COSEN SAWS

C3

NC Fully Automatic Horizontal Bandsaw

(Non-CE & CE Models)

Instruction Manual

The Pinnacle of Cutting Performance

Cosen Mechatronics Co., Ltd.

FROM THE MANUFACTURER

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

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

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

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

NOTE:

- Read this instruction manual carefully to familiarize yourself with the installation, operation and maintenance of your COSEN bandsaw machine.
- Operate the machine following the procedures described in the manual to prevent personal injuries or machine damage.
- Keep this manual handy and refer to it whenever you are uncertain of how to perform any of the procedures.
- For technical support or parts purchase, please contact your nearest COSEN representative or our service center:

For US, Mexico, and Canada:
email: info@cosensaws.com.
phone: 1-704-943-1030
toll free: 1-877-SAWING1
fax: 1-704-943-1031

For service in other countries:
email: info@cosen.com
phone: 886-3-5332143
fax: 886-3-5348324

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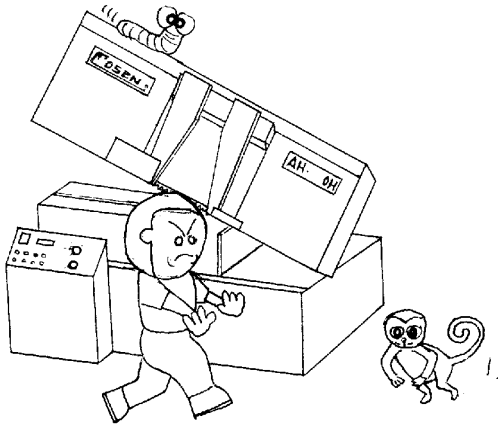
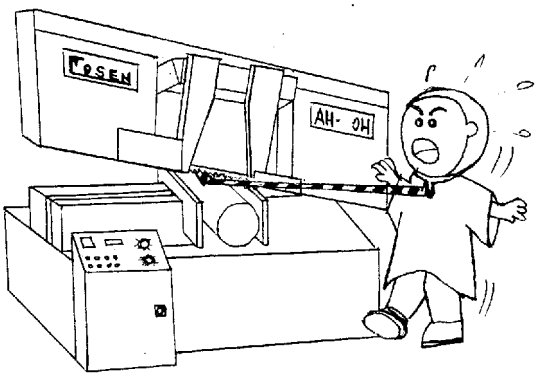
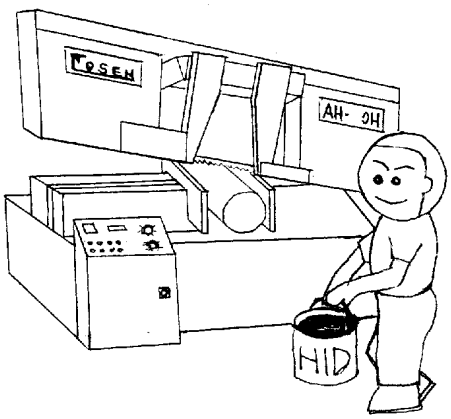
Safety rules



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

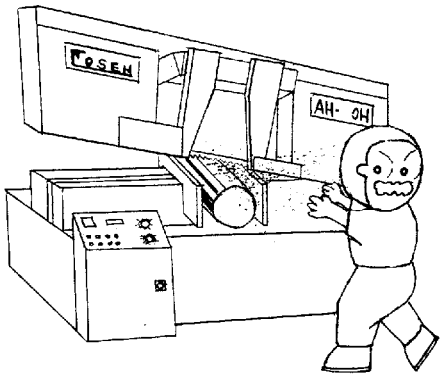


- Never wear gloves or loose clothing when operating the machine. It may lead to serious injury if they are caught in the running machine. Wrap or cover long hair.

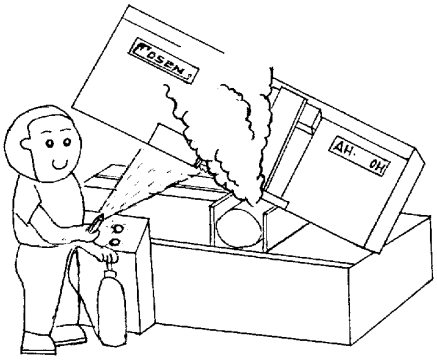


- Use a water-soluble cutting fluid on this machine. Oil-based cutting fluids may emit smoke or catch fire, depending on how they are used.

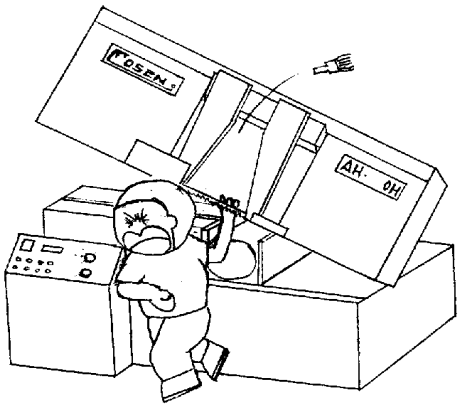
Safety rules



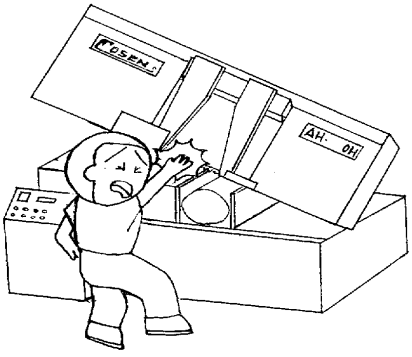
- Never cut carbon or any other material that may produce and disperse explosive dust. It is possible that sparks from motors and other machine parts will ignite and explode the air-borne dust.



- 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.

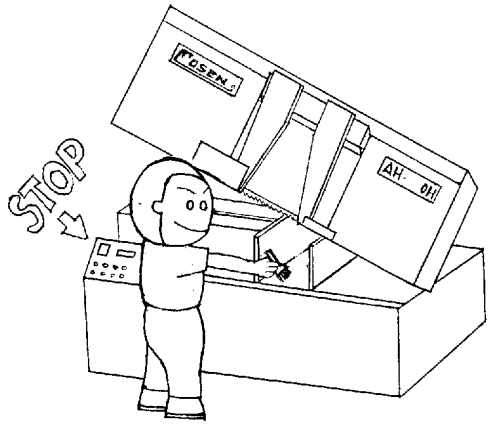


- Never adjust the wire brush or remove chips while the saw blade is still running. It is extremely dangerous if hands or clothing are caught by the running blade.

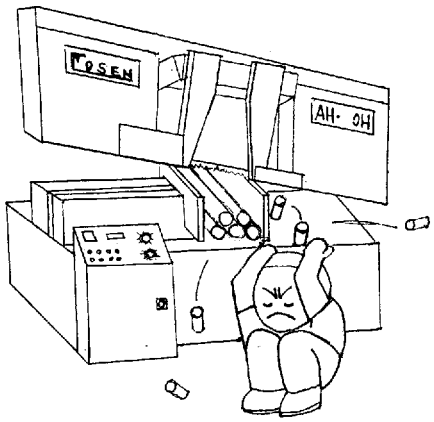


- Never touch the running saw blade with gloves or not. It is dangerous if your hands, clothing or gloves are caught by the running blade.

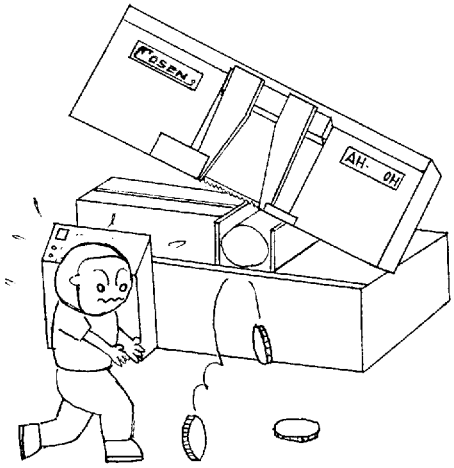
Safety rules



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

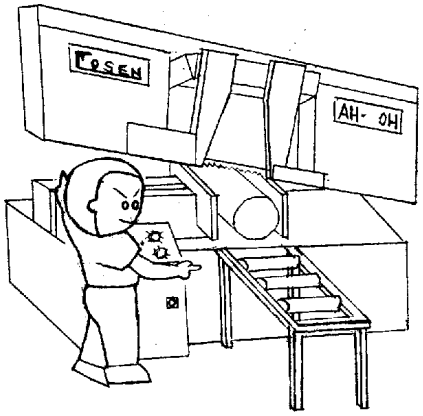


- Never start the saw blade unless the workpiece has been clamped firmly. If the workpiece is not securely clamped, it will be forced out of the vise during cutting.

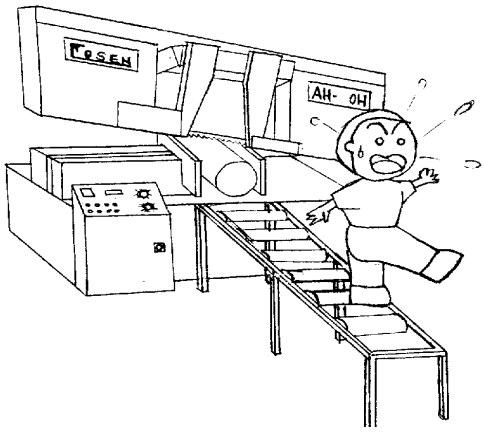


- Take preventive measures when cutting thin or short pieces from the work to keep them from falling. It is dangerous if the cut pieces fall.

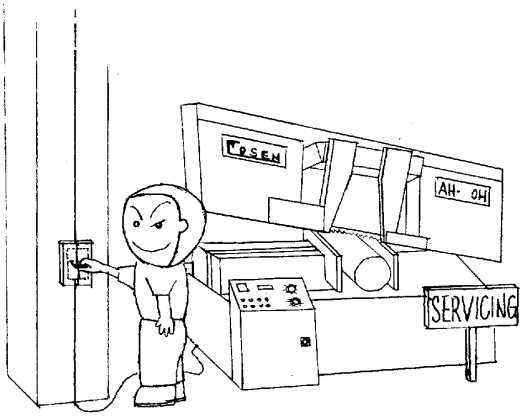
Safety rules



- 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.



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



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

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SAFETY INFORMATION

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

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

SAFETY INSTRUCTIONS

What the icons and signs in this user manual mean:

	This icon marks **DANGER**; hazards or unsafe practices that may result in **severe personal injury or death.**
	This icon marks **WARNING**; hazards or unsafe practices that may result in **personal injury or damage to the machine.**
	This icon marks **CAUTION**; information that should be read before use to prevent **damage to the machine.**
	Supplementary information to the procedures described in this manual.
	Call your local agent or our service center for help.

This manual has important safety information. Read through it carefully before operating this machine to prevent personal injury or machine damage. Learn the operation, limitation and the specific potential hazards peculiar to this band saw.

Do not operate this machine unless it is completely assembled.

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

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

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

Wear proper apparel during operation and when servicing the machine.

Keep unauthorized personnel away.

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

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

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

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

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

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

All users must read it before performing any activity on the machine, such as replacing the saw band or doing regular maintenance.

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

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

Use recommended accessories. Improper accessories may be hazardous.

Keep your work area well illuminated at minimum 500 lumen.

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

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

Check for damaged parts. Before continuing using the machine, the damaged part should be checked and replaced.

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

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

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

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

Do not force the band saw beyond its intended use. It is safer to operate with the cutting rate for which it was designed.

SAFEGUARD DEVICES

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

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

<u>Protection Covers & Guards</u>

1. Idle wheel housing cover
2. Drive wheel housing cover
3. Gear reducer cover
4. Wire brush belt cover
5. Blade guard cover (left & right)
6. Chip conveyor cover (CE model only)

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

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

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

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

Safety Related Switches

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

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

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

EMERGENCY STOP

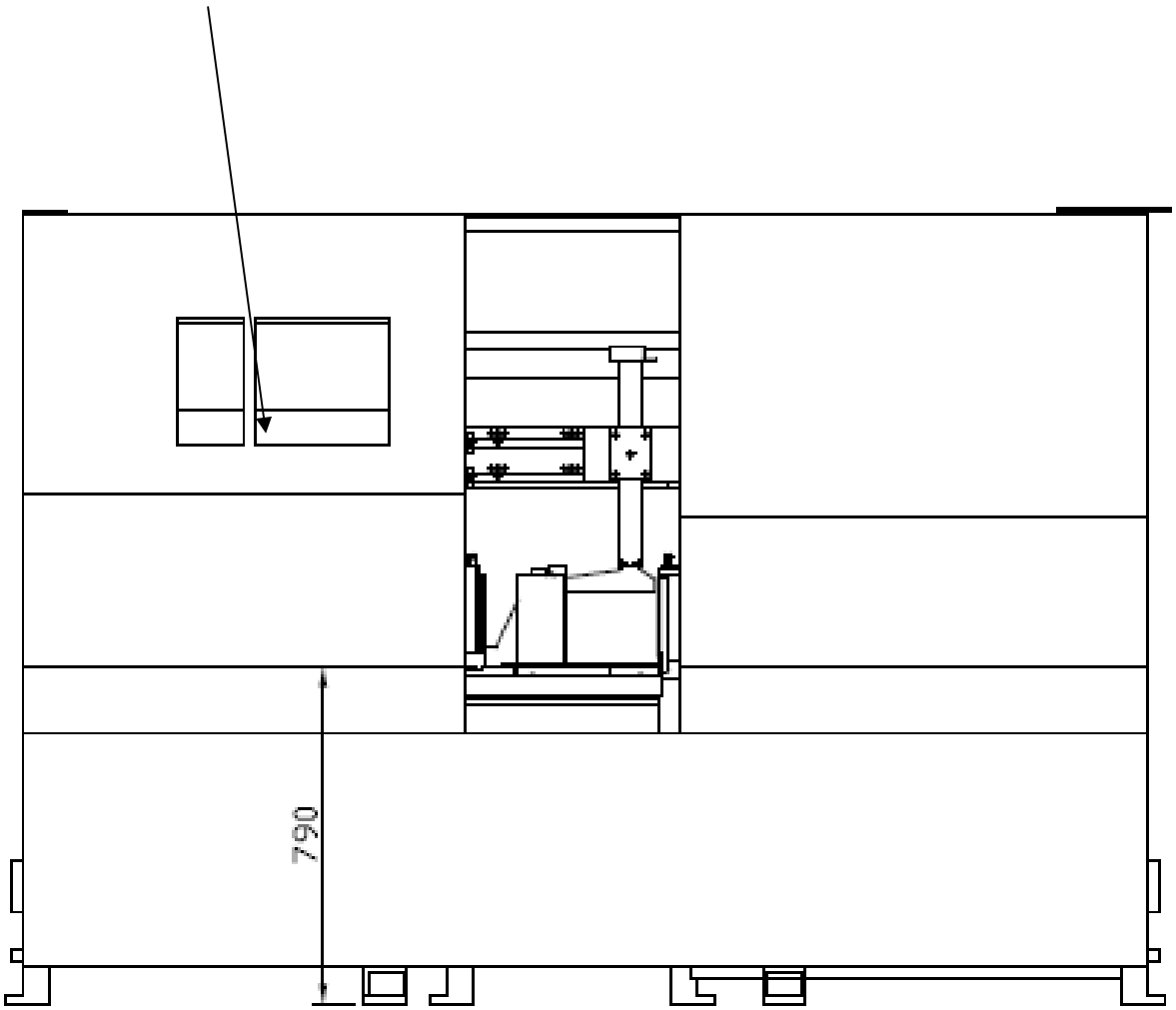
Designed to be easily accessible, the emergency stop button is located on the left bottom corner on the control panel and is made in red color and rubber material. For CE models, supplementary emergency stop button may be available at other area(s) of the machine depending on machine type. Please refer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

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

You should press it immediately without any hesitation when observing:

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

Illustration: Emergency Stop



SAFETY LABELS

Safety-related labels mounted on the machine are categorized into the following four categories. Please read through and understand them before operating the machine. Refer to *Illustration: Safety Labels.*

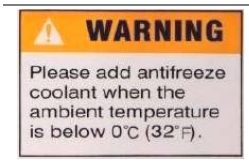
DANGER Labels

A red and white DANGER labels marks s hazards or unsafe practices that will result in severe personal injury or death.

Label	Meaning	Label	Meaning
	Hazardous Voltage TURN POWER OFF before servicing. Failure to following the warning can result in severe injury.		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.

WARNING Labels

An orange and black WARNING label marks hazards or unsafe practices that can result in severe personal injury or damage to the machine.

Label	Meaning	Label	Meaning
	Cutting Hazard KEEP COVER CLOSED while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.		Cutting Hazard KEEP HAND OFF while the blade is running. Turn power off before opening cover. Failure to follow the warning can result in severe injury.
	Please add antifreeze coolant when the ambient temperature is below 0°C (32°F).		Loose Hand Hazard KEEP HAND OFF. Do not touch chip conveyor. Failure to follow the warning can result in severe injury.
	Impact Hazard WEAR SAFET SHOES. Do not approach dropping area during operation.		

CAUTION Labels

Yellow and black CAUTION labels mark hazards or unsafe practices that can result in considerable personal injury.

Label	Meaning
	Keep hands out of the machine while the blade is running.
	Power to machine must be turned off when changing blades or adjusting wire brush.

NOTICE Labels

Blue and white NOTICE labels mean unsafe practices that could result in damage to products or property.

Label	Meaning
	Replace the hydraulic oil every six months or every 1,200 hours of operation. Oil specification: Shell TELLUS 27 or Mobil DTE OIL LIGHT / HYDRAULIC 28
	To extend blade life, always adjust the location of wire brush so that it is properly touching the blade. Also replace a worn wire brush with a new one.

SAFETY INSTRUCTION Labels

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

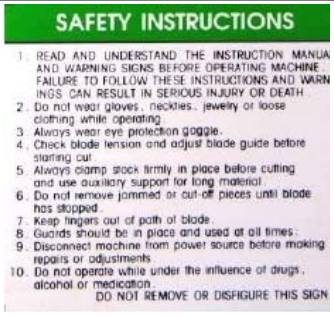
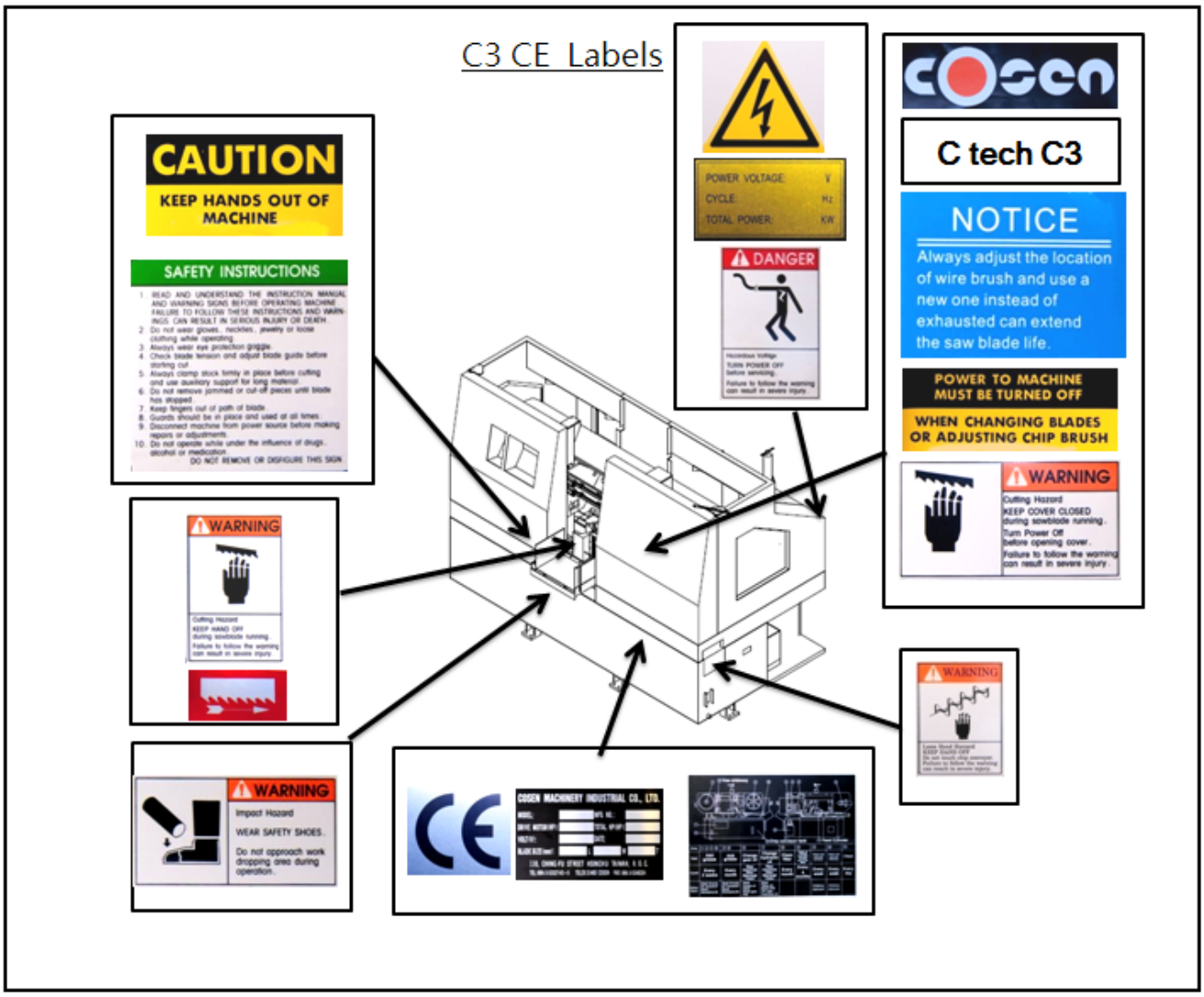
Label	Meaning
	1. Read and understand the instruction manual and warning signs before operating machine. Failure to follow these instructions and warnings can result in serious injury or death. 2. Do not wear gloves, neckties, jewelry or loose clothing while operating the machine. 3. Always wear eye 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 Labels



HEARING PROTECTION

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

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

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

Noise generated by the machine may come from the following:

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

When your machine is running, noise will come out. This is a machine-electric interface problem that may make people feel uncomfortable. Our products pass noise testing less than 78 dBA. If your machine produces an undesirable noise while it is running, you should:

1. Make sure all maintenance tasks have been performed following the prescribed maintenance schedule (Refer to Section 7)

2. If maintenance does not seem to solve the problem, follow the troubleshooting procedures under Section 8.

CE COMPLIANCE

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

RISK ASSESSMENT

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

Section 2

GENERAL INFORMATION

SPECIFICATION

MACHINE PARTS IDENTIFICATION

FLOOR PLAN

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

Safety

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

Convenience & High-Performance

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

Durability

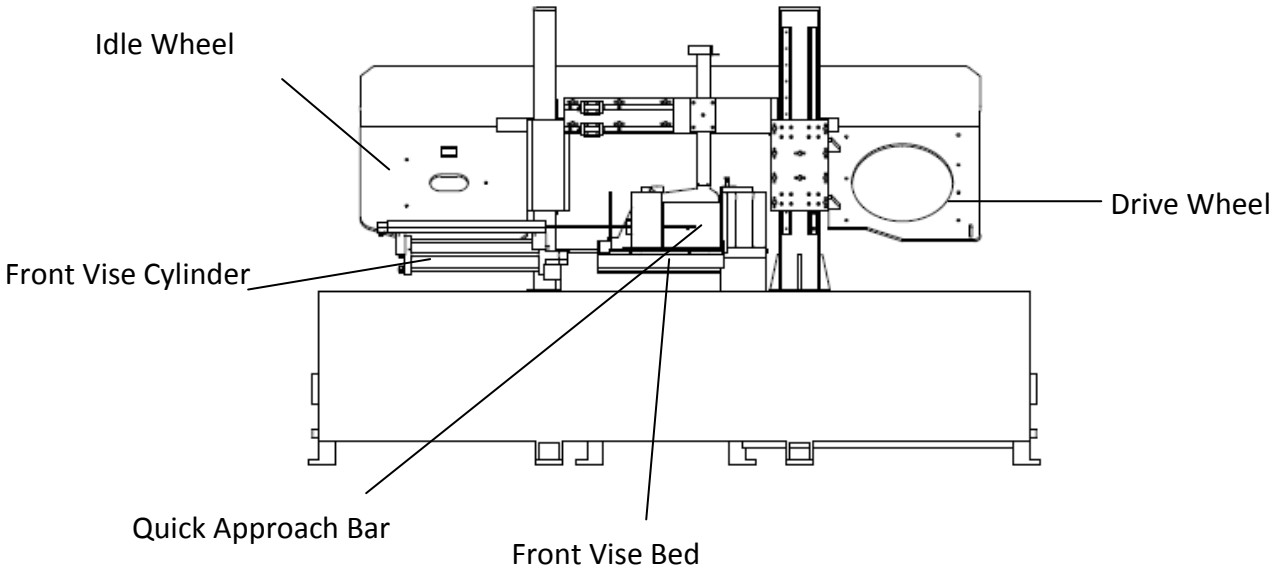
- The intended life-span of the machine is counted based on regular daily operation. It is calculated with the life expectancy of 10 years under normal operating condition and exact attention to the maintenance schedule.

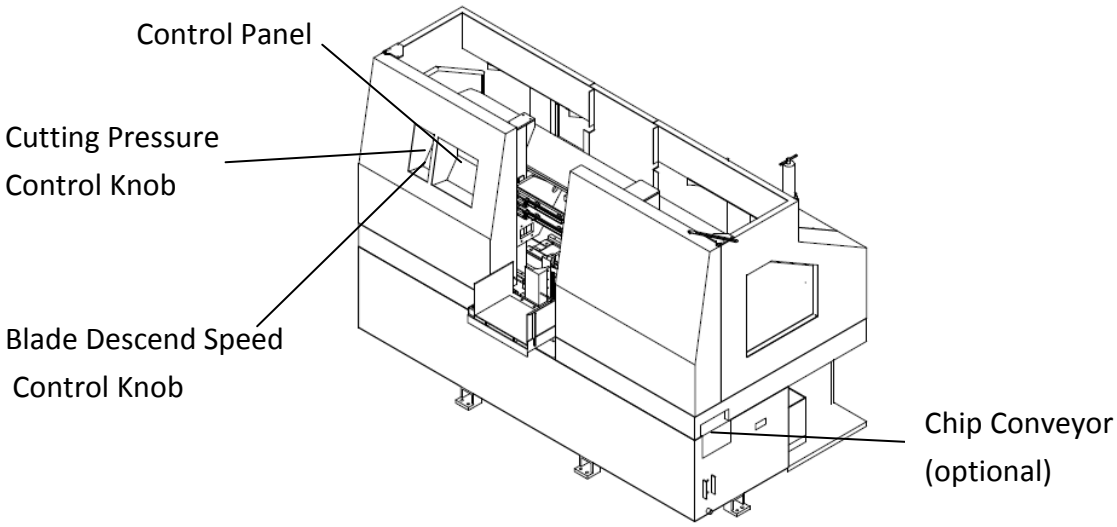
  8 hours × 5 days × 52 weeks × 10 years ＝ 20,800 hours

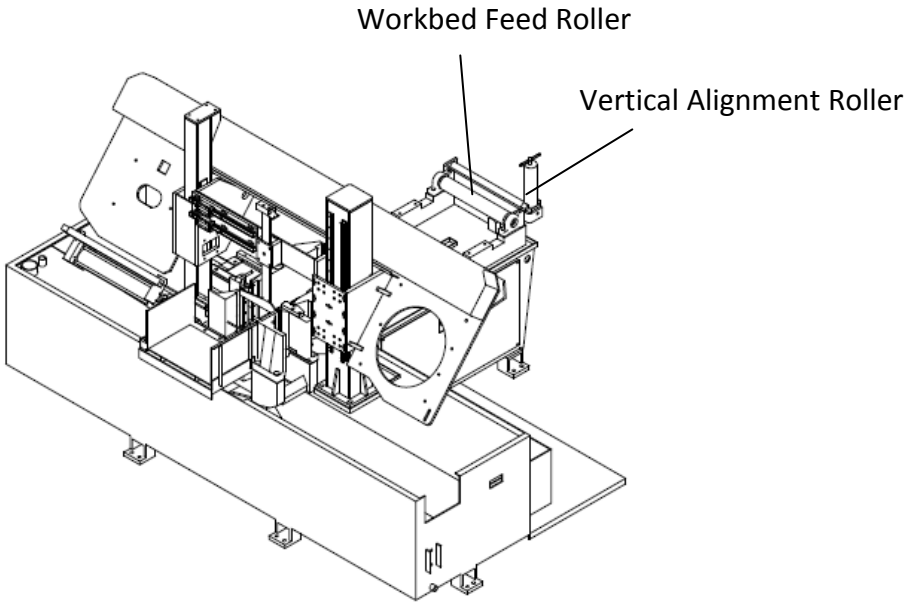
SPECIFICATION

Model		C3 NC Fully Automatic Horizontal Bandsaw
Capacity	Round	360 mm (14.2 in)
	Square	360 x 360 mm (14.2 x 14.2 in)
	Rectangular (H X W)	360 x 400 mm (14.2 x 15.7 in)
	Bundle Cutting	W: 190 ~ 350 mm (7.5 ~ 13.8 in) H: 100 ~ 180 mm (3.9 ~ 7.1in)
Saw Blade	Speed	20~100 m/min (66~328 ft/min)
	Size (L x W x T)	4880 x 41 x 1.3 mm (192 x 1.61 x 0.05 in)
	Tension	Hydraulic with automatic blade breakage detection
	Guide	Interchangeable tungsten carbide
	Cleaning	Steel wire brush with flexible drive shaft driven by main motor
Motor Output	Saw Blade	7.5 HP (5.6 kW)
	Hydraulic	2 HP (1.5 kW)
	Coolant Pump	1/8 HP (0.09 kW)
Tank Capacity	Hydraulic	50 L (12.5 gal)
	Coolant	90 L (23.8 gal)
Vise	Control Method	Hydraulic with full stroke cylinder, NC automatic
	Clamping Pressure	23 kg/cm^2
Feeding Length	Mode	Hydraulic, NC Automatic
	Single Stroke	400 mm (15.7 in)
	Multi Stroke	Max. 99 meter (328 ft)
Workbed Height		790 mm (31.1 in)
Weight	Net	2500 kg (5511 lb)
	Gross	3000 kg (6600 lb)
Floor Space (L X W X H)		3635 x 2310 x 2015 mm (143 x 91 x 79.3 in)

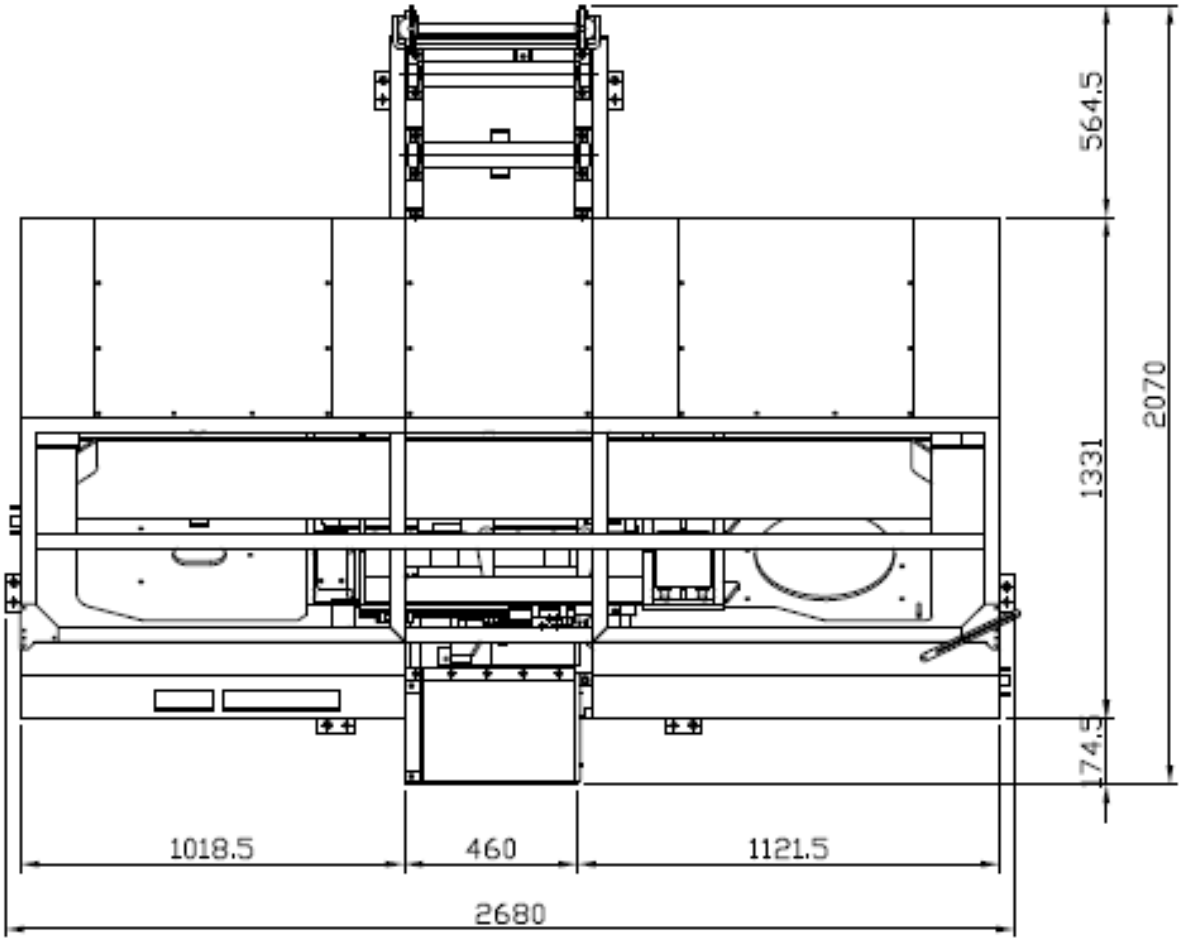
MACHINE PARTS IDENTIFICATION



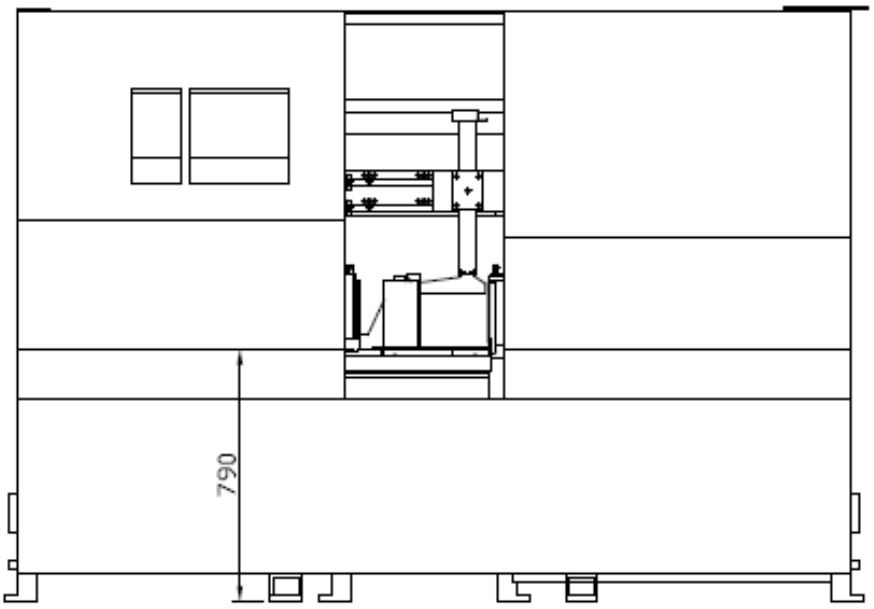




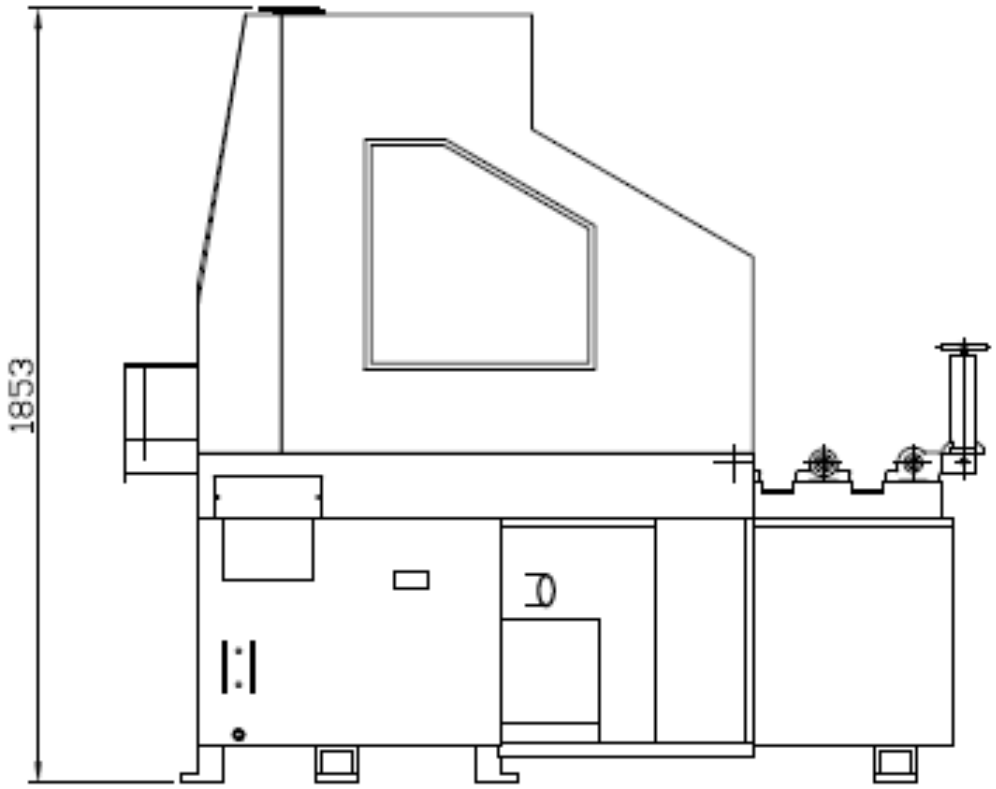
FLOOR PLAN



Machine top view



Machine front view



Machine side view

MOVING & INSTALLATION

LOCATION & ENVIRONMENT

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

Space:

- Leave enough free space around the machine for loading work and unloading cut-off pieces as well as for maintenance and inspection. Refer to *Section 1 Description* for machine dimensions and floor space.

Environment:

- Well lighted (500 lumen at minimum).
- Floor kept dry at all times in order to prevent operators from slipping.
- Away from direct exposure to the sunlight
- Room temperature between 5˚C to 40˚C.
- Humidity level kept at 30%~95%“(without condensation) to avoid dew on electric installation and machine.
- Away from vibration of other machines
- Away from powders or dusts emitted from other machines
- Avoid uneven ground. Choose a solid level concrete floor which can sustain weight of approximately 15 tons (including both machine and material weight).
- Limit the operation area of the machine to staff only.

