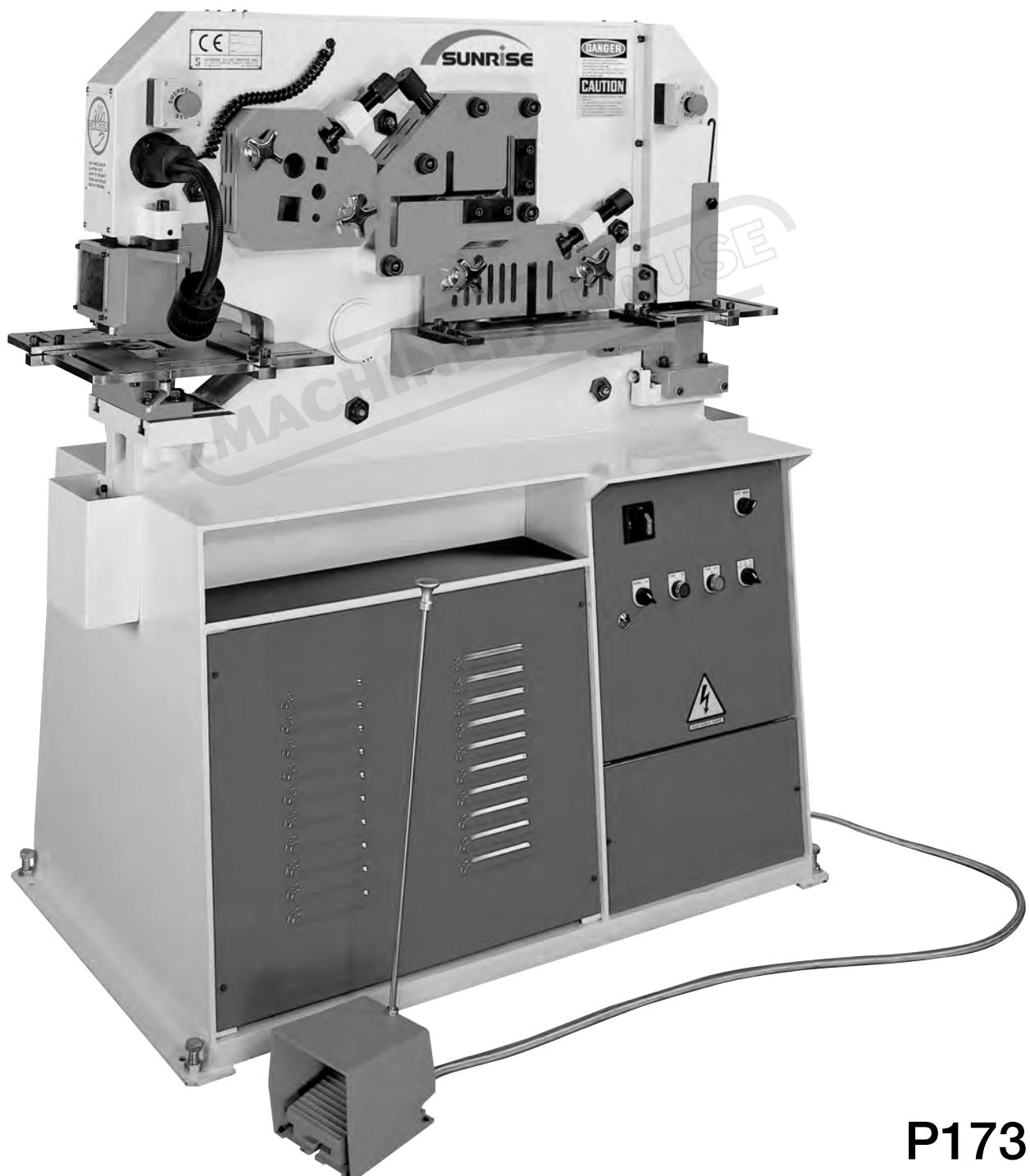


INSTRUCTION MANUAL

IW-60H Hydraulic Punch & Shear (415V) 60 Tonne



P173

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INTRODUCTION

The Sunrise Ironworker is a hydraulically powered metal shearing and punching machine. The machine is equipped with Flat Bar Shear, Angle Shear, Round Bar / Square Bar Shear, Punching and Notching stations (on IW-45M the notcher is optional tooling installed at the punching station). This multi-function aspect allows the Sunrise Ironworker to meet the diversified needs of the metal forming industry. There are many optional accessories that will further increase the versatility of the machine, contact our dealer for details.

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 ironworker 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.

The Sunrise Ironworker has five standard working stations:

- PUNCHING
- FLAT BAR SHEAR
- ANGLE SHEAR
- SQUARE/ROUND BAR SHEAR
- NOTCHING (optional on the IW-45M).

To ensure safe operation, guards are provided for each 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 either the foot switch or by the optional electric backgauge. The operator should be familiar with the control and function of the switch/backgauge 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 all safety guards and hold-downs are in place. Use of optional attachments/tooling should also have proper hold-downs and guards installed.

2. On the single cylinder models, only one operator is allowed to operate the machine. Before each operation, make sure no other person is near the machine.
3. **Operator must wear Protective Glasses during operation to protect the eyes.**
4. Any maintenance/repair of electrical/hydraulic circuit; change/adjust of blade/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 and blade clearances before operation.
7. **Keep hands clear of all moving parts at all times. Fingers must not go under or inside the safety guards, stripper, and holddowns.**
8. Do not punch, shear, or notch parts that are too small to fit under the safety hold downs.
9. 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.
10. The machine should never be left under power when not in operation or unattended. Always isolate the machine after turned the power off.
11. After completion of operation, all slugs and waste materials must be cleaned away from the machine.
12. Regularly check all stations and tooling for defects and wear to ensure safety and maintain good condition.

13. Heavy materials should be supported.
14. Use handling equipment when lifting heavy tooling and materials.
15. 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.
16. **Do not punch material thicker than the diameter of the punch.** Doing so can overload and break the punch and create a hazard.
17. 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 the machine, material, and/or persons caused by the non-compliance of the above safety precaution procedures, in particular for the following situations:

1. **Removal or non-use of any safety protection.**
2. **Place of any body part under or inside the safety guards, stripper, and holdowns.**
3. **Did not wear protective glasses for the eyes.**
4. **Did not close the stripper during operation.**
5. **Did not close the notcher safety cover when using other workstations.**
6. **Did not properly adjustment the clearance resulting the punch/die/blades hitting each other.**
7. **Did not interrupt the main electric power supply before any maintenance work.**
8. **Damage of electric parts due to incorrect electric power supply.**
9. **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 AND HOLD-DOWNS MUST BE IN POSITION BEFORE OPERATING THE MACHINE.**
- **ALWAYS POSITION MATERIAL UNDER A CORRECTLY SET HOLD-DOWN. NEVER ALLOW THE MATERIAL TO FEED BEYOND THE HOLD-DOWN.**

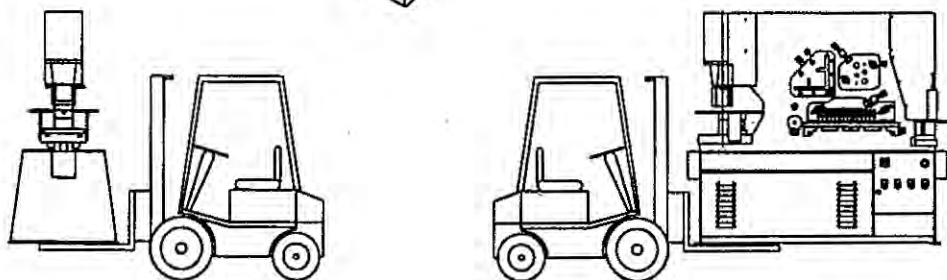
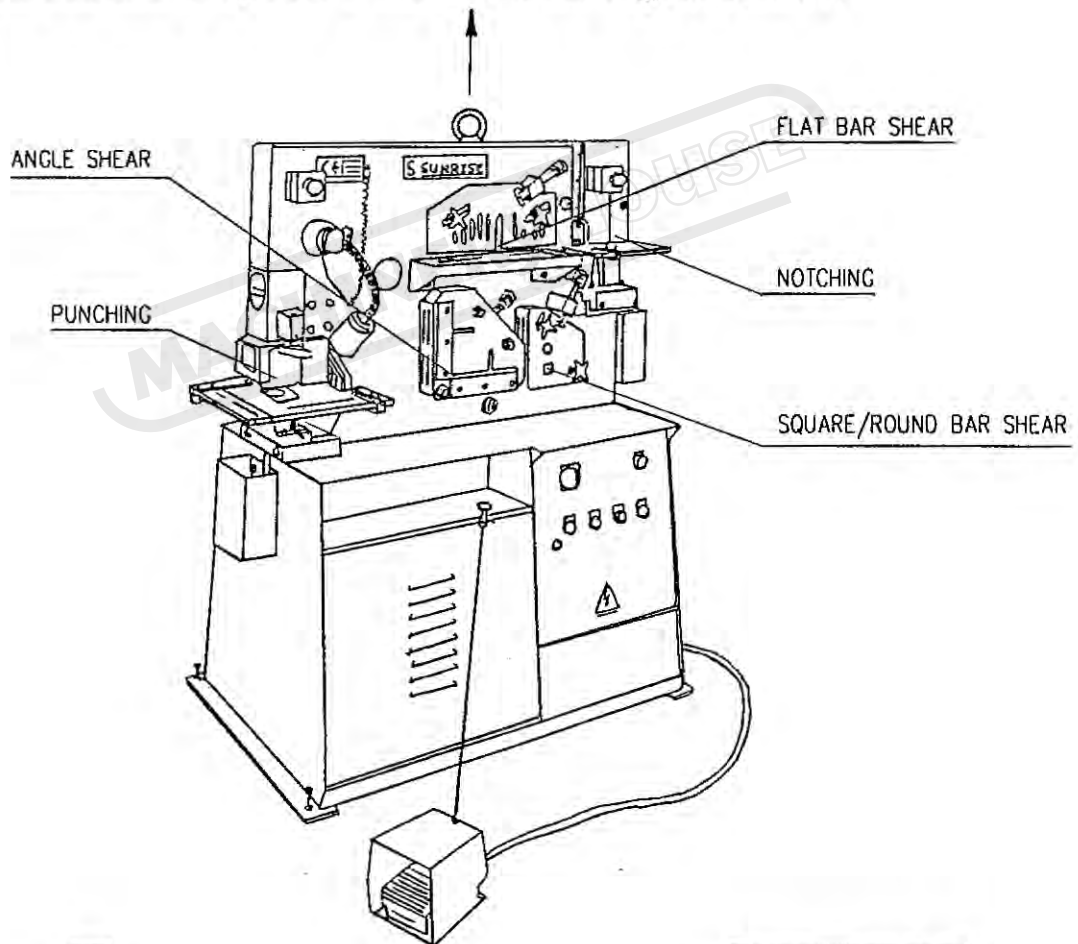
CAUTION

- **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 be extended 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.



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.

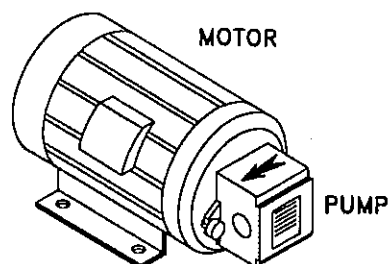
IMPORTANT: Turn off Supply Electricity at your facility's circuit breaker before making electrical connections to the machine.

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.

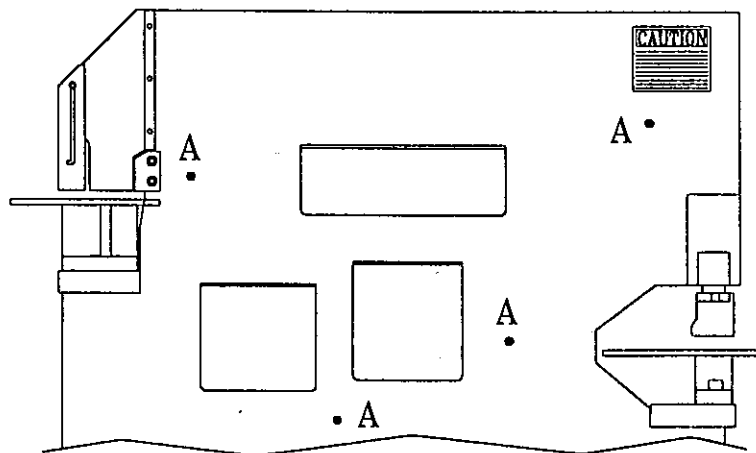
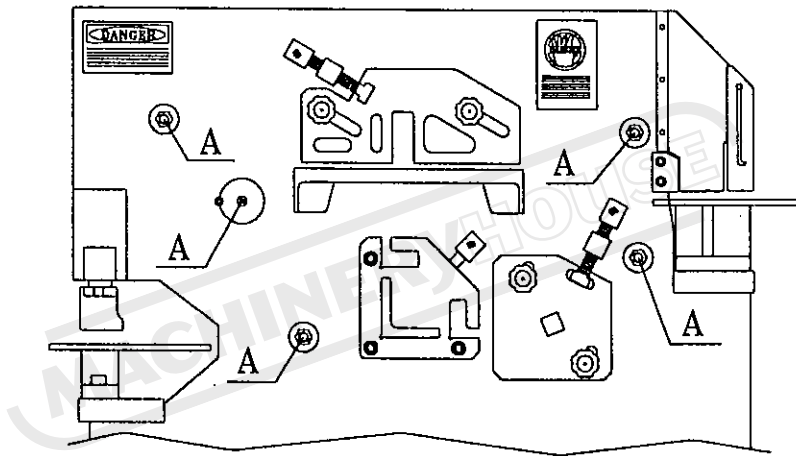
To check the correct rotation of the motor.

- 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.



LUBRICATION

Lubricate the machine with recommended grease every 8 working hours. Use the grease gun provided to supply grease to all lubrication points, which are located on both sides of the machine as shown in the figure.



A: Lubricate Points

RECOMMENDED GREASE

Lubricant Grease (or equivalent):

Esso	Beacon 2
Shell	Alvania Grease R-2
Kraff	KL2

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

Flat Bar Shear Blades	1 set
Angle Shear Blades	1 set
Round & Square Bar Shear Blades	1 set
Rectangular Notch Blades	1 set*
Round Punch and Die (Ø20mm)	1 set
Punch Support Table	1 pc
Notch Support Table	1 pc*
Punch Retaining Nut / Sleeve	1 set
Die Holder	1 pc
Punch Stripper Unit	1 pc
Spotting Light	1 pc*
1 Meter backgague	1 pc
Work station Safety Guards	1 set
Lifting Eye Bolt	1 pc

* : Not supplied on IW-45M

TOOL BOX	1 pc
Grease Gun	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 PANEL

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.

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

NORMAL/JOG Switch - This switch allows selection between the normal (automatic return) mode and the jog (inching, 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 ram/slide move only in downward direction. Also refer to the section on foot switch.

AUTO/MANUAL Switch (for machines equipped with the optional electric backgauge only) - Turn to AUTO to use the backgauge, and turn to MANUAL to use the foot switch. Also refer to the section on electric backgauge.

PUNCH/SHEAR/NOTCH Switch (for IW-50A and IW-60H) - Use this switch to select between punching, shearing or notching operations. In PUNCH and SHEAR mode, the slide travels in full distance set by the

upper and lower stroke limit switches. In the NOTCH mode, the slide travels at a shorter distance set by middle and lower stroke limit switches.

