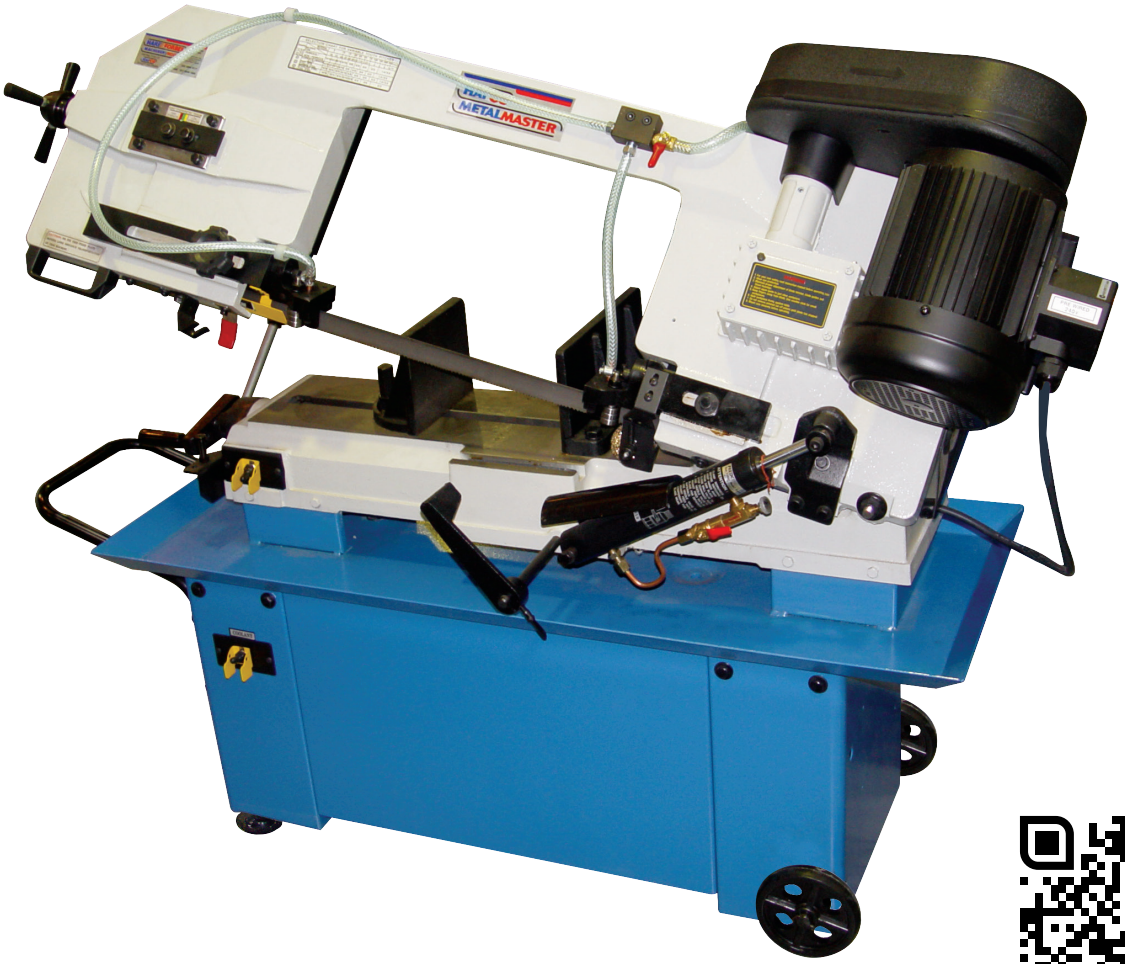
HAFCO
METALMASTER



Edition : 2.0
Date: (04/26)

Instruction Manual

METAL CUTTING BAND SAW
BS-912

Order Code: (B014)

MACHINE DETAILS

MACHINE.	METAL CUTTING BAND SAW
MODEL NO.	BS-912
SERIAL NO.	
DATE OF MANF.	

IMPORTED BY

AUSTRALIA

HARE&FORBES MACHINERYHOUSE

www.machineryhouse.com.au

NEW ZEALAND

MACHINERYHOUSE

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)

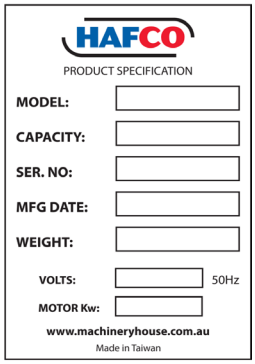


FIG.1

CONTENTS:

1.1 SPECIFICATIONS

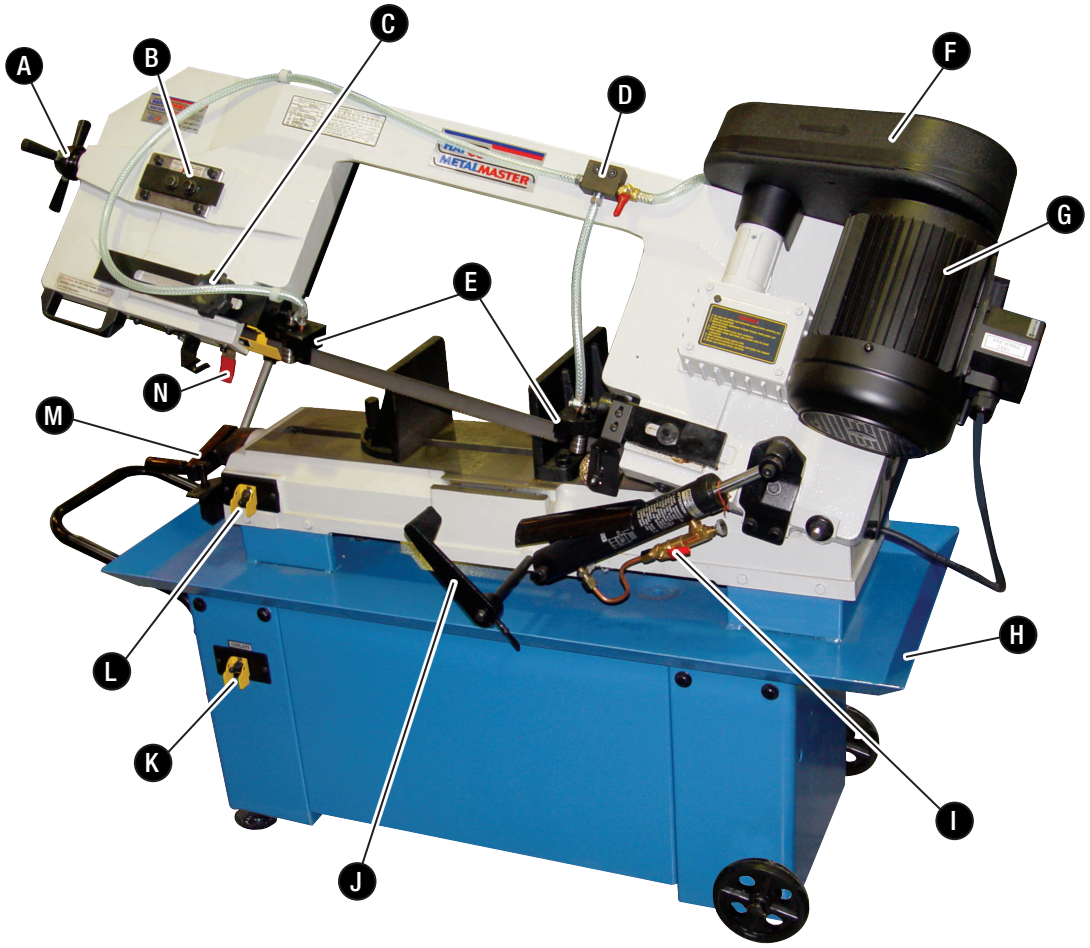
Order Code	B014
Model	**BS-912**
Operation Type	Fixed Head
Capacity Round @ 90° (mm)	230
Capacity Round @ 45° (mm)	150
Capacity Square @ 90° (mm)	230
Capacity Square @ 45° (mm)	127
Capacity Rectangle (W x H) @ 90° (mm)	305 x 178
Capacity Rectangle (W x H) @ 45° (mm)	150 x 127
Table Working Height (mm)	640
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)	26-50-73-96
Blade Size (L x W x T) (mm)	2654 x 27 x 0.9
Motor Power (kW / hp)	0.75 / 1
Voltage / Amperage (V / Amp)	240 / 10
Dimensions (LxWxH) (mm)	1380 x 460 x 1050
Nett Weight (kg)	185

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.



A	Blade Tension Handle	**H**	Coolant Tray
B	Blade Tracking Controls	**I**	Feed ON/OFF Valve Lever
C	Blade Guide Adjustment Knob	**J**	Length Stop
D	Coolant Control Valve	**K**	Coolant Pump ON/OFF Switch
E	Blade Guides	**L**	Motor ON/OFF Switch
F	Pulley Guard	**M**	Vice Handle
G	Motor	**N**	Automatic Shut-Off Tab

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 jewelery 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.....	10 Amps
Full Load Current.....	7.3 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

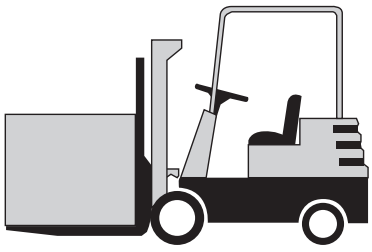
When selecting the site for the machine, consider the largest size of work-piece that will be processed through the machine and provide enough space around the machine for operating the machine safely. Consideration should be given to the installation of auxiliary equipment. Leave enough space around 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.

⚠WARNING ***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 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.

Remove The Transport Clamp:

Undo the height stop bolt and remove the transport clamp bolt. Then replace the height stop bolt and and lower headstock. (Fig. 4.3)

Watch the ON/OFF switch to ensure it switches OFF when the headstock reaches the bottom of its travel. If switch does not switch OFF, then adjust the stop bolt until it switches OFF. The Headstock must not rest on the switch and the teeth of the blade should be just below the table height.

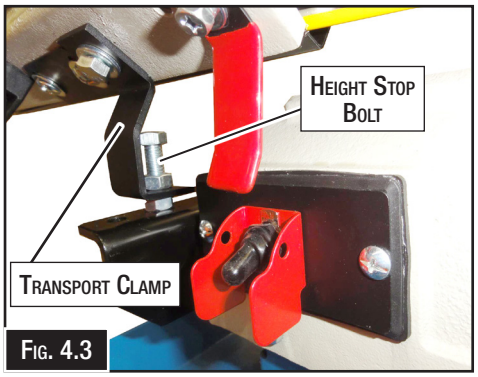


Fig. 4.3

To assemble Work Stop:

Thread the work stop rod onto base.

