

INSTRUCTION MANUAL

HG-3204

Hydraulic NC Guillotine (415V)

3200 x 4mm

1-Axis Ezy-Set NC-89 Go-To Controller



S935

HYDRAULIC SWING PLATE SHEARING MACHINE

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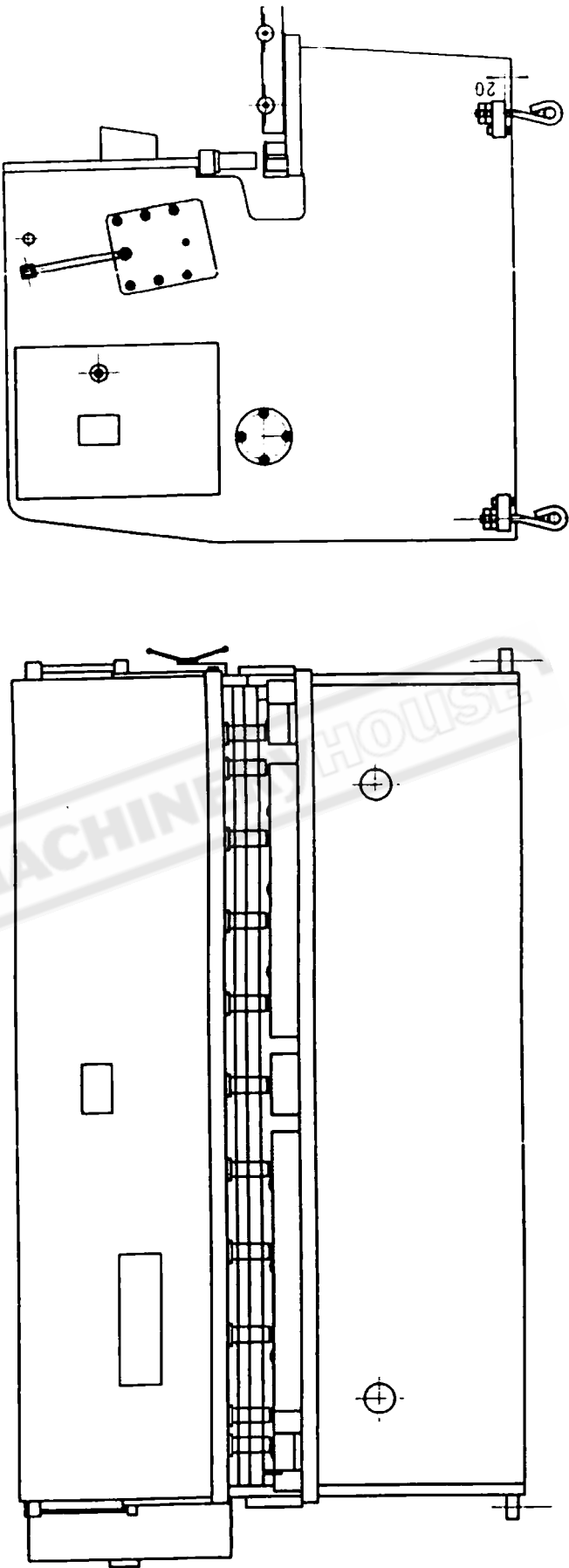
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1. Outline Photo of the Machine



Remark: The dimension of appearance can refer to parameter list

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2. Fundamental Data

No.	Name	Value	Unit	Remarks
1	Max. Shearing Thickness	4	mm	
2	Max. Shearing Width	2000/2500/3200/4000	mm	
3	Strength of shearing Sheets	450	N/mm ²	
4	Shearing Angle	1° 30'		
5	Max. length of Back Gauge	500/600	mm	
6	Stroke number	20	min ⁻¹	
7	Distance between vertical columns	2150/2700/3420/4220	mm	
8	Blade Length	2050/2600/3300/4100	mm	
9	Height of the work Table	740/800	mm	
10	Main Motor	Type	Y132S-4/Y132M2-6	
		Power	5.5	kW
11	Motor for Back Gauge	Type	Y802-6	B3Double out-axis
		Power	0.55	kW
12	Gear Pump	Type	NT ₂ -G10F/NT ₃ -G20F	
		Flow	10/20	mL/r
		Pressure	32	MPa
13	Overall dimension	L	2560/3110/3840/4640	mm
		W	1400/1400/1675/1850	mm
		H	1450/1450/1620/1700	mm

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III、Main Applications , Functions and Features

This machine is used for shearing of steel plates with thickness of 0.5-4mm and width of 2000/2500/3200/4000mm .

The strength of the plates to be shorn should be 450N/mm^2 If the plates of other strength are to be shorn, the thickness of them should be reduced.

This machine adopts plate-welded structure, hydraulic driving. The accumulator stroke cylinder is used. The machine is of steadiness, safety while being used. And it is without much volume, and light weight, good rigidity. The blade clearance is adjusted quickly and simply. It has front and back gauge. The equipment of the back gauge is mechanical driven. There is a counter to show the value. And there is installation of a manually operated fine-tuning. It is easily adjusted and reliable. The front gauge is counted with the scale. It has installation for lights of cutting. Stroke stepless controler raises working efficiency in shearing narrow plate. The barrier is used as the protective device. The machine will stop working automatically, if the shack is opened. So it is of safety.

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IV . HYDRAULIC DRIVING SYSTEM

The hydraulic system (figure 1) is mainly made of NT-series gear pump 2, combined valve 3, overflow valve 3C, magnetic directional valve 3D. The whole system is reasonable.

The needed pressure oil is provided by NT-series gear pump 2. The max. working pressure of system is 16MPa. The return stroke of the top rest is finished by nitrogen cylinder 8, and the fill pressure is about 5MPa.

The working principle of hydraulic system (see figure 1) is: The oil carried from the pipes enters every working cylinder (main cylinder 17, swaging cylinder 19) and combined valve 3 while the oil pump is working. After entering the combined valve, the oil is divided into main oilway and controlled oilway. The controlled oilway will enter magnetic directional valve 3d which is always "on" through the throttle hole to the oil tank, and pressure is formed. Because of the throttle hole 3, certain pressure difference is formed.

The pressure to the oil-in through the cone valve 3b will be higher than that at the controlled side. And then the cone valve 3b will open after overcoming the effect of the spring. The oil will come back to the oil tank through the return oil-in and main oil route also doesn't form any pressure, so the machine will make no action. When the magnetic directional valve is switched on, the controlled oil will enter the overflow valve 3c through the magnetic directional valve. So the overflow valve 3c is closed under the adjusted pressure, that the oil

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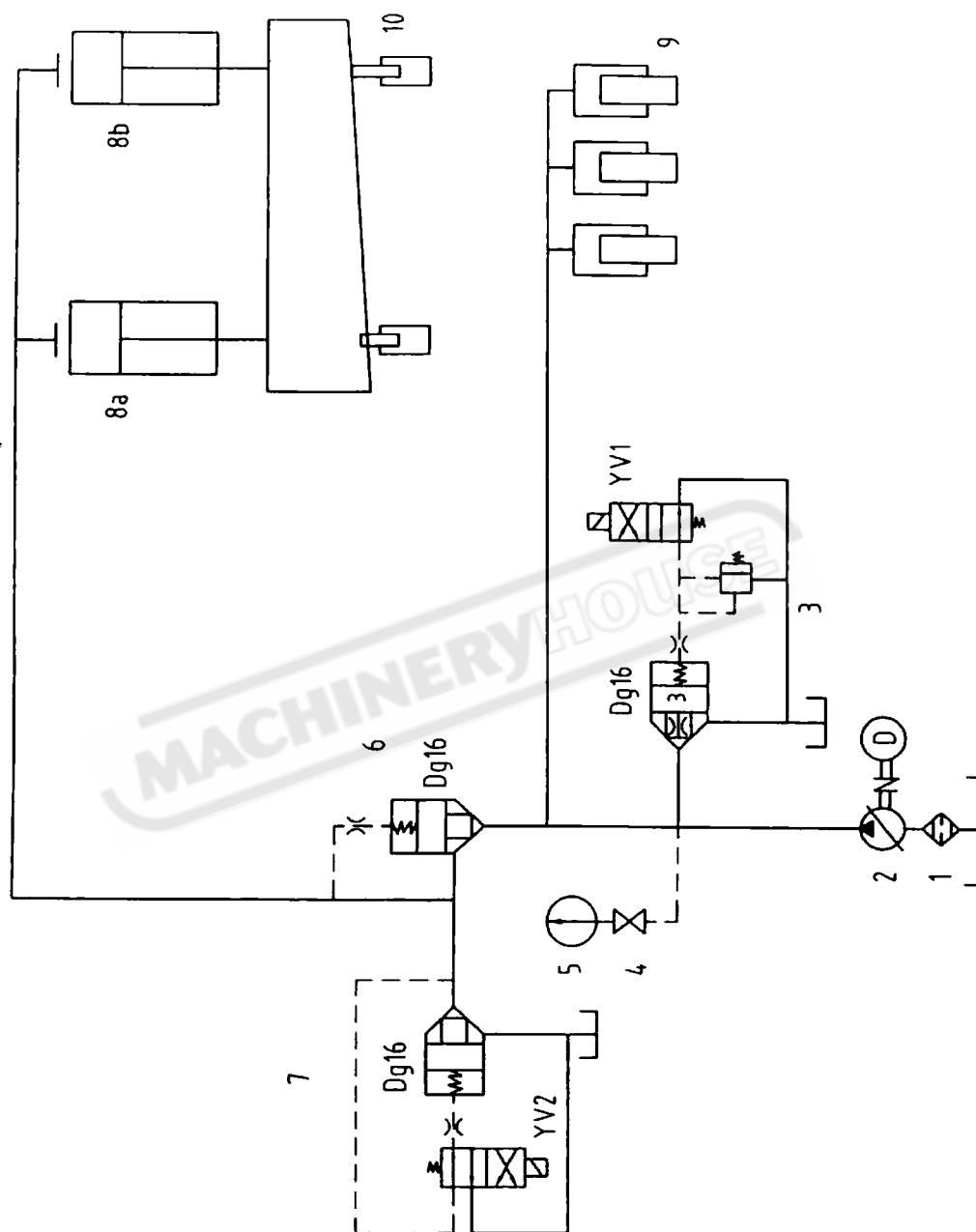
route pressure will increase bit by bit. The pressure is the same on each side of the taper valve 3b. But it is closed owing to the area difference of the valve pith and the effect of spring, hold-down cylinder 9 will press down first after overcoming the pulling force of the spring and later. The top rest moves down after the main oil cylinder 7 overcoming the supporting force to return. At this time the hold-down cylinder 9 and top rest beam will work in order in the short time. The top rest moves to the up-limited point. The dot makes the directional valve 3d power off and restore to the throne. The whole oil route is unloaded. The hold-down cylinder 18 will come to the original position because of the effect of the spring.