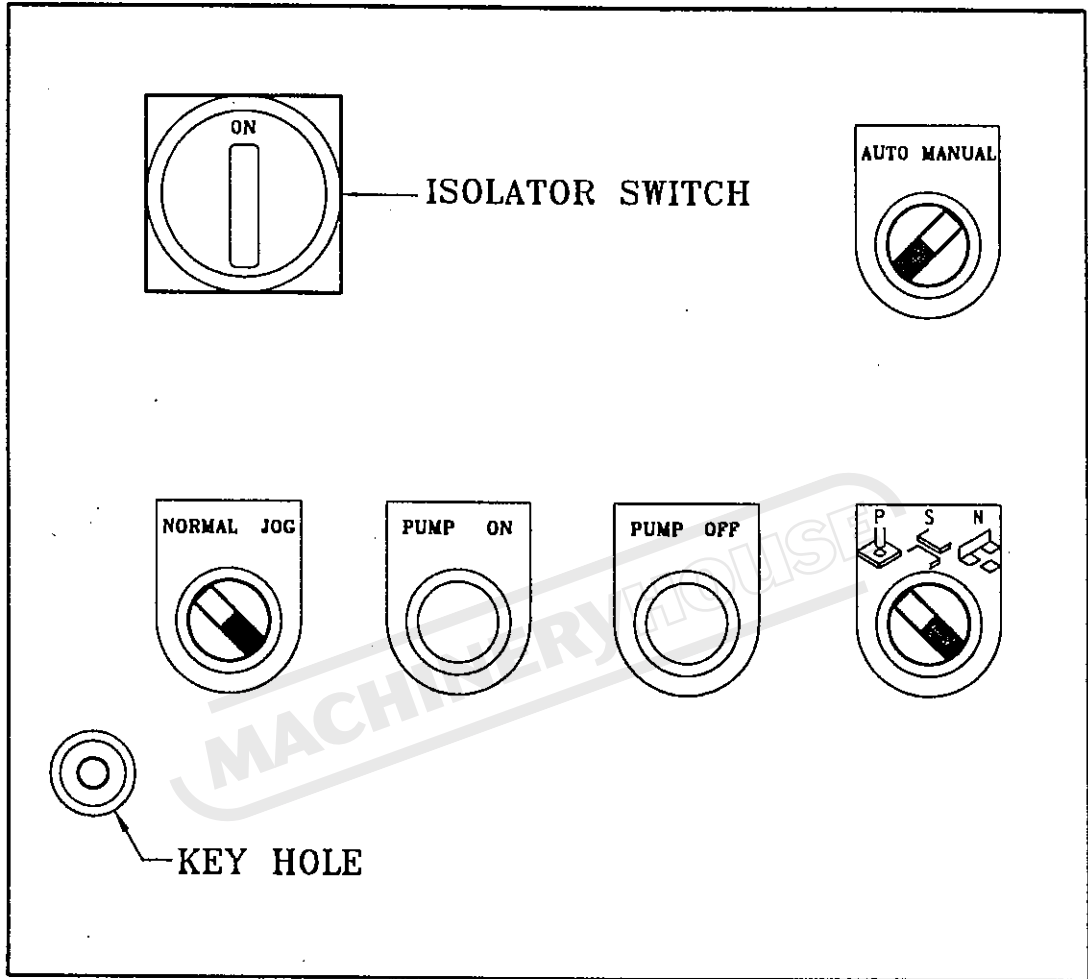
Note: The PUNCH/SHEAR/NOTCH switch is electrically interlocked with the Notch Safety Guard. When in PUNCH and SHEAR mode, the machine is IMMOBILIZED if the Notch Safety Guard is lifted. Please also refer to the section on stroke adjustment.

Note for IW-60H only: Because of the design of the location of the square/round bar shear station, the operation of the bar shear station on IW-60H is in the same selection as the punching operation. In other words, when shearing square/round bars, turn to PUNCH mode instead of Shear mode. Use SHEAR mode for flat shear and angle shear.

PUNCH/SHEAR Switch (for IW-45M) - Use this switch to select punch or shearing operations.

VERY IMPORTANT:

On IW-45M, IW-50A, and IW-60H models, in PUNCH mode the cylinder/slide moves in opposite direction as to the SHEAR/NOTCH mode. Therefore, when switching from Shear or Notch mode to PUNCH mode, the cylinder starts moving and the Shear/Notch Blades will come down. Similarly when switching from Punch mode to SHEAR or NOTCH mode, the cylinder starts moving and the Punch will come down. **This has the potential of body injury. Before turning the PUNCH/SHEAR/NOTCH switch, be very careful and make sure that the punching stripper and notcher cover are closed, that no materials are in any of the workstations, and that all fingers and body parts are away from all moving parts**



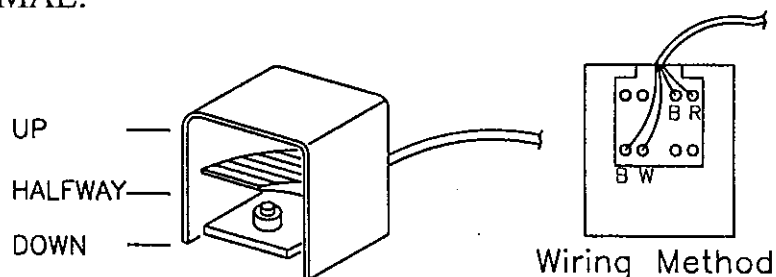
FOOT SWITCH

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.



ELECTRIC BACKGAUGE

Optional electric touch-and-cut back gauge is also available to control the movement of the machine (instead of using the foot paddle). To use the electric back gauge, turn the Auto/Manual switch to AUTO. To use the foot switch, turn the switch to MANUAL.

To use the electric backgauge:

- 1) Install the two pipes of the backgauge.
- 2) Connect the sensor wire to the socket on the back of the machine with the key way correctly aligned.
- 3) Turn the switch to AUTO.
- 4) Adjust the back gauge to the desired length.
- 5) Position the sensor on the back gauge so that the working piece will touch the sensor during operation.
- 6) To operate, simply push in the work piece. When the sensor is touched by the work piece, the blade will start moving down after a short delay. The delayed time can be adjusted by a timer inside the electrical box. After the shear, the cut piece falls out and the blade automatically moves back up for next shear.
- 7) If the length of the sheared piece is not the same as the reading on the backgauge, there is an adjustment nut on the backgauge to set the zero-position of the backgauge reading.

NOTE: Once the sensor is touched and the shearing operation has started, *the machine will complete the whole shearing cycle*. The machine cannot be stopped halfway unless the emergency or stop button is pushed. Although the electric backgauge increases the working efficiency, special care is required when using this function. Carelessness often causes accidents.

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 adjusting the limit switches and actuators on a drive bar installed on the back of machine.

For IW-45M:

There are two limit switches, one for the upper limit and one the lower limit. The role of the limit switches changes from Shear mode to Punch mode. In other words, the upper limit in Shear mode becomes the lower limit when switched to Punch mode, and vice versa.

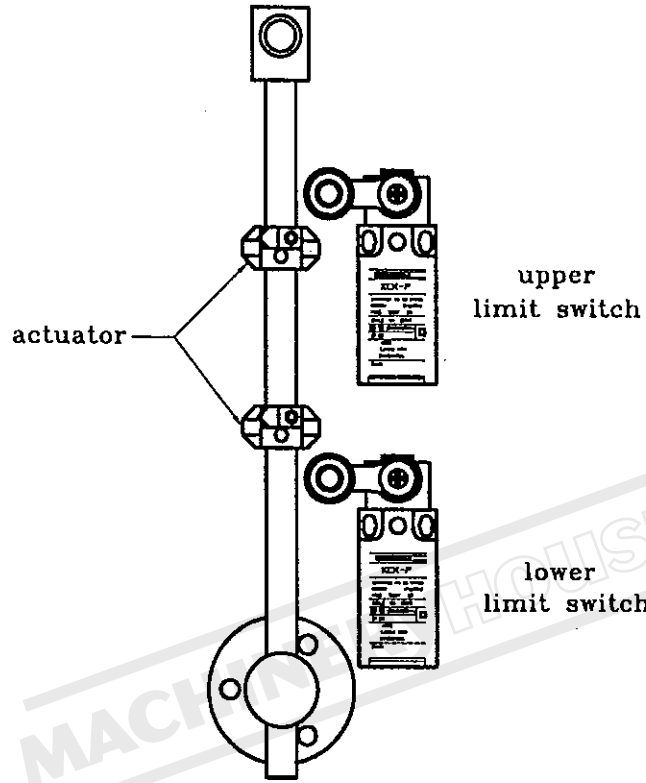
For IW-50A and IW-60H:

There are three limit switches, one for the upper limit, one for the lower limit, and one for the notch upper limit (short stroke). At SHEAR and PUNCH mode, the slide moves in full length between the right limit switch and the left limit switch. The role of the limit switches changes from Shear mode to Punch mode. In other words, the upper limit in Shear mode becomes the lower limit when switched to Punch mode, and vice versa. In NOTCH mode, the center limit switch functions as the upper limit (short stroke), and the slide moves between the center and left limit switches.

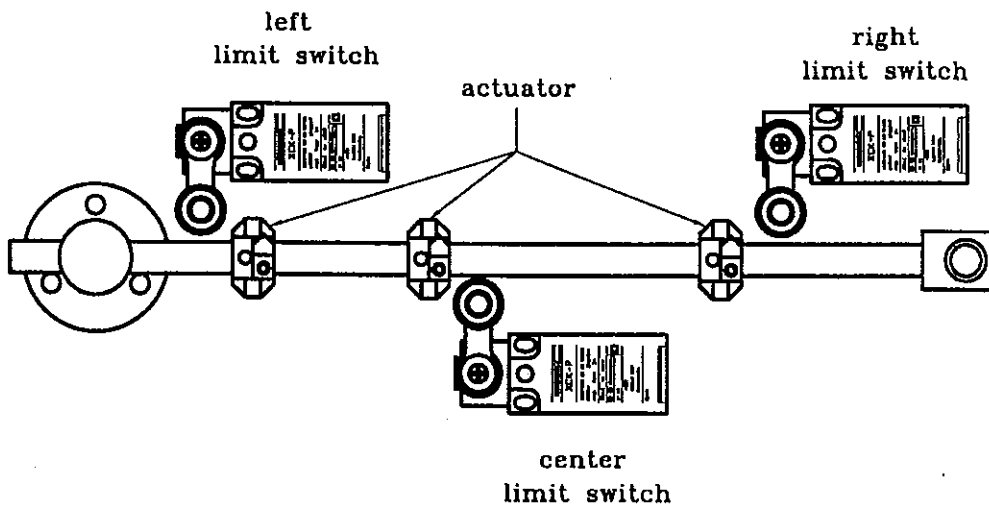
Note: the center actuator for the center limit switch must be adjusted to stay at the left side of the limit switch. This enables the stroke movement between the center and left limit switch in Notch mode. Fail to do so will result in the machine not functioning properly.

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.

IW-45M



IW-50A, IW-60H



ADJUST THE MAIN CENTRAL SLIDE

The central main slide (holding the moving shear/notch blades) should be pushed against the back of the machine body. Adjustment of the central slide is carried out by setting the "Pressure Pads". These pads are located on the front body of the machine. They can easily be identified as each has a grease nipple (same location as the grease points). To adjust, loosen the locking nuts, then tighten the screws firmly. Then, loosen each screw *one third of a turn*. Lastly lock in position by tighten the locking nuts. Repeat the procedure for each of the pressure pads.

ADJUST THE PUNCH RAM (IW-50A Only)

The alignment of the punch ram is guided by a "guide pad" inside the ram holder. 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) Take off the warning plate in front of the punch ram.
- 2) Take out the two screws found underneath the warning plate and then the adjusting screws will be exposed.
- 3) Adjust the adjusting screws to press the guide pad uniformly on the ram. Do not over adjust the guide pad.
- 4) 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 swivel gaps.
- 5) Screw back the two outside screws to prevent loosening
- 6) Put back the warning plate.

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.

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/mm² 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) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to PUNCH.
- 2) Check again that the stripper, punch/die alignment is properly adjusted, and the height of the stripper is adjusted to about only 2 to 3mm above the work material.
- 3) Set the gauging stoppers to the desired position.
- 4) Position the plate on the working table against the stoppers.
- 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 dropped off when the punch retracts out of the hole. **Be very careful with fingers as the material movement has potential of hazard.**

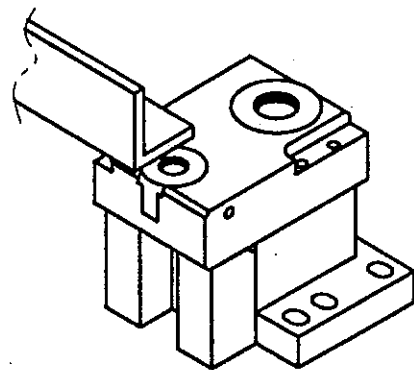
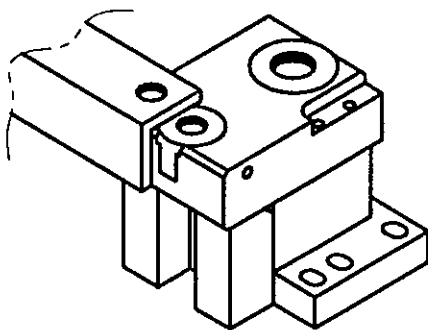
Punching on Angles:

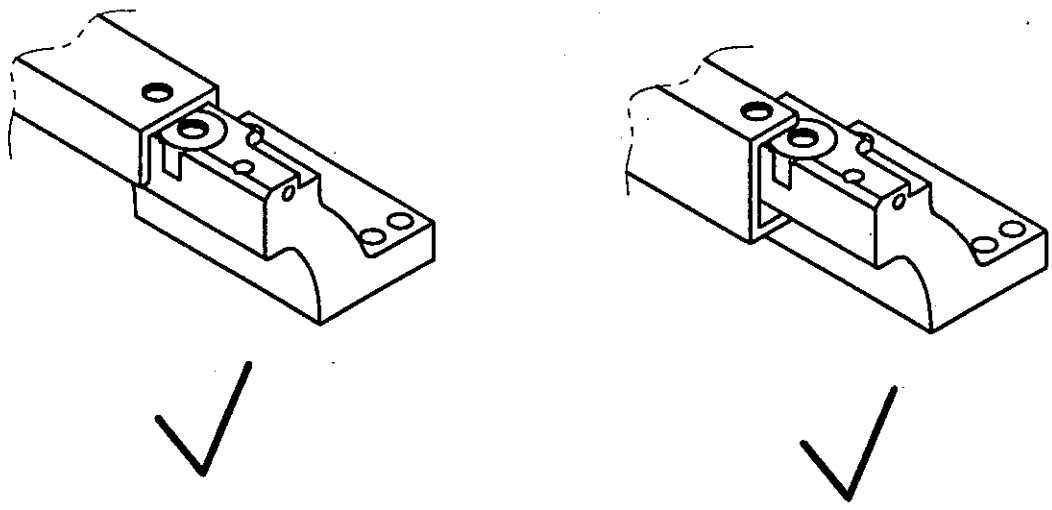
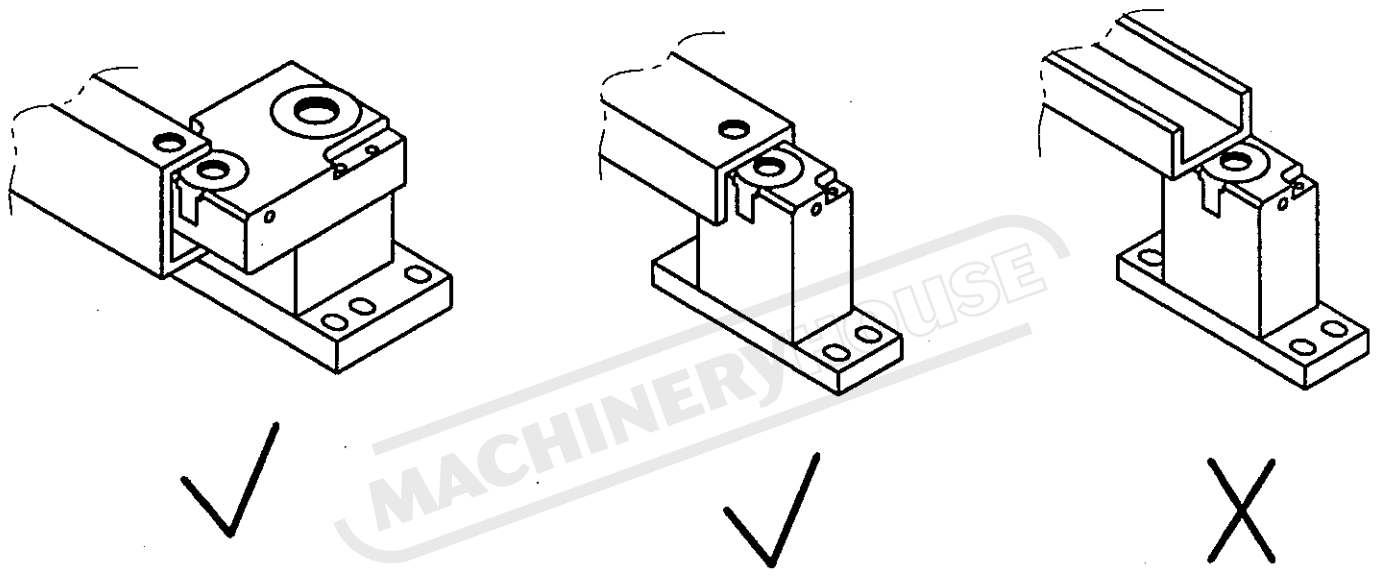
- 1) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to PUNCH.
- 2) Check again that the stripper, punch/die alignment is properly adjusted, and the height of the stripper is adjusted to about only 2 to 3mm above the work material.
- 3) Remove the front piece of the 2-piece table.
- 4) Set the gauging stoppers to the desired position.
- 5) Position the angle against the die holder with one flange facing downward. **Do not position the angle with one flange facing upward.** See figure.
- 6) Press the foot switch to the DOWN position to execute the punch.
- 7) 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) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to PUNCH.

