

SH-460M

Semi-Automatic Miter Cutting Bandsaw



Instruction Manual

The Pinnacle of Cutting Performance
Cosen Mechatronics Co., Ltd.

FROM THE MANUFACTURER

Thank you for your purchase of COSEN's bandsaw machine and your trust in the COSEN brand.

We are excited to have you as our valued customer and look forward as much as you do to the accelerated productivity, long-lasting endurance and superb cost-effectiveness this machine is about to bring to you.

To ensure you are fully utilizing our machine and being advantaged in every possible way, please do take your time and read through this instruction manual.

Any comment or suggestion in making our service better, please do not hesitate to let us know. Thank you again!

NOTE:



- Read this instruction manual carefully to familiarize yourself with the installation, operation and maintenance of your COSEN bandsaw machine.
- Operate the machine following the procedures described in the manual to prevent personal injuries or machine damage.
- Keep this manual handy and refer to it whenever you are uncertain of how to perform any of the procedures.



- For technical support or parts purchase, please contact your nearest COSEN representative or our service center:

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Instruction Manual:

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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 they are caught in the running machine. Wrap or cover long hair.

- 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.



- 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. Never leave the machine unattended when cutting flammable materials.



- 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.

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 to keep them from falling. 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.

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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. COSEN'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. Cosen will not be liable for damages resulting from improper use.

SAFETY INSTRUCTIONS

What the icons and signs in this user manual mean:



This icon marks **DANGER**; hazards or unsafe practices that may result in **severe personal injury or death**.



This icon marks **WARNING**; hazards or unsafe practices that may result in **personal injury or damage to the machine**.



This icon marks **CAUTION**; information that should be read before use to prevent **damage to the machine**.



Supplementary information to the procedures described in this manual.



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 prevent personal injury or machine damage. Learn the operation, limitation and the specific potential hazards peculiar to this band saw.



Do not operate this machine unless it is completely assembled.



Make sure the power switch is off before plugging in power cord.



Disconnect the power cord before making adjustment, maintenance or blade changes.



Keep all guards and shields in place before installing or starting up the machine.



Wear proper apparel during operation and when servicing the machine.



Keep unauthorized personnel away.



Do not reach over or stand on any part of the machine.



Never hold the material by hand for cutting. Always use the vise and make sure the material is clamped securely before cutting.



It is dangerous to operate the machine when the floor is slippery. Keep the floor clean and dry. Check for ice, moisture, or grease before entering.



Do not use the machine to cut explosive material or high pressure vessels as it will generate great amount of heat during the sawing process and may ignite an explosion.



Keep the work environment safe. Do not use band saw in a damp or wet location.



Never operate while under the influence of drugs, alcohol or medication.



All users must read it before performing any activity on the machine, such as replacing the saw band or doing regular maintenance.



Some personal protective equipment is required for the safe use of the machine, e.g. protection goggles.



Keep blade protection cover and wheel covers in place and in working order.



Use recommended accessories. Improper accessories may be hazardous.



Keep your work area well illuminated at minimum 500 lumen.



Keep your work area clean. Cluttered and slippery floors invite accidents.



Remove adjusting keys, wrenches or any loose parts or items from the machine before turning on power.



Check for damaged parts. Before continuing using the machine, the damaged part should be checked and replaced.



Moving parts should be kept in proper alignment and connection with the machine. Check for breakage, mounting and any other conditions that may affect its operation. Any damaged part or guard should be properly repaired or replaced.



When a workpiece is too long or heavy, make sure it is supported with a roller table (recommended).



Always remember to switch off the machine when the work is completed.



Use a sharp saw blade and keep the machine in its best and safest performance by following a periodical maintenance schedule.



Do not force the band saw beyond its intended use. It is safer to operate with the cutting rate for which it was designed.

SAFEGUARD DEVICES

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

1. Protection covers & guards
2. Safety-related switches

Protection Covers & Guards

1. Idle wheel housing cover
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, as shown in Illustration: *Safety Fence*)
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. Even skilled service technicians should still take cautions when 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 bow assembly
- Drive and idle wheels
- Blade guide arm
- Saw blade guide rollers
- Quick approach device
- Wire brush
- Chip conveyor (optional)
- 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 actuated when the machine is in operation.

Wheel motion detector	This is a proximity sensor used to detect the motion of the drive wheel. Once the saw blade is broken or as soon as it starts slipping, the sensor will detect and stop the drive wheel and the machine.
Power switch	Located on the cover of electrical cabinet, the power switch controls the main power of the machine. Up to your company's internal rules, this power switch can be locked with a padlock or a luggage lock to protect the operator and the machine.
Emergency stop button	Located on the control panel, the button when pressed will stop the machine completely.
Vise clamp switch	This switch assures firm clamping of the workpiece. If the workpiece is not clamped properly, the saw blade is not allowed to run.
Wheel cover interlock switches (CE model only)	Located on the two wheel housings, these switches are used to assure that the machine will stop whenever the wheel covers are open. This device is to protect users from being cut by the running saw blades.

Among all these safety switches, some of them are used to protect the users and 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.

EMERGENCY STOP

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 may be available at other area(s) of the machine depending on machine type. Please refer to *Illustration: Emergency Stop*.

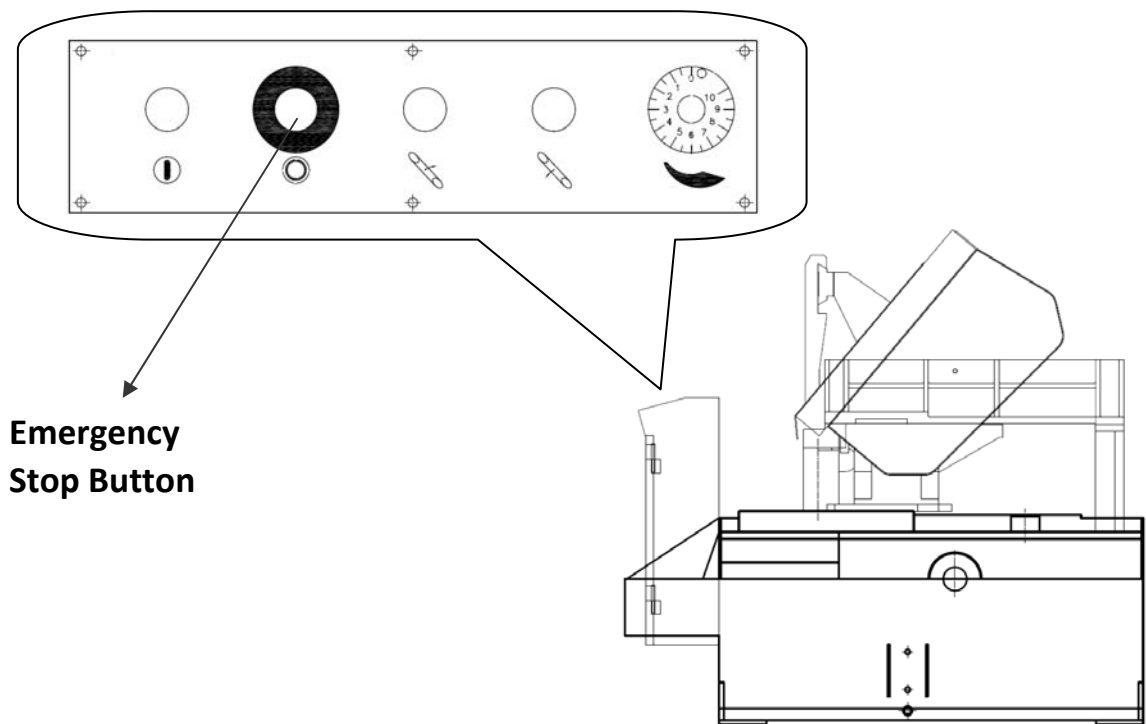
When you press the button, the machine will immediately come to a full stop to avoid injury or damage when an accident occurs. The button will be locked when you press it. To unlock it, pull it upward.

You should press it immediately without any hesitation when observing:

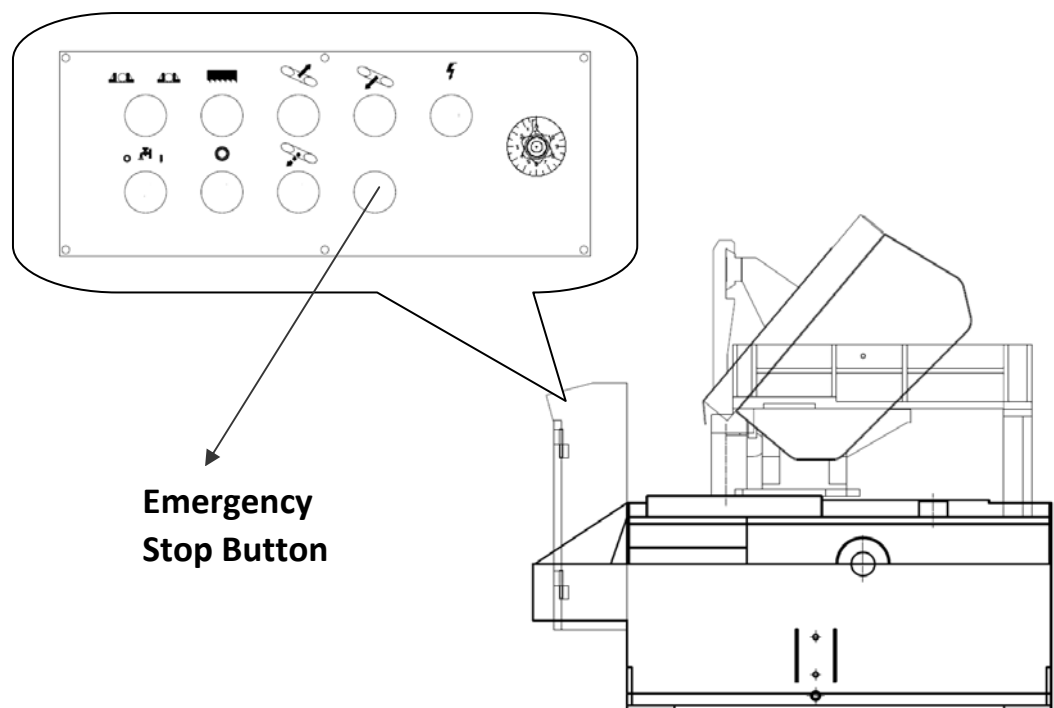
- An emergency situation that would cause any injury or damage
- An abnormal situation or problem such as fire, smoke, abnormal noise and etc.

Illustration: Emergency Stop

Model without hydraulic vise



Model with hydraulic vise





SAFETY LABELS

Safety-related labels mounted on the machine are categorized into the following four categories. Please read through and understand them before operating the machine. Refer to *Illustration: Safety Labels*.



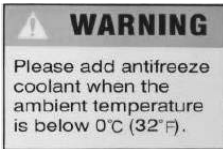

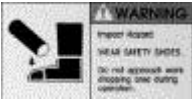
DANGER Labels

A red and white DANGER labels marks s hazards or unsafe practices that will result in severe personal injury or death.

Label	Meaning	Label	Meaning
	Hazardous Voltage TURN POWER OFF before servicing. Failure to following the warning can result in severe injury.		DANGER: Running Blade Blade runs through this area. Keep your hands away from a running blade to avoid severe injury. The arrow indicates direction of the blade.



WARNING Labels

An orange and black WARNING label marks hazards or unsafe practices that can result in severe personal injury or damage to the machine.

Label	Meaning	Label	Meaning
	Cutting Hazard KEEP COVER CLOSED while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.		Cutting Hazard KEEP HAND OFF while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.
	Please add antifreeze coolant when the ambient temperature is below 0°C (32°F).		Loose Hand Hazard KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury.
	Impact Hazard WEAR SAFETY SHOES. Do not approach dropping area during operation.		

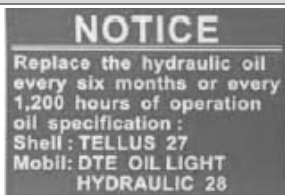
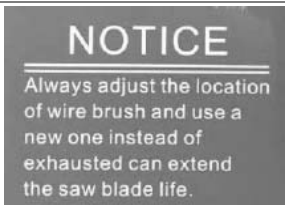
CAUTION Labels

Yellow and black CAUTION labels mark hazards or unsafe practices that can result in considerable personal injury.

Label	Meaning
	Keep hands out of the machine while the blade is running.
	Power to machine must be turned off when changing blades or adjusting wire brush.

NOTICE Labels

Blue and white NOTICE labels mean unsafe practices that could result in damage to products or property.

Label	Meaning
	Replace the hydraulic oil every six months or every 1,200 hours of operation. Oil specification: Shell TELLUS 27 or Mobil DTE OIL LIGHT / HYDRAULIC 28
	To extend blade life, always adjust the location of wire brush so that it is properly touching the blade. Also replace a worn wire brush with a new one.

SAFETY INSTRUCTION Labels

Green and white SAFETY INSTRUCTIONS are important reminders that should be read before operating the machine.

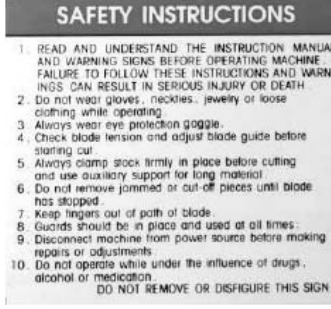
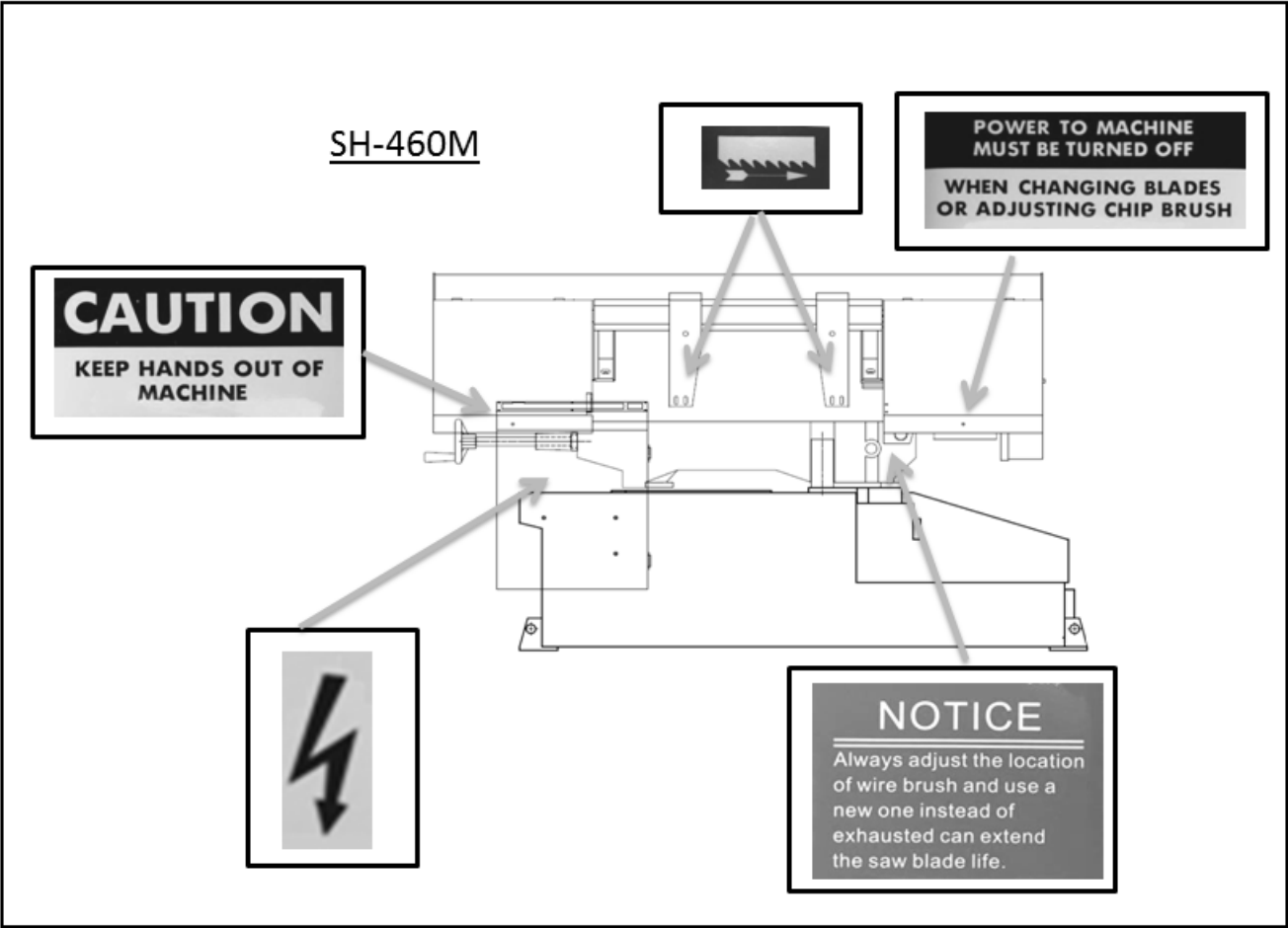
Label	Meaning
	<ol style="list-style-type: none">1. Read and understand the instruction manual and warning signs before operating machine. Failure to follow these instructions and warnings can result in serious injury or death.2. Do not wear gloves, neckties, jewelry or loose clothing while operating the machine.3. Always wear eye protection goggles.4. Check blade tension and adjust blade guide before starting cut.5. Always clamp stock firmly in place before cutting and use auxiliary support for long material.6. Do not remove jammed or cut-off pieces until blade has stopped.7. Keep fingers out of path of blade.8. Blade guards should be in place and used at all times.9. Disconnect machine from power source before making repairs or adjustments.10. Do not operate while under the influence of drugs, alcohol or medication.

Illustration: Safety Labels



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 8).
2. If maintenance does not seem to solve the problem, follow the troubleshooting procedures under Section 9.

CE COMPLIANCE

Cosen's CE model is designed to satisfy regulations of the Council Directive on the approximation of the laws of the Member States relating to machinery (2006/42/EC) - Annex I Essential health and safety requirements relating to the design and construction of machinery.

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).

