

# INSTRUCTION MANUAL

## C-300NC Automatic Hitch Feed Metal Cutting Band Saw (415V) 340 x 300mm (W x H) Rectangle



**B042**

**NOTICE:** Please read this instruction manual carefully to obtain a thorough knowledge of installation, operation and maintenance. Please remember the following: Correctly operate the machine as described in the manual to prevent accident. Do not operate the machine by guesswork. We suggest you always keep manual at hand and refer to it whenever you are not sure of how to perform any procedures for C-300NC.

### TECHNICAL ADVICE/ SPARE PARTS

Please contact the COSEN-representative in your local area in case you need any technical advice or if you want to order spare parts.



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#### **Instruction Manual:**

**C-300NC - CE / without CE Horizontal Bandsaw**

**With Rack gear vise and inverter**

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Any comments or suggestions about the context, please contact us.

Printed in Taiwan



## SAFETY

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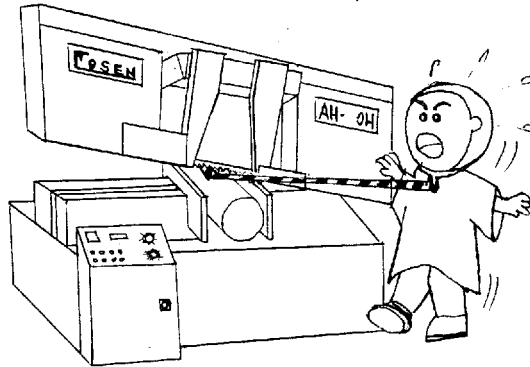
### SAFETY

1. Know your band saw. Read the operator's manual carefully. Learn the operation, application and limitation. Realize the specific potential hazards peculiar to this band saw.
  2. Use recommended accessories. Improper accessories may be hazardous.
  3. Wear proper apparel.
  4. Keep unnecessary people away.
    - \* Do not overreach or stand on tool.
  5. Avoid dangerous environment. Do not use band saw in damp or wet locations. Keep work area well illuminated.
  6. Keep work area clean. Cluttered and slippery floors invite accidents.
  7. Remove adjusting keys and wrenches from band saw before turning on power.
  8. Avoid accidental starting. Make sure switch is off before plugging in power cord.
  9. Do not force band saw. It is safer to operate with the cutting rate for which it was designed.
  10. Never hand hold the material with saw in horizontal position. Always use the vise, and clamp securely.
  11. Keep belt guard and wheel covers in place and in working order.
  12. When a workpiece is too long or heavy, support it from the floor.
  13. Always remember to switch off the machine when the work is completed.
  14. Disconnect power cord before adjusting, servicing and changing blade.
  15. Check damaged parts. Before further use of the tool, a guard or other parts that is damaged should be carefully checked. To assure that it will operate properly and perform its intended function.
  16. Moving parts should keep in an alignment and binding. Check for breakage, mounting and any other conditions that may affect its operation. Any damaged part or guard should be properly repaired or replaced.
  17. Use a sharp blade and keep tool clean for best and safest performance.
  18. Safety is a combination of operator's common sense and alertness at all times when the saw is functioning.
  19. Maintaining the band saw in top condition is essential for safety.
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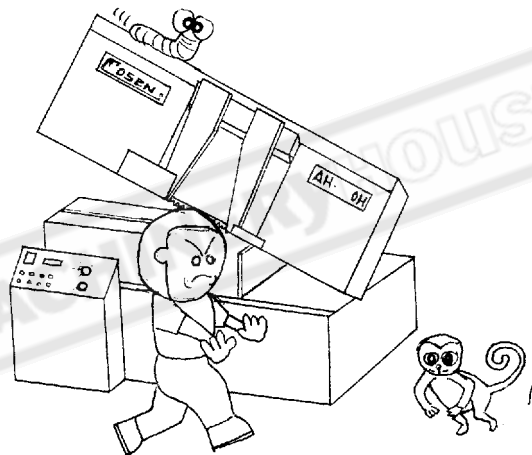


## SAFETY RULES

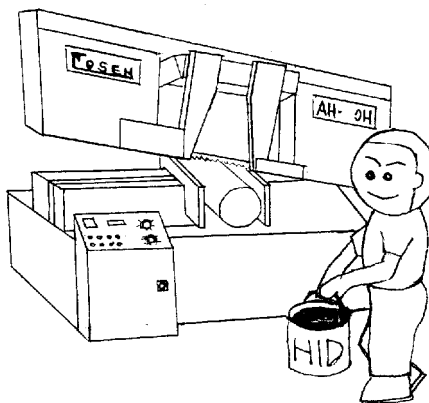
- Never wear gloves loose clothing when operating the machine. They may cause danger if they are caught in a running machine.



- Be sure to confirm that the area around the machine is cleared of people and obstacles every time before starting the machine or operation.



- Use a water-soluble cutting fluid on this machine. Oil-based cutting fluids may emit smoke or catch fire, depending on the condition of their use.

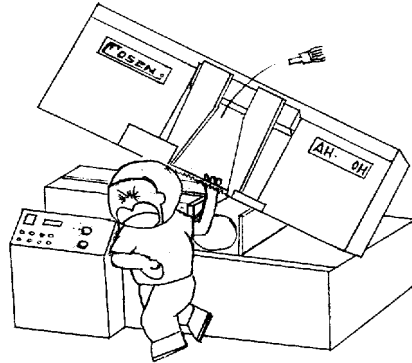




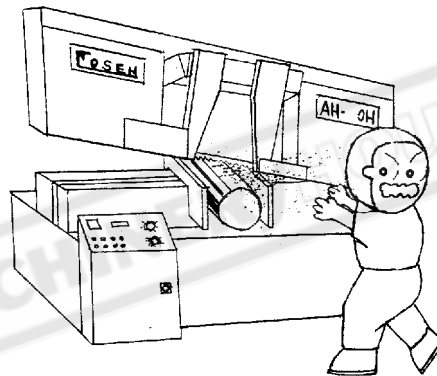


## SAFETY RULES

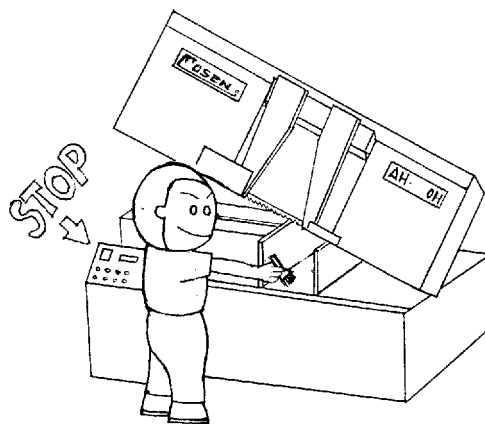
- Never try to adjust the wire brush on the saw blade or remove chips when the saw blade is running. It is dangerous if hands or clothing are caught by the running blade.



- Never cut carbon or any other material that produces and disperses explosive dust on this machine. Sparks from motors and other machine parts may ignite and explode the air-borne dust. The machine needs special measures for cutting explosive materials.



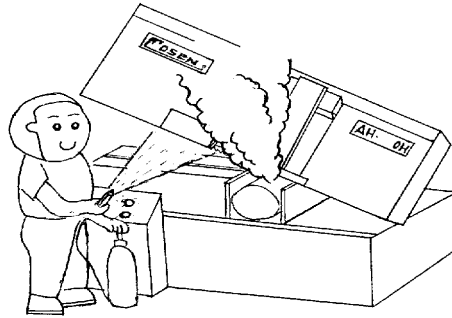
- Stop the saw blade before you clean the machine. It is dangerous if hands or clothing are caught by the running blade.



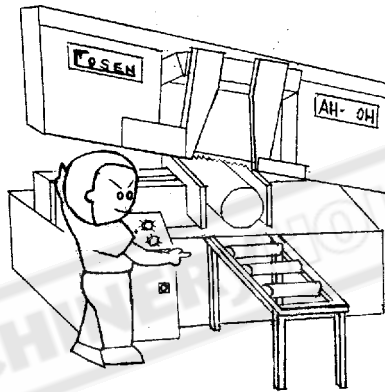


## SAFETY RULES

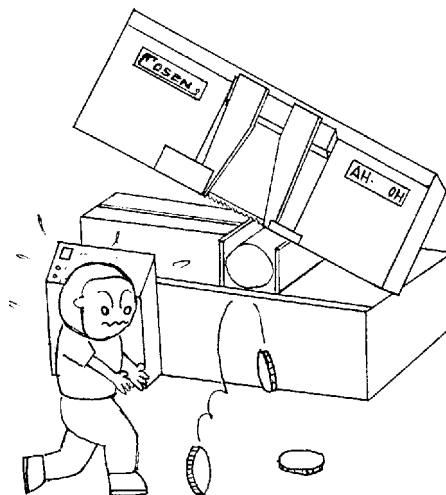
- Be sure to prohibit any use of fire in the shop, and install a fire extinguisher or other fire control device near the machine when cutting titanium, magnesium, or any other material that produces flammable chips. Never operate the machine unattended when cutting flammable materials.



- Use roller tables on both front and rear sides of the machine when cutting the long work. It is dangerous if the work falls off the machine when the roller tables are not used.



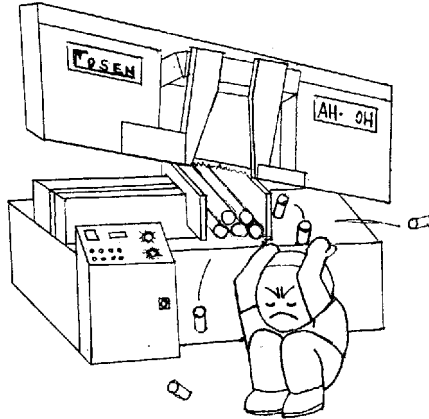
- Take preventive measures when cutting thin or short pieces from the work to keep them from falling. It is dangerous if the cut piece falls.





## SAFETY RULES

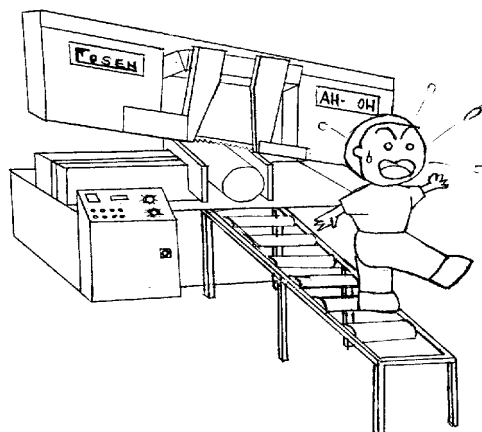
- Never start the saw blade unless it has been confirmed that the work is firmly clamped. If the work is not securely clamped with the vise, pieces will be forced out of the vise during cutting.



- Never touch the running saw blade. It is dangerous if your hands or clothing are caught by the running blade.



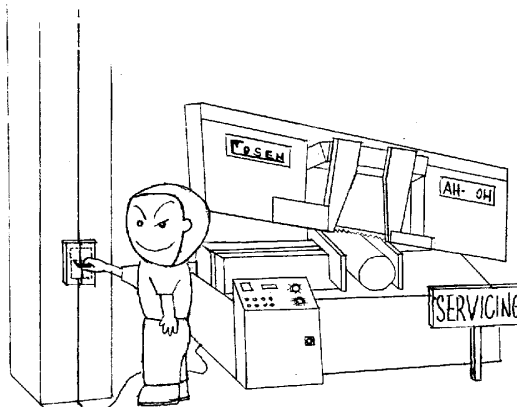
- Never step or stand on the roller table. It is dangerous if your foot slips on the rollers and you fall.





## SAFETY RULES

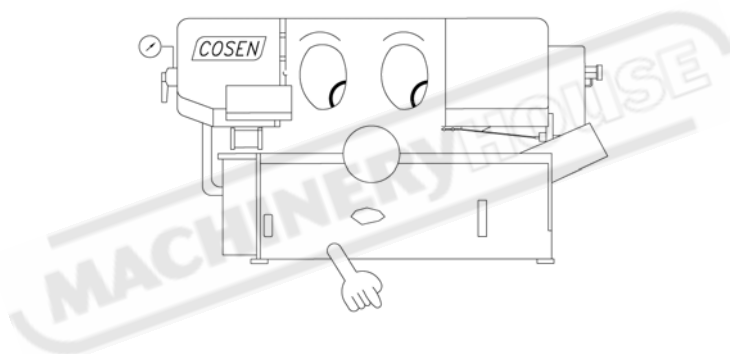
- Turn off the shop circuit breaker switch before servicing the machine. Then post a sign to inform people that the machine is under maintenance.



MACHINERYHOUSE

## *Section 1*

# GENERAL INFORMATION





## SECTION 1

### GENERAL INFORMATION

#### 1.1 INTRODUCTION

This automatic band saw is a model more popular than any other model as witnessed in many countries worldwide. This machine was developed by a group of R&D engineers over a considerable period of time assuring you of the highest efficiency and performance. This machine can automatically detect the conditions of material supply, cutting and quality control. Each component was developed by computer design and analysis. This machine is specifically designed to cut metal material. Your machine has the following advantages:

- Machinery and each component part can be handled safely.
- Machinery and each component part can be easily moved or operated by the user.
- Machinery and each component part has passed strict testing. (Council Directive on the approximation of the laws of the Member States relating to Machinery)

This manual contains shipping, handling, unpacking, initial checkout, operation, maintenance information, etc. It is divided into ten sections. Each section covers a specific aspect of the machine. This section contains a general description of the machine and other available documentation. We are going to introduce this smart machine now.

#### 1.2 EQUIPMENT DESCRIPTION

This automatic band saw machine is designed based on the guidelines of low cost and high performance. It is designed to cut various kinds of materials with the appropriate saw blade installed. The specific features of this band saw machine are as follows:

1. Concern for safety. This machine is designed to fully protect the operator from its moving elements while cutting.
2. When the saw blade is broken, the machine will stop automatically.
3. The machine will stop automatically when out of stock.
4. Dual valve system is designed to achieve optimal cutting performance with the simple setting of feed rate and perspective cutting pressure for different material.
5. The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

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



## GENERAL INFORMATION

### Section 1

#### 1.2.1 Specifications

##### Specification of The Machine

<b>MODEL</b>		C-300NC Numerical Control Automatic bandsaw	
<b>MAX. CAPACITY</b>		●	300 mm (12")
		■ (W×H)	300×300 mm (12"×12")
		■ (W×H)	340×300 mm (13.4"×12")
<b>SAW BLADE</b>	<b>SPEED</b>	20~100m/min (66~328fpm)	
	<b>SIZE(W×L× T)</b>	□ 3660L × 34W × 1.1T mm (144"×1.3"×0.042") □ 3820 ×34 ×1.1 mm (150.4"×1.3"×0.042")	
	<b>TENSION</b>	HYDRAULICALLY, (Factory adjusted)	
	<b>GUIDE</b>	CARBIDE, (Interchangeable)	
	<b>CLEANING</b>	By steel wire brush with a flexible drive shaft driven by main motor.	
<b>MOTOR OUTPUT</b>		HYDRAULIC	0.75 kW (1HP)
		SAW BLADE	3.7kW (5HP)
		COOLANT	0.1kW (1/8HP)
<b>HYDRAULIC OIL SYSTEM</b>		TANK CAPACITY	25 L (6.2 gal.)
		OUTPUT PRESSURE	27 kg/cm <sup>2</sup>
<b>COOLANT</b>		CAPACITY	45 L (11.2 gal.)
<b>FEEDING</b>		MODE	HYDRAULICALLY, Automatic
		LENGTH	Max. 6500 mm (Max. 650")
<b>WISE</b>	CONTROL METHOD		STATIONARY & MOVABLE HYDRAULIC VISE
	CLAMPING PRESSURE		23 kg/cm <sup>2</sup>
<b>MINIMUM LENGTH</b>	<b>CUTTING</b>	8mm	
<b>HEIGHT OF WORK BED</b>		650 MM (25.6")	
<b>NET WEIGHT</b>		1600 kgs (3520 lbs)	
<b>GROSS WEIGHT</b>		1800 kgs (3960 lbs)	

\* Design and specifications are subject to change without notice.



### 1.3 EMERGENCY STOP BUTTON



Your machine's emergency stop button is designed to be very easy to access. When you press it, it will stop the machine completely to avoid severe injury when an accident occurs.

You should press it immediately without hesitation in the following cases:

- Any emergency situation that would cause severe injury.
- Any abnormal situation or error, such as fire etc.

The button is going to be locked when you press it. To unlock it, you must pull it. Its appearance has red color and rubber material for safe operation. We hope you do not press this button inadvertently or otherwise.

### 1.4 GUIDE TO THE MANUAL



The instruction manual is divided into nine sections. Each section contains important information on how to operate the machine properly. Some of the safety precautions are described at the beginning of each section. Please read and understand the manual before operating the machine. For other technical information, please check with the dealer or the manufacturer for further detail.

### 1.5 DOCUMENTATION

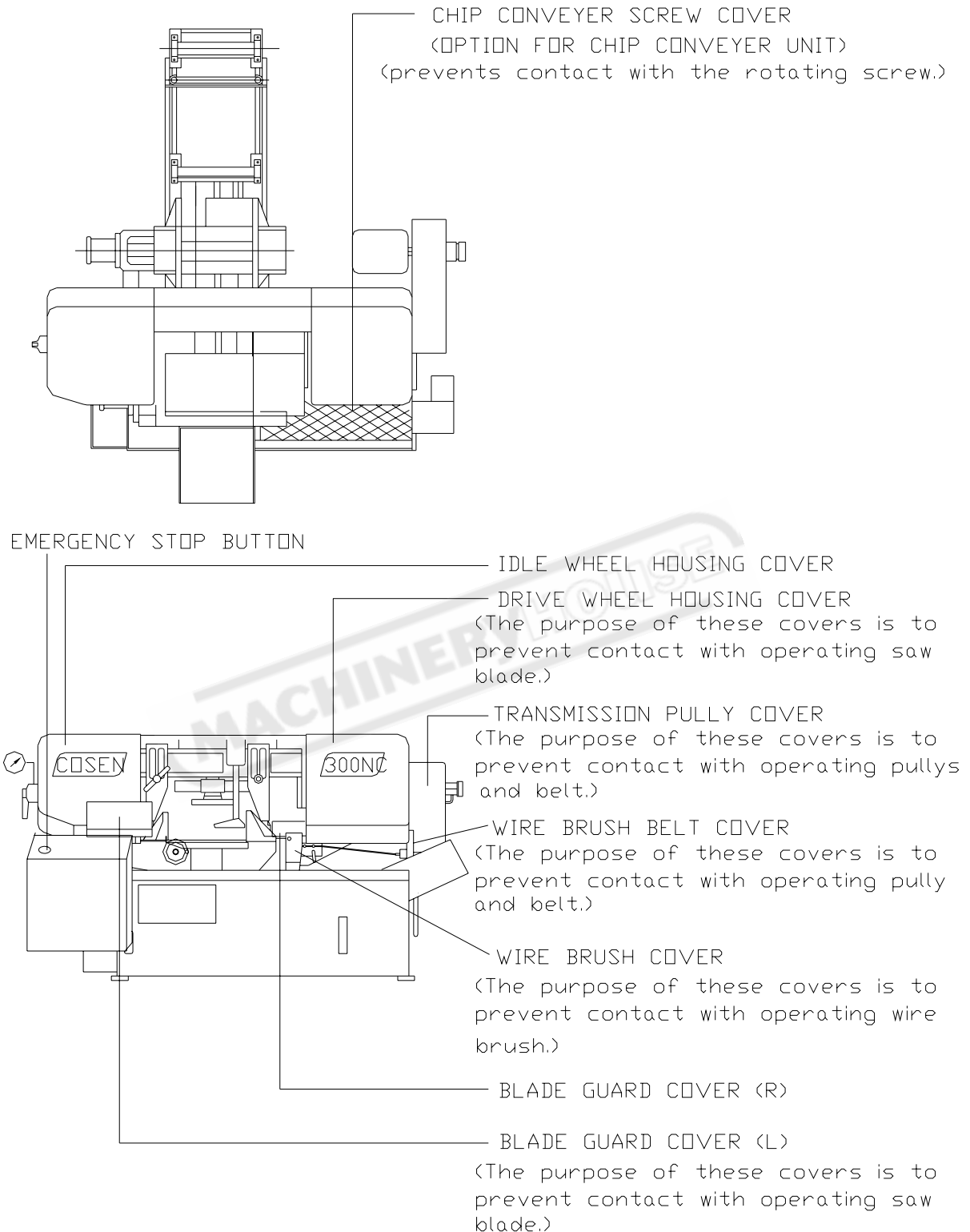
Other than this manual, the manufacturer also provided other related technical documents along with the machine. Please read through them should there be a need.





## GENERAL INFORMATION

### Section 1





# GENERAL INFORMATION

## Section 1

### 1.2.2. Identification of Machine Main Parts & Terminology

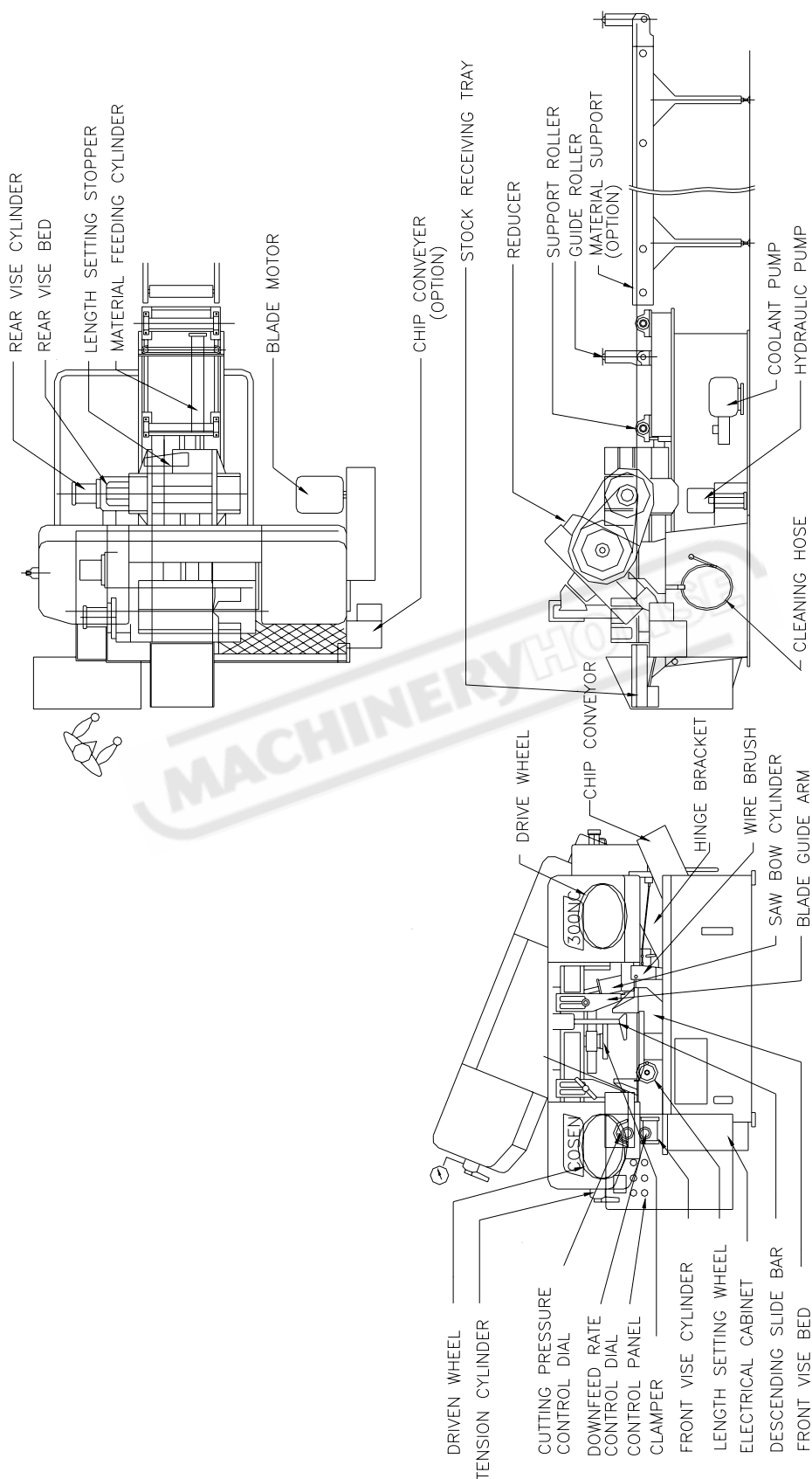
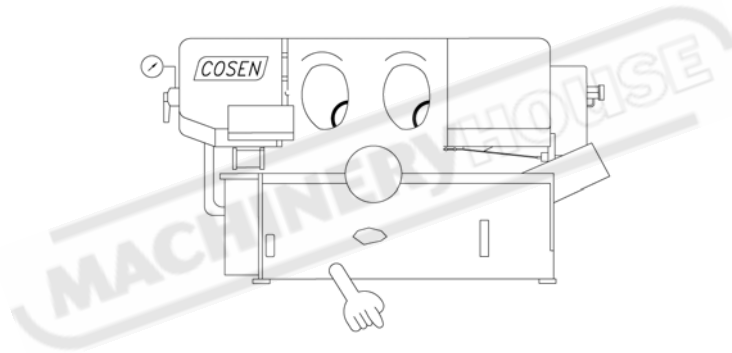


Fig.The main units of the machin

## *Section 2*

# **GENERAL SAFETY INSTRUCTIONS**





## GENERAL SAFETY INSTRUCTIONS

### Section 2

## SECTION 2

### GENERAL SAFETY INSTRUCTIONS

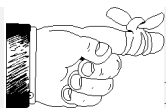
(Only for machine with CE certificated)

#### 2.1 INTRODUCTION

In designing this machine, many safety measures have been taken to prevent personal injury. However, there are still some risks remaining despite all the measures adopted. We then put protective devices at those places. Other than the safety hardware mentioned above, we have also put warning labels on the machine as a reminder to the user and listed all these risks in the manual. We separate all these items into three categories, i.e. danger, warning, and cautions. Please read all **DANGERS** signs to prevent death or severe injury. Read all **WARNINGS** to prevent personal injury, and read all **CAUTIONS** to prevent equipment damage. This section covers general safety rules. We also provide some risk analysis and procedures. The specific precautions for each section are described at the beginning of each subsection in the later sections. We also provide figure 2.1 for your machine at the end of this section.

#### 2.2 GENERAL SAFETY INSTRUCTIONS

Your band saw machine is designed to satisfy regulations of the Council Directive on the approximation of the laws of the Member States relating to machinery (89/392/EEC) - Annex I Essential health and safety requirements relating to the design and construction of machinery. This section will review the rules on the document, and check the current designs of band saw machines to be sure they adopt the requirements.



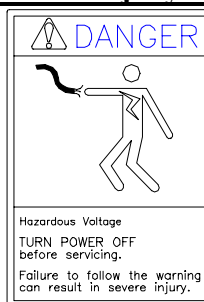
Please read each label carefully as following:



## GENERAL SAFETY INSTRUCTIONS

### Section 2

#### Read all **DANGERS** to prevent severe personal injury and death



- ✓ Red and white **DANGER** labels mean immediate hazards that will result in severe personal injury or death.

**DANGER:** Do not operate this machine unless it is completely assembled.

**DANGER:** Before doing any electrical work, disconnect the electrical power with the Main Power Disconnect switch.

**DANGER:** Before working near moving parts, disconnect the electrical power with the Main Power Disconnect switch.

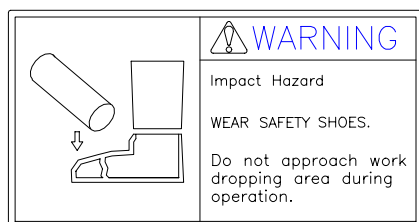
**DANGER:** Keep all guards and shields in place before installing or starting up the machine.

**DANGER:** 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.

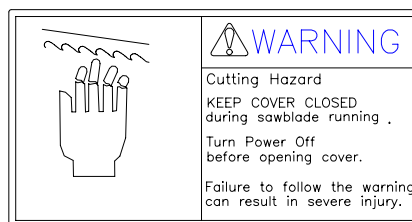
**DANGER:** Do not use the machine to cut explosive material or high pressure vessels. Since it will generate high heat during the sawing process that will ignite an explosion.

#### Read all **WARNINGS** to prevent personal injury

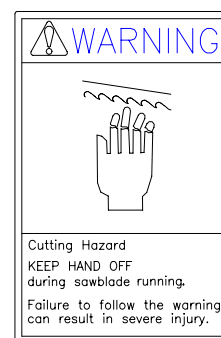
WARNING ABOUT WORK-PIECE



WARNING ABOUT WHEEL AND BLADE COVERS



WARNING ABOUT BLADE RUNNING



- ✓ Orange and black **WARNING** labels mean hazards or unsafe practices can result in severe personal injury or death.

**WARNING:** This manual has important safety information. All users must read it before performing any activity on the machine, such as replacing the saw band or doing regular maintenance.

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



## GENERAL SAFETY INSTRUCTIONS

### Section 2

#### Read all **NOTICES** to prevent equipment damage

<h3 style="color: blue;">NOTICE</h3>
<p>Replace the transmission oil after the first three months or 600 hours of operation and, thereafter, every one year or every 2500 hours of operation, whichever comes first.</p> <p>Recommended Oil: ISO VG-320</p>

- ✓ Blue and White **NOTICE** labels mean unsafe practices that could result in damage to products or property.

**NOTICE:** The transmission fluid of the speed reducer needs to be replaced.

#### Read all **safety labels** on the machine

##### GENERAL SAFETY PRECAUTIONS

<h3 style="color: blue;">SAFETY INSTRUCTIONS</h3>
<ol style="list-style-type: none"> <li>1. READ AND UNDERSTAND THE INSTRUCTION MANUAL AND WARNING SIGNS BEFORE OPERATING MACHINE. FAILURE TO FOLLOW THESE INSTRUCTION AND WARINGS CAN RESULT IN SERIOUS INJURY OR DEATH.</li> <li>2. Do not wear gloves, neckties, jewelry or loose clothing while operating.</li> <li>3. Always wear eye protection.</li> <li>4. Check blade tension and adjust blade guide before start cutting.</li> <li>5. Always clamp stock firmly in place before cutting and use auxiliary support for long material.</li> <li>6. Do not remove jammed or cut-off pieces until blade has stopped.</li> <li>7. Keep fingers out of path of blade.</li> <li>8. Guards should be in place and used at all times.</li> <li>9. Disconnect machine from power source before making repairs or adjustment.</li> <li>10. Do not operate while under the influence of drugs, alcohol or medication.</li> </ol> <p style="text-align: center; font-size: small;">DO NOT REMOVE OR DISFIGURE THIS WARNING SIGN.</p>

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



**Please do not make any decisions casually without first reading all safety instructions.**

## 2.4 NOISE LEVEL

Noise has a major effect on the quality of the environment at the work site. 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. A machine's noise come from the following:



## GENERAL SAFETY INSTRUCTIONS

### Section 2

1. Saw blade during cutting or material feed mechanism
2. Wire brush unit
3. Chip conveyor unit
4. Speed reducer
5. Hydraulic motor/pump
6. Belt transmissions variable speed motors
7. Blade motor
8. Coolant Pump
9. Drive wheel
10. Parts, machine 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 under 78 dBA. If your machine produces an undesirable noise while it is running, you should:

1. Be sure maintenance schedule has been followed exactly.
2. If yes, follow section 9 in this manual for system troubleshooting procedures.

### 2.5 SAFETY DEVICES AND GUARDS

#### Safety moving element:

All the major moving elements on the machine include:

1. Saw head assembly.
2. Saw wheels.
3. Saw blade guide/arm.
4. Saw blade guide roller.
5. Quick approach mechanism.
6. Wire brush.
7. Chip conveyor.
8. Workpiece clamping vises.
9. Material feed mechanism.
10. Multi vises.
11. Belt transmissions variable speed motors or step pulleys.

#### Safety related switches:

The safety related switches on the machine will be actuated in operating situations. The automation detector is a proximity sensor used to detect the motion of the drive saw wheel. Once the saw blade is broken, the driven wheel will stop running. The sensor will then detect this problem and then stop the machine. The power switch controls the main power of the machine.



## GENERAL SAFETY INSTRUCTIONS

### Section 2

The emergency stop switch on the control panel is a red button (with rubber material). It is used for emergency stop at any circumstance.

The saw wheel cover interlock switches located on the two wheel housings 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. The vise clamp switch is to assure firm clamping of the workpiece. If the workpiece is not clamped properly, the saw blade is not allowed to run.

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.

#### Guard mountings:

The locations of all safety guards on the machine are indicated above. All of these protectors should always be mounted on the machine whenever the machine is running. Users are not allowed to move any of these elements under any circumstances except when servicing the machine. However, even skilled service technicians still have to be very careful 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 is not lost and damaged.

