STARTRITE

Startrite Machine Specialist
Unit 15, Pier Road Industrial Estate
Gillingham
Kent
ME7 1RZ
Tel/Fax: 01634 850833
lee@altsawsandspares.com
www.altsawsandspares.co.uk

User Manual
SH330M
Swivelling Head
Metal Cutting
Horizontal Bandsaw

BO10038
Iss 1 17-11-95 RF11241

CE

QUALITY BANDSAW BLADES

TO SUIT THE SH330MV MODEL

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A.L.T. SAWS & SPARES LTD

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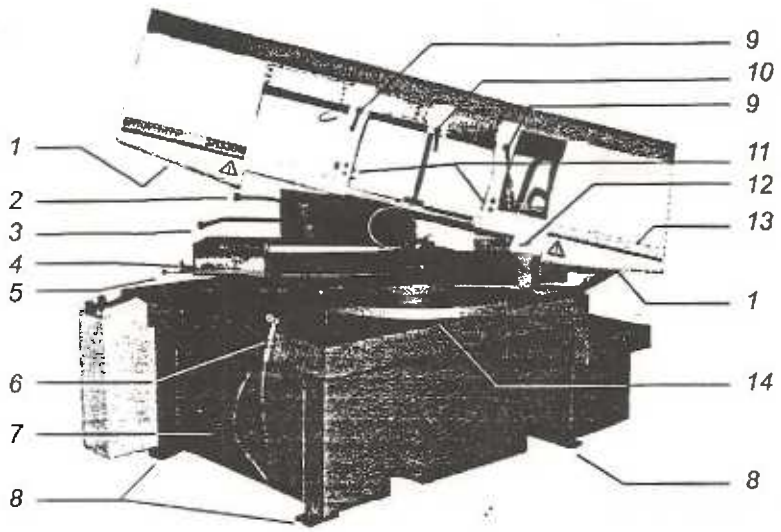


Fig 1a

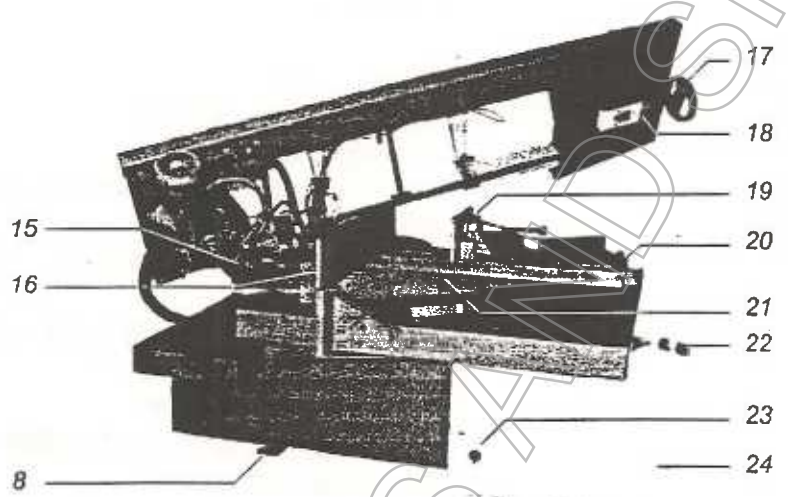


Fig 1b

Key (fig 1a & fig1b))

1 Bandwheel cover retainer
2 Material clamp lever
3 Vice locking lever
4 Head weight adjuster
5 Bed locking lever
6 Flushing hose
7 Access door
7 Coolant reservoir and pump (behind access door)
7 Hydraulic reservoir and pump (behind access door)
8 Fixing points
9 Guide arm locking handle
10 Anti vibration pad adjustment lever 10552
11 Coolant flow regulator
12 Blade brush and adjusting handle
13 Blade/speed selection chart
14 Scale
15 Head up limit switch
16 Fixed vice jaw
17 Tension adjuster
18 Tension indicator
19 Moving vice jaw
20 Top bed
21 Lower bed
22 Control panel
23 Electrical isolator
24 Electrical control box

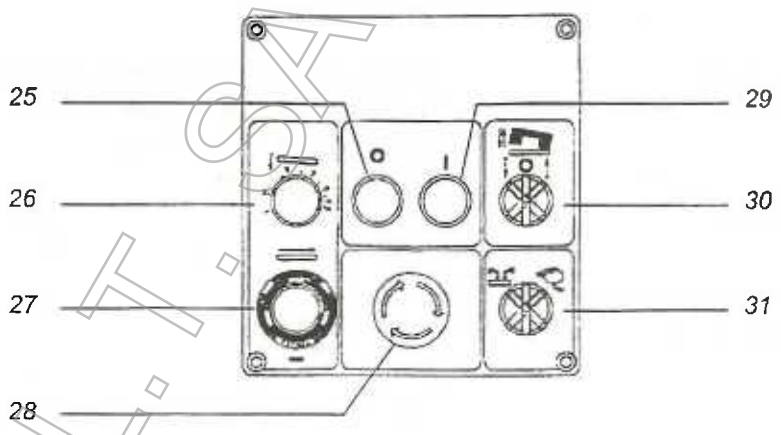


Fig 1c

Key (fig 1c)

25 Stop button
26 Feed speed control
27 Blade speed control
28 Emergency stop button
29 Start button
30 Bow raise/lower control switch
31 Coolant control switch

SPECIFICATION AND STANDARD/OPTIONAL EQUIPMENT

SPECIFICATION

Electrical Supply	3 phase	380 - 415V 50Hz/5A
	3 phase	220V 60Hz/8.5A
	3 phase	460V 60Hz/4A
	3 phase	575V 60Hz/3.5A
Motor Power	(kW/hp)	1.5/2
Coolant motor	(W/hp)	7/0.09
Hydraulic motor	(kW/hp)	0.19/0.25
Control voltage	(V)	110
Stopping time	(secs)	<5
Max blade speed	(m/min)	95
	(ft/min)	330
Min blade speed	(m/min)	15
	(ft/min)	50
Blade size	(mm)	4800 x 32 x 1.1
	(ins)	189 x 1.25 x 0.043
Blade type		M2 or M42 Bi-metal
Bow rotation angle	(°)	+45/-60
Weight	(kg/lbs)	470/1050
Sound power*	(dbA)	< 95

STANDARD/OPTIONAL EQUIPMENT

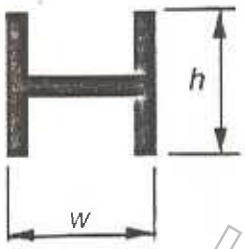
Blade tension indicator	●
Automatic blade cleaning	●
Adjustable coolant system	●
Flushing hose	●
Hydraulically controlled bow descent	●
Hydraulically controlled bow lift	●
Adjustable feed rate	●
Tool kit	●
Blade breakage detection	O
Free standing welder	O

● Standard

O Optional

CAPACITY

The capacities given below are typical. Depending on material shape, size and specification larger or smaller capacities may apply.



