

# STARTRITE

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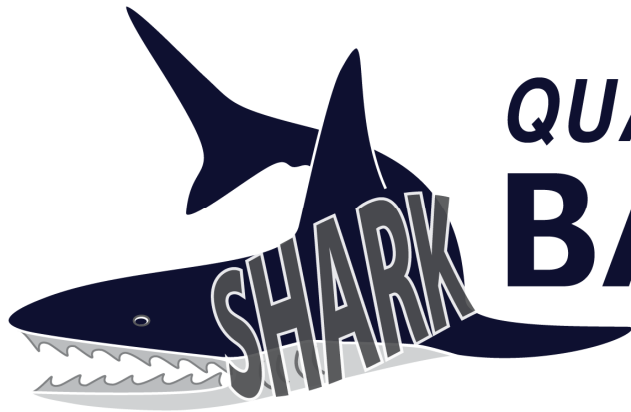
## INSTRUCTION MANUAL

# 502S

## DUAL SPEED VERTICAL BANDSAW

**IMPORTANT**  
**READ THE INSTRUCTIONS**  
**CAREFULLY BEFORE**  
**USING THIS PRODUCT**

**ISSUE 5**  
**CLSD**



**QUALITY**  
**BANDSAW**  
**BLADES**

**TO SUIT THE 502 MODEL**

**ORDER LINE- 01634 850833**

**A.L.T. SAWS & SPARES LTD**

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# GENERAL ARRANGEMENT

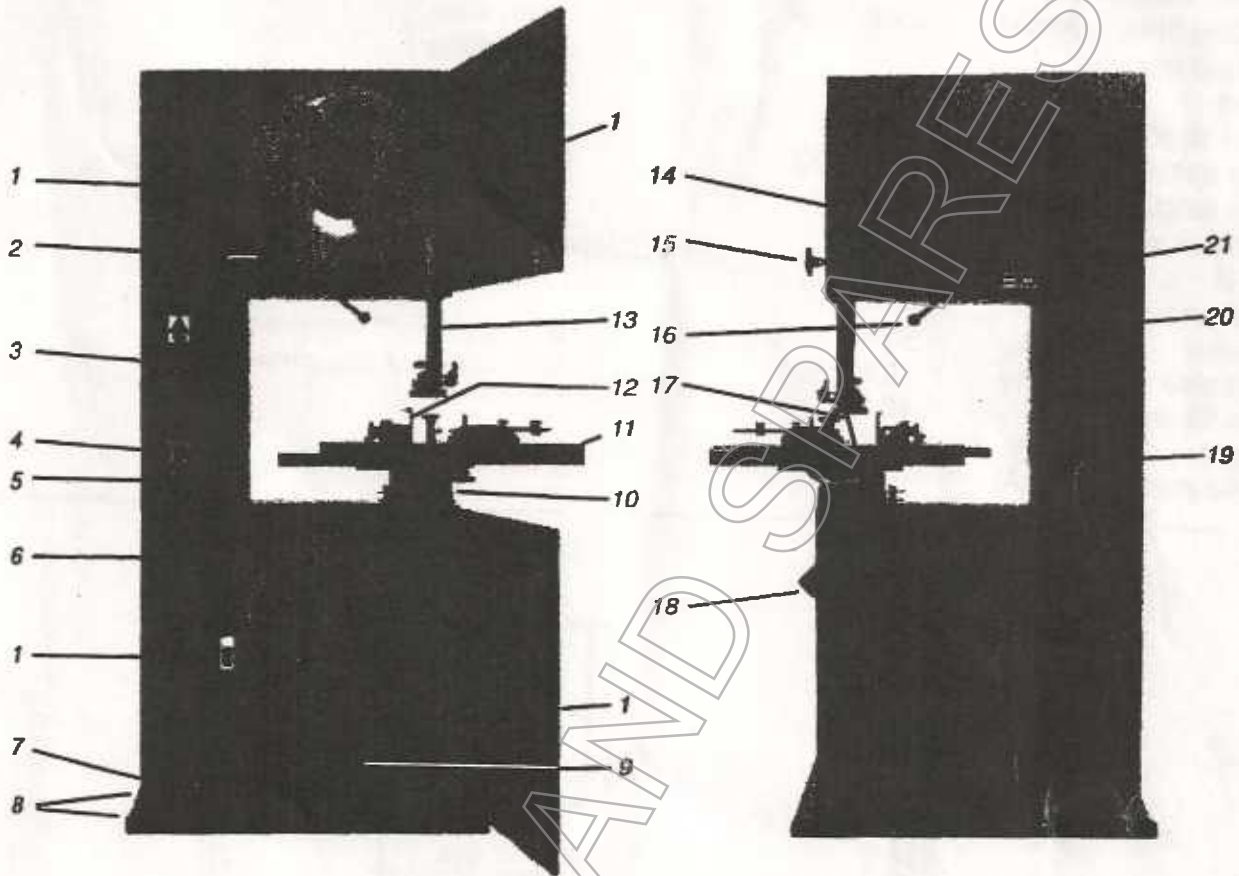


Fig 1

## Key

- |    |  |    |   |
|----|--|----|---|
| 1  | Bandwheel door lock with integral safety interlock | 12 | Rip fence   |
| 2  | Tension indicator                                  | 13 | Upper blade guard   |
| 3  | Lockable isolator                                  | 14 | Blade tracking adjuster                                       |
| 4  | Start control                                      | 15 | Blade guide adjustment lock                                   |
| 5  | Stop control                                       | 16 | Blade tension adjuster  |
| 6  | Blade brush  | 17 | Table insert  |
| 7  | Palm/kick switch                                   | 18 | Dust extraction coupling                                      |
| 8  | Fixing holes (4 off)                               | 19 | Low voltage work lamp socket (optional) (work lamp not shown) |
| 9  | Two speed pulley and drive belt                    | 20 | Key switch (optional)   |
| 10 | Lower blade guard                                  | 21 | Rating/serial number label                                    |
| 11 | Table  |    |   |

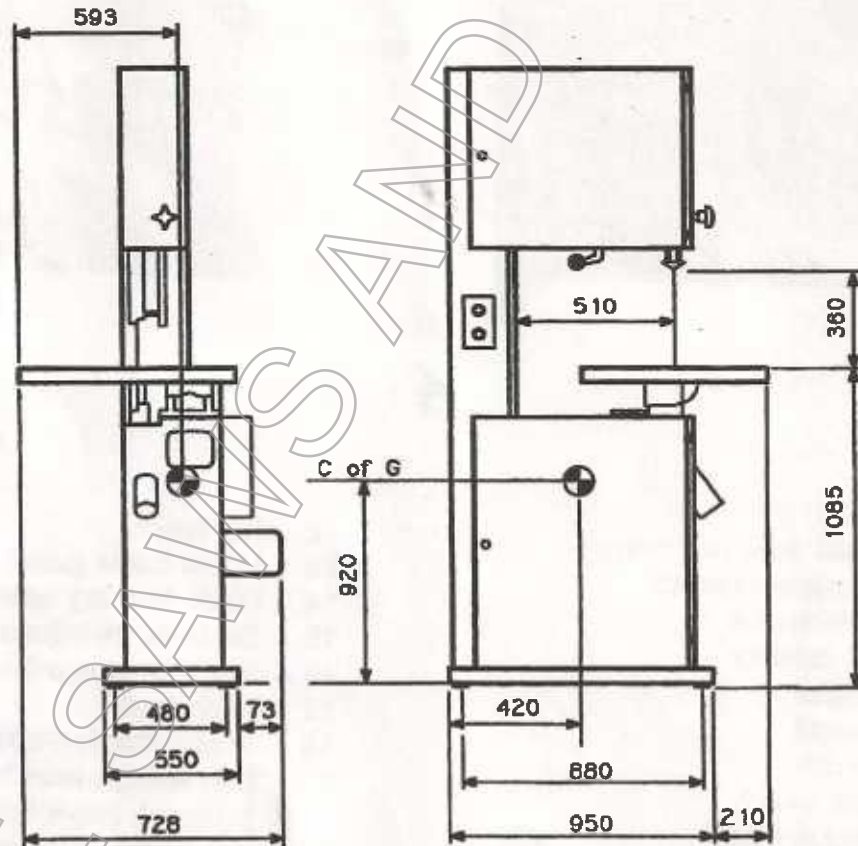
**SPECIFICATION**

**STANDARD/OPTIONAL EQUIPMENT**

Electrical Supply	1 phase	220 - 240V 50Hz/5.9A
	3 phase	380 - 415V 50Hz/11.9A
Motor Power	3 phase	1.5 kW
	1 phase	1.5 kW
Control voltage	(V)	24
Stopping time	(secs)	<10
Height under guides	(mm)	355
Throat depth	(mm)	508
Blade speed	(m/min)	580/1100
Blade length	(mm)	4140
Min blade width	(mm)	6
Max blade width	(mm)	25
Band wheel diameter	(mm)	521
Table size	(mm)	705 x 660
Table tilt angle	(°)	45
Weight	(kg)	240
Sound power*	(dbA)	< 96.9

Reversible rip fence	●
Blade	●
Operating manual	●
Tools	●
Electro-mechanical brake	●
Depth stop	○
Mitre fence	○
Circle cutting attachment	○
Low voltage work lamp	○
Key switch	○
Palm/kick switch	●

● standard equipment  
○ optional equipment



All dimensions are in mm and are approximate.

Due to the policy of continuous product improvement specification may change without notice.

\* The sound power levels quoted are emission levels and are not necessarily working levels. Whilst there is a correlation between emission levels and exposure levels, this cannot be used reliably to determine whether or not further precautions are required. Factors that influence the actual level of exposure of the work force include the duration of exposure, the characteristics of the work room, and other sources of noise. Also permissible exposure levels can vary from country to country. However, this information will enable the user of the machine to make a better evaluation of the hazard and risk.

## HEALTH AND SAFETY ADVICE

Ensure that you have read the contents of this operating manual, and that you have received sufficient training to enable the safe adjustment, use and maintenance of this machine before using it.

Inexperienced users and those under the age of 18 years should not operate this machine unless supervised by an experienced operator.

For safe operation of this machine ensure that:

The blade is suitable for the work to be undertaken and that it is sharp and moving in the correct direction.

The correct blade speed is selected.

Loose items of clothing or jewellery are fastened or preferably removed.

Fences are adjusted correctly and secured, and that push sticks are available

The working area is clean and unobstructed.

Dust extraction equipment is working efficiently and that it is operating.

Suitable protective clothing such as goggles and ear defenders are available and worn if necessary.

The machine is kept clean and maintained in accordance with the Maintenance instructions.

When adjusting, cleaning or maintaining this machine ensure that all moving parts are stationary and that the electrical supply is disconnected.