Slide work stop onto the rod, position it as necessary, then tighten the lock screw. (Fig. 4.4)

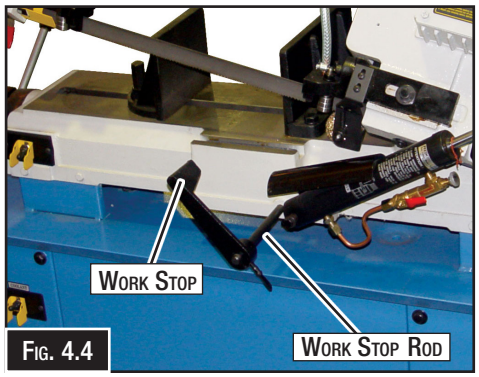


Fig. 4.4

4.6 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:

Connect the machine to the power supply.

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.

Make sure all tools and objects used during set up have been cleared away from the machine.

Turn the machine ON.

Make sure that the machine is traveling in the correct direction.

Listen to and watch for abnormal noises or actions. The machine should run smoothly with little or no vibration or rubbing noises.

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.

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:

Examine the workpiece to make sure it is suitable for cutting.

Select and change the blade that is suitable for the work piece material. Fit and verify that the blade is tensioned correctly.

Adjust the work length stop if needed for operation.

Raise the headstock and lock by turning the hydraulic feed OFF.

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.

Adjust the blade guide supports as close to work piece as possible.

Put on safety equipment such as safety glasses, steel toe boots, and use leather gloves when moving the work piece.

Select the correct speed and adjust the V-Belt if necessary, then start the machine.

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.

When the cut is finished, stop the machine and raise the headstock.

WARNING!

Serious injury or death can result from using this machine BEFORE understanding its controls and related safety information. DO NOT operate, or allow others to operate, the machine until the information is understood.

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.

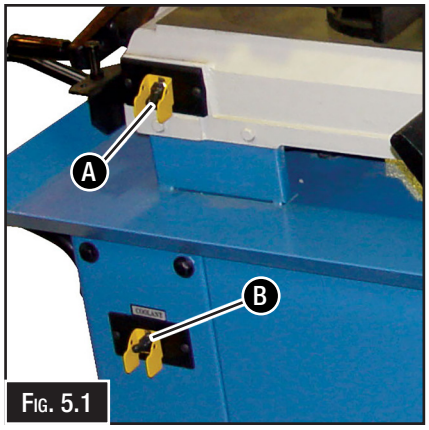


FIG. 5.1

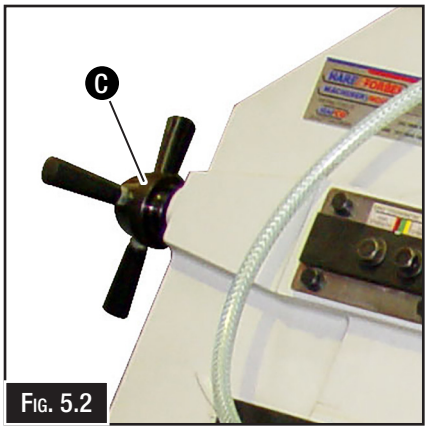


FIG. 5.2

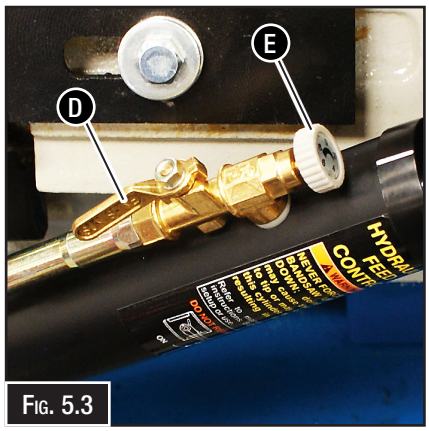


FIG. 5.3

A. Power ON Button: This switch when pushed up, turns the motor **ON** and starts the blade moving and when pushed down switches OFF the machine. (Fig. 5.1)

B. Coolant Pump Switch: The coolant pump switch located on the left side of the base, switches the coolant pump **ON** or **OFF**. (Fig. 5.2)

C. Blade Tension Knob: Rotate clockwise to increase or counterclockwise to decrease blade tension. (Fig. 5.3)

D. Feed Shut Off Valve: This valve shuts off the feed and holds the bow in the position required.

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 rotation of the knob. (Fig. 5.3)

F. 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. (Fig. 5.4)

G. Coolant Shut Off Valve: This valve controls the flow of the coolant. (Fig. 5.5)

H. Length Stop: Quickly positions the workpiece during repetitive cutting operations. (Fig. 5.6)

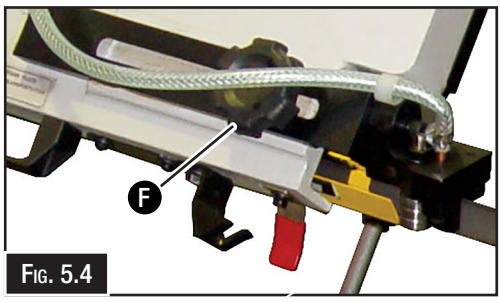


FIG. 5.4

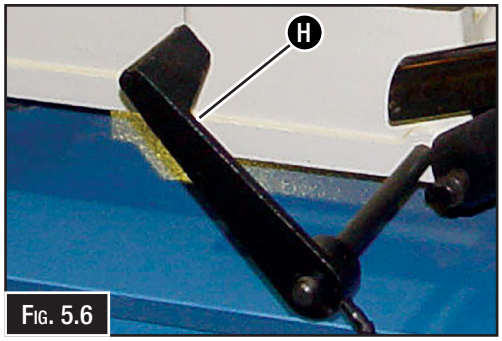


FIG. 5.6

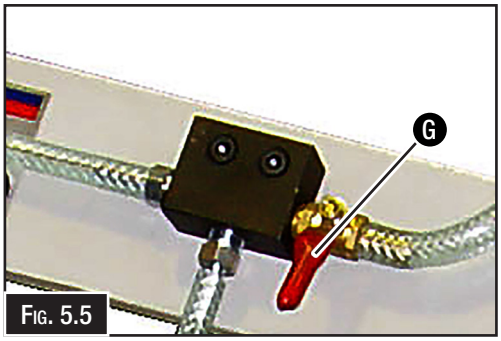


FIG. 5.5

5.2 CONTROLS Cont.

I. Fixed Vice Jaw: Can be adjusted to cut angles from 45° to 90°.

J. Movable Vice Jaw: Features quick-release that allows jaw width to be adjusted when changing from one work piece size to another.

K. Vice Hand Wheel: Adjusts position of movable vice jaw relative to fixed vice jaw.

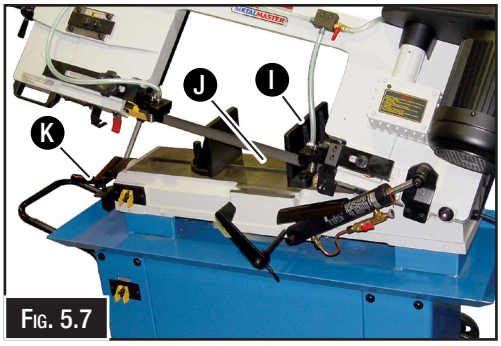


Fig. 5.7

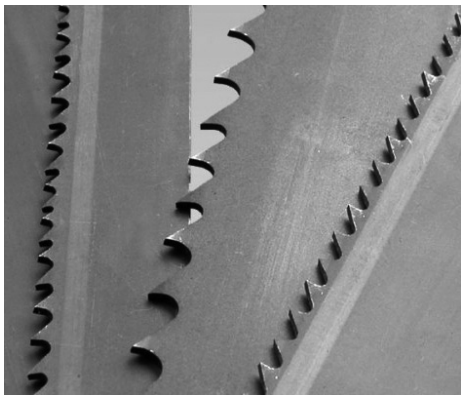
5.3 BLADE SELECTION CHARTS

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 LENGTH STOP

The length stop is used to setup the saw for making multiple cuts of the same length (Fig. 5.8).

To Set The Work Stop:

Loosen the lock screw in the length stop arm. (Fig. 5.8)

Adjust the work stop on the rod to the desired length.

Adjust the length stop so it contacts the end of the workpiece and secure with the lock screw. (Fig. 5.8)

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

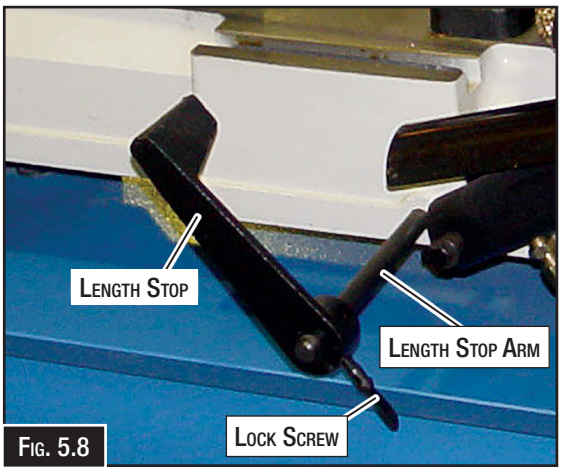


Fig. 5.8

5.5 SELECTING THE SPEED

The “best” speed for a metal cutting band saw varies significantly by material, ranging from approximately 26-95 m/min (105-377 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.

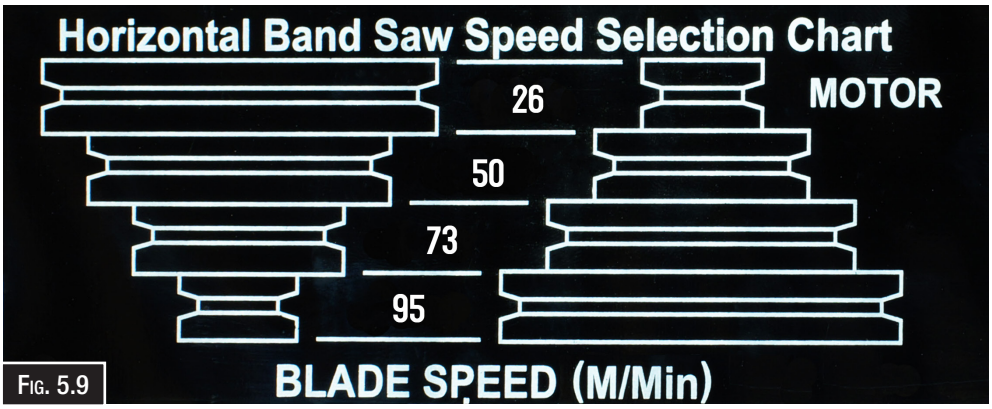
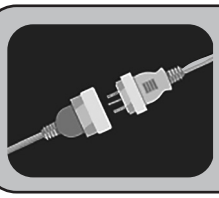


Fig. 5.9

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 doing any adjusting or maintenance to the machine.