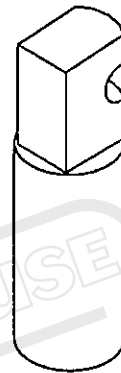
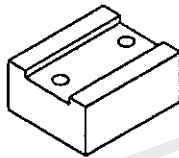
- 2) If punching the channel web, use the single-hole die holder with the table removed. If punching the channel flange, use the optional overhang two-hole die holder with the lower support portion and the front piece of the 2-piece table removed. Special goose-neck die holder is also available for punching both channel web and channel flange. See figure.
- 3) Check again that the stripper, punch/die alignment are properly adjusted, and the height of the stripper is adjusted to about only 2 to 3mm above the work material.
- 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.**



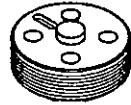


Punching Station Assembly

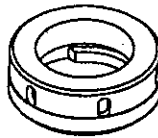
Retaining Thread Support
(IW-45M,IW-60H)



Punch Ram
(IW-50A)

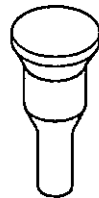


Punch Retaining Thread



Punch Retaining Nut

Round Punch



Oblong Punch



Punch Sleeve

FLAT BAR SHEAR STATION

This station is equipped with a hold down suitable for shearing of various material thickness. The machine also comes with a feed table with guides for material support and positioning. Besides shearing flat bars, this station can also shear the flange of angles.

Blades

Upper Blade (Moving): The moving shearing blade has a special curved cutting edge to minimize distortion on the shearing cuts. The moving blade can be turned to utilize both cutting edges.

Lower Blade (Stationary): The stationary blade can be turned for the use of all four cutting edges to provide a long blade life.

Cutting Clearance

The width of the cutting clearance (the distance between the moving and stationary blades) had been pre-adjusted in the factory to be between 0.2 and 0.3mm. The cutting clearance depends on the thickness and tensile strength of the material. The thicker the material, the wider the cutting clearance should be. Improper cutting clearance can result in the deformation of the working piece. Too large of clearance when shearing thin material can cause the material to bend over instead of being sheared.

The cutting clearance can be adjusted by the fix bolts that "pull in" the stationary blade and the adjusting screws that "push out" the stationary blade. To adjust clearance, follow these steps:

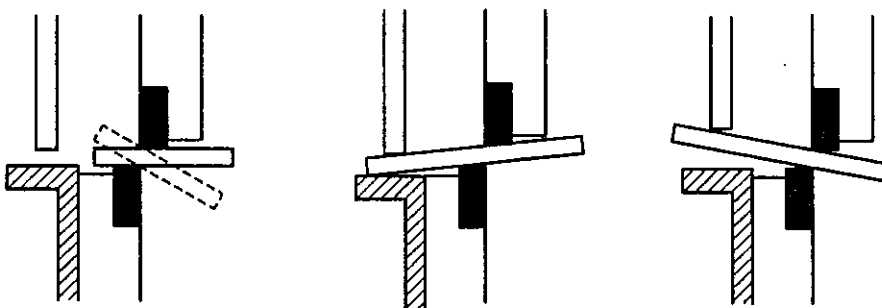
- 1) In JOG mode, move down the top blade to the lower position so that the opening between blades are closed.
- 2) Turn power OFF and isolate the machine.
- 3) Remove the holddown and the feed table.
- 4) Loosen the large fixing bolts that holds the lower blade.
- 5) Loosen the locking nuts on the adjust screws.
- 6) Adjust the clearance by turning the adjusting screws which push the lower blade towards the upper blade.

- 7) Check clearance using a feeler gauge. **It is very important to make sure that the cutting clearance is uniform for the entire blade.**
- 8) Tighten the locking nut of the adjust screws to prevent loosening.
- 9) Tighten the fixing bolts to fix the position of lower blade.
- 10) Reinstall the table and holddown.
- 11) Check clearance again to ensure even clearance.

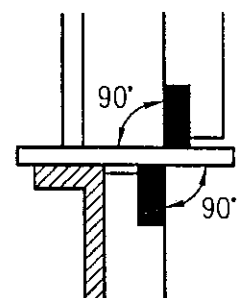
Precaution

- 1) **Do not shear any piece too small to be secured in position by the holddown. Doing so can seriously damage the machine beyond repair. See Figure.**
- 2) Always feed cutting material from front. NEVER insert material from back.
- 3) Keep the cutting edges sharp. Check the sheared material to see whether the cutting clearance is properly set and that the condition of the blades are O.K.
- 4) Clean the scraps and waste materials regularly and keep the work area clean.

INCORRECT



CORRECT



Flat bar Shear Operation

- 1) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to SHEAR.
- 2) Push the material under the hold-down to the desired length. Use the backgauge for getting the precise length.
- 3) Make sure that the material is properly positioned on the table and under the hold-down. Incorrect positioning can damage the blades and/or the machine.
- 4) Use the guide stoppers on the table to position and stabilize the material.
- 5) Lower the hold-down to firmly press the material.
- 6) Tighten the two hand knob nuts to fix the hold-down in position.
- 7) Press the foot switch to execute the shear and release foot switch for the slide to move back up. Alternatively the electric backgauge can be used. See section on Electric Backgauge for details.

Angle Flange Shear Operation

The vertical slot on the hold-down allows the shearing of angle flanges at various degrees. To operate:

- 1) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to SHEAR.
- 2) Push the material into the vertical slot on the hold-down until the vertical flange touches the upper blade.
- 3) Align the material to the desired shearing degree using the marks on the feeding table, then use the movable guide to stabilize the material.
- 4) Lower the hold-down to firmly press the material.
- 5) Tighten the two hand knob nuts to fix the hold-down in position.
- 6) Press the foot switch to execute the shear and release foot switch for the slide to move back up. Electric backgauge should not be used in this operation.

ANGLE SHEAR STATION

This working station can do 90 degree shear on Angles as well as 45 degrees internal miter shear. On IW-60H, external miter shear is also possible. Feed the material through the central slot on the hold-down to for 90 degree shear. On IW-45M and IW-50A, feed the material through the slot on the top and side of the hold-down for different directions of 45 degree internal shear. On IW-60H, feed the material through the two slots on the hold-down for internal and external 45 degree shear.

At 45 degree miter shear, the blades cuts both flanges of the angle. So when matching two angles to make a turning joint, the gap between the vertical flanges is at minimum.

Blades

Stationary Blades: The two stationary blades each has 4 cutting edges. Turn the blades to use the other cutting edges.

Moving Blade: The moving blade also has 4 cutting edges. To avoid the blade making a mark on the material, the tip of the blade can be grounded to match the inside radius of angle.

NOTE: On the IW-60H, there is one large and one small moving blades, and one large and one small stationary blades. Total of 4 blades for this station.

Keep the blades clean. Remove all small slugs and other waste material. Do not allow mill scale to build up in the blade area.

Cutting Clearance

The clearance between the moving blade and the stationary blades were pre-adjusted to be between 0.2mm and 0.3mm. The cutting clearance can be adjusted by the fix bolts that "pull in" the stationary blades and the adjusting screws that "push out" the stationary blades. To adjust the clearance, follow the following steps:

- 1) In JOG mode, move down the moving blades to lower position so that the opening between the blades are closed.
- 2) Turn power OFF and isolate the machine.
- 3) Remove the hold-down.
- 4) Loosen the large blade fixing bolts.
- 5) Loosen the locking nuts on the adjust screws.
- 6) Adjust the clearance by turning the adjusting screws which push the stationary blade towards the moving blade
- 7) Check clearance using a feeler gauge. **It is very important to make sure the cutting clearance is uniform for the entire blades.**
- 8) Tighten the locking nut of the adjust screws to prevent loosening.
- 9) Tighten the fixing bolts.
- 10) Check clearance again to ensure even clearance.
- 11) Reinstall the hold-down.

90 Degree Shear Operation

- 1) Make sure the notcher safety cover and punching stripper are closed.
Turn the Punch/Shear/Notch switch to SHEAR.
- 2) Push the angle through the slot on the holddown to desired length. Use the backgauge for getting the precise length.
- 3) Adjust the screw on the hold-down so that the tip of the screw lies at the root of the angle. The hold-down screw should be tightened so that the working piece does not move upwards while being cut.
- 4) Press the foot switch to execute the shear and release foot switch for the slide to move back up. Alternatively the electric backgauge can be used. See section on Electric Backgauge for details.

45 Degree Internal Miter Shear Operation (on IW-45M and IW-50A)

- 1) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to SHEAR.
- 2) Insert the Angle through the guide slot on the side of the hold down to shear the flanges of angle at 45 degree.
- 3) Insert the another piece of Angle through the guide slot on the top of the hold down to shear the flanges of angle at 45 degree of opposite direction.
- 4) Match the two angles to get an 90 degree turning joint.

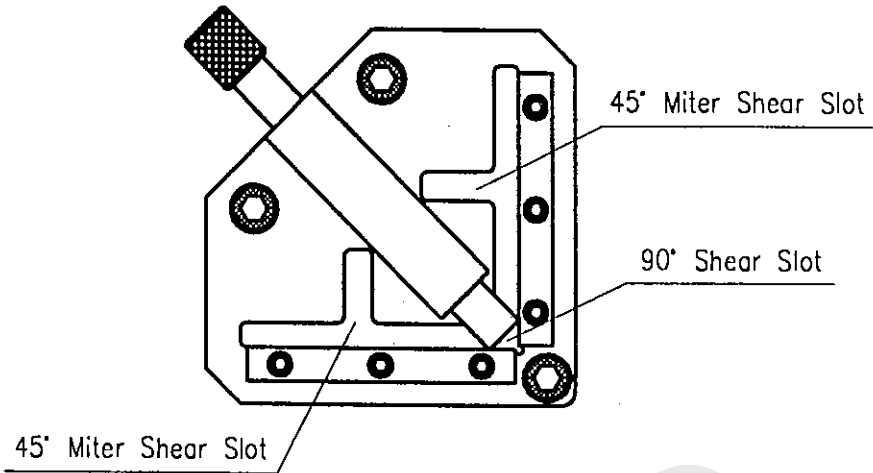
Note: The electric backgauge should not be used for this operation.

45 Degree Internal/External Miter Shear Operation (on IW-60H only)

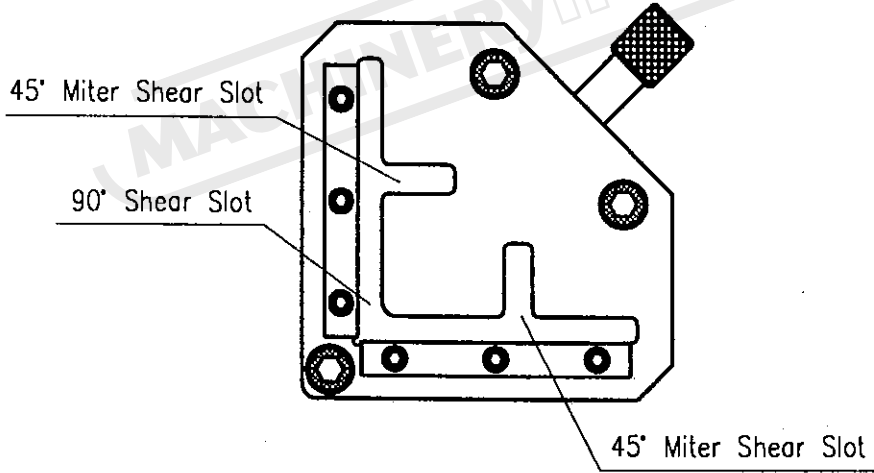
- 1) Make sure the notcher safety cover and punching stripper are closed. Turn the Punch/Shear/Notch switch to SHEAR.
- 2) Insert the Angle through the guide slot on the side of the hold down to shear the flanges of angle at 45 degree. The feeding material and the cut-off material will be one each of internal and external miter shear.
- 3) Insert another piece of Angle through the other guide slot on side of the hold down to shear the flanges of angle at 45 degree of opposite direction. The feeding material and the cut-off material will be one each of internal and external miter shear, opposite in direction from the previous shear.
- 4) Match two angles to get an 90 degree turning joint.

Note: The electric backgauge should not be used for this operation.

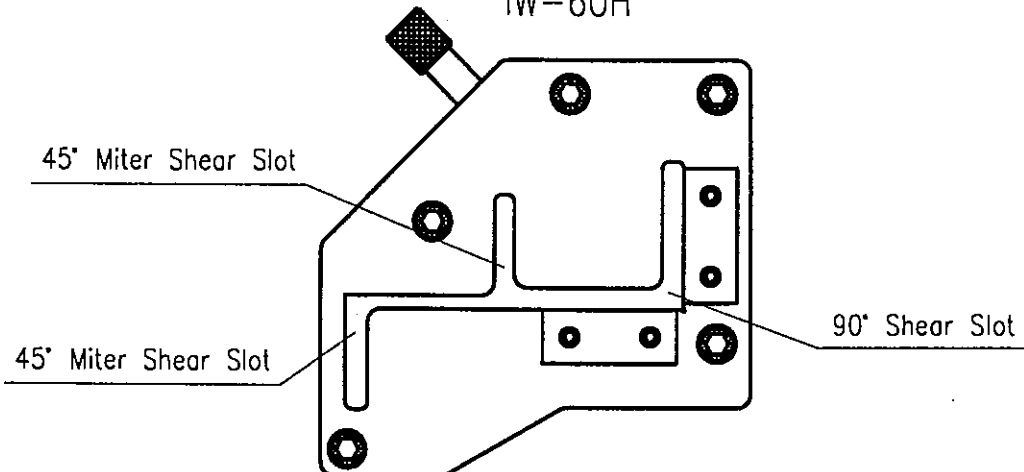
IW-45M



IW-50A



IW-60H



SQUARE/ROUND BAR SHEAR STATION

This station is equipped with a hold down suitable for shearing various sizes of square and round bars. As optional tooling, this station can also shear various type of channels or section bars by changing the moving and stationary blades and hold-downs.

Cutting Clearance

Adjustment of the clearance of the bar shear station is by the adjust screws that push-in the stationary blade against the moving blade. To adjust clearance follow these steps:

- 1) Turn power OFF and isolate the machine.
- 2) Remove the holddown.
- 3) Loosen the locking nuts.
- 4) Tighten the pushing screws firmly. Then, loosen each screw *one third of a turn*. Lock in position by tighten the locking nuts.
- 5) Reinstall the holddown.

Precaution

- 1) **Do not shear any piece too small to be secured in position by the holddown.**
- 2) Always feed cutting material from front. NEVER insert material from back.
- 3) Clean the scraps and waste materials regularly and keep the work area clean.

Bar Shear Operation

- 1) Make sure the notcher cover and punching stripper are closed.
- 2) On IW-45M and IW-50A, turn Punch/Shear/Notch switch to SHEAR to use this station.
On IW-60H, turn Punch/Shear/Notch switch to PUNCH to use this station.
- 3) Push the bar through the slot on the holddown to desired length. Use of the backgauge for precise length.
- 4) Adjust the holddown so that the bar is perpendicular to the blades.
- 5) Tighten the two hand knob nuts to fix the position of holddown.

- 6) Press the foot switch to execute the shear and release foot switch for the slide to move back up. Alternatively the electric backgauge can be used. See section on Electric Backgauge for details.

Note: On IW-45M the holddown for this station is the same as the holddown for the flat shear station.

MACHINERYHOUSE

NOTCHING STATION (On IW-50A and IW-60H)

The rectangular notcher is very useful to notch the edges and corners of flat plates, as well as to notch the flanges of Angles. The triangular Vee-notcher is also available as an optional tooling.

On IW-45M, the notcher is optional tooling to be installed at the punching station.

Blades

The three lower blades each has four cutting edges. Turn the blades to use the other cutting edges. The top blade cannot be turned. We do not suggest grinding of these blades.