Failure and Remotion of hydraulic system

Apperance of damage	Reasons	Way of remotion
The oil line is formed without pressure. And No action of the top rest.	the Magnetic Directional valve's electric plug not touch well	Examine and repair the Electric plug
	The pith of the Magnetic Directional valve is blocked up or coarse. And there is no operation. The valve pith of the combined valve has sundries at the mouth of the sealing washer. There is no sealing effect. The throttle hole of the combined valve is blocked up.	Examine, strip and clean.
The return of the top rest is slowly or can't return to top dead point. Top rest and swaging Cylinder can't work harmoniously	Nitrogen pressure of nitrogen cylinder is not enough	Fill the Nitrogen cylinder to increase pressure.
	Magnetic valve isn't arriving position	Check the magnetic valve

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V Structure of the Machine

1. Machine Frame

This machine is of frame-type construction joined together by welding with good rigidity. Two cylinders are placed on the left and right of the vertical columns. Supplementary Blade Beam is placed on the surface of the work table. So that the bottom blade beam can be adjusted slightly. The rolling balls for delivering plates are also placed on the Work Table. It's easily operated.

2. Top Blade Beam

It's made of steel plates joined together by welding. Which ensures fine rigidity. It uses Eccentric sleeve(8) as bearing point and finishes shearing point and finishes shearing the plates by swinging repeatedly after the driving of the left and right oil cylinder and accumulator stroke cylinder. The blade of the Top Blade Beam and the supporting surface is vertical, and it forms curve. The clearance of the top and bottom blade beam can be identical.

3. Plate-pressed Equipment

It is consisted of several plate-pressed oil cylinders (figure 4) which are fitted on the supporting board in front of the frame. The plate pressed head will overcome the pulling force of the spring(18) and press down after the plate-pressed oil cylinder is filled with oil. Press the plate tightly. After shearing, it will come back to its original position with the help of the pulling force of the spring. The plate pressed pressure can be increased with the thickness of the sheared plates increasing.

4. Front and Back Gauge

Front Gauge: It is placed on the surface of the work table. The numerical value is shown with a staff. Gauge meter can be got by

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adjusting moving ram. It is more convenient to use the front gauge in shearing the thin plates.

Back Gauge (figure 6) is fitted on the top blade beam. And it moves up and down with the top blade beam. The adjustment of the back gauge is driven by the 0.55 kw motor. The gear reduces the speed and the rod drives the back gauge. Pushing the adjusting button "+" (or "-") can move the gauge plate forward (or backward). If all these can't be done by the machine adjustment, manually turning the hand wheel (41) give you the right adjustment value. So the adjustment of the back gauge is convenient and reliable.

The adjustment range of the back gauge is from 20 to 600mm. When the length of a sheet metal to be sheared is longer than the max distance of the back gauge. The gauge board (29) should be driven to the end position. And the bearing (36) and the oblique plane on supporting beam (33) can raise the gauge board (29). The plate of different length can be sheared.

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5. Pneumatics support device

When cutting the plates, it usually adopts the back gauge of the shearing machine to locate, it droop and bow because of the affection of the weight of the plates. So the machine installed the pneumatics support device specially to solve this problem. When feeding, pneumatics roller is in level position, then it can feed locate.

When shearing, the support shelf retract to the under of the support plate automatically, it is convenience to cutting.

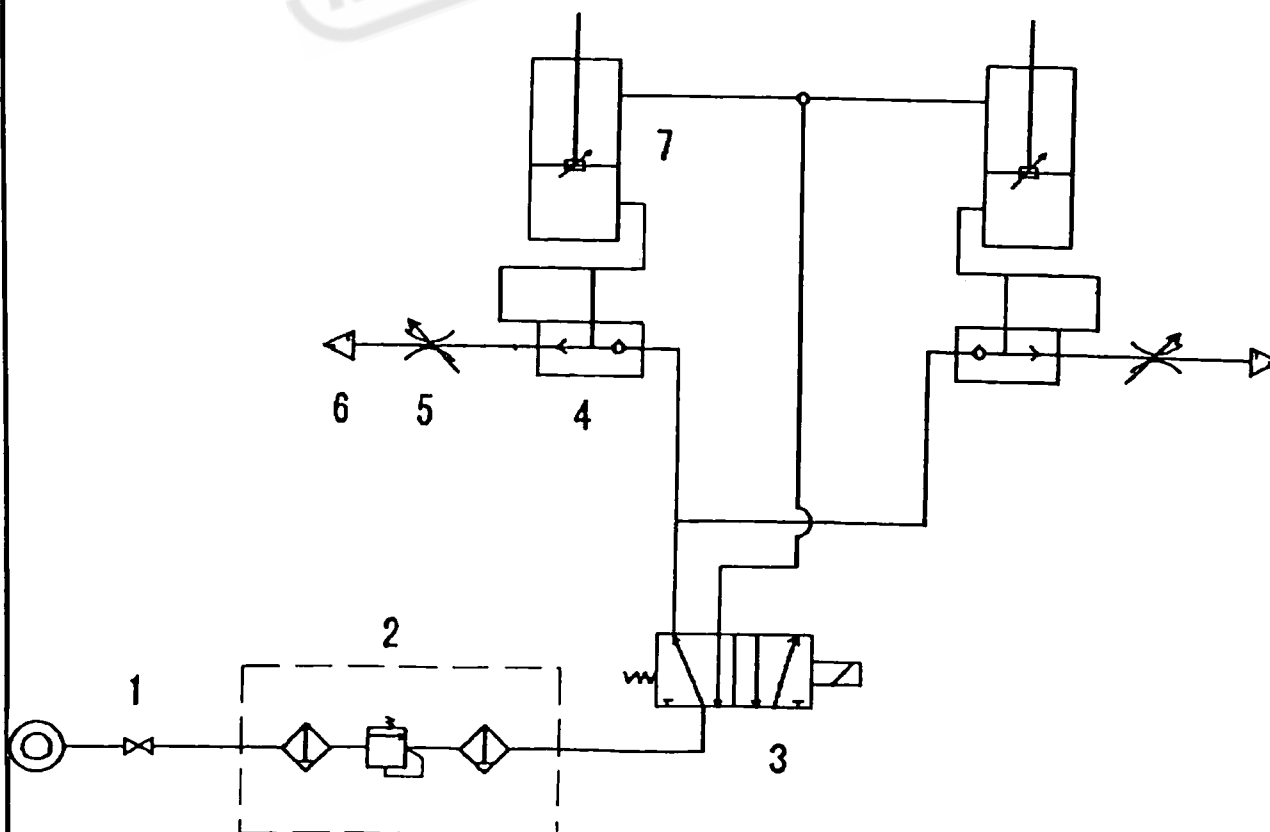
If no need to use, close the ball valve is ok.

Requirement of the gas source: 600L/min 0.6Mpa.

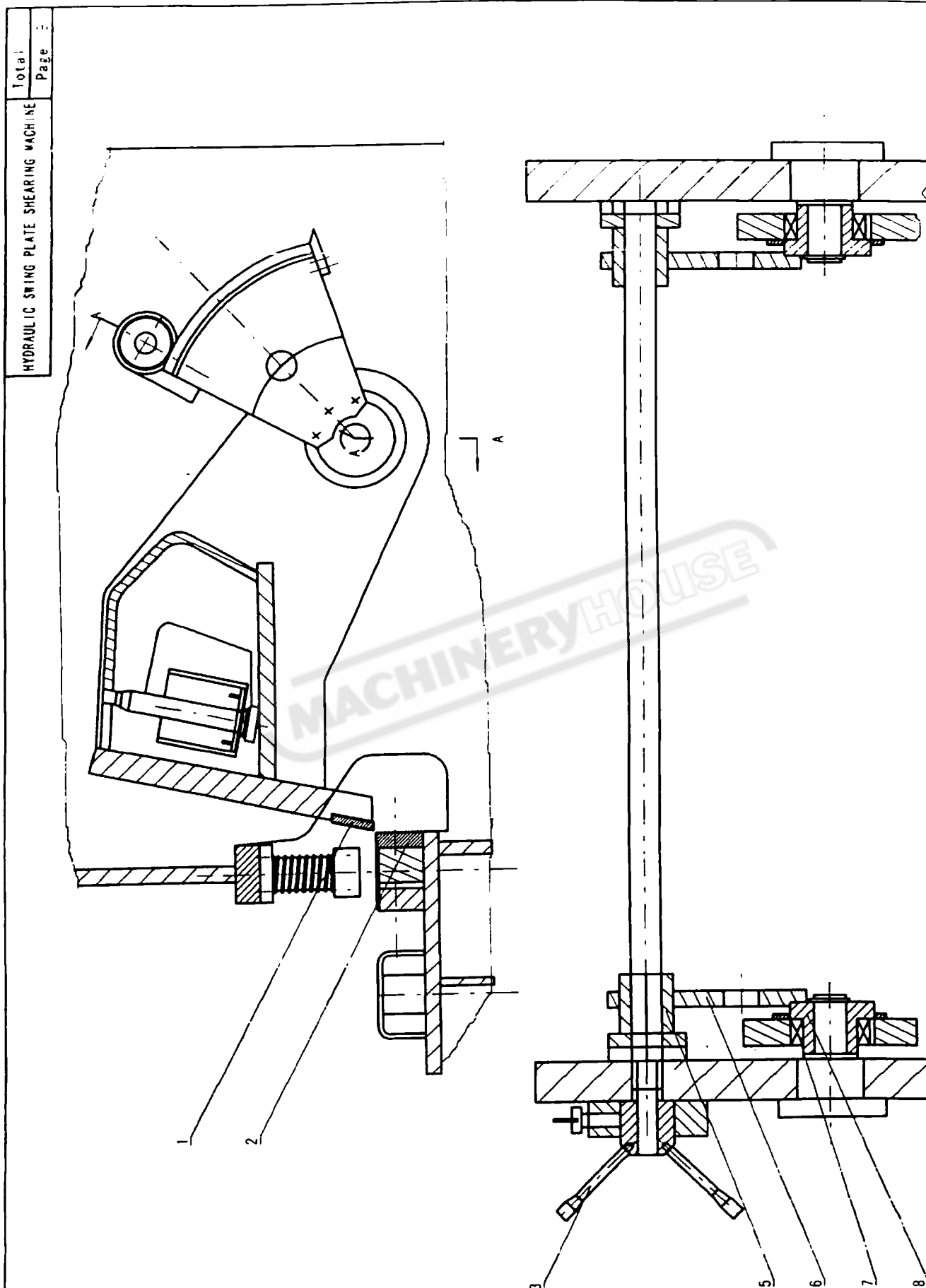
Note:

1. When begin cutting, if find the support frame didn't down itself, should stop cutting immediately to protect the support frame, and prevent the support frame can not action from directional valve sealed or other reasons.

2. When the cutting piece is too narrow or too thick, it is no need to use the support frame, and please close the ball valve.