GENERAL INFORMATION

SPECIFICATION

MACHINE PARTS IDENTIFICATION

FLOOR PLAN

This band saw machine is designed by Cosen'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 and each component has passed strict testing (Council Directive on the approximation of the laws of the Member States relating to Machinery).
- 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

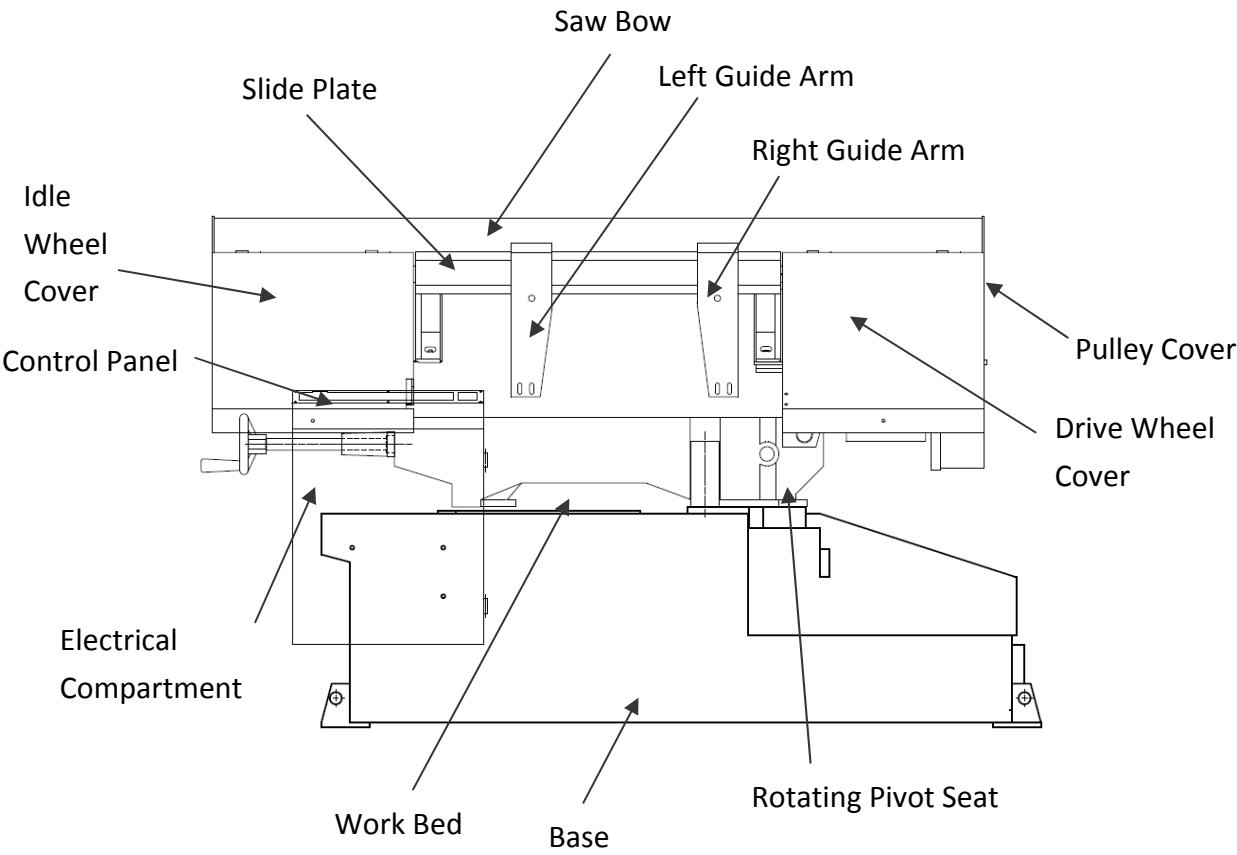
- The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

8 hours × 5 days × 52 weeks × 10 years = 20,800 hours

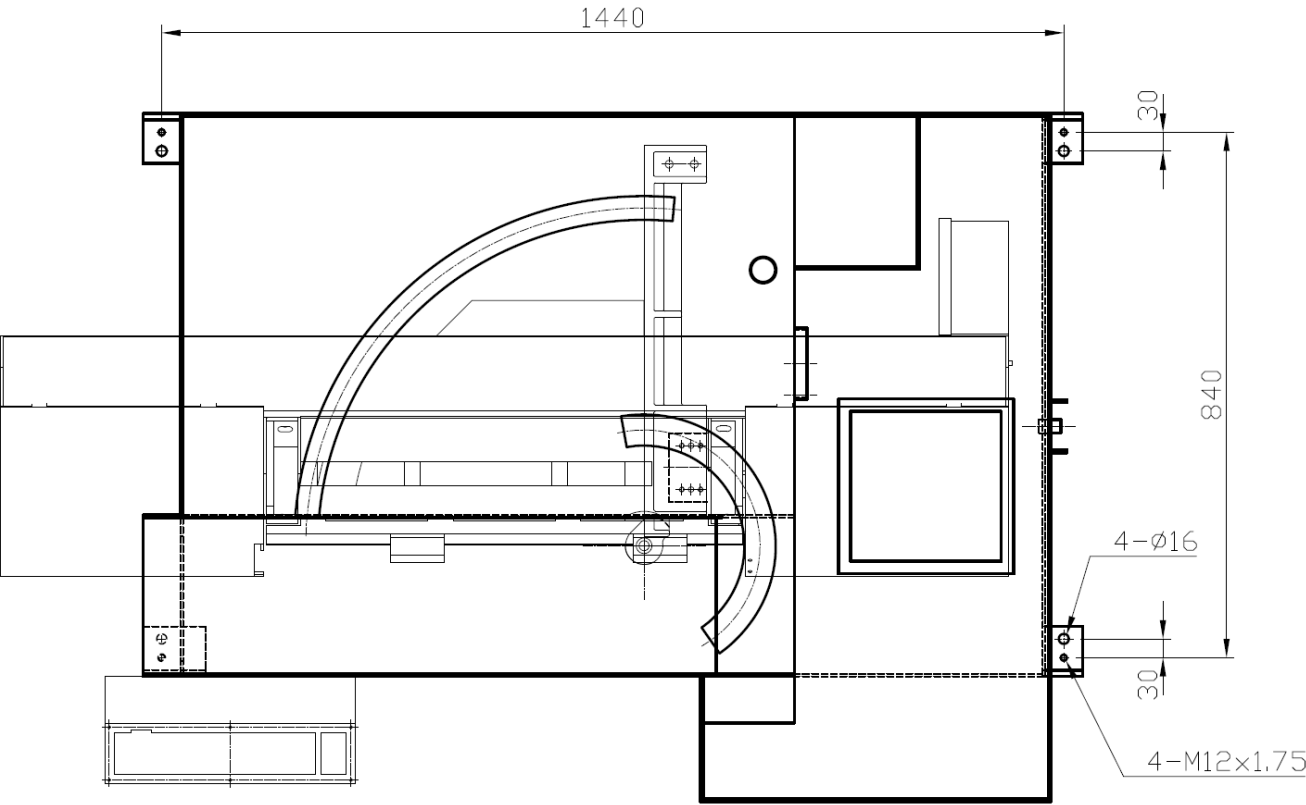
SPECIFICATION

Model		SH-460M		
Capacity	Angle	0°	-45°	-60°
	Round	250 mm (9.8")	230 mm (9.1")	110 mm (4.3")
	Square	230 mm (9.1")	230 mm (9.1")	110 mm (4.3")
	Rectangular (H x W)	230 x 460 mm (9.1" x 18.1")	230 x 230 mm (9.1" x 9.1")	110 x 110 mm (4.3" x 4.3")
Saw Blade	Speed	60Hz: 23, 37, 58, 93 m/min (75, 121, 190, 305 fpm) 50Hz: 19, 31, 45, 67 m/min (62, 102, 157, 256 fpm) Stepless: 20~71 m/min (66~233 fpm)		
	Size (L x W x T)	3,505 x 27 x 0.9 mm (138" x 1.06" x 0.035")		
	Tension	Manual		
	Guide	Interchangeable tungsten carbide		
	Cleaning	Steel wire brush		
Motor Output	Saw Blade	2 HP (1.5 kW)		
	Hydraulic	1/4 HP (0.19 kW)		
	Coolant Pump	1/8 HP (0.09 kW)		
Tank Capacity	Hydraulic	8L (2.08 gal)		
	Coolant	40 L (10.4 gal)		
Workbed Height		640 mm (25.2")		
Weight	Net	560 kg (1,232 lb)		
	Gross	660 kg (1,452 lb)		
Floor Space (L x W x H)		1,751 x 1,100 x 1,052 mm (69.0 x 43.3" x 41.4")		
Operating Environment	Temperature	5~40°C (41~104°F)		
	Humidity	30%~95% (without condensation)		

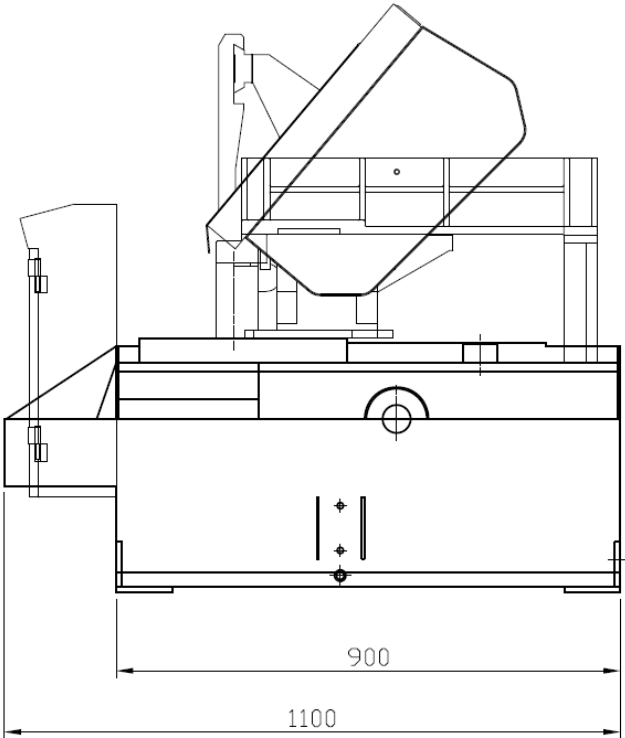
MACHINE PARTS IDENTIFICATION



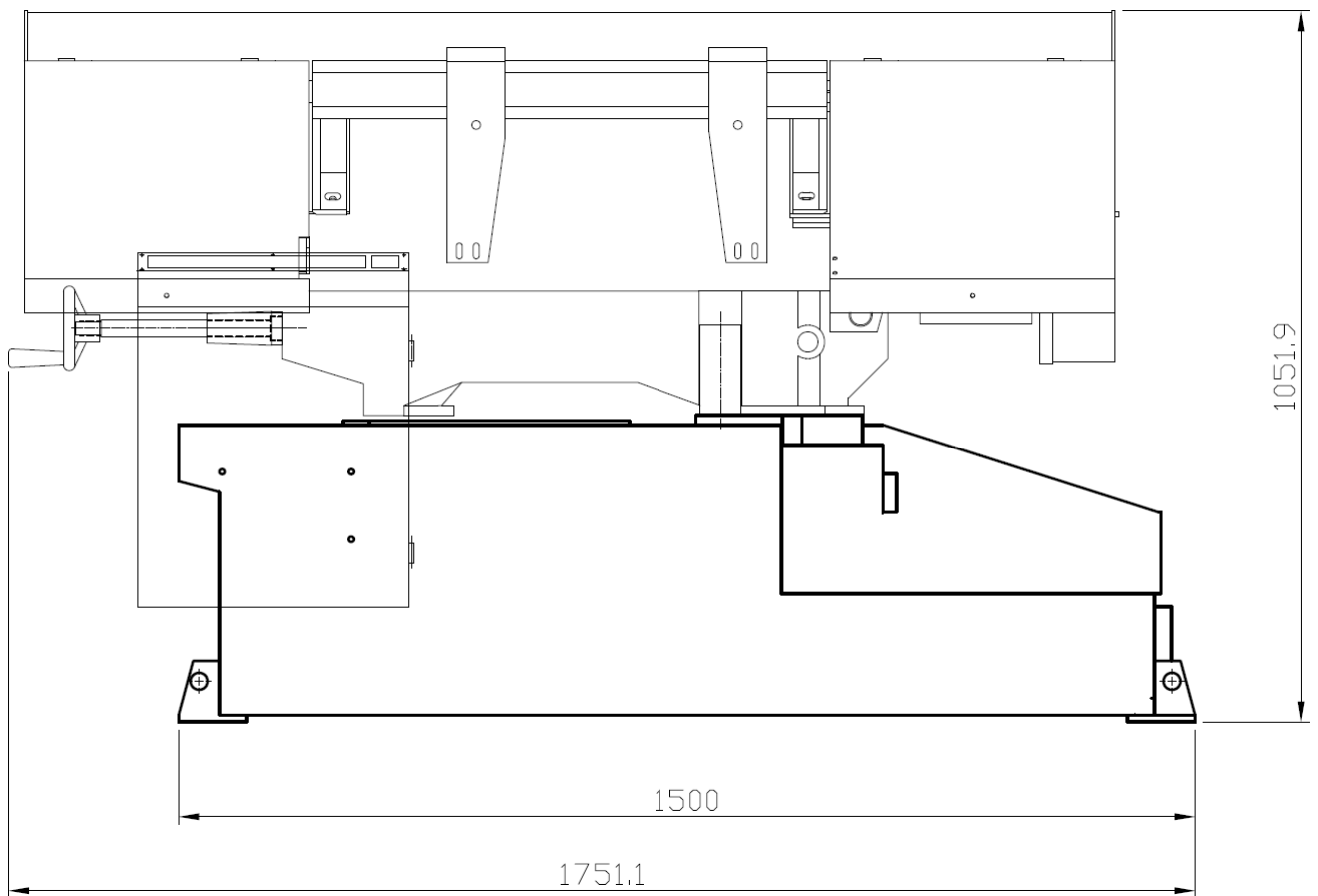
FLOOR PLAN



Machine top view



Machine side view



Machine front view

MOVING & INSTALLATION

LOCATION & ENVIRONMENT

UNPACKING & INSPECTING

LIFTING

REMOVING SHIPPING BRACKET

CLEANING

INSTALLING

RELOCATING

LOCATION & ENVIRONMENT

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 - Specification* 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%“(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.
- Limit the operation area of the machine to staff only.

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

1.	Tool box	1 pc
2.	Grease gun	1 pc
3.	Screwdriver (+, -)	2 pcs
4.	Open-ended spanner	3 pcs
5.	Hexagon wrench	1 set
6.	Chip spade (only for manual models)	1 pc
7.	Operation manual	1 pc



Should you find any missing accessories, please contact your local agent immediately.

LIFTING

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



1. (Only applies to the machine with the design of the hanging point.)

Move the machine to its location by using a crane and a wire rope sling that can fully withstand the weight of the machine (refer to machine specification under Section 2 *General Information*).



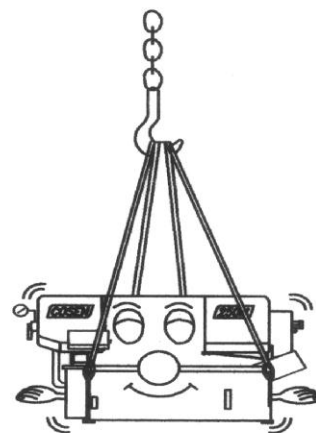
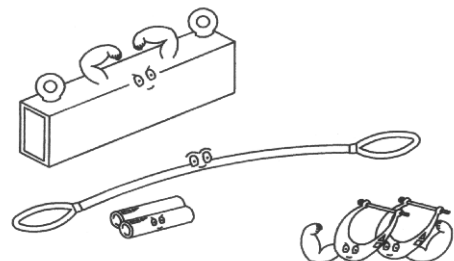
Machine hanging with a crane should be done strictly according to the hanging points designated by the original manufacturer. If there is any doubt on missing hanging points on your machine, please consult with the original manufacturer or its qualified agent before hanging the machine.

- Machine lifting is likely to damage the machine if not performed properly.

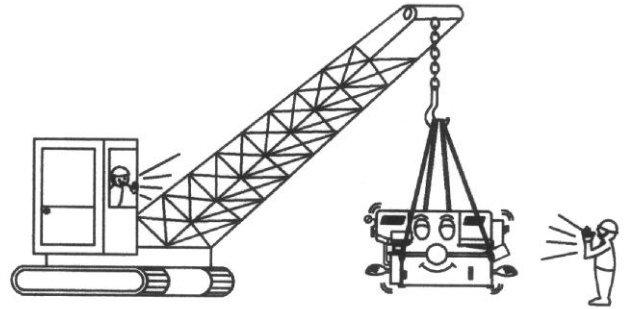


Warning: You must have a qualified crane operator to perform the job.

- You must use tools and equipment with the proper tensile strength and use proper method 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. Also watch out your own fingers and feet to avoid injuries.
- Keep the machine well balanced during lifting process and make sure the wire rope does not interfere with the saw frame.



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



2. **Use a forklift (Only applies to the machine with the design of the lifting point.)**

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



Machine lifting with a forklift should be done strictly according to the lifting points designated by the original manufacturer. If there is any doubt on missing lifting points on your machine, please consult with the original manufacturer or its qualified agent before lifting the machine.

- Machine lifting is likely to damage the machine if not performed properly.



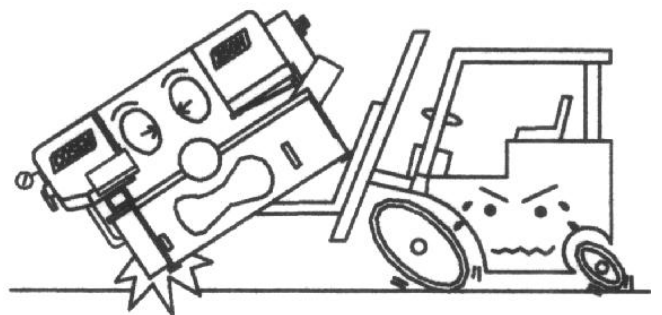
You must have a qualified forklift operator to perform the job.



- You must apply proper forklift technique to avoid damage to the machine.



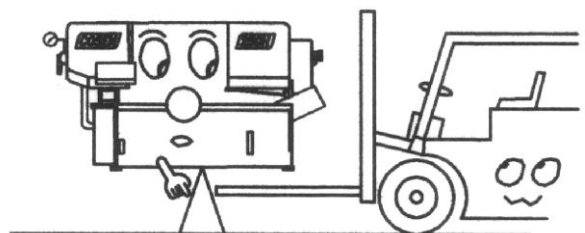
Make sure the forks are able to reach in at least 2/3 of the machine depth.



- You must keep the machine balanced at all times.



Make sure the forks are centered before use.

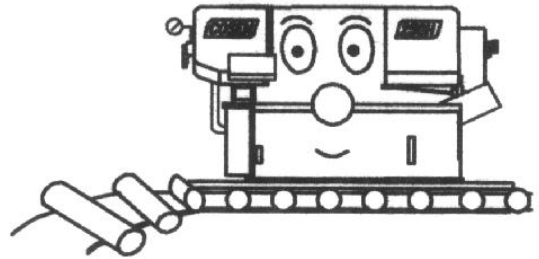


(Illustration only. Please follow user guide of your forklift.)

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.



