

ACER

OPERATION MANUAL

VERTICAL MACHINING CENTER

Model:VMC-2040L

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Chapter 2

Machine Specification

2.1 Introduction

2.1.1 VMC-2040 is one product of the vertical machining center series manufactured by CHIFA MACHINERY MANUFACTURER CO., LTD. This machine is made up of base, headstock, main column, saddle, working table, operation panel, hydraulic and pneumatic system, lubrication system, chip conveyor, chip cart, full splash guard, CNC controllers, etc. VMC-2040 is designed to machine different material of work parts, which do not generate powder chip, corrosion or flammable substances, such as magnesium alloy. Contact us or our local dealer if in doubt we will do the best to help, please.

2.1.2 VMC-2040 can prepare program of cutting piece, and combined with CNC controller in an automatic mode, safety and efficiency of working process. It could be increased tremendously. Nevertheless, read all the manuals we had provided thoroughly. Don't try to use this machine unless you understand how to operate and stop the machine and all the safety matters concerned. Details about how to operate this machine are followed.

2.2 Noise Level

The noise level of this machine is within 85dBA under the condition of CNS 4600 standard. In real life, the noise level can be higher than 85 dBA. The actual working conditions (work parts material, tool performance, cutting coolant) might be different from those of CNS4600 standard. Don't stay in the working area with unpleasant noise level without wearing appropriate protect equipment, such as the ear plug. Otherwise might cause hearing hurt or more serious.

2.3 Machine Specification

1. Spindle				
	Pulley type			a. Belt type
	Spindle	Motor	C~C	r.p.m
	8YUx44T	8YUx44T	272	920-8YU-40W*2 80~8000 r.p.m
b. Spindle bearing grade				P4
c. Spindle shaft hardness				HRC 60 ~ 62
d. Spindle nose taper				BT40
e. Throat depth from spindle center to Z rail face				627 mm
f. Throat depth from Z rail face to table center				353-863 mm
g. Table to nose				120~630 mm

2. Table

a. Table size (Length X width)	Unit:mm	1070X500
b. Max. loading capacity		600 Kgs
c. Working area of X,Y axis	Unit:mm	1020X510
d. T-slot width / No. of T-slot / Pitch		18 H8 / 3 / 150

3. System of automatic tool changer

Unit:mm

a. Magazine type	Umbrella Type
b. ATC type	Genova
c. Tool type	BT40
d. Tool change time	
Total No. of tools magazine	20
Max. tool diameter with adjacent tool	φ80
Max. tool diameter with none adjacent tool)	φ125

4. Axes

a. Ballscrew Accuracy	C3			
b. Rapid travers	Unit:m/min	24	24	24
c. Travel Stroke of X, Y, Z	Unit:mm	1020	510	510
d. Cutting feed		0~5000 mm/min		
e. Positioning	Unit:mm	0.005 / 300		
f. Repeatability		±0.003 mm		

6. Coolant system

a. Coolant motor type	CH2-30/ 460W
b. Coolant tank volume	200L(100%)
d. Rear splash coolant system	CH2-30*2

7. Splash guard requirements

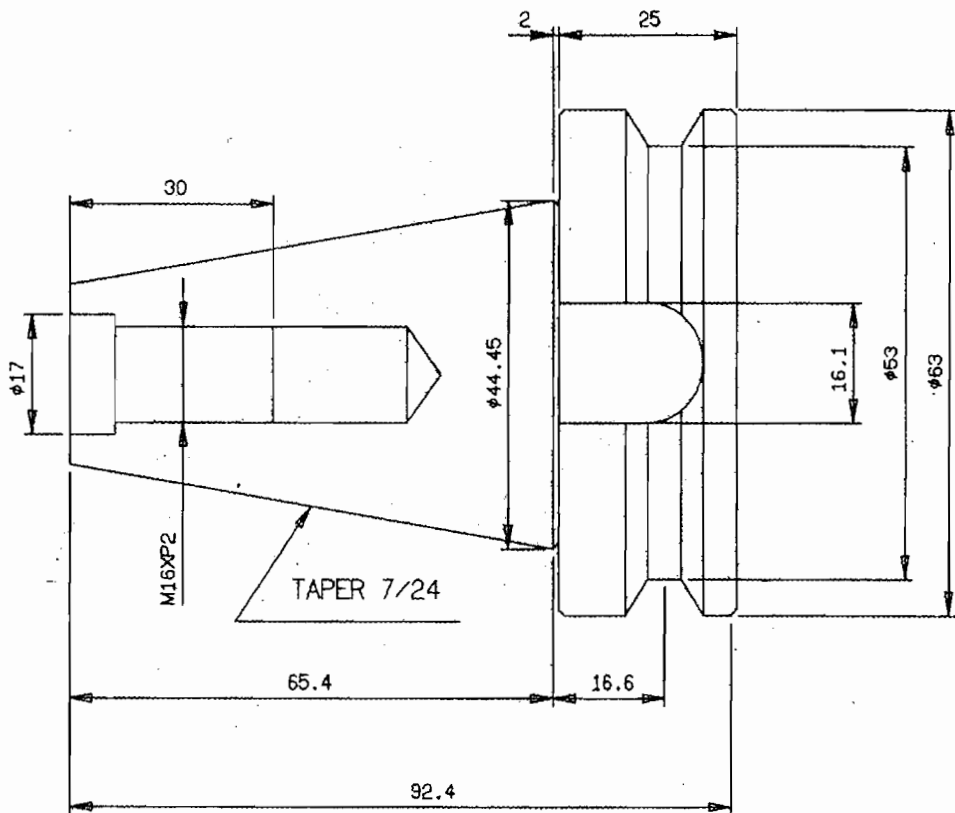
a. Metal sheet type	AE101	AE201	
b. X, Y, Z dust cover	Telescopically cover		

8. General data

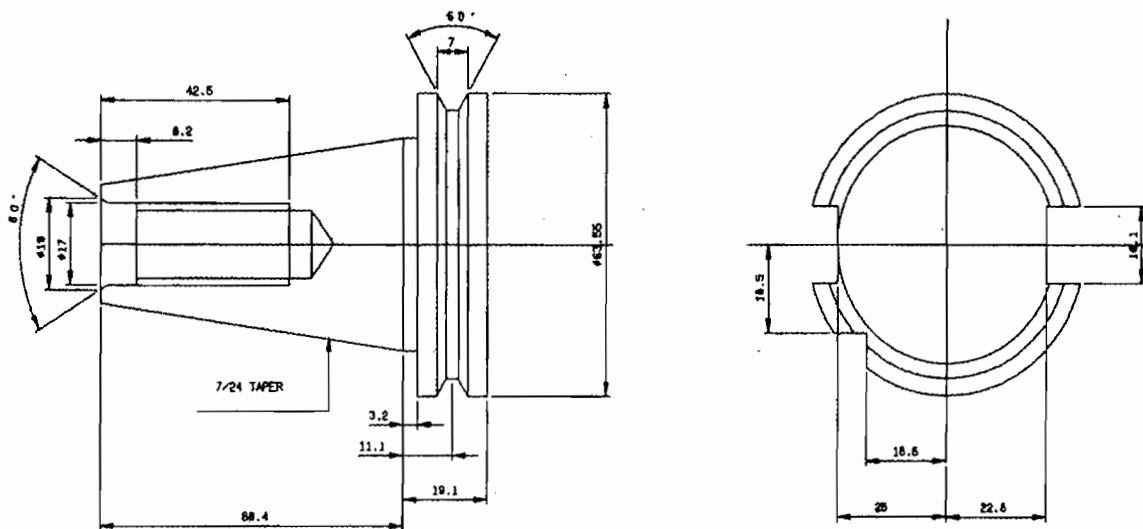
a. Main pressure	6 Kg/cm ²
b. Power capacity	220V
c. Length x Width x Height	2900X2500X2500
d. Net weight	5000 Kgs
e. Gross weight	5200 Kgs

2.6 Dimensions Of Tool Holder

2.6.1 1.Tool shank



BT40



5

CAT40(OPTION)

Chapter 3

Shipping / Handling and Installation

3. Installation

3.1 Machine environment requirement

The machine should be installed under the conditions of followings terms:

3.1.1 Power:

A. Power : rated voltage 3 ϕ 200V/220V \pm 10%

B. Frequency : rated frequency 50/60Hz \pm 2 Hz

Unit	VMC-2040	GENOVA	ARM ATC
NC Unit	0.5KVA	O	
Electric cabinet	0.5KVA	O	
Spindle motor (cont./30min.)	AC 5.5/7.5 KW		
X,Y,Z axis driver motor	AC 2.6 HP		
Coolant pump motor	AC 0.48 KW	0.2KVA	
Coolant through spindle pump	AC 0.375 KW	0.4KVA	OPTION
Tool magazine motor	AC 0.04 KW	0.2KVA	
Lubrication system	AC 0.18 KW	0.02KVA	
Chip conveyor	AC 0.25 KW	0.2KVA	OPTION
Spindle cooler	AC 0.18 KW	0.2KVA	OPTION
TOTAL power consumption		15KVA	

$$A = \frac{KVA \times 1000}{V \times \sqrt{3}}$$

A: CURRENT CAPACITY (AMPERE)

V: POWER SUPPLY VOLTAGE OF BUILDING (VOLT)

KVA: TOTAL POWER CONSUMPTION (KVA)

POWER SUPPLY VOLT	575V	440V	415V	380V	240V	220V	200V
CURRENT CAPACITY	18A	23A	25A	27A	43A	47A	51A
POWER CABLE	8 mm ²	8 mm ²	8 mm ²	8 mm ²	14 mm ²	14 mm ²	14 mm ²

GROUNDING WIRE: 14 mm²

3.1.2 Environment temperature

A. Ambient temperature allowance : 0°C-45°C (32°F-113°F)

B. Relative humidity allowance: 90% smaller than temperature difference and not allowed

Condensed to humidity happened.

- C. Try evilly effort to control environment temperature and humidity to prevent them from change rapidly.

3.1.3 Environment

- A. Keep away from the location of powdering dust environment.
- B. Keep away from the location where acid. Alike and salty air or liquid is generated.
- C. Keep away from the magnetic and static environment.
- D. Do not expose to direct sunlight or high humidity.
- E. Keep away from an abnormal vibration source.
- F. Keep away from larger air compressor or punching machine.
- G. Keep away from electrical noise source (such as welding).

3.1.4 Lifting

This machine is composed of a headstock, bed, saddle, tailstock, operation panel, pneumatic (hydraulic) circuit, lubrication system, power source cabinet and CNC controller.

All the equipment had connected by electrical, pneumatic (hydraulic) circuits. Since it is built up on a single-head, you cannot disassemble them. Because the length of the machine is about 3 m, one should not move anything to prevent any vigorous vibration or contact with other objects.

Note: When lifting the machine with a crane, a specially designed lifting truss capable to hold 6 tons must be used.

- A. Lifting precaution:
- B. Ensure that the wire is able to support the weight of the machine.
- C. Check the balance before the machine is raised.
- D. Lower the machine carefully. Never let it abruptly collide with the floor.

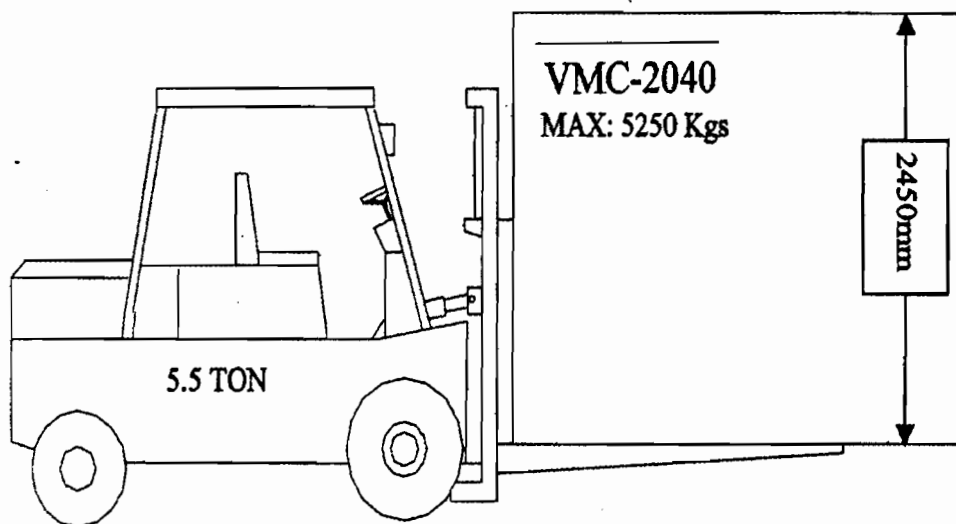
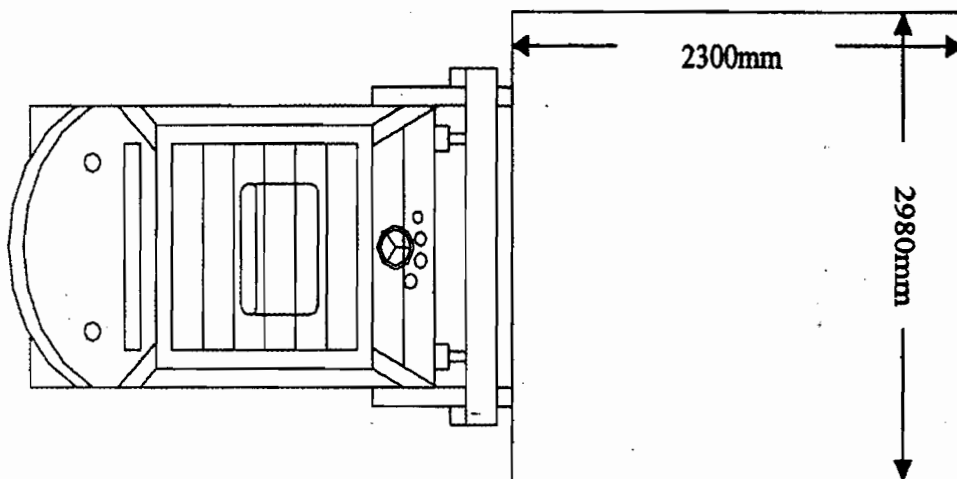
3.1.5 Movement

3.1.5.1 Movement when machine packed

3.1.5.1.1 Movement with fork life truck after machine packed

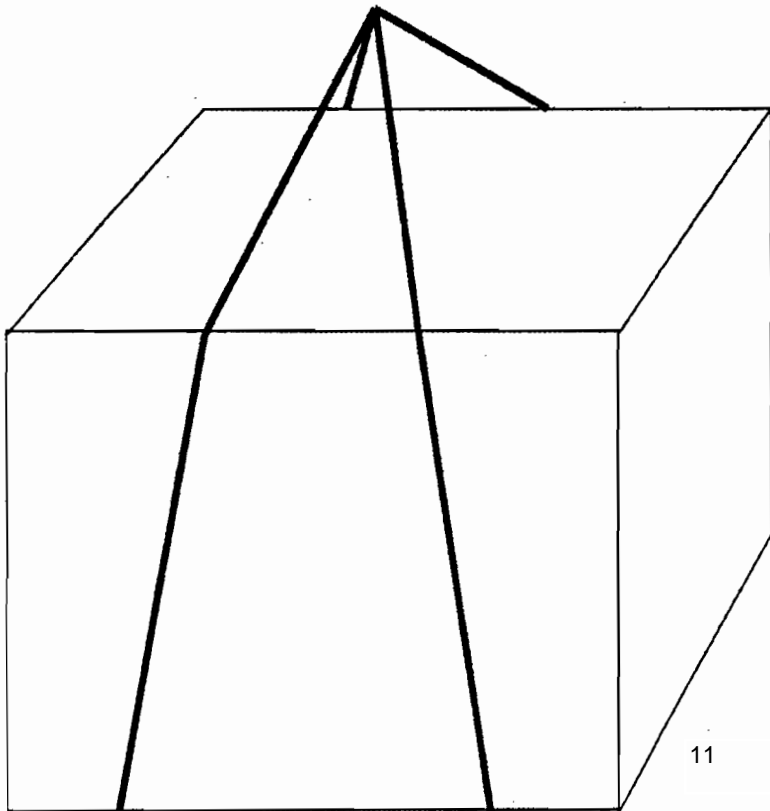
- A. The forklift truck must be able to withstand load over 6 tons because machine weight is about 5.5 tons.
- B. The size after packed is $\overline{\text{VMC-2040}}2300\text{mm(L)}\times 2980\text{mm(W)}\times 2450\text{mm(H)}$, Therefore you must pay attention to whether there are any blockage in moving path or not. Clear all of the blockages before moving.

- C. Adjust the fork off work life truck to the right position and be aware of the gravity center of the machine after packed. Machine must be placed on the load center of fork life truck to avoid machine tilt that will damage and injure propel.
- D. Be careful for the height of forklift truck when lifting. Do not raise too high that will generate vibration because of the tilt of the machine.
- E. Have someone instruct the movement when moving machine to assure security.



Move with crane when machine was packed

- A. The crane must be able to withstand the load over 6 tons because machine's weight is about 5.5 tons. It is prohibited from moving the machine with one, which can't comply with the requirement stated above to avoid any accident happened.
- B. The cable and the chain of crane must also be able to withstand the load over 6 tons avoid any accident happened.
- C. The size after packed is (VMC-2040) 2300mm(L) ×2980mm(W) ×2500mm(H), Therefore you must pay attention to whether there are any blockage in moving path or not. Clear all the blockages before moving to avoid crash and accident of the machine.
- D. Adjust the chain and the cable to right position and be aware of gravity center of the machine after packed. Machine must be placed on the load center of forklift truck to avoid machine tilt that will damage the machine and injure people.
- E. Have someone instruct the movement when moving machine to assure security.

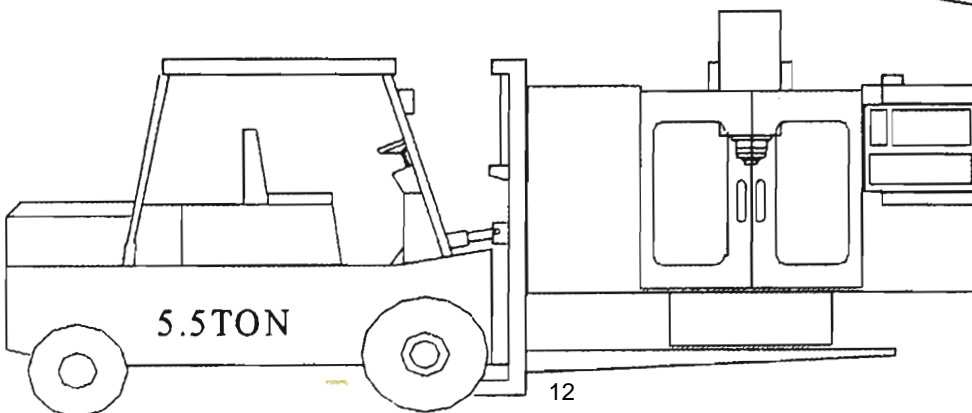
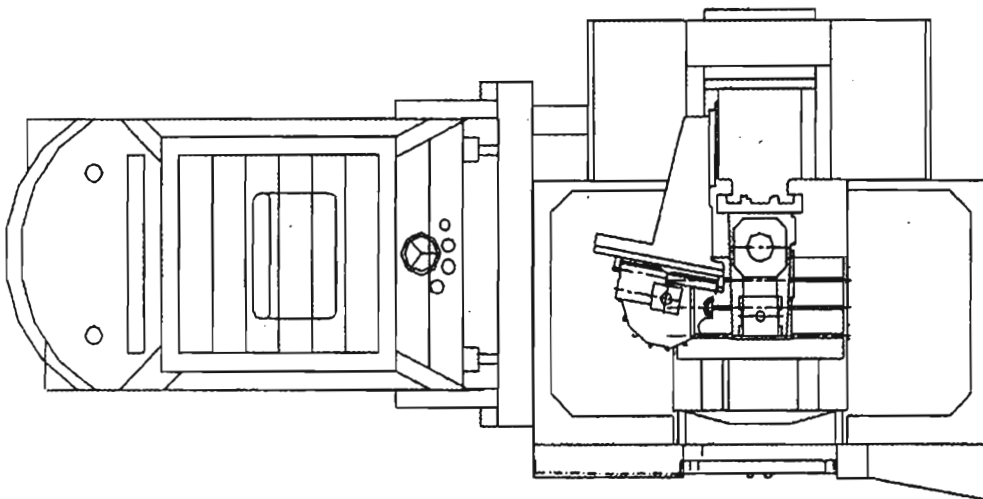


Move when machine was unpacked

3.1.5.1.2 Move with fork lift truck when machine was unpacked

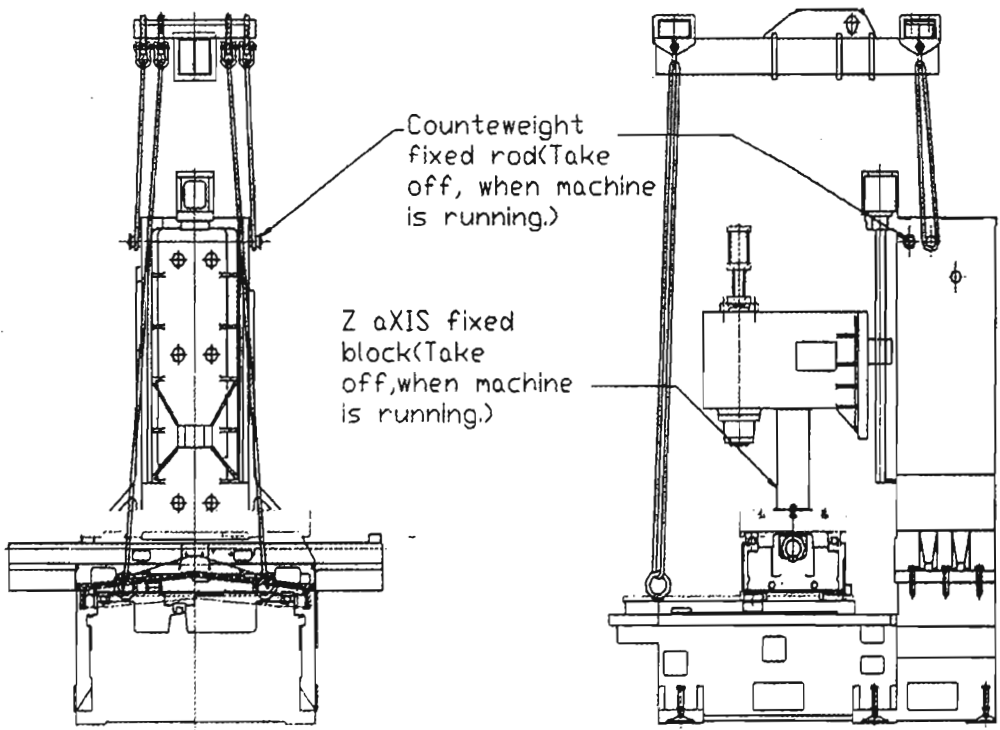
- A. The forklift truck must be able to withstand the load over 5.5 tons because machine's weight is about 5 tons.
- B. The size after packed is 2300mm (L) x 2980mm (W) x 2450mm (H), therefore you must pay attention to whether there is any blockage in moving path or not. Clear all the blockages before moved.
- C. Adjust the fork of forklift truck to the right position and be aware of machine gravity. Machine must be placed in the load center of forklift truck to avoid machine tilt that damage the machine and injure people. The front and rear sides of a machine are not allowed to be contact with mast of fork lift truck. Keep any part of the machine at least 15 cm away from masts of the fork lifting truck. Place two wood blackings of 89 cm and 20 cm in thick respectively between the machine and masts, as shown below.
- D. Be careful for the height of fork of forklift truck when lifting. Do not raised too high that will generate vibration because of gravity, or machine will tilt and people will be hurt and the machine be damaged.
- E. Have someone instruct the movement when moving machine to assure security.

