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S3

COSEN SAWS

V2026NC

Vertical Semi-Automatic Hydraulic Dual Miter Cutting Bandsaw

Instruction Manual

The Pinnacle of Cutting Performance

Cosen Mechatronics Co., Ltd.

FROM THE MANUFACTURER

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

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

To ensure you are fully utilizing our machine and taking advantage of it in every possible way, please take your time to read through this instruction manual.

Any comments or suggestions in making our services 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 procedures.

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

For Taiwan and other countries:
email: service@cosen.com.tw
phone: +886-3-5519700
fax: +886-3-5519705
web: www.cosen.com

For US, Mexico, and Canada:
email: info@cosensaws.com
phone: +1-704-943-1030
fax: +1-704-943-1031
web: www.cosensaws.com

Instruction Manual: **V2026NC**
Vertical Semi-Automatic Hydraulic Dual Miter Cutting Bandsaw
Ver.3 2023/7/20

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Safety rules

- **It's essential to power on your bandsaw machine for at least one hour every two years, if you seldomly use the machine.**
  (This period of power-on must be without proceeding with other operation) Otherwise the machine program may disappear due to not strictly follow this safety rule.

****The restoration-service fee for improper use will be extra charge. Please note.****

- 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.

Safety rules

- 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 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.

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

Do not operate this machine unless it is completely assembled.

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

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

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).

Keep your work area well illuminated at minimum 500 lumen.

Work area defines as full machine capacity area

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

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

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.

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.

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

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

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

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

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

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

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

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

Keep unauthorized personnel away.

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)
7. Chip conveyor cover
8. Tensioner wheel housing cover

***For safety purpose, the safeguard device such as cover and fence can't be removed in any circumstances**

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

Safety distances to prevent access by upper limbs

The figure shows the case that will be analyzed:

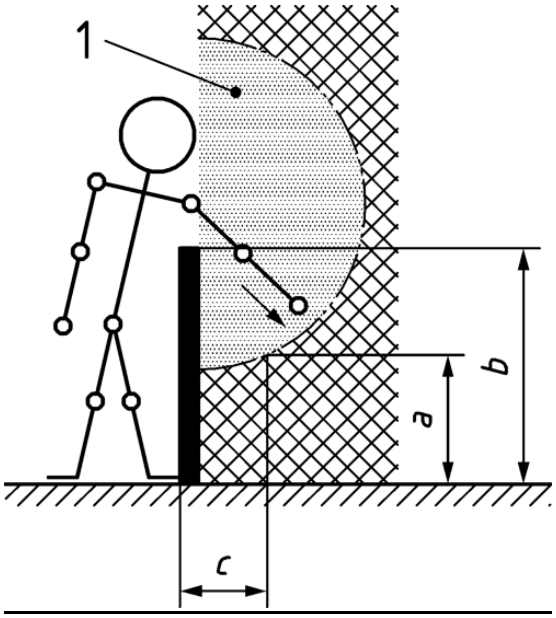
1. Hazard zone

a. Height of hazard zone

b. Height of protective structure

c. Horizontal safety distance to hazard zone

As the level above which people normally stand during the use of the machine or from which they have access to the Hazard Zone. It is necessary to evaluate the risk associated with the hazard zone.



Height of hazard zone [c] *a*	Height of protective structure [a, b] *b*									
	1 000	1 200	1 400	1 600	1 800	2 000	2 200	2 400	2 500	2 700
	Horizontal safety distance to hazard zone, *c*									
2 700	0	0	0	0	0	0	0	0	0	0
2 600	900	800	700	600	600	500	400	300	100	0
2 400	1 100	1 000	900	800	700	600	400	300	100	0
2 200	1 300	1 200	1 000	900	800	600	400	300	0	0
2 000	1 400	1 300	1 100	900	800	600	400	0	0	0
1 800	1 500	1 400	1 100	900	800	600	0	0	0	0
1 600	1 500	1 400	1 100	900	800	500	0	0	0	0
1 400	1 500	1 400	1 100	900	800	0	0	0	0	0
1 200	1 500	1 400	1 100	900	700	0	0	0	0	0
1 000	1 500	1 400	1 000	800	0	0	0	0	0	0
800	1 500	1 300	900	600	0	0	0	0	0	0
600	1 400	1 300	800	0	0	0	0	0	0	0
400	1 400	1 200	400	0	0	0	0	0	0	0
200	1 200	900	0	0	0	0	0	0	0	0
0	1 100	500	0	0	0	0	0	0	0	0

Table 1 — Reaching over the vertical detection zone of electro-sensitive protective equipment

Dimensions in millimetres

Height of hazard zone *a*	Height of upper edge of the detection zone of the electro-sensitive protective equipment *b*											
	900	1 000	1 100	1 200	1 300	1 400	1 600	1 800	2 000	2 200	2 400	2 600
	Additional distance to hazard zone C_{RO}											
2 600[a]	0	0	0	0	0	0	0	0	0	0	0	0
2 500	400	400	350	300	300	300	300	300	250	150	100	0
2 400	550	550	550	500	450	450	400	400	300	250	100	0
2 200	800	750	750	700	650	650	600	550	400	250	0	0
2 000	950	950	850	850	800	750	700	550	400	0	0	0
1 800	1 100	1 100	950	950	850	800	750	550	0	0	0	0
1 600	1 150	1 150	1 100	1 000	900	850	750	450	0	0	0	0
1 400	1 200	1 200	1 100	1 000	900	850	650	0	0	0	0	0
1 200	1 200	1 200	1 100	1 000	850	800	0	0	0	0	0	0
1 000	1 200	1 150	1 050	950	750	700	0	0	0	0	0	0
800	1 150	1 050	950	800	500	450	0	0	0	0	0	0
600	1 050	950	750	550	0	0	0	0	0	0	0	0
400	900	700	0	0	0	0	0	0	0	0	0	0
200	600	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0

When a value of zero is given, the calculation of the minimum distance, S, should be made in accordance with 6.2 to 6.4.

NOTE 1 Electro-sensitive protective equipment with a height of the

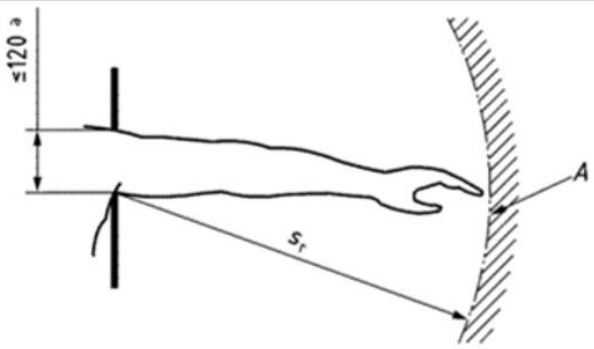
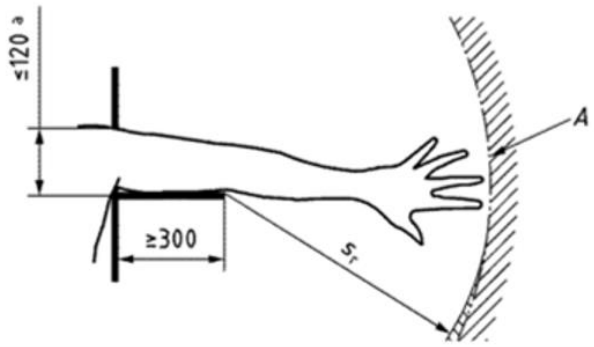
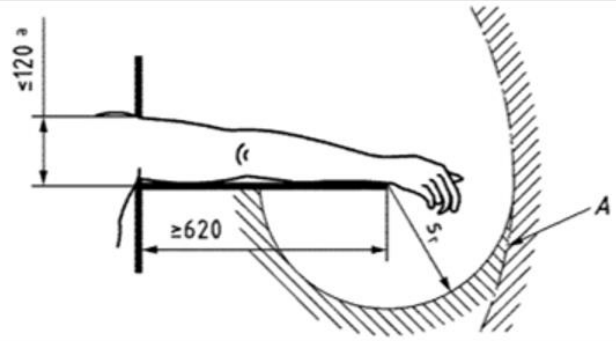
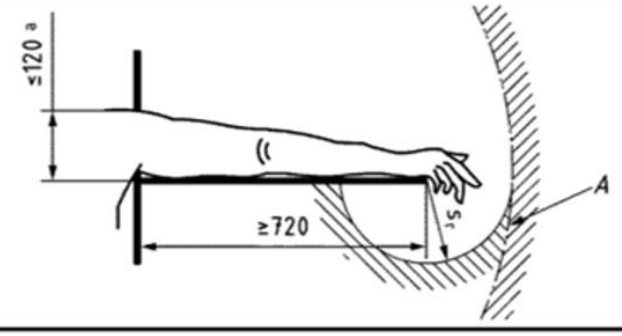
— upper edge of the detection zone below 900 mm is not included since they do not offer sufficient protection against circumventing or stepping over

— lower edge of the detection zone above 300 mm in relation to the reference plane does not offer sufficient protection against crawling below.

NOTE 2 The data for this table were researched at a study of the German BG, see [22].

NOTE 3 Most values given in Table 1 are lower in relation to the values of ISO 13857:2008, Tables 1 and 2, since parts of the body cannot support themselves on safeguards in case of reaching over.

[a] Approach to the hazard zone by reaching over is impossible.

Limitation of movement	Safety distance to hazard zone, s_r	Illustration
Limitation of movement only at shoulder and armpit	≥ 850	
Arm supported up to elbow	≥ 550	
Arm supported up to wrist	≥ 230	
Arm and hand supported up to knuckle joint	≥ 130	

A range of movement of arm

s_r radial safety distance

[a] This is either the diameter of a round opening, or the side of a square opening, or the narrowest dimension of the slot opening.

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 (depends on machine model)	This switch assures firm clamping of the workpiece. If the workpiece is not clamped properly, the saw blade should not be 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

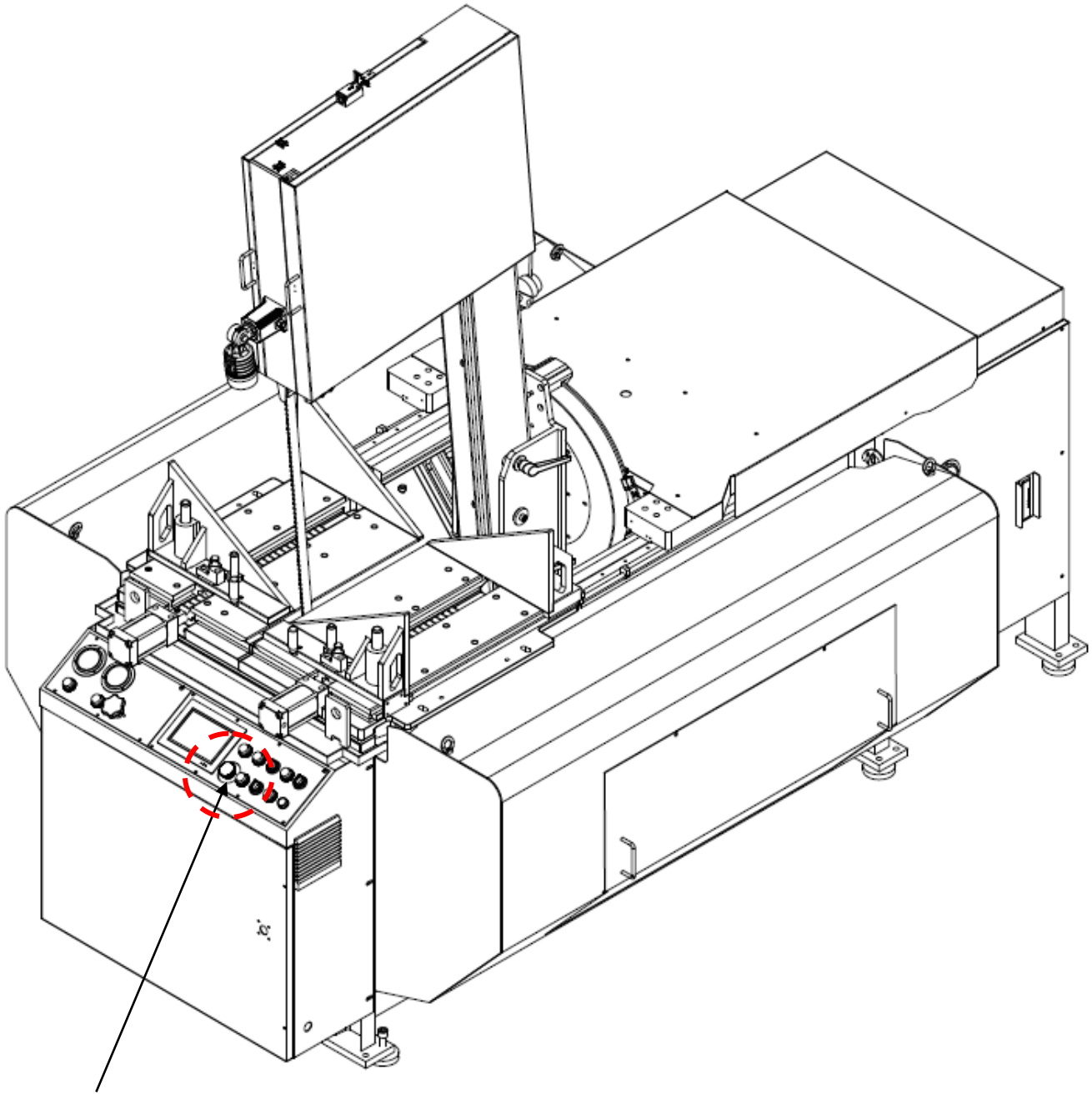
Designed to be easily accessible, the emergency stop button is located on the left bottom corner on the control panel and is made in red color and rubber material. For CE models, supplementary emergency stop button may be available at other area(s) of the machine depending on machine type. Please refer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

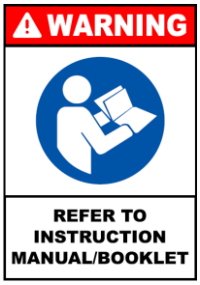
- An emergency situation that would cause any injury or damage
- An abnormal situation or problem such as fire, smoke, abnormal noise and etc.

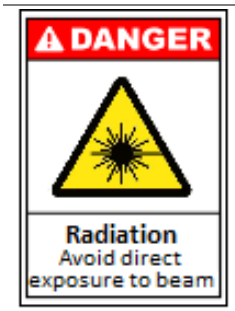
Illustration: Emergency Stop



SAFETY LABELS FOR USA

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 full machine capacity area. Keep your hands away from the full machine capacity area to avoid severe injury. **ALERT: Blade direction** The arrow indicates direction of the blade. Please double check blade direction before install the new 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

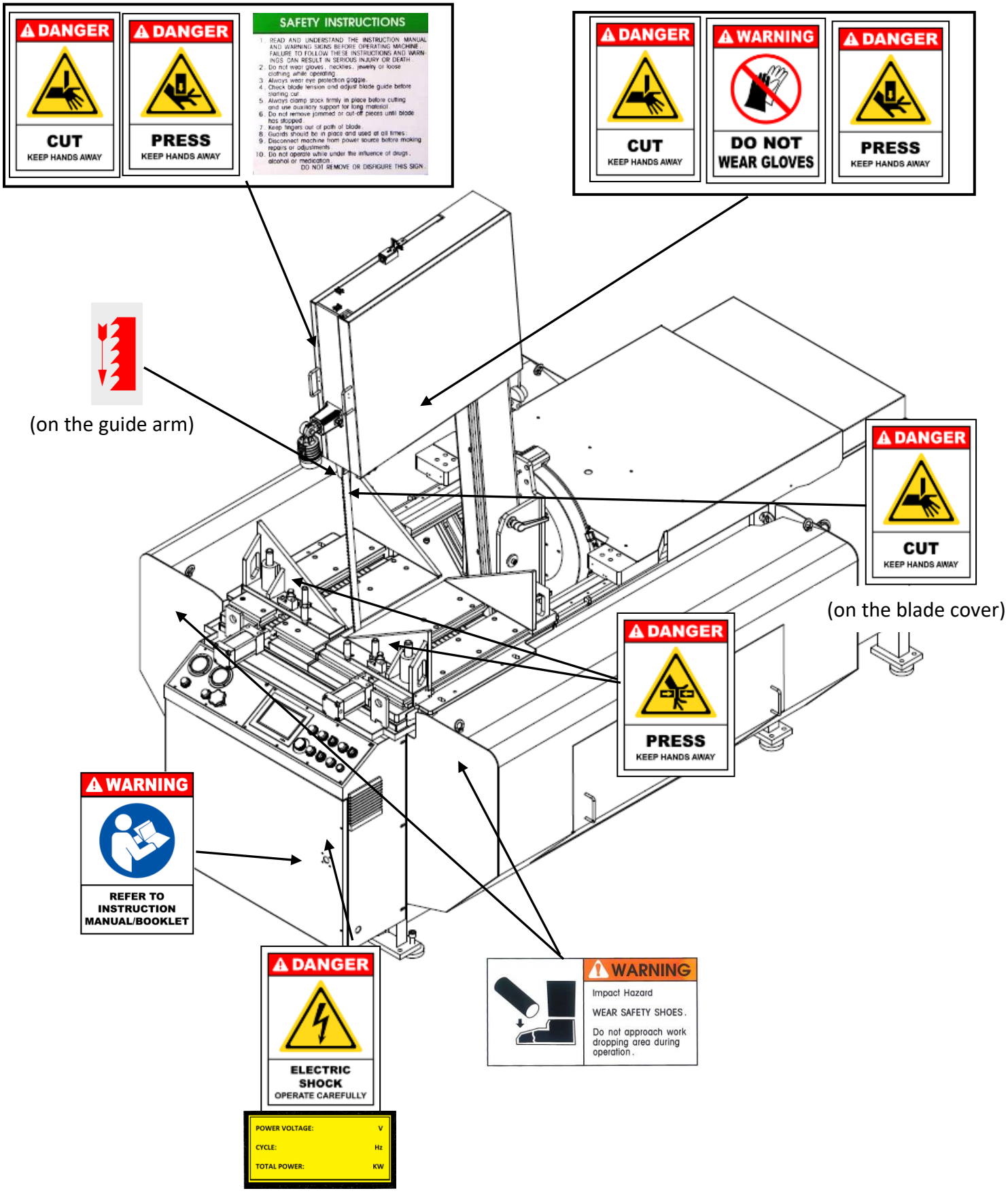
	Hand Crush/Force from Above		Crush hazard by vise
	Loose Hand Hazard KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury.		Pinch Point/Hand Entanglement
	CAUTION : Class I invisible Laser Radiation Present. Avoid direct exposure to beam.		Do not wear glove Never wear gloves or loose clothing when operating the machine.

SAFETY INSTRUCTION Labels

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

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

Illustration: Safety Label (For USA)

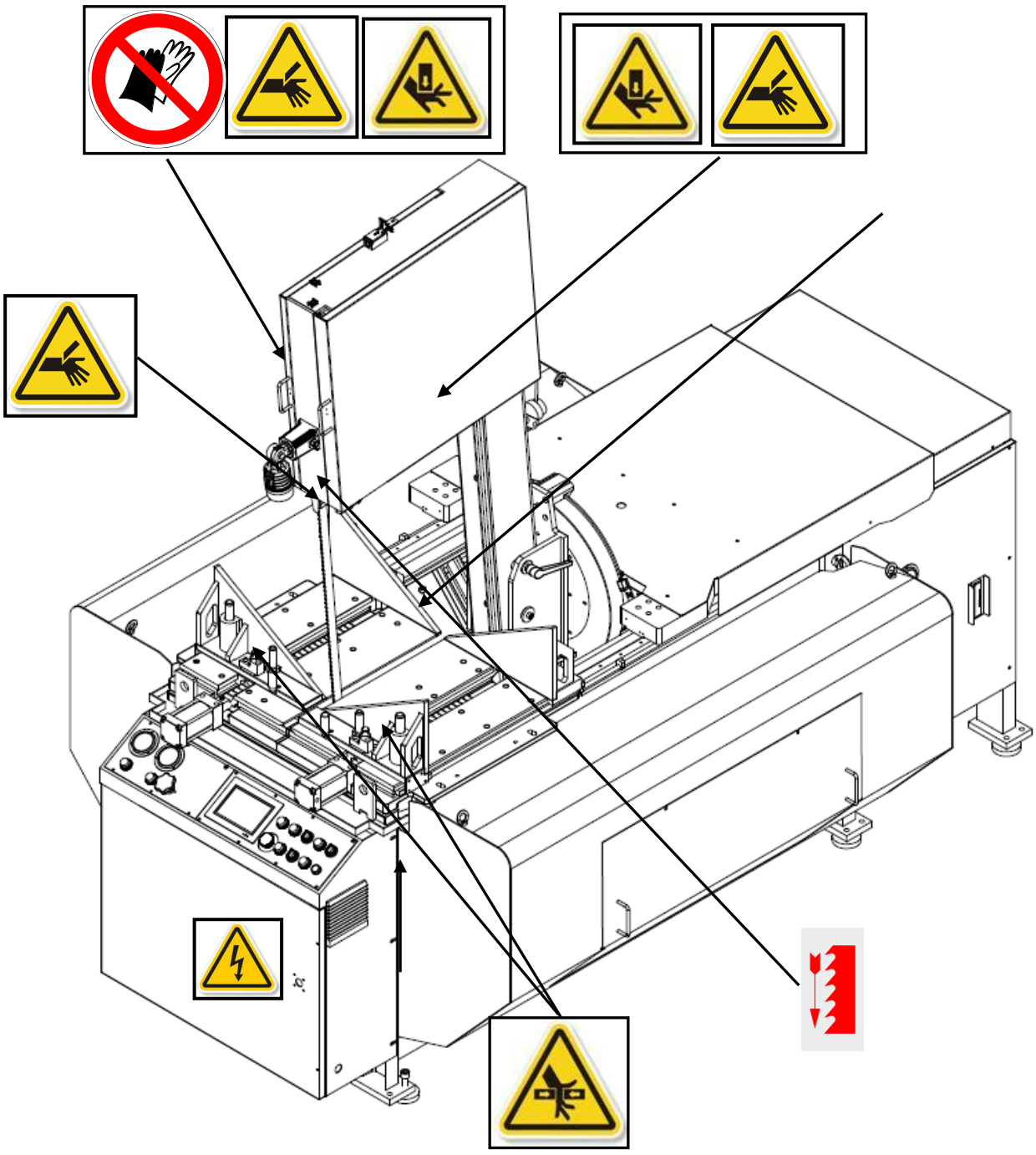


SAFETY LABELS FOR EUROPEAN AREA

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.		Never wear gloves Never wear gloves. It may lead to serious injury if they are caught in the running machine.

***Illustration: Safety Labels (*For European Area)**



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; the ear plugs or other hearing protection are necessary. If your machine produces an undesirable noise while it is running, you should:

1. Make sure all maintenance tasks have been performed following the prescribed maintenance schedule (Refer to Section 8).
2. If maintenance does not seem to solve the problem, follow the troubleshooting procedures under Section 9.

CE COMPLIANCE

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

RISK ASSESSMENT

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

Section 2

GENERAL INFORMATION

SPECIFICATION

MACHINE PARTS IDENTIFICATION

FLOOR PLAN

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

Safety

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

Convenience & High-Performance

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

Specification

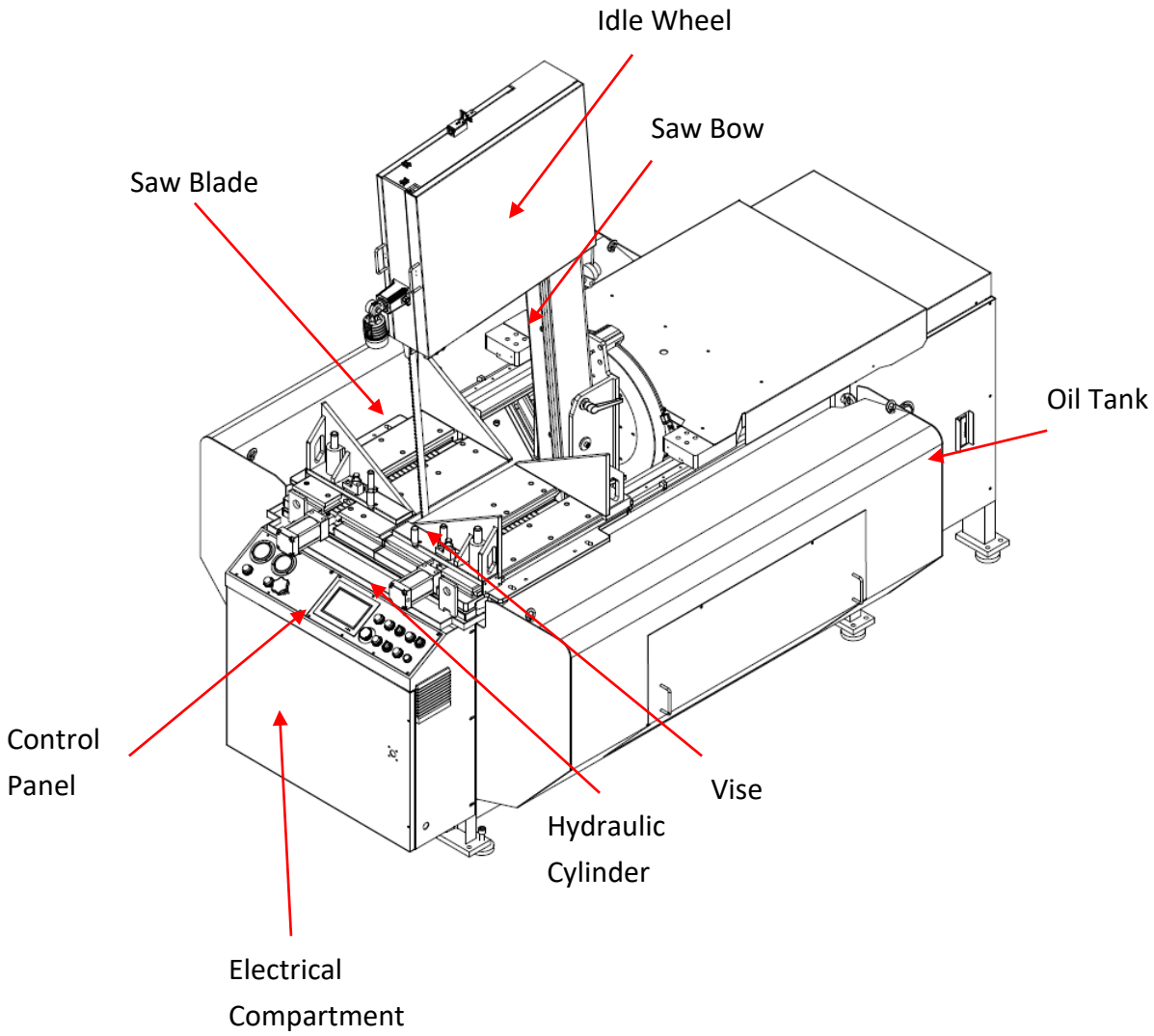
Model / Name of Equipment		V2026 Vertical Semi-Automatic Hydraulic Dual Miter Cutting Bandsaw	
Miter Degree (Angel)		60° left - 60° right	
Blade Cant degree		0° Blade Cant (Horizontal x Vertical)	5° Blade Cant (Horizontal x Vertical)
Max. Cutting Capacity	90°	510 x 670 mm (20.0 x 26.3 in.)	510 x 610 mm (20.0 x 24.0 in.)
	45° Left	510 x 465 mm (20.0 x 18.3 in.)	510 x 425 mm (20.0 x 16.7 in.)
	60° Left	510 x 325 mm (20.0 x 12.7 in.)	510 x 300 mm (20.0 x 11.8 in.)
	45° Right (Optional)	510 x 435 mm (20.0 x 17.1 in.)	510 x 400 mm (20.0 x 15.7 in.)
	60° Right (Optional)	510 x 265 mm (20.0 x 10.4 in.)	510 x 250 mm (20.0 x 9.8 in.)
Top Clamp Capacity		475 x 475 mm (18.7 x 18.7 in.)	
Saw Blade	Speed	20 - 100 m/min (66 - 328 fpm)	
	Size (L x W x T)	5,230 x 34 x 1.1 mm (206 x 1.3 x 0.04 in.)	
	Pressure	30-34 kg / cm2 (TOL: +1-+2 kg / cm^2)	
	Tension	Hydraulic with automatic blade breakage detection 2200-2300 kg / cm2 (TOL: +100-+150 kg / cm^2)	
	Guide	Interchangeable tungsten carbide	
	Cleaning	Steel wire brush with flexible drive shaft driven by main motor	
Main Electricity Output *	Saw Blade	7.5 HP (5.59 kW)	
	Hydraulic	1 HP (0.74 kW)	
	Coolant Pump	1/4 HP (0.18 kW)	
Tank Capacity	Hydraulic	85 L (22.4 gal)	
	Coolant	130 L (34.3 gal)	
Vise Clamping	Control Method	Hydraulic with full stroke cylinder	
	Minimum Clamping Capacity	0 mm	
Feeding	Control Method	----------	
	Speed	----------	
Workbed	Height	1,035mm ±10mm (LEVELING SUPPORT PAD)(40.7 in.)	
Weight	Net / Gross	2,130 kg (4,686 lb) / 2,265 kg (4,983 lb)	
Floor Space (L x W x H)		2,861 x 2,675 x 2,536 mm (112 x 105 x 99 in.)	
Operating Environment	Temperature (° C)	5-40 ° C	
	Humidity (%)	30-85%	

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

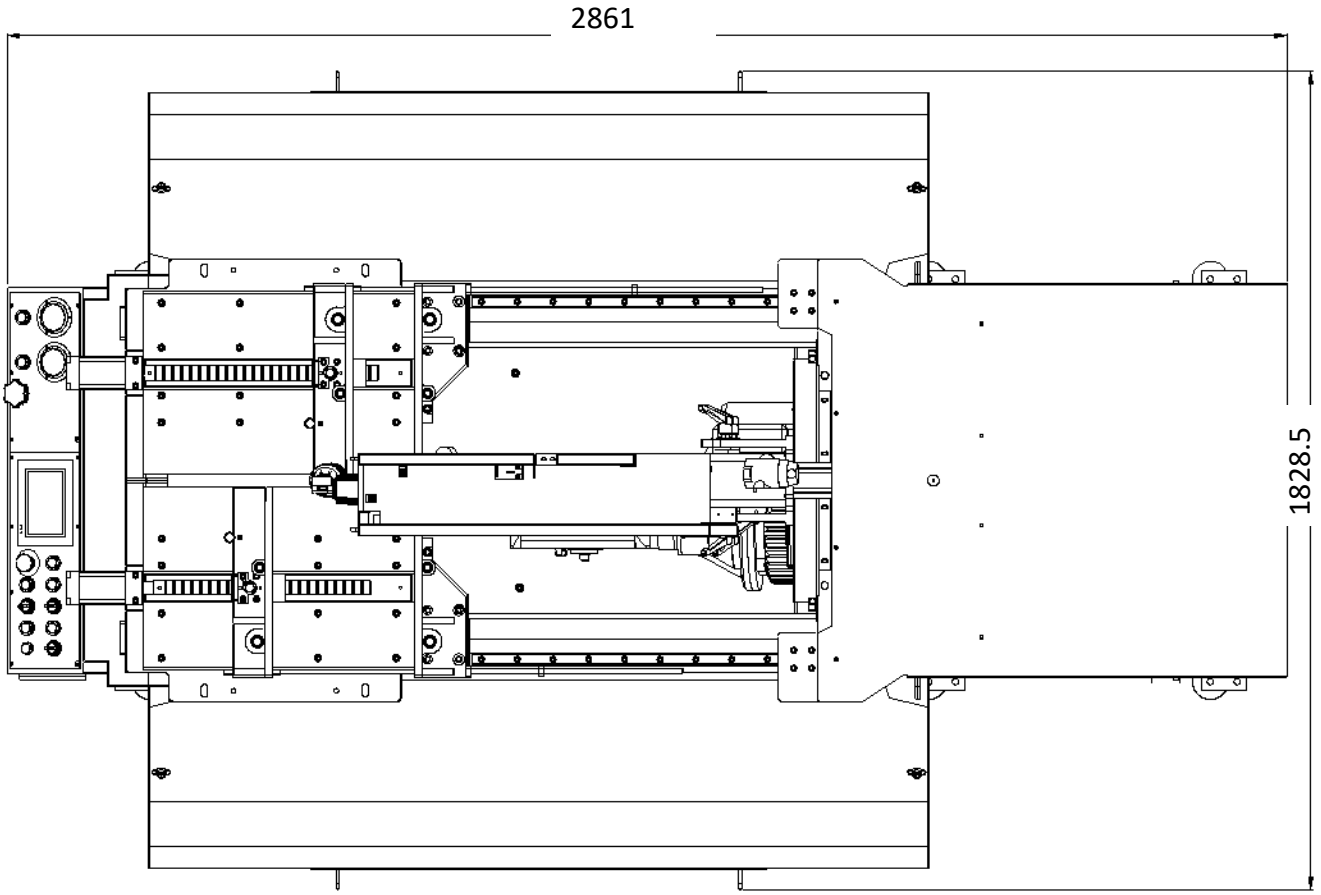
*Design and specification are subjected to change without notice.