Set the arm at the full horizontal position.

Remove the locking screw from the belt cover. Open the drive belt cover to expose the V-belt and pulleys. (Fig 5.10)

Loosen the motor base bolts, then move the belt to the required position on the pulleys.

Once the belt has been moved then re-tension the belt.

NOTE: To check the correct tension press the belt firmly midway between the pulleys. The belt should only deflect around 6mm.

Tighten the motor base bolts to secure the motor in place. Close the belt cover and secure with the set screw.

FIG. 5.10

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.

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.

A knob on the hydraulic cylinder (Fig. 5.11) 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 ON/OFF lever is closed the 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.

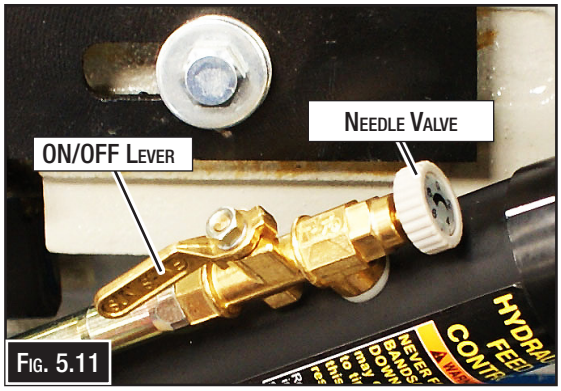


Fig. 5.11

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.

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.

Clamp a section of round stock in the vice. The stock should be 2 inches or larger in diameter.

Operate the saw at low speed. Start the cut with a very light feed rate.

When the saw has completed 1/3 of the cut, increase the feed rate slightly and allow the saw to complete the cut.

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. 5.12)

Adjust as follows:

Loose the clamping bolt and the pivot screw of the fixed vice jaw.

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 protractor with the one side of the slot in the table).

Tighten both clamping bolt and the pivot screw on the fixed vice jaw.

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.

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.

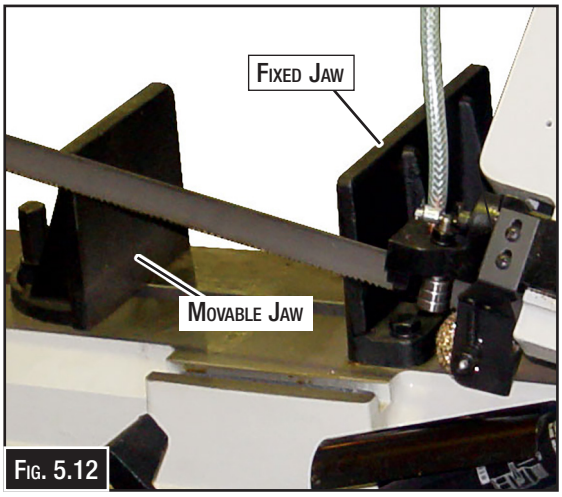


Fig. 5.12

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. 5.13)

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.

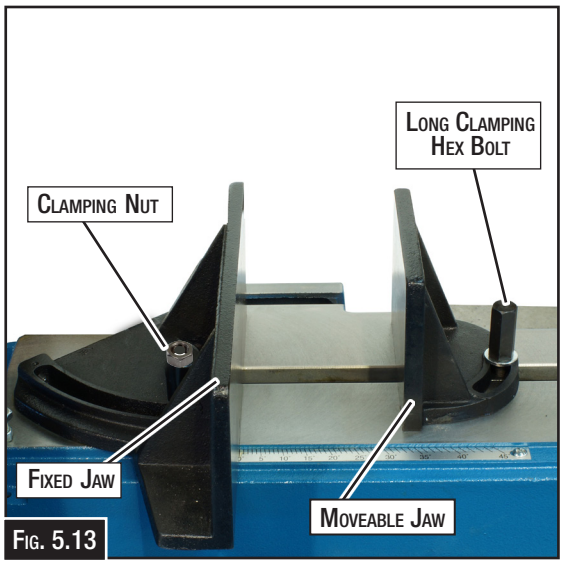


Fig. 5.13

5.11 BLADE GUIDE SUPPORTS SETTING

The band saw has adjustable blade guide supports (Fig. 5.14). 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:

Place the workpiece in the vice and clamp tightly.

Loosen the locking knob on the front of the guide support.

Slide the guide support so the gap between the guide and the movable jaw will clear the work piece.

Tighten the locking knob to secure the guide support.

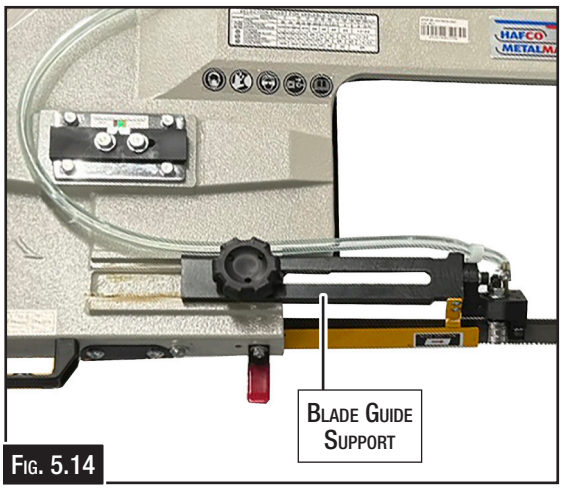


Fig. 5.14

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:

DISCONNECT THE MACHINE FROM THE POWER

Raise the saw head to the fully up position. Lock the hydraulic cylinder to hold the saw head in place. (Fig.5.15)

Open the wheel guard on the back of the saw head (Fig. 5.16)

Undo the 2 Phillips screws and remove the left blade guard. (Fig. 5.18)

Release the blade tension handle until the blade hangs loose.

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.

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.

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.

When the blade is properly tensioned, reconnect the saw to electrical power source.

Check and adjust the tracking of the blade. Refer to Blade tracking adjustment.

Install the wheel guard and the blade cover.

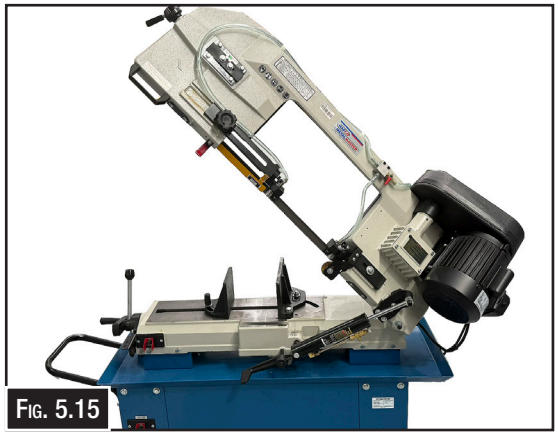


Fig. 5.15

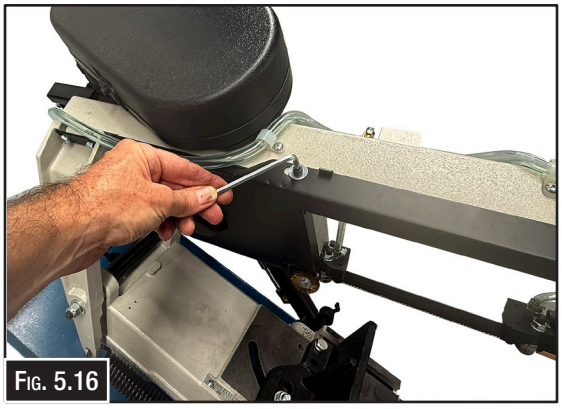


Fig. 5.16

Fig. 5.17

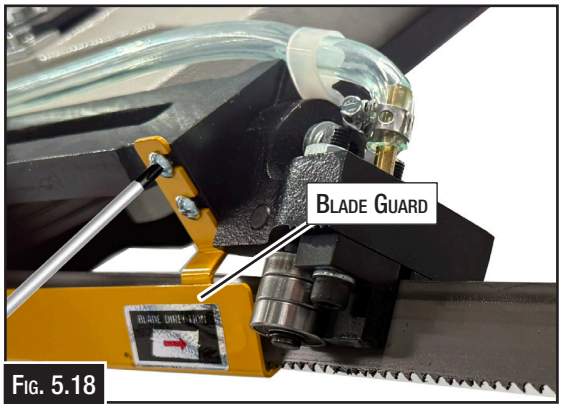


Fig. 5.18

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:
Make sure blade is tracking properly (refer to Blade Tracking on Page 24 for details).

DISCONNECT MACHINE FROM POWER!

Loosen and slide left blade guide arm as far left as it will go, then secure. (see Fig. 5.19)

Turn tension handle clockwise to tighten blade or counter-clockwise to loosen the blade. (Fig. 5.20)

Adjust blade until it has roughly 3 to 1.5mm of side-to-side deflection under moderate finger pressure. For accuracy, use the machine's built-in gauge or the "flutter method": Turn on the saw and tighten until the blade stops wobbling, then add a quarter-turn.

It is important that the blade does not slip on the drive wheel.

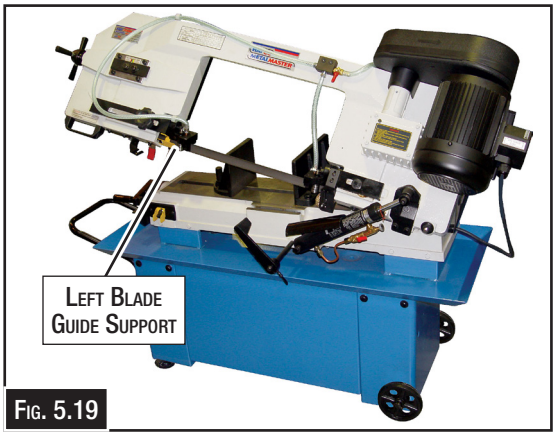


Fig. 5.19

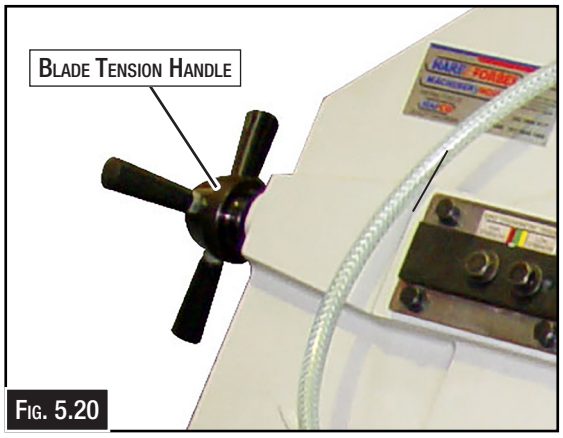


Fig. 5.20

> ⚠ ***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.***

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.