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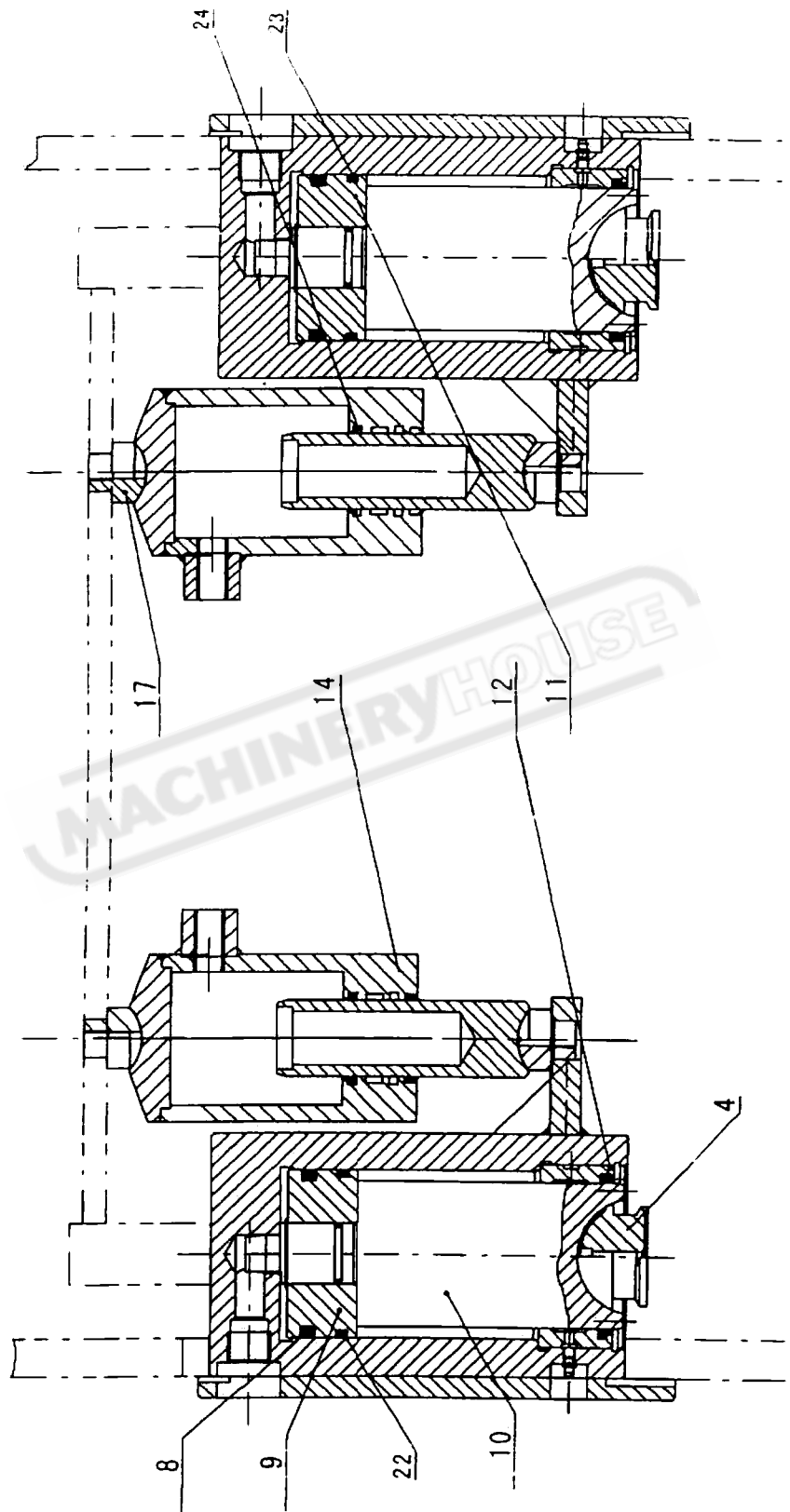


Fig 3 Oil cylinder and return stroke cylinder

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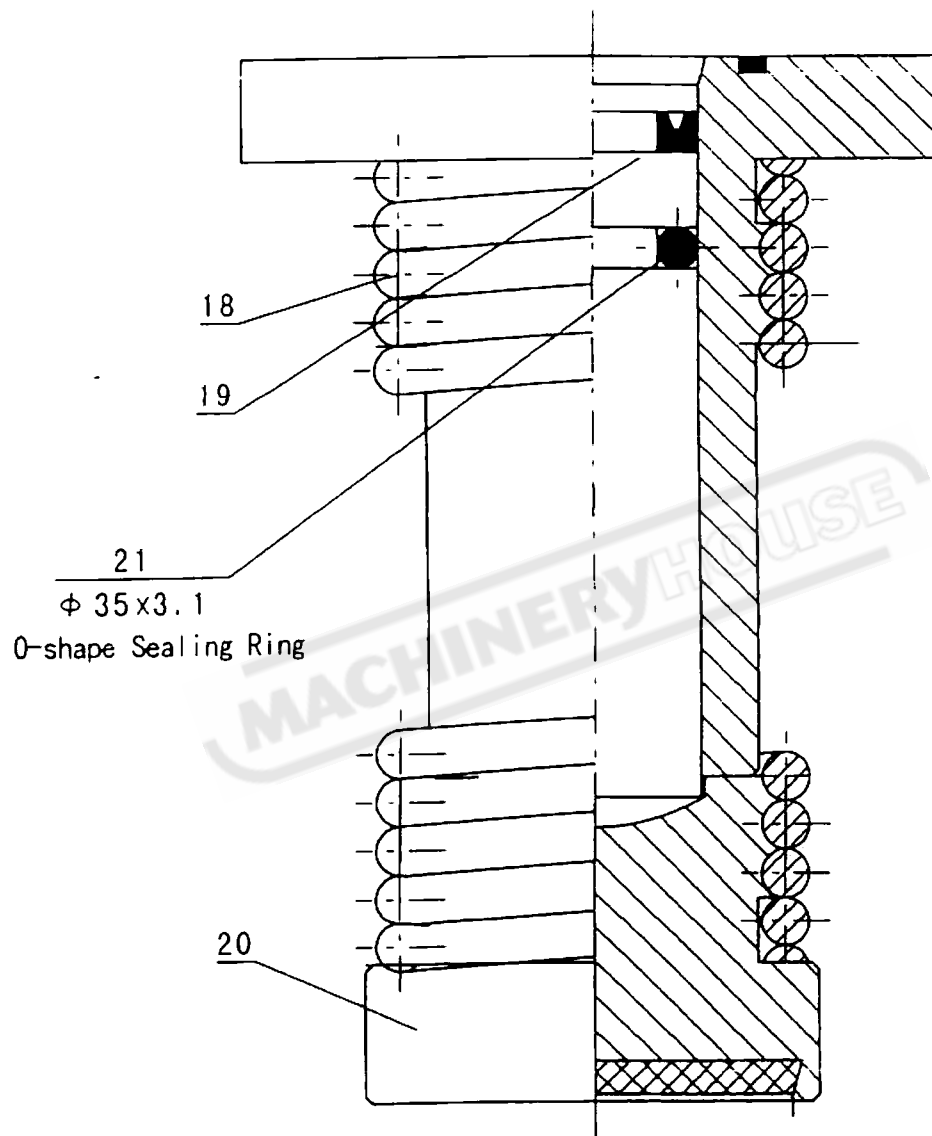


Fig 4 Swaging oil Cylinder

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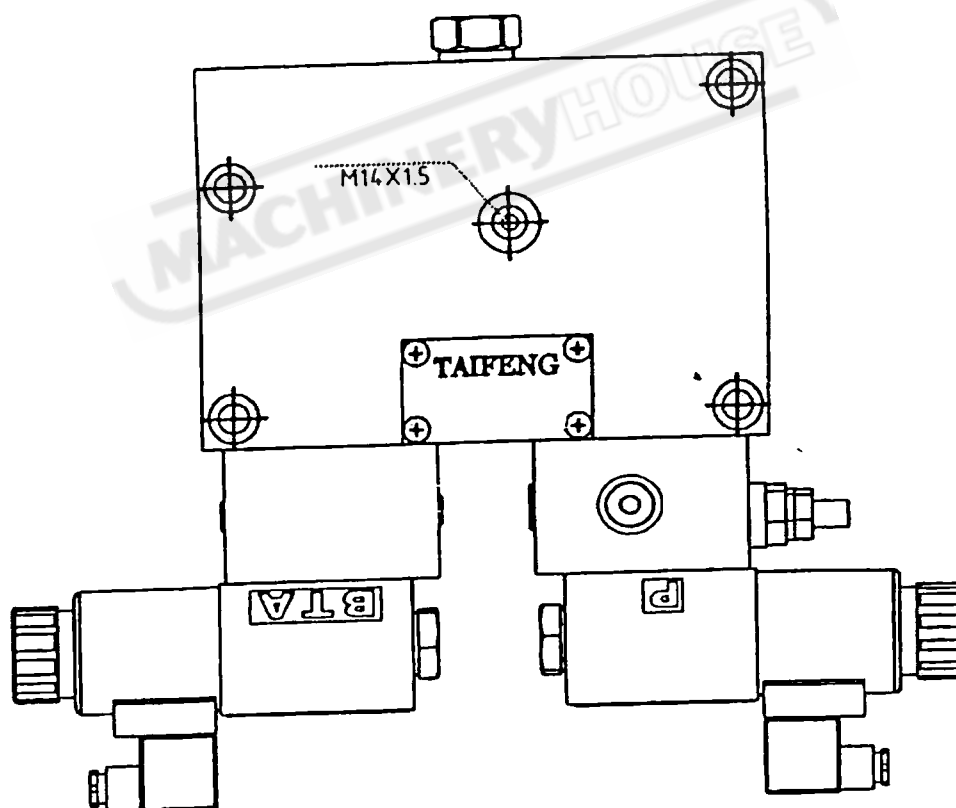
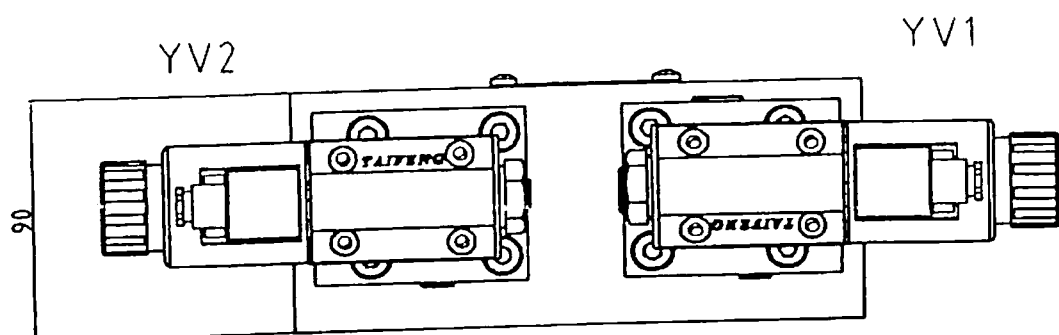


