COSEN／SAWS

# SH-1000F

## Semi-Automatic Double Column Canted Frame Straight Cutting Bandsaw

(Non-CE Model)

# 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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(Non-CE Model)
Ver.7 2017/12/26





Printed in Taiwan

# 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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*Section 1*

# SAFETY INFORMATION

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**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

**<u>Protection Covers & Guards</u>**

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)

 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***


Emergency Stop Button

# 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.*

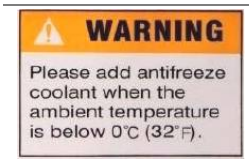
## DANGER Labels

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<br><br>TURN POWER OFF before servicing. Failure to following the warning can result in severe injury. |  | DANGER: Running Blade<br>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<br><br>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<br><br>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<br><br>KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury. |
|  | Impact Hazard<br><br>WEAR SAFET 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.<br><br>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.

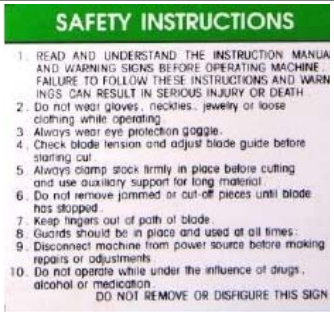
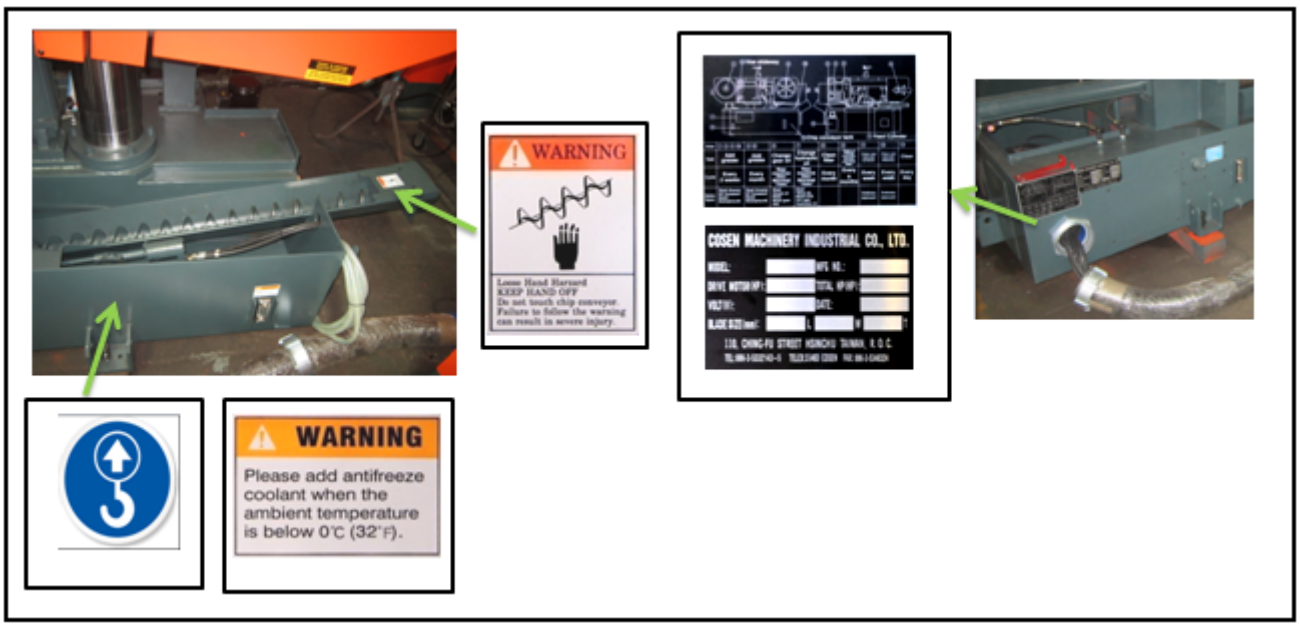
| Label | Meaning |
|---|---|
|  | 1. Read and understand the instruction manual and warning signs before operating machine. Failure to follow these instructions and warnings can result in serious injury or death.<br>2. Do not wear gloves, neckties, jewelry or loose clothing while operating the machine.<br>3. Always wear eye protection goggles.<br>4. Check blade tension and adjust blade guide before starting to cut.<br>5. Always clamp stock firmly in place before cutting.<br>6. Do not remove jammed or cut-off pieces until blade has stopped.<br>7. Keep fingers out of path of blade.<br>8. Blade guards should be in place and used at all times.<br>9. Disconnect machine from power source before marking repairs or adjustments.<br>10. Do not operate while under the influence of drugs, alcohol or medication. |

***Illustration: Safety Labels***

## HEARING PROTECTION

Noise has a major effect on the quality of your work environment. Here we refer you to testing data and information as follows:

Excessive exposure to high levels of noise may cause impairment to hearing, but the vulnerability to hearing loss varies between individuals and must be taken into account in specifying an allowable limit for noise exposure.

A level of 90 dBA is widely accepted as a criterion for 8 hour/day exposure to steady-state broad-band noise. The unprotected ear should not be exposed to noise levels higher than 120 dBA.

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

When your machine is running, noise will come out. This is a machine-electric interface problem that may make people feel uncomfortable. Our products pass noise testing less than 78 dBA. 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).

*Section 2*

# *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 compoment 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

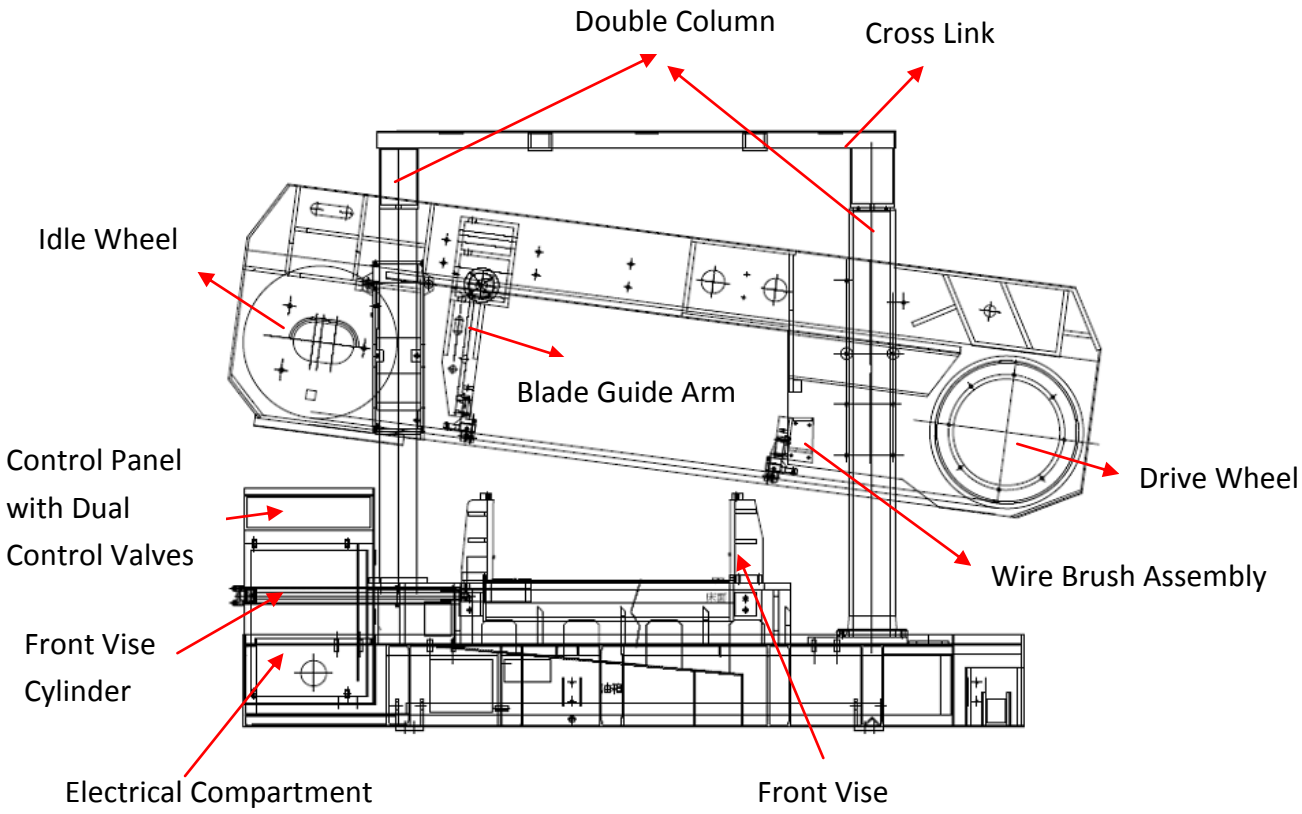
- The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

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

## SPECIFICATION

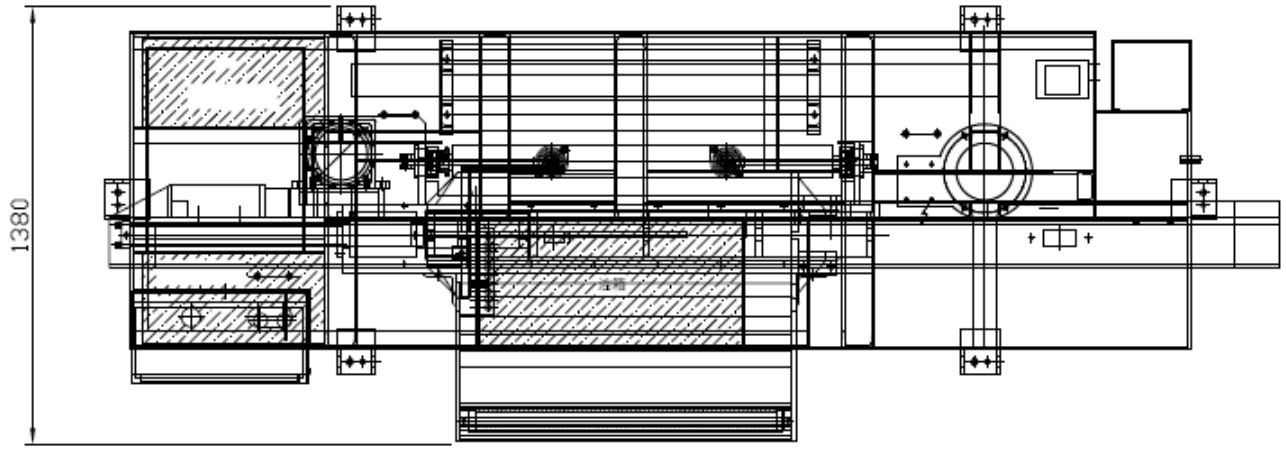
| | | |
|---|---|---|
| Model | | SH-1000F<br>Semi-Automatic Double Column Canted Frame Straight Cutting Bandsaw |
| Blade Cant | | 7.5° |
| Capacity | Round | 660 mm (26 in) |
| | Square | 520 mm (20.5 in) |
| | Rectangular (H x W) | 520 x 1,020 mm (20.5 x 40.1 in) |
| | Bundle Cutting | W: 218 ~ 1,011 mm (8.5 ~ 39.8 in)<br>H: 170 ~ 713 mm (6.6 ~ 28.0 in) |
| Saw Blade | Speed | 20~100 m/min (66~328 fpm) |
| | Size (L x W x T) | 8,000 x 54 x 1.6 mm (315 x 2.1 x 0.063 in) |
| | Tension | Hydraulic with automatic blade breakage detection |
| | Guide | Interchangeable tungsten carbide |
| | Cleaning | Steel wire brush |
| Motor Output | Saw Blade | 10 HP (7.5 kW) |
| | Hydraulic | 2 HP (1.5 kW) |
| | Coolant Pump | 1/4 HP (0.18 kW) |
| Tank Capacity | Hydraulic | 75 L (18.8 gal) |
| | Coolant | 120 L (30 gal) |
| Workbed Height | | 650 mm (25.6 in) |
| Weight | Net | 5,200 kg (11,440 lb) |
| | Gross | 5,600 kg (12,320 lb) |
| Floor Space (L x W x H) | | 1,380 x 3,800 x 2,600 mm (54 x 149 x 102 in) |
| Shipping Space (L x W x H) | | 1,675 x 4,215 x 2,460 mm (66 x 166 x 96 in) |
| Operating Environment | Temperature | 5~40˚C (41~104˚F) |
| | Humidity | 30%~85% (without condensation) |

## MACHINE PARTS IDENTIFICATION

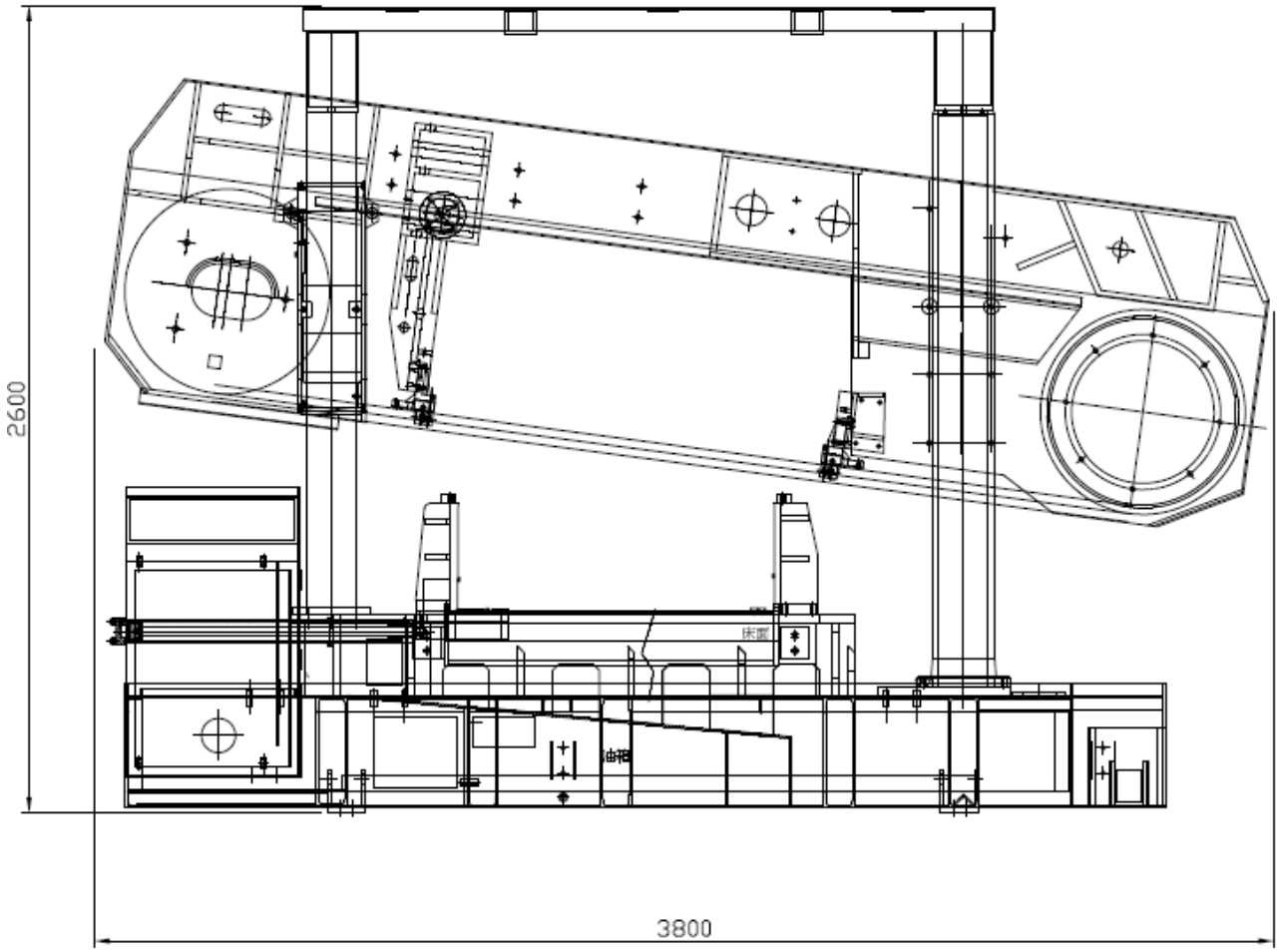



**Machine front view**

## FLOOR PLAN




**Machine top view**




**Machine front view**

# *MOVING & INSTALLATION*



## 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* 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 approximately 15 tons (including both machine and material weight).
- 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.

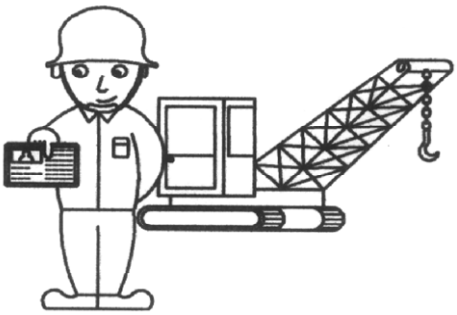
## LIFTING

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

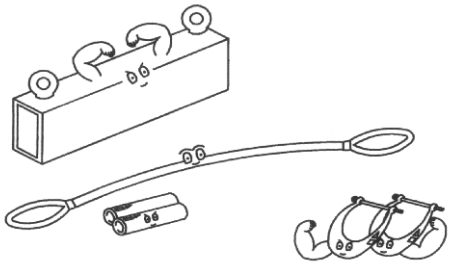
### 1. Use a crane

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

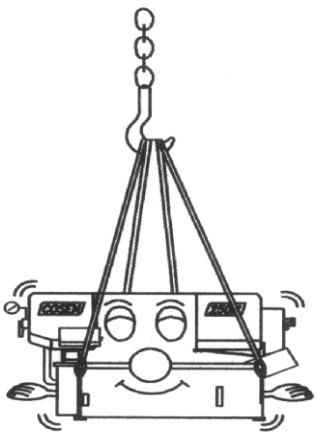


***Warning*:** You must have a qualified crane operator to perform the job.



- 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.