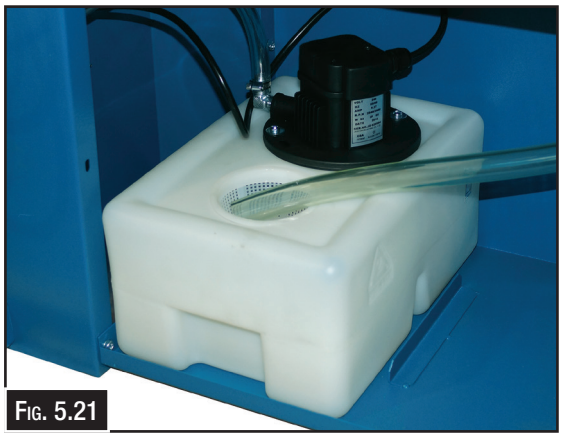


Fig. 5.21

6. MAINTENANCE

⚠ WARNING Before maintaining or cleaning the machine, 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:

- Ball bearings are lubricated and sealed-periodic lubrication is not required.
- Blade guide bearings are lubricated and sealed, periodic lubrication is not required.
- Upper wheel bushing-six to eight drops of oil each week.
- Pivot points, shafts and bearing machine surfaces, six to eight drops of oil each week.
- Replace the oil in the gearbox every 12 months
- 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

Clean off any preservative on machine surfaces.

After cleaning, coat machined surfaces of the machine with a medium consistency machine oil. Re-apply the oil coating at least every six months.

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.

Clean the chip sludge from the coolant tank. Change the coolant on the frequency as instructed by the coolant supplier.

WARNING!

Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do so may cause death or injury.

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. 6.3) for location of blade tracking adjustment screws. ***This procedure should only be carried out by your service engineer***

Put the saw head in the vertical position. Open the wheel guards.

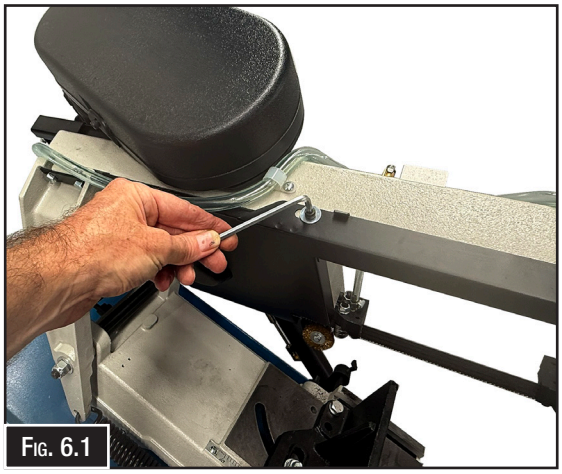


Fig. 6.1

1. Open the blade guard. (Fig. 6.1)
2. Remove the blade guide assemblies (top and bottom) (Fig. 6.2)
3. Loosen the hex head screw in the tilting mechanism to a point where it is loose but snug.
4. With the machine running, adjust both the set crew and blade tension knob simultaneously to keep constant tension on the blade. The set screw and blade tension knob are always turned in opposite directions, ie, when one is turned clockwise the other is turned counterclockwise. (Fig. 6.3)

   The blade is tracking properly when the back side just touches the shoulder of pulley or a slight gap appears near the center line of the pulley. Care should be taken not to over-tighten the saw blade since this will give a false adjustment and limit life of the blade.

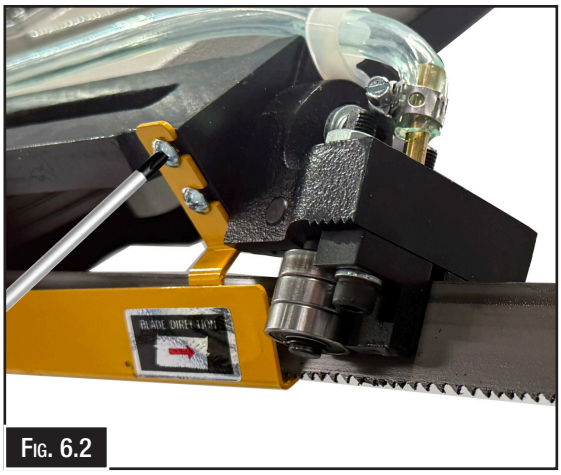


Fig. 6.2

5. Tighten the hex head screw in tilting mechanism.

IMPORTANT: Sometimes in trying to make this critical adjustment it is possible to cause the basic setting to be misaligned. Should this occur, proceed as follows:

a. Loosen the set screw and back it out as far as it can go and still remain in the threaded hole.

b. Turn the hex head screw clockwise until it stops (do not tighten).

c. Turn the set screw clockwise until it bottoms, then continue for half a turn and check the tracking by turning on the machine.

d. If further adjustment is required, go back to step

6. Turn off power to the machine.
7. Replace the blade guide assemblies. It may be necessary to loosen the blade tension slightly.
8. Adjust the vertical position of blade guide bearing assemblies so that the back side of the blade just touches the ball bearing.
9. Make a final run to check tracking. It required, touch up adjustment (See stop 4)
10. Replace the blade guards.

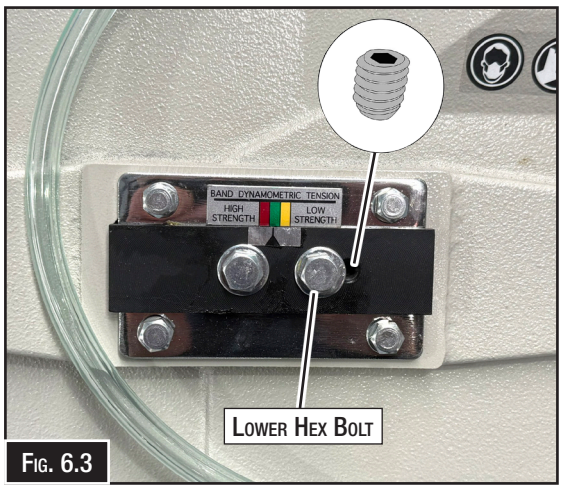


Fig. 6.3

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, adjust 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.

There is also a support bearing on the left and right blade guides that is not adjustable. When the blade guides and tracking are adjusted correctly, these bearings will make light contact with the blade.

To Adjust The Backing Bearings:

Make sure blade is tensioned and tracking correctly before making the adjustments.

1. DISCONNECT MACHINE FROM POWER!
2. Raise headstock completely, then close feed ONOFF valve to keep it from lowering.
3. Check clearance between blade and bearings on both blade guide assemblies. Bearings should make light contact with blade or have a clearance of 0.025 – 0.050mm.

   If all bearings do make light contact with blade or have a clearance of 0.025 - 0.050mm no bearing adjustment is necessary. Proceed to Step 7.

   If all bearings do not make light contact with blade or do not have a clearance of 0.025 - 0.050mm proceed to Step 4.
4. Loosen hex nut on eccentric bushing of bearings that needs adjustment. (Fig. 6.5)
5. Turn eccentric bushing until bearings make light contact with blade or have clearance of 0.025 - 0.050mm.
6. Tighten hex nut to secure bearing position.
7. Repeat Step 3 with blade and carbide blade guides.

   If guides do make light contact with blade or have a clearance of 0.025 - 0.050mm guides do not need adjustment.

   If guides do not make light contact with blade or have a clearance of 0.025 - 0.050mm proceed to Step 8.
8. Loosen cap screw shown in Fig. 6.6 for the carbide blade guide that needs adjustment.
9. Adjust carbide blade guide until guide makes light contact with blade or has clearance of 0.025 - 0.050mm, then tighten cap screw to secure.

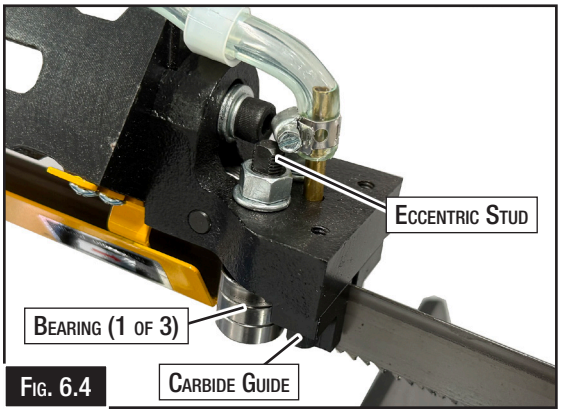


Fig. 6.4

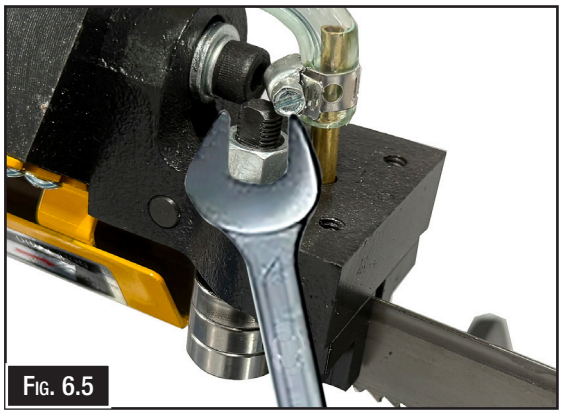


Fig. 6.5

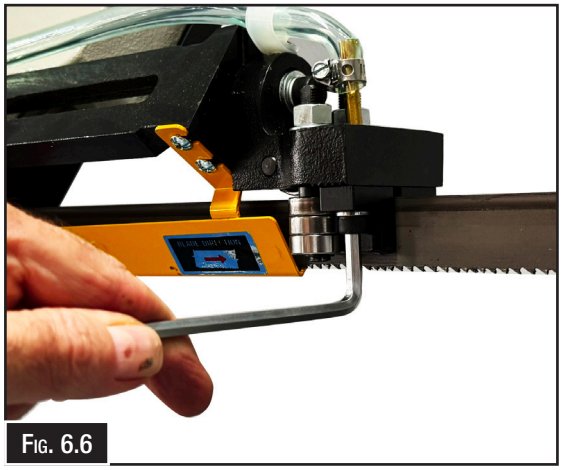


Fig. 6.6

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:

DISCONNECT THE MACHINE FROM THE POWER.

Remove the nut and screw. Remove the worn brush and spacer. (Fig. 6.7)

Install the spacer and replacement brush, screw and nut.

Adjust the bracket, if necessary, so the brush makes slight contact with the saw blade.