Bolster Adjustment

The notch bolster can be adjusted for alignment of the lower blades with the upper blade. To adjust, follow these steps:

- 1) Make sure the punching stripper is closed. Select NOTCH mode on the Punch/Shear/Notch switch and JOG mode on the Normal/Jog switch.
- 2) Lower the working slide until the upper blade inserts into the lower blades by about 3 to 5 mm below the top surface of the lower blades.
- 3) Turn power OFF and isolate the machine.
- 4) Loosen the bolster fixing bolts.
- 5) Loosen the nut on the side adjust screws.
- 6) Loosen the nut for the back hold-back bolt.
- 7) Adjust the bolster position by turning the side adjust screws and the back hold-back bolt.
- 8) Check the cutting clearances on all three cutting faces with a feeler gauge. **It is very important to make sure the cutting clearance is uniform for the entire blades at all 3 cutting faces.**
- 9) Tighten the nuts for the side adjust screws and the back hold-back bolt to lock the screw/bolt in position.
- 10) Tighten the bolster fix bolts to fix the position of the bolster.
- 11) Check clearance again to ensure even clearance.

WARNING

The notch station has been provided with a safety guard. **Do not remove this safety device.** When not using the notching station, the safety guard should cover the blade completely. During the notching operation, because the blades are exposed, there is a higher potential for danger. Pay special attention to the moving blades to prevent body injury. **Make sure no fingers and other body parts are near the blade contacts at all times.**

Notching Operation

- 1) Make sure the punching stripper is closed. Turn the Punch/Shear/Notch switch to NOTCH. The stroke movement of the slide is shorter in Notch mode for better safety.
- 2) Open the safety cover.
- 3) Position the plate or angle on the support table. Use the gauging stoppers on the support table for more accurate and safer operation.
- 4) Adjust the screws on the two strippers to just 1~2mm above the material.
- 5) Press the foot switch to execute the notch and release foot switch for the slide to move back up. During stripping, the material can be lifted up against the stripper and then drop off when the top blade retracts out of the material. **Be very careful with fingers as the material movement has potential of hazard.**
- 6) **Close the safety cover after each operation. Do not leave the cover open.**

MAINTENANCE

1. **Before operating the machine:**

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

Inspect all the blades, 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. **Oil Change:**

Take off and clean the suction filter inside the oil tank every time when changing oil. The first oil change should be performed after approximately 600 operating hours. Further oil change is needed for every 1200 operating hours. A drain outlet is located at the base of the oil tank.

Screw back the cleaned suction filter after the draining the oil. If the suction filter is damaged or clogged, replace the suction filter. 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. **Lubrication**

Lubricate the machine with recommended grease every 8 working hours. Use the grease gun provided to supply grease to all lubrication points which are located on both sides of the machine. (See section on Lubrication)

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)
IW-45M	65	47
IW-50A	86	66
IW-60H	96	73

5. **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.

6. **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	IW-45M	IW-50A	IW-60H
Max Pressure	210 Kg/cm ²	240 Kg/cm ²	250 Kg/cm ²

AIRBORNE NOISE

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

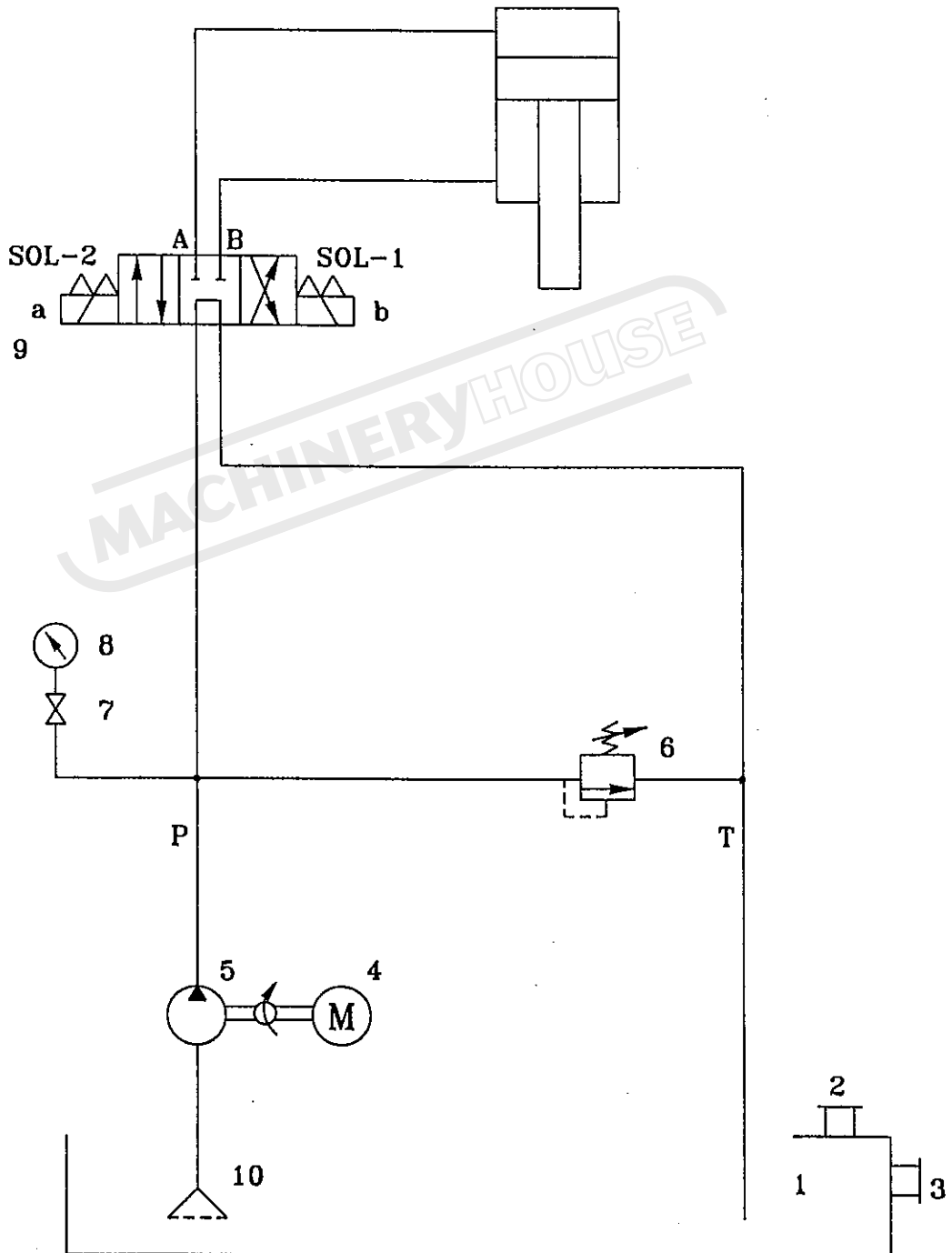
TROUBLE SHOOTING

Problem	Probable cause	Solution
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 solenoid valve.
	5. Foot paddle not sending signal.	Check paddle and replace switch if necessary.
	6. Relay stuck or burn out.	Replace relay

Problem	Probable cause	Solution
(cont.)	7. Interlocked safety covers not closed.	Close covers/stripper.
	8. Limit switch not set at correct position.	Adjust the limit switch for proper stroke travel setting.
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

IW-45M,50A,60H



Hydraulic Circuit Parts

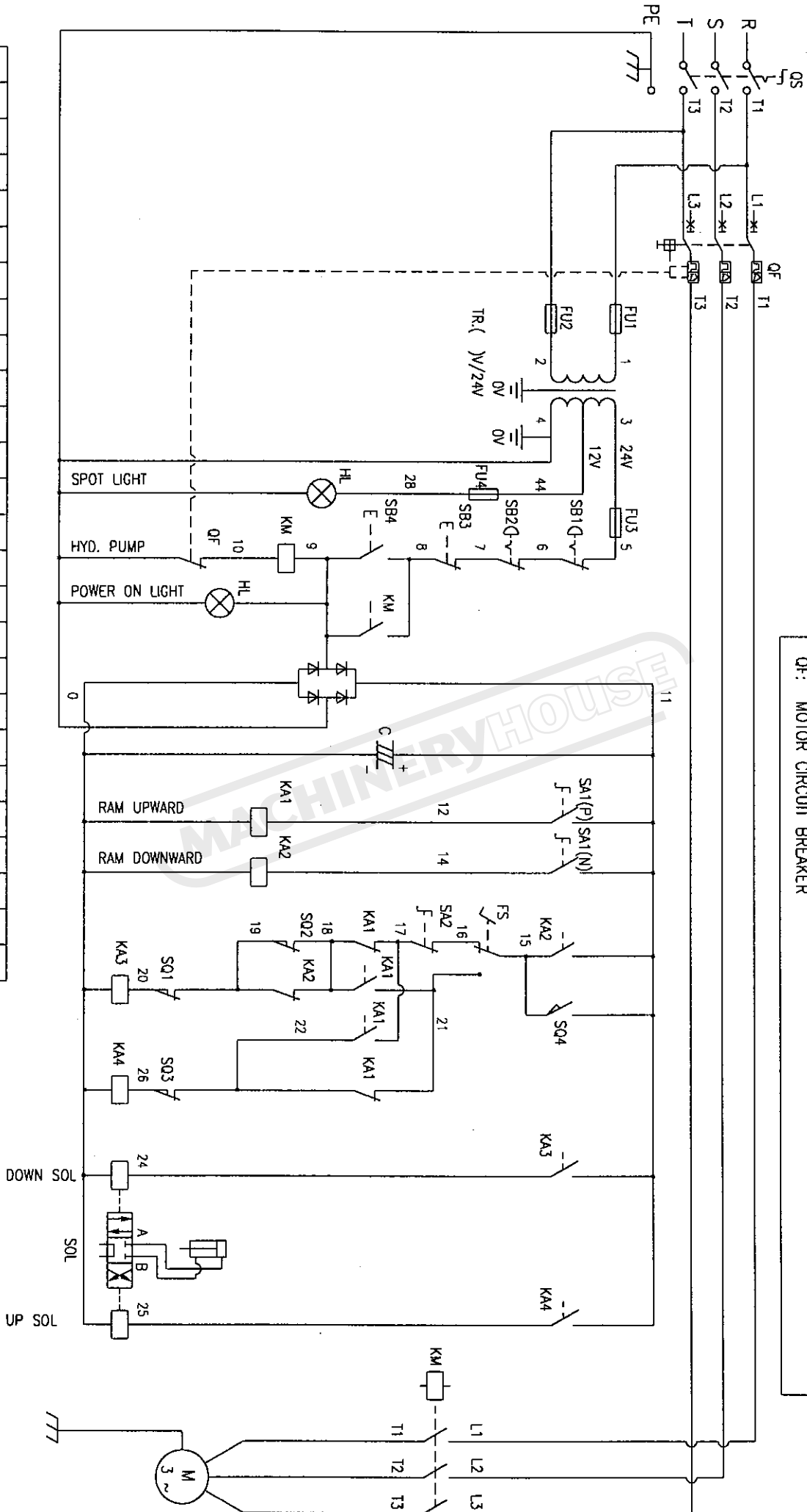
IW-45M, IW-50A, IW-60H

No.	Description	Qty	Specification / Part No.
1	Tank	1	
2	Breather & Filter	1	OL-HY-08A
3	Oil Level Gauge	1	OL-LG-4
4	Motor	1	IW-45M: 5 HP IW-50A: 5 HP IW-60H: 7.5 HP
5	Pump	1	Gear Pump
6	Relief Valve	1	RPEC-FAN
7	Gauge Cock	1	OL-ST-02
8	Pressure Gauge	1	2" x 300 Kg/Cm ²
9	Solenoid Valve	1	4WE6G61/EG24N9K4
10	Suction Oil Filter	1	OL-MF-106

Electrical Circuit

IW-50A, IW-60H

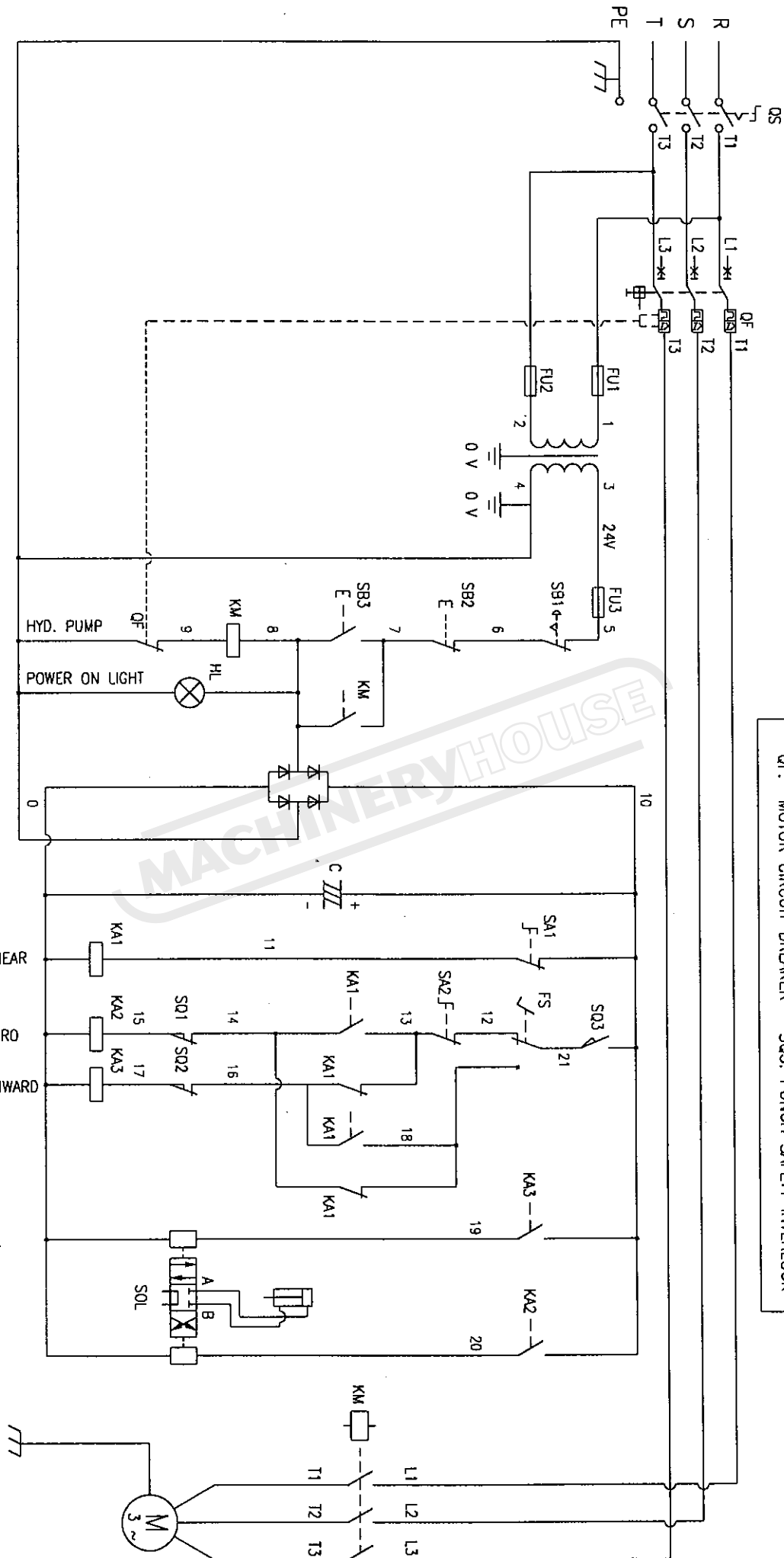
- SB1: EMERGENCY STOP(A)
- SB2: EMERGENCY STOP(B)
- SB3: PUMP OFF
- SB4: PUMP ON
- QF: MOTOR CIRCUIT BREAKER
- FS: FOOT SWITCH
- SA1: PUNCH/SHEAR/NOTCH
- SA2: NORMAL/JOG
- SQ1: RAM DOWN STOP
- SQ2: SHORT STROKE
- SQ3: RAM UP STOP
- SQ4: NOTCH SAFETY INTERLOCK



R	S	T	PE	15	16	21	5	6	6	7	19	19	18	19	22	26	11	15	24	25	0	0	28	4	PE
POWER SOURCE				FS	Y	Y	SB1	Y	SB2	Y	SQ1	Y	SQ2	Y	SQ3	Y	SQ4	Y	SOL	Y	LAMP	Y	Y	Y	Y

Electrical Circuit (CE)