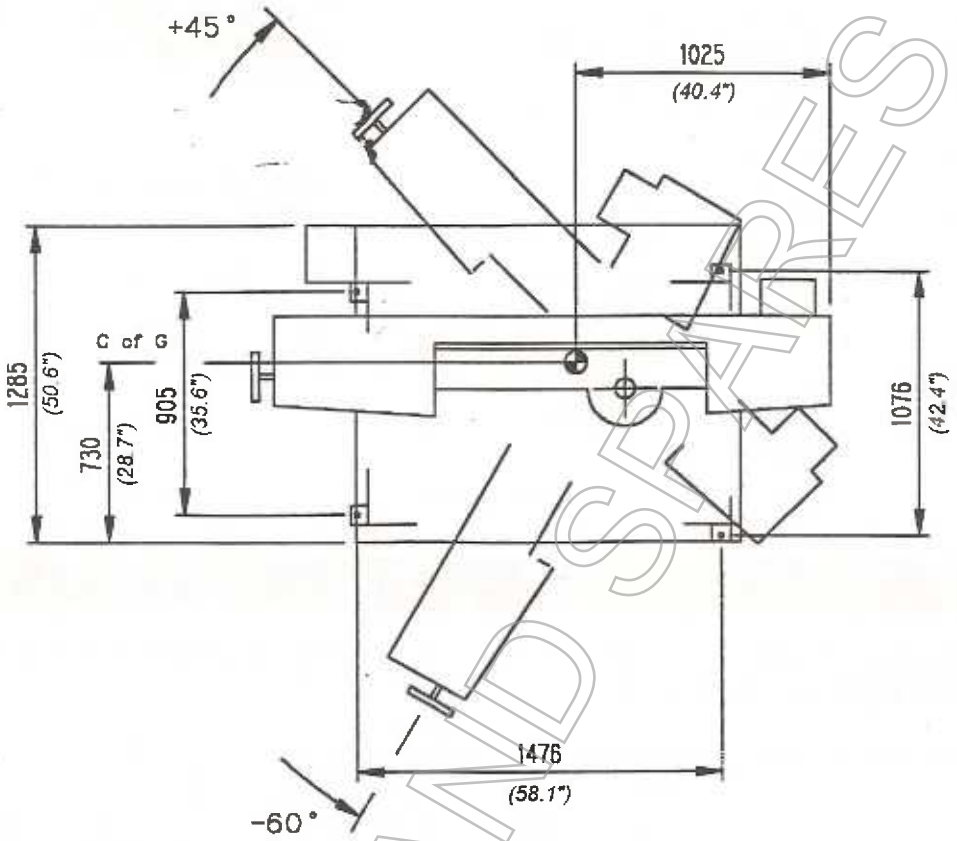
	45° ←	30° ←	15° ←	0°	15° →	30° →	45° →	60° →
d (mm)	330	330	330	330	330	330	330	280
d (ins)	13	13	13	13	13	13	13	11
w (mm)	355	530	590	610	590	515	410	275
x (mm)	x	x	x	x	x	x	x	x
h (mm)	300	300	300	300	300	300	300	300
w (ins)	14	20.9	23.2	24	23.2	20.3	16.1	10.8
x (ins)	x	x	x	x	x	x	x	x
h (ins)	12	12	12	12	12	12	12	12

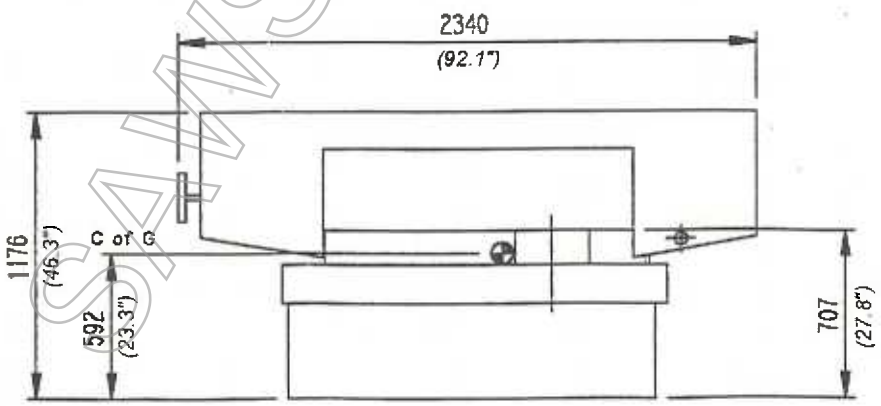
All dimensions are approximate.

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 permissable 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.

DIMENSIONS





All dimensions are approximate and should be used for guidance only

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

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:

- All guards are correctly adjusted, securely fitted and operating correctly
- The work piece is securely clamped in the machine
- 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.
- The material stop and depth stop if fitted are adjusted correctly and secured.
- The working area is clean and unobstructed.
- That the coolant system is working effectively and that all necessary safety precautions are taken when mixing coolant, filling and using coolant system and disposing of coolant.
- 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.

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 page of this manual) or the organisation you purchased the machine from, for advice and the availability of training.

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 or the organisation from which the machine was purchased.

When transporting this machine always locate retaining straps over the machine avoiding handles and other controls. If possible secure to the floor during transport.

When moving and positioning this machine do not hold the vice adjusting handles, operating levers, motor or bow, always hold the machine base. If moving long distances position the machine on a trolley or fork lift machine before moving. Recesses are provided in the base of the machine for this purpose.

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 firm level surface and fixed using four bolts (not supplied). Mounting holes are provided at each corner of the machine base.

Before use ensure that the anti corrosive coating is removed from the vice and other working parts, and that transit straps and brackets have been removed.

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.

THE MACHINE CAN ONLY BE CONNECTED TO A 3 PHASE SUPPLY.

The supply connections are made to the isolator located in the electrical control housing (see fig 1). Access is obtained by switching the isolator (located on the electrical control cabinet door) to the '0' postion and unlocking the electrical control cabinet door using the key provided.

Pass the supply lead through the cable gland located on the left hand side 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).