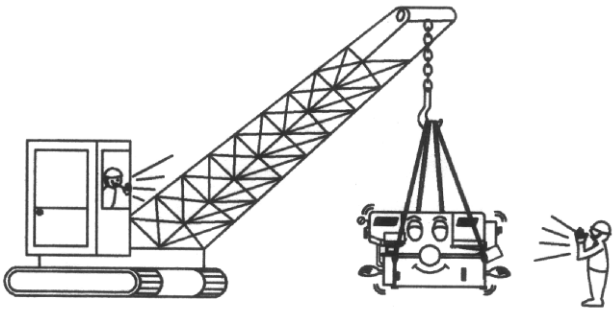
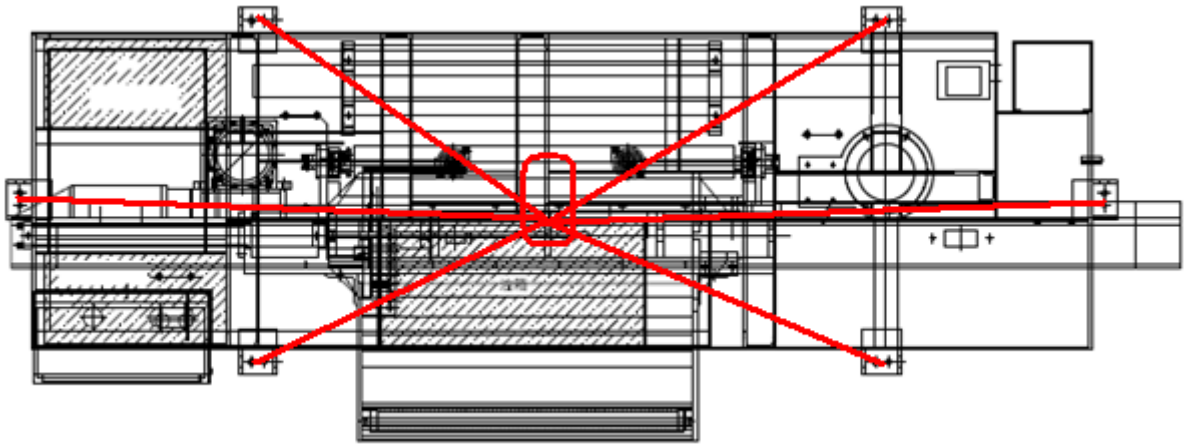


***Illustration: Lifting Points***



**Machine top view**

Minimum weight capacity for each wire rope: **6 ton**

Total number of wire ropes required: **6**

**2. Use a forklift**

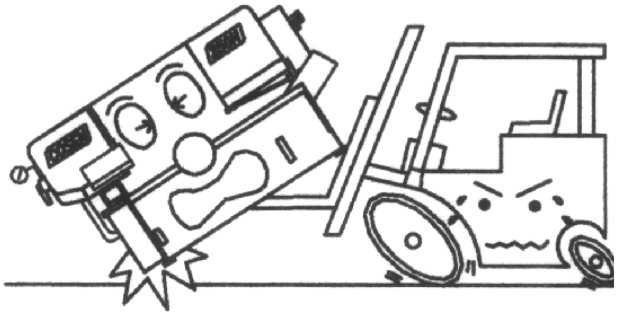
Most users choose this method to move their machine because it is easy to set up. Make sure that the lifting rod can fully withstand the weight of the machine. (Refer to *Section 2 – General Information for Specifications)*

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

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

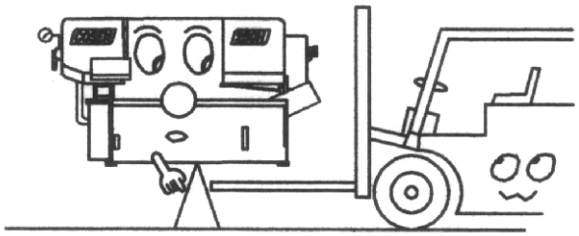
- You must apply proper forklift technique to avoid damage to the machine.

  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.

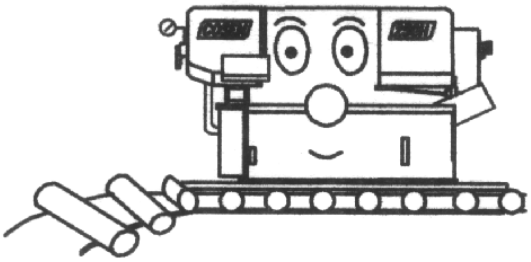


(Illustration only. Please follow user guide of your forklift.)

**3. Use rolling cylinders**

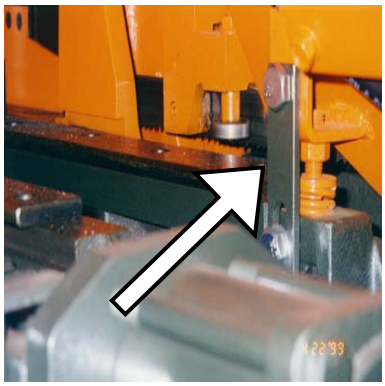
You can use rolling cylinders to move your machine in a small machine shop environment.

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



## 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.



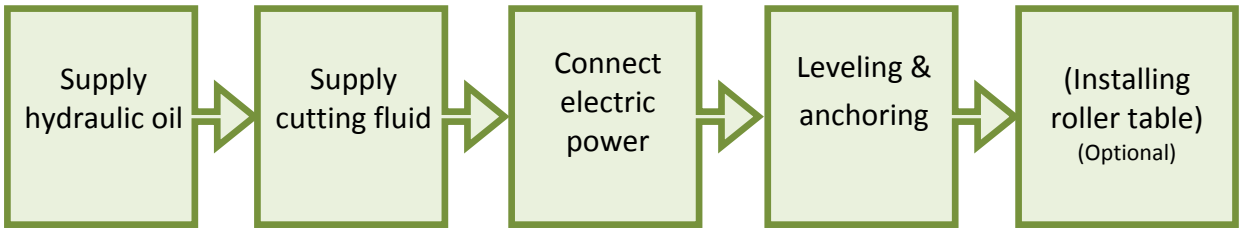
## CLEANING

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

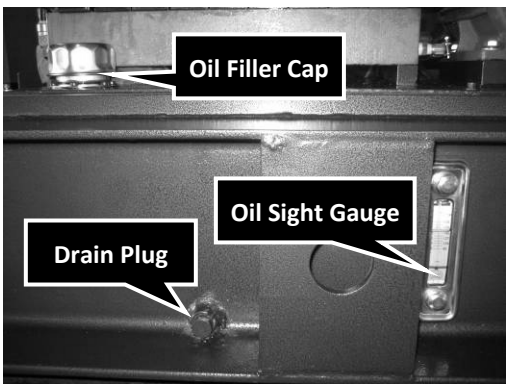
Cosen's bandsaw machine is relatively easy to install. Follow these six easy steps to install your machine.




**Supplying hydraulic oil**

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

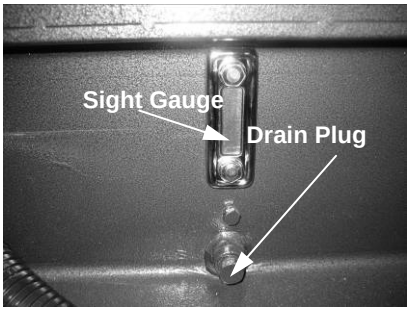
Check the sight gauge to make sure the oil level in the tank.



Refer to specification chart under Section 2 for tank capacity.

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

## Supplying coolant




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

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

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

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

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

## Connecting electric power

Have a qualified electrician make the electrical connections.

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

In some cases, leveling the machine with a slight slope toward the front of the machine is recommended as it would prevent coolant from running down cutting material especially tubes or bundles. To do so, make the rear end of the machine approximately 10 mm higher than the level of the front end.

**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.

*Section 4*

# *OPERATING INSTRUCTION*

## 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 |
|---|---|
| • Have a high cooling effect<br>• Not flammable<br>• Economical<br>• Does not require cleaning of the cut products | • Remove machine paint<br>• Lose its rust protection effect if deteriorated<br>• Tend to create foam<br>• Subject to decay<br>• Decline in performance, depending on the quality of the water used for dilution |

 Never use water as your coolant.

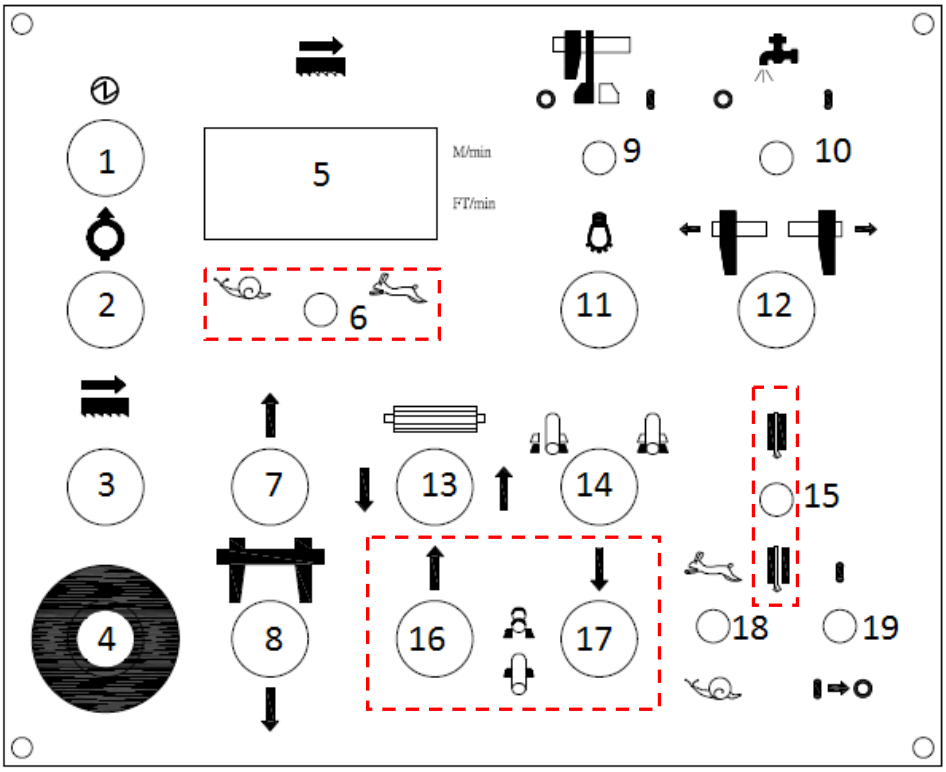
 Always add coolant into water for better mix result.

 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. It includes the following function: power system, hydraulic system, cooling system and the light system. The operator must fully understand the function of each switch and button before operating the machine.




| No. | Name | No. | Name |
|---|---|---|---|
| 1 | Power indicator lamp | 11 | Projection light on button |
| 2 | Hydraulic start button (with built-in lamp) | 12 | Guide arm left/right switch |
| 3 | Blade start button (with built-in lamp) | 13 | Lift rollers up/down switch |
| 4 | Emergency stop button | 14 | Vise open/clamp switch |
| 5 | Blade speed indicator | 15 | Carbide inserts clamp/unclamp switch |
| 6 | Blade speed control knob | 16 | Lift rollers feed backward button |
| 7 | Saw bow up button | 17 | Lift rollers feed forward button |
| 8 | Saw bow down button | 18 | Feeding speed selector switch |
| 9 | Guide arm and vise sync function on/off switch | 19 | Last cut function on/off switch |
| 10 | Coolant on/off switch | | |

## Control Buttons

### 1. Power indicator lamp

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

### 2. Hydraulic start button (with built-in-lamp)

When the button is pressed, the built-in-lamp will come on and the hydraulic motor starts to operate.

When the hydraulic motor is ON, the chip conveyor will run at the same time, please keep your hands away from the chip conveyor.

Press the *emergency stop button* to stop the hydraulic system.

The hydraulic system will not start when the saw bow is at the lower limit position.

### 3. Blade start button (with built-in lamp)

When the button is pressed, the built-in-lamp will come on and the blade motor starts to operate. The blade will start to descend according to the preset *cutting pressure* and *blade descend feed* (later introduced in *blade descend pressure and speed* control panel).

The blade motor will not start when the the saw bow is at the lower limit position.

The *vise open/clamp switch* must be turned to the right to “clamp” position and held for 2 seconds before the blade can start running.

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

### 4. 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.

Also serves as the “hydraulic stop button.”

### 5. Blade speed indicator

Blade speed is shown here in predetermined unit (M/min or fpm).

All parameter settings have been done by Cosen factory before shipment. Please do not make any random change to the parameter as it may affect the accuracy of the blade speed reading. Please consult your agent shall there be any need to reset machine parameters.

**6. Blade speed control knob**

Blade speed is controlled by the inverter. Turning the knob clockwise increases the blade speed.

**7. Saw bow up button**

When this button is pressed, the saw bow rises. Pressing and holding the button for approximately 2 seconds will make the saw bow automatically rise until the saw bow touches the upper limit switch.

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

**8. Saw bow down**

When this button is pressed, the saw bow descends until the operator lets go of the button or until the saw bow touches the lower limit switch.

**9. Guide arm and vise sync function on/off switch**

Flip the switch to the right to turn on the guide arm and vise sync function. When the function is on, the guide arm and the vise will move in synchronization. The sync sensor has to be triggered for the blade to start.

Flip the switch to the left to turn off this function.

 This function is not available for material with width less than 400mm. Before cutting the material with width less than 400mm, please turn off guide arm and vise sync function and manually adjust the guide arm position according to the scale on top of the sliding board. Be sure that the guide arm will not bump into the vise.

 Carbide inserts selection switch must be turned to unclamped position to move the guide arm.

**10. Coolant on/off button**

Flip the switch to the left to turn on the coolant pump; to the right to turn it off.

 A started blade will also start the coolant automatically.

**11. Projection light on button**

Press this button to turn on the projection light. A beam of light will be projected on the work piece for alignment.

 The projection light automatically turns off in 90 seconds to prolong light bulb lifetime.

**12. Guide arm left/right switch**

Turn the switch to the left to move the guide arm to the left; to the right to move the guide arm to the right.

 To move the guide arm, the saw bow must be above the middle limit position AND carbide inserts selection switch must be turned to unclamped position.

 Be sure that the guide arm will not bump into the vise, set the guide arm width according to the scale on top of the sliding board.

**13. Lift rollers up/down switch**

The hydraulic lift rollers can be used to lift up the material, for the operator to adjust the material with greater ease. Turn the switch to the right and the lift rollers will rise up; turn the switch to the left and the lift rollers will descend.

 The lift rollers can be operated only when the vise is unclamped AND the blade is not running.

 If clamping the vise or starting the blade while the lift rollers are still at upper position, the lift rollers will automatically descend slowly as a safety design to help ensure the squareness of the cut.

**14. Vise open/clamp switch**

Turn the switch to the right to clamp the vise. Turn and hold the switch for 2 seconds and let it go; the vise will automatically close until it is fully clamped. Turn the switch to the left to unclamp the vise.

 For the blade to start running, this switch must be turned to the right and held for 2 seconds as to ensure the vise is fully clamped.

 When the saw bow is below the middle limit position, vise can only move in the jog mode to prevent the vise from hitting the guide arm.

**15. Carbide inserts clamp/unclamp switch**

Switch down to unclamp Tungsten carbide inserts. Switch up to clamp Tungsten carbide inserts.

 The carbide inserts are programmed to automatically clamp when the saw blade starts in order to protect the blade and the user.

**16. Lift rollers feed backward button**

When this button is pressed and held, the lift rollers will feed backward. As soon as the button is released, the lift rollers will stop feeding backward.

 The lift rollers can be operated only when the vise is unclamped AND the blade is not running.

**17. Lift rollers feed forward button**

When this button is pressed and held, the lift rollers will feed forward. As soon as the button is released, the lift rollers will stop feeding forward.

The lift rollers can be operated only when the vise is unclamped AND the blade is not running.

