

# HAFCO METALMASTER



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## Instruction Manual

# METAL CUTTING BAND SAW BS-916A

Order Code: (B015)

**MACHINE DETAILS**

MACHINE.	METAL CUTTING BAND SAW
MODEL NO.	BS-916A
SERIAL NO.	
DATE OF MANF.	

IMPORTED BY

AUSTRALIA



[www.machineryhouse.com.au](http://www.machineryhouse.com.au)

NEW ZEALAND



[www.machineryhouse.co.nz](http://www.machineryhouse.co.nz)

**NOTE:**

This manual is only for your reference. At the time of the compiling of this manual every effort to be exact with the instructions, specifications, drawings, and photographs of the machine was taken. Owing to the continuous improvement of the HAFCO METALMASTER machine, changes may be made at any time without obligation or notice. Please ensure the local voltage is the same as listed on the specification plate before operating any electric machine.

**SAFETY SYMBOLS:**

The purpose of safety symbols is to attract your attention to possible hazardous conditions



**WARNING** Indicates a potentially hazardous situation causing injury or death



**CAUTION** Indicates an alert against unsafe practices.

**Note:** Used to alert the user to useful information



**NOTE:**

In order to see the type and model of the machine, please see the specification plate. Usually found on the back of the machine. See example (Fig.1)

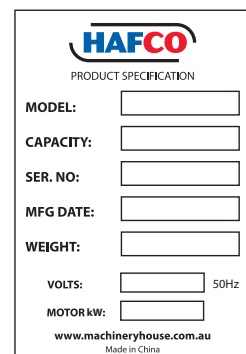


Fig.1

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## 1.1 SPECIFICATIONS

Order Code	B015
<b>Model</b>	<b>BS-916A</b>
Operation Type	Fixed Head
Capacity Round @ 90° (mm)	228
Capacity Round @ 45° (mm)	180
Capacity Square @ 90° (mm)	228
Capacity Square @ 45° (mm)	150
Capacity Rectangle (W x H) @ 90° (mm)	350 x 228
Capacity Rectangle (W x H) @ 45° (mm)	240 x 180
Table Working Height (mm)	675
Cutting Head Beam Type	Manual
Cutting Head Beam Return	Manual Return
Cutting Head Down Feed Control	Adjustable Hydraulic
Vice Clamping Fixture	Manual
Blade Steps / Speeds (m/mm)	29-50-73-96
Blade Size (L x W x T) (mm)	2908 x 27 x 0.9
Motor Power (kW / hp)	1.1 / 1.5
Voltage / Amperage (V / Amp)	240 / 15
Dimensions (LxWxH) (mm)	1630 x 660 x 1045
Nett Weight (kg)	290

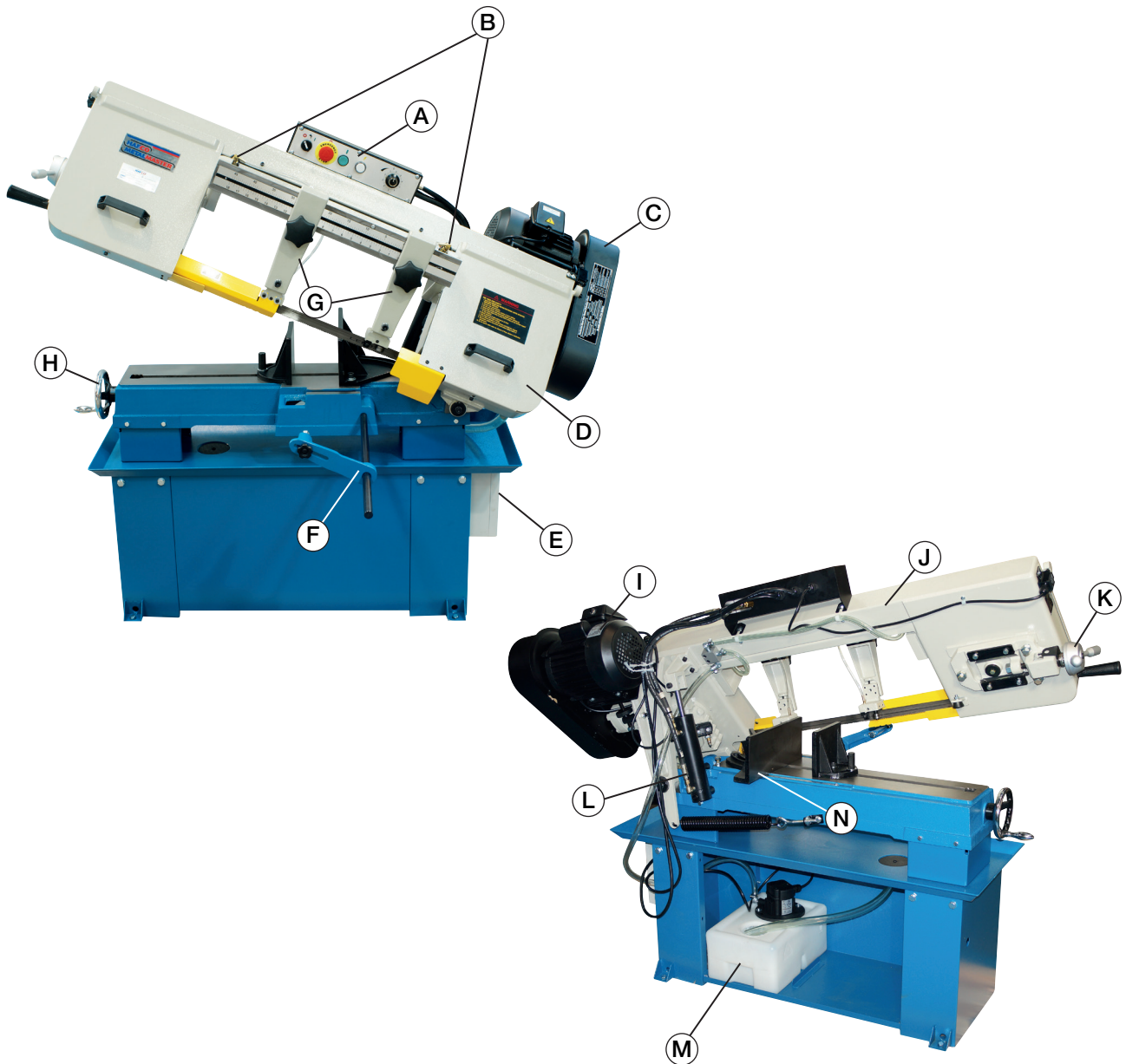
## 1.2 ACCESSORIES

- Adjustable length stop for repetition cutting
- Wire wheel brush to clean swarf from blade
- Band Saw Blade
- Instruction Manual



### 1.3 IDENTIFICATION

Become familiar with the names and locations of the controls and features shown below to better understand the instructions when mentioned later in this manual.



<b>A</b>	Control Panel	<b>H</b>	Vice Hand Wheel
<b>B</b>	Coolant Valve	<b>I</b>	Motor
<b>C</b>	Pulley Cover	<b>J</b>	Headstock (Bow)
<b>D</b>	Wheel Cover	<b>K</b>	Blade Tension Handle
<b>E</b>	Electrical Box	<b>L</b>	Feed Cylinder
<b>F</b>	Length Stop	<b>M</b>	Coolant System
<b>G</b>	Blade Guides	<b>N</b>	Vise

## 2. SAFETY

### 2.1 GENERAL METALWORKING MACHINE SAFETY

DO NOT use this machine unless you have read this manual or have been instructed in the use of this machine in its safe use and operation.



## WARNING!

This manual provides safety instructions on the proper setup, operation, maintenance, and service of this machine. Save this manual, refer to it often, and use it to instruct other operators.

Failure to read, understand and follow the instructions in this manual may result in fire or serious personal injury, including amputation, electrocution, or death.

The owner of this machine is solely responsible for its safe use. This responsibility includes, but is not limited to proper installation in a safe environment, personnel training and authorization to use, proper inspection and maintenance, manual availability and comprehension, of the application of the safety devices, integrity, and the use of personal protective equipment.

The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



- ✓ Always wear safety glasses or goggles.
- ✓ Wear appropriate safety footwear.
- ✓ Wear respiratory protection where required.
- ✓ Gloves should never be worn while operating the machine, and only worn when handling the work piece.
- ✓ Wear hearing protection in areas > 85 dBA. If you have trouble hearing someone speak from one metre (three feet) away, the noise level from the machine may be hazardous.
- ✓ DISCONNECT THE MACHINE FROM POWER when making adjustments or servicing.
- ✓ Check and adjust all safety devices before each job.
- ✓ Ensure that guards are in position and in good working condition before operating.
- ✓ Ensure that all stationary equipment is anchored securely to the floor.
- ✓ Ensure all machines have a start/stop button within easy reach of the operator.
- ✓ Each machine should have only one operator at a time. However, everyone should know how to stop the machine in an emergency.

## 2.1 GENERAL SAFETY REQUIREMENTS CONT.

- ✓ Ensure that keys and adjusting wrenches have been removed from the machine before turning on the power. Appropriate storage for tooling should be provided.
- ✓ Ensure that all cutting tools and blades are clean and sharp. They should be able to cut freely without being forced.
- ✓ Stop the machine before measuring, cleaning or making any adjustments.
- ✓ Wait until the machine has stopped running to clear cuttings with a vacuum, brush or rake.
- ✓ Keep hands away from the cutting head and all moving parts.
- ✓ Avoid awkward operations and hand positions. A sudden slip could cause the hand to move into the cutting tool or blade.
- ✓ Return all portable tooling to their proper storage place after use.
- ✓ Clean all tools after use.
- ✓ Keep work area clean. Floors should be level and have a non-slip surface.
- ✓ Use good lighting so that the work piece, cutting blades, and machine controls can be seen clearly. Position any shade lighting sources so that they do not cause any glare or reflections.
- ✓ Ensure there is enough room around the machine to do the job safely.
- ✓ Obtain first aid immediately for all injuries.
- ✓ Understand that the health and fire hazards can vary from material to material. Make sure all appropriate precautions are taken.
- ✓ Clean machines and the surrounding area when the operation is finished.
- ✓ Use proper lock out procedures when servicing or cleaning the machines or power tools.

### DO NOT

- × Do not distract an operator. Horseplay can lead to injuries and should be strictly prohibited.
- × Do not wear loose clothing, gloves, neckties, rings, bracelets or other jewellery that can become entangled in moving parts. Confine long hair.
- × Do not handle cuttings by hand because they are very sharp. Do not free a stalled cutter without turning the power off first. Do not clean hands with cutting fluids.
- × Do not use rags or wear gloves near moving parts of machines.
- × Do not use compressed air to blow debris from machines or to clean dirt from clothes.
- × Do not force the machine. It will do the job safer and better at the rate for which it was designed.



### **CAUTION!**

*It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.*

## 2.1 GENERAL SAFETY REQUIREMENTS Cont.

**HAZARDS ASSOCIATED WITH MACHINES** include, but are not limited to:

- Being struck by ejected parts of the machinery.
- Being struck by material ejected from the machinery.
- Contact or entanglement with the machinery.
- Contact or entanglement with any material in motion.

**Health Hazards** (other than physical injury caused by moving parts)

- Chemicals hazards that can irritate, burn, or pass through the skin.
- Airborne items that can be inhaled, such as oil mist, metal fumes, solvents, and dust.
- Heat, noise, and vibration.
- Ionizing or non-ionizing radiation. (X-ray, lasers, etc.)
- Biological contamination and waste.
- Soft tissue injuries (for example, to the hands, arms, shoulders, back or neck) resulting from repetitive motion, awkward posture, extended lifting, and pressure grip.

