Instruction Manual

Version 1 20170831

SW-100A

SHARP
Safety rules

- Make sure your work area is cleared of uninvited people and obstacles every time before you start operating the machine.

- Never step or stand on the roller table. Your foot may slip or trip on the rollers and you will fall.

- Never wear gloves or loose clothing when operating the machine. It may lead to serious injury if your hands, clothing or gloves are caught by the running blade.

- Never leave the machine unattended when cutting flammable materials. Titanium, magnesium, or any other metal that produces flammable chips may emit smoke or catch fire, depending on how they are used.

- Use a water-soluble cutting fluid on this machine. Oil-based cutting fluids may emit smoke or catch fire, depending on how they are used.

- Never cut carbon or any other material that may produce and disperse explosive dust. It is possible that sparks from motors and other machine parts will ignite and explode the air-borne dust. Use a fire extinguisher or other fire control device near the machine when cutting titanium, magnesium, or any other material that produces flammable chips.

- Never leave the machine unattended when cutting flammable materials. Titanium, magnesium, or any other metal that produces flammable chips may emit smoke or catch fire, depending on how they are used.

- Make sure any use of fire is prohibited in the shop and install a fire extinguisher or other fire control device near the machine when cutting titanium, magnesium, or any other material that produces flammable chips.

- Your hands, clothing or gloves are caught by the running blade. Never touch the running saw blade with gloves or not. It is dangerous if your hands, clothing or gloves are caught by the running blade.

- Cover long hair.

- Never wear gloves or loose clothing when operating the machine. It may lead to serious injury if they are caught in the running machine.

- Wrap or cover long hair.

- Never step or stand on the roller table. Your foot may slip or trip on the rollers and you will fall.

- Make sure your work area is cleared of uninvited people and obstacles.
Safety rules

- Never adjust the wire brush or remove chips while the saw blade is still running. It is extremely dangerous if hands or clothing are caught by the running blade.
- Stop the saw blade before you clean the machine. It is dangerous if hands or clothing are caught by the running blade.
- Never start the saw blade unless the workpiece has been clamped firmly. If the workpiece is not securely clamped, it will be forced out of the vise during cutting.
- Take preventive measures when cutting thin or short pieces from the work piece. It is dangerous if the cut pieces fall.
- Use roller tables at the front and rear sides of the machine when cutting long work. It is dangerous if the work piece falls off the machine.
- Turn off the shop circuit breaker switch before performing maintenance on the machine. Post a sign indicating the machine is under maintenance.
- Never start the saw blade unless the workpiece has been clamped firmly. If the workpiece is not securely clamped, it will be forced out of the vise during cutting.
- Shop the saw blade before you clean the machine. It is dangerous if hands or clothing are caught by the running blade.
- Never adjust the wire brush or remove chips while the saw blade is still running.
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Welcome to Our Bandsaw Cutting: A Practical Guide. This guide is designed to provide you with a comprehensive overview of our bandsaw, including its features, operation, maintenance, and troubleshooting. Whether you are a new user or an experienced professional, this guide will help you get the most out of your bandsaw.

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Introduction

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Adjusting Coolant Flow

- Test Running the Machine
- Adjusting Coolant Flow

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Positioning Workpiece for Cutting

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Section 1

SAFETY INFORMATION

SAFETY INSTRUCTIONS
SAFEGUARD DEVICES
EMERGENCY STOP
SAFETY LABELS
HEARING PROTECTION
CE COMPLIANCE
RISK ASSESSMENT

Safety is a combination of a well-designed machine, operator’s knowledge about the machine and alertness at all times. SHARP’s band machine has incorporated many safety measures during the design process and used protective devices to prevent personal injuries and potential risks. Warning labels also serve as a reminder to the operator.

Throughout this manual, you will also see various safety-related symbols indicating important information that you should take note of prior to use of the machine or part of its functions. These important safety instructions do not cover all possible situations that might occur. It is your responsibility to take caution and follow procedures stated in this manual when installing, maintaining and operating your machine. SHARP will not be liable for damages resulting from improper use.

SAFETY INSTRUCTIONS

What the icons and signs in this user manual mean:

- ![Warning Icon](image)
  This icon marks **WARNING**: hazards or unsafe practices that may result in personal injury or damage to the machine.

- ![Checkmark Icon](image)
  Supplementary information to the procedures described in this manual.

- ![Phone Icon](image)
  Call your local agent or our service center for help.
This manual has important safety information. Read through it carefully before operating this machine to ensure your safety.

**High Heat Sources**
- Do not use the machine to cut explosive materials or high pressure vessels as it will generate great amount of heat.
- During the sawing process and may ignite an explosion.

**Personal Protection**
- Wear proper apparel during operation.
- Protect your eyes with e.g. protection goggles.
- When handling the machine, use sharp saw blade and keep the cutting edge properly guided.
- When a workpiece is too long or heavy, use a sharp saw blade and keep the cutting edge properly guided.

**Maintenance Schedule**
- Use a sharp saw blade and keep the cutting edge properly guided.
- Making adjustments, maintenance or any other condition that may affect its operation. Any damaged part should be replaced.
- If the machine is damaged, make sure it is supported with a roller table (recommended).
- Before cutting, make sure the material is clamped securely.
- Never hold the material by hand for cutting. Always use the vise and make sure the material is clamped securely.

**Improper Accessories**
- Improper accessories may be hazardous.
- Use recommended accessories.
- Improper accessories may be hazardous.

**Keep All Guards in Place**
- Moving parts should be kept in proper motion.
- Before turning on power, check for broken or any loose parts or items from the machine.
- Remove adjustable keys, wrenches or any objects.

**Electrical Safety**
- Keep all guards and shields in place.
- Disconnect the power cord before plugging in power cord.
- Make sure the power switch is off before plugging in power cord.
- Keep all guards and shields in place.

**Work Environment**
- Keep your work area clean. Cluttered areas could lead to accidents.
- Keep all guards and shields in place.
- Do not reach over or stand on any part of the machine.
- Do not reach over or stand on any part of the machine.
- Do not reach over or stand on any part of the machine.

**Safe Operations**
- Always remember to switch off the machine, such as replacing the saw blade changes.
- Always remember to switch off the machine before starting any maintenance.
- Always remember to switch off the machine before starting any maintenance.

**Personal Safety**
- Keep unauthorized personnel away.
- Keep all guards and shields in place.
- Do not operate the machine unless it is completely assembled.
- Keep all guards and shields in place.
- Keep all guards and shields in place.

**Fire Extinguishers**
- Keep a fire extinguisher near the machine.
- Keep a fire extinguisher near the machine.
- Keep a fire extinguisher near the machine.

**Environmental Safety**
- Keep the work environment safe. Do not use band saw in a damp or wet location.
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**Saw Blade**
- Use a sharp saw blade and keep the cutting edge properly guided.
- When a workpiece is too long or heavy, use a sharp saw blade and keep the cutting edge properly guided.

**Ergonomics**
- Never operate with one hand.
- Keep your work area well illuminated at the minimum 500 lumen.
- Keep your work area well illuminated at the minimum 500 lumen.
- Keep your work area well illuminated at the minimum 500 lumen.

**General Safety**
- Keep your work area well illuminated at the minimum 500 lumen.
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**Supervision**
- Keep all guards and shields in place.
- Keep all guards and shields in place.
- Keep all guards and shields in place.

**Maintenance**
- Keep all guards and shields in place.
- Keep all guards and shields in place.
- Keep all guards and shields in place.

This manual has important safety information. Read through it carefully before operating this machine to ensure your safety.
SAFEGUARD DEVICES

The safeguard devices incorporated in this machine include the following two main parts:

1. Protection covers & guards
   - Protection cover (CE model only)
   - Chip conveyor cover (CE model only, as shown in Illustration: Safety Fence)
2. Drive wheel housing cover
3. Gear reducer cover
4. Wire brush belt cover
5. Blade guard cover (left & right)
6. Safety fence (left & right) (CE model only)
7. Chip conveyor cover (CE model only)

The protection devices should always be mounted on the machine whenever the machine is running. Do not remove any of these safeguard devices under any circumstances except when servicing the machine or performing repairs or service on the machine with any of these protectors removed. It is the responsibility of the user to make sure all these elements are not lost and damaged.

Take note of the following main moving parts on the machine prior to and during machine operation:

- Saw blade guide rollers
- Quick approaching device (optional)
- Wire brush
- Chip conveyor (optional)
- Shuttle vises and workbed rollers
- Drive and idle wheels
- Workpiece clamping vises
- Shuttle vises and workbed rollers
- Top clamps (optional)
- Gear reducer
Safety Related Switches

To protect the operator, the following safety related switches on the machine are ... that would cause any injury or damage:

- An abnormal situation or problem such as fire, smoke, abnormal noise and etc.

When you press the button, the machine will immediately come to a full stop to avoid injury or damage when an accident occurs. The button will be locked when you press it. To unlock it, turn the button clockwise.

Please refer to the illustration: Emergency Stop.

Emergency stop button may be available at other areas of the machine depending on machine type.

Designed to be easily accessible, the emergency stop button is located on the left bottom corner on the control panel and is made in red color and rubber material. For CE models, supplementary emergency stop button is only available, depending on the machine type.

Illustration: Emergency Stop

Among all these safety switches, some of them are used to prevent damage to saw blades, the workpiece and the machine itself, etc. We have taken every precaution to prevent injury or damage and to provide safe and economical operation of the machine.

Always use the machine in operation to protect users from being cut by the running saw blade. Whenever the wheel cover are open, this device is designed to assure that the machine will stop immediately when the machine is in operation.

The button will be locked when you press it. To unlock it, turn the button clockwise.

To protect the operator, the following safety related switches on the machine are actuated when the machine is in operation:

Safety Related Switches:
Illustration: Emergency Stop Button
**SAFETY LABELS**

Please read through and understand them before operating the machine. Refer to Illustration: Safety Labels.

<table>
<thead>
<tr>
<th>Label</th>
<th>Meaning</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Hazard</td>
<td>Keep Hands away</td>
<td>Do not stand on the machine or on the accessories!</td>
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<tr>
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<td>Do not step.</td>
<td>Personal Away</td>
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<td>Above Crush Hazard</td>
<td>Do not step.</td>
<td>Keep Unauthorized Personnel Away</td>
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<tr>
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<td>Keep Unauthorized Personnel Away</td>
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</table>

This manual has important safety information. Read thoroughly. Do not operate the machine without wearing safety glasses. Keep this manual. Do not change machine settings. Only trained personnel are authorized to operate the machine.
HEARING PROTECTION

Always use ear protection!