Move with crane when machine was unpacked



The crane must be able to bear the load over 5.5 tons because machine's weight is about 5 tons. It is prohibited from moving the machine with crane which load with standing is under 6 tons to avoid any accident happened.

- A. The cable and chain of crane must be able to hear the load over 6 tons to avoid any accident happened.
- B. This machine is not allowed to move by crane directly without packing. Use sling frame supplied form us so that it can be moved with crane. It is prohibited from using any hanger, wire, rope etc. to move the machine. Otherwise, it will easily cause serious accident to the machine and people.
- C. The size after packed is 2300mm(L) x 2980mm(W) x 2450mm(H), Therefore you must pay attention to whether there are any blockage in moving path. Clear all of blockage before moving to avoid machine crash and accident.
- D. Adjust the chain and the cable to the right position and be aware of gravity center of the machine after packed. Machine must be placed on the load center of forklift truck to avoid machine tilt that will damage the machine and injure people.
- E. Have someone instruct the movement when moving machine to assure security.



3.1.6 Stock

3.1.6.1 Stock after packed

- A. Before stock. All the moving parts must be clamped and fixed and with anti-rust oil spreader on them.**
- B. When packing. Machine must be fixed tightly with skid to avoid falling while moved.**
- C. When packing machine must be covered with waterproof cover or avoid humidity or corrosive air entering into the machine to cause damage to electrical and mechanical parts.**
- D. Descant is required to place in the box. How many quantities of descant are required is according to the storage period of time.**
- E. After packed. It must place on where the temperature change is not so big and in proper humidity. Do not put it in the conditions of direct sunlight, rapid temperature change, etc.**

3.1.6.2 Stock without packing

- A. Before stock. All the moving parts must be clamped and fixed and with anti-rust oil spreader on them.**
- B. All the guards and doors must be fixed to avoid falling while moved.**
- C. Before stock, machine must be covered with waterproof cover to avoid humidity or corrosive air entering into the machine to cause damage to electrical and mechanical parts.**
- D. Descant is required to place in the machine, cabinet and controller. How many quantities of descant are required is accordant to the period of storage time.**
- E. After packed. It must place on where the temperature change is not so big and in proper humidity. Do not put it in the condition of direct sunlight, rapid temperature change, etc.**
- F. Be sure that all the power is off and cable is disconnected before stock.**

Chapter 5

Importance of Lubrication

5. Lubrication System

5.1 Lubricant & Hydraulic Oil

- A. Lubricant and hydraulic oil should be filled sufficiently before delivery. But they might have leakage or emulsification during lifted. So, check whether lubricant and hydraulic oils are sufficient or not when machine in position. It has to be replaced or filled up if necessary.

5.2 Lubrication

The ability, reliability, and endurance of the machine rely on excellent lubrication management and the lubrication system. Ensure that the surfaces where relative motion occurs are well lubricated, and check the lubricant oil regular. Keep sufficient levels of lubricant available or replace the new lubricant if necessary. One can maintain a longer service life for the machine.

NOTE: Using improper lubricants will lead to poor performance and malfunction of the machine. Keep the lubricant, especially on the headstock, in a clean condition at all times, this will ensure that lubrication function properly.

5.2.1 The Oil Guide Table

OIL USAGE RECOMMEND			
ITEM / BRAND	MOBIL	SHELL	OTHERS
LUBRICATION UNIT	VACTRA 2	TONNA T68	
PNEUMATIC LUBRICATOR	DTE-LIGHT	TELLUS C32	
SPINDLE OIL COOLER SYSTEM	DTE-LIGHT	TELLUS C32	
3 AXES BALLSCREW			GREASE
3 AXES LINEARWAY BLOCK			GREASE

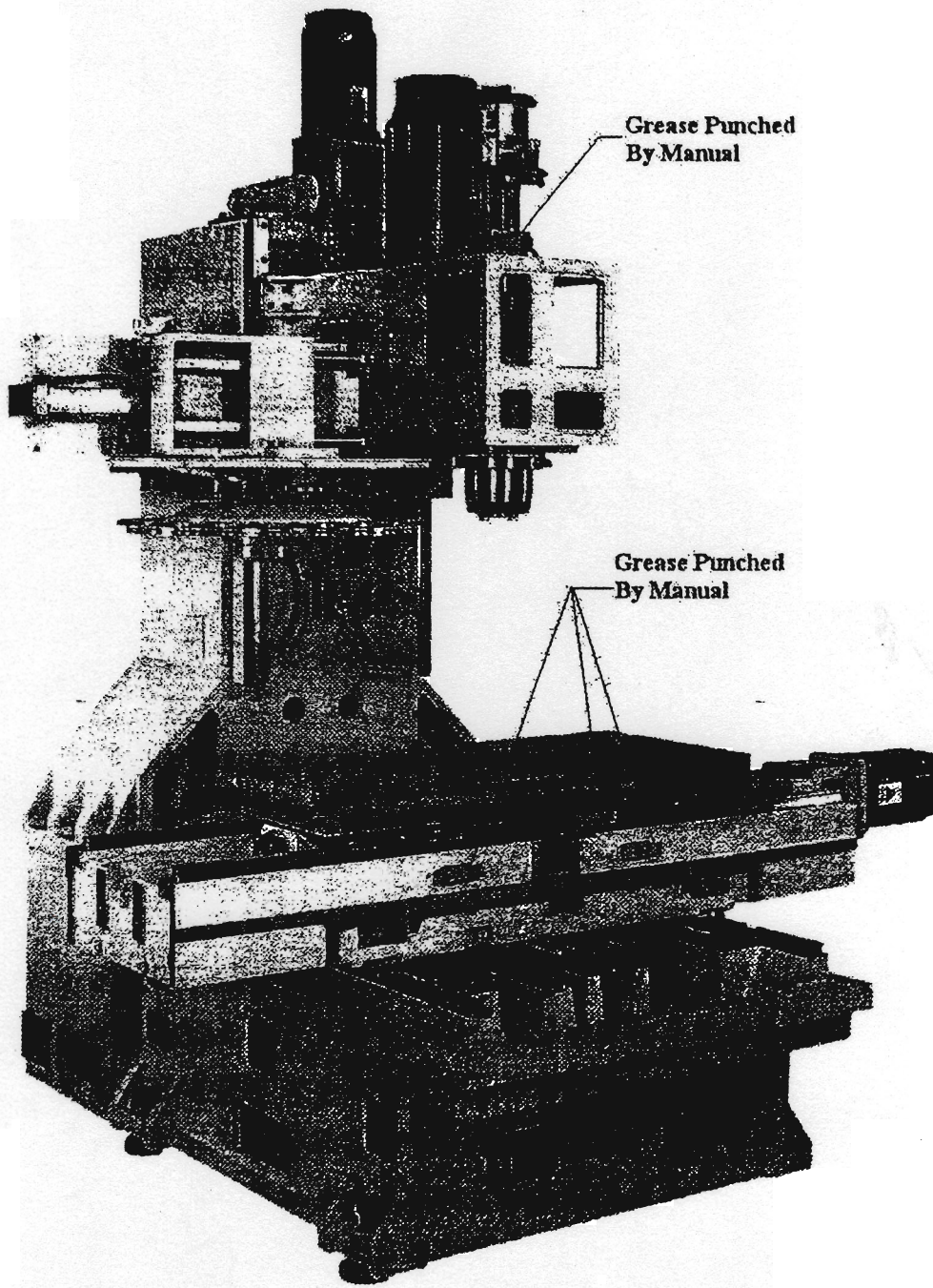
5.2.3 Grease Lubrication Points

- A. Disassemble spindle cover plate, and fill grease into the oil-orifice to lubricate slide block of Z axial linear way.**

- B. Disassemble working table front cover, and fill grease into the oil-orifice to lubricate slide block of X, Y axial linear way. The lubricant checking frequency is 300 hours/time.**

- C. Please caution grease puncher by manual and the stickiness of grease is 95.**

- D. The grease type : Mobilux EP 0.**



**Grease Punched
By Manual**

**Grease Punched
By Manual**

Chapter 6

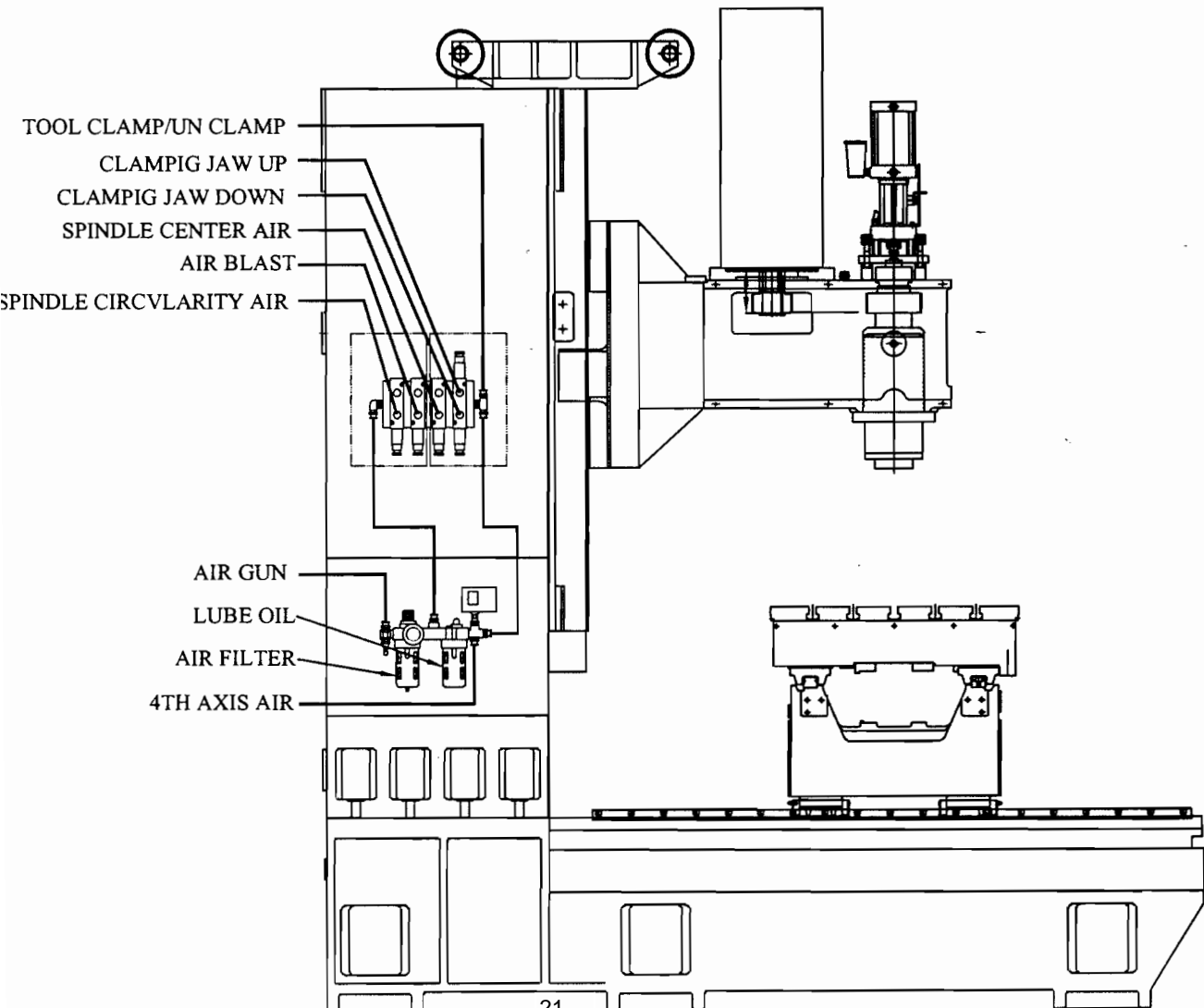
Pneumatic system

6.1 Air System

This machine is designed for very energy saving. No hydraulic is used. Only steady air supply $6\pm 0.5\text{kg/cm}^2$ is required.

1. If the customer has central air supply system, it'll be no problem to supply the main air system and air blast system by a T joint.
2. A central air support system or an air compressor with F.A.D: 200l/min tank capacity: 100 I is required for the pneumatic control system.
Note: We recommended you use separate air systems. Otherwise as the air blast are of open system. Which always make air pressure drop that will cause trouble in main air circuit.
3. We set the pressure gauge at 6.0kg/cm^2 of the air circuit. When air pressure below that point, the ALARM on operator's panel will light and the flash light will work but no emergency stop will be executed. (It will be very impractical to stop the machine every time when the air pressure starts to fall down), so the operator should be very careful when ALARM happened. He should find the cause of pressure low and shoot it in the shortest time. If can't be covered in 60 seconds, the NC system will FEED HOLD the machine. (CYCLE STOP button on operator's panel)

POSITION OF AIR FILTER UNIT



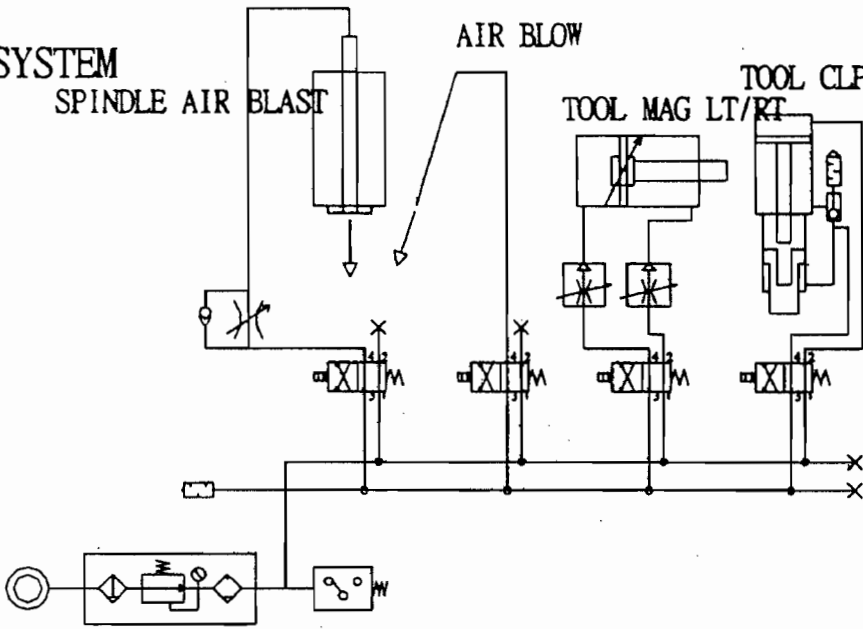
AIR SYSTEM

SPINDLE AIR BLAST

AIR BLOW

TOOL MAG LT/RT

TOOL CLP/UNCLP



AIR CONDITIONING UNIT

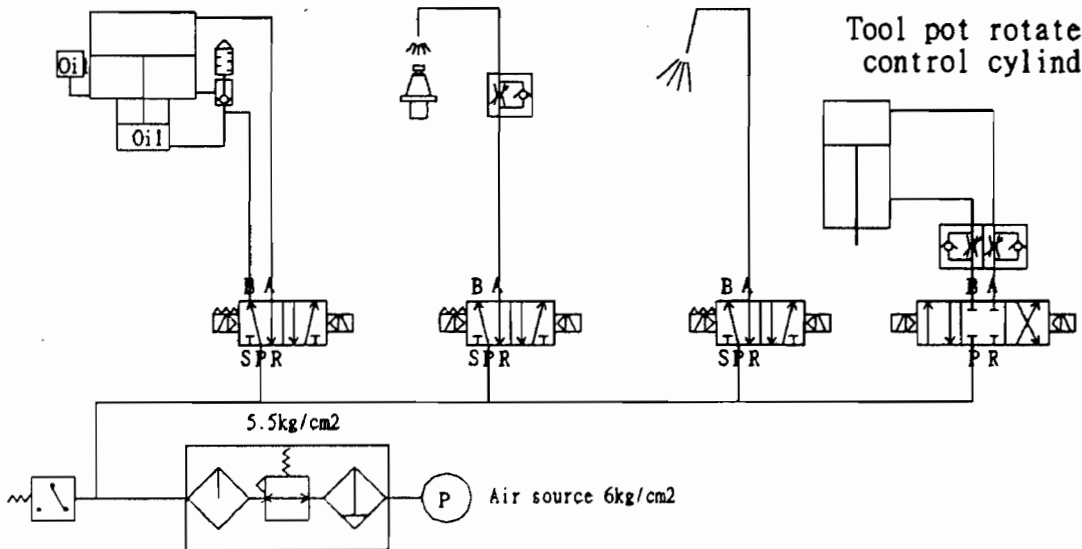
Pneumatic diagram for 24T A.T.C.

1: Tool unclamping control

2: Spindle taper cleaning & Air blow

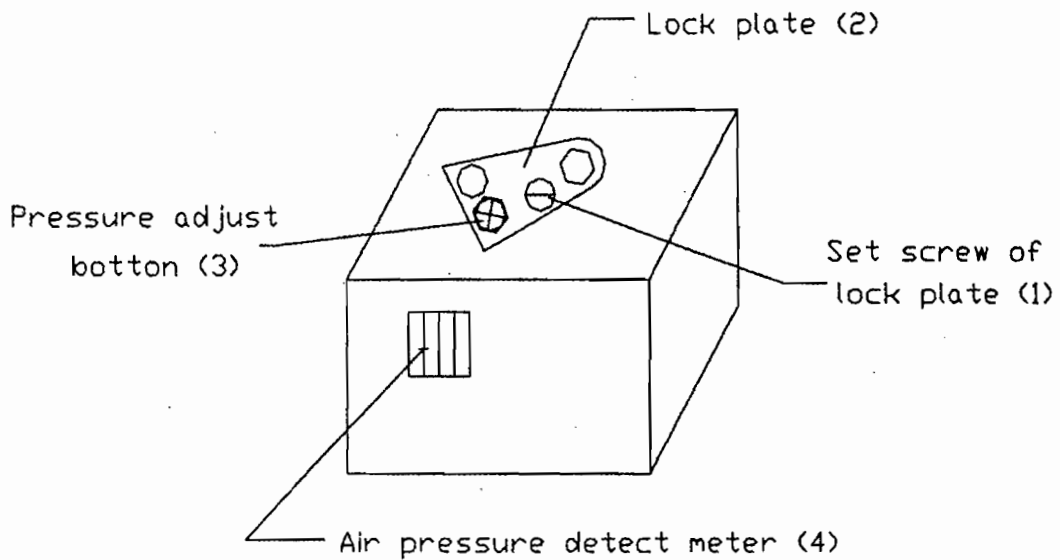
3: 24T A.T.C.

Tool pot rotate 90° control cylinder



Setting pressure 4kg/cm²

6.2 Air pressure adjustment procedure:



The following steps:

- A. Turn ccw direction and take off set screw(1) of lock plate.
- B. Take off the lock plate (2) up.
- C. Take a \oplus screw-driver insert to pressure adjust button (3), turn and set the pressure meter (4) had show on 4 kg/cm^2
- D. Put back lock plate (2), and attention the hex. socket must be at the same position with adjust button \oplus .
- E. Lock set screw of lock plate (1) ◦

Note: We must release the water cup pressure of air component system.

When machine is turning exceed 24 hours, that will be avoid water cup explode.