Report immediately to your supervisor any machine malfunction or operator hazard. Do not attempt to repair the machine unless competent to do so.

The electrical supply must be connected in accordance with the installation instructions. It is recommended that regular insulation and earth continuity / impedance tests are undertaken. As the test method and frequency of such tests may depend on the laws of the country in which the machine is being used, it is recommended the user consult a qualified electrician.

Whilst measures have been taken to minimise the noise emitted by this machine the actual level of noise emissions is dependant on operating conditions and may be higher than specified.

If in doubt about the safe use of this machine contact **A.L.T. Saws & Spares Ltd** (the address and telephone number are given on the front of this manual), or organisation from where the machine was purchased for advice and the availability of training.

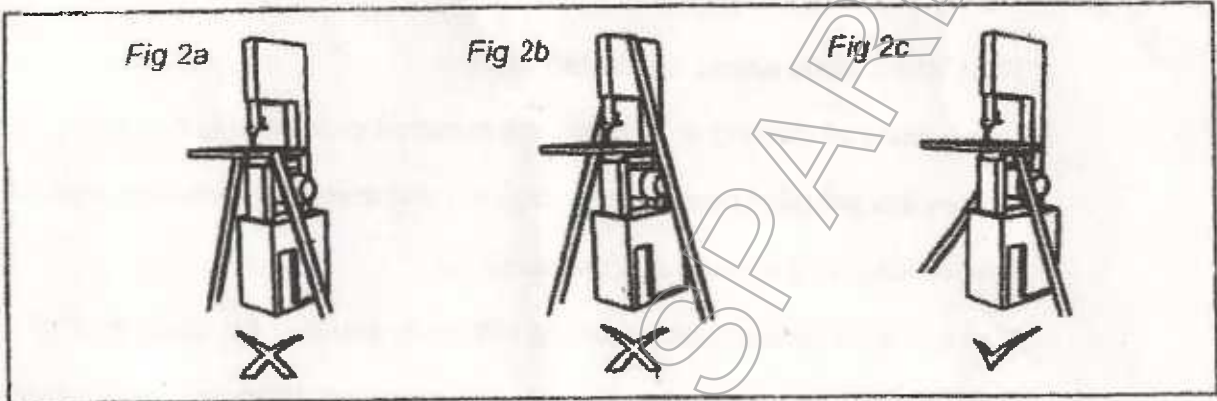
### MACHINE LABELS

The labels on this machine should never be removed or covered over. Replacement labels and details of where to fit them can be obtained from **A.L.T. Saws & Spares Ltd**

## HANDLING, TRANSPORTATION AND FIXING

Damage caused by incorrect handling, transportation or installation may invalidate the guarantee. Consequently if in doubt about the safe handling or installation of the machine, obtain the services of a competent technician or contact **A.L.T. Saws & Spares Ltd CUSTOMER SERVICES**, or contact the organisation from where the machine was purchased.

When transporting this machine do not strap across the table or over the top of the machine (see fig 2a and 2b). Always locate retaining straps over the lower wheel box beneath the table (fig 2c).



The machine may require the table to be fitted. If so lift the table into position allowing the trunnion to seat and the bolt to pass through the slot in the cradle. From the underside of the cradle platform assemble the remaining components and securely tighten the retaining nut (see Fig 3).

When moving and positioning this machine do not hold the table and drag it, always hold the spine or lower wheel box. If moving long distances position the machine on a suitable trolley before moving or preferably use a forklift to move the machine. Position the forks under the base of the machine. Alternatively use a hoist with a sling positioned around the upper wheel box close to the spine (see fig 4).

The machine should not be located in a confined space. Ensure that the working area is adequately lit. A cabinet located nearby is useful for the safe and secure storage of tools, blades and accessories.

The machine should be located on a solid surface that is level and fixed using four bolts (not supplied). Four mounting holes are provided in the base for this purpose.

Ensure that the anti corrosive coating is removed from the table and other working parts before use.

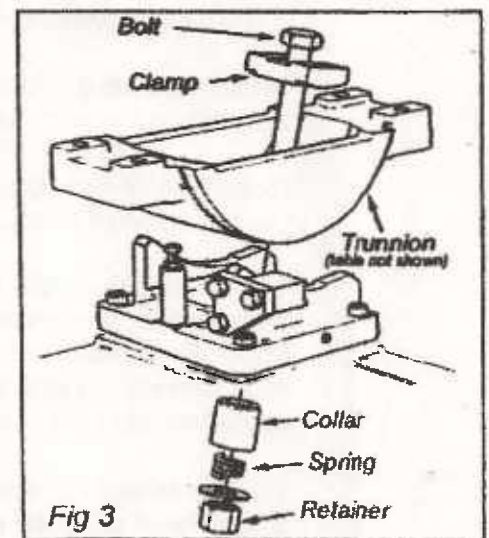


Fig 3

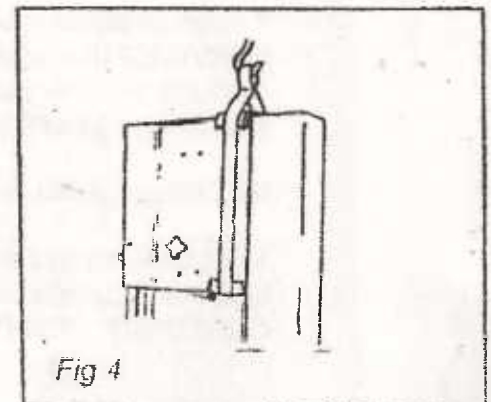


Fig 4

## CONNECTION OF THE ELECTRICAL SUPPLY

Before connecting the electrical supply ensure that it is the correct voltage, phase and frequency, and that it has sufficient capacity for the machine. The relevant information can be found on the rating plate located on the rear of the machine (see fig1).

### THREE PHASE SUPPLY

Remove the screw retaining the electrical control housing. Pass the supply lead through the cable gland located on the lower end of the housing. Connect the supply leads to Terminals L1, L2 and L3 on the isolator. Connect the protective Earth lead (yellow/green) to the earth terminal (E).

Before proceeding further, check the direction of motion of The machine. This should be done without the blade fitted to Prevent damage in the event of the direction of motion being Incorrect. The lower bandwheel should rotate in a clockwise Direction. If it does not, Interchange two of the supply leads.

The use of a 2.5mm<sup>2</sup> cable and fuses rated at 15 A is Recommended.

### SINGLE PHASE SUPPLY

Remove the screw retaining the electrical control housing. Pass the supply lead through the cable gland located on the lower end of the housing. Connect the live (brown) lead to terminal L1 on the isolator. Connect the neutral (blue) wire to terminal 3. Connect the protective earth lead (yellow/green) to the earth terminal (E) (see fig 5). The use of 2.5mm<sup>2</sup> cable and fuses rated at 20 A is recommended.

### IT IS IMPORTANT THAT THE MACHINE IS EFFECTIVELY EARTHED

If in doubt about the connection of the electrical supply consult a qualified electrician.

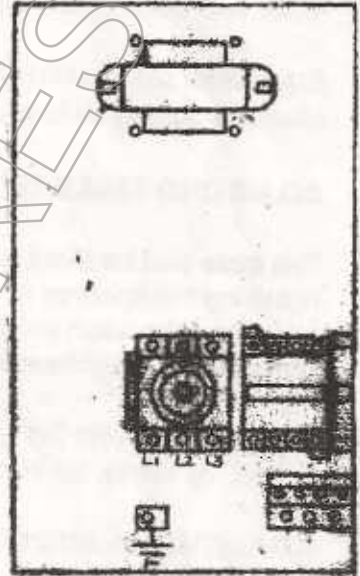
## CONNECTION TO A DUST EXTRACTION SYSTEM

The machine is fitted with an integral dust extraction outlet located on the right hand side of the lower band wheel box (see fig 1). Use only 110mm diameter flexible hose Part No:- BO7083 (not supplied), and a suitable retaining clip, Part No:- BO7316 (not supplied). To ensure effective extraction the flexible hose must be securely fixed to the outlet and be free from obstructions.

Connect the other end of the flexible hose to the inlet of a suitable dust extraction system.

For effective extraction the recommended flow rate is 20 to 25 m/s. For the purposes of specifying a dust extraction system the pressure at the dust extraction outlet of a properly maintained machine is 1050 Pa at m/s and 1660 Pa at 25 m/s. The use of DUST EXTRACTION SYSTEMS is recommended.

For further information on the use and range of dust extraction equipment, contact **A.L.T. Saws & Spares Ltd** or the organisation from where the machine was purchased.





## SETTING AND OPERATING INSTRUCTIONS

### BLADE SPEED SELECTION

The machine has two speeds. The speed can be altered by repositioning the drive belt (located behind the lower bandwheel) connecting the motor and band wheel pulley (see fig 6).

Ensure that the machine has come to rest and is disconnected from the electricity supply before changing the blade speed.

### ADJUSTING TABLE TILT ANGLE

The table can be tilted up to 45°. To tilt the table slacken the trunnion nut using the spanner provided (see fig 7). Tilt the table to the desired angle and the align pointer with protractor scale. Ensure the trunnion nut is securely tightened before using the machine.

When sawing with the table tilted ensure the work is adequately supported by using, for example, the rip fence or mitre gauge supplied.

### ADJUSTING BLADE GUARDS

The upper and lower blade guards are fully adjustable. They should be adjusted to leave the minimum amount of blade exposed.

The upper blade guard can be adjusted by slackening the locking handle and sliding the guard assembly up or down to the desired position (see fig 8a). Ensure the locking handle is securely tightened before sawing commences.

The lower blade guard can be adjusted when the table is tilted by releasing the retaining nut and adjusting to the required position (see fig 8b). Ensure the locking nut is securely tightened before sawing commences.

### ACTUATION OF BANDWHEEL DOOR INTERLOCKS

Both bandwheel doors are interlocked to ensure optimum safety. When either bandwheel door lock is unlocked by rotating the key anticlockwise the electrical supply to the machine is disconnected and the machine will stop in less than 10 seconds (see fig 9). The machine cannot be started with either bandwheel door open and will not restart if the bandwheel door is closed or locked. To restart after activating the bandwheel door interlocks close and lock the doors then press the start control located on the front of the machine (see fig 1).

The interlocks require no adjustment or maintenance. Under no circumstances attempt to override the safety interlocks.