## 2.6 SPECIFICATION OF ELECTRICAL EQUIPMENT

Electrical equipment is very important to the control system. Your machine is a new type system designed for safety by our engineers. We describe briefly as follows:

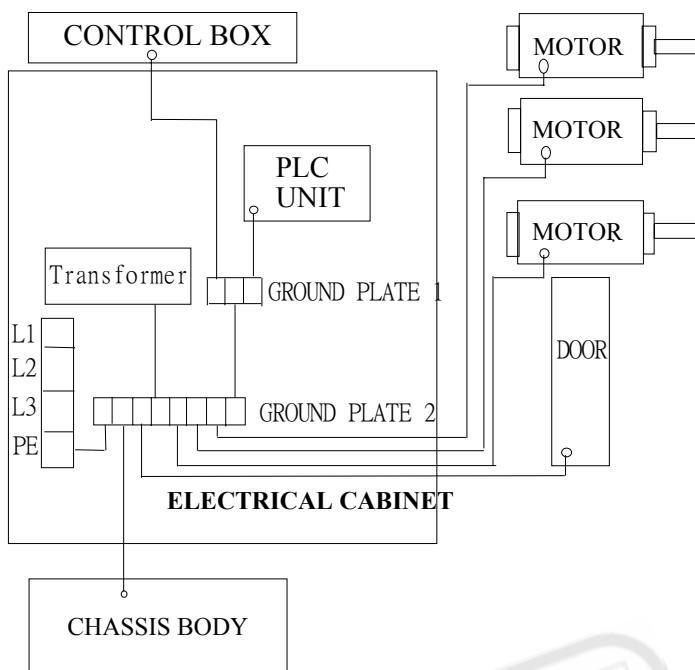




## GENERAL SAFETY INSTRUCTIONS

### Section 2

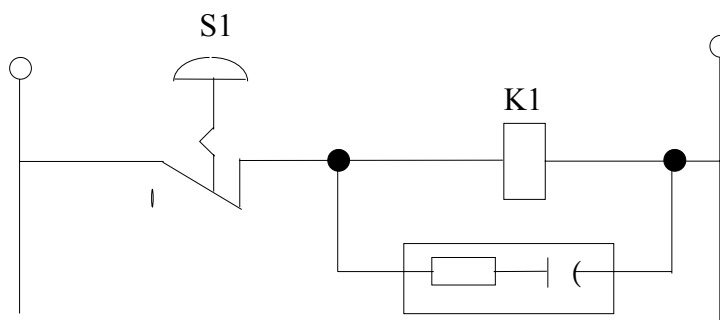
#### GROUND DIAGRAM



#### EMC PROTECTION

1. Provides spark killers on each AC motor, AC control relay.
  - a. AC Motor : Spark killers are connected between motor phases.
  - b. AC control relay : Spark killers are connected between coil of AC control circuit.

AC110V



2. Waveform measurement circuit and measured waveform.
3. RC circuit

Element marker have introduced in recent years spike killers (sometimes called arrester) which are made of mainly zinc oxide with a characteristic of varistor. Comparison of their characteristics toward surge voltage indicates that the former has a smooth attenuation curve with the crest value of a steep surge voltage being less than 4.5 times of the rated voltage. Noise



## GENERAL SAFETY INSTRUCTIONS

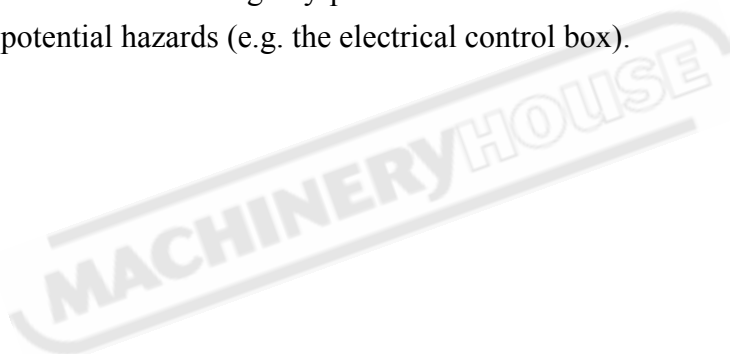
### Section 2

entering a signal line due to electromagnetic induction is considered due to the magnitude of noise change rate rather than due to the noise crest value of the noise generating source. The attenuation waveform of the RC is therefore less unlikely than the pulse waveform of the arrester to cause electromagnetic induction. The RC compound element is thus considered better in noise elimination.

Due to the reasons mentioned above, mount a RC compound element on each of AC motor, AC solenoid and AC control relay.

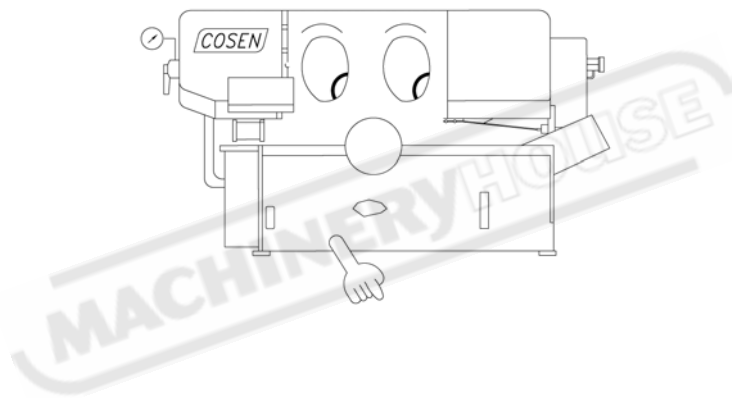
### 2.7 RISK ASSESSMENT

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 3*

## **MOVING AND INSTALLATIONS**





## MOVING AND INSTALLATION

### Section 3

## SECTION 3

## MOVING AND INSTALLATION

### 3.1 INTRODUCTION

Your machine is made of three main system components: Machine equipment, hydraulic system, and electrical control system. Please read the entire manual carefully to obtain a thorough knowledge of the machine. This section describes how to move and install the machine to prevent personal injuries and machine damage. Do not operate the machine by guesswork. Keep the manual at hand and refer to it whenever you are not sure of how to perform any of the procedures.

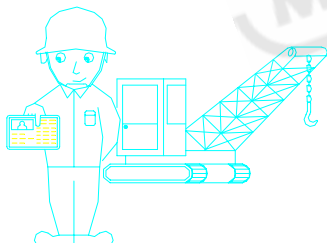
### 3.2 MOVING THE MACHINE

When moving the machine, we strongly suggest that you follow the carrying and cleaning methods described to keep your machine in the best working condition. You can choose any one of the methods described below to move your machine:

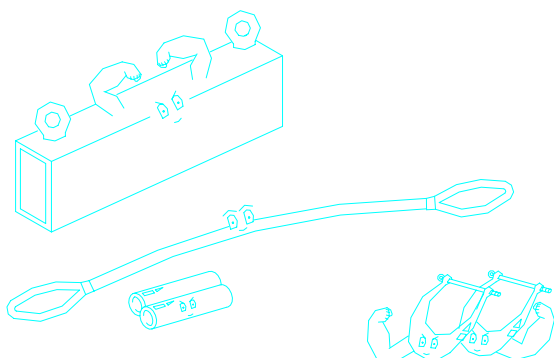
#### Carrying:

##### *1. Use crane to place*

Carry the machine to its designated location by using a crane and a wire rope sling that can fully withstand the weight of the machine. Apply the wire rope sling to the lifting hooks at the rear of the front vise slide and to the rear end of the machine. Slowly lift the machine while taking care so that the machine is not shocked and that the wire rope does not interfere with the saw-head.



- To move your machine with a crane, you must have a crane's qualification license.

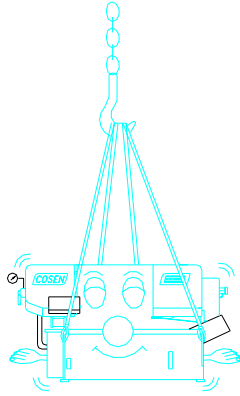


- You must use tools and equipment with the proper tensile strength and use proper method when moving your machine.

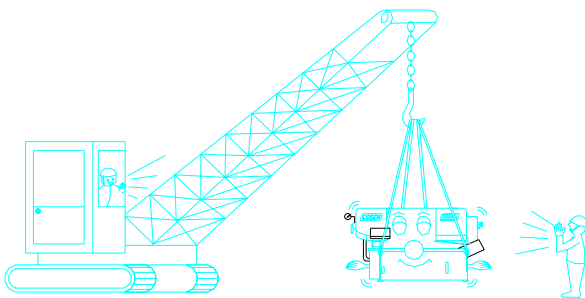


## MOVING AND INSTALLATION

### Section 3



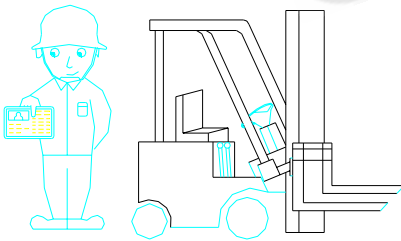
- Apply the wire rope sling to the lifting hole at rear of the front vise slide and to the rear end of the machine. Please keep the machine balanced rear-front and left-right side when you are lifting up the machine.



- When you work together with more than two people, it is best to keep contact with each other by voice for safety.

#### 2. Use forklift to place

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.

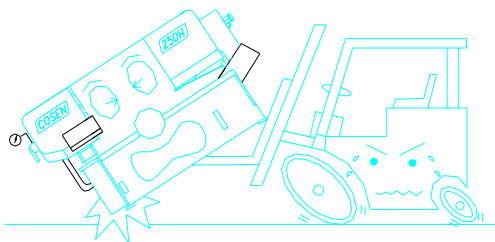


- You must have a qualification license to operate forklift for moving your machine.

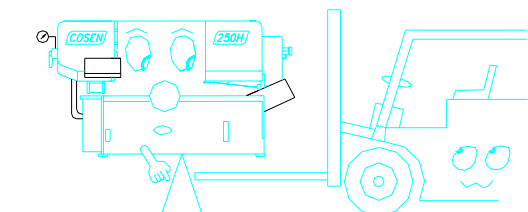


## MOVING AND INSTALLATION

### Section 3



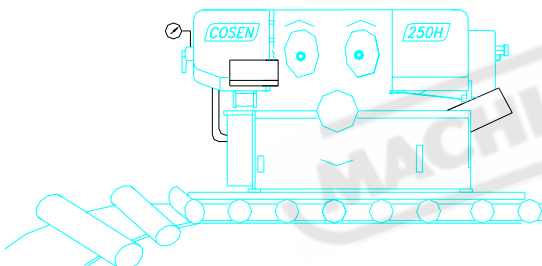
- You must apply proper forklift technique to avoid damage to the machine.



- You also have to keep the machine balanced at all times.

#### 3. Use rolling cylinders to place

You can use this method in small buildings.



- You have to use adaptable stand wood material of proper compressive strength.
- You have to use adaptable rolling cylinder material of proper compressive strength.

#### **Cleaning:**

After the machine has been placed on the correct position, remove the rust-preventive grease with wiping cloth dampened with cleaning oil or kerosene. Apply machine oil to the machine surfaces that are susceptible to rusting.

- Do not remove the rust-preventive grease with a scraper or the like. Do not wipe the painted surfaces with solvent.

### 3.3 INSTALLATION OF THE MACHINE

This band saw machine has been designed and manufactured in accordance with the latest technical standard on safety regulations. Naturally, such a machine tool has a few potentially hazardous locations. So, we strongly suggest following the general rules and regulation on safety precautions and particularly those, given below:



## MOVING AND INSTALLATION

### Section 3

#### 3.3.1 Safety Precautions



Read the operating manual thoroughly to avoid improper operations.

##### Environment:

- Avoid exposing machine to direct sunlight.
- Keep the room temperature between 5° to 40°.
- Keep the humidity of your machine at 30%-95“(without condensation) to avoid dew on electric installation and machine.
- Keep machine away from vibration of other machines.
- Please avoid uneven ground.
- Please avoid wet through water or heavy dust from other machines.

##### Power supply:

- Supply voltage: 90% - 110 % of nominal supply voltage.
- Source frequency: 99% - 101 % of nominal frequency.
- Please avoid using same power supply with electric spark machining, electric welder. Because of unstable electric tension, it may prevent your machine electric installation from working properly.
- Please connect with power supply independently and directly.
- Please use correct electric capability, electric tension, 50/60 Mz.
- ✎ Supply electric power to the machine from a source different from those for welding or other machines that produce electric noise. Ground the machine with an independent grounding conductor.
- ✎ Limit the supply voltage variations to within  $\pm 10\%$
- Have to connect to earth to ground machine.

#### 3.3.2 Initial Inspection

1. You have to confirm that your machine is the correct type ordered.
2. Check machine surface and equipment furnished.

If you find any problem, please contact dealer. ☎

#### 3.3.3 Space Required

Leave enough space around the machine for loading work and unloading cut-off pieces as well as for maintaining and inspecting the machine.

The table and illustrations are as follows:

NO.	MAIN SECTION	NO.	MAIN SECTION
1	Machine Body	6	Hydraulic Unit
2	Electrical Control Box	7	Hydraulic Hose
3	Bed assembly	8	Roller Table
4	Work feed bed assembly	9	Optional Chip Conveyor
5	Hydraulic cylinder	10	Optional Roller Table

#### 3.3.4 Unpacking



## MOVING AND INSTALLATION

### Section 3

- After the machine has been properly positioned, remove the shipping bracket.
- Unpack your machine carefully. Do not damage the machine surface paint.
- Remember to remove the bracket used to lock the saw frame and the saw bed.
- Be sure to retain this bracket so that it can be used again in the event that your machine must be relocated.



BRACKET

#### 3.3.5 Equipment Furnished

Your machine has a set of tools to maintain machine to keep it running. Cutting ease and efficiency can be maintained with proper care. We list the standard accessories and illustration as follows :

1. Tool box	1 pc
2. Grease gun	1 pc
3. Screw drive(+, -)	2 pcs
4. Open end spanner	3 pcs
5. Hexagon wrench	1 set
6. Operation & parts book	1 pcs

#### 3.3.6 Installation Procedure

Your machine is easier to install than other brand type. Following this manual, you can do it yourself step by step. The six major steps are fixing the machine on the floor, machine leveling, installation of feed roller, cutting fluid supply, hydraulic oil supply, and electrical connection.





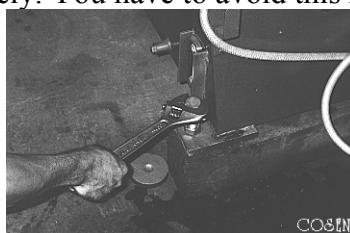


## MOVING AND INSTALLATION

### Section 3

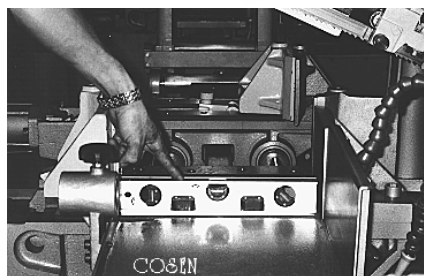
#### ◎ Fixing the machine on the floor

1. For best performance, the band saw has to be placed on a solid and level foundation. The floor is recommended to have a carrying capacity of approximately 3 tons (including both machine and material weight).
2. It also has to be bolted to the floor, and it has to have shock absorption pads on the floor for level regulating.
3. You have to leave sufficient space for operator and large material supplies. It will ensure safety.
4. If a crane is used to lift the machine, make sure that the lifting cable is properly attached to the machine as shown below:
  - ☛ Be careful to protect the machine from impact or shock during this procedure. Also watch out for your fingers and feet.
5. Other machinery may cause vibration or dust for your machine. It will prevent machine from working effectively. You have to avoid this kind of situation.



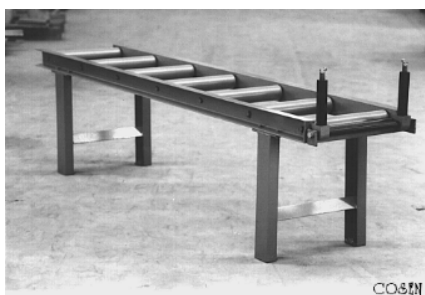
#### ◎ Machine leveling

- Place spirit levels on the vise slide plates and the work feed table, and adjust the left-and-right and fore-and-aft level of the machine with leveling bolts.
- The fore-and-aft level should be adjusted correctly. The level of the rear of the machine is approximately 20 mm higher than the level of the front end. This will allow the proper return of the cutting fluid for working. The illustration is as follows:
  - ☛ Be sure to ascertain that all leveling bolts evenly support the weight of the machine.



- ☛ Use a level gauge to make sure that the platform is flat and even at all angles.

#### ○ Installation of feed roller



If you plan to cut long work pieces, please arrange the roller table and roller stand behind the machine.

- ☛ The roller table and roller stand should be level with the machine itself.

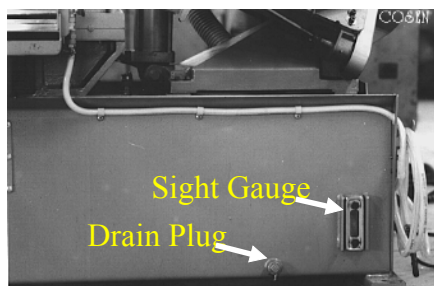


## MOVING AND INSTALLATION

### Section 3

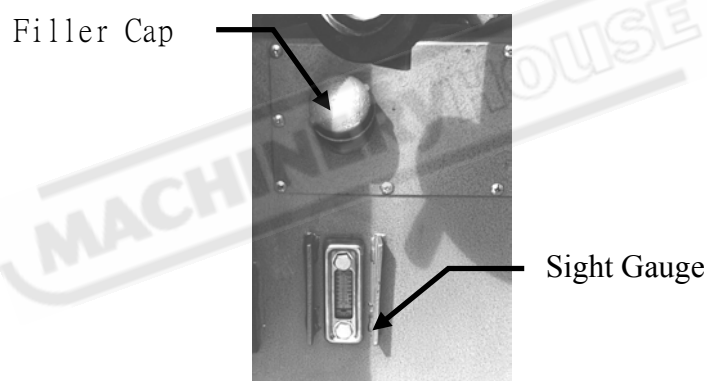
#### ◎ Cutting fluid supply

Fill the cutting fluid tank with the proper cutting fluid mixture. If Shell Dromus BS or Shell Lubricool Yellow Cutting Fluid is used, the ratio of cutting fluid to water should be approximately 1:15~1:20. Check the sight gauge to ascertain the fluid level in the tank. Tank capacity: 80 liters.



#### ◎ Hydraulic oil supply

Open the filler cap. Please fill the hydraulic oil tank with the hydraulic oil furnished with the machine. Check the sight gauge to ascertain the oil level in the tank. (Oil tank should be full already if it is a new machine)



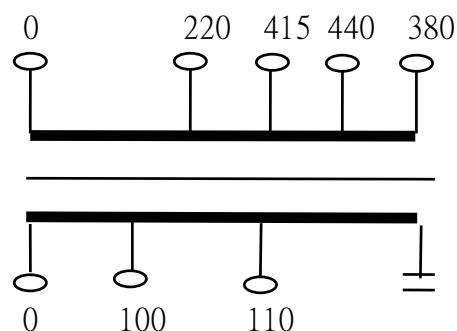
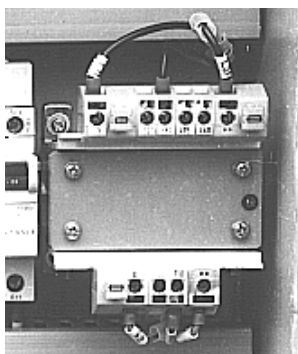
#### ◎ Electrical Connections (Power Requirement)

- Open the electrical enclosure door and connect the power supply cable to the circuit breaker (N.F.B.) terminals that are indicated by the arrow in the illustration below :
- Be sure to connect the ground cable to the ground terminal. The power supply to your machine should agree with the wiring voltage that is indicated on the label attached to the electrical enclosure.
- If the power line voltage is changed, change the wiring of the transformer and motors, and reset or replace the thermal relays shown as follows:
  - ☛ 220 V- 50 Hz
  - 380 V- 50 Hz
  - 415 V- 50 Hz
  - 440 V- 50 Hz



## MOVING AND INSTALLATION

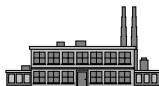
### Section 3



#### ⦿ Installing Fire Control Device

Install a fire extinguisher or other fire control device in the shop to provide safety.

### 3.4 WORKING CONDITIONS



For safety in operating working, we recommend the following:

- ✧ A well lighted work site.
- ✧ To prevent operator from slipping, keep floor dry.
- ✧ Keep dust from other machines away from electrical control facilities.
- ✧ Except operator, please do not anyone or anything near your machine for safety.

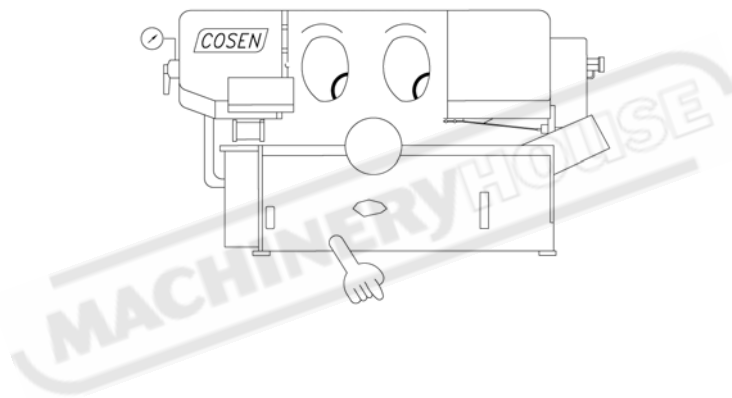
### 3.5 RESHIPMENT PROCEDURE

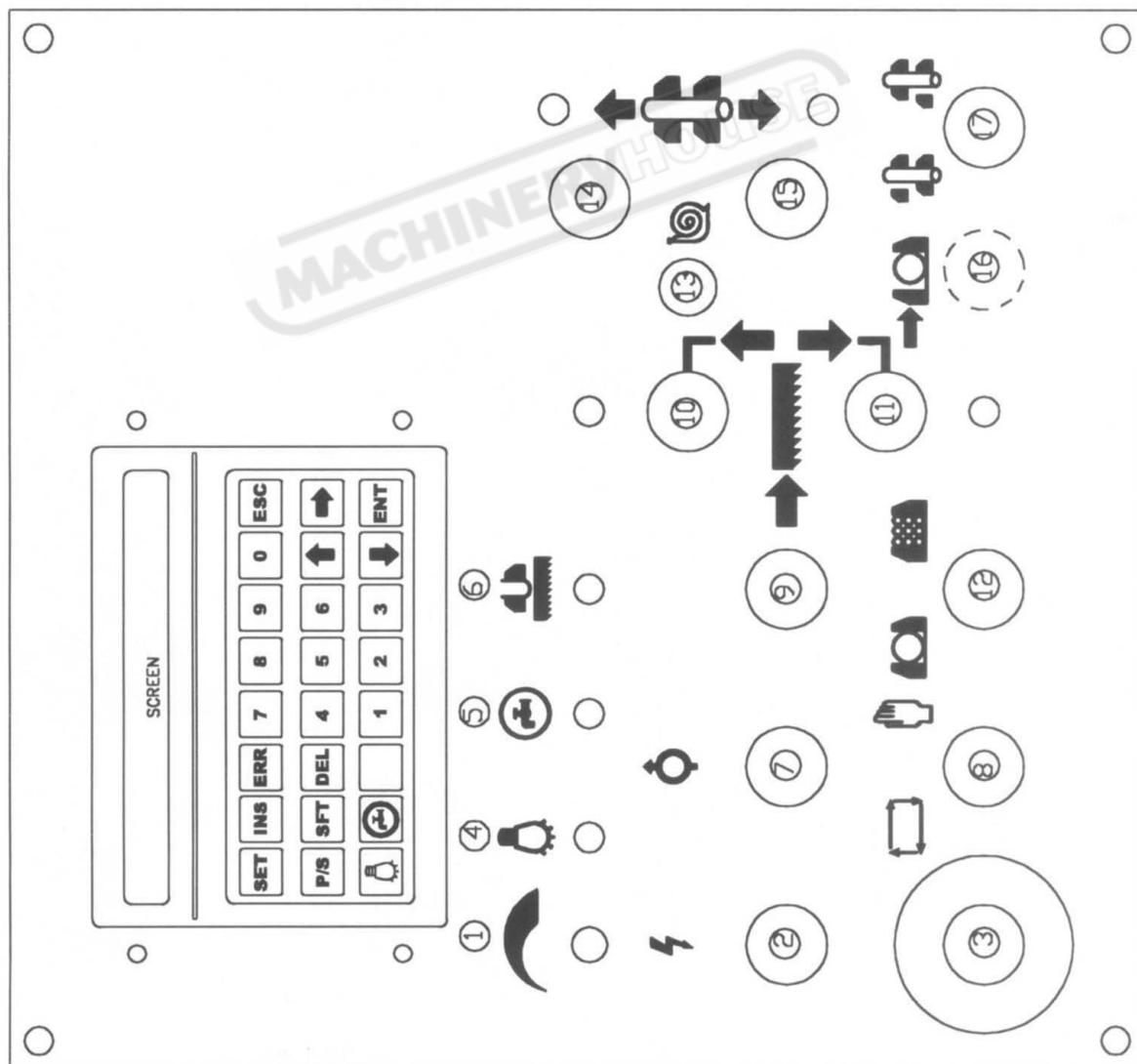
We recommend you do the procedures as follows:

1. Turn off the power.
2. Fix the saw head.
3. Pack machine with plastic bag or soft paper to protecting it from dust.
4. Pack your machine (with bracket) carefully, and 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 reship with equipment furnished, shock absorption pads and operating book.

## *Section 4*

# OPERATION INSTRUCTIONS

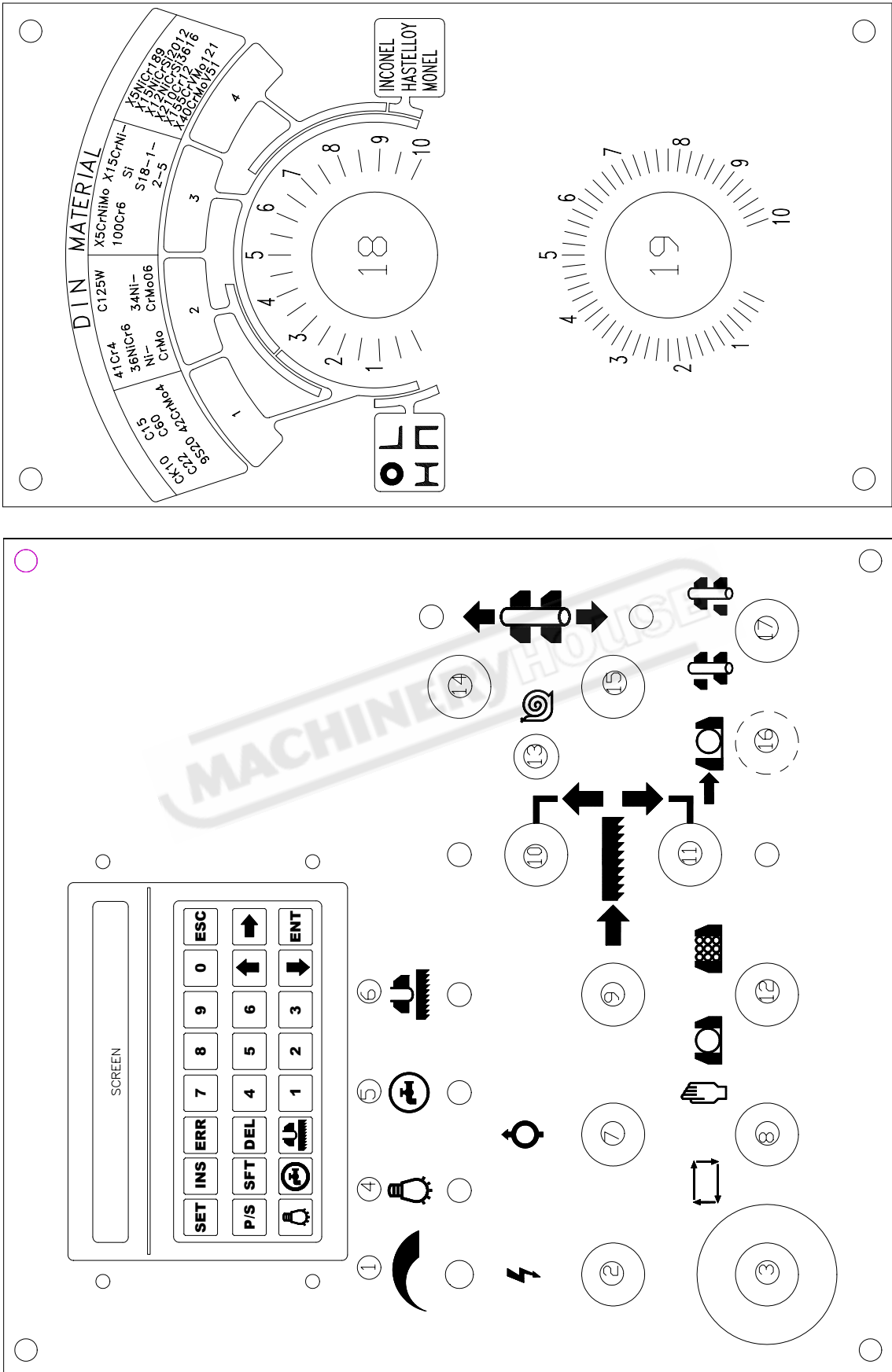






OPERATING INSTRUCTION

Section 4



**SECTION 4****OPERATING INSTRUCTIONS****4.1 SAFETY PRECAUTIONS**

For your safety, please read and understand the instruction manual before you try to operate your machine. The operator should always follow the guidelines:

- ✓ • The machine can only be used its designated purpose.
- ✓ • Do not wear gloves, neckties, jewelry, long hair or loose clothing.
- ✓ • For eye protection always wear protective safety glasses.
- ✓ • Check blade tension and adjust blade guides before starting out.
- ✓ • Always clamp stock firmly in place before cutting and use auxiliary support for long material.
- ✓ • Do not remove jammed or cut-off pieces until blade has stopped.
- ✓ • Keep fingers out of path of blade.
- ✓ • Guards should be in place and used at all times.
- ✓ • Disconnect machine from power source before making repairs or adjustments.
- ✓ • Protective gloves should be worn for band saw changes.
- ✓ • Do not operate while under the influence of drugs, alcohol or medication.
- ✓ • Please do not leave the machine with eyes in any operating.
- ✓ • Please put utility cart or the warning signal to stop people coming up.

**4.2 PREPARATION FOR USE**

The selection of an appropriate saw blade and cutting method is important for cutting, work safety and efficiency. Select an appropriate saw blade and cutting method by fully considering the work to be cut and the requirements of your job(such as cutting accuracy, cutting speed, economy, and safety control).

**Cutting method:**

If you choose dry cutting and low speed of saw blade, the chips may accumulate in machine parts and may cause the operation or insulation failure of the machine. We suggest you choose wet cutting to avoid machine damage. You can refer to chapter 7 for experience data.

**Cutting unknown materials:**

Before cutting an unknown material, consult the supplier of the material, burn a small amount of chips from the material in a safe place, or follow any other procedure to check to see if the material is flammable or not.

- ☛ Never take eyes away from machine during cutting operation.

**Cutting oil:**

If economics are not of critical concern, you can try oil-based cutting fluids. We always suggest you to use water-soluble cutting fluids. The comparison table for it is as follows:



## OPERATING INSTRUCTION

### Section 4

Advantage	Disadvantage
Have high cooling effect	Remove paint
Not flammable	Lose rust protection effect when deteriorated
Economical	Foam
Does not require cleaning of cut products (especially when soluble)	Putrefy
	Decline in performance, depending on quality of water used for dilution

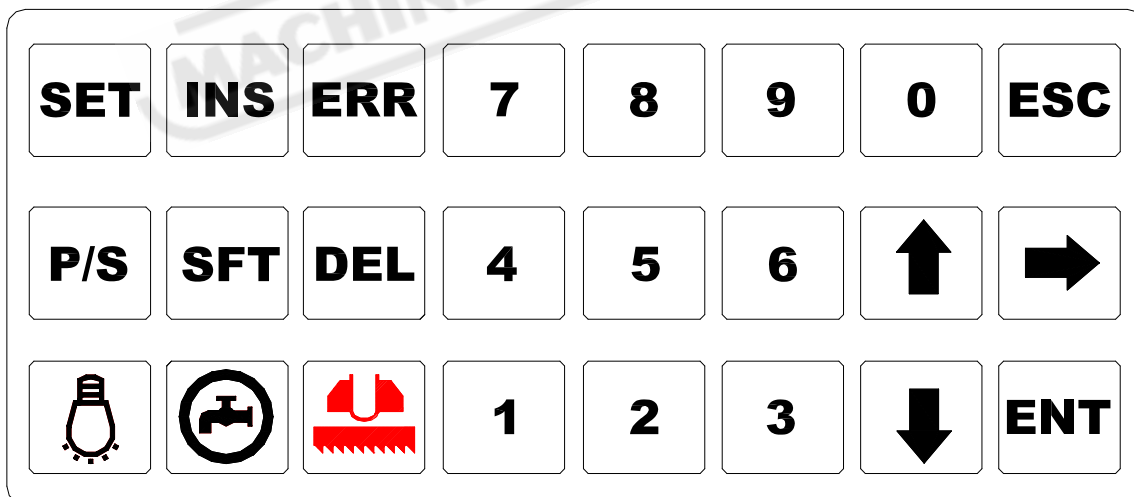
If Shell Dromus BS or Shell Lubricool Yellow Cutting Fluid is used, the ratio of cutting fluid to water should be approximately 1:15~1:20. Check the sight gauge to ascertain the fluid level in the tank. Tank capacity: 38 liters(10 gal.)