When your machine is running, noise generated by the machine may come from the following:

- Saw blade during cutting or material feed mechanism
- Wire brush unit
- Chip conveyor unit
- Speed reducer
- Hydraulic motor/pump
- Belt transmissions variable speed motors
- Blade motor
- Coolant pump
- Drive wheel
- Parts not assembled tightly causing mechanical vibration

Our products pass noise testing less than 78 dBA. Noise level vary according to working conditions and we recommend ear plugs or other hearing protection at all time. If your machine produces an undesirable noise while it is running, you should:

1. Make sure all maintenance tasks have been performed following the prescribed maintenance schedule (Refer to Section 6).
2. If maintenance does not seem to solve the problem, follow the troubleshooting procedures under Section 7.

CE COMPLIANCE


RISK ASSESSMENT

Risk assessment generally takes account of intended use and foreseeable misuse, including process control and maintenance requirements. We made every effort to avoid any personal injury or equipment damage during the machine design stage. However, the operator (or other people) still needs to take precautions when handling any part of the machine that is unfamiliar and anywhere on the machine that has potential hazards (e.g. the electrical control box).
Section 2

GENERAL INFORMATION

SPECIFICATION
MACHINE PARTS IDENTIFICATION
FLOOR PLAN

This band saw machine is designed by SHARP’s R&D engineers to provide you the following features and advantages:

Safety

- This machine is designed to fully protect the operator from its moving parts during cutting operation.
- The machine will shut off automatically when the saw blade is broken, protecting both the operator and the machine.

Convenience & High-Performance

- The machine is designed in the way that the operation and adjustment can be easily performed.
- The machine will stop automatically when out of stock.
- Dual valve system is designed to achieve optimal cutting performance with the simple setting of feed rate and perspective cutting pressure for different material.

Durability

- The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

$$8 \text{ hours} \times 5 \text{ days} \times 52 \text{ weeks} \times 10 \text{ years} = 20,800 \text{ hours}$$
## Automatic Horizontal Bandsaw

### Model
**SW-100A**

### Capacity
- **●** 250 mm (10”)
- **■** (H x W) 250×250 mm (10” × 10”, options)

### Saw Blade Speed
- **50 Hz**:
  - 23, 34, 45, 57, 67 m/min. (23 ~ 67 m/min)
  - 75, 112, 148, 187, 220 fpm. (75 ~ 220 fpm)
- **60 Hz**:
  - 27, 40, 54, 68, 80 m/min. (27 ~ 80 m/min)
  - 89, 131, 177, 223, 262 fpm. (89 ~ 262 fpm)

### Tank Capacity
- **Hydraulic**: 20 L (5.0 gal.)
- **Coolant**: 38 L (9.9 gal.)

### Motor Output
- **Saw Blade**
  - 2.2 kW (3 HP)
- **Hydraulic**
  - 0.75 kW (1 HP)
- **Coolant Pump**: 0.1 kW (1/8 HP)
- **Hydraulic Guide**: 0.1 kW (1/8 HP)

### Feeding Length Mode
- **Hydraulic with full stroke cylinder**
- **Single Stroke**
  - Max. 3600 mm (141.7"")
- **Multi Stroke**
  - Max. 3505 mm (13.7"")

### Workbed Height
- 550 mm (21.7"")

### Workbed Height
- Max. 3500 mm (14.1"")
- 430 mm (13.9"")

### Guide
- Interchangeable tungsten carbide

### Cleaning Guide
- Hydraulic

### Tension
- Size: 34×3505×0.9 mm (options)
- 27×3505×0.9 mm

### Speed (60 Hz)
- 89, 111, 127, 155, 183, 222, 262 rpm. (89 ~ 262 rpm)
- 27, 40, 54, 68, 80 rpm. (27 ~ 80 rpm)

### Speed (50 Hz)
- 75, 112, 148, 187, 220 rpm. (75 ~ 220 rpm)
- 23, 34, 45, 57, 67 rpm. (23 ~ 67 rpm)

### Weight
- **Net**: 1400 kgs (3080 lbs)
- **Gross**: 1600 kgs (3520 lbs)

### Operating Environment
- **Temperature**: 5~40˚C (41~104˚F)
- **Humidity**: 30%~85% (without condensation)

### Floor Space (L x W x H)
- 2000×250×1800 mm (79.5”×98.4”×70.9”)

### Motor
- 2.2 kW (3 HP)

### Specification

### Model
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MACHINE PARTS IDENTIFICATION

Machine front view

Gear Reducer
Workbed Feed Roller
Vertical Alignment Roller
Roller Table (Optional)

Coolant pump
Cleaning Hose
For your safety, please read all information regarding installation before proceeding.

Install your machine in a place satisfying all of the following conditions:

**Space:**
- Leave enough free space around the machine for loading work and unloading cut-off pieces as well as for maintenance and inspection. Refer to Section 2 General Information - Specifications for machine dimensions and floor space.
- Leave enough free space around the machine for loading work and unloading cut-off pieces for maintenance, and inspection. Refer to Section 2 General Information - Specifications for machine dimensions and floor space.

**Environment:**
- Well lighted (500 lumen at minimum).
- Floor kept dry at all times in order to prevent operators from slipping.
- Away from direct exposure to the sunlight.
- Room temperature between 5°C to 40°C.
- Humidity level kept at 30%-95%RH (without condensation) to avoid dew on electric installation and machine.
- Away from vibration of other machines.
- Away from powders or dusts emitted from other machines.
- Avoid uneven ground. Choose a solid level concrete floor which can sustain weight of both machine and material weight.
- Avoid from powders or dusts emitted from other machines.
- Avoid from vibration of other machines.
- Limit the operation area of the machine to staff only.

**Location & Environment:**
- Well lighted (500 lumen at minimum).
UNPACKING & INSPECTING

- Unpack your machine carefully to avoid damage to machine parts or surfaces.
- Upon arrival of your new band saw, please confirm that your machine is the correct model and it comes in the same specification you ordered by checking the model plate on the machine base.
- It is also imperative that a thorough inspection be undertaken to check for any damage that could have occurred during shipping.
- Pay special attention to machine surface, equipments furnished and the electrical and hydraulic systems for damaged cords, hoses and fluid leaks.
- In the event of damage caused during shipping, please contact your dealer and consult about filing a damage claim with the carrier.
- If you find any missing accessories, please contact your local agent immediately.

Your machine comes in with a set of tools for you to maintain the machine. The accessories furnished are as follows:

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<th>Quantity</th>
</tr>
</thead>
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<tr>
<td>Operation manual</td>
<td>1 pc</td>
</tr>
<tr>
<td>Chip guide (only for manual models)</td>
<td>1 pc</td>
</tr>
<tr>
<td>Hexagon wrench</td>
<td>1 set</td>
</tr>
<tr>
<td>Open-ended spanner</td>
<td>3 pcs</td>
</tr>
<tr>
<td>Screwdriver (+, -)</td>
<td>2 pcs</td>
</tr>
<tr>
<td>Grease gun</td>
<td>1 pc</td>
</tr>
<tr>
<td>Tool box</td>
<td>1 pc</td>
</tr>
</tbody>
</table>
LIFTING

When moving the machine, we strongly suggest you choose any one of the methods described below to move your machine.

1. Use a crane.

1. Use a crane.

When you work together with more than two people, it is best to keep consistent verbal communication with each other.

- Machine lifting is likely to damage the machine if not performed properly.
- You must have a qualified crane operator to perform the job.
- You must use tools and equipment with proper tensile strength and use proper method to perform the job.
- You must use a crane to move your machine.

Keep the machine well balanced during lifting and keep to avoid injuries. Also watch out your own fingers and keep to protect the saw frame from impact or shock during this procedure. Always watch out your own fingers when moving your machine.

Apply the wire rope sling to the lifting hooks on the four ends of the machine. Refer to Illustration: Lifting Points for exact locations. Slowly lift the machine. Be sure to protect the machine from impact or shock during this procedure.

When moving the machine (refer to machine specification under Section 2 General Information), move the machine to its location by using a crane and a wire rope sling that can fully withstand the weight of the machine.
2. Use a forklift

Most users choose this method to move their machine because it is easy to set up.

- Make sure the lifting rod can fully withstand the weight of the machine. (Refer to Section 2 – General Information for Specifications.)

3. Use rolling cylinders

You can use rolling cylinders to move your machine in a small machine shop environment.

- You must use rolling cylinders made in material of proper compressive strength.

Illustration only.

- Make sure the forks are centered at all times.
- Make sure the forks are able to reach in at least 2/3 of the machine depth.
- Avoid damage to the machine.
- You must apply proper forklift technique to avoid damage to the machine.
- You must have a qualified forklift operator to perform the job.
- Machine lifting is likely to damage the machine if not performed properly.
Minimum weight capacity for each wire rope: 2. ton
Total number of wire ropes required: 4
REMOVING SHIPPING BRACKET

- After the machine has been properly positioned, remove the shipping bracket that is used to lock the saw frame and the saw bed.
- Retain this bracket so that it can be used again in the event that your machine must be relocated.

CLEANING

After the machine has been placed at the designated position, remove the rust-preventive grease with wiping cloth dampened with cleaning oil or kerosene. Apply machine oil to machine surfaces that are prone to rust.

⚠️ Do not remove the rust-preventive grease with a metal scraper and do not wipe the painted surfaces with solvent as doing so would damage surface paint.

INSTALLING

SHARP’s bandsaw machine is relatively easy to install. Follow these six easy steps to install your machine.

1. Supply hydraulic oil
2. Supply cutting fluid
3. Connect electric power
4. Leveling & Anchoring
5. Installing roller table (optional)
6. Installing Fire Control Device

Supplying hydraulic oil

Open the filler cap and fill the hydraulic oil tank to above 2/3 or full level.

Check the sight gauge to make sure the oil level in the tank.

✔️ Refer to specification chart under Section 2 for tank capacity.

✔️ Oil tank should be full already if it is a new machine that operates for the first time.
Supplying coolant

Fill the coolant tank to the middle level of the sight gauge by pouring the coolant from above the chip conveyor.

Use the sight gauge to check the coolant level remaining in the tank.

Always check the coolant supply before starting the machine. If the coolant pump is started without enough coolant supply in the tank, the pump and its drive motor may be damaged.

Refer to specification chart under Section 2 General Information for tank capacity.

Consult your coolant supplier for bandsaw use regarding coolant type and mix ratio.

Connecting electric power

Have a qualified electrician make the electrical connections.

If the power supply voltage is different from the transformer and motor connection voltage shown on the label attached to the electrical compartment of the machine, contact SHARP or your agent immediately.

Connect to power supply independently and directly. Avoid using the same power supply with electric spark machines such as electric welder. Unstable electric tension may affect your machine’s electric installation from working properly.

