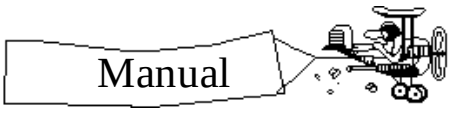
Bandsaw Specialist

Instruction Manual

Model: C-325NC

Programmable Automatic Mass Production
Horizontal Bandsaw



COSEN MACHINERY INDUSTRIAL CO., LTD

NOTICE: Please read this instruction manual carefully to familiarize yourself with the installation, operation and maintenance. Please keep in mind the following: Correctly operate the machine as described in the manual to prevent accidents. We suggest you always keep manual handy and refer to it whenever you are unsure of how to perform any procedure for C-325NC.

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.

Instruction Manual:

C-325NC Cosen Programmable Automatic Mass Production Horizontal Bandsaw

Ver. 1 Date: 03/12/2012

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Printed in Taiwan

Foreword

FROM THE MANUFACTURER

You have just purchased a machine manufactured by the COSEN Machinery Industrial Co., Ltd. We'd like to take this chance to express our appreciation to you for being our valued customer. Any comment from you will help us to design a better product or provide a better service for you.

The band saw machine will provide low cost cutting accuracy for many years if the procedures for installation, operation, maintenance and troubleshooting are followed. However, if there are questions, please contact our agent or our factory for the nearest service or sales representative.

Enough, already. I hope you find ***COSEN*** as incredibly smart as I do. If you have any suggestions for improvement, please tell us, we will appreciate your help.

"again"

Thank you so much for purchasing ***COSEN*** band saw machine.

Mike Huang

President
COSEN Machinery Industrial Co., Ltd.

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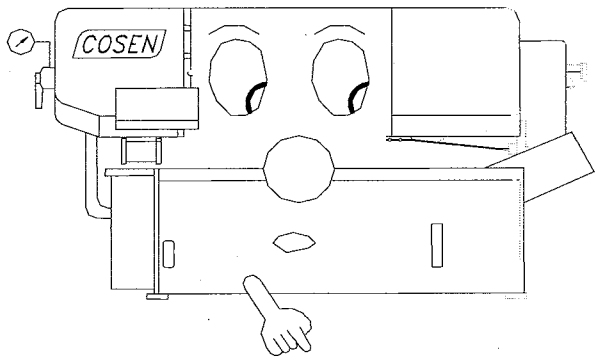
SAFETY RULES



SECTION 1

SAFELY RULES

WARNING

READ THIS SIGN BEFORE OPERATION THIS MACHINE
MISUSE OF MACHINE MAY RESULT IN SERIOUS BODILY INJURY.
YOU MUST THEREFORE FOLLOW THESE SAFE OPERATION PROCEDURES.

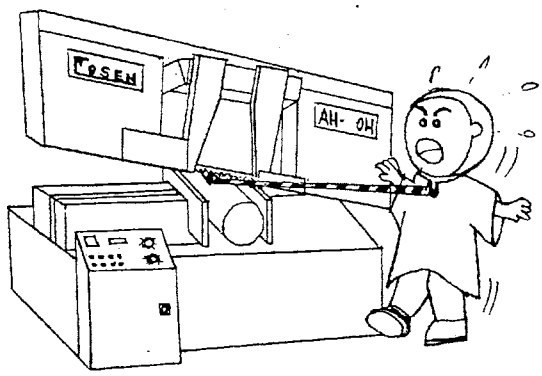
A safety signal world always accompanies the safetyalert symbol. The safety signal words- **DANGER. WARNING, CAUTION** and **NOTE** - identify the severity of a hazard.

- **DANGER indicates a situation which, if not avoided, *will* result in serious injury or death.**
- **WARNING indicates a situation which, if not avoided, *could*result in serious injury or death.**
- **CAUTION indicates a situation which, if not avoided, *can* result in damage to the machine.**
- **NOTE indicates a situation which, if not avoided, *may* result in damage to the machine.**

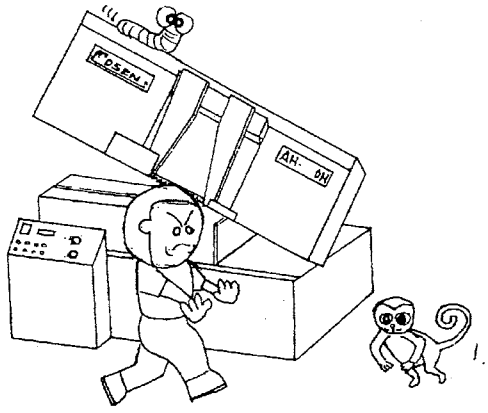
SAFETY

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 adjustings 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.

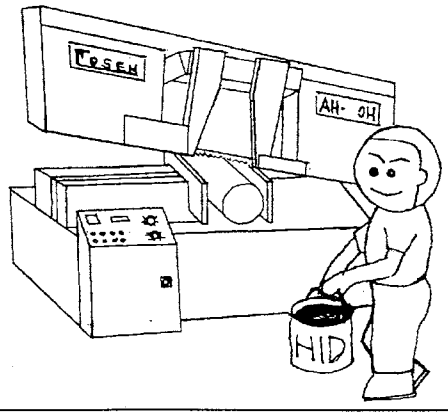
■ Never wear gloves loose clothing when operating the machine. They may cause danger if they are caught in a running machine.



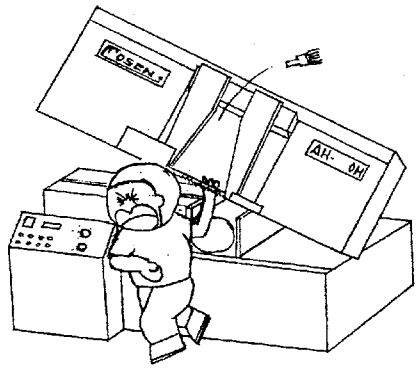
■ Be sure to confirm that the area around the machine is cleared of people and obstacles every time before starting the machine or operation.



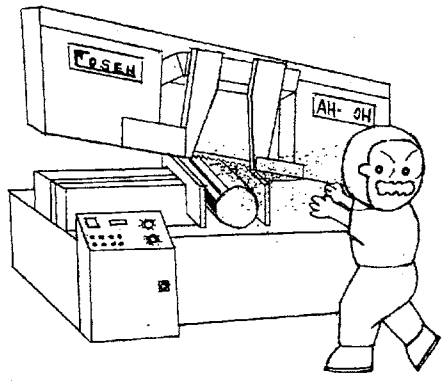
■ Use a water-soluble cutting fluid on this machine. Oil-based cutting fluids may emit smoke or catch fire, depending on the condition of their use.



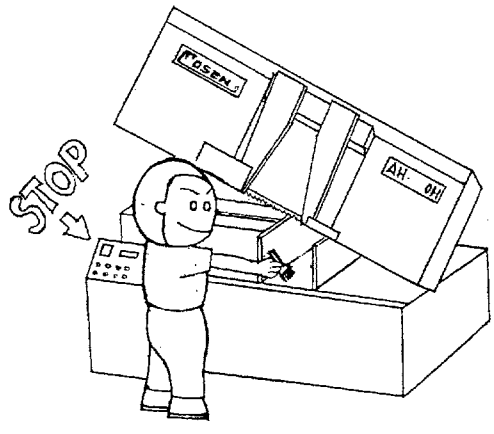
■ Never try to adjust the wire brush on the saw blade or remove chips when the saw blade is running. It is dangerous if hands or clothing are caught by the running blade.



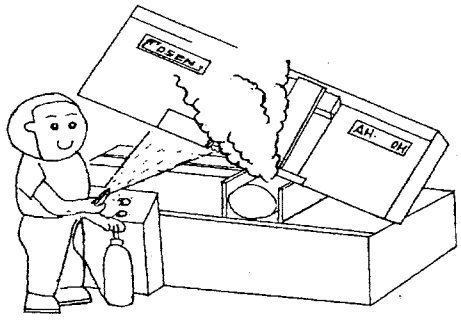
■ Never cut carbon or any other material that produces and disperses explosive dust on this machine. Sparks from motors and other machine parts may ignite and explode the air-borne dust. The machine needs special measures for cutting explosive materials.



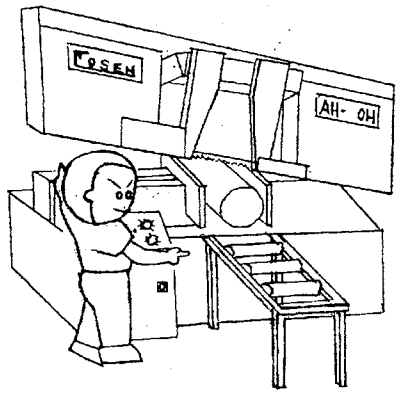
■ Stop the saw blade before you clean the machine. It is dangerous if hands or clothing are caught by the running blade.



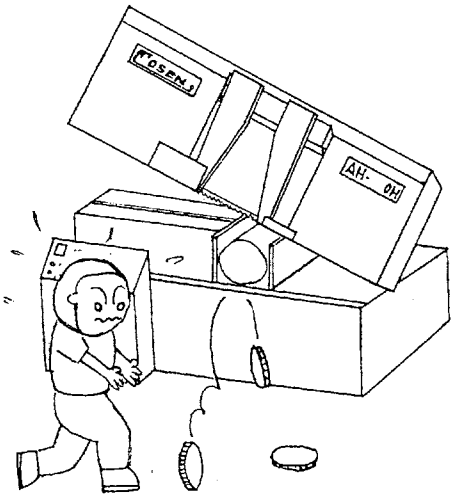
■ Be sure to prohibit any use of fire in the shop, and install a fire extinguisher or other fire control device near the machine when cutting titanium, magnesium, or any other material that produces flammable chips. Never operate the machine unattended when cutting flammable materials.



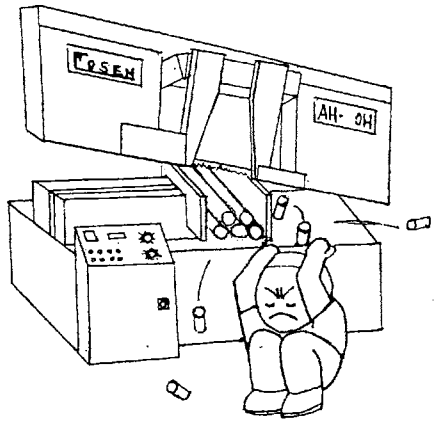
■ Use roller tables on forward and backward sides of the machine when cutting the long work. It is dangerous if the work falls off the machine when the roller tables are not used.



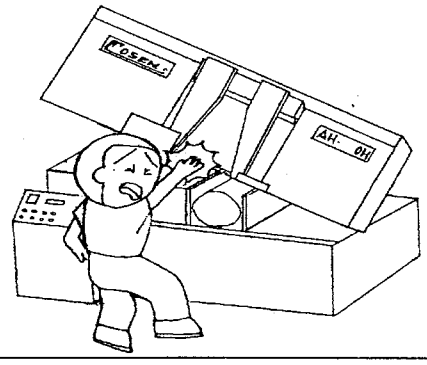
■ Take preventive measures when cutting thin or short pieces from the work to keep them from falling. It is dangerous if the cut piece falls.



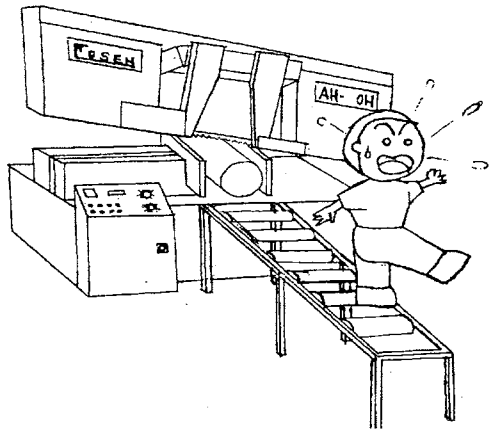
■ Never start the saw blade unless it has been confirmed that the work is firmly clamped. If the work is not securely clamped with the vise, pieces will be forced out of the vise during cutting.



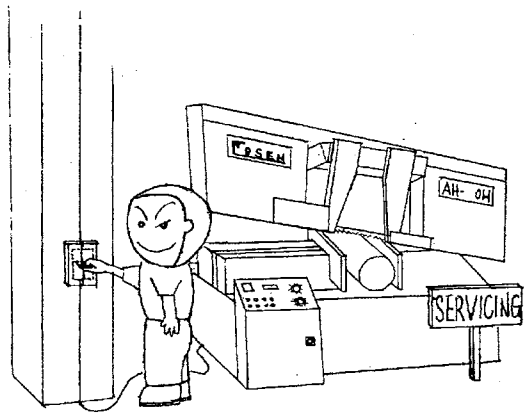
■ Never touch the running saw blade. It is dangerous if your hands or clothing are caught by the running blade.



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



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

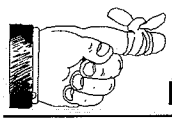


2. INTRODUCTION

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.

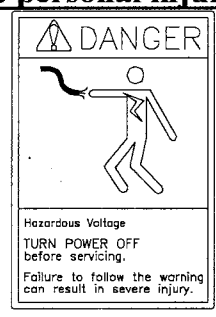
2.1 GENERAL "CE" SAFETY INSTRUCTIONS

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.



PLACE READ EACH LABLE CAREFULLY AS FOLLOWING:

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.

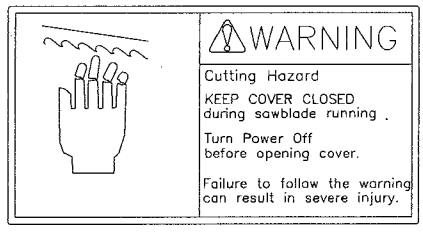
DANGER: It is dangerous to operate the machine when the floor is slippery. Keep the floor clean and dry. Check for ice, moisture, or grease before entering.

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.

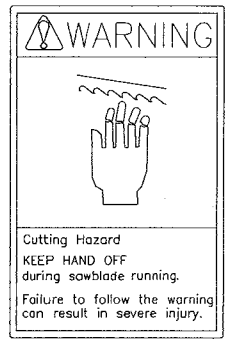
Read all *WARNINGS* to prevent personal injury

WARNING ABOUT WORK–PIECE

WARNING ABOUT WHEEL AND BLADE COVERS



WARNING ABOUT BLADE RUNNING

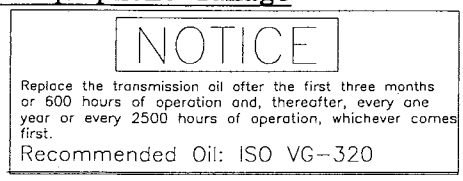


✓ Orange and black ***WARNING*** labels mean hazards or unsafe practices can result in severe personal injury or death.

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.

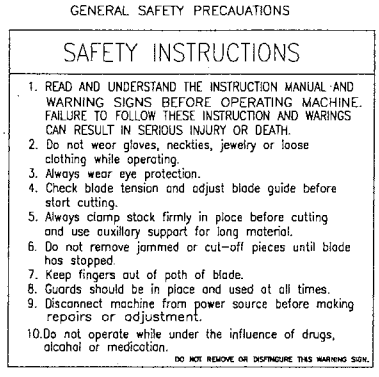
Read all *NOTICES* to prevent equipment damage


NOTICE

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.
Recommended Oil: ISO VG-320

✓ 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 PRECAUATIONS

SAFETY INSTRUCTIONS

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.
2. Do not wear gloves, neckties, jewelry or loose clothing while operating.
3. Always wear eye protection.
4. Check blade tension and adjust blade guide before start cutting.
5. Always clamp stock firmly in place before cutting and use auxillary support for long material.
6. Do not remove jammed or cut-off pieces until blade has stopped.
7. Keep fingers out of path of blade.
8. Guards should be in place and used at all times.
9. Disconnect machine from power source before making repairs or adjustment.
10. Do not operate while under the influence of drugs, alcahol or medication.

DO NOT REMOVE OR DISTINGUISH THIS WARNING SIGN.

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

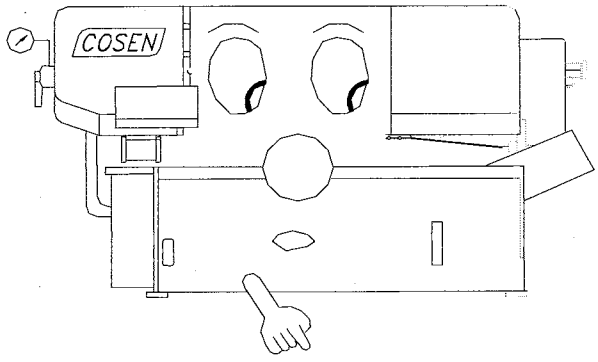
Please do not make any decisions casually without first reading all safety instructions.

2.2 RISK ASSESSMENT

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

Section 2

GENERAL INFORMATION



SECTION 2

GENERAL INFORMATION

I : FOR MACHINE COMMON

2.1 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 10 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.

2.2 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.

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

2.2.1 Specifications

Specification of The Machine

MODEL		C-325NC	
MAXIMUM CUTTING CAPACITY		● Round	325 mm
		■ Square	325 mm
		▬ Rectangle (H×W)	325×380 mm
SAW BLADE	SPEED	20 ~ 100 m/ mim (66 ~ 328 fpm)	
	SIZE (L×W×T)	3820 × 34 × 1.1 mm (150.4" x 1.33" x 0.04")	
	TENSION	Hydraulic controlled	
	GUIDE	Tungsten Carbide Blade Guide	
	CLEANING	Wire Brush	
MOTOR OUTPUT		SAW BLADE	5HP (2,2 kW)
		HYDRAULIC	1HP (0.75kW)
		COOLANT	1/8 HP (0.1 kW)
TANK CAPACITY		HYDRAULIC OIL	35 L
		COOLANT	75 L
FEEDING		Mode	HYDRAULIC, Automatic, NC controller
		Length	Single Stroke: 403 mm (15.9”) Multiple: 9999mm
VISE CONTROL		Hydraulic	
NET WEIGHT		1800 kg	
GROSS WEIGHT		2000 kg	

*** Design and specifications are subjected to change without notice.**

2.2.2 Indentification of Main Parts & Terminology

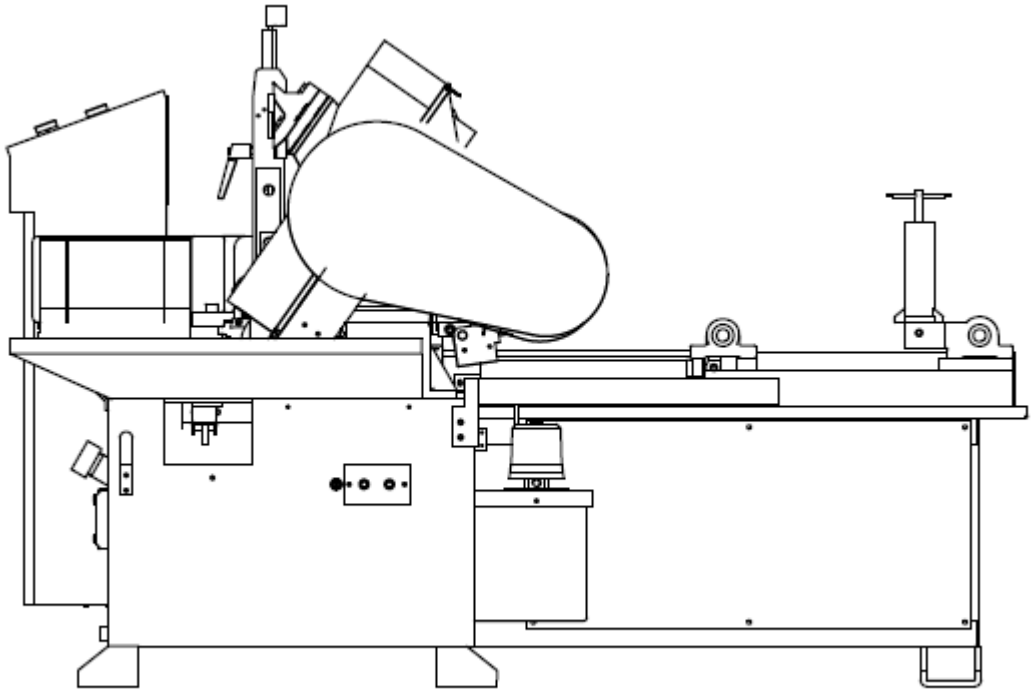


FIG 2-1 THE SIDE VIEW OF THE MACHINE

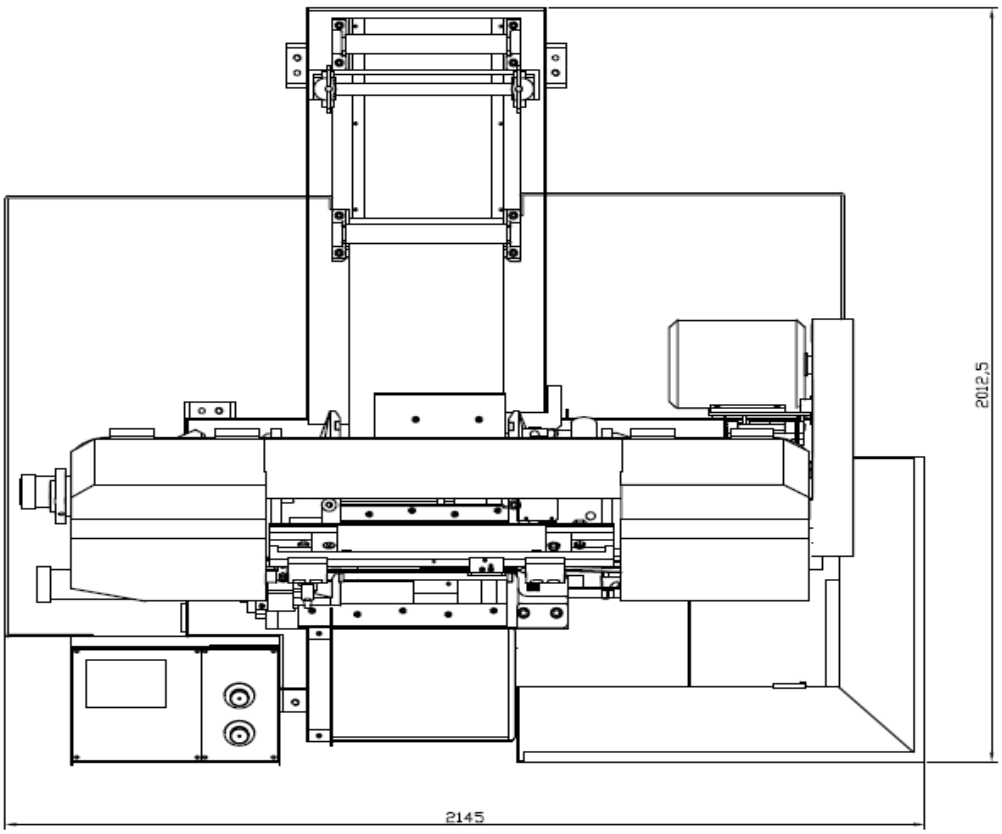


FIG 2-2 TOP VIEW DRAWING

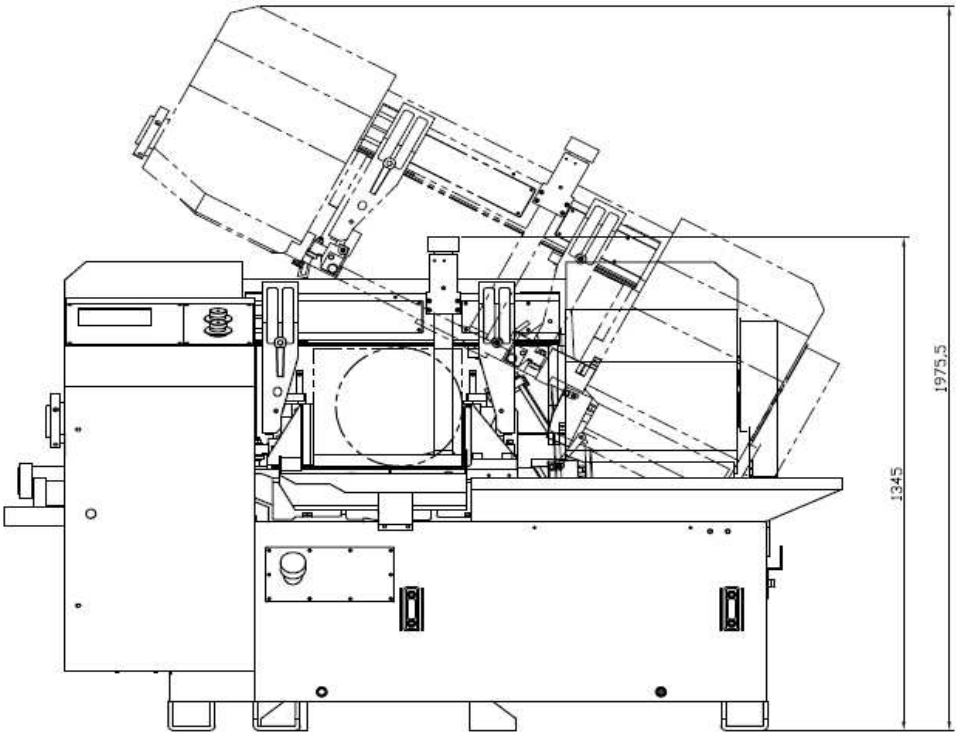


FIG 2-3 FRONT SIDE VIEW

2.2.3 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.

