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# **SUNRISE HYDRAULIC PUNCHING MACHINE**

## **PM MODELS**

## **OPERATION & MAINTENANCE MANUAL**

**Original Instructions**  
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## TABLE OF CONTENTS

Introduction .....	1
Safety Precautions .....	2
Transport .....	6
Installation .....	7
Standard Equipment .....	9
Control Switches.....	10
Low pressure tool alignment with JOG mode.....	12
Foot Switch .....	13
Stroke Adjustment .....	14
Adjust the Punch Cylinder Ram .....	15
Punching Station .....	16
Standard Equipment .....	16
Alignment of Punch and Die .....	16
Punch and Die Clearance .....	17
Adjusting Stripper .....	17
Actual Punching Force .....	18
Precaution .....	18
Punch and Die Lubricant .....	18
Punch Operation .....	19
Punching Station Assembly .....	21
Optional Tooling	
I. Press Brake .....	22
II. Duplicating Table .....	23
III. Hydraulic Punching Stripper .....	25
Maintenance .....	26
Trouble Shooting .....	28
Hydraulic Circuit Diagram PM-35 .....	30
Hydraulic Parts PM-35 .....	31
Hydraulic Circuit Diagram PM-55, PM-80 .....	32
Hydraulic Parts PM-55, PM-80 .....	33
Hydraulic Circuit Diagram PM-120, PM-160, PM-200 .....	34
Hydraulic Parts PM-120, PM-160, PM-200.....	35
Electrical Circuit Diagram .....	36
Electrical Parts List .....	37



## **INTRODUCTION**

The Sunrise Punching Machine is a hydraulically powered machine for punching holes on metals. There are many optional accessories that can be used on the punching machine and turns it into an universal machine. Some example of optional tooling include Press Brake, Bar Shear Tooling, Flat Bar Shear Tooling, Channel or Sectional Bar Shear Tooling, Angle Shear Tooling, Notching Tooling, Pipe Notching, Pipe Punching, and punches and dies of various shapes and sizes.

Each machine has been individually tested in the factory and under-gone an extensive pre-delivery check to ensure that the machines meet the highest quality standard. The punching machine has been designed to be a reliable and dependable machine with excellent performance. We know the working quality of the machine will confirm that you have made a good choice by selecting Sunrise products for your facility.

In order to have a better understanding of the operating procedures, to obtain maximum benefits from the machine, and to minimize the maintenance cost of the equipment, please have the operators and engineers read this Manual thoroughly and carefully before operating the machine.

## **SAFETY PRECAUTIONS**

### **IMPORTANT:**

**It is the duty of both employer and employees to acquaint themselves with the safe working practices contained in this manual and ensure that all operators adopt these practices.**

To ensure safe operation, guards are provided for the work stations. NEVER REMOVE THESE GUARDS. If any guards are damaged or worn out, replace immediately with new guards.

While every effort has been made to furnish sufficient safe guards, this equipment, if not operated and maintained properly, has the potential to cause serious injury or death. A thorough knowledge of the machine and operating with carefulness is the best protection against accidents.

All operations are controlled by the foot switch. The operator should be familiar with the control and function of the switch before perform the operation.

Many warning labels are fixed on the machine. NEVER REMOVE THESE LABELS. Be sure to follow these warnings to avoid injury. Please also pay attention to the following general rules:

1. Do not operate the machine unless the stripper is in place. Use of optional attachments/tooling should also have proper hold-downs and guards installed.
2. **All operators must wear Protective Glasses during operation ot protect the eyes.**
3. Before each operation, make sure no other person is near the machine. Only the operator should be near the machine during operation.



4. Any maintenance/repair of electrical/hydraulic circuit; change/adjust of tooling; and alignment of punch-die should be done only by qualified engineers or personnel.
5. Always turn off power and disconnect electric supply before doing any tool change or maintenance work.
6. After tool changes, always check punch & die alignment before operation.
7. **Keep hands clear of all moving parts at all times. Fingers must not go under or inside the stripper.**
8. If any problem or abnormal condition arises during operation, stop the machine immediately and report to a supervisor. Do not turn on the machine again until the problem is rectified by qualified personnel.
9. The machine should never be left under power when not in operation or unattended. Always isolate the machine after turned the power off.
10. After completion of operation, all slugs and waste materials must be cleaned away from the machine.
11. Regularly check all stations and tooling for defects and wear to ensure safety and maintain good condition.
12. Heavy materials should be supported.
13. Use handling equipment when lifting heavy tooling and materials.
14. Do not punch partial holes as this creates a side load force on the punch and can result in tool breakage. Special tooling may be available for this purpose.
15. **Do not punch material thicker than the diameter of the punch.** Doing so can overload and break the punch and create a hazard.



16. Never exceed the rated capacity of the machine. Refer to the specification chart for details for each model.

**The manufacturer shall not be held for any liability for damages, body injuries and other consequences to machine, material, and/or persons caused by the non-compliance of the above safety precaution procedures, in particular for the following situation:**

1. **Removing or disabling any guards or hold-downs is a violation and will result in the termination of your warranty.**
2. **Place of any body part under or inside the safety guards/stripper.**
3. **Did not wear protective glasses for the eyes.**
4. **Did not close the stripper during operation.**
5. **Did not properly adjusted the clearance resulting the tooling hitting each other.**
6. **Did not interrupt the main electric power supply before any maintenance or repair work.**
7. **Damage of electric parts or risk of fire due to incorrect electric power supply.**
8. **Damage of pump or other hydraulic parts due to incorrect setting of the limit switches.**



## **DANGER**

- **KEEP HANDS CLEAR OF ALL MOVING PARTS.**
- **ALL GUARDS MUST BE IN POSITION BEFORE OPERATING THE MACHINE.**
- **ALWAYS POSITION MATERIAL UNDER A CORRECTLY SET STRIPPER/HOLD-DOWN. NEVER ALLOW THE MATERIAL TO FEED BEYOND THE HOLD-DOWN.**