Ground the machine with an independent grounding conductor.

Supply voltage: 90% - 110 % of nominal supply voltage.

Source frequency: 99% - 101 % of nominal frequency.

Refer to the specification chart under Section 2 for total electric power consumption of the motors and make sure your shop circuit breaker is capable of this consumption amount. Also use a power supply cable of proper size to suit the power supply voltage.
1. Turn off the shop circuit breaker.

2. Make sure the machine circuit breaker switch on the electrical compartment door is turned to OFF.

3. Remove the screw securing the electrical compartment and then open the door.

4. Pull the power supply cable and grounding conductor through the power supply inlet into the electrical compartment (shown right).

5. Connect the power supply cable to the circuit breaker (N.F.B.) to the R, S and T terminals, and connect the ground cable to the E terminal.

6. Close the compartment door and fasten the screw.

7. Turn on the shop circuit breaker and then turn the machine circuit breaker switch to ON. The Power Indicator on the control panel will come on.

8. Indicator on the control panel will come on.

9. Make sure the sawing area is clear of any objects.

10. Press the hydraulic ON button to start the hydraulic motor.

2. Make sure all leveling bolts evenly support the machine weight.

3. Level the machine in both directions i.e. along and across the feed table.

4. Place spirit level on the vise slide plates and the workpiece slide plates and the workpiece.

5. Place spirit level on the vise slide plates and the workpiece.

6. Place spirit level on the vise slide plates and the workpiece.

7. Place spirit level on the vise slide plates and the workpiece.

8. Place spirit level on the vise slide plates and the workpiece.

9. Place spirit level on the vise slide plates and the workpiece.

10. Level the machine by turning the leveling bolts. Adjust the level of the machine by turning the leveling bolts.

In some cases, leveling the machine with a slight slope toward the front of the machine is recommended as it would prevent coolant from running down cutting the rear end of the machine or bundles. To do so, make the material especially close to bundles. To prevent coolant from running down cutting material especially close to bundles. To prevent coolant from running down cutting material especially close to bundles. To prevent coolant from running down cutting material especially close to bundles. To prevent coolant from running down cutting material especially close to bundles. To prevent coolant from running down cutting material especially close to bundles.
Anchoring

Normally there is no need to anchor the machine. If the machine is likely to vibrate, fix the machine to the floor with anchor bolts. Shock absorption steel plates are provided and can be placed under each leveling bolt to prevent the machine sinking into the concrete floor.

Installing roller table (optional)

The roller table is used to support long material at the rear and/or the front of the machine. If you have ordered the optional roller table for cutting long material, position it before or behind the machine.

Level the roller table and the stand with the machine by adjusting the leveling bolts. If you have ordered the optional roller table for cutting long material, position it before or behind the machine.

Installing fire control device

Install a fire extinguisher or any other fire control device in the shop in case a fire breaks out.

RELOCATING

We recommend you follow these procedures when relocating or shipping your machine to other places:

1. Descend the saw frame to its lowest position then turn off the power.
2. Fix the saw frame using the shipping bracket that originally came with the machine.
3. If you are shipping the machine, pack the machine carefully with industrial plastic wraps to protect it from dust.
4. Place the crane or fork lift to raise it. If a crane is used to lift the machine, ensure that the lifting cable is properly attached to the machine.
5. Do not forget to include the equipment originally furnished including the shock absorption steel plates and the instruction manual.

Adjust bolts 3-9
SAFETY PRECAUTIONS
BEFORE OPERATING
CONTROL PANEL
STANDARD ACCESSORIES
OPTIONAL ACCESSORIES
UNROLLING & INSTALLING THE BLADE
BREAKING-IN THE BLADE
ADJUSTING WIRE BRUSH
ADJUSTING COOLANT FLOW
ADJUSTING SAW ARM
ADJUSTING BLADE SPEED
PLACING WORKPIECE ONTO WORKBED
POSITIONING WORKPIECE FOR CUTTING
TEST-RUNNING THE MACHINE
STARTING AN AUTOMATIC OPERATION
USING TOP CLAMP FOR BUNDLE CUTTING
TERMINATING A CUTTING OPERATION

INSTRUCTIONS
OPERATING
Section 4
SAFETY PRECAUTIONS

For your safety, please read and understand the instruction manual before you operate the machine.

The operator should always follow these safety guidelines:

- The machine should only be used for its designated purpose.
- Do not wear gloves or jewelry while operating the machine.
- Wear protective glasses while changing the blade.
- Disconnect machine from the power source before making repairs or adjustments.
- Wear protective gloves only when changing the blade.
- Do not operate the machine under the influence of drugs, alcohol or medication.
- Do not remove jammed or cut-off pieces until the blade has come to a full stop.
- Keep fingers away from the path of the blade.
- Do not take your eyes off of the machine while in operation.
- Place warning signs to mark out machine work zone and restrict entry to be staff-only.
- For eye protection, always wear protective safety glasses.
- Do not place auxiliary clamping or supporting devices to fix material in place before cutting.
- Check the blade tension and adjust blade guides before starting the machine.
- Remove these devices.

Remember to always wear protective safety glasses and keep your hands away from the blade path.

The operator should always follow these safety guidelines for their safety and the safety of others.
BEFORE OPERATING

Choosing an appropriate saw blade and using the right cutting method is essential to your cutting efficiency and safety. Select a suitable saw blade and cutting method based on your work material, cutting accuracy, cutting speed, economic concern, and safety control. Choose an appropriate saw blade and using the right cutting method is essential to your cutting process.

Wet cutting
If you choose dry cutting or low-speed cutting, the chips may accumulate in machine parts and may cause operation failure or insulation malfunction. We suggest you choose wet cutting to avoid machine damage.

Cutting fluid
For cooling and lubrication purpose, we recommend you use water-soluble cutting fluids. The following table lists out its pros and cons for your reference.

<table>
<thead>
<tr>
<th>Pro</th>
<th>Con</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Have a high coolant effect</td>
<td>• Remove machine paint</td>
</tr>
<tr>
<td>• Not flammable</td>
<td>• Lose its rust protection effect</td>
</tr>
<tr>
<td>• Economical</td>
<td>• Subject to decay</td>
</tr>
<tr>
<td>• Does not require cleaning of the cut</td>
<td>• Tend to create foam</td>
</tr>
<tr>
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</tr>
<tr>
<td>• Not flammable</td>
<td>• Tend to create foam</td>
</tr>
</tbody>
</table>

Never take your eyes off the machine while in operation.

Consult your coolant supplier for bandsaw use regarding coolant type and mix ratio.

Before starting a cutting job, make sure there is sufficient amount of coolant in the tank. Check the fluid level through the sight gauge. Please refer to machine specifications in this manual (Section 2) for tank capacity.
The control panel is located on the top of the electrical box. It includes the following function: power system, hydraulic system, cooling system and the human-machine interface (HMI). The operator must fully understand the function of each switch and button before operating the machine.

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When the lamp is on, it indicates the power to the machine is turned on.

1. **POWER "ON" button indicator lamp**
   - Depressed this button the hydraulic motor and chip conveyor will start and the white light will come on. When the lamp is on, it indicates the power to the machine is turned on.

2. **POWER "OFF" button**
   - Depressed this button all of power will shut off and the whole machine operation stops immediately.

3. **AUTO/Manual mode switch**
   - Use this switch to select between automatic and manual mode.
     - **AUTO** mode: used to automatically perform continuous cutting jobs. When switched to the manual mode, this mode, the machine will automatically operate according to the preset cutting data. This function can be used for the machine to automatically cut the work after it trims the end of the work.
     - **Manual** mode: used to perform individual cutting jobs. When switched to the manual mode, you can execute each individual function.

4. **BLADE DRIVE button**
   - When the VISE CLAMP SELECTOR [7] is turned to "Ⅱ" and this button is depressed, the blade motor will operate and the saw head will descend quickly before the Limit switch of the Quick approach device contact with the workpiece. Thereafter, the sawhead descends at the designated cutting speed.

The operation other than cutting, the machine stops immediately.

- When the lamp is on, it indicates the power to the machine is turned on.

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4-6

The button is engaged when "number 3" AUTO/MANUAL select switch is turned to "a".

The quick approach feeler may be damaged if the rear vise is moved with the work clamped and in contact with the front vise.

The rear vise cannot be moved forward if the front vise and rear vise are both closed. The quick approach feeler may be damaged if the rear vise is moved with the work clamped and in contact with the front vise.

Press to feed the stock forward.

If the VISE CLAMP SELECTOR is turned to "a", the blade motor will not operate at all even if this button is depressed.

5. RISE button
When this button is depressed, the blade motor will stop and the sawhead will rise. The sawhead will rise at all even if this button is depressed.

6. QUICK APPROACH button
This button is used to allow the sawhead to approach the workpiece quickly when the saw blade is at a distance from the workpiece. While this button is depressed, the sawhead descends quickly; when the saw button is at a distance from the workpiece, the sawhead stops moving down quickly.

This button is used to allow the sawhead to approach the workpiece quickly when the saw blade is at a distance from the workpiece.

7. VISE CLAMP selector
After setting the AUTO / MANUAL SELECTOR [3] to "a", the motions of front vise and rear vise can be controlled as following.

The front vise opens and the rear vise closes.

The front vise closes and the rear vise opens.

The rear vise moves forward and the rear vise moves backward.

The forward and backward motion of the rear vise can be controlled by these two buttons after turning the AUTO / FORWARD / BACKWARD selector.

8. REAR VISE FORWARD / BACKWARD selector
The forward and backward motion of the rear vise can be controlled by these two buttons after turning the AUTO / FORWARD / BACKWARD selector.
The rear vise cannot be moved either if the quick approach feeler is in contact with the work, or is raised and locked. The rear vise cannot be moved backward if the front vise and rear vise are both closed. The rear vise is engaged when "number 3 AUTO/MANUAL select switch is turned to "1."  

Press reset button to return zero. 

- Count range is 1~99999. 
- Automatically counts and indicates the number of pieces already cut under AUTO mode. The count readout (white color digital number): You can press "+" type button at top side to change count. 
- Indicates the number of pieces to be cut under AUTO mode. The setup range is 1~99999. 
- Press reset button (yellow color digital number): 

Following stops: 

When under manual and bundle cutting mode, the feedin vise must be touching the Front Limit switch. 

- OFF mode The work lamp shuts down. 
- ON mode The work lamp operates. 

11. COOLANT PUMP selector 

- OFF mode The coolant pump halts and the coolant supply stops. 
- ON mode The coolant pump operates and the coolant supply begins. 