2.2.4 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:

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 less than 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 10 in this manual for system troubleshooting procedures.

2.2.5 Safety Devices and Guards

This manual show safety related components illustration as following:

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 approcah 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 be detecting this problem and then stop the machine.* The power switch controls the main power of the machine. The emergency stop switch on the control panel is a red button (with rubber material). It is used for emergency stop at any circumstances.

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.

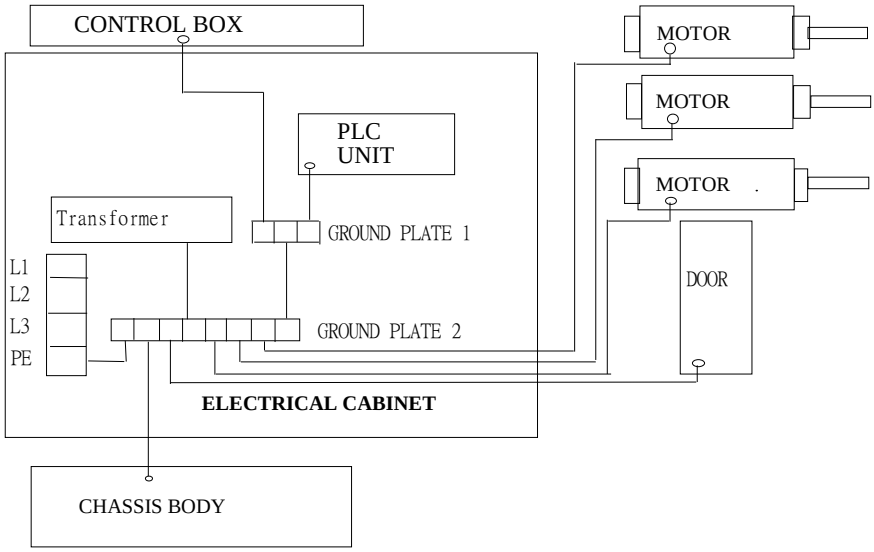
Guard mountings**:**

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.

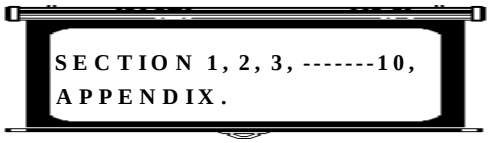
2.2.6 Specification of Electrical Equipment

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

GROUND DIAGRAM



2.3 GUIDE TO THE MANUAL



The instruction manual is divided into ten 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.

2.4 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.

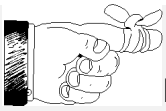
II : ONLY FOR MACHINE WITH *"CE "* Certificated

2.5 INTRODUCTION

In designing this machine, many measures have been taken to prevent personal injury. However, there still some risks remaining despite all the measure 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 four categories, Please detail reading manual Section 1 **[*SAFELY RULES*]** before operated machine. 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.

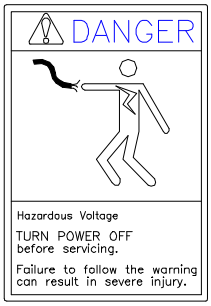
2.5.1 GENERAL SAFETY INSTRUCTIONS

Your band saw machine is designed to satisfy regulations of the Council Directive on the approximation of the laws of the Member Stated relating to machinery (89/392/EEC) – Annex I Essential health and safely 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:

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.

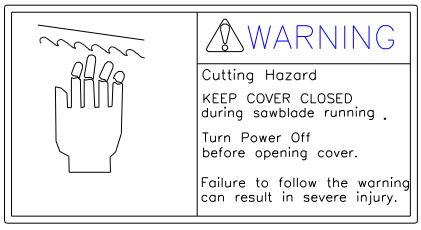
  DANGER: It is dangerous to operate the machine when the floor is slippery. Keep the floor clean and dry. Check for ice, moisture, or grease before entering.

  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.

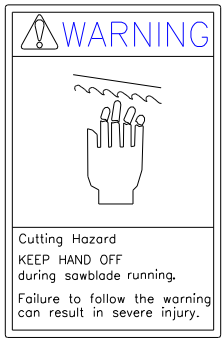
Read all *WARNINGS* to prevent personal injury

WARNING ABOUT WORK-PIECE

WARNING ABOUT WHEEL AND BLADE COVERS



WARNING ABOUT BLADE RUNNING

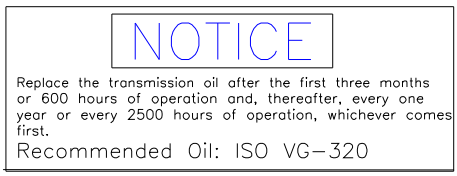


- ✓ Orange and black ***WARNING*** labels mean hazards or unsafe practices can result in severe personal injury or death.

  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.

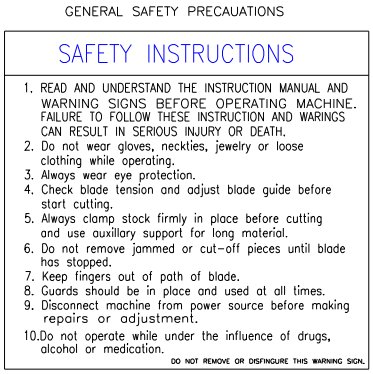
Read all *NOTICES* to prevent equipment damage



- ✓ 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 PRECAUATIONS

SAFETY INSTRUCTIONS

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.
2. Do not wear gloves, neckties, jewelry or loose clothing while operating.
3. Always wear eye protection.
4. Check blade tension and adjust blade guide before start cutting.
5. Always clamp stock firmly in place before cutting and use auxillary support for long material.
6. Do not remove jammed or cut-off pieces until blade has stopped.
7. Keep fingers out of path of blade.
8. Guards should be in place and used at all times.
9. Disconnect machine from power source before making repairs or adjustment.
10. Do not operate while under the influence of drugs, alcohol or medication.

DO NOT REMOVE OR DISFINGURE THIS WARNING SIGN.

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

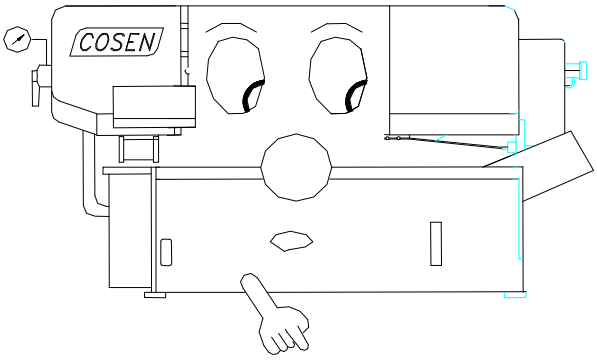
Please do not make any decisions casually without first reading all safety instructions.

2.6 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 STALLATION



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

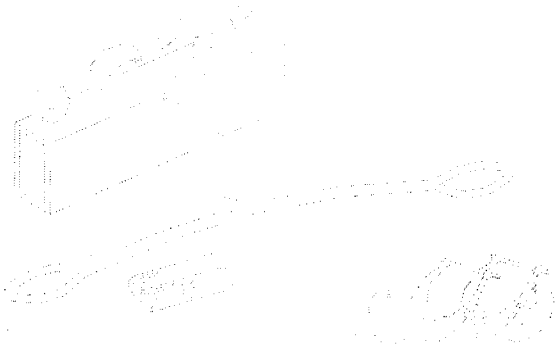
When moving the machine, we strongly suggest that you follow the carrying and cleaning methods described to keep your machine in the best working condition. You can choose any one of the methods described below to move your machine:

Carrying:

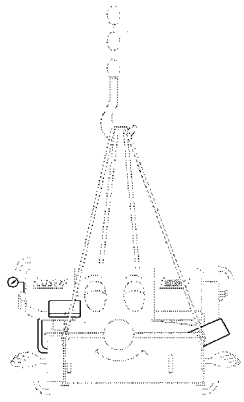
1. Use crane to place

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.

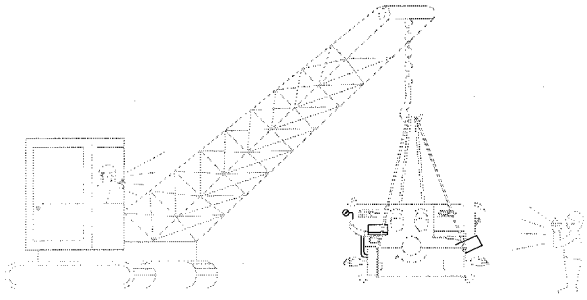
• To move your machine with a crane, you must have a crane's qualification license.



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



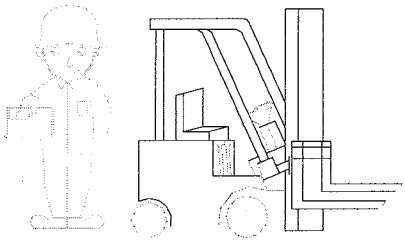
• Apply the wire rope sling to the lifting hole at rear of the front vise slide and to the rear end of the machine. Please keep the machine balanced rear-front and left-right side when you are lifting up the machine.



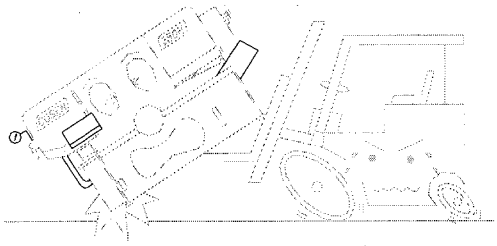
• When you work together with more than two people, it is best to keep contact with each other by voice for safety.

2. Use forklift to place

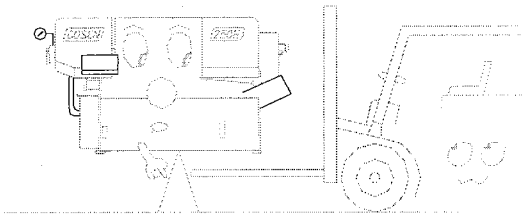
Most users choose this method to move their machine because it is easy to set up. Make sure that the lifting rod can fully withstand the weight of the machine.



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



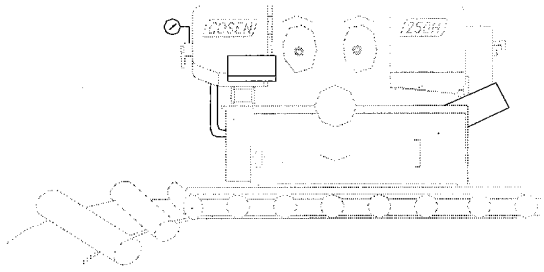
- You must apply proper forklift technique to avoid damage to the machine.



- 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.

NOTE: 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:

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.

NOTE:①Supply 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.

② Limit the supply voltage variations to within ± 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	5	Coolant Unit
2	Electrical Control Box	6	Hydraulic Hose
3	Work Tray	7	Roller Table
4	Chip Remover	8	Hydraulic Unit

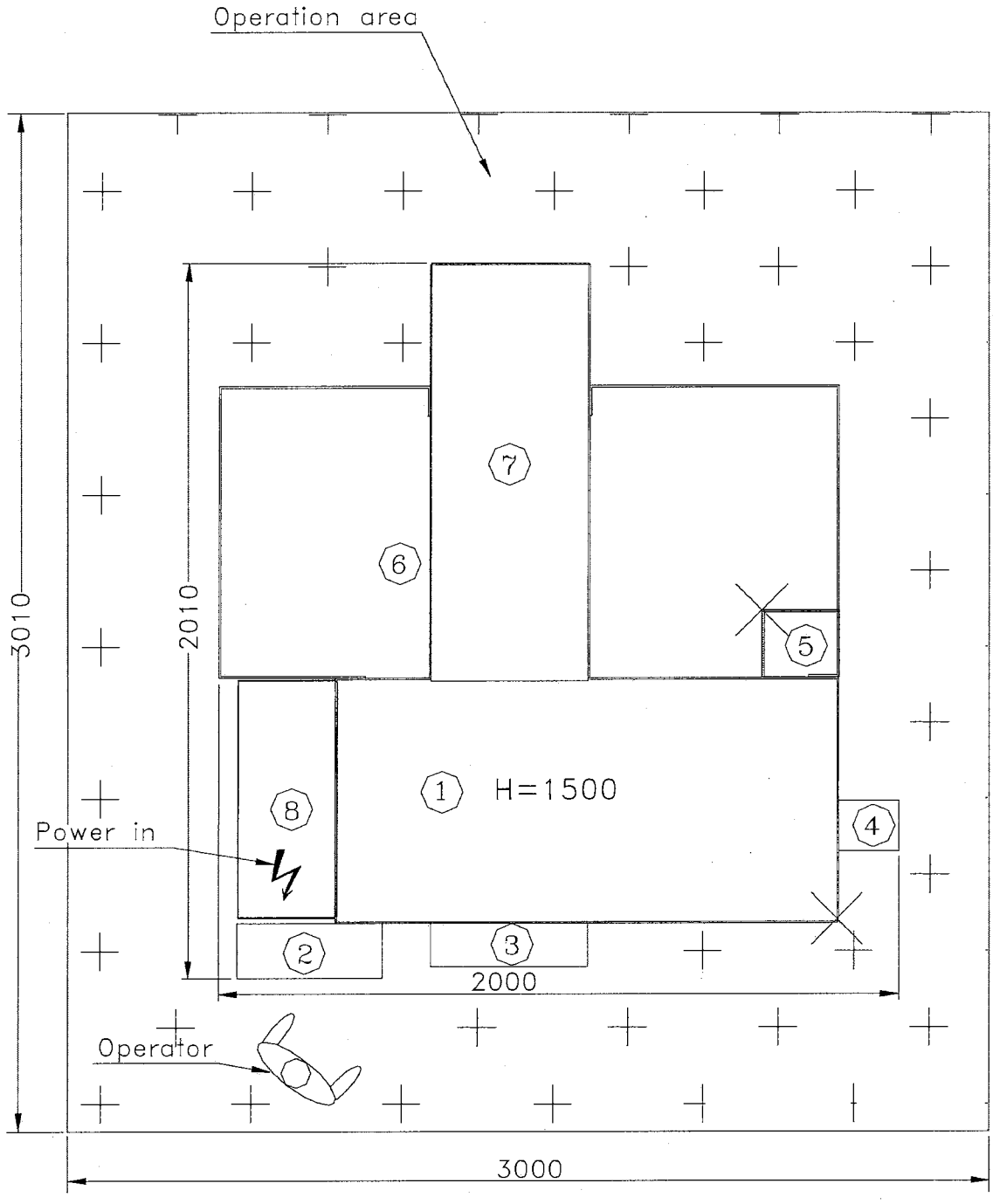


FIG 3-1 FLOOR SPACE REQUIRED WITHOUT OPTIONAL TABLE

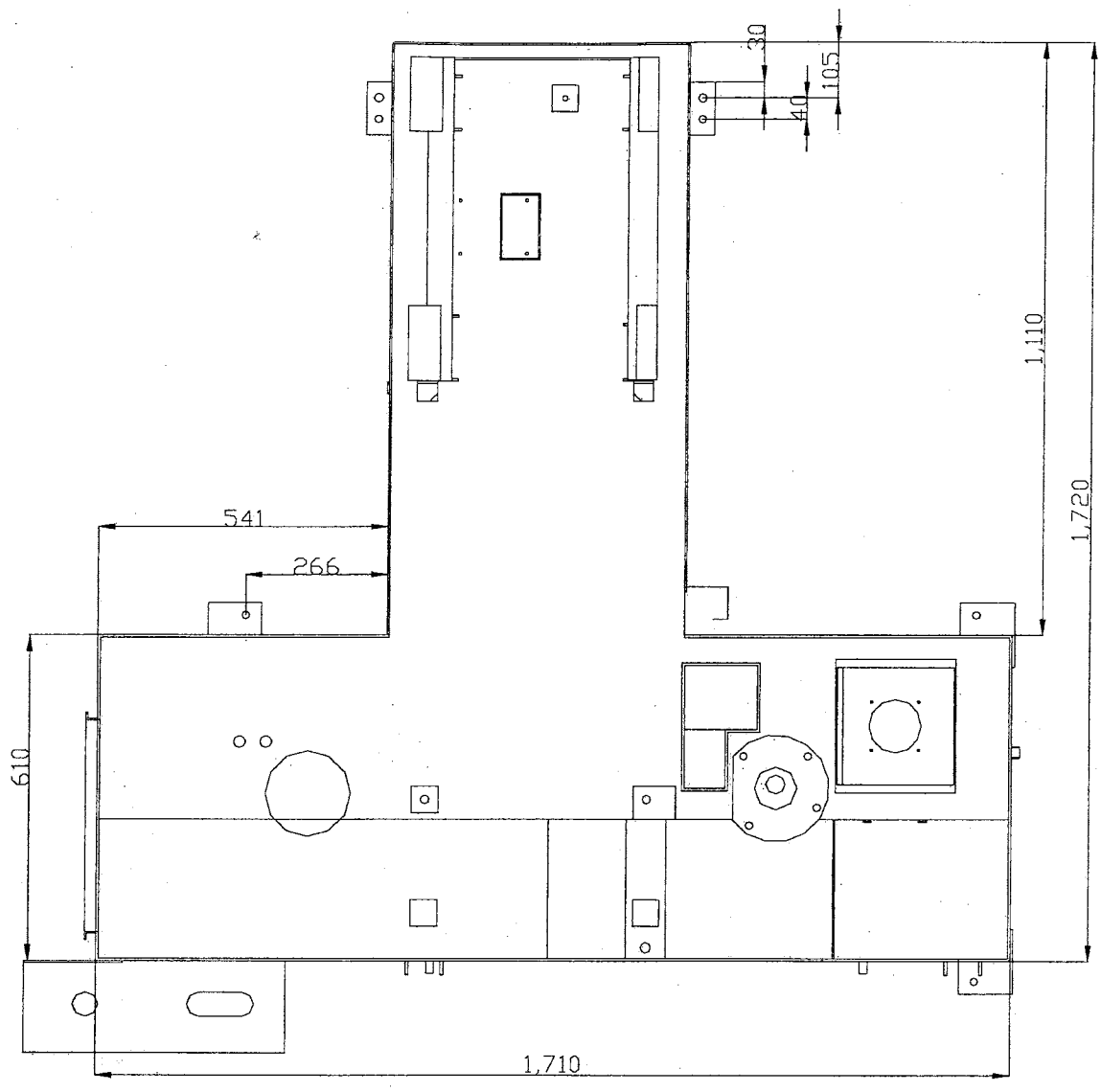
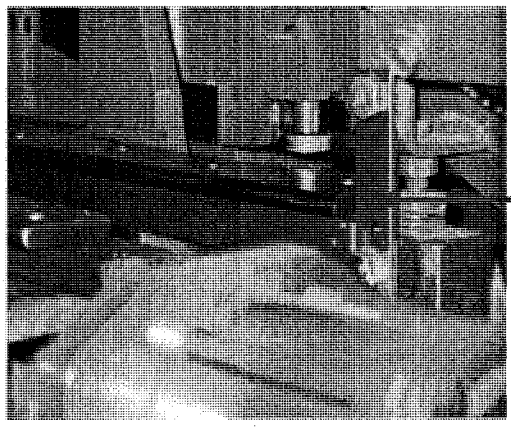


FIG 3-2 FOUNDATION DIAGRAM

3.3.4 Unpacking

- 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.
- Remember used the wrench to lose the bolts of bracket the saw frame and saw bed.
- Be sure to retain this bracket so that it can be used again in the event that your machine must be relocated.



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.	Chip filings spade (only manual type machine)	1 pcs
7.	Operation manual	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 major machine function setting up is as follows: 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 .

⊙ 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 5 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:

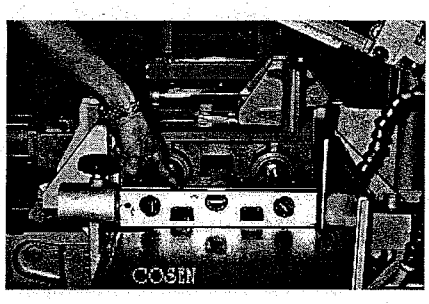
NOTE: Be careful to protect the machine from impact or shock during this procedure. Also watch out for your fingers and feet.

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

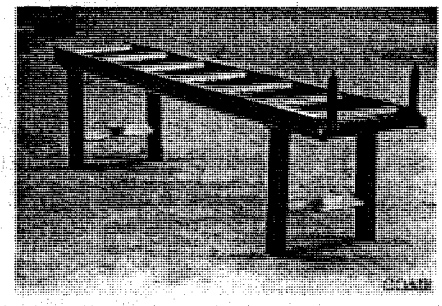
■ Place spirit levels on the vise slide plates and the work feed table, and adjust the left-and-right and fore-and-aft level of the machine with leveling bolts.

NOTE: Be sure to ascertain that all leveling bolts evenly support the weight of the machine.



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

◎ Installation of feed roller

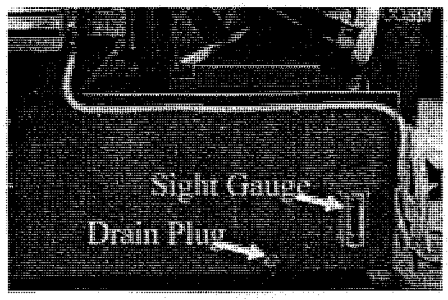


If you plan to cut long work pieces, please arrange the roller table and roller stand behind the machine.

NOTE: The roller table and roller stand should be level with the machine itself.

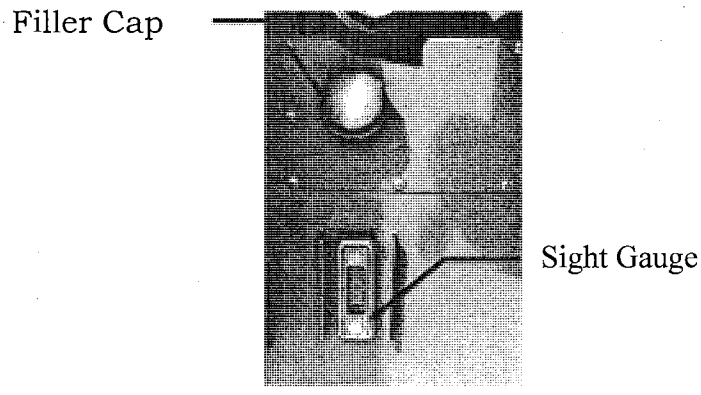
◎ Cutting fluid supply

Fill the cutting fluid tank with the proper cutting fluid mixture. Recommend 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

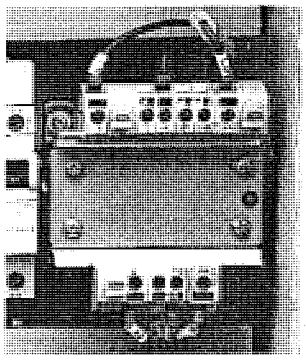
Open the filler cap. Please fill the hydraulic oil tank with the hydraulic oil furnished with the machine. Check the sight gauge to ascertain the oil level in the tank. (Oil tank should be full already if it is a new machine)(If operation new machine, the oil tank should be fill hydraulic oil to full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

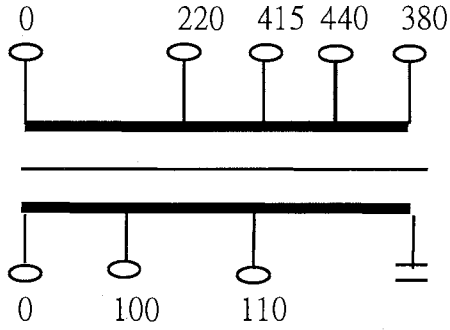


◎ Electrical Connections (Power Requirement)

- 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:

NOTE: 220 V- 50 Hz
380 V- 50 Hz
415 V- 50 Hz
440 V- 50 Hz





◎ 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.

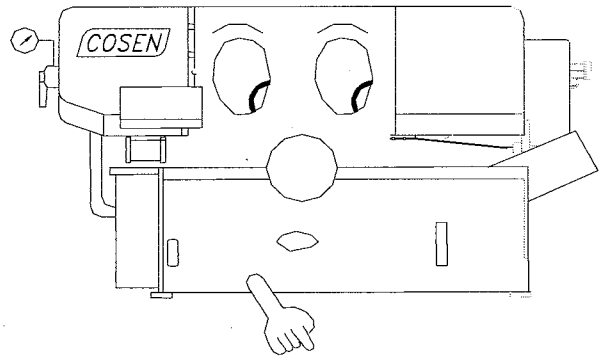
3.5 RESHIPMENT PROCEDURE

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 manual.

Section 4

OPERATION INSTRUCTION



Section 4

OPERATING INSTRUCTION

4.1 SAFETY PRECAUTIONS

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

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

4.2 BEFORE OPERATING

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

Wet cutting

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

Cutting unknown materials

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

Caution: Never take your eyes off the machine while in operation.

Cutting fluid

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

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

Note: Never use water as your coolant.

Note: Always add coolant into water for better mix result.

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

Note: Before starting a cutting job, make sure there is sufficient amount of coolant in the tank. Check the fluid level through the sight gauge. Please refer to machine specifications in this manual (Section 2) for tank capacity.

4.3 CONTROL PANEL

4.3.1 Control panel

The control panel is located on the top of the electrical box. It includes the following function: power system, hydraulic system, cooling system and the human-machine–interface (HMI) and the laser projecting system. The operator must fully understand the function of each switch and button before operating the machine.