Fig 5 Combined Valve

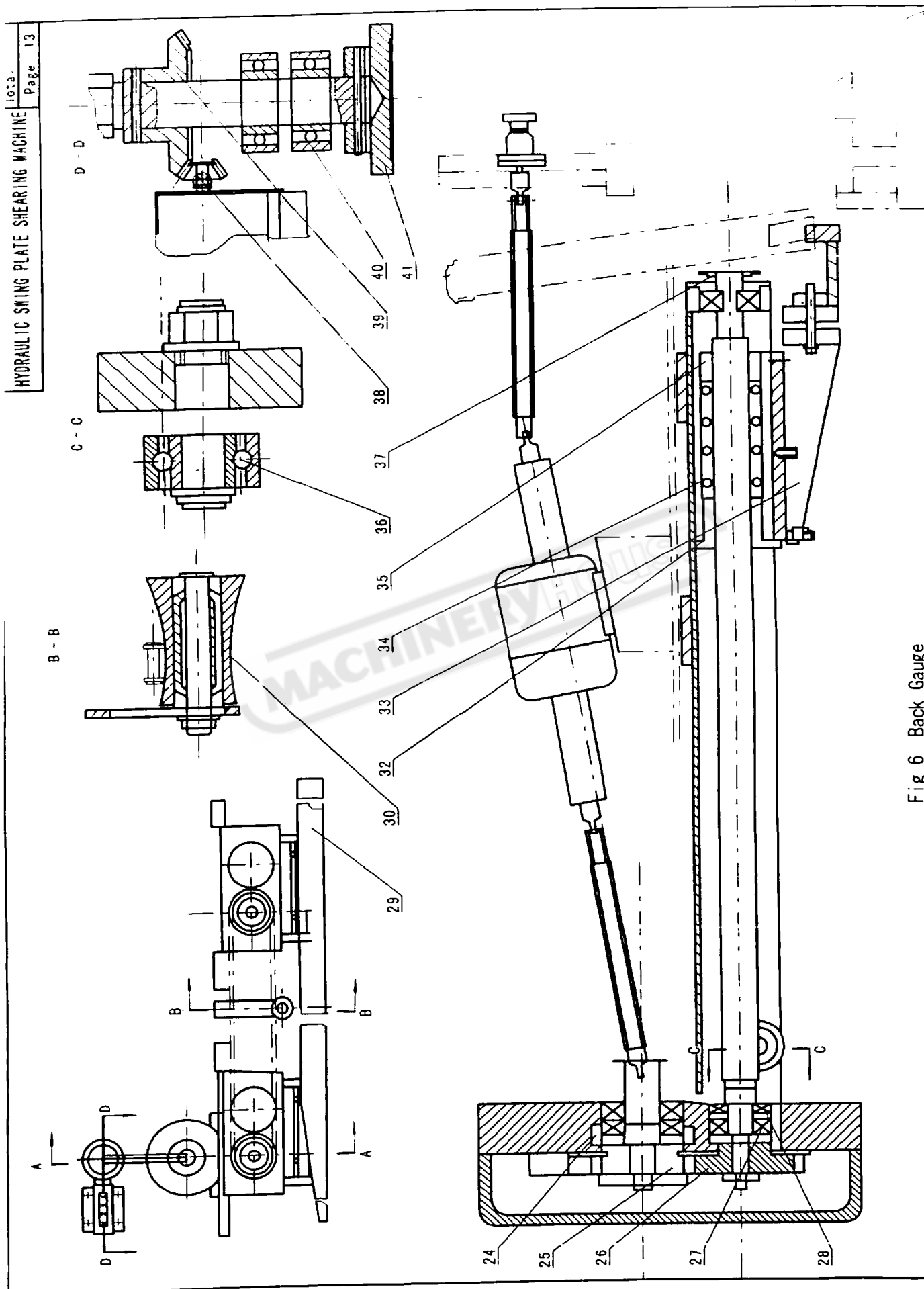


Fig 6 Back Gauge

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6. Electric System of the Machine

The electric supply for the machine is 415V 50HZ 3 PH. The motor adopts 415V 3 PH. And the control transformer adopts 415V 2 PH. And the 415V output of control transformer is for the lights. And 110 V is for control loop. After being commutated, 29V supplies the solenoid valve and counter relay. 6V is for the indicator.

The control box is fixed on the left side of the machine. The electric box is equipped with interlocking mechanism and urgent stop button, for control the power source of the machine.

Except the pedal switch SF, all the operation components of the machine are fixed on the button station in the front of the machine. The function of each operation components is marked with the symbol.

Instructions of the operation are as follows:

Turn the mechanical interlocking handle to the "Close" position. Then turn on the power. And turn on the key button (), and the control circuit powered. Indicator HL2 () lights if the machine is powered

Press the button SB3 OR SB4 (+  -) to enlarge and reduce the distance of backgauge. There are stroke switch (SQ4, SQ5) on the Max. and Min. position of the backgauge to limit the stroke.

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Press the button SB2 () to start the oil pump. There is an indicator on the button SB2 to indicate if the oil pump is working.

Rotate the switch SA3 () to choose the shearing mode. When button SA3 is on the position (), the machine will cut the plate with "Single stroke". When button SA3 is on the position (), the machine will cut the plate with "Continuous stroke". When button SA3 is on the position of "Single stroke", the upper blade carrier will come down when the foot pedal is pressed down. And the upper blade carrier will come to the up dead position if loose the button SF. Press down the button SF if you need to cut the shearing plate again. Remember not to loose the foot pedal SF if the plate has not been entirely cut down, or the cutting sheet will be damaged. When the SA3 is in the position "Continuous stroke", press down the foot pedal SF (Remember not to press it down for a long time. Or it will be single stroke). And the machine will continue to cut the plate. Press down the SF again, the machine will stop continuous shearing the plate.

Also, the machine is with the adjustment of shearing length, counter, etc. Rotate the button () to adjust the shearing length.

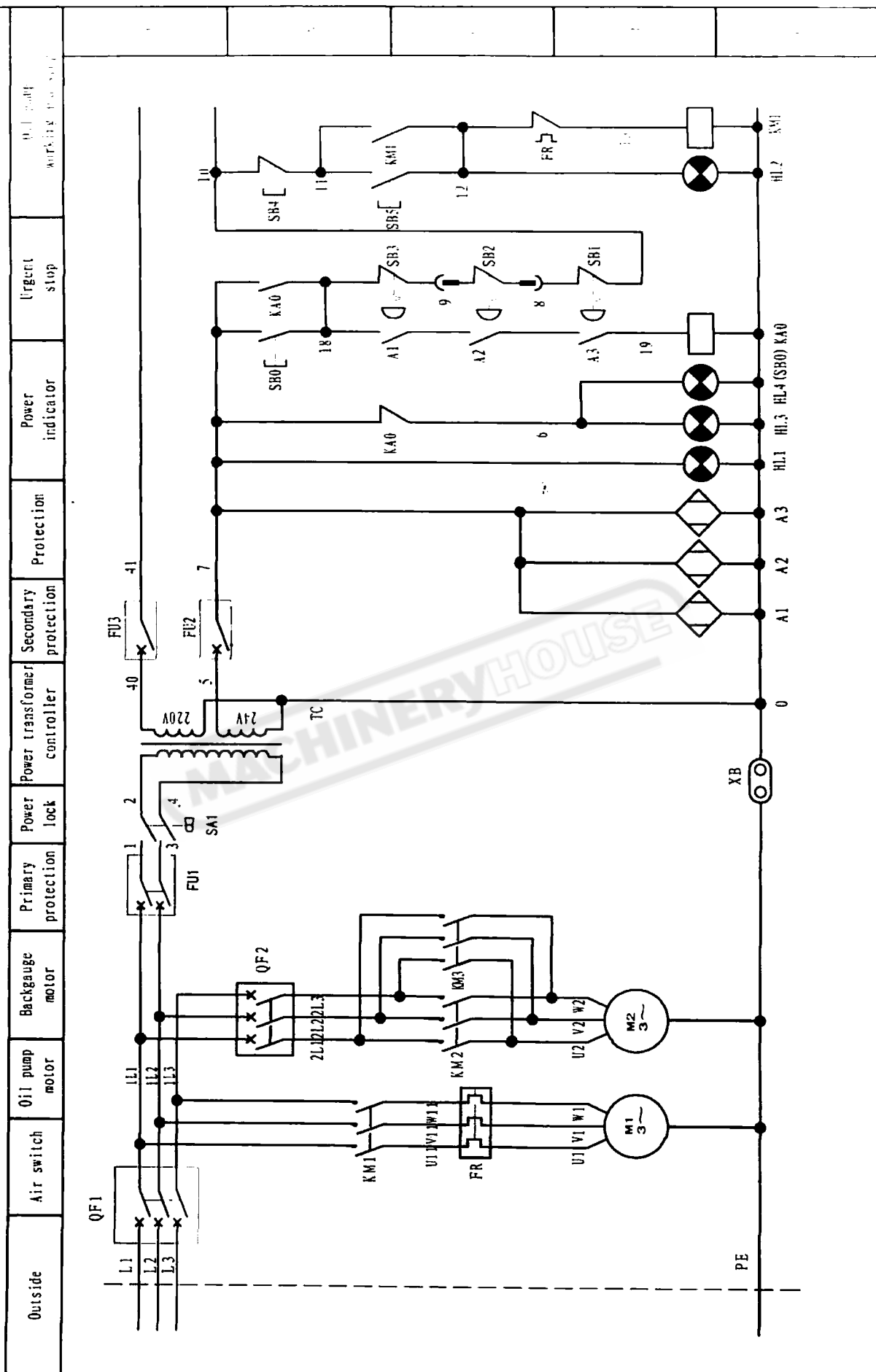
Rotate the switch SA2 () to turn on the lights.

Remember to lock the switch SA1 and electric interlocking on the control box when leaving the machine.

Machine must be well grounded.

