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

HANDBOOK
BO10016

V 500
VERTICAL BANDSAWING MACHINE

A.L.T. Saws & Spares Ltd
Startrite Machine Specialist
Unit 15, Pier Road Industrial Estate
Gillingham
Kent
ME7 1RZ
Tel/Fax: 01634 850833
www.altsawsandspares.co.uk

Issue 2 17-05-94 RF 11097

CONTENTS

SPECIFICATION

Throat	20″	508mm
Max. Work Height under Top Guide	14″	355mm
Bandwheel Diameter	20.5″	521mm
Bandwheel Width	1.75″	44.5mm
Table Size V500F	24″ x 24″	610mm x 610mm
Table Size V500H	26″ x 27.75″	660mm x 705mm
Table Tilt	45 Degrees Right	15 Degrees Left
Table Height	39″	990mm
Drive Motor Power	3 H.P. 2.2 Kw	1150 R.P.M.
Alternative (1)	3 H.P. 2.2 Kw	960 R.P.M.
Electrical Supply	220/240 Volt 3 Phase	50 Hz
Alternative (1)	220/240 Volt 3 Phase	60 Hz
Alternative (2)	380/440 Volt 3 Phase	50 Hz
Alternative (3)	380/440 Volt 3 Phase	60 Hz
Alternative (4)	575 Volt 3 Phase	60 Hz
Blade Speeds	50 - 5200 ft/min	15 - 1585 mtr/min
Dimensions; Width	47.5″	1206mm
Depth	36″	914mm
Height	82″	2082mm
Net Weight V500F	1240 pounds	562 Kilograms
Net Weight V500H	1477 pounds	670 Kilograms

FOR BEST RESULTS USE `A.L.T.` SAW BLADES

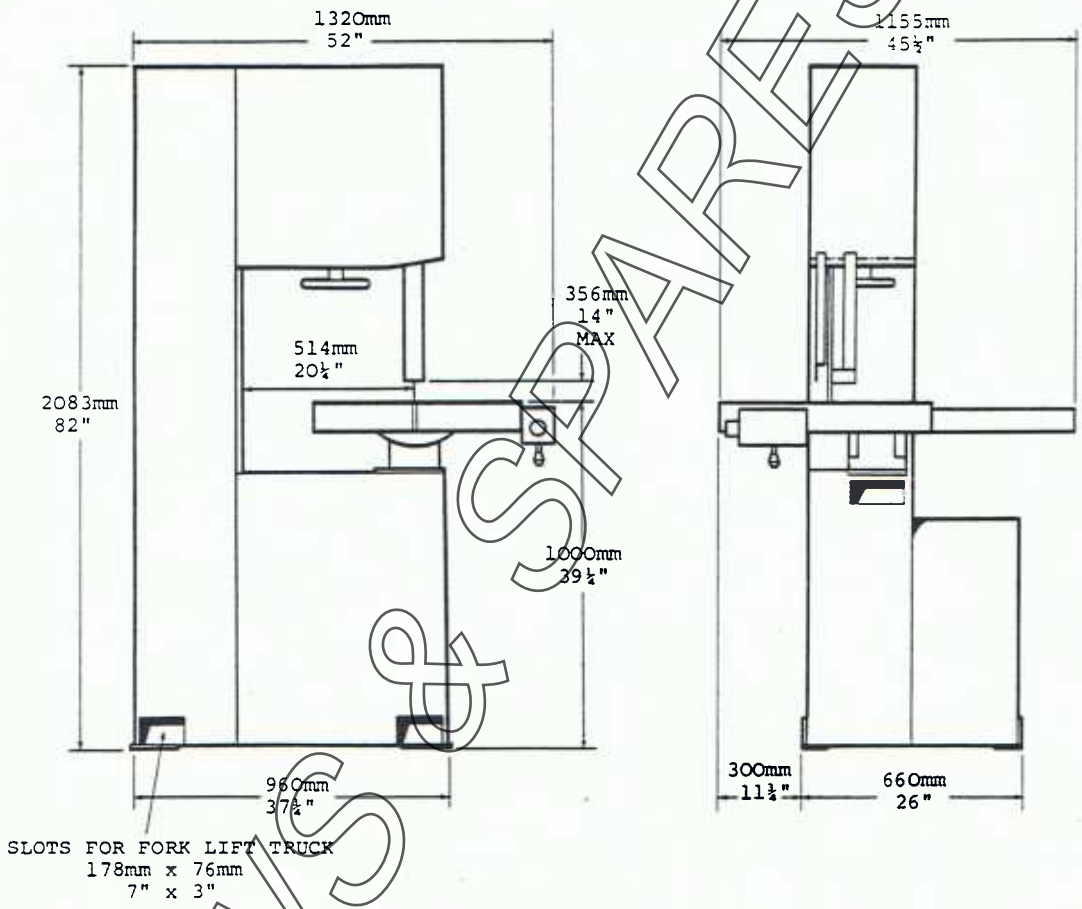
When ordering parts, please state:-

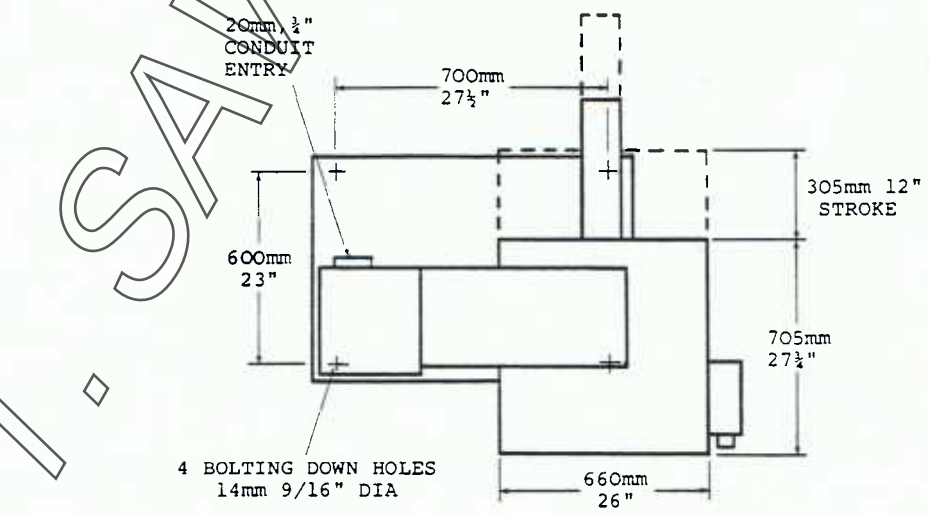
1. Machine Model and Serial Number
2. Part Number (where applicable) and Description
3. Quantity required
4. Specify power supply for electrical components

NOTE: ILLUSTRATIONS MAY VARY IN DETAIL ACCORDING TO MODEL

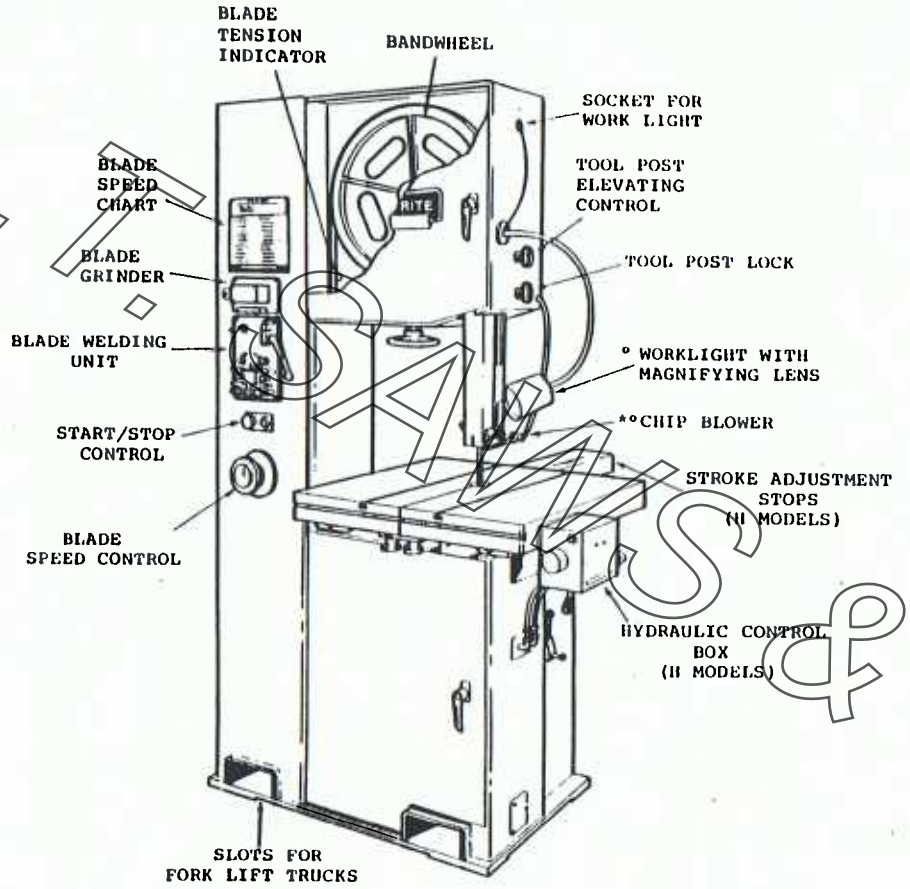
Startrite Machine Tool Company Limited
Waterside Works, Waterside Lane,
Gads Hill, Gillingham,
Kent, ME7 2SF, England.

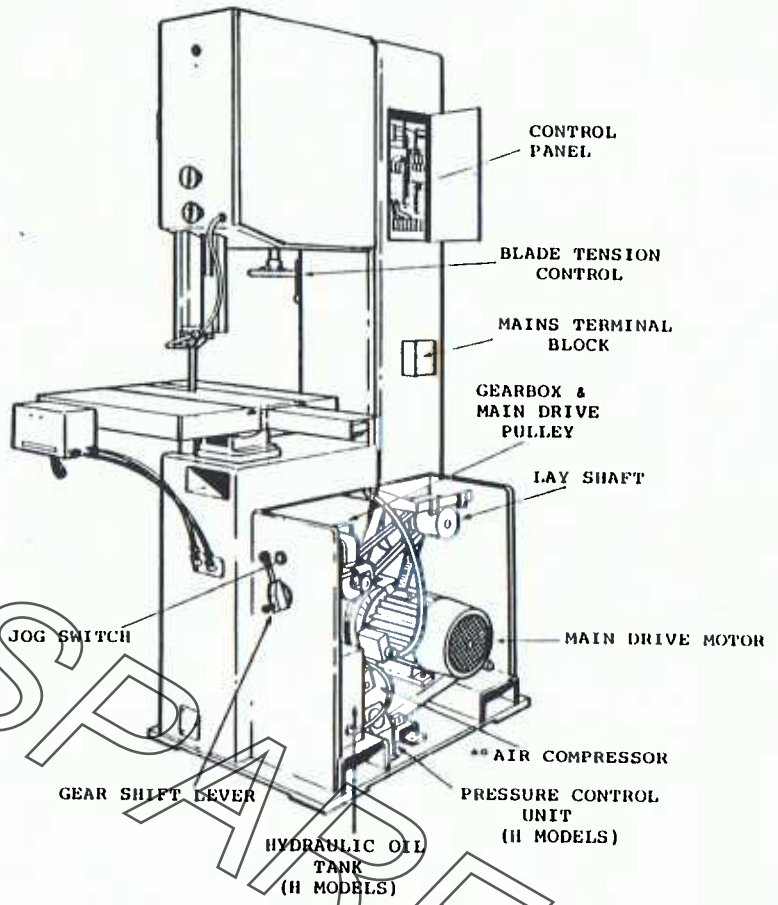
ALL DIMENSIONS ARE APPROXIMATE





FOUNDATION PLAN FOR V500 SERIES BANDSAWING MACHINES
(DETAILS VARY ACCORDING TO MODEL)





GENERAL LAYOUT FOR V500 SERIES BANDSAWING MACHINES.
(DETAILS VARY ACCORDING TO MODEL).

° OPTIONAL EXTRAS (NOT SUPPLIED WITH STANDARD MODELS).
* SUPPLIED AS STANDARD ON HYDRAULIC MACHINES.

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.

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 the machine to site, use Fork Lift truck.

WARNING: The use of slings around the machine body is not recommended and on no account must the table or its mounting mechanism be used as a sling attachment point when positioning 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 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 (see page 1 for appropriate dimensions) to accept ½" diameter anchor bolts (not supplied),

INSTALLATION (CONTINUED).

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: (V500H)

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

1. Lift the table into position allowing the trunnion to seat and the 20mm diameter bolt to pass through the slots in cradles. Where necessary, the bolt may be assembled into the trunnion by passing it through the table insert aperture.
2. From the underside of the cradle platform, assemble in bolt on order:-
   Spring Housing, spigot end first.
   Spring, into body of housing.
   Washer.
   Nut, using spanner supplied.

MACHINES FITTED WITH HYDRAULIC SYSTEM:

V500H machines have two hydraulic pipes marked 'P' & 'T' connecting 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 oil tank (V500H Models Only) 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 five minutes, shift table control lever to 'TABLE FORWARD' and check pressure gauge reading when the table has travelled the full extent of its stroke. If necessary, slacken lock nut on the Pressure Control Assy and turn the soc. cap screw to give an indicated pressure reading of 130 P.S.I., re-locking after adjustment. Set table feed control to maximum 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. If this is not the case check that the two flexible hydraulic pipes from the machine body marked 'P' & 'T' are connected to the control box connections similary marked 'P' & 'T'.

SETTING UP THE MACHINE.

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

MACHINE CONTROLS.

BLADE SPEED CONTROL:

Operation of the gearshift lever at the side of the machine selects a low speed range of 50 - 520 feet per minute (15 - 150 meters per minute), or a high speed range of 500 - 5200 feet per minute (150 - 1585 metres per minute).

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

The motor can be jogged to facilitate engaging gear, but allow motor to stop before operating gearshift lever.

Variation of saw speed in each range is controlled by the speed selector dial at the front of the machine.

IMPORTANT: OPERATE SPEED CONTROL DIAL ONLY WHEN MOTOR IS RUNNING. TURNING SPEED CONTROL DIAL WITH MOTOR STOPPED WILL DAMAGE VARIABLE SPEED DRIVE.

SLIDING TABLE: (V500H)

The table is secured in position by a single bolt passing through the tilting cradle with the locking nut accessible through the opening beneath the table mounting. Slackening the nut about one half turn will allow the table to be tilted up to 45° to the right and 15° to the left. A table traverse of 12" (305mm) can be obtained with hydraulic feed system. When required, the length of stroke can be limited by means of stop collars mounted on the threaded shaft situated beneath the table.

HYDRAULIC SYSTEM (WHERE FITTED) :

Hydraulic pressure (V500H) 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 along side the hydraulic oil tank, and is normally set at 130 P.S.I., but may be increased, if necessary, to 150 P.S.I. The three position lever controls the direction of 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 33" inches (0.83 meters per minute). The greater the number on the dial setting, the per minute faster the feed. Pressing the 'FAST TRAVERSE' button will override the feed setting and provide maximum feed in either direction until released.

WEEKLY MAINTENANCE:

Remove embedded chips from bandwheel tires.
Clean upper and lower saw blade guide assemblies checking that the thrust roller faces present an unbroken polished ring. Replace thrust roller if face appears scored or unduly abraded.
Clean table slideways.
Check that the expanding pulley faces and variable speed belt are free from grease and dirt.

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 (where fitted) when replacing screw. Check condition and tension of vee-belts. Do not adjust tension of variable speed belt as this is automatically determined by the spring pressure.
Check level of hydraulic oil in tank (V500H Model).

YEARLY MAINTENANCE:

Drain hydraulic system (where fitted), clean tank and replace filter (Part No.AC33B). Refill with 14 imperial pints (8 litres) of clean hydraulic oil and operate controls to remove air locks, see page 4.

GENERAL:

Otherwise than above, clean and lubricate working parts as required. The bandwheels, Air Compressor, (where fitted) 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 AIR COMPRESSOR	ESSO Esstic 50 Oil TEXACO Ursa P20 Oil SHELL Tellus 68 Oil
GEARBOX	ESSO Pen-o-led EP2 Oil GULF EP65 Lubricant Oil MOBIL Mobilgear 629 Oil TEXACO Meropa 2 Lubricant Oil SHELL Macoma R150 Oil
HYDRAULIC SYSTEM (Where fitted)	ESSO Nuto H44 Oil GULF Harmony 43AW Oil MOBIL D.T.E. 24 Oil TEXACO Rando HDA Oil SHELL Tellus 37 Oil

TO FIT A NEW VARIABLE SPEED BELT.

Run the machine at 50 feet per minute (15 metres per minute) and switch off. Release nut securing motor platform to support bracket, and raise assembly to maximum height, retighten nut. This operation will remove tension on variable speed belt, and speed change chain.

Next remove cover plate from side of machine to obtain access to chain and jockey wheel assemblies. Release nut securing one of the jockey wheel assemblies, and slide clear of chain. Remove chain from bottom sprocket, to permit removal of the old variable speed belt.

Install the new belt over pulleys, slacking nut securing motor platform to support bracket, and lower to give 11 13/16" (300mm) between motor and variable speed pulley centres. Replace chain over bottom sprocket & Re-tension as tight as possible using one jockey wheel assembly.

Secure cover plate onto side of machine, and check setting of speed dial indicator.

Refer to section 301 page 8.

TO FIT NEW DRIVE VEE BELTS.

Proceed as per "FIT NEW VARIABLE SPEED BELT" (above) to remove variable speed belt and chain

Next remove three screws securing gear change handle assembly to side of machine, and pull complete assemble clear. Remove the two fitting bolts which secure the support arm to the gearbox, and swing the arm clockwise to permit removal of old vee belts from gearbox pulley, and over Simplatroll assembly. Install the new belts over the pulleys, reposition. Support arm and secure to gearbox. Position and secure gear change handle assembly. Slacken four bolts securing layshaft plummer block, and by using jacking screw adjust belt tension, ensuring plummer block is held firmly against the two side jacking bolts before securing layshaft assembly. Replace variable speed belt and chain, adjust as per instructions.

TO FIT AIR COMPRESSOR VEE BELT

Proceed as per"FIT NEW VARIABLE SPEED BELT" Section as above to remove variable speed belt and chain. Next remove cap screw from Simplatroll drive adjustment housing. Slacken nuts securing compressor, and remove old Vee belt. Install the new vee belt over pulleys,ensure pulley alignment is correct before securing compressor to motor platform.Re-Secure cap screw into adjustment housing.Replace variable speed belt and chain, adjust as per instructions.

SECTION 301

INSTRUCTIONS FOR SETTING SPEED INDICATOR

1. Connect machine to electrical supply and run.

2. Turn black speed indicator counter-clockwise to stop.(see Fig.1).

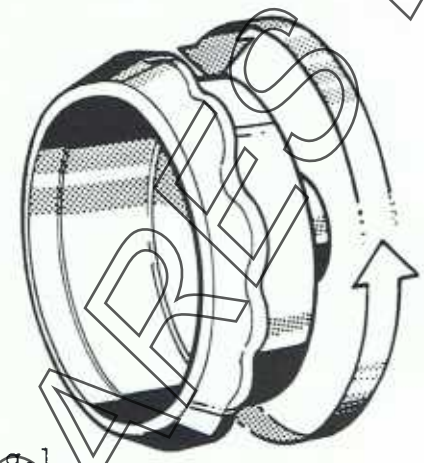


Fig.1

3. Hold indicator dial body in one hand ,face vertical, and rotate until the red needle is at 50.(see Fig.2).

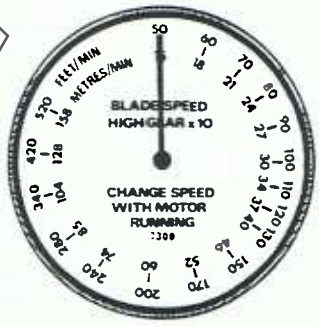


Fig.2

4. Place indicator dial body into aperture in handwheel with needle vertical - lock in position using socket set screw.(see Fig.3).

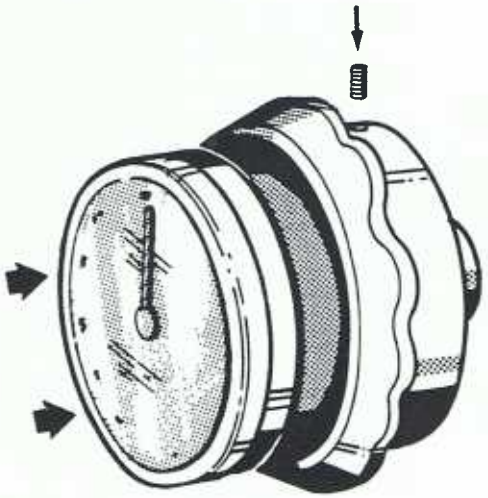


Fig.3

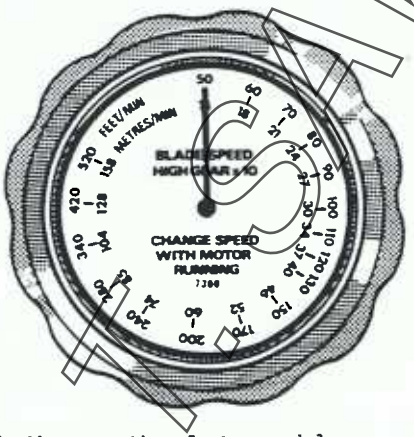
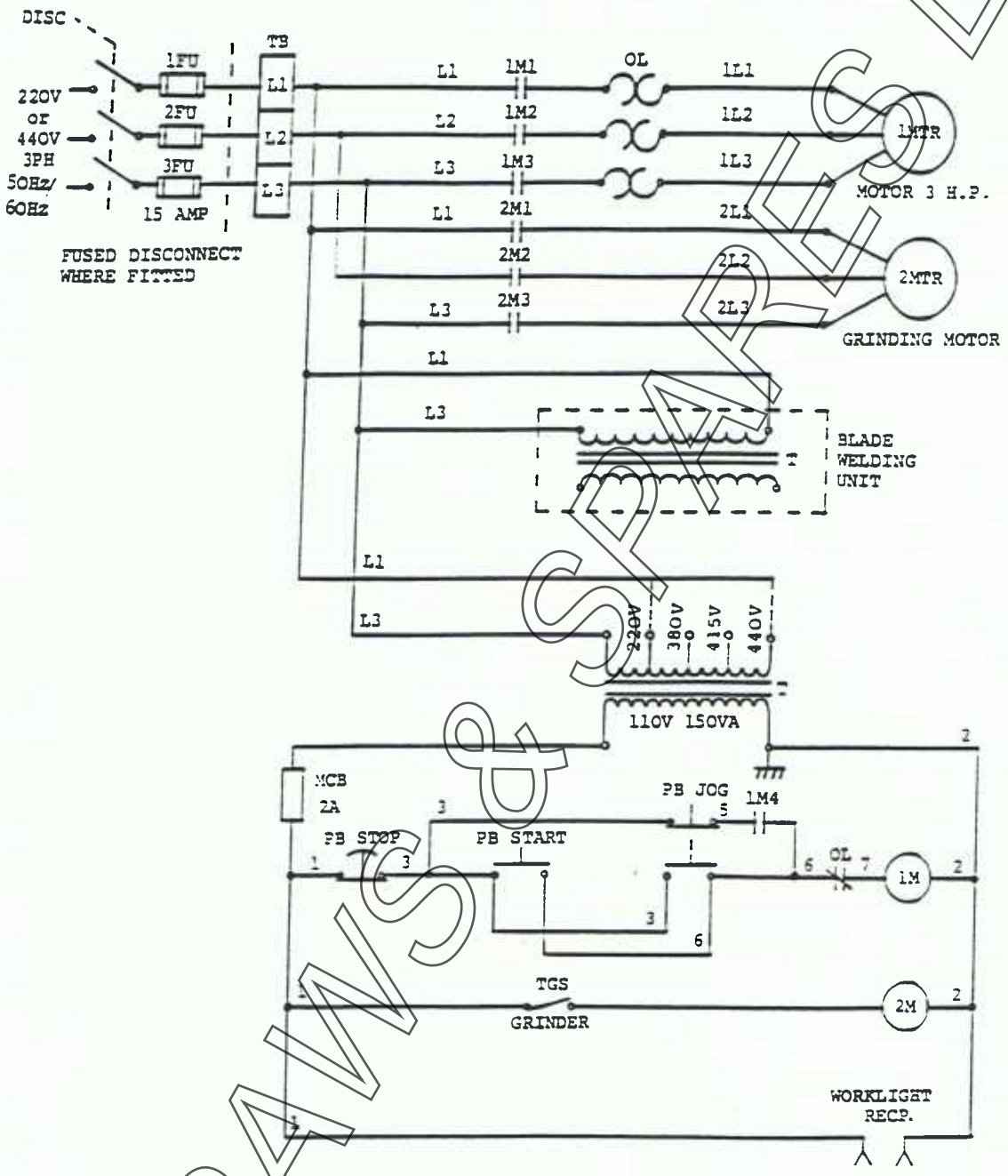
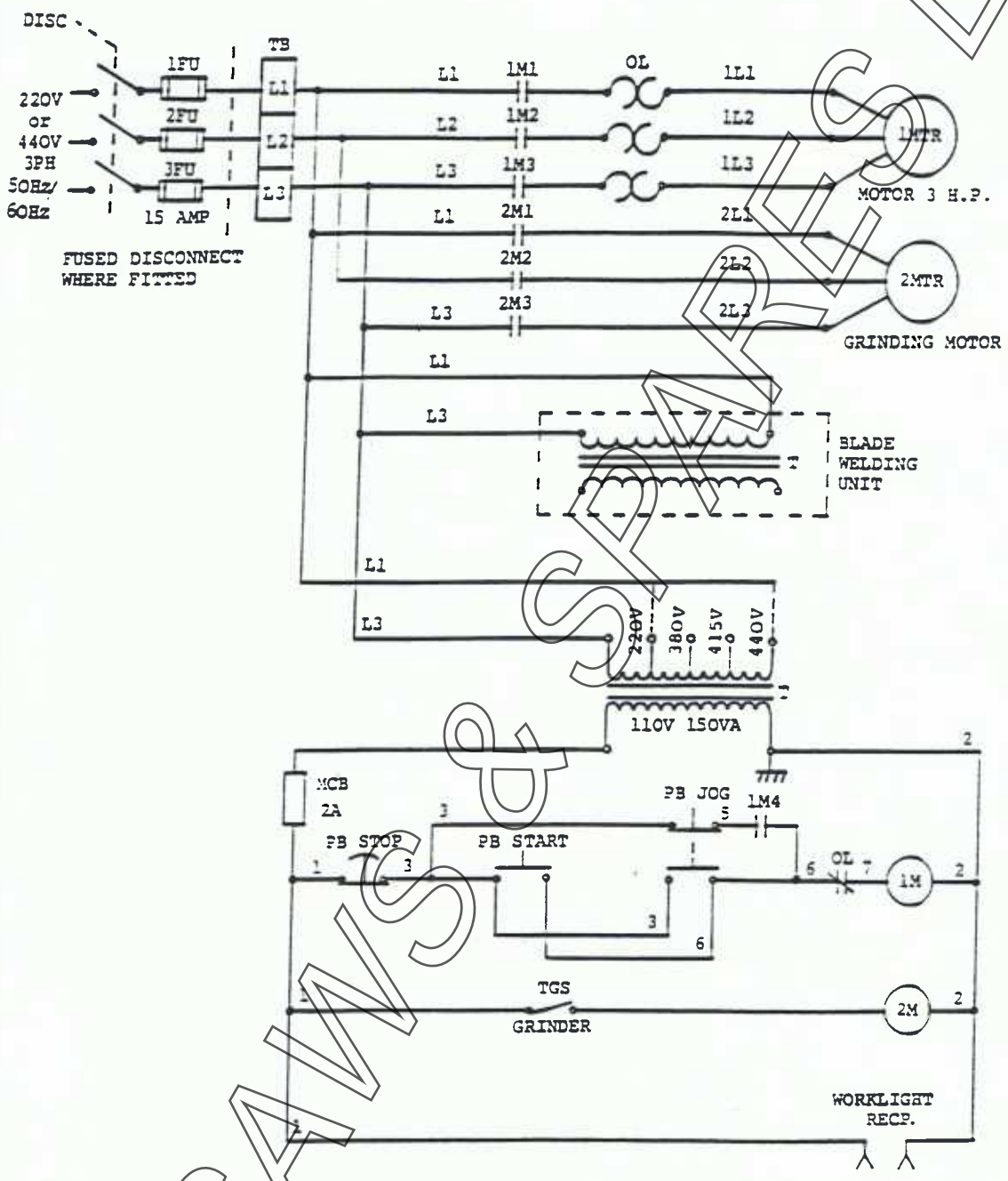


Fig.4,Shows Final Assembly.