Fig 6



Fig 7

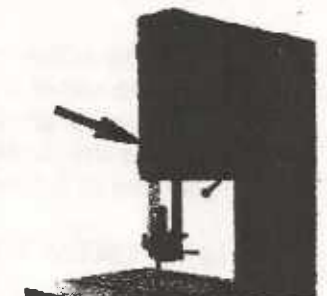


Fig 8a



Fig 8b

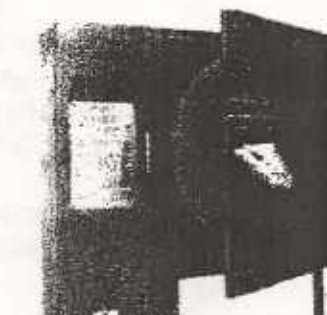


Fig 9

### ADJUSTING THE BANDWHEEL BRUSH

For effective sawing it is important to ensure the lower bandwheel is kept free from dust and waste material. A bandwheel brush located near the top of the lower bandwheel is provided for this purpose. To adjust slacken the retaining nut and slide the brush toward the bandwheel whilst applying light pressure (approximately 1 kg) then tighten the retaining nut (see fig 10). Prior to operating the machine ensure that all fasteners are securely tightened. Replace the brush when the length of the bristles is less than 8mm.



Fig 10

### REPLACING THE TABLE INSERT

A plastic insert is fitted in the table (see fig 1) to ensure that the blade is not damaged should contact be made. When replacing the insert ensure that the slot is aligned with the slot in the table, that the top surface of the insert is flush with the table surface and that the retaining screw is securely tightened.

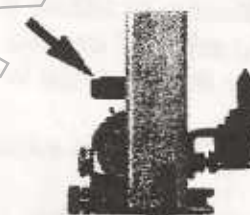


Fig 11a

### FITTING THE BLADE

To remove the blade open both bandwheel doors, remove the upper guard by slackening the retaining screw (see fig 11a), remove the lower blade guard by slackening the retaining nut (see fig 11b), and remove the swing latch by slackening the two retaining screws located beneath the front edge of the table (see fig 11c).



Fig 11b

Release the blade tension by rotating the blade tension adjuster (see fig 1). Carefully lift the blade from the upper and lower bandwheels and slide it through the table slot and from under the fixed guard attached to the spine.



Fig 11c

When replacing the blade position it centrally on the bandwheels ensuring it is not snagging on the fixed guard attached to the spine or the table slot. Also ensure it is positioned between the upper and lower blade guides.

Whilst tensioning the blade it may be necessary to adjust the blade tracking to ensure the blade runs centrally on the bandwheels. Adjustment of tracking and tension is described below.

Having adjusted the blade tracking and tension replace the upper and lower guards and swing latch ensuring that all retaining screws are securely fastened. To ensure optimum cutting performance and blade life the rip fence should be aligned with the table slot by adjusting the position of the fence rail.

### BLADE TENSION ADJUSTMENT

Blade tension is adjusted by rotating the blade tension adjuster (see fig 1). Rotate the adjuster clockwise to increase blade tension and anti clockwise to decrease blade tension (see fig 12).



Fig 12

## SETTING AND OPERATING INSTRUCTIONS (Continued)

### BLADE TENSION INDICATION

Blade tension is shown by the blade tension indicator (see fig 13). The correct tension is dependent on the blade, material being sawn and the material thickness. More information is given in the section on blade selection later in this handbook (see table 2).



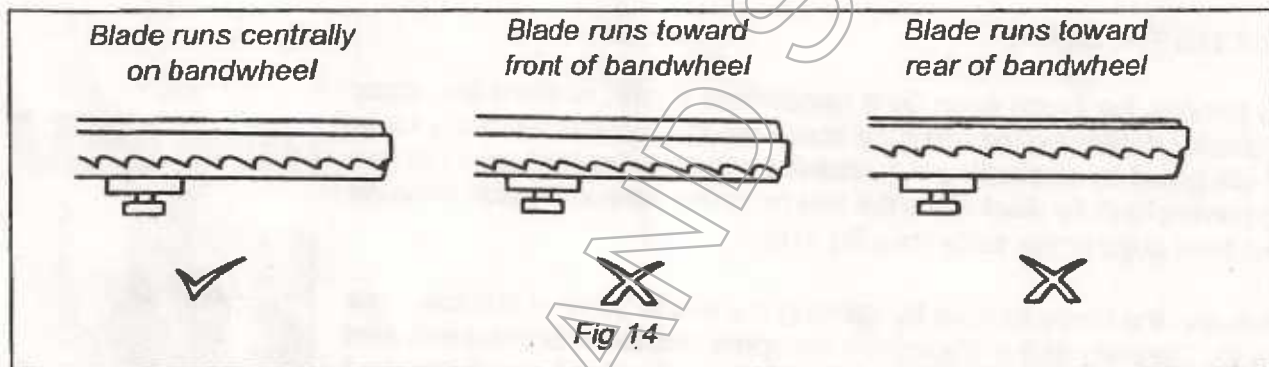
Fig 13

### BLADE TRACKING

It is important that the blade runs centrally on the bandwheels (see fig 14). To ensure this it may be necessary to adjust the blade tracking. This is done by releasing the lock nut securing the tracking adjuster located on the rear of the machine. When correctly adjusted secure the adjuster by fastening the lock nut.

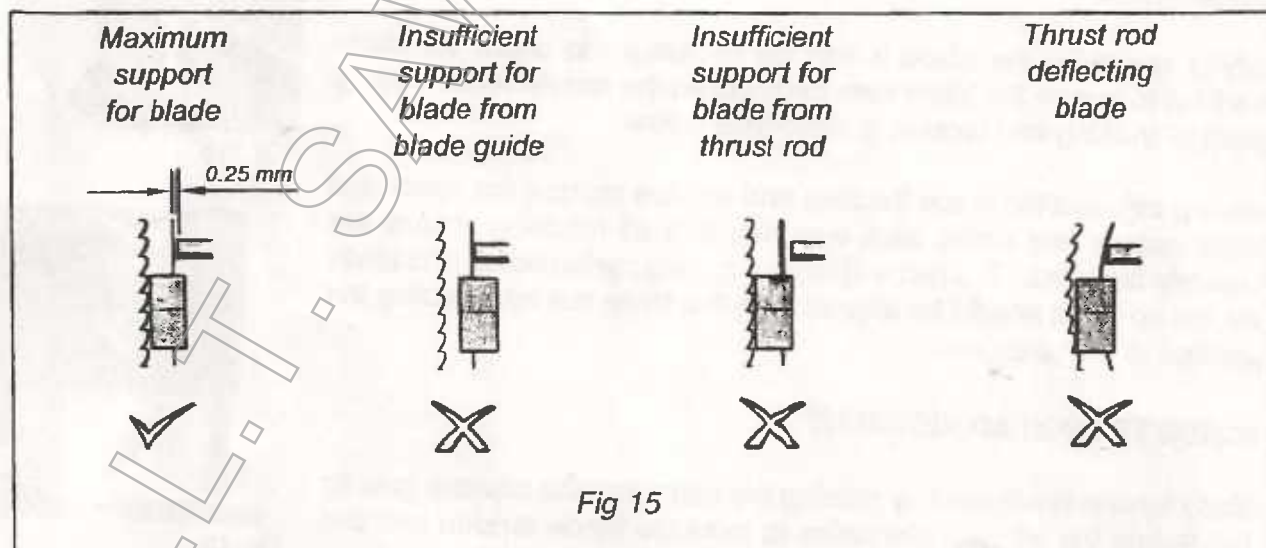
**Note:** This will be easier if the motor brake is released. See page 14.

After replacing a blade or adjusting the tracking it is important to ensure the upper and lower blade guides are correctly set. The adjustment of these is described below.



### BLADE GUIDE ADJUSTMENT

The upper and lower blade guide system incorporates lateral guidance and back edge support. It is important that blade guides are set to provide the maximum support for the blade (see fig 15).



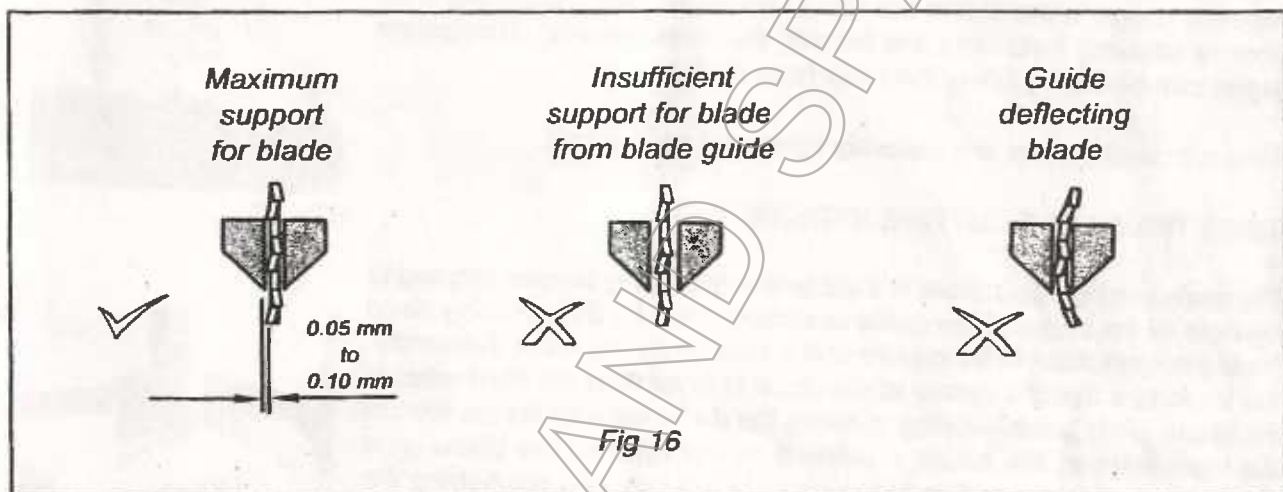
## SETTING AND OPERATING INSTRUCTIONS (Continued)

The lateral guides are adjusted by loosening the retaining screw and positioning them so that they just clear the gullet of the blade teeth and there is a gap of between 0.05mm and 0.10mm between the blade and the guide (see fig 16). The roller thrust support is adjusted by loosening the retaining screw and positioning to provide a gap of 0.25mm between the back edge of the blade and the surface of the roller thrust support.

The upper blade guide is fully adjustable. It should be adjusted to leave the minimum amount of blade exposed.

The upper blade guide can be adjusted by slackening the locking handle and sliding the guide assembly up or down to the desired position (see fig 8a). Ensure the locking handle is securely tightened before sawing commences.

After adjustment ensure that all retaining screws and nuts are securely tightened before operating the machine.



### ADJUSTMENT OF RIP FENCE

A reversible dual height rip fence is provided to enable safe and accurate sawing of all thicknesses of material.

The fence assembly can be located on either side of the blade by slackening the fence retaining screw and relocating the fence assembly on the fence guide rail (see fig 17). Ensure the fence retaining screw is securely fastened before sawing.

To reverse the fence slacken the fence assembly retaining screw to remove the fence assembly from the fence guide rail (see fig 17) then remove the fence rail retainers to separate the fence clamp and fence body. After reversing the fence body securely tighten the fence rail retainers before repositioning the fence assembly on the fence guide rail (see fig 18). Ensure that all retaining screws are securely fastened before sawing.