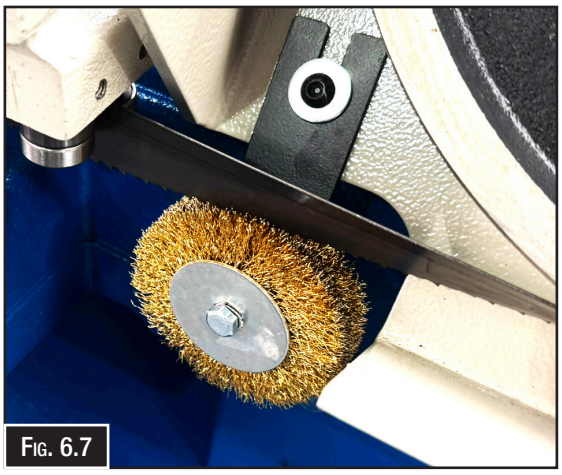


Fig. 6.7

6.7 ADJUSTING THE STOP SWITCH

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

DISCONNECT THE MACHINE FROM THE POWER.

Lift headstock, then adjust feed rate dial as needed, and lower headstock.

Watch the ON/OFF switch to switch OFF (Fig. 6.8) when the headstock reaches bottom of its travel. If switch does not switch OFF, the loosen jam nut, on the stop bolt and adjust the stop bolt until it switches OFF. (Fig. 6.9)

Tighten jam nut against the base to prevent stop bolt from loosening during use.

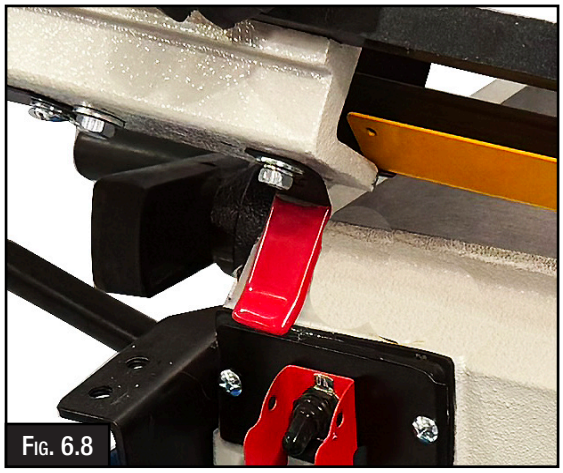


Fig. 6.8

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.

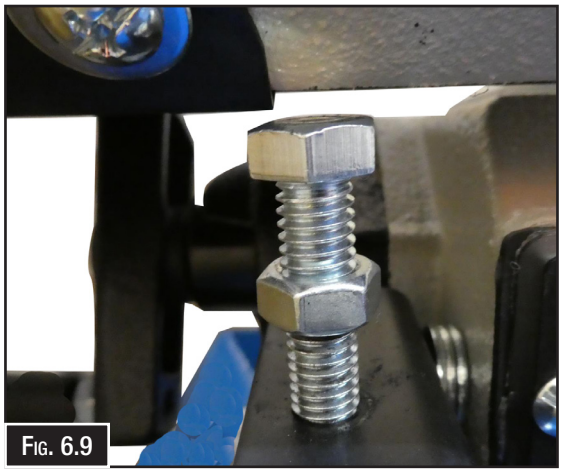


Fig. 6.9

WARNING!

Disconnect all power from the machine before servicing. There may be multiple power sources present. Remove the plug from the power point or remove the fuse if hardwired. Failure to do so may cause death or injury.

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	1. Excessive belt tension 2. Excessive head pressure. 3. Excessive blade speed. 4. Improper blade selection	1. Adjust belt tension so that belt does not slip on drive belt under moderate pressure. 2. Reduce head pressure. 3. Refer to “Selecting The Speed” on page 17. 4. Refer to “Blade Selection Chart” page 16.
Cannot make square cut.	1. Dull Blade. 2. Guide rollers not adjusted properly. 3. Vice jaw not adjusted properly. 4. Excessive head pressure.	1. Replace The Blade. 2. Refer to “Blade Guide Adjustment” page 25. 3. Check the vice jaws. 4. Reduce the feed rate.
Increased cutting time	1. Dull Blade. 2. Insufficient head pressure. 3. Reduced Blade speed.	1. Replace the blade. 2. Increase the feed rate. 3. Refer to “Selecting The Speed” on page 17.
Will not cut	1. Motor running in wrong direction. 2. Blade teeth pointing in wrong direction. 3. Hardened material	1. Reverse rotation of motor. 2. Remove blade, turn blade inside out and Re-install blade. 3. Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required)
Motor will not start	1. Overload relay activated. 2. Magnetic switch open, or protector open. 3. Low voltage. 4. Open circuit in motor or loose connections.	1. Reset the relay. 2. Reset protector by pushing red button. (inside electric box.) 3. Check power line for proper voltage. 4. Inspect all lead terminations on motor for loose or open connections
Motor will not start, fuse or circuit breakers “blow”.	1. Short circuit in line, cord or plug. 2. Short circuit in motor or loose connections. 3. Incorrect fuses or circuit breakers in power line.	1. Inspect line, cord and plug for damaged insulation and shorted wire. 2. Inspect all lead terminations on motor for loose or shorted terminals or worn insulation on wires. 3. Install correct fuses or circuit breakers.
Motor fail to develop full power.	1. Power line overloaded with lights, appliances and other motors. 2. Under size wires or circuit too long. 3. General overloading of local power facilities.	1. Reduce the load on the power line. 2. Increase wire sizes, or reduce length of wiring. 3. Request a voltage check from the power company
Motor overheats	1. Motor overloaded. 2. Air circulation through the motor restricted	1. Reduce load on motor. 2. Clean out motor to provide normal air circulation through motor.
Motor stalls	1. Short circuit in motor or loose connections. 2. Low voltage. 3. Incorrect fuses or circuit breakers in power line. 4. Motor overloaded.	1. Inspect terminals in motor for loose or shorted terminals or worn insulation on lead wires. 2. Correct the low line voltage conditions. 3. Install correct fuses circuit breakers. 4. Reduce motor load.
Frequent opening of fuses or circuit breakers.	1. Motor overloaded 2. Incorrect fuses or circuit breakers.	1. Reduce motor load. 2. Install correct fuses or circuit breakers.
Teeth stripping	1. Too few teeth per inch. 2. Loading of gullets. 3. Excessive feed. 4. Work not secured in vice.	1. Use finer tooth blade. 2. Use coarse tooth blade or cutting lubricant. 3. Decrease feed. 4. Clamp material securely.

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	1. Teeth too coarse. 2. Misalignment of guides. 3. Dry cutting 4. Excessive speed 5. Excessive feed	1. Use a finer tooth blade. 2. Adjust saw guides. 3. Use cutting lubricant. 4. Lower speed. See Operating Instructions “Selecting the Speed” Page 17. 5. Reduce feed pressure. Refer to Operating Instructions “Feed Control” Page 18.
Blade breakage	1. Excessive tension. 2. Wheels out of line	1. Tension blade to prevent slippage on drive wheel while cutting. 2. Adjust wheels
Blade cut Run-out or Run-in	1. Guides out of line. 2. Excessive pressure. 3. Support of blade insufficient. 4. Material not properly secured in vise. 5. Blade tension incorrect.	1. For a straight and true cut, realign guides, check bearings for wear. 2. Conservative pressure assures long blade life and clean straight cuts. 3. Move saw guides as close to work as possible. 4. Clamp material in vice, level and secure. 5. Loosen or tighten tension on blade.
Blade twisting	1. Blade not in line with guide bearings. 2. Excessive blade pressure. 3. Blade binding in cut.	1. Check bearings for wear and alignment. 2. Decrease pressure and blade tension. 3. Decrease feed pressure.
Premature tooth wear	1. Dry cutting. 2. Blade too coarse. 3. Not enough feed. 4. Excessive speed	1. Use lubricant on all materials, except cast iron. 2. Use finer tooth blade. 3. Increase feed so that blade does not ride in cut. 4. Decrease speed.

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-912

Order Code: (B014)

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** and fill out the inquiry form attaching a copy of scanned parts list.

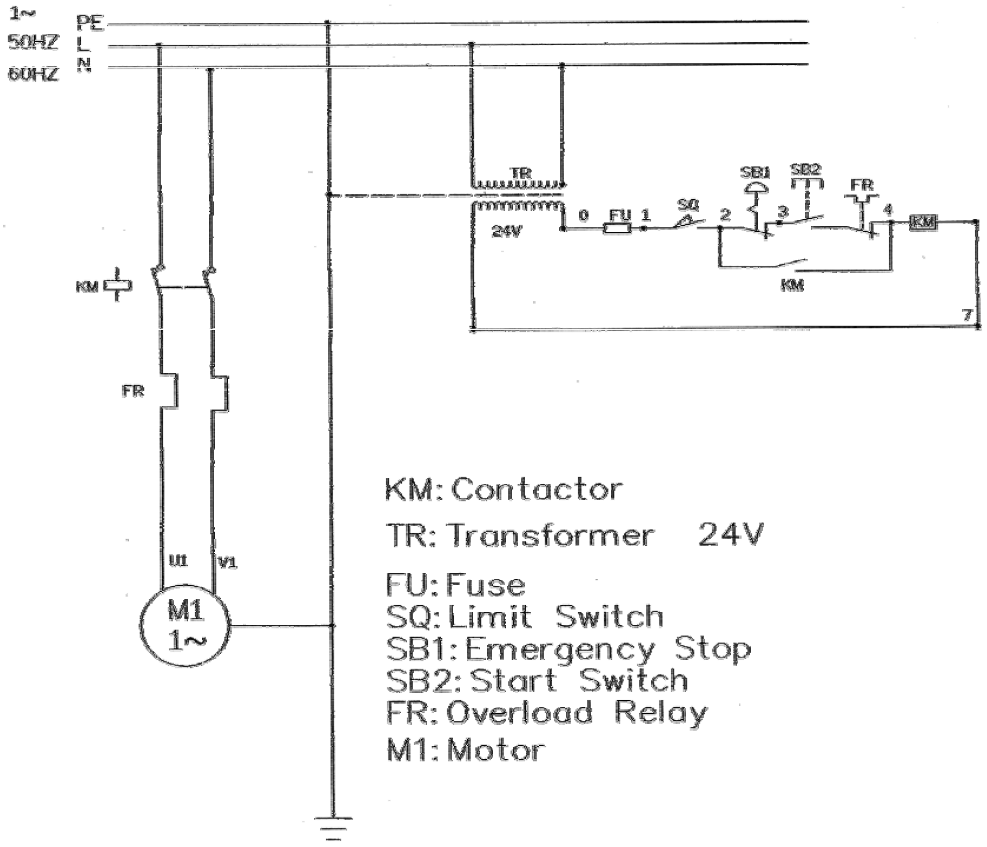
WARNING!