4. Other ways to move

If the machine does not have

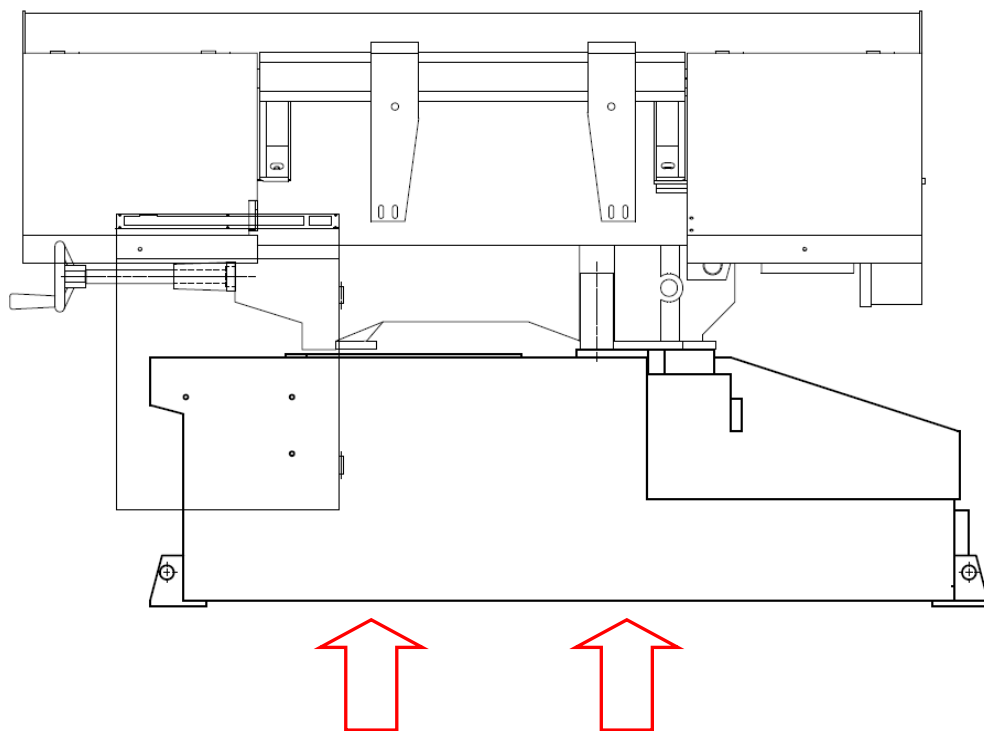


or



stickers, please contact your local agent immediately.

Illustration: Lifting Points



Minimum weight capacity for each lifting rod: **1 ton**

Total number of lifting rod required: **2**

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

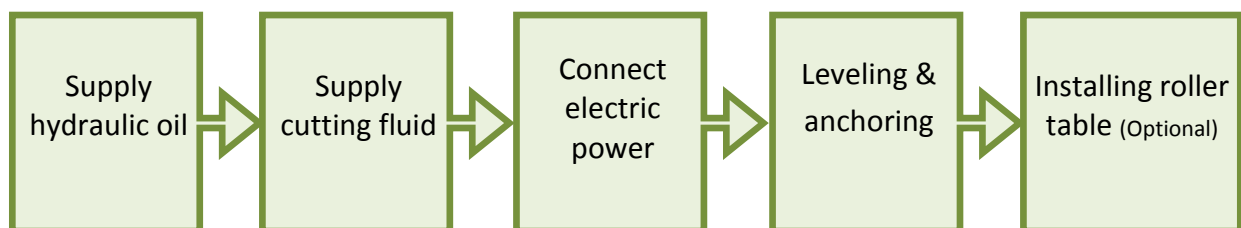
After the machine has been placed at the designated position, remove the rust-preventive grease with wiping cloth dampened with cleaning oil or kerosene. Apply machine oil to machine surfaces that are prone to rust.



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

Cosen's bandsaw machine is relatively easy to install. Follow these six easy steps to install your machine.



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.

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 COSEN 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.

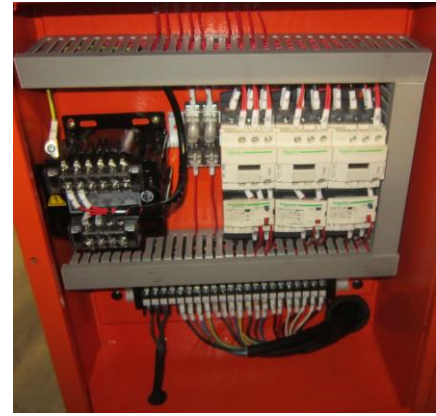


Source frequency: 99% - 101 % of nominal frequency.



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.

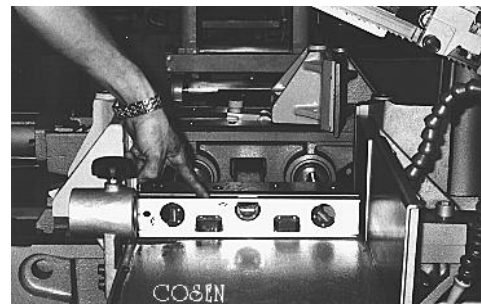
1. Turn off the shop circuit breaker.
2. Make sure the machine circuit breaker switch on the electrical compartment door is turned to OFF.
3. Remove the screw securing the electrical compartment and then open the door.
4. Pull the power supply cable and grounding conductor through the power supply inlet 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 back.
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. Pull to unlock the *Emergency Stop* button and press the *hydraulic ON* button to start the hydraulic motor.
9. Make sure the sawing area is clear of any objects. Start the blade and check the blade rotation. If the electrical connections are made correctly, the blade should run in a counterclockwise direction. If not, shut the hydraulics off, turn off the machine as well as the shop circuit breaker. Then swap the power the power cable conductors connected to R and T terminals.
10. Repeat step 6 to 9 to ensure the electrical connections are in the right order.



Leveling

Place spirit level on the vise slide plates and the work feed table.

Level the machine in both directions i.e. along and across the machine. Adjust the level of the machine by turning the leveling bolts.



Make sure all leveling bolts evenly support the machine weight.

Anchoring the machine

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.

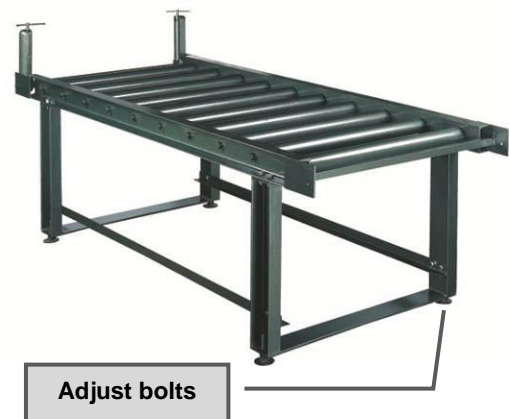
Shock absorption steel plates are provided and can be placed under each leveling bolt to prevent their sinking into the concrete floor.

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.



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 place:

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. Use a crane or forklift 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 equipments originally furnished including the shock absorption steel plates and the instruction manual.

OPERATING INSTRUCTION

SAFETY PRECAUTIONS

BEFORE OPERATING

CONTROL PANEL

UNROLLING & INSTALLING THE BLADE

SELECTING BLADE SPEED

ADJUSTING BLADE SPEED

ANGLE CUTTING

ADJUSTING FEED RATE (CUTTING PRESSURE)

ADJUSTING VISE

ADJUSTING WIRE BRUSH

ADJUSTING SAW ARM

CUTTING IRREGULAR CROSS SECTION

ADJUSTING COOLANT FLOW

INSTALLING MATERIAL STOP BRACKET

ADJUSTING HORIZONTAL STOP SPRING CUSHION

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, neckties, jewelry or loose clothing/hair while operating the machine.
- For eye protection, always wear protective safety glasses.
- Check the blade tension and adjust blade guides before starting the machine.
- Use auxiliary clamping or supporting devices to fix material in place before cutting long workpieces. Always make sure the material is clamped firmly in place before starting to cut.
- 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.
- Protection devices should be in place at all times. For your own safety, never remove these devices.
- Disconnect machine from the power source before making repairs or adjustments.
- Wear protection gloves only when changing the blade.
- Do not operate the machine while under the influence of drugs, alcohol or medication.
- Do not take your eyes off the machine while in operation.
- Do place warning signs to mark out machine work zone and restrict entry to be staff-only.

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 and job requirements e.g. cutting accuracy, cutting speed, economic concern, and safety control.

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 unknown materials

Before cutting an unknown material, consult the material supplier, burn a small amount of chips from the material in a safe place, or follow any other procedure to check if the material is flammable.



Never take your eyes off the machine while in operation.

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.

Pro	Con
<ul style="list-style-type: none">• Have a high cooling effect• Not flammable• Economical• Does not require cleaning of the cut products	<ul style="list-style-type: none">• Remove machine paint• Lose its rust protection effect if deteriorated• Tend to create foam• Subject to decay• Decline in performance, depending on the quality of the water used for dilution



Never use water as your coolant.



Always add coolant into water for better mix result.



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

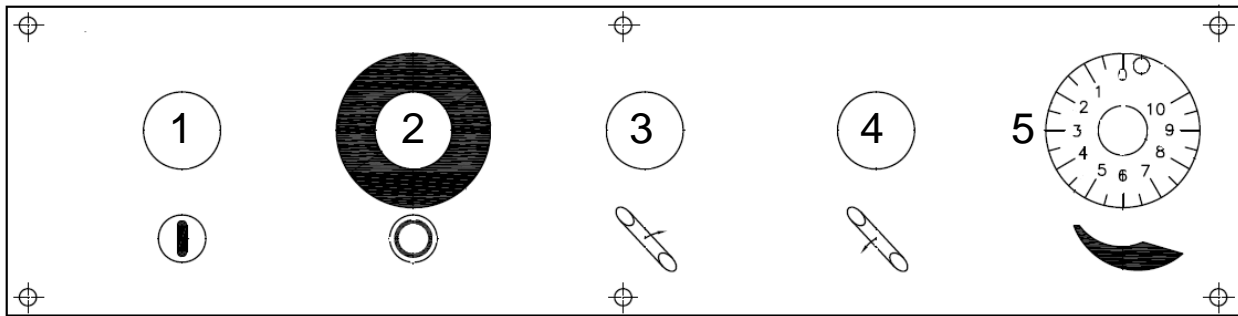


Before starting a cutting job, make sure there is sufficient amount of coolant in the tank.

Check the fluid level through the sight gauge. Please refer to machine specifications in this manual (Section 2) for tank capacity.

CONTROL PANEL

The control panel is located on the top of the electrical box. The operator must fully understand the function of each switch and button before operating the machine.



Model without hydraulic vise

No.	Control Function	No.	Control Function
1	Blade start button	4	Saw bow down button
2	Emergency stop button	5	Blade descend speed control knob
3	Saw bow up button		

Control Buttons

1. Blade start button

Press this button to start the blade motor and the built-in light will come on.



Make sure the material is securely clamped by the vise before cutting.



Press the *saw bow up* button to stop the running blade.

2. Emergency stop button

Press this button to stop the machine in an emergency. When the button is pressed, it brings the machine to a full stop. The button locks when pressed. In order to unlock it, please turn the button clockwise.

3. Saw bow up button

When this button is pressed, the saw bow rises until the operator lets go of the button.



While pressing the *saw bow up* button can stop the running blade, please still make use of the *emergency stop* button in an emergency.

4. Saw bow down button

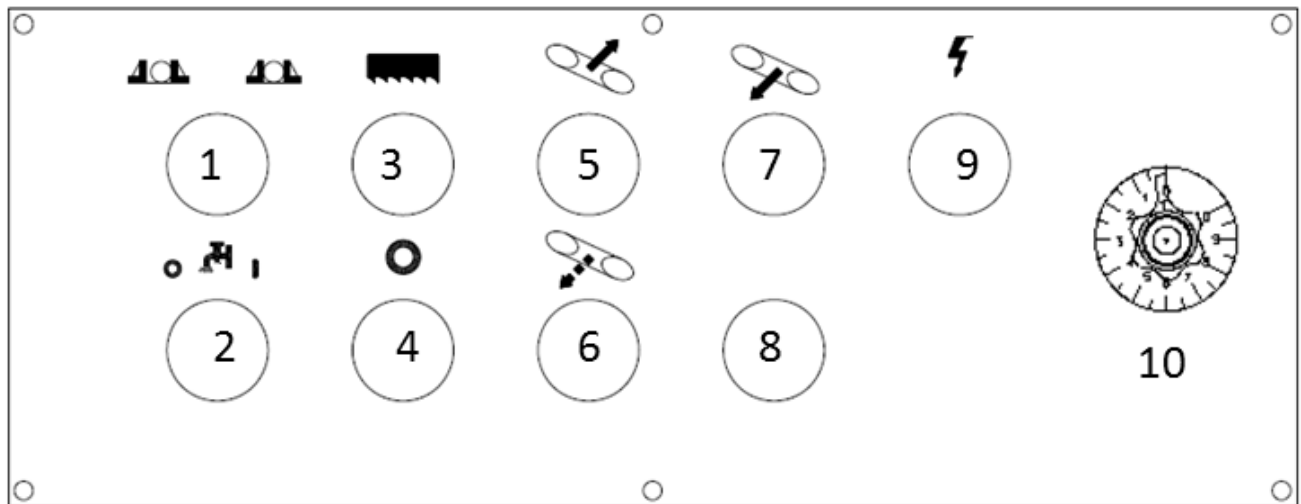
When this button is pressed, the saw bow descends according to the preset speed of *blade descend speed control knob*.



Before lowering the saw bow, the guide arm must be positioned outside the vise in order to avoid hitting the vise and causing damages.

5. 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.
- Also commonly known as the flow control valve



Model with hydraulic vise

No.	Control Function	No.	Control Function
1	Vise open/clamp switch	6	Saw bow slowly down button (N/A)
2	Coolant pump on/off switch	7	Saw bow down button
3	Saw blade start button	8	Emergency stop button
4	Saw blade stop button	9	Power indicator lamp
5	Saw bow up button	10	Blade descend speed control knob

Control Buttons

1. Vise open/clamp switch

When the switch is turned to the left, the vises open. When the switch is turned to the right, the vises close until the operator lets go of the switch or until the full stroke vises are clamped together.



After the blade motor is running, the function of this switch is disabled for the safety concern.

2. Coolant pump on/off switch

When this switch is set at “I”, the coolant pump operates and the cutting fluid will be injected. When this switch is set at “O”, the coolant pump stops and cutting fluid supply will be terminated.



Cutting fluid can lower the workpiece temperature during cutting.

3. Saw blade start button

Press this button to start the blade motor.



Make sure the material is securely clamped by the vise before cutting.

4. Saw blade stop button

Press this button to stop the blade motor.



After the cutting job is done, the saw blade will stop and the saw bow will automatically go up to the top limit switch position.

5. Saw bow up button

When this button is pressed, the saw bow rises until the operator lets go of the button.



While pressing the *saw bow up* button can stop the running blade, please still make use of the *emergency stop* button in an emergency.

6. Saw bow slowly down button(N/A)

7. Saw bow down button

When this button is pressed, the saw bow descends according to the preset speed of *blade descend speed control knob*.



Before descending the saw bow, please move the guide arm to a safe position to prevent it from hitting the vise.



Press *saw bow up button* to stop saw bow descending.

8. Emergency stop button

Press this button to stop the machine in an emergency. When the button is pressed, it brings the machine to a full stop. The button locks when pressed. In order to unlock it, please turn the button clockwise.

9. Power indicator lamp

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

10. Blade descend speed control knob

This knob is used to adjust the descend speed of the saw blade. Turning the knob counterclockwise increases the blade descend speed.

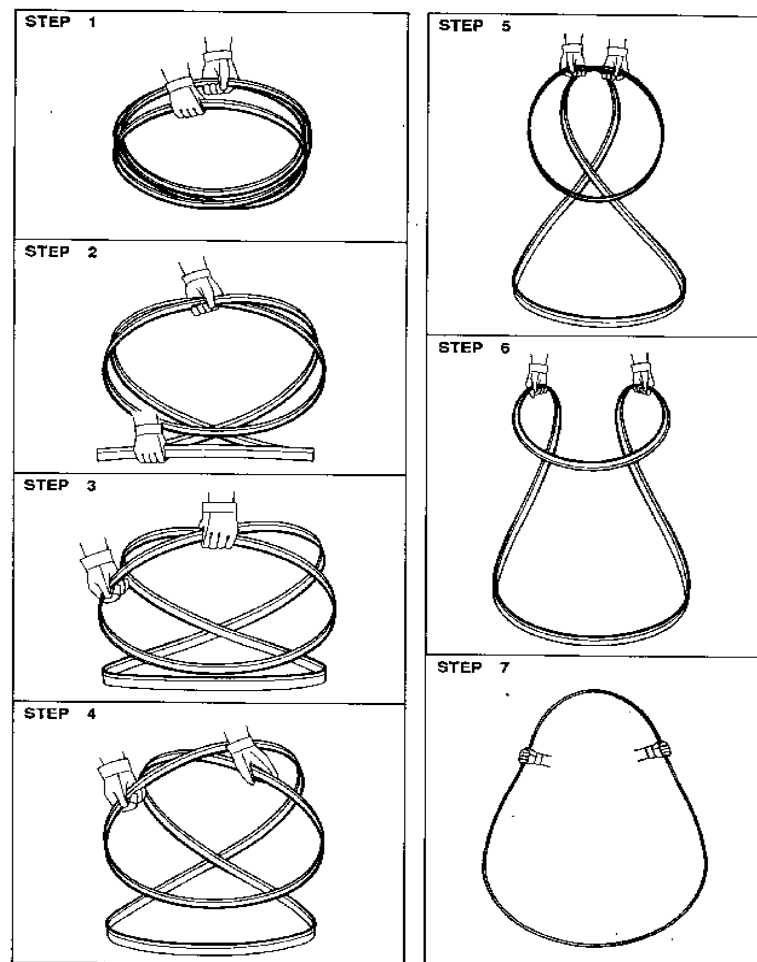
UNROLLING & INSTALLING THE BLADE



Always wear leather gloves and protection glasses when handling a blade.

Unrolling the blade

Please follow the procedures illustrated below.



Unroll and roll the blade

Installing a new blade

Step 1 - Select the most suitable saw blade for your workpiece considering the size, shape and material.

Step 2 - Turn on the machine power.

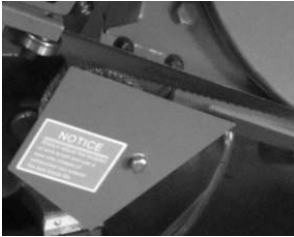
Step 3 - Press the *saw bow up* button and elevate the saw bow to the highest position.

Step 4 - Release blade tension by turning the blade tension handle counterclockwise. The idle wheel will then move slightly toward the direction of the drive wheel.



Step 5 - Open the idle and drive wheel covers.

Step 6 - Loosen the screw and lower the wire brush.



Step 7 - Remove the old blade. If necessary, clean the carbide inserts before installing a new saw blade.

Step 8 - Place the new blade around the idle wheel and the drive wheel.

Step 9 - 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 10 - Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel.

Step 11 - Make sure the back of the blade is also pressed against the flange of the idle wheel.

Step 12 - Apply tension by turning the blade tension handle clockwise. Make sure you have proper blade tension. Proper tension exists when the blade does not slip on the drive wheel when cutting.

Step 13 - Make sure the sides of the blade are in close contact with the carbide inserts.

Step 14 - Gently close the idle and drive wheel covers.

Step 15 - Press the *saw blade start* button to start the blade. Allow the blade to run for a few rotations then press the *saw bow up* button to elevate the saw bow. Open the wheel covers and make sure the blade has not fallen off the drive and idle wheels. If the blade has shifted, follow the same procedure to reinstall the blade again.

Step 16 - Adjust wire brush to a proper position. Refer to *Adjust wire brush* in this section.

SELECTING BLADE SPEED

Blade speed selection should be made according to the material being cut. The following chart provides information on blade speed and is used for reference only.

