

ACER

OPERATION MANUAL Bed Type Milling Machine with Model: ATC 1454 & ATM 1454II

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1. BASIC MACHINE INFORMATION

Bed type mill is very high precision and CNC controlled machine. Therefore, before operating this type of the machine, please read this manual carefully, and make sure you have the knowledge to operate this machine properly. If you have any question, please contact our local distributor. We will answer your question promptly.

1-1. Machine Specification

Specification	Model	ATM 1454II/ATC 1454
Table	Table Size	14"x54" (356x1372mm)
	T-Slots	3 x 5/8" (16mm)
	Table Load	1960 lbs (891kgs)
Travel	X Axis Max./Rapid Feed	40" (1016mm)/200ipm
	Y Axis Max./Rapid Feed	22.44"(570mm)/200ipm
	Z Axis Max./Rapid Feed	26.77"(680mm)/200ipm
	Max Spindle Nose to Table	5"(125.4mm)~31.69" (805mm)
	Spindle Center to Column Face	21.3" (540mm)
Spindle	Quill Diameter	4.72" (120mm)
	Spindle Taper	CAT#40; (BT#40, NMTB#40 Opt.)
	Spindle Speed Hi/Low RPM	0~6000
Motor	Spindle HP	7.5
	X Axis Servo Motor	DC 31.3 in-lb (AC 1.5KW Opt.)
	Y Axis Servo Motor	DC 31.3 in-lb (AC 1.5KW Opt.)
	Z Axis Servo Motor	DC 31.3 in-lb (AC 2.2KW Opt.)
	Coolant Pump HP (Opt.)	1/8
	Lubrication Pump Watts	80
ATC Tool Dimension	Tool Total Length	12" (300mm)
	Tool Maximum Width	4.13" (105mm)
	Tool Total Weight	17.6 lbs (8kgs)
Power	Control	110V/1P/20A (230V/3P/50A Opt.)
	Machine	9HP (6KVA)
Air Req.	Pneumatic Pressure	85.34 psi (6kg/cm ²) min.
Dimension	Max Height	108.7" (2760mm)
	Height from Table Top to Bottom of Bed	31.5" (800mm)
	Width of Machine Including Table	94.49" (2400mm)
	Overall Length with Electrical Door Closed	84.65" (2150mm)
	Overall Length with Electrical Door Open	109.06" (2770mm)
	Overall Width with Full Table Traverse	141.73"(3600mm)
	Footprint of Machine inches	100" x 74" x110"
	Footprint of Machine metric	2540x1880x2794mm
Weight	Net Approx.	6710 lbs (3050 kgs)
	Gross Approx.	6974 lbs (3170 kgs)
Packing Dimension Approx.	X x Y x Z inch (metric) w/balancing block	90.95"x78.74"x96.46" 231x200x245cm

1-2. Accessories of the Machine

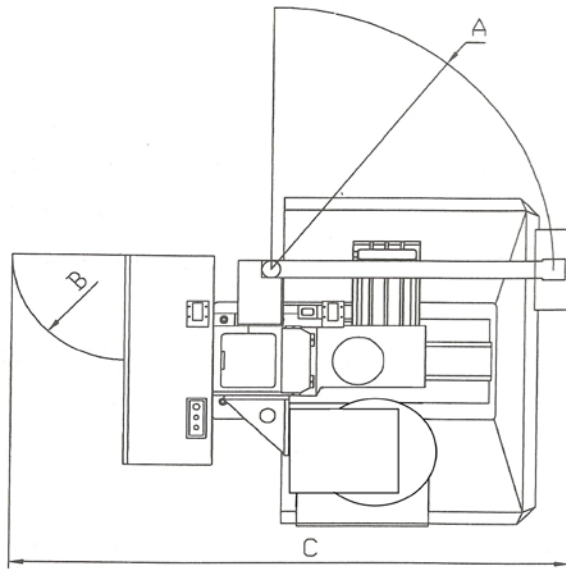
1-2-1. Standard Accessories

- a. Coolant system**
- b. Three axes C5x2B ball screw**
- c. Timed lubrication system**
- d. Leveling pads & screws**
- e. Tool box w/tools**
- f. Three axes CNC control or with 4th axis installed.**
- g. Coolant tank on machine base at 6.87 gallons or 26 liters.**
- h. Halogen light**

1-2-2. Optional Accessories

- a. Column Side guard**
- b. Chip pan**
- c. Y axis metal type way cover**
- d. T slot cover**
- e. Clamping kit**
- f. Milling vise**
- g. Horizontal/vertical rotary table**
- h. Super indexing spacer**
- i. CAT/BT#40 collet holder set**
- j. Hydraulic machine vise**
- k. Tool maker's vise**
- l. CNC power vise**
- m. 4th axis rotary table**
- n. Pull stud**

1-3. Floor Space of the Machine



A	71"	1800mm
B	32"	813mm
C	125"	3175mm
D	23"	584.2mm
E	109.4"	2550mm
F	20.47"	520mm
G	54"	1372mm
H	28.5"	723.9mm
I	32.28"	820mm
J	26.37"	670mm
K	136"	3454.4mm
L	92.5"	2349.5mm

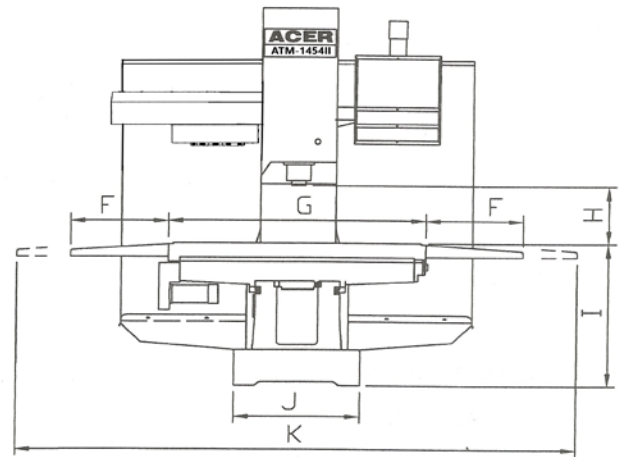
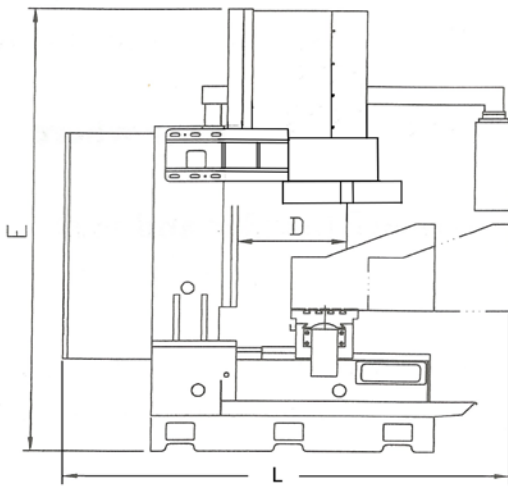


Figure 1

Note: Figure machine shown with ATC system.

2. INSTALLATION

2-1. Machine Foundation Requirement

Incorrect foundation will affect machine's accuracy. Only correctly done foundation will avoid machine vibration, reduce machine malfunction, and loosening level of the machine. All these factors will contribute to machine's machining accuracy.

Every machine has a different control and is weighed differently. They are also designed different. Therefore they also need a different foundation. We strongly suggest customers to build the foundation according to the requirement (shown on fig. 2 & 3).

All new machines, we have supply with leveling pads and screws. They are used to level the machine, and reduce the vibration. All accessories are shipped with the machine. Please check for any missing items and contact your distributor for replacement.

2-2. Installation & Its Site

To prolong the life of the machine and its accuracy, please carefully select the proper installation site. The criteria are:

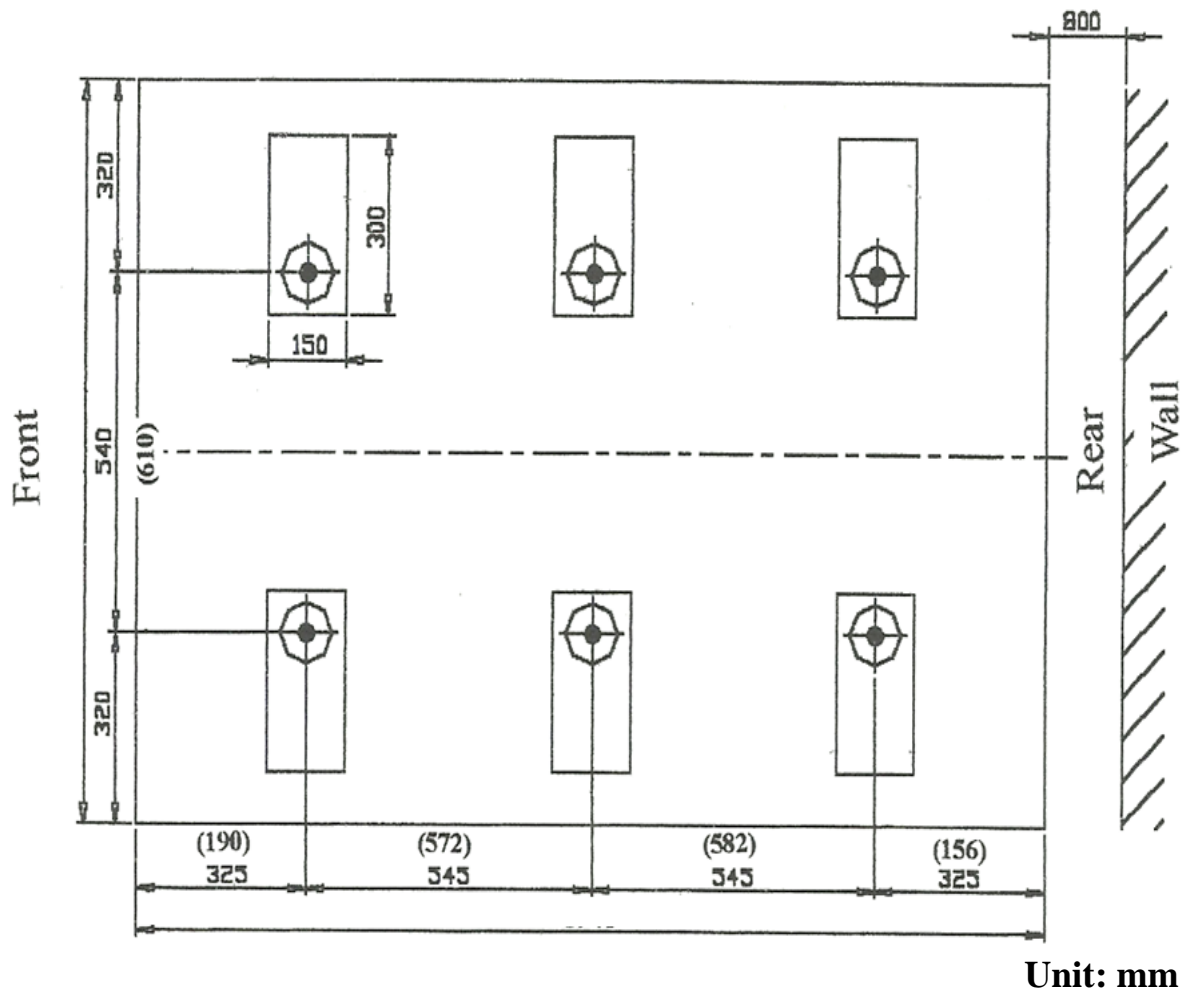
- a. Find the site where there is vibration-free and there is no power shortage. Please avoid install the machine around press, shaping machine etc. They will affect the accuracy of the machine.**
- b. Never install the machine under direct sunlight or where humidity is high.**
- c. Avoid the site where there is corrosive powder and mist.**

2-3. Level & Leveling Screws

The method of building the foundation is as figure 2. Please build the foundation 15 days before machine arrive. The procedure is as follow:

- a. Check the foundation map before digging.**
- b. Dig the foundation area to the proper depth, flatten it, fill it with rocks, and use rubbles to fill the gaps.**
- c. Make the screw molds for selected leveling screw area. Make sure they are not out of straight or penetrate out of shape.**
- d. Concrete mix ratio is 1:2:4 (concrete: sand: small rubbles) They need to be mixed thoroughly, and make sure the concrete mix has the right elasticity and color content.**
- e. Before pouring in the concrete mix, place the screw molds in place. They are prepared for J type locating screws.**

- f. After concrete solidified, you may remove the molds. In summer, the time required for concrete to solidify is 4~5 days, and in winter, it is 8~10 days.
- g. When the machine is shipped to the location, install the J type locating screws through leveling screws and screw on the hex nuts, and then slowly settling down the machine on the foundation site. Be sure to match each J screw position before completely lowering down the machine.
- h. After adjust each J screws' length to 6'' above the ground, the concrete can be poured into the J screw positions.
- i. After the concrete is solidified, you may then adjust the level of the machine.
- j. Machine level in X and Y axis has to be within 0.0008/12'' or better.



***Above is the foundation map of the bed mills.

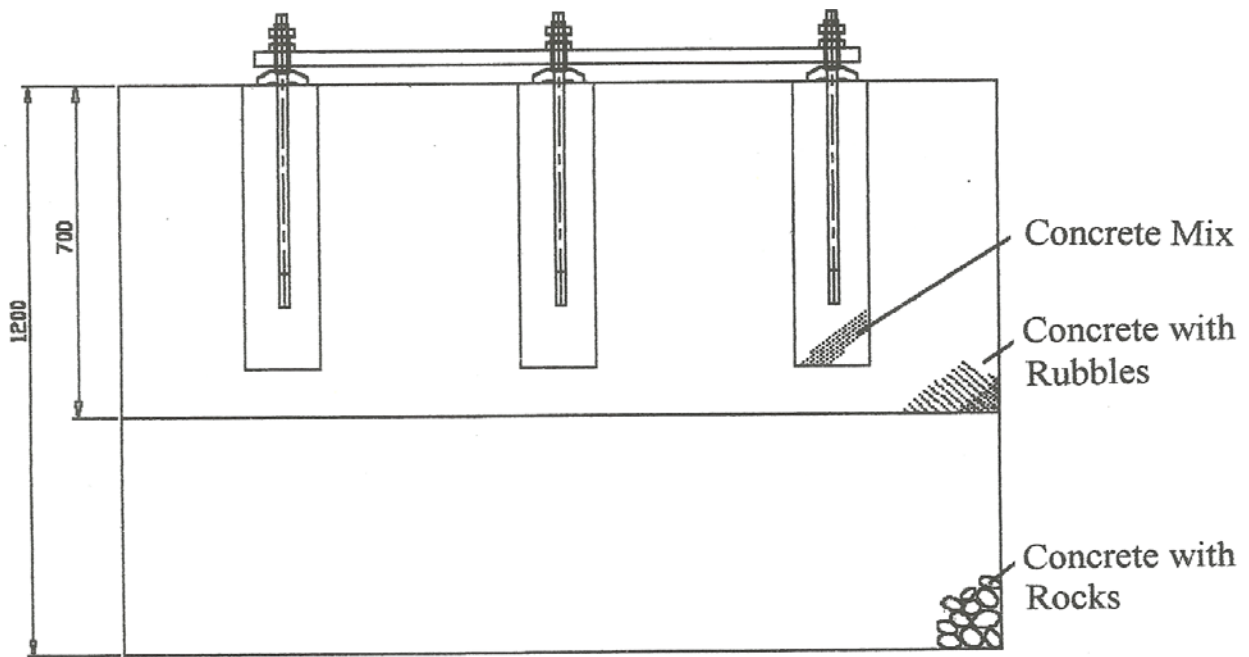


Figure 2

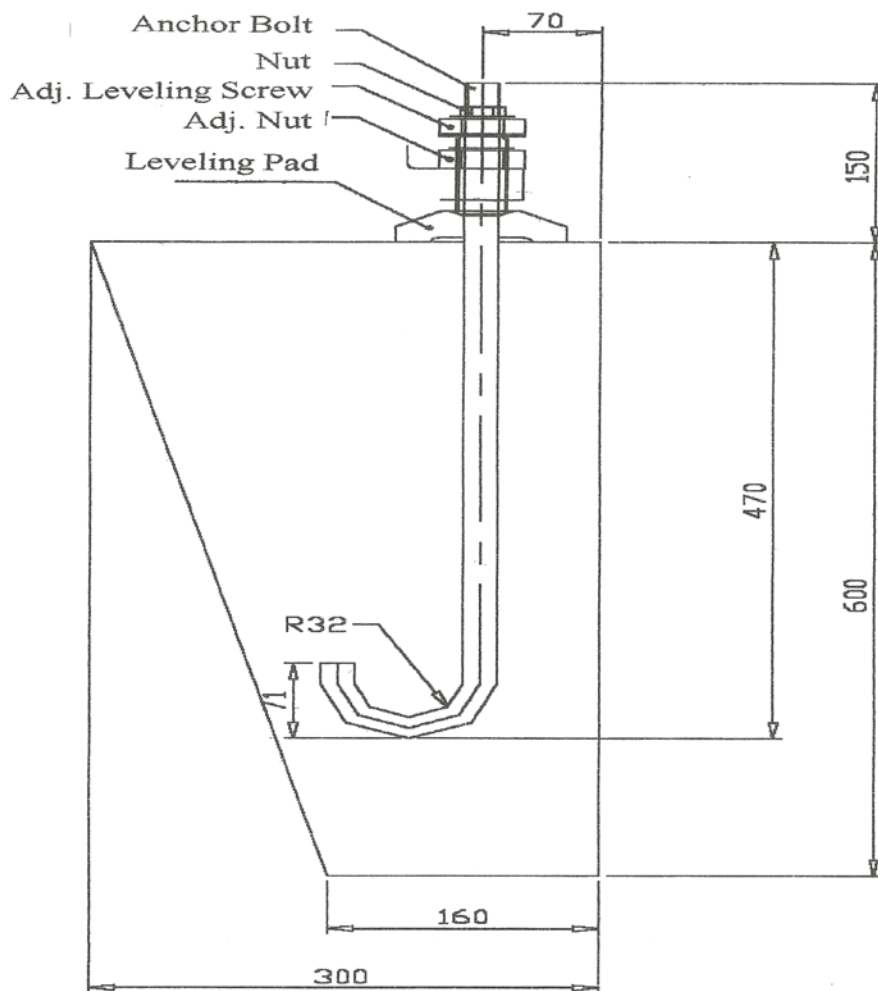


Figure 3

Unit: mm

3. MACHINE PACKAGE & ITS METHOD

To make sure quality and accuracy of the machine are maintained. Before machine is shipped out, we carefully inspect packaging procedure and check the final packaging pallet. Until they are done properly, we will not ship it out.

Package Method Before Shipping:

On the pallet, a PE plastic bag is set on top of it. Then the machine is lowered on the pallet, and is screwed tight onto the pallet. Before the PE plastic bag is wrapped up, absorbent bags are placed and machine is sprayed with cosmoline. Please see the following picture for sample (Figure 4). (Crated if individually shipped!)