**Other Hazards**

- Slips and falls from and around machinery during maintenance.
- Unstable equipment that is not secured against falling over.
- Safe access to/from machines. (access, egress)
- Fire or explosion.
- Pressure injection injuries from the release of fluids and gases under high pressure.
- Electrical Hazards, such as electrocution from faulty or ungrounded electrical components.
- Environment in which the machine is used. (in a machine shop, or on a work site)



### **WARNING!**

The machine is the sole responsibility of the owner for its safe use. This responsibility includes but is not limited to proper installation in a safe environment, personnel training, proper inspection and maintenance, manual availability and comprehension. The manufacturer will not be held liable for injury or property damage from negligence, improper training, machine modifications or misuse.



### **WARNING!**

Machines are safeguarded to protect the operator from injury or death with the placement of guards. Machines must not be operated with the guards removed or damaged.

## 2.2 SPECIFIC SAFETY FOR METAL CUTTING BAND SAW

**DO NOT use this machine unless you have been instructed in its safe use and operation and have read and understood this manual**



*Safety glasses must be worn at all times in work areas*



*Long and loose hair must be contained.*



*Gloves must not be worn when using this machine.*



*Sturdy footwear must be worn at all times in work areas*



*Close fitting/ protective clothing must be worn*



*Rings and jewelry must not be worn.*

### PRE-OPERATIONAL SAFETY CHECKS

1. Ensure no slip/trip hazards are present in workspaces and walkways.
2. Check that all guards are in position.
3. Ensure hydraulic damping mechanism functions.
4. Check that the blade is in good condition.
5. Ensure that blade speed, blade tension and blade tracking are properly adjusted.
6. Check coolant delivery system to allow for sufficient flow of coolant.
7. Locate and ensure you are familiar with the operation of the ON/OFF starter and E-Stop.
8. Faulty equipment must not be used. Immediately report suspect machinery.

### OPERATIONAL SAFETY CHECKS

1. Lift the head of unit up and lock it in the upward position.
2. Set the angle of the vice, or check it to ensure its squareness.
3. Clamp work piece firmly into the vice. Long material must be supported.
4. Adjust blade guards to cover unused portion of blade.
5. Ensure hands are away from the blade, and then turn the machine on.
6. Allow the upper head assembly to come down slowly until the teeth are cutting the material.
7. Keep hands away from the point of operation during cutting.
8. Turn off the machine and bring it to a complete standstill if the blade is to be lifted out of an uncompleted or jammed cut.
9. Stop the machine and bring it to a complete standstill before removing scrap pieces from the vice area or making adjustments.
10. Stop the saw immediately if the blade develops a 'click'. Report it to your supervisor.
11. Ensure the cutting head is locked in the upward position before removing work piece.

### AFTER OPERATION

1. Switch off the saw and reset all guards to a fully closed position.
2. Leave the machine in a safe, clean and tidy state.

### DO NOT

- Pushing down on the cutting head while it is cutting.
- Leaving the machine running unattended.

### 3. POWER SUPPLY

#### 3.1 ELECTRICAL REQUIREMENTS

Place the machine near an existing power source. Make sure all power cords are protected from traffic, material handling, moisture, chemicals, or other hazards. Make sure there is access to a means of disconnecting the power source. The electrical circuit must meet the requirements for 240V. To minimize the risk of electrocution, fire, or equipment damage, these machines should be hard wired with installation work and electrical wiring done by a qualified electrician.

**NOTE : The use of an extension cord is not recommended as it may decrease the life of electrical components on your machine.**

#### ELECTRICAL REQUIREMENTS

Nominal Voltage.....	240V
Cycle.....	50 Hz
Phase.....	Single Phase
Power Supply Circuit.....	15 Amps
Full Load Current .....	10.5 Amps

(Full load current rating is also on the specification plate on the motor.)

#### 3.2 FULL-LOAD CURRENT RATING

The full-load current rating is the amperage a machine draws when running at 100% of the output power. Where machines have more than one motor, the full load current is the amperage drawn by the largest motor or a total of all the motors and electrical devices that might operate at one time during normal operations.

Full-Load Current Rating for these machine can be found on the motor nameplate.

It should be noted that the full-load current is not the maximum amount of amps that the machine will draw. If the machine is overloaded, it will draw additional amps beyond the full-load rating and if the machine is overloaded for a long period of time, damage, overheating, or fire may be caused to the motor and circuitry.

This is especially true if connected to an undersized circuit or a long extension lead. To reduce the risk of these hazards, avoid overloading the machine during operation and make sure it is connected to a power supply circuit that meets the requirements.



## 4 SET-UP

### 4.1 UNPACKING

This machine was carefully packaged for safe transport. When unpacking, separate all enclosed items from packaging materials and inspect them for shipping damage. If items are damaged, please contact your distributor.

**NOTE: Save all the packaging materials until you are completely satisfied with the machine and have resolved any issues with the distributor, or the shipping agent.**

When unpacking, check the packing list to make sure that all parts shown are included. If any parts are missing or broken, please contact your distributor.

### 4.2 CLEAN - UP

The unpainted surfaces of the machine have been coated with a waxy oil to protect them from corrosion during shipment. Remove the protective coating with a solvent cleaner or a citrus based degreaser.

Optimum performance from your machine will be achieved when you clean all moving parts or sliding contact surfaces that are coated with rust preventive products.

It is advised to avoid chlorine based solvents, such as acetone or brake parts cleaner, as they will damage painted surfaces and strip metal should they come in contact. Always follow the manufacturer's instructions when using any type of cleaning product.

### 4.3 SITE PREPARATION

When selecting the site for the machine, consider the largest size of work-piece that will be processed through the machine and provide enough space around the machine for operating the machine safely. Consideration should be given to the installation of auxiliary equipment. Leave enough space around the machine to open or remove doors/covers as required for the maintenance and service as described in this manual.

It is recommended that the machine is anchored to the floor to prevent tipping or shifting. It also reduces vibration that may occur during operation.

### 4.4 LIFTING INSTRUCTIONS

On the day that the machine arrives, make sure that a forklift or lifting device, with sufficient capacity is available to unload the machine from the vehicle. Ensure access to the chosen site is clear and that doors and ceilings are sufficiently high and wide enough to receive the machine.



*This machine is extremely heavy.*

*Serious personal injury may occur if safe moving methods are not followed. To be safe, you will need assistance and power equipment when moving the shipping crate and removing the machine from the crate.*



### **WARNING!**

*Make sure everyone is away from the load before hoisting. The load must be under control when lowering loads suspended. Rigging and crane operation must be carried out by persons with approved qualifications.*

#### 4.5 ANCHORING TO THE FLOOR

The machine is best mounted on a concrete slab.

Masonry anchors with bolts are the best way to anchor machinery, because the anchors sit flush with the floor surface, making it easy to unbolt and move the machine later if needed. (Fig. 4.1)

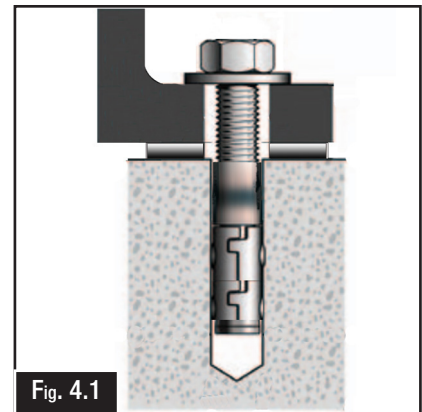


Fig. 4.1

#### 4.6 MACHINE LEVELING

To set your machine up so that it operates to optimum performance, apply the following procedure.

After your machine has been anchored to a concrete slab floor, it then needs to be leveled. Loosen the hold down bolts and place a level on the surface of the working table. Metal shims need to be placed under the corner of the base of the machine until level. Once level then tighten the hold down bolts. (Fig. 4.2).

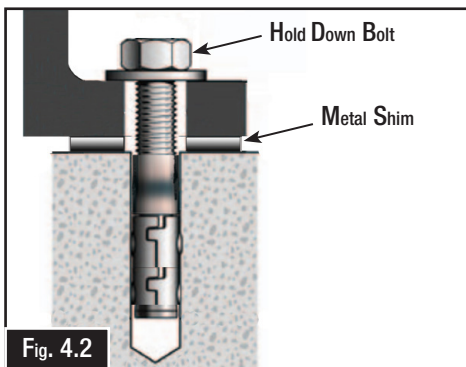


Fig. 4.2



**CAUTION!**

*The machine must not rest on supports other than those defined in Fig. 4.2*

#### 4.7 ASSEMBLY

The machine must be fully assembled before it can be operated. First clean any parts that are coated in rust preventative to ensure the assembly process can proceed smoothly.

To assemble machine:

1. Thread work stop rod onto base (see Fig. 4.3).
2. Slide work stop onto the rod, position it as necessary, then tighten set screw. (Fig. 4.3)

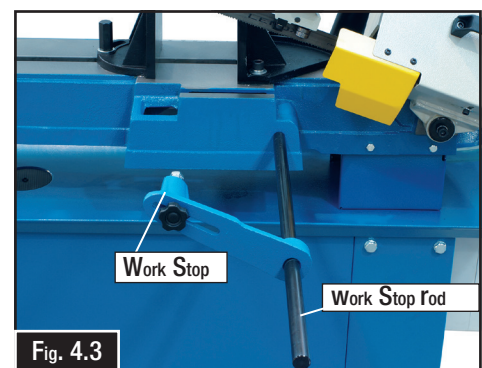


Fig. 4.3



**WARNING!**

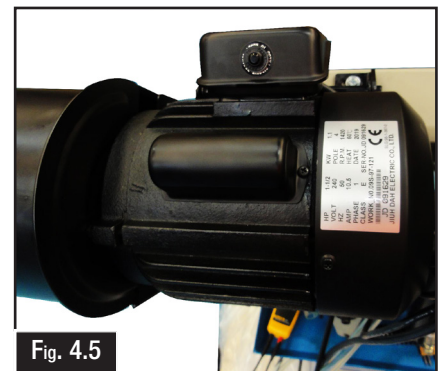
*Make sure that the machine is fully assembled before operating. Failure to do so could cause injury and damage to the machine*

### Motor Fitting Instructions

This band saw has been supplied with the motor disassembled for packing. Please follow the steps below to fit motor, belts and guarding.

#### To assemble machine:

1. Fit the motor mount plate on the rear right of saw using the 4 x bolts supplied (don't tighten yet)
2. Using a ruler or straight edge align the 2 x pulleys, now tighten the motor bolts
3. Slide belt guard behind pulleys, align holes and attach using bolts supplied
4. Fit V-belt and tension using the knurled disc type knob under the motor. Press down firmly on the V-belt midway between pulleys. When properly tightened v-belt will depress no more than the belt width.
5. Close belt cover and secure lid with Socket Head Cap Screw supplied
6. Fit electrical box to the top of the band saw arm in the centre using the bolts supplied
7. Secure wires and hoses from electrical box and motor, away from moving parts using the cable ties.



### 4.8 TEST RUN

Once assembly is complete, test run the machine to ensure it is properly connected to the power and safety components are functioning correctly. Check that the direction of the motor is correct and make sure that the machine rotates in the correct direction.

If the direction is incorrect, isolate the machine and have the electrician make changes to the wiring.

If you find an unusual problem during the test run, immediately stop the machine, disconnect it from power, and fix the problem BEFORE operating the machine again. The Troubleshooting table in the Maintenance section of this manual may be able to help. If the problem persists then contact your dealers service technician.

#### To test run the machine:

1. Connect the machine to the power supply.
2. Make sure that the manual has been read and that the safety instructions at the beginning of the manual are understood. Make sure the machine has been setup correctly.
3. Make sure all tools and objects used during set up have been cleared away from the machine.
4. Turn the machine ON.
5. Make sure that the machine is traveling in the correct direction.
6. Listen to and watch for abnormal noises or actions. The machine should run smoothly with little or no vibration or rubbing noises.
7. Any strange or unusual noises should be investigated and corrected before operating the machine again. Always disconnect the machine from power supply when investigating or correcting potential problems. The troubleshooting chart in the maintenance section may be helpful in rectifying a problem.

