COSEN SAWS

C-320NC

SNC-100 Programmable Automatic Mass Production Horizontal Bandsaw

(CE & Non-CE Models)

Instruction Manual

The Pinnacle of Cutting Performance

Cosen Mechatronics Co., Ltd.

FROM THE MANUFACTURER

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

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

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

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

NOTE:

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

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

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

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

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

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

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

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

- Never cut carbon or any other material that may produce and disperse explosive dust. It is possible that sparks from motors and other machine parts will ignite and explode the air-borne dust.

- Never adjust the wire brush or remove chips while the saw blade is still running. It is extremely dangerous if hands or clothing are caught by the running blade.

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

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

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

- Use roller tables at the front and rear sides of the machine when cutting long work. It is dangerous if the work piece falls off the machine.

- Turn off the shop circuit breaker switch before performing maintenance on the machine. Post a sign indicating the machine is under maintenance.

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SAFETY INFORMATION

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RISK ASSESSMENT

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

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

SAFETY INSTRUCTIONS

What the icons and signs in this user manual mean:

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

Supplementary information to the procedures described in this manual.

Call your local agent or our service center for help.

This manual has important safety information. Read through it carefully before operating this machine to prevent personal injury or machine damage. Learn the operation, limitation and the specific potential hazards peculiar to this band saw. All users must read it before performing any activity on the machine, such as replacing the saw band or doing regular maintenance.

Do not operate this machine unless it is completely assembled.

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

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

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

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

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

Keep unauthorized personnel away.

Use recommended accessories. Improper accessories may be hazardous.

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

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

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

Wear proper apparel during operation and when servicing the machine. Some personal protective equipment is required for the safe use of the machine, e.g. protection goggles.

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

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

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.

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

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

Keep your work area well illuminated at minimum 500 lumen.

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

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

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

SAFEGUARD DEVICES

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

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

Protection Covers & Guards

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

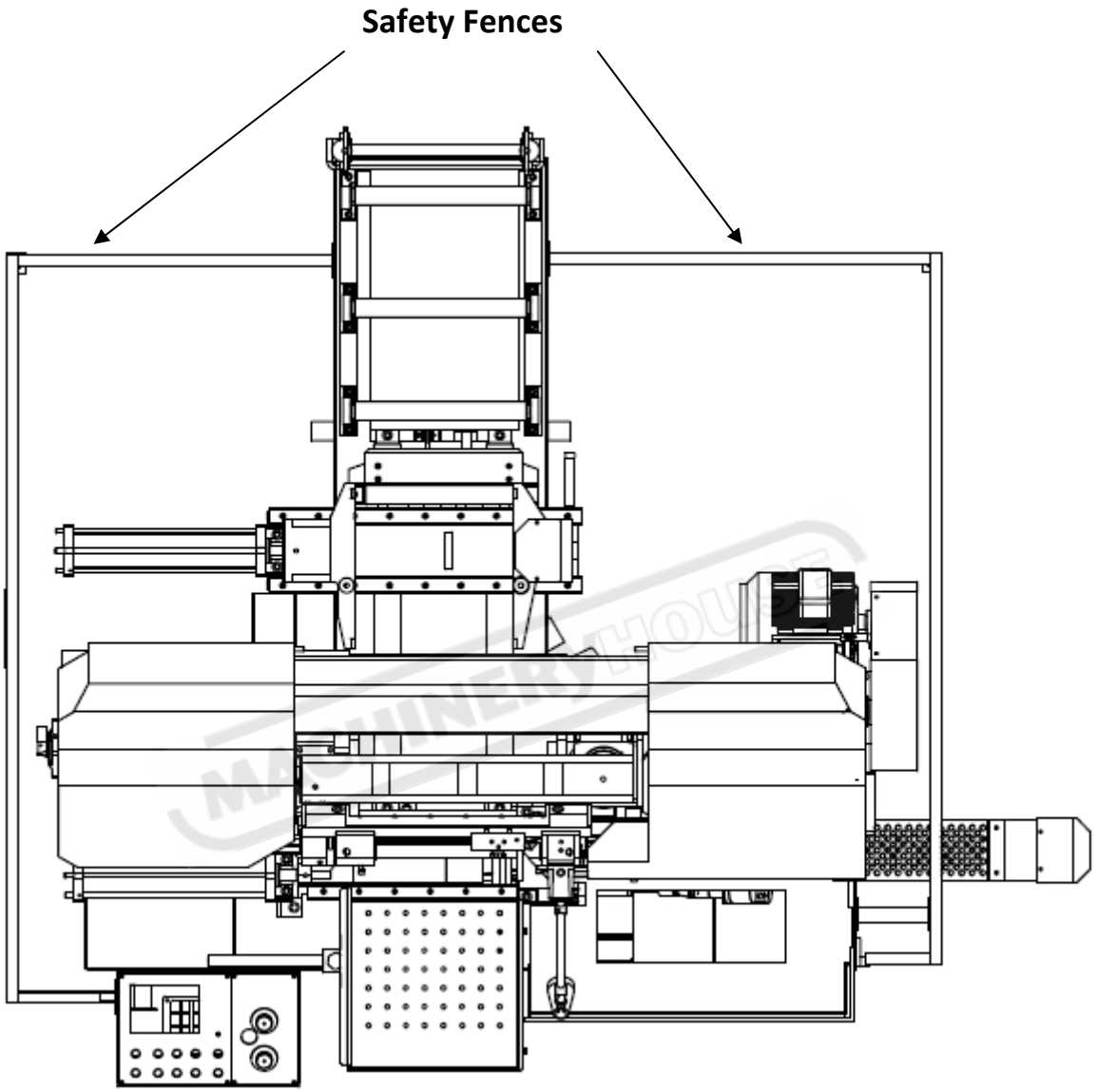

The protection devices should always be mounted on the machine whenever the machine is running.


Do not remove any of these safeguard devices under any circumstances except when servicing the machine. Even skilled service technicians should still take cautions when performing repairs or service on the machine with any of these protectors removed. It is the responsibility of the user to make sure all these elements are not lost and damaged.


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

- Saw bow assembly
- Drive and idle wheels
- Blade guide arm
- Saw blade guide rollers
- Quick approach device (optional)
- Wire brush
- Chip conveyor (optional)
- Workpiece clamping vises
- Shuttle vises and workbed rollers
- Top clamps (optional)
- Gear reducer

Illustration: Safety Fence



Safety Related Switches

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

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

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

EMERGENCY STOP

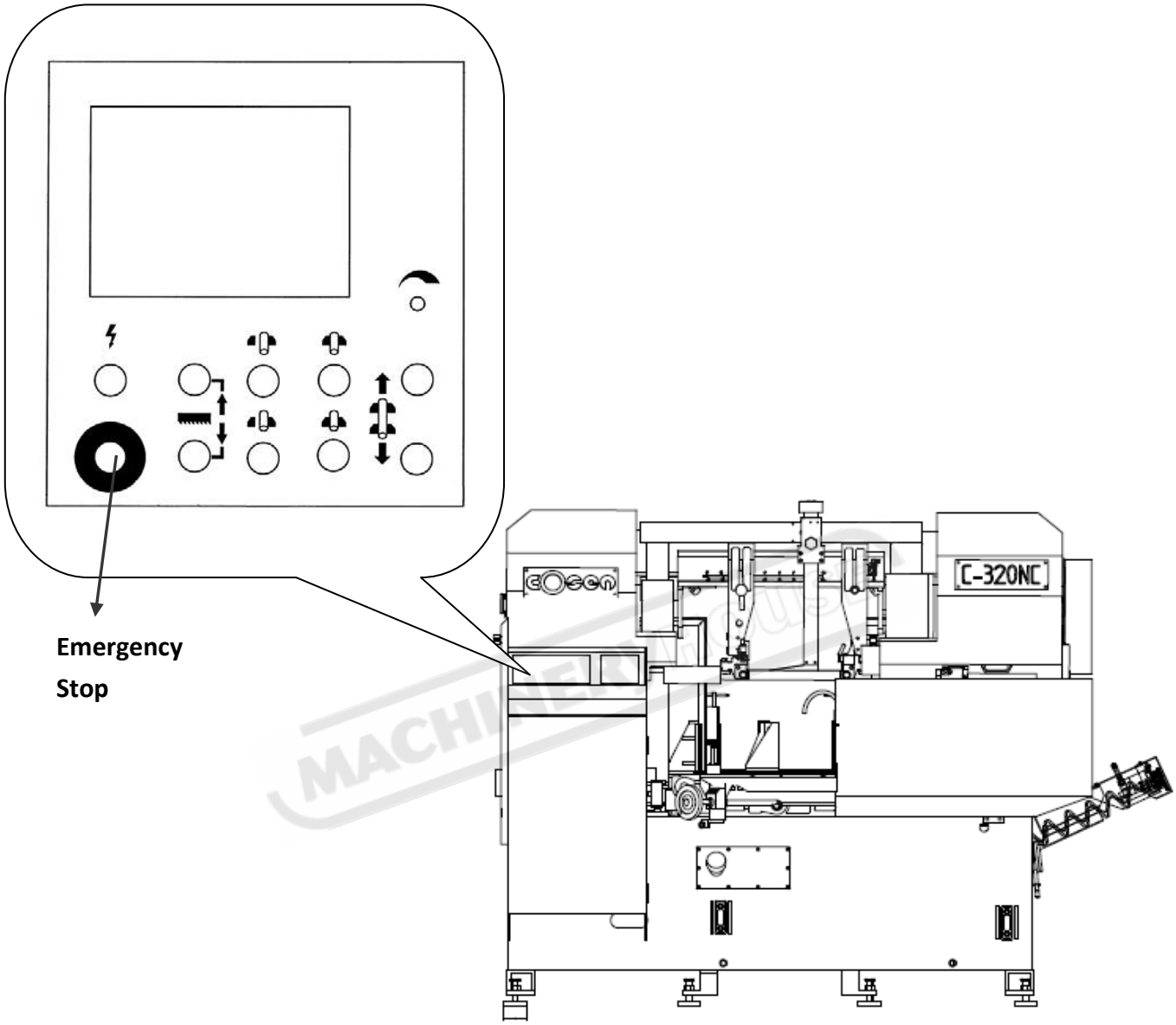
Designed to be easily accessible, the emergency stop button is located on the left bottom corner on the control panel and is made in red color and rubber material. For CE models, supplementary emergency stop button may be available at other area(s) of the machine depending on machine type. Please refer to *Illustration: Emergency Stop.*

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

You should press it immediately without any hesitation when observing:

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

Illustration: Emergency Stop

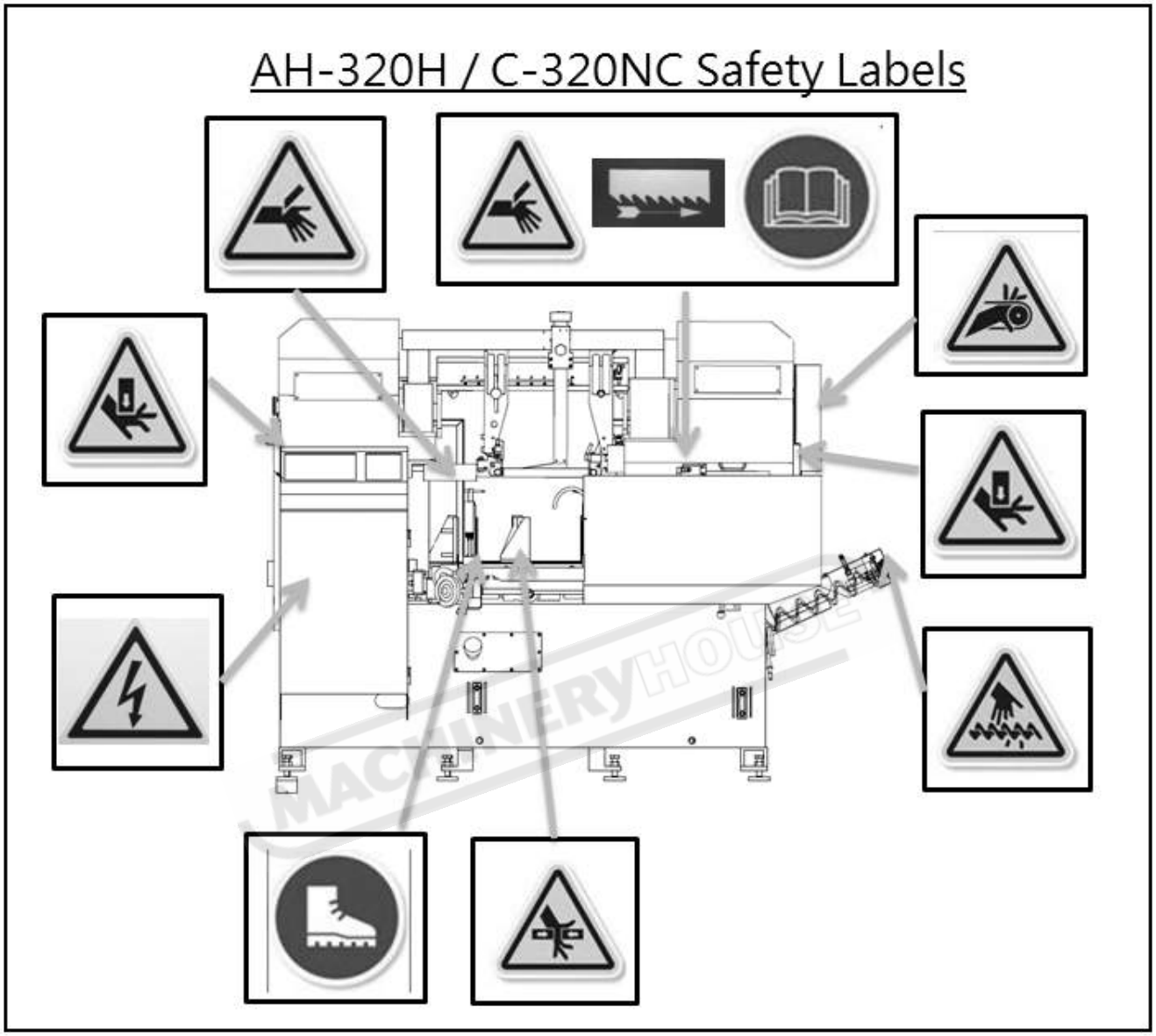


SAFETY LABELS

Please read through and understand these safety labels before operating the machine. Refer to *Illustration: Safety Labels.*

Label	Meaning	Label	Meaning
	Impact Hazard WEAR SAFETY SHOES. Do not approach dropping area during operation.		Read Operator's Manual This manual has important safety information. Read through it carefully before operating this machine to prevent personal injury or machine damage.
	Keep Unauthorized Personnel Away		Do not step. Do not stand on the machine or on the accessories!
	DANGER: Running Blade Blade runs through this area. Keep your hands away from a running blade to avoid severe injury. The arrow indicates direction of the blade.		Cutting Hazard KEEP COVER CLOSED / KEEP HAND OFF while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.
	Hazardous Voltage TURN POWER OFF before servicing. Failure to following the warning can result in severe injury.		Burn Hazard/Hot Surface
	Hand Crush/Force from Above		Crush hazard by vise
	Loose Hand Hazard KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury.		Pinch Point/Hand Entanglement
	CAUTION : Class I invisible Laser Radiation Present. Avoid direct exposure to beam.		

Illustration: Safety Labels



HEARING PROTECTION


Always use ear protection!

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

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

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

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

CE COMPLIANCE

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

RISK ASSESSMENT

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

Section 2

GENERAL INFORMATION

SPECIFICATION

MACHINE PARTS IDENTIFICATION

FLOOR PLAN

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

Safety

- This machine is designed to fully protect the operator from its moving parts during cutting operation.
- The machine and each compoment has passed strict testing (Council Directive on the approximation of the laws of the Member States relating to Machinery).
- The machine will shut off automatically when the saw blade is broken, protecting both the operator and the machine.

Convenience & High-Performance

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

Durability

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

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

Operating Environment

Temperature : 5~40˚C (41~104˚F)

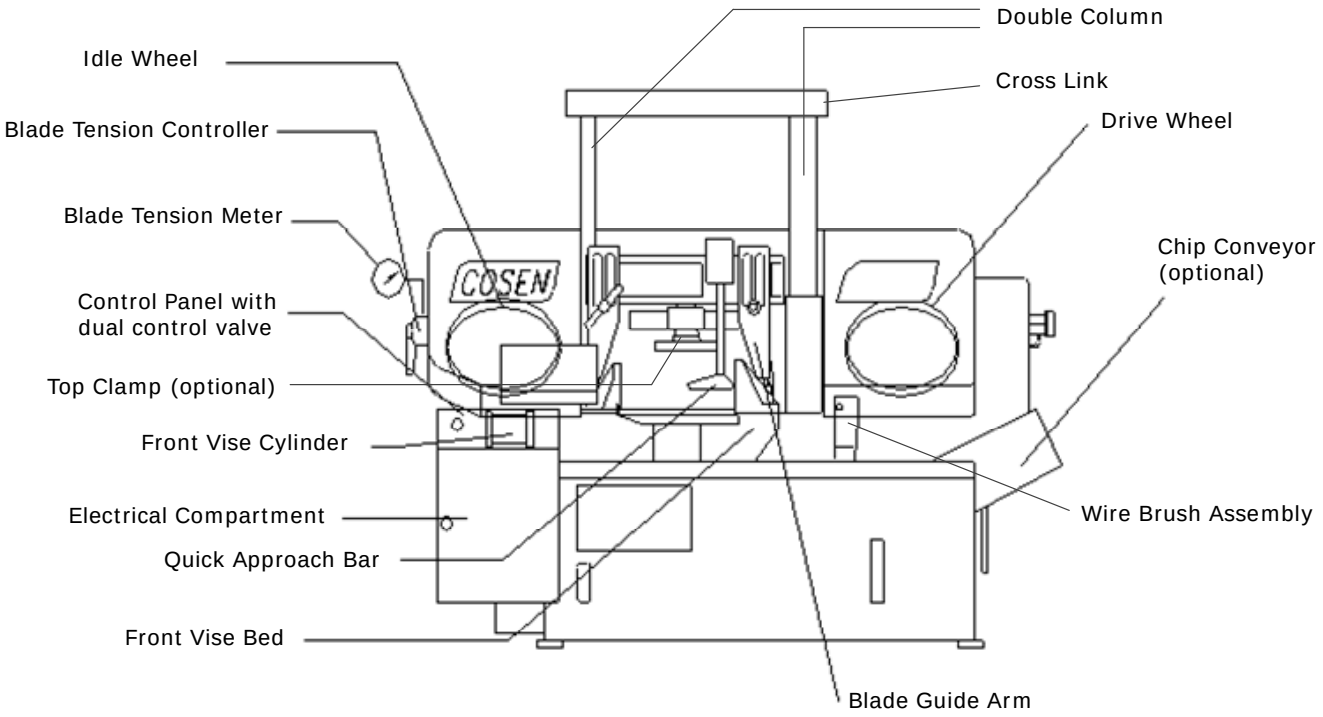
Humidity : 30%~85% (without condensation)

SPECIFICATION

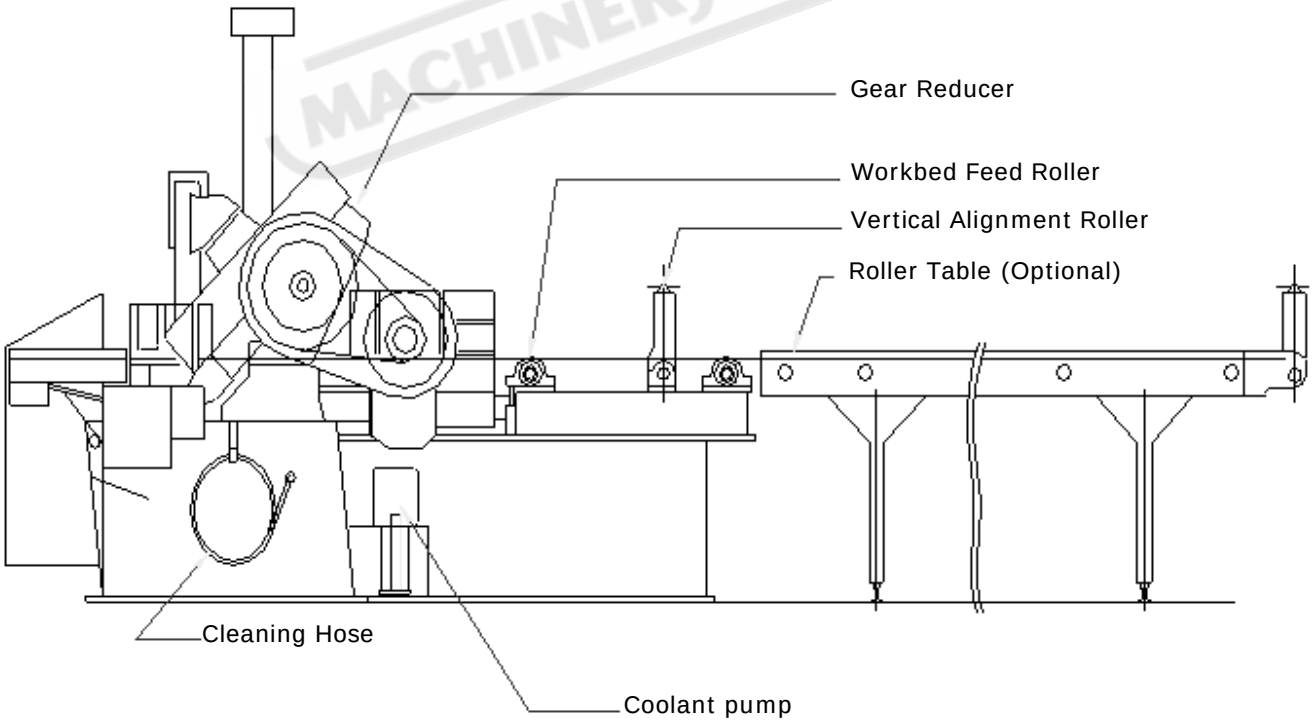
Model / Name of Equipment			C-320NC Programmable Automatic Mass Production Horizontal Bandsaw
Max. Cutting Capacity	Angel		/
	Round		320 mm (12.6”)
	Square		320 mm (12.6”)
	Rectangle (H x W)		320 x 380 mm (12.6” x 15”)
Top Clamp Capacity	Bundle		W: 190 ~ 300 mm (7.5” ~ 11.8”) H: 70 ~ 140 mm (2.8” ~ 5.5”)
	Cutting		
Saw Blade	Speed		15~80 m/min (49~262 fpm)
	Size (L x W x T)		4,240 x 34 x 1.1 mm (167” x 1.34” x 0.04”)
	Tension		Hydraulic with automatic blade breakage detection
	Guide		Interchangeable tungsten carbide
	Cleaning		Steel wire brush with flexible drive shaft driven by main motor
Main Electricity Output *	Saw Blade		5 HP (3.75 kW)
	Hydraulic		1 HP (0.75 kW)
	Coolant Pump		1/8 HP (0.1 kW)
	Other Electri. Components		----------
Saw bow down feed (if available)			----------
Servo shuttle feeding (if available)			----------
Tank Capacity	Hydraulic		25 L (6.6 gal)
	Coolant		45 L (11.9 gal)
Vise Clamping	Control Method		Hydraulic with full stroke cylinder, NC automatic
Remnant Length			----------
Feeding	Control Method		Hydraulic, NC Programmable Fully Automatic
	Vise-Clamping Material Pull Weight		----------
	Speed		----------
	Length	Single Stroke	403 mm (15.9”)
		Multi Stroke	Max. 99 m (3897”)
Workbed	Height		790 mm (31.1”)
	Weight Capacity		----------
Weight	Net		1,550kg (3,417 lb)
	Gross		1,850 kg (4079 lb)
Floor Space (L x W x H)			5,215 x 2,225 x 2,915mm (205 x 87.5 x 114.7 in)

*To get the amperage, please refer to the formula “Watt/Voltage =Amperage”.

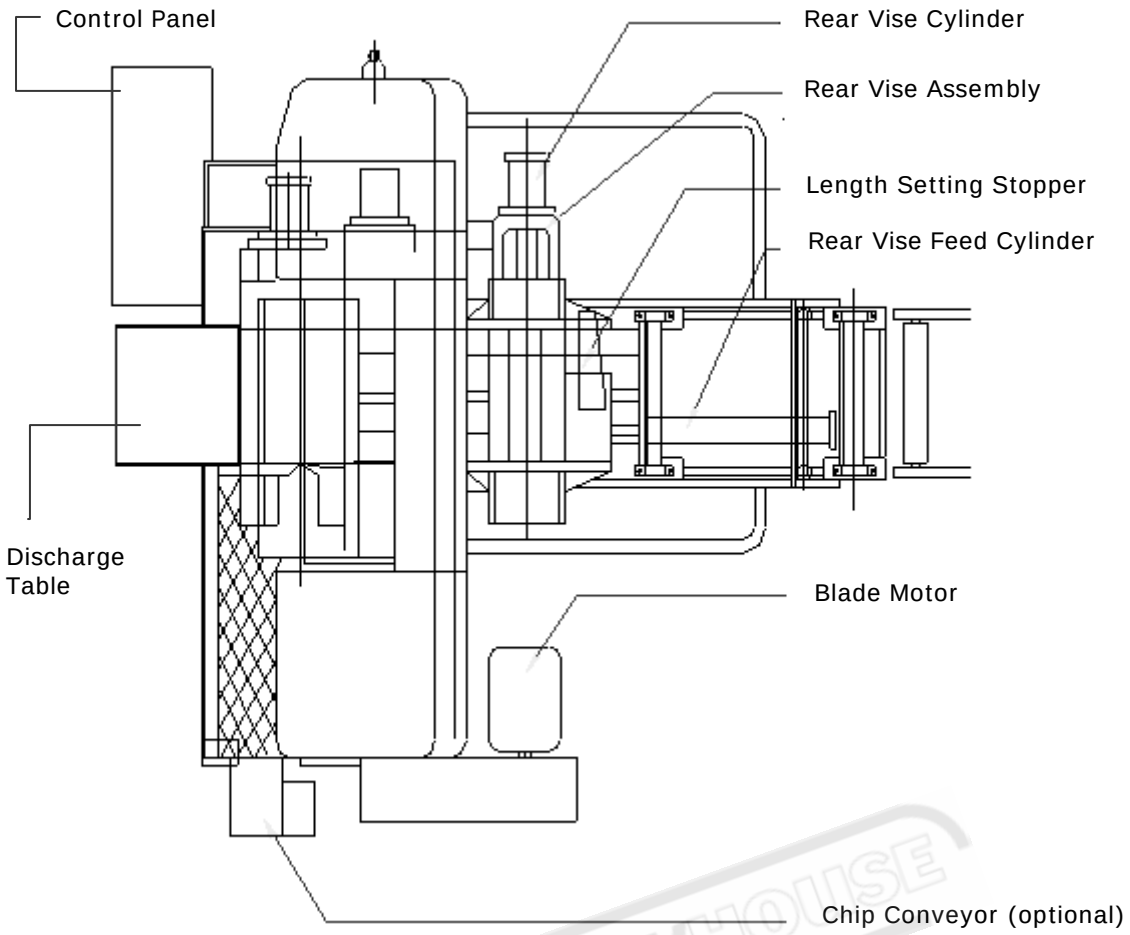
MACHINE PARTS IDENTIFICATION



Machine front view

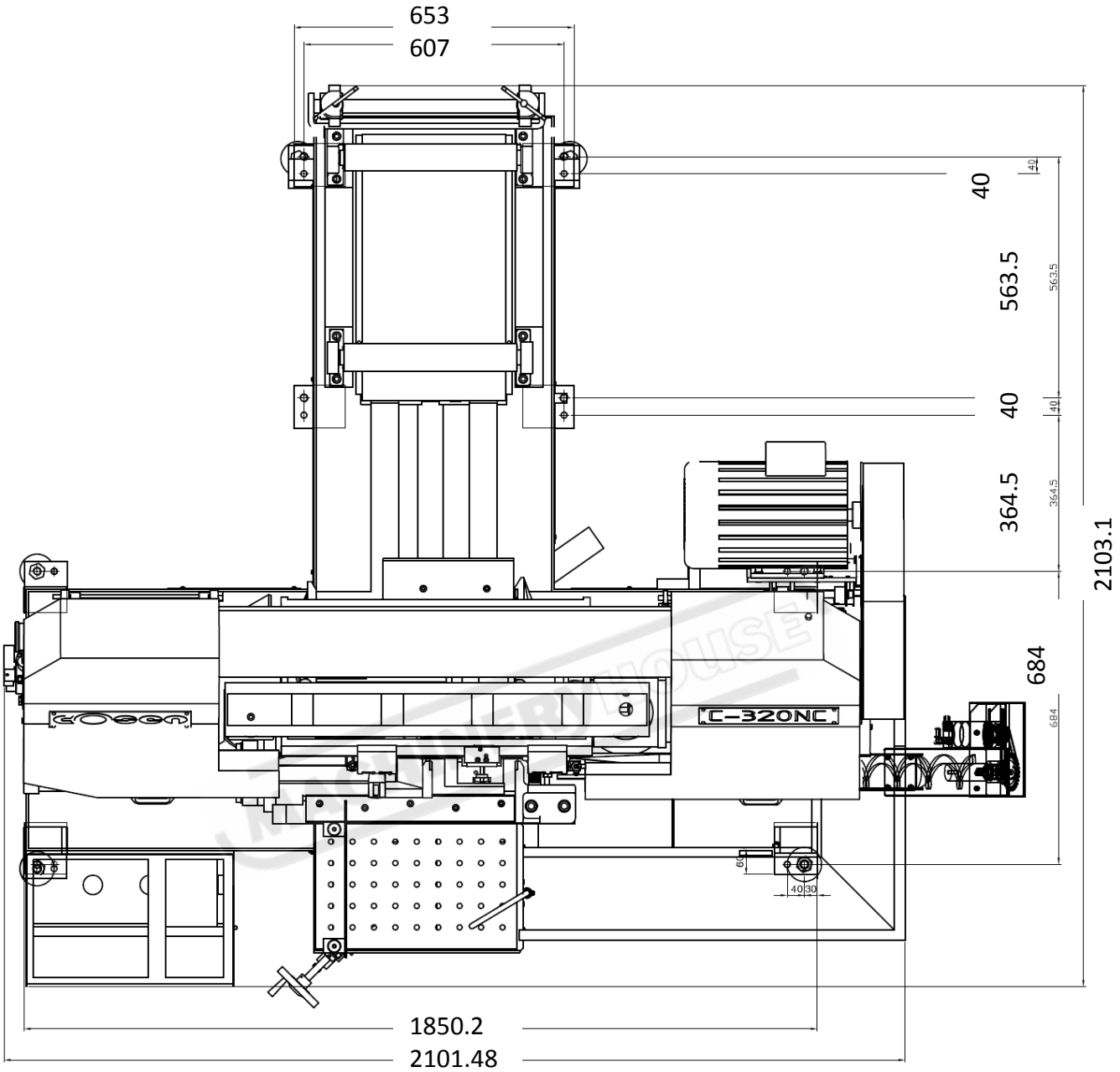


Machine side view

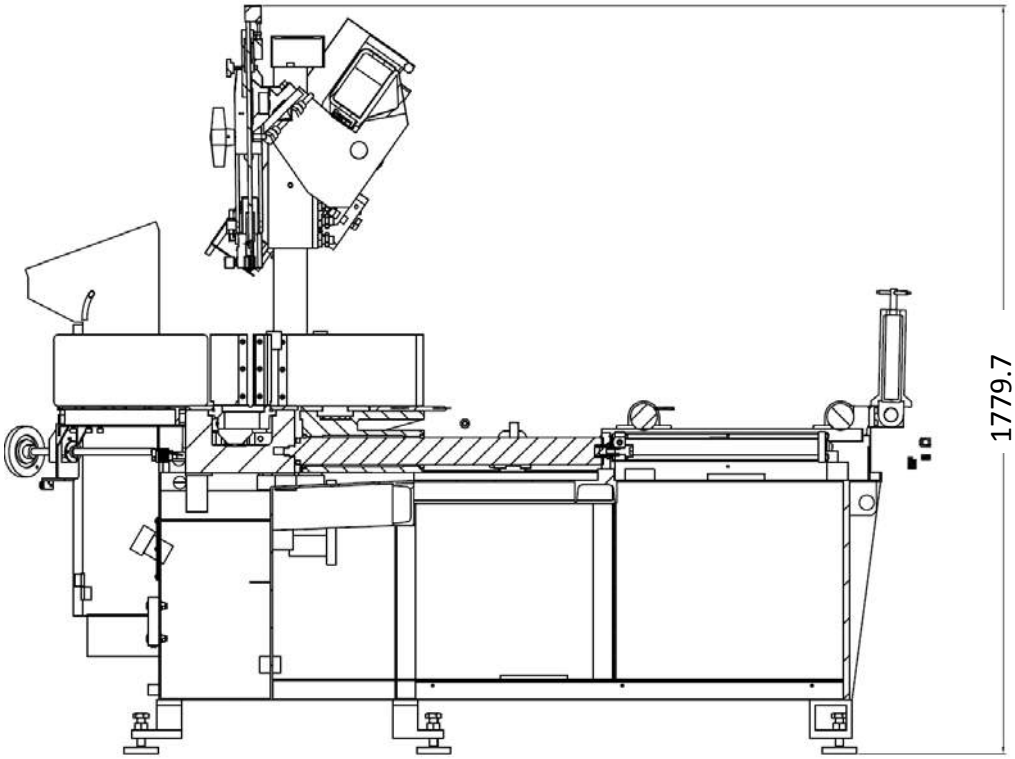


Machine top view

FLOOR PLAN



Machine top view



Machine side view

Section 3

MOVING & INSTALLATION

LOCATION & ENVIRONMENT

For your safety, please read all information regarding installation before proceeding. Install your machine in a place satisfying all of the following conditions:

Space:

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

Environment:

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

UNPACKING & INSPECTING

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

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

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

LIFTING

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

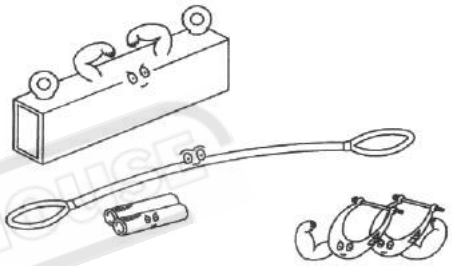
1. Use a crane

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

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

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

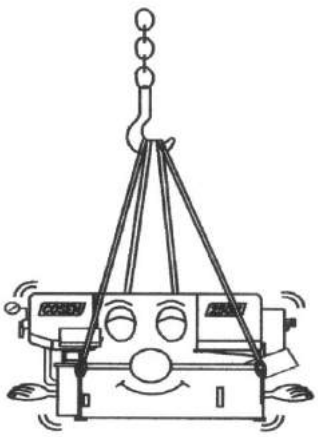
- You must use tools and equipment with the proper tensile strength and use proper method when moving your machine.



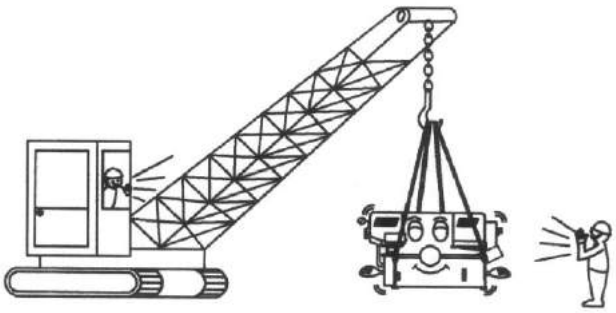
- Apply the wire rope sling to the lifting hooks on the four ends of the machine. Refer to *Illustration: Lifting Points* for exact locations.

- Slowly lift the machine. Be sure to protect the machine from impact or shock during this procedure. Also watch out your own fingers and feet to avoid injuries.

- Keep the machine well balanced during lifting process and make sure the wire rope does not interfere with the saw frame.