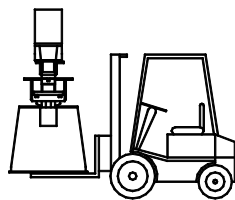
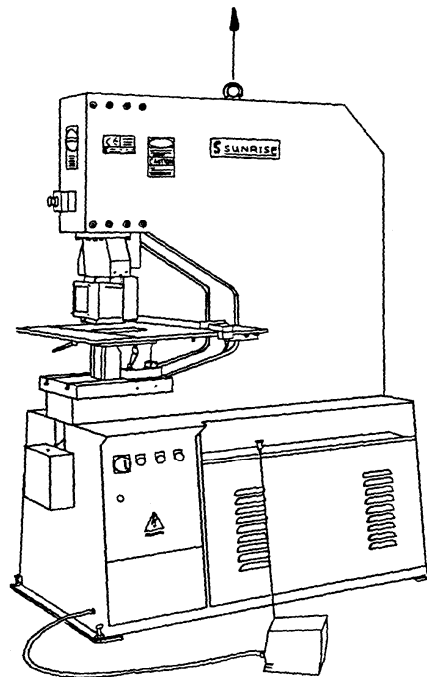
## **CAUTION**

- **THOROUGHLY READ THE OPERATION MANUAL BEFORE OPERATION.**
- **TURN OFF POWER AND ISOLATE THE MACHINE WHEN CHANGING TOOLING OR DOING MAINTENANCE.**
- **ALL MAINTENANCE/REPAIR WORK MUST BE DONE BY QUALIFIED PERSONNEL.**
- **IF ANY PROBLEM OR ABNORMAL CONDITION OCCURS, STOP THE MACHINE IMMEDIATELY. DO NOT OPERATE THE MACHINE AGAIN UNTIL THE PROBLEM IS FIXED.**

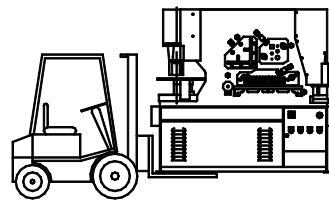
## TRANSPORT

When transporting the machine by a crane, hook the crane to the eye bolt on top of the machine. **Do not use slings under the machine.** Pay special care if lifting / transporting the machine with forklifts. The forks should extend fully to cover the width of the machine. **Do not put the forks from either end.**

**NOTE:** As the top of the machine is heavy, the high center of gravity can cause the machine to tip over if machine is not in good balance.



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## **INSTALLATION**

The machine only requires the normal industrial concrete foundation. If the ground is uneven and the machine vibrates during operation, use foundation bolts to tighten the machine firmly to the ground or alternatively mount the machine on anti-vibration pads.

### **IMPORTANT:**

- Maintain a spacious working area around the machine for safety.
- Have the work area well illuminated with proper lighting.
- Clean the scraps and waste materials regularly, and make sure the work area is free of obstructing objects.
- Keep the ground free of oil and make sure it is not slippery.
- If long lengths of material are to be fed into the machine, make sure that they will not extend into any gangways.

*Crowded, poorly illuminated or slippery area are often causes for accidents.*

Remove all anti-corrosion grease after installing the machine. Check that the oil reservoir, located in the machine base, has been properly filled. When refilling oil, use recommended oil and fill the reservoir to the upper level of the oil level gauge.

### **Connecting Power Supply**

Electrical wiring must be done by a qualified electrician. Before connecting the electrical supply, make sure the voltage and current is compatible to the electrical components in the machine. Check the data shown in the electrical control box.

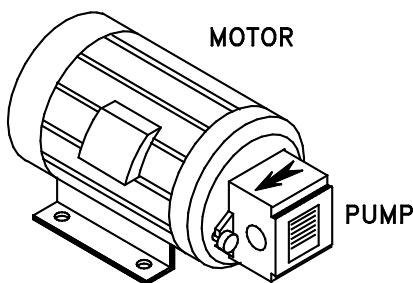
**IMPORTANT: Turn off Supply Electricity at your facility's circuit breaker before making electrical connections to the machine.**

To connect the power cord:

- 1) Open the electric box.
- 2) Remove the small panel under the electric box.
- 3) Insert the power cord through the entrance hole on the base of machine, and then through the base of electric box.
- 4) Connect the three phase wires to the power terminal strip in the electric box.
- 5) Also make sure to ground the machine properly.
- 6) Check that the power cord surface is not damaged, scratched or cut during installation.
- 7) Reinstall the panel and close the electric box.

To check the correct rotation of the motor.

- Remove the back cover.
- Briefly start and stop the motor and check that the motor rotates in the same direction as the arrow indicated on motor. **Improper rotation can severely damage the pump.**
- To change the motor rotation, first make sure the power is disconnected, then reverse any two of the three phases of the electrical power supply.





**STANDARD EQUIPMENT SUPPLIED WITH MACHINE**  
**(including items pre-installed on the machine)**

Punch and Die (20mm)	1 set
Punch Support Tables	1 set
Punch Retaining Nut / Sleeve	1 set
Die Holder	1 pc
Punch Stripper Unit	1 pc
Lifting Eye Bolt	1 pc

TOOL BOX	1 pc
Adjustable Spanner (250mm)	1 pc
Screw Drivers (+)	1 pc
Screw Driver (-)	1 pc
Hex Key Wrench Set	1 set
Hex Wrench (12mm)	1 pc
Hex Wrench (14mm)	1 pc
SPA Spanner	1 pc



## **CONTROL SWITCHES**

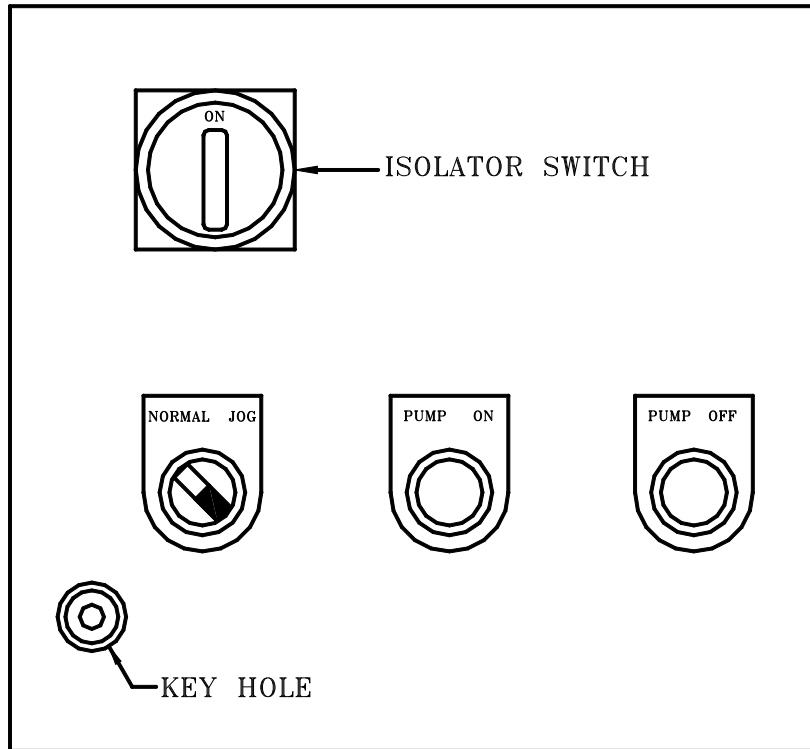
**EMERGENCY STOPS** – Use the EMERGENCY STOP buttons to stop the machine in an emergency. The Emergency button must be released before the PUMP ON button will function. To release the emergency stop button, turn knob slightly to the right.