☛ Never work with pure water only.

### 4.3 CONTROLS DESCRIPTION AND OPERATION

Here we briefly describe the control panel, manual mode, automatic mode and identification of failure condition.

SNC 20 Control Panel Illustration (option)



Operational Ambient Temperature	5 ° C~50 ° C	Saving Ambient Temperature	-10 ° C~60 ° C
Ambient Humidity	30%~85% RH (non-condensed)	Connection to	RS422 MMI port
Environment	No condensed droplet & no corrosion		

Notice: The setting value of SNC20 only could be modified under MANUAL MODE.





## OPERATING INSTRUCTION

### Section 4

1. LCD screen : After the machine on, the below message will be shown on LCD screen.

**** Welcome to ****
SMART NC-20 SYSTEM

2. SET : Press this button for switching between “Auto mode” and “Cutting piece program setting”.

Pressing Once → Auto mode

Auto mode

NO.	LENTH	CNT
01	0100.0	002

Pressing Twice → Cutting piece program setting

NO	LENTH	COUNTER
01	0100.0	005

NO : Section no.

LENTH : Length (Max. 6,500mm)

COUNTER : Preset Cutting Quantity

\* This mode is only available under the manual mode.


3. P/S : Feeding position and blade turning speed (Press SET or ESC to exit.)

LENTH	SPEED(M/m)
0110.9	00000

After press ESC, press P/S twice, the blade life will be displayed.

☛ Under this mode, press DEL to reset the blade life and ESC to exit.

BLADE LIFE : 00006 hrs
DEL-RESET / ESC-EXIT

4.  : Work light control

5.  : Page up





6.  : Shift right

7.  : Page down



## OPERATING INSTRUCTION

### Section 4

8.  : Coolant Supply
9. INS : No Function
10.  : After cut off, the saw frame stays at the lower limit switch and the material retract 2mm automatically.
11. ERR : Error message display. Press  or  for switching page.

ERROR CODE	Message
01 N/A	
02 LEFT WHEEL COVER WITHOUT CLOSE	The cover of the left wheel cover does not close.
02 BLADE BREAKAGE	The blade is breakage or slippage.
04 OVER RELAY ACTIVE	The inverter is running abnormal.
05 OVER RELAY ACTIVE	The hydraulic motor is running abnormal.
06 OVER RELAY ACTIVE	The coolant pump is running abnormal.
07 N/A	
08 N/A	
09 N/A	
10 NO MATERIAL	Without material.
11 RIGHT WHEEL COVER WITHOUT CLOSE	The cover of the right wheel cover does not close.
12 COUNTER UP, STOP AUTO-CYCLE	The preset counter piece is achieved.
13 N/A	
14 N/A	
21 ZERO Err	The forward limit switch operates abnormally.
22 ZERO Err	The backward limit switch operates abnormally.
23 POSITING Err	Incorrect stop position.
24 POSITING Err	The upper limit switch is abnormal.
26 RISING Err	Incorrect action of the saw bow.
28 FEED FORWARD Err	
30 2mm BACK Err	This message will show up when feed back over 4mm.

ESC → Exit

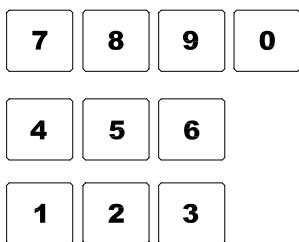
12. ESC : EXIT
13. DEL : Pressing DEL + DEL → Clear all of the program setting  
Pressing once → Reset the blade life
14. ENT : ENTER
15. SFT : SHIFT



## OPERATING INSTRUCTION

### Section 4

#### 16. Numerical Input code :



#### Control Panel Description



1. **BLADE SPEED CONTROL KNOB**  
The blade speed is controlled by the inverter installed underneath the bed and the blade speed can be increased by turning this knob clockwise.
2. **POWER INDICATOR LAMP**  
Indicates that the power of band saw machine is turned on. Light comes on when you turn on machine circuit breaker switch on the electrical enclosure for machine. This lamp indicates preparation for start-up.
3. **EMERGENCY STOP button**  
Press to stop the machine in an emergency. When you press it, it brings the machine to a total stop. The button locks when pressed and must be turned to unlocked it.
4. **WORK LIGHT indicator**  
This light on when the knob on SNC 20 is pressed.
5. **CUTTING FLUID SUPPLY indicator**  
This light on when the knob on SNC 20 is pressed.
6. **STOCK 2mm PULL BACK indicator**  
This light on when the knob on SNC 20 is pressed.
7. **HYDRAULIC MOTOR ON/OFF button(with light)**  
ON mode(green color button):
  - Press to start the hydraulic pump motor.
  - When pressed, it turns on the built-in light and starts the hydraulic pump motor.
  - This button is only valid under Manual Mode.
  - This button is disabled when the EMERGENCY STOP button “number 3” is pressed and locked.
    - ☛ When the hydraulic motor is on, the chip conveyor will run at the same time, please keep your hands away from chip conveyor.OFF mode(red color button):
  - Press to stop the hydraulic pump motor.
  - When pressed, it turns off hydraulic pump motor and the built-in light.



## OPERATING INSTRUCTION

### Section 4

#### 8. AUTO/MANUAL selectswitch

Use to select automatic or manual mode of operation. When the switch is turned to MANUAL() , you can operate each function individually. When the switch is turned to AUTO() , the machine automatically operates according to the preset cutting data.

- ☛ When the machine is first started in the MANUAL mode and then switched to the AUTO mode, the first cut is not counted, but the machine automatically operates according to the preset cutting data. This function can be used for the machine to automatically cut the work after it trims the end of the work.
- ☛ In the automatic mode, when the switch is turned to MANUAL during cutting, the machine stops on completion of the cut, and when the switch is turned to MANUAL during the operation other than cutting, the machine stops immediately.

#### 9. BLADE DRIVE ON/OFF button (with light)

ON mode:

- Press to start the saw blade motor.

OFF mode:

- Press to stop the saw blade motor.
- ☛ The saw bow must be on the top position when press to drive blade “on” or the circulation under the automatic cutting will be effected.



#### 10. BLADE UP button

When this button is depressed, the saw head ascends. The saw head stops ascending when the button is released.

#### 11. QUICK APPROACH button

While this button is depressed, the saw head descends quickly. This button is used to allow the saw blade to approach the workpiece quickly when the saw blade is at a distance from the workpiece. Before the saw blade comes in contact with the workpiece, this button should be released to stop its descent.

#### 12. SINGLE / BUNDLE CUTTING selectswitch


- To cut a single piece of work, set the switch to () . The rear vise will automatically move to backward limit (starting point).
- To cut a stack of workpieces, set the switch to () . The rear vise will automatically move to forward limit.
- ☛ **Notice to select optimum cutting mode under the manual mode.**

#### 13. SNAIL FEEDING

Turn this function on, the feeding speed will be slow down. The accuracy of stock position will be obtained easily.

- ☛ Only functions under Manual mode.

#### 14. FEEDING BACKWARD button

- Press to feed the stock backward.
- The rear vise cannot be moved backward if the front vise and rear vise are both closed. The rear vise cannot be moved either if the quick approach feeler is in contact with the work, or is raised and locked.
- The button is engaged when “number 8” AUTO/MANUAL selectswitch is turned to “”.




## OPERATING INSTRUCTION

### Section 4

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

#### 15. FEEDING FORWARD button

- Press to feed the stock forward.
- The rear vise cannot be moved forward if the front vise and rear vise are both closed. The quick approach feeler may be damaged if the rear vise is moved with the work clamped and in contact with the quick approach feeler.
- The button is engaged when “number 8” AUTO/MANUAL selectswitch is turned to “”.

#### 16. VISE OPERATION BUTTON

Press this button and the rear and front vises will open or close until release the button.

- ☛ The motion of rear and front vises will accord to the No. 17 Vise clamp selectswitch.

#### 17. VISE CLAMP selectswitch



mode:

Press to close the front vise.

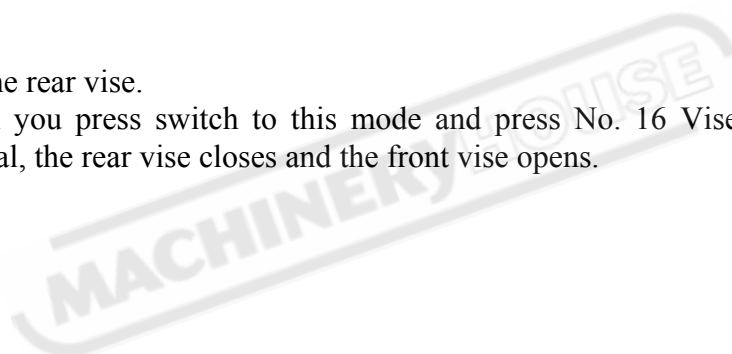
- When you press switch to this mode and press No. 16 Vise operation button under manual, the front vise closes and the rear vise opens.



mode:

Press to close the rear vise.

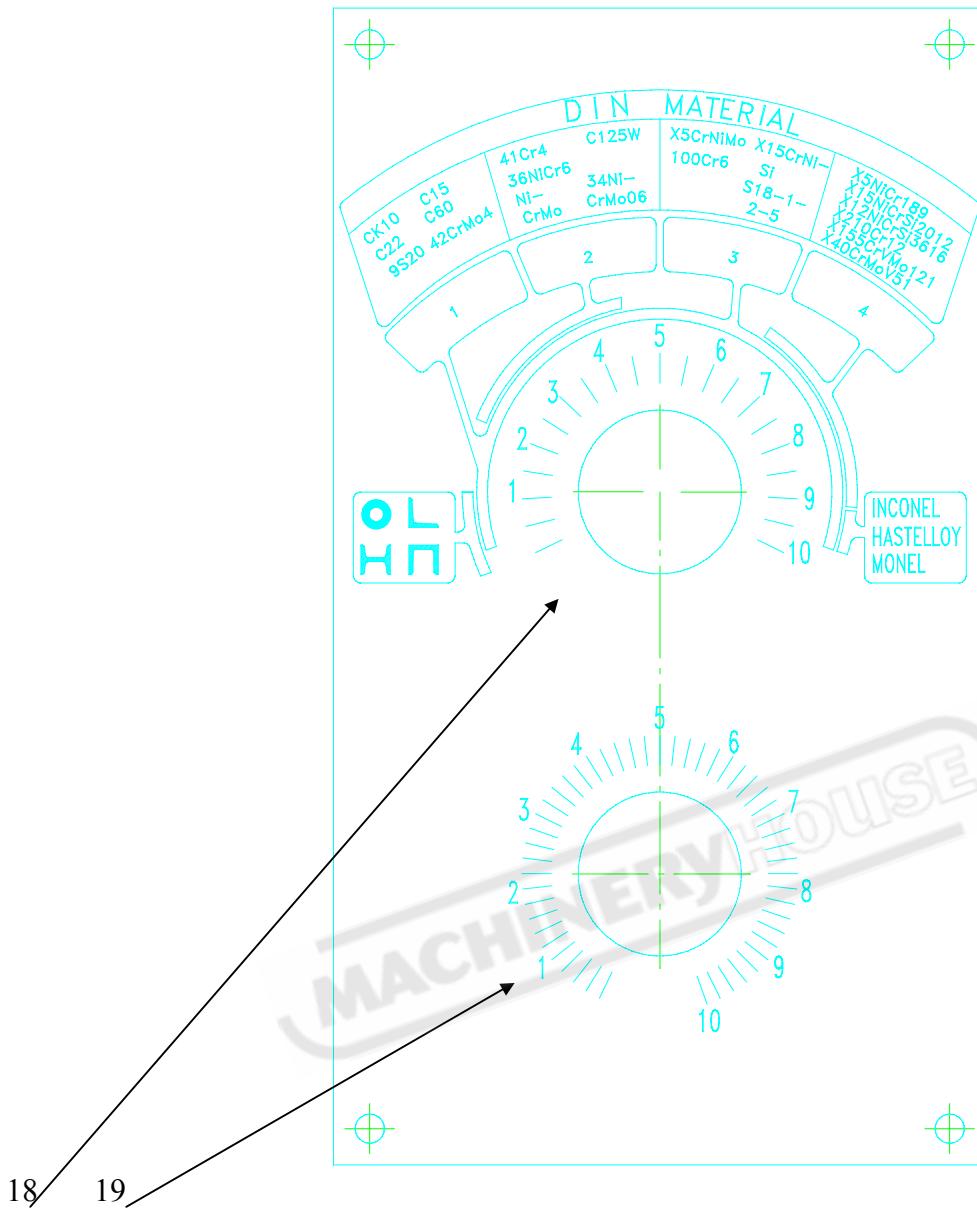
- When you press switch to this mode and press No. 16 Vise operation button under manual, the rear vise closes and the front vise opens.





# OPERATING INSTRUCTION

## Section 4



### Cutting Parameters Control Panel

#### 18 Cutting Pressure Control Dial

This control dial is used to control the cutting pressure applied to the material during the cutting period. Proper cutting pressures are supposed to be chosen to achieve the most effective cutting conditions when cutting different materials. Turn this dial to a colored position corresponding to the material to be cut.

#### 19 Saw Blade Downfeed Rate Control Dial

Choose this control dial to adjust the downfeed rate of the blade. The **cutting time** and the **roughness of the cutting surface** are determined by this parameter.

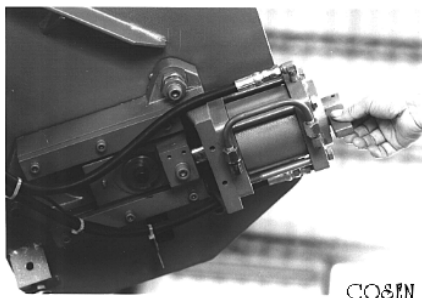




## OPERATING INSTRUCTION

### Section 4

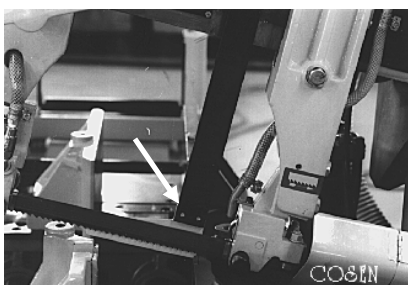
#### 4.4 STANDARD ACCESSORIES

##### Blade Tension Device



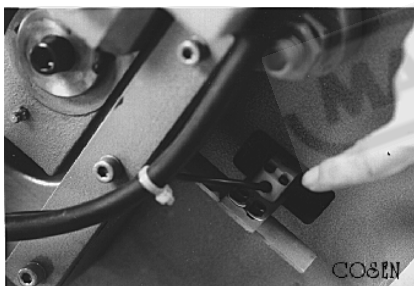
This device provides for adequate blade tension (with the aid of the hydraulic cylinder). To provide the saw blade with tension, turn the selector to “”. Should the saw blade be broken during operation, the safety device automatically activates and stops all machine operation. The limit switch of the safety device is reset by turning the blade tension selector to “” position.

##### Quick Approach Device



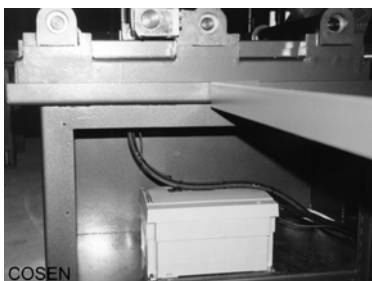
This device is used to allow the saw blade to descend to position quickly, just above the position at which the saw blade reaches the workpiece.

##### Motion Detector



This device protects the saw blade to avoid damaging people and machine in case the blade overloads during cutting. Also, if the saw blade is broken, or slips, the driven wheel will stop in ten seconds.

##### Inverter



The inverter is installed in the base. It controls the rotation speed of the blade speed. The blade speed can be settled stepless during the cutting period. Control the blade speed by turning the blade speed control knob on the control panel.

**\* Not available for the local voltage over 460V**

- Note:**
1. Check the state and tightness of connections.
  2. Ensure that the temperature in the area around the equipment remains at an acceptable level, and that ventilation is effective.
  3. Ensure the speed controller is free from dust.

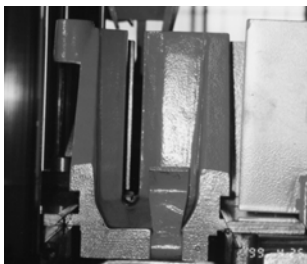
For repairs and replacement on Inverter, consult your agent



## OPERATING INSTRUCTION

### Section 4

#### Split Front Vise



The split front vise holds the workpiece tightly. Even when cutting the short or profiled material, the work also can be clamped on both front and rear side of the blade simultaneously and securely.

#### Gear Reducer



Gear Reducer

Motor

The Gear Reducer is specially designed for the high transmission purpose.

**Note: Refer to Section 6 about the maintenance of the gear reducer.**

### 4.5 OPTIONAL ACCESSORIES

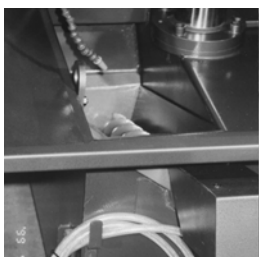
#### Vise Pressure Regulation Valve



This valve is used to control the pressure of the vise. When cutting the tube or soft material, it is necessary to lower the vise pressure to avoid the heavy vise pressure affects the material shape. Adjust the pressure according to different material. Remember not to adjust the pressure lower than 5 kg/cm<sup>2</sup>.

**Note : Don't adjust the pressure during cutting period.**

#### Chip Conveyor



The chip conveyor screw will drill out the chip produced during cutting.

**Note : Take out the chip conveyor and the plate to clean the tank regularly.**

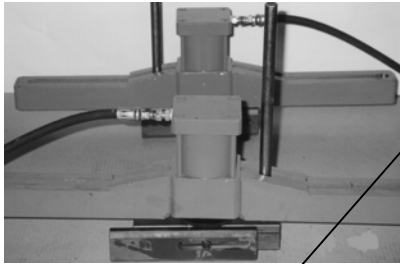




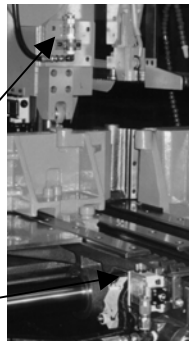
## OPERATING INSTRUCTION

### Section 4

#### Multi Vise



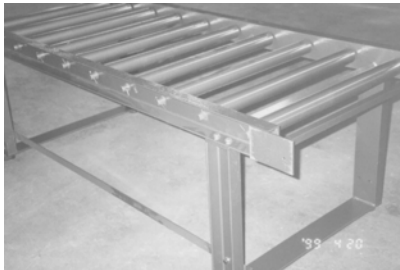
Multi Vise connector



The multi vise have to be installed for the bundle cutting.

Please refer to section 4.7 automatic operation about the proper stacking of workpiece when bundle cutting.

#### 2M Roller Table



The feeding table will support the material to be cut and ensure to feed the material straightly and smoothly

Refer to Section 9.8 about the adjustment of the roller table.

MACHINERYHOUSE




## OPERATING INSTRUCTION

### Section 4

#### 4.6 Manual Mode:



4.6.1 Place the saw blade onto both the drive and driven wheels using the following procedures:

- 1) Select the saw blade best suited for the workpiece to be cut. The size and shape of the workpiece, and the type of material being cut should all be considered when selecting the saw blade to be used.
- 2) Turn the circuit breaker ON.
- 3) Turn the auto-manual select switch to “”.
- 4) Depress the blade up button and raise the saw head until the right insert holder completely clears the front fixed vise.



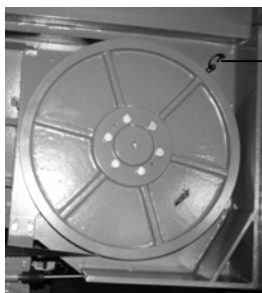
Insert Holder

Front Fixed Vise

- 5) Turn the tension handle “” to “” position to move the driven wheel toward the drive wheel.

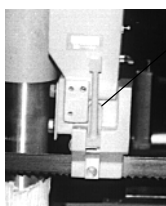


- 6) Open both the drive, driven wheel covers.
- 7) Pull down the “Easy Blade Replacement Device’ to hold the blade and allow one man to replace the saw blade.



Easy Blade Replacement Device

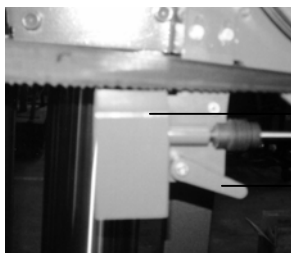
- 7) Loosen both the left and right insert lock bar to open the inserts.



LOCK BAR

**OPERATING INSTRUCTION****Section 4**

- 8) Open saw blade cover.
- 9) Lower the wire brush case.



Wire Brush Case

Lock Lever

- 10) Place the saw blade on both the drive and driven wheels.
- 11) Insert the saw blade into both the left and right inserts so that the back edge of the saw blade securely touches the back-up rollers of each insert.
- 12) Properly position the saw blade on the drive wheel so that the back edge of the saw blade makes secure contact with the flange of the drive wheel. Then engage the blade holder with the blade to prevent its dislocation from the drive wheel.
  - ☛ The blade holder will disengage as the saw blade begins rotating.



- 13) Ensure that the back of the saw blade makes contact with the flange of the driven wheel. Turn the tension handle to “○○” position so that sufficient tension is placed on the saw blade. Proper blade tension is obtained.
  - ☛ Ensure that the back edges of the saw blade make contact with the flanges of the drive and driven wheels.



- 14) Tighten the insert lock bar to lock left insert securely.
- 15) Close the covers of both the drive and driven wheel.

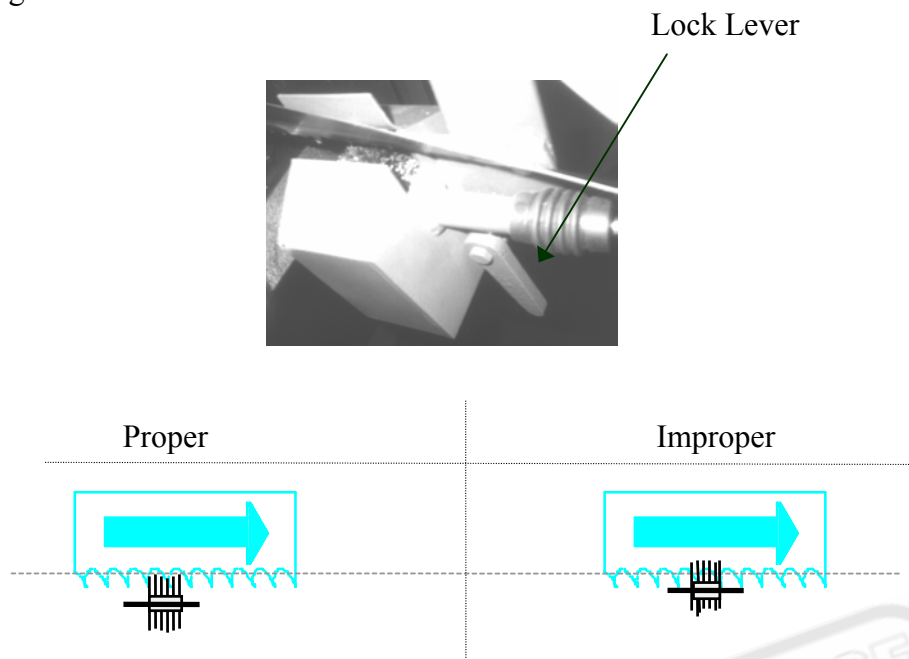


## OPERATING INSTRUCTION

### Section 4

4.6.2. Adjust the position of the wire brush using the following procedures:

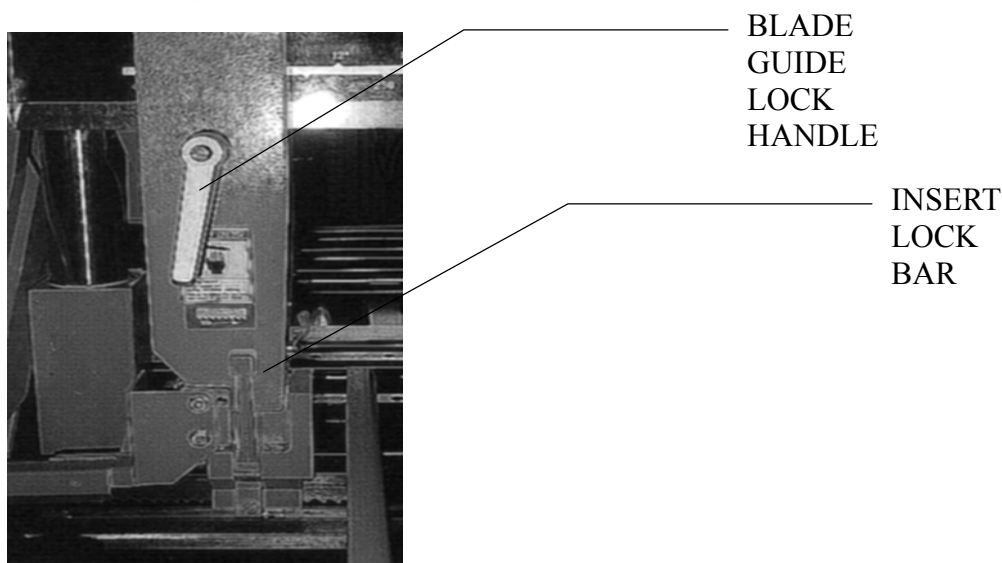
- 1) Loosen the lock lever for the wire brush case.
- 2) Manually move the wire brush case so that the wire brush makes proper contact with the saw blade.
- 3) Tighten the lock lever.



4.6.3. Adjust the guide arm

Properly position the blade guide according to the diameter (or the width) of the workpiece using the following procedures:

- 1) Loosen the insert lock bar to open the left insert.
- 2) Loosen the lock handle and manually move the blade guide. Align the indicator of the blade guide with the scale on the guide bar in accordance with the size of the workpiece.



- 3) After adjusting the position of the blade guide, tighten the lock handle to lock the blade guide securely.



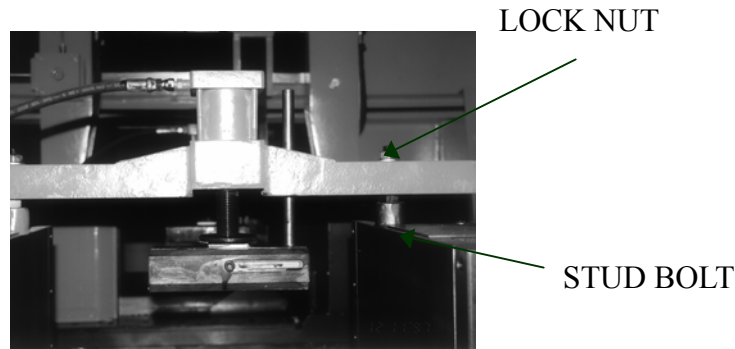
## OPERATING INSTRUCTION

### Section 4

- ☛ When tightening the lock handle, gently swing the lower end of the blade guide alternately to the left and right so that the dovetail is properly aligned.
- 4) Tighten the insert lock bar to lock left insert securely.

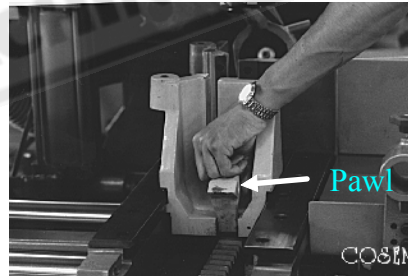
4.6.4. When performing the single-cutting, remove the multi-vises using the following procedures:

- 1) Disconnect the multi-vise hoses.
- 2) Loosen the lock nuts and remove the multi-vise.
- 3) Remove the stud bolts.



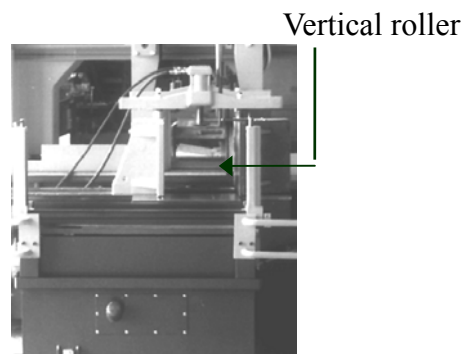
4.6.5. Properly place the workpiece on the work feed table using the following procedures:

- 1) Depress the raise button to raise the saw blade until it is at the highest position.
- 2) Manually disengage the pawls from both the front and rear vise racks, and fully open the front and rear vises.



4.6.6. Properly place the workpiece on the work feed table using the following procedures:

- 1) Depress the raise button to raise the saw blade until it is at the highest position.
- 2) Depress the front and rear vise unclamp button to open the vise.
- 3) Loosen the lock handles of the vertical roller guides and fully open the vertical roller guides.

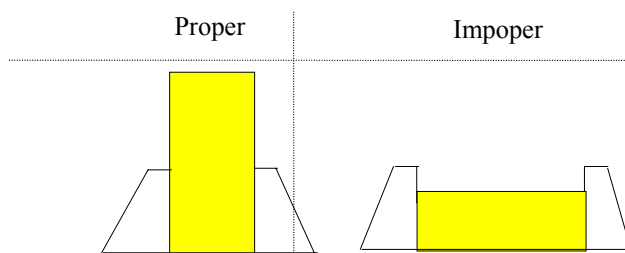





## OPERATING INSTRUCTION

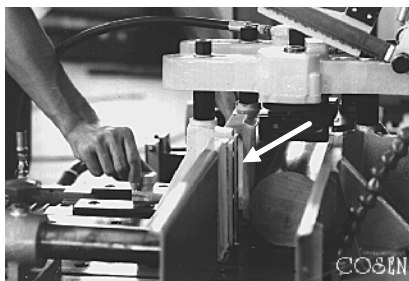
### Section 4



- 4) Place the workpiece onto the work feed table carefully so that it extends approximately 30 mm (1.2 in.) beyond the rear vise toward the front vise.

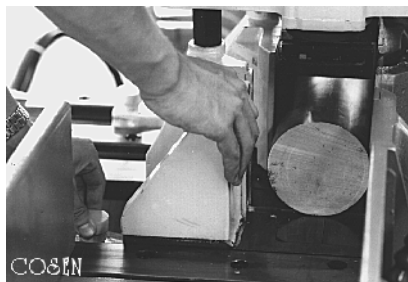




4.6.7 Determine the proper cutting position of the workpiece using the following procedures:

- 1) Turn the vise No. 17 clamp selectswitch to “” and depress the No.16 button.
- 2) Manually position the rear vise so that it pushes against the workpiece. Then engage the pawl with the rack.



- 3) Turn the vise clamp selectswitch to “” and depress No.16 button again so that the workpiece is securely clamped with the rear vise.
- 4) Push the vertical roller guides against the workpiece, and lock the guides by tightening the lock handles.
- 5) Turn the rear vise forward-backward No.15 button “” and depress it until the rear vise moves to the forward limit position.
- 6) Manually position the front vise so that it pushes against the workpiece. Then engage the pawl with the rack.




- 7) Turn the vise clamp selectswitch to “” and depress No.16 again so that the workpiece is securely clamped with the front vise.
- 8) Turn the rear vise forward-backward No.14 button and depress it until the rear vise moves to the backward limit position.
- 9) Turn the vise clamp selectswitch to “” and depress No.16 button again so that the workpiece is securely clamped with the rear vise.
- 10) Lower the saw head by depressing the quick approach button until the quick approach feeler is 10 mm (0.4 in.) above the workpiece.




## OPERATING INSTRUCTION

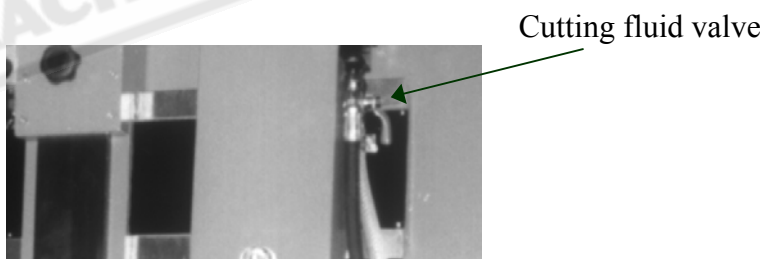
### Section 4

- ☛ Under no circumstances should the quick approach feeler be lowered beyond the height of the workpiece.
- 11) Turn the rear vise forward-backward No.15 button and depress it to move the workpiece forward until the cutting position of the work piece is aligned with the saw blade.
  - ☛ If the desired cutting length is not obtained with the above procedure, repeat steps 7 through 11, omitting step 10.
- 12) After properly adjusting the position of the workpiece, to “ ” and No.16 button so that the workpiece is securely clamped with the front vise.