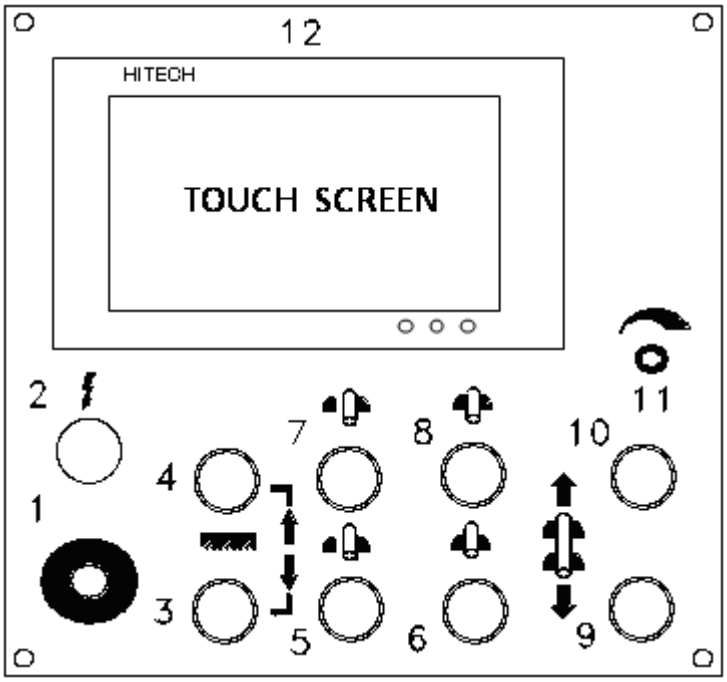


Fig. 4-1 Control Panel Illustration

No.	Name	No.	Name
1	Emergency stop button	7	Rear vise open button
2	Power indicator lamp	8	Rear vise clamp button
3	Saw bow down button	9	Feed forward button
4	Saw bow up button	10	Feed backward button
5	Front vise open button	11	Blade speed control knob
6	Front vise clamp button	12	HMI touch screen

4.3.2 Control buttons

1. Emergency stop

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

2. Power indicator

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

3. Saw bow down

When this button is pressed, the saw bow descends.

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

4. Saw bow up

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

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

5. Front vise open

This button only works when the machine is switched to manual mode "".

Note: If the saw bow is not above the middle limit switch, the front vise can only be opened in small increments, so as to prevent the vise from hitting the guide arm.

6. Front vise clamp

This button only works when the machine is switched to manual mode "".

7. Rear vise open

This button only works when the machine is switched to manual mode "".

8. Rear vise clamp

This button only works when the machine is switched to manual mode "".

9. Feed forward

- When this button is pressed, the feeding workbed will move forward. Press and hold the button to feed forward. As soon as the button is released, the feeding workbed will stop moving forward.
- This button only works when the machine is switched to manual mode "".
- This button is only in function when the quick approach bar is touching the upper limit switch AND when either of the front and rear vises are unclamped.

Note: After the blade motor starts running, the function of rear vise is disabled due to safety concerns.

10. Feed backward

- When this button is pressed, the feeding workbed will move backward. Press and hold the button to feed backward. As soon as the button is released, the feeding workbed will stop moving backward.
- This button only works when the machine is switched to manual mode "".
- This button is only in function when the quick approach bar is touching the upper limit switch AND when either of the front and rear vises are unclamped.

Note: After the blade motor starts running, the function of rear vise is disabled due to safety concerns.

11. Blade speed control knob

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

12. HMI touch screen

Please refer to section 4.3.4 for detailed introduction.

4.3.3 Blade descend pressure and speed control panel

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

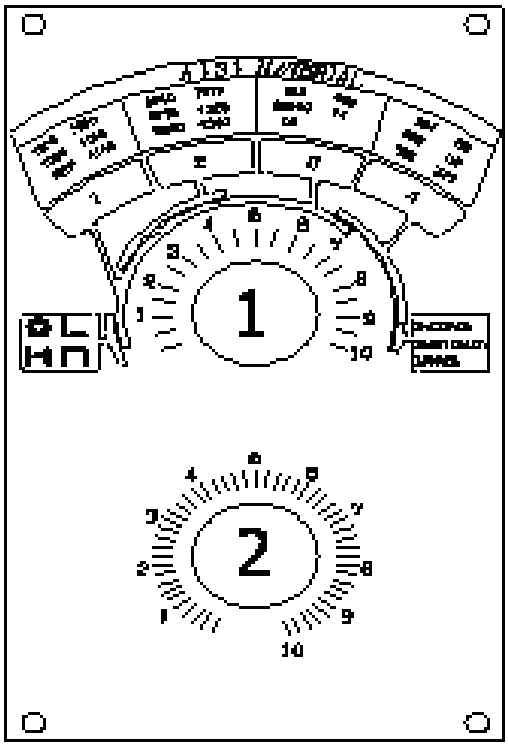


Fig 4-2 Cutting pressure and speed control panel

1. Cutting pressure control knob

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

2. Blade descend speed control knob

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

4.3.4 Human-machine-interface (HMI) touch screen

This HMI touch screen displays operation messages so that the operator is able to understand the system condition. It also provides different operating modes and selections for the operator to work with. During a cutting job, the operator can still enter the system and make changes to the cutting operation as needed.

Warning: Do not wipe or clean the screen with volatile solvents.

Warning: Do not overexert pressure on the screen. The touch screen is very sensitive; all buttons on the screen just need a slight touch to operate.

Note: All range parameters in HITECH 5.7” are configured under the “manual” mode.

Note: Please pay attention to the following environment conditions necessary for HITECH 5.7" HMI touch screen to properly operate:

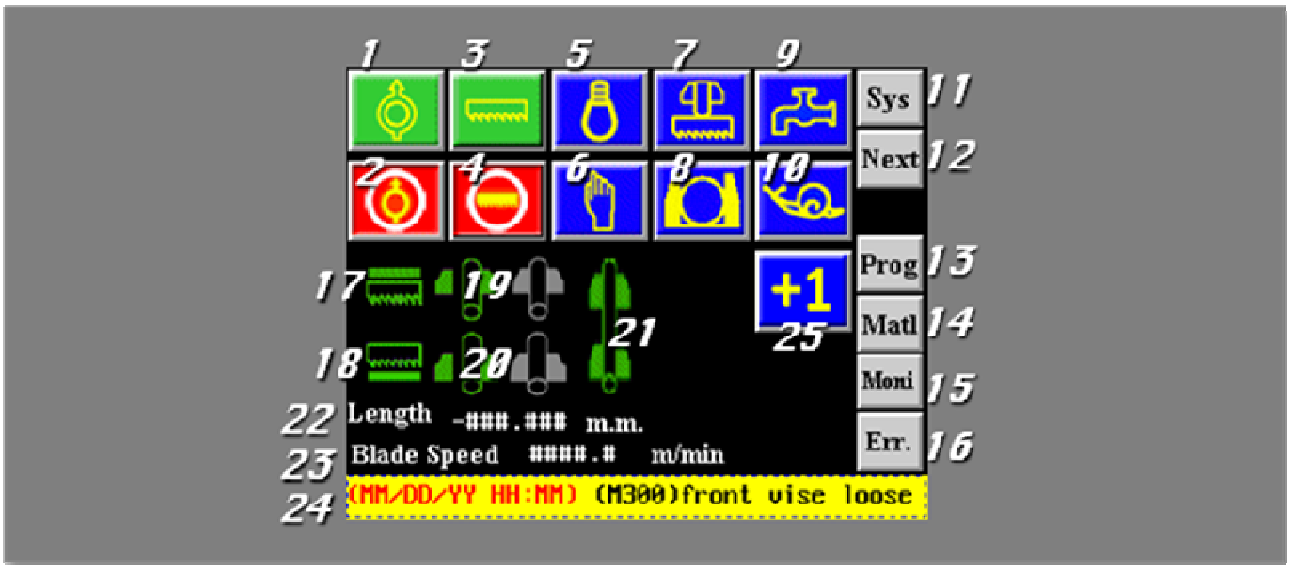
Item	Range
Ambient temperature	5℃ ~ 50℃
Temperature for safe operation	-10℃ ~ 60℃
Ambient humidity	30%~85% RH (No condensation)
Connection	RS422 MMI port
Environment	No condensation and rust

Startup Screen

After the power is turned on, Cosen's logo will appear as the startup screen, followed by the main operation menu..

Main control menu

The main control menu includes some operating button that were used on the control panel of the earlier machines. Some convenient functions are added to the page for the operator to better understand the features of the machine. Setting the parameters shown on the screen requires a gentle touch of the finger. You can also look up the parameters or make changes while in the middle of a cut.



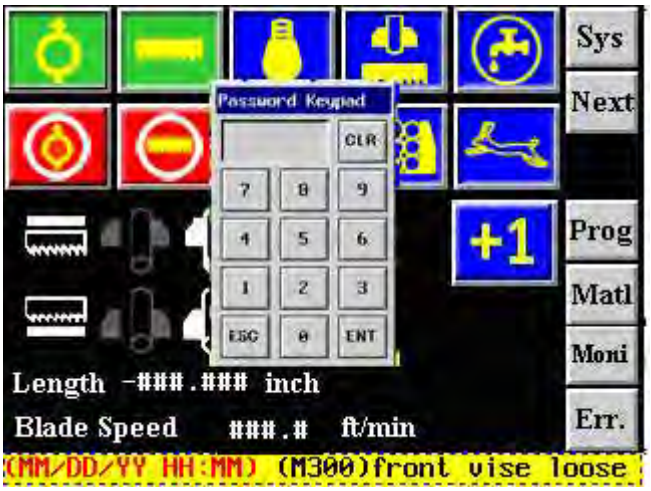
Refer to the table below for descriptions of each function.

No	Item	Function	Description
1		Hydraulic start	When the power is turned on, press this button to start the hydraulic motor. A solid yellow icon indicates the hydraulic system has been turned on. 
2		Hydraulic stop	Press this button to turn off the hydraulic motor immediately.  ***Note:*** When the blade is running, the Hydraulic Stop button is temporarily disabled. You need to press the *saw blade stop* or the *emergency stop* button to stop the blade first.
3		Saw blade start	When the work piece is clamped properly, press this button to start cutting. A solid yellow blade icon indicates the blade has been started. 
4		Saw blade stop	Press this button to stop the blade.
5		Work light ON/OFF	Press this button to turn on the work light. The light bulb showing a solid yellow icon indicates the worklight has been turned on. 

No	Item	Function	Description
6		AUTO/Manual mode	Use this button to switch between automatic and manual mode. ● AUTO mode ( ): used to automatically perform continuous cutting jobs. When switched to the AUTO mode, the machine will automatically operate according to the preset parameters. ● Manual mode ( ): used to perform individual cutting job. When switched to the Manual mode, you can execute each individual function. ***Note:*** *Trim Cut* - When the machine is switched from the Manual mode to the AUTO mode, the first cut (trim cut) will not be counted into finished cuts and the machine will continue to operate according to the preset parameter. This function allows the machine to finish the trim cut and directly proceed into automatic cutting till the last cutting job. ***Note:*** When in AUTO mode, switching to Manual mode while cutting is in action, the machine will stop after the individual cut is finished. Switching to manual mode at any time other than cutting, the machine will proceed with the next cut until it is finished.
7		Material retract 2mm ON/OFF	When this function is turned on, the machine will retract the material for 2mm after completing each cut before the blade rises from its lowest position. A solid yellow icon indicates the *Material retract 2mm* mode has been turned on.
8		Single/Bundle cutting mode	This button is used to switch between single or bundle cutting mode. ● Switch to single cutting model ( ) to cut a single work piece. ● Switch to bundle cutting mode ( ) to cut a stack of work pieces. ***Note:*** When under bundle cutting mode, the feeding vise must be touching the front limit switch for the blade to be able to start.
9		Coolant ON/OFF	Press this button to turn on the coolant pump. A solid yellow faucet icon indicates the coolant pump has been turned on. Press again to turn off the coolant pump.

No	Item	Function	Description
10		Slow material feeding mode	Used only when under Manual mode. When the slow material feeding mode is turned on, the material feeding speed will dramatically reduce to help you position the work piece precisely.
11		System parameter setting	Press this button to set up system parameters.  ***Note:*** All parameters have been set up by the manufacturer. Do not make any random change to these parameters as doing so will affect cutting precision and machine life.
12		Cutting parameter setting	Press this button to display cutting-related information e.g. total number of cuts completed and feeding length OR to set parameters e.g. cutting lengths and quantity. (A total of 100 cutting programs can be set.) Blade deviation detector (optional) can be also configured in this setup page. Refer to Cutting Display & Setup in the following page.
13		Cutting program setting	Press this button to directly enter the cutting job program setup page. A total of 100 cutting programs can be set.
14		Material cutting reference	This 2-page reference chart lists out the required blade speed and cutting rate for each different material.
15		PLC monitor	Shows current PLC signals.
16		Error report	Lists a historical report of the errors and the time of occurrence as well as provides troubleshooting support. 6 pages in total.
17		Saw blade up indicator	Indicates that the saw blade is rising. When activated, the saw blade icon will turn solid white. 
18		Saw blade down indicator	Indicates that a cut is completed and the saw blade is at its lowest position. When the blade completes each cut and triggers the lower limit switch, the saw blade icon will turn solid white. 

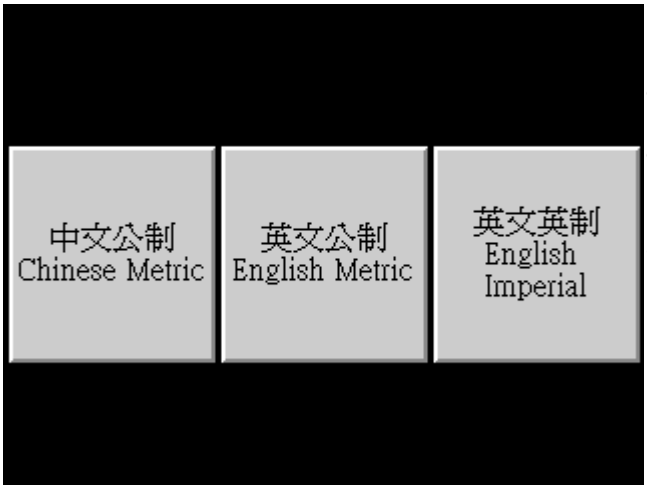
No	Item	Function	Description
19		Rear vise status indicator	Indicates if the **rear** vises have clamped and secured the workpiece. When the rear vises have secured the workpiece, the clamping vise icon on the right will turn solid white. 
20		Front vise status indicator	Indicates if the **front** vises have clamped and secured the workpiece. When the front vises have secured the workpiece, the clamping vise icon on the right will turn solid white. 
21		Feeding movement indicator	When the feeding vise reaches the front limit, the vise set icon will turn solid white. 
22		Feeding length display	Displays current feeding length while the material is being fed.
23		Blade speed display	Displays current blade speed.
24	(yellow highlight)	Error display	Displays error messages in the order of occurrences; press the message for three seconds to clear the messages.
25		Trim cut ON/OFF	This selection button works with the automatic cutting mode. When under AUTO mode and before proceeding with your automatic cutting jobs, select +0 if you wish the first cut to be "trim cut" i.e. trimming the edge of your material without the cut being counted into the "finished cuts." In the other hand, select +1 if you do not need to trim cut the material. The first cut will then be counted as the first cut of your programmed jobs.  ***Note:*** After the first cut begins, you may still change your selection before the saw bow has descended to its lowest point.



Setting parameters

- Press Sys to enter parameter setting page.
- Key in password and press Enter to set up parameters.

Note: All parameters have been set up by the manufacturer. Do not make any random change to these parameters as doing so will affect cutting precision and machine life.

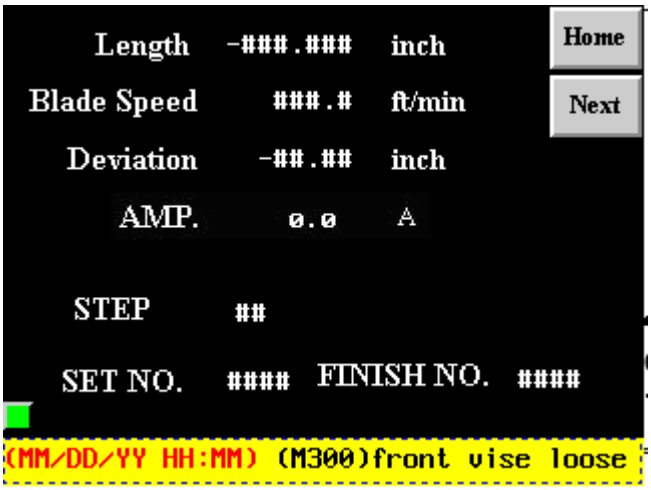


Setting language

- Press Lang. to enter the language selection page.
- Select “Chinese Metric,” “English Metric,” or “English Inch” to complete language setting.
- The screen will automatically return to the main control page.

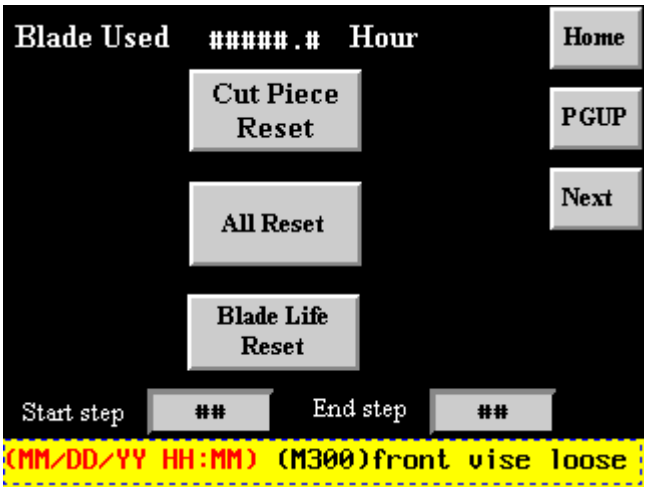
Next Cutting status display & setup

When cutting is in operation, press Next to enter cutting status display and setup page.



Page 1 – cutting status display 1

- This page shows the following information (from top to bottom):
  - Feeding length (current feeding vise position)
  - Blade speed
  - Deviation value (optional)
  - Current in ampere (optional)
  - Number of current cutting job/step in operation
  - Preset quantity of current cutting job
  - Number of cuts finished
  - Error messages (highlighted in yellow; can be cleared by pressing down for three seconds)
- Press Home to return to the main control menu.
- Press NEXT to go to the next setup page.
- The green square light on the bottom left corner indicates the warranty status of the HMI touch screen. Warranty is one year and starts counting after 70 hours of operation after the machine is shipped. Warranty status light turning to red indicates the HMI touch screen has expired.



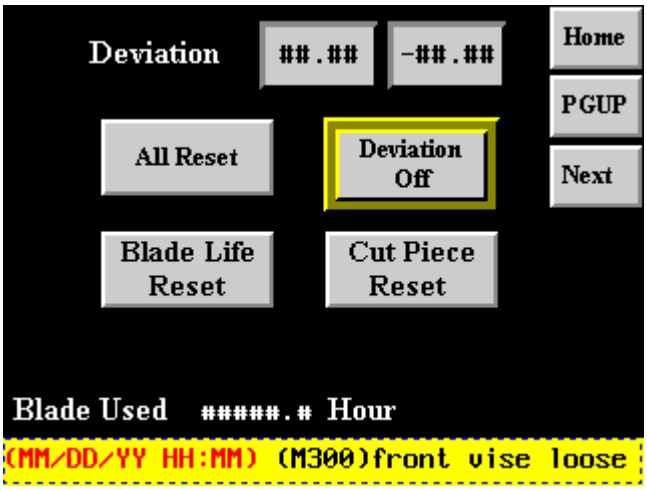
(Display without optional blade deviation detector included)

Page 2 – cutting status display 2

This page comes in two versions depending on if the optional blade deviation detector is installed on the machine. The shared features are as follows:

- Current blade life in hours
- Error message (bottom of page)
- Cut Piece Reset - Reset all *Cuts Finished* data by pressing this button for three seconds.

  Note: If you start a new set of program without clearing cutoff data from previous job, the first cut (trim cut) will be skipped as the second program is deemed as the succeeding part of the previous program.
- All Reset - Reset all preset cutting data within *Starts Step* and *Ends Step* by pressing this button for three seconds.

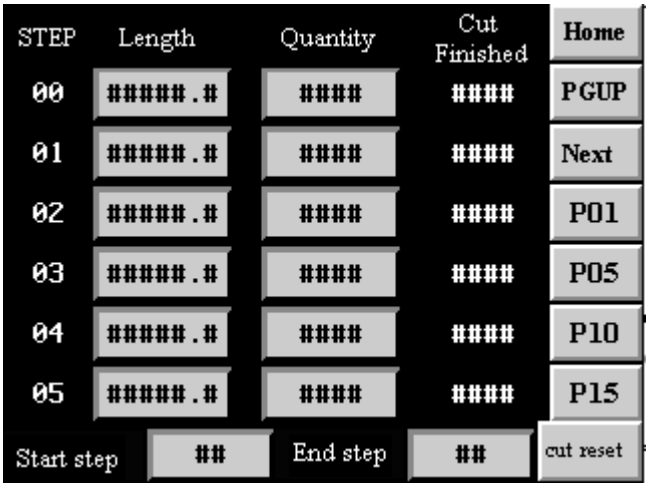


(Display with optional blade deviation detector included)

- Blade Life Reset - Reset the blade life to zero
- Press Home to return to the main control menu.
- Press PGUP to go back to the previous setup page.
- Press NEXT to go to the next setup page.

For machines with optional blade deviation detector installed, additional two command are provided:

- Deviation - Set deviation tolerance value based on the precision requirement of your material.
- Deviation ON/Off - Turn on or turn off the deviation detector if installed.



Page 3 – cutting program setup

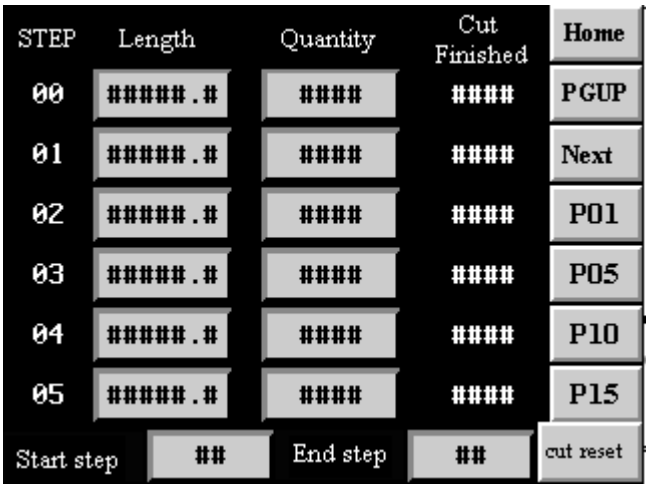
- In this page you can set your desired cutting length and quantity and see the number of finished cuts (*Cut Finished*).
- A total of 100 cutting jobs can be set and performed under the automatic mode.
- In “start step” and the “end step” field, fill in the number of the cutting job you wish to start and end with. The machine will automatically perform cutting jobs within this range.
- In *Length* column, set each respective cutting length in mm or inch.
- In *Quantity* column, set each respective cutting quantity.
- Press cut reset button for 3 seconds to reset the cutoff quantity.

Note: If you start a new set of program without clearing cutoff data from previous job, the first cut (trim cut) will be skipped as the second program is deemed as the succeeding part of the previous program.

- Press Home to return to the main control menu.
- Press PGUP to go back to the previous setup page.
- Press NEXT to go to the next cutting program setup page.
- Press P01, P05, P10, P15 to quickly jump between cutting programs (Step 00 ~ 99)

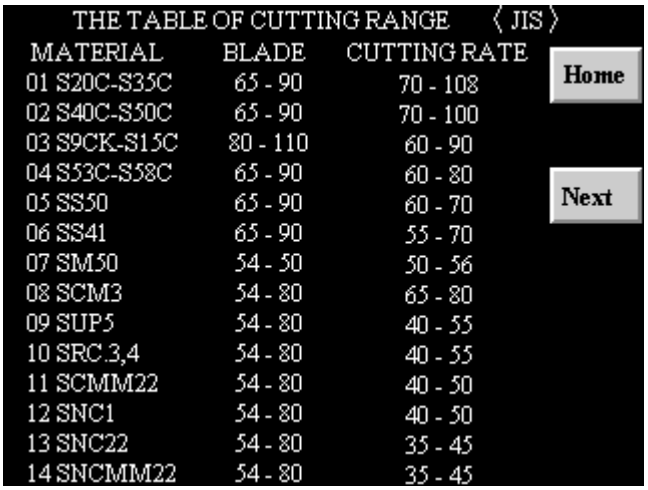
Prog *Cutting program setup*

When cutting is in operation, press Prog to quickly access the cutting program setup page (the same as page 3 of the cutting status display and setup page)



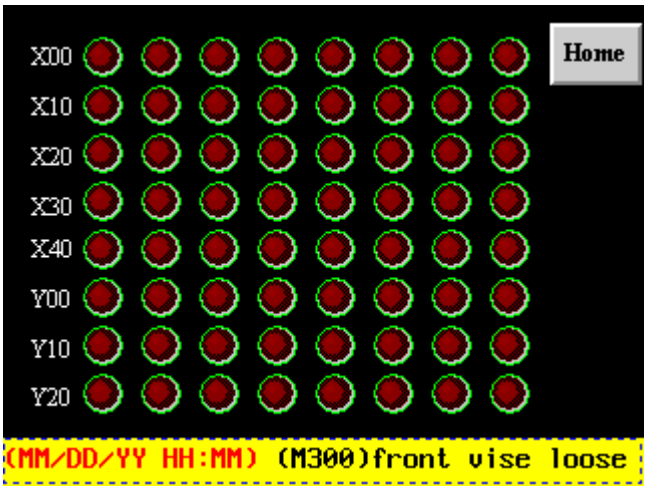
This setup page is the same as page 3 of the cutting status display and setup page.