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



2. Use a forklift

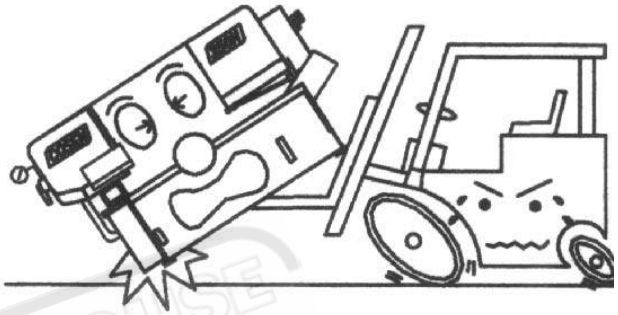
Most users choose this method to move their machine because it is easy to set up. Make sure that the lifting rod can fully withstand the weight of the machine. (Refer to *Section 2 – General Information for Specifications)*

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

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

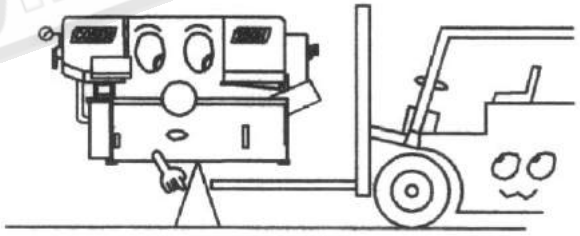
- You must apply proper forklift technique to avoid damage to the machine.

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



- You must keep the machine balanced at all times.

  Make sure the forks are centered before use.



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

3. Use rolling cylinders

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

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

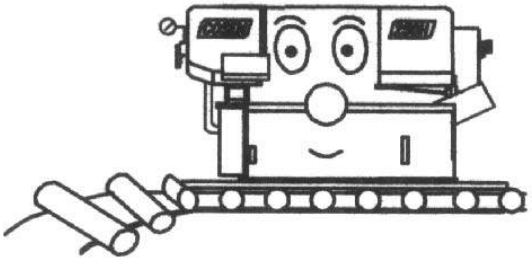
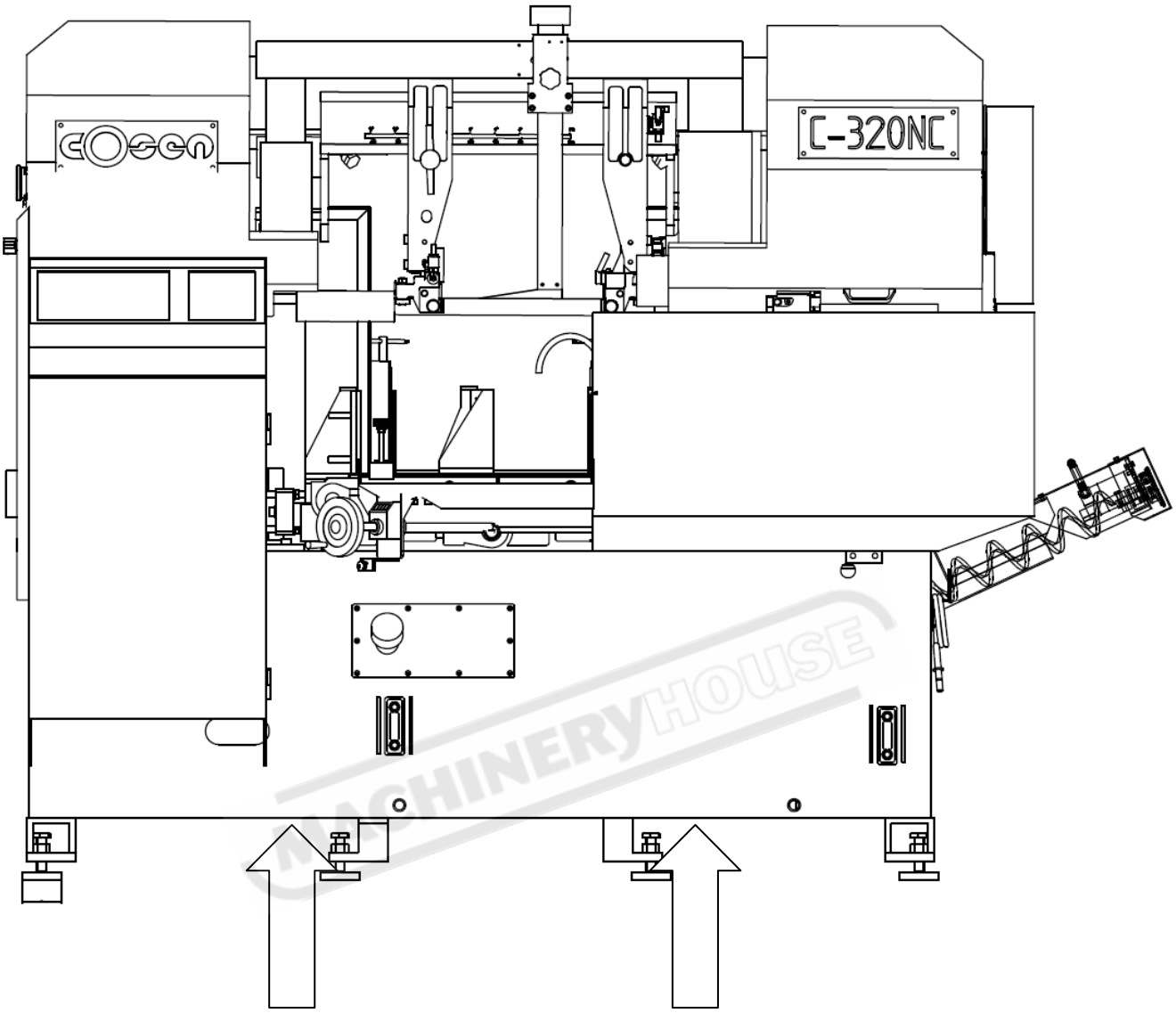
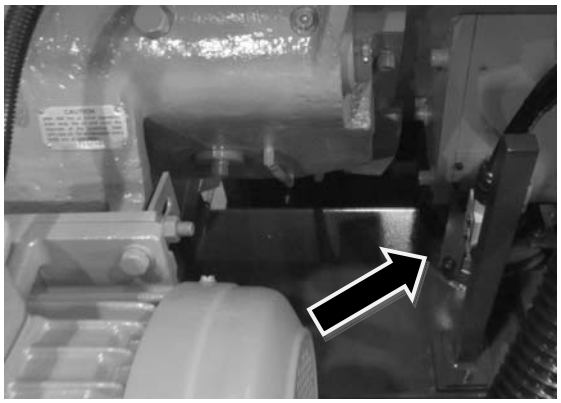


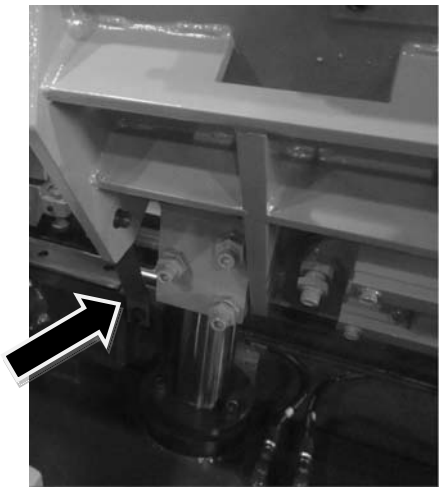
Illustration: Lifting Points



REMOVING SHIPPING BRACKET

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





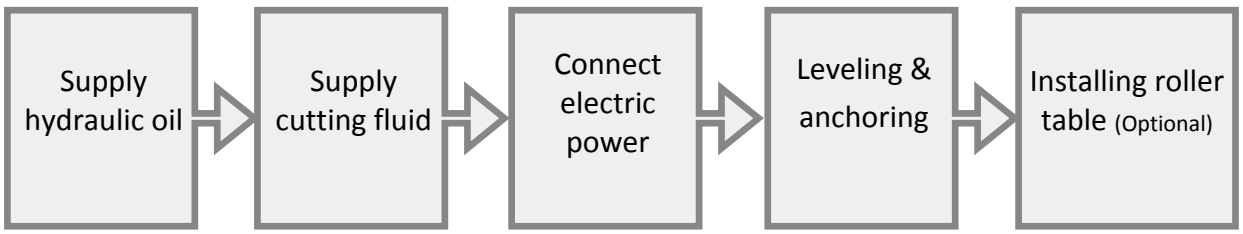
CLEANING

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

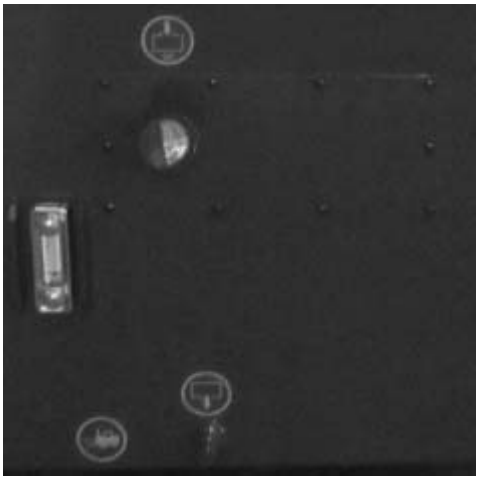
Do not remove the rust-preventive grease with a metal scraper and do not wipe the painted surfaces with solvent as doing so would damage surface paint.

INSTALLING

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



Supplying hydraulic oil



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

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

Refer to specification chart under Section 2 for tank capacity.

Supplying coolant

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

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

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

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

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

Connecting electric power

Have a qualified electrician make the electrical connections.

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

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

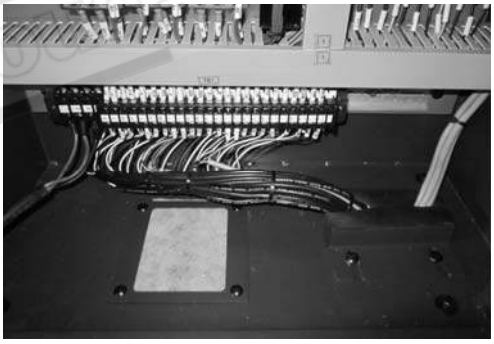
Ground the machine with an independent grounding conductor.

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

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

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

1. Turn off the shop circuit breaker.
2. Make sure the machine circuit breaker switch on the electrical compartment door is turned to OFF.
3. Remove the screw securing the electrical compartment and then open the door.
4. Pull the power supply cable and grounding conductor through the power supply inlet into the electrical compartment. (Shown right)
5. Connect the power supply cable to the circuit breaker (N.F.B.) to the R, S and T terminals, and connect the ground cable to the E terminal.
6. Close the compartment door and fasten the screw back.
7. Turn on the shop circuit breaker and then turn the machine circuit breaker switch to ON. The *Power Indicator* on the control panel will come on.
8. Pull to unlock the *Emergency Stop* button and press the *hydraulic ON* button to start the hydraulic motor.
9. Make sure the sawing area is clear of any objects. Start the blade and check the blade rotation. If the electrical connections are made correctly, the blade should run in a counterclockwise direction. If not, shut the hydraulics off, turn off the machine as well as the shop circuit breaker. Then swap the power the power cable conductors connected to R and T terminals.
10. Repeat step 6 to 9 to ensure the electrical connections are in the right order.



Leveling

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

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

Make sure all leveling bolts evenly support the machine weight.

Anchoring the machine

Normally there is no need to anchor the machine. If the machine is likely to vibrate, fix the machine to the floor with anchor bolts.

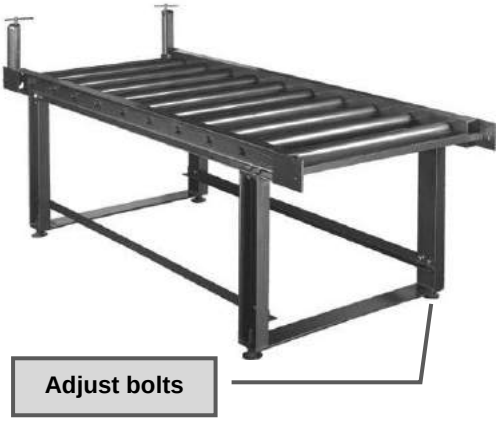
Shock absorption steel plates are provided and can be placed under each leveling bolt to prevent their sinking into the concrete floor.

Installing roller table (optional)

The roller table is used to support long material at the rear and/or the front of the machine.

If you have ordered the optional roller table for cutting long material, position it before or behind the machine.

Level the roller table and the stand with the machine by adjusting the leveling bolts.



Installing Fire Control Device

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

RELOCATING

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

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

Section 4

OPERATING INSTRUCTION

SAFETY PRECAUTIONS

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

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

BEFORE OPERATING

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

Wet cutting

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

Cutting unknown materials

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

Never take your eyes off the machine while in operation.

Cutting fluid

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

Pro	Con
• Have a high cooling effect • 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

Never use water as your coolant.

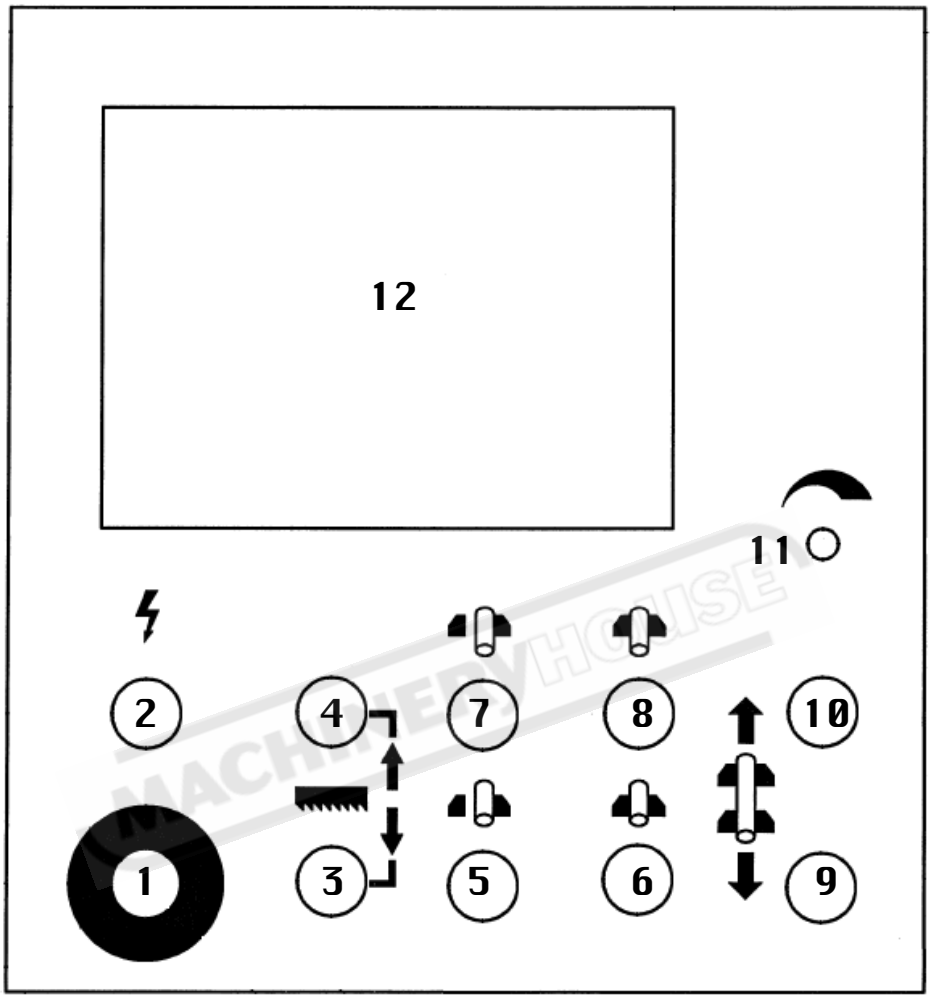
Always add coolant into water for better mix result.

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

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

CONTROL PANEL

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



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

Control Buttons

1. Emergency stop button

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

2. Power indicator lamp

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.

 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 button

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.

 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 button

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

 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 button

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

7. Rear vise open button

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

8. Rear vise clamp button

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

9. Feed forward button

- 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.

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

10. Feed backward button

- 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.

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

11. Blade speed control knob

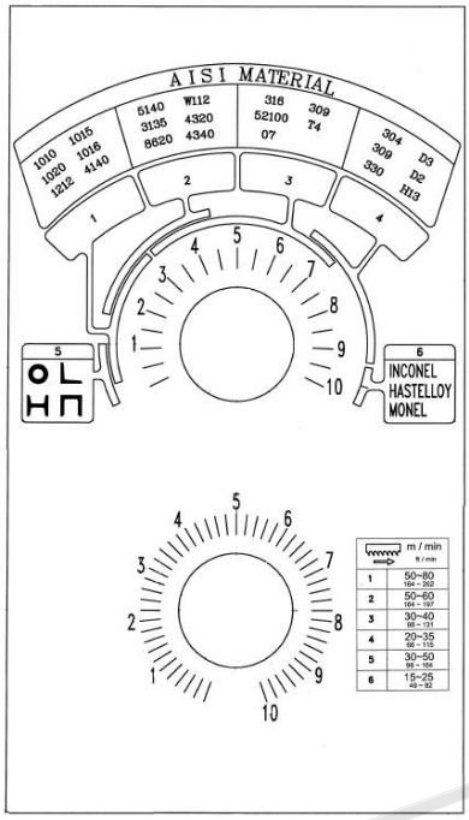
Blade speed is controlled by the inverter in the control box. Turning the knob clockwise increases the blade speed.

12. HMI touch screen

Please refer to later section for detailed introduction.

Blade Descend Pressure and Speed

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



Cutting pressure and speed control panel

1. Cutting pressure control knob

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

2. Blade descend speed control knob

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

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.

Do not wipe or clean the screen with volatile solvents.

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.

All range parameters in HMI are configured under the “manual” mode.

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

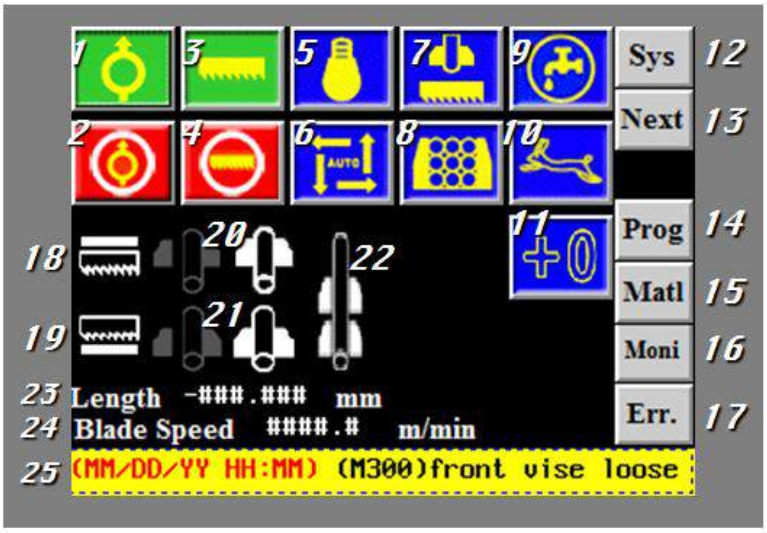
Item	Range
Ambient temperature	5℃ ~ 50℃
Temperature for safe operation	-10℃ ~ 60℃
Ambient humidity	30%~85% RH (No condensation)
Connection	RS422 MMI port
Environment	No condensation and rust

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.  When the blade is running, the *hydraulic stop* button is temporarily disabled. You need to press the *saw blade stop* or the *saw bow up* button to stop the blade first.
3		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		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.  Press again to turn off the work light.
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 this 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.  *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.  If you switch to manual mode while cutting is already

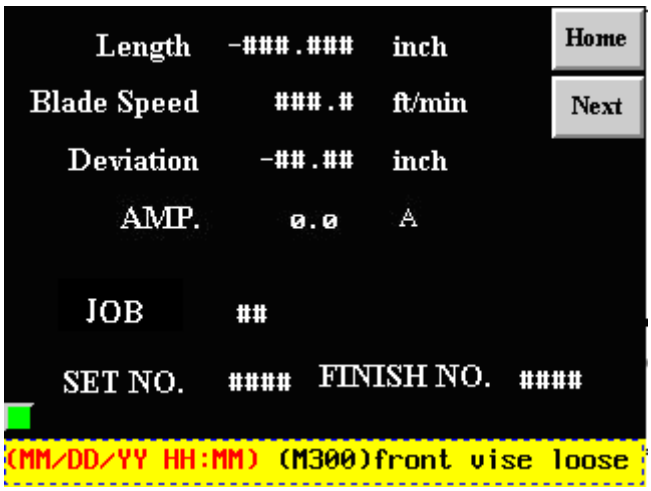
No.	Item	Function	Description
			in action under AUTO mode, the machine will stop after the individual cut is finished. Switching to manual mode at any time other than cutting, the machine will proceed with the next cut until it is finished.
7		Material retract 2mm ON/OFF	When this function is turned 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.  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.
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		Trim cut ON/OFF	This selection button works with the AUTO 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.  After the first cut begins, you may still change your selection before the saw bow has descended to its lowest point.

No.	Item	Function	Description
12		System parameter setting	Press this button to set up system parameters. Password is required.  All parameters have been set up by the manufacturer. In order to prevent random change from being made to these parameters and affect cutting precision and machine life, this function is protected with a set of password.
13		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.
14		Cutting program setting	Press this button to directly enter the cutting job program setup page. A total of 100 cutting programs can be set.
15		Material cutting reference	This 2-page reference chart lists out the required blade speed and cutting rate for each different material.
16		PLC monitor	Shows current PLC signals.
17		Error report	Lists a historical report of the errors and the time of occurrence as well as provides troubleshooting support. 6 pages in total.
18		Saw blade up indicator	Indicates that the saw blade is rising. When activated, the saw blade icon will turn solid white. 
19		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. 
20		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. 

No.	Item	Function	Description
21		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. 
22		Feeding movement indicator	When the feeding vise reaches the front limit, the vise set icon will turn solid white. 
23	Length	Feeding length display	Displays current feeding length while the material is being fed.
24	Blade Speed	Blade speed display	Displays current blade speed.
25	(yellow highlight)	Error display	Displays error messages in the order of occurrences; press the message for one second to clear the messages.  **The message must be cleared for the machine to continue to operate normally.**

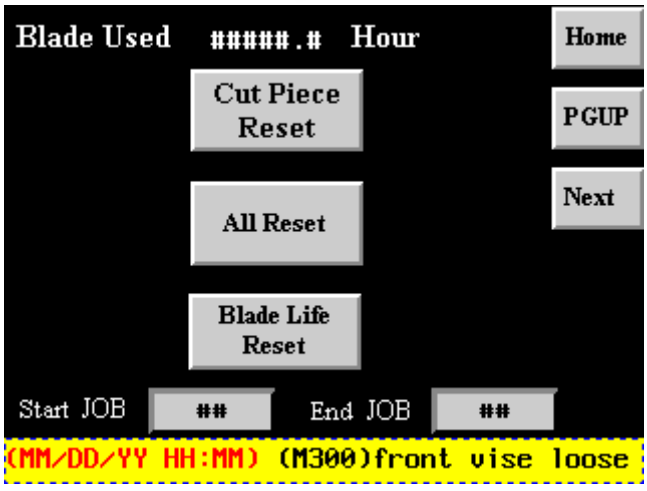
Next *Cutting status display & setup*

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



Page 1 – cutting status display

- 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
  - 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.
  - Error messages (highlighted in yellow; can be cleared by pressing down for one second)
- Press Home to return to the main control menu.
- Press Next to go to the next setup page.



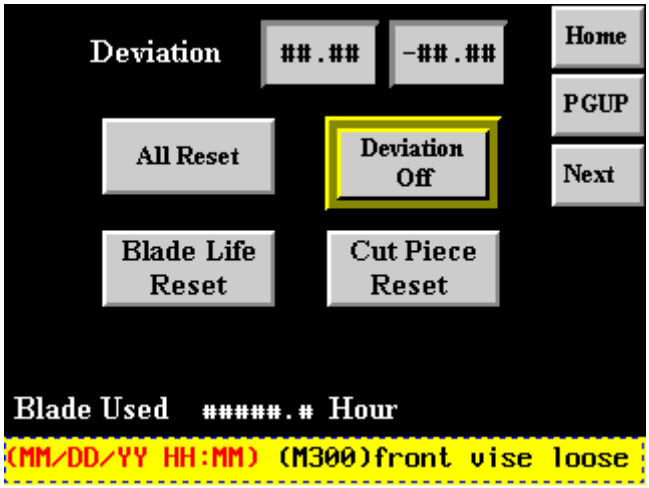
(Display without optional blade deviation detector included)

Page 2 – cutting status setup

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.

  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.
- Blade Life Reset - Reset the blade life to zero

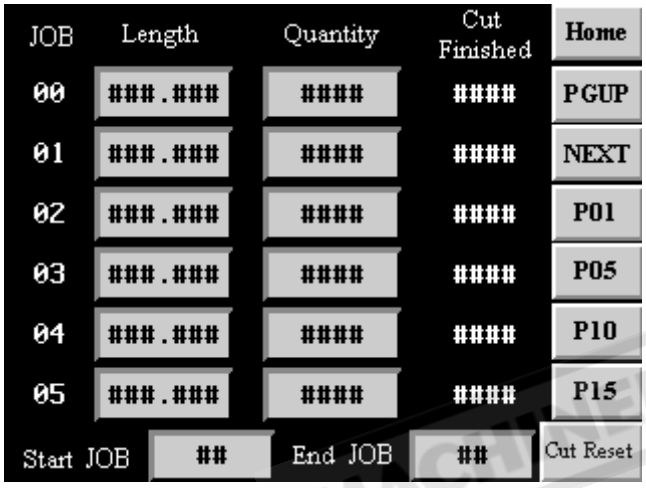


(Display with optional blade deviation detector included)

- 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

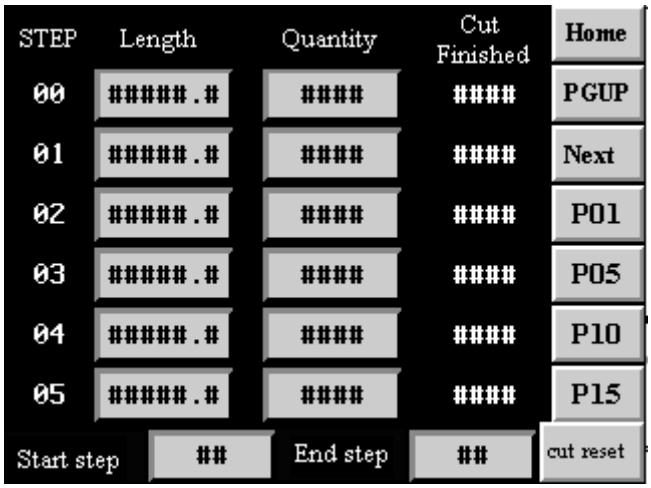
- In this page you can set your desired cutting length and quantity and see the number of finished cuts (*Cut Finished*).
- A total of 100 cutting jobs can be set and performed under the automatic mode.
- In “start step/job” and the “end step/job” field, fill in the number of the cutting job you wish 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.

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/Job 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)

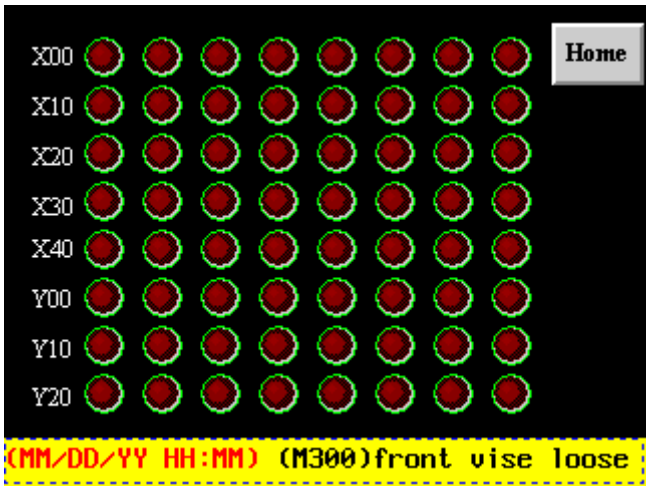


This setup page is the same as page 3 of the cutting status display and setup page.

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*

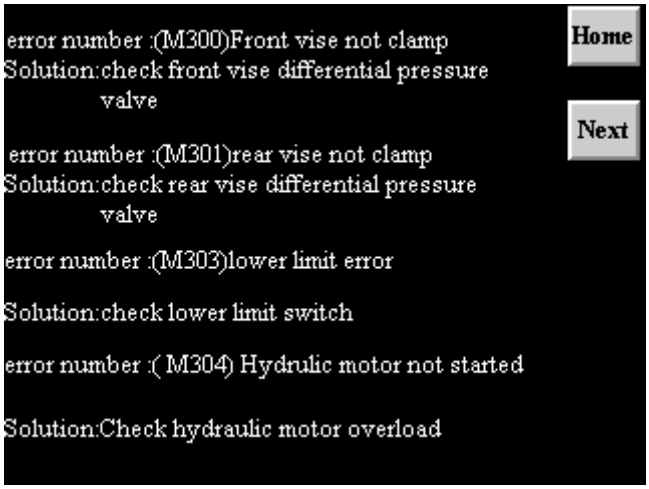


- Shows all signals of the PLC system.
- Press Home to return to the main control menu.

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

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.

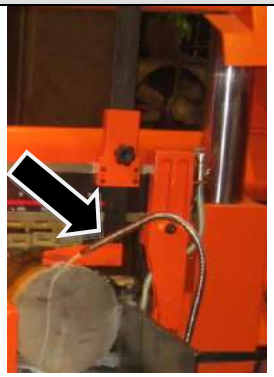
Inverter

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

Note:

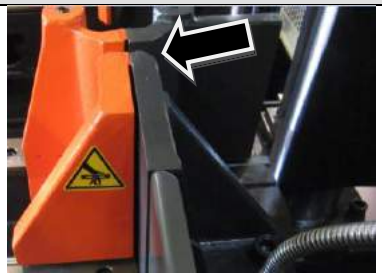
1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.

Quick approach device



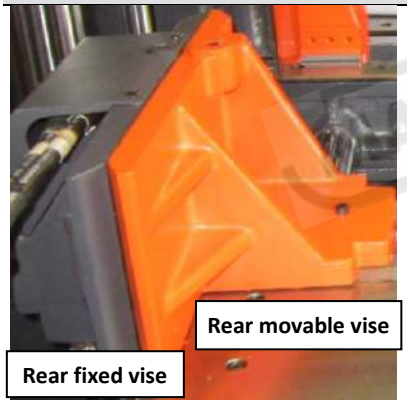
This device allows the blade to quickly descend to just right above the material to save you operation time.

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.

Double retracting rear vise



The rear fixed vise has a built-in hydraulic cylinder. When rear vises start actions, the rear fixed vise will always act ahead of the rear movable vise, compensating for crooked and/or misaligned material. In addition, this design reduces the remnant piece.

Double retracting rear vise can be adjusted for crooked material. Please contact your agent.

Gear reducer

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

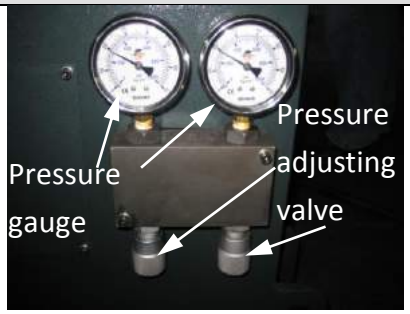
Please refer to Section 8 for information on maintenance.

Coolant pump

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

OPTIONAL ACCESSORIES

Vise pressure regulator

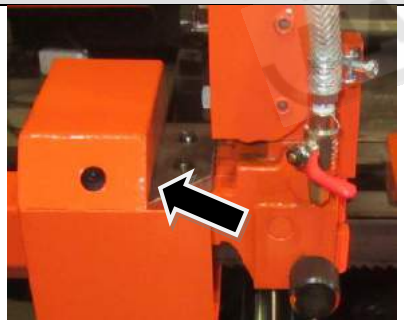


- This adjustment valve is used to control vise pressure.
- Adjust vise pressure based on the material of your workpiece.
- When cutting pipes or soft materials, reduce vise pressure to prevent exerted pressure from damaging the workpiece shape or exterior.

Do not adjust vise pressure at any time during cutting.

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

Vibration damper



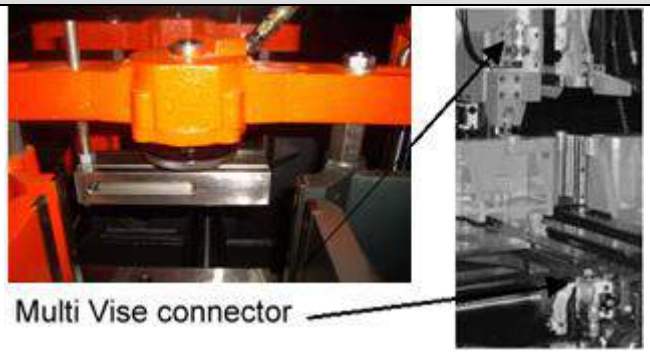
The vibration damper can be assembled to the left saw arm. This optional accessory is extremely useful in reducing the high-frequency noise produced when cutting large-sized material.

Chip conveyor

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

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 *Using Top Clamp for Bundle Cutting* for operating procedure on bundle cutting.

Blade Deviation Detector & Calibration Procedure (Optional)

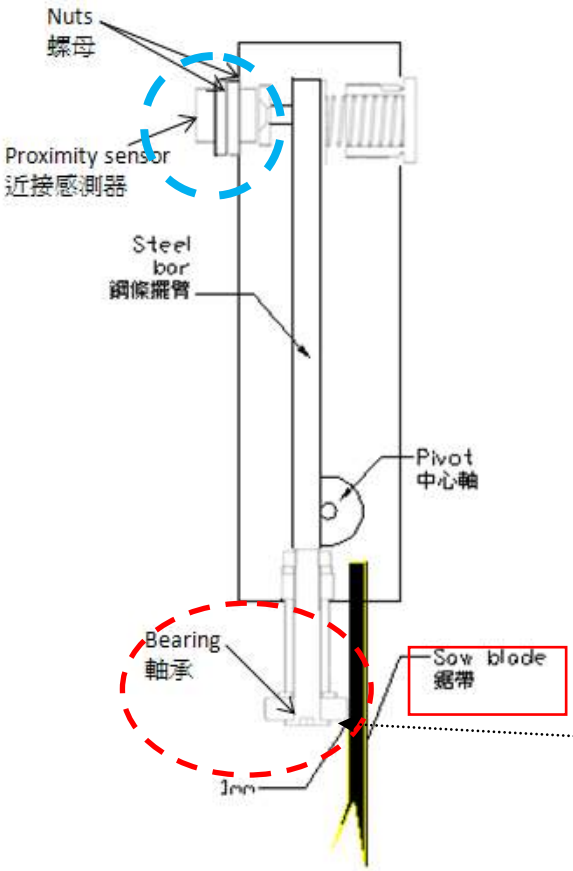
Blade Deviation Detector

This device detects blade deviation. If the blade deviates out of the tolerance range, the machine will stop automatically.

※ [Remark] When this device is installed, the cutting width will be reduced.

The blade deviation detected value and present values are displayed on the HMI screen.

Before cutting, please make sure if the deviation value is “Zero”. If not, please calibrate the deviation detector before proceeding to cutting.