**ISOLATOR Switch** - This switch controls the main electric source. It also functions as a lock for the electric box. At the ON position the switch locks the electric box and enables you to start the machine. At the OFF position, the power is cut off and the electric box can be opened.

**PUMP ON** - Push this button to turn on the machine. All EMERGENCY STOP buttons must be released before the PUMP ON button will function. The green POWER LIGHT stays on when the machine is turned on.

**PUMP OFF** - Push this button to turn off the machine.

**NORMAL/JOG keyed Switch** - This switch allows selection between the normal (automatic return) mode and the jog (low pressure, slow speed, non- return) mode. Use the normal mode to operate the machine. Use the jog mode to align punch/die, to set blade clearance, and to set the strokes. In NORMAL mode, the ram/slide move in both up and down directions. In JOG mode, the hydraulic system is in low pressure setting and the ram/slide move only in downward direction at slower speed. Also refer to the section on Low Pressure Tool Alignment in JOG mode.





## **Low pressure tool alignment with JOG mode**

Sunrise Fluid Power Inc. is the market leader in providing low pressure tool alignment setting on its products. When the NORMAL/JOG switch is turned to JOG mode, the machine provides a low pressure and low speed setting for safer tool alignment operation. This will reduce tool damages due to miss-alignment of tools and increase the operator safety. If a material is placed under the punch in JOG mode, the punch will only make a dent on the material without punching through. In addition, the punch cylinder will only move downward when the foot paddle is pressed, and will not retract backup when the foot paddle is released. Turn the NORMAL/JOG switch to NORMAL to move the cylinder upward.

**WARNING: for ease of tool alignment, the stripper cover is allowed to open in JOG mode. Even with the low pressure setting, be sure to keep all body parts away from moving parts, wear appropriate eye protection goggles and gloves for eye and hand protection. The JOG mode is a keyed switch, and only properly trained and authorized personnel should have access to the key and use the machine with JOG mode.**

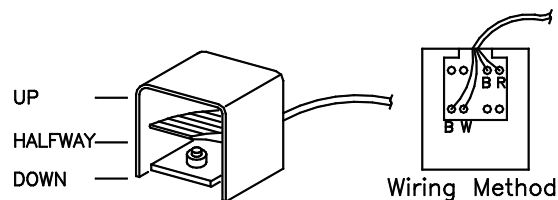
## FOOT SWITCH

The machine uses a foot switch for easy and fast operation control. The foot switch enables the operator to use the machine while holding the work piece with both hands. NEVER has one operator hold the material and another operator press the foot switch.

The foot switch has three positions: UP, HALFWAY and DOWN.  
UP position is when you release the foot switch completely.  
HALFWAY position is when you press or release the foot switch halfway.  
DOWN position is when you press the foot switch all the way down.  
When not pressed, an internal spring pushes the switch to the UP position.  
The foot switch functions differently in the NORMAL and the JOG modes.

**In NORMAL mode**, press the foot switch to DOWN position for the downward motion of the slide. Release the foot switch to HALFWAY position will cause the slide to stop. This is very useful in position the work piece without using the gauge stoppers. Press the foot switch again to Down position and the slide will continue moving downward until reaching the lowest position set by the limit switches. Releasing the foot switch completely (UP position) will cause the slide to return to its up position.

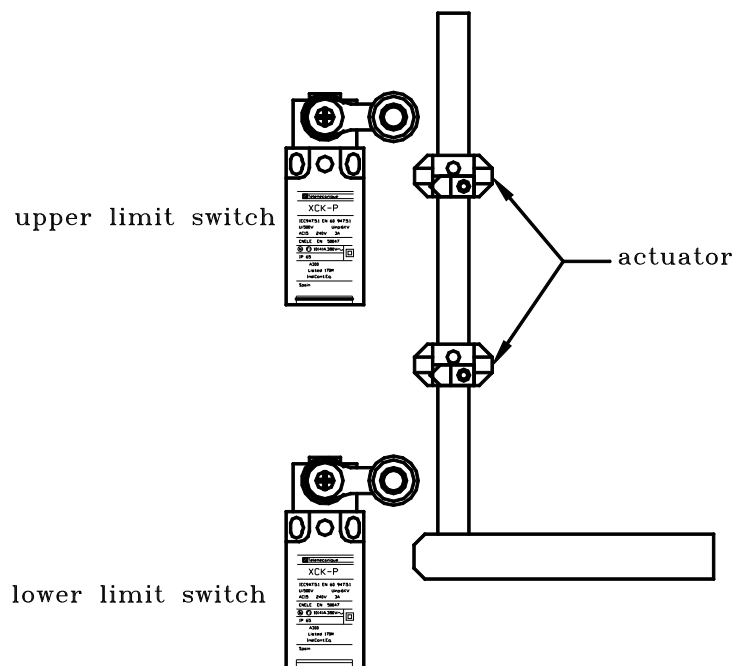
**In JOG mode**, press the foot switch to the DOWN position for the downward motion of the slide. The slide stops moving when the foot switch is released to either HALFWAY position or UP position. The slide does not move back up even when foot switch is completely released. This allows the operator to make necessary adjustment / alignment. In other words, the slide moves only in one direction in JOG mode. To move the slide back to the up position, switch the Normal/Jog switch to NORMAL.



## STROKE ADJUSTMENT

Certain working operations do not require a full working stroke. For large quantities of the same operation, merely execute the required working stroke distance to save operating time. The position and length of the cylinder strokes are controlled by limit switches and actuators on a drive bar installed inside the back panel of machine. There are two limit switches, one for the upper limit and one for the lower limit. Adjust the length of stroke by shifting the position of the actuator mount on the drive bar. See Figure.