CIRCUIT DIAGRAM FOR 220/440V 3PH 60/50Hz V500 MACHINES.



CIRCUIT DIAGRAM FOR 220/440V 3PH 60/50Hz V500 MACHINES.

WIRING INSTRUCTIONS

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 direction, 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 gained by opening the hinged panel cover situated at the rear of the machine body. The complete panel may be removed from the machine by disconnecting the external wires to the terminal block and removing secuing nuts retaining panel.

ITEM 1 TRANSFORMER

220/440V primary, 110V 150VA control circuit and worklight.

ITEM 2 CIRCUIT BREAKER

2 Amp rating for control circuit and work light protection.

ITEM 3 CONTACTOR

110V coil, provides Start/Stop control for grinder motor.

ITEM 4 CONTACTOR

110V coil, provides Start/Stop control for main motor.

ITEM 5 OVERLOAD UNIT

Provides overload protection for main motor.

ITEM 6 TERMINAL BLOCK

ITEM 7 TERMINAL BLOCK

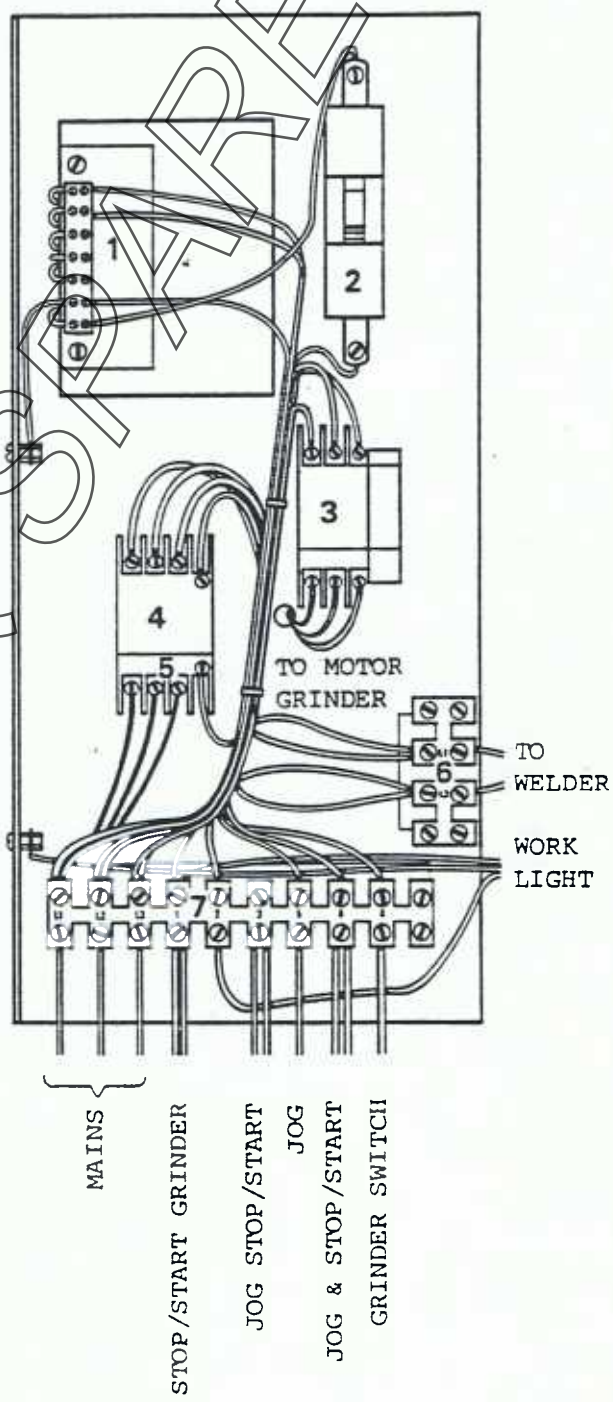


Fig.1.

WIRING INSTRUCTIONS

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

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

ITEM 1 TRANSFORMER

220/440V primary, 110V 150VA control circuit and worklight.

ITEM 2 CIRCUIT BREAKER

2 Amp rating for control circuit and work light protection.

ITEM 3 CONTACTOR

110V coil, provides Start/Stop control for grinder motor.

ITEM 4 CONTACTOR

110V coil, provides Start/Stop control for main motor.

ITEM 5 OVERLOAD UNIT

Provides overload protection for main motor.

ITEM 6 TERMINAL BLOCK

ITEM 7 TERMINAL BLOCK

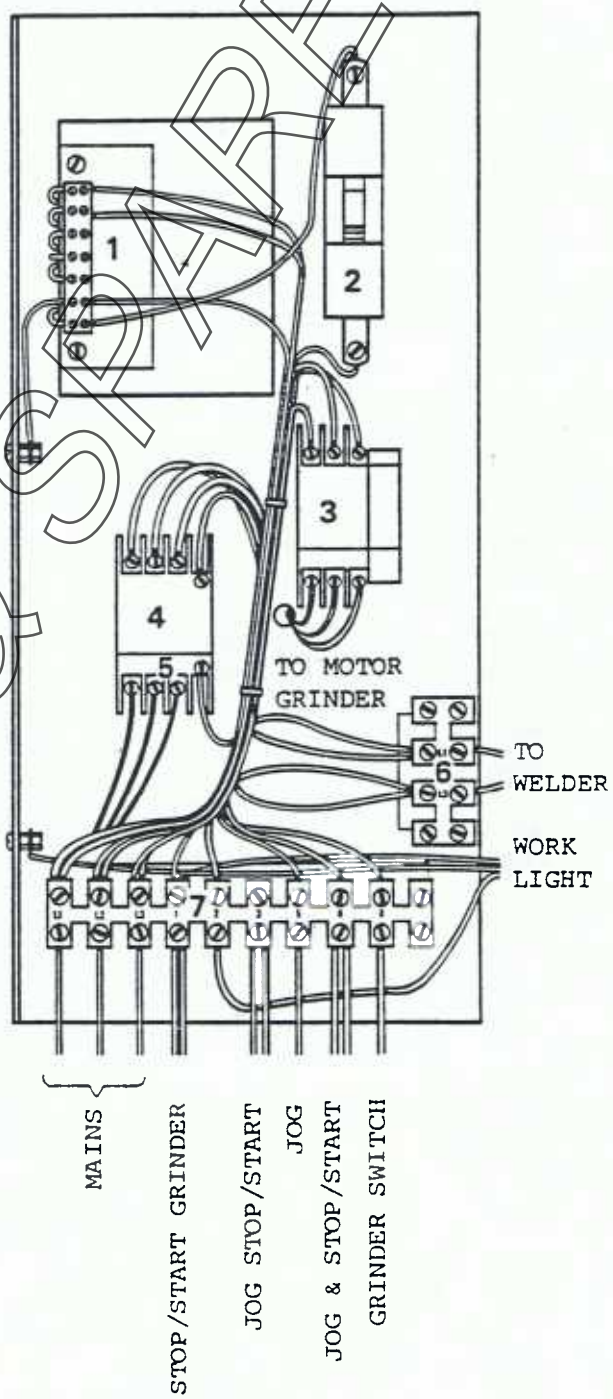


Fig.1.

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.

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. With the gearshift in the neutral position, 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.1a.

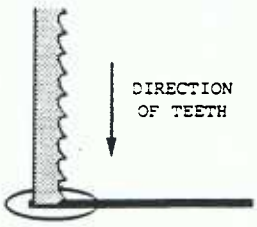


Fig.1.

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.1a.

When the saw blade tracks in a satisfactory manner, apply the appropriate blade tension as shown by the tension indicator, see Fig.2. The tension scale registers tension applied in terms of saw blade width, thus a reading of '¾/20mm' indicates that tension to suit a ¾" or 20mm 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 circumstance.

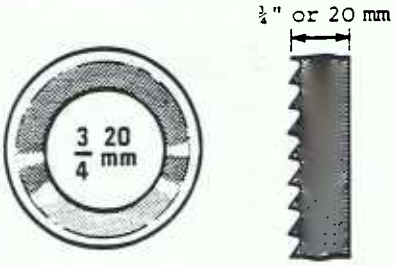
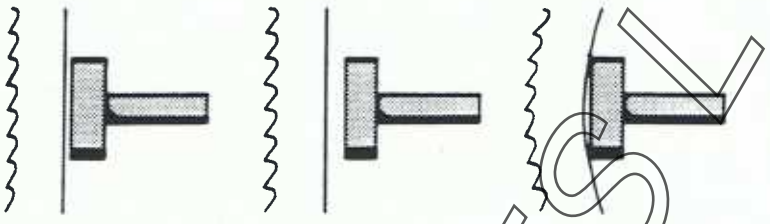


Fig.2.

Set the thrust rollers to support the back edge of the saw blade when finger pressure is applied to the blade teeth. There should be a small gap (.010" approx., see Fig.3) between the saw blade and the thrust roller face when pressure is removed. Check that the thrust rollers rotate freely when cutting pressure is applied to the saw blade.



CORRECT
Thrust roller .010" max.from back edge of saw blade.

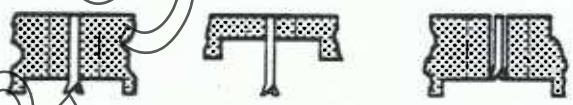
INCORRECT
Thrust roller not supporting saw blade.

INCORRECT
Thrust roller deflecting saw blade.

Fig.3.

Fit correct size Chevron guide into guide holder (see Parts List on page 4) and adjust the guides to support the saw blade in its natural path with the minimum of side clearance (.002" to .004"). A quick and positive method of setting the guides is to position one guide to just contact the saw blade, then adjust the second guide to contact the saw blade plus a .002" feeler gauge. After setting the gap in the top and bottom blade guides, rotate bandwheels by hand to check that the welded joint of the saw blade does not jam as it passes through the blade guides.

The correct size guides should always be used as they offer maximum support to the saw blade (see Fig.4). Should the correct size guides not be available, guides to suit the next size narrower saw blade may be used as an emergency measure.
IMPORTANT: Never use wider size guides as this would instantly destroy the teeth of the saw blade.



CORRECT INCORRECT INCORRECT

Fig.4.

When fitting a saw blade which is identical to the one previously in use, it will not normally be necessary to re-set the blade guides, but some slight adjustmaents to the tracking may be required. It is most important that the top and bottom blade guides are positioned as close to the table as is practical so as to give maximum support to the saw blade. Using the machine with incorrectly adjusted guides can only result in poor quality work and short blade life.

Set the machine to run at recommended blade speed. Operation of the gear shift lever at the side of the machine, selects a low speed range of 50 - 520 feet per minute (15 - 150 meters per minute), or a high speed range of 500 - 5200 feet per minute (150 - 1585 meters per minute).
IMPORTANT : DO NOT SHIFT GEAR WHEN MOTOR IS RUNNING.

The motor can be jogged to facilitate engaging gear, but allow the motor to stop before operating gear shift lever. Variation of saw speed in each range is controlled by the speed selector dial at the front of the machine.
IMPORTANT : OPERATE SPEED CONTROL DIAL ONLY WHEN MOTOR IS RUNNING. TURNING SPEED CONTROL DIAL WITH THE MOTOR STOPPED WILL DAMAGE VARIABLE SPEED DRIVE.

The recommended speed for the various materials will be found suitable for average operational conditions. Some improvement to the cutting performance may be obtained by slight variation from these speeds as the recommendations cannot allow for condition of the saw blade and the shape of the workpiece.

CHEVRON BLADE GUIDES.

The chevron top and bottom blade guide assemblies illustrated in Fig.5. have interchangeable carbide blade guides. A set of double ended guides for ½" and ¾" wide saw blades are supplied as standard equipment with the machine. Double ended guides for ¼" and ⅜", ¾" and ⅝" and single ended guides for 1" wide saw blades are also available as optional extras.

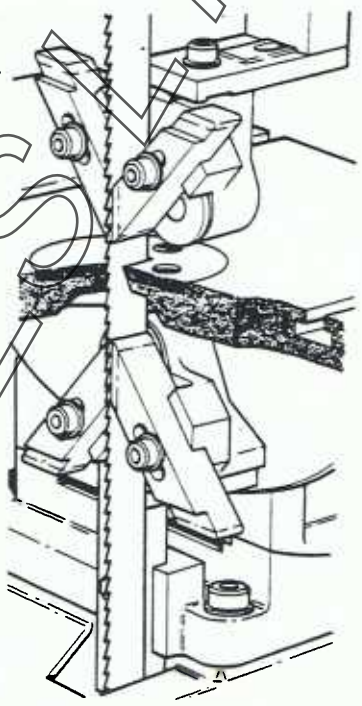
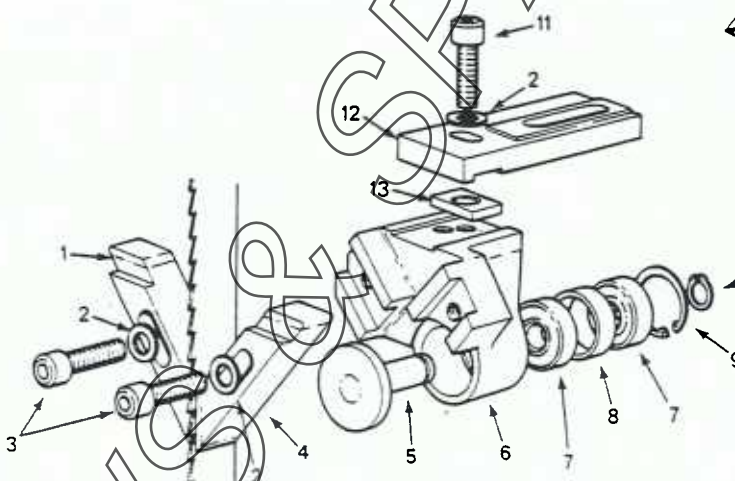
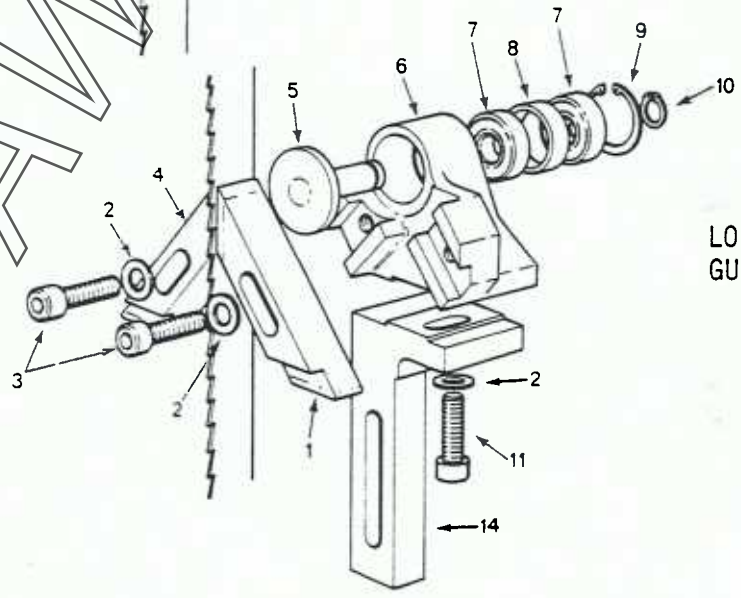


Fig.5.



UPPER BLADE GUIDE ASSEMBLY



LOWER BLADE GUIDE ASSEMBLY

SECTION 307

CHEVRON HOLDER ASSEMBLIES - LOWER GUIDE ASSEMBLY NO: SM1661
- UPPER GUIDE ASSEMBLY NO: SM1662

ITEM	PT NO	DESCRIPTION	NO OFF
1	SM1659/BA	Blade Guide; 1/2" - 3/4"	2
2	BO5917	Washer	3
3	BO5076	Cap Screw;	3
4	SM1659/BB	Blade Guide; 3/4" - 1/2"	2
5	SM1660	Blade Thrust Plate	1
6	7807	Blade Guide Housing	1
7	BO2021	Bearing;	2
8	7819	Bearing Spacer	1
9	BO6032	Int.Circlip;	1
10	BO6004	Ext.Circlip;	1
11	BO5075	Cap Screw;	1
12	7923	Upper Guide Plate	1
13	7922	Key	1
14	7808	Guide Housing Bracket	1

OPTIONAL BLADE GUIDES - not illustrated

15	SM1659/AA	Blade Guide; 1/4" - 3/8"	2
16	SM1659/AB	Blade Guide; 3/8" - 1/4"	2
17	SM1659/C	Blade Guide; 1"	4
18	SM1659/DA	Blade Guide; 5/8" - 3/4"	2
19	SM1659/DB	Blade Guide; 3/4" - 5/8"	2
20	SM1659/BA	Blade Guide; 1/2" - 3/4"	2

ROLLER BLADE GUIDES.

These guides (see Fig.6), which are available as an optional extra, utilise the same location points on the machine as the standard guides and are therefore fully interchangeable with them. The roller guides will be found useful for the continuous high speed sawing of plastics and non ferrous materials etc. Rollers are available to suit ½" , ⅝" , or ¾" wide saw blades, see Parts List on page 6.

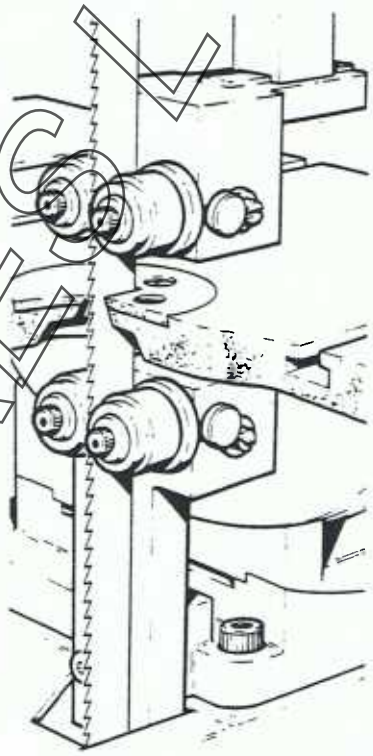
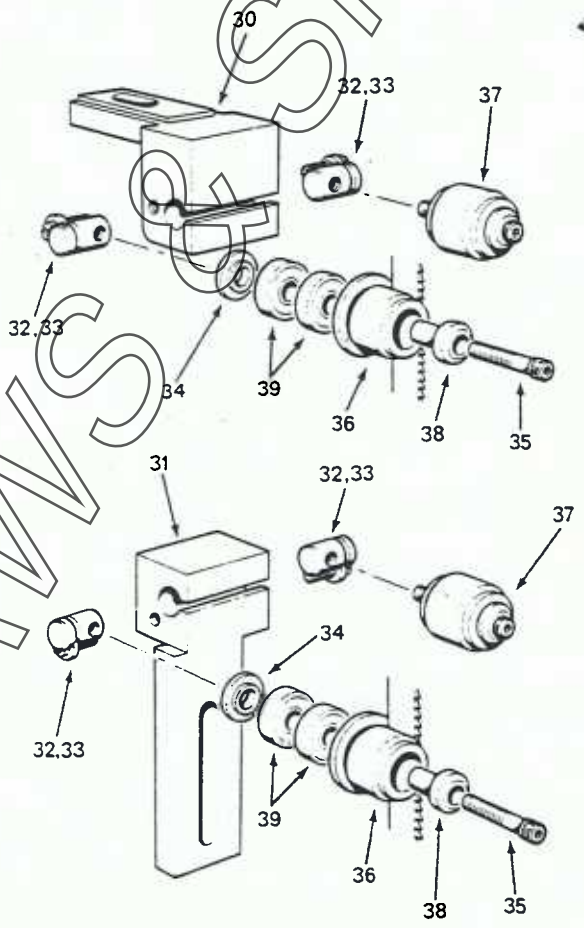


Fig.6.



ROLLER BLADE GUIDE ASSEMBLY - ASSEMBLY NO: SM416

ITEM	PT NO	DESCRIPTION	NO OFF
	NOTE !	Rollers are NOT included with this assembly and must be ordered separately.	
	NOTE !	When ordering rollers, two (2) sets of flanged rollers and two (2) sets of plain rollers are required per machine.	
30	3254	Roller Housing	1
31	3255	Roller Housing	1
32	3171	Sliding Nut	4
33	3307	Adjusting Screw	4
34	3180	Spacer	4
35	BO5022	Cap Screw;	4

3/4" FLANGED GUIDES - ASSEMBLY NO: SM427/A

36	3175	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

3/4" PLAIN ROLLER - ASSEMBLY NO: SM427/B

37	3172	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

5/8" FLANGED GUIDES - ASSEMBLY NO: SM428/A

36	3176	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

5/8" PLAIN ROLLER - ASSEMBLY NO: SM428/B

37	3173	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

1/2" FLANGED GUIDES - ASSEMBLY NO: SM429/A

36	3177	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

1/2" PLAIN ROLLER - ASSEMBLY NO: SM429/B

37	3174	Roller	1
38	3178	Bearing Shaft	1
39	BO2004	Bearing;	2

ANGLED ROLLER BLADE GUIDES.

These blade guides (see Fig.7), are available as an optional extra. Similar in construction to the roller guides (see pages 5 & 6), except that the rollers are set at an angle to the guide body. 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. 8 & 9. When angled blade guides are being used the blade speed should not exceed 350 feet per minute (105 meters per minute). Rollers are available for ½" , ⅝" and ¾" wide saw blades, see Parts Lists on pages 6 & 8.

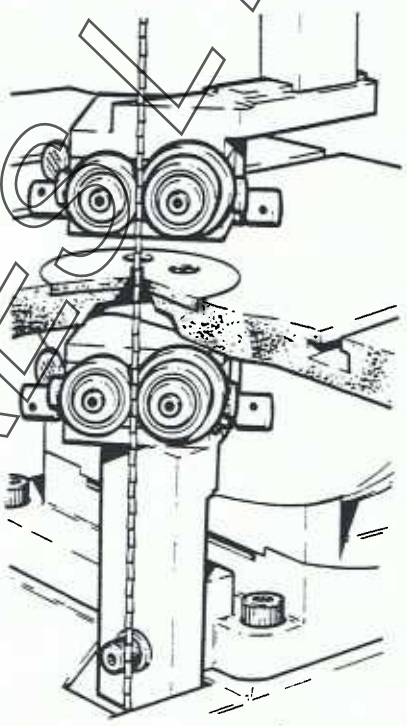


Fig.7.

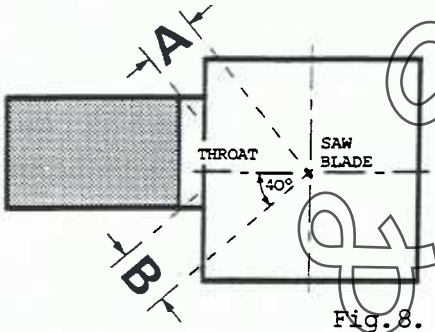


Fig.8.

Throat capacity with saw blade twisted at 40°:-

DIMENSION 'A' - 8⅝"

DIMENSION 'A' - 11¾"

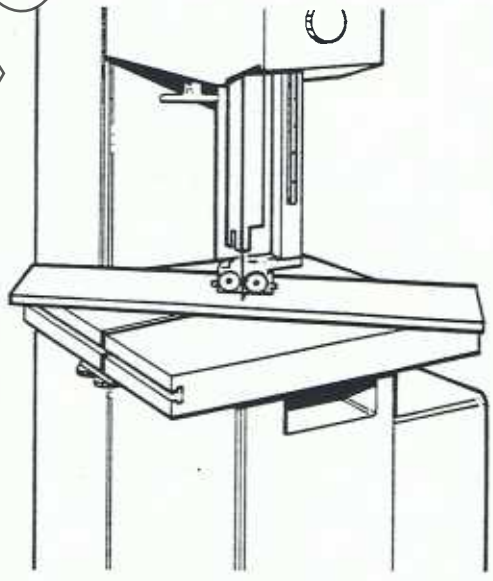
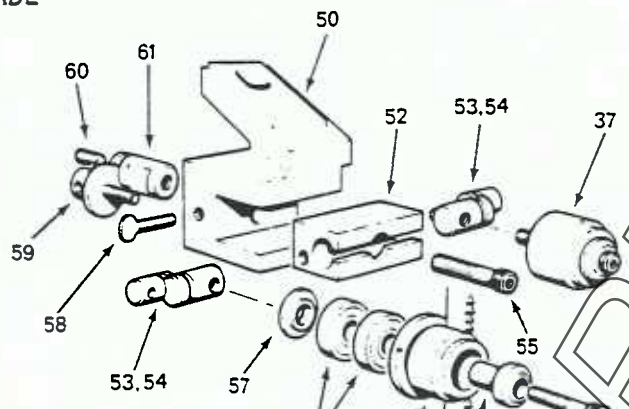
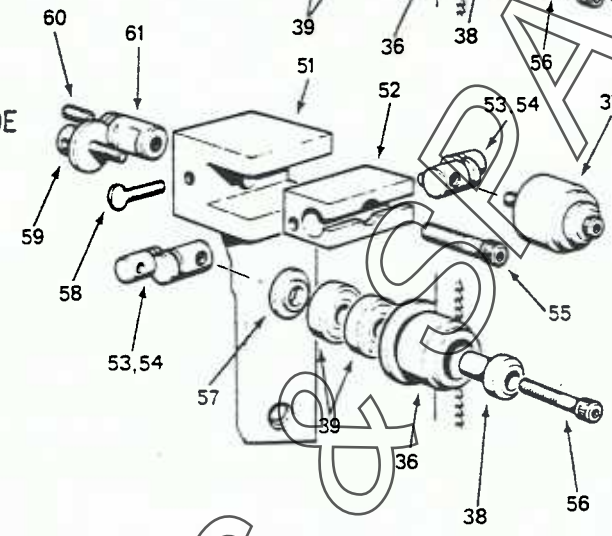


Fig.9.

ANGLED ROLLER BLADE GUIDES - UPPER



ANGLED ROLLER BLADE GUIDES - LOWER



ANGLED ROLLER BLADE GUIDE - ASSEMBLY NO'S: SM401/A & SM401/B

ITEM	PT NO	DESCRIPTION	NO OFF
	NOTE !	Rollers are NOT included with these assemblies and must be ordered separately.	
50	3170	Roller Housing - Upper (SM401/A only)	1
51	3169	Roller Housing - Lower (SM401/B only)	1
52	3184	Adjusting Block	1
53	3171	Sliding Nut	1
54	3182	Adjusting Nut	2
55	BO5029	Cap Screw;	1
56	BO5022	Cap Screw;	2
57	3180	Spacer	2
58	3181	Adjusting Nut	1
59	5057	Thumb Screw	1
60	BO5170	Set Screw;	1
61	3183	Adjusting Shaft	1
	NOTE !	When ordering rollers, two (2) sets of flanged rollers and two (2) sets of plain rollers are required per machine.	