Deviation Dectector Side Section

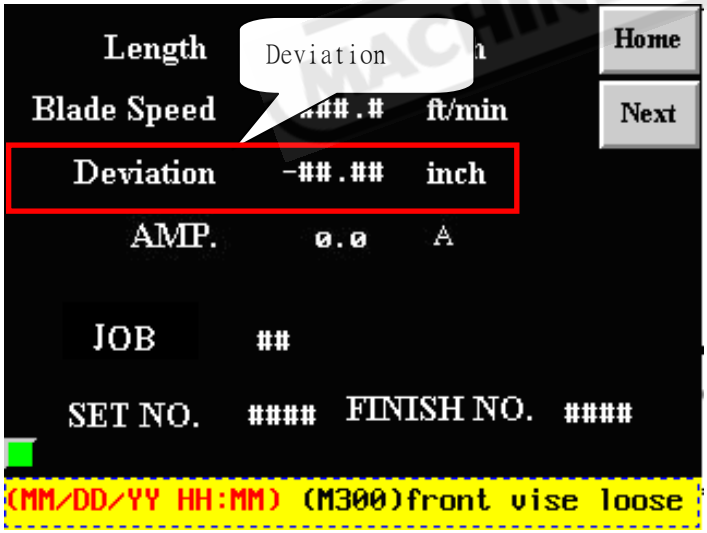
How to Adjust

1. Loosen the nuts.
2. Adjust the proximity sensor until the blade deviation value shown the display returns to zero. (Please refer to the next page.)
3. Tighten the nuts.

How to Check

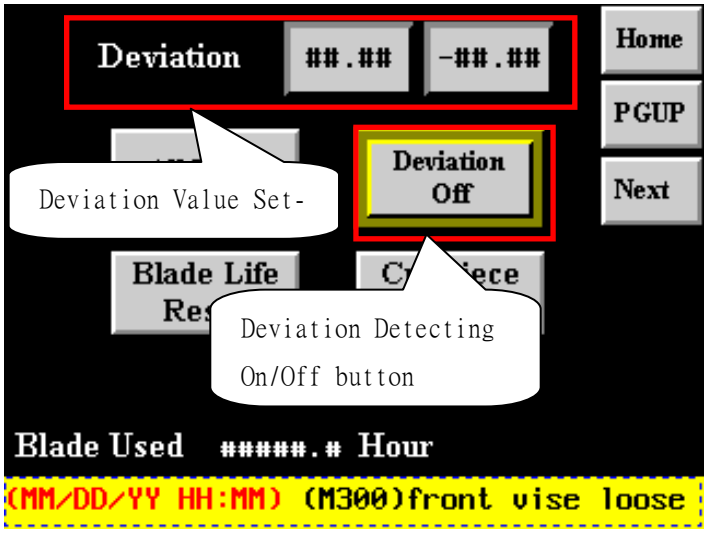
Put a thick ruler (0.1mm) between saw blade and deviation roller for measurement. Also, check the deviation tilt value; it should be 0.1mm.

- Adjust the proximity sensor until the blade deviation displayed on the control panel is zero.
- If the deviation value not changed when adjusting the proximity sensor or **bearing**, it means the deviation detector with malfunction. Need to replace a new one.
- Please clean the internal shell of deviation detector sometimes for keeping dry and clean.



Picture B : Deviation Value Display

- Make the proximity sensor connect with power & adjust the proximity sensor until the blade deviation displayed on the control panel is 0 mm。
- Tolerance: ±0.03 mm (0.0012”)。



Picture C:
Deviation Value Set-Up & On/Off button

- Deviation Value Set-Up:
  - Set up the tolerance of deviation value; if the value out of range when blading for 15 seconds, the machine will be automatically full stopped with alarm message.
- Deviation Detecting On/Off button:
  - Turn On/Off the deviation detecting function.

2M roller table

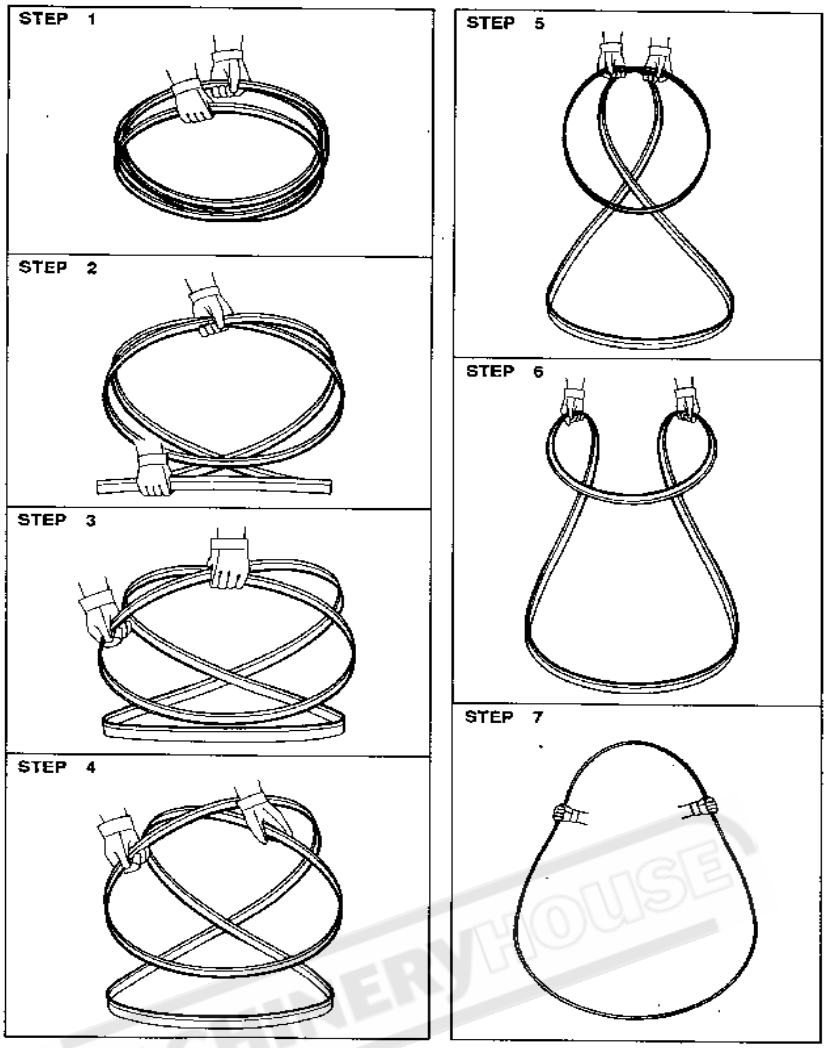
- The optional 2M roller table supports the work material and ensures the material be fed in smoothly.
- Refer to Section 9 for further information on adjusting the roller table.

UNROLLING & INSTALLING THE BLADE

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

Unrolling the blade

Please follow the procedures illustrated below.



Unroll and roll the blade

Installing a new blade

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

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

Step 3 - Switch to *manual* (✋) mode.

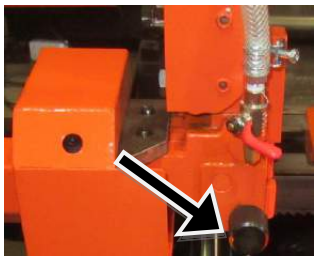
Step 4 - Press the *saw bow up* button and elevate the saw bow until the right insert holder is clear of the front fixed vise.

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.

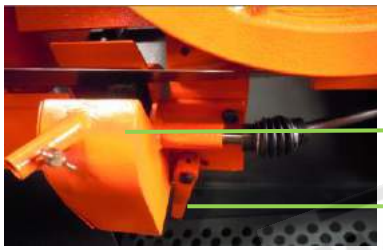
Step 6 - Open the idle and drive wheel covers.

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

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



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



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

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

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

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

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

Step 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 19 - Adjust wire brush to a proper position. Refer to *Adjusting Wire Brush* in this section.

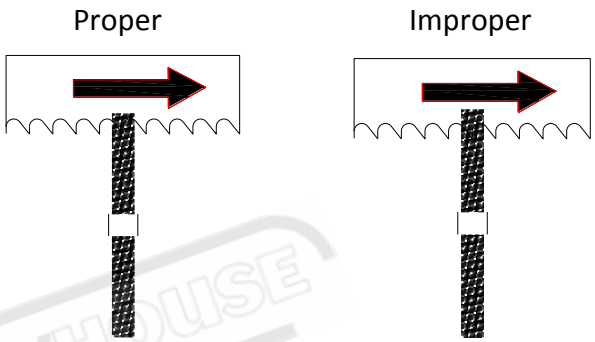
ADJUSTING WIRE BRUSH

Follow these steps to adjust wire brush to appropriate position:

Step 1 - Open the drive wheel cover. Loosen the lock lever.

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

Step 3 - Tighten the lock lever. Close the drive wheel cover.



ADJUSTING SAW ARM

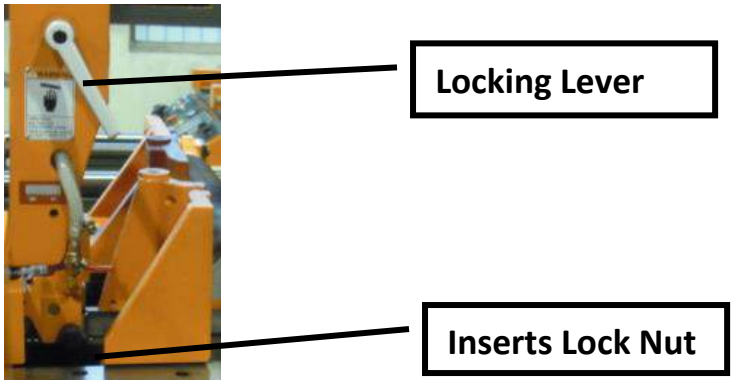
Adjust the blade guide (guide arm) position based on the size of your workpiece:

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

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

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

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

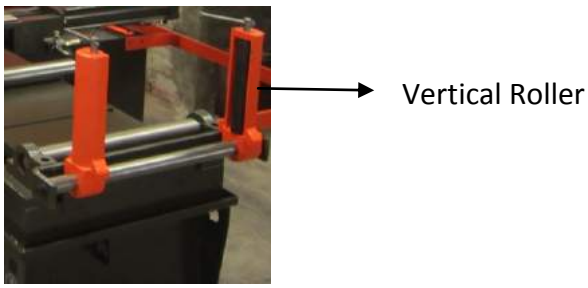


ADJUSTING BLADE SPEED

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.

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.



POSITIONING WORKPIECE FOR CUTTING

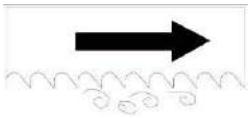
Follow these steps to position your workpiece:

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*	Simultaneously press the *front vise open* button and the *rear vise clamp* button to make sure the material is being clamped.
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.  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.

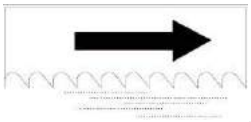
ADJUSTING COOLANT FLOW

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

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



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



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

BREAKING-IN THE BLADE

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

Step 1 - Reduce the blade speed to one-half of its normal setting.
Step 2 - Lengthen the cutting time to 2-3 times of what is normally required.
Step 3 - Start the break-in operation.
Step 4 - After the break-in operation is completed, set all parameters back to normal settings.

TEST-RUNNING THE MACHINE

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

Testing machine performance:

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

Step 1 – Disassemble shipping brackets and bolts.

Step 2 – Install roller table (optional).

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

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

Step 5 – 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

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.

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

Step 3 – Position your workpiece.

Step 4 – Clamp the workpiece.

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

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

Step 7 – Start running the blade.

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

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

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

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

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

Before Cutting , Make sure that the bundle is properly tightly clamped but not being distorted by clamp force.

Any improper bundle cutting can cause damage to the blade, reduce the blade life.

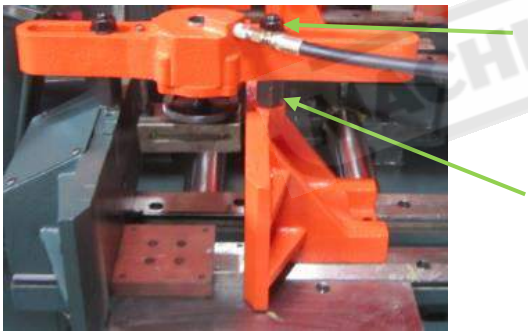
Notice: There are several factors to makes bundle cutting more difficult and unstable, such as vibration, wide guide spacing, coolant getting to the teeth and cutting through work hardened chips.

1. Each bar of the bundle is suggested to be the same size for being firmly clamped in the bundle.
2. Make sure that the bundle is properly placed (before cutting) to refrain from vibration, spinning and changing length position during 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.

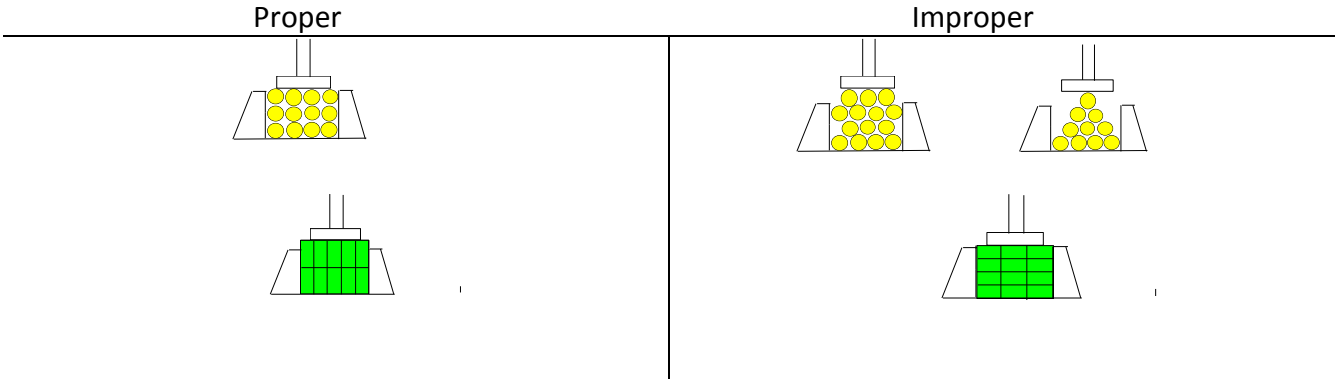


Step 2 – Connect the top clamp hoses to the pressure joints on the vise hydraulic cylinders.

Step 3 – Position the workpiece for bundle cutting.

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

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.

TERMINATING A CUTTING OPERATION 

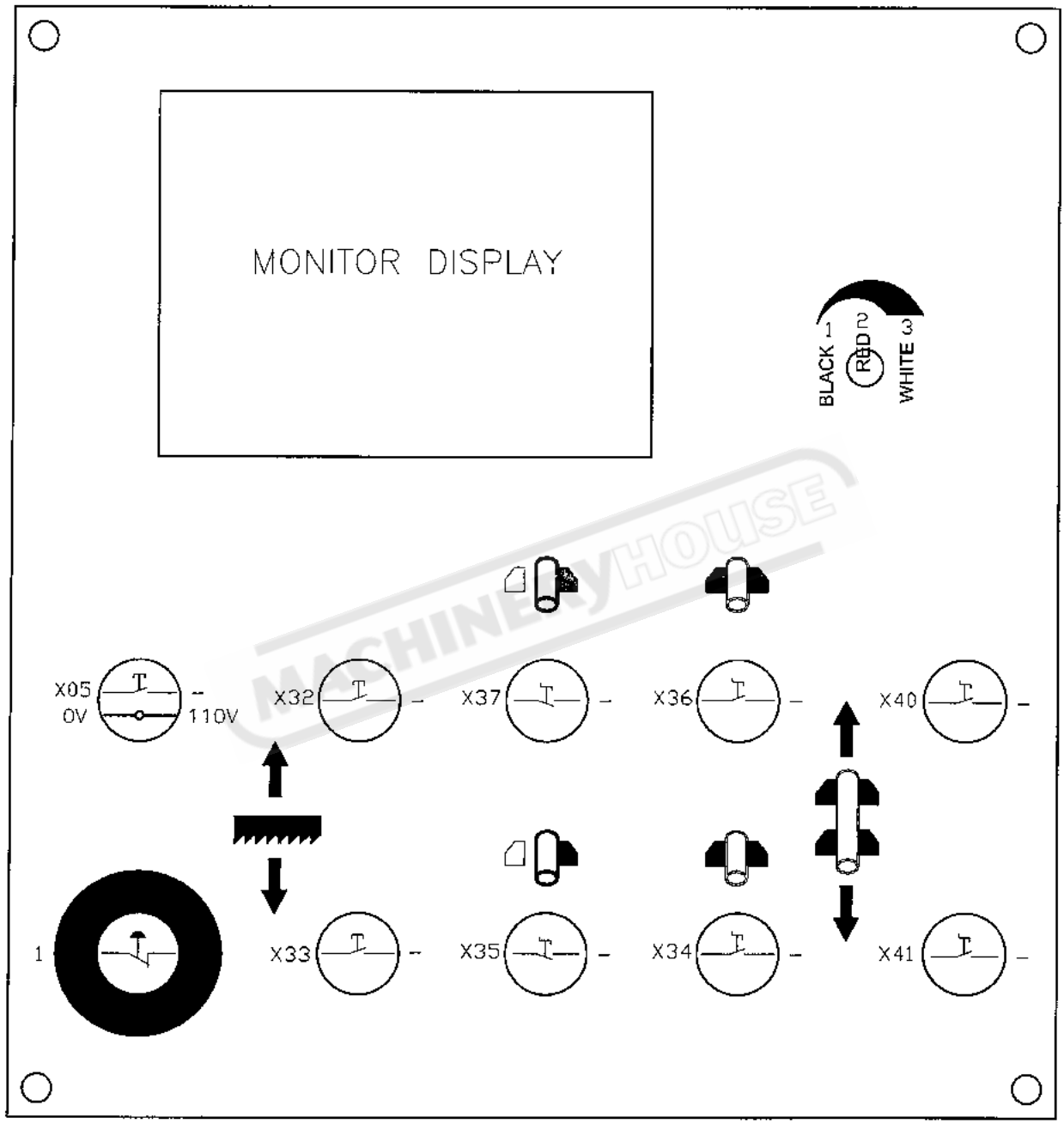
- To terminate a cutting operation, press either the *saw bow up* button or the *emergency stop* button.
- The saw blade will stop running when the *saw bow up* button is pressed.
- Both the saw blade and hydraulic pump motors will stop running when the *emergency stop* button is pressed.
- The machine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

-

Section 5

ELECTRICAL SYSTEM

ELECTRICAL CIRCUIT DIAGRAMS



高型機械工業股份有限公司 Coeen Machinery Industrial Co., Ltd.	圖名	面板配置圖	圖號	EL-C320NC-A	繪圖	蕭淑芬	日期	1000120
					審核		日期	

版本 S0

圖名	線路板配置圖
圖號	EL-C320NC-B
繪圖	蕭淑芬
日期	1000120
版本	S0

TB-1

+24	0V	E	-	-	X32	X33	X34	X35	X36	X37	X40	X41	110V			

E + A B1 X11 X13 X15 X17 X21 X23 X25 X27 X31 X33 X35 X37 X41

⏚	S/S	X1	X3	X5	X7	X11	X13	X15	X17	X21	X23	X25	X27	X31	X33	X35	X37	X41	X43
L	N	X0	X2	X4	X6	X10	X12	X14	X16	X20	X22	X24	X26	X30	X32	X34	X36	X40	X42

2 0V B A1 X10 X12 X16 X20 X22 X24 X26 X30 X32 X34 X36 X40

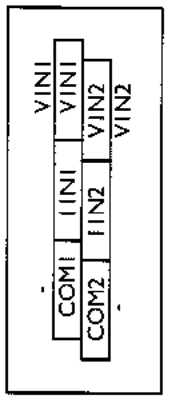
FX3G-60M

\- 4 Y1 Y2 Y4 Y6 Y10 Y12 Y14 Y16 Y16 Y16

0V	Y0	Y1	Y2	·	Y4	Y6	·	Y10	Y12	·	Y14	Y16	·	Y20	Y22	·	Y24	Y26	·
24V	COM0	COM1	COM2	Y3	COM3	Y5	Y7	COM4	Y11	Y13	COM5	Y15	Y17	COM6	Y21	Y23	COM7	Y25	Y27

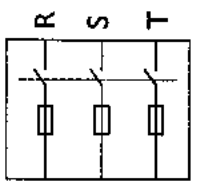
\+ 3 2 2 Y3 2 Y5 Y7 2 Y11 Y13 2 Y15 Y15 2 Y15 2

OPTION:

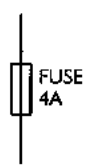


FX2N-2AD

Q1



110V



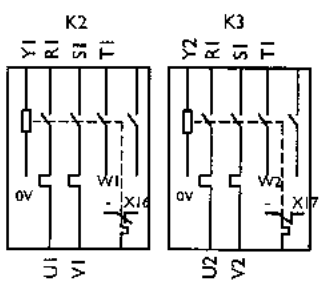
110V

OPTION:

POWER SUPPLY

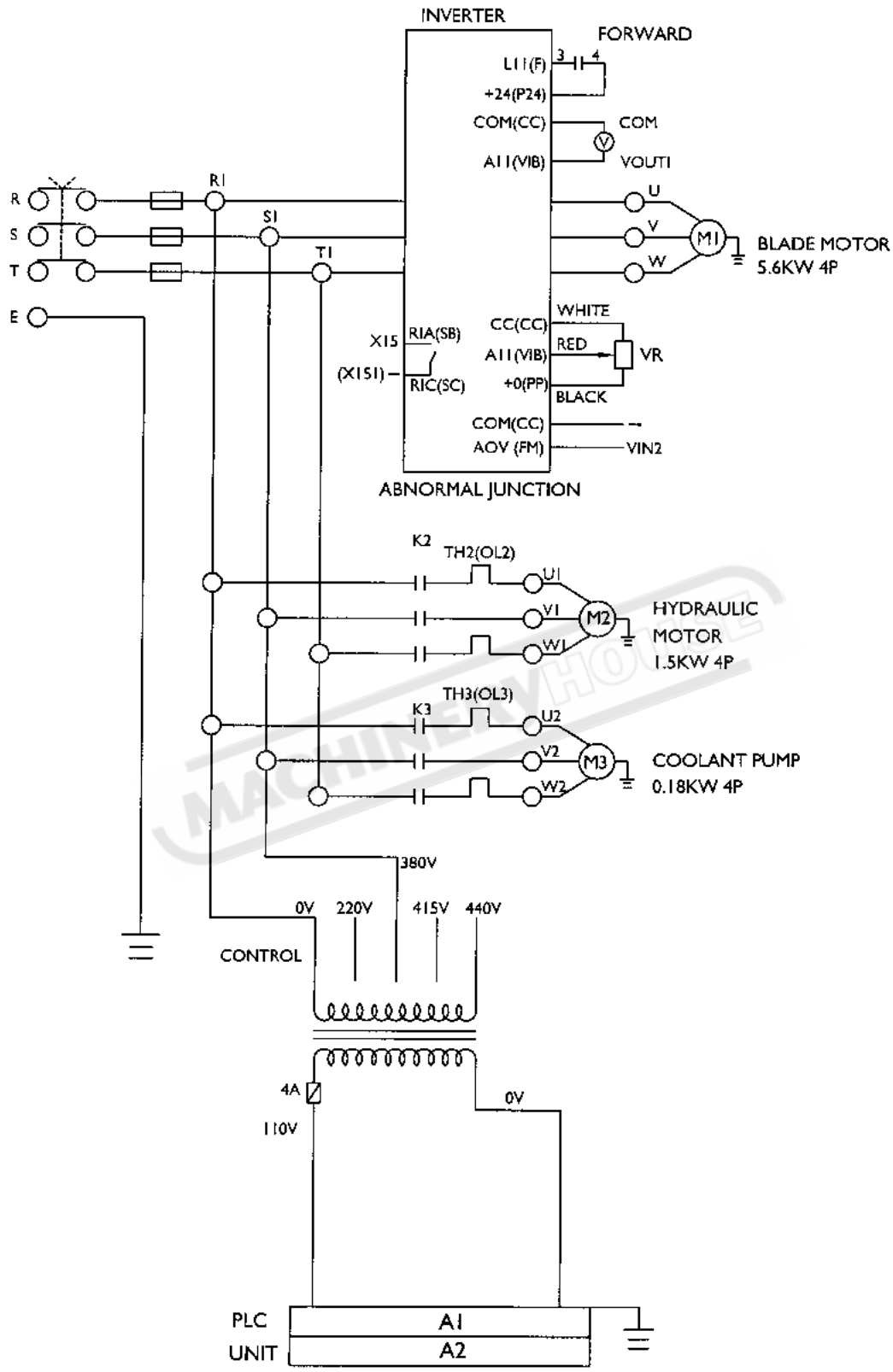
110V	0V	⏚	+24V	0V
L	N		V+	V-

0V	220V	380V	415V	440V
TR				
0V	100V	110V	120V	



TB-2

R	S	T	E	R1	S1	T1	E	—	X7	X10	—	—	X11	—	—	X13	X20	+	+	—	—		X23	—	—	0V	0V	Y6	Y5	Y10	Y7	0V	0V	Y11		0V	0V	Y13	Y14	Y15	Y16	0V	0V	X15	—	3	4



高聖機械工業股份有限公司 Cosen Machinery Industrial Co., Ltd.	圖名	動力配置圖	圖號	EL-C320NC-C	繪圖	蕭淑芬	日期	1000120	版本
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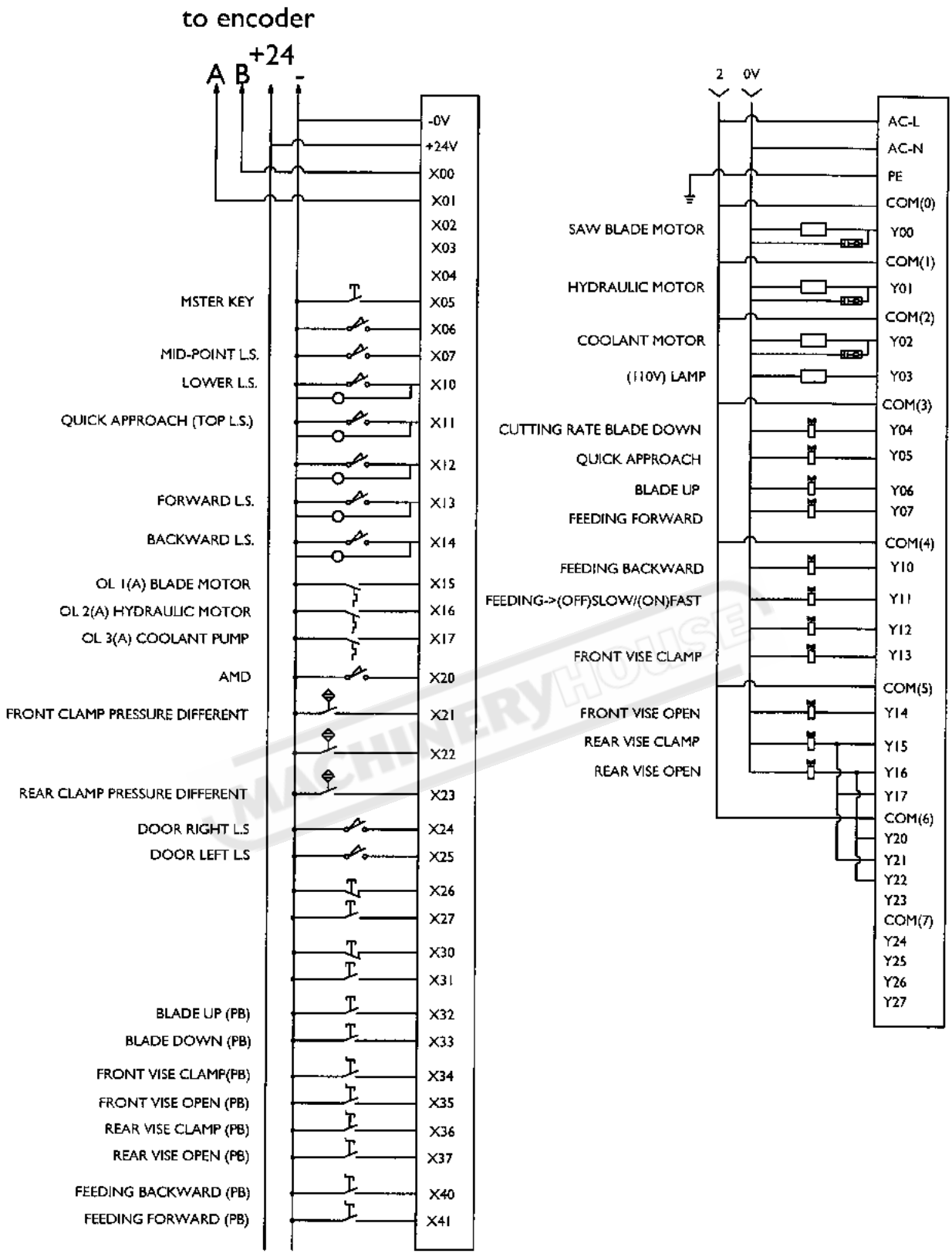

高聖機械工業股份有限公司 Cosen Machinery Industrial Co., Ltd.	圖名	PLC I/O配置圖	圖號	EL-C320NC-D	繪圖	蕭淑芬	日期	1000120	版本
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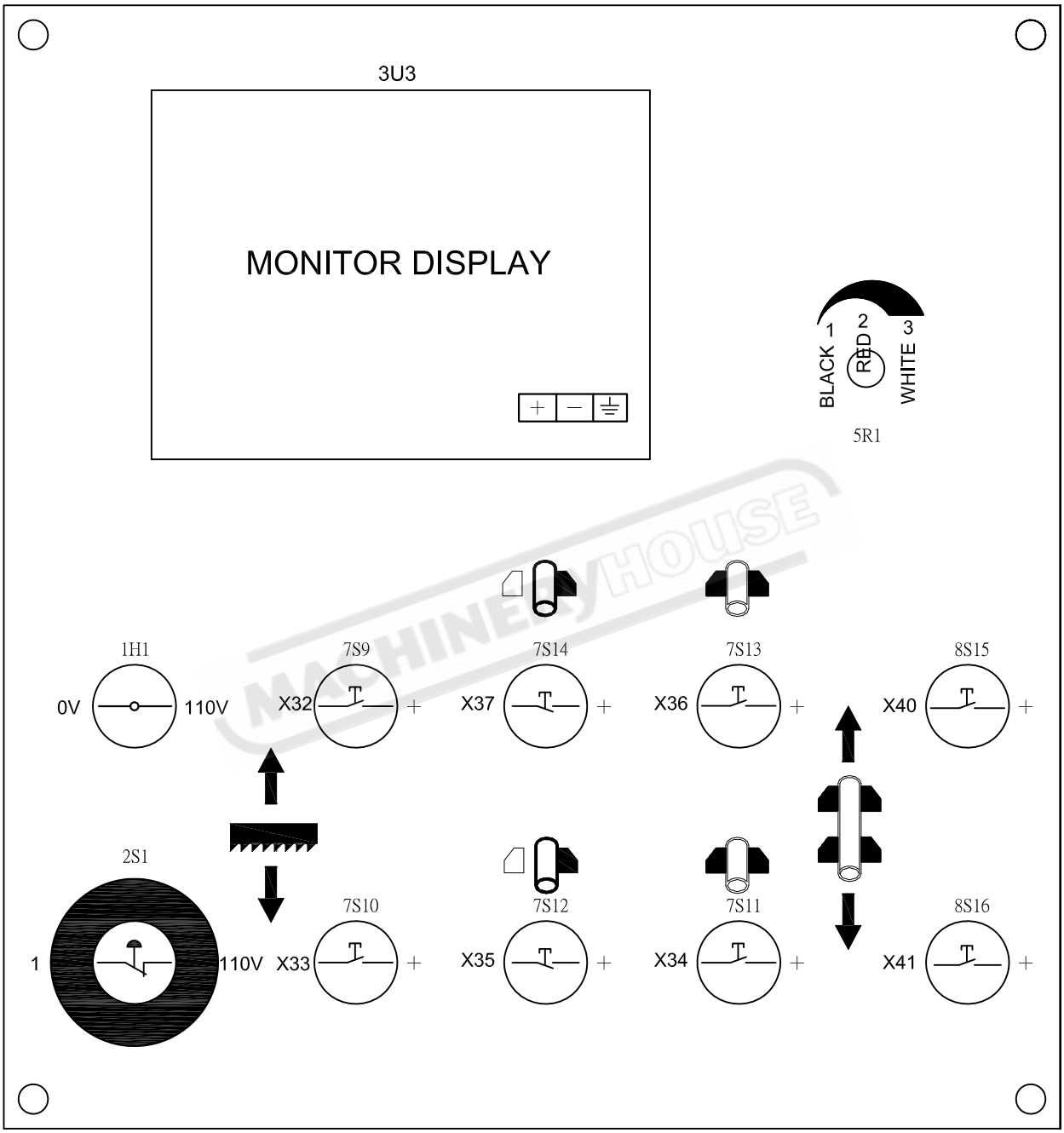