**IMPORTANT:** The limit switch must be actuated before the Cylinder reaches the full extend or full extract position. In other words, the pump should be unloaded in upper or lower limit of the slide travel. *Fail to do so can overload the motor and damaging the pump.* If the pump is not in unloading position at either upper or lower limit, a loud noise is heard from the pump. Immediately turn the machine off and adjust the limit switch actuators to set the proper stroke movement.



## **ADJUST THE PUNCH CYLINDER RAM**

The alignment of the punch cylinder ram is guided by a "bronze guide pad" inside the cylinder cast. When the ram is loose and starts to swivel or when the ram is misaligned (not square with the die base), the punch ram should be adjusted.

To adjust the punch ram, follow these steps:

- 1) Remove the two locking nuts located on the left side of the cylinder cast.
- 2) Adjust the two adjusting screws to lightly press the guide pad onto the ram.
- 3) Check the adjustment by moving the ram up and down with non-round (oblong or square) punches and dies. The ram should be moving smoothly and without any gaps.
- 4) Retighten the lock nuts to prevent loosening.

## **PUNCHING STATION**

### **Standard Equipment**

The machine is equipped with one set of Ø20mm round punch and die. Many other punching tools of different sizes are also available upon request. In addition, a large 2-piece support table with gauges is installed as standard equipment. Measuring scales on the table enable accurate positioning.

**IMPORTANT:** The punch stripper must be closed properly during operation. On some models with an interlock limit switch inside the stripper back cover, the punching station is **IMMOBILIZED** if the stripper is open.

### **Alignment of Punch and Die**

The punch and the die may have previously been centered. However, you should check the tools regularly for proper alignment. To center the die, follow these steps:

- 1) Insert Punch into Retaining Nut, then tighten the nut onto the Retaining Thread.
- 2) Insert the Die into the Holder and secure the set screw.
- 3) Loosen all of the die holder fixing bolts
- 4) Lower the punch gradually (by using the JOG mode).

**WARNING: Be very careful that the punch does not hit the die which can break the punch and create a hazard.**

- 5) After the punch is inside the die, turn power off and isolate the machine.
- 6) Adjust the position of the Die Holder until the Clearance around the punch and die is even all the way around.
- 7) Tighten the die holder bolts to fix the die position.
- 8) Adjust the limit switches to change the stroke length if necessary.

When setting up square or oblong punches and dies, be sure to properly locate the key on top of the punch in the keyway of the punch retaining thread. Check carefully the alignment (both position and direction) of the die with the punch. Incorrect set up will damage the punch and die, and may cause danger.

**IMPORTANT:** Be sure to check the alignment of the punch and die whenever tools are changed.

### **Punch and Die Clearance**

Punch size is the same as the desired hole size. Die size is bigger by the clearance. The clearance depends on the thickness of the material. The clearance is usually about 10% of the material thickness. Please also refer to the following chart for recommend clearance.

Material Thickness	mm	up to 4	4 - 9	9 - 14	14 - 20
Die Clearance	mm	0.2	0.7	1.2	1.7

### **Adjusting Stripper**

- The distance between the stripper and the material should be adjusted to about 2~3mm. Adjust the stripper height each time when changing to material of different thickness.
- Adjust the stripper height by turning the large knurled screws at both sides of the stripper.
- If the stripper tend to fall down at the right side, tighten the spring at the left side of stripper.
- Make sure the stripper is at even height for left and right sides. The stripper should be adjusted so that the work-piece contact the stripper evenly when the punch retracts out of the material. Unbalanced stripping may break the punch and cause hazard.
- If the material cannot have adequate contact with the stripper when stripping, such as asymmetrical material, material too small, or punched hole too close to the edge of material, do not proceed with the punching operation.

The stripper has exchangeable plates with various opening sizes to match the size of the hole. Select the plate with the smallest suitable opening. Keeping the opening close to the size of punch will greatly reduce deformation, especially on thinner materials.

### **Actual Punching Force**

The actual force required in a punching operation is calculated by the circumference of the hole multiplied by the thickness of material multiplied by tensile strength of material.

$$\text{Max. Capacity} = \text{circumference} \times \text{thickness} \times \text{tensile strength}$$

The capacity chart is based on material with 45 kg/mm<sup>2</sup> tensile. Do not attempt a punching operation that requires force over the maximum capacity of the machine.

### **Precaution**

- 1) Always use die with the proper clearance.
- 2) Always check the alignment after each tool change.
- 3) To prevent overloading and breakage of the punch, do not punch material which is thicker than the hole diameter,
- 4) Do not punch partial holes. Punching incomplete holes will cause the punch and die to bend and break.
- 5) Applying some lubricant oil on the punch will prolong the life of the punch and reduce the stripping load.
- 6) Regrinding of punching tools is not recommended.

### **Punch and Die Lubricant**

SHELL	-	GARIA 927
B. P.	-	SERVORA 68
CASTROL	-	ILOBROACH 219
DUCKHAMS	-	ADFORNOL EP7
JOSEPH BATSON	-	LB 733

## Punch Operation

### Punching on Flat Plates:

- 1) Check again that the stripper, punch/die alignment are properly adjusted.
- 2) Set the gauging stoppers to the desired position.
- 3) Position the plate on the working table against the stoppers.
- 4) Press the foot switch to the DOWN position to execute the punch.
- 5) Release the foot switch for the punch to retract. During stripping, the material can be lifted up against the stripper and then drop off when the punch retracts out of the hole. **Be very careful with fingers as the material movement has potential of hazard.**

