



BM-3 CNC Bed Mill *Operation 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:

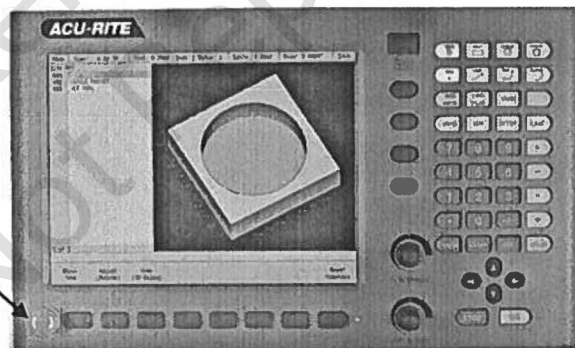
1. Only the person whose ability is confirmed or the qualified person can be equipped with the job of operation or maintenance:

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.

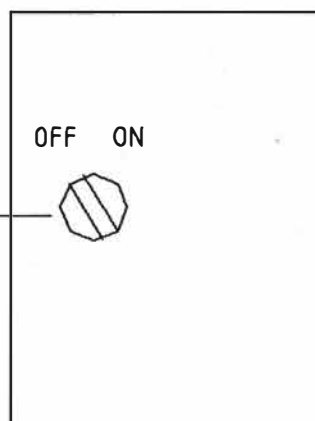
3-1 Operation panel

Emergency Stop button



- 3-2 Before maintenance, or any emergency situations, please turn this knob to OFF position

Power Switch
(Electric Cabinet)

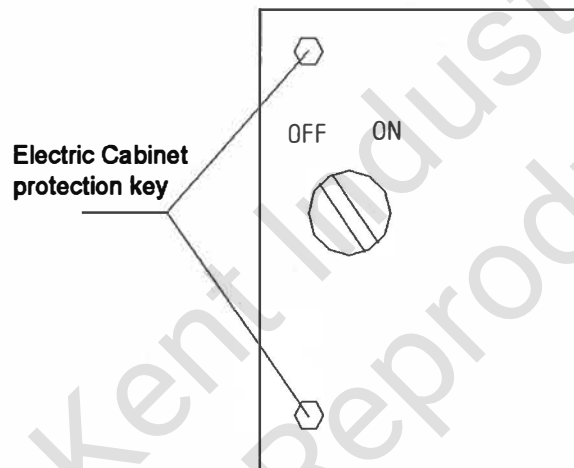


4. The safety key needs to be stored by pointed person.

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 tool 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) : 1700×2000×2200 mm

Net weight : 1700 kgs

Gross weight : 2000 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 : 2,000kgs

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

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.

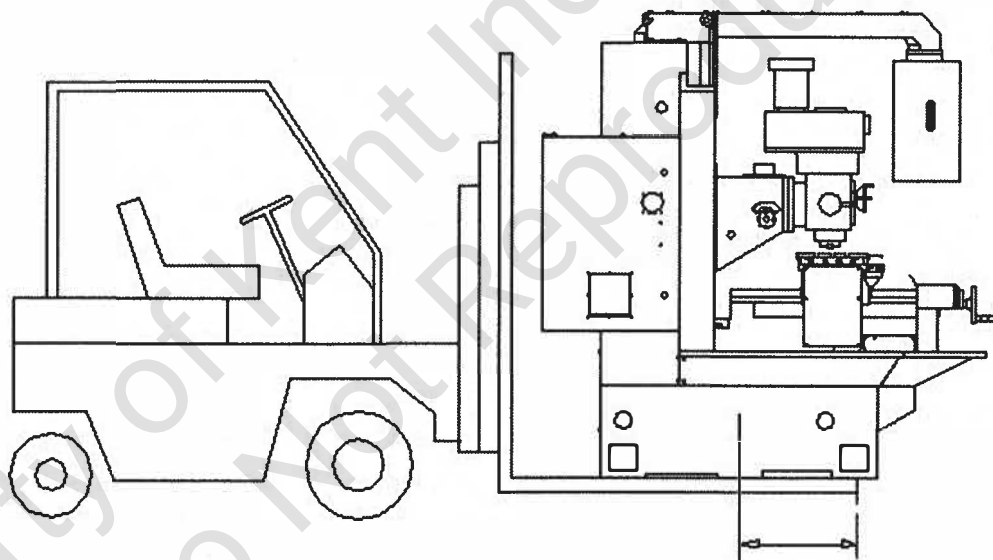
2. Forklifter:

- (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 : 1,700kgs

Fork Length : 1,300mm

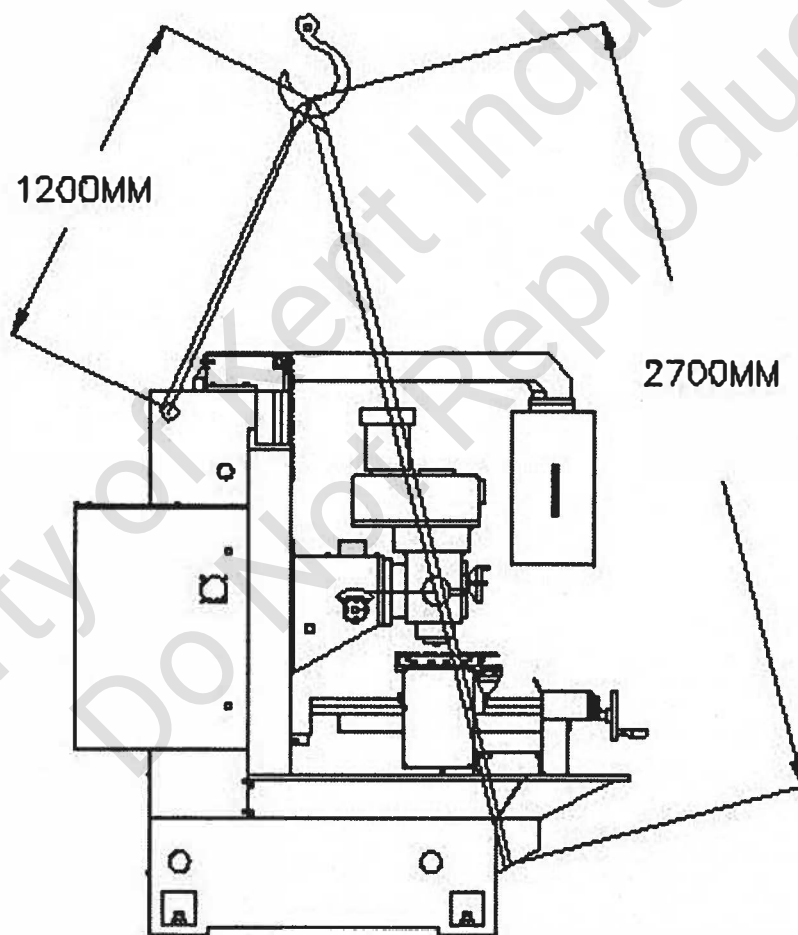


Over 100mm from the center

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:

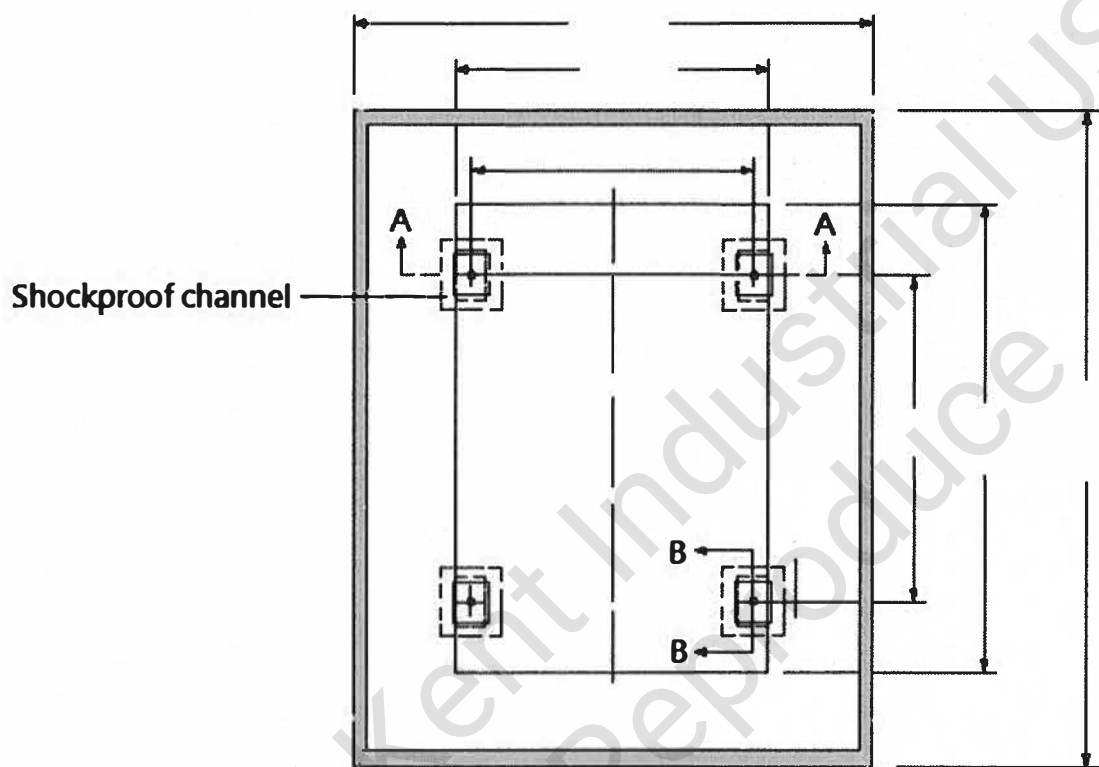
Our machine passes the strict function test and quality test before shipping.

The customer shall check the follows items after uncrating:

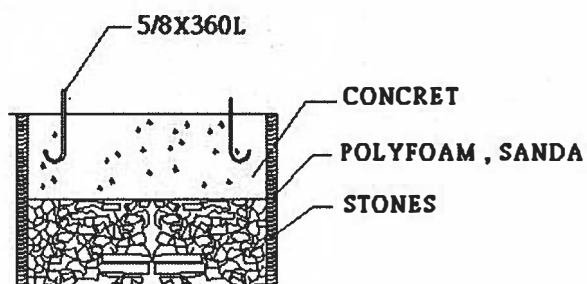
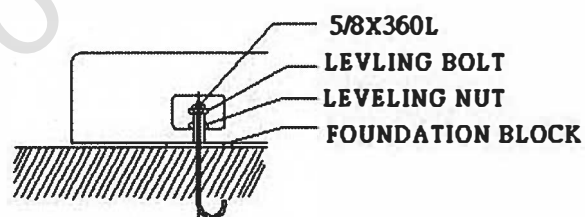
- (1) Whether or not the model is correct (coincidence with order)?
- (2) Whether or not the accessories or parts are complete?
- (3) Whether or not the machine was damaged due to transportation?
- (4) Whether or not the machine includes the inspection record?