### Testing The Emergency Stop Button

Make sure that the emergency button is working correctly

1. Twist the top of the Emergency Stop button to ensure that it is in the raised position.
2. Start the machine and then press the emergency stop button. The machine should stop and the power should be cut off. If the machine cannot be started then the emergency stop is working correctly.
3. To reset the Emergency Stop twist the red top until it pops up. The machine should now work again.



## 5. OPERATION

This machine may perform many types of operations that are beyond the scope of this manual. Many of these operations may be dangerous or deadly if performed incorrectly.

The instructions in this section are written with the understanding that the operator has the necessary knowledge and skills to operate this machine. If at any time you are experiencing difficulties performing any operation, stop using the machine!

If you are an inexperienced operator, we strongly recommend that you read books, trade articles, or seek training from an experienced operator before performing any unfamiliar operations.

**Above all, your safety should come first!**

### 5.1 OPERATION OVERVIEW

This overview purpose is to provide a novice machine operator with a basic understanding of how the machine is used during operation, and so that if the machine controls or components are mentioned later in this manual, it will be easy to understand. The overview is not intended to be an instructional guide and is only generic in nature. To learn more about the specific operation, read this entire manual and seek additional training from an experienced machine operator. Another source of information may be found in video's on websites or by reading trade magazines.

**To complete an operation:**

1. Examine the workpiece to make sure it is suitable for cutting.
2. Select and change the blade that is suitable for the for workpiece material. Fit and verify that the blade is tensioned correctly.
3. Adjust the work length stop if needed for operation.
4. Raise the headstock and lock by turning the hydraulic feed OFF.
5. Adjust the vice angle required for the operation and securely clamp the workpiece in the vice. Ensure that the work piece is stable and the cutting area is free of any obstructions.
6. Adjust the blade guide supports as close to work piece as possible.
7. Put on safety equipment such as safety glasses, steel toe boots, and use leather gloves when moving the work piece.
8. Select the correct speed and adjust the V-Belt if necessary, then start the machine.
9. Slowly lower the headstock until blade makes contact with workpiece, then releases headstock. Adjust the hydraulic feed rate to lower the blade into workpiece until cut is finished.
10. When the cut is finished, stop the machine and raise the headstock.

## 5.2 CONTROLS

The purpose of this control overview is to provide the machine operator with a basic understanding of the machine controls and what they do. It also helps the operator to understand if they are discussed later in this manual.

**NOTE: DO NOT start the machine until all of the setup instructions have been performed. Operating a machine that is not setup correctly may result in malfunction or unexpected results that can lead to serious injury, death or damage to the machine or property.**

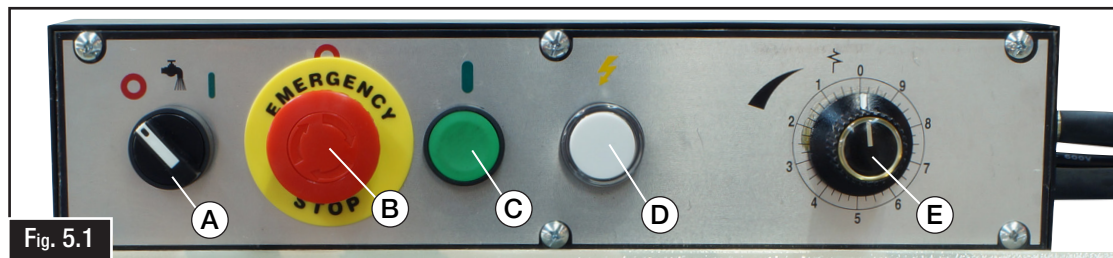


Fig. 5.1

### Control Panel:

- A. **Coolant Pump Switch:** The coolant pump switch located on the left side of the panel, switches the coolant pump ON or OFF. The amount of flow is regulated by the “Coolant Shut Off Valve”.
- B. **Emergency Stop Button:** When this button is pressed the machine will shut down. The power will be locked off until the button is reset, by twisting the top and allowing the button to pop up.
- C. **Power ON Button:** This button switches the motor ON and starts the blade moving.
- D. **Power On Lamp:** Illuminates when power is applied to the machine.
- E. **Feed Control Knob:** This knob is used to set the amount of downward force that is applied to the saw blade. The feed rate is proportional to the opening of the valve. Increasing the valve opening, increases the feed rate; decreasing the valve opening, reduces the feed rate.

### Other Controls:

- A. **Coolant Shut Off Valve:** This valve controls the flow of the coolant. (Fig. 5.2)
- G. **Blade Tension Knob and Gauge:** Rotate clockwise to increase or counterclockwise to decrease blade tension. (Fig. 5.3)
- H. **Blade Guide Scale:** Displays position of blade guide arms relative to fixed vise jaw.
- I. **Blade Guide Arms:** Hold blade guides that support band saw blade. Arms are placed as close to workpiece as possible during cutting to prevent blade from twisting.
- J. **Work Stop:** Quickly positions workpiece during repetitive cutting operations. (Fig. 5.5)

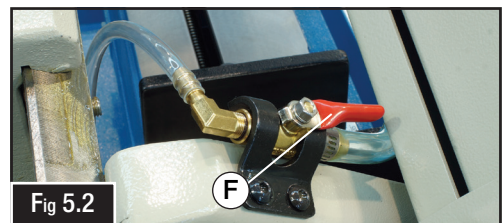


Fig 5.2

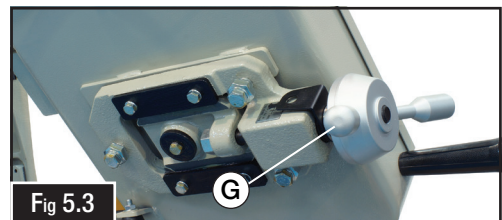


Fig 5.3

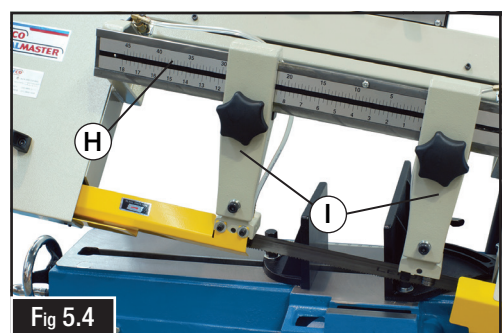
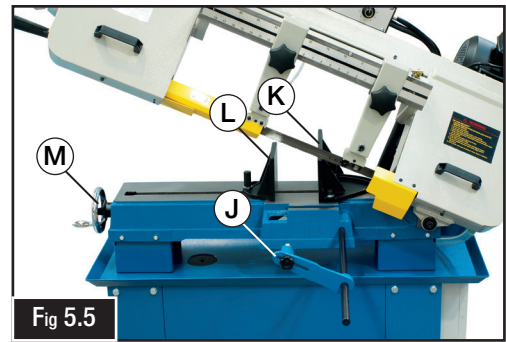


Fig 5.4

**Other Controls Cont.:**

- K. **Fixed Vise Jaw:** Can be adjusted to cut angles from 45° to 90°.
- L. **Movable Vise Jaw:** Features quick-release that allows jaw width to be adjusted when changing from one work piece size to another.
- M. **Vise Hand Wheel:** Adjusts position of movable vise jaw relative to fixed vise jaw.



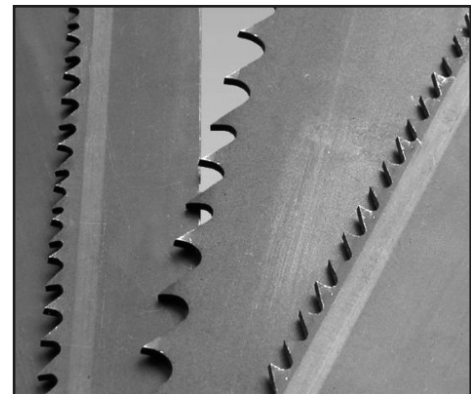
**5.3 BLADE SELECTION CHARTS**

Band saw tooth size is determined by the size of the cross section to be cut. In general cutting thinner sections requires more teeth per inch, thicker sections require coarser pitches, or less teeth per inch.

To select an appropriate tooth size please refer to the table immediately below unless material to be cut is a tube, in which case refer to the larger table below. For general purpose cutting use a constant pitch blade, for more aggressive production cutting of harder to cut materials use a variable pitch blade.

**SOLID SECTION**

SECTION SIZE (MM)	CONSTANT PITCH (TPI)	VARIABLE PITCH (TPI)
UP to 10	24 or 18	14/18 or 10/14
10 - 15	14	8 - 12
16 - 30	10	6 - 10
31 - 50	8	5 - 8
51 - 80	6	4 - 6
81 - 120	4	3 - 4
121 - 200	3	1 - 3
OVER 200	2 or 1.25	1.4 - 2 or 0.8 - 1.3



**TUBE SECTION**

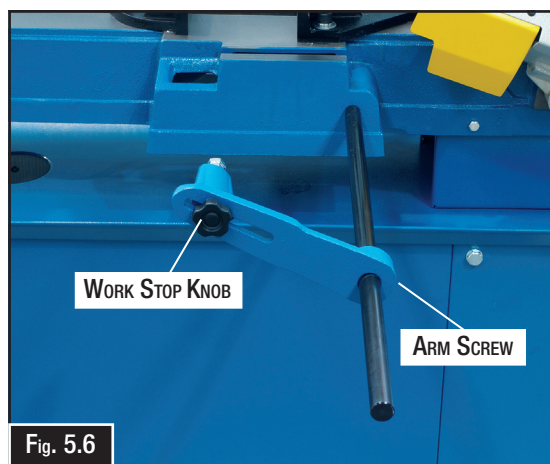
WALL THICKNESS (MM)	OUTSIDE DIAMETER OF TUBE OR MAXIMUM PROFILE SECTION LENGTH (MM)												
	20	40	60	80	100	120	150	200	300	500	600	700	800
2	14	14	14	14	14	14	10-14	10-14	8-12	8-12	6-10	5-8	5-8
3	14	14	10-14	10-14	10-14	10-14	8-12	8-12	6-10	6-10	5-8	5-8	5-8
4	14	14	10-14	10-14	8-12	8-12	6-10	6-10	5-8	5-8	4-6	4-6	4-6
5	14	10-14	10-14	8-12	8-12	6-10	6-10	5-8	5-8	4-6	4-6	4-6	4-6
6	14	10-14	10-14	8-12	8-12	6-10	6-10	5-8	5-8	4-6	4-6	3-4	3-4
8	16	10-14	8-12	8-12	6-10	6-10	5-8	5-8	4-6	4-6	3-4	3-4	3-4
10		8-12	8-12	6-10	6-10	5-8	5-8	4-6	4-6	3-4	3-4	3-4	3-4
12		8-12	6-10	6-10	5-8	5-8	4-6	4-6	3-4	3-4	3-4	3-4	2-3
15			6-10	5-8	5-8	4-6	4-6	4-6	3-4	3-4	3-4	2-3	2-3
20				5-8	4-6	4-6	4-6	3-4	3-4	2-3	2-3	2-3	2-3
30					4-6	4-6	3-4	3-4	3-4	2-3	2-3	2-3	2-3
50						3-4	3-4	3-4	2-3	2-3	2-3	2-3	2-3
75							2-3	2-3	2-3	2-3	2-3	1.4-2	1.4-2

### 5.4 SETTING THE WORK STOP

The work stop is used to setup the saw for making multiple cuts of the same length (Fig. 5.6).