PART LIST

E SERIES

VERTICAL MACHINING CENTER

VMC-2040

PART LIST

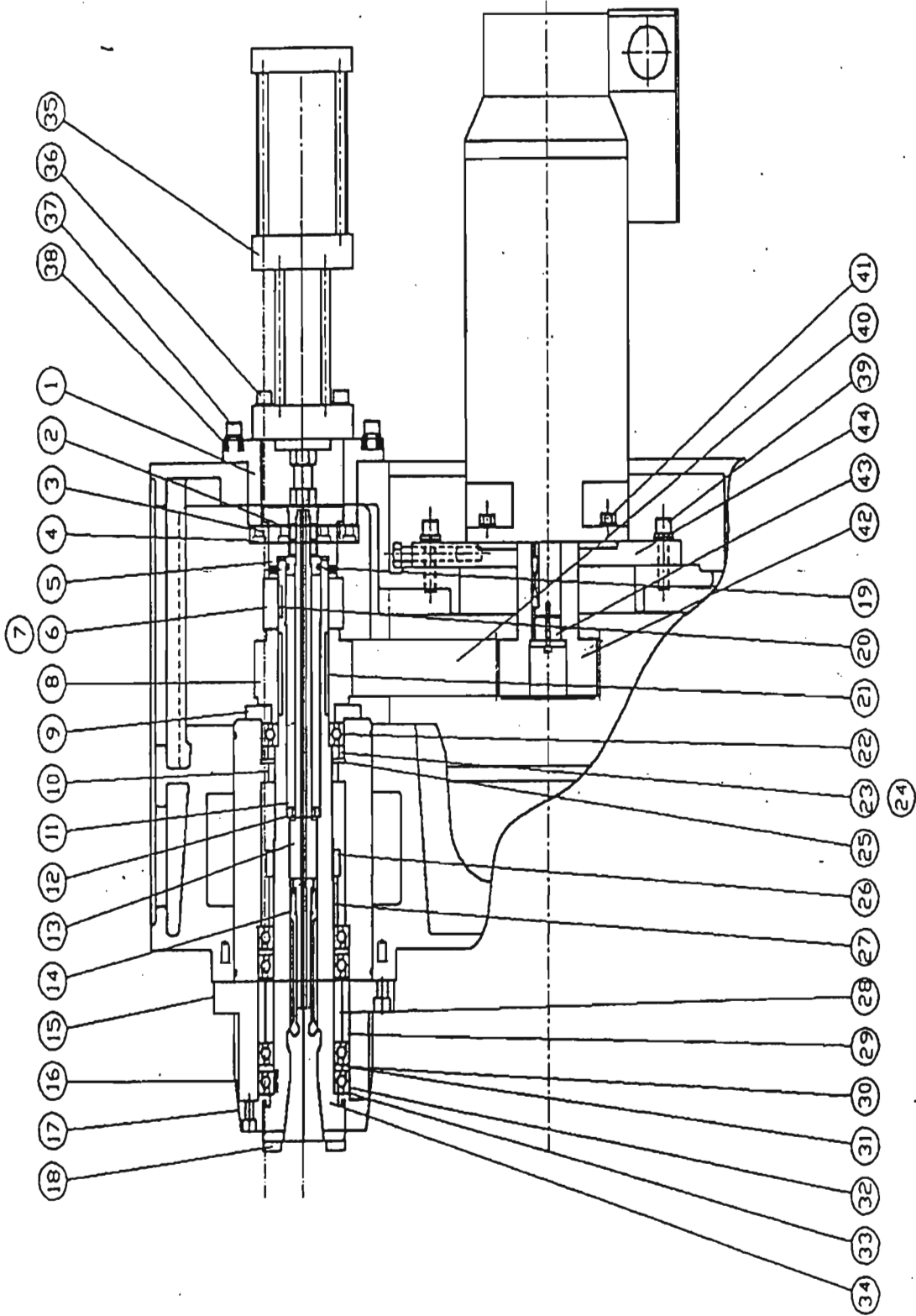
MACHINE MODEL : VMC-2040

SPINDLE ASSEMBLY

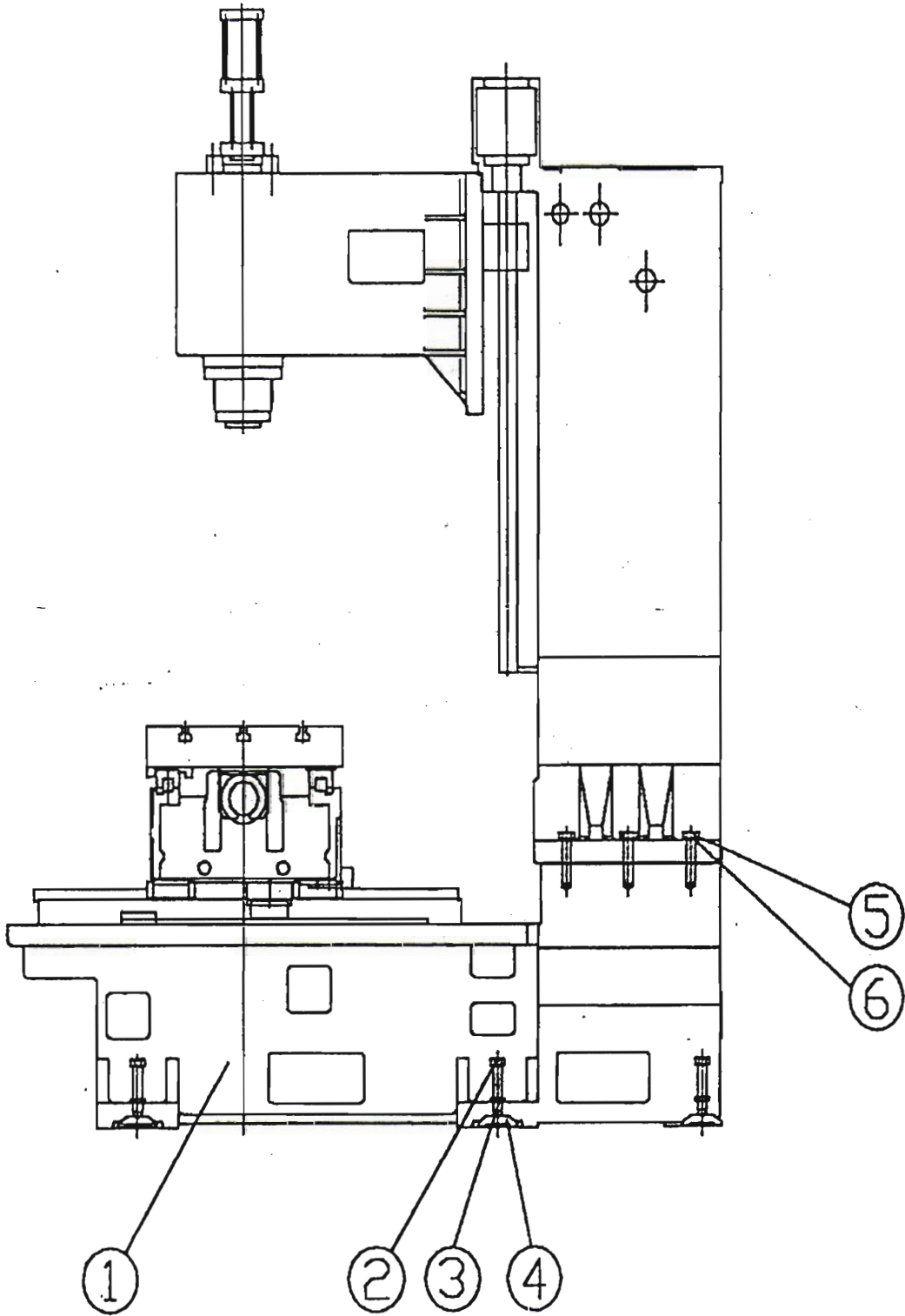
ASSEMBLY NO : CVEA5A01

NO : 1

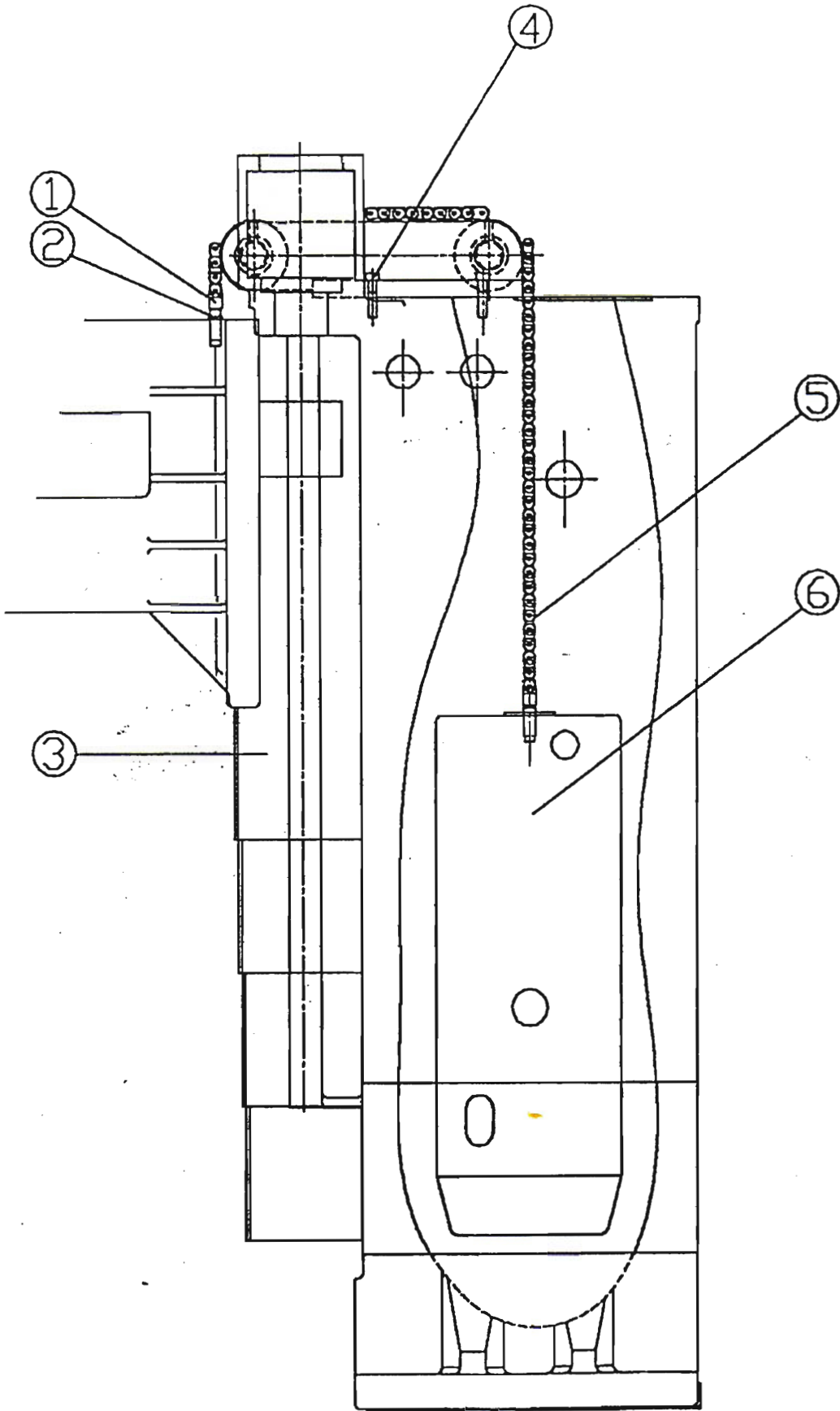
No.	PART No.	PART NAME / SPECIFICATION	Q'TY	REMARK
1	VEA511100	PULL COVER	1	
2	B18160000	NUT / M16*P2	2	
3	VEA511000	SUPPORT SEAT OF CLAMP/UNCLAMP CYLINDER	1	
4	B01080250	HEX. SOCKET BOLT / M8*P1.25*L25	2	
5	V2563100	LOCK NUT	1	
6	V2563010	SPINDLE ORIENTATION WHEEL	1	
7	V2563200	SPINDLE ORIENTATION DETECT BLOCK	1	
8	V2562901	PULLEY OF SPINDLE / 8YU*44T	1	
9	V2562800	SPINDLE END COVER	1	
10	V2563800	RING	1	
11	V2565500	SPRING DISC / 16H	1	
12	V2564900	COLLAR OF SPRING DISC	1	
13	V2564100	DRAW BAR	1	
14	V2565100	COLLECTOR	1	
15	V2562102	FRONT SLEEVE OF SPINDLE	1	
16	V2565700	SPINDLE NOSE SLEEVE (OPTINAL)	1	
17	V2562401	SPINDLE NOSE COVER	1	
18	V2562300	SPINDLE NOSE KEY	2	
19	V2565000	TOP SUPPORT COLLAR OF DRAW BAR	1	
20	B40207250	KEY / 7*7*25	1	
21	B40208650	KEY / 8*7*65	2	
22	V2563700	REAR WASHER	1	(ST)
23	V2565300	REAR SUPPORT BEARING / NSK 6011*P4	1	
24	V2565310	REAR SUPPORT BEARING / OPTI(12000rpm)	2	
25	V2565400	WAVE WASHER / BWW-6308	2	
26	B20460200	LOCK NUT / YSF-M60*P2.0	1	
27	V2563300	COLLAR	1	
28	V2562501	INNER COLLAR(MIDDLE)	1	
29	V2562601	OUT COLLAR(MIDDLE)	1	
30	V2563500	INNER COLLAR(FRONT)	1	
31	V2563600	OUT COLLAR(FRONT)	1	
32	V2565200	FRONT BEARING / KSK 7013C TYCBP4	3	
33	V2563900	NILOS RING / 6013-JU	1	
34	V2562201	SPINDLE	1	
35	B25G40130	SINGLE STEP AIR/OIL CYLINDER	1	
36	B01100400	SCREW / M10*P1.5*L40	4	
37	B01100400	SCREW / M10P1.5L40	4	
38	B41235200	COMPRESSION SPRING	4	
39	B01100350	SCREW(ADJUSTABLE PLATE) M10P1.5L35	4	
40	B48889400	PULLEY OF SPINDLE (TIMING BELT)	1	Q20-8YU-40
41	B01120350	SCREW (MOTOR) M12P1.75L35	4	
42	VEA518101	PULLEY OF SPINDLE MOTOR	1	SJ5.5*W8,SJ7.5A,
	VEA518111	PULLEY OF SPINDLE MOTOR	1	SJ7.5A(OP),α8
	VEA518120	PULLEY OF SPINDLE MOTOR	1	西門子PH7107
43	VEA518201	COVER OF MOTOR	1	SJ5.5, α6
	VEA518211	COVER OF MOTOR	1	SJ7.5, α6
	VEA518220	COVER OF MOTOR	1	西門子PH7107
44	V25661A1	ADJUSTABLE PLATE A OF SPINDLE	1	SJ5.5*W8,SJ7.5



ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種	VMC-2040L	圖號	CVEA5A01	比例	1:16
	TYPE		PART NO		SCALE	
	圖名	主軸內部機構/SPINDLE ASSEMBLY		版次	1	
	DESCRIP			VERSION	1	



ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.		機 種	VMC-2040L	圖 號	CVEA1A01	比 例	1:16
		TYPE		PART NO		SCALE	
		圖 名	立柱與底座之結合/COLUMN&BASE COMBINATION ASSEMBLY	版 次		VERSION	1
		DESCRIP					



ACER
TAIWAN SPRINGWOOD INTERNATIONAL, INC.
FORMOSA SPRINGWOOD INTERNATIONAL, INC.

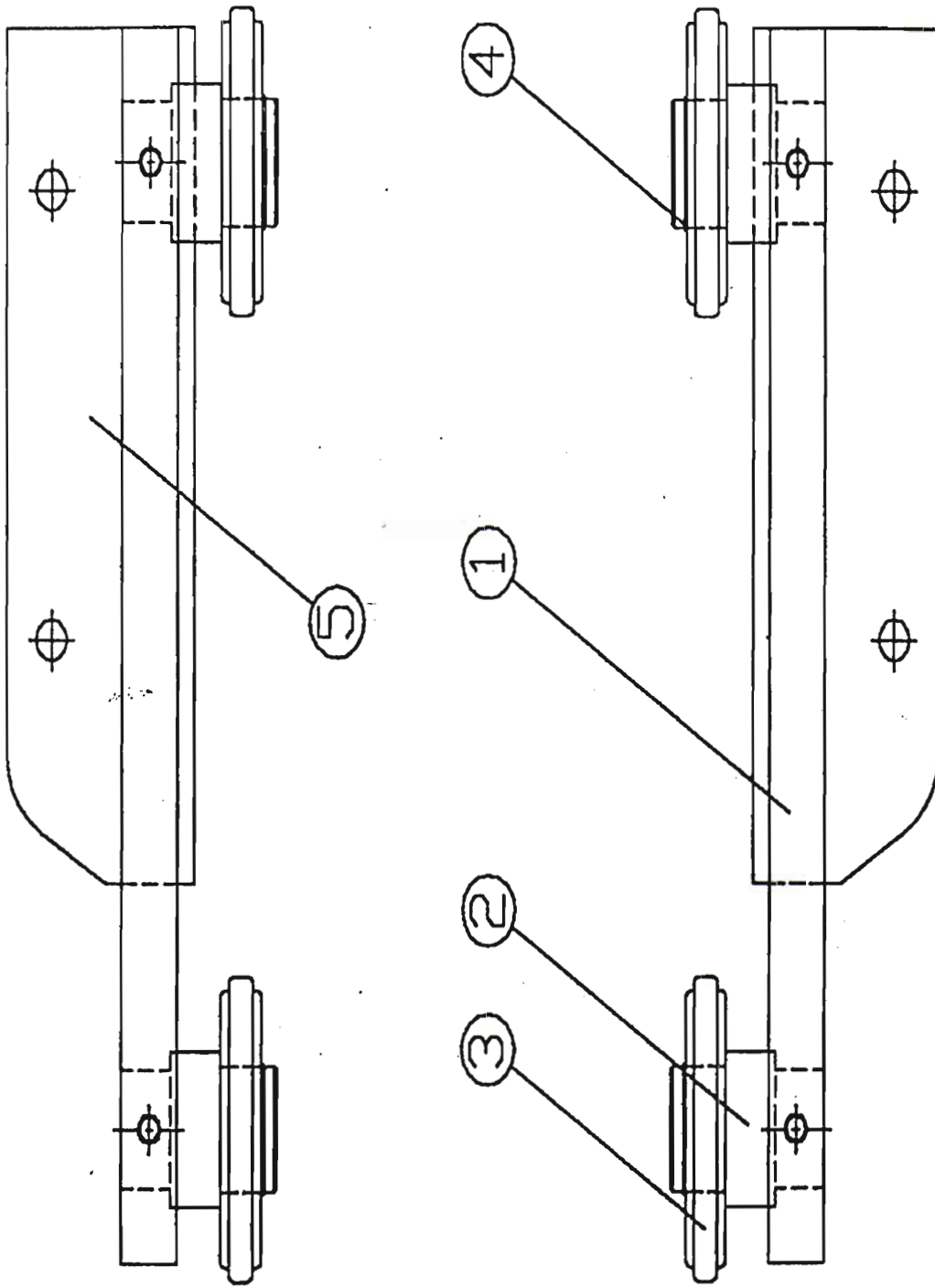
機 種
 TYPE

圖 名
 主軸頭與配重機構/HEADSTOCK & COUNTERWEIGHT ASSEMBLY

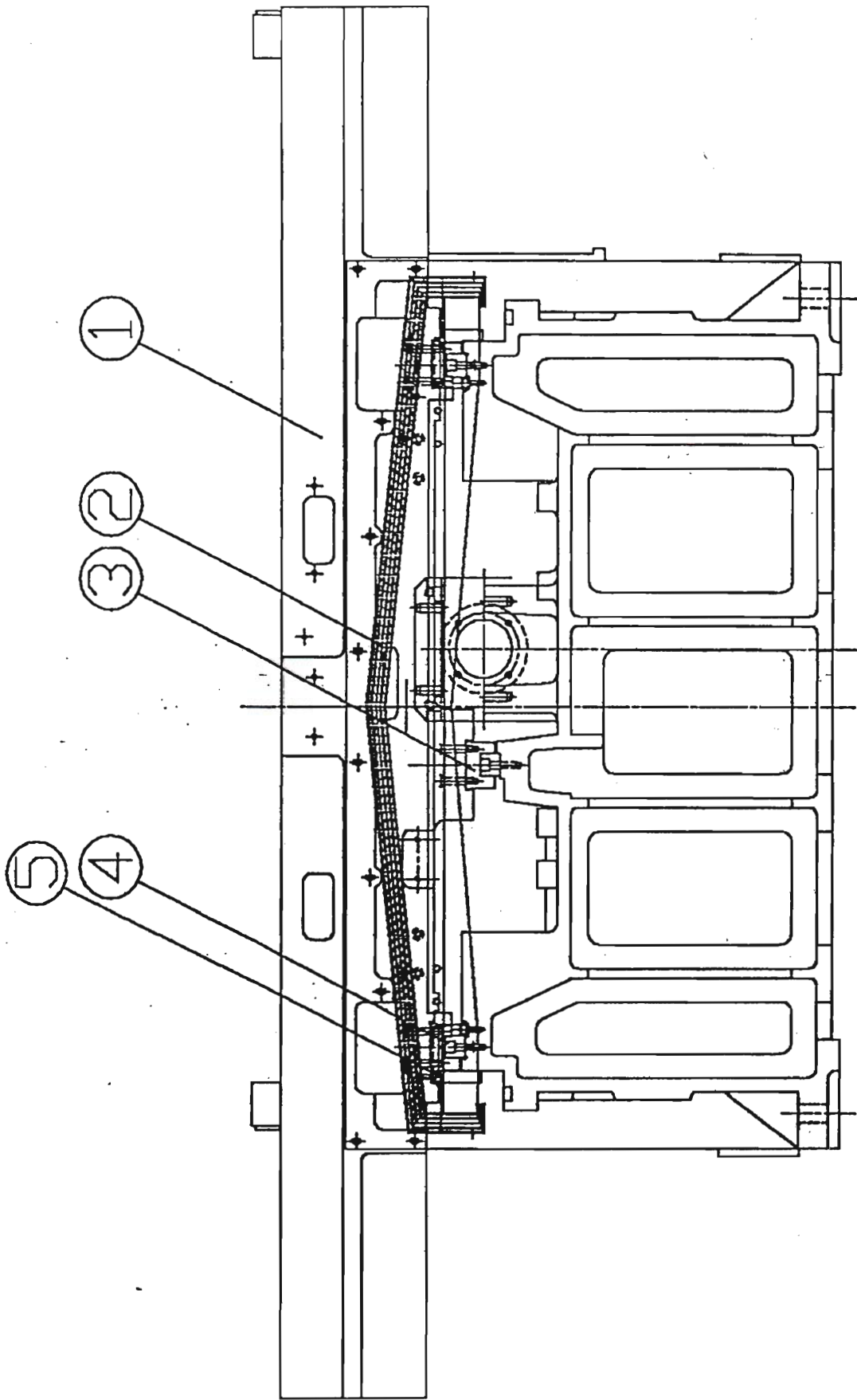
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 PART NO
 VMC-2040L
 CVEA2A01