**18. Feeding speed selector switch**

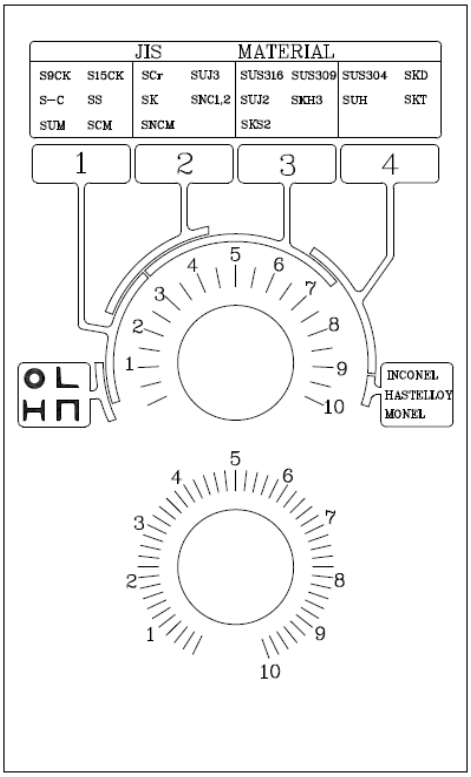
Switch down to turn on the slow roller feeding mode (snail), the material feeding speed will dramatically reduce to help you position the workpiece precisely. Switch up to turn on the fast roller feeding mode (bunny).

**19. Last cut function on/off switch**

Switch down to select the last cut mode and the blade will automatically stop and the hydraulic system will shut down (in 10 seconds) after the current cut is finished.

## Blade Descend Pressure and Speed

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



Cutting pressure and speed control panel

**1. Cutting pressure control knob**

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

**2. Blade descend speed control knob**

- This knob is used to adjust the descend speed of the saw blade.
- Turning the knob clockwise increases the blade descend speed.
- Blade descend speed is a determining factor to a good cutting time and quality cutoff surface.
- Set the blade descend speed in accordance with the *cutting pressure control* knob.
- Also commonly known as the flow control valve

## STANDARD ACCESSORIES

### Blade tension device

- This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.
- To tighten the saw blade, turn the selector to  .
- Upon saw blade breakage, the safety device will activate and automatically stop all machine operation.
- The limit switch of the safety device can be reset by turning the blade tension selector to  .
- To change the blade, turn the handle to  to release saw blade tension.

### Blade speed/motion detector


- Besides detecting the blade speed, the speed/motion detector also functions as a safety device.
- The speed/motion detector protects operators and the machine by preventing blade overloads and consequent damages if a saw blade breaks or skids.
- Once blade breakage or slippage is detected, the drive wheel will stop in 10 seconds.

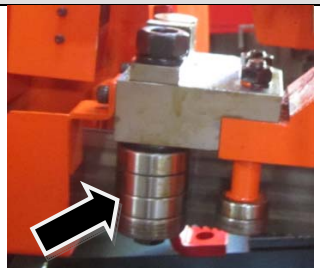
### Inverter

- This inverter is installed inside the electrical compartment. It is used to control and stabilize the saw blade speed during cutting.
- To adjust blade speed, use the *blade speed control knob* on the control panel.

**Note:**

1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.

### Vibration damper

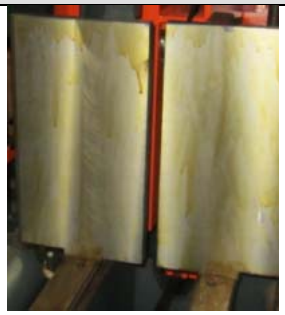


The vibration damper can be assembled to the left saw arm. This accessory is extremely useful in reducing the high-frequency noise produced when cutting large-sized material.

## Work height selector

This device allows the operator to adjust the upper limit and lower limit positions.

## Split vise



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

## Gear reducer

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

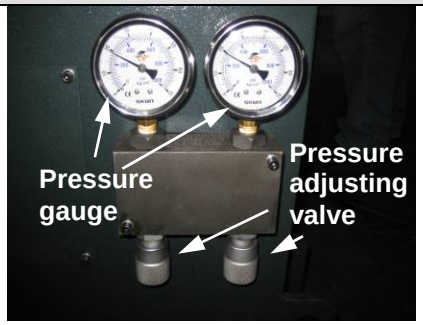
Please refer to Section 8 for information on maintenance.

## Coolant pump

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

# OPTIONAL ACCESSORIES

## Vise pressure regulator




- This adjustment valve is used to control vise pressure.
- Adjust vise pressure based on the material of your workpiece.
- When cutting pipes or soft materials, reduce vise pressure to prevent exerted pressure from damaging the workpiece shape or exterior.

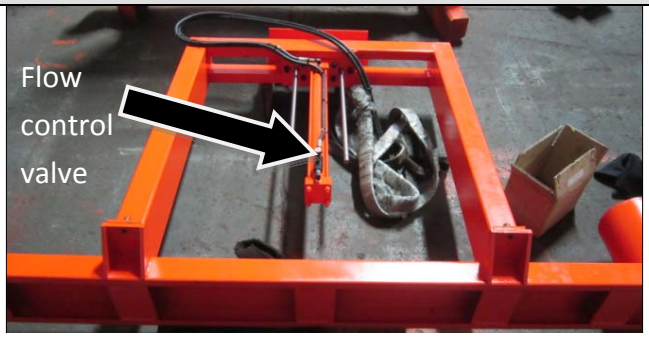
Vise pressure should never be lower than 8 kg/cm$^2$.

## Chip conveyor

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

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

## Hydraulic top clamp




- The top clamp device is installed on top of the cross link before executing bundle cutting.
- To use the top clamp, open the flow control valve so that top clamp can move in synchronization with the vise.

Note the allowable clamping width and height. Refer to Section 2 – General Information, Specifications.

## 2M roller table

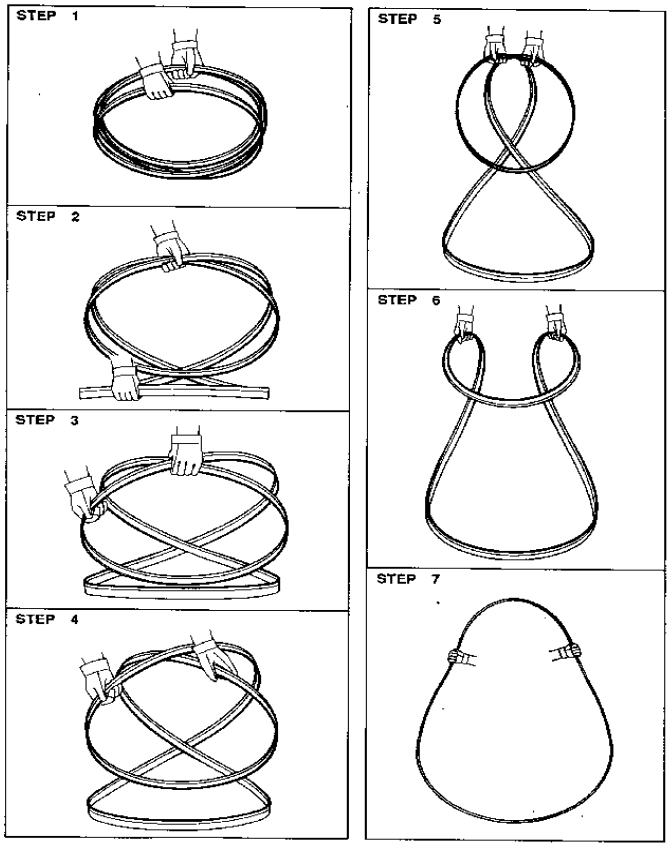
- The optional 2M roller table supports the work material and ensures the material be fed in smoothly.
- Refer to Section 9 for further information on adjusting the roller table.

## 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.

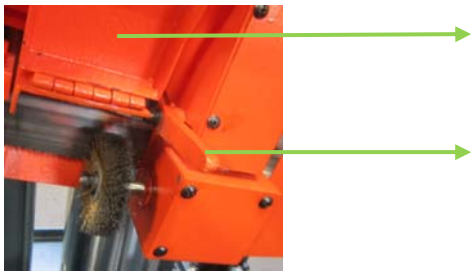
Step 2 - Turn on the machine power by switching to *ON* and turn on the hydraulic system.

Step 3 - Press the *saw bow up* button and elevate the saw bow until it reaches to its highest point.

Step 4 - Turn the tension controller handle from "◯◯" to "◯◯" position to release tension. The idle wheel will then move slightly toward the direction of the drive wheel.

Step 5 - Open the idle and drive wheel covers.

Step 6 - Open the wire brush cover. Loosen the lock level and lower the wire brush.




Step 7 - Loosen the left and right carbide inserts by flipping the carbide inserts switch down.

Step 8 - Remove the old blade. If necessary, clean the carbide inserts before installing a new saw blade.

Step 9 - Place the new blade around the idle wheel and the drive wheel.

Step 10 - 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 11 - Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel.

Step 12 - Make sure the back of the blade is also pressed against the flange of the idle wheel.

Step 13 - Turn the tension controller handle to [◯ ◯] position to obtain blade tension.

Step 14 - Make sure the sides of the blade are in close contact with the carbide inserts and then tighten the left and right carbide inserts by flipping the carbide inserts switch up.

Step 15 - Gently close the idle and drive wheel covers.

Step 16 - 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 17 - Adjust wire brush to a proper position. Refer to *Adjusting Wire Brush* in this section.

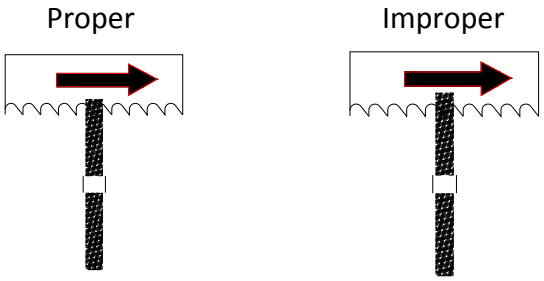
## ADJUSTING WIRE BRUSH

Follow these steps to adjust wire brush to appropriate position:

Step 1 - Open the wire brush cover and loosen the lock lever.

Step 2 - Move brush up/down until it makes proper contact with the saw blade (see below illustration).

Step 3 - Tighten the lock lever and close the wire brush cover.

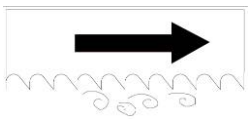

## ADJUSTING COOLANT FLOW

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

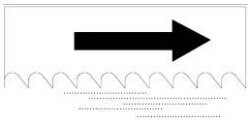
Step 2 – Press the *saw bow down* button to lower the saw bow.

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

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



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



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

## ADJUSTING SAW ARM

For workpiece with width less than 400mm, adjust the blade guide (guide arm) position manually:
Step 1 - Loosen the carbide inserts by flipping the carbide inserts switch down on control panel.
Step 2 - Utilize the *guide arm left/right switch* to adjust guide arm position.
Step 3 - After adjustment is made, clamp the inserts back by flipping the carbide inserts switch up.

 The saw bow must be above the middle limit to move the guide arm.

 Be sure that the guide arm will not bump into the vise, set the guide arm width according to the scale on top of the sliding board.

## ADJUSTING BLADE SPEED

Step 1 – Set the flow control to "0" position.
Step 2 – Press the *saw blade start* button to start the blade.
Step 3 – Turn the *blade speed control knob* to adjust the blade speed. The blade speed should be adjusted based on the size and the material of the workpiece

## TEST-RUNNING THE MACHINE

Test-running this machine can ensure good machine performance in the future. We suggest you run the following tests on the machine before first use:

**Testing machine performance:**
Turn on the power and run a basic performance test after you finish installing the machine. Follow these steps to test machine performance:
Step 1 – Disassemble shipping brackets and bolts.
Step 2 – Install roller table (optional).
Step 3 – Turn on the relay switch in the control box.
Step 4 – Elevate the saw bow. (If your coolant pump is in reverse and the machine cannot run, please change the electrical phase.)
Step 5 – Remove the rust-prevention grease with cleaning oil or kerosene.
Step 6 – Start the coolant pump.
Step 7 – Test these functions:

- vise clamping/unclamping
- saw bow ascending/descending
- feeding forward and backward

## BREAKING-IN THE BLADE

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

Step 1 - Reduce the blade speed to one-half of its normal setting.

Step 2 - Lengthen the cutting time to 2-3 times of what is normally required.

Step 3 - After the break-in operation is completed, set all parameters back to normal settings.

## PLACING WORKPIECE ONTO WORKBED

Step 1 – Press the s*aw bow up* button and elevate the saw bow until it reaches to its highest point.

Step 2 – Turn the *vise open/clamp switch* to the left to open the vise.

Step 3 – Carefully place the workpiece onto the work feed table.

## POSITIONING WORKPIECE FOR CUTTING

Follow these steps to position your workpiece:

| Step | | Action |
|---|---|---|
| lift the rollers up | *1* | Turn and hold the *lift rollers up/down switch* to the right to lift up the rollers. |
| turn on the projection light | *2* | Press the *projection light on button*. A beam of light will be projected on the workpiece for alignment. |
| rough position | *3* | Press the *lift rollers feed forward button* until the cutoff point on the workpiece almost aligns with the blade line. |
| confirm cutoff point | *4* | Press the *saw bow down* button to lower the saw bow until the blade descends to just about 10mm (0.4 inch) above the workpiece. |
| precision position | *5* | Press the *lift rollers feed forward button* (and the *feed backwar*d button if necessary) until the cutoff point on the workpiece aligns with the blade line. |
| lower the rollers down | *6* | Turn and hold the *lift rollers up/down switch* to the left to lower the rollers down. |
| vise clamp material; ready to cut | *7* | After the workpiece is correctly positioned, turn and hold the *vise open/clamp switch* to the right for 2 seconds and let it go; the vise will automatically close until the workpiece is securely clamped. |

## CUTTING OPERATION

Step 1 – Check before you cut

- **Power:** Check the voltage and frequency of your power source.
- **Coolant:** Check if you have sufficient coolant in the tank.
- **Hydraulic:** Check if you have sufficient (at least two-thirds or higher) hydraulic oil.
- **Workbed:** Check if there is any object on the feeding bed that may cause interference.
- **Blade:** Check the blade teeth and make sure there is no worn out teeth along the blade.
- **Light:** Check the projection light and make sure there is sufficient lighting.
- **Roller:** Check all the rollers on the workbed can roll smoothly.
- **Saw bow:** Check the saw bow to see if it can be elevated and lowered smoothly.

Step 2 – Place your workpiece onto the workbed manually or by using a lifting tool e.g. a crane.

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

Step 3 – Position your workpiece.

Step 4 – Clamp the workpiece.

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

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

Step 7 – Start running the blade.

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

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

Step 9 – Select the proper cutting condition according to different material.

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

Step 11 – Clean the workbed by removing chips and cutting fluids.

Step 12 – Lower the saw bow to a proper position then turn off the power.

## TERMINATING A CUTTING OPERATION


- To terminate a cutting operation, press either the *saw bow up* button or the *emergency stop* button.
- The saw blade will stop running when the *saw bow up* button is pressed.
- Both the saw blade and hydraulic pump motors will stop running when the *emergency stop* button is pressed.

*Section 5*

# *ELECTRICAL SYSTEM*

**ELECTRICAL CIRCUIT DIAGRAMS**

The following are electrical circuit diagrams of the system:

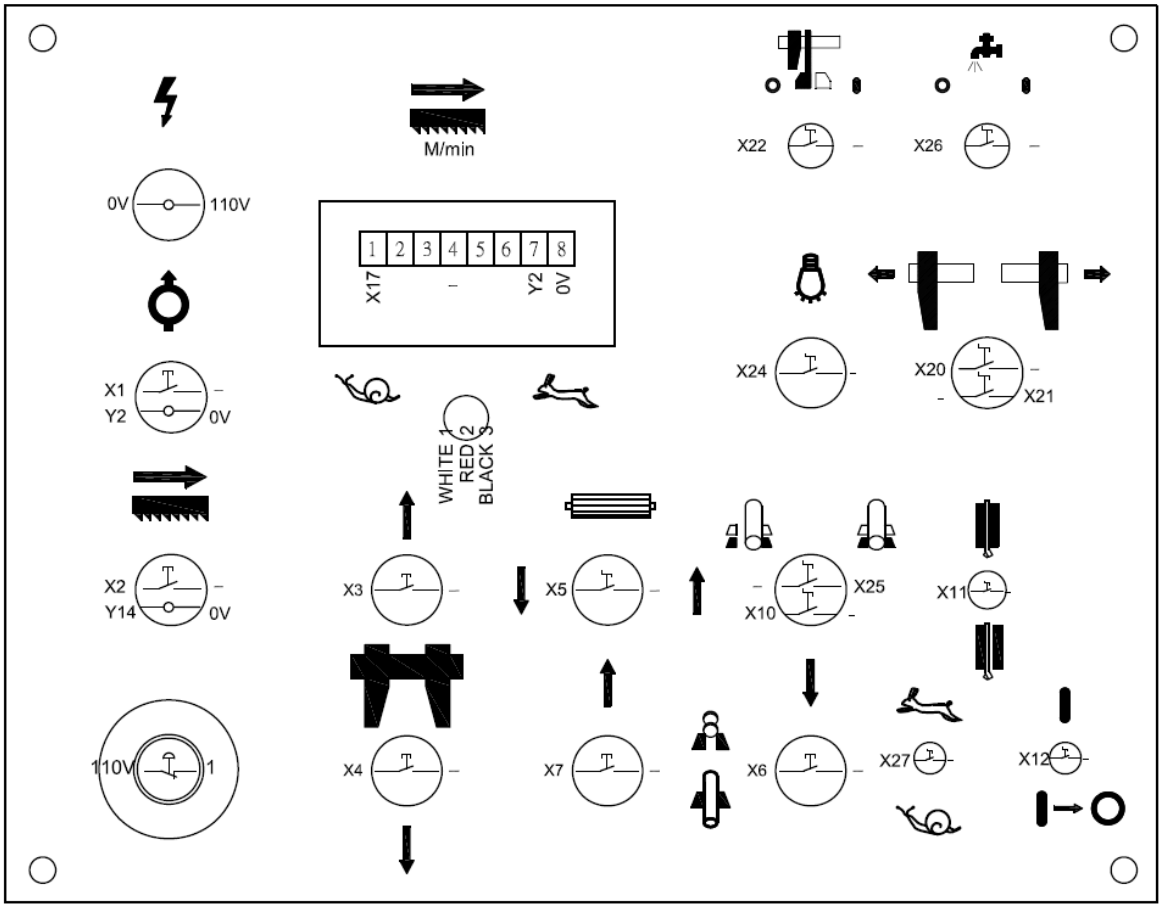
Non-CE model

Fig. 5-1 Control Panel Layout

Fig. 5-2 Circuit Board Layout

Fig. 5-3 Power Supply Layout

Fig. 5-4 PLC Input/Output Layout




| | | | | | | | | | |
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| 高至精密機電股份有限公司 COSEN MECHATRONICS CO., LTD. | 圖名 | Control Panel Layout 面板配置圖 | 圖號 | EL-SH1000F-F15-000S3-A | 繪圖 | 鍾泓龍 | 日期 | 1030716 | 版本 |
| | | | | | 審核 | | 日期 | | S3 |