SAW AND SPEED SELECTION CHART.							
MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS				
			UNDER ¼"	¼"-½"	½"-1"	1"-3"	3"-6"
ANILINE FORMALDEHYDE	-	FPM	3500	3200	3000	2900	2800
		TPI	18	14	10	3S	3S
ALUMINIUM - Die Casting	20	FPM	1500	1200	900	750	500
		TPI	18	10	8	6S	3S
ALUMINIUM - Sand Cast Alloy	20	FPM	1200	1000	800	600	400
		TPI	18	14	10	6S	3S
ALUMINIUM - Rolled & Extruded Sections	20	FPM	2500	2000	1500	1400	1200
		TPI	18	10	8	6S	3S
ASBESTOS - Corrugated	-	FPM	3000	3000	3000	3000	
		TPI	14	10	6	3S	
ASBESTOS - Paper	-	FPM	3000	3000	3000	2800	2500
		TPI	10	8	6	3S	3S
ASBESTOS - Wall Board	-	FPM	150	100	100	100	
		TPI	14	10	6	3S	
BABBIT	20	FPM	2500	2000	1500	1200	
		TPI	18	14	8	6	
BAKELITE	-	FPM	2500	2300	2000	1500	1200
		TPI	14	10	8	6S	3S
BERYLLIUM	20	FPM	175	150	100	75	50
		TPI	18	14	10	8	4H
BONE	-	FPM	3500	3200	3000	3000	
		TPI	10	8	6	3S	
BRAKE LINING	-	FPM	300	250	200	200	200
		TPI	14	10	8	6	3S
BRASS - Cast	-	FPM	350	300	200	150	
		TPI	18	14	6	3S	
BRASS - Hard Drawn	-	FPM	360	330	300	280	250
		TPI	18	14	8	6	3S
BRASS - Soft Commercial	-	FPM	2500	2000	1500	1300	1200
		TPI	18	14	8	6	3S
BRONZE - Aluminium	-	FPM	330	320	300	250	
		TPI	18	14	10	6	
BRONZE - Manganese	-	FPM	800	600	350	300	200
		TPI	18	14	8	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"	1"-3"	3"-6"
BRONZE - Phosphor	-	FPM	500	350	300	250	200
		TPI	18	14	8	6	3S
BRONZE - Silicon	-	FPM	1200	900	600	400	200
		TPI	18	14	10	6	4H
CADMIUM	-	FPM	3500	3200	3000	2800	2500
		TPI	10	8	6H	4H	4H
CARBON	-	FPM	3600	3600	3600	3000	3000
		TPI	18	14	6	3S	3S
CARDBOARD - Corrugated	-	FPM	3500	3500	3000	3000	3000
		TPI	SC	SC	SC	SC	SC
CARDBOARD - Sheet	-	FPM	3000	3000	3000	2500	2500
		TPI	14	10	8	6H	4H
CELLULOSE ACETATE	20	FPM	3500	3500	3000	2500	2000
		TPI	14	10	8	3S	3S
CELLULOSE NITRATE	W	FPM	1500	1200	1100	1000	900
		TPI	10	8	6S	3S	3S
COPPER - Beryllium	20	FPM	2500	2500	1600	1200	800
		TPI	14	10	6	3S	3S
COPPER - Hard Drawn	20	FPM	800	700	550	400	200
		TPI	18	14	10	6H	4H
COPPER - Commercial Pure	20	FPM	3200	3000	2700	2500	2000
		TPI	18	14	6	3S	3S
CORK	-	FPM	3500	3500	3500	3500	3000
		TPI	14	10	6H	4H	4H
ETHYL CELLULOSE	W	FPM	3500	3000	2500	2000	1500
		TPI	10	8	6	3S	3S
FIBER BOARD	-	FPM	2500	1500	1100	1000	1000
		TPI	18	14	10	6	4H
FORMICA	-	FPM	2900				
		TPI	18				
GLASS BONDED MICA	-	FPM	75	75	50	50	
		TPI	18	14	10	8	
GLASS FIBER	-	FPM	1000	1000	1000	1000	
		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"	1"-3"	3"-6"
GRAPHITE	-	FPM TPI	3000 18	3000 14	3000 10	2500 4H	2500 4H
HARDBOARD	-	FPM TPI	5000 10				
HORN - Animal	-	FPM TPI	2500 24	2000 18	1500 14	1200 10	1000 6
IRON - Grey Cast	-	FPM TPI	200 24	150 18	125 14	100 10	85 6
IRON - Malleable	-	FPM TPI	275 18	260 14	230 10	200 6	
IRON - Meehanite	-	FPM TPI	150 18	130 14	120 10	110 6	95 4H
LEAD	20	FPM TPI	3000 18	2500 10	1800 10	1200 6S	800 3S
LEATHER	-	FPM TPI	3500 14	3200 10	3000 6	2800 3S	2500 3S
LINEN	-	FPM TPI	3500 KN	3500 KN	3500 SC	3500 SC	
MAGNESIUM	W	FPM TPI	3500 14	3300 10	3200 6H	3000 4H	2800 4H
MICA	-	FPM TPI	225 18	225 14	200 10	200 8	
MONEL	-	FPM TPI	150 18	125 14	50 8	50 6H	
NEOPRENE	-	FPM TPI	3000 10	2800 8	2500 6	2300 4H	2000 4H
NICKEL SILVER	20	FPM TPI	300 18	250 14	200 10	180 6	150 4H
PAPER - Sheet	-	FPM TPI	3000 18	3000 14	2500 10	2500 6H	2000 4H
PAPER - Tissue	-	FPM TPI	3500 SC	3500 SC	3500 SC	3000 SC	3000 SC
PAPIER MACHE	-	FPM TPI	3500 KN	3500 10	3000 6H	3000 4H	3000 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"	1"-3"	3"-6"
PERSPEX	20	FPM TPI	3500 14	3500 10	3000 6	2500 3S	2500 3S
PHENOL FORMALDEHYDE	-	FPM TPI	3500 14	3500 10	3000 6	3000 3S	2500 3S
PLEXIGLASS	-	FPM TPI	3500 14	3500 10	3000 6	2300 3S	2000 3S
POLYSTYRENE	-	FPM TPI	3000 10	2500 8	2000 6	2000 3S	2000 3S
RUBBER - Crepe	-	FPM TPI	3500 10	3500 8	3500 6	3000 6S	3000 3S
RUBBER - Hard	-	FPM TPI	3000 10	2800 8	2500 6	2300 4H	2000 4H
SILVER	20	FPM TPI	2800 18	2400 14	2200 10	2000 6	1500 3S
SLATE	-	FPM TPI	750 18	700 14	600 10	500 6	
STEEL - Carbon Case Hardening SAE 1010 1012 1016 EN32A/B	20	FPM TPI	180 24	160 14	150 10	140 6H	140 4H
STEEL - 0.2% Carbon SAE 1018-1023 EN3	20	FPM TPI	240 24	210 14	180 10	160 6H	150 4H
STEEL - Carbon Manganese SAE 1024 1027 EN14	20	FPM TPI	240 18	220 14	200 10	175 6	150 4H
STEEL - 0.3% Carbon SAE 1029 1030 EN5	20	FPM TPI	230 24	200 14	180 10	160 6	140 4H
STEEL - 0.4% Carbon SAE 1037-1040 EN8	20	FPM TPI	200 24	150 14	125 10	100 6	95 4H
STEEL - 0.55% Carbon SAE 1054 1055 EN9	20	FPM TPI	200 24	150 14	125 10	100 6H	90 4H
STEEL - Low Carbon Free Cutting SAE 1111-1113 1211-1213 1215 EN1	20	FPM TPI	250 18	220 14	200 10	180 6H	170 4H
STEEL - Case Hardening Free Cutting SAE 1115 1117 EN32M 202	20	FPM TPI	200 24	190 14	180 10	160 6	150 4H
STEEL - 0.4% Carbon Free Cutting SAE 1137-1141 EN8M	20	FPM TPI	230 24	200 14	180 10	160 6	150 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"	1"-3"	3"-6"
STEEL - 3% Nickel SAE 2317 2330-2345 EN33 51	20	FPM TPI	150 18	125 14	100 10	90 6H	75 4H
STEEL - 1% Chrome Molybdenum SAE 4130-4140 EN19 20	20	FPM TPI	150 18	100 14	90 10	60 6H	50 4H
STEEL - 1% Nickel-Chrome- Molybdenum SAE 4340 EN24	15	FPM TPI	150 18	125 14	100 10	75 6H	50 4H
STEEL - 2% Nickel Molybdenum SAE 4640 EN160	15	FPM TPI	150 18	125 14	100 10	75 6H	50 4H
STEEL - 1% Chrome Vanadium SAE 6150 EN47	15	FPM TPI	175 18	125 14	100 10	75 6H	50 4H
STEEL - Nickel-Chrome-Moly- bdenum SAE 8616-8645 EN100	20	FPM TPI	140 18	110 14	90 10	70 6H	50 4H
STEEL - Silicon Manganese SAE 9255 EN45	20	FPM TPI	160 18	140 14	125 10	100 6H	70 4H
STEEL - 3% Nickel Chrome SAE 9310-9217 EN36	15	FPM TPI	125 18	100 14	80 10	60 6H	50 4H
STEEL - 1% Carbon Chrome SAE 50100-52100 EN31	15	FPM TPI	160 24	130 14	100 10	75 6H	50 4H
STEEL - Die D-2 D-3	15	FPM TPI	125 18	100 14	80 10	60 6H	50 4H
STEEL - Die D-7	15	FPM TPI	100 24	80 18	65 10	60 6H	50 4H
STEEL - Hot Working H-12 H-13 H-21	15	FPM TPI	125 18	100 14	75 10	60 6H	50 4H
STEEL - Tool L-6 L-7	15	FPM TPI	115 18	95 14	80 10	65 8	50 4H
STEEL - High Speed M-1	20	FPM TPI	185 18	150 14	125 10	90 6H	60 4H
STEEL - High Speed M-2 M-3 M-4 M-5 M-10	15	FPM TPI	130 18	100 14	80 10	60 6H	50 4H
STEEL - Die O-1 O-2	20	FPM TPI	175 18	150 14	125 10	100 6H	80 4H
STEEL - Die O-6	20	FPM TPI	210 18	180 14	150 10	120 6H	100 4H

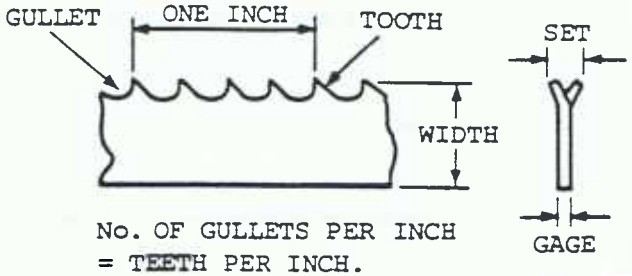
Speeds indicated are for Carbon Steel Saw Blades.
(Regular tooth where not stated otherwise.)
H = Hook Tooth S = Skip Tooth SC = Scallop Blade KN = Knife Edge Blade
W = Water FPM = Feet Per Minute TPI = Teeth Per Inch

SAW AND SPEED SELECTION CHART.							
MATERIAL	WATER TO STARCOOL RATIO		MATERIAL THICKNESS				
			UNDER ¼"	¼"-½"	½"-1"	1"-3"	3"-6"
STEEL - Shock Resisting S-1	15	FPM	125	100	80	65	50
		TPI	18	14	10	6H	4H
STEEL - Shock Resisting S-2 S-5	15	FPM	100	80	60	55	50
		TPI	18	14	10	6H	4H
STEEL - High Speed T-1 T-2	15	FPM	140	110	90	70	55
		TPI	18	14	10	6H	4H
STEEL - High Speed T-4 T-5 T-6 T-8	15	FPM	115	95	85	70	50
		TPI	18	14	10	6H	4H
STEEL - Water Hardening	20	FPM	175	150	125	100	75
		TPI	18	14	10	6H	4H
STRAWBOARD	-	FPM	3500	3500	3000	3000	2500
		TPI	14	10	8	6S	3S
STRING	-	FPM	3500				
		TPI	SC				
TUFNOL	-	FPM	2500	2300	2000	1500	1000
		TPI	14	10	6H	6H	4H
WOOD	-	FPM	4500	4500	3600	3600	3300
		TPI	14	10	6H	4H	4H
ZINC	20	FPM	2500	2300	2000	1500	1000
		TPI	14	10	6H	4H	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 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. The lowest cost saw blade is not necessarily the most economic to use, whilst use of the more expensive types cannot always be justified.



No. OF GULLETS PER INCH = TEETH PER INCH.

Each type is superior in some way for specific applications and therfore selection should be made in relation to the duty required.

Careful blade selection is necessary for sawing metals if optimum results are to be obtained. The Chart below should provide a useful guide for initial saw blade selection.

QUICK REFERENCE CHART FOR BLADE TYPE SELECTION.					
MATERIAL	DUTY REQUIRED				
	GENERAL CUT OFF WORK	LOW PRODUCTION STRAIGHT CUTTING	HIGH PRODUCTION STRAIGHT CUTTING	EXTERNAL CONTOUR CUTTING	INTERNAL CONTOUR CUTTING
Low carbon & free cutting steels, copper, brass, aluminium sections.	CARBON	CARBON	BI-METAL	CARBON	CARBON
Aluminium alloy castings & forgings silicon bronze, aluminium bronze.	CARBON	HARD BACK	BI-METAL	CARBON	CARBON
High carbon steels, alloy steels.	HARD BACK	HARD BACK	BI-METAL	BI-METAL	BI-METAL
High speed steels, stainless steels, tool & die steels.	H.S.S.	H.S.S.	BI-METAL	BI-METAL	BI-METAL

CARBON STEEL SAW BLADES are available in the widest range of styles and sizes at low cost. They are suitable for cutting low and medium carbon steels, also the readily machineable non-ferrous alloys. Being easily weldable, they are recommended for internal contour sawing in all but the hardest materials, also where saw blade breakage is a problem due to many operators using the machine for general cut-off work.

HARD BACK SAW BLADES are intermediate in cost and application between carbon and high speed saw blades. Some brands are weldable and these may prove suitable for internal contour sawing harder materials. They are to be preferred on short run work where the extended tool life of high speed steel or bi-metal saw blades cannot be fully utilised.

HIGH SPEED STEEL (H.S.S.) SAW BLADES permit much higher sawing rates than can be obtained with carbon steel saw blades. They are particularly suitable for production sawing all steels including stainless steel and the harder alloys, but are not much superior to carbon steel saw blades in cutting many non-ferrous materials. Being less flexible than carbon steel they tend to fatigue more readily if over stressed by bending. High speed saw blades cannot be satisfactorily welded with standard butt-welding equipment and therefore are not generally used for internal contour sawing.

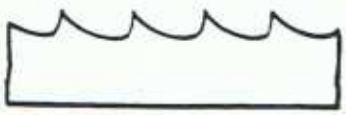
BI-METAL SAW BLADES have high speed steel teeth electron beam welded to a carbon steel band. In this way, the bi-metal saw blade combines the flexibility and welding characteristics of carbon steel with the cutting qualities of high speed steel. The long tool life and fast cutting rates

attainable usually make this type of saw blade economic for production sawing most steels and alloys.

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 and 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.

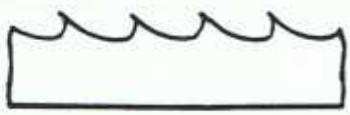
REGULAR TOOTH saw blades are the most common in use because the zero front rake and well rounded gullet present a robust tooth with good shock resistance and work penetration properties. It will produce accurate fine finish work in steel and most medium hard materials but tend to clog when used on soft 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

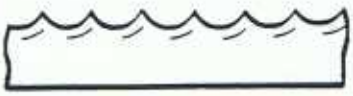
WAVY SET saw blades have the teeth alternately set to the left and right in groups or waves. Wavy set saw blades are ideal for sawing tubes and very thin sections as the progressive set reduces the shock load on individual teeth. With this formation of tooth set however, relatively few teeth are cutting at the side of the kerf and therefore there is some tendency for the saw blade to jam when sawing abrasive materials.

WAVY SET

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

KNIFE EDGE BAND



SCALLOPED EDGE BAND

WAVY EDGE BAND

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. Lubricant should not be used with this type of material. Heat generated by sawing friction cause thermosetting materials to become clogged by swarf, particularly when a blunt or fine pitch sawblade is used. Water may be used as a lubricant in most cases, but where there is a risk of water absorption as in the case of insulating materials, the best recourse is to experiment with the lower blade speeds.

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	1/8"	3/16"	1/4"	3/8"	1/2"	5/8"	3/4"	1"
MINIMUM SAWING RADIUS	5/16"	5/8"	1"	1 1/2"	2 1/2"	4 1/2"	5 3/4"	7 1/2"

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.
Guide inserts snagging set of teeth.
Blade speed too fast, and/or blade pitch too fine.
Hard spots in material.

TEETH TORN FROM BLADE:

Excessive feed pressure.
Gullets of teeth loading.
Blade speed too fast, and/or blade pitch too coarse.
Material pressure welding to teeth.

BLADE DEVELOPING TWIST:

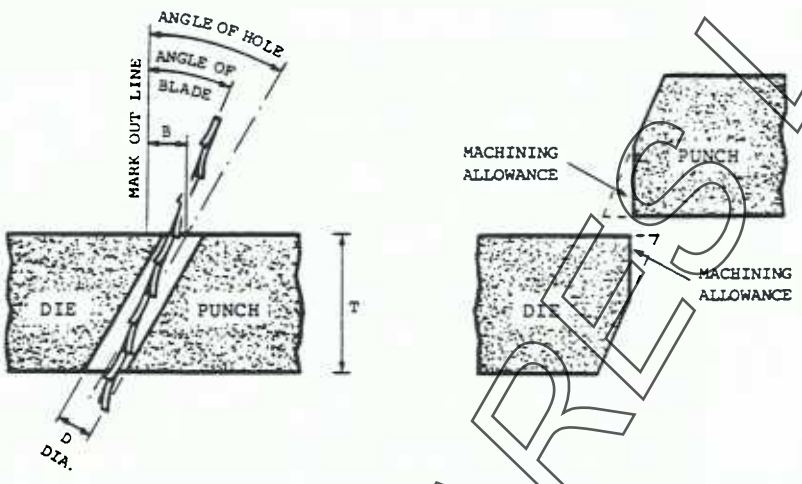
Excessive feed pressure.
Guide inserts snagging blade.
Blade too wide for radius of cut.
Excessive blade tension.
Blade not tracking correctly.
Loss of set to one side of saw teeth.

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".



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 :-

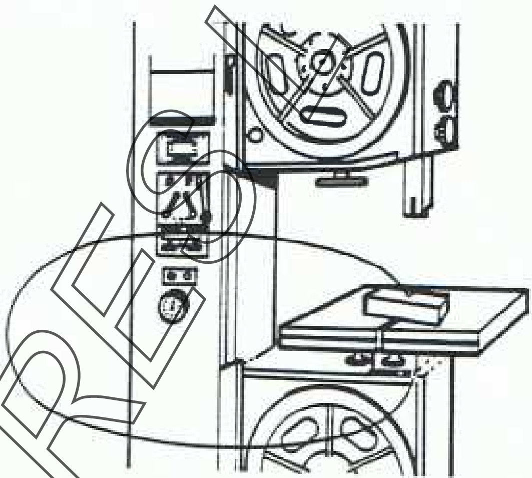
Let T = Die Thickness
B = Width of selected saw blade
Then :- Starting hole diameter = $\frac{3B}{T}$

starting hole centre to mark out line = B
Tangent of starting hole angle = $\frac{3B}{T}$
Tangent of saw blade angle = $\frac{3B}{T}$

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°

BUTT-WELDING SAW BLADES.



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 saw 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 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.

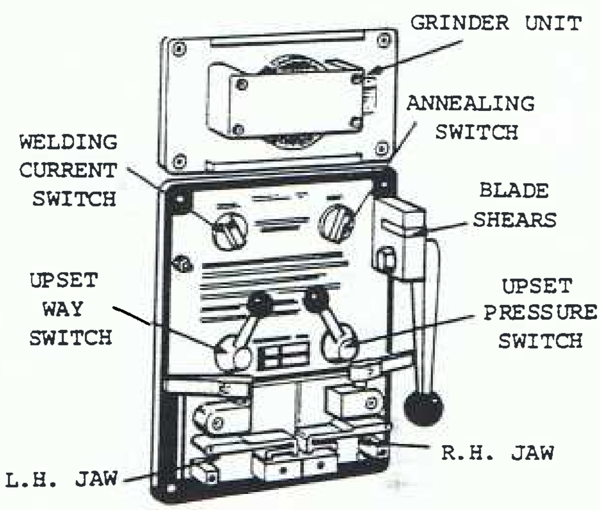
PREPARING THE SAW BLADE.

BLADE LENGTH - 159½",4051mm:Minimum 164",4166mm:Maximum

Cut the saw blade to length (see above) using the blade shear attached to the front of the welder (see Fig. 3.). 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 saw 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 unit 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 midway 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.



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 switch 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.

This 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 colour.

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 drop 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 (saw 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 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 sensitive ball bearing track and therefore should not be forced in any way.

CARE OF THE GRINDING UNIT.

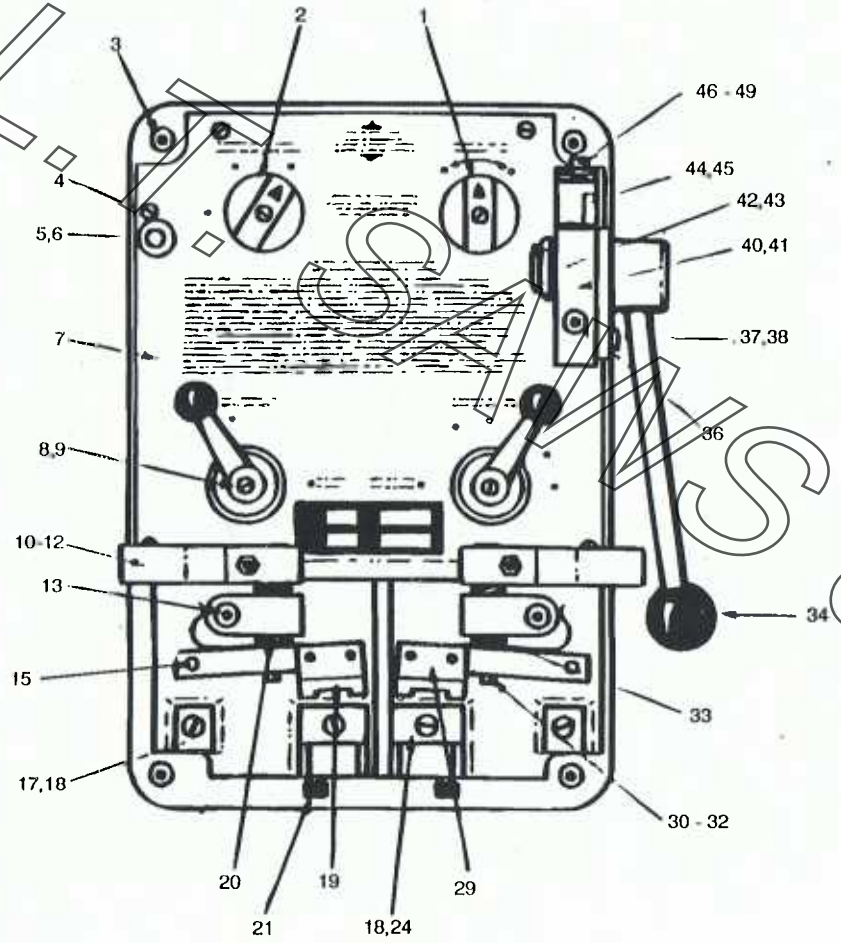
The grinding motor will produce excessive whine if allowed to run with an unbalanced wheel. Dress new wheel upon replacement and if necessary, adjust wheel clamping washer to run eccentric in order to improve dynamic balance. Dress periphery of wheel occasionally to remove embedded swarf.

Wheel size : 63mm. Dia. x 15mm. Wide x 10mm. Bore
Grade : A46 PV
Max speed : 3000 r.p.m. Synchronous (50Hz supply)
Max.speed : 3600 r.p.m. Synchronous (60Hz supply)

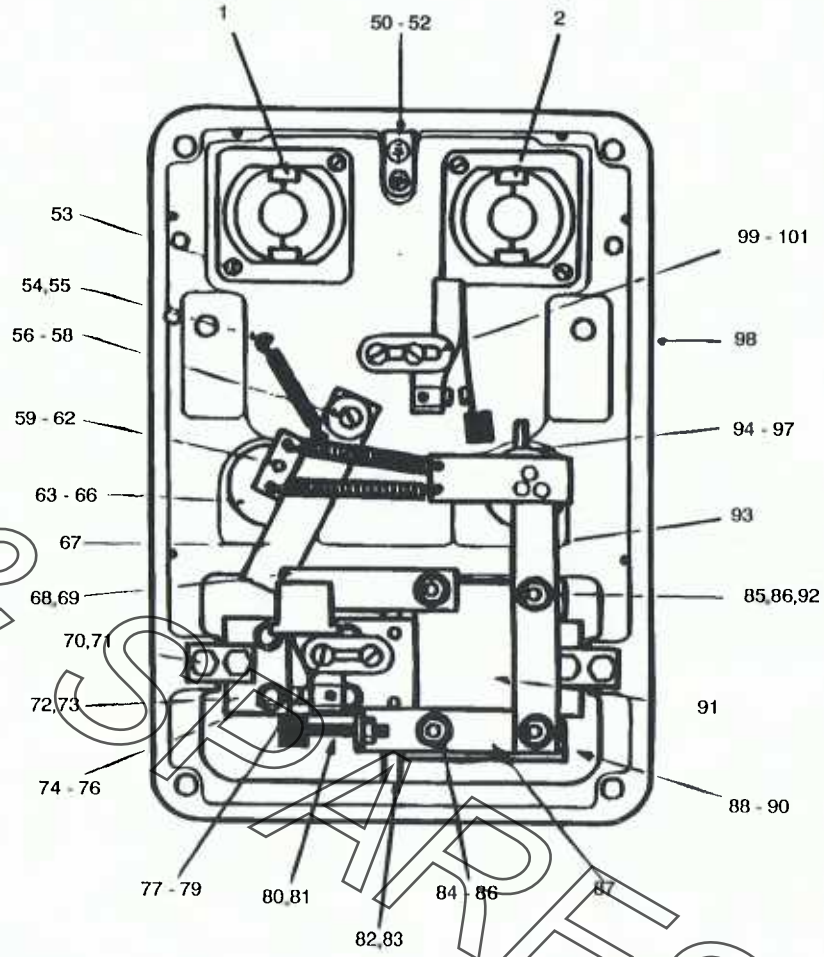
PARTS LIST FOR MODEL BSO.25 WELDER

ITEM	PART NUMBER	DESCRIPTION	No.OFF
1	BO1329	Switch	1
2	BO1328	Switch	1
3	BO5067	Soc. Hd. Cap Screw	4
4	BO7750	Ch. Hd. Screw	6
5	5385	Support Bolt	1
6	BO5752	Hex. Locknut	1
7	5286	Instruction Plate	1
8	BOS1172	Control Knob	2
9	BO7751	Ch.Hd.Screw	2
10	5247	Clamp Handle	2
11	BO5477	Ch. Hd. Screw	2
12	BO5712	Hex. Nut	2
13	BO5061	Soc. Hd. Cap Screw	2
14			
15	5263	Clamp Pivot	2
16			
17	5255	Blade Location Plate (Outer)	2
18	BO7752	Rd. Hd. Screw	4
19	EAB90/3544	L.H. Jaw	1
20	5246	L.H. Clamp Screw	1
21	BO5059	Soc.Hd.Cap Screw	2
22			
23			
24	5256	Blade Location Plate (Inner)	2
25			
26			
27			
28			
29	EAB90/3544	R.H. Jaw	1
30	5264	Clamp Locknut	2
31	BO7753	Disc Spring Washer	4
32	BO5472	Ch. Hd. Screw	2
33	5245	R.H. Clamp Screw	1
34	SM1391	Handle Assembly	1
35			
36	BO5072	Soc.Hd.Cap Screw	1
37	BO5890	Dowel Pin	1
38	6665	Knife	1
39			
40	6663	Shear Body (Old No. 5379)	
41	BO7754	Mills Pin	1
42	BO2244	Disc Spring Washer	1
43	BO5755	Self Locking Nut	1
44	6664	Shear Knife (Old No. 5380)	
45	BO7755	C'sk.Hd.Screw	2
46	5383	Plate	2
47	5382	Distance Piece (Lower)	1
48	5384	Distance Piece (Upper)	1
49	BO7756	Pan Hd. Screw	1
50	3879	Earth Tag	1
51	BO7757	Brass Stud	1
52	BO7758	Brass Hex. Locknut	2
53	BO5476	Ch. Hd. Screw	4