UNPACKING & INSPECTING

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

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

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

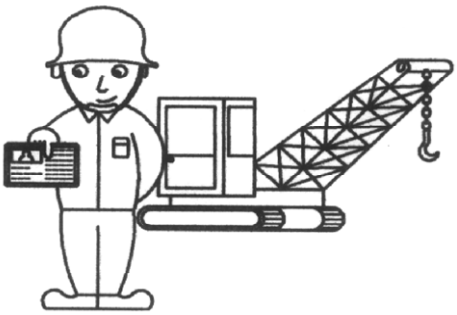
LIFTING

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

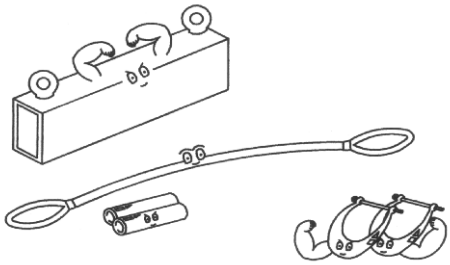
1. Use a crane

Move the machine to its location by using a crane and a wire rope sling that can fully withstand the weight of the machine (refer to machine specification under Section 1 *Description*).

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

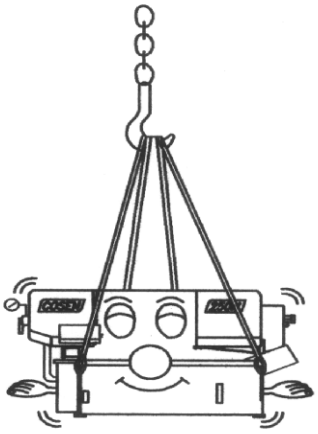


***Warning*:** You must have a qualified crane operator to perform the job.



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

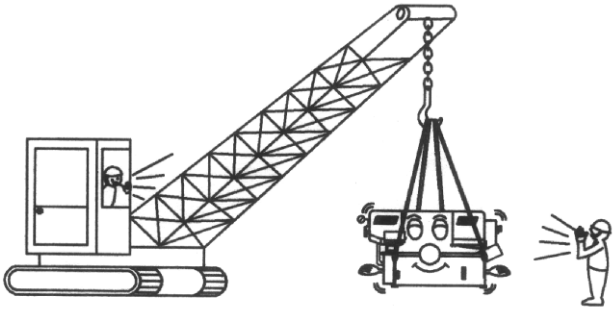
- Apply the wire rope sling to the lifting hooks on the four ends of the machine.



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

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

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



2. Use a forklift

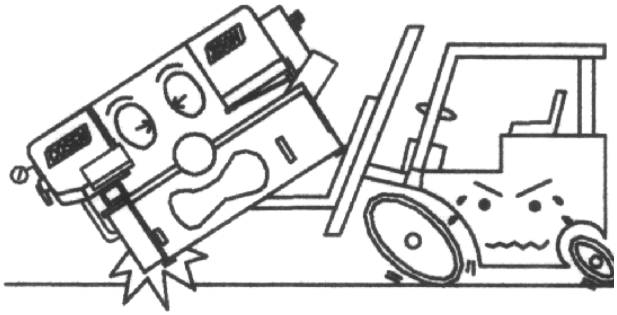
Most users choose this method to move their machine because it is easy to set up. Make sure that the lifting rod can fully withstand the weight of the machine. (Refer to *Section 2 – General Information for Specifications)*

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

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

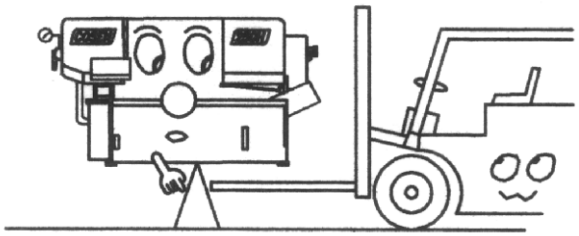
- You must apply proper forklift technique to avoid damage to the machine.

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



- You must keep the machine balanced at all times.

  Make sure the forks are centered before use.

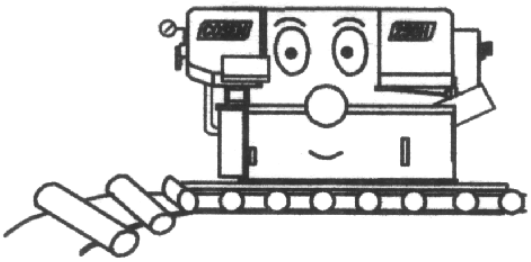


Refer to *Picture: Lifting Points* for exact locations.

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.



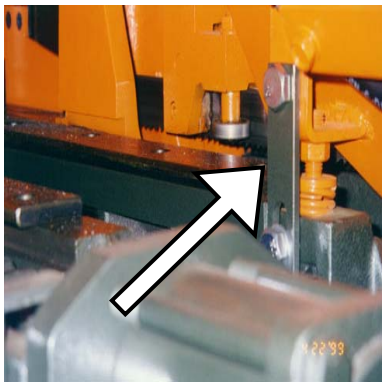
Picture: Lifting Points

Minimum weight capacity for each lifting rod: **3 ton**

Total number of lifting rod required: 2

REMOVING SHIPPING BRACKET

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



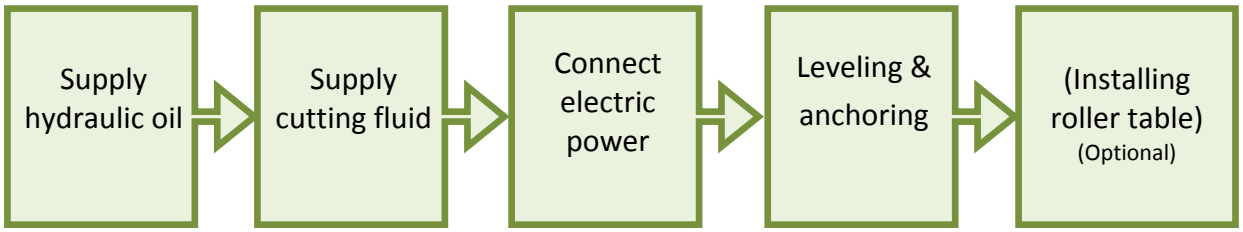
CLEANING

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

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

INSTALLING

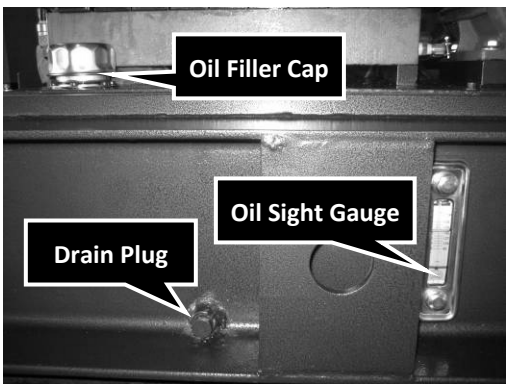
Cosen's bandsaw machine is relatively easy to install. Follow these six easy steps to install your machine.



Supplying hydraulic oil

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

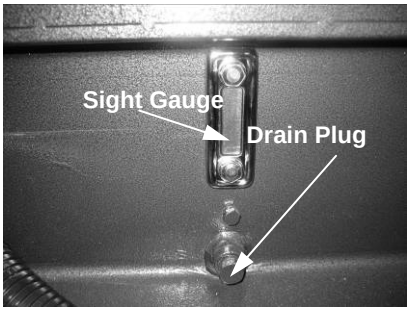
Check the sight gauge to make sure the oil level in the tank.



Refer to specification chart under Section 1 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 1 *Description* 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 1 for total electric power consumption of the motors and make sure your shop circuit breaker is capable of this consumption amount. Also use a power supply cable of proper size to suit the power supply voltage.

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

Leveling

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

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

Make sure all leveling bolts evenly support the machine weight.

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

Anchoring the machine

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

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

Installing roller table (optional)

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

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

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

Installing Fire Control Device

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

RELOCATING

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

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

Section 4

OPERATING INSTRUCTIONS

SAFETY PRECAUTIONS

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

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

BEFORE OPERATING

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

Wet cutting

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

Cutting unknown materials

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

 Never take your eyes off the machine while in operation.

Cutting fluid

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

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

 Never use water as your coolant.

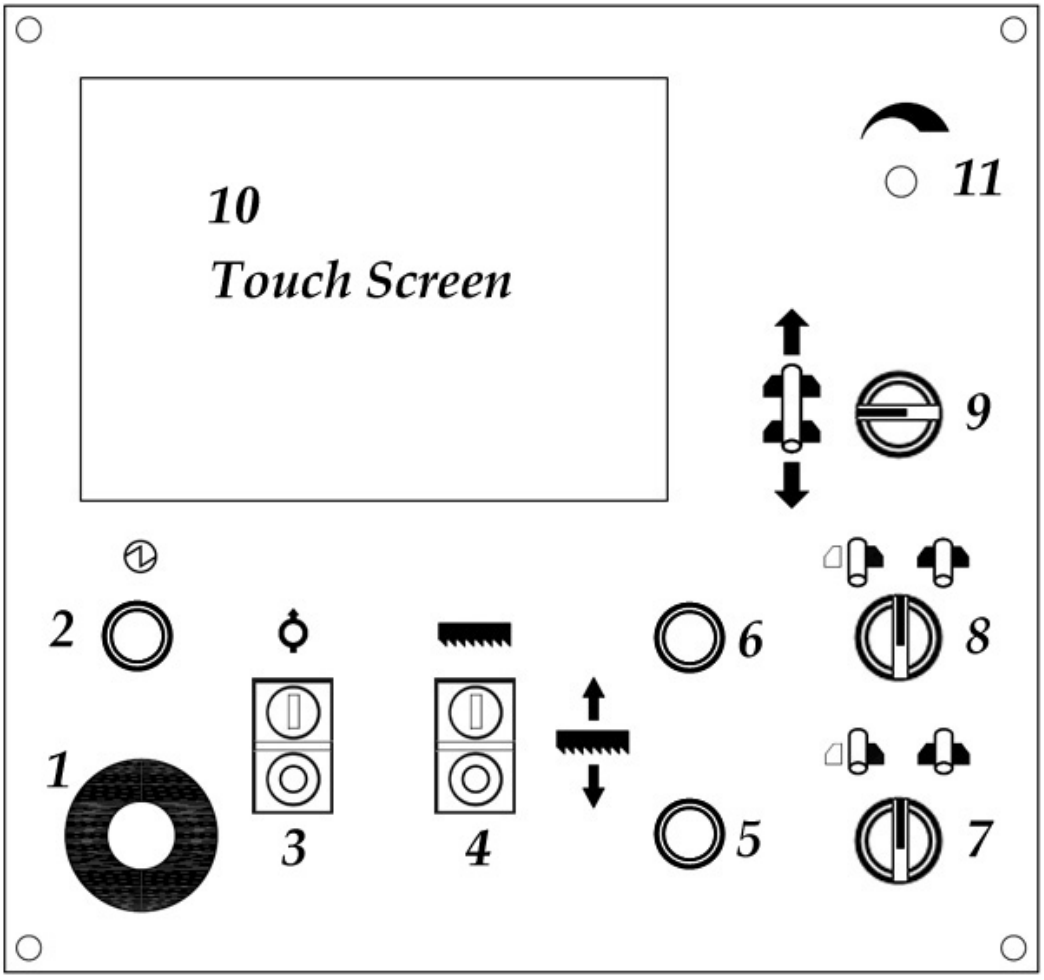
 Always add coolant into water for better mix result.

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

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

CONTROL PANEL

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



No.	Name	No.	Name
1	Emergency stop button	7	Front vise clamp/open selector switch
2	Power indicator lamp	8	Rear vise clamp/open selector switch
3	Hydraulic start/stop buttons (with built-in light) (for CE model only)	9	Feed forward/backward selector switch
4	Saw blade start/stop buttons (with built-in light) (for CE model only)	10	HMI touch screen
5	Saw bow down button	11	Blade speed control knob (Inactive; moved into HMI system)
6	Saw bow up button		

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. Hydraulic start/stop buttons (with built-in light) (for CE model only)

Press green button to **start** the hydraulic motor. (The button lights up when pressed.)
Press red button to **stop** the hydraulic motor. (The button lights off when pressed.)

 When the emergency stop button is pressed, the hydraulic motor will be shut off.

 When the hydraulic motor is turned on, the chip conveyor will start running at the same time. Please take cautions and keep your hands away from chip conveyor.

4. Saw blade start/stop buttons (with built-in light) (for CE model only)

Press green button to **start** the blade drive motor. (The button lights up when pressed.)
Press red button to **stop** the blade drive motor. (The button lights off when pressed.)

5. Saw bow down button

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

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

6. Saw bow up button

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

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

7. Front vise clamp/open selector switch

When this switch is turned to the “open” position (to the left), the front vises will continue to open until the operator lets go of the switch. Hold the switch until the desired vise position is reached.

When this switch is turned to the “closed” position (to the right), the front vises will continue to close until the operator lets go of the switch or when the vises are fully clamped. Hold the switch until the desired vise position is reached.

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

8. Rear vise clamp/open selector switch

When this switch is turned to the “open” position (to the left), the rear vises will continue to open until the operator lets go of the switch. Hold the switch until the desired vise position is reached.

When this switch is turned to the “closed” position (to the right), the rear vises will continue to close until the operator lets go of the switch or when the vises are fully clamped. Hold the switch until the desired vise position is reached.

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

9. Feed forward/backward selector switch

When the selector switch is turned to the “forward” position (to the lower left), the feeding workbed will move forward, feeding material forward. Press and hold the button to feed forward. As soon as the button is released, the feeding workbed will stop moving forward.

When the selector switch is turned to the “backward” position (to the upper left), the feeding workbed will move backward, feeding material backward. Press and hold the button to feed backward. As soon as the button is released, the feeding workbed will stop moving backward.

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

 This selector switch is only in function when the quick approach bar is touching the upper limit switch AND when either of the front and rear vises are unclamped.

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

10. HMI touch screen

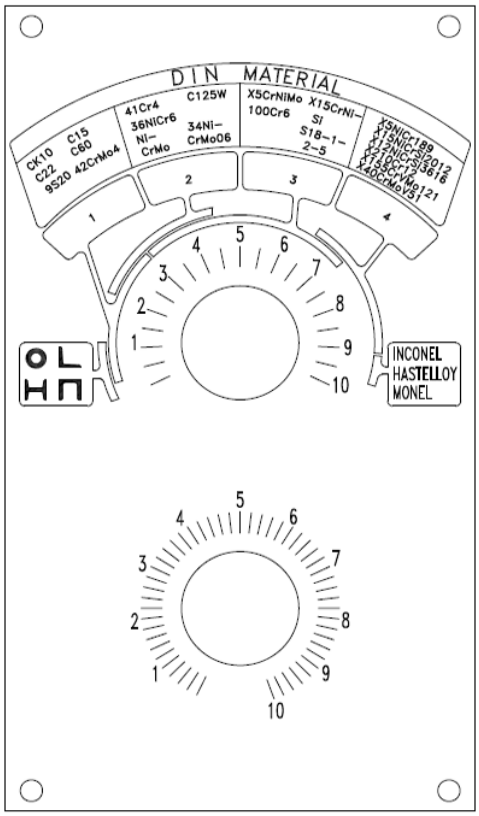
Please refer to later section for detailed introduction.

11. Blade speed control knob (Inactive; moved into HMI system)

Blade speed is controlled by the inverter located under the workbed. This button is now inactive as the blade control function has been included in the HMI system.

Blade descend pressure and speed control panel

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



Cutting pressure and speed control panel

1. Cutting pressure control knob

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

2. Blade descend speed control knob

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

Human-machine-interface (HMI) touch screen

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

Do not wipe or clean the screen with volatile solvents.

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

All range parameters in Easy View 7” are configured under the “manual” mode.

Please pay attention to the following environment conditions necessary for Easy View 7” HMI touch screen to properly operate:

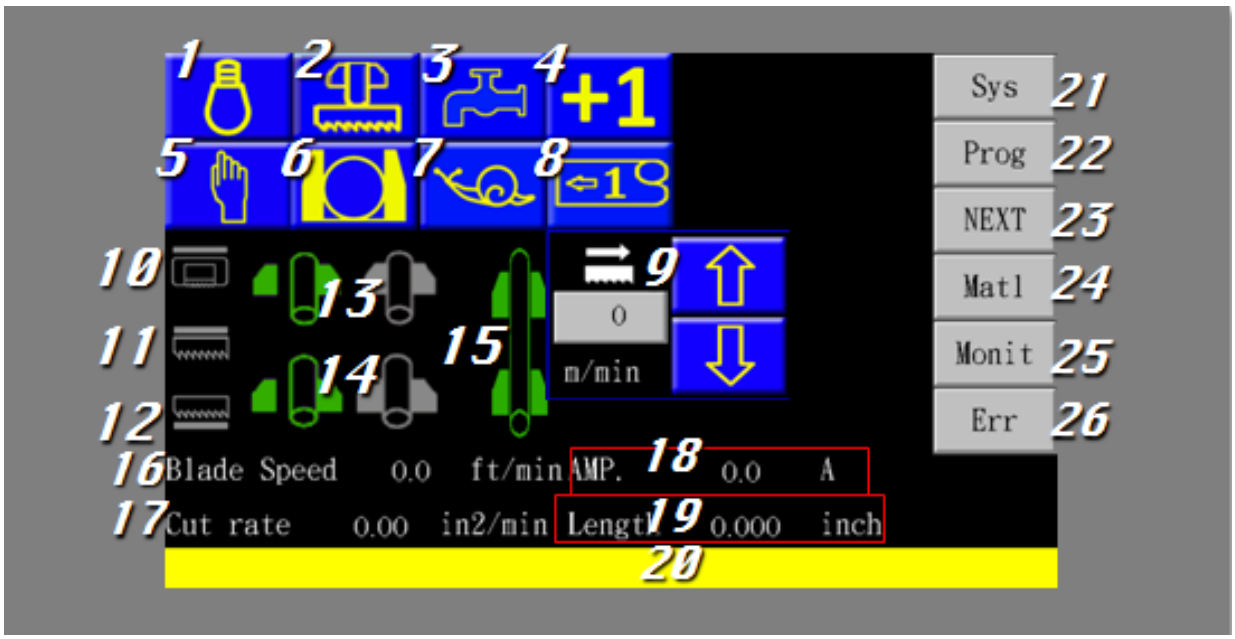
Item	Range
Ambient temperature	5℃ ~ 50℃
Temperature for safe operation	-10℃ ~ 60℃
Ambient humidity	30%~85% RH (No condensation)
Connection	RS422 MMI port
Environment	No condensation and rust

Startup Screen

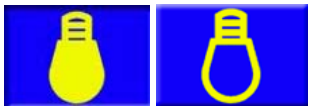
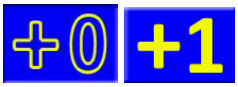
After the power is turned on, Cosen's logo will appear as the startup screen, followed by the main operation menu..

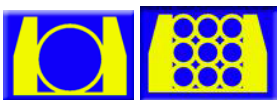
Main control menu

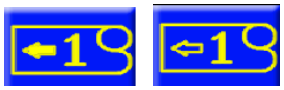
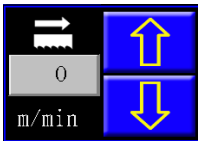
The main control menu includes some operating button that were used on the control panel of the earlier machines. Some convenient functions are added to the page for the operator to better understand the features of the machine. Setting the parameters shown on the screen requires a gentle touch of the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



Refer to the table below for descriptions of each function.

No	Item	Function	Description
1		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 off the work light.
2		Material retract 2mm ON/OFF	When this function is turned on, the machine will retract the material for 2mm after completing each cut before the blade rises from its lowest position. A solid yellow icon indicates the Material retract 2mm mode has been turned on.
3		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.
4		Trim cut ON/OFF	+0 : indicates the “one cut” in action, as soon as it is finished, will NOT be counted into the “finished cuts,” i.e. “finished cuts” value will increase by 0. (trim cut) +1 : indicates the “one cut” in action, as soon as it is finished, will be counted into the “finished cuts,” i.e. “finished cuts” value will increase by 1. When under AUTO mode and before proceeding with your automatic cutting jobs, select +0 if you wish the first cut to be “trim cut” i.e. trimming the edge of your material without the cut being counted into the “finished cuts.” On the other hand, select +1 if you do not need to trim cut the material. The first cut will then be counted as the first cut of your programmed jobs. This function works with automatic mode. Different selections under manual mode has no impact on finished cut figures. Press this button for about 1~2 seconds to switch between +1 and +0. As soon as the trim cut (i.e. the cut using +0

No	Item	Function	Description
			function) is completed, trim cut function will be automatically turned back to OFF, showing +1. After the first cut begins, you may still change your selection between +1 and +0 before the saw bow has descended to its lowest point. **The cutting material width must be OVER 30mm to be able to use automatic first cut properly.**
5		AUTO/Manual mode	Use this button to switch between automatic and manual mode. ● AUTO mode ( ): used to automatically perform continuous cutting jobs. When switched to the AUTO mode, the machine will automatically operate according to the preset parameters. ● Manual mode ( ): used to perform individual cutting job. When switched to the Manual mode, you can execute each individual function. Trim Cut - When the machine is started up first under the Manual mode and then switched to the AUTO mode, whether the first cut (trim cut) will be counted into finished cuts or not will depend on how the trim cut ON/OFF switch is selected. Switching from AUTO mode to Manual mode during continuous cutting jobs, the machine will stop at the very next time the blade descends to the lowest point (touching lower limit switch). If switching to Manual mode while cutting is in action, the machine will stop when the one cut is finished and the blade has descended to the lowest point. Switching at any time other than cutting such as blade rising or vise retracting, the machine will proceed with the following cutting job until it is finished.
6		Single/Bundle cutting mode	This button is used to switch between single or bundle cutting mode. ● Switch to single cutting model ( ) to cut

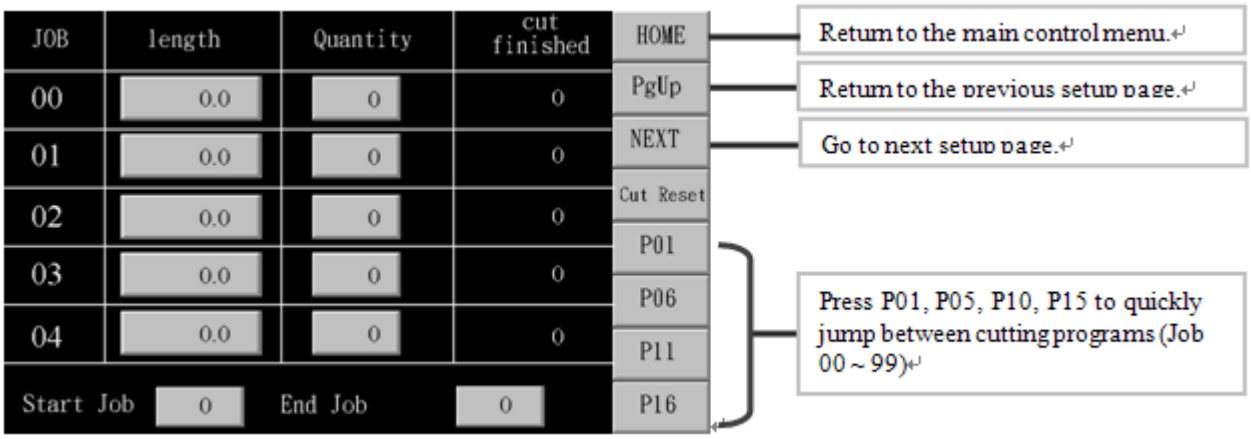
No	Item	Function	Description
			a single work piece. ● Switch to bundle cutting mode ( ) to cut a stack of work pieces. When under bundle cutting mode, the feeding vise must be touching the front limit switch for the blade to be able to start.
7		Slow/Fast material feeding mode	Used only when under Manual mode. When the slow material feeding mode (snail icon) is turned on, the material feeding speed will dramatically reduce to help you position the work piece precisely.
8		Automatic first cut function ON/OFF	This selection button works with the automatic cutting mode. When under AUTO mode and before proceeding with your automatic cutting jobs, select  if you wish the machine to automatically execute the first cut of the cutting jobs you programmed in the system. (For cutting program setting, refer to introduction under “Cutting Parameter Setup - Page 3”) With the first cut function, simply clamp the material with the rear vise with about 60~70 mm sticking out toward the blade, turn on the first cut function and switch to automatic mode, then the machine will automatically feed the material to the right position to execute the first cut, followed by the rest of the programmed cutting jobs. The first cut is also counted into finished cuts. Select  if you do not need to use automatic first cut function.
9		Blade speed controller	Blade speed is controlled by the inverter located under the workbed.
10		Saw bow up indicator	Indicates that the saw blade has risen to the point of touching upper limit switch. When activated, the saw blade icon will turn solid white.

No	Item	Function	Description
11		Saw blade middle indicator	Indicates that the saw blade has descended to the position of the middle limit switch. When activated, the saw blade icon will turn solid white. Due to safety considerations, the shuttle bed feeding/retracting function will be temporarily disabled while the saw blade middle indicator is activated.
12		Saw bow down indicator	Indicates that a cut is completed and the saw bow is at its lowest position. When the blade completes each cut and triggers the lower limit switch, the saw blade icon will turn solid white.
13		Rear vise status indicator	Indicates if the **rear** vises have clamped and secured the workpiece. When the rear vises have secured the workpiece, the clamping vise icon on the right will turn solid white. Otherwise, the unclamping vise icon on the left will be in solid green.
14		Front vise status indicator	Indicates if the **front** vises have clamped and secured the workpiece. When the front vises have secured the workpiece, the clamping vise icon on the right will turn solid white. Otherwise, the unclamping vise icon on the left will be in solid green. The front vise must be clamped in order for the blade to be able to start.
15		Feeding movement indicator	When the feeding vise reaches the front limit, the vise set icon will turn solid white.
16		Blade speed display	Displays current blade speed.
17		Cutting rate display	Displays the current cutting rate. Cutting rate display is available only if the optional saw blade height decoder is equipped on the machine.

No	Item	Function	Description
18	AMP.	Blade motor amp draw	Displays the motor amperage drawn. With this information the operator will be able to optimize cutting speed and blade usage.
19	Length	Feeding length display	Displays current feeding length while the material is being fed.
20	(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.**
21	Sys	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.
22	Prog	Cutting program setting	Press this button to directly enter the cutting job program setup page. A total of 100 cutting programs can be set. Refer to Cutting Program Setup in the following page.
23	NEXT	Cutting parameter setting	Press this button to display cutting-related information e.g. total number of cuts completed and feeding length OR to set parameters e.g. cutting lengths and quantity. (A total of 100 cutting programs can be set.) Blade deviation detector (optional) can be also configured in this setup page. Refer to Cutting Display & Setup in the following page.
24	Mtrl	Material cutting reference	This 2-page reference chart lists out the required blade speed and cutting rate for each different material.
25	Moni	PLC monitor	Shows current PLC signals.
26	Err	Error report	Lists a historical report of the errors and the time of occurrence as well as provides troubleshooting support. 6 pages in total.

Prog *Cutting program setup*

At any given time, press Prog to quickly jump to the cutting program setup page (the same as page 3 of the cutting status display and setup page). As shown below, this page is where the operator program automatic cutting by setting cutting length and quantity under each job. A total of 100 cutting jobs can be set and performed under the automatic mode.



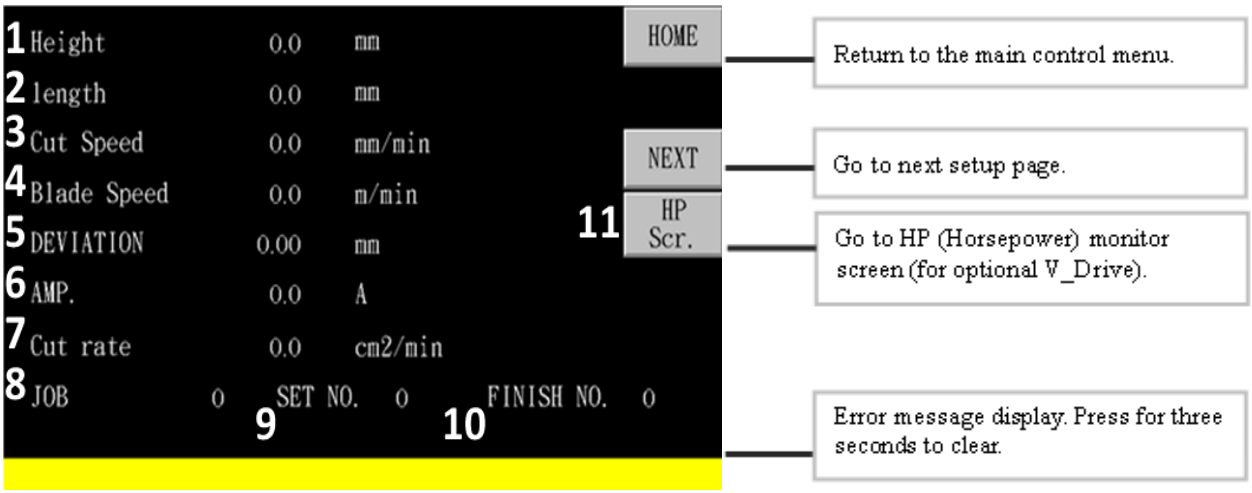
Item	Function	Description
Length column	Cutting length setup	Press these buttons to set each respective cutting length in the preset length unit (mm or inch). A number key pad will pop out. If any preset cutting program data is altered during an automatic operation, the cutting result will be changed.
Quantity column	Cutting quantity setup	Press these buttons to set each respective cutting quantity. A number key pad will pop out. If any preset cutting program data is altered during an automatic operation, the cutting result will be changed.
Cut Finished column	Cutoff quantity display	This column displays the number of finished cuts for each job.
Start Job	Starting cutting job setup	Key in the number of the job you wish to execute first under automatic mode. The starting job can be set to any number and does not need to be job "0." Both "Starts job" and "End job" need to be set for an automatic operation to be started.
End Job	Ending cutting job setup	Key in the number of the job you wish to execute last under automatic mode. Both "Starts job" and "End job" need to be set for an automatic operation to be started.

Item	Function	Description
Cut Reset	Clear finished cuts data	Reset all Cut Finished data by pressing this button for three seconds. (Same as “Cut Piece Reset” described earlier.) If this key is pressed during an automatic operation, the finished cut data of the current job will be reset and recalculated.

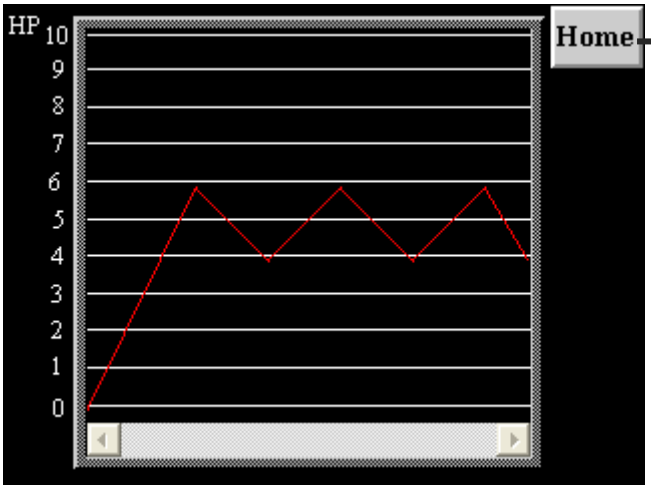
NEXT *Cutting status display & setup*

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

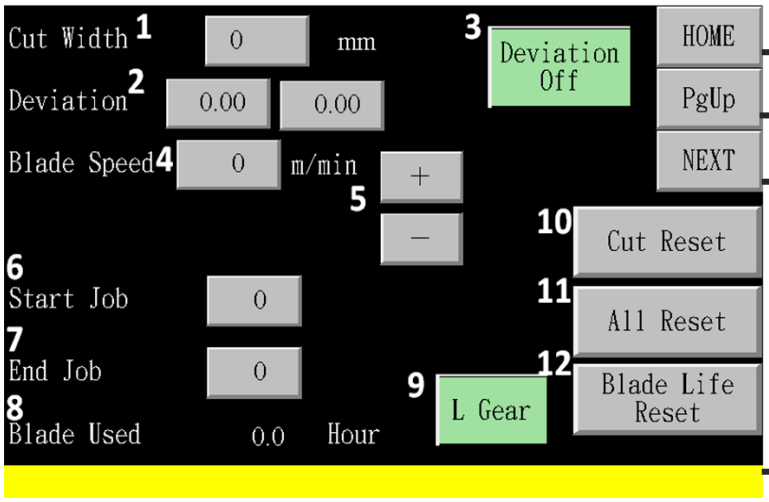
Page 1: cutting status display



No	Item	Function	Description
1	Height	Blade height display	Displays current blade height.
2	Length	Feeding length display	Displays current feeding length while the material is being fed.
3	Cut Speed	Blade downfeed speed display	Displays the current blade descending speed.
4	Blade Speed	Blade speed display	Displays current blade speed.
5	Deviation	Deviation display	Displays current deviation value

No	Item	Function	Description
6	AMP.	Blade motor amp draw	Displays the motor amperage drawn. With this information the operator will be able to optimize cutting speed and blade usage.
7	Cut rate	Cutting rate display	Displays the current cutting rate.
8	JOB	Current job number display	Displays the number of the current cutting job.
9	SET NO.	Preset quantity display	Displays the preset quantity of the current cutting job.
10	Finish NO.	Finished quantity display	Displays the number of cuts finished.
11	HP Scr.	Press this button to enter the HP (horsepower) monitor screen for V_Drive, which is an optional accessory for enhancing cutting efficiency and reducing cutting vibrations.	
			Return to the main control menu.

Page 2: cutting status setup



Return to the main control menu.

Return to the previous setup page.

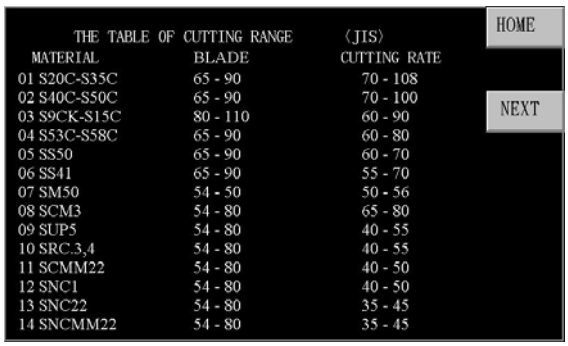
Go to next setup page.

Error message display. Press to clear.

No	Item	Function	Description
1	Cut Width	Material width setting	Press this button to set material width. With material width, the system can automatically calculate cutting rate.
2	**Deviation**	Blade deviation setting	● Left: Positive deviation ● Right: Negative deviation During cutting, if the blade deviation is greater than the set values, the saw blade will be stopped to protect the blade. This function is available only if the optional blade deviation detector is equipped with the machine.
3	Deviation Off	Blade deviation detection ON/OFF	Gently press the button to switch between ON and OFF modes. ● Deviation ON: indicates blade deviation detector is turned ON and will detect blade deviation when it exceeds preset value. ● Deviation OFF: indicates blade deviation detector function is temporarily turned off. This function is available only if the optional blade deviation detector is equipped with the machine.
4	**Blade Speed**	Blade speed setting	Press this key to adjust the blade speed according to the material being cut. The operator must make sure the pulley is at high or low gear. Speed range = 15~100 M/min.
5	+ / −	Blade accelerates/decelerates	Press and hold these keys to increase/decrease the blade speed.
6	Start Job	Starting cutting job setting	Key in the number of the job you wish to execute first under automatic mode.
7	End Job	Ending cutting job setting	Key in the number of the job you wish to execute last under automatic mode.

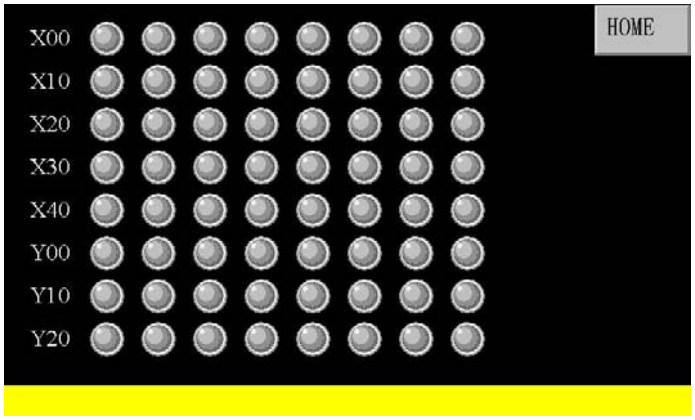
No	Item	Function	Description
8	Blade Used	Blade lifetime display	Displays the total usage time of the blade, if the "Blade life Reset" is pressed, the blade usage time will be recalculated.
9	L Gear	High/low gear selection switch	Press this key to switch between low and high gears for the drive belt. ●L Gear：indicates the drive belt is at low gear. ●H Gear：indicates the drive belt is at high gear. Maximum blade speed: On L Gear: 72 M/min On H Gear: 100 M/min Not shown if the machine comes without this option.
10	Cut Reset	Clear finished cuts data	Reset all *Cut Finished* data by pressing this button for three seconds. If you start a new set of program without clearing cutoff data from previous job, the first cut (trim cut) will be skipped as the second program is deemed as the succeeding part of the previous program. If this key is pressed during an automatic operation, the finished cut data of the current job will be reset and recalculated.
11	All Reset	Reset all cutting data	Press this key for three seconds to clear all preset cutting data between the ***starting job*** and the ***ending job***. Do not press this key during an automatic operation.
12	Blade Life Reset	Reset blade life	Press this button to reset blade life to zero.

Mtrl *Material cutting reference*



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

Moni *PLC Monitor*

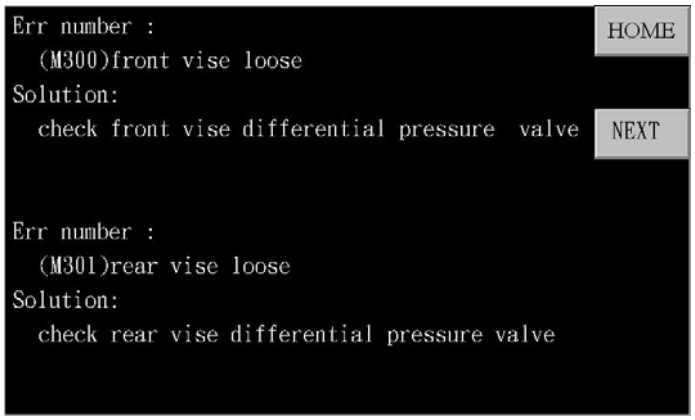


- Shows all signals of the PLC system.