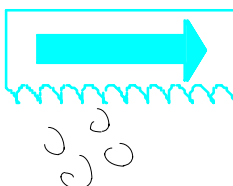
#### 4.6.8. Adjust the saw blade speed.

- 1) Set the flow control at zero.
- 2) Depress the blade drive button to start the saw blade As the blade begins to rotate the rear vise will automatically move to the backward limit position and clamp the workpiece at that position (When No.12 selectswitch turn to “ ” position under auto mode).
- 3) Turn the “No. 1” speed control knob to adjust the speed of the saw blade. It is necessary to properly adjust the saw blade speed depending upon the material and shape of the workpiece to be cut.
  - ☛ When a new saw blade is used be sure to BREAK in the blade before using it for actual continuous operation. Failure to do so will shorten the service life of the blade resulting in less than optimum efficiency.

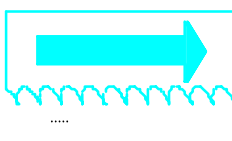
- 4.6.9. Depress the blade drive button when the blade drive button is depressed, the saw blade motor operates and then depress the saw head descending switch No.11 the saw head begins descend for actual cutting. Adjust the cutting fluid flow with the control levers according to the workpiece to be cut.



- If the saw chips are sharp and curved, increase the flow of cutting fluid.



- If the saw chips are grained, reduce the flow of cutting fluid.

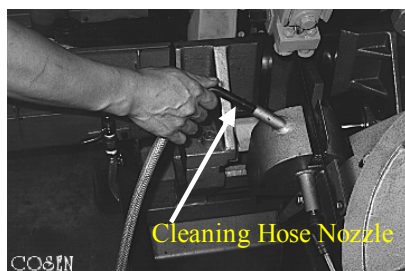


- ☛ Before depressing the blade drive button, insert the cleaning hose nozzle into the wire brush case.



## OPERATING INSTRUCTION

### Section 4



After completion of the cutting, the saw head stops descending at the lower limit position and the saw blade also stops its drive at that position.

☛ After completion of the day's work, be sure to lower the saw head to the lower limit position after removing the work piece.

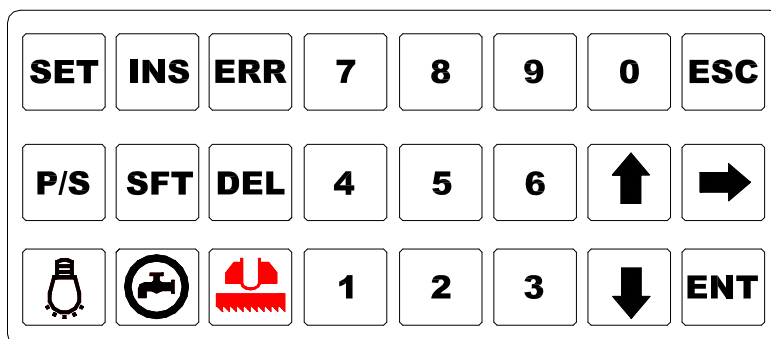
#### BREAK-IN OPERATION

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:

1. Reduce the blade speed to one-half of its normal setting.
2. Lengthen the time required for cutting 2-3 times that of normal.
3. The break-in operation can be considered sufficient if all the unusual noises or metallic sounds have been eliminated. For instance, to completely break in the blade, a minimum of five complete cuts of a 200 mm (7.9 in.) diameter workpiece will be required.
4. After completion of the break-in operation, return the blade speed and descending speed of the saw head to their normal settings.

#### 4.7. Automatic Operation

1. Cut the edge of the workpiece by using the same procedures as those described under manual operation.
2. After the saw blade has stopped its drive at the lower limit position of the saw head, depress the BLADE UP button to raise the saw head until the quick approach feeder is approximately 10 mm (0.4 in.) above the workpiece.
3. Turn the "auto/manual" select switch (No. 8) to "manual" position.
4. Set the required cutting length and quantity on the SNC20 control panel.



5. It is able to set 20 different jobs on the program.
6. Turn the "auto/manual" select switch (No. 8) to "auto" position.
7. Depress the blade speed motor "ON" and then depress the saw head down "No. 11" button to start cutting.





OPERATING INSTRUCTION

Section 4

- For example: Requiring the workpiece with the length 200mm for 20pcs and the length 150mm for 30pcs.
1. Cut the edge of the workpiece by using the same procedures as those described under manual operation.
  2. Use SNC20 controller to key in the required cutting program.

Under Manual Mode:


NO	LENGTH	CNT			
01	0200.0	020	+	ENT	+ 

\* Flashing digits is under editable mode.

NO	LENGTH	CNT			
02	0150.0	030	+	ENT	+ 

Cosen Machinery Industrial Co., Ltd.					
Tel: 886-3-5332143; Fax: 886-3-5348324					

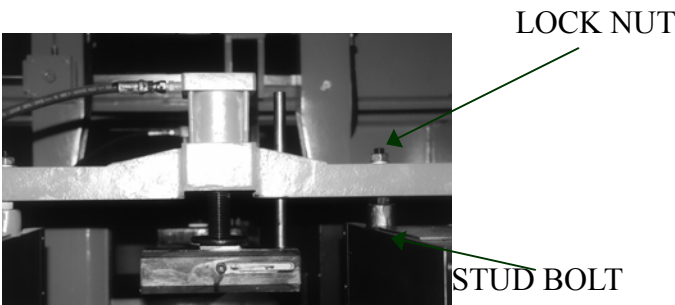
(Note: After finished the program enter, must return to this mode for the program execution.)

3. After the saw blade has stopped its drive at the lower limit position of the material, depress the BLADE UP button to raise the saw head until the quick approach feeder is approximately 10mm (0.4”) above the workpiece. (Note: The front vise is clamped.)
4. Turn the vise clamp selectswitch to “

Bundle Cutting

To perform bundle cutting, use the multi-vise and proceed as follows:

1. Install stud bolts on the front and rear vises, and position the multi-vises on the front and rear vises.

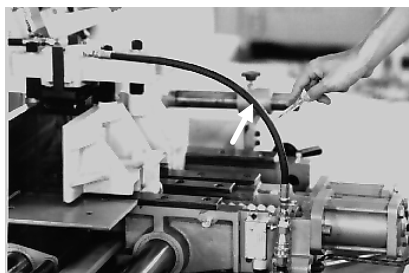


2. Connect the multi-vise hoses to the connectors on the machine.



## OPERATING INSTRUCTION

### Section 4



#### 3. Position the workpiece for bundle cutting.

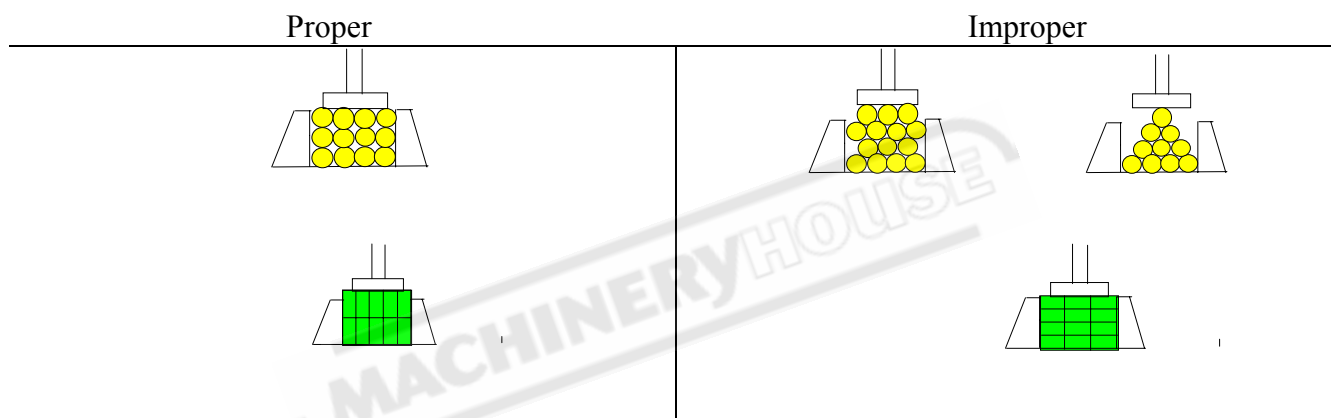
Allowable clamping width:

190 to 300 mm

Allowable clamping height:

70 to 140 mm

#### Proper and improper stacking of workpieces



#### 4. Align the multi-vise cylinders with the center of the workpiece to be bundle cut, and tighten the lock nuts.

#### 5. Turn the multi-vise handles so that the clearance between the work retaining plate of the multi-vise and the top of the bundled work-piece is 5 ~10 mm (0.2 ~ 0.4 in.).

\* Refer to picture of bundle cutting.

#### 6. Attach the bundle-cutting fence to the work tray. The fence is designed to prevent cut pieces from spreading out across the work tray. Adjust the width of the fence so that it equals the width of the bundle.

\* Refer to picture of bundle cutting.

#### 7. For subsequent, refer to the instructions under manual operation and automatic operation, and perform the bundle cutting.



## OPERATING INSTRUCTION

### Section 4

#### 4.8 TEST RUN THE MACHINE

This machine testing can confirm your machine performance excellently in future. We suggest you do the procedure as following:

##### Machinery performance testing:

You can open the power to run the machine for performance testing when you finish setting up. Please do procedures as following:

1. Relax fixed screw on bandsaw.
2. Install roller table.
3. Turn on machine circuit breaker switch on the electrical enclosure.
4. Ascends the saw head. (Case: It can not work when your hydraulic pump motor is returning. Please change the wiring.)
5. After saw head ascends, please take off quick approach.
6. Remove the rust-prevention grease with cleaning oil or kerosene.
7. Fixed already for blade tension and steel tungsten leaf.
8. Supply coolant.
9. Test vise clamp, saw head ascending and descending, feed vise bed forward and backward using manual operation.

##### Unloading test:

1. First, you have to clamp the workpieces with rear vise clamp.
2. Return Zero the cutting pieces counter and preset the number of cuts required in automatic mode.
3. Exchange to clamp the workpieces at front clamp.
4. Start saw blade to check its cutting direction, to check its coolant flow.
5. How about machinery moving.
6. Have a squeal noise?

##### Loading test:

1. First, you have to preset cut length and the number of cuts required before clamping the workpieces with rear vise clamp for cutting
2. Start cutting
  - ☛ If you press the button to close the front vise, please move ahead rear vise carefully to avoid vise deformation at front vise touch rear vise situation.
3. Gauge workpieces

Item	Design value
Ø 100 m/m	Accuracy degree 0.2 m/m
Length accuracy degree	+ 0.1~ 0.2 m/m
Blade tension	2100~2200 kg ( refer chapter 7 )
Hydraulic pressure	21~23 kg/cm <sup>2</sup>
Reducer gearing temperature	15 <sup>0</sup> ~55 <sup>0</sup> C

If you try to test band saw cutting for your workpieces, please refer to chapter 7.2 and 7.3 for speed chosen. It is easy to operation if you practice a couple of hours.



## OPERATING INSTRUCTION

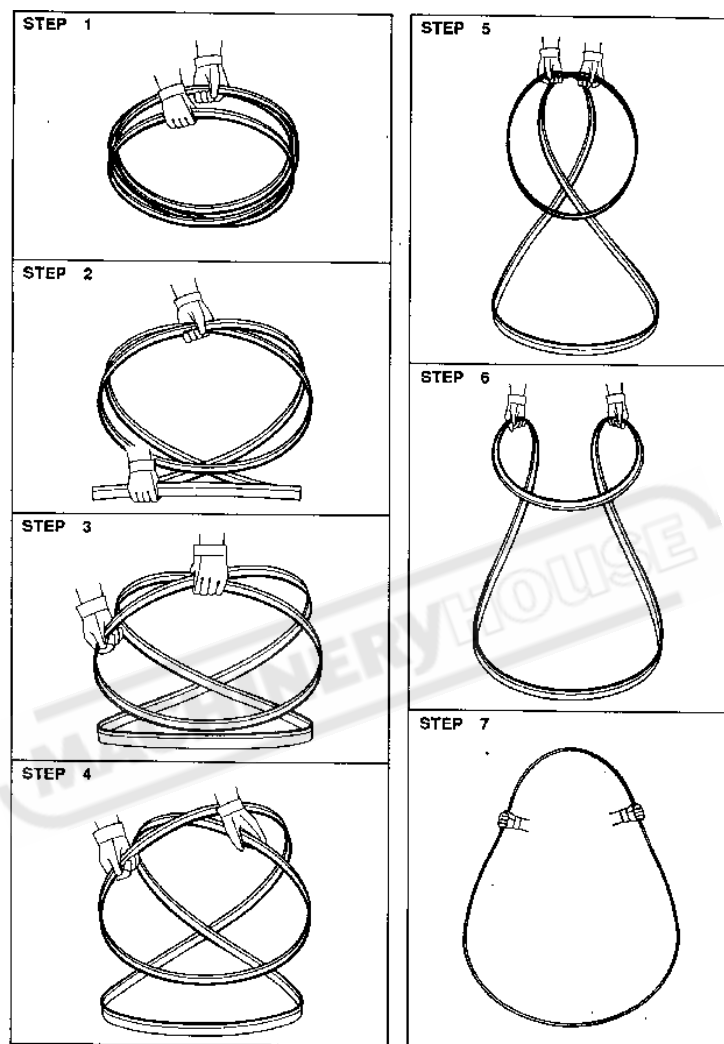
### Section 4

#### 4.9 HOW TO REPLACE THE SAW BLADE

##### Unfolding saw blade:


When you decide to unfold saw blade in order to change a new one, you can follow the method as illustrated below:

☛ Please wear leather gloves and protective goggles in those procedures. You can refer Section 4.6.1. manual model to operation.



##### Installing saw blade:


Please refer to 4.6.1 for saw blade changing

1. Move saw head upward against stop.
2. Open the wheel cover.
3. Open the driven-side saw blade safety cover.
4. Pull down the saw blade insert.
5. Turn the saw blade tension lever to “ ” position to move the driven wheel close the drive wheel.
6. Loosen the wire brush lock lever, and lower the wire brush.
7. Clean the saw band guides before installing a new saw blade.
8. Install the saw blade on the drive and driven wheels with the cutting edge facing down.
  - ☛ Wear leather gloves when handling the saw blade.



## OPERATING INSTRUCTION

### Section 4

9. Put the saw blade into the left-hand and right-hand saw blade inserts. When the back of the saw blade is pressed against the backup rollers(backup tip) in each saw blade insert, pull up the saw blade insert open/close levers to clamp the saw blade.
10. Press the back of the saw blade against the flange of the drive wheel, and hold the saw blade with the blade holder.
  - ☛ The blade holder will automatically release the saw blade when the saw blade starts running.
11. Press the back of the saw blade against the flange of the driven wheel, and turn the saw blade tension lever to the “  ” position. The saw blade will be tensioned to the proper degree.
12. Pull up the saw blade insert open/close levers.
13. Close the saw blade safety cover and gently close the wheel cover.
14. Press the blade drive button to start the saw blade running.
15. Open the wheel cover and check to see that the saw blade is not off the drive and driven wheels and is securely pressed against the backup rollers(backup tips).
16. Move chip of wire brush back to cleaning position. Adjust brush allowing the tips to run free through the bottom of the teeth and tighten the lock lever.
17. Close the wheel cover.

#### 4.10 HOW TO LOAD THE WORKPIECE

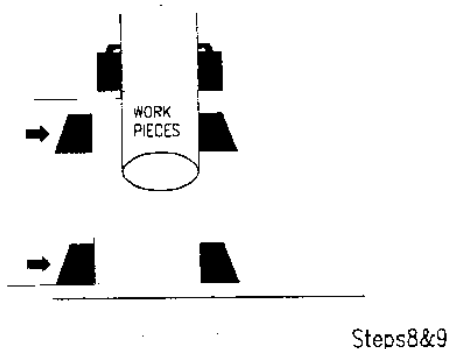
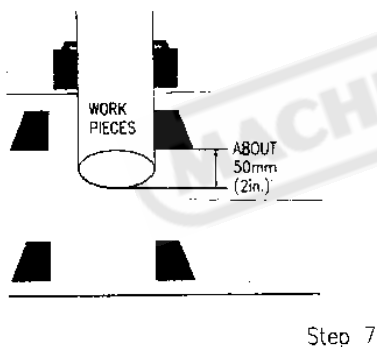
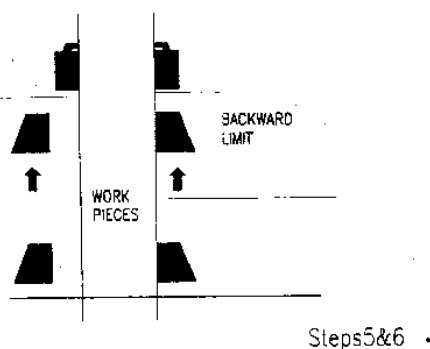
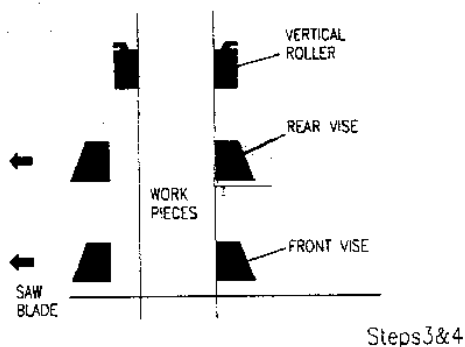
Please refer to 4.6. manual mode

- ☛ If the work cannot be securely clamped with the front and rear vises, use jigs to clamp it securely. It is dangerous if the work is clamped loosely and forced out of the vises during cutting.



## OPERATING INSTRUCTION

### Section 4



1. Turn the AUTO/MANUAL selectswitch to MANUAL model

2. Press and hold the BLADE UP button until the saw head rises to the upper limit.

➡ Please press and hold the BLADE UP button until the saw head rises to the upper limit.

3. Press and hold the FRONT VISE UNCLAMP open the front vise wider than the width of the work to be loaded.

4. Press and hold the REAR VISE UNCLAMP button to open the REAR VISE UNCLAMP button to open the rear vise wider than the width of the work to be loaded.

5. Press and hold the REAR VISE BACKWARD button until the rear vise moves to the backward limit.

6. Loosen the lock lever at the top of each vertical roller, and move by hand the vertical rollers wider than the width of the work to be loaded.

7. Gently place the work between the rear vise jaws. Project the end of the work by about 50 mm (2 in.) from the front end of the rear vise toward the front vise.

8. Press and hold the REAR VISE CLAMP BUTTON TO CLAMP THE WORK.

9. Move the vertical rollers close to the work by hand, and tighten the lock lever of each vertical roller.



## OPERATING INSTRUCTION

### Section 4

#### 4.11 PROCEDURES TO STOP AN OPERATING PROCESS



##### Manual cutting operating:

- To stop the cutting operation, please press the BLADE UP button, or HYDRAULIC OFF button.
- The saw blade stops running when the BLADE UP button is pressed. The saw blade and hydraulic pump motor both stop running when the HYDRAULIC OFF button is pressed.
- When an error occurs, the machine automatically stops.

##### Automatic cutting operating:

- To stop the cutting operation, press the BLADE UP button or HYDRAULIC OFF button.
- The saw blade stops running when the BLADE UP button is pressed. The saw blade and hydraulic pump motor both stop running when the HYDRAULIC OFF button is pressed.
- When these buttons are pressed in the middle of a cutting operation, the pieces being cut will not be counted among the number of pieces already cut.
- The operation that was stopped by pressing the BLADE UP button can be resumed by pressing the BLADE DRIVE button.
- The operation that was stopped by pressing the HYDRAULIC OFF button cannot be resumed, it must be restarted from the beginning after removing the cause for the stop.
- When the AUTO/MANUAL selectswitch is turned to MANUAL while the machine is operating in the automatic mode, the saw blade stops running.
- When the AUTO/MANUAL selectswitch is turned to MANUAL while the saw blade is cutting the work, the saw blade stops running after completing the cut.
- The operation that was stopped by turning the AUTO/MANUAL selectswitch to MANUAL cannot be resumed, it must be restarted from the beginning.

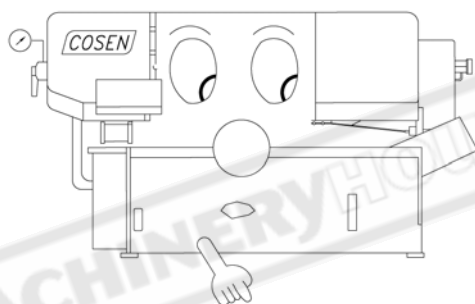
#### 4.12 PROHIBITED MEASURES ON THE MACHINE

You can operate your machine easily and comfortably if you follow the instruction in this manual to operate your machine.



## *Section 5*

# **ELECTRICAL SYSTEM**





**SECTION 4****ELECTRICAL SYSTEM****4.1 INTRODUCTION**

The electrical circuit diagram is discussed in this section. It is simple and easy to understand the diagram for machine maintenance in the future. Here, the electrical component layout on the machine and the component inside the electric cabinet will be described in section 4.2. The circuit symbol explanation and the circuit diagram will be described in section 4.2.

**4.2 ELECTRICAL COMPONENTS LAYOUT**

- The electrical components on the whole machine is shown in Figure 4.1.
- The locations of limit switches, sensors, control panel and electric cabinet are indicated in the figure. They provide a global view of the electrical system.

MACHINERYHOUSE



## ELECTRICAL SYSTEM

### Section 4

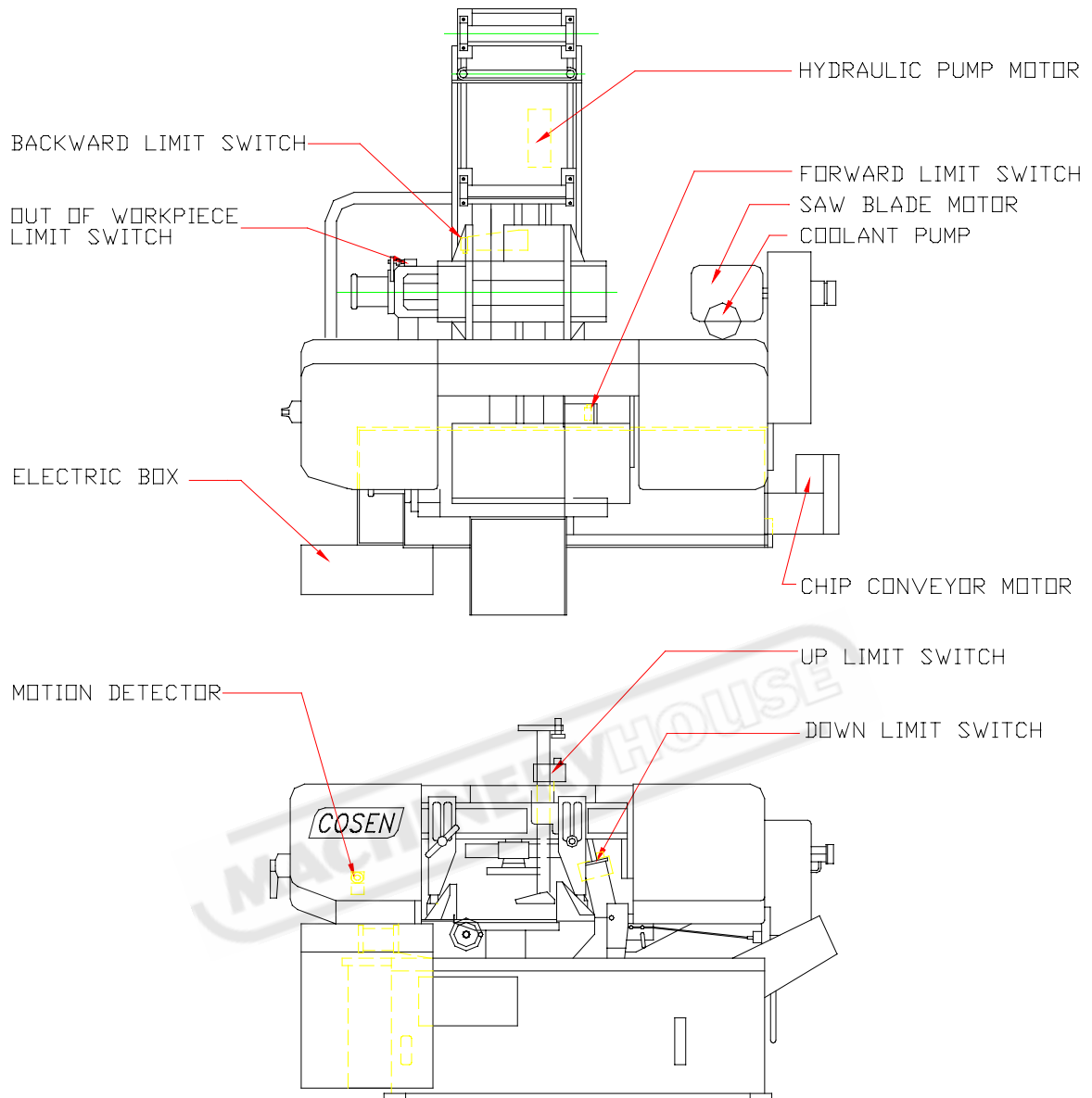


Fig. 4.1 The electrical components layout on the machine



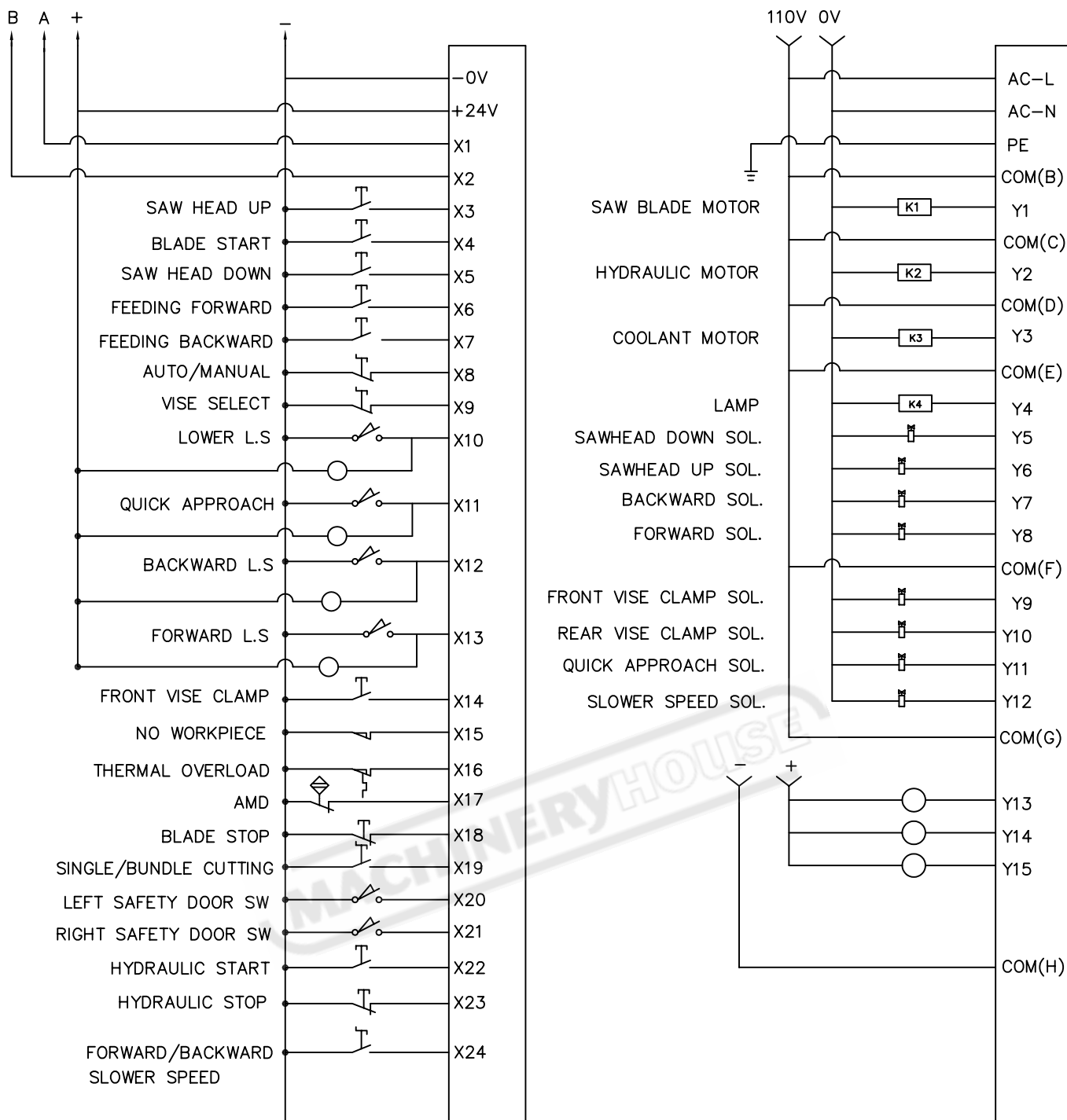
# ELECTRIC DIAGRAM

For

C-300NC without CE

MACHINERYHOUSE

D:\ELECTRIC\ES\300H\T4\5100



COSEN MACHINERY INDUSTRIAL CO.