Fig. 5-1 Control Panel Layout

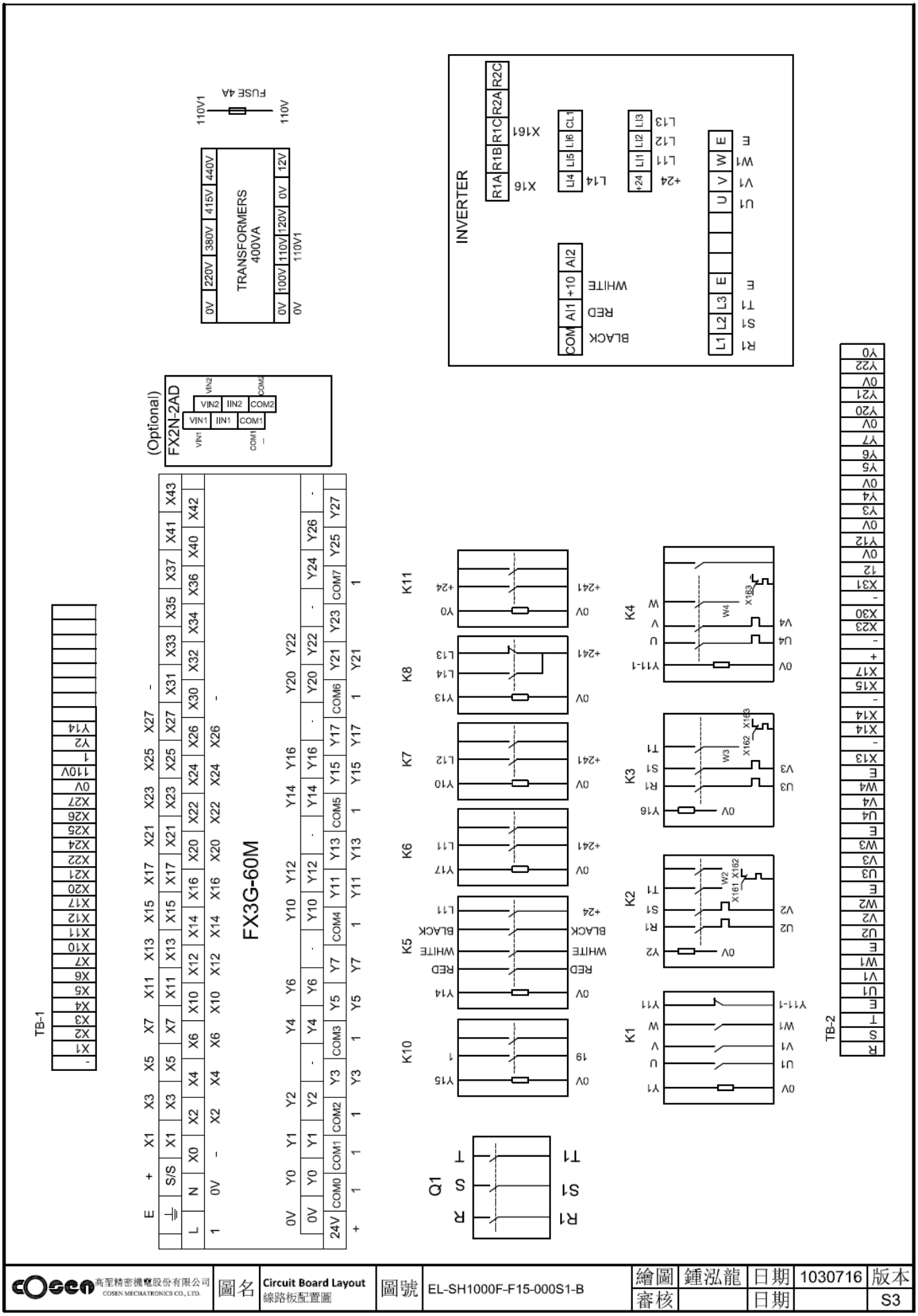
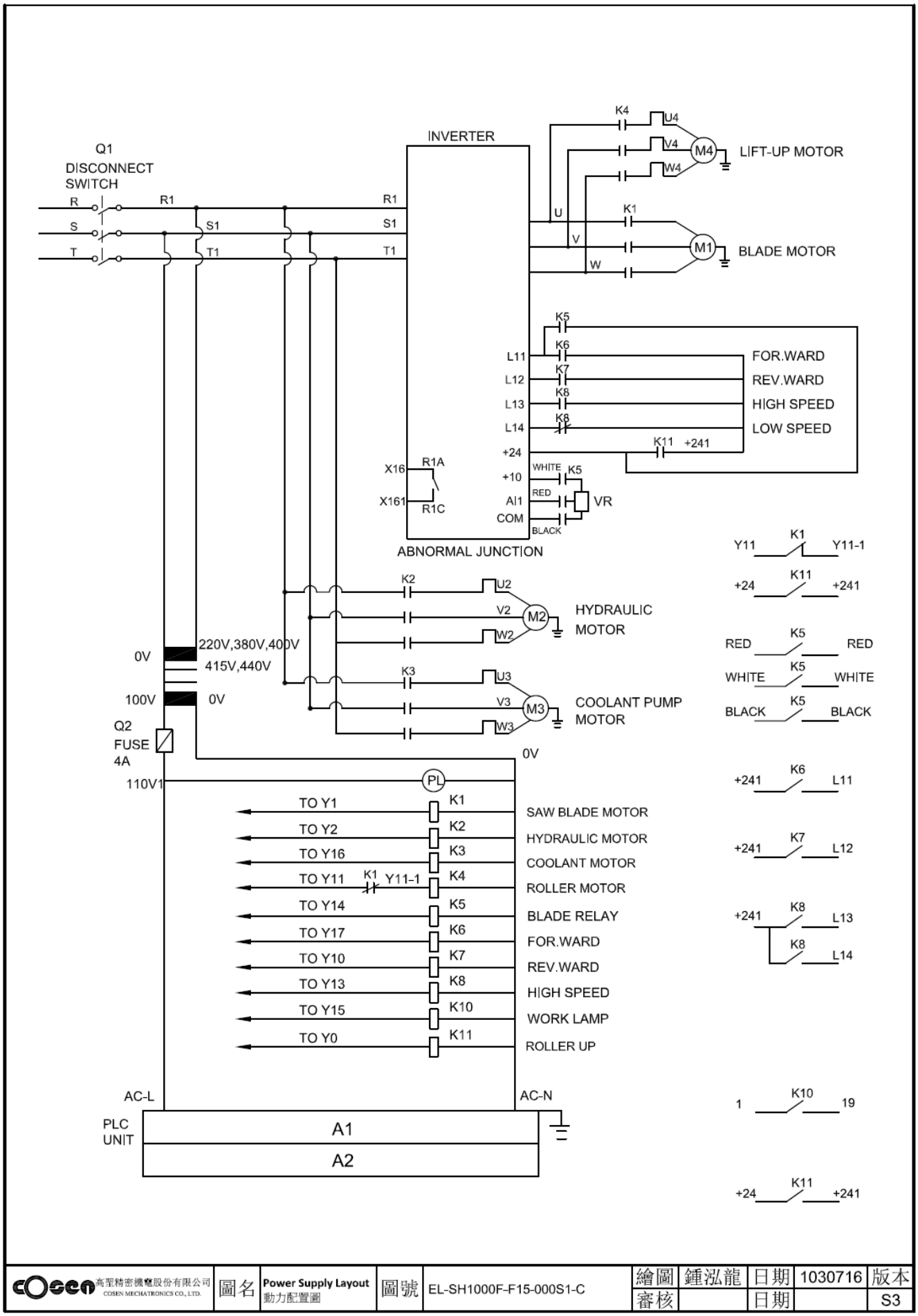
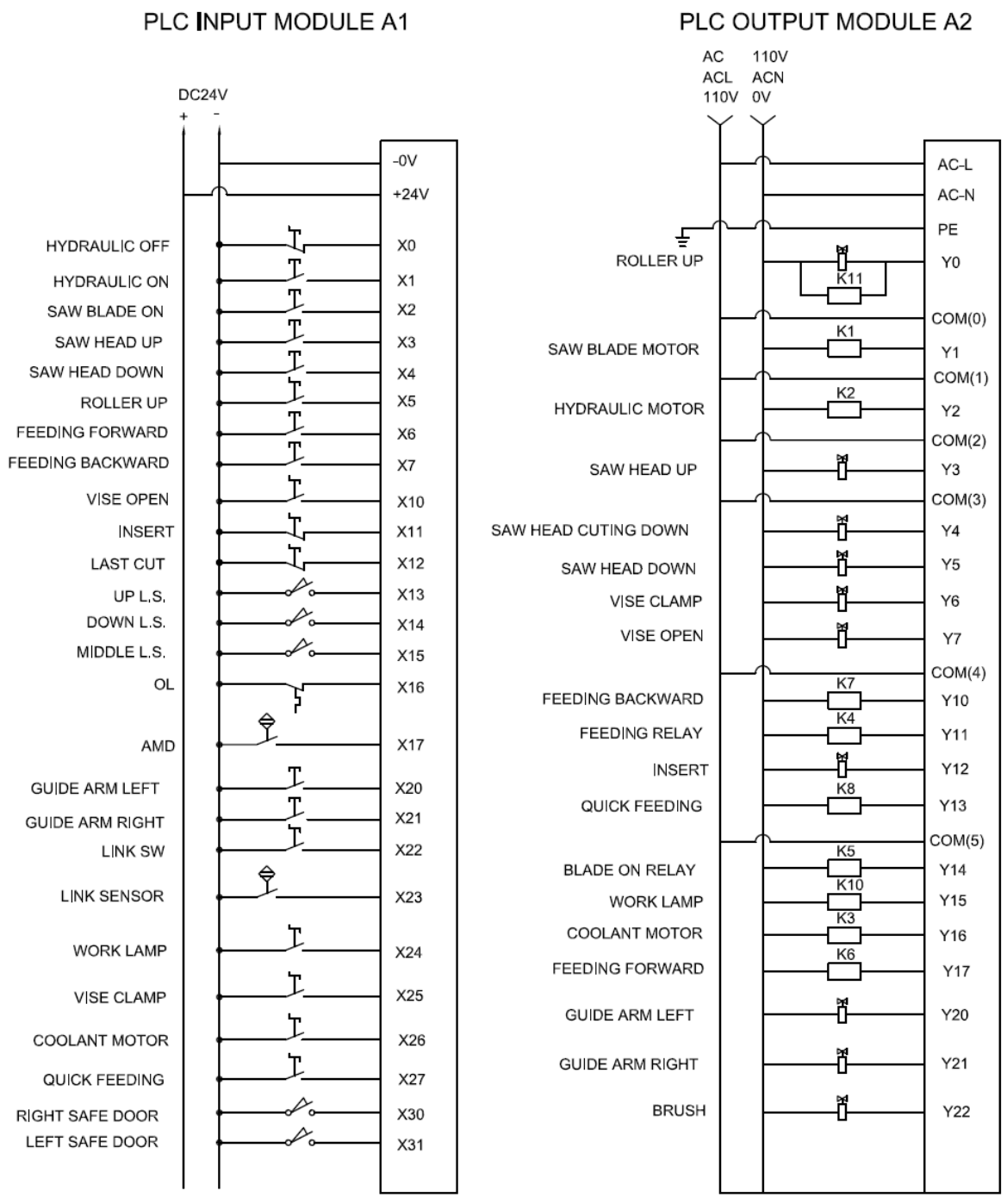



Fig. 5-2 Circuit Board Layout




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| COSEN 高至精密機電股份有限公司 COSEN MECHATRONICS CO., LTD. | 圖名 | Power Supply Layout 動力配置圖 | 圖號 | EL-SH1000F-F15-000S1-C | 繪圖 | 鍾泓龍 | 日期 | 1030716 | 版本 |
| | | | | | 審核 | | 日期 | | S3 |

Fig. 5-3 Power Supply Layout




| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| COSEN 高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD. | 圖名 | PLC Input /Output Layout PLC I/O配置圖 | 圖號 | EL-SH1000F-F15-000S1-D | 繪圖 | 鍾泓龍 | 日期 | 1030716 | 版本 |
| | | | | | 審核 | | 日期 | | S3 |

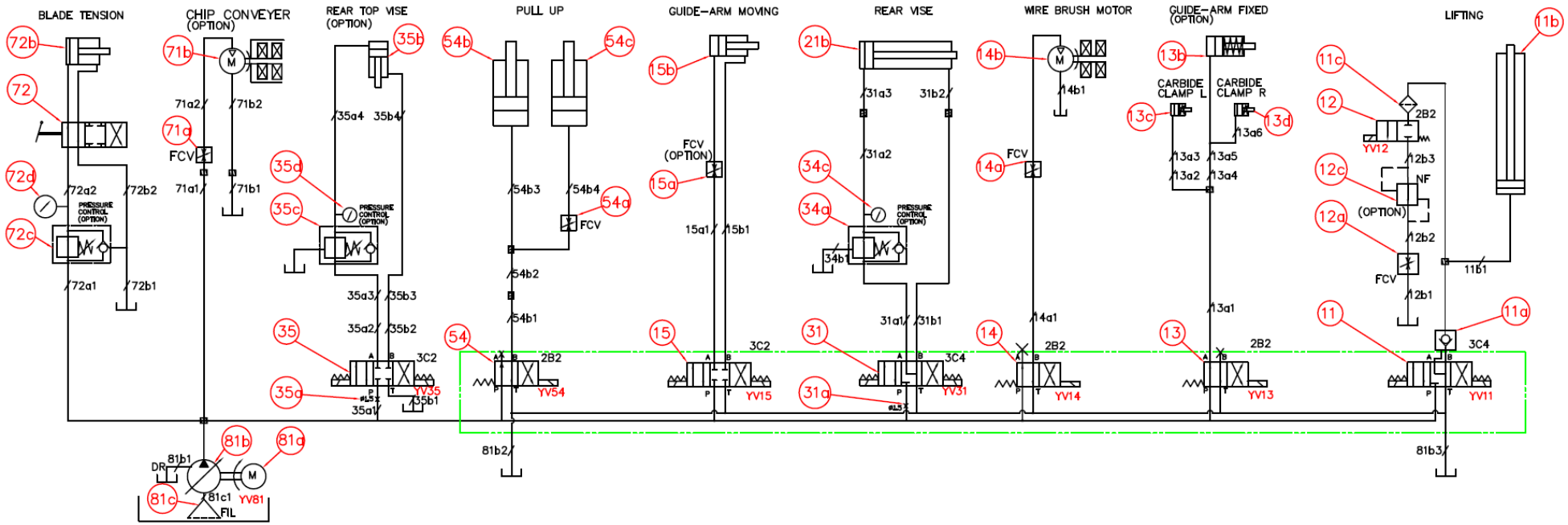
Fig. 5-4 PLC Input/Output Layout

# *HYDRAULIC SYSTEM*

**HYDRAULIC CIRCUIT DIAGRAM**

COSEN

# SH-1000F HYDRAULIC CIRCUIT

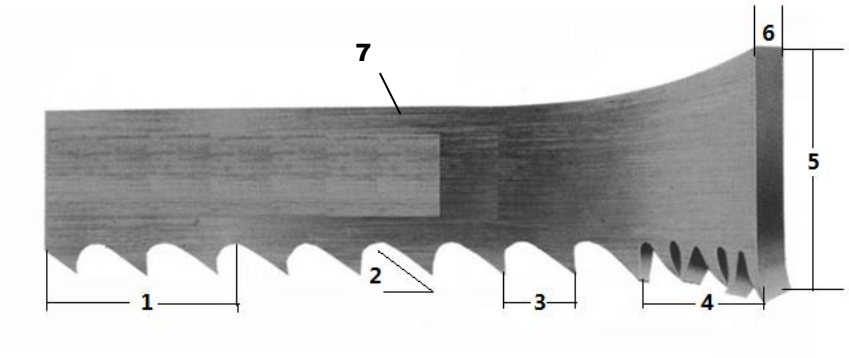



| | | | | |
|---|---|---|---|---|
| COSEN MECHATRONICS CO., LTD. | DRAW | 20140715 | ANDY | NOTE |
| | CHECK | | | |
| TITLE SH-1000F HYDRAULIC CIRCUIT | APPROVED | | | |
| DRAWING NO. SH-1000F HYDRA.DWG VERSION 1-0 | | DATE | NAME | |