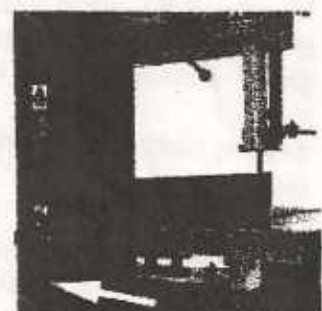


Fig 17



Fig 18

## SETTING AND OPERATING INSTRUCTIONS (Continued)

### USING THE DEPTH STOP

The depth stop can be used in conjunction with the rip fence to assist in the production of tenons. The depth stop is attached to the rear edge of the table by passing the fixing screw through the slot and retainer, then fastening the retaining screw. The position of the stop is adjusted by slackening the locking screw located in the top of the retainer (see fig 19).

Ensure that all screws are securely tightened before use.

### USING THE MITRE GAUGE

The mitre gauge is used to produce simple or compound angle cuts. After setting the angle of cut by slackening the locking screw located the mitre gauge in the slot in the table. When cutting ensure the work piece is securely held onto the face of the mitre gauge. Compound angles can be cut by tilting the table (see fig 20).

Ensure that all screws are securely tightened before use.

### USING THE CIRCLE CUTTING ATTACHMENT

The circle cutting attachment is fixed to the mounting bracket located to the right of the upper blade guide assembly (see fig 21). Having sized the blank workpiece to be square and a little *oversize*, mark the centre. It is important that the centre of the circle is level with the front edge of the blade. This is achieved by marking the rip fence with the position of the front edge of the blade, moving it to the right of the blade by a distance equal to the radius of the circle being cut, and positioning the pointer over the mark. Having made a cut parallel to one side of the blank until the blade reaches the circle, stop the machine and lower the pointer by lowering guide assembly and tap the pointer into the work piece. Finally continue the cut to produce a circular blank.

Ensure that all fasteners are securely tightened before operating machine.

### STARTING AND SAWING

Ensure that all guards are correctly adjusted and securely fixed, and that the fence is correctly positioned and secure.

The blade is set in motion by pressing the start control marked "1" located on the front of the machine (see fig 22).

Feed the work piece with even and moderate pressure. If the feed pressure is too great cutting will be inaccurate and the blade will wear prematurely. To avoid contact with the blade use a push stick to guide work past the blade.

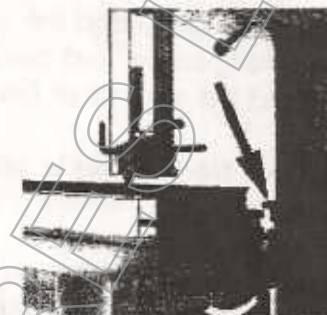


Fig 19

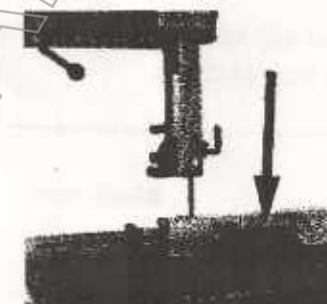


Fig 20

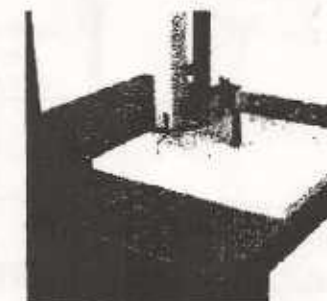


Fig 21



Fig 22

## SETTING AND OPERATING INSTRUCTIONS (Continued)

### STOPPING

The saw blade is stopped by depressing the red stop control marked "O" located below the start control on the front of the machine (see fig 22). The stop control latches preventing the machine from being restarted. Prior to restarting, rotate the stop control clockwise to release. The blade can also be stopped by actuating the palm/kick switch (see fig 23).

### PREVENTING UNAUTHORISED USE

To prevent unauthorised use or to provide security whilst undertaking maintenance, a lockable isolator is fitted to the front of the spine (see fig 1). The electrical supply is disconnected by rotating the control clockwise to the "O" position (see fig 24). Security can be provided by padlocking the control in the off position (padlock not supplied). The electrical supply is reconnected by removing the padlock (if fitted) and rotating the control anticlockwise to the "I" position. The blade will not move until the start control marked "I" is depressed.



Fig 23

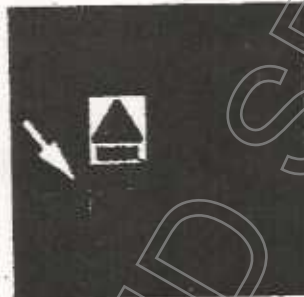


Fig 24

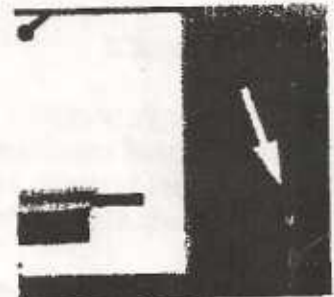


Fig 25

## MAINTENANCE

The frequency of maintenance is dependant on the frequency of use and the nature of the work undertaken. It is recommended that the following maintenance schedule is undertaken at least monthly to ensure trouble free operation. Ensure that the electrical supply is disconnected from the machine and that it has come to rest before undertaking any maintenance.

Remove swarf, chips and dust from bandwheel tyres. Check for wear and Replace bandwheels if necessary.

Adjust bandwheel brush to ensure effective bandwheel cleaning.

Clean dust from inside of bandwheels and ensure dust extraction ducting is Free from obstructions.

Clean and check upper and lower guide assemblies for correct clearance and Alignment. Replace if worn.

Clean and lubricate adjusting screws with light machine oil.

Bandwheel hubs are mounted on sealed pre lubricated maintenance free bearings.

For genuine spare parts and service from fully trained engineers, contact **A.L.T. Saws & Spares Ltd** or the organisation from where the machine was purchased. We can also supply blades for application.

## ELECTRO - MECHANICAL BRAKE

The 502S machine motor is supplied with an integral electro mechanical brake to assist in stopping the machine when it is switched off or if there is a power failure. This brake operates automatically when power is cut off by releasing helical springs to cause the anchor plate to push on to the brake rotor containing the brake pad, which in turn presses on the motor body.

### HAND RELEASE LEVER

Pulling this lever towards the end of the motor will release the brake mechanism when power is off i.e when the brake is on.

### MAINTENANCE

The brake is, virtually maintenance free. Under normal conditions the machine will come to rest in under 10 seconds. After long usage the braking effect may be reduced. This can easily be adjusted as follows:

- Isolate machine from electricity supply
- Unscrew hand release-lever and remove brake cover
- The air-gap "A" between the brake body and friction ring is set initially to 0.3mm - nominal gap. With long usage this gap will increase. The maximum permitted gap is 0.8mm
- The gap is adjusted by undoing the 3 cap head screws "C" by half a turn. The threaded collars "B" which surround these screws can then be screwed into the magnetic body. Turn the 3 screws clockwise to reduce the air gap, until the 0.3mm air gap is achieved - using feeler gauges to measure this gap. The 3 threaded collars, are then screwed out of the body until they butt up to the motor body. Re-tighten the 3 screws. The air gap must then be re-checked.
- Replace the cover and hand-release-lever

### BRAKE PAD REPLACEMENT

After 3 full air gap adjustments it may be necessary to replace the brake rotor containing the friction pads. This should be replaced when the thickness of the friction pads has reached a minimum thickness of 7.5mm. This can easily be removed by fully unscrewing the three screws "C", sliding the brake body, the friction pad and then the brake rotor off the motor spindle.

**Note:** More detailed information on this brake may be obtained from A.L.T. Saws & Spares Ltd

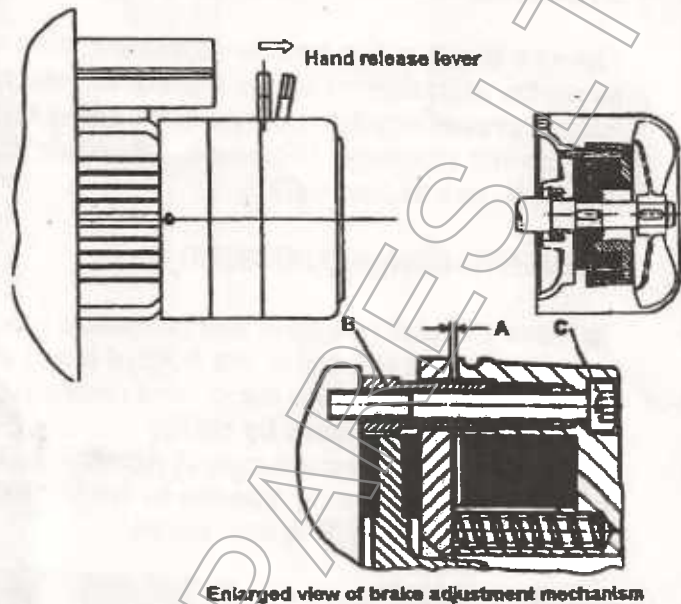


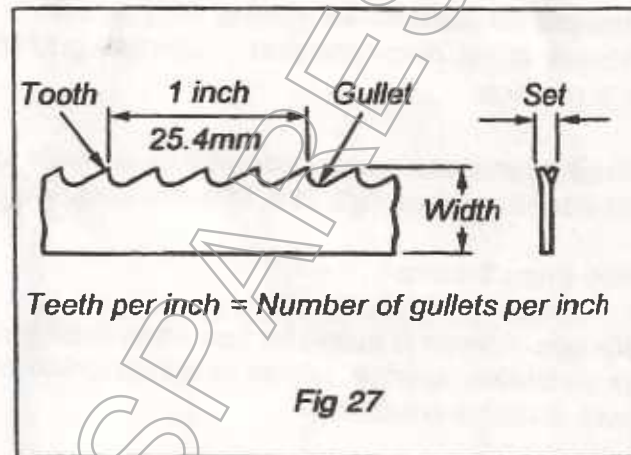
Fig 26

## BLADE, SPEED AND TENSION SELECTION

An understanding of the design and application of the various types of saw blades is important to enable the most effective use of your bandsaw.

### SELECTION OF TOOTH PITCH

The selection of the best tooth pitch (see fig 27) is necessary for the optimum cutting performance. As the tooth pitch becomes finer a blade will have more teeth. Correct tooth pitch is primarily dependent on two factors: material thickness and material hardness. For a given material thickness a finer tooth pitch should be selected as material hardness increases. However, when the tooth pitch is too small for a given hardness the tooth loading will be insufficient to enable penetration and cutting and the teeth will rapidly lose their sharpness. A smaller tooth pitch should also decrease as material thickness decreases. The accompanying blade selection chart (table 1) gives guidance on the tooth pitch that should give the best results when cutting a variety of material types and thicknesses.



### SELECTION OF TOOTH FORM

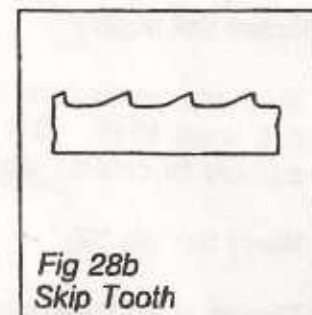
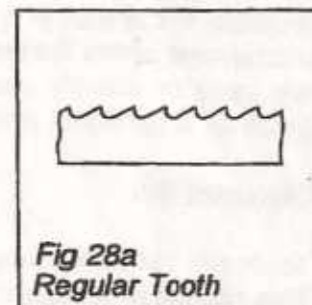
There are three most commonly specified tooth forms: regular tooth, skip tooth and hook tooth. Each will provide further improvement in cutting efficiency depending on the material being cut (see fig's 28a, 28b and 28c). The blade selection chart (table 1) includes recommendations on the choice of suitable tooth forms.

#### Regular Tooth Blades (fig 28a)

These are the most commonly used blades for wood and metal cutting. The zero front rake and rounded gullets provide robust teeth with good shock resistance that are capable of good work penetration that will provide a good finish when used to cut most medium hardness materials. There is tendency to clog when used with soft or ductile materials. Standard pitches are 6, 8, 10, 14, 18 and 24 teeth per inch.

#### Skip Tooth Blades (fig 28b)

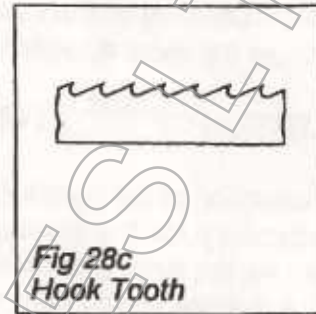
The tooth form is similar to the regular tooth form but alternate teeth are omitted. This allows greater gullet capacity without significantly affecting blade strength. These blades are suited for use with soft alloys or when making deep cuts in hard or wet wood, or man made materials that contain abrasive bonding agents (e.g. chipboard). For such applications best results can usually be achieved by selecting the low cutting speed. Standard pitches are 3, 4 and 6 teeth per inch.





**Hook Tooth Blades (fig 28c)**

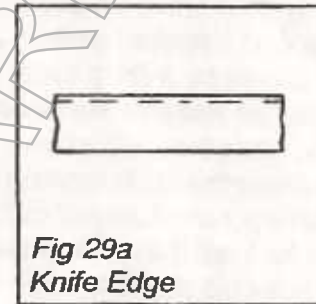
Compared to the regular tooth form the hook tooth has a positive front rake which provides greater work penetration capability. This makes such blades suitable for use when cutting harder materials. In addition the coarse pitch and large gullets associated with this tooth form make it suitable for sawing deep sections. Use with abrasive materials is not recommended. Standard pitches are 2, 3, 4 and 6 teeth per inch.



Other less commonly used blade forms are knife edge, scalloped edge and wavy edge (see fig's 29a, 29b and 29c).

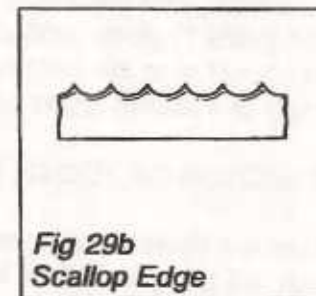
**Knife Edge Blades**

This type of blade is suited for use when cutting soft materials such as woven fabrics, sponge, rubber and corrugated cardboard. Very little swarf or dust is produced.



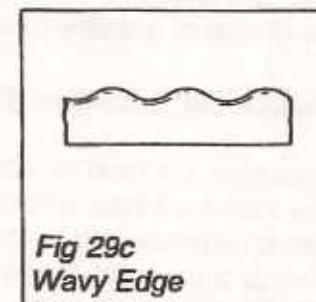
**Scallop and Wavy Edge Blades**

Where the material being cut is fibrous or difficult to sever scallop or wavy edge blades provide better cutting performance. Examples of such materials are cork, filter material and felt. Very little swarf or dust is produced.



**SELECTION OF TOOTH SET**

Tooth set is the angling of the saw blade teeth which results in them protruding either side of the main body of the saw blade. Tooth set provides a cut that is wider than the width of the blade body. This clearance enables the blade to be manoeuvred in the work piece. There are three commonly used tooth set patterns. Recommended set is given for a variety of material types and thicknesses in table 1.

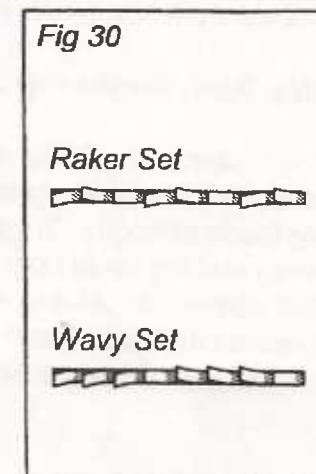


**Standard Set**

Teeth are set alternately to the left and to the right of the blade body. This pattern is particularly suitable for cutting soft materials and wood.

**Raker Set (fig30)**

Teeth are set with one tooth set to the right, one to the left followed by one unset tooth. This pattern is widely preferred and is considered suitable for contour sawing.



**Wavy Set (fig 30)**

Groups of teeth are alternatively set to the right and then to the left. As relatively few teeth are cutting on the kerf side of the blade there is a tendency for blades to jam when cutting abrasive materials.

## BLADE, SPEED AND TENSION SELECTION (continued)

### SPEED SELECTION

For optimum cutting performance it is important to select the correct blade speed. The optimum speed is dependant on material and material thickness. Table 1 shows the recommended blade speed for a variety of commonly used materials. If in doubt about any aspect of blade or speed selection contact **A.L.T. Saws & Spares Ltd** or the organisation from where the machine was purchased for assistance.

Table 1 Blade and Speed Selection Chart

Material	Speed	Material Thickness, t (mm)			
		T<6	6<t<12	12<t<25	t>25
Aluminium extrusion	Low	18R	10R	8R	6S
Aluminium diecast	Low	18R			
Brass (soft)	Low	18R	14R	8R	6R
Copper (soft)	Low	18R	14R	6R	3S
Lead	Low	18R	14R	10R	6R
Zinc	Low	14R	10R	6H	
Thermoset plastic (bakelite)	Low	14R	10R	6R	3S
Resin bonded comp (tufnol)	Low	14R	10R	6H	
Formica	High	18R			
Glass fibre	Low	18R	14R	10R	6H
Perspex	High	14R	10R		
Chipboard	High		6S	3S	3S
Fibre board	High	18R	14R		
Hardboard	High	10R			
Plywood	High	10R	8R	6S	3S
Strawboard	High	14R	10R		
Cork	High	14R	6S	4S	4S
Leather	High	14R			
Rubber	Low	10R	8R	6R	
Cardboard – corrugated	High	SC	SC	SC	SC
Paper – sheet	High	10R	6H		
Paper – sheet	Low			10R	6H
Paper – tissue	High	SC	SC	SC	SC
Papier mache	High	KN	10R		
Wood – log	Low				3S
Wood – soft	High	6S	6S	4S	4S
Wood – hard	High	6S	3S	3S	3S
Wood – wet	Low				3S
Bone	Low	10R	8R	6R	3S
Strawboard	Low			8S	6S
Linen	High	KN	KN	SC	SC
Perspex	Low			6R	3S

#### Key

- R Regular Tooth
- S Skip Tooth
- H Hook tooth
- KN Knife Edge
- SC Scallop Edge

Numbers denote teeth per inch

## BLADE SELECTION (continued)

### TENSION SELECTION

It is important that the blade is correctly tensioned to ensure optimum cutting performance and cutting accuracy. Table 2 below provides guidance on the appropriate tension for a variety of blade types and sizes.

Table 2 Blade Tension Guide

Blade Type	Blade Width (mm)			
	6	12	20	25
Metal Cutting	Low	Med	High	High
Scalloped/Knife Edge	Low	Low/Med	Med/High	-

### BANDSAWING PRACTICE

Having selected an appropriate blade for the particular thickness and type of material to be sawn, it is essential that the saw blade is allowed to cut freely by not applying too much pressure. The need for excessive pressure is likely to be a result of the incorrect blade selection or a worn blade and will result in inaccurate cutting and possibly blade breakage.

When contouring the width of the blade limits the minimum radius that can be cut. If the blade is too wide for the cutting radius the blade will twist and possibly jam or break. The smaller the radius the narrower the blade has to be. Table 3 provides guidance on the minimum radius to be cut with the most commonly used blade widths. Regularly examine the blade for excessive damage or cracking as a result of fatigue. If such damage is present replace the blade.

It is important to use a sharp blade. Dull teeth result in increased feed pressure producing a poor quality finish and an inaccurate cut.