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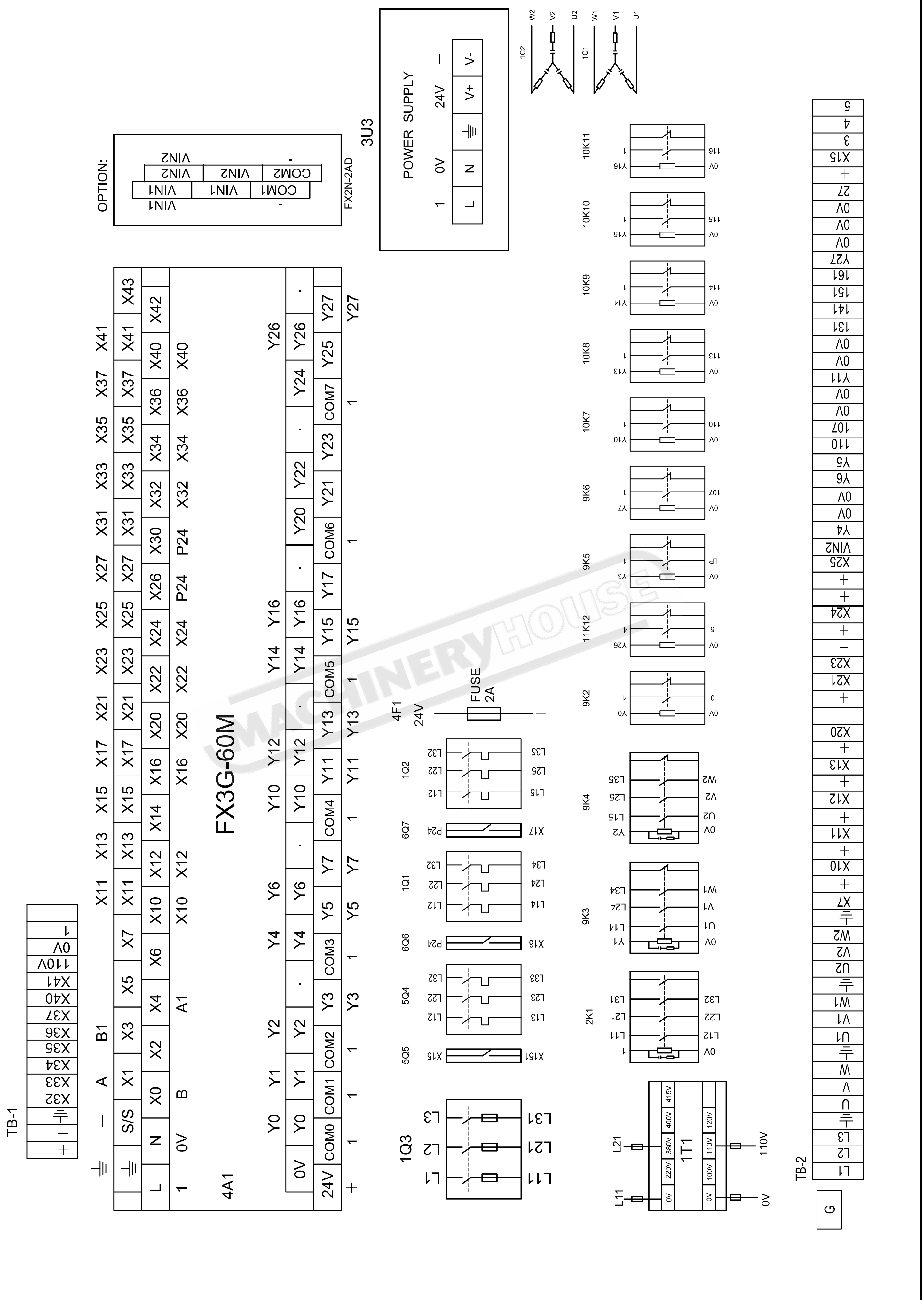
					審核	張鴻昌	日期	1030219	S1



cosen 高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	Circuit Board Layout 線路板配置圖	圖號	EL-C320NC-F09-001S1-B	繪圖	鍾泓龍	日期	1030213	版本
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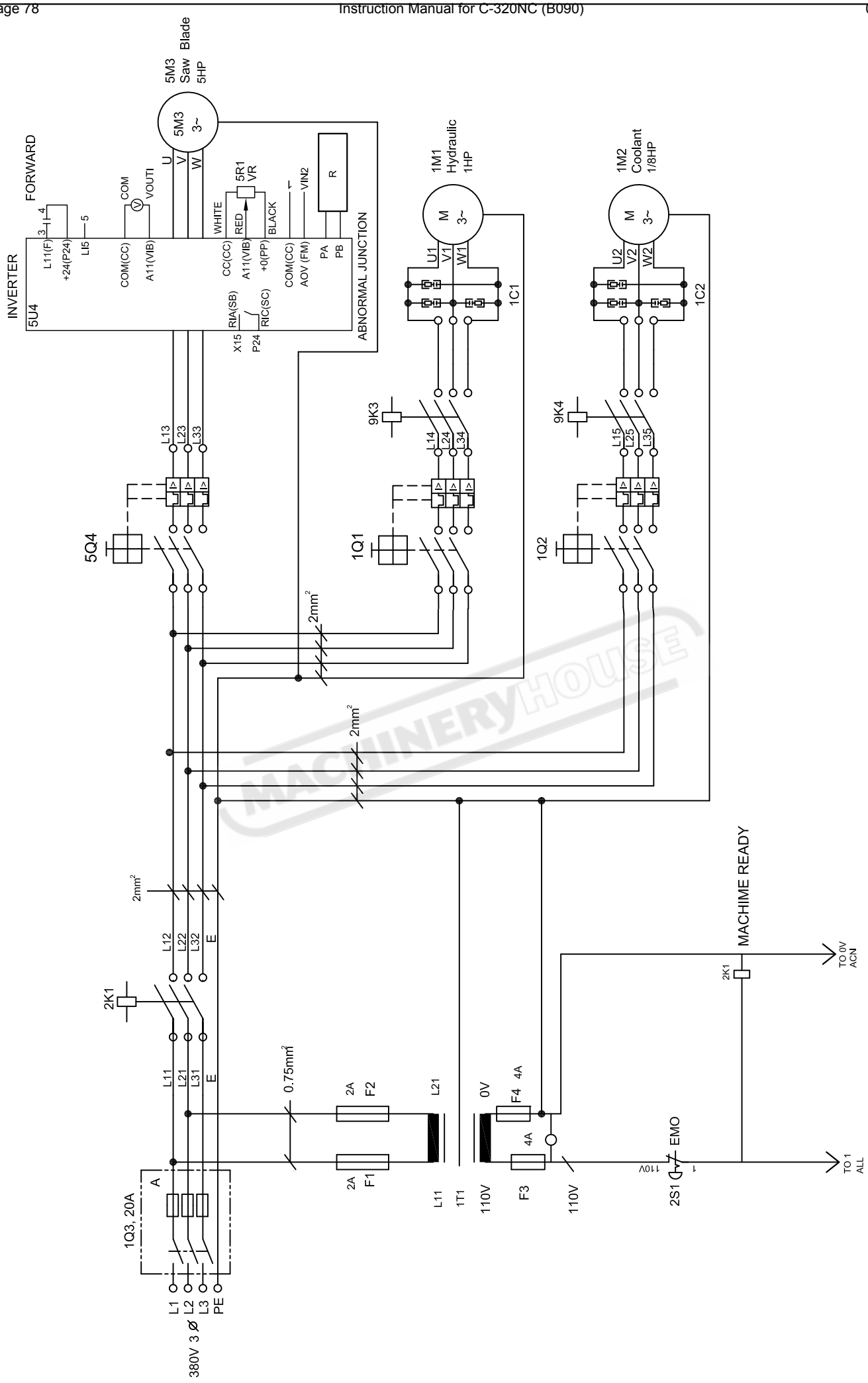

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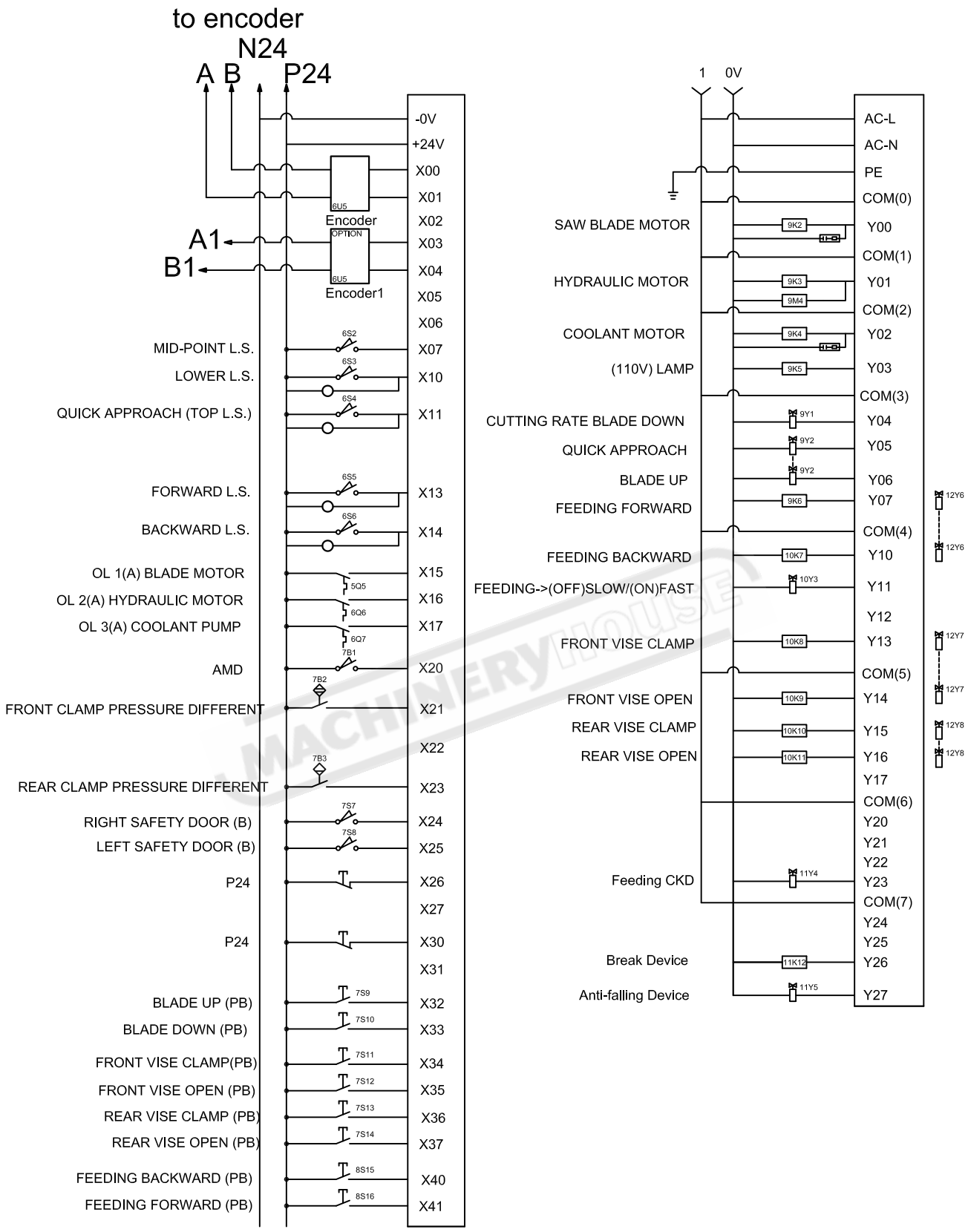


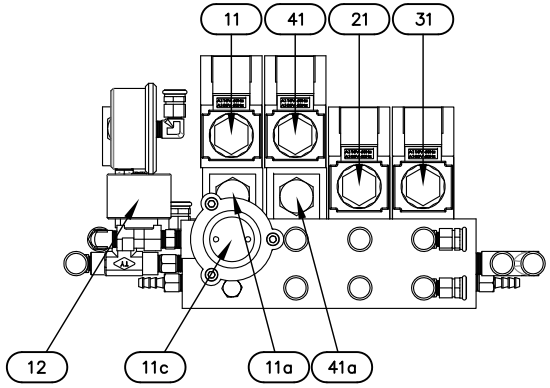
高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	PLC Input /Output Layout PLC I/O配置圖	圖號	EL-C320NC-F09-001S1-D	繪圖	鍾泓龍	日期	1030213	版本
					審核	張鴻昌	日期	1030219	S1

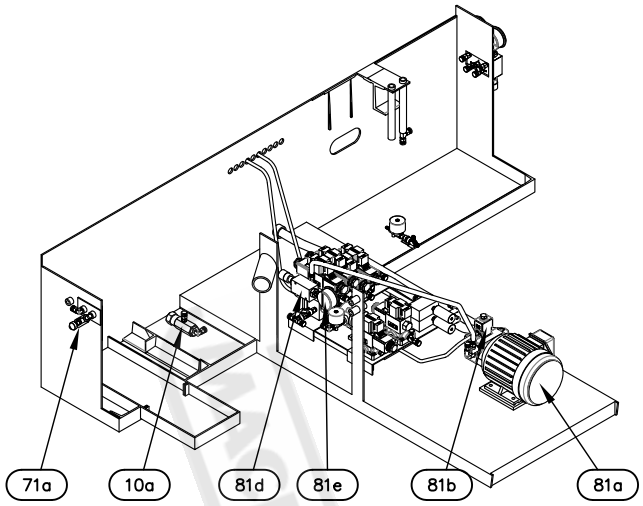
Section 6

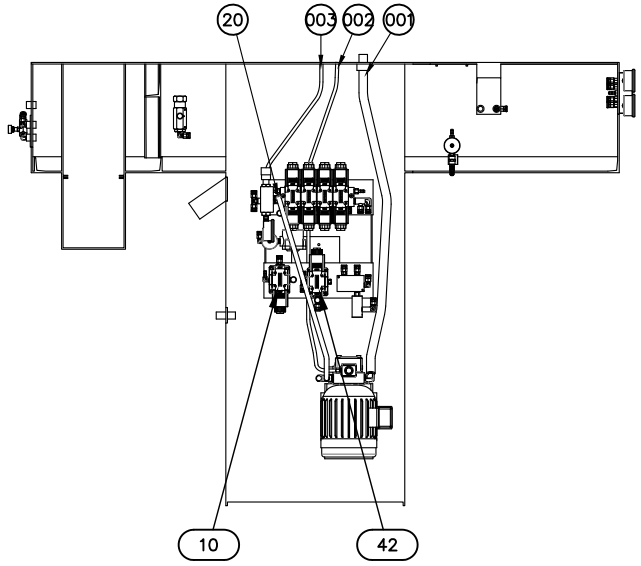
HYDRAULIC SYSTEM

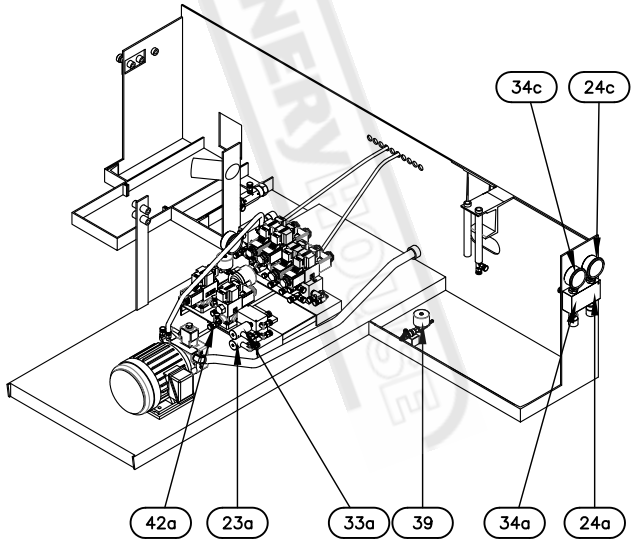
HYDRAULIC DIAGRAMS

CE model: page 6-2~6-6







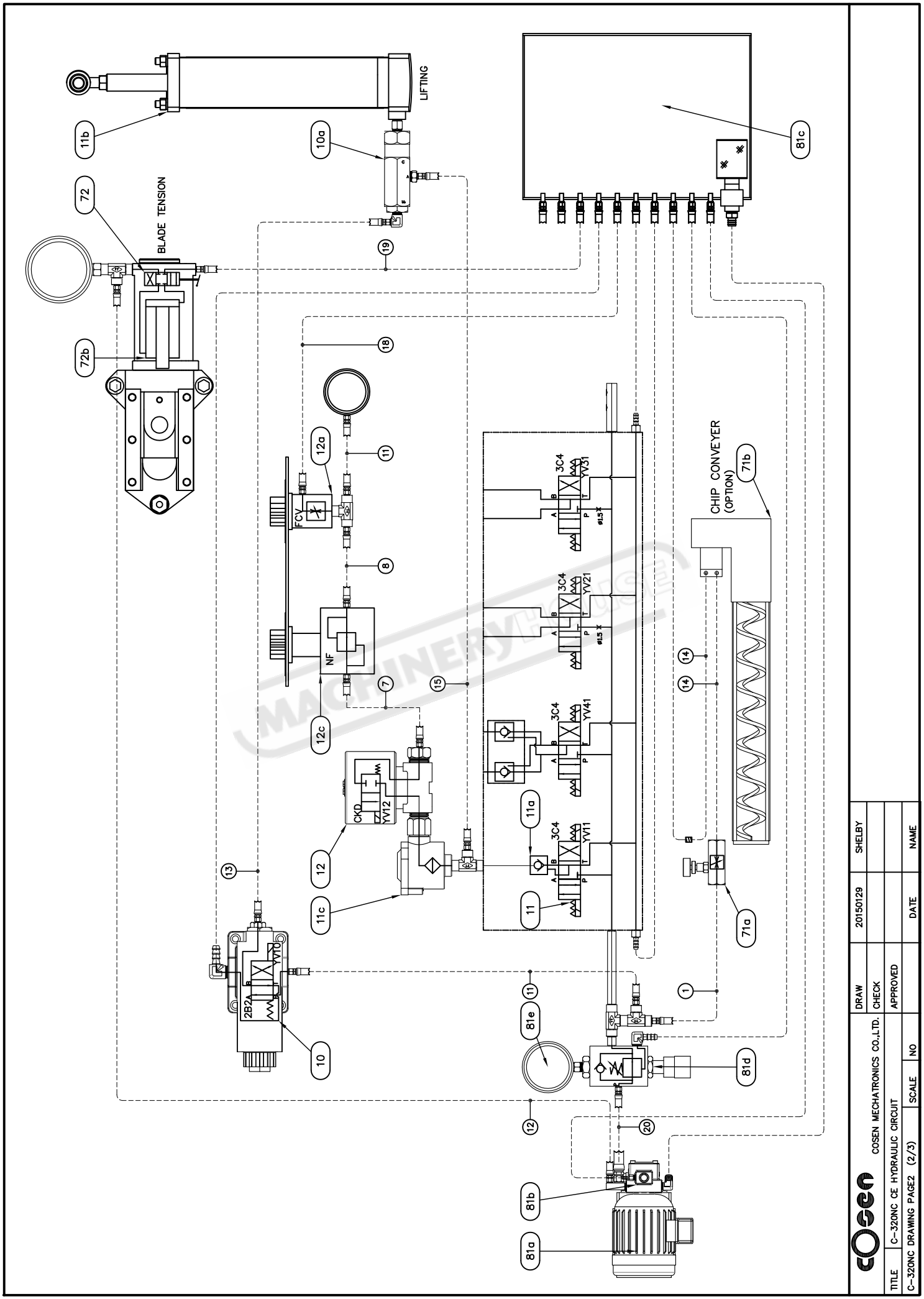


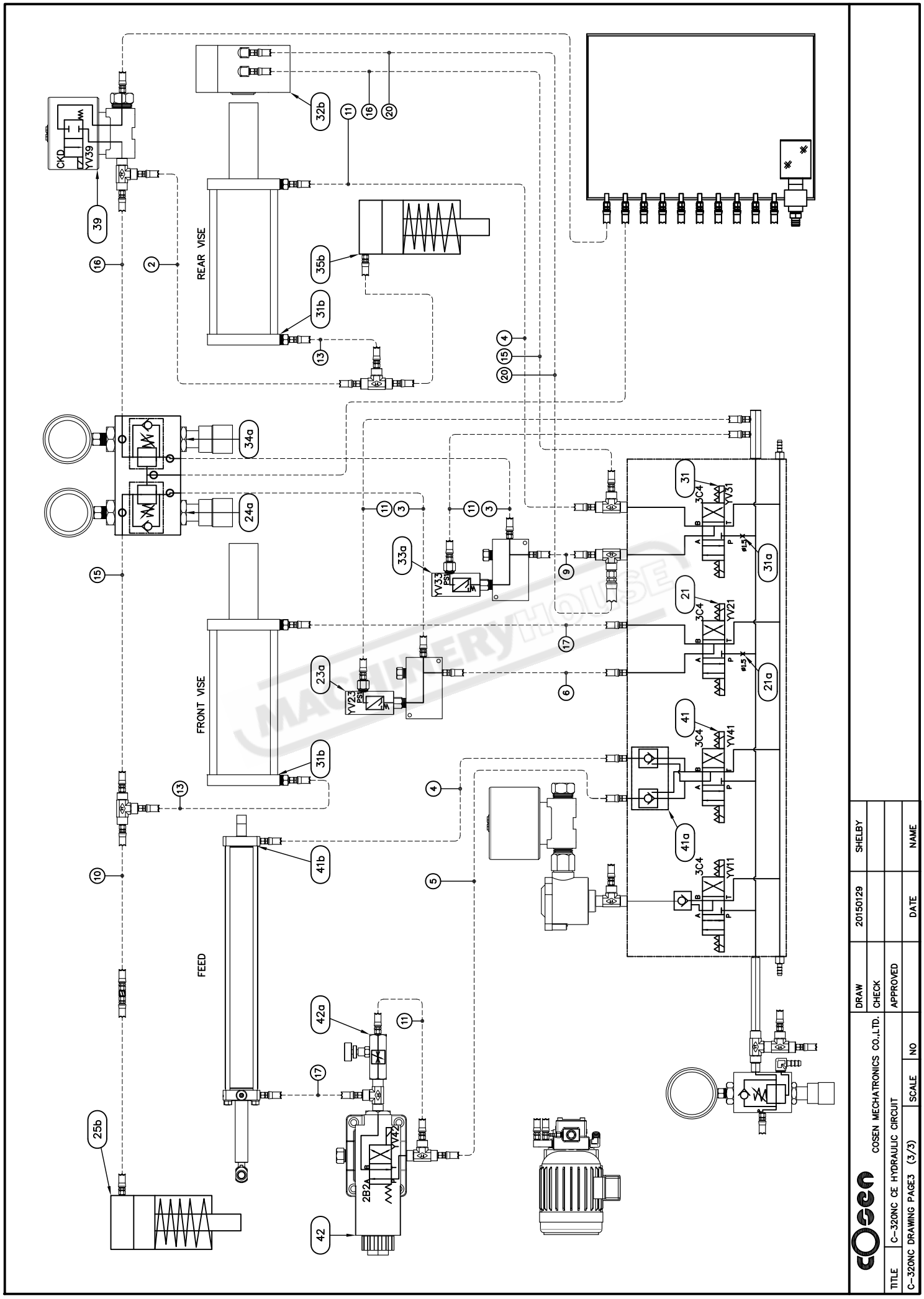
C-320NC-CE："Hydraulic space3D"

No.	Part Name	Describe
10	Solenoid valve	PP-43503
10a	Guiding check valve	PP-43121-03
11	Solenoid valve	PP-43521
11a	Guiding check valve	PP-43125
11c	Oil filter assembly	AGB-707270
12	Solenoid valve	PP-43601
21	Solenoid valve	PP-43521
23a	Pressure valve	NGG-33000-1
24a	Vise hydraulic pressure regulator	AHA-10400
24c	Pressure gauge	PP-43311
31	Solenoid valve	PP-43521
33a	Pressure valve	NGG-33000-1
34a	Vise hydraulic pressure regulator	AHA-10400
34c	Pressure gauge	PP-43311
39	Solenoid valve	PP-43600
41	Solenoid valve	PP-43521
41a	Guiding check valve	PP-43125
42	Solenoid valve	PP-43503
42a	Needle valve assembly	AGC-10150
71a	Flow control valve	PP-43117
81a	Hydraulic motor	PHH1-C408-C
81b	Hydraulic pump	PP-32220
81d	Pressure regulator	PP-43127B
81e	Pressure gauge	PP-43311

No.	Part Name	Describe
001	Hydraulic hose	PHD-06D-900
002	Return hose	
003	Return hose	
20	Hydraulic hose	PHD-03D-850

COSEN MECHATRONICS CO.,LTD.			DRAW	20150126	SHELBY
			CHECK		
TITLE	C-320NC CE 3D HYDRAULIC CIRCUIT		APPROVED		
C-320NC DRAWING NO.1 (1/3)	SCALE	1:30		DATE	NAME


LIFTING
BLADE TENSION
CHIP CONVEYER (OPTION)
FCV
NF
CKD
3C4
2B2a
COSEN MECHATRONICS CO.,LTD.
DRAW
CHECK
APPROVED
DATE
NAME
20150129
SHELBY
TITLE
C-320NC CE HYDRAULIC CIRCUIT
C-320NC DRAWING PAGE2 (2/3)
SCALE
NO


REAR VISE
FRONT VISE
FEED
CKD
YV39
32b
35b
31b
34a
24a
33a
YV33
23a
YV23
42a
2B2A
YV42
42
25b
41b
31
3C4
YV31
31a
21
YV21
21a
41
YV41
41a
YV11
SHELBY
20150129
DRAW
CHECK
APPROVED
DATE
NAME
COSEN MECHATRONICS CO.,LTD.
TITLE
C-320NC CE HYDRAULIC CIRCUIT
C-320NC DRAWING PAGE3 (3/3)
SCALE
NO

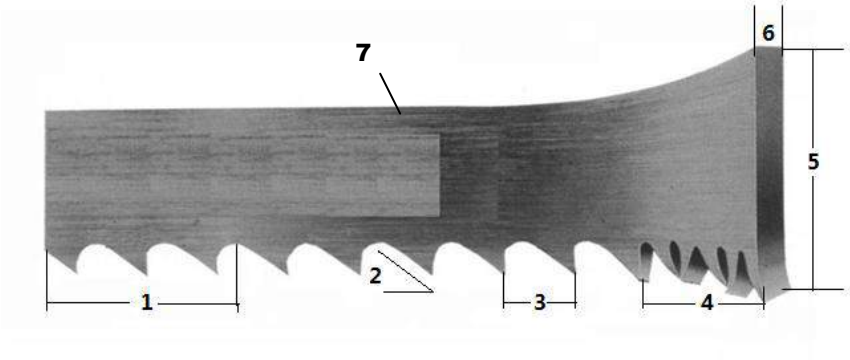
Item	Part No.	Part Name	Norm
10	PP-43503	Solenoid valve	DFB-2B2-02-C1
10a	PP-43121-03	Guiding check valve	3/8 3000PSI 4:1
11	PP-43521	Solenoid valve	DFB-3C4-O2-C1
11a	PP-43125	Guiding check valve	MPC-02-W
11b	AGC-10200-1	Saw bow cylinder assembly	
11c	AGB-707270	Oil filter assembly	AGB-70730/AGB-70729/AGB-70728
12	PP-43601	Solenoid valve	MK2-5016-8 110V
12a	AHA-6100	Flow valve assembly	
12c	AHA-10289	Adjusting valve assembly	
21	PP-43521	Solenoid valve	DFB-3C4-O2-C1
21a	AGC-1015-1	Plunger screw	1.5m/m Socket set screws8x8
21b	AGC-2300	Vise hydraulic cylinder assembly	
23a	NGG-33000-1	pressure valve	
24a&34a	AGB-70736	Reserved fixed seat	
24a&34a	AHA-10400	Vise hydraulic pressure regulator	
24c	PP-43311	Pressure gauge	1/2 * 1/4PT
25b	AHC-19038	Front top clamp hydraulic cylinder	
31	PP-43521	Solenoid valve	DFB-3C4-O2-C1
31a	AGC-1015-1	Plunger screw	1.5m/m Socket set screws8x8
31b	C320H-23000	Vise hydraulic cylinder assembly	
32b	AGC-2200-1	Rear fixed cylinder assembly	
33a	NGG-33000-1	pressure valve	
24a&34a	AGB-70736	Reserved fixed seat	
24a&34a	AHA-10400	Vise hydraulic pressure regulator	
34c	PP-43311	Pressure gauge	1/2 * 1/4PT
35b	AHC-19039	Rear top clamp hydraulic cylinder	
39	PP-43600	Solenoid valve	MK2-2030-8 110V
41	PP-43521	Solenoid valve	DFB-3C4-O2-C1
41a	PP-43125	Guiding check valve	MPC-02-W
41b	AHA-16019-1	Feeding cylinder sssembly	
42	PP-43503	Solenoid valve	DFB-2B2-02-C1
42a	AGC-10150	Needle valve assembly	0.02kg/PT1/4*1/4H /0.01Kg
42c	AHB-16100-1	Buffer valve	
71a	PP-43117	Flow control valve	1/4 simple hex
71b	AGC-C001	Chip conveyor	
71d	PP-43309	Pressure gauge	LAD-40mm-50Kg 1/8"PT
72&72b	AHA-06189-1	Tensioner cylinder assembly	
81a	PHH1-C408-C	Hydraulic motor	1HP 3φ 50HZ 200/400V 4.1/2.0A 4P
81b	PP-32220	Hydraulic pump	VCMSF20B10
81c		oil tank	
81d	PP-43127B	Pressure regulator	RSN-P02
81e	PP-43311	Pressure gauge	1/2 * 1/4PT

Item	Part No.	Part Name	Qty
1	PHD-02D-1000	Hydraulic hose	1
2	PHD-02D-1100	Hydraulic hose	1
3	PHD-02D-1300	Hydraulic hose	3
4	PHD-02D-1900	Hydraulic hose	1
5	PHD-02D-200	Hydraulic hose	1
6	PHD-02D-220	Hydraulic hose	1
7	PHD-02D-2200	Hydraulic hose	1
8	PHD-02D-260	Hydraulic hose	1
9	PHD-02D-280	Hydraulic hose	1
10	PHD-02D-2900	Hydraulic hose	1
11	PHD-02D-300	Hydraulic hose	5
12	PHD-02D-3900	Hydraulic hose	1
13	PHD-02D-520	Hydraulic hose	3
14	PHD-02D-550	Hydraulic hose	2
15	PHD-02D-700	Hydraulic hose	3
16	PHD-02D-820	Hydraulic hose	2
17	PHD-02D-860	Hydraulic hose	2
18	PHD-02S-2100	Hydraulic hose	1
19	PHD-02S-4200	Hydraulic hose	1
20	PHD-03D-850	Hydraulic hose	3

Section 7

BANDSAW CUTTING: A PRACTICAL GUIDE

INTRODUCTION



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

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

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

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

Variable tooth pitches, for instance 2-3 tpi, can be characterized by two measures: 2 tpi stands for the maximum tooth distance and 3 tpi stands for the minimum tooth distance in the toothing interval.

Constant **Variable**

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

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

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

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

SAW BLADE SELECTION

1. Band length

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

Please refer to Section 2 – General Information

2. Band width

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

3. Cutting edge material

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

4. Tooth pitch

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

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

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

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

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

- The surface conditions will also affect the cutting rate. If there are places on the surface on the material which are hard, a slower blade speed will be required or blade damage may result.
- It will be slower to cut tubing than to cut solids, because the blade must enter the material twice, and because coolant will not follow the blade as well.
- Tough or abrasive materials are much harder to cut than their machinability rating would indicate.
- Tooth spacing is determined by the hardness of the material and its thickness in cross section.
- Tooth set prevents the blade from binding in the cut. It may be either a "regular set" (also called a "raker set") or a "wavy set".
- The regular or raker set is most common and consists of a pattern of one tooth to the left, one tooth to the right, and one which is straight, or unset. This type of set is generally used where the material to be cut is uniform in size and for contour cutting.
- Wavy set has groups of teeth set alternately to right and left, forming a wave-like pattern. This reduces the stress on each individual tooth, making it suitable for cutting thin material or a variety of materials where blade changing is impractical. Wavy set is often used where tooth breakage is a problem. This is shown in Fig. 7.2 as follows:

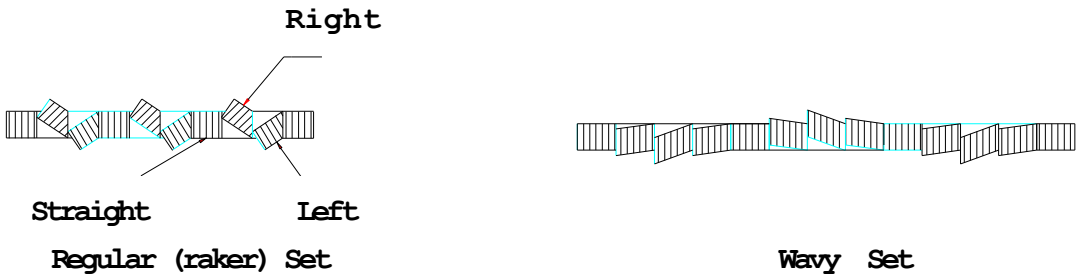
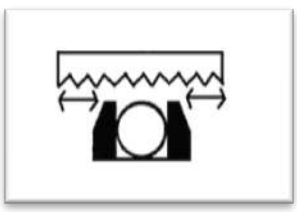


Fig. 7.2 The Saw Set

VISE LOADING

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

Often, loading smaller bundles can mean greater sawing efficiency.



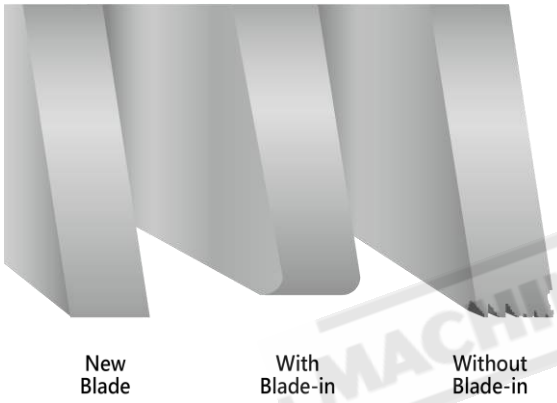
When it comes to cutting odd-shaped material, such as angles, I-beams, channel, and tubing, the main point is to arrange the materials in such a way that the blade cuts through as uniform a width as possible throughout the entire distance of cut.

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

BladeBreak -In

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

1. Select the proper band speed for the material to be cut.



2. Reduce the feed force/rate to achieve a cutting rate 20% to 50% of normal (soft materials require a larger feed rate reduction than harder materials).

3.Begin the first cut at the reduced rate. Make sure the teeth are forming a chip. Small adjustments to the band speed may be made in the event of excessive noise/vibration. During the first cut, **increase feed rate/force** slightly once the blade fully enters the workpiece.With each following cut, **gradually increase feed rate/force** until normal cutting rate is reached.

Section 8

MAINTENANCE & SERVICE

INTRODUCTION

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

BASIC MAINTENANCE

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

MAINTENANCE SCHEDULE

We suggest you do the maintenance on schedule.

Before beginning a day's work

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

After ending a day's work

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

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

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

Every 2 weeks

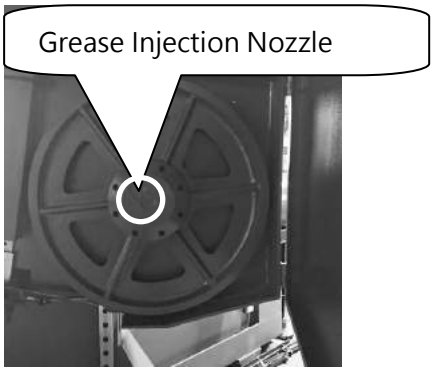
Please apply grease to the following points:

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

Recommended Grease:

- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

Grease Injection Hole:



1. Grease Injection Nozzles at the middle of drive wheel and idle wheel;

   (You need to rotate the wheel until you ssee the Grease injection nozzle.)


: The position of injection indicating.

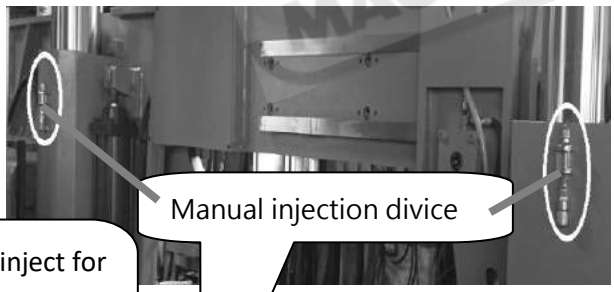
2. Please inject the grease into the Nozzle.

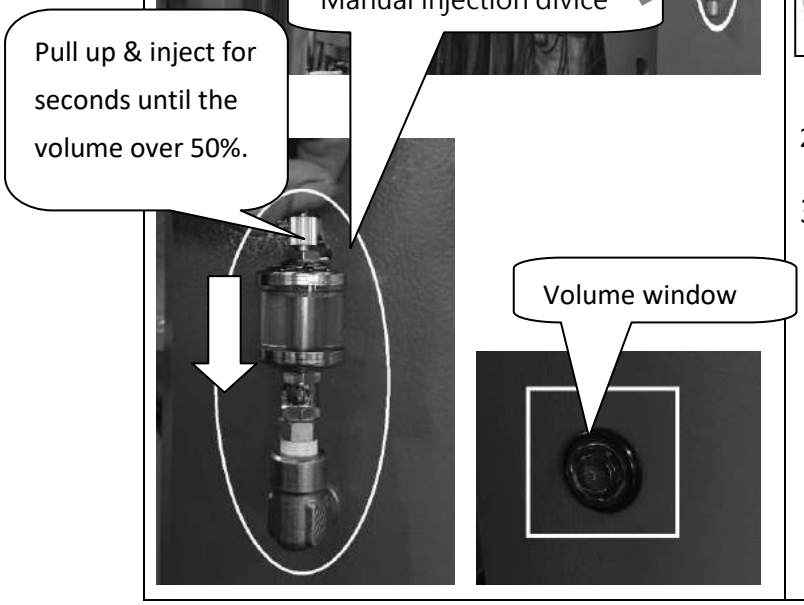
1. Grease Injection Nozzle on the blade tension device.


: The position of injection indicating.

3. Please inject the grease into the Nozzle.

Grease Injection for Main shaft (double column) (if applicable):





1. Two manual injection device for two main shafts (double column)


: The position of injection indicating.

2. Pull up & inject grease for seconds
3. Recommend always keeping the volume over 50% inside the vessel of volume window. ˚

First 600hrs for new machine,then every 1200hrs for routine change

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

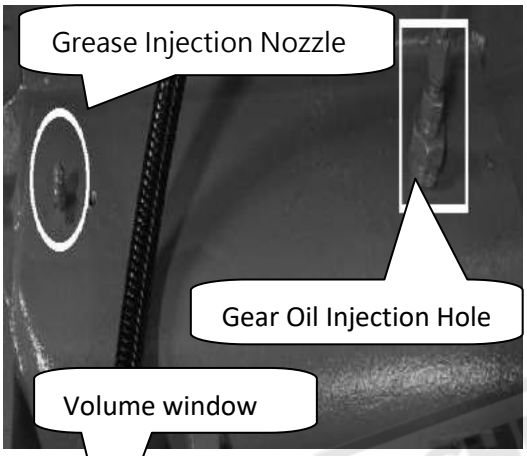
Recommended gear oil

- Shell Omala oil HD220
- Mobil gear 630

Recommended hydraulic oil

- ShellTellus 32
- Mobil DTE Oil Light Hydraulic 24

Gear Oil & Grease Injection Hole:

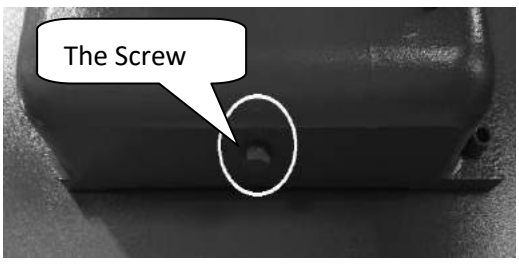


4. A grease injection hole and a gear oil injection hole on the top of gear reducer.

: The position of injection indicating.

