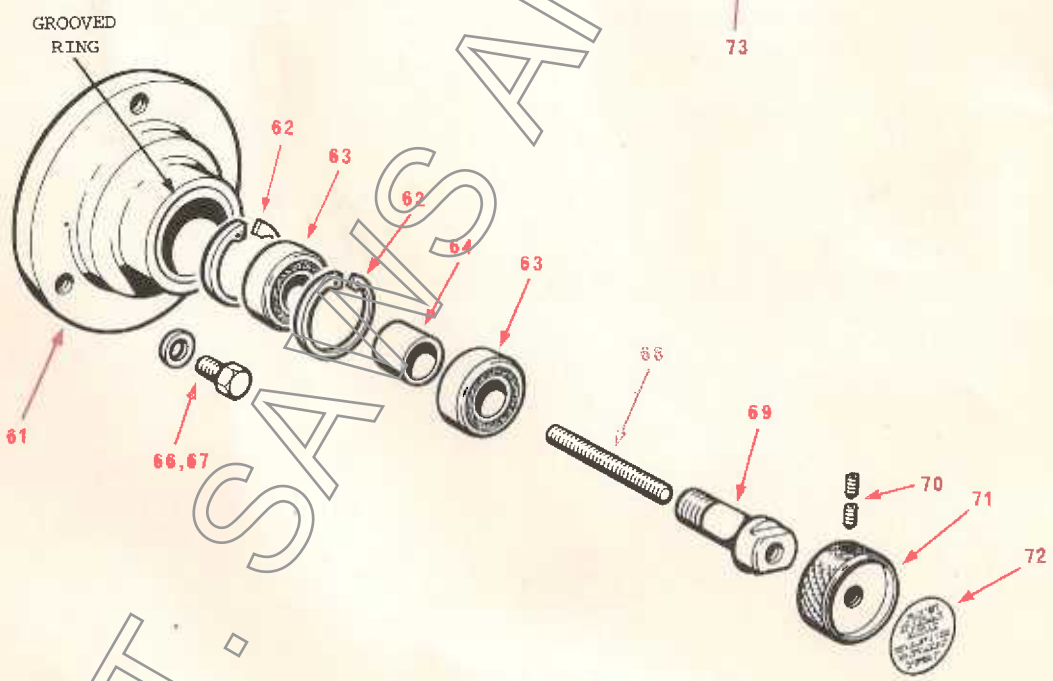
WHEEL BRUSH - ASSEMBLY No.SM1001

80	5485	Stud	1
81	2270	Wheel Brush	1
82		Washer	2
83		Hex. Nut	3

WHEEL BRUSH



FIXED BANDWHEEL HUB



TRACKING BANDWHEEL HUB

32·4

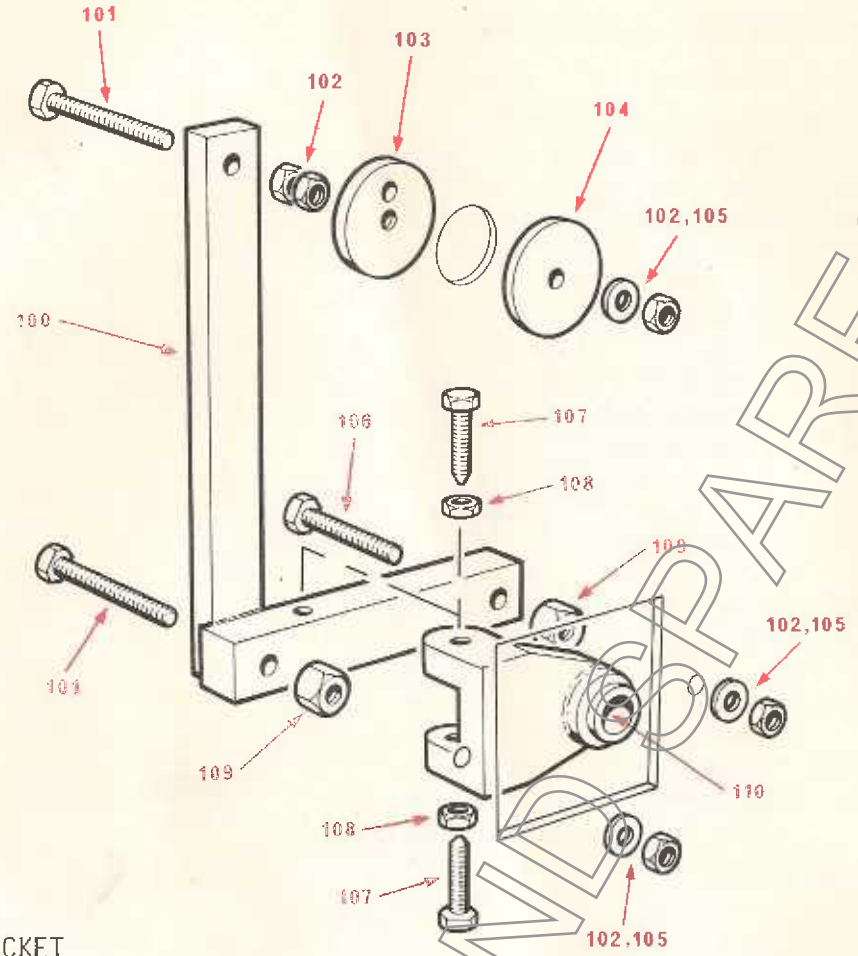
TRACKING BRACKET - ASSEMBLY No.SM1395

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
	NOTE : 30" Throat Machines ONLY.		
100	SM1140	Tracking Bracket	1
101		Hex. Hd. Screw	2
102		Hex. Nut	5
103	5797	Nut Plate	1
104	5796	Washer	1
105		Std. Washer	3
106		Hex. Hd. Screw	1
107	5682	Pivot Screw	2
108		Hex. Locknut	2
109	5798	Special Nut	2
110	5681	Tilt Bracket	1

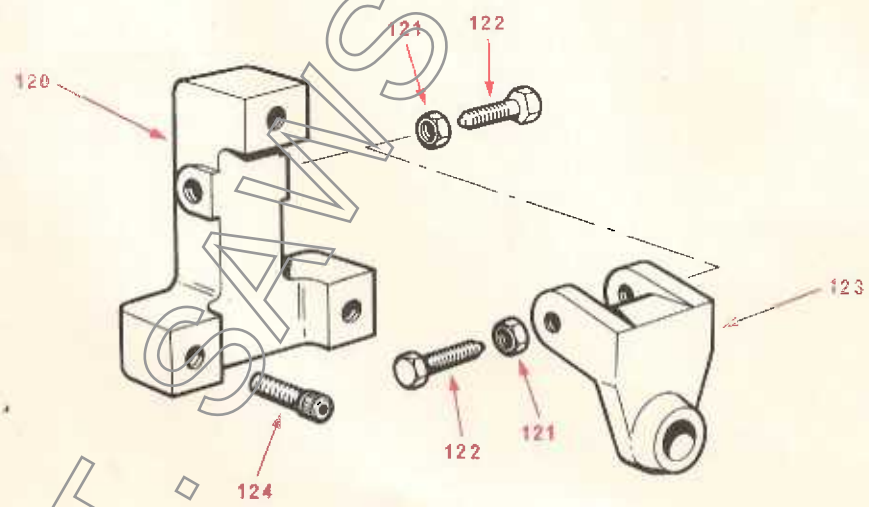
PIVOT BRACKET - ASSEMBLY No.SP333

NOTE : 20" Throat Machines ONLY.

120	3708	Bridge Piece	1
121		Hex. Locknut	2
122	5682	Pivot Screw	2
123	5681	Tilt Bracket	1
124		Soc. Hd. Cap Screw	3



TRACKING BRACKET



PIVOT BRACKET

SLIDING TABLE ASSEMBLY

ITEM	PART NUMBER	AND DESCRIPTION	No. OFF
1	2825	Sliding Table	1
2		Std. Stud	2
3	2828	Swing Latch	1
4		Std. Washer	2
5		Handknob	2
6	2821	Table Insert	1
7		Slotted C'sk. Hd. Screw	2