12. CUTTING PIECE counter 

This counter is used to preset the number of cuts required under automatic mode. When the counter reaches the preset number, the machine stops automatically. You can turn cal screw counter clockwise to open plastic protection cover. To activate the counter set according to the following steps: 

- "ON" mode The work lamp operates. 
- "OFF" mode The work lamp shuts down. 

When under manual and bundle cutting mode, the feedin vise must be touching the Front Limit switch to bundle a stack of work pieces. 

9. Single/Bundle cutting mode switch 

This button is used to switch between single or bundle cutting mode. 

8. Vise LOCK 

The rear vise will not operate for safety measurement if button is pressed when the saw blade motor is operating. 

The rear vise will not operate for safety measurement if button is pressed when the saw blade motor is operating. 

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The rear vise will not operate for safety measurement if button is pressed when the saw blade motor is operating.
4-3. **FEEDING TIMES selector**

Depress the "–" type button at top or at under side for number changing. When this selector is pressed to "2", the rear vice performs a double (two-times) feeding of the workpiece. On this selector, the maximum cutting length is 3600 mm (141.7 in.) [400 mm x 9]. In addition, if cutting length is 1200 mm, then the feeding times should be set to "3". The maximum feeding times are "9".

13. **COUNTER "ON / OFF" switch**

| "ON" mode | When the switch is turned to this mode, the "CUTTING PIECES COUNTER" is turned on.
| "OFF" mode | When the switch is turned to this mode, the "CUTTING PIECES COUNTER" is turned off.

14. **FEEDING TIMES selector**

![Diagram of the feeding times selector with labels for Set Value, Cut Piece Readout, and Reset Button]
Blade Descend Pressure and Speed

The part of control panel is where cutting pressure and saw bow descend speed can be adjusted.

1. Cutting pressure control knob
   - This pressure control knob is used to adjust the cutting pressure of the blade.
   - Turning the knob clockwise increases the cutting pressure.
   - To obtain a good cutting result, choose the right cutting pressure by turning the knob until it points to your material on the color chart.

2. Blade descend speed control knob
   - This knob is used to adjust the descend speed of the saw blade.
   - Turning the knob clockwise increases the blade descend speed.
   - Blade descend speed is a determining factor to a good cutting time and quality cutoff surface.
   - Set the blade descend speed in accordance with the cutting pressure control knob.
   - Blade descend speed is determined by the factor of the saw blade.

STANDARD ACCESSORIES

Blade tension device
- This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.
- To tighten the saw blade, turn the selector to "0".
- Upon saw blade breakage, the safety device will activate and automatically stop all machine operation.
- The limit switch of the safety device can be reset by turning the blade tension selector to "0".
- To change the blade, turn the handle to release saw blade tension.
- Never adjust blade tension while the blade is running.

Cutting pressure and speed control panel

I. Cutting pressure control knob
   - This pressure control knob is used to adjust cutting pressure.

II. Blade descend speed control knob
   - This knob is used to adjust the speed of the blade.

III. Tension
   - To change the blade, turn the handle to release saw blade tension.

IV. Tension selector to "0".
   - The limit switch of the safety device can be reset by turning the blade tension selector to "0".
   - To tighten the saw blade, turn the selector to "0".
   - This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.

Never adjust blade tension while the blade is running.
Blade speed/motion detector

Besides detecting the blade speed, the speed/motion detector also functions as a safety device. The specially designed gear reducer can work toward your preset blade speed and torque.

Quick approach device

This device allows the blade to quickly descend to just right above the material to save you operation time.

Split front vises

The split vise is a clever design to make sure your workpiece is tightly clamped by the two vises from both sides of the blade, maximizing stability and cutting precision.

Gear reducer

The specially designed gear reducer can work toward your preset blade speed and torque.

Please refer to Section 6 for information on maintenance.
When the hydraulic system is turned on, the coolant pump can be operated individually from the control panel. Coolant can be used to wash off chips as well as providing cooling during cutting.

**OPTIONAL ACCESSORIES**

**Vise pressure regulator**
- This adjustment valve is used to control vise pressure.
- Adjust vise pressure based on the material of your workpiece.
- The top clamp device composed of two clamps is installed on top of the front and rear vises before executing bundle cutting.
- Vise pressure should never be lower than 8 kg/cm².

As a regular maintenance, remove the chip conveyor and clean all chip deposits inside.

**Chip conveyor**
Chip conveyor is a spiral device to bring chips out during cutting.

**Pressure adjusting valve**

When cutting pipes or soft materials, reduce vise pressure to prevent exerted pressure from damaging the workpiece shape or exterior.

This adjustment valve is used to control vise pressure.

When the hydraulic system is turned on, the coolant pump can be operated individually from the control panel. Coolant can be used to wash off chips as well as providing cooling during cutting.
The optional 2M roller table supports the work material and ensures the material be fed in smoothly.

Refer to Section 6 for further information on adjusting the roller table.

- Ensure the material be fed in smoothly.
- The optional 2M roller table supports the work material and...
Step 5 - Turn the tension controller handle from " " to  " position to release tension. The idle wheel will then move slightly toward the direction of the drive wheel.

Step 6 - Remove the blade safety cover and open the idle and drive wheel covers.

Step 7 - Press the blade clip device to hold onto the blade. This device makes blade changing easy and feasible even with only one operator available.

Step 8 - Loosen the left and right carbide inserts by loosening the „lock nut” shown below.

Step 9 - Open the wire brush cover. Loosen the lock lever and lower the wire brush.

Step 10 - Remove the old blade. If necessary, clean the carbide inserts before installing a new saw blade.

Step 11 - Place the new blade around the idle wheel and the drive wheel.

Step 12 - Insert the blade into the left and right tungsten carbide inserts. The back and the sides of the blade need to be touching the inserts as well as the adjacent rollers.

Step 13 - Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel.
When saw blade begins to rotate, the blade holder will automatically release the blade and fall back to its original position.

- **Step 1:** Open the drive wheel cover.
- **Step 2:** Loosen the lock lever and the wire brush cover.
- **Step 3:** Move brush up/down until it makes proper contact with the saw blade (see below).

Follow these steps to adjust wire brush to appropriate position:

**Adjusting Wire Brush**

- **Step 4:** After the break-in operation is completed, set all parameters back to normal settings.
- **Step 3:** The break-in operation can be considered sufficient if all the unusual noises or metallic sounds have been eliminated.
- **Step 2:** Lengthen the cutting time to 2-3 times of what is normally required.
- **Step 1:** Reduce the blade speed to one-half of its normal setting.

Breaking-in the Blade

When a new saw blade is used, be sure to first break it in the blade before using it for actual, extended operation. Failure to break in the blade will result in less than optimum efficiency. To perform this operation, follow the instructions below:

- **Step 1:** Reduce the blade speed to one-half of its normal setting.
- **Step 2:** Lengthen the cutting time to 2-3 times of what is normally required.
- **Step 3:** The break-in operation can be considered sufficient if all the unusual noises or metallic sounds have been eliminated.
- **Step 4:** After the break-in operation is completed, set all parameters back to normal settings.

**Adjusting Wire Brush**

Follow these steps to adjust wire brush to a proper position:

- **Step 1:** Open the drive wheel cover.
- **Step 2:** Loosen the lock lever and the wire brush cover.
- **Step 3:** Move brush up/down until it makes proper contact with the saw blade (see below).
- **Step 4:** Reinstall the wire brush cover and tighten the lock lever.
Step 1 – Press the saw blade start button to start the saw blade drive motor.

Step 2 – Press the saw bow down button to lower the saw bow.

Step 3 – Use the flow control valve (shown below) to adjust the amount of fluid flowing to the cutting area.

Adjust the flow amount if you observe the following changes to the chips generated from the cutting.

- If the chips are sharp and curved, increase the coolant flow amount.
- If the chips are granulated, decrease the coolant flow amount.

Step 4 – Loosen the inserts by unlocking the lock nut.

Step 5 – Close the drive wheel cover.
Step 2 – Loosen the blade guide locking lever. Then adjust the guide arm to a position suitable for your workpiece size.

Step 3 – After adjustment is made, tighten the blade guide locking lever.

Step 4 – Clamp the inserts back by tightening the lock nut.

Step 2 – Manually lift up the paws and fully open the front and rear vises.

Step 3 – Ease the saw bow into its highest position.

Step 4 – Carefully place the workpiece onto the work feed table to where it extends approximately 30mm (1.2 inch) beyond the rear vise toward the front vise.

Placing Workpiece onto Workbed

Step 2 – Loosen the vertical roller lock handles and fully open the vertical rollers.

Step 3 – Loosen the blade guide arm to a position suitable for your workpiece size.

Step 4 – Clamp the inserts back by tightening the lock nut.
- Follow these steps to position your workpiece:

<table>
<thead>
<tr>
<th>Step</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rear vises clamp material. Turn the vise clamp switch to the left to open the rear vise. Lift up the pawl and manually position the rear vise so it pushes against the workpiece. Then, turn the vise clamp switch to the right until the workpiece is securely clamped by the rear vise.</td>
</tr>
<tr>
<td>2</td>
<td>Align vertical rollers. Press the feed forward button until the front vise touches the front limit switch.</td>
</tr>
<tr>
<td>3</td>
<td>Feed material forward. Press the feed forward button (and the feed backward button if necessary) until the cutoff point on the workpiece aligns with the blade line.</td>
</tr>
<tr>
<td>4</td>
<td>Lift up the pawl and manually position the front vise so it pushes against the workpiece. Then, turn the vise clamp switch to the left to open the front vise.</td>
</tr>
<tr>
<td>5</td>
<td>Rear vises retract to clamp material again. Turn the vise clamp switch to the left to open the rear vise. Lift up the pawl and manually position the rear vise so it pushes against the workpiece.</td>
</tr>
<tr>
<td>6</td>
<td>Precision position. Press the feed forward button (and the feed forward switch if necessary) until the workpiece aligns with the rear vise.</td>
</tr>
<tr>
<td>7</td>
<td>Limit switch. Turn the vise clamp switch to the left so the workpiece is correctly positioned. Turn the vise clamp switch to the right until the workpiece is securely clamped by the front vise.</td>
</tr>
<tr>
<td>8</td>
<td>Confirm cutoff point. Press the saw bow down button to lower the saw bow until the quick approach bar descends to just about 10mm (0.4 inch) above the workpiece. Under no circumstances should the quick approach bar be lowered below the height of the workpiece.</td>
</tr>
<tr>
<td>9</td>
<td>Precision position. Press the feed forward button (and the feed backward button if necessary) until the cutoff point on the workpiece aligns with the blade line.</td>
</tr>
</tbody>
</table>
| 10   | Rear vises clamp material. Ready to cut.
Test-running this machine can ensure good machine performance in the future. We suggest you run the following tests on the machine before first use:

**Testing machine performance:**

1. Turn on the power and run a basic performance test after you finish installing the machine. Follow these steps to test machine performance:
   - Turn on the relay switch in the control box.
   - Elevate the saw bow. (If your coolant pump is in reverse and the machine cannot run, please change the electrical phase.)
   - After the saw bow ascends, extend the quick approach device.
   - Remove the rust-prevention grease with cleaning oil or kerosene.
   - Start the coolant pump.
   - Test these functions under manual mode:
     - Vise clamping/unclamping
     - Saw bow ascending/descending
     - Feeding forward and backward

2. Turn the coolant on before you run a full performance test after you finish installing the machine. Follow the following tests on the machine before first use:

**Test-running the machine:**
CUTTING OPERATION

Step 1 – Check before you cut

- Power: Check the voltage and frequency of your power source.
- Coolant: Check if you have sufficient coolant in the tank.
- Hydraulic: Check if you have sufficient hydraulic oil.
- Workbed: Check if there is no other object on the feeding bed that may cause interference.
- Rollers: Check all the rollers on the front and rear workbed can roll smoothly.
- Light: Check the work lamp or laser light (optional) and make sure there is sufficient lighting.
- Blade: Check the blade teeth and make sure there is no worn out teeth along the blade.
- Workbed: Check if you have sufficient (at least two-thirds or higher) hydraulic oil.
- Power: Check the voltage and frequency of your power source.
- Cutter: Check if you have sufficient coolant in the tank.