IW-45M model



- SB1: EMERGENCY STOP
- SB2: PUMP OFF
- SB3: PUMP ON
- FS: FOOT SWITCH
- QF: MOTOR CIRCUIT BREAKER
- SA1: PUNCH/SHEAR
- SA2: NORMAL/JOG
- SQ1: RAM UP STOP
- SQ2: RAM DOWN STOP
- SQ3: PUNCH SAFETY INTERLOCK

R	S	T	PE	21	12	18	5	6	14	15	16	17	10	21	19	20	0	0	PE
POWER SOURCE																			
				FS			SB1		SQ1		SQ2		SQ3			SOL			

Electrical Parts

IW-45M (CE)

Code	Description	Quantity	Function
QF	Motor Circuit Breaker	1	Motor Protection
FU1,FU2,FU3	Fuse	3	Control Circuit 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	Punch / Shear Switch
SA2	Selector Switch	1	Normal / Jog Switch
FS	Foot Switch	1	Foot Switch Control
KA1	Relay	1	Punch / Shear
KA2	Relay	1	Ram Upward
KA3	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	Solenoid Valves	1	
KM	Magnetic Switch (Contactors)	1	
	Bridge Rectifiers	1	
Tr	Transformer	1	

Electrical Parts

IW-50A, IW-60H

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,SB2	Push-Lock Push Bottom	2	Emergency Stop
SB3	Flush Push Bottom (Red)	1	Pump Off
SB4	Flush Push Bottom (Green)	1	Pump On
SA1	Selector Switch	1	Punch/Shear/Notch Switch
SA2	Selector Switch	1	Normal/Jog Switch
FS	Foot Switch	1	Foot Switch Control
KA1	Relay	1	Punch/Shear Stroke
KA2	Relay	1	Notch Stroke
KA3	Relay	1	Ram Downward
KA4	Relay	1	Ram Upward
SQ1	Limit Switch	1	Ram Down Limit Switch
SQ2	Limit Switch	1	Short (Notch) Stroke Limit Switch
SQ3	Limit Switch	1	Ram Up Limit Switch
SQ4	Limit Switch	1	Notch Safety Interlock
SOL	Solenoid Valve	1	
KM	Magnetic Switch (Contactors)	1	
	Bridge Rectifiers	1	
Tr	Transformer	1	

Electrical Parts

IW-50A, IW-60H (CE)

With Electric Backgauge

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,SB2	Push-Lock Push Bottom	2	Emergency Stop
SB3	Flush Push Bottom (Red)	1	Pump Off
SB4	Flush Push Bottom (Green)	1	Pump On
SA1	Selector Switch	1	Punch/Shear/Notch Switch
SA2	Selector Switch	1	Normal/Jog Switch
SA3	Selector Switch	1	Auto/Manual Switch
FS	Foot Switch	1	Foot Switch Control
KA1	Relay	1	Punch/Shear Stroke
KA2	Relay	1	Notch Stroke
KA3	Relay	1	Ram Downward
KA4	Relay	1	Ram Upward
KA5, KA6	Relay	2	Backgauge Sensor Control
SQ1	Limit Switch	1	Ram Down Limit Switch
SQ2	Limit Switch	1	Short (Notch) Stroke Limit Switch
SQ3	Limit Switch	1	Ram Up Limit Switch
SQ4	Limit Switch	1	Notch Safety Interlock
SQ5	Limit Switch	1	Punch Safety Interlock
T	Timer for Electric Backgauge	1	Sensor Timer
SENSOR	Sensor	1	Backgauge Sensor
SOL	Solenoid Valve	1	
KM	Magnetic Switch	1	
	Bridge Rectifiers	1	
Tr	Transformer	1	

SINGLE CYLINDER MODELS

CAPACITIES AND SPECIFICATIONS

Unit: mm

MODEL	IW-45M	IW-45K	IW-50A	IW-60H
PUNCHING				
Punching Pressure	45 Ton	45 Ton	50 Ton	60 Ton
Punch Capacity (Diameter x Thickness)	∅22 x 15 ∅40 x 8	∅22 x 15 ∅40 x 8	∅20 x 18 ∅40 x 9	∅28 x 15 ∅40 x 11
Throat Depth	175	165	180	220
Max. Stroke Length	35	30	42	55
Cycles/Min. (15mm stroke)	31	37	24	29
Working Height Up to Die	970	1050	840	1000
FLAT SHEARING				
Flat Bar Shear (Width x Thickness)	350 x 8 180 x 12	300 x 10	300 x 12 200 x 18	350 x 15 210 x 20
Blade Length	360	310	310	360
Angle Flange Trim	75	75	100	100
Working Height	970	800	1150	1006
ANGLE SHEARING				
At 90° Shearing	80 x 80 x 8	75 x 75 x 6	100 x 100 x 10	100 x 100 x 13
At 45° Miter Shearing	50 x 50 x 6	.....	65 x 65 x 8	80 x 80 x 8
Working Height	1120	1000	850	1236
BAR SHEARING				
Round Bar Shear	∅25	∅30	∅32	∅40
Square Bar Shear	25 x 25	25 x 25	30 x 30	38 x 38
Channel Shear	.....	76*	76*	102*
H Beams Shear	.....	76*	76*	102*
Working Height	1190	1000	880	1260
NOTCHING				
Rectangular Notcher (W x D x T)	50.8 x 90 x 7**	50.8 x 90 x 7	50.8 x 90 x 7	50.8 x 90 x 8
Vee-Notcher (Side x Side x T)	90 x 90 x 8**	90 x 90 x 8*	90 x 90 x 8*	90 x 90 x 10*
Working Height	.....	1050	1150	1006
SPECIAL TOOLING				
Single Vee Press Brake (L x T)	160 x 6*	160 x 8*	160 x 10*	160 x 8*
Multi-Vee Press Brake (L x T)	.....	250 x 4*	250 x 6*	.....
Angle Bending*	65 x 8*	65 x 8*	65 x 8*	65 x 10*
Pipe Notching*	.....	∅63*	∅63*	.....
OTHER				
Electric Power (HP)	5 HP	5 HP	5 HP	7.5 HP
Net Weight (Apr.)	830 kg	840 kg	1130 kg	1500 kg
Gross Weight (Apr.)	930 kg	940 kg	1250 kg	1650 kg
Machine Dimensions (Apr.) (L x W x H)	1260 x 700 x 1350	1050 x 760 x 1490	1310 x 770 x 1450	1460 x 770 x 1560
Packing Dimensions (Apr.) (L x W x H)	1530 x 860 x 1630	1320 x 920 x 1770	1580 x 930 x 1730	1730 x 930 x 1840

* : Optional Tooling

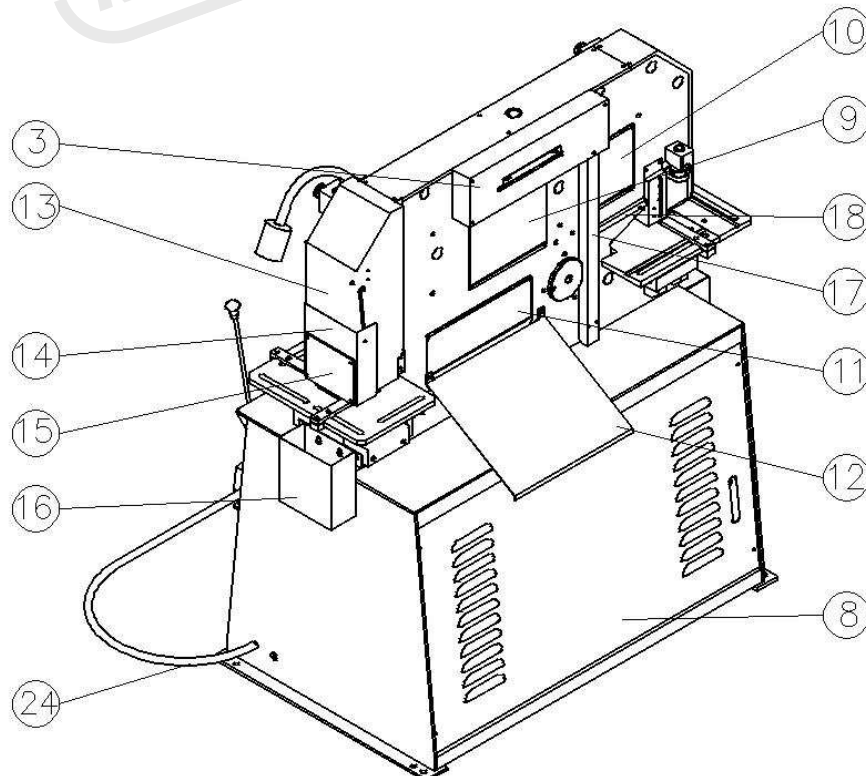
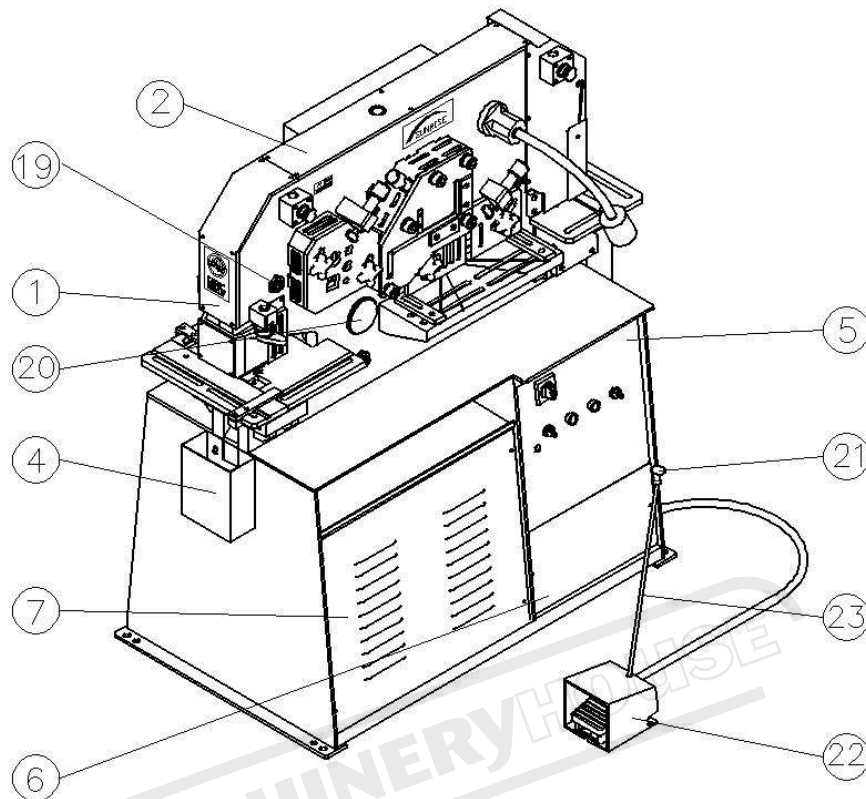
** : On IW-45M the notcher is optional tooling to be installed at the punching station.

Note: Based on material strength of 45kg/mm² tensile.

Design and specifications subject to change without notice.

An 1-hole die holder and a 2-piece gauging table are provided as standard equipment on all single cylinder models.

IW-60H



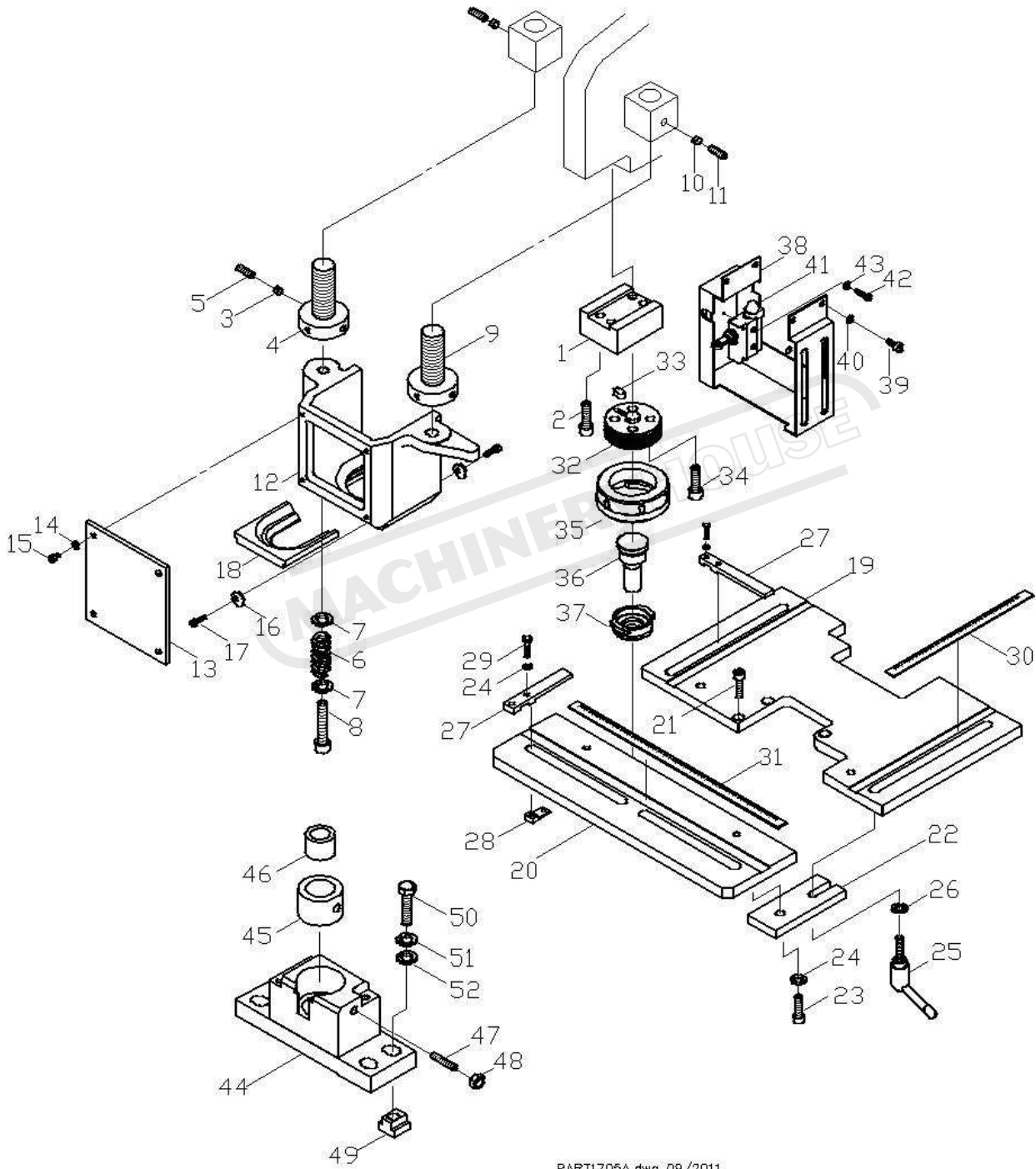
Sunrise Ironworker Parts List

Model: IW-60H
Part: Cover Plates

 Date: 02/2012

Item	Part Number	Description	產品名稱	Q'ty	Memo
1	211902003B	Top Cover A	護蓋 A	1	
2	211902004D	Top Cover B	護蓋 B	1	
3	211902012D	Limit Switch Cover	微動開關護板	1	
4	211302021A	Scrap Box For Punching	沖孔鐵屑盒	1	
5	211802900 211802011B 211302025C 211802012A 52414APL93902	Electrical Box	電氣箱總成	1	
6	211902019A	Front Base Cover	電氣箱底座護蓋	1	
7	211902001	Front Base Cover	底座前蓋	1	
8	211902002A	Rear Base Cover	底座後蓋	1	
9	211902008	Safety Guard for Angle Shear	剪角鐵護板	1	
10	211902010A	Safety Guard for Bar Shear	剪圓方護板	1	
11	211902009A	Safety Guard for Flat Shear	剪平板護板	1	
12	211902011B	Flat Bar Shear Back Plate	滑料片	1	
13	211902026A	Notching Station Cover	剪角側安全護蓋	1	
14	211902027A	Safety Guard For Notching	剪角安全護板	1	
15	42STBH003	Notching Clear Cover	剝料器安全護板	1	
16	211302022	Scrap Box For Notching	剪角鐵屑盒	1	
17	211902006A	Wire Cover for Limit Switch	微動開關配線蓋	1	
18	211902017	Wire Cover	配線蓋	1	
19	213010005 211310008B	Adjust Pushing Screw Adjust Pushing Nut	壓塊固定螺絲 壓塊固定螺帽	5	
20	211910001B	Main Pivot Pin	支持點心軸	1	
21	56314118036M10	Waist Shaped Knobs 1180-36-M10	凹槽式旋鈕		
22	52413YC135D	Foot Switch YC-135D(CE)	腳踏開關	1	
23	213210008	Foot Switch Handle	腳踏開關提桿	1	
24	56320G0061800A	Foot Switch Cable 1800mm	電線保護管 1800mm	1	