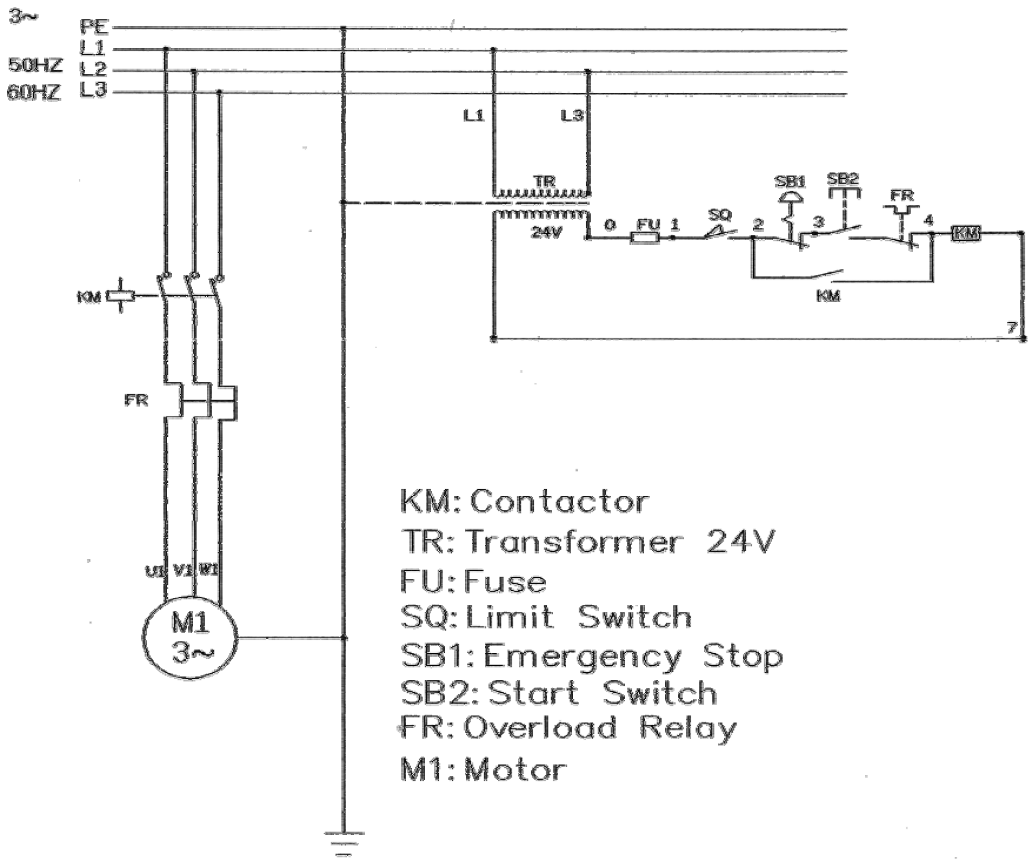
Electricity is dangerous and could cause death
All electrical work must be carried out by a qualified electrician.

CAUTION!

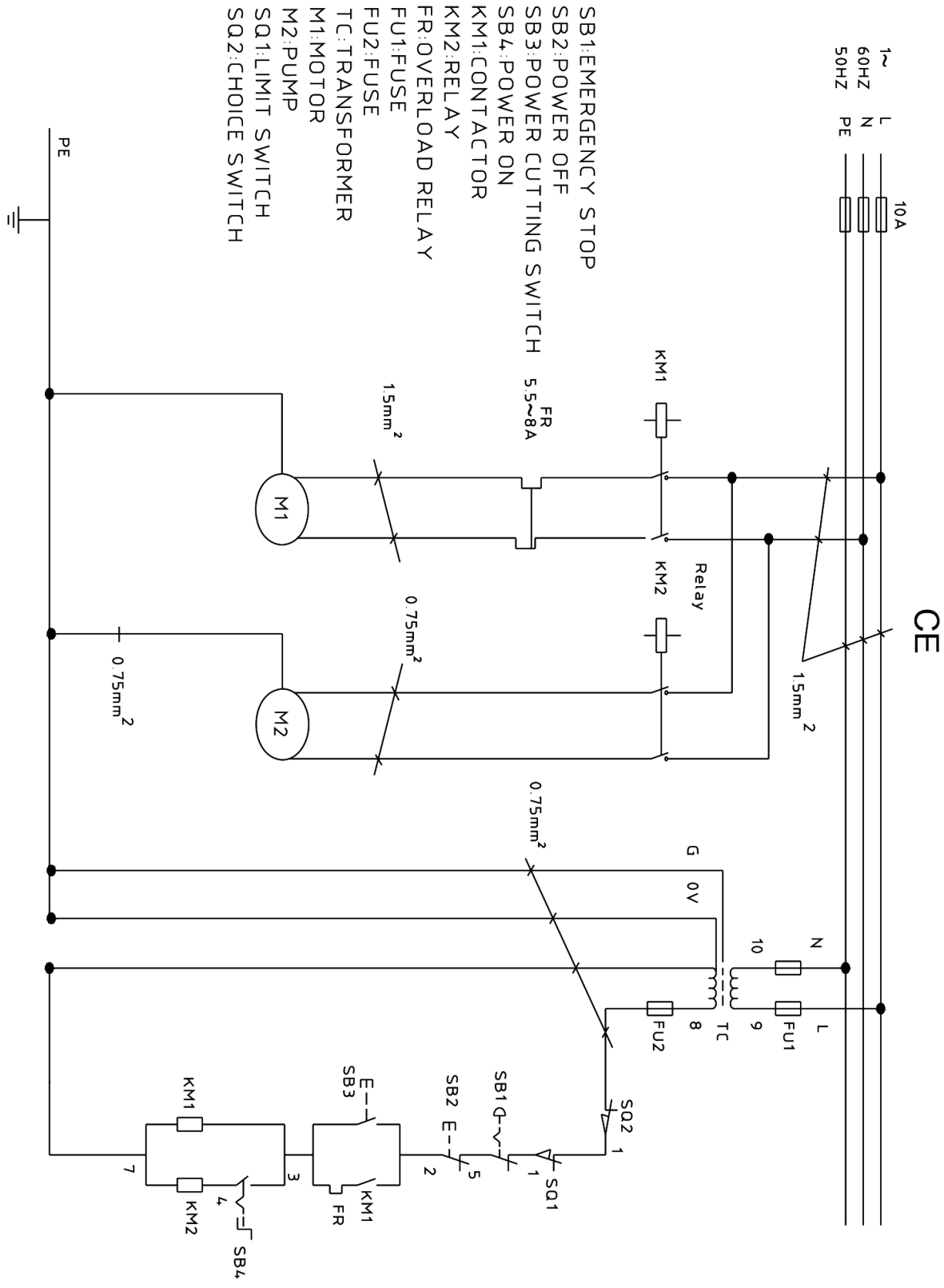
It is impossible to cover all possible hazards Every workshop environment is different. These are designed as a guide to be used to compliment training and as a reminder to users prior to equipment use. Always consider safety first, as it applies to the individual working conditions.