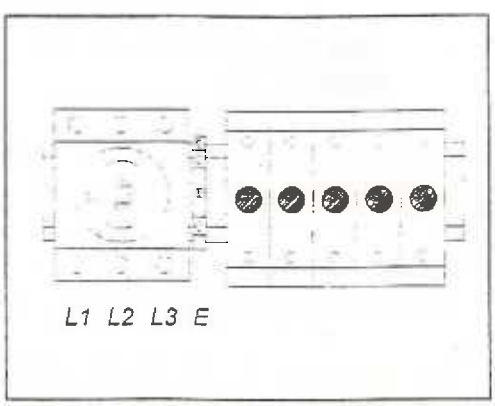


Fig 2

It is important that the direction of rotation of the hydraulic pump is checked after connecting the electrical supply. Damage may occur if the pump rotation is incorrect. The hydraulic pump is located on the top of the hydraulic tank located in the base of the machine. Before using machine ensure that the pump rotates in the direction of the arrow on the pump housing.

The size of the electrical supply cable and fuse rating is dependent on the supply voltage. If in doubt about connecting the machine to the electrcal supply consult a qualified electrician.

IT IS IMPORTANT THAT THE MACHINE IS EFFECTIVELY EARTHED.

BLADE COOLANT OPERATION

To optimise cutting performance the machine is fitted with an electrically actuated coolant/blade lubricating system. The coolant flow is switched on by rotating the coolant operating control (located on the operator control panel) anti clockwise (see fig 3).

Fig 3

The coolant flow rate is controlled by the valves located in the blade guide mounting blocks (see fig 4). The coolant pump only works when the blade is moving.

The coolant tank is located in the base of the machine. Access can be obtained by loosening the retaining screw and opening the door located on the front of the machine base (see fig 1). Ensure the retaining screw is securely tightened after closing the cover.

To ensure optimum cutting performance it is important that the coolant system is correctly maintained. See the maintenance instructions for further information.

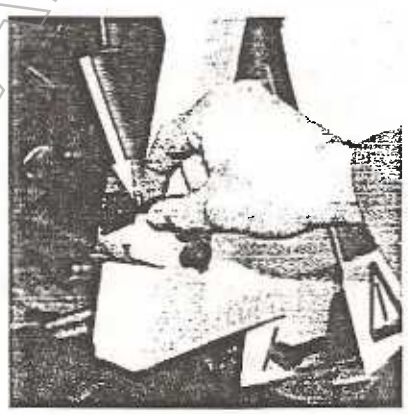


Fig 4

FLUSHING HOSE OPERATION

The flushing hose is used to clean swarf from the working parts of the machine.

The flushing hose can be operated at any time whilst the blade is moving. When the blade is not moving it can be operated by rotating the coolant operating control clockwise (see fig 3).

The coolant flow is controlled by depressing the handle on the flushing hose nozzle (see fig 5).

The flushing hose will not operate whilst the emergency stop button is depressed.

Fig 5

COOLANT FLUID

The use of STARCOOL209 is recommended for optimum cutting performance. This should be diluted with water in the ratio of 15 parts water to 1 part STARCOOL209. If other coolants are used follow the manufacturer's recommendations.

Never use undiluted coolant, damage to the coolant pump may occur and the coolant flow will be adversely affected. Always add water to the coolant to prevent accidental spillage of coolant and mix well before using.

Observe the handling and safety precautions provided with the coolant particularly when mixing, filling the coolant system, clearing spillages or disposing of coolant.

Always wear gloves and goggles when handling or mixing coolant. To avoid spillage always ensure that the machine and drainage outlet is clear of swarf.

Before undertaking any adjustment ensure the machine has come to rest and that it is disconnected from the electrical supply by rotating the isolator switch to the 'O' position. The isolator switch is located on the electrical control cabinet door (see fig 1).

Ensure that adequate protective equipment is worn when adjusting or maintaining the machine.

FITTING BLADE

Fig 6

Before fitting a blade, release and open the bandwheel covers (see fig 1) and remove the blade guards by slackening the retaining screws. Slacken the guide arm locking handles (see fig 1).

Slacken the blade tension by rotating the blade tensioning control handle anti clockwise (see fig 6). Carefully remove the blade from the bandwheels and slide it from between the blade guides and from the housing located near the top of the bow.

To avoid injury or damage dispose of the blade carefully. Uncoil the new blade taking care not to cause damage or injury.

To fit the new blade position the blade with the teeth facing outwards. Locate it in the housing located near the top of the bow. Position the lower blade between the blade guides ensuring that the blade is fully inserted. Position the blade over the bandwheels ensuring that the teeth are facing outward and that the back of the blade is seated against the flange on the rear of the bandwheels. Ensure that the teeth are also pointing toward the rear of the machine. Tighten the guide arm retaining handles then apply blade tension as described below.

Before starting machine ensure that all covers and guards are securely fitted and correctly adjusted. Ensure that the blade wheel brush is adjusted correctly.

ADJUSTING BLADE TENSION

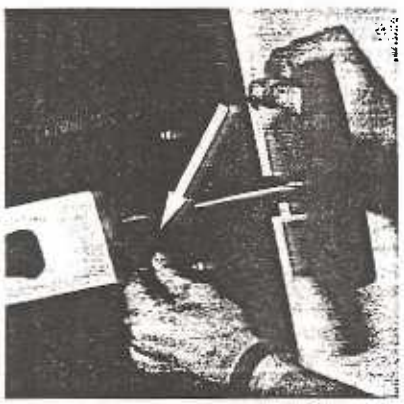


Fig 7

Apply blade tension by rotating the tensioning control handle clockwise. The correct blade tension is achieved when the the tension gauge just fits betwen the collars. The tension gauge is located on the rear of the bow (see fig 7).

Incorrect blade tension may impair cutting performance and blade life. Check the blade tension daily.

ADJUSTING BLADE SPEED

The blade speed controls how quickly the material is removed and should be set fast enough to prevent the teeth from becoming clogged. Increasing blade speed may require increases in head weight and feed speed.

Before cutting select the appropriate blade speed by rotating the blade speed control knob located on the control panel (see fig 1). The speed indicator scale is calibrated in m/min and feet/min. To increase blade speed rotate the control knob clockwise, to decrease blade speed rotate the control knob anti-clockwise. Guidance on the selection of the correct blade speed and type is given in the speed selection chart attached to the machine and the section of this handbook on blade and speed selection.

ADJUSTING BLADE GUIDE ARM AND BLADE GUIDES

Before cutting ensure that the blade guides are correctly positioned. For optimum cutting performance it is advised that the left hand guide arm be moved as close to the work piece as possible. To adjust the position loosen the locking handle at the top of the guide arm (see fig 1) and slide the guide arm to the correct position.