Step 2 – Clean the workbed by removing chips and cutting fluids.

Step 3 – Position your workpiece.

Step 4 – Clamp the workpiece.

Step 5 – Turn the cutting pressure control knob to adjust cutting pressure accordingly to the material.

Step 6 – Adjust the blade descent speed control knob to obtain a suitable blade descent speed for your material.

Step 7 – Start running the blade.

Step 8 – While the blade descends, adjust the blade speed if necessary. You can do so by turning the blade speed control knob, clockwise to speed up and counterclockwise to slow down. The blade speed is displayed on the HMI touch screen.

Step 9 – Before you start cutting, check again that there is no other object in the cutting area.

Step 10 – After the entire cutting job is completed, elevate the saw bow to the top and open the vises to remove the workpiece.

Step 11 – Lower the saw bow to a proper position then turn off the power.

Step 12 – Clean the workbed by removing chips and cutting fluids.

Before loading, make sure the vises are opened to at least wider than the width of the workpiece.

Before loading, check manually or by using a lighting tool e.g. a crane.
STARTING AN AUTOMATIC OPERATION

Step 1 – Use manual mode and cut the edge of the workpiece by using the same procedures as those described under manual operation.

Step 2 – After the trim cut is completed and the saw blade has stopped at the lower limit position, press the saw blade up button to raise the saw bow until the quick approach bar is approximately 10mm (0.4 inch) above the workpiece.

Step 3 – Turn the Auto / manual switch to manual.

Step 4 – Open the front vise.

Step 5 – Feed the workpiece forward to the required cutting position.

Step 6 – Clamp the front vise.

Step 7 – Set the required cutting length on the cutting length preset counter using the following procedures:

1) Loosen the lock screw.

2) Turn the handwheel to set the required cutting length which was determined in step 4 above on the counter. When setting the required cutting length, be sure to turn the handwheel clockwise to prevent setting error due to backlash.

3) Tighten the lock screw.

Step 8 – If the required cutting length is more than 400mm (15.7") feed the workpiece twice by turning the feeding times button.

Step 9 – If the required cutting length is 600mm, C = (600 – 1.6 x (2 – 1))/2 = 299.2mm

For example, when the required cutting length is 600mm, C = (600 – 1.6 x (2 – 1))/2 = 299.2mm

u = Reading times

l = set with L/mm

I = Required cutting length (mm)

C = Value set on counter (mm)

\[
\frac{u}{1 - \frac{l}{u} + \frac{1}{u}} = C
\]

To determine the value to be set on the cutting length preset counter, be sure to use the following equation:

 Turning the feeding times button.

Step 9 – If the required cutting length is more than 400mm (15.7"), feed the workpiece twice by turning the feeding times button.

Step 10 – Turn the Auto / manual switch to Auto.

Press the saw blade up button to raise the saw bow until the quick approach bar is depressed under manual operation.

Step 1 – Use manual mode and cut the edge of the workpiece by using the same procedures as those described under manual operation.
USING TOP CLAMP FOR BUNDLE CUTTING

Installing top clamp

To perform bundle cutting, use the top clamps and take the following installation procedures.

Step 1 – Install stud bolts on the front and rear vises and position the top clamp. The bundled workpiece is within 5 to 10 mm (0.2 ~ 0.4 in).

Step 2 – Connect the top clamp hoses to the pressure joints on the vise hydraulic cylinders.

Step 3 – Position the workpiece for bundle cutting.

Step 4 – Align the top clamp cylinders with the center of the workpiece and tighten the lock nuts.

Step 5 – Turn the top clamp handles so that the clearance between the top clamp jaw and the top of the bundled workpiece is within 5 to 10 mm (0.2 ~ 0.4 in).

Step 6 – Install the bundle-cutting fence to the work tray. The fence is designed to prevent cut pieces.

Proper and Improper Stacking of Workpieces:

Proper

Improper

Note the allowable clamping width and height. (Refer to Section 2 – General Information.)

Specifications.

To perform bundle cutting, use the top clamps and take the following installation procedures.
terminating a cutting operation, press either the saw bow up button or the emergency stop button.

The saw blade will stop running when the saw bow up button is pressed.

The machine will stop automatically when an error occurs.

The saw blade and hydraulic pump motors will stop running when the emergency stop button is pressed.

Step 3 -- Remove the stud bolts.
Step 2 -- Loosen the lock nuts and remove the top clamp.
Step 1 -- Disconnect the top clamp hoses.

Follow these steps to uninstall top clamp for cutting single material:

Uninstalling Top Clamp

Automatic operation.

Step 8 -- For subsequent cutting procedures, refer to the instructions under manual operation and then the width of the bundle.
Step 7 -- Press Single/Bundle cutting mode button and switch to bundle cutting mode.

from scattering across the work tray. Adjust the width of the fence to be slightly larger.
Section 5
ELECTRICAL SYSTEM

ELECTRICAL CIRCUIT DIAGRAMS

5-2 Control Panel Layout
5-3 Circuit Board Layout
5-4 Power Supply Layout
5-5 PLC Input/Output Layout

Electrical Circuit Diagrams

Section 5
### TB-1

<table>
<thead>
<tr>
<th>A</th>
<th>X1</th>
<th>X3</th>
<th>X5</th>
<th>X7</th>
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<th>X13</th>
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<th>X37</th>
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<tbody>
<tr>
<td>L</td>
<td>110V</td>
<td>0V</td>
<td>X0</td>
<td>X2</td>
<td>X4</td>
<td>X6</td>
<td>X10</td>
<td>X12</td>
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<td>X24</td>
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<td>X30</td>
<td>X32</td>
<td>X34</td>
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### FX3G-60M

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<th>Y2</th>
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<th>Y6</th>
<th>Y10</th>
<th>Y12</th>
<th>Y14</th>
<th>Y16</th>
<th>Y20</th>
<th>Y22</th>
<th>Y24</th>
<th>Y26</th>
</tr>
</thead>
<tbody>
<tr>
<td>0V</td>
<td>Y0</td>
<td>Y1</td>
<td>Y2</td>
<td>-</td>
<td>Y4</td>
<td>Y6</td>
<td>-</td>
<td>Y10</td>
<td>Y12</td>
<td>-</td>
<td>Y14</td>
<td>Y16</td>
<td>-</td>
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</table>

### RST T

- 1
- 4
- 1
- 5
- 7
- 11
- 13
- 15
- 17
- 21
- 23
- 25
- 27
- 31
- 33
- 35
- 37
- 41
- 43

### Transformer

- 40VA
- 400VA

### FUSE 4A

- 110V
INTRODUCTION
SAW BLADE SELECTION
VISE LOADING
BladeBreak
SOLUTIONS TO SAWING PROBLEMS
INTRODUCTION

1. **TPI:** The number of teeth per inch as measured from gullet to gullet.

2. **Tooth Rake Angle:** The angle of the tooth face measured with respect to a line perpendicular to the cutting direction of the saw.

3. **Tooth Pitch:** Tooth pitch refers to the number of teeth per inch (tpi). 1 inch equals to 25.4 mm.

4. **Set:** The bending of teeth to right or left to allow clearance of the back of the blade through the cut.

5. **Width:** The nominal dimension of a saw blade as measured from the tip of the tooth to the back of the blade.

6. **Thickness:** The dimension from side to side on the blade.

7. **Gullet:** The curved area at the base of the tooth. The tooth tip to the bottom of the gullet is the gullet depth.

SAW BLADE SELECTION

1. **Band Length:** The dimensions of the band will depend on the band saw machine that has been installed.

2. **Band Width:** Band width: the wider the band saw blade, the more stability it will have.

3. **Cutting edge material:** Band width:

   - **TPI:** The number of teeth per inch as measured from gullet to gullet.
   - **Tooth Rake Angle:** The angle of the tooth face measured with respect to a line perpendicular to the cutting direction of the saw.
   - **Tooth Pitch:** Tooth pitch refers to the number of teeth per inch (tpi). 1 inch equals to 25.4 mm.
   - **Set:** The bending of teeth to right or left to allow clearance of the back of the blade through the cut.
   - **Band Length:**
   - **Band Width:**
   - **Cutting edge material:** Band width:

   *Please refer to Section Z – General Information*

   The dimensions of the band will depend on the band saw machine that has been installed.

   **7. Gullet:** The curved area at the base of the tooth. The tooth tip to the bottom of the gullet is the gullet depth.

   **6. Thickness:** The dimension from side to side on the blade.

   **5. Width:** The nominal dimension of a saw blade as measured from the tip of the tooth to the back of the blade.

   **4. Set:** The bending of teeth to right or left to allow clearance of the back of the blade through the cut.

   **Variable**: Tooth pitch refers to the number of teeth per inch (tpi). 1 inch equals to 25.4 mm.

   A distinction is made between constant tooth pitches with a uniform tooth distance, 2 tpi for example, and variable tooth pitches with different tooth distances within one toothing interval. Variable tooth pitches, for instance 2-3 tpi, can be characterized by two measures: 2 tpi stands for the maximum tooth distance and 3 tpi stands for the minimum tooth distance in the toothing interval.