Table 3 Minimum Cutting Radius

Blade Width (mm)	6	10	12	16	20	25
Minimum Radius (mm)	25	40	64	100	145	190

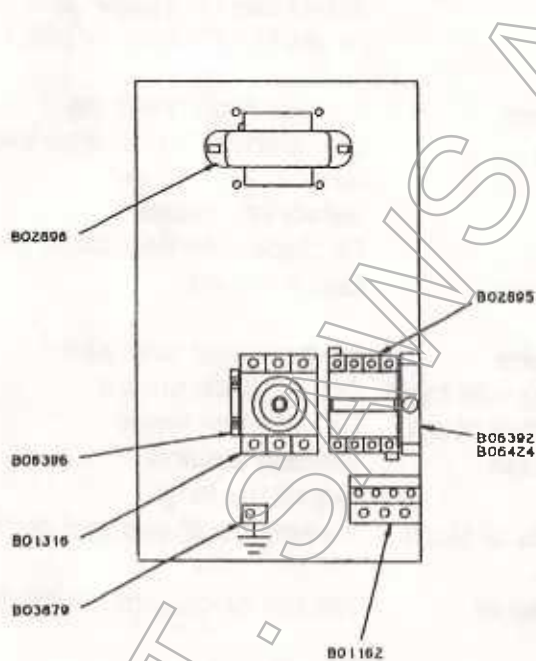
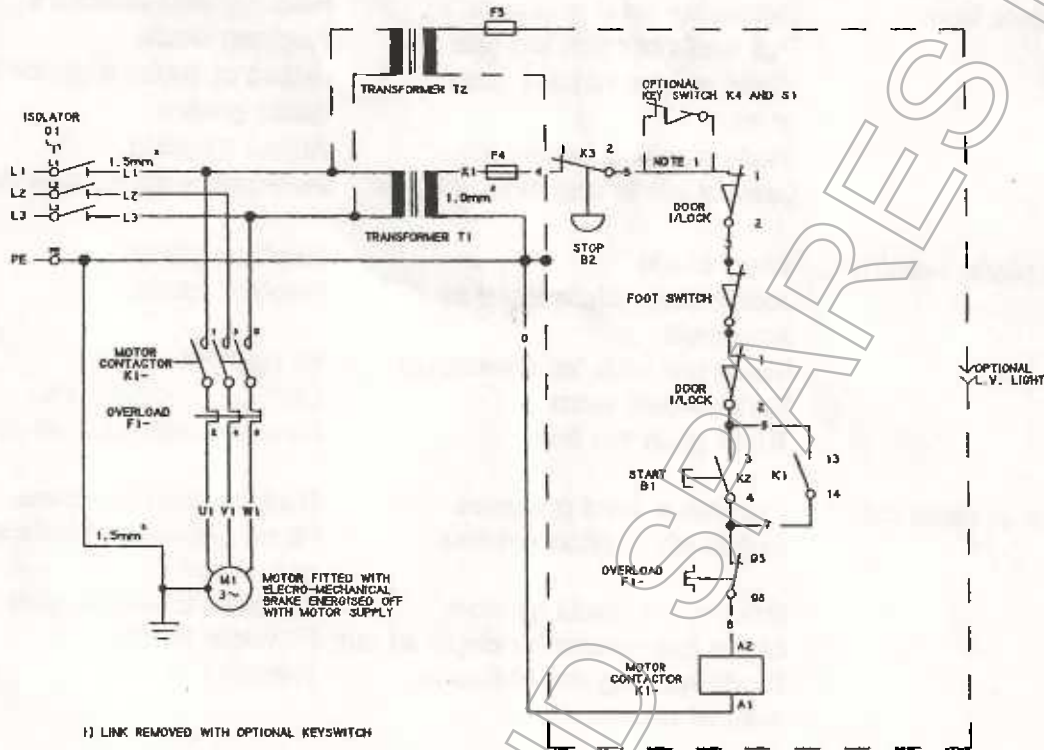
In situations such as cutting scrolls it may not be possible to complete a cut. This requires the blade to be reversed out of the cut. Care is necessary to minimise damage to the work and blade. When removing large pieces of material it is advisable to make the shorter cut last to avoid having to reverse out of the longer cut.

When cutting aluminium or zinc alloys it may be necessary to apply lubricant such as paraffin or wax to prevent clogging of the blade.

## COMMON SAWING PROBLEMS

PROBLEM	POSSIBLE CAUSE	REMEDY
Blade wanders from true line	Excessive feed pressure Dull teeth or pitch too fine Blade guides not set correctly or worn Blade tracking incorrectly Loss of set to one side of blade	Reduce feed pressure Replace blade Adjust or replace upper and lower guides Adjust tracking Investigate cause and replace
Premature blade breakage	Worn blade Joint incorrectly welded or annealed Blade too wide for curved cut Bandwheels worn Tooth pitch too fine	Replace blade Replace blade Fit narrower blade Change bandwheels Fit blade with coarser pitch
Blade bows in deep cut	Excessive feed pressure Dull teeth or pitch too fine  Insufficient blade tension Blade too narrow for depth of cut Blade running out of line at start of cut	Reduce feed pressure Fit new blade or blade with coarser pitch  Increase blade tension Fit wider blade Restart cut
Teeth dull rapidly	Insufficient feed pressure Guide inserts interfering on teeth Blade speed too fast Blade pitch too fine	Increase feed pressure Adjust guides Select low blade speed Fit blade with coarser pitch
Teeth break from blade	Excessive feed pressure Tooth gulleys clogging  Blade speed too fast Tooth pitch too coarse Material welding to teeth	Reduce feed pressure Use lubricant or change tooth form  Select low speed Fit blade with finer tooth pitch Use lubricant
Blade twisting	Excessive feed pressure Blade guide interfering with teeth Blade too wide for radius of cut Insufficient blade tension Incorrect tracking Loss of set to one side of blade	Reduce feed pressure Adjust blade guides Fit narrower blade Reduce tension Adjust tracking Investigate cause and rectify
Blade vibrates	Workpiece not secured or properly seated Blade speed too fast Tooth pitch too coarse Insufficient blade tension Blade not adequately supported by thrust pad	Secure or clear obstruction  Select low speed Fit blade with finer pitch Increase blade tension Adjust thrust pad

# WIRING AND LOCATION DIAGRAM - 502S (3 PHASE MODEL)



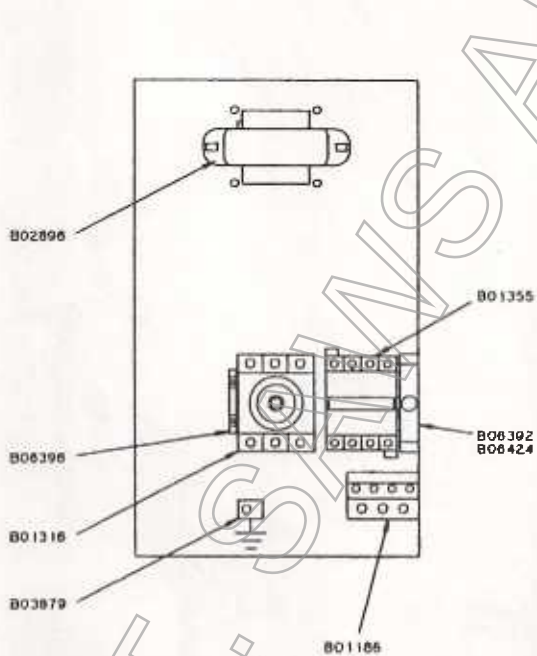
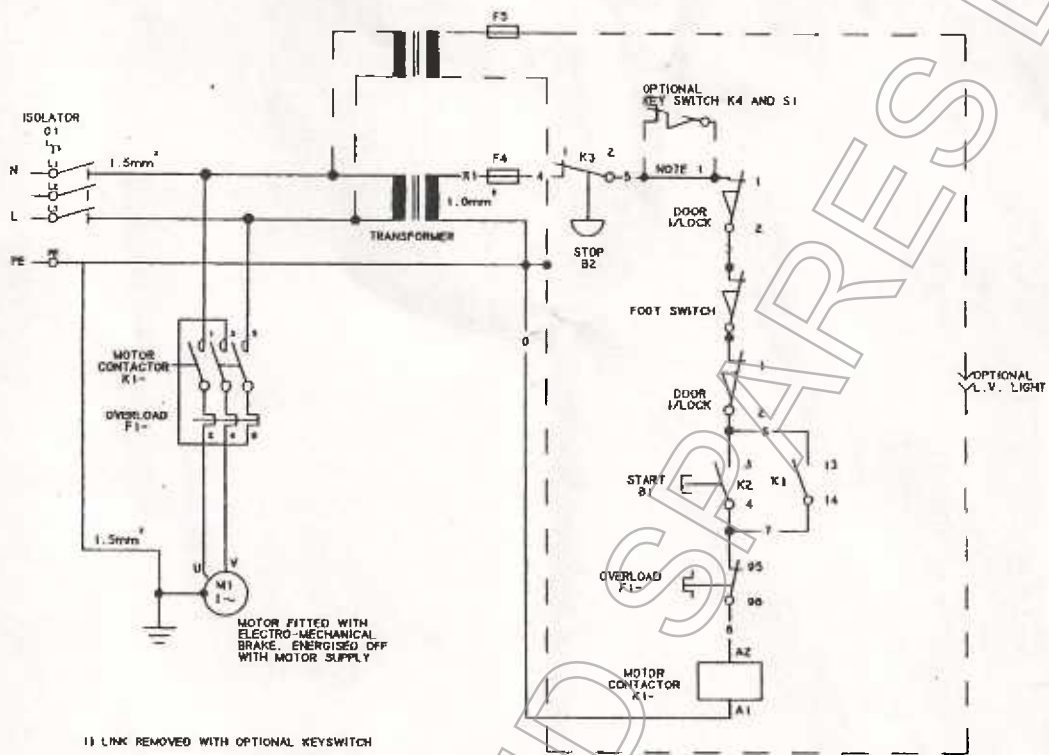
PART No	DESCRIPTION	REF	QTY
B02895	CONTACTOR 24V	K1	1
B01182	MOTOR THERMAL OVERLOAD	F1	1
B01316	ISOLATOR	Q1	1
B01595	DOOR INTERLOCK MICROSWITCH	K2	2
B06392	FUSE HOLDER DIN MOUNTING	F4	1
B06396	EARTH TERMINAL BLOCK	F4	1
B06424	2 AMP FUSE	F4	1
B02896	TRANSFORMER 24V	T1	1
B01187	STAY-IN STOP BUTTON	B2	1
B01181	N/C CONTACT BLOCK	K3	1
B01172	START BUTTON	B1	1
B01180	N/O CONTACT BLOCK	K2	1
B02879	FOOT SWITCH		1
B03879	EARTHING TAG		1
B06422	6 AMP FUSE	F5	1
B06392	FUSE HOLDER DIN MOUNTING	F5	1
B01572	TRANSFORMER 24V	T2	1
B01383	KEY SWITCH	S1	1
B01180	N/O CONTACT BLOCK	K4	1

} WITH OPTIONAL L.V. LIGHT

} WITH OPTIONAL KEY SWITCH COMPLETE UNIT PART NO. SM2203

502S-3ph

# WIRING AND LOCATION DIAGRAM - 502S (1 PHASE MODEL)



PART No	DESCRIPTION	REF	QTY
B01355	CONTACTOR 24V	K1	1
B01186	MOTOR THERMAL OVERLOAD	F1	1
B01316	ISOLATOR	G1	1
B01595	DOOR INTERLOCK MICROSWITCH	Z	2
B06392	FUSE HOLDER DIN MOUNTING	F4	1
B06398	EARTH TERMINAL BLOCK		1
B06424	2 AMP FUSE	F4	1
B02896	TRANSFORMER 24V	T1	1
B01187	STAY-IN STOP BUTTON	B2	1
B01181	N/C CONTACT BLOCK	K3	1
B01172	START BUTTON	B1	1
B01180	N/O CONTACT BLOCK	K2	1
B02680	FOOT SWITCH		1
B03879	EARTHING TAG		1
B06422	6 AMP FUSE	F5	1
B06392	FUSE HOLDER DIN MOUNTING	F5	1
B01572	TRANSFORMER 24V	T2	1
B01303	KEY SWITCH	S1	1
B01180	N/O CONTACT BLOCK	K4	1