APPROVED BY

TITLE: AH-300H-T4

AUDIT BY

DRAWING NO. AHC-5501

DRAWN BY

XIAOPING DAI 880906

TITLE: AH-300H-T4

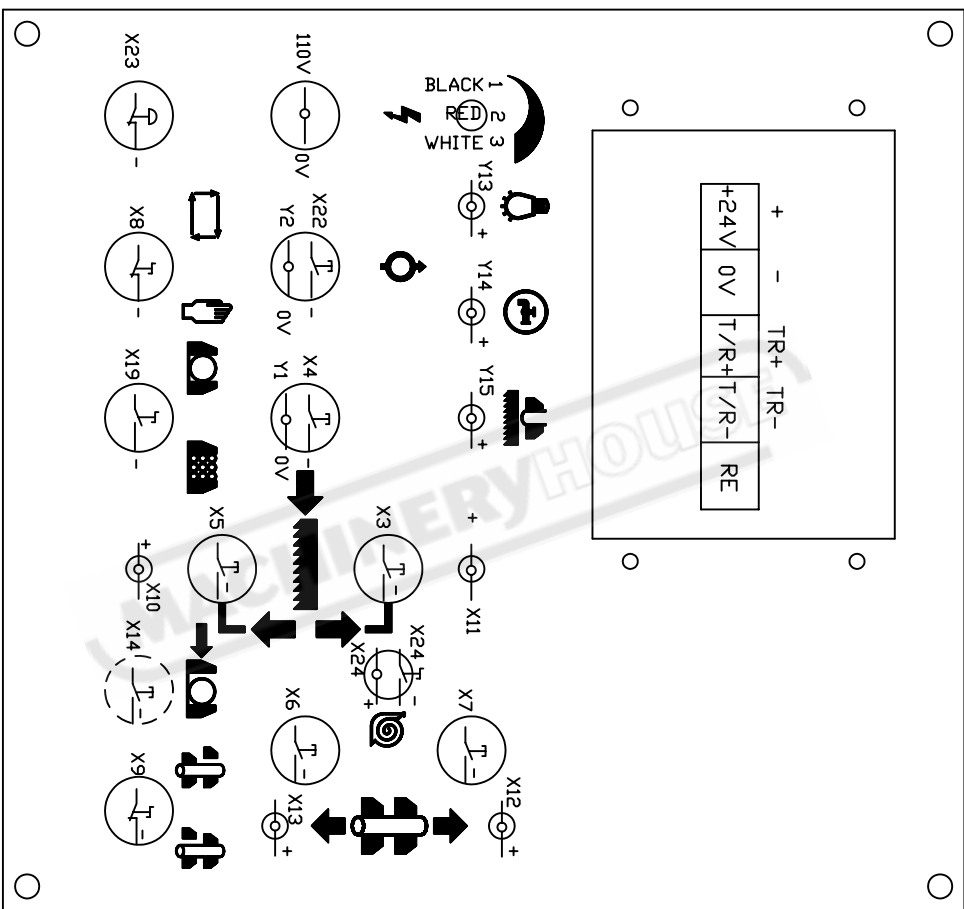
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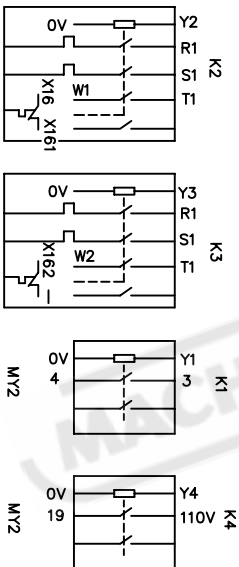
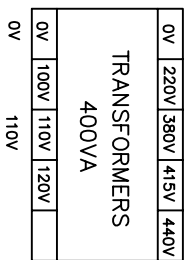
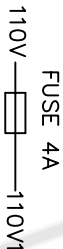
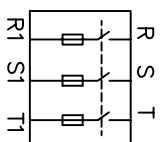
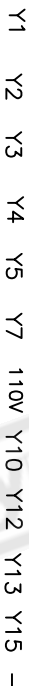
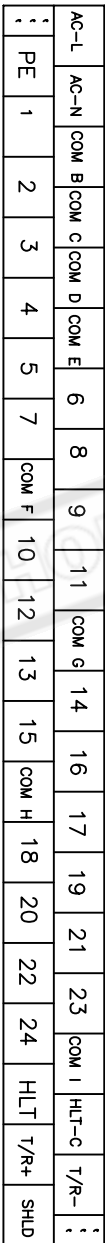
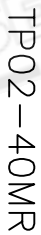
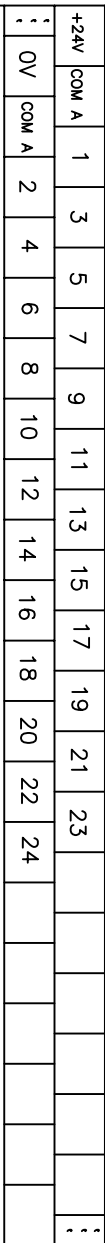
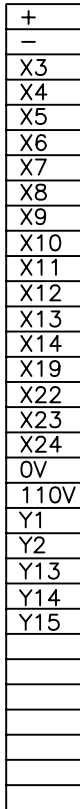
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XIAOPING DAI  
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ENCODER TAKELINC  
+ WHITE  
- BLACK  
A RED  
B GREEN





# ELECTRIC DIAGRAM

For

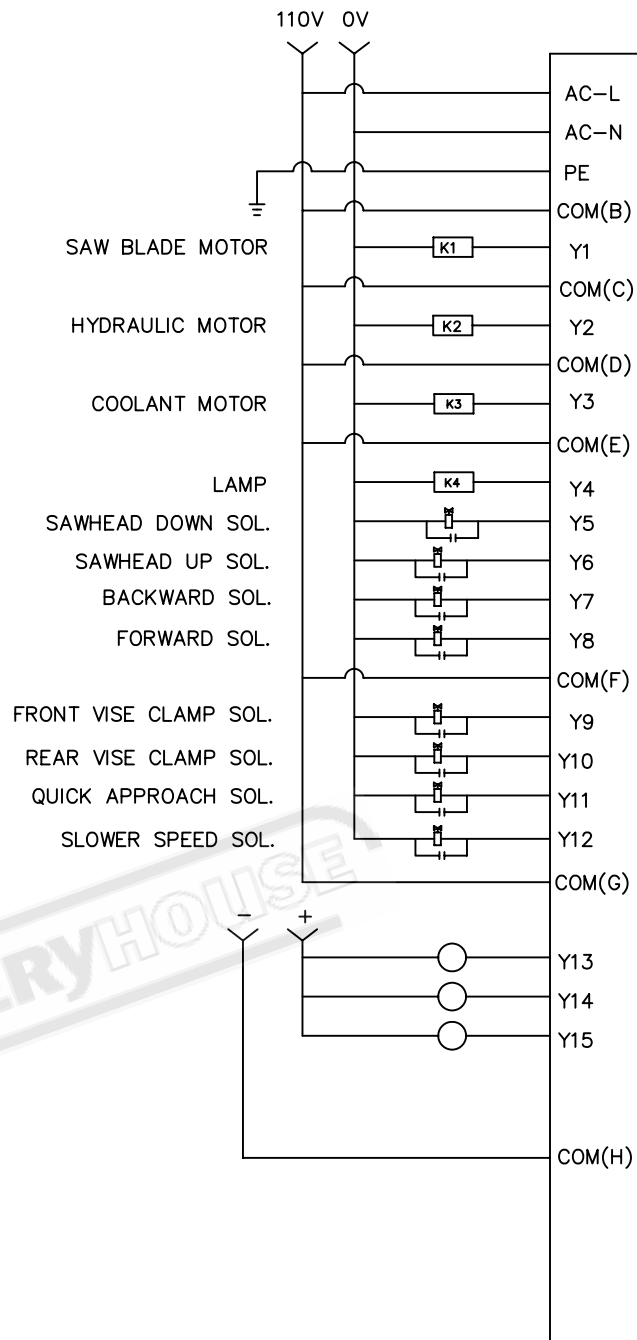
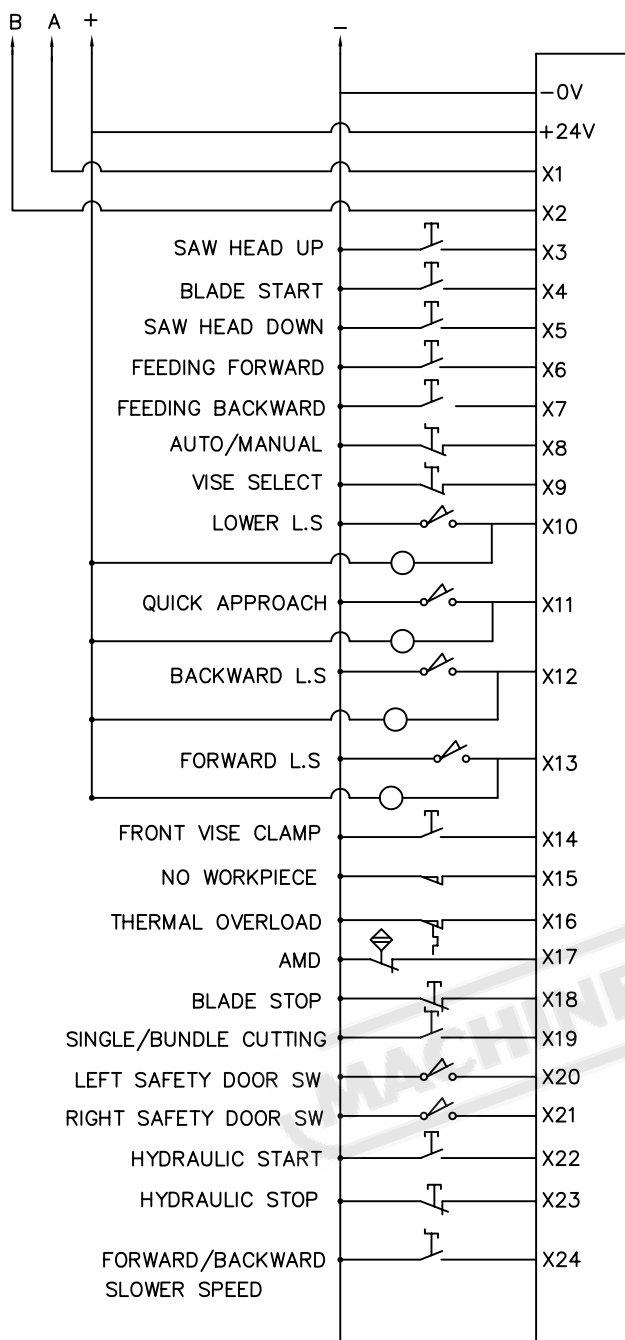
C-300NC with CE

MACHINERYHOUSE





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COSEN MACHINERY INDUSTRIAL CO.

APPROVED BY

TITLE: AH-300H-T16

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DRAWING NO. AHC-5501-CE

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XIAOPING DAI 880906



COSEN MACHINERY INDUSTRIAL CO.

TITLE: AH-300H-T16

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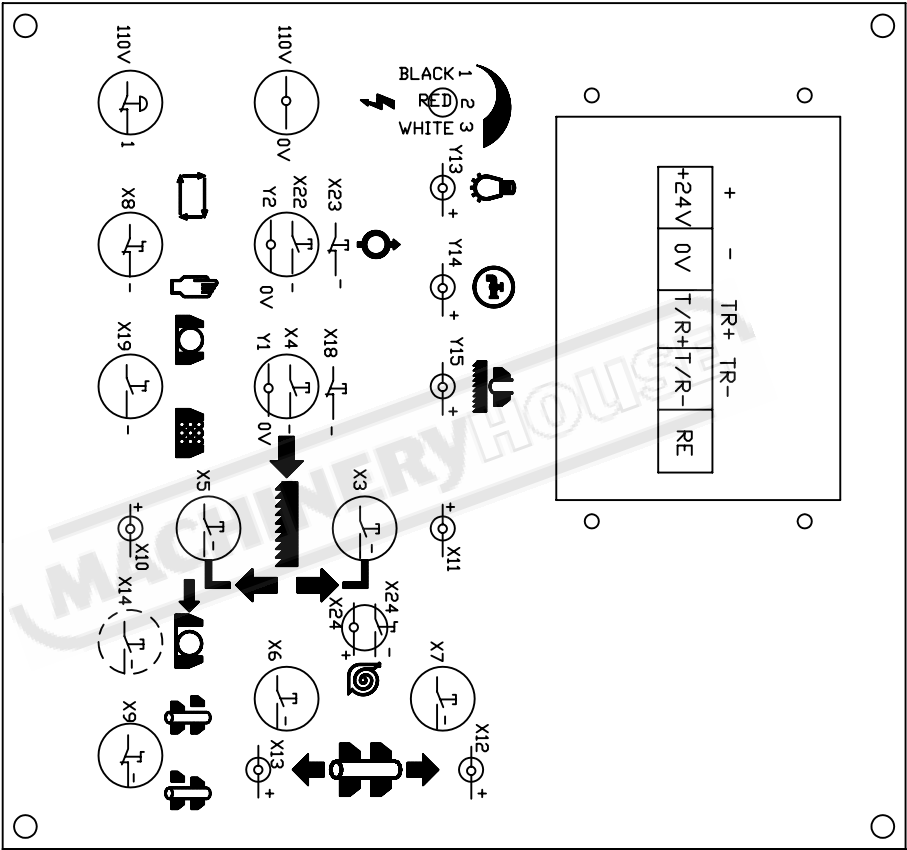
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**COSEN MACHINERY INDUSTRIAL CO.**

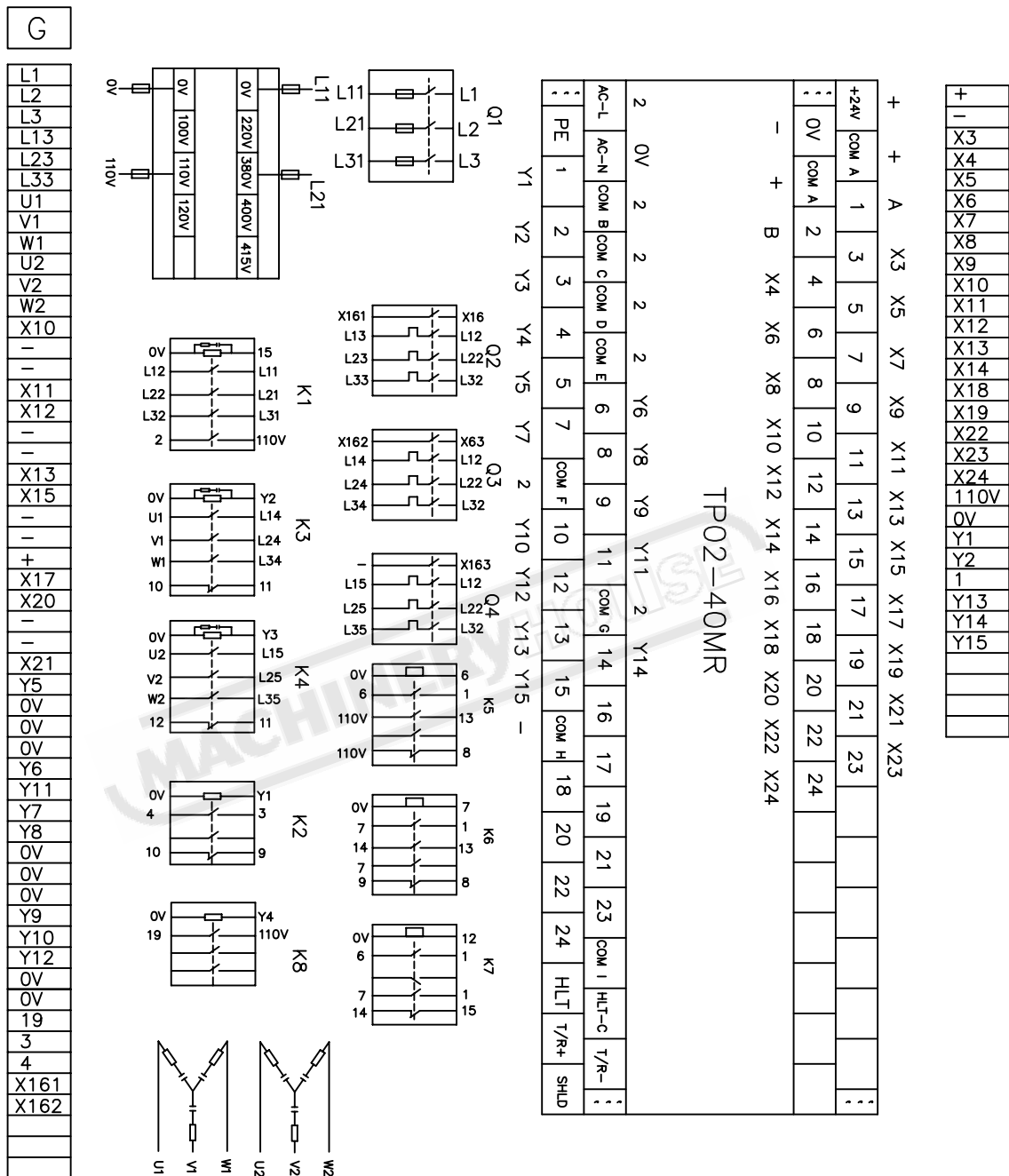
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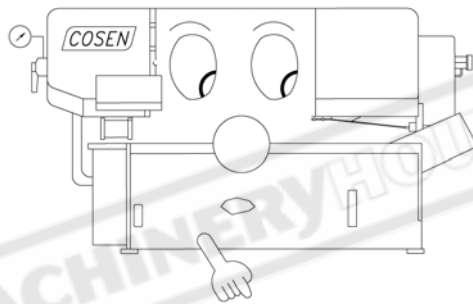
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## *Section 6*

# HYDRAULIC SYSTEM

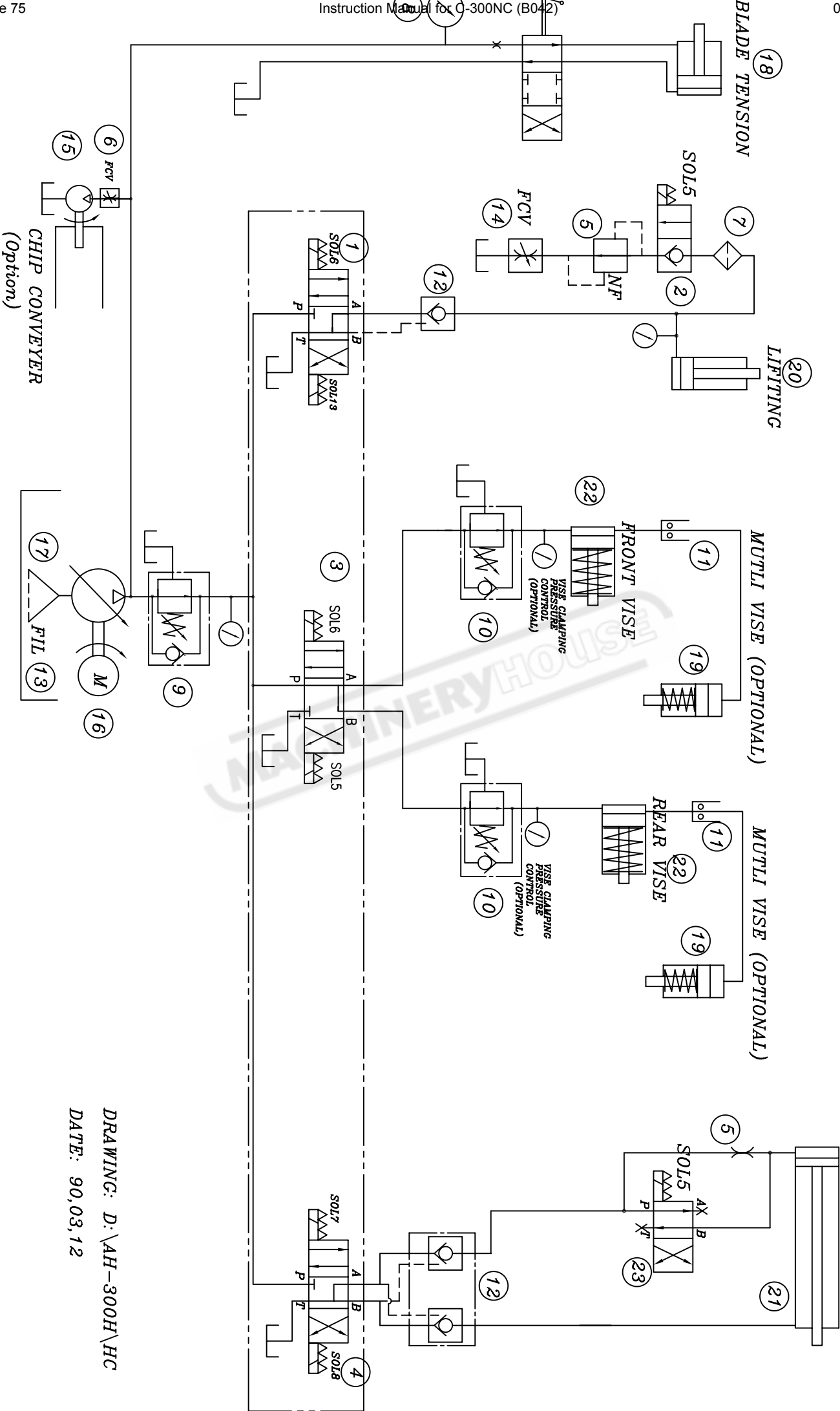


**SECTION 6****HYDRAULIC SYSTEM****6.1 INTRODUCTION**

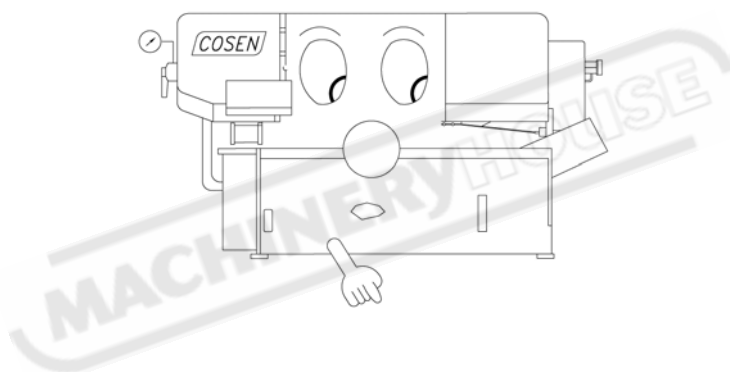
The band saw model for your device is a hydraulic driven automatic machine. Most of the movement of the machine elements are powered by the hydraulic system. For example, the lifting of the saw head is driven by a hydraulic cylinder located between the machine base and saw head. The tension of the saw blade is also adjusted through a hydraulic cylinder mounted on the back of left saw wheel housing. The feed of the stock is also driven by a long stroke hydraulic cylinder which moves back and forth on the rear material support frame. The clamping of the workpiece is also done by the power of two hydraulic cylinders. Even for the multi-vise used in the occasion of bundle cutting, there are small hydraulic cylinders built inside.



# HYDRAULIC CIRCUIT C-300NC



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DATE: 90.03.12

*Section 7***BANDSAW CUTTING -  
A PRACTICAL GUIDE**





## BAND SAW CUTTING - A PRACTICAL GUIDE

### Section7

## SECTION 7

### BAND SAW CUTTING - A PRACTICAL GUIDE

#### 7.1 INTRODUCTION

COSEN band saw machines are designed to be installed with high quality using high speed saw blades for maximizing productivity. To be able to use this kind of high performance band saw blade, the machine has to be of rugged design, have high quality saw blade guides, have sufficient motor horse power for high saw band speeds, and has to be able to apply necessary tension to the saw bands. Your COSEN machine has all these features to provide a better service for you.

The saw blade is guided through the cutting area by roller guides to keep it straight as it comes off the driving wheels. The precision carbide inserted guides then holds the blade securely and accurately throughout the sawing process. The tension of the saw blade is adjusted through the tensioning device on the strong saw bow. The cutting feed and down feed pressure of the blade is regulated automatically by hydraulic regulation.

#### 7.2 BAND SAW BLADE SELECTION

The factors affecting cutting performance are:

- Type of material
- Material size and shape
- Guide spacing
- Blade selection
- Blade speed and feed
- Blade tension
- Blade vibration
- Coolant

Material and its relation to the cutting rate:



- ☐ Depending on the hardness of the material the cutting rate will increase or decrease. For example, it takes more time to cut stainless steel than to cut cast iron.



## BAND SAW CUTTING - A PRACTICAL GUIDE

### Section 7

- ❑ 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. Set to the right, to the left 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. 7.1 as follows:



Fig. 7.1 The saw set

#### Blade Speed and Feed:

Blade speed is generally limited by vibration and the ability to keep the blade sufficiently cool to avoid dulling the teeth. A blade which is running fast and taking a very light cut will dull quickly because the tips of the teeth will overheat from the rubbing action. If, however, we force the blade teeth deeper into the material, the blade will be less sensitive to heat, because the teeth are cutting more and rubbing less.

#### Blade selection:

There are five types of blade material generally used:

- Hard-back carbon
- Semi-high speed
- High speed
- Carbon
- Electron-welded blade

In most high speed production cutting either the semi-high speed or the electron-welded band are used. Electron welded blade is the best blade. But it is also the most expensive. To construct the electron-welded blade, M-2 tool steel is welded to the blade back. Therefore the blade is capable of very high surface speed. The semi-high speed blade is used more in structural because it is capable of taking a great deal more abuse. The hard-back carbon blade's teeth does not have red-hardness but if the blade is run slowly it can be very economical. We do not recommend carbon blades because the back of the blade is not sufficiently strong to stand adequate tension and because it has poor resistance to heat and abrasion. Usually, the coarse hook tooth blade will give better results, but accurate feed control is a must with a coarse tooth blade.



## BAND SAW CUTTING - A PRACTICAL GUIDE

### Section 7

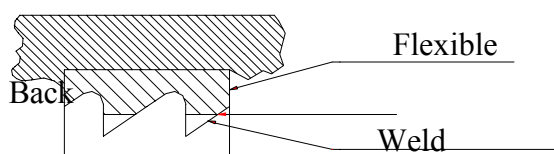


Fig. 7.2 Electron Welded Blade

A particular blade may have teeth which are too hard at the tips, causing them to break off in the material. This is most likely to happen as a result of chips wedging together in the cut. A broken tooth in the material can easily cause dulling on one side of the entire blade before it is dislodged from the cut.

#### Tooth Form and Spacing:

The selection of a tooth form generally is determined by the material to be cut. There are three general factors to consider: Tooth form, style or shape of the teeth; Tooth spacing, The number of teeth to the inch; and tooth set, which provides clearance for the body of the blade. Three styles of tooth are shown in Fig. 7.3 below:

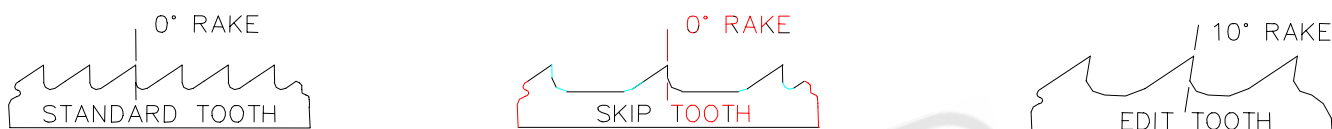


Fig. 7.3 Three styles of tooth

#### Material Size and Shape:

The optimum material width for a band saw blade is 1 inch wide by 0.35 thick and is about 5 inches long. Below this width tooth loading may become excessive and the cutting rate must be reduced. Above this width blade control begins to be lost, as discussed below. Since the blade "sees" only that material it is cutting, the shape of the stock being cut will also affect cutting speeds, particularly if the piece is excessively wide or if it varies in the dimensions being cut.

#### Guide Spacing:

The rigidity of the blade is a function of guide spacing, with rigidity being reduced to the third power as the distance between the guides increases. For example, with guides spaced 2 inches apart, blade deflection might be approximately 0.2. Under the same conditions, but with the guides spaced at 4 inches apart, blade deflection would be approximately 0.8.

This is a much simplified version of the formula, because it does not consider band tension or guide design. It is important to recognize, for example that rollers are considered as a pivotal contact. Whereas carbide faces could be considered as anchored supports. A more complete deviation, including band tension and guide design, is included in Roark's handbook, "Formula for stress and strain".

### 7.3 Some Sawing Practices

#### 7.3.1. Selection of Saw Pitch :

Sawing "Rules of Thumb":



## BAND SAW CUTTING - A PRACTICAL GUIDE

### Section 7

1. The thinner the stock, the finer the saw pitch
2. The thicker the stock, the coarser the saw pitch
3. The more difficult the stock, the finer the saw pitch
4. The softer the material, the coarser the saw pitch

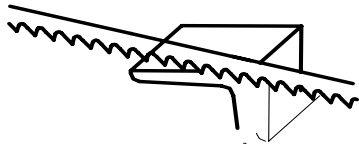
Always have at least three teeth in contact with the material being cut.

#### 7.3.2. Material Size and Saw Pitch

Anytime during the cutting operation, at least three teeth must be in contact with the material being cut. Figure 7.4 shows some sawing practices:

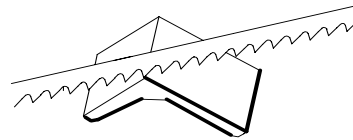
### Sawing Practices:

Correct

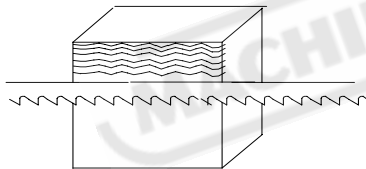


Several teeth contact work

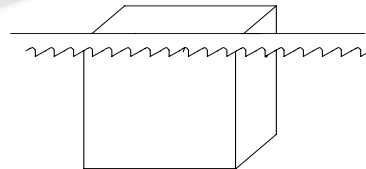
Incorrect



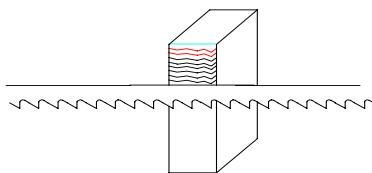
Teeth strike sharp edge



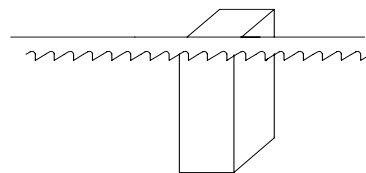
Coarse teeth clear chips freely



Teeth too fine for large solids



Three or more teeth on cutting wall



Coarse teeth rip on thin wall

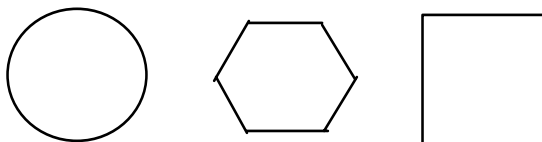
Fig. 7.4 Some sawing practices

#### Solid Stock:



## BAND SAW CUTTING - A PRACTICAL GUIDE

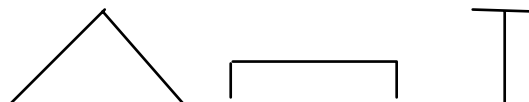
### Section 7



up to 25 mm - 1"  
 25-100mm - 1"-4"  
 100-250mm - 4-10"

8-10 Teeth per inch(TPI)  
 6-8 TPI  
 3-4 TPI

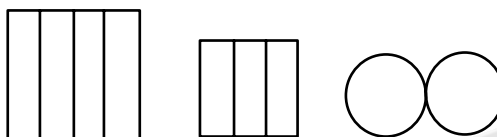
#### Structurals:



up to 10 mm - 3/8"  
 10-20mm - 3/8-3/4"  
 above 20mm - 3/4"

10-8 TPI  
 8-10 TPI  
 6-8 TPI

#### Solid:



up to 20mm - 3/4"  
 20-80mm - 3/4-3.1/4"  
 above 80 mm - 3.1/4"

8-10 TPI  
 2- 8 TPI  
 4- 6 TPI

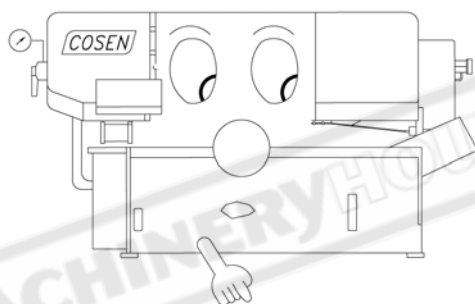
You can refer to the feed and speed chart (Metric Table) as follows:



MACHINERYHOUSE

## *Section 8*

# MAINTENANCE



**SECTION 8****MAINTENANCE & SERVICE****8.1 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.

**8.2 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.

**8.3 MAINTENANCE SCHEDULE**

We suggest you do the maintenance on schedule. The recommended schedule includes three periods, namely daily maintenance, monthly maintenance and once every six months maintenance as follows:

**Before beginning of work each day**

- ✓ 1. Please check the hydraulic oil level, adding oil as necessary.(middle level is better)
- ✓ 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 driven 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.

**Before ending work each day**

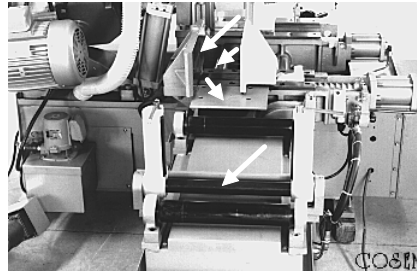
- ✓ 1. Please remove saw chips and clean the machine with discharging the cutting fluid when work has been completed.



## MAINTENANCE & SERVICE

### Section 8

- ☛ When cutting fluid is being discharged while the saw blade is operating, please follow the safety methods carefully. Otherwise, it will cause severe injury to your hand.
- ✓ 2. Lubricate the following points:
  - Front vise slide plates
  - Rear vise slide plates
  - Feed cylinder guide shafts
  - Rear vise guide bars



Once every month

Please apply grease to the following points:

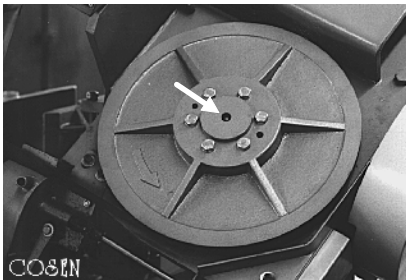
- ✓ 1. Drive wheel
- ✓ 2. Driven wheel
- ✓ 3. Blade tension device
- ✓ 4. Worm shaft

#### Recommended Grease:

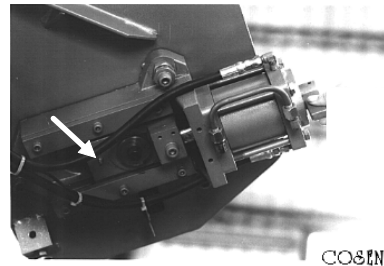
Shell Alvania EP Grease 2

Mobil Mobilplex 48

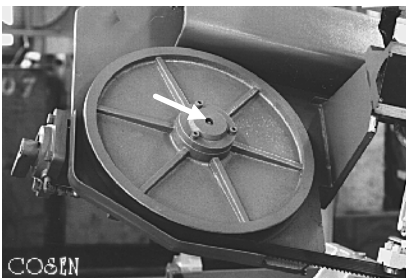
1.



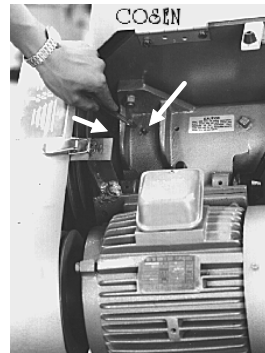
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2.



4.





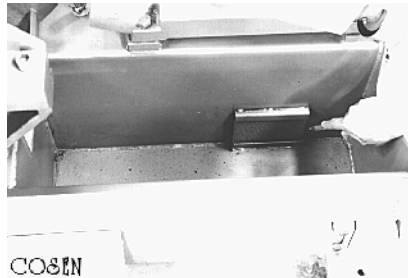


## MAINTENANCE & SERVICE

### Section 8

Once every six months

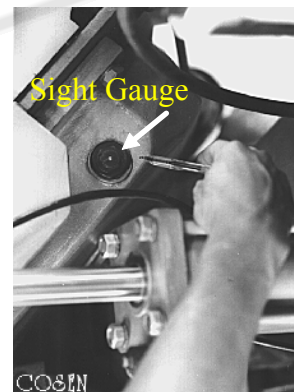
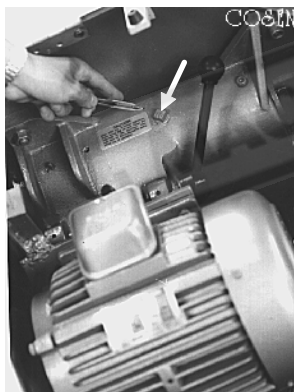
- ✓ 1. Please clean the filters in the cutting fluid tank. (First, please loosen the chip conveyor screw cover)



- ✓ 2. Please replace the transmission oil after the first three months (or 600 hours of operation). Thereafter, every six months (or every 1200 hours of operation), whichever occurs first, check the sight gauge to ascertain the transmission oil level. Lubricant oil must have a viscosity sufficient to reduce friction of the worm and worm gear. So that the gear reducer can operate smoothly under high load and impact.