比 例
 SCALE
 1:8

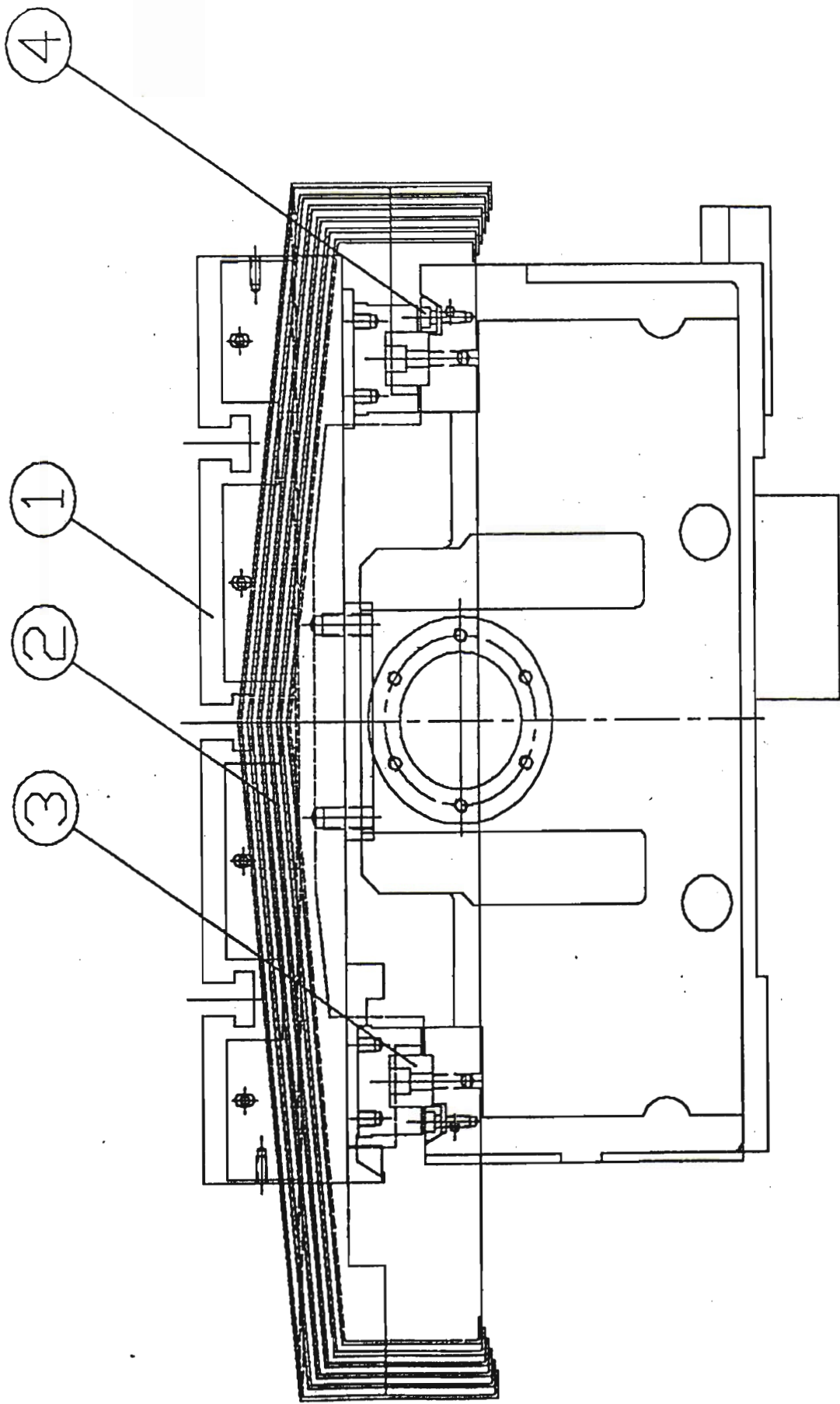
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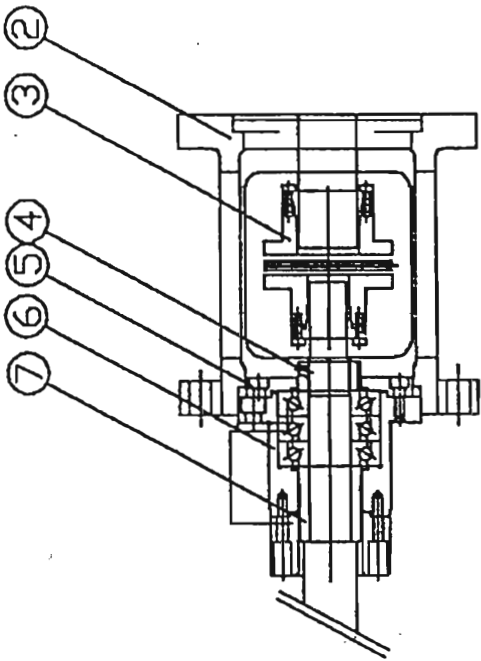
ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機 種 TYPE 圖 名 DESCRIP	VMC-2040L 鏈輪座機構/SPROCKET SEAT ASSEMBLY	圖 號 PART NO CVEA2A02	比 例 SCALE 版 次 VERSION 1:3 1
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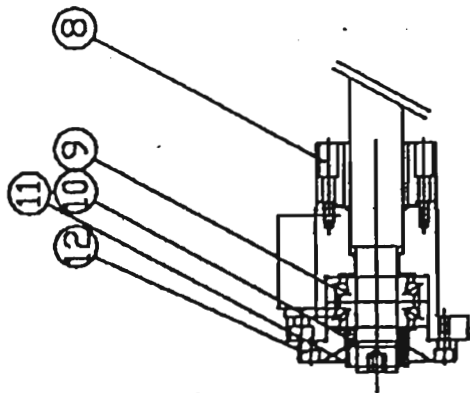
ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種 TYPE 圖名 DESCRIP	VMC-2040L 鞍座組合圖/SADDLE ASSEMBLY	圖號 PART NO CVEA3A01	比例 SCALE 1:8 版次 VERSION 1
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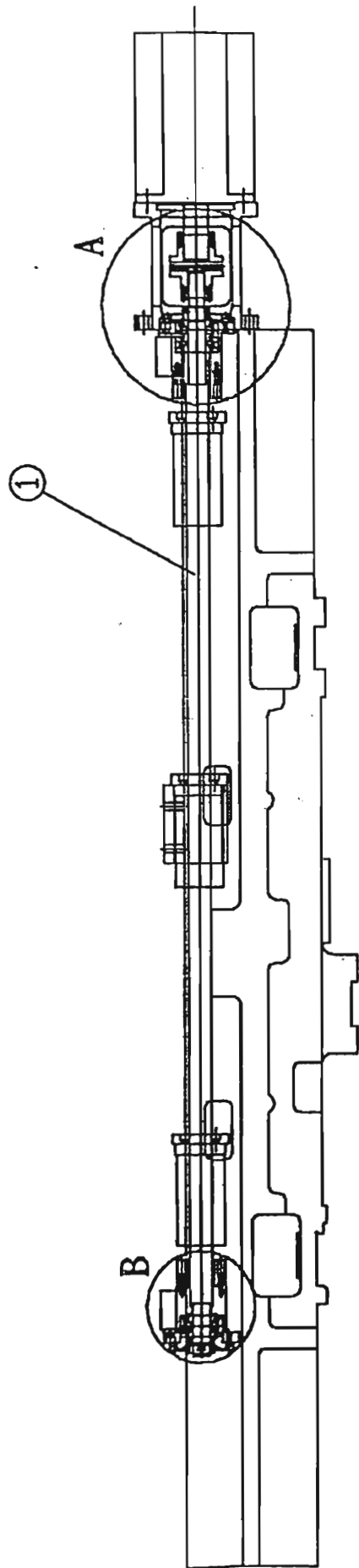
ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種 TYPE	VMC-2040L 工作台組台圖/TABLE ASSEMBLY	圖號 PART NO CVEA4A01	比例 SCALE 1:3.5 版次 VERSION 1
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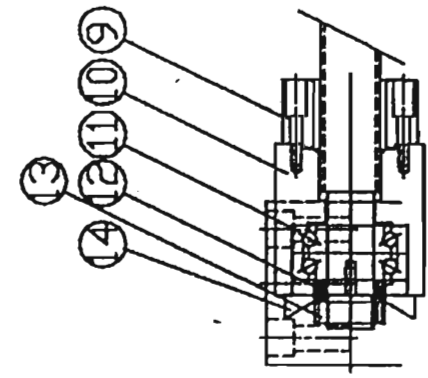
A-A part view



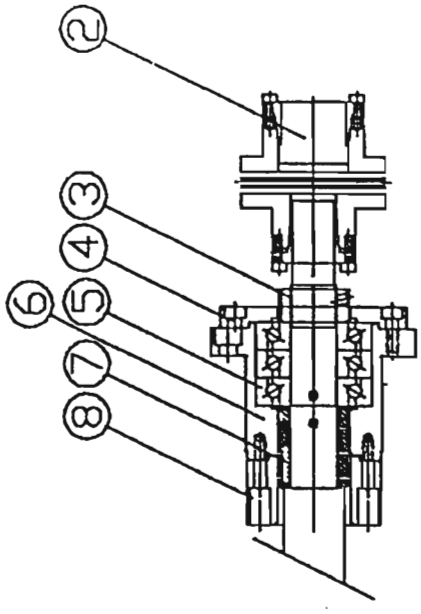
B-B part view



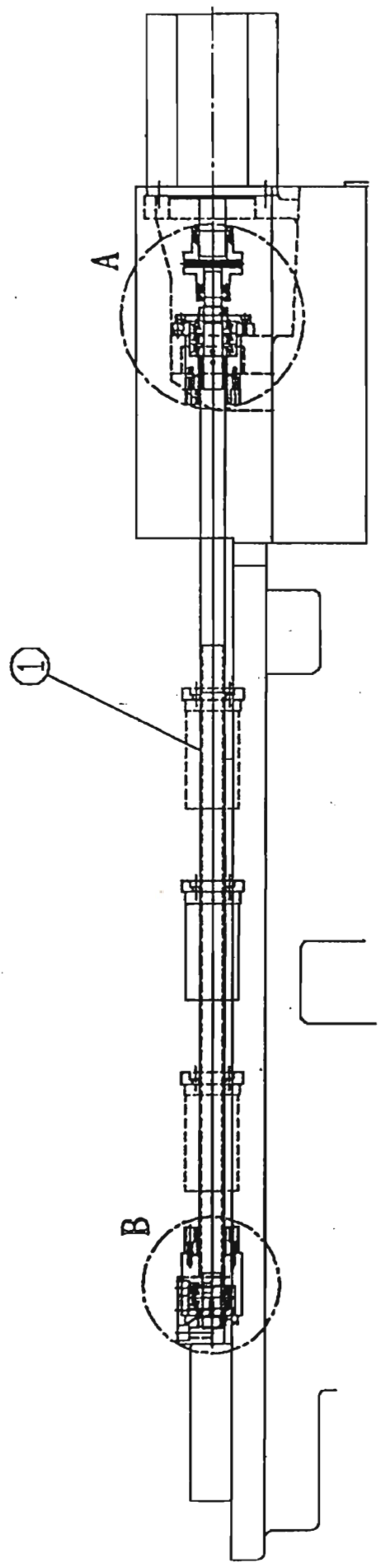
ACER		TAIWAN SPRINGWOOD INTERNATIONAL, INC.		FORMOSA SPRINGWOOD INTERNATIONAL, INC.		機 種 TYPE	VMC-2040L	圖 號 PART NO	CVEA6X01	比 例 SCALE	1:9	
							圖 名 DESCRIP	X軸傳動機構/X-AXIS TRANSMISSION ASSEMBLY				
							版 次 VERSION	1				



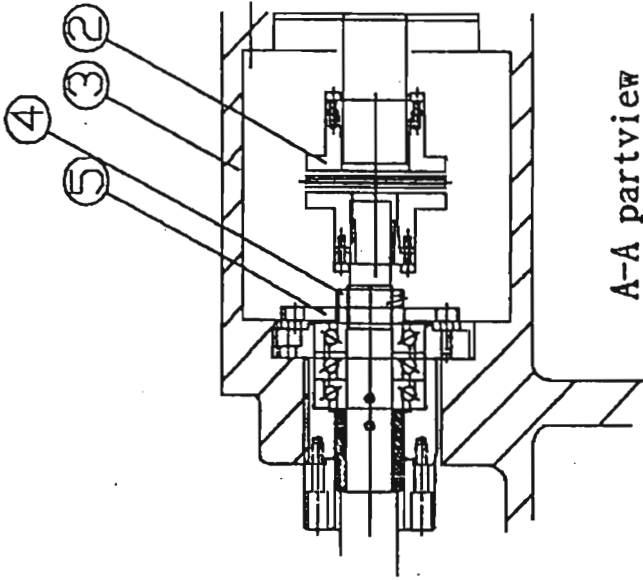
B-B partview



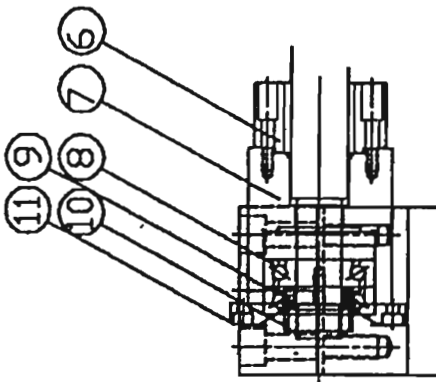
A-A partview



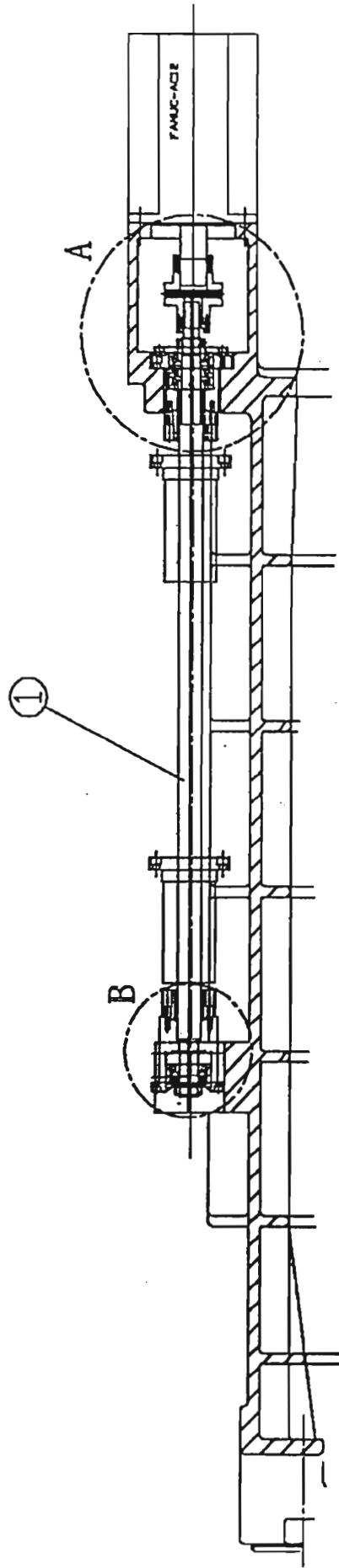
ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機 種	VMC-2040L	圖 號	CVEA6Y01	比 例	1:8
	TYPE		PART NO		SCALE	
	圖 名	Y軸傳動機構/Y -AXIS TRANSMISSION ASSEMBLY				
	DESCRIP					
			版 次	1	VERSION	1



A-A partview



B-B partview



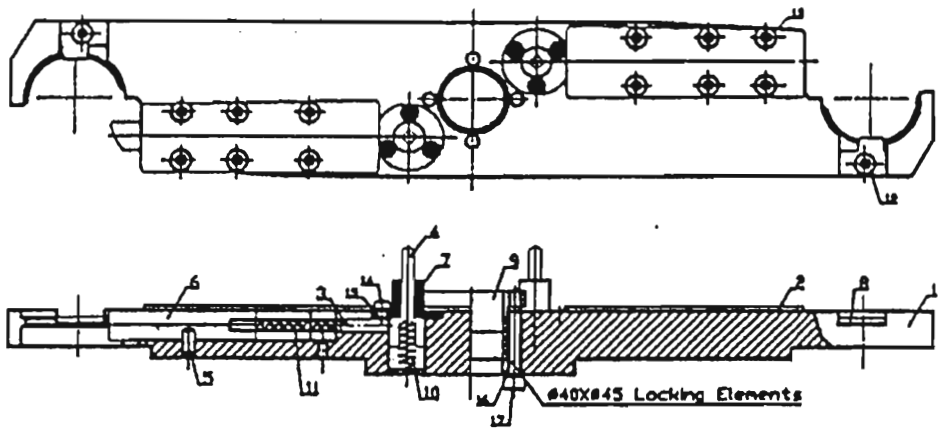
ACER TAIWAN SPRINGWOOD INTERNATIONAL, INC. FORMOSA SPRINGWOOD INTERNATIONAL, INC.	機種	VMC-2040L	圖號	CVEA6Z01	比例	1:8
	TYPE		PART NO		SCALE	
	圖名	Z軸傳動機構/Z-AXIS TRANSMISSION ASSEMBLY	圖號		版次	1
	DESCRIP				VERSION	

CAT-40 & BT-40 DISK-TYPE AUTOMATIC TOOL CHANGING SYSTEM

INSTRUCTION

1. This system is using cylindrical cam reel to reducing the speed by gear, the cylindrical cam is driven by an motor, this motor attached with automatic power off brake, to produce the indexing angle and positioning the POT. While POT is on position, the pneumatic cylinder will drive the flat type cam, to make the clamping jaws goes up and down, the movement of the clamping jaws will also drive the POT to rotate horizontally or upright, and this will make the tool changing to be quick & smoothly.
2. Every single rotation cycle of cylindrical cam will drive the POT for one indexing, and in every 360° rotation of the cylindrical cam, there are 270° to be the angle of movement of the cam, and 90° to be the angle of non-movement. This design will helps the brake motor to stop and positioning. (The rotation angle of the brake motor will be $45^{\circ} \pm 20^{\circ}$)
3. The effective rotate angle for the clamping cam is approximately 100°, 10° plus on both the left and right side to be the angle of non-movement.
4. The motor is 3 phases, 220V 200W. The gear reducing ration is 1:20, the attached automatic power off brake can be rotate either clockwise (CW) or counter clockwise (CCW). For every single indexing, the using time theoretically is 0.7 second, and the complete indexing cycle (24 index) will take 16.8 seconds.
5. The travel of clamping cylinder is ψ 50mm \times 100mm, detected by magnetic ring.
6. The solenoid valve is 2 phases, 24V, 1/4"PT. (For pneumatic ATC).
7. The Proximity Sensors: brand name: BALLUFF (ISO-9001) REG NO: 19279-01 Specification : M12 \times 1, detecting distance 2mm, Voltage: 10-30V DC \cong 130mA \cong 800HZ PNP 3 cords.
8. The distribution diagram of the pneumatic cylinder and electro magnetic valve & cam-type connecting diagram of circuit are in showed fig(1). (For pneumatic ATC).
9. Tool capacity: 24 standard tool magazine with tool sleeve, max. Tool size: 80mm or 106mm.
10. Max. Tool length: 300mm.
11. Max. Tool weight: 8Kg.
12. The material of the POT is Nylon mixture with 33% glass fiber, one piece forged, with the tolerance of the weight up to 100Kg, and the highest thermo tolerance is 120°C to -20°C.
13. The counting and positioning of the rotation is controlled by PLC, through the detection of the proximity sensors, this tooling system can rotate clockwise (CW) or counterclockwise (CCW). To execute the tool indexing by selecting the nearest path.
14. The total weight of the automatic tool changing system, is approximately 140Kg, the clamping arm and cover excluded, (the weight of the body and tool plate is light, but still carry high rigidity, the cylinder and drive motor are located on the back side of tool magazine, to bring the convenience for maintenance & repair.)
15. The drawing and size of the tool magazine please reference to fig(2).

Arm ass'y

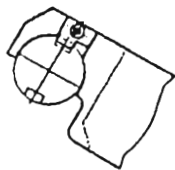
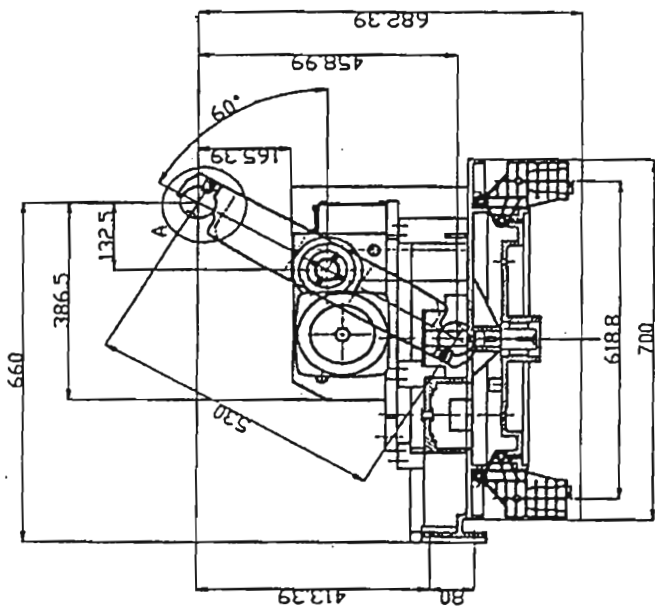


NO.	Part no.	Description	Specification	Dim:	Quantity
1	MB-4025	Arm	BT \ CAT \ HSK	430 mm	1
				460 mm	1
				500 mm	1
				530 mm	1
				600 mm	1
2	MB-4028	Case	430 mm	114 mm	2
			460 mm	129 mm	2
			500 mm	149 mm	2
			530 mm	164 mm	2
			600 mm	199 mm	2
3	MB-4029	Movement pin	430 mm	65 mm	2
			460 mm	80 mm	2
			500 mm	100 mm	2
			530 mm	115 mm	2
			600 mm	150 mm	2
4	MB-4030	Pin	BT	64 mm	2
			CAT	62 mm	2
			Dex2 BT	54 mm	2
			Dex2 CAT	52 mm	2
5	MB-4031	Pin		$\psi 8 \times 16L$	2
6	MB-4032	Stop Movement			2
7	MB-4033	Pin Plate	Standard	24 mm	2
			Dex2	21 mm	2
8	MB-4034	Home key	60°		2
			65°		2
			70°		2
9	MB-4035	Case			1
10		Spring 1	$\psi 1.1 \times \psi 9 \times 14T \times 41L$		2
11		Spring 2	$\psi 1.2 \times \psi 11 \times 20T \times 78.5L$		2
12	Commercial Products	Hexagon Head Bolt	M6 \times 1P \times 10L		2
13	Commercial Products	Hexagon Head Bolt	M6 \times 1P \times 10L		12
14	Commercial Products	CAP Bolt	M6 \times 1P \times 12L		6
15	Commercial Products	Washer	$\phi 6$		6
16	Commercial Products	Washer	$\phi 6$		4
17	Commercial Products	CAP Bolt 44	M8 \times 1.25P \times 55L		4