3-2. Before installing:

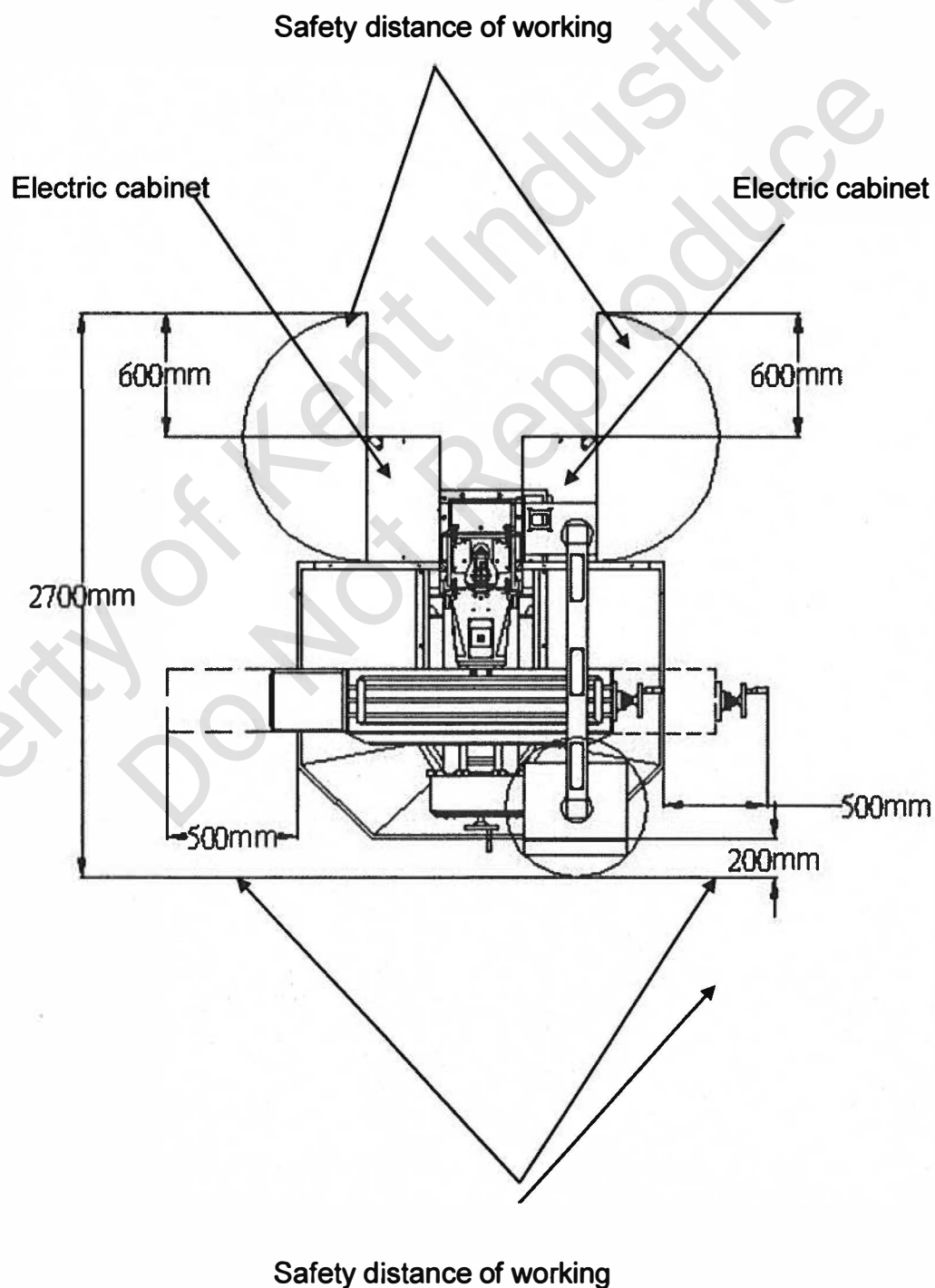
1. The machine's foundation's work shown on the drawing below:



The foundations 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 : $0^{\circ}\text{C} \sim 45^{\circ}\text{C}$.

(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:

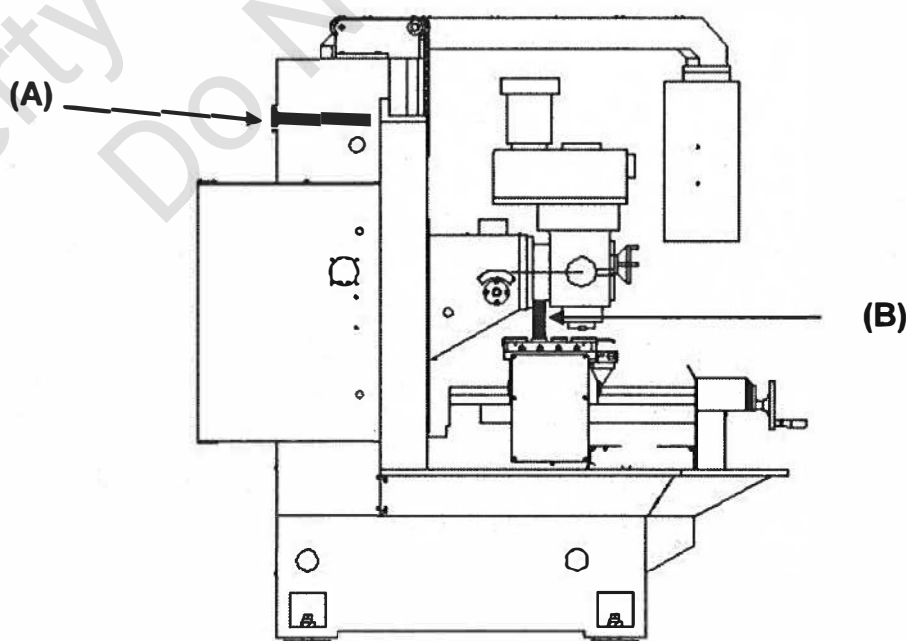
1. Put the machine on the planned foundation firstly.
2. Put the foundation bolts and foundation brackets beside the foundation holes Temporarily.
3. Lift up the machine, and then put in the foundation bolts, and brackets to the holes of leveling screws, then tight up the nuts to prevent the falling.
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 $220\text{ V} \pm 10\%$.
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.

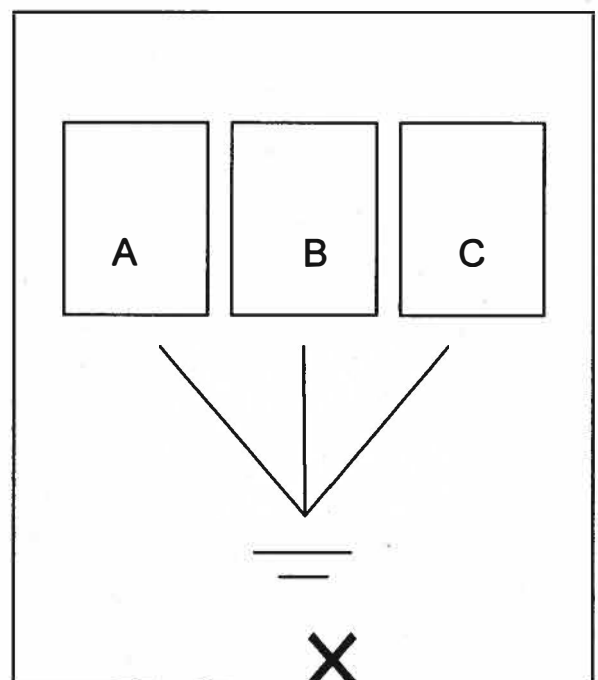
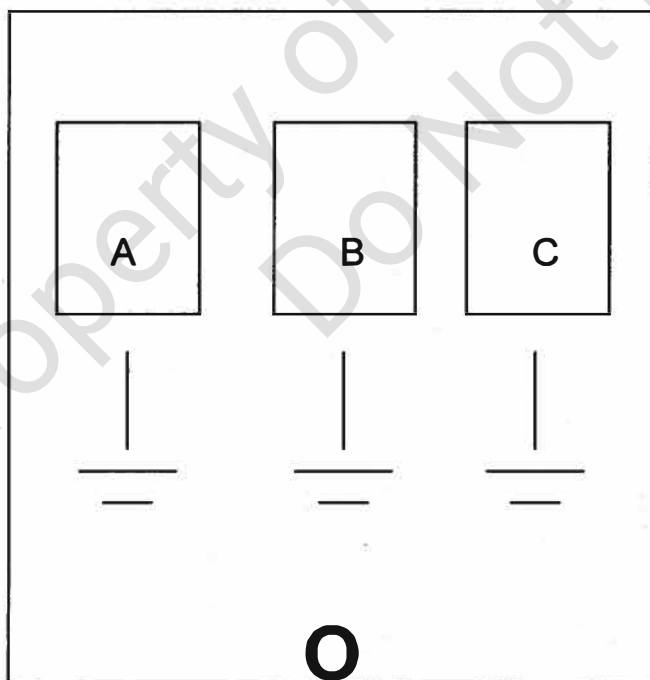


3-6. Cleaning and lubricating:

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.

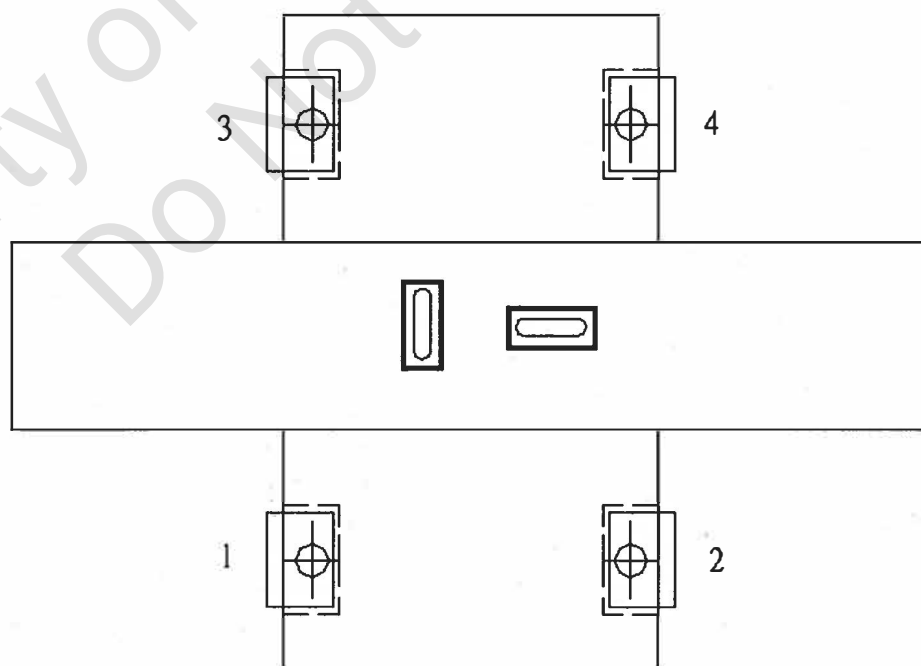
3-7. Machine's grounding:

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:

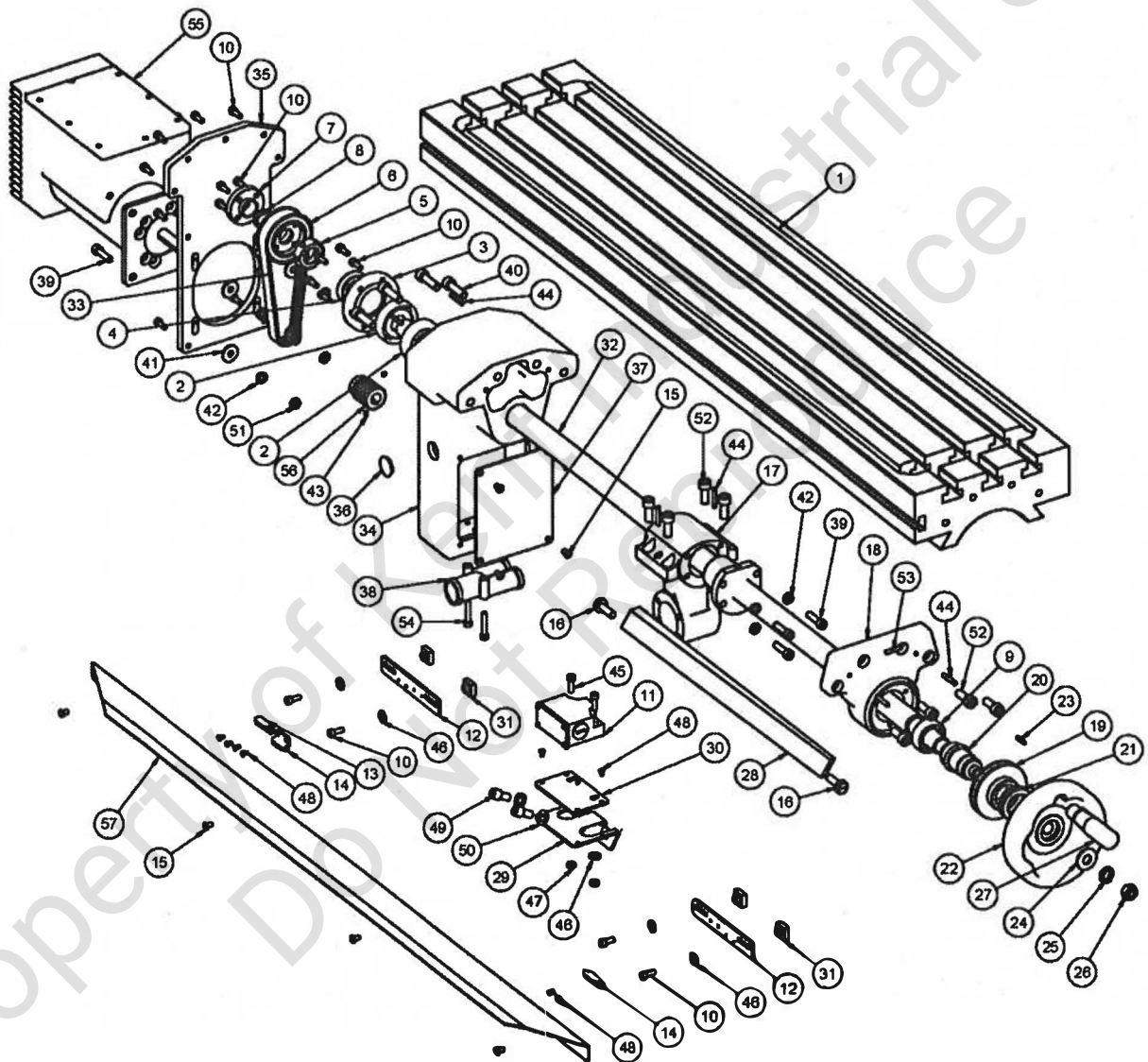
1. Prepare two of precision bubble levels (0.02mm per scale).
2. Before adjustment, please check firstly the accuracy of the precision bubble level, the method is as below:
 - (1) Put the level on a fixed position of the table.
 - (2) After the bubble is stable, please record the bubble position, and 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 2 firstly, and then adjust 3~ 4 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