Mtrl *Material cutting reference*



- This 2-page reference chart lists out the required blade speed and cutting rate for each different material.

Moni PLC Monitor

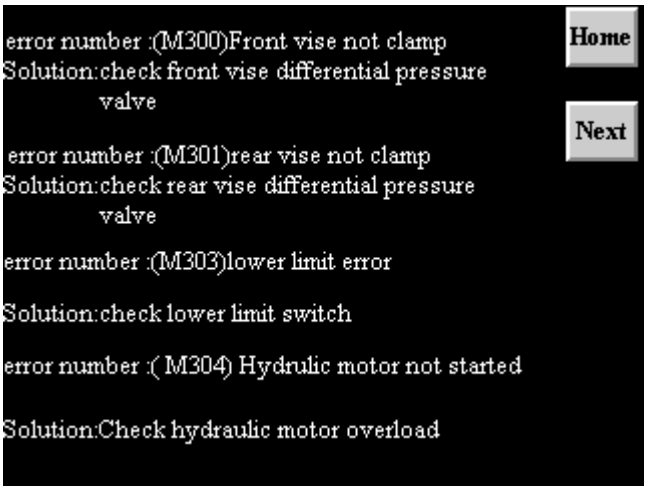


- Shows all signals of the PLC system.

Err. Error report

Page 1 – error report

- Lists a historical report of the errors and the time of occurrence.
- Press Home to return to the main control menu.
- Press NEXT to go to the troubleshooting support page.



Page 2 – troubleshooting

- Provides suggestions on troubleshooting. 6 pages in total.
- Also refer to the Table 4.1 for error codes, descriptions and solutions.
- Press Home to return to the main control menu.
- Press NEXT to go to the troubleshooting support page.

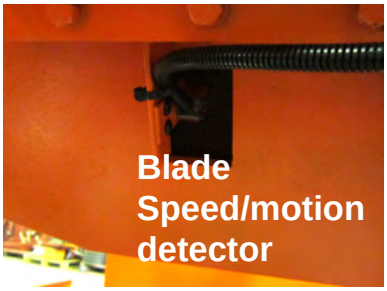
Error Code	Error Description	Solution
M300	Front vises not clamping	Check if the queen valve works
M301	Rear vises not clamping	Check if the queen valve works
M303	Lower limit switch error	Check if the lower limit switch works
M304	Hydraulic motor not starting	Check if the hydraulic motor works
M306	Broken blade detected	1. Check if the speed switch works 2. Check if the blade is broken
M308	Left safety door abnormal	1. Check if the left safety door is shut properly 2. Check if the left safety door limit switch works
M309	Right safety door abnormal	1. Check if the right safety door is hut properly 2. Check if the right safety door limit switch works
M312	Quick approach bar abnormal	Check if the quick approach limit switch works
M313	OL1 abnormal	Check if the blade motor overload relay has tripped
M314	OL2 abnormal	Check if the hydraulic motor overload relay has tripped
M315	OL3 abnormal	Check if the coolant pump motor overload relay has tripped
M316	Saw bow upper limit abnormal	Check the upper limit switch works
M352	Front vise clamping error	1. Place new material 2. Check if the vise queen valve works 3.Check if the “no material parameter” is too low
M357	Saw bow descending error	1. Check if the descend solenoid valve is stuck 2. Check the quick approach bar works 3. Check if the quick approach bar limit switch works
M358	Saw bow ascending error	1. Check if the ascend solenoid valve is stuck 2. Check the quick approach bar works 3. Check the quick approach bar limit switch works
M361	No material	1. Place new material 2. Check if the vise queen valve works 3.Check if the “no material parameter” is too low
M363	PLC battery voltage too low	Replace PLC battery

4.4 STANDARD ACCESSORIES

Blade tension device

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

Blade speed/motion detector



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

Inverter

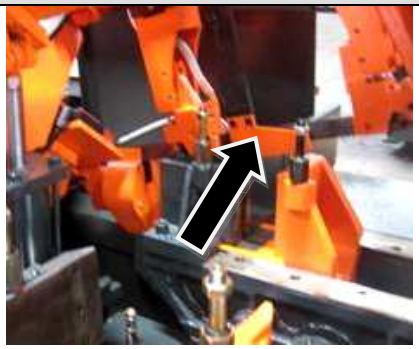
This inverter is installed inside the machine base. It is used to control and stabilize the saw blade speed during cutting.
To adjust blade speed, use the speed control turn-knob on the control panel.

Caution: Voltage used should not exceed AC 640V.

Note:

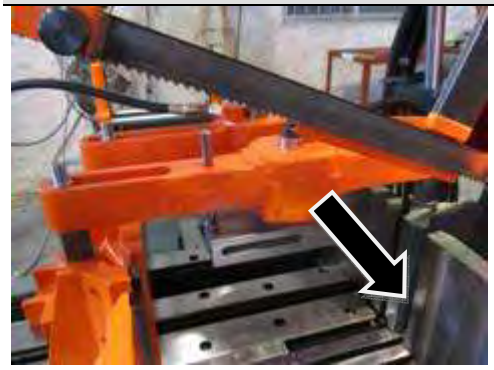
1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.
5.

Quick approach device



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

Split front vises



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

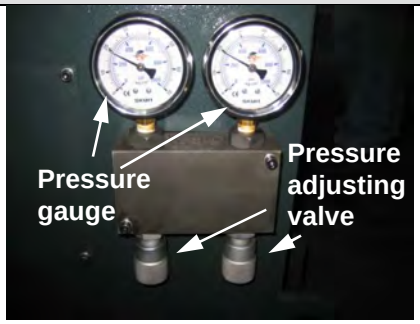
Gear reducer

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

Note: Please refer to Chapter 8 for information on maintenance.

4.5 OPTIONAL ACCESSORIES

Vise pressure regulator



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

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

Vibration Damper

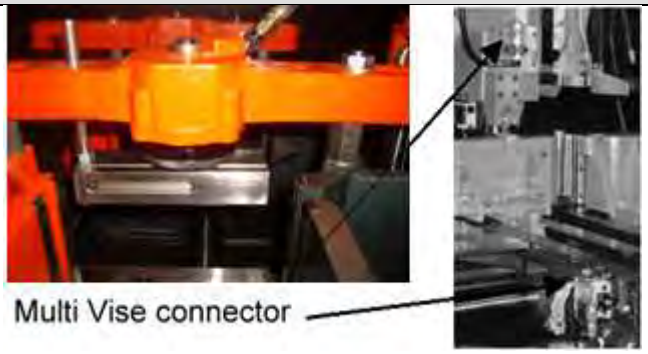
- The vibration damper can be assembled to the left saw arm. This optional accessory is extremely useful in reducing the high-frequency noise produced when cutting large-sized material.

Chip conveyor

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

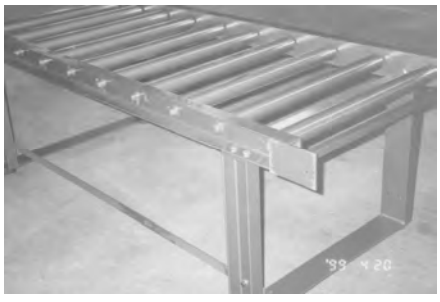
Note: As a regular maintenance, remove the chip conveyor and clean all chip deposits inside.

Hydraulic top clamps



- The top clamp device composed of two clamps is installed on top of the front and rear vises before executing bundle cutting.
- Refer to Chapter 4.7 for operating procedure on bundle cutting.

2M roller table



- The optional 2M roller table supports the work material and ensures the material be fed in smoothly.
- Refer to Chapter 9.8 for further information on adjusting the roller table.

4.6 MANUAL MODE

4.6.1 UNROLLING & INSTALLING THE BLADE

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

Unrolling the blade

Please follow the procedures illustrated below.

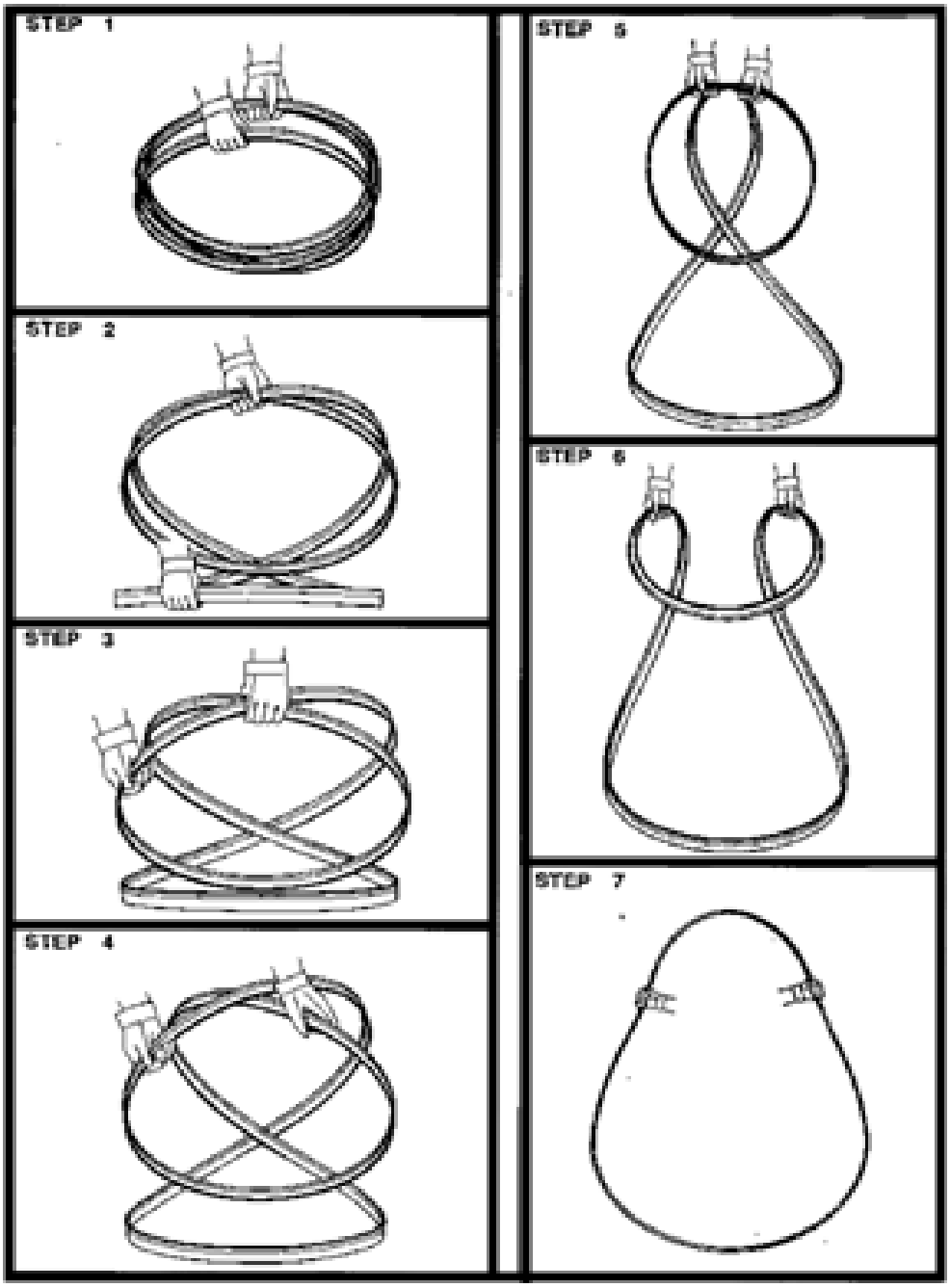


Fig 4 – 3 Unroll and roll the blade

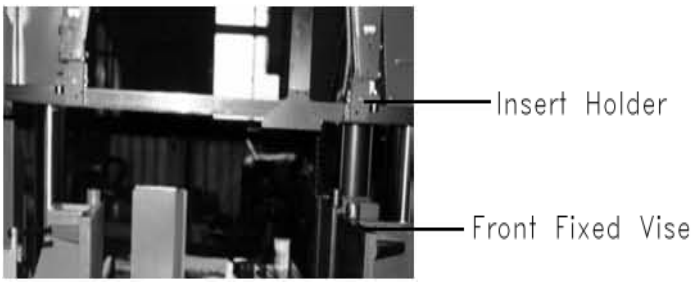
Installing a new blade

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

Step 2 – Turn on the machine power by switching to *ON*.

Step 3 – Switch to *manual* (✋) mode.

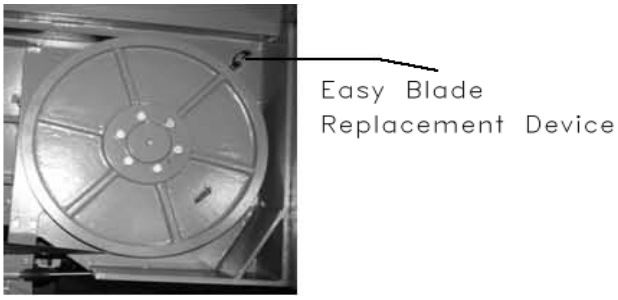
Step 4 – Press the *saw bow up* button and elevate the saw bow until the right insert holder is clear of the front fixed vise (see below picture).



Step 5 – Turn the tension controller handle from "◯◯" to "◯◯" position to release tension. The idle wheel will then move slightly toward the direction of the drive wheel.

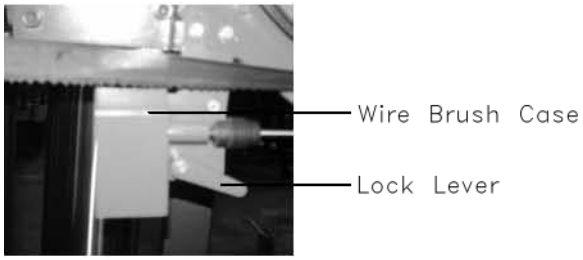
Step 6 – Open the idle and drive wheel cover.

Step 7 – Press the *Blade Clip* device to hold onto the blade. This device makes blade changing easy and feasible even with only one operator available.



Step 8 – Loosen the left and right carbide inserts by loosening the "lock nut" shown below.

Step 9 – Open the wire brush cover. Loosen the lock level and lower the wire brush.



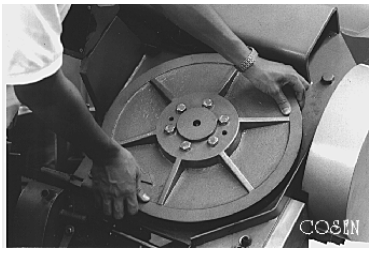
Step 10 – If necessary, clean the carbide inserts before installing a new saw blade.

Step 11 – Place the new blade around the idle wheel and the drive wheel

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

Step 13 – Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel. Use the *Blade Clip* device to tightly hold the blade from falling out of the drive wheel.

Note: When saw blade begins to rotate, the blade holder will automatically release the blade and fall back to its original position.



Step 14 – Make sure the back of the blade is also pressed against the flange of the idle wheel.

Step 15 – Turn the tension controller handle to [◯◯] position to obtain blade tension.

Step 16 – Make sure the sides of the blade are in close contact with the carbide inserts and then tighten the left and right carbide inserts by tightening the "lock nut."

Step 17 - Gently close the idle and drive wheel covers.

Step 18 – Press the *saw blade start* button to start the blade. Allow the blade to run for a few rotations then press the *saw bow up* button to elevate the saw bow. Open the wheel covers and make sure the blade has not fallen off the drive and idle wheels. If the blade has shifted, follow the same procedure to reinstall the blade again.

Step 20 – Adjust wire brush to a proper position. Refer to *Adjust wire brush* in this section.

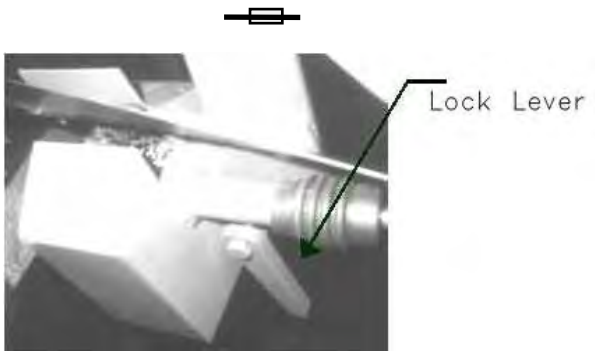
4.6.2. Adjusting wire brush

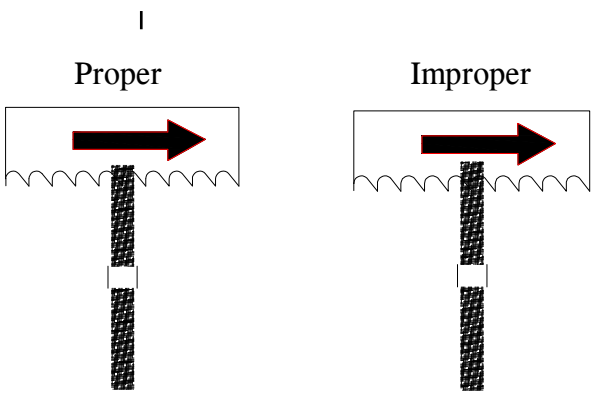
Follow these steps to adjust wire brush to appropriate position:

Step 1 – Loosen the lock lever and the wire brush cover.

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

Step 3 – Reinstall the wire brush cover and tighten the lock lever.





4.6.3 Adjusting saw arm

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

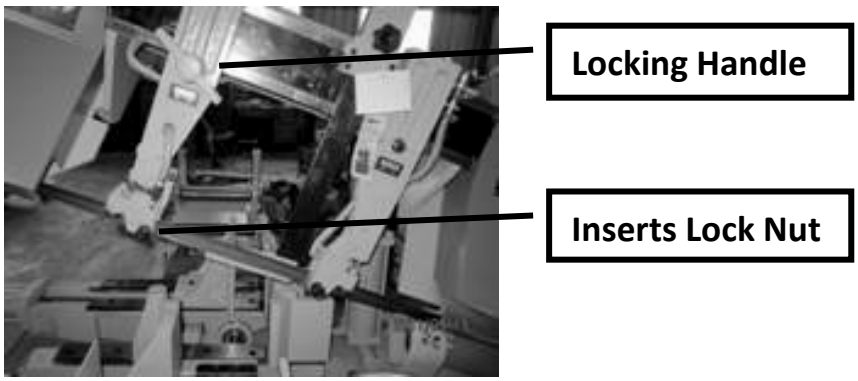
Step 1 - Loosen the inserts by unlocking the lock nut.

Step 2 - Loosen the blade guide locking handle. Then adjust the guide arm to a position suitable for your workpiece size.

Step 3 - After adjustment is made, tighten the blade guide locking handle.

Note: When tightening the blade guide locking handle, gently shake the lower end of the blade guide so that the dovetail fixed block behind is properly aligned.

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



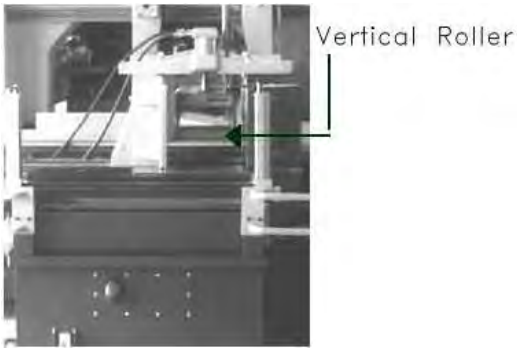
4.6.4 Placing workpiece onto workbed

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

Step 2 - Press the *front vise open* and *rear vise open* buttons to open vises.

Step 3 - Loosen the vertical roller lock handles and fully open the vertical rollers.

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



4.6.5 Positioning workpiece for cutting

Follow these steps to position your workpiece:

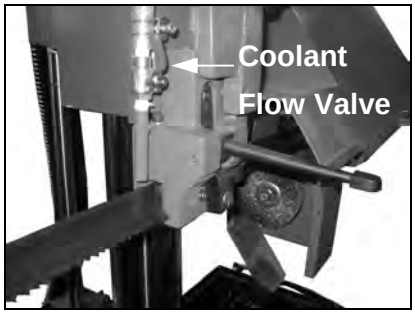
Step		Action
rear vises clamp material	1	Press the *rear vise clamp* button until the workpiece is securely clamped.
align vertical rollers	2	Move the vertical alignment rollers toward workpiece until it stands against the workpiece. Lock the vertical alignment rollers by tightening the lock handles
feed material forward	3	Press the *feed forward* button until the rear vise touches the front limit switch.
front vises clamp material	4	Press the *front vise clamp* button until the workpiece is securely clamped.
rear vises retract to clamp material again	5	Press the *rear vise open* button.
	6	Press the *feed backward* button until the rear vises reach back limit switch.
	7	Press the *rear vise clamp* button until the workpiece is securely clamped again.
front vises open; prepare for precision position	8	Press the *front vise open* button and the *rear vise clamp* button again to make sure the two vises are clamping the material simultaneously.
confirm cutoff point	9	Press the *saw bow down* button to lower the saw bow until the quick approach bar descends to just about 10mm (0.4 inch) above the workpiece. ***Caution:*** Under no circumstances should the quick approach bar be lowered below the height of the workpiece.
precision position	10	Press the *feed forward* button (and the *feed backward* button if necessary) until the cutoff point on the workpiece aligns with the blade line.
front vises clamp material; ready to cut	11	After the workpiece is correctly positioned, press the *front vise clamp* button so the workpiece is securely clamped.

4.6.6 Adjusting blade speed

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

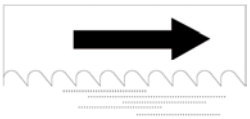
4.6.7 Adjusting coolant flow

Step 1 - Press the *saw blade start* button to start the saw blade drive motor.
Step 2 - Press the *saw bow down* button to lower the saw bow.
Step 3 - Use the flow control valve (shown below) to adjust the amount of fluid flowing to the cutting area.



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

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



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

4.6.8 Breaking-in the blade

BREAKING-IN THE BLADE

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

(1) Reduce the blade speed to one-half of its normal setting.
(2) Lengthen the cutting time to 2-3 times of what is normally required.
(3) The complete break-in operation requires cutting on a 645 mm^2 (25.4 square inches) section for 5 times.
(4) After the break-in operation is completed, set all parameters back to normal settings.

4.7 STARTING AN AUTOMATIC OPERATION

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

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

Step 3 - Turn the *Auto/ manual* switch to manual.

Step 4 - Set your desired cutting length and quantity via the HMI touch screen. A total of 100 sets of cutting data can be programmed.

Step 5 - Turn the *Auto/ manual* switch to Auto.

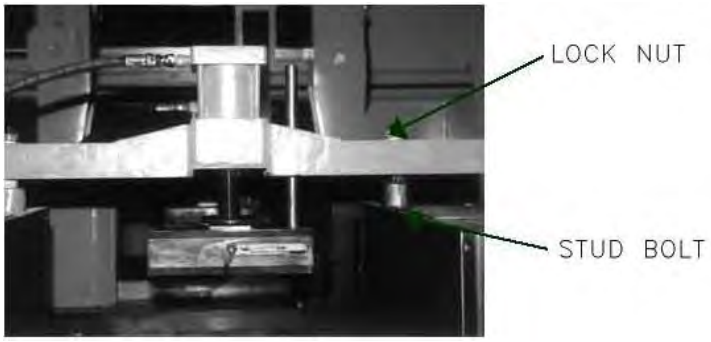
Step 6 - Press the *saw blade start* button and press the *saw bow down* button to start automatic cutting.

Using top clamp for bundle cutting

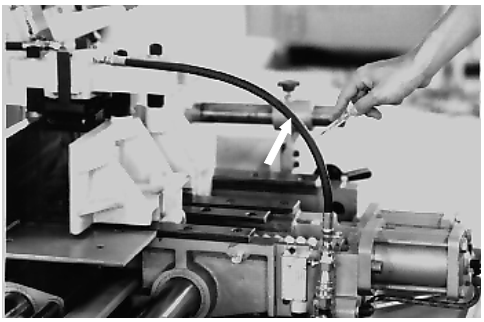
Installing top clamp

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

Step 1 - Install stud bolts on the front and rear vises and position the top clamp.