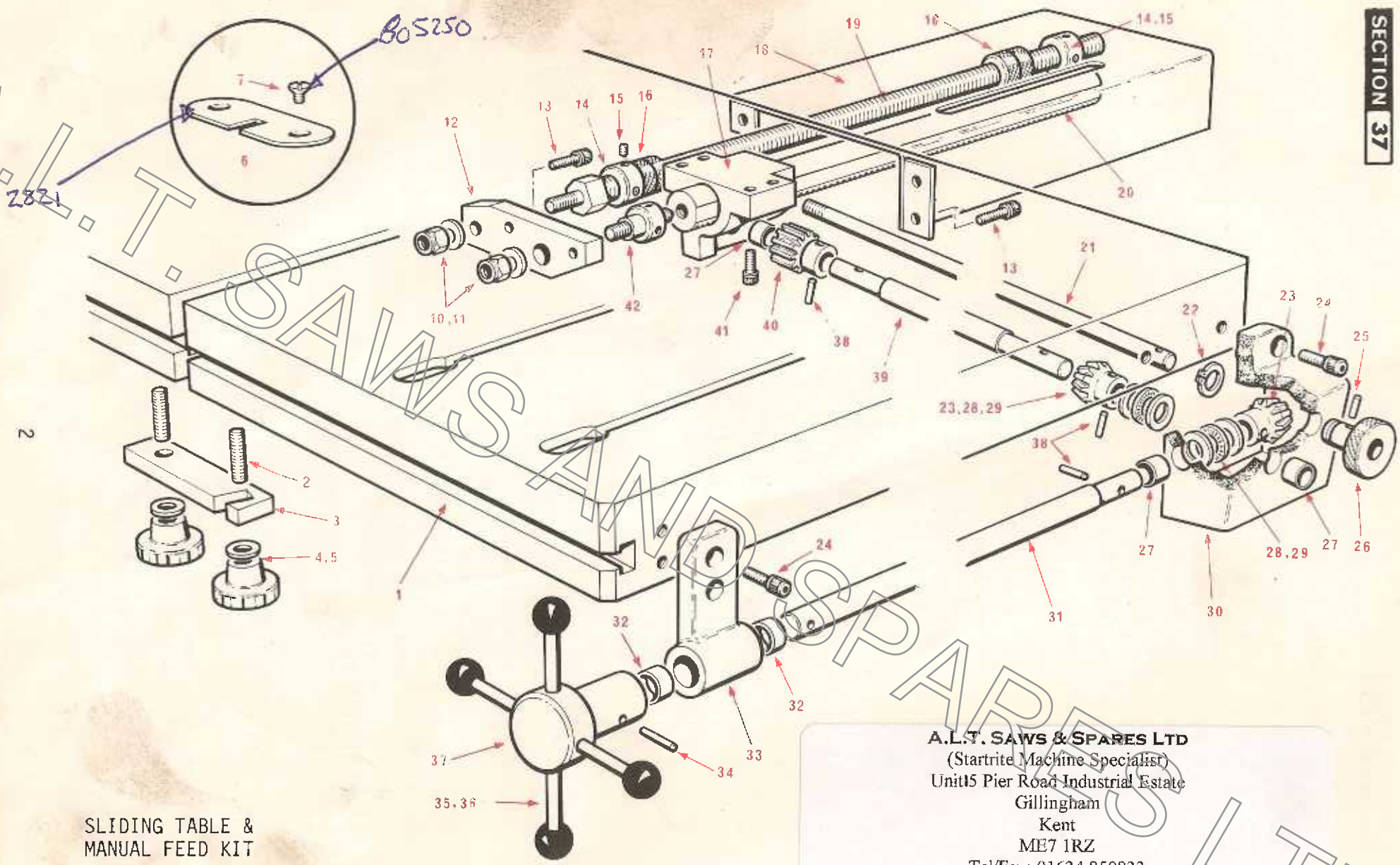
MANUAL FEED KIT - ASSEMBLY No.PK74

10		Self Locking Nut	2
11		Std. Washer	2
12	4419	Anchor Plate	1
13		Soc. Hd. Cap Screw	5
14	3210	Stop Collar	2
15		Soc. Set Screw	4
16	663	Feed Stop Nut	4
17	2830	Rack Housing	1
18	SP649	Rack Cover	1
19	SM426	Feed Stop Screw	1
20	2817	Rack	1
21	2818	Locking Screw	1
22		Circlip External	1
23	2715	Mitre Gear	2
24		Soc. Hd. Cap Screw	4
25		Mills Pin	1
26	2819	Locking Screw Knob	1
27		Compo Bush	3
28		Thrust Race	4
29		Thrust Bearing	2
30	2829	Bevel Gear Housing	1
31	2822	Outer Feed Shaft	1
32		Compo Bush	2
33	2827	Feed Shaft Bracket	1
34		Mills Pin	1
35	2831	Feed Handle	4
36		Ball Knob	4
37	2826	Hub	1
38		Mills Pin	3
39	2823	Inner Feed Shaft	1
40	2836	Pinion	1
41		Soc. Hd. Cap Screw	4
42	2956	Rack Coupling	1

AUXILIARY TABLE ASSEMBLY (NOT ILLUSTRATED)

NOTE : 30" Throat Machines ONLY.

	2705	Auxiliary Table	1
	2709	Spacer	4
	2936	Stud	4
		Hex. Nut	12



SLIDING TABLE &
MANUAL FEED KIT

A.L.T. SAWS & SPARES LTD
(Startrite Machine Specialist)
Unit15 Pier Road Industrial Estate
Gillingham
Kent
ME7 1RZ
Tel/Fax: 01634 850833
www.altsawsandspares.co.uk

4-WAY TILT CRADLE - ASSEMBLY No.SP425

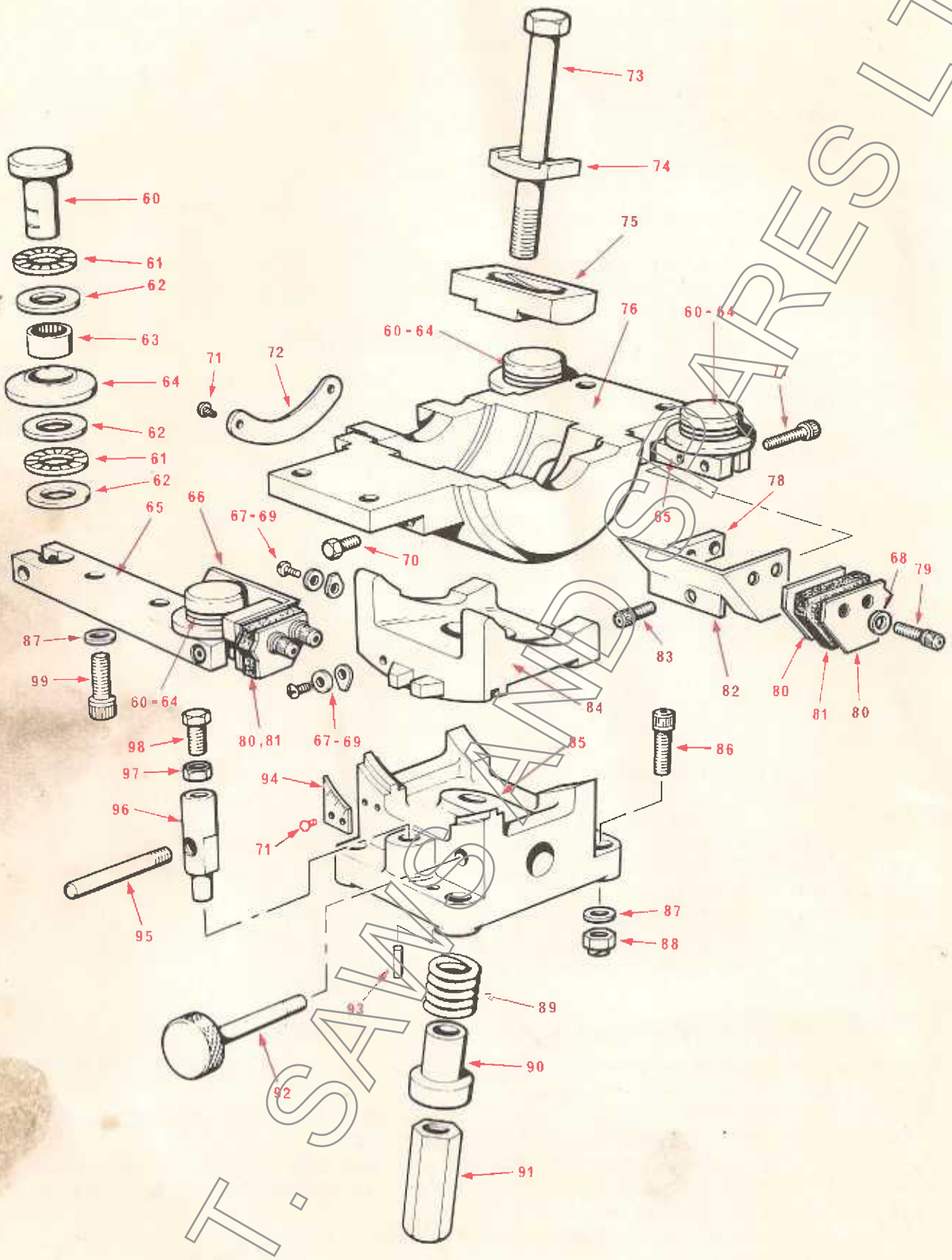
ITEM	PART NUMBER	DESCRIPTION	No.OFF
60	2834	Roller Spindle	4
61		Needle Thrust Bearing	8
62		Thrust Washer	12
63		Needle Race	4
64	2832	Roller	4
65	2833	Roller Bracket	2
66	2955A	Roller Shroud	1
67		Rd. Hd. Screw Recessed	2
68		Std. Washer	6
69	2812	Pointer	2
70		Hex. Hd. Screw	4
71		Drive Screw	4
72	2371	Tilt Scale	1
73		Hex. Hd. Screw	1
74	2808	Seating Washer	1
75	2807	Clamp	1
76	2835	Trunnion	1
77		Soc. Hd. Cap Screw	4
78	2952	Clamp Bar	2
79		Soc. Hd. Cap Screw	4
80	2953	Side Plate	4
81	2954	Felt Wiper	2
82	2955	Roller Shroud	1
83		Soc. Hd. Cap Screw	2
84	2805	Compound Cradle	1
85	2806	Bottom Cradle	1
86		Soc. Hd. Cap Screw	4
87		Std. Washer	8
88		Self Locking Nut	4
89		Compression Spring	1
90	2370	Sleeve	1
91	2409	Special Nut	1
92	2500	Thumb Screw	1
93		Spring Dowel	1
94	2811	Compound Tilt Scale	1
95	2810	Tommy Bar	1
96	2809	Stop Pin	1
97		Lock Nut	1
98		Hex. Hd. Screw	1
99		Soc. Hd. Cap Screw	4

INSTRUCTIONS FOR DISMANTLING THE SLIDING TABLE & CRADLE.

The table is mounted on four pre-loaded rollers which are engaged under pressure between the table tracks.
BE SURE THAT THE METHOD OF PRE-LOADING THESE UNITS IS FULLY UNDERSTOOD BEFORE ATTEMPTING TO DISMANTLE OR ADJUST THIS UNIT.

1. Through the access door at the rear of the machine, remove special nut, sleeve and compression spring (Items 89, 90 & 91). Support the table whilst this operation is carried out.
2. Lift the table vertically away from the cradle mounting and place top face downwards on a bench.

(CONTINUED ON PAGE 5)



4-WAY TILT CRADLE

INSTRUCTIONS FOR DISMANTLING THE SLIDING TABLE & CRADLE - CONTINUED.

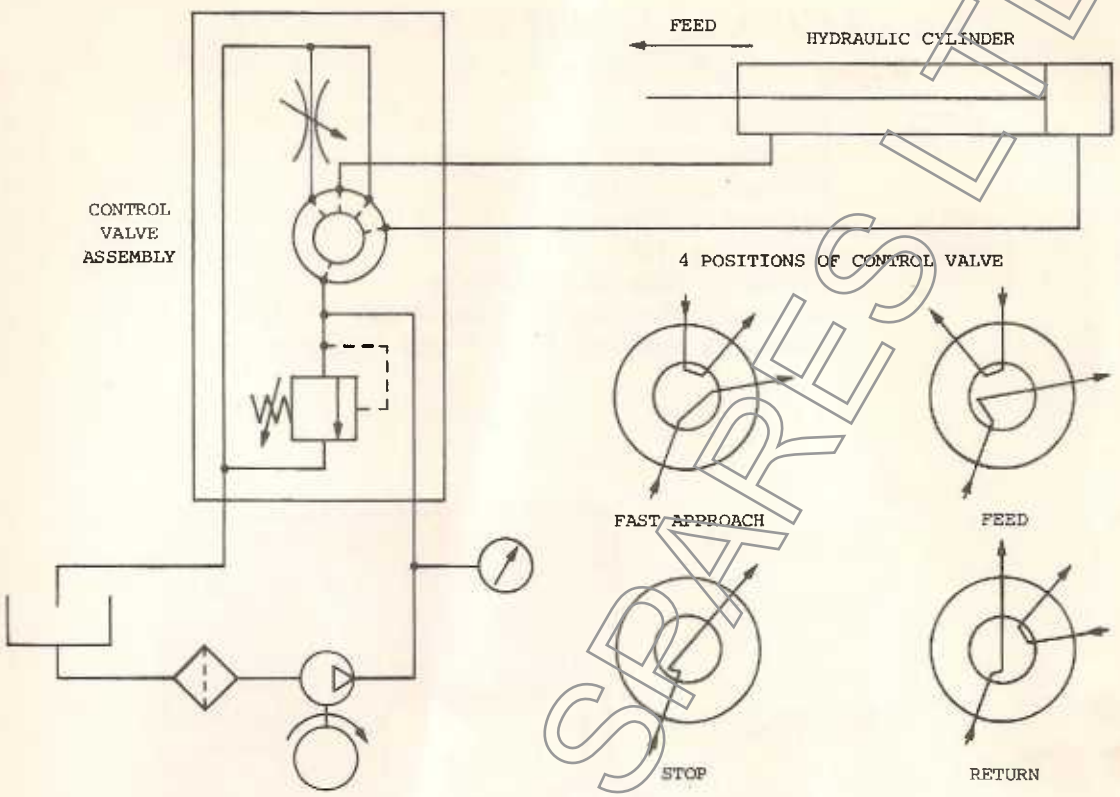
3. Remove two screws securing anchor plate (Items 12 & 13 of PK74) to allow the rack assembly to be disengaged.
4. Mark both roller brackets (Item 65) to establish their original positions.
5. Screw inwards two jacking screws (Item 70) to one roller bracket only (do not alter the jacking screws to the second roller bracket, or the pre-set alignment of the table will be lost) and remove two retaining screws (Item 99). The roller bracket can now be removed and the cradle assembly lifted away from the table.
6. Without disturbing the setting of the jacking screws, remove the second roller bracket.
7. Remove two shrouds with wiper assemblies (Items 78, 80, 81, 82 & 83).
8. Slacken screws (Item 77) and press out roller spindle (Item 60) complete with roller and bearings.