   **Constant**: Tooth pitch refers to the number of teeth per inch (tpi). 1 inch equals to 25.4 mm.

   Direction of the saw:

   **2. Tooth Rake Angle:** The angle of the tooth face measured with respect to a line perpendicular to the cutting direction of the saw.

   **1. TPI:** The number of teeth per inch as measured from gullet to gullet.
Often, loading smaller bundles can mean greater sawing efficiency.

The position in which material is placed in the vise can have a significant impact on the cost per cut.

**TOOTH SPACING**

Tooth spacing is determined by the hardness of the material and its thickness in cross section.

Tooth or abrasive materials are much harder to cut than their machinability rating would indicate, and because coolant will not follow the blade as well, it will be slower to cut tubing than to cut solids, because the blade must enter the material twice, and because coolant will not follow the blade as well.

The surface conditions will also affect the cutting rate. If there are places on the surface on the material which are hard, a slower blade speed will be required or blade damage may result.

**TOOTH PITCH**

A. Tooth Pitch

The saw blade must contact the cutting material at least two pitches in the case of a thickness of 15 mm.

When it comes to cutting odd-shaped material, such as angles, I-beams, channel, and tubing, the main point is to arrange the materials in such a way where blade changing is impractical. Wavy set is often used where the position in which material is placed in the vise can have a significant impact on the cost per cut.

**VISE LOADING**

Fig. 7.2. The Saw Set

- Regular or Raker Set
- Straight Set
- Wavy Set

This reduces the stress on each individual tooth, making it suitable for cutting thin material where the material to be cut is uniform in size and for contour cutting.

If it is 3 P, 25.4 ÷ 3 P = 8.46 mm If the number is small, it means that the tooth is large.

If it is 4 P, 25.4 ÷ 4 P = 6.35 mm, that is, one tooth is 6.35 mm.

The saw blade must contact the cutting material at least two pitches in the case of a thickness of 15 mm.

What is written as $3/4$ is that it is a variable pitch of large ($3$) / small ($4$).

$4P = OK, 3P = NG$. The saw blade must contact the cutting material at least two pitches in the case of a thickness of 15 mm.
The following diagrams suggest some cost-effective ways of loading and fixturing. Be sure, regardless of the arrangement selected, that the work can be firmly secured to avoid damage to the machine or injury to the operator.

Blade Break-In

1. Select the proper blade speed for the material to be cut.
2. Reduce the feed force/rate to achieve a cutting rate 20% to 50% of normal (soft materials require a larger feed rate reduction than harder materials).
3. Begin the first cut at the reduced rate. Make sure the teeth are forming a chip. Small adjustments to the band speed may be made in the event of excessive noise/vibration. During the first cut, increase feed rate/force slightly once the blade fully enters the workpiece. With each following cut, gradually increase feed rate/force until normal cutting rate is reached.

Completing a proper break-in on a new band saw blade will dramatically increase its life.

Blade Break-In
IntRODUCTION

For the best performance and longer life of the band saw machine, a maintenance schedule is necessary. Some of the daily maintenance usually takes just a little time but will give remarkable results for the efficient and proper operation of cutting.

BASIC MAINTENANCE

It is always easy and takes just a little effort to do the basic maintenance. But it always turns out to be a very essential process to assure the long life and efficient operation of the machine. Most of the basic maintenance requires the operator to perform it regularly.

OIL RECOMMENDATION FOR MAINTENANCE

TERMINATING THE USE OF MACHINE

STORAGE CONDITIONS

EVERY SIX MONTHS

EVERY THREE MONTHS

EVERY MONTH

AFTER ENDING A DAY’S WORK

BEFORE BEGINNING A DAY’S WORK

MAINTENANCE SCHEDULE

BASIC MAINTENANCE

INTRODUCTION
MAINTENANCE SCHEDULE

We suggest you do the maintenance on schedule.

Before beginning a day's work
1. Please check the hydraulic oil level. If oil level volume is below 1/2, please add oil as necessary. (Filling up to 2/3 level is better for system operation.)
2. Please check the cutting fluid level, adding fluid as necessary. If the fluid appears contaminated or deteriorated, drain and replace it.
3. Please check the saw blade to ensure that it is properly positioned on both the drive and idle wheels.
4. Please make sure that the saw blade is properly clamped by the left and right inserts.
5. Please check the wire brush for proper contact with the saw blade. Replace the wire brush if it is worn out.

After ending a day’s work
Please remove saw chips and clean the machine with discharging the cutting fluid when work has been completed.

Do not discharge cutting fluid while the saw blade is operating because it will cause severe injury on operator’s hand.

Replace the transmission oil after operating for three months (or 600 hours).

Recommended Grease:
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48
- Shell Alvania EP Grease 2

Every three months

- Mobil Mobilplex 48
- Shell Alvania EP Grease 2

Every month

- Do not discharge cutting fluid while the saw blade is operating because it will cause severe injury on operator’s hand.

Please apply grease to the following points:

Before beginning a day’s work

We suggest you do the maintenance on schedule.
Every six months

1. Clean the filter of the cutting fluid.
2. Replace the transmission oil for every half of a year (or 1200 hours).

Check the sight gauge to ascertain the transmission level. It can avoid storing the oil in an unsafe place with bottom. Ask an environment specialist to handle the oil. If you can avoid when your machine can not work anymore, you should leak out the oil from machining body. Please waste disposal:

TERMINATING THE USE OF THE MACHINE

(7) Must be connected to earth.
(6) Avoid exposer to abnormal vibration.
(5) Avoid exposer to direct sunlight or heat rays which can change the environmental temperature.
(4) Avoid exposer to corrosive gases and dirt.
(3) Ambient humidity: 30%-95% (without condensation)
(2) Ambient temperature: 5℃~40℃
(1) Turn off the power.

Generally the machine will be store on the following conditions in future:

STORAGE CONDITIONS

- Mobil DTE Oil Light Hydraulic
- Shell Tellus 27
- Recommended Hydraulic Oil
- 3 Replace the hydraulic oil.
- Mobil Comp 632 600W Cylinder Oil
- Omala Oil HDP20
- Recommended Transmission Oil
- Check the sight glass to ascertain the transmission level.
- 2 Replace the transmission oil for every half of a year (or 1200 hours).
- 1 Clean the filter of the cutting fluid.
### OIL RECOMMENDATION FOR MAINTENANCE

<table>
<thead>
<tr>
<th>Item</th>
<th>Method</th>
<th>Revolution</th>
<th>Suggest Oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dovetail guide</td>
<td>Keep grease covered. Antirust.</td>
<td>Daily</td>
<td>Shell R2</td>
</tr>
<tr>
<td>Roller bearing</td>
<td>Oil with lubricant. but not excess.</td>
<td>Weekly</td>
<td>SEA #10</td>
</tr>
<tr>
<td>Bed roller / surface</td>
<td>Oil with lubricant. but not excess.</td>
<td>Daily</td>
<td>SEA #10</td>
</tr>
<tr>
<td>Nipples of bearing</td>
<td>Oil with lubricant. but not excess.</td>
<td>Monthly</td>
<td>Shell Alvania EP, Mobil Mobilplex 48, OMala oil HD220, Mobil DTE oil Light Hydraulic 24, Shell Tellus 32, Mobil DTE oil Light Hydraulic 24, Shell Tellus 32</td>
</tr>
<tr>
<td>Band wheel</td>
<td>Oil with lubricant. but not excess.</td>
<td>Weekly</td>
<td>Shell R2</td>
</tr>
<tr>
<td>Cylinder</td>
<td>Oil with lubricant. but not excess.</td>
<td>Daily</td>
<td>Shell R2</td>
</tr>
<tr>
<td>Hydraulic system</td>
<td>Inspect half a year. Change oil every year.</td>
<td>Monthly</td>
<td>Shell R2</td>
</tr>
<tr>
<td>Reducer</td>
<td>Inspect once a week. Change oil of 600 hours of using. Change it every year.</td>
<td>Monthly</td>
<td>Shell R2</td>
</tr>
</tbody>
</table>

**1.** Turn off the stop circuit breaker switch before servicing the machine.

**2.** Then post a sign to inform people that the machine is under maintenance.

**3.** Drain all of the cutting fluid and oil off and carefully treat them to avoid pollution.
Introduction

All the machines manufactured by us pass a 48 hours continuously running test before shipping out and we are responsible for the after sales service problems during the warranty period if the machines are used normally. However, there still exist some unpredictable problems which may disable the machine from operating. We have accumulated enough experiences and technical data to handle all of the regular system troubles. Meanwhile, our engineering department had been continuously improving the machines to prevent all possible troubles. Generally speaking, the system troubles in this machine model can be classified into three types, namely GENERAL TROUBLES, MOTOR TROUBLES and BLADE TROUBLES. Although you may have other mechanical, electric or hydraulic parts of the machine, troubles which can not be recognized in advance, such as malfunctions due to the limited life-span of mechanical parts, electric parts, motor parts and hydraulic parts. It is hoped that you will give us your maintenance experience and ideas so that both sides can achieve the best performance.

Troubleshooting

- Adjusting the Roller Table
- Sawing Problems & Solutions
- Blade Troubles & Solutions
- Motor Troubles & Solutions
- Minor Troubles & Solutions
- General Troubles & Solutions
- Precautions

Troubleshooting
### PRECAUTIONS

When an abnormality occurs in the machine during operation, you can do it yourself safely. If you have to stop machine motion immediately for parts exchanging, you should do so according to the following procedures:

- Press HYDRAULIC MOTOR OFF button or EMERGENCY STOP button.
- Open the electrical enclosure door.
- Turn off breaker.

#### Before any adjustment or maintenance of the machine, please make sure to turn off the machine and disconnect the power supply.