# *Section 7*

# *BANDSAW CUTTING: A PRACTICAL GUIDE*

## 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 ÷ 4 P = 6.35 mm, that is, one tooth is 6.35 mm.

If it is 3P, 25.4 ÷ 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:

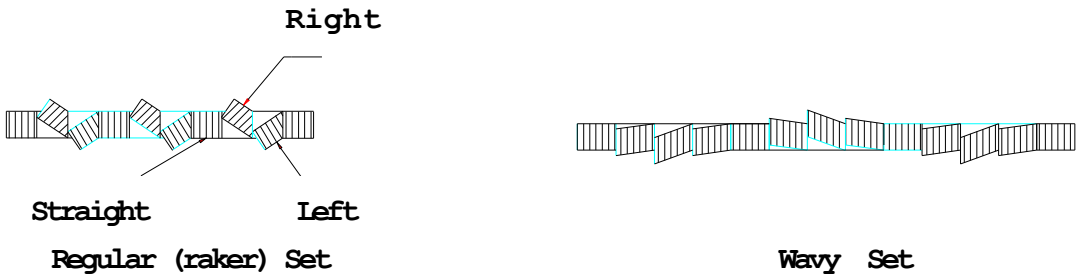



Fig. 7.2 The Saw Set

**VISE 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.

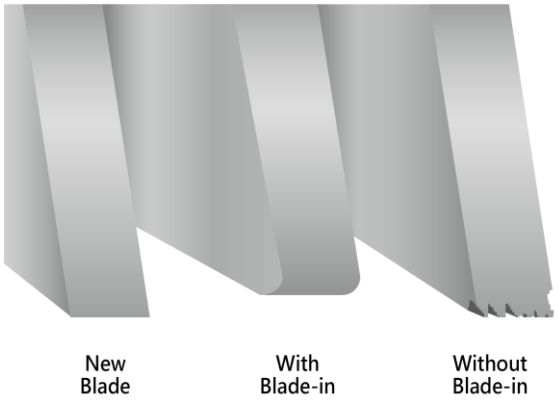
When it comes to cutting odd-shaped material, such as angles, I-beams, channel, and tubing, the main point is to arrange the materials in such a way that the blade cuts through as uniform a width as possible throughout the entire distance of cut.

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.

*Section 8*

# *MAINTENANCE & SERVICE*



## 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. The recommended schedule includes three periods, 1.Daily maintenance. 2.Monthly maintenance. 3. Six months maintenance.

## 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.

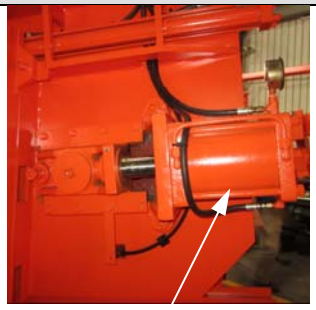
## After ending a day's work

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 month

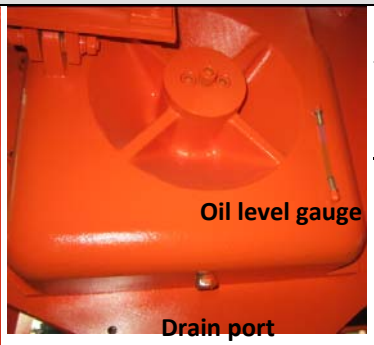


**Blade tension cylinder**


Please apply grease to the following points:
1. Idle wheel
2. Drive wheel
3. Blade tension device

<u>Recommended Grease:</u>
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

## Every three months


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

<u>Recommended Grease:</u>
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48 (600W Cylinder oil)

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 Hydraulic28

## STORAGE CONDITIONS

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

(1) Turn off the power.

(2) Ambient temperature: 5℃ ~ 40℃

(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 R2 |
| Reducer | | Inspect once a week. Change oil of 600 hours of using. Change it every year. | Regularly | Omala oil HD220<br>Mobil Gear 630 |
| Hydraulic system | | Inspect half a year. Change oil every year. | Regularly | Shell Tellus 32<br>Mobil DTE oil<br>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.**

*Section 9*

# *TROUBLESHOOTING*



## 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 strippage | 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. |
| | Wheels out of line | Adjust wheels |
| Blade line Run-out or Run-in | 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 tension improper | Loosen or tighten tension on blade. |
| Blade twisting | Blade not in line with guide bearings | Check bearings for wear and alignment. |
| | Excessive blade pressure | Decrease pressure and blade tension |
| | Blade binding in cut | Decrease feed pressure |
| Premature tooth wear | 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

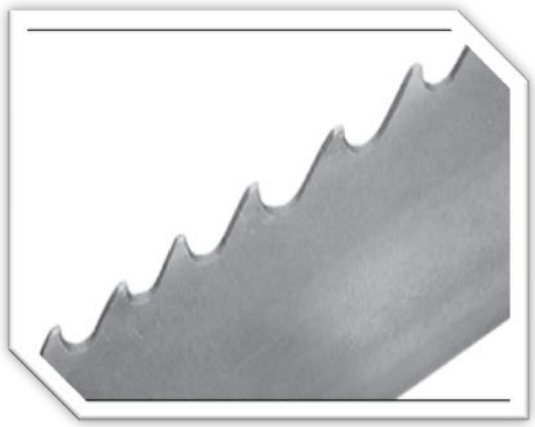
| Vibration during cutting | Failure to cut | Short life of saw blade | Curved cutting | Broken blade | | |
|---|---|---|---|---|---|---|
| ✓ | ✓ | ✓ | ✓ | ✓ | **Use of blade with incorrect pitch** | **Use blade with correct pitch suited to workpiece width** |
| ✓ | ✓ | ✓ | ✓ | ✓ | **Failure to break-in 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 Replace** |
| | ✓ | ✓ | ✓ | | **Saw blade teeth worn** | **Replace** |

## SOLUTIONS TO SAWING PROBLEMS

Table Of Contents



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



**Probable Cause :**

**A.** Improper break-in procedure.

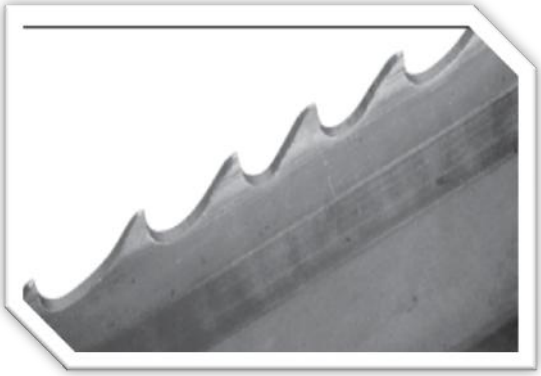
**B.** Excessive band speed for the type of material being cut. This generates a high tooth tip temperature resulting in accelerated tooth wear.

**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



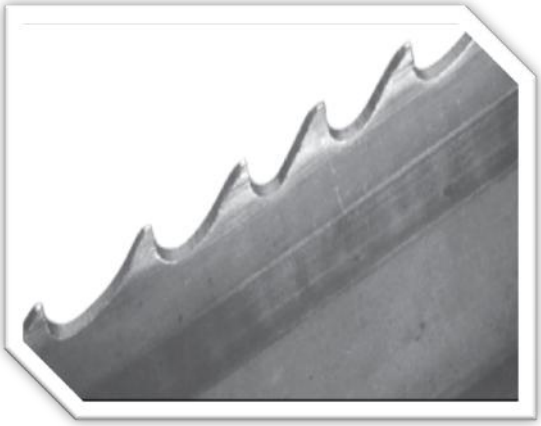
**Probable Cause :**

**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.

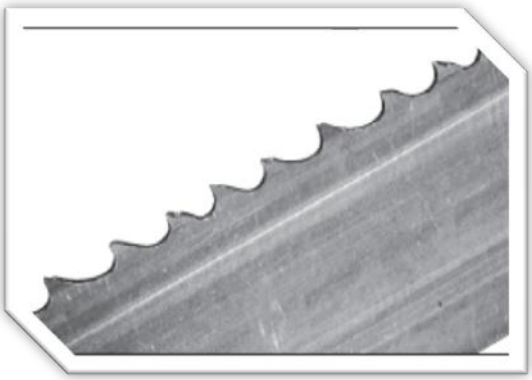
**B.** Loose or improperly positioned side guides.

**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.

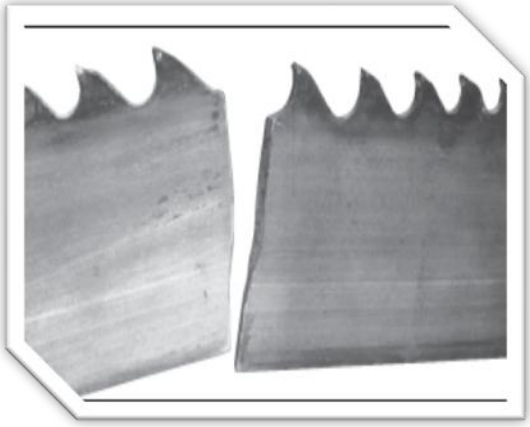
**C.** Handling damage due to improper opening of folded band.

**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.

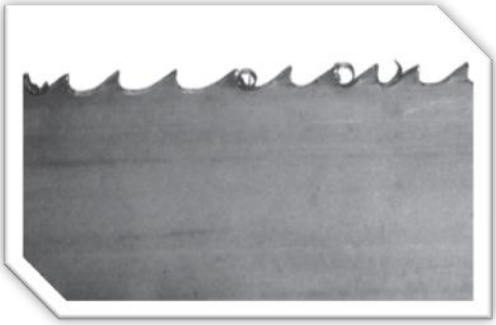
**F.** Improper positioning of material being cut.

**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 :**

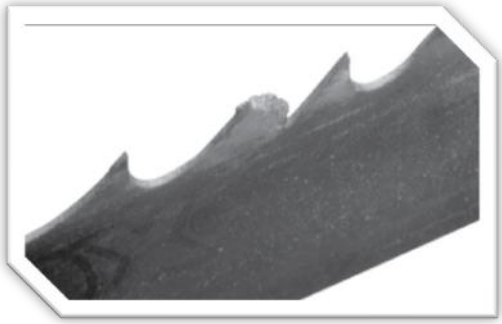
**A.** Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

**B.** Worn, missing or improperly positioned chip brush.

**C.** Improper band speed.

**D.** Improper feeding rate.

### #8. Gullets Loading Up With Material



**Probable Cause :**

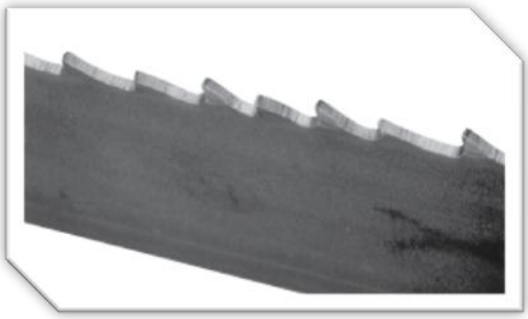
**A.** Too fine of a tooth pitch – insufficient gullet capacity.

**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 :**

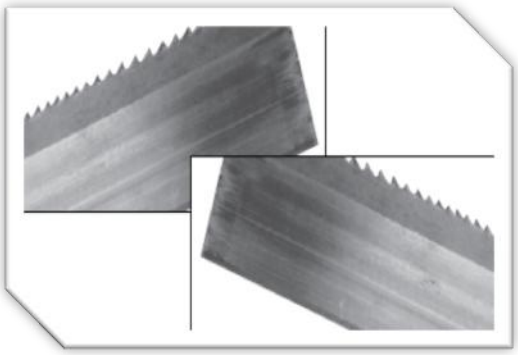
**A.** Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

**B.** Excessive band speed.

**C.** Improper feeding rate.

**D.** Band installed backwards.

### 10. Heavy Wear On Both Sides Of Band



**Probable Cause :**

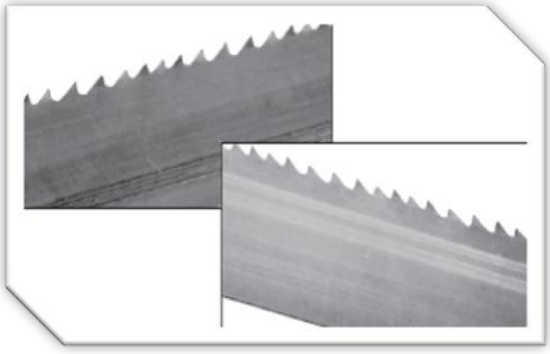
**A.** Chipped or broken side guides.

**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.

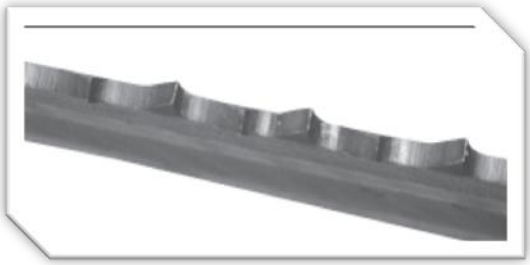
### #13. Butt Weld Breakage

**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 :**

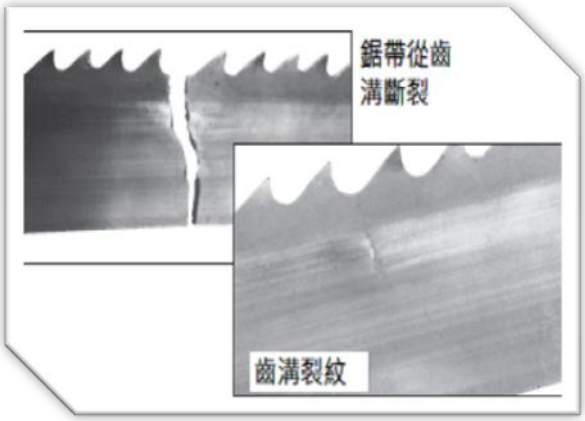
**A.** An excessive twist type of stress existed.

**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.

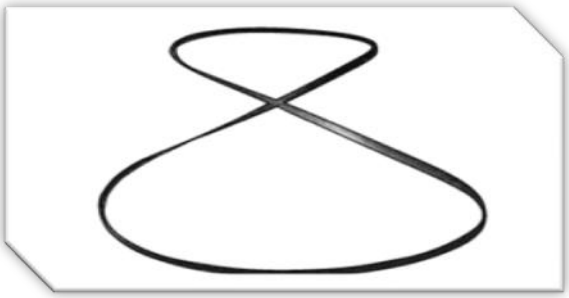
**C.** Guide arms spread to maximum capacity.