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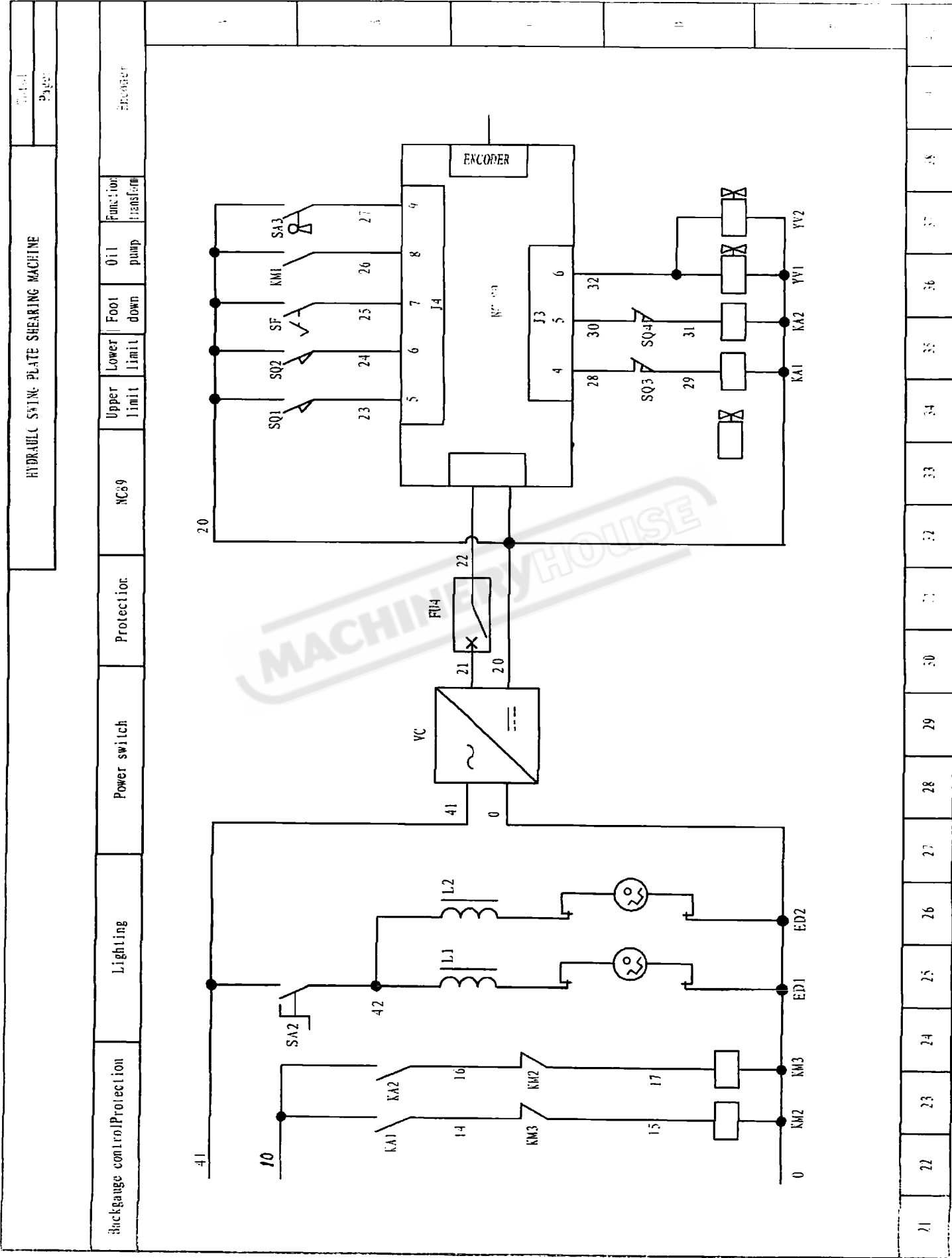
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COMPONENTS LIST

CODE	ITEM	NAME	TYPE	QTY	REMARK
QF1	2	Main Breaker	NSC60E3060	1	
KM1	16	Contactor	LC1-D25B7C	1	
QF2	6	Breaker	C32NC6/3P	1	
KA5	30	Contactor	LC1-D09B7C	1	
KA6	31	Contactor	LC1-D09B7C	1	
FU1	8	Breaker	C32NC3/2P	1	
TC	10	Transformer	JBK5-400	1	Input: 415V (50HZ) Output: 220V/110V/29V/6.3V
FU2-5	11	Breaker	C32NC4/1P	4	
FR1	3	Thermorelay	LRD22C	1	
ED1	11	Lamp	YG1 1-1	1	
ED2	11	Lamp	YG1 1-1	1	
A1-2	13	Photoelectric Switch	E3JK-5M1	2	
KA0	15	Relay	CAD-32F5C	1	
KA2	23	Relay	CAD-32F5C	1	
KA3	25	Relay	CAD-32F5C	1	

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COMPONENTS LIST

CODE	ITEM	NAME	TYPE	QTY	REMARK
FR2	6	Thermorelay	LRD7C	1	Pneumatic Support
VC1	34	Rectifier	KBPC1002	1	
CNT	41	Digital Display Device	E10-S	1	
SA1	9	Key Switch	XB2-BG21C	1	
SA2	12	Selective Switch	XB2-BD21C	1	
SB1 SB5 SB6	15	Emergency Pushbutton	XB2-BS542C	3	
SB2	16	Pushbutton	XB2-BW33B1C	1	6.3V
SA3	17	Key Switch	XB2-BG21C	1	
SA4	28	Selective Switch	XB2-BD21C	1	
SB7	16	Push button	XB2-EA121	1	red
SB3-4	32	Push button	XB2-EA121	2	
HL1	30	Indicator	XB2-BVB3C	1	6.3V
SQ1-2	29	Limit Switch	XCKN2118P20C	2	
SQ4	22	Stroke Switch	XCK-M115C	1	
SQ5	24	Stroke Switch	XCK-M115C	1	

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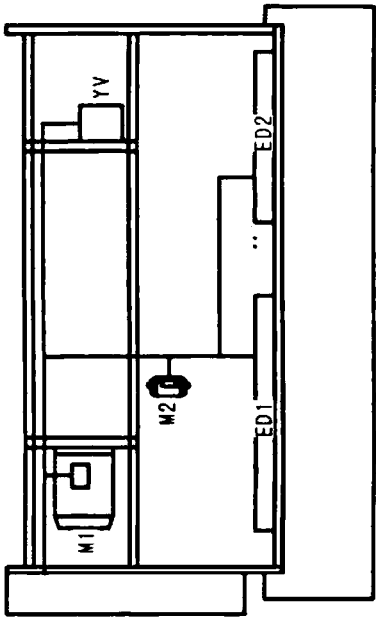
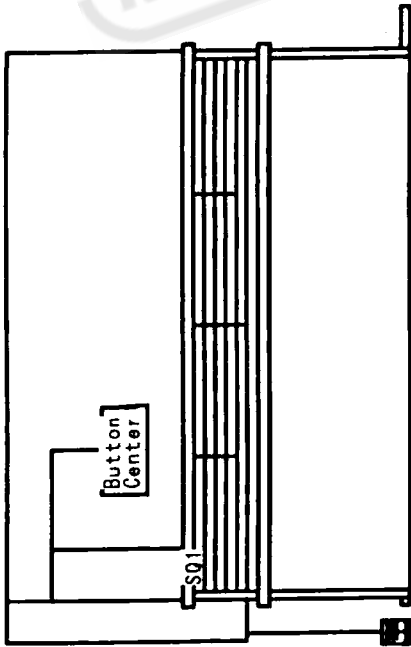
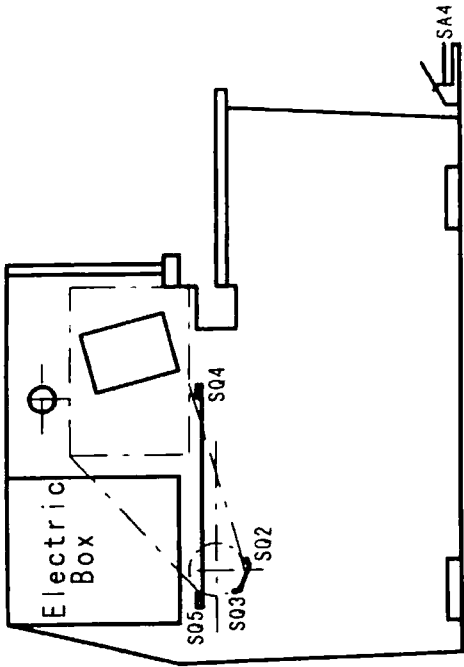


Fig 10 Electric Position

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VII Hoist, Conveyance and Installation

1. While the machine being transported the ways given on the Diagram (figure 10) for hoisting should be taken.

2. Foundation of the Machine:

a. The foundations dimension may refer to the Installation Diagram of Foundation (figure 11).

b. The depth depends on the soil texture.

3. The Installation

While the machine being installed and fixed, the rolling ball cover should be taken apart and a one-meter straight ruler should be put on the two cushions. It is no more than 0.2mm on the crisscross level for every 1000mm.

VIII Lubrication

Oil gun filling form is used to lubricate every main lubricating point. The following are the lubricating points:

NO.	Names of lubricating points	Oil Amount	Filling time	Type and trade mark of Lubricating oil
1	One Point on the left and Right of the Bottom of the Stroke cylinder	small	once for 16 hours	Grease ZG-3GB491 Mechanical oil N46GB443
2	One point on the left and Right of the Screw of the back gauge	middle	once for 8 hours	
3	One point on the left and Right of the Swing Fulcrum of the Top Blade Beam	small	once for 24 hours	
4	One point on the Left and Right of the axle sleeve of the adjusting axes	small	once for 48 hours	
5	One point on the left and Right of the piston rod middle of the left and right of oil cylinder	middle	once for 8 hours	
6	One point on the left and right of cushion of the left and right oil cylinder	middle	once for 8 hours	4#graphite lithium grease Q/SY 1000

NOTE: 1. In practical use grease ZG(50%) should be mixed with mechanical oil (50%)