INSTRUCTIONS FOR RE-ASSEMBLING THE SLIDING TABLE & CRADLE.

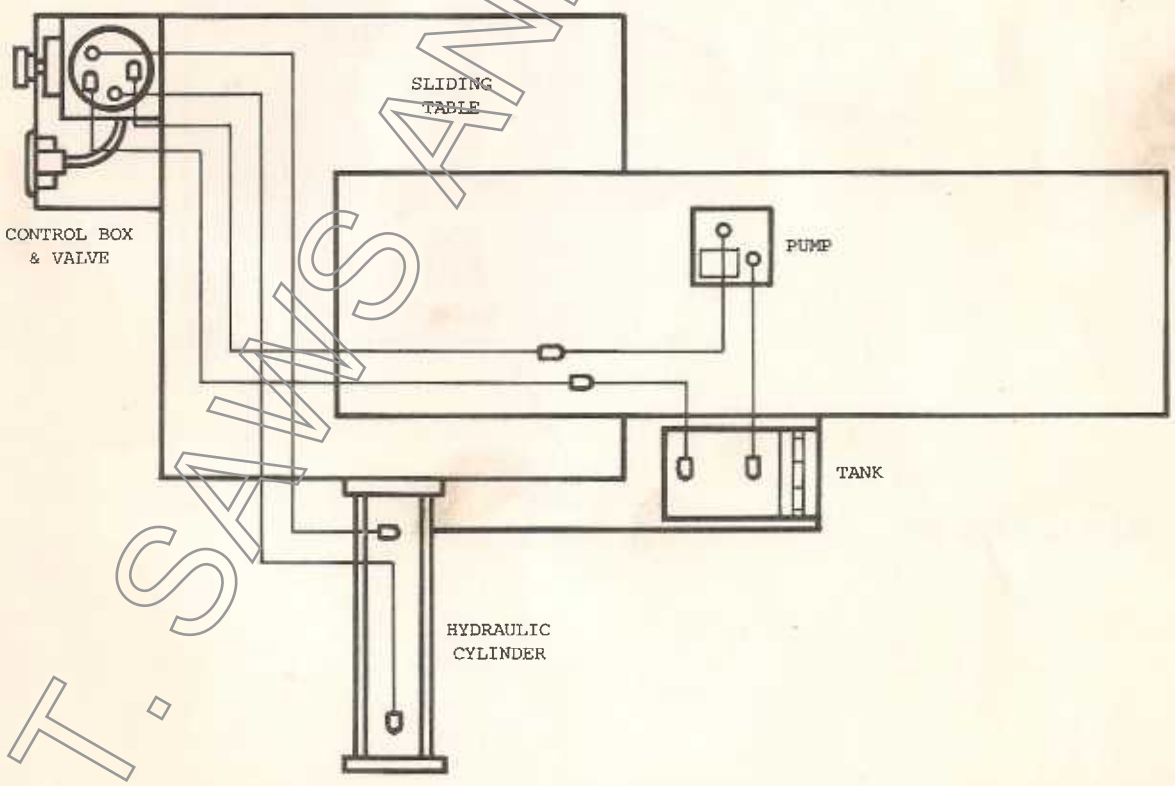
1. Assemble needle bearings, thrust washers and roller (Items 61, 62, 63 & 64) on roller spindle (Item 60) with light coating of medium grease.
NOTE : If the needle bearings (Item 63) have been replaced, check that they do not protrude beyond either face of the collar.
2. Insert the roller spindle complete with roller etc. into the roller bracket and press home with a force of 70 lb. (32 kg.). This pressure must be maintained whilst the clamping screw (Item 77) is securely locked. Assemble all four rollers in this fashion.
3. Assemble the appropriate roller bracket to the side of the trunnion which has the jacking screws in the original position and secure the bracket in place. Make sure that the side of the roller bracket is in contact with the head of the jacking screws.
4. Assemble the trunnion to the table so that the rollers engage in one side of the table track.
5. Place the second roller bracket in position and tighten the fixing screws with a light finger pressure only. Apply a force of 90 lb. (41 kg.) between the roller bracket and the trunnion to pre-load the rollers into the table tracks. Securely tighten the fixing screws whilst this force is maintained. Adjust the other two jacking screws so that their heads make firm contact with the side of the second roller bracket.
6. Assemble the roller shrouds making sure that the wipers make good contact with the table tracks and adjacent machined faces. New wipers should be charged with oil before fitting.
7. Complete assembly in reverse order, ensuring that there is good alignment of working parts in order to avoid undue stiffness to the table movement. New wipers will impart some additional stiffness which will ease as soon as the wipers have embedded down. On no account must the pre-loading be eased off in order to remove this preliminary stiffness.

TABLE ALIGNMENT.

The alignment of the table relative to the blade may be adjusted by careful setting of the position of the roller brackets. The table should be removed from the machine for this purpose and the instructions for pre-loading the rollers applied.



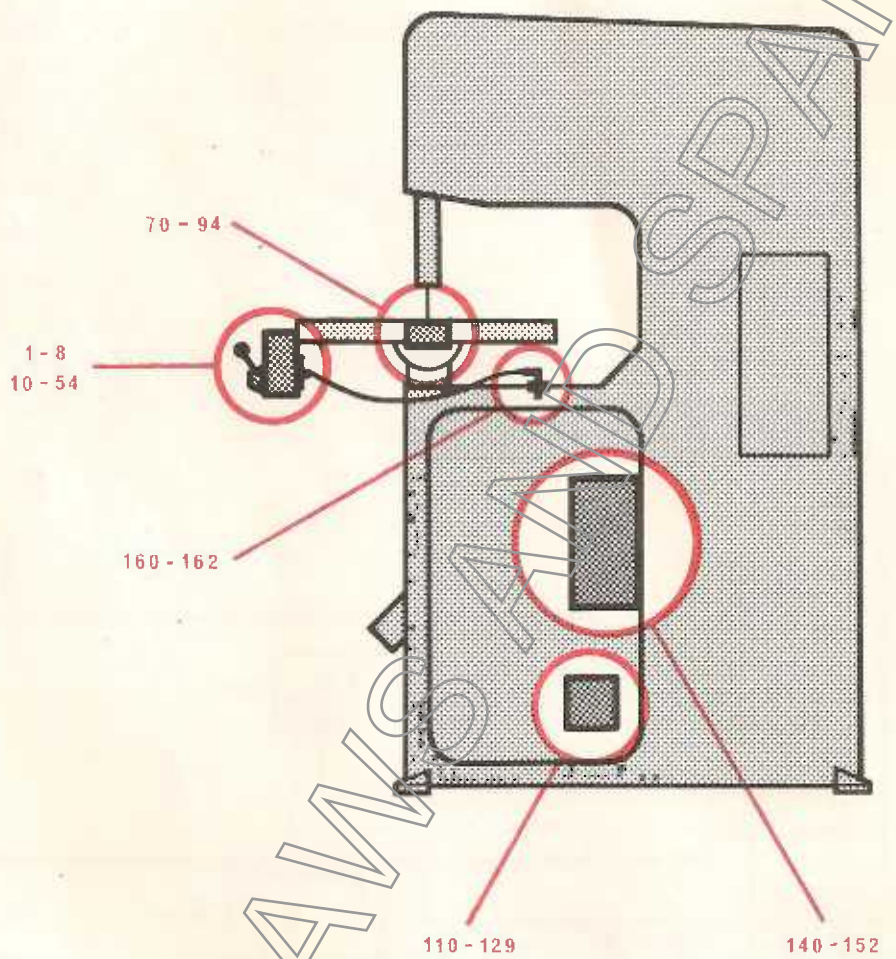
HYDRAULIC CIRCUIT DIAGRAM FOR RWH MACHINES.



HYDRAULIC PIPE LAYOUT FOR RWH MACHINES.

HYDRAULIC FEED KIT - ASSEMBLY No.PK113

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
1-8	SP473	Control Box	1
10-54	SP463	Control Valve	1
70-94	SM724	Hydraulic Cylinder	1
110-129	SP532	Hydraulic Pump	1
140-152	SP607	Hydraulic Tank	1
160		Flexible Tube	2
161		Bulkhead Fitting	2
162		Elbow	2