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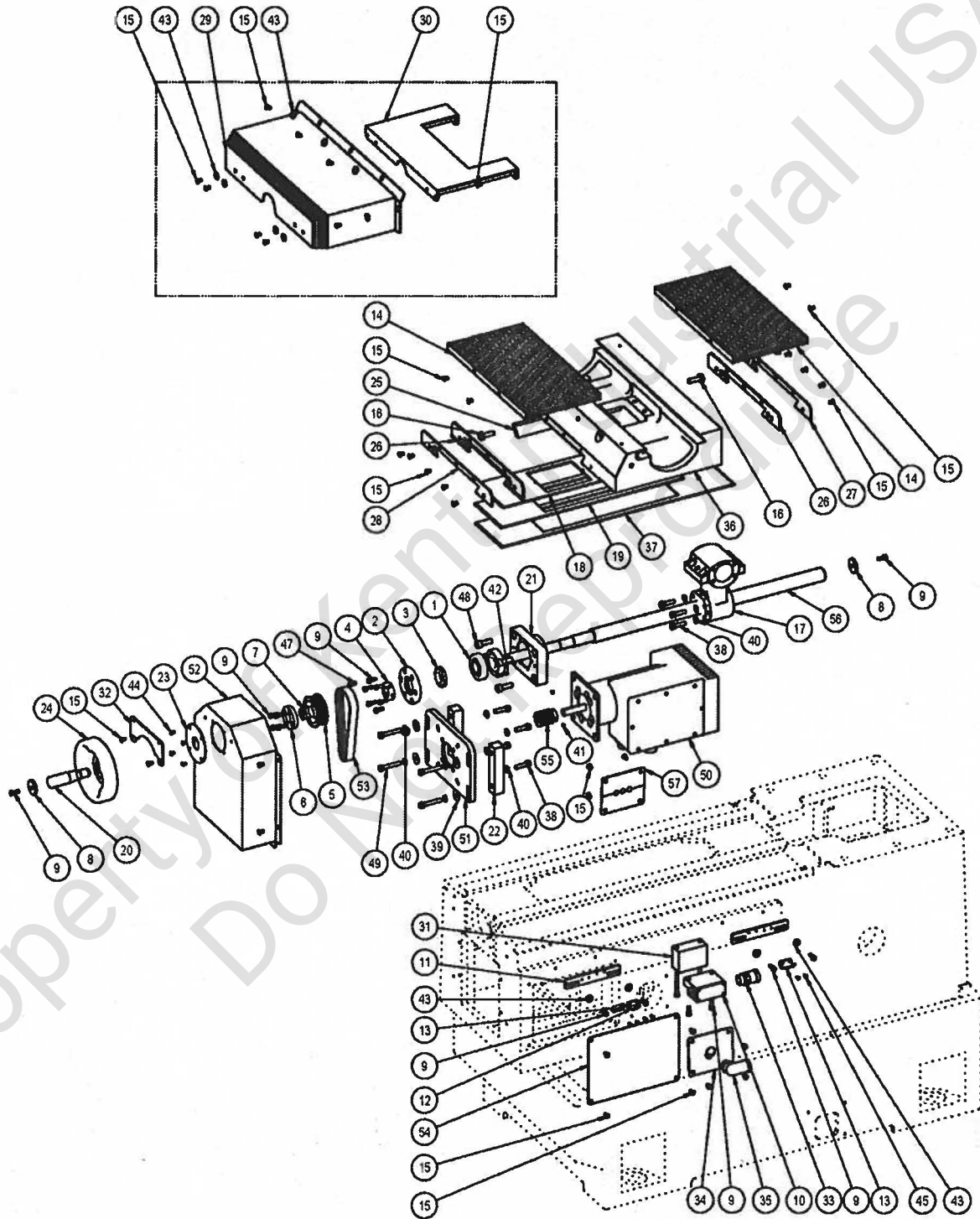
3BM X-AXIS ASSEMBLY



3BM X-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION
1	2001-50	Table (10**50")
2	020-BST2562	Precision Ball Screw Bearing (2Req)
3	TA-2011	Bearing Retainer Ring
4	TA-2013	Dust Proof Washer
5	021-0000MR25	Lock Nut (MR25)
6	5A-2013A	Timing Belt Pulley
7	5B-2014A	Fled Block For Cone Ring Key
8	032-00022x26	Cone Ring Key (22x26)
9	020-006204ZZ	Bearing (6204ZZ)
10	001-M0600016	Socket Head Cap Screw (M6*16) (23Req)
11	022-00000001	Limit Switch (BNS-819-B02-D12-31-12)
12	4B-2031	Limit Dog Bracket (2Req)
13	4B-2029F	Limit Dog
14	4B-2029	Limit Dog (2Req)
15	002-M0600010	Hemisphere Head Cap Screw (M6*10) (8Req)
16	3028	Gib Adj-Screw (2Req)
17	TF-3025	Longitudinal Feed Bracket
18	2006	Bearing Bracket
19	2012-I	Dial With 200 Graduations (INCH TYPE)
19	2012-M	Dial With 250Graduations (MM TYPE)
20	2014	Dial Holder
21	2016	Dial Lock Nut
22	TF-2018A	Hand Wheels
23	013-03030020	Key (3*3*20)
24	011-I0000040	Washer (1/2")
25	012-I0000040	Spring Washer (1/2")
26	009-IUNF0040	NUT (1/2UNF)
27	HL-80	Handle
28	3026	Table/Saddle Glb
29	TF-2036H	Limit Switch Bracket
30	TF-2036H-1	Adjust The Board
31	5A-2043	Blocking (4Req)
32	3BM-2002-I	X Axis Ballscrew (INCH TYPE)
32	3BM-2002-M	X Axis Ballscrew (MM TYPE)
33	023-5M047519	Timing Belt (5M-475-19)
34	3BM-2006	Motor Support Bracket
35	3BM-2007	Motor Bracket
36	026-0000HP25	Plug (HP-25)
37	3BM-2006-1	Cover
38	BVYD-231717GT	Y-Type Nylon Quick Connectors
39	001-M0800030	Socket Head Cap Screw (M8*30) (8Req)
40	001-M1000035	Socket Head Cap Screw (M10*35) (4Req)
41	011-M0000008	Washer (M8) (4Req)
42	012-M0000008	Spring Washer (M8) (8Req)
43	008-M0500005	Set Screw (M5*5) (2Req)
44	014-05000030	Roll Pin (5*30) (6Req)
45	001-M0600020	Socket Head Cap Screw (M6*20) (2Req)
46	011-M0000006	Washer (M6) (6Req)
47	009-M0000006	Nut (M6) (2Req)
48	002-M0400008	Hemisphere Head Cap Screw (M4*8) (10Req)
49	001-I0300060	Socket Head Cap SCrew (3/8*3/4L) (2Req)
50	011-M0000S10	Washer (M10) (2Req)
51	009-M0000008	Nut (M8) (4Req)
52	001-M1000025	Socket Head Cap Screw (M10*25) (8Req)
53	5016-1	Plate
54	001-M0600035	Socket Head Cap Screw (M6*35) (2Req)
55		Servo Motor
56	5B-2018AUC	Timing Belt Pulley
57	5A-2021-800	Table Foent Cover