2. Graphite Lithium grease should be mixed with mechanical oil (30%) in use.

3. The oil in the oil box should be changed once half a year in principle.

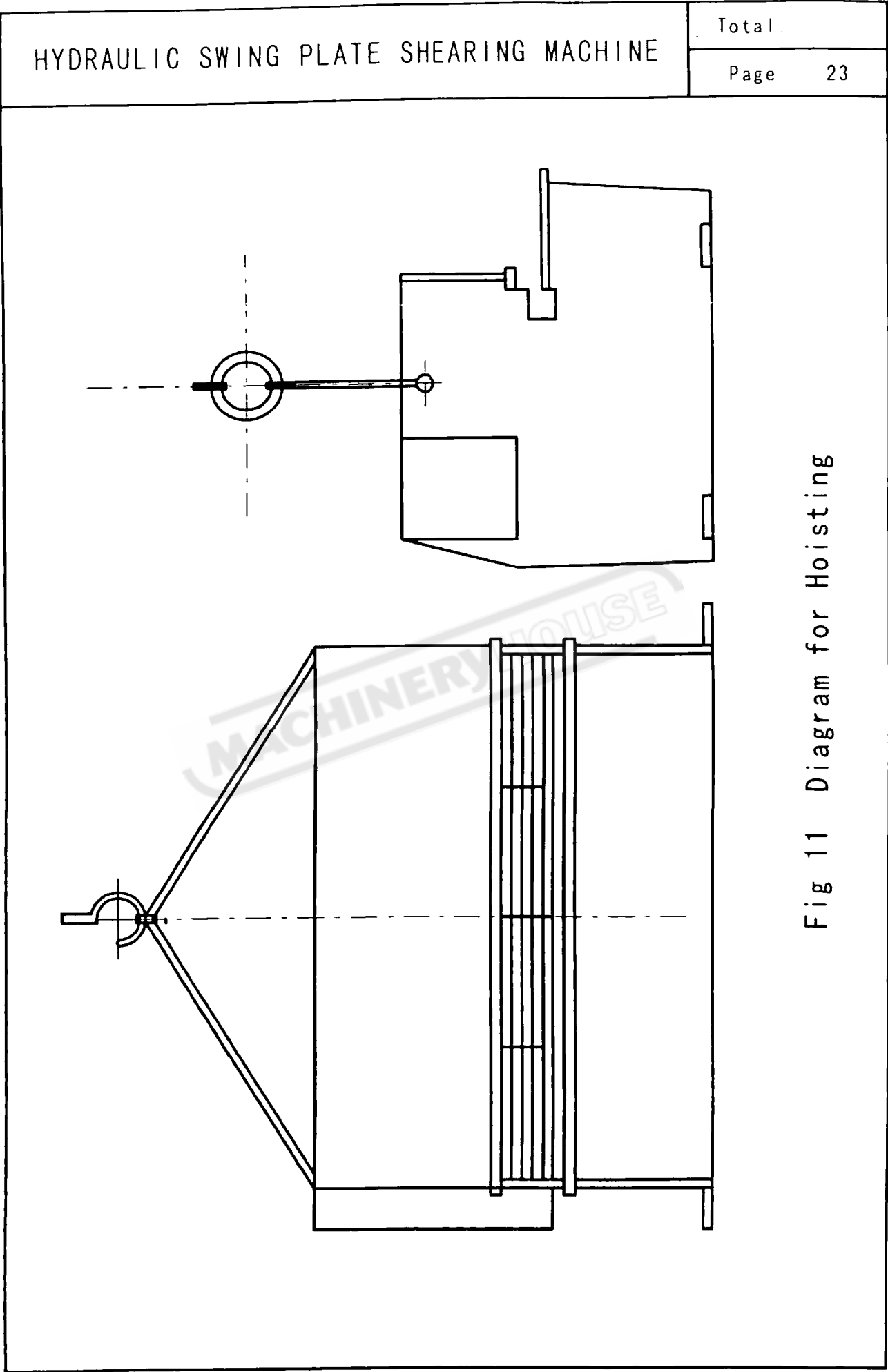
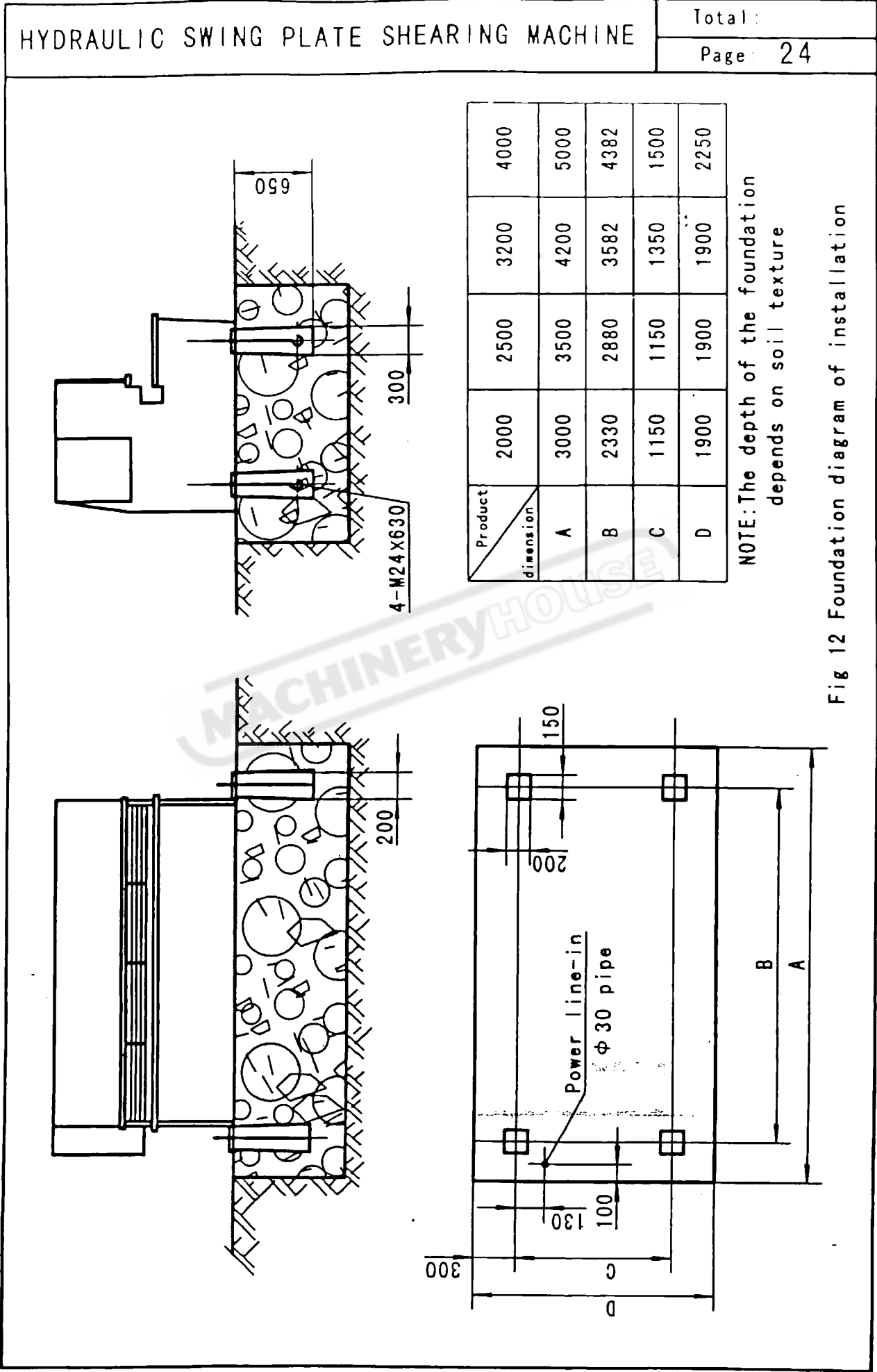


Fig 11 Diagram for Hoisting



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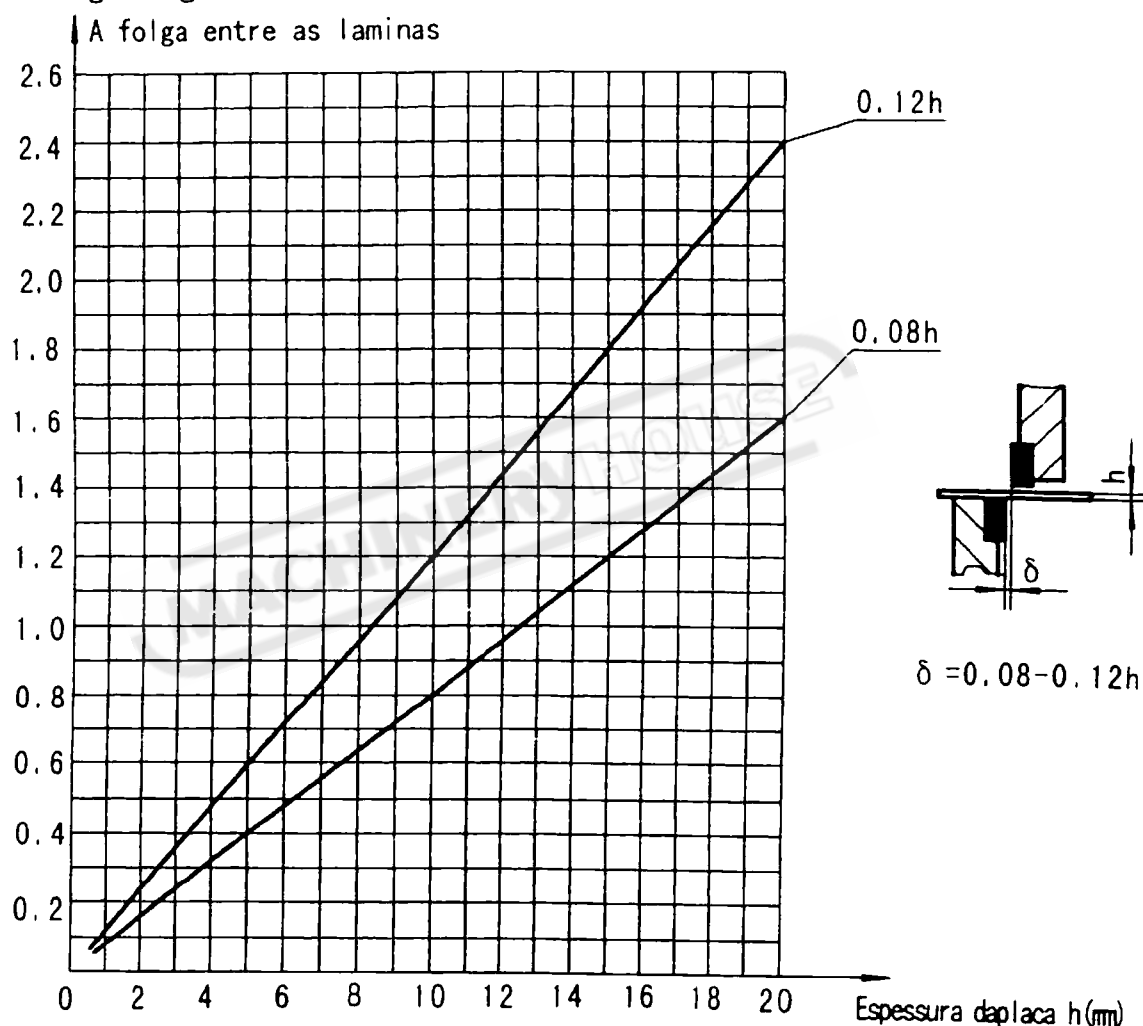
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IX. Adjustment and Operation

1. Adjustment of the clearance of cutting-edges

Whether correct ways to adjust the clearance of cutting edges are the important factors which affect the shearing quality and service life of the blades. selecting the clearance may refer to following diagram.



Loosen screws (3), during adjusting clearance (See 2). Then turn handle to request graduation, and locking screws, last. Ball valve (in the right of machine, outside of cylinders) is used for measure evenness degree for cutting edge clearance on top and bottom blades. The details use: As single-stroke, when top rest moves to lower dead point, fast turn ball-valve, close oil-way to let the top rest stop on lower dead point. Then just a little to open and close ball-valve, the top rest will go up more and more. thus, it can measure the evenness degree of cutting-edge clearance.

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2.Preparation before the operation.

(1)Clean the parts of the machine and make the surface oil dirt away.
Make sure the bal value should be in the opening position.

(2)Every lubricating point must be filled with lubricating grease.

(3)Fill the oil tank with thick Hm46 hydraulic oil.

(4)The machine must have ground connection. Switch it on and examine the coordination of each electric equipment's action.

3.Operation

(1)Start the machine to let it run without material several times, when the machine is proved to be all right, try to shear the material of different thickness(from thin to thick plates).

(2)Turn on the pressure meter while operating. Observe the pressure valve of the oil route.If there is something unusual adjust the discharge valve to make it up to the specification.