5. Recommend keeping the volume over 50% inside the vessel of volume window. °

To unload the waste fluid:



Bottom of Gear reducer

1. Put the waste oil container in the bottom of the reducer for unloading waste fluid

.

2. Use the wrench to open the screw for unloading the waste fluid.

3. Make sure the screw bolted tightly after unloading completed,

Every six months

1.Clean the filter of the cutting fluid.

2.Replace the transmission oil for every half of a year(or 1200 hours).

Check the sight gauge to ascertain the transmission level.

Recommended TRANSMISSION OIL

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

3.Replace the hydraulic oil.

Recommended HYDRAULIC OIL

- ShellTellus 32
- Mobil DTE Oil Light Hydraulic 24

STORAGE CONDITIONS

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

(1) Turn off the power.

(2) Ambient temperature: 5℃ ~ 40℃

(3) Relative humidity: 30%~85% (without condensation)

(4) Atmosphere: use a plastic canvas to cover machine to avoid excessive dust, acid fume, corrosive gases and salt.

(5) Avoid exposing to direct sunlight or heat rays which can change the environmental temperature.

(6) Avoid exposing to abnormal vibration.

(7) Must be connected to earth.

TERMINATING THE USE OF THE MACHINE

Waste disposal:

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

- Hydraulic oil
- Cutting fluid
- Drive wheel gear oil

OIL RECOMMENDATION FOR MAINTENANCE

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

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

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

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

4. The machine must be either LOCKED OUT OR TAGGED OUT while under maintenance.

Section 9

TROUBLESHOOTING

INTRODUCTION

All the machines manufactured by us pass a 48 hours continuously running test before shipping out and we are responsible for the after sales service problems during the warranty period if the machines are used normally. However, there still exist the some unpredictable problems which may disable the machine from operating.

Generally speaking, the system troubles in this machine model can be classified into three types, namely GENERAL TROUBLES, MOTOR TROUBLES and BLADE TROUBLES. Although you may have other troubles which can not be recognized in advance, such as malfunctions due to the limited life-span of mechanical, electric or hydraulic parts of the machine.

We have accumulated enough experiences and technical data to handle all of the regular system troubles. Meanwhile, our engineering department had been continuously improving the machines to prevent all possible troubles.

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

PRECAUTIONS

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

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

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

GENERAL TROUBLES AND SOLUTIONS

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

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

MINOR TROUBLES & SOLUTIONS

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

MOTOR TROUBLES & SOLUTIONS

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

BLADE TROUBLES AND SOLUTIONS

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

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

SAWING PROBLEMS AND SOLUTIONS

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

Sawing Problems and Solutions

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

SOLUTIONS TO SAWING PROBLEMS

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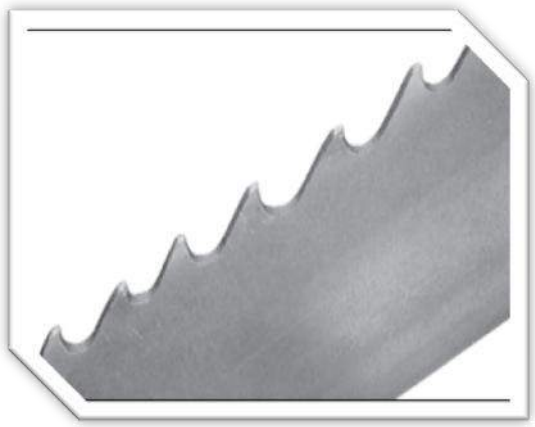
#1. Heavy Even Wear On Tips and Corners Of Teeth



Probable Cause :

A. Improper break-in procedure.

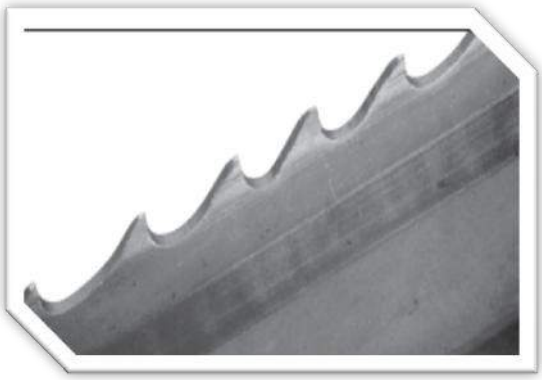
B. Excessive band speed for the type of material being cut. This generates a high tooth tip temperature resulting in accelerated tooth wear.

C. Low feed rate causes teeth to rub instead of penetrate. This is most common on work hardened materials such as stainless and toolsteels.

D. Hard materials being cut such as "Flame Cut Edge" or abrasive materials such as " Fiber Reinforced Composites".

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

#2. Wear On Both Sides Of Teeth



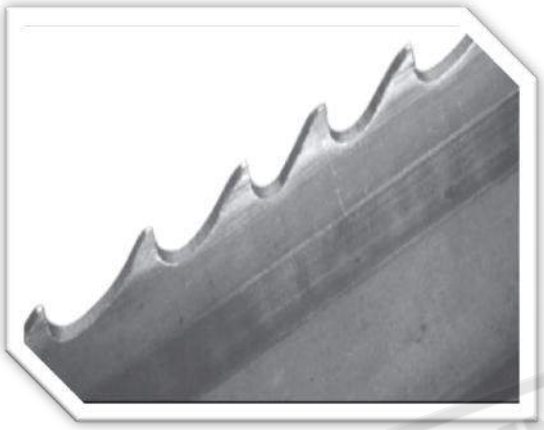
Probable Cause :

A. Broken, worn or missing back-up guides allowing teeth to contact side guides.

B. Improper side guides for band width.

C. Backing the band out of an incomplete cut.

#3. Wear On One Side Of Teeth



Probable Cause :

A. Worn wheel flange, allowing side of teeth to contact wheel surface or improper tracking on flangeless wheel.

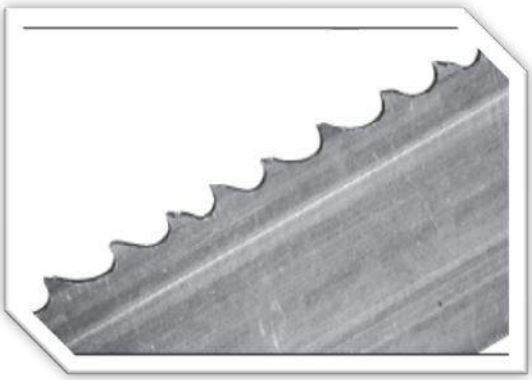
B. Loose or improperly positioned side guides.

C. Blade not perpendicular to cut.

D. Blade rubbing against cut surface on return stroke of machine head.

E. The teeth rubbing against a part of machine such as chip brush assembly, guards, etc.

#4. Chipped Or Broken Teeth



Probable Cause :

A. Improper break-in procedure.

B. Improper blade selection for application.

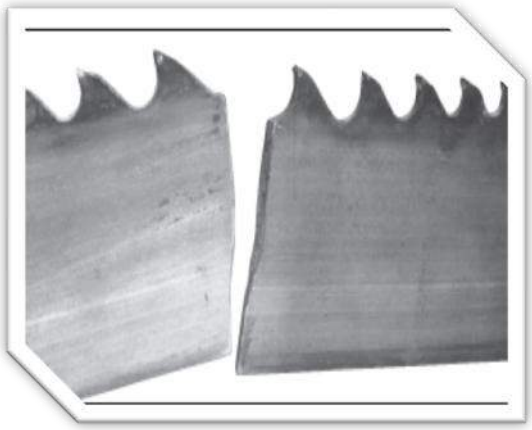
C. Handling damage due to improper opening of folded band.

D. Improper positioning or clamping of material.

E. Excessive feeding rate or feed pressure.

F. Hitting hard spots or hard scale in material

#5. Body Breakage Or Cracks From Back Edge



Probable Cause :

A. Excessive back-up guide "preload" will cause back edge to work harden which results in cracking.

B. Excessive feed rate.

C. Improper band tracking – back edge rubbing heavy on wheel flange.

D. Worn or defective back-up guides.

E. Improper band tension.

F. Notches in back edge from handling damage

#6. Tooth Strippage

Probable Cause :

A. Improper or lack of break-in procedure.

B. Worn, missing or improperly positioned chip brush.

C. Excessive feeding rate or feed pressure.

D. Movement or vibration of material being cut.

E. Improper tooth pitch for cross sectional size of material being cut.

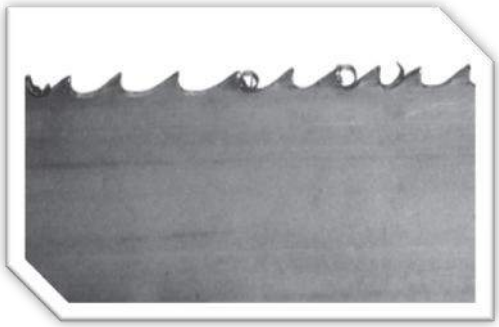
F. Improper positioning of material being cut.

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

H. Hard spots in material being cut.

I. Band speed too slow for grade of material being cut.

#7. Chips Welded To Tooth Tips



Probable Cause :

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

B. Worn, missing or improperly positioned chip brush.

C. Improper band speed.

D. Improper feeding rate.

#8. Gullets Loading Up With Material

Probable Cause :

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

B. Excessive feeding rate producing too large of a chip.

C. Worn, missing or improperly positioned chip brush.

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

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

Probable Cause :

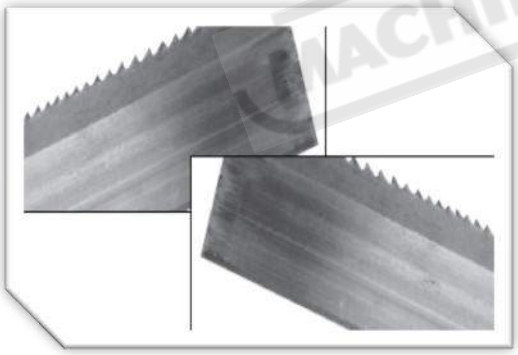
A. Insufficient sawing fluid due to inadequate supply, improper ratio and/or improper application.

B. Excessive band speed.

C. Improper feeding rate.

D. Band installed backwards.

10. Heavy Wear On Both Sides Of Band



Probable Cause :

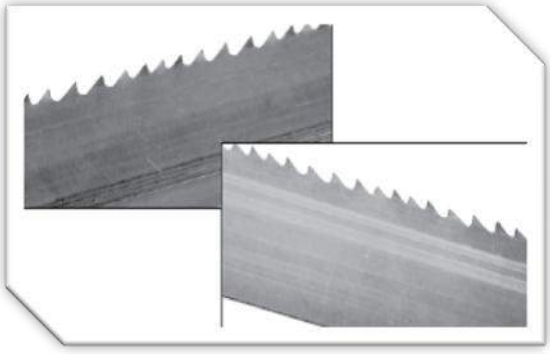
A. Chipped or broken side guides.

B. Side guide adjustment may be too tight.

C. Insufficient flow of sawing fluid through the side guides.

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

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



Probable Cause :

A. Loose side guides.

B. Chipped, worn or defective side guides.

C. Band is rubbing on part of the machine.

D. Guide arms spread to maximum capacity.

E. Accumulation of chips in side guides.

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

Probable Cause :

A. Excessive feed rate.

B. Excessive back-up guide "preload".

C. Improper band tracking – back edge rubbing heavy on wheel flange.

D. Worn or defective back-up guides.

#13. Butt Weld Breakage

Probable Cause :

A. Any of the factors that cause body breaks can also cause butt weld breaks.

(See Observations #5, #15 and #16)

#14. Heavy Wear In Only The Smallest Gullets

Probable Cause :

A. Excessive feeding rate.

B. Too slow of band speed.

C. Using too fine of a tooth pitch for the size of material being cut.

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

Probable Cause :

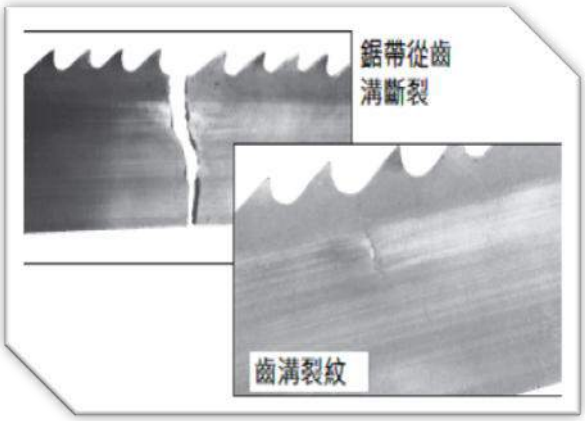
A. An excessive twist type of stress existed.

B. Guide arms spread to capacity causing excessive twist from band wheel to guides.

C. Guide arms spread too wide while cutting small cross sections.

D. Excessive back-up guide "preload".

#16. Body Breakage Or Cracks From Gullets



Probable Cause :

A. Excessive back-up guide "preload".

B. Improper band tension.

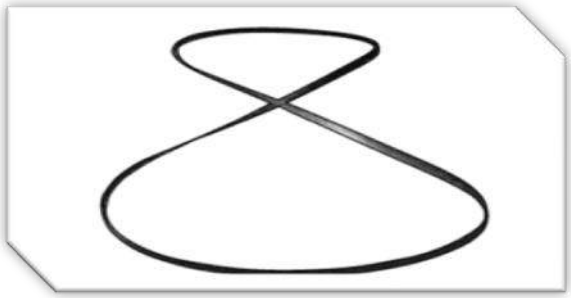
C. Guide arms spread to maximum capacity.

D. Improper beam bar alignment.

E. Side guide adjustment is too tight.

F. Excessively worn teeth.

#17. Band is Twisted Into A Figure "8" Configuration



Probable Cause :

A. Excessive band tension.

B. Any of the band conditions which cause the band to be long (#18) or short (#19) on tooth edge.

C. Cutting a tight radius.

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

Probable Cause :

A. Side guides are too tight – rubbing near gullets.

B. Excessive "preload" – band riding heavily against back-up guides.

C. Worn band wheels causing uneven tension.

D. Excessive feeding rate.

E. Guide arms are spread to maximum capacity.

F. Improper band tracking – back edge rubbing heavy on wheel flange.

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

Probable Cause :

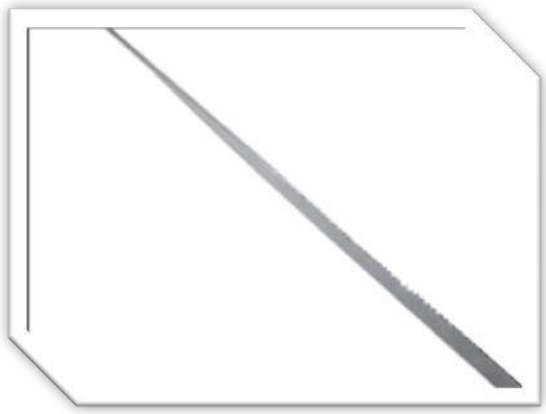
A. Side guides are too tight – rubbing near back edge.

B. Worn band wheels causing uneven tension.

C. Guide arms are spread too far apart.

D. Excessive feeding rate.

#20. Broken Band Shows A Twist In Band Length



Probable Cause :

A. Excessive band tension

B. Any of the band conditions which cause the band to be long (#18) or short (#19) on tooth edge.

C. Cutting a tight radius.

RE-ADJUSTING THE ROLLER TABLE

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

TOOL, measuring

Measurement, Horizontal balance

Procedure

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

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

Section 10

PARTS

SPARE PARTS RECOMMENDATIONS

PART LIST

SPARE PARTS RECOMMENDATIONS

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

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

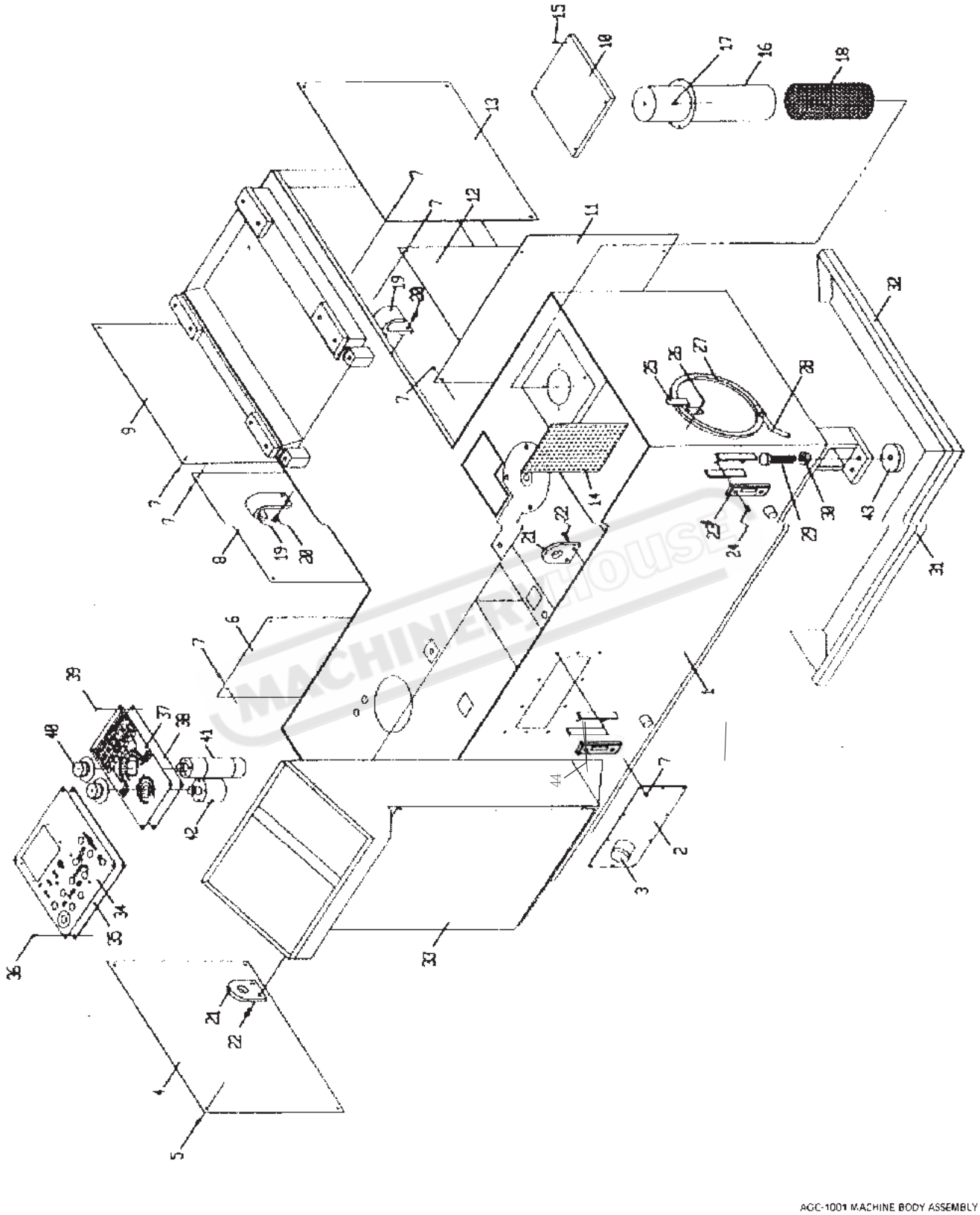


Fig 1 MACHINE FOUNDATION ASSEMBLY

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
1-1	AGC-1001	base seat	底座		1
1-2	AHA-0102	oil tank cover	油箱蓋		1
1-3	PP-90857	cap	油箱蓋螺帽		1
1-4	AGC-1057A	left elec.box cover	左電氣箱蓋		1
1-5		screw	丸頭螺絲	M6*6L	4
1-6	AGC-1054	left rear cover	底座左後蓋		1
1-7		screw	丸頭螺絲	M6*5L	34
1-8	AGC-1052	left cover	底座左蓋		1
1-9	AGC-1053	side cover	底座邊蓋		1
1-10	AGC-1059	coolnat pump cover	水邦浦護蓋		1
1-11	AGC-1050A	right rear cover	底座右後蓋		1
1-12	AGC-1051	right cover	底座右蓋		1
1-13	AGC-1053	side cover	底座邊蓋		1
1-14	AHA-0138	filter	水箱通道濾網		1
1-15		bolt	內六角螺絲	M5*5L	4
1-16	PP-32081	pump	浸水泵浦	1/8HP*210L	1
1-17		bolt	外六角螺絲	M6*10L	4
1-18	AHA-0131	filter	浸水泵浦濾網		1
1-19	AHC-0160	hanger	吊耳(三)		2
1-20		bolt	外六角螺絲	M10*20L	4
1-21	AHC-0161	hanger	吊耳(四)		2
1-22		bolt	外六角螺絲	M10*20L	4
1-23	PP-21030A	Water gauge	水面計	3"	1
1-24		bolt	螺絲		4
1-25	AHA-1309	bracket	軟管架		1
1-26		bolt	內六角螺絲	M6*6L	2
1-27		cable duct	護管	3/8*1000L	1
1-28	AHA-1313	nozzle	噴嘴		1
1-29	AHC-0153	adjusting bolt	底座調整螺絲		6
1-30		nut	螺帽	M20	6
1-31	AHC-1503-NC	right front plate	右前擋板		1
1-32	AHC-1504-NC	right side plate	右側擋板		1
1-33	AHC-0131-CE	elec.box	電氣箱		1
1-34	AGC-1040B	elec.data plate	控制面板		1
1-35	AGC-1041B	control plate	控制底板		1
1-36		screw	丸頭螺絲	M8*8L	4
1-37	AHC-0134-CE	elec.data plate	控制面板		1
1-38	AHC-0135-CE	control plate	控制底板		1
1-39		screw	丸頭螺絲	M8*8L	4
1-40	AHA-1806	vernier dial	流量閥旋鈕		2
1-41	AHA-10289	regulator set	調壓閥		1
1-42	AHA-6100	folw control valve	流量控制閥		1
1-43	AHR-1055	base support	底座墊塊		6
1-44	PP-21030	oil sight gauge	油面計 (含刻度表)	3"	1
1-45					
1-46					

Fig 1 MACHINE FOUNDATION ASSEMBLY

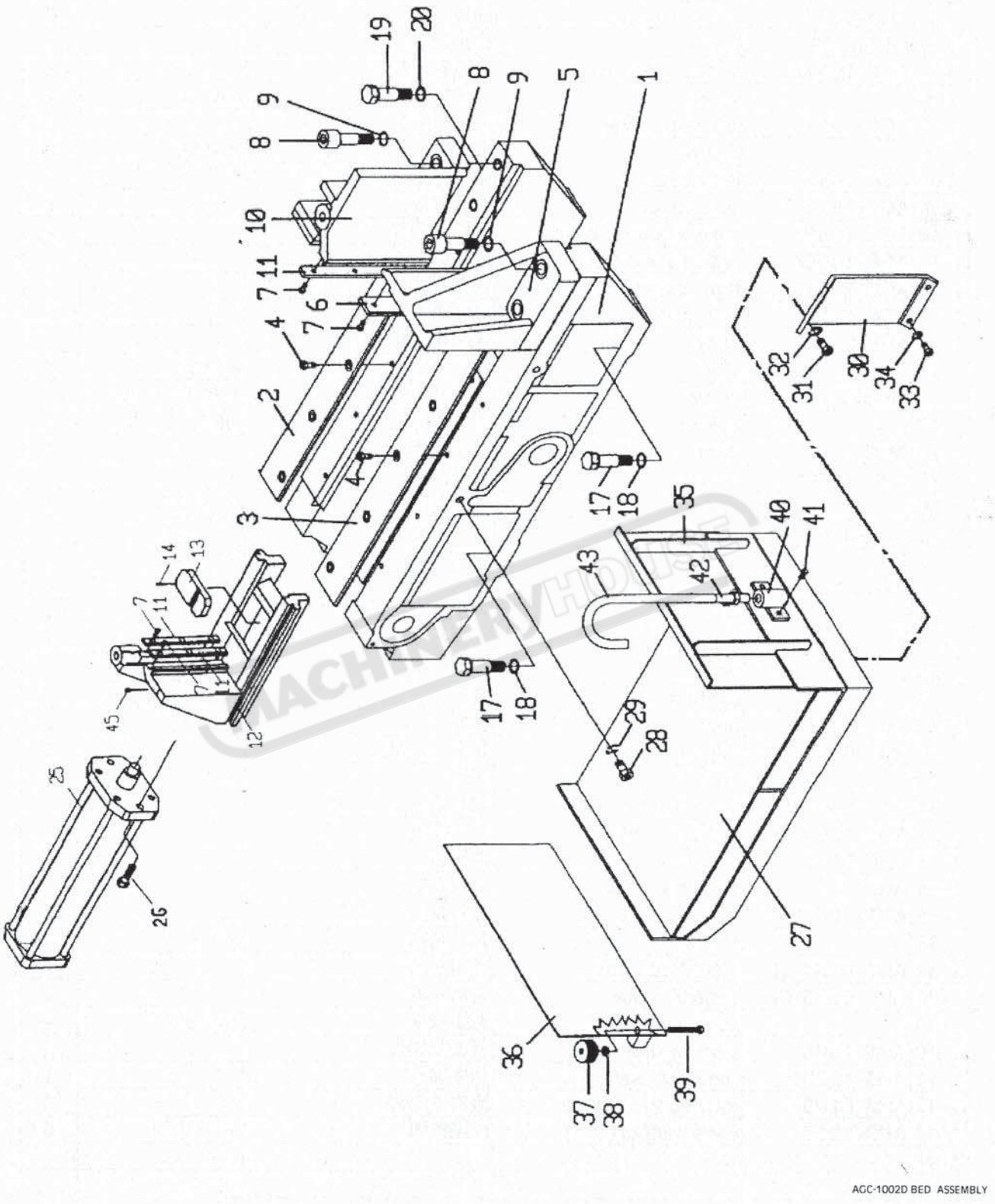


Fig 2 BED ASSEMBLY

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
2-1	AHC-0201	vise bed	床面		1
2-2	AHC-0234B	slide plate	床面鋼板		1
2-3	AHC-0234A	slide plate	床面鋼板		1
2-4		bolt	內六角螺絲	M8*20L	10
2-5	AHC-0230	front fixed vise jaw	前固定虎鉗(二)		1
2-6	AHC-0238	vise plate	虎鉗鋼板		1
2-7		bolt	內六角螺絲	M6*16L	12
2-8	AHA-0122B	fixed bolt	固定螺絲(二)		4
2-9		spring washer	彈簧華司		4
2-10	AHC-0229	front fixed vise jaw	前固定虎鉗(一)		1
2-11	AHC-0239B	vise plate	虎鉗鋼板		3
2-12	AHC-0223-NC	front movable vise jaw	前活動虎鉗		1
2-13	AHA-0227A	auxiliary plate	輔助板		3
2-14		spring pin	彈簧銷	φ6*16L	2
2-15	AHA-0224	pawl	施力板		1
2-16	AHA-0225A	straight pin	施力板插銷		1
2-17	AHA-0122A	fixed bolt	固定螺絲(一)		2
2-18		washer	華司	M16	2
2-19		bolt	外六角螺絲	M14*45L	2
2-20		spring washer	彈簧華司	M14	2
2-21	AHB-0215C	rack	浪形板		1
2-22	AHA-0210B	rack guide ring	浪形板活動圈		1
2-23		spring washer	彈簧華司	M8	1
2-24		bolt	內六角螺絲	M8*20L	1
2-25	AHA-02139-1	vise cylinder	虎鉗油壓缸		1
2-26		spring pin	彈簧銷	φ6*35L	1
2-27	AGC-1035	stock receiving tray	托架		1
2-28		bolt	內六角螺絲	M12*30L	2
2-29		spring washer	彈簧華司	M12	2
2-30	AHC-1437	support	托架支持板		1
2-31		bolt	內六角螺絲	M10*15L	2
2-32		spring washer	彈簧華司	M10	2
2-33		bolt	內六角螺絲	M6*15L	2
2-34		spring washer	彈簧華司	M6	2
2-35	AHC-1424	right fence	托架右板		1
2-36	AHC-1423-CE	left fence	托架左板		1
2-37	SJM-4029	Nut	普利護蓋螺母		2
2-38		Nut	螺帽	M8	2
2-39		Bolt	內六角螺絲	M8*100L	2
2-40	AGB-70220	Bracket	冷卻水管固定板		1
2-41		Bolt	內六角螺絲	M5*12L	2
2-42	PP-43136	Valve	開關閥	A103 PT 3/8	1
2-43	PP-57079	Hose	出水管	3/8*25"	1
2-44					
2-45		set screw	止付螺絲	M6*8L	1
2-46					

Fig 2 BED ASSEMBLY

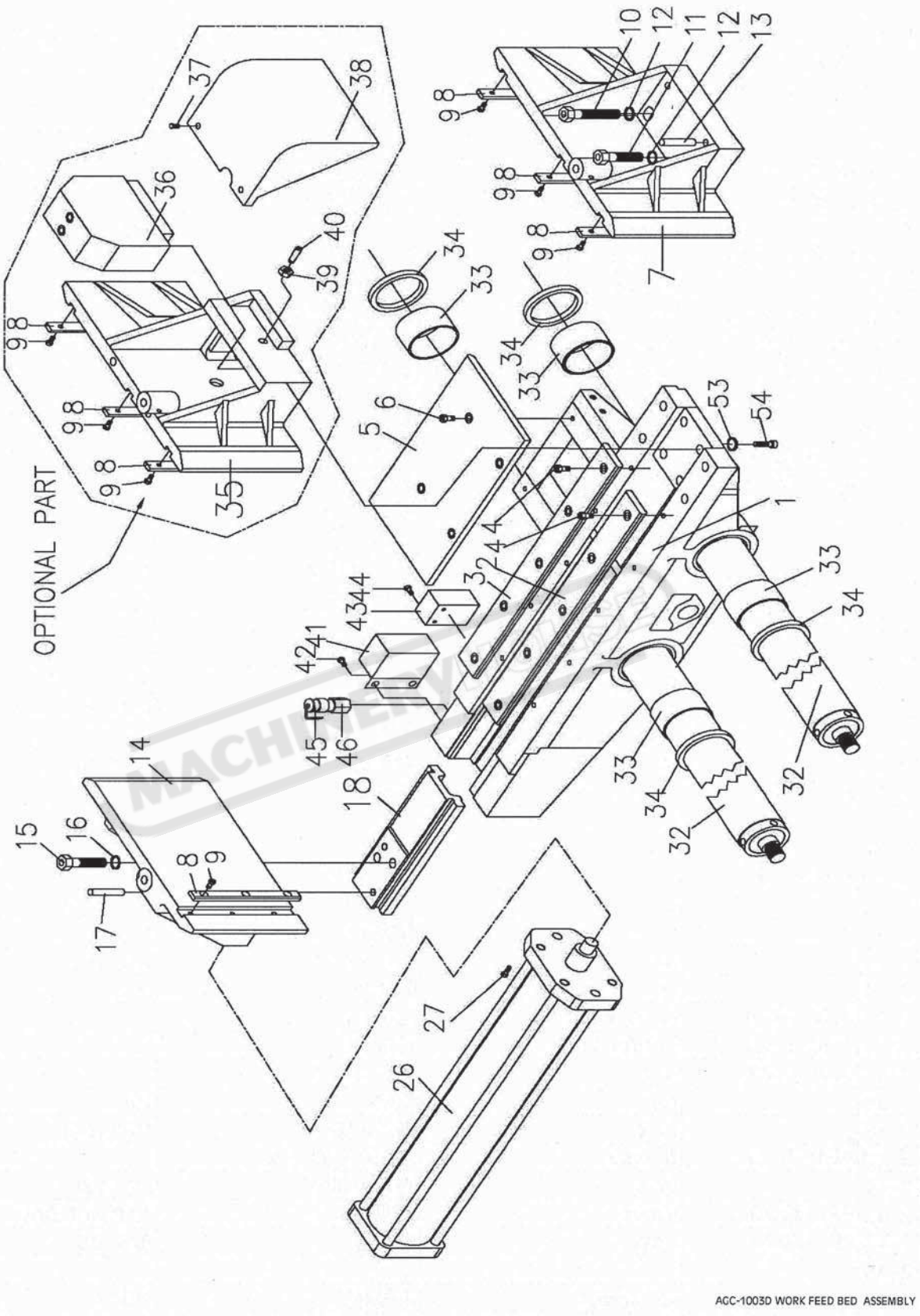


Fig 3 WORK FEED BED ASSEMBLY

COSEN

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
3-1	AHC-1510	feed vise bed	自動送料座		1
3-2	AHC-1513	slide plate	送料床面鋼板		1
3-3	AHC-1513	slide plate	送料床面鋼板		1
3-4	PDA-8-20	bolt	內六角螺絲	M8*20L	10
3-5	AHC-15241Y1	plate	遮板		1
3-6		bolt	內六角螺絲	M8*20L	4
3-7	AHC-1527	rear fixed vise jaw	後固定虎鉗		1
3-8	AHC-0239D	vise plate	前活動虎鉗鋼板		4
3-9		bolt	內六角螺絲	M6*16L	12
3-10		bolt	內六角螺絲	M16*60L	1
3-11		bolt	內六角螺絲	M16*40L	1
3-12		spring washer	彈簧華司	M16	2
3-13		taper pin	斜度銷	Ø10 X 50L	2
3-14	AHC-1520A	rear movable vise jaw	後活動虎鉗		1
3-15	PBA-16-60	bolt	內六角螺絲	M16*25L	2
3-16	PQA-16	washer	華司	M16	2
3-17	PRB-10-50	taper pin	斜度銷	Ø10 X 50L	2
3-18	AHA-1518	vise body	虎鉗滑座		1
3-19	AHA-0224	pawl	施力板		1
3-20	AHA-0225B	straight pin	施力板插銷		1
3-21		set screw	止付螺絲	M6*8L	1
3-22	AHB-0215C	rack	浪形板		1
3-23	AHA-0210B	rack guide ring	浪形板活動圈		1
3-24		spring washer	彈簧華司	M8	1
3-25		bolt	內六角螺絲	M8*20L	1
3-26	AHA-02139-1	vise cylinder	虎鉗油壓缸		1
3-27		spring pin	彈簧銷	Ø6 X 35L	1
3-28	AHC-1544-CE	lever	開關擋板(一)		1
3-29		bolt	外六角螺絲	M8*30L	1
3-30		nut	螺帽	M8	1
3-31		bolt	外六角螺絲	M6*15L	2
3-32	AHA-1601B	feed shaft	送料軸		2
3-33	PP-13260	du bushing	乾式軸承	6540	4
3-34	PP-51146	dust seal	防塵套	65*79*8/11	4
3-35	AGC-2202T	Rear fixed vise	後固定虎鉗		1
3-36	AGC-2200-1	Rear fixed cylinder assy	後虎鉗固定油壓缸組		1
3-37	PFA-5-10	Oval head screw (+)	丸頭螺絲(十字)(公)	Φ 5 x 10 mm	2
3-38	AGC-2209	Vise cover	固定虎鉗蓋		1
3-39	POA-12-175	Nut	螺母(公)	12 mm Φ x P 1.75	1
3-40	PAA-12-50	Set screw	止付螺絲(公)	M12 x P1.75 x 50	2
3-41		limit switch	限動開關	ZCK-M	1
3-42		bolt	內六角螺絲	M6*12L	2
3-43		limit switch	限動開關	ZCK-J	1
3-44		bolt	內六角螺絲	M6*12L	2
3-45	AHA-1932	dust seal	防塵套(母)		1
3-46	PP-21099	connect	快速接頭	1/4"	1
3-53	PQA-12	spring washer	彈簧華司(公)	Φ 12 mm	4
3-54	PBA-12-25	Hex soc cap screw	有頭內六角螺絲(公)	M12 x P1.75 x 25	2
	PBA-12-30	Hex soc cap screw	有頭內六角螺絲(公)	M12 x P1.75 x 30	2