Punching Station for IW-45M / 60H



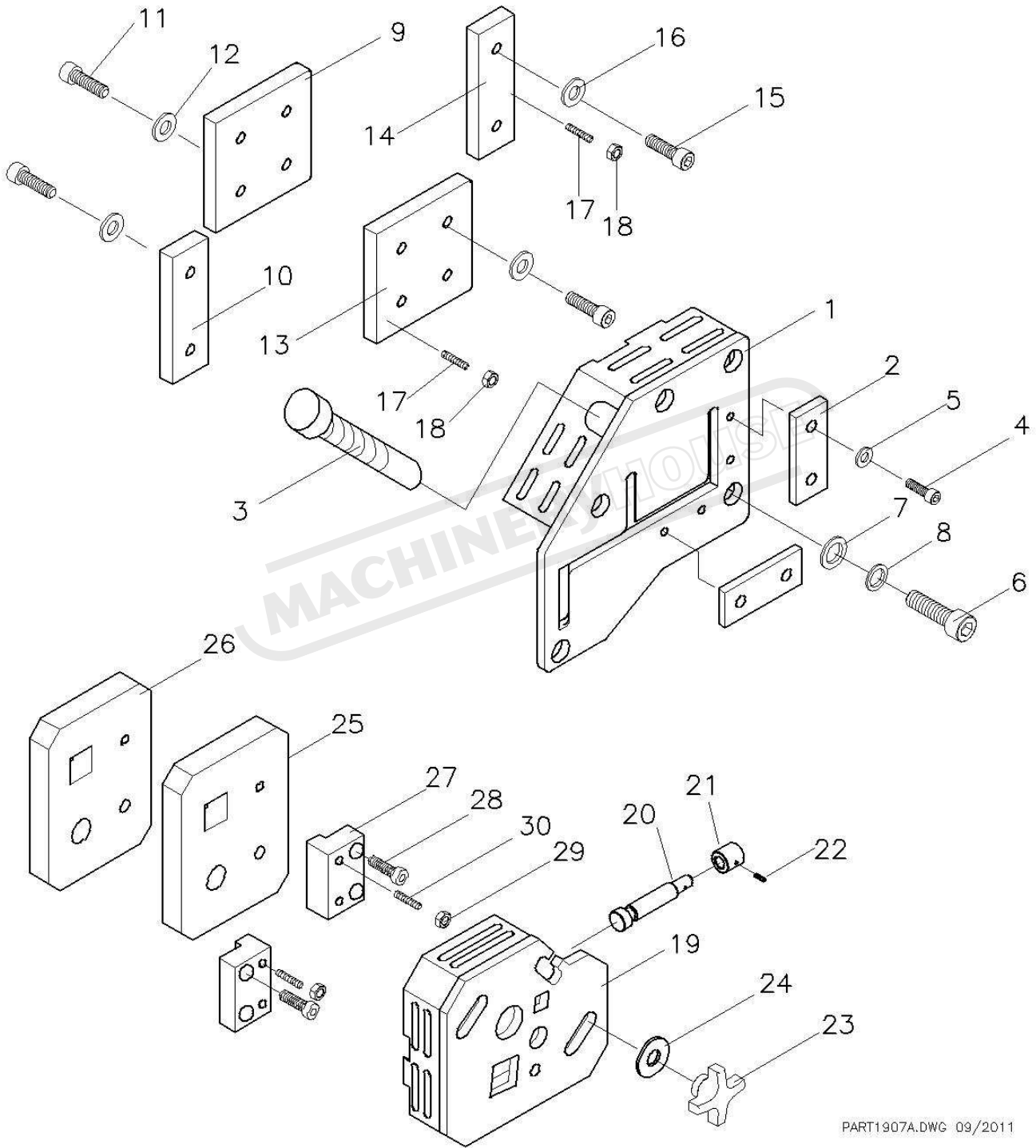
Sunrise Ironworker Parts List

Model: IW-60H
Part: Punching Station

 Date: 02/2012

Item	Part Number	Description	產品名稱	Q'ty	Memo
1	211505001D	Retaining Thread Support	螺紋塊固定座	1	
2	56301A0014035	Hex Bolt M14X35	六角承窩頭螺栓	2	
3	211305090	212211009	Copper Piece	定位銅片	1
4		211305005B	Stripper Adj. Screw (2)	剝料器調整螺桿(二)	1
5		56301C0006010	Set Screw M6X10	止付內六角螺栓	1
6		211305006	Stripper Spring	沖孔剝料器彈簧	1
7		56303D00012024045	Flat Washer M12	平墊圈	2
8		56301A0012090	Hex Bolt M12X90	六角承窩頭螺栓	1
9	211305004B	Stripper Adj. Screw (1)	剝料器調整螺桿(一)	1	
10	213205010	Copper Piece	銅墊	2	
11	56301C0010012	Set Screw M10X12	止付內六角螺栓	2	
12	42STMD	42STMC003B	Stripper	沖孔剝料器	1
13		42STMC002	Stripper Clear Cover	剝料器護板	1
14		56303A00005	Spring Washer M5	彈簧墊圈	4
15		56301A0005012	Hex Bolt M5X12	六角承窩頭螺栓	4
16		42STBC004	Washer	墊片	2
17		56301I0005008	Cap Screw M5X8	半圓內六孔	2
18		42STBC003A-20 42STBC003A-42	Stripper Exchangeable Plate	剝料器底板	1
19		212905001A	Punching Table A (Main)	沖孔工作板(A)	1
20	211605004C	Punching Table B (Front)	沖孔工作板(B)	1	
21	211905100	56301A0008016	Hex Bolt M8X16	六角承窩頭螺栓	3
22		211305009B	Table Connecting Plate	工作板連接塊	2
23		56301A0010025	Hex Bolt M10X25	六角承窩頭螺栓	2
24		56303A00010	Spring Washer M10	彈簧墊圈	6
25		56315404163M1025	Clamp Handle M10X25	萬向把手	2
26		56303B11012025	Flat Washer M10	平墊圈	2
27		211605008A	Stopper Plate	工作板定位塊	2
28		211605009A	Clamping Plate	定位板固定滑塊	2
29		56301A4010040	Hex Bolt M10X40	六角承窩頭螺栓	4
30		211905003A	Punching Stopper Guide Ruler	沖孔工作板 Y 軸標尺	2
31		211605011A	Punching Table Ruler	沖孔工作板 X 軸標尺	1

Angle and Bar Shear Station for IW-60H



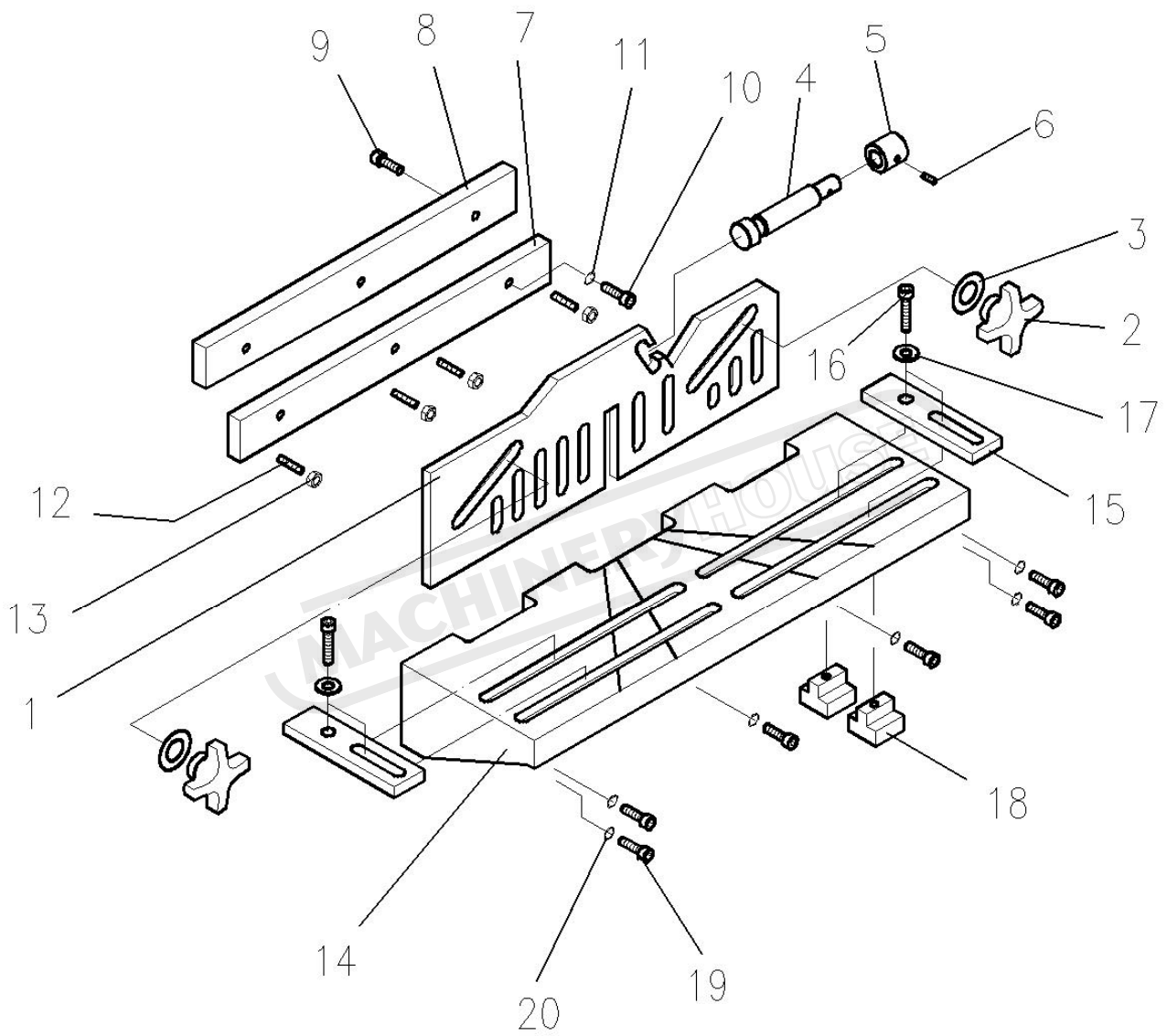
Sunrise Ironworker Parts List

Model: IW-60H Part: Angle and Bar Shear Station

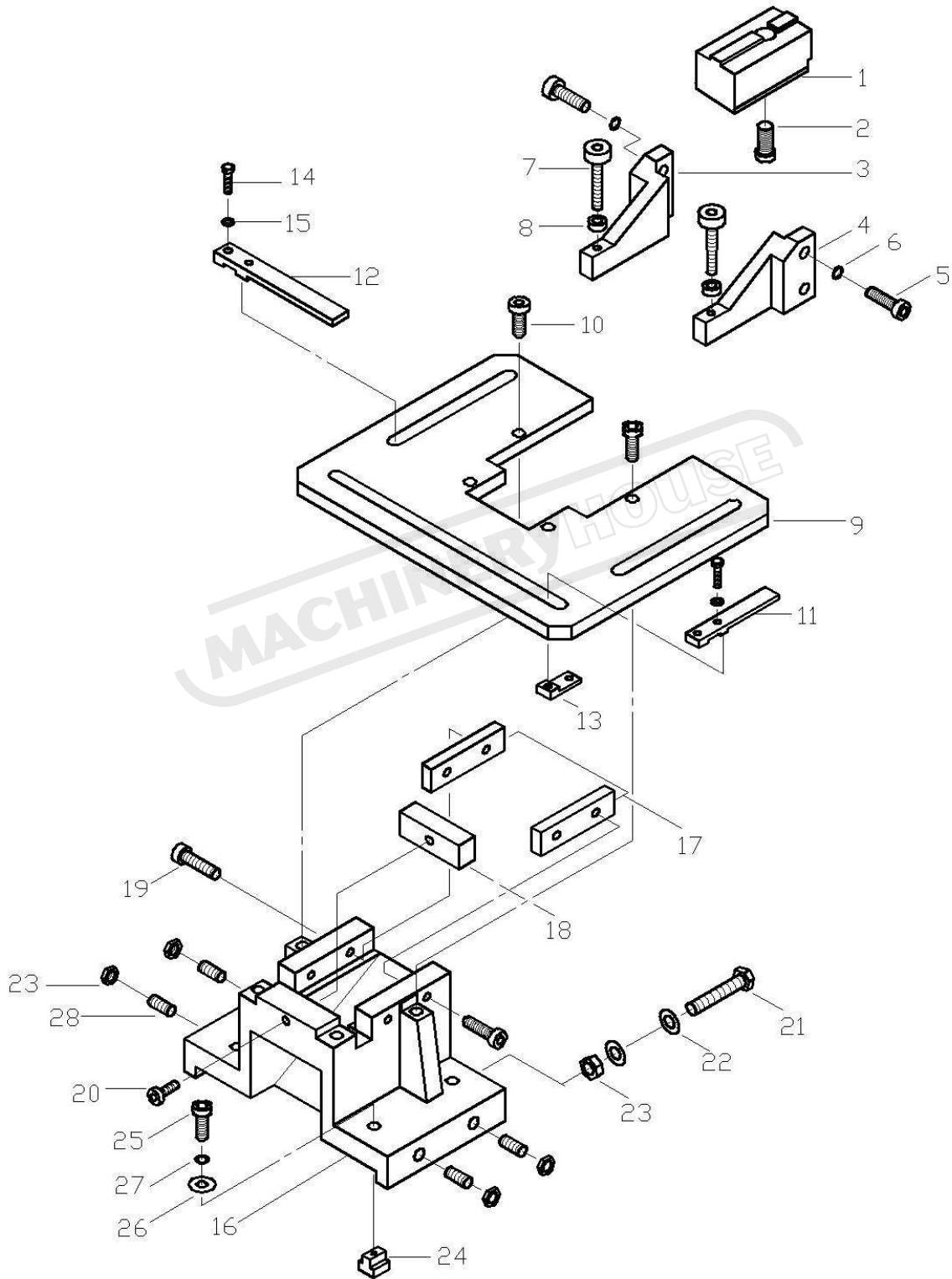
Date: 02/2012

Item	Part Number		Description	產品名稱	Q'ty	Memo
1	211907901	211907001D	Angle Shear Holddown	角鐵剪切座	1	
		211907002				
		211902014B				
2	211507005A		Angle Holddown Adjusting Plate	L型鐵座調整壓塊	2	
3	211810005		Angle Holddown Screw	L型鐵座調整螺桿	1	
4	56301A0010020		Hex Bolt M10x20	六角承窩頭螺栓	4	
5	56303A00010		Spring Washer M10	彈簧墊圈	4	
6	56301A0020030		Hex Bolt M20X30	六角承窩頭螺栓	5	
7	56303B00020037040		Flat Washer M20	平墊圈	5	
8	56303A00020		Spring Washer M20	彈簧墊圈	5	
9	211807004B		Angle Shear Moving Blade(2)	剪角鐵刀具(活動2)	1	
10	211507003C		Angle Shear Moving Blade(1)	剪角鐵刀具(活動1)	1	
11	56301A0014050		Hex Bolt M14X50	六角承窩頭螺栓	5	
12	56303A00014		Spring Washer M14	彈簧墊圈	5	
13	211507001B		Angle Shear Stationary Blade(1)	剪角鐵刀具(固定1)	1	
14	211507002C		Angle Shear Stationary Blade(2)	剪角鐵刀具(固定2)	1	
15	56301A0014045		Hex Bolt M14X45	六角承窩頭螺栓	6	
16	56303A00014		Spring Washer M14	彈簧墊圈	6	
17	56301C8010030		Set Screw M10X30	止付內六角螺栓	8	
18	56302B0110		Nut M10	螺帽	8	
19	211909900	211909003	Rd/Sq Shear Holddown	圓方壓板	1	
		211902015				
		211902016				
20	211810900A	211810006C	Shear Holddown Screw	平板,圓方壓板調整螺桿	1	
21		211810009	Handle for Screw	調整螺桿握把		
22		56301C0008006	Set Screw M8X6	止付內六角螺絲		
23	56314DIN633576		Fix Nut for Holddown	十字旋鈕(不銹鋼)	2	
24	56303B11020040		Flat Washer M16	平墊圈	2	
25	211909001		Rd/Sq Shear Stationary Blade	圓方刀具(固定)	1	
26	211909002		Rd/Sq Shear Moving Blade	圓方刀具(活動)	1	
27	211309004		Rd/Sq Shear Blade Fix Plate	圓方刀具固定塊	2	
28	56301A0012020		Hex Bolt M12X20	六角承窩頭螺栓	4	
29	56302B0110		Nut M10	螺帽	4	
30	56301C8010040		Set Screw M10X40	止付內六角螺栓	4	