To reduce the vibration when shipping, all movable items are fixed and fastened at a particular position. The positions are as follow:

- a. X axis ball screw is fixed by a locking plate between table and saddle. (Shown on photo below; located at back right side of the table and saddle.)**



- b. Y & Z axes ball screw is fixed by the wooden block under the spindle nose. (Fig 5)**
- c. Balancing block is tightened at column. (Fig 5)**
- d. Control box is support on top of the table with wooden block. (Option)**

- e. **Position screw on umbrella ATC shown on the photo. (Please open the top cover of the ATC to locate the position screw and its fixing nuts.)**



*****To make sure all levers and locating items are loosen, please double-check and make sure all of them in doubt are “surely” loosen before operating the machine.**

Packing for Shipment

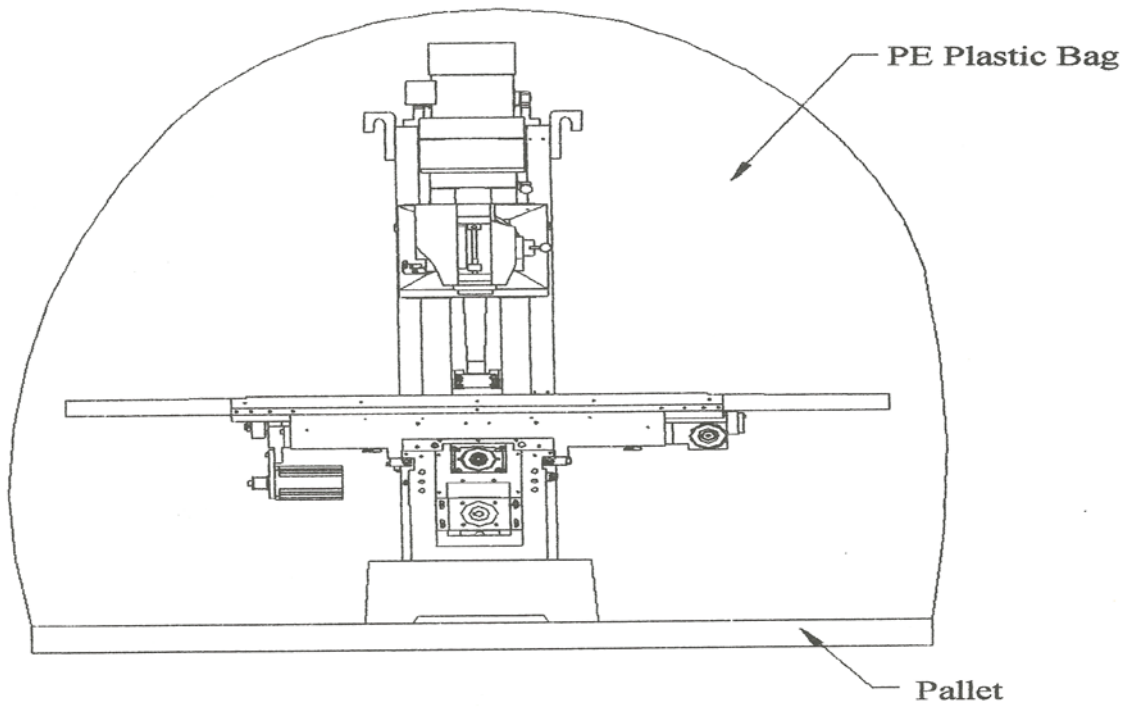


Figure 4

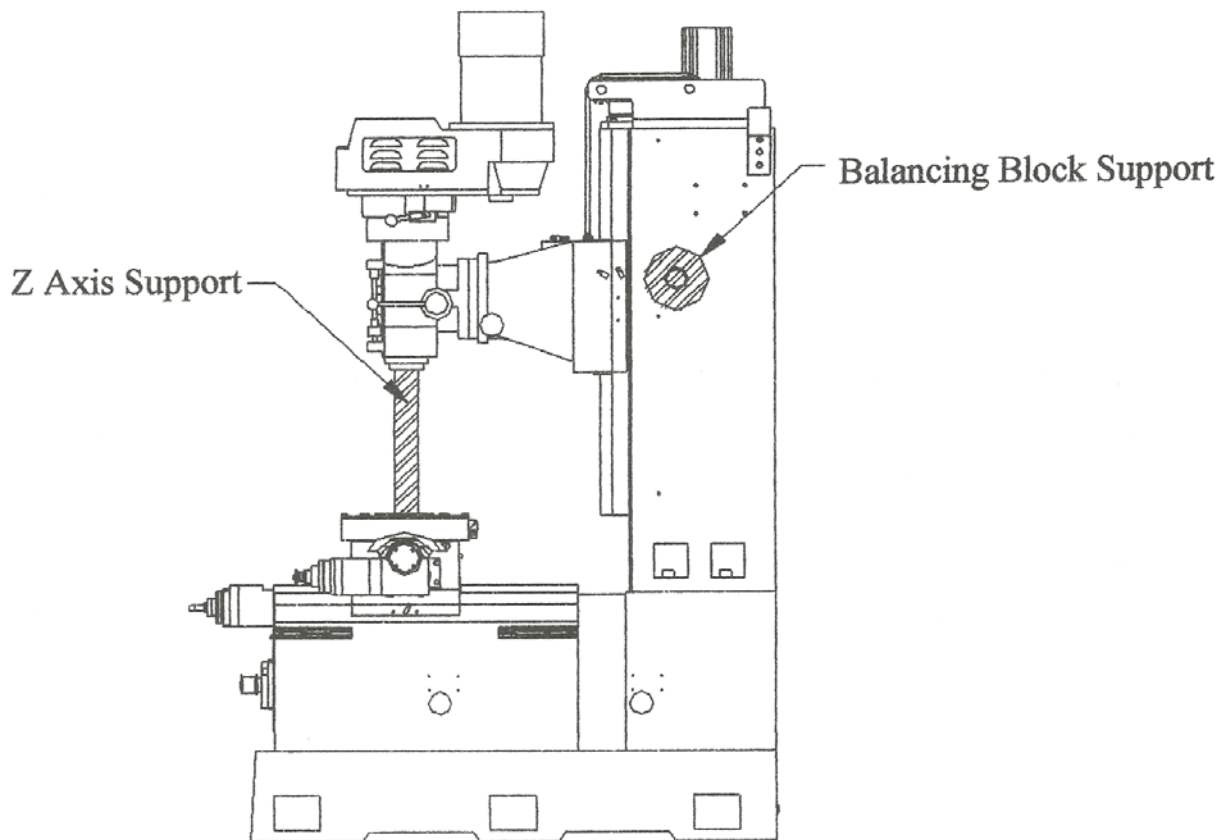


Figure 5

4. UN-PACKAGING & INSTALLATION ON SITE

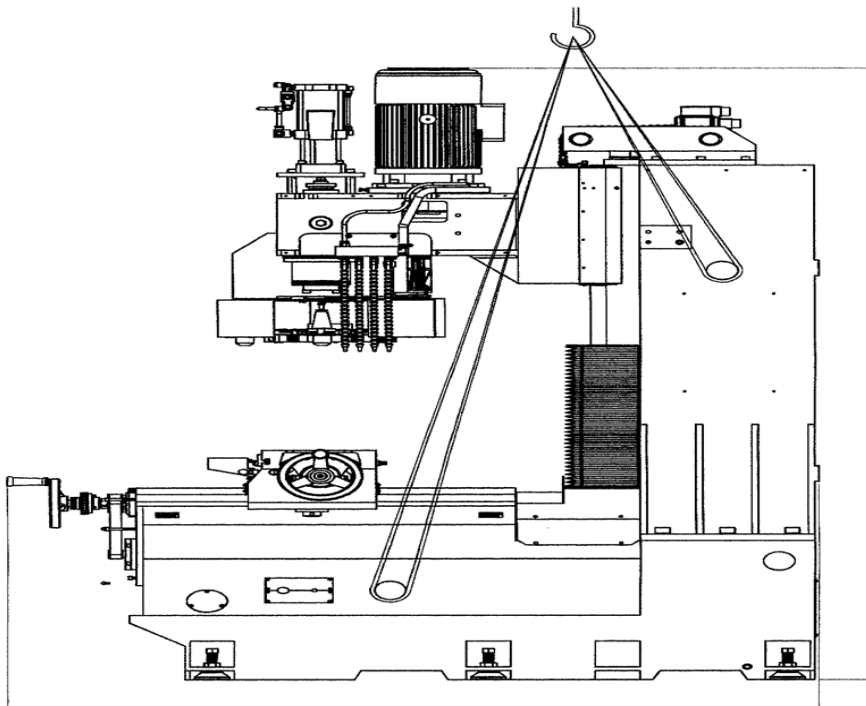
When the machine arrives to the site, unscrew the locating bolts and nuts before lifting the machine. Transporting the machine onto the site is very dangerous. So please follow the instructions below carefully:

- a. Before settling the machine, make sure the locking items have not been loosened.**
- b. On the way to transport the machine to the site, make sure there is no obstacle or make sure all personnel are out of the way.**
- c. After removing from the pallet, the transporting equipment (example such as forklift) must have a capacity over 7,000 lbs (3.5 tons) to move or lift the machine.**
- d. When lifting, the machine must stay balanced. It might tip over and damage the machine if it is not balanced.**
- e. When transporting, please do not vibrate the machine too much. Vibration will cause the machine to lose its accuracy.**

Installation of machine:

Depending on the term, customer can request assistance from the factory or distributor. They can assist to do the installation and train the customer.

Machine Transporting with Overhead Crane



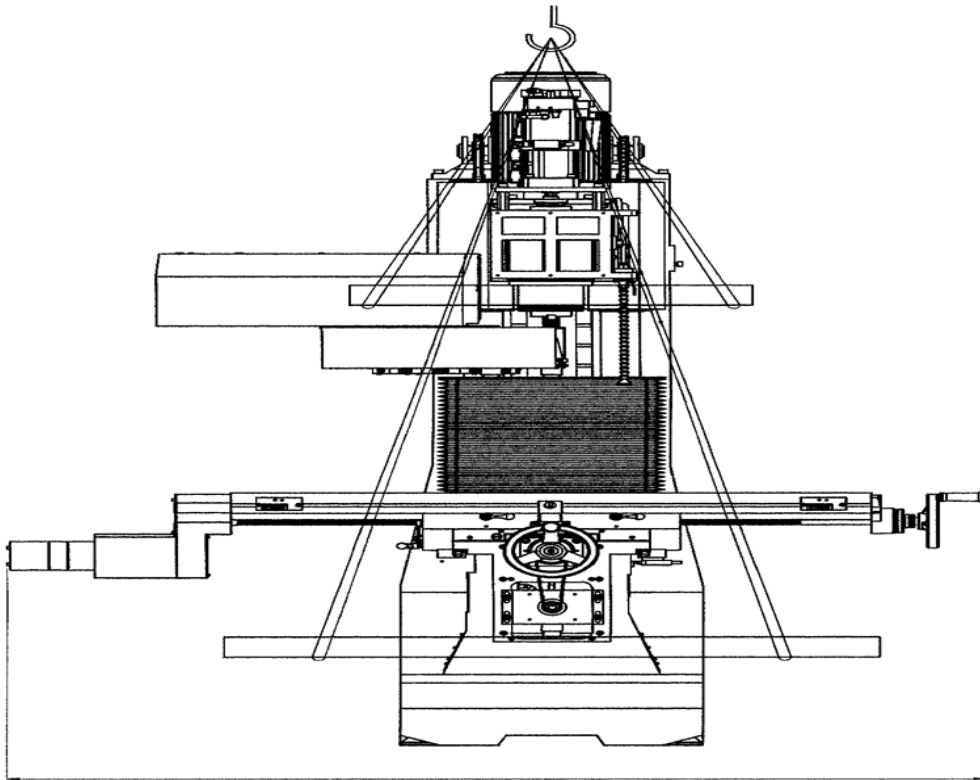


Figure 6

Below figure shown Machine Shipment on Pallet

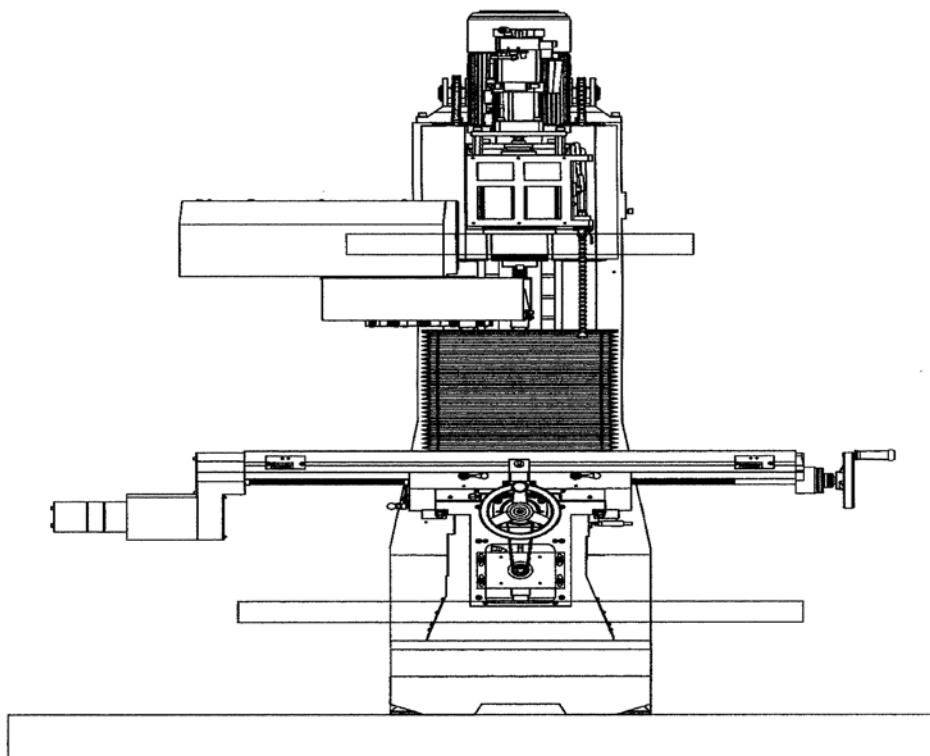


Figure 7

5. PROCEDURE BEFORE INTIAL OPERATION

To increase operation efficiency and maintain machine accuracy, please check the following points:

- a. Is power source within 10 % of 230V or 460V or 10% of local voltage?**
- b. Is compressor pressure within specification?**
- c. All locating items are removed and loosen?**
- d. Are all cosmoline cleaned?**
- e. Are all movable items removed from the table top, X, Y, Z traveling mechanism?**

The above instructions must follow each time before operation. This is done to reduce the chance of damaging the machine, and also might otherwise hurt the operator or bystanders accidentally.

6. PREVENTIVE MAINTENANCE

6-1. Everyday maintenance:

- 1. Check the oil level of lubrication pump. Add more if it is below low level.**
- 2. Check all lubrication points to see if oil is present.**
- 3. Check compressor pressure to be 6 kg/cm ².**
- 4. Check all air hoses for leaking. Must fix the air leak if it is found!**
- 5. Check oil level of air filter gauge. Add if not to the level.**
- 6. Remove all movable items from the machine to reduce the chance of damaging the machine and operator.**
- 7. Check coolant system to see if it is full and is operational?**
- 8. After each day's work, clean the machine and lubricate all moving parts.**
- 9. Spindle taper must be clean and lubricated each day.**
- 10. Add a few drops of #10 spindle oil into oil cups around the milling head.**
- 11. If any false signal is present, please stop the machine and repair the machine immediately.**

6-2. Weekly maintenance:

- 1. Please use clean rags or paper towels to clean halogen light and control panel to keep them readable.**
- 2. Use water based solvent to clean air filter. This is to keep air pressure normal and machine operational.**
- 3. Make sure spindle taper is smooth and chip-less.**
- 4. Check all lubrication points and lubrication pump to see if they are function normally.**
- 5. Check coolant mixture is still usable? Color changed, etc.**

6-3. Six month maintenance:

- 1. Check taper run-out of spindle to see if it is still within accuracy.**
- 2. Check all machine's screws and nuts to see if they are still tight?**
- 3. Check the tightness of the gibs. Are they still within specification?**
- 4. Inspect all electrical terminals and wires. Make sure they are normal and functional. Clean the dust within the electric cabinet.**
- 5. Inspect the servo drive and its parameters. Make sure they are adjusted.**
- 6. Level the machine with precision engineering levels again. Levelness should come within 0.00008/12" (0.02mm/300mm). If not, please re-level the machine.**

- 7. Lower head gear housing must add grease thru the grease fitting.**
- 8. Replace coolant mixture recommended.**

6-4. Yearly maintenance

- 1. Check all electric components on the control panel to see if they are still sensitive.**
- 2. Remove all carbon deposit on the magnetic contactors.**
- 3. Check balance block mechanism. Are they functional?**
- 4. Replace coolant liquid with new one to ensure machining accuracy.**
- 5. Clean and replace lubrication pump's oil reservoir with new way lube oil.**
- 6. Check leveling and adjust the machine to maintain machine accuracy.**
- 7. Replace coolant mixture regardless of usage.**

6-5. Points to watch on doing maintenance

- 1. All scheduled maintenance must be exercised and recorded.**
- 2. During mechanical maintenance such as gibs adjustment, etc., all power must be shut-off to prevent accidental injury.**
- 3. When inspecting servo drive boards outside of their sockets, do not supply power! It might cause servo motor to rotate in its high speed state and cause injury.**
- 4. In any unable maintenance situation, please contact authorized distributor or corresponding manufacturer.**
- 5. Before doing any maintenance work, maintenance personnel must concur with manual to disconnect power or not. This is to reduce accidental injury.**
- 6. Any discoloration on the coolant mixture, coolant must be replaced immediately! This is done to prolong life-span of cutting tools.**

7. LUBRICATION SYSTEM

7-1. Lubrication of the Machine

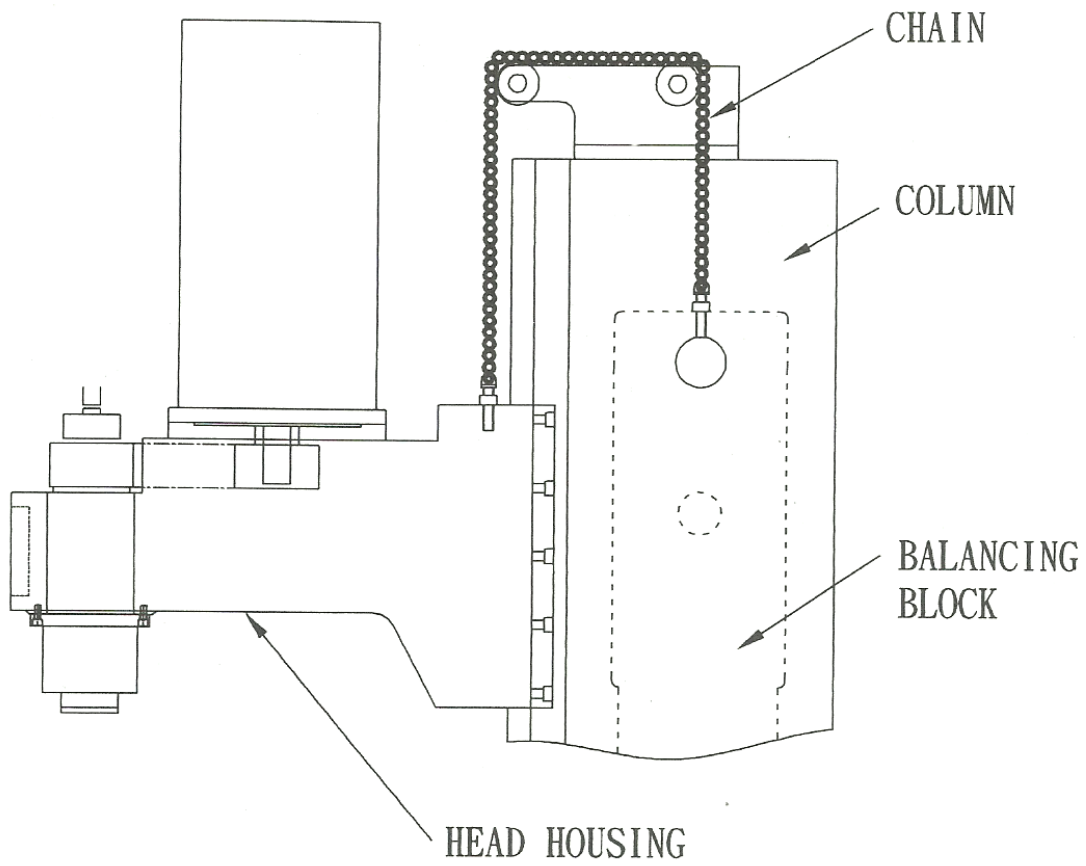
All machines have lubrication system. To maintain their accuracy, users must check and inspect lubrication system every so often. A properly lubricated machine will prolong its life-span and maintain its accuracy longer. All sections of a machine need to be lubricated, but there are few parts that particularly need more attention:

- a. Spindle bearing has seal packed high pressure & temperature grease. It needs to be inspected for its condition every 6 months. Recommended grease type: Kluber LDS 18 or equivalent.**
- b. Some section of slideways are coated with Turcite-B to reduce wear and vibration. The waylube oil for this type of material must have high viscosity, and it is tolerable to high pressure and very wear resistance. Recommended oil type: Mobil Vactra # 2 waylube, Chevron 68X waylube or equivalent.**
- c. All ball screws must be lubricated. They need oil present at all time. Recommended oil type: See item b.**
- d. Balance block's chain mechanism need to be greased when needed. Recommended grease type: Any lithium based grease is OK.**
- e. Air filter unit needs #10 spindle oil when oil level is below recommended level.**

7-2. Lubrication Chart

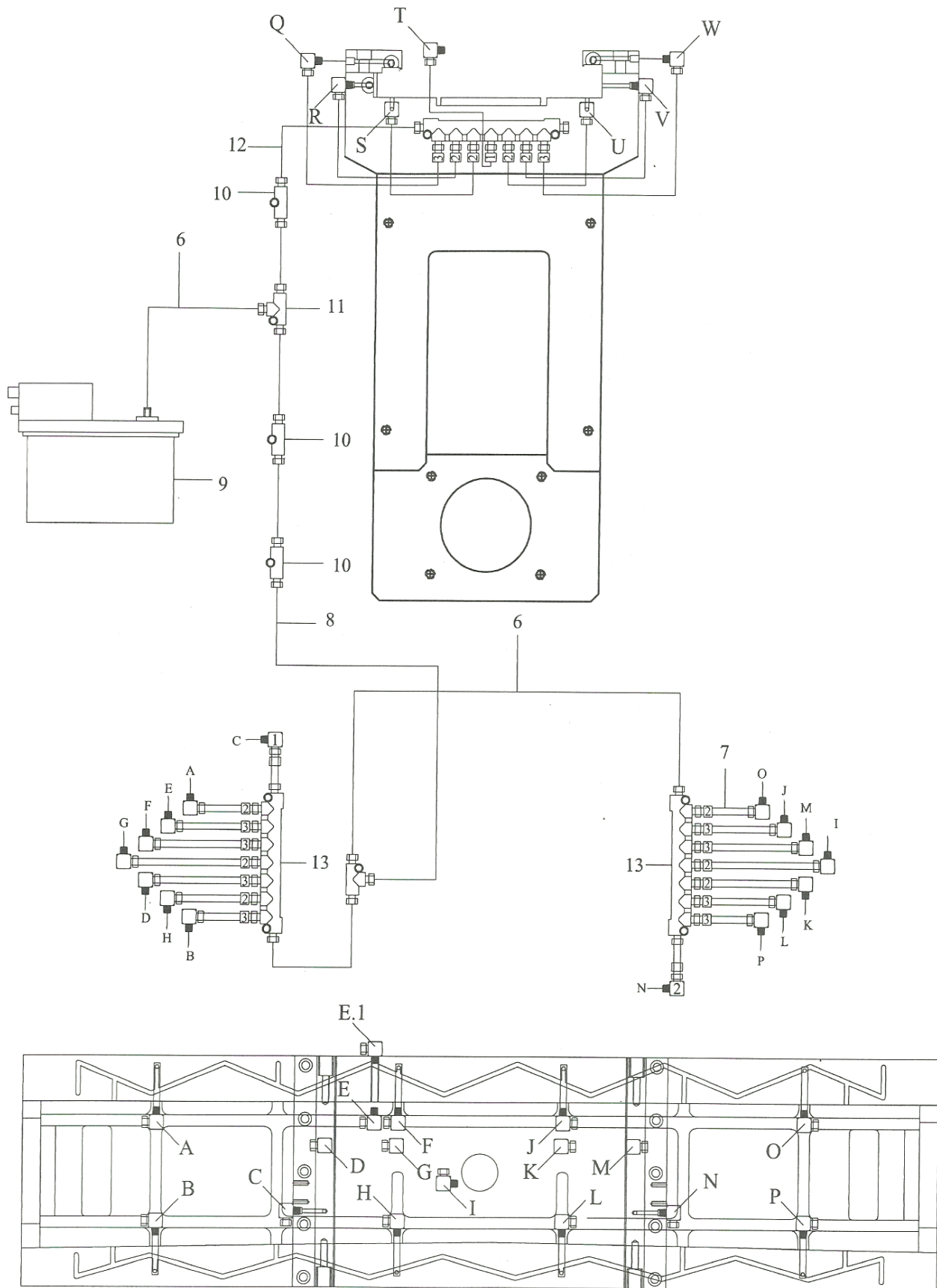
Lubrication Area	Table, Saddle, Slideways, X, Y, Z Ball Screws	Cutting Tool	Air Filter Unit	Chain, Chain Gear	Pressure Unit
Volume	3 Liters	Circulation	Mist Lub.	Hand Grease	Hand add Oil
Schedule Changing	Add if Below Level	Every Year	Add if Below Level	Every 6 Months	Every Year
Oil Type	*Viscosity ISOVG68 *Thickness > 100 *High Pressure, Friction Resist. *Anti-rust, Bubbleless, Oxidization Resistance	*High Heat Resistance *High Pressure Resistance	*Viscosity ISOVG32 *Thickness >95 *Anti-rust, Bubbleless, Oxidization & Colourization Resist. *Stable, not Easy to Change	Lithium Based	*Viscosity ISOVG32 *Thickness >95 *Anti-rust, Bubbleless, Oxidization & Colourization Resist
Suggestion	*Mobil Vacetra #2 *Esso Febisck 68 *Shell Tonna T68 *Chevron Way-NT68	*Esso Pennex #47 *Shell Dromus B	*Mobil DTE Oil #10 *Shell Tellus #10 *Esso Nuto H10	*Esso #2 *Shell Alvaia R-2	*Mobil DTE Oil #26 *Esso Nuto H32 *Shell Tellus #32
Lube Pump Position	Lower Column	Coolant Tank within Machine Base	Top side of Column	Top of Column	Lower Column

7-3. Manual Lubrication Area



Please grease the chain roller at least every six months. Recommend grease type is shown within lubrication chart of section 7-2.