For optimum cutting performance it is important that the carbide blade guides and blade guidance bearings are checked regularly and adjusted or changed if necessary. The gap between the carbide inserts that control the lateral stability of the blade and the blade can be adjusted by rotating the adjusting screw to give a gap of 0.25mm (0.010 ins).

Replace the guide inserts before the blade makes contact with the blade guide body or the guide insert retaining nuts.

Ensure that all retaining screws and locking handles are securely fastened before starting the machine.

ADJUSTING CUTTING ANGLE (see fig 8)

To enable material to be mitred the bow rotates 45° to the right and 60° to the left. To swivel the bow rotate the locking lever located on the right hand side of the machine bed anti-clockwise (see fig 1). Rotate the bow in the desired direction until the desired angle is reached. The angle is indicated on the scale attached to the support rail (see fig 1).

To provide the optimum vice performance ensure that the top bed (see fig 1) is correctly positioned prior to locking the bow in position by rotating the locking lever clockwise.

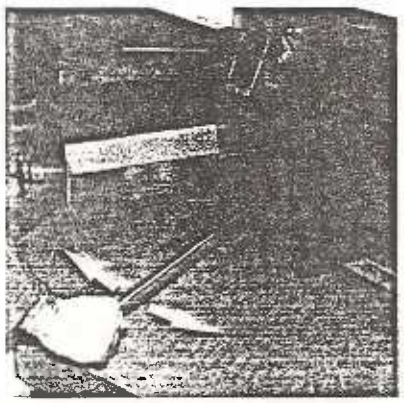


Fig 8

USE AND POSITIONING OF INFEED AND OUTFEED SUPPORT ROLLERS

To prevent risk of the work piece falling ensure that it is adequately supported by suitable infeed and outfeed rollers (optional equipment).

Ensure that these are positioned correctly, are securely adjusted to the correct working height and securely fixed to a firm surface. Ensure the work piece is supported over it's full length.

To prevent premature wear to the machine bed the optional infeed material support roller is adjustable enabling the work piece to be raised during the feeding operation.

ADJUSTING VICE

It is important that the work piece is securely fastened in the vice prior to commencing sawing. The position of the fixed vice is factory set and should not require adjustment.

The moving vice jaw is fitted with a quick release mechanism to permit easy adjustment and securing of the work piece. Adjustment of the vice should only be made with the bow raised. Prior to adjustment ensure the material clamp lever (see fig 1) is located in the correct position by rotating it fully anti-clockwise.

ADJUSTING VICE (continued)

To clamp the work piece in the vice release the vice by rotating the locking lever anti-clockwise (see fig 9). Slide the vice toward the work piece until the face of the vice jaw is touching the work piece. Clamp the vice to the bed of the machine by rotating the clamp lever clockwise, then clamp the work piece by rotating the vice actuating lever clockwise (see fig 10). To release the work piece rotate the material clamp lever anti-clockwise.

Fig 9

To prevent risk of injury it is important that the work piece is adequately supported.

ADJUSTING AND REPLACING BLADE BRUSH

To prevent damage to the band wheels and sawing problems it is important that the blade brush is correctly adjusted to effectively remove swarf from the blade. To adjust, loosen the locking handle (see fig 11). Position the brush so that the teeth of the blade are covered and securely tighten the locking handle.

Fig 10

Replace the blade brush when the bristles are less than 25mm (1") long. Remove the brush assembly by releasing the locking handle. Remove the brush from the spindle by removing the retaining nut. Place the new brush on the spindle and adjust the retaining nut to enable the brush to rotate freely. Refit the brush assembly to the guard and adjust as described above.

CHECKING AND ADJUSTING HEAD WEIGHT

The head weight provides the pressure on the work piece during sawing. The head weight is factory set at 16 to 16.5 kg (35 to 36.5lbs). When sawing materials with low machinability, such as hard steels, the head weight should be increased. The head weight should be decreased when sawing more easily machined materials. Excessive feed pressure dulls the saw blade and may result in blade breakage or misaligned cuts.

Fig 11

To check the head weight lower the bow to within 25 mm (1") of the bed. Place a spring balance on the blade tension adjustment handle (see fig 1). With the bow supported, open feed speed valve by rotating it anti clockwise. Turn the contol handle B (see fig 12) until it rests against the washer C.

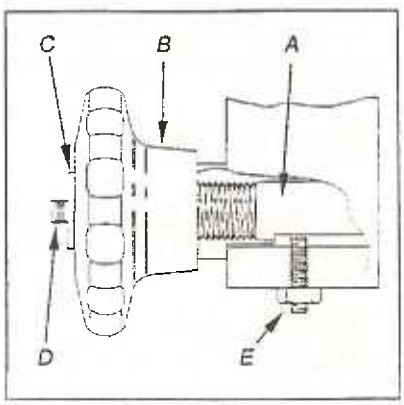


Fig 12

To adjust the head weight release the remove the set screw and locking nut E. To increase the head weight turn control handle B anti-clockwise.

To decrease the head weight place a socket wrench in the cap screw D and turn clockwise.

After checking and adjusting the head weight ensure that the set screw located in the shaft A is securely tightened.

ADJUSTING BOW POSITION

To raise or lower the bow rotate the actuating control located on the control panel in the appropriate direction (see fig 13).

Fig 13

ADJUSTING UPPER LIMIT SWITCH

Adjustment of the upper limit switch (see fig 14) enables the upper bow position to be varied. To adjust release the locking screw. Raise the bow to the desired position using the actuating control (see fig 13). Adjust the limit switch (A) actuating arm until it just causes the limit switch to be actuated. Securely tighten the locking screw and check the upper bow limit by lowering and raising the bow using the actuating control as described above.

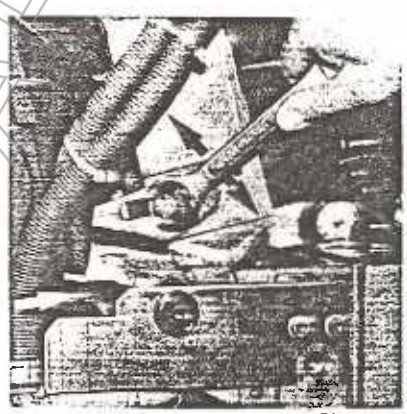


Fig 14

ADJUSTING FEED SPEED

The speed at which the bow descends is controlled by the feed speed control knob located on the control panel (see fig 15). To increase the rate of descent rotate the control anti-clockwise. To decrease the rate of descent rotate the control clockwise. Rotating the control fully clockwise will stop the bow.