Err *Error report*

Page 1 – error report

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



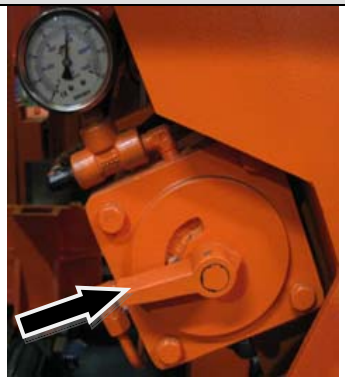
Page 2 – troubleshooting

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

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

STANDARD ACCESSORIES

Blade tension device



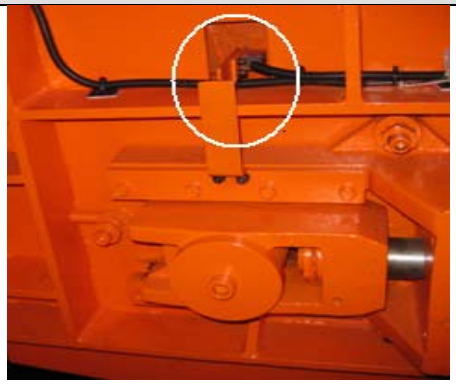
- This blade tension device equipped with hydraulic cylinder provides appropriate tension to the saw blade.
- To tighten the saw blade, turn the selector to ◯◯.
- Upon saw blade breakage, the safety device will activate and automatically stop all machine operation.
- To change the blade, turn the handle to ◯◯ to release saw blade tension.

Never adjust blade tension while the blade is running.

The blade tension pressure meter is controlled by system pressure. Blade tension has been configured at time of manufacturing. Do not make random changes as it will affect machine performance.

- Standard blade pressure: 35 ~ 40 kg/cm2
- Standard blade tension: 2300 ~ 2400 kg/cm2

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.

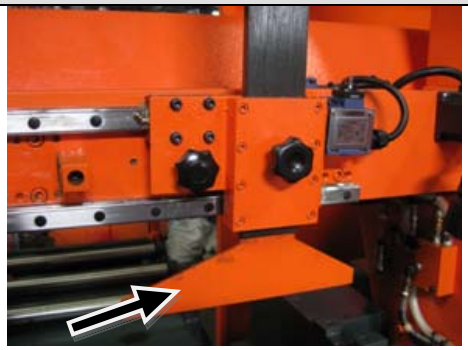
To adjust blade speed, use the *blade speed control* buttons on the HMI touch screen.

Voltage used should not exceed AC 460V.

Note:

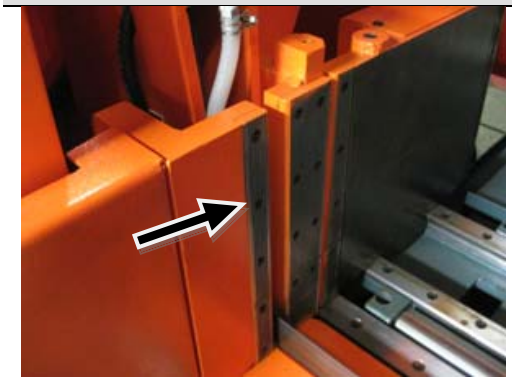
1. Make sure the terminal points are connected.
2. Make sure the ambient temperature is within acceptable range and keep the surroundings well ventilated.
3. Keep the inverter away from dust.
4. For repair or maintenance, please contact your local agent.

Quick Approach Device



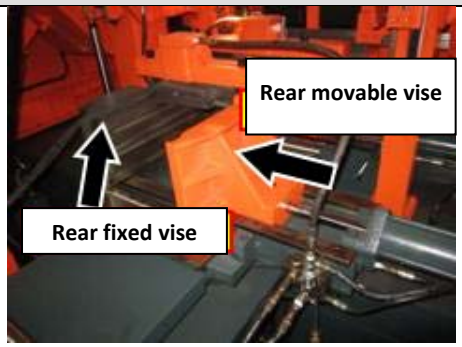
This device is used to allow the saw blade to quickly descend to just above the workpiece. As the quick approach bar touches the material top, the saw bow's descending speed shifts back to cutting mode, which can be changed by adjusting the blade descend speed control valve based on the material to be cut.

Split Front Vise



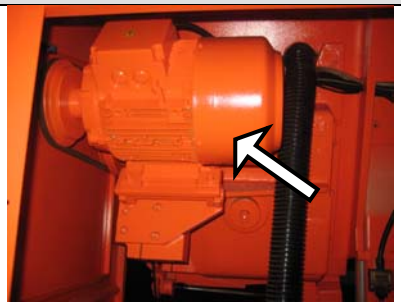
The spilt vises are a clever design to make sure your workpiece is tightly clamped by the two vises from both sides of the blade, maximizing stability and cutting precision.

Double Retracting Rear Vise



The rear fixed vise has a built-in hydraulic cylinder. When rear vises start actions, the rear fixed vise will always act ahead of the rear movable vise.

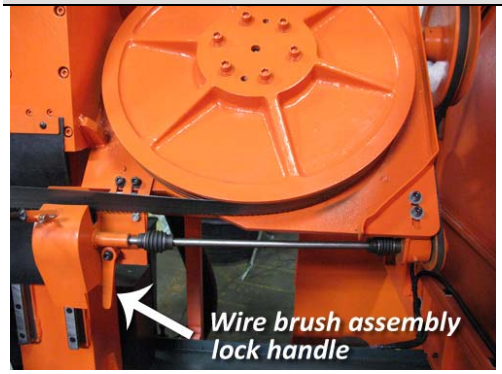
Gear reducer



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

Please refer to Chapter 8 for information on maintenance.

Wire Brush Assembly

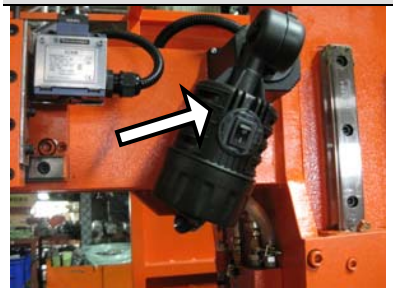


The wire brush is driven by the main motor to remove the metal chips on the saw blade teeth so that blade life can be extended.

Keep hands away from the transmission shaft and 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.

Work light



The work light installed on top of the saw is a useful tool when supplementary lighting is needed for material alignment or operation.

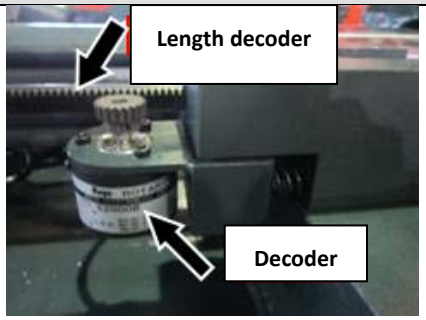
Height Decoder

With this device installed on the left column, the operator can input work piece width via HMI touch panel. When cutting begins and the blade starts to descend, the panel will display the current blade height, the blade descend speed, and the cutting rate calculated by the system.

The decoder is a precision electronic device. All configurations have been made in the factory before shipment. Please do not make any random change unless instructed directly by the manufacturer.

Avoid impact of any sort to this device.

Length Decoder

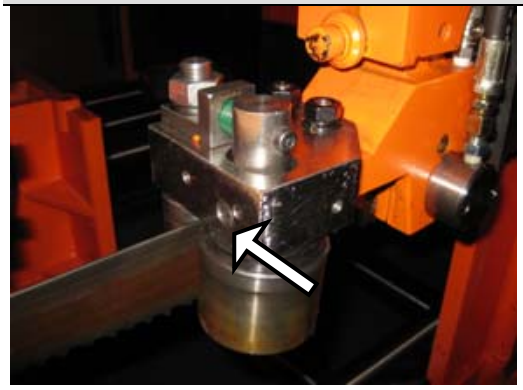


The length decoder is installed on the top of the rear workbed. This decoder detects and interprets the feeding length we need.

The decoder is a precision electronic device. All configurations have been made in the factory before shipment. Please do not make any random change unless instructed directly by the manufacturer.

Avoid impact of any sort to this device.

Vibration Damper



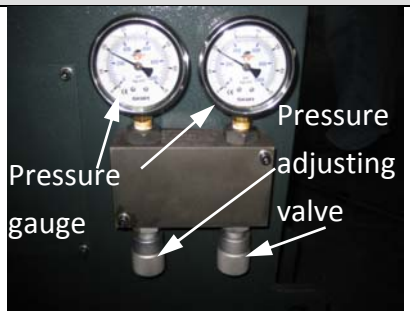
Installed in the left guide arm, the anti-vibration roller set reduces high frequency noise when the saw blade is cutting heavy material producing noise.

Coolant Pump

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

OPTIONAL ACCESSORIES

Vise Pressure Regulator



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

Do not adjust vise pressure at any time during cutting.

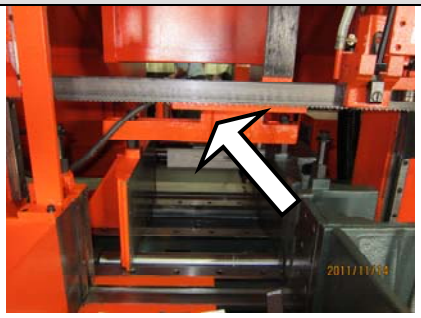
Vise pressure should never be lower than 8 kg/cm^2.

Chip conveyor

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

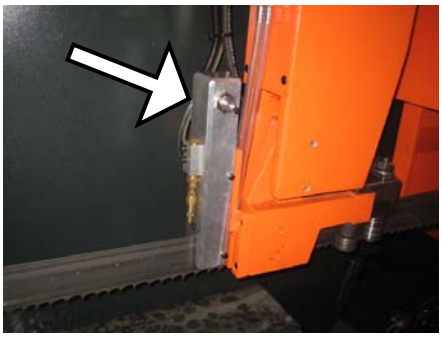
As a regular maintenance, remove the chip conveyor and clean all chip deposits inside.

Hydraulic top clamps



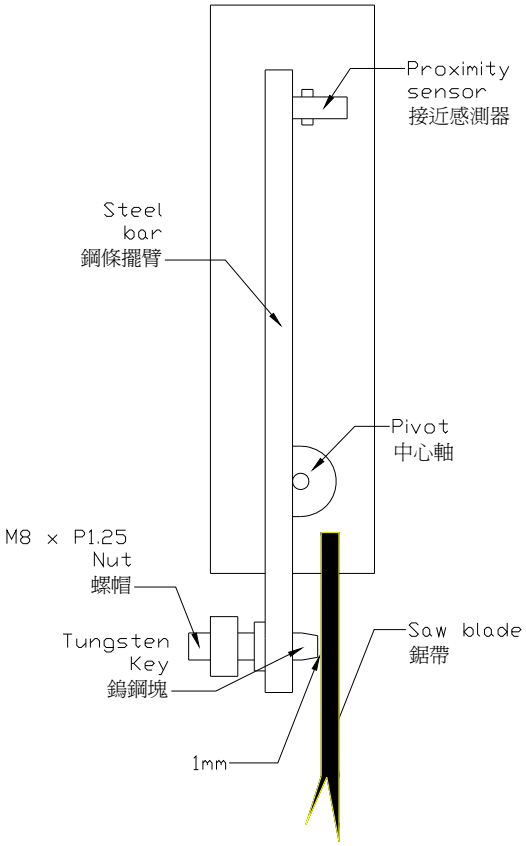
The top clamp device composed of two clamps is installed on top of the front and rear vises before executing bundle cutting.

Blade Deviation Detector



This device detects blade deviation. If the blade deviates beyond the preset range, the machine will stop automatically. When this device is installed, the cutting width will be reduced. The blade deviation detected value and preset values are displayed on the control panel screen.

Deviation Detector Calibration Procedure



How to Adjust

1. Unclamp the tungsten carbide inserts.
2. Loosen the nut (M8 x P1.25).
3. Adjust the nut until the blade deviation value shown the display returns to zero.
4. Tighten the nut.
5. Clamp the tungsten carbide inserts.

How to Check

1. When the carbide inserts are relieved, the distance between the saw blade and the proximity sensor set should be about **4 mm.**
2. When the carbide inserts are clamped, the distance between the saw blade and the proximity sensor set should be about **1 mm.**

Adjust the nut so that when the steel bar touches the proximity sensor, the blade deviation displayed on the control panel is zero.

Make sure the saw blade is set up square at 90° right angle.

2M Roller Table

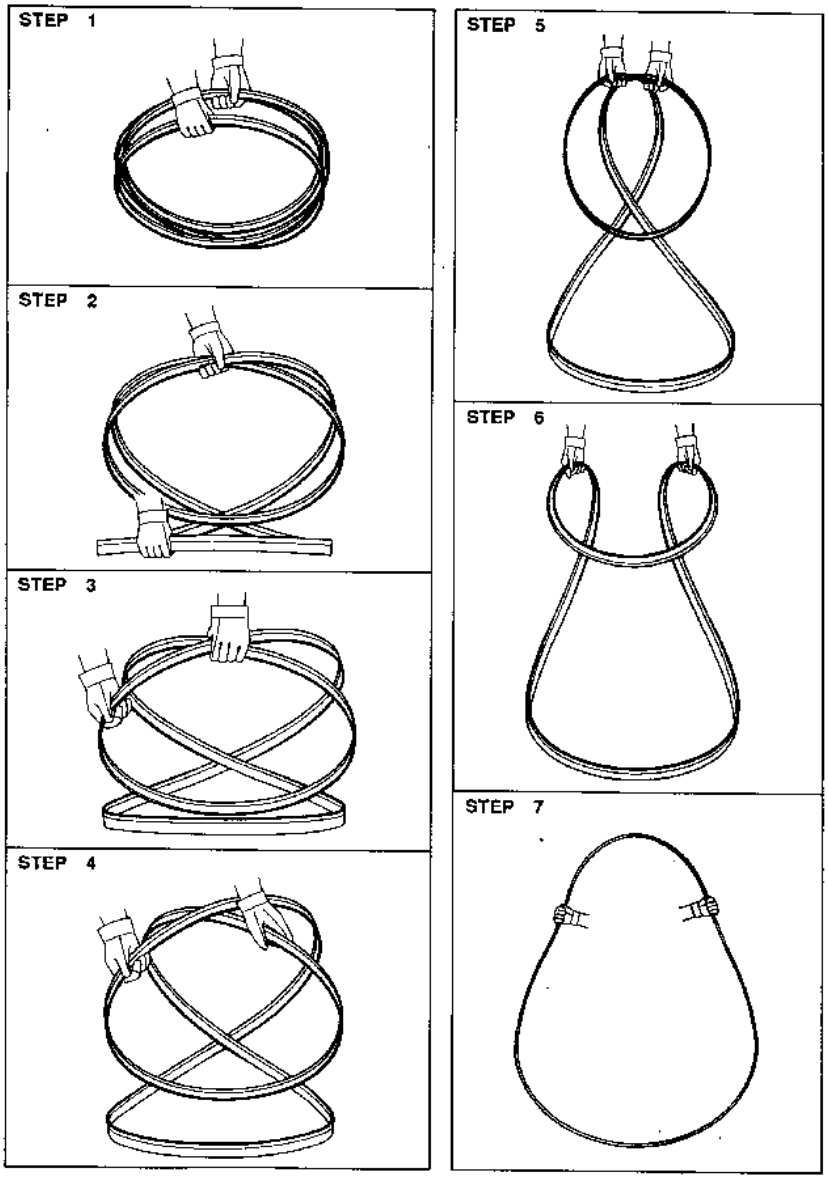
The optional 2M roller table supports the work material and ensures the material is fed in smoothly.

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

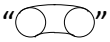
Step 1 - Select the most suitable saw blade for your workpiece considering the size, shape and material.

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

Step 3 – Switch to *manual* () mode.

Step 4 - Press the *saw bow up* button and elevate the saw bow until the blade is slightly above the top of vises with enough room for blade changing.

Step 5 – Unclamp the carbide inserts.

Step 6 - 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 7 - Open the idle and drive wheel covers.

Step 8 – Loosen the wire brush assembly lock nuts and move the wire brush away from the blade. Refer below *ADJUSTING WIRE BRUSH*.

Step 9 - Pull down the worn saw blade from the carbide inserts, wire brush assembly and from the two wheels. Roll up the used blade and place it at a safe place.

Step 10 - If necessary, clean the blade guide rollers before installing a new saw blade.

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

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

 Before changing the blade, make note of the direction the blade is running and the blade teeth is facing.

Step 13 - Place the blade to the drive wheel and press the back of the blade against the flange of the drive wheel.

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

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

Step 16 - Make sure the sides of the blade are in close contact with the carbide inserts and then tighten the left and right carbide inserts.

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

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

Step 19 - Adjust wire brush to a proper position.

ADJUSTING WIRE BRUSH

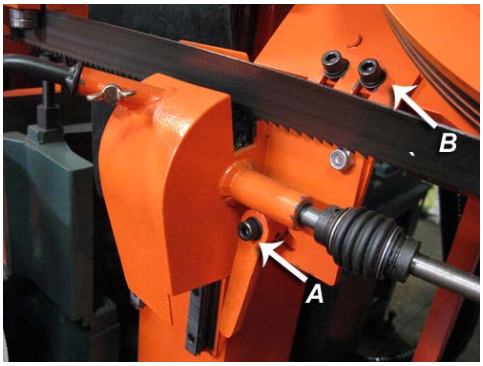
Follow these steps to adjust wire brush to appropriate position:

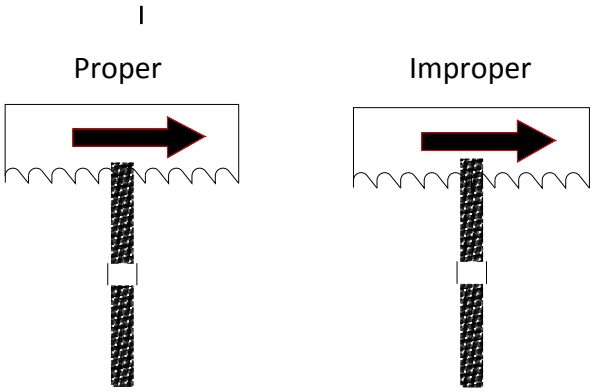
Step 1 – Loosen the wire brush adjusting screw (indicated A in below picture) and lower wire brush via adjusting handle.

Step 2 – Loosen the wire brush lock nut (indicated B in below picture), remove the old worn wire brush and replace with a new one. Tighten the wire brush lock nut.

Step 3 – Make brush move up / down via the adjusting handle until it makes proper contact with the saw blade (also see below illustration).

Step 4 – Tighten the wire brush adjusting screw.





ADJUSTING SAW ARM

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

Step 1 – Loosen the carbide inserts by pulling down the lock handle at the left and right blade guide brackets.

Step 2 – Adjust the guide arm to a position suitable for your workpiece size. The left guide arm rides on a linear guide. Directly slide it to your desired position with a moderate push.

Step 3 – After adjustment is made, tighten the blade guide lock handle.

ADJUSTING BLADE SPEED

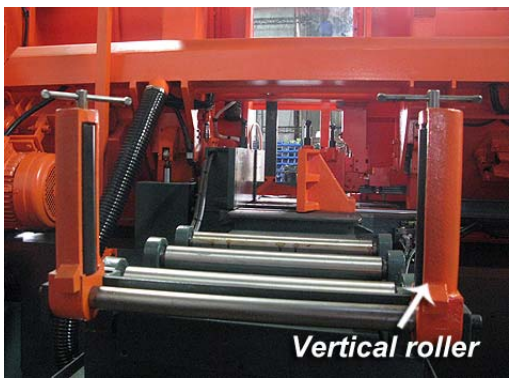
Step 1 – Set the flow control to “0” position.
Step 2 – Press the *saw blade start* button to start the blade.
Step 3 – Via HMI touch screen, you can set the blade speed by directly keying in the value or use the acceleration/deceleration button to control the speed. The blade speed should be adjusted 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 - The complete break-in operation requires cutting on a 645 mm2 (25.4 square inches) section for 5 times.
Step 4 - After the break-in operation is completed, set all parameters back to normal settings.

PLACING WORKPIECE ONTO WORKBED

Step 1 – Press the saw bow up button and elevate the saw bow until it reaches to its highest point.
Step 2 – Press the front vise open and rear vise open buttons to open vises.
Step 3 – Loosen the vertical roller lock handles and fully open the vertical rollers.
Step 4 – Carefully place the workpiece onto the work feed table to where it extends approximately 70~100 mm (2.75~3.9 inch) beyond the rear vise toward the front vise.



POSITIONING WORKPIECE FOR CUTTING

A. Without using AUTOMATIC FIRST CUT FUNCTION

Follow these steps to position your workpiece:

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

B. Using AUTOMATIC FIRST CUT FUNCTION

The cutting material width must be OVER 30mm to be able to use automatic first cut properly.

Follow these steps to position your workpiece and get it ready for an automatic cutting job using the automatic first cut function.

Step		Action
rear vises clamp material	*1*	After the workpiece has been properly placed on the workbed (with about 70-100 mm sticking out past the rear vises toward the front vises, leaving enough room before the front vises), press the *rear vise clamp* button until the workpiece is securely clamped.
align vertical rollers	*2*	Move the vertical alignment rollers toward workpiece until it stands against the workpiece. Lock the vertical alignment rollers by tightening the lock handles.
close front vises	*3*	Press the *front vise clamp* button until the front vises are clamped together.
program cutting jobs	*4*	Via the HMI touch screen, making the following settings: • Set your desired length and quantity for the first step of your cutting job. If you wish to apply the first cut as trim-cut, however, set quantity to 1 and remember to turn on *trim-cut* function (+0) so it will not be counted into finished cuts. • Program the rest of your cutting jobs if any. Remember to set your starting step and ending step accordingly.
turn on automatic first cut function	*5*	Via the HMI touch screen, turn on the *automatic first cut* function and switch to *automatic cutting mode*.
ready to cut and start	*6*	Now the material is ready for automatic cutting. Press the *blade start* button to start cutting. The following actions will take place: • The saw bow rises to the upper limit position; • the rear vises start feeding material forward until the front end of the workpiece touches the front vise detector block, triggering the feeding motion to stop; • the rear vises retract slightly; • the front vises start to open; • the rear vises feed the material to the exact cutoff position; • the front vises close back up; • the blade start running and saw bow descend while the movable guide arm automatically moves to the closest position possible.

ADJUSTING COOLANT FLOW

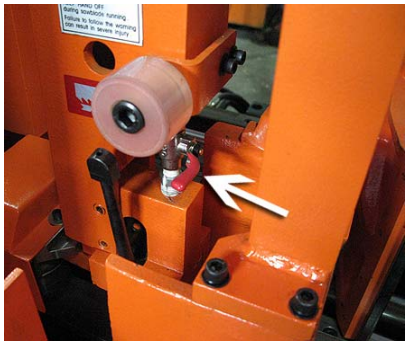
A total of four coolant flow control valves are in place to provide lubrication, cooling and cleaning for this machine. These valves control coolant flow amount to:

- the left blade guide,
- the right blade guide
- the coolant nozzle and,
- to the wire brush

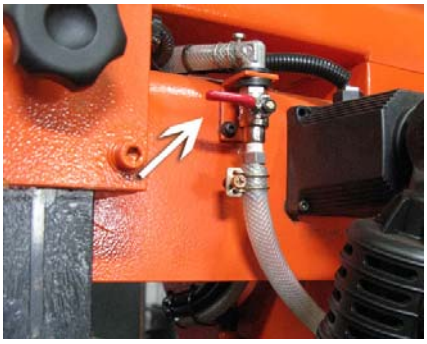
To adjust the coolant flow, follow these steps:

Step 1 – Press the coolant ON button to start the coolant pump.

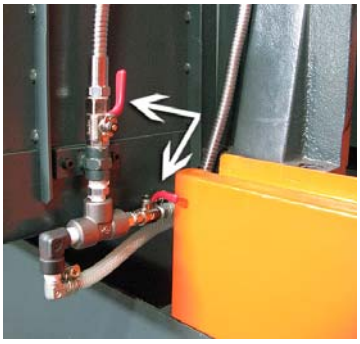
Step 2 – Use the coolant flow control valves (shown below) to adjust the amount of fluid flowing to the cutting area.



(For left blade guide)



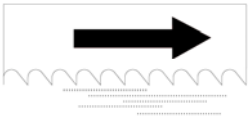
(For right blade guide)



(For coolant nozzle & wire brush)

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.

TEST-RUNNING THE MACHINE

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

Testing machine performance:

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

Step 1 – Disassemble shipping brackets and bolts.

Step 2 – Install roller table (optional).

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

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

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

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

Step 7 – Start the coolant pump.

Step 8 – Test these functions under manual mode:

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

CUTTING OPERATION

Step 1 – Check before you cut

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

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

 Before loading, make sure the vises are opened wide enough and the blade is raised high enough to allow enough clearance for the workpiece. When loading, take extra care not to have the workpiece bump into the blade.

Step 3 – Position your workpiece. Decide to use the automatic first cut function or not. Refer above POSITIONING WORKPIECE FOR CUTTING. With the automatic first cut function, the machine can automatically detect material front end and feed it exactly to where it needs to be for your programmed jobs.

 **The cutting material width must be OVER 30mm to be able to use automatic first cut properly.**

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 *blade descend speed control* knob to obtain a suitable blade descend speed for your material.

Step 7 – Start running the blade.

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

Step 8 – While the blade descends, adjust the blade speed if necessary. You can do so by pressing the acceleration and deceleration buttons on the HMI touch screen. The blade speed is displayed on the HMI touch screen.

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

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

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

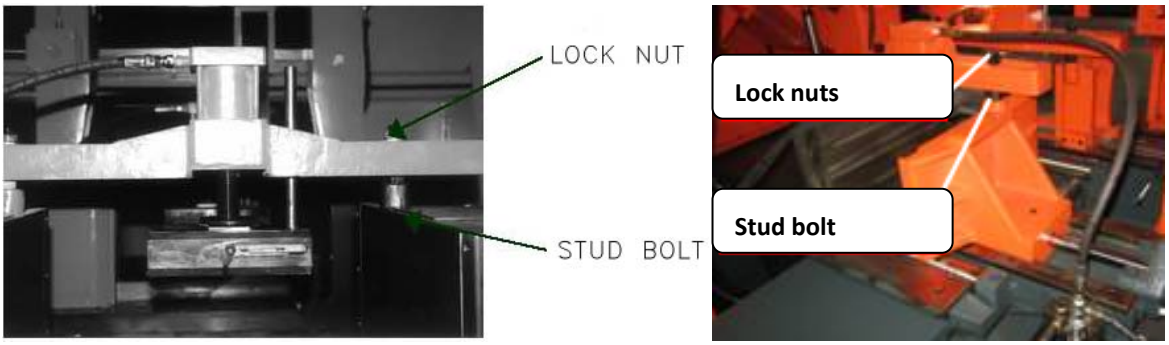
Step 12 – Lower the saw bow to a proper position then turn off the power.

USING TOP CLAMP FOR BUNDLE CUTTING

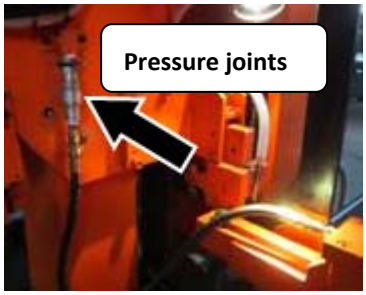
Installing top clamp

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

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



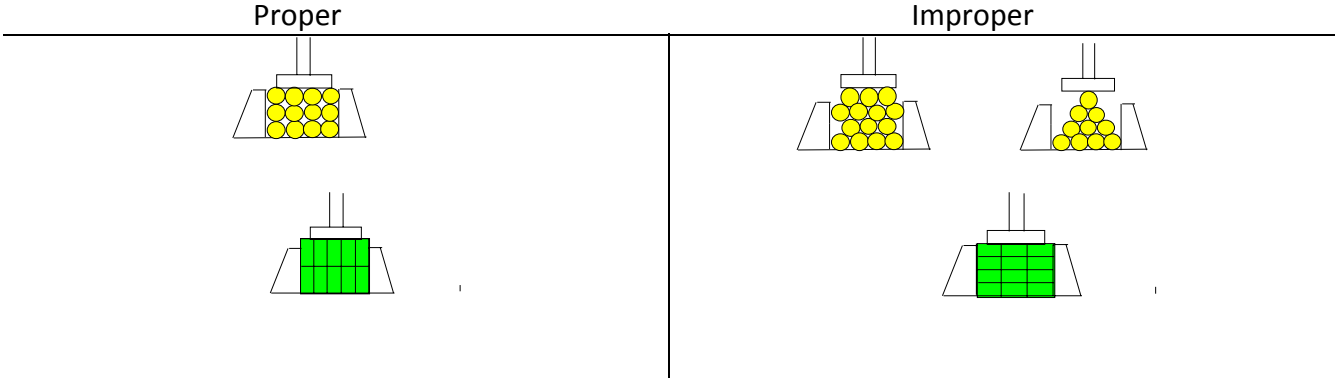
Step 2 – Connect the top clamp hoses to the pressure joints on the vise hydraulic cylinders.



Step 3 – Tie the workpiece to prevent cut pieces from scattering across the workbed. 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 up* button or the *hydraulic stop* button.
- The saw blade will stop running when the *saw bow up* button is pressed.
- Both the saw blade and hydraulic pump motors will stop running when the *hydraulic stop* button is pressed.
- The machine will stop automatically when an error occurs. The error message will be shown on the screen.

Section 5

ELECTRICAL SYSTEM

ELECTRICAL CIRCUIT DIAGRAMS

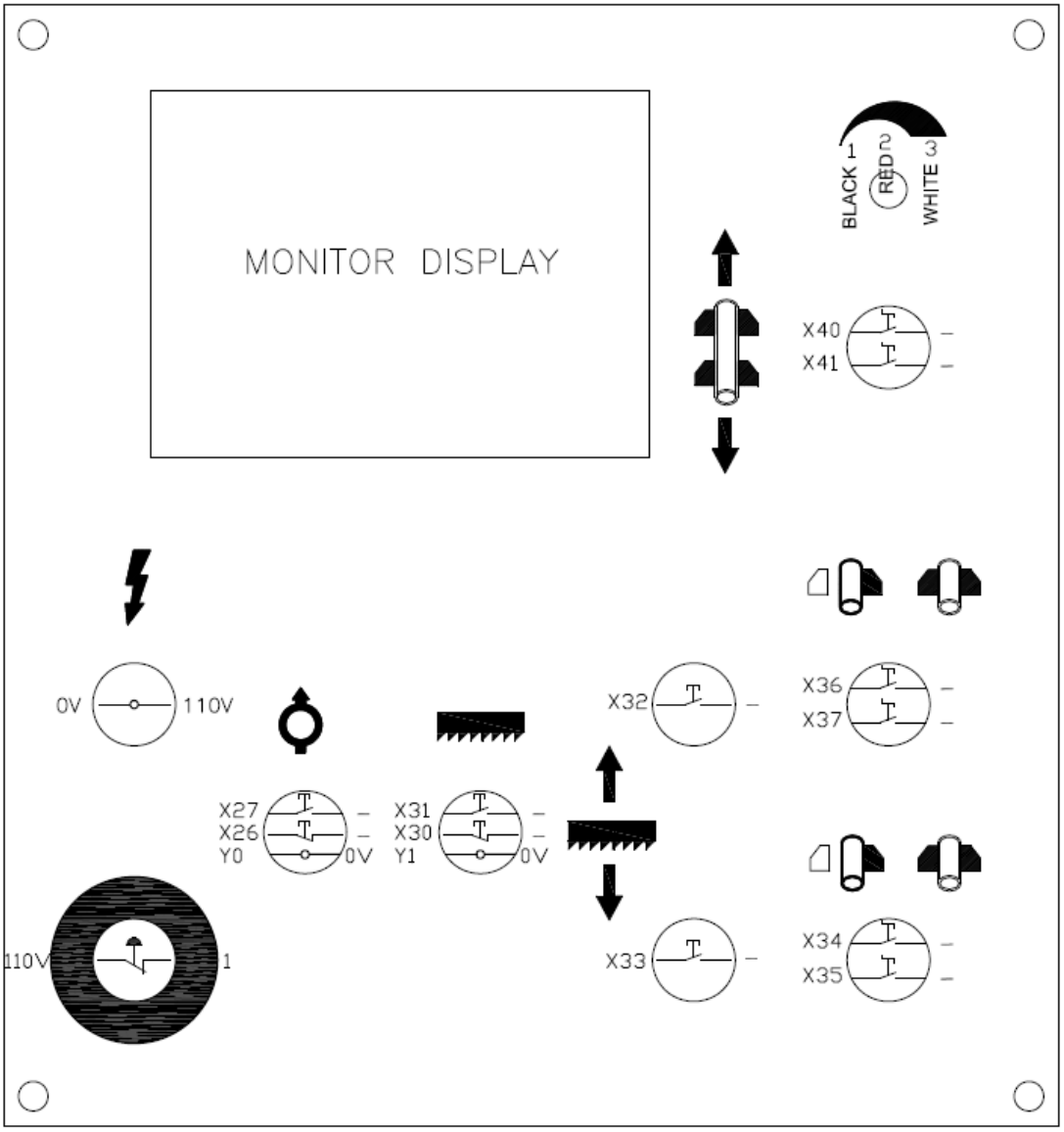
The following are electrical circuit diagrams of the system:

Fig 5-1 Control panel layout

Fig 5-2 Circuit board layout

Fig 5-3 Power supply layout

Fig 5-4 PLC I/O layout



cosen 高聖機械工業股份有限公司 Cosen Machinery Industrial Co., Ltd.	圖名	面板配置圖	圖號	EL-C3-F09-000S0-A	繪圖	陳偉崧	日期	1010405	版本
					審核		日期		S0