#### Recommended Oil:

- SHELL Omala Oil 220
- Mobil Gear 630



- ✓ 3. Replace the hydraulic oil.  
Recommended Oil:  
 Shell Tellus 32  
 Mobil DTE Oil Light Hydraulic 24

### 8.4 STORAGE CONDITION OF THE MACHINE

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

- (1) Turn off the power
- (2) Ambient temperature: 5-40° C
- (3) Relative humidity: 30%-95" of (without condensation)
- (4) Atmosphere: Use a plastic canvas to cover machine to avoid excessive dust, acid fume, corrosive gases and salt.



## MAINTENANCE & SERVICE

### Section 8

- (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.

#### 8.5 TERMINATING THE USE OF THE MACHINE

Waste disposal:

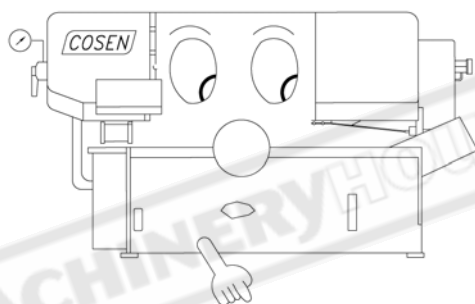
When your machine can not work anymore, you should leak out the oil from machine body. Please storage the oil in safe place with bottom. Ask a environment specialist to handle the oil. It can avoid soil pollution. The oil list in machine :

- Hydraulic oil
- Cutting fluid
- Drive wheel gear oil



## *Section 9*

# **SYSTEMS TROUBLESHOOTING**





## SYSTEMS TROUBLE SHOOTING

### Section 9

## SECTION 9

### SYSTEMS TROUBLE SHOOTING

#### 9.1 INTRODUCTION

All the machines being manufactured by COSEN pass a 72 hours continuously running test before shipping out and COSEN is responsible for the after sales service problems during the warranty period if the machine 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.

As a twenty year old company, COSEN has accumulated enough experiences and technical data to handle all of the regular system troubles. Meanwhile, the engineering department of COSEN had been continuously improving the machines to prevent all possible troubles.

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

#### 9.2 PRECAUTION

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.



## SYSTEMS TROUBLE SHOOTING

### Section 9

#### 9.3 GENERAL TROUBLES AND SOLUTIONS

**WARNING** DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION

TROUBLE	PROBABLE CAUSE	SUGGESTED REMEDY
<b>Motor stalls</b>	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".
<b>Cannot make square cut</b>	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."
<b>Increased cutting time</b>	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."
<b>Will not cut</b>	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.)



## SYSTEMS TROUBLE SHOOTING

### Section 9

#### 9.4 MOTOR TROUBLES AND 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 w/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.



## SYSTEMS TROUBLE SHOOTING

### Section 9

#### 9.5 BLADE TROUBLES AND SOLUTIONS

**WARNING** 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



## Section 9

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

- 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













## SYSTEMS TROUBLE SHOOTING

### Section 9

#### 9.7 MINOR TROUBLE SHOOTING

Item	Symptom	Probable Cause	Corrective Action
1	Saw blade motor does not run even though blade drive button is depressed.	a. Overload relay activated	Reset
		b. Vise clamp selectswitch turned to "  "	Turn it to "  "
		c. Saw blade is at lower limit position	Depress BLADE UP button
2	Rear vise does not move forward even though its selector is manipulated	a. Auto-manual selectswitch turned to "  "	Turn it to "  "
		b. Saw blade motor is in operation	Depress BLADE UP button
		c. Saw head not at its up limit position.	Raise saw head to its up limit position
3.	Read vise does not move backward even though its selector is manipulated	a. Auto-manual selectswitch turned to "  "	Turn it to "  "
		b. Saw blade motor is in operation	Depress BLADE UP button
4.	Vise does not open or close even though vise clamp selectswitch is manipulated	a. Auto-manual selectswitch turned to "  "	Turn it to "  "
		b. Saw blade motor is in operation	Depress BLADE UP button

For problem not indicated on the above chart, please refer to the electrical circuit and hydraulic circuit diagrams provided on section 5, 6 of this manual.

#### NOTE:

**BEFORE ANY ADJUSTMENT OR MENTENANCE OF THE MACHINE, PLEASE MAKE SURE TO TURN OFF THE MACHINE AND DISCONNECT THE POWER SUPPLY.**



## SYSTEMS TROUBLE SHOOTING

### Section 9

#### 9.8 THE ADJUSTMENT OF THE FEEDING 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.

##### Warning:

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.

MACHINERYHOUSE



**COSEN MACHINERY INDUSTRIAL CO., LTD.**

110, CHING-FU STREET, HSIN-CHU, TAIWAN, R. O. C.

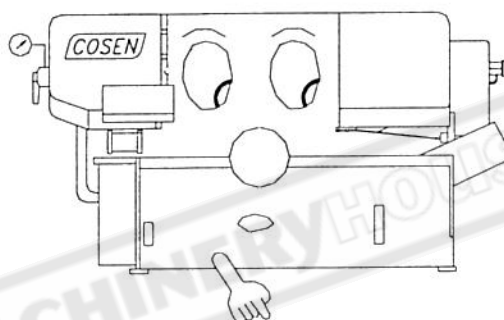
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FAX 886-3-5348324

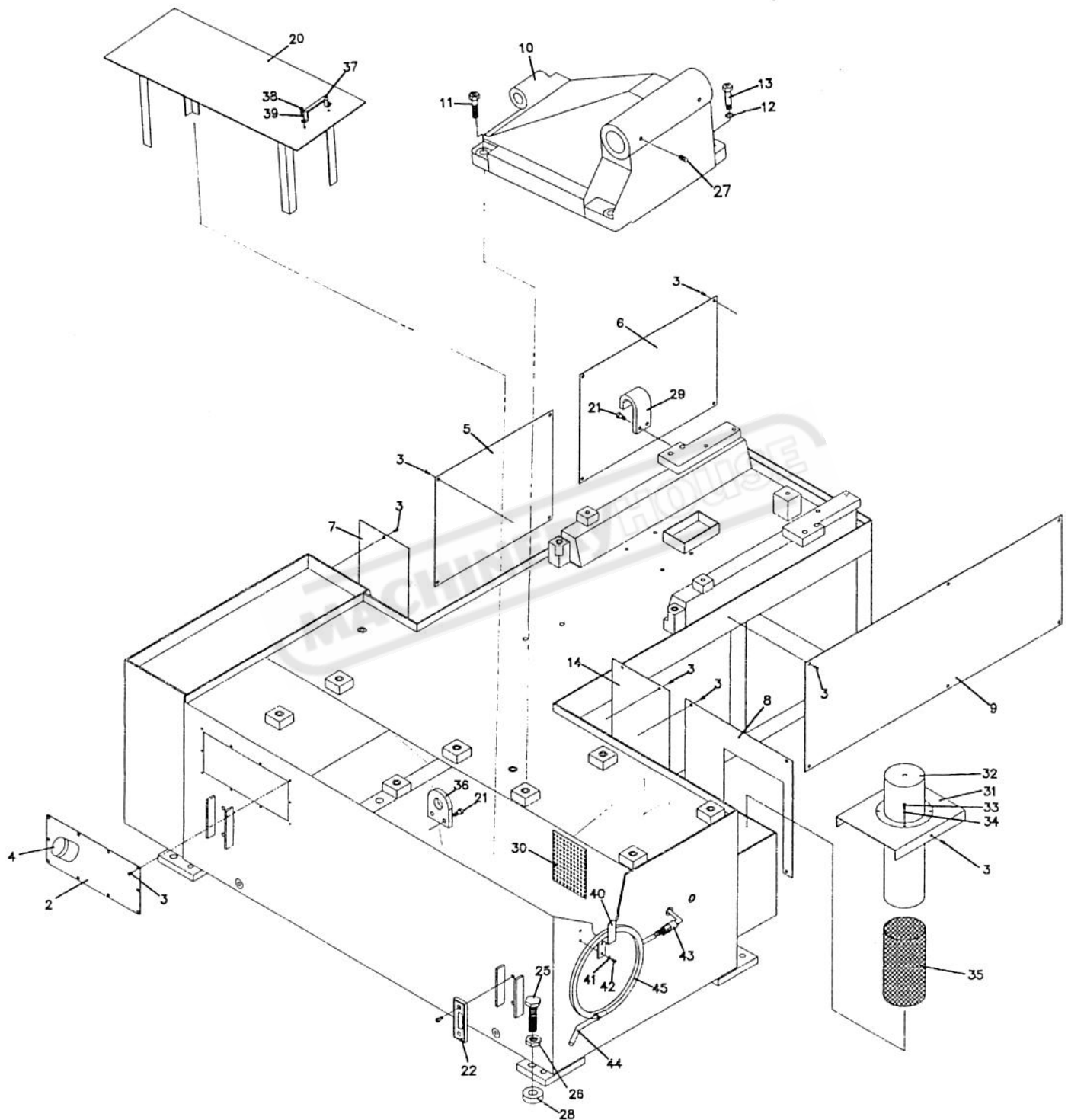
e-mail [cosen@ms9.hinet.net](mailto:cosen@ms9.hinet.net)

## *Section 9*

# PARTS LIST



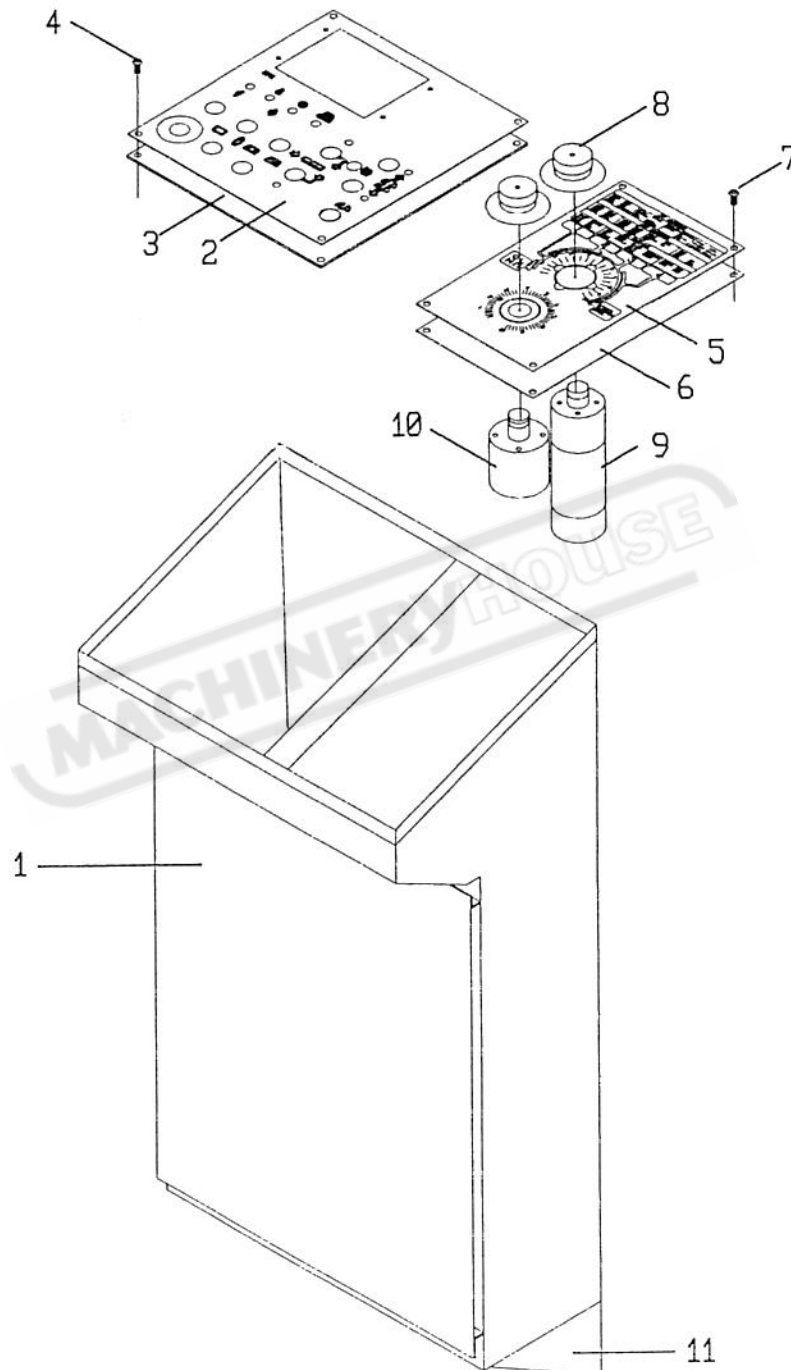
AHC-1001C.WRK  
MACHINE BODY ASSEMBLY



## AHC-1001C.WRK MACHINE BODY ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1-1	AHC-0101-CE	oil pan	底座		1
1-2	AHA-0102	oil tank cover	油箱蓋		1
1-3		screw	大丸頭螺絲	M5*10L	37
1-4	PP-90857	cap	油壓箱蓋螺帽		1
1-5	AHC-0101N-4	side cover	底座邊蓋(四)		1
1-6	AHC-0101N-3	side cover	底座邊蓋(三)		1
1-7	AHC-0101N-5	side cover	底座邊蓋(五)		1
1-8	AHC-0101N-6	side cover	底座邊蓋(六)		1
1-9	AHC-0101N-1	side cover	底座邊蓋(一)		1
1-10	AHC-0119	hinge bracket	關節座		1
1-11		bolt	外六角螺絲	M14*55L	2
1-12		spring washer	彈簧華司	M14	4
1-13	AHA-0122A	bolt	外六角固定螺栓		2
1-14	AHC-0101N-2	side cover	底座邊蓋(二)		1
1-15					
1-16					
1-17					
1-18					
1-19					
1-20	AHC-2009	plate	集屑板		1
1-21		bolt	內六角螺絲	M10*20L	8
1-22	PP-21030	oil level gauge	油面計	3"	2
1-23					
1-24		screw	螺絲	M8*20L	4
1-25	AHR-0153	adjusting bolt	底座調整螺絲		6
1-26		adjusting nut	底座調整螺帽	M20	6
1-27		threaded taper pin	止付螺絲	M10*45L	2
1-28	AHR-1055	base support	底座墊塊		6
1-29	AHC-0160	hanger	吊耳(三)		2
1-30	AHA-0138	filter	濾網		1
1-31	AHA-0136	bracket	固定座板		1
1-32	PP-32081	pump	浸水泵浦	1/8HP,210L	1
1-33		bolt	外六角螺絲	M6*12L	4
1-34		spring washer	彈簧華司	M6	4
1-35	AHA-0131	filter	濾網		1
1-36	AHC-0161	hanger	吊耳(四)		2
1-37	PP-52080	handle	輪箱把手		1
1-38		bolt	丸頭螺絲	M5*8L	2
1-39		spring washer	彈簧華司	M5	2
1-40	AHA-1309	bracket	軟管架		1
1-41		spring washer	彈簧華司	M5	2
1-42		bolt	內六角螺絲	M5*12L	2
1-43	PP-43132	switch	開關閥	1/8"	1
1-44	AHA-1313	nozzle	噴嘴		1
1-45		cable duct	護管	3/8"*1000L	1
1-46					

AHC-1001-3.WRK  
ELECTRICAL ASS'Y



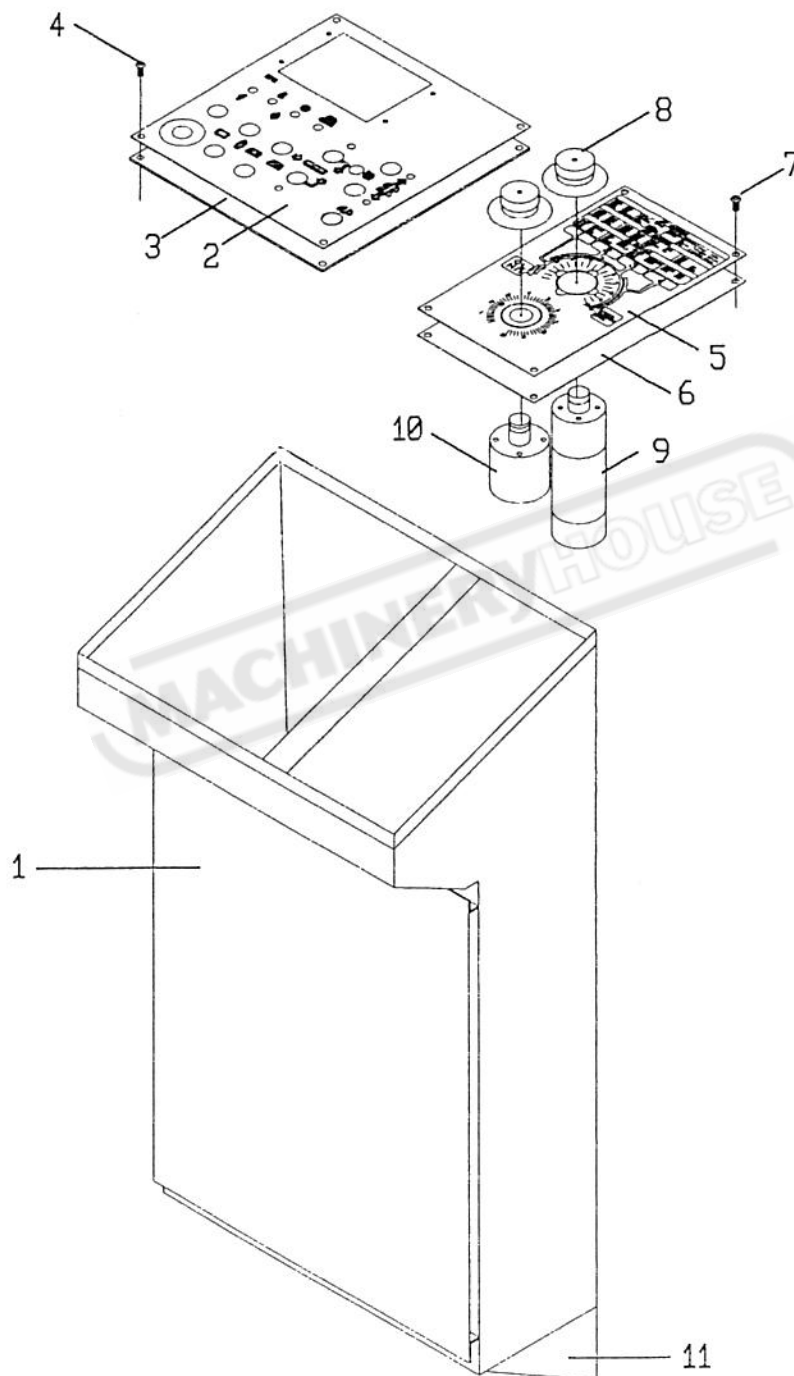


## AHC-1001C.WRK MACHINE BODY ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1-1	AHC-0101-CE	oil pan	底座		1
1-2	AHA-0102	oil tank cover	油箱蓋		1
1-3		screw	大丸頭螺絲	M5*10L	37
1-4	PP-90857	cap	油壓箱蓋螺帽		1
1-5	AHC-0101N-4	side cover	底座邊蓋(四)		1
1-6	AHC-0101N-3	side cover	底座邊蓋(三)		1
1-7	AHC-0101N-5	side cover	底座邊蓋(五)		1
1-8	AHC-0101N-6	side cover	底座邊蓋(六)		1
1-9	AHC-0101N-1	side cover	底座邊蓋(一)		1
1-10	AHC-0119	hinge bracket	關節座		1
1-11		bolt	外六角螺絲	M14*55L	2
1-12		spring washer	彈簧華司	M14	4
1-13	AHA-0122A	bolt	外六角固定螺栓		2
1-14	AHC-0101N-2	side cover	底座邊蓋(二)		1
1-15					
1-16					
1-17					
1-18					
1-19					
1-20	AHC-2009	plate	集屑板		1
1-21		bolt	內六角螺絲	M10*20L	8
1-22	PP-21030	oil level gauge	油面計	3"	2
1-23					
1-24		screw	螺絲	M8*20L	4
1-25	AHR-0153	adjusting bolt	底座調整螺絲		6
1-26		adjusting nut	底座調整螺帽	M20	6
1-27		threaded taper pin	止付螺絲	M10*45L	2
1-28	AHR-1055	base support	底座墊塊		6
1-29	AHC-0160	hanger	吊耳(三)		2
1-30	AHA-0138	filter	濾網		1
1-31	AHA-0136	bracket	固定座板		1
1-32	PP-32081	pump	浸水泵浦	1/8HP,210L	1
1-33		bolt	外六角螺絲	M6*12L	4
1-34		spring washer	彈簧華司	M6	4
1-35	AHA-0131	filter	濾網		1
1-36	AHC-0161	hanger	吊耳(四)		2
1-37	PP-52080	handle	輪箱把手		1
1-38		bolt	丸頭螺絲	M5*8L	2
1-39		spring washer	彈簧華司	M5	2
1-40	AHA-1309	bracket	軟管架		1
1-41		spring washer	彈簧華司	M5	2
1-42		bolt	內六角螺絲	M5*12L	2
1-43	PP-43132	switch	開關閥	1/8"	1
1-44	AHA-1313	nozzle	噴嘴		1
1-45		cable duct	護管	3/8"*1000L	1
1-46					

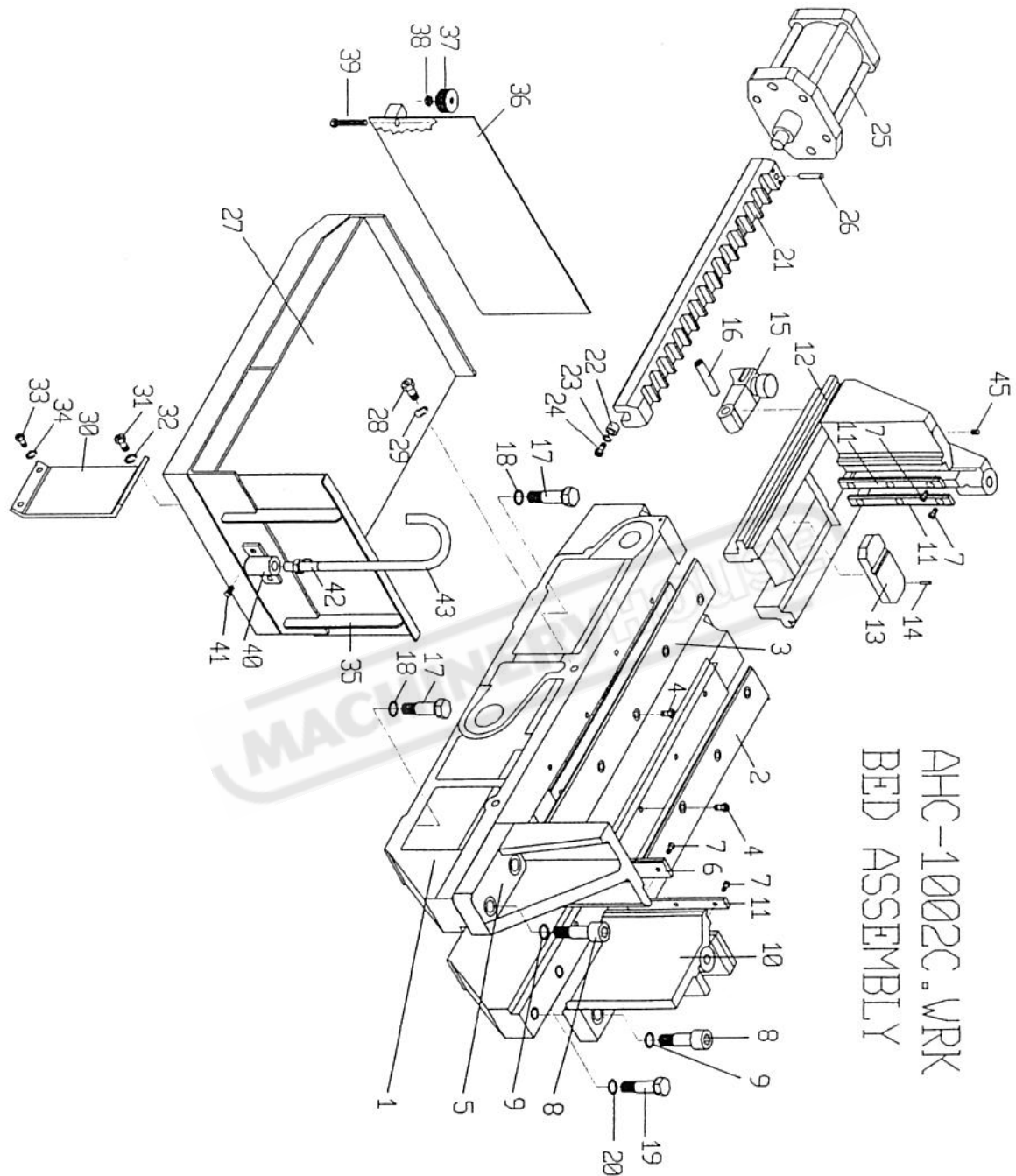


AHC-1001-3.WRK  
ELECTRICAL ASS'Y



## AHC-1001-3.WRK ELECTRICAL ASSEMBLY

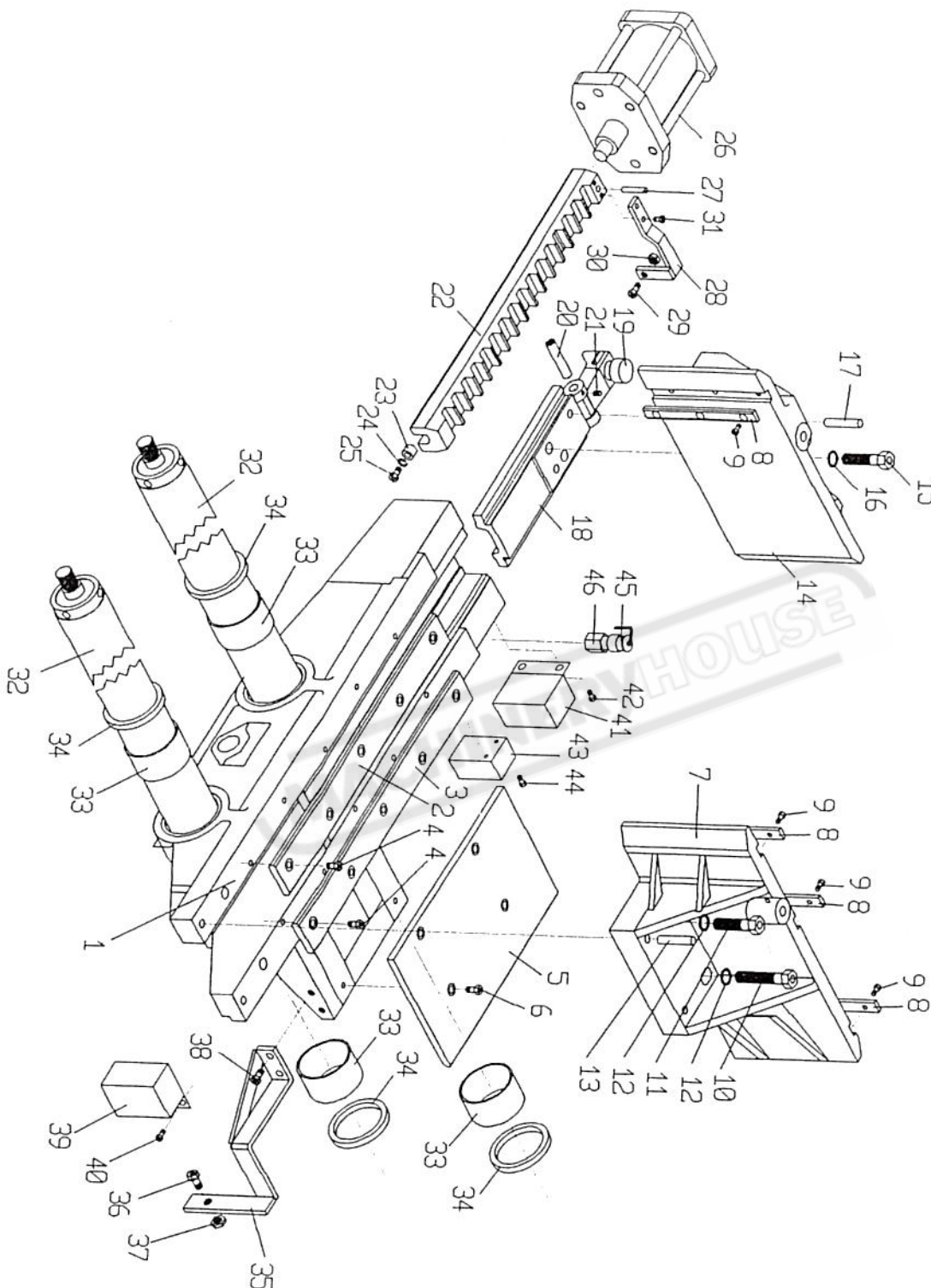
NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
1-3-1	AHC-0131-CE	elec.box	電氣箱		1
1-3-2	AGC-1040B	elec.data plate	控制面板		1
1-3-3	AGC-1041B	control plate	控制底板		1
1-3-4		screw	丸頭螺絲	M8*8L	4
1-3-5	AHC-0134-CE	elec.data plate	控制面板		1
1-3-6	AHC-0135-CE	control plate	控制底板		1
1-3-7		screw	丸頭螺絲	M8*8L	4
1-3-8	AHA-1806	vernier dial	流量閥旋鈕		2
1-3-9	AHA-10289	regulator set	調壓閥		1
1-3-10	AHA-6100	flow control valve	流量控制閥		1
1-3-11	AHC-0101-CE3	bracket	電氣箱架		1
1-3-12					
1-3-13					
1-3-14					
1-3-15					
1-3-16					
1-3-17					
1-3-18					
1-3-19					
1-3-20					
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1-3-39					
1-3-40					
1-3-41					
1-3-42					
1-3-43					
1-3-44					
1-3-45					
1-3-46					



## AHC-1002C.WRK BED ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
2-1	AHC-0201	vise bed	床面		1
2-2	AHC-0234B	slide plate	床面鋼板		1
2-3	AHC-0234A	slide plate	床面鋼板		1
2-4		bolt	內六角螺絲	M8*20L	10
2-5	AHC-0229	front fixed vise jaw	前固定虎鉗(一)	M6*6L	1
2-6	AHC-0238	vise plate	虎鉗鋼板		1
2-7		bolt	內六角螺絲	M6*16L	12
2-8	AHA-0122B	fixed bolt	固定螺絲(二)		4
2-9		spring washer	彈簧華司		4
2-10	AHC-0230	front fixed vise jaw	前固定虎鉗(二)		1
2-11	AHC-0239B	vise plate	虎鉗鋼板		3
2-12	AHC-0223	front movable vise jaw	前活動虎鉗		1
2-13	AHA-0227A	auxiliary plate	輔助板		3
2-14		spring pin	彈簧銷	φ 6*16L	2
2-15	AHA-0224	pawl	施力板		1
2-16	AHA-0225A	straight pin	施力板插銷		1
2-17	AHA-0122A	fixed bolt	固定螺絲(一)		2
2-18		washer	華司	M16	2
2-19		bolt	外六角螺絲	M14*45L	2
2-20		spring washer	彈簧華司	M14	2
2-21	AHB-0215C	rack	浪形板		1
2-22	AHA-0210B	rack guide ring	浪形板活動圈		1
2-23		spring washer	彈簧華司	M8	1
2-24		bolt	內六角螺絲	M8*20L	1
2-25	AHA-02139-1	vise cylinder	虎鉗油壓缸		1
2-26		spring pin	彈簧銷	φ 6*35L	1
2-27	AHC-1427-CE	stock receiving tray	托架		1
2-28		bolt	內六角螺絲	M12*30L	2
2-29		spring washer	彈簧華司	M12	2
2-30	AHC-1437	support	托架支持板		1
2-31		bolt	內六角螺絲	M10*15L	2
2-32		spring washer	彈簧華司	M10	2
2-33		bolt	內六角螺絲	M6*15L	2
2-34		spring washer	彈簧華司	M6	2
2-35	AHC-1424	right fence	托架右板		1
2-36	AHC-1423-CE	left fence	托架左板		1
2-37	SJM-4029	nut	普利護蓋螺母		2
2-38		nut	螺帽	M8	2
2-39		bolt	內六角螺絲	M8*100L	2
2-40	AGB-70220	bracket	冷卻水管固定板		1
2-41		bolt	內六角螺絲	M5*12L	2
2-42	PP-43136	valve	開關閥	A103 PT 3/8	1
2-43	PP-57079	hose	出水管	3/8*25"	1
2-44					
2-45		set screw	止付螺絲	M6*8L	1
2-46					