*The saw blade pressure and tension standard above are the general values. For special saw blade, please contact to the saw blade manufacturer for the applicable values.

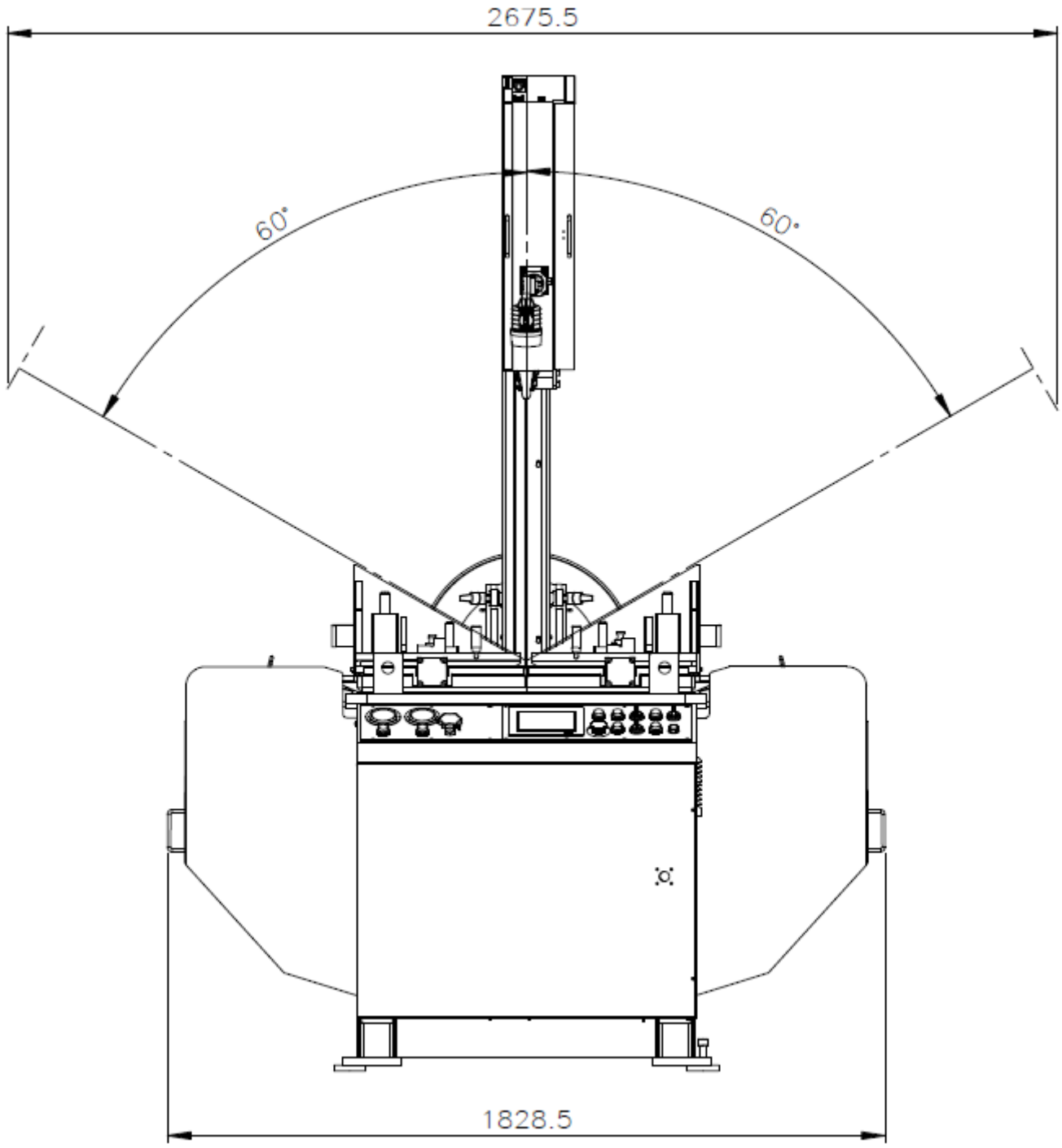
MACHINE PARTS IDENTIFICATION



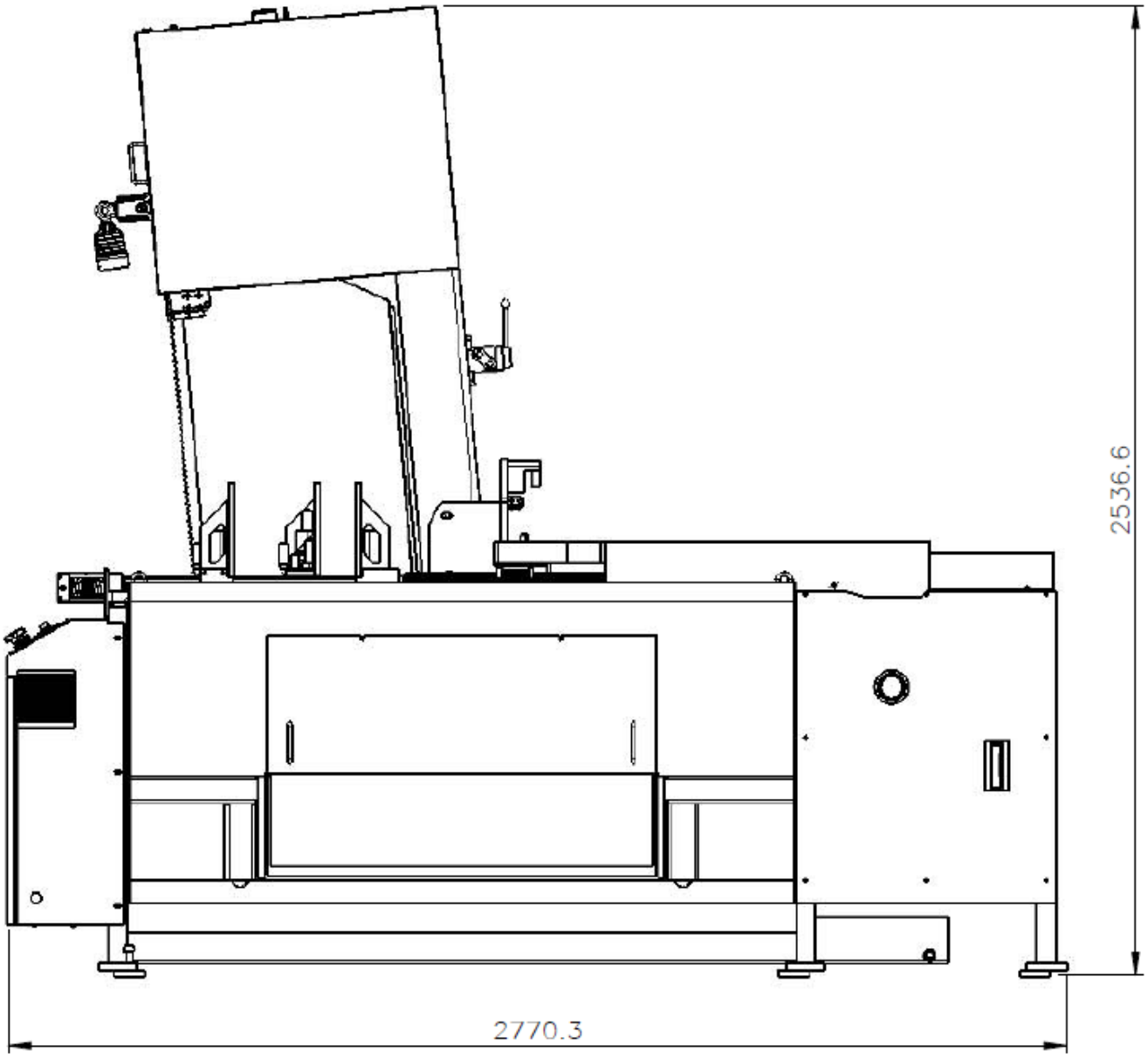
FLOOR PLAN

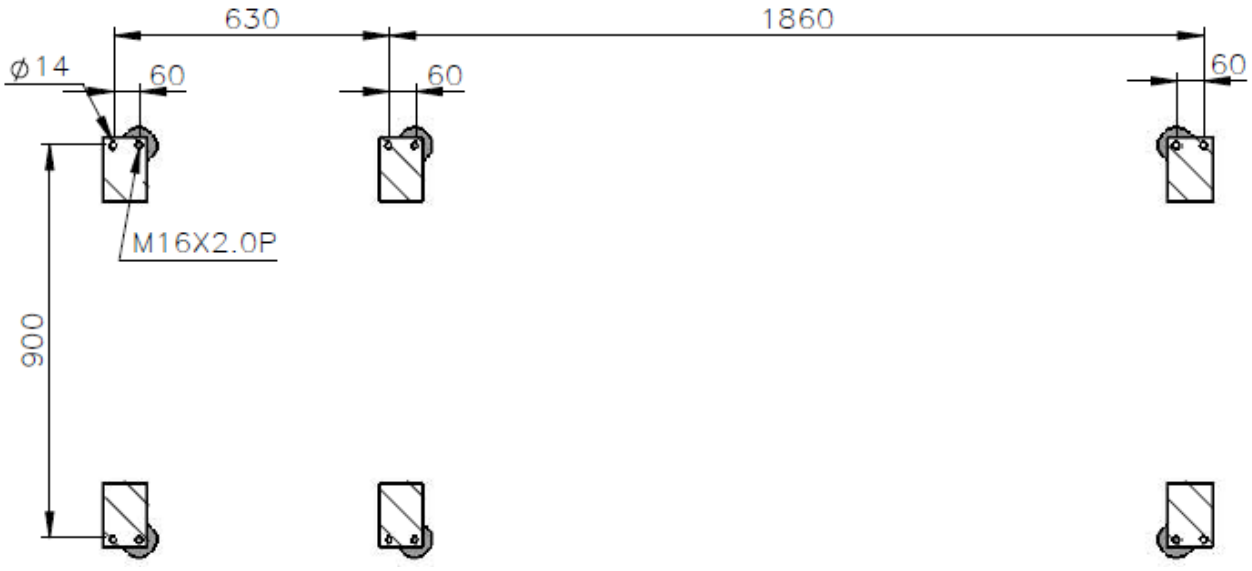


Machine top view



Machine front view





Machine right 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%~85%“(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 weight.

- Limit the operation area of the machine to staff only.

UNPACKING & INSPECTING

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

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

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

LIFTING

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

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

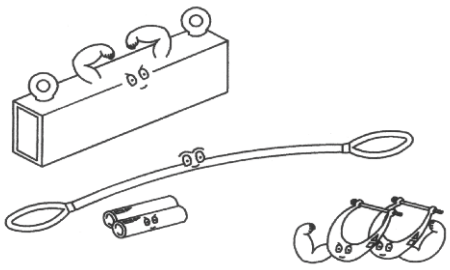
Move the machine to its location by using a crane and a wire rope sling that can fully withstand the weight of the machine (refer to machine specification under Section 2 *General Information*).

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

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

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

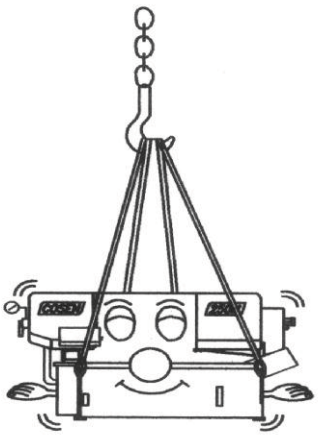
- You must use tools and equipment with the proper tensile strength and use proper method when moving your machine.



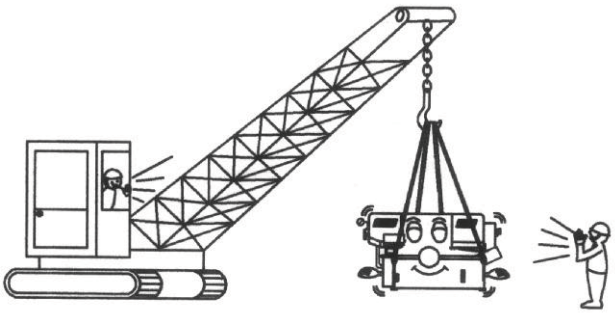
- Apply the wire rope sling to the lifting hooks on the four ends of the machine. Refer to *Illustration: Lifting Points* for exact locations.

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

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



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



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

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

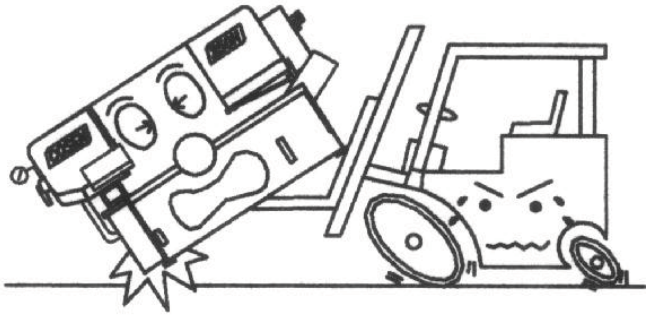
Machine lifting with a forklift should be done strictly according to the lifting points designated by the original manufacturer. If there is any doubt on missing lifting points on your machine, please consult with the original manufacturer or its qualified agent before lifting the machine.

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

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

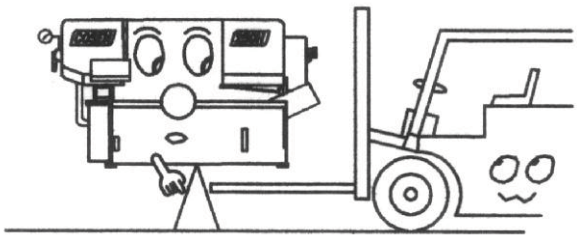
- You must apply proper forklift technique to avoid damage to the machine.

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



- You must keep the machine balanced at all times.

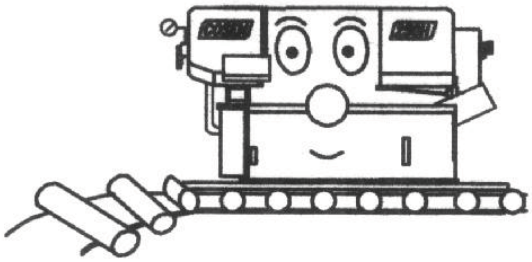
  Make sure the forks are centered before use.



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

3. Use rolling cylinders

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

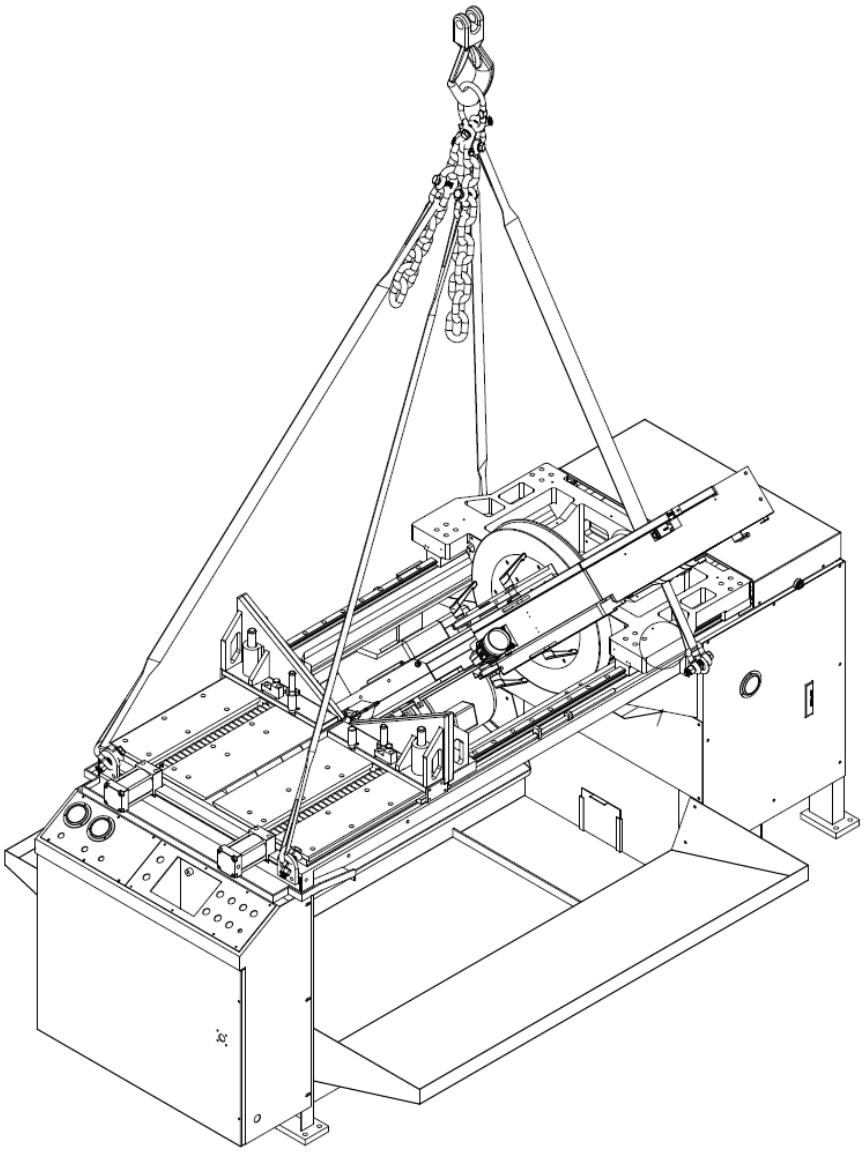


- You must use rolling cylinders made in material of proper compressive strength.

4. Other ways to move

If the machine does not have  or  stickers, please contact your local agent immediately.

Illustration: Lifting Points



Minimum weight capacity for each wire rope: **2.5 ton**

Require: **4 fiber double ply slings (2,000 x 50mm; 78 .7 x 2 inch), 8 shackles (5/8), 10 interlocking rings (Φ20), and 1 oval alloy steel ring (5/8)**

REMOVING SHIPPING BRACKET

- After the machine has been properly positioned, remove 2 shipping brackets that are used to lock the saw frame and the saw bed.
- Retain this bracket so that it can be used again in the event that your machine must be relocated.

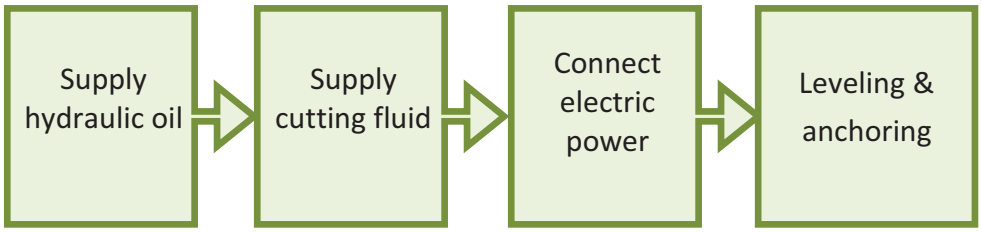
CLEANING

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

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

INSTALLING

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



Supplying hydraulic oil

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

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

Refer to specification chart under Section 2 for tank capacity.

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

Supplying coolant

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

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

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

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

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

Connecting electric power

 Have a qualified electrician make the electrical connections.

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

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

 Ground the machine with an independent grounding conductor.

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

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

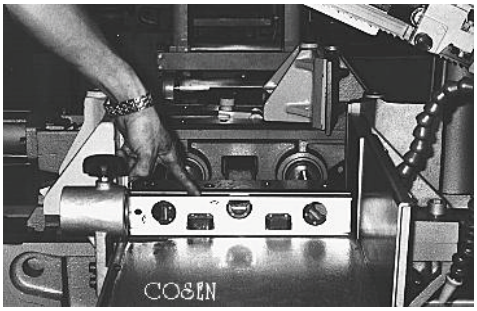
 Refer to the specification chart under Section 2 for total electric power consumption of the motors and make sure your shop circuit breaker is capable of this consumption amount. Also use a power supply cable of proper size to suit the power supply voltage.

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

Leveling

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

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



Make sure all leveling bolts evenly support the machine weight.

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

Anchoring the machine

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

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

Installing 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.

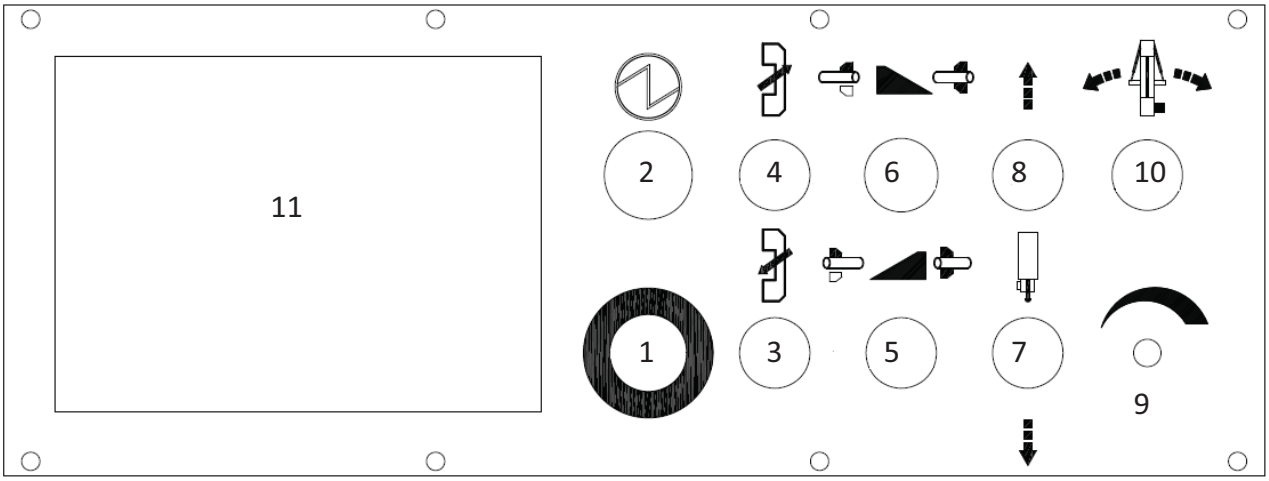
 Always add coolant into water for better mix result.

 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, the human-machine–interface (HMI) and the projecting light system. 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	Guide arm down button
2	Power indicator lamp	8	Guide arm up button
3	Saw bow forward button	9	Blade speed control knob
4	Saw bow backward button	10	Saw bow angle control knob
5	Right vise clamp/release knob	11	HMI touch screen
6	Left vise clamp/release knob		

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 forward button

When this button is pressed with the running blade, saw bow moves forward slowly. When this button is pressed with the stopped blade, saw bow moves fast forward until the operator releases the button.

4. Saw bow backward button

When the button is pressed, saw bow moves backward until the operator releases the button or until the saw bow reaches the rear limit position.

5. Right vise clamp/release knob

Turn the knob to the left for clamping the material. Turn the knob to the right for releasing the material.

 Cutting can be started with either left vise or right vise clamping, but for better performance, use both left and right vises to clamp the material.

6. Left vise clamp/release knob

Turn the knob to the left for clamping the material. Turn the knob to the right for releasing the material.

 Cutting can be started with either left vise or right vise clamping, but for better performance, use both left and right vises to clamp the material.

7. Guide arm down button

When this button is pressed, guide arm descends until the operater releases the button.

 When adjusting guide arm, please avoid hitting the material.

 The closer the guide arm approaches the workpiece, the better the stability of cutting.

8. Guide arm up button

When this button is pressed, guide arm rises until the operater releases the button.

9. Blade speed control knob

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

BLADE SPEEDS FOR BI-METAL BLADES

MATERIAL	AISI-SAE OR TRADE NAME	FPM
Structurals	A36	330
Low Carbon	1005-1012	320
	1015-1030,1513-1536	330
Medium Carbon	1033-1055	230
High Carbon	1060-1080,1541-1572	200
	1084-1095	185
Low Carbon-Resulferized	1108-1110,1211-1215	340
	1116-1119	350
Medium Carbon-Resulferized	1132-1151	270
Alloy Steel	4418,4130	270
	4135,4137,4140,4142	250
	4145,4147,4150,4161	210
	4337,4340	220
	8615,8617,8620,8622	240
Tool Steels	A-2,A-3,A-8,A-9	200
	D-2,D-5	110
	M-1,M-2	120
	M-3,M-4	100
	T-1 THRU T-6	140
Stainless Steel	201,202,301,302,304	120
	309,309s,310	75
	316,316L,317,330	80
Cast Iron	Class 20	180
	Class 40	130
	Class 60	110
Ductile Iron	60-40-18	270
	100-70-03	120
	120-90-02	75
Titanium Alloy	Commercially Pure	80

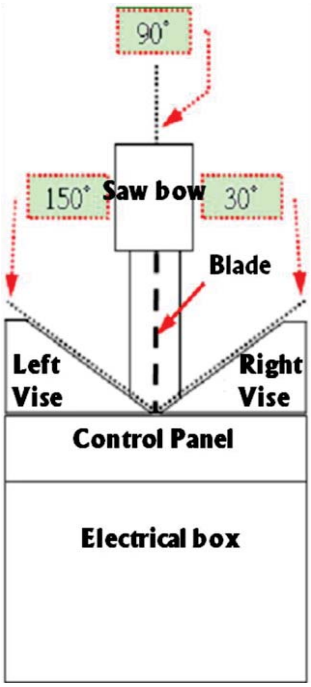
Above speeds are for cutting 4" material (with 3/4 pitch) when using a cutting fluid.
Increase speed 15% for 1/4" material with 10/14 tooth
11% for 3/4" material with 6/8 tooth blade
9% for 1-1/4" material with 5/8 blade
5% for 2-1/2" material with 4/6 tooth blade
Decrease speed 11% for 8" material with 2/3 tooth blade

7

10. Saw bow angle control knob

- When the knob is turned to the left, saw bow inclines to the left. When saw bow reaches 150° and touches the left limit switch, saw bow left limit switch red light on HMI touch screen is triggered and saw bow stops.
- When the knob is turned to the right, saw bow inclines to the right. When saw bow reaches 30° and touches the right limit switch, saw bow right limit switch red light on HMI touch screen is triggered and saw bow stops.

Return-to-zero point of angle encoder is installed at 150°. Angle can be adjusted in HMI (angle margin of error: 0.2°). Refer to below figure for the definition of angle.



When saw bow swivel to the right at 30~45° position, the guide arm has risk to hit the vise plate in moving, please be careful.

This control knob only works when the saw bow is at rear limit position.

IF 90° VISE PLATES ARE INSTALLED, DO NOT SWIVEL SAW BOW. OTHERWISE, SAW BLADE WILL CUT THE VISE PLATES.

11. HMI touch screen

Please refer to later section for detailed introduction.

Cutting pressure, vise pressure, and feeding speed control panel

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

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.

2. Vise pressure control knob

- This pressure control knob is used to adjust the vise pressure.
- Turning the knob clockwise increases the vise pressure.
- Adjust vise pressure according to different material, i.e. pipe, steel bar, H beam.
- When cutting pipes or soft materials, reduce vise pressure to prevent exerted pressure from damaging the workpiece shape or exterior.

Vise preesure should not be adjusted during cutting.

Vise pressure cannot be lower than 8 kg/cm^2.

3. Saw bow feeding speed control knob

- This control knob is used to adjust the feeding speed of the saw bow.
- Turning the knob counterclockwise increases the saw bow feeding speed.
- Saw bow feeding speed is a determining factor to a good cutting time and quality cutoff surface.
- Set the saw bow feeding 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:

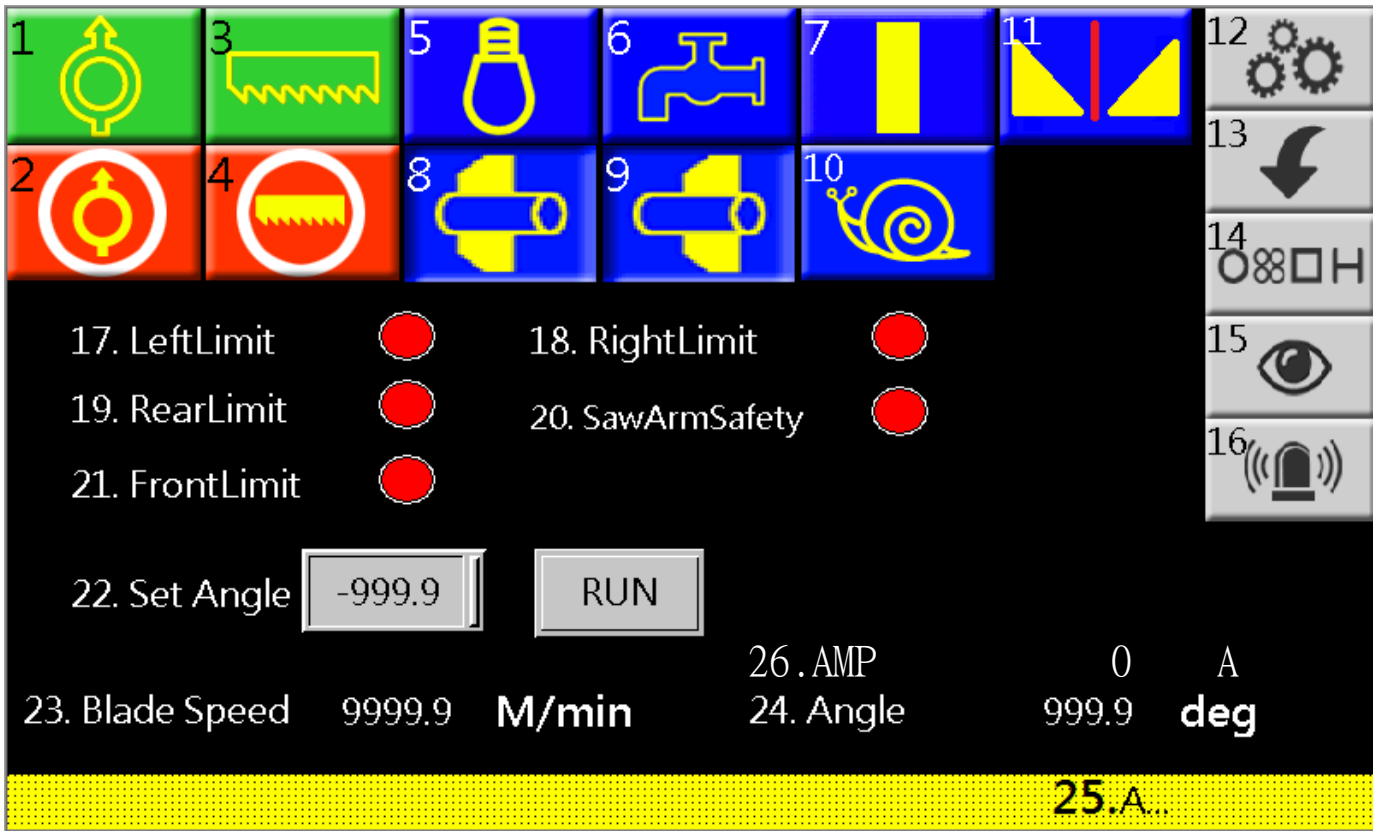
Item	Range
Ambient temperature	5℃ ~ 50℃
Temperature for safe operation	-10℃ ~ 60℃
Ambient humidity	30%~85% RH (No condensation)
Connection	RS422 MMI port
Environment	No condensation and rust

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

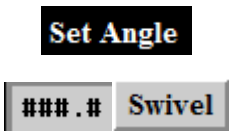
The main control menu includes some operating button that were used on the control panel of the earlier machines. Some convenient functions are added to the page for the operator to better understand the features of the machine. Setting the parameters shown on the screen requires a gentle touch of the 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.

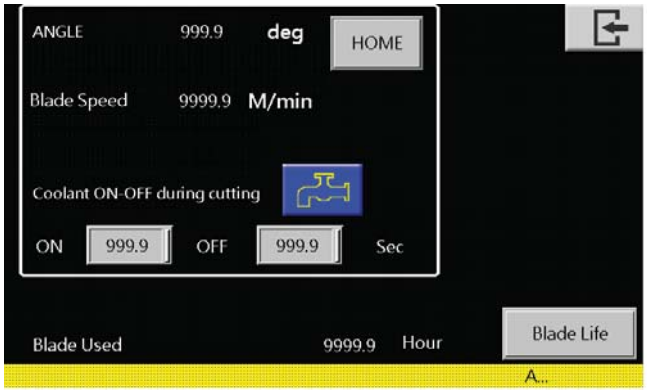
No	Item	Function	Description
1		Hydraulic start	When the power is turned on, press this button to start the hydraulic motor. A solid yellow icon indicates the hydraulic system has been turned on.
2		Hydraulic stop	Press this button to turn off the hydraulic motor immediately.  When the blade is running, the hydraulic stop button is temporarily disabled. You need to press the *saw blade stop* or the *saw bow backward* button to stop the blade first.
3		Saw blade start	When the work piece is clamped properly, press this button to start cutting. A solid yellow blade icon indicates the blade has been started.  When the blade is running, all the buttons are temporarily disabled except the emergency stop button, saw bow backward button, blade speed control knob, and saw bow feeding speed control knob. When cutting is finished, all the control buttons resume function.
4		Saw blade stop	Press this icon to stop the saw blade.
5		Work light ON/OFF	Press this button to turn on the work light. A solid yellow light bulb icon indicates the lamp has been turned on. Press again to turn the light off.
6		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.
7		Last cut function ON/OFF	When the  mode is selected, the blade will automatically stop and the hydraulic system will shut down (in 10 seconds) after the current cut is finished.
8		Left vise lock/unlock	Press this button to lock/unlock left vise. Lock the left vise and vise clamping light must be on, otherwise blade will not start cutting.