(Continued)



FRONT VIEW



REAR VIEW
(WITH TRANSFORMER REMOVED)

PARTS LIST FOR MODEL BSO. 25 WELDER - CONTINUED

ITEM	PART NUMBER	DESCRIPTION	No.OFF
54	5427	Tension Spring	
55	BO7759	Grooved Mills Pin	1
56	5423	Distance Piece	1
57	5425	Spacing Cap	1
58	BO5478	Ch.Hd.Screw	1
59	5431	Tension Spring	2
60	5277	Spring Anchor Plate	1
61	5424	Roller	1
62	BO7760	Grooved Mills Pin	1
63	5268	Index Cam	1
64	5250	Switch Centre Bolt (Short)	1
65	5426	Compression Spring	3
66	BO7761	Steel Ball	3
67	5271	Cam Lever	1
68	5269	Striker Plate	1
69	5270	Striker Pin	1
70	5276	Carriage Clamp	2
71	BO5552	Hex. Hd. Screw	4
72*	5278	Carriage	1
73*	5281	Insulator Plate	1
74*	5282	Insulator Tube	4
75*	BO5547	Hex. Hd. Screw	4
76*	BO7762	Fibre Washer	4
77	SM980	Cut-Out Switch	1
78	5430	Spacing Block	1
79	BO5479	Ch. Hd. Screw	2
80	BO7763	Std. Stud	1
81	BO7764	Hex. Locknut	1
82*	5284	Spark Protection Plate	1
83*	BO7765	St. Stl. R'sd. C'sk. Hd. Screw	1
84*	5274	Distance Bolt (Short)	2
85*	BO5751	Hex. Locknut	4
86*	BO5713	Hex. Nut	5
87	5272	Switch Bracket	1
88*	SM944	Hair Pin & Strip Assembly	1
89*	5279	Slide Rail L.H. & R.H.	2
90*	BO7766	Steel Ball	14
91*	5273	Connection Plate	1
92*	5275	Distance Bolt (Long)	2
93	SM937	Cam Striker	1
94	5251	Switch Centre Bol (Long)	1
95	5252	Centre Cam	1
96	BO7767	Dowel Pin	1
97	BO5340	Sel-lock Pin	1
98	5240	Front Plate	1
99	SM981	Start Switch	1
100 ◇	5428	Spacing Block	1
101	BO7768	Ch. Hd. Screw	2

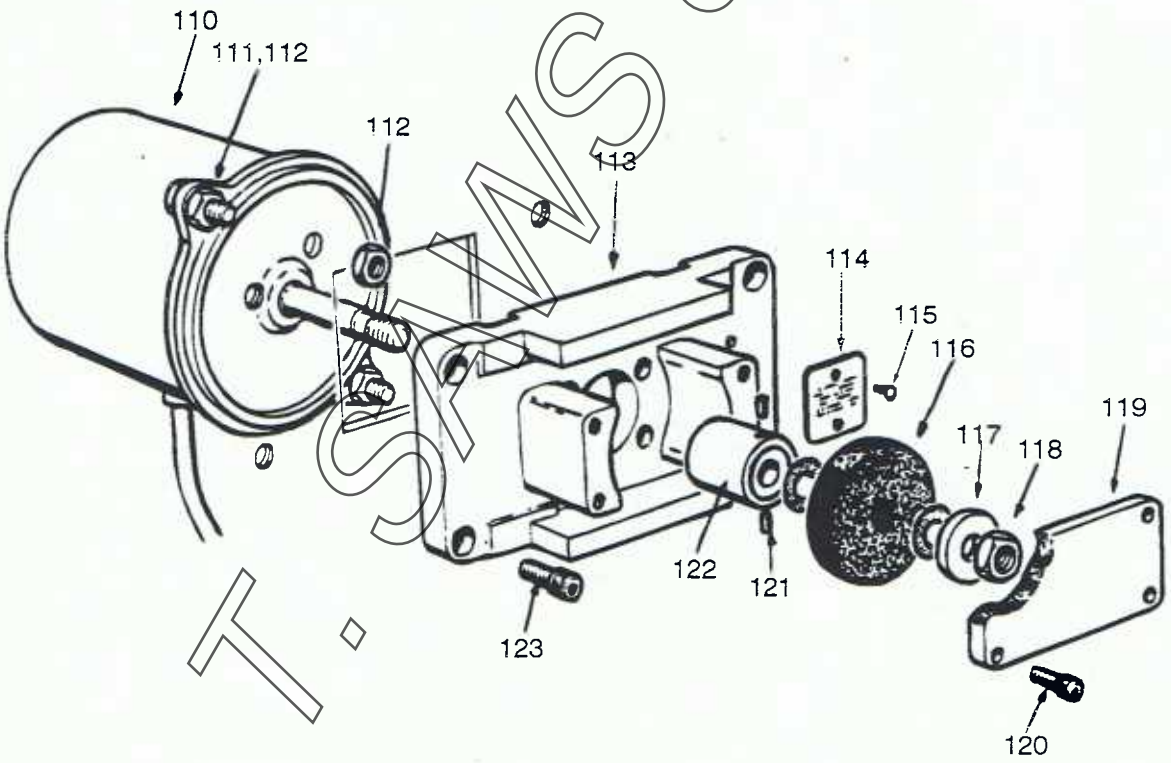
NOTE *ITEMS INCLUDED ON SM947 CARRIAGE ASSEMBLY AND ARE NOT AVAILABLE SEPARATELY

NOT ILLUSTRATED:

Transformer (State Voltage)

GRINDER - ASSEMBLY No.SM918

ITEM	PART NUMBER	DESCRIPTION	No.OFF
110	STARCRO091	Motor	1
	STARCRO092	Motor	1
111	BO5548	Hex.Hd.Screw	2
112	BO5713	Hex. Nut	4
113	4565	Mounting Plate	1
114	4567	Speed Plate (50Hz)	1
	4670	Speed Plate (60Hz)	1
115	BO5871	Hammer Drive Screw	2
116	BO2570	Grinding Wheel	1
117	5084	Washer	1
118	BO5716	Hex. Nut	1
119	4566	Guard Plate	1
120	BO5007	Soc. Hd. Cap Screw	4
121	BO5186	Soc. Set Screw	2
122	5189	Collar	2
123	BO5067	Soc. Hd. Cap Screw	4



ABRASIVE BAND GUIDE.

Fig. 2 shows the abrasive band guide (Part No. SP393) 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, 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 saw blade. Align face of guide to back of band. Use highest blade speed available.

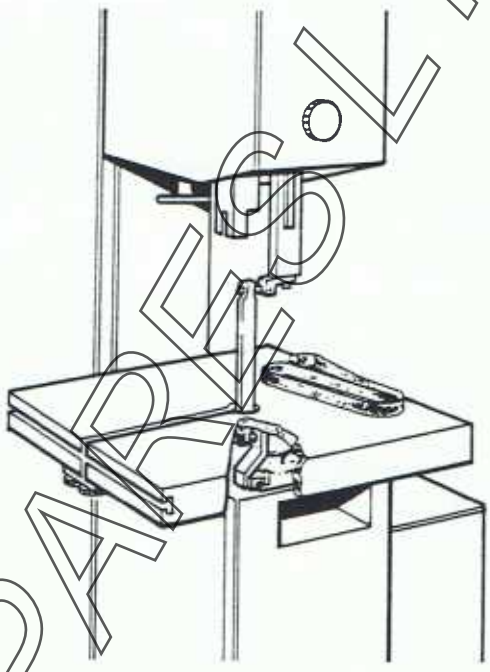


Fig. 1

CIRCLE CUTTING ATTACHMENT.

Fig 1 shows the circle cutting attachment (Part No. SP395) in use on a machine, which facilitates the production sawing of circular blanks up to 23" 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 three sides of the blank to prevent the saw blade emerging from the cut until the full circle has been completed. Select the saw blade width according to the radius to be sawn (see Section on Sawing Practice). The location pin must be set to lie tangential to the saw blade otherwise blade wander will result. If the saw blade tends to cut away from a true circle, the pin position is incorrect, or possibly the saw blade is too wide.

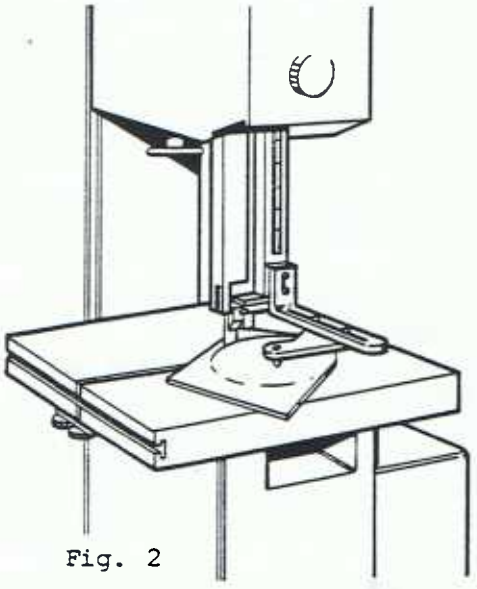


Fig. 2

RIP FENCE.

Fig 3 shows the rip fence (Part No. SP388) in use on a cachine. It can be used for making accurate parallel cuts using hand feed, or as a work stop using power feed.

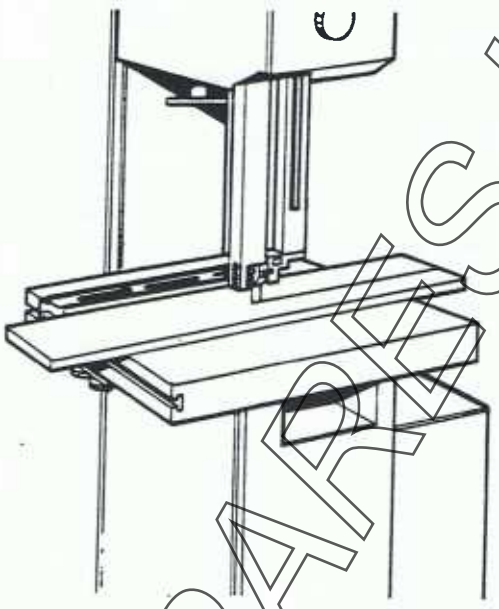


Fig.3.

BANDFILE GUIDE.

Fig. 4 shows the bandfile guide (Part No. SP394) in position on a machine, which adapts the machine for power filing. Bandfiling 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 accomodate standard files of ¼" , ⅜", or ½" width.
To set up machine for bandfiling:- Remove the saw blade, blade guides and table insert. Assemble back guide and spacers to suit width of file to be used. Insert the support arm into the same holes as used to locate the blade guides. Mount the bandfile 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 file band on the bandwheels without it slipping.
NOTE: EXCESSIVE TENSION WILL DAMAGE THE BAND.

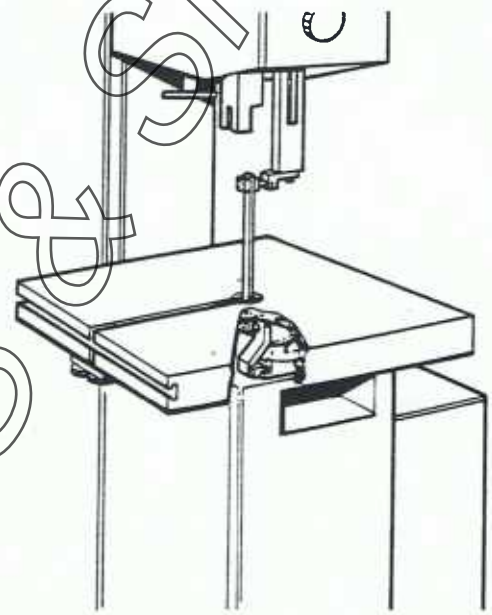


Fig.4.

Position the bandfile back guide just clear 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 (18 meters per minute) for die steel, and up to 120 feet per minute (36 meters per minute) for mild steel. Speeds in excess of 300 feet per minute (91 meters per minute) may damage the bandfile.

MITRE GAUGE

Fig.5.shows the Mitre Gauge (Part No.SP198)in use on a machine.The pusher provides an easy means of feeding and controlling the work piece.

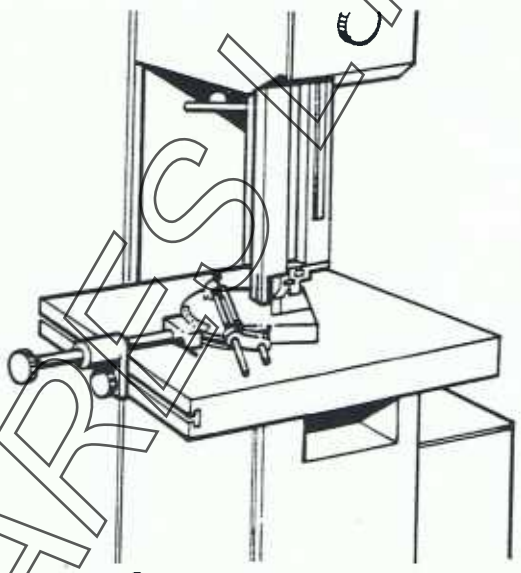


Fig.5.

GEARED PUSHER ATTACHMENT.

Fig.6.shows the geared pusher attachment (Part No.SP46/1) in use on a machine. On machines with fixed tables some mechanical advantage may be obtained by using this equipment.The geared pusher attachment is clamped to the front of the table flange and provides a practical means of applying feed pressure with a high degree of control.

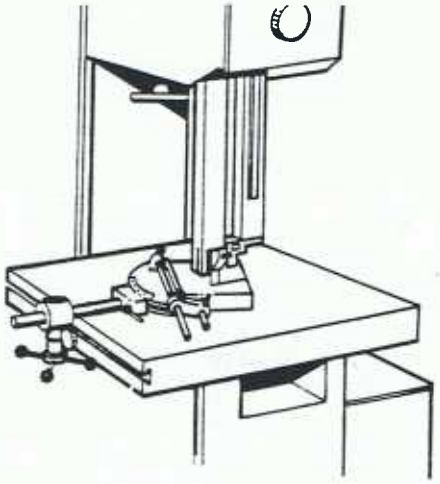


Fig.6.

WEIGHT FEED FOR CONTOUR CUTTING

Fig.7. Shows Weight Feed Kit(Part No.SM1468) in use on machine.The Adjustable Feed is provided by a lever operated weight attached to a work holder by wire and roller chain. The foot lever when fully depressed and engaged under the stop plate allows work location and setting up,it can also be depressed during cutting to decrease the feed rate when cutting the more intricate parts of a contour.The weight when positioned at the outer end of its lever gives a maximum feed load of 80lbs(36kgs). (Fixed Table Machines Only).

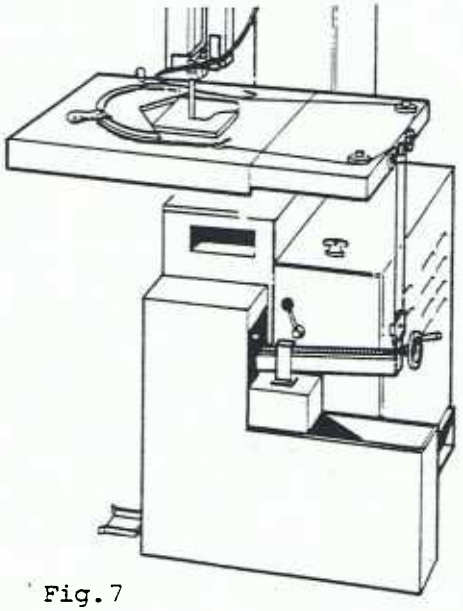


Fig.7

GRAVITY FEED MIST SPRAY COOLANT KIT.

Fig.8. shows the air/spray coolant 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 to be 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.

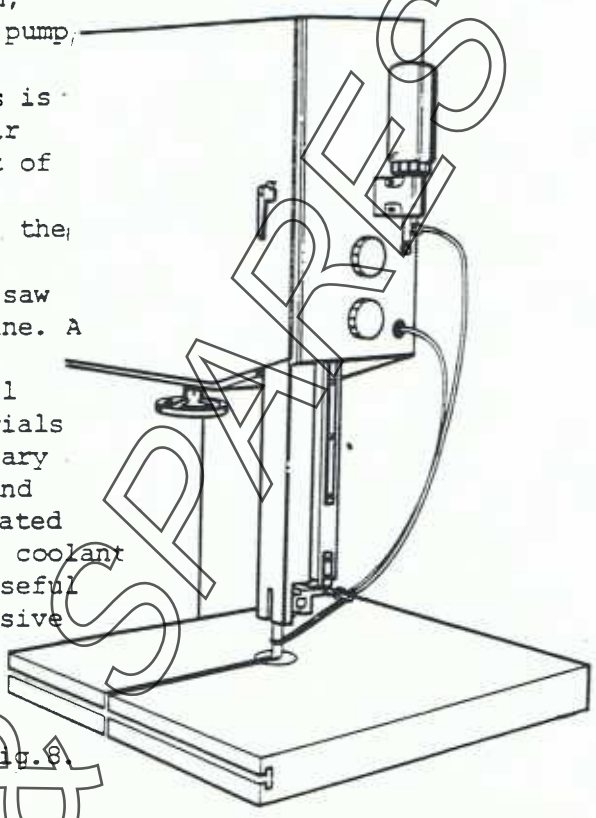


Fig.8.

NOTE: DILUTED STARCOOL SOLUBLE 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.

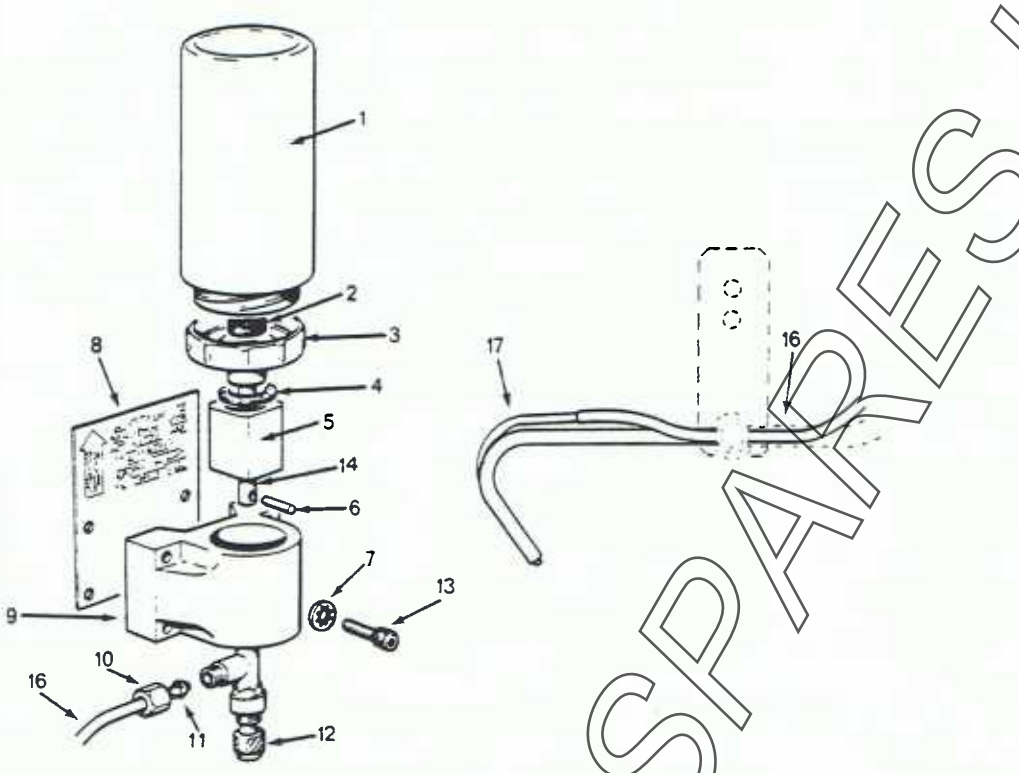
COOLANT - ASSEMBLY NO: SM2021

ITEM	PT NO	DESCRIPTION	NO OFF
1	BO2572	Bottle;	1
2	BO5958	`Vacca' Washer;	1
3	4203	Screw Cap	1
4	1209	Neoprene Washer	1
5	4200	Valve Body	1
6	BO5367	Sel loc;	1
7	BO5942	Washer	1
8	4204	Instruction Plate; Coolant	1
9	4199	Mounting Braclet	1
10		NOT USED	
11		NOT USED	
12	BO2456	Valve;	1
13	BO5011	Cap Screw;	1
14	4202	Valve Stem	1
15	4201	Bush	1
16	BO6382	Black Tube;	0.91
17	SM679	Coolant Tube	1

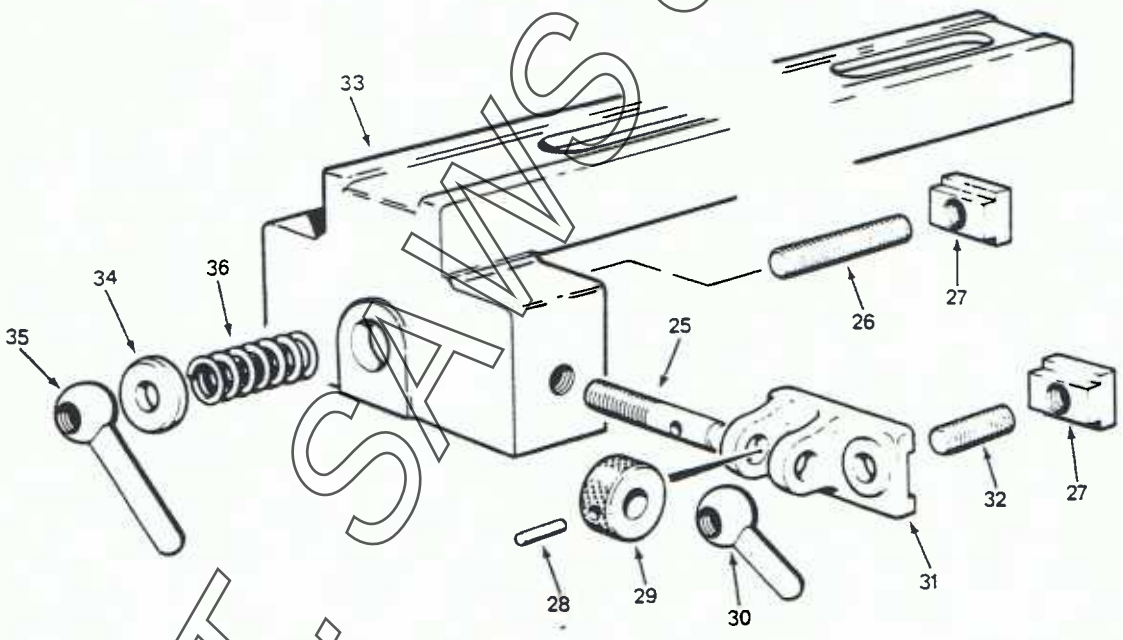
RIP FENCE - ASSEMBLY NO: SM388

25	1113	Adjusting Screw	1
26	2841	Stud	1
27	2842	Tenon Nut - small	2
28	BO5346	Sel-loc;	1
29	1112/METRIC	Adjusting Collar	1
30	1143/METRIC	Ball Handle	1
31	1206	Fence Adj.Bracket	1
32	3229	Stud	1
33	3055	Fence	1
34	1114	Special Washer	1
35	1143/METRIC	Ball Handle	1
36	BO2231	Spring;	1

SECTION 318



GRAVITY FEED MIST SPRAY COOLANT KIT



RIP FENCE

CIRCLE CUTTING ATTACHMENT - ASSEMBLY NO: SM395

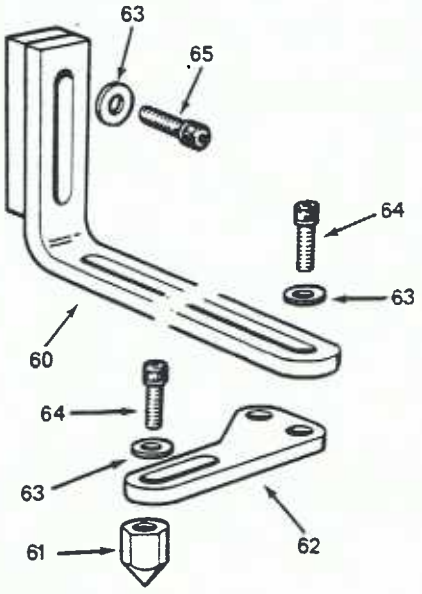
ITEM	PT NO	DESCRIPTION	NO OFF
60	SM396	Arm Assembly	1
61	2543	Centre Pin	1
62	3138	Bracket	1
63	BO5915	Washer	5
64	BO5019	Cap Screw;	3
65	BO5023	Cap Screw;	2

POLISH GUIDE - ASSEMBLY NO: SM393

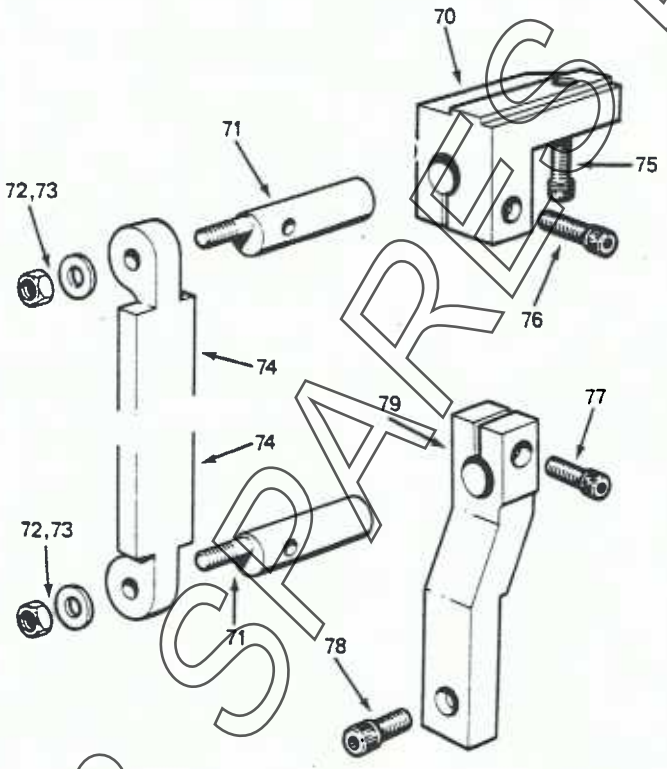
70	3132	Top Mounting Bracket	1
71	3135	Support Arm	2
72	BO5703	Full Nut	2
73	BO5918	Washer	2
74	2426	Backing Plate	1
75	BO5037	Cap Screw;	1
76	BO5029	Cap Screw;	1
77	BO5026	Cap Screw;	1
78	BO5035	Cap Screw;	1
79	3131	Bottom Mounting Bracket	1