WIRING DIAGRAM

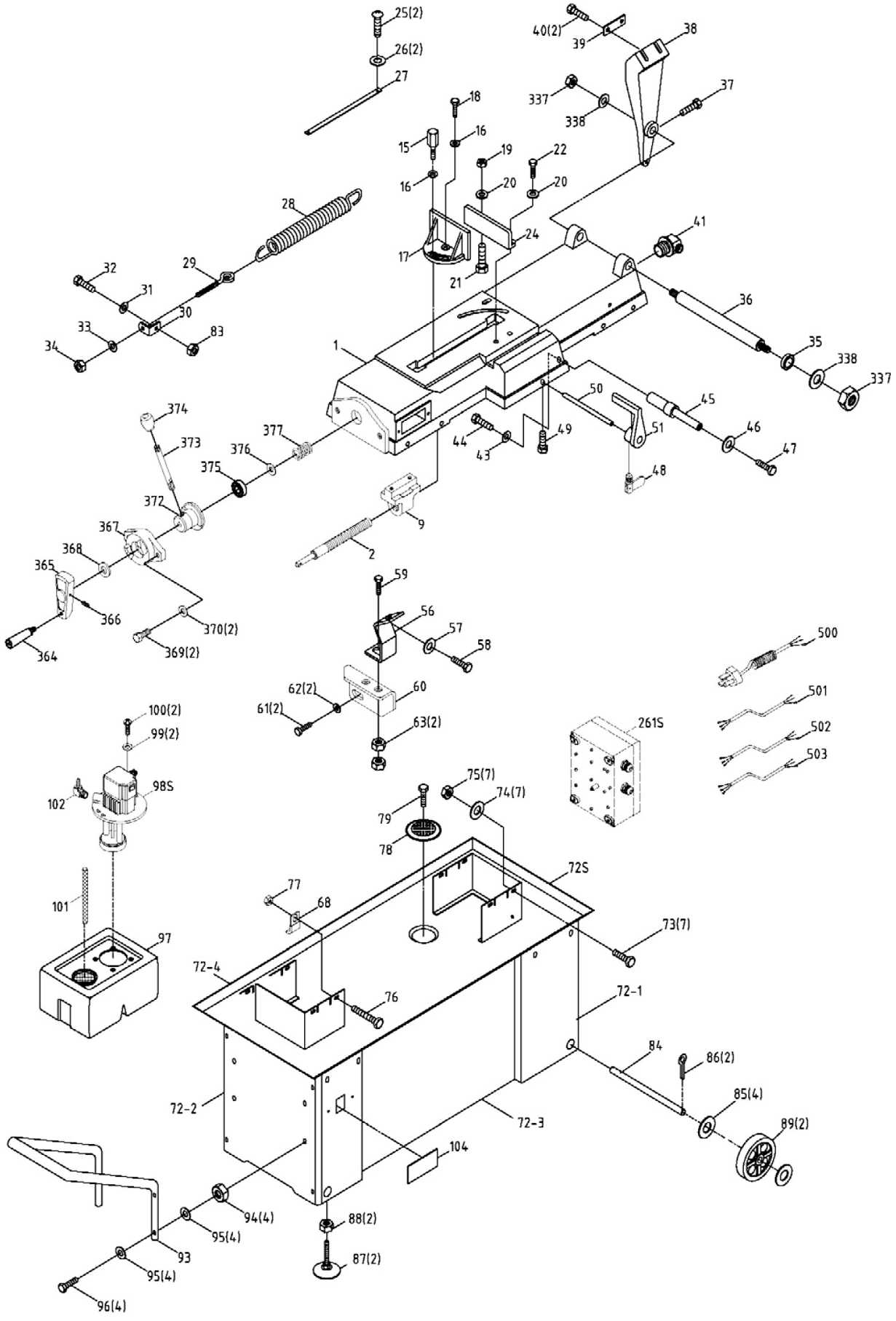




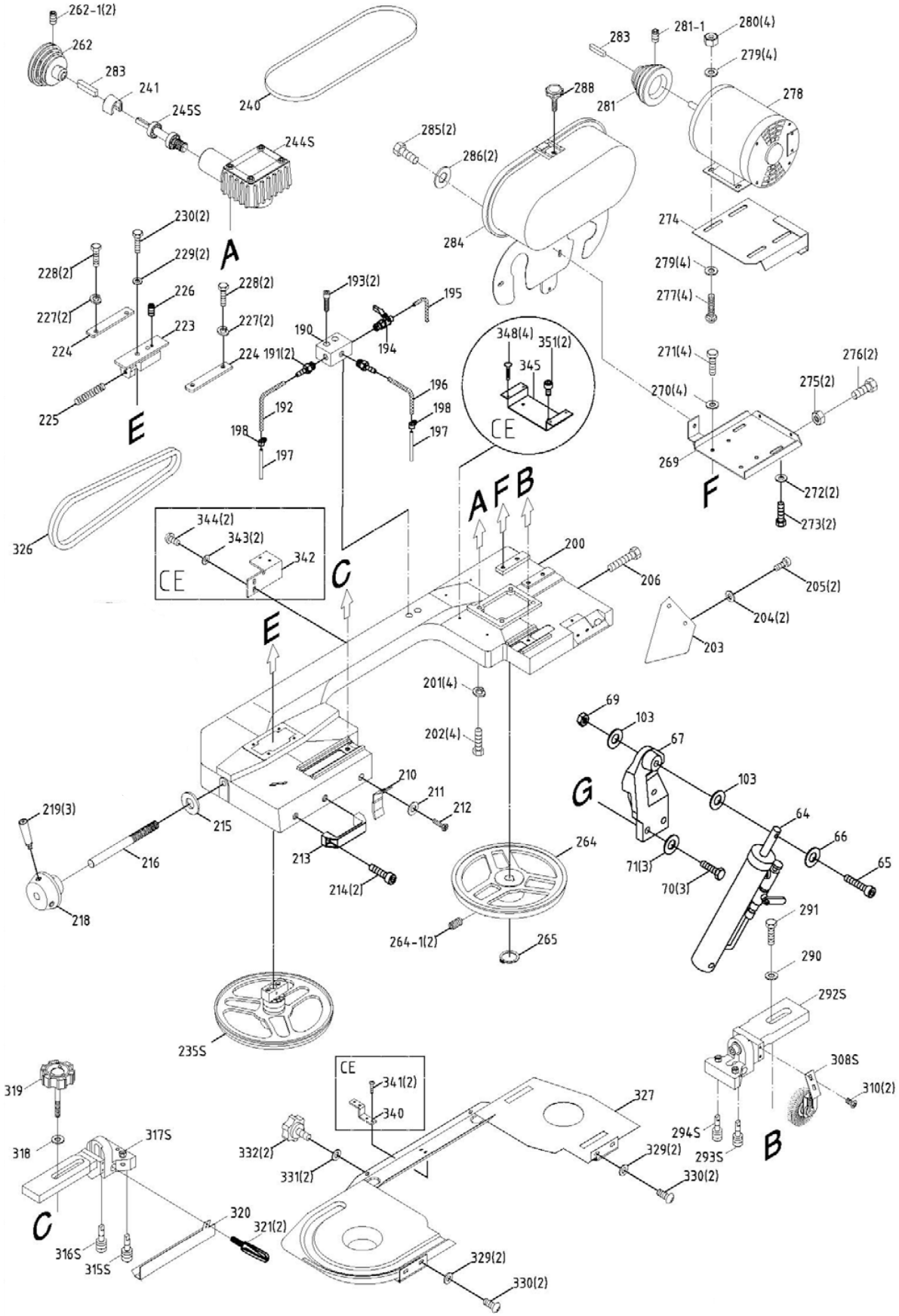
WIRING DIAGRAM



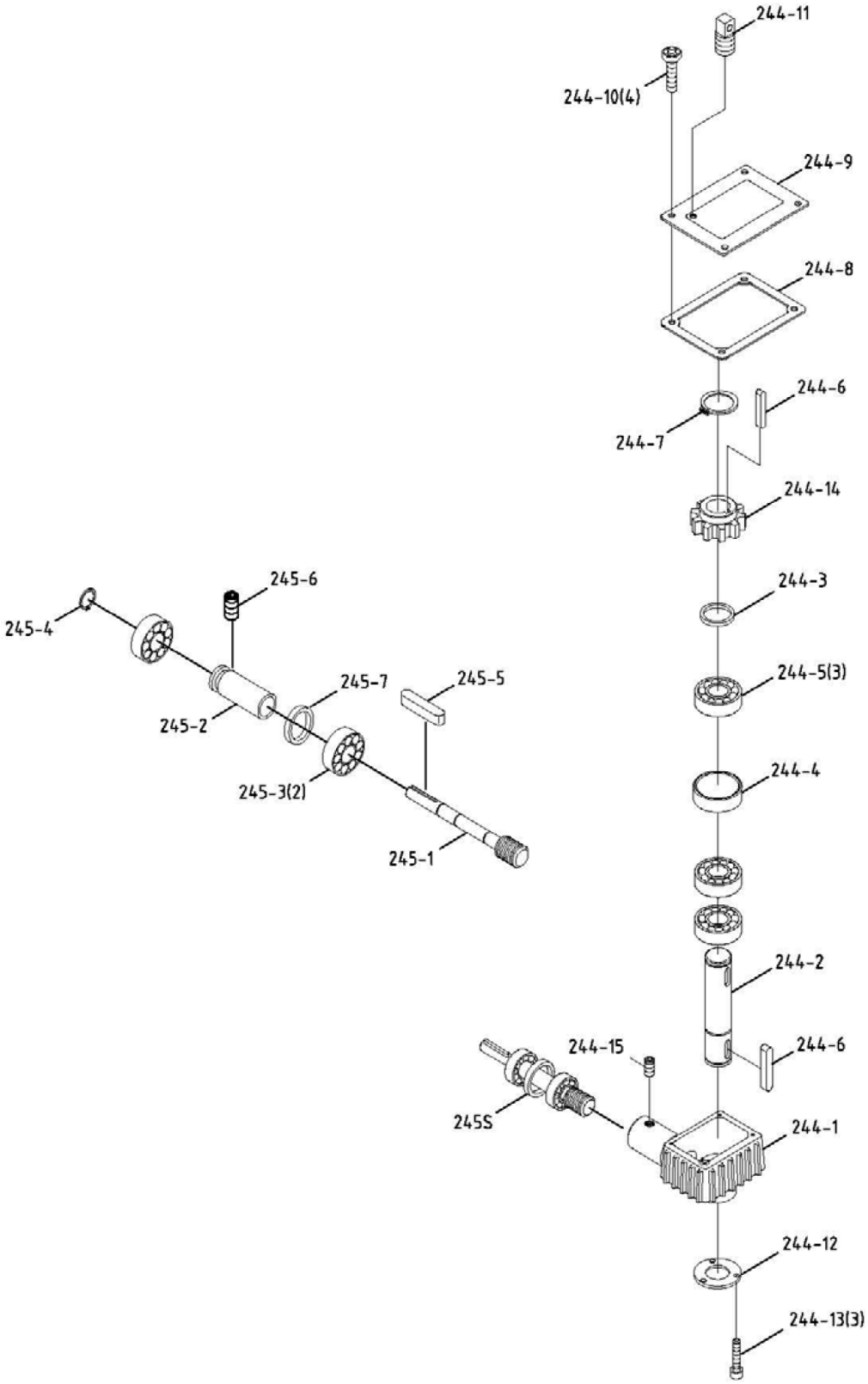
PARTS DIAGRAM - 1



PARTS DIAGRAM - 2



PARTS DIAGRAM - 3



SPARE PARTS LIST

Index No.	Part No.	Description	Size	Qty
1	192012A	SWIVEL BASE		1
2	192009A	ACME SCREW		1
9	181138B	ACME NUT		1
15	181266	FIXED BOLT		1
16	W008	WASHER	3/8”X25XT2	2
17	192015	VICE JAW BRACKET(FRONT)		1
18	S012	HEX. HEAD SCREW	3/8”X1-1/2”L	1
19	N001	HEX. NUT	1/2”	1
20	W002	WASHER	1/2”X28XT2	2
21	S501	CARRIAGE SCREW	1/2”X2”L	1
22	S003	HEX. HEAD SCREW	1/2”X2”L	1
24	192008	VICE JAW BRACKET(REAR)		1
25	S708	CROSS ROUND HEAD SCREW	3/16”X3/8”L	2
26	W007	WASHER	3/16”X12XT0.8	2
27	192044	SCALE		1
28	181117-1	SPRING		1
29	181118	SPRING ADJUSTING ROD		1
30	192040	SPRING HANDLE BRACKET		1
31	W016	WASHER	5/16”X23XT2	1
32	S022	HEX. HEAD SCREW	5/16”X3/4”L	1
33	W014	WASHER	3/8”X23XT2	1
34	N005	HEX. NUT	3/8”	1
35	192051	BUSHING		1
36	192042A	SUPPORT ROD		1
37	P602	HEX. HEAD SCREW	5/16”X3/4”L	1
38	192003	PIVOT BRACKET		1
39	181270	WASHER		1
40	S012	HEX. HEAD SCREW	3/8”X1-1/2”L	2
41	ET2108	WIRE NIPPLE	5/8”	1
43	W018	WASHER	5/16”X23XT3	1
44	S022	HEX. HEAD SCREW	5/16”X3/4”L	1
45	181301-2	CYLINDER LOWER SUPPORT		1
46	W016	WASHER	5/16”X19XT1.5	1
47	S018	HEX. HEAD SCREW	5/16”X1/2”L	1
48	181130	THUMB SCREW		1
49	S022	HEX. HEAD SCREW	5/16”X3/4”L	1
50	3021	STOCK STOP ROD		1
50	3021A	STOCK STOP ROD		1
51	181125	STOP BLOCK		1
56	192011	FIXED PLATE		1
57	W005	WASHER	1/4”X16XT1.5	1
58	S019	HEX. HEAD SCREW	5/16”X1-1/2”L	1
59	S014	HEX. HEAD SCREW	3/8”X1-3/4”L	1
60	181112A	SUPPORT PLATE		1
61	S022	HEX. HEAD SCREW	5/16”X3/4”L	2
62	W017	WASHER	5/16”X18XT1.5	2
63	N005	HEX. NUT	3/8”	2
64	181304B	CYLINDER COMPLETE SET	RF-712N	1
65	S412	HEX. SOCKET HEAD SCREW	3/8”X2-1/4”L	1
66	W008	WASHER	3/8”X25XT2	1
67	181302-2	CYLINDER UPPER SUPPORT		1
68	3076	SWITCH CUT OFF TIP		1
69	N005	HEX. NUT	3/8”	1
70	S017	HEX. HEAD SCREW	5/16”X1”L	3
71	W017	WASHER	5/16”X18XT1.5	3