HYDRAULIC FEED KIT

CONTROL BOX - ASSEMBLY No.SP473

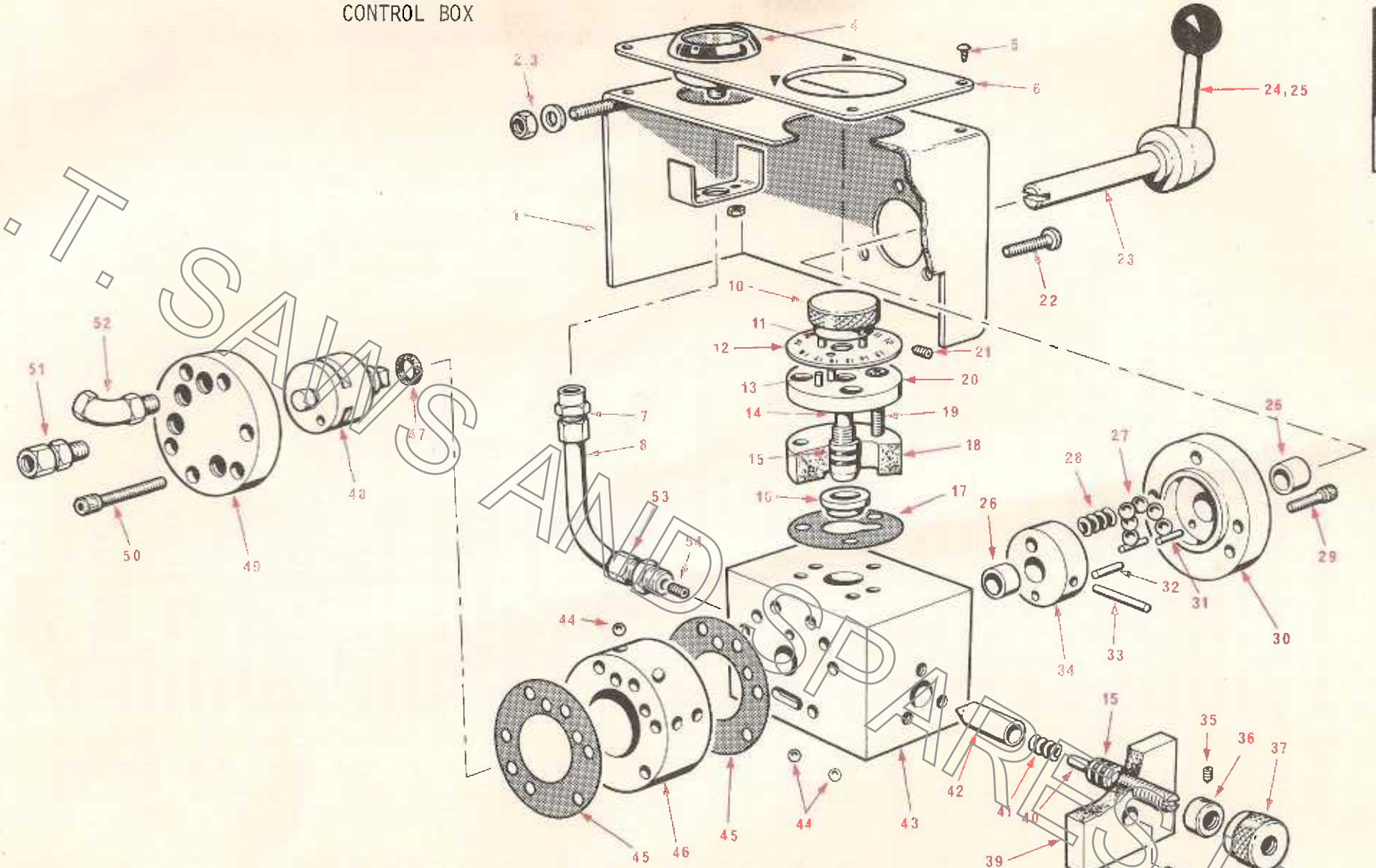
ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	SP472	Control Box	1
2		Hex. Nut	2
3		Std. Washer	2
4		Pressure Gage	1
5		Drive Screw Type	4
6	3548	Instruction Plate	1
7		Par. Female Stud Coupling	1
8		Nylon Tube	1

CONTROL VALVE - ASSEMBLY No.SP463

10	3203	Control Knob	1
11		Drive Screw	2
12	3195	Feed Control Dial	1
13		Mills Pin No.(	2
14	3533	Valve Spindle	1
15		'O' Ring	4
16	3534	Valve Insert	1
17	3536	Gasket	1
18	3527	Valve Housing	1
19		Soc. Hd. Cap Screw	3
20	3528	Top Cap	1
21		Soc. Set Screw	2
22		Soc. Dome Hd.	3
23	3529	Control Spindle	1
24	2917	Feed Handle	1
25		Ball Knob	1
26		Compo Bush	2
27		Steel Ball	6
28		Compression Spring	1
29		Soc. Hd. Cap Screw	2
30	3523	Front Cap	1
31		Spring Dowel	2
32		Mills Pin	1
33		Mills Pin	1
34	3530	Collar	1
35		Soc. Set Screw	1
36	3606	Locking Collar	1
37	3607	Thumbnut	1
38		Soc. Hd. Cap Screw	3
39	3704	Regulator Block	1
40	3532	Regulator Spindle	1
41		Compression Spring	1
42	3535	Regulator Piston	1
43	3522	Valve Body	1
44		Steel Ball	10
45	3367	Gasket	2
46	3524	Spool Housing	1
47		'O' Ring	1
48	3526	Spool	1
49	3525	Rear Cap	1

(CONTINUED)

CONTROL BOX



CONTROL VALVE

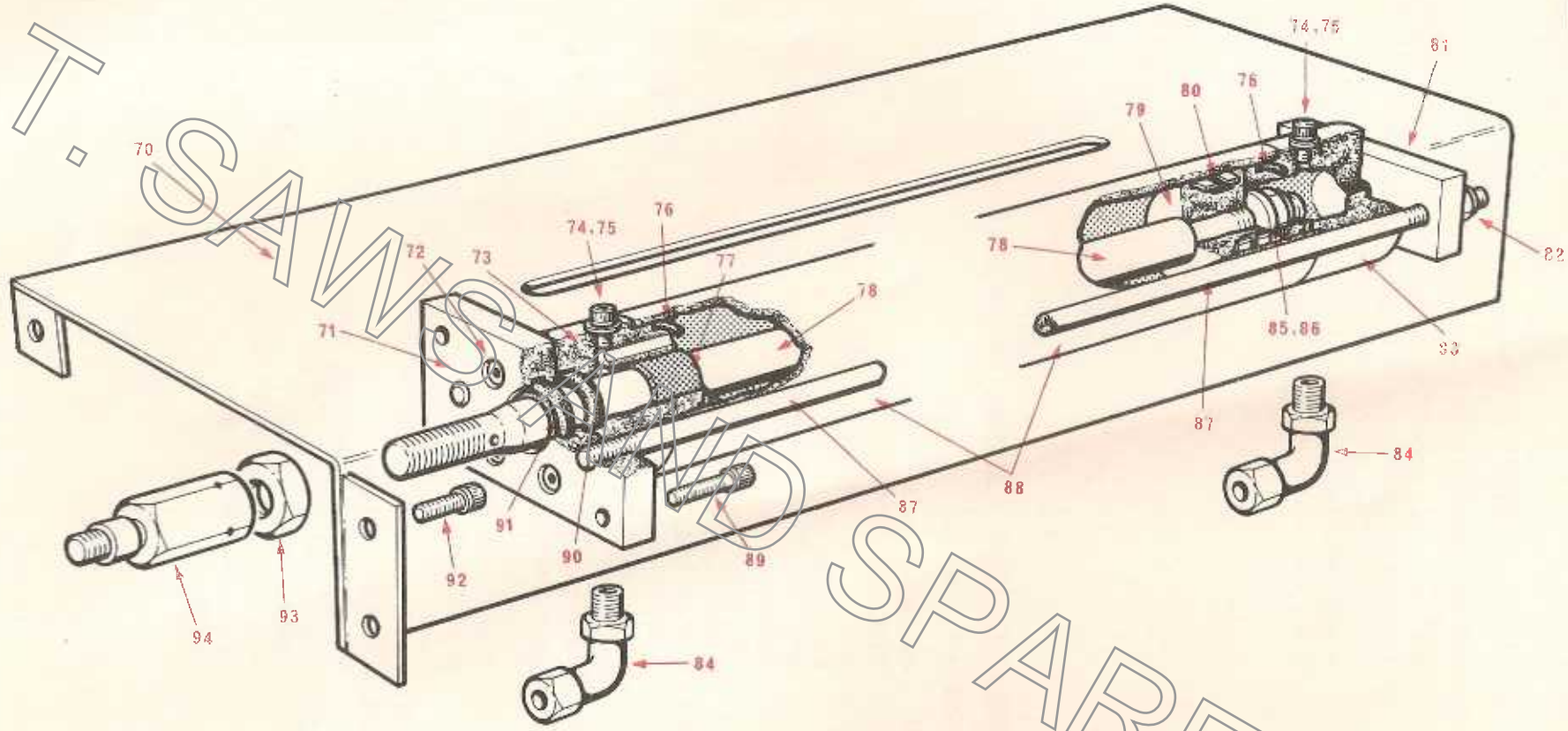
CONTROL VALVE - ASSEMBLY No.SP463 - CONTINUED

ITEM	PART NUMBER AND DESCRIPTION	No.OFF
50	Soc. Hd. Cap Screw	6
51	Taper Male Stud Coupling	2
52	Stud Elbow	2
53	Taper Male Stud Coupling	1
54	Soc. Set Screw	1

HYDRAULIC CYLINDER - ASSEMBLY No.SM724

9" (228 mm) STROKE.

70	SP649	Cylinder Cover	1
71	5745	Mounting Plate	1
72		Soc. C'sk. Hd. Screw	4
73	5747	Front End Cap	1
74		Soc. Hd. Cap Screw	2
75		Fiber Washer	2
76		'O' Ring	2
77		Compo Bush	1
78	5737/1	Piston Rod	1
79	5738	Piston Head	1
80		Delta Seal	1
81	4401	Tie Bar	1
82		Self Locking Nut	2
83	5746	Rear End Cap	1
84		Taper Elbow Ferrule	2
85		Self Locking Nut	1
86		Fiber Washer	1
87	5740/1	Tie Rod	2
88	4397/1	Cylinder Barrel	1
89		Soc. Hd. Cap Screw	4
90		Fluid Seal	1
91		Wiper Ring	1
92		Soc. Hd. Cap Screw	3
93		Hex. Lock Nut	1
94	5739	Adaptor	1