BANDFILE GUIDE - ASSEMBLY NO: SM394

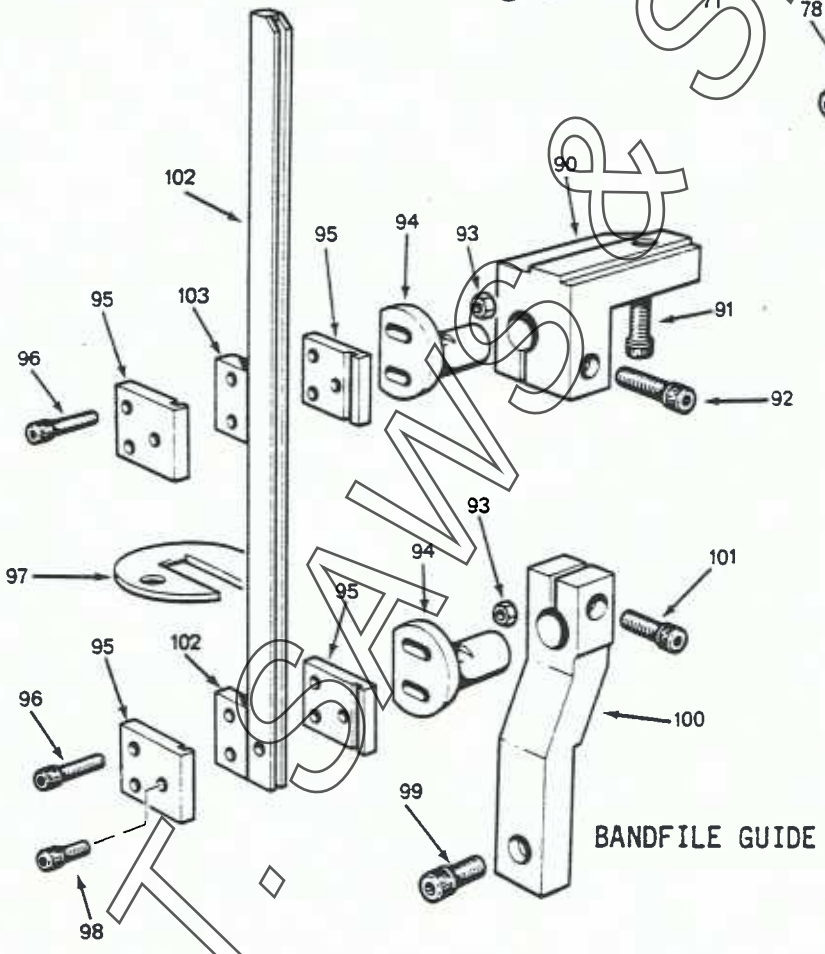
90	3132	Top Mounting Bracket	1
91	BO5037	Cap Screw;	1
92	BO5029	Cap Screw;	1
93	BO5700	Full Nut	4
94	3133	File Guide Bracket	2
95	1984	Edge Guide	4
96	BO5012	Cap Screw;	4
97	3134	Table Insert	1
98	BO5007	Cap Screw;	1
99	BO5035	Cap Screw;	1
100	3131	Bottom Mounting Bracket	1
101	BO5026	Cap Screw;	1
102	1989/A	Back Guide; 1/4"	1
	1989/B	Back Guide; 3/8"	1
	1989/C	Back Guide; 1/2"	1
103	1990/A	Spacer; 1/4"	2
	1990/B	Spacer; 3/8"	2
	1990/C	Spacer; 1/2"	2



CIRCLE CUTTING ATTACHMENT



ABRASIVE BAND GUIDE



BANDFILE GUIDE

MITRE GUAGE & PUSHER ATTACHMENT - ASSEMBLY NO: SM198/B

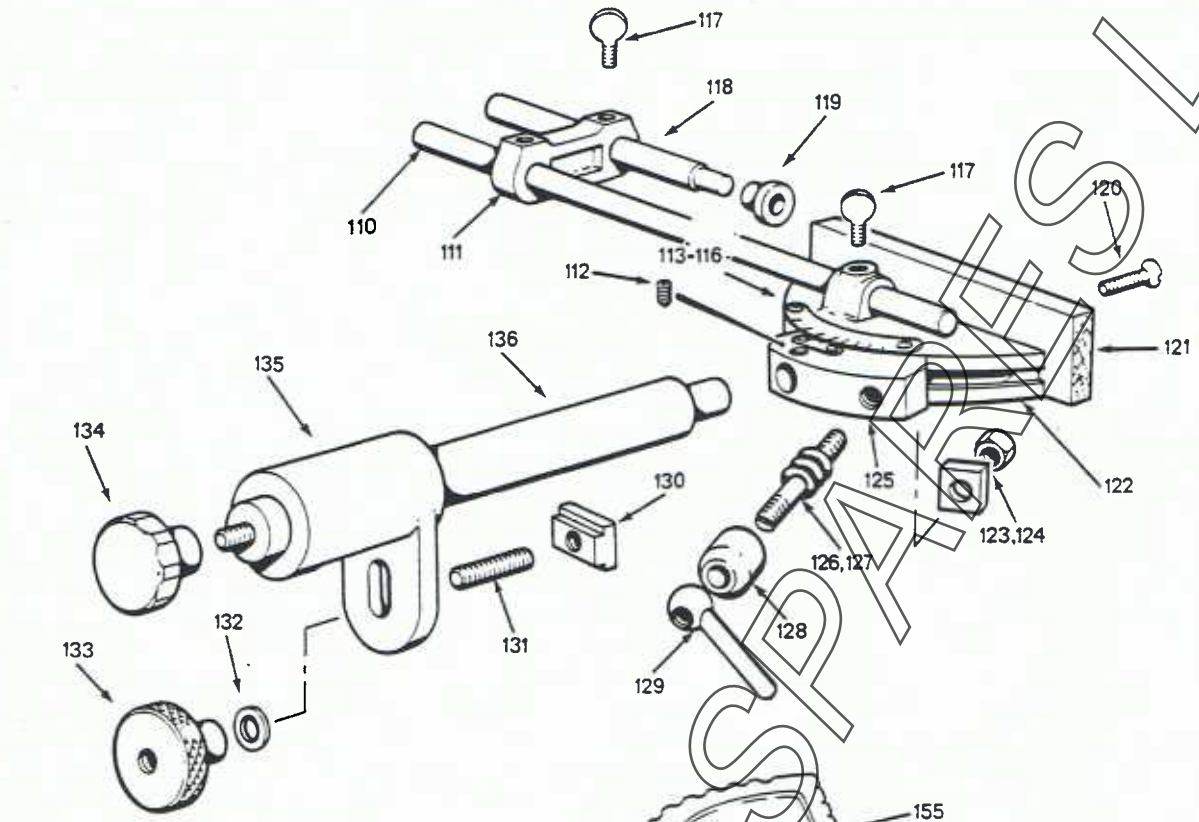
ITEM	PT NO	DESCRIPTION	NO OFF
110	1822	Gauge Rod	1
111	1507/A	Bracket	1
112	BO5195	Set Screw;	1
113	1388	Zero Plate	1
114	BO5871	Drive Screw	2
115	1513	Scale	1
116	BO5415	Phillips Rec. Screw;	2
117	7486	Thumb Screw	3
118	1526	Stop Rod	1
119	1837	End Stop	1
120	BO5311	Slot Screw;	2
121	1821	Facing Strip	1
122	1511	Protractor Body	1
123	1820	Special Nut	1
124	BO5747	Locknut;	1
125	1514	Cradle	1
126	1499	Spring	1
127	1516	Stud	1
128	1515	Bush	1
129	1143/METRIC	Ball Handle	1
130	2842	Tenon Nut - small	1
131	3229	Stud	1
132	BO5919	Washer	1
133	2513/METRIC	Hand Knob	1
134	5130	Handknob;	1
135	2512	Housing	1
136	2514/A	Shaft; long	1

GEARED PUSHER ATTACHMENT - ASSEMBLY NO: SM46/B

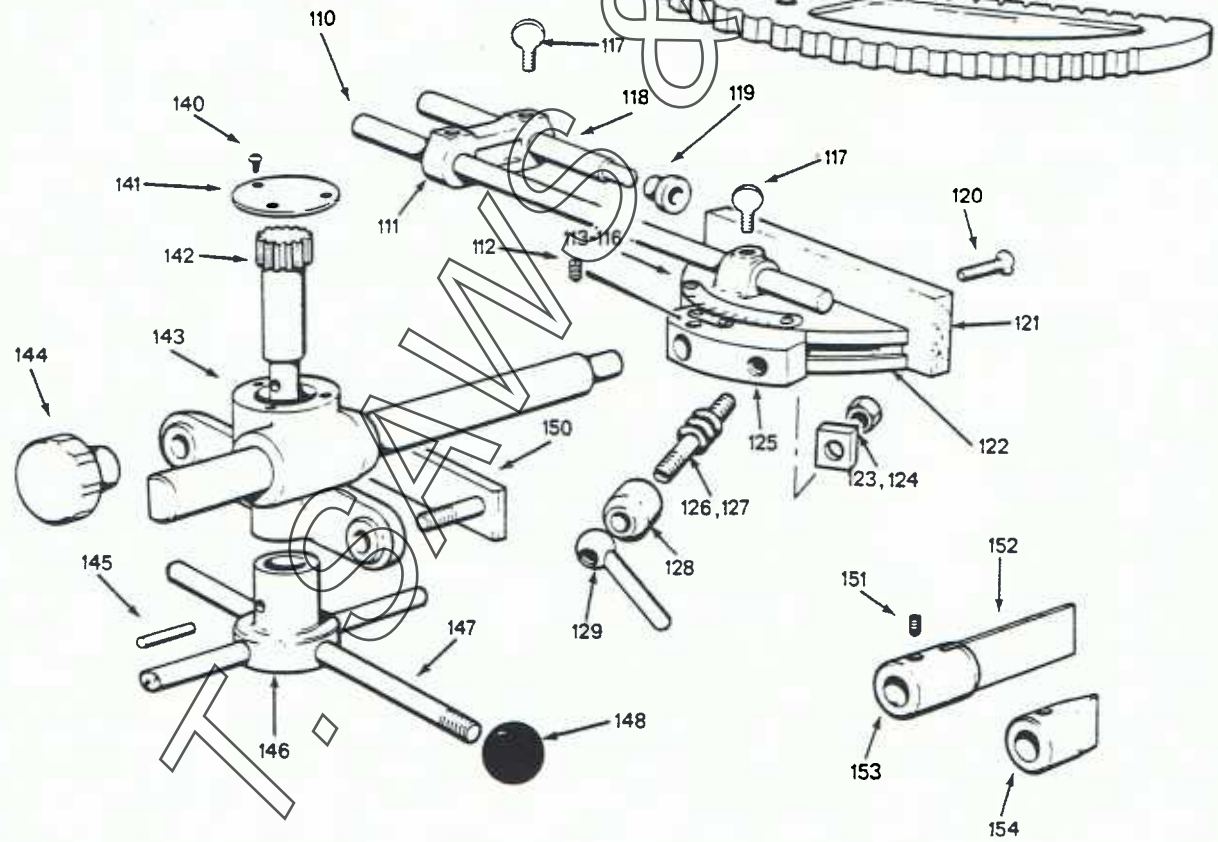
Note ! Items 110 - 129 of SM198/B are common to SM46/B

140	BO5405	Phillips Rec. Screw;	3
141	1525	Cover Plate	1
142	971	Pinion Shaft	1
143	7434	Housing	1
144	BO2539	Knob;	2
145	BO5379	Sel-loc;	1
146	6900	Hub	1
147	1391	Lever	4
148	BO2540	Knob;	4
149	1524/B	Rack	1
150	SM351	Tenon Strip Assembly	1
151	BO5163	Set Screw;	3
152	2057	Pusher Head - split	1
153	2058	Pusher Head - solid	1
154	2056	Leaf Spring	1
155	2008	Work Holder	1

NOTE ! Not illustrated: BO2479 Nipple



MITRE GAUGE ATTACHMENT

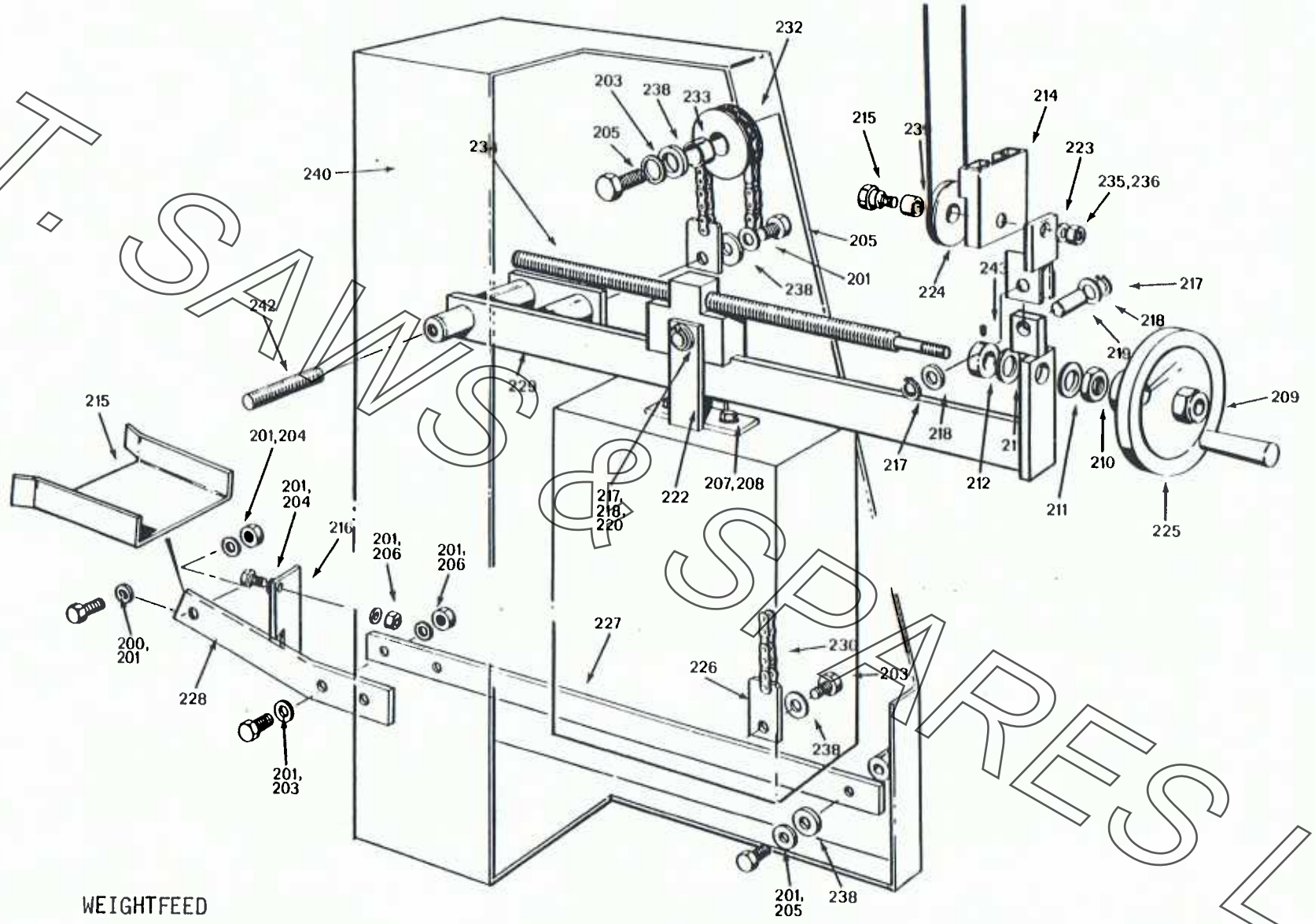


GEARED PUSHER ATTACHMENT

WEIGHTFEED KIT (CONTOUR CUTTING) - ASSEMBLY NO: SM1468

ITEM	PT NO	DESCRIPTION	NO OFF
200	BO5562	Hex. Screw;	1
201	BO5944	Washer	11
202	BO5917	Washer	11
203	BO5564	Hex. Screw:	2
204	BO5715	Full Nut	6
205	BO5561	Hex. Screw;	4
206		NOT USED	
207	BO5573	Hex. Screw;	2
208	BO5945	Washer	2
209	BO5755	Locknut	2
210		NOT USED	
211	BO5921	Washer	4
212	6835	Collar	1
213	6948	Shoulder Screw	1
214	6899	Cable Guide	1
215	SM1427	Foot Pedal Assembly	1
216	7366	Stop Plate	1
217	BO6003	Ext.Circlip;	4
218	BO5921	Washer	4
219	7419	Hinge Pin	1
220	7430	Weight Pin	1
221	7409	Special Nut	1
222	SM1519	Weight Bracket	1
223	SM1471	Pulley Bracket	1
224	6766	Pulley	5
225	BO2526	Handwheel;	1
226	7417	Chain Connector	2
227	SM1509	Foot Lever	1
228	7320	Lever Extension	1
229	SM1470	Weight Carrier	1
230	BO2178	Chain;	1
231	7422	Weight	1
232	7265	Jockey Wheel	1
233	BO2308	Bush;	5
234	7418	Adjusting Screw	1
235	BO5946	Washer	6
236	BO5717	Full Nut	1
237	BO2325	Bush;	1
238	4919	Washer	4
239	BO2307	Bush;	1
240	SM1508	Mounting Bracket	1
241		NOT USED	
242	7420	Pivot Pin	1
243	BO5194	Set Screw;	1
244	BO5943	Washer	3

NOTE ! Not illustrated: SM1570, Weight Guard, 1 qty

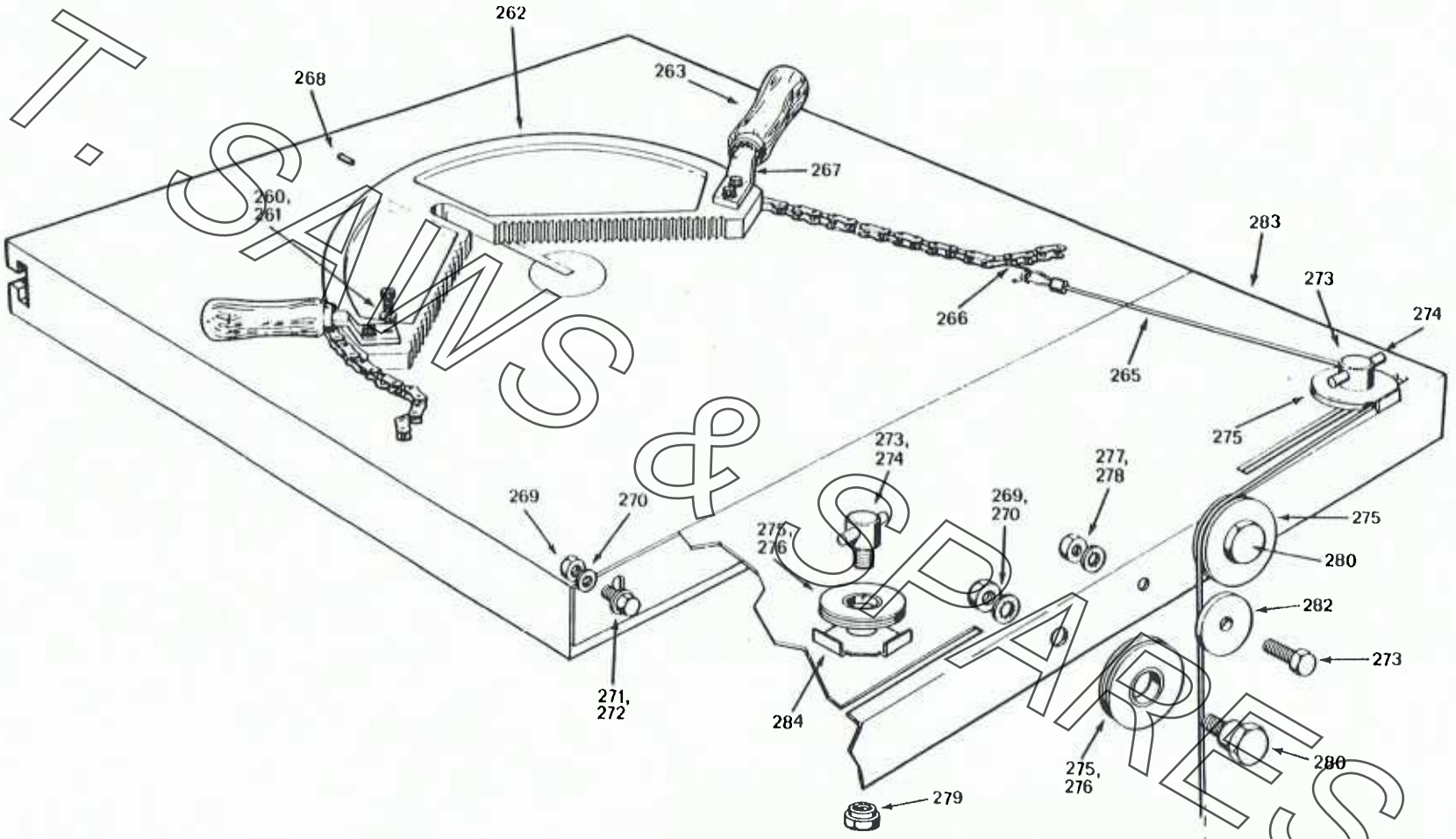


WEIGHTFEED

WEIGHT FEED (CONTOUR CUTTING) - ASSEMBLY NO: SM1468

(CONTINUED)

ITEM	PT NO	DESCRIPTION	NO OFF
260	BO5067	Cap Screw;	4
261	BO5943	Washer	4
262	6798	Notched Work Holder	1
263	BO6482	File Handle	2
264	BO2172	Chain;	1
265	BO2560	Bowden Cable;	1
266	2863	Hook	1
267	2862	Handle Bracket	2
268	BO5351	Sel-loc;	1
269	BO5717	Full Nut	5
270	BO5946	Washer	2
271	BO5577	Hex. Screw;	3
272	BO5921	Washer	2
273	2867	Spindle	2
274	2864	Tommy Bar	2
275	6766	Pulley	4
276	BO2307	Bush;	4
277	BO5715	Full	1
278	BO5944	Washer	3
279	2866	Spindle Nut	2
280	6767	Shoulder Screw	2
281	BO5562	Hex. Screw;	6
282	6768	Spacer	1
283	SM1469	Pulley Platform	1
284	6949	Cable Retainer	2

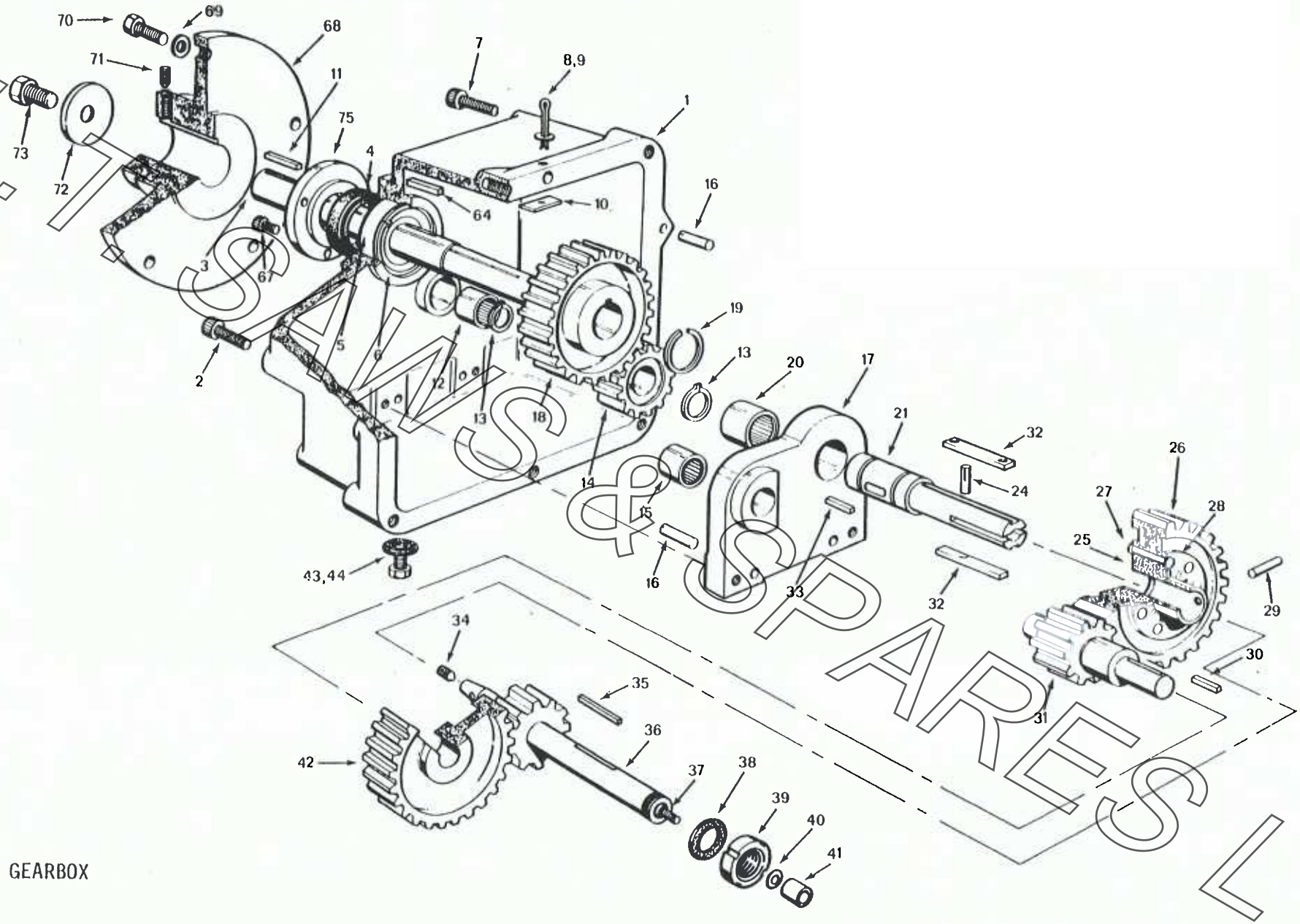


WEIGHTFEED

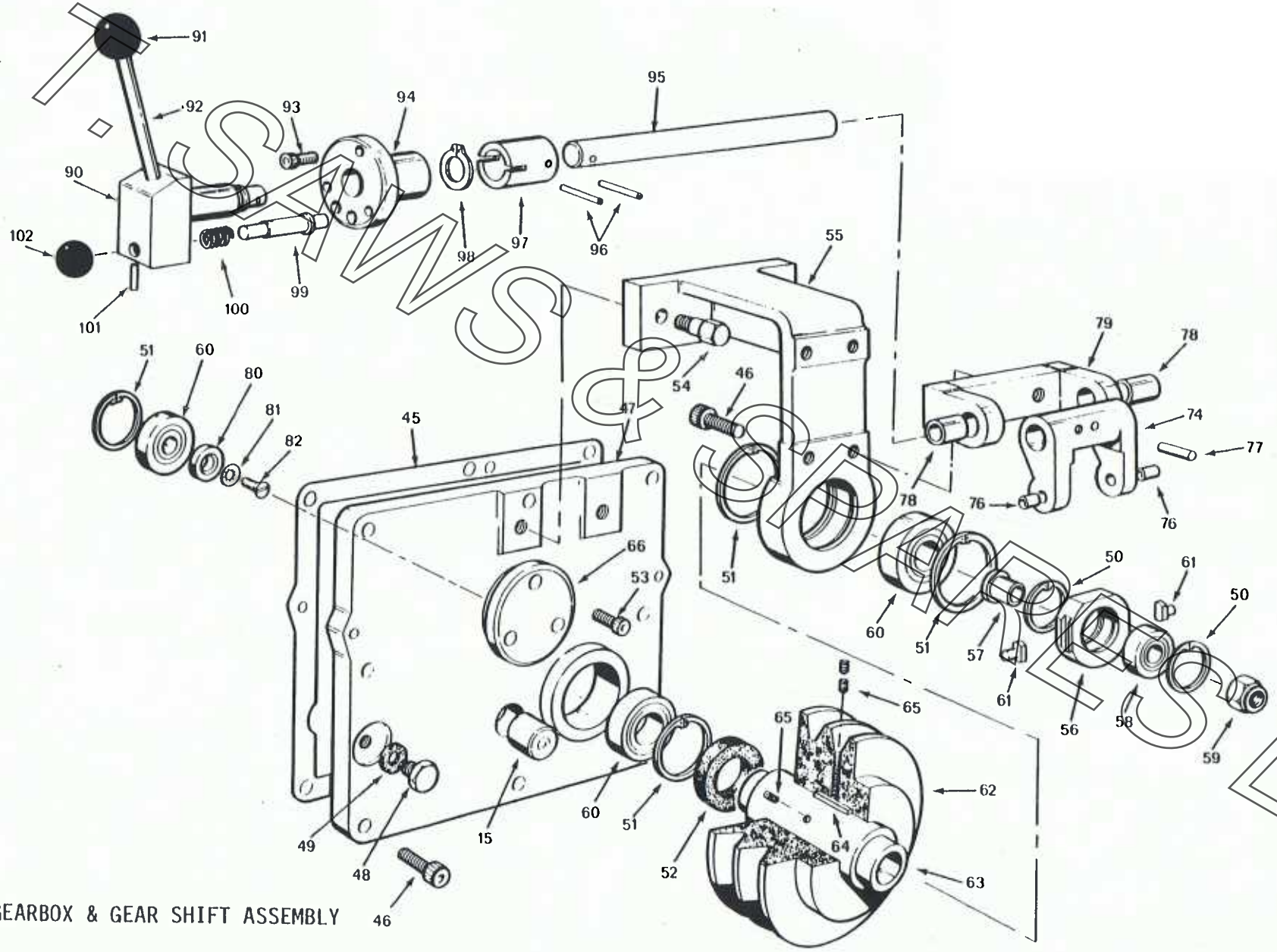
GEARBOX - ASSEMBLY NO: SM331/D & F

ITEM	PT NO	DESCRIPTION	NO OFF
1	2651/B	Gearbox Housing	1
2	BO5074	Cap Screw;	2
3	7581	Output Shaft	1
4	BO2116	O-Seal;	1
5	BO2019	Bearing;	1
6	BO6042	Int.Circlip;	1
7	BO5086	Cap Screw;	4
8	2657	Washer	1
9	BO5812	Split Pin;	1
10	2799	Baffle Plate	1
11*	2659	Key;	1
12	BO2072	Needle Race;	2
13	BO6009	Ext.Circlip;	2
14	2653	Final Drive Pinion	1
15	BO2069	Needle Race;	2
16	BO5890	Dowel;	4
17	2660/B	Bridge	1
18	7582	Final Drive Gear	1
19	BO6028	Ext.Ring;	1
20	BO2063	Needle Race;	1
21	2656	Intermediate Shaft	1
22		NOT USED	
23		NOT USED	
24	BO5370	Sel-loc;	1
25	1036	Liner	1
26	7668	Intermediate Gear	1
27	BO5803	Rivet;	8
28	1035	Clutch Plate	1
29	1024	Pin	1
30	1147	Key	1
31	3253	Layshaft	1
32	1027/B	Special Key	2
33	2658	Key;	1
34	BO5185	Set Screw;	1
35	5920	Key;	1
36	7310	Input Shaft	1
37	7303	Control Rod	1
38	1209	Neoprene Washer	1
39	BO5781	SKF Locknut;	1
40	BO2250	O-Ring;	1
41	BO2331	Oilite Bush;	1
42	3252	Gear	1
43	BO5552	Hex. Screw;	1
44	BO5952	F/Washer;	1
45	2723	Gasket	1
46	BO5068	Cap Screw;	10
47	2664/B	Gearbox Lid	1
48	BO2482	Socket Set Plug	1
49		NOT USED	