The feed speed should be adjusted to to enable the rate of descent of the bow to match the rate of material removal. On commencement of sawing the blade should be slowed to prevent damage to the blade when making initial contact with the work piece, particularly when cutting thin sections such as structural steel sections.

The bow will not descend until the blade starts to move.

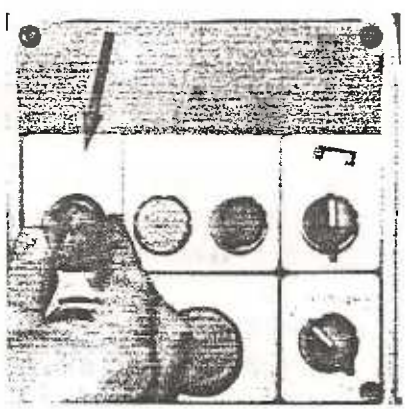


Fig 15

ADJUSTING ANTI VIBRATION PAD

In some circumstances, particularly when sawing structural sections, the work piece may vibrate. To dampen vibration the saw is fitted with a removable vibration pad.

To adjust the position of the pad loosen the locking handle (see fig 16), move to the desired position and lock the handle.

Ensure the damper is free to rise and fall and is resting on the blade before turning the machine on.

Regularly check the pad for wear and replace when necessary.

Fig 16

STARTING AND SAWING

Before starting the machine ensure that all adjustments have been made and that the work piece is securely clamped in the vice and correctly supported.

STARTING AND SAWING (Continued)

To start sawing press the green button marked 'I' located on the control panel (see fig 17). The bow will not descend until the blade has started moving. The rate at which the bow descends (feed speed) and blade speed can be adjusted whilst sawing.

When sawing stand clear of the work piece. Do not hold the work piece during sawing.

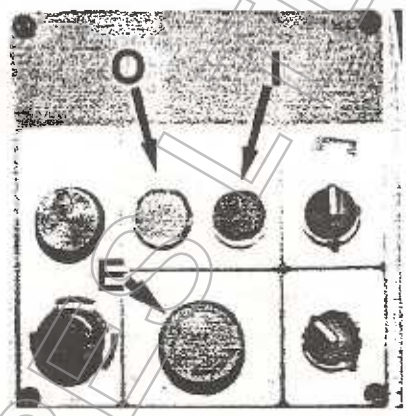


Fig 17

STOPPING

The saw blade is stopped at any time by pressing the red button marked 'O' located on the control panel , or the emergency stop button ('E' stop) (see fig 17). To release the emergency stop button rotate it in a clockwise direction.

PREVENTING UNAUTHORISED USE

To prevent unauthorised use or to provide security whilst undertaking maintenance, a lockable isolator is fitted to the control housing (see fig 18). The electrical supply is disconnected by rotating the control anti-clockwise to the "O" position.

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.

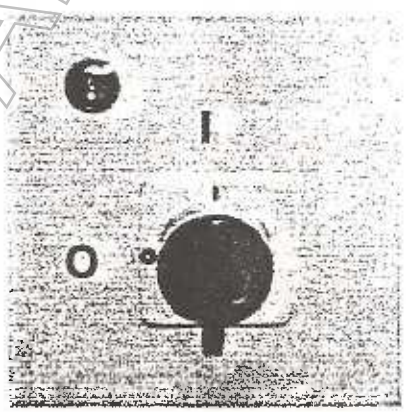


Fig 18

MAINTENANCE

The frequency of maintenance is dependent on the frequency of use and the nature of the work undertaken. It is recommended that the following maintenance schedule is undertaken 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.

DAILY MAINTENANCE (or every 8 hours of use)

- Remove swarf and chips from the machine bed and other working parts.
- Check coolant level and top up if necessary with diluted coolant in accordance with the suppliers instructions.
- Check blade condition and tension.

WEEKLY MAINTENANCE (or every 40 hours of use)

In addition to the above.

- Check hydraulic fluid level and top up if necessary with approved hydraulic fluid (table 1).

MONTHLY MAINTENANCE (or every 150 hours of use)

In addition to the above.

- Grease both ends of the bow pivot shaft using approved lubricant (see table 1).
- Grease the swivel bed bearing using approved lubricant (see table 1)
- Check blade guides and bearings for wear and adjust or replace as necessary.
- Grease vice actuating mechanism using approved lubricant (see table 1).
- Check anti vibartion pad for wear and replace if necessary.

ANNUAL MAINTENANCE (or every 1,800 hours of use)

In addition to the above.

- Drain and clean coolant tank and all coolant wells by removing filter plates.
- Clean swarf from coolant pump impeller by removing impeller cover retaining screws as indicated in fig 19. If the impeller does not rotate freely the pump should be replaced.

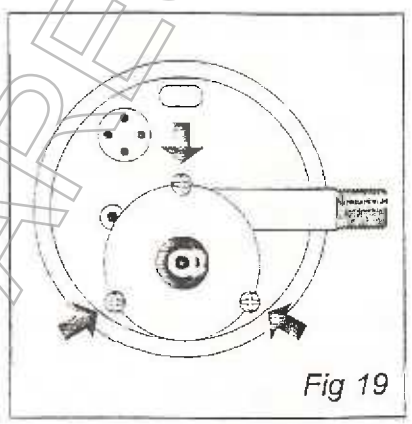


Fig 19

GEARBOX

The gearbox is sealed for life and should not require maintenance.

APPROVED LUBRICANTS

Table 1 Approved Oils

Application	Manufacturer	Grade
General lubrication	Mobil	Vactra or DTE Heavy Medium Oil
	Shell	Tellus 68
	Gulf	Service 51
	Texaco	Ursa P20
Grease points	Mobil	Mobiplex 48 Grease
	Shell	R2 All Purpose Grease
	Gulf	Gulfcrown No 3 Grease
	Texaco	Regal Starfak Premium 3 Grease
Hydraulic fluid	Mobil	DTE 24
	Shell	T37
	Gulf	Harmony 43AW
	Texaco	Rando HDA or HD32

Always wear suitable protective equipment such as gloves and goggles when changing the oil or coolant fluid. For advice on the safe handling, disposal and action to be taken in the event of a spillage consult the information given on the oil container.

For genuine spare parts and service from fully trained engineers contact **A.L.T. Saws & Spares Ltd** or the supplier of the machine. We can also supply blades for any application.

To enable the most effective use of the saw it is important to select the correct cutting speed and blade. These are dependent on the material specification, shape and size.