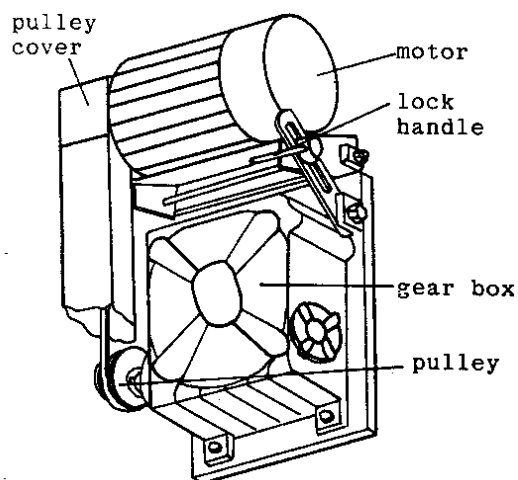
Material	Speed		Pulley Groove Used	
	50 Hz	60 Hz	Motor pulley	Saw Pulley
High speed alloy, stainless and heavy cross section material	57	68	Smallest	Large
Tool, stainless and alloy steel, bearing bronze	100	120	Small	Medium
Cast iron, mild steel, hard brass, bronze	164	196	Medium	Small
Plastic, copper, soft brass, aluminum, other light materials	277	330	Large	Smallest



Some materials due to manufacturing processes such as certain types of cast iron pipe or materials containing certain types of welds cannot be cut on the machine.

ADJUSTING BLADE SPEED

4 Speed Step Pulley



Step 1 - Remove pulley cover.

Step 2 - Loosen lock handle.

Step 3 - Position belt in proper grooves according to below speed selection chart attached on the pulley cover.

Step 4 - Make sure the belt is tightly and securely positioned in the groove and tighten lock handle.

Step 5 - Install pulley cover back in place.

BLADE SPEED		
FEET/METER PER MINUTE		
	50HZ	60HZ
	78/24	95/29
	124/38	150/46
	173/53	213/65
	265/81	321/98

Speed Selection Chart

Variable Stepless Pulley Drive

Infinitely variable blade speed is easily achieved with this optional device. Our variable stepless pulley drive assembly allows the operator to select the optimum speed for best performance in all cutting applications.

Turn the blade speed control knob clockwise to decrease blade speed; counterclockwise to increase speed.

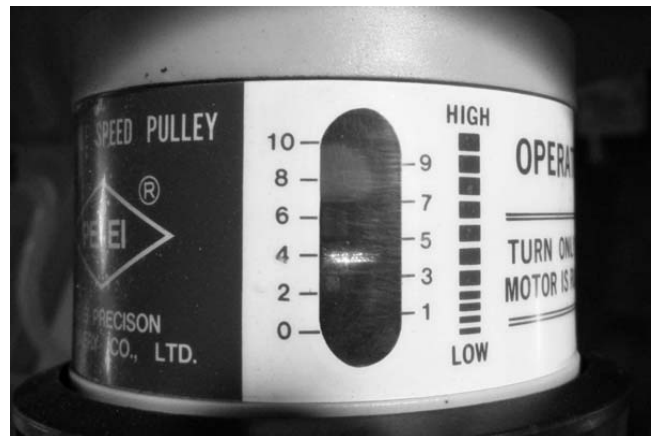
On and behind the control knob is also the speed mark indicator showing current speed level. Refer to the blade speed reference chart posted on the pulley cover to see the actual blade speed in m/min or ft/min.



Blade Speed Control Knob

BLADE SPEED/MARK	0	1	2	3	4	5	6	7
M/MIN								
50HZ	20	24	30	36	41	53	62	71
60HZ	24	30	37	44	50	65	76	87
FT/MIN								
50HZ	66	79	98	118	135	174	203	233
60HZ	79	98	121	144	164	213	249	285

Blade Speed Reference Chart



Speed Mark Indicator

ANGLE CUTTING

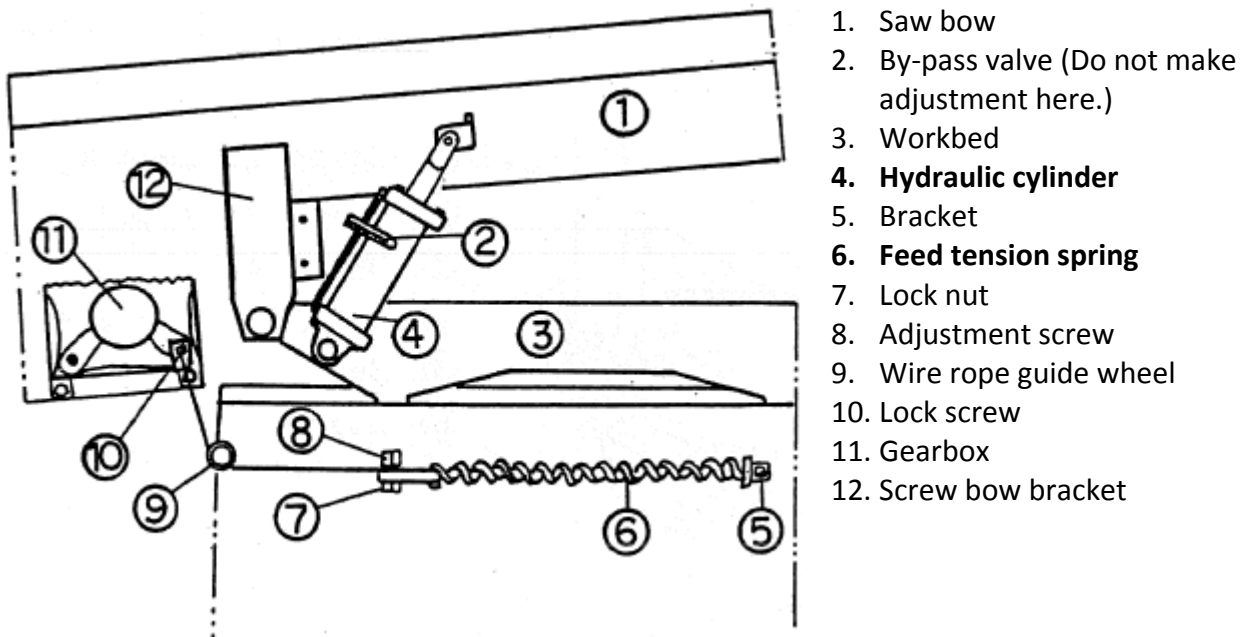


The swivel sawhead allows the user to cut at any angle between 0° (straight cut) and 60° (miter cut). The angles have been accurately configured before machine shipment.

For your miter-cutting jobs, simply loosen the angle lock handle, swivel the saw bow until the pointer points to your desired angle and lock the saw bow via angle lock handle. Also loosen the vise bolts and adjust the vise position according to the miter cut angle.

ADJUSTING FEED RATE (CUTTING PRESSURE)

To obtain desired feed rate (cutting pressure), the “hydraulic cylinder” (#4) and “feed tension spring” (#6) are to be adjusted together.



- Feed pressure is the amount of pressure forcing the blade downward into the material.
- Proper feed pressure is important. Excessive pressure can break the blade or stall the saw. Insufficient pressure rapidly dulls the blade.
- The hydraulic cylinder regulates the rate at which the blade is lowered into the material being cut. Adjusting the *blade descend speed control knob* provides an infinite choice for feed rate.
- When cutting workpiece of 2 mm thick or below, please adjust the *blade descend speed control knob* to between “1~2” gradually; when cutting workpiece of 3 mm and above, to “3~4” gradually.



The by-pass valve (#2) has been factory adjusted and should not be altered.

- Using *blade descend speed control knob* while repositioning your workpiece: When repositioning your workpiece, raise the saw head halfway up and turn the *blade descend speed control knob* clockwise all the way pass “0” to hold the saw head in position.

ADJUSTING VISE



Always use the vise to clamp the work. Never hand-hold the work for cutting.

Clamp material securely by turning the vise hand wheel clockwise.



Vise hand wheel

ADJUSTING WIRE BRUSH

Follow these steps to adjust wire brush to appropriate position:

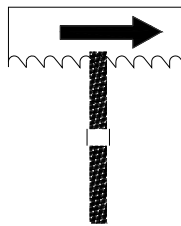
Step 1 - Open the drive wheel cover.

Step 2 - Adjust the screw to make brush move up / down until it makes proper contact with the saw blade (see below illustration).

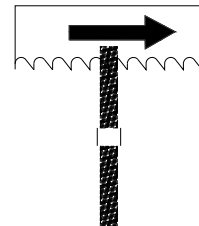
Step 3 - Close the drive wheel cover.



Proper



Improper



ADJUSTING SAW ARM



Locking Handle

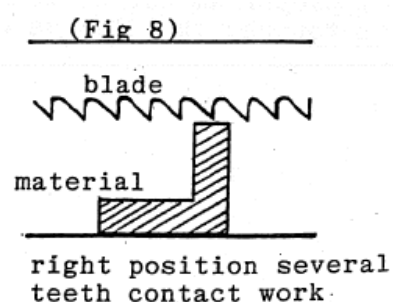
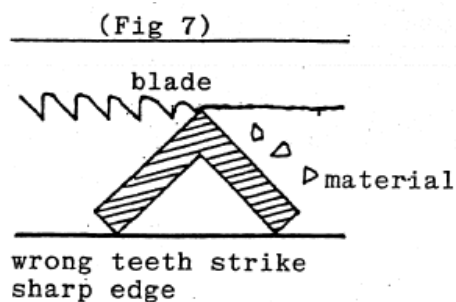
Adjust the blade guide (guide arm) position based on the size of your workpiece:

Step 1 – Loosen the blade guide locking handle. Then adjust the guide arm to a position suitable for your workpiece size.

Step 2 – After adjustment is made, tighten the blade guide locking handle.

CUTTING IRREGULAR CROSS SECTION

When cutting irregularly-shaped material, if possible, avoid positioning the work in the way that the cut would be started on a sharp corner. Arrange your workpiece in the way that as many teeth as possible will be applied to the work at one time.



ADJUSTING COOLANT FLOW

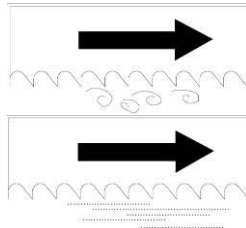
Step 1 – Press the *power on* button to start the saw blade drive motor.

Step 2 – Lower the saw bow.

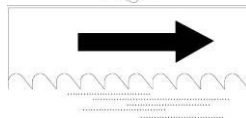
Step 3 – Use the flow control valve (shown below) to adjust the amount of fluid flowing to the cutting area.



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

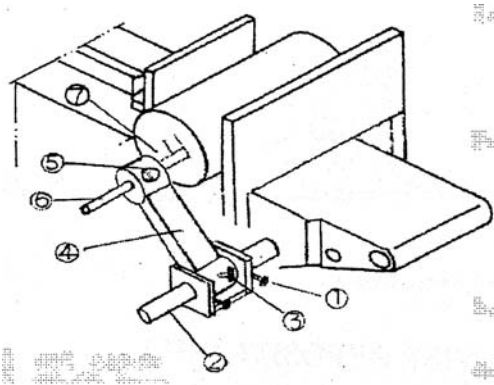


If the chips are sharp and curved, increase the coolant flow amount.



If the chips are granulated, decrease the coolant flow amount.

INSTALLING MATERIAL STOP BRACKET



1. SET SCREW
2. DEPTH BAR
3. FASTENING BOLT
4. STOPPER BRACKET
5. STOPPER HANDLE
6. STOPPER
7. FRONT END OF MATERIAL

Fig 9 Material Stop Bracket

Step 1 - Install the depth bar (Fig 9, #2) and tighten the set screw (Fig 9, #1). (The depth bar is taken off from the machine base during transit for safety reason.

Step 2 - Lift the saw bow and clamp material securely with vise.

Step 3 - Lower the saw bow to allow about 1 mm clearance between saw blade teeth edge and the top of the material. Then measure your desired cutoff length.

Step 4 - Loosen the fastening bolt (Fig 9, #3)

Step 5 - Slide and position the stopper (Fig 9, #6) so that the end of stopper faces the direction of the front end of the material. Then tighten the stopper handle (Fig 9, #5) to fix the stopper in the bracket (Fig 9, #4).

Step 6 - Move the stopper bracket (Fig 9, #4) toward the workpiece so the stopper end just touches the front of the material, then tighten the fastening bolt (Fig 9, #3).

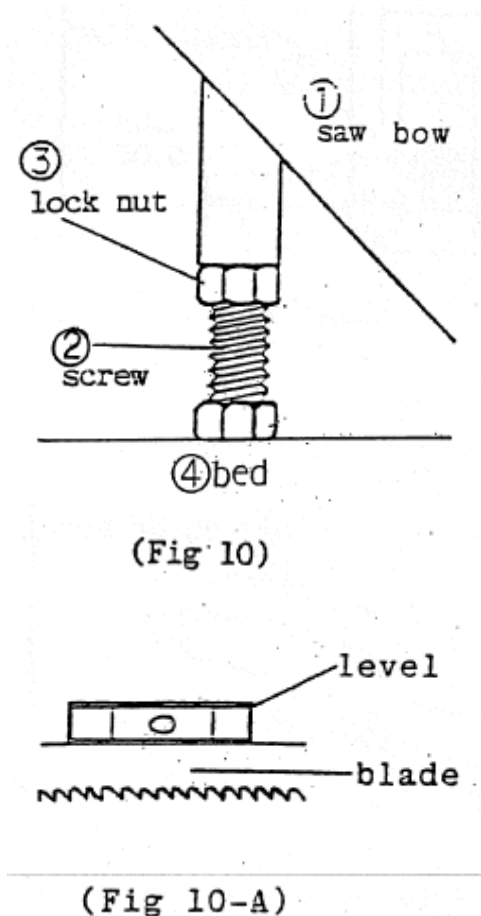
ADJUSTING HORIZONTAL STOP SPRING CUSHION



Always make sure the power cord is disconnected from power source when making adjustments.

Complete Cut – Adjusting Horizontal Stop Spring Cushion

The workpiece should be able to cut through completely. If it does not, please follow these steps to adjust the horizontal stop spring cushion.



Step 1 - Place a level on the workbed (Fig 10, #4) to make sure the bed is level.

Step 2 - Loosen the lock nut (Fig 10, #3) and lower down the saw bow. Place the level on top of the saw blade (Fig 10-A) to check its leveling against the bed horizontal line. Adjust the screw (Fig 10, #2) until the blade is level.

Step 3 - Tighten the lock nut (Fig 10, #3) when leveling is obtained.



If the saw blade top line is not leveled against the bed horizontal line, the workpiece will not be able to cut off completely.

Automatic Shut-Off – Adjusting Horizontal Stop Spring Cushion

The motor should shut off immediately after the blade has cut through the material and right before the head comes to rest on the horizontal stop spring cushion. If it does not, the spring cushion must be adjusted.

1. Check the horizontal stop spring cushion. Refer to “Complete Cut – Adjusting Horizontal Stop Spring Cushion.”
2. Raise the saw head and press the power on button to ON. Lower the saw head slowly and observe the switch mechanism.

ELECTRICAL SYSTEM

ELECTRICAL CIRCUIT DIAGRAMS

Model without safety doors & hydraulic vise

P.5-2 Power Supply Layout

P.5-3 Circuit Board Layout

Model with safety doors & without hydraulic vise

P.5-4 Power Supply Layout

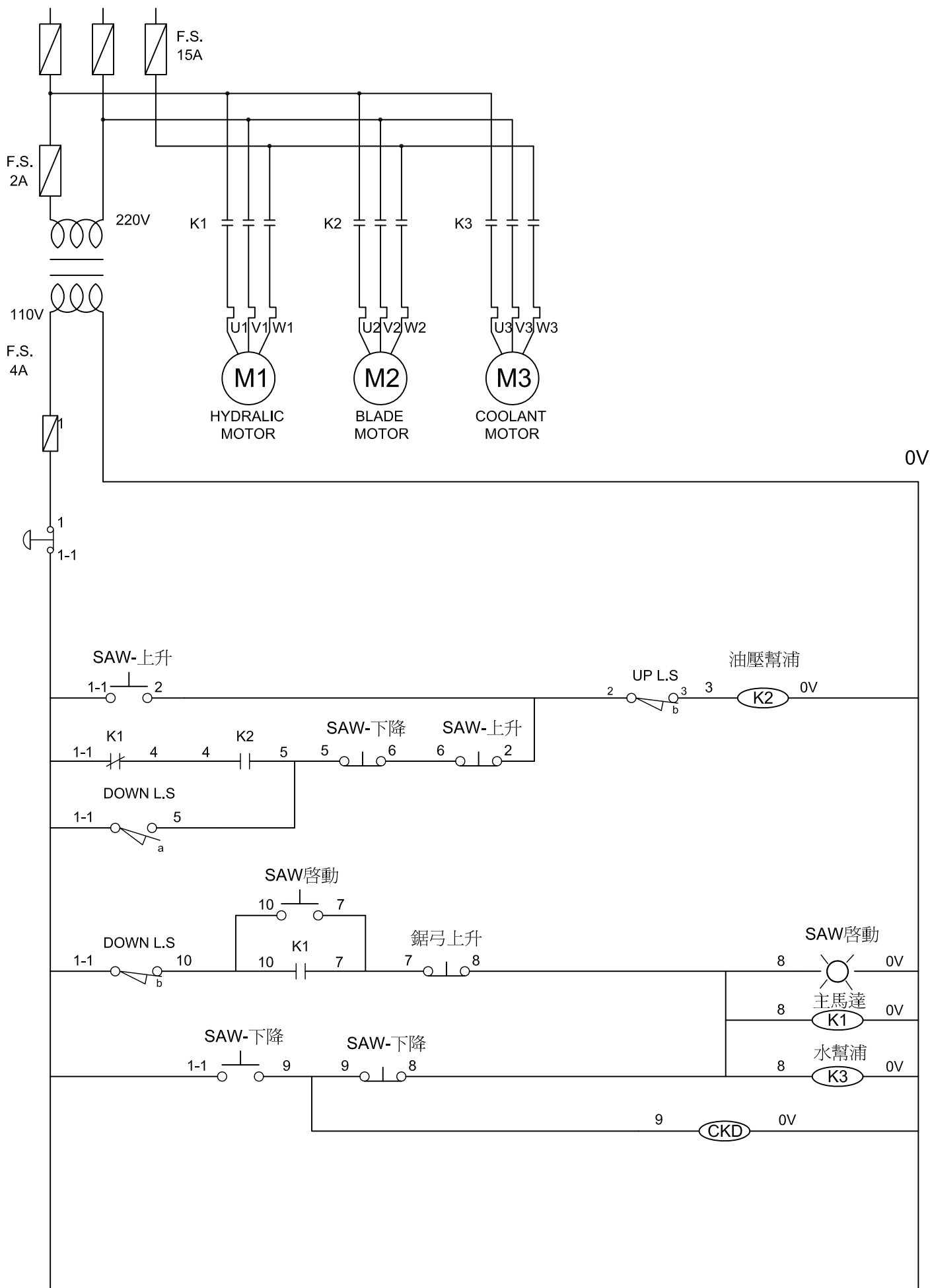
P.5-5 Circuit Board Layout

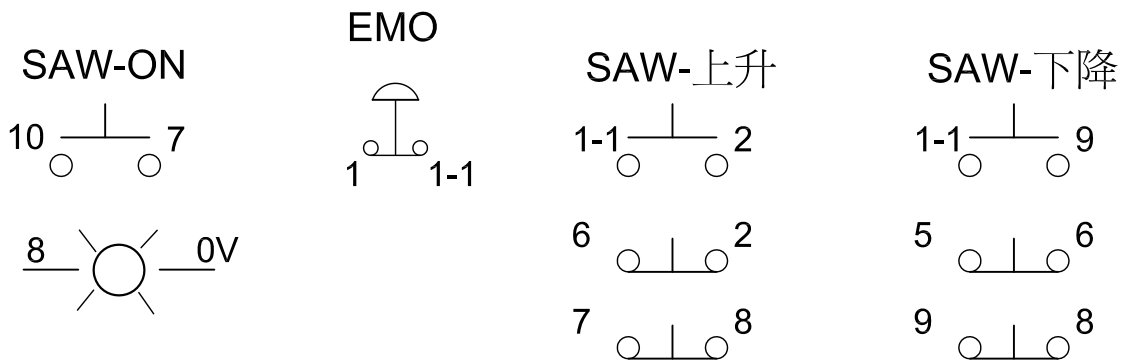
Model with hydraulic vise

P.5-6 Power Supply Layout

P.5-7 Circuit Board Layout

P.5-8 Control Panel Layout



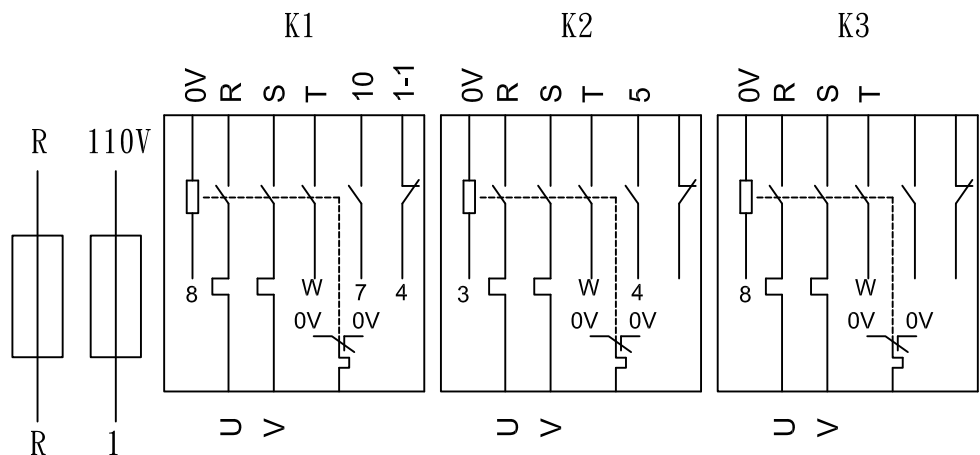


TB-1

0V	1	1-1	2	5	6	7	8	9	10
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0-220-380-400-415-440

