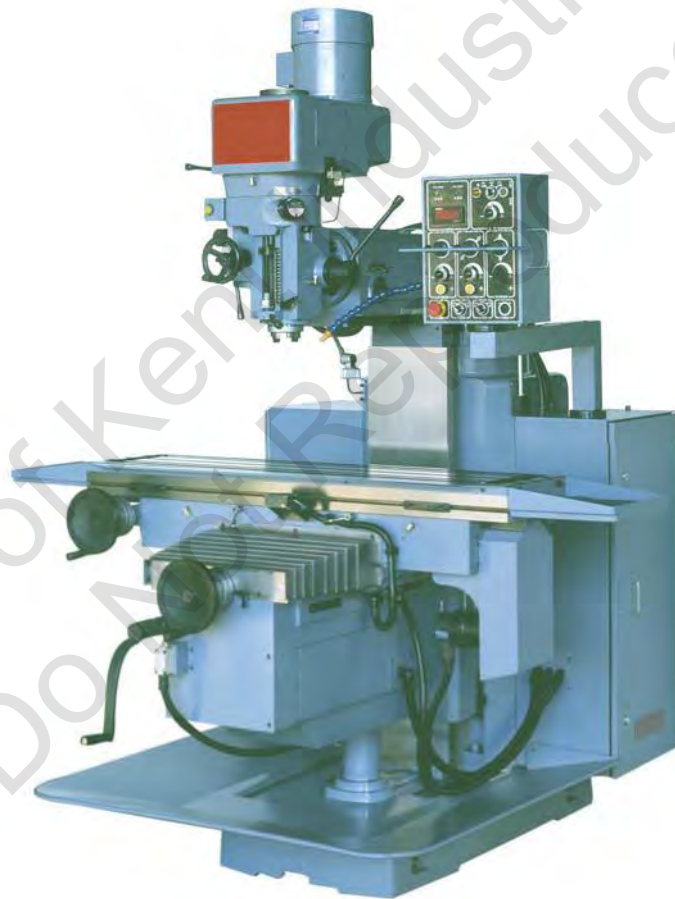


VERTICAL MILLING MACHINE
Model : KTM-5AVKF

Operation Manual



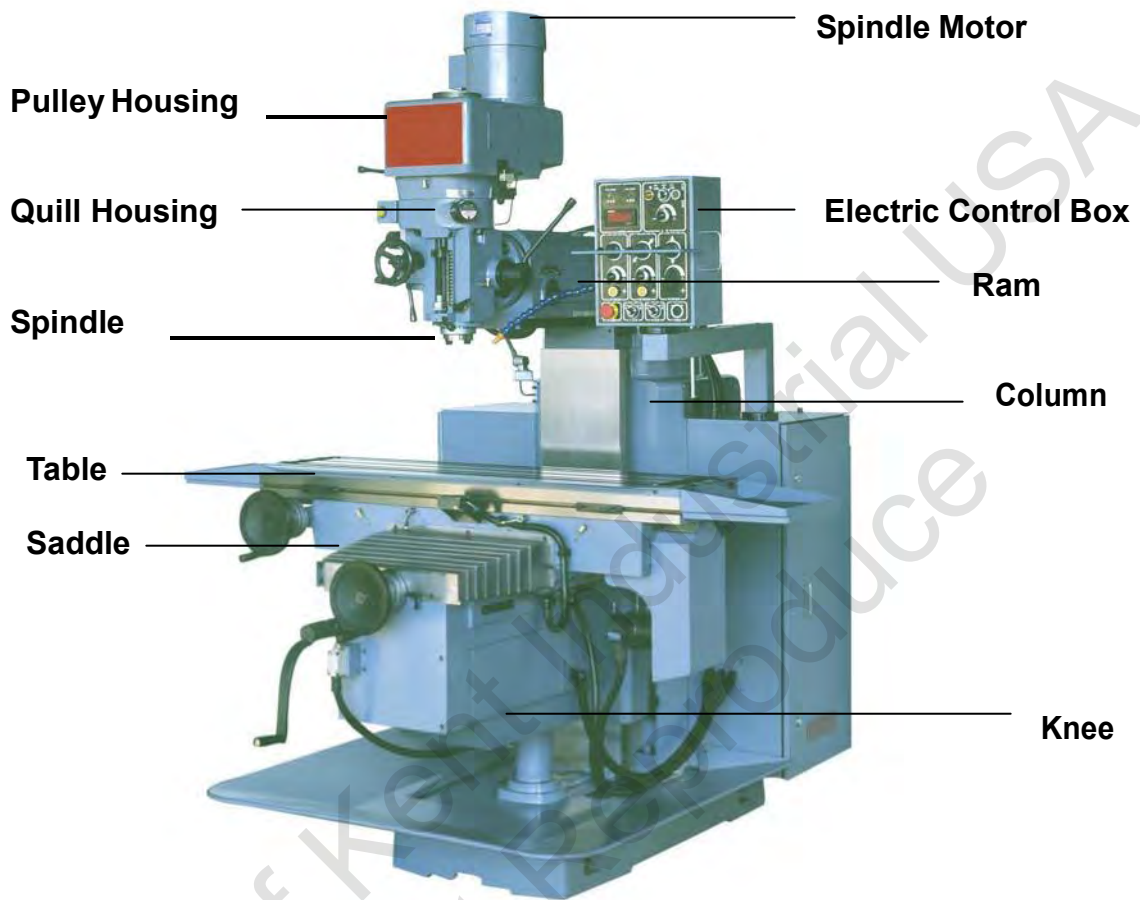
KENT USA

TABLE OF CONTENTS

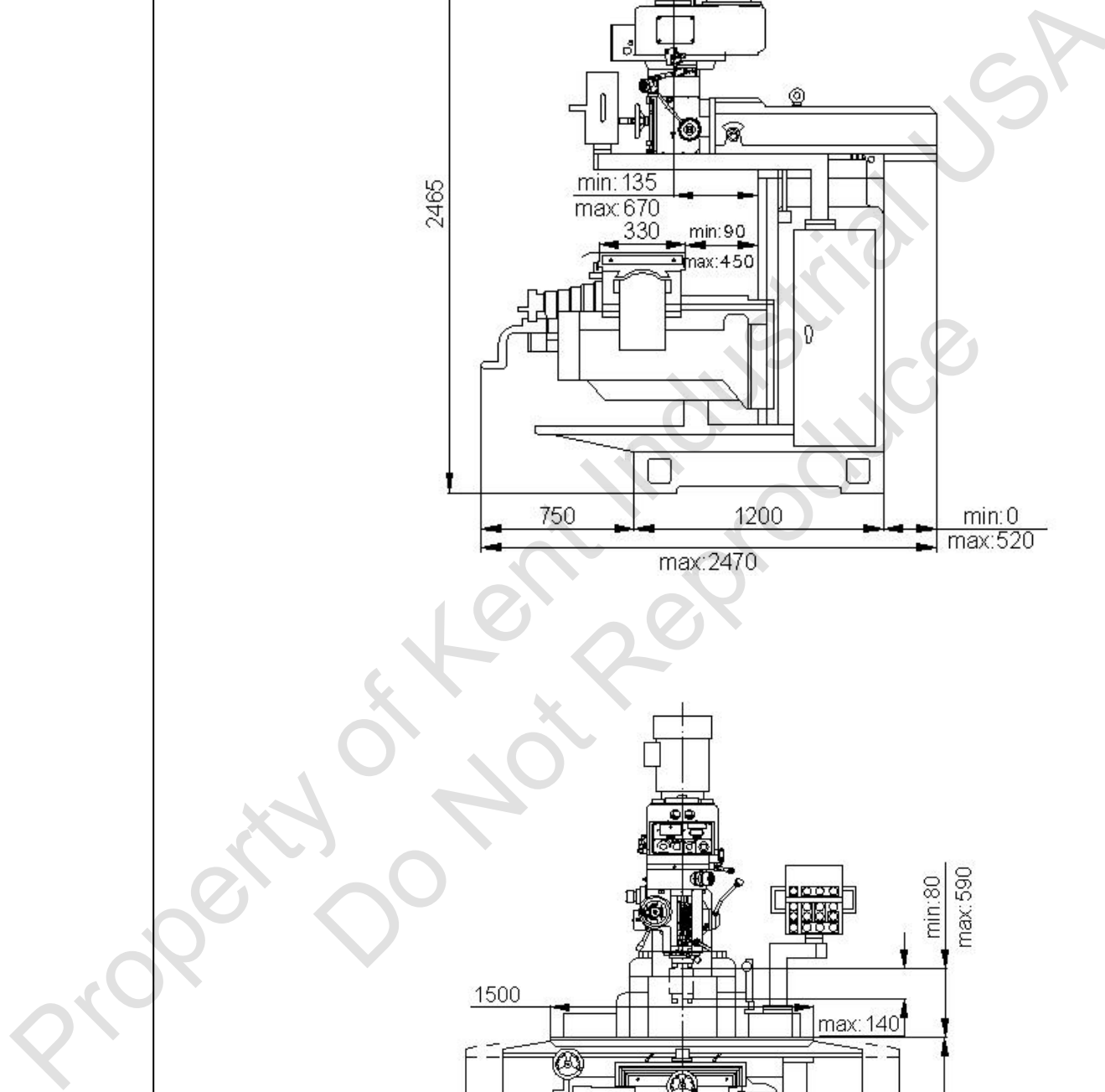
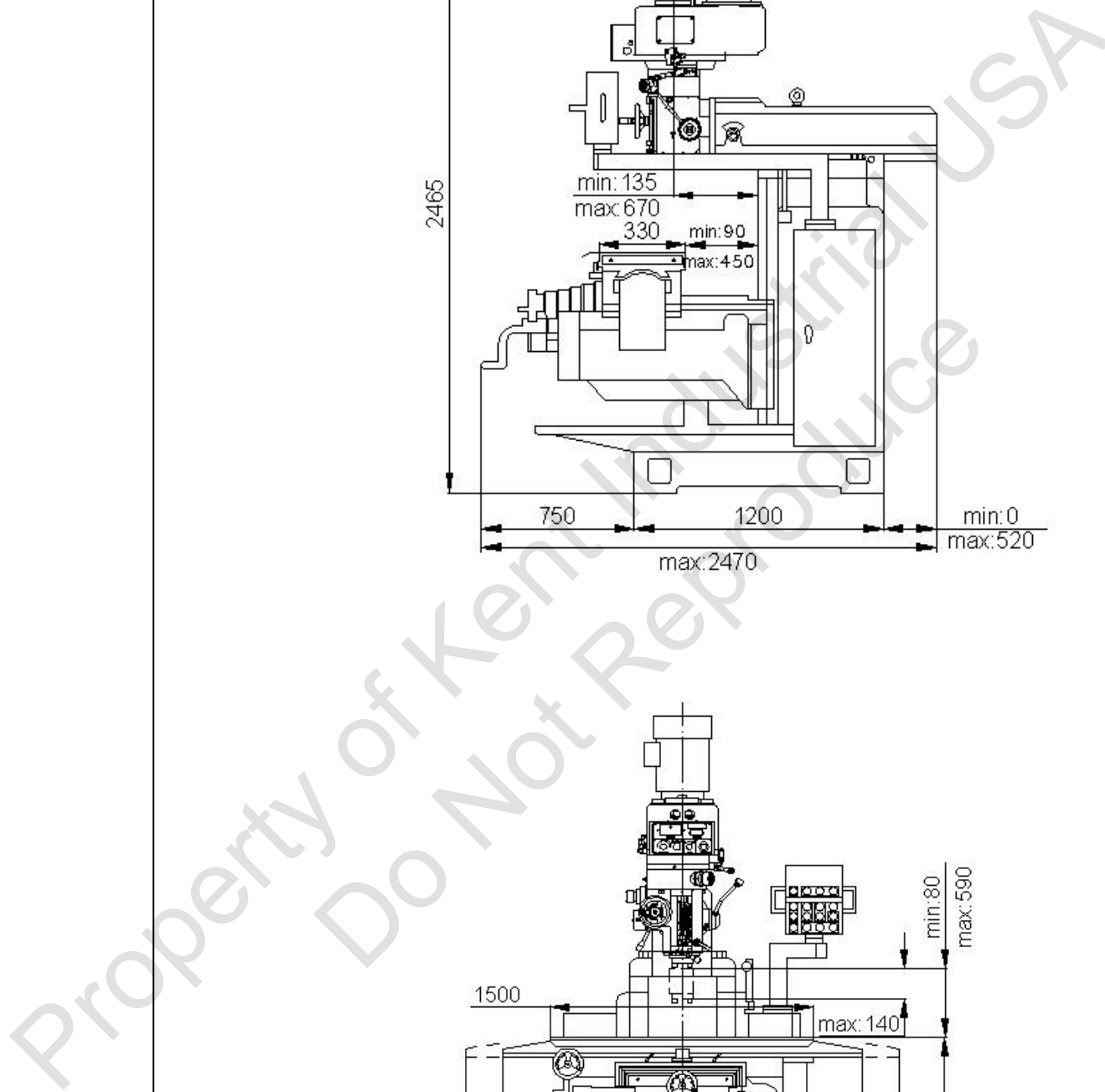
	Page
Machine Specifications.....	3
Chapter 1 Safety Instructions.....	4
1-1. The Basic Conditions for Safety Performance.....	4
1-2. Safety & Prevention.....	4
1- 3. The Hazardous Zone of the Machine.....	10
Chapter 2 Carry and Stock.....	11
2-1. Machine Packaging.....	11
2-2. Lifting the Equipment.....	11
2-3. Forklift Instructions.....	11
2-4. Cable Lift Instructions.....	13
2-5. The Stock of the Machine.....	13
Chapter 3 Dismantle and Installation Instruction.....	14
3-1. Dismantle Instruction.....	14
3-2. Head Alignment.....	15
3-3. Electricity Requirement.....	16
3-4. Cleaning and Lubricating.....	16
3-5. Machine's Grounding.....	16
3-6. Balance of the Machine.....	17
Chapter 4 Description of Operation Panel.....	18
4-1. Spindle Forward / Stop / Reverse.....	18
4-2. X · Y · Z Axis Feed.....	19
4-3. Emergency Stop, Work Light, & Coolant Pump Switch.....	20
Chapter 5 Description of Operating Manual.....	21
5-1. 5HP Inverter Motor Milling Head.....	21
5-2. Operation.....	22
5-3. Head Control.....	23
5-4. Spindle Quill Down Feed.....	24
Chapter 6 Descriptions of Main Parts.....	25
Function.....	
6-1. Knee Up/Down Feed.....	25
6-2. X-Axis.....	26
6-3. Y-Axis.....	27
Chapter 7 Central Lubricating OIL-Feeding Equipment.....	28
Chapter 8 Electrical Diagram.....	30
Chapter 9 Parts List.....	34

Machine Specifications

Machine Description



Specifications	KTM-5AVKF
Worktable Surface	330mm x 1500mm (13" x 59")
T-Slot (Size × NO. × Distance)	18mm x 3mm x 80mm (0.7" x 3" x 3.15")
Longitudinal Travel (X-Axis)	1000mm (40")
Cross Travel (Y-Axis)	440 mm (17.3")
Knee Travel	470 mm (18.5")
Ram	535 mm (21")
Spindle Nose to Table Top	80mm ~ 590mm (3.14" ~ 23.2")
Spindle Center to Column	225mm ~ 750mm (8.85" ~ 29.5")
Spindle Taper	NT#40
Spindle Motor (AC Frequency Drive)	5HP
Spindle Speed (RPM)	LO: 70 ~ 500 rpm HI: 500 ~ 4200 rpm
Quill Travel	140mm (5.5")
Quill Feed (3 Steps)	0.040 / 0.083 / 0.138 mm/rev
Coolant Pump	1/2 HP
Machine Weight	28,500 kgs



【 Chapter 1: Safety Instructions 】

1-1 The Basic Conditions for Safety Performance

Please follow the three basic safety conditions below:

1. Only qualified personnel can operate or perform maintenance on the machine:
The qualified person must undergo proper training in order to understand the safety precautions and correct maintenance of the machine. Especially for the electrical maintenance, the qualified person has to have the experience and capability of performing this job. Meanwhile, he/she must be familiar with the safety standards and official safety regulations.
2. Before operating the machine, the person must pay close attention to the safety instructions on every individual part; this 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.

1-2. Safety & Prevention

Safety & Prevention Instructions:

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

1-2-1. Basic Operation Practice

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

1. 【 Warning 】

1. Please do not touch the control button with wet hands.
2. The operator must be familiar with the location of the “Emergency Stop” button in case of an emergency.
3. When replacing a fuse, the main power must be turned off.
4. Please reserve enough working space and prevent tools and workpieces from falling.
5. Please keep the working area clean. The coolant, oil, and chips must be cleaned frequently in order to prevent slippage and injury.
6. When operating, please make sure to press the correct buttons for the exact function you wish to execute.
7. If there are two or more people operating the machine at the same time, ensure that these individuals are well trained, and can communicate well with one another before operating the machine to prevent accidents from occurring.

2. 【 Attention 】

1. When the power from this machine malfunctions, please turn off the main power immediately.
2. Please use the recommended lubricating oil.
3. The fuse should be replaced with the general, common fuse.
4. Preventing the control box, electrical box, and etc. from leaking electricity in the case of a malfunction.
5. Do not modify the computer setting and storage capacity without saving the original data. Please save the original data as a backup file before making a modification.
6. The warning plate must be kept clean. If it is not clear enough, please replace the plate. Remember to make a mark below the warning plate in order to avoid incorrect installation.

1-2-2. Before Starting the Machine

Before turning on the machine, make sure the power supply is grounded correctly.

Hazardous Objects :

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

1. 【 Warning 】

1. Please make sure the operator understands all the instructions and is familiar with every function and working procedure of the machine.
2. Please wear slip resistant boots and protective clothing.
3. Please make sure all the safety doors and guards that are protecting the NC unit, controller, electrical cabinet, and etc. are closed.

2. 【 Attention 】

1. The electric wires must be fixed to the floor and isolated by insulation sleeves in order to prevent damage to the wires and chip.
2. Before operating a machine that has not been used for a lengthy period of time, or a new machine, please make sure the slide ways are well lubricated.
3. Please fill up all the oil containers in the machine.
4. Please lubricate each required 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 operation 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 the main circuit switch are turned to the “ON” position.

1-2-3. After the Power Switch is Turned “ON”

1. 【 Attention 】

When the power switch is turned to the “ON” position, the “READY” light will turn on. If it does not turn on, please inspect the problem area.

1-2-4. Routine Inspection

1. 【 Warning 】

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

2. 【 Attention 】

1. Please inspect the pressure gauge; it must be set up correctly.
2. Please pay attention to the motor, gear box, and other assembly parts to see if there are any unusual noises.
3. Please inspect the lubrication unit and lubricating oil level.
4. Please inspect every safety device and guard.
5. Please inspect the belt's tightness. If necessary, please re-tighten or replace the belt with the correct tension.
6. Please inspect the oil pressure unit to see if there is enough oil.

1-2-5. Warming-Up Before Operation of the Machine

1. 【 Attention 】

1. Use the automatic control to control the feeding of each axis and the rotation of the main axis for 10 to 20 minutes, while setting the speed at half or a third of the highest speed.
2. Meanwhile, please inspect the action of other assembly parts with the automatic control program.
3. Please pay special attention while the spindle is warming-up when rotation speed is up to 4000 RPM. When operating the machine after it has started without sufficient lubrication, the machine will become damaged. Meanwhile, the thermal expansion of each part will cause the machine to become unstable and inaccurate.

1-2-6. Preparation

1. 【 Warning 】

The tools and cutters have to meet this machine's required specification.

1. Extremely worn out tools will damage the workpiece or inflict injury to people. Thus, these tools must be replaced in advance.
2. Surrounding the work environment, sufficient light must be used for safety and convenience when conducting inspections.
3. The cutters and other parts must be placed on a suitable clean box.
4. 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 with other tools.
2. Please run a test run after clamping the cutter.