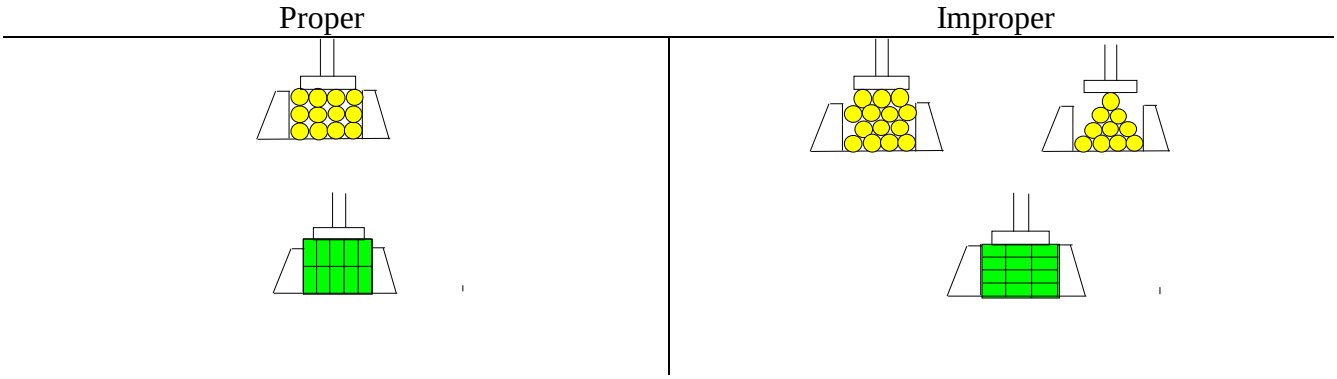


Step 2 - Connect the top clamp hoses to the pressure joints on the vise hydraulic cylinders.



Step 3 - Position the workpiece for bundle cutting. Note the allowable clamping width and height.
Clamping width: 190 – 300 mm (7.5 – 11.8 inch)
Clamping height: 70 – 140 mm (2.8 – 5.5 inch)
Also refer to machine specification in the manual.

Proper and improper stacking of workpieces



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

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

Step 6 - Install the bundle-cutting fence to the work tray. The fence is designed to prevent cut pieces from scattering across the work tray. Adjust the width of the fence to be slightly larger than the width of the bundle.

Step 7 - Press *Single/Bundle cutting mode* button and switch to bundle cutting mode.

Step 8 - For subsequent cutting procedures, refer to the instructions under manual operation and automatic operation.

Uninstalling top clamp

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

Step 1 - Disconnect the top clamp hoses.

Step 2 - Loosen the lock nuts and remove the top clamp.

Step 3 - Remove the stud bolts.

4.8 TEST RUN THE MACHINE

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

Testing machine performance:

Turn on the power and run a basic performance test after you finish installing the machine. Follow these steps to test machine performance:

Step 1 - Disassemble shipping brackets and bolts.

Step 2 - Install roller table

Step 3 - Turn on the relay switch in the control box.

Step 4 - Elevate the saw bow. (If your coolant pump is in reverse and the machine cannot run, please change the electrical phase.)

Step 5 - After the saw bow ascends, extend the quick approach device.

Step 6 - Remove the rust-prevention grease with cleaning oil or kerosene.

Step 7 - Start the coolant pump

Step 8 - Test these functions under manual mode:

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

4.9 CUTTING OPERATION

Step 1 - Check before you cut

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

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

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

Step 3 - Position your workpiece.

Step 4 - Clamp the workpiece.

Step 5 - Turn the *cutting pressure control* knob to adjust blade descending speed according to the material.

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

Step 7 - Start running the blade.

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

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

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

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

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

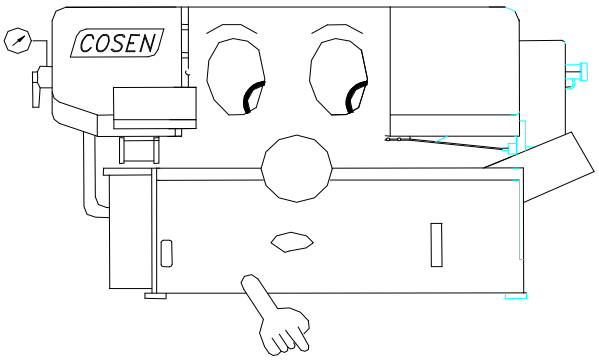
Step 12 - Lower the saw bow to a proper position then turn off the power.

4.10 TERMINATING A CUTTING OPERATION

- To terminate a cutting operation, press either the *saw bow up* button or the *hydraulic stop* button.
- The saw blade will stop running when the *saw bow up* button is pressed.
- Both the saw blade and hydraulic pump motors will stop running when the *hydraulic stop* button is pressed.
- The machine will stop automatically when an error occurs. The error message will be shown on the screen.

Section 5

ELECTRICAL SYSTEM



SECTION 5

ELECTRICAL SYSTEM

5.1 INTRODUCTION

This section will introduce the machine's electric system diagram in easy understand way.

5.2 ELECTRICAL CIRCUIT DIAGRAMS

As mentioned earlier at the beginning of the section. The electric circuit diagrams shown here are:
The electric circuit diagram of the system :

Fig 5-1 control panel layout
Fig 5-2 circuit board layout
Fig 5-3 power supply layout
Fig 5-4 PLC I/O layout

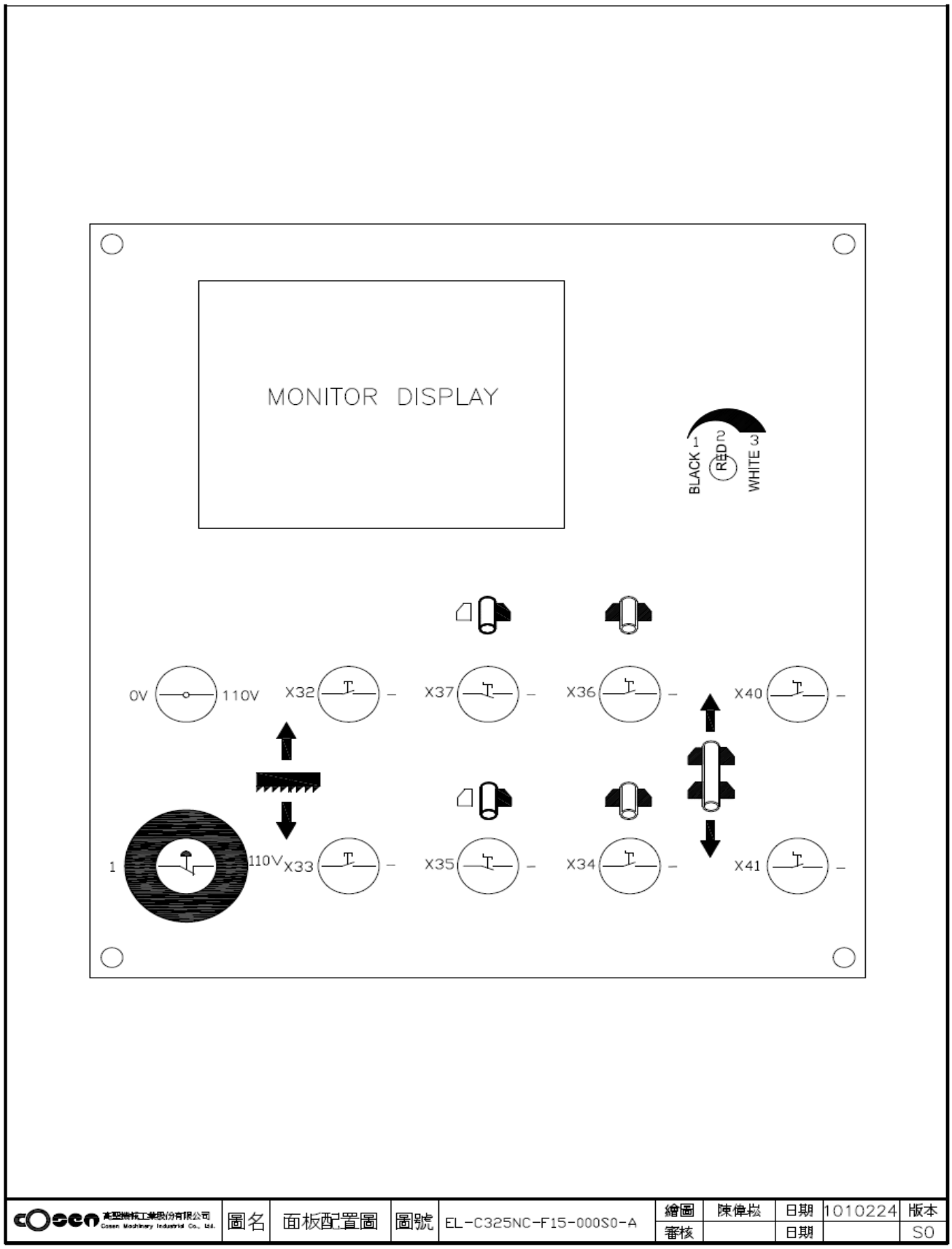


Fig.5-1 control panel layout

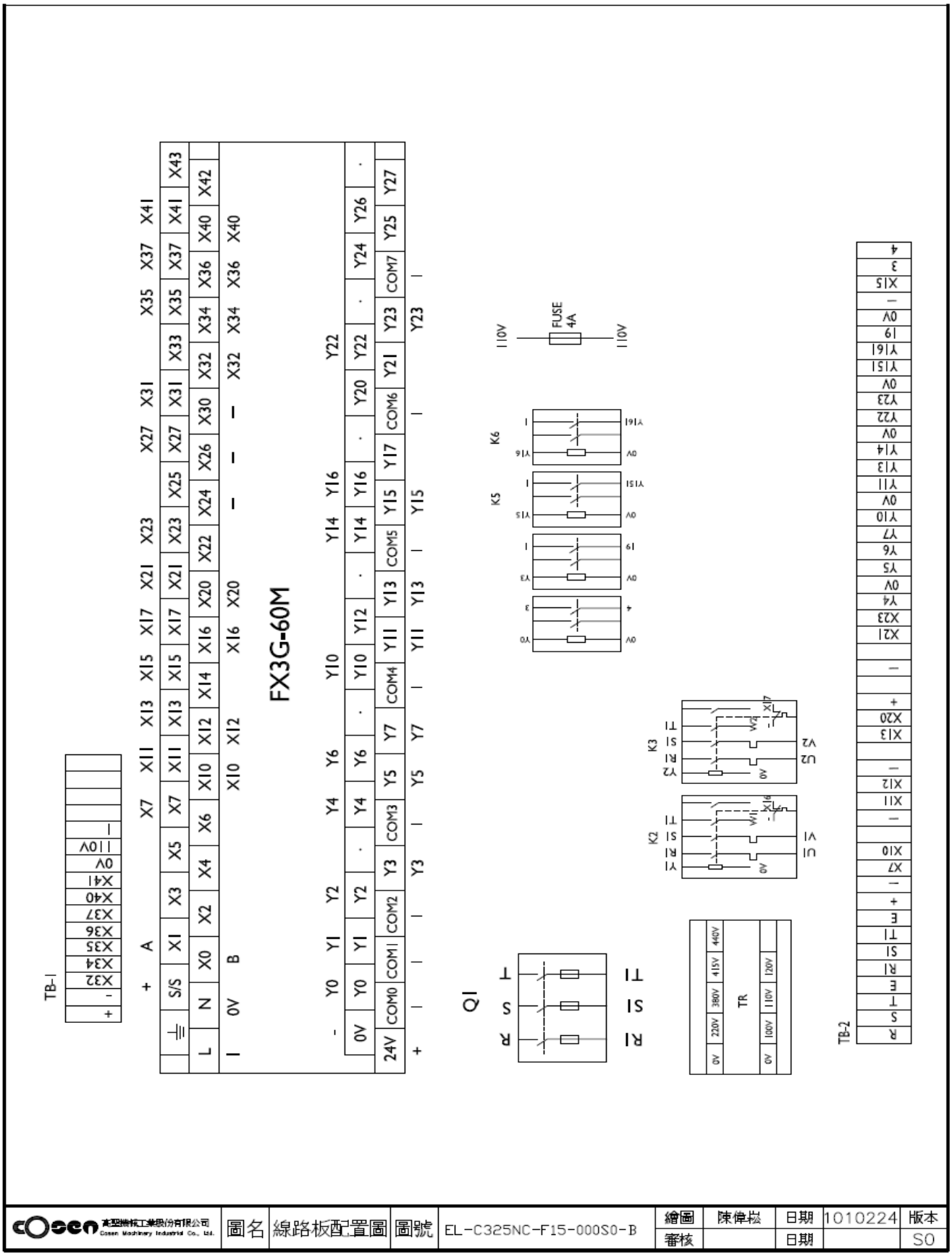


Fig.5-2 circuit board layout

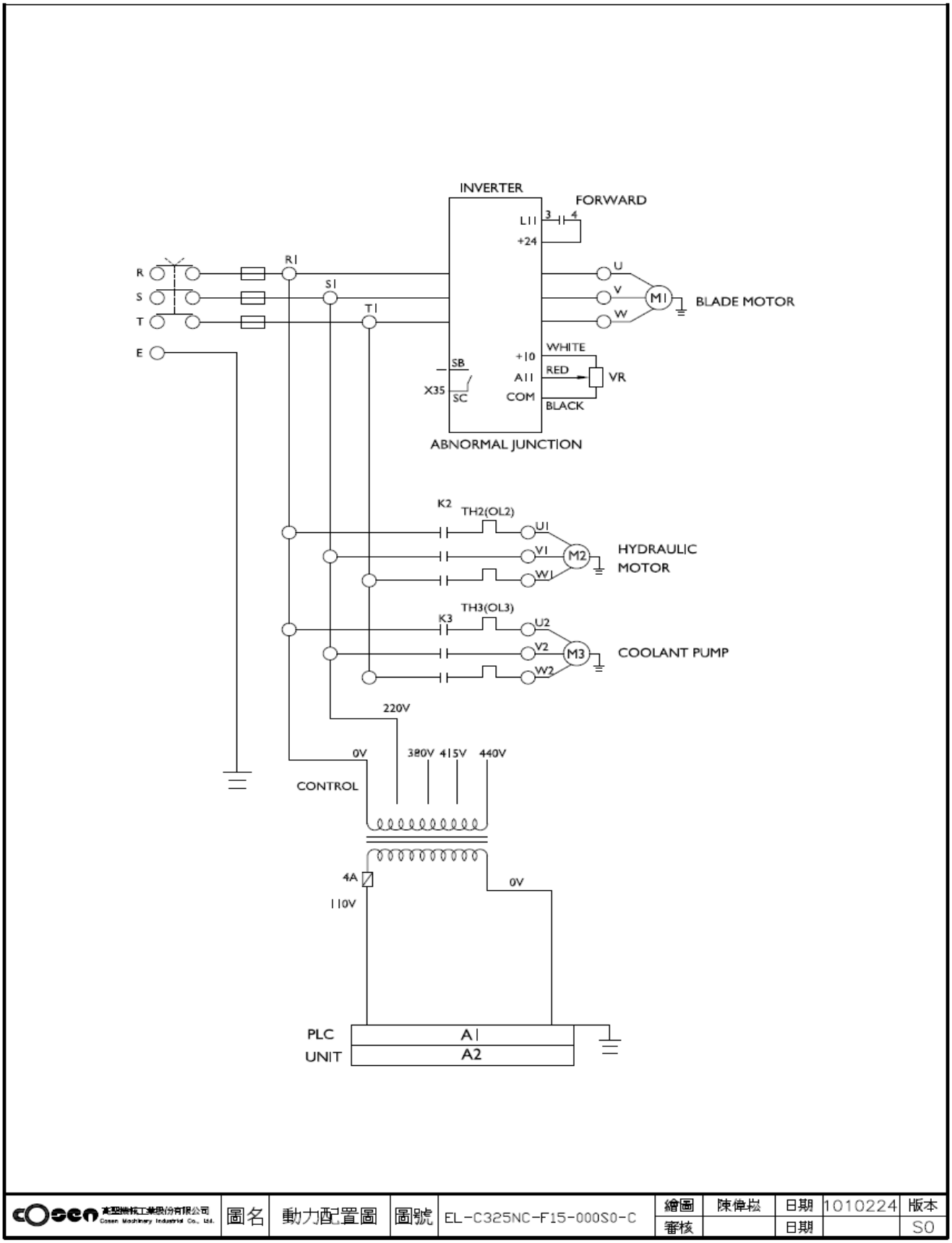


Fig.5-3 power supply layout

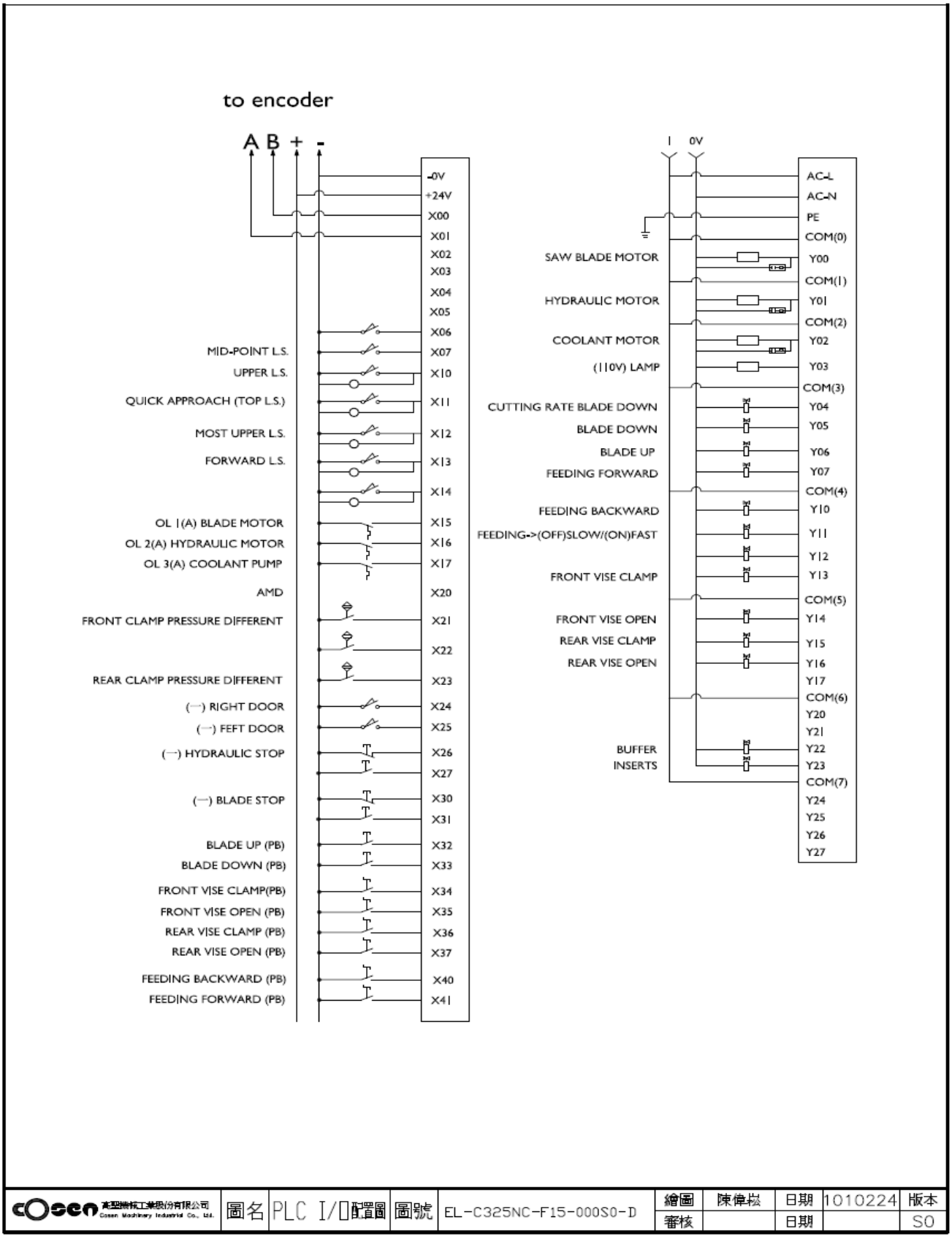
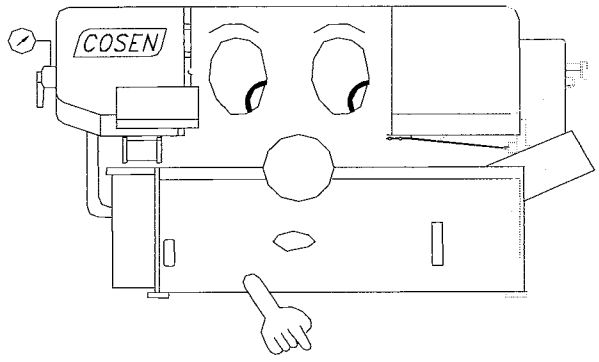


Fig.5-4-1 PLC I/O layout

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. In the front of drive wheel installed one set of tension adjusting part, used on adjusting the tention as saw blade required. The hydraulic cylinder provides pressure to clamp material.

CAUTION

During installation or handling of higer pressure hydraulic hoses do not bend hose to smaller than specified minimum bend radius. Installed higer pressure hoses removed for other maintenance assessibility should be reinstalled in same location. These hoses develop a permanent set and straightening action could cause damage to the inner liner. Any sharp bends or bumps could cause liner to collapse and result in system leakage.

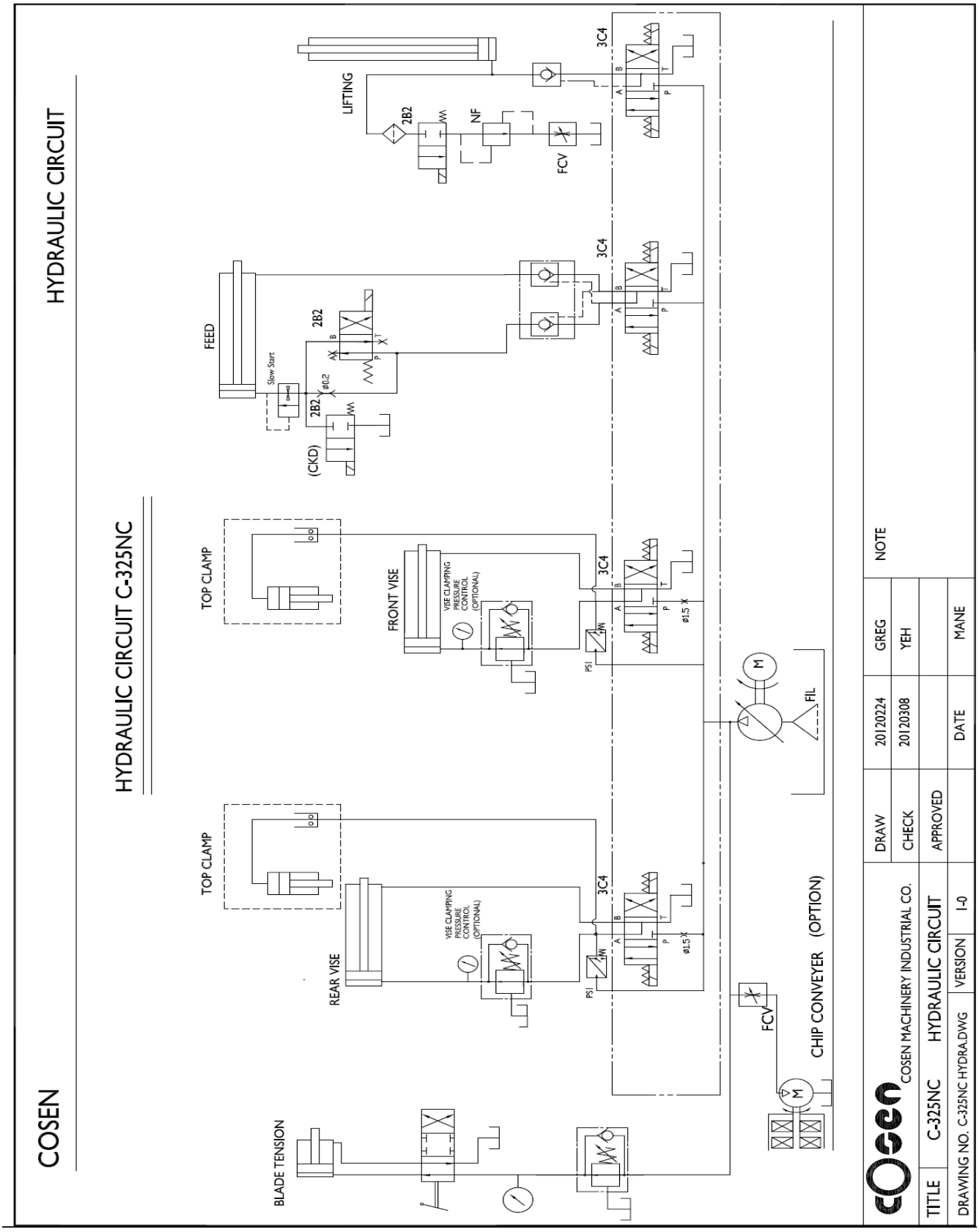
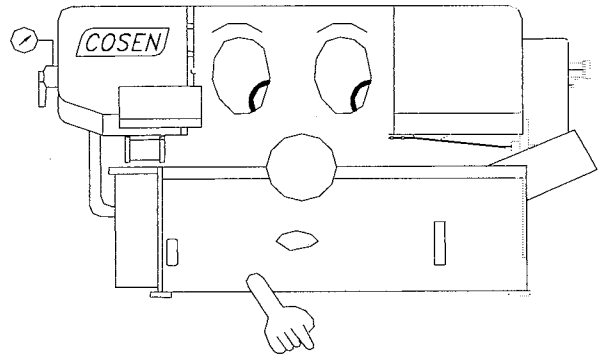


Fig 6-1 HYDRAULIC CIRCULIC

Section 7

BAND SAW CUTTING A PRACTICAL GUIDE



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:

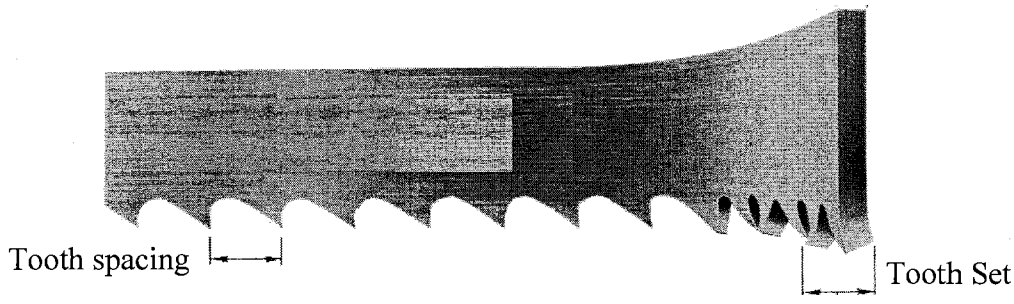


Fig. 7.1 Description of Band

- ☐ 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.
- ☐ 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:

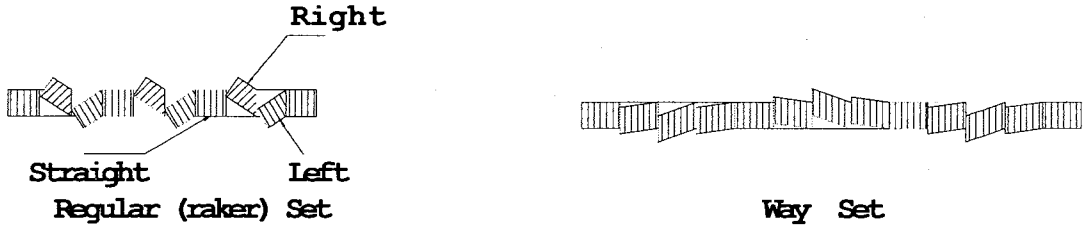


Fig. 7.2 The saw set

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.