**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**

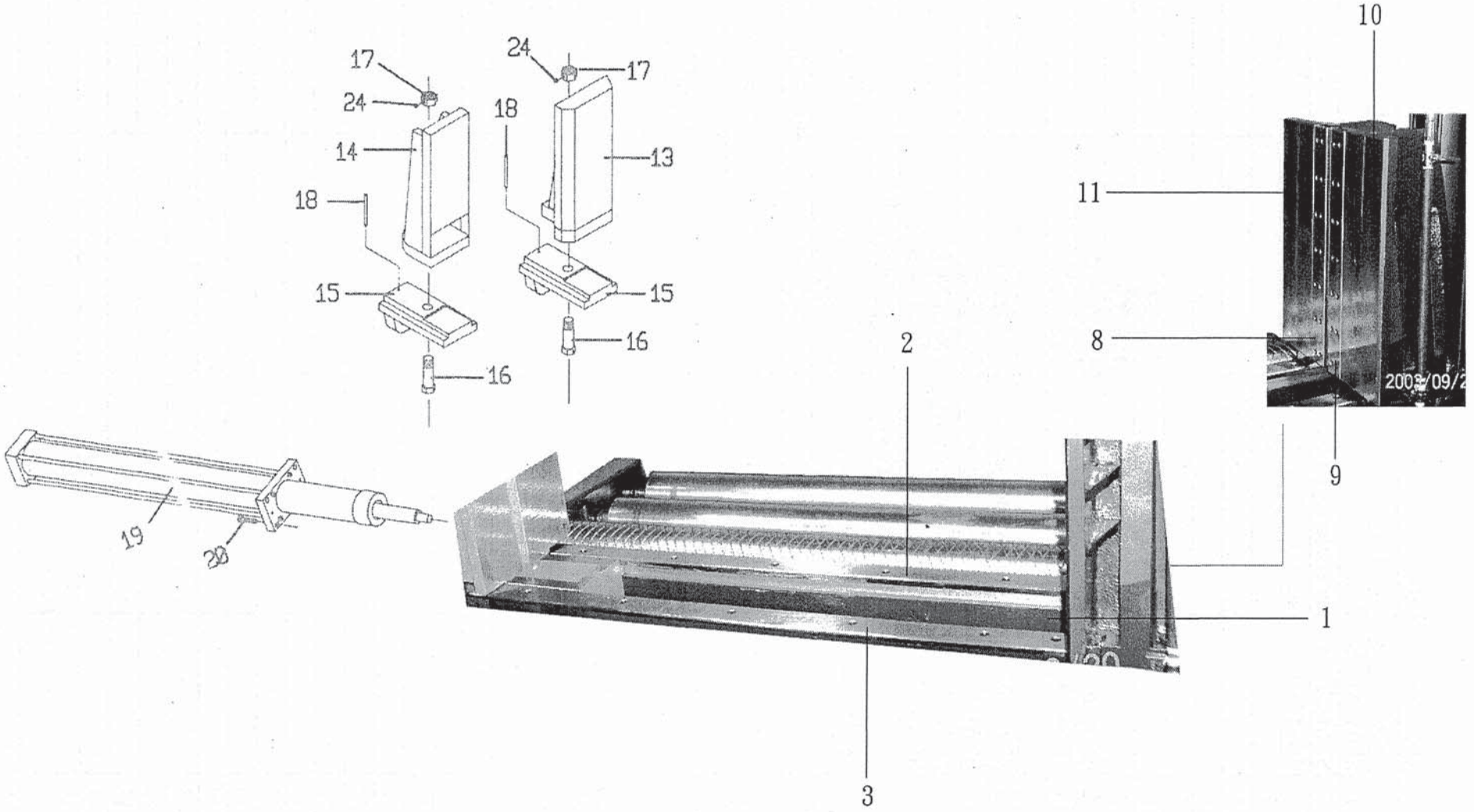
**PART LIST**

## SPARE PARTS RECOMMENDATIONS

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

| Part Name | Part Name |
|---|---|
| Saw blade | Coolant tank filter |
| Wire brush | Steel plates |
| Carbide inserts | Rollers |
| Bearings | Belt |
| Hydraulic tank leak-proof gasket | Duster seal |
| Rubber washer | Oil seal |
| O-ring | Snap ring |
| Drive wheel | Idle wheel |

# SDM-2002K BED



SDM-2002K BED

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | SDM-2011K | bed | 床面 | | 1 |
| 2 | SDM-2017K | steel plate a for bed | 床面鋼板A | | 1 |
| 3 | SDM-2018K | steel plate b for bed | 床面鋼板B | | 1 |
| 4 | | | | | |
| 5 | | | | | |
| 6 | | | | | |
| 7 | | | | | |
| 8 | | vise plate | 虎鉗鋼板 | | 1 |
| 9 | | vise plate | 虎鉗鋼板 | | 1 |
| 10 | SDM-2023K | front fixed vise | 前固定虎鉗 | | 1 |
| 11 | SDM-2024K | rear fixed vise | 後固定虎鉗 | | 1 |
| 12 | | | | | |
| 13 | SDM-2022K | rear movable vise jaw | 後活動虎鉗 | | 1 |
| 14 | SDM-2022K | movable vise jaw | 活動虎鉗 | | 1 |
| 15 | SDM-2023 | slide for movable vise | 活動虎鉗滑塊 | | 2 |
| 16 | SDM-2024 | pin bolt for movable vis | 活動虎鉗銷螺栓 | | 2 |
| 17 | SDM-2026 | nut for movable vise | 活動虎鉗固定螺母 | | 2 |
| 18 | PP-91353 | pin | 直銷 | φ 5*80L | 2 |
| 19 | SDM-20450 | vise hydraulic | 虎鉗油壓缸 | | 1 |
| 20 | | bolt | 內六角螺絲 | M10*35L | 8 |
| 21 | | | | | |
| 22 | | | | | |
| 23 | | | | | |
| 24 | | set screw | 止付螺絲 | M6*6L | 2 |
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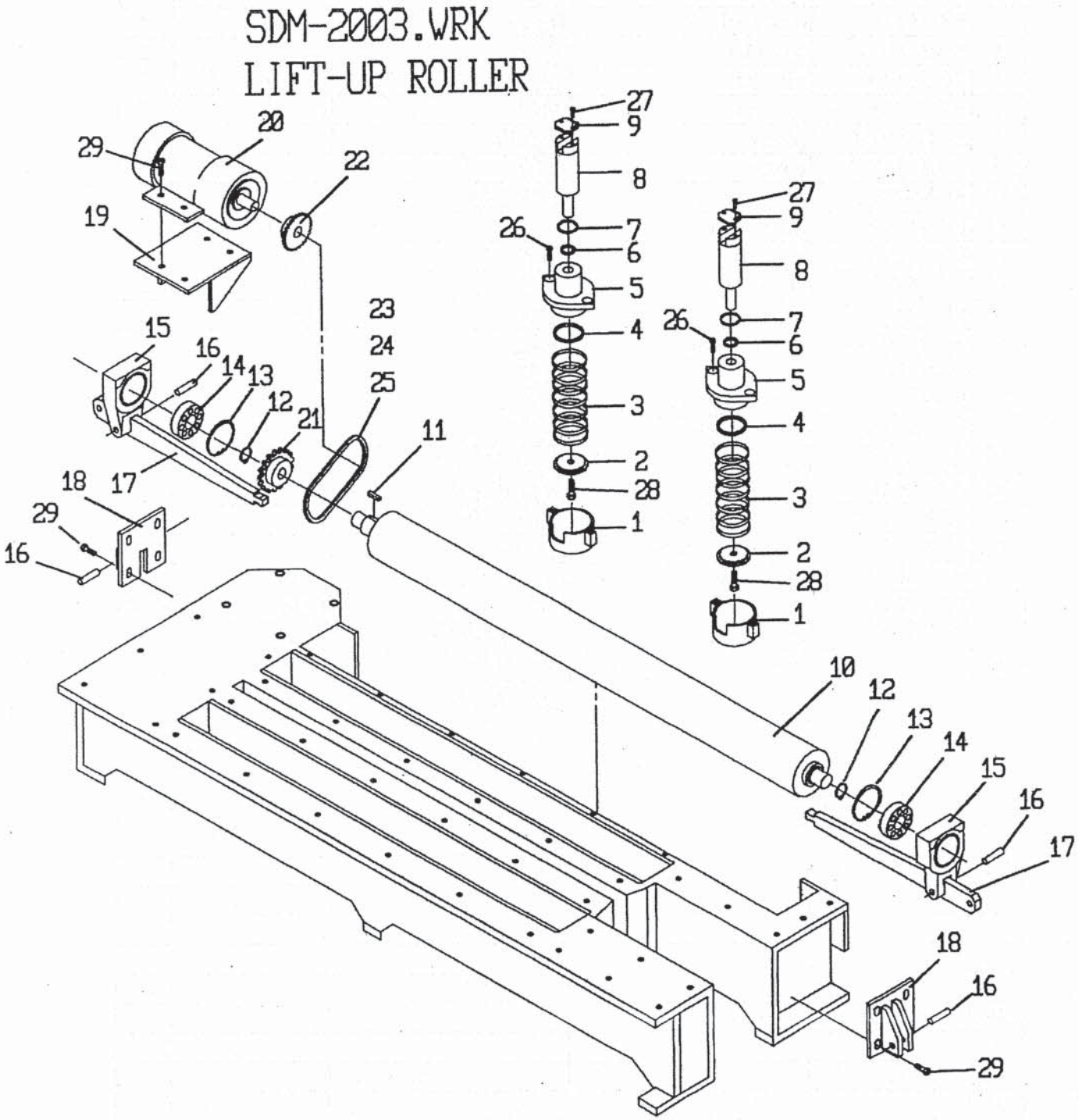
SDM-2003.WRK
LIFT-UP ROLLER
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SDM-2003 LIFT -UP ROLLER

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | SDM-2012 | cylinder holder | 上浮油缸座 | | 2 |
| 2 | SGB-71039 | spring seat | 彈簧擋板 | | 2 |
| 3 | SGB-71038 | spring | 彈簧 | | 2 |
| 4 | PP-51116 | dust seal | 防塵套 | 45*57*7 | 2 |
| 5 | SGB-71037 | cylinder | 缸筒 | | 2 |
| 6 | PP-51149 | oil seat | 油封 | UHP-20 | 2 |
| 7 | PP-51081 | oil seat | 油封 | UN-45 | 2 |
| 8 | SGB-71036 | piston | 活塞桿 | | 2 |
| 9 | SGB-71121 | cover | 蓋板 | | 2 |
| 10 | SDM-2101 | lift -up roller | 上浮滾輪 | | 1 |
| 11 | PP-91707 | parallel key | 平行鍵 | 7*8*30L | 1 |
| 12 | PP-52095 | snap ring | 扣環 | S30 | 2 |
| 13 | PP-58112 | snap ring | 扣環 | R72 | 2 |
| 14 | PP-14513 | bearing | 軸承 | 2306 | 2 |
| 15 | SGB-71040 | roller holder | 滾輪固定座 | | 2 |
| 16 | SGB-71057 | pin | 支架銷 | | 4 |
| 17 | SGB-71054 | roller support link | 滾輪支板 | | 2 |
| 18 | SDM-2104 | roller bracket | 上浮支架桿座 | | 2 |
| 19 | SDM-2100 | fixed plate for lift-up motor | 上浮馬達底板 | | 1 |
| 20 | PP-31646 | gear motor | 齒輪減速機 | 1/4HP,1/90 | 1 |
| 21 | SDM-2102 | drive chain wheel | 上浮軸鏈輪 | | 1 |
| 22 | SDM-2103 | drive chain wheel | 主動鏈輪 | | 1 |
| 23 | PP-19003 | chain link | 鏈條接頭(全目) | RS50 | 1 |
| 24 | PP-19015 | chain | 鏈條 | RS50 | 1M |
| 25 | PP-19045 | chain link | 鏈條接頭(半目) | RS50 | 1 |
| 26 | | bolt | 內六角螺絲 | M8*25L | 4 |
| 27 | | bolt | 內六角螺絲 | M6*15L | 4 |
| 28 | | bolt | 內六角螺絲 | M12*15L | 2 |
| 29 | | bolt | 內六角螺絲 | M10*20L | 12 |
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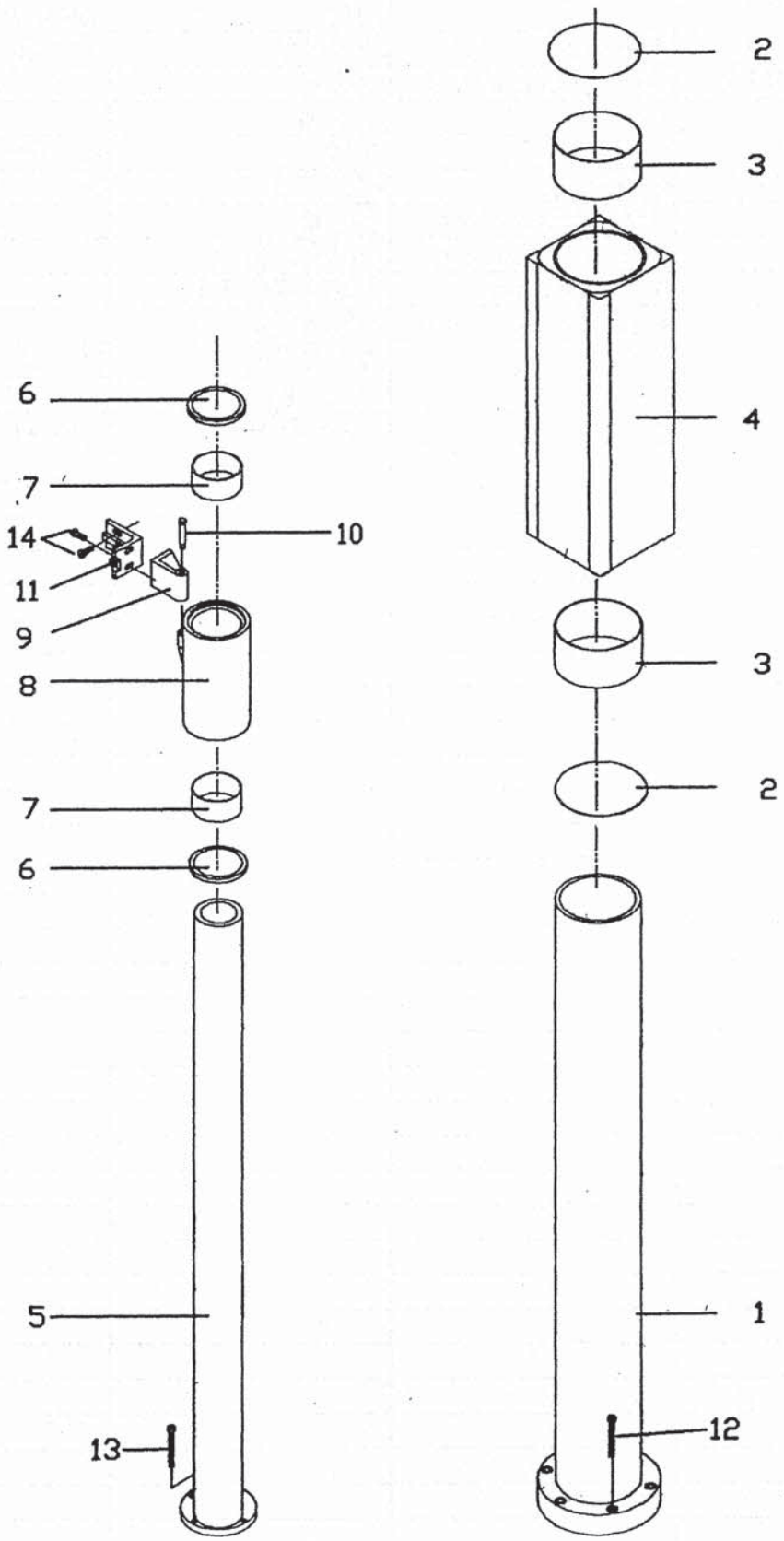
# SDM-2004K MAIN-SHAFT & SUB-SHAFT



SDM-2004K MAIN SHAFT & SUB SHAFT

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | AGB-70214 | main shaft | 大主軸 | | 1 |
| 2 | PP-51132 | oil seal | 油封 | 200*230*6 | 2 |
| 3 | PP-13363 | du bearing | 乾式軸承 | 200*205*100 | 2 |
| 4 | AGB-70302 | sleeve for main shaft | 大軸套 | | 1 |
| 5 | | sub shaft | 小主軸 | | 1 |
| 6 | PP-51129 | oil seal | 油封 | 160*190*16 | 2 |
| 7 | PP-13360 | du bearing | 乾式軸承 | 16080 | 2 |
| 8 | | sleeve for sub shaft | 小軸套 | | 1 |
| 9 | | positioning plate a of sub shaft sleeve | 小軸套定位板 A | | 1 |
| 10 | | positioning pin | 小軸套定位銷 B | | 1 |
| 11 | | support for sub shaft sleeve | 小軸套支板 | | 1 |
| 12 | | bolt | 內六角螺絲 | M16*60L | 6 |
| 13 | | bolt | 內六角螺絲 | M16*55L | 4 |
| 14 | | bolt | 內六角螺絲 | M14*40L | 4 |
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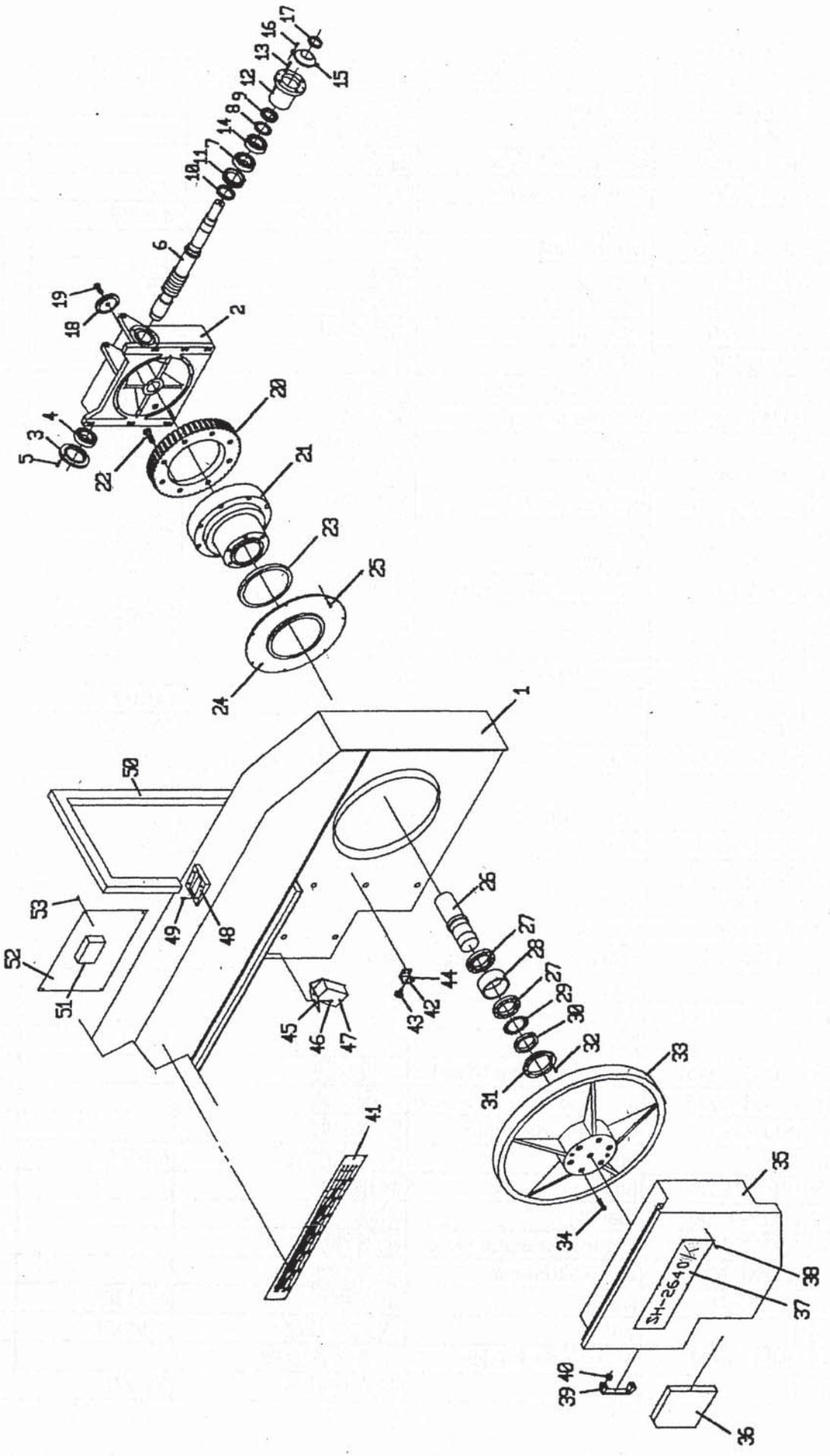
# SDM-2006.WRK DRIVE WHEEL