7-4. Distribution of Lubrication System



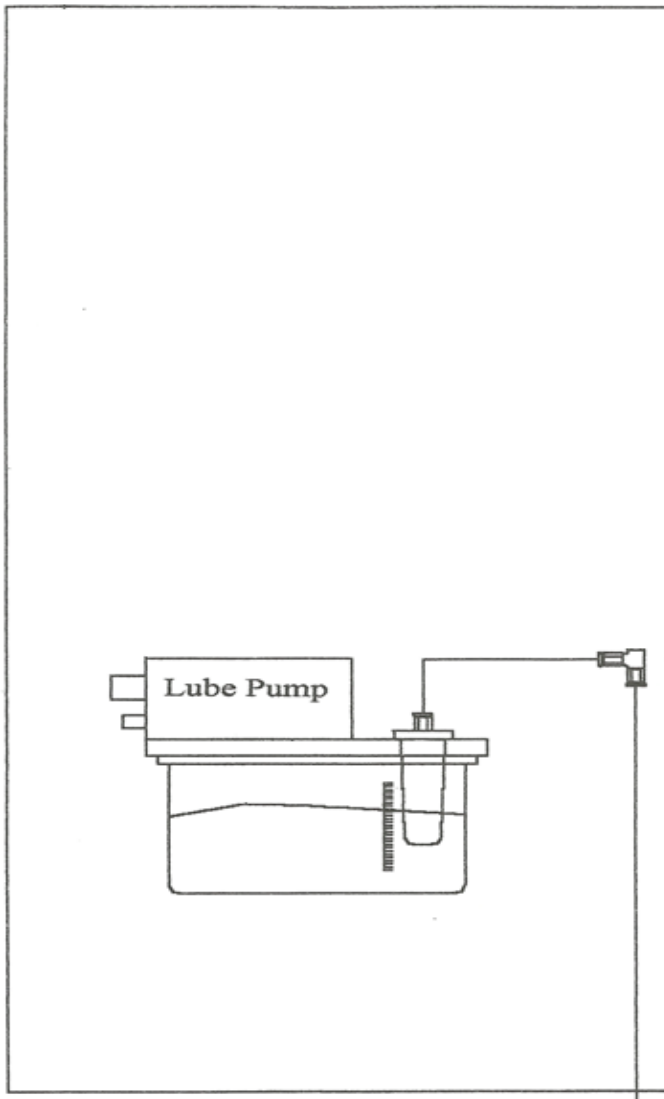
Part list of lubrication system

Description	Part #	Description	Part #
1. #1 oil metering valve	9030	2. #2 oil metering valve	9031
3. #3 oil metering valve	9032	4. #4 oil metering valve	9033
5. #5 oil metering valve	9034	6. D 6mm aluminum tubing	9036
7. D 4mm aluminum tubing	9002	8. Flexible oil tube x 550L	9037
9. CESD lubrication pump	9040	10. 2 way joining fitting	9038
11. 3 way distributing base	9004	12. Flexible oil tube x 180L	9039
13. 9 way distributing base	9035	14. 90 degree elbow fitting	9041
		(for A~W distribution point on the diagram)	

Distribution point of lubrication oil on saddle

A. saddle left/rear	B. saddle left/front
C. lower left saddle gib	D. lower left slideway
E. to E1 (Y axis ball screw)	F. saddle 2 nd left/rear
G. saddle side left slideway	H. saddle 2 nd left/front
I. X axis ball screw	J. saddle 2 nd right/rear
K. saddle side right slideway	L. saddle 2 nd right/front
M. lower right slideway	N. lower left saddle gib
O. saddle right/rear	P. saddle right/front
Q. left housing gib/slideway	R. left side gib
S. left slideway	T. Z axis ball screw
U. right slideway	V. right side slideway
W. Right housing gib/slideway	

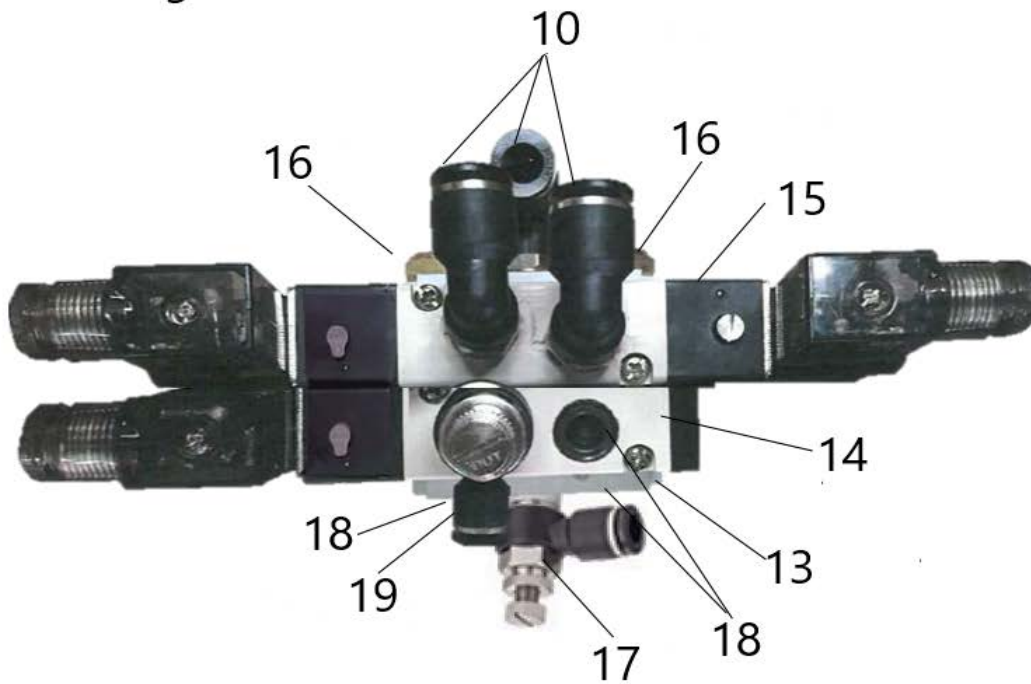
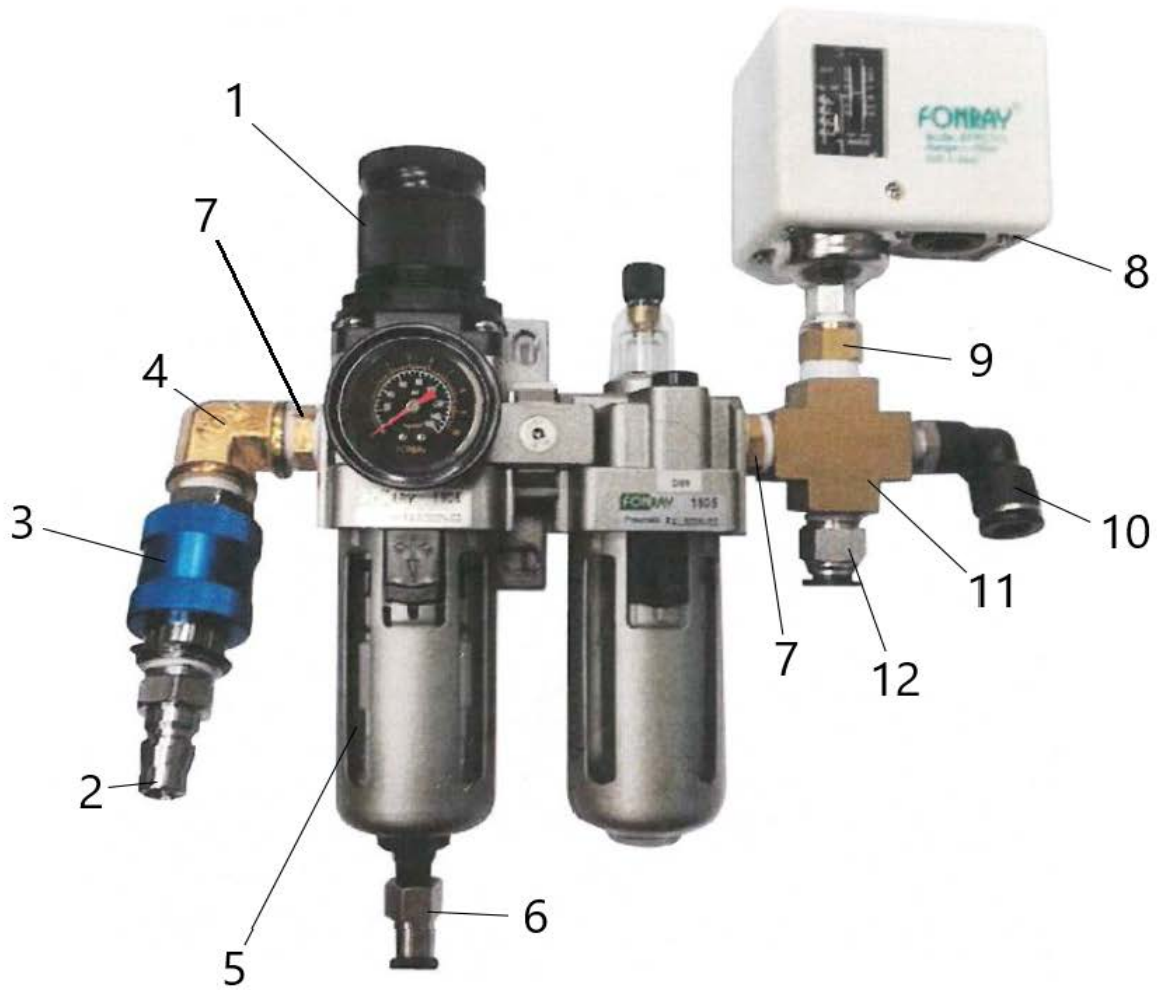
7-5. Position of Lubrication Pump



To X, Y & Z "shown left side of column"

**Please add lube oil to the pump whenever it is eyed 1/4 tank full.
Recommended oil type is shown within lubrication chart of section 7-2.**

7-6. Air Lubrication Assembly
Air Unit Lubrication & Filtration Assembly

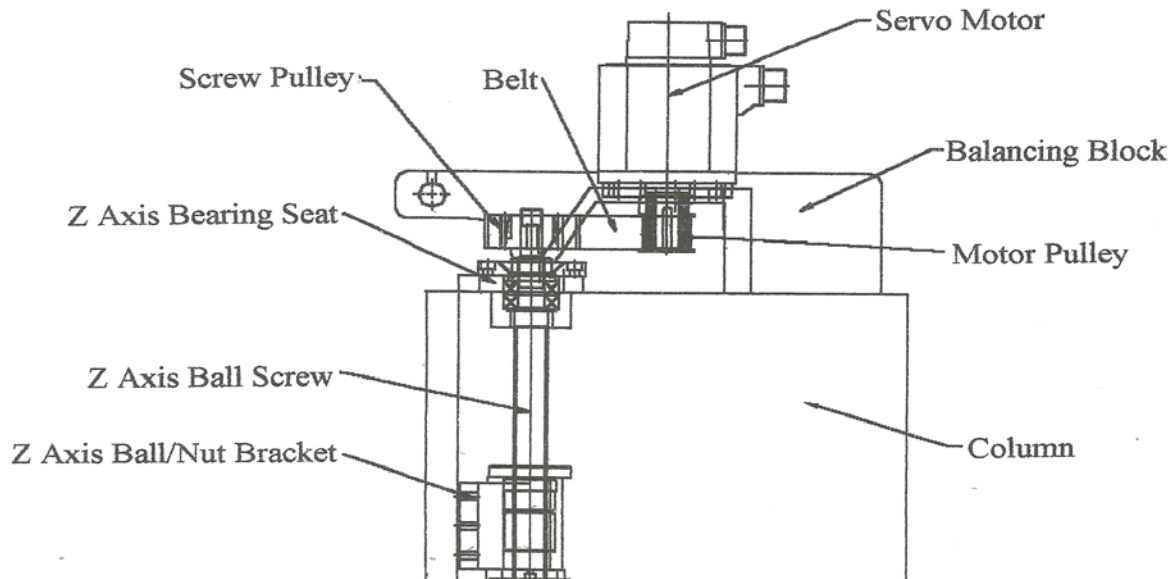


Item #	Part #	Description	QTY
1.	FAC301N-03	Air Lubrication & Filtration Unit	1
2.	30PM-I	Male Air Quick-Filtration Unit	1
3.	HSV-03	Air Releasing Valve	1
4.	BLF-003	Brass Elbow Joint 3/8*3/8	1
5.	MADV-300	Air Quick-Filtration Unit	1
6.	EPCF6-01	Dual End Thread Straight Point	1
7.	P013	Straight Joint 3/8*3/8	2
8.	FPRC110	Pressure Gauge	1
9.	E09C-302	Pressure Coupler 3/8PT*1/4H	1
10.	EPL10-03	Flow Air Quick Fitting	4
11.	P099	Four Way Joint 3/8"	1
12.	EPC10-03	Flow Air Quick Fitting	1
13.	310M-02F	Air Manifold	1
14.	4V310-10-F-DC24V	One-direction Solenoid	1
15.	4V320-10-F-DC24V	Bi-direction Solenoid	1
16.	FSL-03	Noise Reducing Plug 3/8"	2
17.	ESL10-03-B	Adjustable Air Fitting	1
18.	ISH-03	Jam Nut 3/8"	3
19.	ESL6-03	Adjustable Air Fitting	1

8. X, Y, & Z AXES TRANSMISSION METHOD

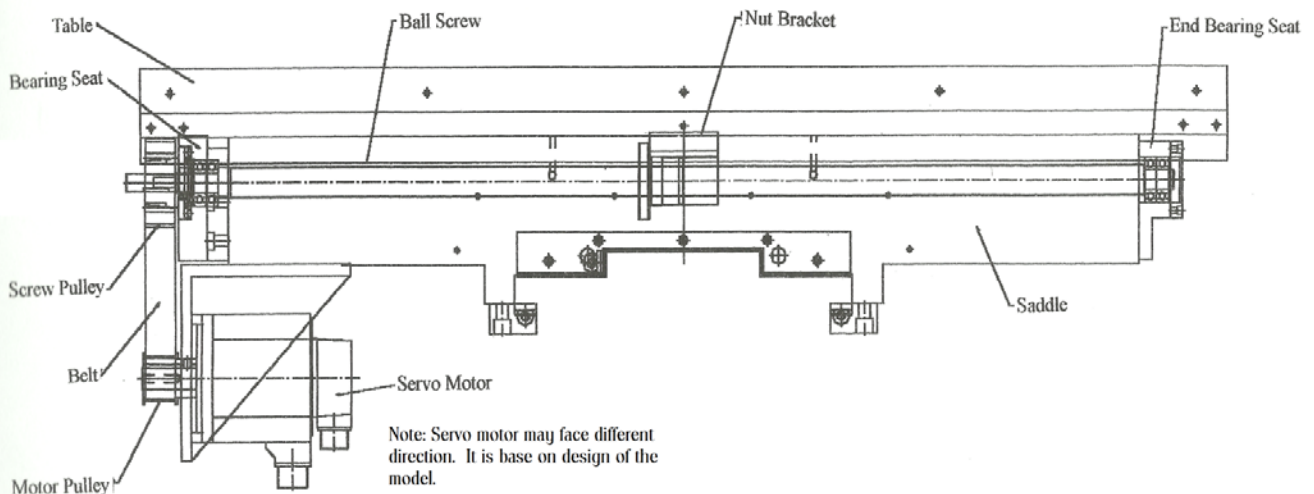
8-1. Z axis transmission method

Z axis is driven by AC servo motor. The brand name varies with control brand. Between the servo motor and the ball screw, there are two timing belt pulleys and a timing belt. The head housing moves up and down when servo motor rotates the ball screw in either direction. Please see drawing below:



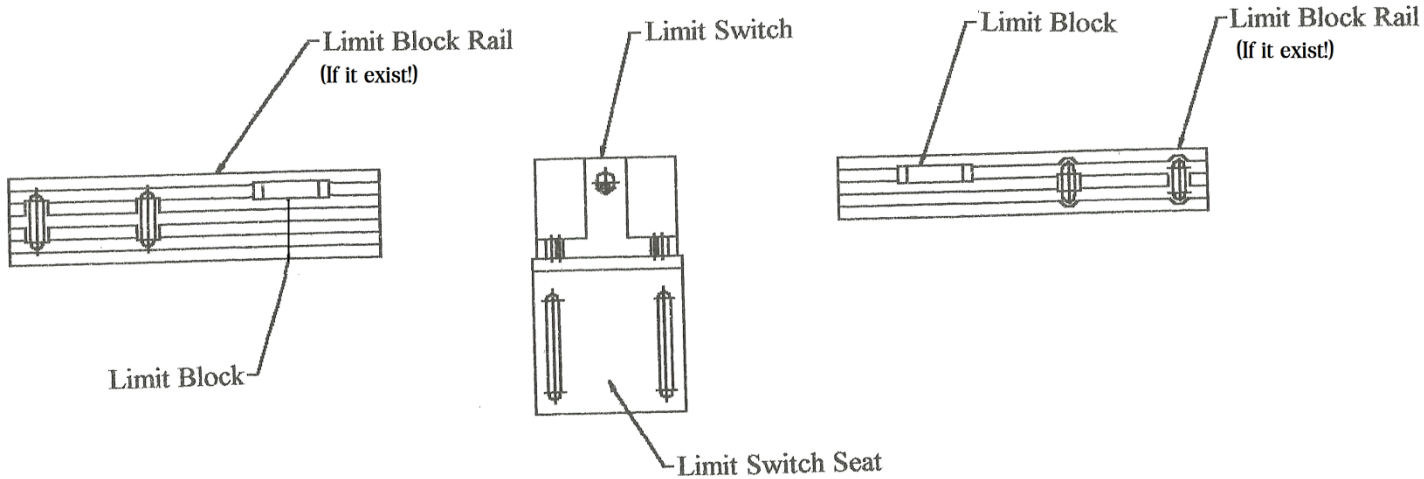
8-2. X & Y axes transmission method

X & Y axes' motion is control by AC servo motor. Name brand is also tagged with control. The servo motors drive the ball screws through two pulleys and a timing belt. Both axes will move when servo motor rotate. The items in motion are saddle and working table. Please see the drawing below:



8-3. Travel adjustment of X, Y, & Z axes

The control package usually comes with maximum travel setting design. This design is to avoid damage when user sets the travel over the travel limit. When machine over travels (on all axes), a limit block will bump a limit switch. The limit switch will send a signal to the control, which will then stop all motions on the machine. Please see drawing for the design below.