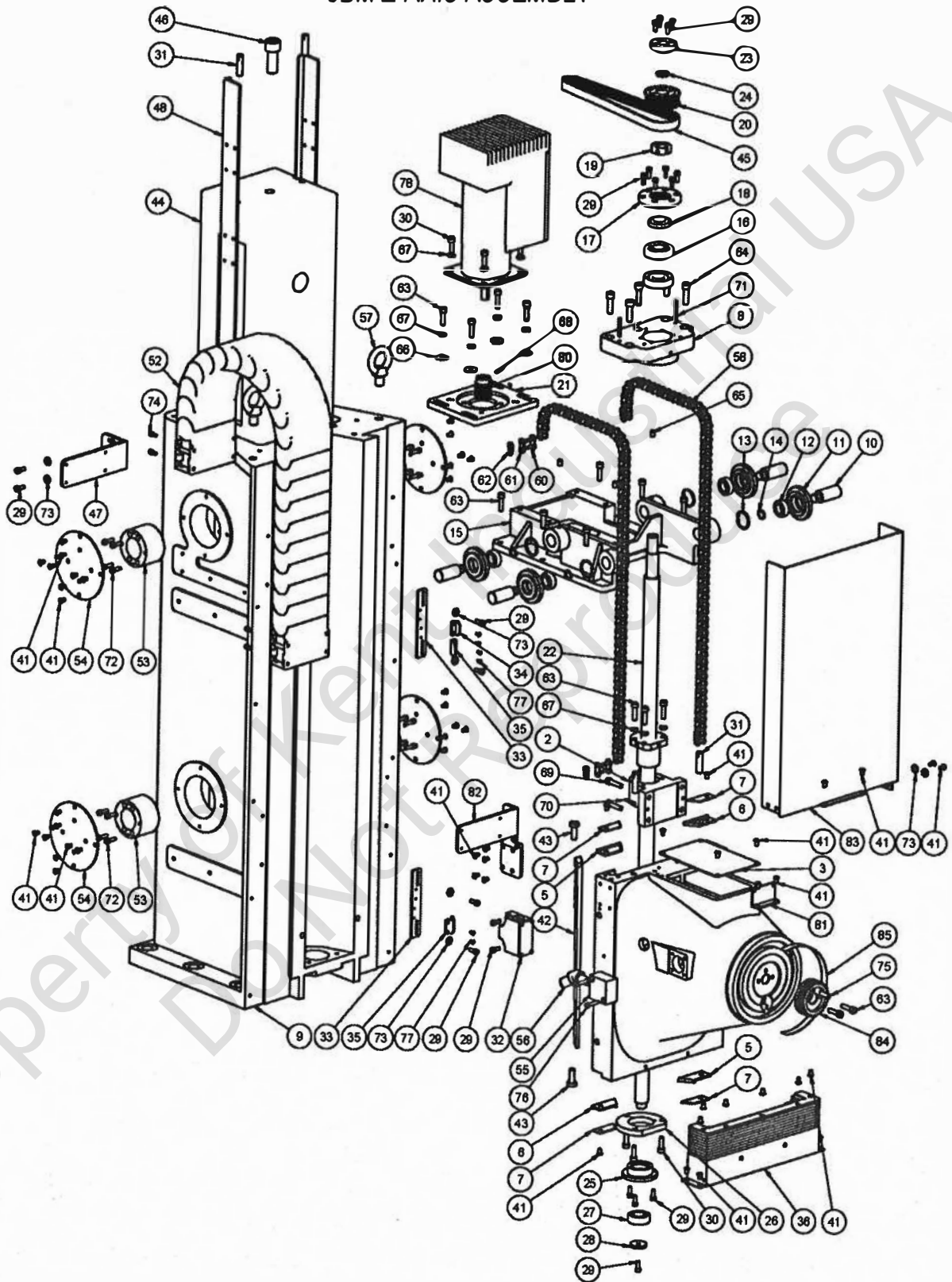
3BM Y-AXIS ASSEMBLY



3BM Y-AXIS ASSEMBLY

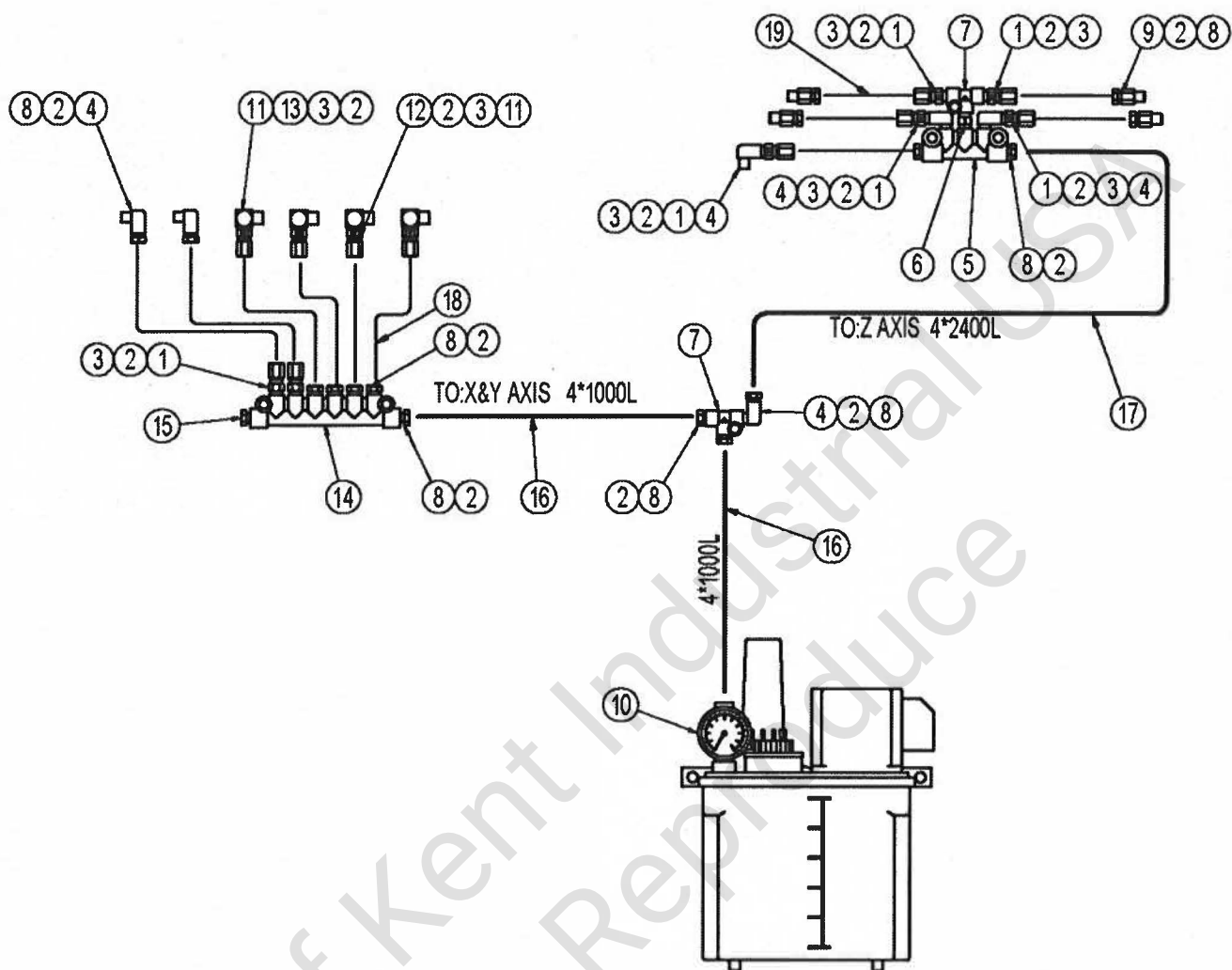
ITEM NO.	PARTS NO.	DESCRIPTION
1	020-BST2562	Precision Ball Screw Bearing (2Req)
2	TA-2011	Bearing Retainer Ring
3	TA-2013	Dust Proof Washer
4	021-0000MR25	Lock Nut (MR25)
5	5A-2013A	Timing Belt Pulley
6	5B-2014A	Fled Block For Cone Ring Key
7	032-00022x26	Cone Ring Key (22x26)
8	5A-2035	Washer (2Req)
9	001-M0600018	Socket Head Cap Screw (M6*18) (18Req)
10	022-00000001	Limit Switch (BNS-819-B02-D12-31-12)
11	4B -2031	Limit Dog Bracket (2Req)
12	4B-2029F	Limit Dog
13	4B -2029	Limit Dog
14	041-WW380450	Rubber Way Cover (2Req)
15	002-M0800010	Hemisphere Head Cap Screw (45Req)
18	3028	Gib Adj-Screw (2Req)
17	TF-3025	Feed Nut Bracket
18	3040	Chip Guards
19	H-3039-1	Chip Guards
20	HL-80	Handle
21	3B-3005	Bearing Bracket
22	5A-3020-1	Block (2Req)
23	3B-3004-1	Cover
24	TF-2018	Hand Wheels
25	3027	Saddle/Base Gib
26	3H-3037	Felt Wipers (2Req)
27	3H-3037-1A	Wiper Holder (Behind)
28	3H-3037-1	Wiper Holder (Front)
29	3BM-3037	Telescope Cover
30	3BM-3037A-1	Telescope Cover Bracket
31	3BM-3005	Limit Switch Bracket
32	3BM-3037-2	Rubber Way Cover Bracket
33	BVND-P167GT	Nylon Quick Connectors
34	5A-4001-1-23	Cover
35	BVWD-P167GT	L-TYPE Nylon Quick Connectors
36	3H-3001	Saddle
37	4H-3039	Chip Guards
38	001-M0800030	Socket Head Cap Screw (M8*30) (8Req)
39	011-M0000008	Washer (M8) (4Req)
40	012-M0000008	Spring Washer (M8) (12Req)
41	008-M0500005	Set Screw (M5*5) (2Req)
42	014-05000030	Roll Pin (5*30) (2Req)
43	011-M0000006	Washer (M6) (13Req)
44	002-M0500008	Hemisphere Head Cap Screw (M5*8) (4Req)
45	002-M0400008	Hemisphere Head Cap Screw (M4*8) (6Req)
46	001-M0600055	Socket Head Cap Screw (M6*55) (2Req)
47	013-05050020	Key (5*5*20)
48	001-M10000030	Socket Head Cap Screw (M10*30) (4Req)
49	001-M0800050	Socket Head Cap Screw (M8*50) (4Req)
50		Servo Motor
51	TB-3020F	Motor Bracket
52	3BM-3004	Cover
53	023-5M044019	Timing Belt (5M-440-19)
54	3BM-1001-1	Cover
55	5B-2018AUC	Timing Belt Pulley
56	4G-3002-I	Y-Axis Ballscrew (INCH TYPE)
56	4G-3002-M	Y-Axis Ballscrew (MM TYPE)
57	3BM-1001-2	Cover

3BM Z-AXIS ASSEMBLY



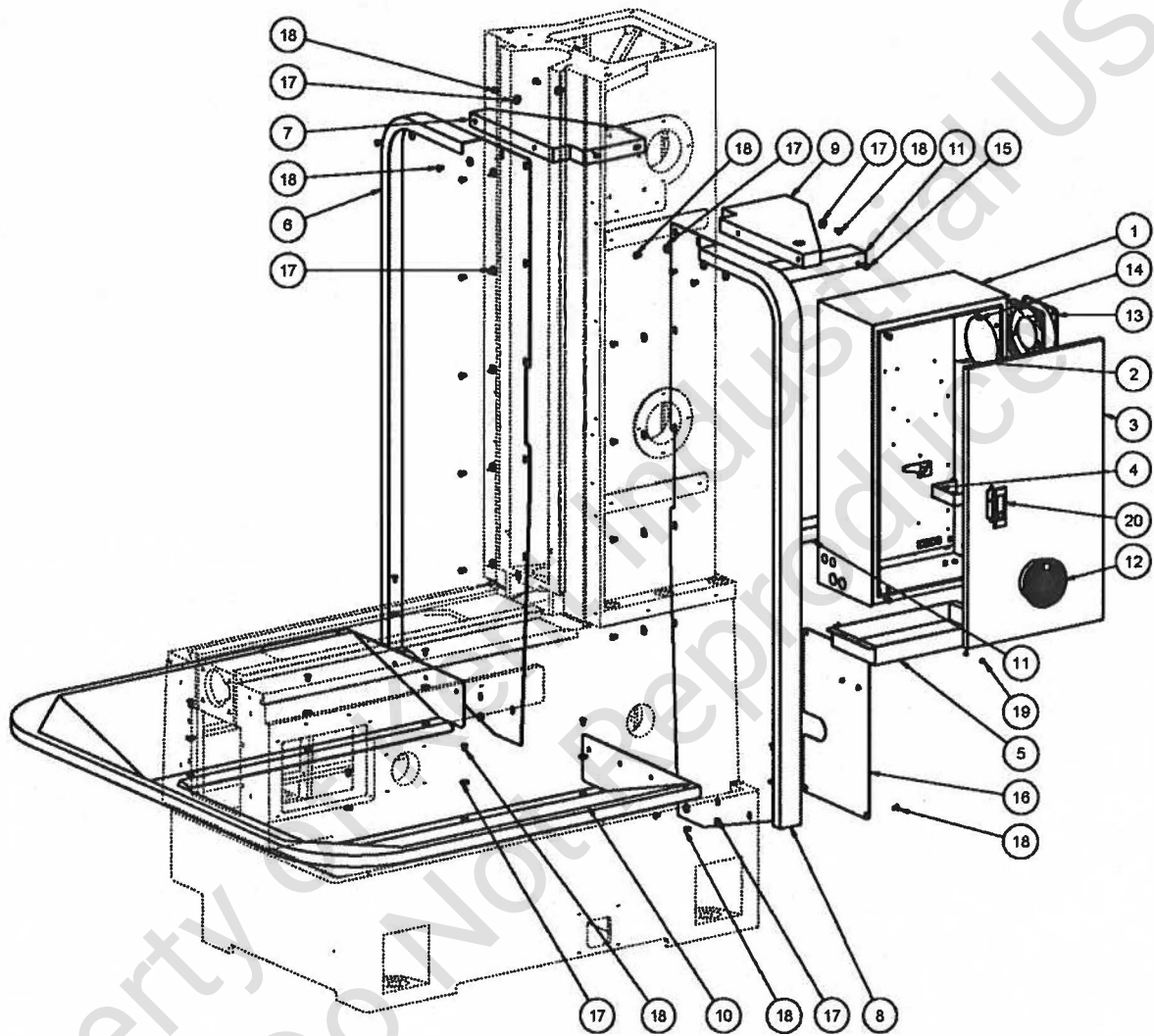
3BM Z-AXIS ASSEMBLY

零件表			零件表		
ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	3BM-4001	Head Sled-Block	42	4038	Column/Head Gib
2	3B-3023	Bracket For Z-Axis Ballscrew	43	3028	Gib Adj-Screw (2Req)
3	5A-5006	Cover	44	3BM-5026	Counter Weight
5	4028	Wiper Holder (2Req)	45	023-5M072019	Timing Belt (5M-720-19)
6	4028-1	Wiper Holder (2Req)	46	001-M2000050	Socket Head Cap Screw (M20*50)
7	4028-2	Wiper Holder Plate (4Req)	47	3BM-5001-2	Cable Drag Chain Bracket
8	5A-3005A	Bearing Bracket	48	3BM-5004	Counter Weight Guide Plate (2Req)
9	3BM-5001	Column	52	IGUS-158.100.150-20P	Cable Drag Chain
10	TB-5007	Chain Wheel Shaft (4Req)	53	3BM-5005	Guide Bracket (4Req)
11	TP-5018	Chain Wheel (4Req)	54	3BM-5008	Cover (4Req)
12	020-008003ZZ	Bearing (8003ZZ) (4Req)	55	3A-6045	Water Switch Bracket
13	015-R0000035	Snap Ring (R35) (4Req)	56	029-WSJU450304	45 Deg Copper Connector (PT3/8" PH1/2)
14	015-S0000017	Snap Ring (S15) (4Req)	57	025-M0000016	Eye Bolt (M16) (2Req)
15	3BM-5002	Chain Bracket	58	018-0500P0063	Chain (50#-63P) (2Set)
16	020-08ST2562	Precision Ball Screw Bearing (2Req)	63	001-M0800030	Socket Head Cap Screw (M8*30) (16Req)
17	TA-2011	Bearing Retainer Ring	64	001-M1000035	Socket Head Cap Screw (M10*35) (5Req)
18	TA-2013	Dust Proof Washer	65	008-M0800012	Set Screw (M8*12) (4Req)
19	021-0000MR25	Lock Nut (MR25)	66	011-M0000008	Washer (M8) (4Req)
20	5A-2013A	Timing Belt Pulley	67	012-M0000008	Spring Washer (M8) (12Req)
21	5B-3008F	Motor Bracket	68	008-M0500005	Set Screw (M5*25) (2Req)
22	3BM-4002	Z-Axis Ballscrew	69	001-M0800035	Socket Head Cap Screw (M8*35) (4Req)
23	5B-2014A	Fled Block For Cone Ring Key	70	014-05000030	Roll Pin (5*30) (2req)
24	032-00022x26	Cone Key (22*26)	71	014-05000040	Roll Pin (5*40) (2req)
25	4006	Bearing Cap	72	001-M0600020	Socket Head Cap Screw (M6*20) (16Req)
26	3BM-4003	Ewaring Cap Bracket	73	011-M0000008	Washer (M6) (8Req)
27	020-006204ZZ	Bearing (6204ZZ)	74	001-M0500012	Socket Head Cap Screw (M5*12) (8Req)
28	5A-2035	Washer	75	014-08000028	Roll Pin (8*28)
29	001-M0600016	Socket Head Cap Screw (M6*16) (22Req)	76	001-M0600025	Socket Head Cap Screw (M6*25) (2Req)
30	001-M0800025	Socket Head Cap Screw (M8*25) (7Req)	77	002-M0400008	Hemisphere Head Cap Screw (M4*8) (6Req)
31	3BM-5003	Counter Weight Chain Joint (4Req)	78		Servo Motor
32	022-00000001	Limit Switch (BNS-819-B02-D12-31-12)	80	5B-2018AUC	Timing Belt Pulley
33	4B-2031	Limit Dog Bracket (2Req)	81	3BM-4001-1	Oil Distributor Bracket
34	4B-2029F	Limit Dog	82	3BM-5001-1K	Cable Drag Chain Bracket
35	4B-2029	Limit Dog (2Req)	83	3BM-4004K	Cover
36	3BM-4005	Bellows Cover	84	5033	Worm Gear
41	002-M0800012	Hemisphere Head Cap Screw (M8*12) (61Req)	85	5016	Angle Plate