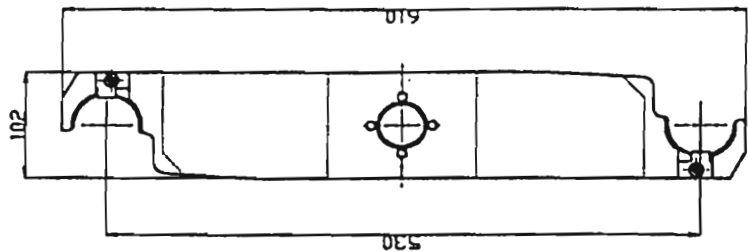
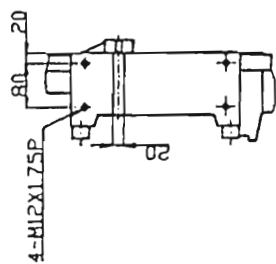
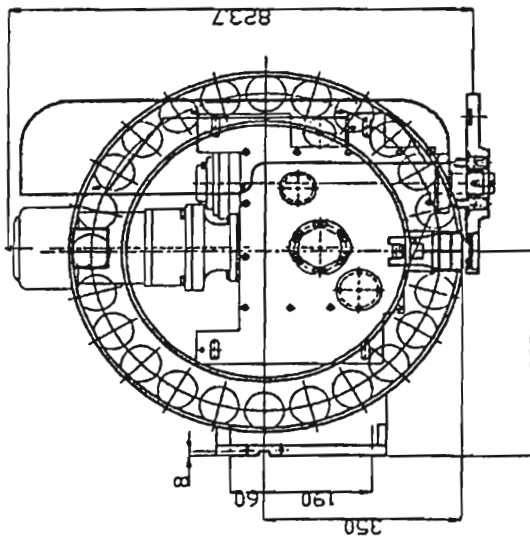
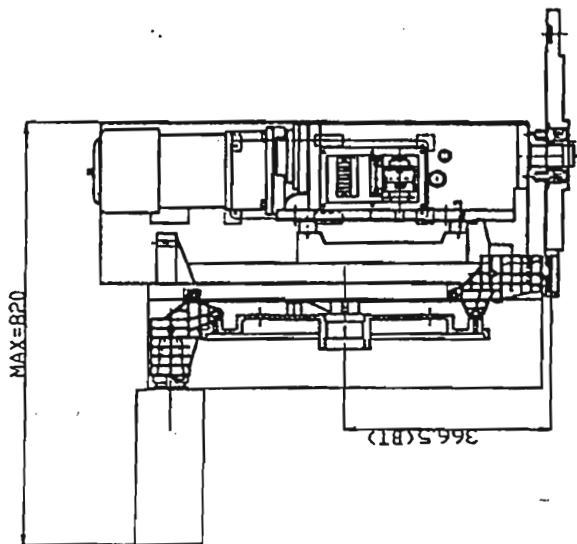
刀具規格

換刀時間:1.5秒(60Hz)
 最大刀重:8kg
 最大刀長:300mm
 刀庫重量:280kg

刀具型式:MAS 403 BT-40
 拉栓型式:MAS 403 P40T-1
 刀具數量:24刀
 最大刀徑:1.滿刀狀態:φ81
 2.鄰空刀狀態:φ162
 刀庫電源:220V/60Hz(三相)
 ATC電源:220V/60Hz(三相)

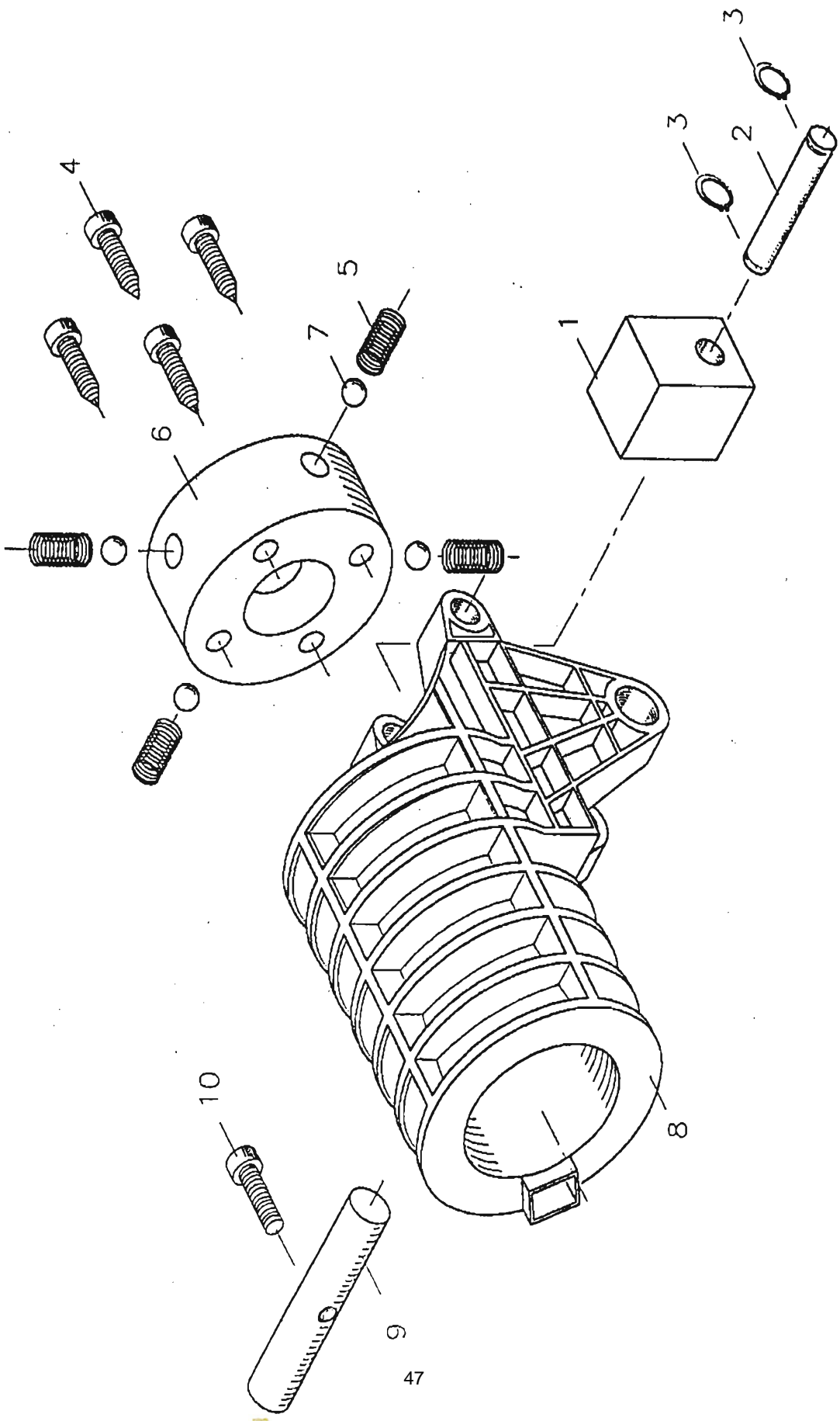


A詳圖 S=2/1

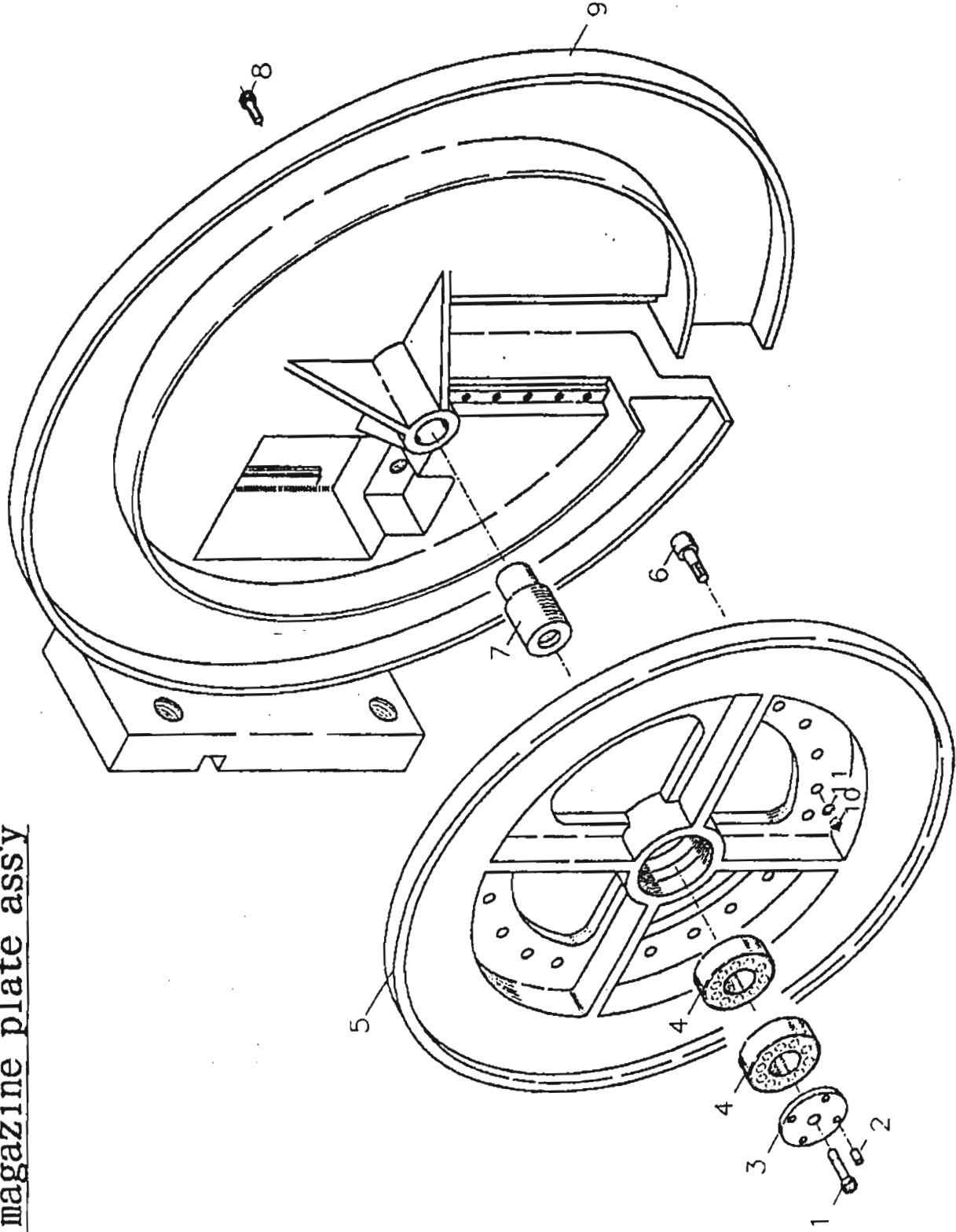


刀庫規格 S=2/1

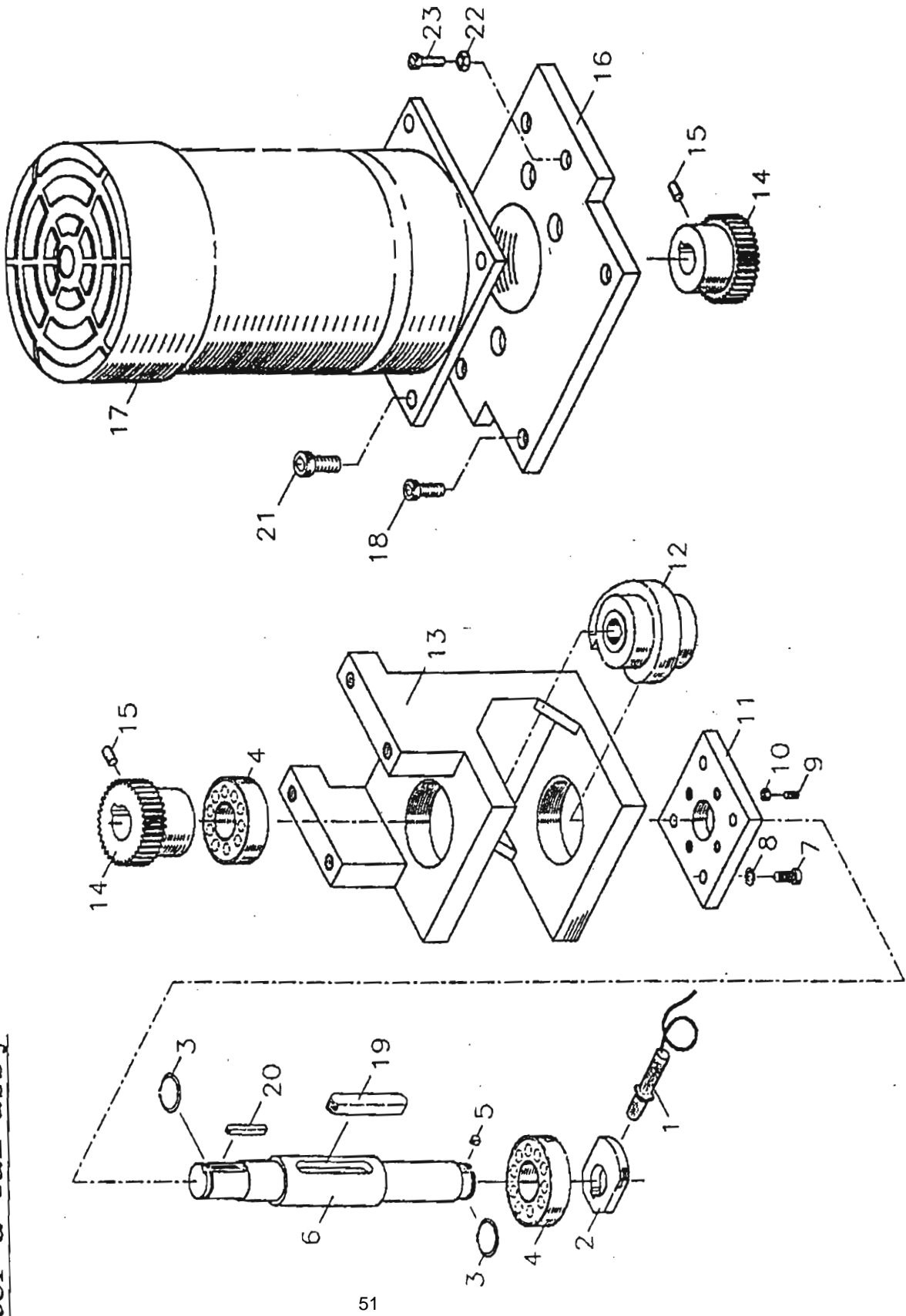
Pot ass'y



Body & magazine plate ass'y



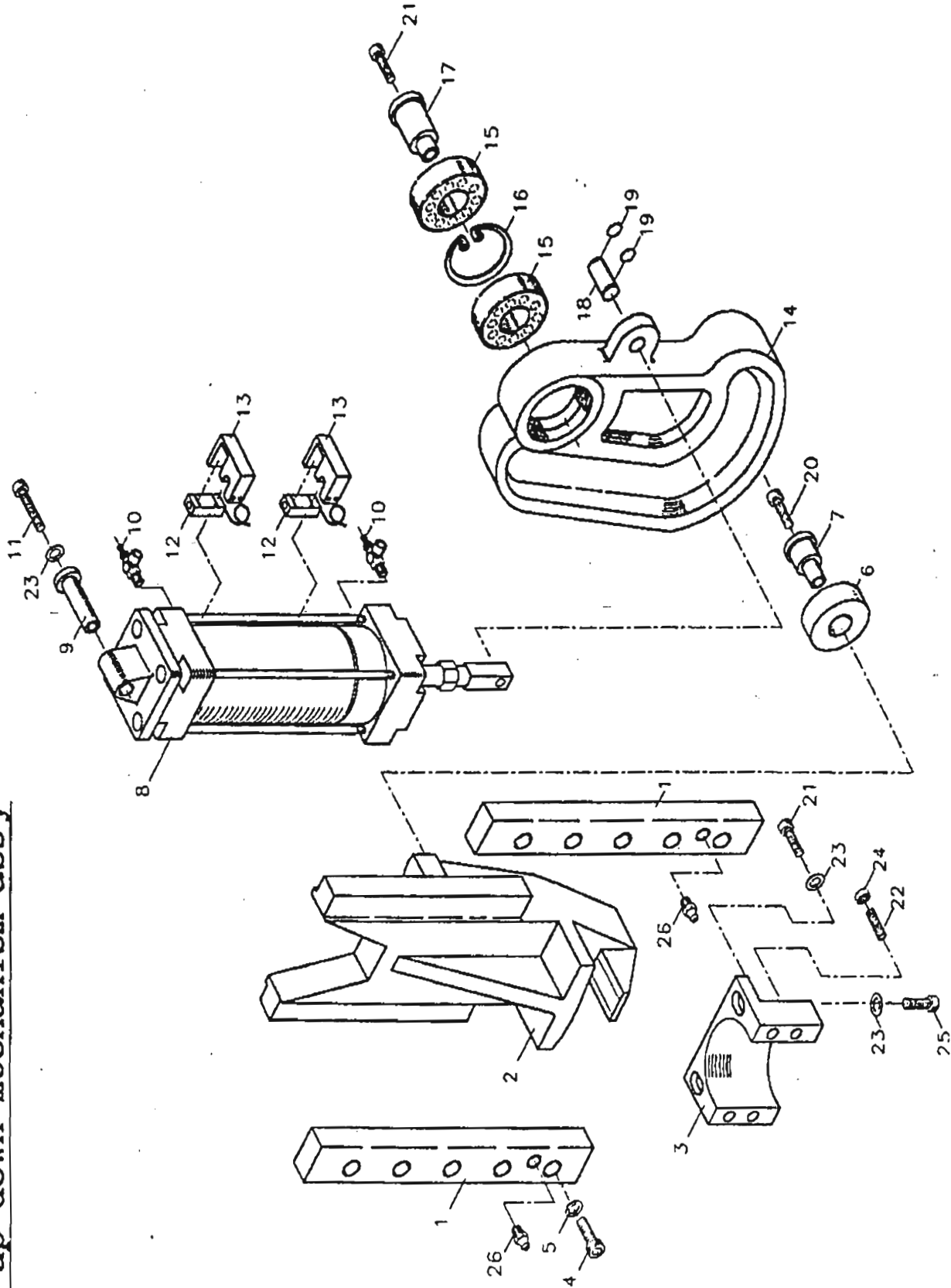
Motor & Cam Assy



Motor & Cam ass'y part diagram

Item	Part no.	Description	Material / Specification	Quantity	Remark
1	Commercial Products	Proximity Sensor	M12	1	
2	MB-4019	Sensing Device	Powder Metallurgy	1	
3	Commercial Products	U-Clip	S18	2	
4	Commercial Products	Bearing	30204JR	2	
5	Commercial Products	Square Key	5×5×6L	1	
6	MB-4016	Shaft	S45C	1	
7	Commercial Products	CAP	M6×20L	4	
8	Commercial Products	Washer	M6	4	
9	Commercial Products	Fixing Bolt	M6×20L	4	
10	Commercial Products	Screw	M6	4	
11	MB-4018	Adjusting Plate	S45C	1	
12	MB-4017	Cam	SCM435	1	
13	MB-4015	Cam Housing	FCD55	1	
14	MB-4013	Gear 36T	S45C	2	
15	Commercial Products	Fixing Bolt	M8×8L(M6×10L)	2	
16	MB-4014	Motor Support	SS41	1	
17	Commercial Products	Motor	3P,220V,1/4HP,1/20	1	
18	Commercial Products	CAP	M8×25L	4	
19	Commercial Products	Square Key	8×8×45L	1	
20	Commercial Products	Square Key	5×5×30L	1	
21	Commercial Products	CAP	M8×16L	4	
22	Commercial Products	Screw	M8	2	
23	Commercial Products	CAP	M8×30L	2	

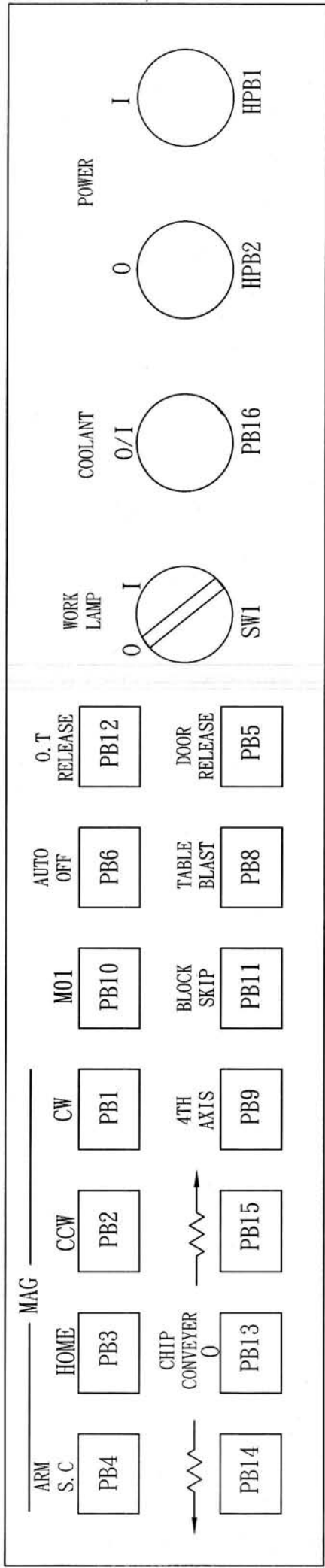
Pot up-down mechanism ass'y



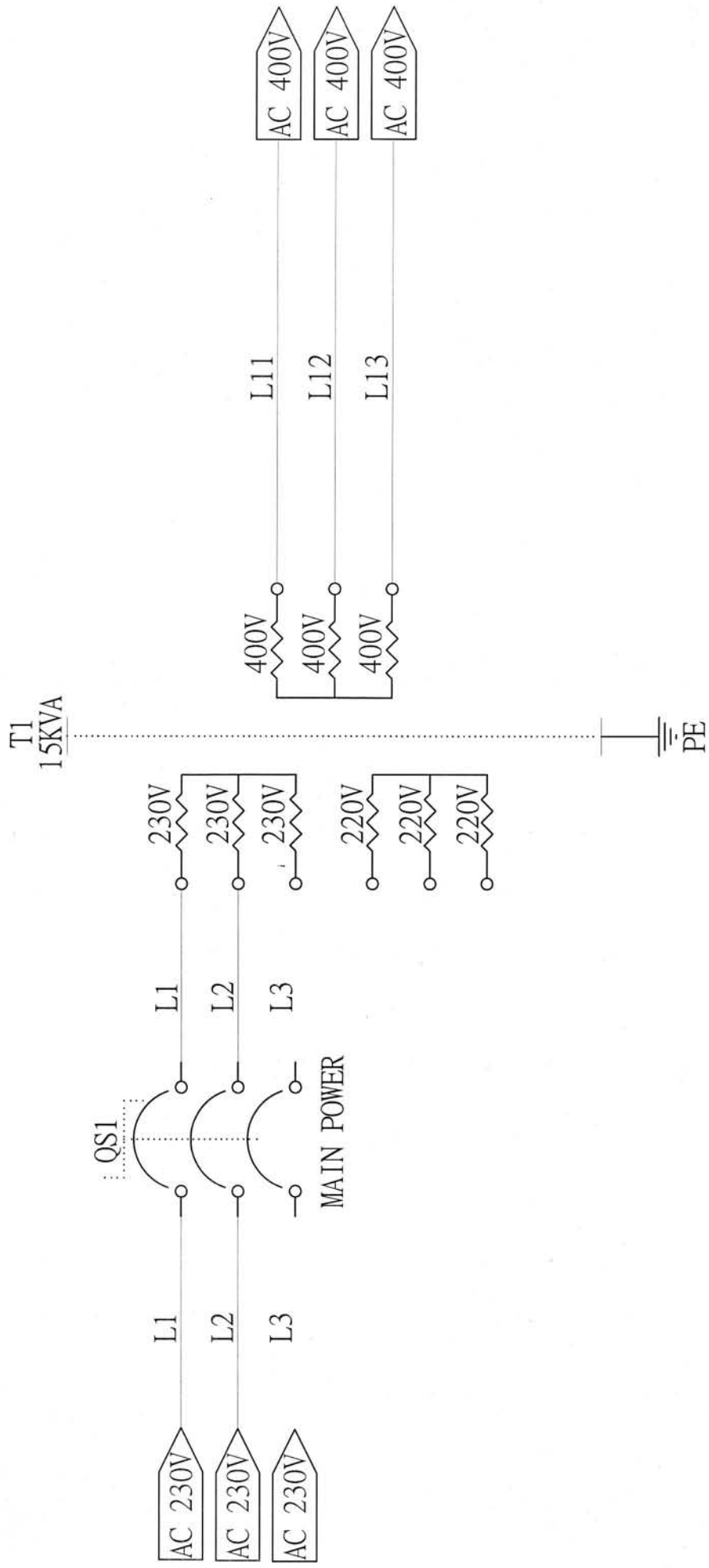
Pot up-down mechanism ass'y part diagram