SDM-2006K DRIVE WHEEL

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1. | SDM-1001 | saw head | 弓鋸頭 | | 1 |
| 2 | SDM-1004 | box body | 減速機本體 | | 1 |
| 3 | SDM-1009 | bearing holder a | 軸承座A | | 1 |
| 4 | PP-14136 | bearing holder a | 軸承 | 6210 | 1 |
| 5 | | bolt | 內六角螺絲 | M8*20L | 2 |
| 6 | SDM-1006 | wrom shaft | 蝸桿 | | 1 |
| 7 | PP-14616 | bearing | 軸承 | 30210 | 1 |
| 8 | PP-14960 | lock washer | 止動環 | AW10 | 1 |
| 9 | PP-14910 | lock nut | 固定螺母 | AN10 | 1 |
| 10 | PP-51106 | oil seal | 油封 | 60*75*8 | 1 |
| 11 | SDM-1005 | holder for oil seal | 油封固定座 | | 1 |
| 12 | SDM-1007 | bearing holder | 軸承座 | | 1 |
| 13 | | bolt | 內六角螺絲 | M8*25L | 4 |
| 14 | PP-14665 | bearing | 軸承 | 32010 | 1 |
| 15 | SDM-1008 | bearing holder b | 軸承座B | | 1 |
| 16 | | bolt | 內六角螺絲 | M6*15L | 2 |
| 17 | PP-51107 | oil seal | 油封 | 47*58*7 | 1 |
| 18 | SDM-1015 | lock washer for drive wheel shaft | 下輪軸固定墊圈 | | 1 |
| 19 | | bolt | 內六角螺絲 | M16*25 | 1 |
| 20 | SDM-1010 | worm | 蝸輪 | | 1 |
| 21 | SDM-1011 | worm holder | 蝸輪固定座 | | 1 |
| 22 | | bolt | 內六角螺絲 | M10*35L | 8 |
| 23 | PP-51132 | oil seal | 油封 | 200*230*6 | 1 |
| 24 | SDM-1021 | holder for output shaft oil seal | 出力軸油封固定座 | | 1 |
| 25 | | bolt | 內六角螺絲 | M6*20L | 10 |
| 26 | SDM-1014B | drive wheel shaft | 下輪軸 | | 1 |
| 27 | PP-1466 | bearing | 軸承 | 3201 | 2 |
| 28 | SDM-1012 | bearing bush for drive wheel shaft | 下輪軸承套環 | | 1 |
| 29 | PP-14915 | lock nut | 固定螺母 | AN15 | 1 |
| 30 | PP-14965 | lock washer a | 止動環 | AW15 | 1 |
| 31 | SDM-1013 | bearing pressing ring | 軸承壓環 | | 1 |
| 32 | | bolt | 內六角螺絲 | M6*20L | 6 |
| 33 | SDM-1016C | drive wheel | 下輪 | | 1 |
| 34 | | bolt | 內六角螺絲 | M14*45L | 6 |
| 35 | SDM-1046B | cover for drive wheel b | 下輪箱蓋 | | 1 |
| 36 | SDM-1040B | protect cover for wire brush | 鋼刷護蓋 | | 1 |
| 37 | SDM-1057A | model name plate | 機型銘牌 | | 1 |
| 38 | | bolt | 內六角螺絲 | M5*4L | 4 |
| 39 | PP-52121 | handle | 輪箱把手 | | 1 |
| 40 | SGB-71067 | mat | 墊塊 | | 2 |
| 41 | SGM-3015 | guide arm name plate | 鋸臂銘牌 | | 1 |
| 42 | SDM-2094 | cover fixed ear | 護蓋固定耳 | | 1 |
| 43 | PP-53010 | screw | 梅花螺絲 | M8*20L | 1 |
| 44 | | bolt | 內六角螺絲 | M6*10L | 2 |
| 45 | SGL-3024 | beam light holder | 投影燈固定座 | | 1 |
| 46 | | bolt | 內六角螺絲 | M6*8L | 2 |

SDM-2006K DRIVE WHEEL

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 47 | SDM-5101 | light | 投影燈 | | 1 |
| 48 | SDM-1053 | plate | 鋸弓軟管接板 | | 1 |
| 49 | | bolt | 內六角螺絲 | M6*25L | 4 |
| 50 | PP-57093 | squire pipe | 金屬護管 | RK 150*985L | 1 |
| 51 | SDM-1051 | manifold | 鋸弓油水路板 | | 1 |
| 52 | SDM-1052D | cover plate | 鋸弓配管護罩 | | 1 |
| 53 | | bolt | 內六角螺絲 | M6*5L | 4 |
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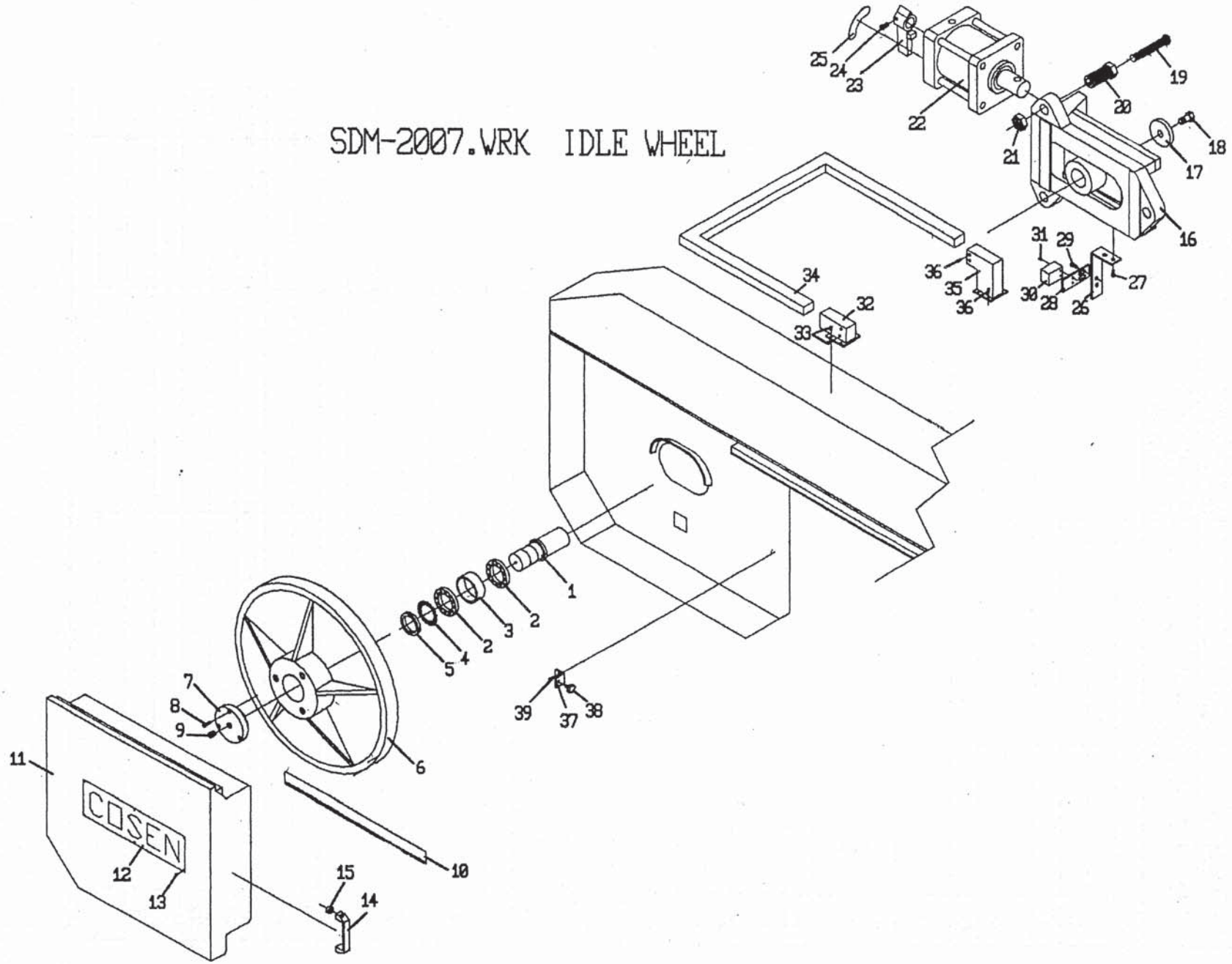
SDM-2007.WRK IDLE WHEEL
COSEN

SDM-2007 IDLE WHEEL

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | SDM-1017 | idle wheel shaft | 上輪軸 | | 1 |
| 2 | PP-14705 | bearing | 軸承 | 33013 | 2 |
| 3 | SDM-1019 | bearing washer for idle wheel shaft | 上輪軸承墊圈 | | 1 |
| 4 | PP-14913 | lock nut | 固定螺母 | AN13 | 1 |
| 5 | PP-14963 | lock washer | 止動環 | AW13 | 1 |
| 6 | SDM-1020 | idle wheel | 上輪 | | 1 |
| 7 | SDM-1037B | bearing cap for idle whe | 上輪軸承蓋 | | 1 |
| 8 | | bolt | 內六角螺絲 | M8*30L | 3 |
| 9 | | oil mouth | 油嘴 | PT 1/8 | 1 |
| 10 | PP-18801 | blade | 鋸帶 | 7800*50*1.6t | 1 |
| 11 | SDM-1044 | cover for idle wheel box | 上輪箱蓋 | | 1 |
| 12 | AGE-2063 | company's name plate | 公司銘牌 | | 1 |
| 13 | | bolt | 內六角螺絲 | M5*5L | 4 |
| 14 | PP-52121 | handle | 輪箱把手 | | 1 |
| 15 | SGB-71067 | mat | 墊塊 | | 2 |
| 16 | SGF-10110 | tension body ass' | 張力滑座組 | | 1 |
| 17 | SDM-1018 | lock washer for idle wheel shaft | 上輪軸固定墊圈 | | 1 |
| 18 | | bolt | 內六角螺絲 | M16*30L | 1 |
| 19 | | bolt | 內六角螺絲 | M20*80L | 3 |
| 20 | AGE-2042 | adjust bolt | 張力座調整螺栓 | | 3 |
| 21 | | adjust nut | 螺帽 | | 3 |
| 22 | SGF-10080 | tension hydraulic | 張力油壓缸 | | 1 |
| 23 | AHB-0653 | change over handle | 切換把手 | | 1 |
| 24 | | set screw | 止付螺絲 | M6*10L | 1 |
| 25 | | legend plate | 銘牌 | | 1 |
| 26 | SGF-1013 | holder for proximity swit | 近接開關座 | | 1 |
| 27 | | bolt | 內六角螺絲 | M5*6L | 2 |
| 28 | | proximity switch mounting plate | 感應器底板 | | 1 |
| 29 | | bolt | 內六角螺絲 | M5*8L | 2 |
| 30 | | limit switch | 限動開關 | | 1 |
| 31 | | bolt | 內六角螺絲 | M3*15L | 2 |
| 32 | AGE-2083 | holder | 金屬軟管直角連接板 | | 1 |
| 33 | | bolt | 內六角螺絲 | M6*10L | 8 |
| 34 | PP-57103 | squire pipe | 方形護管 | RK 60 56*36*1200L | 1 |
| 35 | SGN-3056 | holder | 鋸弓護蓋接座 | | 1 |
| 36 | | bolt | 內六角螺絲 | M6*10L | 8 |
| 37 | SDM-2094 | cover fixed ear | 護蓋固定耳 | | 1 |
| 38 | PP-53010 | screw | 梅花螺絲 | M8*20L | 1 |
| 39 | | bolt | 內六角螺絲 | M6*10L | 2 |
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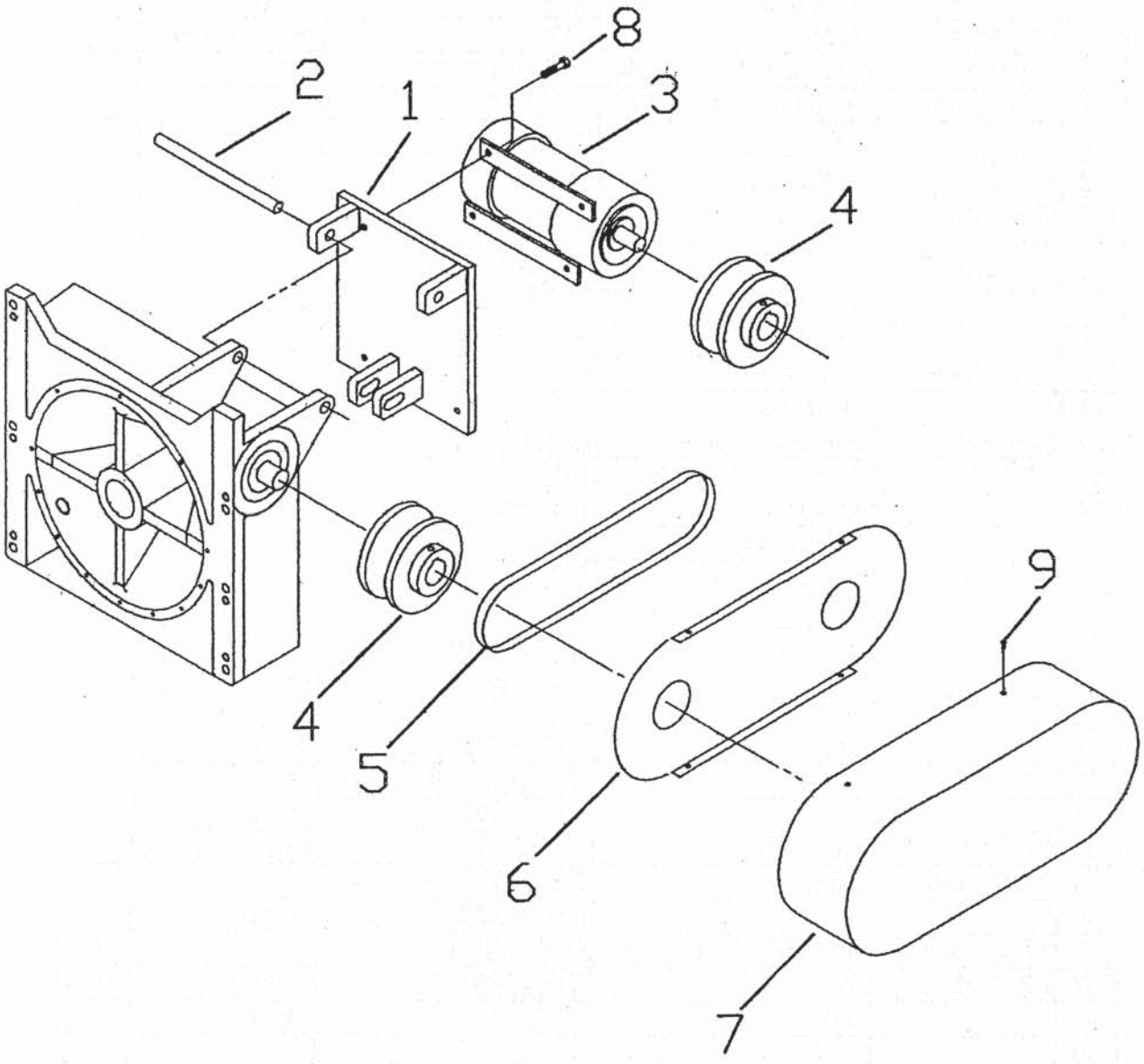
# SDM-2009K MOTOR PULLEY