1-2-7. When the Machine is Running

1. 【 Warning 】

1. Long hair must be tied neatly and worn under a hat.
2. Please do not push any control button with a glove on in case of malfunction.
3. In order to prevent injury, two or more people should be lifting heavy workpieces.
2. Only experienced and well-trained individuals can operate the lifter, crane, sling, and other lifting devices.
3. When operating lifting devices, please do not collide with other devices.
4. When hanging the workpiece, please ensure the slings, belts, and ropes are strong enough to hold the weight of the workpiece.
5. Please make sure the workpiece is fixed and stable.
6. The coolant flux should be adjusted when the machine is stopped.
7. Please do not touch the functioning workpiece or spindle.
8. The workpiece and the cutter must kept at a safe distance, and the workpiece can only be moved when the spindle is stopped.
9. When the machine is running, please do not clean the chips with hands or rags.
10. Do not machine on the workpiece before installing the safety guards and splashguards.
11. Please clean the cutter with a brush. DO NOT use hands.
12. When machining magnesium alloy, please wear a protection mask.

2. 【 Attention 】

1. Please do not open the door and window during operation.
2. During heavy load machining, please pay close attention to the jumped-out chips in order to avoid damage to the skin.

1-2-8. End of Machining

1. 【 Warning 】

When finished machining, please turn “NFB” switch to “OFF” position.

1-2-9. End of Work

1. 【 Attention 】

1. When cleaning the chips from the machine, please wait for the machine to stop.
2. All of the cutters, tools, and parts must be returned to where they belong.
3. Please inspect the felt wipers for damage and replace when necessary.
4. Please inspect the coolant for pollution, oil inside the oil cylinder,

- and lubrication oil. Please replace when necessary.
5. Please inspect the level of the coolant, 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 to the machine when it is no longer being used.

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. Maintenance personnel must be authorized by their supervisor to maintain the machine.
2. Please prepare the accessories, parts and the following items below. (oil-sealing, O-ring, machine oil, grease)
3. Prepare to record every job, which is or isn't needed to maintain or adjust.

1. 【 Attention 】

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

1-2-12. Maintenance

1. 【 Attention 】

Perform the maintenance work only after the machine has stopped completely.

2. 【 Hazard 】

1. Only experienced personnel or persons who are familiar with it are allowed to conduct electric cabinet maintenance work. Do not maintain the machine arbitrarily. There needs to be good communication between the maintenance personnel and the charged person.
2. Please do not move the dogs, limit switches, approaching switches, or other connecting mechanisms.
3. Please use a ladder to maintain devices that are too high to reach.
4. Please use high quality fuses and wires.
5. Please turn off the main power before doing any maintenance work.

1-2-13. Work Before Starting the Machine after Maintenance

【 Warning 】

1. Please keep the oil-wipe rag, oil cleaner, and etc. for cleaning.
2. Please return the unnecessary tools, parts, and rest oil to where they belong.

【 Attention 】

1. The maintenance person has to make sure the machine is 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 speeds, the actions of each axis, and the automatic tool changing, the area between the table, spindle, and tool magazine is very dangerous. Meanwhile, the inside of the machine will be wet and at a high temperature due to the splashing of chips and coolant during machining.

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

【 Warning 】

1. Under Auto mode, do not open the working door, Plexiglas window, and other enclosures.
2. Please pay special attention to the operating condition and the power of the machine when “ON.” Ignoring the warning above can lead to death and extreme injury, or damage to the machine.

【Chapter 2 Carry and Stock】

2-1. Machine Packaging:

Crate Size (L × W × H) : 1990mm × 1600mm × 2230mm

Net Weight : 2750 kgs

Gross Weight : 3050kgs

※The machine is packaged in a crate for transportation. This is the standard method unless the buyer requests for a different packaging method.

2-2. Lifting the Equipment:

2-2-1. Forklift Requirements:

Machine Weight : 2,850 kgs

Fork Length : 1,300mm

- ** 1. The forklift must be capable of lifting at least this weight.
2. The sling must be capable of lifting at least this weight.
3. The trailer or the dray must be capable of transporting at least this weight and supporting this length.

2-2-2. Safety Requirements for Lifting

1. Crane:

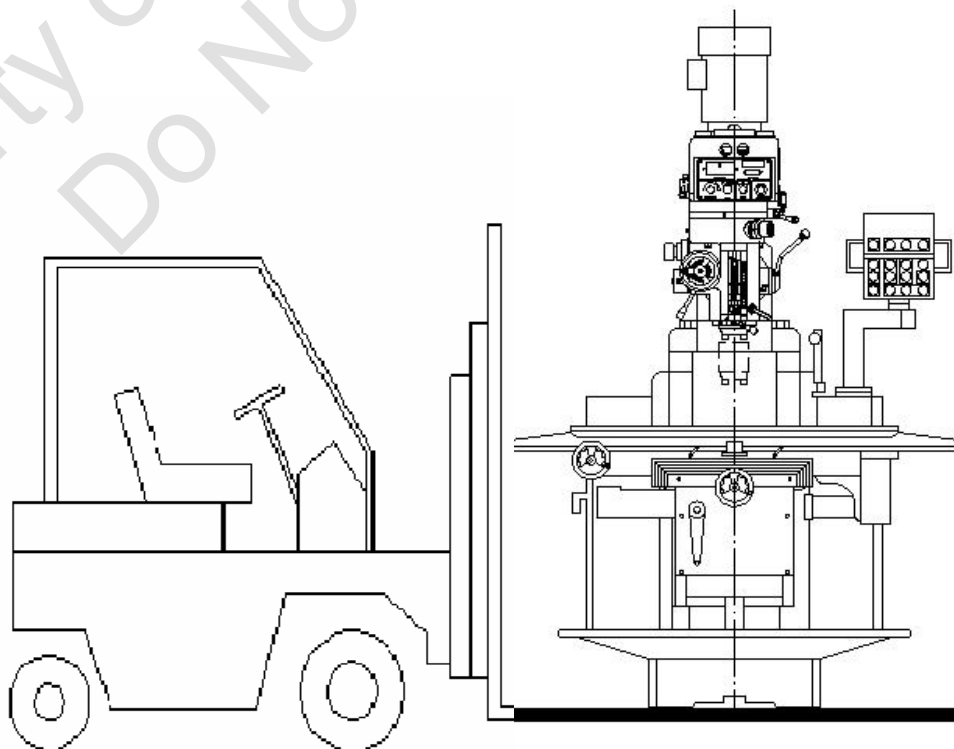
- (1) During lifting and unloading, please avoid compression or collision because of the fact that this machine is a high precision machine. (The speed must be lower than 25m/min)
- (2) Jog the table to the machine's center, and the head to the bottom. Then fix the head with a stationary barrier.
- (3) 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 lift method and the lifter should be inspected.
- (7) The crane or forklift operator should be well trained and experienced.
- (8) All loose parts must be pulled tight before lifting. The contact surface of the machine should be protected with rags or wood to prevent scratching. In order to prevent the swing from moving, please tighten a strong rope to a corner of the machine.
- (9) Please pay close attention to the air pressure pipes, wires, NC controller, and other devices when the slings are being pulled.
- (10) Please confirm that there are no people on top of the machine, on the side of the machine, and in the way of movement before moving the machine.
- (11) Please remove objects that are in the way of the machine, and pay close attention to the control buttons.
- (12) The length of the slings on the four corners should be equal, and the distance of the four corners between the machine and the ground should be kept leveled when lifting (50 cm suggested).
- (13) Please ensure that there are no wires, pipes, and etc. on the ground when putting down the machine.

2. Forklift:

- (1) During lifting and unloading, please avoid compression and collision due to the fact that 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 with a 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 lift method and the lifter must be completely inspected.
- (7) The crane or forklift operator must be well trained and experienced.
- (8) Please remove the objects that are in the way, and pay close attention to the control buttons.
- (9) Please confirm that there are no people on top of the machine, on the side of the machine, and in the way of movement before moving the machine.
- (10) Please ensure that there are no wires, pipes, and etc. on the ground when putting down the machine.

2-3. Fork Lift Instructions: (As the figure 2-3 shows)

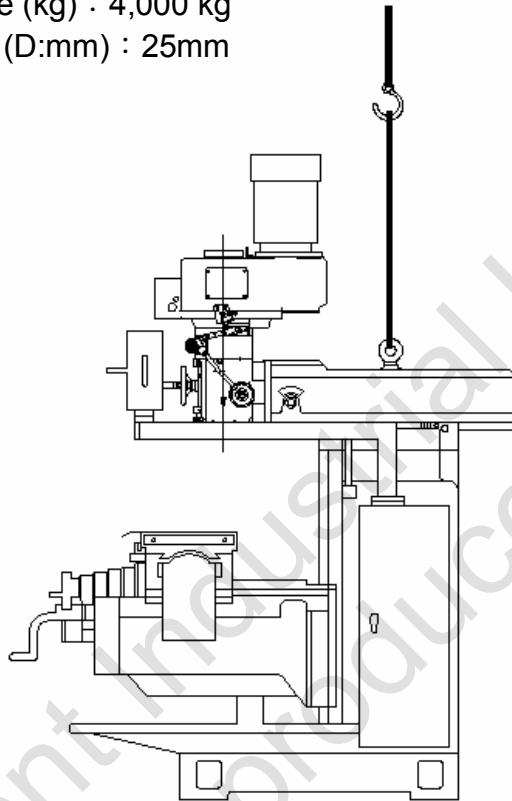
Machine Weight : 2,850 kgs
Fork Length : 1,300mm



2-4. Cable Lift Instructions: (As the figure 2-3 shows)

Max. Load of Crane (kg) : 4,000 kg

Sling Specification (D:mm) : 25mm



2-5. The Stock of the Machine :

1. If the machine is not installed immediately after arrival, please keep it in stock condition in order to prevent dust or damp buildup.
2. Storage Temperature Range: -5 °C to 45 °C
3. Ambient Humidity: less than 90% relative humidity, non-condensing.
4. The machine must be placed on a flat surface in order to maintain the machine's accuracy.
5. The anti-rust oil should be reapplied when storing the machine because the oil gets removed during shipping.
6. Suggested anti-rust oil: (Please keep record the valid day of storage)

(1) The transparent, and clear type: (Brand: COTEC Model :VCI-369G)
The anti-rust oil can prevent the machine from rusting for 6 months after the machine leaves our company.

(2) The brown & grease type : (Brand: model:)
The anti-rust oil can prevent the machine from rusting for 6 months after the machine leaves our company.

【 Chapter 3 Dismantle and Installation Instruction 】

3-1. Dismantle Instruction:

1. Installation tools required:

- (1) Crane
- (2) Scissors
- (3) Wrench (17mm/19mm)
- (4) Adjustable Wrench
- (5) Ladder
- (6) Claw Hammer
- (7) Air Wrench (21mm)
- (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 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 the plastic cover.

3. Uncrating the Pallet:

- (1) Unbolt the 6 fixed bolts and caps on the pallet with a wrench or adjustable wrench.
- (2) Cut off the iron plate that fixes the accessories onto the pallet, and remove the accessories by crane.

4. Move the Machine without the crate: Move the machine by crane or forklift.

- (1) The required of forklift is stated in the previous chapter. The forks must be over 1800mm (at least over 100mm from machine's center).
- (2) When moving by forklift, make sure to move slowly and pay attention to its balance.
- (3) Please use suitable slings and steel frames to lift the machine.
- (4) Please remove the machine from the pallet by crane or forklift.
- (5) Refer to Section 2-2.

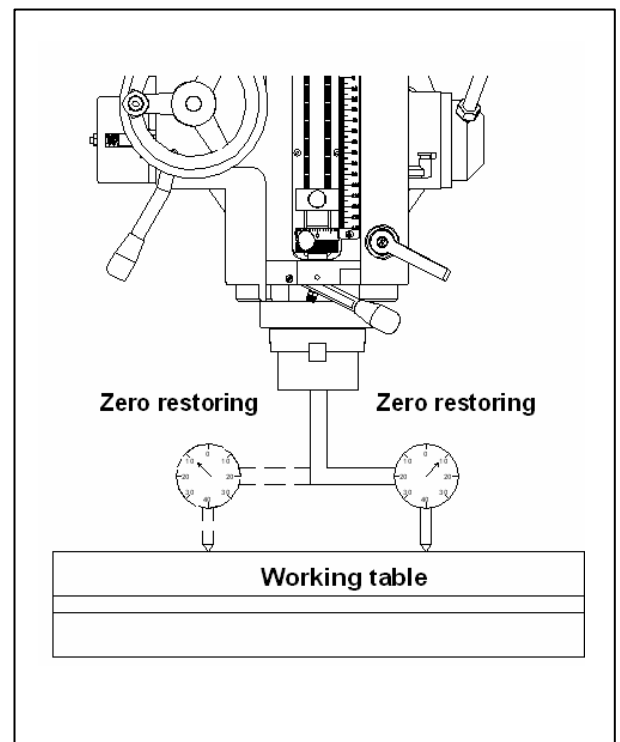
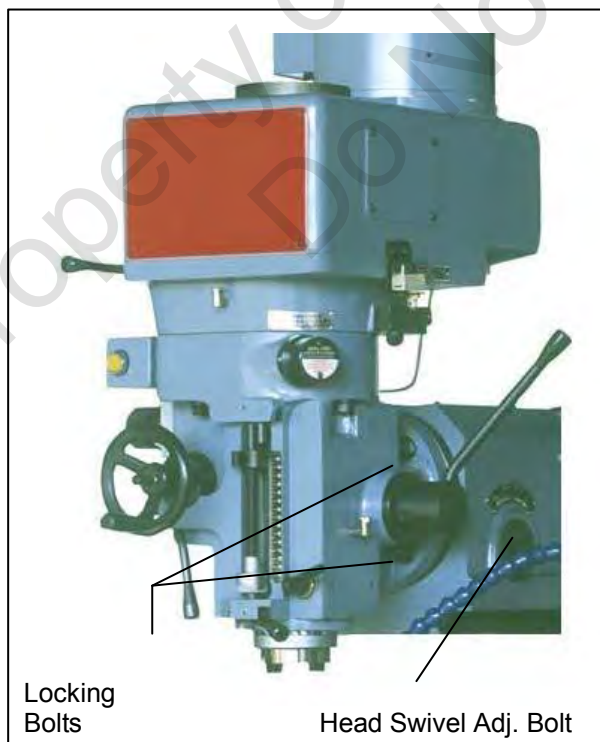
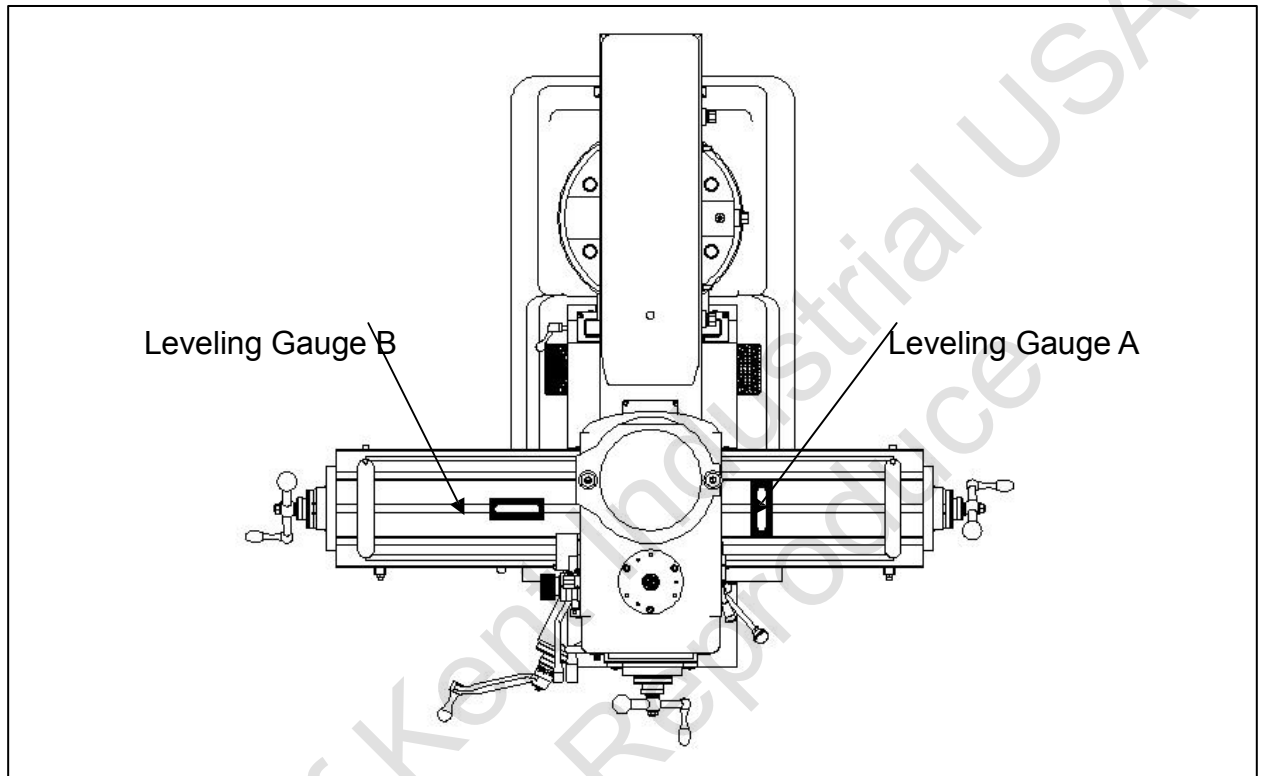
5. Inspection:

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

- (1) Whether or not the model is correct (matches with order).
- (2) Whether or not the accessories or parts are complete.
- (3) Whether or not the machine was damaged during transportation.
- (4) Whether or not the machine includes the inspection record.

3-2. Head Alignment:

- (1) Put the Levels on the table according to the drawing.
- (2) Adjust foundation blot to reach proper leveling.
- (3) As the drawing shows in "Figure 5-1", after adjusting to 'zero' by indicator, lock nuts and push taper pin on.



3-3. Electricity Requirement:

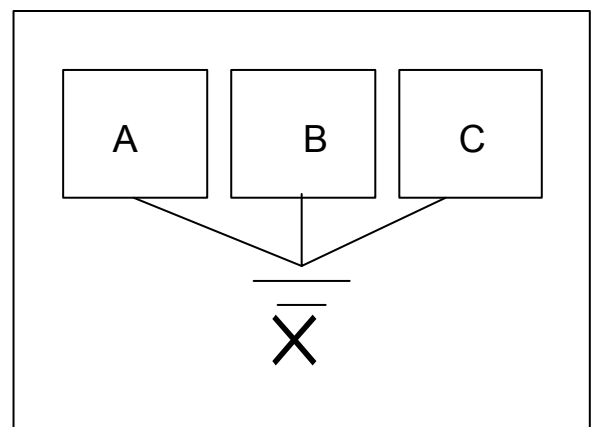
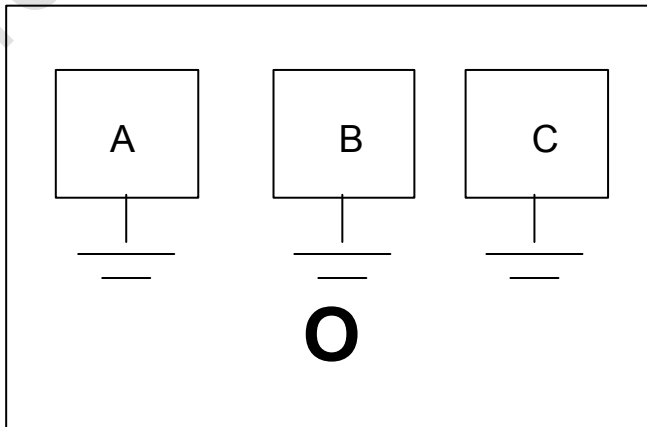
1. Power supply system:
 - (1) Voltage: 220V
 - (2) 3 Phase Power Supply: 60 Hz
 - (3) Electricity Currency: Over 30A
2. The diameter of the power supply's wire should be 16 to 25mm, and should be mounted with a 30A's breaker (NFB breaker).
3. After inspecting the wiring and connection, please check the voltage, which needs to be $220V \pm 10\%$.
4. Confirm the orientation of the motor's phase when running.
5. Compressor's Specification:
 - Pressure: 6 to 8 kef / cm
 - Supply capacity: 200 L / min

3-4. Cleaning and Lubricating:

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

3-5. Machine's Grounding:

1. It is best to ground the machine's electric elements and factory's power system together. In general, it is connected in series. Please notice that it is NOT connected in parallel method.
2. The grounding wire should be selected with a diameter over 19mm's insulation wire.
3. The Grounding resistance must be below 100Ω .
4. Use steel rods as a grounding pole; the inner diameter should be over 19mm. Copper rods are a better choice and its length should be over 1 meter.
5. The grounding pole should be buried in the ground over 1m. If the rod is obstructed by a rock, it can be buried transversely in the ground over 1.5m depth.