To Set The Work Stop:

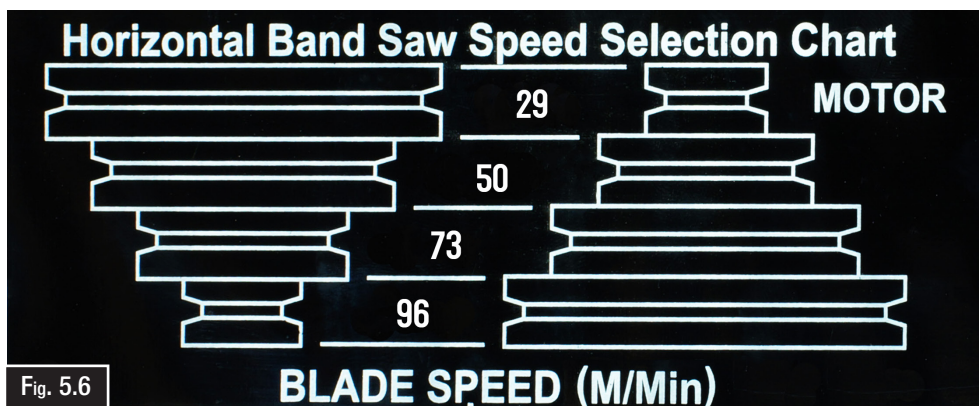
1. Loosen the screw in the work stop arm. (Fig. 5.6)
2. Adjust the work stop rod to the desired length.
3. Adjust the work stop rod so it contacts the end of the workpiece.
4. Loosen the work stop knob and slide it down as close to the bottom of the cut as possible. Tighten the knob. (Fig. 5.6)



**CAUTION: Do not allow the blade to rest on the workpiece when the saw is not cutting.**

### 5.5 SELECTING THE SPEED

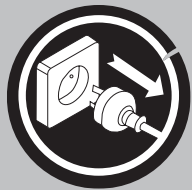
The “best” speed for a metal cutting band saw varies significantly by material, ranging from approximately 20-150 m/min (65-500 ft/min), with the specific optimal speed determined by the material’s hardness and thickness. Slower speeds are for hard materials like tool steel (e.g., 25-36 m/min), while faster speeds are for softer metals like copper alloys (e.g., 147 m/min) or aluminium (which can go up to the maximum speed of the saw to prevent chip welding). See charts below.



### SUGGESTED SPEED CHART

Material	Speed (M/Min)	Drive Motor Pulley
Tool Steel, Stainless Steel, Alloy Steels	38 ~ 52	1
Medium to High Carbon Steel	51 ~ 70	2
Low Carbon Steel Soft Brass	136 ~ 184	3
Cast Iron, Working Tool Steels	55 ~ 70	2
Aluminum, Copper, Plastics	100 ~ 138	4

## 5.6 CHANGING THE SPEED



### **WARNING!**

*Always disconnect the power to the machine before servicing or doing maintenance to the machine.*

1. Set the arm at the full horizontal position.
  2. Remove the locking screw from the belt cover. Open the drive belt cover to expose the V-belt and pulleys. (Fig 5.7)
  3. Loosen the knob on the front of the drive assembly, and pivot the motor to loosen the belt.
  4. Move the belt to the required position on the pulleys.
  5. Once the belt has been moved then re-tension the belt by adjusting the knob on the front of the drive assembly until the belt is tensioned. (Fig. 5.8)
- NOTE: To check the correct tension press the belt firmly midway between the pulleys. The belt should only deflect around 6mm.**
6. Use the lock nut to secure the motor in place.
  7. Close the belt cover and secure with the set screw.

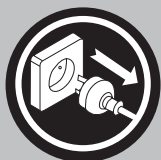
FIG. 5.7, FIG. 5.8



Fig. 5.7



Fig. 5.8



### **WARNING!**

*Always disconnect the power to the machine before servicing or doing maintenance to the machine.*

## 5.7 FEED CONTROL

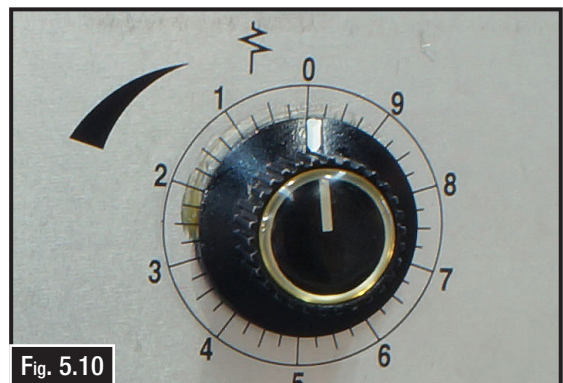
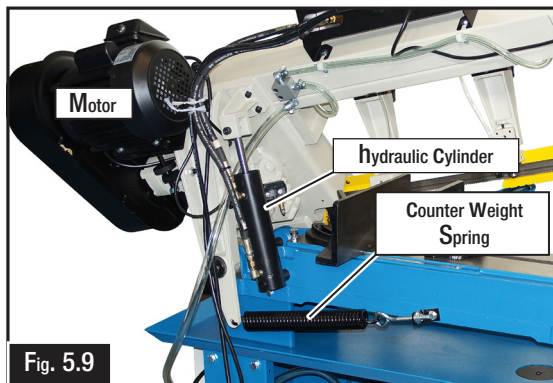
The weight of the saw head provides the force needed to cut through the workpiece. The cut-off saw has a hydraulic cylinder that controls the feed rate of the saw. The hydraulic feed control circuit consists of a single-acting hydraulic cylinder and a flow-control valve. The feed control cylinder resists motion in the downward direction to control the feed rate.

The control cylinder offers no resistance when raised upward. (Fig. 5.9)

A knob on the control panel (Fig. 5.10) controls the rate at which the saw head is lowered. The control knob (needle valve) controls the rate at which the hydraulic fluid is released from the hydraulic cylinder. When the needle valve is closed, cylinder is locked. With the needle valve slightly open, the cylinder permits slow, or light, downward force.

Opening the needle valve further increases the feed rate and applies more weight to the saw blade and workpiece. The needle valve is adjusted until the saw is operating efficiently. The efficiency of operation is usually evaluated by observing chip formation. If the chips formed are curled, but colored-blue or straw colored from heat generated during the cut then the feed rate is too high. If the chips are slightly curled and are not colored by heat-the blade is sufficiently sharp and is cutting at its most efficient rate.

## 5.7 FEED CONTROL Cont.



**Note:** The feed dial is not rated at any value but only an indication for increase or decreasing the feed rate. Observe chips that exit the cut, and increase or decrease feed rate according to chip characteristics. (Fig. 5.9)

## 5.8 BLADE BREAK IN

New blades are very sharp, and therefore have a tooth geometry that is easily damaged if a careful break-in procedure is not followed. Consult the blade manufacturer's literature of break-in of specific blades on specific materials. However, the following procedure will be adequate for break-in of HAFCO supplied blades on lower alloy ferrous materials.

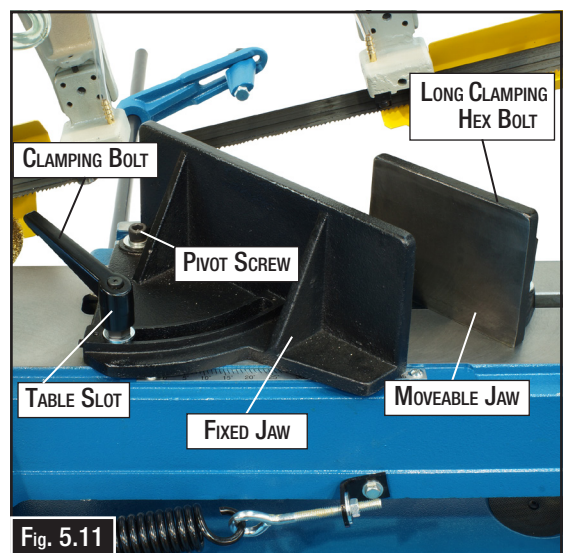
1. Clamp a section of round stock in the vice. The stock should be 2 inches or larger in diameter.
2. Operate the saw at low speed. Start the cut with a very light feed rate.
3. When the saw has completed 1/3 of the cut, increase the feed rate slightly and allow the saw to complete the cut.
4. Keep the hydraulic cylinder needle valve in the same position and begin a second cut on the same or similar workpiece.

## 5.9 SETTING THE VICE FOR ANGLE CUTS

The vice can be adjusted through a 45-degree (Refer to Fig. 5.11)

Adjust as follows:

1. Loose the clamping bolt and the pivot screw of the fixed vice jaw.
2. Rotate the fixed vice jaw to the desired angle. For accurate cuts, use a variable protractor to set the position of the jaw (align one side of the slot in the table).
3. Tighten both clamping bolt and the pivot screw on the fixed vice jaw.
4. Loosen the long hex clamping screw on the moveable vice jaw. Adjust the position of the moveable vice jaw so it is parallel to the fixed vice jaw.
5. If the the work piece has non-parallel sides, set the moveable vice jaw against the side of the work piece. Tighten the clamping bolt on the moveable vice jaw to secure it.



### 5.10 SETTING THE VICE FOR SQUARE CUTS

The procedure for setting the vice for square cuts is identical to the setting for angle cuts, except that a machinist's square is used to position the fixed vice jaw.

Align one side of the square with the side of the slot in the table. (Fig. 5.12)

#### **CAUTION!**

*Make sure the blade is not in contact with the workpiece when the Motor is started. Do not drop the saw Head on the workpiece or force the saw through the workpiece.*

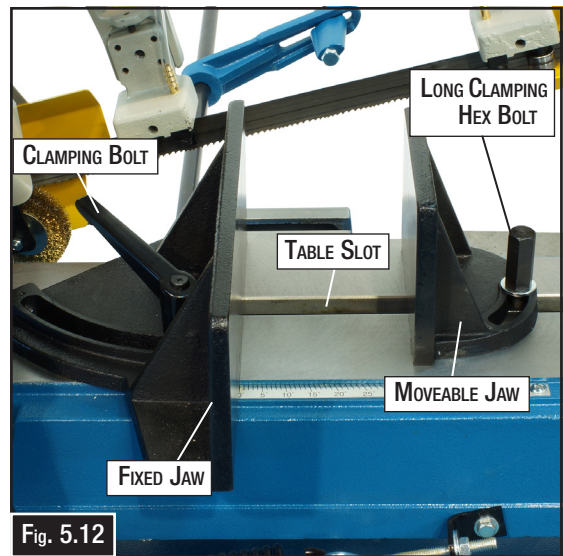


Fig. 5.12

### 5.11 BLADE GUIDE SUPPORTS SETTING

The band saw has adjustable blade guide supports (Fig. 5.13). The blade guide support allows you to set the blade guide for varying widths of workpieces.

To make accurate cuts and prolong blade life, the blade guide supports should be set close to the work piece. The blade guide support should be set so it just clears the piece to be cut. Adjust the bar position as follows:

1. Place the workpiece in the vice and clamp tightly.
2. Loosen the locking knobs on the front of the guide supports.
3. Slide the guide supports so the gap between them will clear the work piece.
4. Tighten the locking knobs to secure the guide supports.

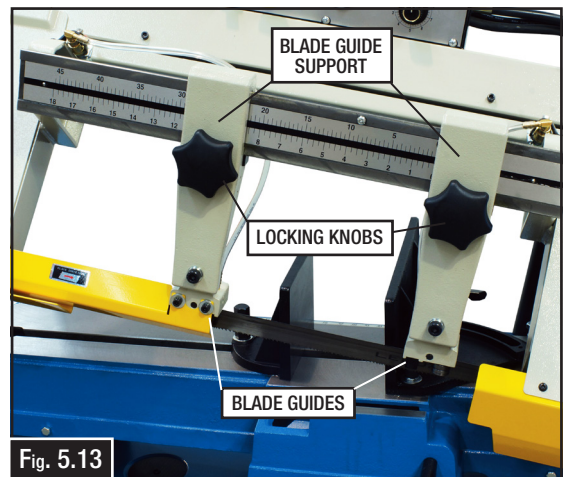
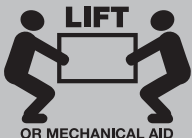


Fig. 5.13

#### **2 PERSON LIFT**



#### **CAUTION!**

*This work piece may not appear to be heavy, but damage to the back or legs can occur if lifting practices are not followed. When lifting bend the knees and keep the back straight.*

## 5.12 CHANGING THE BLADE

Blades should be changed when they become dull, damaged, or when you are using materials that require a blade of a certain type or tooth count.