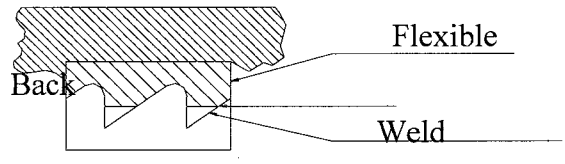


Fig. 7.3 Electron Welded Blade

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:

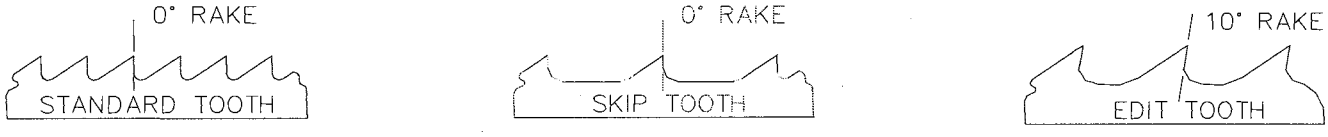


Fig. 7.4 Three styles of tooth

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":

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:

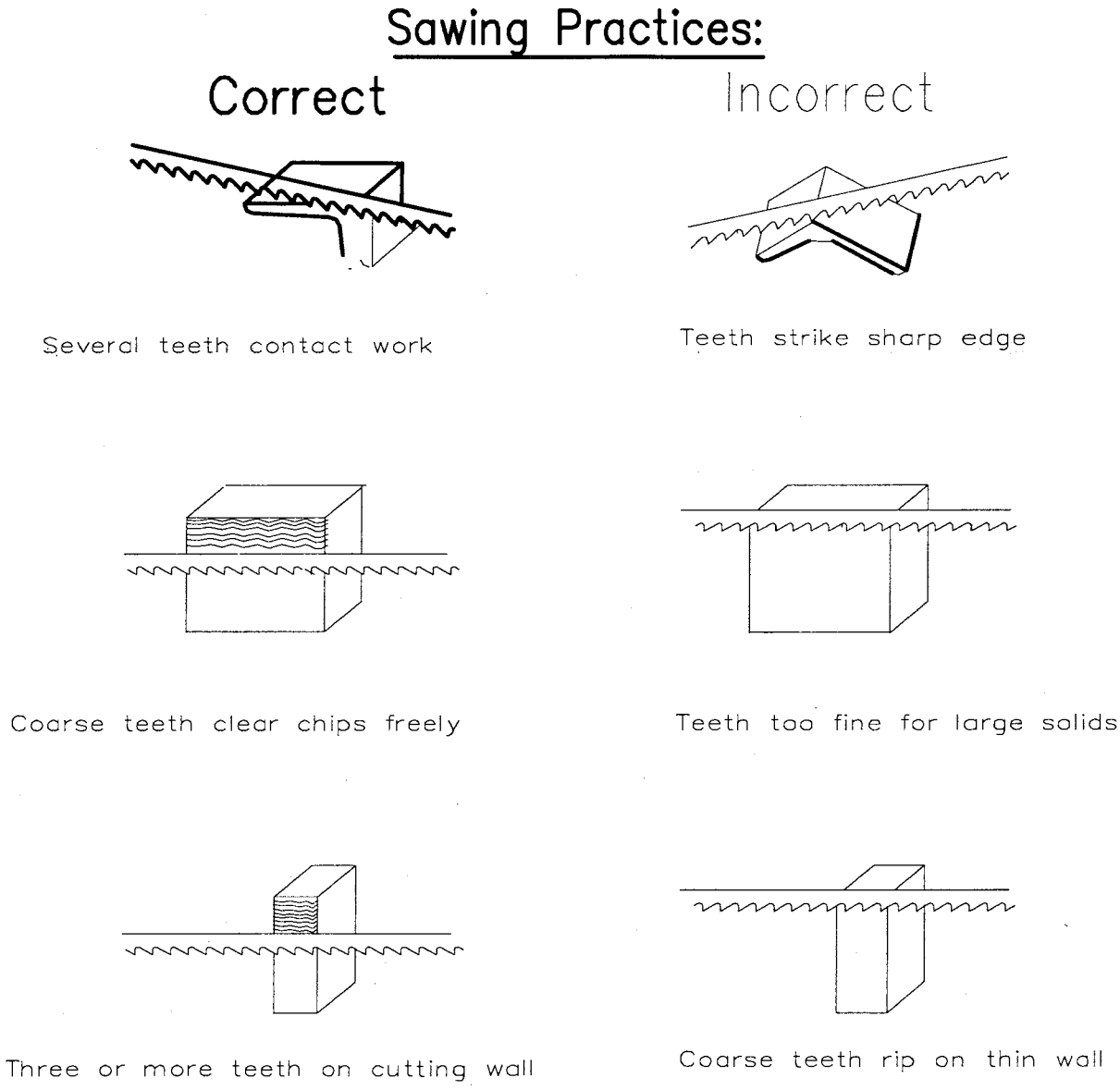
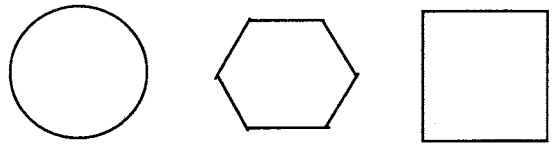


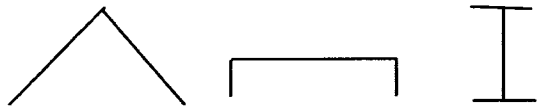
Fig. 7.4 Some sawing practices

Solid Stock:



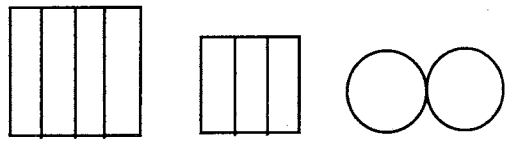
up to 25 mm	- 1“	8-10 Teeth per inch(TPI)
25-100mm	- 1“-4”	6-8 TPI
100-250mm	- 4-10“	3-4 TPI

Structurals:



up to 10 mm	- 3/8“	10-8 TPI
10-20mm	- 3/8-3/4“	8-10 TPI
above 20mm	- 3/4“	6-8 TPI

Solid:

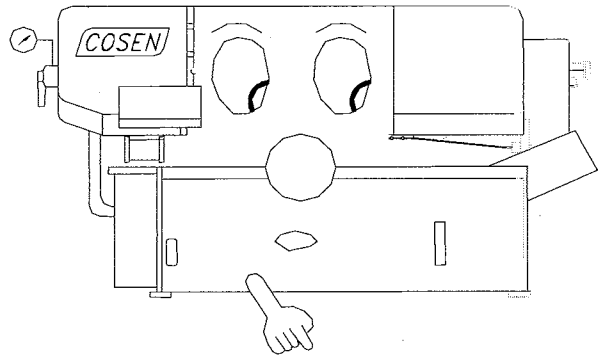


up to 20mm	- 3/4“	8-10 TPI
20-80mm	- 3/4-3.1/4“	2- 8 TPI
above 80 mm	- 3.1/4“	4- 6 TPI

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

Section 8

MAINTENANCE & SERVICE



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, 1.Daily maintenance. 2.Monthly maintenance. 3. Six months maintenance.

Before beginning of work each day

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

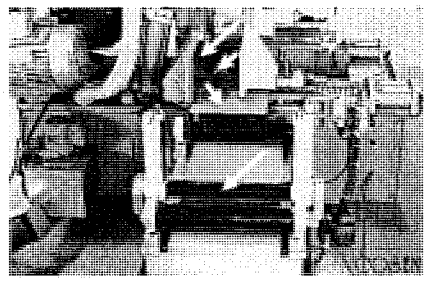
After ending work each day

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

WARNING

⊙ Do not discharged cutting fluid while the saw blade is operating. Because, it will cause severe injury operator hand.
⊙ Be sure the saw blade is fully stop, it will be performed after working inspection.

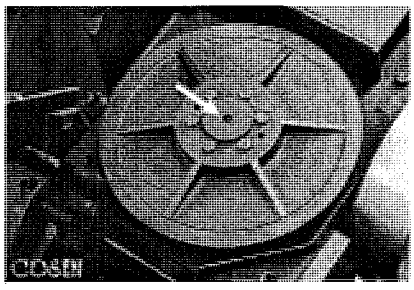
✓ 2. Lubricate the following points:
- Front vise slide plates
- Rear vise slide plates
- Feed cylinder guide shafts
- Rear vise guide bars



Every monthly maintenance.

Please apply grease to the following points:
✓ 1. Idle 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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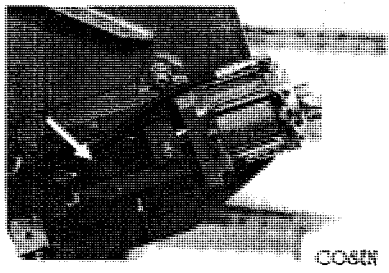
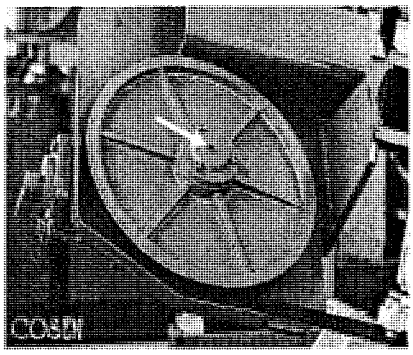
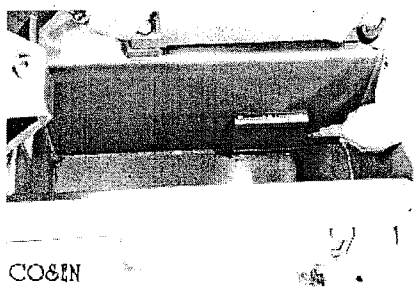


2.


4.

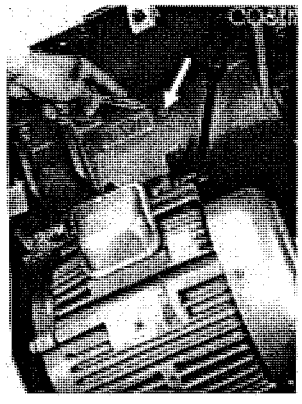

Every six months maintenance.

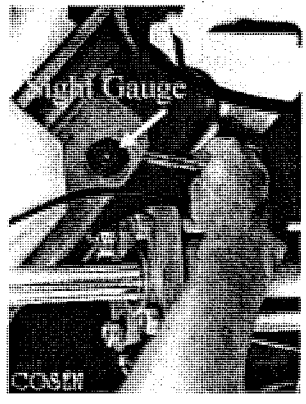
✓ 1. Please clean the filters in the cutting fluid tank. (First, please remove the chip conveyor screw cover)



✓ 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:
- Omala Oil R220 (Cold area use.eg:Korea, Russia……)
- Mobil Comp 632 600W Cyclinder oil





✓ 3. Replace the hydraulic oil.
Recommended Oil:
Shell Tellus 32
Mobil DTE Oil Light Hydraulic 28

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℃
(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.

(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

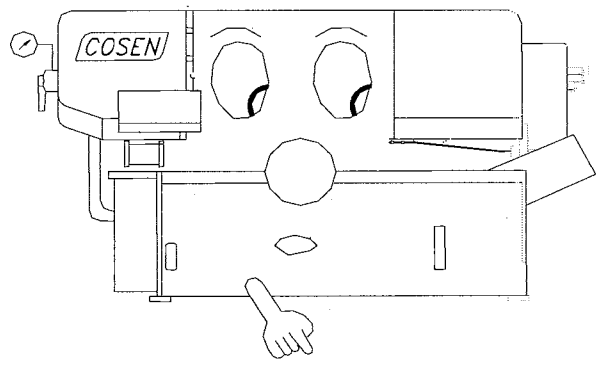
8.6 OIL RECOMMENDATION FOR MAINTENANCE

Item		Method	Revolution	Suggest oil
Dovetail guide		Keep grease covered. Antirust.	Daily	Shell R2
Roller bearing		Sweep clean and oil with lubricant.	Daily	SEA #10
Bed roller / surface		Sweep clean and oil with lubricant.	Daily	SEA #10
Nipples of bearing		Use grease gun, but not excess.	Monthly	Shell R2
Blade tension device		Use grease gun, but not excess.	Monthly	Shell R2
Reducer		Inspect once a week. Change oil of 600hrs of using. Change it every year.	Regularly	Omala oil R220 Mobil Gear 630
Hydraulic system		Inspect half a year. Change oil every year.	Regularly	Shell Tellus 32 Mobil DTE oil Light Hydraulic 24
Bearing	Inserts	Oil with lubricant, but not excess.	Daily	Shell R2
	Band wheel	Oil with lubricant, but not excess.	Weekly	
	Cylinder	Oil with lubricant, but not excess.	6 Monthly	
	Wire brush	Oil with lubricant, but not excess.	6 Monthly	

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

Section 9

SYSTEM TROUBLE SHOOTING



SECTION 9

SYSTEM 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.

9.3 GENERAL TROUBLES AND SOLUTIONS

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

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

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.

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

9.6 SAWING PROBLEMS AND SOLUTIONS

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

Sawing Problems and Solutions

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

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 in 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 4, 5 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.

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

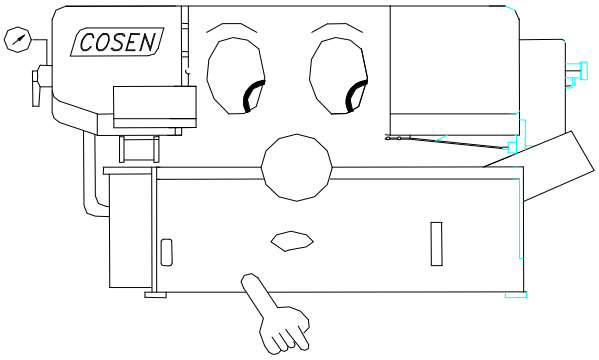
1. Screw or loosen the adjusting bolt to attain the horizontal balance (leveling) between the roller table and the machine frame.
2. Ensure that the machine frame is not struck by the loaded material on the feeding table.
3. Check the leveling by the measuring tool.
4. After finished the adjusting, fix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

WARNING:

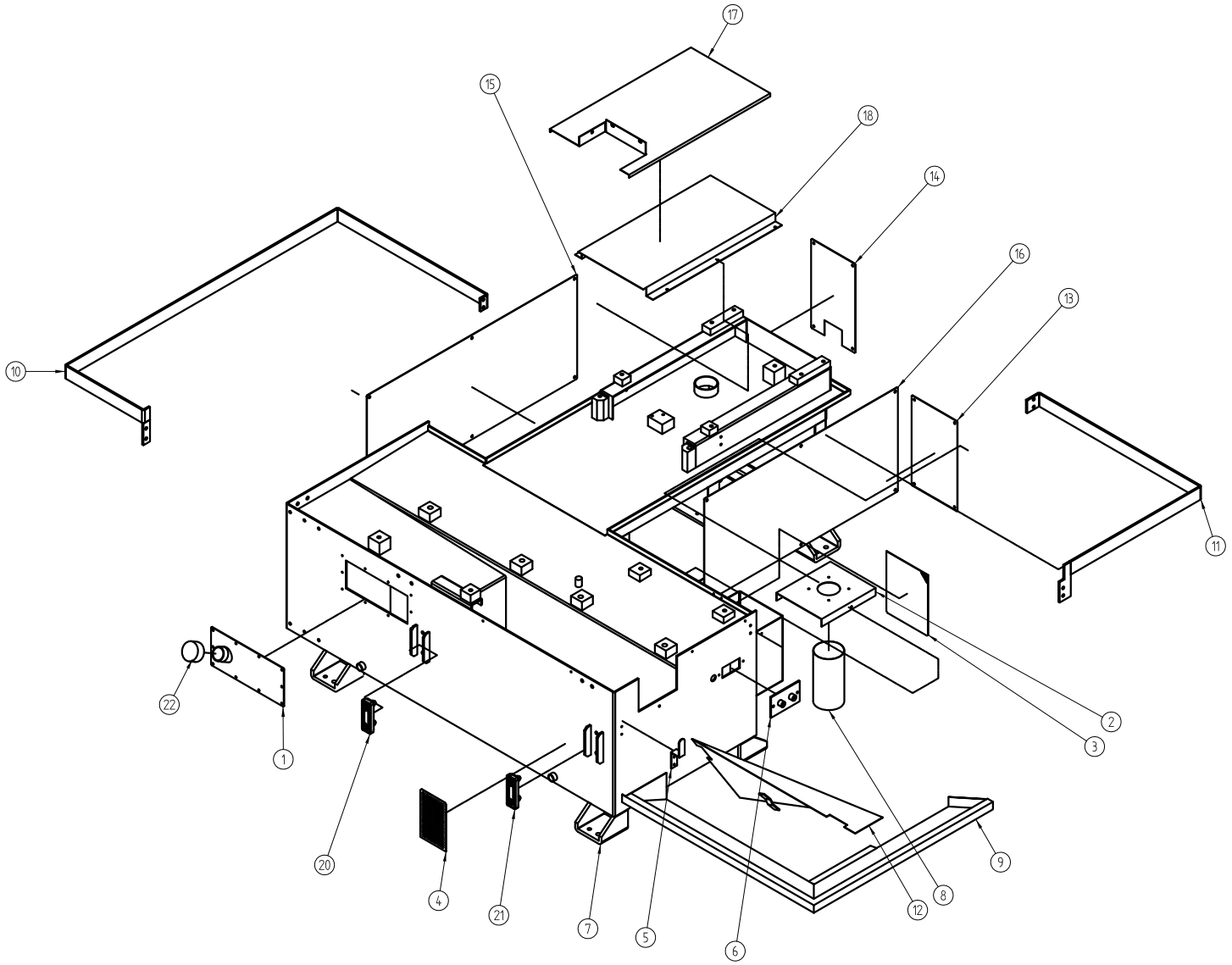
If the feeding table and the machine frame are not positioned under the horizontal balance, the loaded material may be going up gradually and affect the cutting effect.

Section 10

PART LIST

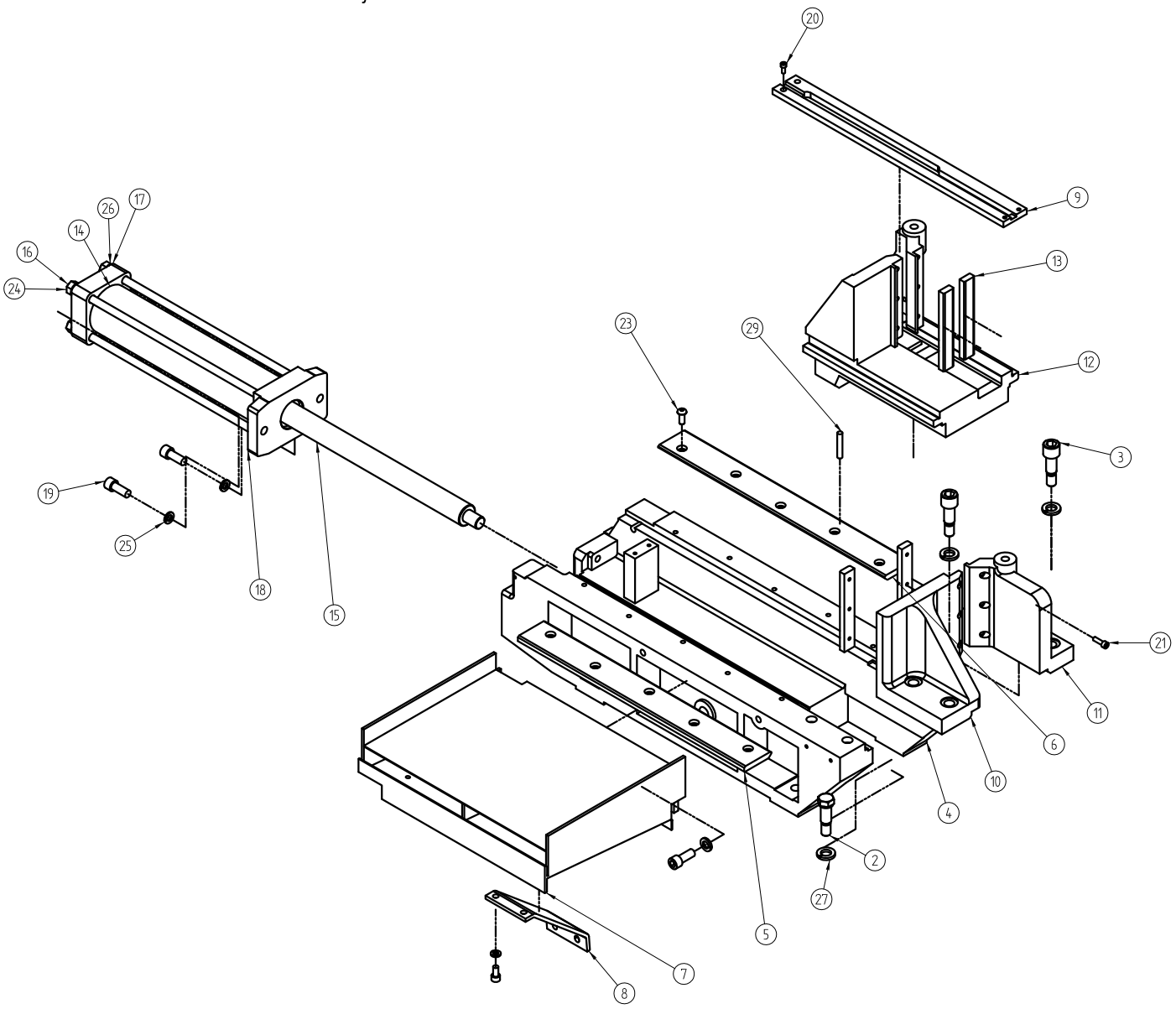


Base Assembly



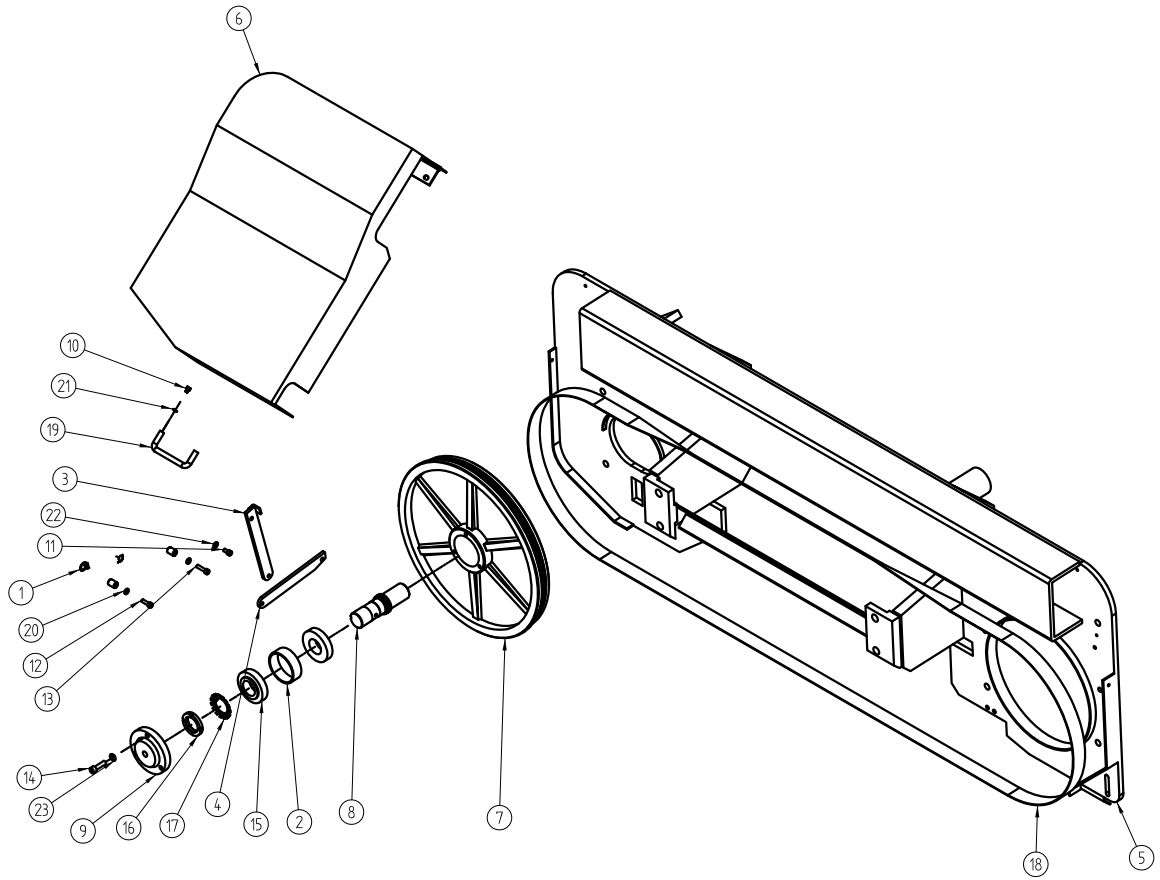
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	AHA-0102	Oil tank cover	油箱蓋	1
2	AHA-0136	Coolant pump fixed seat cover	冷卻泵浦固定座蓋	1
3	AHA-0138	Filter	水箱通管濾網	1
4	AHA-0139	Filter	水箱通管濾網(小)	1
5	AHA-1309	Hose bracket	軟管架	1
6	AHG-0138	Fitting seat	水管接頭座	1
7	C325H-1001	Base	底座	1
8	C250H-1007	Pump filter	浸水幫浦濾網(二)	1
9	C325H-1025	Splash shield	右防濺板	1
10	C325H-1031	Left fence	左護欄	1
11	C325H-1033	Right fence	右護欄	1
12	C325H-1041	Collecting chip board	水槽集屑板	1
13	C250H-1060	Cover	右後左蓋	1
14	C250H-1061	Cover	左後蓋	1
15	C250H-1063	Cover	後左後蓋	1
16	C250H-1067	Cover	後右後蓋	1
17	C250H-1281	Feeding shaft cover	送料軸護蓋	1
18	C325H-1283	Feeding cylinder cover	送料油缸護蓋	1
20	PP-21030	Oil gauge	油面計(含刻度錶)	1
21	PP-21030A	Water gauge	水面計(不含刻度錶)	1
22	PP-90857	Nut	油箱蓋螺帽	1