(continued)



GEARBOX



GEARBOX & GEAR SHIFT ASSEMBLY

SECTION 320

GEARBOX - ASSEMBLY NO: SM331/D & F - continued

ITEM	PT NO	DESCRIPTION	NO OFF
50	BO6033	Int.Circlip;	2
51	BO6038	Int.Circlip;	4
52	BO2123	Seal;	1
53	BO5059	Cap Screw;	3
54	2732	Fitting Bolt	2
55	7298	Support Arm	1
56	2598	Bearing Housing	1
57	7316	Bearing Bush	1
58	BO2002	Bearing;	1
59	BO5774	Binx Nut	1
60	BO2031	Bearing;	3
61	2597	Flatted Pin	2
62	6856	Gearbox Pulley; 60 Hz	1
	6857	Gearbox Pulley; 50 Hz	1
63	7312	Gearbox Drive Shaft	1
64	7583	Key;	1
65	BO5194	Set Screw;	2
66	7314	Cover Plate	1
67	BO5066	Cap Screw;	3
68*	7610	Bandwheel Hub	1
69*	BO5917	Washer	5
70*	BO5563	Hex. Screw;	5
71*	BO5201	Set Screw;	1
72*	6541	Special Washer	1
73*	BO5577	Hex. Screw;	1
74	2601	Fork	1
75	7598	End Cap Output Shaft	1
76	BO2301	Bush;	2
77	BO5353	Sel.loc;	1
78	BO2303	Bush;	2
79	2733	Bracket	1
80	7315	Washer	1
81	BO5933	C/Sk Locking Washer	1
82	BO5268	C/Sk Screw;	1

* denotes valid parts that do not belong to this assembly number

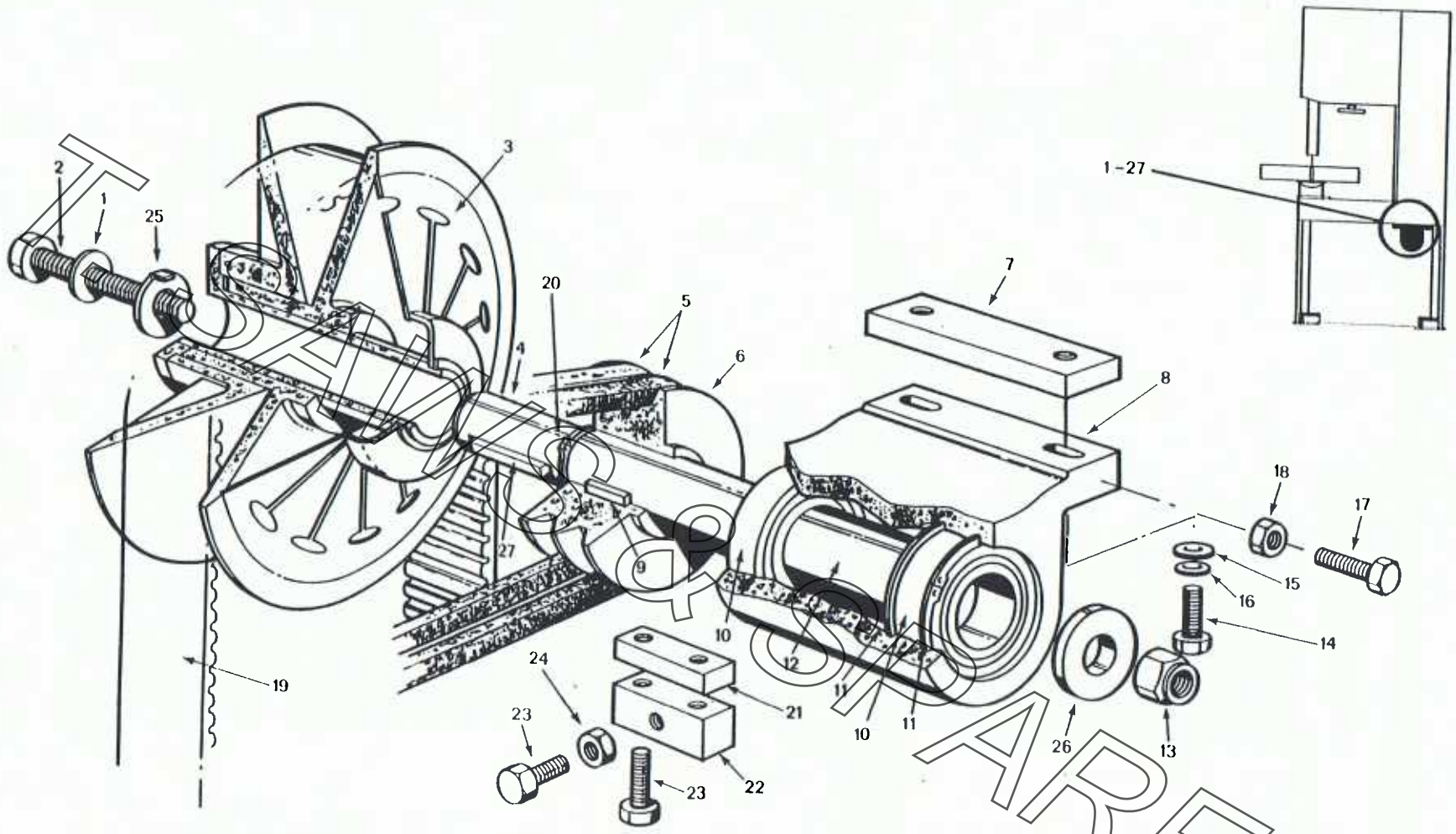
LOCATING GEARSHIFT - ASSEMBLY NO: SM1618

ITEM	PT NO	DESCRIPTION	NO OFF
90	7676	Gear Shift Handle	1
91	BO2530	B'Knob;	1
92	7319	Gear Shift Lever	1
93	BO5067	Cap Screw;	3
94	7675	Location Housing	1
95	BO5067	Cap Screw;	3
96	BO5352	Sel-loc;	4
97	7285	Coupling	1
98	BO6009	Ext.Circlip;	1
99	7677	Plunger	1
100	BO2227	Spring;	1
101	BO5345	Sel-loc;	1
102	BO2529	B'Knob;	1

LAYSHAFT HOUSING - ASSEMBLY NO: SM1465
AND COMMON PARTS ASSEMBLY NO: SM7026 - marked *

1		PART OF ITEM 3 (BO1451)	
2		PART OF ITEM 3 (BO1451)	
3*	BO1451	Spring Loaded Pulley	1
4	6854	Layshaft	1
5	BO240	V-Belt;	2
		V-Belt;	2
6*	7262	Layshaft Pulley	1
7	2968	Clamp Plate	2
8	6851	Bearing Housing	1
9*	6853	Key	1
10	BO2024	Bearing;	2
11	BO6045	Int.Circlip;	2
12	6852	Spacer	1
13	BO5777	Binx Nut	1
14*	BO5531	Hex. Screw;	4
15	BO5919	Washer	4
16	BO5945	Washer	4
17*	BO5575	Hex. Screw;	2
18*	BO5716	Full Nut	2
19*	BO2157	V-Belt;	1
20	BO6013	Ext.Circlip;	1
21*	3060	Clamping Bar	1
22*	3059	Jacking Block	1
23*	BO5530	Hex. Screw;	3
24**	BO5704	Full Nut	1
25		PART OF ITEM 3 (BO1451)	
26**	5151	Washer (drive end)	1
27**	5952	Key;	1

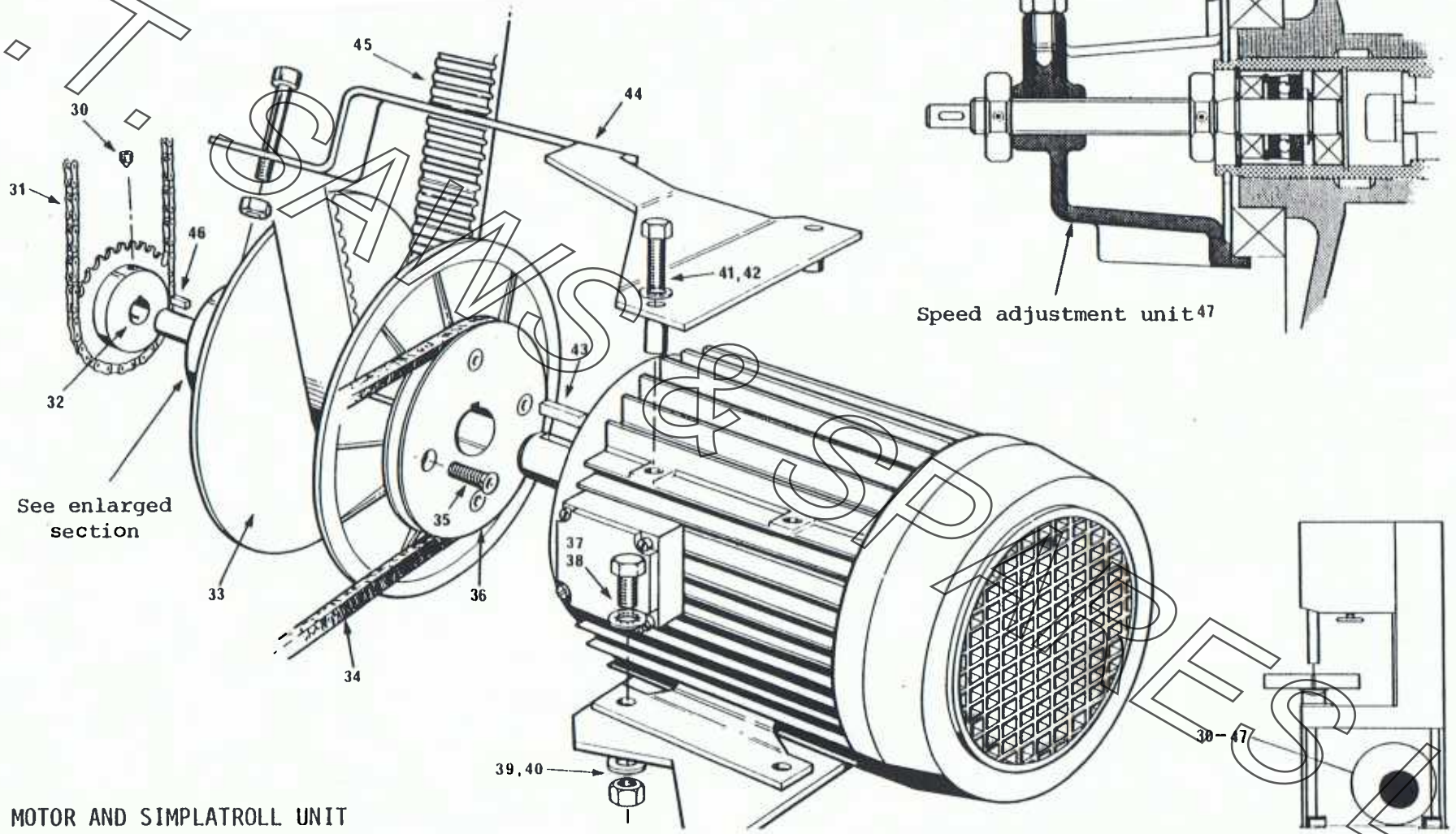
** denotes valid parts that do not belong to THIS assembly no.



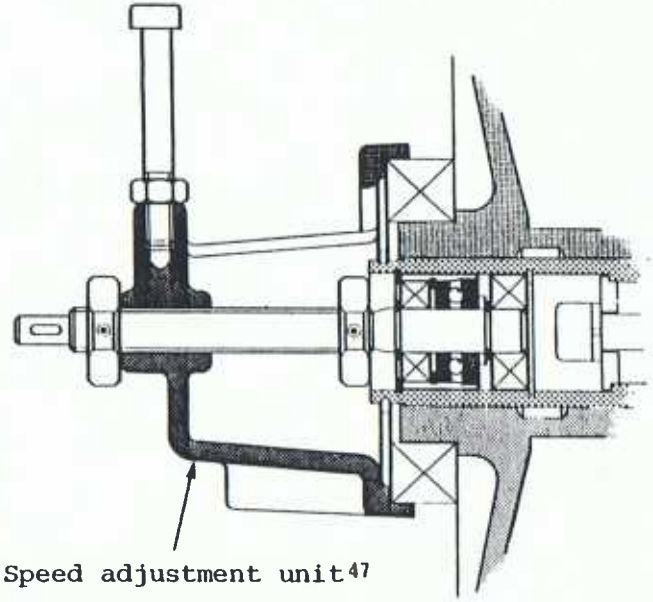
LAYSHAFT ASSEMBLY & SIMPLATROLL PULLEY UNIT.

MOTOR AND SIMPLATROLL UNIT - ASSEMBLY NO: SM1480/A & D

ITEM	PT NO	DESCRIPTION	NO OFF
30	BO5195	Set Screw;	1
31	BO2177	Chain;	1
32	7660	Sprocket;	1
33	BO1452	Adjustable Pulley	1
34	BO2156	V-Belt;	1
35		PART OF ITEM 33 (BO1452)	
36	6859	Compressor Drive	1
37	BO5575	Hex. Screw;	4
38		PART OF ITEM 33 (BO1452)	
39	4222	Washer	4
40	BO5716	Full Nut	4
41	BO5715	Full Nut	2
42	BO5568	Hex. Screw;	2
43	5952	Key	1
44	SM1555	Stop Bar	1
45	BO2140	V-Belt;	1
46	6941	Key;	1
47	BO1453	Adjustment Device	1



MOTOR AND SIMPLATROLL UNIT

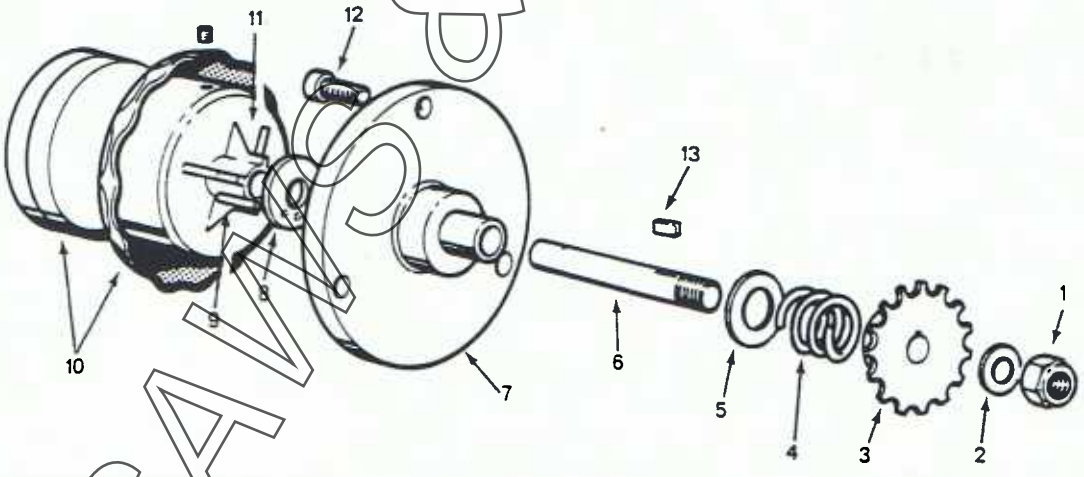


SPEED INDICATOR HOUSING - ASSEMBLY NO: SM1563/A

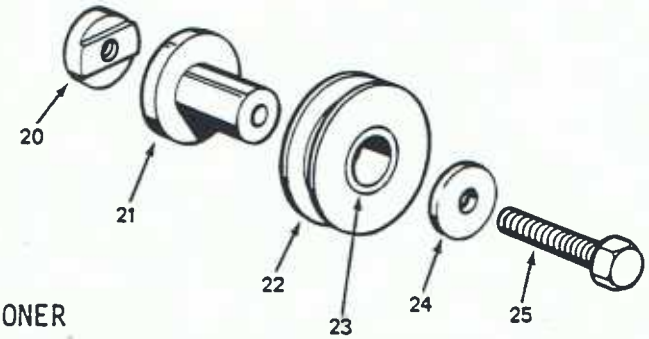
ITEM	PT NO	DESCRIPTION	NO OFF
1	BO5755	Locknut	1
2	BO5921	Washer	1
3	7269	Sprocket;	1
4	BO2214	Spring;	1
5	BO5923	Washer	1
6	7552	Indicator Shaft	1
7	7553	Speed Indicator Housing	1
8	7554	Special Washer	1
9	BO5345	Sel-loc;	2
10	BO1454	Ind. Handwheel & Dial	1
11		PART OF ITEM 10 (BO1454)	
12		PART OF ITEM 10 (BO1454)	
13	6941	Key;	1

CHAIN TENSIONER - ASSEMBLY NO: SM378/A

20	2866	Spindle Nut	1
21	3056	Spindle	1
22*	7265	Jockey Wheel	1
23*	BO2308	Bush;	1
24	2447	Washer	1
25	BO5531	Hex. Screw;	1



VARIABLE SPEED CONTROL



CHAIN TENSIONER

* denotes valid parts that do not belong to THIS assembly no.

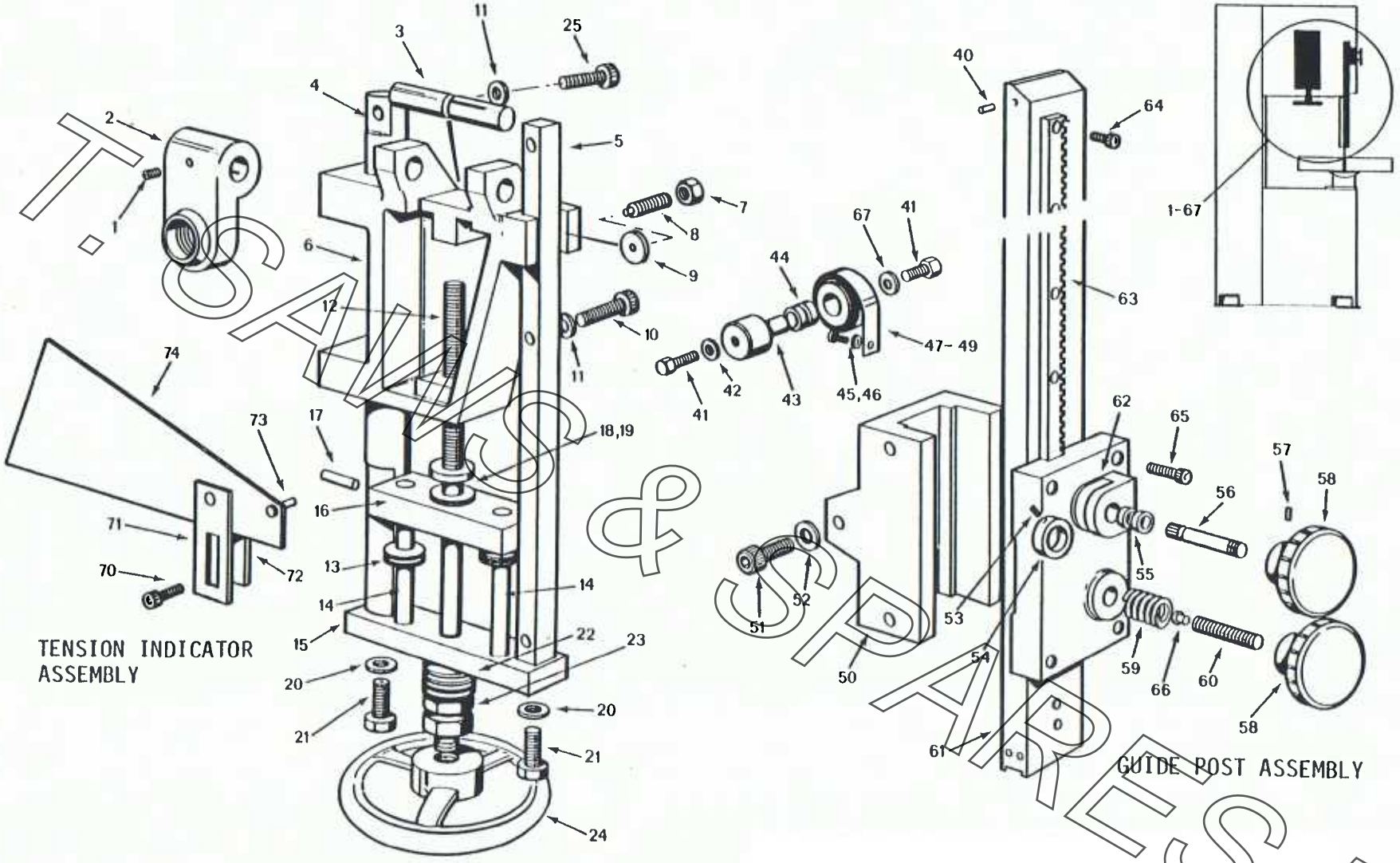
TENSION BRACKET - ASSEMBLY NO: SM1472

ITEM	PT NO	DESCRIPTION	NO OFF
1*	BO5165	Set Screw;	1
2	2880	Tilt Bracket	1
3	2881	Pin	1
4	7273	Guide Bar	1
5	7277	Guide Bar	1
6	7271	Tension Bracket	1
7*	BO5754	Locknut	1
8	7283	Locating Stud	1
9	7278	Pad	1
10	BO5087	Cap Screw;	5
11*	BO5945	Washer	5
12	7274	Tension Screw	1
13	BO2242	Disc Spring;	72
14	7275	Spring Pivot Pin	2
15	7280	End Plate	1
16	7281	Tension Plate	1
17	BO5357	Sel-loc;	1
18	BO2067	Thrust Race;	1
19	BO2068	Thrust Washer;	2
20*	BO5919	Washer	1
21	BO5574	Hex. Screw;	2
22	BO2240	Disc Spring;	4
23	BO5746	Locknut	2
24	9770	2 Spoke H/wheel;	1
25*	BO5088	Cap Screw;	5

GUIDE POST BRACKET - ASSEMBLY NO: SM1466

40	BO5331	Mills;	1
41	BO5561	Hex. Screw;	2
42	BO5918	Washer	1
43	7282	Tension Spring Spigot	1
44	BO2326	Bush;	2
45	BO5001	Cap Screw;	1
46	BO5941	Washer	1
47	7284	Spring Spool	1
48	BO2189	Spring;	1
49	BO2190	Spring;	1
50	7272	Guide Post Bracket	1
51	BO5086	Cap Screw;	1
	BO5085	Cap Screw;	2
52		NOT USED	
53	BO5151	Set Screw;	2
54	2958	Collar	1
55	BO2304	Bush;	2
56	2934	Pinion	1
57	BO5370	Sel-loc;	2
58	5130	Handknob;	2
59	BO2208	Spring;	1

(continued)



TENSION INDICATOR ASSEMBLY

TENSION BRACKET ASSEMBLY

GUIDE POST ASSEMBLY

GUIDE POST BRACKET - ASSEMBLY NO: SM1466 - continued

ITEM	PT NO	DESCRIPTION	NO OFF
60	2935	Locking Screw	1
61	2923	Guide Post	1
62	2884	Retaining Bracket	1
63	2928	Rack	1
64	BO5008	Cap Screw;	5
65	BO5557	Hex. Screw;	4
66	2924	Locking Pad	1
67	4919	Washer	1

TENSION INDICATOR - ASSEMBLY NO: SM1441

70	BO5009	Cap Screw;	2
71	2942	Pivot Plate	1
72	2940	Clamping Bar	1
73	2941	Register Pin	1
74	7289	Tension Indicator Scale	1

TRACKING HUB - ASSEMBLY NO: SM364

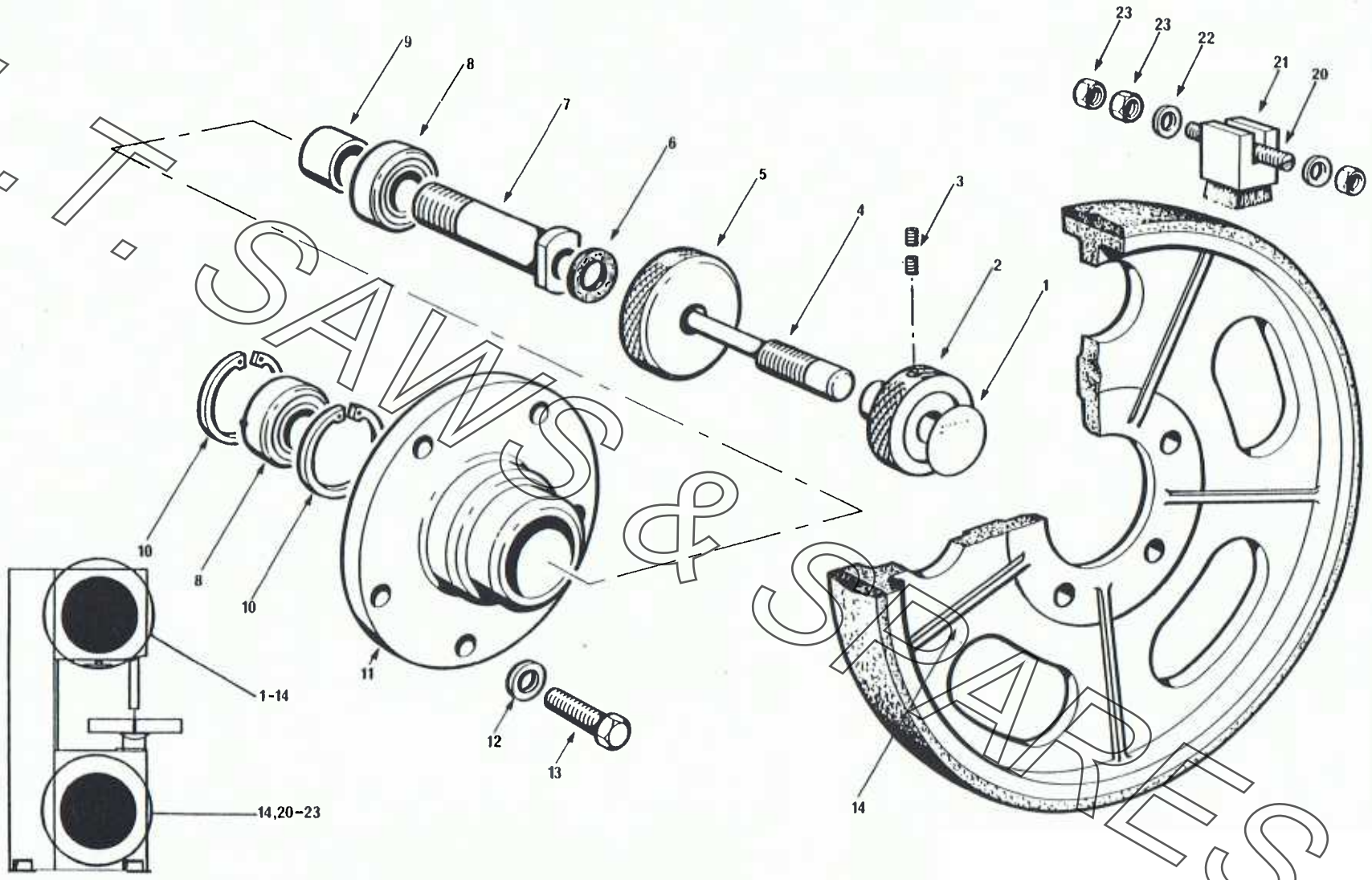
1	2466	Blade Tracking Label	1
2	2873	Knurled Hand Nut	1
3	BO5194	Set Screw;	2
4	2876	Shaft	1
5	2874	Knurled Locknut	1
6	3342	Fibre Washer	1
7	2875	Bearing Shaft	1
8	BO2020	Bearing;	2
9	2878	Spacer	1
10	BO6042	Int.Circlip;	2
11	2877/B	Bandwheel Location	1
12*	BO5917	Washer	5
13*	BO5563	Hex. Screw;	5
14*	7791	Bandwheel	2

NOTE : Not illustated BO5944, Washer , 5 qty.