ITEM NO.		PARTS NO.	DESCRIPTION
1	7	028-000CPV-3	Joint of Distribution (CPV-3) (7Req)
2	27	028-0000PB-4	Thimble (PB-4) (27req)
3	11	028-0000PR-8	Screw Nut (PR-8) (11Req)
4	6	028-00PH-408	Elbow Joint (PH-408) (6req)
5	1	028-00000A-5	A Type Distributor (A-5)
6	1	028-PROCPV-1	Nipples (M8*M8)
7	2	028-000PKD-4	3-Way Junction (PKD-4) (2Req)
8	16	028-0000PA-4	Thimble (PA-4) (16Req)
9	4	028-00PD-408	Straight Adapter (PD-408) (4Req)
10	1	028-CESMA-60-4	Electric Lubricator
11	4	028-00PI-101	Elbow Joint (PI-101) (4R)
12	2	028-000CPS-5	Joint of Distribution (CPS-5) (2Req)
13	2	028-000CPS-4	Joint of Distribution (CPS4) (2Req)
14	1	028-00000A-8	A Type Distributor (A-8)
15	1	028-00PG-004	Union (PG-004)
16	2	028-01041000	Outside Steel Wire Soft Tube (4*1000L) (2Req)
17	1	028-01042400	Outside Steel Wire Soft Tube (4*2400L)
18	1	028-AL-PI-04	Aluminum Pipe
19	1	028-Ny-PI-04	Nylon Tubing

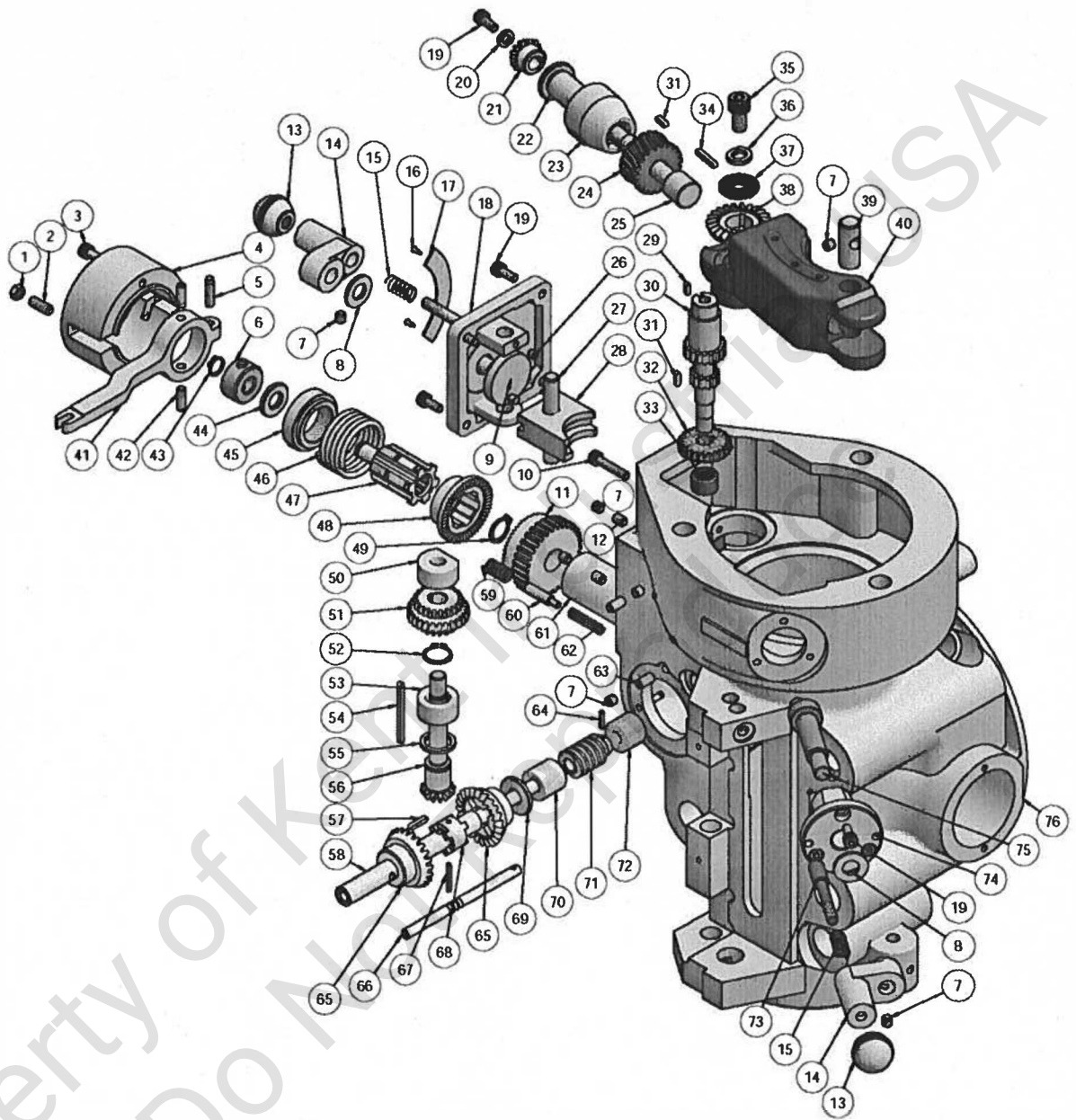
3BM SHEEL METAL ASSEMBLY



3BM SHEEL METAL ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION
1	1020S	Electric Cabinet
2	1020S-1	Wring Plate
3	1020S-2	Electric Cabinet Door
4	1020S-3	Switch Bracket
5	1020S-4	Resistance Cover
6	3BM-1008	Left Chip Guard
7	3BM-1008-1	Left Chip Guard Support Plate
8	3BM-1009	Right Chip Guard
9	3BM-1009A-1	Right Chip Guard Support Plate
10	3BM-1204	Chip Pan
11	3BM-5001-3	Support For Electric Box (2Req)
12	FU-9701A	Vent Screen (FU-9701A)
13	KS1238HA1SAT	Fan (110V or 220V)
14	001-M0600012	Socket HEAD Cap Screw (M6*12) (4Req)
15	001-M0600016	Socket Head Cap Screw (M6*16) (4Req)
16	TB-1005	Cover
17	011-M0000006	Washer (M6) (32Req)
18	002-M0600010	Hemisphere Head Cap Screw (M6*10) (36Req)
19	004-M04000005	Chem Blacked RD. HD. Screw (M4*5) (6Req)
20	030-A-240-3-1	Door Latch