No	Item	Function	Description
9		Right vise lock/unlock	Press this button to lock/unlock right vise Lock the right vise and vise clamping light must be on, otherwise blade will not start cutting.
10		Saw bow fast/slow swiveling mode	When the slow mode is turned on, the saw bow swiveling speed will dramatically reduce to help you position the work piece precisely
11		non-90°/90° vise plates mode	If installing 30° and 45° vise plates, choose non-90° vise plates mode. If installing 90° vise plates, choose 90° vise plates mode. Under 90° vise plates mode, saw bow cannot swivel so saw blade will not cut the vise plates.
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 status display	Press this button to display cutting-related information e.g. blade speed and blade life. Information and parameter setups for optional accessories such as blade deviation detector can also be configured in this setup page. Refer to Cutting Display & Setup in the following page.
14		PLC monitor	Shows current PLC signals.
15		Material cutting reference	This 2-page reference chart lists out the required blade speed and cutting rate for each different material.
16		Error report	Lists a historical report of the errors and the time of occurrence as well as provides troubleshooting support. 6 pages in total.
17		Saw bow left limit switch indicator	When saw bow touches left limit switch and red right is on, it means saw bow inclines left max. 150°.
18		Saw bow right limit switch indicator	When saw bow touches right limit switch and red light is on, it means saw bow inclines right max. 30°.
19		Saw bow rear limit switch indicator	After the cut is finished, blade will stop running and saw bow will move backward automatically until it touches the rear limit switch and the RED light will come on.

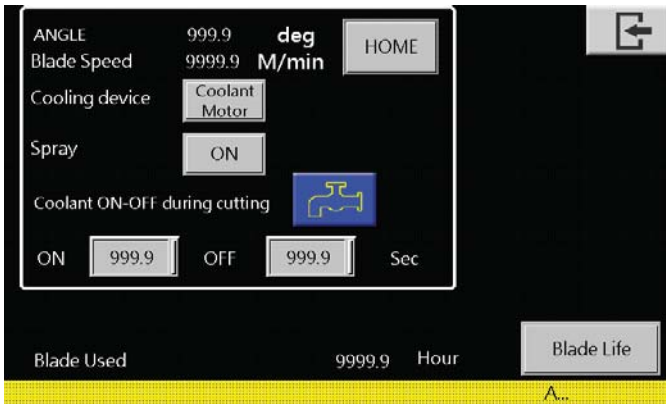
No	Item	Function	Description
20		Guide arm safety position indicator	Indicates if the guide(saw) arm is within its safety range for the saw bow to move forward. This safety design prevents the saw arm from being improperly positioned and hitting the workbed while blade moves forward. • **Light on:** Saw bow has reached the minimum height and is not allowed to descend any further. Raise the saw bow again, check on the saw arm position and move it to a safer place. • **Light off:** Saw arm is at a proper height and within the safe range.
21		Saw bow front limit switch indicator	When saw bow cuts or moves forward and touches the front limit switch, the RED light will come on which means the cut is finished or saw bow already reaches the end. All limit switches have been set up by the manufacturer before shipment. Make random changes will affect cutting precision.
22		Angle setting	Key-in ###.# in HMI, press “Swivel” and saw bow inclines to the setting angle. Saw bow must be at rear limit switch position to swivel. Do not swivel saw bow if installing 90° vise plates. Otherwise saw blade will cut the vise plates. When adjusting the angle of saw bow manually, actual angle and angle displayed on the screen need to match for the machine to start cutting.
23		Blade speed display	Displays current blade speed.
24		Miter angle display	Displays the current angle the saw bow is swiveled at.
25	 (yellow highlight)	Error display	Displays error messages in the order of occurrences; press the message to clear the messages. **Error messages must be cleared for the machine to continue to operate normally.**
26		Blade cutting current display	Displays the current amplitude while the blade is running.

Cutting status display & setup

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



(Display without Spray device included)



(Display with optional Spray device included)

Cutting status display & setup

This page comes in two versions depending on if the optional mist coolant spray device is installed on the machine. The shared features are as follows:

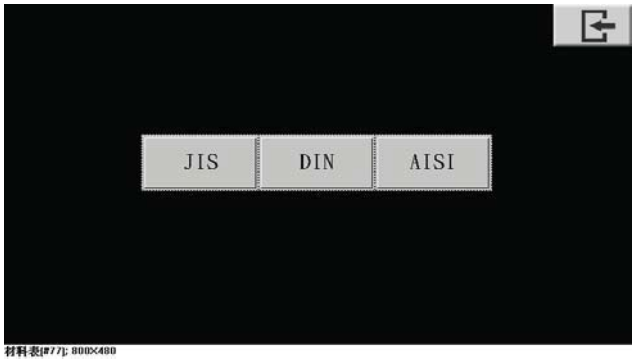
- Blade speed
- Angle: mitering angle
- HOME(Return-to-zero point) – After machine is restarted, this icon will turn grey. When this icon is pressed, saw bow will swivel to return-to-zero point, left 150°, and back to 90° and the icon will turn yellow. Thus, blade can be started.

   This button must be yellow to start the blade.
- Coolant On/Off during cutting - Press this faucet icon to allow coolant pump start automatically during cutting.
- Blade Used - Current blade life in hours
- Blade Life – Reset the blade life to zero
- Warranty status - 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 1~2 seconds)
- Press Home to return to the main control menu.

For machines with optional spray device installed, additional two command are provided:

- Cooling device: press this button to use either coolant or spray
- SPRAY: press this button to turn on/off the spray. When both this button and the *coolant ON/OFF* button on main control menu are turned on, spray device can be started manually.
- RUN: press this button to set up how long the spray will run if using the spray
- STOP: press this button to set up how long the spray will stop if using the spray

Material cutting reference



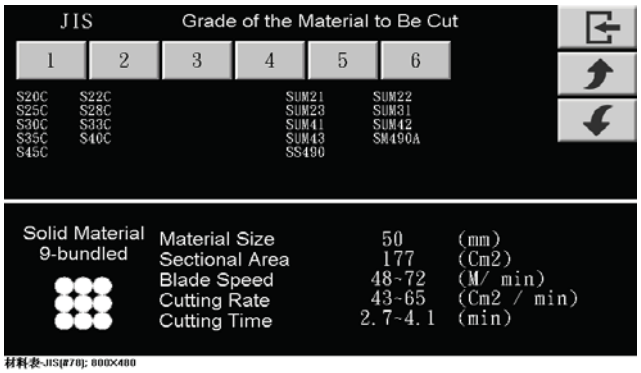
Page 1 –Material cutting reference display 1

Choose JIS / DIN / AISI and, Press it to go to the next material cutting reference display page.

JIS: Japanese Industrial Standards (JIS)

DIN: Deutsches Institut für Normung e.V. (DIN; in English, the German Institute for Standardization)

AISI: American Iron and Steel Institute



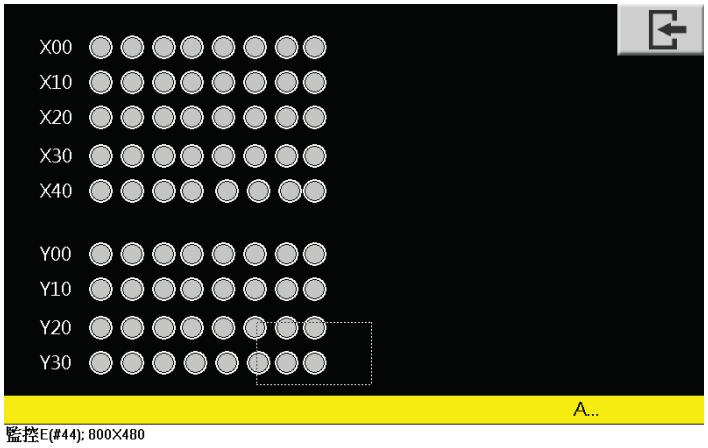
This 2-page reference chart lists out the required blade speed and cutting rate for each different material.

- Press to return to the main control menu.

Press to return to material cutting reference display.

Press to go to the next setup page.

PLC Monitor



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

Error report

Page 1 – error report

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

Page 2 – troubleshooting

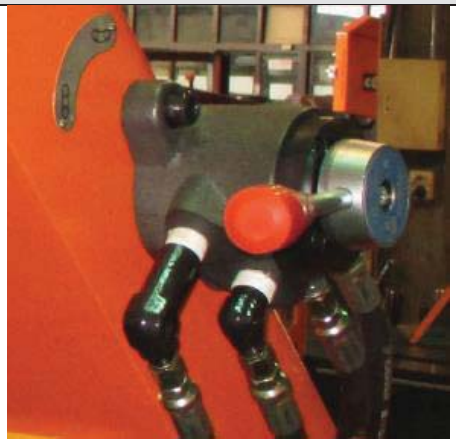
- Provides suggestions on troubleshooting. 9 pages in total.
- Also refer to below Table for error codes, descriptions and solutions.
- Press  to return to the main control menu.
- Press  to go to the troubleshooting support page.

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 the blade motion detector01 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	Blade motor overload	Check if the blade motor overload relay has tripped
M314	Hydraulic motor overload	Check if the hydraulic motor overload relay has tripped
M315	Coolant pump overload	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

Error Code	Error Description	Solution
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
M368	Left visenot set in function/clamping	Reset or clamp left vise
M369	Right visenot set in function/clamping	Rest or clamp right vise
M370	Mitering angle different from preset angle	1. Swivel saw bow by pressing “swivel” button 2. Reset mitering angle
M371	Abnormal blade retraction upon completed cut	1. Check the saw bow rear limit switch 2. Check the solenoid valve 3. Check PLC output Y12
M372	Saw bow NOT at rear limit	1. Send saw bow to rear limit switch position 2. Check rear limit switch
M373	Saw arm not in safe position	Raise saw arm to upper limit position
M374	Saw bow not initial	Saw bow implement initial

STANDARD ACCESSORIES

Blade tension device

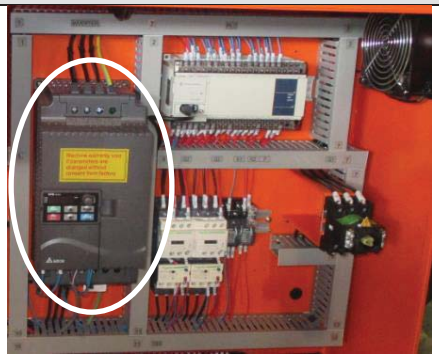


- This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.
- To tighten the saw blade, turn the selector to  .
- Upon saw blade breakage, the safety device will activate and automatically stop all machine operation.
- The limit switch of the safety device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

Blade speed/motion detector

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

Inverter



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

Note:

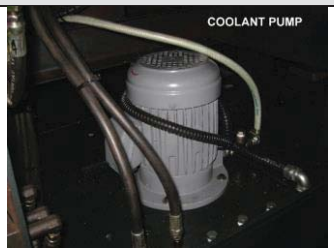
1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.

Gear reducer

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

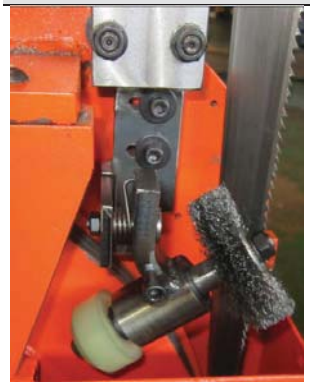
Please refer to Section 8 for information on maintenance.

Coolant pump



The coolant pump supplies coolant to cool off cutting temperatures during cutting. Also, it can be used to wash off chips.

Hydraulic powered wire brush



The wire brush removes the metal chips on the saw blade teeth so that blade life can be extended.

Keep hands away from the brush while the wire brush is running.

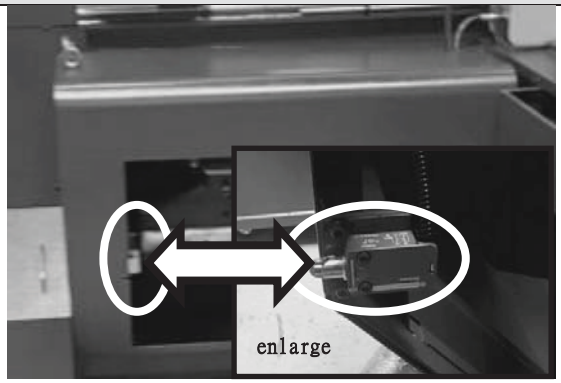
Turn off the hydraulic motor or the main power switch before performing maintenance or cleaning on the wire brush drive system.

OPTIONAL ACCESSORIES

Spray system

On HMI screen, choose to use either coolant or spray system to clean the chips. Also set up how long the spary will run and stop on HMI.

Limit Switch (Interrupt Power Function)* (Optional)



This device is installed inside the base assembly. It detects the protection base cover movement. It is corresponding with the interrupt power function for safety prevention.

When the protection cover removed, the interrupt power function is ON. Power disconnected.

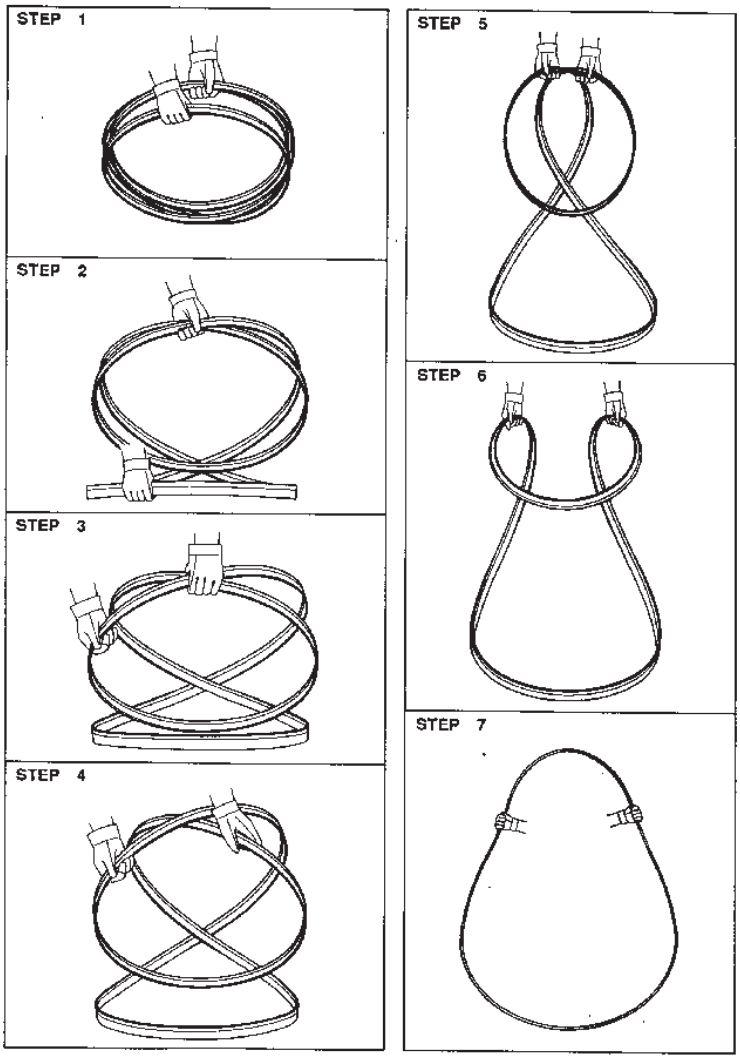
When the protection cover resetted, the interrupt power function is OFF. Power reconnected.

UNROLLING & INSTALLING THE BLADE

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

Unrolling the blade

Please follow the procedures illustrated below.



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 - Move saw bow to rear limit switch position then swivel the saw bow to 30°.

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

Step 5 - Open the idle and drive wheel covers.

Step 6 - Loosen the blade cover.

Step 7 - Loosen the wire brush assembly screws and pull the wire brush away from the blade.

Step 8 - Pull the entire blade out.

Step 9 - If necessary, clean the carbide inserts before installing a new saw blade.

Step 10 - Place the new blade around the idle wheel and the drive wheel

Step 11 - Insert the blade into the carbide inserts. The back and the sides of the blade need to be touching the inserts as well as the adjacent rollers.

Step 12 - Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel.

Step 13 - Make sure the back of the blade is also pressed against the flange of the idle wheel.

Step 14 - Tighten the blade by moving the bolt up and tightening the nut.

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

Step 16 - Swivel the saw head to 90°. Adjust wire brush to a proper position.

Step 17 - Press the *saw blade start* button to start the blade. Allow the blade to run for a few rotations then press the *saw bow backward* button to move the saw bow backward. 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.

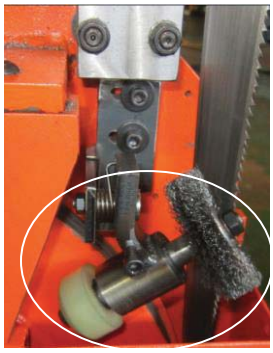
ADJUSTING WIRE BRUSH

Follow these steps to adjust wire brush to appropriate position:

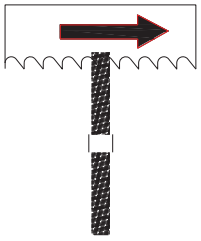
Step 1 – Loosen the adjustment screws.

Step 2 – Adjust the adjustment screws to make brush move left/right until it makes proper contact with the saw blade (see below illustration).

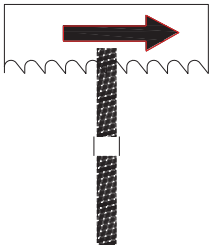
Step 4 – Tighten the adjustment screws.



Proper



Improper

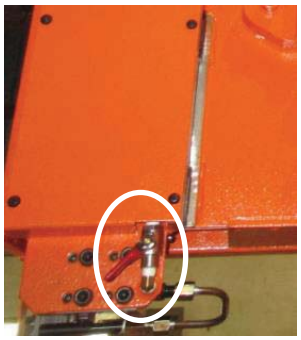


ADJUSTING COOLANT FLOW

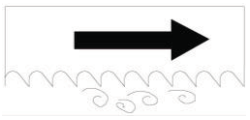
Step 1 – Press the *saw blade start* button to start the saw blade drive motor.

Step 2 – Press the *saw bow forward* button to move the saw bow forward.

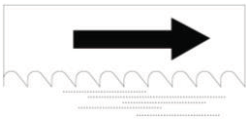
Step 3 – Use the flow control valve (shown below) to adjust the amount of fluid flowing to the cutting area.



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



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



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

ADJUSTING 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.

BREAKING-IN THE BLADE

When a new saw blade is used, be sure to first break in the blade before using it for actual, extended operation. Failure to break in the blade will result in less than optimum efficiency. To perform this break-in operation, the following instructions should be followed:
Step 1 - Reduce the blade speed to one-half of its normal setting.
Step 2 - Lengthen the cutting time to 2-3 times of what is normally required.
Step 3 - After the break-in operation is completed, set all parameters back to normal settings.

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

Step 5 – Remove the rust-prevention grease with cleaning oil or kerosene.

Step 6 – Start the coolant pump.

Step 7 – Test these functions:

- vise clamping/unclamping
- saw bow moving forward/backward

ADJUSTING SAW BOW INCLINING ANGLE

For this machine, the saw bow is a forward inclined type. It can be inclined from 0°~5°. Follow below steps to adjust the angle.

Step 1- Loosen fixed bolts x 4 (2 on each side).

Step 2- Adjust the angle of saw bow by adjustment handle.

Clockwise	Backward (5°~0°)
Counterclockwise	Forward (0°~5°)

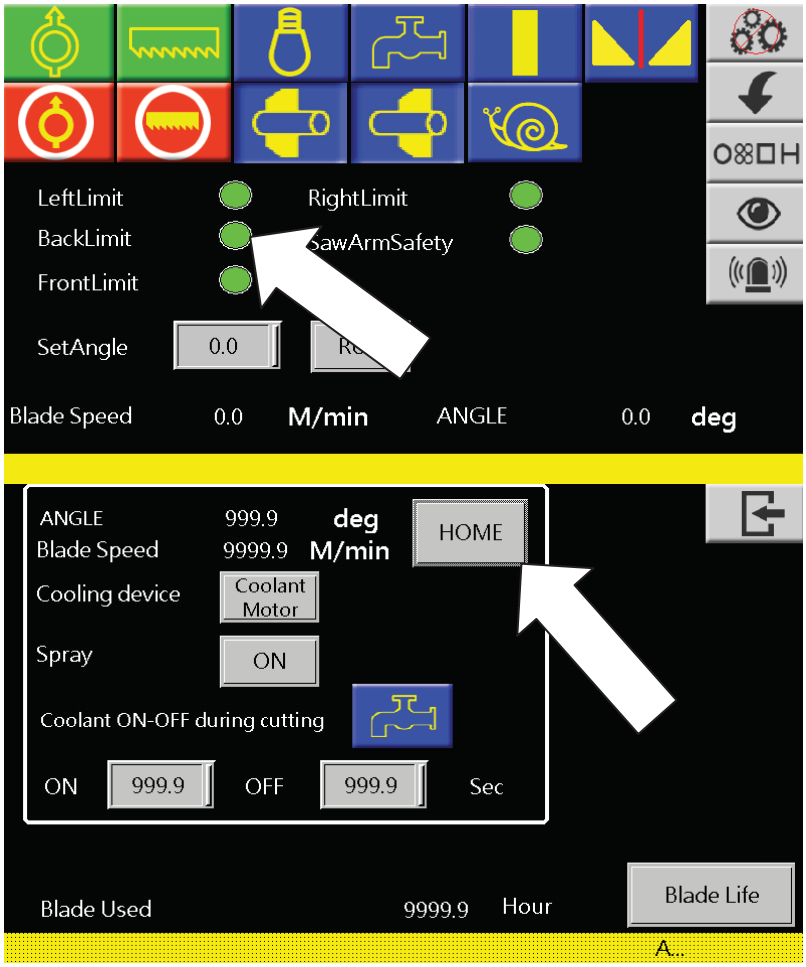
Step 3- Fasten the fixed bolts.

Saw bow inclineded angle will affect cutting ability. Refer Section 2 for product specification.

INSTALLING 90° VISE PLATES & TOP CLAMPS

Step 1 - After the machine has been properly positioned, remove 2 shipping brackets that are used to lock the saw frame and the saw bed. Retain these brackets so that they can be used again in the event that your machine must be relocated.

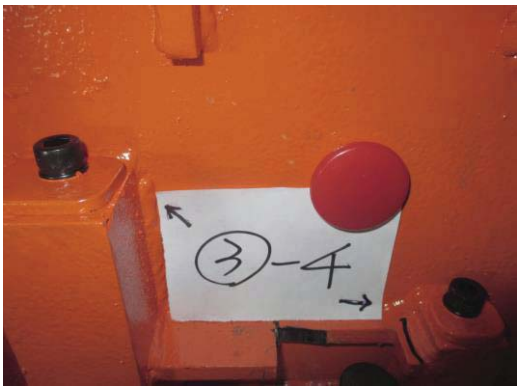
Step 2 - Move the saw bow backward until it reaches the **rear limit position** and the **rear limit indicator light turns on**. Press "**Home**" button to move machine to home position.



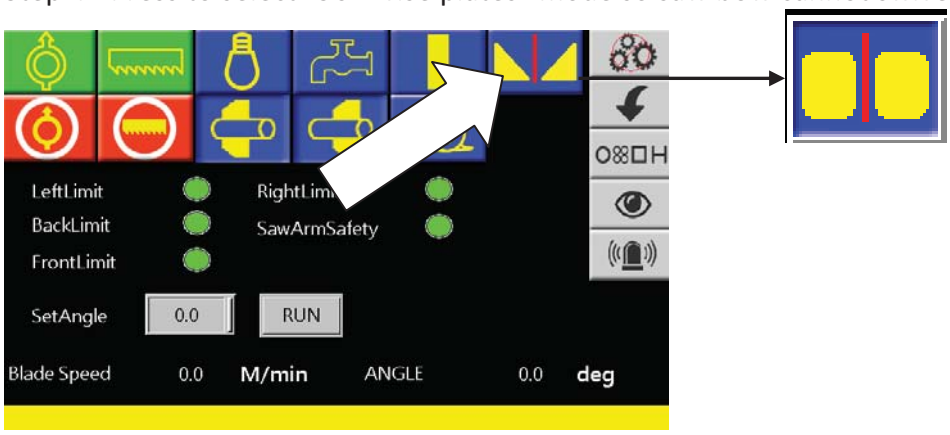
Step 3 - Remove 30° vise plates. Install 90° vise plates. Install top clamps. Washers and screws of the 90° vise plates need to be tightened securely.



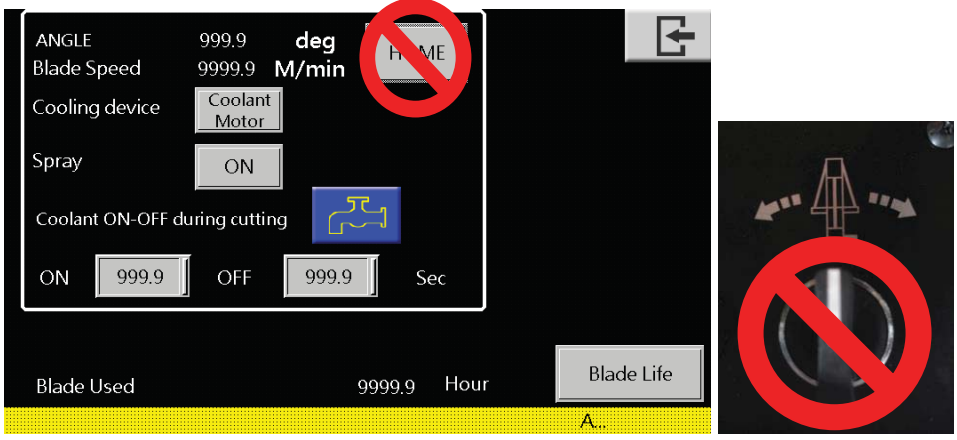




Step 4 - Press to select "90° vise plates" mode so saw bow cannot swivel.



Under "90° vise plates" mode, "**HOME**" buttons and saw bow angle control knob are temporarily disabled to avoid saw bow swiveling.



Step 5 - After the workpiece is clamped by the vises, turn the manual direction valves of the top clamps to clamp the workpiece.

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

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.
- **Saw bow:** Check the saw bow to see if it can be forward and backward 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 blade cutting pressure according to the material.

Step 6 – Adjust *saw bow feeding speed control* knob to obtain a suitable blade feeding 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 moves forward, 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, move the saw bow backward to the rear limit position and open the vises to remove the workpiece.
Step 11 – Clean the workbed by removing chips and cutting fluids.
Step 12 – Move the saw bow forward to a proper position then turn off the power.

USING TOP CLAMP FOR BUNDLE CUTTING (OPTIONAL)

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

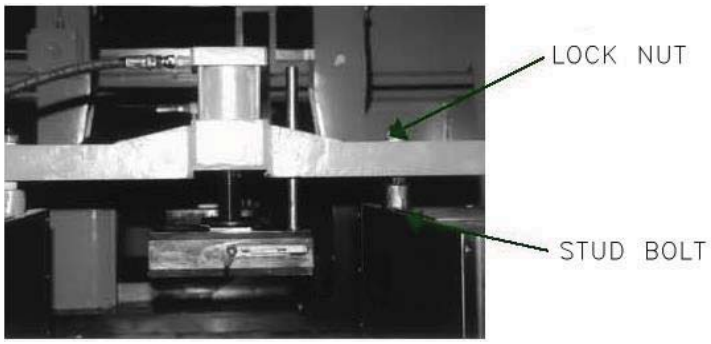
Any improper bundle cutting can cause damage to the blade, reduce the blade life.

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.

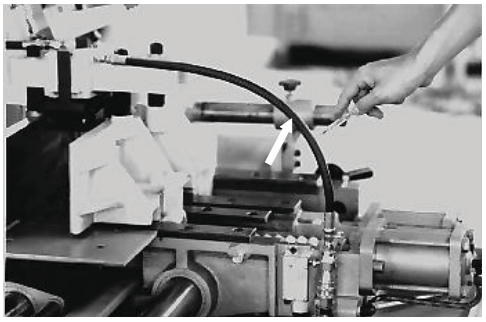
1. Each bar of the bundle is suggested to be the same size for being firmly clamped in the bundle.
2. Make sure that the bundle is properly placed (before cutting) to refrain from vibration, spinning and changing length position during cutting.
3. Tack welding ends of bars will prevent spinning but not vibration.

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.



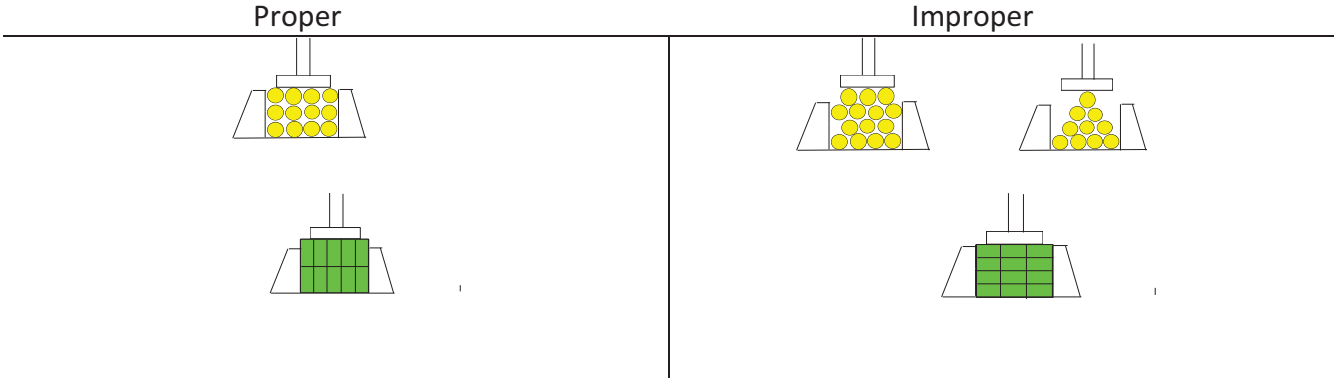
Step 2 – Connect the top clamp hoses to the pressure joints on the vise hydraulic cylinders.



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 in).

Step 6 – Press *Single/Bundle cutting mode* button and switch to bundle cutting mode.

Step 7 – For subsequent cutting procedures, refer to the cutting instructions above.

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.