(3)While operating , If there is unusual noise or the oil tank is too hot,the machine should be stopped to be examined.The top temperature of the oil tank is $\leq 60^{\circ}\text{C}$

X Safety Technique and maintenance

1.Operators must get familiar with the machine's structure and function.The machine is operated by several persons at the same time . So a Person should be in charge of it and direct work.

2.Don't put hands between top and bottom blades to avoid accident.

3.All impurities and tools mustn't be placed on the work table.otherwise they will be rolled into the blade edge to cause accident.

4.Examine the thickness of the blade edges at regular intervals.If the blades are blunt,sharpen or change them in time.Just sharpen the thickness of the blades.

5.Examine every part of the machine at regular intervals.Keep the machine and the place nearby clean.The insulation should be OK.

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6. Net shape oil-filter fitted on the mouth of the oil pump should often be examined and cleaned to keep the oil filter full of proper oil. If pump absorbs nothing, the service life of the pump will be affected.

7. Oxygen, compressed air or other easily burning gas can't be filled into the nitrogen cylinder. It's better to fill the nitrogen slowly, so that the rubber can't be broken.

8. Fill the nitrogen cylinder with air instead of liquid first. Filling tool should be used in filling the nitrogen. The filling pressure is 3/3/4/5MPa.

9. Let the pressure oil out first before the nitrogen cylinder is taken apart.

MACHINERYHOUSE

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XI List of Rolling Bearings

NO	Name of bearing	Name of bearing	specification	precision	Qty.	fitting position
1	3518	Double centripetal ball surface bearing	d=90 D=160 H=40		2	Top blade beam
24	80202	single centripetal ball bearing with dust proof	a=15 D=35 H=11		2	back gauge
27	80205	-ditto-	a=25 D=52 H=15		4	-ditto-
28	8305	single direction pushing ball bearing	a=25 D=52 H=18		2	-ditto-
36	180502	single centripetal ball bearing with sealing ring	a=15 D=35 H=14		2	-ditto-
40	180502	-ditto-	a=15 D=35 H=14		2	-ditto-
30	941/12	Rolling bearing only with pressure out ring	d=21 D=17 B=12		2	-ditto-

XII List of Gear

NO	Name	B	a	m	z	Da	β	f_a	H	spiral direction	precision grade	lateral	Qty.	Heat treatment
5	Pinion	20	20°	2	25	50		1	4.5		9FHGB10095	45	2	
6	fan shape gear	18	20°	2	250	500		1	4.5		9HKG810095	45	2	
25	gear	18	20°	2	17	34		1	4.5		8GJGB10095	45	1	
26	gear	16	20°	2	68	136		1	4.5		8GJGB10095	45	1	
37	chain gear				14	57.1		1				45	2	hrc38-43
38	taper gear	10	20°	1	20	20		1			Grade 9-8 -8DC	45	1	
39	taper gear	10	20°	1	50	50		1			Grade 9-8 -8DC	45	1	

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XIII List of Basic Accessories Attached to the machine

NO.	Name	Specification	Type	Qty.
	Oil Gun	200cm ³	JB288-60	1
	Air Inflation Tools			1
	Feeler			1

XIV List of Easily Worn Parts Provided by Subscribers

No.	Name	Material	Weight	Qty	Parts Belonging to
1	Top Blade	6CrW2Si		2/2/3/4	Blade Beam
2	Bottom Blade	6CrW2Si		2/2/3/4	Workframe
4	Half Round Ram	4# Zinc Base Metal		2	Workframe
17	Half Round Ram	4# Zinc Base Metal		4	Stroke Cylinder

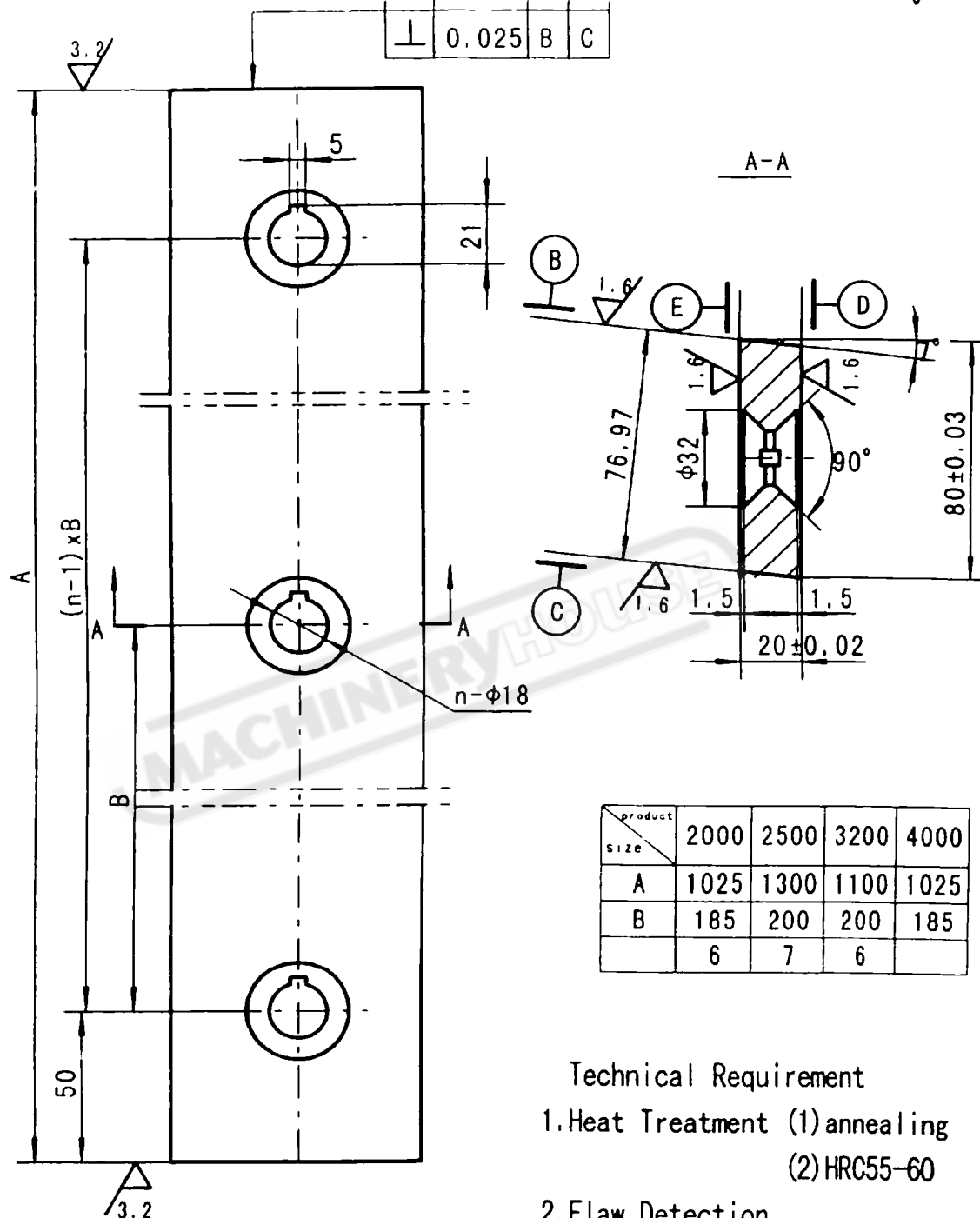
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Two-sides surface

$\perp$	0.012	E	D
$\perp$	0.025	B	C

Others $\sqrt{12.5}$ 

Technical Requirement

1. Heat Treatment (1) annealing
(2) HRC55-60
2. Flaw Detection
3. The blade mustn't be blunted

1	Top Blade	6CrW2Si	1:2	
No.	Name	Material	Scale	Remark

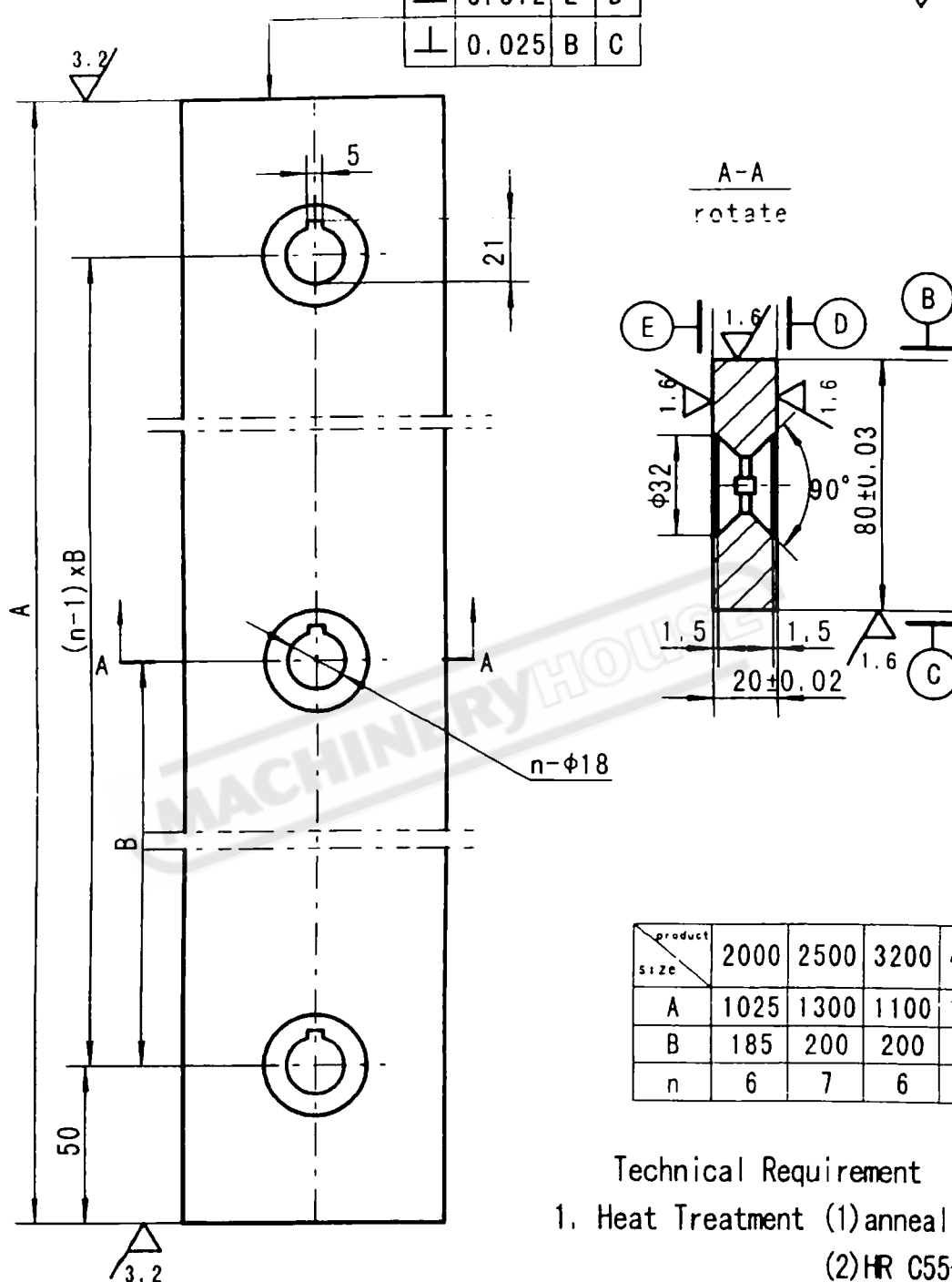
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Two-sides