SELECTION OF BLADE TYPE AND TOOTH FORM

It is normal practice to use bi-metal blades for sawing metal. The bi-metal blade consists of a ductile backing electron beam welded to a HSS steel cutting edge giving a tough flexible backing and superior cutting performance and breakage resistance. The HSS section of the blade stops short of the tooth gullet which reduces shatter in the event of the blade snapping or teeth breaking. There are two types of bi-metal blade in common use.

The M2 HSS bi-metal which is used for general purpose cutting and cutting of free machining steels. Rewelding these blades is possible.

The M42 Cobalt bi-metal blade has a Cobalt HSS composition for the cutting edge. This makes such blades suitable for cutting more difficult materials such as Ni-Cr steels, Ni-Cr-Mo steels, Inconel etc. This type of blade can also be used for general sawing. Rewelding of these blades is also possible.

M2 and M42 bi-metal blades are available in a variety of tooth forms and pitches. The correct selection of blade will ensure the optimum trouble free cutting.

The basic terminology used when describing blades is given in fig. 20.

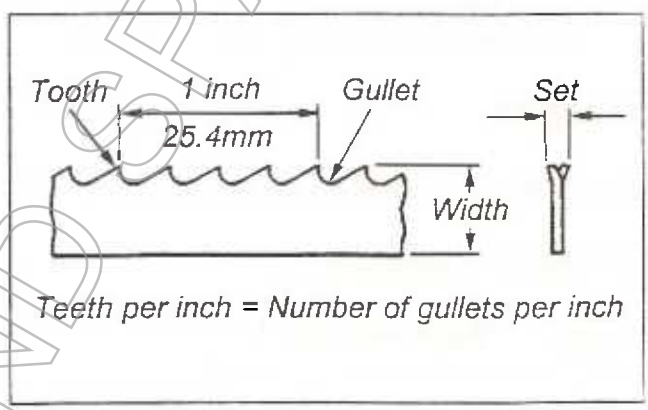


Fig 20

Metal sawing blades are generally manufactured in four basic tooth forms.

Regular Tooth Blades (fig 21a)

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 and 14 teeth per inch.

Fig 21a
Regular Tooth

Hook Tooth Blades (fig 21b)

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 suitable for sawing deep sections. Use with abrasive materials is not recommended. Standard pitches are 2, 3, 4 and 6 teeth per inch.

Fig 21b
Hook Tooth

Variable Tooth Blades (fig 21c)

This type of blade has both varying size teeth and cutting angles. Variable tooth blades are best used for cutting structural sections, bundle cutting of pipes, tubing etc. The main benefit is the reduction in vibration levels often experienced when cutting such sections with regular tooth blades.

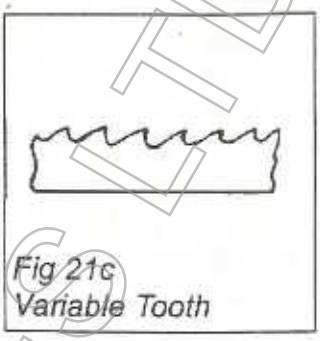


Fig 21c
Variable Tooth

Skip Tooth Blades (fig 21d)

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 non ferrous materials as the tooth profile breaks up the large ductile chips which tend to clog regular teeth. Standard pitches are 3, 4 and 6 teeth per inch.

Fig 21d
Skip Tooth

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 two commonly used tooth set patterns. Recommended set is given for a variety of material types and thicknesses in table 3.

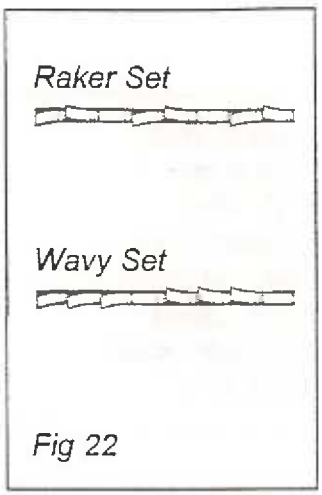


Fig 22

Raker Set (fig 22)

Teeth are set with one tooth set to the right, one to the left followed by one unset tooth. This pattern is widely preferred.

Wavy Set (fig 22)

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.

SELECTION OF TOOTH PITCH

The selection of the optimum blade tooth pitch is determined by the length of cut and the machinability of the work piece. In general terms large sections need to to be sawn with coarse blades whilst small sections are better sawn with a fine blade. Soft or ductile materials require fewer teeth in contact than do harder less machinable materials.

Too many teeth in contact with the work piece will result in reduced loading and result in the teeth sliding through the work piece rather than cutting. This will result in premature dulling of the blade. Too few teeth in contact with the work piece will result in high tooth loading and may result in blade chatter and vibration, and may cause teeth to break.

Table 2 provides a general guide to selecting the optimum tooth pitch for solid materials. However, it may be necessary to test a variety of blades to obtain the optimum cutting performance.

Table 2 Selection of Tooth Pitch for Solid Materials

Section Width (t) mm (ins)	No. of Teeth per Inch (25mm)
t < 25 (1)	6 - 10 tpi
25 (1) < t < 75 (3)	6 - 8 tpi
75 (3) < t < 150 (6)	4 - 6 tpi
150 (6) < t	2 - 3 tpi

Tubular and structural sections have changes in cross section when sawing. As a guide allow at least 2 to 3 teeth to be in engagement at the thinnest section. The use of variable tooth blades is recommended to minimise vibration.

SELECTION OF BLADE SPEED

Table 3 provides a guide for the selection of the correct blade speed when using bi-metal blades. However, the blade speed should be set in conjunction with the feed speed and head weight for optimum performance, and are given for guidance only.

Table 2 Blade Speed Selection Guide - speed given in m/min (ft/min)

Material	Section Width (t) mm (ins)			
	t < 25(1)	25(1) < t < 75(3)	75(3) < t < 150(6)	150(6) < t
Carbon steel	77(250)	77(250)	77(250)	67(220)
Tool steel	37(120)	34(110)	31(100)	25(80)
NiCr steel	67(220)	61(200)	55(180)	46(150)
NiCrMo steel	70(230)	61(200)	61(200)	52(170)
Chrome steel	86(280)	77(250)	74(240)	55(180)
Cr Va Steel	69(225)	69(225)	61(200)	52(170)
Stainless steel	37(120)	31(100)	31(100)	31(100)
Cast Iron	67(220)	61(200)	55(180)	49(160)