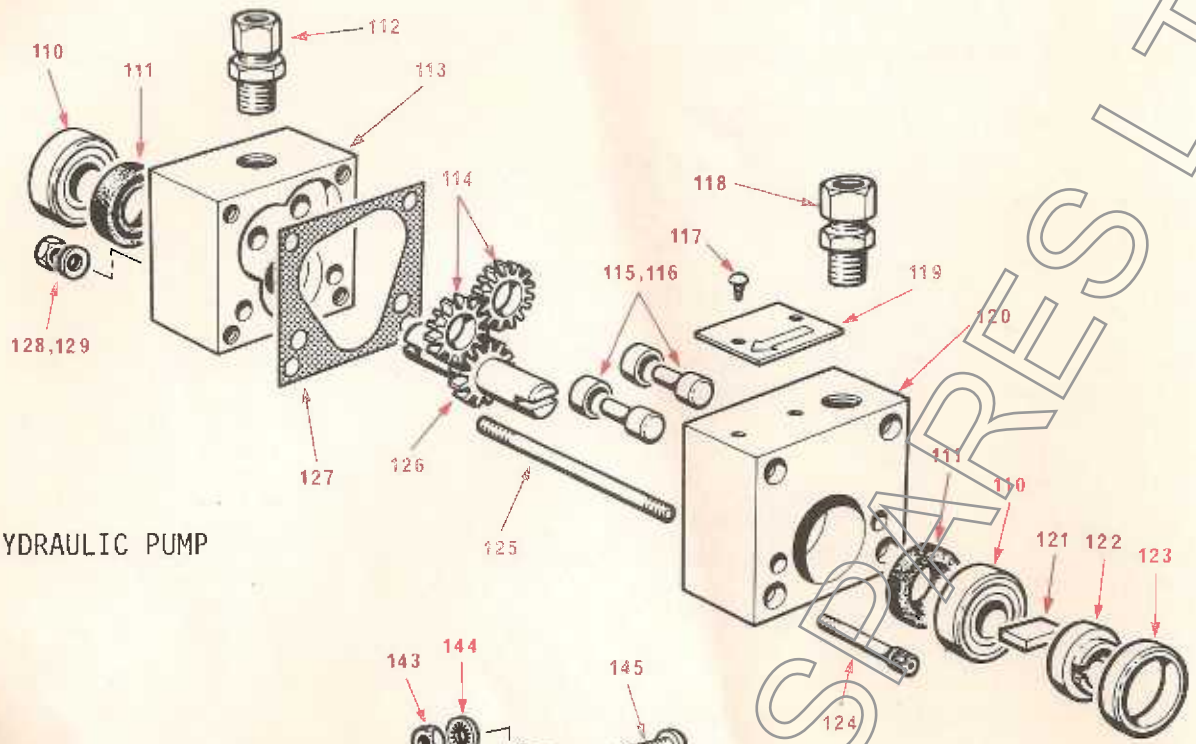
HYDRAULIC CYLINDER

HYDRAULIC PUMP - ASSEMBLY No.SP532

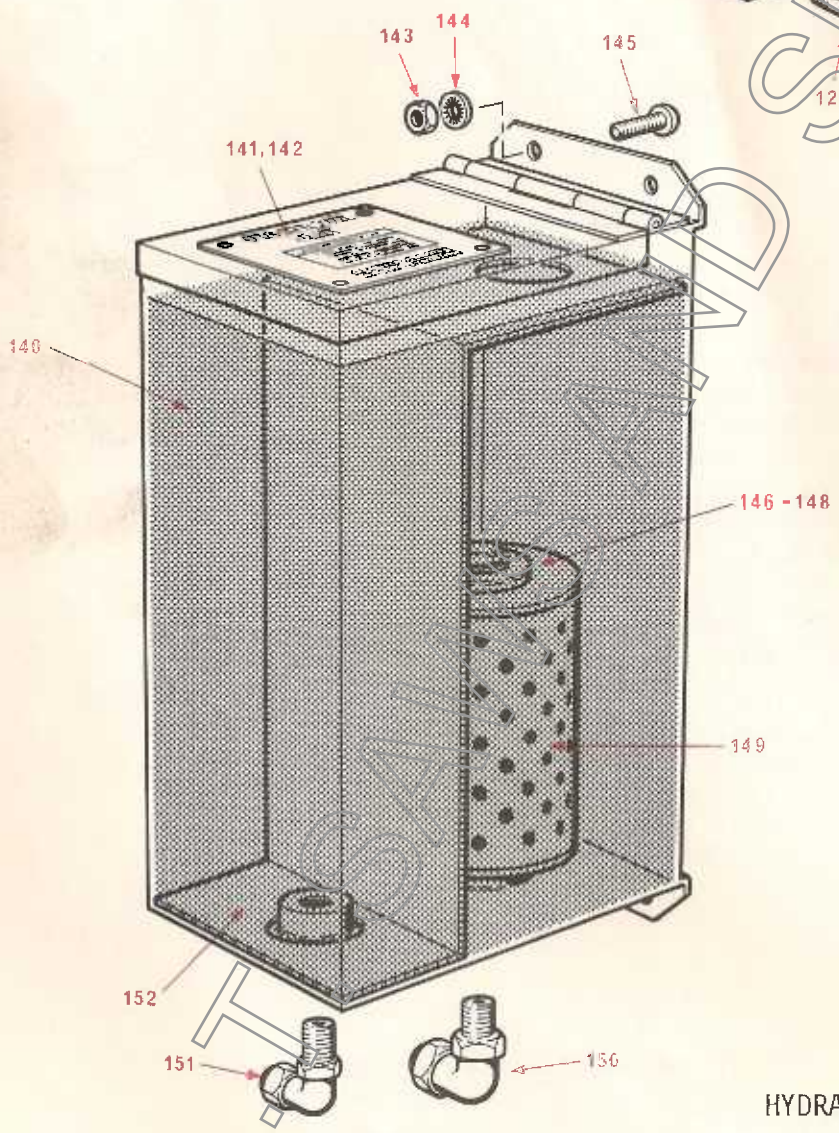
ITEM	PART NUMBER AND DESCRIPTION		No.OFF
110		Ball Bearing	2
111		Oil Seal	2
112		Male Coupling	1
113	3645	Pump Body	1
114	3648	Gear	2
115	994	Pin	2
116		Compo Bush	2
117		Drive Screw	2
118		Male Coupling	1
119	3649	Instruction Plate	1
120	3646	Cap	1
121	3608	Key	1
122	3588	Coupling	1
123	3589	Register Ring	1
124		Soc. Hd. Cap Screw	4
125	3609	Stud	2
126	3647	Drive Shaft	1
127	3584	Gasket	1
128		Hex. Nut	2
129		Std. Washer	2

HYDRAULIC TANK - ASSEMBLY No.SP607

140	SP606	Hydraulic Tank	1
141	4084	Instruction Plate	1
142		Pop Rivet	4
143		Hex. Nut	4
144		Shakeproof Washer	4
145		Rd. Hd. Screw Recessed	4
146	3187	Filter Retaining Washer	1
147		Hex. Hd. Bolt	1
148		Std. Washer	1
149		Filter	1
150		Taper Male Stud Elbow	1
151		Taper Male Stud Elbow	1
152	4083	Baffle Plate	1



HYDRAULIC PUMP



HYDRAULIC TANK

AIR COMPRESSOR - ASSEMBLY No.SP486

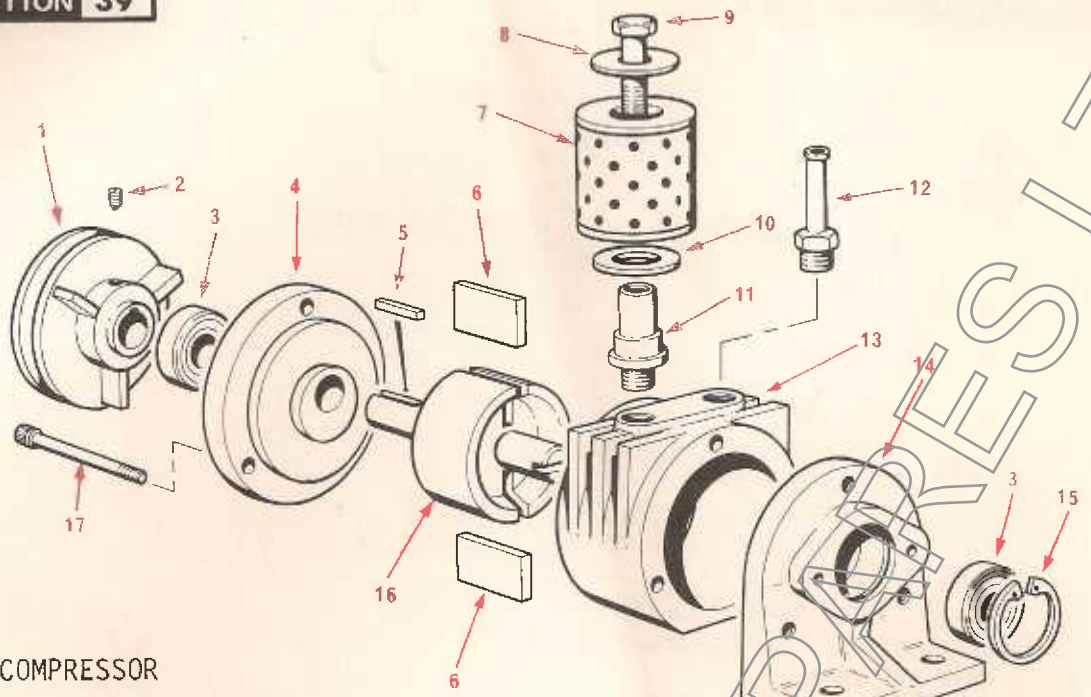
ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	5354	Pulley	1
2		Soc. Set Screw	1
3		Ball Bearing	2
4	3575	End Cap	1
5	1148	Key	1
6	3579	Vane	2
7		Filter	1
8	3611	Washer	1
9		Hex. Hd. Screw	1
10	3612	Washer	1
11	3599	Filter Mounting	1
12		Tube Connector	1
13	3576	Cylinder	1
14	3577	Cylinder Mounting	1
15		Circlip Internal	1
16	3578	Rotor	1
17		Soc. Hd. Cap Screw	3

AIR PUMP - ASSEMBLY No.SP98

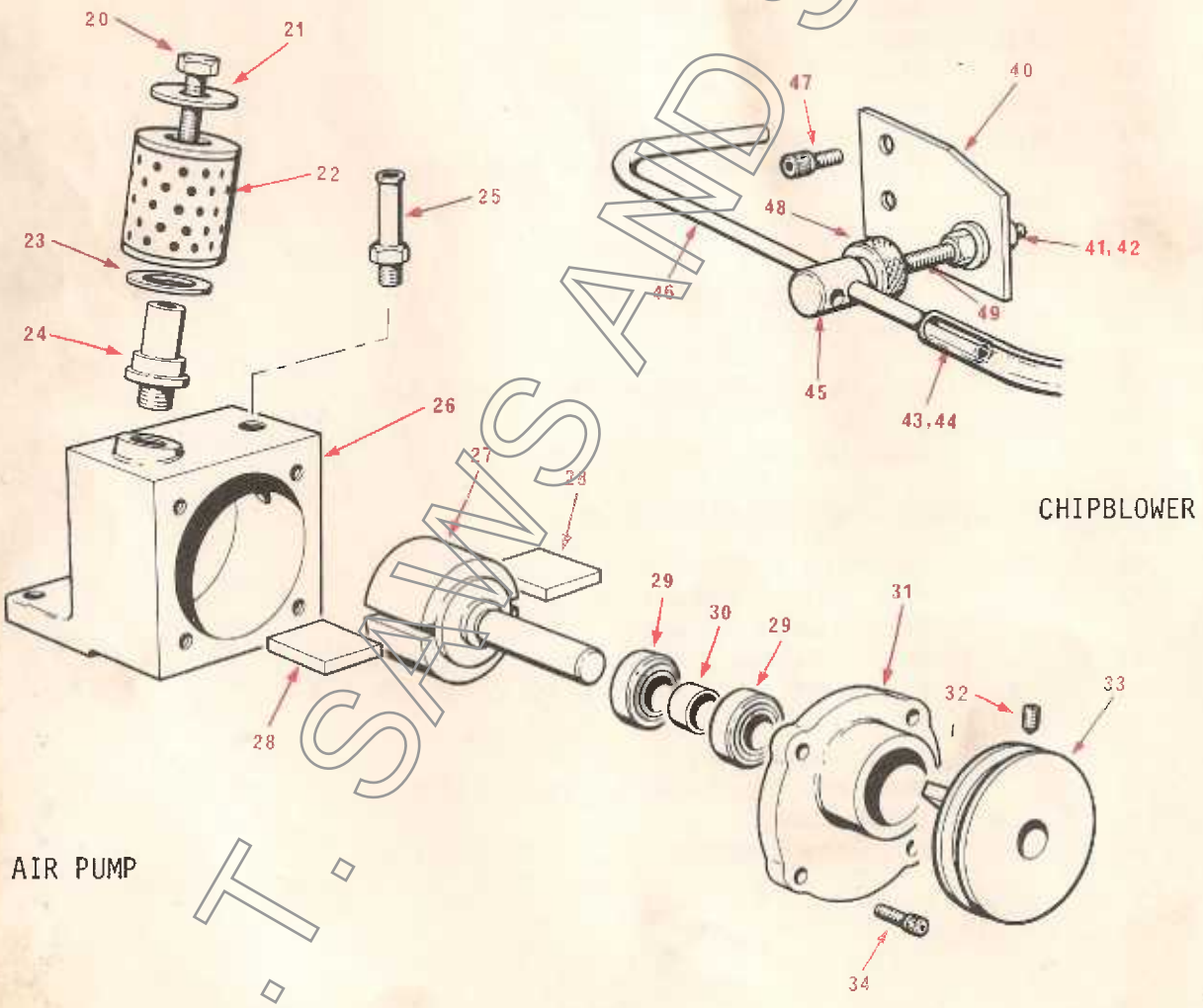
20		Hex. Hd. Screw	1
21	3611	Washer	1
22		Filter	1
23	3612	Washer	1
24	3621	Filter Mounting	1
25		Tube Connector	1
26	1245	Body	1
27	1247	Spindle	1
28	1248	Vane	2
29		Ball Bearing	2
30	535	Spacer Collar	1
31	1244	Cover	1
32		Soc. Set Screw	1
33	5353	Pulley	1
34		Soc. Hd. Cap Screw	4