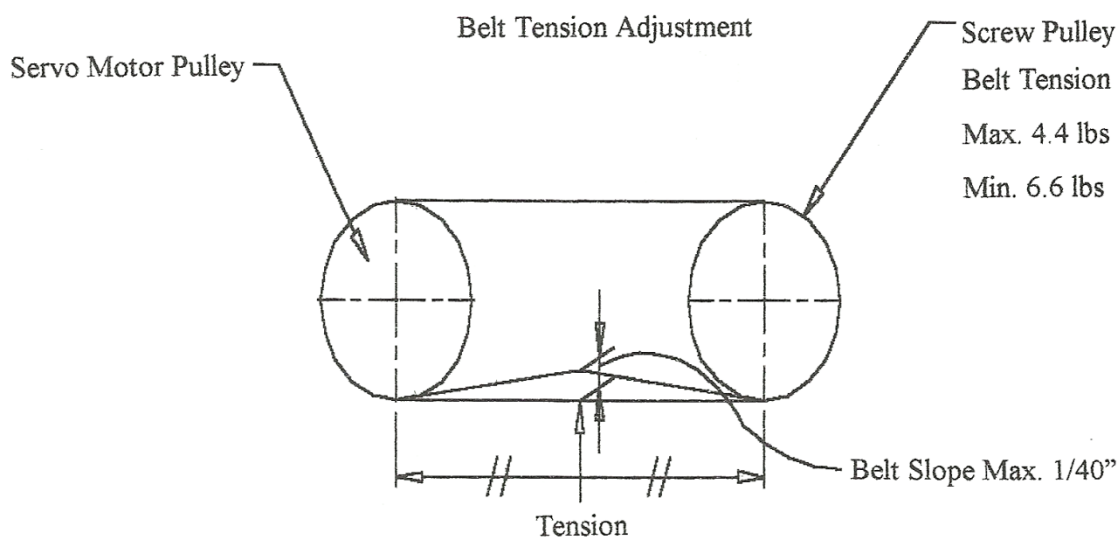


9. MAINTENANCE

9-1. ADJUSTMENT OF THE TIMING BELT

Because all three axes are drive through using a timing belt, it is essential to keep the tension on the timing belt at constant. Please check the belts every six months and adjust them when needed. The method of adjustment is as following:

- a. Release servo motor by unscrewing the locating bolts.
- b. Re-adjust the motor distance from the ball screw by feeling the tension on the timing belt. The pressure on the timing belt should be between 4.4 to 6.6 lbs.
- d. Screw tight on the motor locating bolts.



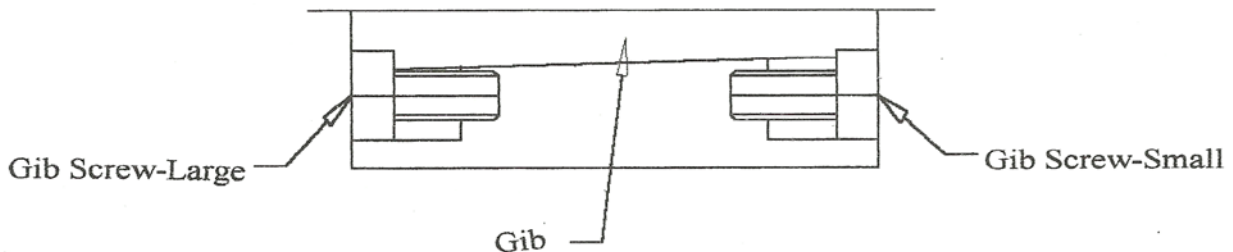
Belt Tension in Between Pulley center

9-2. ADJUSTMENT OF THE GIBS

During machine's motion, there will be wears on the moving items, and will create backlashes on all three axes. To compensate for this situation, user can adjust gibs to minimize effect.

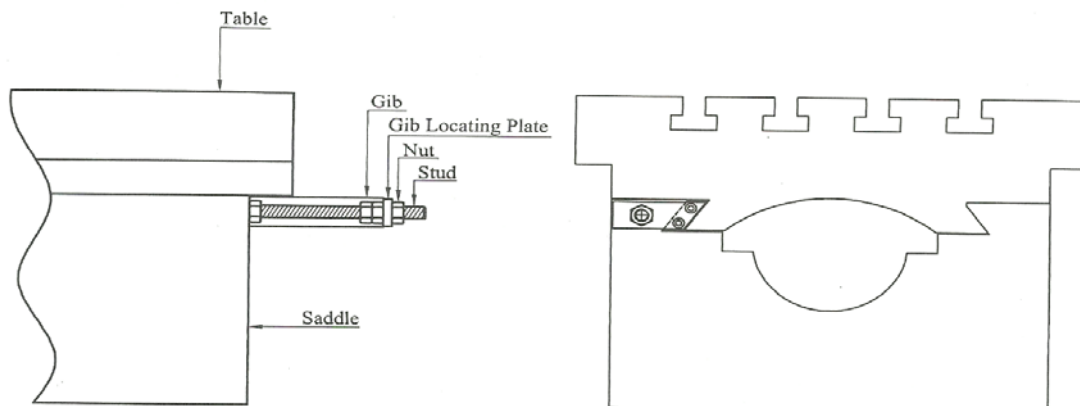
The procedure for adjusting gibs (for Z & Y axes):

- a. Release the smaller taper end gib by unscrewing the gib screw half turn.
- b. Rotate the axis toward the smaller taper end to close the gap between the sliding surfaces.
- c. Screw in the gib screw on the big taper end side.
- d. Repeat the procedure until surface pressure on the gib is 3.5kg/cm².
- e. Check gibs pressure once every six months.



For table gib adjustment:

- a. Unscrew the inner side hex nuts on the stud (show as A on the figure).
- b. Use an open-end wrench to screw in the outer hex nut to proper tension (about 5kg/cm²). Note: Turn the nut clockwise!
- c. When the hex nut is turned about 1/4 turn, move the table left and right to test the tightness of the gib. Repeat this procedure until proper tension is achieved.
- d. Check gib pressure once every six months.



10. ELECTRICAL DIAGRAM & ITS PARTS LIST

To order parts, please have the following information ready:

- 1. Year of production**
- 2. Model and serial number**
- 3. Item number and description**
- 4. Quantity**

Note: If the machine is shipped with CNC control, in order to get its parts information, please refer to its supplied control manuals to find the correct part number and specification. And please contact the original control manufacturer for the ordering instructions.

*****Trouble shooting on the control? Please contact control manufacturer's service department, they can get your question solved and get you going quickly. Any other question, please contact our service department. The phone numbers are listed at the front page of the manual. Or please visit our websites www.acerlinks.com, and www.aceronline.net, and leave us with your questions, we will response quickly. Thank you for your attention and have a great day!**

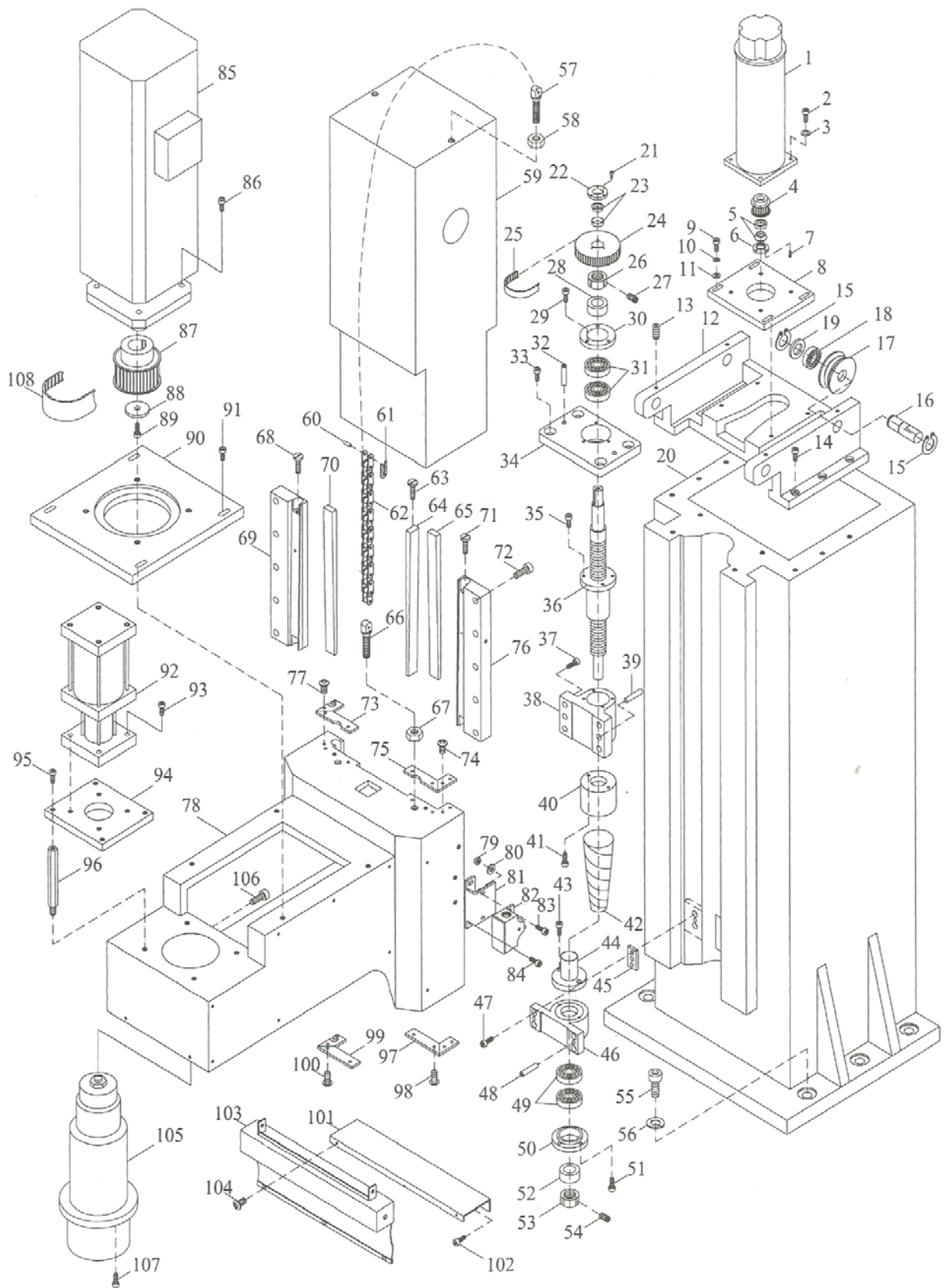
10-1. Electrical Diagram and Circuit—Please visit Electrical Diagram Manual.

11. Mechanical Drawings & Parts Breakdown List

Note: When ordering parts, please be prepared with,

1. Machine model & serial number.
2. Item number.
3. Part number and description.
4. Year of Production.
5. Voltage & horsepower.
6. Quantity

11-1. SPINDLE HOUSING ASSEMBLY



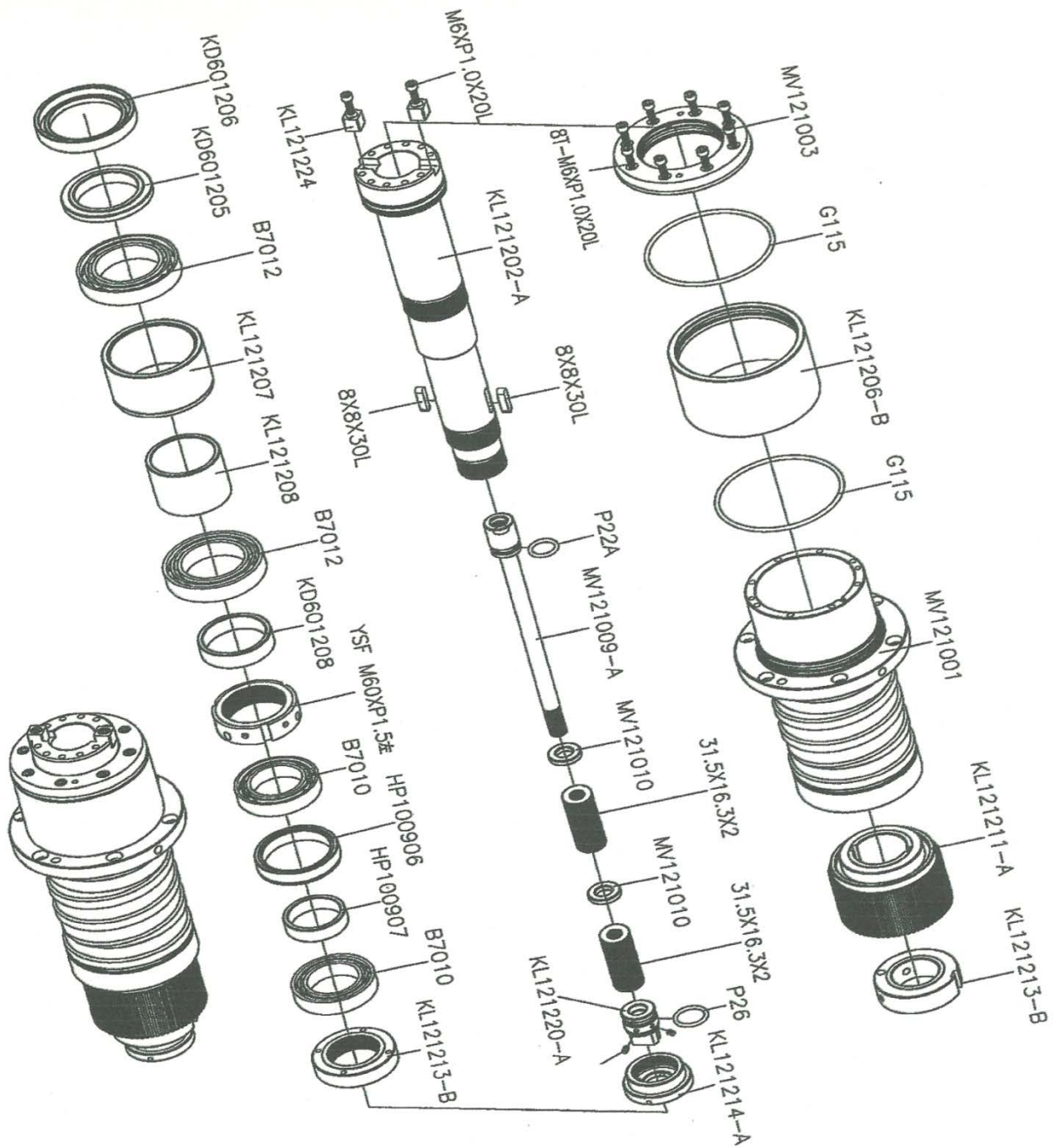
ITEM NO.	PART NO.	DESCRIPTION	QT'Y
1	MCCP-004	Servo Motor	1
2	MBSHS0830	Socket Head Cap Screw	4
3	MBSWM08	Spring Washer	1
4	MCCP-005	Motor Pulley (5GT30T)	1
5	MCCP-006	Pulley Sleeve Set (2428)	1
6	MCCP-007	Pulley End Cap	1
7	MBSHS0625	Socket Head Cap Screw	3
8	MBCZ-001	Z Axis Motor Plate	1
9	MBSHS0830	Socket Head Cap Screw	4
10	MBSWM08	Spring Washer	4
11	MBWM08	Washer	4
12	MBCZ-002	Chain Roller Seat	1
13	MBSS0806	Set Screw	8
14	MBSHS0825	Socket Head Cap Screw	6
15	MBSR25	Snap Ring	4
16	MBCZ-003	Chain Roller Shaft	4
17	MBCZ-004	Chain Wheel	4
18	MBNA4905	Ball Bearing NA4905R	4
19	MBCZ-005	Spacer	4
20	MBCZ-006	Column	1
21	MBSHS0625	Socket Head Cap Screw	3
22	MCCP-003	Pulley End Cap (2025)	1
23	MCCP-002	Pulley Sleeve Set	1
24	MCCP-001	Ball Screw Pulley (5GT60T)	1
25	MCTB5GT-600	Timing Belt	1
26	MBYSF-M25*1.5P	Lock Nut	1
27	MBSS0604	Set Screw	3
28	MBCZ-007	Spacer	1
29	MBSHS0615	Socket Head Cap Screw	3
30	MBCZ-008	Bearing Retainer	1
31	MBBST2562	Ball Bearing (Angular)	2
32	MBTP4#	Taper Pin	2

ITEM NO.	PART NO.	DESCRIPTION	QT'Y
33	MBSHS1235	Socket Head Cap Screw	4
34	MBCZ-009	Z Axis Bearing Seat	1
35	MBSHS0612	Socket Head Cap Screw	5
36	MBCZ-010	Z Axis Ball Screw W/Nut	1
37	MBSHS1225	Socket Head Cap Screw	4
38	MBCZ-011	Ball Screw Nut Seat	1
39	MBTP4#	Taper Pin	2
40	MBCZ-012	Ball Screw Upper End Cover	1
41	MBSHS0612	Socket Head Cap Screw	2
42	MBCZ-013	Ball Screw Cover	1
43	MBSHS0612	Socket Head Cap Screw	2
44	MBCZ-014	Ball Screw Lower End Cover	1
45	MBCZ-015	Spacer Plate	2
46	MBCZ-016	Z Axis Ball Screw Bracket	1
47	MBSHS0825	Socket Head Cap Screw	4
48	MBTP4#	Taper Pin	2
49	MBTVP7205B	Ball Bearing (Angular)	2
50	MBXYZ7842	Bearing Retainer (X. Y. Z.)	1
51	MBSHS0615	Socket Head Cap Screw	3
52	MBXYZ4217	Spacer	1
53	MBYSR-M25*1.5P	Lock Nut	1
54	MBSS0604	Set Screw	3
55	MBSHS2080	Socket Head Cap Screw	7
56	MBSWM20	Spring Washer	7
57	MBCZ-017	Balancing Block Screw	2
58	MBNUTM14	Hex Nut	2
59	MBCZ-018-1	Balancing Block	1
60	MBRP5	Roller Pin (5/8x68+ 2)	2
61	MBSR5	Clip Ring (5/8x68+ 2)	2
62	MCCZ-001	Chain (5/8x68+ 2)	2
63	MB-3028	Gib Adj-Screw	2
64	MCCZ-002	Center Housing Gib (7x32x520)	1

ITEM NO.	PART NO.	DESCRIPTION	QT'Y
65	MCCZ-003	Right Housing Gib (7x25x520)	1
66	MBCZ-017	Balancing Block Screw	2
67	MBM14P2	Hex. Nut	2
68	MB-3028	Gib Adj-Screw	2
69	MCCZ-004	Left Gib Plate (32x77x420)	1
70	MCCZ-003	Left Housing Gib	1
71	MB-3028	Gib Adj-Screw	2
72	MBSHS1240	Socket Head Cap Screw	10
73	MBCZ-022	Left Housing Wiper (Top)	1
74	MBRHS0510	Round Head Socket Cap Screw	4
75	MBCZ-023	Right Housing Wiper (Top)	1
76	MCCZ-006	Right Gib Plate (32x77x420)	1
77	MBRHS0510	Round Head Socket Cap Screw	4
78	MCCZ-007	Spindle Housing	1
79	MBM06P1	Hex Nut	2
80	MBWM06	Washer	2
81	MCCZ-008	Travel Limit Bracket	1
82	MCCP-008	Travel Limit Switch	1
83	MBSHS0625	Socket Head Cap Screw	2
84	MBSHS0616	Socket Head Cap Screw	2
85	MCCZ-009	Spindle Servo Motor	1
86	MBSHS1235	Socket Head Cap Screw	4
87	MCCZ-010	Spindle Motor Pulley	1
88	MCCZ-011	End Washer	1
89	MBSHS1235	Socket Head Cap Screw	1
90	MCCZ-012	Spindle Motor Plate	1
91	MBSHS1240	Socket Head Cap Screw	4
92	MCCZ-013	Air Cylinder Ass'y	1
93	MBSHS1055	Socket Head Cap Screw	4
94	MCCZ-014	Air Cylinder plate	1
95	MBSHS1030	Socket Head Cap Screw	4
96	MCCZ-015	Cylinder Support Shaft	4

ITEM NO.	PART NO.	DESCRIPTION	QT'Y
97	MBCZ-028	Right Housing Wiper (Lower)	1
98	MBRHS0510	Round Head Socket Cap Screw	4
99	MBCZ-029	Left Housing Wiper (Lower)	1
100	MBRHS0510	Round Head Socket Cap Screw	4
101	MBCZ-030	Bracket	1
102	MBSHS0608	Socket Head Cap Screw	2
103	MBCZ-031-1	Way Cover Assembly	1
104	MBRHS0506	Round Head Socket Cap Screw	3
105	MCCZ-016	Spindle Ass'y	1
106	MBSHS0635	Socket Head Cap Screw	1
107	MBSHS0825	Socket Head Cap Screw	6
108	MCTB8YU800	Leather Belt	1