To change the blade:

1. DISCONNECT THE MACHINE FROM THE POWER
2. Raise the saw head to the fully up position. Lock the hydraulic cylinder to hold the saw head in place.
3. Open the wheel guards on the sides of the saw head (guards at both ends are hinged.) (Fig. 5.15)
4. Undo the 2 screws and remove the left blade guard. (Fig. 5.16)
5. Release the blade tension handle until the blade hangs loose.
6. Use leather gloves to prevent cuts or scratches. Pull the blade off the drive wheels and out of the blade guides. Store the removed blade carefully before proceeding. (Fig. 5.17)
7. Slide the new blade into the blade guides, then loop the blade over the upper and lower drive wheels. Install the new blade so the vertical side of the teeth contacts the workpiece first.
8. Push the blade so it is seated against the shoulders of the wheels. When it is seated against the shoulder turn the blade tension handle clockwise to increase the tension. Do not over-tension the blade; tighten it just enough so it does not slip while cutting.
9. When the blade is properly tensioned, reconnect the saw to electrical power source.
10. Check and adjust the tracking of the blade. Refer to Blade tracking adjustment.
11. Install the wheel guards and the blade covers.



### **WARNING!**

*Blades are very sharp. If not careful serious injury can result from touching the blades with bare hands. Leather work gloves should be worn when handling these blades.*

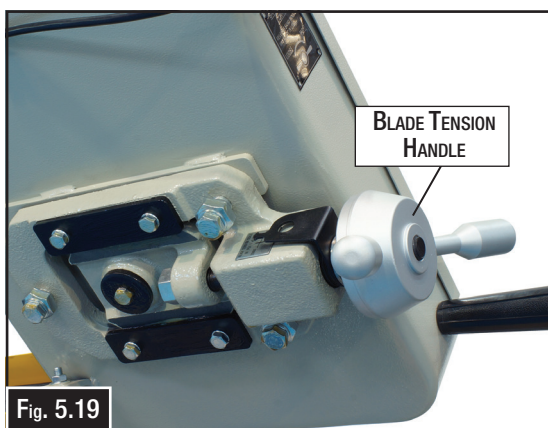
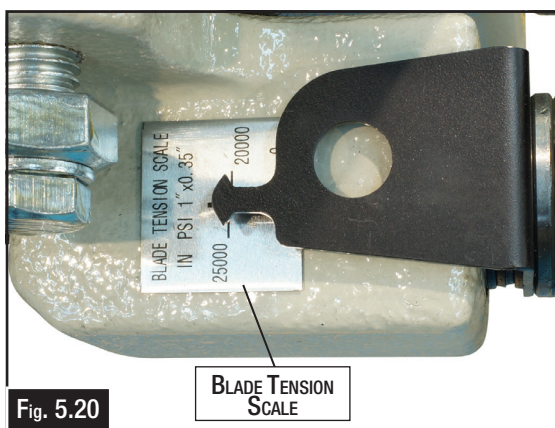
### 5.13 TENSIONING THE BLADE

Correct blade tension is essential to avoid blade twist, vibration, or slippage on the wheels. A blade that is correctly tensioned will give straight cuts, long blade life, and efficient cutting times.

There are three major signs of incorrect blade tension: 1) The blade stalls in the cut and slips on the wheels, 2) the blade frequently breaks, and 3) the band saw does not make straight cuts.

#### To Tension The Blade:

1. Make sure blade is tracking properly (refer to Blade Tracking on Page 24 for details).
2. DISCONNECT MACHINE FROM POWER!
3. Loosen and slide left blade guide arm as far left as it will go, then secure. (see Fig. 5.18)
4. Turn tension handle clockwise to tighten blade or counterclockwise to loosen the blade. (Fig. 5.19)
5. Tighten blade until tension scale needle moves into the centre section of scale for 27mm wide blades, as shown in Fig. 5.19.



### 5.14 COOLANT

The coolant tank and motor are housed in the base of the machine and can be accessed from the rear of the machine. (Fig. 5.21)

The general-purpose coolant is a mixture of soluble oil and water. Mix one part of soluble oil to twenty parts of water.

For the coolant pump to operate properly the coolant needs to be above the minimum line on the tank.

There are numerous coolants on the market that are formulated for special applications. Consult your local distributor for details in the event you have a long range production task, or are required to cut some of the more exotic materials.



## 6. MAINTENANCE



*Before maintaining or cleaning the machine, turn off the circuit breaker, or disconnect the machine from the power supply. Post a sign to inform other workers that the machine is under maintenance.*

For optimum performance from the machine, it is important that the machine is well cleaned and maintained. Follow the maintenance schedule listed in the following section and refer to any specific instructions given.

### 6.1 SCHEDULE

#### Daily Check

- Loose mounting bolts.
- Worn or damaged wires.
- Check/adjust lubrication.
- Any other unsafe condition

#### Cleaning

Cleaning the machine is relatively easy. Wipe down all unpainted and machined surfaces daily to keep them rust free and in top condition. This includes any surface that is vulnerable to rust if left unprotected. Use ISO 68 machine oil or any other quality metal lubricant.

### 6.2 LUBRICATION

Lubricate the following components at the specific frequencies and using the lubricants defined as follows:

1. Ball bearings are lubricated and sealed-periodic lubrication is not required.
2. Blade guide bearings are lubricated and sealed, periodic lubrication is not required.
3. Upper wheel bushing-six to eight drops of oil each week.
4. Pivot points, shafts and bearing machine surfaces, six to eight drops of oil each week.
5. Replace the oil in the gearbox every 12 months
6. Change coolant on a frequency depending on the type of coolant being used. Oil based coolants can sour. Refer to the coolant supplier's instructions for change frequency.

### 6.3 CLEANING

1. Clean off any preservative on machine surfaces
2. After cleaning, coat machined surfaces of the machine with a medium consistency machine oil. Re-apply the oil coating at least every six months.
3. Clean up accumulated saw cuttings after use. Make sure the lead screw and rapid nut are kept free from saw cuttings and other material that would cause damage.
4. Clean the chip sludge from the coolant tank. Change the coolant on the frequency as instructed by the coolant supplier.

## 6.4 BLADE TRACKING ADJUSTMENT

Blade tracking has been tested at the factory. Adjustment is rarely required when the blade is used properly or if the blade is correctly welded. (Refer to Fig. 6.1) for location of blade tracking adjustment screws. ***This procedure should only be carried out by your service engineer***

1. Put the saw head in the vertical position. Open the wheel guards.
2. Remove both of the blade-guide bearing bracket assemblies.
3. Make sure the blade is properly tensioned.

**NOTE: Keep proper tension at all times using blade tightening assembly.**

4. Loosen the hex jam nut in the top head near the blade tension, until it is snug against the slide casting.

**CAUTION: While performing the following, keep the blade from rubbing excessively on the shoulder of the wheel. Excessive rubbing will damage the wheel and/or the blade.**

5. Start the saw. Turn the setscrew to tilt the idler wheel until the blade is touching the shoulder of the idler wheel.
6. Turn the setscrew so the blade starts to move away from the shoulder of the wheel, then immediately turn the setscrew in the other direction so the blade stops. Then move the blade slowly toward the shoulder.
7. Turn the setscrew to stop motion of the blade on the wheel as it gets closer to the wheel shoulder. Put a 6-inch length of paper between the blade and the wheel as shown in Fig. 6.2. The paper should not be cut as it passes between the wheel shoulder and the blade.
8. Turn the setscrew a small amount. Repeat the insertion of the paper between the wheel shoulder and the blade until the paper is cut in two pieces.

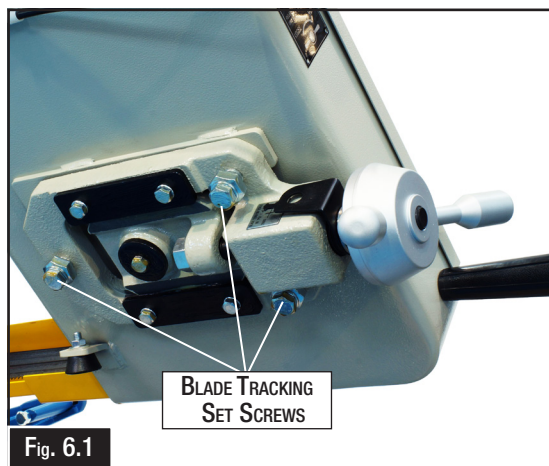


Fig. 6.1

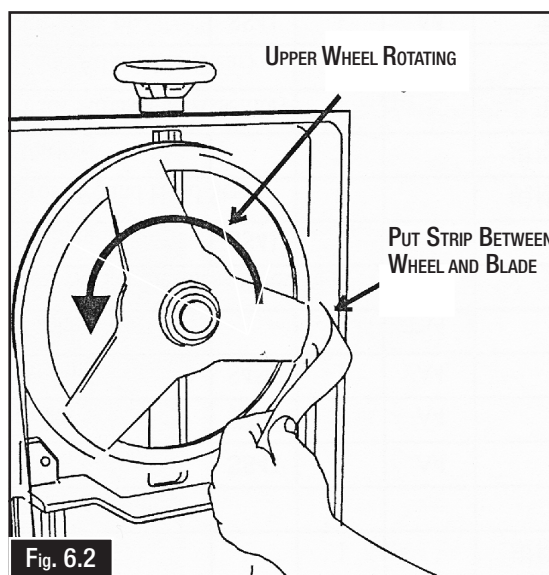


Fig. 6.2

**WARNING: KEEP FINGERS CLEAR OF THE BLADE AND WHEEL TO AVOID INJURY.**

**NOTE: You may have to repeat the check with the paper several times before the blade and the shoulder cut the paper into two pieces. Do not hurry the adjustment. Patience and accuracy here will pay off with better, more accurate, quieter cutting and much longer machine and blade life.**

9. When the paper is cut, turn the setscrew slightly in the counterclockwise direction. This assures that the blade is not touching the shoulder of the wheel.
10. Shut off the saw and tighten the hex jam nut against the setscrews and casting.
11. Install the top and bottom blade guide assemblies. Position the guides so the top bearing just touches the blade.
12. Close and secure the wheel covers.

## 6.5 BLADE GUIDE ADJUSTMENT

Proper adjustment of the blade guide bearings is critical to efficient operation of the band saw. The blade guide bearings are adjusted at the Factory and they should rarely require adjustment. When adjustment is required, readjust immediately. Failure to maintain proper blade adjustment may cause serious blade damage or inaccurate cuts.

It is always better to try a new blade when cutting performance is poor. If performance remains poor after changing the blade, make the necessary adjustments.

If a new blade does not correct the problem, check the blade guides for proper spacing. For most efficient operation and maximum accuracy, provide 0.025mm clearance between the blade and the guide bearings. The bearings will still turn freely with this clearance. If the clearance is incorrect, the blade may track off the drive wheel. If required, adjust the guide bearings as follows:

### To Adjust The Backing Bearings:

1. Make sure blade is tensioned and tracking correctly before making the adjustments,.
2. DISCONNECT MACHINE FROM POWER!
3. Raise the headstock high enough to give you room to work, then lock in place.
4. Remove blade guard from left blade arm.
5. Loosen cap screw on right blade guide arm (facing front of machine), as shown in Fig. 6.3.
6. Using a Hex key move the assembly up or down until the backing bearing lightly touches the back of the blade, then tighten cap screw. (Fig. 6.4)

**Note: If it is difficult to slide blade guide assembly onto blade, adjust blade guide roller bearings and carbide guides away from blade.**

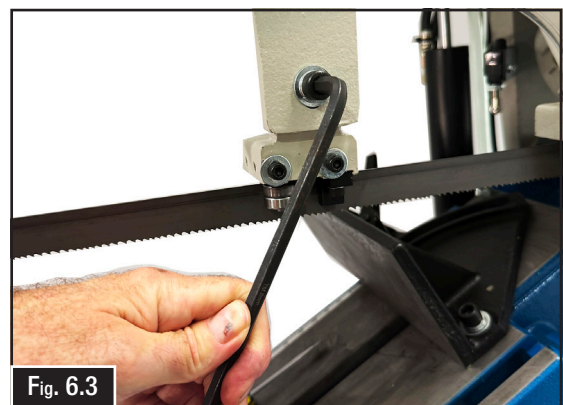
7. Repeat Step 5 for left blade guide arm.