3-6. Balance of the Machine:

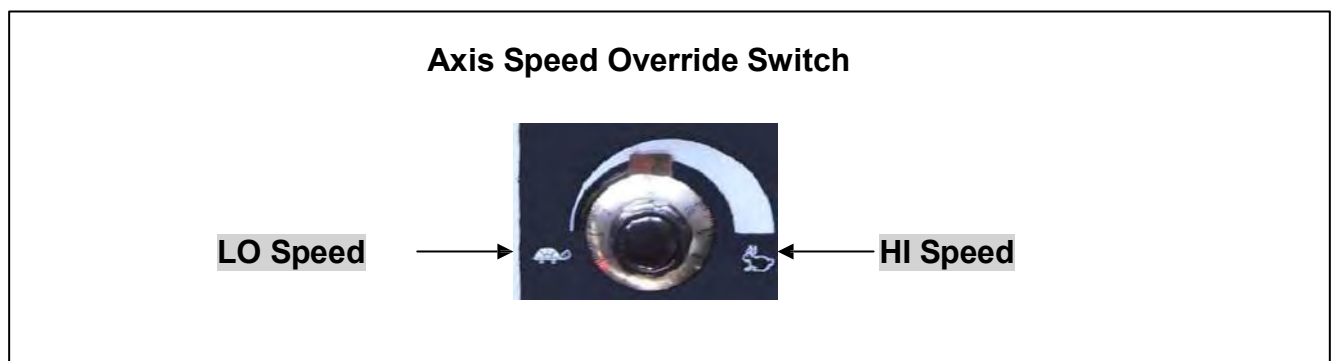
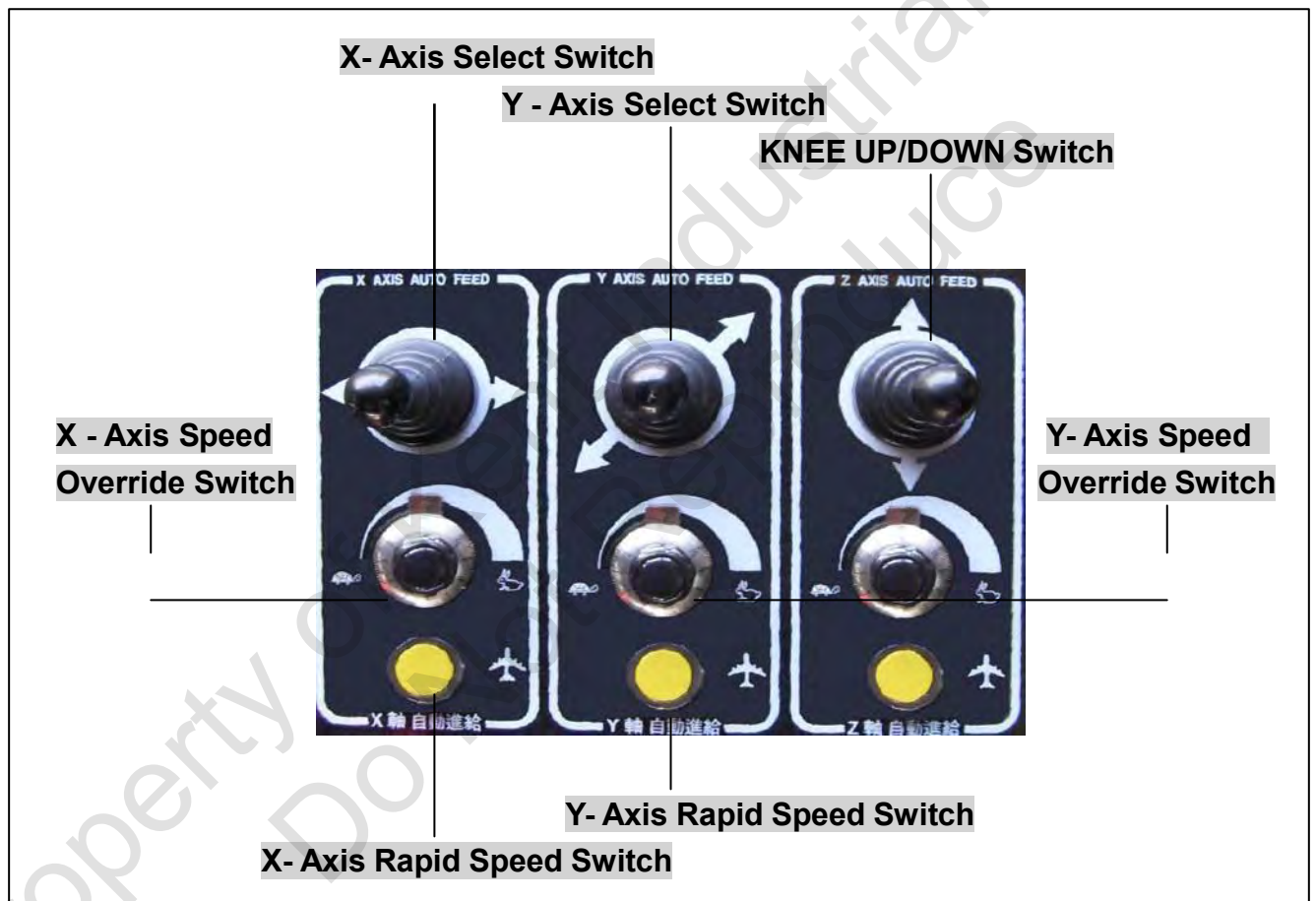
1. Prepare two precision bubble levels (0.02mm per scale).
2. Before adjustment, please check first the accuracy of the precision bubble level by following the method below:
 - (1) Put the level on a fixed position on the table.
 - (2) After the bubble is stable, please record the bubble position, and then rotate it 180 degrees. When the bubble is stable, please compare it with a 0° bubble position, the tolerance is allowed within 1/3 scale.
3. Jog the table and saddle to the center.
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.

Chapter 4 Description of Operating Box

4-1. SPINDLE FORWARD / STOP / REVERSE:



4-2. X、Y、Z Axis Feed:



4-3. Emergency Stop, Work Light, & Coolant Pump Switch:



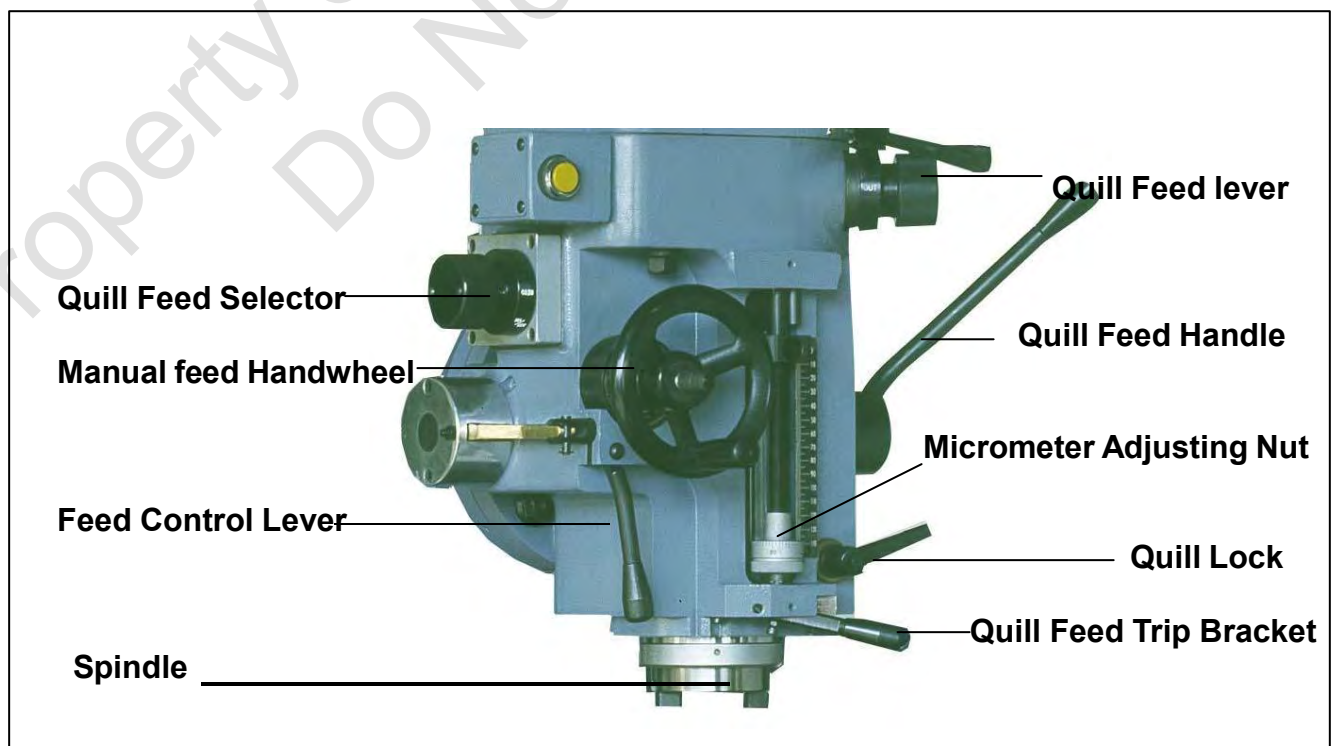
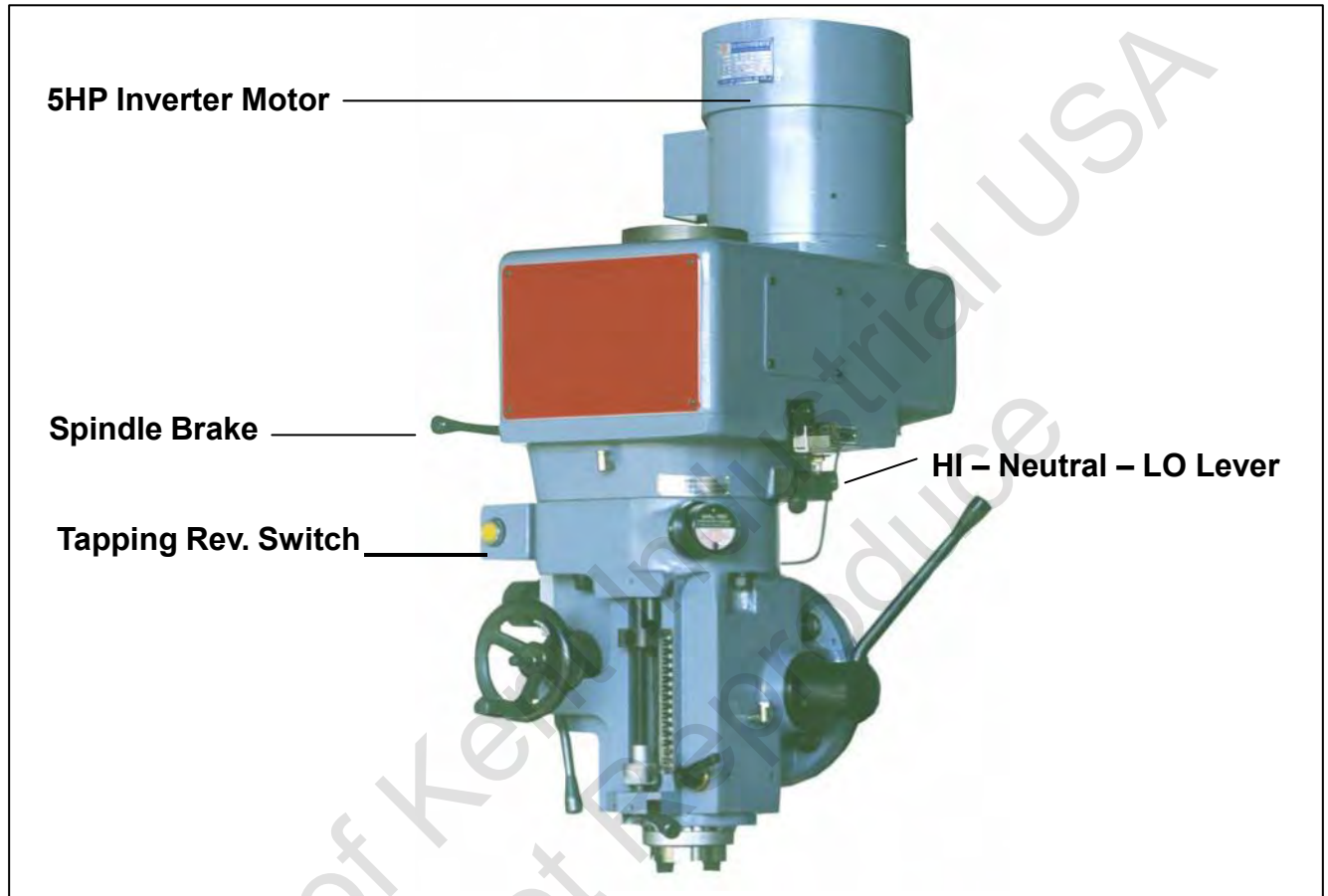
Emergency Stop Switch

Work Light

Coolant Pump Switch

Chapter 5 Description of Operating Manual

5-1. 5HP Inverter Motor Milling Head



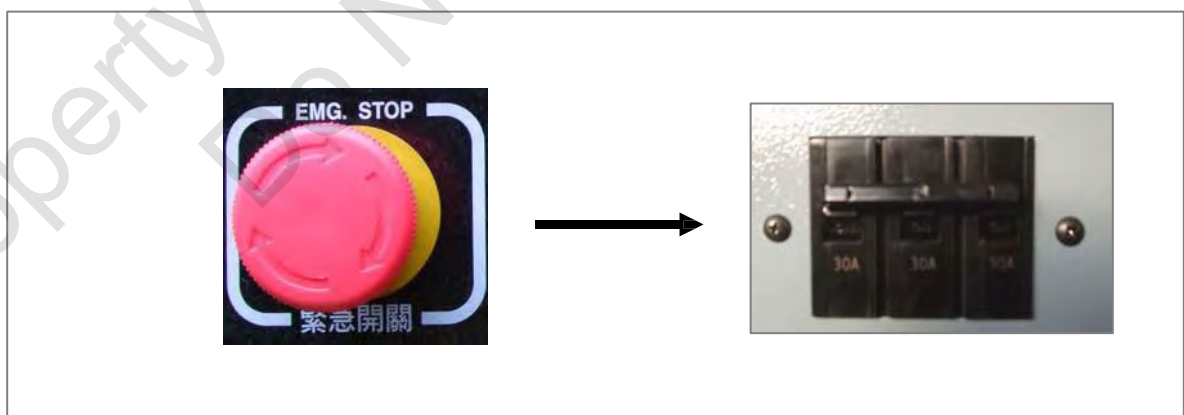
5-2. Operation:

1. Starting:

- (1) Connect power.
- (2) Release “EMG. STOP” button.
- (3) Turn power switch to the “ON” position.
- (4) Push spindle power on button to operate spindle.



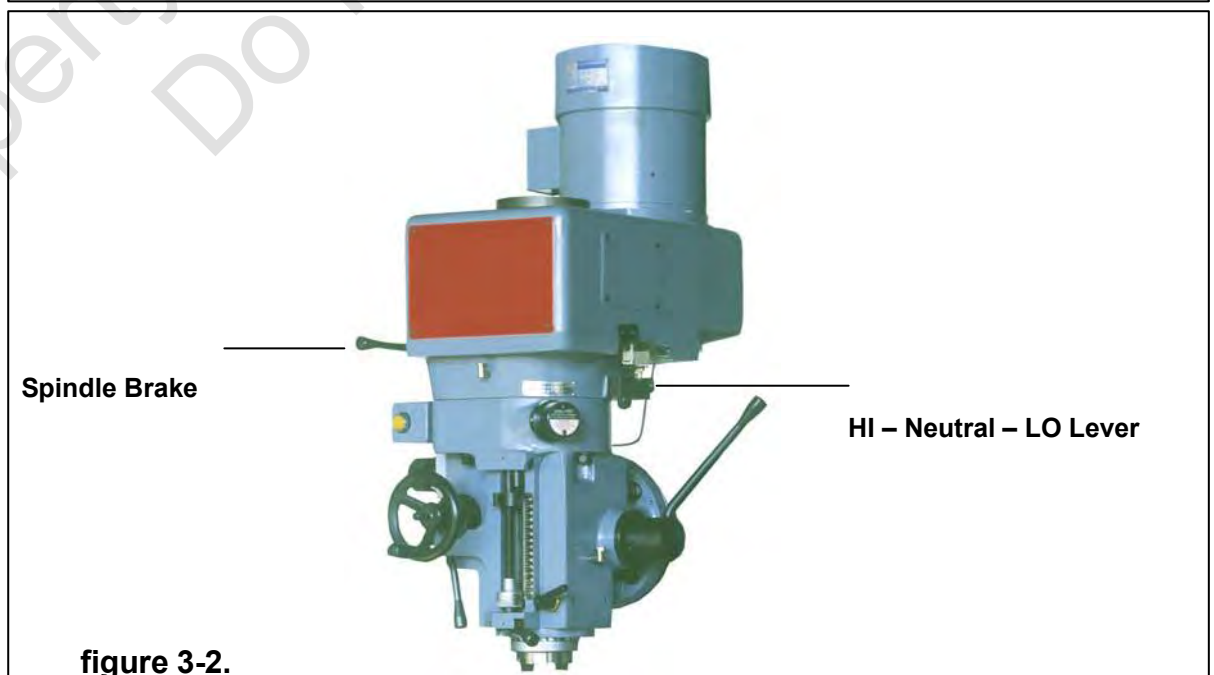
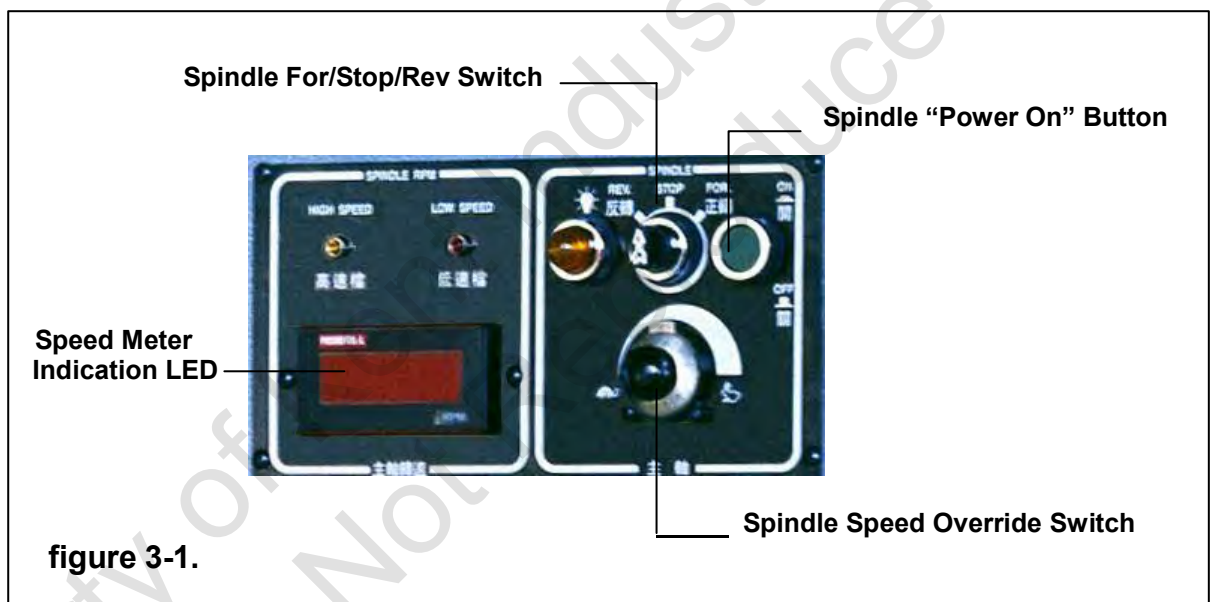
2. Stopping: Push “EMG. STOP” button to stop spindle immediately



5-3. Head Control:

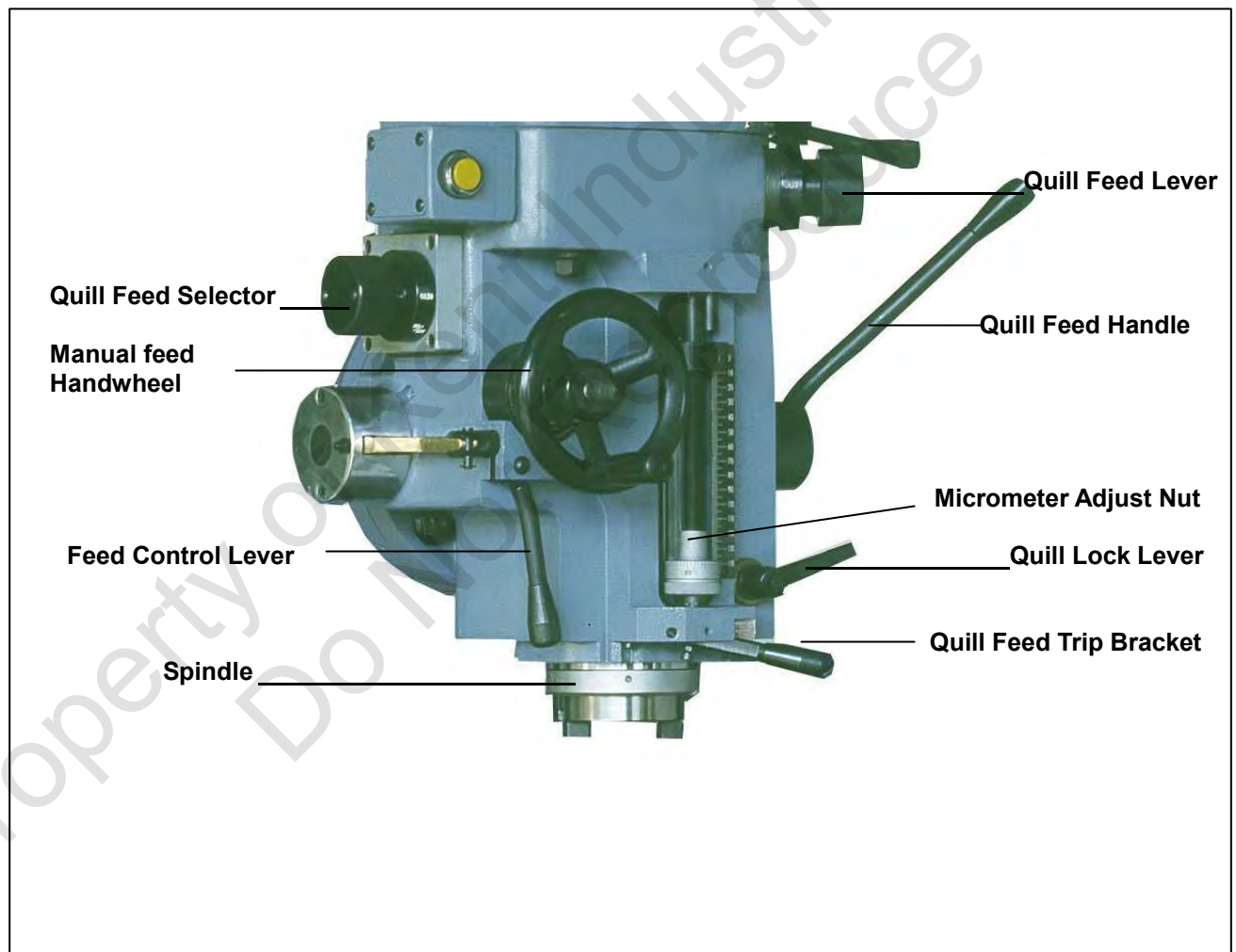
Follow the steps below before beginning operation.

- (1) Release the “EMG. STOP” button according to direct of “→”.
- (2) Confirm the spindle is at LO (Low speed) or HI (High speed), figure “3-2”.
- (3) Push Spindle “Power On” button to operate spindle, figure “3-1”.
- (4) Turn Spindle For/Stop/Rev Switch, figure “B”. The spindle will start to run.
- (5) Adjust spindle speed using the “Spindle Speed Override Switch,” figure “3-1”.
- (6) Stopping:
 - A. Turn Spindle For/Stop/Rev Switch, figure “3-1”. The spindle will stop immediately.
 - B. Figure “3-2,” lever can be moved in either direction to stop spindle. Lever should be moved to down and then raised.



5-4. Spindle Quill Downfeed:

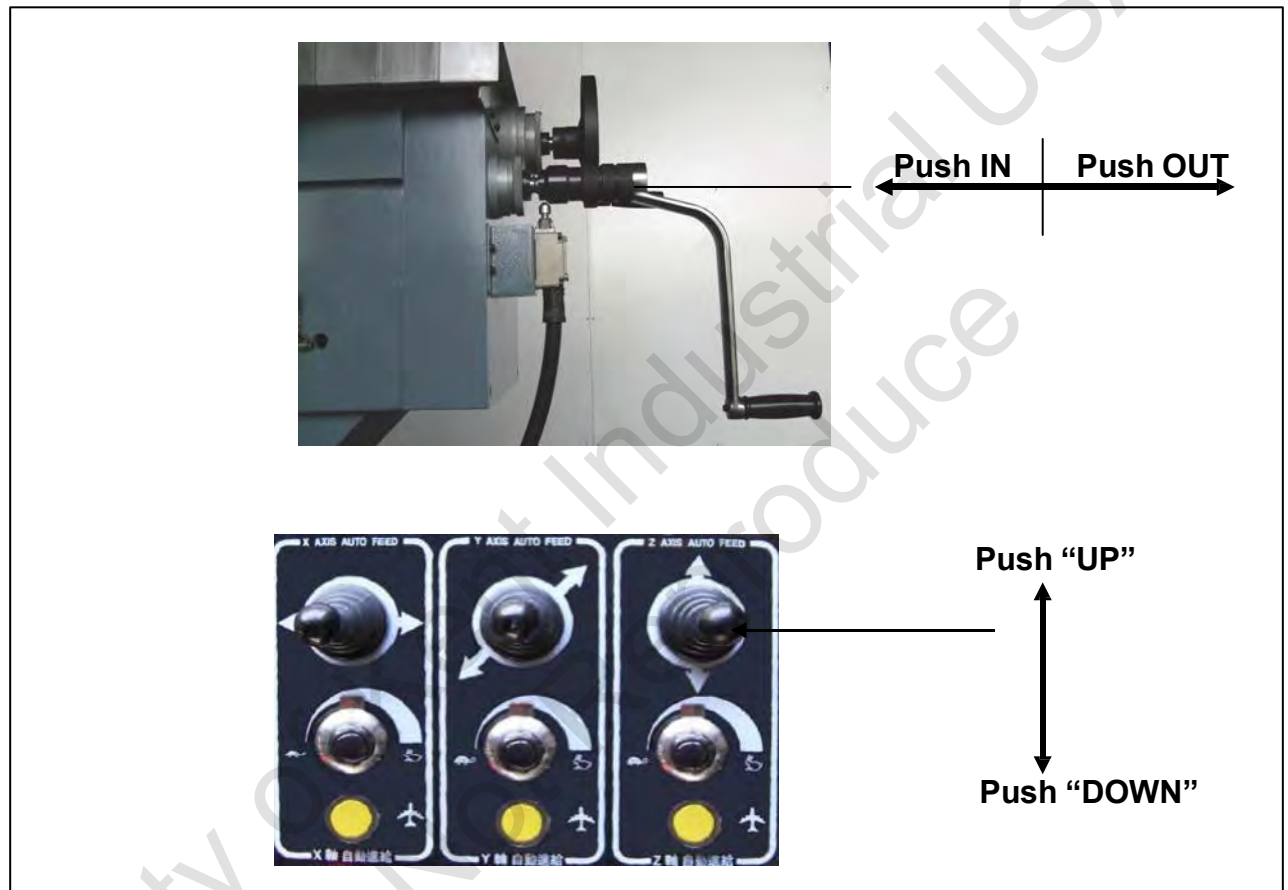
- (1) Locate “Quill Feed Lever” clutch location.
- (2) Release “Quill Lock Lever.”
- (3) Select feed speed. (0.040, 0.083, 0.138 mm/rev)
- (4) Engage “Feed Control Lever” to left, push spindle start, the spindle quill will automatically downfeed.
- (5) Push “Quill Feed Trip Bracket,” the feeding will immediately stop.



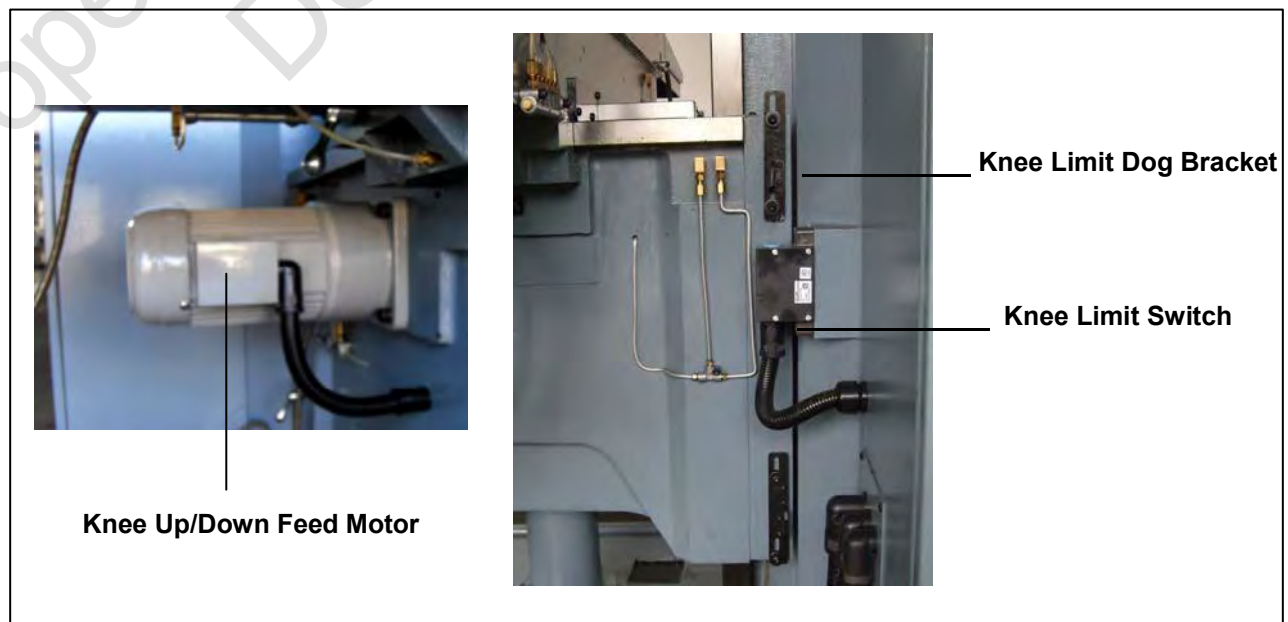
Chapter 6 Description of Main Parts Function

6-1. Knee Up/Down Feed

1. Push “IN” handle for manual operation. Push “OUT” for automation operation.
2. Push “UP” button for knee up. Push “DOWN” button for knee down.

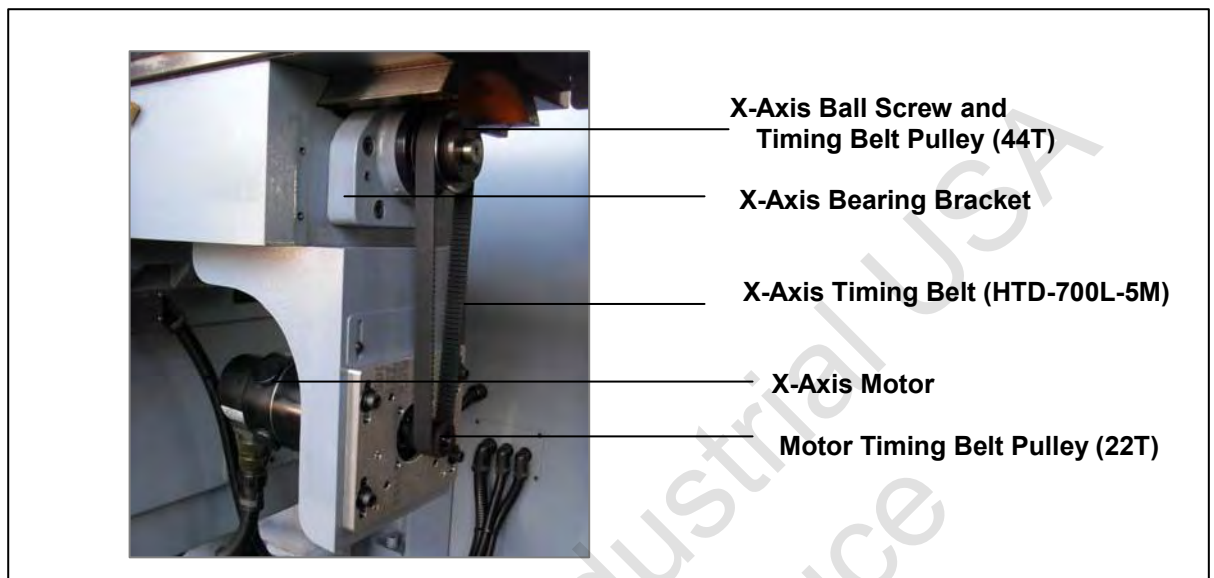


3. Knee Limit Switch

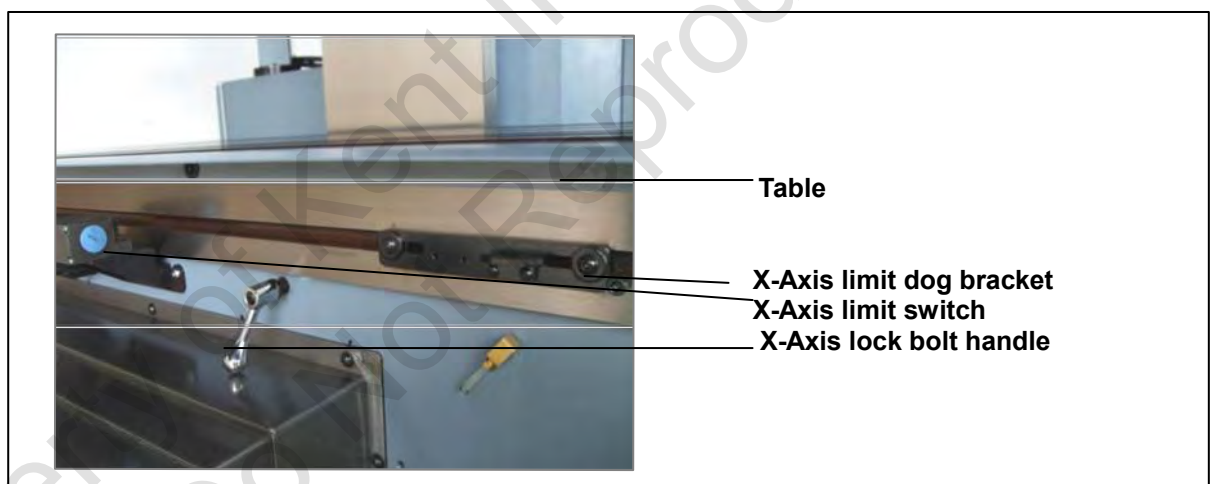


6-2. X-Axis:

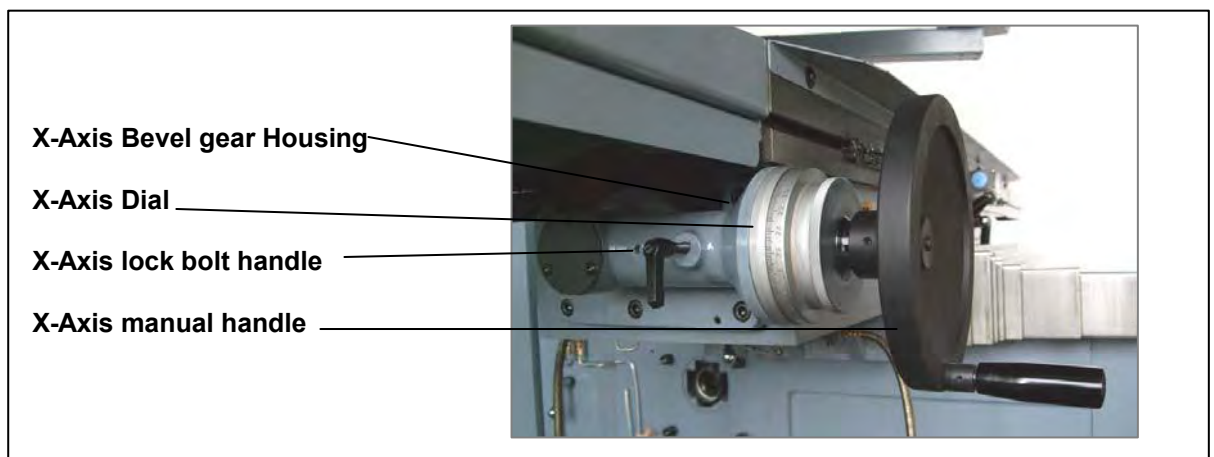
(1) X-Axis Feed System:



(2) X-Axis Limit Switch

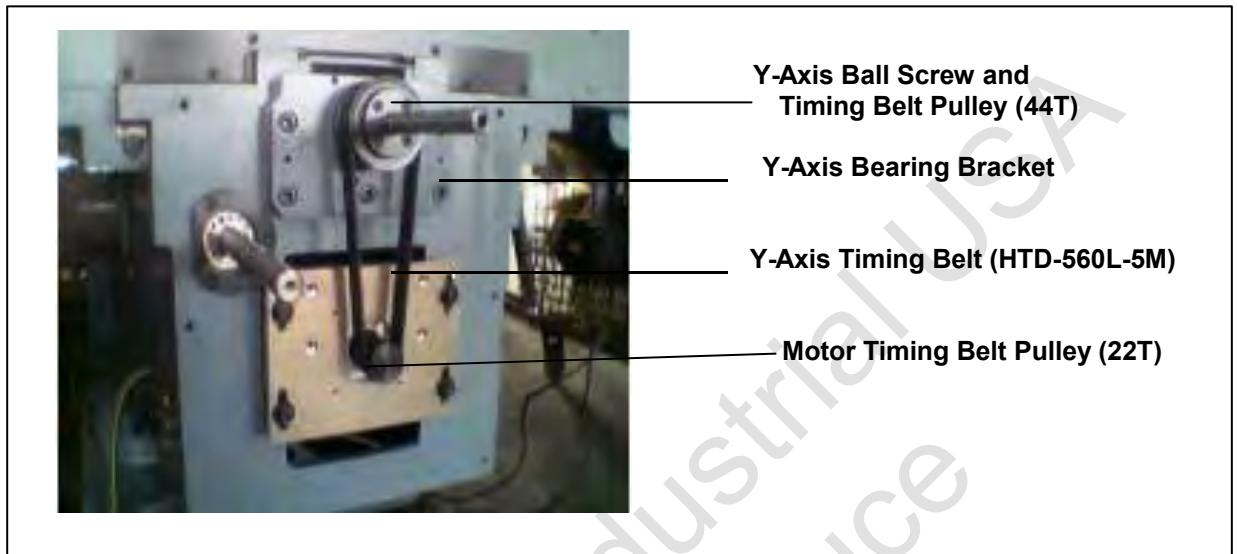


(3) X-Axis Manual Handle

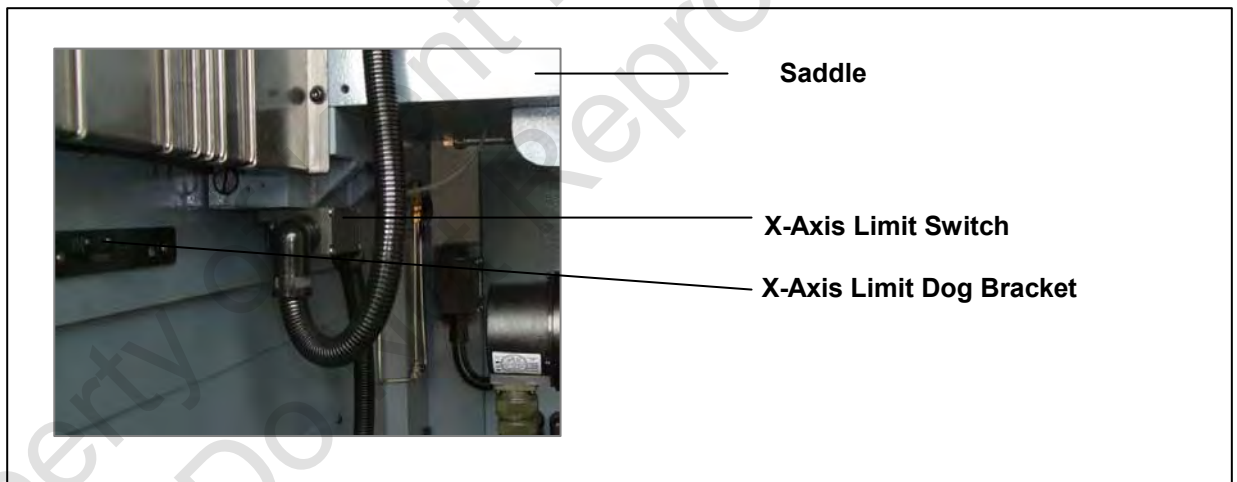


6-3 Y-Axis:

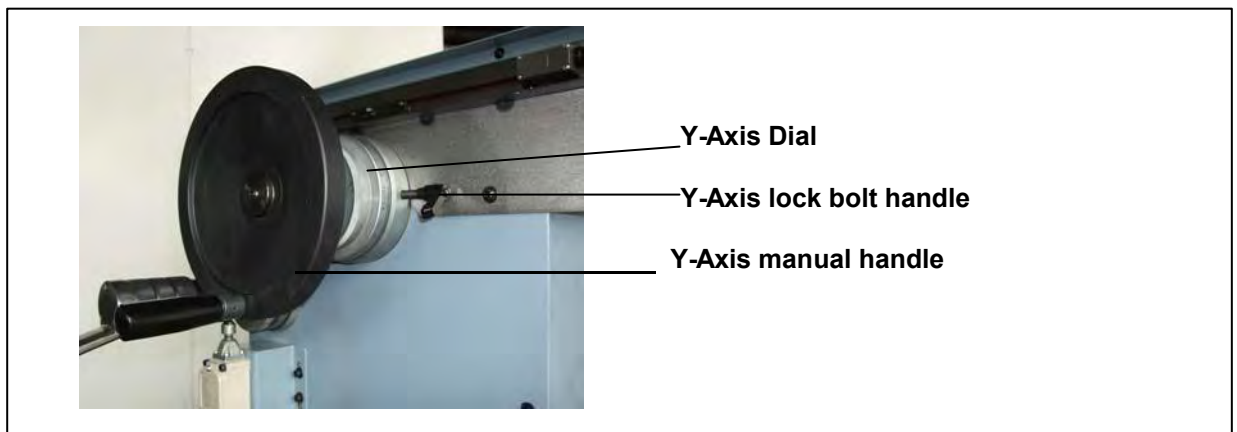
(1) Y-Axis Feed System:



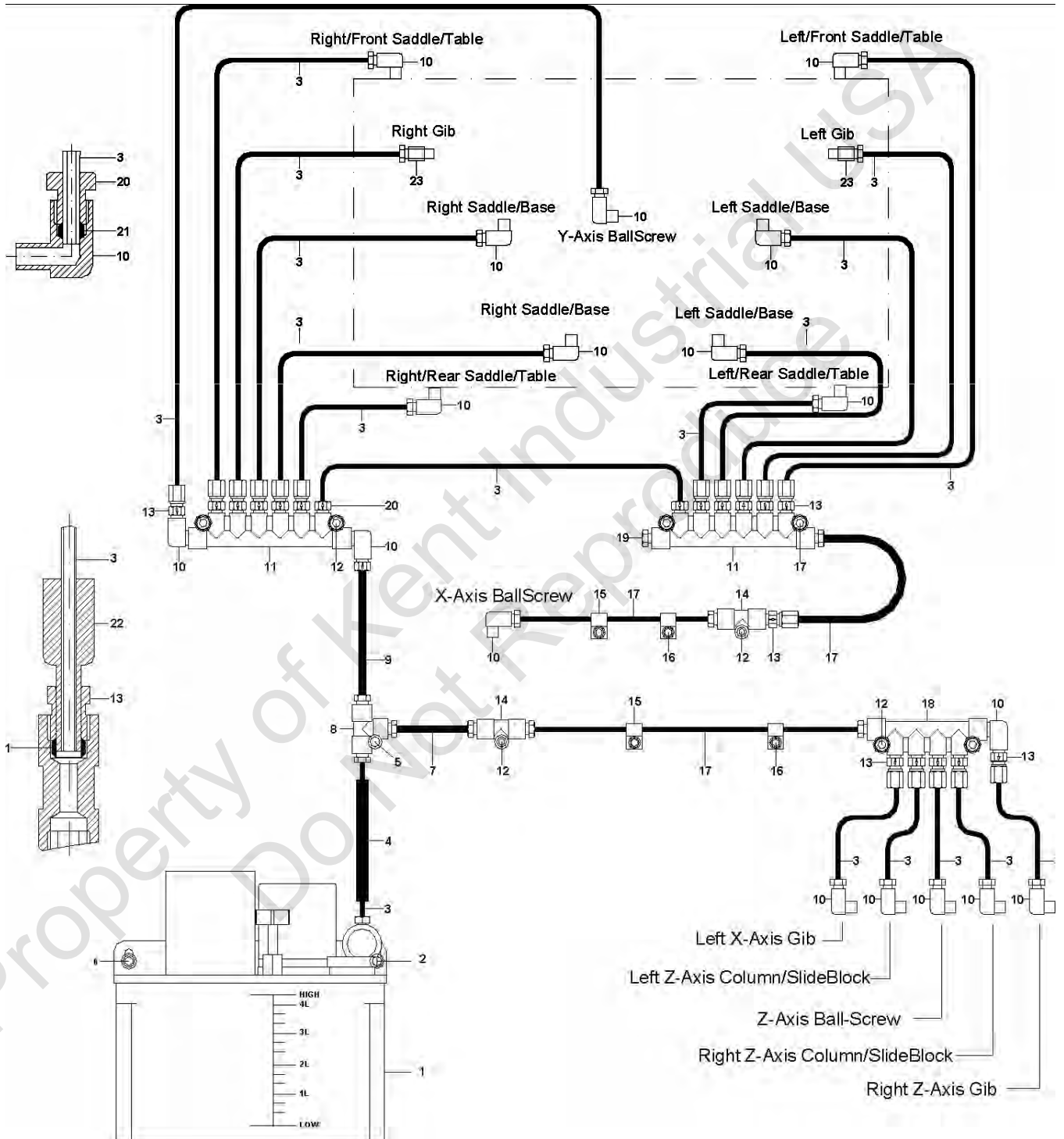
(2) Y-Axis Limit Switch



(3) Y-Axis Manual Handle



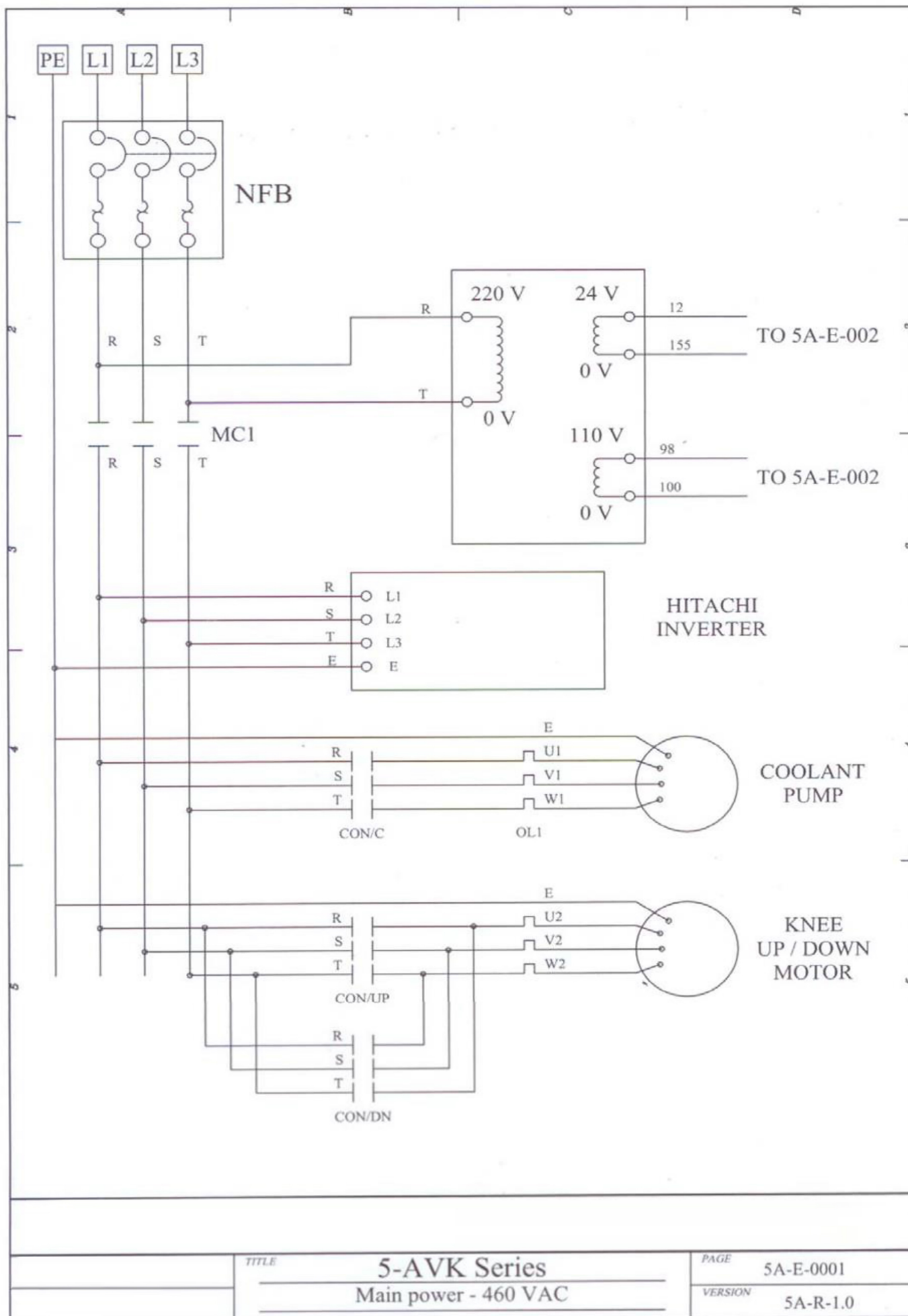
Chapter 7 Central Lubricating OIL-Feeding Equipment

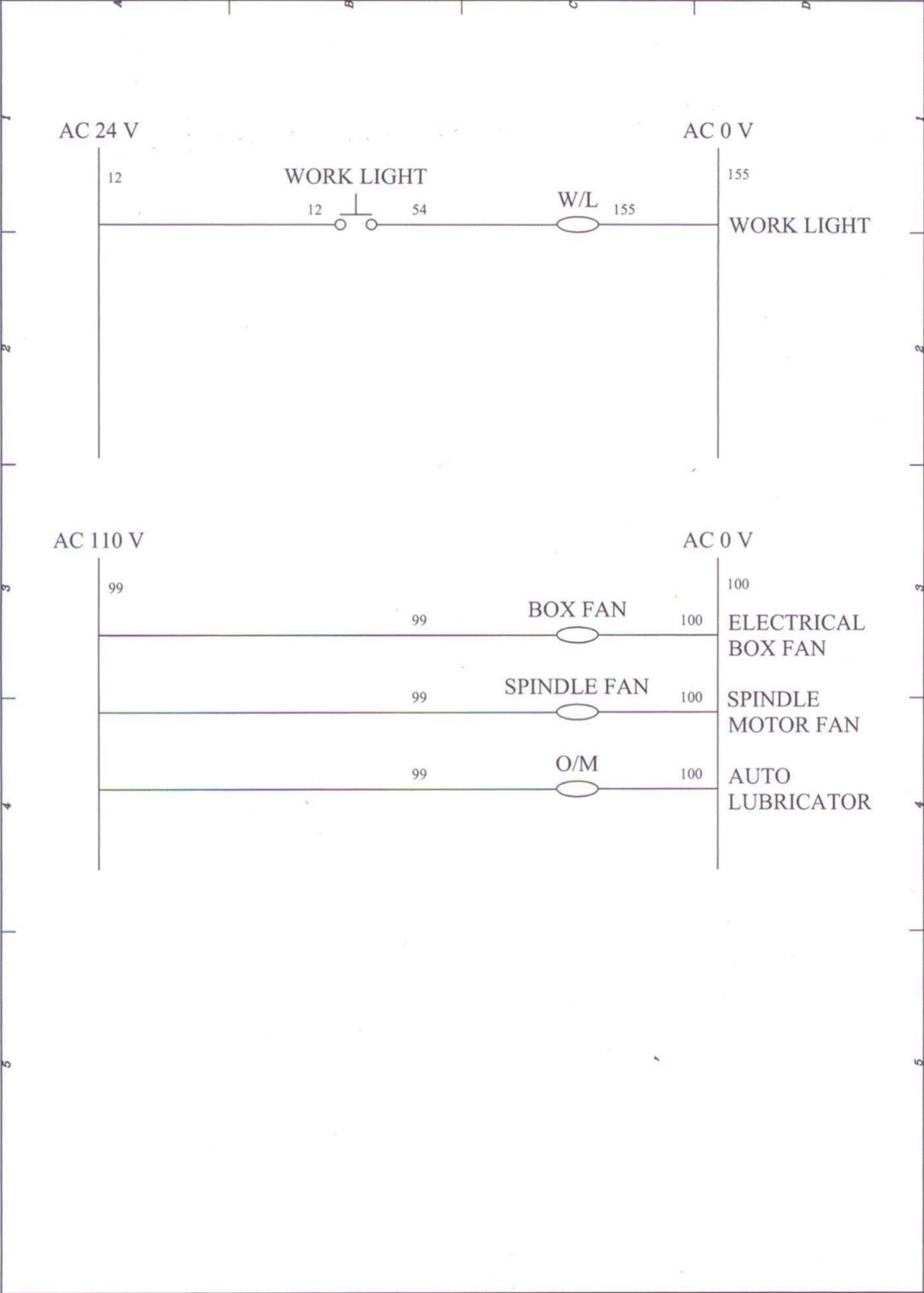


Central Lubricating OIL-Feeding Equipment

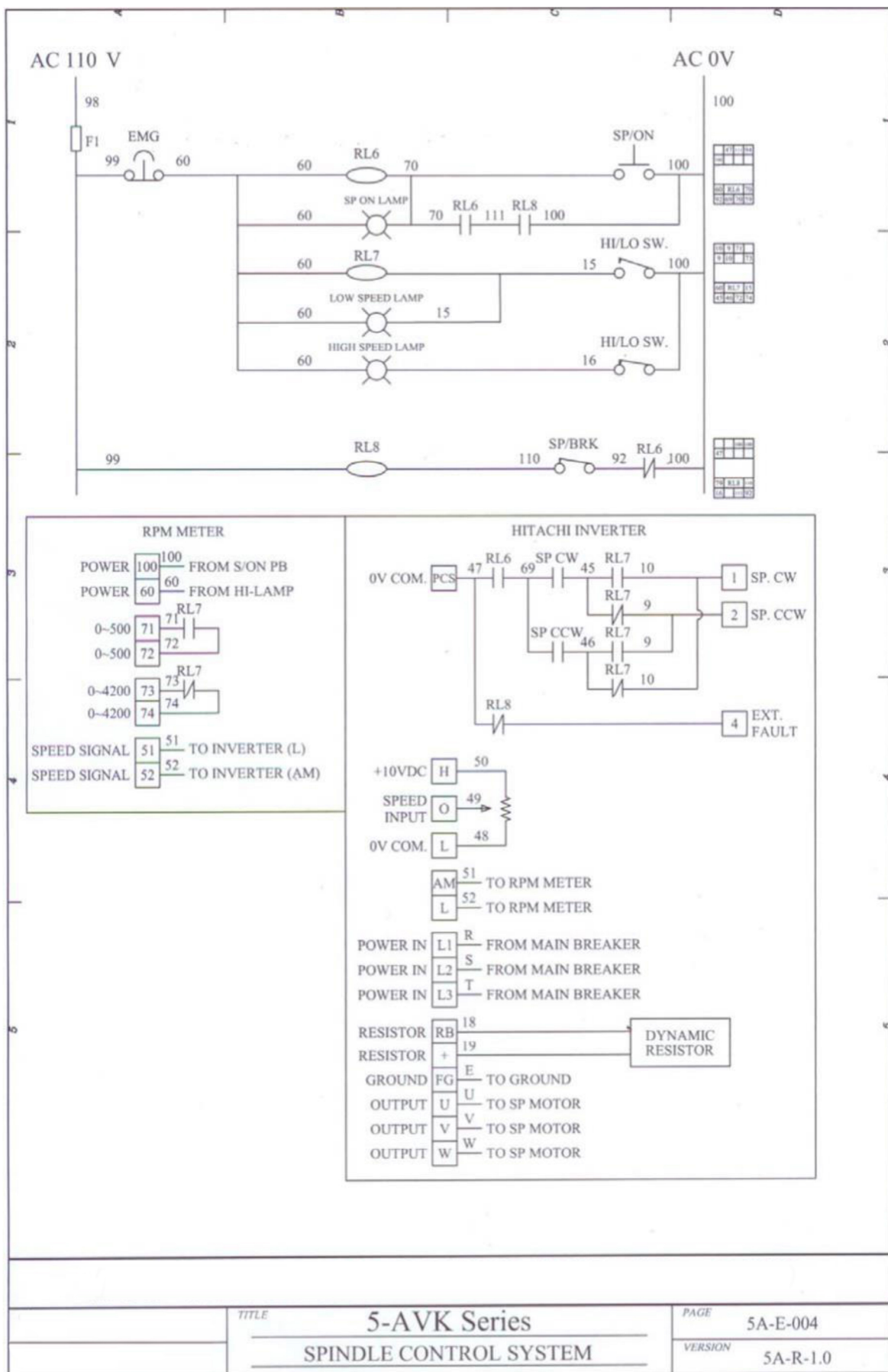
Item no.	Parts no.	Description
1	TB9001	Electric Lubricator
2	TB9003	Washer (M6) (2 Req)
3	TB9004	Nylon Tubing ($\phi 4$)
4	TB9005	Outside Steel Wire ($\phi 4$)
5	TB9007	Socket Head Cap Screw (M6x20)
6	TB9002	Socket Head Cap Screw (M6x16) (2 Req)
7	TB9008	Outside Steel Wire Soft Tube ($\phi 4 \times 1200$) (2 Req)
8	TB9006	T-Joint ($\phi 4$)
9	TB9017	Outside Steel Wire Soft Tube ($\phi 4 \times 800$)
10	TB9015	Elbow Joint (PH-408 M8xxM8) (18 Req)
11	TB9018	A Type Distributor (A-8) (2 Req)
12	TB9010	Socket Head Cap Screw (M6x25) (8 Req)
13	TB9016	Joint of Ratio Distribution (CPV3) (17 Req)
14	TB-9009	A Fixed Twin Joints A (JD-40) (2 Req)
15	TB9012	Pipe Clip ($\phi 4$) (4 Req)
16	TB9013	Socket Head Cap Screw (M5x10) (4 Req)
17	TB9011	Aluminum Pipe ($\phi 4$)
18	TB9014	A Type Distributor (A-6)
19	TB9020	Union (PG-004)
20	TB9019	Thimble Nut (PA-4) (29 Req)
21	TB9021	Thimble (PB-4) (46 Req)
22	TB9022	Screw Nut (17 Req)
23	TB9023	Straight Joint (PD-408) (2 Req)