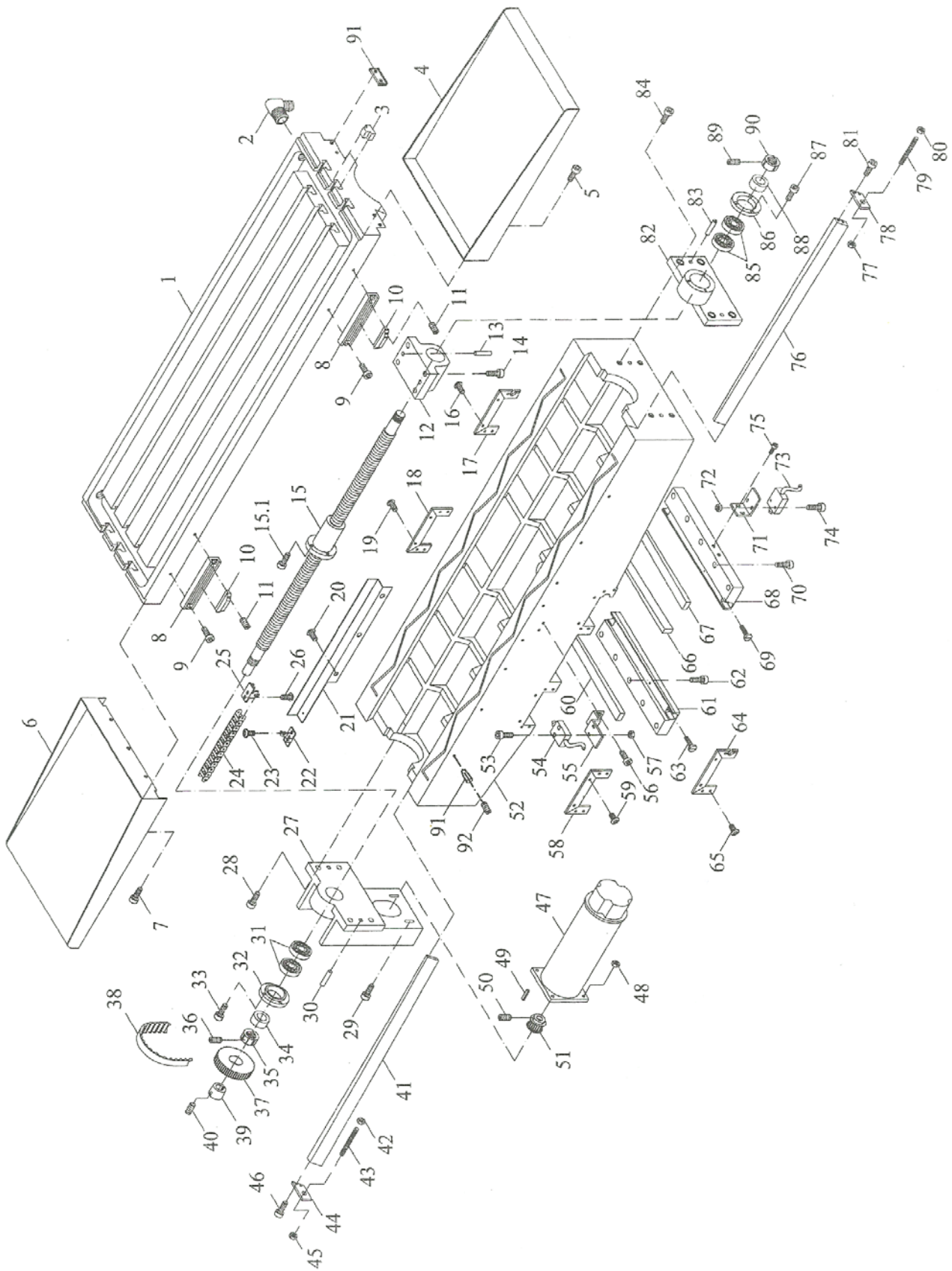
11-2. 7.5 HP SPINDLE ASSEMBLY



品名	圖號	數量
軸心	KL121202-A	1
外水套	KL121206-B	1
外隔環	KL121207	1
內隔環	KL121208	1
皮帶輪	KL121211-A	1
螺母	KL121212	1
磁性開關座	KL121213-B	1
後螺母	KL121214-A	1
拉桿螺母	KL121220-A	1
定位塊	KL121224	1
軸管	MN121001	1
前蓋	MN121003	1
拉桿	MN121009-A	1
墊片	MN121010	2
外隔環	HP100906	1
內隔環	HP100907	1
前防護蓋	KD601205	1
前防護蓋	KD601206	1
內隔環	KD601208	1
軸承	B7012	2
軸承	B7010	2
無頭螺絲	M5XP0.8X6L	6
內六角螺絲	M6XP1.0X20L	10
O型環	P22A	1
O型環	P26	1
O型環	G115	2
螺母	YSR M60XP1.5 左	1
雙頭圓錐	8X8X30L	2
碟型簧片	31.5X16.3X2	90

Spindle Assembly			KL1212
Item#	Part #	Description	Quantity
1	KL121202-A	Spindle Shaft	1
2	KL121206-B	External Jacket	1
3	KL121207	Spacer	1
4	KL121208	Spacer	1
5	KL121211-A	Spindle Pulley	1
6	KL121212	Screw Nut	1
7	KL121213-B	Magnetic Switch Seat	1
8	KL121214-A	Screw Nut	1
9	KL121220-A	Nut of Drawbar	1
10	KL121224	Alignment Key	1
11	MV121001	Spindle Housing	1
12	MV121003	Front Cover	1
13	MV121009-A	Drawbar	1
14	MV121010	Washer	2
15	HP100906	Spacer	1
16	HP100907	Spacer	1
17	KD601205	Dust Proof Cap	1
18	KD601206	Dust Proof Cap	1
19	KD601208	Spacer	1
20	B7012	Ball Bearing	2
21	B7010	Ball Bearing	2
22	M5xP0.8x6L	Set Screw	6
23	M6xP1.0x20L	Socket HD Cap Screw	10
24	P22A	O Ring	1
25	P26	O Ring	1
26	G115	O Ring	2
27	YSR M60XP1.5	Precision Ground Lock Nut-Left Hand Thread	1
28	8x8x30L	Key	2
29	31.5x16.3x2	Disk Spring	90
30	BT40-45°	Clamping Jaw-same for CAT#40	1

11-3. BED MILL X AXIS SECTION

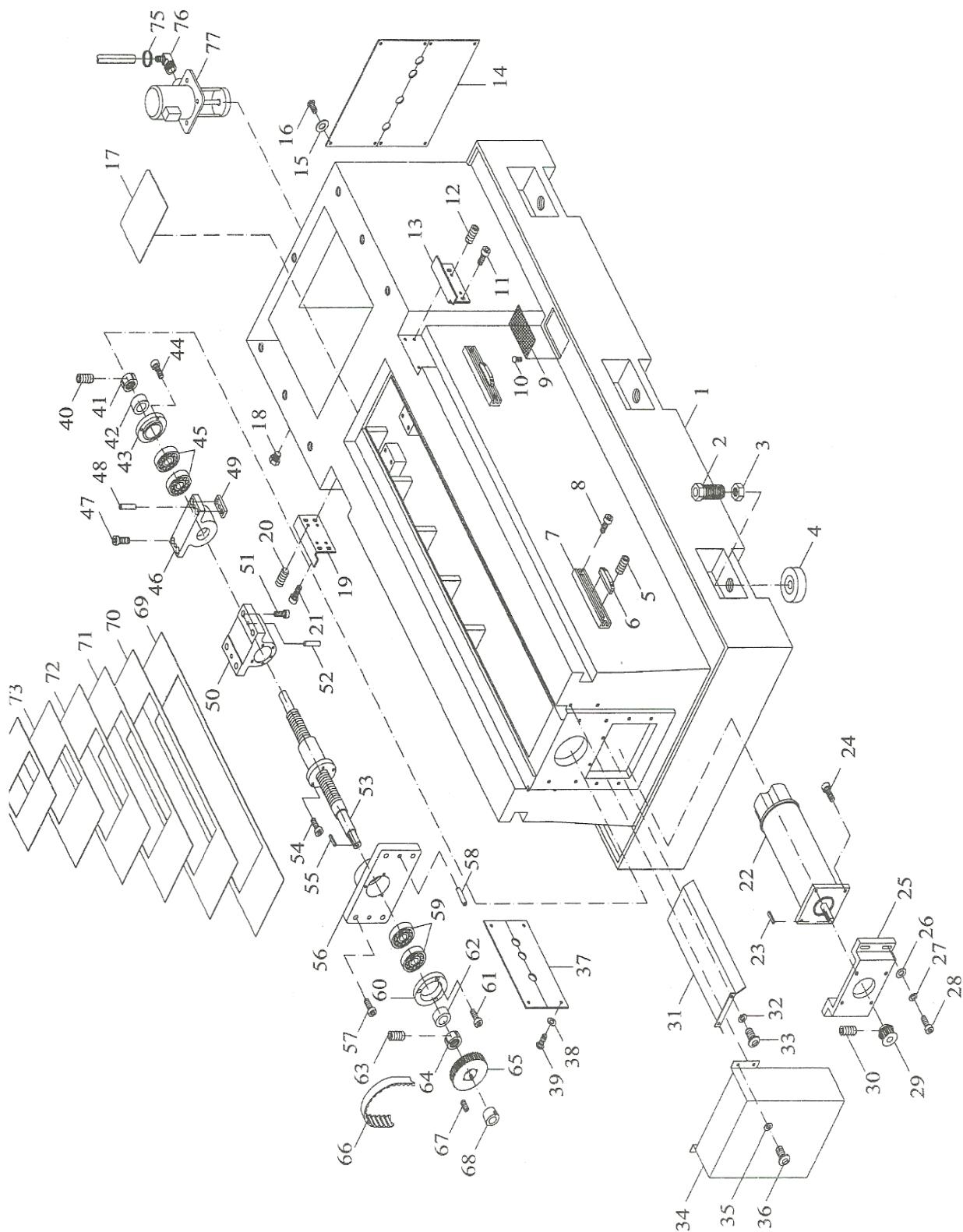


ITEM NO.	PART NO.	DESCRIPTION	QT'Y
1	MBTSX-001	Table	1
2	MB1"PT*1E	90 Degree Coolant Hose Connector	2
3	MBTSX-002	Rubber Plug	6
4	MBSMS-001	Right Table End Cover	1
5	MBSHS0816	Socket Head Cap Screw	3
6	MBSMS-002	Left Table End Cover	1
7	MBSHS0816	Socket Head Cap Screw	3
8	MBCP-001	Limit block Travel Rail	2
9	MBSHS0616	Socket Head Cap Screw	4
10	MBCP-002	Limit block	4
11	MBCP-003	Special Set Screw	8
12	MBTSX-003	Ball Screw Nut Seat (X. Y.)	1
13	MBTP4#	Taper Pin	2
14	MBSHS1225	Socket Head Cap Screw	4
15	MBTSX-004	X Axis Ball Screw W/Nut	1
15.1	MBSHS0612	Socket Head Cap Screw	5
16	MBRHS0510	Round Head Socket Cap Screw	6
17	MBTSX-005	Saddle Way Wiper	1
18	MBTSX-006	Saddle Way Wiper	1
19	MBRHS0510	Round Head Socket Cap Screw	6
20	MBRHS0608	Round Head Socket Cap Screw	3
21	MBSMS-003	Guide Rail	1
22	MBSQ604-U	Flange	1
23	MBRHS0406	Round Head Socket Cap Screw	2
24	MBSQ604-R20	Cable Protector Housing	1
25	MBSQ604-L	Flange	1
26	MBRHS0406	Round Head Socket Cap Screw	2
27	MBTSX-006	X Axis Servo Motor Bracket	1
28	MBSHS1225	Socket Head Cap Screw	4
29	MBSHS0630	Socket Head Cap Screw	4
30	MBTP4#	Taper Pin	2
31	MBBST2562	Ball Bearing	2
32	MBTSX-007	Bearing Retainer	1

ITEM NO.	PART NO.	DESCRIPTION	
33	MBSHS0615	Socket Head Cap Screw	3
34	MBCP4217	Spacer	1
35	MBYSF-M25*1.5P	Lock Nut	1
36	MBSS0604	Set Screw	3
37	MBPDL16	Ball Screw Pulley	1
38	MBTB5M550	Timing Belt	1
39	MBPDLT02	Pulley Sleeve	1
40	MBSS1/4-20*1/2	Set Screw	2
41	MBTSX-008	Left Table Gib	1
42	MBNUTM10	Hex. Nut	1
43	MBTSX-009	Stud	1
44	MBTSX-010	Gib Detent Plate	1
45	MBNUTM10	Hex. Nut	2
46	MBSHS0612	Socket Head Cap Screw	2
47	MBMD07	Servo Motor	1
48	MBNUTM06	Hex. Nut	4
49	MBKEY0530	Key	1
50	MBSSW5/16	Set Screw	3
51	MBPDL17	Motor Pulley	1
52	MBTSX-011	Saddle	1
53	MBSHS0630	Socket Head Cap Screw	2
54	MBTZ-3310	Travel Limit Switch	1
55	MBTSX-012	Travel Limit Switch Bracket	1
56	MBSHS0612	Socket Head Cap Screw	2
57	MBNUTM05	Hex Nut	2
58	MBTSX-013	Saddle Way Wiper	1
59	MBRHS0510	Round Head Socket Cap Screw	6
60	MBTSX-021	Left Lower Adj-Gib	1
61	MBTSX-014	Left Gib Plate	1
62	MBSHS1240	Socket Head Cap Screw	5
63	MB-3028	Gib Adj-Screw	2
64	MBTSX-015	Saddle Way Wiper	1

ITEM NO.	PART NO.	DESCRIPTION	QT'Y
65	MBRHS0510	Round Head Socket Cap Screw	6
66	MBTSX-016	Center Adj-Gib	1
67	MBTSX-014	Right/Lower Gib	1
68	MBTSX-017	Right/Lower Gib Plate	1
69	MB-3028	Gib Adj-Screw	4
70	MBSHS1240	Socket Head Cap Screw	5
71	MBTSX-018	Travel Limit Switch Bracket	1
72	MBNUTM05	Hex. Nut	2
73	MBTZ-3310	Travel Limit Switch	1
74	MBSHS0630	Socket Head Cap Screw	2
75	MBSHS0612	Socket Head Cap Screw	2
76	MBTSX-019	Right Table Gib	1
77	MBNUTM10	Hex. Nut	1
78	MBTSX-010	Gib Detent Plate	1
79	MBTSX-009	Stud	1
80	MBNUTM10	Hex. Nut	2
81	MBSHS0612	Socket Head Cap Screw	2
82	MBTSX-020	X Axis Bearing Seat	1
83	MBTP4#	Taper Pin	2
84	MBSHS1235	Socket Head Cap Screw	4
85	MBTVP7205B	Ball Bearing	2
86	MBCP7842	Bearing Retainer	1
87	MBSHS0615	Socket Head Cap Screw	3
88	MBCP4217	Spacer	1
89	MBSSW5/16	Set Screw	3
90	MBYSF-M25*1.5P	Lock Nut	1
91	MBTSX-021	Saddle Lock Plunger	8
92	MBSSW1/2	Set Screw	8

11-4. BED MILL Y AXIS SECTION

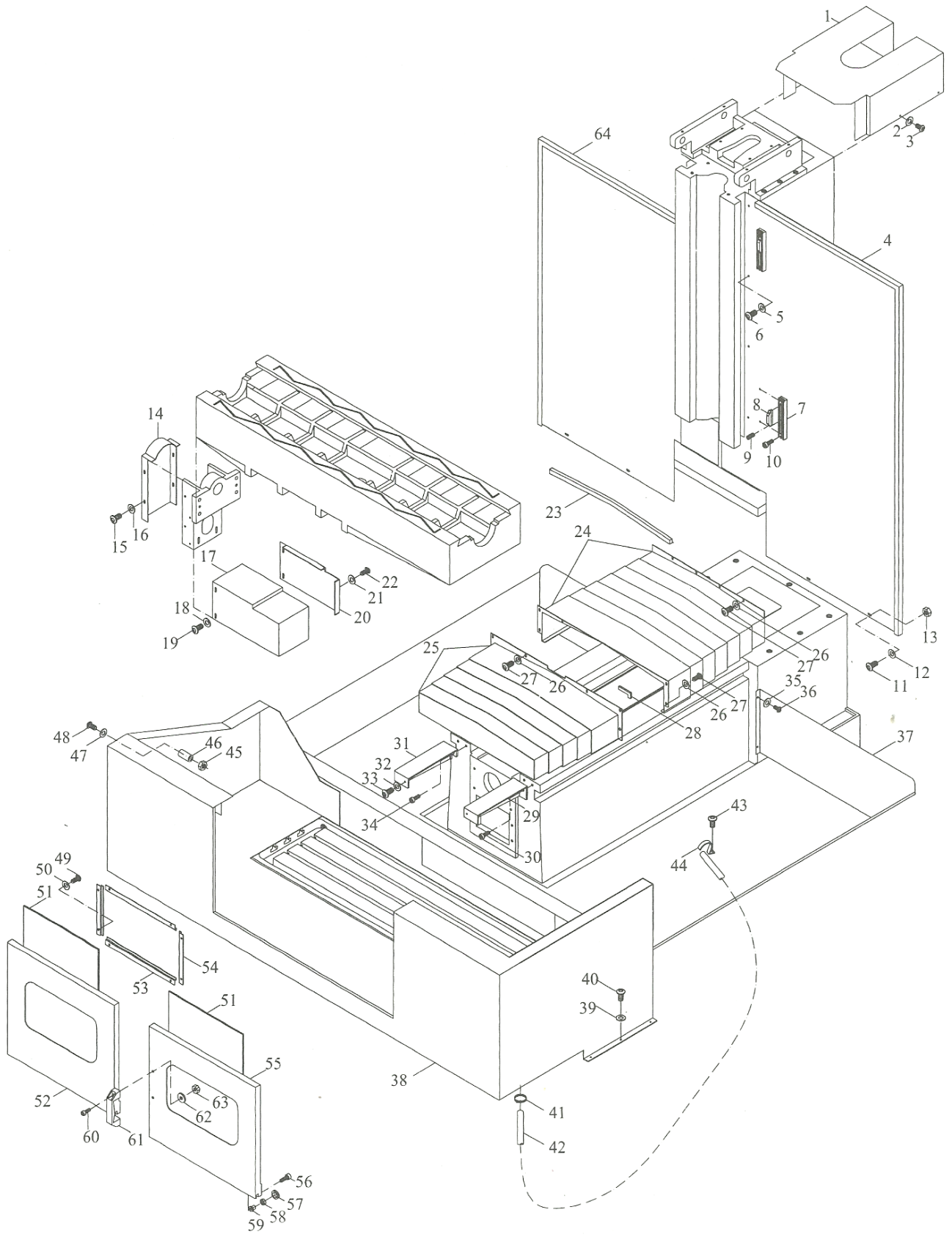


ITEM NO.	PART NO.	DESCRIPTION	QTY
1	MBBY-001	Machine Base	1
2	MBBY-002	Leveing Screw	6
3	MBBY-003	Nut	6
4	MBBY-004	Leveing Pad	6
5	MBCP-003	Special Set Screw	4
6	MBCP-002	Limit block	2
7	MBCP-001	Limit block Travel Rail	2
8	MBSHS0616	Socket Head Cap Screw	4
9	MBSMS-004	Filter	2
10	MBRD-001	Round HD Drive Screw	8
11	MBSHS0612	Socket Head Cap Screw	4
12	MBSS0610	Set Screw	4
13	MBSMS-005	Way Cover Bracket	1
14	MBSMS-006	Base Back Cover	1
15	MBWM08	Washer	8
16	MBSHS0610	Socket Head Cap Screw	8
17	MBSMS-007	Y Axis Way Cover Plate	1
18	MB1/2PT	Plug	1
19	MBSMS-008	Way Cover Bracket	1
20	MBSS0610	Set Screw	4
21	MBSHS0612	Socket Head Cap Screw	4
22	MBMD07	Servo Motor	1
23	MBKEY0530	Key	1
24	MBSHS0625	Socket Head Cap Screw	4
25	MBBY-004	Y Axis Motor Plate	1
26	MBWM08	Washer	4
27	MBSWM08	Spring Washer	4
28	MBSHS0825	Socket Head Cap Screw	4
29	MBPDL17	Motor Pulley	1
30	MBSSW5/16	Set Screw	3
31	MBSMS-009	Y Axis Motor Upper Cover Plate	1
32	MBWM06	Washer	2

ITEM NO.	PART NO.	DESCRIPTION	
33	MBSHS0610	Round Head Socket Cap Screw	2
34	MBSMS-010	Base Front Cover	1
35	MBWM06	Washer	4
36	MBSHS0610	Round Head Socket Cap Screw	4
37	MBSMS-011	Left Cover	1
38	MBWM06	Washer	6
39	MBSHS0610	Round Head Socket Cap Screw	6
40	MBSS0604	Set Screw	3
41	MBYSF-M25*1.5P	Nut	1
42	MBXYZ4217	Spacer	1
43	MBXYZ7842	Bearing Retainer	1
44	MBSHS0615	Socket Head Cap Screw	3
45	MBTVP7205B	Ball Bearing	2
46	MBBY-005	Y Axis Ball Screw Bracket	1
47	MBSHS0825	Socket Head Cap Screw	4
48	MBTP4#	Taper Pin	2
49	MBCZ-015	Spacer Plate	2
50	MBTSX-003	Ball Screw Nut Seat	1
51	MBSHS1225	Socket Head Cap Screw	4
52	MBTP4#	Taper Pin	2
53	MBBY-006	Y Axis Ball Screw W/Nut	1
54	MBSHS0612	Socket Head Cap Screw	5
55	MBKEY0620	Key	1
56	MBCZ-009	Bearing Seat	1
57	MBSHS1235	Socket Head Cap Screw	4
58	MBTP4#	Taper Pin	2
59	MBBST2562	Ball Bearing	2
60	MBTSX-007	Bearing Retainer	1
61	MBSHS0612	Socket Head Cap Screw	3
62	MBXYZ4217	Spacer	1
63	MBSS0604	Set Screw	3
64	MBTB5M550	Timing Belt	1

ITEM NO.	PART NO.	DESCRIPTION	QT'Y
65	MBPDL16	Ball Screw Pulley	1
66	MBTB5M550	Timing Belt	1
67	MBSS1/4-20*1/2	Set Screw	2
68	MBPDLT02	Pulley Sleeve	1
69	MBSMS-012	Y Axis Way Cover Plate	1
70	MBSMS-013	Y Axis Way Cover Plate	1
71	MBSMS-014	Y Axis Way Cover Plate	1
72	MBSMS-015	Y Axis Way Cover Plate	1
73	MBSMS-016	Y Axis Way Cover Plate	1
74	MBSMS-017	Y Axis Way Cover Plate	1
75	MBHC1/2	Hose Clamp	1
76	MB1/2PT1/2PE	Coolant Hose Connector	1
77	MB1/8HP*2P	Coolant Pump	1