CHIPBLOWER - ASSEMBLY No.PK172

40	4241	Mounting Plate	1
41		Std. Nut	2
42		Std. Washer	2
43		Nylon Sleeve	1
44		Clear P.V.C. Tube	1
45	3630	Sleeve	1
46	4930	Chipblower Pipe	1
47		Soc. Hd. Cap Screw	2
48	3628	Thumb Knob	1
49	3635	Adjustment Screw	1



AIR COMPRESSOR



CHIPBLOWER

AIR PUMP

MAINTENANCE.

Every 3 months apply grease to grease nipple (Item 125) situated on Expanding Pulley Assembly. DO NOT USE EXCESSIVE GREASE.
Check tension of drive belts and adjust if necessary, see Section on Installation/Maintenance for instructions.

VARIABLE SPEED GEARBOX - ASSEMBLY No.SM1004

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
1		Hex. Hd. Screw	3
2		Std. Washer	4
3		Soc. Set Screw	1
4	2561	Bandwheel Hub	1
5		Std. Stud	3
6		Hex. Nut	3
7		Std. Washer	3
8		Hex. Nut	6
9	4172	Gearbox Housing	1
10		Std. Dowel	2
11	1029	Output Shaft	1
12	1148	Key	2
13		Compression Spring	1
14		Steel Ball	1
15		Mills Pin	1
16	1027	Key	2
17	1036	Liner	1
18	1035	Clutch Plate	1
19	1044	Gear	1
20		Snap Hd. Rivet	8
21		Circlip External	1
22		Self Locking Nut	1
23	5345	Pivot Shaft	1
24		Compo Bush	2
25		Ball Bearing	2
26		Circlip Internal	2
27	1030	Spacer	1
28	5334	Bracket	1
29	5352	Stud	1
30	4238	Washer	2
31		Hex. Nut	6
32		Spring Dowel	2
33		Soc. Hd. Cap Screw	2
34		Soc. Hd. Cap Screw	2
35		Circlip External	1
36		Self Locking Nut	1
37		Std. Washer	1
38		Spring Pin	1
39	SM953	Sleeve & Lug	1
40	5340	Speed Control Screw	1
41		Circlip External	2
42	5343	Coupling	1
43	5346	Pulley Shaft	1
44	5492	Control Lever	1

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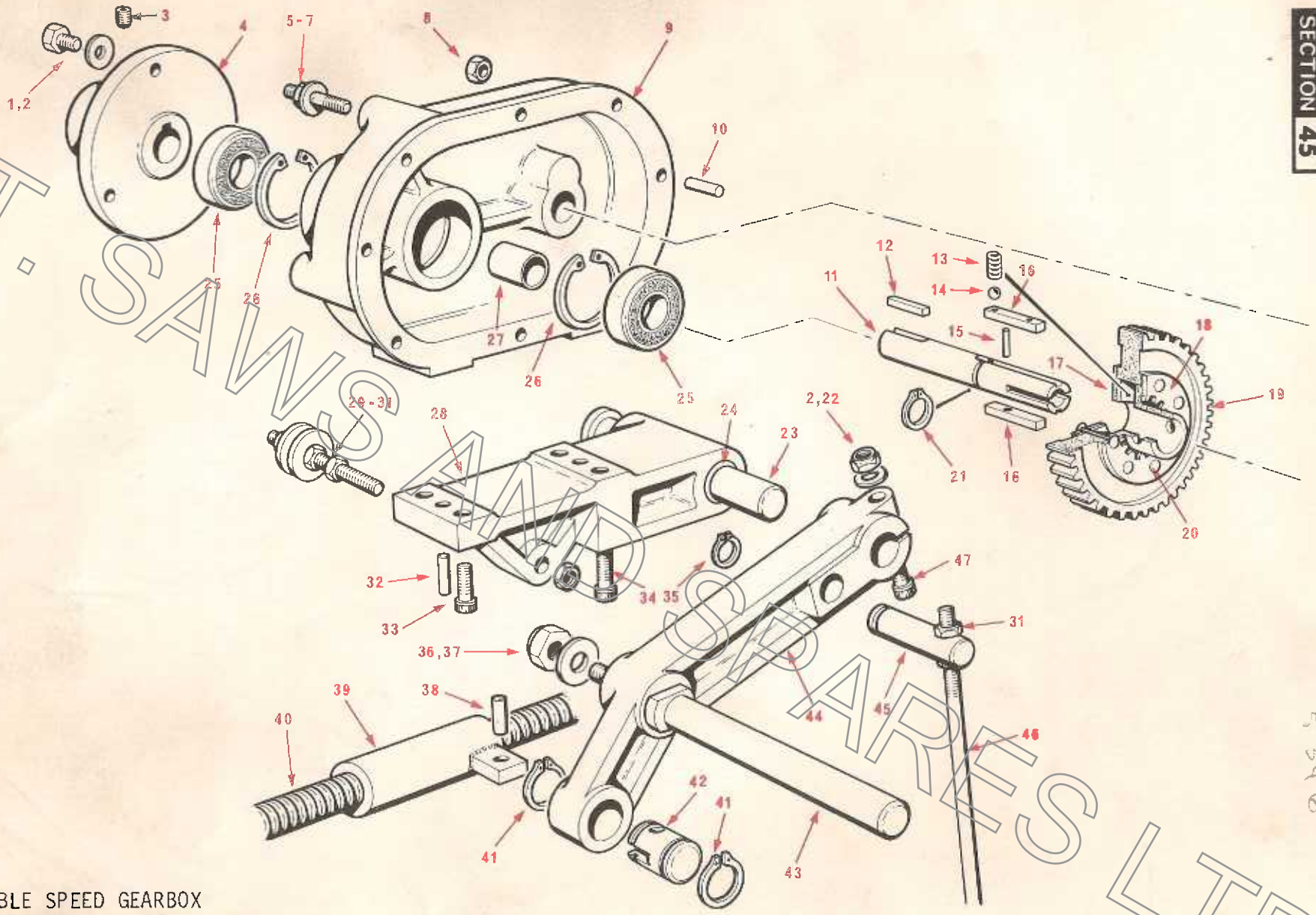
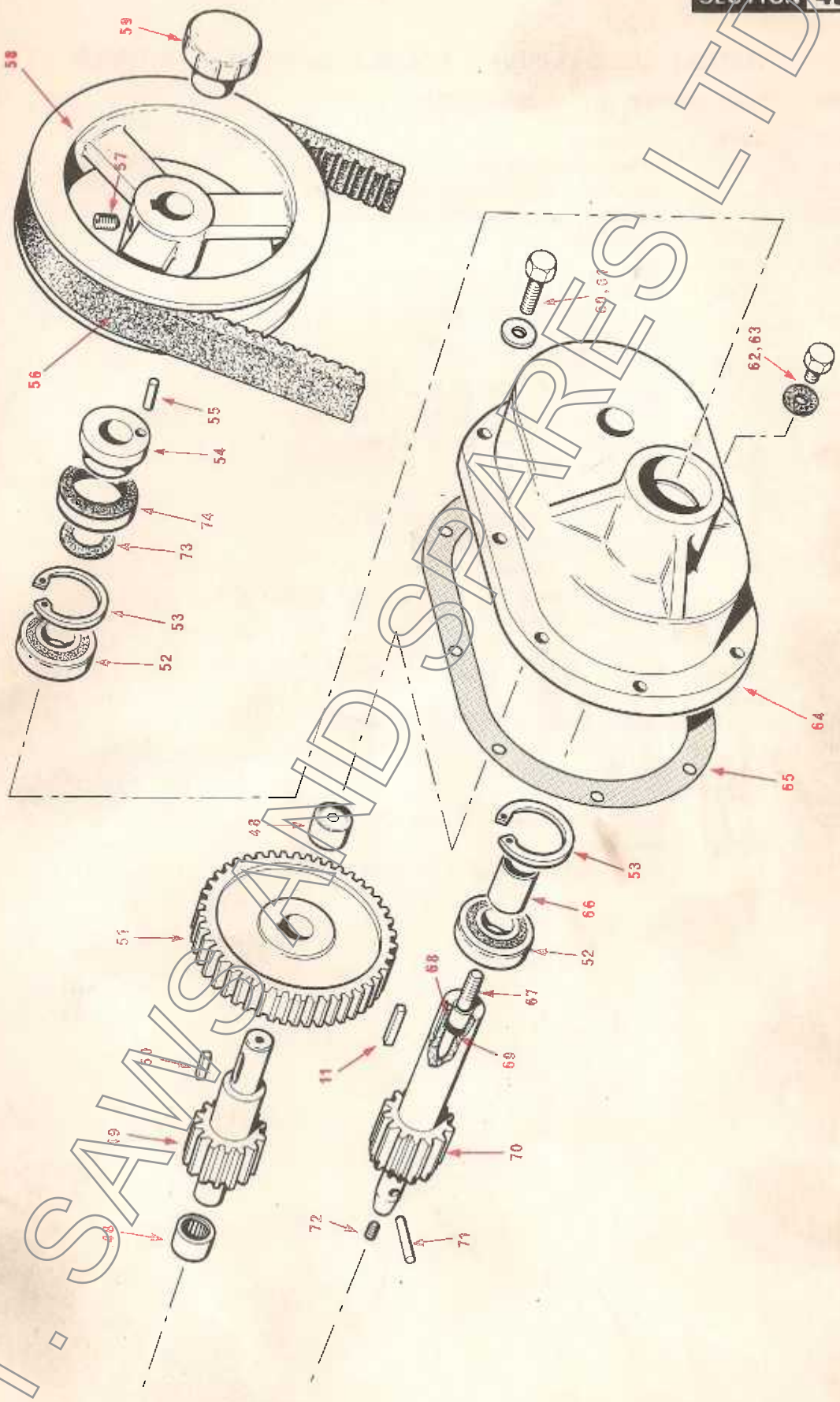