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

SPARE PARTS LIST

Index No.	Part No.	Description	Size	Qty
72S	192045FS	STAND COMPLETE ASSEMBLY		1
73	S017	HEX. HEAD SCREW	5/16”X1”L	7
74	W017	WASHER	5/16”X18XT1.5	7
75	N007	HEX. NUT	5/16”	7
76	S013	HEX. HEAD SCREW	3/8”X1-1/4”L	1
77	N005	HEX. NUT	3/8”	1
78	191106A	FILTER		1
79	S006	HEX. HEAD SCREW	1/4”-20*1/2”L	1
83	N007	HEX. NUT	5/16”	1
84	195022B	WHEEL ROD		1
85	W019	WASHER	5/8”X30XT3MM	4
86	HP210	COTTER PIN	Ø3X25L	2
87	195038	COASTER OF STAND	1/2”	2
88	N001	HEX. NUT	1/2”-12	2
89	181129	WHEEL		2
93	192039	HAND ROD		1
94	N007	HEX. NUT	5/16”-18	4
95	W016	WASHER	5/16”X23XT2MM	8
96	S019	HEX. HEAD SCREW	5/16”-18X1-1/2”L	4
97S	181256	COOLANT TANK		1
98S		PUMP		1
99	W004	WASHER	1/4”X19XT1.5	2
100	S717	CROSS ROUND HEAD SCREW	1/4”X5/8”L	2
101	181854	HOSE	5/8”X200MM	1
102	181852A	COUPLER	3/8”PTX5/16”	1
103	W013	WASHER	3/8”X20XT2	2
104	181900	WARNING MARK		1
190	101073	3 WAY VALVE		1
191	1341089	TUBE CLAMP	1/4PTX1/4”	2
192	192056	HOSE	OD8XID6X1100L(1/4”)	1
193	S475	HEX. SOCKET HEAD SCREW	1/4”X1-1/4”L	2
194	192053	VALVE	1/4”PTX5/16”	1
195	192058	HOSE	OD12XID8X1400L(5/16”)	1
196	192057	HOSE	OD8XID6X400L(1/4”)	1
197	101079	HOSE BIB		2
198	103126-4	HOSE CLAMP		2
200	192001	BODY FRAME		1
201	W204	SPRING WASHER	3/8”	4
202	S013	HEX. HEAD SCREW	3/8”X1-1/4”L	4
203	192041	SUPPORT PLATE		1
204	W005	WASHER	1/4”X16XT1.5	2
205	S201	CROSS SOCKET HEX. HEAD SCREW	1/4”X5/8”L	2
206	S022	HEX. HEAD SCREW	5/16”X3/4”L	1
210	192023A	SWITCH CUT OFF TIP		1
211	W005	WASHER	1/4”X16XT1.5	1
212	S201	CROSS SOCKET HEX. HEAD SCREW	1/4”X5/8”L	1
213	1965052	KNOB		1
214	S414	HEX. SOCKET HEAD SCREW	5/16”X1”L	2
215	W008	WASHER	3/8”X25XT2	1
216	192038A	BLADE TENSION BAR		1

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

SPARE PARTS LIST

Index No.	Part No.	Description	Size	Qty
218	192037B	HANDLE BODY		1
219	3027	KNOB		3
223	192052	BLADE TENSION SLIDING BLOCK		1
224	181210	SLIDING PLATE		2
225	192026	SPRING		1
226	S608	HEX. SOCKET HEADLESS SCREW	5/16”X3/4”L	1
227	W205	SPRING WASHER	5/16”	4
228	S020	HEX. HEAD SCREW	5/16”×1”L	4
229	W015	WASHER	5/16”X12XT2	2
230	S019	HEX. HEAD SCREW	5/16”X1-1/2”L	2
235S	192016AS	IDLER WHEEL SET		1
235-1	192016A	IDLER WHEEL		1
235-2	HCR06	C-RETAINER RING	R52	2
235-3	CA6205LLU	BEARING	6205LLU	2
235-4	181245	BUSHING		1
235-6	W018	WASHER	5/16”X20XT3	1
235-7	S022	HEX. HEAD SCREW	5/16”X3/4”L	1
235-9	193050	BLADE WHEEL SHAFT		1
235-10	P005	PIN	5X34L	1
235-11	193052	SLIDING PLATE DRAW BLOCK		1
240	192050A	BLADE	27X0.9X2655X5-8T	1
241	181237D	COVER		1
244S	181216-1AS	GEAR BOX ASSEMBLY		1
244-1	181216A	GEAR BOX		1
244-2	181219-1	TRANSMISSION WHEEL SHAFT		1
244-3	181218-1	BUSHING		1
244-4	181217-1	BUSHING		1
244-5	CA6205LLU	BEARING	6205LLU	2
244-6	HK025	KEY	6X6X20L	2
244-7	HCS13	C-RETAINER RING	S25	1
244-8	3092	GEAR BOX GASKET		1
244-9	181222-1	GEAR BOX COVER		1
244-10	S201	CROSS SOCKET HEX. HEAD SCREW	1/4”X5/8”L	4
244-11	3149	VENT PLUG	M8XP1	1
244-12	181246	BEARING COVER		1
244-13	S708	CROSS ROUND HEAD SCREW	3/16”X3/8”L	3
244-14	181220-1	WORM GEAR		1
244-15	S607	HEX. SOCKET HEADLESS SCREW	5/16”X1/2”L	1
245S	192010S	WORM GEAR SHAFT ASSEMBLY		1
245-1	192010	WORM SHAFT		1
245-2	181224	BEARING BUSHING		1
245-3	CA6003LLU	BEARING	6003LLU	2
245-4	HCS06	C-RETAINER RING	S17	1
245-5	K008	KEY	5X5X30L	1
245-6	S607	HEX. SOCKET HEADLESS SCREW	5/16”X1/2”L	1
245-7	193049	WASHER		1
261S		BOX		1
262	181226B	SPINDLE PULLEY		1
262-1	S604	HEX. SOCKET HEADLESS SCREW	1/4”X3/8”L	2
263S	ET1924S	CONTROL BOX		1
264	192017A	DRIVE WHEEL		1
264-1	S604	HEX. SOCKET HEADLESS SCREW	1/4”X3/8”L	2
265	HCS13	C-RETAINER RING	S25	1
269	181233A	MOTOR MOUNT BRACKET		1
270	W016	WASHER	5/16”X23XT2	4

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

SPARE PARTS LIST

Index No.	Part No.	Description	Size	Qty
271	S022	HEX. HEAD SCREW	5/16”X3/4”L	4
272	W018	WASHER	5/16”X23XT3	2
273	S022	HEX. HEAD SCREW	5/16”X3/4”L	2
274	181234A	MOTOR MOUNT PLATE		1
275	N007	HEX. NUT	5/16”	2
276	S020	HEX. HEAD SCREW	5/16”X1”L	2
277	S503	CARRIAGE SCREW	5/16”X1”L	4
278		MOTOR		1
279	W016	WASHER	5/16”X23XT2	8
280	N007	HEX. NUT	5/16”	4
281	181235B	MOTOR PULLEY		1
281-1	S604	HEX. SOCKET HEADLESS SCREW	1/4”X3/8”L	1
283	K008	KEY	5X5X30L	2
284	181237I	MOTOR PULLEY COVER		1
285	W202	SPRING WASHER	1/4”	2
286	S006	HEX. HEAD SCREW	1/4”X1/2”L	2
288	3058	PLUM HANDLE		1
290	W008	WASHER	3/8”X25XT2	1
291	S013	HEX. HEAD SCREW	3/8”X1-1/4”L	1
292S	192004AS	ADJUSTABLE BRACKET		1
293S	192021AS	GUIDE PIVOT (RIGHT)		1
294S	192020AS	BEARING SHAFT		1
308S	181242BS	BRUSH ASSEMBLY		1
310	S708	CROSS ROUND HEAD SCREW	3/16”X3/8”L	2
315S	192021AS	GUIDE PIVOT (RIGHT)		1
316S	192020AS	BEARING SHAFT		1
317S	192005S	ADJUSTABLE BRACKET(FRONT) SET		1
318	W008	WASHER	3/8”X25XT2	1
319	3066-3	BLADE ADJUSTABLE KNOB		1
320	181231A	BLADE COVER(FRONT)		1
321	S711	CROSS ROUND HEAD SCREW	5/32”X1/4”L	2
326	181874	BELT	3VX270	1
327	192002B	BLADE BACK COVER		1
329	W005	WASHER	1/4”X16XT1.5	4
330	S701	CROSS ROUND HEAD SCREW	1/4”X1/2”L	4
331	W005	WASHER	1/4”X16XT1.5	2
332	195083	KNOB		2
337	N016	NUT	1/2”	2
338	W002	WASHER	1/2”X28XT2	2
340	181306	BRACKET , FOR CE ONLY		1
341	S720	CROSS ROUND HEAD SCREW	M4X5L	2
342	181305	SWITCH BASE		1
343	W023	WASHER	M5	2
344	S721	CROSS ROUND HEAD SCREW	M5X10L	2
364	3027-1	KNOB		1
365	193057	KNOB		1

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

SPARE PARTS LIST

Index No.	Part No.	Description	Size	Qty
366	S612	HEX. SOCKET HEADLESS SCREW	5/16”-18X1/2”L	1
367	193055	PRESSURE PUMP		1
368	HW007	WASHER	M12XT2	1
369	S013	HEX. HEAD SCREW	3/8”X1-1/4”L	2
370	W013	WASHER	3/8”X20XT2	2
372	193056	PRESSURE SHAFT		1
373	193059	KNOB W/SHAFT		1
374	290086	PLASTIC ROUND KNOB		1
375	CA51101	BEARING		1
376	HW007	WASHER	M12	1
377	193058	SPRING		1
500		POWER CABLE		1
501		PUMP-CABLE		1
502		LIMIT-CABLE		1
503		MOTOR-CABLE		1

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

NOTES:

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.

IMPORTED BY

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