ORDERING BLADES

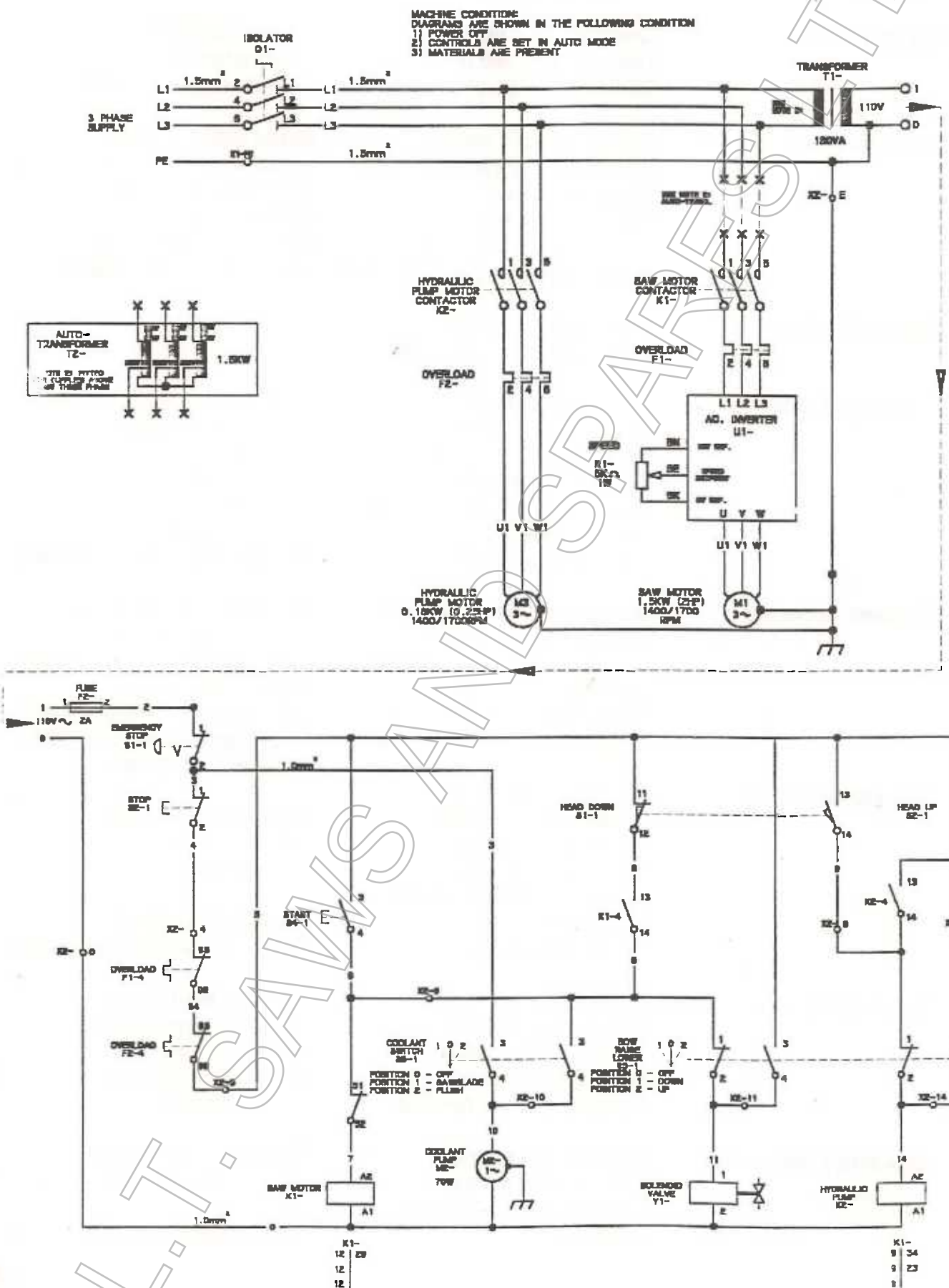
When ordering blades always specify:

- the model number of the machine to which the blade is to be fitted
- the blade type
- the tooth form, set and pitch
- the length width of the blade

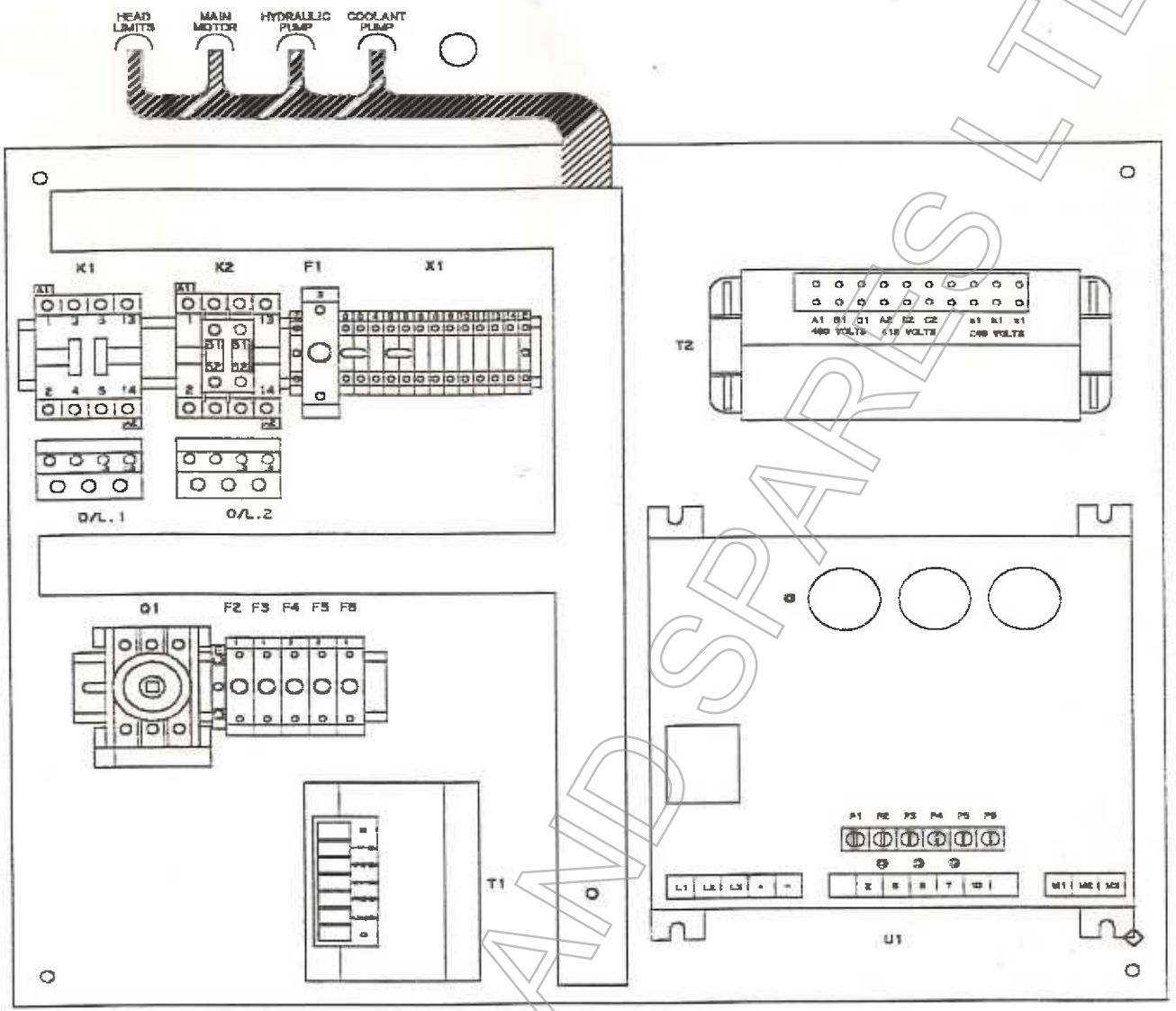
For further information or advice contact A.L.T. Saws & Spares Ltd or the supplier of the machine.