### To Adjust The Guide Bearings:

1. Loosen set screws shown to allow guide bearings on front blade guide arm to turn.
2. Turn eccentric shaft with a screwdriver and adjust guide bearings so they lightly contact blade or have maximum clearance of 0.05 mm.

**Note: Since bearings twist blade into position, it is acceptable if there is 0.025 - 0.05mm gap between blade and front or back of bearing. Just make sure not to squeeze blade too tightly with bearings.**

3. After the guide bearings are set, you should be able to rotate them although they will be hard to move with your fingers. (Fig. 6.5)
4. Tighten set screws.



## 6.5 BLADE GUIDE ADJUSTMENT Cont.

### To Adjust The Guide Bearings Cont:

5. Adjust the carbide blade guides so they make same contact with blade the same as the guide bearings. (Fig. 6.6)
6. Reposition right blade guide arm flush with right end of blade guide scale, so it does not contact vice during operation.
7. Adjust blade guide bearings on left blade guide arm in same manner.
8. Re-install blade guard onto left blade arm.



## 6.6 CHIP BRUSH REPLACEMENT

The purpose of the brush is to remove chips from the saw teeth and off of the blade so excessive amounts of chips don't get into the wheel guard section of the saw.

### To Replace The Brush:

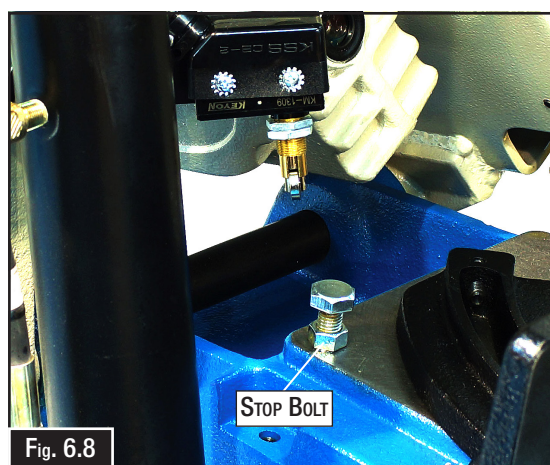
1. DISCONNECT THE MACHINE FROM THE POWER.
2. Remove the nut and screw. Remove the worn brush and spacer.
3. Install the spacer and replacement brush, screw and nut.
5. Adjust the bracket, if necessary, so the brush makes slight contact with the saw blade.



## 6.7 ADJUSTING THE LIMIT STOP

Adjust the limit switch stop so that the machine will stop when the saw has cut through the workpiece.

1. DISCONNECT THE MACHINE FROM THE POWER.
2. Lift headstock, then adjust feed rate dial as needed, and lower headstock.
3. Listen for click from limit switch when headstock reaches bottom of its travel. If switch does not click, loosen jam nut, slightly adjust stop bolt, and repeat until satisfactory. (Fig. 6.8)
4. Tighten jam nut against the base to prevent stop bolt from loosening during use.



## 6.8 TROUBLESHOOTING

Review the troubleshooting and procedures in this section if a problem develops with your machine. If you need replacement parts then follow the procedure in the beginning of the spare parts section or if additional help with a procedure is required, then contact your distributor.

**Note: Make sure you have the model of the machine, serial number, and manufacture date before calling.**

Symptoms	Possible Cause	Possible Solution
Motor stalls	<ol style="list-style-type: none"> <li>Excessive belt tension</li> <li>Excessive head pressure.</li> <li>Excessive blade speed.</li> <li>Improper blade selection</li> </ol>	<ol style="list-style-type: none"> <li>Adjust belt tension so that belt does not slip on drive belt under moderate pressure.</li> <li>Reduce head pressure.</li> <li>Refer to "Selecting The Speed" on page 17.</li> <li>Refer to "Blade Selection Chart" page 16.</li> </ol>
Cannot make square cut.	<ol style="list-style-type: none"> <li>Dull Blade.</li> <li>Guide rollers not adjusted properly.</li> <li>Vise jaw not adjusted properly.</li> <li>Excessive head pressure.</li> </ol>	<ol style="list-style-type: none"> <li>Replace The Blade.</li> <li>Refer to "Blade Guide Adjustment" page 25.</li> <li>Check the vice jaws.</li> <li>Reduce the feed rate.</li> </ol>
Increased cutting time	<ol style="list-style-type: none"> <li>Dull Blade.</li> <li>Insufficient head pressure.</li> <li>Reduced Blade speed.</li> </ol>	<ol style="list-style-type: none"> <li>Replace the blade.</li> <li>Increase the feed rate.</li> <li>Refer to "Selecting The Speed" on page 17.</li> </ol>
Will not cut	<ol style="list-style-type: none"> <li>Motor running in wrong direction.</li> <li>Blade teeth pointing in wrong direction.</li> <li>Hardened material</li> </ol>	<ol style="list-style-type: none"> <li>Reverse rotation of motor.</li> <li>Remove blade, turn blade inside out and Re-install blade.</li> <li>Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required)</li> </ol>
Motor will not start	<ol style="list-style-type: none"> <li>Overload relay activated.</li> <li>Magnetic switch open, or protector open.</li> <li>Low voltage.</li> <li>Open circuit in motor or loose connections.</li> </ol>	<ol style="list-style-type: none"> <li>Reset the relay.</li> <li>Reset protector by pushing red button. (inside electric box.)</li> <li>Check power line for proper voltage.</li> <li>Inspect all lead terminations on motor for loose or open connections</li> </ol>
Motor will not start, fuse or circuit breakers "blow".	<ol style="list-style-type: none"> <li>Short circuit in line, cord or plug.</li> <li>Short circuit in motor or loose connections.</li> <li>Incorrect fuses or circuit breakers in power line.</li> </ol>	<ol style="list-style-type: none"> <li>Inspect line, cord and plug for damaged insulation and shorted wire.</li> <li>Inspect all lead terminations on motor for loose or shorted terminals or worn insulation on wires.</li> <li>Install correct fuses or circuit breakers.</li> </ol>
Motor fail to develop full power.	<ol style="list-style-type: none"> <li>Power line overloaded with lights, appliances and other motors.</li> <li>Under size wires or circuit too long.</li> <li>General overloading of local power facilities.</li> </ol>	<ol style="list-style-type: none"> <li>Reduce the load on the power line.</li> <li>Increase wire sizes, or reduce length of wiring.</li> <li>Request a voltage check from the power company</li> </ol>
Motor overheat	<ol style="list-style-type: none"> <li>Motor overloaded.</li> <li>Air circulation through the motor restricted</li> </ol>	<ol style="list-style-type: none"> <li>Reduce load on motor.</li> <li>Clean out motor to provide normal air circulation through motor.</li> </ol>
Motor stalls	<ol style="list-style-type: none"> <li>Short circuit in motor or loose connections.</li> <li>Low voltage.</li> <li>Incorrect fuses or circuit breakers in power line.</li> <li>Motor overloaded.</li> </ol>	<ol style="list-style-type: none"> <li>Inspect terminals in motor for loose or shorted terminals or worn insulation on lead wires.</li> <li>Correct the low line voltage conditions.</li> <li>Install correct fuses circuit breakers.</li> <li>Reduce motor load.</li> </ol>
Frequent opening of fuses or circuit breakers.	<ol style="list-style-type: none"> <li>Motor overloaded</li> <li>Incorrect fuses or circuit breakers.</li> </ol>	<ol style="list-style-type: none"> <li>Reduce motor load.</li> <li>Install correct fuses or circuit breakers.</li> </ol>
Teeth stripping	<ol style="list-style-type: none"> <li>Too few teeth per inch.</li> <li>Loading of gullets.</li> <li>Excessive feed.</li> <li>Work not secured in vise.</li> </ol>	<ol style="list-style-type: none"> <li>Use finer tooth blade.</li> <li>Use coarse tooth blade or cutting lubricant.</li> <li>Decrease feed.</li> <li>Clamp material securely.</li> </ol>



### **WARNING!**

**Make sure the machine is turned OFF and the cord is disconnected from the power source before installing/removing and servicing any component of the machine.**

**6.8 TROUBLESHOOTING Cont.**

Symptoms	Possible Cause	Possible Solution
Blade breakage	<ol style="list-style-type: none"> <li>Teeth too coarse.</li> <li>Misalignment of guides.</li> <li>Dry cutting</li> <li>Excessive speed</li> <li>Excessive feed</li> </ol>	<ol style="list-style-type: none"> <li>Use a finer tooth blade.</li> <li>Adjust saw guides.</li> <li>Use cutting lubricant.</li> <li>Lower speed. See Operating Instructions "Selecting the Speed" Page 17.</li> <li>Reduce feed pressure. Refer to Operating Instructions "Feed Control" Page 18.</li> </ol>
Blade breakage	<ol style="list-style-type: none"> <li>Excessive tension.</li> <li>Wheels out of line</li> </ol>	<ol style="list-style-type: none"> <li>Tension blade to prevent slippage on drive wheel while cutting.</li> <li>Adjust wheels</li> </ol>
Blade cut Run-out or Run-in	<ol style="list-style-type: none"> <li>Guides out of line.</li> <li>Excessive pressure.</li> <li>Support of blade insufficient.</li> <li>Material not properly secured in vise.</li> <li>Blade tension incorrect.</li> </ol>	<ol style="list-style-type: none"> <li>For a straight and true cut, realign guides, check bearings for wear.</li> <li>Conservative pressure assures long blade life and clean straight cuts.</li> <li>Move saw guides as close to work as possible.</li> <li>Clamp material in vise, level and secure.</li> <li>Loosen or tighten tension on blade.</li> </ol>
Blade twisting	<ol style="list-style-type: none"> <li>Blade not in line with guide bearings.</li> <li>Excessive blade pressure.</li> <li>Blade binding in cut.</li> </ol>	<ol style="list-style-type: none"> <li>Check bearings for wear and alignment.</li> <li>Decrease pressure and blade tension.</li> <li>Decrease feed pressure.</li> </ol>
Premature tooth wear	<ol style="list-style-type: none"> <li>Dry cutting.</li> <li>Blade too coarse.</li> <li>Not enough feed.</li> <li>Excessive speed</li> </ol>	<ol style="list-style-type: none"> <li>Use lubricant on all materials, except cast iron.</li> <li>Use finer tooth blade.</li> <li>Increase feed so that blade does not ride in cut.</li> <li>Decrease speed.</li> </ol>



**WARNING!**

*Electricity is dangerous and could cause death  
All electrical work must be carried out by a qualified electrician.*



**WARNING!**

*If the machine is to be hardwired to the power source, we strongly recommend securing your machine to the floor. Consult with your local electrician to ensure compliance with local codes.*

## METAL CUTTING BAND SAW

### BS-916A

Order Code: (B015)

The following section covers the spare parts diagrams and lists that were current at the time this manual was originally printed. Due to continuous improvements of the machine, changes may be made at anytime without notification.

#### HOW TO ORDER SPARE PARTS

1. Have your machines model number, serial number & date of manufacture on hand, these can be found on the specification plate mounted on the machine.
2. A scanned copy of your parts list/diagram with required spare part/s identified.

#### NOTE: SOME PARTS MAY ONLY BE AVAILABLE AS AN ASSEMBLY

3. Go to [www.machineryhouse.com.au/contactus](http://www.machineryhouse.com.au/contactus) and fill out the inquiry form attaching a copy of scanned parts list.