Fig.5-1 Control panel layout

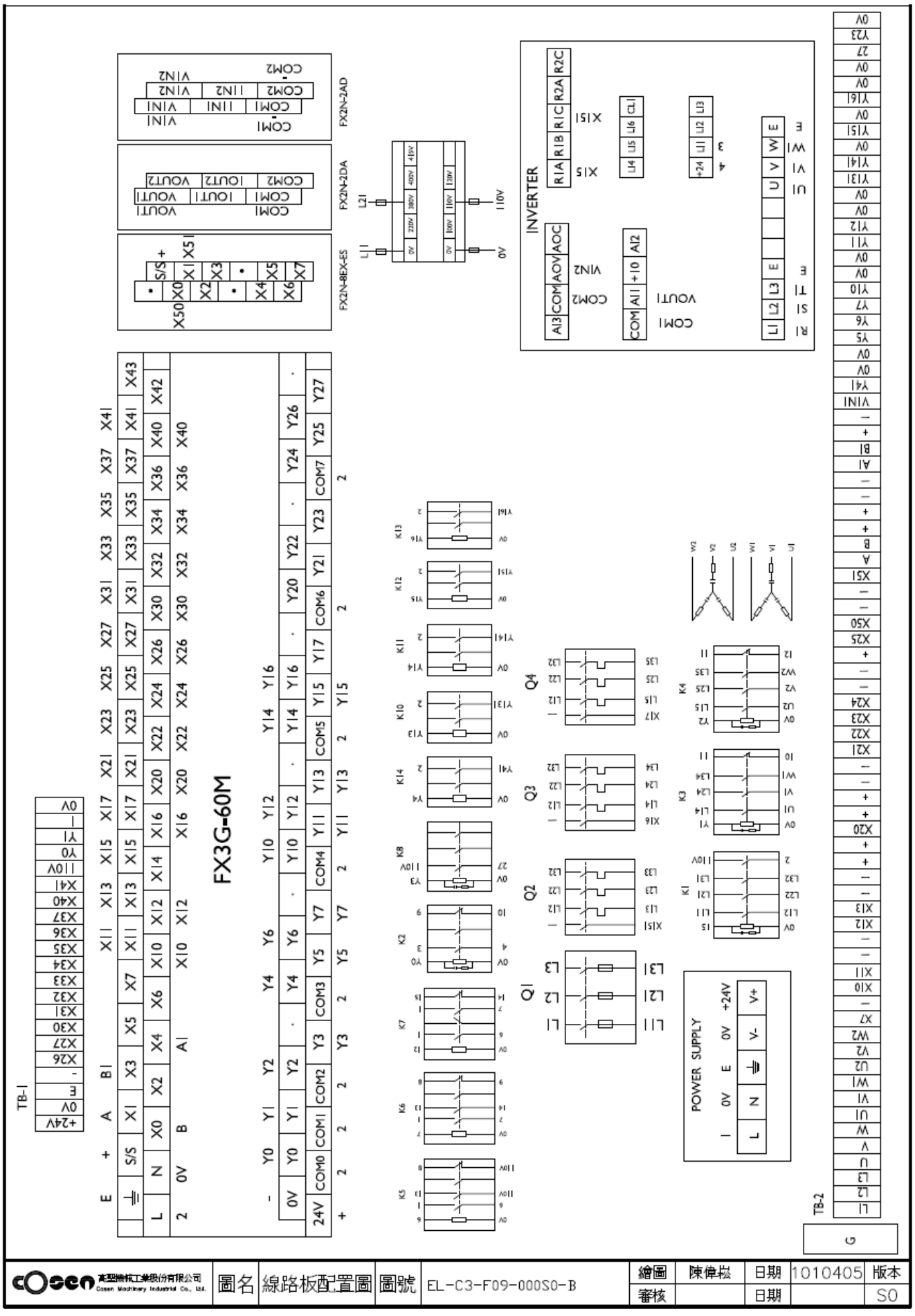


Fig.5-2 Circuit board layout

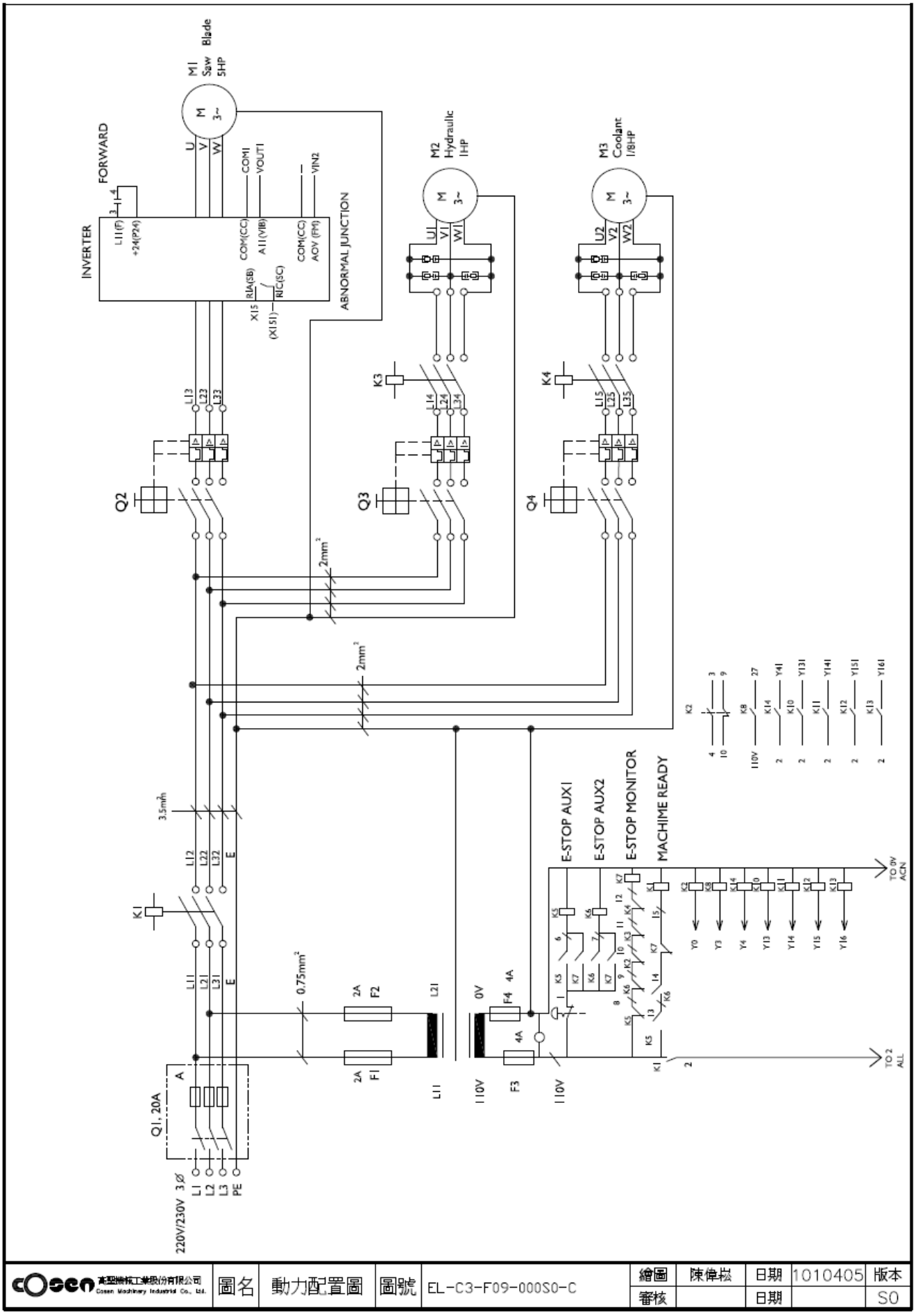


Fig.5-3 Power supply layout

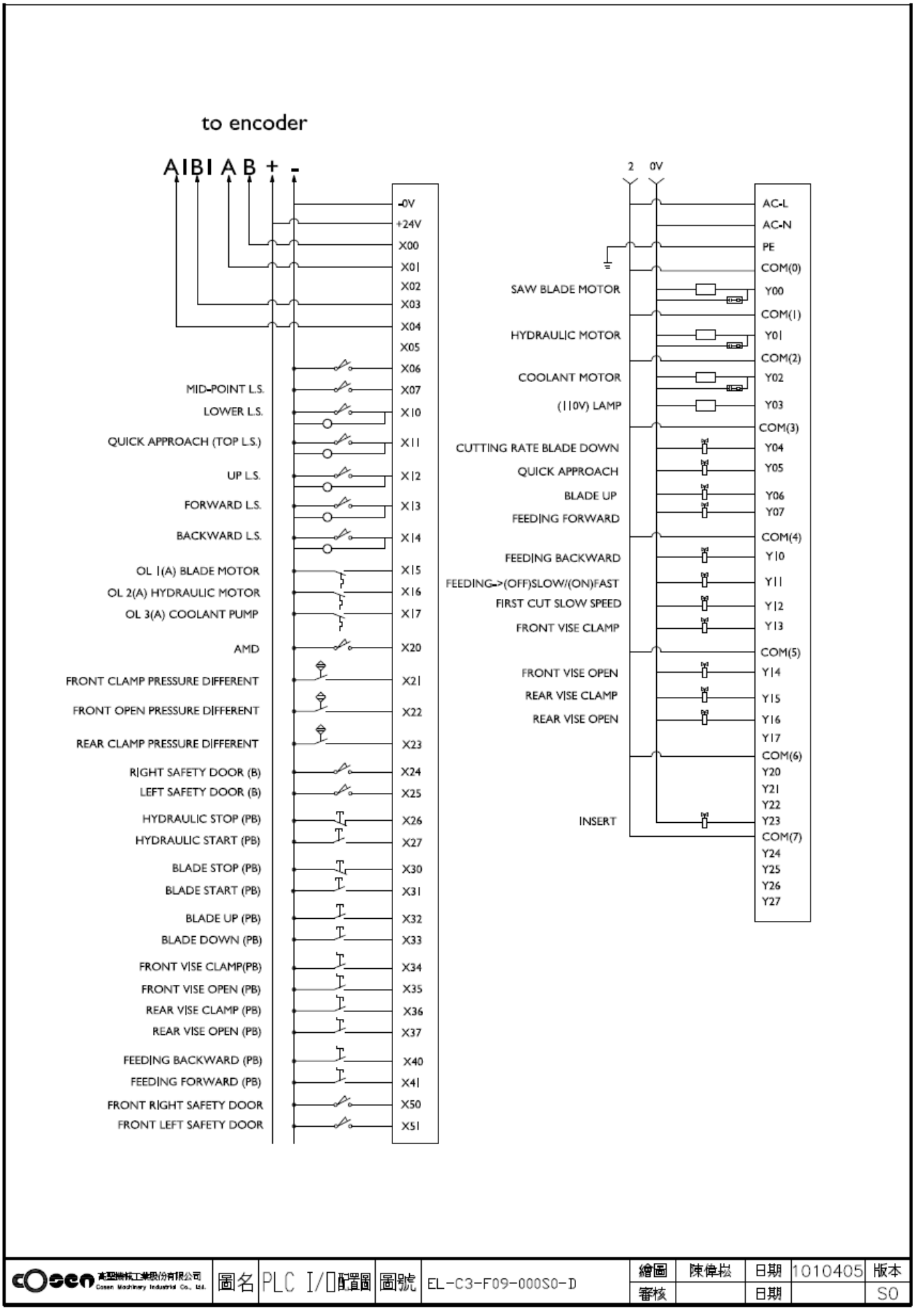


Fig.5-4 PLC I/O layout

HYDRAULIC SYSTEM

HYDRAULIC DIAGRAMS

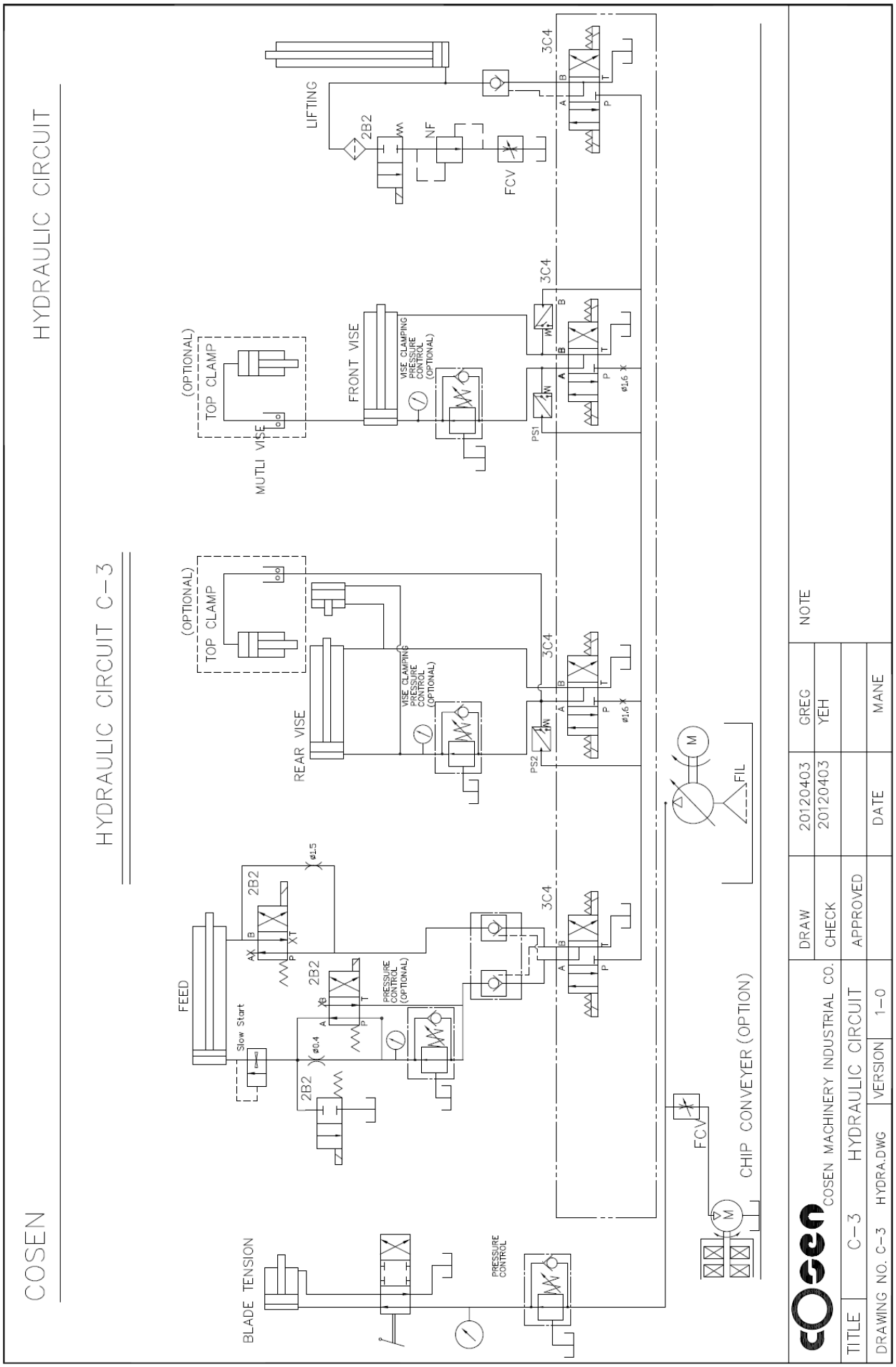


Fig. 6-1 Hydraulic layout

BAND SAW CUTTING: A PRACTICAL GUIDE

INTRODUCTION

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

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

SAW BLADE SELECTION

The factors affecting cutting performance are:

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

Material and its relation to the cutting rate:

Fig. 7.1 Description of Band

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

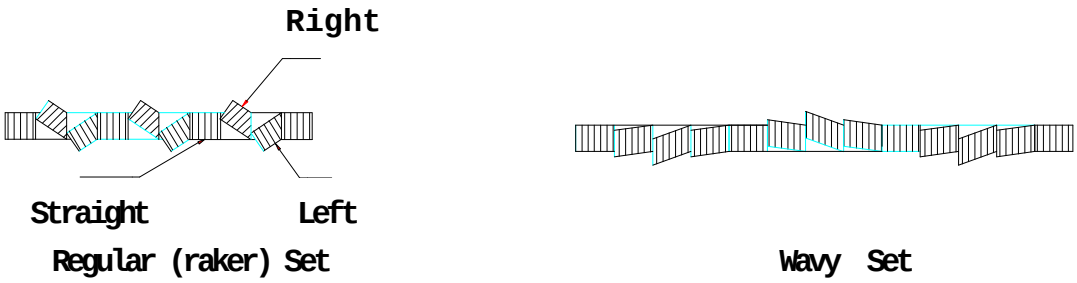


Fig. 7.2 The saw set

Material Size and Shape:

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

Guide Spacing:

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

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

Blade selection:

There are five types of blade material generally used:

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

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

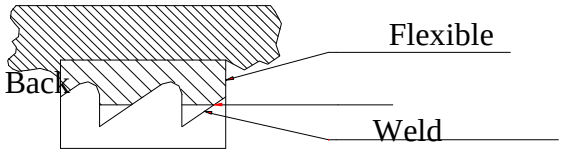


Fig. 7.3 Electron Welded Blade

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

Blade Speed and Feed:

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

Tooth Form and Spacing:

The selection of a tooth form generally is determined by the material to be cut. There are three general factors to consider: tooth form, style or shape of the teeth; tooth spacing, the number of teeth to the inch; and tooth set, which provides clearance for the body of the blade. Three styles of tooth are shown in Fig. 7.4 below:

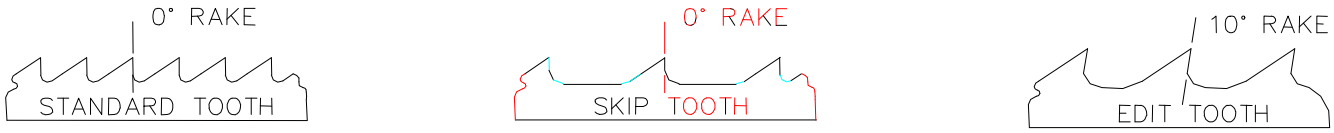


Fig. 7.4 Three styles of tooth

SOME SAWING PRACTICES

Saw Pitch Selection

Sawing “Rules of Thumb”:

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

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

Material Size and Saw Pitch

Anytime during the cutting operation, at least three teeth must be in contact with the material being cut. Figure 7.5 shows some sawing practices:

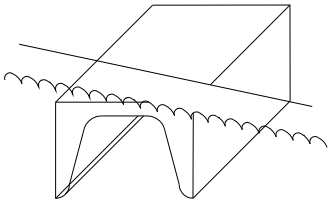
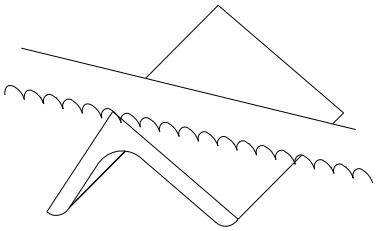
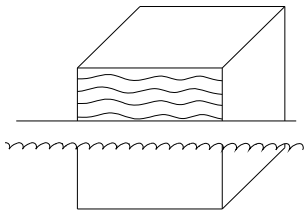
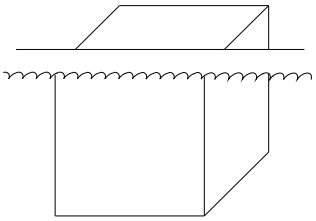
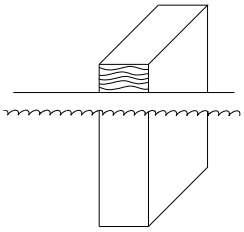
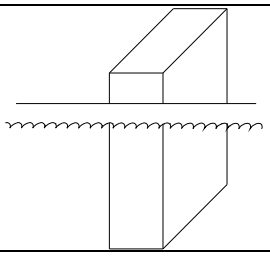
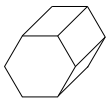
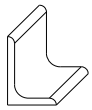
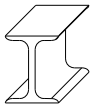
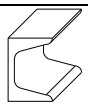
SAWING PRACTICES	
CORRECT	**INCORRECT**
	
several teeth contact work	teeth strike sharp edge
	
Coarse teeth clear chips freely	Teeth too fine for large solids
	
Three or more teeth on cutting wall	Coarse teeth rip on thin wall

Fig. 7.5 Some sawing practices

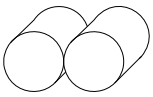
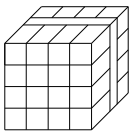
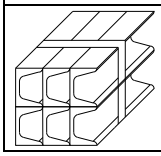
Solid Stock:

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

Structurals:

STYLE	up to 10 mm (3/8”)	10-20mm (3/8-3/4”)	above 20mm (3/4”)
  	10-8 TPI	8-10 TPI	6-8 TPI

Solid Bundle:

STYLE	up to 20 mm (3/4”)	20-80mm (3/4–3 1/4”)	above 80mm (3 1/4”)
  	8 - 10 TPI	2 - 8 TPI	4 - 6 TPI

Section 8

MAINTENANCE & SERVICE

INTRODUCTION

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

BASIC MAINTENANCE

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

MAINTENANCE SCHEDULE

We suggest you do the maintenance on schedule. The recommended schedule includes three periods, 1.Daily maintenance. 2.Monthly maintenance. 3. Six months maintenance.

Before beginning a day's work

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

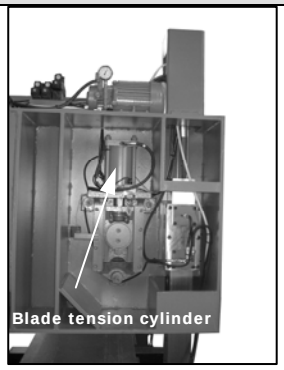
After ending a day's work

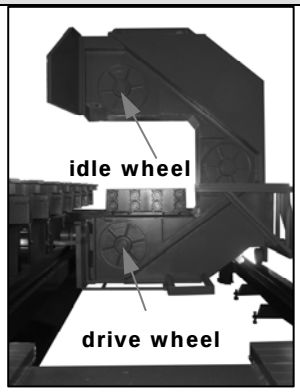
Please remove saw chips and clean the machine with discharging the cutting fluid when work has been completed.

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

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

Every month

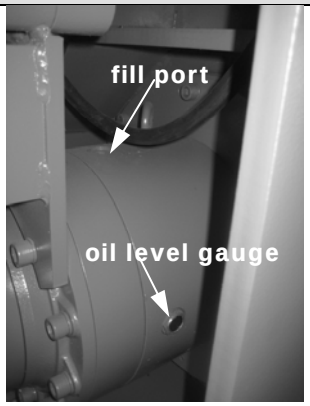


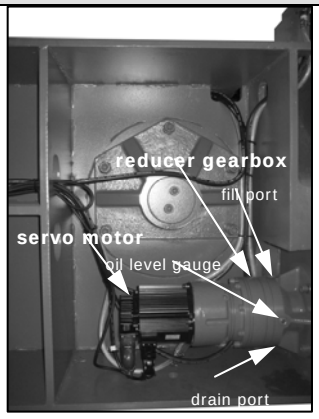


Please apply grease to the following points:
1. Idle wheel
2. Drive wheel
3. Blade tension device

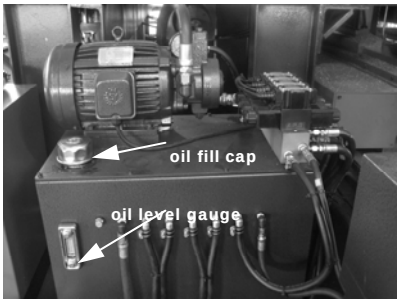
<u>Recommended Grease:</u>
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48

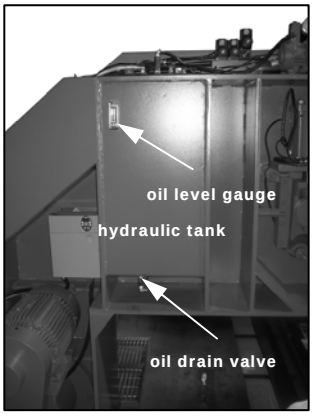
Every three months





Replace the transmission oil after operating for three months (or 600 hours).
<u>Recommended Grease:</u>
- Shell Alvania EP Grease 2
- Mobil Mobilplex 48 (600W Cylinder oil)





1.Clean the filter of the cutting fluid.
2.Replace the transmission oil for every half of a year(or 1200 hours). Check the sight gauge to ascertain the transmission level.
Recommended TRANSMISSION OIL
- Omala oil HD220
- Mobil comp 632 600W Cylinder oil

3.Replace the hydraulic oil.
Recommended HYDRAULIC OIL
- Shell Tellus 27
- Mobil DTE OIL light Hydraulic28

STORAGE CONDITIONS

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

(1) Turn off the power.

(2) Ambient temperature: 5℃ ~ 40℃

(3) Relative humidity: 30%~95% (without condensation)

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

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

(6) Avoid exposing to abnormal vibration.

(7) Must be connected to earth.

TERMINATING THE USE OF THE MACHINE

Waste disposal:

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

- Hydraulic oil
- Cutting fluid
- Drive wheel gear oil

OIL RECOMMENDATION FOR MAINTENANCE

Item		Method	Revolution	Suggest oil
Dovetail guide		Keep grease covered. Antirust.	Daily	Shell R2
Roller bearing		Sweep clean and oil with lubricant.	Daily	SEA #10
Bed roller / surface		Sweep clean and oil with lubricant.	Daily	SEA #10
Nipples of bearing		Use grease gun, but not excess.	Monthly	Shell R2
Blade tension device		Use grease gun, but not excess.	Monthly	Shell R2
Reducer		Inspect once a week. Change oil of 600 hours of using. Change it every year.	Regularly	Omala oil HD220 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.

Section 9

TROUBLESHOOTING

INTRODUCTION

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

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

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

PRECAUTIONS

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

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

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

GENERAL TROUBLES AND SOLUTIONS

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

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

MINOR TROUBLES & SOLUTIONS

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

MOTOR TROUBLES & SOLUTIONS

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

BLADE TROUBLES AND SOLUTIONS

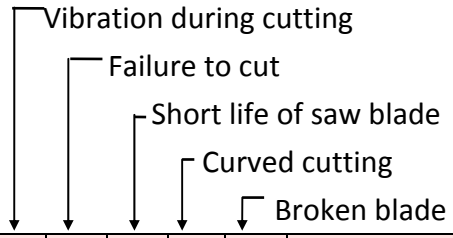
DISCONNECT POWER CORD TO MOTOR BEFORE ATTEMPTING ANY REPAIR OR INSPECTION.

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

SAWING PROBLEMS AND SOLUTIONS

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

Sawing Problems and Solutions



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

RE-ADJUSTING THE ROLLER TABLE

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

TOOL, measuring

Measurement, Horizontal balance

Procedure

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

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

PARTS

SPARE PARTS RECOMMENDATIONS

PART LIST

SPARE PARTS RECOMMENDATIONS

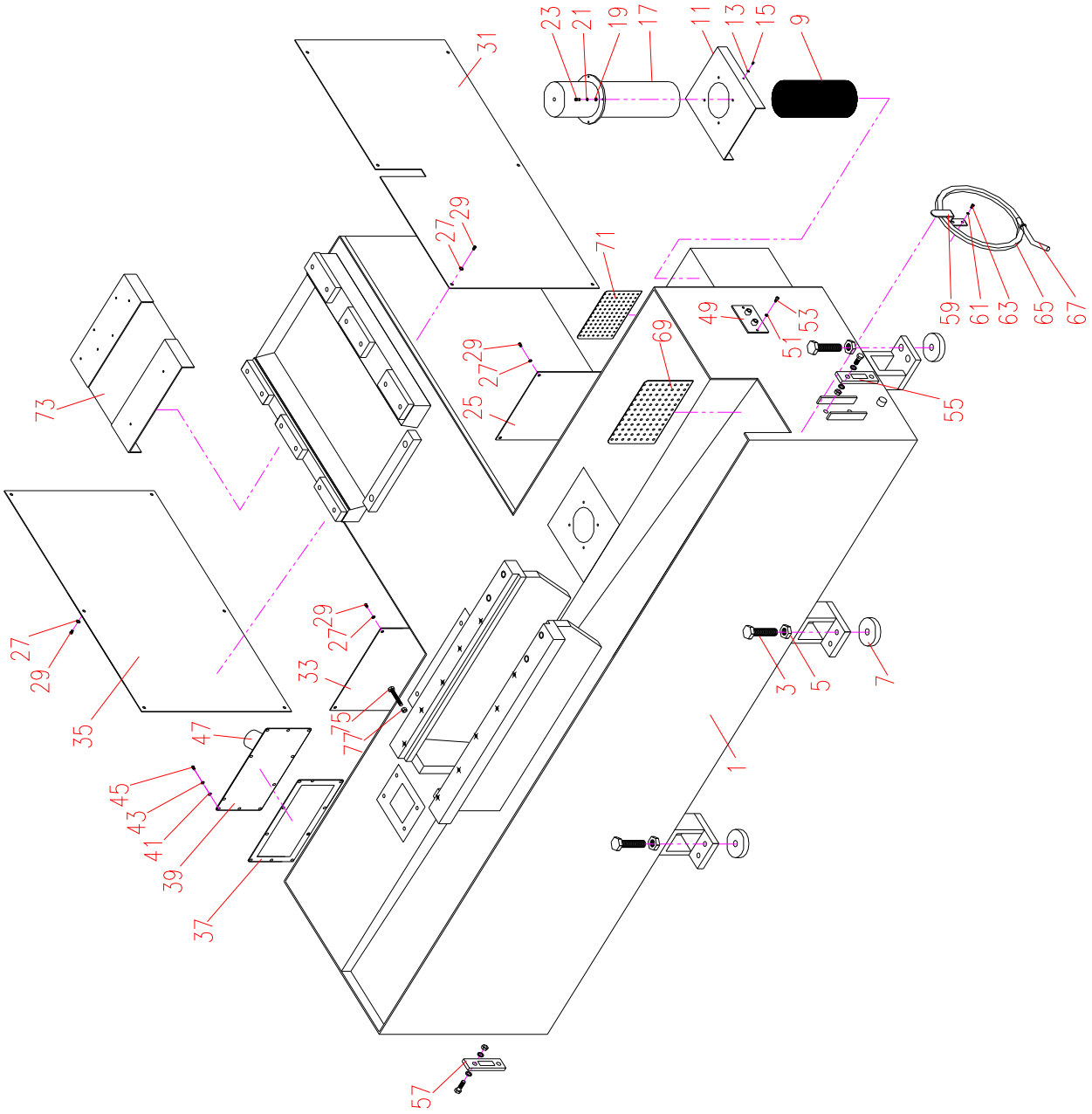
The following table lists the common spare parts we suggest you purchase in advance:

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

INDEX

PART A

MACHINE FOUNDATION ASSEMBLY

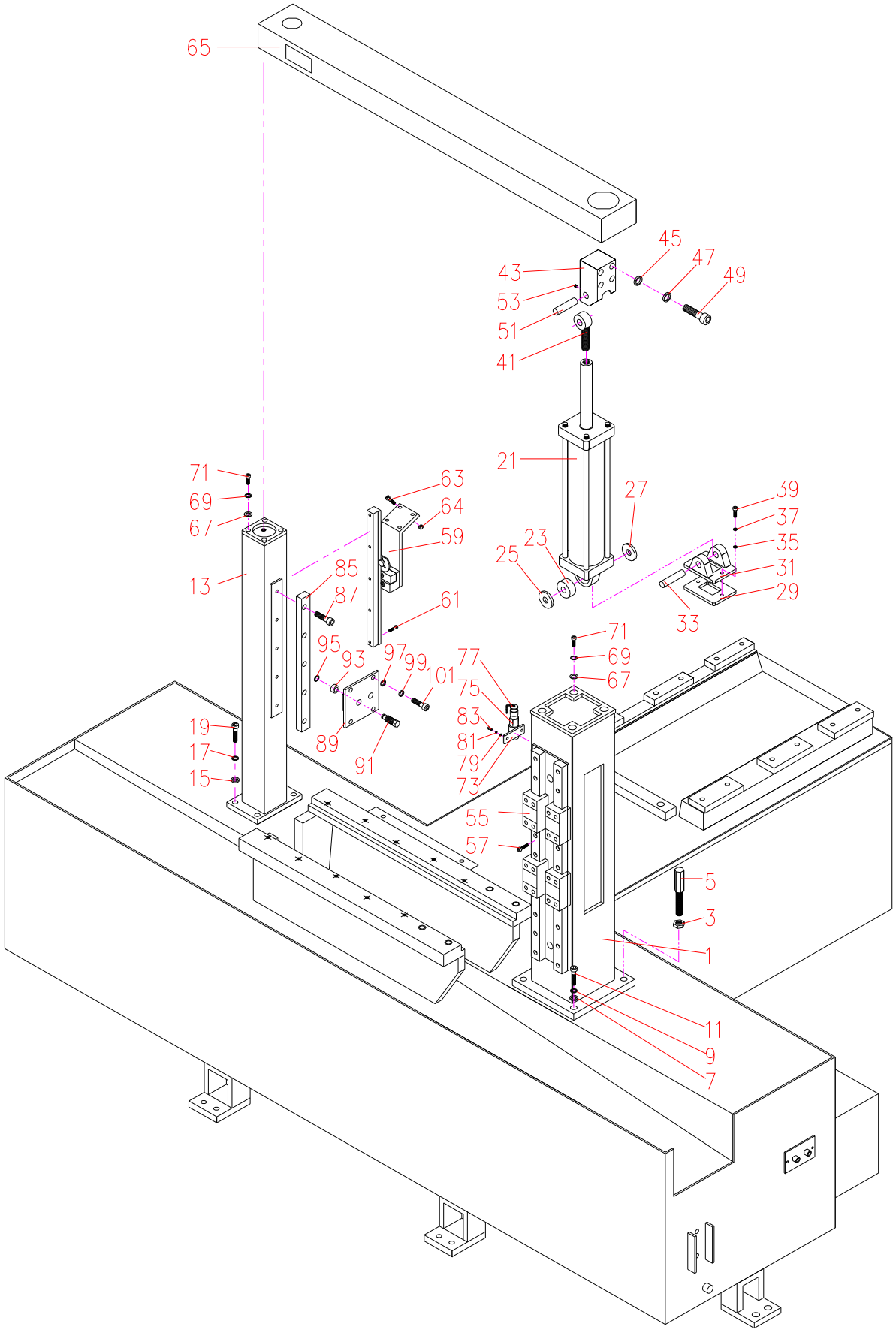


PART A
MACHINE FOUNDATION ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-1001	Base seat	底座		1	PCS
3	AHC-0153	adjusting bolt	底座調整螺桿	M20xP2.5xL80	8	PCS
5	POA-20-25	nut	螺母	M20xP2.5	8	PCS
7	AHR-1055	base support	底座墊塊	Ø80xD15	8	PCS
9	AHA-0131	filter	浸水泵浦濾網	40 目濾網	1	PCS
11	AHA-0136	coolnat pump cover	冷卻邦浦固定蓋		1	PCS
13	PPA-5	washer	平面華司	§5	1	PCS
15	PDA-5-10	screw	丸頭內六角螺絲(公)	M5xP0.8xL10	1	PCS
17	PP-32084C	pump	浸水幫浦	1/8HP 3ψ 210L	1	PCS
19	PPA-6	washer	平面華司	§6	4	PCS
21	PQA-6	spring washer	彈簧華司	§6	4	PCS
23	PBA-6-10	blot	有頭內六角螺絲(公)	M6xP1.0xL10	4	PCS
25	C360L-1059	right rear cover	右後蓋		1	PCS
27	PPA-6	washer	平面華司	§6	20	PCS
29	PBA-6-10	blot	有頭內六角螺絲(公)	M6xP1.0xL10	20	PCS
31	C360L-1067	right rear side cover	後右蓋		1	PCS
33	C360L-1061	left rear cover	左後蓋		1	PCS
35	C360L-1063	left rear side cover	後左蓋		1	PCS
37	AHA-0108	oil tank washer	油箱蓋防漏石綿		1	PCS
39	AHA-0102	oil tank cover	油箱蓋		1	PCS
41	PPA-6	washer	平面華司	§6	10	PCS
43	PQA-6	spring washer	彈簧華司	§6	10	PCS
45	PDA-6-10	screw	丸頭內六角螺絲(公)	M6xP1.0xL10	10	PCS
47	PP-90857	cap	油箱蓋螺帽		1	PCS
49	AHG-0138	bracket	水管接頭座		1	PCS
51	PPA-6	washer	平面華司	§6	2	PCS
53	PBA-6-12	blot	有頭內六角螺絲(公)	M6xP1.0xL12	2	PCS
55	PP-21030A	fluid level	水面計(含固定螺絲螺帽)	LS-3"	1	PCS
57	PP-21030	fluid level	油面計(含固定螺絲螺帽)	LS-3"	1	PCS
59	AHA-1309	bracket	軟管架		1	PCS
61	PPA-6	washer	平面華司	§6	2	PCS
63	PDA-6-10	screw	丸頭內六角螺絲(公)	M6xP1.0xL10	2	PCS
65	PP-57079	water pipe	出水管	SP103 3/8"x24"	1	PCS
67	PP-58003	nozzle	水槍	N965	1	PCS
69	AHA-0138	filter	水箱通道濾網		1	PCS
71	AHA-0139	filter	水箱通管濾網(小)		1	PCS
73	AGC-1014	bracket	油路固定板		1	PCS
75	PLA-8-60	bolt	外六角螺絲	M8 x 60L	1	PCS
77	POA-8-125	nut	螺母	M8	1	PCS

PART B

MAIN SHAFT & SUB SHAFT ASSEMBLY



PART B
MAIN SHAFT & SUB SHAFT ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-1101	main shaft	大主軸		1	PCS
3	POA-16-20	nut	螺帽	M16 xP2.0	1	PCS
5	AHE-1094	bolt	下限定位支桿		1	PCS
7	PPA-16	washer	平面華司	∮16	3	PCS
9	PQA-16	spring washer	彈簧華司	∮16	3	PCS
11	PBA-16-50	bolt	有頭內六角螺絲	M16 xP2.0x 50L	3	PCS
13	C360L-1121	sub shaft	小主軸		1	PCS
15	PPA-12	washer	平面華司	∮12	4	PCS
17	PQA-12	spring washer	彈簧華司	∮12	4	PCS
19	PBA-12-40	bolt	有頭內六角螺絲	M12 xP1.75x 45L	4	PCS
21	C360L-32500-1	housing yoke cylinder	鋸弓油壓缸		1	SET
23	PP-14510	bearing	軸承	2303	1	PCS
25	AHA-1105A	washer	活動軸墊圈		1	PCS
27	AHA-1105	washer	橡膠墊圈		1	PCS
29	AGC-1032	hydraulic holder plate	油缸固定座板		1	PCS
31	AGC-1031	hydraulic holder	油缸固定座		1	PCS
33	AGB-70304B	pin	下插銷		1	PCS
35	PPA-8	washer	平面華司	∮8	2	PCS
37	PQA-8	spring washer	彈簧華司	∮8	2	PCS
39	PBA-8-16	bolt	有頭內六角螺絲	M8 xP1.25x 16L	2	PCS
41	PP-14480	link bearing	連桿軸承	POS 18 (M18xP1.5)	1	PCS
43	C260L-3275	cylinder upper ear	鋸弓油缸上耳		1	PCS
45	PPA-10	washer	平面華司	∮10	2	PCS
47	PQA-10	spring washer	彈簧華司	∮10	2	PCS
49	PBA-10-40	bolt	有頭內六角螺絲	M10 xP1.5x 40L	2	PCS
51	AGB-70304A	pin	上鋸弓油缸插銷		1	PCS
53	PAA-6-10	set screw	止付螺絲	M6 xP1.0x10L	2	PCS
55	PP-92026	Linear Guideway	滑軌滑塊	RBS25B2x700L/NZ1	2	PCS
57	PBA-6-25	bolt	有頭內六角螺絲	M6 Xp1.0 x25L	24	PCS
59	C360L-21000	encoder assembly	高度譯碼器組		1	PCS
61	PBA-6-20	bolt	有頭內六角螺絲	M6 xP1x 20L	4	PCS
63	PBA-8-30	bolt	有頭內六角螺絲	M8 xP1.25x 30L	4	PCS
64	POA-8-125	Nut	螺帽	M8	4	PCS
65	C360L-1131	cross link	橫樑		1	PCS
67	PPA-10	washer	平面華司	∮10	8	PCS
69	PQA-10	spring washer	彈簧華司	∮10	8	PCS
71	PBA-10-20	bolt	有頭內六角螺絲	M10P1.5x 20	8	PCS
73	AGB-70220	coolant bracket	冷卻水管固定板		1	PCS
75	PP-21099	connect	快速接頭	1/4"	1	PCS
77	AHA-1932	dust seal	防塵套(母)		1	PCS
79	PPA-6	washer	平面華司	∮6	2	PCS
81	PQA-6	spring washer	彈簧華司	∮6	2	PCS
83	PBA-6-14	bolt	有頭內六角螺絲	M6xP1.0*14L	2	PCS

PART B

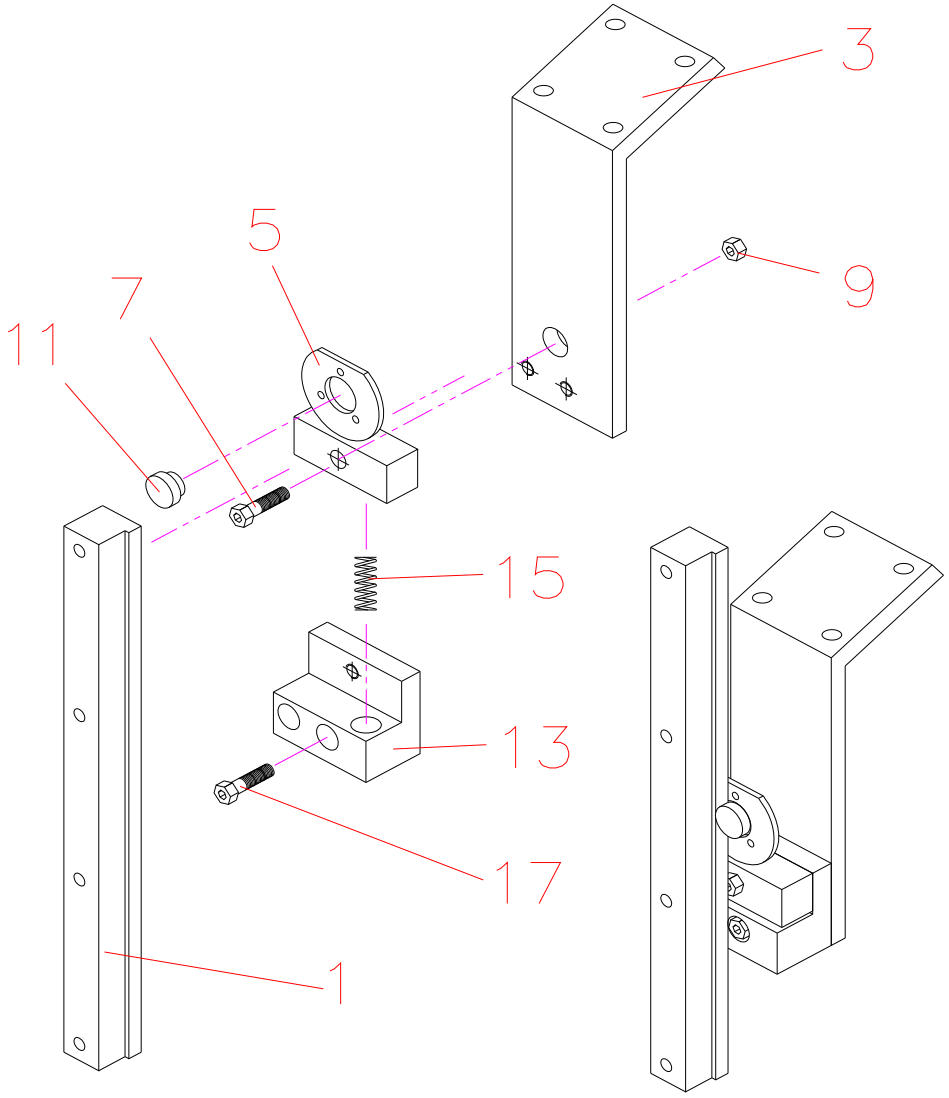
MAIN SHAFT & SUB SHAFT ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
85	C360L-1124	shaft	小軸限動桿		1	PCS
87	PBA-8-20	bolt	有頭內六角螺絲	M8xP1.25*20L	5	PCS
89	C560L-1125	bracket	小軸限動座		1	PCS
91	C260L-1128	pin	小軸軸承銷		2	PCS
93	PP-13041	bearing	乾式軸承	1410	2	PCS
95	PP-52085	snap ring	扣環	S12	2	PCS
97	PPA-10	washer	平面華司	∮10	4	PCS
99	PQA-10	spring washer	彈簧華司	∮10	4	PCS
101	PBA-10-20	bolt	有頭內六角螺絲	M10xP1.5*14L	4	PCS