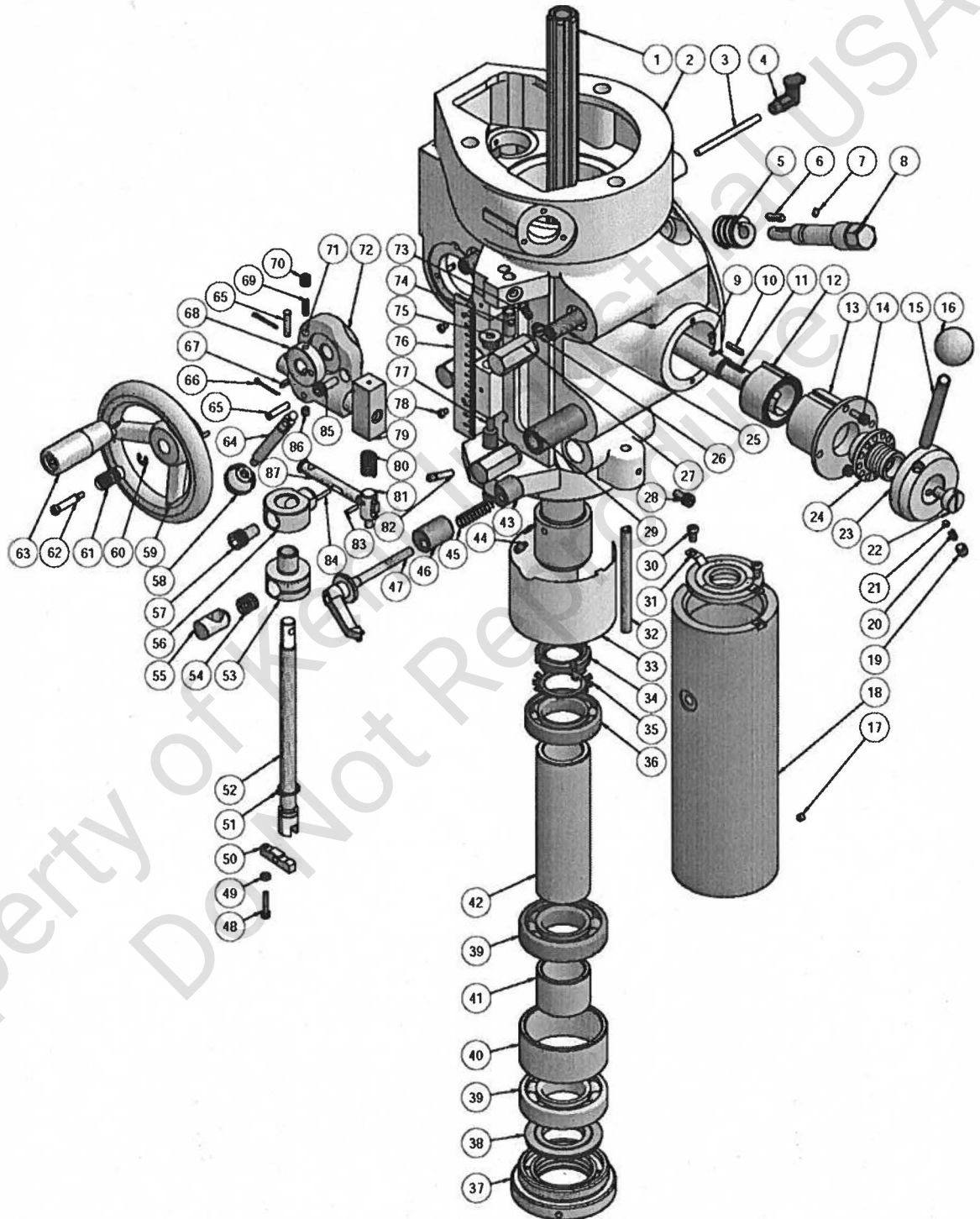
R8 SPINDLE HEAD PART A



R8 SPINDLE HEAD PART A

ITEM ON.	PARTS NO.	DESCRIPTION	ITEM ON.	PARTS NO.	DESCRIPTION
1	009-M0000005	Nut(M5) (6208)	39	6122	Feed Engage Pin
2	008-M0600016	Set Screw(M6*16) (6207)	40	6121	Worm Gear Cradle
3	001-M0500030	Socket Head Cap Screw(M5*30)(2Req) (6206)	41	6203	Overload Clutch Tnp Lever
4	6205	Clutch Arm Cover	42	6202	Clutch Ring Pin (2Req)
5	016-P0500020	Pin(5*20) (6204)	43	015-S0000010	Snap Ring(S10) (6195-1)
6	6200	Clutch Ring	44	6201	Overload Clutch Washer
7	008-M0600006	Set Screw(M6*6) (8Req) (6227-2)	45	6198	Overload Clutch Locknut
8	6016-2	Washer (2Req)	46	6197	Safety Clutch Spring
9	6166	Cluster Gear Shift Crank	47	6195	Overload Clutch Sleeve
10	001-M0500025	Socket Head Cap Screw(M5*25) (6121-1)	48	6194	Overload Clutch
11	6187.88	Overload Clutch Guards	49	015-S0000015	Snap Ring(S15)
12	008-M0600008	Set Screw(M6*8) (5Req) (6227-1)	50	6157	Cluster Gear Shaft Upper Bearing
13	6131	Black Plastic Ball(1/4") (2Req)	51	6152.3.4	Cluster Gears Assembly
14	6168	Shift Crank (2Req)	52	015-S0000016	Snap Ring(S16) (6188-1)
15	6170	Compression Spring (2Req)	53	6156	Bevel Gear Bearing
16	033-00000001	Round HD Drive Screw (2Req) (6256-1)	54	013-03030045	Key(3*3*45) (6160)
17	6256-I	Vari-Speed Dial(INCH TYPE)	55	6159	Bevel Gear Thrust Spacer
17	6256-M	Vari-Speed Dial(M/M TYPE)	56	6151	Cluster Gear Shaft
18	6161	Cluster Gear Cover	57	013-03030015	Key(3*3*15) (6230)
19	001-M0500012	Socket Head Cap Screw(M5*12)(8Req) (6165)	58	6209	Feed Worm Shaft
20	6139-1	Bevel Pinion Washer	59	6192	Compression Spring
21	6139	Feed Bevel Pinion	60	6193	Overload Clutch Lever Spring Plunger
22	6138	Feed Worm Gear Shaft Sleeve	61	6186	Quill Pinion Shaft Bushing
23	6137	Worm Cradle Busting	62	6191	Compression Spring
24	6134	Feed Drive Wonn Gear	63	008-M0600012	Set Screw(M6*12) (2Req) (6156-1)
25	6133	Feed Drive Wonn Gear Shaft	64	014-03000012	Roll Pin(3*12) (6226)
26	008-M0500005	Set Screw(M5*5) (6164)	65	6220	Feed Reverse Bevel Gear (2Req)
27	6163	Feed Shift Rod	66	6216	Reverse Clutch Rod
28	6162	Feed Gear Shift Fork	67	014-03000020	Roll Pin(3*20) (6217)
29	013-03030008	Key(3*3*8) (6147)	68	6222	Feed Reverse Clutch
30	6143.46	Feed Driving Gear	69	6223	Feed Worm Shaft Thrust Washer
31	013-03030010	Key(3*3*10) (2Req) (6145)	70	6224	Feed Worm Shaft Bushing
32	6144	Feed Driving Gear	71	6225	Worm
33	020-00SCE66A	Needle Bearing(SCE 66A#) (6252)	72	6227	Bushing
34	013-03030020	Key(3*3*20) (6135)	73	6169	Gear Shift Plunger (2Req)
35	001-M0800016	Socket Head Cap Screw(M8*16) (6150)	74	6125	Shift Sleeve
36	012-M0000008	Spring Washer(M8) (6149-1)	75	6126	Worm Gear Cradle Throw-Out
37	5K-6149	Washer	76	6101	Quill Housing
38	6148	Feed Reverse Bevel Gear			

R8 SPINDLE HEAD PART B

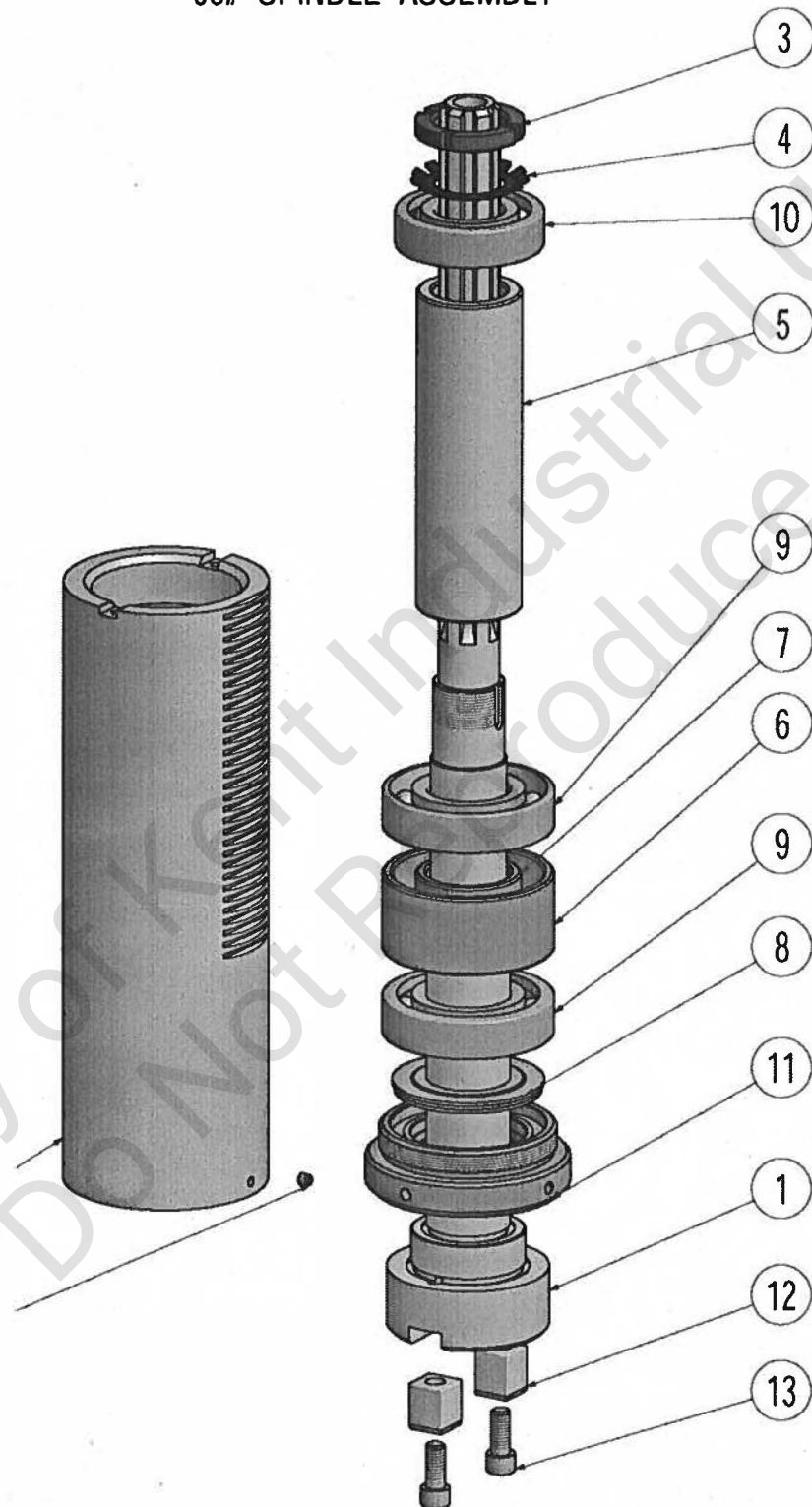


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R8 SPINDLE HEAD PART B

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	6084	Spindle	47	6117.19	Quill Lock Bolt
2	6101	Quill Housing	48	001-M0400020	Socket Head Cap Screw(M4*20) (6113)
3	6259	Copper Pipe	49	009-M0000004	Nut(M4) (6113-1)
4	037-00000010	Oil Cap(PT1/8") (6258)	50	6111	Feed Trp Lever
5	5039	Worm Gear	51	015-S0000016	Snap Ring(S16) (6115)
6	013-04040020	Key(4*4*20) (5041)	52	6104-I	Quill Stop Micro-Screw(INCH TYPE)
7	008-M0400006	Set Screw(M4*6) (5042)	52	6104-M	Quill Stop Micro-Screw(M/M TYPE)
8	5040	Adj Worm Shaft	53	6107-I	Micrometer Nut(INCH TYPE)
9	002-M0400008	Hemisphere Head Cap Screw(M4*8) (6172-1)	53	6107-M	Micrometer Nut(M/M TYPE)
10	013-03030018	Key(3*3*18) (6184)	54	6108-1	Spring
11	6172	Quill Pinion Shaft	55	6108-I	Quill Micro-Stop Nut(INCH TYPE)
12	6181	Clock Spring Assembly	55	6108-M	Quill Micro-Stop Nut(M/M TYPE)
13	6180	Spring Cover	56	6105	Quill Stop Knob
14	001-M0500012	Socket Cap Screw(M5*12)(2Req) (6180-1)	57	001-I0300040	Socket Head Cap Screw(3/8" *1/2") (6106)
15	6174	Pinion Shaft Hub Handle	58	6131	Black Plastic Ball(1/4")
16	6173	Black Plastic Ball Handles(3/8")	59	6210	Handwheel
17	008-M0500005	Set Screw(M5*5) (6085-1)	60	015-E0000005	Snap Ring(E5) (6215)
18	6085	Quill	61	6213	Reverse Knob
19	008-M0800008	Set Screw(M8*8) (6177)	62	6214	Feed Reverse Knob Stud
20	6175	Compression Spring	63	6210-1	Handle
21	027-00000200	Steel Ball(1/4") (6176)	64	6234	Trp Handle
22	6183	Pinion Shaft Hub Screw	65	6236-1(6231-1)	Dowel Pin (2Req)
23	6178	Rack Feed Handle Hub	66	038-01250060	Cotter Pin(3/32*3/4") (2Req) (6257)
24	6182	Pinion Shaft Hub Sleeve	67	013-03030010	Key(3*3*10) (6229)
25	5036	T-Bolt Assembly (4Req)	68	6218	Handwheel Clutch
26	6114	Reverse Trip Ball Lever Screw	69	6219-2	Compression Spring
27	5038	Locknut (4Req)	70	6219-1	Handwheel Clutch Spring Screw
28	001-M0600016	Socket Head Cap Screw(M6*16) (6251-1)	71	027-00000150	Steel Ball(3/16") (6255)
29	6120	Lower Clamping Bolt Spacer (2Req)	72	6231	Feed Trip Bracket
30	004-M0500010	Felt Washer Screw(M5*10) (2Req) (6088-1)	73	6110	Reverse Trip Ball Lever
31	6088	Felt Washer	74	6109	Feed Reverse Trp Plunger
32	6251	Set Bar	75	6118-1	Trp Plunger Bushing
33	6086	Quill Skirt	76	6243-I	Micrometer Scale(INCH TYPE)
34	6090	Locknut	76	6243-M	Micrometer Scale(M/M TYPE)
35	035-0000AW06	Lockwasher(AW06) (6091)	77	6118	Feed Trip Plunger
36	020-06206LLB	Bearing(6206LLB#) (6092)	78	004-M0400005	Chem Blacked RD. HD. Screw(M4*5)(2Req) (6244)
37	6098-R8	Nose-Piece			
38	6097	Spindle Dirt Shield	79	6236	Cam Rod Sleeve Assembly
39	020-00007207	Bearing(7207-P4#) (2Req) (6093)	80	6242	Compression Spring
40	6095	Bearing Spacer- Small	81	6240	Trp Plunger
41	6096	Bearing Spacer- Large	82	6112	Trp Lever Pin
42	6094	Sleeve	83	014-03000012	Roll Pin(3*12) (6237)
43	6116B	Quill Lock Sleeve	84	014-03000016	Roll Pin(3*16) (6241)
44	6253	Special Socket Set Screw	85	001-M0600016	Socket Head Cap Screw(M6*16)(2Req) (6232)
45	6116-1	Compression Spring	86	008-M0600006	Set Screw(M6*6) (6219)
46	6116A	Quill Lock Sleeve Tapped	87	6239	Cam Rod