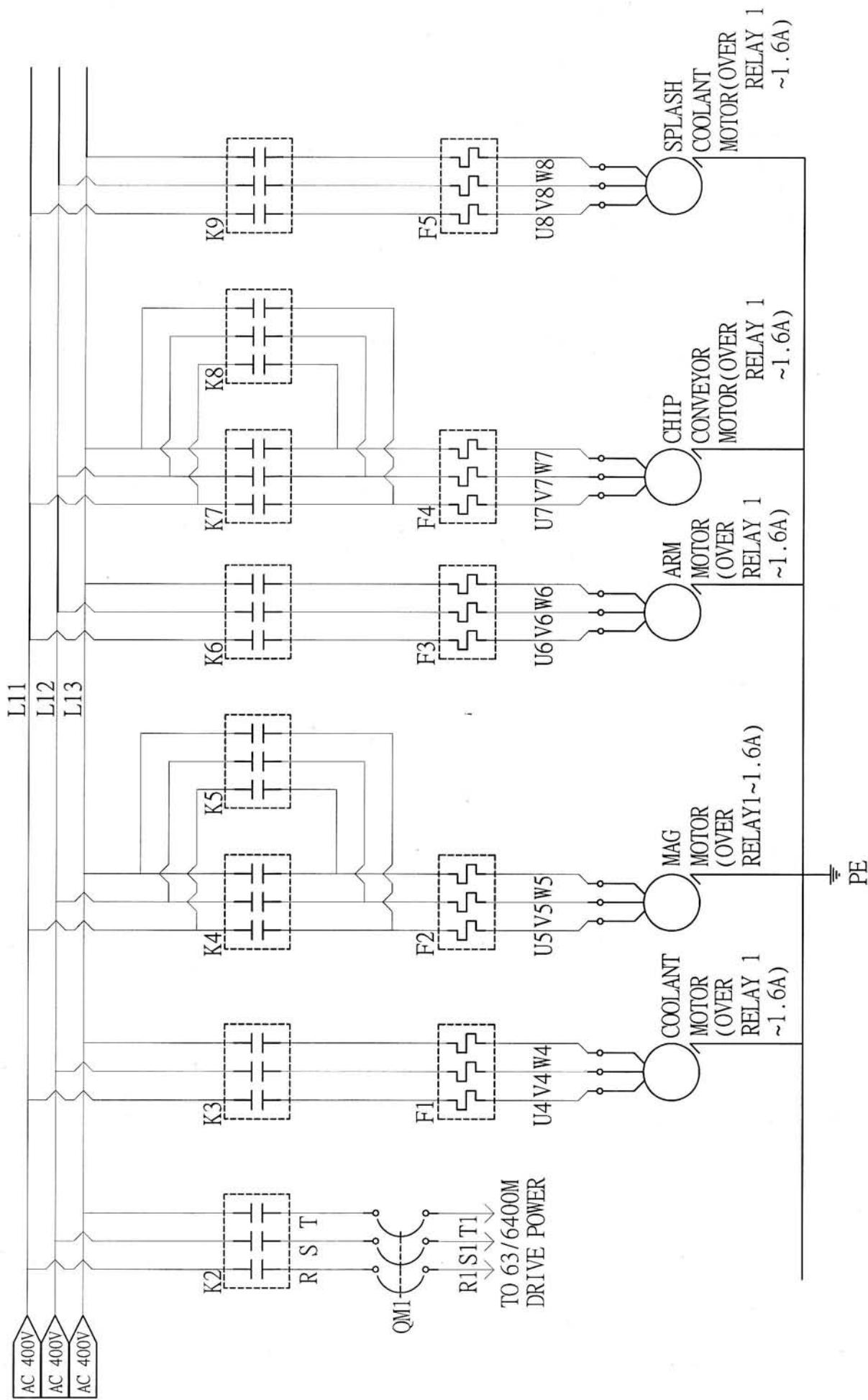
Item	Part no.	Description	Material / Specification	Quantity	Remark
1	MB-4008	Plate	S45C	2	
2	MB-4005	Sprawl	FCD55	1	
3	MB-4007	Housing	FC20	1	
4	Commercial Products	CAP	M6×20L	10	
5	Commercial Products	SW	M6	10	
6	MB-4039	Collar	S45C	1	
7	MB-4006	Sleeve	S45C	1	
8	Commercial Products	Cyliner	CA-φ 50×100L	1	
9	MB-4011	Shaft	S45C	1	
10	Commercial Products	Adjusting Valve	1/4PT× φ 8	1	
11	Commercial Products	CAP	M8×55L	1	
12	Commercial Products	Sensor		2	
13	Commercial Products	Sensor Housing		2	
14	MB-4009	Cam	FCD60	1	
15	Commercial Products	Bearing	6004ZZ	2	
16	Commercial Products	U-Clip	R42	1	
17	MB-4010	Shaft	S45C	1	
18	MB-4012	Adaptor	S45C	1	
19	Commercial Products	Clip	S12	2	
20	Commercial Products	CAP	M6×25L	2	
21	Commercial Products	CAP	M8×40L	2	
22	Commercial Products	Fixing Bolt	M8	2	
23	Commercial Products	SW	M8	5	
24	Commercial Products	Screw	M8	2	
25	Commercial Products	CAP	M8×25L	2	
26	Commercial Products	Nipple grease	1/8PT	2	

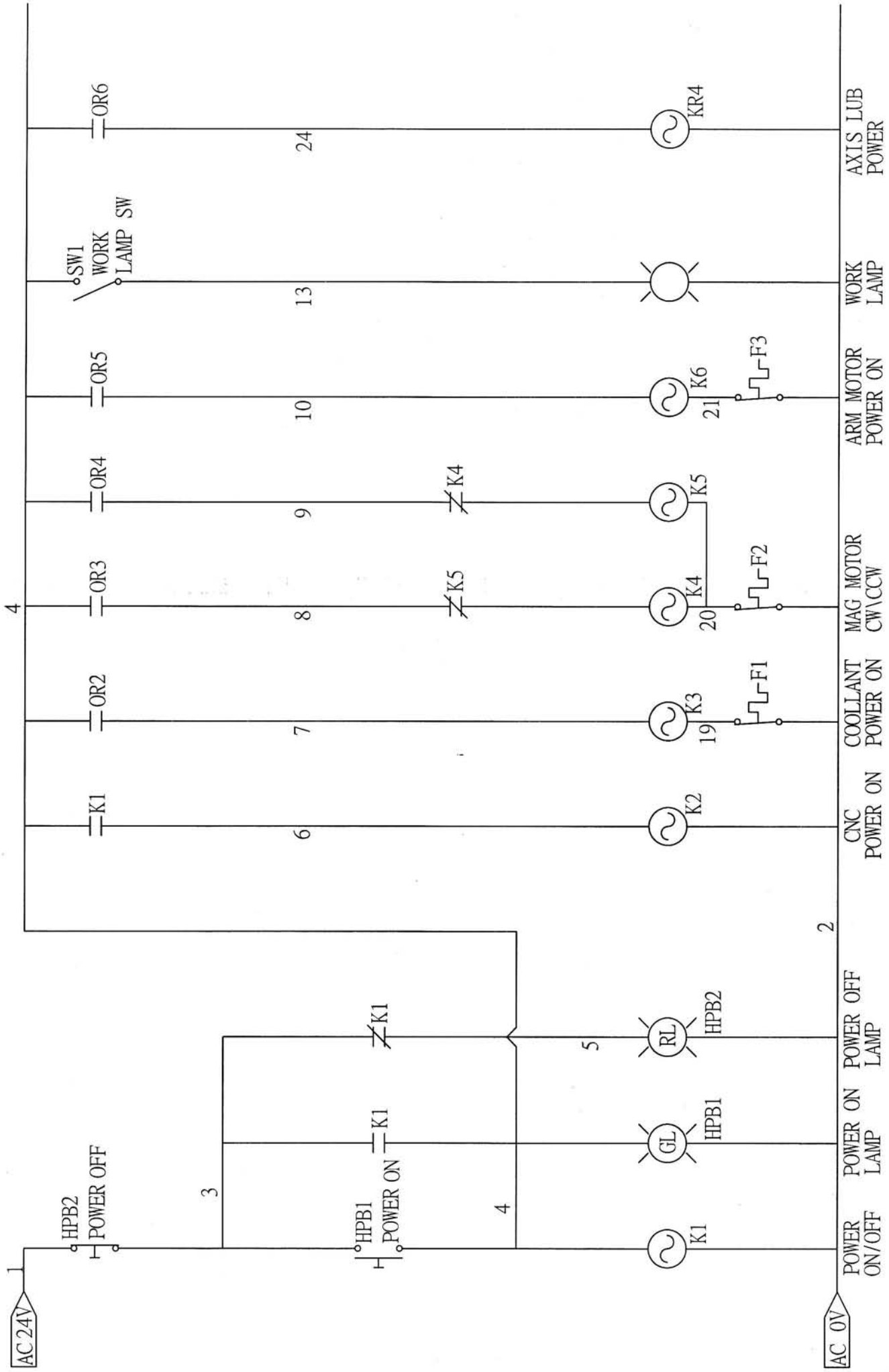
Electrical Diagram

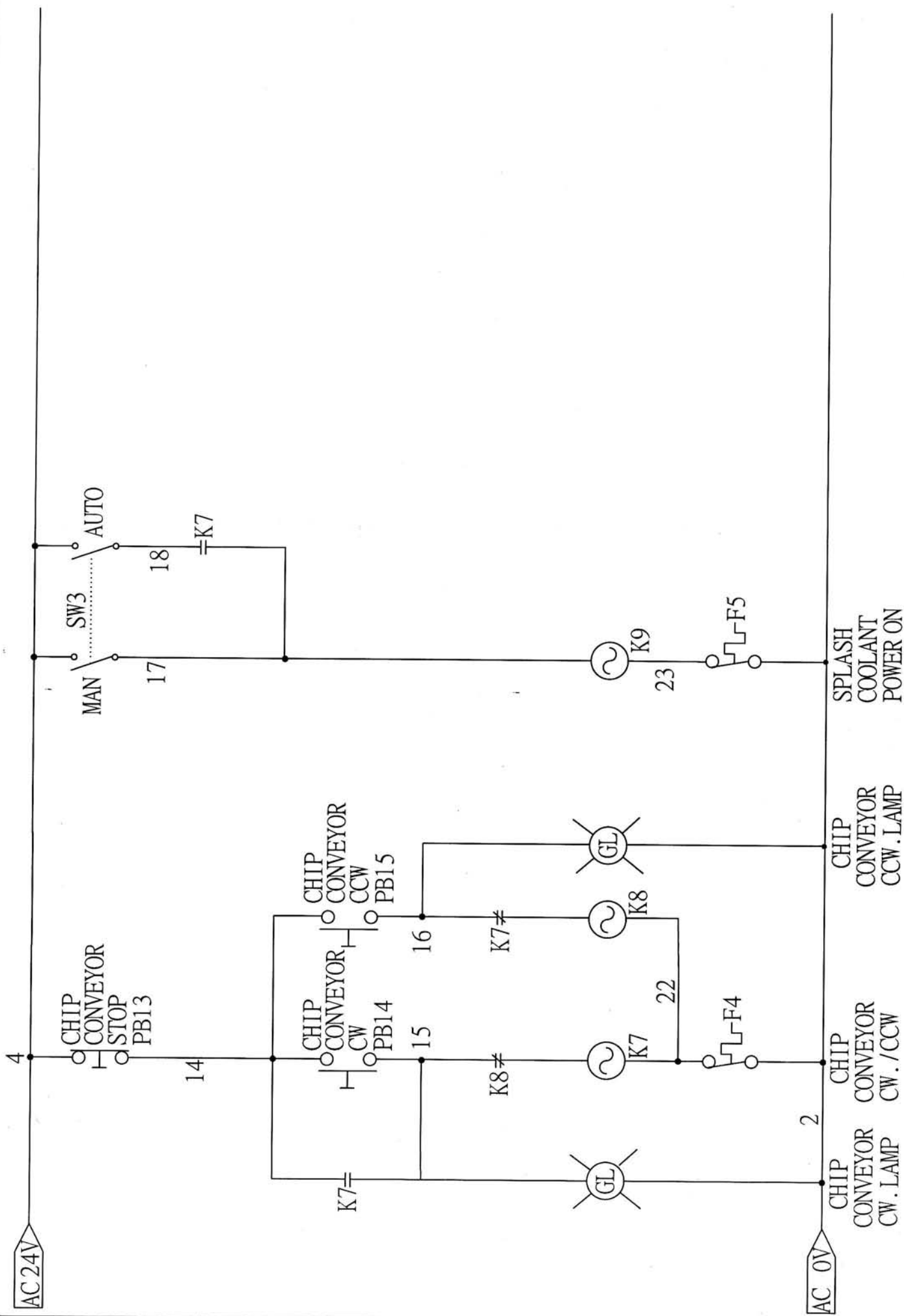


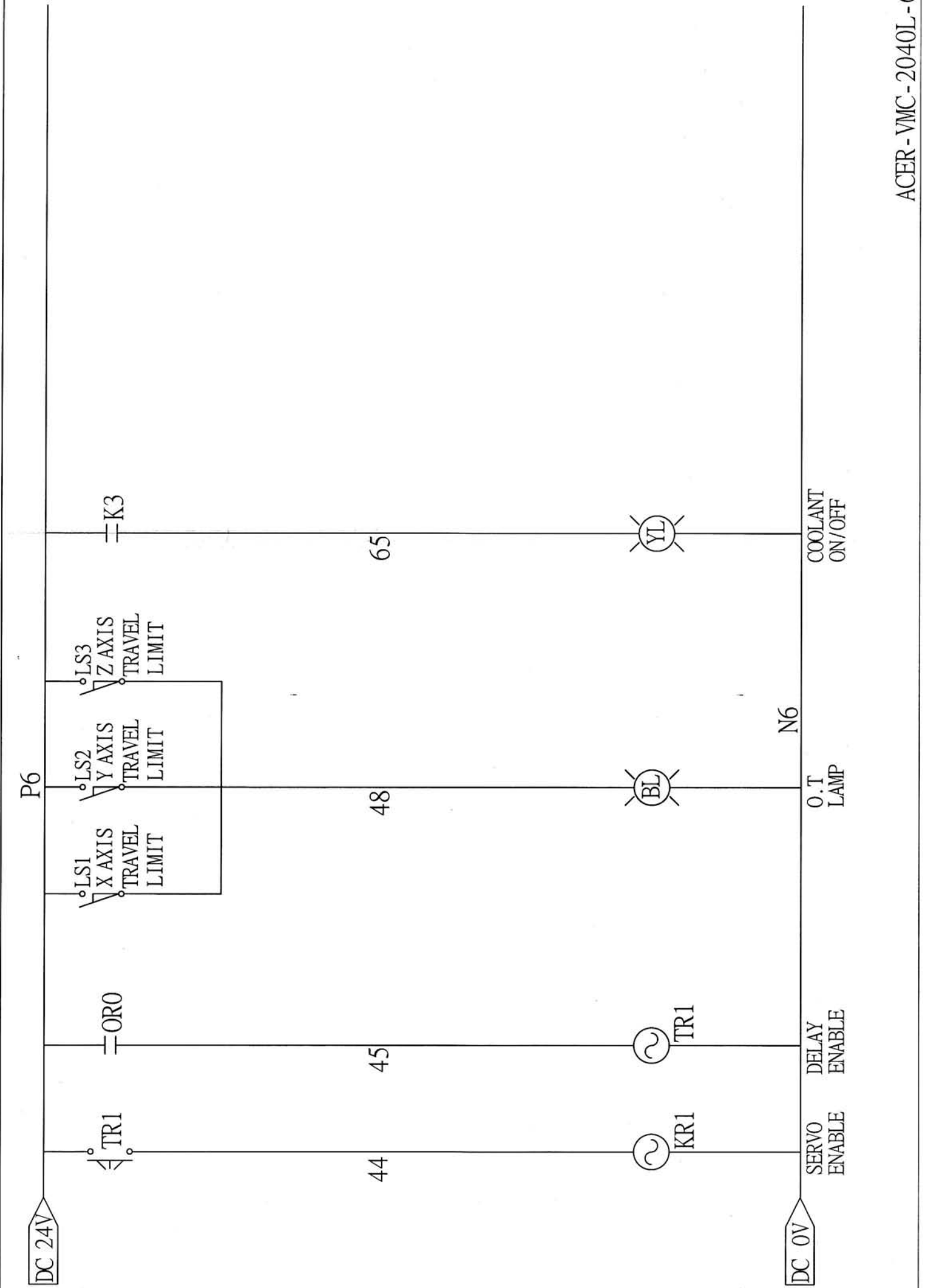
PART POSITION	PART #	DESCRIPTIONS	PART POSITION	PART #	DESCRIPTIONS
POWER 1	MC2040L-HPB 1	POWER ON	PB 6	MC2040L-PB 6	AUTO OFF
POWER 0	MC2040L-HPB 2	POWER OFF	PB 7	MC2040L-PB 7	TOOL UNCLAMP
SW 1	MC2040L-SW 1	WORK LAMP	PB 8	MC2040L-PB 8	TABLE BLAST
SW 2	MC2040L-SW 2	WORK LAMP	PB 9	MC2040L-PB 9	4TH AXIS (OPTION)
SW 3	MC2040L-SW 3	SPLASH COOLANT POWER ON	PB 10	MC2040L-PB 10	M01
SPB 1	MC2040L-SPB 1	EMERGENCY STOP	PB 11	MC2040L-PB 11	BLOCK SKIP
PB 1	MC2040L-PB 1	MAG CW	PB 12	MC2040L-PB 12	O.T RELEASE
PB 2	MC2040L-PB 2	MAG CCW	PB 13	MC2040L-PB 13	CHIP CONVEYER
PB 3	MC2040L-PB 3	MAG HOME	PB 14	MC2040L-PB 14	←
PB 4	MC2040L-PB 4	ARM S.C	PB 15	MC2040L-PB 15	→
PB 5	MC2040L-PB 5	DOOR RELEASE	PB 16	MC2040L-PB 16	COOLANT