PART B1

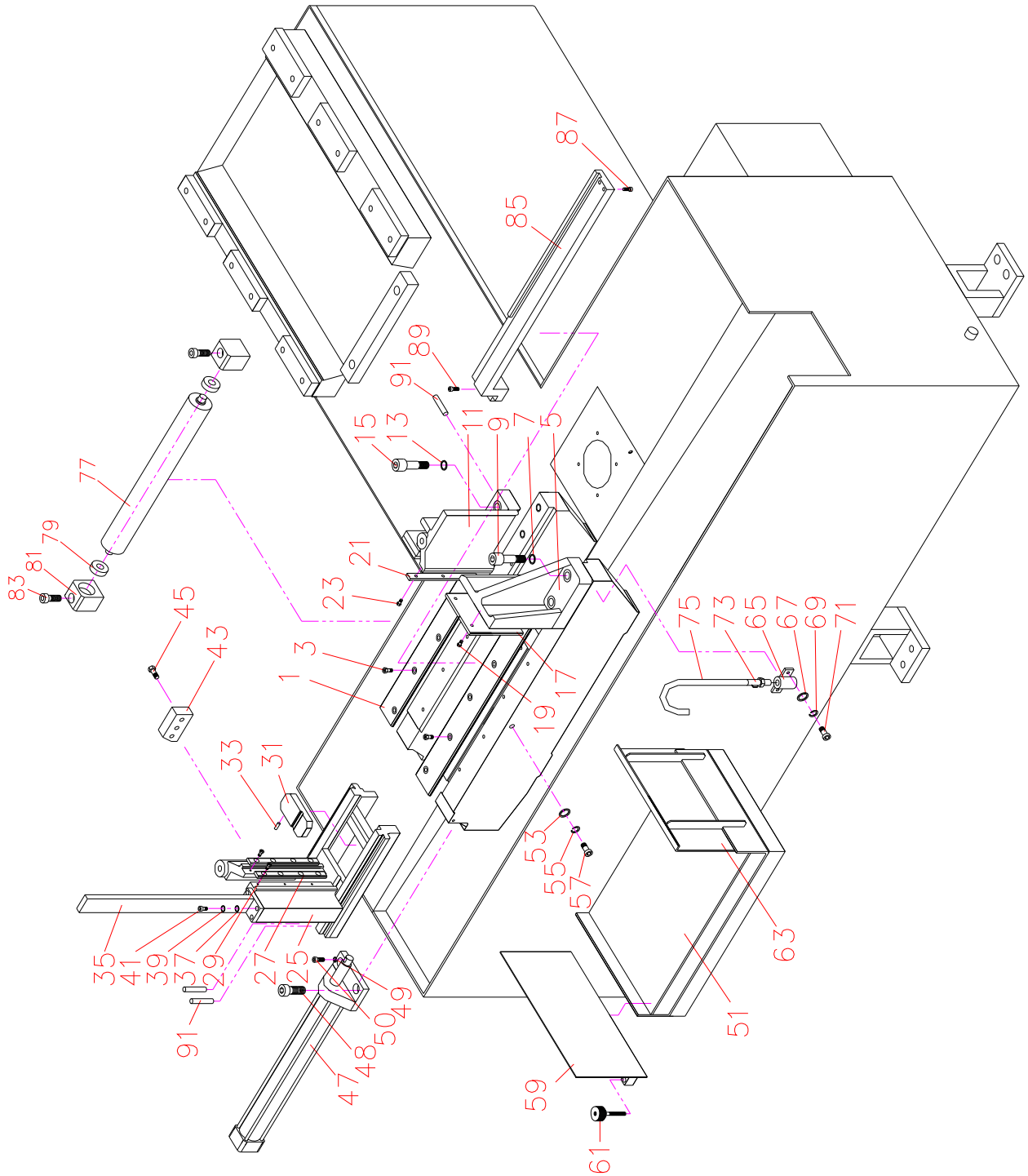
ENCODER ASSEMBLY

PART NO : C360L-21000



ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-2109	stop chain	定寸齒條		1	PCS
3	C360L-2121	Encoder plate	譯碼器調整板		1	PCS
5	AGB-70536	encoder bracket	譯碼器固定座(二)		1	PCS
7	PBA-8-20	bolt	有頭內六角螺絲	M8 xP1.25x 20L	2	PCS
9	POA-8-125	Nut	螺帽	M8	2	PCS
11	C560L-2105	stop gear	定寸齒輪		1	PCS
13	C560L-2103	movable plate	譯碼器活動座		1	PCS
15	AHA-1565	spring	壓縮彈簧		1	PCS
17	PBA-8-30	bolt	有頭內六角螺絲	M8 xP1.25x 30L	2	PCS

PART C
BED ASSEMBLY



PART C
BED ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHK-2801	slide plate	固定床面鋼板		2	PCS
3	PBA-8-20	bolt	有頭內六角螺絲	M8 xP1.25x 20L	12	PCS
5	AHN-2809E	front fixed vise jaw	前固定虎鉗(二)		1	PCS
7	PQA-16	spring washer	彈簧華司	§16	4	PCS
9	AGB-70518	bolt	銷螺絲 B		4	PCS
11	AHN-2808E	front fixed vise jaw	前固定虎鉗 (一)		1	PCS
15	PLA-16-60	bolt	外六角螺絲	M16x 60L	2	PCS
17	AHN-2806E	plate	鋼板		1	PCS
19	PLA-8-30	bolt	外六角螺絲	M8 x 30L	8	PCS
21	AHN-2804E	vise plate	鋼板		1	PCS
23	PLA-6-16	bolt	外六角螺絲	M6 x 16L	4	PCS
25	AHN-2803E	front movable vise jaw	前活動虎鉗		1	PCS
27	AHN-2804F	vise plate	虎鉗鋼板		2	PCS
29	PLA-6-16	bolt	外六角螺絲	M6 x 16L	8	PCS
31	AHN-2811	auxiliary plate	虎鉗輔助板		1	PCS
33	PRA-8-16	spring pin	彈簧銷	Φ8 x 16L (SPP-6-16)	2	PCS
35	C360L-3175	guide block	鋸臂連動擋板		1	PCS
37	PQA-8	spring washer	彈簧華司	§8	3	PCS
39	PPA-8	washer	平面華司	§8	3	PCS
41	PLA-8-30	bolt	外六角螺絲	M8 x 30L	3	PCS
43	AHC-0224-NC	bracket	第一次自切定位板		1	PCS
45	PBA-8-30	bolt	有頭內六角螺絲	M8 x P1.25x35L	3	PCS
47	AHK-4200-1	vise cylinder	虎鉗油缸組		1	SET
48	PBA-16-40	bolt	有頭內六角螺絲	M16 x P2.05x40L	2	PCS
49	PQA-8	spring washer	彈簧華司	§8	1	PCS
50	PLA-8-20	bolt	外六角螺絲	M8 x 20L	1	PCS
51	C360L-1201	stock receiving tray	托架		1	PCS
53	PPA-12	washer	平面華司	§12	3	PCS
55	PQA-12	spring washer	彈簧華司	M12	2	PCS
57	PBA-12-35	bolt	有頭內六角螺絲	M12 x P1.75x35L	2	PCS
59	C360L-1211	left fence	托架活動側板		1	PCS
61	PP-53010	screw	梅花螺絲	(含塞銅)8*20"	2	PCS
63	C360L-1209	right fence	托架固定側板		1	PCS
65	AGB-70220	Bracket	冷卻水管固定板		1	PCS
67	PPA-12	washer	平面華司	§12	3	PCS
69	PQA-12	spring washer	彈簧華司	M12	2	PCS
71	PBA-12-35	bolt	有頭內六角螺絲	M12 x P1.75x35L	2	PCS
73	PP-43136	Valve	開關閥(無頭)	A103 PT 3/8	1	PCS
75	PP-57079	Hose	出水管	3/8 x 25"	1	PCS
77	AHK-4582	roller	滾輪		1	PCS
79	PP-14003	bearing	軸承	6202VV	2	PCS
81	AHN-4581	roller seat	軸承座		2	PCS

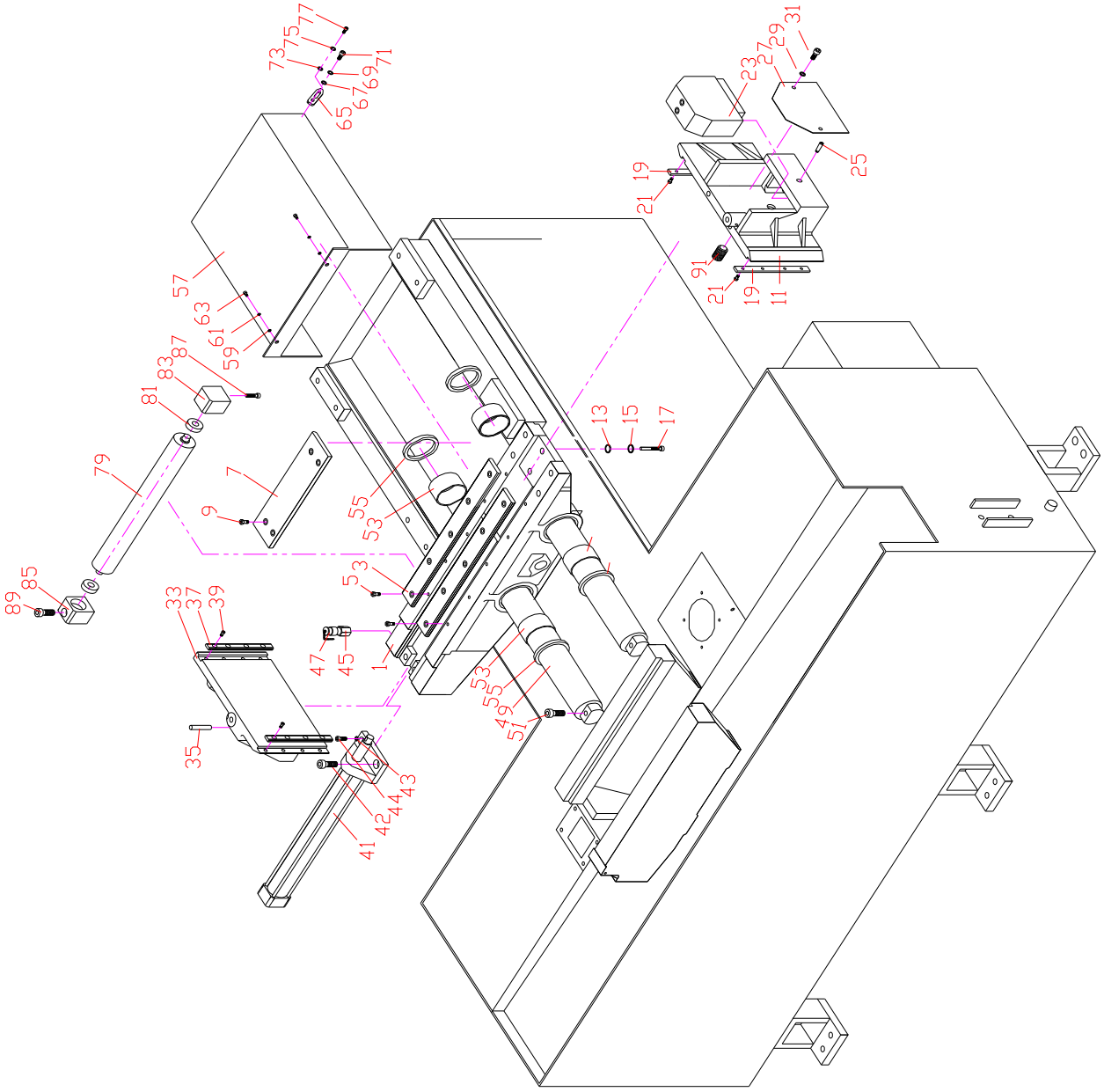
PART C

BED ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
83	PBA-12-60	bolt	有頭內六角螺絲	M12 x P1.75x60L	2	PCS
85	AHK-2802A	plate	鋸帶線鋼板		1	PCS
87	PBA-6-20	bolt	有頭內六角螺絲	M6 x P1.0x20L	2	PCS
89	PBA-8-30	bolt	有頭內六角螺絲	M8 x P1.25x30L	1	PCS
91	PRB-10-50	PIN	斜銷	#10*50MML	3	PCS

PART D

WORK FEED BED ASSEMBLY



PART D
WORK FEED BED ASSEMBLY

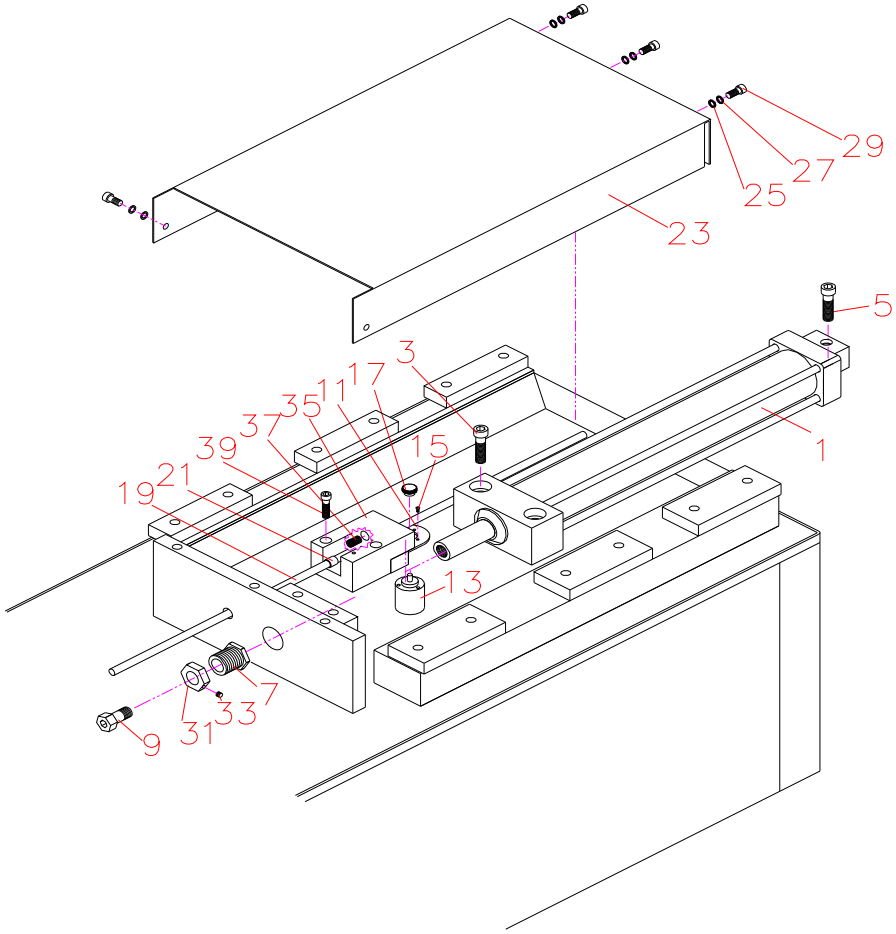
ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHK-2911	feed vise bed	送料床身		1	PCS
3	AHK-2801	slide plate	固定床面鋼板		2	PCS
5	PBA-8-20	bolt	內六角螺絲	M8 xP1.25x 20L	18	PCS
7	AHK-2909	plate	床面拖板		1	PCS
9	PBA-8-20	bolt	內六角螺絲	M8 xP1.25x 20L	4	PCS
11	AHN-2901E	rear fixed vise jaw	送料固定虎鉗		1	PCS
13	PPA-14	washer	平面華司	§14	2	PCS
15	PQA-14	spring washer	彈簧華司	§14	2	PCS
17	PBA-14-75	bolt	有頭內六角螺絲	M14 x P2.0x75L	2	PCS
19	AHN-2804E	vise plate	鋼板		2	PCS
21	PLA-6-16	bolt	外六角螺絲	M6 x 16L	8	PCS
23	AHN-2200-1	vise cylinder	後虎鉗固定油缸組		1	SET
25	PP-70001	grease nipple	油嘴	1/4"-28UNF	1	PCS
27	AHN-2902	cover	後固定虎鉗蓋		1	PCS
29	PPA-6	washer	平面華司	§6	2	PCS
31	PDA-6-10	screw	丸頭內六角螺絲(公)	M6Xp1.0xL10	2	PCS
33	AHN-2910E	rear movable vise jaw	送料活動虎鉗		1	PCS
35	PRB-10-50	taper pin	斜度銷	φ10 x 50L	2	PCS
37	AHN-2903F	vise plate	虎鉗鋼板		2	PCS
39	PLA-6-16	bolt	外六角螺絲	M6 x 16L	8	PCS
41	AHK-4200-1	vise cylinder	虎鉗油缸組		1	SET
42	PBA-16-40	bolt	有頭內六角螺絲	M16 x P2.05x40L	2	PCS
43	PQA-8	spring washer	彈簧華司	§8	1	PCS
44	PLA-8-20	bolt	外六角螺絲	M8 x 20L	1	PCS
45	AHA-1932	dust seal	防塵套(母)		1	PCS
47	PP-21099	connect	快速接頭	1/4"	1	PCS
49	C360L-2021	feed shaft	送料軸		2	PCS
51	PBA-16-45	bolt	有頭內六角螺絲	M16 x P2.0 x45L	4	PCS
53	PP-13250	du bushing	乾式軸承	MB5060DU	4	PCS
55	PP-51193	dust seal	防塵套	70*84*8	4	PCS
57	C360L-1283	cylinder cover	送料軸護蓋		1	PCS
59	PPA-6	washer	平面華司	§6	2	PCS
61	PQA-6	spring washer	彈簧華司	§6	2	PCS
63	PBA-6-15	bolt	有頭內六角螺絲	M6 Xp1.0 x15L	2	PCS
65	AGC-1043	bracket	送料軸護蓋支撐板		2	PCS
67	PPA-8	washer	平面華司	§8	2	PCS
69	PQA-8	spring washer	彈簧華司	§8	2	PCS
71	PBA-8-10	bolt	有頭內六角螺絲	M8 Xp1.0 x10L	2	PCS

PART D
WORK FEED BED ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
73	PPA-6	washer	平面華司	§6	2	PCS
75	PQA-6	spring washer	彈簧華司	§6	2	PCS
77	PBA-6-15	bolt	有頭內六角螺絲	M6 Xp1.0 x15L	2	PCS
79	AHK-4582	roller	滾輪		1	PCS
81	PP-14003	bearing	軸承	6202VV	2	PCS
83	AHN-4581A	bearing case	軸承座		1	PCS
85	AHN-4581	bearing case	軸承座		1	PCS
87	PBA-12-55	bolt	有頭內六角螺絲	M12 x P1.75x55L	1	PCS
89	PBA-12-30	bolt	有頭內六角螺絲	M12 x P1.75x30L	1	PCS
91	AHB-1507	bolt	止動螺絲		1	PCS

PART E

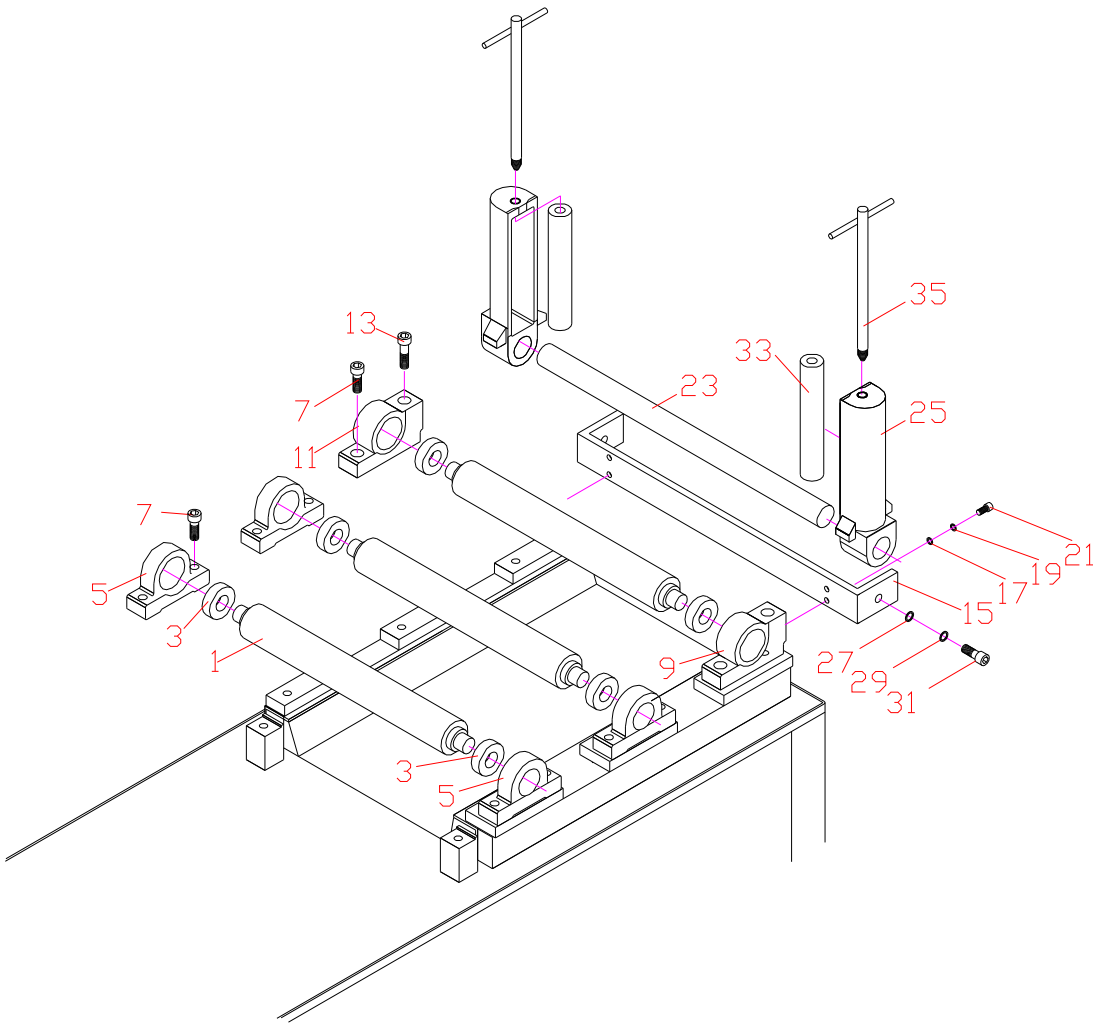
FEED EQUIPMENT & FEED CYLINDER ASSEMBLY



ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-23500-1	feed cylinder	送料油缸組	Ø60*405L	1	PCS
3	PBA-12-45	bolt	有頭內六角螺絲	M12 x P1.75 x45L	2	PCS
5	PBA-12-50	bolt	有頭內六角螺絲	M12 x P1.75 x50L	1	PCS
7	AHA-1605	bush bolt	襯套螺帽		1	PCS
9	PBA-18-60	bolt	內六角螺絲	M18*60L	1	PCS
11	AHN-4403	encoder bracket	解碼器固定座		1	PCS
13	PP-90492	encoder	譯碼器	LBT-002-2000	1	PCS
15	PBA-3-8	bolt	內六角螺絲	M3*8L	3	PCS
17	AHA-1560	stop gear	定寸齒輪		1	PCS
19	AHA-1561-1	stop chain	定寸齒條		1	PCS
21	PP-13020	du bushing	乾式軸承	MB1012	2	PCS
23	C360L-12081	Cylinder cover	送料油缸護蓋		1	PCS
25	PPA-8	washer	平面華司	§8	5	PCS
27	PQA-8	spring washer	彈簧華司	§8	5	PCS
29	PBA-8-10	bolt	有頭內六角螺絲	M8 x P1.25 x10L	5	PCS
31	AHA-1643	nut	螺帽		1	PCS
33	PAA-6-8	set screw	止付螺絲	M6x8L	1	PCS
35	AHN-4402	bracket	固定座		1	PCS
37	AHA-1565	spring	壓縮彈簧		1	PCS
39	PBA-8-40	bolt	有頭內六角螺絲	M8 x P1.25 x40L	2	PCS

PART F

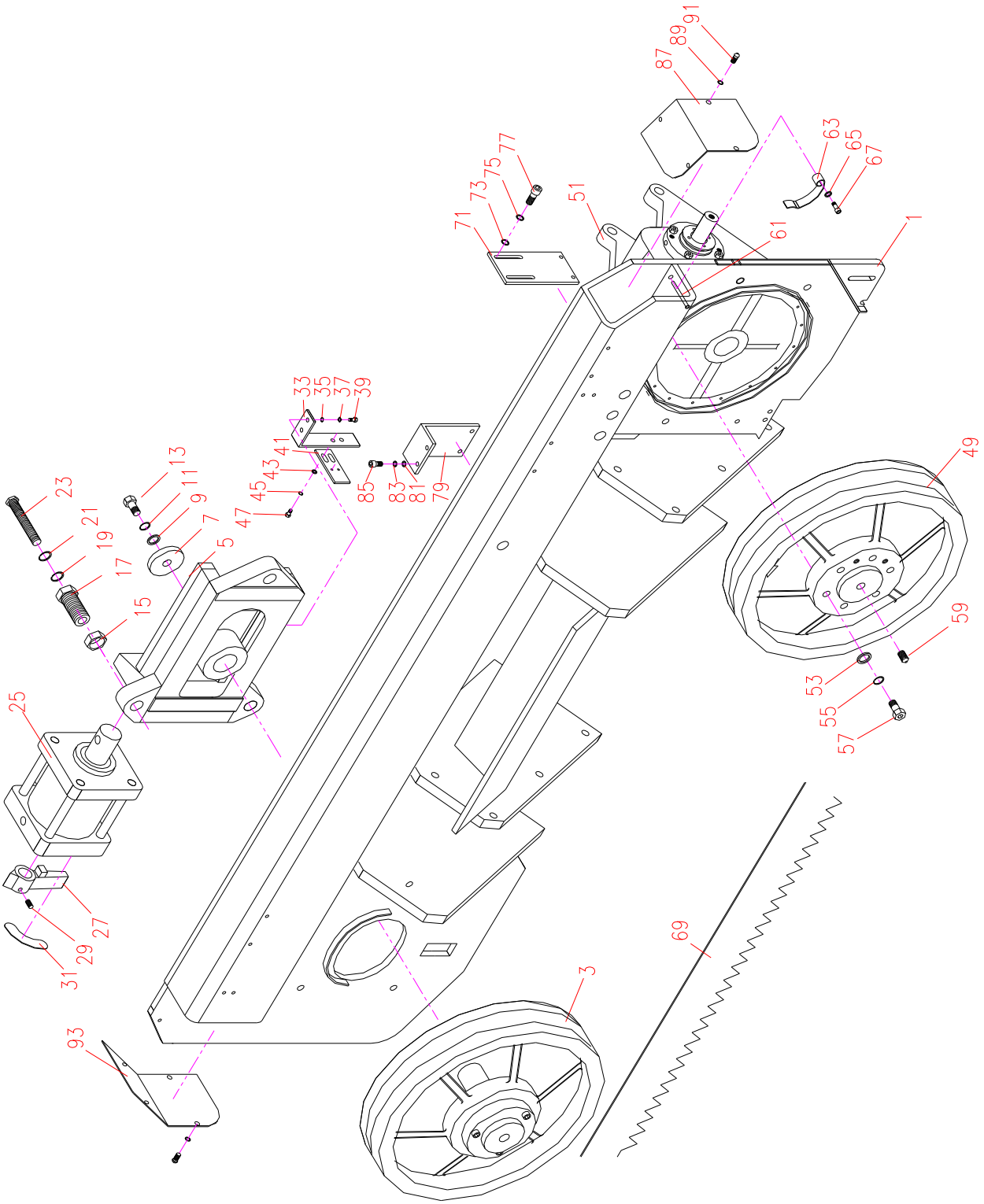
WORK FEED ASSEMBLY



ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHB-1654A	roller	滾輪		3	PCS
3	PP-14275	bearing	軸承	6205ZZ	6	PCS
5	AHA-1636	roller bracket	滾輪固定座		4	PCS
7	PBA-12-30	bolt	有頭內六角螺絲	M12 x 30L	10	PCS
9	AHB-1653	right roller bracket	滾輪固定座(右)		1	PCS
11	AHB-1656	left roller bracket	滾輪固定座(左)		1	PCS
13	PBA-12-40	bolt	有頭內六角螺絲	M12 x 40L	2	PCS
15	AGC-1064	stopper plate	側滾輪擋板		1	PCS
17	PPA-8	washer	平面華司	∮8	4	PCS
19	PQA-8	spring washer	彈簧華司	∮8	4	PCS
21	PBA-8-20	bolt	有頭內六角螺絲	M8 x P1.25 x20L	4	PCS
23	AGC-1065	guide bar	側滾輪滑軸		1	PCS
25	OPR-5015C	side roller seat	側滾輪座	207L	2	PCS
27	PPA-8	washer	平面華司	∮8	4	PCS
29	PQA-8	spring washer	彈簧華司	∮8	4	PCS
31	PBA-12-30	bolt	有頭內六角螺絲	M12 x 30L	4	PCS
33	OPR-5013C	side roller	側滾輪	200L	2	PCS
35	OPR-5014B	shaft	側滾輪軸及把手	265L	2	PCS

PART G

IDLE WHEEL MOTOR ASSEMBLY



PART G
IDLE WHEEL MOTOR ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-3001	housing yoke	鋸弓		1	PCS
3	C360L-30300	idle wheel	上輪組		1	PCS
5	AHA-06029	tension ass'y	張力滑座滑板組		1	SET
7	AHA-0403	lock washer	鎖緊墊圈		1	PCS
9	PPA-12	washer	平面華司	M12	1	PCS
11	PQA-12	spring washer	彈簧華司	M12	3	PCS
13	PBA-12-35	bolt	有頭內六角螺絲	M12 x 35L	1	PCS
15	AHA-0611	adjusting nut	調整螺母		3	PCS
17	AHA-0610	adjusting bolt	調整螺絲		3	PCS
19	PQA-12	spring washer	彈簧華司	M12	3	PCS
21	PPA-12	washer	平面華司	M12	3	PCS
23	PBA-12-80	bolt	有頭內六角螺絲	M12 x 80L	3	PCS
25	AHA-06189-1	tension cylinder	張力油壓缸組		1	PCS
27	AHB-0653	valve lever	切換把手		1	PCS
29	PAA-6-10	set screw	止付螺絲	M6x10L	1	PCS
31	AHB-0660	legend plate	鋸片鬆緊銘牌	CS-88	1	PCS
33	AGB-70334A	bracket	感應器底板座		1	PCS
35	PPA-5	washer	平面華司	M5	2	PCS
37	PQA-5	spring washer	彈簧華司	M5	2	PCS
39	PBA-5-6	bolt	有頭內六角螺絲	M5 x 6L	2	PCS
41	AHA-0672	proximity switch mounting plate	感應器底板		1	PCS
43	PPA-5	washer	平面華司	M5	2	PCS
45	PQA-5	spring washer	彈簧華司	M5	2	PCS
47	PBA-5-8	bolt	有頭內六角螺絲	M5 x 8L	2	PCS
49	AHR-2008	drive wheel	下輪		1	PCS
51	AGC-03040	gear box	減速機整組		1	SET
53	PPA-12	washer	平面華司	M12	6	PCS
55	PQA-12	spring washer	彈簧華司	M12	6	PCS
57	PLA-12-40	bolt	外六角螺絲	M12 x 40L	6	PCS
59	PUC-005	grease nipple	油嘴	1/16"	1	PCS
61	PRA-5-60	spring pin	彈簧銷	φ5 x 60L	1	PCS
63	AHA-0414	plate	鋸片安裝板		1	PCS
65	PPA-5	washer	平面華司	M5	1	PCS
67	PBA-5-6	bolt	有頭內六角螺絲	M6 x 60L	1	PCS
69	PP-18250	Saw blade	鋸帶	HS4880x41x1.3x3/4T	1	SET
71	AHA-0140-NC	bracket	上限開關固定座		1	PCS
73	PPA-5	washer	平面華司	M5	2	PCS
75	PQA-5	spring washer	彈簧華司	M5	2	PCS
77	PBA-5-30	bolt	有頭內六角螺絲	M5 x 30L	2	PCS

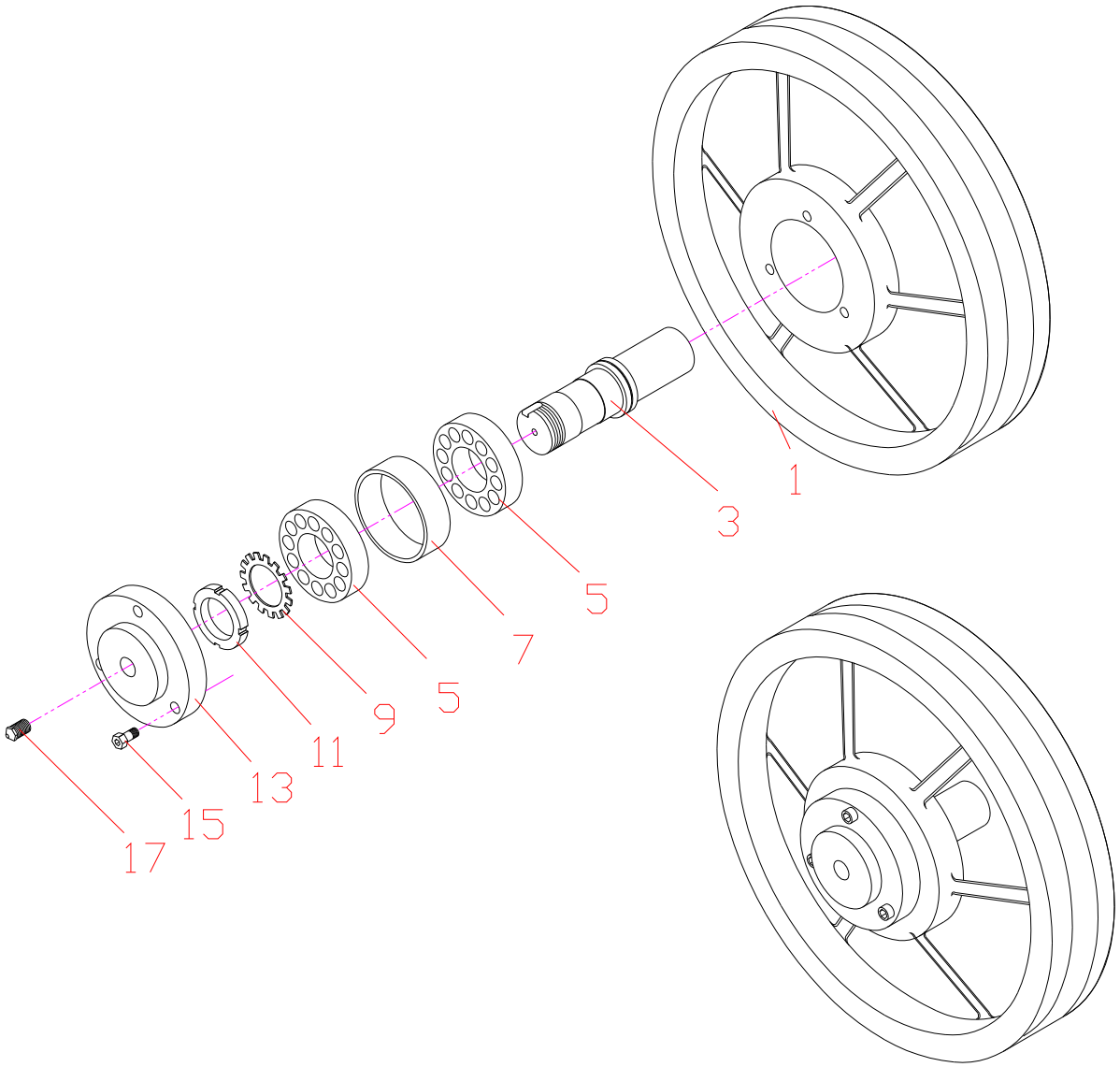
PART G
IDLE WHEEL MOTOR ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
79	AGC-1033	bracket	中限開關座		1	PCS
81	PPA-5	washer	平面華司	M5	2	PCS
83	PQA-5	spring washer	彈簧華司	M5	2	PCS
85	PBA-5-12	bolt	有頭內六角螺絲	M5 x 12L	2	PCS
87	C360L-3016	cover	鋸弓左護蓋		1	PCS
89	PPA-6	washer	平面華司	M6	8	PCS
91	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	8	PCS
93	C360L-3020	cover	鋸弓右護蓋		1	PCS

PART G1

IDLE WHEEL ASSEMBLY

PART NO : C360L-30300

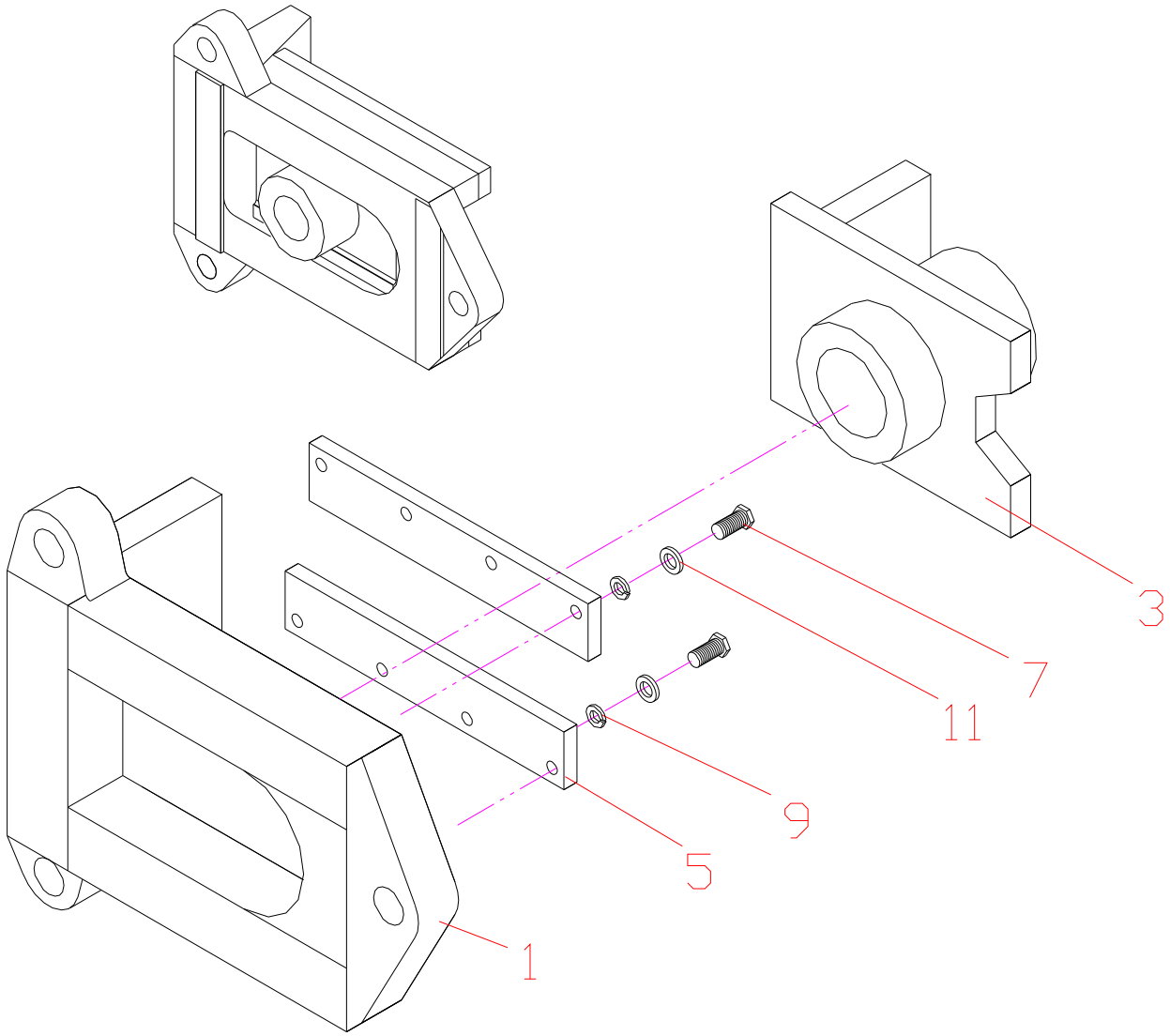


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHR-2007	idle wheel	上輪		1	PCS
3	AHA-0635	wheel shaft	上輪軸		1	PCS
5	PP-14613	bearing	滾錐軸承	30207	2	PCS
7	AHA-0637	bearing collar	上輪軸承墊圈		1	PCS
9	PP-14957	toothed ring	止動環	AW07	1	PCS
11	PP-14909	toothed nut	固定螺母	AN09	1	PCS
13	SHA-04140	bearing cap	上輪軸蓋		1	PCS
15	PBA-8-30	bolt	有頭內六角螺絲	M8 x 30L	3	PCS
17	PUC-005	grease nipple	油嘴	1/16"	1	PCS