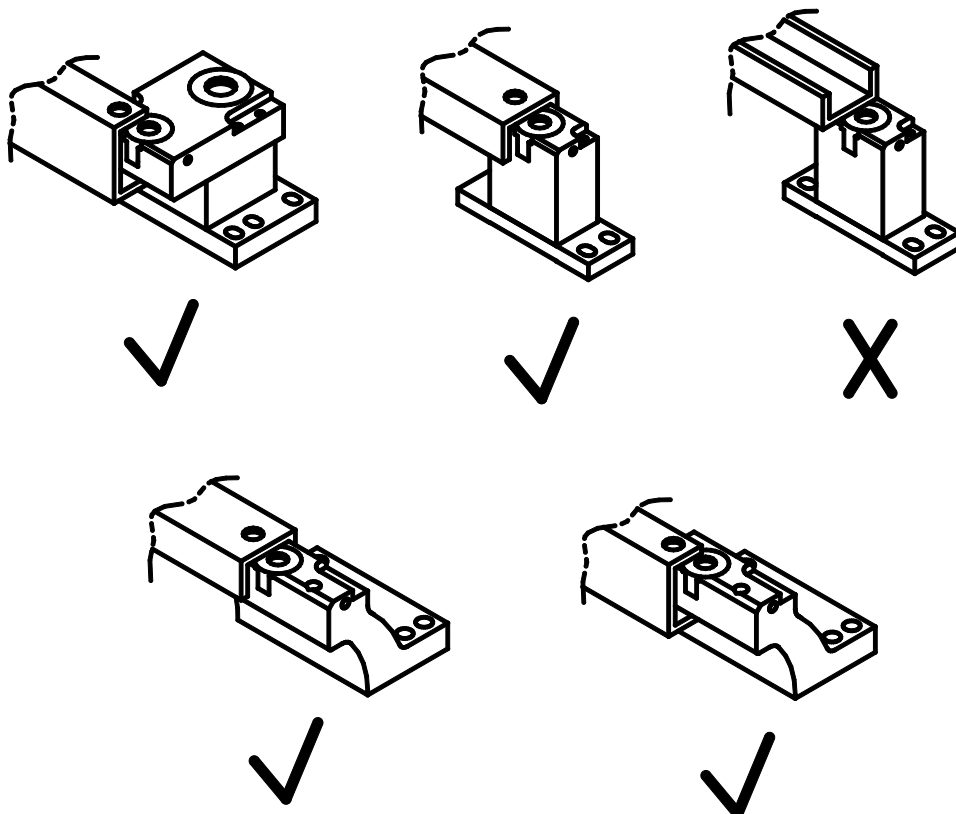
### Punching on Angles:

- 1) Check again that the stripper, punch/die alignment are properly adjusted.
- 2) Remove the front piece of the 2-piece table.
- 3) Set the gauging stoppers to the desired position.
- 4) Position the angles against the die holder with one flange facing downward. **Do not position the angle with one flange facing upward.** See figure.
- 5) Press the foot switch to the DOWN position to execute the punch.
- 6) Release the foot switch for the punch to retract. During stripping, the material can be lifted up against the stripper and then drop off when the punch retracts out of the hole. **Be very careful with fingers as the material movement has potential of hazard.**

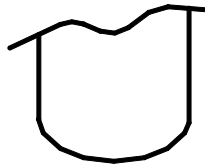
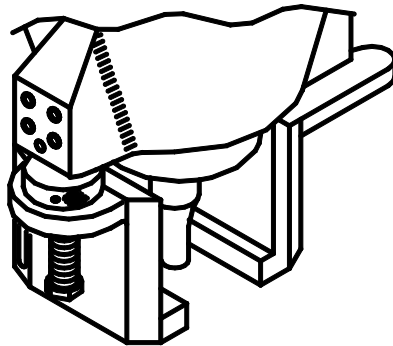
### Punching on Channels:

- 1) If punching the channel web, use the single-hole die holder (optional) with the table removed. If punching the channel flange, use the overhang two-hole die holder with the lower support portion and the front piece of the 2-piece table removed. Special goose-neck die holder is also available for punching both channel web and channel flange. See figure.
- 2) Check again that the stripper, punch/die alignment are properly adjusted.
- 3) Set the gauging stoppers to the desired position.

- 4) If punching channel web, position the channel with both flanges facing downward. If punching channel flange, position the channel with the flange being punched on top. See figure.
- 5) Press the foot switch to the DOWN position to execute the punch.
- 6) Release the foot switch for the punch to retract. During stripping, the material can be lifted up against the stripper and then drop off when the punch retracts out of the hole. **Be very careful with fingers as the material movement has potential of hazard.**



## Punching Station Assembly



**Cylinder Rod**



**Punch Retaining Thread**



**Punch Retaining Nut**



**Round Punch**



**Oblong Punch**



**Punch Sleeve**

## OPTIONAL TOOLING

### **I. PRESS BRAKE**

Three kinds of press brakes are available to be installed on the Punch station to perform bending work. The single-vee press brake is for bending thick materials. The multi-vee press brake is for bending thin materials. The angle bending tool is for bending angles after a Vee notch operation. Always bend the material at the center position of the tooling (directly under the cylinder ram). Do not bend the material at the side of the tool as that will create side-load force on the tool and cylinder.

#### **WARNING**

As the press brake tool is not covered by guards, pay special attention to safety when using this tool. **Always make sure no fingers or other body parts is in between the upper tool and lower die before excusing the bending operation.**

#### **NOTE:**

While using the press brake, the pump is not unloaded by the limit switch when the upper tool reach the lowest position onto the lower die. At this position the oil pressure stays at the maximum pressure set by the relief valve, until the foot paddle is released to allow the cylinder to retract. This will cause the oil temperature to raise quickly, also may shorten the life of pump and hydraulic parts due to over-loading. Do not allow the top tool to stay at the low position too long by release the foot paddle immediately when bending is complete. The press brake is an optional tooling intended for occasional operation. Continuous production work is not recommended. Allow intermit break period for the oil to cool down. Use fan for cooling down when oil temperature is too high. Lower the pressure setting by adjust the relief valve to the level just enough capacity to perform the bending operation.



## II. DUPLICATING TABLE

The duplicating table is to copy the position of existing holes on a master plate to the working plate. This device can greatly save time and labor on repetitious punching. We strongly recommend the hydraulic stripper to be used together with the duplicating table.

To duplicate the holes, follow these steps:

- 1.) Make a master plate and fix it on the extended table. The material should be placed against the zero point at the left upper corner. Secure the plate with the screws on two sides.
- 2.) Fix the working material on the two clamps. The material should be placed against the zero point at the stopper guide on the right lower corner.
- 3.) Move the working material along the X-Y linear guide until the pointing device is pointed to the hole on the master. Then simply push and hold the button on the pointing device. Enacted by compress air, the point device comes down into the hole and locks into position.
- 4.) Press the foot paddle to punch the hole.

The corn shape tip of the pointing device provides a self-centering effect for precise positioning. Various sizes of the corn shape tip are provided for the different master plate thickness and hole sizes. Select the correct tip that will have full contact around the hole to ensure accurate positioning.