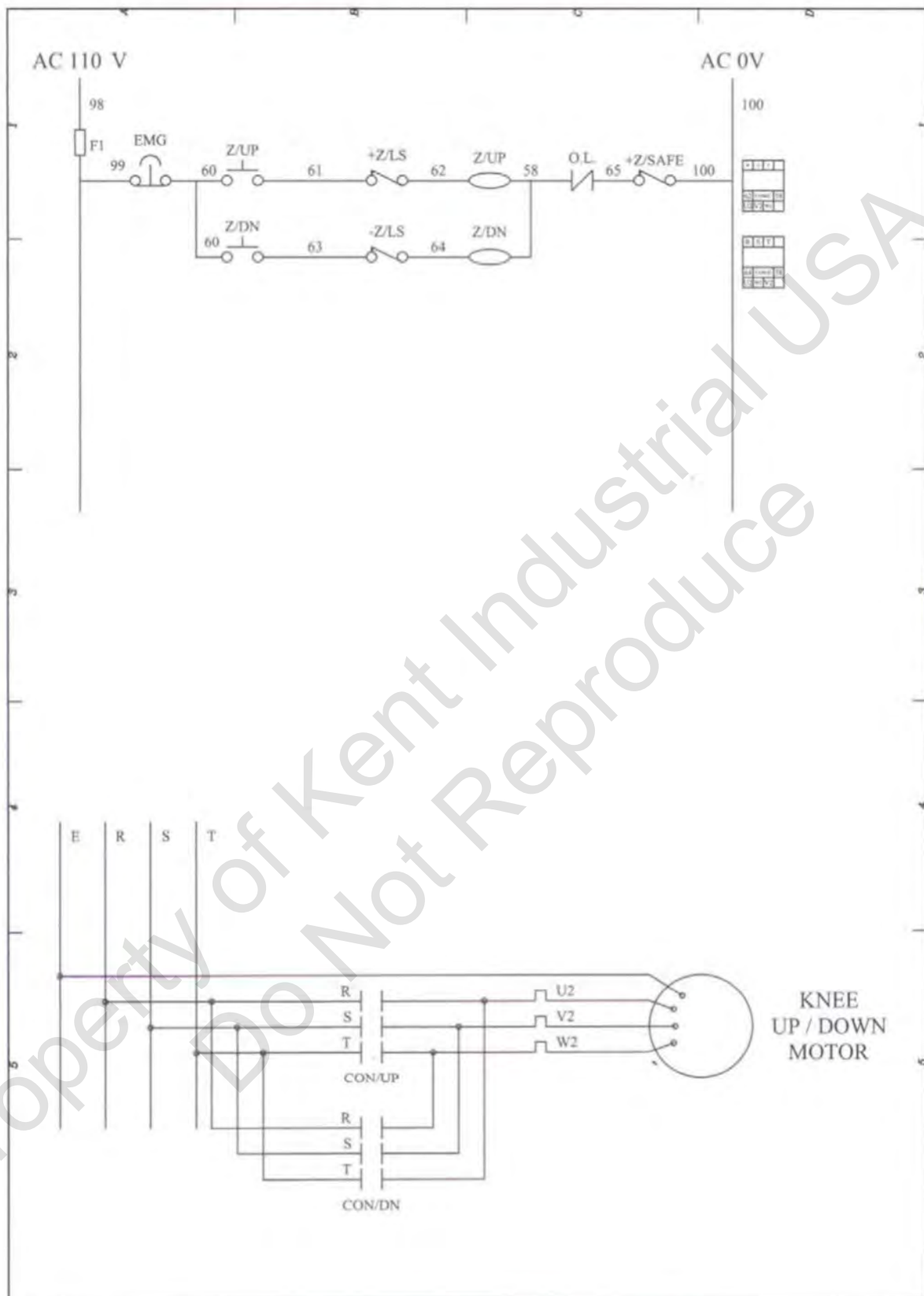
Chapter 8 Electrical Diagram



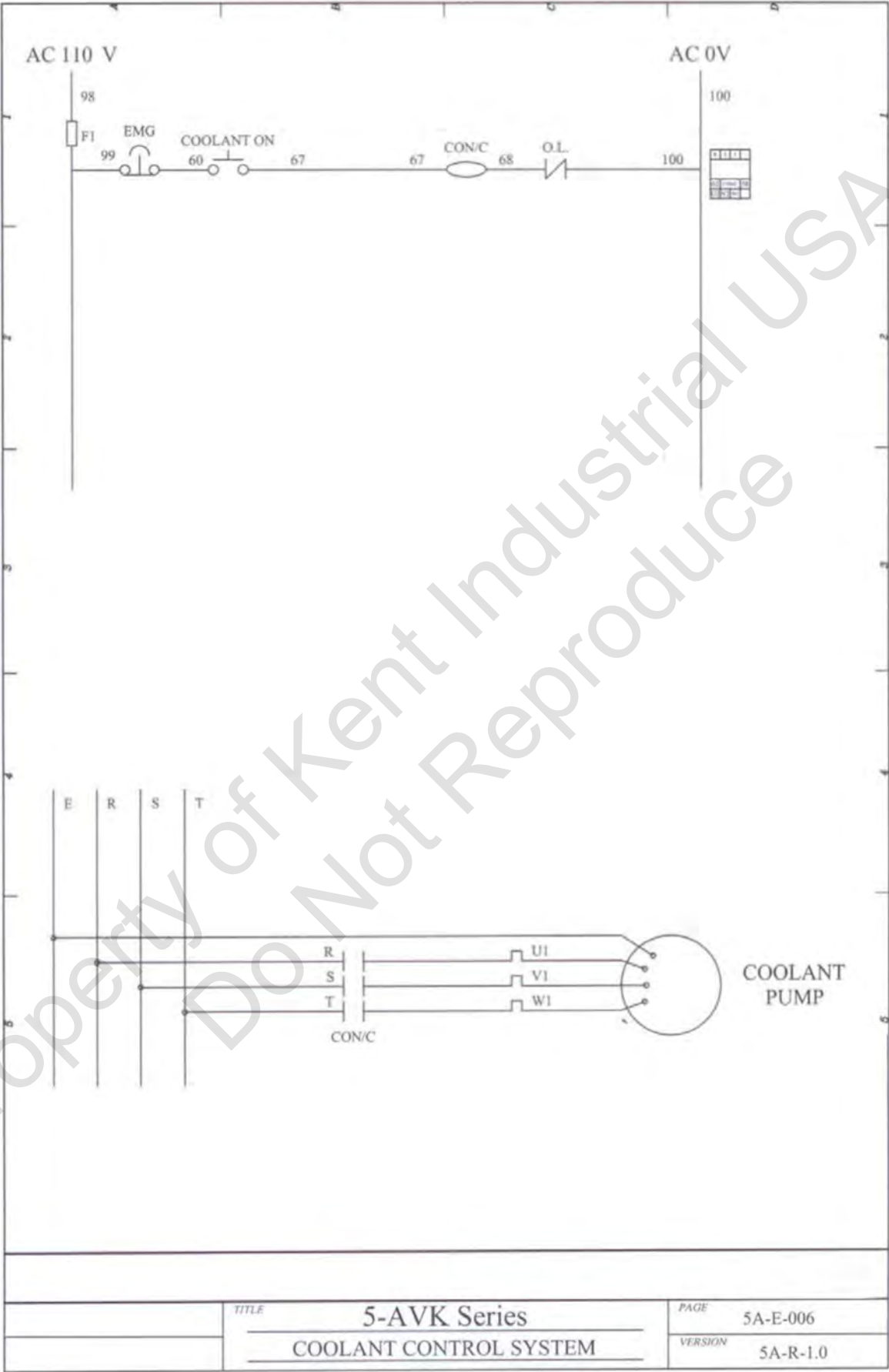


	<div>TITLE</div> <div>5-AVK Series</div>	<div>PAGE</div> <div>5A-E-002</div>
	<div>Control Circuit - 24 / 110 VAC</div>	<div>VERSION</div> <div>5A-R-1.0</div>



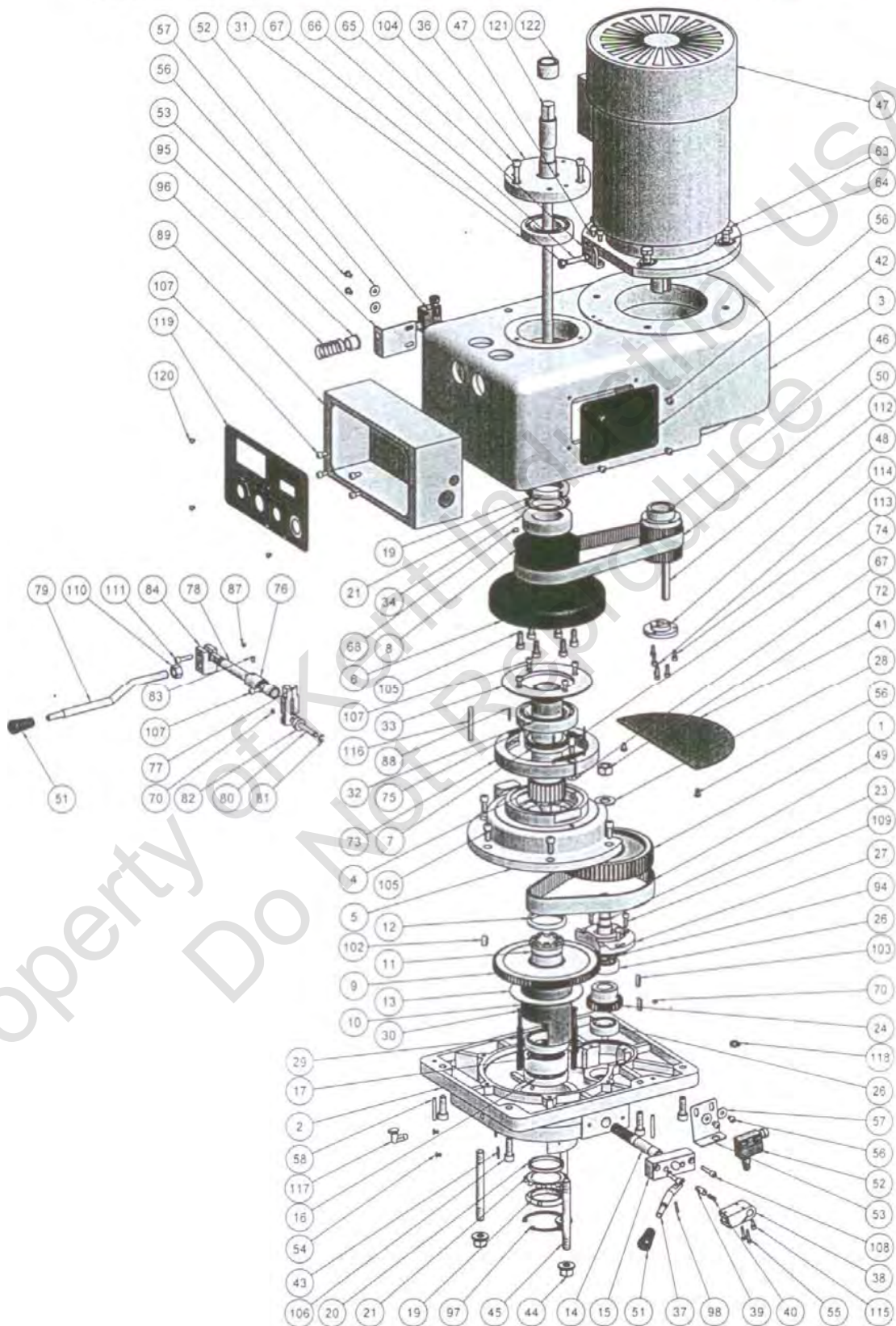


	TITLE 5-AVK Series	PAGE 5A-E-005
	KNEE UP / DOWN CONTROL SYSTEM	VERSION 5A-R-1.0



Chapter 9 Parts List

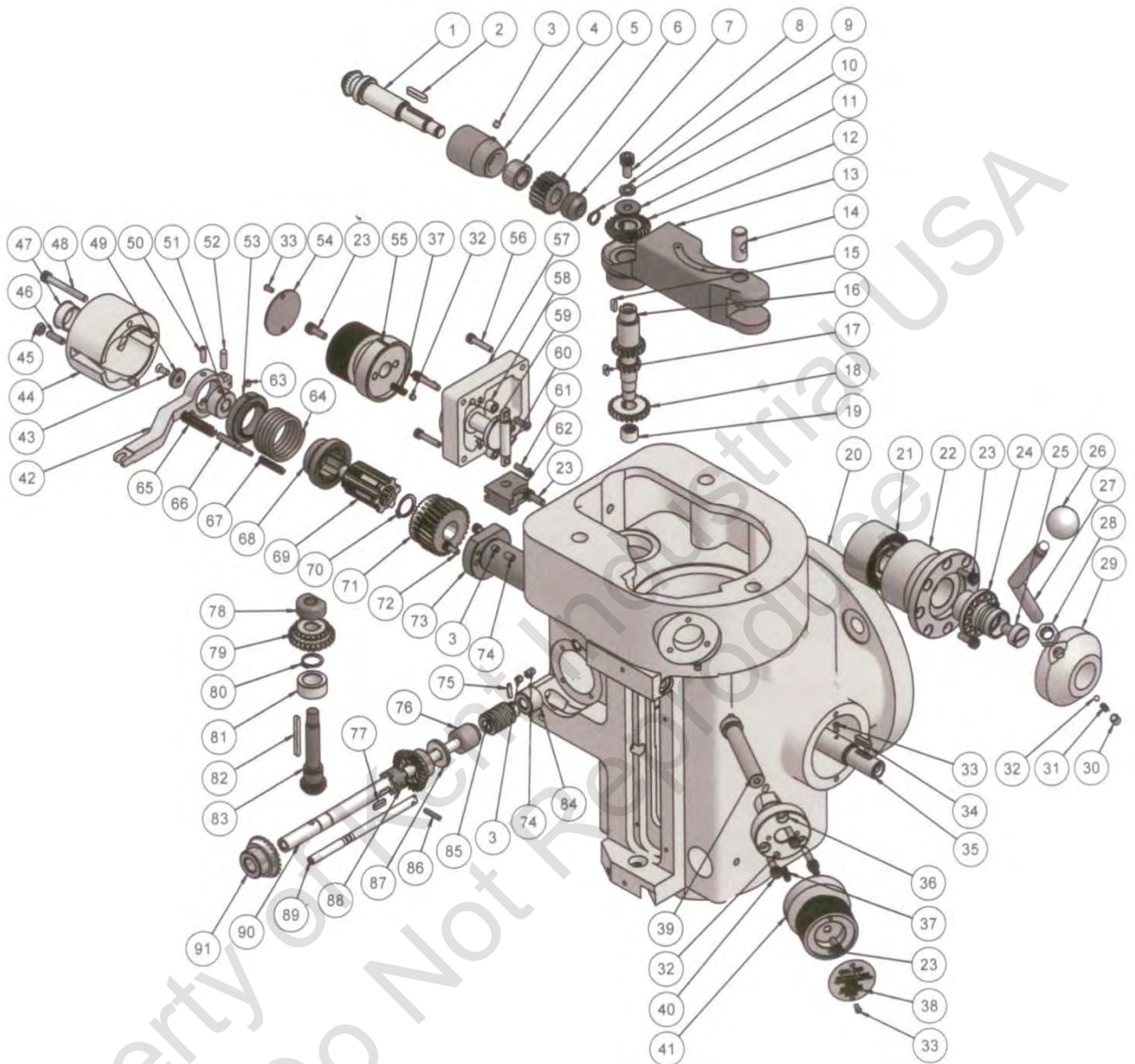
5VKF TW-40QI HEAD TOP HOUSING OF INVERTER MOTOR TYPE



5VKF TW-40QI HEAD TOP HOUSING OF INVERTER MOTOR TYPE

ITEM N	PARTS NO.	DESCRIPTION	ITEM N	PARTS NO.	DESCRIPTION
1	5K-7086	Timing Belt Pulley	64	011-M0000012	Washer(M12)(4Req)
2	5K-8063	Gear Housing	65	TRH-8005	
3	TRH-6013	Belt Housing	66	007-M0800035	Hex Jam Screw(M8*35)
4	5K-6040	Spindle Pulley Hub	67	009-M0000008	Hex Jam Nut(M8)(2Req)
5	5K-8053	Belt Housing Base	68	008-M0600010	Set Screw(M6*10)
6	5B-6048B	Brake Wheel	70	008-M0600006	Set Screw(M6*6)(2Req)
7	5K-8033	Spindle Pulley Spacer	72	009-I00000005	Hex Jam Nut(5/8)
8	5B-6048A	Spindle Timing Belt Pulley	73	5K-8032	Brake Shoe Assembly
9	5K-7040	Spindle Bull Gear Assembly	74	5K-8036	Brake Shoe Pivot Sleeve
10	5K-7057	Bearing Sleeve	75	5K-8031	Brake Spring(2Req)
11	5K-7039	Spindle Gear Hub	76	5K-8073	Sleeve For Brake Lock Shaft
12	5K-7038	Timing Pulley Clutch Sleeve	77	5K-8067	Brake Finger Pivot Stud(2Req)
13	5K-7048	Ball Bearing Gear Sleeve Washer	78	5K-8074	Brake Lock Shaft
14	5K-7059	Bull Gear Shaft Pinion	79	5K-8070	Brake Lock Handle
15	5K-7060	Hi-Low Detent Plate	80	5K-8068	Brake Operating Finger
16	020-006910ZZ	Ball Bearing(6910#)(2Req)	81	015-E00000006	Snap Ring (E6)
17	5K-7043-7044	Ball Bearing Spacer	82	5K-8068-1	Washer
19	5K-7056	Bearing Locknut	83	008-M0600008	Set Screw(M6*8)
20	5K-7057-2	Washer	84	5K-8071	Brake Lock Handle
21	035-000AW10	Lock Washer(AW10#)(2Req)	87	008-M05000005	Set Screw(M5*5)
23	5K-7080	Gear Shaft	88	014-00300022	Roll Pin(3*22)(4Req)
24	5K-7083	Bull Gear Pinion	89	70051-1	Pendant Box
26	020-006204ZZ	Ball Bearing(6204#)(2Req)	94	017-BWW006204	Wave Spring Washer(BWW-6204)
27	5K-7084	Ball Bearing Housing	95	5B-8071-1	Nut
28	011-I00000005	Washer(5/8)	96	5A-2029	Spring
29	5K-7055	Compression Spring(3Req)	97	015-0000R072	Snap Ring (R72)
30	7055-1	Adjust Pin(3Req)	98	014-00400022	Roll Pin(4*22)
31	020-06209LLB	Ball Bearing(6209#)	102	013-1008R015	Key(10*8*14.5)
32	020-06013LLB	Ball Bearing(6013#)	103	013-06060020	Key(6*6*20)(2Req)
33	5K-8029	Brake Bearing Cap	104	001-M0800040	Socket Cap Screw(M8*40)(3Req)
34	5K-6040-1	Washer	105	001-M0800020	Socket Cap Screw(M8*20)(11Req)
36	5K-7013	Top Bearing Cap	106	001-M1000030	Socket Cap Screw(M10*30)(6Req)
37	5K-7070	Hi-Low Shift Crank	107	001-M0600012	Socket Cap Screw(M6*12)(11Req)
38	5K-7071	Hi-Low Pinion Block	108	001-M0600030	Socket Cap Screw(M6*30)(2Req)
39	5K-7066	Hi-Low Detent Plunger	109	001-M0600016	Socket Cap Screw(M6*16)(3Req)
40	5K-7067	Spring	110	009-I000000050	Nut(1/2")
41	TRH-6013-1	Cover	111	001-M0600025	Socket Cap Screw(M6*25)
42	60131-2	Cover	112	013-10080070	Key(10*8*70)
43	7051	Gulp For Clutch Bracket(2Req)	113	001-M0500012	Socket Cap Screw(M5*12)(3Req)
44	5K-7061	Nut(1/2)(3Req)	114	001-M0500016	Socket Cap Screw(M5*16)(3Req)
45	5K-7063	Studs(3Req)	115	001-M0500010	Socket Cap Screw(M5*10)
46	5B-6009	Motor Timing Pulley(5GT-44T)	116	013-08070060	Key(8*7*60)
46	5B-6009-55T	Motor Timing Pulley(5GT-55T)	117	037-00000010	Oil Cap(1/8")
47	5BI-6001-5HP	5HP-Inverter Motor	118	036-00000010	Grease Nipple(1/8")
48	TA-4040A	Pulley Washer	119	70051-2-K	Pendant Plate
49	023-8M060029	Timing Belt(8M-600-29)	119	70051-2	Pendant Plate
50	023-5GT720025	Timing Belt(5GT-720-25)	120	006-M0400005	Chen Blocked RD.HD.Scerw(M4*5)(4Req)
50	023-5GT740025	(66T:55T):Timing Belt(5GT-740-25)	121	5K-6031-M	Darwbar For M/M NT40# Type
51	3H-8069	Bakelite Ball Handle(2Req)	121	5K-6031-I	Darwbar For Inch NT40# Type
52	022-00000005	Limite Switch(D4E-1A20N)(2Req)	121	5K-6031-MBT	Darwbar For M/M BT40# Type
53	3B-7071-1	Limit Switch Bracket(2Req)	121	5K-6031-ICAT	Darwbar For Inch cat40# Type
54	005-M0500012	Flat HD Socket Cap Screw(2Req)	121	5K-6031P-M	For M/M NT40# Power Darwbar Type
55	001-M0400020	Socket Cap Screw(M4*20)(2Req)	121	5K-6031P-I	For Inch NT40# Power Darwbar Type
56	002-M0600010	Socket Cap Screw(M6*10)(11Req)	121	5K-6031P-MBT	For M/M BT40# Power Darwbar Type
57	011-M0000006	Washer(4Req)	121	5K-6031P-ICAT	For Inch CAT40# Power Darwbar
58	016-T05000040	Taper Pin(2Req)	122	5K-8020	Plastic Insert
63	007-M1200040	Hex Jam Screw(M12*40)(4Req)			