PART G2

TENSION ASSEMBLY

PART NO : AHA-06029

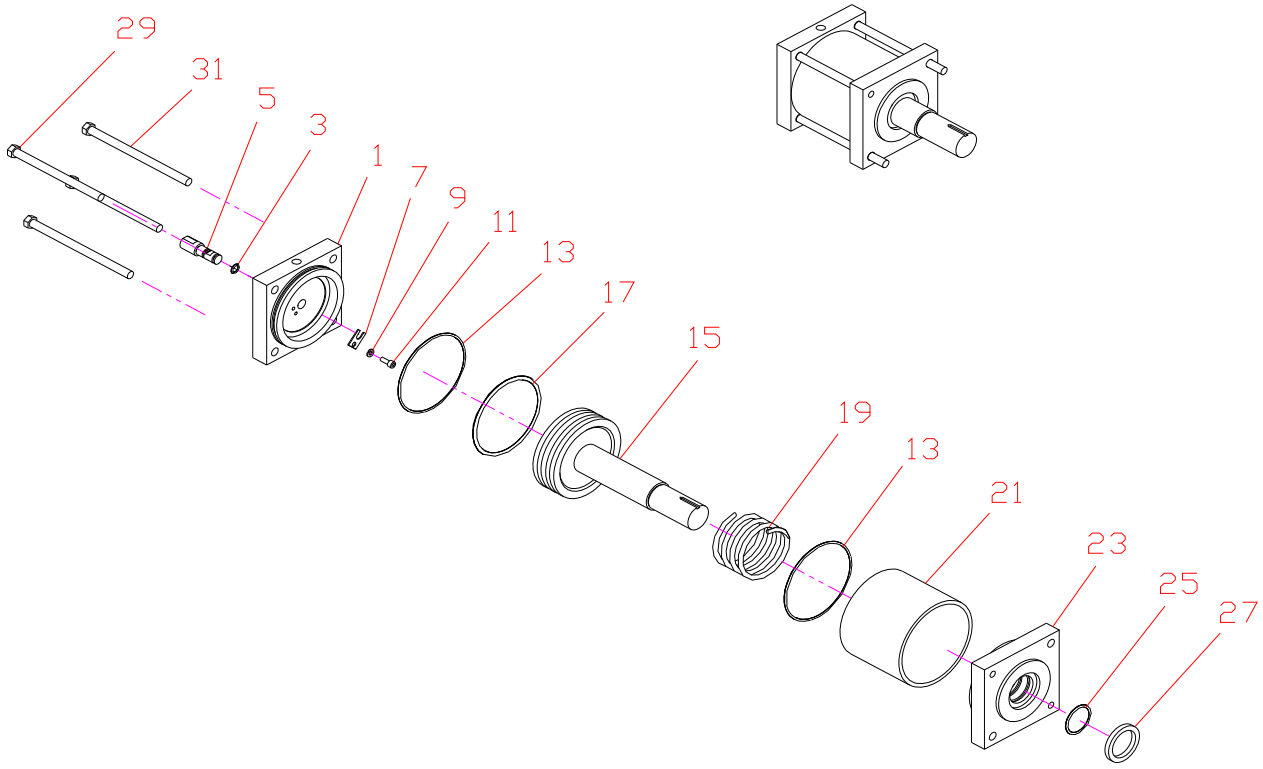


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-0612A	tension body	張力滑座		1	PCS
3	AHA-0608A	slide piece	張力滑板		1	PCS
5	AHA-0603	guide plate	壓板		2	PCS
7	PLA-8-30	hexagon head bolt	外六角螺絲	M8x30L	8	PCS
9	PQA-8	spring washer	彈簧華司	M8	8	PCS
11	PPA-8	washer	平面華司	M8	8	PCS

PART G3

TENSION CYLINDER ASSEMBLY

PART NO : AHA-06189-1

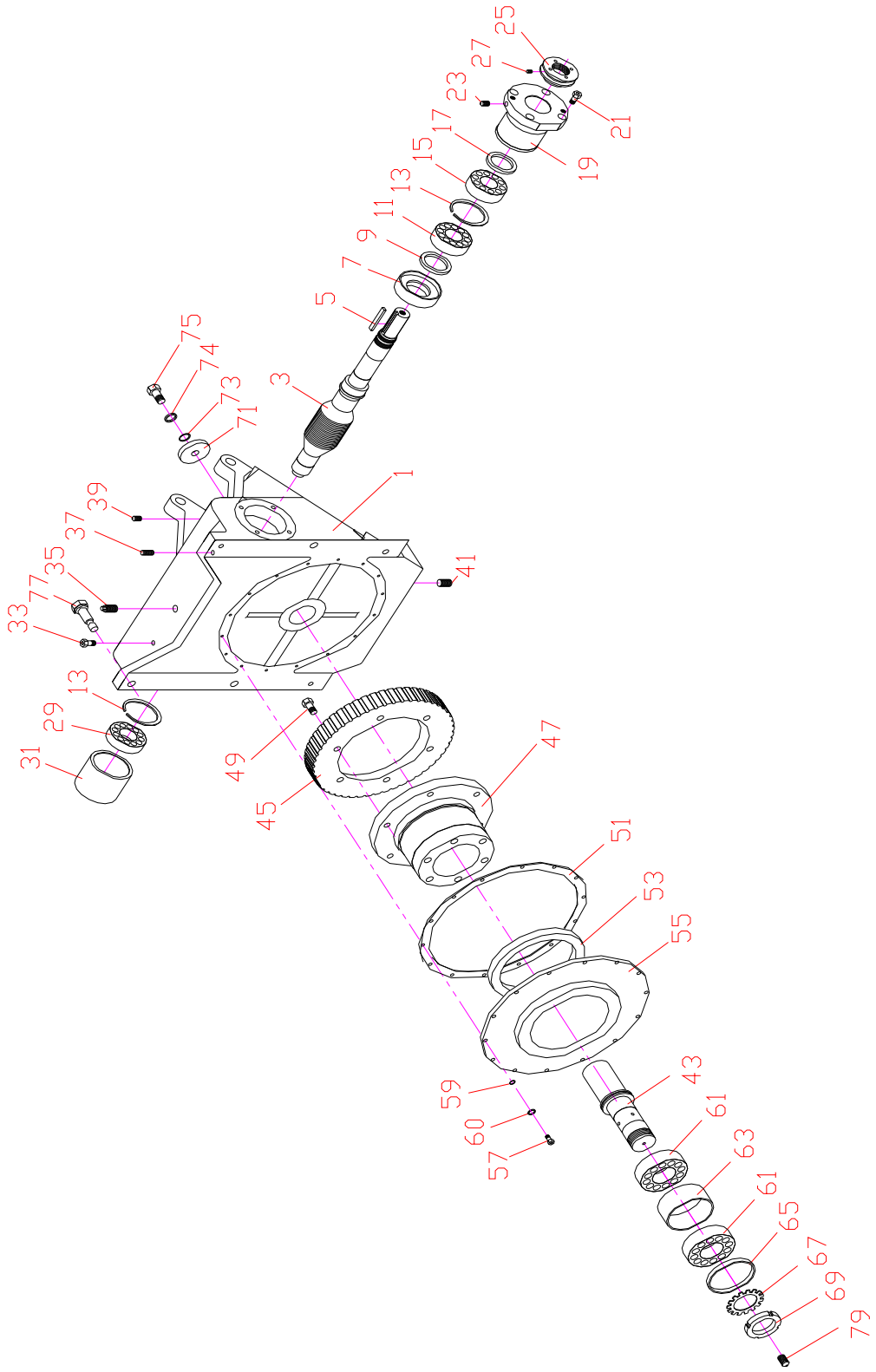


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-0618C	cylinder rear cap	張力油缸後蓋		1	PCS
3	PP-59050	o-ring	O 型環	P-11	2	PCS
5	AHB-0651	needle rod	切換閥針		1	PCS
7	AHB-0655	plate	閥針定位板		1	PCS
9	PQA-6	spring washer	彈簧華司	M6	1	PCS
11	PBA-6-16	bolt	有頭內六角螺絲	M6x16L	2	PCS
13	PP-59600	o-ring	O 型環	G-85	2	PCS
15	AHA-0618A	piston	活塞及桿(張力油缸)		1	PCS
17	PP-59180	o-ring	O 型環	P-80	1	PCS
19	AHN-3313	spring	張力油壓缸內彈簧		1	PCS
21	AHA-0618D	cylinder	張力油壓缸管		1	PCS
23	AHA-0618B	cylinder front cap	張力油缸前蓋		1	PCS
25	PP-59120	o-ring	O 型環	P-32	1	PCS
27	PP-51141	oil seal	油封	32x45X7	4	PCS
29	PP-90859	hexagon head bolt	外六角螺栓	M12*165L	2	PCS
31	PP-90860	hexagon head bolt	外六角螺栓	M12*190L	2	PCS

PART G4

GEAR BOX ASSEMBLY

PART NO：AGC-03040

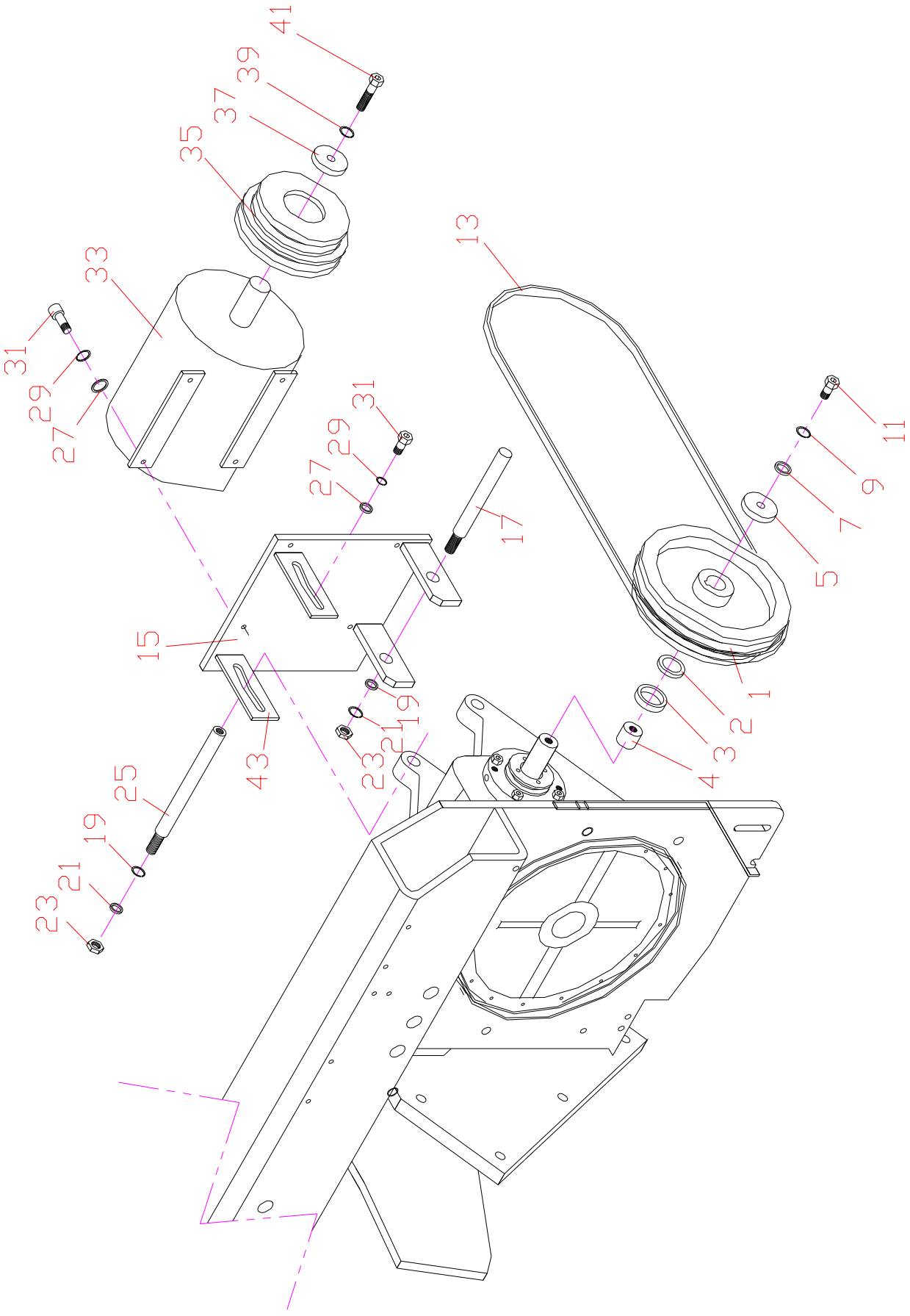


PART G4
GEAR BOX ASSEMBLY
PART NO：AGC-03040

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AGC-3008	hinge bracket	減速機本體		1	PCS
3	AHA-0305	worm	蝸桿		1	PCS
5	PS-4-7	key	方鍵	4 x 7 x 50L	1	PCS
7	AHA-0314	bearing support	軸承座蓋		1	PCS
9	PP-51080	oil seal	油封	E9	1	PCS
11	PP-14652	taoer roller bearing	滾錐軸承	30306D	1	PCS
13	PP-58103	snap ring	內鎖	R62	2	PCS
15	PP-14691	taoer roller bearing	滾錐軸承	32206	1	PCS
17	PP-51070	oil seal	油封	V38 x 50 x 5	1	PCS
19	AHA-0319	bracket	軸承座(一)		1	PCS
21	PBA-8-25	bolt	有頭內六角螺絲	M8 x 25L	4	PCS
23	PUC-005	grease nipple	油嘴	1/16"	1	PCS
25	AHA-0320	wire brush pulley	鋼刷普利		1	PCS
27	PAA-5-8	set screw	止付螺絲	M5 x 8L	2	PCS
29	PP-14131	bearing	軸承	6206Z	1	PCS
31	AHA-0326	bracket	軸承座(二)		1	PCS
33	AHA-0328	bolt	注油螺絲	M8 x 16L (3/16-28 牙)	1	PCS
35	AHA-0307	soc.hd.plug	透氣塞頭	1/2"	1	PCS
37	PAA-8-20	set screw	止付螺絲	M8 x 20L	1	PCS
39	PUC-020	grease nipple	油嘴	1/4"	1	PCS
41	PED-025	soc.hd.plug	管塞	1/2"	1	PCS
43	AHA-0407	wheel shaft	下輪軸		1	PCS
45	AHA-0404	worm wheel	蝸輪		1	PCS
47	AHA-0406	housing	蝸輪固定座		1	PCS
49	PBA-10-35	bolt	有頭內六角螺絲	M10 x 35L	6	PCS
51	AHA-0454	rubber wahser	橡膠墊圈		1	PCS
53	PP-51090A	oil seal	油封	130 x 160 x14	1	PCS
55	AHA-0433	fixed ring	油封固定盤		1	PCS
57	PBA-6-16	bolt	有頭內六角螺絲	M6 x 16L	14	PCS
59	PQA-6	spring washer	彈簧華司	M6	14	PCS
60	PPA-6	washer	平面華司	M6	14	PCS
61	PP-14693	taoer roller bearing	滾錐軸承	32208	1	PCS
63	AHA-0431	distance roller	軸承墊圈		1	PCS
65	AHA-0429	adjusting collar	調整環		1	PCS
67	PP-14958	toothed washer	止動環	AW08	1	PCS
69	PP-14908	toothed nut	固定螺母	AN08	1	PCS
71	AHA-0403	lock washer	鎖緊墊圈		1	PCS
73	PQA-12	spring washer	彈簧華司	M12	1	PCS
74	PPA-12	washer	平面華司	M12	1	PCS
75	PBA-12-35	bolt	有頭內六角螺絲	M12 x 35L	1	PCS
77	AHA-0309	fixed bolt	固定螺絲		2	PCS
79	PUC-005	grease nipple	油嘴	1/16"	1	PCS

PART H

DRIVE WHEEL MOTOR ASSEMBLY

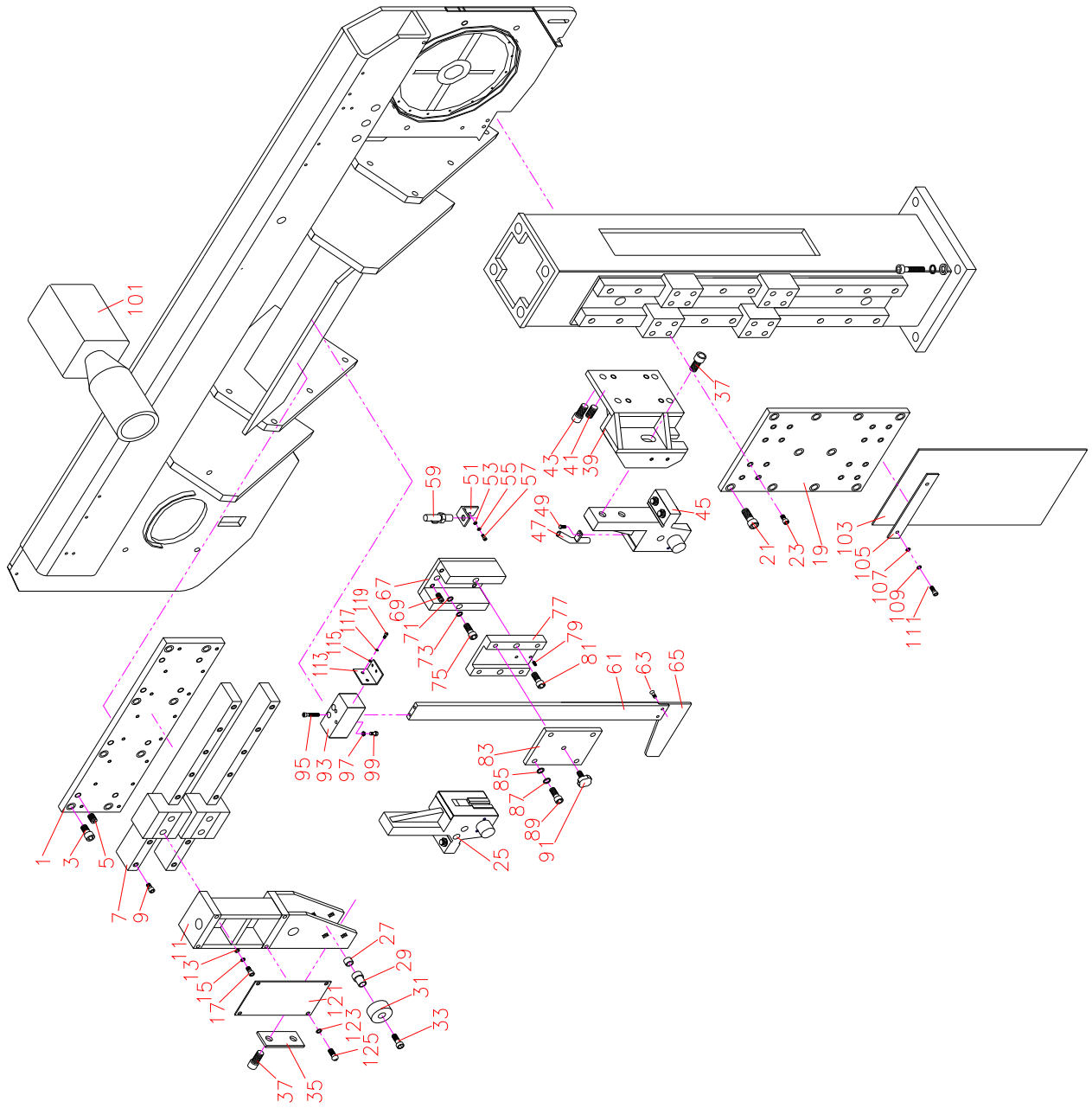


PART H
DRIVE WHEEL MOTOR ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-0514G	reducer pulley	減速機皮帶輪		1	PCS
2	MAE-2025	washer	上輪軸墊圈		1	PCS
3	ACA-1074	washer	蝸輪軸墊圈		1	PCS
4	C360L-3377	shaft	蝸桿接軸		1	PCS
5	AHA-0525	washer	墊圈		2	PCS
7	PPA-10	washer	平面華司	M10	1	PCS
9	PQA-10	spring washer	彈簧華司	M10	1	PCS
11	PBA-10-35	bolt	有頭內六角螺絲	M10 x 35L	1	PCS
13	PP-56287	belt	皮帶	B-44	1	PCS
15	AHR-2027	motor base plate	馬達底板		1	PCS
17	AHA-0515	movable bar	馬達活動軸		1	PCS
19	PPA-12	washer	平面華司	M12	2	PCS
21	PQA-12	spring washer	彈簧華司	M12	2	PCS
23	POA-12-175	nut	螺帽	M12	2	PCS
25	AHA-0526	set pipe	馬達定位軸		1	PCS
27	PPA-10	washer	平面華司	M10	5	PCS
29	PQA-10	spring washer	彈簧華司	M10	5	PCS
31	PBA-10-25	bolt	有頭內六角螺絲	M10 x 25L	5	PCS
33	PP-31090	motor	馬達	5HP	1	PCS
35	AHA-0538G	motor pulley	馬達皮帶輪		1	PCS
37	PPA-10	washer	平面華司	M10	1	PCS
39	PQA-10	spring washer	彈簧華司	M10	1	PCS
41	PBA-10-50	bolt	有頭內六角螺絲	M10 x 50L	1	PCS
43	AHA-0510B	bracket	馬達底板耳		2	PCS

PART J

GUIDE BRACKET ASSEMBLY



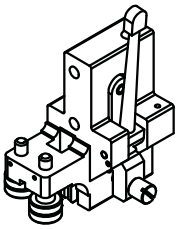
PART J
GUIDE BRACKET ASSEMBLY

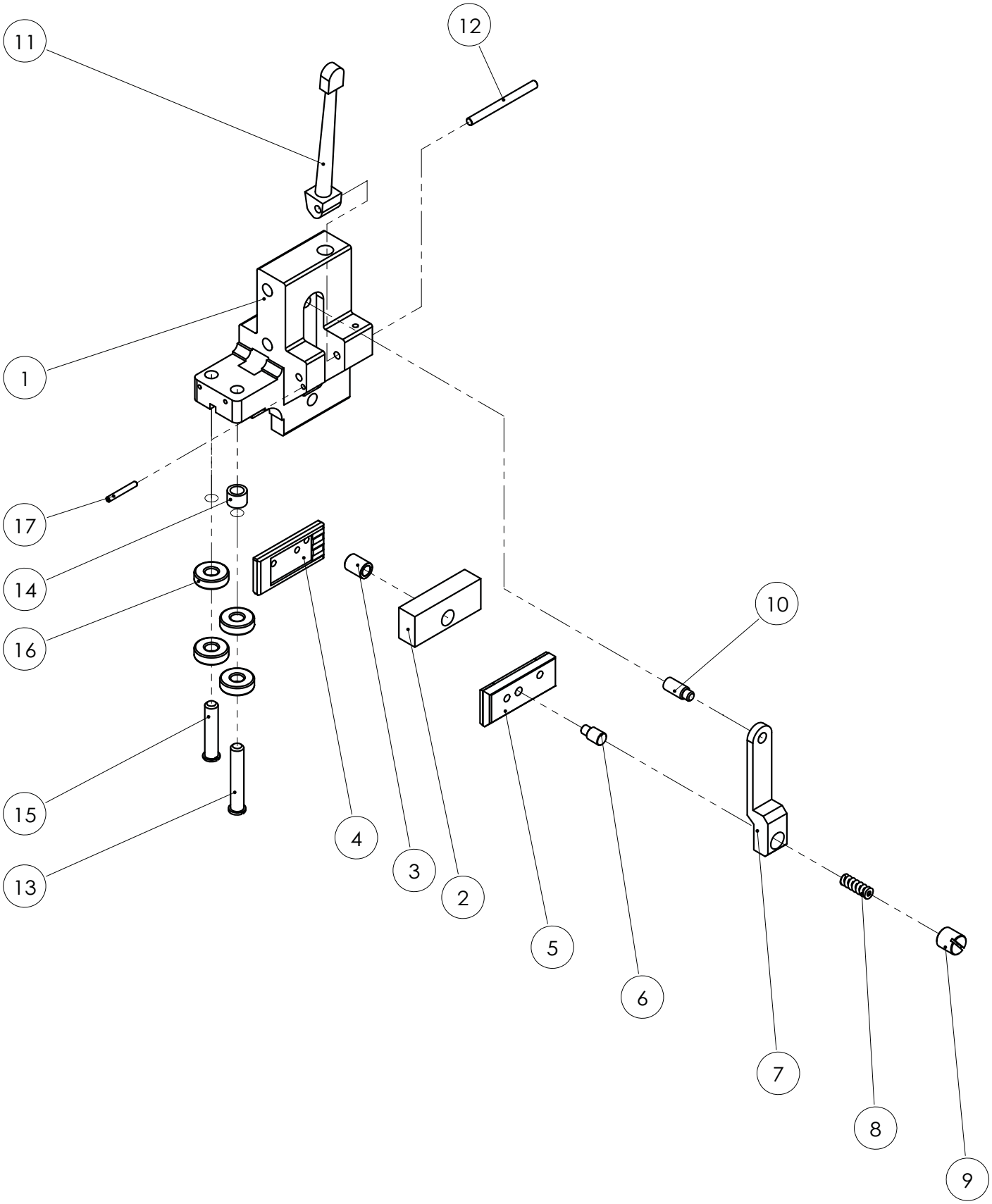
ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C260L-3102	plate	滑板調整板		1	PCS
3	PBA-10-20	bolt	有頭內六角螺絲	M10 x 20L	8	PCS
5	PAA-10-15	set screw	止付螺絲	M10 x 15L	8	PCS
7	PP-92024	Linear Guideway	滑軌滑塊	BRS25B1x450L/NZ1	1	PCS
9	PBA-6-20	bolt	有頭內六角螺絲	M6 x 20L	16	PCS
11	C260-3103	left guide bracket	活動鋸臂		1	PCS
13	PPA-6	washer	平面華司	M6	4	PCS
15	PQA-6	spring washer	彈簧華司	M6	4	PCS
17	PBA-6-15	bolt	有頭內六角螺絲	M6 x 15L	4	PCS
19	C260L-3002A	bracket	鋸弓滑塊固定板		1	PCS
21	PBA-10-20	bolt	有頭內六角螺絲	M10 x 20L	10	PCS
23	PBA-6-15	bolt	有頭內六角螺絲	M6 x 15L	4	PCS
25	AHA-07120	left insert holder set	左導輪座組		1	PCS
27	PP-13045	bearing	乾式軸承	1415	1	PCS
29	C560L-3173	Rings	連動擋輪套環		1	PCS
31	C560L-3171	feedler	鋸臂連動擋輪		1	PCS
33	PBA-10-35	bolt	有頭內六角螺絲	M10 x 35L	1	PCS
35	AHA-0719	plain washer	導輪座墊片		1	PCS
37	PBA-12-40	bolt	有頭內六角螺絲	M12 x 40L	4	PCS
39	C260-3105	right guide bracket	固定右鋸臂		1	PCS
41	PAA-10-10	set screw	止付螺絲	M10 x 10L	4	PCS
43	PBA-10-35	bolt	有頭內六角螺絲	M10 x 35L	4	PCS
45	AHA-07480	right insert holder set	右導輪座組	(1 1/4")	1	SET
47	AHA-0745	coolant nozzle	冷卻水噴嘴		1	PCS
49	PBA-5-8	bolt	有頭內六角螺絲	M5 x 8L	1	PCS
51	MJA-2041	bracket	水龍頭座板		1	PCS
53	PPA-6	washer	平面華司	M5	2	PCS
55	PQA-6	spring washer	彈簧華司	M5	2	PCS
57	PBA-5-10	bolt	有頭內六角螺絲	M5*10L	2	PCS
59	PP-43132	coolant valve	開關閥(無頭)	1/8"	3	PCS
61	C360L-2101	descending slide bar	急降桿		1	PCS
63	AHG-0930	feedler	急降桿檔板		1	PCS
65	PCA-6-8	bolt	平頭內六角螺絲	M6 x 8L	2	PCS
67	C360L-3211	descending slide bracket	急降桿固定座 (50W)		1	PCS
69	PAA-10-10	set screw	止付螺絲	M10 x 10L	4	PCS
71	PQA-10	spring washer	彈簧華司	M10	2	PCS
73	PPA-10	washer	平面華司	M10	2	PCS
75	PBA-10-25	bolt	有頭內六角螺絲	M10 x 25L	2	PCS
77	AHG-0913	bracket	急降桿座		1	PCS
79	PAA-5-10	set screw	止付螺絲	M5 x 10L	2	PCS
81	PBA-10-60	bolt	有頭內六角螺絲	M10 x 60L	2	PCS
83	AHA-1754	cover plate	急降桿座蓋		1	PCS
85	PPA-8	washer	平面華司	M8	4	PCS
87	PQA-8	spring washer	彈簧華司	M8	4	PCS
89	PBA-8-30	bolt	有頭內六角螺絲	M8 x 30L	4	PCS
91	PP-53010	screw	梅花螺絲	M8 x 20L	1	PCS

PART J
GUIDE BRACKET ASSEMBLY

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
93	AHG-0938	block	急降桿配重		1	PCS
95	PBA-6-50	bolt	有頭內六角螺絲	M6 x 50L	2	PCS
97	POA-6	nut	螺帽	M6	2	PCS
99	PLA-6-40	hexagon head bolt	外六角螺絲	M6x40L	2	PCS
101	PP-91804E	Work light	工作燈	JH-35 1/2RNTM110V20W	1	PCS
103	PP-57001B	rubber plate	耐油橡皮	200*360*3T	1	PCS
105	AGC-1008	plate	遮屑壓板		1	PCS
107	PPA-5	washer	平面華司	M5	2	PCS
109	PQA-5	spring washer	彈簧華司	M5	2	PCS
111	PBA-5-10	bolt	有頭內六角螺絲	M5 x 10L	2	PCS
113	AHA-0672-CE	plate	左固定片(二)		1	PCS
115	PPA-4	washer	平面華司	M4	2	PCS
117	PQA-4	spring washer	彈簧華司	M4	2	PCS
119	PBA-4-12	bolt	有頭內六角螺絲	M5 x 12L	2	PCS
121	C360L-3118	cover	活動鋸臂護蓋		1	PCS
123	PPA-6	washer	平面華司	M6	4	PCS
125	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	4	PCS

PART-J-1
LEFT INSERT HOLDER ASSEMBLY
C420H-31300 左導輪座組

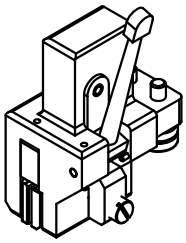


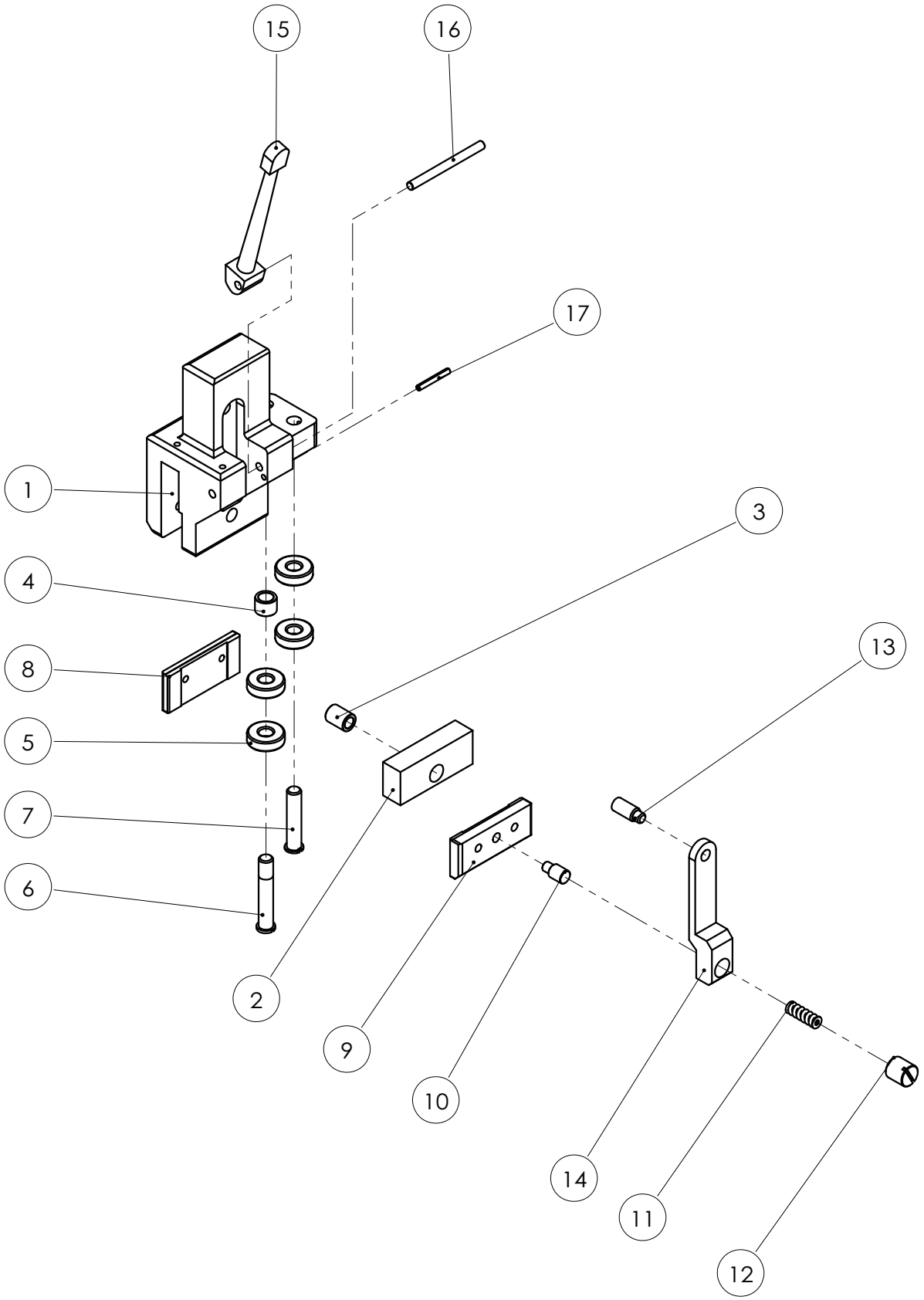


PART-J-1
LEFT INSERT HOLDER ASSEMBLY
C420H-31300 左導輪座組

C420H-31300 左導輪座組					
ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AHK-3803A	Left insert holder	左導輪座		1
2	AHA-0704A	Pressure block	下壓座		1
3	AHB-0822	Position ring	下壓固定塊定位圈		1
4	AHB-0814	Left fixed insert	左固定鎢鋼片		1
5	AHB-0816	Left movable insert	左活動鎢鋼片		1
6	AHN-3845	Position pillar	定位柱		1
7	AHN-3848	Position block	定位塊		1
8	AHA-0710	Spring	鎢鋼片彈簧		1
9	AHN-3847	Postion bolt	定位螺絲		1
10	AHN-3851	Position bolt	彈簧定位螺絲		1
11	AHN-3850	Handler	施力把手		1
12	AHN-3849	Core shaft	心軸		1
13	AHA-0707A	Guide wheel shaft 1	導輪軸(一)		1
14	AHA-0708A	washer	導輪墊圈		1
15	AHA-0714	Guide wheel shaft 2	導輪軸(二)		1
16	PP-14105	Bearing	軸承	6000 2RUCM	4
17	PRA-4-30	Spring pin	彈簧銷	SPP-4-30㎜	1

PART-J-2
RIGHT INSERT HOLDER ASSEMBLY
C420H-31600 右導輪座組

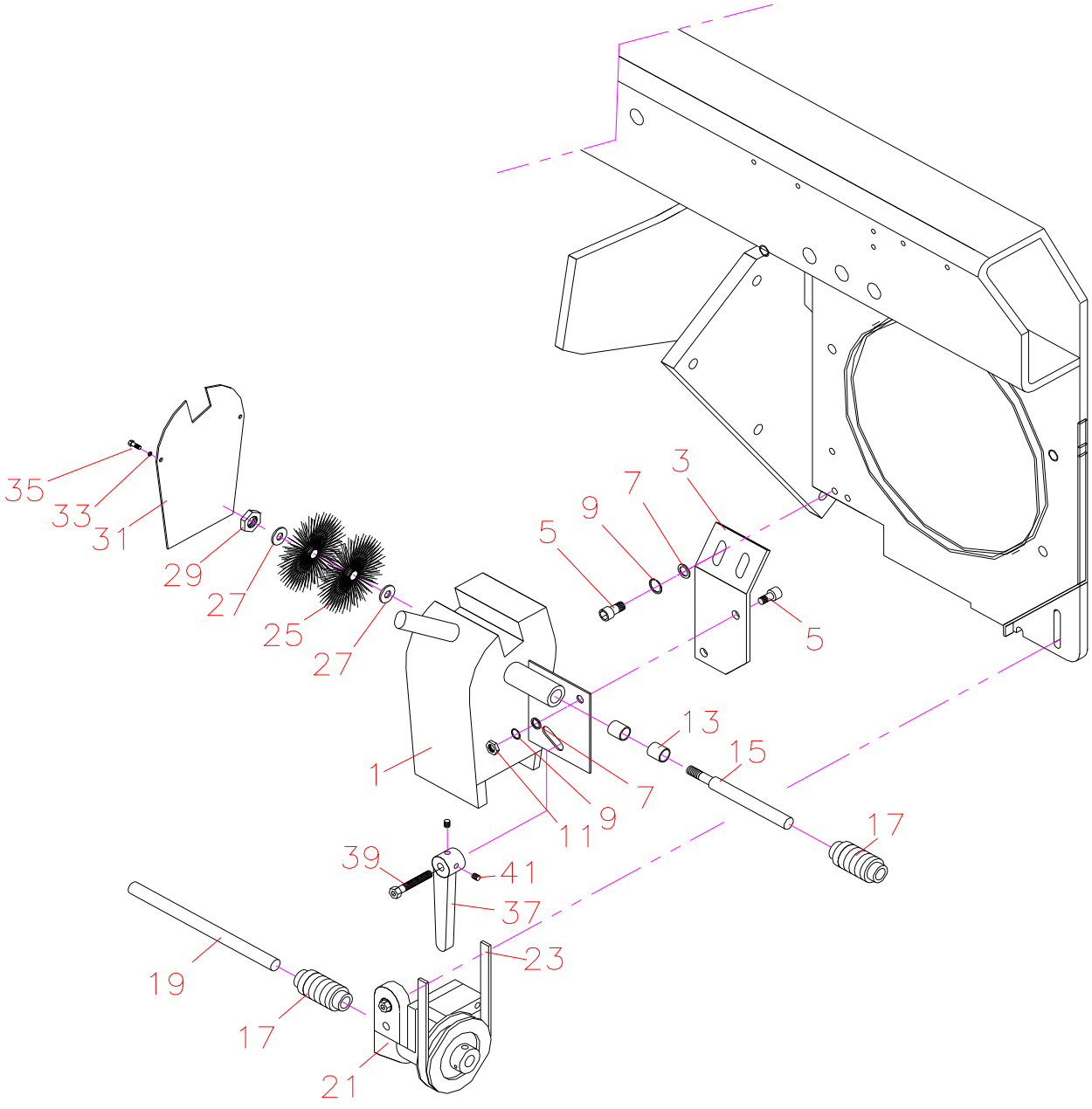




PART-J-2
RIGHT INSERT HOLDER ASSEMBLY
C420H-31600 右導輪座組

C420H-31600 右導輪座組					
ITEM	PART NO.	PART NAME	PART NAME IN CHINESE	PART SPEC.	QTY
1	AHK-3843A	Right guide wheel seat	右導輪座		1
2	AHA-0704A	Pressure block	下壓座		1
3	AHB-0822	Position ring	下壓固定塊定位圈		1
4	AHA-0708A	Washer	導輪墊圈		1
5	PP-14105	Bearing	軸承	6000 2RUCM	4
6	AHA-0707A	Guide wheel shaft 1	導輪軸(一)		1
7	AHA-0714	Guide wheel shaft 2	導輪軸(二)		1
8	AHB-0836	Right fixed insert	右固定鎢鋼片		1
9	AHB-0837	Right movable insert	右活動鎢鋼片		1
10	AHN-3845	Position pillar	定位柱		1
11	AHA-0710	Spring	鎢鋼片彈簧		1
12	AHN-3847	Postion bolt	定位螺絲		1
13	AHN-3851	Position bolt	彈簧定位螺絲		1
14	AHN-3848	Position block	定位塊		1
15	AHN-3850	Handler	施力把手		1
16	AHN-3849	Core shaft	心軸		1
17	PRA-4-30	Spring pin	彈簧銷	SPP-4-30㎜	1

PART K
WIRE BRUSH ASSEMBLY



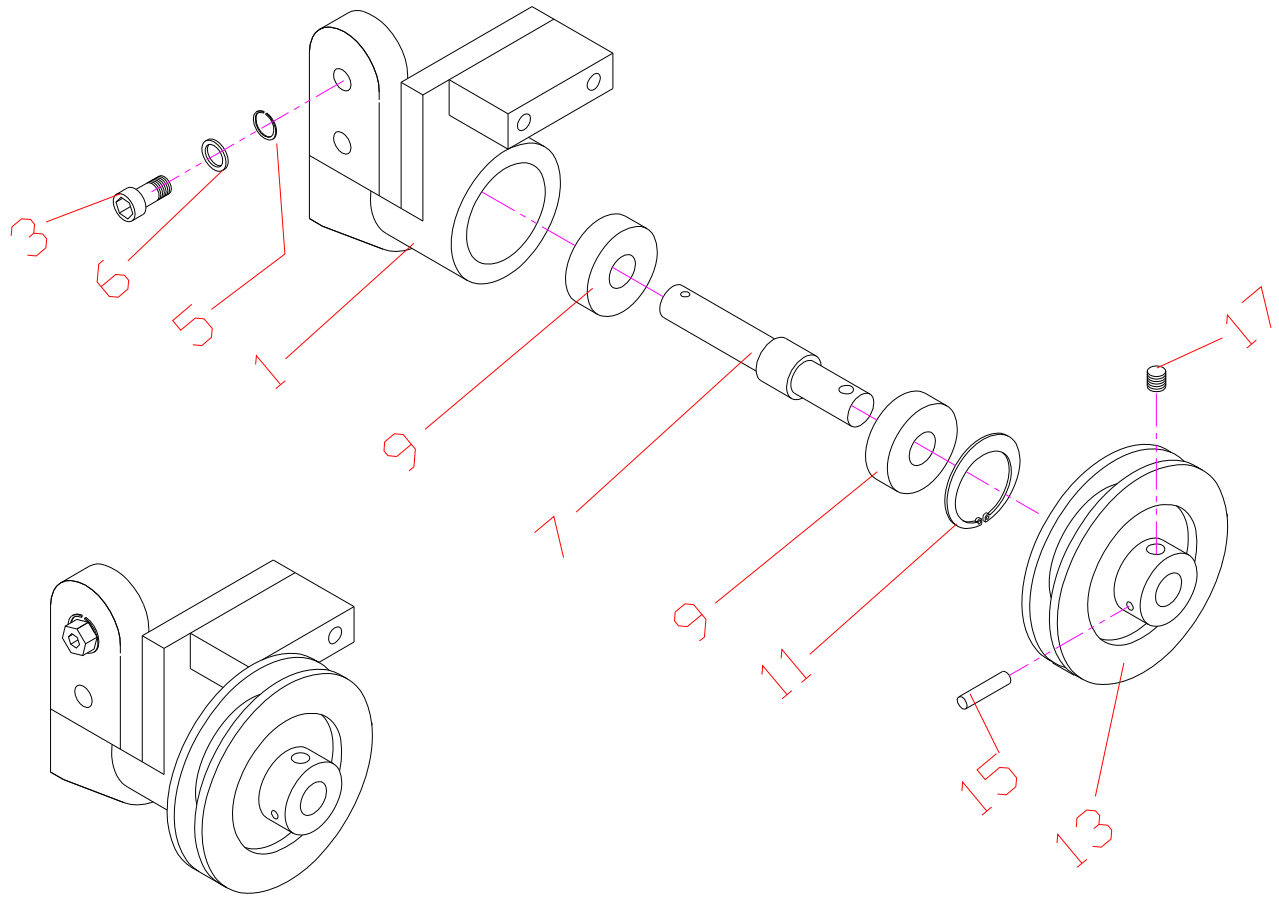
PART K
WIRE BRUSH ASSEMBLY
PART NO : C360L-32200

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AGC-3025	brush cover	鋼刷護蓋		1	PCS
3	AGC-3027	brush bracket	鋼刷護蓋固定板		1	PCS
5	PPA-8	washer	平面華司	M8	2	PCS
7	PQA-8	spring washer	彈簧華司	M8	3	PCS
9	PBA-8-16	bolt	有頭內六角螺絲	M8 x 16L	3	PCS
11	POA-8	nut	螺帽	M8	1	PCS
13	PP-13025	du bearing	乾式軸承	1215	2	PCS
15	AHB-0519	brush shaft	鋼刷軸		1	PCS
17	PP-15010	universal ioint	萬向接頭	12M/M(加防塵套)	2	PCS
19	AHA-1215	shaft	鋼刷傳動軸		1	PCS
21	AHA-12110-1	bearing bracket set	鋼刷軸承座組		1	SET
23	PP-56512	belt	皮帶	M-39	1	PCS
25	PP-58002	wire brush	鋼刷	90m/m*8m/m#0.3	2	PCS
27	PPA-8	washer	平面華司	M8	2	PCS
29	POA-8	nut	螺帽	M8	1	PCS
31	AHA-1220-2	brush cover plate	鋼刷護蓋板		1	PCS
33	PPA-4	washer	平面華司	M4	2	PCS
35	PBA-4-4	bolt	有頭六角螺絲	M4 x 4L	2	PCS
37	AHA-1217	lock lever	鋼刷調整桿		1	PCS
39	PBA-8-35	bolt	有頭六角螺絲	M8 x 35L	1	PCS
41	PPA-5-6	set screw	止付螺絲	M5 x 6L	2	PCS

PART K1

BRUSH SHAFT ASSEMBLY

PART NO : AHA-12110

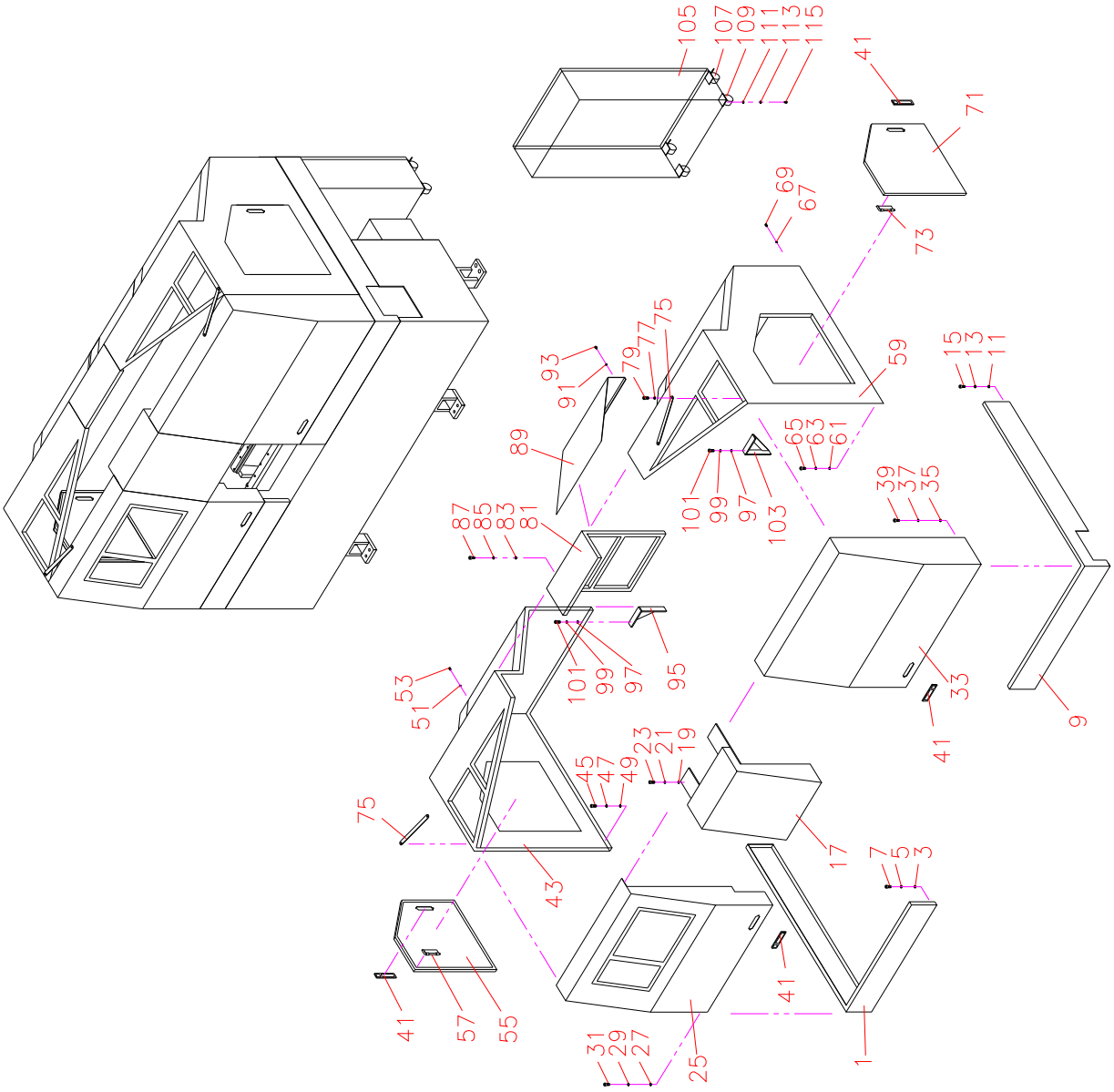


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-1211	bearing bracket	軸承座		1	PCS
3	PBA-8-40	bolt	有頭六角螺絲	M8 x 40L	2	PCS
5	PPA-8	washer	平面華司	M8	2	PCS
6	PQA-8	spring washer	彈簧華司	M8	2	PCS
7	AHA-1207	pulley shaft	皮帶輪軸		1	PCS
9	PP-14272	bearing	軸承	6201V	2	PCS
11	PP-58109	snap ring	扣環	R32	1	PCS
13	AHA-1202	brush pulley	鋼刷皮帶輪		1	PCS
15	PRA-4-25	spring pin	彈簧銷	φ4 x 25L	1	PCS
17	PAA-6-6	set screw	止付螺絲	M6 x 6L	1	PCS

PART L

COVER ASSEMBLY

PART NO：C360L-14000



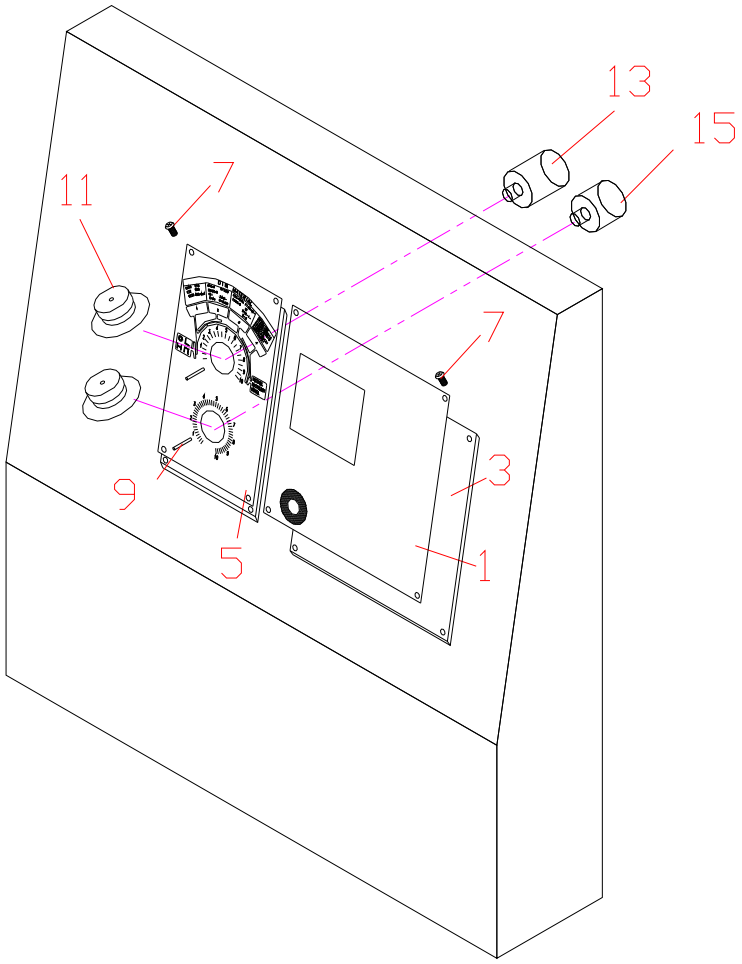
PART L
COVER ASSEMBLY
PART NO：C360L-14000

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-1401	Left cover	左底盤		1	PCS
3	PPA-6	washer	平面華司	M6	11	PCS
5	PQA-6	spring washer	彈簧華司	M6	11	PCS
7	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	11	PCS
9	C360L-1403	Right cover	右底盤		1	PCS
11	PPA-6	washer	平面華司	M6	11	PCS
13	PQA-6	spring washer	彈簧華司	M6	11	PCS
15	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	11	PCS
17	C360L-1405	Front cover	前罩		1	PCS
19	PPA-6	washer	平面華司	M6	11	PCS
21	PQA-6	spring washer	彈簧華司	M6	11	PCS
23	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	11	PCS
25	C360L-1407	cover	左前罩		1	PCS
27	PPA-6	washer	平面華司	M6	4	PCS
29	PQA-6	spring washer	彈簧華司	M6	4	PCS
31	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	4	PCS
33	C360L-1409	cover	右前罩		1	PCS
35	PPA-6	washer	平面華司	M6	4	PCS
37	PQA-6	spring washer	彈簧華司	M6	4	PCS
39	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	4	PCS
41	PP-54001	flush handles	平面跳脫把手	AP-240-2-B	4	PCS
43	C360L-1411	Front rear cover	左後罩		1	PCS
45	PPA-6	washer	平面華司	M6	7	PCS
47	PQA-6	spring washer	彈簧華司	M6	7	PCS
49	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	7	PCS
51	PPA-6	washer	平面華司	M6	18	PCS
53	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	18	PCS
55	C360L-1413	Front door	左側門		1	PCS
57	PP-54002	hinges with springs	彈簧丁雙(彈簧後鈕)	1062#-L	1	PCS
59	C360L-1417	Right rear cover	右後罩		1	PCS
61	PPA-6	washer	平面華司	M6	7	PCS
63	PQA-6	spring washer	彈簧華司	M6	7	PCS
65	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	7	PCS
67	PPA-6	washer	平面華司	M6	18	PCS
69	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	18	PCS
71	C360L-1419	Right door	右側門		1	PCS
73	PP-54003	hinges with springs	彈簧丁雙(彈簧後鈕)	1062#-R	1	PCS
75	C260L-1421	cover	護罩限動板		2	PCS
77	PPA-6	washer	平面華司	M6	7	PCS
79	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	7	PCS
81	C360L-1431	cover	後罩連接板(一)		1	PCS
83	PPA-6	washer	平面華司	M6	12	PCS
85	PQA-6	spring washer	彈簧華司	M6	12	PCS
87	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	12	PCS
89	C360L-1433	cover	後罩連接板(二)		1	PCS
91	PPA-6	washer	平面華司	M6	8	PCS
93	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	8	PCS
95	C260L-1443A	Front fence	左後支撐架		1	PCS
97	PPA-6	washer	平面華司	M6	8	PCS

PART L
C0VER ASSEMBLY
PART NO：C360L-14000

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
99	PQA-6	spring washer	彈簧華司	M6	8	PCS
101	PBA-6-10	bolt	有頭六角螺絲	M6 x 10L	8	PCS
103	C260L-1445A	Right fence	右後支撐架		1	PCS
105	C360L-1421	Electric box	電器箱		1	PCS
107	PP-57004	Light duty casters	2”PU 活動輪		1	PCS
109	PP-57008	Light medium dutycasters	2”PU 煞車活動輪		2	PCS
111	PPA-6	washer	平面華司	M6	16	PCS
113	PQA-6	spring washer	彈簧華司	M6	16	PCS
115	PFA-6-10	screw	丸頭螺絲(十字)(公)	Φ 6 x 10 mm L	16	PCS

PART M
ELECTRIC BOX ASSEMBLY

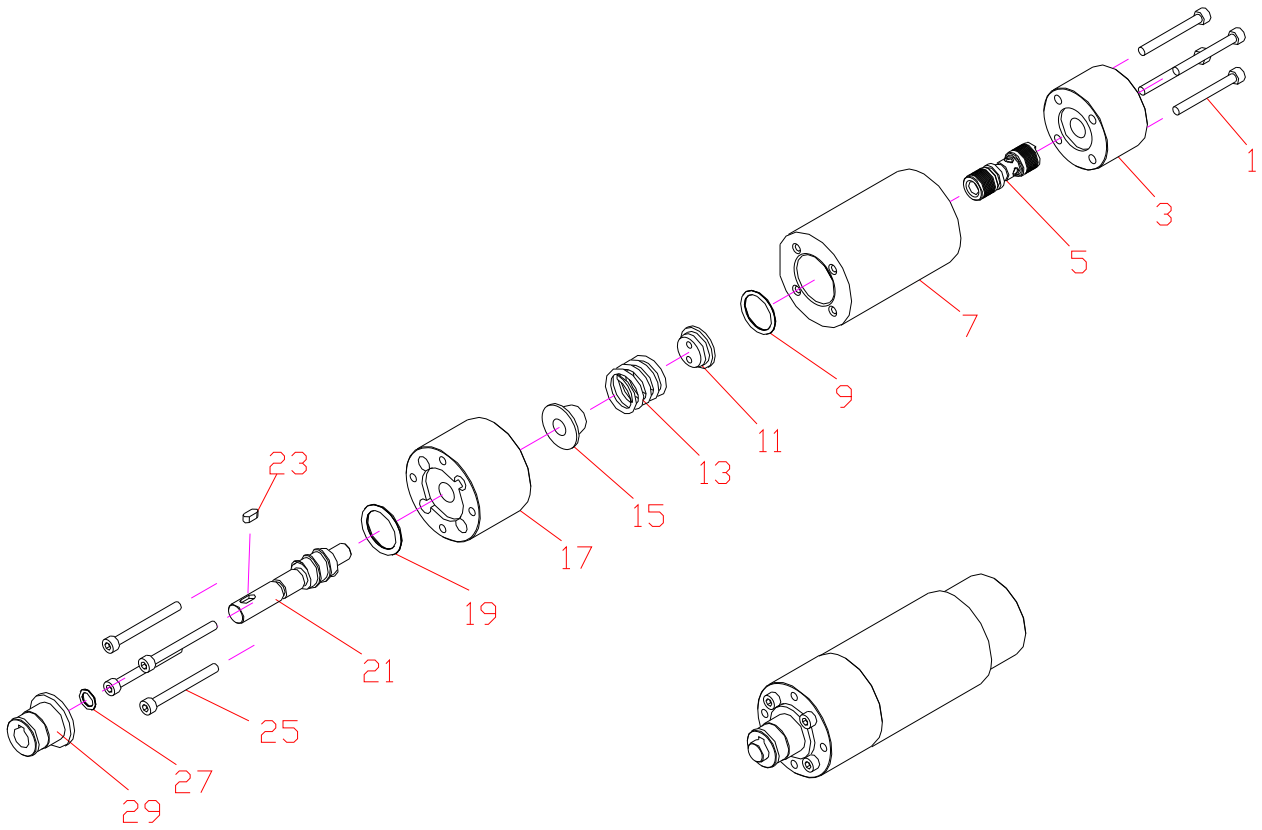


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C560L-1321	elec.data plate	控制面板		1	PCS
3	C560L-1323	control plate	面板底板		1	PCS
5	AHC-0134A-CE	elec.data plate	流量閥控制面板	DIN CS-198	1	PCS
7	PFA-8-8	screw	丸頭螺絲(十字)(公)	M8 X8L	8	PCS
9	PRA-3-26	spring pin	彈簧銷	SPP-3*26MM	2	PCS
11	AHA-1806	vernier dial	流量閥旋鈕		2	PCS
13	AHA-10289	regulator set	調壓閥整組		1	SET
15	AHA-6100	folw control valve	流量閥組		1	SET

PART M1

REGULATOR SET ASSEMBLY

PART NO : AHA-10289

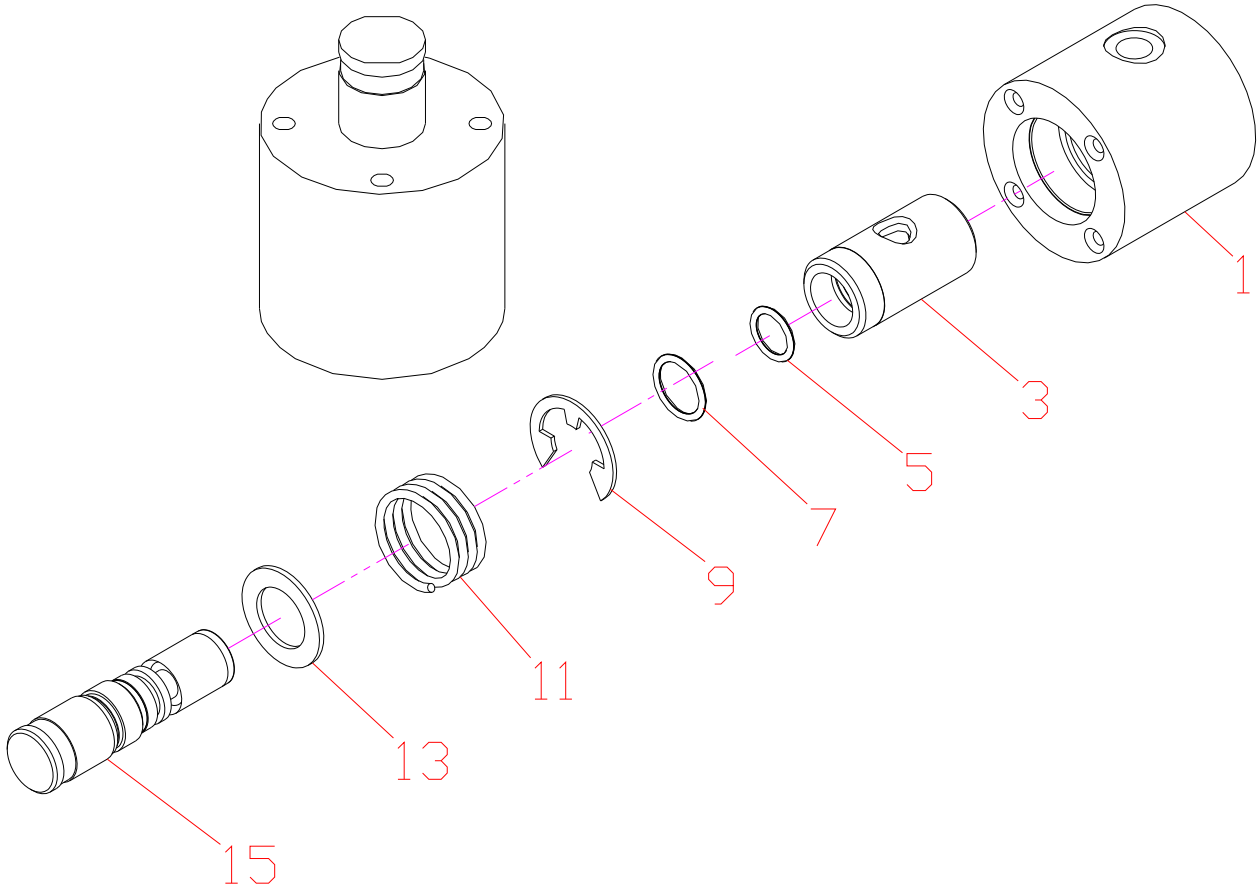


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	PBA-5-45	bolt	有頭內六角螺絲	M5x45L	4	PCS
3	AHA-1036	rear cap	後蓋		1	PCS
5	AHA-1030	valve	針閥		1	PCS
7	AHA-1029	valve seat	閥座		1	PCS
9	PP-59082	o-ring	O 形環	P-22	1	PCS
11	AHA-1031	spring seat	彈簧定位套(一)		1	PCS
13	AHA-1032	spring	彈簧		1	PCS
15	AHA-1033	spring seat	彈簧定位套(二)		1	PCS
17	AHA-1035	front cap	前蓋		1	PCS
19	PP-59090	o-ring	O 形環	P-24	1	PCS
21	AHA-1034	adjusting bolt	調整螺栓		1	PCS
23	PS-4-4-10	key	方鍵	4x4x10L	1	PCS
25	PBA-5-50	bolt	有頭內六角螺絲	M5x50L	4	PCS
27	PP-59030	o-ring	O 形環	P-9	1	PCS
29	AHA-1037	dial seat	旋鈕座		1	PCS

PART M2

FLOW CONTROL VALVE ASSEMBLY

PART NO : AHA-6100

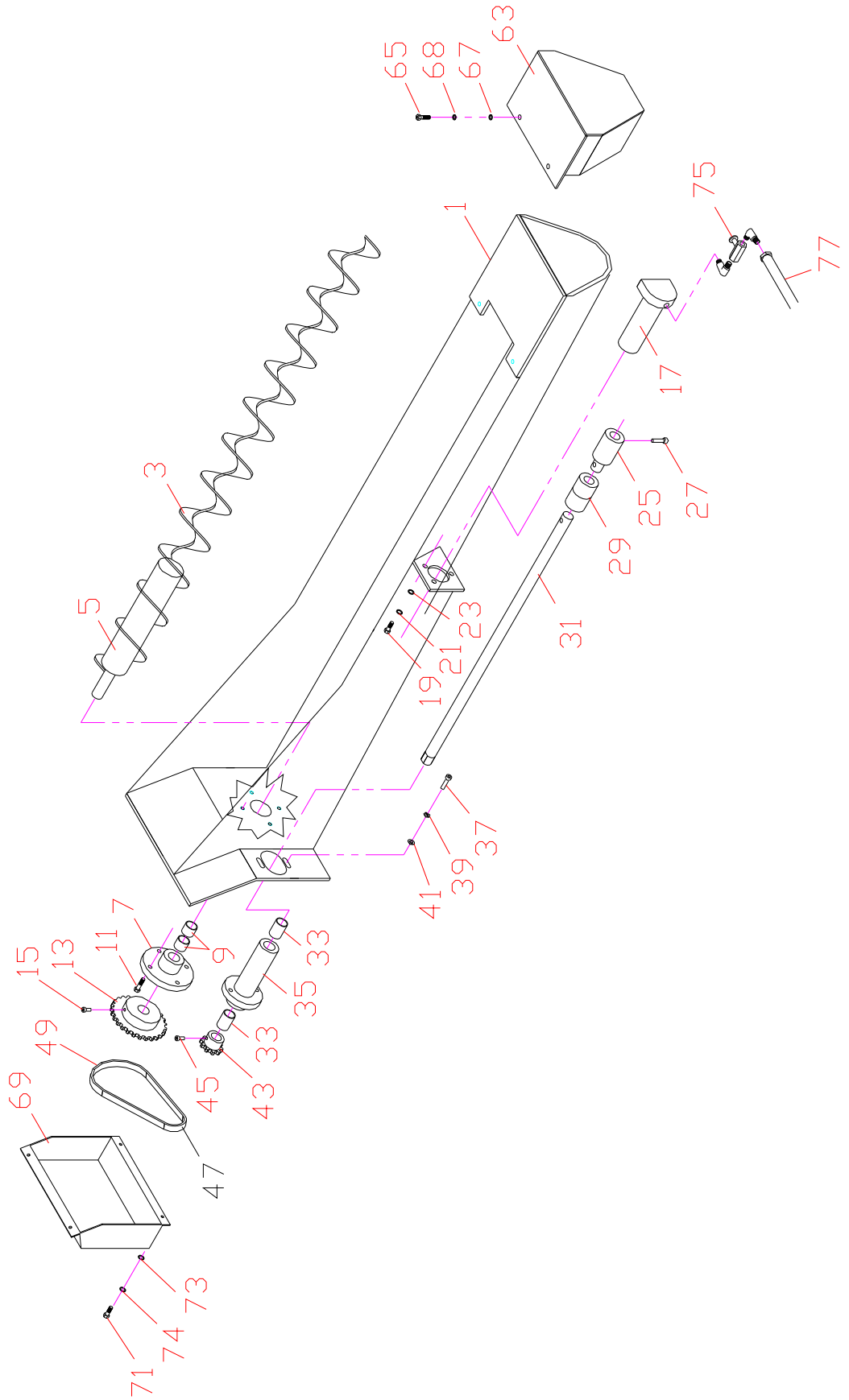


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-1039	valve seat	閥座		1	PCS
3	AHA-1043	valve sleeve	針閥套筒		1	PCS
5	PP-59071	o-ring	O 形環	P-15	1	PCS
7	PP-59075	o-ring	O 形環	P-19	1	PCS
9	PP-58152	snap ring	E 扣環	E-19	1	PCS
11	AHA-1042	spring	彈簧		1	PCS
13	AHA-1041	washer	彈簧墊圈		1	PCS
15	AHA-1040	valve	針閥		1	PCS

PART N

CHIP CONVEYOR ASSEMBLY (OPTIONAL)

PART NO：C360L-C001



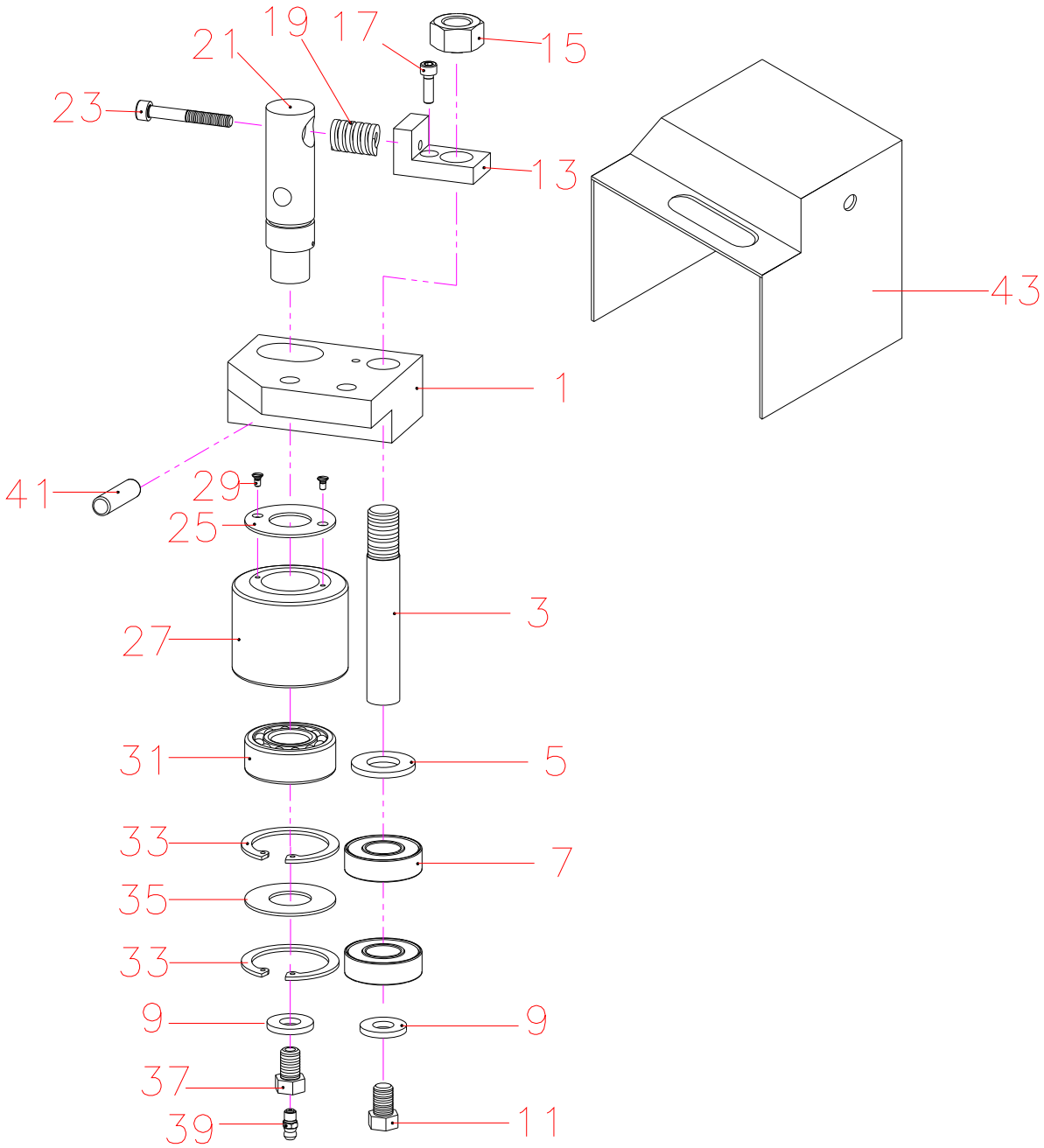
PART N
CHIP CONVEYOR ASSEMBLY (OPTIONAL)
PART NO：C360L-C001

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	C360L-4001	basket	切屑槽		1	PCS
3	AGF-1027	leader screw	除屑螺旋		1	PCS
5	AHN-1416A	rod	除屑螺桿		1	PCS
7	AHN-1411	bearing bracket	軸座		1	PCS
9	PP-13119	du bushing	自潤軸承	2215	2	PCS
11	PBA-6-10	bolt	有頭內六角螺絲	M6x10L	4	PCS
13	AHB-2019D	wheel	鏈輪		1	PCS
15	PBA-5-12	bolt	有頭內六角螺絲	M5x12L	2	PCS
17	PP-31640-1	hydraulic motor	油壓馬達	MMS-32C	1	PCS
19	PBA-6-10	bolt	有頭內六角螺絲	M6x10L	3	PCS
21	PQA-6	spring washer	彈簧華司	M6	3	PCS
23	PPA-6	washer	平面華司	M6	3	PCS
25	AHN-1414	tie shaft	連接軸		1	PCS
27	PAA-6-10	set screw	止付螺絲	M6x10L	1	PCS
29	PP-15031	universal joint	萬向接頭 3 節-16		1	PCS
31	AHN-1403	shaft	傳動心軸		1	PCS
33	PP-13070	du bushing	乾式軸承	1625	2	PCS
35	AHN-1406	bearing bracket	軸座		1	PCS
37	PBA-6-16	bolt	有頭內六角螺絲	M6x16L	2	PCS
39	PQA-6	spring washer	彈簧華司	M6	2	PCS
41	PPA-6	washer	平面華司	M6	2	PCS
43	AHB-2019B	wheel	傳動鍊輪(小)		1	PCS
45	PBA-5-8	bolt	有頭內六角螺絲	M5x8L	2	PCS
47	PP-19061	chain	鏈條	RS35	1	PCS
49	PP-19062	chain joint	鏈條接頭	RS35	1	PCS
63	AHN-1417-CE	cover	除屑螺旋護蓋		1	PCS
65	PBA-6-10	bolt	有頭內六角螺絲	M6x10L	2	PCS
67	PQA-6	spring washer	彈簧華司	M6	2	PCS
68	PPA-6	washer	平面華司	M6	2	PCS
69	AHN-1407A	cover	鍊齒蓋板		1	PCS
71	PBA-5-10	bolt	有頭內六角螺絲	M5x10L	4	PCS
73	PQA-5	spring washer	彈簧華司	M5	4	PCS
74	PPA-5	washer	平面華司	M5	4	PCS
75	PP-43117	flow control valve	流量閥1/4 六角簡易型		1	PCS
77	PP-80009	hydraulic pipe	油壓管 1/4 x 雙x550L		1	PCS

PART O

ANTI-VIBRATION ROLLER ASSEMBLY (OPTIONAL)