Fixed Bed Assembly



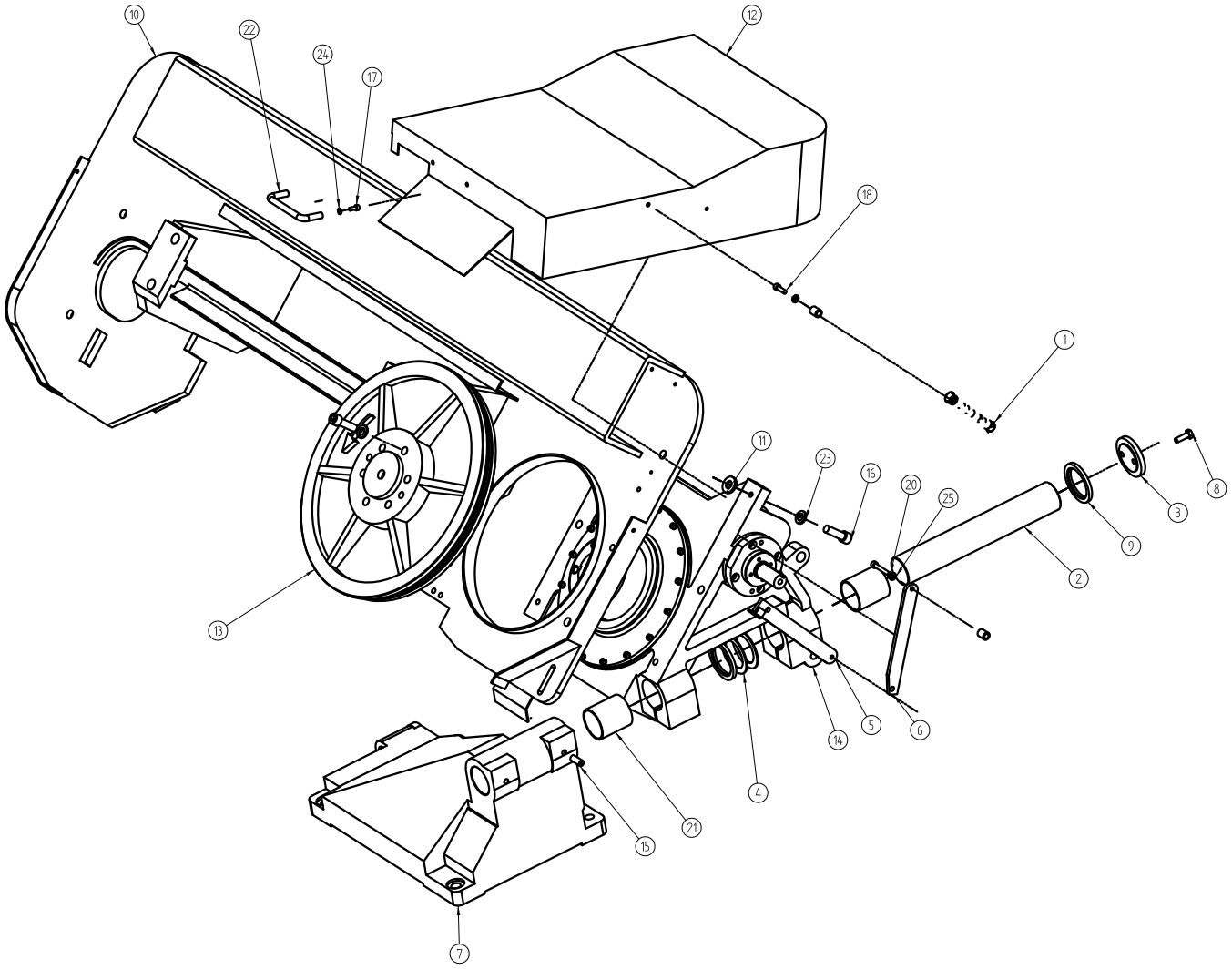
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1*	AGB-70220	Water pipe fixed bracket	冷卻水管固定板	1
2	AHA-0122A	Fixed nut	外六角固定螺栓	1
3	AHA-0122B	Fixed nut	內六角固定螺栓	2
4	C325H-2001	Base	床面	1
5	AHC-0234A	Rear bed plate	後床面鋼板	1
6	AHC-0234B	Front bed plate	前床面鋼板	1
7	C325H-1201	Braket	托架	1
8	C325H-1202	Supporter	托架支撐板	1
9	C325H-2008	Blade plate	前鋸線鋼板	1
10	C325H-2201	Front fixed vise 1	前固定虎鉗(一)	1
11	C325H-2203	Front fixed vise(rear)	前固定虎鉗(後)	1
12	C325H-2215	Movable vise	活動虎鉗	1
13	C325H-2241	Vise plate	虎鉗鋼板(一)	4
14	C325H-2305	Tube	缸管	1
15	C325H-2307	Piston	活塞(含桿)	1
16	C325H-2309	Cylinder shaft	油缸連桿	4
17	C250H-2324	Cyliner rear cover	夾料前油缸後蓋	1
18	C250H-2325	Cyliner front cover	夾料前油缸前蓋	1
19	PBA-12-30	Bolt	有頭內六角螺絲(公)	3
20	PBA-5-12	Bolt	有頭內六角螺絲(公)	1
21	PBA-6-20	Bolt	有頭內六角螺絲(公)	1
22*	PBA-8-16	Bolt	有頭內六角螺絲(公)	2
23	PDA-8-20	Ball bolt	丸頭內六角螺絲(公)	1
24	POA-12	Nut	螺母(公)	4
25	PQA-10	Spring washer	彈簧華司(公)	2
26	PQA-12	Spring washer	彈簧華司(公)	5
27	PQA-16	Spring washer	彈簧華司(公)	3
28*	PQA-8	Spring washer	彈簧華司(公)	2
29	PRD-8-45	Pin	平行銷	1

Idel Wheel Assembly



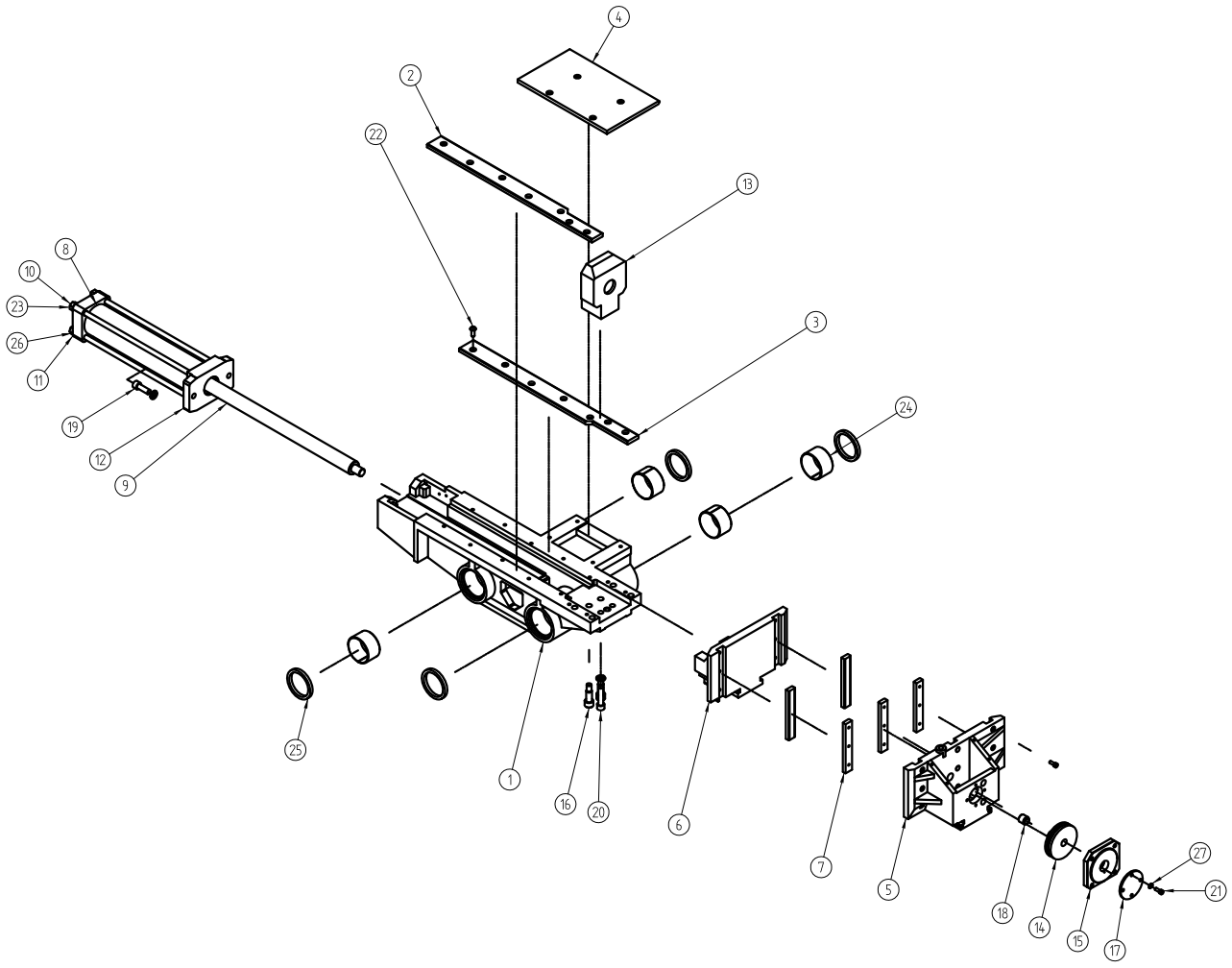
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	ACA-2010	Spring	曲板彈簧	1
2	AHA-0637	Washer	上輪軸承墊圈	1
3	AHB-0726A	Position board	箱蓋定位板	1
4	AHB-0726C	Position board	箱蓋定位板	1
5	C325H-3001	Saw bow	鋸弓	1
6	C325H-3003	Idel wheel cover	上輪箱蓋	1
7	C250H-3031	Idel wheel	上輪(1 1/4")	1
8	C250H-3033	Idle wheel shaft	上輪軸	1
9	C250H-3037	Idle wheel shaft cover	上輪軸蓋	1
10	PBA-5-6	Bolt	有頭內六角螺絲(公)	1
11	PBA-6-12	Bolt	有頭內六角螺絲(公)	1
12	PBA-6-20	Bolt	有頭內六角螺絲(公)	1
13	PBA-6-25	Bolt	有頭內六角螺絲(公)	1
14	PBA-8-30	Bolt	有頭內六角螺絲(公)	1
15	PP-14613	Ball bearing	滾錐軸承	2
16	PP-14907	Fixed nuts	固定螺母	1
17	PP-14957	Stop ring	止動環	1
18	PP-18187A	Blade	鋸帶	1
19	PP-52124	Handle	輪箱把手	1
20	PPA-6	Washer	平面華司(公)	2
21	PQA-5	Spring washer	彈簧華司(公)	1
22	PQA-6	Spring washer	彈簧華司(公)	1
23	PQA-8	Spring washer	彈簧華司(公)	1

Drive Wheel Assembly



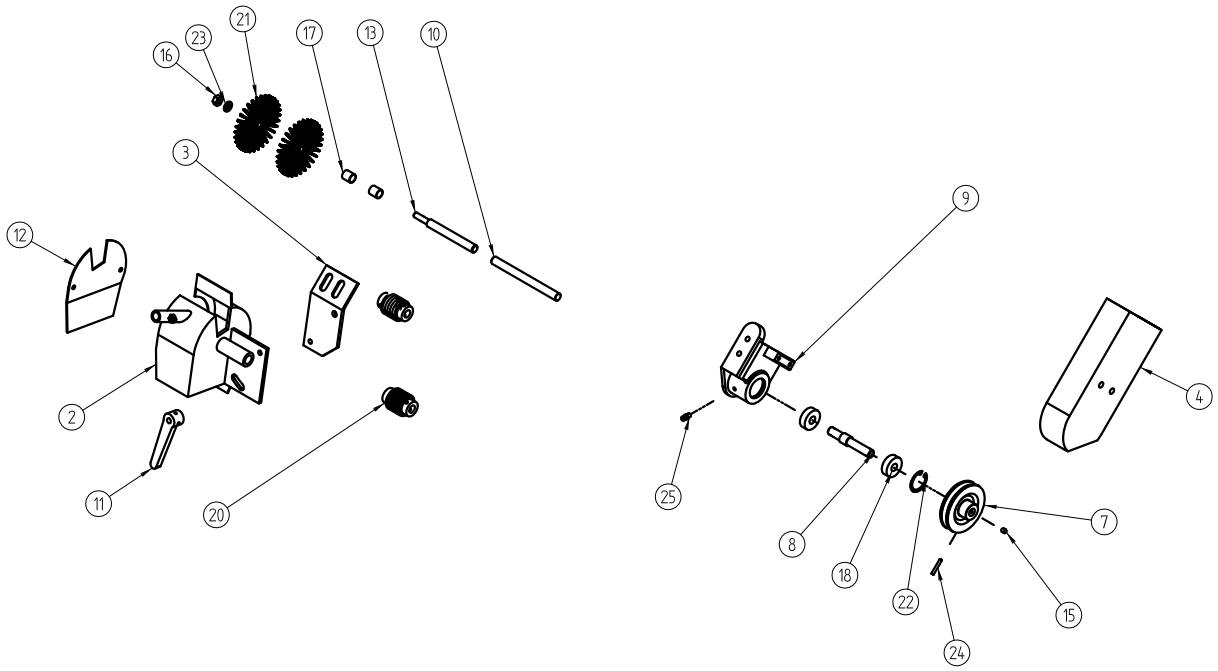
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	ACA-2010	Spring	曲板彈簧	1
2	AHA-0310	Joint shaft	關節軸	1
3	AHA-0311	Joint shaft cover	關節軸蓋	1
4	AHA-0324	Telfon washer	鐵弗龍墊圈	2
5	AHB-0726A	Position board	箱蓋定位板	1
6	AHB-0726C	Position board	箱蓋定位板	1
7	C325H-1151	Joint seat	關節座	1
8	C250H-1167	Fixed bolt	固定螺絲	1
9	C250H-1169	Washer	關節座華司	2
10	C325H-3001	Saw bow	鋸弓	1
11	C250H-3002	Saw bow washer	鋸弓平面墊圈	1
12	C325H-3005	Drive wheel cover	下輪箱蓋	1
13	C250H-3041	Drive wheel	下輪	1
14	C325H-33500	Gear reducer	減速機整組	1
15	PAA-10-25	Set screw	止付螺絲公	1
16	PBA-12-40	Bolt	有頭內六角螺絲公	2
17	PBA-5-12	Bolt	有頭內六角螺絲公	1
18	PBA-6-20	Bolt	有頭內六角螺絲公	1
19'	PBA-6-30	Bolt	有頭內六角螺絲公	1
20	PBA-6-40	Bolt	有頭內六角螺絲公	1
21	PP-13250	Du Busing	乾式軸承	2
22	PP-52124	Handle	輪箱把手	1
23	PQA-12	Spring washer	彈簧華司公	2
24	PQA-5	Spring washer	彈簧華司公	1
25	PQA-6	Spring washer	彈簧華司公	3

Feeding Bed Assembly



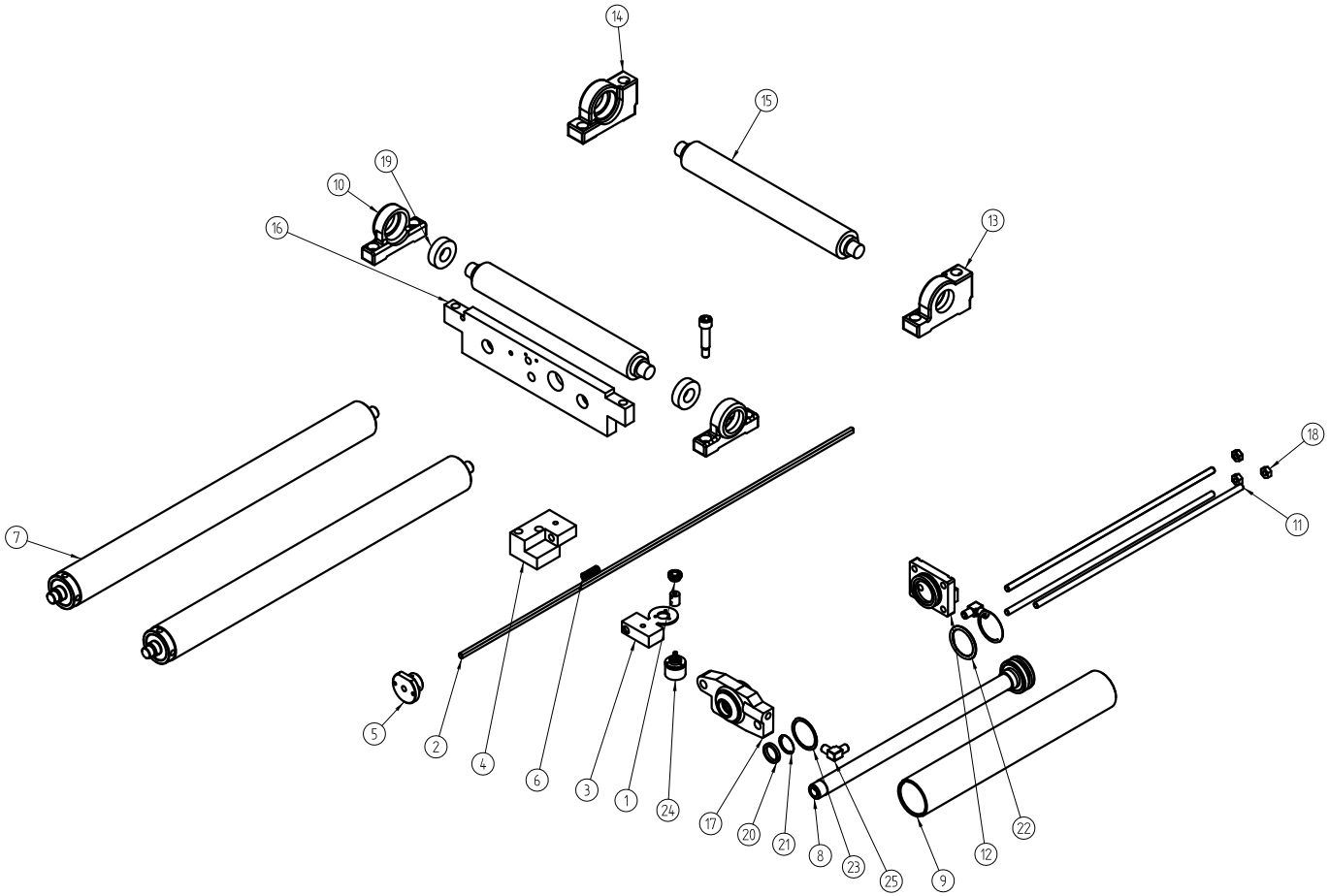
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	C325H-2011	Feeding bed	送料床面	1
2	C325H-2013	Feeding bed plate 1	送料床面鋼板(一)	1
3	C325H-2015	Feeding bed plate 2	送料床面鋼板(二)	1
4	AHC-1524-Y2	Bed cover	床面遮板	1
5	C325H-2221	Rear fixed vise	後固定虎鉗	1
6	C325H-2223	Rear movable vise	後活動虎鉗	1
7	C325H-2241	Vise plate	虎鉗鋼板(一)	5
8	C325H-2305	Tube	缸管	1
9	C325H-2307	Piston	活塞(含桿)	1
10	C325H-2309	Cylinder shaft	油缸連桿	4
11	C250H-2324	Cyliner rear cover	夾料前油缸後蓋	1
12	C250H-2325	Cyliner front cover	夾料前油缸前蓋	1
13	C250H-2801	Rear fixed vise cylinder	後固定虎鉗油缸	1
14	C250H-2803	Piston	活塞	1
15	C250H-2805	Piston rear cover	活塞後蓋	1
16	C250H-2807	Position pin	雙動虎鉗油缸定位梢	2
17	C250H-2809	Spring shield	彈簧擋板	1
18	C250H-2811	Stop bolt	止動螺絲	1
19	PBA-12-35	Bolt	有頭內六角螺絲(公)	1
20	PBA-12-50	Bolt	有頭內六角螺絲(公)	1
21	PBA-6-16	Bolt	有頭內六角螺絲(公)	2
22	PDA-8-20	Ball bolt	丸頭內六角螺絲(公)	1
23	PQA-12	Nut	螺母(公)	4
24	PP-13260	Du Bushing	乾式軸承	4
25	PP-51146	Dust seal	防塵套	4
26	PQA-12	Spring washer	彈簧華司(公)	6
27	PQA-6	Spring washer	彈簧華司(公)	1