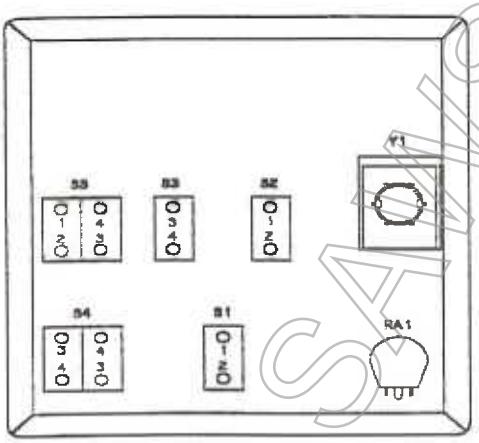
COMMON PROBLEMS

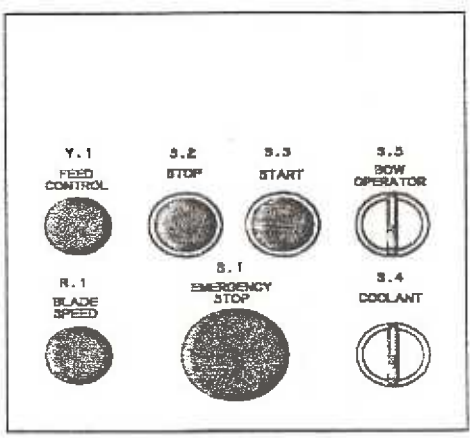
PROBLEM	POSSIBLE CAUSE	REMEDY
Coolant will not flow	Coolant tank empty	Fill with correct mix of coolant
	Defective/blocked pump	Replace/unblock pump
	Defective electrical supply	Inspect wiring and repair
Cut not square	Excessive head weight	Adjust feed pressure
	Incorrect blade tension	Check and adjust tension
	Blade speed too slow	Increase blade speed
	Feed speed too high	Reduce feed speed
	Material not correctly clamped	Reposition work piece
	Blade teeth dull or pitch too fine	Check and replace blade
Blade will not cut	Blade teeth reversed	Remount blade
	Material too hard for blade	Change saw blade
Breaking of teeth	Feed speed too fast	Reduce feed speed
	Head weight too high	Reduce head weight
	Tooth pitch too coarse	Change blade
	Tooth pitch too fine	Change blade
	Insufficient coolant	Increase coolant flow
	Incorrect coolant	Change coolant
	Material loose in vice	Reposition and clamp material
Breaking of blade	Blade joint incorrectly welded	Replace or reweld blade
	Head weight too high	Reduce head weight
	Incorrect blade tension/tracking	Check and adjust if necessary
	Feed speed too fast	Reduce feed speed
	Material loose in vice	Reposition and clamp material
	Swarf building up on bandwheels	Clean bandwheels and check/ replace blade brush.
Saw blade vibrates	Work piece not correctly positioned or clamped	Reposition and clamp
	Blade speed too fast	Change speed
	Tooth pitch too coarse	Change blade
	Work piece incorrectly clamped or adjusted	Adjust and reclamp
	Blade tension too low	Check and adjust if necessary
Teeth dull rapidly	Feed speed too slow	Increase feed speed
	Head weight too low	Increase head weight
	Tooth pitch too coarse	Change blade
	Insufficient coolant	Increase coolant flow
	Material too hard for blade	Change blade
Saw blade stalls in cut	Head weight too high	Decrease head weight
	Feed speed too high	Reduce feed speed
	Incorrect blade selection or speed	Adjust speed or change blade



WIRING AND LOCATION DIAGRAM - SH330M (Continued)







ITEM	PART NO	DESCRIPTION	QTY
S1	801187	STAY PUT STOP BUTTON	1
	801181	CONTACT ASSBY 1-N/C	1
S2	801252	STOP BUTTON	1
	801181	CONTACT ASSBY 1-N/O	1
S3	801172	START BUTTON	1
	801180	CONTACT ASSBY 1-N/O	1
S4	801174	COOLANT SWITCH	1
	801182	CONTACT ASSBY 2-N/O	1
S5	801387	BOW OPERATOR	1
	801183	CONTACT ASSBY 1-N/O, 1-N/C	1
	801184	CONTACT BLOCK N/C	1
	801185	CONTACT BLOCK N/O	1
K1	801158	CONTACTOR 110v/1Ø	1
RA1	2581	CONTROL KNOB	1
	801384	POTENTIOMETER 15K	1

ITEM	PART NO	DESCRIPTION	QTY
T1	801273	TRANSFORMER [illegible] VAT	1
T2	801388	1.2KW TRANSFORMER 575-460/240v	1
U1	806231	2.2KW 240v INVERTER	1
	806422	5.3 AMPRE [illegible]	3
	806424	2 [illegible] USED IN [illegible]	3
X1	806389	END SECTION	1
	806397	[illegible] PLATE	2
	806395	[illegible] BLOCK [illegible]	3
	806394	TERMINAL BLOCK [illegible]	12
F1-3	806392	TERMINAL BLOCK [illegible]	8
Q1	801318	[illegible]	1
FR2	801165	OVERLOAD 0.63-1.0 AMPRES	1
FR1	801161	OVERLOAD 5.5-8.0 AMPRES	1
KZ	801155	CONTACTOR [illegible] Volts	1
	801171	AUX [illegible] N/C	1
Y1	[illegible]	COIL	1
	801213	VALVE BODY	1
	10388	CONTROL KNOB	1