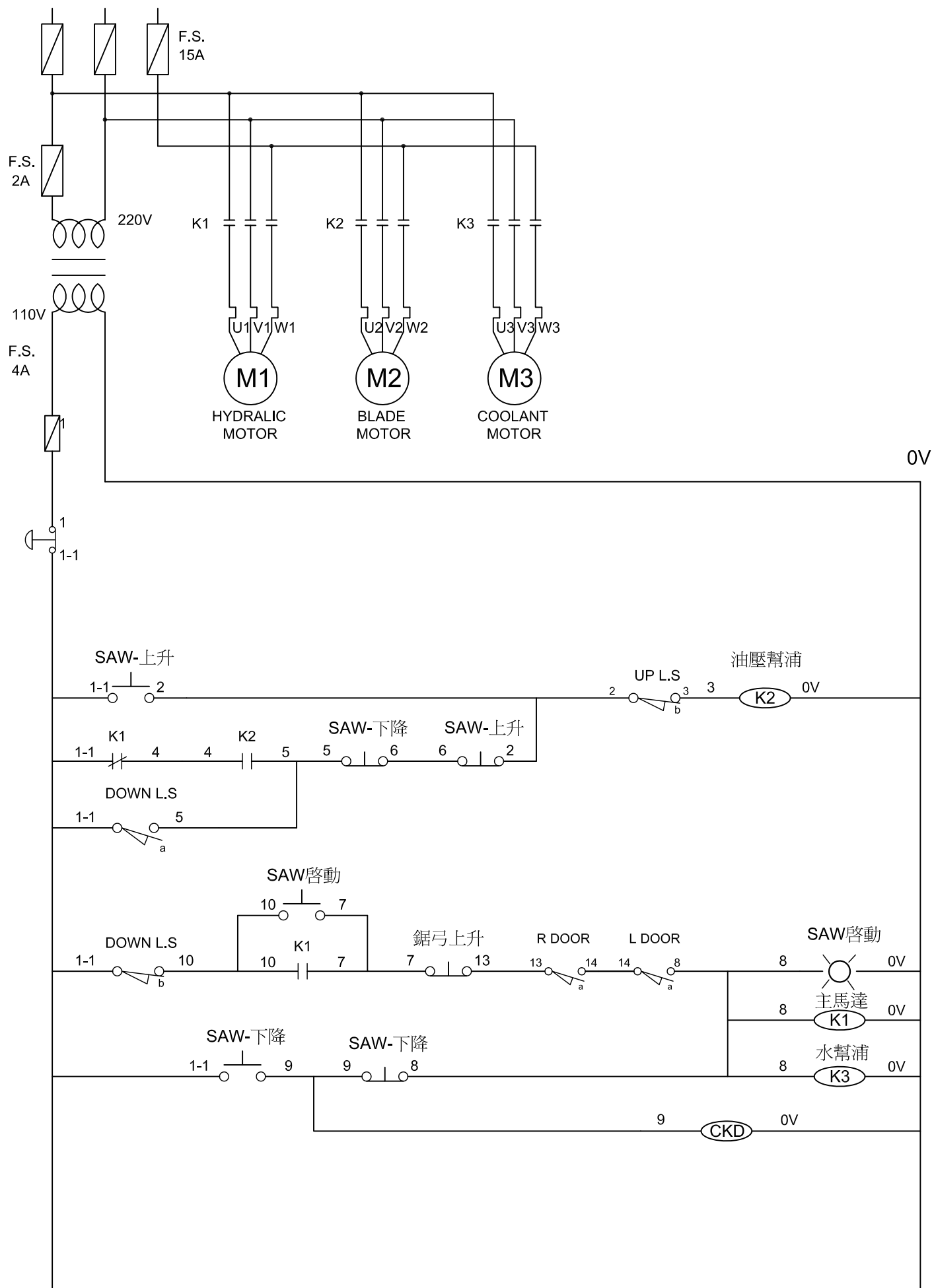
0-110V 0-24V

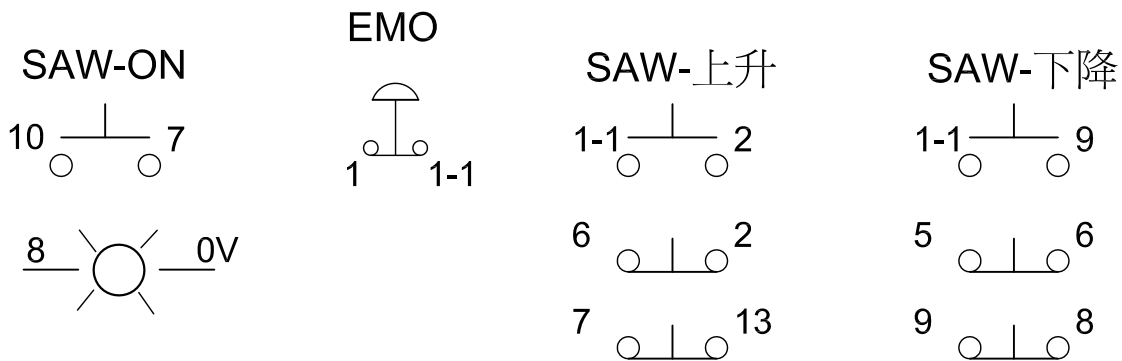


TB-2

R	S	T	E	U	V	W	E	U1	V1	W1	E	U2	V2	W2	E	1-1	5	10	2	3	9	0V	E
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5-3



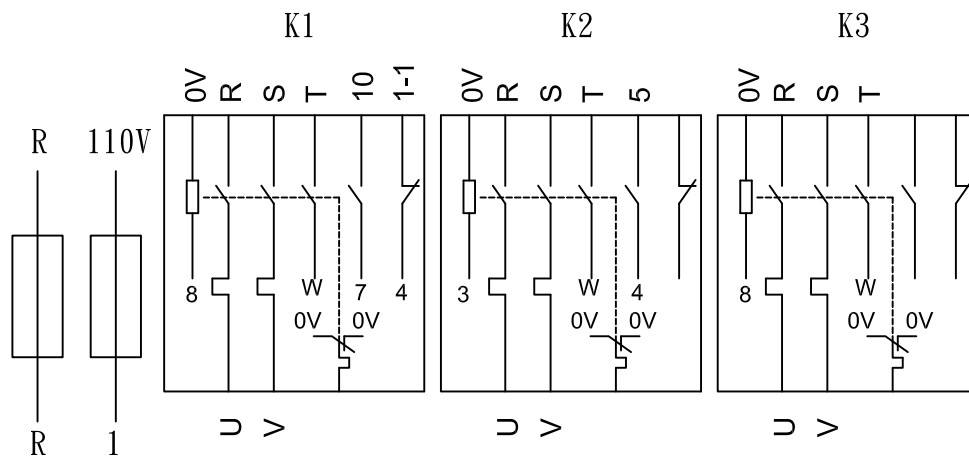


TB-1

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TB-2

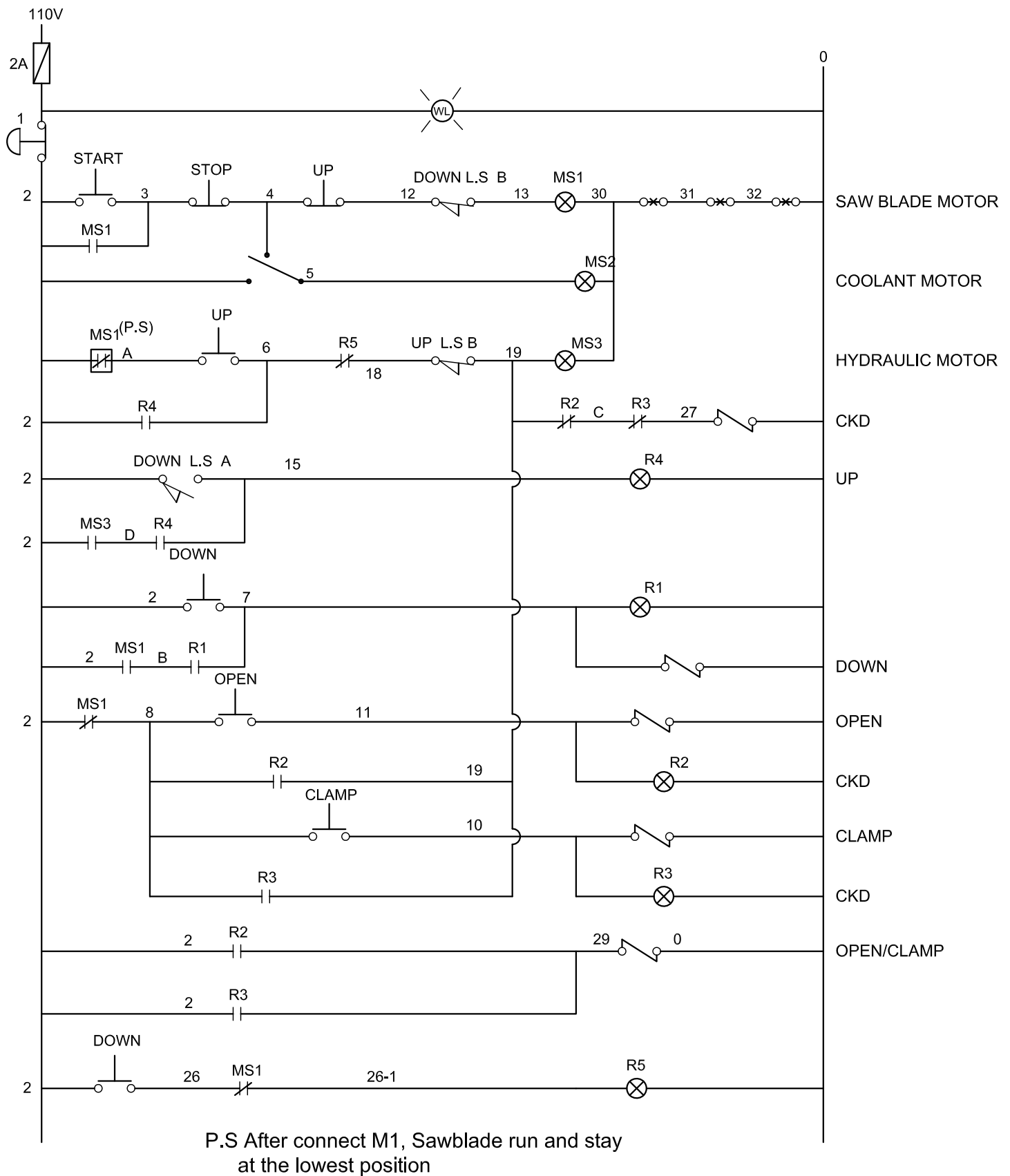
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5-5

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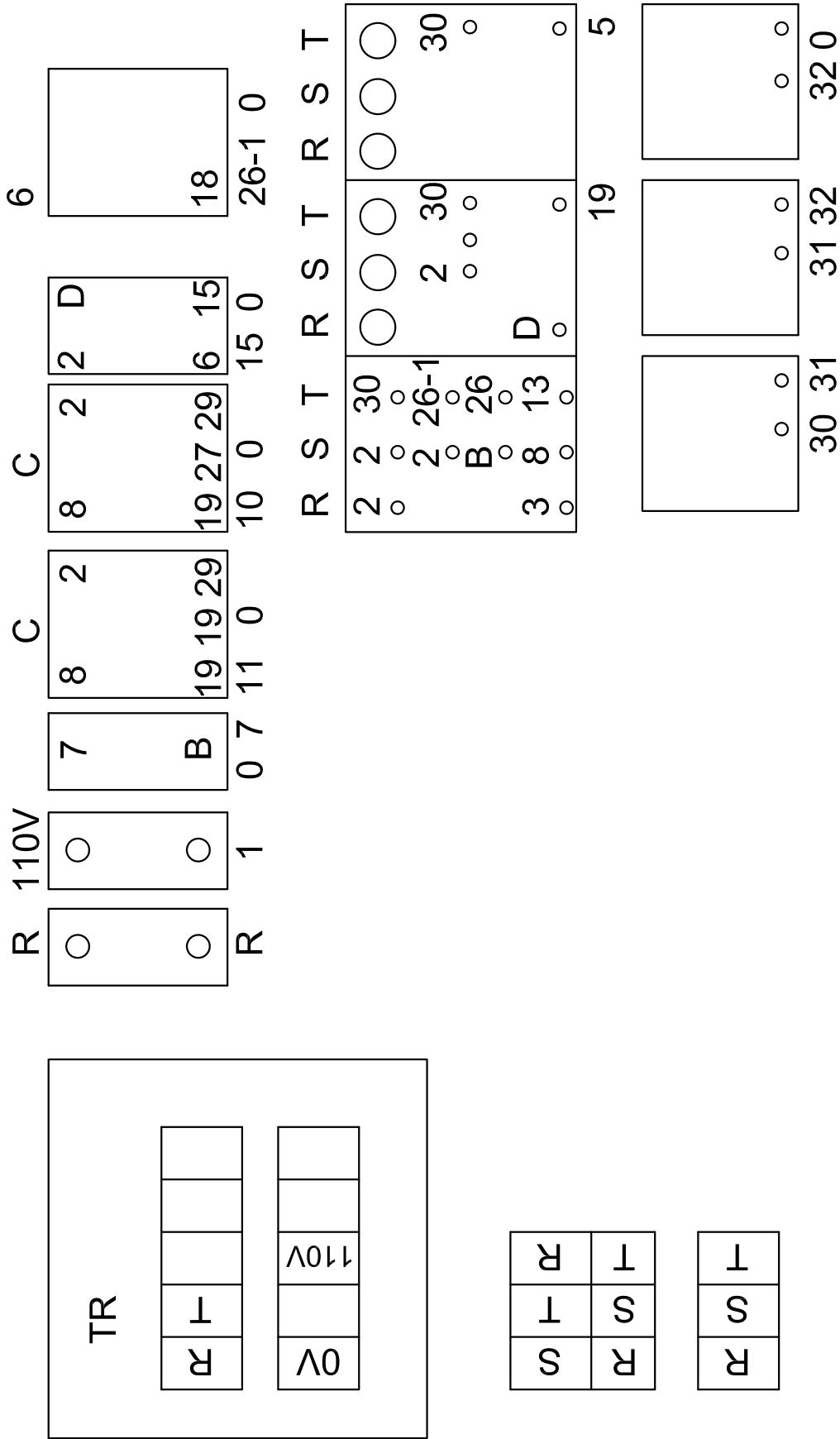
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CSA：12.13.2.15.18.19.10.11.0.0.29.7.0.0.26-1.27.0.0



P.S After connect M1, Sawblade run and stay at the lowest position

26	12	11	10	8	7	6	5	3	2	1	0
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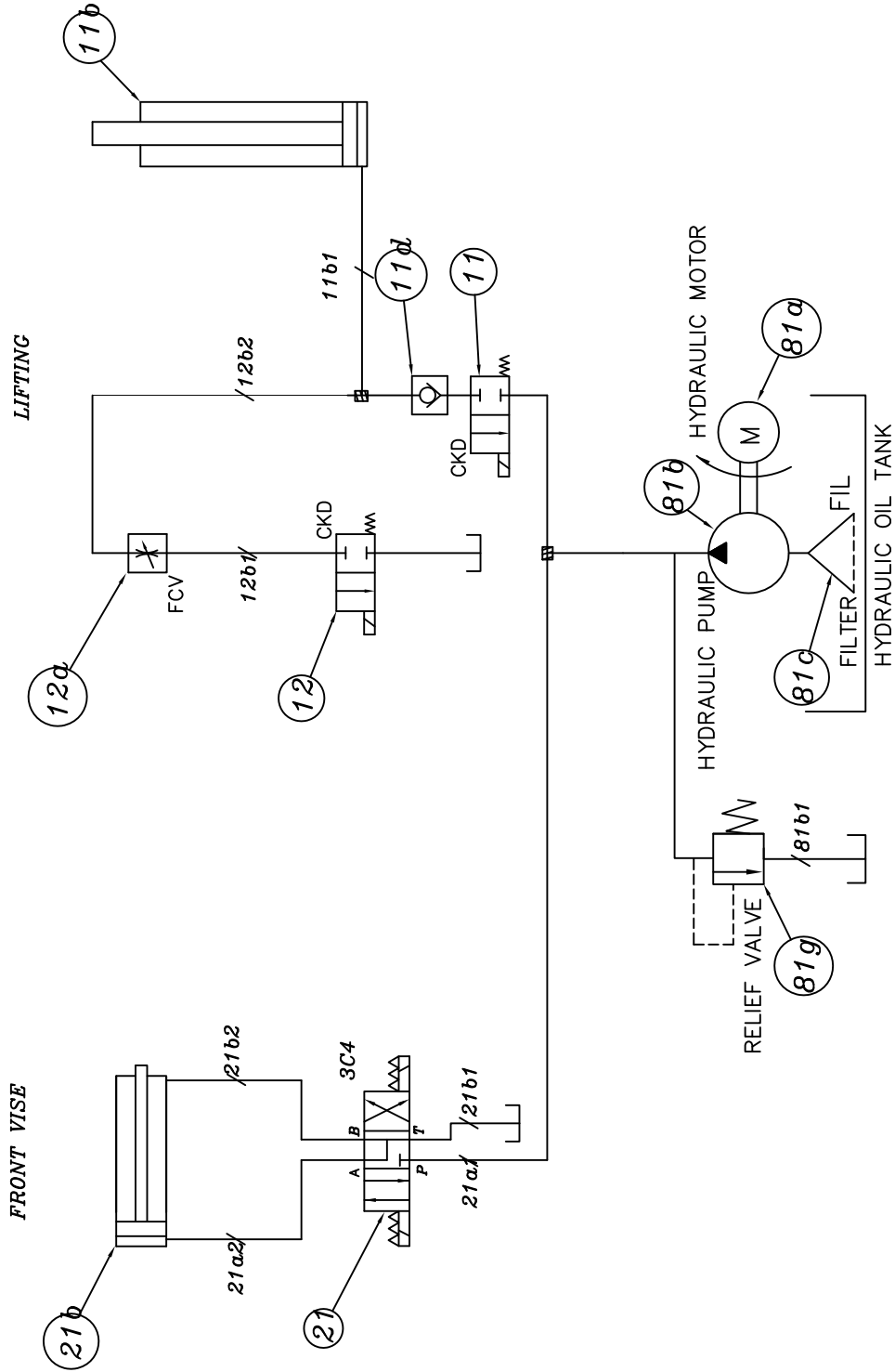
W2	V2	U2	W1	V1	U1	W	V	U
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HYDRAULIC SYSTEM

HYDRAULIC DIAGRAMS

COSEN

HYDROLIC CIRCUIT SH-460M STANDARD



SH-460M-HYDRA.DWG

COSEN

COSEN MECHATRONICS CO., LTD.

TITLE SH-460M HYDRAULIC CIRCUIT

DRAWING NO. 05SH-460M-04CE

VERSION 1.0

DRAW

CHECK

APPROVED

DATE

NAME

NOTE

SHELBY

20140910

Section 7

BANDSAW CUTTING: A PRACTICAL GUIDE

INTRODUCTION

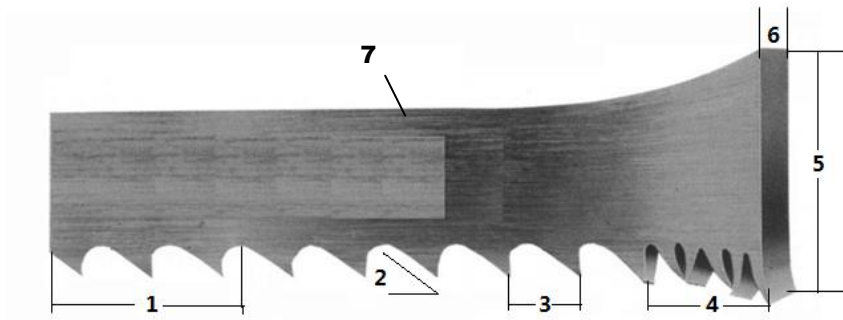
SAW BLADE SELECTION

WISE LOADING

BladeBreak -In

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 equates to 25.4 mm.

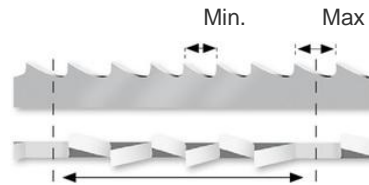
A distinction is made between constant tooth pitches with a uniform tooth distance, 2 tpi for example, and variable tooth pitches with different tooth distances within one toothing interval.

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



Variable



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 band.
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.

Please refer to Section 2 – General Information

2. Band width

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

3. Cutting edge material

The machinability of the material to be cut determines what cutting material you should choose.

4. Tooth pitch

The main factor here is the contact length of the blade in the workpiece.

If it is 4P, $25.4 \div 4 P = 6.35$ mm, that is, one tooth is 6.35 mm.

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

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

The saw blade must contact the cutting material at least two pitches. In the case of a thickness of 15 mm, 4P = OK, 3P = NG.

- 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.
- 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.
- Tough or abrasive materials are much harder to cut than their machinability rating would indicate.
- Tooth spacing is determined by the hardness of the material and its thickness in cross section.
- Tooth set prevents the blade from binding in the cut. It may be either a "regular set" (also called a "raker set") or a "wavy set".
- The regular or raker set is most common and consists of a pattern of one tooth to the left, one tooth to the right, and one which is straight, or unset. This type of set is generally used where the material to be cut is uniform in size and for contour cutting.
- Wavy set has groups of teeth set alternately to right and left, forming a wave-like pattern. This reduces the stress on each individual tooth, making it suitable for cutting thin material or a variety of materials where blade changing is impractical. Wavy set is often used where tooth breakage is a problem. This is shown in Fig. 7.2 as follows:

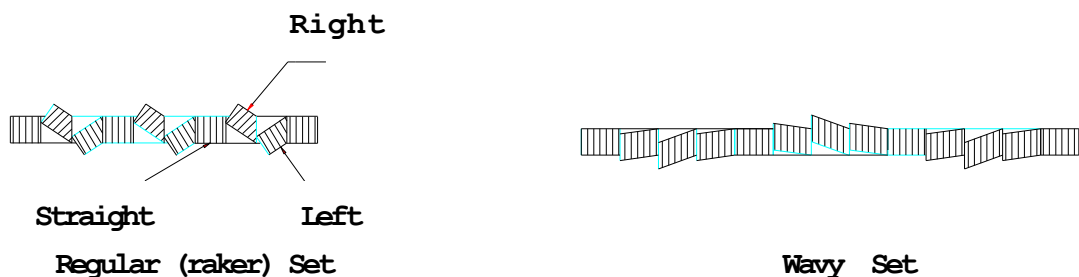


Fig. 7.2 The Saw Set

WISE LOADING

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

Often, loading smaller bundles can mean greater sawing efficiency.



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 that the blade cuts through as uniform a width as possible throughout the entire distance of cut.

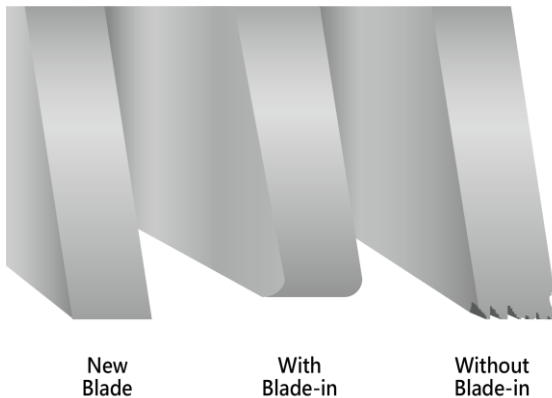
The following diagrams suggest some costeffective ways of loading and fixturing. Be sure, regardless of the arrangement selected, that the work can be firmly secured to avoid damage to the machine or injury to the operator.



BladeBreak -In

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

1. **Select the proper band 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.

MAINTENANCE & SERVICE

INTRODUCTION

BASIC MAINTENANCE

MAINTENANCE SCHEDULE

BEFORE BEGINNING A DAY'S WORK

AFTER ENDING A DAY'S WORK

Every 2 weeks

First 600hrs for new machine, then every 1200hrs

EVERY SIX MONTHS

STORAGE CONDITIONS

TERMINATING THE USE OF MACHINE

OIL RECOMMENDATION FOR MAINTENANCE

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.

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.



Be sure the saw blade is fully stop, it will be performed after working inspection.

Every 2 weeks

Please apply grease to the following points:

1. Idle wheel
2. Drive wheel
3. Blade tension device

Recommended Grease:

- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

First 600hrs for new machine, then every 1200hrs

Replace the transmission oil after operating for first 600hrs for new machine, then every 1200hrs

Recommended gear oil

- Shell Omala oil HD220
- Mobil gear 630

Recommended hydraulic oil

- ShellTellus 32
- Mobil DTE Oil Light Hydraulic 28

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.

Recommended TRANSMISSION OIL

- Omala oil HD220
- Mobil comp 632 600W Cylinder oil

3. Replace the hydraulic oil.

Recommended HYDRAULIC OIL

- Shell Tellus 27
- Mobil DTE OIL light Hydraulic 28

STORAGE CONDITIONS

Generally, this machine will be stored on the following conditions in future:

- (1) Turn off the power.
- (2) Ambient temperature: 5°C ~ 40°C
- (3) Relative humidity: 30%~95% (without condensation)
- (4) Atmosphere: use a plastic canvas to cover machine to avoid excessive dust, acid fume, corrosive gases and salt.
- (5) Avoid exposing to direct sunlight or heat rays which can change the environmental temperature.
- (6) Avoid exposing to abnormal vibration.
- (7) Must be connected to earth.

TERMINATING THE USE OF THE MACHINE

Waste disposal:

When your machine can not work anymore, you should leak out the oil from machine body. Please storage the oil in safe place with bottom. Ask a environment specialist to handle the oil. It can avoid soil pollution. The oil list in machine:

- Hydraulic oil
- Cutting fluid
- Drive wheel gear oil

OIL RECOMMENDATION FOR MAINTENANCE

Item		Method	Revolution	Suggest oil
Dovetail guide		Keep grease covered. Antirust.	Daily	Shell R2
Roller bearing		Sweep clean and oil with lubricant.	Daily	SEA #10
Bed roller / surface		Sweep clean and oil with lubricant.	Daily	SEA #10
Nipples of bearing		Use grease gun, but not excess.	Monthly	Shell R2
Blade tension device		Use grease gun, but not excess.	Monthly	Shell Alvania EP Grease 2, Mobil Mobilplex 48
Reducer		Inspect once a week. Change oil of 600 hours of using. Change it every year.	Regularly	Omala oil HD220 Mobil Gear 630
Hydraulic system		Inspect half a year. Change oil every year.	Regularly	Shell Tellus 32 Mobil DTE oil Light Hydraulic 24
Bearing	Inserts	Oil with lubricant, but not excess.	Daily	Shell R2
	Band wheel	Oil with lubricant, but not excess.	Weekly	
	Cylinder	Oil with lubricant, but not excess.	6 Monthly	
	Wire brush	Oil with lubricant, but not excess.	6 Monthly	



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.

TROUBLESHOOTING

INTRODUCTION

PRECAUTIONS

GENERAL TROUBLES & SOLUTIONS

MINOR TROUBLES & SOLUTIONS

MOTOR TROUBLES & SOLUTIONS

BLADE TROUBLES & SOLUTIONS

SAWING PROBLEMS & SOLUTIONS

RE-ADJUSTING THE ROLLER TABLE

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 the some unpredictable problems which may disable the machine from operating.

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 troubles which can not be recognized in advance, such as malfunctions due to the limited life-span of mechanical, electric or hydraulic parts of the machine.

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.

It is hoped that you will give us your maintenance experience and ideas so that both sides can achieve the best performance.

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



DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Motor stalls	Excessive belt tension	Adjust belt tension so that belt does not slip on drive pulley while cutting (1/2" Min. deflection of belt under moderate pressure.)
	Excessive head pressure	Reduce head pressure. Refer to Operating Instructions "Adjusting Feed".
	Excessive blade speed	Refer to Operating Instructions "Speed Selection".
	Improper blade selection	Refer to Operating Instructions "Blade Selection".
Cannot make square cut	Dull blade	Replace blade.
	Guide rollers not adjusted properly	Refer to Adjustments.
	Rear vise jaw not adjusted properly	Set fixed vise jaw 90° to blade.
	Excessive head pressure	Reduce head pressure. Refer to operating instructions "Adjusting Feed."
Increased cutting time	Dull blade	Replace blade
	Insufficient head pressure	Increase head pressure. Refer to Operating Instructions "Adjusting Feed."
	Reduce blade speed	Refer to Operating Instructions "Speed Selection."
Will not cut	Motor running in wrong direction	Reverse rotation of motor. (Motor rotation C.C.W. pulley end.)
	Blade teeth pointing in wrong direction	Remove blade, turn blade inside out. Re-install blade. (Teeth must point in direction of travel.)
	Hardened material	Use special alloy blades. (Consult your industrial distributor for recommendation on type of blade required.)

MINOR TROUBLES & SOLUTIONS

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Saw blade motor does not run even though blade drive button is pressed.	Overload relay activated	Reset
	Saw blade is not at forward limit position.	Press SAW FRAME FORWARD button

MOTOR TROUBLES & SOLUTIONS

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Motor will not start	Magnetic switch open, or protector open.	Reset protector by pushing red button (inside electric box.)
	Low voltage	Check power line for proper voltage.
	Open circuit in motor or loose connections.	Inspect all lead terminations on motor for loose or open connections.
Motor will not start, fuse or circuit breakers "blow".	Short circuit in line, cord or plug.	Inspect line, cord and plug for damaged insulation and shorted wire.
	Short circuit in motor or loose connections	Inspect all lead terminations on motor for loose or shorted terminals or worn insulation on wires.
	Incorrect fuses or circuit breakers in power line.	Install correct fuses or circuit breakers.
Motor fail to develop full power. (Power output of motor decreases rapidly with decrease in voltage at motor terminals.)	Power line overloaded with lights, appliances and other motors.	Reduce the load on the power line.
	Undersize wires or circuit too long.	Increase wire sizes, or reduce length of wiring
	General overloading of power company's facilities.	Request a voltage check from the power company
Motor overheat	Motor overloaded.	Reduce load on motor
	Air circulation through the motor restricted.	Clean out motor to provide normal air circulation through motor.
Motor stalls (Resulting in blown fuses or tripped circuit breakers)	Short circuit in motor or loose connections.	Inspect terminals in motor for loose or shorted terminals or worn insulation on lead wires.
	Low voltage	Correct the low line voltage conditions.
	Incorrect fuses or circuit breakers in power line.	Install correct fuses circuit breakers.
	Motor overloaded	Reduce motor load.
Frequent opening of fuses or circuit breakers.	Motor overloaded	Reduce motor load
	Incorrect fuses or circuit breakers.	Install correct fuses or circuit breakers.

BLADE TROUBLES AND SOLUTIONS



DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
Teeth stripping	Too few teeth per inch	Use finer tooth blade
	Loading of gullets	Use coarse tooth blade or cutting lubricant.
	Excessive feed	Decrease feed
	Work not secured in vise	Clamp material securely
Blade breakage	Teeth too coarse	Use a finer tooth blade
	Misalignment of guides	Adjust saw guides
	Dry cutting	Use cutting lubricant
	Excessive speed	Lower speed. See Operating Instructions "Speed selection."
	Excessive speed	Reduce feed pressure. Refer to Operating Instructions "Adjusting Feed."
	Excessive tension	Tension blade to prevent slippage on drive wheel while cutting.
Blade line Run-out or Run-in	Wheels out of line	Adjust wheels
	Guides out of line	For a straight and true cut, realign guides, check bearings for wear.
	Excessive pressure	Conservative pressure assures long blade life and clean straight cuts.
	Support of blade insufficient	Move saw guides as close to work as possible.
	Material not properly secured in vise	Clamp material in vise, level and securely.
Blade twisting	Blade tension improper	Loosen or tighten tension on blade.
	Blade not in line with guide bearings	Check bearings for wear and alignment.
	Excessive blade pressure	Decrease pressure and blade tension
Premature tooth wear	Blade binding in cut	Decrease feed pressure
	Dry cutting	Use lubricant on all materials, except cast iron
	Blade too coarse	Use finer tooth blade
	Not enough feed	Increase feed so that blade does not ride in cut
	Excessive speed	Decrease speed

SAWING PROBLEMS AND SOLUTIONS

Other than this manual, the manufacturer also provides some related technical documents listed as follows:

Sawing Problems and Solutions

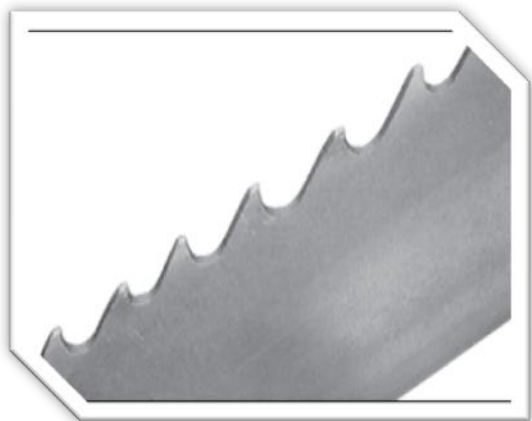
<div> <div>Vibration during cutting</div> <div>Failure to cut</div> <div>Short life of saw blade</div> <div>Curved cutting</div> <div>Broken blade</div> </div>						
✓	✓	✓	✓	✓	Use of blade with incorrect pitch	Use blade with correct pitch suited to workpiece width
✓	✓	✓	✓	✓	Failure to break-in saw blade	Perform break-in operation
✓	✓	✓			Excessive saw blade speed	Reduce speed
			✓	✓	Insufficient saw blade speed	Increase speed
✓		✓	✓	✓	Excessive saw head descending speed	Reduce speed
✓		✓	✓		Insufficient saw head descending speed	Increase speed
		✓	✓		Insufficient saw blade tension	Increase tension
✓		✓	✓	✓	Wire brush improperly positioned	Relocate
✓		✓	✓		Blade improperly clamped by insert	Check and correct
✓	✓	✓	✓	✓	Improperly clamped workpiece	Check and correct
	✓	✓	✓		Excessively hard material surface	Soften material surface
		✓	✓	✓	Excessive cutting rate	Reduce cutting rate
	✓	✓			Non-annealed workpiece	Replace with suitable workpiece
✓		✓	✓	✓	Insufficient or lean cutting fluid	Add fluid or replace
✓		✓	✓	✓	Vibration near machine	Relocate machine
		✓	✓		Non-water soluble cutting fluid used	Replace
✓		✓	✓		Air in cylinder	Bleed air
✓		✓		✓	Broken back-up roller	Replace
✓	✓	✓	✓	✓	Use of non-specified saw blade	Replace
✓	✓	✓	✓	✓	Fluctuation of line voltage	Stabilize
✓		✓	✓		Adjustable blade guide too far from workpiece	Bring blade guide close to workpiece
✓		✓	✓	✓	Loose blade guide	Tighten
		✓		✓	Blue or purple saw chips	Reduce cutting rate
✓		✓		✓	Accumulation of chips at inserts	Clean
	✓				Reverse positioning of blade on machine	Reinstall
✓		✓	✓		Workpieces are not bundled properly	Re-bundle
✓		✓		✓	Back edge of blade touching wheel flange	Adjust wheel to obtain clearance
✓	✓	✓			Workpiece of insufficient diameter	Use other machine, suited for diameter of workpiece
	✓	✓	✓		Saw blade teeth worn	Replace

SOLUTIONS TO SAWING PROBLEMS

Table Of Contents

#1. Heavy Even Wear On Tips and Corners Of Teeth	#11. Uneven Wear Or Scoring On The Sides Of Band
#2. Wear On Both Sides Of Teeth	#12. Heavy Wear And/Or Swagging On Back Edge
#3. Wear On One Side Of Teeth	#13. Butt Weld Breakage
#4. Chipped Or Broken Teeth	#14. Heavy Wear In Only The Smallest Gullets
#5. Body Breakage Or Cracks From Back Edge	#15. Body Breaking – Fracture Traveling In An Angular Direction
#6. Tooth Strippage	#16. Body Breakage Or Cracks From Gullets
#7. Chips Welded To Tooth Tips	#17. Band is Twisted Into A Figure "8" Configuration
#8. Gullets Loading Up With Material	#18. Used Band Is "Long" On The Tooth Edge
#9. Discolored Tips Of Teeth Due To Excessive Frictional Heat	#19. Used Band Is "Short" On The Tooth Edge
#10. Heavy Wear On Both Sides Of Band	#20. Broken Band Shows A Twist In Band Length.

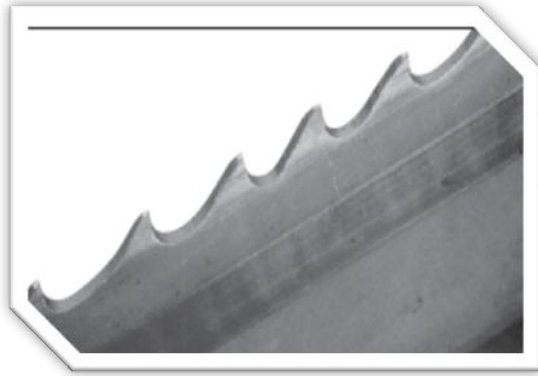
#1. Heavy Even Wear On Tips and Corners Of Teeth



Probable Cause :

- A.** Improper break-in procedure.
- B.** Excessive band speed for the type of material being cut. This generates a high tooth tip temperature resulting in accelerated tooth wear.
- C.** Low feed rate causes teeth to rub instead of penetrate. This is most common on work hardened materials such as stainless and toolsteels.
- 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

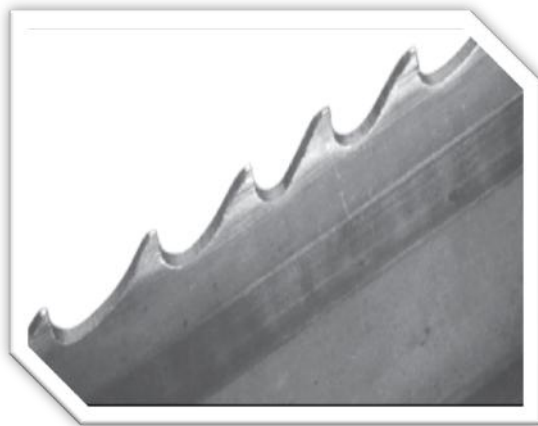
#2. Wear On Both Sides Of Teeth



Probable Cause :

- A. Broken, worn or missing back-up guides allowing teeth to contact side guides.
- B. Improper side guides for band width.
- C. Backing the band out of an incomplete cut.

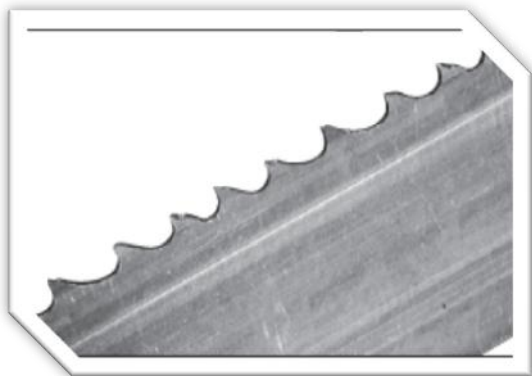
#3. Wear On One Side Of Teeth



Probable Cause :

- A. Worn wheel flange, allowing side of teeth to contact wheel surface or improper tracking on flangeless wheel.
- 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. The teeth rubbing against a part of machine such as chip brush assembly, guards, etc.

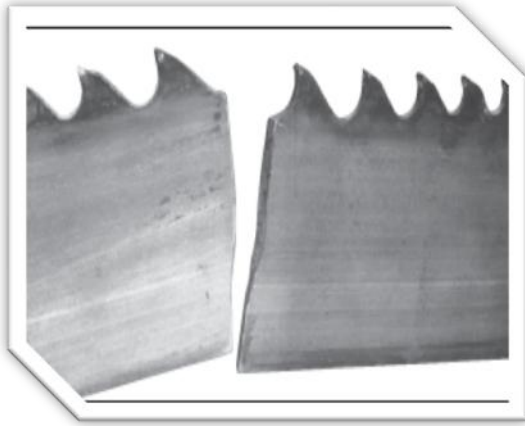
#4. Chipped Or Broken Teeth



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

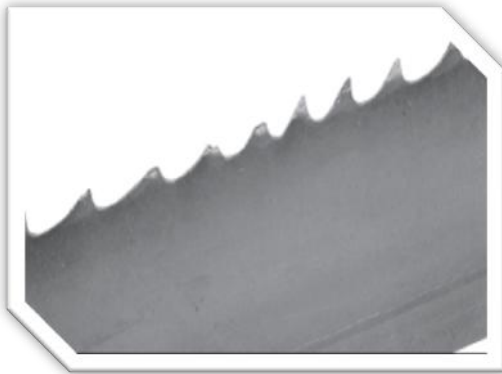
#5. Body Breakage Or Cracks From Back Edge



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. Worn or defective back-up guides.
- E. Improper band tension.
- F. Notches in back edge from handling damage

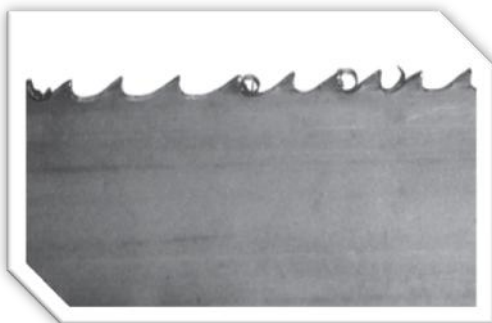
#6. Tooth Strippage



Probable Cause :

- A. Improper or lack of break-in procedure.
- B. Worn, missing or improperly positioned chip brush.
- C. Excessive feeding rate or feed pressure.
- D. Movement or vibration of material being cut.
- E. Improper tooth pitch for cross sectional size of material being cut.
- F. Improper positioning of material being cut.
- G. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
- H. Hard spots in material being cut.
- I. Band speed too slow for grade of material being cut.

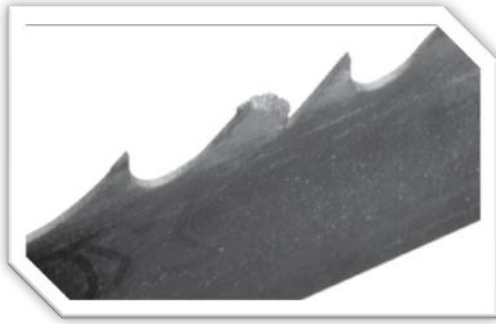
#7. Chips Welded To Tooth Tips



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.

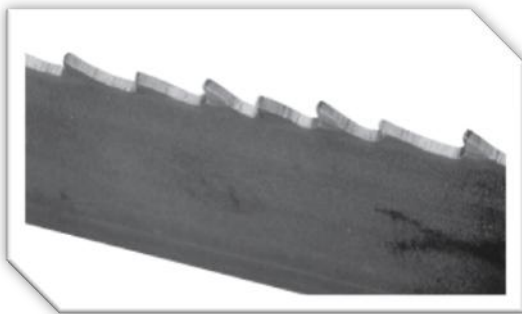
#8. Gullets Loading Up With Material



Probable Cause :

- A. Too fine of a tooth pitch – insufficient gullet capacity.
- B. Excessive feeding rate producing too large of a chip.
- C. Worn, missing or improperly positioned chip brush.
- D. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

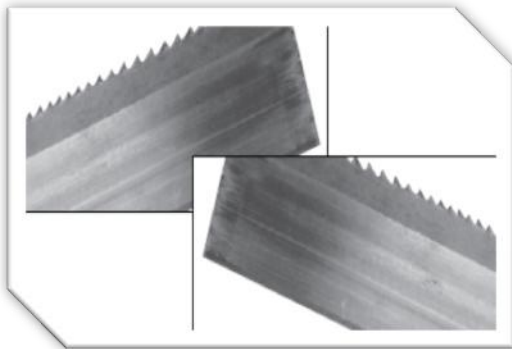
#9. Discolored Tips Of Teeth Due To Excessive Frictional Heat



Probable Cause :

- A. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.
- B. Excessive band speed.
- C. Improper feeding rate.
- D. Band installed backwards.

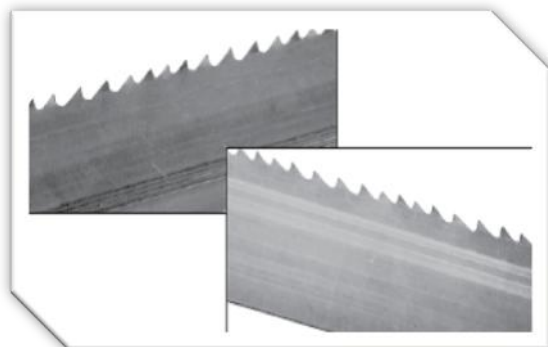
10. Heavy Wear On Both Sides Of Band



Probable Cause :

- A. Chipped or broken side guides.
- B. Side guide adjustment may be too tight.
- C. Insufficient flow of sawing fluid through the side guides.
- D. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

#11. Uneven Wear Or Scoring On The Sides Of Band



Probable Cause :

- A. Loose side guides.
- B. Chipped, worn or defective side guides.
- C. Band is rubbing on part of the machine.
- D. Guide arms spread to maximum capacity.
- E. Accumulation of chips in side guides.

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



Probable Cause :

- A. Excessive feed rate.
- B. Excessive back-up guide "preload".
- C. Improper band tracking – back edge rubbing heavy on wheel flange.
- D. Worn or defective back-up guides.

#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)

#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 being cut.

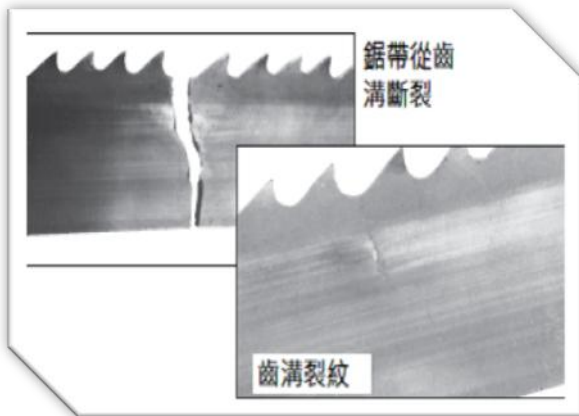
#15. Body Breaking – Fracture Traveling In An Angular Direction



Probable Cause :

- A. An excessive twist type of stress existed.
- B. Guide arms spread 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".

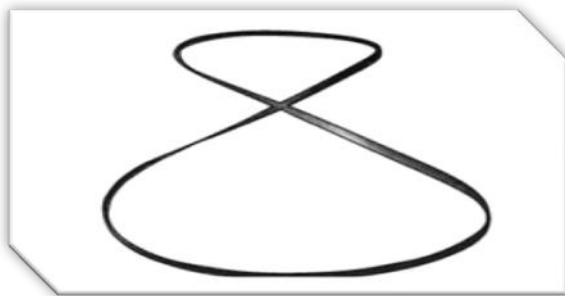
#16. Body Breakage Or Cracks From Gullets



Probable Cause :

- A. Excessive back-up guide "preload".
- B. Improper band tension.
- C. Guide arms spread to maximum capacity.
- D. Improper beam bar alignment.
- E. Side guide adjustment is too tight.
- F. Excessively worn teeth.

#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.

#18. Used Band Is "Long" On The Tooth Edge



Probable Cause :

- A. Side guides are too tight – rubbing near gullets.
- B. Excessive "preload" – band riding heavily against back-up guides.
- C. Worn band wheels causing uneven tension.
- D. Excessive feeding rate.
- E. Guide arms are spread to maximum capacity.
- F. Improper band tracking – back edge rubbing heavy on wheel flange.

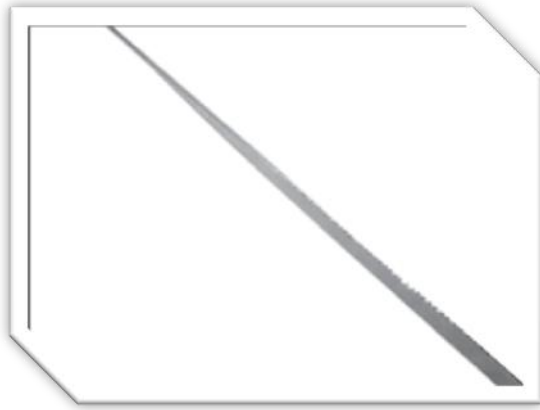
#19. Used Band Is "Short" On The Tooth Edge



Probable Cause :

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

#20. Broken Band Shows A Twist In Band Length



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 suffers the huge stroke and the alignment is effected, follow the below procedure to adjust.

TOOL, measuring

Measurement, Horizontal balance

Procedure

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.



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.

PARTS

SPARE PARTS RECOMMENDATIONS

PART LIST

SPARE PARTS RECOMMENDATIONS

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

Part Name	Part Name
Saw blade	Filter
Wire brush	Steel plates
Carbide inserts	Rollers
Bearings	Belt
Chain	Duster seal
Asbestos	Washer

1. SAW BOW

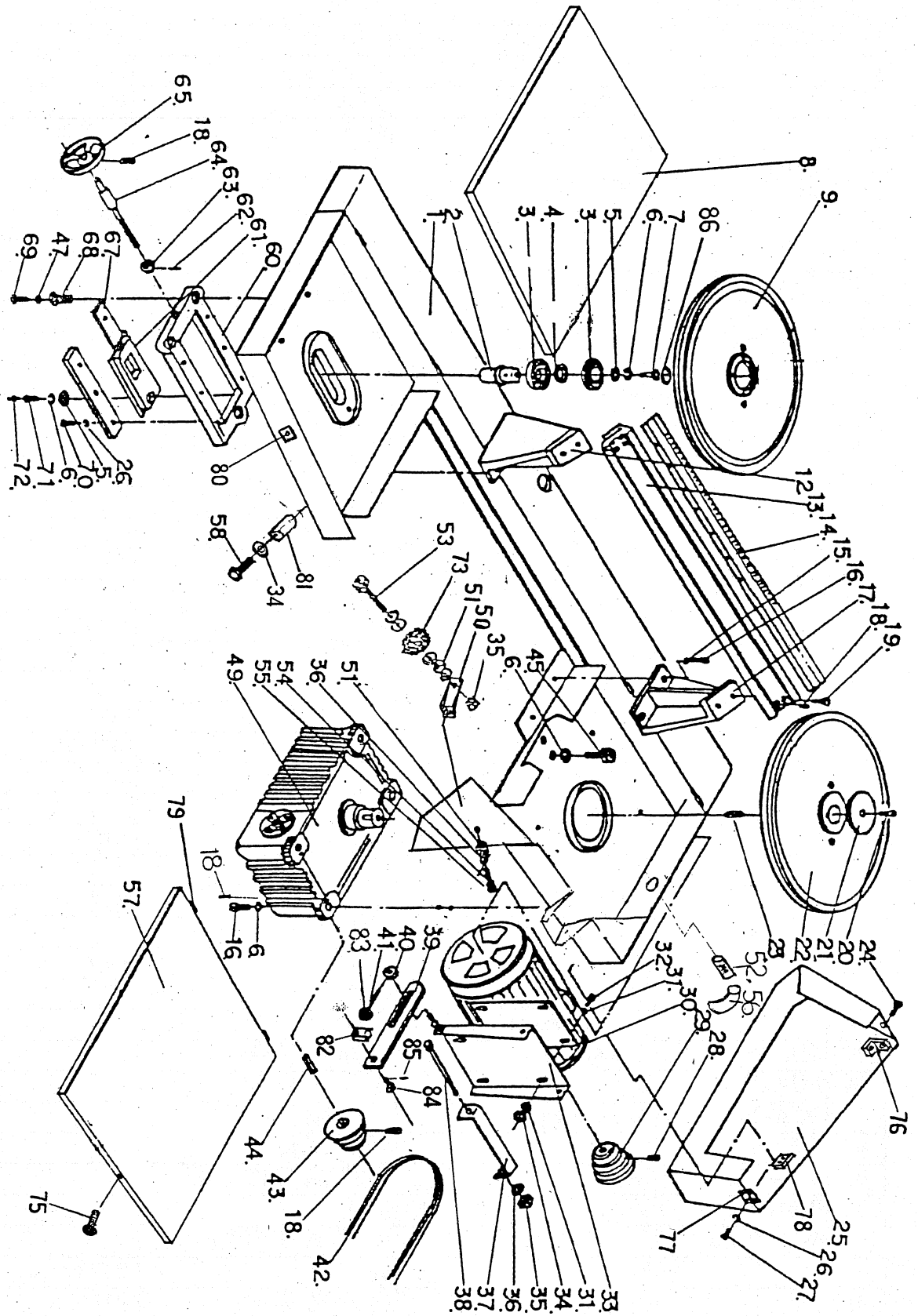


CHART 1 SAW BOW

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1	SYM-5001	Saw bow	弓鋸頭		1
2	SJY-1114	Idle wheel shaft	上輪軸		1
3	PP-14130	Bearing	軸承	6205Z	2
4	MAE-2025	Bearing washer	上輪軸墊圈		1
5		Washer	平面華司	M12	2
6		Spring washer	彈簧華司	M12	8
7		Bolt	外六角螺絲	M12*20L	1
8	MJA-2014	Wheel cover (left)	上下輪箱蓋		1
9	MJA-2017A	Idle wheel	上輪		1
10				DELETED	
11				DELETED	
12	SYM-5003	Bracket (left)	左鋸臂滑板固定座		1
13	SJY-1105	Dovetail guide	鋸臂滑板		1
14	MJA-2044	Gauge plate (ruler)	銘板	CS-5	1
15		Spring washer	彈簧華司	M12	4
16		Bolt	內六角螺絲	M12*30L	8
17	SYM-5004	Bracket (right)	右鋸臂滑板固定座		1
18		Set screw	止付螺絲	M8*20L	10
19		Screw	內六角螺絲	M10*30L	4
20		Screw	內六角螺絲	5/16*3/4	1
21	MJA-2013	Washer (B)	下輪軸蓋		1
22	SJY-1118	Drive wheel	下輪		1
23		Key	鍵	10*8*20 mm	1
24	PP-53021	Screw	梅花螺絲	M6*12L	1
25	MJA-2008C	Pulley cover	皮帶輪護蓋		1
26		Spring washer	彈簧華司	M6	12
27		Screw	丸頭螺絲	M6*12L	4
28		Set screw	止付螺絲	M8*10L	1
29	SJY-1119	Motor pulley	馬達普利		1
30	PP-31041	Motor	馬達	2HP,4P	1
31		Washer	彈簧華司	M10	4
32		Screw	外六角螺絲	M10*25L	5
33	MJA-2067	Motor mounting plat	馬達底板		1
34		Nut	螺帽	M10	5
35		Nut	螺帽	M8	2
36		Spring washer	彈簧華司	M8	2
37	MJA-2069A	Bracket	馬達調整架		1
38	MJA-2072	Lock screw	馬達架螺絲		1
39	MJA-2068	Adjusting plate	馬達調整板		1
40	SJY-1127	Lock nut	固定螺母		1
41	SJY-1126	Lever	馬達調整固定把手		1
42	PP-56100	V Belt	皮帶	A-39	1
43	MJA-2011C	Transmission pulley	減速機皮帶輪		1
44		Key	鍵	7*7*25 mm	1
45		Bolt	內六角螺絲	M12*40L	6
46				DELETED	