WITH OPTIONAL L.V. LIGHT

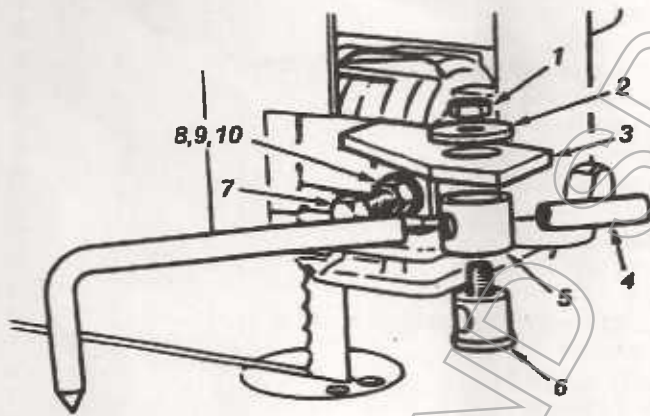
WITH OPTIONAL KEY SWITCH COMPLETE UNIT PART NO. SM2263

502S-1ph

## PARTS LIST 502S

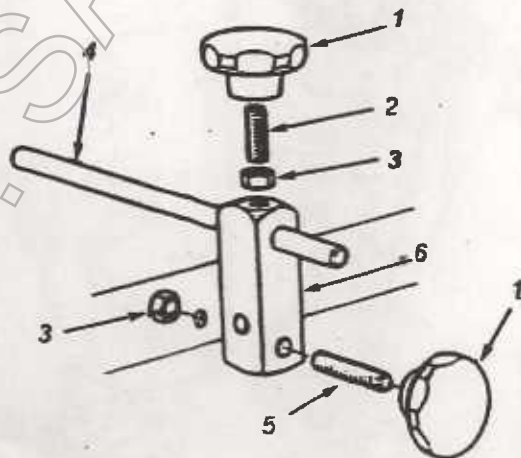
### CIRCLE CUTTING ATTACHMENT SM1720 (OPTIONAL)

Item	Part Number	Description	Qty
1	BO5715	Nut	1
2	4919	Spacer	1
3	8104	Bracket	1
4	8107	Centre Rod	1
5	8105	Clamping Sleeve	1
6	8106	Clamping Bolt	1
7	BO5519	hex head screw	1
8	BO5703	Nut	1
9	BO5944	Spring Washer	1
10	BO5917	Washer	1



### DEPTH STOP ASSEMBLY SM1734 (OPTIONAL)

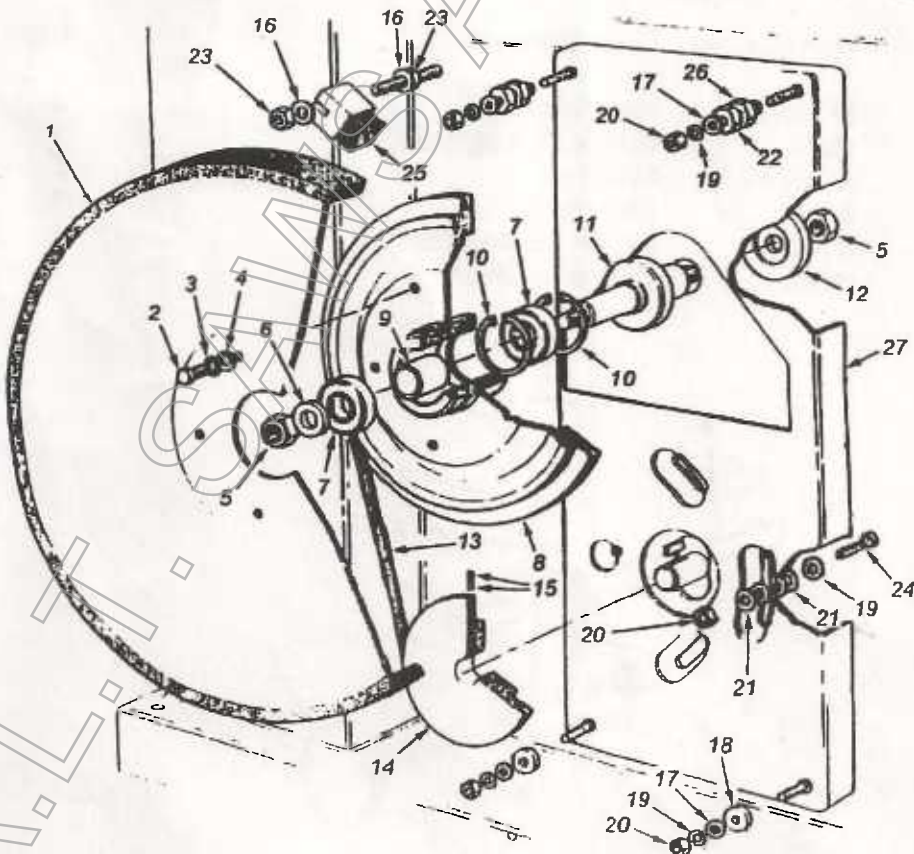
Item	Part Number	Description	Qty
1	BO2547	Handwheel	2
2	7988	stud	1
3	BO5754	Nut	2
4	8130	Stop Rod	1
5	8145	stud	1
6	8129	Clamping Block	1



**PARTS LIST - 502S (continued)**

**LOWER BANDWHEEL AND MOTOR PLATFORM ASSEMBLY**

Item	Part Number	Description	Quantity
1	<b>10023 - 7791</b>	Band wheel	1
2	BO5562	hexagon head screw	5
3	BO5944	locking washer	5
4	BO5917	washer form A	5
5	BO5777	self locking nut	2
6	5216/A	Washer	1
7	BO2006	Bearing	2
8	<b>9891 - 7968</b>	Bandwheel pulley	1
9	7982/A	Spacer	1
10	BO6041	Internal circlip	2
11	7983	Bandwheel spindle	1
12	8063	washer	1
13	BO2184	Vee belt	1
14	<b>9892 - 7969</b>	Motor pulley	1
15	BO5194	hexagon socket set screw	2
16	BO5918	washer form C	2
17	BO5919	washer	4
18	8006	Spacer	2
19	BO5945	lock washer	8
20	BO5716	nut	8
21	BO5920	washer	16
22	7824	Jacking Bolt	2
23	BO5715	nut	3
24	BO5574	hexagon head screw	4
25	2270	Wheel brush	1
26	BO5764	lock nut	2
27	SM2693 STAR237 STAR238	Motor platform Motor 1 phase Motor 3 phase	1 1 1

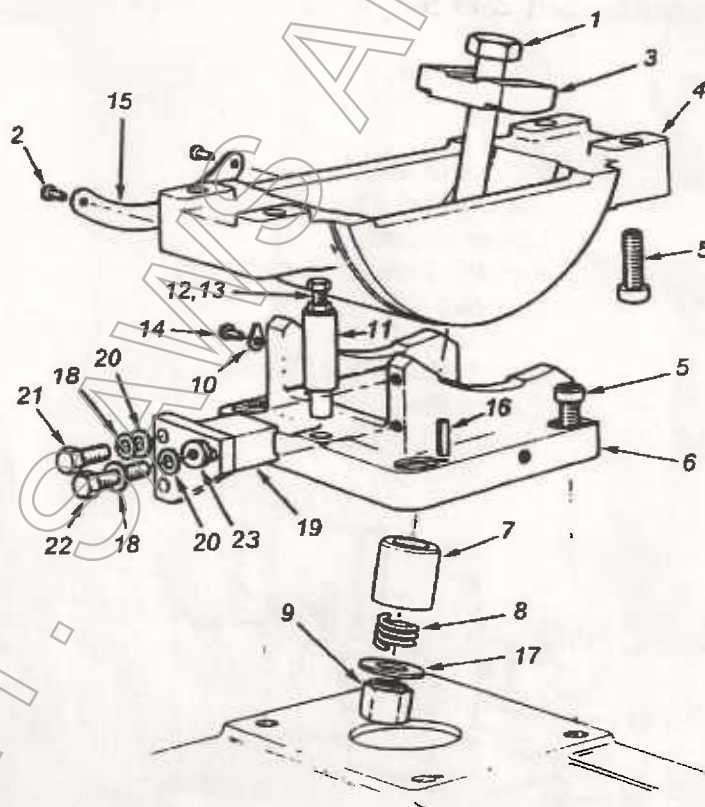




PARTS LIST - 502S (continued)

CRADLE ASSEMBLY

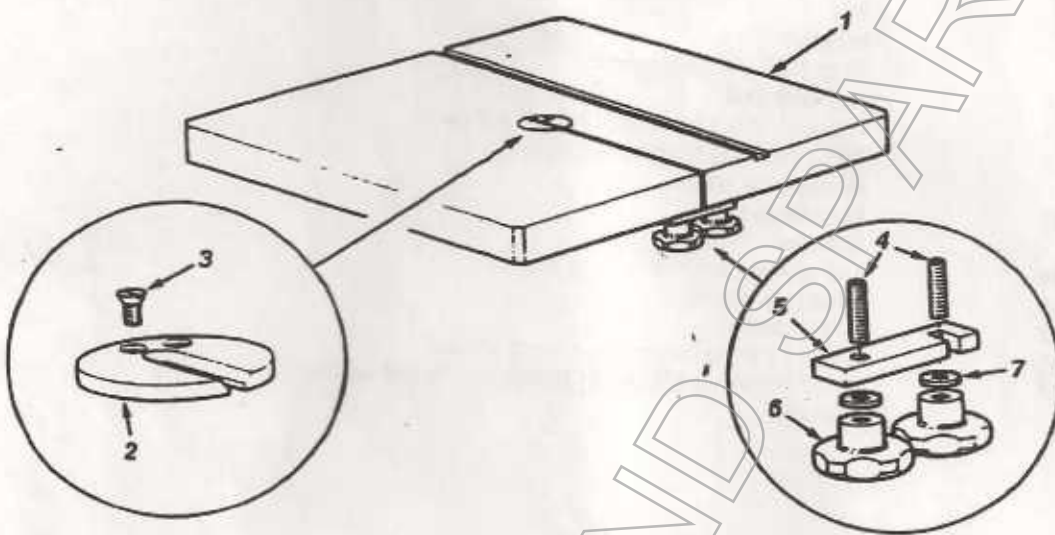
Item	Part Number	Description	Quantity
1	BO5615	hexagon head bolt	1
2	BO5452	pan head screw	2
3	7874	Clamp	1
4	8156	Trunnion	1
5	BO5094	hexagon socket cap screw	4
6	7748/A	Tilt Cradle	1
7	7875	Collar	1
8	BO2215	Spring	1
9	7876	Nut	1
10	2812	Pointer	1
11	7336	Stop Pin	1
12	BO5753	lock nut	1
13	BO5563	hexagon head screw	1
14	BO5415	pan head screw	1
15	7872	Protractor scale	1
16	BO5892	Locating pin	2
17	6893	Spacer	2
18	BO5944	spring washer	3
19	SM1703	Guide support	1
20	BO5917	washer	3
21	BO5561	hexagon head screw	2
22	BO5524	hexagon head screw	1
23	4919	Spacer	1