Brush Assembly



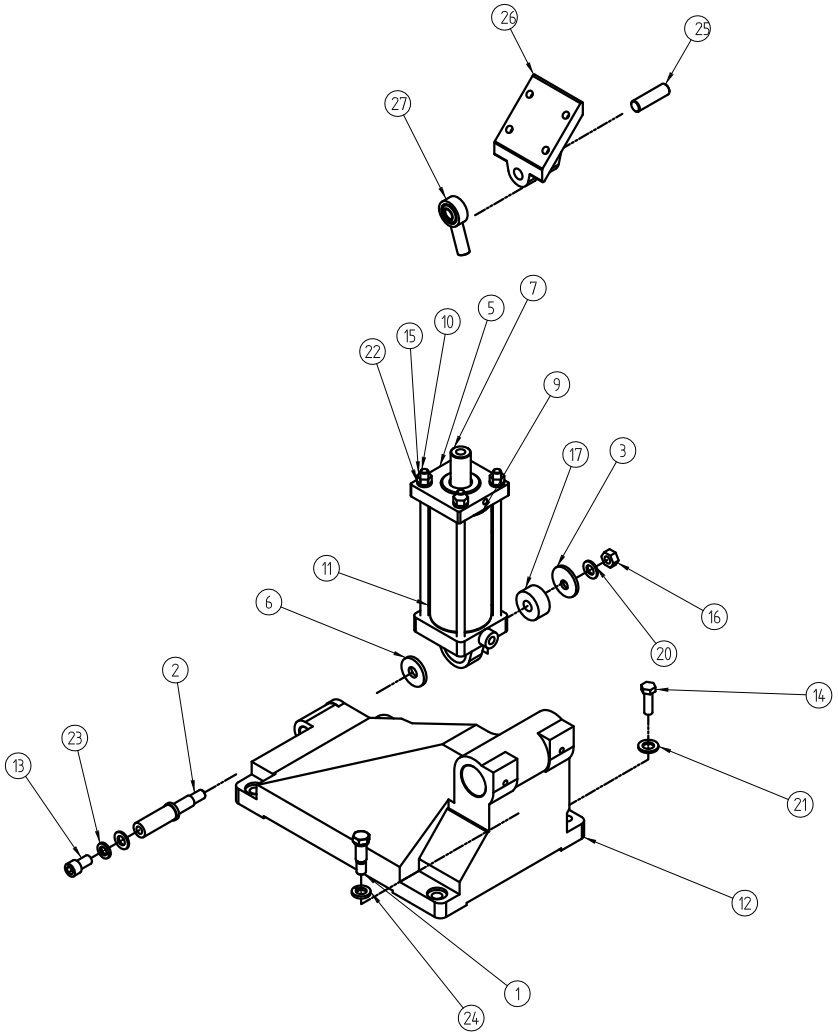
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
2	AGC-3025	Wire brush cover	鋼刷護蓋	1
3	AGC-3027	Wire brush cover bracket	鋼刷護蓋固定板	1
4	C325H-3237	Pulley cover	鋼刷普利護蓋	1
7	AHA-1202	Brush pulley	鋼刷皮帶輪	1
8	AHA-1207	Pulley shaft	皮帶輪軸(鋼刷)	1
9	AHA-1211	Bearing bracket	軸承座	1
10	AHA-1215	Transmission shaft	鋼刷傳動軸	1
11	AHA-1217	Transmission shaft	鋼刷調整桿	1
12	AHA-1220-2	Wire brush cover board	鋼刷護蓋板	1
13	AHB-0519	Wire brush shaft	鋼刷軸	1
15	PAA-6-6	Set crew	止付螺絲(公)	1
16	POA-8	Nut	螺母(公)	1
17	PP-13025	Du bushing 1215	乾式軸承	2
18	PP-14272	Bearing	軸承	2
20	PP-15010	Universal joint	萬向接頭	2
21	PP-58002	Wire brush	鋼刷	2
22	PP-58109	Snap ring	扣環	1
23	POA-8	Spring washer	彈簧華司(公)	1
24	PRA-4-25	Spring pin	彈簧銷	1
25	PUC-020	Nipple	油嘴	1

Feeding Shaft Assembly



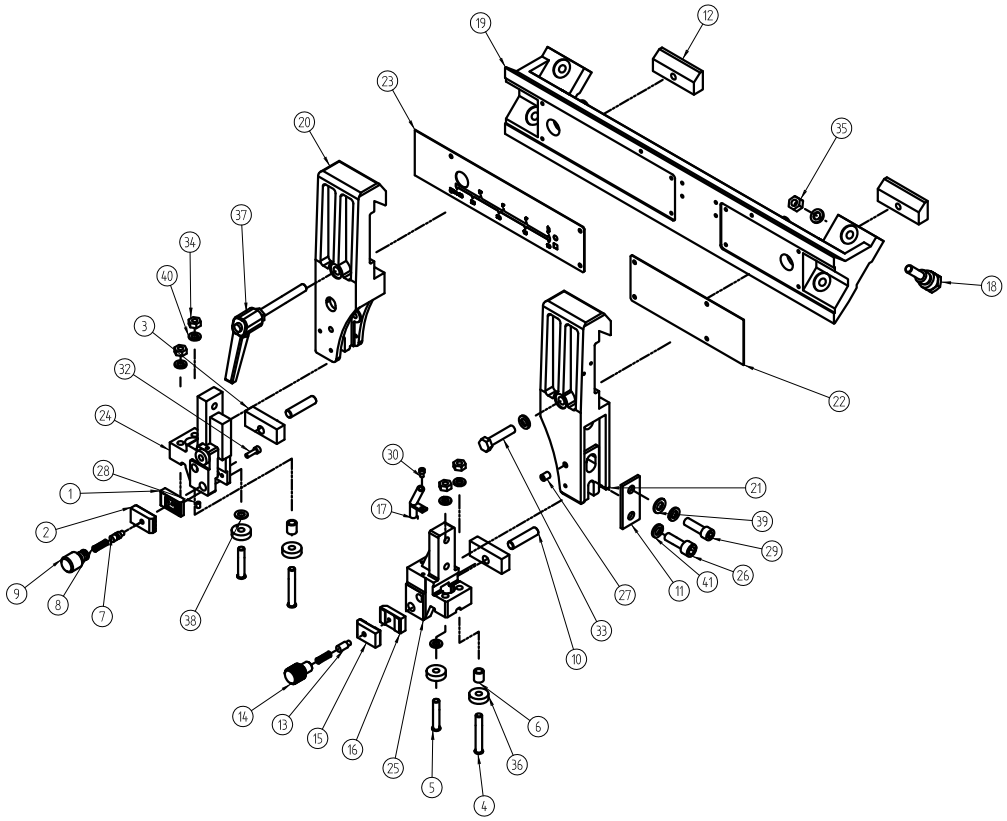
NO.	PART NO.	PART NAME	PART NAME (CH)	QTY
1	AHA-1560	Inch wheel	定寸齒輪	1
2	AHA-1561-1	Tooth bar	定寸齒條	1
3	AHA-1562	Movable plate	譯碼器活動板	1
4	AHA-1563	Encorder seat	譯碼器固定座	1
5	AHA-1564	Tooth bar seat	齒排固定座(二)	1
6	AHA-1565	Spring	壓縮彈簧	1
7	AHA-1601B	Feeding shaft	送料軸(二)有孔	2
8	AHA-1602	Piston and shaft	活塞及桿	1
9	AHA-1620	Tube	缸筒	1
10	C325H-1253	Roller fixed shaft	滾輪固定座	2
11	AHA-1660	Shaft	連桿	4
12	AHA-1679	Rear cover	後蓋	1
13	C325H-1257	Roller fixed seat (right)	滾輪固定座(右)	1
14	C325H-1255	Roller fixed seat (left)	滾輪固定座(左)	1
15	AHC-1625	Roller	滾輪	2
16	C250H-2029	Fixed bracket	送料軸固定板	1
17	C250H-2651	Rear cover	前蓋(送料)	1
18	POA-10	Nut	螺母(公)	4
19	PP-14275	Bearing 6205ZZ	軸承	2
20	PP-51150	U type oil seal	U型油封	1
21	PP-59105	O-ring	O型環	1
22	PP-59196	O-ring	O型環	1
23	PP-59545	O-ring	O型環	2
24	PP-90492E	Encorder	譯碼器	1
25	PUJ-020-020-02	Curved Fitting	彎接頭	2

Saw Bow Cylinder Assembly



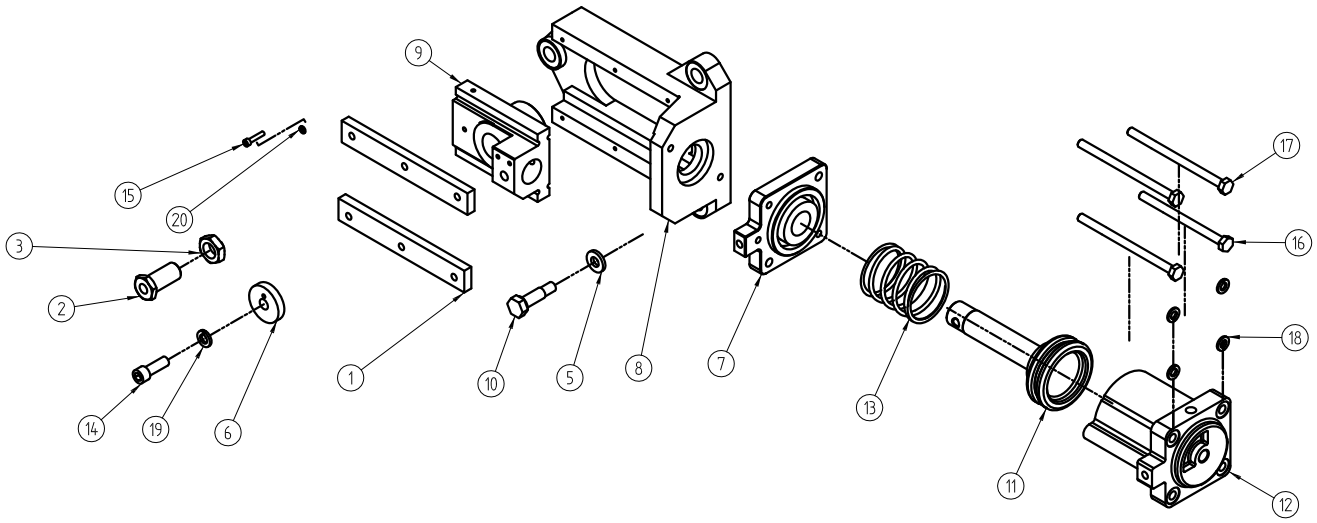
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	AHA-0122A	Fixed nut	外六角固定螺栓	1
2	AHA-0126	Movable shaft	油缸活動軸	1
3	AHA-0129	Washer	偏心墊圈	1
4*	AHA-1101	Spring	鋸弓油壓缸彈簧	1
5	AHA-1102	Front cover	前蓋	1
6	AHA-1105	Rubber pad	橡膠墊圈	1
7	C325H-3251	Piston and shaft	活塞及桿	1
8*	AHA-1117	Teflon washer	鐵弗龍墊圈	1
9	AHC-1119	Tube	缸筒	1
10	AHC-1120	Shaft	連桿	4
11	AHA-1122	Rear cover	後蓋	1
12	C325H-1151	Joint seat	關節座	1
13	PBA-14-20	Bolt	有頭內六角螺絲(公)	1
14	PLA-12-40	Bolt	外六角頭螺絲(公)	1
15	POA-12	Nut	螺母(公)	4
16	POA-14	Nut	螺母(公)	1
17	PP-14510	Bearing	軸承	1
18*	PP-59110	O ring	O形環	1
19*	PP-59170	O ring	O形環	1
20	PPA-14	Washer	平面華司(公)	2
21	PPA-16	Washer	平面華司(公)	1
22	PQA-12	Spring washer	彈簧華司(公)	4
23	PQA-14	Spring washer	彈簧華司(公)	1
24	PQA-16	Spring washer	彈簧華司(公)	1
25	AGB-70304A	Pin	上鋸弓油缸插梢	1
26	AHA-1113	Cylinder top seat	油壓缸頂座	1
27	PP-14480	Bearing	連桿軸承	1

Guide Arm Assembly



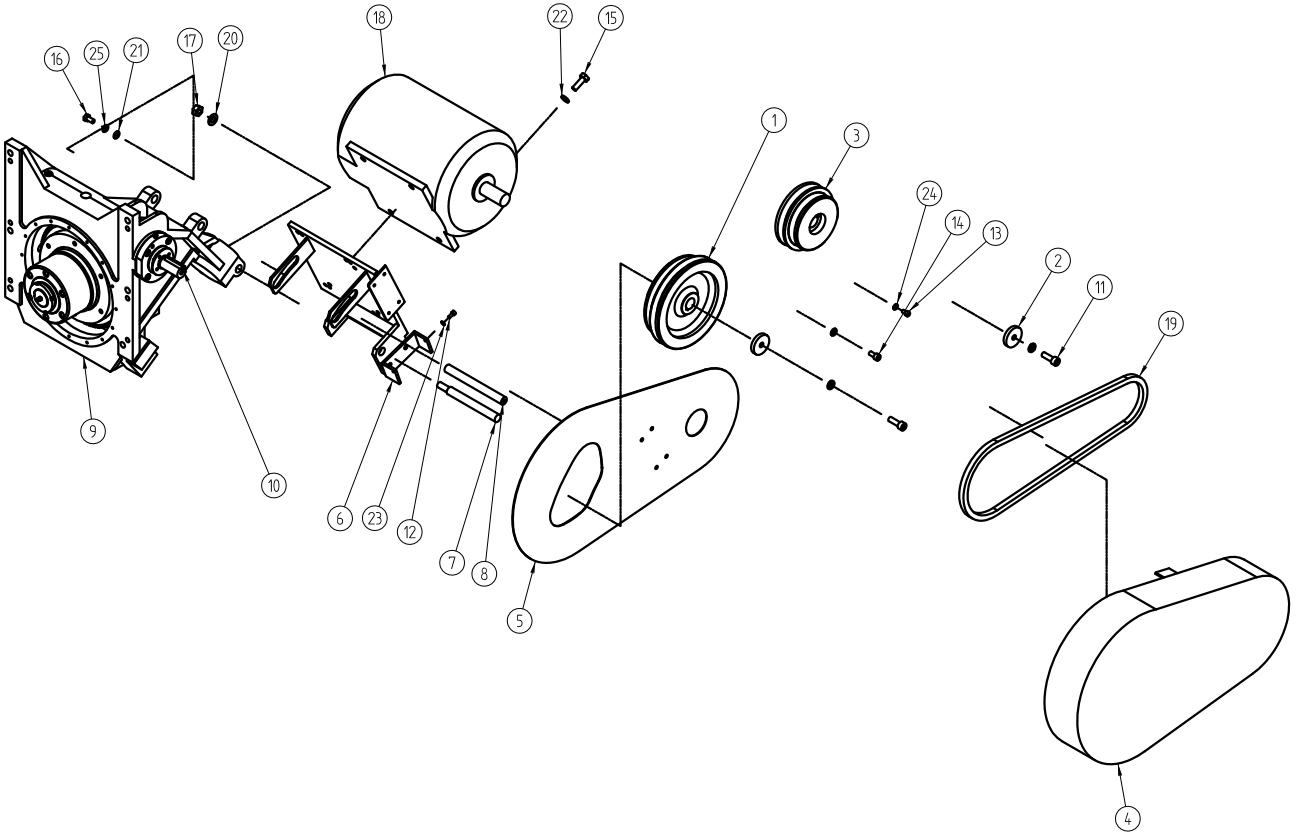
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	AHA-0701B	Left fixed insert	左固定鎢鋼片1 1/4	1
2	AHA-0702B	Left movable insert	左活動鎢鋼片1 1/4	1
3	AHA-0704A	Pressure block	下壓座(EU79用)	2
4	AHA-0707B	Roller pin	導輪軸1 1/4	2
5	AHA-0707C	Roller pin	導輪軸(三)	2
6	AHA-0708B	Washer	導輪墊圈1 1/4	2
7	AHA-0709	Left fitting	左簧塞	1
8	AHA-0710	Spring	鎢鋼片彈簧	2
9	AHA-0711	Adjusting bolt	左調整螺絲	1
10	AHA-0713-1	Straight shaft	軸承座固定軸	2
11	AHA-0719	Spacer	導輪座墊片	1
12	AHA-0737	Saw arm fixed block	鋸臂固定塊	2
13	AHA-0741	Right fitting	右簧塞	1
14	AHA-0742	Right insert knob	右調整螺絲	1
15	AHA-0743B	Right movable insert	右活動鎢鋼片1 1/4	1
16	AHA-0744B	Right fixed insert	右固定鎢鋼片1 1/4	1
17	AHA-0745	Coolant nozzle	冷卻水噴嘴	1
18	C325H-3021	Adjusting Bolt	滑板調整螺絲	1
19	C325H-3101	Saw arm sliding board	鋸臂滑板	1
20	C325H-3103	Left guide arm	左鋸臂	1
21	C325H-3105	Right guide arm	右鋸臂	1
22	C325H-3111	Nameplate	右鋸臂滑座銘牌	1
23	C325H-3112	Nameplate	左鋸臂滑座銘牌	1
24	C250H-3131	Left insert holder	左導輪座	1
25	C250H-3161	Right guide roller seat	右導輪座	1
26	C250H-3167	Position pin	導輪座定位銷	1
27	PAA-10-12	Set screw	止付螺絲(公)	1
28	PAA-6-8	Set screw	止付螺絲(公)	1
29	PBA-12-40	Bolt	有頭內六角螺絲(公)	1
30	PBA-5-8	Bolt	有頭內六角螺絲(公)	1
31*	PBA-6-12	Bolt	有頭內六角螺絲(公)	1
32	PBA-6-20	Bolt	有頭內六角螺絲(公)	1
33	PLA-12-55	Bolt	外六角頭螺絲(公)	1
34	POA-10	Nut	螺母(公)	4
35	POA-12	Nut	螺母(公)	1
36	PP-14270	Bearing	軸承	4
37	PP-52111E	Saw arm handle	鋸臂把手	1
38	PPA-10	Washer	平面華司(公)	1
39	PPA-12	Washer	平面華司(公)	1
40	PQA-10	Spring washer	彈簧華司(公)	5
41	PQA-12	Spring washer	彈簧華司(公)	4

Tension Assembly



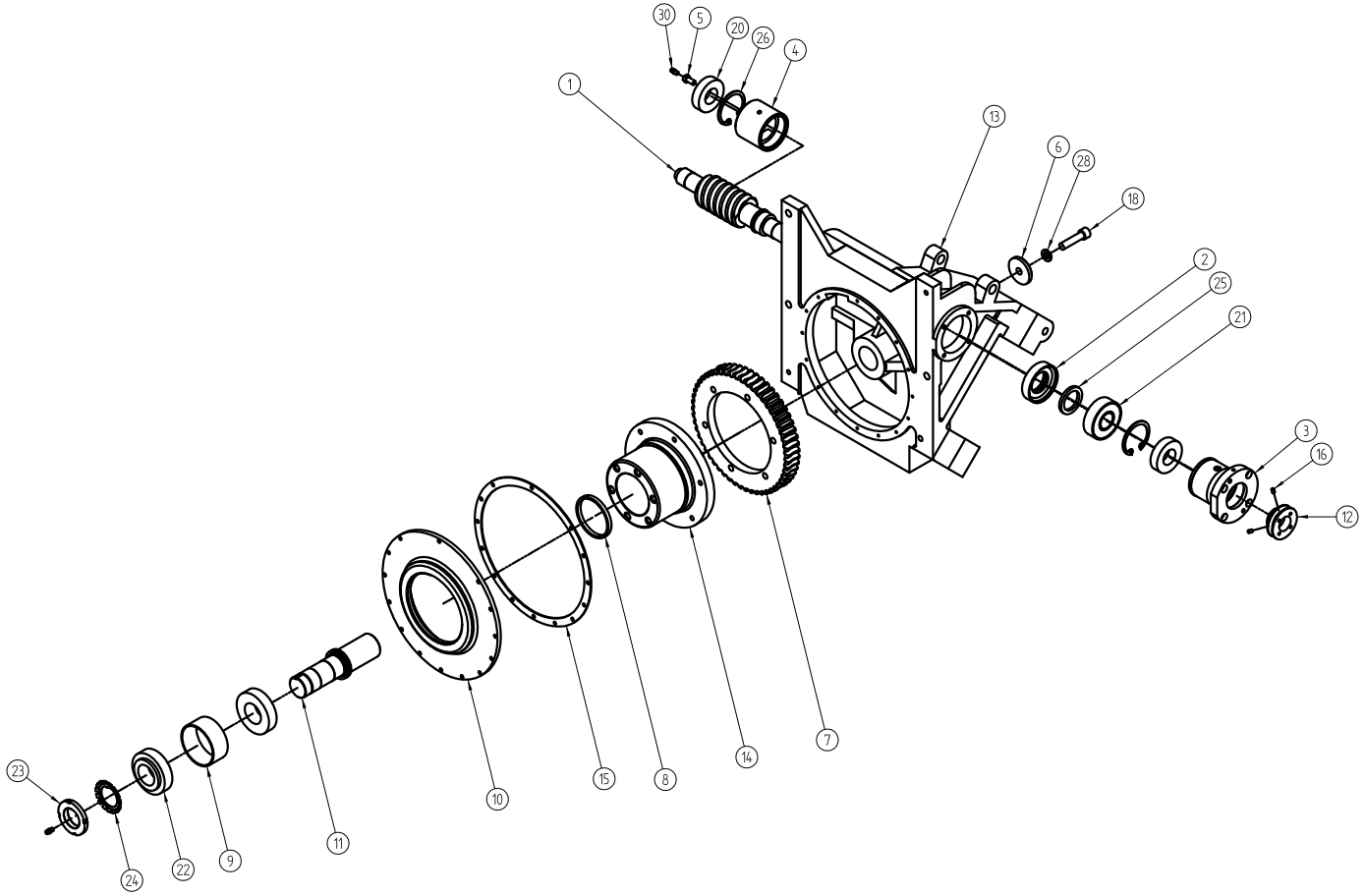
NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	AHA-0603	Tensioner sliding seat	導板壓條	2
2	AHA-0610	Adjusting bolt	調整螺絲	1
3	AHA-0611	Adjusting nut	調整螺母	1
5	C250H-3002	Saw bow washer	鋸弓平面墊圈	1
6	C250H-3045	Fixed washer	上輪軸固定華司	1
7	C250H-3221	Cylinder front cover	張力油缸前蓋	1
8	C250H-3301	Slidding seat	張力滑座	1
9	C250H-3303	Slidding board	張力滑板	1
10	C250H-3315	Position bolt	定位螺絲	1
11	C250H-3325	Piston and shaft	活塞及桿	1
12	C250H-3327	Tube	缸筒	1
13	C250H-3329	Spring	彈簧	1
14	PBA-12-35	Bolt	有頭內六角螺絲(公)	1
15	PBA-5-25	Bolt	有頭內六角螺絲(公)	1
16	PLA-10-140	Bolt	外六角頭螺絲(公)	2
17	PLA-10-160	Bolt	外六角頭螺絲(公)	2
18	PQA-10	Spring washer	彈簧華司(公)	4
19	PQA-12	Spring washer	彈簧華司(公)	1
20	PQA-5	Spring washer	彈簧華司(公)	1

Motor Assembly



NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	AHA-0514G	Gear reducer belt wheel	減速機皮帶輪(無段)	1
2	AHA-0525	Washer	墊圈	2
3	AHA-0538G	Belt wheel	馬達皮帶輪	1
4	C325H-3071	Pulley cover	普利護蓋	1
5	C325H-3073	Pulley cover bracket	普利護蓋固定板	1
6	C325H-3081	Motor plate	馬達底板	1
7	C250H-3082	Motor movable shaft	馬達活動軸	1
8	C250H-3085	Motor position shaft	馬達定位軸	1
9	C325H-33500	Gear reducer	減速機整組	1
10	C250H-3354	Gear reducer pulley pin	減速機普利方鍵	1
11	PBA-10-30	Bolt	有頭內六角螺絲(公)	2
12	PBA-5-12	Bolt	有頭內六角螺絲(公)	1
13	PBA-6-10	bolt	有頭內六角螺絲(公)	1
14	PBA-8-16	Bolt	有頭內六角螺絲(公)	1
15	PLA-10-30	Bolt	外六角頭螺絲(公)	1
16	PLA-8-16	Bolt	外六角頭螺絲(公)	1
17	POA-12	Nut	螺母(公)	1
18	PP-31081	Motor	馬達	1
19	PP-56287	Belt	皮帶	1
20	PPA-12	Washer	平面華司(公)	1
21	PPA-8	Washer	平面華司(公)	1
22	PQA-10	Spring washer	彈簧華司(公)	3
23	PQA-5	Spring washer	彈簧華司(公)	1
24	PQA-6	Spring washer	彈簧華司(公)	1
25	PQA-8	Spring washer	彈簧華司(公)	2

Gear Reducer Assembly



NO.	PART NO.	PART NAME	PART NAME (CH)	Q'TY
1	C300H-3353	Worm shaft	蝸桿	1
2	AHA-0314	Bearing seat cover	軸承座蓋	1
3	AHA-0319	Bearing seat 1	軸承座(一)	1
4	AHA-0326	Bearing seat 2	軸承座(二)	1
5	AHA-0328	Filling screw	注油螺絲	1
6	AHA-0403	Washer	下輪鎖緊墊圈	1
7	C300H-3355	Worm	蝸輪	1
8	AHA-0429	Adjusting ring	調整環	1
9	AHA-0431	Bearing washer	軸承墊圈	1
10	AHA-0433	Oil fixed plate	油封固定盤	1
11	C250H-3043	Drive shaft	下輪軸	1
12	C250H-3061	Wire brush pulley	鋼刷普利	1
13	C325H-3351	Bearbox body	減速機本體	1
14	C250H-3365	Worm fixed seat	蝸輪固定座	1
15	C250H-3369	Washer	耐油墊圈	1
16	PAA-5-8	Set screw	止付螺絲(公)	2
17*	PBA-10-30	Bolt	有頭內六角螺絲(公)	6
18	PBA-12-50	Bolt	有頭內六角螺絲(公)	1
19*	PBA-5-20	Bolt	有頭內六角螺絲(公)	16
20	PP-14131	Bearing	軸承	2
21	PP-14652A	Ball bearing	滾錐軸承	1
22	PP-14693	Ball bearing	滾錐軸承	2
23	PP-14908	Fixed nuts	固定螺母	1
24	PP-14958	Stop ring	止動環	1
25	PP-51080	Oil seal	油封	1
26	PP-58103	Interlock	內鎖	2
27*	PQA-10	Spring washer	彈簧華司(公)	6
28	PQA-12	Spring washer	彈簧華司(公)	1
29*	PQA-5	Spring washer	彈簧華司(公)	16
30	PUC-020	Nipple	油嘴	2

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