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CHART 1 SAW BOW

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
47				DELETED	
48				DELETED	
49	PP-16022	Gear box	減速機	70#	1
50	SJY-1136	Bracket	鋼刷固定板		1
51		Washer	平面華司	M8	5
52		Coolant nozzle	水管接頭	PT1/8*3/8PE	2
53		Screw	內六角螺絲	M8*25L	1
54		Screw	內六角螺絲	M8*12L	1
55	MAM-2041	Wire brush cover	鋼刷護蓋		1
56		包沙管	Hose	3/8*500l	1
57	MJA-2014	Wheel cover (right)	上下輪箱蓋		1
58		Screw	外六角螺絲	M10*25L	1
59				DELETED	
60	SJY-11029	Tension plate	張力調整滑座		1
61	SJY-11029	Adjusting slide	張力調整板		1
62		Spring pin	彈簧銷	φ 3*25L	1
63	MJA-2024	Collar	張力調整固定圈		1
64	SJY-1115	Blade tensioning scr	張力調整螺桿		1
65	SJY-1103	Hand wheel	手輪		1
66				DELETED	
67	SJY-11029	Guide plate	壓條(半)		2
68	SJY-1104	Adjusting bolt	張力調整螺絲	M16*40L	3
69		Screw	外六角螺絲	M10*50L	3
70		Screw	外六角螺絲	M6*20L	6
71	SJY-1150	Nipple	關節油嘴		1
72		Nipple	油嘴	1/16"	1
73	PP-58002	Wire brush	鋼刷	90*8 mm #0.3	1
74					
75	PP-53030	Screw	梅花螺絲	1/4*3/4	2
76	KM-2012	Bracket	輪箱蓋固定板		1
77	MAE-2027B	Hinge	鉸鏈		1
78	SJY-1120	Bracket	護蓋固定板		1
79	MJA-1004	Pin	箱蓋栓		4
80	MJA-2054	Bracket	輪蓋固定板		2
81	SJY-1128	Bracket	鋸弓定位塊		1
82	MJA-2070	Adjusting plate	馬達調整塊		1
83	PP-52040	Plastic ball	塑膠球	3/8"	1
84	MJA-2073	Adjusting nut	調整螺母		1
85		Pin	開口梢	5/32*1 1/4	1
86		Snap ring	扣環	R52	2
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CHART 2 BLADE GUIDE ARMS

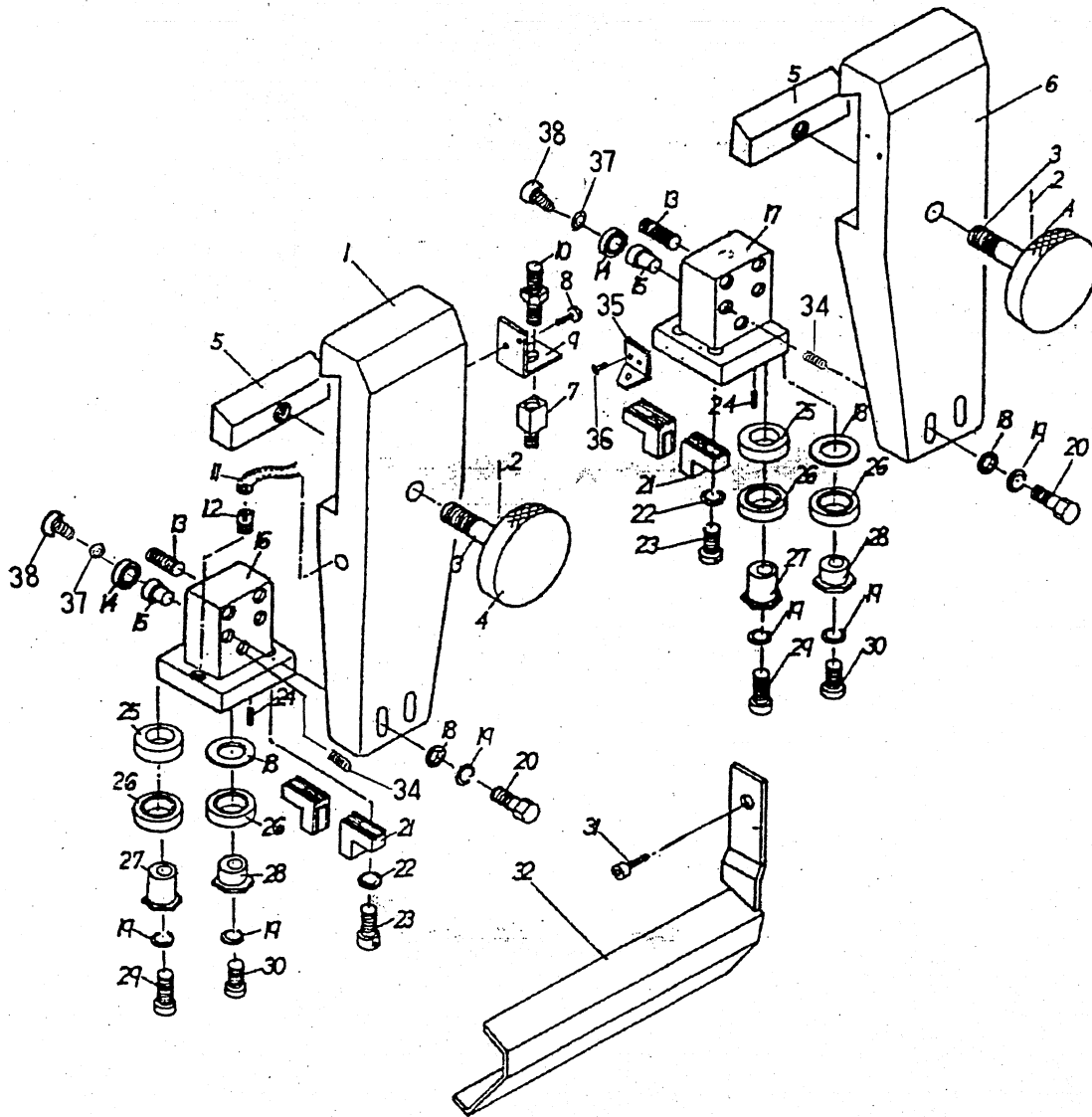


CHART 2 BLADE GUADE ARMS

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1	SYM-8005	Guide arm (left)	左鋸臂		1
2		Spring pin	彈簧梢	φ 3*30L	1
3		Bolt	外六角螺絲	1/2-20UNF*2 3/8	1
4	MJA-2031	Guide handle	鋸臂把手組		1
5	MJA-2032	Clamping block	鋸臂固定塊		2
6	SYM-8006	Guide arm (right)	右鋸臂		1
7	PP-43132	Coolant valve	開關閥	1/8	1
8		Screw	丸頭螺絲	M5*10L	4
9	MJA-2041	Bracket	水龍頭座板		2
10	MJA-2043	Fitting	水管接頭	PT1/8	2
11		Hose	水管	1/4*2500L	2
12	MAB-6014	Coolant nozzle	固定塊水管接頭		2
13		Set screw	止付螺絲	M6*12L	4
14	PP-14211	Guide bearing	軸承	608ZZ	2
15	SJY-1112A	Bearing shaft	下壓滾輪軸		2
16	SJY-1110	Guide seat (left)	左導輪座		1
17	SJY-1111	Guide seat (right)	右導輪座		1
18		Washer	平面華司	M8	6
19		Spring washer	彈簧華司	M8	8
20		Screw	內六角螺絲	M8*30L	4
21	MAB-6006	Tungsten carbide blade guide	鋸片固定塊		4
22		Spring washer	彈簧華司	M6	4
23		Screw	內六角螺絲	M6*25L	4
24		Set screw	止付螺絲	M6*10L	2
25	MAB-6008	Washer	偏心輪墊圈		2
26	PP-14003	Guide bearing	軸承	6202ZZ	4
27	MAB-6005	Eccentric bushing (long)	長偏心輪		2
28	MAE-2041	Eccentric bushing (short)	短偏心輪		2
29		Screw	內六角螺絲	M10*40L	2
30		Screw	內六角螺絲	M10*25L	2
31		Screw	內六角螺絲	M6*10L	1
32	MJA-2038	Blade guard	鋸片護蓋		1
33					
34		Set screw	止付螺絲	M8*16L	2
35	SJY-1134	Bracket	水龍頭固定板		2
36		Screw	內六角螺絲	M5*10L	4
37		Washer	平面華司	M4	2
38		Screw	丸頭螺絲	M4*6L	2
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CHART 3 BASE ASSEMBLY AND BED

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1	SYM-6001	Base	底座		1
2	SJY-1149B	Lead screw nut	導桿螺母		1
3	SYM-6017A	Bed	床面		1
4		Spring washer	彈簧華司	M10	4
5		Bolt	外六角螺絲	M10*25L	2
6	MJA-1012A	Screw sleeve	導螺桿座		1
7		Screw	外六角螺絲	M6*12L	4
8		Pump cover	幫浦護蓋		1
9		Screw	外六角螺絲	M6*20L	4
10	PP-32042	Pump	浸水幫浦	1/8HP, 3 ϕ , 150L	1
11				DELETED	
12	PP-52030	Handle	手輪柄	3/8"	1
13	PP-52020	Hand wheel	手輪	6", 20 ϕ	1
14	MJA-1013	Collar	導輪桿固定圈		1
15		Spring pin	彈簧銷	ϕ 6*30L	1
16	MJA-1014	Vise lead screw	導輪桿		1
17		Snap ring	扣環	A30	1
18	SJM-4020B	Cylinder pivot	油壓缸活動軸		1
19	SJY-1151	Movable vise jaw	活動虎鉗		1
20	SJM-4026	Cylinder	油壓缸		1
21		Screw	外六角螺絲	M8*19L	1
22		Screw	丸頭螺絲	M5*35L	4
23	PP-90020	Limit switch	限動開關	D4MC-5000	1
24	SJY-1131	Switch bracket	限動開關滑座		1
25		Piston head	油壓油Y接頭		1
26	SJM-4028	Splite pin	油壓缸固定梢		1
27		Cotter pin	開口梢	5/32*1 1/4"	1
28		Screw	外六角螺絲	M8*60L	2
29		Height setting slide	限動開關滑板		1
30		Washer	平面華司	M12	3
31		Spring washer	彈簧華司	M12	5
32		Bolt	外六角螺絲	M12*38L	5
33	SYM-6002	Fixed vise jaw	固定虎鉗		1
34		Washer	平面華司	M16	1
35		Spring washer	彈簧華司	M16	1
36	SJY-1127	Fixed nut	固定螺母		1
37	SYM-5010	Stopper plate	關節座蓋板		1
38		Screw	平頭內六角螺絲	M5*10L	4
39	SYM-5002	Saw bow bracket	關節座		1
40		Set screw	止付螺絲	M6*12L	2
41	PP-13190	Needle bearing	乾式軸承	3015	2
42	SYM-6007	Pivot	關節軸		1
43	MJM-5006B	Spring	回程彈簧		1
44				DELETED	
45				DELETED	
46				DELETED	

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CHART 3 BASE ASSEMBLY AND BED

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
47	MBR-9037	Stopper	定寸擋桿		1
48	PP-53009	Lock bolt	梅花螺絲	M10*30L	2
49	MBR-9036	Stopper bracket	定寸滑座		1
50	SYM-6011	Pivot	定寸轉軸		1
51		Screw	外六角螺絲	M8*20L	2
52		Spring washer	彈簧華司	M8	2
53	MAM-1010		定寸座		1
54	MAM-1011		托架		1
55				DELETED	
56				DELETED	
57				DELETED	
58				DELETED	
59				DELETED	
60				DELETED	
61	MJA-4005-CE	Electric box	控制箱		1
62	SYM-6008	Turning slide	旋轉軌道 A		1
63	SYM-6009	Turning slide	旋轉軌道 B		1
64		Screw	外六角螺絲	M12*35L	4
65				DELETED	
66				DELETED	
67				DELETED	
68				DELETED	
69				DELETED	
70				DELETED	
71	SJY-1126	Fixed handle	固定把手		1
72	PP-52040	Plastic ball	塑膠球	3/8	1
73	SYM-5022	Bracket	油壓缸固定耳		1
74	MLA-1010	Washer	耐磨墊圈		3
75	SYM-5008	Plate	關節墊圈壓板		1
76	SYM-6019	Bracket	定位板		2
77		Nut	螺母	M10	2
78		Screw	外六角螺絲	M10*40L	2
79		Screw	外六角螺絲	M10*20L	2
80	SYM-6014	Fixed nut	固定螺母		2
81	SJA-6001B	Control plate	控制面板		1
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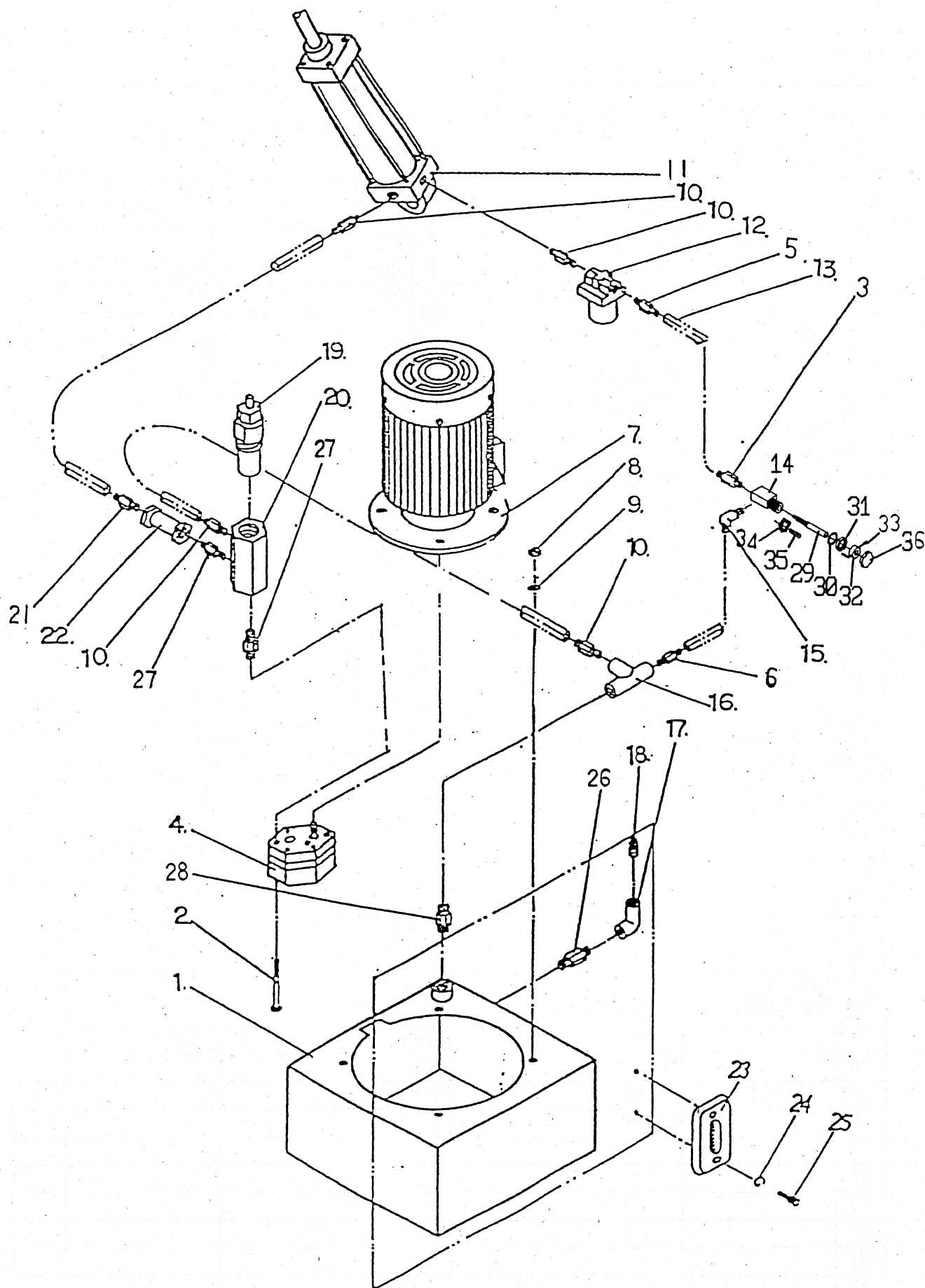


CHART 4 HYDRAULIC SYSTEM

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1	SJY-2105A	Hydraulic oil tank	油壓箱		1
2		Screw	內六角螺絲	M6*25L	4
3		Pipe connector	直接頭	PT1/8*1/4H	1
4	PP-32200	Oil pump	油壓幫浦		1
5		Pipe connector	直接頭	PT1/4*1/4H	1
6		Pipe connector	直接頭	PT1/4*PT1/4	1
7	PP-31311	Motor	馬達	1/4HP	1
8		Nut	螺帽	M10	4
9		Spring washer	彈簧華司	M10	4
10		Pipe connector	彎接頭	1/4T*1/4H	4
11	SJM-4026	Cylinder	油壓缸		1
12	PP-43601	Solenoid	電磁閥	MAIB-D1353-00-110	1
13		Hydraulic hose	油管	1/4	1
14	ACA-2063-2	Feed rate valve	流量閥本體		1
15		Elbow	彎接頭	PT1/8*1/4H	1
16		TEE	三通接頭	PT1/4	1
17		Elbow	彎頭	PT1/2	1
18		Socket hd.plug	塞頭	1/2	1
19	ACA-10100	Relief valve	洩壓閥整組		1
20	KM-1040	Oil distributing block	減壓閥固定座		1
21		Pipe connector	彎接頭	PT3/8*1/4H	1
22	PP-43110	Check valve	止回閥		1
23	PP-21030	Oil level gauge	油面計		1
24		Spring washer	彈簧華司	3/8	2
25		Screw	螺絲		2
26		Pipe connector	直接頭	PT1/2*PT1/2	1
27		Pipe connector	直接頭	PT1/4*PT3/8	1
28		Pipe connector	直接頭	PT1/2*PT1/4	1
29	ACA-2063-1	Adjusting rod	流量閥調整桿		1
30		Washer	平面華司	φ 16	1
31	MAJ-4010	Nut	六角螺帽		1
32	MAJ-4007	Pointer & Bracket	指針及座		1
33		Screw	丸頭螺絲	3/16*3/8	1
34		Nut	螺母	3/16	1
35	MAJ-4008	Pointer rod	指針擋桿		1
36		Knob	旋鈕		1
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Warranty

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

In the case of components or units purchased by Seller including work holding devices, tool holders, motors and controls, the warranty shall not exceed that received by Seller from the supplier of such components or units.

Seller will not assume responsibility for products or components returned to Seller without prior consent or for unauthorized repairs to its products, even though defective.

Electrical Equipment: 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.

Accessories Supplied with Manufacturer's Equipment: The warranties available to the Buyer are those extended by the accessory manufacturer, if any, to the extent they are in force and effect. The ACCESSORY MANUFACTURER'S WARRANTY, if any, is exclusive and is in lieu of all other warranties whether written, oral or implied.

COSEN SAWS

Vertical Plate Saws
Horizontal Billet Saws
NC/CNC Band Saws
Structural Miter-Cutting Saws
Automatic Band Saws

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