**PARTS LIST – 502S (continued)**

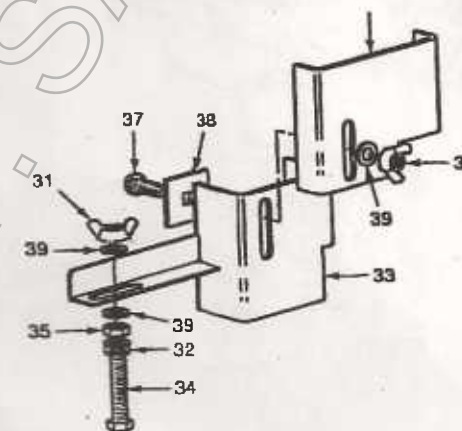
**TABLE ASSEMBLY**

Item	Part Number	Description	Qty
1	8601	Table	1
2	2922	Table Insert	1
3	BO5267	countersunk head screw	1
4	BO5839	stud	2
5	2828	Swing Latch	1
6	BO2547	Handwheel	2
7	BO5920	Washer	2



**LOWER BLADE GUARD - SM2973**

Item	Part Number	Description	Qty
30	10384	Visor	1
31	BO5785	Wing Nut	2
32	BO5917	Washer Form A	2
33	SM2971	Lower Guard	1
34	BO5568	Hex Hd Screw	1
35	BO5715	Hex Nut	1
37	BO5620	Coach Bolt	1
38	5096	Clamp Plate	1
39	BO5918	Washer Form C	3

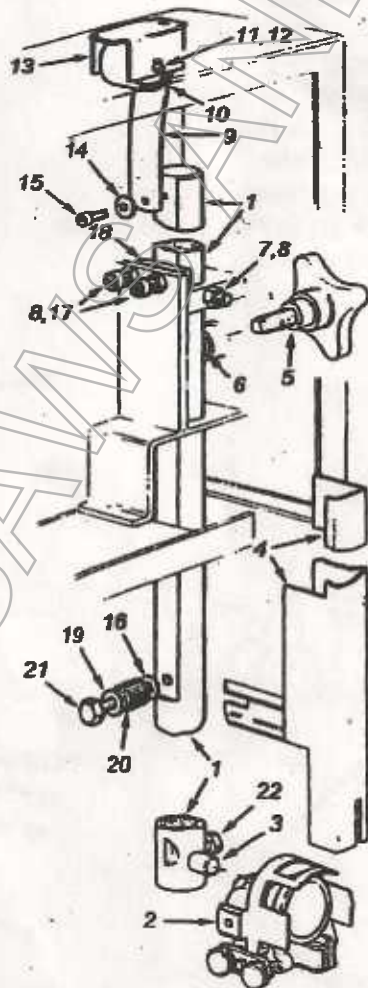


LOWER BLADE GUARD

**PARTS LIST – 502S (continued)**

**GUIDE POST AND UPPER BLADE GUARD**

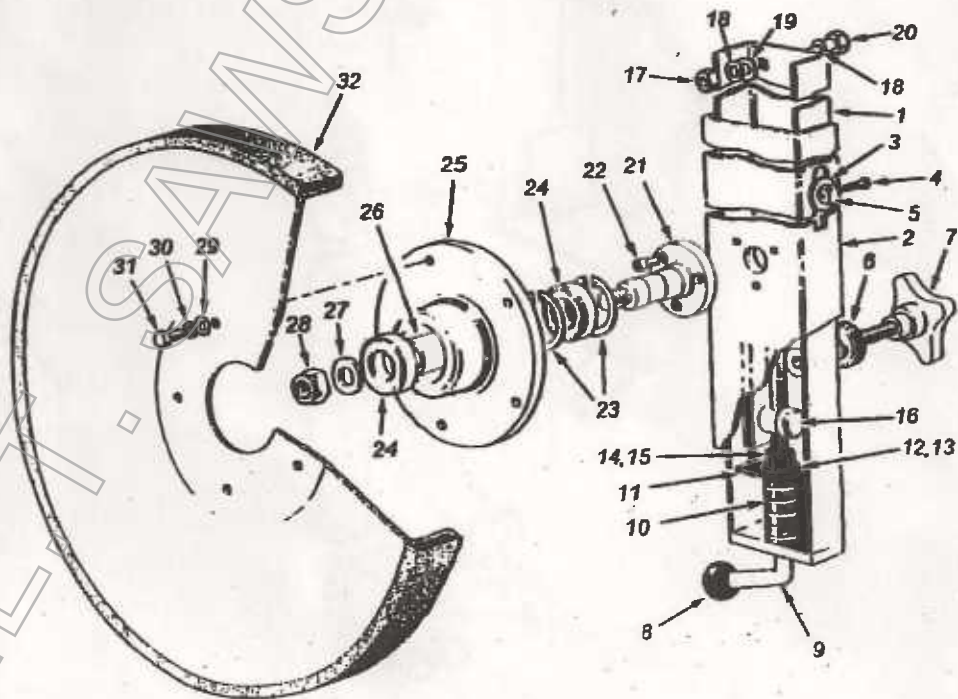
Item	Part Number	Description	Qty
1	7989	Guide Post	1
2	BO2592	Carter Guide	2
3	7992	Rod Top Guide	1
4	SM1705	Upper Guard Assy	1
5	BO2548	Clamping handle assembly	1
6	BO2208	Spring	4
7	BO5207	Hex Socket set screw	2
8	BO5715	Nut	4
9	BO2189	Tensator Spring	1
10	4105	Reel	1
11	2379	Reel Spindle	1
12	BO5810	Split pin	2
13	2378	Reel bracket	1
14	BO5912	Washer	1
15	BO5046	Hex socket cap screw	1
16	BO5918	Washer Form A	1
17	5313	Special Hex socket cap screw	2
18	4859	Guide Block	1
19	BO5917	Washer Form C	3
20	5496	Blade Guard Handle	1
21	BO5567	Hex head screw	1
22	BO5561	Hex head screw	1



**PARTS LIST - 502 (continued)**

**BLADE TENSIONING AND BANDWHEEL TRACKING ASSEMBLY**

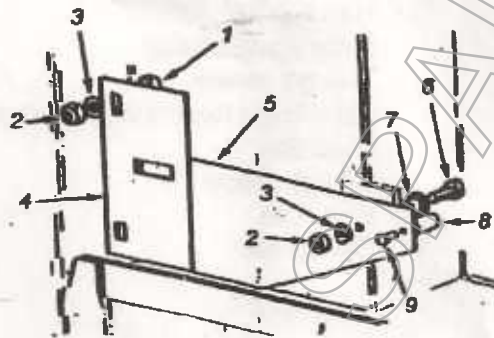
Item	Part Number	Description	Qty
1	SM1694	Guide	1
2	SM1695	Tracking Channel	1
3	BO5922	Washer	2
4	BO5812	Split cotter pin	1
5	8003	Pivot pin	1
6	8020	Lock nut	1
7	BO2548	Tracking handknob assembly	1
8	BO2530	Ball knob	1
9	7996	Tension Screw	1
10	BO2244	Disc spring	32
11	8002	Spring plate	1
12	BO2066	Thrust race	1
13	BO2065	Thrust washer	2
14	8001	Slotted nut	1
15	BO5346	locking pin	1
16	7967	Trunnion nut	1
17	BO5716	nut	4
18	BO5945	locking washer	8
19	BO5920	washer	4
20	BO5573	Hex head screw	4
21	7981	Bandwheel spindle *	1
22	BO5068	Hex socket cap screw	3
23	BO6041	Circlip internal	2
24	BO2006	Radial bearing	2
25	7978	Bandwheel hub	1
26	7982/B	Spacer	1
27	5216/B	Washer	1
28	BO5777	Lock nut	1
29	BO5917	Washer	5
30	BO5944	Locking washer	5
31	BO5562	Hex head screw	5
32	7791	Band wheel	1



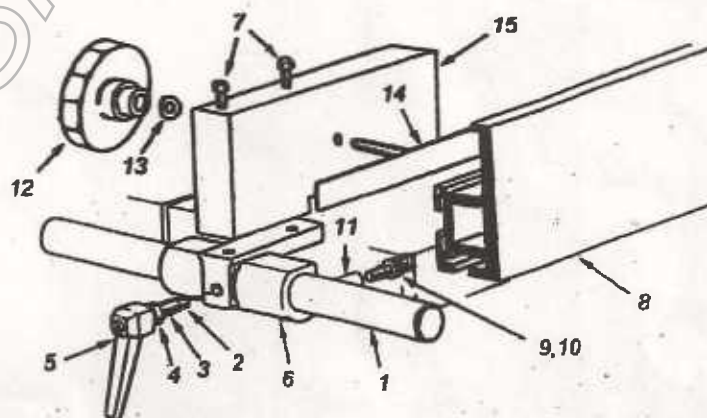
## PARTS LIST – 502S (continued)

### BLADE TENSION INDICATOR

Item	Part Number	Description	Qty
1	BO5713	Nut	4
2	BO5773	Self locking nut	3
3	BO5914	washer	3
4	7878	Tension plate	1
5	8079	Tension indicator plate	1
6	BO5547	Hexagon head screw	1
7	7839	Pivot bush	1
8	4906	Pin	1
9	BO5871	Drive screw	1



Item	Part Number	Description	Qty
1	10121	Fence rail	1
2	2924	Locking pad	1
3	8069	Clamping stud	1
4	BO5755	Lock nut	1
5	BO2555	Adjusting handle	1
6	8075/B	Fence casting	1
7	BO5629	Hexagon head screw	2
8	7338/C	Fence	1
9	BO5568	Hexagon head screw	2
10	BO5717	Washer Form A	2
11	8074	Spacer	2
12	BO2545	Handwheel	2
13	BO5718	Washer Form C	1
14	SM1795	Clamp plate assembly	1
15	10120	Fence block	1



**PARTS LIST – 502S (continued)**

**MITRE GAUGE ASSEMBLY SM1522 (OPTIONAL)**

Item	Part Number	Description	Qty
1	BO5340	Locking pin	2
2	7451	Tenon strip	1
3	BO5185	Hex socket set screw	1
4	8068	Knob	1
5	7794	Block	1
6	BO5473	Cheese head screw	2
7	BO2229	Spring	1
8	7793	Locating pin	1
9	7453	Stud	1
10	BO2542	Handwheel	1
11	7436	Mitre gauge body	1
12	7486	Thumb screw	3
13	BO5193	Hex socket set screw	1
14	7485	Stop Bar	1
15	1507/B	Bridge piece	1
16	7454	Pivot pin	1
17	7484	Clamp bar	1