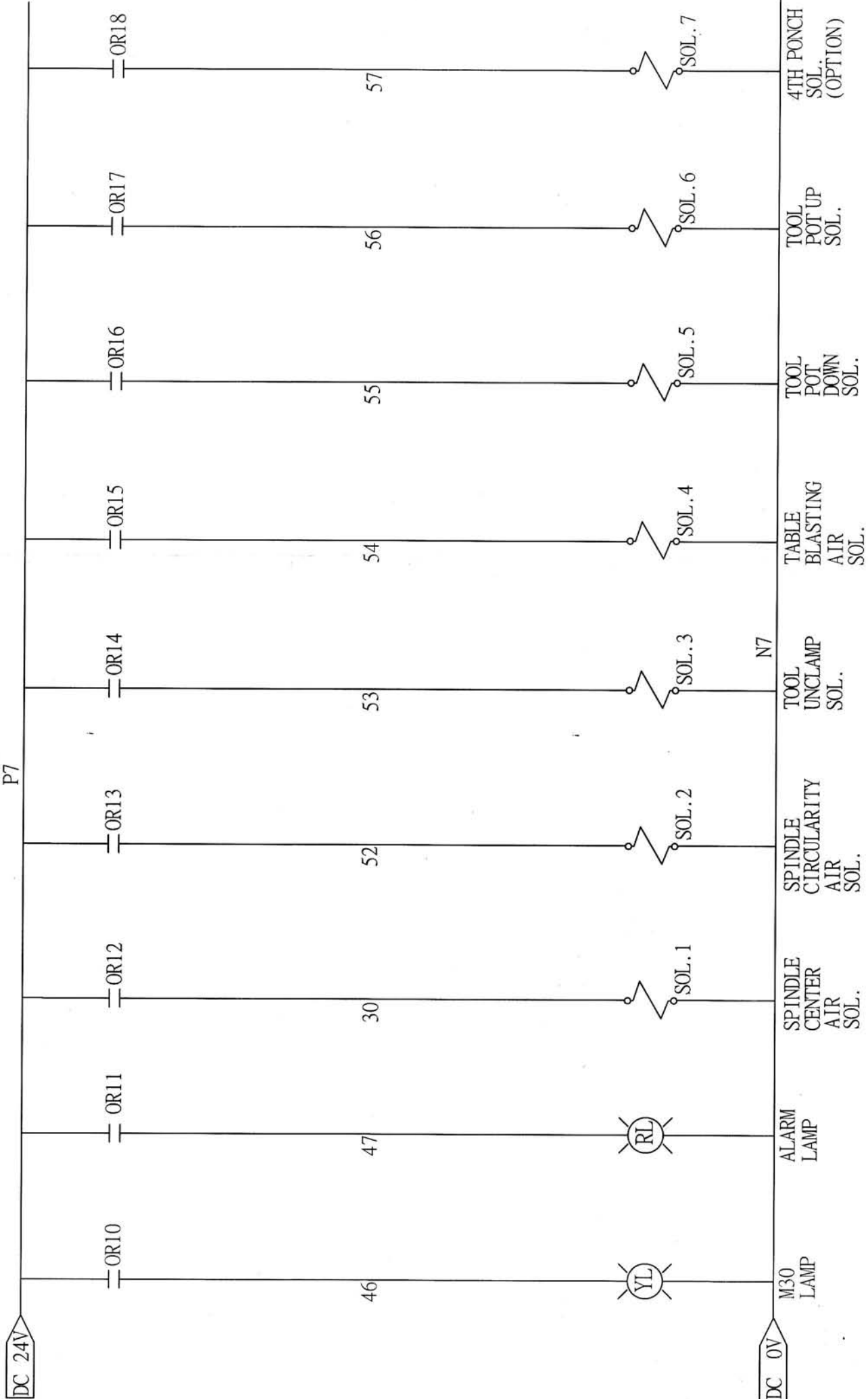








P7



46 M30 LAMP

47 ALARM LAMP

30 SPINDLE CENTER AIR SOL.

52 SPINDLE CIRCULARITY AIR SOL.

53 TOOL UNCLAMP SOL.

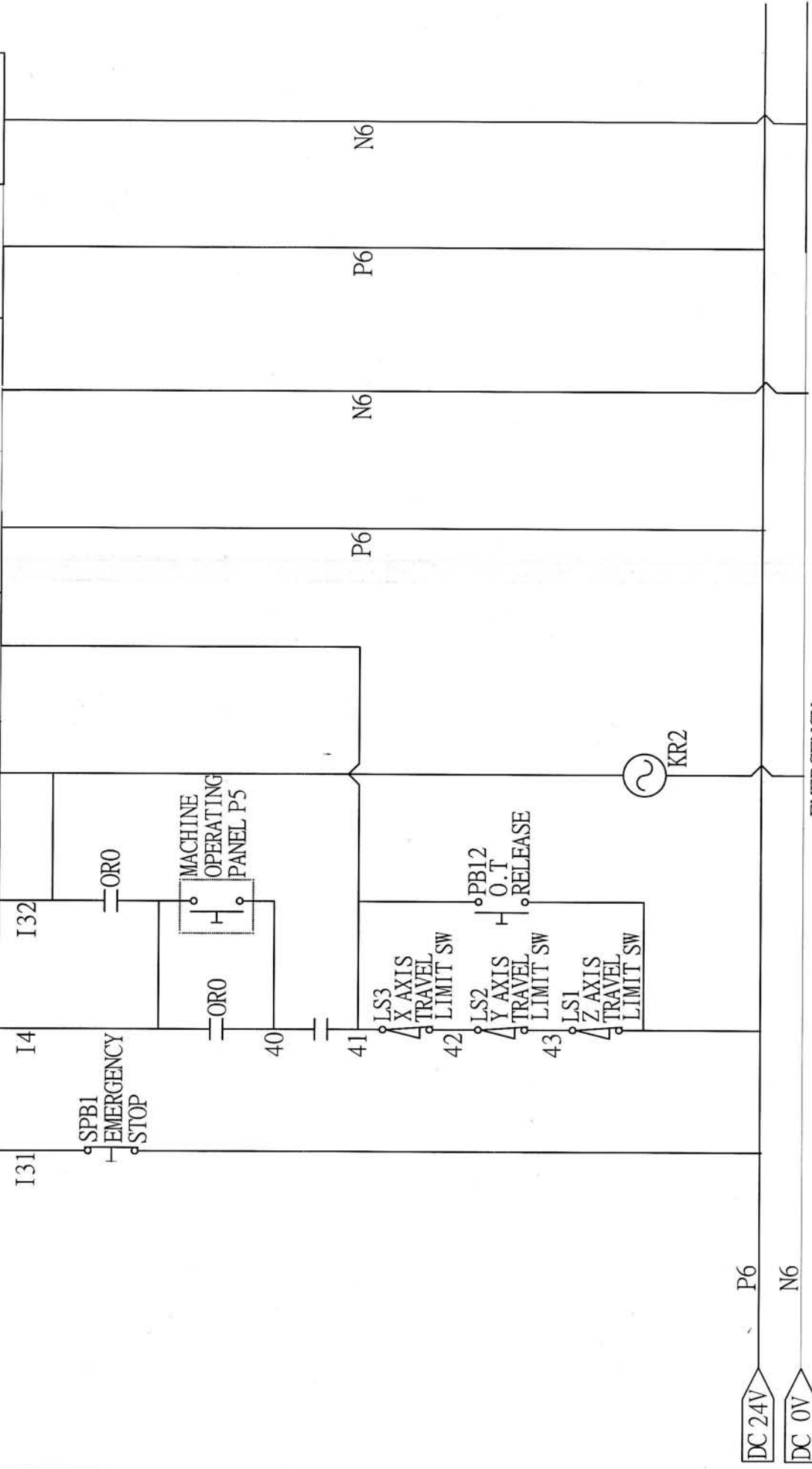
54 TABLE BLASTING AIR SOL.

55 TOOL POT DOWN SOL.

56 TOOL POT UP SOL.

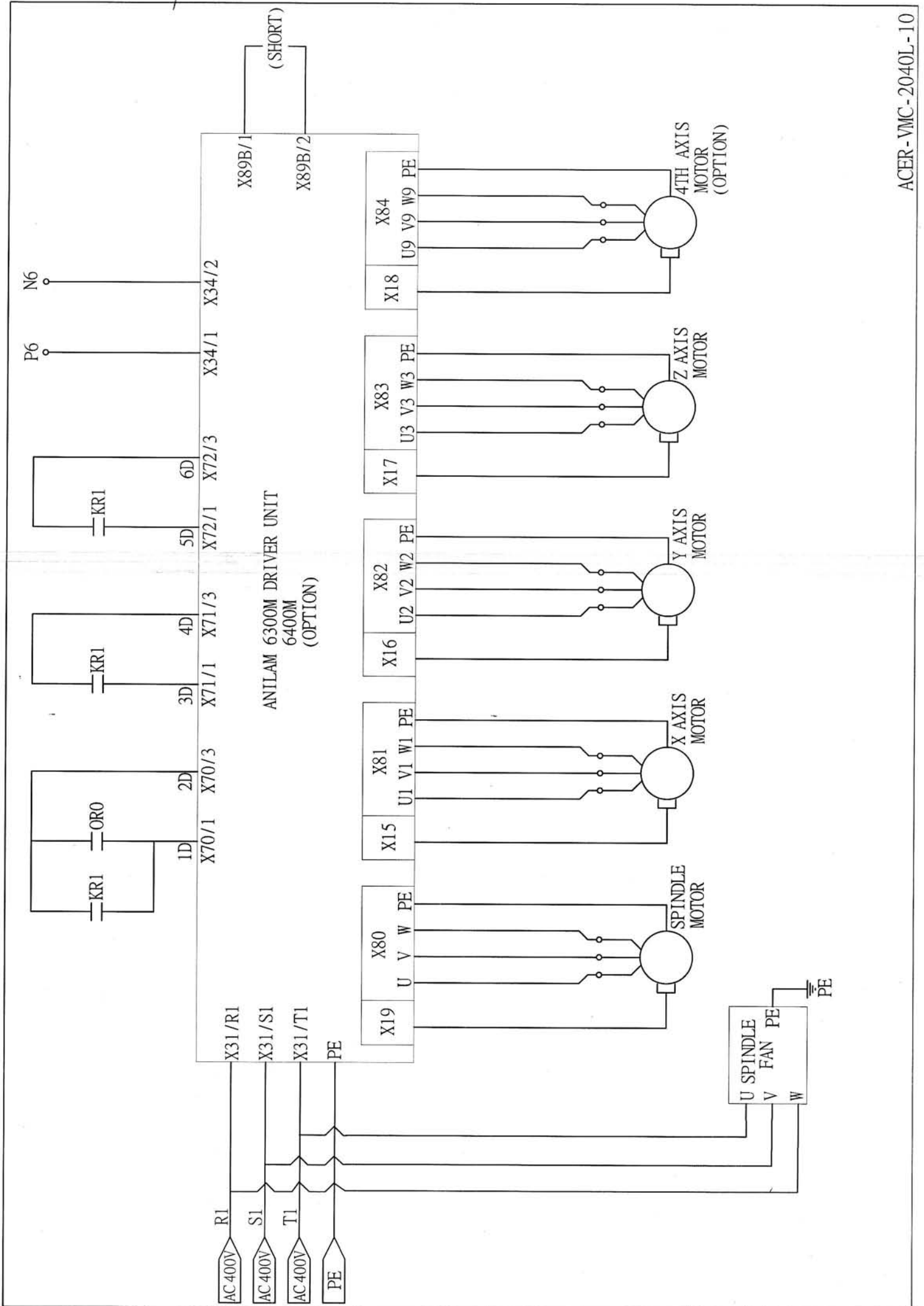
57 4TH PUNCH SOL. (OPTION)

PROT INTERFACE	X42 (INPUT PORT)				X44-CONNECTOR	X34-CONNECTOR
ADDRESS	X0.29	X0.3	X0.30	X0.30		
CNC PIN NO.	X42-31	X42-5	X42-32	X42-33	X44-2	X34-1



DC 24V P6
DC 0V N6

EMERGENCY
ENABLE



ANILAM
4TH DRIVER
25 PIN

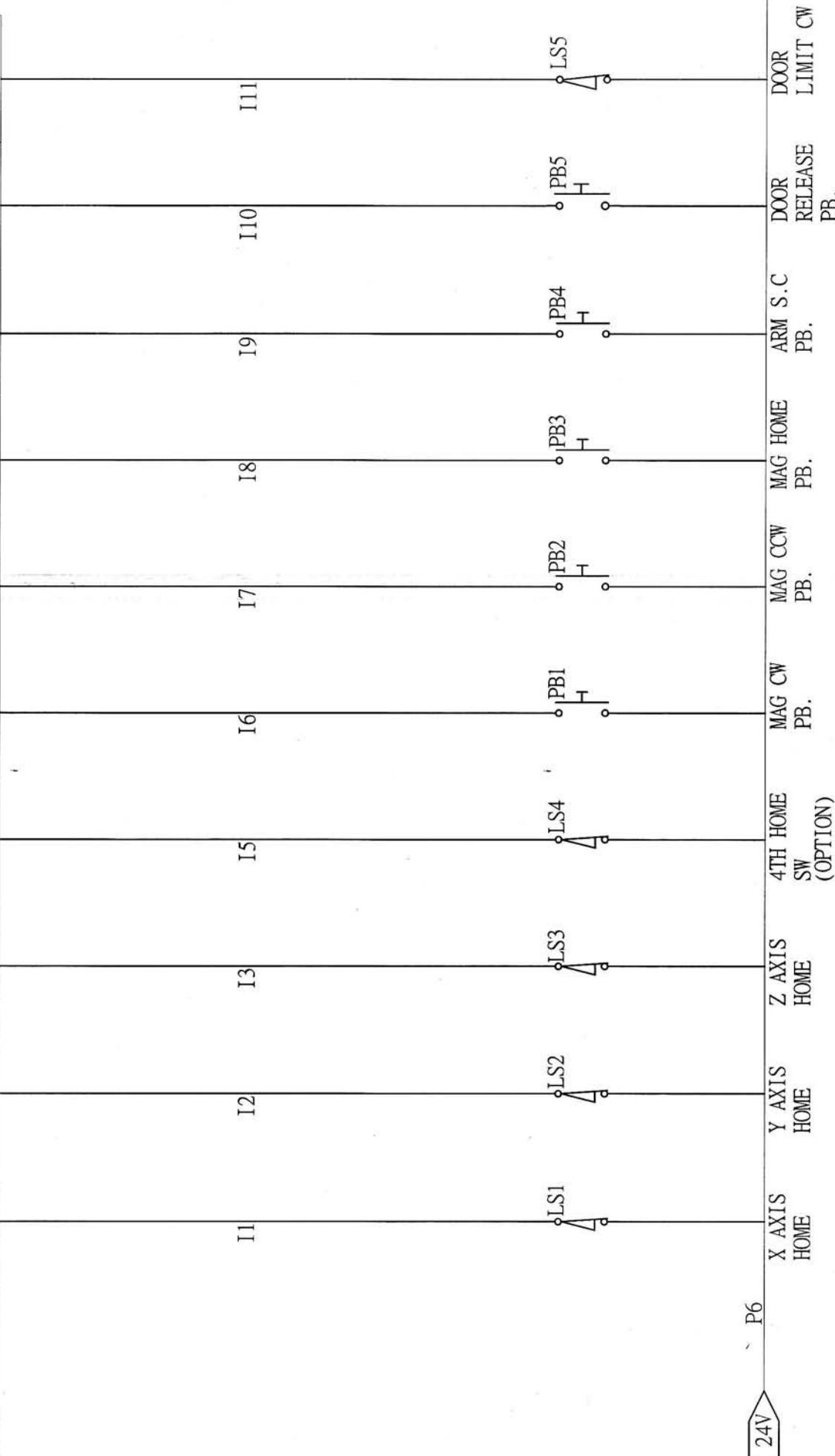
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<2>	WHITE/GREEN	
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<4>	YELLOW/BLACK	<D>
<6>	BLUE/BLACK	<E>
<7>	RED/BLACK	<F>
<8>	INTERNAL SHIELD	<G>
<13>	YELLOW	<H>
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MAS-3102A
22-14S

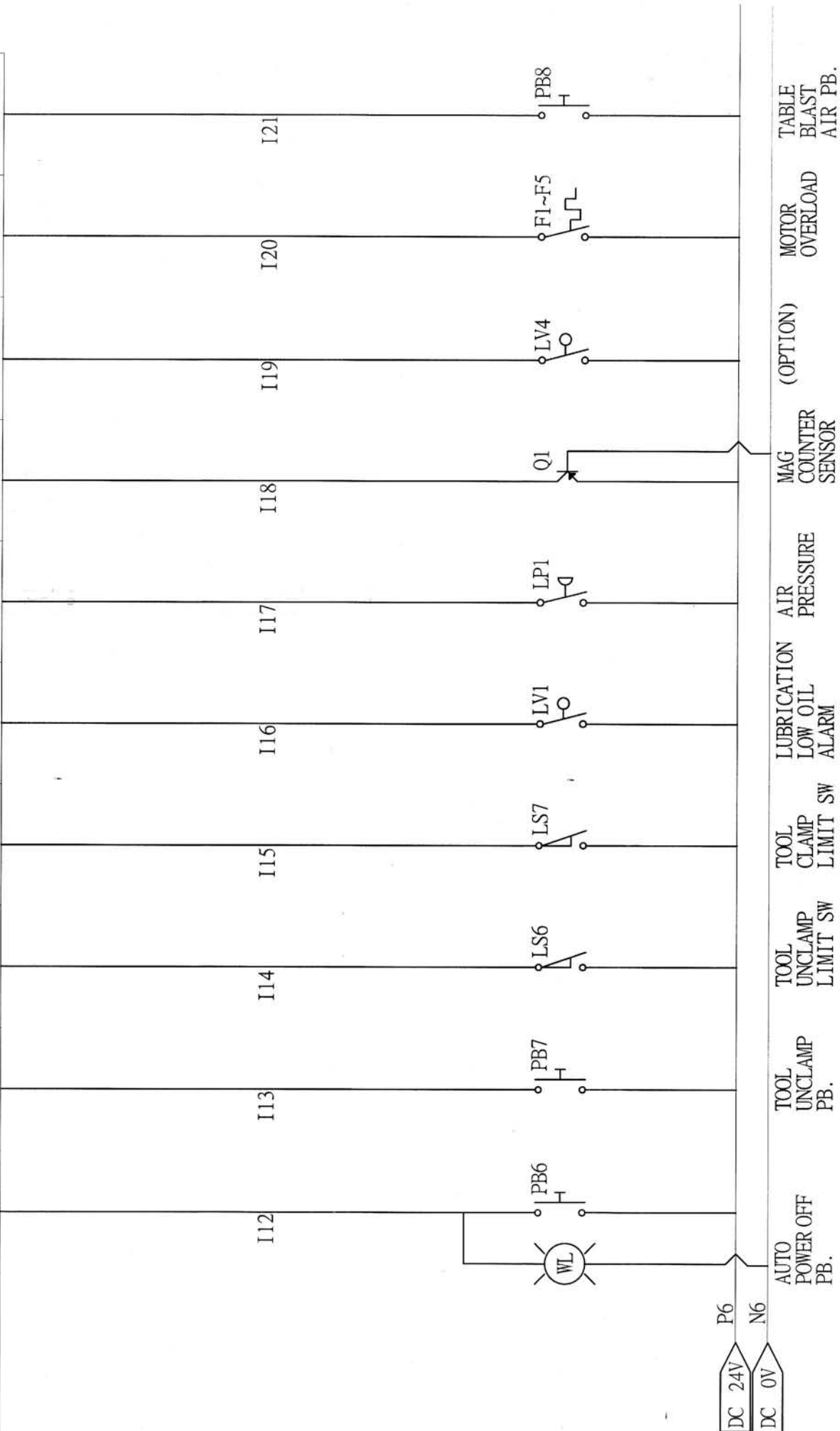
<G>	<H>	<J>	<K>	<L>	<M>	<A>		<C>	<R>	<S>	<N>	<P>
<G>	<H>	U9	V9	W9	GED	P6	I22	I23	P6	I5	N7	57
			MOTOR DRIVE				4TH CLAMP	4TH UNCLAMP	4TH HOME		4TH BARKE	SOL.

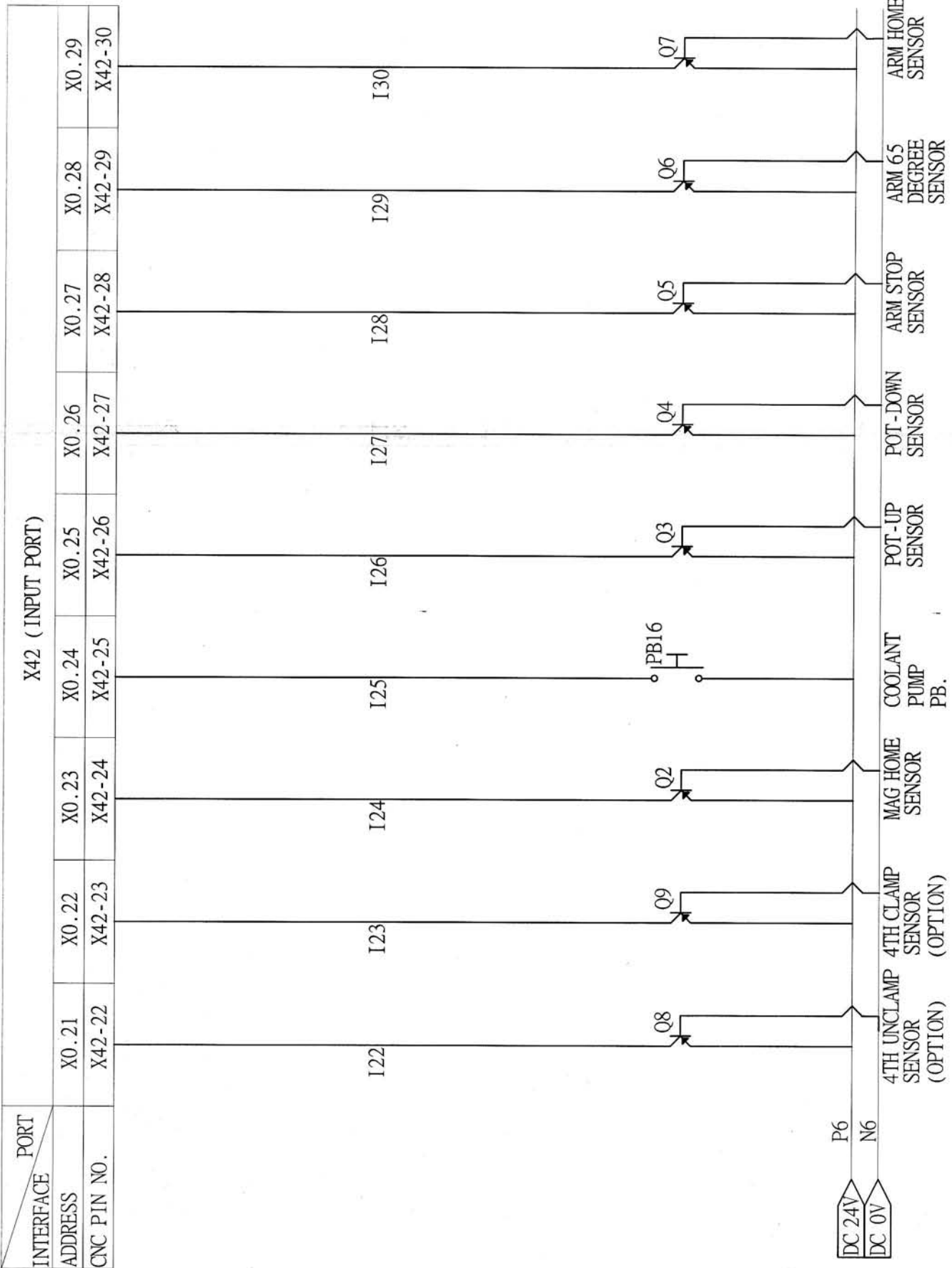
MAS-3102A
28-11S

X42 (INPUT PORT)				
PORT INTERFACE	ADDRESS	CNC PIN NO.		
X0.0	X0.1	X0.2	X0.4	X0.5
X42-1	X42-2	X42-3	X42-5	X42-6
			X42-7	X42-8
			X42-9	X42-10
			X42-11	