#### WARNING!

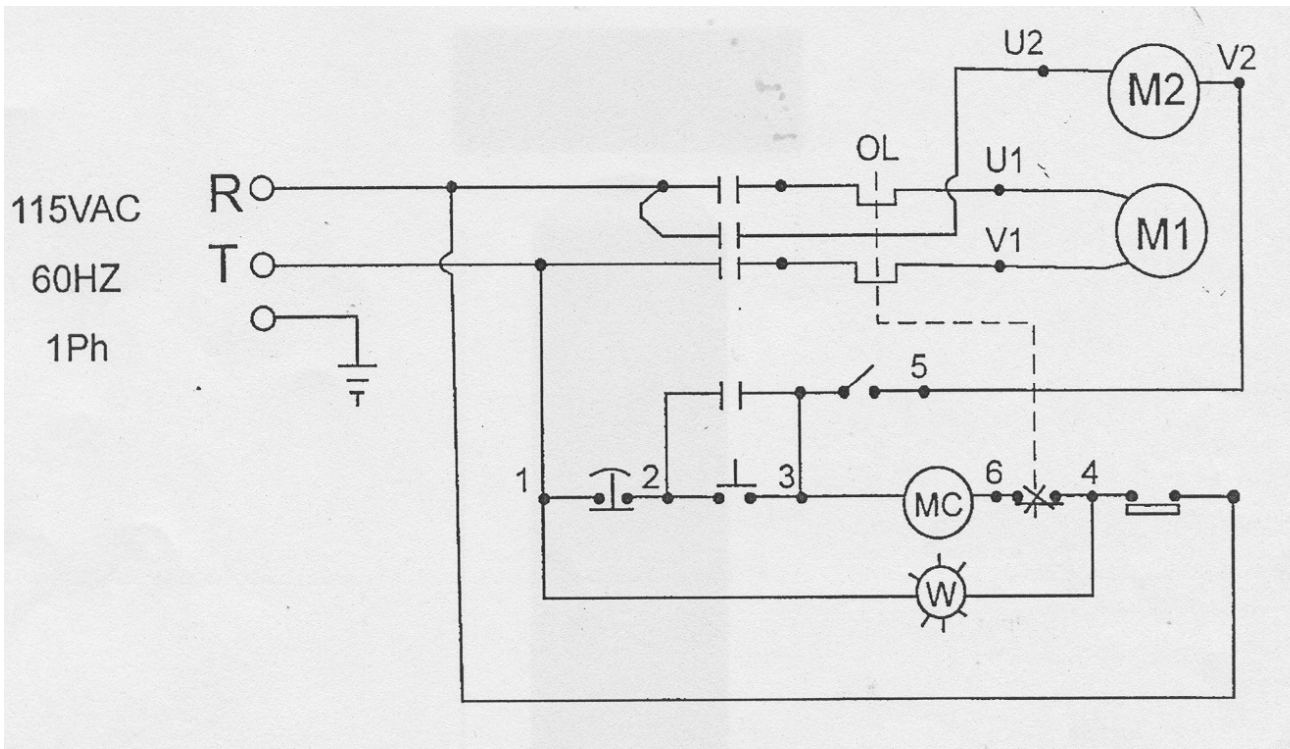
Electricity is dangerous and could cause death  
All electrical work must be carried out by a qualified electrician.



#### CAUTION!

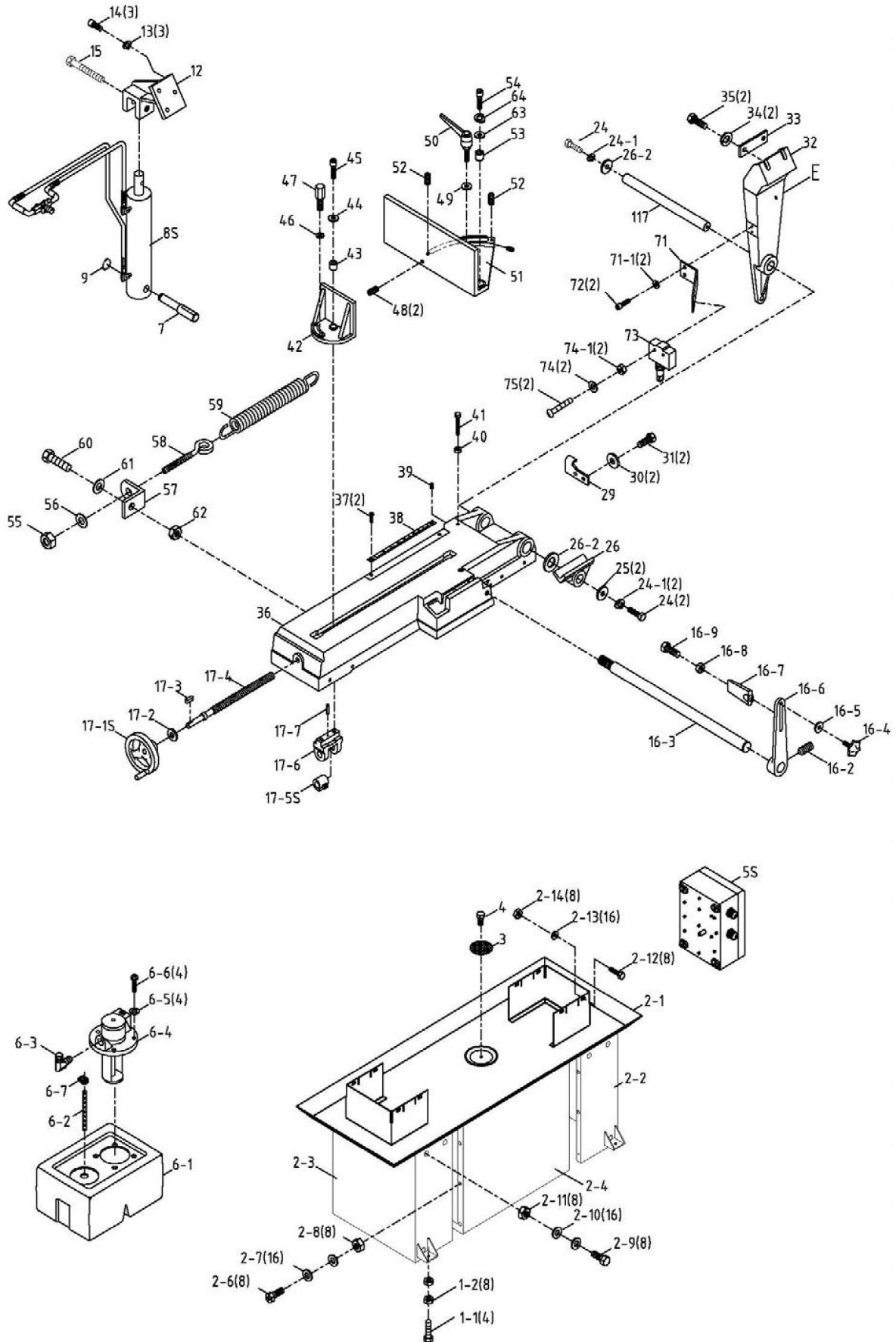
It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

**WIRING DIAGRAM**





**PARTS DIAGRAM - 2**



## PARTS LIST

Item	Fig. No.	Description	Qty	Item	Fig. No.	Description	Qty.
1-1	HS093	Hex. Head Screw M12-1.75P*50L	4	17-6	181138B	Bracket	1
1-2	HN007	Hex. Nut M12-1.75P	8	17-7	181610	Pin	1
2S	189001S	Stand Complete Assembly	1	24	HS059	Hex. Head Screw M10-1.5Px25L	2
2-1	189001C1	Coolant Pan	1	24-1	HW106	Spring Washer $\phi$ 10.2-3t	2
2-2	189001C2	Leg(Right)	1	25	198037	Drive Shaft Washer	2
2-3	189001C3	Leg(Left)	1	26	189013	Gap Ring	1
2-4	189001C4	Panel	1	26-2	189085B	Washer	2
2-6	S204	Hex. Head Screw 1/4"-20*3/4"L	8	29	196228	Position Set Bracket	1
2-7	W005	Washer 1/4"x16xt1.5	16	30	W018	Washer 5/16"x23xt3mm	2
2-8	N003	Hex. Nut 1/4"-20	8	31	HS046	Hex. Head Screw M8-1.25Px20L	2
2-9	S010	Hex. Head Screw 3/8"-16*1"L	8	32	189012	Rear Pivot Bracket	1
2-10	W013	Washer 3/8"x20xt2	16	33	191219	Bushing	1
2-11	N005	Hex. Nut 3/8"-16	8	34	HW106	Spring Washer $\phi$ 10.2-3t	2
2-12	HS050	Hex. Head Screw M8-1.25Px40L	8	35	HS061	Hex. Head Screw M10-1.5Px35L	2
2-13	W016	Washer 5/16"x23x2mm	16	36	189002	Base	1
2-14	HN005	Hex. Nut M8	8	37	HE501	Tablet Head Screw M5-0.8Px8L	2
3	191106A	Filter	1	38	189064	Degree-Meter	1
4	HS033	Hex. Head Screw M6-1.0Px15L	1	39	HS430	Hex. Headless Screw M8-1.25Px10L	1
5S	ET1924S	Control Box	1	40	HN005	Hex. Nut M8-1.25P	1
6S	MB240FS	Pump Set 1/8HP 230V 1PH/ 130MM	1	41	HS051	Hex. Head Screw M8-1.25Px45L	1
6-1	181256	Coolant Tank	1	42	196208	Vice Jaw Bracket	1
6-2	189061	Hose 13x19-350mm	1	43	191209	Bushing	1
6-3	103125-4	Coupler PT1/2x3/8	1	44	MW013	Flat Washer 3/8"	1
6-4	MB240	Pump 1/8HP/110V/220V/1PH	1	45	MS012	Hex. Head Bolt 3/8"-16 X 1-1/2"L	1
6-5	W004	Washer 1/4"x19xt1.5mm	4	46	HW025	Washer $\phi$ 10.5* $\phi$ 27Xt3mm	1
6-6	S717	Round Head Screw 1/4"-20*5/8"L	4	47	189067	Fixed Bolt	1
6-7	103125-5	Hose Clamp $\phi$ 19	1	48	HS434	Hex. Headless Screw M8-1.25Px30L	2
7	189036	Pivot Shaft	1	49	HW025	Washer $\phi$ 10.5* $\phi$ 27Xt3mm	1
8S	189065BS	Cylinder Assembly	1	50	191210	Knob	1
9	HCS07	C-Retainer S18	1	51	1966003	Vice Jaw Bracket(Rear)	1
12	189025	Cylinder Upper Bracket	1	52	HS422	Hex. Headless Screw M6-1.0Px10L	2
13	W205	Spring Washer 5/16"-2.0t	3	53	1966004	Bushing	1
14	HS244	Hex. Head Cap Screw M8-1.25Px30L	3	54	HS261	Hex. Head Screw M10-1.5Px35L	1
15	HS064	Hex. Head Screw M10-1.5Px50L	1	55	N005	Hex. Nut 3/8"	1
16S	189037S	Length Stop Set	1	56	W014	Washer 3/8"x23xt2	1
16-2	HS422	Hex. Headless Screw M6-1.0Px10L	1	57	181115	Spring Handle Bracket	1
16-3	189037	Distance Set Rod	1	58	181118	Spring Adjusting Rod	1
16-4	196213	Plum Screw	1	59	181117-1	Spring	1
16-5	W004	Spring Washer 1/4"x19xt1.5mm	1	60	S022	Hex. Head Screw 5/16"x3/4"L	1
16-6	189038	Support Rod	1	61	W016	Washer 5/16"x23xt2	1
16-7	1966008	Distance Set Bracket	1	62	N007	Hex. Nut 5/16"-18	1
16-8	HN006	Hex. Nut M10-1.5P	1	63	HW023	Washer $\phi$ 10.5* $\phi$ 21Xt2mm	1
16-9	HS059	Hex. Head Screw M10-1.5Px25L	1	64	HW106	Spring Washer $\phi$ 10.2-3t	1
17S	966002AS	Screw Set	1	71	189034	Limit Switch Support	1
17-1S	189055S	Hand wheel	1	71-1	HW004	Washer $\phi$ 6.5X $\phi$ 18Xt1.5mm	2
	189055	Hand wheel	1	72	HS334	Hex. Head Screw M6-1.0Px12L	2
	189055R	Knob	1	73	ET1617	Switch (For CE Only)	1
	HS422	Hex. Headless Screw M6-1.0Px10L	1	74	HW002	Washer $\phi$ 4.3X $\phi$ 9Xt0.8mm	2
17-2	W029	Washer 7/16"x30xt3mm	1	74-1	HN002	Hex. Nut M4-0.7P	2
17-3	HK007	Key 5x5x15L	1	75	HS513	Round Head Screw M4-0.7P*30L	2
17-4	1966002A	Acme Screw	1	117	189035	Pivot Shaft	1
17-5S	181604S	Acme Nut Assembly	1	133	HW004	Washer $\phi$ 6.5X $\phi$ 13Xt1mm	4
	181604	Acme Nut	1	134	HW104	Spring Washer M6	4
	181605	Button	1	200	189023J	Blade Guard (Front)	1
	191206	Retainer	1	201	196504	Saw Direction Label	1
	HF519	Round Head Screw M5-0.8Px10L	8	202	HT003	Button Head Screw M6-1.0P*10L	2
	HW103	Spring Washer $\phi$ 5.1-1.3t	1	202	103127	Knob M6-1.0Px10L	2