WHEEL BRUSH - ASSEMBLY NO: SM1855

20	2579	Stud	1
21	2270	Wire Brush	1
22	BO5917	Washer	2
23	BO5703	Full Nut	3

* denotes valid parts that do not belong to THIS assembly no.



TRACKING HUB ASSEMBLY

FIXED TABLE - ASSEMBLY NO: SM1743/C

ITEM	PT NO	DESCRIPTION	NO OFF
1	7750/B	Fixed Table	1
2	2922	Table Insert	1
3	BO5264	C/Sk Screw;	1
4	BO5839	Stud;	2
5	2828	Swing Latch	1
6	BO2547	Handwheel;	2
7	BO5920	Washer	2
8		NOT USED	
9		NOT USED	
10	BO5615	Hex. Bolt;	1
11		NOT USED	
12	7874	Clamp	1
13	8156	Trunnion	1
14		NOT USED	
15	BO5094	Cap Screw;	4
16	7748/A	Tilt Cradle	1
17		NOT USED	
18	7875	Collar	1
19	BO2215	Spring;	1
20	6893	Spacer	1
21	7876	Special Nut	1
22	2812	Pointer	1
23	7336	Stop Pin	1
24	BO5715	Full Nut	1
25	BO5563	Hex. Screw;	1
26	BO5415	Phillips Rec.Screw;	3
27	7872	Protractor Scale	1
28		NOT USED	

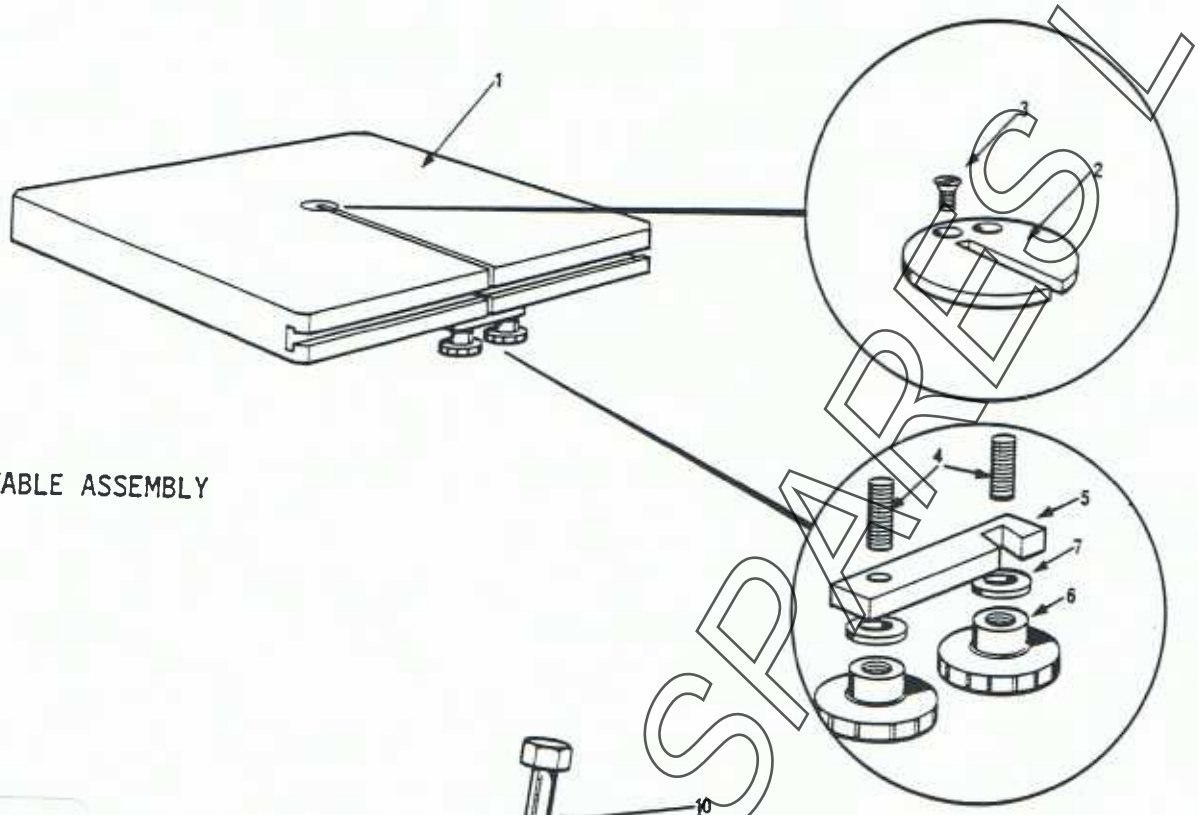
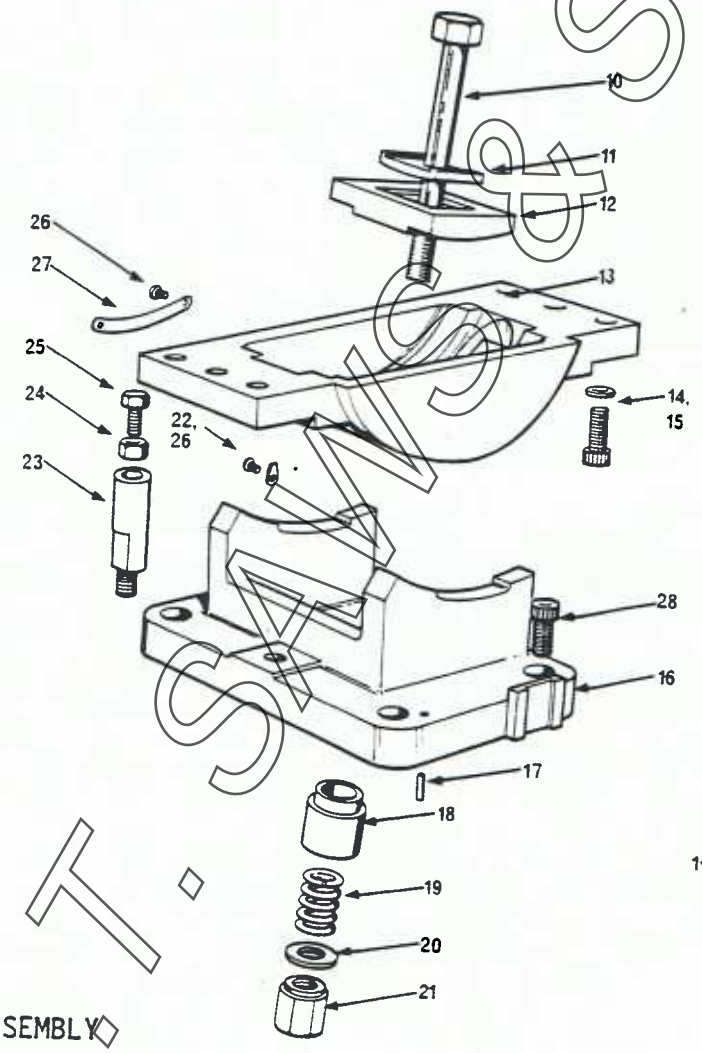
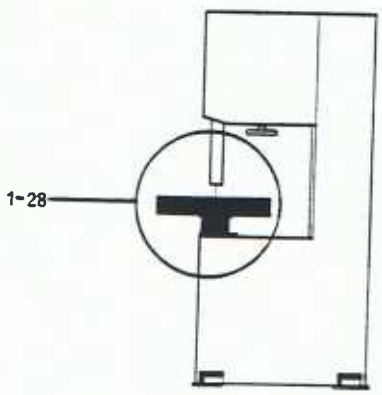


TABLE ASSEMBLY



CRADLE ASSEMBLY



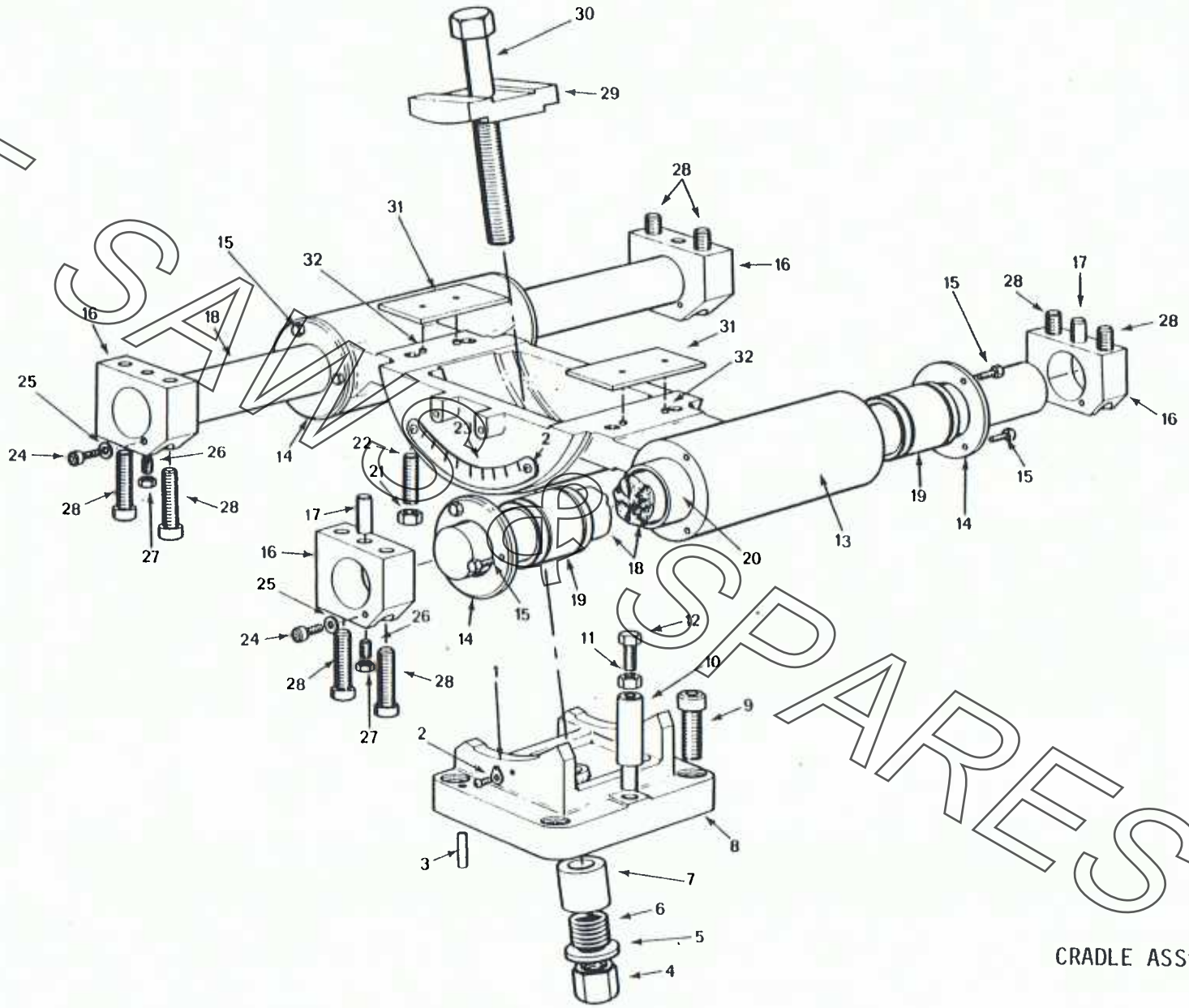
SLIDING TABLE - ASSEMBLY NO: SM1680/A

ITEM	PT NO	DESCRIPTION	NO OFF
1	2812	Pointer	1
2	BO5420	Phillips Rec.Screw;	3
3*	BO5378	Spring Dowel;	2
4	7876	Special Nut	1
5	6893	Spacer	1
6	BO2215	Spring;	1
7	7875	Collar	1
8	7748/A	Tilt Cradle	1
9*	BO5094	Cap Screw;	4
10	7336	Stop Pin	1
11	BO5715	Full Nut	1
12	BO5563	Hex. Screw;	1
13	7749	Sliding Table Trunnion	1
14	7811	End Cap	4
15	BO5553	Hex. Screw;	12
16	7847	Shaft Support Block	4
17	BO5896	Dowel;	2
18	BO2041	Shaft;	2
19	BO2042	Linear Bearing;	4
20	7812	Spacer	2
21	BO5755	Locknut	4
22	BO5217	Set Screw;	4
23	7872	Protractor Scale	1
24	BO5066	Cap Screw;	2
25	BO5916	Washer	2
26	BO5195	Set Screw;	4
27	BO5752	Locknut	4
28	BO5088	Cap Screw;	8
29	7874	Clamp	1
30	BO5615	Hex. Bolt;	1
31	7813	Wear Strip	2
32	BO5344	Sel-loc;	4

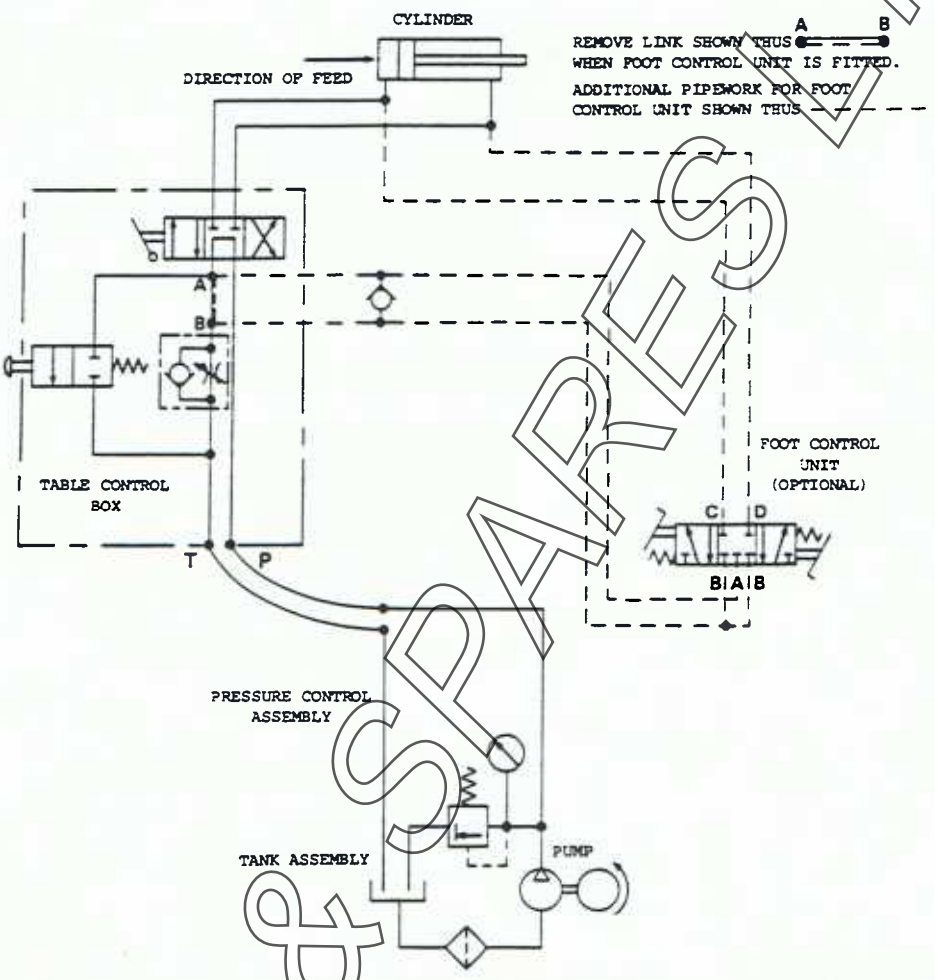
NOT SHOWN IN THIS SECTION, SEE SECTION 328 ITEMS 1 TO 7 FOR ILLUSTRATION

40	7750	Sliding Table	1
41	2922	Table Insert	1
42	BO5264	C/Sk Screw;	1
43	BO5839	Stud;	2
44	2828	Swing Latch	1
45	BO2547	Handwheel;	2
46	BO5920	Washer	2

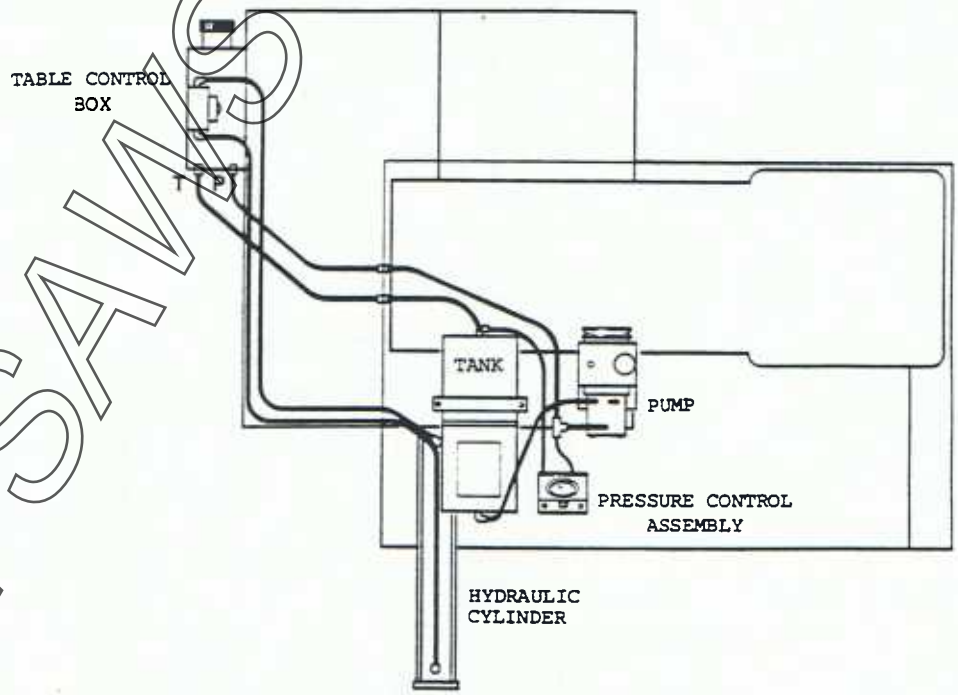
* denotes valid parts that do not belong to THIS assembly no.



CRADLE ASSEMBLY



HYDRAULIC CIRCUIT DIAGRAM FOR V500H MACHINES.



HYDRAULIC PIPE LAYOUT FOR V500H MACHINES.

SECTION 331

HYDRAULIC TABLE FEED - ASSEMBLY NO: SM1687/A

ITEM	PT NO	DESCRIPTION	NO OFF
1- 38	SM1673/A	Table Control	1
70- 94	SM1103	Hydraulic Cylinder	1
110-129	SM532	Hydraulic / Coolant Pump	1
140-155	SM490	Hydraulic Tank	1

HYDRAULIC CONNECTION KIT - ASSEMBLY NO: SM1976

160	BO2493	Flexituble;	1
161	BO2418	Female Elbow;	2
162	BO2403	Fitting;	2
163	7886	Connection Plate	1

OPTIONAL FOOT CONTROL

170-190	SM1674	Optional Foot Control Unit	1

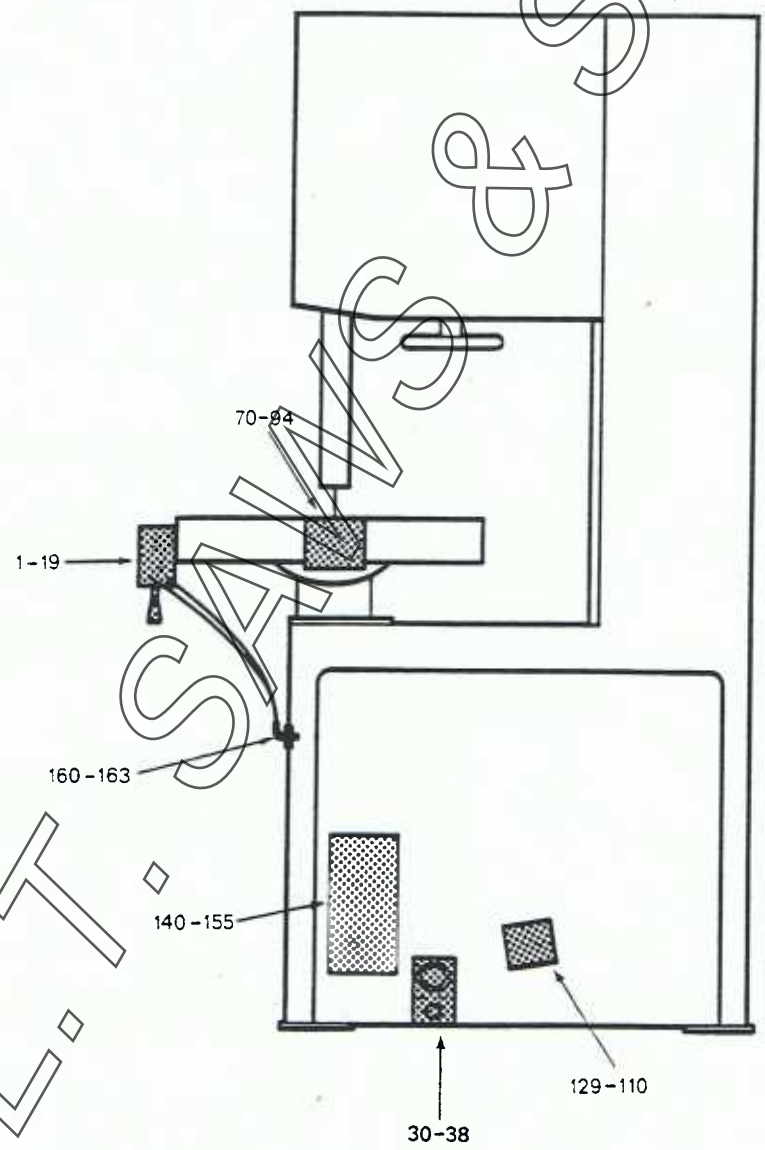


TABLE CONTROL - ASSEMBLY NO: SM1673/A

ITEM	PT NO	DESCRIPTION	NO OFF
1	SM1689	Control Box Assembly	1
2	BO5715	Full Nut	4
3	BO5944	Washer	4
4	BO2423	Male Elbow;	3
5	5564	Female Adaptor;	3
6	BO2446	Branch Tee;	1
7		NOT USED	
8	BO2412	Male Stud;	1
9	BO2469	Poppet Valve;	1
10	BO5457	Domed Screw;	2
11	BO5195	Set Screw;	2
12	7905	Valve Knob	1
13	BO2422	Male Elbow;	3
14	BO2470	Speed Control Valve;	1
15	BO2468	Rotary Valve;	1
16	BO2426	Male Stud Tee;	1
17	BO2403	Fitting;	3
18	BO6384	Black Tube;	1.0
19		NOT USED	
33		NOT USED	
31	BO2454	Pressure Gauge	1
32	BO2448	Female Stud;	1
33*	7921	Snubber Disc	1
34		NOT USED	
35		NOT USED	
36		NOT USED	
37		NOT USED	
38		NOT USED	

Note ! Items 20 - 29 inc. are not used.