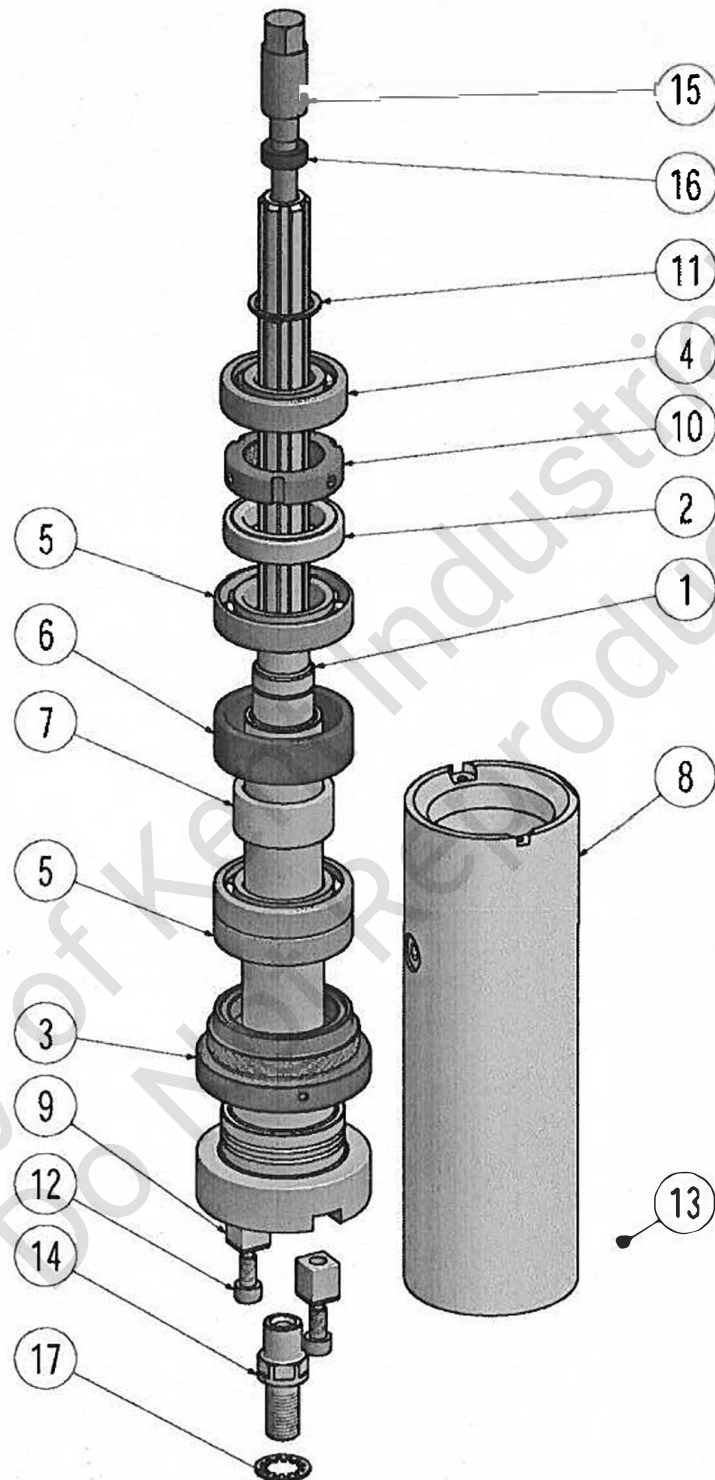
30# SPINDLE ASSEMBLY



30# SPINDLE ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION
1	6084-30#	Spindle For 30#
2	6085	Quill
3	6090	Locknet
4	035-0000AW06	Lockwasher(AW06) (6091)
5	6094	Sleeve
6	6095	Bearing Spacer-Small
7	6096	Bearing Spacer-Large
8	6097	Spindle Dirt Shield
9	020-00007207	Bearing(7207-P4#) (2Req) (6093)
10	020-06206LLB	Bearing(6206LLB#) (6092)
11	6098-30#	Nose-Piece
12	6099	Keeper Key(2Req)
13	001-I0250060	Socket Head Cap Screw(5/6"*3/4") (2Req)
14	008-M0500005	Set Screw(M5*5) (6085-1)

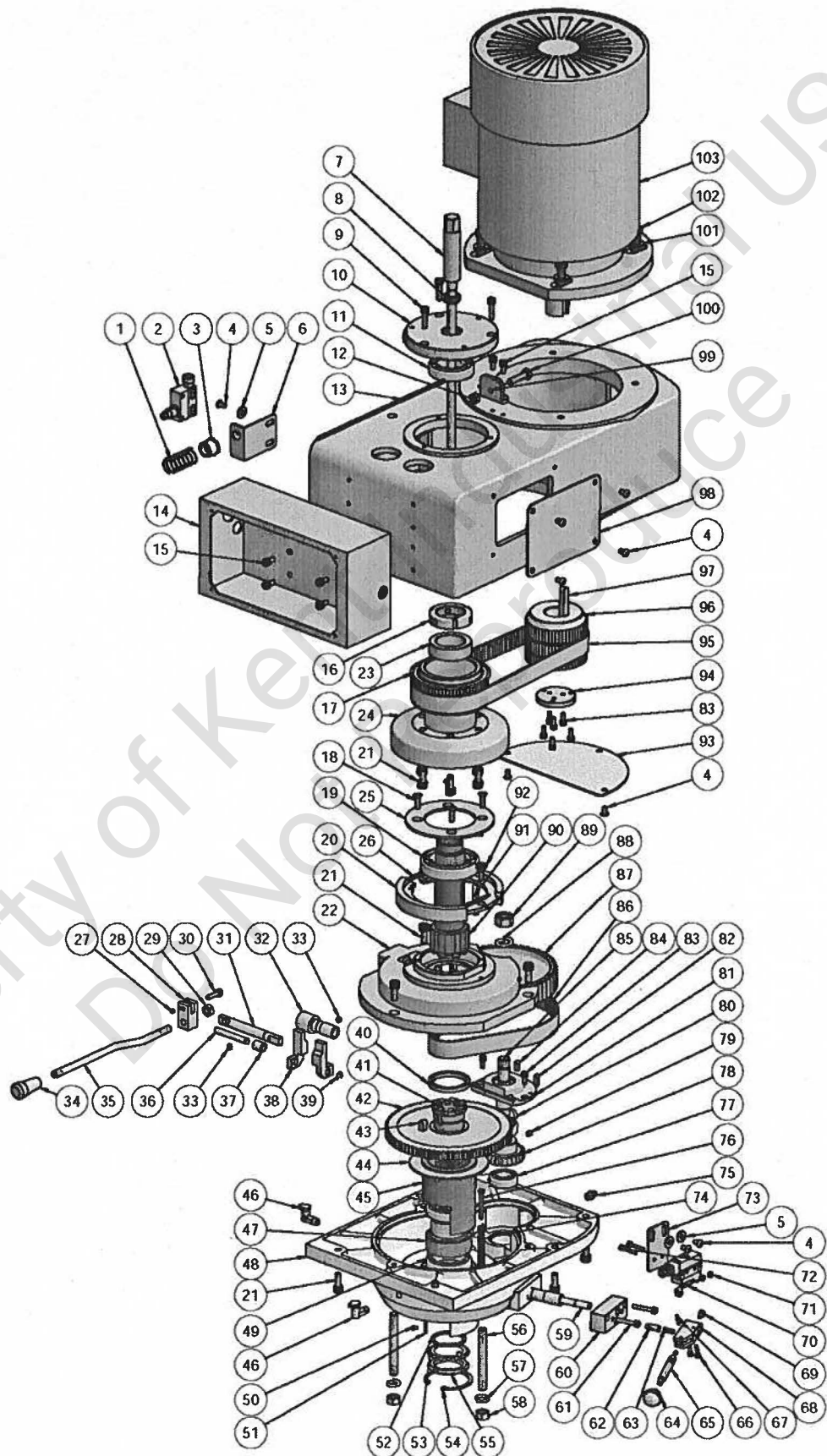
40# SPINDLE ASSEMBLY FOR 3VK/3VKF/4VK/4VKF



40# SPINDLE ASSEMBLY FOR 2S/3VK/3VKF/4VK/4VKF

ITEM NO.	PARTS NO.	DESCRIPTION
1	6084-40#	Spindle For 40#
2	6097-40#	Washer
3	6098-40#	Nose-Piece
4	020-6206LLB	Bearing(6206LLB#) (6092)
5	020-00007008	Bearing(7008-P4#) (3Req)
6	6095-40#	Bearing Spacer(Large)
7	6096-40#	Bearing Spacer(Small)
8	6085-40#	Quill
9	6099	Keeper Key(2Req)
10	6090-40#	Locknut
11	015-S0000030	Snap Ring(S30)
12	5K-6100	Socket Head Cap Screw(M8*20) (2Req)
13	008-M0500005	Set Screw(M5*5) (6085-1)
14	6084-1-40#-I	Pull Studs For NT40#-Inch Type
14	6084-1-40#-M	Pull Studs For NT40#-MM Type
15	3G-8014	Darwbar For 3GL-NT40# Spindle
15	8014-40#	Darwbar For 3VKF & 3RG-NT40# Spindle
15	8014-M-40#	Darwbar For 2VS & 3VK-NT40# Spindle
16	8020-30#	Darwbar Washer
17	043-0000M16S	Washer(M16S)

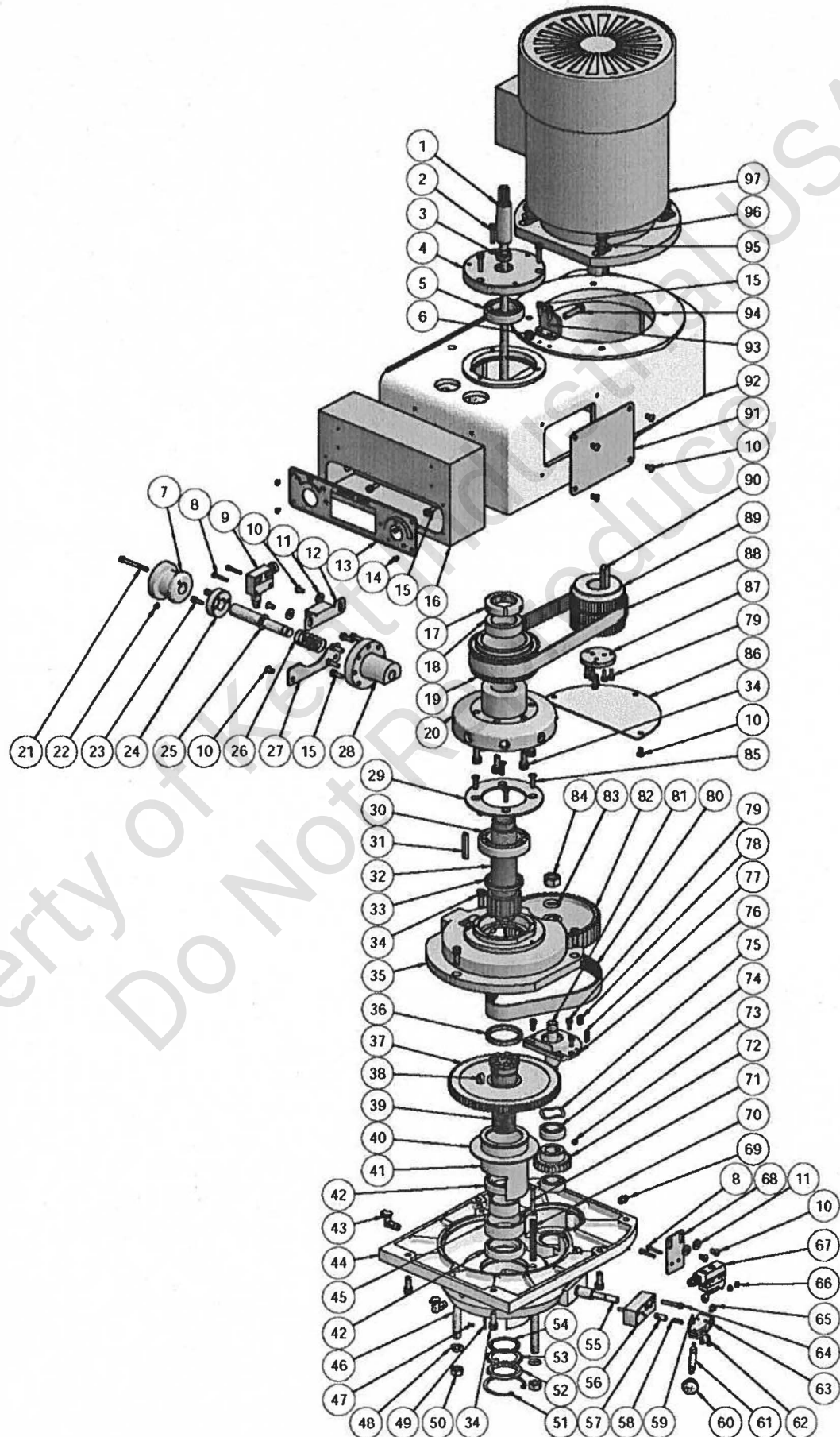
3VSF 3VKF HEAD TOP HOUSING OF INVERTER MOTOR TYPE