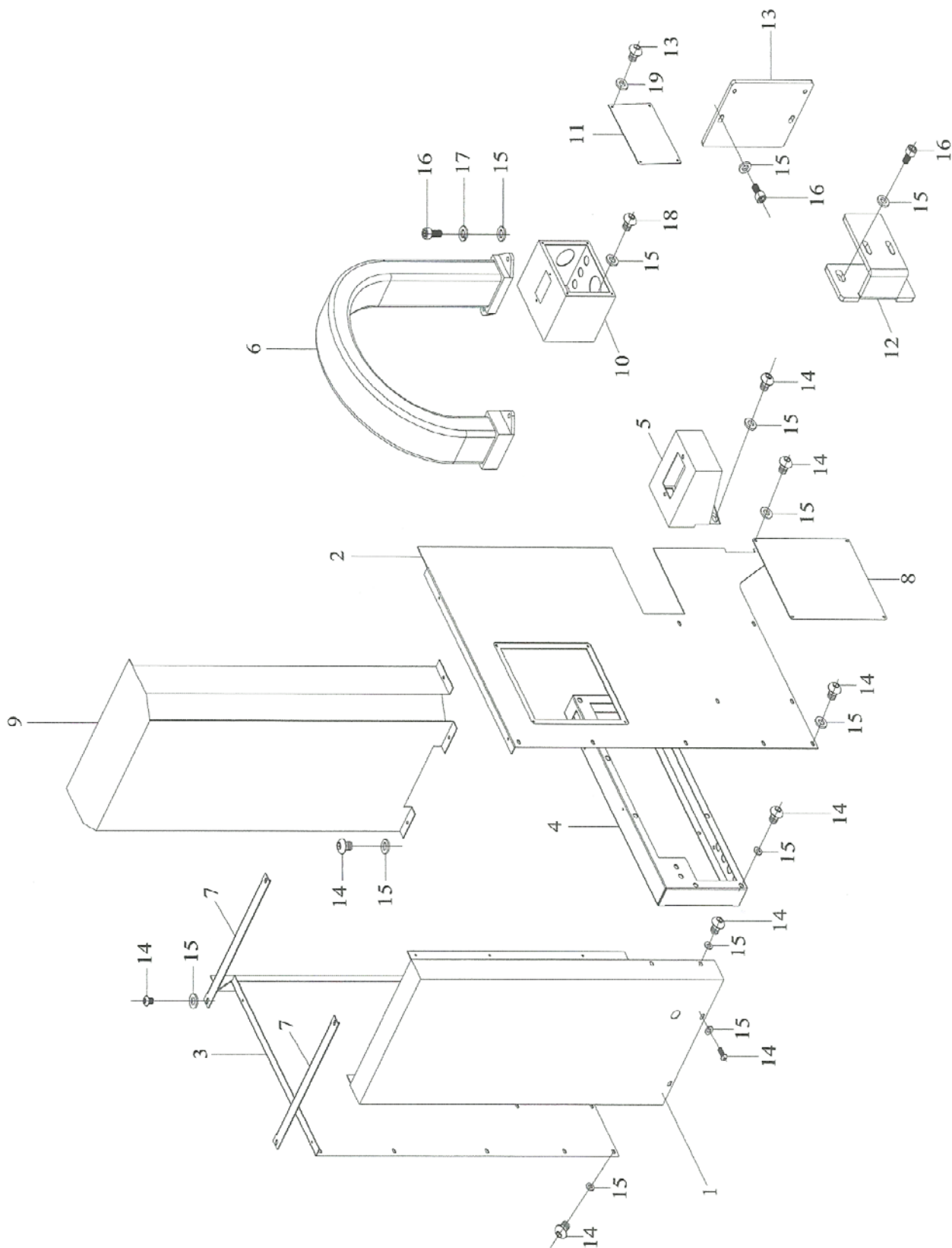
11-5. SHEETMETAL SECTION I



ITEM NO.	PART NO.	DESCRIPTION	QT'Y
1	MBSMS-016	Column Top Cover	1
2	MBWM06	Washer	10
3	MBRHS0608	Round Head Socket Cap Screw	10
4	MBSMS-019	Right Column Side Guard	1
5	MBWM06	Washer	6
6	MBRHS0608	Round Head Socket Cap Screw	6
7	MBCP-001	Limit Block	4
8	MBCP-002	Limit Block Travel Rail	2
9	MBCP-003	Special Set Screw	4
10	MBSHS1240	Socket Head Cap Screw	4
11	MBRHS0608	Round Head Socket Cap Screw	4
12	MBWM06	Washer	4
13	MBNUTM06	Hex Nut	4
14	MBSMS-023	X Axis Motor Bracket Cover	1
15	MBRHS0608	Round Head Socket Cap Screw	4
16	MBWM06	Washer	4
17	MCSMS-025	X Axis Motor Cover	1
18	MBWM06	Washer	2
19	MBRHS0608	Round Head Socket Cap Screw	2
20	MCSMS-026	X Axis Motor Side Cover	1
21	MBWM06	Washer	4
22	MBRHS0608	Round Head Socket Cap Screw	4
23	MBCP-004	Wiper Plate	10
24	MBCP-005	Back Way Cover	1
25	MBCP-006	Front Way Cover	1
26	MBWM06	Washer	16
27	MBRHS0608	Round Head Socket Cap Screw	16
28	MBCP-007	Plastic Guide	18
29	MBSMS-026	Right Way Cover Bracket	1
30	MBSHS1240	Socket Head Cap Screw	2
31	MBSMS-027	Left Way Cover Bracket	1
32	MBWM06	Washer	2

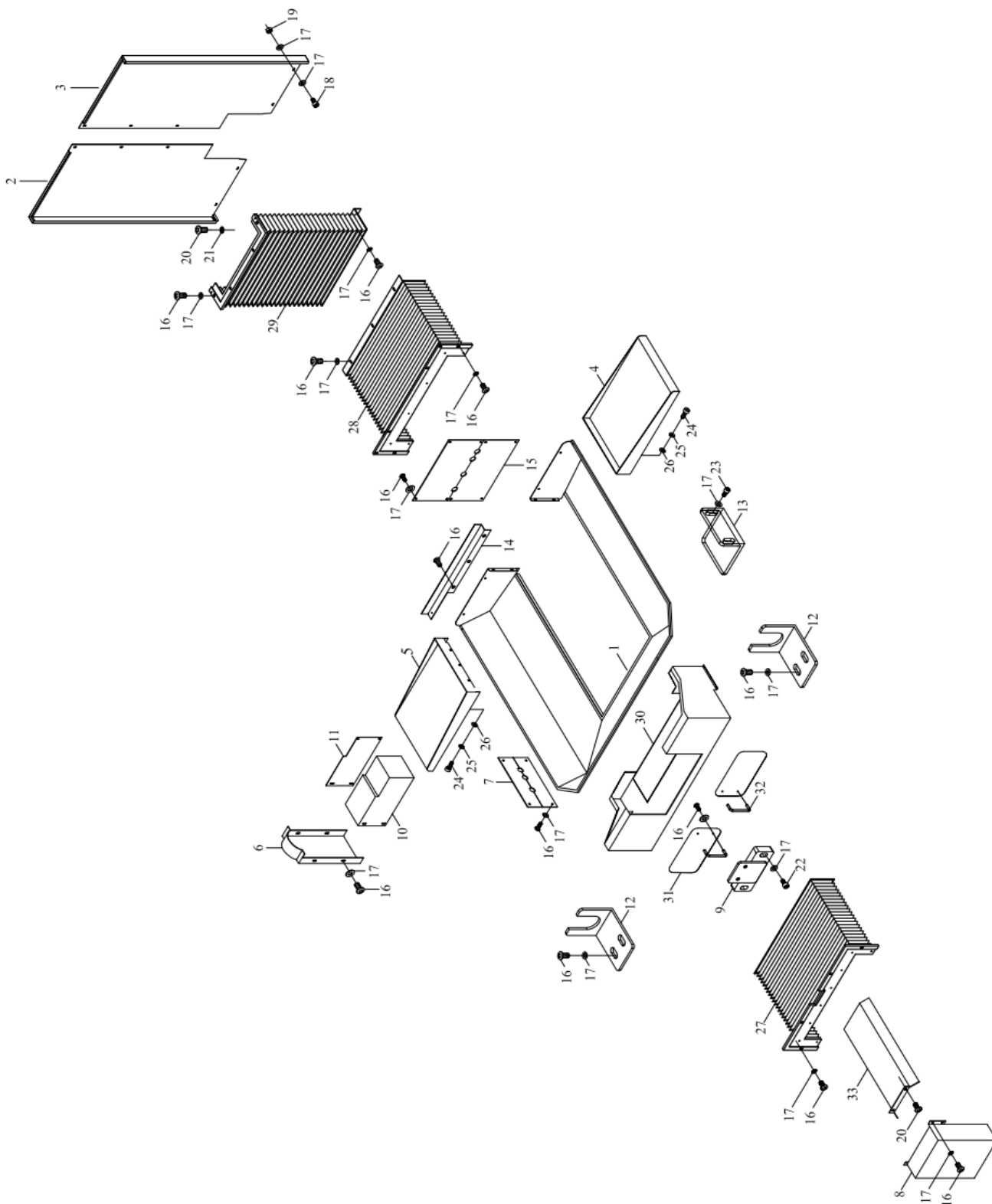
ITEM NO.	PART NO.	DESCRIPTION	QT'Y
33	MBRHS0608	Round Head Socket Cap Screw	2
34	MBSHS1240	Socket Head Cap Screw	2
35	MBWM06	Washer	4
36	MBRHS0608	Round Head Socket Cap Screw	4
37	MBSMS-028	Coolant Chip Pan	1
38	MBSMS-029	Table Splash Guard	1
39	MBWM06	Washer	25
40	MBRHS0608	Round Head Socket Cap Screw	25
41	MBCH1"	Hose Clamp	2
42	MBH1"	Hose	2
43	MBRHS0608	Round Head Socket Cap Screw	2
44	MBCP-008	Hose Set Clamp	2
45	MBNUTM06	Hex Nut	2
46	MBCP-009	PU Plastic	2
47	MBWM06	Washer	2
48	MBRHS0608	Round Head Socket Cap Screw	2
49	MBRHS0608	Round Head Socket Cap Screw	16
50	MBWM06	Washer	16
51	MBCP-010	Acrylic Board	2
52	MBSMS-030	Left Moving Door	1
53	MBSMS-031	Acrylic Cocating Plate Long	4
54	MBSMS-032	Acrylic Cocating Plate Short	4
55	MBSMS-033	Right Moving Door	1
56	MBSHS1240	Socket Head Cap Screw	6
57	MBCP-011	Roller Wheel	6
58	MB627	Bearing 627ZZCNM/1KT	6
59	MBCP-012	Special Nut	6
60	MBSHS0825	Socket Head Cap Screw	4
61	MCCB-002	Side Handle	2
62	MBWM08	Washer	4
63	MBNUTM08	Hex Nut	4
64	MCSMS-001	Left Column Side Guard	1

11-6. SHEETMETAL SPINDLE SECTION



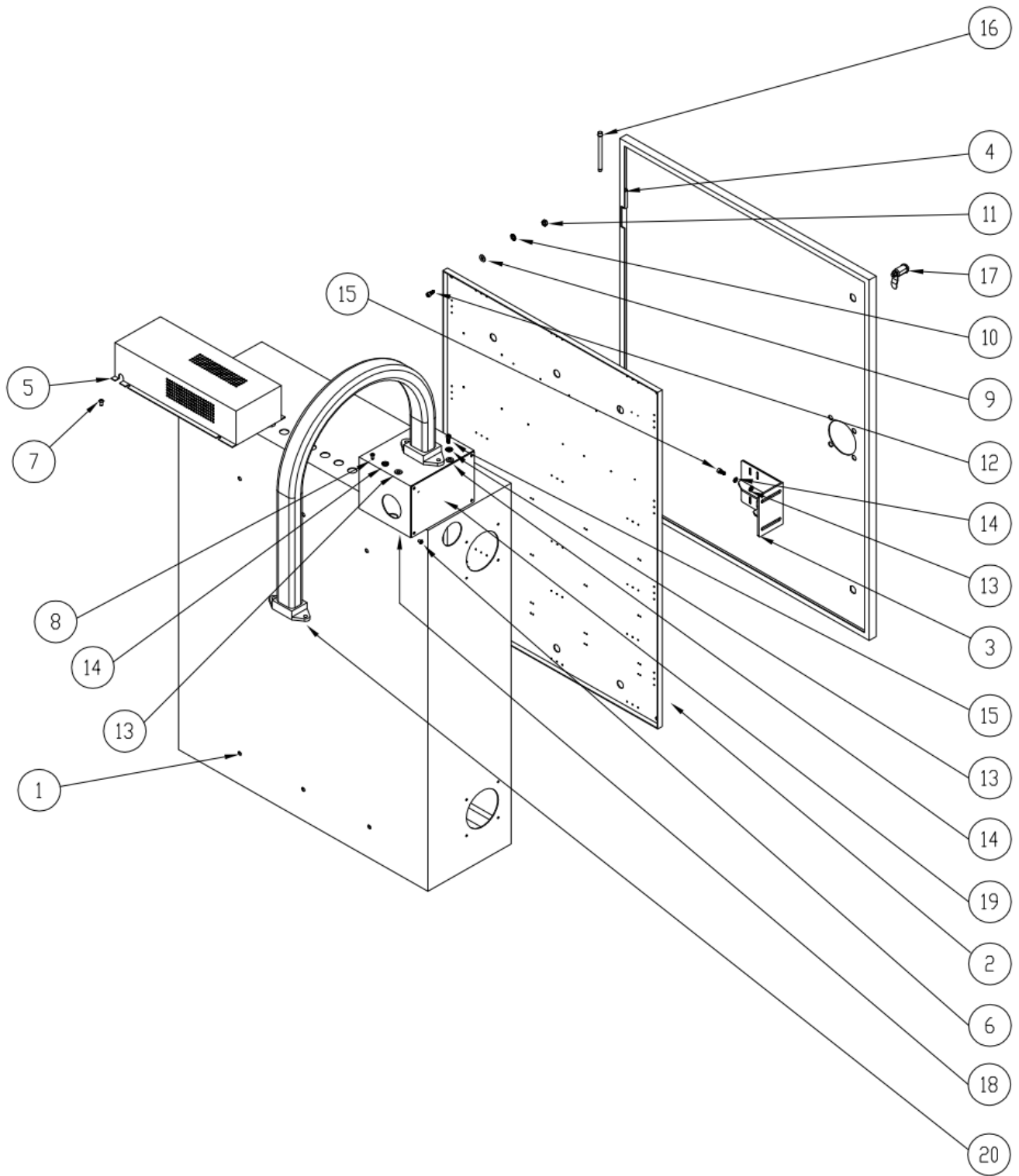
Item #	Part #	Description	QTY
1	EMC2240-01	Front Housing Connector Box	1
2	EMC2240-02	Right Housing Cover	1
3	EMC2240-05	Light Housing Cover	1
4	EMC2240-03	Housing Coolant Bracket	1
5	EMC2240-04	Head Housing Connector Box	1
6	ACU-SQ303II	Cable Protector Housing (SQ303II*KR100*1036L*NO8)	1
7	EMC2240-06	Top Housing Bracket	2
8	EMC2240-02-1	Right Housing Cover	1
9	MBSMS-022A	Upper Housing Cover	1
10	ACU-B09+	Electric Joint Box Main Body	1
11	ACER-B10+	Joint Box Cover	1
12	MBCZ-027	Z Axis Travel Limit Bracket	1
13	MBSMS-035	Z Axis Limit Block Travel Bracket	1
14		M6*10 Round Head Socket Cap Screw	50
15		M6 Washer	67
16		M6*16 Socket Head Cap Screw	8
17		M6 Spring Washer	4
18		M6*12 Round Head Socket Cap Screw	4
19		M6*8 Round Head Socket Cap Screw	4

11-7. SHEETMETAL SECTION II FOR ATM 1454+ AND BED MILL 1454II



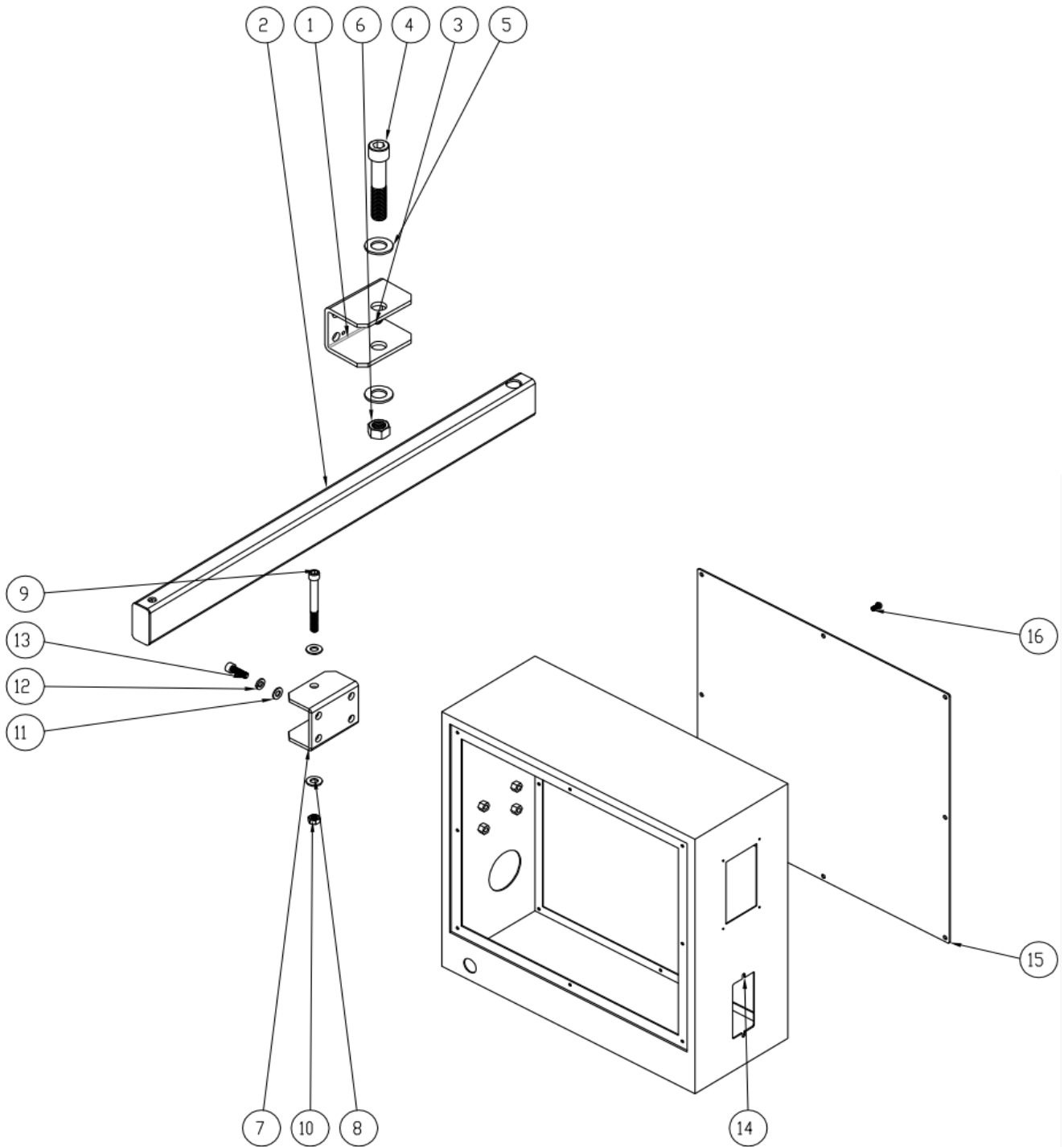
Item	Part#	Description	QTY
1.	ATM-028	Coolant Chip Pan	1
2.	ATM-019	Left Column Side Guard	1
3.	ATM-020	Right Column Side Guard	1
4.	MBSMS-001	Right Table End Cover	1
5.	MBSMS-002	Left Table End Cover	1
6.	MBSMS-023	X Axis Motor Bracket Cover	1
7.	MBSMS-004	Left Cover Set	1
8.	MBSMS-010	Base Front Cover	1
9.	MBSMS-012	X Axis Travel Limit Switch Bracket (Fagor)	1
10.	MBSMS-041	X Axis Front Cover	1
11.	MBSMS-042	X Axis Back Cover	1
12.	MBTSX-021	X , Y Wire Collection Tubing Bracket	2
13.	MBTSX-018	Y Axis Travel Limit Switch Bracket (Fagor)	1
14.	MBSMS-003	Guide Rail	1
15.	MBSMS-004	Base Back Cover Set	1
16.		M6*10 Round Head Socket Cap Screw	64
17.		M6 Washer	73
18.		M6*16 Socket Head Cap Screw	4
19.		M6*P1 Hex Nut	4
20.		M5*10 Round Head Socket Cap Screw	4
21.		M5 Washer	2
22.		M6*20 Socket Head Cap Screw	2
23.		M6*12 Socket Head Cap Screw	2
24.		M8*20 Socket Head Cap Screw	6
25.		M8 Spring Washer	6
26.		M8 Washer	6
27.	MPCP-006A	Y Axis Accordion Way Cover-Front	1
28.	MPCP-006A	Y Axis Accordion Way Cover-Back	1
29.	MBCZ-031A	Z Axis Accordion Way Cover-Lower One	1
30.	MBSMS-029C	Table Splash Guard	1
31.	MPCP-010A	Acrylic Board	2
32.	MCCB-002A	Side Handle	2
33.	MBSMS-009	Y Axis Motor Upper Cover Plate	1

11-8. ELECTRIC CABINET



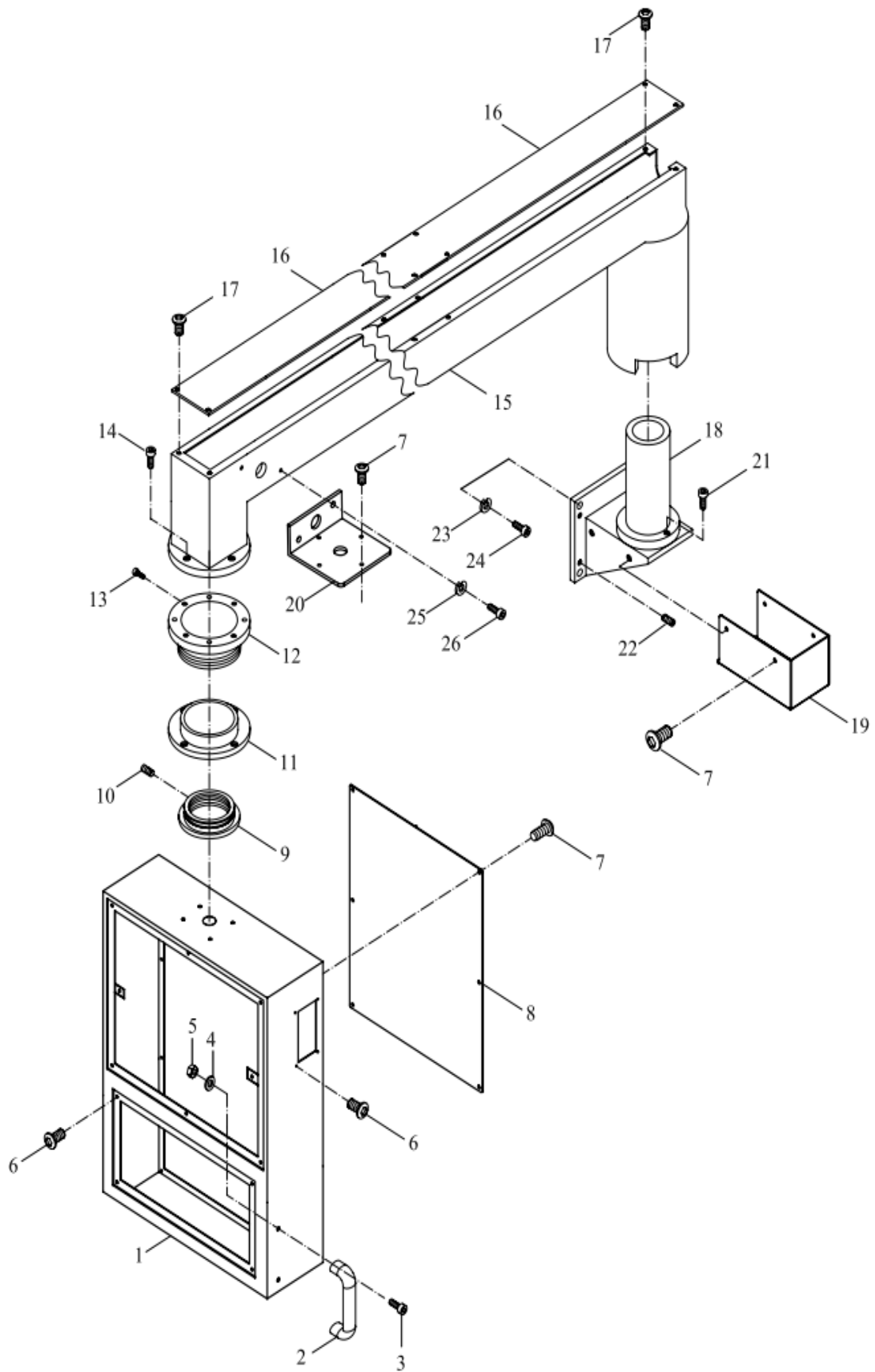
Item#	Part#	Description	QTY
1	ACU-A01FG	Electric Cabinet	1
2	ACU-A02FG	Electric Component Plate	1
3	ACU-A04	Power Switch Locating Bracket	1
4	ACU-A03FG	Electric Component Plate for Fagor Servo System	1
4	ACU-A03FA	Electric Component Plate for Fanuc Servo System	1
5	ACU-A14F	Bracket Resistor-Cover	1
6		B18.3.4M-5*0.8*8 SBHCH--C	4
7		B18.3.4M-6*1.0*12 SBHCH--C	4
8		B18.3.1M6*1.0*16 SBHCH--C	4
9		M8 Washer	6
10		M8 Spring Washer	6
11		M8 Hex Nut	6
12		B18.3.1M-8*1.25*30 SHCS--30CHX	6
13		B18.3.22M-Plan Washer , 6mm, narrow	6
14		M6 Spring Washer	6
15		M6*16 Socket Head Cap Screw	4
16	ACU-003	Hinge Roll Pin	2
17	ACU-004	Door Lock Set	2
18	ACU-B09	Electric Joint Box	1
19	ACU-B10	Electric Joint Box Cover	1
20	ACU-SQ303II	Cable Protector Housing(SQ303II*KR100*NO8)	1

11-9. CONTROL ARM ASSEMBLY FOR ATM-1454II/ATC 1454 FAGOR CONTROL



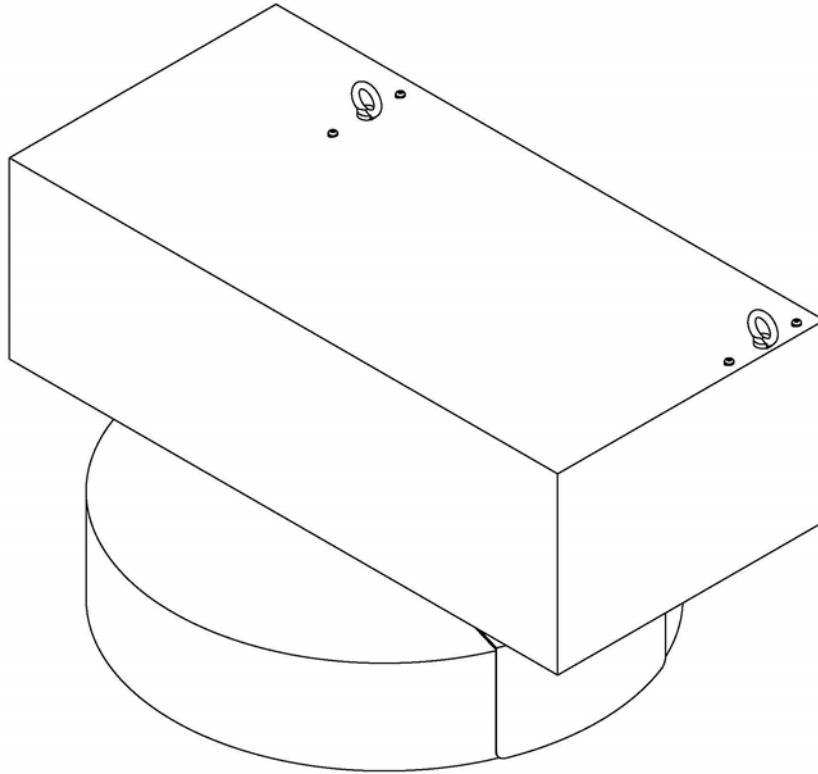
Item #	Part #	Description	QTY
1	ACER-B1-F001	Control Arm Locating Bracket-Column Side	1
2	ACER-B1-F002A	Control Arm for Fagor Control	1
3		3/4" x 4" Socket Head Cap Screw	1
4		M20 Flat Washer	1
5		3/4" Hex Nut	1
6	ACER-B1-F003	Control Arm Locating Bracket-Panel Side	1
7		M10 Flat Washer	2
8		3/8" x 16UNC x 88.9 Socket Head Cap Screw	1
9		3/8" x 16UNC Hex Nut	1
10		M8 Flat Washer	4
11		M8 Spring Washer	4
12		M8 x 1.25 x 25 Socket Head Cap Screw	4
13	ACER-B1-F004	Control Box	1
	ACER-B1-F004F	Control Box for Fagor Control	1
14	ACER-B1-F005	Control Box Cover	1
15		M5 x 0.8 x 12 Round Head Socket Cap Screw	8
16	ACU-010	Handle Hinge 508	1
17	AM-M4-C	Screw Nut	2
18		M10 Spring Washer	4
19		M10 x 1.5 x 30 Socket Head Cap Screw	4

11-10. CONTROL ARM ASSEMBLY FOR ATM-1454II/ATC 1454 FANUC CONTROL



Item #	Part #	Description	QTY
1.	MVBCV-024A	Control Box	1
2.	ECCB-002	Side Handle	1
3.	MBSHS0825	Socket Head Cap Screw	2
4.	MBWM08	Washer	2
5.	MBNUT08	Hex Nut	2
6.	MBRSH0410	Round Head Socket Screw	16
7.	MBRSH0510	Round Head Socket Screw	14
8.	MVBCV-025A	Back Cover	1
9.	MBVCB-012A	Bracket Ring Adaptor	1
10.	MBSS0806	Set Screw	1
11.	MVBCV-02A	Box Ring Adaptor	1
12.	MVBCV-03A	Control Arm Ring Adaptor	1
13.	MBSHS0825	Socket Head Cap Screw	1
14.	MBSHS0620	Socket Head Cap Screw	4
15.	MBVCB-015A	Control Arm	1
16.	MBVCB-016A	Arm Cover	1
17.	MBRSH0610	Round Head Socket Screw	6
18.	MBVCB-020A	Connector Bracket	1
19.	MBVCB-026A	Connector Bracket Cover	1
20.	MBVCB-027A	Bracket of Warning Light	1
21.	MBSHS0820	Socket Head Cap Screw	1
22.	MBSS0810	Set Screw	4
23.	MBWM10	Spring Washer	4
24.	MBSHS1025	Socket Head Cap Screw	4
25.	MBSWM6	Spring Washer	2
26.	MBSHS0610	Socket Head Cap Screw	2

Ya-Gin Machine Tool Manufacturing, Inc.



#40 UMBRELLA TYPE AUTOMATIC TOOL CHANGER

HYG-408/412

AUTOMATIC TOOL CHANGER

OPERATION MANUAL

No. 101, 506 Lane, Shen-Tso Rd. ,Shen Karng District, Taichung City, 429 Taiwan.

Tel: 886-4-2520-4120

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E-mail: info@acerlinks.com

Website: www.acerlinks.com

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#40 UMBRELLA TYPE AUTOMATIC TOOL CHANGER HYG-408/412 OPERATION MANUAL

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DIMENSIONAL DRAWING.....	64
PARTS LIST.....	67
ELECTRIC CONTROL AND AIR COMPRESSOR UNIT....	75

**#40 UMBRELLA TYPE
AUTOMATIC
TOOL CHANGER
HYG-408/412
OPERATION MANUAL**

MECHANICAL SPECIFICATION

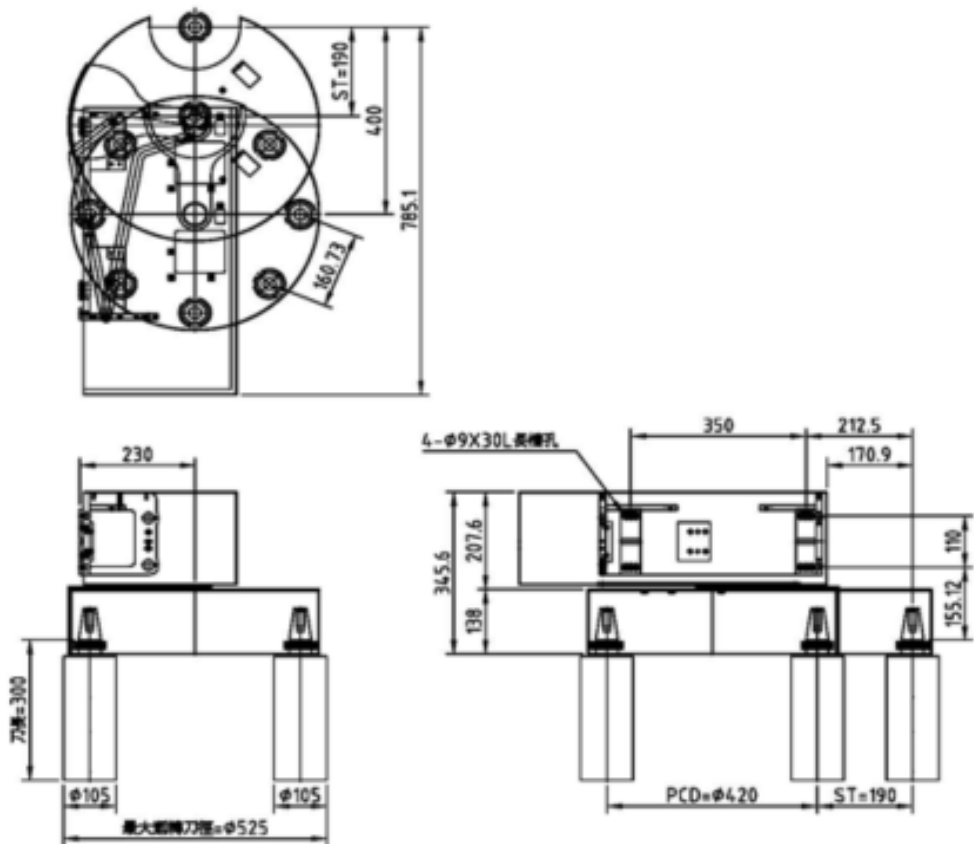
1.	Number of Tools	8	12
2.	Max. Tool Weight	8 kgs/17.6 lbs	8 kgs/17.6 lbs
3.	Max. Tool Diameter	105mm(4.13") / 160mm(6.30")	105mm(4.13")/ 160mm(4.30")
4.	Max. Tool Length	300mm(11.81")	300mm(11.81")
5.	Tool to Tool	1.35sec (60HZ)	1.35sec (60HZ)
6.	Pattern of Selecting Tool Holder	Bi-directional Random Select	Bi-directional Random Select
7.	Input Voltage	AC220V3Ø 60HZ /380V 3Ø 50HZ	AC220V3Ø 60HZ /380V 3Ø 50HZ
8.	Source of Pressure	5~6Kg/cm ² (71.12~85.34psi)	5~6Kg/cm ² (71.12~85.34psi)

DIMENSIONAL DRAWING

ACER

Customer Confirmation Figure	客戶 Customer	機種 Machine Model
刀庫型式 Magazine Spec.	HGY-408 (#40 x 8T)	卸刀分割時間 Mag. Indexing Time
刀套規格 Pocket Spec.	BT40,CAT40,DIN40	50Hz 1.6 sec
刀盤直徑 Cutter Diameter	420 mm	60Hz 1.35 sec
刀庫淨重 Magazine Weight	KG	氣缸往復時間 Cylinder Redracting Time
		2.0 sec
		最大刀徑 Maximum Tool Dia.
		MAX: $\phi 105$
		刀具重量 Tool Weight (Kgf)
		MAX: 8
		TOTAL: 64

客戶編號	銘額編號	品名	刀套	刀臂	電壓	頻率	顏色



配件表 Accessories

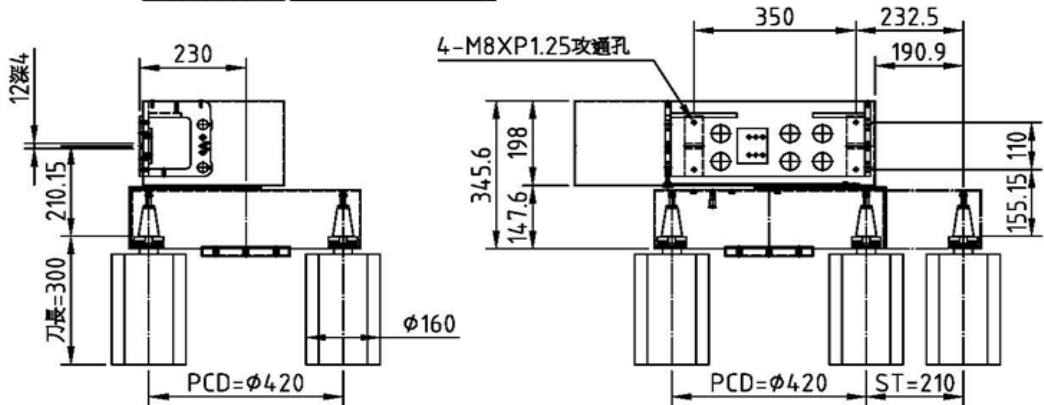
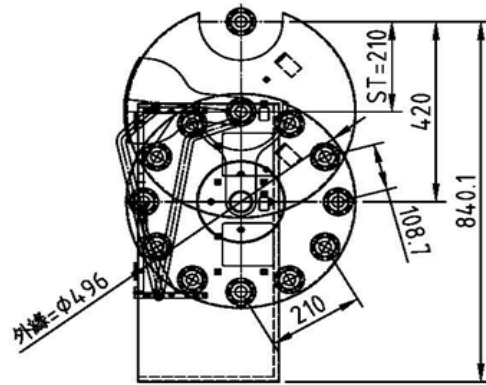
1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

客戶確認 Customer Confirm: _____ 繪圖者 Designer: _____
 確認日期 Confirm Date: _____ 繪圖日期 Draw Date: _____

ACER

Customer Confirmation Figure		客戶 Customer	機種 Machine Model	
刀庫型式 Magazine Spec.	HYG-412 (40# X 12T)		鄰刀分割時間 Mag. Indexing Time	50Hz 1.6 sec 60Hz 1.35 sec
刀套規格 Pocket Spec.	BT40		氣缸往復時間 Cylinder Reciprocating Time	2.0 sec
刀盤直徑 Cutter Diameter	420 mm (210L)		最大刀徑 Maximum Tool Dia.	MAX: $\phi 105 / \phi 160$
刀庫淨重 Magazine Weight	KG		刀具重量 Tool Weight (Kgf)	MAX: 8 TOTAL: 96