### GENERAL TROUBLES AND SOLUTIONS

<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Motor stalls</td>
<td>Excessive head pressure</td>
<td>Reduce head pressure. Refer to Operating Instructions “Adjusting Feed.”</td>
</tr>
<tr>
<td>Cannot make square cut</td>
<td>Incorrect head pressure</td>
<td>Increase head pressure. Refer to Operating Instructions “Adjusting Feed.”</td>
</tr>
<tr>
<td>Increased cutting time</td>
<td>Dull blade</td>
<td>Replace blade.</td>
</tr>
<tr>
<td>Dull blade</td>
<td>Insufficient head pressure</td>
<td>Increase head pressure. Refer to Operating Instructions “Adjusting Feed.”</td>
</tr>
<tr>
<td>Reduced blade speed</td>
<td>Excessive blade speed</td>
<td>Refer to Operating Instructions “Speed Selection.”</td>
</tr>
<tr>
<td>Excessive blade speed</td>
<td>Refer to Operating Instructions “Blade Selection.”</td>
<td></td>
</tr>
<tr>
<td>Blade teeth pointing in wrong direction</td>
<td>Blade teeth pointing in wrong direction.</td>
<td>Remove blade, turn blade inside out, reinstall blade. (Teeth must point in direction of travel.)</td>
</tr>
<tr>
<td>Guide rollers not adjusted properly</td>
<td>Guide rollers not adjusted properly.</td>
<td>Refer to Adjustments.</td>
</tr>
<tr>
<td>Rear vise jaw not adjusted properly</td>
<td>Rear vise jaw not adjusted properly.</td>
<td>Set rear vise jaw 90° to blade.</td>
</tr>
<tr>
<td>Dull blade</td>
<td>Blade selection</td>
<td>Refer to Operating Instructions “Blade Selection.”</td>
</tr>
</tbody>
</table>

**WARNING:**

When an abnormality occurs in the machine during operation, you can do it yourself safely. If you have to stop machine motion immediately for parts exchanging, you should do so according to the following procedures:

1. Press HYDRAULIC MOTOR OFF button or EMERGENCY STOP button.
2. Open the electrical enclosure door.
3. Turn off breaker.

**CONSIDERATION:**

- Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required.)
- Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required.)
<table>
<thead>
<tr>
<th>TROUBLE</th>
<th>PROBABLE CAUSE</th>
<th>SUGGESTED REMEDY</th>
</tr>
</thead>
<tbody>
<tr>
<td>Saw blade motor does not run even though blade is not at forward limit position</td>
<td>Motor overloaded</td>
<td>Reduce motor load.</td>
</tr>
<tr>
<td></td>
<td>Incorrect fuses or circuit breakers</td>
<td>Install correct fuses or circuit breakers.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Reduce motor load.</td>
</tr>
<tr>
<td>Motor stalls</td>
<td>Incorrect fuses or circuit breakers</td>
<td>Install correct fuses or circuit breakers.</td>
</tr>
<tr>
<td></td>
<td>Low voltage at motor</td>
<td>Request a voltage check from the power company.</td>
</tr>
<tr>
<td></td>
<td>Motor restricted</td>
<td>Increase wire sizes, or reduce length of wiring.</td>
</tr>
<tr>
<td></td>
<td>Air circulation through the motor restricted</td>
<td>Clean out motor to provide normal air circulation through the motor.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Reduce load on motor.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Short circuit in motor or loose connections.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Inspect all lead terminations on motor for loose, shorted terminals, or worn insulation on lead wires.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Inspect all lead terminations on motor for loose, shorted terminals, or worn insulation on lead wires.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Inspect line, cord and plug for damaged insulation and shorted wires.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Open circuit in line, cord or plug.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Open circuit in line, cord or plug.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Magnetic switch open.</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Reset protector by pushing red button (inside electric box).</td>
</tr>
<tr>
<td></td>
<td>Motor overloaded</td>
<td>Check power line for proper voltage.</td>
</tr>
<tr>
<td></td>
<td>Frequent opening of circuit breakers</td>
<td>Install correct fuses or circuit breakers.</td>
</tr>
<tr>
<td></td>
<td>Frequent opening of circuit breakers</td>
<td>Inspect all lead terminations on motor for loose, shorted terminals, or worn insulation on lead wires.</td>
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<tr>
<td></td>
<td>Motor overloaded</td>
<td>Check power line for proper voltage.</td>
</tr>
</tbody>
</table>

**MOTOR TROUBLES & SOLUTIONS**

- **Trouble:** Saw blade is not at forward limit position.
  - **Suggested Remedy:** Forward switch open.
  - **Probable Cause:** Saw blade is not at forward limit position.

**MINOR TROUBLES & SOLUTIONS**

- **Trouble:** Saw blade motor does not run even though blade is not at forward limit position.
  - **Suggested Remedy:** Reduce motor load.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Frequent opening of circuit breakers.
  - **Suggested Remedy:** Install correct fuses or circuit breakers.
  - **Probable Cause:** Incorrect fuses or circuit breakers.

- **Trouble:** Motor stalls.
  - **Suggested Remedy:** Install correct fuses or circuit breakers.
  - **Probable Cause:** Incorrect fuses or circuit breakers.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Reduce motor load.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Increase wire sizes, or reduce length of wiring.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Inspect all lead terminations on motor for loose, shorted terminals, or worn insulation on lead wires.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Inspect line, cord and plug for damaged insulation and shorted wires.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Open circuit in line, cord or plug.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Magnetic switch open.
  - **Probable Cause:** Motor overloaded.

- **Trouble:** Motor overloaded.
  - **Suggested Remedy:** Reset protector by pushing red button (inside electric box).
  - **Probable Cause:** Motor overloaded.
<table>
<thead>
<tr>
<th>Trouble</th>
<th>Probable Cause</th>
<th>Suggested Remedy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teeth stripping</td>
<td>Too few teeth per inch</td>
<td>Use finer tooth blade</td>
</tr>
<tr>
<td>Teeth breakage</td>
<td>Sheet too coarse</td>
<td>Use a finer tooth blade</td>
</tr>
<tr>
<td>Dry cutting</td>
<td>Misalignment of guides</td>
<td>Adjust saw guides</td>
</tr>
<tr>
<td></td>
<td>Teeth too coarse</td>
<td>Use a finer tooth blade</td>
</tr>
<tr>
<td></td>
<td>Work not secured in vise</td>
<td>Clamp material securely</td>
</tr>
<tr>
<td></td>
<td>Excessive feed</td>
<td>Decrease feed</td>
</tr>
<tr>
<td></td>
<td>Loading of gullets</td>
<td>Use cutting lubricant</td>
</tr>
<tr>
<td></td>
<td>Use coarse tooth blade or cutting lubricant.</td>
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<tr>
<td></td>
<td>Misalignment of guides</td>
<td>Adjust saw guides</td>
</tr>
<tr>
<td>Excessive pressure</td>
<td>Blades not in line with guides</td>
<td>Check bearings for wear and alignment.</td>
</tr>
<tr>
<td></td>
<td>Blade too coarse</td>
<td>Use a finer tooth blade</td>
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<tr>
<td></td>
<td>Use cutting lubricant</td>
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<tr>
<td></td>
<td>Use correct tooth blade for cutting lubricant.</td>
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<tr>
<td>Premature tooth wear</td>
<td>Dry cutting</td>
<td>Use cutting lubricant</td>
</tr>
<tr>
<td></td>
<td>Use coarse tooth blade</td>
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<tr>
<td></td>
<td>Use lubricant on all materials, except cast iron.</td>
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<tr>
<td></td>
<td>Use cutting lubricant</td>
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<tr>
<td></td>
<td>Decrease speed</td>
<td>Decrease speed</td>
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<tr>
<td></td>
<td>Reduce feed pressure. Refer to Operating Instructions “Adjusting Feed.”</td>
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<td></td>
<td>Use a finer tooth blade</td>
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<td></td>
<td>Decrease speed</td>
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<td>Decrease feed</td>
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<td></td>
<td>Decrease feed pressure and blade tension</td>
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<td></td>
<td>Lower speed. See Operating Instructions “Speed selection.”</td>
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<td></td>
<td>Decrease feed pressure</td>
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<td></td>
<td>Use finer tooth blade</td>
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<td></td>
<td>Increase feed</td>
<td>Increase feed</td>
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<td></td>
<td>Use coarse tooth blade or cutting lubricant.</td>
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<tr>
<td></td>
<td>Use a finer tooth blade</td>
<td></td>
</tr>
<tr>
<td>Sawing Problems and Solutions</td>
<td>Solution</td>
<td></td>
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<tr>
<td>-------------------------------</td>
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<td></td>
</tr>
<tr>
<td>Saw blade teeth worn</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Workpiece of insufficient diameter</td>
<td>Use other machine, suited for diameter of workpiece</td>
<td></td>
</tr>
<tr>
<td>Flange</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Back edge of blade touching wheel</td>
<td>Re-bundle</td>
<td></td>
</tr>
<tr>
<td>Workpieces are not bundled properly</td>
<td>Clean</td>
<td></td>
</tr>
<tr>
<td>Reversal positioning of blade on machine</td>
<td>Accumulation of chips at inserts</td>
<td></td>
</tr>
<tr>
<td>Blue or purple saw chips</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Loose blade guide</td>
<td>Tighten</td>
<td></td>
</tr>
<tr>
<td>Workpiece</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Bring blade guide close to guide edge</td>
<td>Replace from vibration of line voltage</td>
<td></td>
</tr>
<tr>
<td>Vibration near machine</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Non-water soluble cutting fluid used</td>
<td>Replace with suitable workpiece</td>
<td></td>
</tr>
<tr>
<td>Excessive cutting rate</td>
<td>Reduce</td>
<td></td>
</tr>
<tr>
<td>Excessive material surface</td>
<td>Replace</td>
<td></td>
</tr>
<tr>
<td>Insufficient or lean cutting fluid</td>
<td>Insufficient or lean cutting fluid</td>
<td></td>
</tr>
<tr>
<td>Improperly chamfered workpiece</td>
<td>Improperly chamfered by insert</td>
<td></td>
</tr>
<tr>
<td>Check and correct</td>
<td>Repair</td>
<td></td>
</tr>
<tr>
<td>Weir brush improperly positioned</td>
<td>Close front of machine</td>
<td></td>
</tr>
<tr>
<td>Insufficient saw blade tension</td>
<td>Increase speed</td>
<td></td>
</tr>
<tr>
<td>Excessive saw head descending speed</td>
<td>Reduce speed</td>
<td></td>
</tr>
<tr>
<td>Insufficient saw blade speed</td>
<td>Increase speed</td>
<td></td>
</tr>
<tr>
<td>Excessive saw blade speed</td>
<td>Reduce speed</td>
<td></td>
</tr>
<tr>
<td>Failure to break-in saw blade</td>
<td>Break-in operation</td>
<td></td>
</tr>
<tr>
<td>Use of blade with incorrect pitch suited</td>
<td>Use blade with correct pitch suited</td>
<td></td>
</tr>
</tbody>
</table>

- Broken blade
- Curved cutting
- Short life of saw blade
- Failure to cut
- Vibration during cutting

Follows:

Other than this manual, the manufacturer also provides some related technical documents listed as
#1. Heavy Even Wear On Tips and Corners Of Teeth

Probable Cause:
- A. Improper break-in procedure.
- B. Excessive band speed for the type of material being cut. This guarantees a high tooth tip temperature resulting in accelerated tooth wear.
- C. Low feed rate causes teeth to rub instead of cutting, this is most common on work hardened materials such as stainless and tool steels.
- D. Hard materials being cut such as "Flame Cut Edge" or abrasive materials such as "Fiber Reinforced Composites".
- E. Insufficient sawing fluid due to inadequate supply, improper ratio, and/or improper application.