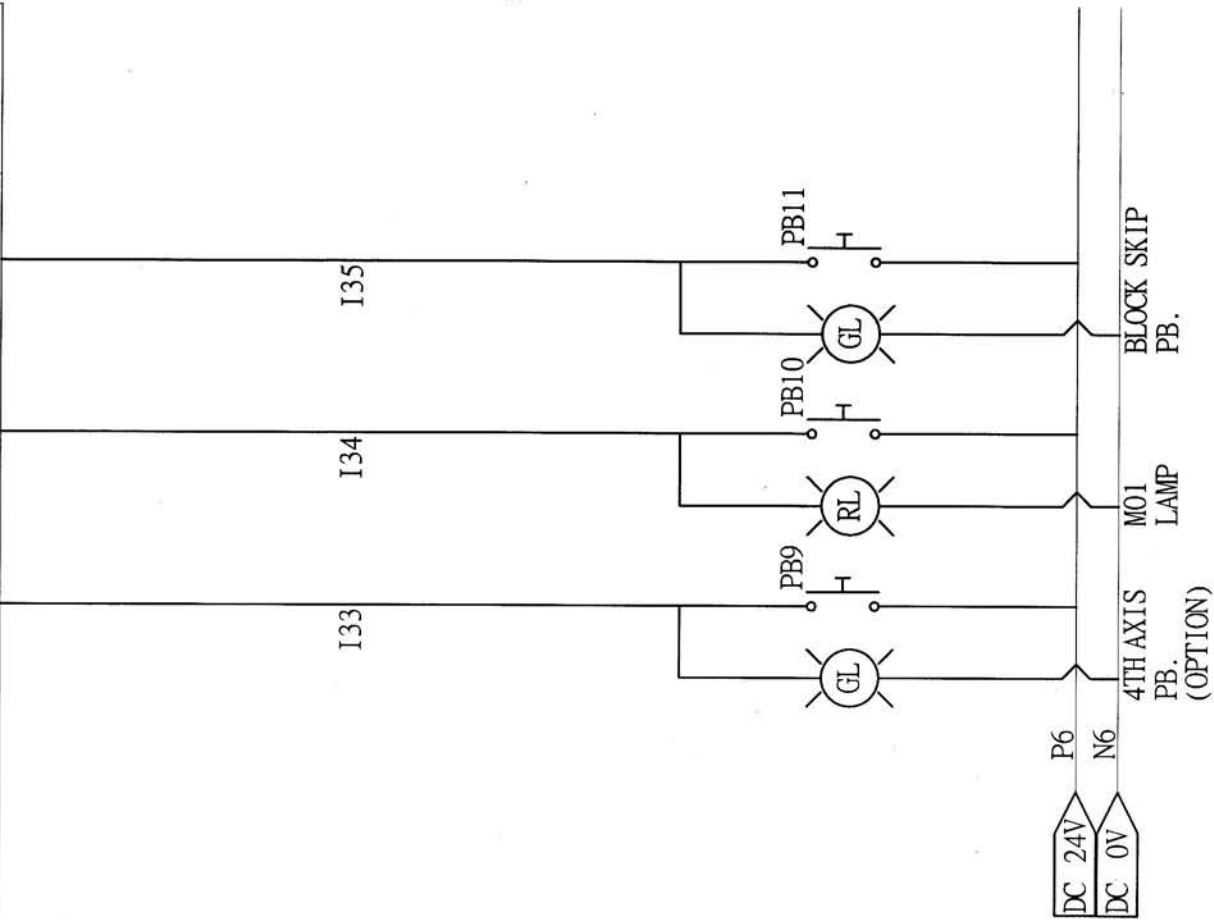


PORT		X42 (INPUT PORT)									
INTERFACE	ADDRESS	X0.11	X0.12	X0.13	X0.14	X0.15	X0.16	X0.17	X0.18	X0.19	X0.20
	CNC PIN NO.	X42-12	X42-13	X42-14	X42-15	X42-16	X42-17	X42-18	X42-19	X42-20	X42-21



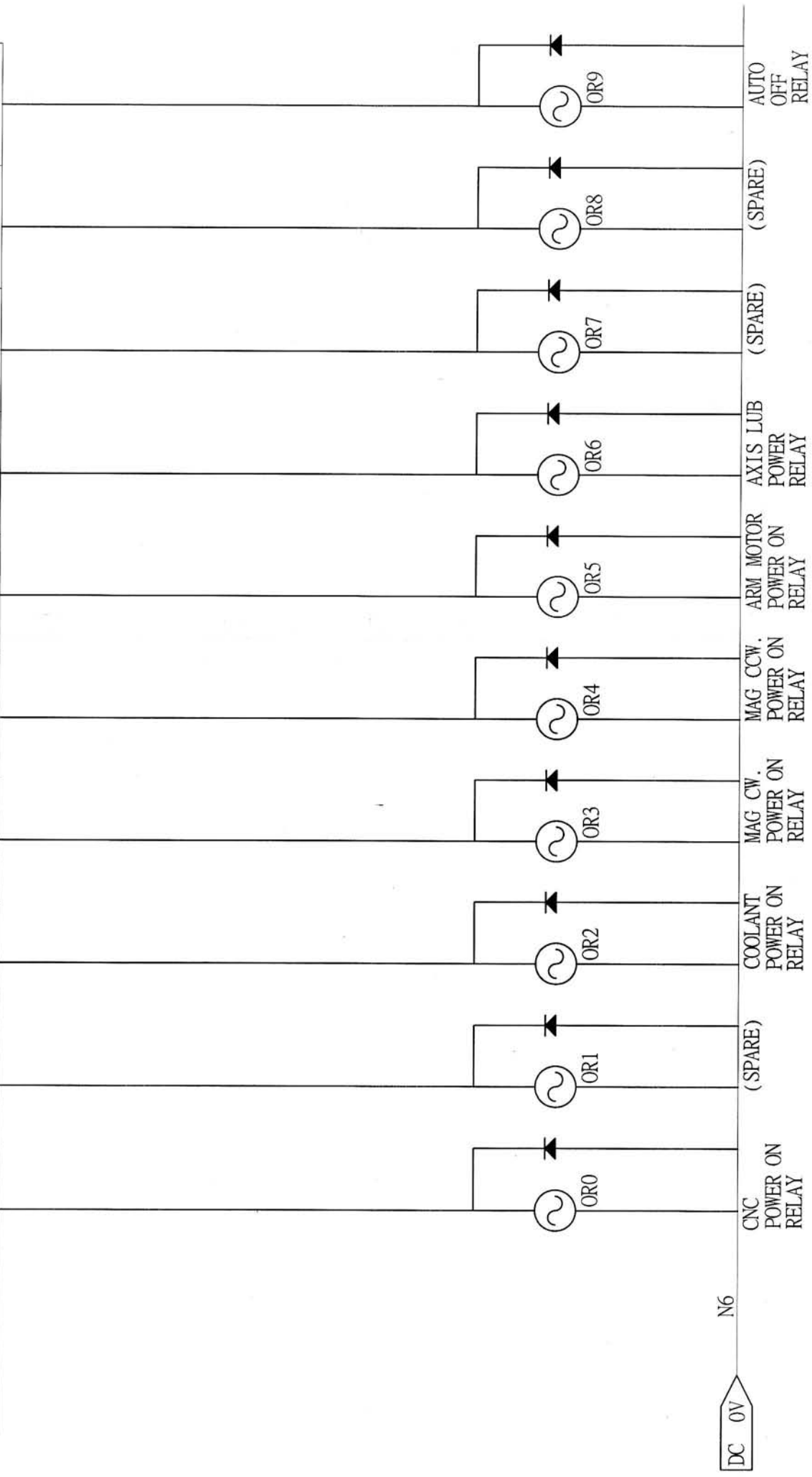


PORT		PLN (INPUT PORT)	
INTERFACE			
ADDRESS	X0.122	X0.123	X0.124
CNC PIN NO.	P4-3	P4-4	P4-5

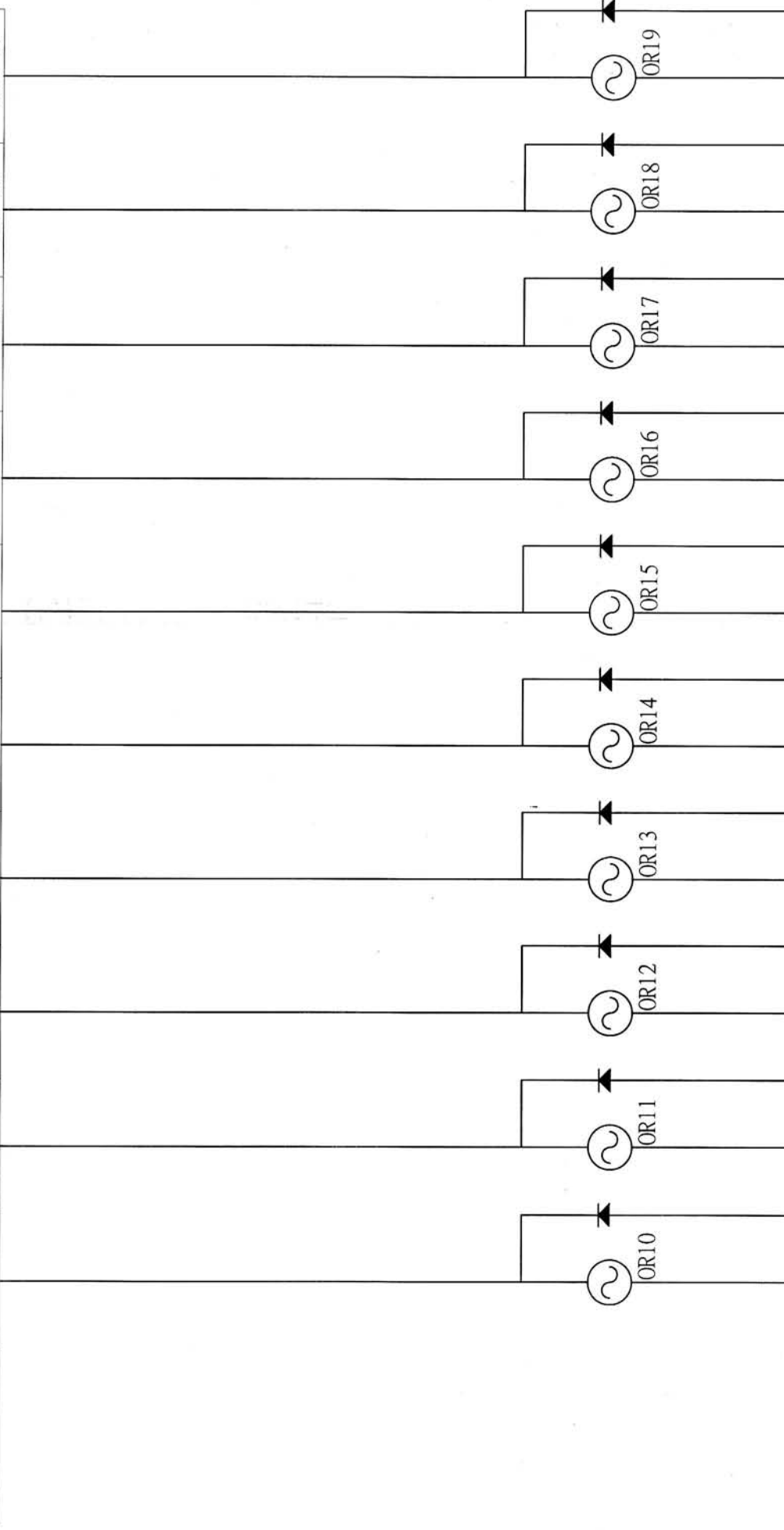


X41 (OUTPUT PORT)

INTERFACE	PORT									
ADDRESS	Y0.0	Y0.1	Y0.2	Y0.3	Y0.4	Y0.5	Y0.6	Y0.7	Y0.8	Y0.9
CNC PIN NO.	X41-9	X41-10	X41-11	X41-12	X41-13	X41-14	X41-15	X41-16	X41-17	X41-18

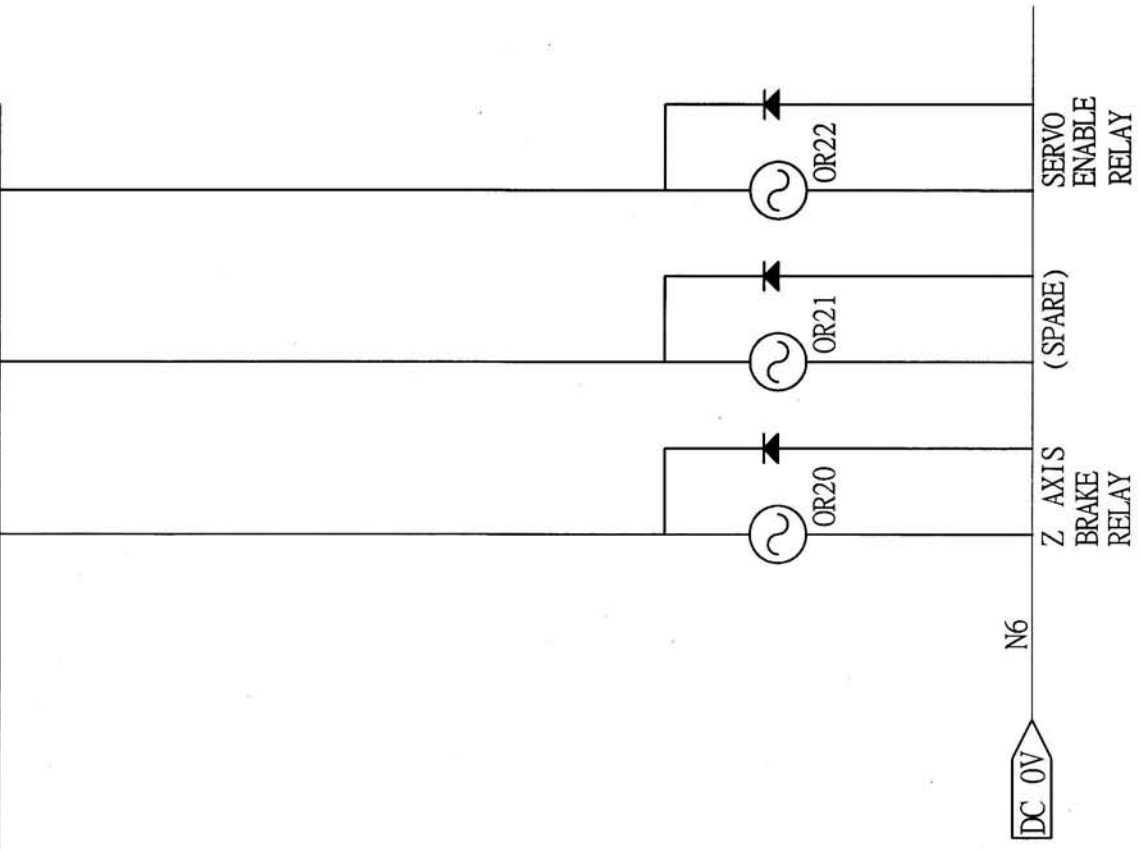


PORT INTERFACE		X41 (OUTPUT PROT)									
ADDRESS		Y0.10	Y0.11	Y0.12	Y0.13	Y0.14	Y0.15	Y0.16	Y0.17	Y0.18	Y0.19
CNC PIN NO.		X41-19	X41-20	X41-21	X41-22	X41-23	X41-24	X41-25	X41-26	X41-27	X41-28



DC 0V N6

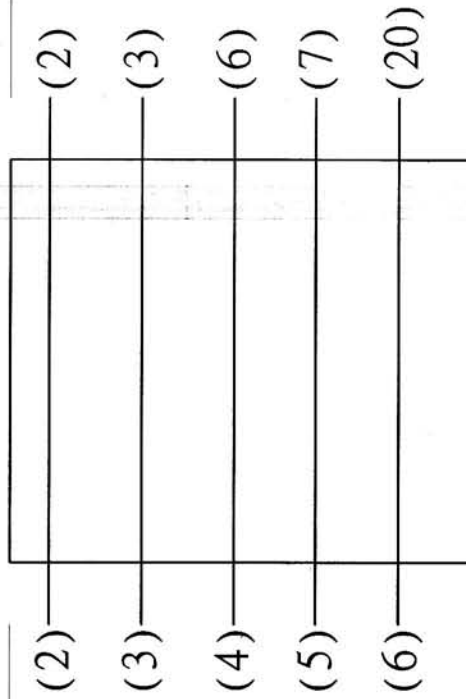
PROT INTERFACE	X41 (OUTPUT PROT)		
ADDRESS	Y0.20	Y0.21	Y0.22
CNC PIN NO.	X40-29	X41-30	X41-31



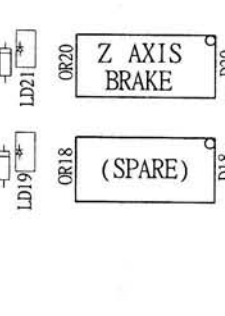
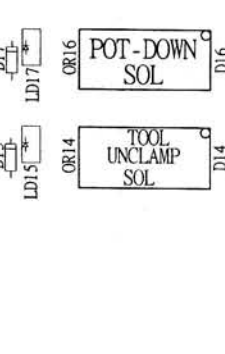
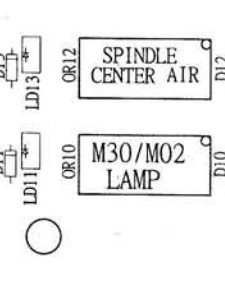
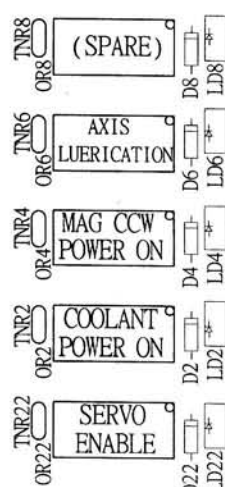
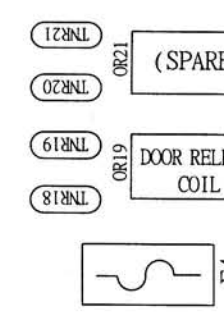
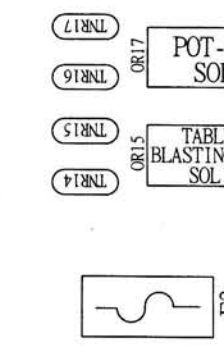
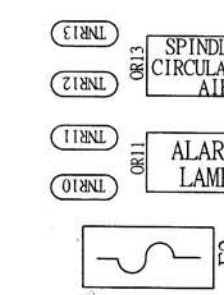
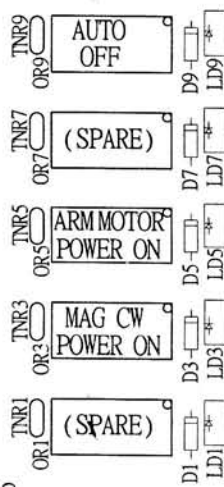
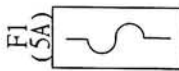
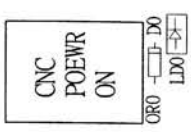
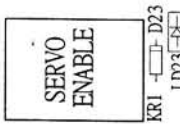
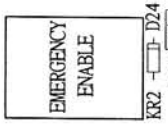
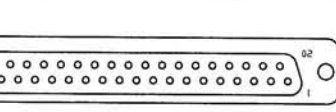
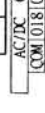
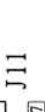
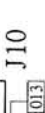
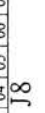
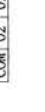
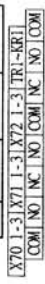
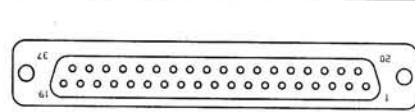
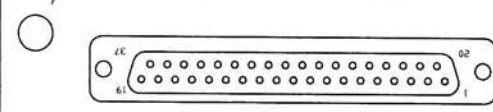
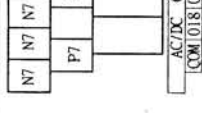
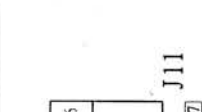
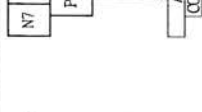
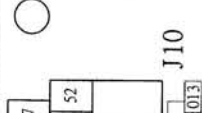
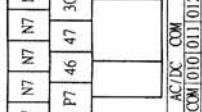
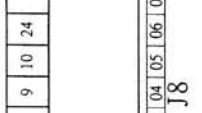
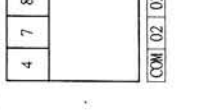
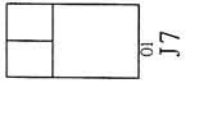
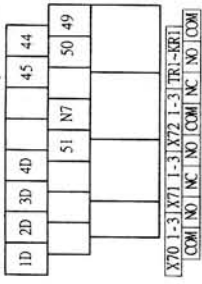
ANILAM
6300M\6400M

X27 (CNC SIDE)
9-PIN

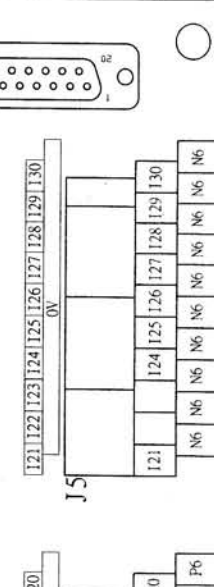
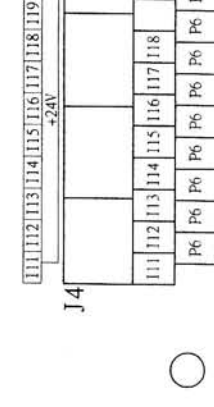
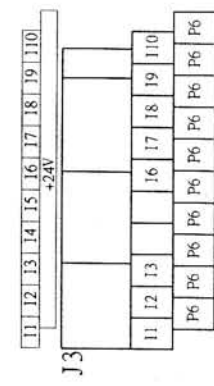
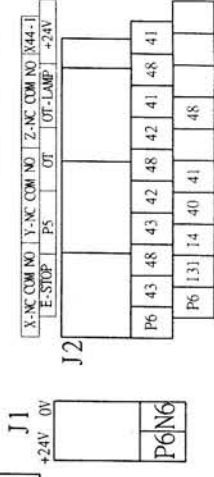
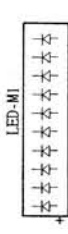
RS-232
25-PIN



ACER-VMC-2040L-RS-232



JD-001_A-FOR-
VMC-2040L



X-N COM NO Y-N COM NO Z-N COM NO X4-1
E-STOP P5 OT TOR-LAMP +24V