PART NO：AHA-33010



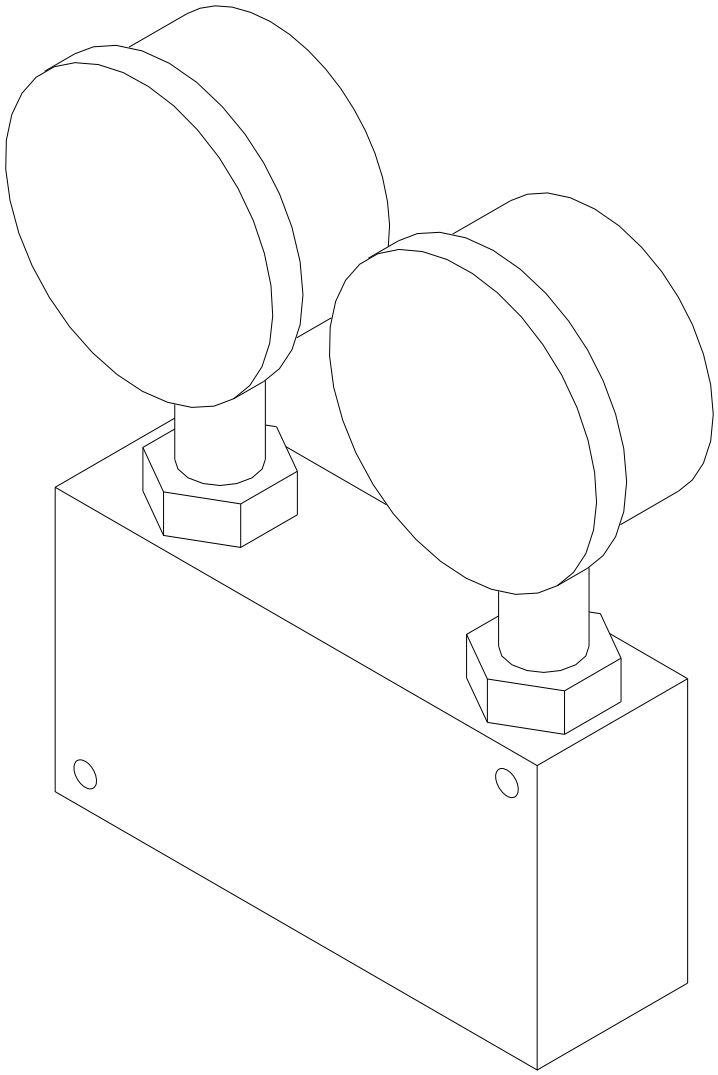
PART O
ANTI-VIBRATION ROLLER ASSEMBLY (OPTIONAL)
PART NO：AHA-33010

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AHA-3303	roller housing	防震座		1	PCS
3	AHA-3305	anti-vibration roller shaft	固定導輪軸		1	PCS
5	PPA-16	flat washer	平面華司(公)	M16	1	PCS
7	PP-14267	bearing	軸承	62032R	2	PCS
9	PPA-10	flat washer	平面華司(公)	M10	2	PCS
11	PLA-10-16	bolt	外六角螺絲	M10 x 16L	1	PCS
13	AGB-3306N	spring adapter	防震彈簧座		1	PCS
15	POA-16-20	nut	螺母	M16	1	PCS
17	PBA-5-16	bolt	有頭內六角螺絲	M5 x 16L	1	PCS
19	PP-57403	spring	彈簧	TH-1625	1	PCS
21	AHA-3302	anti-vibration roller shaft	防震導輪軸		1	PCS
23	PBA-6-45	bolt	有頭內六角螺絲	M6 x 45L	1	PCS
25	AGB-3308	Rubber plate	遮水橡皮		1	PCS
27	AHA-3301	anti-vibration roller	防震導輪		1	PCS
29	PJA-3-6	Screw	平頭螺絲	M3 x 6L	2	PCS
31	PP-14507	Bearing	調心軸承	2204	1	PCS
33	PP-58111	Snap ring	扣環	R47	2	PCS
35	AGB-3307A	grease seal plate	牛油擋	26 x47 x2	1	PCS
37	AGB-3309	Nipple bolt	油咀螺絲		1	PCS
39	PUC-020	Nipple	油嘴	1/4-28UNF	1	PCS
41	PRD-8-40	Pin	平行銷	Φ 8 x 40 mmL	1	PCS
43	AHA-3317	cover	防震滾輪護蓋		1	PCS

PART P

VISE HYDRAULIC PRESSURE REGULATOR (OPTIONAL)

PART NO: AHA-10400

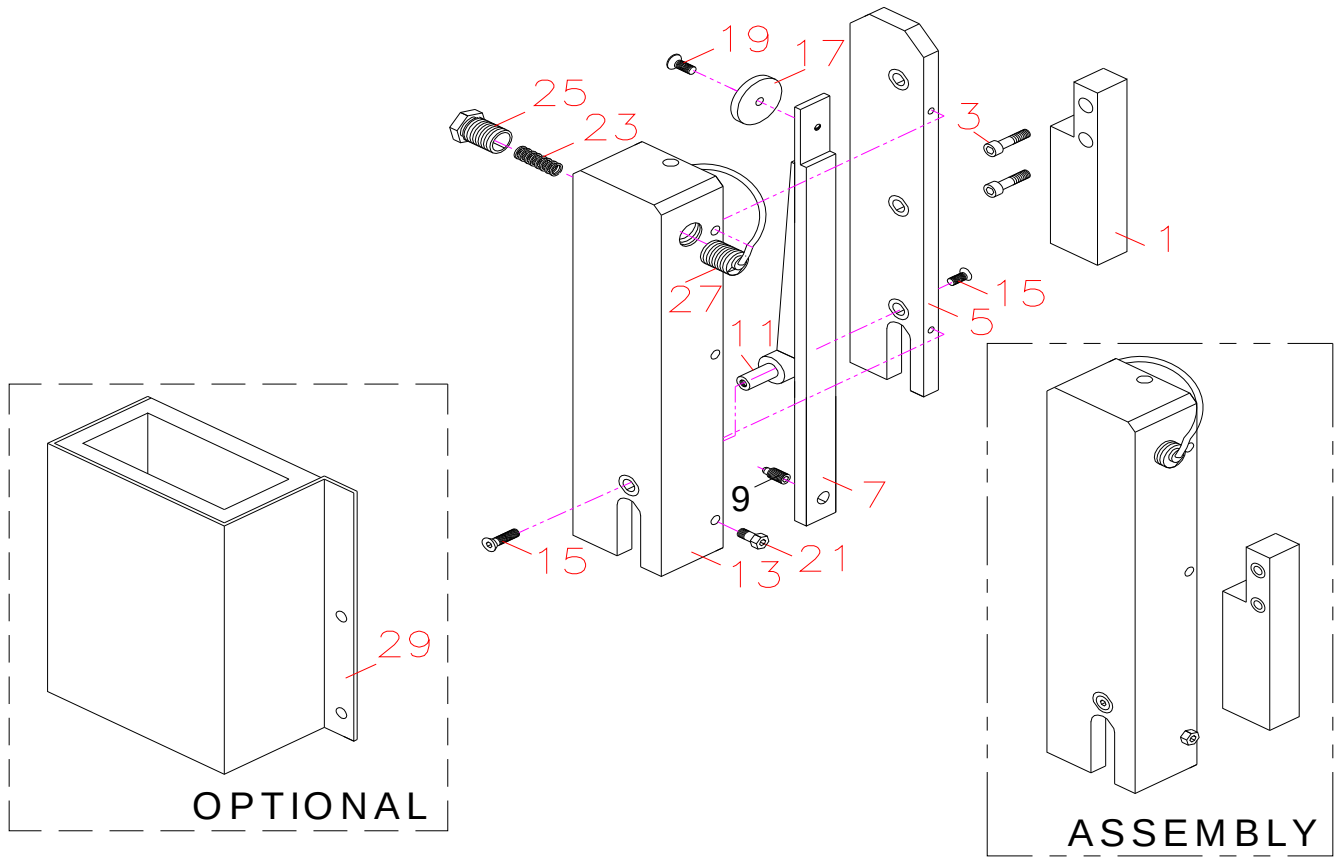


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	PP-43127A	relief valve	減壓閥	RSW-902	1	PCS
3	PP-43311	pressure gauge	壓力表	70kg* 2 1/2 * 1/4PT	2	PCS

PART Q

CHECK STRAIGHT SENSOR MODULE (OPTIONAL)

PART NO: AHC-33010

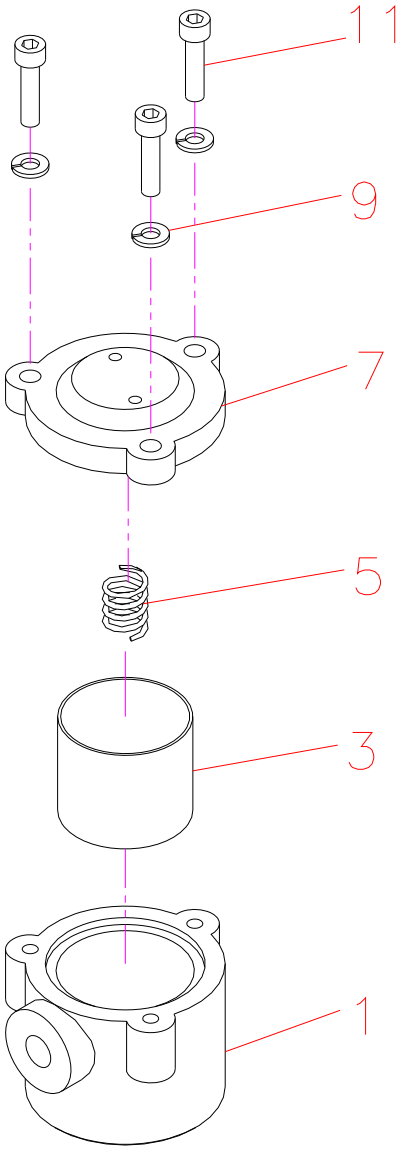


ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	NGG-3323	fixed plate	歪斜檢知固定板		1	PCS
3	PBA-5-20	bolt	有頭內六角螺絲	M5xP0.8x20L	2	PCS
5	AHC-3301	base	歪斜檢知本體	(32W)	1	PCS
7	AHC-3302	bed plate	偵測底板	鋸帶 32W 用	1	PCS
9	NGG-3303	thimble	鎢鋼頂針		1	PCS
11	AHC-3304	sensor rod	偵測板轉軸		1	PCS
13	AHC-3305	protecting cover	歪斜檢知護蓋		1	PCS
15	PJA-5-15	bolt	平頭螺絲(十字)	Ø5x15L	2	PCS
17	AHC-3306	sensor board	偵測板		1	PCS
19	PJA-5-8	bolt	平頭螺絲(十字)	Ø5x8L	1	PCS
21	PBA-5-15	bolt	有頭內六角螺絲	M5xP0.8x15L	7	PCS
23	M3L-9-10	spring	微動彈簧		1	PCS
25	NGG-3309	holder	偵測彈簧座		1	PCS
27	PP-90419	sensor	近接開關	BAW M18ME-UAC50B-BP03	1	PCS
29	AER-3107	protecting cover	線速表護蓋	OPTIONAL	1	PCS

PART R

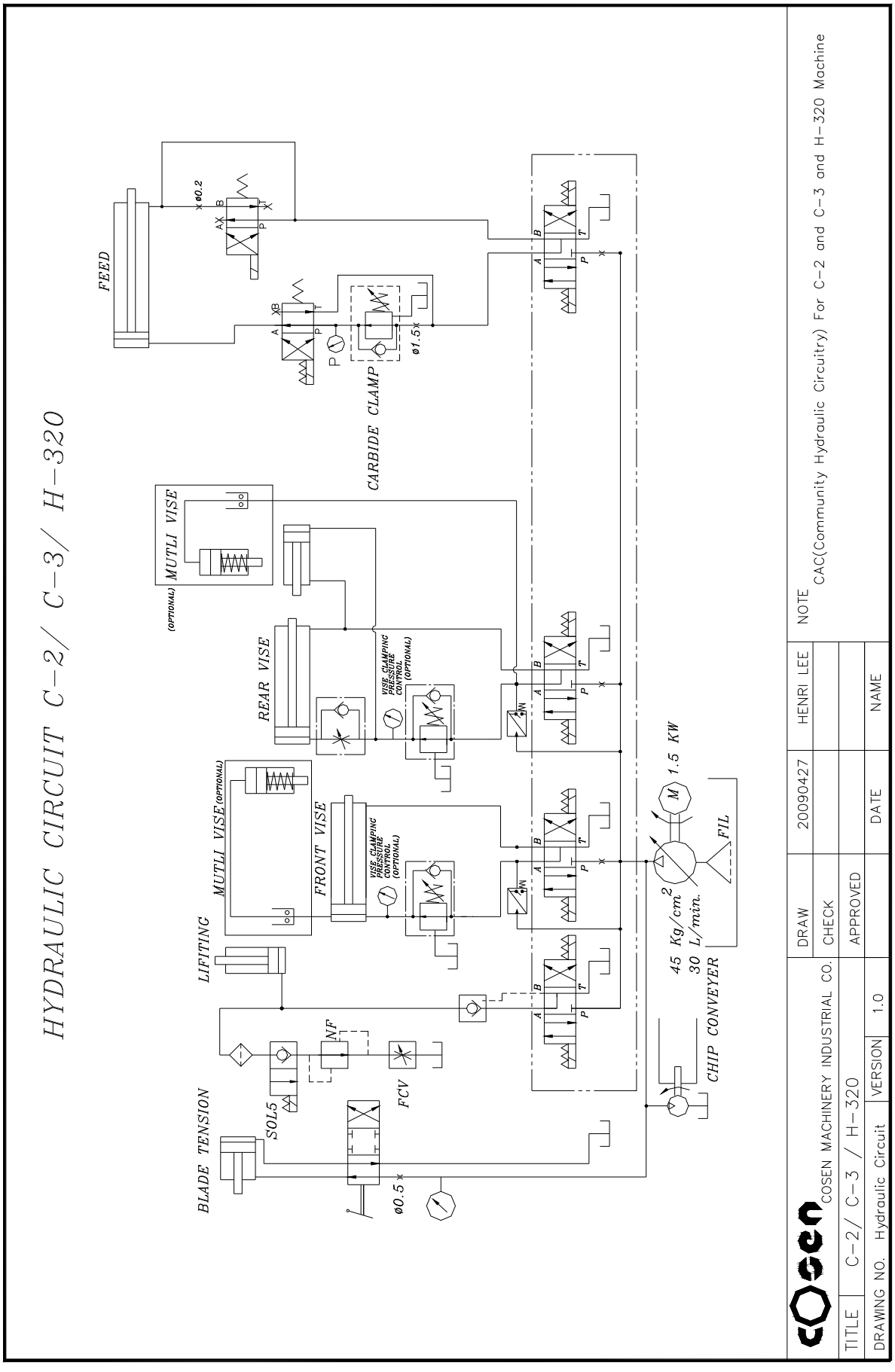
OIL FILTER ASSEMBLY

PART NO : AGB-707270



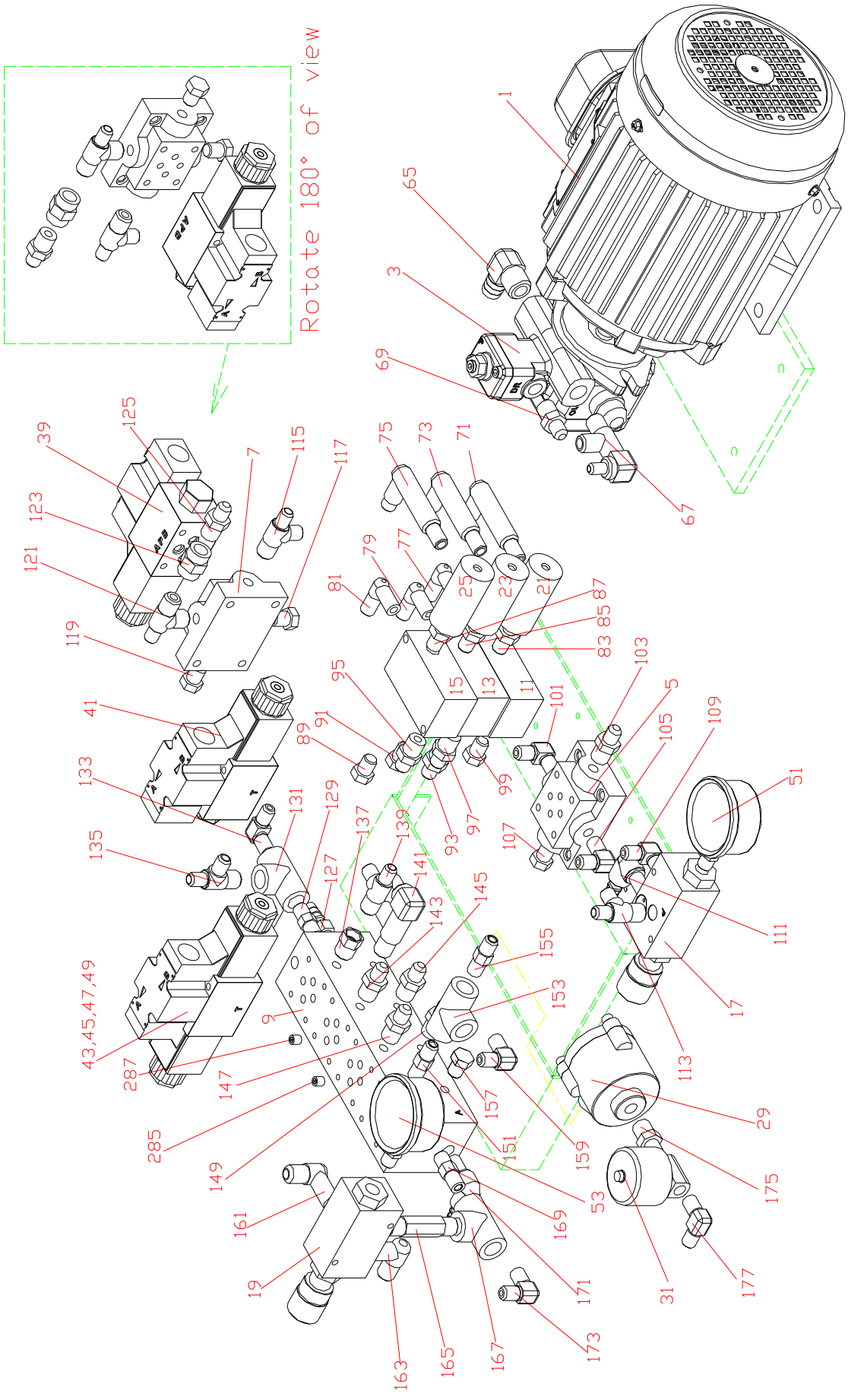
ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	AGB-70727	filter frame	濾油器本體		1	PCS
3	AGB-70730	filter	濾油器芯		1	PCS
5	AGB-70729	spring	濾油器彈簧		1	PCS
7	AGB-70728	cap	濾油器蓋		1	PCS
9	PQA-6	spring washer	彈簧華司	M6	3	PCS
11	PBA-6-25	bolt	有頭內六角螺絲	M6x25L	3	PCS

PART S
HYDRAULIC ASSEMBLY INSTRUCTION



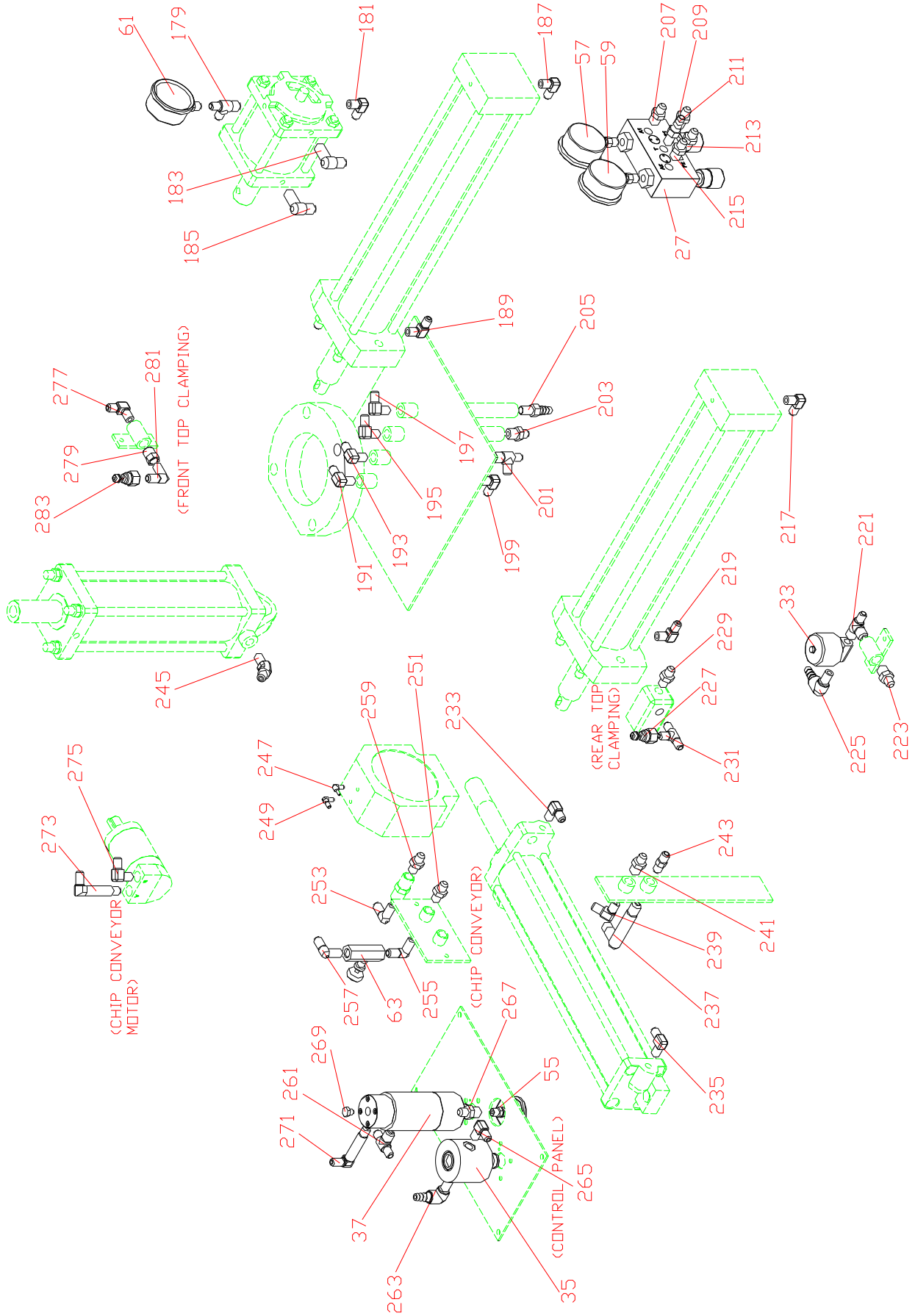
PART S

HYDRAULIC ASSEMBLY INSTRUCTION



PART S

HYDRAULIC ASSEMBLY INSTRUCTION



PART S
HYDRAULIC ASSEMBLY INSTRUCTION

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
1	PP-31421	Hydraulic motor	液壓馬達		1	PCS
3	PP-322220	Hydraulic pump	液壓泵浦	VCMSF20B10	1	PCS
5	SJM-4043-1	Plate	油路板		1	PCS
7	SJM-4043-1	Plate	油路板		1	PCS
9	AHA-1001B	Plate	油路板		1	PCS
11	AHB-1562Y1	Vise plate	油路板		1	PCS
13	AHB-1562Y1	Vise plate	油路板		1	PCS
15	AHB-1562Y1	Vise plate	油路板		1	PCS
17	PP-43127B	Regular valve	調節閥		1	PCS
19	PP-43127B	Regular valve	調節閥		1	PCS
21	NGG-33000-1	Diff. pressure unit	差壓閥組		1	PCS
23	NGG-33000-1	Diff. pressure unit	差壓閥組		1	PCS
25	NGG-33000-1	Diff. pressure unit	差壓閥組		1	PCS
27	PP-43127A	Regular valve	調節閥		1	PCS
29	AGB-707270	Oil filter	濾油器		1	PCS
31	PP-43601	CKD	電磁閥	MK2-3016-8 1.6mm	1	PCS
33	PP-43601	CKD	電磁閥	MK2-3016-8 1.6mm	1	PCS
35	AHA-6100	Pressure valve	壓力瓣		1	PCS
37	AHA-10289	Flow valve	流量閥		1	PCS
39	PP-43503	Sol. valve	電磁閥	DBF-2B2-02-C1	1	PCS
41	PP-43503	Sol. valve	電磁閥	DBF-2B2-02-C1	1	PCS
43	PP-43521	Sol. valve	電磁閥	DBF-3C4-02-C1	1	PCS
45	PP-43521	Sol. valve	電磁閥	DBF-3C4-02-C1	1	PCS
47	PP-43521	Sol. valve	電磁閥	DBF-3C4-02-C1	1	PCS
49	PP-43521	Sol. valve	電磁閥	DBF-3C4-02-C1	1	PCS
51	PP-43311	Pressure gauge	壓力表		1	PCS
53	PP-43311	Pressure gauge	壓力表		1	PCS
55	PP-43309	Diff. pressure gauge	差壓表		1	PCS
57	PP-43311	Pressure gauge	壓力表		1	PCS
59	PP-43311	Pressure gauge	壓力表		1	PCS
61	PP-43311	Pressure gauge	壓力表		1	PCS
63	PP-43117B	Regular valve	調節閥		1	PCS
65	PUJ-060-060-01	Elbow 90°	彎頭	3/4Px3/4E	1	PCS
67	PUK-030-020-020-01	Elbow 3way	三通彎頭	3/8Px3/8Hx1/4H	1	PCS
69	PUI-030-040-01	Joint	接頭	3/8Px1/2E	1	PCS
71	PUJ-020-020-01	Elbow 90° 70L	彎頭	1/4Px1/4H 70L	1	PCS
73	PUJ-020-020-01	Elbow 90° 70L	彎頭	1/4Px1/4H 70L	1	PCS
75	PUJ-020-020-01	Elbow 90° 70L	彎頭	1/4Px1/4H 70L	1	PCS
77	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
79	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
81	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
83	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
85	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
87	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
89	PED-015	Plug	塞頭	1/4Hex	1	PCS
91	PED-015	Plug	塞頭	1/4Hex	1	PCS
93	PUI-020-030-04	Joint	接頭	1/4Px3/8H	1	PCS
95	PUI-020-030-04	Joint	接頭	1/4Px3/8H	1	PCS
97	PUI-020-030-04	Joint	接頭	1/4Px3/8H	1	PCS
99	PED-015	Plug	塞頭	1/4Hex	1	PCS

PART S
HYDRAULIC ASSEMBLY INSTRUCTION

ITEM	PART NO.	PART NAME	PART NAME(CH)	PART SPEC.	COUNT	UNIT
101	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
103	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
105	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
107	PED-015	Plug	塞頭	1/4Hex	1	PCS
109	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
111	PUJ-030-040-02	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
113	PUK-030-020-020-01	Elbow 3way	三通彎頭	3/8Px1/4Hx1/4H	1	PCS
115	PUK-030-020-020-01	Elbow 3way	三通彎頭	3/8Px1/4Hx1/4H	1	PCS
117	PED-015	Plug	塞頭	1/4Hex	1	PCS
119	PED-015	Plug	塞頭	1/4Hex	1	PCS
121	PUK-030-030-020-01	Elbow 3way	三通彎頭	3/8Px3/8Hx1/4H	1	PCS
123	PUI-030-030-03	Joint	接頭	3/8Px3/8P	1	PCS
125	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
127	PUI-030-030-01	Joint	接頭	3/8Px1/4H	1	PCS
129	PUI-030-030-04	Joint	接頭	3/8Px3/8H	1	PCS
131	PUK-030-030-030-04	Elbow 3way	三通彎頭	3/8Hx3/8Hx3/8H	1	PCS
133	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
135	PUK-030-020-020-01	Elbow 3way	三通彎頭	3/8Px1/4Hx1/4H	1	PCS
137	PUH-030-020-02	Bushing	卜申	3/8x1/2	1	PCS
139	PUK-020-020-030-01	Elbow 3way	三通彎頭	1/4Px1/4Hx3/8H	1	PCS
141	PUK-030-030-020-01	Elbow 3way	三通彎頭	3/8Px3/8Hx1/4H	1	PCS
143	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
145	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
147	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
149	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
151	PUI-030-030-05	Joint	接頭	3/8Px3/8P	1	PCS
153	PUK-030-030-030-01	Elbow 3way	三通彎頭	INTER 3/8	1	PCS
155	PUI-030-030-05	Joint	接頭	3/8Px3/8P	1	PCS
157	PED-015	Plug	塞頭	1/4Hex	1	PCS
159	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
161	PUJ-030-030-04	Elbow 90°	彎頭	3/8Px3/8H	1	PCS
163	PUJ-030-040-02	Elbow 90°	彎頭	3/8Px1/2E	1	PCS
165	PUI-020-020-09	Joint	接頭	1/4Px1/4P 50L	1	PCS
167	PUK-030-030-030-01	Elbow 3way	三通彎頭	INTER 3/8	1	PCS
169	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
171	PUJ-030-040-02	Elbow 90°	彎頭	3/8Hx1/2P	1	PCS
173	PUJ-030-030-04	Elbow 90°	彎頭	3/8Px3/8H	1	PCS
175	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
177	PUJ-030-030-04	Elbow 90°	彎頭	3/8Px3/8H	1	PCS
179	PUK-030-020-020-01	Elbow 3way	三通彎頭	3/8Px1/4Hx1/4H	1	PCS
181	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
183	PUJ-030-030-02	Elbow 90°	彎頭	3/8Px3/8E	1	PCS
185	PUJ-030-030-02	Elbow 90°	彎頭	3/8Px3/8E	1	PCS
187	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
189	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
191	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
193	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
195	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
197	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
199	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS

PART S
HYDRAULIC ASSEMBLY INSTRUCTION

ITEM	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
201	PUK-030-030-020-01	Elbow 3way	三通彎頭	3/8Px3/8Hx1/4H	1	PCS
203	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
205	PUI-030-030-01	Joint	接頭	3/8Px3/8E	1	PCS
207	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
209	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
211	PUI-030-030-01	Joint	接頭	3/8Px3/8E	1	PCS
213	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
215	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
217	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
219	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
221	PUK-030-030-020-01	Elbow 3way	三通彎頭	3/8Px3/8Hx1/4H	1	PCS
223	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
225	PUJ-030-040-02	Elbow 90°	彎頭	3/8Px1/2E	1	PCS
227	PP-21099	Quick adapter	快拆接頭		1	PCS
229	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
231	PUK-020-020-020-03	Elbow 3way	三通彎頭	1/4Px1/4Px1/4P	1	PCS
233	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
235	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
237	PUJ-030-030-06	Elbow 90°	彎頭	3/8Px3/8H 50L	1	PCS
239	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
241	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
243	PUI-030-030-05	Joint	接頭	3/8Px3/8P	1	PCS
245	PUJ-020-020-06	Elbow 45°	彎頭	1/4Px1/4H 45°	1	PCS
247	PUJ-010-020-01	Elbow 90°	彎頭	1/8Px1/4H CU	1	PCS
249	PUJ-010-030-02	Elbow 90°	彎頭	1/8Px3/8H	1	PCS
251	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
253	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
255	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
257	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
259	PUI-020-020-11	Joint	接頭	1/4Px1/4H	1	PCS
261	PUK-020-030-030-01	Elbow 3way	三通彎頭	1/4Px3/8Hx3/8H	1	PCS
263	PUJ-030-040-02	Elbow 90°	彎頭	3/8Px1/2E	1	PCS
265	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
267	PUI-030-020-01	Joint	接頭	3/8Px1/4H	1	PCS
269	PED-015	Plug	塞頭	1/4Hex	1	PCS
271	PUJ-030-020-01	Elbow 90°	彎頭	3/8Px1/4H 70L	1	PCS
273	PUJ-030-020-01	Elbow 90°	彎頭	3/8Px1/4H 70L	1	PCS
275	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
277	PUJ-030-020-03	Elbow 90°	彎頭	3/8Px1/4H	1	PCS
279	PUH-030-020-02	Bushing	卜申	3/8x1/2	1	PCS
281	PUJ-020-020-05	Elbow 90°	彎頭	1/4Px1/4H	1	PCS
283	PP-21099	Quick adapter	快拆接頭		1	PCS
285	AGC-1015-1	Plug	塞頭		1	PCS
287	AGC-1015-1	Plug	塞頭		1	PCS

PART S
HYDRAULIC ASSEMBLY INSTRUCTION

From To	PART NO.	PART NAME	PART NAME (CH)	PART SPEC.	COUNT	UNIT
65 ->oil tank		PRESSURE PIPE	壓力管	3/4x3/4x600L	1	PCS
117 -> oil tank	PP-80051D	RETURN PIPE	回油管	1/4x1100L	1	PCS
67 -> 161	PP-80137	PRESSURE PIPE	壓力管	3/8x3/8x850L	1	PCS
67 -> 179	PP-80018A	PRESSURE PIPE	壓力管	1/4 x 1/4 x4100L	1	PCS
71 -> 133	PP-80060	PRESSURE PIPE	壓力管	1/4 x 1/4 x400L	1	PCS
73 -> 135	PP-80060	PRESSURE PIPE	壓力管	1/4 x 1/4 x400L	1	PCS
75 -> 135	PP-80060	PRESSURE PIPE	壓力管	1/4 x 1/4 x400L	1	PCS
77 -> 209	PP-80045	PRESSURE PIPE	壓力管	1/4 x 1/4 x1300L	1	PCS
79 -> 213	PP-80045	PRESSURE PIPE	壓力管	1/4 x 1/4 x1300L	1	PCS
81 -> 199	PP-80060	PRESSURE PIPE	壓力管	1/4 x 1/4 x400L	1	PCS
115 -> 233	PP-80065A	PRESSURE PIPE	壓力管	1/4 x 1/4 x800L	1	PCS
115 -> 125	PP-80005	PRESSURE PIPE	壓力管	1/4 x 1/4 x200L	1	PCS
121 -> 147	PP-80063A	PRESSURE PIPE	壓力管	1/4 x 1/4 x860L	1	PCS
113 -> 149	PP-80056A	PRESSURE PIPE	壓力管	1/4 x 1/4 x260L	1	PCS
113 -> 105	PP-80057	PRESSURE PIPE	壓力管	1/4 x 1/4 x280L	1	PCS
103 -> 235	PP-80065A	PRESSURE PIPE	壓力管	1/4 x 1/4 x800L	1	PCS
109 -> 101	PP-80060	PRESSURE PIPE	壓力管	1/4 x 1/4 x400L	1	PCS
111 -> oil tank		RETURN PIPE	回油管	1/4 returned	1	PCS
171 -> oil tank		RETURN PIPE	回油管	1/4 returned	1	PCS
163 -> oil tank		RETURN PIPE	回油管	1/4 returned	1	PCS
165 -> 251	PP-80004	PRESSURE PIPE	壓力管	1/4 x 1/4 x1000L	1	PCS
259 -> oil tank		RETURN PIPE	回油管	1/4 returned	1	PCS
177 -> 203	PP-80019	PRESSURE PIPE	壓力管	1/4 x 1/4 x 2100L	1	PCS
159 -> 245	PP-80008	PRESSURE PIPE	壓力管	1/4 x 1/4 x700L	1	PCS
143 -> 95	PP-80031	PRESSURE PIPE	壓力管	1/4 x 1/4 x300L	1	PCS
145 -> 97	PP-80031	PRESSURE PIPE	壓力管	1/4 x 1/4 x300L	1	PCS
141 -> 93	PP-80031	PRESSURE PIPE	壓力管	1/4 x 1/4 x300L	1	PCS
141 -> 243	PP-80137	PRESSURE PIPE	壓力管	3/8 x 3/8 x850L	1	PCS
139 -> 241	PP-80065A	PRESSURE PIPE	壓力管	1/4 x 1/4 x820L	1	PCS
139 -> 219	PP-80017	PRESSURE PIPE	壓力管	1/4 x 1/4 x1900L	1	PCS
263 -> oil tank	PP-80052	RETURN PIPE	回油管	1/4 x 2100L	1	PCS
215 -> 201	PP-80008	PRESSURE PIPE	壓力管	1/4 x 1/4 x700L	1	PCS
205 -> oil tank	PP-80051C	RETURN PIPE	回油管	1/4 x 1000L	1	PCS
191 -> 189	PP-80031	PRESSURE PIPE	壓力管	1/4 x 1/4 x300L	1	PCS
193 -> 187	PP-80009	PRESSURE PIPE	壓力管	1/4 x 1/4 x550L	1	PCS
223 -> 231	PP-80065A	PRESSURE PIPE	壓力管	1/4 x 1/4 x800L	1	PCS
225 -> oil tank		RETURN PIPE	回油管	1/4 returned	1	PCS
181 -> oil tank	PP-80401	RETURN PIPE	回油管	1/4 x 4400L	1	PCS
237 -> 249	PP-80065A	PRESSURE PIPE	壓力管	1/4 x 1/4 x820L	1	PCS
239 -> 247	PP-80137	PRESSURE PIPE	壓力管	3/8 x 3/8 x850L	1	PCS
195 -> 271	PP-80004	PRESSURE PIPE	壓力管	1/4 x 1/4 x1000L	1	PCS
229 -> 217	PP-80009	PRESSURE PIPE	壓力管	1/4 x 1/4 x550L	1	PCS
261 -> 265	PP-80009	PRESSURE PIPE	壓力管	1/4 x 1/4 x300L	1	PCS
261 -> 267		COPPER PIPE	銅管現配	1/4 x 1/4 x350L	1	PCS
257 -> 273	PP-80009	PRESSURE PIPE	壓力管	1/4 x 1/4 x550L	1	PCS
253 -> 275	PP-80009	PRESSURE PIPE	壓力管	1/4 x 1/4 x550L	1	PCS
201 -> 277	PP-80072	PRESSURE PIPE	壓力管	1/4 x 1/4 x2900L	1	PCS
183 -> 185		COPPER PIPE	銅管現配	3/8 x 3/8 x350L	1	PCS

Section 11

Warranty

Warranty

New machines are warranted to be free from defects in workmanship and material for a period of one (1) year from the date of shipment by Seller. The warranty period is based on normal usage of two thousand eighty hours (2080) per year and is reduced proportionately for any excess usage. Products, which under normal operating conditions in Buyer's plant are defective in workmanship or material, will be repaired or replaced at the option of Seller.

This warranty does not cover shipping freight charges for either the return of the defective part or for the shipping of the replacement or repaired part.

Seller will have no obligation to repair or replace perishable parts, or materials or parts damaged by misuse, negligence or failure of Buyer to provide appropriate maintenance and service as stated in the operator's manual or industry standard and normally acceptable practices.

This warranty does not apply if the machine has been altered or modified without our prior written consent.

In the case of components or units purchased by Seller including work holding devices, tool holders, motors and controls, the warranty shall not exceed that received by Seller from the supplier of such components or units.

Seller will not assume responsibility for products or components returned to Seller without prior consent or for unauthorized repairs to its products, even though defective.

Electrical Equipment: The warranty available for all electrical components to the Buyer will be voided if the voltage supplied to the machine is found to be outside the stated voltage of the machine by +/- 10% and/or grounded at machine.

Accessories Supplied with Manufacturer's Equipment: The warranties available to the Buyer are those extended by the accessory manufacturer, if any, to the extent they are in force and effect. The ACCESSORY MANUFACTURER'S WARRANTY, if any, is exclusive and is in lieu of all other warranties whether written, oral or implied.

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