VARIABLE SPEED GEARBOX

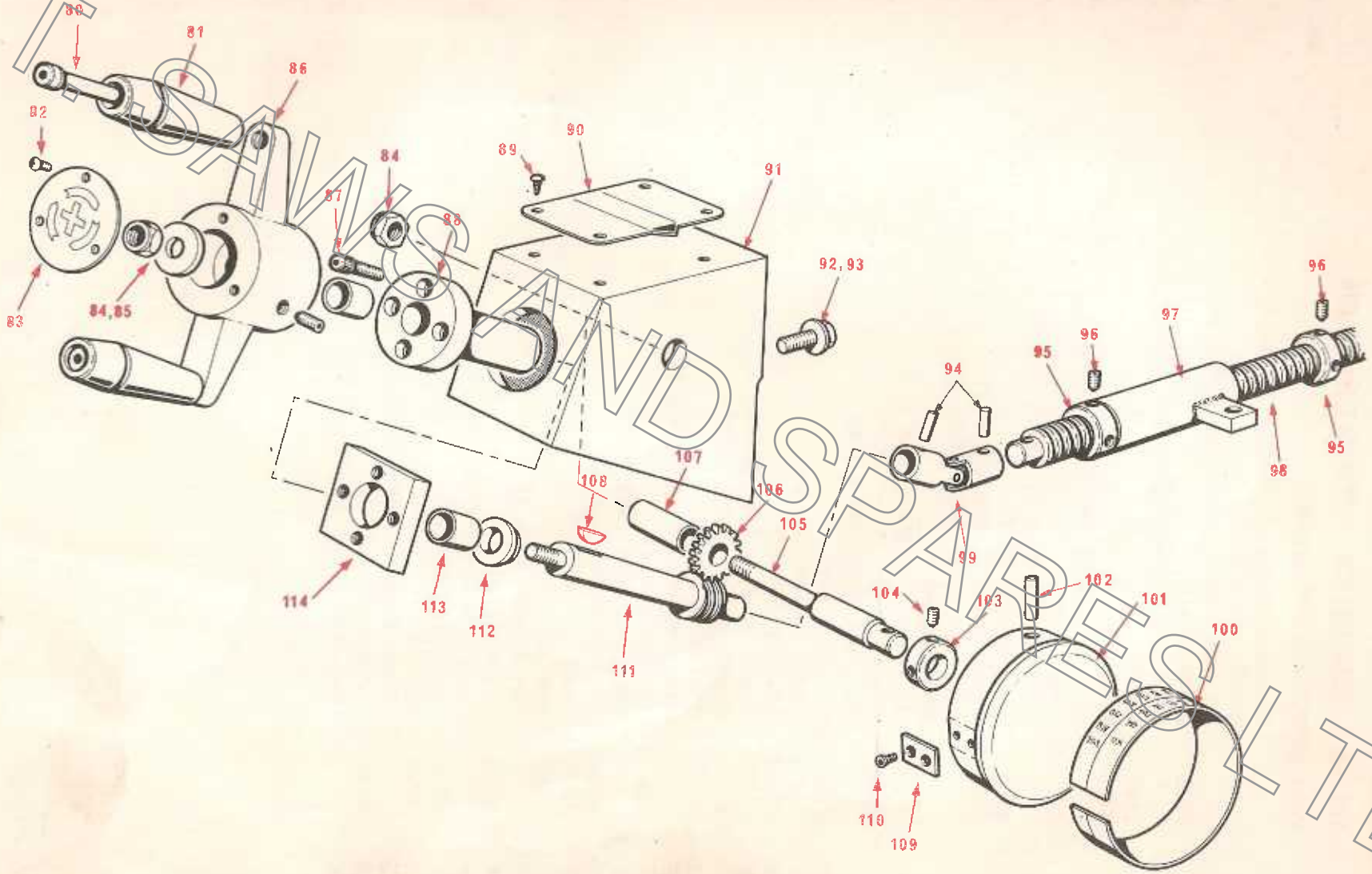


VARIABLE SPEED GEARBOX

SECTION 45

VARIABLE SPEED GEARBOX - ASSEMBLY No.SM1004 - CONTINUED

ITEM	PART NUMBER	AND DESCRIPTION	No.OFF
45	5348	Trunnion	1
46	5493	Tensioning Stud	1
47		Soc. Hd. Cap Screw	1
48		Needle Bearing	2
49	3253	Layshaft	1
50	1147	Key	1
51	3252	Gear	1
52		Ball Bearing	2
53		Circlip Internal	2
54	5332	Seating Bush	1
55		Spring Pin	1
56		Drive Belt (Upper)	1
57		Soc. Set Screw	1
58	5490	Gearbox Pulley	1
59		Handknob	1
60		Hex. Hd. Screw	6
61		Std. Washer	6
62		Hex. Hd. Screw	2
63		Fiber Washer	2
64	4173	Gearbox Cover	1
65	4223	Gasket	1
66	1031	Spacer	1
67	1037	Control Rod	1
68		Compo Bush	1
69		'O'	1
70	1032	Input Shaft	1
71	1024	Pin	1
72		Soc. Set Screw	1
73	1209	Washer	1
74		Oil Seal	1