SDM-2009K MOTOR PULLEY

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | SGO-3037 | motor support plate | 馬達底板 | | 1 |
| 2 | SDM-1048 | spindle for motor support plate | 馬達底板轉軸 | | 1 |
| 3 | PP-31164 | motor | 馬達 | 10HP,4P | 1 |
| 4 | SGJ-2046 | motor pulley | 馬達皮帶輪 | | 2 |
| 5 | PP-56285 | belt | 皮帶 | B42 | 1 |
| 6 | | base plate for pulley cove | 普利護蓋底板 | | 1 |
| 7 | SGJ-2047 | pulley cover | 普利護蓋 | | 1 |
| 8 | | bolt | 內六角螺絲 | M10*25L | 4 |
| 9 | | bolt | 內六角螺絲 | M4*5L | 4 |
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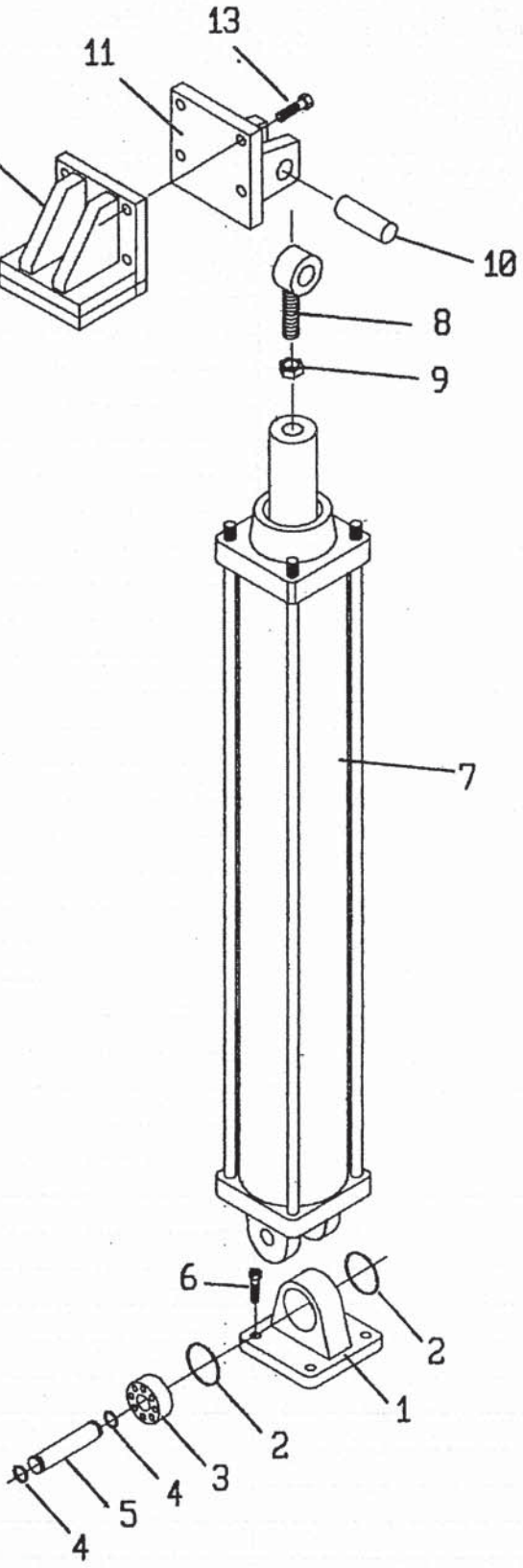
# SDM-2010.WRK SAW BOW HYDRAULIC



SDM-2010 SAW BOW HYDRAULICS

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | SDM-2038 | base seat for cylinder | 鋸弓油缸基座 | | 1 |
| 2 | PP-58107 | inner snap ring | 內鎖扣環 | R52 | 2 |
| 3 | PP-14511 | bearing | 軸承 | 2304 | 1 |
| 4 | PP-52093 | snap ring | 扣環 | S20 | 2 |
| 5 | SDM-2046 | pivot | 鋸弓油缸轉軸 | | 1 |
| 6 | | bolt | 內六角螺絲 | M10*30L | 4 |
| 7 | SDM-20390 | saw bow hydraulic | 鋸弓油壓缸 | | 1 |
| 8 | PP-14482 | link bearing | 連桿軸承 | POS-25 | 1 |
| 9 | | nut | 螺母 | M25 | 1 |
| 10 | SDM-2048 | pin for cylinder ear | 鋸弓油缸耳插銷 | | 1 |
| 11 | SDM-2092 | cylinder upper ear | 鋸弓油缸上耳 | | 1 |
| 12 | SDM-2047 | holder for cylinder upper ear | 鋸弓油缸上耳固定座 | | 1 |
| 13 | | bolt | 內六角螺絲 | M12*40L | 4 |
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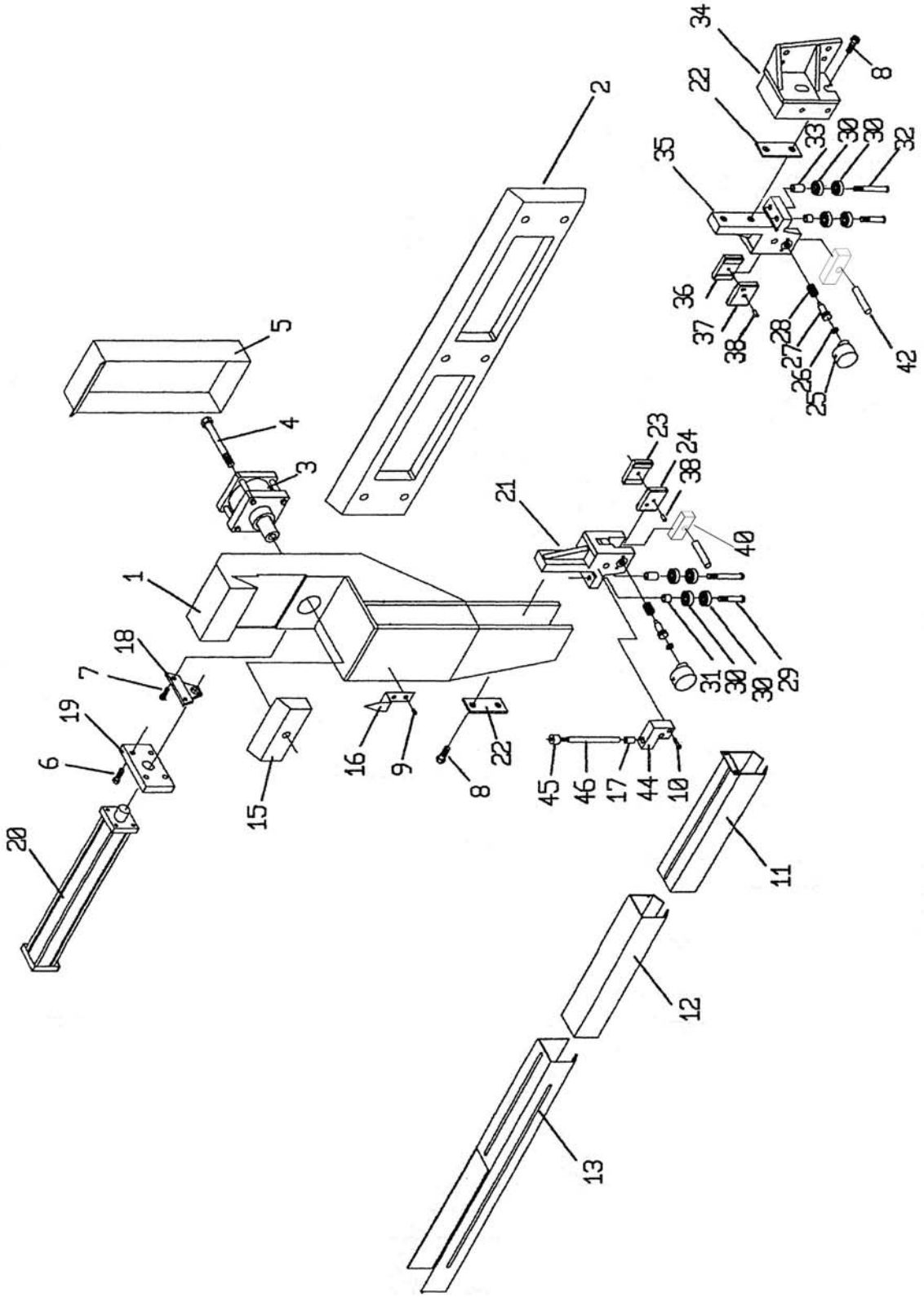
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# ASSEMBLY

| ITEM | PART NO. | PART NAME | PART NAME IN CHINESE | PART SPEC. | QTY |
|---|---|---|---|---|---|
| 1 | SDM-1026 | moving blade guide arm | 活動鋸臂 | | 1 |
| 2 | SDM-1027 | sliding guide | 鋸臂滑板 | | 1 |
| 3 | SDM-10230 | guide arm locking hydraulic | 鋸臂鎖緊油壓缸 | | 1 |
| 4 | | bolt | 內六角螺絲 | M16*100 | 1 |
| 5 | SDM-1038 | arm housing | 鋸臂遮蓋 | | 1 |
| 6 | | bolt | 內六角螺絲 | M16*25L | 4 |
| 7 | | bolt | 內六角螺絲 | M8*15L | 2 |
| 8 | | bolt | 內六角螺絲 | M12*25L | 4 |
| 9 | | bolt | 內六角螺絲 | M5*5L | 2 |
| 10 | | bolt | 內六角螺絲 | M6*25L | 2 |
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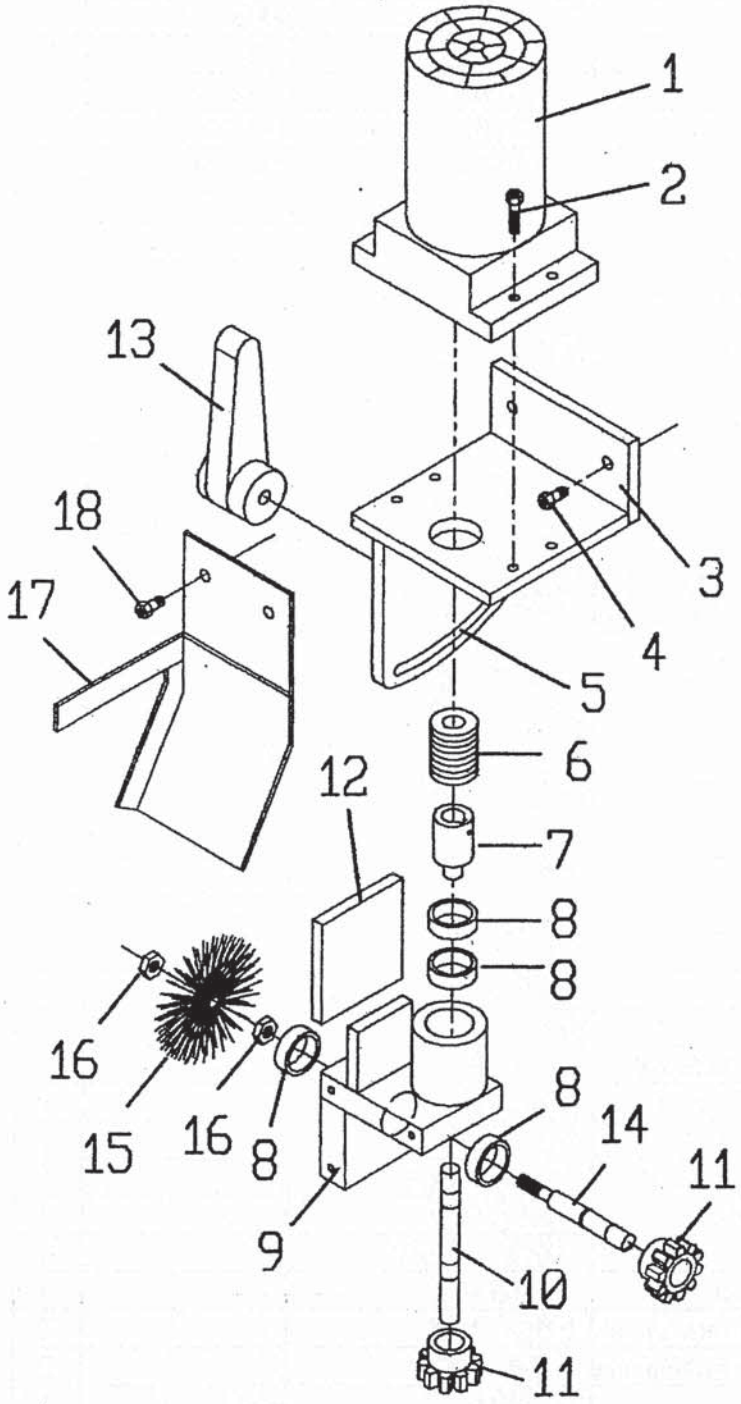
| 15 | SDM-1058 | arrn fixed plate | 鋸臂固定板 | | 1 |
| 16 | SDM-2095 | pointer | 指針 | | 1 |
| 17 | PP-13011 | du bearing | 乾式軸承 | 1020 | 1 |
| 18 | SDM-1059 | fixed ear for cylinder | 鋸臂油缸固定耳 | | 1 |
| 19 | SDM-2093 | holder for arm moving cylinder | 鋸臂移動油缸座 | | 1 |
| 20 | PP-43402 | cylinder | 油壓缸 | S-F A-N40*700L | 1 |
| 21 | SDM-1029 | holder for left guide roll | 左導輪座 | | 1 |
| 22 | AGB-70407 | locking plate of guide roll | 導輪鎖緊墊板 | | 2 |
| 23 | SDM-1031D | left fixed inderts | 左固定鎢鋼片 | | 1 |
| 24 | SDM-1030D | left rnovable inserts | 左活動鎢鋼片 | | 1 |
| 25 | AGB-70715 | cylinder | 鎢鋼片油壓缸 | | 2 |
| 26 | PP-59070 | o-ring | O型環 | P14 | 2 |
| 27 | AGB-70716 | piston | 鎢鋼片鎖緊活塞 | | 2 |
| 28 | AGB-70416 | spring | 鎢鋼片彈簧 | | 2 |
| 29 | AHA-0707C | roller pin | 導輪軸 | | 2 |
| 30 | PP-14270 | bearing | 軸承 | 6200VV | 8 |
| 31 | AGB-70418 | collar | 導輪墊圈 | | 2 |
| 32 | SDM-1034 | roller pin | 長導輪軸 | | 2 |
| 33 | SDM-1035 | collar | 導輪墊圈 | | 2 |
| 34 | SDM-1036 | fixed blade guide roller | 固定鋸臂 | | 1 |
| 35 | SDM-1028 | holder for right guide roll | 右導輪座 | | 1 |
| 36 | SDM-1032D | right fixed inserts | 右固定鎢鋼片 | | 1 |
| 37 | SDM-1033D | right movable inserts | 右活動鎢鋼片 | | 1 |
| 38 | AGB-70415 | coolant nozzle | 冷卻水導管 | | 2 |
| 39 | AGB-70412 | washer | 下壓軸承墊圈 | | 4 |
| 40 | AHA-0704A | bearing holder | 下壓軸承座 | | 2 |
| 41 | | | | | |
| 42 | AGB-70410A | support pin for back-up rolle | 下壓軸承銷 | | 2 |
| 43 | PP-13195 | du bearing | 乾式軸承 | 3020 | 1 |
| 44 | SDM-2205 | holder | 快降桿固定座 | | 1 |
| 45 | SDM-2206 | nut | 快降桿螺母 | | 1 |
| 46 | SDM-2207 | quick escend rod | 快降桿 | | 1 |

# SDM-1012N.WRK BRUSH ASSEMBLY



SDM-2012 WIRE BRUSH

| NO. | PART NO. | PART NAME | PART NAMEI N CHINESE | PART SPEC. | Q'TY |
|---|---|---|---|---|---|
| 1 | PP-31174 | motor | 馬達 | 5IK90G 5GU5K | 1 |
| 2 | | bolt | 內六角螺絲 | M8*25L | 4 |
| 3 | SDM-2408 | motor bracket | 鋼刷馬達座 | | 1 |
| 4 | | bolt | 內六角螺絲 | M8*20L | 2 |
| 5 | SDM-2404 | brush seat movable plat | 鋼刷調整板 | | 1 |
| 6 | PP-15015 | universal joint | 萬向接頭 | 12MM | 1 |
| 7 | SDM-2409 | brush shaft support | 鋼刷傳動接頭 | | 1 |
| 8 | PP-14296 | bearing | 軸承 | 6301ZZ | 4 |
| 9 | SDM-2401 | brush transmission mechanism | 鋼刷傳動本體 | | 1 |
| 10 | SDM-2403 | motor shaft | 鋼刷馬達傳動軸 | | 1 |
| 11 | SDM-2405 | brush transmission gear | 鋼刷傳動齒輪 | | 2 |
| 12 | SDM-2406 | brush fixed plate | 鋼刷固定板 | | 1 |
| 13 | AHA-1217 | lock lever | 鋼刷調整桿 | | 1 |
| 14 | SDM-2402 | brush shaft | 鋼刷傳動軸 | | 1 |
| 15 | PP-58002A | brush | 鋼刷 | | 1 |
| 16 | | nut | 螺帽 | M8 | 2 |
| 17 | SDM-1041 | brush cover | 鋼刷護蓋 | | 1 |
| 18 | | bolt | 內六角螺絲 | M8*8L | 2 |
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*Section 11*

# *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.

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

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