3VSF 3VKF HEAD TOP HOUSING OF INVERTER MOTOR TYPE

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5A-2029	Spring	52	7057-2	Washer
2	022-00000005	Limit Switch(D4E-1A20N)	53	035-0000AW08	Lock Washer(AW08#) (7057-1)
3	5B-8071-1	Nut	54	015-R0000062	Snap Ring(R62) (7042)
4	002-M0600010	Hemisphere Head Cap Screw(M6*10) (11Req)	55	7056	Bearing Locknut
5	011-M0000006	Washer(M6) (4Req)	56	7063	Studs (3Req)
6	3B-7071-1	Limit Switch Bracket	57	012-I0000035	Spring Washer(7/16") (3Req) (7062)
7	8014F-R8	Draw For R8 Spindle	58	009-I0000035	Nut(7/16") (3Req) (7061)
7	8014F-30#	Draw For 30# Spindle	59	7059	Bull Gear Shaft Pinion
7	3VKF-8014P	Draw For 40# Spindle	60	3A-7060	Hi-Low Detent Plate (7060)
8	8020-R8	Draw Bar Washer For R8 Spindle	61	001-M0500030	Socket Head Cap Screw(M5*30)(2Req) (7068)
8	8020-30#	Draw Bar Washer For 30# or 40# Spindle	62	7066	Hi-Low Detent Plunger
9	001-M0600025	Socket Head Cap Screw(M6*25)(3Req) (8001)	63	7067	Spring
10	7013	Top Bearing Cap	64	6131	Bakelite Ball Handle(1/4")
11	020-06007LLB	Bearing(6007LLB#) (8004)	65	7070	Hi-Low Shift Crank
12	009-M0000008	Nut(M8)	66	001-M0400016	Socket Cap Screw(M4*16)(2Req) (7072-1)
13	TW-6013I	Belt Housing (I-6013)	67	014-03000016	Roll Pin(3*16) (7072)
14	7005I-1	Pendant Box	68	7071	Hi-Low Pinion Block
15	001-M0600016	Socket Head Cap Screw(M6*16) (6Req)	69	001-M0500006	Socket Head Cap Screw(M5*6) (7071-1)
16	021-0000MR40	Lock Nut(MR40-P1.5) (7056)	70	022-00000011	Limit Switch(SHL-W255)
17	5B-6048A	Spindle Timing Belt Pulley (5BI-6048A)	71	009-M0000004	Nut(M4) (2Req)
18	003-M0600016	Flat Head Cap Screw(M6*16)(4Req) (8029-1)	72	001-M0400025	Socket Head Cap Screw(M4*25) (2Req)
19	020-06010LLB	Ball Bearing(6010LLB#) (8023)	73	3B-7071-1A	Limit Switch Bracket
20	8032	Brake Shoe Assembly	74	7055	Compression Spring (3Req)
21	001-M0800020	Socket Head Cap Screw(M8*20)(15Req) (5BI-6048B-1)	75	036-00000010	Grease Nipple(PT1/8") (8063-1)
22	H-8053	Belt Housing Base (8053)	76	7055-1	Adjust Pin (3Req)
23	H-8034I-1	Washer	77	020-006203ZZ	Ball Bearing(6203ZZ#) (2Req) (7079)
24	H-6048B	Brake Wheel	78	7083	Bull Gear Pinion
25	8029	Brake Bearing Cap	79	008-I0200020	Set Screw(1/4"*1/4") (7077)
26	8031	Brake Spring (2Req)	80	017-BWW06203	Weve Spring Washer(BWW-6203) (7082)
27	008-M0500005	Set Screw(M5*5) (H-8070-1)	81	7084	Ball Bearing Housing
28	3H-8071	Brake Lock Handle (H-8071)	82	013-05050018	Key(5*5*18) (7078-1)
29	009-I0000030	Nut(3/8") (H-8070-3)	83	001-M0500012	Socket Cap Screw(M5*12)(9Req) (5BI-6009-1)
30	001-M0600020	Socket Head Cap Screw(M6*20) (H-8070-2)	84	013-05050015	Key(5*5*15) (7078)
31	H-8074	Brake Lock Shaft	85	7080	Gear Shaft
32	H-8073	Sleeve For Brake Lock Shaft	86	023-225L0100	Timing Belt(225L-100) (7036)
33	008-M0600006	Set Screw(M6*6) (2Req) (8077)	87	7086	Timing Belt Pulley
34	3H-7069	Bakelite Ball Handle	88	012-I0000050	Spring Washer(5/8") (7087-1)
35	3H-8070	Brake Lock Handle (H-8070)	89	009-IUNF0050	Nut(5/8"-18UNF) (7087)
36	H-8068	Brake Operating Finger	90	H-8034I	Spindle Pulley Hub
37	H-8068-1	Spacer	91	013-06060045	Key(6*6*45) (5K-6039)
38	H-8067	Brake Finger Pivot Stud (2Req) (8067)	92	8036	Brake Shoe Pivot Sleeve
39	015-E0000006	Snap Ring(E6) (8066)	93	TW-6013I-1	Cover
40	7038	Timing Pulley Clutch Sleeve	94	TA-4040	Pulley Washer
41	7039	Spindle Gear Hub	95	023-5G072030	Timing Belt(5GT-720-30) (5BI-6034)
42	7040	Spindle Bull Gear Assembly	95	023-5G074025	(66T:55T):Timing Belt(5GT-740-25) (5BI-6034)
43	013-0808R014	Key(8*8*13.5) (7081)	96	5B-6009	Motor Timing Pulley(5GT-44T) (5BI-6009)
44	7048	Ball Bearing Gear Sleeve Washer	96	5B-6009-55T	Motor Timing Pulley(5GT-55T) (5BI-6009)
45	7057	Bearing Sleeve	97	013-1008R070	Key(10*8*70) (5BI-6001-1)
46	037-00000010	Oil Cap(PT1/8") (2Req) (7054)	98	TW-6013I-2	Cover (I-6013-2)
47	7043.44	Ball Bearing Spacer	99	TRH-8005	Socket Head Cap Screw Motor Bracket
48	H-8063	Gear Housing	100	007-M0800035	Hex Jam Screw(M8*35)
49	020-006908ZZ	Ball Bearing(6908ZZ#) (2Req) (7041)	101	011-M0000010	Washer(M10) (4Req)
50	005-M0400005	Flat HD Socket Cap Screw(M4*5)(2Req) (7052)	102	007-M1000040	Hex Jam Screw(M10*40) (4Req)
51	7051	Guide For Clutch Bracket (2Req)	103	5BI-6001-3HP	3HP-Inverter Motor (3BI-6001)

3RG HEAD TOP HOUSING OF INVERTER MOTOR TYPE



3RG HEAD TOP HOUSING OF INVERTER MOTOR TYPE

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	3F-8014P-30	Drawbar For 30# Spindle With Power Drawbar	48	012-10000035	Spring Washer(7/16") (3Req) (7062)
1	3F-8014P-R8	Drawbar For R8 Spindle With Power Drawbar	49	7051	Guide For Clutch Bracket (2Req)
1	6031-R8	Drawbar For R8 Spindle	50	009-10000035	Nut(7/16") (3Req) (7061)
1	8014F-30-I	Drawbar For 30# Spindle	51	015-R0000062	Snap Ring(R62) (7042)
1	8014F-30-IW	Drawbar For 30# Spindle	52	7056	Bearing Locknut
2	001-M0600025	Socket Head Cap Screw(M6*25)(3Req) (8001)	53	035-0000AW08	Lock Washer(AW08#) (7057-1)
3	8020-30	Draw Bar Washer For 30#	54	7057-2	Washer
3	8020-R8	Draw Bar Washer For R8	55	7059	Bull Gear Shaft Pinion
4	7013	Top Bearing Cap	56	3A-7060	Hi-Low Detent Plate (7060)
5	020-006007LLB	Bearing(6007LLB#) (8004)	57	7066	Hi-Low Detent Plunger
6	009-M0000008	Nut(M8)	58	7067	Spring
7	TR-8074-1	Spindle Lock Handle	59	014-03000016	Roll Pin(3*16) (7072)
8	001-M0400025	Socket Head Cap Screw(M4*25) (4Req)	60	6131	Bakelite Ball Handle(1/4")
9	022-00000006	Limit Switch(D4E-1B20N)	61	7070	Hi-Low Shift Crank
10	002-M0600010	Hemisphere Head Cap Screw(M6*10)(13Req)	62	001-M0400016	Socket Cap Screw(M4*16)(2Req) (7072-1)
11	011-M0000006	Washer(M6) (4Req)	63	7071	Hi-Low Pinion Block
12	5G-7071-1	Limit Switch	64	001-M0500030	Socket Head Cap Screw(M5*30)(2Req) (7068)
13	3F-7005	Plastic Face Plate	65	001-M0500006	Socket Head Cap Screw(M5*6) (7071-1)
14	004-M0400005	Flat Hd. Cap Screw(M4*5) (4Req)	66	009-M0000004	Nut(M4) (2Req)
15	001-M0600016	Socket Head Cap Screw(M6*16) (13Req)	67	022-00000011	Limit Switch(SHL-W255)
16	7005H	Pendant Box	68	3B-7071-1A	Limit Switch Bracket
17	021-0000MR40	Lock Nut(MR40-P1.5) (7056)	69	036-00000010	Grease Nipple(PT1/8") (8063-1)
18	H-8034I-1	Washer	70	7055	Compression Spring (3Req)
19	5B-6048A	Spindle Timing Belt Pulley (5BI-6048A)	71	7055-1	Adjust Pin (3Req)
20	H-6048B-3RG	Brake Wheel	72	7083	Bull Gear Pinion
21	001-M0500050	Socket Head Cap Screw(M5*50)	73	008-10200020	Set Screw(1/4"*1/4") (7077)
22	008-M0600008	Set Screw(M6*8)	74	020-006203ZZ	Ball Bearing(6203ZZ#) (2Req) (7079)
23	001-M0500016	Socket Head Cap Screw(M5*16) (2Req)	75	017-BWW06203	Wave Spring Washer(BWW-6203) (7082)
24	TR-8074-2	Spindle Lock Block	76	7084	Ball Bearing Housing
25	5G-8074-1	Spindle Lock Shaft	77	013-05050018	Key(5*5*18) (7078-1)
26	5A-2029	Spring	78	013-05050015	Key(5*5*15) (7078)
27	3G-8074-2	Cover	79	001-M0500012	Socket Cap Screw(M5*12)(9Req) (5BI-6009-1)
28	5G-8074	Shaft Sleeve	80	023-225L0100	Timing Belt(225L-100) (7036)
29	8029	Brake Bearing Cap	81	7080	Gear Shaft
30	020-06010LLB	Ball Bearing(6010LLB#) (8023)	82	7086	Timing Belt Pulley
31	013-06060045	Key(6*6*45) (5K-6039)	83	012-10000050	Spring Washer(5/8") (7087-1)
32	H-8034I	Spindle Pulley Hub	84	009-IUNF0050	Nut(5/8"-18UNF) (7087)
33	8033	Spindle Pulley Spacer	85	003-M0600016	Flat Head Cap Screw(M6*16)(4Req) (8029-1)
34	001-M0800020	Socket Head Cap Screw(M8*20)(15Req) (5BI-6048B-1)	86	TW-6013I-1	Cover
35	H-8053	Belt Housing Base (8053)	87	TA-4040	Pulley Washer
36	7038	Timing Pulley Clutch Sleeve	88	023-5G720025	Timing Belt(5GT-720-25) (5BI-6034)
37	7040	Spindle Bull Gear Assembly	88	023-5G740025	(66T:55T):Timing Belt(5GT-740-25) (5BI-6034)
38	013-0808R014	Key(8*8*13.5) (7081)	89	5B-6009	Motor Timing Pulley(5GT-44T) (5BI-6009)
39	7039	Spindle Gear Hub	89	5B-6009-55T	Motor Timing Pulley(5GT-55T) (5BI-6009)
40	7048	Ball Bearing Gear Sleeve Washer	90	013-1008R070	Key(10*8*70) (5BI-6001-1)
41	7057	Bearing Sleeve	91	TW-6013I-2	Cover (I-6013-2)
42	020-006908ZZ	Bearing(6908ZZ#) (2Req) (7041)	92	TW-6013I-3RG	Belt Housing
43	037-00000010	Oil Cap(PT1/8") (2Req) (7054)	93	TRH-8005	Socket Head Cap Screw Motor Bracket
44	H-8063	Gear Housing	94	007-M0800035	Hex Jam Screw(M8*35)
45	7043.44	Ball Bearing Spacer (7043)	95	011-M0000010	Washer(M10) (4Req)
46	7063	Studs (3Req)	96	007-M1000040	Hex Jam Screw(M10*40) (4Req)
47	005-M0400005	Flat Head Cap Screw(M4*5) (2Req) (7052)	97	5BI-6001-3HP	3HP-Inverter Motor (3BI-6001)