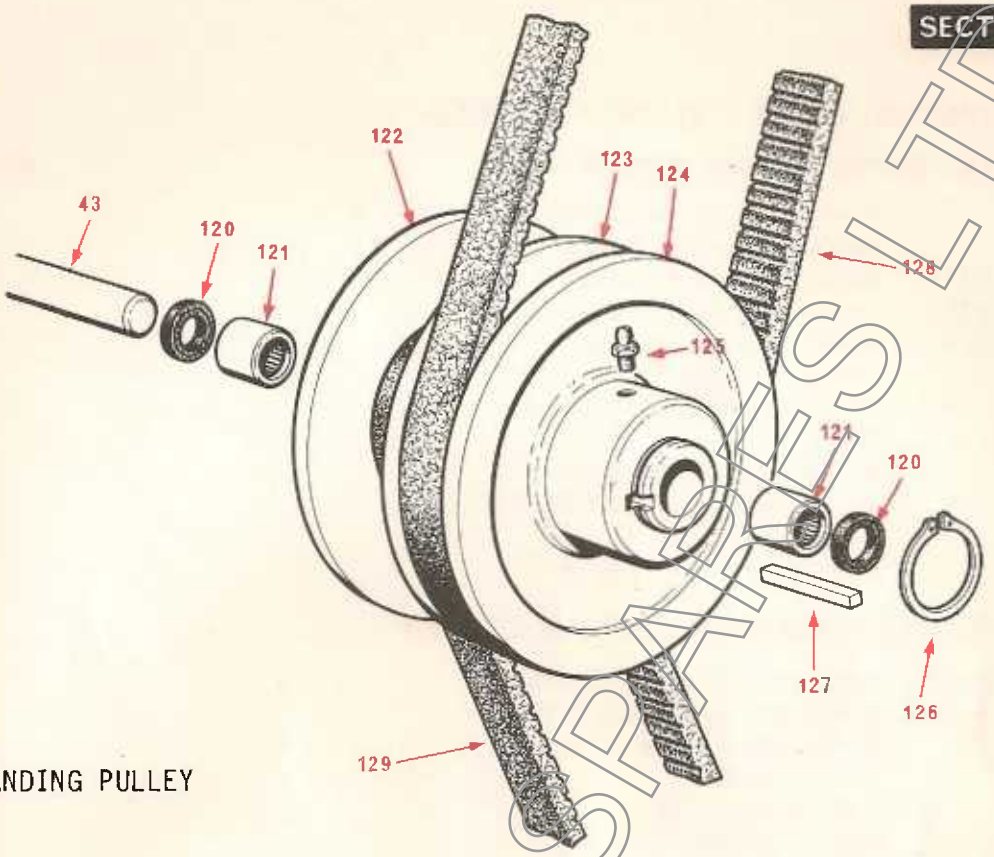


VARIABLE SPEED CONTROL

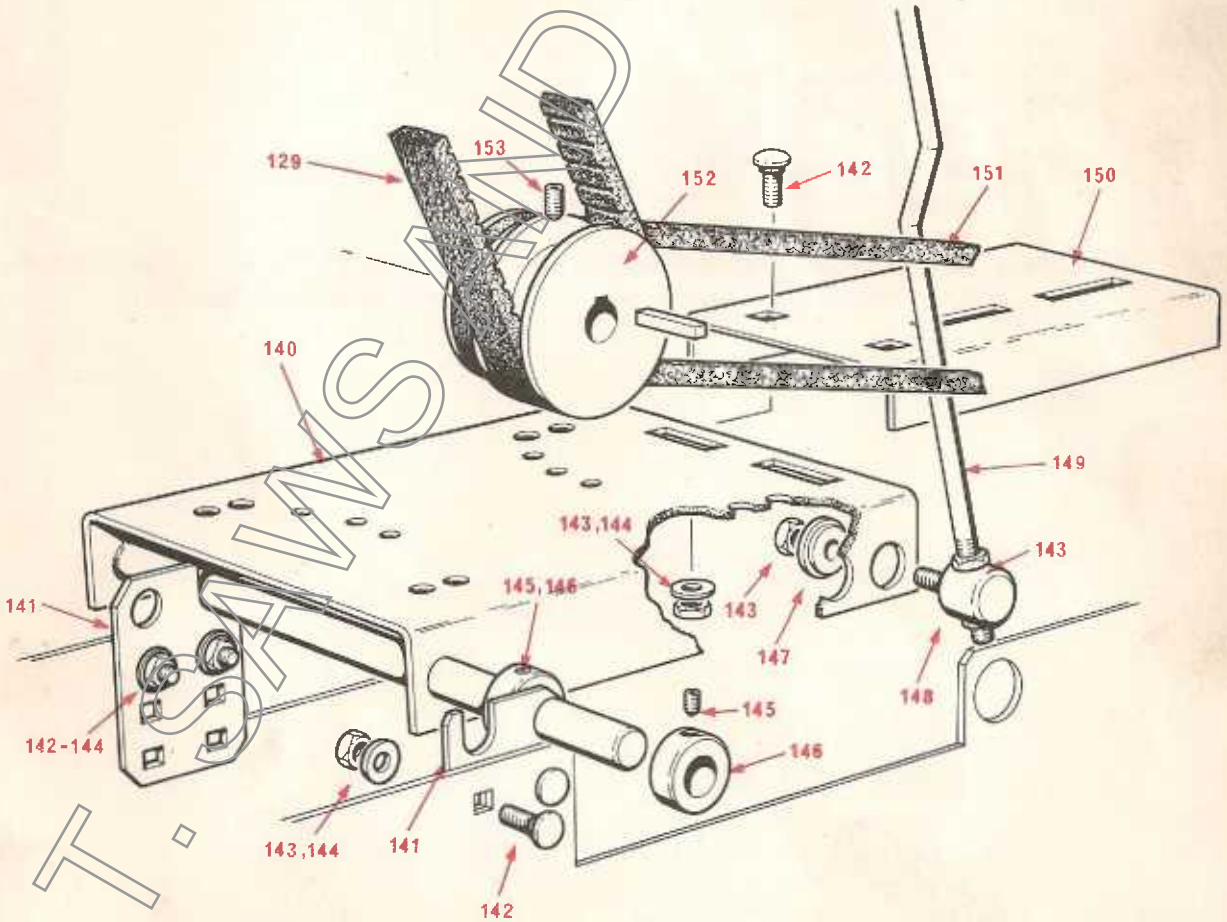
SECTION 45

VARIABLE SPEED CONTROL - ASSEMBLY No.SM1006

ITEM	PART NUMBER	DESCRIPTION	No.OFF
80		Shoulder Screw	2
81		Handle	2
82		Rd. Hd. Screw - Recessed	3
83	4220	Cover Plate	1
84		Self Locking Nut	2
85	2447	Washer	1
86	4216	Handle	1
87		Soc. Hd. Cap Screw	4
88	4217	Bush	1
89		Drive Screw	4
90	4205	Instruction Plate	1
91	5335	Speed Control Housing	1
92		Hex. Hd. Screw	3
93		Std. Washer	3
94		Mills Pin	2
95	5350	Sleeve Stop	2
96		Soc. Set Screw	4
97	SM953	Sleeve & Lug	1
98	5340	Speed Control Screw	1
99	SP212	Universal Joint	1
100	5488	Speed Scale - 50Hz Models	1
	5489	Speed Scale - 60Hz Models	1
101	4209	Indicator Drum	1
102		Mills Pin	1
103	666	Locking Collar	1
104		Soc. Set Screw	2
105	4211	Indicator Spindle	1
106	4210	Gear	1
107	4212	Spacer	1
108		Key	1
109	4219	Scale Clamp	1
110		Soc. C'sk. Hd. Screw	2
111	4208	Operating Shaft	1
112	4215	Spacer	1
113		Compo Bush	2
114	4218	Clamping Plate	1
115		Soc. Set Screw	1



EXPANDING PULLEY



VARIABLE SPEED MOTOR PLATFORM

SECTION 45

EXPANDING PULLEY - ASSEMBLY No.SM958

ITEM	PART NUMBER AND DESCRIPTION		No. OFF
120		Bearing Seal	2
121		Needle Bearing	2
122	5327	Inner Pulley Section	1
123	5328	Central Pulley Section	1
124	5329	Outer Pulley Section	1
125		Grease Nipple	1
126		Circlip External	1
127	5331	Key	1
128		Drive Belt (Upper)	1
129		Drive Belt (Lower)	1

VARIABLE SPEED MOTOR PLATFORM ASSEMBLY

140	SM999	Motor Platform & Shaft	1
141	5435	Platform Support Bracket	2
142		Coach Bolt	6
143		Hex. Nut	9
144		Std. Washer	6
145		Soc. Set Screw	2
146	5401/1	Collar	1
147	5443	Spacing Washer	1
148	5480	Trunnion	1
149	5493	Tensioning Stud	1
150	5434	Pump Platform	1
151		Vee-Belt	1
152	5491	Motor & Pump Pulley	1
153		Soc. Set Screw	1

NOTE : Drive belts and vee-belts may vary according to motor fitted.
When ordering, check No. on belt and order accordingly.

UPPER BLADE GUARD - ASSEMBLY No.SM1076

ITEM	PART NUMBER AND DESCRIPTION		No.OFF
1	SM1078	Slide Cover	1
2	SM1077	Blade Guard	1
3		Std. Washer	1
4		Thumb Screw	1
5	2338	Thumb Screw	1
6	2453	Guard Bracket	1

INTERMEDIATE BLADE GUARD ASSEMBLY

NOTE : Used on 30" Throat Machines ONLY.

10	SP443	Intermediate Blade Guard	1
11	2711	Thumb Knob	3
12		Rd. Hd. Screw Recessed	3
13		Hex. Nut	3

LOWER BLADE GUARD - ASSEMBLY No.SM858

20	SM857	Blade Guard	1
21		Hex. Hd. Screw	2
22		Std. Washer	4
23	5035	Adjustable Guard	1
24		Wing Nut	2
25		Hex. Locknut	1

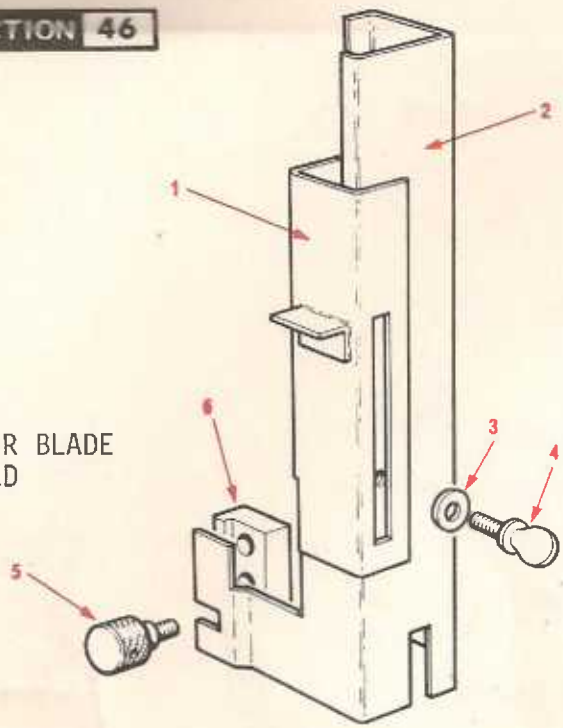
DOOR INTERLOCK - ASSEMBLY No.SM1130

30	5701	Switch Mounting Plate	1
31		Hex. Nut	4
32		Hex. Hd. Screw	2
33	5703	Threaded Push Rod	1
34	5705	Interlock Mounting Plate	1
35		Hex. Nut	2
36		Compression Spring	1
37		Split Pin	1
38	5702	Switch Operating Plate	1
39	5704	Plain Push Rod	1
40		Ch. Hd. Screw	2
41		Micro Switch	1

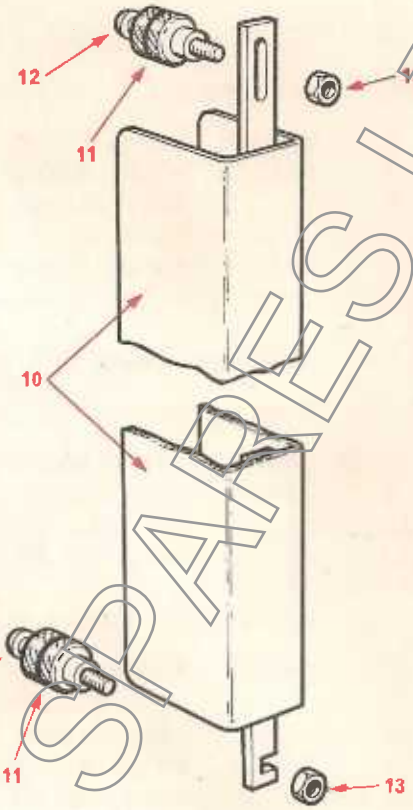
WORKLIGHT - ASSEMBLY No.SM1003

50	5463	Lamp Shade	1
51	30.297-	Lamp	1
52	3601	Lens Mounting	1
53	3605	Lens	1
54		Lamp Holder	1
55		Hex. Hd. Screw	1
56		Washer	1

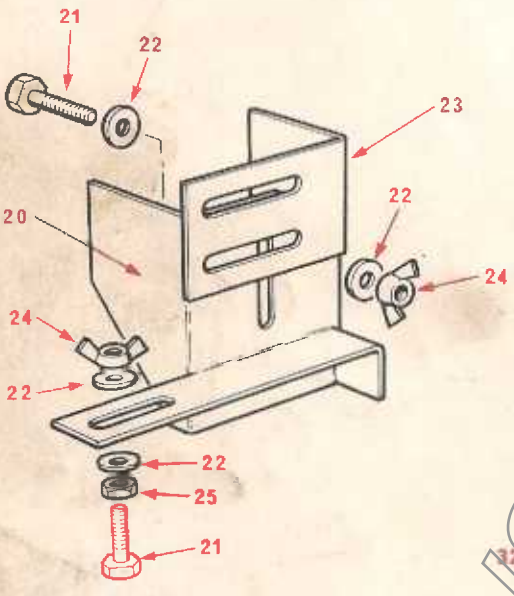
To remove lamp, press inwards, twist anti-clockwise and pull out.



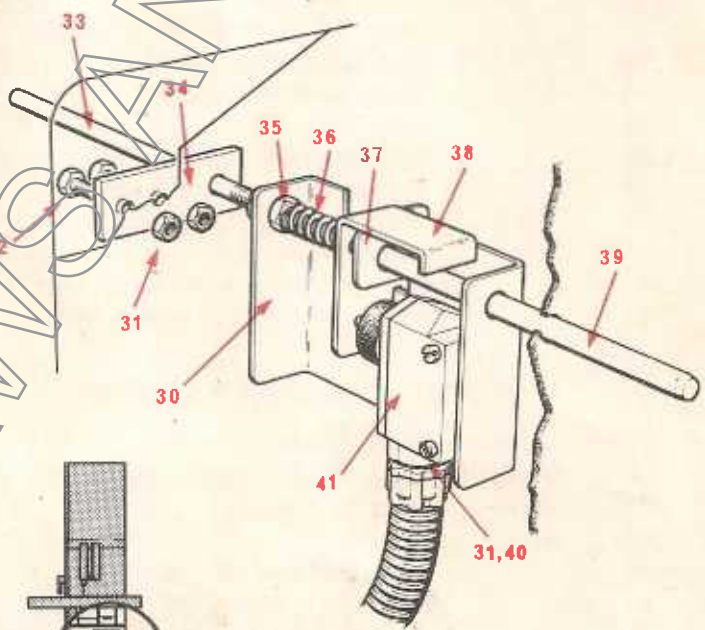
UPPER BLADE GUARD

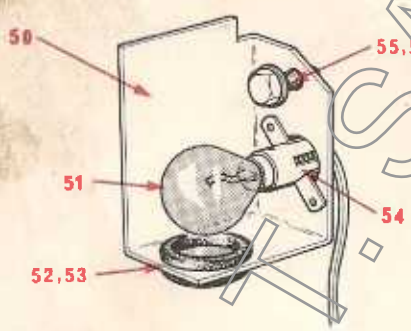


INTERMEDIATE BLADE GUARD

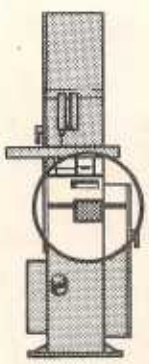


LOWER BLADE GUARD





WORKLIGHT



DOOR INTERLOCK