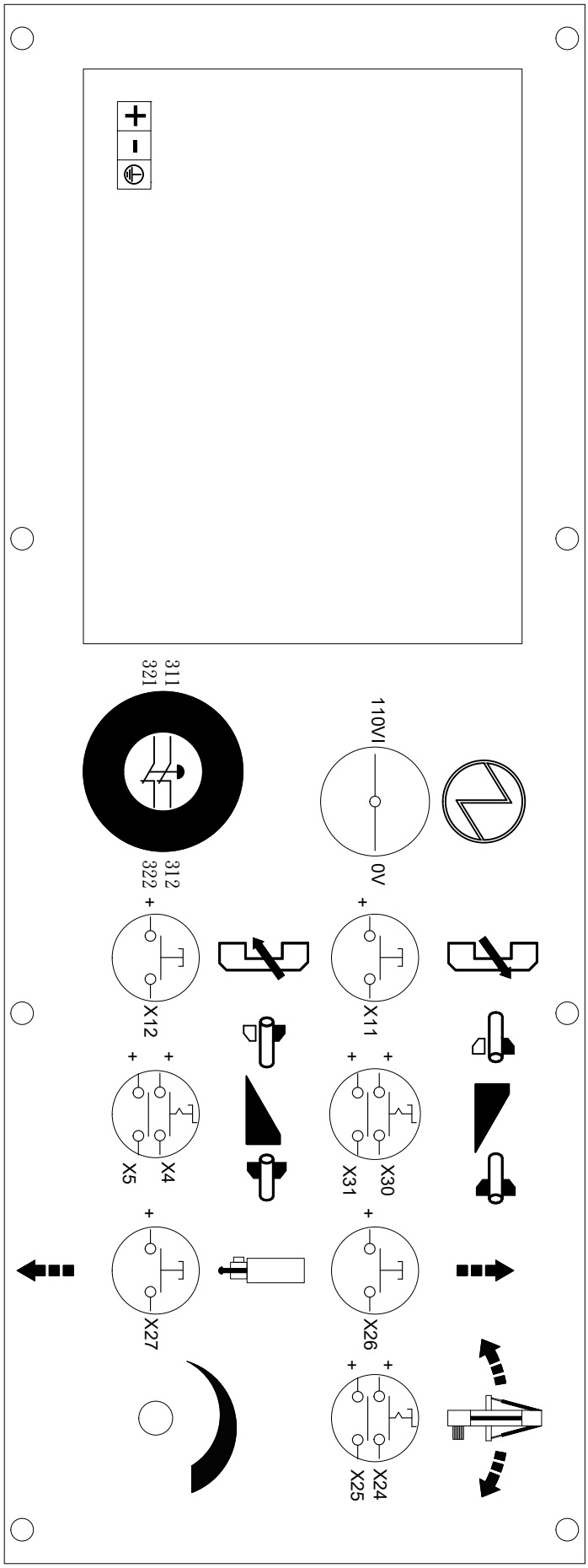
TERMINATING A CUTTING OPERATION 

- To terminate a cutting operation, press either the *saw bow backward* button or the *emergency stop* button.
- The saw blade will stop running when the *saw bow backward* 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



V2026NC-V2230NC-SVC670DM-CE共用

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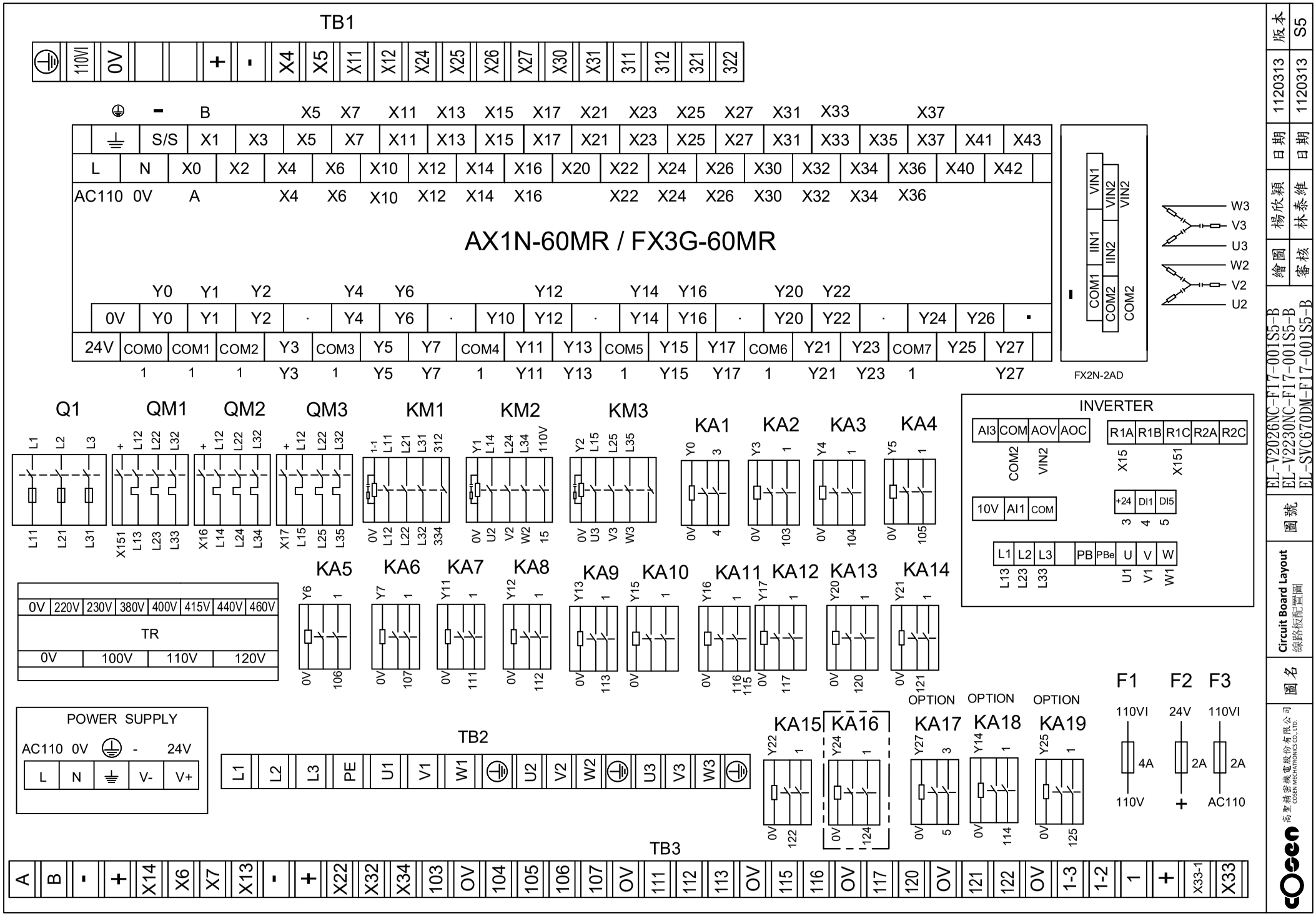
					審核	林泰維	日期	1120313	S5

F-F-31 9MV-2026-AM55CE S3



版本	S5
1120313	1120313
日期	日期
楊欣穎	林泰維
繪圖	審核

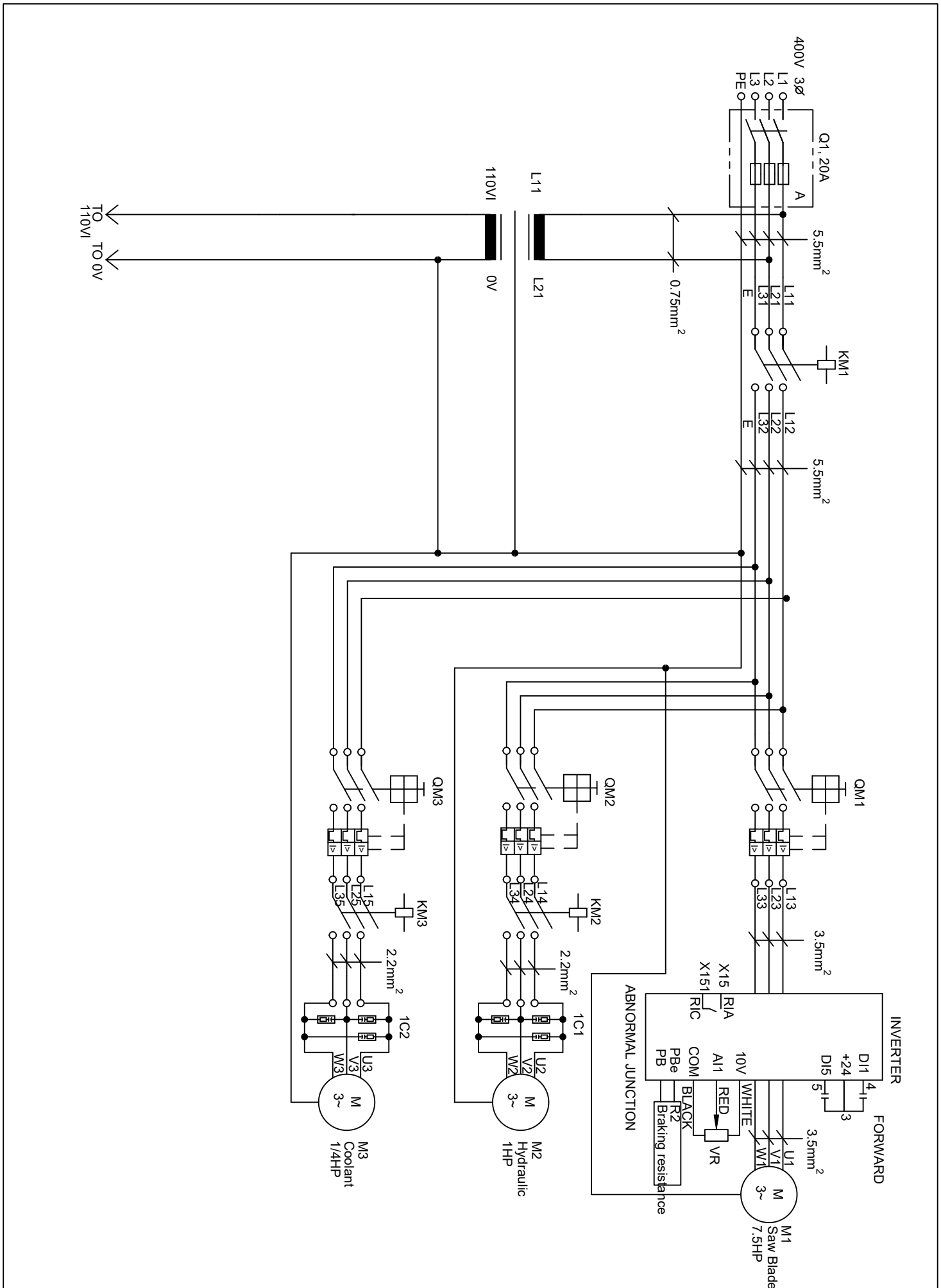
EL-V2026NC-F17-001S5-B
EL-V2230NC-F17-001S5-B
EL-SVC670DM-F17-001S5-B

圖號

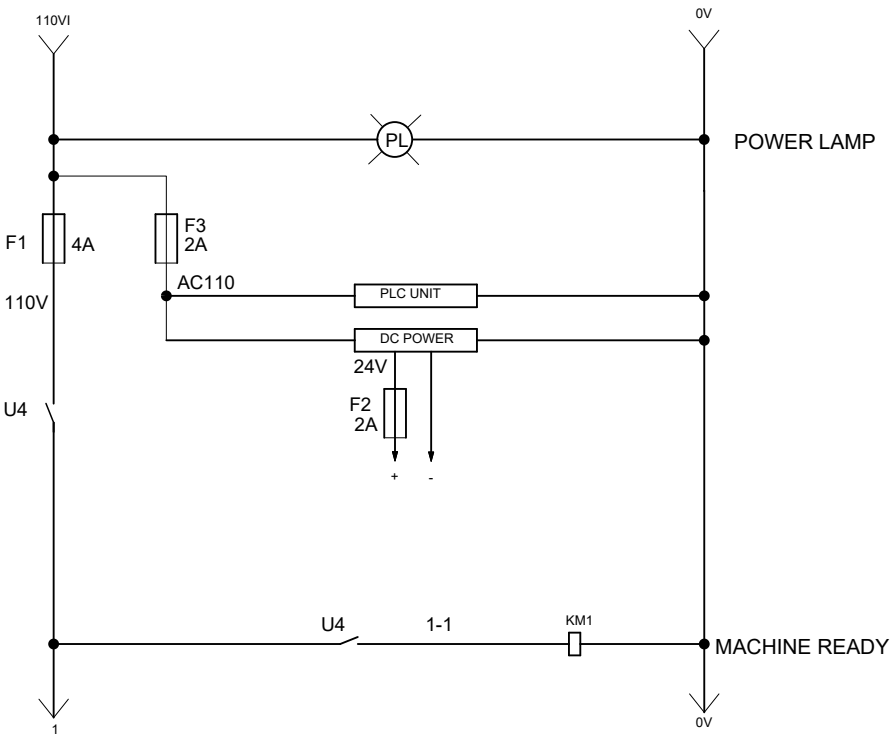
Circuit Board Layout
線路板配置圖

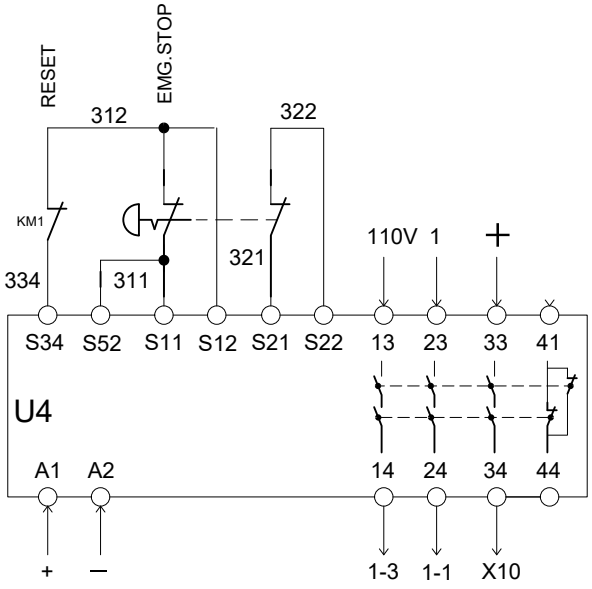
圖名

高聖精密機電股份有限公司
COSEN MECHATRONICS CO., LTD.



高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	動力配置圖 Power supply Layout	圖號	EL-V2026NC-F17-001S5-C EL-V2230NC-F17-001S5-C EL-SVC670DM-F17-001S5-C	繪圖	楊欣穎	日期	1120313	版本
					審核	林泰維	日期	1120313	S5





cosen 高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	PLC Input /Output Layout PLC I/O配置圖	圖號	EL-V2026NC-F17-001S5-D EL-V2230NC-F17-001S5-D EL-SVC670DM-F17-001S5-D	繪圖	楊欣穎	日期	1120313	版本
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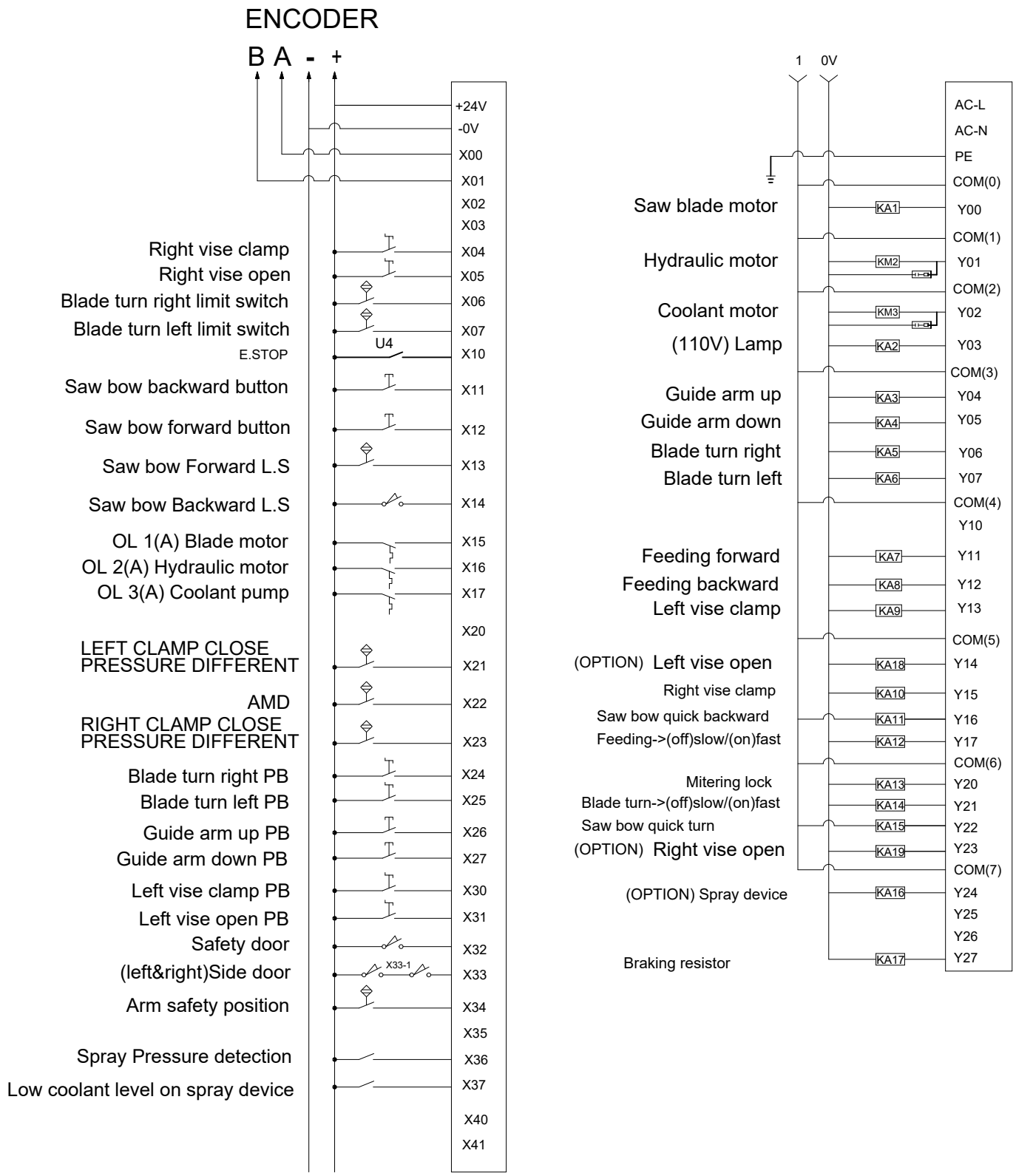
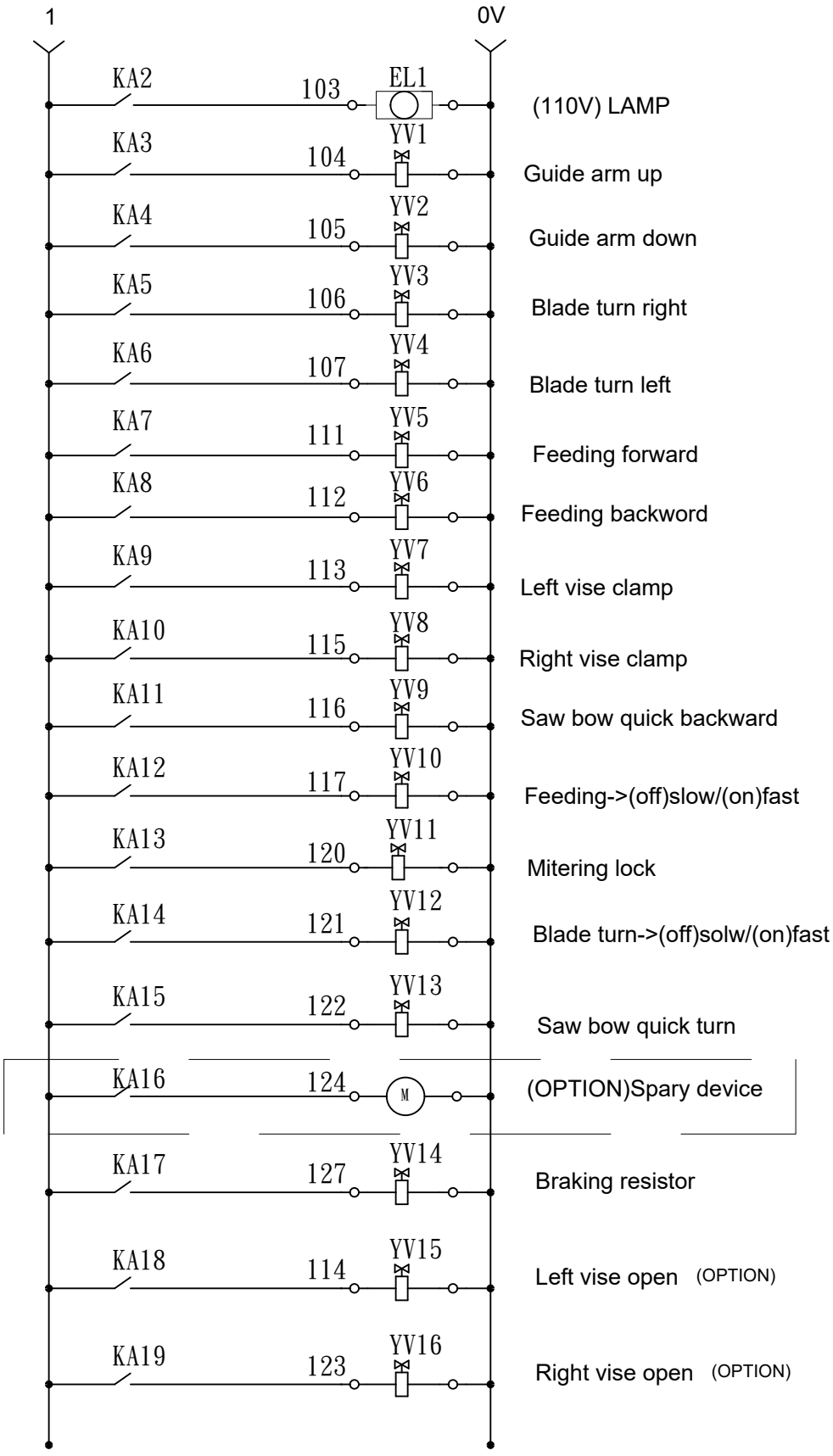


高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	PLC Input/Output Layout PLC I/O 配置圖	圖號	EL-V2026NC-F17-001S5-E EL-V2230NC-F17-001S5-E EL-SVC670DM-F17-001S5-E	繪圖	楊欣穎	日期	1120313	版本
					審核	林泰維	日期	1120313	S5



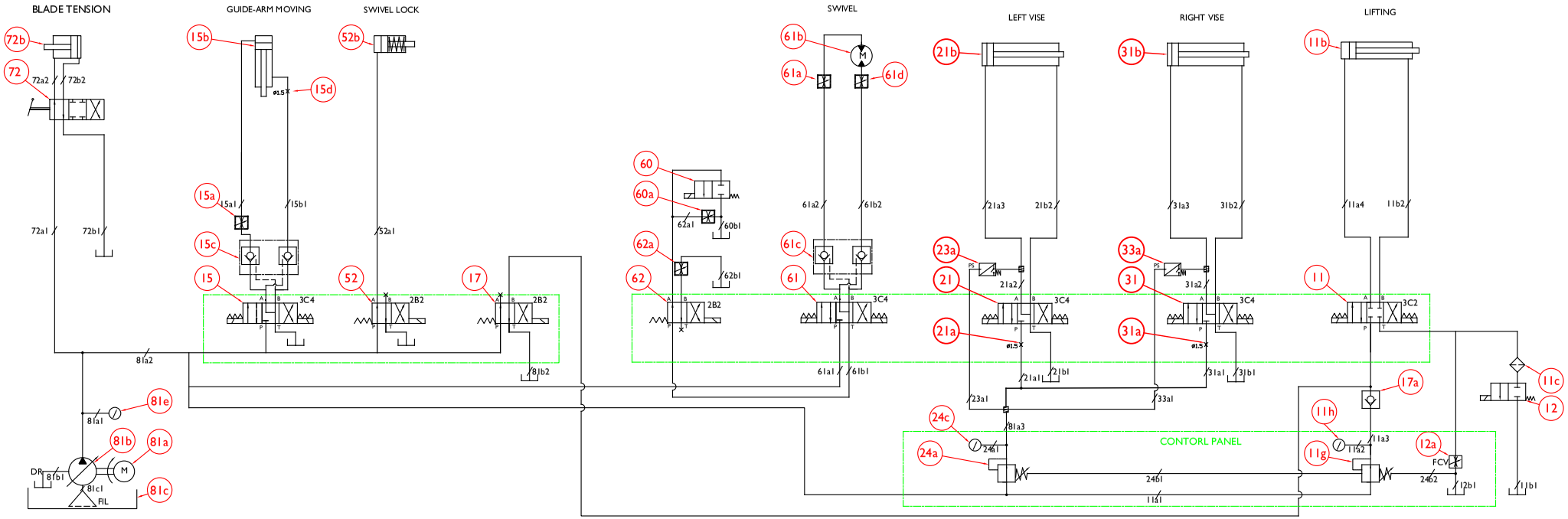
高聖精密機電股份有限公司 COSEN MECHATRONICS CO., LTD.	圖名	PLC Input /Output Layout PLC I/O配置圖	圖號	EL-V2026NC-F17-001S5-F EL-V2230NC-F17-001S5-F EL-SVC670DM-F17-001S5-F	繪圖	楊欣穎	日期	1120313	版本
					審核	林泰維	日期	1120313	S5

Section 6

HYDRAULIC SYSTEM

HYDRAULIC CIRCUIT DIAGRAMS

V-2026NC HYDRAULIC CIRCUIT (FULL STROKE)



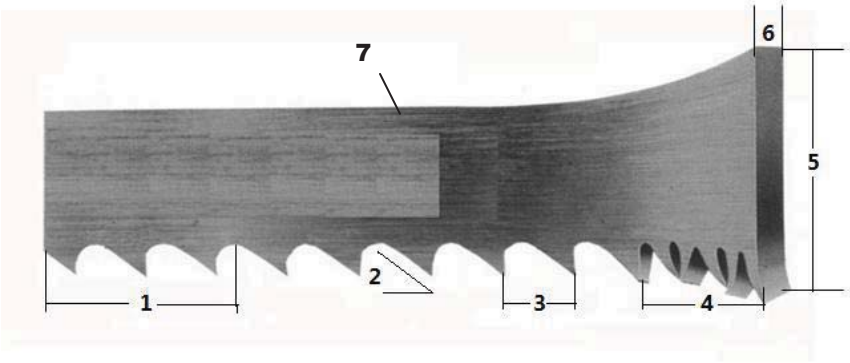
COSEN MECHATRONICS CO.,LTD.			DRAW	20200205	ELAINE
			CHECK	20200205	TAVIA
TITLE	V-2026NC HYDRAULIC CIRCUIT FOR FULL STROKE		APPROVED	20200205	TAVIA
DRAWING NO.05V-2026NC*T	VERSION	1-1		DATE	NAME

F-F-31 9MV-2026-AM55CE S3

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:

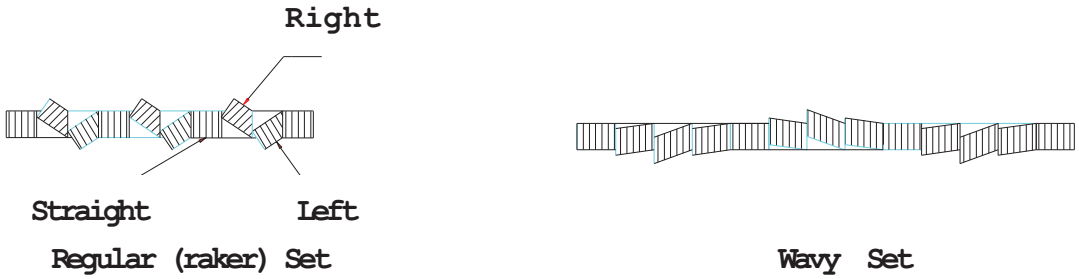


Fig. 7.2 The Saw Set

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.

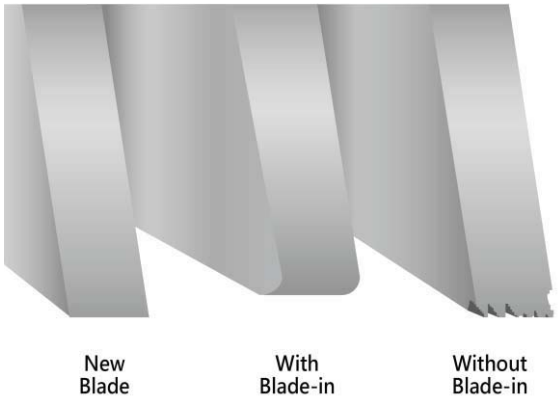
When it comes to cutting odd-shaped material, such as angles, I-beams, channel, and tubing, the main point is to arrange the materials in such a way that the blade cuts through as uniform a width as possible throughout the entire distance of cut.

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

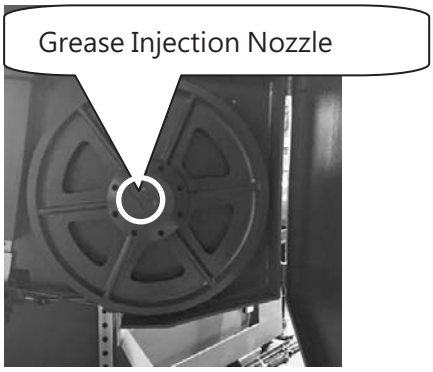
Please apply Grease to the following points:
1. Idle wheel
2. Drive wheel
3. Blade tension device

Recommended Grease:
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

Please apply lubricating oil to the following points: (if applicable)
Main shaft (double column)

Recommended Lubricating Oil:
- CPC Circluation oil R68

Grease Injection Hole:

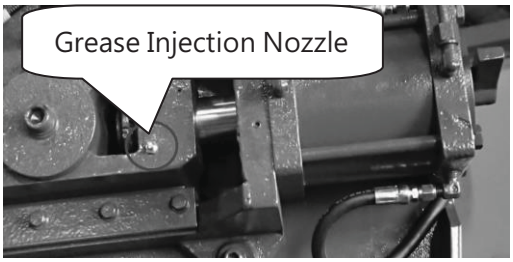


1. Grease Injection Nozzles at the middle of drive wheel and idle wheel;

   (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.

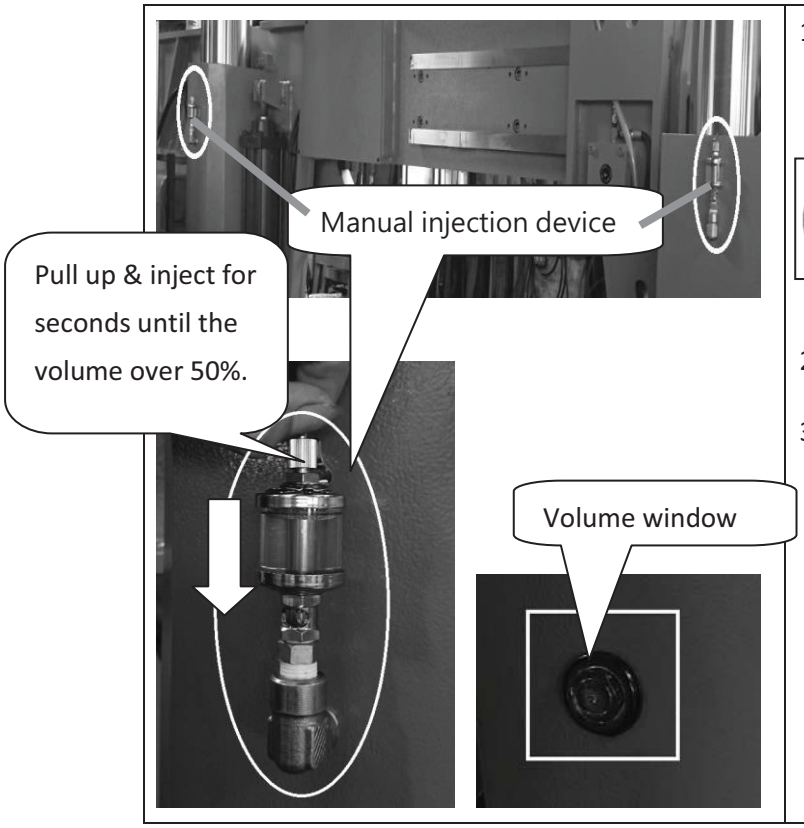


1. Grease Injection Nozzle on the blade tension device.

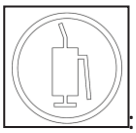

: The position of injection indicating.

3. Please inject the grease into the Nozzle.

Lubricating Oil 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 lubricating oil for seconds
3. Recommend always keeping the volume over 50% inside the vessel of volume window. ◦

Manual Lubrication Injection Device: (if applicable)

Lubrication volume indicator.
Recommend keeping the volume over 50% inside the vessel.

Please take down this vessel cap to replenish the lubrication.

For the prevention of working environment pollution, **DO NOT** replenish too much volume of lubrication while supplying the lubrication into the vessel.

Under the circumstances of normal operation, replenish the lubrication once every three days.

It may be adjusted the schedule of replenishing whenever the user needs.

The main function is to lubricate the **slide rail and block**.

(The **liner guideway for saw bow**).

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

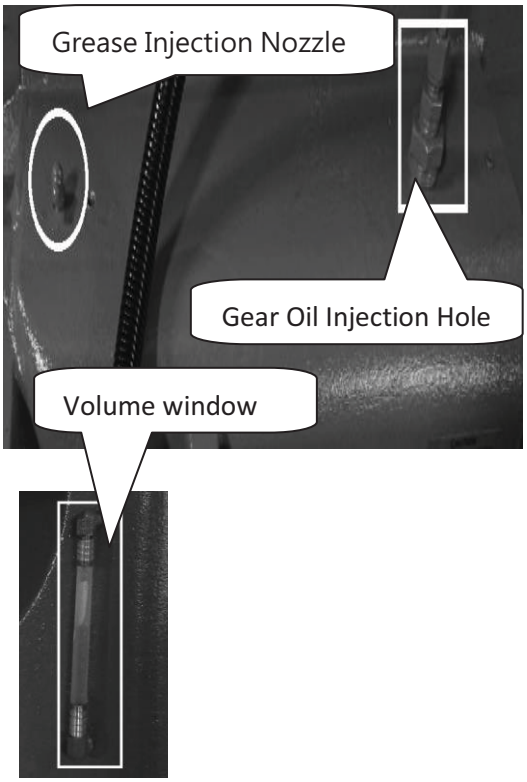
Every six months

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

Gear Oil & Grease Injection Hole:



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

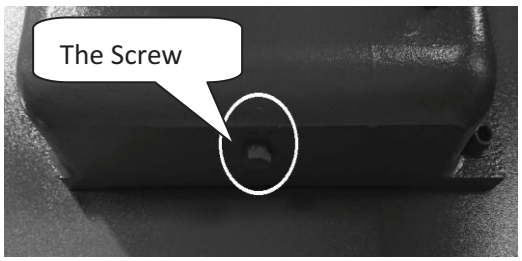
: The position of injection indicating.

2. *Keeping the volume under 30% inside the vessel of volume window.

***NOTE: More than 30% oil in the gear box will cause oil spilling out.**

3. To use the machine in a sub-zero environment, please add antifreeze into gear reducer.

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,

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	SAE #10
Bed roller / surface		Sweep clean and oil with lubricant.	Daily	SAE #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

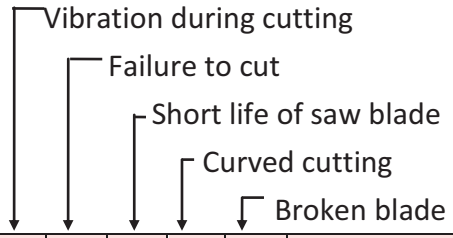
DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.

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



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

SOLUTIONS TO SAWING PROBLEMS

Table Of Contents

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

Probable Cause :

A. Improper break-in procedure.

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

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

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

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

#2. Wear On Both Sides Of Teeth

Probable Cause :

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

B. Improper side guides for band width.

C. Backing the band out of an incomplete cut.

#3. Wear On One Side Of Teeth

Probable Cause :

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

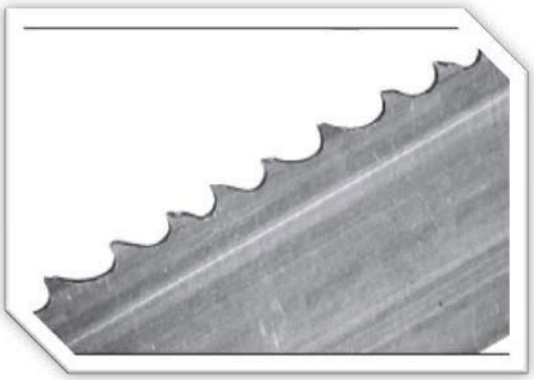
B. Loose or improperly positioned side guides.

C. Blade not perpendicular to cut.

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

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

#4. Chipped Or Broken Teeth



Probable Cause :

A. Improper break-in procedure.

B. Improper blade selection for application.

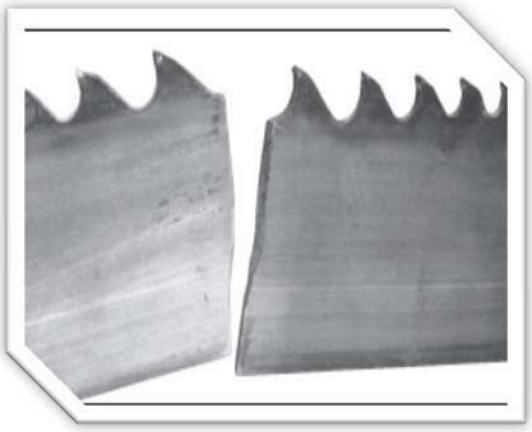
C. Handling damage due to improper opening of folded band.

D. Improper positioning or clamping of material.

E. Excessive feeding rate or feed pressure.

F. Hitting hard spots or hard scale in material

#5. Body Breakage Or Cracks From Back Edge



Probable Cause :

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

B. Excessive feed rate.

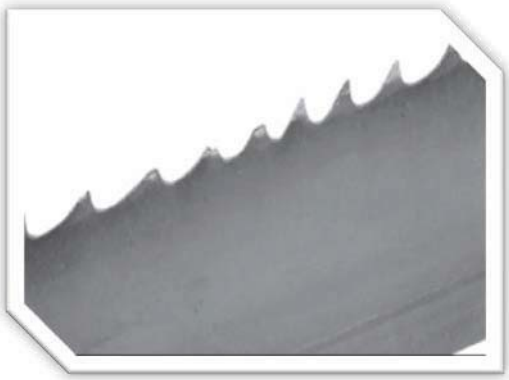
C. Improper band tracking – back edge rubbing heavy on wheel flange.

D. Worn or defective back-up guides.

E. Improper band tension.

F. Notches in back edge from handling damage

#6. Tooth Strippage



Probable Cause :

A. Improper or lack of break-in procedure.

B. Worn, missing or improperly positioned chip brush.

C. Excessive feeding rate or feed pressure.

D. Movement or vibration of material being cut.

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

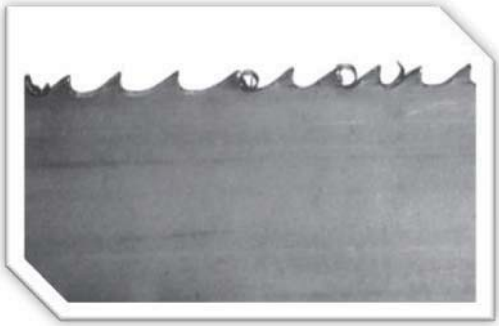
F. Improper positioning of material being cut.

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

H. Hard spots in material being cut.

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

#7. Chips Welded To Tooth Tips



Probable Cause :

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

B. Worn, missing or improperly positioned chip brush.

C. Improper band speed.

D. Improper feeding rate.

#8. Gullets Loading Up With Material

Probable Cause :

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

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

C. Worn, missing or improperly positioned chip brush.

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

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

Probable Cause :

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

B. Excessive band speed.

C. Improper feeding rate.

D. Band installed backwards.

10. Heavy Wear On Both Sides Of Band

Probable Cause :

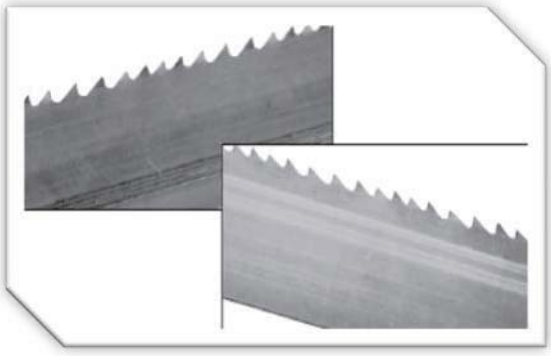
A. Chipped or broken side guides.

B. Side guide adjustment may be too tight.

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

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

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



Probable Cause :

A. Loose side guides.

B. Chipped, worn or defective side guides.

C. Band is rubbing on part of the machine.

D. Guide arms spread to maximum capacity.

E. Accumulation of chips in side guides.

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

Probable Cause :

A. Excessive feed rate.

B. Excessive back-up guide "preload".

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

D. Worn or defective back-up guides.

#13. Butt Weld Breakage

Probable Cause :

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

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

#14. Heavy Wear In Only The Smallest Gullets

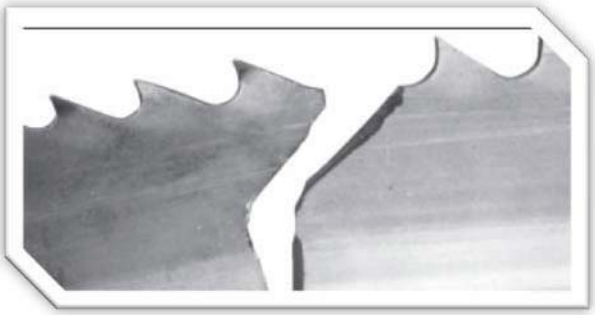
Probable Cause :

A. Excessive feeding rate.

B. Too slow of band speed.

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

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



Probable Cause :

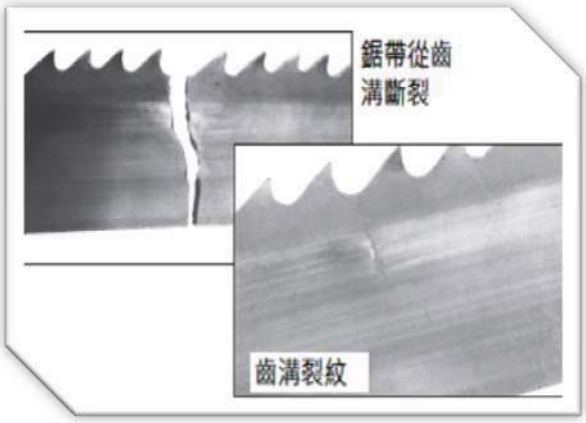
A. An excessive twist type of stress existed.

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

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

D. Excessive back-up guide "preload".

#16. Body Breakage Or Cracks From Gullets



Probable Cause :

A. Excessive back-up guide "preload".

B. Improper band tension.

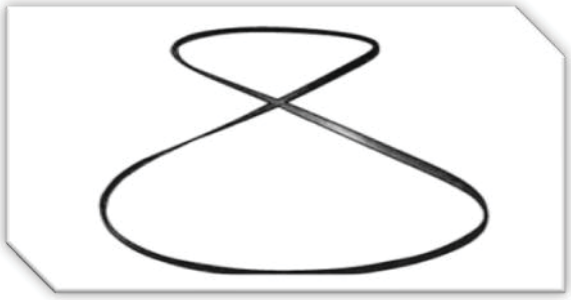
C. Guide arms spread to maximum capacity.

D. Improper beam bar alignment.

E. Side guide adjustment is too tight.

F. Excessively worn teeth.

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



Probable Cause :

A. Excessive band tension.

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

C. Cutting a tight radius.

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

Probable Cause :

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

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

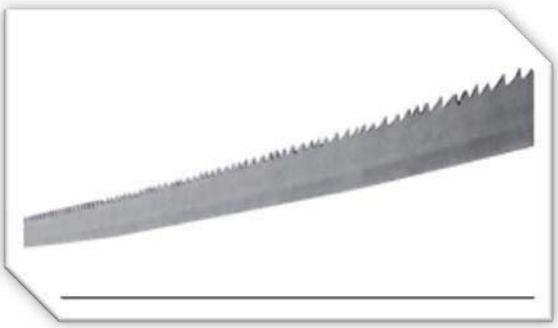
C. Worn band wheels causing uneven tension.

D. Excessive feeding rate.

E. Guide arms are spread to maximum capacity.

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

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



Probable Cause :

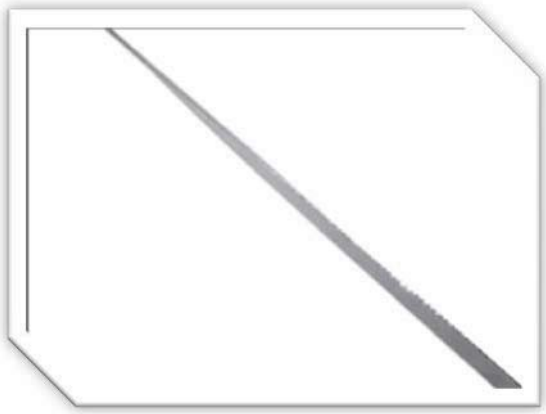
A. Side guides are too tight – rubbing near back edge.

B. Worn band wheels causing uneven tension.

C. Guide arms are spread too far apart.

D. Excessive feeding rate.

#20. Broken Band Shows A Twist In Band Length



Probable Cause :

A. Excessive band tension

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

C. Cutting a tight radius.

RE-ADJUSTING THE ROLLER TABLE

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

TOOL, measuring

Measurement, Horizontal balance

Procedure

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

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

Section 10

PARTS

SPARE PARTS RECOMMENDATIONS

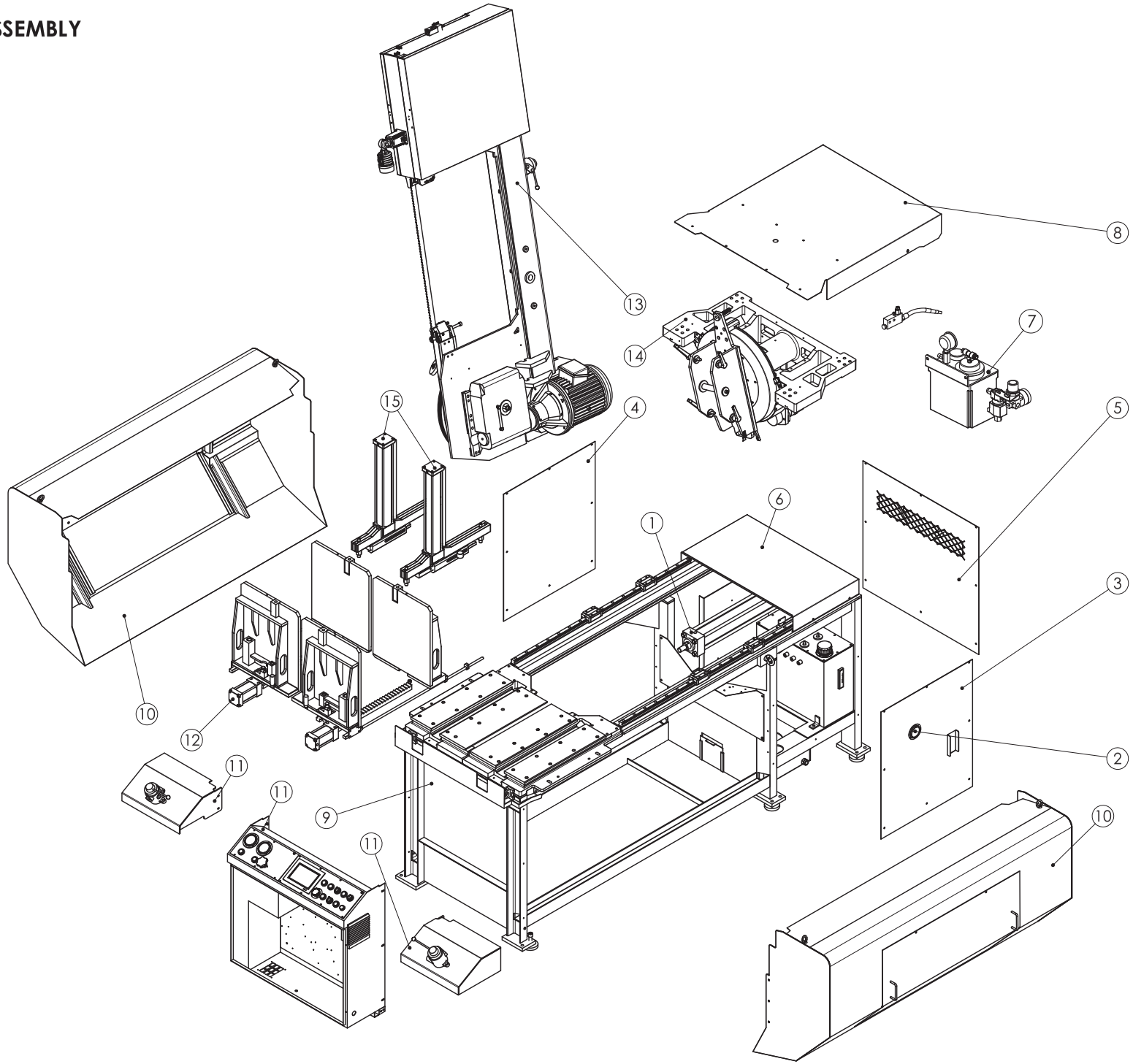
PART LIST

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	Coolant pump
Hydraulic tank leak-proof gasket	Belt
Rubber washer	Duster seal
Gear reducer	Oil seal
O-ring	Snap ring
Drive wheel	Idle wheel

總組合 TOTAL ASSEMBLY



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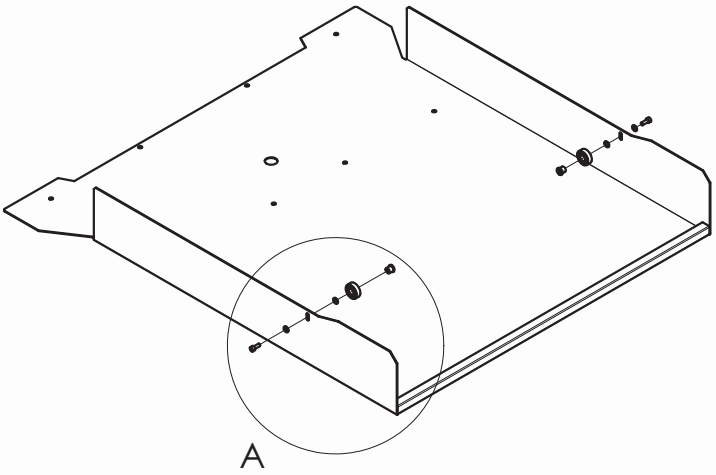
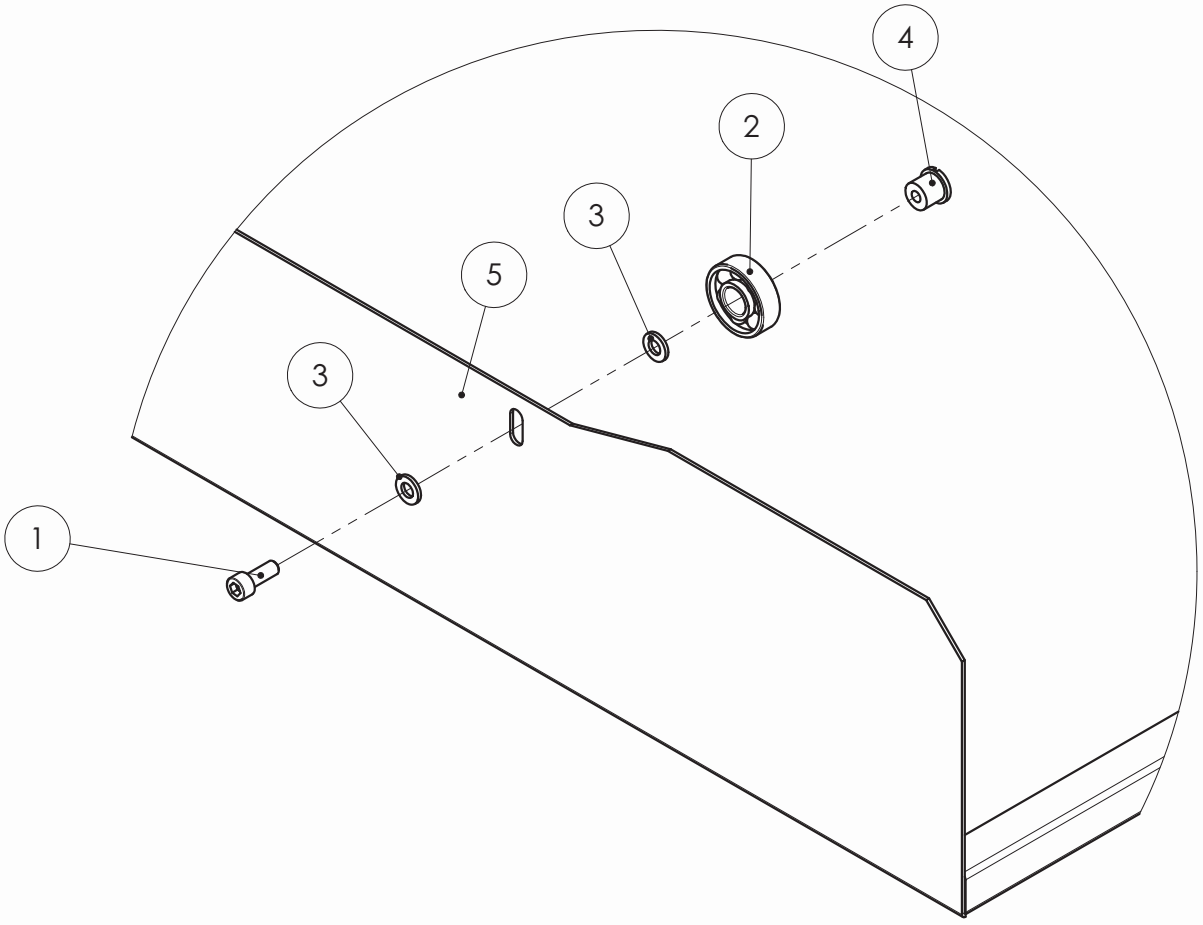
總組合 TOTAL ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	HFB80L605E35	hydraulic cylinder	油壓缸		1
2	PP-43315	Built-in pressure gauge	油錶		1
3	VC670D-1059	right rear cover	右後蓋		1
4	VC670D-1061	left rear cover	左後蓋		1
5	VC670D-1071	rear cover	後蓋		1
6	VC670D-2014	rear cover (1)	後護蓋(一)		1
7	PP-35010A-1	pneumatic oil injector	油霧式幫浦組		1
8	VC600D-2016	rear cover 2 assembly	後護蓋(二)組		1
9	VC670D-10000	base assembly	底座組		1
10	V2026-10600	base cover assembly	底座護蓋組		1
11	VC670D-13000	electrical compartment assembly	電控箱組		1
12	VC670D-20000	bed and vise assembly	床面虎鉗組		1
13	VC670D-30000	saw bow assembly	鋸弓組		1
14	VC670D-34500	saw bow rotating assembly	鋸弓滑軌組		1
15	VC600D-41000	Top clamp assembly	下壓組		2

後護蓋組





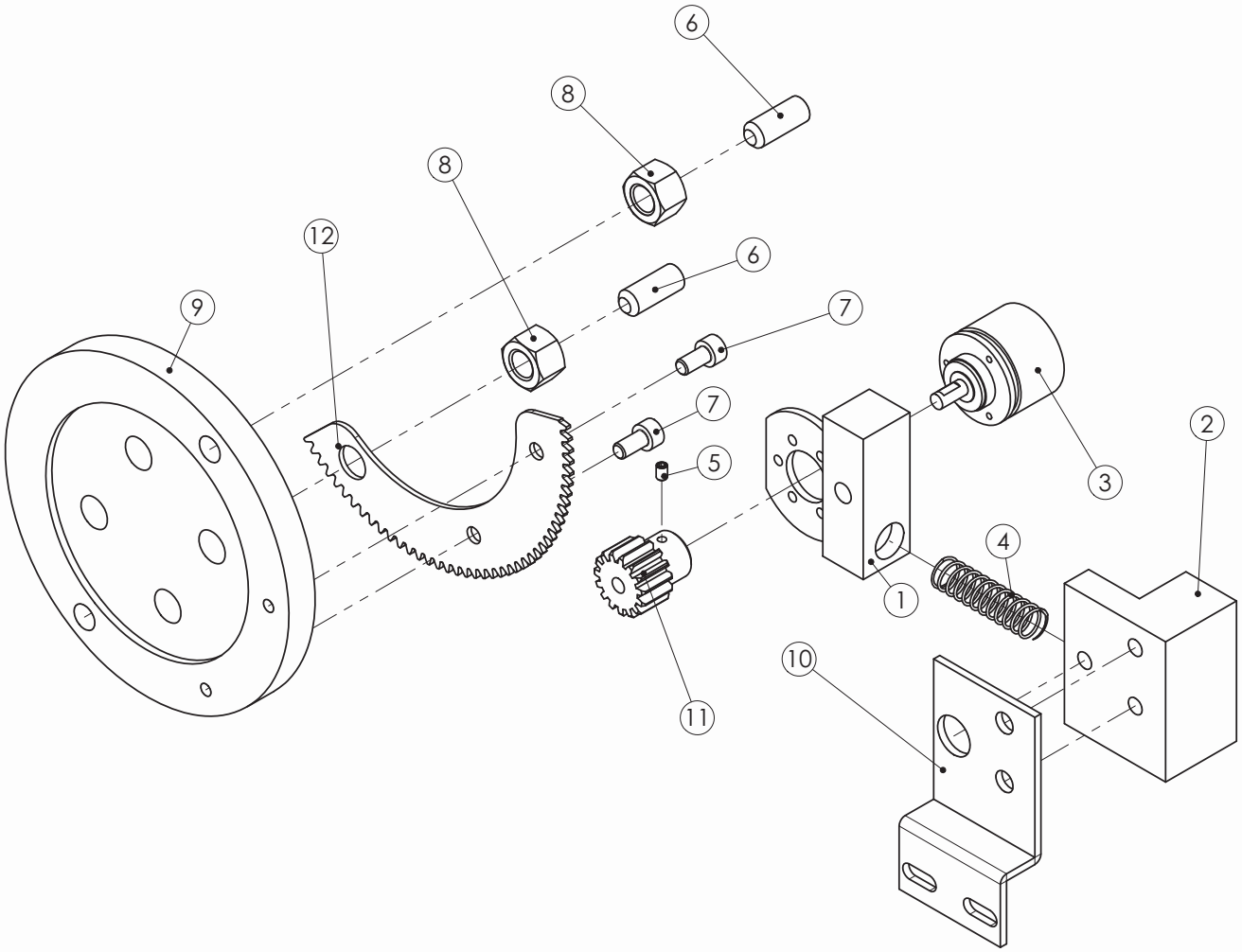
細部放大圖 A
比例 1 : 3

SVC-670DMM / SVC-670DMC / MVC-670DM / V-2026NC 2015/7/15

後護蓋組 REAR COVER ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	PBA-6-15	Hex soc cap screw	內六角螺絲		2
2	PP-14271	bearing	軸承		2
3	PPA-8	flat washer	平面華司		2
4	VC600D-1480	Bearing fixed seat	軸承固定座		2
5	VC600D-2016	Rear cover (2)	後護蓋(二)		1

VC600D-21000 譯碼器組

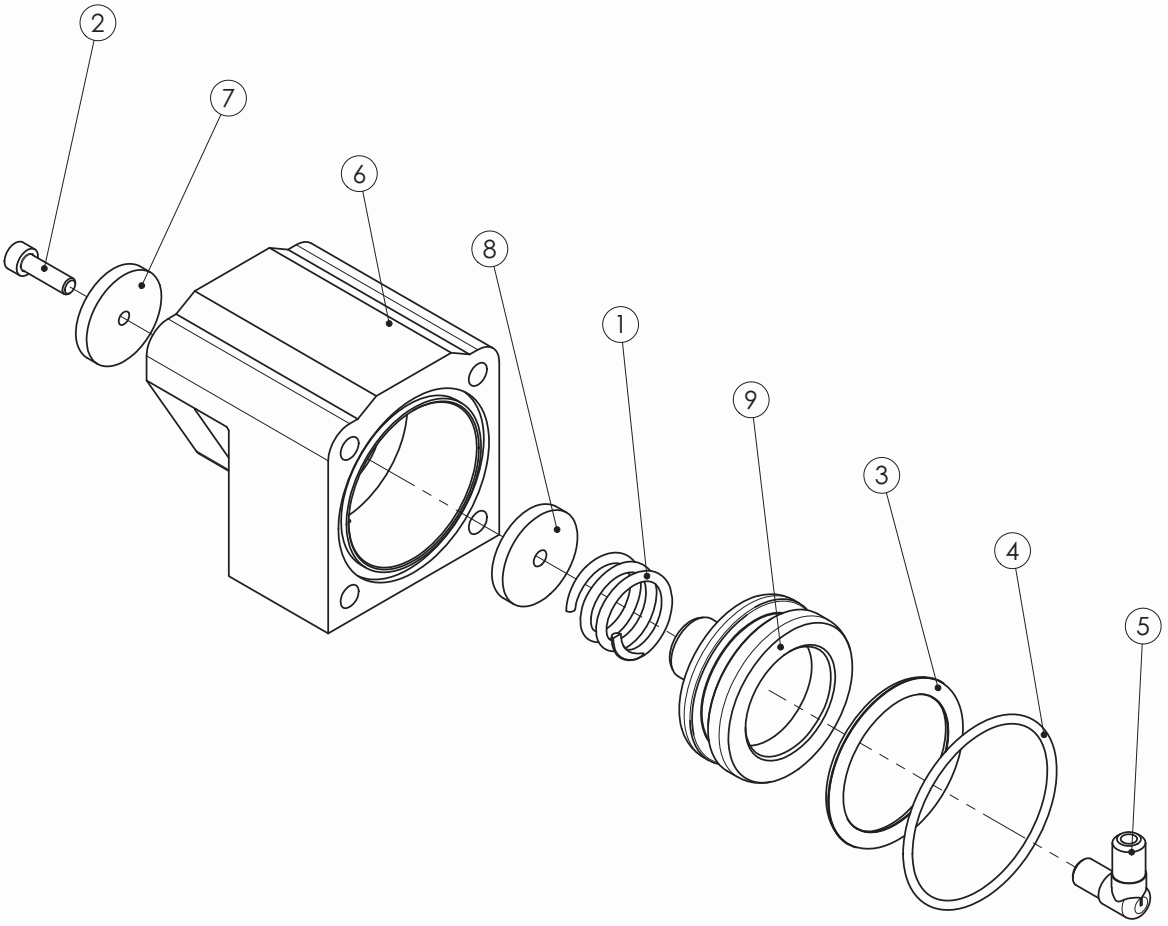


SVC-670DMM / SVC-670DMC / V-2026NC 2015/7/15

VC600D-21000 譯碼器組 ENCODER ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	C320G-70536	Encoder fixed seat	譯碼器固定座		1
2	C560L-2103	Encoder movable seat	譯碼器活動座		1
3	EP-90492I	Encoder	譯碼器		1
4	M3L-9-10	Spring	微動彈簧		1
5	PAA-4-6	Set screw	止付螺絲		*
6	PBA-10-25	Hex soc cap screw	內六角螺絲		*
7	PBA-6-12	Hex soc cap screw	內六角螺絲		*
8	POA-12	Nut	螺帽		*
9	SV600D-2107A	Rotating shaft end plate	旋轉軸端板		1
10	VC600D-2101B	Encoder fixed seat	譯碼器固定座		1
11	VC600D-2105	Gear	1.5定寸齒輪		1
12	VC600D-2112	Toothed plate	M1.5齒型板		1

VC600D-37500B 制動器組 BRAKE ASSEMBLY

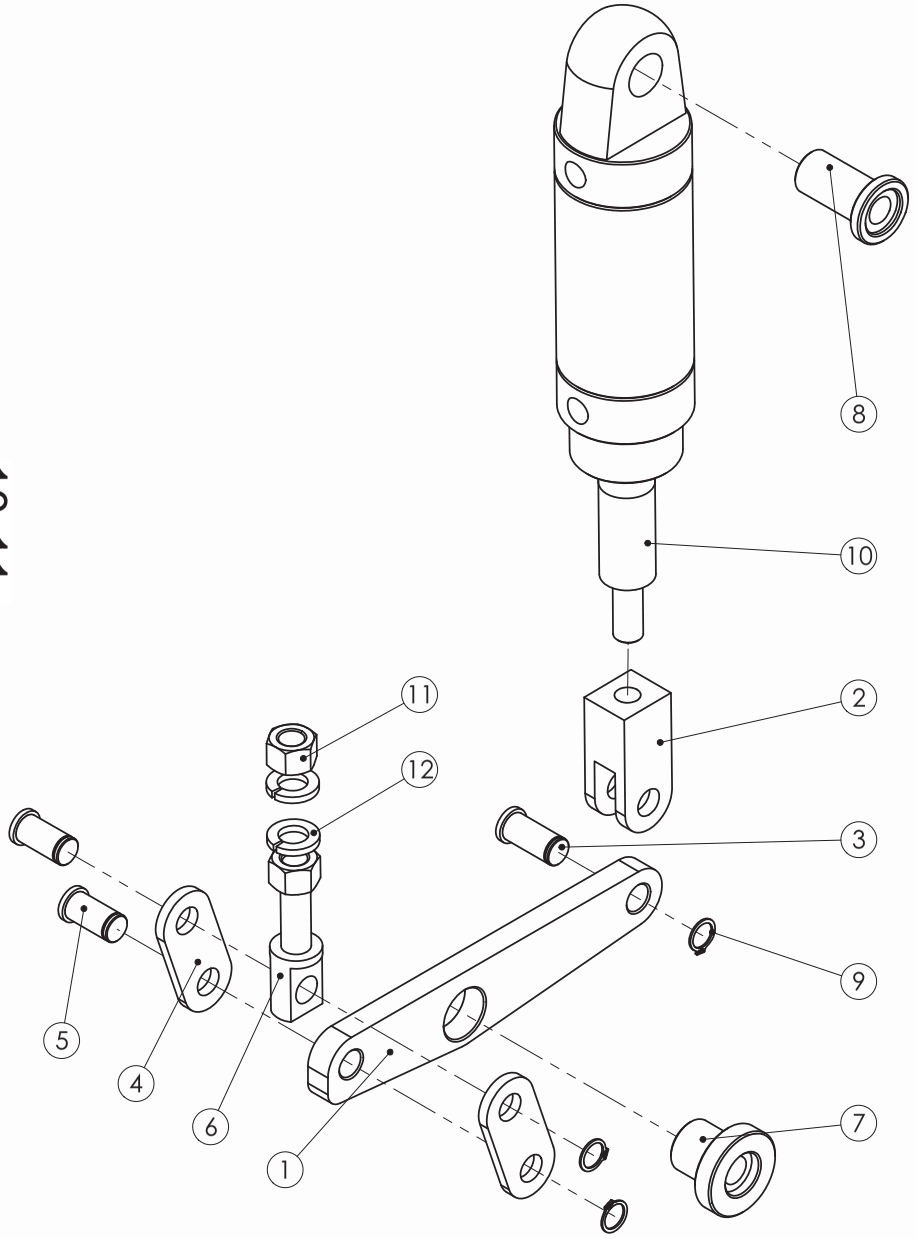


670DMM / SVC-670DMC / V-2026NC 2015/7/15

VC600D-37500B 制動器組 BRAKE ASSEMBLY

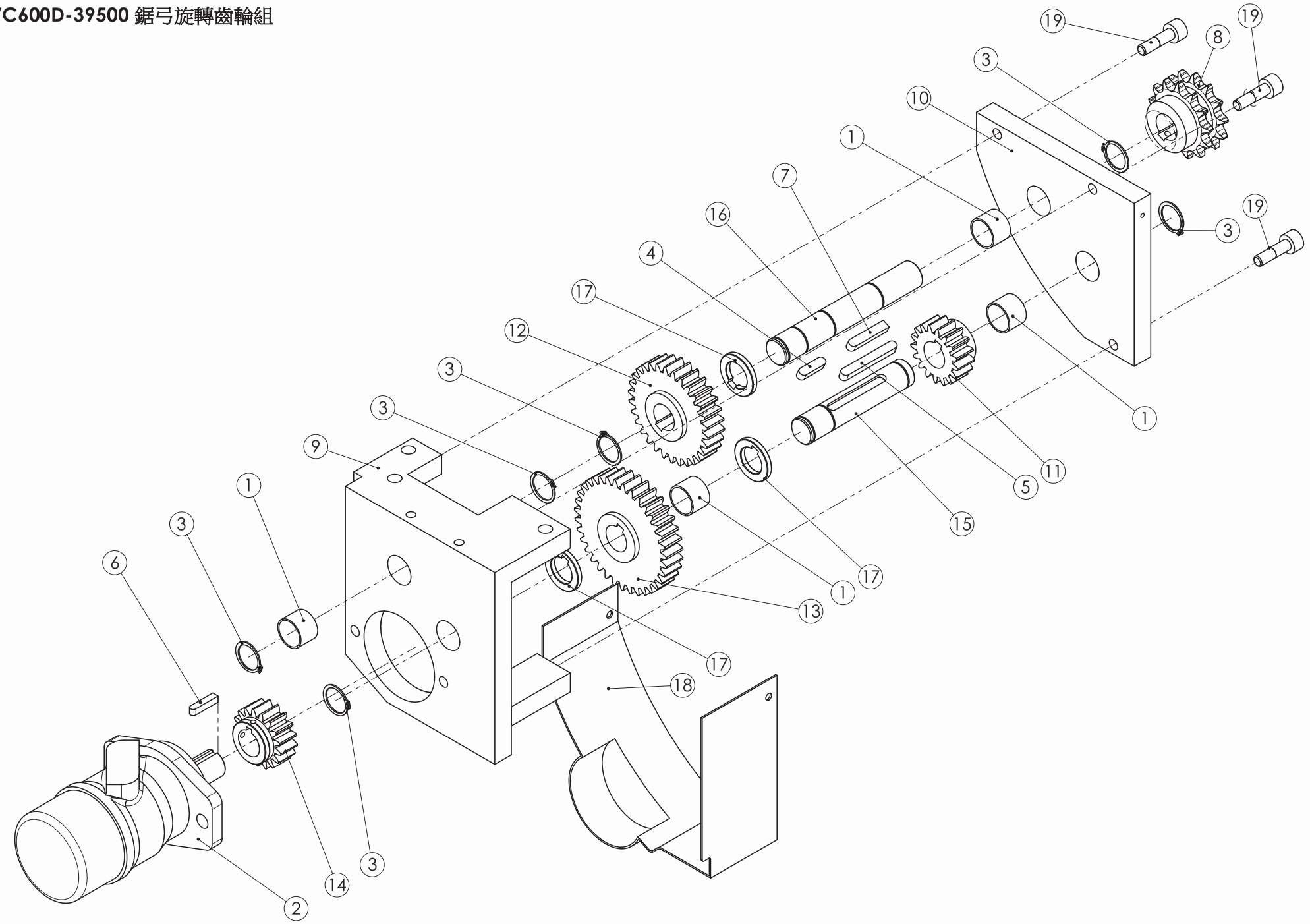
ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AHA-0629	buffer spring	緩衝彈簧		1
2	PBA-6-20	Hexagon socket head cap screw	內六角螺絲		*
3	PP-59196	O-ring	O型環		1
4	PP-59570	O-ring	O型環	G-65	1
5	PUI-010-020-04	Connector	直接頭	規格1/8P x 1/4H	1
6	VC600D-3752B	brake supporting seat	制動器支撐座		1
7	VC600D-3753	brake fixed plate	制動固定片		1
8	VC600D-3754	brake movable plate	制動活動片		1
9	VC600D-3755A	brake piston	制動活塞		1

VC600D-39200 張力連桿組
Tensioner shaft Assembly



ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	VC600D-3316A	Tensioner sliding seat shaft	張力滑座連桿		1
2	VC600D-3317A	Sliding seat connecting block	滑座連接塊		1
3	VC600D-3310	Tensioner shaft pin (2)	張力連桿插銷(二)		1
4	VC600D-3318	Sliding seat connecting plate	滑座連接板		2
5	VC600D-3308	Tensioner shaft pin (1)	張力連桿插銷(一)		2
6	VC600D-3468	tensioner connecting rod	滑板連接桿		1
7	VC600D-3312A	sliding seat shaft press plate	滑座連桿壓板		1
8	VC600D-3322	tension hydraulic cylinder washer	張力油壓缸墊圈		1
9	PP-52097A	Snap ring	扣環	S16	3
10	PP-43436B	Hydraulic Cylinder	油壓缸		1
11	POA-16-20A	Nut	螺帽	M16x2.0	2
12	PQA-16	Screw	彈簧華司	16	2

VC600D-39500 鋸弓旋轉齒輪組



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VC600D-39500 鋸弓旋轉齒輪組 SAW BOW ROTATING GEAR ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	PP-13140	DU bushing	乾式軸承(2520)		4
2	PP-31510	Hydraulic motor	油壓馬達 H-PM125		1
3	PP-52092	C-ring	C型扣環		6
4	PP-91731A	Double head round key	雙圓平行鍵		1
5	PP-91731B	Double head round key	雙圓平行鍵		1
6	PP-91735	Single head round key	單頭平行鍵		1
7	PP-91736	Single head round key	單頭平行鍵		1
8	VC600D-2551A	Chain wheel	鏈輪		1
9	VC600D-3951	Gearbox plate (1)	齒輪箱板(一)		1
10	VC600D-3952	Gearbox plate (2)	齒輪箱板(二)		1
11	VC600D-3956	Gear 1	齒輪(一)		1
12	VC600D-3957	Gear 2	齒輪(二)		1
13	VC600D-3958	Gear 3	齒輪(三)		1
14	VC600D-3959	Gear 4	齒輪(四)		1
15	VC600D-3961	Gear shaft	齒輪軸		1
16	VC600D-3962	Chain wheel shaft	鏈輪軸		1
17	VC600D-3963	Gear shaft washer	齒輪軸墊片		3
18	VC600D-3964	Gearbox cover	齒輪箱護蓋		1

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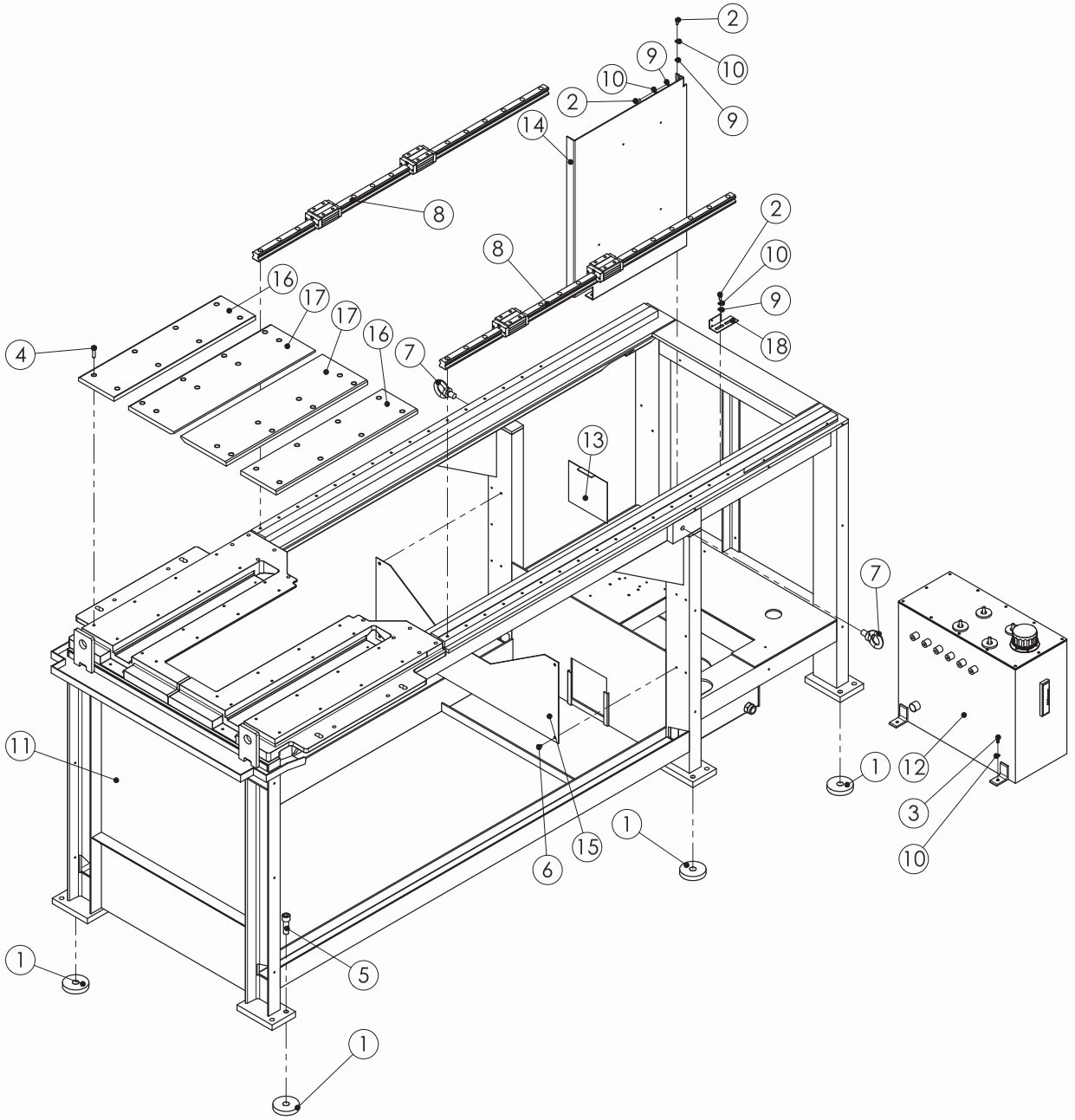
VC600D-39500 鋸弓旋轉齒輪組 SAW BOW ROTATING GEAR ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
19	VC600D-3965	Gearbox screw	齒輪箱板銷螺絲		3

VC670D-10000-底座組

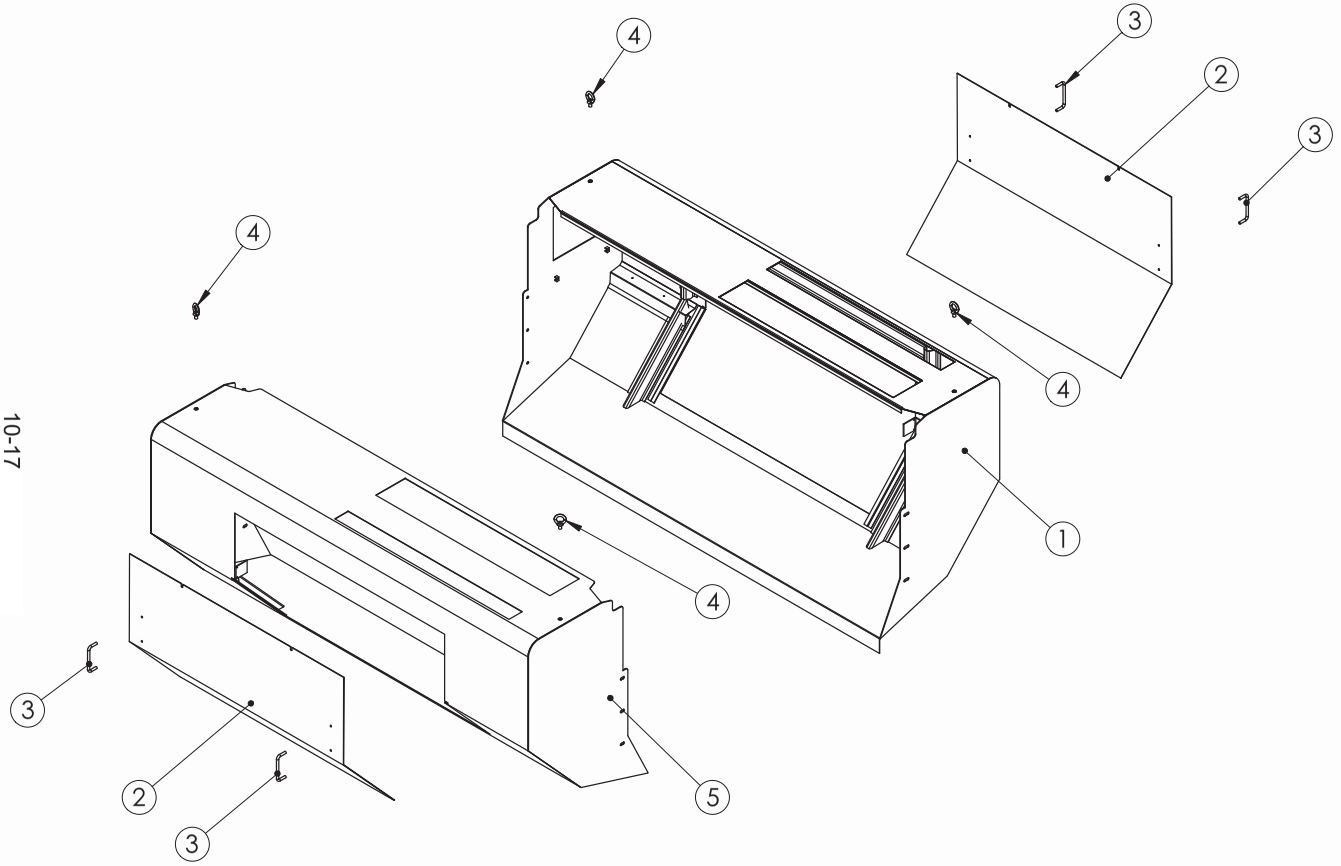


V-2026NC 2015/7/15

VC670D-10000 底座組 BASE ASSEMBLY

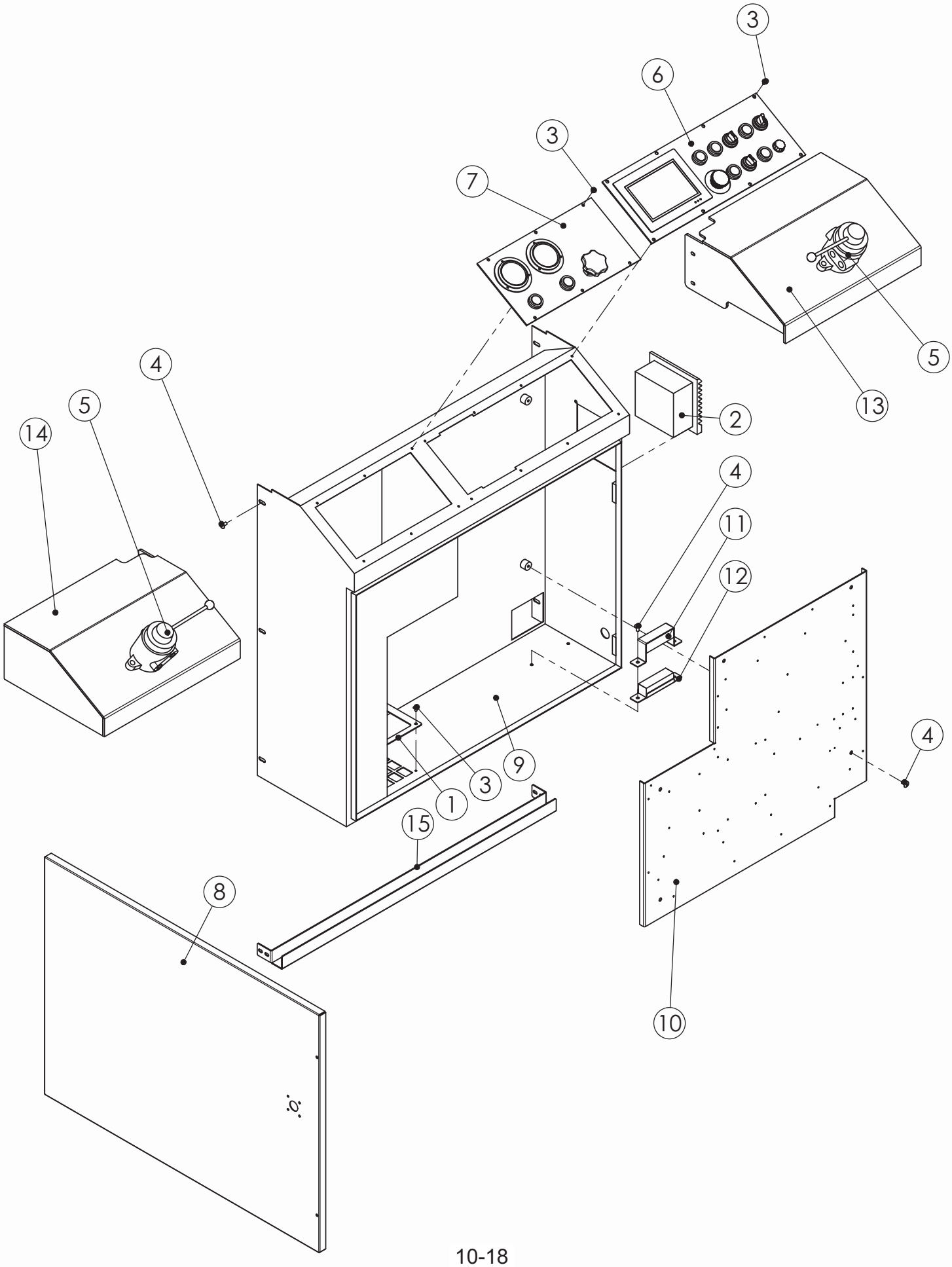
ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AHR-1055	table stand pad	底座墊塊		6
2	PBA-6-12	Hexagon socket head cap screw	內六角螺絲		*
3	PBA-6-16	Hexagon socket head cap screw	內六角螺絲		*
4	PBA-8-30	Hexagon socket head cap screw	內六角螺絲		*
5	PBA-16-50	Hexagon socket head cap screw	內六角螺絲		*
6	PHA-6-12	Round head screw	大扁丸頭螺絲		*
7	PP-57905	Eye bolt	環首螺栓		2
8	PP-92007	Linear guide	線性滑軌(含座和塞子)		2
9	PPA-6	flat washer	平面華司		*
10	PQA-6	Spring washer	彈簧華司		*
11	VC670D-1001	base	底座		1
12	VC600D-1002	oil tank assembly	油箱組		1
13	VC600D-1009	tank filter	水箱濾網		1
14	VC670D-1015	manifold plate seat	油路板座		1
15	VC670D-1022	base chip shield	底座擋屑板		1
16	VC670D-2003	bed steel plate 1	床面鋼板(一)		2
17	VC670D-2005	bed steel plate 2	床面鋼板(二)		2
18	VC600D-2887	rear limit fixed plate	後限固定板		1

V2026-10600-底座護蓋圖



ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	V2026-1043	Base cover	底座護蓋		1
2	VC670D-1044	Base splash shield	底座遮水板		2
3	PP-52124	Handle	輪箱把手	枝輝 A42C	4
4	PP-57902	Eye bolt	環首螺栓	M10xP1.5	4
5	V2026-1044	Base cover	底座護蓋		1

VC670D-13000 電控箱組 ELECTRICAL COMPARTMENT ASSEMBLY



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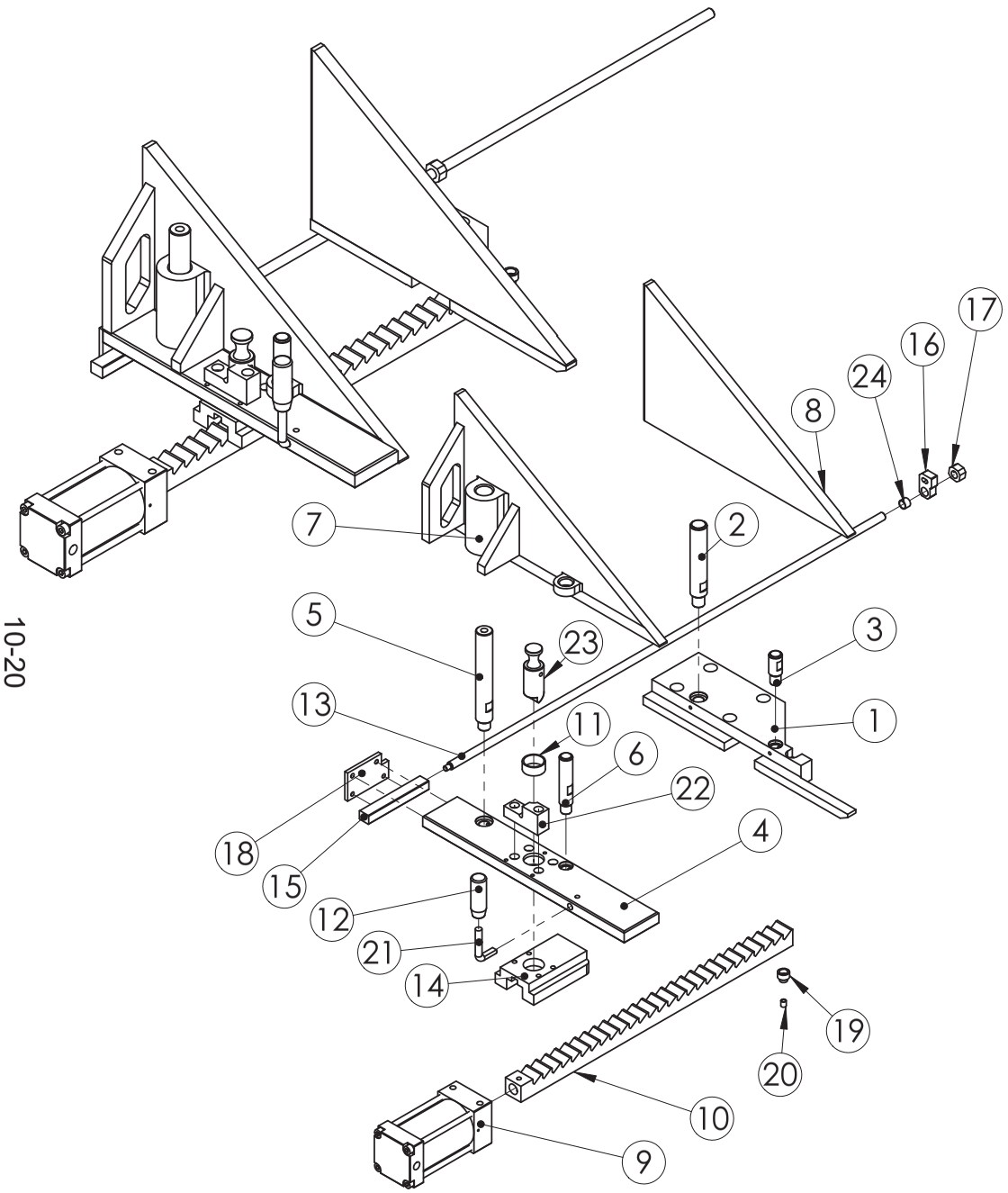
VC670D-13000 電控箱組 ELECTRICAL COMPARTMENT ASSEMBLY

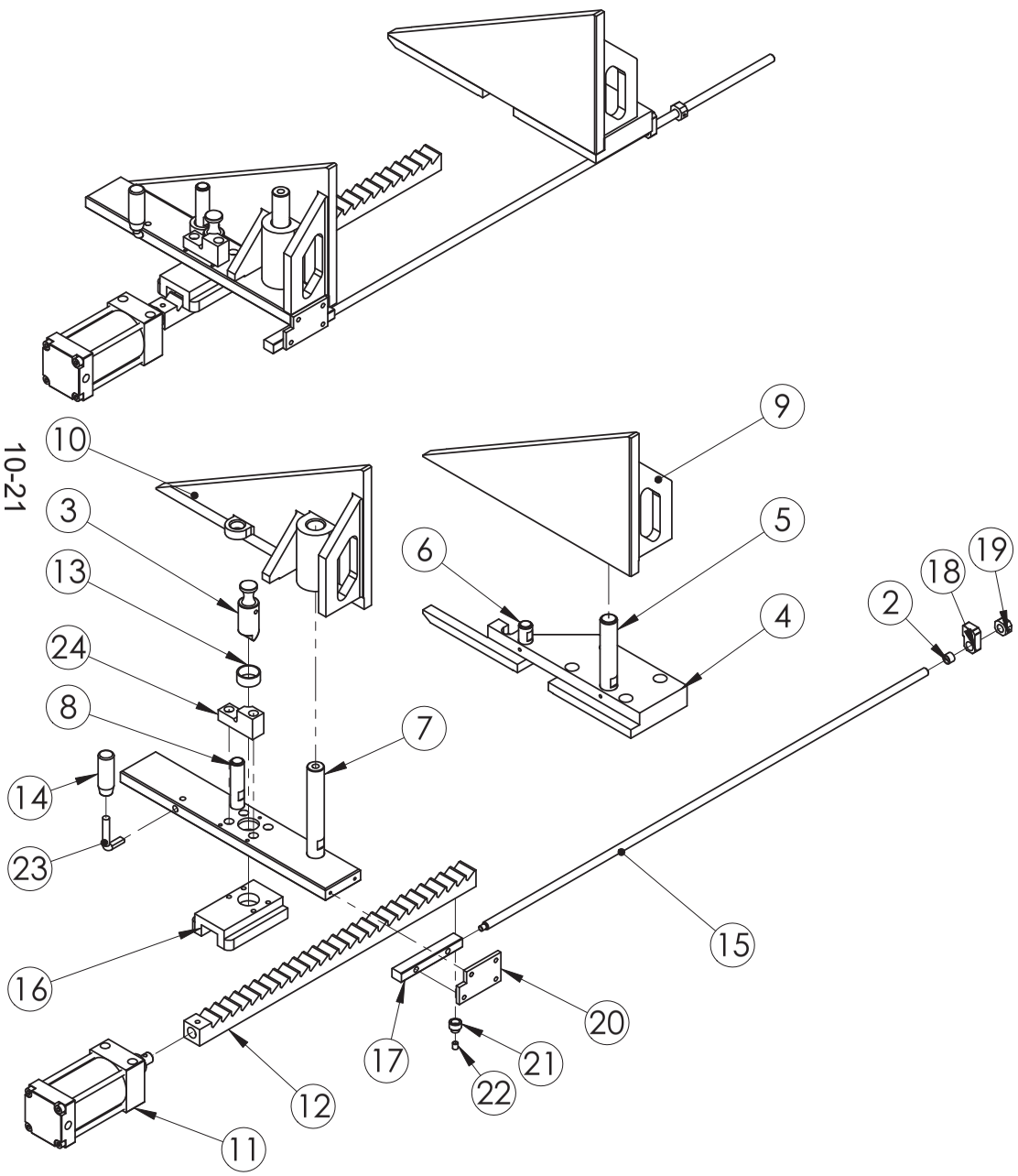
ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	C250H-1312	Control box gasket	控制箱防塵壓板		1
2	EP-90641-8	fan	風扇		1
3	PBA-5-8	hexagon socket	內六角螺絲		*
4	PHA-6-12	round head screw	大扁丸頭螺絲		*
5	PP-43842	manual direction valve	手動方向閥		2
6	SRF-1213A	pressure control panel assembly	壓力控制面板組		1
7	SV600D-1212D	control panel assembly	控制面板組		1
8	VC600D-1301	control box door cover	控制箱門蓋		1
9	VC600D-1301	control box	控制箱		1
10	VC600D-1302A	circuit board	線路板		1
11	VC600D-1320	Wire fixed Board	電線固定板		1
12	VC600D-1320-1	Foam fixed seat	泡棉固定座		1
13	WVC670D-0001	Manual valve fixed seat - R	手動閥固定座-R		1
14	WVC670D-0002	Manual valve fixed seat - L	手動閥固定座-L		1
15	WVC670D-0003	Wire channel	管線座		1

VC670D-22000 左虎鉗組
Left Vise Assembly



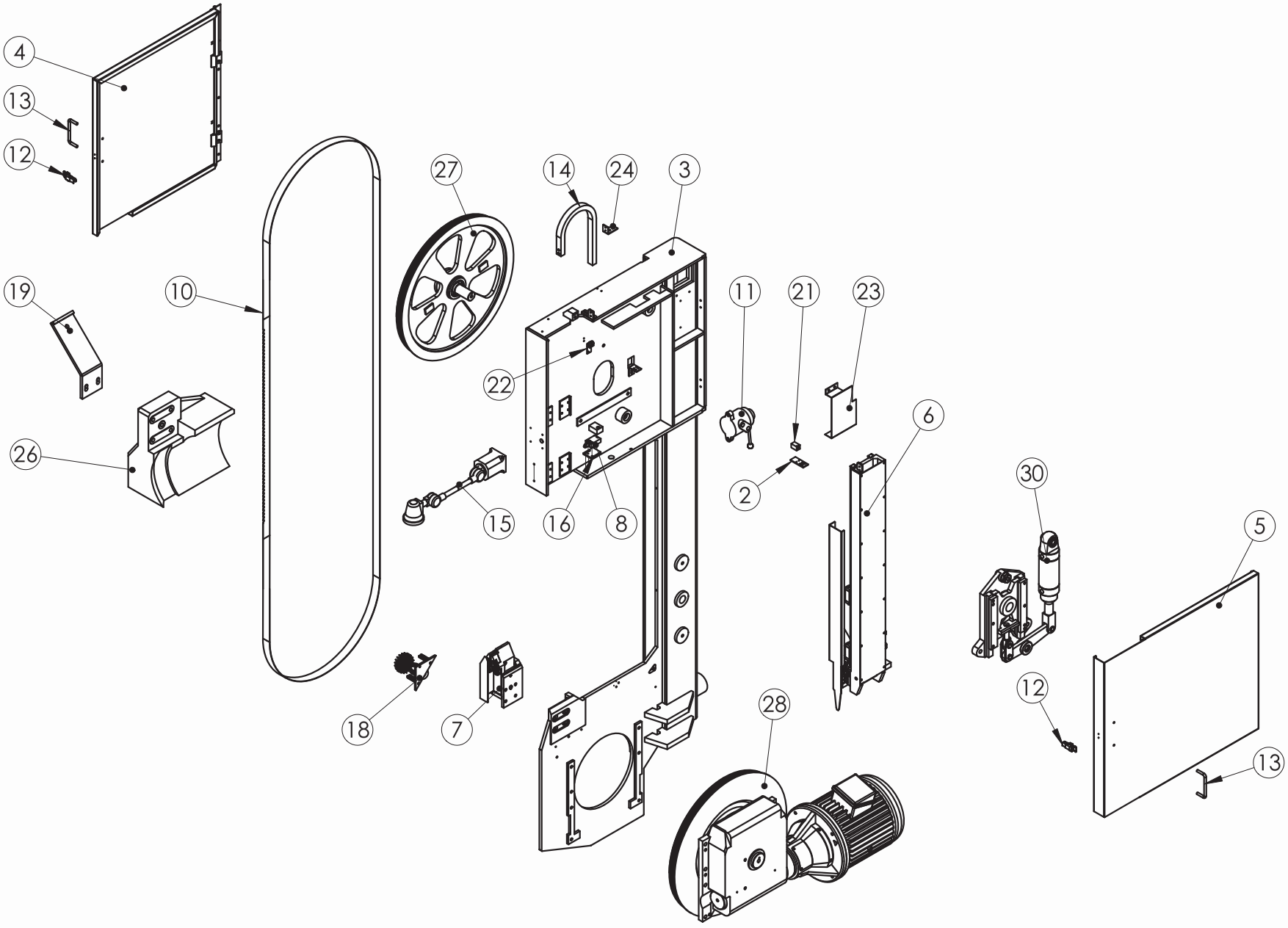
VC670D-22000 左虎鉗組				
ITEM	PART NO	PART NAME	PART NAME IN CHINESE	QTY
1	V2026-2201	left fixed vise seat	左固定虎鉗座	1
2	V2026-2203	Steel plate guide shaft	鋼板導軸(一)	1
3	V2026-2204	Steel plate guide shaft	鋼板導軸(二)	1
4	V2026-2205	left movable vise seat	左活動虎鉗座	1
5	V2026-2207	Steel plate guide shaft (top clamp)	鋼板導長軸(下壓)	1
6	V2026-2208	Steel plate guide shaft	鋼板導軸(四)	1
7	VC600D-2241A	Vise steel plate	虎鉗鋼板(一)	1
8	VC600D-2243A	vise steel plate	虎鉗鋼板(二)	1
9	SRF-25000A	hydraulic cylinder	油壓缸組	1
10	VC670D-2703	rack gear	浪形板	1
11	PP-13190	DU bushing	乾式軸承	1
12	PP-52055	Hydraulic cylinder	電木手柄	1
13	V2026-2281	Rod sensing block	感應器滑桿	1
14	VC600D-2225B	Vise sliding seat	虎鉗滑座	1
15	VC600D-2282	Rod fixed seat	滑桿固定座	1
16	VC600D-2284A	Rod bracket	滑桿支架	1
17	VC600D-2285	Rod sensing block	滑桿感應塊	1
18	VC600D-2286A	Rod connecting plate	滑桿連接板	1
19	VC600D-2704	Rack gear sliding block	浪形板滑塊	1
20	VC600D-2705	rack gear position ring	浪形板定位環	1
21	VC600D-2713	Handle shaft	把手軸心	1
22	VC600D-2714	Pawl holder	施力板座	1
23	VC600D-2701B	pawl	施力板	1
24	PP-13021	DU bushing	乾式軸承MB1210DU	1

VC670D-22500 右虎鉗組
Left Vise Assembly



VC670D-22500 右虎鉗組				
ITEM	PART NO	PART NAME	PART NAME IN CHINESE	QTY
1	V2026-2206	right movable vise seat	右活動虎鉗座	1
2	PP-13021	DU bushing	乾式軸承B1210DU	1
3	VC600D-2701B	pawl	施力板	1
4	V2026-2202	right fixed vise seat	右固定虎鉗座	1
5	V2026-2203	Steel plate guide shaft	鋼板導軸(一)	1
6	V2026-2204	Steel plate guide shaft	鋼板導軸(二)	1
7	V2026-2207	Steel plate guide shaft (top clamp)	鋼板導長軸(下壓)	1
8	V2026-2208	Steel plate guide shaft	鋼板導軸(四)	1
9	VC600D-2241A	Vise steel plate	虎鉗鋼板(一)	1
10	VC600D-2243A	vise steel plate	虎鉗鋼板(二)	1
11	SRF-25000B	hydraulic cylinder	油壓缸組	1
12	VC670D-2703	rack gear	浪形板	1
13	PP-13190	DU bushing	乾式軸承MB3015	1
14	PP-52055	Hydraulic cylinder	電木手柄	1
15	V2026-2281	Rod sensing block	感應器滑桿	1
16	VC600D-2225B	Vise sliding seat	虎鉗滑座	1
17	VC600D-2282	Rod fixed seat	滑桿固定座	1
18	VC600D-2284A	Rod bracket	滑桿支架	1
19	VC600D-2285	Rod sensing block	滑桿感應塊	1
20	VC600D-2286A	Rod connecting plate	滑桿連接板	1
21	VC600D-2704	Rack gear sliding block	浪形板滑塊	1
22	VC600D-2705	rack gear position ring	浪形板定位環	1
23	VC600D-2713	Handle shaft	把手軸心	1
24	VC600D-2714	Pawl holder	施力板座	1

AV2026-30000 鋸弓組
SAW BOW ASSEMBLY



AV2026-30000 鋸弓組
SAW BOW ASSEMBLY

ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
2	AHA-0672A	Sensor base plate	感應器底板	1
3	AV2026-3001	Saw bow	鋸弓	1
4	AV2026-3003	Tension wheel cover	張力輪箱蓋	1
5	AV2026-3004	Tension cover	張力護蓋	1
6	V2026-31000	Saw arm assembly	活動鋸臂組	1
7	AV2026-31050	Fixed saw arm assembly	固定鋸臂組	1
9	EP-90014G	Limit switch	限動開關	1
10	PP-18251	Saw blade	鋸帶	1
11	PP-43842	Manual direction valve	手動方向閥	1
12	PP-52090	Cover clip	蓋扣(小)二合一	2
13	PP-52124	Handle	輪箱把手(枝輝)	2
14	PP-57155S	Chain chute	鏈條管	1
15	PP-91804C	Work light	工作燈	1
16	S1100L-2526-S1	Limit switch adjusting plate	限動開關調整板	1

ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
17	V2026-3107	Chain chute fixed seat(1)	鏈條管固定座(一)	1
18	V2026-32200	Wire brush assembly	鋼刷組	1
19	VC600D-1087	Left shipping bracket	出車固定板(左)	1
20	VC600D-3053	Sensor seat	感測器座	1
21	VC600D-3056	Sensor seat	感測器座	1
22	VC600D-3467	coolant fitting	切削水接頭	1
23	VC600D-3469	terminal cover	鋸弓線路端子護蓋	1
24	VC600D-3470	Idle wheel cover switch seat	上輪箱開關座	1
25	VC600D-3481	Protection sleeve seat	油電護管座	1
26	VC600D-3494A	Balance weight 3	配重塊(三)	1
27	VC670D-30300	Idle wheel assembly	張力輪組	1
28	VC670D-30400	Drive wheel assembly	主動輪組	1
29	VC670D-33000	Tensioner sliding seat assembly	張力滑座滑板組	1
30	VC600D-39200	Tensioner shaft assembly	張力連桿組	1

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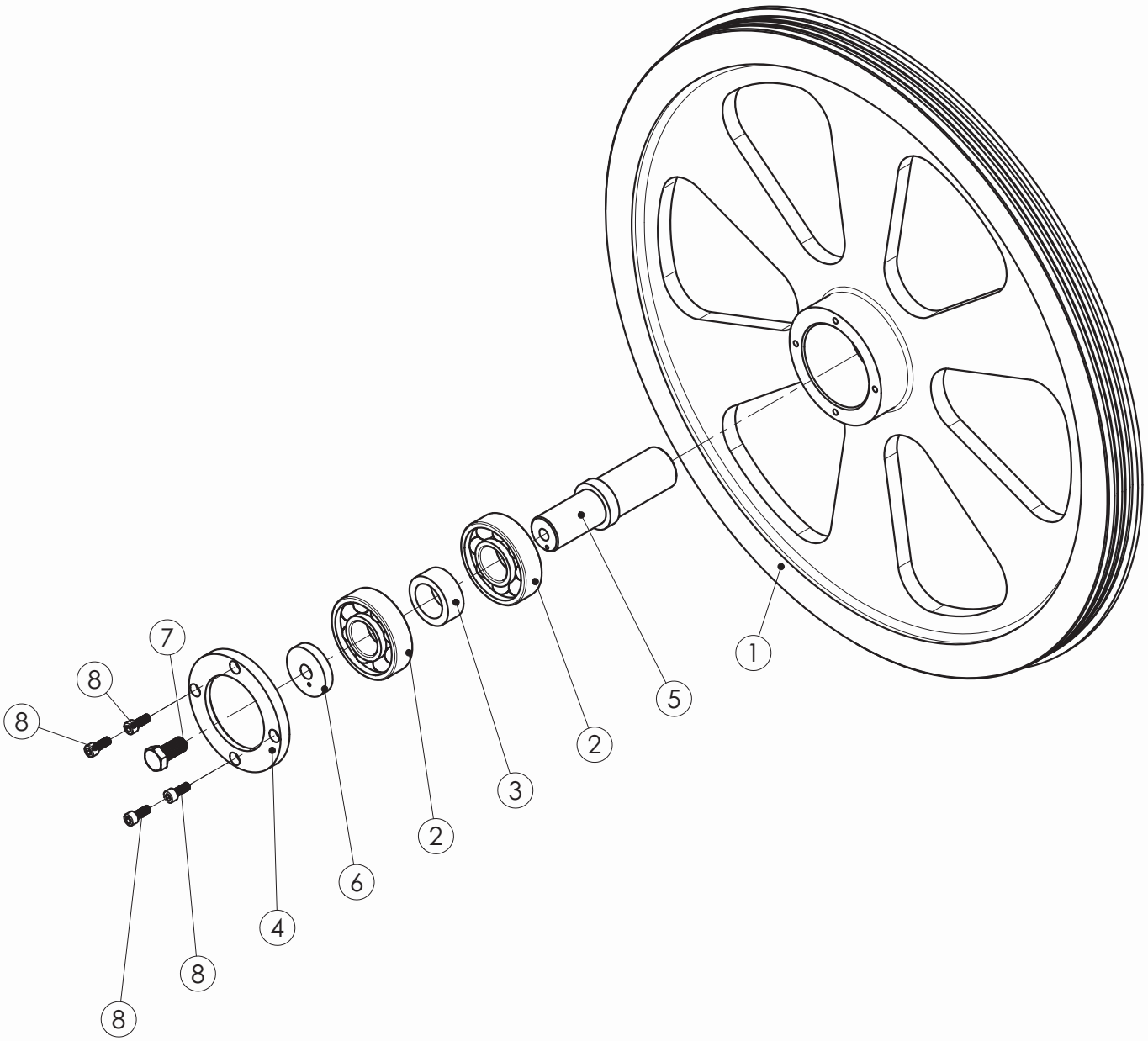
2020/5/4

VC670D-30300 張力輪組



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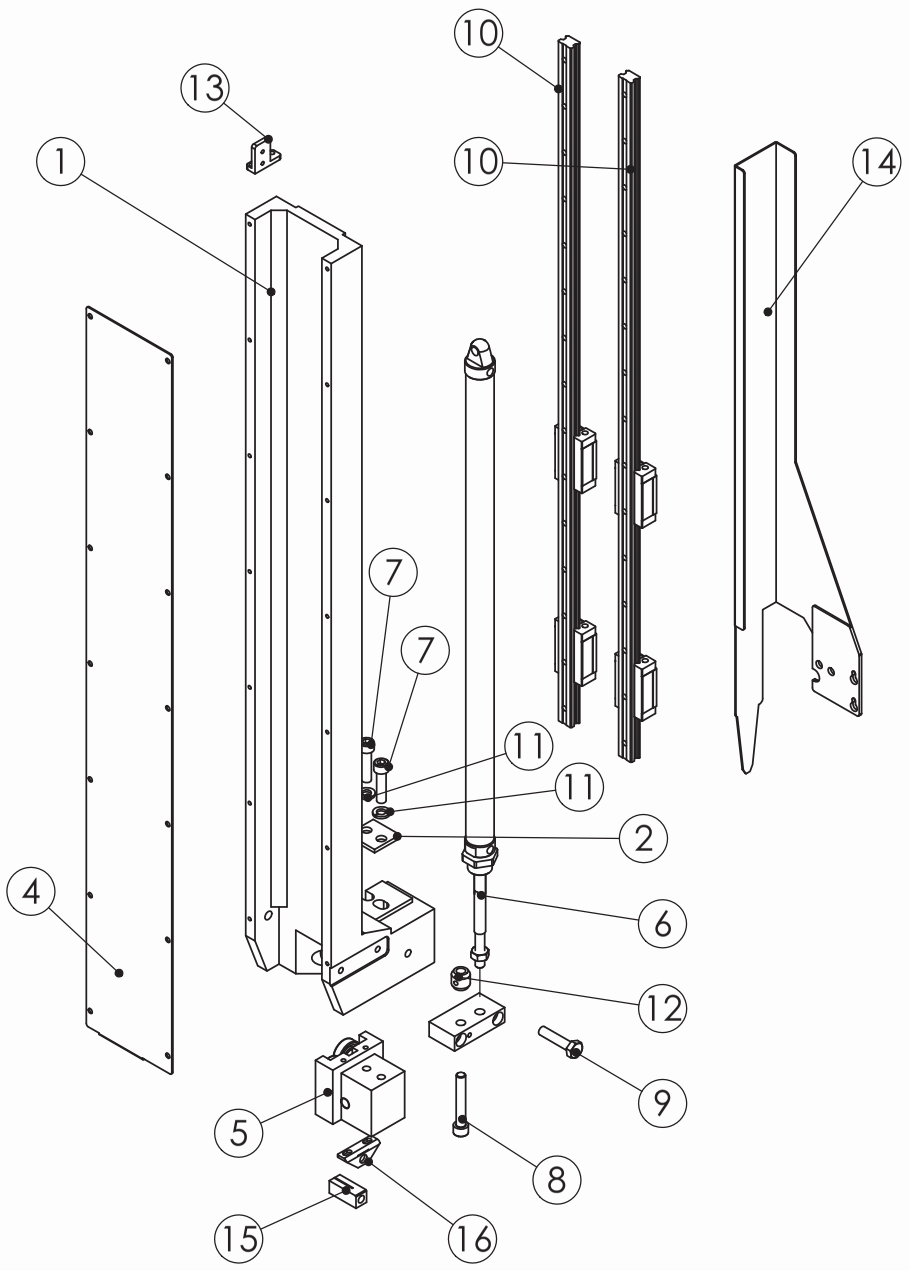
VC670D-30300 張力輪組 IDLE WHEEL ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	VC670D-3031	idle wheel	張力輪		1
2	PP-14294	bearing	軸承		2
3	SRF-2905	distance ring	間隔環		1
4	SRF-2906	fixed ring (idle wheel)	固定環(上輪)		1
5	VC600D-3033	idle wheel shaft	上輪軸		1
6	SRF-2913	idle wheel washer	上輪墊片		1
7	PLA-12-25A	Hexagon head cap screw	外六角螺絲		1
8	PBA-6-16	Hexagon socket head cap screw	內六角螺絲		4

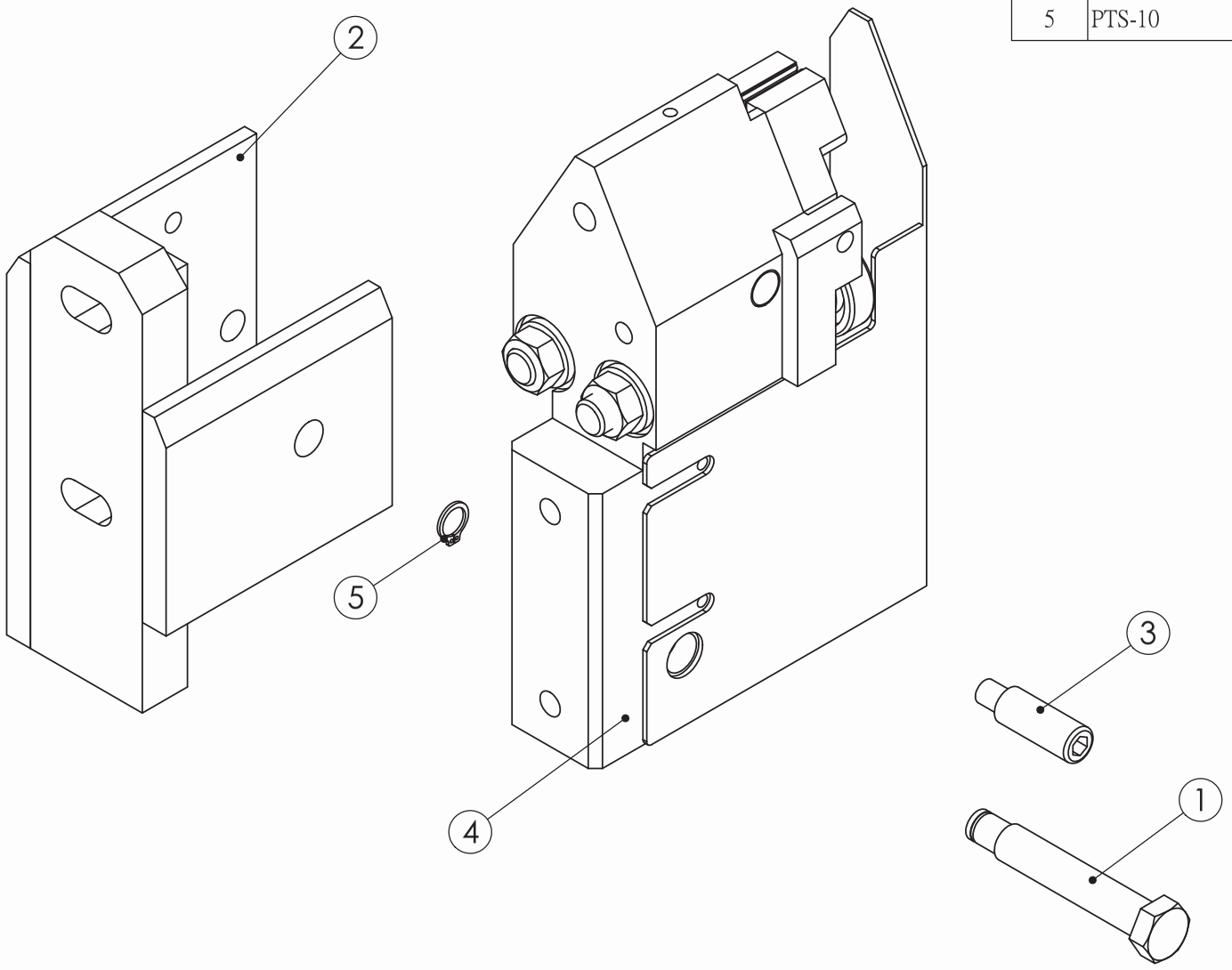
V2026-31000 活動鋸臂組
MOVABLE GUIDE ARM ASSEMBLY



ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
1	AV2026-3103A	Movable guide arm	活動鋸臂	1
2	AV2026-3138	Guide roller seat fixed plate	導輪座鎖緊墊板	1
3	AV2026-3486	adaptor plate	鋸臂油缸轉接板	1
4	AV2026-3496	Guide arm shield	鋸臂遮版	1
5	AV2026-31300	guide roller assembly	活動導輪座組	1
6	HMB20L550E32	Hydraulic cylinder	油壓缸	1
7	PBA-10-40	Head hex socket screw	有頭內六角螺絲(公)	2
8	PBA-10-65	Head hex socket screw	有頭內六角螺絲(公)	1
9	PLA-10-45	Hexagon screw	外六角頭螺絲(公)(染黑)	1
10	PP-92008E	Linear guide and sliding block	滑軌滑塊	2
11	PQA-10	Spring washer	彈簧華司(公)	2
12	S1100L-2525	Sensing block	感應塊	1
13	V2026-3109	Chain chute fixed seat(2)	鏈條管固定座(2)	1
14	V2026-3483	Saw arm splash shield	鋸臂擋水板	1
15	VC600D-3183B	Coolant spray nozzle	冷卻水噴嘴	1
16	VC600D-3185A	Spray nozzle fixed seat	噴嘴固定座	1

AV2026-31050 固定鋸臂組
MOVABLE GUIDE ARM ASSEMBLY

ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
1	AV2026-3021	Adjusting screw	調整螺絲	1
2	AV2026-3105	Fixed guide arm	固定鋸臂	1
3	AV2026-3158	Rod	導桿	1
4	AV2026-31600	Fixed saw arm assembly	固定導輪座組	1
5	PTS-10	Snap ring	戒子/扣環	1



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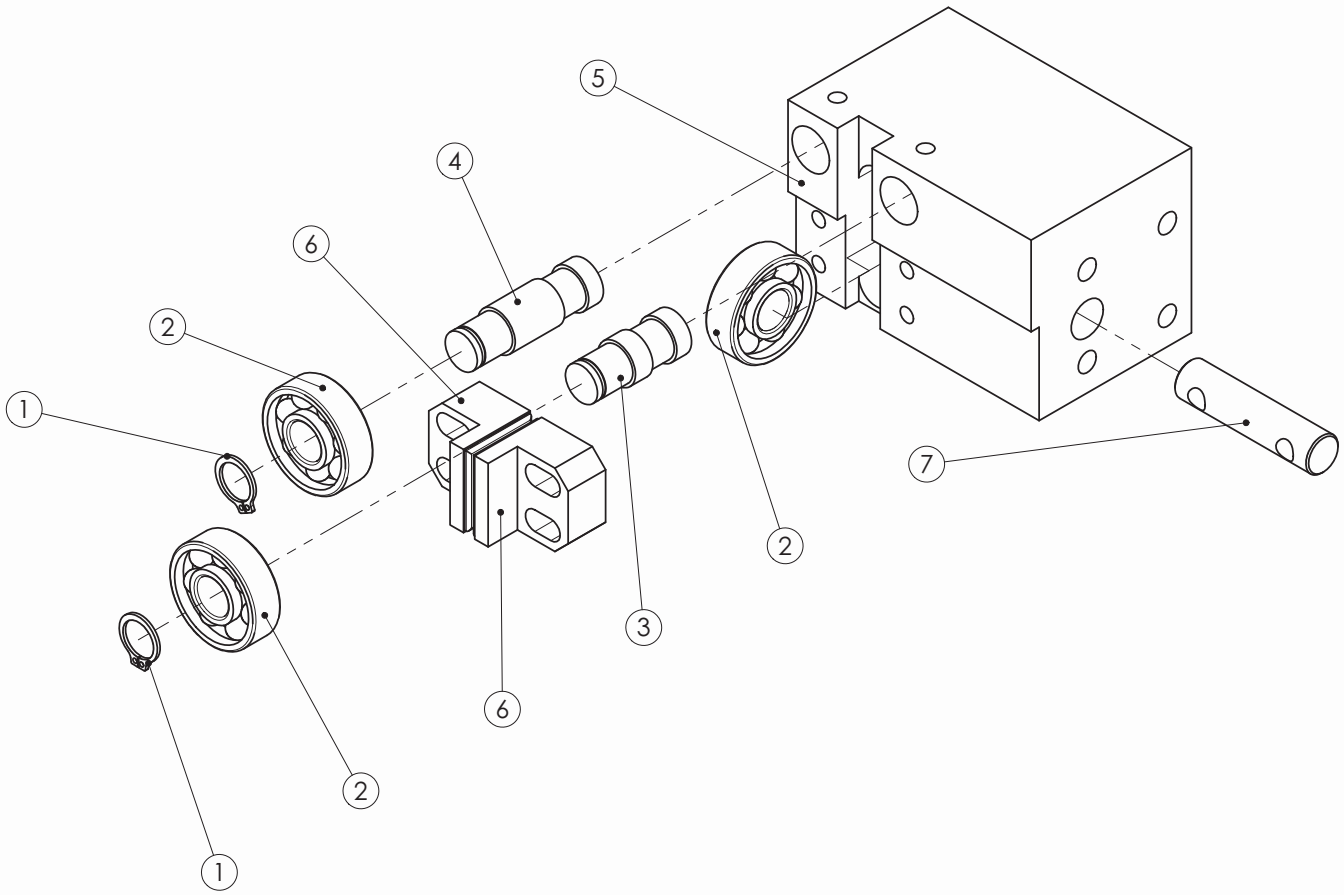
2019/12/16

VC670D-31300-上導輪座組

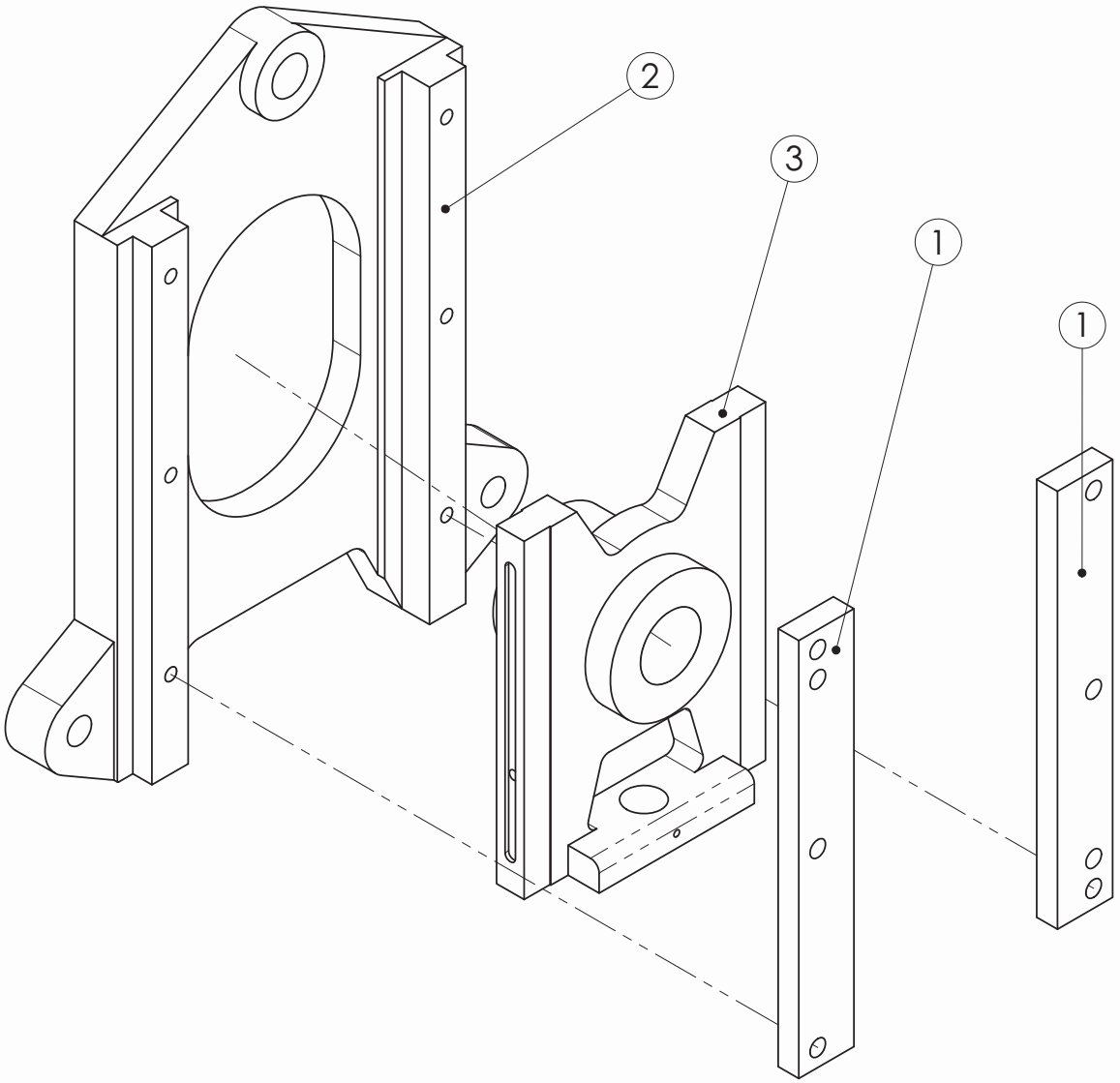


SVC-670DMM / SVC-670DMC / MVC-670DM / V-2026NC 2015/7/15

VC670D-31300 上導輪座組 UPPER GUIDE ROLLER ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	PP-52085	C-ring	C型扣環		2
2	PP-14271A	bearing	軸承		3
3	SRF-3202A	guide roller shaft 2	導輪軸(2)		1
4	SRF-3202	guide roller shaft 1	導輪軸(1)		1
5	VC670D-3131	guide roller seat	導輪座		1
6	VC600D-3133	fixed carbide insert	固定鎢鋼片		2
7	VC600D-3139	bearing pin	軸承銷		1

VC670D-33000　張力滑座組 TENSIONER SLIDING SEAT ASSEMBLY

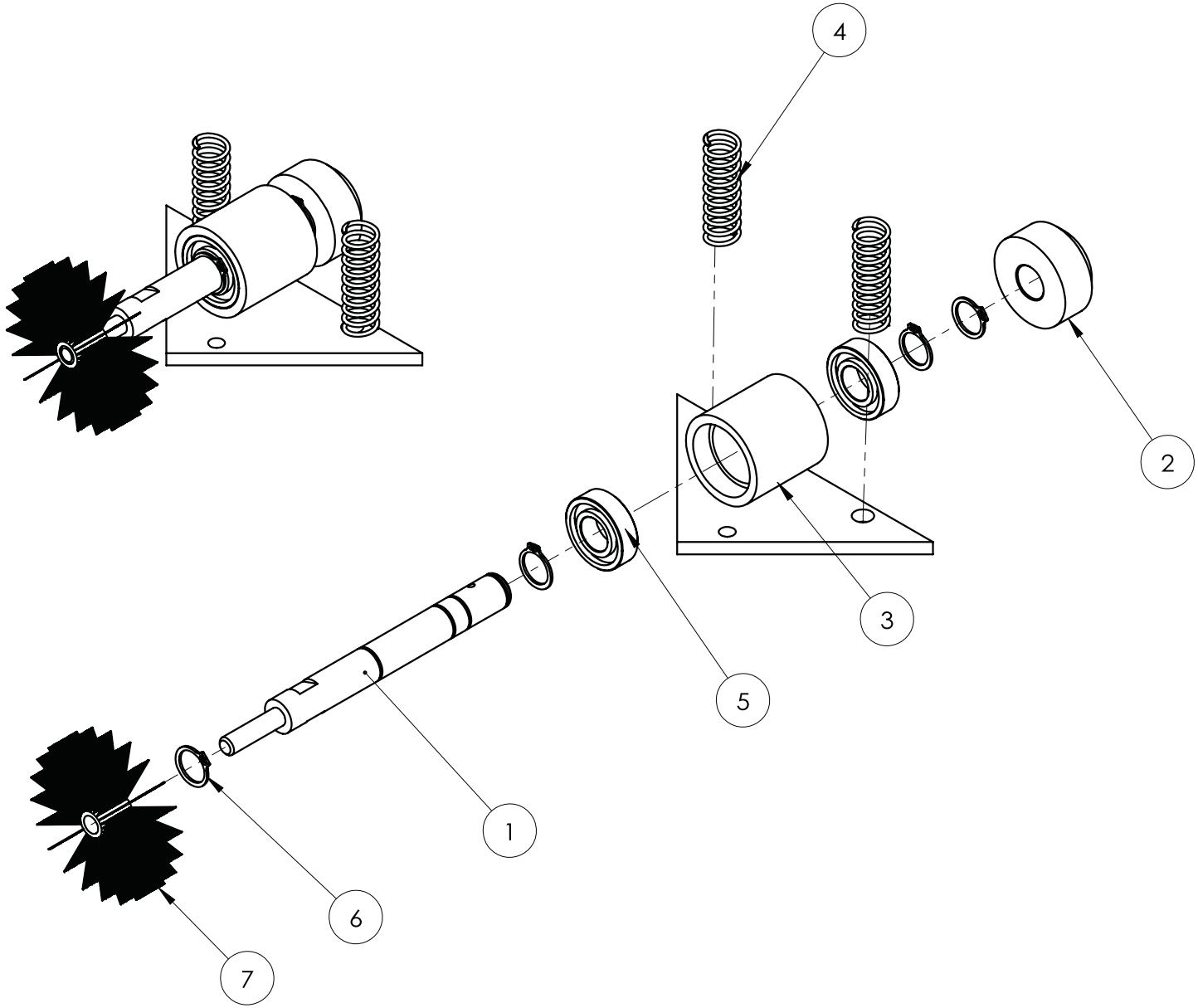


SVC-670DMM / SVC-670DMC / V-2026NC 2015/7/15

VC670D-33000 張力滑座滑板組TENSIONER SLIDING SEAT ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	SV600D-2905	tensioner press plate 1	張力壓板(一)		2
2	VC600D-3301	tensioner sliding seat	張力滑座		1
3	VC600D-3303	tensioner sliding plate	張力滑板		1

V2026-32200 鋼刷組
Wire brush assembly



V2026-32200 2016/11/25

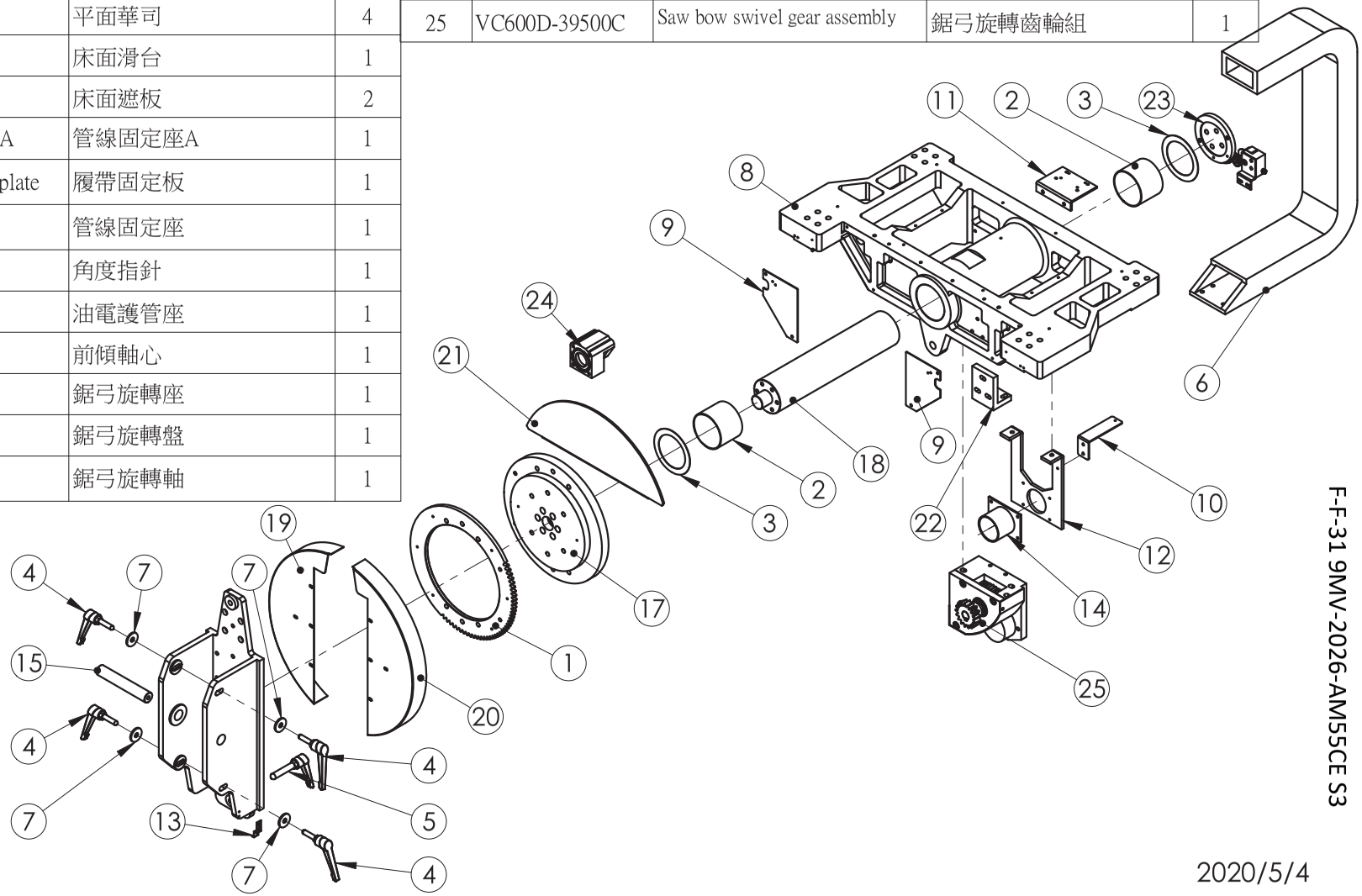
V2026-32200 鋼刷組 WIRE BRUSH ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	MBR-9129	Wire brush shaft	鋼刷軸		1
2	MBR-9131	Brush drive wheel	鋼刷傳動輪		1
3	MBR-9132-B	Wire brush bearing seat	鋼刷軸承座		1
4	MER-3109	Spring	鋼刷壓縮彈簧		2
5	PP-14250	Bearing	軸承	6002ZZ	2
6	PP-52097	C-ring	C型扣環		4
7	PP-58002B	Wire brush	鋼刷		1

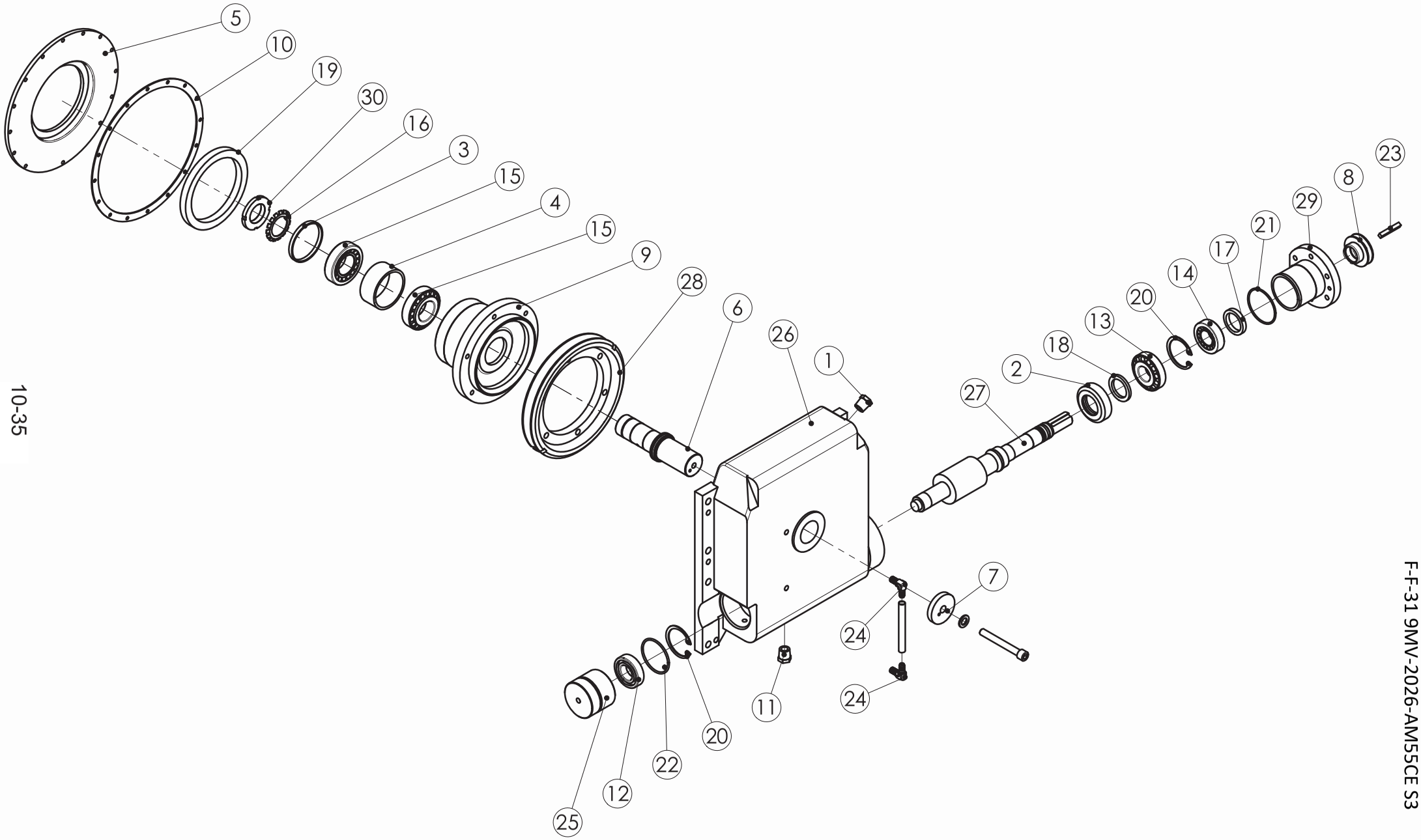
VC670D-34500A-鋸弓滑軌組
SAW BOW ROTATING ASSEMBLY

ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
1	AV2026-3451	Swivel ring gear	旋轉齒環	1
2	PP-13295D	DU bushing	乾式軸承10080	2
3	PP-14444	Thrust collar	推力圈AS100	2
4	PP-52054	Adjusting handle	調整式手輪	4
5	PP-52111I	Saw arm handle	鋸臂手把	1
6	PP-60019C	Continuous track	拖鏈履帶	1
7	PPA-12D	Flat washer	平面華司	4
8	VC600D-2001	Bed slide	床面滑台	1
9	VC600D-2036	Bed cover	床面遮板	2
10	VC600D-2394	Utility lines fixed seat A	管線固定座A	1
11	VC600D-2553	Continuous track fixed plate	履帶固定板	1
12	VC600D-3476	Utility lines fixed seat	管線固定座	1
13	VC600D-3480	Angle pointer	角度指針	1
14	VC600D-3481	Protection sleeve seat	油電護管座	1
15	VC670D-3485	Shaft	前傾軸心	1
16	VC600D-3487A	Tensioner sliding	鋸弓旋轉座	1
17	VC600D-3488A	Saw bow rotating plate	鋸弓旋轉盤	1
18	VC600D-3489	Saw bow rotating	鋸弓旋轉軸	1

ITEM	PART NO	PART NAME	PART NAME IN CHINESE	Q'TY
19	VC600D-3498	Chain cover 1	鏈條護蓋(一)	1
20	VC600D-3499	Chain cover 2	鏈條護蓋(二)	1
21	VC600D-3751A	Brake plate	制動盤	1
22	VC600D-3954	Reinforced plate	齒輪箱固定座加強板	1
23	VC600D-21000	Encoder assembly	譯碼器組	1
24	VC600D-37500B	Saw bow swivel brake assembly	鋸弓旋轉制動組	1
25	VC600D-39500C	Saw bow swivel gear assembly	鋸弓旋轉齒輪組	1



V600D-33500A 減速機組



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V-2026NC/V-2230NC/V-1822NC/SVC-670DMM-03

2015/11/13

V600D-33500A 減速機組

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AHA-0307	Plug	透氣塞頭		1
2	AHA-0314	Fixed seat cover	固定座蓋		1
3	AHA-0429	Adjusting ring	調整環		1
4	AHA-0431B	Bearing washer	軸承墊圈		1
5	AHA-0433A	Oil fixed plate	油封固定盤		1
6	AHA-0407	Drive wheel shaft	下輪軸		1
7	C250H-3046	Drive wheel shaft fixed washer	下輪軸固定華司		1
8	C250H-3061	Wire brush pulley	鋼刷普利		1
9	C250H-3365	Housing	蝸輪固定座		1
10	C250H-3369	Gear reducer rubber washer	減速機橡膠墊片		1
11	PED-025	Hexagon plug	外六角塞頭(英)	1/2PT	1
12	PP-14131	Bearing	軸承	6206Z SKF	1
13	PP-14652A	Ball bearing	滾錐軸承	30306D	1
14	PP-14691	Ball bearing	滾錐軸承	32206	1
15	PP-14693B	Ball bearing	滾錐軸承	32208	2
16	PP-14958	Stop ring	止動環	AW08	1
17	PP-51070	Oil Seal	油封	38.50.8	1

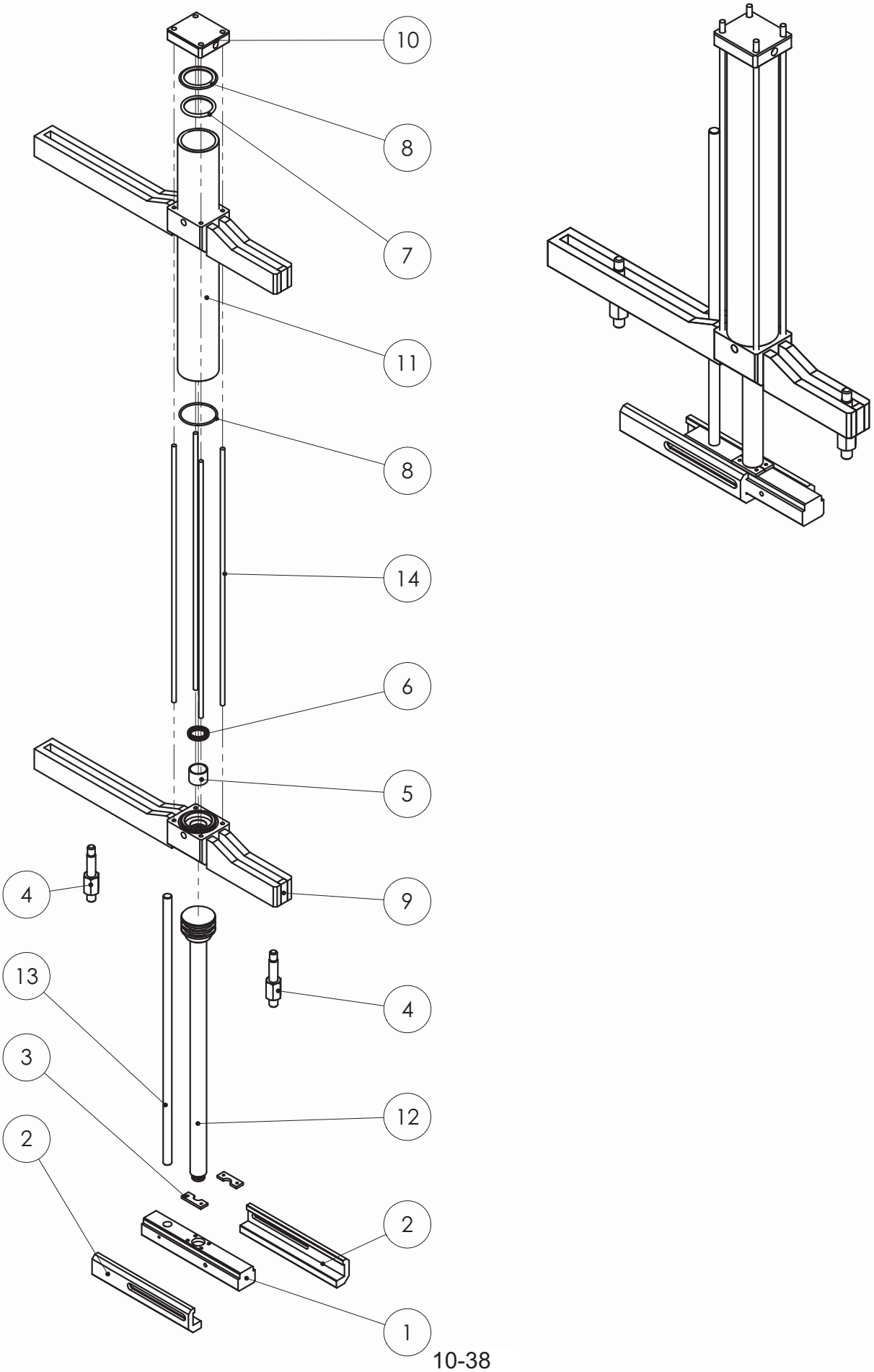
V-2026NC/V-2230NC/V-1822NC/SVC-670DMM-03

2015/11/13

V600D-33500A 減速機組

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
18	PP-51080	Oil Seal	油封	38*52*5	1
19	PP-51090B	Oil Seal	油封	130x160x14T	1
20	PP-58103	Interlock	內鎖	R62	2
21	PP-59015	O-ring	O型環	AS-568 147	1
22	PP-59570	O-ring	O型環	G65	1
23	PP-91708B	Key	方鍵	7x7x50	1
24	PUJ-010-025-01	Elbow joint	彎接頭	1/8P x5/16E	2
25	SV600D-3024	Bearing seat (2)	軸承座(二)		1
26	VC600D-3351	Gear reducer body	減速機本體		1
27	VC600D-3353A	Worm shaft	蝸桿 1/45		1
28	VC600D-3355A	Worm gear	蝸輪 1/45		1
29	VC670D-3361	Bearing seat	軸承座		1
30	PP-14908	Fixed nut	固定螺母	AN08	1

VC600D-41000 下壓組

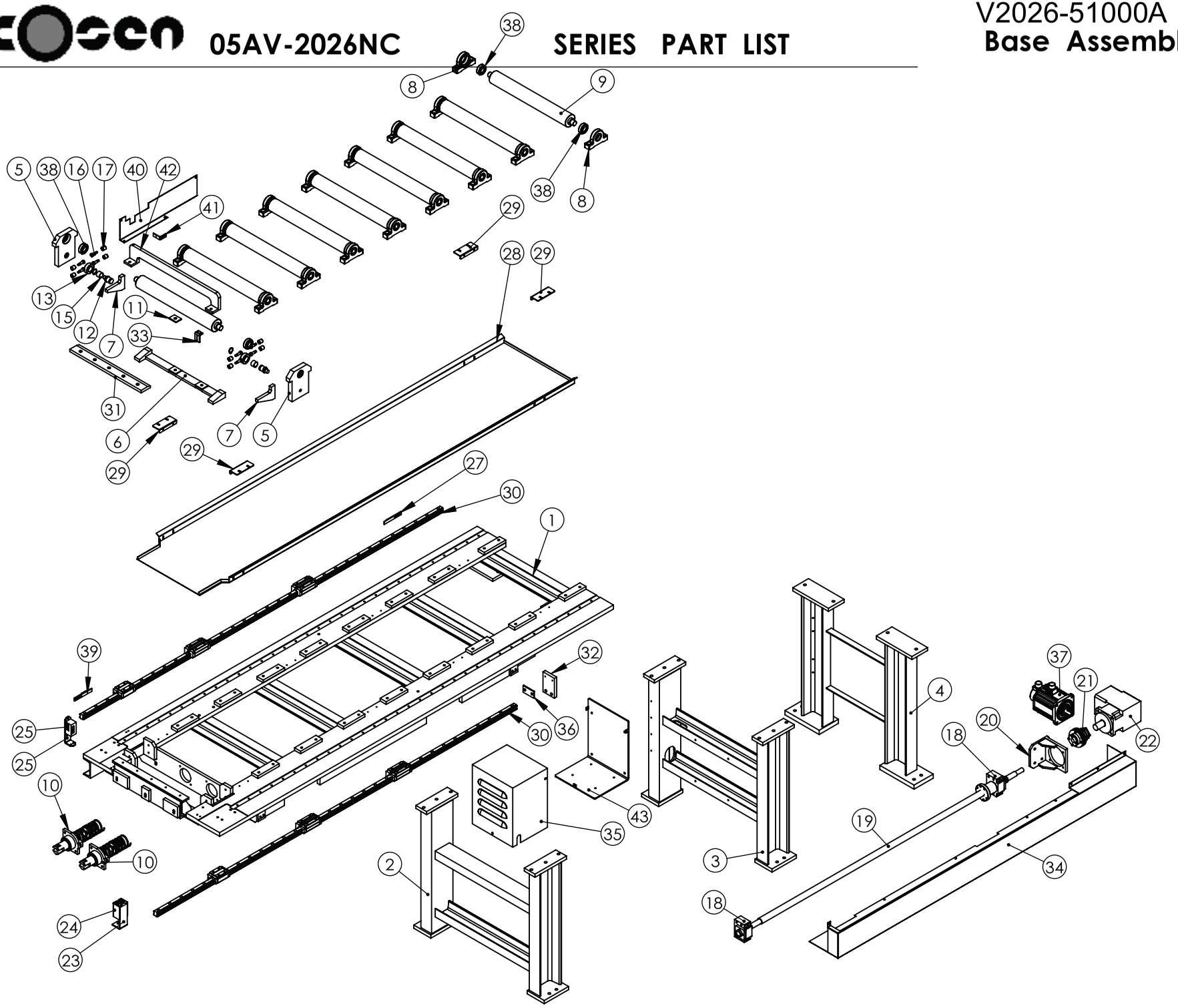


V-2026NC 2015/10/15

VC600D-41000 下壓組 TOP CLAMP ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AGB-70908	Press down plate	壓板(下壓)		1
2	AGB-70909A	Press down plate	下壓板		2
3	AHB-1921	Position plate for bolt	螺桿定位板(下壓)		2
4	C460H-2431	Top clamp fixed bolt	下壓固定螺栓		2
5	PP-13200	DU bushing	乾式軸承	3025	1
6	PP-51041	U type oil seal	U型油封	USH-30	1
7	PP-59150	O-ring	O 型環	P-53	2
8	PP-59570	O-ring	O型環	G65	2
9	VC600D-4101	Clamping seat	下壓座		2
10	VC600D-4102	Top clamp cylinder rear cover	下壓油缸後蓋		1
11	VC600D-4103	Tube	缸筒(下壓)		1
12	VC600D-4104	Piston and shaft	活塞及桿		1
13	VC600D-4105	Top clamp position rod	下壓定位桿		1
14	VC600D-4106	Top clamp cylinder rod	下壓連桿		4

V2026-51000A 料架底座組
Base Assembly



2018/09/04

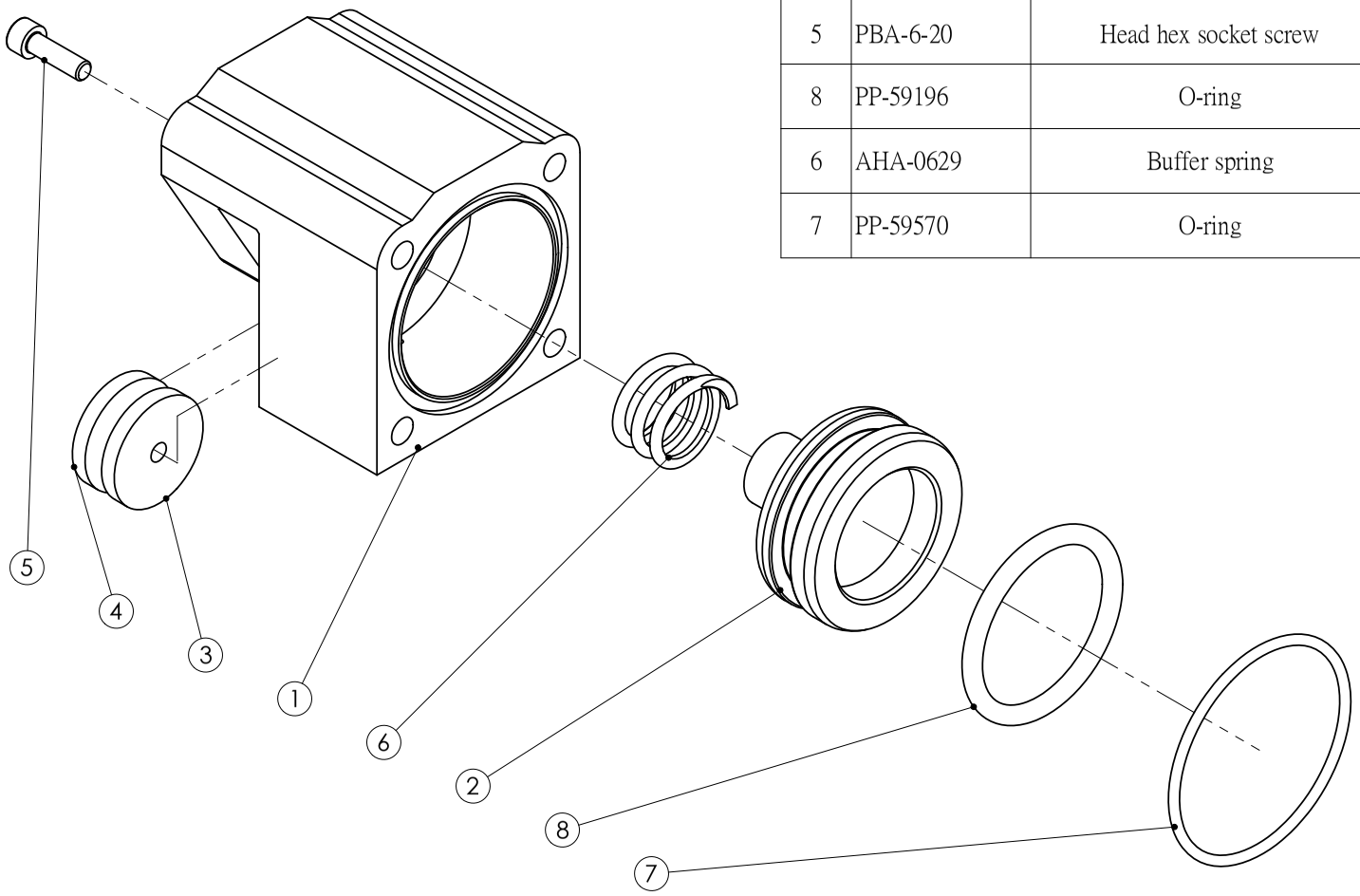
V2026-51000A 料架底座組
Base Assembly

ITEM	PART NO	PART NAME	品名	QTY
1	V2026-5101A	Roller table base	料架基座	1
2	V2026-5105A-1	Roller table foot-1	料架腳-1	1
3	V2026-5105A-2	Roller table foot-2	料架腳-2	1
4	V2026-5105A-3	Roller table foot-3	料架腳-3	1
5	V2026-5104A	Lifting bearing saet	上浮軸承座	2
6	V2026-5131	Lifting press plate	上浮推板	1
7	V2026-5130	Support plate	支撐板	2
8	C325H-1253	Roller fixed seat	滾輪固定座	16
9	V2026-5109	Roller	滾輪	9
10	AV2026-45500 A	Lifting cylinder assembly	上浮油壓缸組	1
11	V2026-5132	Lifting washer	上浮墊片	3
12	V2026-5117A	Lifting shaft	上浮軸	2
13	V2026-5119	Lifting roller	上浮滾輪	2
14	PP-52092	Snap ring	扣環S25	2
15	PP-13140	Bearing	乾式軸承 (2520)	2
16	PP-91315B	Cap screw	等高螺絲	8
17	V2026-5115	Lifting guide wheel	上浮導輪	8
18	PP-92073	Ballscrew nut housing	送料螺桿固定 座(BK-25)	2
19	PP-921540	Ballscrew & Ball nut	滾珠螺桿(銀泰-轉造級- FSKW-32-32)+滾珠螺帽	1
20	V2026-5133	Seat	固定座	1
21	PP-92059D	Gear coupling	聯軸器-SAP-94C-20-32	1
22	PP-16068B	Planetary gearbox	行星減速機MFL120L1 -10 -M-S(聚盛)-台達	1
23	V2026-5111A	Laser fixxed seat	雷射固定座	1

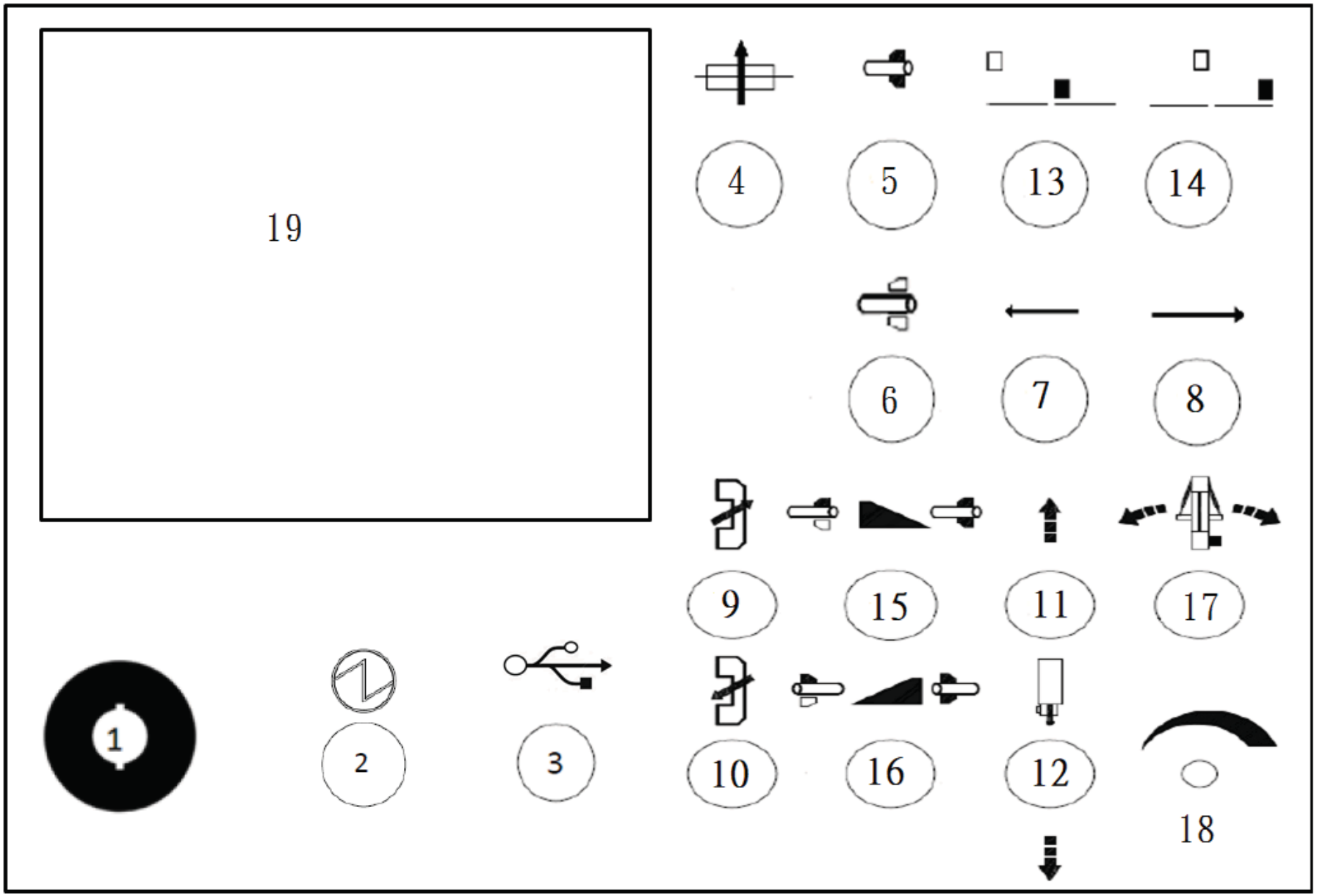
ITEM	PART NO	PART NAME	品名	QTY
24	V2026-5112A	Laser cover	雷射護蓋	1
25	V2026-5113	Reflector fixxed seat	反射固定座	1
26	V2026-5114	Reflector cover	反射護蓋	1
27	V2026-5118	Limit sensing block	限動感應塊	1
28	V2026-5120A	Front splash shield	前遮水板	1
29	V2026-5122	Fixed plate	遮水固定板	4
30	PP-92196N	Linear guide and sliding block	滑塊+滑軌	2
31	V2026-5127A	Roller table bed plate	料架床面鋼板	1
32	V2026-5134	Rear limit sensing block	後限檔塊	1
33	V2026-5125	Sensor fixed seat	感測器固定座	1
34	AV2026-5125	Ballscrew cover	滾珠螺桿 板金遮罩	1
35	AV2026-5130	Transformer cover	變壓器護罩 (380V,高電壓選配)	1
36	C260L-3128	Stopper plate	擋板(優力膠)	1
37	EP-31177-11	Moter	伺服馬達	1
38	PP-14275A	Bearing	軸承(滾輪專用)6205ZZ雙鐵蓋辦密	18
39	V2026-5118A	Limit sensing block	限動感應塊	1
40	AV2026-5126	Cover	遮板	1
41	AV2026-5128	Proximity switch	近接開關底板座(單片)	1
42	AV2026-5127	Press down support plate	下壓支撐桿	1
43	AV2026-5129	Transformer seat	變壓器固定座 (380V,高電壓選配)	1

VC600D-37500B 鋸弓旋轉制動組
Saw bow rotating brake Assembly

ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	VC600D-3752B	Brake supporting seat	制動器支撐座	S3	1
2	VC600D-3755A	Brake piston	制動活賽	S1	1
3	VC600D-3754	brake movable plate	制動活動片	S0	1
4	VC600D-3753	brake fixed plate	制動固定片	S0	1
5	PBA-6-20	Head hex socket screw	有頭內六角螺絲(公)	M6x20	1
8	PP-59196	O-ring	O型環	P-50A	1
6	AHA-0629	Buffer spring	緩衝彈簧	S0	1
7	PP-59570	O-ring	O型環	G-65	1



CONTROL PANEL BUTTONS



CONTROL PANEL BUTTONS

No.	PART NUMBER	PART Name IN ENG.	PART Name IN CHI.	Q'TY
1	EP-90763A & EP-90760	Emergency stop button	緊急停止按鈕	1
2	EP-90755-1	Power indicator lamp	電源指示燈	1
3	EP-90981-SM	USB plug	USB 插座	1
4	EP-90758 & EP-90759	ROLLER LIFTING BUTTON	滾輪上升按鈕	1
5	EP-90758 & EP-90759	REAR VISE CLAMP BUTTON	後虎鉗夾持按鈕	1
6	EP-90758 & EP-90759	REAR VISE OPEN BUTTON	後虎鉗釋放按鈕	1
13	EP-9075B & EP-90760A	WORKBED BKW TOP CLAMP BUTTON	床面後退上部夾持按鈕	1
14	EP-9075B & EP-90760A	WORKBED FRW TOP CLAMP BUTTON	床面前進上部夾持按鈕	1
7	EP-90758 & EP-90759	WORKBED BKW BUTTON	床面後退按鈕	1
8	EP-90758 & EP-90759	WORKBED FRW BUTTON	床面前進按鈕	1
9	EP-90758 & EP-90759	Saw bow forward button	鋸弓前進按鈕	1
10	EP-90758 & EP-90759	Saw bow backward button	鋸弓後退按鈕	1
15	EP-9075B & EP-90760A	Left vise clamp/release knob	左虎鉗夾持/釋放按鈕	1
16	EP-9075B & EP-90760A	Right vise clamp/release knob	右虎鉗夾持/釋放按鈕	1
11	EP-90758 & EP-90759	Guide arm up button	鋸臂上升按鈕	1
12	EP-90758 & EP-90759	Guide arm down button	鋸臂下降按鈕	1
17	EP-9075B & EP-90760A	Saw bow angle control knob	鋸弓角度控制旋鈕	1
18	EP-90769	Blade speed control knob	鋸刀切硝速度控制旋鈕	1
19	EP-90957P	HMI touch screen	HMI 觸控螢幕	1

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