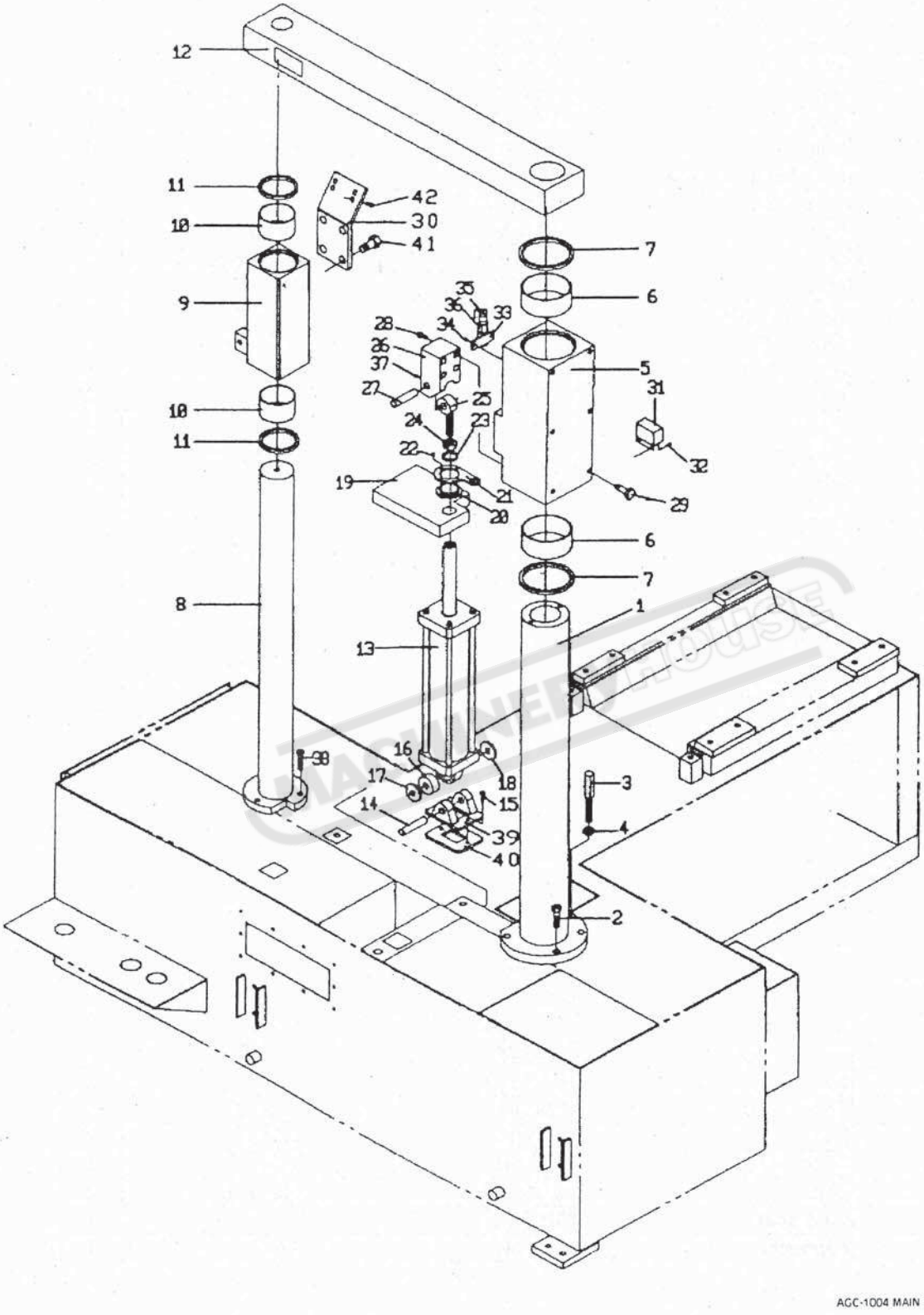


Fig 4 MAIN SHAFT & SUB SHAFT ASSEMBLY

COSEN

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
4-1	AGC-1010	main shaft	大主軸		1
4-2		bolt	內六角螺絲	M16*50L	3
4-3	AGC-1030	bolt	下限定位支桿		1
4-4		nut	螺帽	M16	1
4-5	AGC-3009	main shaft sleeve	大軸套		1
4-6	PP-13310	du bushing	乾式軸承	11050	2
4-7	PP-51140	dust seal	防塵套	110*126*9	2
4-8	AGC-1011	sub shaft	小主軸		1
4-9	AGC-3010	sub shaft sleeve	小軸套		1
4-10	PP-13281	du bushing	乾式軸承	8050	2
4-11	PP-51196	dust seal	防塵套	80*94*8	2
4-12	AGC-1012	cross link	主軸樑		1
4-13	AGC-10200	housing yoke cylinder	鋸弓油壓缸		1
4-14	AGB-70304B	pin	鋸弓油缸下插銷		1
4-15		bolt	內六角螺絲	M8*15L	2
4-16	PP-14510	bearing	軸承	2303	1
4-17	AHA-1105A	washer	活動軸墊圈		1
4-18	AHA-1105	washer	橡膠墊圈		1
4-19	AGC-1018A	cover	鋸弓油缸護罩		1
4-20	AGC-1022	conceal ring	鋸弓油缸遮環		1
4-21	AGC-1029	fixed plate	底座油封固定板		1
4-22		bolt	內六角螺絲	M4*15L	4
4-23	PP-51018	oil seal	油封	30*40*5	1
4-24		nut	螺帽	M18	1
4-25	PP-14480	link bearing	連桿軸承	POS 18	1
4-26	AGC-3011	cylinder upper ear	鋸弓油缸上耳		1
4-27	AGB-70304A	pin	鋸弓油缸上插銷		1
4-28		bolt	內六角螺絲	M10*35L	4
4-29	AGC-1013	bolt	大軸套定位螺絲		2
4-30	AGC-3012	bracket	小軸套固定板		1
4-31		limit switch	限動開關	ZCK-M	1
4-32		bolt	內六角螺絲	M5*12L	2
4-33	AGB-70220	coolant bracket	冷卻水管固定板		1
4-34		bolt	內六角螺絲	M5*12L	2
4-35	AHA-1932	dust seal	母防塵套		1
4-36	PP-21099	connect	快速接頭	1/4"	1
4-37		set screw	止付螺絲	M6*6L	1
4-38		bolt	內六角螺絲	M12*40L	3
4-39	AGC-1031	hydraulic holder	油壓缸固定座		1
4-40	AGC-1032	hydraulic holder plate	油壓缸固定座板		1
4-41		bolt	內六角螺絲	M22*30L	4
4-42		bolt	內六角螺絲	M8*20L	4
4-43					
4-44					
4-45					
4-46					

Fig 4 MAIN SHAFT & SUB SHAFT ASSEMBLY

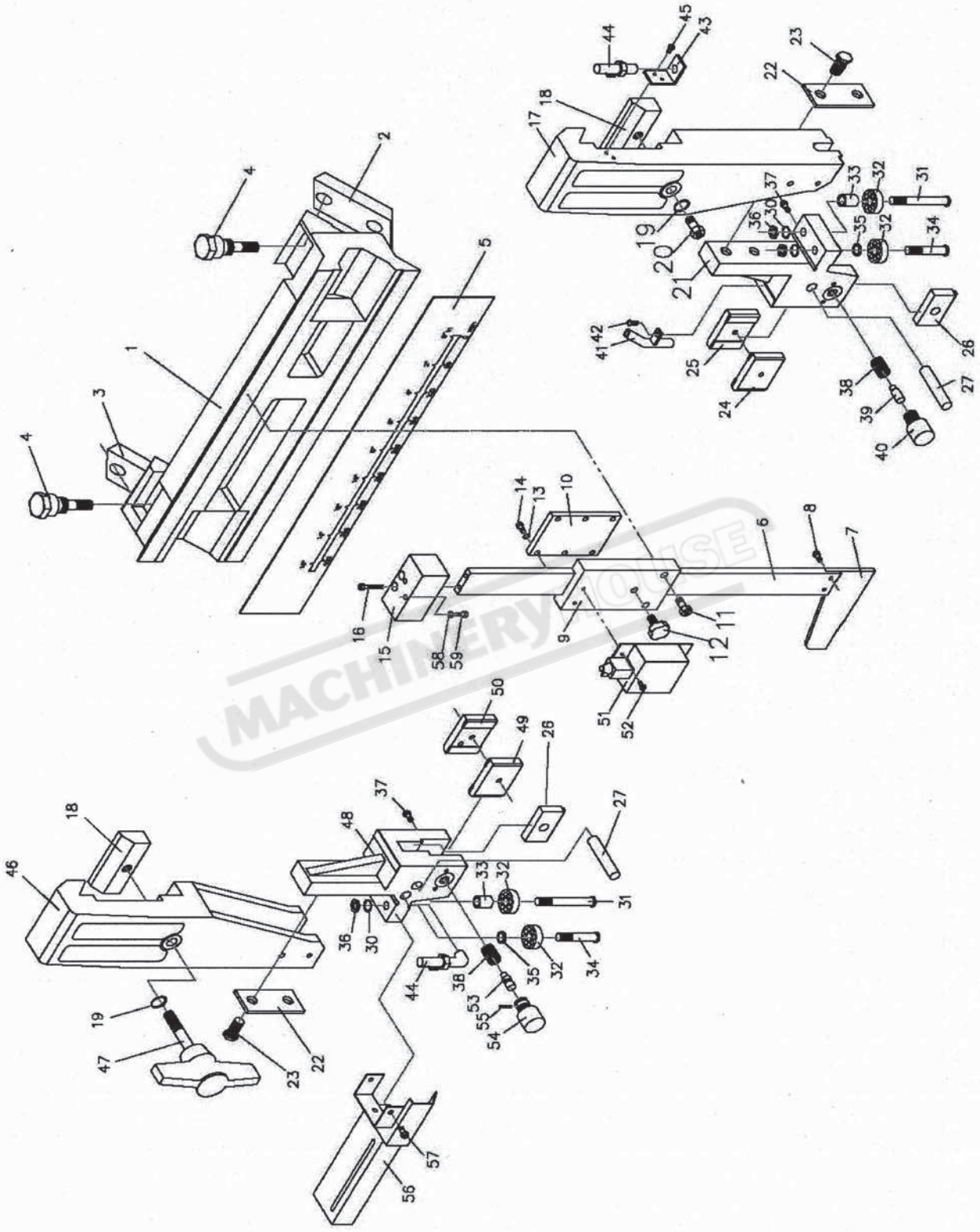


Fig 8 GUIDE BRACKET ASSEMBLY

COSEN

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
8-1	AHC-0738	guide bar	鋸臂滑板		1
8-2	AHA-0439B	slide tip (2)	鋸臂滑板固定塊(二)		1
8-4	AHA-0734	adjusting bolt	滑板調整螺絲		4
8-3	AHA-0439A	slide tip (1)	鋸臂滑板固定塊(一)		1
8-5	AGC-3018	ruler plate	鋸臂滑板銘牌		1
8-6	AHC-1753B	descending slide bar	急降桿		1
8-7	AHA-1755C	feedler	急降桿擋板		1
8-8		bolt	內六角螺絲	M6*10L	2
8-9	AHA-1752	descending slide bracket	急降桿固定座		1
8-10	AHA-1754	cover plate	急降桿座蓋		1
8-11		bolt	內六角螺絲	M10*30L	2
8-12	PP53010	screw	梅花螺絲	M8*20L	1
8-13		spring washer	彈簧華司	M6	3
8-14		bolt	內六角螺絲	M6*12L	3
8-15	AHA-1756	limit block	限動開關座		1
8-16		bolt	內六角螺絲	M6*40L	2
8-17	AHC-0749	right guide bracket	右鋸臂		1
8-18	AHA-0737	slide tip	鋸臂固定塊		2
8-19		spring washer	彈簧華司	M12	1
8-20		bolt	外六角螺絲	M12*75L	1
8-21	AHA-0748B	right insert holder	右導輪座		1
8-22	AHA-0719	plain washer	導輪座墊片		2
8-23		bolt	外六角螺絲	M12*40L	4
8-24	AHA-0743B	right movable insert	右活動鎢鋼片		1
8-25	AHA-0744B	right fixed insert	右固定鎢鋼片		1
8-26	AHA-0704A	Pressure block	下壓鎢鋼片塊座		2
8-27	AHA-0713-1	Shaft	下壓鎢鋼片短軸		2
8-28				Deleted	
8-29				Deleted	
8-30		spring washer	彈簧華司	M10	1
8-31	AHA-0707B	roller pin	導輪軸		2
8-32	PP-14270	bearing	軸承	6200 VV	4
8-33	AHA-0708B	washer	墊圈		2
8-34	AHA-0707C	roller pin	短導輪軸		2
8-35		washer	墊圈	M10	2
8-36		nut	螺帽	M10	4
8-37		bolt	內六角螺絲	M6*20L	2
8-38	AHA-0710	spring	彈簧		2
8-39	AHA-0741	right fitting	右簧塞		1
8-40	AHA-0742	right insert knob	右調整螺絲		1
8-41	AHA-0745	coolant nozzle	冷卻水噴嘴		1
8-42		bolt	內六角螺絲	M5*8L	1
8-43	MJA-2041	bracket	水龍頭座板		1
8-44	PP-43132	coolant valve	開關閥	1/8"	2
8-45		bolt	內六角螺絲	M5*8L	2
8-46	AHC-0722	left guide bracket	左鋸臂		1

Fig 8 GUIDE BRACKET ASSEMBLY

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
8-47	AHA-07259	handle	把手		1
8-48	AHA-0712B	left insert holder	左導輪座		1
8-49	AHA-0702B	left movable insert	左活動鎢鋼片		1
8-50	AHA-0701B	left fixed insert	左固定鎢鋼片		1
8-51		limit switch	限動開關		1
8-52		bolt	內六角螺絲	M5*25L	2
8-53	AHA-0709	left fitting	左簧塞		1
8-54	AHA-0711	adjusting bolt	調整螺絲		1
8-55		pin	銷	φ3*16L	1
8-56	AGC-3020	movable saw blade cover	活動鋸片護蓋		1
8-57		bolt	內六角螺絲	M6*5L	1
8-58		nut	螺帽	M6	1
8-59		bolt	外六角螺絲	M6*35L	1
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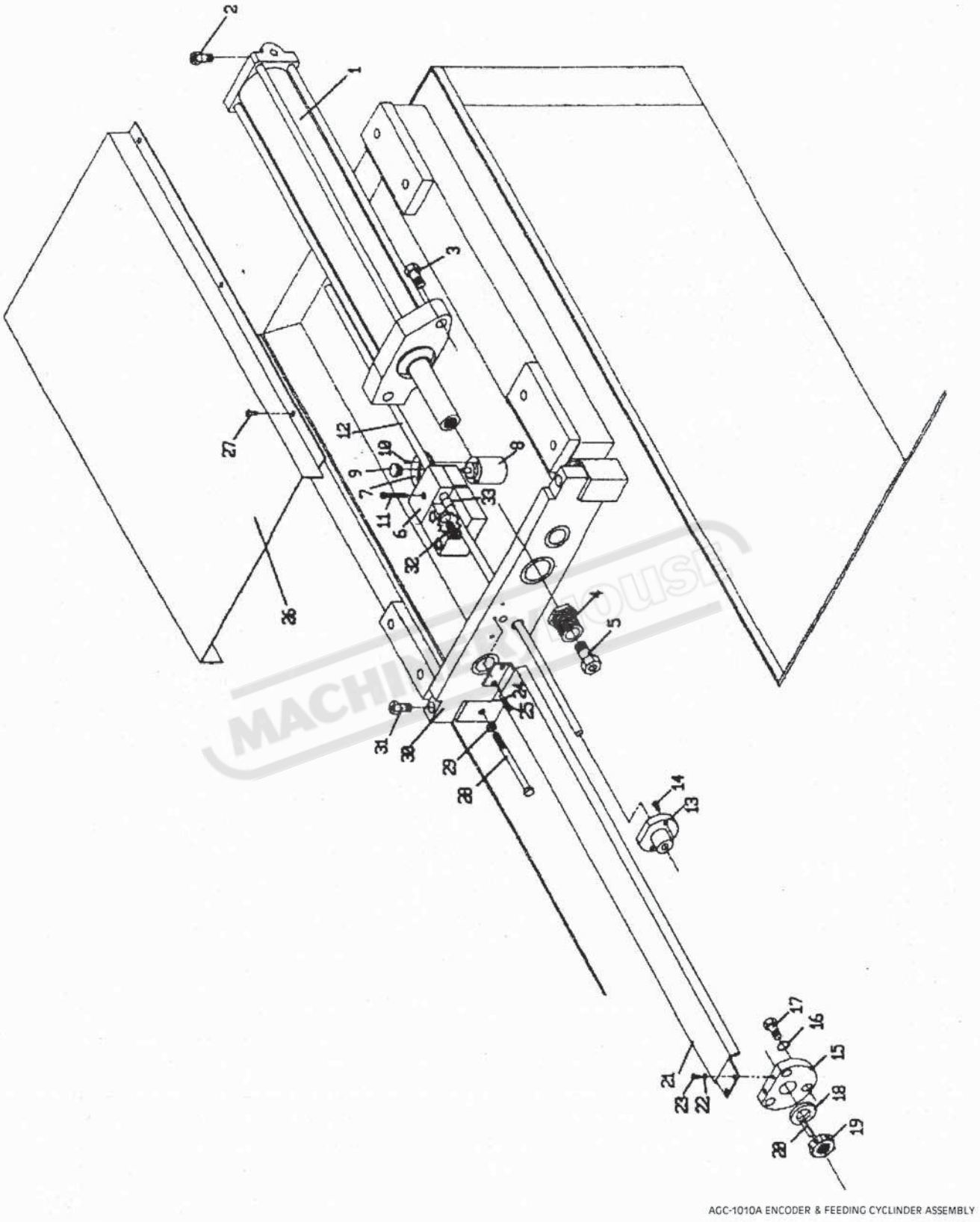

Fig 10 ENCORE & FEEDING CYCLINDER ASSEMBLY

COSEN

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	Q'TY
10-1	AHA-16019-1	feed cylinder	送料油壓缸		1
10-2		bolt	內六角螺絲	M12*30L	1
10-3		bolt	內六角螺絲	M14*25L	2
10-4	AHA-1605	bush bolt	襯套螺絲		1
10-5		bolt	內六角螺絲	M18*60L	1
10-6	AHA-1563	encoder bracket	譯碼器固定座		1
10-7	AHA-1562	movable plate	譯碼器活動板		1
10-8	PP-90492	encoder	譯碼器	LBT-002-2000	1
10-9	AHA-1560	stop gear	定寸齒輪		1
10-10		bolt	內六角螺絲	M3*8L	3
10-11		bolt	內六角螺絲	M6*40L	1
10-12	AHA-1561-1	stop chain	定寸齒條		1
10-13	AHA-1564	encoder bracket (2)	齒排固定座(二)		1
10-14		bolt	內六角螺絲	M5*10L	2
10-15	AHA-1645	bearing holder	軸承座		1
10-16		spring washer	彈簧華司	M12	1
10-17		bolt	內六角螺絲	M12*30L	1
10-18	PP-14430,A,B	bearing	軸承	2035	1PC/EA
10-19	AHA-1643	nut	螺帽		1
10-20		pin	銷	φ5*25L	1
10-21	AHA-1641	cover	定寸螺桿護蓋		1
10-22		spring washer	彈簧華司	M5	2
10-23		bolt	內六角螺絲	M5*12L	2
10-24		spring washer	彈簧華司	M5	2
10-25		bolt	內六角螺絲	M5*12L	2
10-26	AGC-1038	cylinder cover	油壓缸護蓋		1
10-27		bolt	內六角螺絲	M5*8L	6
10-28		bolt	外六角螺絲	M8*100L	1
10-29		nut	螺帽	M8	1
10-30	AHC-1654	set plate	送料軸固定板		1
10-31		bolt	內六角螺絲	M12*50L	2
10-32	M3L-9-10	spring	彈簧		1
10-33	PP-13020	du bushing	乾式軸承	1012	2
10-34					
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10-36					
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Fig 10 ENCORE & FEEDING CYCLINDER ASSEMBLY

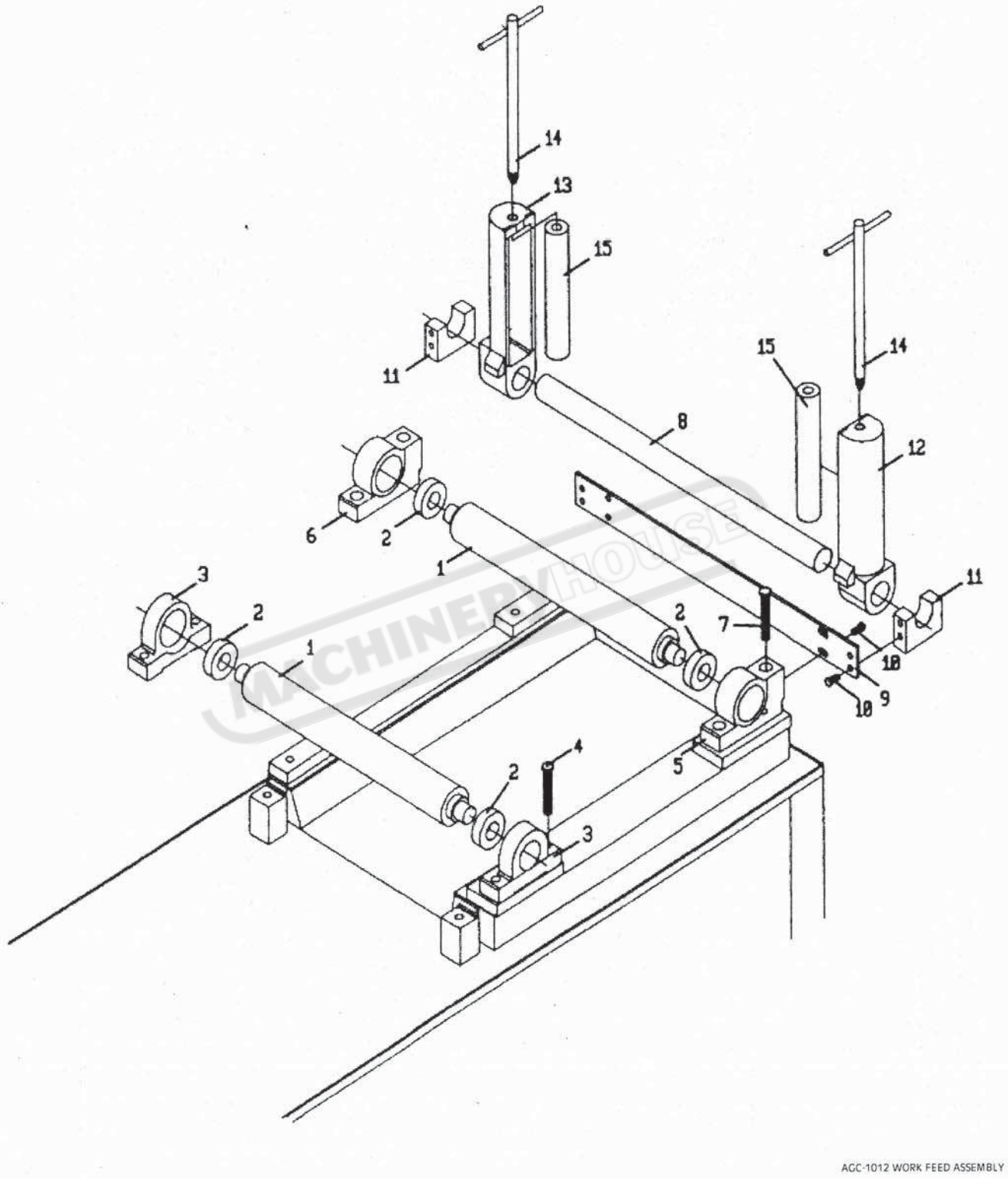

Fig 12 WORK FEED ASSEMBLY

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
12-1	AHB-1654	roller	滾輪		2
12-2	PP-14275	bearing	軸承	6205 ZZ	4
12-3	AHA-1636	roller bracket	滾輪固定座		2
12-4		bolt	內六角螺絲	M12*25L	4
12-5	AHB-1653	right roller bracket	右滾輪固定座		1
12-6	AHB-1691	left roller bracket	左滾輪固定座		1
12-7		bolt	內六角螺絲	M12*25L	4
12-8		guide bar	側滾輪固定軸		1
12-9		stopper plate	側滾輪擋板		1
12-10		bolt	內六角螺絲	M8*25L	8
12-11	AHB-1682	roller bracket	側滾輪固定座		2
12-12	AHB-1687	right roller bracket	右側滾輪座		1
12-13	AHB-1686	left roller bracket	左側滾輪座		1
12-14	AHB-1690	shaft	側滾輪軸		2
12-15	AHB-1688B	roller	側滾輪		2
12-16					
12-17					
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Fig 12 WORK FEED ASSEMBLY

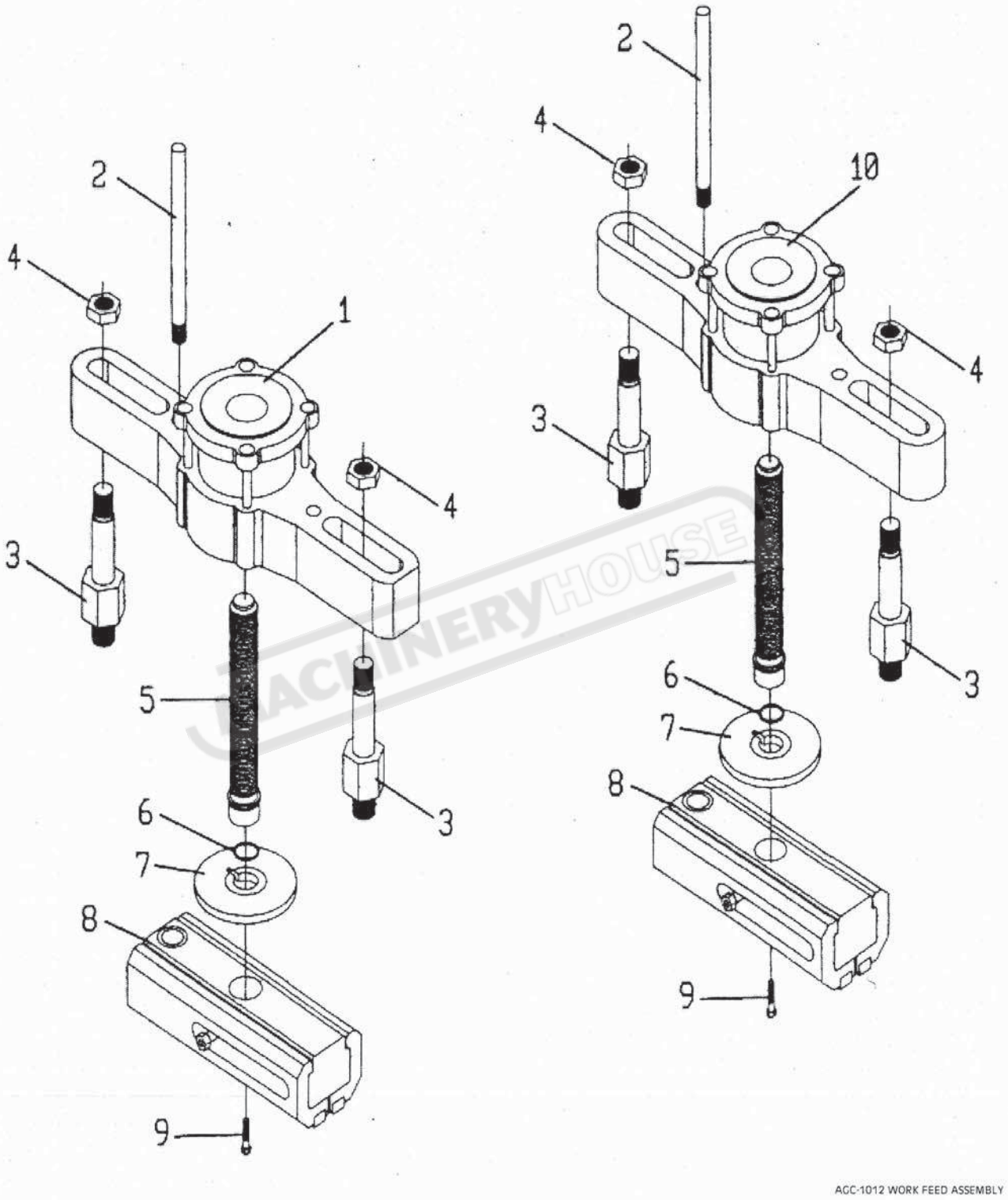

Fig 13 MULTI-VISE (OPTIONAL)

PART LIST

Section 10

NO.	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	Q'TY
13-1	AHC-19038	front multi-vise cylinder	前下壓缸組		1
13-2	AHA-1908	rod	推把		2
13-3	AHA-1905	fixed bolt	固定螺栓		4
13-4		nut	螺帽	M14	4
13-5	AHC-1912	adjusting bolt	下壓調整螺桿		2
13-6		snap ring	扣環	S20	2
13-7	AHA-1923	adjusting handle	調整手輪		2
13-8	AHC-19240	clamper	下壓板組		2
13-9		bolt	內六角螺絲	M8*20L	2
13-10	AHC-19039	rear multi-vise cylinder	後下壓缸組		1
13-11					
13-12					
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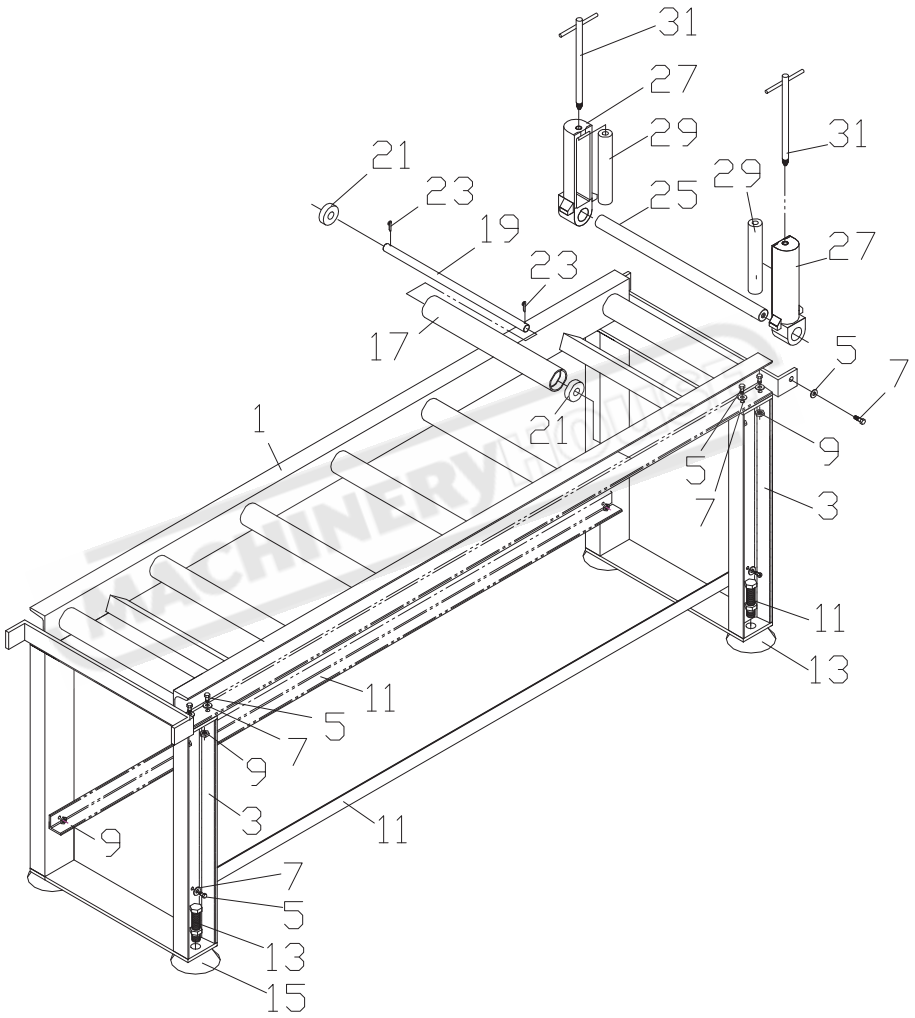
Fig 13 MULTI-VISE (OPTIONAL)

PART P

2M ROLLER TABLE (OPTIONAL)

PART NO : 05OPR-320-2M



PART LIST

PART P
2M ROLLER TABLE (OPTIONAL)
PART NO : 05OPR-320-2M

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	OPR-5002A	roller table	滾輪料架	(440W)	1	PCS
3	PLA-12-20	bolt	外六角螺絲	M12 x 20L	12	PCS
5	PPA-12	washer	平面華司(公)	M12	12	PCS
7	POA-12-175	nut	螺母	M12 xP1.75	8	PCS
9	OPR-5003AA	roller table frame	料架腳	440WX 770H	2	PCS
11	OPR-5004	angle bar	料架腳連桿		2	PCS
13	AHC-0152	adjusting bolt	送料架調整螺桿		4	PCS
15	AHR-1055	base support	底座墊塊		4	PCS
17	OPR-5001A	roller	滾輪	440W	7	PCS
19	OPR-5009A	shaft	滾輪軸	440W	7	PCS
21	PP-14297A	bearing	軸承	6304-ZZ URB	14	PCS
23	PUA-007-140	split pin	開口銷	3/32 x 1-1/2	14	PCS
25	OPR-5008A	side roller shaft	側滾輪滑軸	(440W) (D32*559L)	1	PCS
27	OPR-5015B	side roller bracket	側滾輪座	177L	2	PCS
29	OPR-5013B	roller	側滾輪	172L	2	PCS
31	OPR-5014B	shaft	側滾輪軸及把手	265L	2	PCS