Flat Shear Station for IW-60H



Notching Station Assembly for IW-50A / 60H



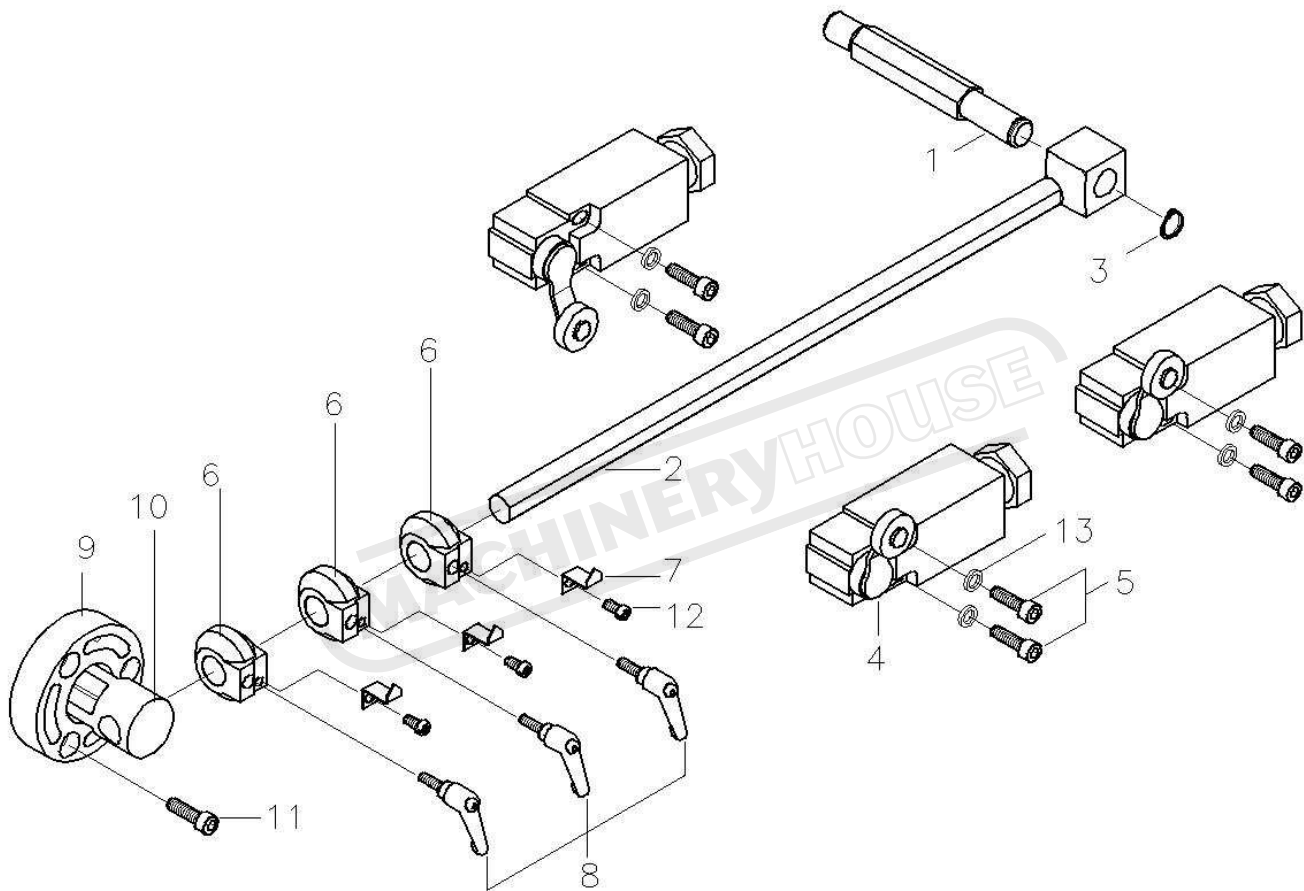
Sunrise Ironworker Parts List

Model: IW-50A/60H
Part: Notching Station

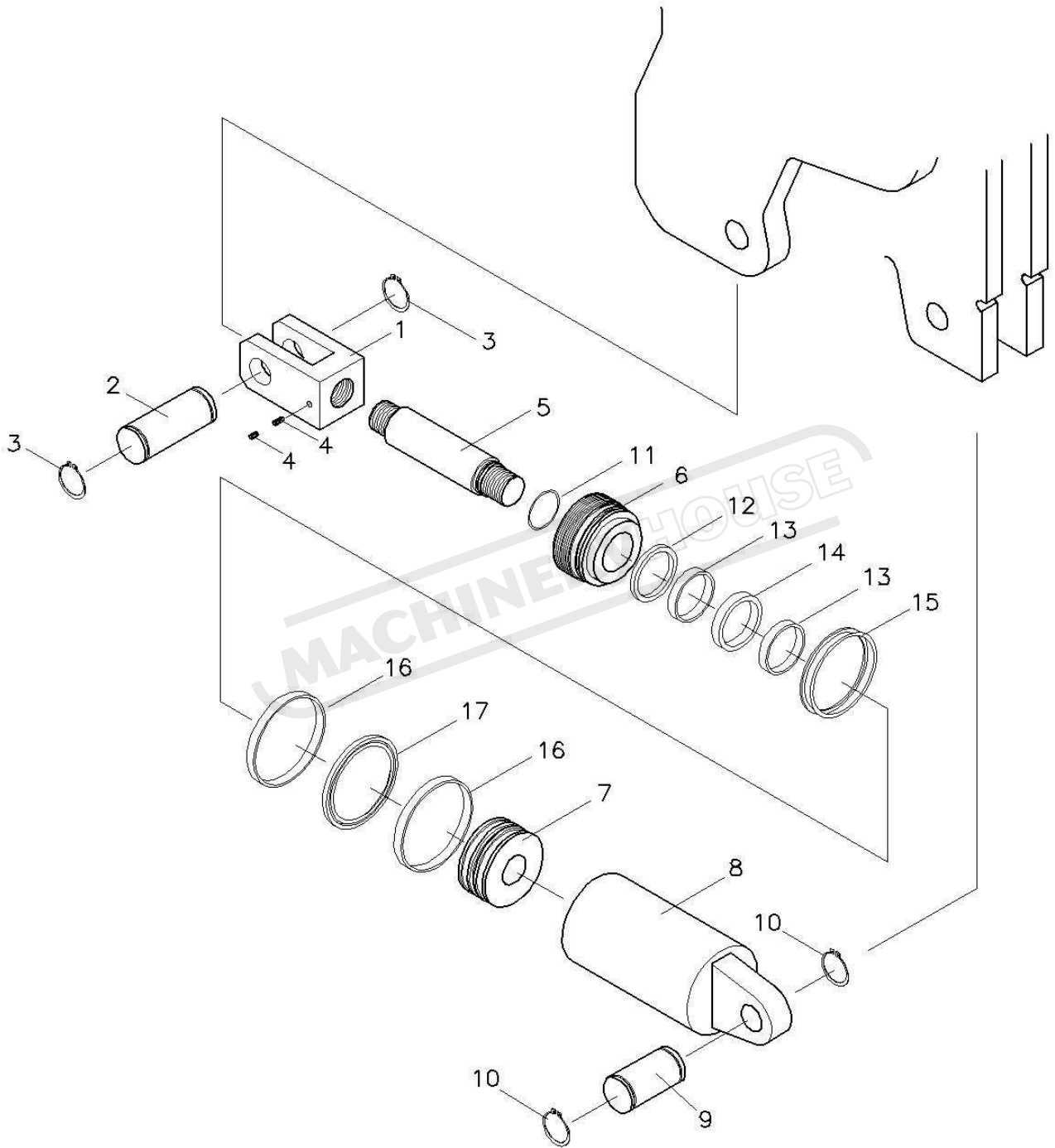
 Date: 02/2012

Item	Part No	Description	產品名稱	Q'ty	Memo	
1	213206001A	Notcher Top Blade	方型剪角刀具	1		
2	56301A0018035	Hex Bolt M18X35	六角承窩頭螺栓	1		
3	211306004A	Notching Stripper (left)	剪角剝料器(左)	1		
4	211306005A	Notching Stripper (right)	剪角剝料器(右)	1		
5	56301A0012030	Hex Bolt M12X30	六角承窩頭螺栓	4		
6	56303A00012	Spring Washer M12	彈簧墊圈	4		
7	56301A0008050	Hex Bolt M8X50	六角承窩頭螺栓	2		
8	56302B0108	Nut M8	六角螺帽	2		
9	211606100	211606003A	Notching Table	剪角工作板	1	
10		56301A0008016	Hex Bolt M8X16	六角承窩頭螺栓	4	
11		211605008A	Stopper Plate (short)	工作板定位塊(短)	1	
12		211606007	Stopper Plate (long)	工作板定位塊(長)	1	
13		211605009A	Clamping Plate	定位板固定滑塊	2	
14		56301A0010040	Hex Bolt M10X40	六角承窩頭螺栓	4	
15		56303A00010	Spring Washer M10	彈簧墊圈	4	
16		211306008D	Notching Bolster	方型剪角下模座	1	
17	211306002F	Notcher Side Blade	方型剪角側刀	2		
18	211306003C	Notcher Front Blade	方型剪角前刀	1		
19	56301A0010020	Hex Bolt M10X20	六角承窩頭螺栓	4		
20	56301A0010035	Hex Bolt M10X35	六角承窩頭螺栓	1		
21	HW-BTD12055	Hex Bolt M12X55	六角頭螺栓	2		
22	56303D00012024045	Flat Washer M12	平墊圈	4		
23	56302B0112	Nut M12	六角螺帽	6		
24	211305012	T-Shaped Nut M12	T形螺帽	4		
25	56301A0012050	Hex Bolt M12X50	六角承窩頭螺栓	4		
26	56303D00012024045	Flat Washer M12	平墊圈	4		
27	56303A00012	Spring Washer M12	彈簧墊圈	4		
28	56301C0012025	Set Screw M12X25	止付內六角螺栓	4		