The duplicating table for PM-T models (310mm throat) has approximately the following dimension (mm):

Main Table (for working material):	850 (W) x 320 (D)
Extended Table (for master):	950 (W) x 560 (D)
Copiable Area:	760 (W) x 270 (D)

The duplicating table for PM-LT models (510mm throat) has approximately the following dimension (mm):

Main Table (for working material):	850 (W) x 532 (D)
Extended Table (for master):	950 (W) x 760 (D)
Copiable Area:	760 (W) x 470 (D)



The duplicating table for PM-XT models (760mm throat) has approximately the following dimension (mm):

Main Table (for working material):	850 (W) x 782 (D)
Extended Table (for master):	950 (W) x 980 (D)
Copiable Area:	760 (W) x 720 (D)

### III. HYDRAULIC PUNCHING STRIPPER

The hydraulic punching stripper moves down with hydraulic force and holds the material in position. Therefore, it increases the accuracy of the punching and reduces deformation. The hydraulic stripper moves downward *before* the punching takes place. It moves up *after* the punching is completed and the punch is stripped out of the hole. The hydraulic stripper is highly recommended when using the duplicating table to ensure the accuracy and performance.

To use the hydraulic stripper, turn the Hydraulic Stripper Auto/Manual switch on the control panel to AUTO position. Position the material as in normal punching operation. The hydraulic stripper will function automatically for each punching operation.

To adjust the height of the stripper, turn the screws in the rod on two sides of the stripper to move up and move down the position of the stripper. The stripper height should be adjusted so that when activated it will press the material firmly and evenly. **Make sure to have the same height on both sides so that the stripping force will be balanced.** Unbalanced stripping may break the punch and cause hazard.

If the material cannot have adequate contact with the stripper, such as asymmetrical material, material too small, or punched hole too close to the edge of material, do not proceed with the punching operation.

If the hydraulic stripping is not desired, turn off the hydraulic stripper by switching the Hydraulic Stripper Auto/Manual switch to MANUAL.

**Warning:**

The hydraulic stripper can break fingers and cause serious injuries. **Never remove the guards around the stripper.** Before each punch, always pay special care that nothing is under the stripper other than the material being punched.

## MAINTENANCE

1. **Before operating the machine:**

Routinely check the electrical power cable and the foot switch cable for any loosening or damage.

Inspect the punch, die, and safety guards to ensure they are in good condition.

Clean all slugs, cut off pieces, and other waste material from each work stations and around the machine.

2. **Filter and Oil Change:**

The first oil change should be performed after approximately 600 operating hours. Further oil change is needed for every 2000 operating hours. A drain outlet is located at the base of the oil tank. Do not mix different brands of oil.

Hydraulic Fluid (or equivalent)

Mobil	DTE 46
Esso	Nuto H46
Shell	Tellus 46 or Hydraulic oil 46
B.P.	Energol HLP 46
Castrol	Hyspin AWS 46 6018

3. **Oil temperature:**

The oil temperature should be under 50 degrees Celsius. If the upper/lower limit switches are not set correctly for unloading of the pump, the oil temperature can raise quickly. Adjust the limit switches so the pump will be in the unloading condition.

4. **Oil level:**

Make sure the hydraulic oil level is in the range indicated on the oil level gauge. It is better to keep the oil level close to the high mark indicated on the gauge.



Model	Capacity (liter)	Oil Required (liter)
PM-35T	91	73
PM-35LT	102	82
PM-35XT	112	88
PM-55T	100	79
PM-55LT	116	89
PM-55XT	123	94
PM-80T	117	92
PM-80LT	128	100
PM-80XT	102	74
PM-120LT/XT	109	94
PM-160LT/XT	131	113
PM-200LT/XT	136	117

**5. Hydraulic pressure:**

The working pressure of the hydraulic system is pre-set in the factory. The pressure should ONLY be adjusted by the service engineer. There is a pressure gauge to indicate the working pressure of the machine. The pressure gauge should be locked and be used only during service/maintenance work.

Model	PM-35	PM-55	PM-80	PM-120	PM-160	PM-200
Max Pressure	240 kg/cm <sup>2</sup>	235 kg/cm <sup>2</sup>	230 kg/cm <sup>2</sup>	255 kg/cm <sup>2</sup>	230 kg/cm <sup>2</sup>	230 kg/cm <sup>2</sup>

**AIRBORNE NOISE**

The continuous airborne noise level of the machine under normal condition is approximately 75 dB ± 5 dB.

## TROUBLE SHOOTING

<b>Problem</b>	<b>Probable cause</b>	<b>Solution</b>
Motor cannot start	1. No power.	Check the power source.
	2. Isolator switch not turn on.	Turn the switch to ON position.
	3. Emergency buttons not released.	Release both emergency buttons by turning knob to the right.
	4. Motor broken.	Replace motor.
	5. Motor power cable not connected properly.	Check the cable connection and reconnect cable. Change cable if worn out.
	6. Motor circuit breaker jumped to OFF.	Reset the breaker to ON position.
	7. Fuse broken.	Check and replace fuse.
	8. Magnetic switch broken or burn out.	Replace switch
	9. Transformer broken.	Replace transformer
Motor is on, but machine won't move	1. Motor turning in wrong direction.	Turn machine off. Change any two of the three power source wire. Re-check motor direction.
	2. Not enough hydraulic oil.	Check oil level and add oil if necessary.
	3. Solenoid valve stuck.	Clean or replace valve.
	4. Solenoid valve coil burn out.	Replace coil.
	5. Foot paddle not sending signal.	Check paddle and replace switch is necessary.
	6. Relay stuck or burn out.	Replace relay