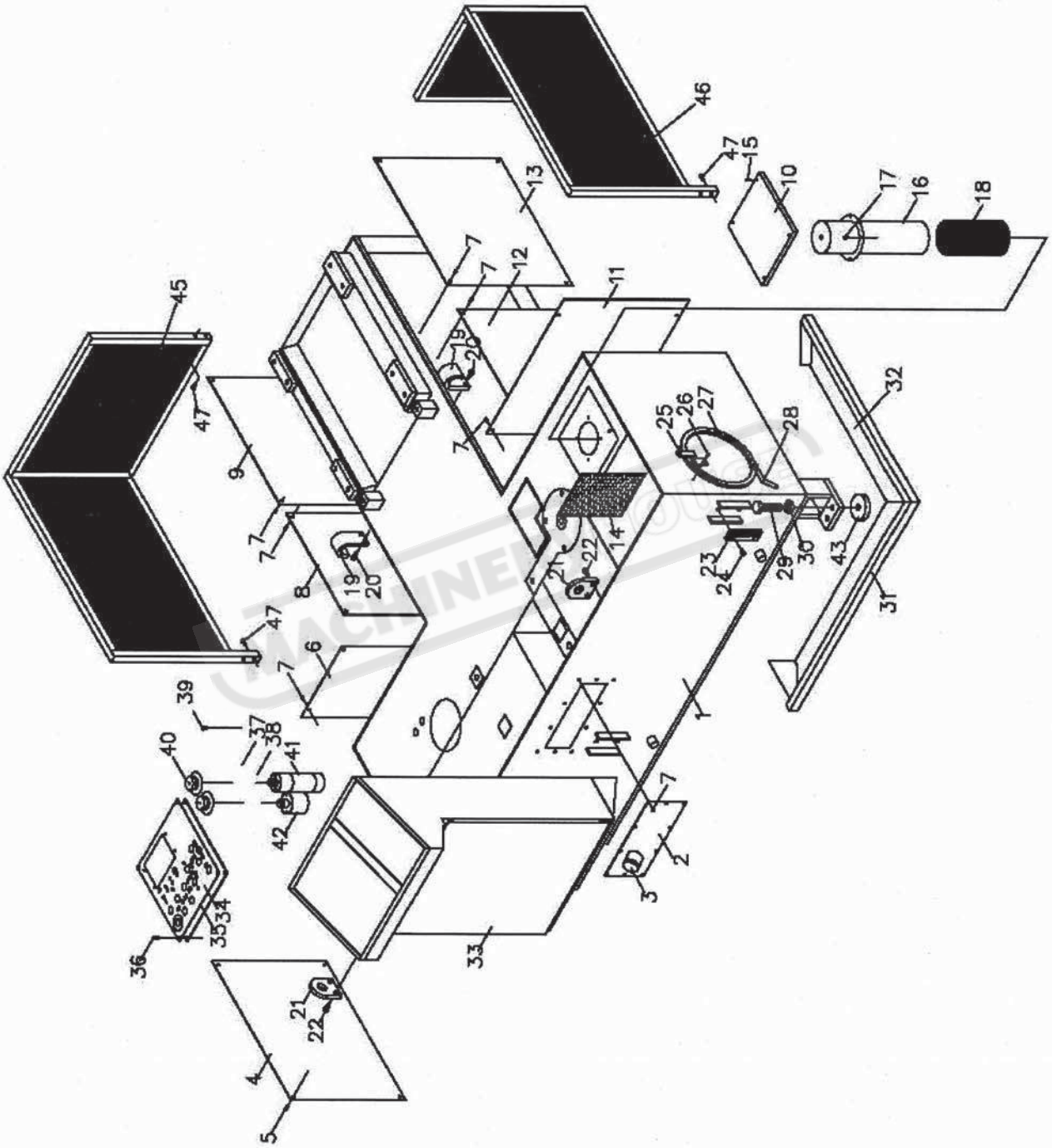


Fig 15 MACHINE FOUNDATION ASSEMBLY(FOR CE)

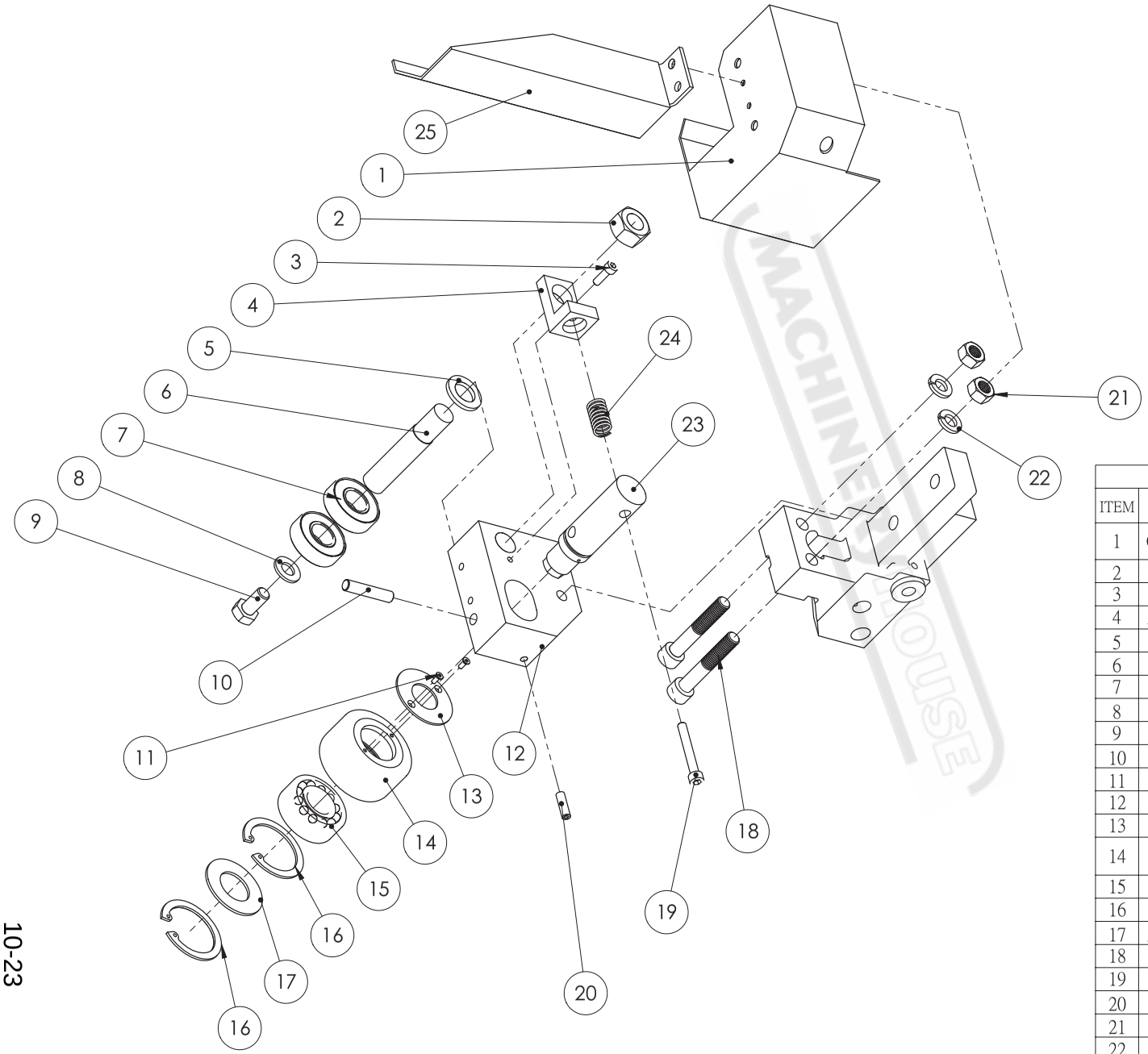
COSEN

PART LIST

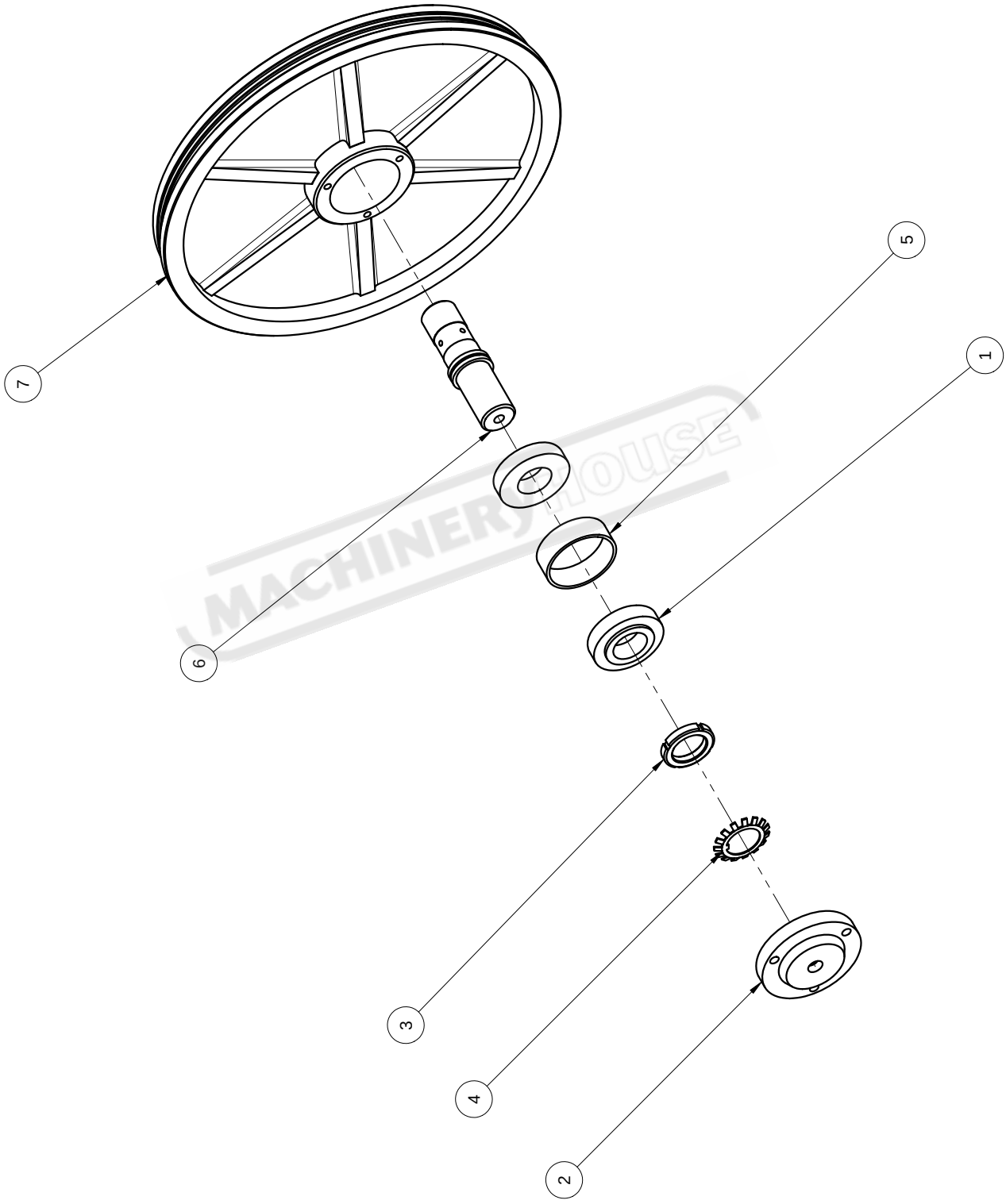
Section 10

NO.	PART NO.	PART NAME	PART NAMEI N CHINESE	PART SPEC.	QTY
1-1	AGC-1001	base seat	底座		1
1-2	AHA-0102	oil tank cover	油箱蓋		1
1-3	PP-90857	cap	油箱蓋螺帽		1
1-4	AGC-1057A	left elec.box cover	左電氣箱蓋		1
1-5		screw	丸頭螺絲	M6*6L	4
1-6	AGC-1054	left rear cover	底座左後蓋		1
1-7		screw	丸頭螺絲	M6*5L	34
1-8	AGC-1052	left cover	底座左蓋		1
1-9	AGC-1053	side cover	底座邊蓋		1
1-10	AGC-1059	coolnat pump cover	水邦浦護蓋		1
1-11	AGC-1050A	right rear cover	底座右後蓋		1
1-12	AGC-1051	right cover	底座右蓋		1
1-13	AGC-1053	side cover	底座邊蓋		1
1-14	AHA-0138	filter	水箱通道濾網		1
1-15		bolt	內六角螺絲	M5*5L	4
1-16	PP-32081	pump	浸水泵浦	1/8HP*210L	1
1-17		bolt	外六角螺絲	M6*10L	4
1-18	AHA-0131	filter	浸水泵浦濾網		1
1-19	AHC-0160	hanger	吊耳(三)		2
1-20		bolt	外六角螺絲	M10*20L	4
1-21	AHC-0161	hanger	吊耳(四)		2
1-22		bolt	外六角螺絲	M10*20L	4
1-23	PP-21030	oil level gauge	油面計	3"	2
1-24		bolt	螺絲		4
1-25	AHA-1309	bracket	軟管架		1
1-26		bolt	內六角螺絲	M6*6L	2
1-27		cable duct	護管	3/8*1000L	1
1-28	AHA-1313	nozzle	噴嘴		1
1-29	AHC-0153	adjusting bolt	底座調整螺絲		6
1-30		nut	螺帽	M20	6
1-31	AHC-1503-NC	right front plate	右前擋板		1
1-32	AHC-1504-NC	right side plate	右側擋板		1
1-33	AHC-0131-CE	elec.box	電氣箱		1
1-34	AGC-1040B	elec.data plate	控制面板		1
1-35	AGC-1041B	control plate	控制底板		1
1-36		screw	丸頭螺絲	M8*8L	4
1-37	AHC-0134-CE	elec.data plate	控制面板		1
1-38	AHC-0135-CE	control plate	控制底板		1
1-39		screw	丸頭螺絲	M8*8L	4
1-40	AHA-1806	vernier dial	流量閥旋鈕		2
1-41	AHA-10289	regulator set	調壓閥		1
1-42	AHA-6100	folw control valve	流量控制閥		1
1-43	AHR-1055	base support	底座墊塊		6
1-44					
1-45	AGC-1048E			Only for CE	1
1-46				Only for CE	1
1-47		Bolt			6

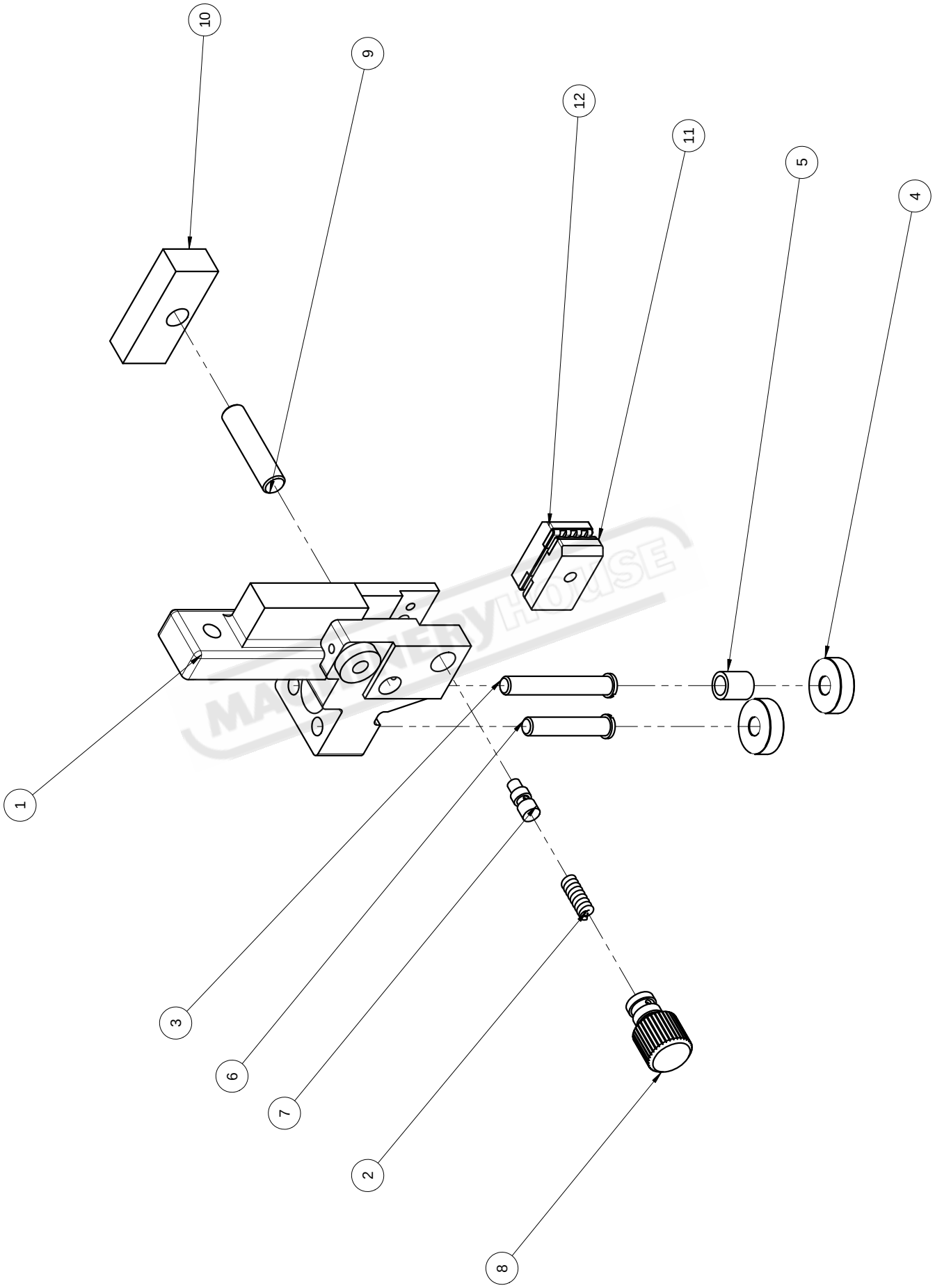
Fig 15 MACHINE FOUNDATION ASSEMBLY(FOR CE)



C320H-42000 防震滾輪組					
ITEM	PART NO	PART NAME	PART NAME IN CHINESE	PART SPEC	QTY
1	C320H-4202	Vibration damper cover	防震滾輪護蓋		1
2	POA-16	Nut	螺母(公)	M16xP2.0	1
3	PBA-5-16	Hex soc cap screw	有頭內六角螺絲(公)	M5xP0.8x16	1
4	AGB-3306N	Spring holder	防震彈簧座		1
5	PPA-16	Flat washer	平面華司(公)	∅16	1
6	AHA-3305	Shaft	固定導輪軸		1
7	PP-14267	Bearing	軸承	6203	2
8	PPA-10	Flat washer	平面華司(公)	∅10	2
9	PLA-10-20	Hexagon bolt	外六角螺絲(公)	M10xP1.5x20	1
10	PRD-8-40	Pin	平行銷	∅8x40	1
11	PCA-3-8	Flat screw	平頭內六角螺絲(公)	M3xP0.5x8	2
12	AHA-3303	Vibration damper seat	防震座		1
13	AGB-3308	Rubber ring	遮水橡皮		1
14	AHA-3301	Vibration damper roller	防震導輪		1
15	PP-14507	Bearing	調心軸承	2204	1
16	PP-58111	Snap ring	扣環	R47	2
17	AGB-3307A	Grease cover	牛油擋		1
18	PBA-10-60	Hex soc cap screw	有頭內六角螺絲(公)	M10xP1.5x60	2
19	PBA-6-45	Hex soc cap screw	有頭內六角螺絲(公)	M6xP1.0x45	1
20	PAA-6-20	Set screw	止付螺絲(公)	M6xP1.0x20	1
21	POA-10	Nut	M10螺帽	M10xP1.5	2
22	PQA-10	Spring washer	彈簧華司(公)	∅10	2
23	AHA-3302	Roller shaft	防震導輪軸		1
24	PP-57403	Spring	彈簧	TH-1625	1
25	C320H-3013	Blade cover	鋸帶護蓋(防震用)		1



上輪組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	PP-14613	Ball bearing	滾珠軸承		2	
2	SHA-04140	Idle wheel shaft cover	上輪軸蓋		1	
3	PP-14907	Fixed nut	固定螺母	AN07	1	
4	PP-14957	Stop ring	止動環	AW07	1	
5	AHA-0637	Idle wheel bearing washer	上輪軸承墊圈		1	
6	AHA-0635	Idle wheel shaft	上輪軸		1	
7	AHA-0634B	Idle wheel	上輪		1	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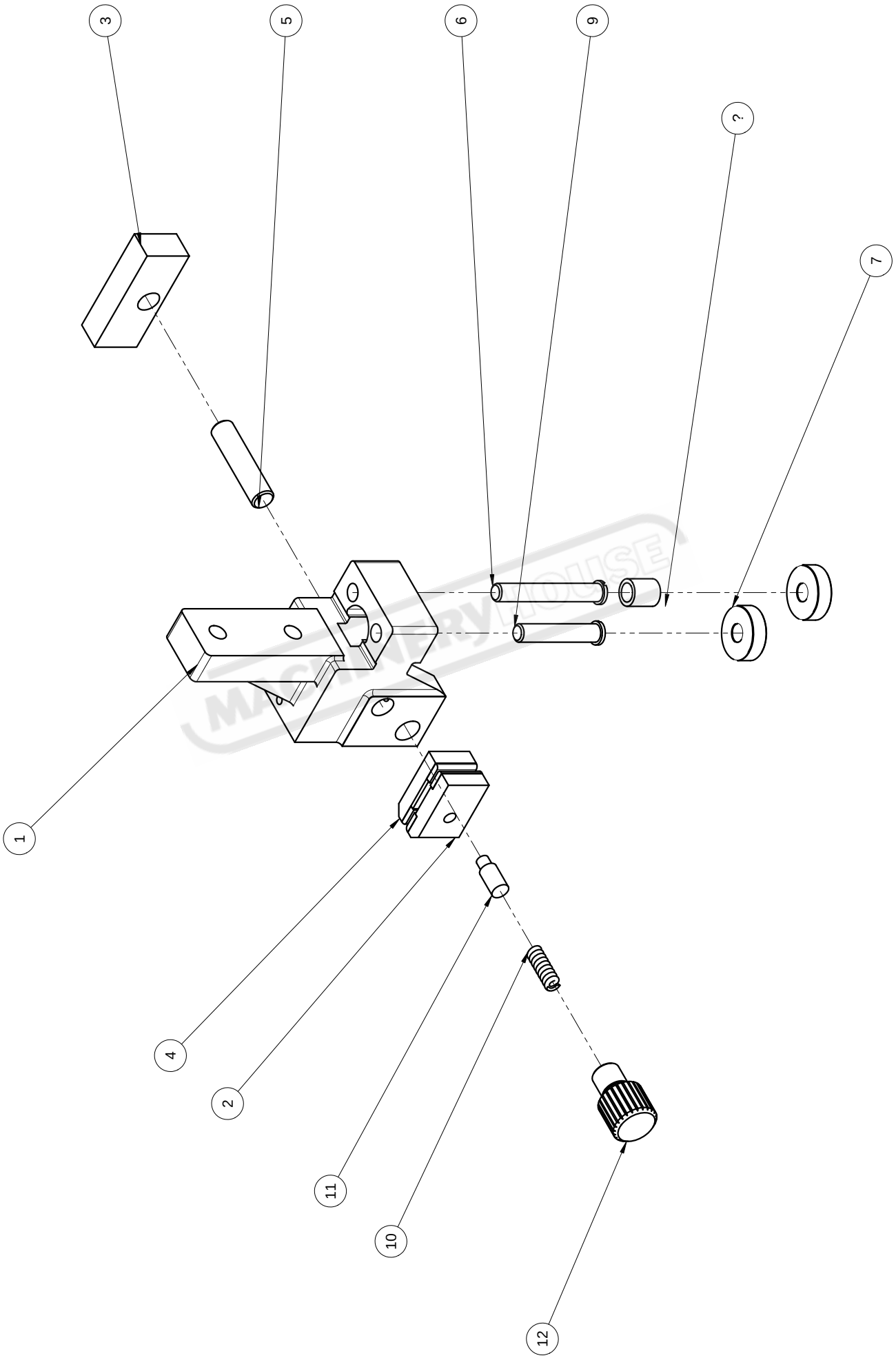
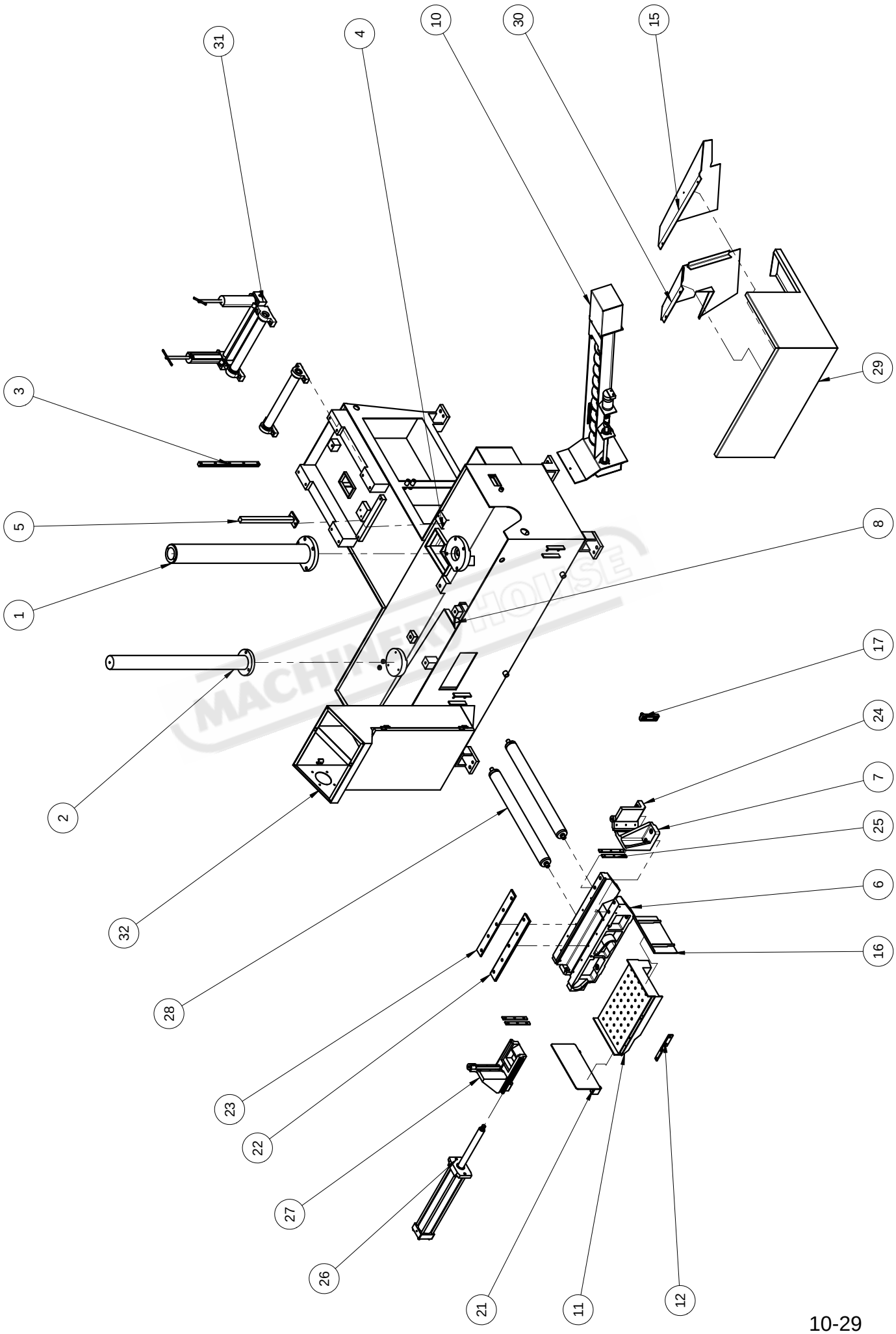
右導輪座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHA-0712B	Left guide roller seat	左導輪座		1	
2	AHA-0710	Carbide insert spring	彈簧(鎢鋼片)		1	
3	AHA-0707B	Guide roller shaft	導輪軸		1	
4	PP-14270B	Bearing	軸承	6200	2	
5	AHA-0708B	Washer	導輪墊圈		1	
6	AHA-0707C	Guide roller shaft(3)	導輪軸(三)		1	
7	AHA-0709	Left spring plug	左簧塞		1	
8	AHA-0711A	Adjusting screw-left	左調整螺絲		1	
9	AHA-0713-1	Ficed shaft	軸承座固定銷		1	
10	AHA-0704A	Pressure block	下壓座		1	
11	AHA-0702B	Left movable insert	左活動鎢鋼片		1	
12	AHA-0701B	Left fixed insert	左固定鎢鋼片		1	

C-320NC 左導輪座組 SERIES PART LIST 2018/10/19



左導輪座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHA-0748B-S2	Right guide roller seat	右導輪座		1	
2	AHA-0743B	Right movable insert	右活動鎢鋼片		1	
3	AHA-0704A	Pressure block	下壓座		1	
4	AHA-0744B	Right fixed insert	右固定鎢鋼片		1	
5	AHA-0713-1	Ficed shaft	軸承座固定銷		1	
6	AHA-0707B	Guide roller shaft	導輪軸		1	
7	PP-14270B	Bearing	軸承	6200	2	
8	AHA-0708B	Washer	導輪墊圈		1	
9	AHA-0707C	Guide roller shaft(3)	導輪軸(三)		1	
10	AHA-0710	Carbide insert spring	彈簧(鎢鋼片)		1	
11	AHA-0741	Rigjt spring plug	右簧塞		1	
12	AHA-0742	Adjusting screw-right	右調整螺絲		1	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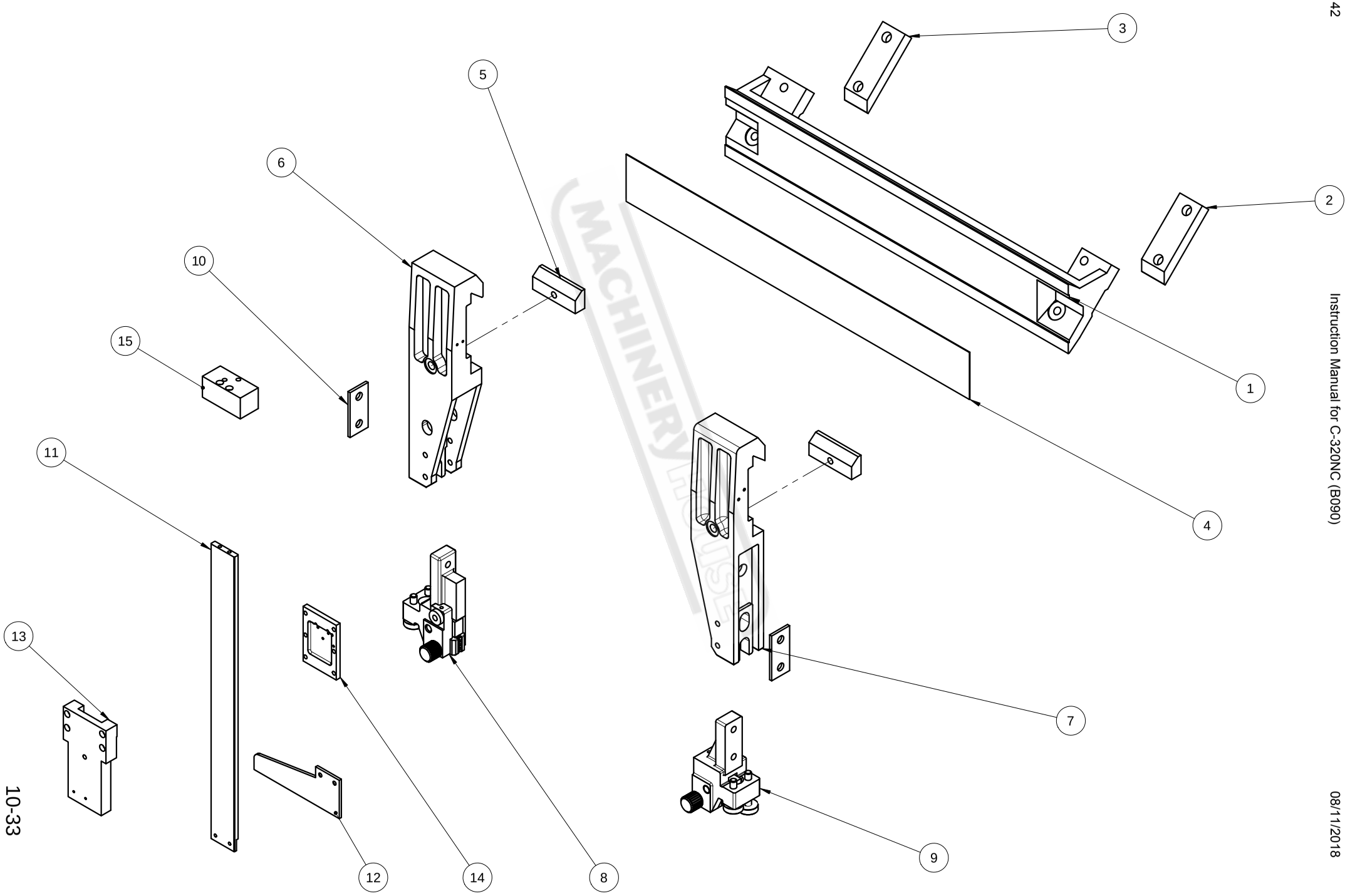
底座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AGC-1010	Main shaft	大主軸		1	
2	AGC-1011	Sub shaft	小主軸		1	
3	C320G-21000	Height encoder assembly	高度驛碼器		1	
4	AGC-1034-NC	fixed block	中限固定塊		1	
5	AHK-1905-NC	Base plate	中限固定座		1	
6	AHC-0201	Bed	床面		1	
7	AHC-0230	Front fixed vise 2	前固定虎鉗(二)		1	
8	C320H-1001	Base	底座		1	
9	C320H-4009	Fixed bracket	除屑機固定板		1	
10	C320H-40000-1	Chip conveyor assembly	除屑機組 (整組外購)		1	
11	AGC-1035	Bracket	托架		1	

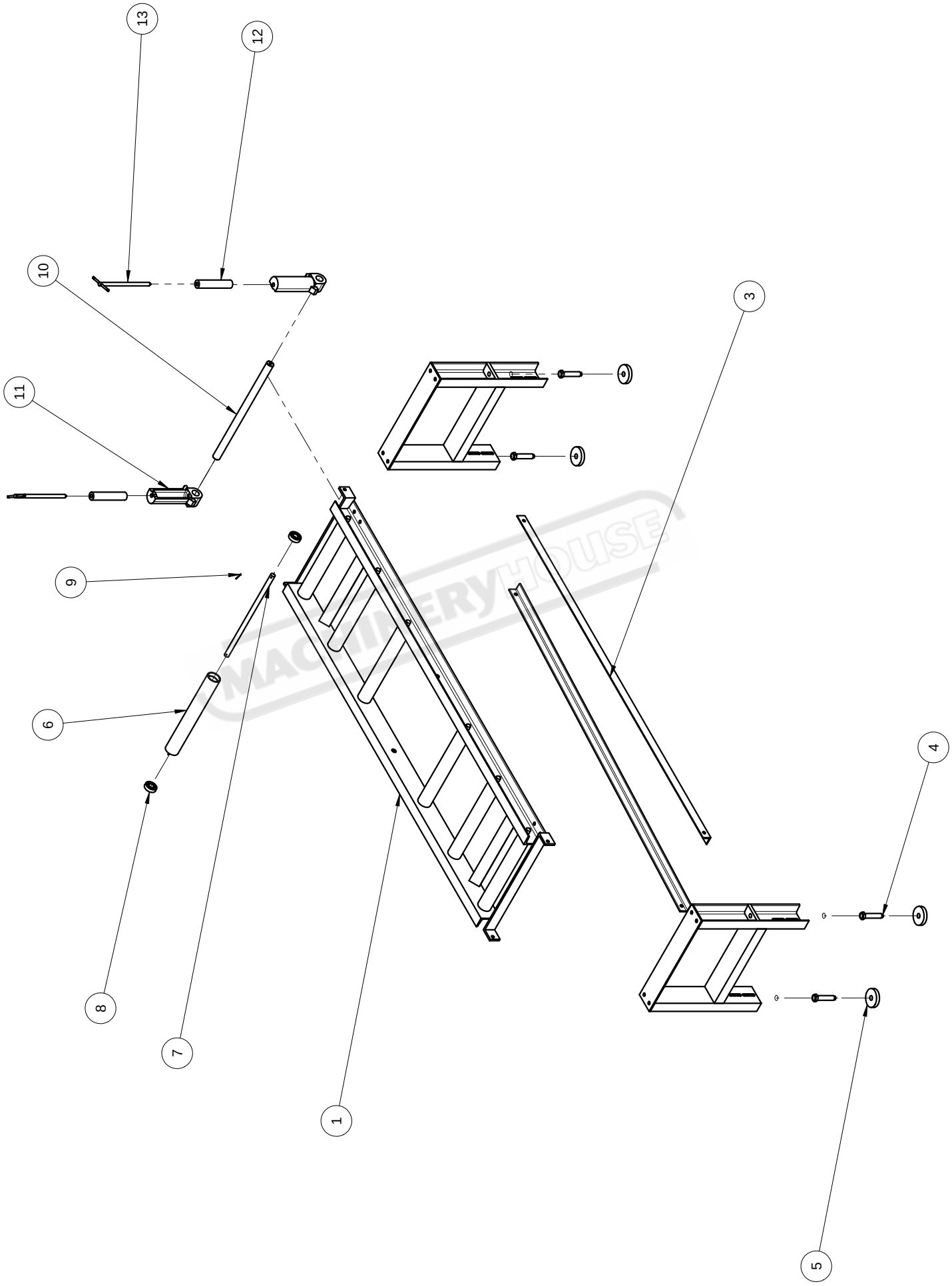
底座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
12	AHC-1437	Supporter	托架支持板		1	
13	C320H-4008		前導屑板		1	
14	C320H-1504B		右側擋板		1	
15	C320H-1045	Catchment plate	集水板-2		1	
16	AHC-1424	Right bracket	托架右板		1	
17	PP-21030	Oil sight gauge	油面計	3"	1	
18	C320H-1043A	Catchment plate	集水板		1	
19	C320H-2009A	Chip collector	集屑板		1	
20	C320H-1042	Catchment plate	集水板		1	
21	AHC-1423-CE	Left bracket	托架左板		1	
22	AHC-0234A	Bed steel plate	床面鋼板(一)		1	