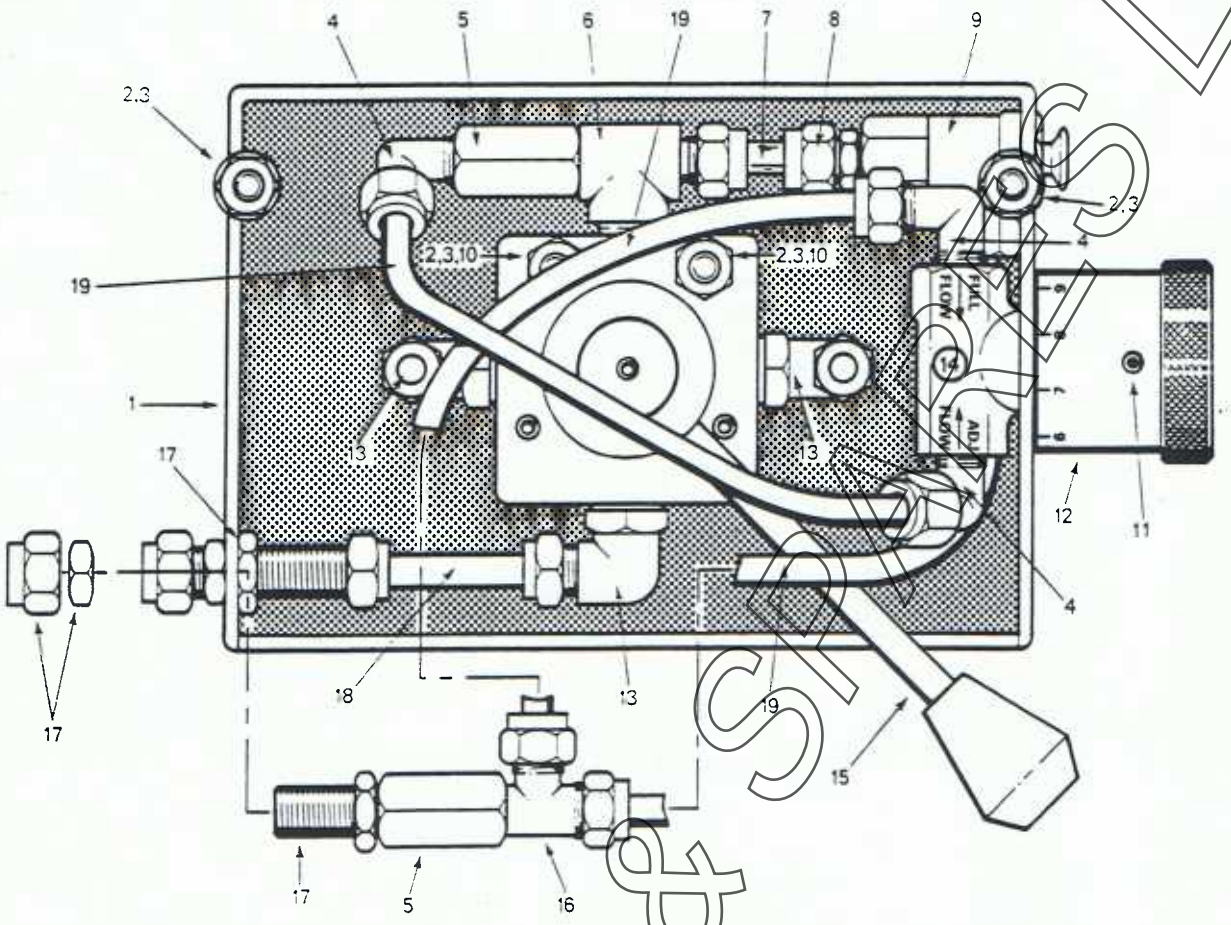
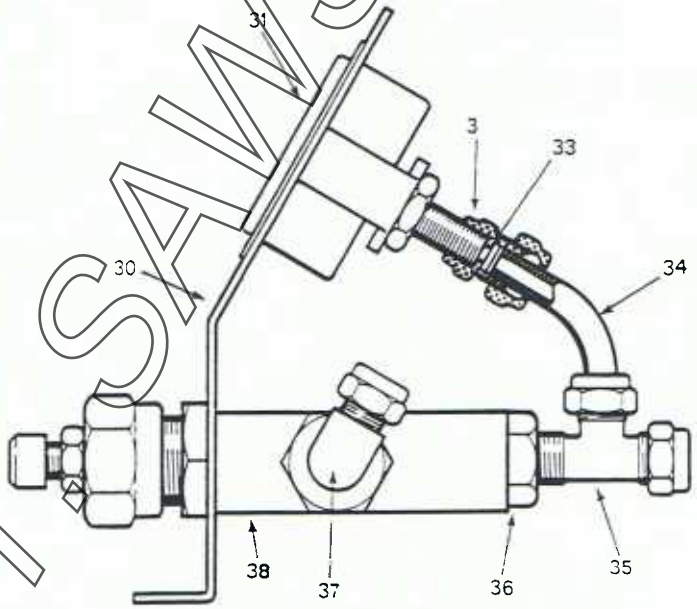


TABLE CONTROL BOX ASSEMBLY

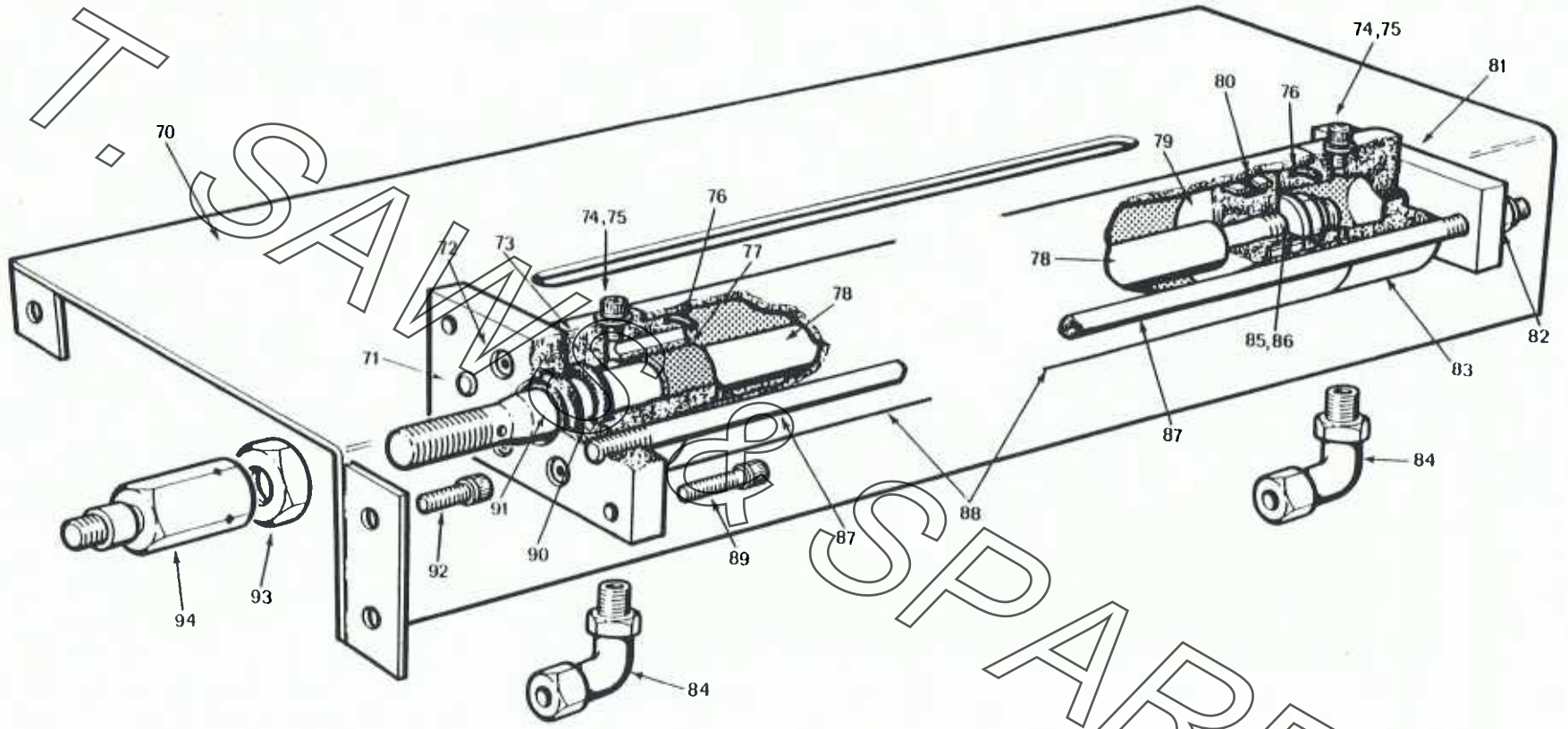


PRESSURE CONTROL ASSEMBLY

HYDRAULIC CYLINDER ASSEMBLY NO: SM1103

ITEM	PT NO	DESCRIPTION	NO OFF
70*	SM650	Cylinder Cover Assembly	1
71	5745	Mounting Plate	1
72	BO5265	C/Sk Screw;	4
73	5747	Front End Cap	1
74	BO5058	Cap Screw;	2
75	BO5951	F/Washer	2
76	BO2263	O-Ring;	2
77	BO2305	Bush;	1
78	5737/A	Piston Rod	1
79	5738	Piston Head	1
80	BO2110	Seal;	1
81	4401	Tie Bar	1
82	BO5774	Binx Nut	2
83	5746	Rear End Cap	1
84	BO2421	Stud Elbow;	2
85	BO5775	Binx Nut	1
86	BO5954	F/Washer;	1
87	5740/A	Tie Rod	2
88	5743	Cylinder Barrel	1
89	BO5068	Cap Screw;	4
90	BO2111	Fluid Seal;	1
91	BO2114	Wiper Ring;	1
92	BO5067	Cap Screw;	3
93	BO5748	Locknut	1
94*	5739/A	Adaptor	14

* denotes valid parts that do not belong to THIS assembly no.



HYDRAULIC CYLINDER

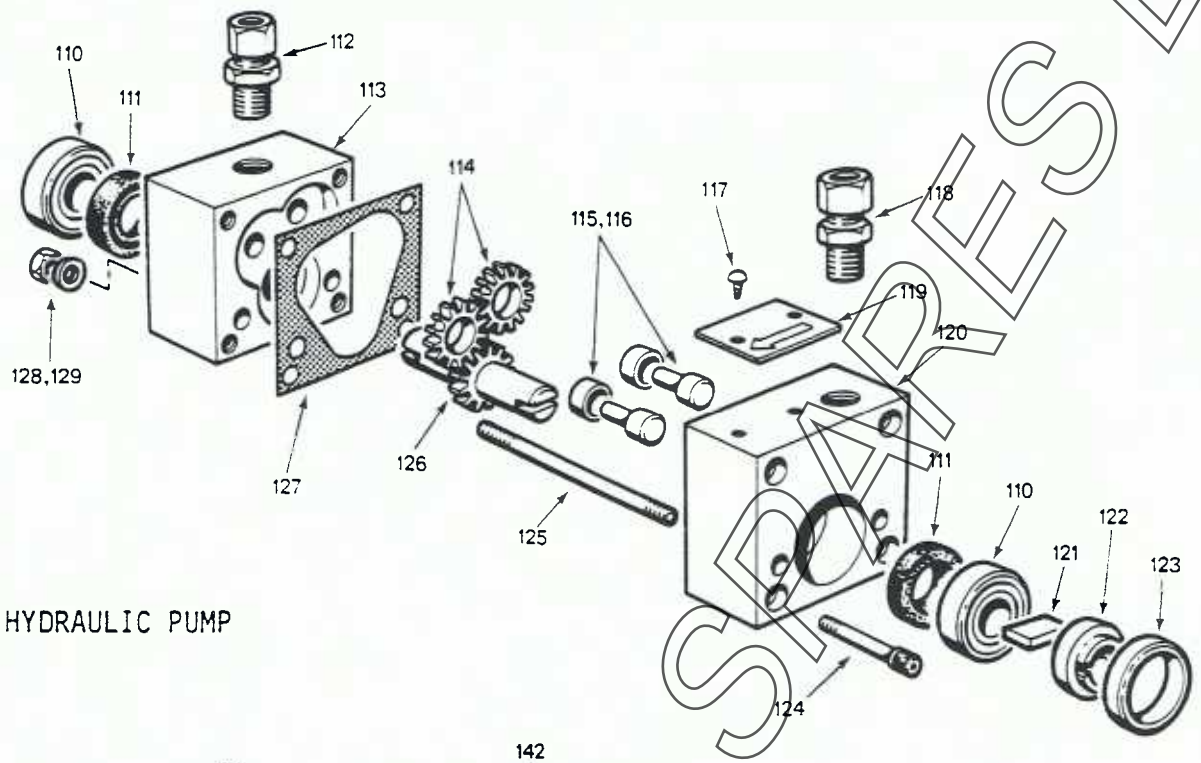
HYDRAULIC /COOLANT PUMP - ASSEMBLY NO: SM532

ITEM	PT NO	DESCRIPTION	NO OFF
110	BO2013	Bearing;	2
111	BO2119	O-Seal;	2
112	BO2412	Male Stud	1
113	3645	Pump Body	1
114	3648	Gear	2
115	994	Planet Pinion Pin	2
116	BO2302	Bush;	2
117	BO5870	Drive Screw;	2
118	BO2410	Male Stud	1
119	3649	Instruction Plate	1
120	3646	Cap	1
121*	3608	Key	1
122*	3588	Coupling	1
123*	3589	Register Ring	1
124	BO5013	Cap Screw	4
125*	3609	Stud	2
126	3647	Drive Shaft	1
127	3584	Gasket	1
128*	BO5700	Full Nut	6
129*	BO5914	Washer	2

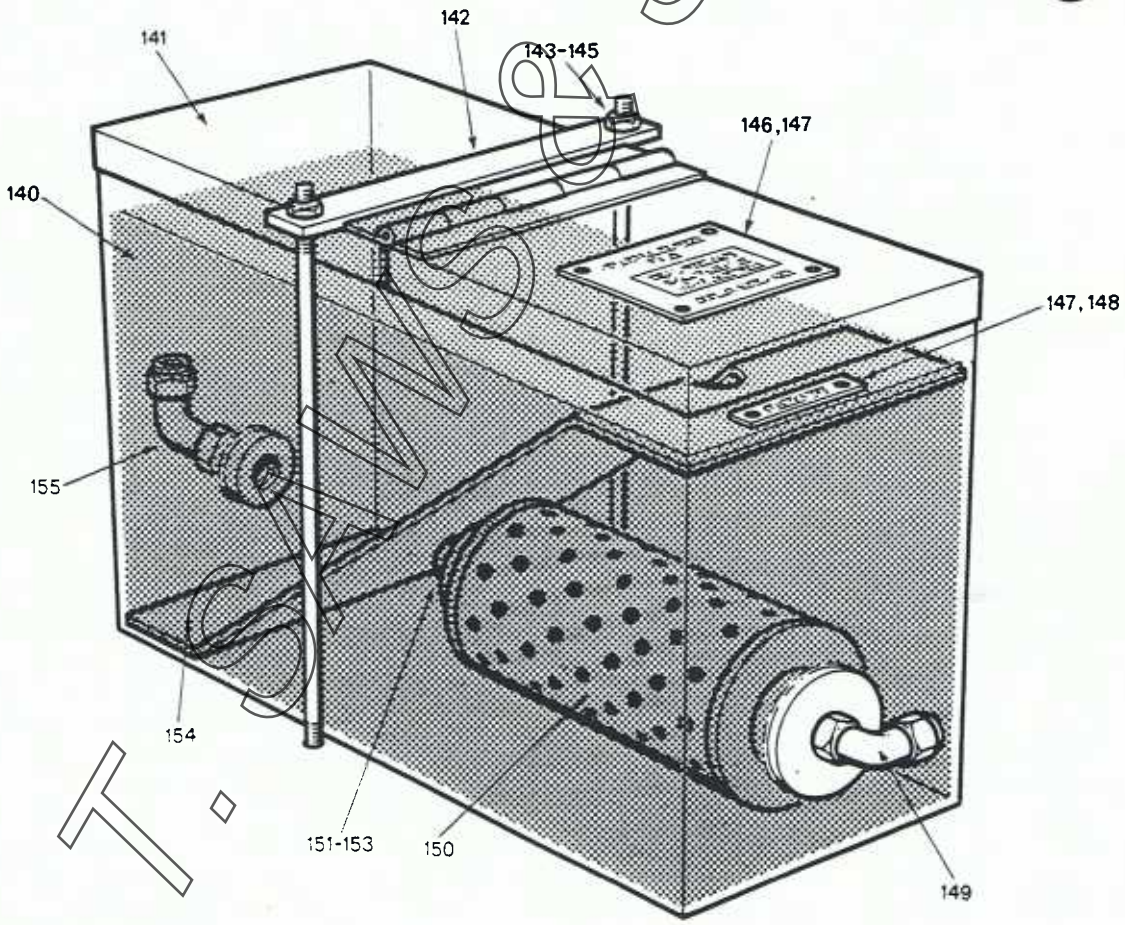
HYDRAULIC TANK - ASSEMBLY NO: SM490

140	SM488	Hydraulic Tank	1
141	SM489	Tank Lid	1
142*	3602	Clamp	1
143*	3604	Stud	1
144	BO5702	Full Nut	2
145	BO5915	Washer	2
146	3597	Instruction Plate	1
147	BO5794	Pop Rivet;	6
148	3598	Lever Plate	1
149	BO2424	Male Elbow;	1
150	BO2569	Filter;	1
151	3187	Filter Retaining Washer	1
152	BO5601	Hex. Bolt;	1
153	BO5919	Washer	1
154	3596	Inside Plate	1
155	BO2426	Male Stud Tee;	1

* denotes valid parts that do not belong to THIS assembly



HYDRAULIC PUMP



HYDRAULIC TANK

OPTIONAL FOOT CONTROL UNIT SM1674

The Foot Control Unit allows table to be traversed on fine forward or return feed rate by way of a foot valve. With Table Control hand valve in STOP position press foot switch forwards or backwards to control table movement. When released the foot switch will return to CENTRE OFF position and stop table.

FITTING INSTRUCTIONS

Disconnect hydraulic pipes from fittings at the side of machine and remove 2 way connection plate 7886. Remove lower cover plate and replace with Foot Control Unit, feeding the hydraulic pipe up through the inside of the machine. Secure 6 way connection plate 7887 to the inside of the machine in place of the 2 way plate, and reconnect the hydraulic pipes from the Control Box marked P & T. Remove link A-B (see hydraulic circuit diagram, page 1) from the Control Box and replace with the two hydraulic pipes marked A & B from the connection plate. Locate the hydraulic pipes from the Control Box to the cylinder which run along the under side of the table. Cut the pipe of the Cylinder forward line and connect in the TEE marked CYL. FWD from the connection plate. Repeat for the CYL. RTN line.Connect the hydraulic pressure and tank lines to the back of the connection plate. Ensure all connections are tight. Run the machine and check for oil leaks. Check level of hydralic oil in tank and replenish if necessary.

NOTE: THE FOOT CONTROL UNIT IS AN OPTIONAL EXTRA FOR HYDRAULIC MACHINES.

OPTIONAL FOOT CONTROL UNIT - ASSEMBLY NO: SM1674

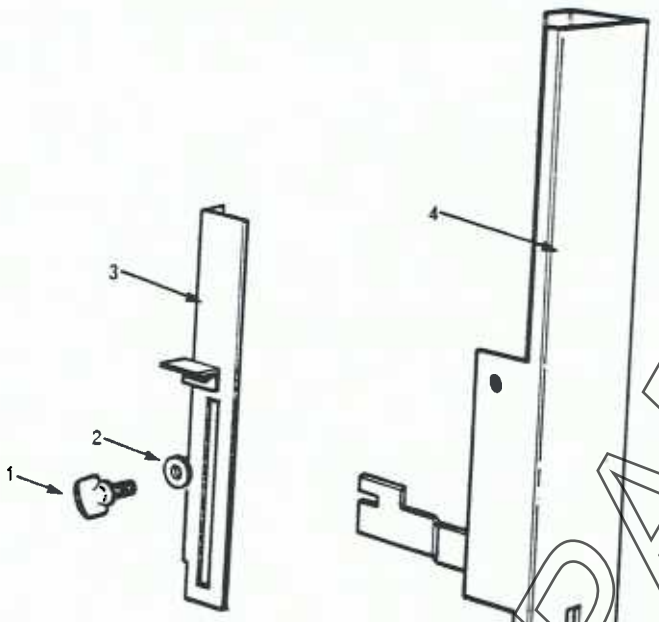
ITEM	PT NO	DESCRIPTION	NO OFF
170	BO2472	Valve;	1
171	SM1663	Foot Control Mounting	1
172	BO5579	Hex. Screw;	2
173	BO5715	Full Nut	4
174	BO5917	Washer	6
175	BO5563	Hex. Screw;	2
176	BO2423	Male Elbow;	3
177	BO2450	Banjo;	2
178	BO6384	Black Tube;	4.5
179	BO2408	Equal Tee;	1
180	7827	Corner Bracket	1
181	BO5561	Hex. Screw;	2
182	BO5475	Cheese Screw;	7
183	7829	Cover	1
184	7828	Foot Valve Cover	1
		NOTE ! Not illustrated, parts supplied with SM1674	
185	7887	Connection Plate	1
186	BO2457	Non Return Valve;	1
187	BO2402	Female Tee;	2
188	BO2403	Fitting;	4
189	BO2408	Equal Tee;	2
190	BO2493	Flexitube;	4

UPPER GUARD - ASSEMBLY NO: SM1473

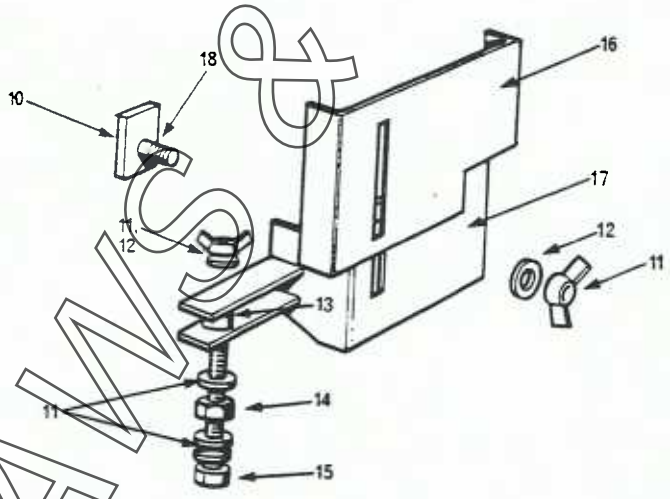
ITEM	PART NO	DESCRITION	NO. OFF
1	BO5826	Thumb Screw;	1
2	BO5917	Washer	1
3	SM1474	Guard Slide Cover	1
4	SM1475	Top Blade Guard Body	1

LOWER GUARD - ASSEMBLY NO: SM886

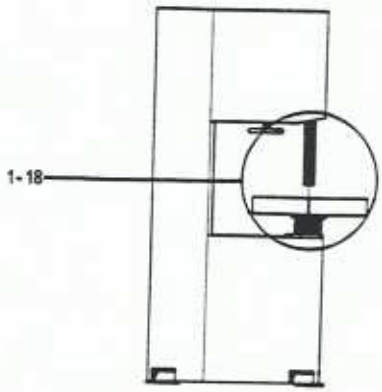
10	5096	Clamp Plate	1
11	BO5785	Wing Nut;	2
12	BO5917	Washer	5
13	5100	Spacer	1
14	BO5715	Full Nut	1
15	BO5568	Hex. Screw;	1
16	5099	Visor	1
17	SM885	Lower Guard	1
18	BO5620	Coach Bolt;	1



UPPER GUARD ASSEMBLY



LOWER GUARD ASSEMBLY



MOTOR PLATFORM - ASSEMBLY NO: SM381/B

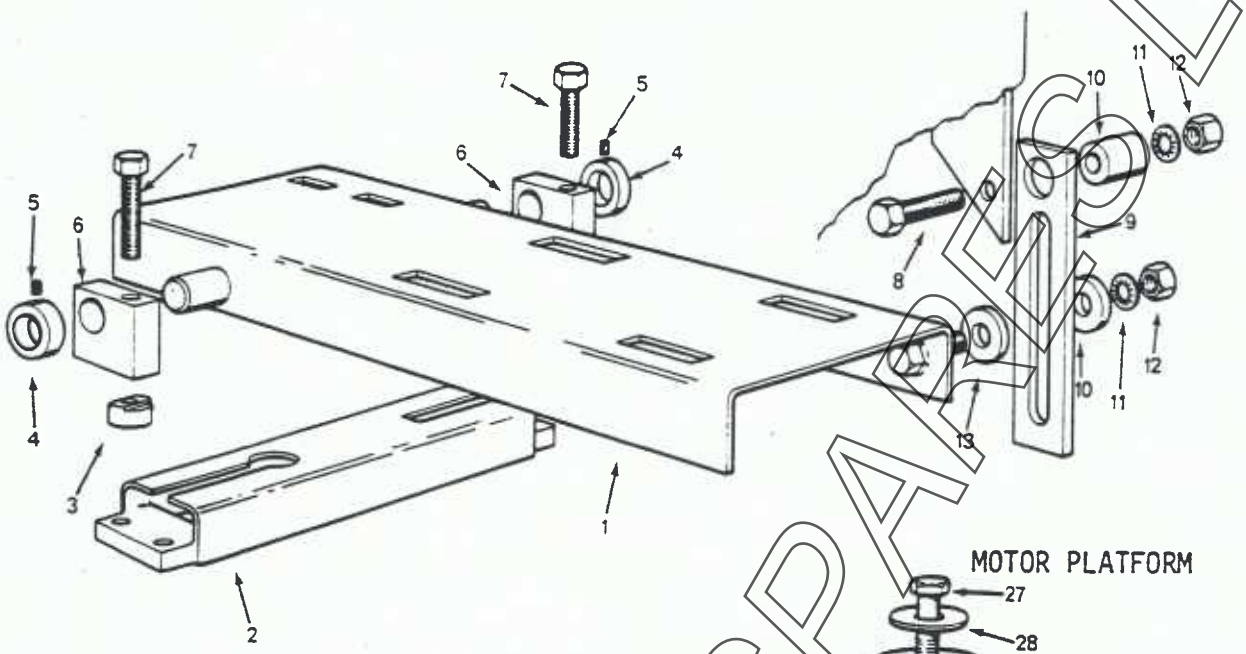
ITEM	PT NO	DESCRIPTION	NO OFF
1	SM1467	Motor Platform	1
2	SM383/B	Mounting Bracket	1
3	2866	Spindle Nut	2
4	2452	Collar	2
5	BO5163	Set Screw;	2
6	3071	Support Block	2
7	BO5532	Hex. Screw;	2
8	BO5609	Hex. Screw;	2
9	3070	Belt Tensioning Bracket	1
10	7550	Spacer	1
11	BO5946	Washer	1
12	BO5717	Full Nut	1
13	3068	Washer	2

AIR COMPRESSOR - ASSEMBLY NO: SM486/A

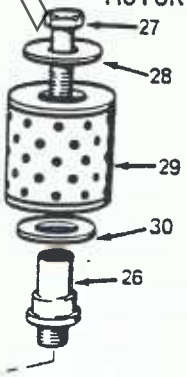
20	5354	Compressor Pulley	1
21	BO5186	Set Screw;	1
22	BO2013	Bearing;	2
23	3575	End Cap	1
24	1148	Key;	1
25	3579	Vane	2
26	BO2568	Filter;	1
27	3611	Washer	1
28	BO5564	Hex. Screw;	1
29	3612	Washer	1
30	3599	Filter Mounting	1
31	BO2430	Nozz;e;	1
32	3576	Cylinder	1
33	3577	Cylinder Mounting	1
34	BO6034	Int. Circlip;	1
35	3578	Rotor	1
36	BO5016	Cap Screw;	3

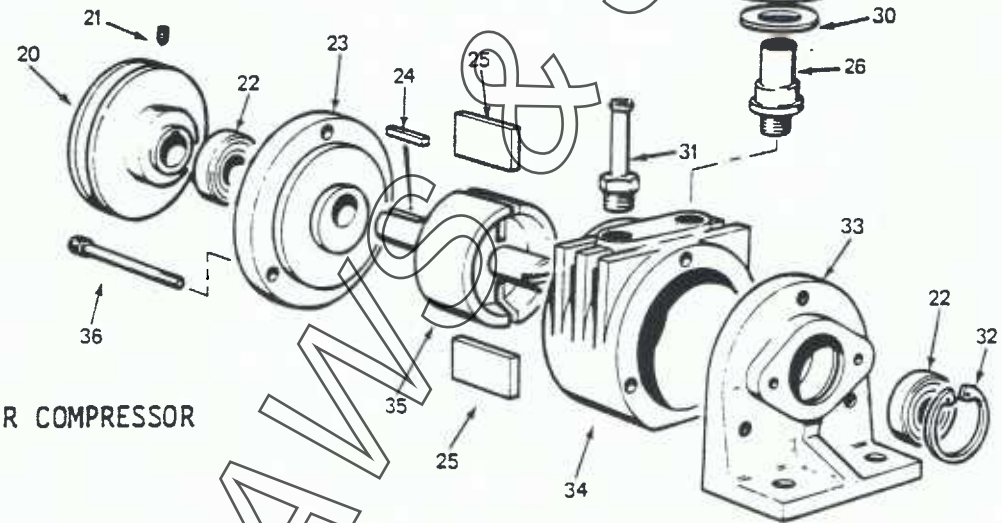
CHIPBLOWER KIT - ASSEMBLY NO: SM1883/B

46	4930	Chipblower Pipe	1
47	BO5017	Cap Screw;	2
48	4931	Bracket	2
49	BO5708	Full Nut	1
50	3635	Adjusting Screw	1
51	BO6378	Clear Tube;	0.1
52	3630	Sleeve	1
53	3628	Thumb Knob	1
54	BO5919	Washer	2
55	BO6379	Clear Tube;	11.0

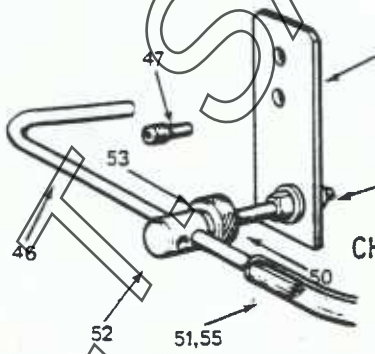


MOTOR PLATFORM





AIR COMPRESSOR



CHIP BLOWER