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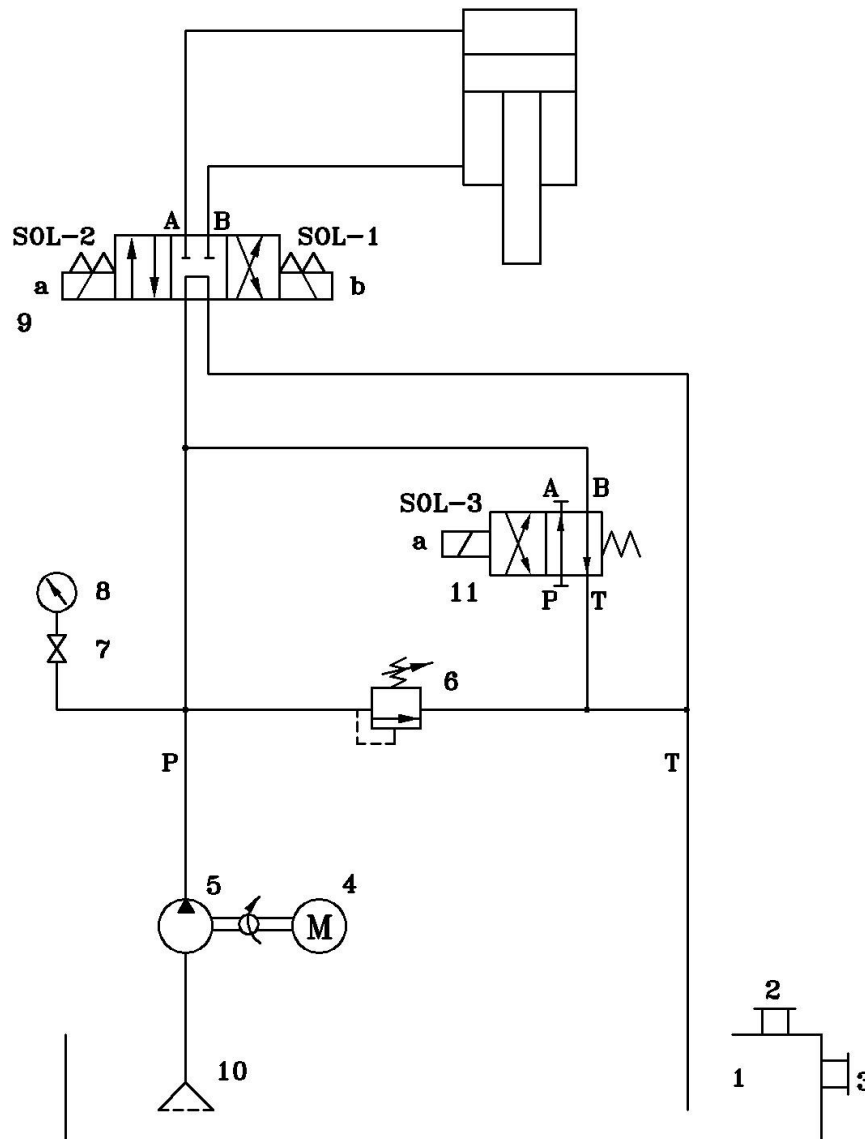
www.sunriseiw.com.tw

<b>Problem</b>	<b>Probable cause</b>	<b>Solution</b>
Machine moves, but cannot reach capacity	1. Relieve valve not set correctly	Check hydraulic pressure and adjust relieve valve (tighten to increase pressure)
	2. Relieve valve broken.	Replace relieve valve.
	3. Pump broken.	Replace pump.
	4. Cylinder internal leak.	Contact dealer for service.
	5. Pilot check valve not set correctly.	Adjust the correct pressure setting of the valve.
Excess hydraulic noise	1. Motor turning wrong direction.	Turn machine off. Change any two of the three power source wire. Re-check motor direction.
	2. Pump worn out.	Replace pump.
	3. Filter is dirty.	Replace filter element.
	4. Not enough oil.	Check oil level and add oil if necessary.

## Hydraulic Circuit Parts

### PM-35

(with low pressure JOG)



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## Hydraulic Circuit Parts

### PM-35

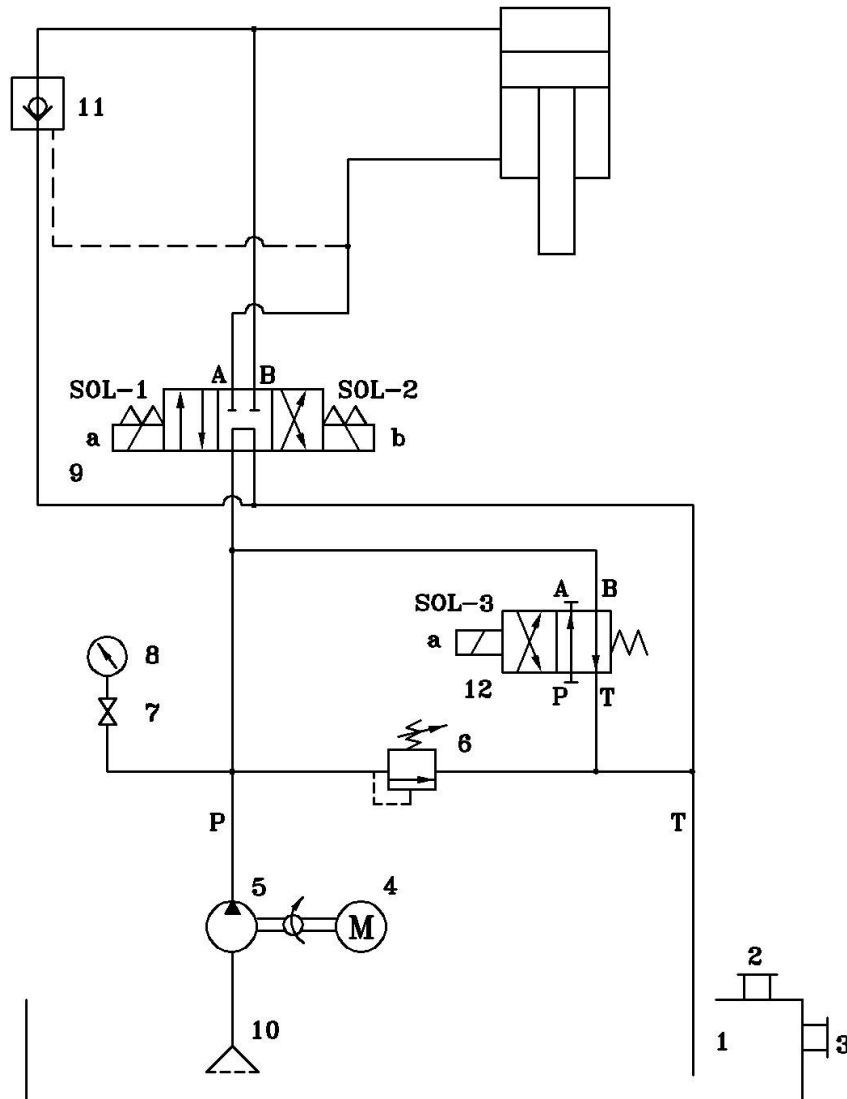
(with low pressure JOG)

No.	Description	Qty	Specification / Part No.
1	Tank	1	PM-35T : 214002930 (JOG) PM-35LT: 214102930 (JOG) PM-35XT: 214202930 (JOG)
2	Breather & Filter	1	53702HY08A
3	Oil Level Gauge	1	53701LG4
4	Motor	1	5 HP
5	Pump	1	53201ALP2AS16
6	Relief Valve	1	53656RPECFAN
7	Gauge Cock	1	53652ST02L
8	Pressure Gauge	1	53621CBLM63350
9	Solenoid Valve	1	53651DFA02005
10	Suction Oil Filter	1	53301MF086
11	Solenoid Valve	1	53651DFA02001