底座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
23	AHC-0234B	Bed steel plate	床面鋼板(二)		1	
24	AHC-0229	Front fixed vise 1	前固定虎鉗(一)		1	
25	AHC-0239D	Vise steel plate	虎鉗鋼板		4	
26	AGC-2300	Vise hydraulic cylinder	虎鉗油壓缸組		1	
27	AHC-0223-NC	Front movable vise	前活動虎鉗		1	
28	AHA-1601B	Feeding shaft	送料軸		2	
29	AGC-1058-CE		除屑擋板		1	
30	C320H-1044	Catchment plate	集水板-1		1	
31		Feeding roller assembly	送料滾輪座組		1	
32	AHC-0131-CE	Control box	控制箱		1	



活動鋸臂組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHC-0738	Guide arm sliding plate	鋸臂滑板		1	
2	AHA-0439B	Guide arm sliding plate	鋸臂滑板固定塊(二)		1	
3	AHA-0439A	Guide arm sliding plate	鋸臂滑板固定塊(一)		1	
4	AGC-3018	Saw arm sliding board	鋸臂滑板銘牌		1	
5	AHA-0737	Guide arm fixed block	鋸臂固定塊		2	
6	AHC-0722	Left guide arm	左鋸臂		1	
7	AHC-0749	Right guide arm	右鋸臂		1	
8		Right guide roller assembly	右導輪座組		1	
9		Left guide roller assembly	左導輪座組		1	
10	AHA-0719	Spacer	導輪座墊板		2	

活動鋸臂組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
11	AHC-1753B	Descending slide bar	急降桿		1	
12	AHA-1755C	Feedler	急降桿擋板		1	
13	AHA-1752	Descending slide bracket	急降桿固定座		1	
14	AHA-1754	Cover plate	急降桿座蓋		1	
15	AHA-1756	Limit block	限動開關座		1	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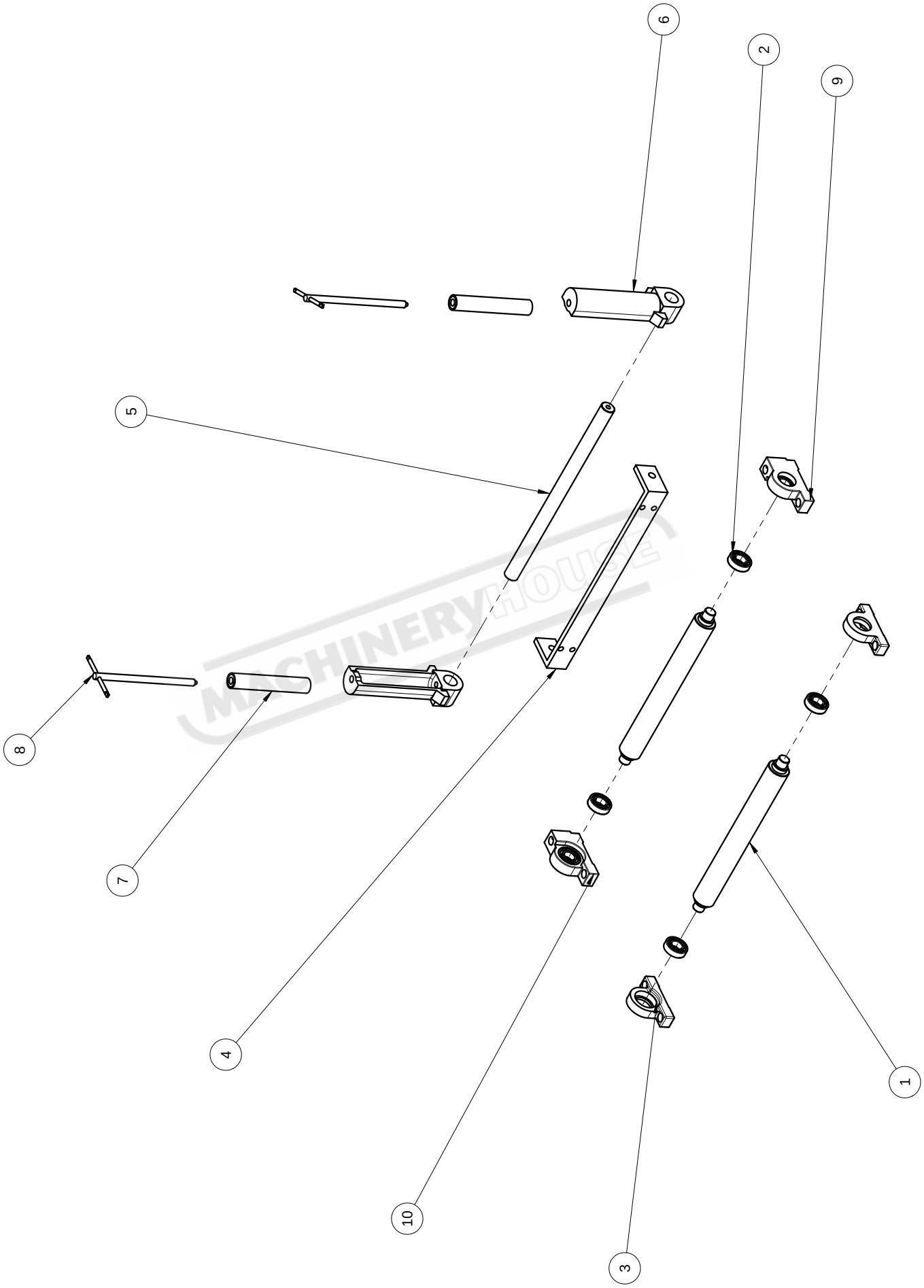
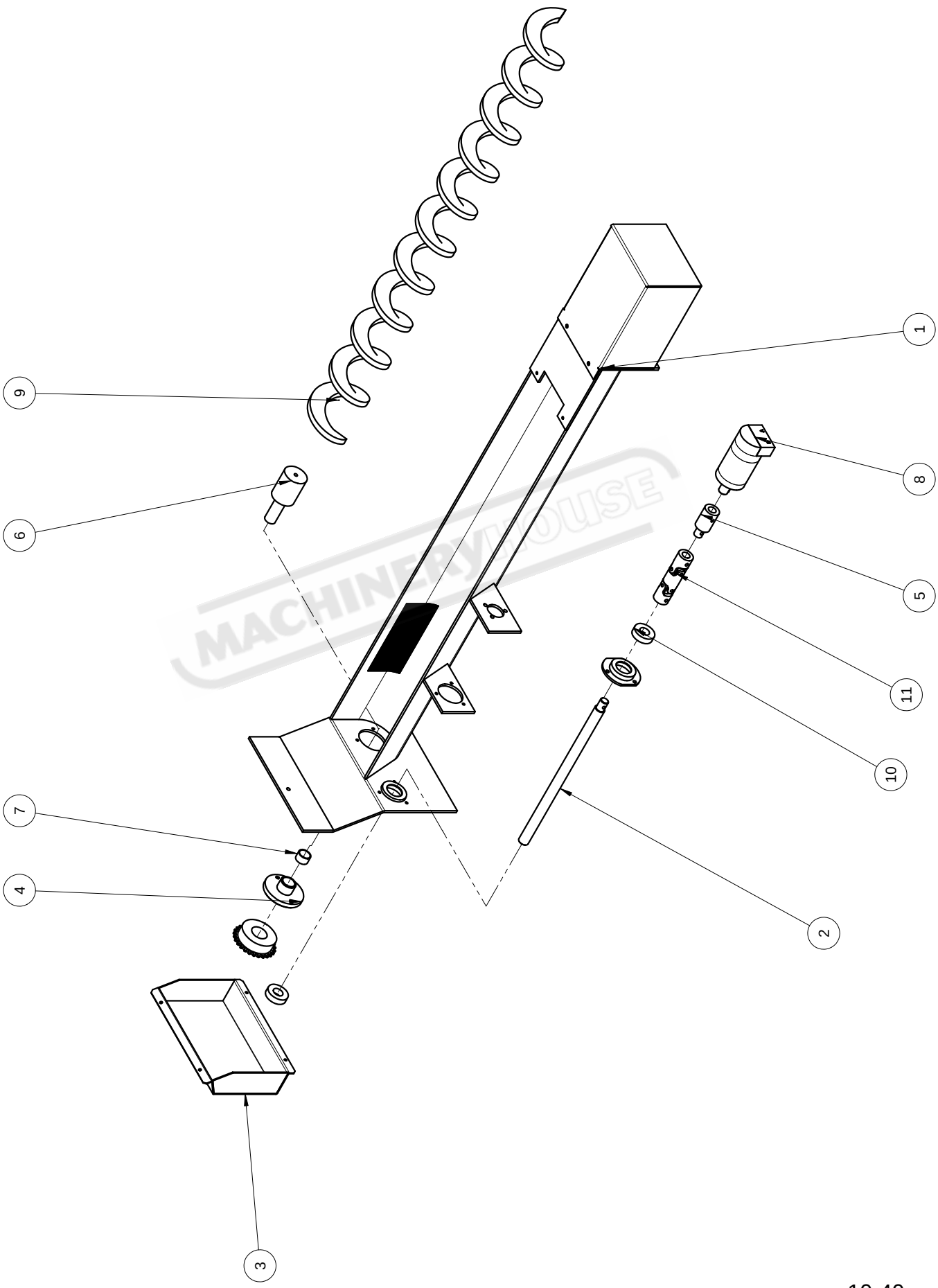
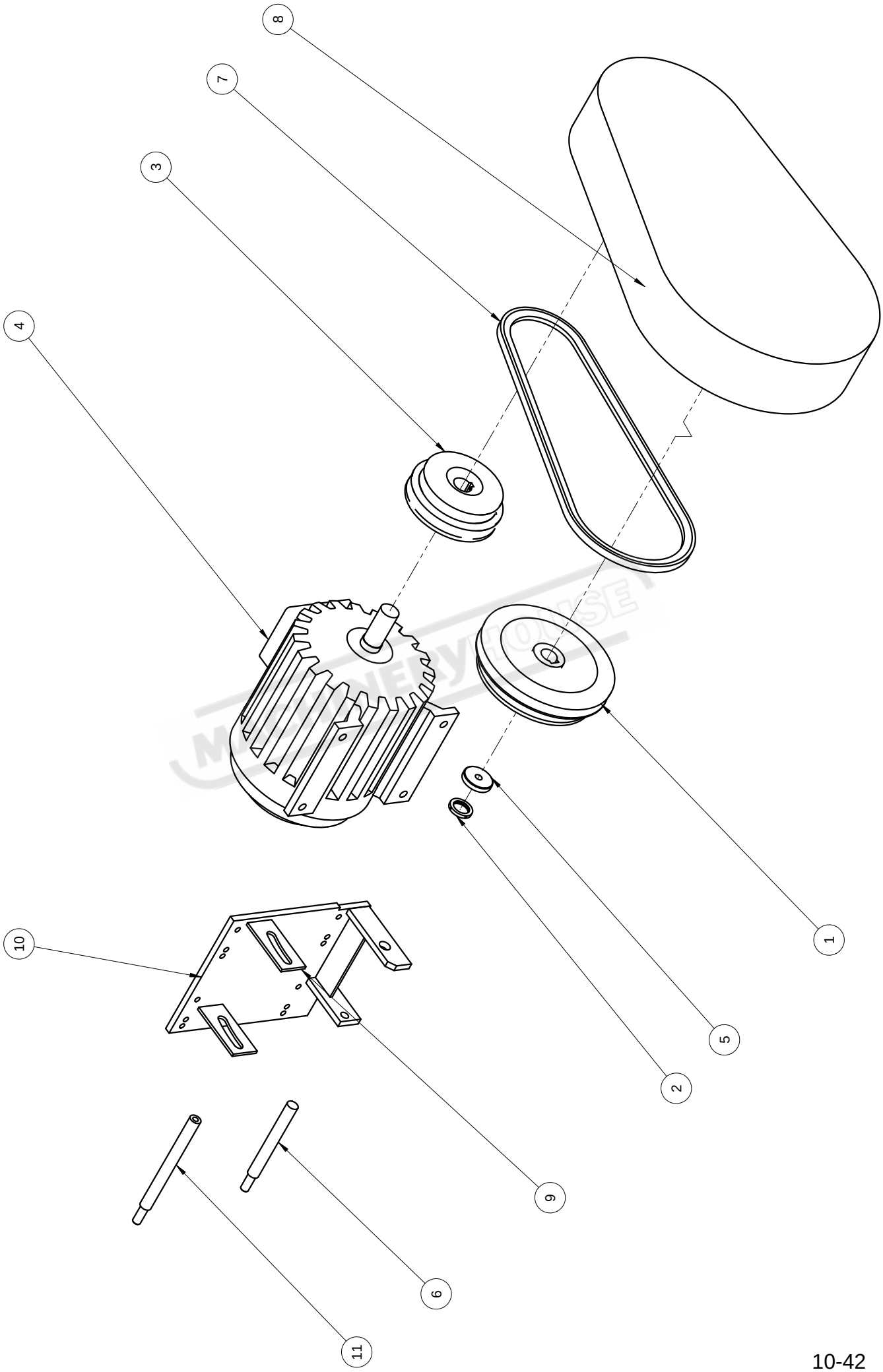
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	RC4460-5002	Roller frame	滾輪料架		1	
2	RC4460-5003		固定腳架		2	
3	RC4460-5004	Roller table foot connecting rod	料架腳連桿		2	
4	AHC-0152	Table stand adjusting rod	送料架調整螺桿		4	
5	AHR-1055	Table stand pad	底座墊塊		4	
6	RC4460-5001	Roller	滾輪		7	
7	OPR-5009A	Roller shaft	滾輪軸		7	
8	PP-14297A	Bearing	軸承	6304	14	
9	PUA-007-140	Split pin	開口銷		14	
10	OPR-5008A	Vertical roller sliding shaft	側滾輪滑軸		1	
11	OPR-5015B	Vertical roller seat	側滾輪座		2	
12	OPR-5013B	Vertical roller	側滾輪		2	
13	OPR-5014B	Vertical roller shaft	側滾輪軸及把手		2	



送料滾輪座組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHB-1654A	Roller	滾輪		2	
2	PP-14275	Bearing	軸承		4	
3	AHA-1636	Roller fixed seat	滾輪固定座		2	
4	AGC-1064	Side roller stopper	側滾輪擋板		1	
5	AGC-1065	Vertical roller sliding shaft	側滾輪滑軸		1	
6	OPR-5015B	Vertical roller seat	側滾輪座		2	
7	OPR-5013C	Vertical roller	側滾輪		2	
8	OPR-5014B	Vertical roller shaft	側滾輪軸及把手		2	
9	AHB-16530	Roller fixed seat(right)	滾輪固定座(右)		1	
10	AHB-16560	Roller fixed seat(left)	滾輪固定座(左)		1	



除屑機組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	C320H-40000-1	Chip conveyor body	除屑機本體		1	
2	AHN-1403	Core shaft	傳動心軸		1	
3	AHN-1407A		鏈齒蓋板		1	
4	AHN-1411	Shsft seat	軸座		1	
5	AHN-1414	Connecting shaft	連接軸		1	
6	C520H-4051	Chip screw rod	除屑螺桿		1	
7	PP-13119	Bearing	自潤軸承	2215	1	
8	PP-31640-1	Hydraulic motor	油壓馬達	MMS-32C	1	
9	S1713-4003C	Chip spiral	除屑螺旋		1	
10	PP-14252	Bearing	軸承	6004ZZ	2	
11	PP-15031	Universal joint	萬向接頭		1	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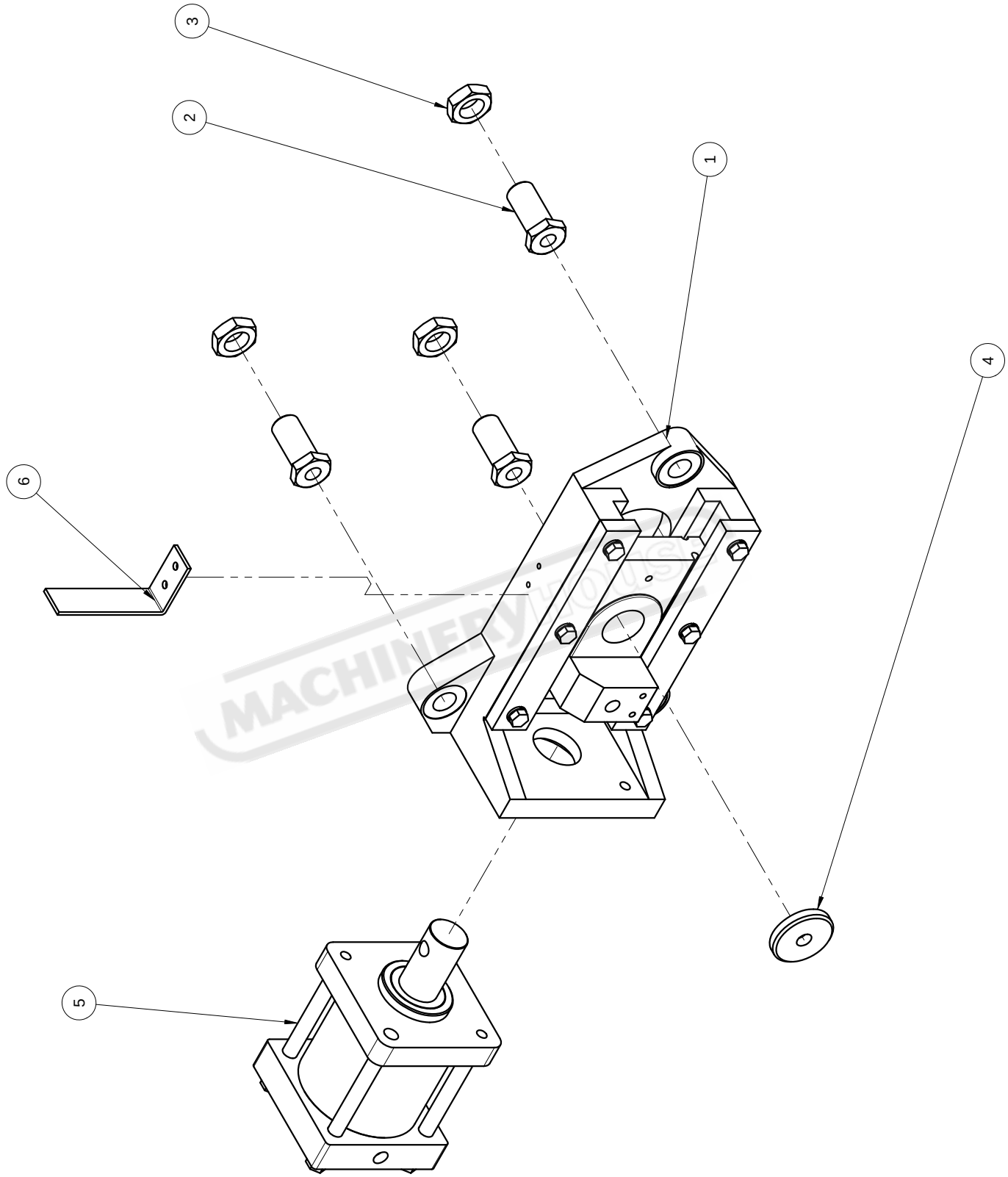
馬達組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHA-0514G	Transmission puley	減速機普利		1	
2	MAE-2025	Idle wheel shaft washer	上輪軸墊圈		1	
3	AHA-0538G	Motor belt wheel	馬達皮帶輪		1	
4	PBH5-D414-C	Motor	馬達		1	
5	AHA-0525	Washer	墊圈		1	
6	AHA-0515	Motor movable shaft	馬達活動軸		1	
7	PP-56287	Belt	皮帶		1	
8	AHC-0501	Pulley cover	普利護蓋		1	
9	AHA-0510B		馬達底板耳		2	
10	AHR-2027	Pulley cover	馬達底板		1	
11	AHA-0526	Motor position shaft	馬達定位軸		1	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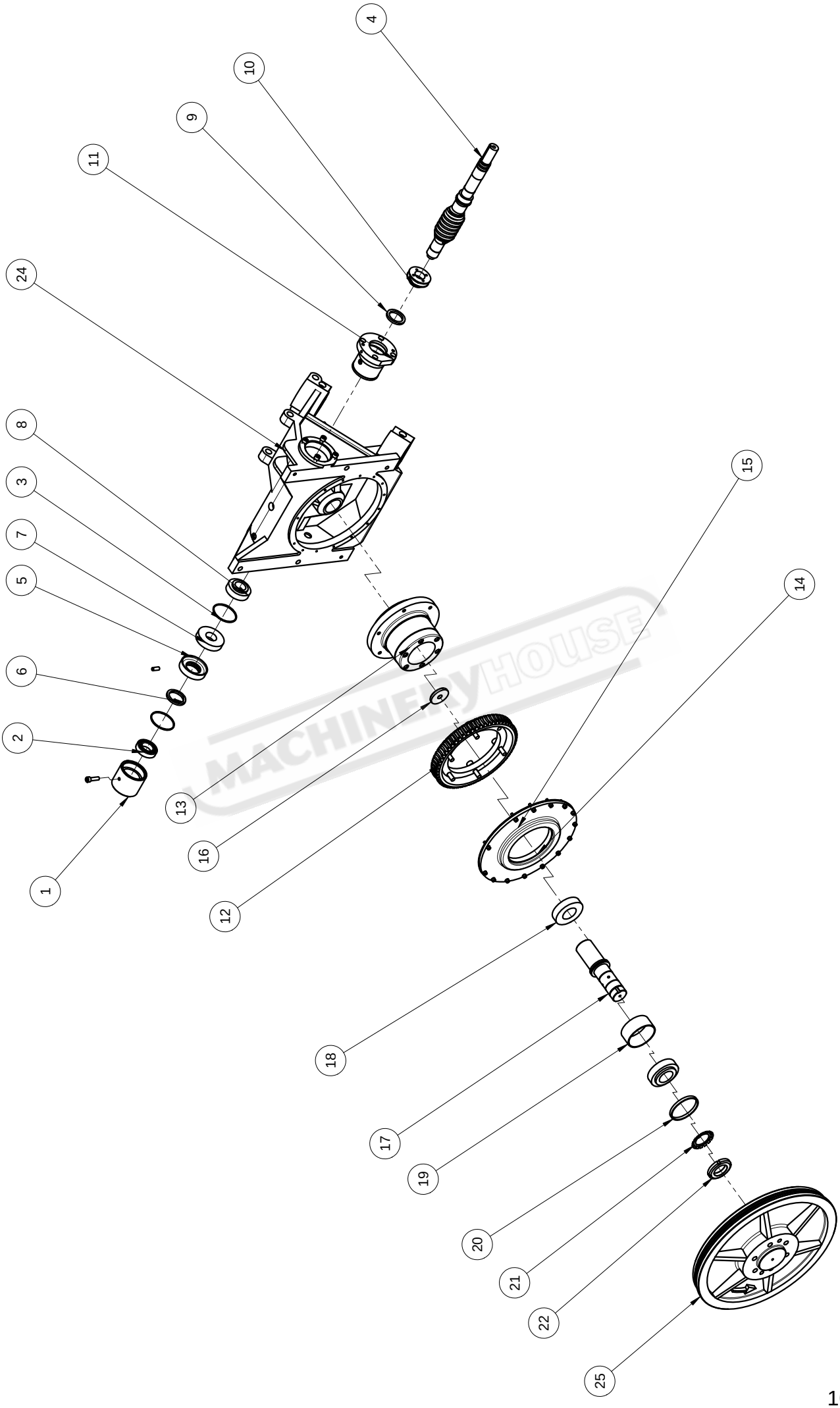
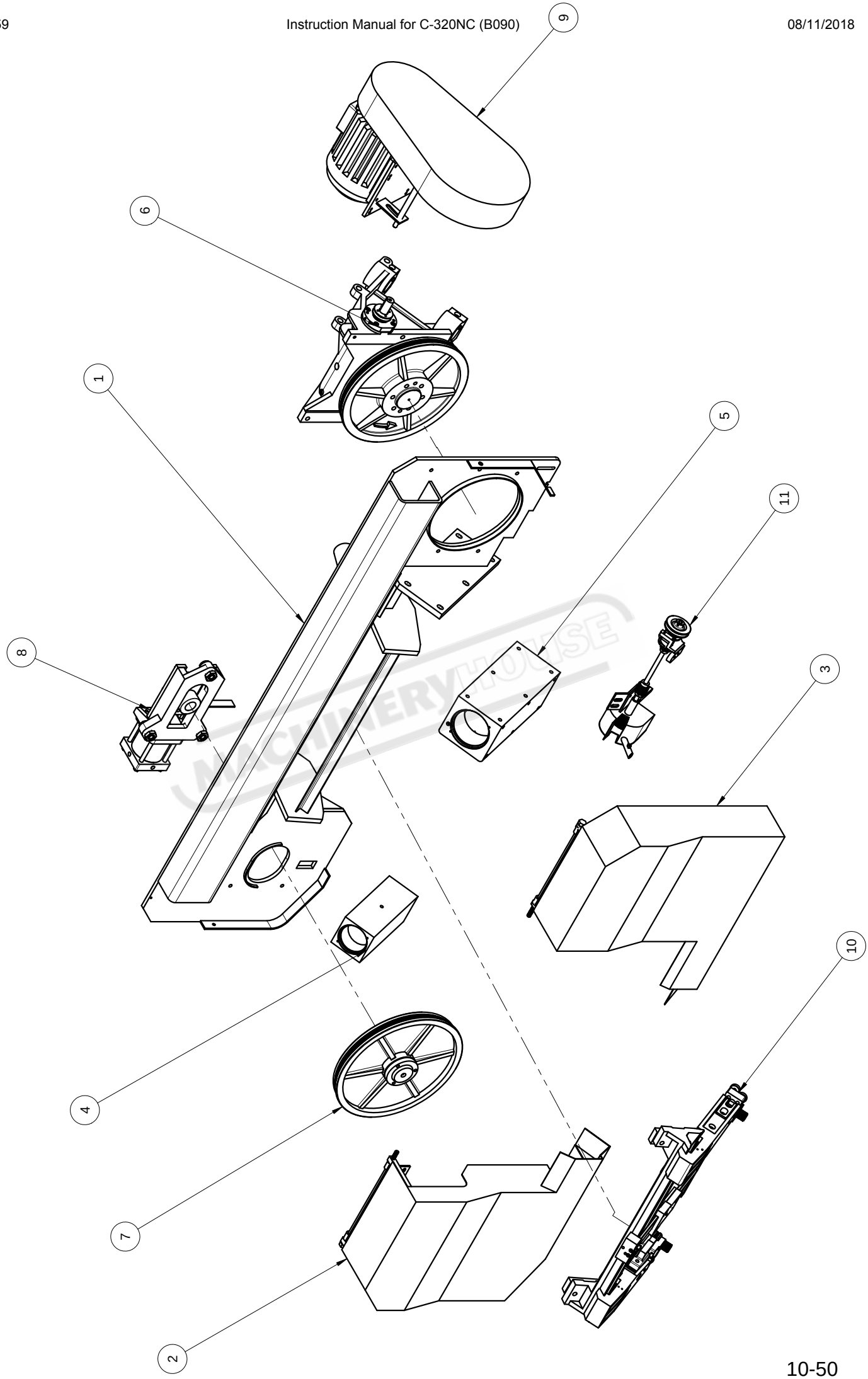
張力滑座滑板組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHA-06029	Tensioner sliding plate	張力滑座滑板組		1	
2	AHA-0610	Adjusting screw	調整螺絲		3	
3	AHA-0611	Adjusting nut	調整螺母		3	
4	AHA-0403	Washer	下輪鎖緊墊圈		1	
5	AHA-06189-1	Tensioner cylinder assembly	張力油壓缸組		1	
6	AHA-0670A	Sensor seat	感應器底板座		1	



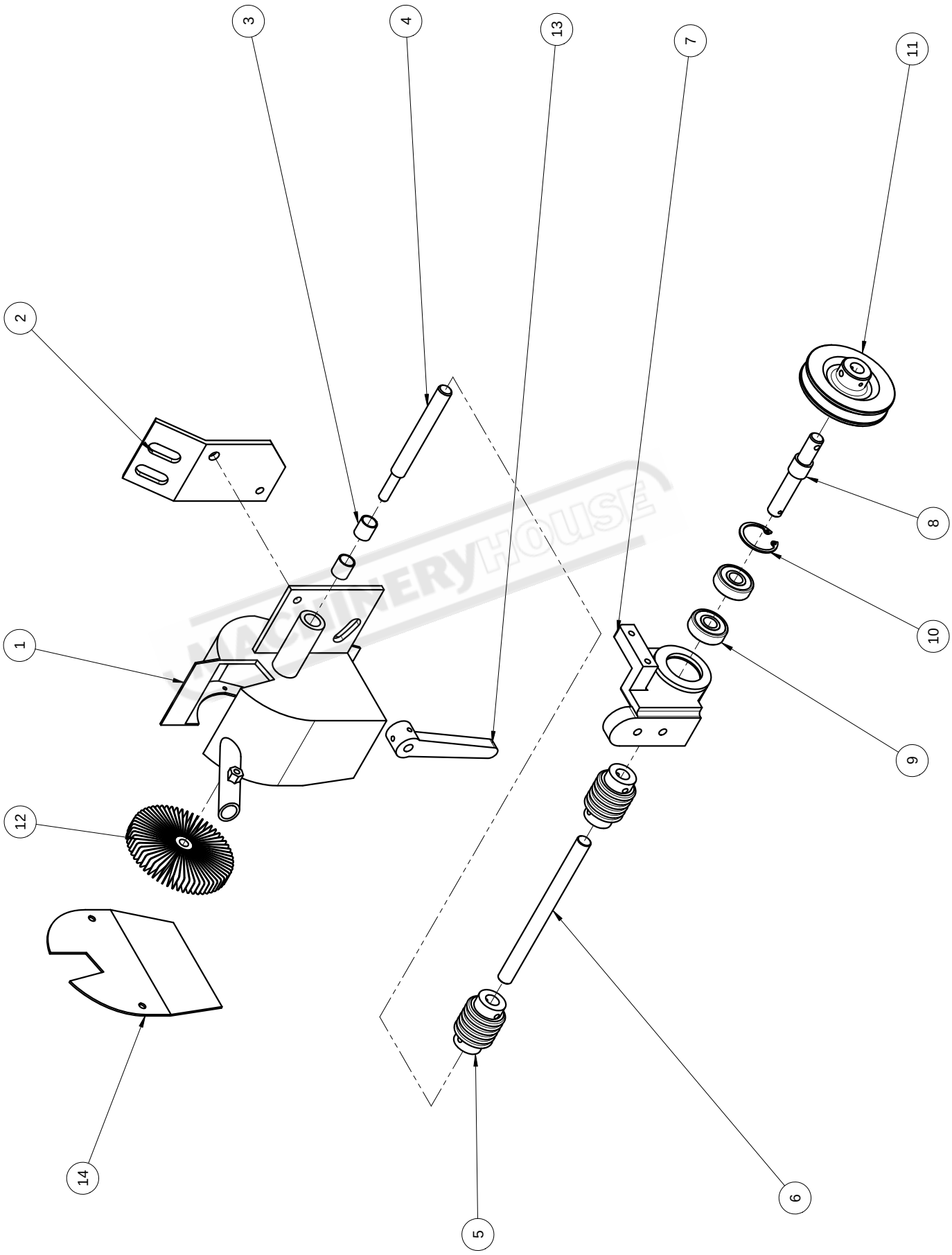
減速機組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AHA-0326	Fixed seat (2)	固定座(二)		1	
2	PP-14142A	Bearing	軸承	6006ZZ	1	
3	PP-58103	Interlock	扣環	R62	2	
4	AHA-0305	Worm gear	蝸桿		1	
5	AHA-0314	Fixed seat cover	固定座蓋		1	
6	PP-51080	Oil seal	油封		1	
7	PP-14652	Ball bearing	滾錐軸承	30306D	1	
8	PP-14691	Ball bearing	滾錐軸承	32206	1	
9	PP-51070	Oil seal	油封		1	
10	AHA-0320	Wire brush pulley	鋼刷普利		1	
11	AHA-0319	Fixed seat (1)	固定座(一)		1	

減速機組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
12	AHA-0404	Worm gear	蝸桿		1	
13	C250H-3365	Worm gear seat	蝸輪固定座		1	
14	PP-51090A	Oil seal	油封		1	
15	AHA-0433A	Oil fixed plate	油封固定盤		1	
16	AHA-0403	Washer	下輪鎖緊墊圈		1	
17	AHA-0407	Drive wheel shaft	下輪軸		1	
18	PP-14693B	Ball bearing	滾錐軸承	32208	2	
19	AHA-0431	Bearing washer	軸承墊圈		1	
20	AHA-0429	Adjusting ring	調整環		1	
21	PP-14958	Stop ring	止動環		1	
22	PP-14908	Fixed nut	固定螺母	AN08	1	

減速機組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
23	AHA-0454	Rubber washer	橡膠墊圈		1	
24	AGC-3008	Gear reducer body	減速機本體		1	
25	AHA-0416B	Drine wheel	下輪		1	



鋸弓組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AGC-3001	Saw bow	鋸弓		1	
2	AGC-3002A	Idle wheel cover	上輪箱蓋		1	
3	AGC-3003A	Drive wheel cover	下輪箱蓋		1	
4	AGC-3010	Sub shaft sleeve	小軸套		1	
5	AHP-1801A	Main shaft sleeve	大軸套		1	
6		Gear reducer assembly	減速機組		1	
7		Idle wheel assembly	上輪組		1	
8		Tensioner sliding plate	張力滑座滑板組		1	
9		Motor assembly	馬達組		1	
10		Saw arm assembly	鋸臂組		1	
11		Wire brush assembly	鋼刷除屑組		1	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鋼刷組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
1	AGC-3025	Wire brush cover	鋼刷護蓋		1	
2	C320H-3246	Brush cover fixed plate	鋼刷護蓋固定板		1	
3	PP-13025	DU bearing	乾式軸承	1215	2	
4	AHB-0519	Wire brush shaft	鋼刷軸		1	
5	PP-15010	Universal joint	萬向接頭	12M/M	2	
6	AGC-3026	Wire brush transmission shaft	鋼刷傳動桿		1	
7	AHA-12110-1	Wire brush bearing seat	鋼刷軸承座組		1	
8	AHA-1207	Belt wheel shaft	皮帶輪軸		1	
9	PP-14272	Bearing	軸承	6201V	2	
10	PP-58109	Snap ring	扣環	R32	1	
11	AHA-1202	Belt wheel	鋼刷皮帶輪		1	

鋼刷組						
ITME	PART NO.	PART NAME	PART NAME CHINESE	PART SPEC.	QTY	NOTE
12	PP-58002	Wire btush	鋼刷	90mm*8mm*16T	1	
13	AHA-1217	Wire brush fixed handle	鋼刷調整桿		1	
14	AHA-1220-2	Wire brush cover plate	鋼刷護蓋板		1	

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