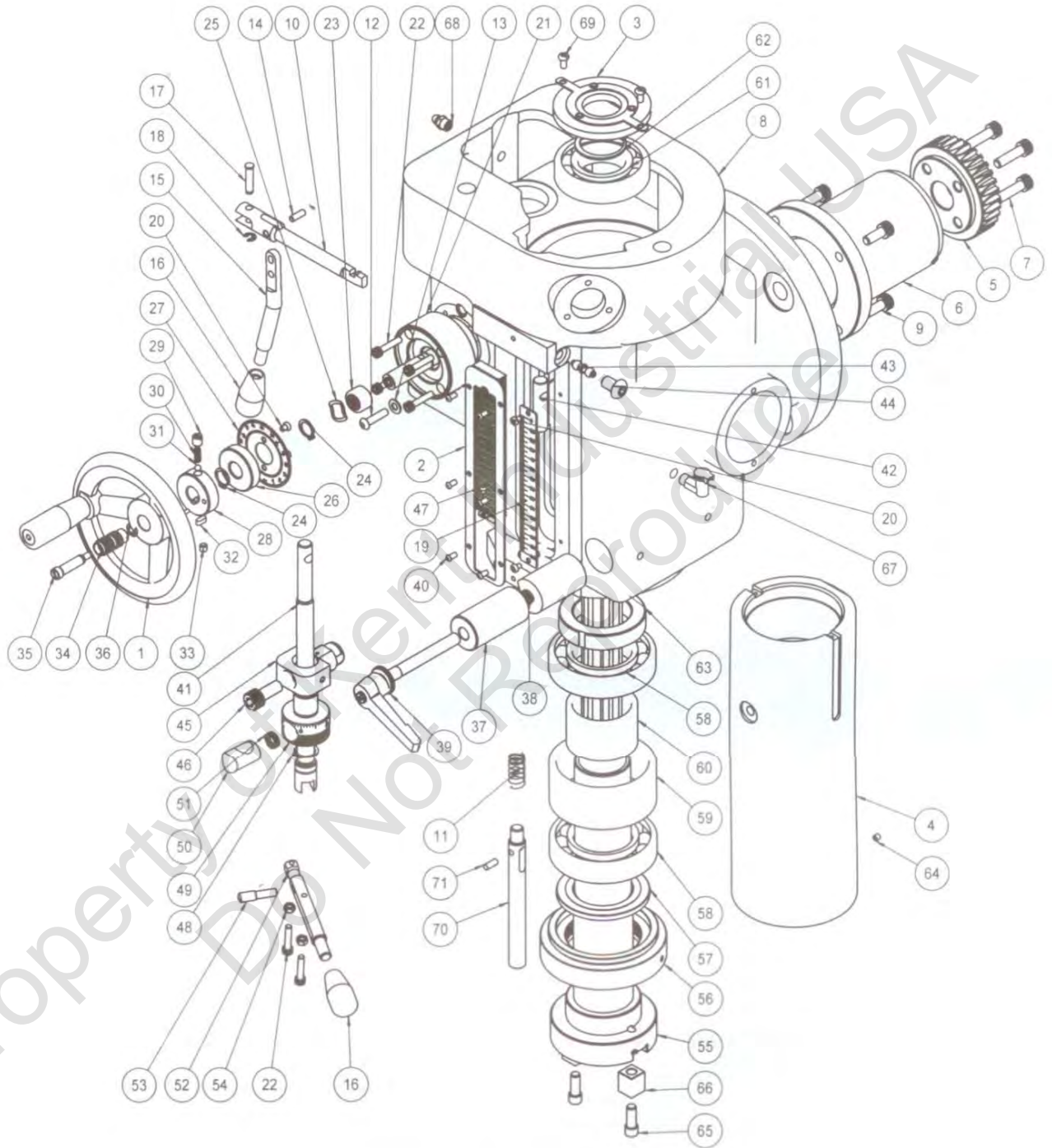
NT40# SPINDLE HEAD PART A



NT40# SPINDLE HEAD PART A

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5K-6139N	Feed Bevel Pinion	47	026-0000HP25	Plastic Plug(HP25)
2	013-05050025	Key(5*5*25)	48	001-M0600050	Socket Head Cap Screw(M6*50) (2Req)
3	008-M0600006	Set Screw(M6*6) (5Req)	49	5K-6200-1	Overload Clutch Washer
4	5K-6137	Worm Geadle Bushing	50	6202	Clutch Ring Pin (2Req)
5	5K-6136	Worm Gear Spacer	51	5K-6200	Clutch Ring
6	5K-6134	Feed Drive Worm Gear	52	016-P0600020	Pin(6*20)
7	5K-6136-1	Worm Gear Bushing	53	5K-6198	Overload Clutch Locknut
8	001-M0800016	Socket Head Cap Screw(M8*16)	54	5K-8061-1	Cover
9	012-M0000008	Spring Washer(M8)	55	5K-6168B-I	Handle(INCH TYPE)
10	015-S0000013	Snap Ring(S13)	55	5K-6168B-M	Handle(M/M TYPE)
11	5K-6149	Washer	56	001-M0500025	Socket Head Cap Screw(M5*25) (4Req)
12	5K-6148N	Feed Reverse Bevel Gear	57	5K-6161	Cluster Gear Cover
13	5K-6121	Worm Gear Cradle	58	5K-6164	Washer (2Req)
14	5K-6122	Feed Engage Pin	59	5K-6166	Cluster Gear Shift Crank
15	013-04040012	Key(4*4*12)	60	5K-6163	Feed Shift Rod
16	5K-6143	Feed Driving Gear	61	002-M0500016	Hemisphere Head Cap Screw(M5*16) (2Req)
17	013-04040010	Key(4*4*10)	62	5K-6162	Feed Gear Shift Fork
18	5K-6144	Feed Drive Gear	63	008-M0500005	Set Screw(M5*5)
19	020-00HK1210	Needle Bearing(HK1210#)	64	5K-6197	Safety Clutch Spring
20	5K-6101	Quill Housing	65	5K-6192	Compression Spring
21	5K-6181	Clock Spring	66	5K-6193	Overload Clutch Lever Spring Plunger
22	5K-6180	Spring Cover	67	5K-6191	Compression Spring
23	001-M0600016	Socket Head Cap Screw(M6*16) (5Req)	68	5K-6194	Overload Clutch
24	5K-6182	Pinion Shaft Hub Sleeve	69	5K-6195	Overload Clutch Sleeve
25	5K-6183	Pinion Shaft Hub Screw	70	015-S0000020	Snap Ring(S20)
26	6173	Black Plastic Ball Handles(3/8")	71	5K-6187.88	Overload Clutch
27	5K-6174	Pinion Shaft Hub Handle	72	001-M0500012	Socket Head Cap Screw(M5*12) (2Req)
28	009-I0000040	Nut(1/2")	73	5K-6186N	Quill Pinion Shaft Bushing
29	5K-6178	Rack Feed Handle Hub	74	008-M0600010	Set Screw(M6*10) (3Req)
30	008-M0800008	Set Screw(M8*8)	75	014-04000014	Roll Pin(4*14)
31	6175	Compression Spring	76	5K-6224	Feed Worm Shaft Bushing
32	027-00000200	Steel Ball(1/4") (5Req)	77	013-04040015	Key(4*4*15)
33	004-M0400008	Socket Head Cap Screw(M4*8) (5Req)	78	5K-6157	Cluster Gear Shaft Upper Bearing
34	013-05050020	Key(5*5*20)	79	5K-6152.53.54	Cluster Gears Assembly
35	5K-6172	Quill Pinion Shaft	80	015-S0000018	Snap Ring(S18)
36	5K-6125	Shift Sleeve	81	5K-6156	Bevel Gear Bearing
37	5K-7067	Spring (4Req)	82	013-04040045	Key(4*4*45)
38	5K-8061	Quill Feed Nameplate	83	5K-6151	Cluster Gear Shaft
39	5K-6126	Worm Gear Cradle Throw-Out	84	5K-6227	Bushing
40	001-M0600020	Socket Head Cap Screw(M6*20) (3Req)	85	5K-6225	Worm
41	5K-6168A	Clutch Handle	86	014-04000020	Roll Pin(4*20)
42	5K-6203	Overload Clutch Trip Lever	87	5K-6223	Feed Worm Shaft Thrust Washer
43	005-M0500012	Flat HD Socket Cap Screw(M5*12)	88	5K-6222	Feed Reverse Clutch
44	5K-6205	Clutch Arm Cover	89	5K-6216N	Reverse Clutch Rod
45	009-M0000006	Nut(M6)	90	5K-6209N	Feed Worm Shaft
46	008-M0600020	Set Screw(M6*20)	91	5K-6220N	Feed Reverse Bevel Gear(2Req)

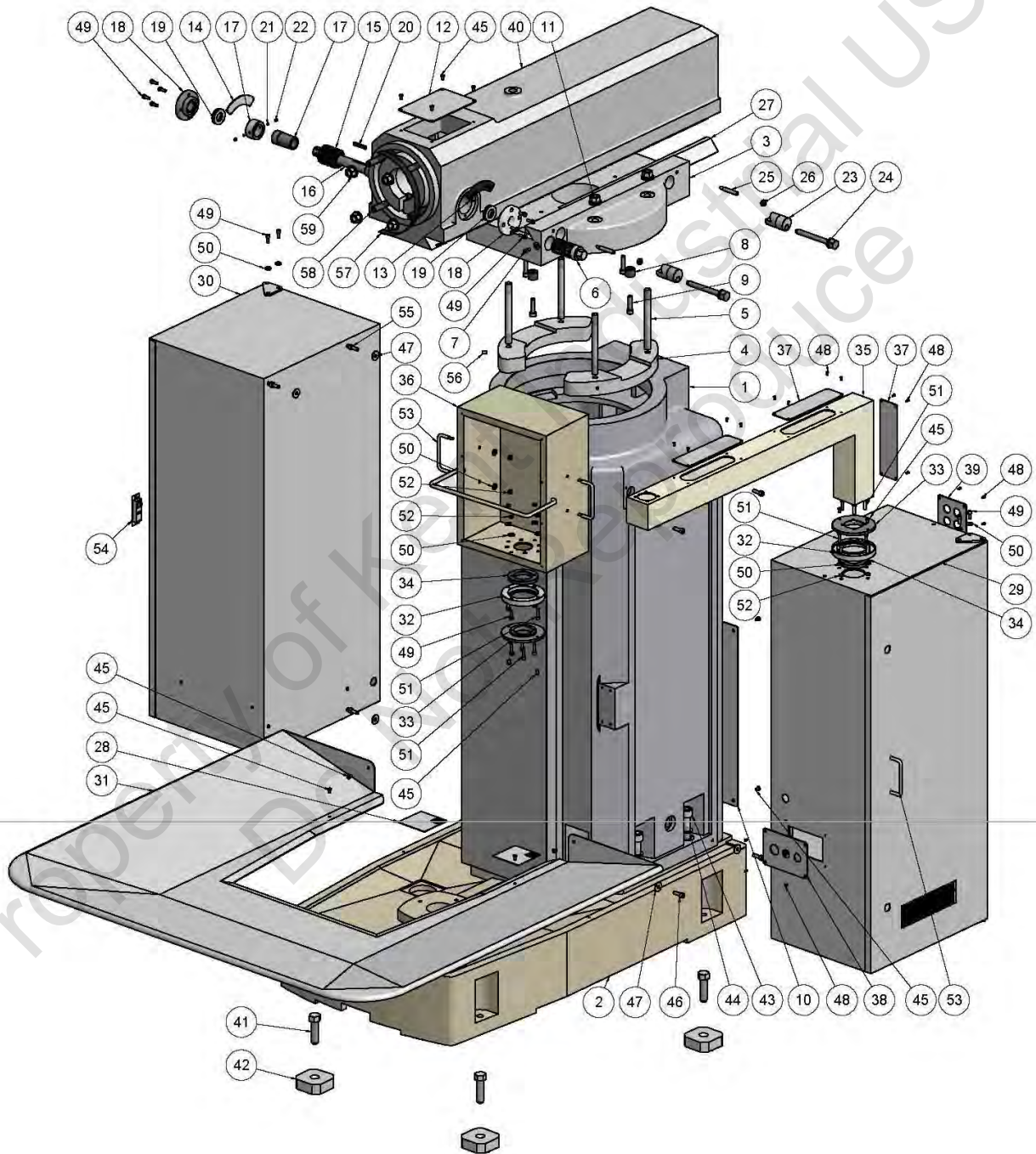
NT40# SPINDLE HEAD PART B



NT40# SPINDLE HEAD PART B

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5K-6240N	Feed Trip Plunger	38	5K-6116	Quill Lock Sleeve Guard
2	5K-6210	Hand Wheel	39	5K-6116-1	Compression Spring
3	5K-6086N	Quill Skirt	40	5K-6117	Quill Lock Bolt Spacer
4	5K-6088	Felt Washer	41	5K-6119	Quill Lock Bolt Spacer
5	5K-6085	Quill	42	5K-6117-1	Spring
6	5K-5033	Worm Gear	43	5K-6117-2	Spring Screw
7	5K-5033-1	Worm Gear Shaft	44	002-M0400008	Hemisphere Head Cap Screw(M4*8) (6Req)
8	001-M0800030	Socket Head Cap Screw(M8*30) (4Req)	45	5K-6104N-M	Quill Stop Micro-Screw(MM)
9	5K-6101	Quill Housing	45	5K-6104N-I	Quill Stop Micro-Screw(INCH)
10	001-M0800020	Socket Head Cap Screw(M8*20) (4Req)	46	5K-6109N	Feed Reverse Trip Plunger
11	5K-6239N	Cam Rod	47	5K-6110	Reverse Trip Ball Lever
12	5K-6242	Compression Spring	48	002-M1000016	Hemisphere Head Cap Screw(M10*16)
13	002-M0600025	Hemisphere Head Cap Screw(M6*25)	49	5K-6105N	Quill Stop Knob
14	011-M0000006	Washer(M6)	50	001-M1000020	Socket Head Cap Screw(M10*20)
15	016-P0500015	Pin(5*15)	51	5K-6244	Chem Blacked RD.HD.Screw
16	5K-6234N	Trip Handle	52	015-S0000018	Snap Ring(S18)
17	3H-7069	Plastic Handle (2Req)	53	5K-6107-M	Micrometer Nut(M/M TYPE)
18	5K-6236-1	Dowel Pin	53	5K-6107-I	Micrometer Nut(INCH TYPE)
19	015-E0000005	Snap Ring(E5)	54	5K-6108-I	Quill Micro-Stop Nut(INCH TYPE)
20	5K-6243-I	Micrometer Scale(INCH TYPE)	54	5K-6108-M	Quill Micro-Stop Nut(M/M TYPE)
20	5K-6243-M	Micrometer Scale(M/M TYPE)	55	5K-6108-1	Compression Spring
21	006-M0400005	Chem Blacked RD.HD.Screw(M4*5) (4Req)	56	5K-6111N	Feed Trip Lever
22	5K-6231N	Feed Trip Bracket	57	5K-6112	Trip Lever Pin
23	001-M0500025	Socket Head Cap Screw(M5*25) (6Req)	58	009-M0000005	Nut(M5) (2Req)
24	020-00HK1412	Needle Bearing(HK1412#)	59	5K-6084	Spindle 40#
25	015-S0000015	Snap Ring(S15) (2Req)	60	5K-6098	Nose-Piece
26	017-WW000014	Spring Washer(WW14)	61	5K-6097	Spindle Dirt Shield
27	5K-6244N	Scale Ring Bracket	62	020-00007210	Ball Bearing(7210-P4#) (2Req)
28	5K-6245N-M	Scale Ring(MM)	63	5K-6095	Bearing Spacer-Large
28	5K-6245N-I	Scale Ring(INCH)	64	5K-6096	Bearing Spacer-Small
29	5K-6218	Hand Wheel Clutch	65	020-06208LLB	Ball Bearing(6208LLB#)
30	6219-1	Hand Wheel Clutch Spring Screw	66	015-S0000040	Snap Ring(S40)
31	6219-2	Compression Spring	67	5K-6094	Nut
32	027-00000150	Steel Ball(3/16")	68	008-M0500005	Set Screw(M5*5)
33	013-04040010	Key(4*4*10)	69	5K-6100	Cap Screw (2Req)
34	008-M0600006	Set Screw(M6*6)	70	5K-6099	Keeper Key (2Req)
35	5K-6213	Feed Reverse Knob Stud	71	037-00000010	Oil Cap(PT1/8")
36	5K-6214	Feed Reverse Knob Stud	72	036-00000010	Grease Nipple(PT1/8")
37	015-E0000006	Snap Ring(E6)	73	006-M1000024	Felt Washer Screw(M10*24) (2Req)