## Causes

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<thead>
<tr>
<th>#20. Broken Band Shows A Twist In Band Length.</th>
<th>#10. Heavy Wear On Both Sides Of Band</th>
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<td>#14. Heavy Wear In Only The Smallest Gullets</td>
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<td>#12. Heavy Wear On Both Sides Of Teeth</td>
<td></td>
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<td>#11. Uneven Wear On The Sides Of Band</td>
<td></td>
</tr>
<tr>
<td>#1. Heavy Even Wear On Tips and Corners Of Teeth</td>
<td></td>
</tr>
</tbody>
</table>
#2. Wear On Both Sides Of Teeth

Probable Cause:

A. Broken, worn or missing back-up guides allowing teeth to contact side guides.
B. Improper side guides to improper opening of folded band.
C. Handling damage due to improper fit of material.

#3. Wear On One Side Of Teeth

Probable Cause:

A. Worn wheel flange, allowing side of teeth to contact
   chip brush assembly, guards, etc.
B. Loose or improperly positioned side guides.
C. Blade not perpendicular to cut.
D. Blade rubbing against cut surface on return stroke of machine head.
E. Teething rubbing against a part of machine such as chip brush assembly, guards, etc.

#4. Chipped Or Broken Teeth

Probable Cause:

A. Improper break-in procedure.
B. Improper blade selection for application.
C. Handling damage due to improper opening of folded band.
D. Improper positioning or clamping of material.
E. Excessive feeding rate or feed pressure.
F. Hitting hard spots or hard scale in material.
#5. Body Breakage Or Cracks From Back Edge

Probable Cause:
A. Excessive back-up guide "preload" will cause back edge to work harden which results in cracking.
B. Excessive feed rate.
C. Improper band tracking – back edge rubbing heavy on wheel flange.
D. Improper band speed.
E. Insufficient sawing fluid due to inadequate supply.
F. Insufficient sawing fluid due to inadequate supply.
G. Insufficient sawing fluid due to inadequate supply.
H. Improper or lack of break-in procedure.

#6. Tooth Strippage

Probable Cause:
A. Improper tooth pitch for cross sectional size of material being cut.
B. Movement or vibration of material being cut.
C. Excessive feed rate or feed pressure.
D. Worn, missing or improperly positioned chip brush.
E. Improper tooth pitch for cross sectional size of material being cut.
F. Improper positioning of material being cut.
G. Material being cut.
H. Hard spots in material being cut.
I. Band speed too slow for grade of material being cut.

#7. Chips Welded To Tooth Tips

Probable Cause:
A. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
B. Worn, missing or improperly positioned chip brush.
C. Improper band speed.
D. Improper feeding rate.
E. Improper band tension.
F. Improper feed.
G. Notches in back edge from handling damage.
8. Gullets Loading Up With Material

Probable Cause:
A. Too fine of a tooth pitch – insufficient gullet capacity.
B. Chipped, worn or defective side guides.
C. Loose side guides.
D. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

9. Discolored Tips Of Teeth Due To Excessive Frictional Heat

Probable Cause:
A. Insufficient sawing fluid due to inadequate supply.
B. Excessive feed rate.
C. Insufficient sawing fluid due to inadequate supply.
D. Insufficient sawing fluid due to inappropriate application.
E. Worn, missing or improperly positioned chip brush.

10. Heavy Wear On Both Sides Of Band

Probable Cause:
A. Loose side guides.
B. Insufficient sawing fluid due to inadequate supply.
C. Insufficient sawing fluid due to inadequate supply.
D. Insufficient sawing fluid due to inadequate supply.
E. Insufficient sawing fluid due to inadequate supply.

11. Uneven Wear Or Scoring On The Sides Of Band

Probable Cause:
A. Loose side guides.
B. Insufficient sawing fluid due to inadequate supply.
C. Insufficient sawing fluid due to inadequate supply.
D. Insufficient sawing fluid due to inadequate supply.
#12. Heavy Wear And/Or Swagging On Back Edge

Probable Cause:
A. Excessive feed rate.
B. Excessive back-up guide "preload".
C. Guide arms spread too wide while cutting.
D. Excessive twist from band wheel to guides.
E. Guide arms spread too close to capacity causing heavy on wheel flange.
F. An excessive twist type of stress existed.

#13. Butt Weld Breakage

Probable Cause:
A. Any of the factors that cause body breaks can also cause butt weld breaks. (See Observations #5, #15 and #16)
B. Too slow of band speed.
C. Using too fine of a tooth pitch for the size of material.

#14. Heavy Wear In Only The Smallest Gullets

Probable Cause:
A. Excessive feeding rate.
B. Too slow of band speed.
C. Using too fine of a tooth pitch for the size of material.

#15. Body Breaking – Fracture Traveling In An Angular Direction

Probable Cause:
A. An excessive twist type of stress existed.
B. Guide arms spread too close to capacity causing excessive twist from band wheel to guides.
C. Guide arms spread too wide while cutting small cross sections.
D. Excessive back-up guide "preload".

#12. Heavy Wear And/Or Swagging On Back Edge

Probable Cause:
A. Excessive feed rate.
B. Excessive back-up guide "preload".
C. Guide arms spread too wide while cutting.
D. Excessive twist from band wheel to guides.
E. Guide arms spread too close to capacity causing heavy on wheel flange.
F. An excessive twist type of stress existed.

#13. Butt Weld Breakage

Probable Cause:
A. Any of the factors that cause body breaks can also cause butt weld breaks.
B. Worn or defective back-up guides.
C. Improper band tracking – back edge rubbing.
D. Heavy on wheel flange.

#14. Heavy Wear In Only The Smallest Gullets

Probable Cause:
A. Excessive feeding rate.
B. Too slow of band speed.
C. Using too fine of a tooth pitch for the size of material.

#15. Body Breaking – Fracture Traveling In An Angular Direction

Probable Cause:
A. An excessive twist type of stress existed.
B. Guide arms spread too close to capacity causing excessive twist from band wheel to guides.
C. Guide arms spread too wide while cutting small cross sections.
D. Excessive back-up guide "preload".
#16. Body Breakage Or Cracks From Gullets

Probable Cause:
A. Excessive back-up guide “preload”.
B. Worn band wheels causing uneven tension.
C. Guide arms are too tight – rubbing near back edge.
D. Excessively worn teeth.
E. Side guide arms are too tight – rubbing near gullets.
F. Excessively heavy guide arms are spread too far apart.

#17. Band is Twisted Into A Figure “8” Configuration

Probable Cause:
A. Excessive band tension.
B. Any of the band conditions which cause the band to be long (#18) or short (#19) on tooth edge.
C. Cutting a tight radius.
D. Excessive feeding rate.
E. Band riding heavily against back-up guide.
F. Excessively worn teeth.

#18. Used Band Is “Long” On The Tooth Edge

Probable Cause:
A. Side guides are too tight – rubbing near gullets.
B. Worn band wheels causing uneven tension.
C. Guide arms are spread too far apart.
D. Excessive feeding rate.
E. Excessively “preloaded” – band riding heavily against back-up guide.
F. Excessively heavy guide arms are spread too far apart.

#19. Used Band Is “Short” On The Tooth Edge

Probable Cause:
A. Side guides are too tight – rubbing near edge.
B. Worn band wheels causing uneven tension.
C. Guide arms are spread too far apart.
D. Excessive feeding rate.
Probable Cause:

A. Excessive band tension
B. Any of the band conditions which cause the band to be long (#18) or short (#19) on tooth edge.
C. Cutting a tight radius.

RE-ADJUSTING THE ROLLER TABLE

If the feeding table and the machine frame are not positioned under the horizontal balance, the loaded material may be going up gradually and affect the cutting effect.

IF THE FEEDING TABLE AND THE MACHINE FRAME ARE NOT POSITIONED UNDER THE HORIZONTAL BALANCE, THE LOADED MATERIAL MAY BE GOING UP GRADUALLY AND AFFECT THE CUTTING EFFECT.

1. Screw or loosen the adjusting bolt to attain the horizontal balance (leveling) between the roller table and the machine frame.
2. Ensure that the machine frame is not struck by the loaded material on the feeding table.
3. Check the leveling by the measuring tool.
4. After finished the adjusting, fix the roller table.

TOOL, MEASUREMENT, HORIZONTAL BALANCE

RE-ADJUSTING THE ROLLER TABLE

#20. Broken Band Shows A Twist In Band Length
Warranty

New machines are warranted to be free from defects in workmanship and material for a period of one (1) year from the date of shipment by Seller. The warranty period is based on normal usage of two thousand eighty hours (2080) per year and is reduced proportionately for any excess usage.

Products, which under normal operating conditions in Buyer’s plant are defective in workmanship or material, will be repaired or replaced at the option of Seller.

This warranty does not cover shipping freight charges for either the return of the defective part or for the shipping of the replacement or repaired part. Seller will have no obligation to repair or replace perishable parts, or materials or parts damaged by misuse, negligence or failure of Buyer to provide appropriate maintenance and service as stated in the operator’s manual or industry standard and normally acceptable practices.

This warranty applies to all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

Accessories supplied with Manufacturer’s Equipment: The warranties available for all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

This warranty does not apply if the machine has been altered or modified without our prior written consent.

Accessories supplied with Manufacturer’s Equipment: The warranties available for all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

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New machines are warranted to be free from defects in workmanship and material for a period of one (1) year from the date of shipment by Seller. The warranty period is based on normal usage of two thousand eighty hours (2080) per year and is reduced proportionately for any excess usage.

Buyer is exclusive and is in lieu of all other warranties those extended by the accessory manufacturer, if any, to the extent they are in force and effect. The warranty available for all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

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The following table lists the common spare parts we suggest you purchase in advance:

<table>
<thead>
<tr>
<th>Part Name</th>
<th>Part Name</th>
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<tbody>
<tr>
<td>C-ring</td>
<td>Oil seal</td>
</tr>
<tr>
<td>Snap ring</td>
<td>Rubber washer</td>
</tr>
<tr>
<td>Door/door rollers</td>
<td>Hydraulic tank</td>
</tr>
<tr>
<td>Wire brush</td>
<td>Leak-proof gasket</td>
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<tr>
<td>Steel plates</td>
<td>Duster seal</td>
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<tr>
<td>Carbide inserts</td>
<td>Rubber washer</td>
</tr>
<tr>
<td>Belt</td>
<td>Snap ring</td>
</tr>
<tr>
<td>Bearings</td>
<td>Oil seal</td>
</tr>
<tr>
<td>Belt</td>
<td>O-ring</td>
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Spare Parts Recommendations