$\perp$	0.012	E	D
$\perp$	0.025	B	C

Others $\nabla^{12.5}$ 

product size	2000	2500	3200	4000
A	1025	1300	1100	1025
B	185	200	200	185
n	6	7	6	6

Technical Requirement

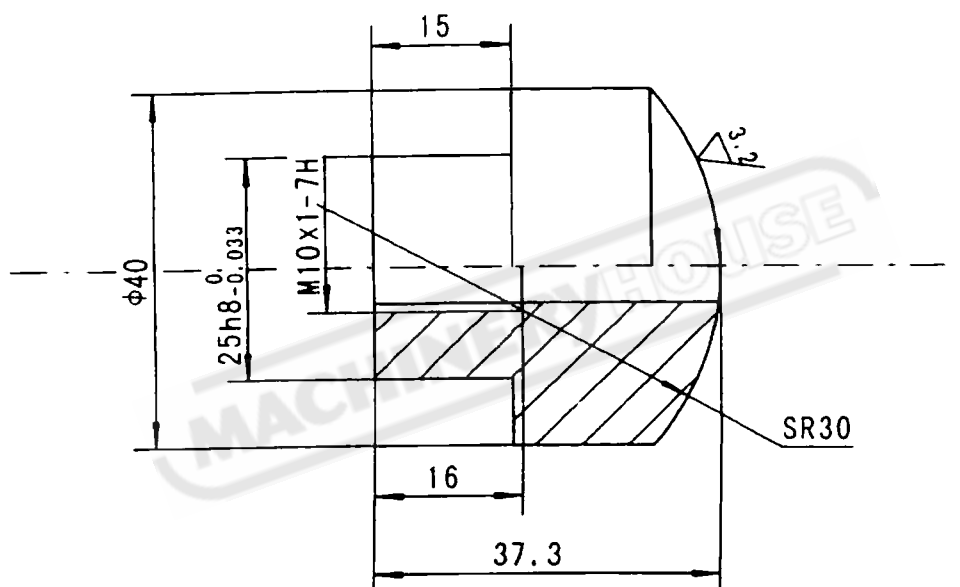
- Heat Treatment (1)annealing
(2)HR C55-60
- Flaw Detection
- The blade mustn't be blunted

2	Bottom Blade	6CrW2Si	1:2	
No.	Name	Material	Scale	Remark

HYDRAULIC SWING PLATE SHEARING MACHINE

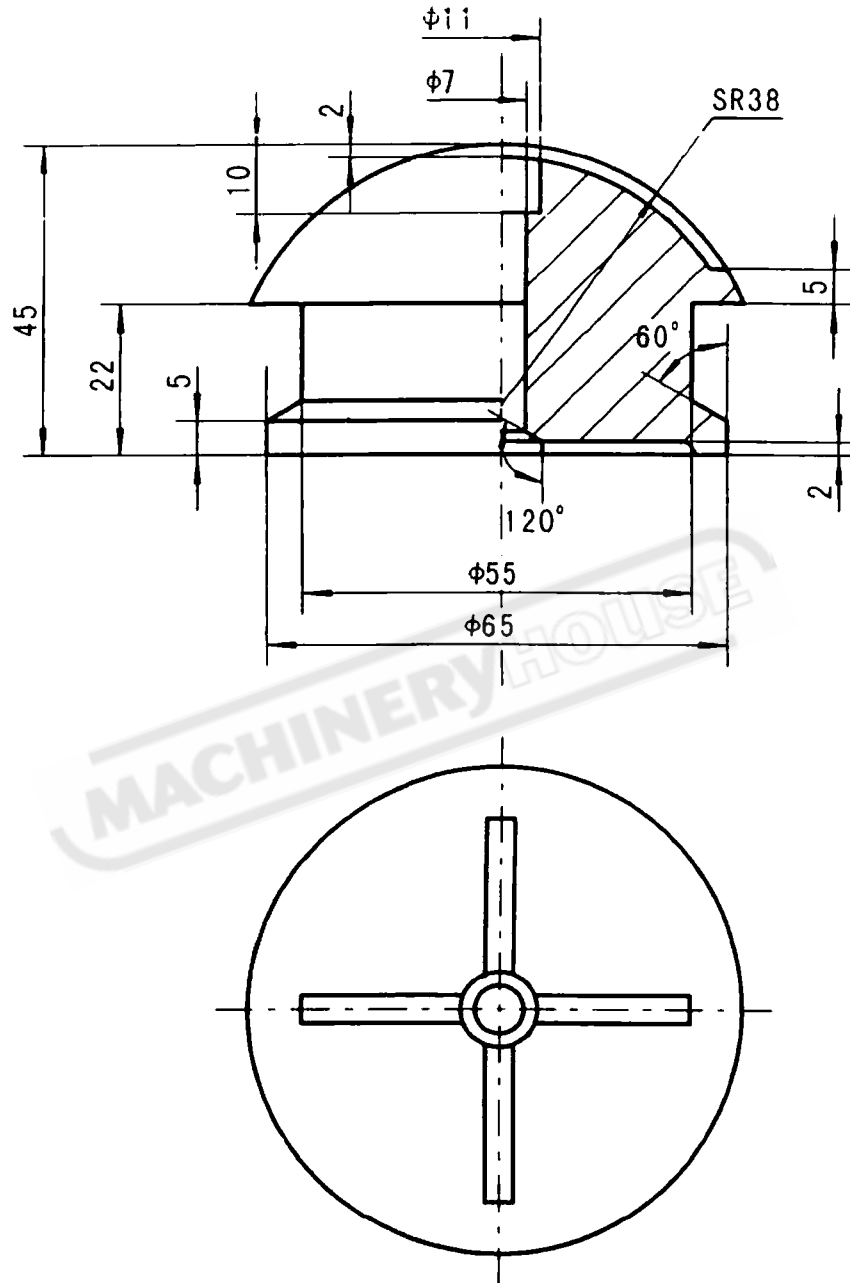
Total :

Page: 32

Other $\frac{6.3}{\sqrt{\quad}}$ 

17	semicircle block	4# Zine Base Metal	1:1	
No.	Name	Material	Scale	Remark

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4	Half Round Ram	4# Zine Base Metal	1:1	
No.	Name	Material	Scale	Weight

QC12Y- 4 SERIES HYDRAULIC SWING PLATE SHEARING MACHINE

CERTIFICATE OF QUALITY

Shearing Thickness: 4 mm

Shearing Width: mm

Delivery NO.:

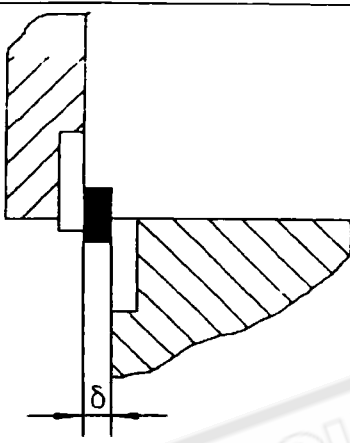
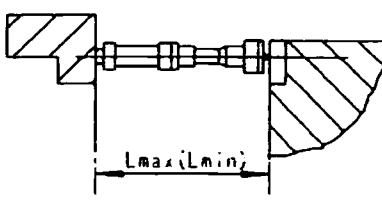
MACHINERYHOUSE

QUALITY CERTIFICATE

Total

Page 2

I Geometric Precision Inspection

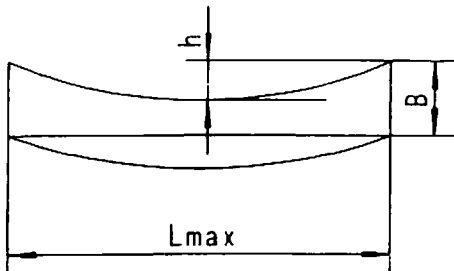
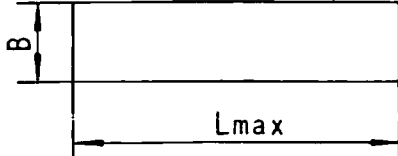
NO.	Inspection Item	Inspecting way and Diagram	Precision	
			Allowable Error (mm)	Practical measurement (mm)
1	Evenness Between Top and Bottom Blade Edges	 Measure several points of the clearance between top and bottom blade edges from the vertical position with the feeler along the bottom blade. (At least 3 points in one meter) Error is got according to the biggest value.	0.06	
2	Parallelism Between Bottom Blade and stopper	 Fix the stopper to the far front and final position. Measure the distance between blade and stopper at several places. Error is figured out with the max value within one meter long.	On 1 Grade precision a 1000mm stroke 0.10; on 2 grade precision a 1000mm stroke 0.20; on 3 grade precision a 1000mm stroke 0.50	

QUALITY CERTIFICATE

Total

Page 3

II Work Precision Inspection

NO.	Inspection Item	Inspecting way and diagram	Precision	
			Allowable Error (mm)	Practical measurement (mm)
1	Straightness of sheared strip piece	 Put the inspecting ruler on the surface of the sheared plate and measure the clearance with the feeler. Error is figured out with the max value within one meter long	On I grade precision a 1000mm stroke 0.25 On II grade precision a 1000mm stroke 0.50: On III grade precision a 1000mm stroke 1.00	
2	Parallelism of sheared strip piece	 Measure the two corresponding points distance of the sheared plate with a vernier caliper. Error is figured out with the grade precision max value within one meter long a 1000mm stroke.	On I grade precision a 1000mm stroke 0.15; On II grade precision a 1000mm stroke 0.30; On III grade precision a 1000mm stroke 0.75	

QC12Y- 4 SERIES HYDRAULIC SWING PLATE SHEARING MACHINE

PACKING LIST

Shearing Thickness: 4 mm

Shearing Width: mm

Delivery NO.:

MACHINERYHOUSE

PACKING LIST

QC12Y-4x Hydraulic Swing Shearing Machine

Reference NO.:

Case Dimensions (LxWxH):

Gross Weight:

Net Weight:

N0.	Name and Specification	Qty.	Remark
1	Main machine	1 set	
2	Front bracket	3 piece	
3	Pedal Switch	1 set	
4	O-shape Sealing Ring 30×3.5	10	
5	O-shape Sealing Ring 45×3.5	10	
6	Dust Ring d65	2 sets	
7	Dust Ring d50	2 sets	
8	Foundation Bolt M24x500	4 group	
9	feeler	1 set	
10	200cm ³ oil gun	1 set	
11	filling Tool	1 set	
12	Power key for key button	2 set	
13	attached files (operation manual certificate of quality, packing list)	1 piece	

Packing Inspector:

Date: