



**TW-40/50MCO
CNC Bed Mill**

Operation and Parts Manual



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【Chapter 1 safety instruction】

1-1 The basic condition of safety performance

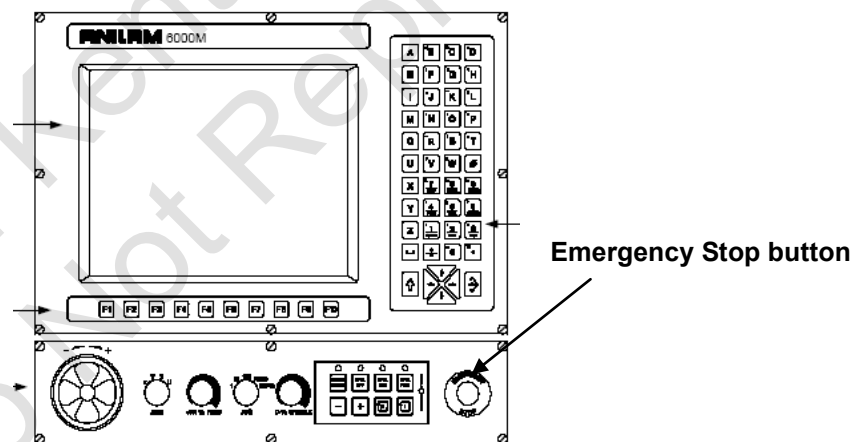
Please obey exactly the five basic conditions below:

1. Only the person whose ability is confirmed or the qualified person can be equipped with the job of operation or maintenance:

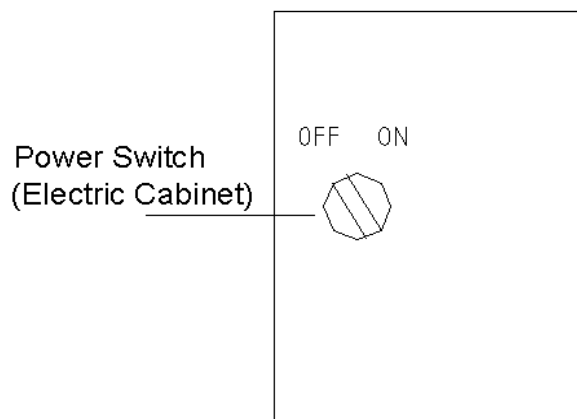
The qualified person must accept the suitable training in order to understand the safety precaution and maintenance of the machine, meanwhile, as to the safety control field, his (or her) capability must be qualified. Especially for the electro-maintenance, the charged person has to have the experiences and capable of this job. Meanwhile, he must be familiar with the safety standards and official regulations.

2. Before operating the machine, the person must pay highly attention on the safety instructions in every individual part; it includes the detail procedure of operation, program and maintenance.
3. The machine operator and maintenance person must be familiar with the position and function of the "Emergency Stop" button.

Operation panel



Before maintenance, or any emergency situations, please turn this knob to **OFF** position.

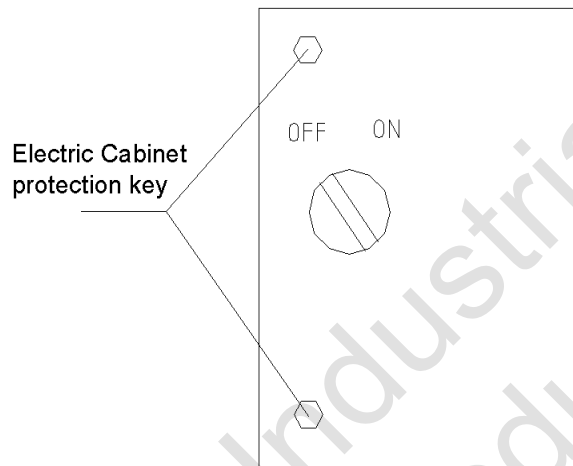


4. The safety key needs to be stored by pointed person.

This machine is equipped with two safety keys in order to protect the memory in the controller, and prevent the cabinet's door opened without permitting.

(1) Electric cabinet protection key:

This key protects the electric cabinet that could not be opened without authorizing.



5. All of this machine's operation manuals should be kept in a convenience place. If the operation manual's contents or words are too muddy to read, please contact the agent and inform him (or her) the model of yours machine.

1-2.Safety prevention

Safety prevention instruction:

This machine is equipped with many safety devices in order to prevent the injury of the operator and the damage of machine parts. Therefore, the operator must completely understand the safety prevention instruction below:

1-2-1. The basic operation practice

Our milling machine possess the potential danger as follows: specific control buttons, transformer, motor, circuit combination box, high-voltage connector etc. Please do not touch the dangerous objects.

1. 【 Warning 】

1. Please do not touch the control button with wet hand.
2. The operator must be familiar with the position of Emergency Stop button in case of the emergent situation happens.
3. When replacing the fuse, the main power must be turned off.
4. Please preserve enough working space, and prevent the falling of tool and work-piece.
5. Please keep the cleaning of the working field. The coolant, oil, chips must be cleaned any time in order to prevent the slip.

6. When operating, please make sure the button is what you're going to push.
7. If there are two or more than two people operating the machine in the same time, these people have to be will-trained, and these people have to build good communication before operating the machine in case of the accident happened.

2. 【 Attention 】

1. When the power of this machine is malfunction, please turn off the main power immediately.
2. Please use the recommended lubricating oil.
3. The fuse should be replaced with the general, and common fuse.
4. Preventing the NC unit, control box, electro box ... etc from leak of electricity in case of the malfunction.
5. Do not modify the computer setting, and storage capacity arbitrarily. Please save the original data as a back up file before making a modification.
6. The warning plate must be kept clean, when it is not clear enough, please replace the plate. Remember to make a mark below of the warning plate in order to avoid the wrong installation.

1-2-2. Before starting the machine

Before starting, make sure the power supply is grounded correctly and exactly.

Hazard objects :

Before operating, please inspect all the ropes, slings, and electric wires are in the correct position in order to prevent the pulling, pushing, or entanglement of wires and the electricity leakage, or any dangers of the machine.

1. 【 Warning 】

1. Please make sure the operator understanding all the instructions, being familiar with every function and working procedure.
2. Please wear the anti-slip boots, and the security clothing.
3. Please make sure all the safety doors and guards that are protected the NC unit, controller, electric cabinet... etc. being closed.

2. 【 Attention 】

1. The electric wires must be fixed on the floor and isolated by insulation sleeves in order to prevent the chips damage the wire's insulation and the shortcut.
2. Before operating the machine that didn't operate for a long time, or a new machine, please make sure the slide ways are well - lubricated.
3. Please fill up all the oil containers in each part.
4. Please lubricate each pointed point, use the recommended lubricating oil and maintain the suitable oil volume in accordance with the instructions on the nameplate.
5. Please inspect each button and handle operating smoothly.
6. Please inspect the coolant volume.

7. Please make sure the power supply switch of the factory, the main power switch of the machine, and main circuit switch are turned to "ON" position.

1-2-3. After the power switch is turned ON

1. 【 Attention 】

When the power switch is turned to **ON** position, the **READY** light will light up. If not, please inspect the malfunction's position.

1-2-4. Routine inspection

1. 【 Warning 】

When inspecting the belt, please do not stretch your hands between belt and belt pulley.

2. 【 Attention 】

1. Please inspect the pressure gauge; it must be set up correctly.
2. Please pay attention on the motor、gear box and other assembly parts to see if there are unusual noise.
3. Please inspect the lubrication unit and lubricating oil level.
4. Please inspect every security equipment, and guard.
5. Please inspect the belt's tightness. If it is necessary, please replace the belt with same tension.
6. Please inspect the oil pressure unit to see if there is oil.

1-2-5. The warming-up before operation the machine

1. 【 Attention 】

1. Using the automatic control to control the feeding of each axis and the rotation of main axis for 10 to 20 minutes, and setting the speed at the half or 1/3 speed of the highest speed.
2. Meanwhile, please inspect the action of others assembly parts with automatic control program.
3. Please pay special attention on the spindle's warming-up when rotation speed is up to 4000 RPM. If operating the machine after it is just started without sufficient lubrication, the machine will be damaged. Meanwhile, due to the thermal expansion of each part, the machine is unstable, and causes the defeat of accuracy.

1-2-6. Preparation

1. 【 Warning 】

1. The tools and cutters have to meet this machine's requested specification.
2. The extreme worn tools will hurt the working piece or the people. Hence it must be replaced in advance.

3. Surrounding the working field, it must have sufficient light for safety and convenience of doing some inspection.
4. The cutters and other parts must be put on suitable and clean box.
5. Do not clamp the cutter on the spindle, and put the cutter on the tool magazine, and the guards.

2. 【 Attention 】

1. Please check the length of the cutter in order to avoid the interference of other tools.
2. Please run the test drive after clamping the cutter.

1-2-7. When the machine is performing

1. 【 Warning 】

1. The long hair must be tied neat and put under the cap.
2. Please do not push any control button with glove in case of the malfunction.
3. When carrying huge work-piece, it should be more than 2 people to carry it in order to prevent the danger.
4. Only the experienced, and well-trained people could operate the lifter, crane, sling, and other lifting devices.
5. When operating the lifter above (lifter, crane), please do not collide with other devices.
6. When hanging the work piece, please confirm the strength of slings, belts and ropes.
7. Please make sure the work piece is fixed stably.
8. The coolant flux should be adjusted when the machine is stopped.
9. Please do not touch the functioning working piece or spindle.
10. The working piece and the cutter must keep a safety distance, and the working piece only can be carried when the spindle is stopped.
11. When the machine is running, please do not clean the chips with hands or rags.
12. Do not machine on the working piece before installing the safety guards, and splashguards.
13. Please clean the cutter with brush. DO NOT use hands.
14. When machining the magnesium alloy, please wear the protection mask.

2. 【 Attention 】

1. Please do not open the door and window during running.
2. During heavy load machining, please pay highly attention on the jumped-out chips in order to avoid the burning of skin.

1-2-8. End of machining

1. 【 Warning 】

When end of the machining, please turn NFB switch to OFF position.

1-2-9. End of work

1. 【 Attention 】

1. When cleaning the chips on the machine, please wait for the stop of the machine.
2. All of the cutters, tools and parts must be return to its own position.
3. Please inspect the damaged felt wipers, and replace it when necessary.
4. Please inspect the polluted degree of the coolant, oil inside the oil cylinder, and lubrication oil. Please replace them when necessary.
5. Please inspect the level of the coolant, and oil inside the oil cylinder, and refill them when necessary.
6. Please make sure all switches are turned off before leaving the machine.
7. Please turn off the main power when stopping the machine for a long time.

1-2-10. Safety equipment

1. Enclosure, splashguard, chip pan, and telescope of three axes.
2. Limit switch for program saving. (NC software).
3. Emergency Stop button.

1-2-11. Preparation of maintenance

1. The maintenance personnel have to be authorized by the superior to maintain the machine.
2. Please prepare the accessories, parts and the consuming items previously. (oil-sealing 、 O-ring 、 machine oil, grease)
3. Prepare to record every job, which is or isn't needed to maintain or adjust.

【 Attention 】

1. Please understand every safety precaution procedure firstly.
2. Please use the specified tools to process the maintenance job in order to prevent the damage of the machine.

1-2-12. Maintenance

【 Attention 】

To process the maintenance job after the machine is stopped completely.

【 Hazard 】

1. Only the experienced person or the person who is familiar with it can do the electric cabinet maintenance job. Do not maintain the machine arbitrary. It has to have good communication between the maintenance

- personnel and the charged person.
2. Please do not move the dogs, limit switch, approaching switch, and other connecting mechanism.
 3. Please use the ladder to maintain the devices that are on the high position.
 4. Please use the high quality fuses, wires.
 5. Please turn off the main power before doing any maintenance job.

1-2-13. The work before start the machine after the maintenance

【 Warning 】

1. Please keep well of the oil-wipe rag, oil cleaner.... etc for maintaining.
2. Please return the unnecessary tools, parts, and rest oil to its original place.

【 Attention 】

1. The maintenance person has to make sure the machine running safely.
2. Please keep the maintenance record and data for reference.

1- 3 The hazard zone of the machine

1-3-1 Moving parts

Because the spindle is running at high speed, and the actions of each axis, and the automatically tool changing, the area between the table, spindle, and too magazine is very dangerous. Meanwhile, the inside of the machine will be wet and high temperature due to the splashing chips and coolant when it is machining.

※ The full enclosure is an optional accessory; the table guard with plexiglass is the standard specification.

【 Warning 】

1. Under Auto mode, do not open the working door, plexiglass window, and other enclosure.
2. Please pay special attention on the condition of operating or the power of the machine is “**ON**”. In case ignoring the warning above, it may lead to the death and extremely injury of people, or machine’s damage.

【Chapter 2 Carry and Stock】

2-1. Packing of the machine:

Crate size (L × W × H) : 2185×2000×2350 mm

Net weight : 3500 kgs

Gross weight : 3800 kgs

※The machine packaged in a crate for transportation is a standard transportation method, unless the buyer asks for other method for package.

2-2. The carry of equipment:

2-2-1. The lifter's requirement:

Machine weight : 3,800kgs

Fork Length : 1,300mm

** The forklifter must be capable of lifting at least this weight.
The sling must be capable of lifting at least this weight.
The trailer or the dray must be capable of transporting at least this weight and length

2-2-2. The safety requirement of carry

1. Crane:

- (1) During the carry and unloading, please avoid compression or collision because of the fact this machine is a high precision machine. (The speed must be lower than 25m / min)
- (2) Jog the table to the machine's center, and the head to the bottom. Then fix the head by stationary barrier.
- (3) The counterweight is locked by the stationary barrier.
- (4) Place a pad between the doors, pull them closed, and secure them with two wire ties through the handles.
- (5) The lube unit's exhausting holes must be locked.
- (6) The carry method and the lifter should be totally inspected.
- (7) The crane or forklifter's operator should be well trained or experienced.
- (8) The loose parts should be pulled tight when lifting. And the contact surface of machine should be protected by the rags or woods in case of the scratch.
- (9) In order to prevent the swing of the machine, please tight a strengthened rope on a corner of the machine. The hands are extremely forbidden.

- (10) Please notice on the air pressure pipes, wires, NC controller, and other devices, when the slings are pulled.
- (11) Please confirm that there are no people on the top of the machine, on the side of the machine, and on the way of move before moving the machine.
- (12) Please remove the objects occupied on the way, and pay highly attention on the control buttons.
- (13) The length of the slings on four corners should be same, and the distance of four corners between the machine and the ground should be kept the same when lifting (50 cm suggested).
- (14) Please notice on the ground when putting down the machine in order to confirm there are no wires, pipes under the machine.

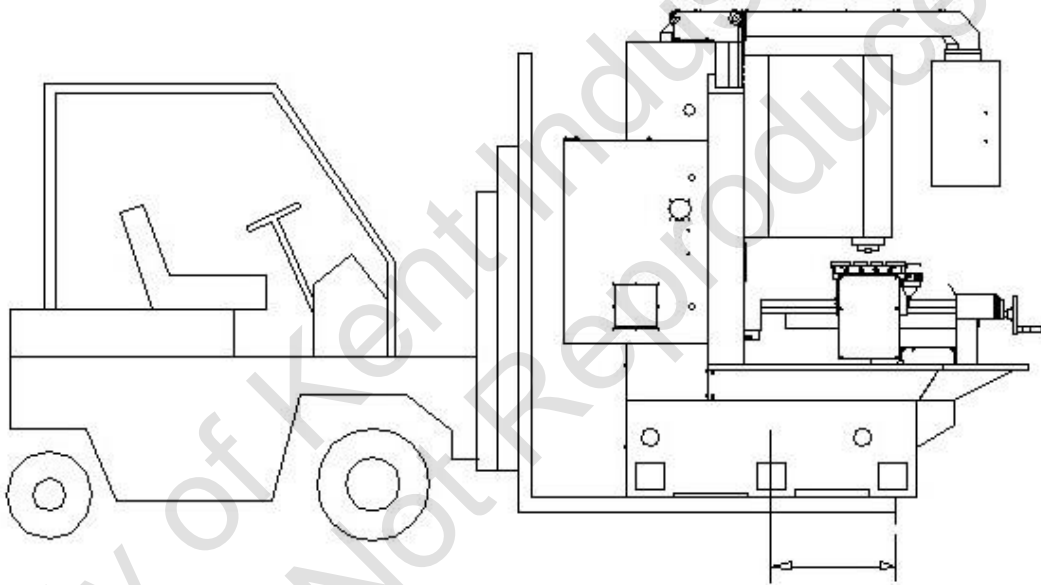
2. Forklifter:

- (1) During the carry and unloading, please avoid compression or collision because of the fact this machine is a high precision machine. (The speed must be lower than 25m / min)
- (2) Jog the table to the machine's center, and the head to the bottom. Then fix the head by stationary barrier.
- (3) The counterweight is locked by the stationary barrier.
- (4) Place a pad between the doors, pull them closed, and secure them with two wire ties through the handles.
- (5) The lube unit's exhausting holes must be locked.
- (6) The carry method and the lifter should be totally inspected.
- (7) The crane or forklifter's operator should be well trained or experienced.
- (8) Please remove the objects occupied on the way, and pay highly attention on the control buttons.
- (9) Please confirm that there are no people on the top of the machine, on the side of the machine, and on the way of move before moving the machine.
- (10) Please notice on the ground when putting down the machine in order to confirm there are no wires, pipes under the machine.

2-3. fork lift instruction: (As the figure 2-3 shown)

Machine weight : 2,200kgs

Fork Length : 1,300mm

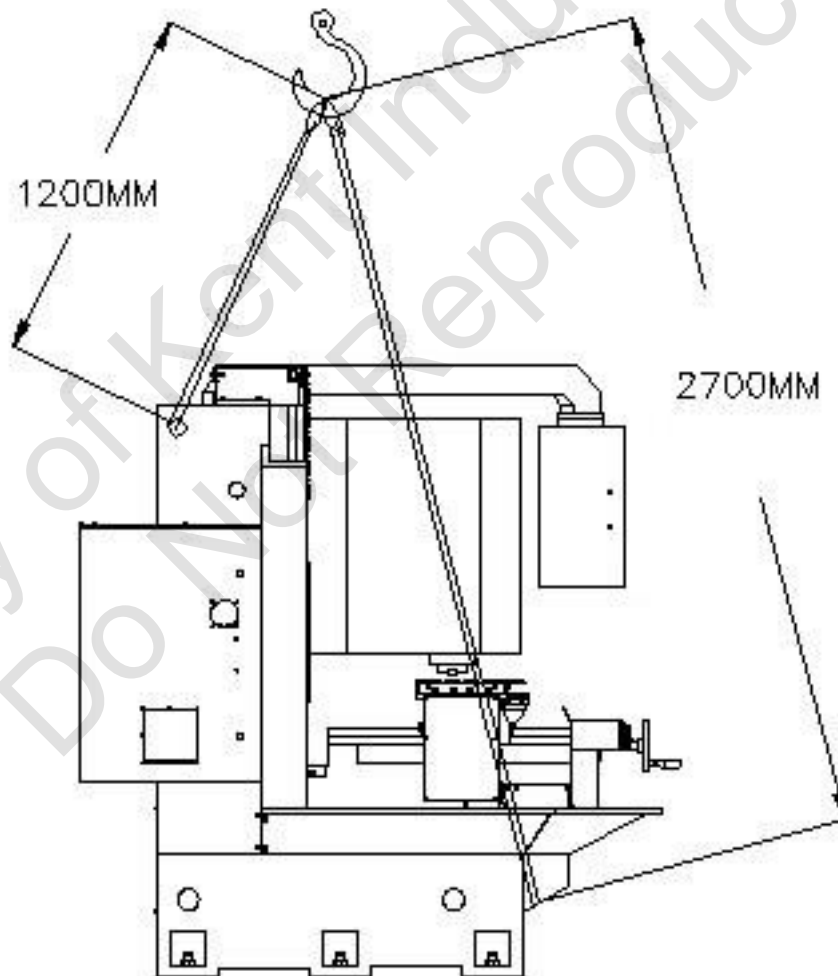


Over 100mm from the center

2-4. Cable lift instruction: (As the figure 2-3 shown)

Max. Load of crane (kg) : 4,000 Kg

Sling specification (D: mm) : 25mm



2-5. The stock of machine :

1. After the arrival of machine, if it is not installed immediately, please store in the stock in order to prevent the dust and the damp.
2. Storage Temperature Range: -5 °C to 45 °C
3. Ambient Humidity: less than 90 % relative humidity, non-condensing.
4. The machine must be put on the flat place in order to maintain the machine's accuracy
5. The anti-rust oil should be respray when storing the machine because the oil would be wiped off during shipping.
6. Suggested anti-rust oil: (Please keep mind the valid day of storage)
 - (1) The transparent, and clear type: (Brand: COTEC Model :VCI-369G)
The anti rust-oil could prevent the machine from rust for 6 months since the machine leave our company.
 - (2) The brown & grease type : (Brand: model:)
The anti rust-oil could prevent the machine from rust for 6 months since the machine leave our company.

【Chapter 3 Dismantle and installation instruction】

3-1. Dismantle instruction:

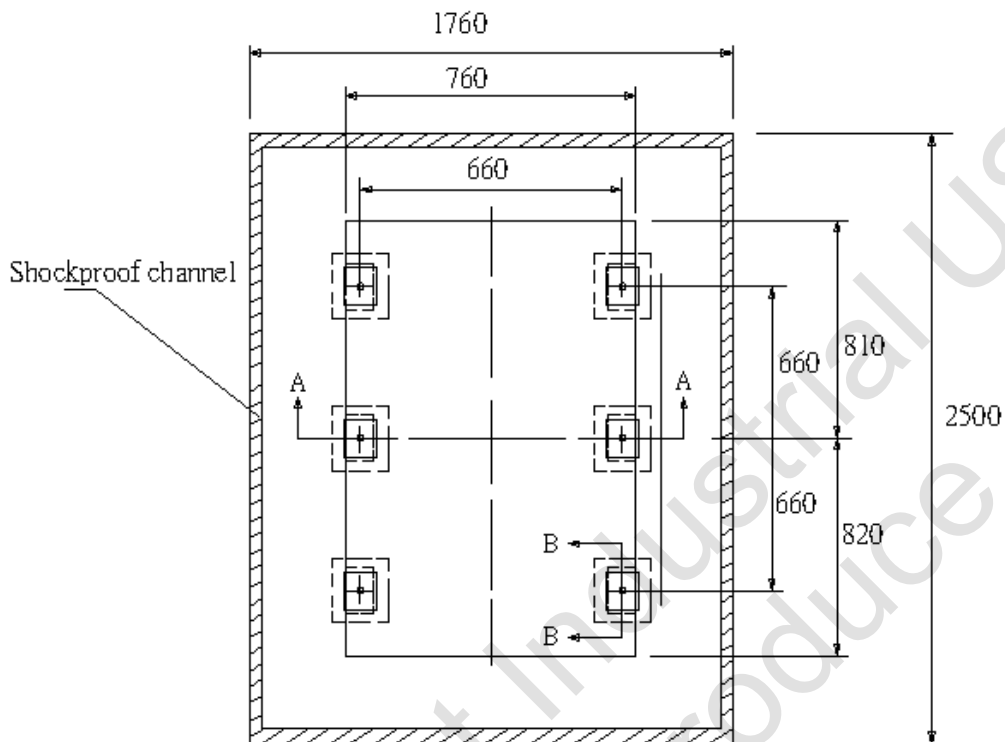
1. Installation tools required:
 - (1) Crane.
 - (2) Scissors
 - (3) Wrench (17 / 19 mm)
 - (4) Adjustable wrench.
 - (5) Ladder.
 - (6) Claw hammer.
 - (7) Air wrench. (21 mm)
 - (8) Hammer.
2. Uncrating:
 - (1) Pry off the clips around the top of the crate with a claw hammer and remove the top panel. Some crates have lag screws which hold the crate walls and roof together. A wrench is necessary to remove these.
 - (2) Pry off the enforcement beam where inside the craft's top. (It should be pried by two people.)
 - (3) Pry off all but one clip at each corner of the crate.
 - (4) Remove plastic cover.
3. Uncrating the pallet:
 - (1) Unbolt the 6 fixed bolts and caps where on the pallet by wrench or adjustable wrench.
 - (2) Cut off the iron plate, which fixed the accessories on the pallet, and remove the accessories by crane.
4. Move the machine without the crate: Move the machine by crane or forklifter.
 - (1) The capability of forklifter is stated as previous chapter, The forks must be over 1800 mm (at least over 100mm from machine's center)
 - (2) When moving by forklifter, it has to move slowly and pay attention on balance.
 - (3) Please use suitable slings and steel frames to lift the machine.
 - (4) Please remove the machine from the pallet by crane or forklifter.
 - (5) The notices are same as Section 2-2.
5. Inspection:

Our machine passes the strict function test and quality test before shipping. The customer shall check the follows items after uncrating:

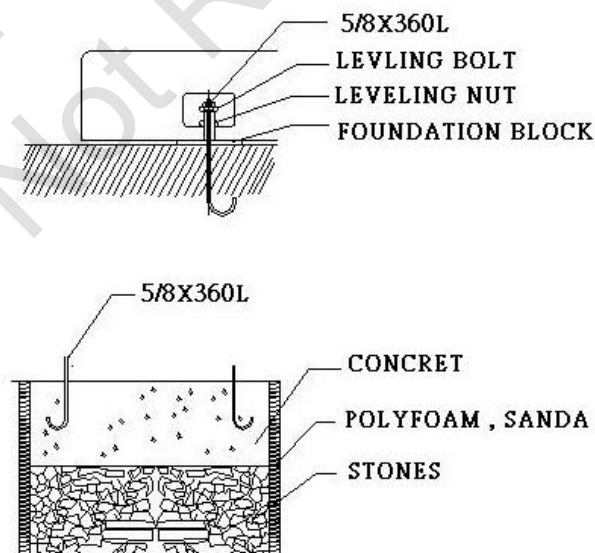
 - (1) Whether or not the model is correct (coincidence with order)?
 - (2) Whether or not the accessories or parts are complete?
 - (3) Whether or not the machine was damaged due to transportation?
 - (4) Whether or not the machine includes the inspection record?

3-2. Before installing:

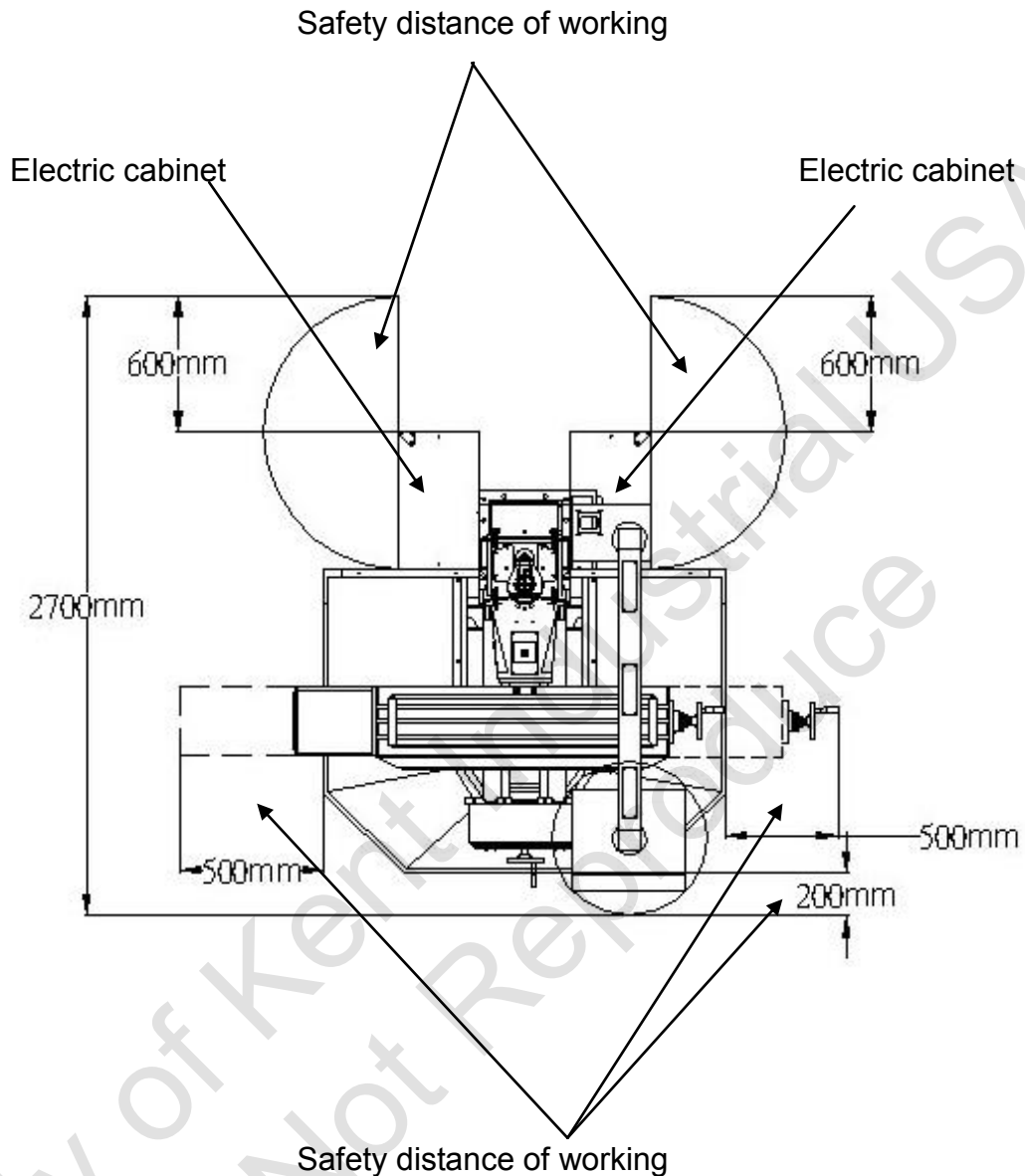
1. The machine's foundation's work shown on the drawing below:



The foundation's drawing of machine



2. Before the machine is arrived at the buyer's factory, the customer should contact with the riggers or the forklifters for moving the machine in accordance with Chapter 2.
3. Please move the machine in accordance with sections 2-2, 2-3.
4. Please uncrate the crate in terms of section 3-1.
5. In order to make convenience of repair, the machine's location must preserve sufficient space for opening fully of the electric-cabinet and the worker. (Shown on the drawing)



6. Working environment requirement:

- (1) Temperature : 0°C ~ 45°C.
- (2) Humidity : 40% ~ 75%.

7. When positioning the machine, do not operate the machine under these environments:

- (1) The location where oil 、 water 、 chip might splash.
- (2) The location where there are strong electromagnetic devices or electro welding machines nearby.
- (3) The location where there are vibrational sources, such as punching machine, press machine, shearing machine surrounded.
- (4) The location where exposed under the sunlight.
- (5) The location where the ground is inclining or slide.

3-3. Installation instruction:

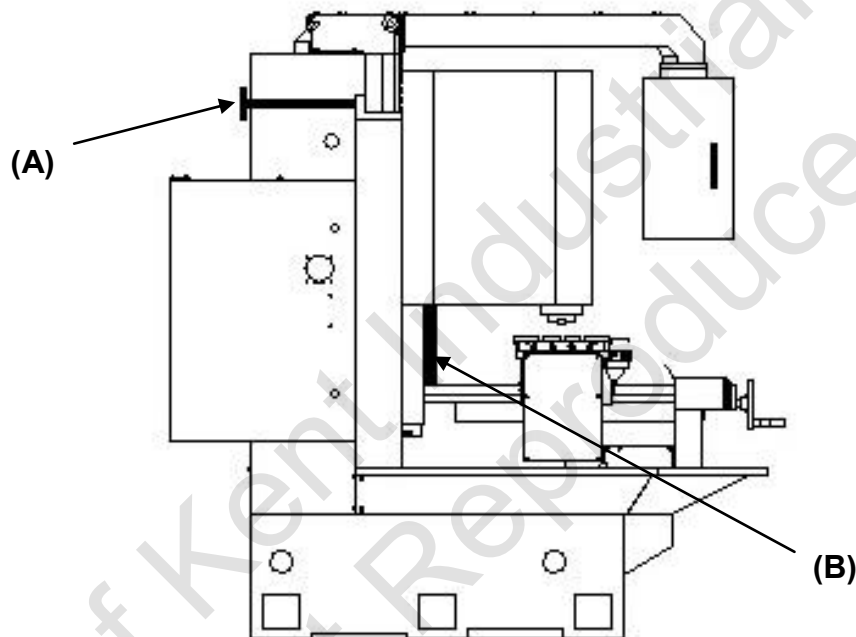
1. Put the machine on the planned foundation firstly.
2. Put the foundation bolts and foundation brackets beside the foundation holes Temporarily.
3. Lift up the machine, and then put in the foundation bolts, and brackets to the holes of leveling screws, then tight up the nuts to prevent the falling.
4. Lift down the machine on the ground, and then insert the foundation bolts into the foundation holes.
5. Pour a little of the concrete into the foundation hole firstly, please notice that the concrete should use the suitable proportion, and expanding coefficient in order to prevent the shrink effect after adjusting.
6. After the foundation bolts are in the leveling screws, and then please pour the concrete into the foundation holes and fill it. After that please level the machine.
7. After leveling, please screw up the leveling nuts of the leveling screws, foundation bolts and hexogen nut.

3-4. Electricity Requirement:

1. Power supply system:
 - (1) Voltage: 220V.
 - (2) 3 phase power supply: 60 Hz
 - (3) Electricity currency: over 50 Amp.
2. The diameter of power supply's wire should be 16 to 25 mm, and mount with a 50A's breaker (NFB breaker).
3. After inspecting the wiring and connection, please check the voltage that is 220 V \pm 10%.
4. Confirm the orientation of the motor's phase when running.
5. Compressor's specification:
 - Pressure: 6 to 8 KgF / cm
 - Supply capacity: 200 L / min

3-5. Remove the shipping bracket:

1. Jog the Z-axis 3 mm toward to the +Z direction, and remove the wood block (A) between spindle and column.
2. Jog the Z-axis toward to the -Z direction in order to pull tight the chains where upon the counterweight (B), and take out the fixed rod of the counterweight.
3. When the machine is fixed on the ground, please store the shipping bracket well.
4. Remove all the driers hanging in the machine including electric cabinet.
5. Please DO NOT power on the machine before the shipping bracket is removed exactly.

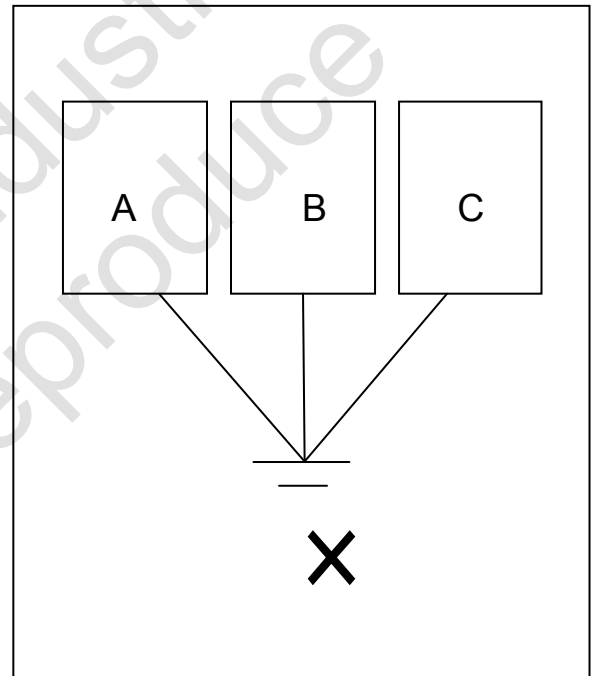
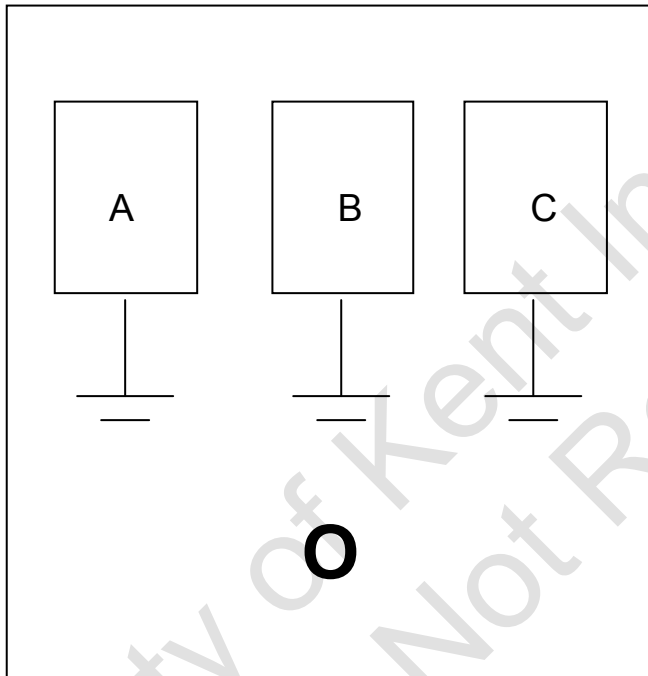


3-6. Cleaning and lubricating:

1. In order to prevent rust and corrupt, we spray the anti-rust oil on the parts where is not painted. Therefore, after installing, please wipe off the anti-rust oil by soft rags, and kerosene.
2. DO NOT flow the kerosene or other clean agents into the spindle, and three axes. It may void the warranty.
3. After cleaning, the unpainted parts should be sprayed on the lube oil.

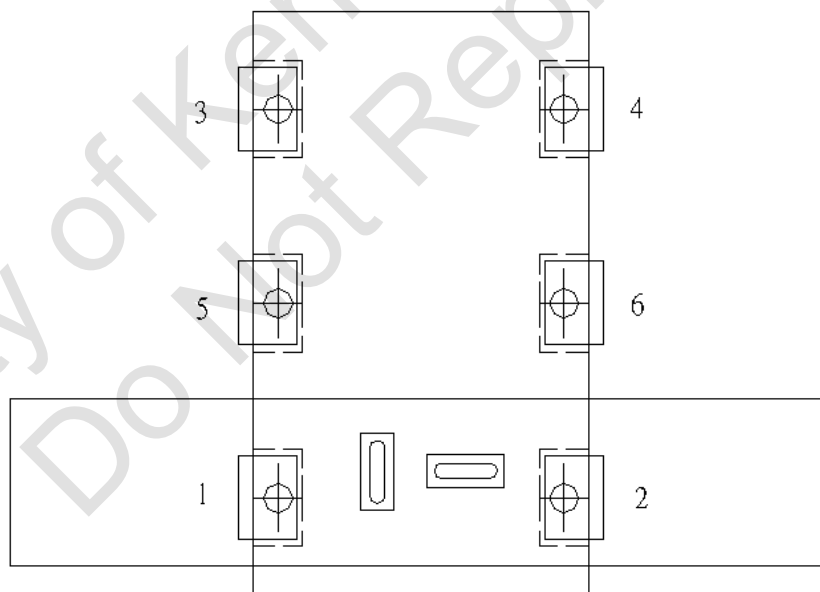
3-7. Machine's grounding:

1. It is better to ground the machine's electric elements and factory's power system together. In general, it is connected in series connection, but please notice that DOES NOT connect in parallel method.
2. The grounding wire should be selected with the diameter over 19 mm's insulation wire.
3. The Grounding resistant must be below 100Ω .
4. Use steel rods as grounding pole; the inner diameter should be over 19 mm, The copper rods is a better choice, and its length should over 1 meter.
5. The grounding pole should be buried in the ground over 1 M, if the rod is obstruct by the rock, it can be buried transversely in the ground over 1.5 M depth.



3-8. Balance of the machine:

1. Prepare two of precision bubble levels (0.02mm per scale).
2. Before adjustment, please check firstly the accuracy of the precision bubble level, the method is as below:
 - (1) Put the level on a fixed position of the table.
 - (2) After the bubble is stable, please record the bubble position, and then rotate it to 180°. When the bubble is stable, please compare with 0°'s bubble position, the tolerance is allowed within 1/3 scale.
3. Jog the table and saddle to the central.
4. Put the precision bubble level on the center of the table; please adjust the machine's level in accordance with the position of the bubble by adjusting the foundation bolts as shown.
5. Please adjust bolts 1 to 4 firstly, and then adjust 5~ 6 in sequence.
6. The leveling accuracy is within 0.04 mm (about 2 scales). After leveling please tight up the foundation bolts ◦
7. Please notice that the foundation bolts should be put into the slots of the foundation brackets.
8. Calibrating and adjusting the perpendicular degree between the table and spindle center.
9. After 6 months of installation, please adjust again to make sure the foundation is stable.

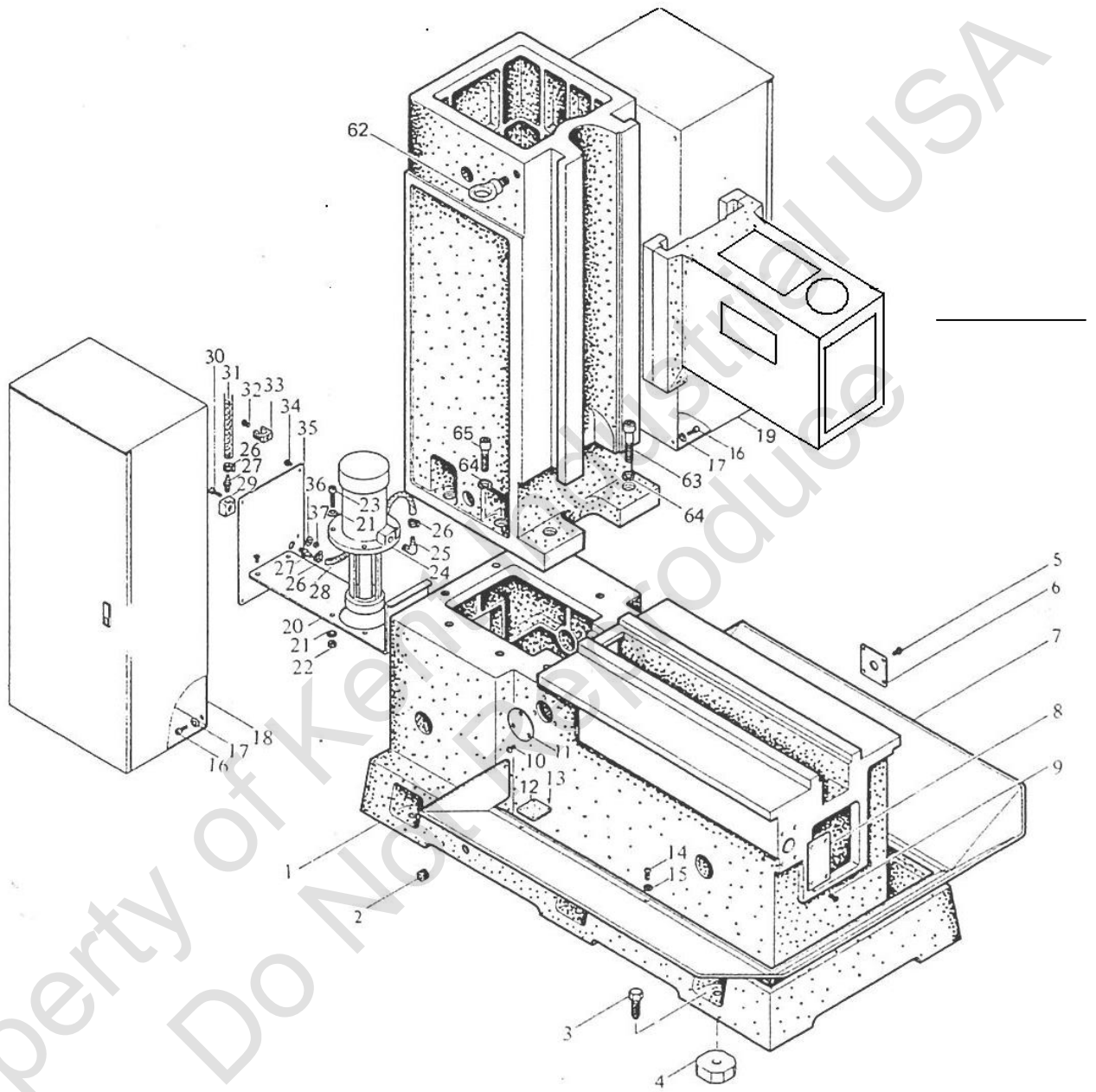


CH 4 **Parts List**

COLUMN & BASE	23
X-AXIS ASSEMBLY	25
Y-AXIS ASSEMBLY	27
Z-AXIS ASSEMBLY	29
RIGID HEAD & SPINDLE.....	31

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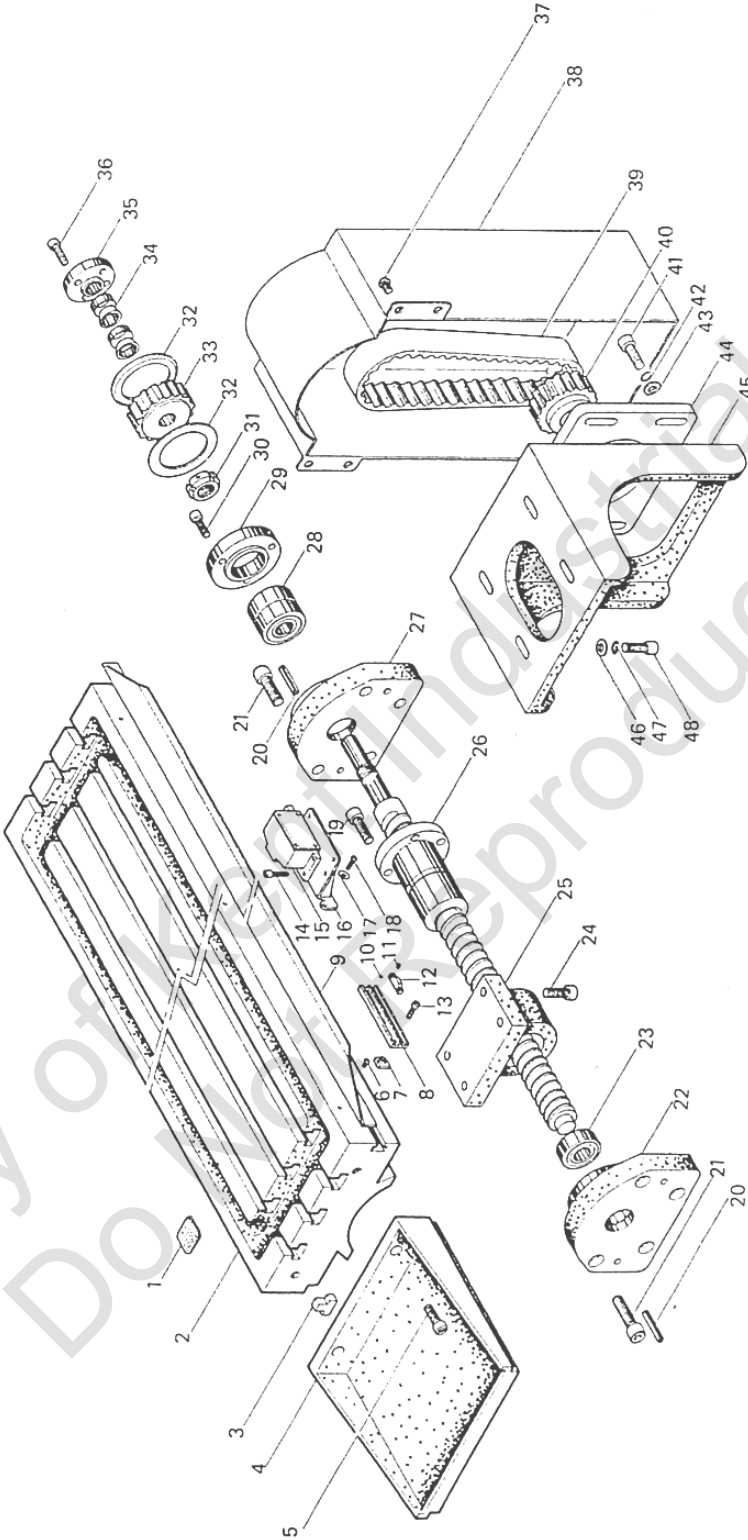
TW-40/50 COLUMN & BASE ASSEMBLY



TW-40/50 COLUMN & BASE ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	EM NO.	PARTS NO.	DESCRIPTION
1	TB1001	Base	34	TB1011	Socket Head Cap Screw (M6×10) (4 Req)
2	TB1002	Set Screw (PT 1/2")	35	TB1005	Cover
3	4H1001-2	Adj. Balance Bolt (6 Req)	36	TB1217	Washer (M6) (2 Req)
4	TP1066	Adj. Balance Disc (6 Req)	37	TB1218	Hexagon Nut (M6) (2 Req)
5	TB1003	Socket Head Cap Screw (M6×10) (4 Req)	38	3A6045A	Tap Bracket
6	5A4001-1	Cover	61	TB1008	Socket Head Cap screw (M6×10) (4 Req)
7	TB1204	Coolant Tray	62	TB1009	Eye Hook (1") (2 Req)
8	TB1004	Cover	63	TB1010	Socket Head Cap Screw (3/4"×4") (2 Req)
9	TB1006	Socket Head Cap Screw (M6×10) (4 Req)	64	TB1012	Spring Washer (3/4") (8 Req)
10	TB1007	Socket Head Cap Screw (M6×10) (3 Req)			
11	5B6007	Cover			
12	4H1004	Strainer (2 Req)			
13	5032	Drive Screw (8 Req)			
14	TB1205	Socket Head Cap Screw (M6×16) (8 Req)			
15	TB1206	Washer (M6) (8 Req)			
16	TB1109	Socket Head Cap Screw (M6×16) (8 Req)			
17	TB1112	Washer (M6) (8 Req)			
18	5A1108	Tool Box			
19	5A1107	Electric Cabinet			
20	TB1202	Pump Bracket			
21	TB1208	Washer (M6) (8 Req)			
22	TB1207	Hexagon Nut (M6) (4 Req)			
23	TB1203	Socket Head Cap Screw (M6×25) (4 Req)			
24	TB1201	Pump (1/2 HP-4P)			
25	TB1209	L Type Inserting Pipe Joint (PT 3/4×PE 1/2)			
26	TB1210	Hose Clip (3/4") (4 Req)			
27	TB1211	Gas Adapter (PT 1/4×PE 1/2) (3 Req)			
28	TB1212	Plastic Hose (1/2"×750mm)			
29	3A6045	Tap Bracket			
30	TB1213	Socket Head Cap Screw (M6×35) (4 Req)			
31	TB1214	Net Plastic Pipe (1/2"×3300mm)			
32	TB1215	Socket Head Cap Screw (M6×10) (3 Req)			
33	TB1216	Clip (3 Req)			

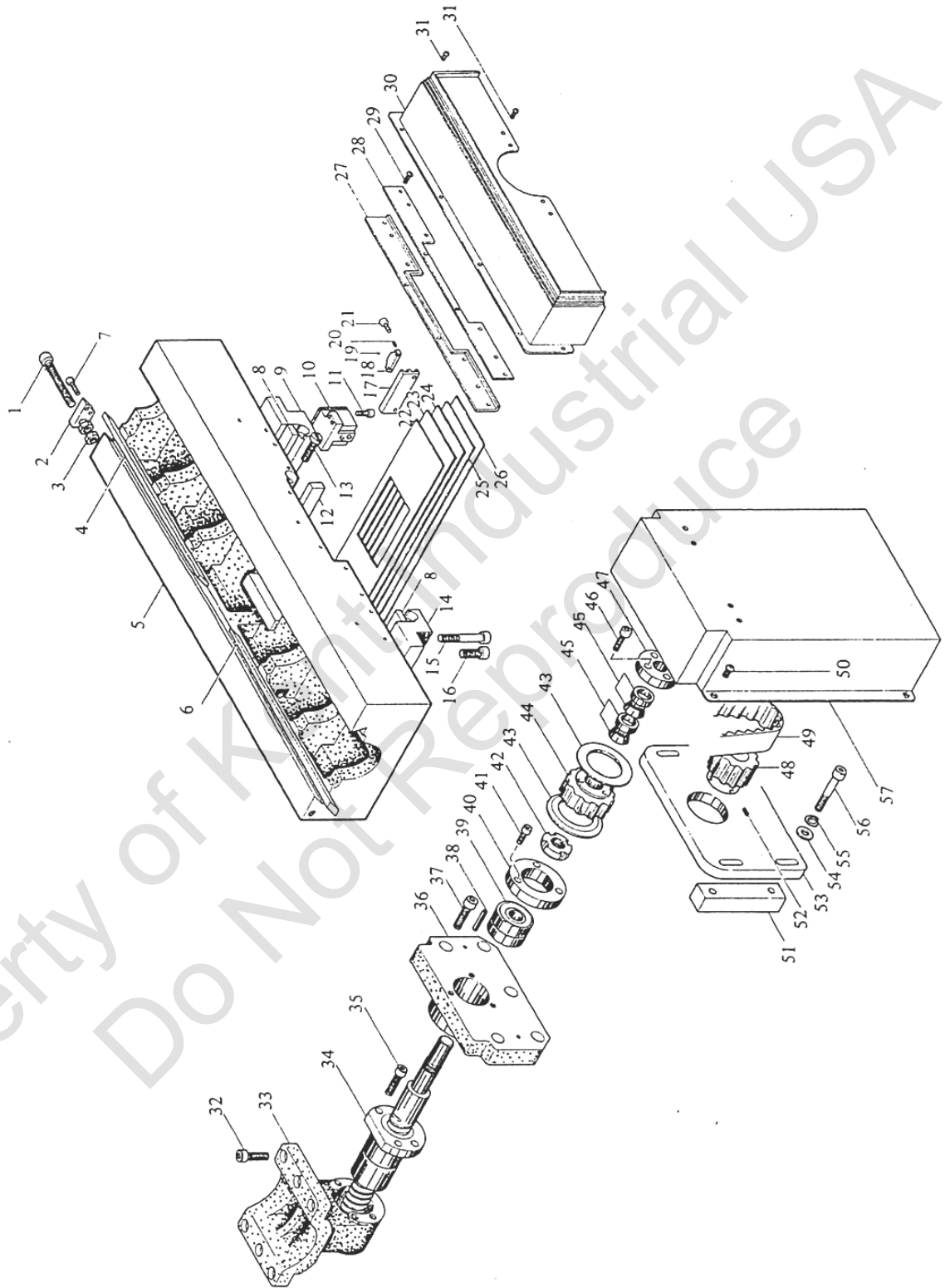
TW-40/50 X-AXIS ASSEMBLY



TW-40/50 X-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5A2001-1	Strainer (2 Req)	25	3B3023	Longitudinal Feed Bracket
2	5A2001-1000	Table (13"×59")	26	TB2002A	X-Axis Ball Screw
3	3B2001-1	Protection Shield Rubber (6 Req)	27	3B2006	Bearing Bracket
4	5A2003	Table End Cover (2 Req)	28	3A2008	Precision Ball Screw Bearing (BST20×47) (2 Req)
5	5A2003-1	Socket Head Cap Screw (M10×25) (4 Req)	29	3A2011	Bearing Retainer Ring
6	3B2021-1	Socket Head Cap Screw (M6×10) (4 Req)	30	3A2010	Socket Head Cap Screw (M6×16) (3 Req)
7	5A2043	Blocking (4 Req)	31	3B2009	Lock Nut
8	4B2031	Limit Dog Bracket (2 Req)	32	5B2012	Timing Belt Pulley Flange (2 Req)
9	5A2021-1000	Table Front Cover	33	5B2013H	Timing Belt Pulley
10	4B2030	Steel Ball (φ4) (6 Req)	34	5B2010	Cone Ring Key (18×22) (2 Req)
11	4B2032	Set Screw (M5×5) (6 Req)	35	5B2014	Fixed Block for Cone Ring Key
12	4B2029	Limit Dog (3 Req)	36	5B2014-1	Socket Head Cap Screw (M5×20) (4 Req)
13	TB2054	Socket Head Cap Screw (M6×20) (4 Req)	37	5B2016-1	Socket Head Cap Screw (M6×10) (4 Req)
14	3A2038	Socket Head Cap Screw (M6×25) (4 Req)	38	5B2016	Timing Belt Pulley Cover
15	3A2034	Limit Switch	39	TB2020A	Timing Belt
16	4B2036	Limit Switch Bracket	40	3B2018F	Timing Belt Pulley
17	4B2037-1	Washer (M6) (2 Req)	41	3B3008	Socket Head Cap Screw (M8×30) (4 Req)
18	4B2037	Socket Head Cap Screw (M6×16) (2 Req)	42	3B3007-1	Spring Washer (M8) (4 Req)
19	TB2006	Socket Head Cap Screw (M8×30) (4 Req)	43	3B3007	Washer (M8) (4 Req)
20	3A2005	Roll Pin (5×40) (4 Req)	44	5B3006F	Motor Bracket
21	3A2004	Socket Head Cap Screw (M10×35) (8 Req)	45	3B2006-1	Motor Support
22	3B2025	Bearing Bracket	46	3B2006-2	Washer (M8) (4 Req)
23	3B2025-1	Ball Bearing (#6204)	47	3B2006-3	Spring Washer (M8) (4 Req)
24	TB2007	Socket Head Cap Screw (M8×30) (4 Req)	48	3B2006-4	Socket Head Cap Screw (M8×30) (4 Req)

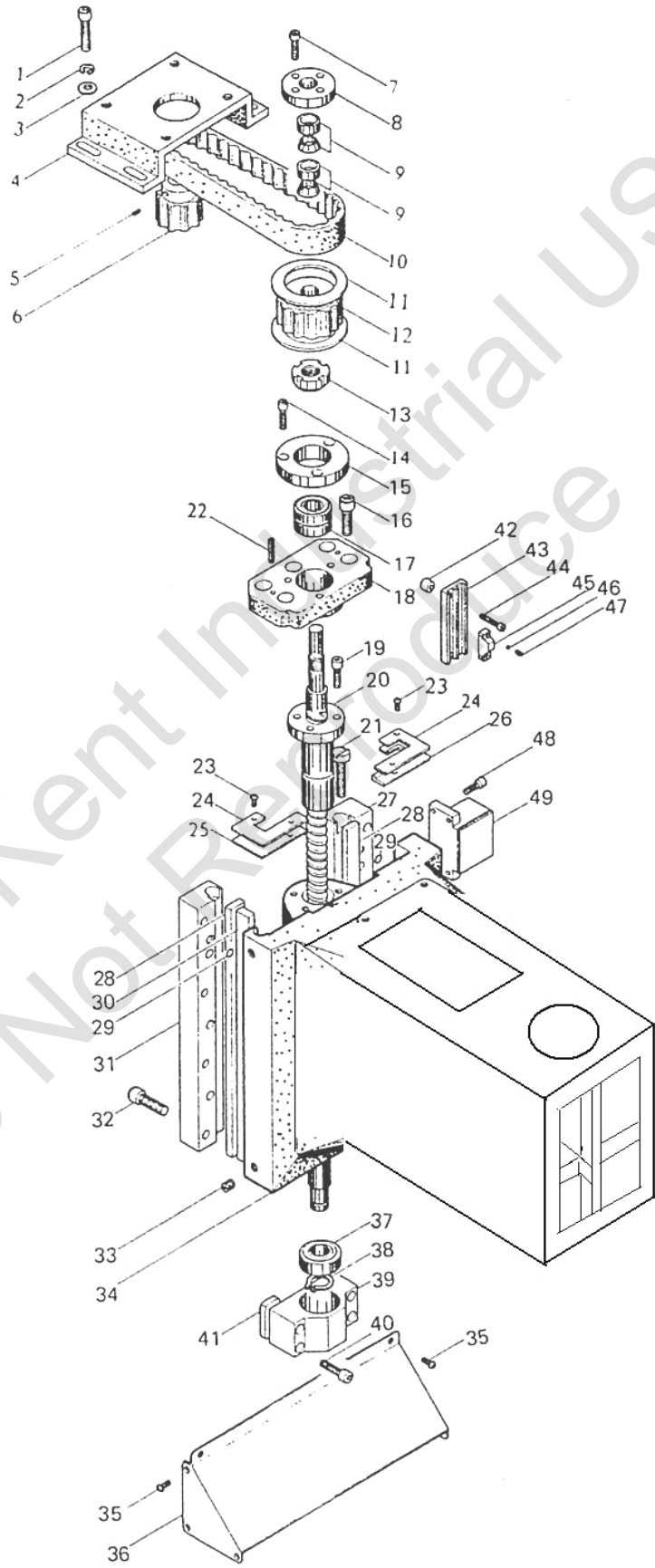
TW-40/50 Y-AXIS ASSEMBLY



TW-40/50 Y-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	3B3010	Socket Head Cap Screw (M10×70) (2 Req)	30	TB3037	Telescopic Cover
2	3B3009	Fixed Block for Adj. Plate (2 Req)	31	TB3038	Socket Head Cap Screw (M6×10) (10 Req)
3	3B3011	Hex. Nut (M10) (4 Req)	32	TB3004	Socket Head Cap Screw (M8×30) (6 Req)
4	3B3026-1	Saddle/Table Gib	33	3B3022	Bracket for Y-Axis Ballscrew
5	5A3001-1000	Saddle	34	TB3002A	Y Axis Ball Screw
6	3B3026	Saddle/Table Gib	35	TB3003	Socket Head Cap Screw (M8×30) (4 Req)
7	3B3012	Socket Head Cap Screw (M5×20) (4 Req)	36	5A3005	Cross Feed Bearing Bracket
8	TP3043	Saddle/Base Gib (2 Req)	37	5A3006	Socket Head Cap Screw (M10×30) (5 Req)
9	TP3045	Saddle/Base Gib Support	38	5A3007	Roll Pin (5×40) (2 Req)
10	3A2034	Limit Switch	39	3A2008	Precision Ball Screw Bearing (BST20×47) (2Req)
11	3A2038	Socket Head Cap Screw (M6×25) (4 Req)	40	3A2011	Rearing Retainer Ring
12	TP3043	Saddle/Bese Gib	41	3A2010	Socket Head Cap Screw (M6×16) (3 Req)
13	3028	Gib Adj-Screw (6 Req)	42	3B2009	Lock Nut
14	TP3044	Saddle/Bese Gib Support	43	5B2012	Timing Belt Pulley Flange (2 Req)
15	TP3046	Socket Head Cap Screw (M8×75) (8 Req)	44	5B2013H	Timing Belt Pulley
16	TP3047	Socket Head Cap Screw (M8×40) (8 Req)	45	5B2010	Cone Ring Key (18×22) (2 Req)
17	4B2031	Limit Dog Bracket (2 Req)	46	5B2014-1	Socket Head Cap Screw (M5×20) (4 Req)
18	4B2029	Limit Dog (3 Req)	47	5B2014	Fled Block for Cone Ring Key
19	4B2030	Steel Ball (φ4) (6 Req)	48	3B2018F	Timing Belt Pulley
20	4B2032	Set Screw (M5×5) (6 Req)	49	TB3017A	Timing Belt
21	4B2033	Socket Head Cap Screw (M6×12) (4 Req)	50	TB3006	Socket Head Cap Screw (M6×10) (4 Req)
22	TB3010	Chip Guards	51	TB3020-1	Block (2 Req)
23	TB3011	Chip Guards	52	TB3018	Set Screw (M5×5) (2 Req)
24	TB3012	Chip Guards	53	TB3020F	Motor Bracket
25	TB3013	Chip Guards	54	TB3023	Washer (M8) (4 Req)
26	TB3014	Chip Guards	55	TB3022	Spring Washer (M8) (4 Req)
27	TB3015-1	Felt Wipers (2 Req)	56	TB3021	Socket Head Cap Screw (M8×50) (4 Req)
28	TB3015	Wiper Holder (2 Req)	57	TB3005A	Cross Feed Pulley Cover
29	TB3016	Socket Head Cap Screw (M6×16) (16 Req)			

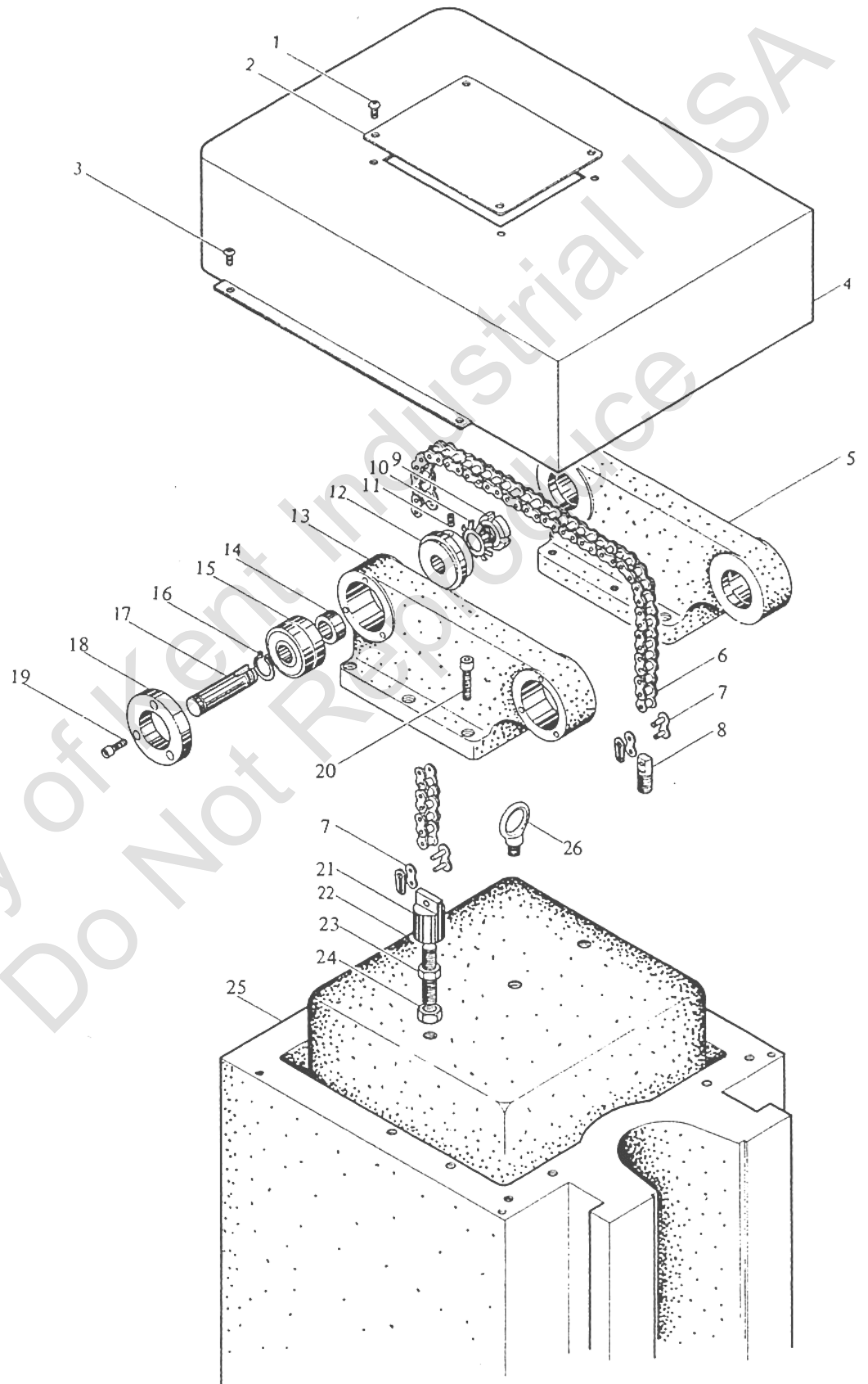
TW-40/50 Z-AXIS ASSEMBLY



TW-40/50 Z-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	TB4069	Socket Head Cap Screw (M8×30) (4 Req)	35	TB4002A-2	Socket Head Cap Screw (M6×10) (8 Req)
2	TB4070	Spring Washer (M8) (4 Req)	36	TB4002A-1	Cover
3	TB4071	Washer (M8) (4 Req)	37	TB4030	Ball Bearing (#6204)
4	TB4075	Motor Bracket	38	TB4029	Snap Ring (S20)
5	TB3018	Set Screw (M5×5) (2 Req)	39	TP3035	Ball Bearing Housing
6	3B2018F	Motor Timing Belt Pulley	40	TP3025	Socket Head Cap Screw (M10×50) (4 Req)
7	5B2014-1	Socket Head Cap Screw (M5×20) (4 Req)	41	TP3035-1	Spacer (2 Req)
8	5B2014	Cone Ring Clamping Block	42	TP2039	Washer (4 Req)
9	5B2010	Cone Ring Key (18×22) (2 Req)	43	4B2031	Limit Dog Bracket (2 Req)
10	TB4066A	Timing Belt	44	TB4012	Socket Head Cap Screw (M6×25) (4 Req)
11	5B2012	Timing Belt Pulley Flange (2 Req)	45	4B2029	Limit Dog (3 Req)
12	5B201311	Timing Belt Pulley	46	4B2030	Steel Ball (∅4) (6 Req)
13	3B2009	Lock Nut	47	4B2032	Set Screw (M5×5) (6 Req)
14	3A2010	Socket Head Cap Screw (M6×16) (3 Req)	48	3A2038	Socket Head Cap Screw (M6×25) (4 Req)
15	3A2011	Bearing Retainer Ring	49	3A2034	Limit Switch
16	5A3006	Socket Head Cap Screw (M10×35) (5 Req)	50	5A5007	Socket Head Cap Screw (M6×10) (4 Req)
17	3A2008	Precision Ball Screw Bearing (BST20×47) (2 Req)	51	5A5006	Cover
18	5A3005	Bearing Bracket	52	5A5043	Head Swivel Plate
19	TB4004	Socket Head Cap Screw (M8×30) (4 Req)	53	5032	Drive Screw (11 Req)
20	TB4002A	Ball Screw	54	5A5043-1	Head Swivel Plate
21	3028	Gib Adj-Screw (6 Req)	55	5K5040-2	Worm Fixd Cover (2 Req)
22	5A3007	Roll Pin (5×40) (2 Req)	56	5K5040-3	Socket Head Cap Screw (M6×16) (8 Req)
23	TB4011-3	Socket Head Cap Screw (M6×16) (8 Req)	57	5K5042	Single Direction Thrust Ball Bearing (#51105) (2 Req)
24	TB4011-2	Wiper Holder (4 Req)	58	5A5040	Worm Shaft
25	TB4011	Felt Wipers (2 Req)	59	5K5039	Worm
26	TB4011-1	Felt Wipers (2 Req)	60	5A5040-1	Adj. Bushing (1 SET)
27	TB4006	Gib Support	61	5K5040-4	Set Screw (M6×6)
28	4114053	Column/Head Slide Block Gib (2 Req)	62	6199-1	Brass Plug
29	TB4009	O Ring (P9) (2 Req)	63	5K5041	Key (6×6×45)
30	4114038	Column/Head Slide Block Gib	64	5K5016	Angle Plate
31	TB4005	Gib Support	65	5K5033-3	Socket Head Cap Screw (M8×35) (4 Req)
32	TB4007	Socket Head Cap Screw (M10×60) (14 Req)	66	5K5033-2	Socket Head Cap Screw (M8×25) (4 Req)
33	TB4005-1	Set Screw (1/2"×1/2") (2 Req)	67	5K5033	Worm Gear
34	TB4001	Head Slide-Block	68	5K5033-1	Worm Shaft

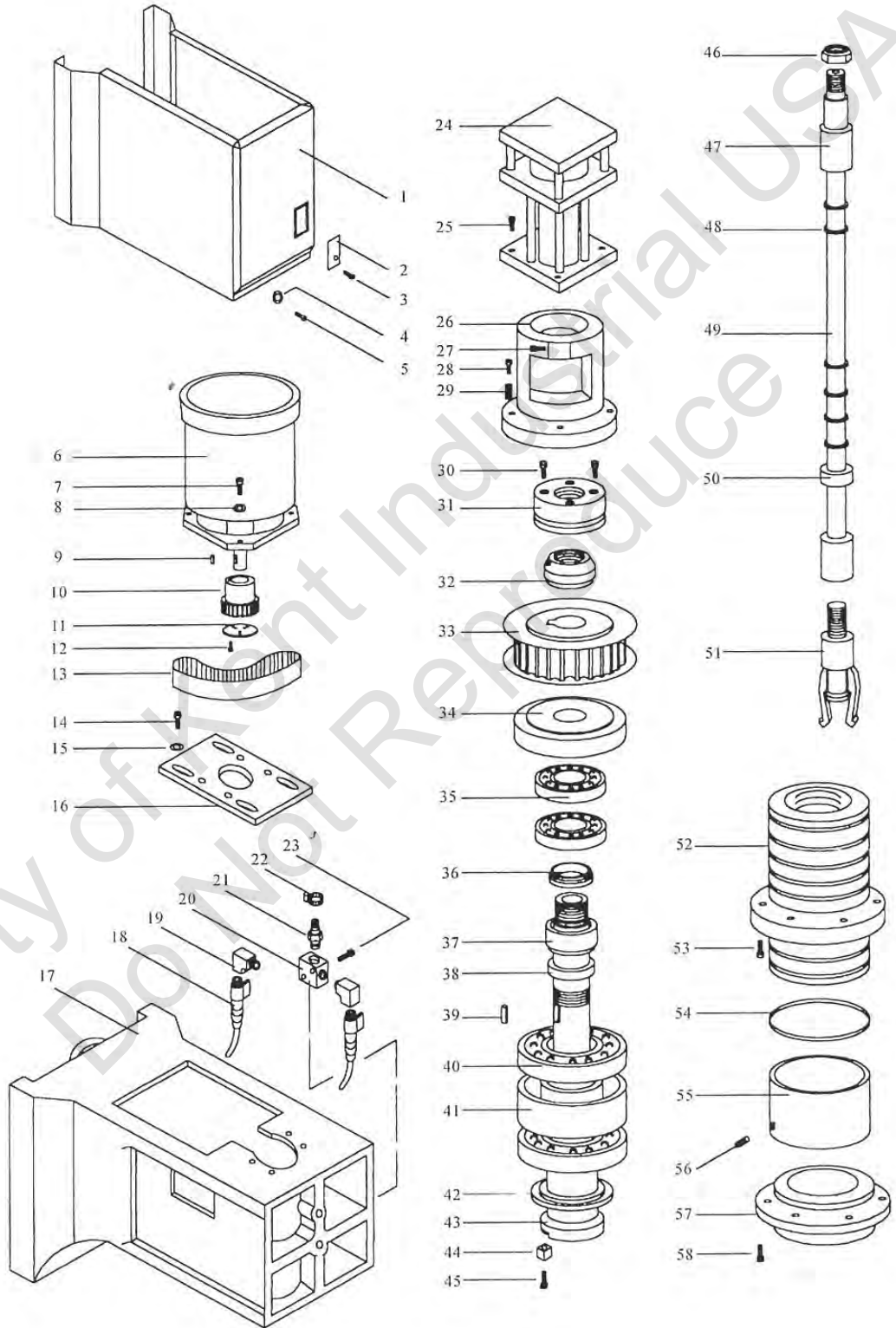
TW-40/50 COUNTERWEIGHT ASSEMBLY



TW-40/50 COUNTERWEIGHT ASSEMBLY

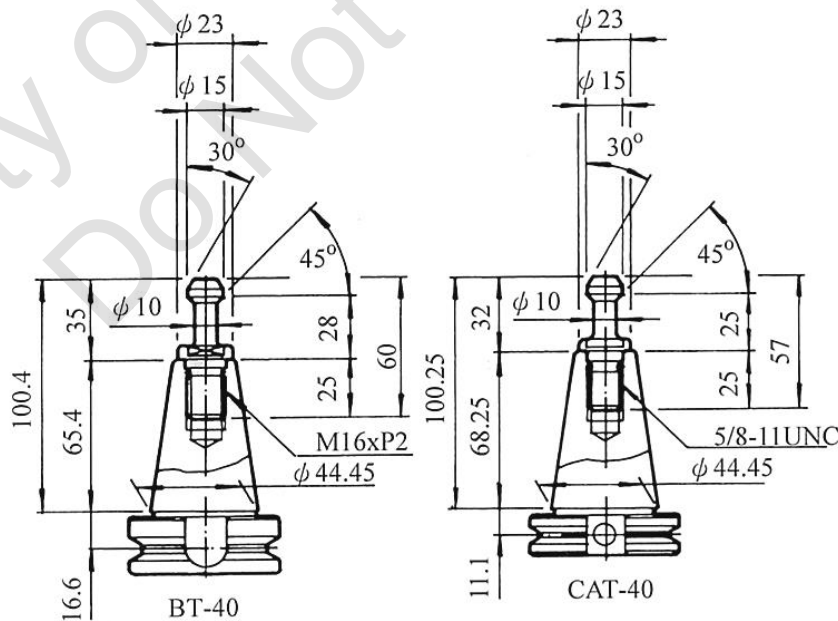
ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	TB5004-3	Socket Head Cap Screw (M6 × 10) (4 Req)	14	5BH5014	Washer (4 Req)
2	TB5004-1	Cover	15	TB5009	Ball bearing (#6305) (8 Req)
3	TB5004-2	Socket Head Cap Screw (M6 × 10) (4 Req)	16	TB5008	Snap Ring (S25) (4 Req)
4	TB5004	Cover	17	TB5007	Chain Wheel Shaft (4 Req)
5	TB5003	Right Chain Braciet	18	5A2020	Ball Bearing Retainer Ring (4 Req)
6	TB5014	Chain (TW-105: #50 × 89 TW 105CNC: #50 × 81)	19	TB5013	Socket Head Cap Screw (M6 × 12) (12 Req)
7	TP5013	Chain Joint (No:50) (4 Req)	20	TB5006	Socket Head Cap Screw (M8 × 40) (8 Req)
8	TP5016	Chain Joint Bolt (2 Req)	21	TP5010	Counterweight Chain Joint (2 Req)
9	5A2019	Lock Nut (ANG) (4 Req)	22	TB5026	Counter-Weight
10	5A2018	Lock Washer (AW05) (4 Req)	23	TP5017	Counter-Weight Adj. Screw (2 Req)
11	TB5012	Set Screw (M6 × 12) (4 Req)	24	TP5012	Hex. Nut (5/8") (2 Req)
12	5BH5015	Chain Whell	25	TB5001	Column
13	TB5002	Left Chain Bracket	26	TB5027	Eye Ring (5/8")

TW-40/50 RIGID HEAD & SPINDLE



TW-31 MV / TW-40 MV RIGID HEAD & SPINDLE

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	TRM4002N	Cover For Head	31	TM4026	Adj. Lock Nut
2	TM4052	Push Button Switch Plate	32	TM4018	Lock Nut
3	Tm4053	Cap Screw (M4 X 8)(4 Req)	33	TRM4617	Spindle Timing Belt Pulley
4	TM4002N-2	Washer (M6) (20 Req)	34	TRM4016	Cover
5	TM4002N-1	Cap Screw (M6 X 10)(20 Req)	35	Tm4014	Precision Bearing (#7012-P4)(2 Req)
6	TM-4050	Inverter Motor	36	TM4015	Bearing Spacer
7	TM4044	Cap Screw (M12 X 30)(4 Req)	37	TM4013	Lock Nut
8	TM4044-1	Washer (M12)	38	TM4012	Spacer
9	TM4056	Key (10x 8x60)	39	TM4019	Key (16x 10x30)
10	5B6009	Motor Timing Pulley	40	TM4010	Precision Bearing (#7014-P4)(2 Req)
11	TA4044	Pulley Washer	41	TM4011	Bearing Spacer
12	5B6009-1	Cap Screw (M4 x 20)(6 Req)	42	TM4009	Spindle Dirt Shield
13	TM4038	Timing Belt (740-5GT-30)	43	Tm4002	Spindle
14	TM4043-1	Cap Screw (M12 x 30)(4 Req)	44	TM4031	Keeper Key (2 Req)
15	TM4043-2	Washer (M12) (4 Req)	45	TM4030	Cap Screw (M8 x 20)(2 Req)
16	TM4043	Motor Bracket	46	TM4029	Lock Nut (M16 x P1.5)
17	TRM4001	Milling Head	47	Tm4028	Bushing
18	TM4048	Switch / Praying Pipe (Pt3/8" 1 x 4")	48	TM4024	Spring (31.5 x 16.3 x 2) (132 Req)
19	TM4047	L Type Pipe Joint (PT3/4) (2 Req)	49	TM4025	Draw Bar
20	TM4045	Tap Bracket	50	TM4023	Bushing
21	TM4045-1	Gas Adapter (PT 1/4 X PE1/2)	51	TM4022	4. Jews Collet
22	TM4045-2	Hose Clip (3/4")	52	TM4003	Quill
23	TM4046	Cap Screw (M6 X 35)(2 Req)	53	TM4035	Cap Screw (M8x 25)(6Req)
24	TM4033	Oil Cylinder	54	TM4007	O- Ring (G135)
25	TM4034	Cap Screw (M10 X 40)(4 Req)	55	TM4006	O-Ring Cover
26	TM4032	Oil Cylinder Seating	56	TM4005	Set Screw (M5 x 5)(2req)
27	TM4036	Cap Screw (M8 X 30)(4 Req)	57	TM4004	Nose -Piece
28	5K8036	Lock Spring Screw(4 Req)	58	TM4008	Cap Screw (M6 x16)(8req)
29	5K6242	Spring(4 Req)			
30	TM4027	Cap Screw (M8 X 30)(4 Req)			



Pull Stud & Tool Shank

TW-40/50 CENTRAL LUBRICATING OIL-FEEDING EQUIPMENT

CENTRAL LUBRICATING OIL-FEEDING EQUIPMENT

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	TB9001	Electric Lubricator	13	TB9016	Joint of Ratio Distribution (CPV3) (17
2	TB9003	Washer (M6) (2 Req)	14	TB9009	A Fixed Twin Joints A (JD-4) (2 Req)
3	TB9004	Nylon Tubing (ϕ 4)	15	TB9012	Pipe Clip (ϕ 4) (4 Req)
4	TB9005	Outside Steel Wire (ϕ 4)	16	TB9013	Socket Head Cap Screw (M5 \times 10) (4 Req)
5	TB9007	Socket Head Cap Screw (M6 \times 20)	17	TB9011	Aluminum Pipe (ϕ 4)
6	TB9002	Socket Head Cap Screw (M6 \times 16) (2 Req)	18	TB9014	A Type Distributor (A-6)
7	TB9008	Outside Steel Wire Soft Tube (ϕ 4 \times 1200) (2 Req)	19	TB9020	Union (PG-004)
8	TB9006	T-Joint (ϕ 4)	20	TB9019	Thimble Nut (PA-4) (29 Req)
9	TB9017	Outside Steel Wire Soft Tube (ϕ 4 \times 800)	21	TB9021	Thimble (PB-4) (46 Req)
10	TB9015	Elbow Joint (PH-408 M8 \times M8) (18 Req)	22	TB9022	Screw Nut (17 Req)
11	TB9018	A Type Distributor (A-8) (2 Req)	23	TB9023	Straight Joint (PD-408) (2 Req)
12	TB9010	Socket Head Cap Screw (M6 \times 25) (8 Req)			