客戶編號	錠類編號	品名	刀套	刀臂	電壓	頻率	顏色

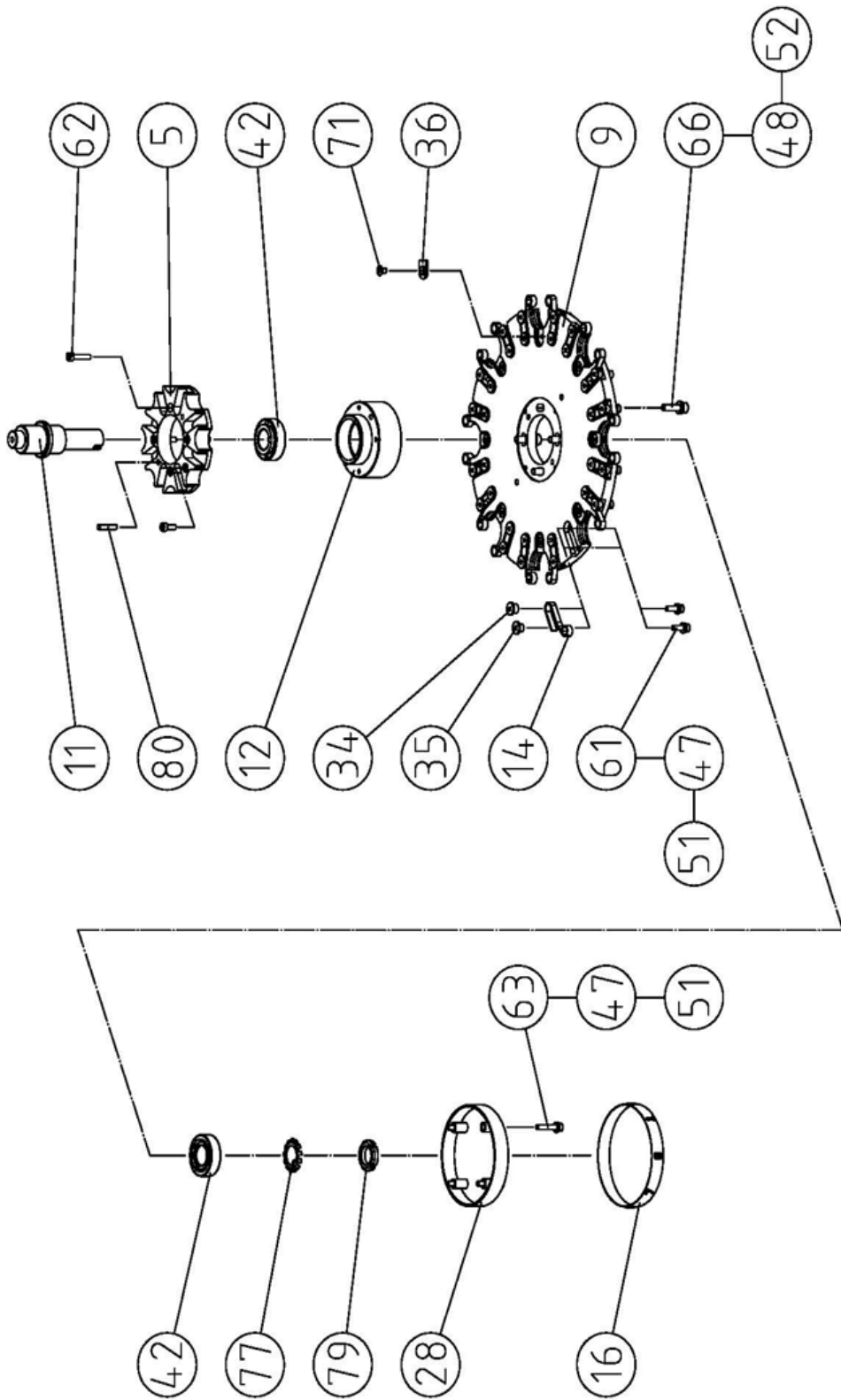


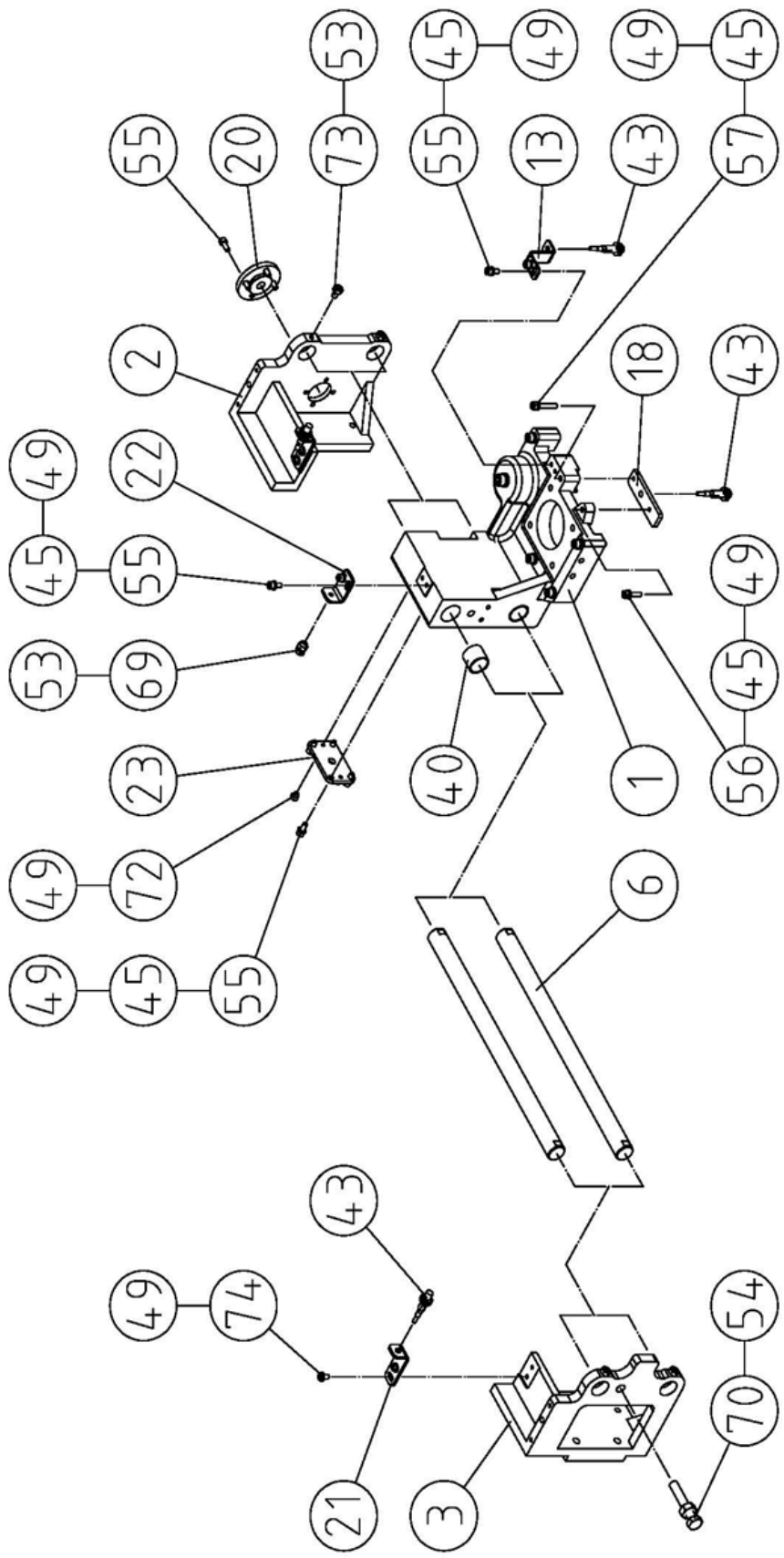
配件表 Accessories

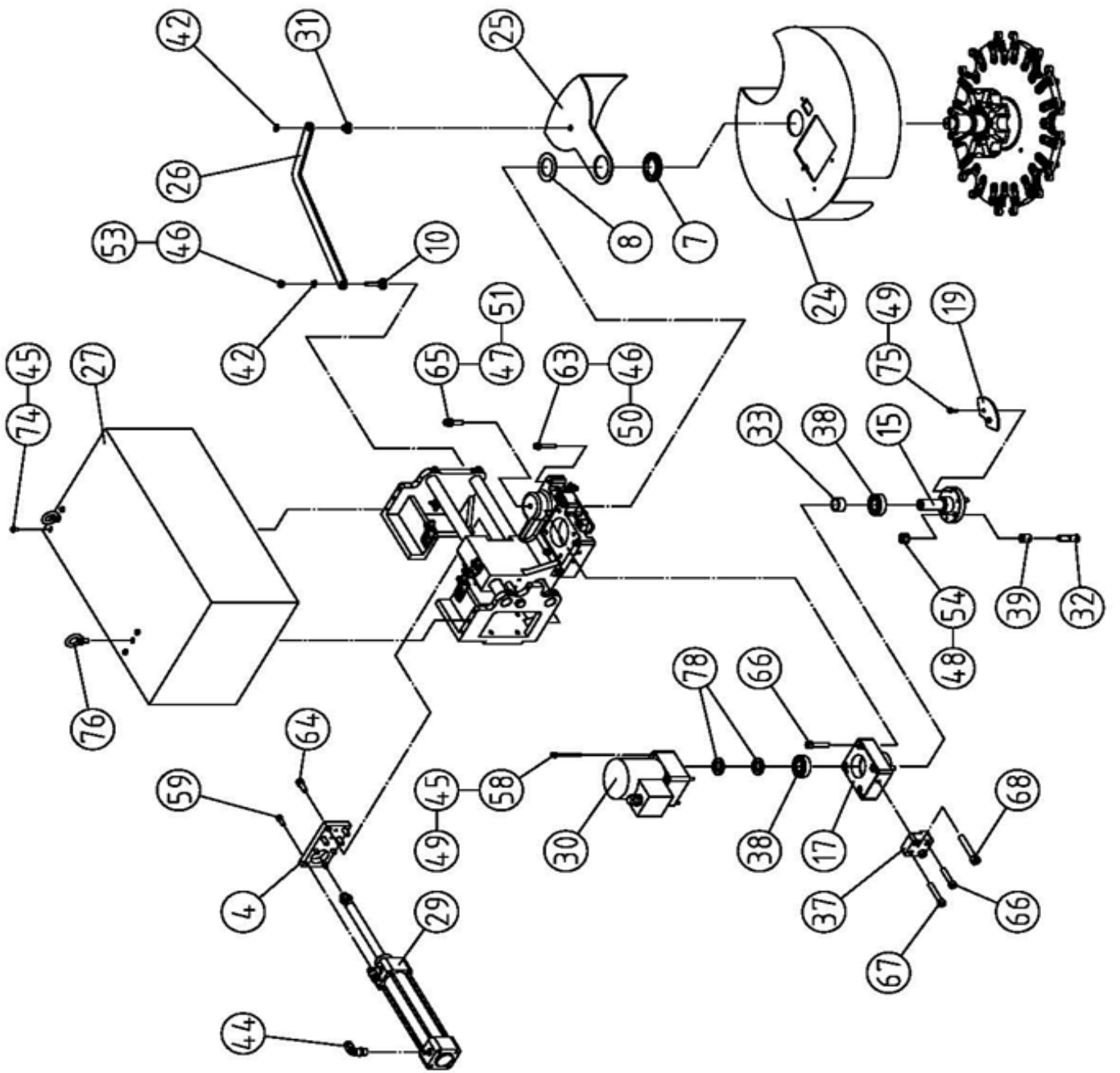
1.	7.
2.	8.
3.	9.
4.	10.
5.	11.
6.	12.

客戶確認 Customer Confirm: _____ 繪圖者 Designer: _____
 確認日期 Confirm Date: _____ 繪圖日期 Draw Date: 2017.11.10

PARTS LIST







		HYG-412/408	ASSEM.PART NO.		
		2013.08.01	ASSEM.DWG. NAME	(UMBRELLA TYPE)	
NO.	PART NO.	DESCRIPTION	SPECIFICATION /MATERIAL	QTY	REMARK
1	GA-31000010	Slide rest body 8T	FC25	1	
	GA-41000050	Slide rest body 12T	FC25	1	
2	GA-31000020	Fixed body (right)	SS41	1	
3	GA-31000030	Fixed body (left)	SS41	1	
4	GA-32000010	Air cylinder fixed plate 8T	SS41	1	
	GA-42000320	Air cylinder fixed plate 12T	SS41	1	
5	GA-32000020	Dividing dial 8T	SS41	1	
	GA-42000310	Dividing dial 12T	SS41	1	
6	GA-32000030	Slider 8T	Chrome plated shaft	2	Travel 150mm
	GA-32000270	Slider 12T	Chrome plated shaft	2	Travel 190mm
7	GA-32000040	Rod pad	Plastic steel	1	
8	GA-32000050	Rod flake	Plastic steel	1	
9	GA-32000060	Disk CAT40-8T	Aluminum 5052	1	BT Opt.
	GA-42000300	Disk CAT40-12T	Aluminum 5052	1	BT Opt.
10	GA-32000070	Pull rod fixed axis	SS41	1	
11	GA-32000080	Disk rod 8T	S45C	1	
	GA-32000220	Disk rod 12T	S45C	1	
12	GA-32000090	Bearing seat 8T	S45C	1	
	GA-32000230	Bearing seat 12T	S45C	1	
13	GA-32000100	Origin proximity fixed plate	SPHC	1	
14	GA-32000110	Tool spring 8T	SWP	16	
	GA-42000120	Tool spring 12T	SWP	16	
15	GA-32000120	Disk driveshaft 8T	S45C	1	
	GA-42000350	Disk driveshaft 12T	S45C	1	
16	GA-32000130	Nameplate(8T)	AL	1	
	GA-42000360	Nameplate(12T)	AL	1	
17	GA-32000140	Motor holder 8T	FC25	1	
	GA-42000340	Motor holder 12T	FC25	1	
18	GA-32000150	Proximity sensor holder	SPHC	1	
19	GA-32000170	Fixed position piece	SPHC	1	
20	GA-32000180	Air cylinder fixed holder	SS41	1	

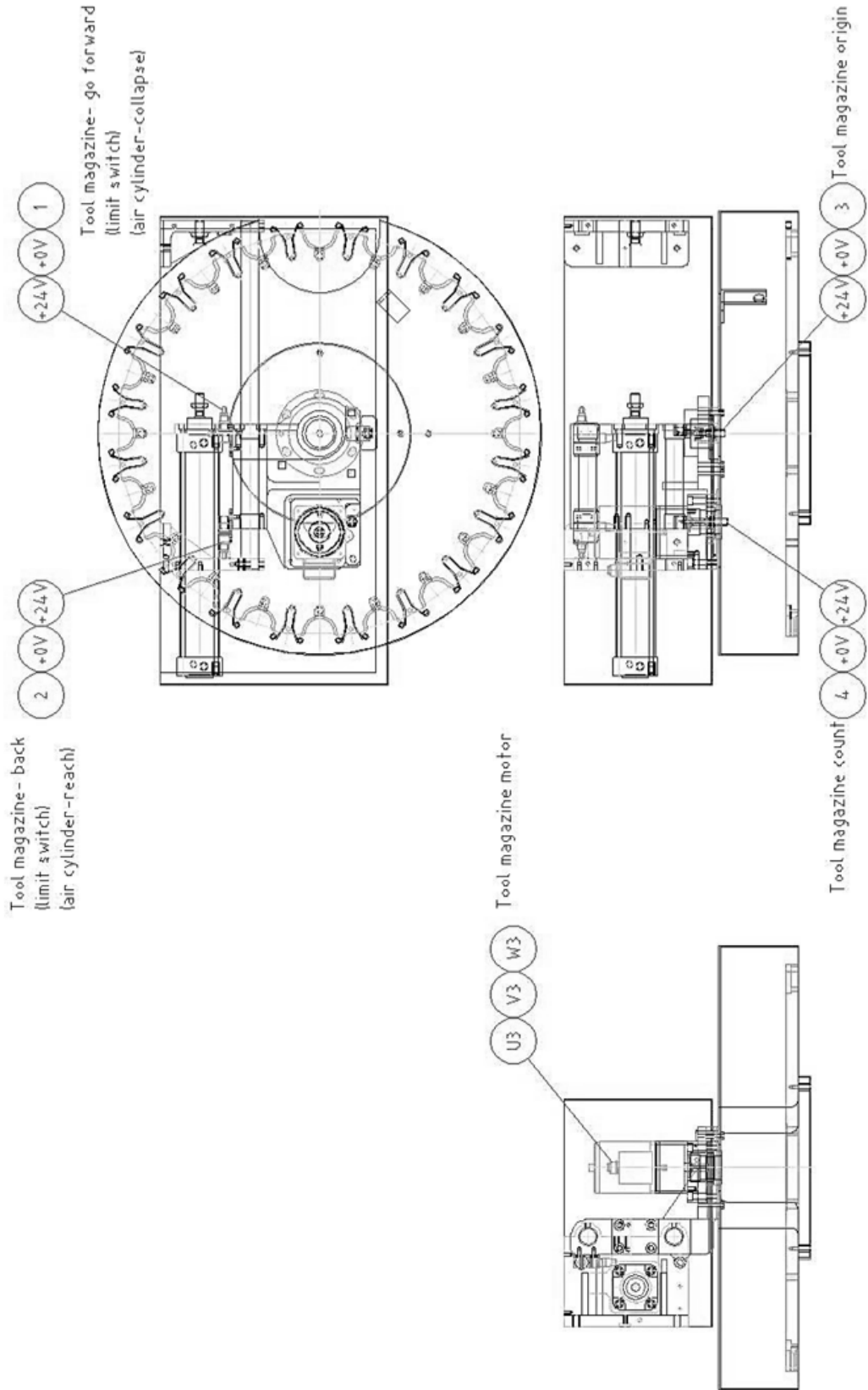
		HYG-412/408	ASSEM.PART NO.		
		2013.08.01	ASSEM.DWG. NAME	(UMBRELLA TYPE)	
21	GA-32000190	Magnetic reed switch fixed holder 1	SPHC	2	
22	GA-32000200	Magnetic reed switch fixed holder 2	SPHC	1	
23	GA-32000210	Body flange	SPHC	2	
24	GA-34000010	Round tool cover 8T	SPHC	1	
	GA-44000190	Round tool cover 12T	SPHC	1	
25	GA-34000020	Dodge gate cover	SPHC	1	
26	GA-34000030	Dodge gate pull rod	SPHC	1	
27	GA-34000040	Tool magazine cover 8T	SPHC	1	
	GA-44000180	Tool magazine cover 12T	SPHC	1	
28	GA-34000050	Number card cover 8T	SPHC	1	
	GA-44000210	Number card cover 12T	SPHC	1	
29	GA-36000010	Air cylinder 8T	MCQV2-11-50-150	1	Travel 150mm
	GA-46000090	Air cylinder 12T	MCQV2-11-50-190M	1	Travel 190mm
30	GA-36000060	Mini motor gear reducer 8T	CGMT25-B06(25W/1:25)	1	
	GA-36000170	Mini motor gear reducer 12T	CGMT36-B06(36W/1:36)	1	
31	GA-42000060	Kier door fixed axis	SPHC	1	
32	US-42000050	Bushing rod	SCM440	1	
33	US-42000080	Spacer ring	S45C	1	
34	US-42000090	Spring pin bush	S45C	16	
35	US-42000100	Spring pin bush	S45C	16	
36	US-42000150	Key	SPHC	8	
37	ZA-41000020	Adjusted piece	SS41	1	
38	BA0006004ZZ	Deep groove ball bearing	6004ZZ	2	
39	BF012016165	bushing	IKO IRT-1216-1	1	
40	BL022025020	Self lubricating bearing	Ø30xØ34x20L	4	LFB-2220
41	BN000032205	Roller bearing	32205	2	
42	CA000000S10	“C” snap ring	S-10	2	

		HYG-412/408	ASSEM.PART NO.	(UMBRELLA TYPE)	
		2013.08.01	ASSEM.DWG. NAME		
43	EA000000005		E2E-X1R5F1	4	
44	JA008000104	90°quick coupling	Ø8-1/4"	2	
45	WA000000005	Spring washer	M5	24	
46	WA000000006	Spring washer	M6	41	
47	WA000000008	Spring washer	M8	5	
48	WA000000010	Spring washer	M10	1	
49	WB000000500	Flat washer	M5	26	
50	WB000000600	Flat washer	M6	40	
51	WB000000800	Flat washer	M8	5	
52	WC005080050	Hex. nut	M5XP0.8X4T	4	
53	WC006100050	Hex. nut	M6XP1.0X5T	6	
54	WC010015080	Hex. nut	M10XP1.5X8T	2	
55	WD005008012	Hex. socket head screw	M5XP0.8X12L	16	
56	WD005008020	Hex. socket head screw	M5XP0.8X20L	1	
57	WD005008030	Hex. socket head screw	M5XP0.8X30L	1	
58	WD005008060	Hex. socket head screw	M5XP0.8X60L	4	
59	WD006010016	Hex. socket head screw	M6XP1.0X16L	5	
60	WD006010020	Hex. socket head screw	M6XP1.0X20L	32	
61	WD006010030	Hex. socket head screw	M6XP1.0X30L	4	
62	WD006010035	Hex. socket head screw	M6XP1.0X35L	4	
63	WD006010040	Hex. socket head screw	M6XP1.0X40L	4	
64	WD008125020	Hex. socket head screw	M8XP1.25X20L	4	
65	WD008125030	Hex. socket head screw	M8XP1.25X30L	5	
66	WD008125040	Hex. socket head screw	M8XP1.25X40L	6	
67	WD008125050	Hex. socket head screw	M8XP1.25X50L	1	
68	WD010015060	Hex. socket head screw	M10XP1.5X60L	2	
69	WE06010012A	Hex. head screw	M6XP1.0X12L	1	
70	WE10015060A	Hex. head screw	M10XP1.5X60L	1	
71	WF006010010	Flat head screw	M6XP1.0X10L	8	
72	WG005008010	Set screw	M5XP0.8X10L	4	
73	WG006010016	Set screw	M6XP1.0X16L	4	
74	WH005080010	Oval socket head screw	M5XP0.8X10L	8	
75	WH005080016	Oval socket head screw	M5XP0.8X16L	2	
76	WK000000008	Hand ring	M8	2	
77	WL00000AW05	Bearing lock washer	AW05	1	
78	WM00000AN04	Bearing lock nut	AN04 M20xP1.0	2	

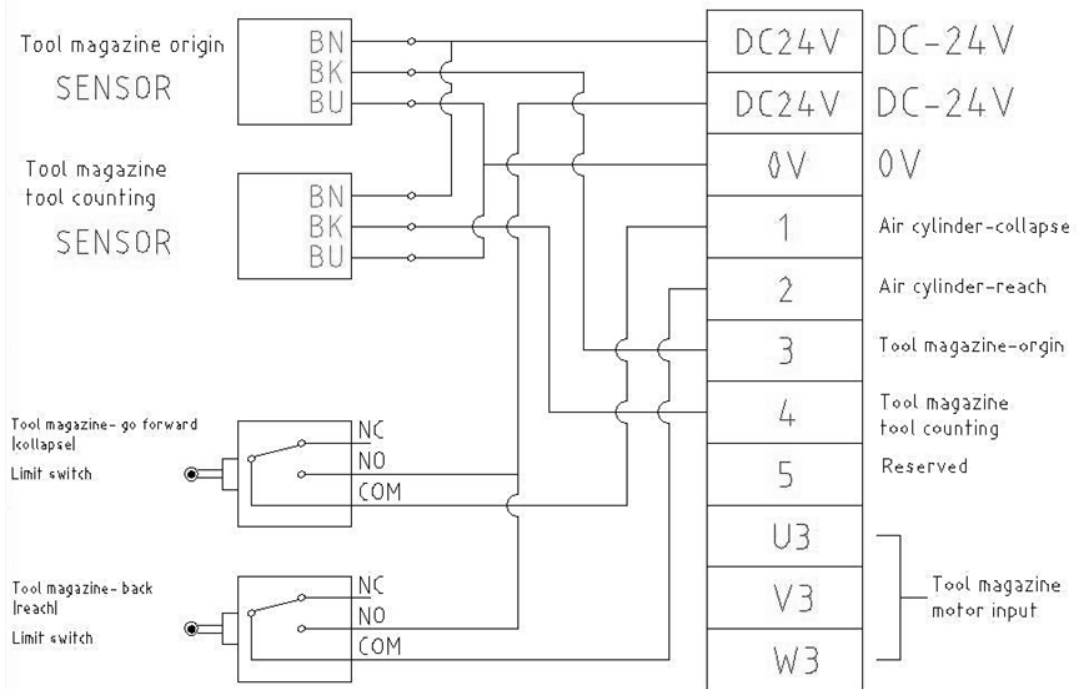
		HYG-412/408	ASSEM.PART NO.		
		2013.08.01	ASSEM.DWG. NAME	(UMBRELLA TYPE)	
79	WM00000AN05	Bearing lock nut	AN05 M25xP1.5	1	
80	XD000006030	Straight pin	Ø6x30L	2	

**ELECTRIC CONTROL
AND
AIR COMPRESSOR UNIT**

EXPLANATION DRAWING OF CONTROL ELEMENT LOCATION



WIRING DIAGRAM FOR #50 DRUM & UMBRELLA TYPE TOOL MAGAZINE



CIRCUIT DIAGRAM OF PRESSURE