AHC-1003. WRK  
WORK FEED BED ASSEMBLY



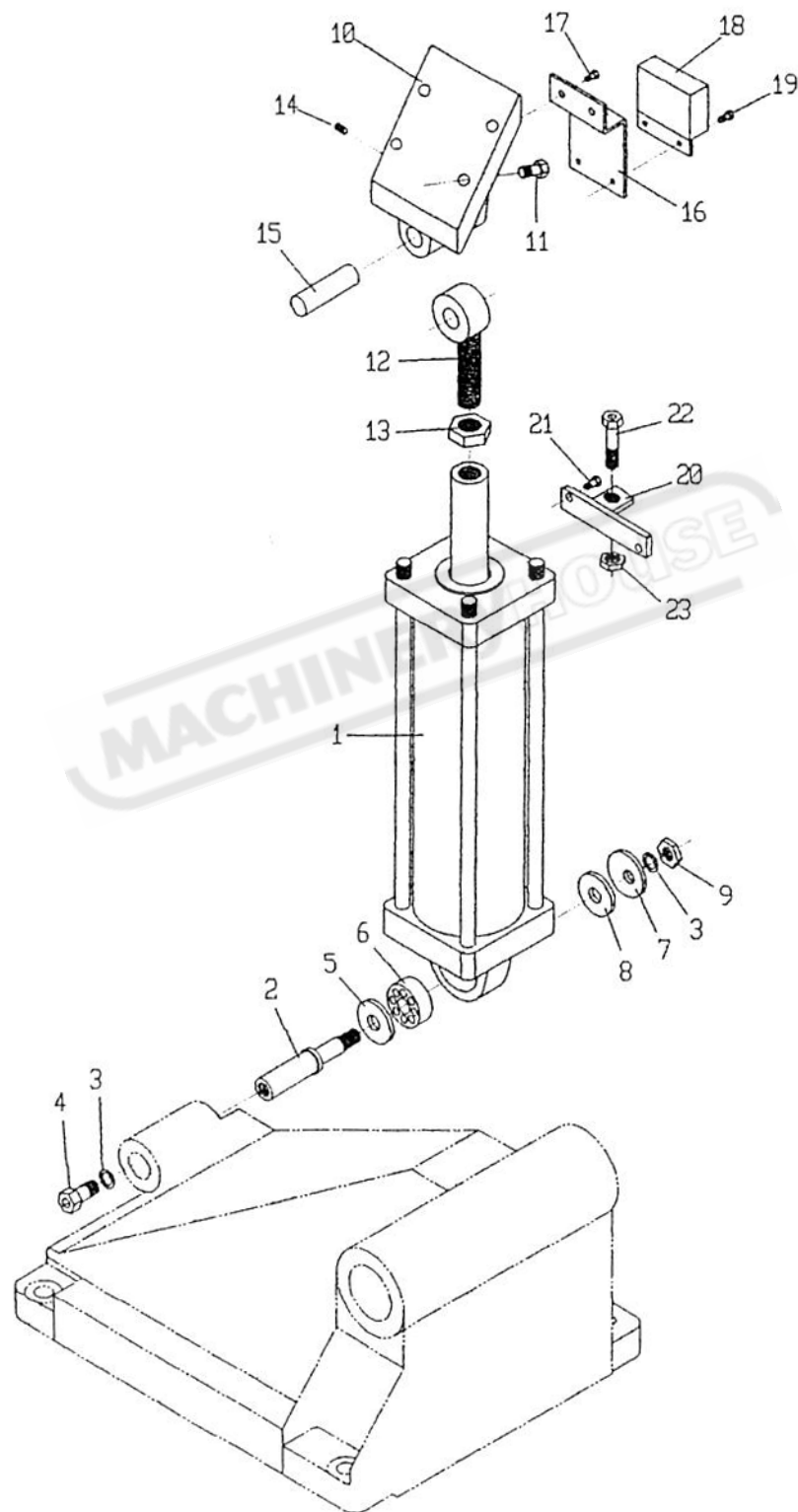


## AHC-1003.WRK WORK FEED BED ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
3-1	AHC-1510	feed vise bed	自動送料座		1
3-2	AHC-1513	slide plate	送料床面鋼板		1
3-3	AHC-1513	slide plate	送料床面鋼板		1
3-4		bolt	內六角螺絲	M8*20L	10
3-5	AHC-1524	plate	遮板		1
3-6		bolt	內六角螺絲	M8*20L	4
3-7	AHC-1527	rear fixed vise jaw	後固定虎鉗		1
3-8	AHC-0239B	vise plate	前活動虎鉗鋼板		4
3-9		bolt	內六角螺絲	M6*16L	12
3-10		bolt	內六角螺絲	M16*60L	1
3-11		bolt	內六角螺絲	M16*40L	1
3-12		spring washer	彈簧華司	M16	2
3-13		taper pin	斜度銷	φ 10*50L	2
3-14	AHC-1520	rear movable vise jaw	後活動虎鉗		1
3-15		bolt	內六角螺絲	M16*25L	2
3-16		washer	華司	M16	2
3-17		taper pin	斜度銷	φ 10*50L	2
3-18	AHA-1518	vise body	虎鉗滑座		1
3-19	AHA-0224	pawl	施力板		1
3-20	AHA-0225B	straight pin	施力板插銷		1
3-21		set screw	止付螺絲	M6*8L	1
3-22	AHB-0215C	rack	浪形板		1
3-23	AHA-0210B	rack guide ring	浪形板活動圈		1
3-24		spring washer	彈簧華司	M8	1
3-25		bolt	內六角螺絲	M8*20L	1
3-26	AHA-02139-1	vise cylinder	虎鉗油壓缸		1
3-27		spring pin	彈簧銷	φ 6*35L	1
3-28	AHC-1544-CE	lever	開關擋板(一)		1
3-29		bolt	外六角螺絲	M8*30L	1
3-30		nut	螺帽	M8	1
3-31		bolt	外六角螺絲	M6*15L	2
3-32	AHA-1601B	feed shaft	送料軸		2
3-33	PP-13260	du bushing	乾式軸承	6540	4
3-34	PP-51146	dust seal	防塵套	65*79*8/11	4
3-35	AHC-1533-CE	lever	開關擋板		1
3-36		bolt	外六角螺絲	M10*30L	1
3-37		ut	螺帽	M10	1
3-38		bolt	外六角螺絲	M8*15L	2
3-39		limit switch	限動開關	ZCK-M	1
3-40		bolt	內六角螺絲	M6*12L	2
3-41		limit switch	限動開關	ZCK-M	1
3-42		bolt	內六角螺絲	M6*12L	2
3-43		limit switch	限動開關	ZCK-J	1
3-44		bolt	內六角螺絲	M6*12L	2
3-45	AHA-1932	dust seal	防塵套(母)		1
3-46	PP-21099	connect	快速接頭	1/4"	1

AH-300H

AHC-1004.WRK  
HEAD CYLINDER ASS'Y

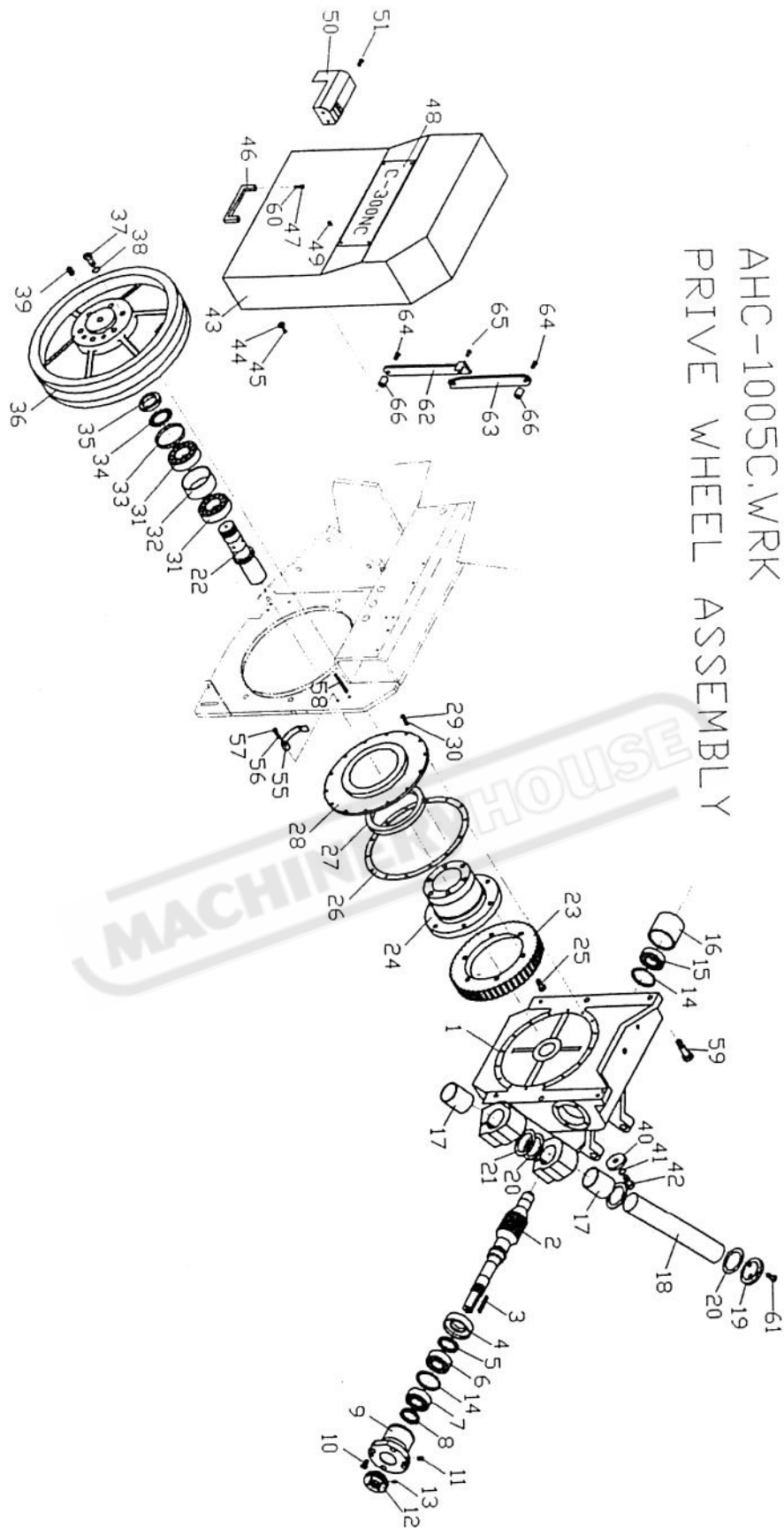


## AHC-1004.WRK HEAD CYLINDER ASS'Y

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
4-1	AHC-11119-1	hydraulic cylinder	鋸弓油壓缸		1
4-2	AHA-0126	hinge pin	油壓缸活動軸		1
4-3		spring washer	彈簧華司	M14	2
4-4		bolt	外六角螺絲	M14*20L	1
4-5	AHA-1105	bearing tap	橡皮墊圈		1
4-6	PP-14510	ball bearing	軸承	2303	1
4-7	AHA-0129	washer	偏心墊圈		1
4-8	AHA-1105A	bearing tap	橡皮墊圈		1
4-9		nut	螺帽	M14	1
4-10	AHC-1113	upper cylinder holder	油壓缸頂座		1
4-11		socket hd.bolt	內六角螺絲	M10*25L	4
4-12	PP-14480	link bearing	連桿軸承	POS-18	1
4-13		nut	螺母	M18	1
4-14		set screw	止付螺絲	M5*10L	1
4-15	AGB-70304A	hinge shaft	油壓缸插銷		1
4-16	AHC-1108-1C	bracket	限動開關擋板		1
4-17		socket hd.bolt	內六角螺絲	M6*12L	2
4-18	PP-90015-CE	limit switch	限動開關	XCK-M110	1
4-19		socket hd.bolt	內六角螺絲	M6*12L	2
4-20	AHC-1108-2C	stopper	限動開關擋板		1
4-21		bolt	內六角螺絲	M6*12L	2
4-22		bolt	內六角螺絲	M8*25L	1
4-23		nut	螺母	M8	1
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## AHC-1005C.WRK PRIVE WHEEL ASSEMBLY

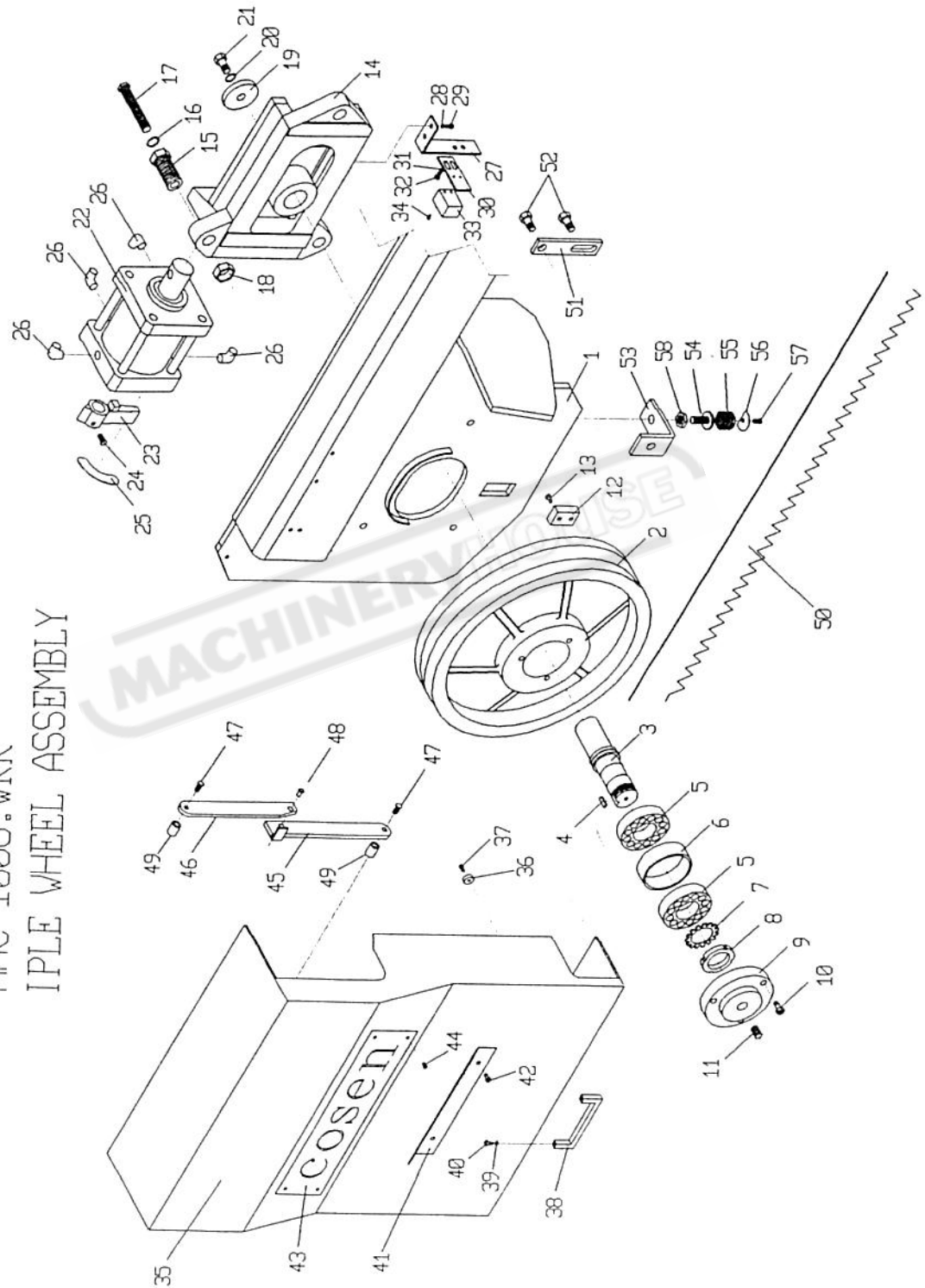
NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
5-1	AHC-0301	hinge bracket	減速機本體		1
5-2	AHA-0305	worm	蝸桿		1
5-3		key	方鍵	4*7*50L	1
5-4	AHA-0314	bearing support	軸承座蓋		1
5-5	PP-51080	oil seal	油封	E9	1
5-6	PP-14652	taoer roller bearing	滾錐軸承	30306D	1
5-7	PP-14691	taoer roller bearing	滾錐軸承	32206	1
5-8	PP-51070	oil seal	油封	V38*50*5	1
5-9	AHA-0319	bracket	軸承座(一)		1
5-10		bolt	內六角螺絲	M8*25L	4
5-11		grease nipple	油嘴	1/16"	1
5-12	AHA-0320	wire brush pulley	鋼刷普利		1
5-13		set screw	止付螺絲	M5*8L	2
5-14	PP-58103	snap ring	內鎖	R62	2
5-15	PP-14131	bearing	軸承	6206Z	1
5-16	AHA-0326	bracket	軸承座(二)		1
5-17	PP-13250	du-bushing	乾式軸承	5060	2
5-18	AHA-0310	hinge pin	關節軸		1
5-19	AHA-0311	cap	關節軸蓋		1
5-20	AHA-0324	teflin washer	鐵弗龍墊圈		3
5-21	AHA-0325	thrust bearing enndle washe	平面墊圈		2
5-22	AHA-0407	wheel shaft	下輪軸		1
5-23	AHA-0404	worm wheel	蝸輪		1
5-24	AHA-0406	housing	蝸輪固定座		1
5-25		bolt	內六角螺絲	M10*35L	6
5-26	AHA-0454	rubber wahser	橡膠墊圈		1
5-27	PP-51090	oil seal	油封	130*160*14	1
5-28	AHA-0433	fixed ring	油封固定盤		1
5-29		bolt	內六角螺絲	M6*16L	14
5-30		spring washer	彈簧華司	M6	14
5-31	PP-14693	taoer roller bearing	滾錐軸承	32208	2
5-32	AHA-0431	distance roller	軸承墊圈		1
5-33	AHA-0429	adjusting collar	調整環		1
5-34	PP-14958	toothed washer	止動環	AW08	1
5-35	PP-14908	toothed nut	固定螺母	AN08	1
5-36	AHA-0416B	drive wheel	下輪		1
5-37		bolt	外六角螺絲	M12*40L	6
5-38		spring washer	彈簧華司	M12	6
5-39		grease nipple	油嘴	1/16"	1
5-40	AHA-0403	lock washer	鎖緊墊圈		1
5-41		spring washer	彈簧華司	M12	1
5-42		bolt	內六角螺絲	M12*35L	1
5-43	AHA-0419-CE	housing cover	下輪箱蓋		1
5-44	AHA-0434	rubber wahser	橡皮墊圈		2
5-45		screw	丸頭螺絲	M4*12L	2
5-46	PP-52080	handle	輪箱把手		1

## AHC-1005C.WRK PRIVE WHEEL ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
5-47		screw	丸頭螺絲	M5*8L	2
5-48	AHC-0423A	modle plate	機型銘牌		1
5-49		screw	丸頭螺絲	M4*5L	4
5-50	AHA-1230	cover	鋼刷遮蓋		1
5-51		bolt	內六角螺絲	M5*5L	2
5-52					
5-53					
5-54					
5-55	AHA-0414	plate	鋸片安裝輔助板		1
5-56		washer	墊圈	M6	1
5-57		bolt	內六角螺絲	M6*60L	1
5-58		spring pin	彈簧銷	φ 5*60L	1
5-59	AHA-0309	fixed bolt	固定螺絲		2
5-60		spring washer	彈簧華司	M5	2
5-61		bolt	內六角螺絲	M8*25L	2
5-62	AHB-0726A	right cover bracket	右箱蓋定位板		1
5-63	AHB-0726C	cover bracket	箱蓋定位板		1
5-64		bolt	內六角螺絲	M6*25L	2
5-65		fix screw	鉚釘	φ 6	1
5-66	AHB-0822	lock washer	固定圈		2
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# AHC-1006.WRK IPLE WHEEL ASSEMBLY



## AHC-1006.WRK IPLE WHEEL ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
6-1	AHC-0415-CE	housing yoke	鋸弓		1
6-2	AHA-0634B	idle wheel	上輪		1
6-3	AHA-0635	wheel shaft	上輪軸		1
6-4		key	方鍵	3*6*15L	1
6-5	PP-14613	bearing	軸承	30207	2
6-6	AHA-0637	bearing collar	上輪軸承墊圈		1
6-7	PP-14957	toothed ring	止動環	AW07	1
6-8	PP-14907	toothed nut	固定螺母	AN07	1
6-9	SHA-04140	bearing cap	上輪軸蓋		1
6-10		bolt	內六角螺絲	M8*35L	3
6-11		grease nipple	油嘴	1/16"	1
6-12	AHA-0633-CE	proximity switch plate	上輪感側塊		1
6-13		bolt	內六角螺絲	M5*16L	2
6-14	AHA-06029	tension ass'y	張力滑座組		1
6-15	AHA-0610	adjusting bolt	調整螺絲		3
6-16		spring washer	彈簧華司	M12	3
6-17		bolt	內六角螺絲	M12*80L	3
6-18	AHA-0611	adjusting nut	調整螺母		3
6-19	AHA-0403	lock washer	鎖緊墊圈		1
6-20		washer	墊圈	M12	1
6-21		bolt	內六角螺絲	M12*35L	1
6-22	AHA-06189-1	tension cylinder	張力油壓缸		1
6-23	AHB-0653	valve lever	切換把手		1
6-24		set screw	止付螺絲	M6*10L	1
6-25	AHB-0660	legend plate	銘牌		1
6-26		plug	彎管接頭	PT 1/8"*1/4"	4
6-27	AHA-0670A	bracket	感應器底板座		1
6-28		spring washer	彈簧華司	M5	2
6-29		bolt	內六角螺絲	M5*6L	2
6-30	AHA-0672	proximity switch mounting pla	感應器底板		1
6-31		spring washer	彈簧華司	M5	2
6-32		bolt	內六角螺絲	M5*8L	2
6-33		limit switch	限動開關	ZCK-M	1
6-34		bolt	內六角螺絲	M3*15L	2
6-35	AHA-0665-CE	housing cover	上輪箱蓋		1
6-36	AHA-0434	rubber washer	橡皮墊圈		2
6-37		screw	丸頭螺絲	M4*12L	2
6-38	PP-52080	handle	輪箱把手		1
6-39		spring washer	彈簧華司	M5	2
6-40		screw	丸頭螺絲	M5*8L	2
6-41	AHA-0668	cover bracket	鋸片護蓋座板		1
6-42		bolt	內六角螺絲	M5*5L	2
6-43	AHA-0666	name plate	公司銘牌		1
6-44		screw	丸頭螺絲	M4*5L	4
6-45	AHB-0726B	left cover bracket	左箱蓋定位板		1
6-46	AHB-0726C	cover bracket	箱蓋定位板		1

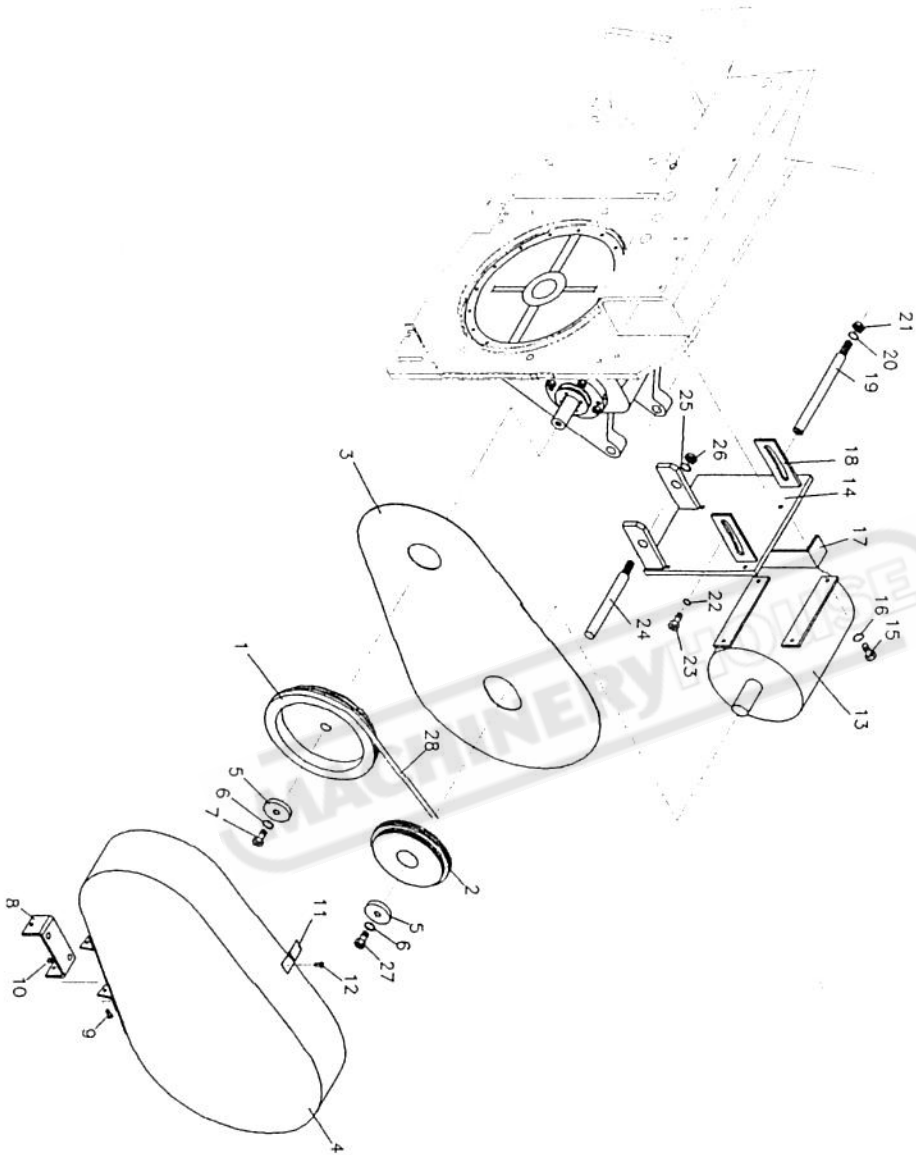
## AHC-1006.WRK IPLE WHEEL ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
6-47		bolt	內六角螺絲	M6*25L	2
6-48		fix screw	鉚釘	φ6	1
6-49	AHB-0822	lock washer	固定圈		2
6-50	PP-18187	saw blade	鋸帶	HS 3660*34*1.	1
6-51	AHA-0451	fixed plate	鋸弓固定板		1
6-52		bolt	內六角螺絲	M12*12L	2
6-53	AHC-0452	bracket (saw bow )	鋸弓定位塊		1
6-54	AHA-0631	bolt	定位螺絲		1
6-55	AHA-0629	spring	緩衝彈簧		1
6-56	AHA-0630	spring plate	墊圈		1
6-57		bolt	內六角螺絲	M6*12L	1
6-58		nut	螺帽	M12	1
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AHC-1007B.WRK  
DRIVE MOTOR ASSEMBLY  
(INVERTER)



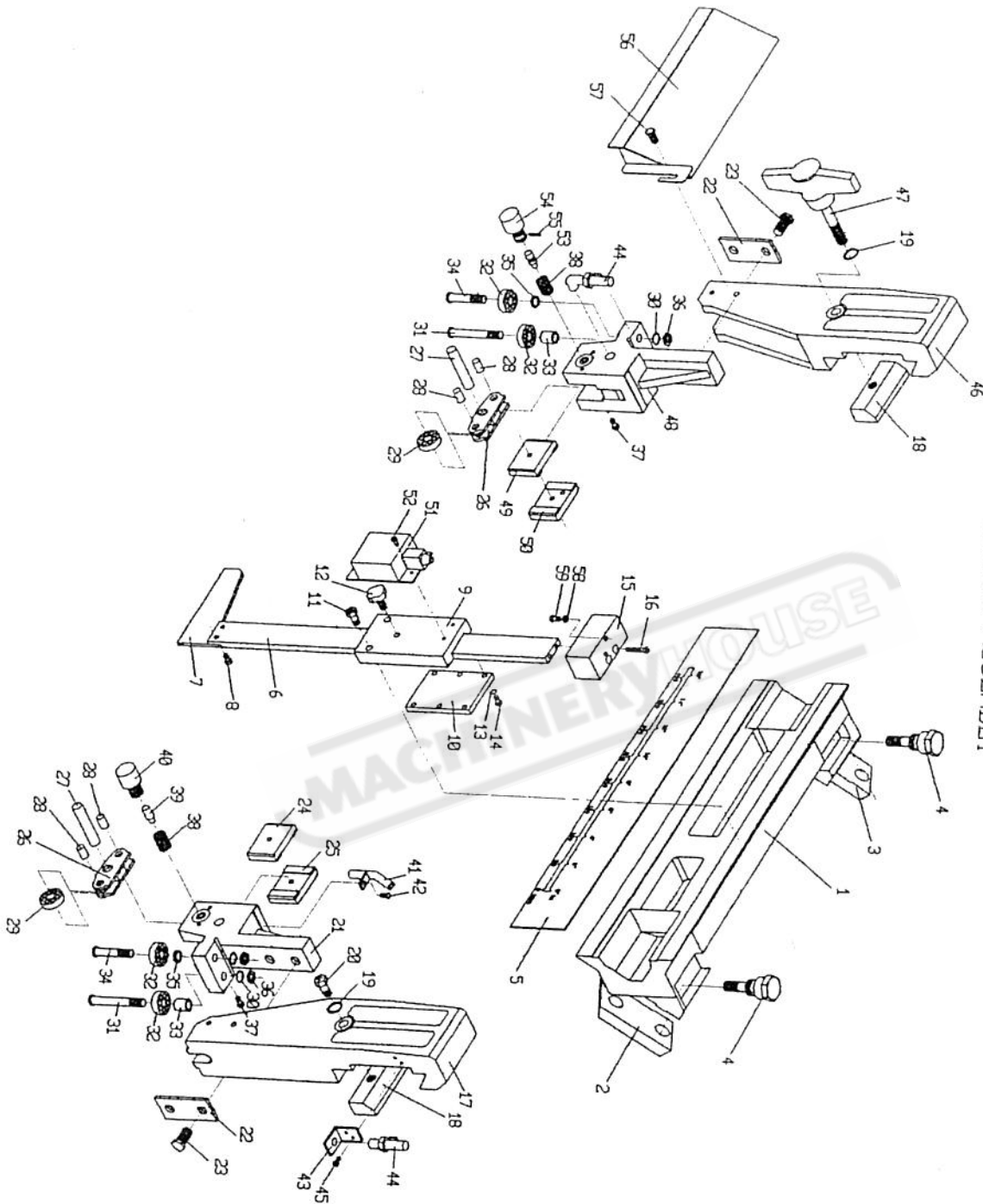
## AHC-1007B.WRK DRIVE MOTOR ASSEMBLY (INVERTER)

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
7B-1	AHA-0514G	reducer pulley	減速機皮帶輪		1
7B-2	AHA-0538G	motor pulley	馬達皮帶輪		1
7B-3	AHC-0512	pulley cover base plate	普利護蓋底板		1
7B-4	AHC-0501	pulley cover	普利護蓋		1
7B-5	AHA-0525	washer	墊圈		2
7B-6		spring washer	彈簧華司	M10	2
7B-7		bolt	內六角螺絲	M10*30L	1
7B-8	AHA-0507	bracket	護蓋耳		1
7B-9		bolt	內六角螺絲	M5*12L	2
7B-10		nut	螺母	M5	2
7B-11	PP-52090	lock plate	蓋扣		1
7B-12		bolt	內六角螺絲	M5*16L	1
7B-13	PP-31081	motor	馬達	5HP	1
7B-14	AHR-2027	motor base plate	馬達底板		1
7B-15		bolt	內六角螺絲	M10*25L	4
7B-16		spring washer	彈簧華司	M10	4
7B-17	AHC-0511	bracket	普利護蓋固定耳		1
7B-18	AHA-0510B	bracket	馬達底板耳		2
7B-19	AHA-0526	fixed shaft	馬達定位軸		1
7B-20		spring washer	彈簧華司	M12	1
7B-21		nut	螺母	M12	1
7B-22		washer	華司	M10	1
7B-23		bolt	內六角螺絲	M10*32L	1
7B-24	AHA-0515	bar	馬達活動軸		1
7B-25		spring washer	彈簧華司	M12	1
7B-26		nut	螺母	M12	1
7B-27		bolt	內六角螺絲	M10*50L	1
7B-28	PP-56288A	belt	皮帶	B46	1
7B-29					
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7B-31					
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AHC-1008.WRK  
GUIDE BRACKET ASSEMBLY