## PARTS LIST CONT.

Item	Fig. No.	Description	Qty	Item	Fig. No.	Description	Qty.
203	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	2	305	HN005	Hex. Nut M8-1.25P	4
204	HS243	Hex. Head Screw M8-1.25Px25L	2	306	189026	Cover	1
205	HI105	Spring Washer $\phi 8.2-2.5t$	2	306	189026E	Cover	1
206	HW005	Washer $\phi 8.4 * \phi 17 \times 1.6$ mm	2	306-1	189079	Sponge Pad	2
207	1965015	Blade Adjustable Knob	2	307	HS046	Hex. Head Screw M8-1.25Px20L	1
208	HW023	Washer $\phi 10.5 * \phi 21 \times 2$ mm	2	308	HW027	Washer $\phi 30 \times \phi 16 \times 3$ mm	1
209	189020	Arm (Left)	2	309	CA6205	Bearing 6025	2
209-1	189077	Label	2	310	189017	Idler Wheel	1
210	1965014	Gib	2	311	187056	Shaft	1
211	C100	C-Retainer $\phi 8$	4	312	189033	Handle	1
212	CA6082RS	Bearing 608-2RS	10	313	N005	Hex. Nut 3/8"	2
213	189018	Eccentric Guide	2	314	189010	Body Frame	1
214	189019	Eccentric Guide	2	314-1	HD602	Pipe Connector PT1/2"	1
215	HS230	Hex. Head Screw M6-1.0Px20L	4	314-2	189060	Net Tube $\phi 18 * 24-190$ mm	1
216	103120	Carbide Guide	4	314-3	189087	Screw M8-1.25P	1
217	121061	Bearing Shaft	2	314-4	HN005	Hex. Nut M8-1.25P	2
218	HS421	Hex. Headless Screw M6-1.0Px5L	4	314-5	189080	Filter	1
219	189015	Bearing Bracket (Left)	1	314-6	HT001	Round Head Screw M5-0.8Px10L	1
220S	189081S	Valve Assembly	2	315	189030	Cover	1
220-1	189081	Valve	2	315-1	103127	Hex. Head Screw M6-1.0Px10L	2
220-2	189088	Hose $\phi 6$	2	316	189039	Scale	1
220-3	189083	Straight Connector	2	316-1	HH001	Rivet $\phi 2 \times 5$ L	2
220-4	189084	Press Board	2	317	HS278	Hex. Head Screw M12-1.75P*20L	2
220-5	HW104	Spring Washer $\phi 6.1 * 1.9$	4	318	1965011	Column	1
220-6	HT016	Button Head Screw M6-1.0P*12L	4	319	HS432	Hex. Headless Screw M8-1.25Px20L	4
220-7	103126-4	Hose Clamp $\phi 12$	2	320	HS089	Hex. Head Screw M12-1.75P*30L	1
221	189014	Blade Adjustable (Rear)	1	321	HW107	Spring Washer $\phi 12.2-3.6t$	1
222S	189022S	Brush Assembly	1	322	198036	Drive Shaft Washer	1
222-1	189022	Brush Support	1	323	HK044	Key 7x7x30	1
222-2	191334A	Brush	1	324	189063	Blade 25*0.9*2908*5/8Tmm	1
222-3	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	2	325	189016	Drive Wheel key $\phi 8$ MM	1
222-4	HN004	Hex. Nut M6-1.0P	2	326	HS258	Hex. Head Screw M10-1.5Px20L	3
222-5	HS037	Hex. Head Screw M6-1.0Px35L	1	327	HW106	Spring Washer $\phi 10.2-3t$	3
223	HS032	Hex. Head Screw M6-1.0Px10L	1	328	19116S-3	Gear Box Assembly 1:30, $\phi 22$ ,key=5X5	1
223-1	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	1	328	19116S-1	Gear Box Assembly 1:30, $\phi 22$ ,key=7X7	1
224	HF404	Round Head Screw M6-1.0Px12L	2	329	HN006	Hex. Nut M10-1.5P	2
225	189021	Blade Guard II (Rear)	1	330	189031	Shaft	1
226	HN004	Hex. Nut M6-1.0P	2	330-1	189032	Knob	1
230	189091	Micro Switch Bracket	2	331	HN007	Hex. Nut M12-1.75P	1
231	HT001	Round Head Screw M5-0.8Px10L	2	332	HS266	Hex. Head Screw M10-1.5Px60L	1
232	HS032	Hex. Head Screw M6-1.0P*10L	2	333	105076	Shaft	1
233	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	2	334	105050B	Motor Plate	1
290S	189072S	Infrared Assembly	2	335	105079	Motor Bracket	2
290	189074	Infrared Bracket	2	336	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	4
291	189072	Infrared	2	337	HS034	Hex. Head Screw M6-1.0Px20L	4
292	HS558	Round Head Screw M5-0.8P*8L	2	338	M601	Motor 1KW) 220V 60HZ 11.5A .4 P	1
293	HW003	Washer $\phi 5.3 * \phi 10 \times 1$ mm	2	339	HK108	Key 7x7x35L	1
294	HS558	Round Head Screw M5-0.8P*8L	4	339	HK108	Key 8x7x35L	1
295	189073	infrared Bracket	10	340	HW005	Washer $\phi 8.4 * \phi 17 \times 1.6$ mm	4
300	HS241	Hex. Head Screw M8-1.25Px15L	2	341	HS045	Hex. Head Screw M8-1.25Px15L	4
301	1965052	Knob	2	342	HS032	Hex. Head Screw M6-1.0Px10L	3
302	103127	Knob M6-1.0Px10L	4	343	HW016	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	3
302-1	HW003	Washer $\phi 5.3 * \phi 10 \times 1$ mm	4	345S	189059JS	Motor Pulley Cover Assembly	1
302-2	HT001	Round Head Screw M5-0.8Px10L	2	345-1	103127	Hex. Head Screw M6-1.0Px10L	1
303	189027	Blade Back Cover	4	345-2	HW004	Washer $\phi 6.5 \times \phi 18 \times 1.5$ mm	1
303	189027E	Blade Back Cover	1	345-3	189086	Bracket	1
304	HW105	Spring Washer $\phi 8.2-2.5t$	2	345-4	HS228	Hex. Head Screw M6-1.0Px10L	1

## SPARE PARTS LIST

Item	Fig. No.	Description	Qty	Item	Fig. No.	Description	Qty.
345	189059V	Pulley Cover	1	360-1	189041	Tension Scale	1
345-1	189058V	Pulley Cover	1	361	HS423	Hex. Headless Screw M6-1.0Px15L	1
345-2	103127	Hex. Head Screw M6-1.0Px10L	3	362	189051	Anchor Block	1
345-3	1966018	Stopper	1	363	HN008	Hex. Nut M16XP2	1
345-4	HS812	Table Head Screw M5-0.8Px8L	2	364	121011	Washer	1
348	189029	Spindle Pulley Ø22,key=5X5	1	365	HS242	Hex. Head Screw M8-1.25PX20L	1
349	HS430	Hex. Headless Screw M8-1.25Px10L	2	366	189054	Screw	3
350	189046	Belt 17-330(=A32)	1	367	HW106	Spring Washer ø10.2-3t	3
350	1965045	Belt 1422/V330/22x22	1	368	HS066	Hex. Head Screw M10-1.5Px60L	3
351	1965050B	Motor Pulley Ø24key=7X7	1	369	189052	Press Board	2
351S	1965032S	Variable Speed Pulley Set	1	370	HW105	Spring Washer ø8.2-2.5t	4
351-1	1965032	Variable Speed Pulley Ø24key=8X7	1	371	HS240	Hex. Head Screw M8-1.25Px10L	4
351-2	1965033	Spindle Pulley Ø22,key=7X7	1	372	HF024	Hex. Head Screw M6-1.0Px12L	2
351-3	1965073	Speed Indicator Dial	1	373	W005	Washer ø1/4"x16xt1.5	2
352	HS430	Hex. Headless Screw M8-1.25Px10L	2	374	189048	Control Box	1
352	HK093	Key 7x7x37L	1	375	HS622	Flat Head Screw M6-1.0Px12L	2
353	189040	Speed Indicator Dial	1	376	189047	Control Plate	1
354S	103127S	3 Way Valve Assembly	1	376	189047A	Control Plate	1
354-1	103126-4	Hose Clamp Ø12	3	377	HE501	Table Head Screw M5-0.8Px8L(Washer)	8
354-2	103127-6	Micro Control Block PT1/4"x1/2"	1	380S	198150MS	Micro Switch Assembly	1
354-3	103127-6	Micro Control Block PT1/4"x1/2"	1	380	198150M	Micro Switch Bracket	1
354-4	103125-5	Hose Clamp Ø19	1	381	ET-1615	Micro Switch	1
354-5	103127-4	Net Tube ID1/4"x2.2tx80cm	1	382	HS513	Round Head Screw M4-0.7Px30L	2
354-6	105173	3 Way Valve	1	383	HW005	Washer M5	2
354-7	103127-1	Straight Connector PT1/4"x1/4"	1	384	HS219	Hex. Head Screw M5X15L	2
354-8	HS232	Hex. Head Screw M6-1.0Px30L	2	386	198170	Scale	1
354-9	103127-3	Net Tube ID1/4"x2.2tx143cm	1	387	187066	Disconnection	1
354-10	189062	Net Tube ID1/4"x2.8tx32cm	1				
354-11	HI105	fixed support	2				
354-12	HS527	Round Head Screw M6*10L	2				
355	198051A	Blade Tension Handle	1				
355-1	198086	Knob	2				
356	CA51203	Bearing 51203	1				
357	189053	Tension Indication Ring	1				
358	198093	Spring Washer ØID16.3XØ31.5X1.8t	10				
359	198026	Leadscrew	1				
359	187067	Leadscrew	1				
360	189050	Tension	1				



#### **ENVIRONMENT PROTECTION**

Recycle unwanted materials instead of disposing of them as waste. All tools, accessories and packaging should be sorted, taken to a recycling centre and disposed of in a manner which is compatible with the environment. When the product becomes completely unserviceable and requires disposal, drain any fluids (if applicable) into approved containers and dispose of the product and fluids according to local regulations.

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