## Hydraulic Circuit Parts

### PM-55, PM-80

(with low pressure JOG)



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## Hydraulic Circuit Parts

### PM-55, PM-80

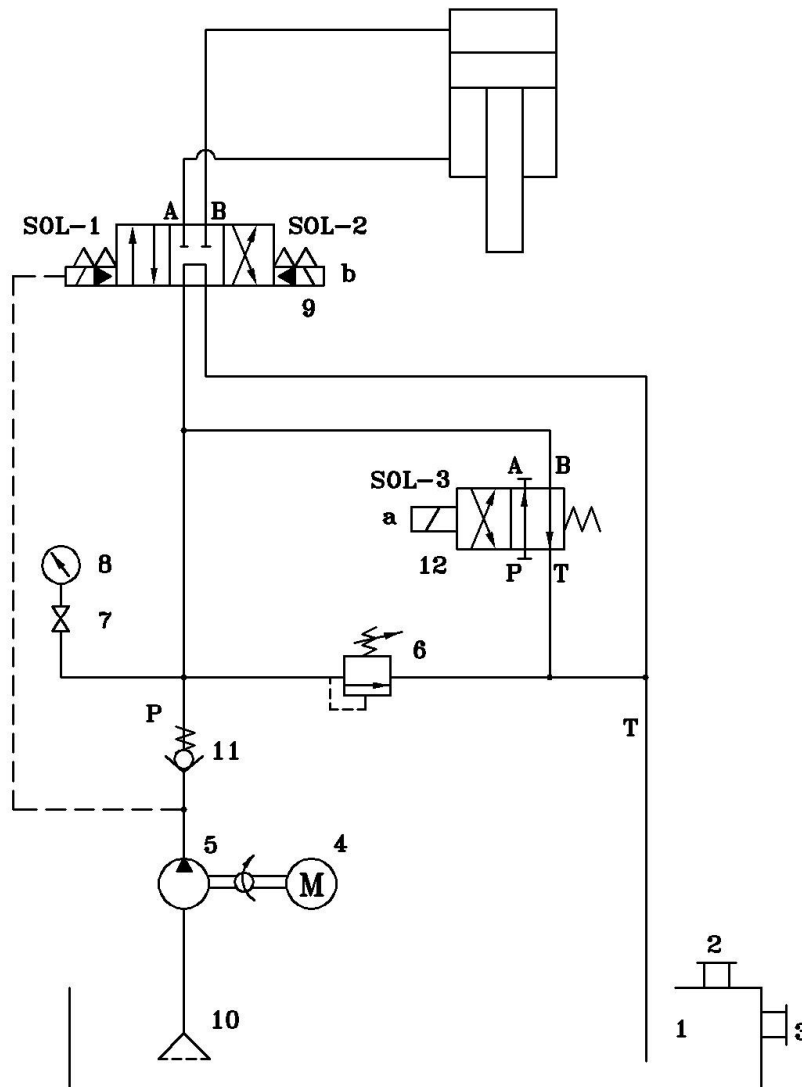
(with low pressure JOG)

No.	Description	Qty	Specification / Part No.
1	Tank	1	PM-55T : 214302930 (JOG) PM-55LT: 214402930 (JOG) PM-55XT: 214502930 (JOG) PM-80T : 214602930 (JOG) PM-80LT: 214702930 (JOG) PM-80XT: 214802930 (JOG)
2	Breather & Filter	1	53702HY08A
3	Oil Level Gauge	1	53701LG4
4	Motor	1	PM-55: 5 HP PM-80: 7.5 HP
5	Pump	1	PM-55: 53201ALP2AS16 PM-80: 53201GHP2AS25
6	Relief Valve	1	53656RPECFAN
7	Gauge Cock	1	53652ST02L
8	Pressure Gauge	1	53621CBLM63350
9	Solenoid Valve	1	53651DFA03003
10	Suction Oil Filter	1	PM-55: 53301MF086 PM-80: 53301MF106
11	Check Valve	1	53654CKEBXCN
12	Solenoid Valve	1	53651DFA02001

## Hydraulic Circuit Parts

### PM-120, PM-160, PM-200

(with low pressure JOG)



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## Hydraulic Circuit Parts

### PM-120, PM-160, PM-200

(with low pressure JOG)

No.	Description	Qty	Specification / Part No.
1	Tank	1	PM-120LT/XT: 214902910A PM-120T: 215502910 PM-160: 215102910A PM-200LT: 215302910B PM-200XT: 215402910
2	Breather & Filter	1	53702HY08A
3	Oil Level Gauge	1	53701LG4
4	Motor	1	PM-120: 10HP PM-160: 15HP PM-200: 20HP
5	Pump	1	PM-120: 53201GHP2AS34 PM-160: 53201SAL236 PM-200: 53201SAL250
6	Relief Valve	1	53656RPECFAN
7	Gauge Cock	1	53652ST02L
8	Pressure Gauge	1	53621CBLM63350
9	Solenoid Valve	1	PM-120: 53651DSHG04001 PM-160: 53651DSHG04001 PM-200: 53651DSHG06003
10	Suction Oil Filter	1	PM-120: 53301MF106 PM-160: 53301MF128 PM-200: 53301MF128
11	Check Valve	1	53654CIT065030T
12	Solenoid Valve	1	53651DFA02001



## Electrical Parts PM (CE)

(with low pressure JOG)

Code	Description	Quantity	Function
QF	Motor Circuit Breaker	1	Motor Protection
FU1,FU2,FU3	Fuse	3	Control Circuit Protection
FU4	Fuse	1	Spot Light Protection
QS	Isolator Switch	1	Circuit Interrupter
SB1	Push-Lock Push Bottom	1	Emergency Stop
SB2	Flush Push Bottom (Red)	1	Pump Off
SB3	Flush Push Bottom (Green)	1	Pump On
SA1	Selector Switch	1	Normal / Jog Key Switch
FS	Foot Switch	1	Foot Switch Control
KA1	Relay	1	Ram Upward
KA2	Relay	1	Ram Downward
SQ1	Limit Switch	1	Ram Up Limit Switch
SQ2	Limit Switch	1	Ram Down Limit Switch
SQ3	Limit Switch	1	Punch Safety Interlock
SOL A	Solenoid Valves	1	
SOL B	Solenoid Valves	1	
KM	Magnetic Switch (Contactors)	1	
	Bridge Rectifiers	1	
Tr	Transformer	1	