## AHC-1008.WRK GUIDE BRACKET ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
8-1	AHC-0738	guide bar	鋸臂滑板		1
8-2	AHA-0439B	slide tip	鋸臂滑板固定塊(二)		1
8-3	AHA-0734	adjusting bolt	滑板調整螺絲		4
8-4	AHA-0439A	slide tip	鋸臂滑板固定塊(一)		1
8-5	AHC-0735A	ruler plate	鋸臂滑板銘牌		1
8-6	AHC-1753B	descending slide bar	急降桿		1
8-7	AHA-1755B	feeder	急降桿擋板		1
8-8		bolt	內六角螺絲	M6*10L	2
8-9	AHA-1752	descending slide brack	急降桿固定座		1
8-10	AHA-1754	cover plate	急降桿座蓋		1
8-11		bolt	內六角螺絲	M10*30L	2
8-12	PP53010	screw	梅花螺絲	M8*20L	1
8-13		spring washer	彈簧華司	M6	6
8-14		bolt	內六角螺絲	M6*12L	6
8-15	AHA-1756	limit block	限動開關座		1
8-16		bolt	內六角螺絲	M6*40L	2
8-17	AHC-0749	right guide bracket	右鋸臂		1
8-18	AHA-0737	slide tip	鋸臂固定塊		2
8-19		spring washer	彈簧華司	M12	2
8-20		bolt	外六角螺絲	M12*75L	1
8-21	AHA-0748B	right insert holder	右導輪座		1
8-22	AHA-0719	plain washer	導輪座墊片		2
8-23		bolt	外六角螺絲	M12*40L	4
8-24	AHA-0743B	right movable insert	右活動鋸鋼片		1
8-25	AHA-0744B	right fixed insert	右固定鋸鋼片		1
8-26	AHA-0704	bearing holder	下壓軸承座		2
8-27	AHA-0713-1	straight shaft	軸承座固定軸		2
8-28	AHA-0706B	straight pin	下壓軸承銷		4
8-29	PP-14270	bearing	軸承	6200 VV	4
8-30		spring washer	彈簧華司	M10	4
8-31	AHA-0707B	roller pin	導輪軸		2
8-32	PP-14270	bearing	軸承	6200 VV	8
8-33	AHA-0708B	washer	墊圈		2
8-34	AHA-0707C	roller pin	短導輪軸		2
8-35		washer	墊圈	M10	2
8-36		nut	螺帽	M10	4
8-37		bolt	內六角螺絲	M6*20L	2
8-38	AHA-0710	spring	彈簧		2
8-39	AHA-0741	right fitting	右簧塞		1
8-40	AHA-0742	right insert knob	右調整螺絲		1
8-41	AHA-0745	coolant nozzle	冷卻水噴嘴		1
8-42		bolt	內六角螺絲	M5*8L	1
8-43	MJA-2041	bracket	水龍頭座板		1
8-44	PP-43132	coolant valve	開關閥	1/8"	2
8-45		bolt	內六角螺絲	M5*8L	2
8-46	AHC-0722	left guide bracket	左鋸臂		1

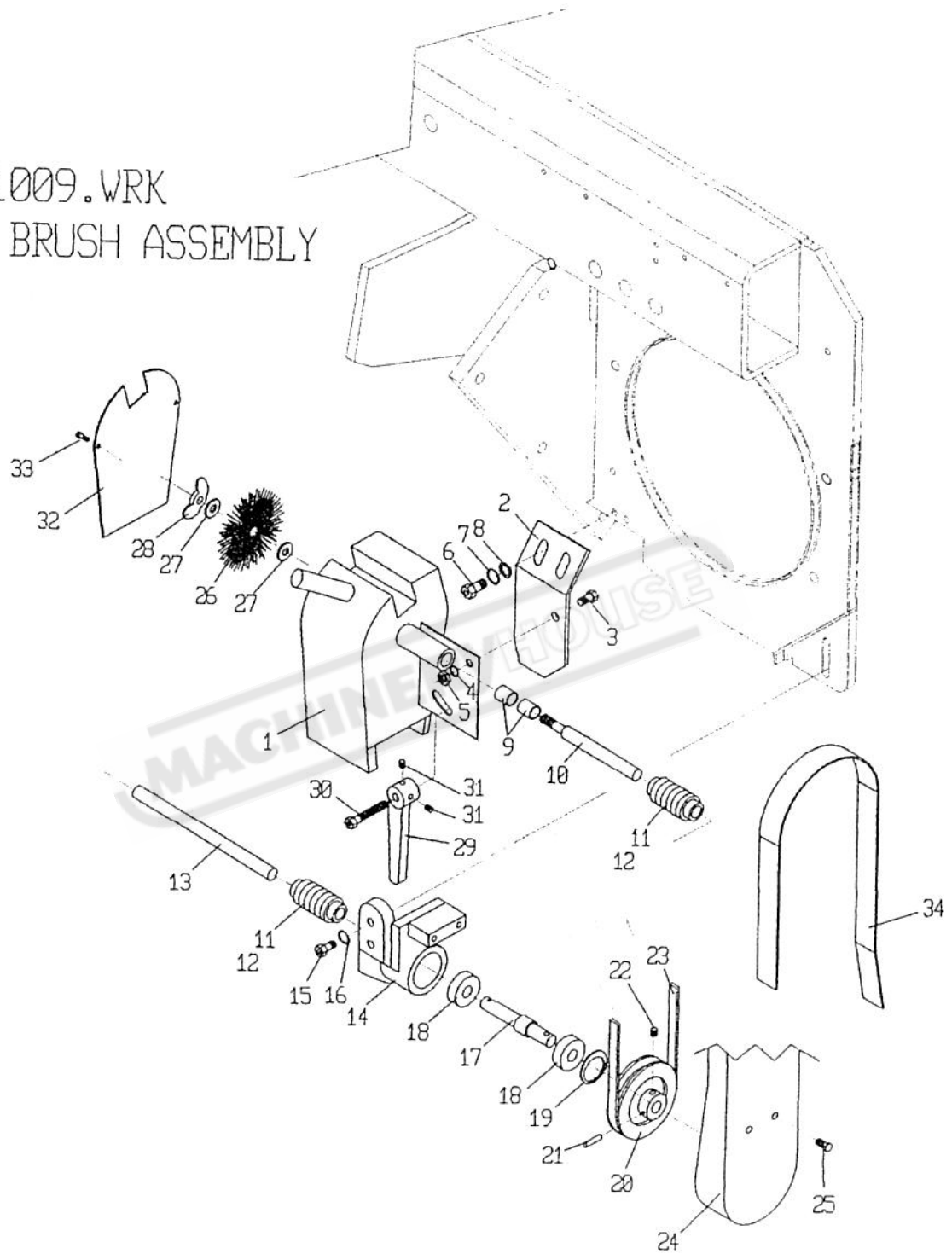
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## AHC-1008.WRK GUIDE BRACKET ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
8-47	AHA-07259	handle	把手		1
8-48	AHA-0712B	left insert holder	左導輪座		1
8-49	AHA-0702B	left movable insert	左活動鋤鋼片		1
8-50	AHA-0701B	left fixed insert	左固定鋤鋼片		1
8-51		limit switch	限動開關		1
8-52		bolt	內六角螺絲	M5*25L	2
8-53	AHA-0709	left fitting	左簧塞		1
8-54	AHA-0711	adjusting bolt	調整螺絲		1
8-55		pin	銷	φ 3*16L	1
8-56	AHA-0667	movable saw blade cov	活動鋸片護蓋		1
8-57		bolt	內六角螺絲	M6*5L	1
8-58		nut	螺帽	M6	1
8-59		bolt	外六角螺絲	M6*35L	1
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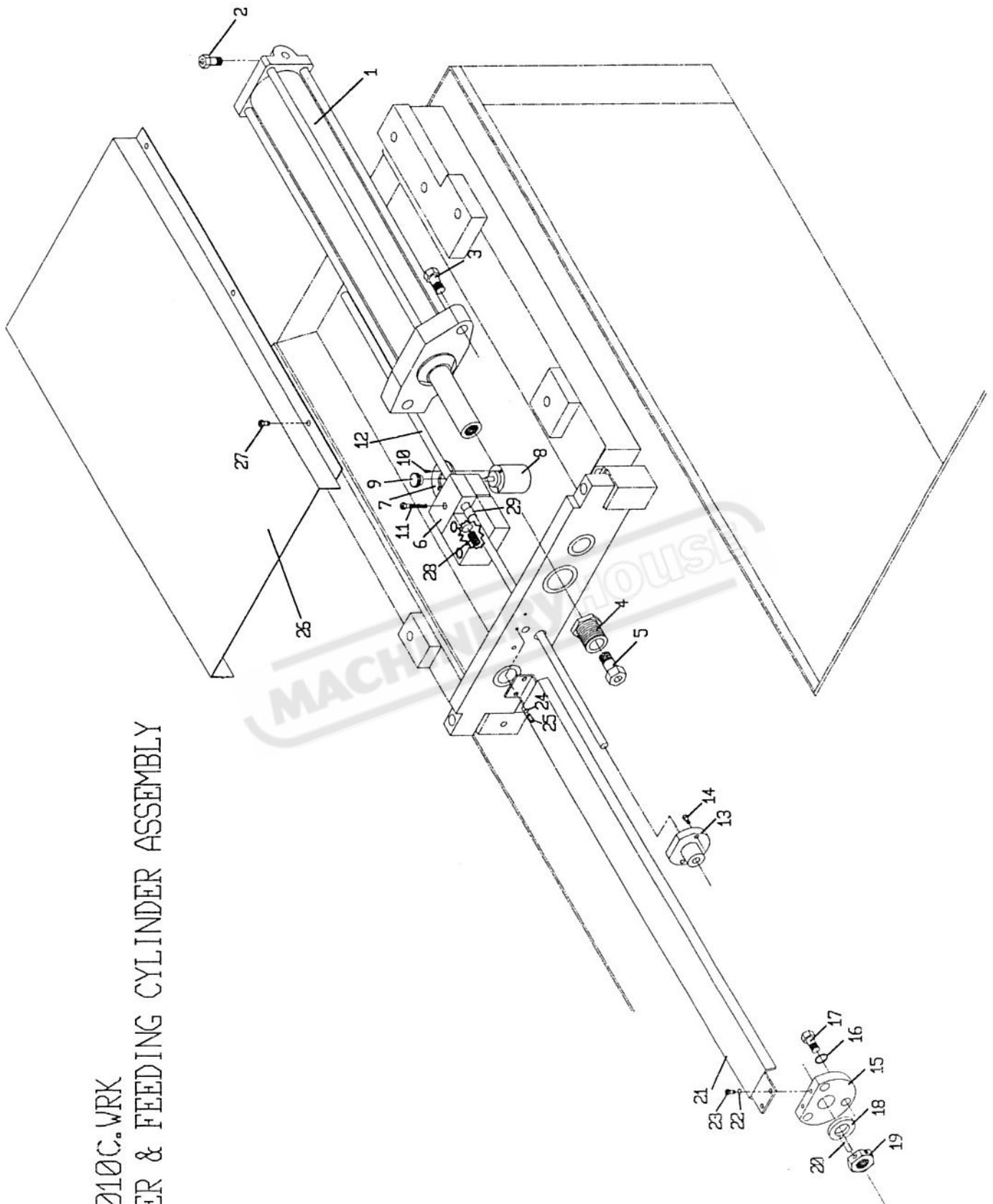
# AHC-1009.WRK WIRE BRUSH ASSEMBLY



## AHC-1009.WRK WIRE BRUSH ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
9-1	AHA-1220	brush cover	鋼刷護蓋		1
9-2	AHC-1225	brush bracket	鋼刷護蓋固定板		1
9-3		bolt	外六角螺絲	M8*16L	2
9-4		spring washer	彈簧華司	M8	2
9-5		nut	螺帽	M8	2
9-6		bolt	外六角螺絲	M8*15L	2
9-7		spring washer	彈簧華司	M8	2
9-8		washer	平面華司	M8	2
9-9	PP-13025	du bearing	乾式軸承	1215	2
9-10	AHB-0519	brush shaft	鋼刷軸		2
9-11	PP-15010	universal joint	萬向接頭	12MM	2
9-12	PP-15012	dust seal	萬向接頭防塵套		2
9-13	AHA-1215	shaft	鋼刷傳動桿		1
9-14	AHA-1211	bearing bracket	軸承座		1
9-15		bolt	外六角螺絲	M8*40L	2
9-16		spring washer	彈簧華司	M8	2
9-17	AHA-1207	pulley shaft	皮帶輪軸		1
9-18	PP-14272	bearing	軸承	6201V	2
9-19	PP-58109	snap ring	扣環	R32	1
9-20	AHA-1202	brush pulley	鋼刷皮帶輪		1
9-21		spring pin	彈簧銷	φ4*25L	1
9-22		set screw	止付螺絲	M6*6L	1
9-23	PP-56510	belt	皮帶	M37	1
9-24	AHA-1201	brush pulley cover	鋼刷普利護蓋		1
9-25		bolt	外六角螺絲	M6*16L	1
9-26	PP-58002	wire brush	鋼刷	90*8MM	1
9-27		washer	平面華司	5/16"	2
9-28		nut	螺帽	M8	1
9-29	AHA-1217	lock lever	鋼刷固定把手		1
9-30		bolt	外六角螺絲	M8*35L	1
9-31		set screw	止付螺絲	M5*6L	2
9-32	AHA-1220-1	brush cover plate	鋼刷護蓋板		1
9-33		bolt	內六角螺絲	M4*4L	2
9-34	AHA-1203-CE	brush pulley cover (二)	鋼刷皮帶輪護蓋(二)		1
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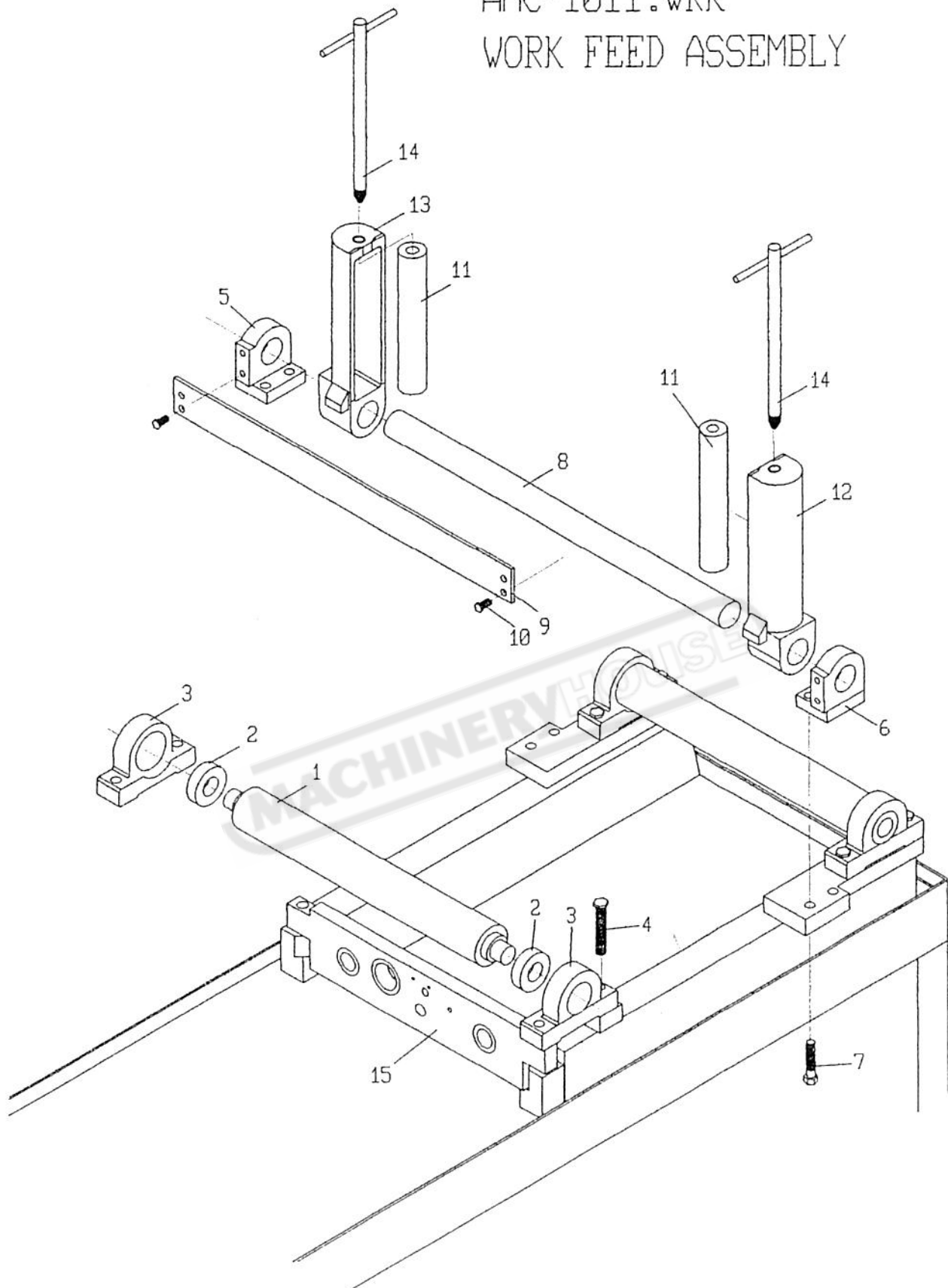
AHC-1010C.WRK  
ENCODER & FEEDING CYLINDER ASSEMBLY



## AHC-1010C ENCODER &amp; FEEDING CYLINDER ASSEMBLY

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
10-1	AHA-16019-1	feed cylinder	送料油壓缸		1
10-2		bolt	內六角螺絲	M12*30L	1
10-3		bolt	內六角螺絲	M14*25L	2
10-4	AHA-1605	bush bolt	襯套螺絲		1
10-5		bolt	內六角螺絲	M18*60L	1
10-6	AHA-1563	encoder bracket	譯碼器固定座		1
10-7	AHA-1562	movable plate	譯碼器活動板		1
10-8	PP-90492	encoder	譯碼器	LBT-002-2000	1
10-9	AHA-1560	stop gear	定寸齒輪		1
10-10		bolt	內六角螺絲	M3*8L	3
10-11		bolt	內六角螺絲	M6*40L	1
10-12	AHA-1561-1	stop chain	定寸齒條		1
10-13	AHA-1564	encoder bracket (二)	齒排固定座(二)		1
10-14		bolt	內六角螺絲	M5*10L	2
10-15	AHA-1645	bearing holder	軸承座		1
10-16		spring washer	彈簧華司	M12	1
10-17		bolt	內六角螺絲	M12*30L	1
10-18	PP-14430,A,B	bearing	軸承	2035	1PC/EA
10-19	AHA-1643	nut	螺帽		1
10-20		pin	銷	φ 5*25L	1
10-21	AHA-1641	cover	定寸螺桿護蓋		1
10-22		spring washer	彈簧華司	M5	2
10-23		bolt	內六角螺絲	M5*12L	2
10-24		spring washer	彈簧華司	M5	2
10-25		bolt	內六角螺絲	M5*12L	2
10-26	AHC-1607	cylinder cover	油壓缸護蓋		1
10-27		bolt	內六角螺絲	M5*8L	6
10-28	M3L-9-10	spring	彈簧		1
10-29	PP-13020	du bushing	乾式軸承	1012	2
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# AHC-1011.WRK WORK FEED ASSEMBLY

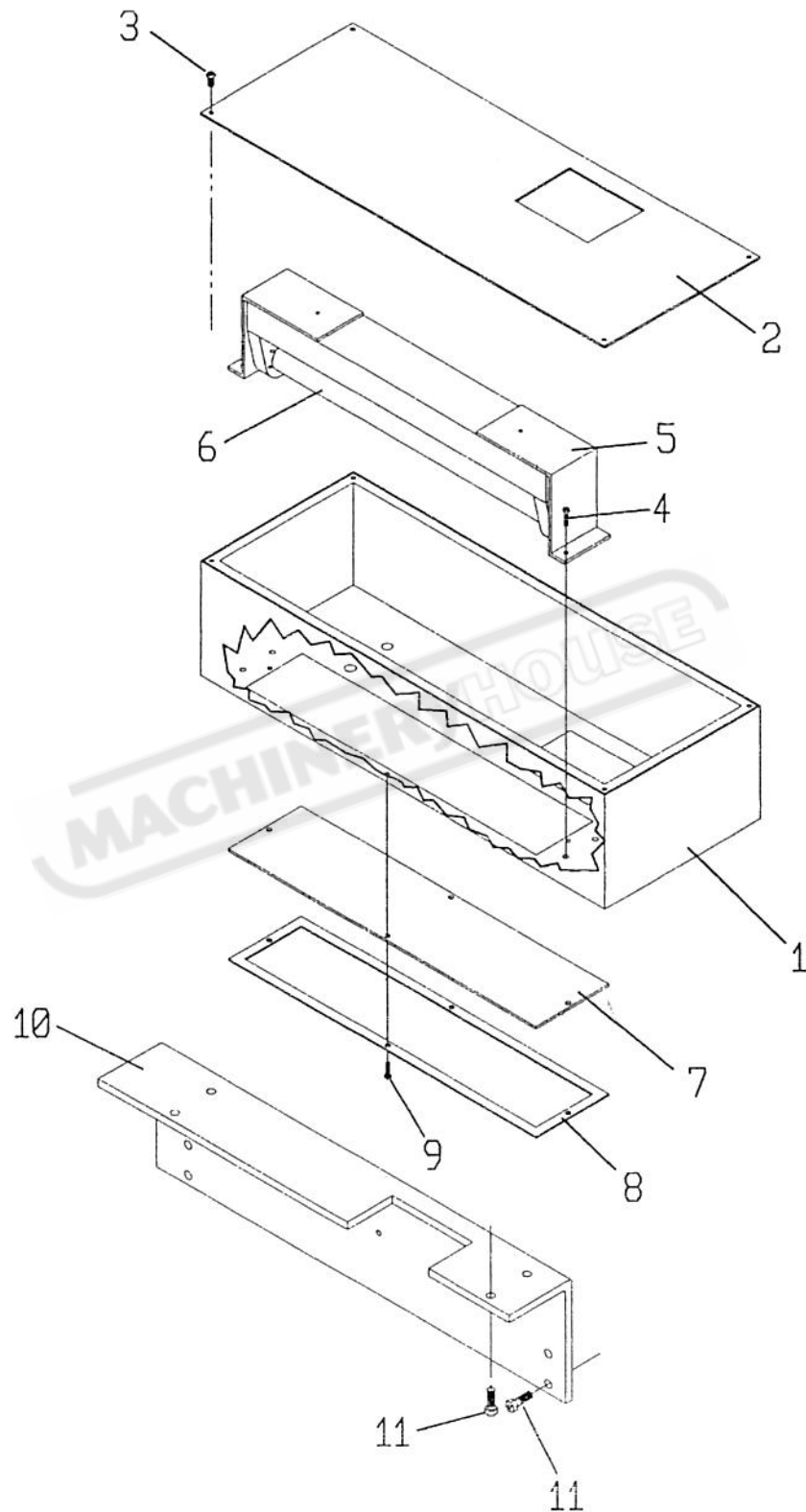




## AHC-1011.WRK WORK FEED ASSEMBLY

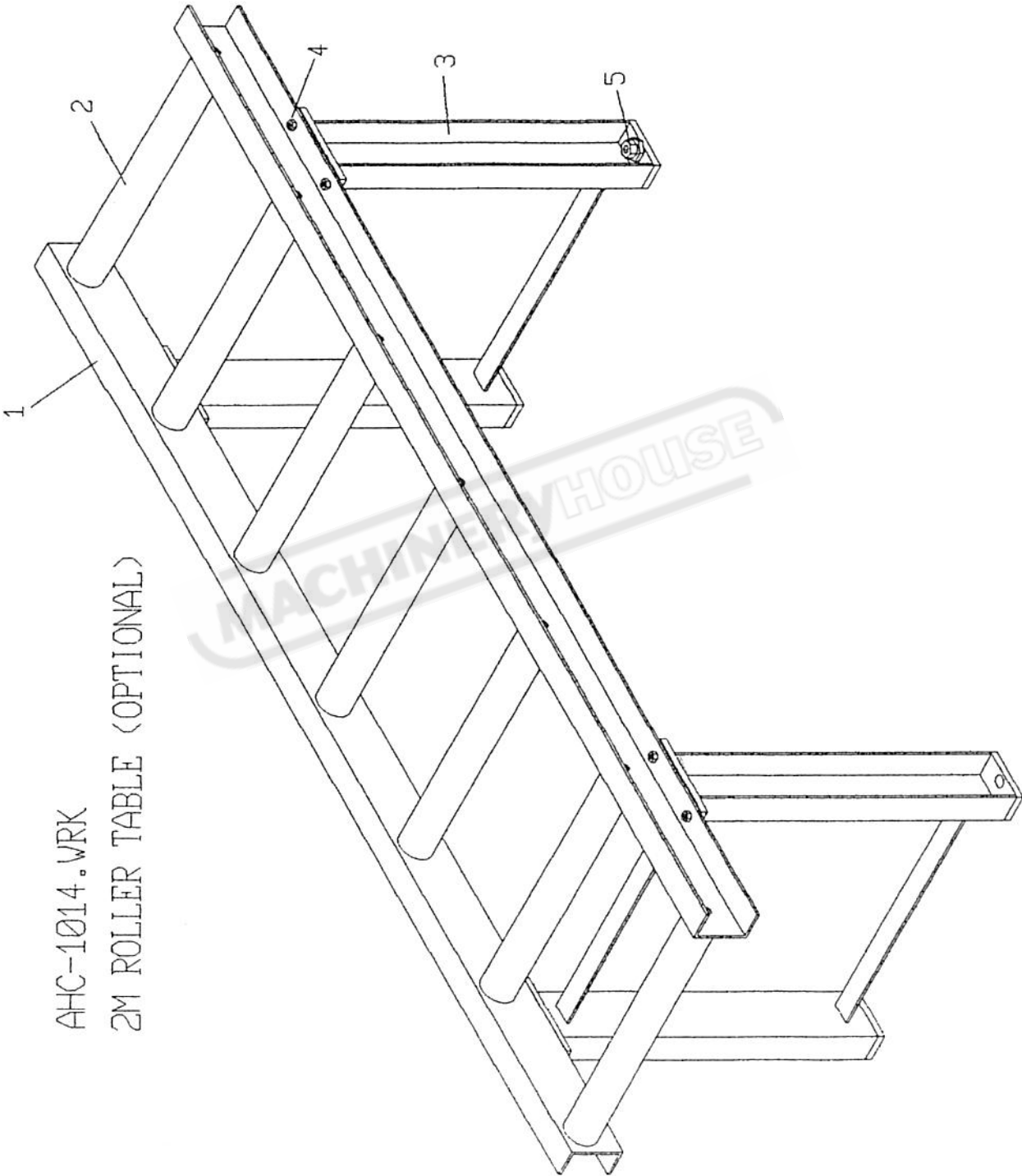
NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
11-1	AHC-1625	roller	滾輪		2
11-2	PP-14275	bearing	軸承	6205 ZZ	4
11-3	AHA-1636	roller bracket	滾輪固定座		4
11-4		bolt	內六角螺絲	M12*25L	8
11-5	AHA-1669B	right roller bracket	右滾輪固定座		1
11-6	AHA-1669A	left roller bracket	左滾輪固定座		1
11-7		bolt	內六角螺絲	M12*25L	4
11-8	AHC-1662	guide bar	側滾輪固定軸		1
11-9	AHC-1675	stopper plate	側滾輪擋板		1
11-10		bolt	內六角螺絲	M8*25L	4
11-11	AHC-1677B	shaft	側滾輪軸		2
11-12	AHC-1667B	right roller bracket	右側滾輪座		1
11-13	AHC-1667B	left roller bracket	左側滾輪座		1
11-14	AHB-1690	shaft	側滾輪軸		2
11-15	AHC-1654	fixed plate	送料軸固定板		1
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# AHC-1012C.WRK WORK LAMP ASSEMBLY



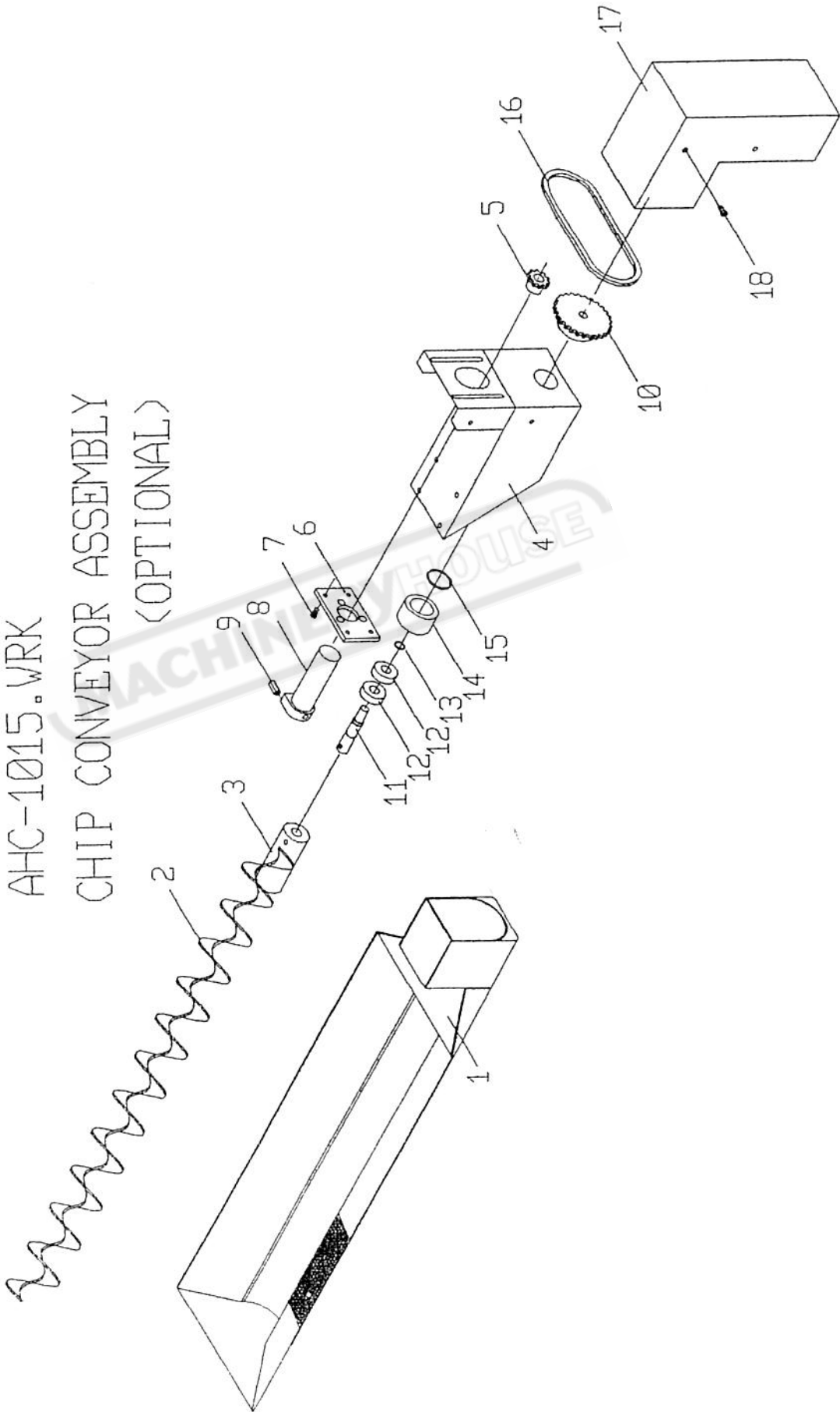
## AHC-1012C.WRK WORK LAMP ASS'Y

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
12-1	AHC-0663-NC	lamp box	照明燈箱体		1
12-2	AHC-0664-NC	lamp box cover	蓋板		1
12-3		bolt	內六角螺絲	M4*5L	4
12-4	AHB-1102-NC	lamp bracket	照明燈固定座		2
12-5		bolt	內六角螺絲	M4*6L	4
12-6	PP-90602C	lamp	防水燈		1
12-7	AGB-70345-NC	lamp cover	燈罩		1
12-8	AGB-70346-NC	lamp bracket	燈罩護板		1
12-9		bolt	內六角螺絲	M3*8L	4
12-10	AHC-1808	bracket	控制箱固定板		1
12-11		bolt	內六角螺絲	M8*15L	8
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## AHC-1014.WRK 2M ROLLER TABLE (OPTIONAL)

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
14-1	AHA-2002	roller table	送料架		2
14-2	AHC-2001	roller	滾輪		7
14-3	AHC-2003	roller table frame	送料腳架		2
14-4		bolt	內六角螺絲	M12*20L	8
14-5		adjusting bolt	內六角螺絲	M20*40L	4
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## AHC-1015.WRK CHIP CONVEYOR ASSEMBLY (OPTIONAL)

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
15-1	AHA-2015A	basket	除屑機本體		1
15-2	AHA-2014	rod	除屑螺旋		1
15-3	AHA-2022B	shaft	除屑螺旋軸		1
15-4	AHB-2016	motor bracket	除屑馬達座		1
15-5	AHB-2019B	wheel	傳動鍊輪(小)		1
15-6	AHB-2026	plate	泵浦連接板		1
15-7		bolt	內六角螺絲		4
15-8	PP-31640-1	motor	油壓馬達	OMM-20-128-00	1
15-9	PP-43117	flow control valve	流量閥		1
15-10	AHB-2019A	wheel	傳動鍊輪(大)		1
15-11	AHB-2023A	wheel shaft	鍊輪軸		1
15-12	PP-14003	bearing	軸承	6202 VV	2
15-13	PP-52097	snap ring	扣環	S15	1
15-14	AHB-2020B	bearing holder	軸承座		1
15-15	PP-58106	snap ring	扣環	R35	1
15-16	PP-19061	chain	鏈條	RS35	1
15-17	AHB-2018	motor cover	除屑馬達蓋		1
15-18		bolt	內六角螺絲	M6*5L	2
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