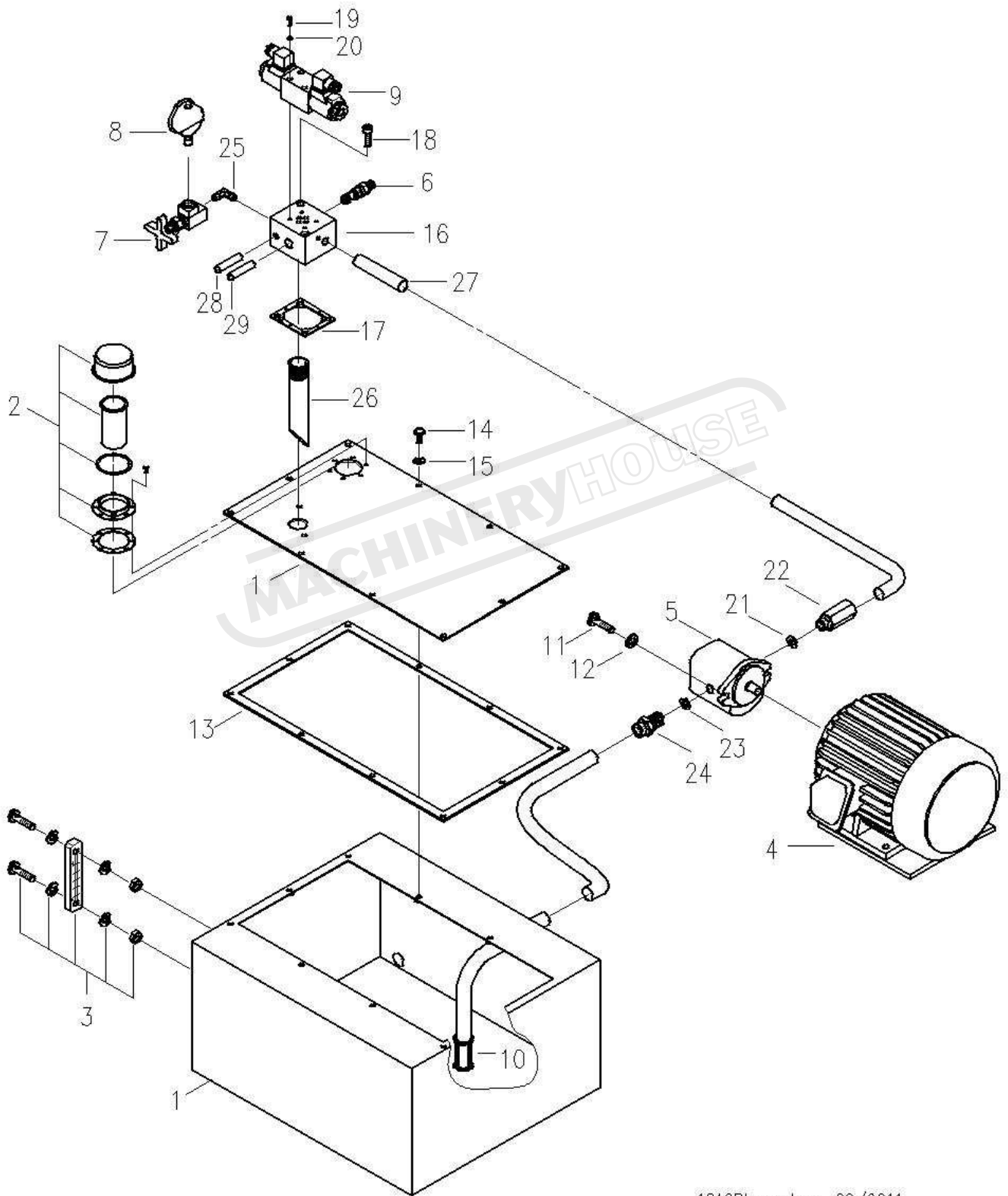
Stroke Adjustment for IW-50A & IW-60H



Cylinder Assembly IW-50A / 60H



Hydraulic Components for IW-50A / 60H

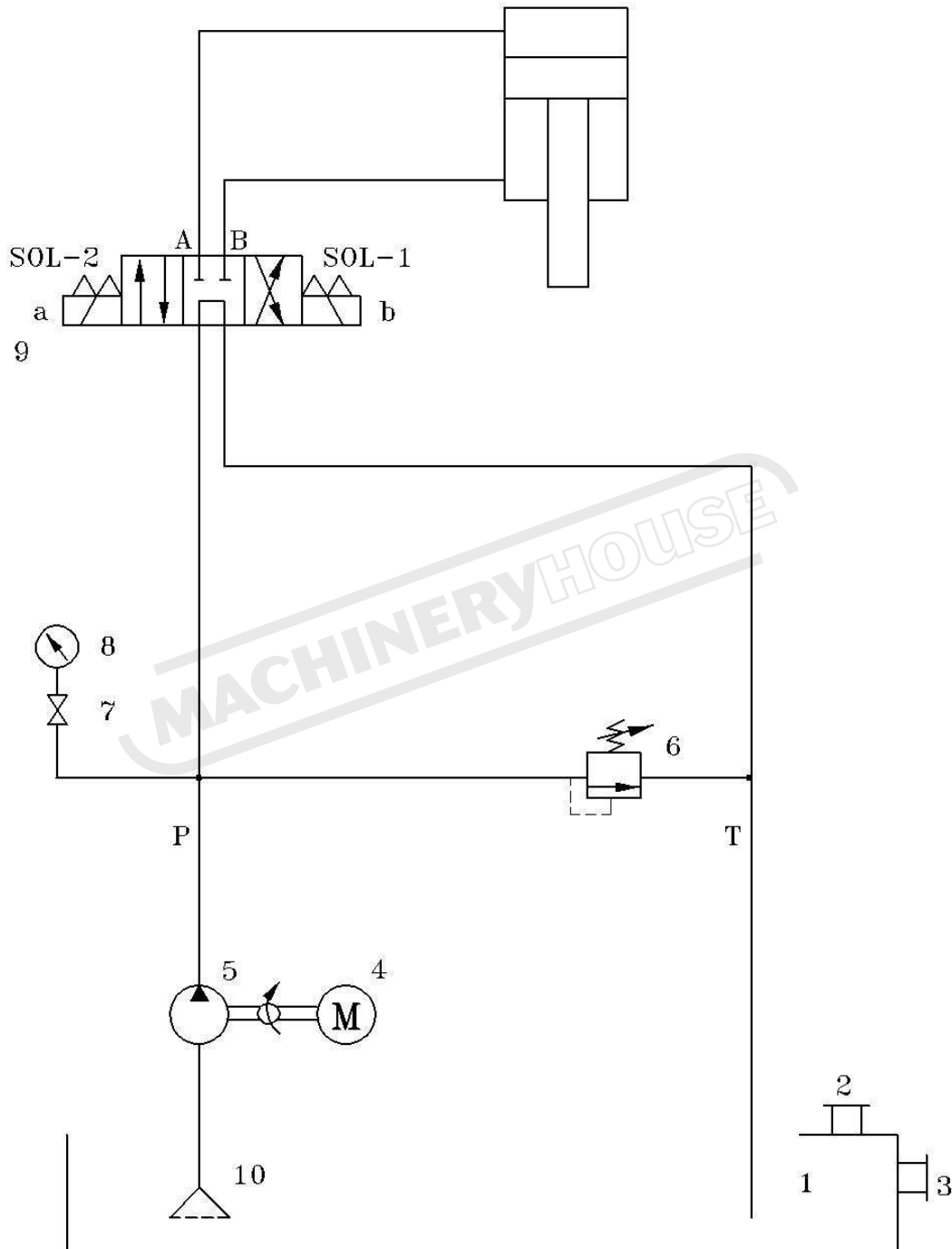


Sunrise Ironworker Parts List

Model: **IW-60H**Part: **Hydraulic Components Assembly**Date: 02/2012

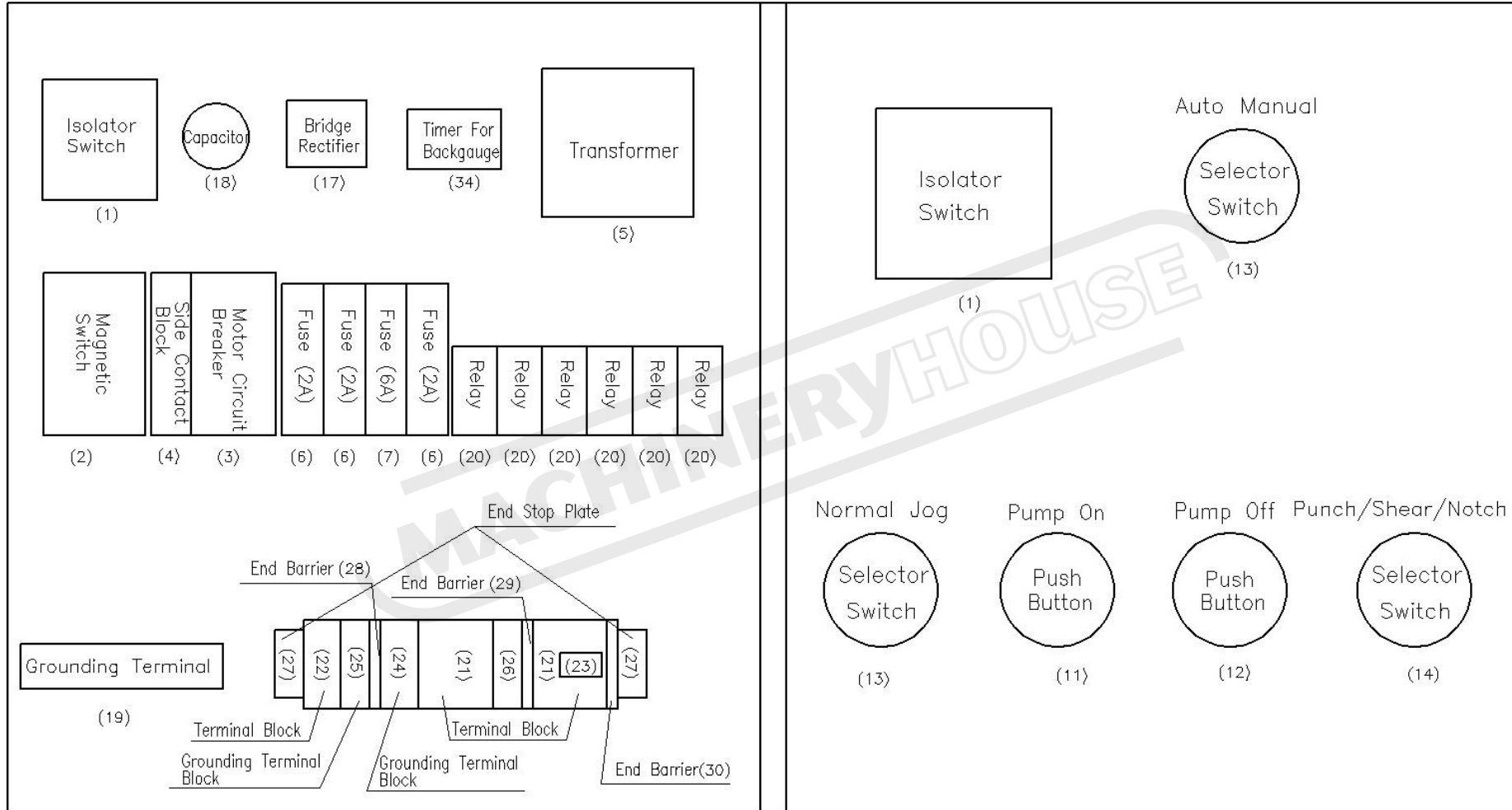
Item	Part Number		Name	產品名稱	Q'ty	Memo
1	211902910A	211902018D	Oil Tank	油箱	1	
		211802026				
2	53702HY08A		Breather & Filler	注油器	1	
3	53701LG4		Oil Level Gauge	油面計	1	
4	7.5HP 50Hz	380V: 52301075JN 400V: 52301075JN 415V: 52301075JN	Motor	馬達	1	
	7.5HP 60Hz	220V: 52301075FG 230V: 52301075FG 380V: 52301075FG 460V: 52301075FG 575V: 52301075DH				
	7.5HP 60Hz	220V: 52303075YF 380V: 52303075YF				
5	50Hz: 53201GHP2AS22 60Hz: 53201GHP2AS20		Pump	泵浦	1	
6	53656RPECFAN		Relief Valve	洩壓閥	1	
7	53652ST02L		Gauge Cock	考克	1	
8	53621CBLM63350		Pressure Gauge	壓力錶	1	
9	53651DFA02005		Solenoid Valve	電磁閥	1	
10	53301MF106		Suction Filter	濾油網	1	
11	56301A0010025		Hex Bolt M10X25	六角承窩頭螺栓	2	
12	56303A00010		Spring Washer M10	彈簧墊圈	2	
13	211303008		Oil Tank Cover Seal	油箱油封	1	
14	56301D0008025		Hex Bolt M8X25	六角頭螺栓	10	
15	56303A00008		Spring Washer M8	彈簧墊圈	10	
16	211603003A		Manifold Block	油路板	1	
17	211603005		Packing	橡膠油封	1	
18	56301A0008065		Hex Bolt M8X65	六角承窩頭螺栓	2	
19	56301A0005040		Hex Bolt M5X40	六角承窩頭螺栓	4	
20	56303A00005		Spring Washer M5	彈簧墊圈	4	
21	53403P020VT		O-Ring	O 型環	1	
22	210LJT006A		Oil Joint	泵浦出油口接頭	1	

Hydraulic Circuit for IW-45M / 50A / 60H



ELECTRIC PANEL DIAGRAM

IW-50A, 60H MODELS with ELECTRIC BACKGAUGE



IW-60H ELECTRICAL PARTS

With Electrical Backgauge, CE

02/2012

	Part Number	Code	Description	Manufacturer	Q'ty	產品名稱	Memo
1	220V: 52407OT40F3 230V: 52407OT40F3 380V: 52407OT25F3 415V: 52407OT25F3 460V: 52407OT40F3 575V: 52407OT16F3	QS	Isolator Switch	ABB Control OY	1	電源開關	
2	220V: 52401LC1D25B7 230V: 52401LC1D25B7 380V: 52401LC1D18B7 415V: 52401LC1D18B7 460V: 52401LC1D25B7 575V: 52401LC1D12B7	KM	Magnetic Switch	TE	1	電磁接觸器	
3	220V: 52402GV2ME22 230V: 52402GV2ME22 380V: 52402GV2ME16 415V: 52402GV2ME16 460V: 52402GV2ME16 575V: 52402GV2ME14	QF	Motor Circuit Breaker	TE	1	馬達啓動斷路器	
4	52419GVAN11		Side Contact Block	TE	1	輔助接點	
5	220V: 524032201510 230V: 524035751520 380V: 524032201510 415V: 524032201510 460V: 524035751520 575V: 524035751520	TR	Transformer	SUENN LIANG	1	變壓器	
6	52801A02A	FU1,FU2, FU4	Fuse	Bussmann	3	保險絲	
7	52801A06A	FU3	Fuse	Bussmann	1	保險絲	

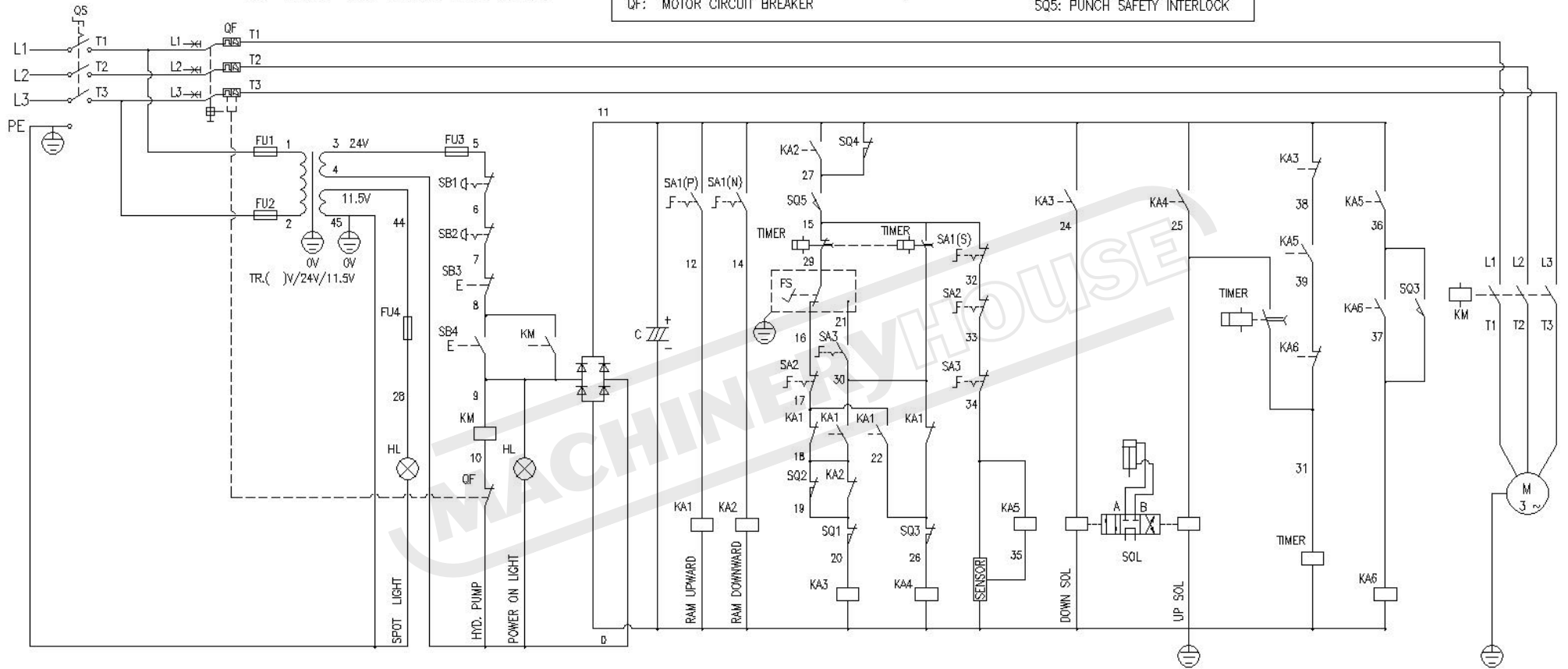
	Part Number	Code	Description	Manufacturer	Q'ty	產品名稱	Memo
8	52801CFBSCHM1D		Fuse Base	Bussmann	4	保險絲座	
9	52421XB5AS542	SB2	Emergency Stop Button (Shear Side)	TE	1	緊急停止	
10	52421XB5AS542	SB1	Emergency Stop Button (Punch Side)	TE	1	緊急停止	
11	52420XB5AW3361	SB4	Pump ON Push Button	TE	1	綠色罩光按鈕	
12	52407XB5AL42	SB3	Pump OFF Push Button	TE	1	泵浦停止	
13	52415ZB5AD2	SA1,SA3	Selector Switch	TE	2	選擇開關	
14	52415ZB5AD3	SA2	Selector Switch	TE	1	選擇開關	
15	52419ZBE101		Normal Open Contact	TE	3	選擇 A 接點	
16	52419ZBE102		Normal Close Contact	TE	1	選擇 B 接點	
17	52202KBPC2506		Bridge Rectifier	FY	1	橋式整流器	
18	522034700UF50V	C	Capacitor	廣華 (Kuan Hua)	1	電容器	
19	527026P		Grounding Terminal	Wago	1	接地端子台	
20	52404RMIA2YF08AE	KA1~KA6	Relay	Carlo Gavazzi	6	繼電器	
21	52702280901		Terminal Block	Wago	27	端子匣	
22	52702282901		Terminal Block	Wago	3	端子匣	
23	52702280402		Jumper Bar	Wago	3	短路片	
24	52702280907		Grounding Terminal Block	Wago	1	接地端子匣	
25	52702282907		Grounding Terminal Block	Wago	1	接地端子匣	
26	52702280681		Terminal Block	Wago	1	端子匣	
27	52702249117		End Stop Plate	Wago	2	擋片	
28	52702282325		End Barrier	Wago	1	端板	
29	52702282325		End Barrier	Wago	1	端板	
30	52702280324		End Barrier	Wago	1	端板	

	Part Number	Code	Description	Manufacturer	Q'ty	產品名稱	Memo
31	52702280308		End Barrier	Wago	1	端板	
32	52702261301		Terminal Block	Wago	2	端子匣	
33	52702261361		End Barrier	Wago	1	端板	
34	52405H3M1	TIMER	Timer for Backgauge	Fotek	1	計時器	
35	56294202504		4 Pin Connector For Backgauge	PLT	1	金屬接頭	
36	5240921A12DSN04	SENSOR	Proximity Sensor for Backgauge	CARLO	1	近接開關	
37	52413YC135D	FS1,FS2	Foot Switch	SSUPOU	1	腳踏開關	
38	52811AL201WTG23012	HL	Halogen Lamp	ARC	1	石英燈	
39	52411XCKN2118G11	SQ1~SQ3	Limit Switch for Stroke Adjustment	TE	3	微動開關	
40	52411TZ7311	SQ4	Limit Switch for Notcher	Tend	1	剪角微動開關	
41	52411TZ7312	SQ5	Limit Switch for Stripper	Tend	1	剝料微動開關	

Electrical Circuit (CE)

IW-50A, IW-60H model with sensor

- | | | |
|---------------------------|------------------------|-----------------------------|
| SB1: EMERGENCY STOP(A) | FS: FOOT SWITCH | SQ1: RAM DOWN STOP |
| SB2: EMERGENCY STOP(B) | SA1: PUNCH/SHEAR/NOTCH | SQ2: SHORT STROKE |
| SB3: PUMP OFF | SA2: NORMAL/JOG | SQ3: RAM UP STOP |
| SB4: PUMP ON | SA3: AUTO/MANU | SQ4: NOTCH SAFETY INTERLOCK |
| QF: MOTOR CIRCUIT BREAKER | | SQ5: PUNCH SAFETY INTERLOCK |



L1	L2	L3	PE	G	29	16	21	5	6	6	7	19	20	18	19	22	26	36	37	11	27	15	27	24	25	0	0	0	34	35	28	45	
POWER SOURCE						FS	SB1	SB2	SQ1	SQ2	SQ3	SQ4	SQ5	SOL	SENSOR	LAMP																	