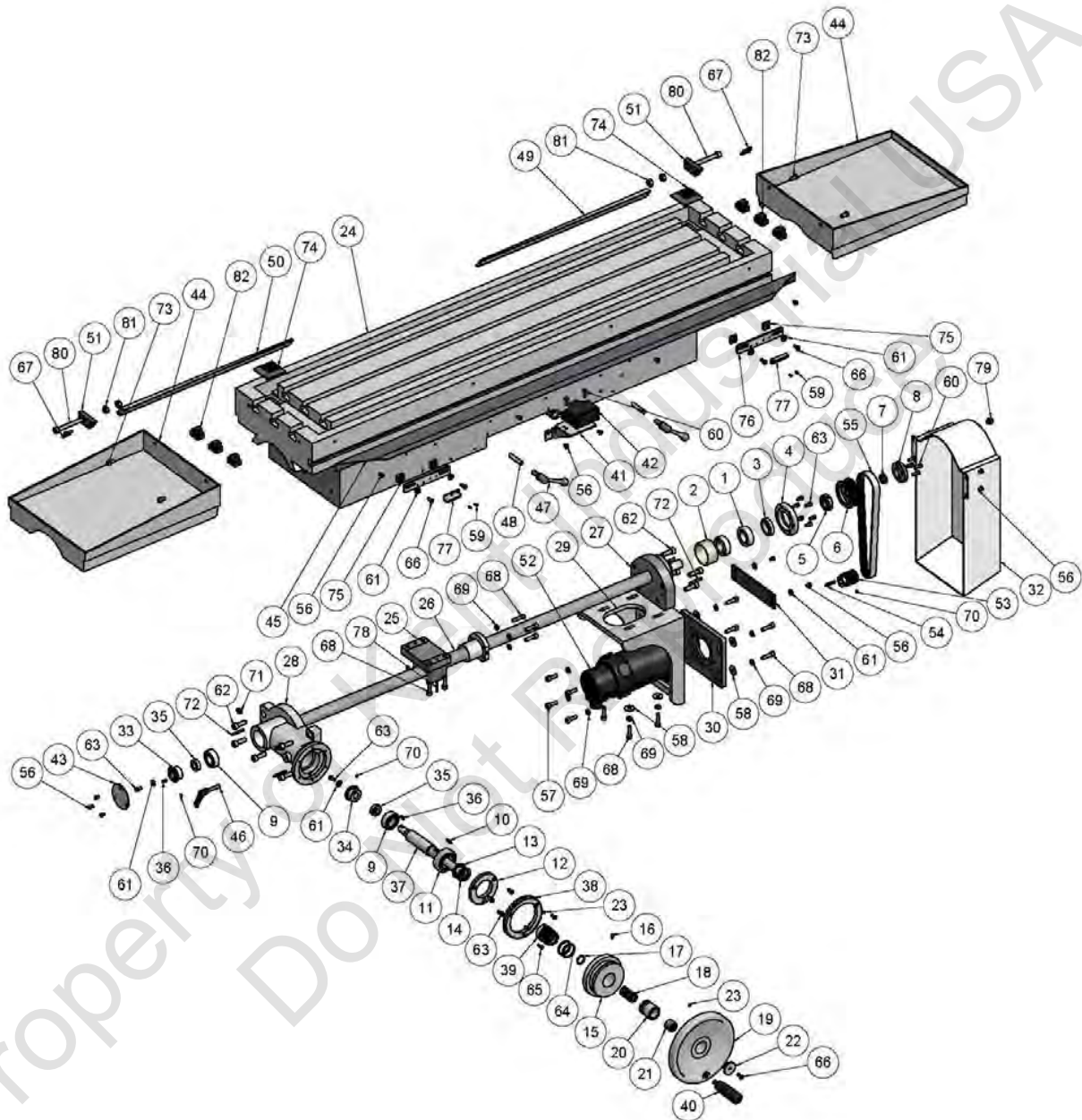
5AVK BASIC MACHINE



5AVK BASIC MACHINE

ITEM NO.	PARTS NO.	DESCRIPTION
1	5A-1001A	Column
2	5A-1001B	Base
3	5A-5001	Turret
4	5A-5003	Spider (2Req)
5	5A-5004	Studs (4Req)
6	5A-5012	Ram Pinion
7	5015	Ram Pinion Screw
8	5A-5001-1	Turret Fixture Sleeve (4Req)
9	001-M1000040	Socket Head Cap Screw (M10x40) (4Req)
10	5A-1002	Column Cover
11	5A-5005	Hex.Nut (4Req)
12	5A-5006	Cover
13	5A-5043-1	Head Swivel Plate
14	5A-5043	Head Swivel Plate
15	5K-5039	Worm
16	5A-5040	Worm Shaft
17	5A-5040-1	Adj. Bushing (1SET)
18	5K-5040-2	Worm Fixd Cover (2Req)
19	020-00051105	Thrust Ball Bearings (51105#) (2Req)
20	013-06060045	Key (6x6x45)
21	6199-1	Brass Plug (2Req)
22	008-M0600006	Set Screw (M6x6) (2Req)
23	5K-5006	Ram Lock Plunger (2Req)
24	5K-5010	Ram Lock Stud (2Req)
25	H-5007	Gib Screw (2Req)
26	009-I0000030	Gib Screw Nut (3/8") (2Req)
27	5A-5002	Ram/Turret Gib
28	5A-1001-4	Filter (2Req)
29	5A-1107	Electric Cabinet
30	5A-1108	Big Tools Cabint
31	5A-1204	Chip Pan
32	5A-1104	Upper Rotation Disk (2Req)
33	5A-1105	Lower Rotation Disk (2Req)
34	5A-1106	Fixture Disk (2Req)
35	5A-1101	Pendant Box Arm
36	5A-1102	Pendant Box
37	TA-1020-1	Cover (3Req)
38	5A-1107-1	Cover
39	5A-1107-4	Cover
40	5A-5018	Ram
41	4H-1001-2	Foundation Bolt (4Req)
42	TP-1066	Leveling Pad (4Req)
43	001-I0600300	Socket Head Cap Screw (3/4"x3") (8Req)
44	012-I0000060	Spring Washer (3/4") (8Req)
45	002-M0600010	Hemisphere Head Cap Screw (M6x10) (16Req)
46	001-M0800025	Socket Head Screw (M8x25) (4Req)
47	011-M0000008	Washer (M8) (8Req)
48	011-M0400008	Hemisphere Head Cap Screw (M4x8) (22Req)
49	001-M0600016	Socket Head Cap Screw (M6x16) (16Req)
50	011-M0000006	Washer (M6) (18Req)
51	001-M0600025	Socket Head Cap Screw (M6x25) (12Req)
52	009-M0000006	Hex.Nut (M6) (14Req)
53	030-M06CC100	Handle (3Req)
54	030-A-240-3-1	Door Latsh
55	001-M0800020	Socket Head Cap Screw (M8x20) (4Req)
56	008-M0800012	Set Screw (M8x12) (4Req)
57	5K-5016N	Ram Adapter Plate
58	5K-5036N	T-Bolt Assy (4Req)
59	5K-5038	Lock Nut (4Req)

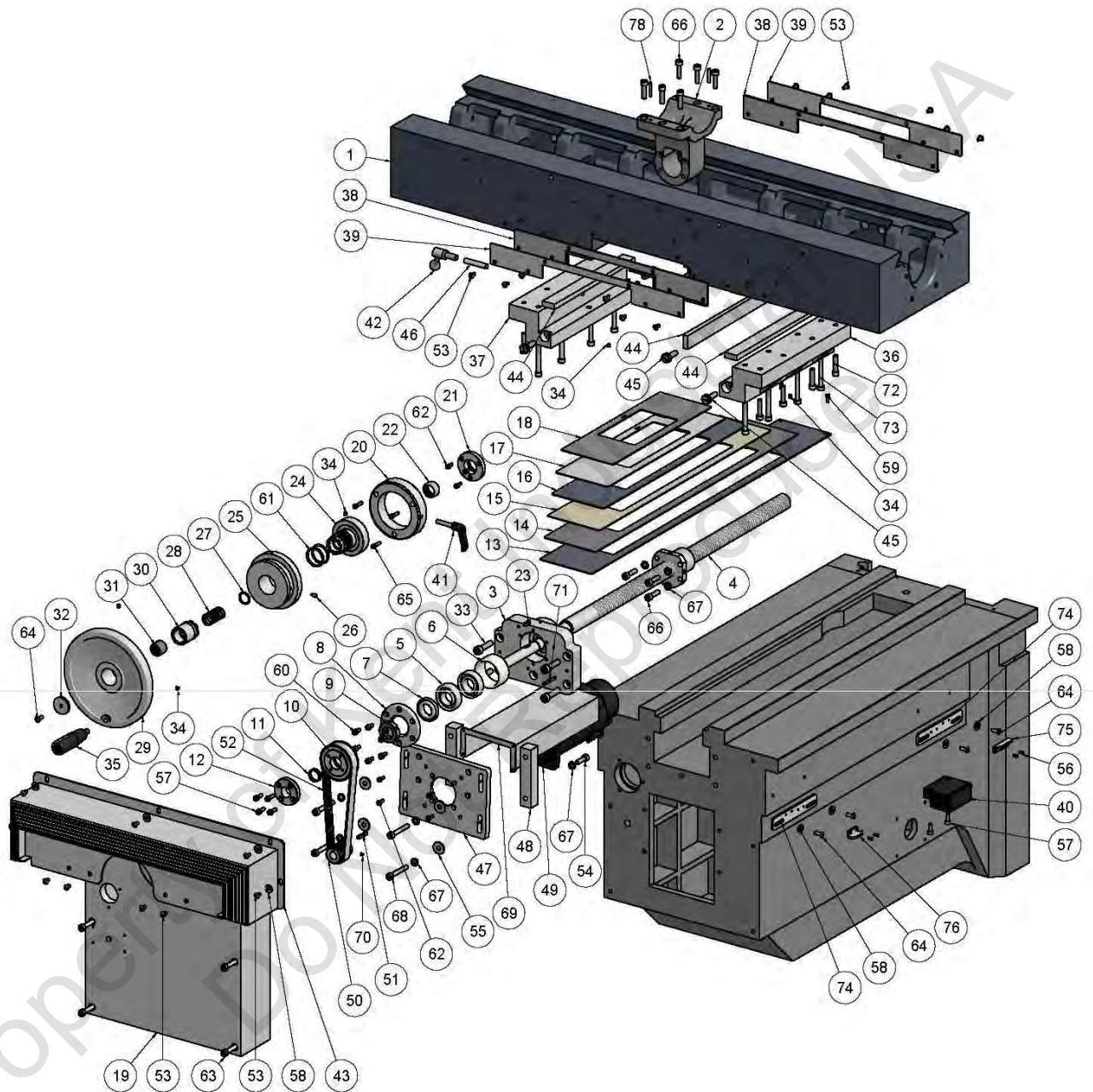
5AVK X-AXIS ASSEMBLY



5AVK X-AXIS ASSEMBLY

ITEM NO.	PASTS NO.	DECSRIPTION	ITEM NO.	PASTS NO.	DECSRIPTION
1	020-007205DB	Precision Ball Bearing (7205DB) (2Req)	41	4B-2036	Limit Switch Bracket
2	TF-2006B	Bearing Sleeve	42	022-00000001	Limit Switch (BNS-819-B02-L12-61-12)
3	TA-2013	Bearing Washer	43	5A-2008	Cover
4	TA-2011	Bearing Retainer Ring	44	5A-2003	Table End Cover
5	021-0000MR25	Lock Nut	45	5A-2021-1000	Table Foent Cover
6	5A-2013A	Timing Belt Pulley	46	TA-1024	Locking Handle
7	032-00022x26	Cone Ring Key (22x26)	47	3030.31	Lock Bolt Handle (2Req)
8	5B-2014A	Fled Block For Cone Ring Key	48	5A-3029	Table Lock Plunger (2Req)
9	020-006204ZZ	Bearing (6204ZZ#) (2Req)	49	TB-3026-1	Table/Saddle Right Gib
10	013-04040020	Key (4x4x20)	50	TB-3026	Table/Saddle Left Gib
11	020-0006305ZZ	Bearing (6305ZZ#)	51	3B-3009	Fixed Block For ADJ.Plate (2Req)
12	5A-2020	Bearing Retainer Ring	52	CDS-MM600T	Motor (CDS-MM600T-2.4NM)
13	035-0000AW05	Lock Washer (AW05)	53	5B-2018Z	Motor Timing Pulley
14	035-0000AN05	Lock Nut (AN05)	54	013-0505R030	Key (5x5x30)
15	5A-2024-M	Dial With 250 Graduations (mm)	55	023-5M070019	Timing Belt (5M-700-19)
15	5A-2024-I	Dial With 200 Graduations (inch)	56	002-M0600010	Hemisphere Head Cap Screw (M6x10))15Req)
16	6253	Set Screw	57	001-M0800025	Socket Head Cap Screw (M8x25) (4Req)
17	5K-6187-1	Washer	58	011-M0000008	Washer (M8) (8Req)
18	5A-2029	Spring	59	002-M0400008	Hemisphere Head Cap Screw (M4x8) (4Req)
19	5A-2031-A	Handwheel	60	001-M0600016	Socket Head Cap Screw (M6x15) (6Req)
20	5A-2030	Needle Bearing Housing	61	011-M0000006	Washer (M6) (8Req)
21	020-00HK2020	Needle Bearing (HK2020)	62	001-M1000030	Socket Head Cap Screw (M10x30) (9Req)
22	5A-2035	Washer	63	001-M0600012	Socket Head Cap Screw (M6x12) (11Req)
23	008-M0600006	Set Screw (M6x6) (3Req)	64	O024-030x3.55	O-Ring (30x3.55) (2Req)
24	5A-2001-1000	Table (330x1500)	65	001-M0500012	Socket Head Cap Screw (M5x12) (3Req)
25	3B-3023	Longitudinal Feed Bracket	66	002-M0600016	Hemisphere Head Cap Screw (M6x16) (5Req)
26	TB-2002S-M	X-Axis Ball Screw (mm)	67	001-M0500020	Socket Head Cap Screw (M5x20) (4Req)
26	TB-2002S-I	X-Axis Ball Screw (inch)	68	001-M0800030	Socket Head Cap Screw (M8x30) (16Req)
27	3B-2006A	Bearing Bracket	69	012-M0000008	Spring Washer (M8) (16Req)
28	5A-2005	Bevel Gear Housing	70	008-M0500005	Set Screw (M5x5) (6Req)
29	3B-2006-1	Motor Support	71	036-00000010	Grease Nipple (PT1/8")
30	5B-3006E	Motor Bracket	72	014-05000040	Roll Pin (5x40) (4Req)
31	3B-2016-1	Cover	73	002-M0800016	Hemisphere Head Cap Screw (M8x16) (4Req)
32	3B-2016	Timing Belt Pulley Cover	74	5A-2001-1	Strainer (2Req)
33	5A-2011-R	Bevel Gear (Clockwise)	75	5A-2043	Blocking (4Req)
34	5A-2011-L	Bevel Gear (Counter Clockwise)	76	4B-2031	Limit Dog Bracket (2Req)
35	4014-1	Washer	77	4B-2030-1	Limit Dog (2Req)
36	013-05050015	Key (5x5x15)	78	014-0500030	Roll Pin (5x30) (2Req)
37	5A-2016	Bevel Gear Shaft	79	伸縮護罩擋塊	
38	5A-2022	Dial Ring Base	80	001-M1000080	Socket Head Cap Screw (M10x80) (2Req)
39	5A-2026	Clutch Bushing	81	009-M0000010	Hex. Nut (M10) (4Req)
40	5A-2032	Handle	82	3B-2001-10	Protection Shield Rubber (6Req)

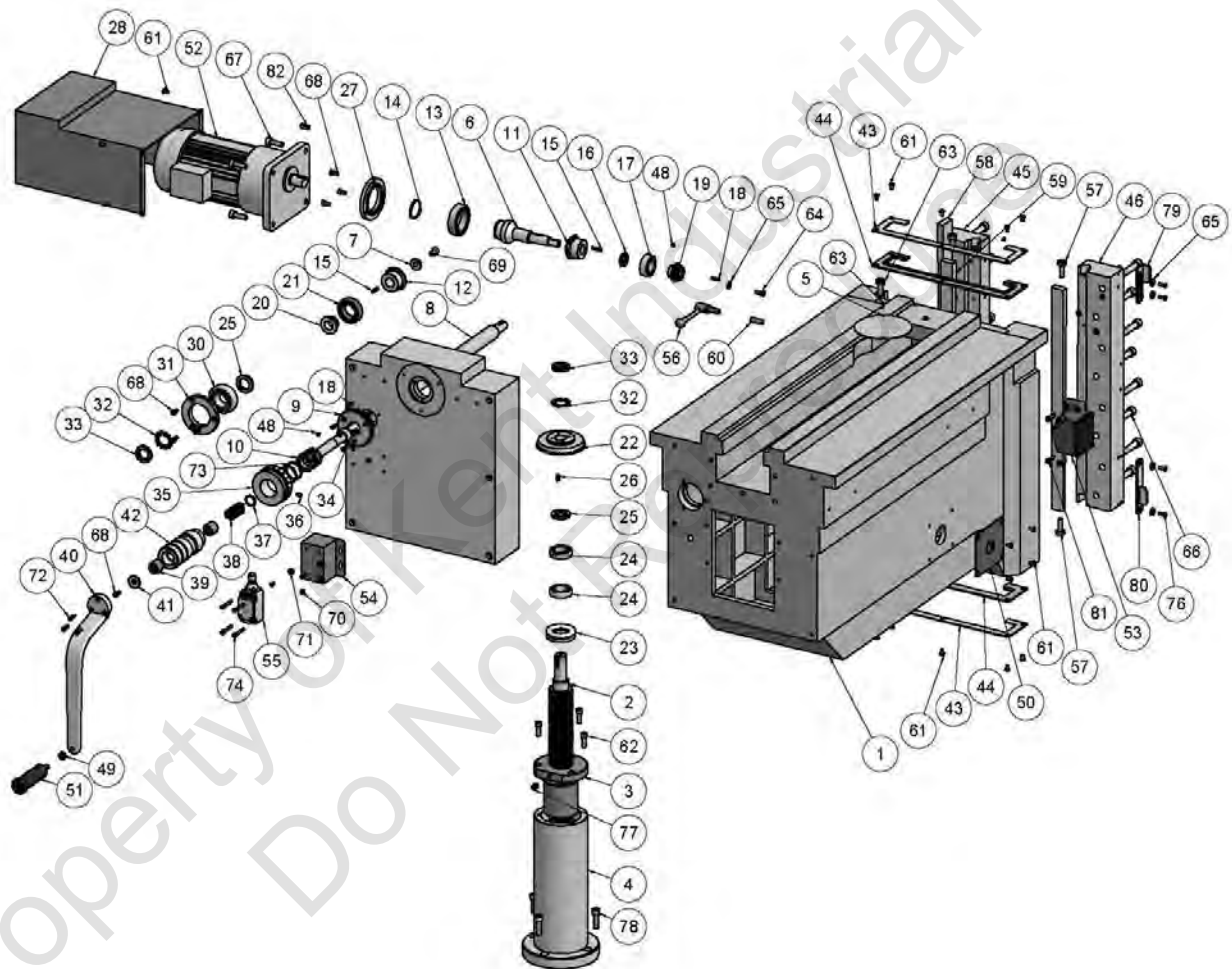
5AVK Y-AXIS ASSEMBLY



5AVK Y-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5A-3001-1000	Saddle	39	5A-3023	Wiper Holder (2Req)
2	3B-3022	Bracket For Y-Axis Ballscrew	40	022-00000001	Limit Switch BNS-819-B02-L12-61-12)
3	5A-3005A	Cross Feed Bearing Bracket	41	TA-1024	Lock Handle
4	5A-3002	Y-Axis Ballscrew	42	3030.31	Lock Bolt Handle
5	7205DB	Precision Bearing (7205DB) (2Req)	43	5A-3037	Telescope Cover
6	TF-2006B	Bearing Housing	44	TP-3042	Saddle/Knee Gib (3Req)
7	TA-2013	Washer	45	3028	Gib Adj-Screw (6Req)
8	TA-2011	Bearing Retainer Ring	46	5A-3032	Saddle Lock Plunger
9	021-0000MR25	Lock Nut	47	5A-3028E	Motor Bracket
10	5A-2013A	Timing Belt Pulley	48	5A-3020-1	Block (2Req)
11	032-00022x26	Cone Ring Key (22x26)	49	CDS-MM600T	Motor (CDS-MM600T-2.4NM
12	5B-2014A	Fled Block For Cone Ring Key	50	5B-2018Z	Timing Pulley
13	5A-3018	Chip Guards	51	013-0505R030	Key (5x5x30)
14	5A-3017	Chip Guards	52	023-5M056019	Timing Belt (5M-560-19)
15	5A-3018	Chip Guards	53	002-M0600010	Hemisphere Head Cap Screw (M6x10) (21Req)
16	5A-3019	Chip Guards	54	001-M0800025	Socket Head Cap Screw (M8x25) (4Req)
17	5A-3020	Chip Guards	55	011-M0000008	Washer (M8) (4Req)
18	5A-3020-1	Chip Guards	56	002-M04000008	Hemisphere Head Cap Screw (M4x8) (4Req)
19	5A-3004	CrossFeed Pulley Cover	57	001-M0600016	Socket Head Cap Screw (M6x16) (6Req)
20	5A-3011	Dial Base Ring	58	011-M0000006	Washer (M6) (9Req)
21	5A-3008	Needle Bearing Housing	59	001-M0400012	Socket Head Cap Screw (M4x12) (2Req)
22	020-0RNA4903	Needle Bearing (RNA4903)	60	001-M0600012	Socket Head Cap Screw (M6x12) (6Req)
23	013-05050020	Key (5x5x20)	61	024-030x3.55	O-Ring (30x3.55) (2Req)
24	5A-3012	Greasshaft Clutch Insert	62	001-M0500012	Socket Head Cap Screw (M5x12) (7Req)
25	5A-2024-M	Dial With 250 Graduations (mm)	63	001-M0800110	Socket Head Cap Screw (M8x110) (6Req)
25	5A-2024-I	Dial With 200 Graduations (Inch)	64	002-M0600016	Hemisphere Head Cap Screw (M6x16) (5Req)
26	6253	Set Screw	65	001-M0500020	Socket Head Cap Screw (M5x20) (3Req)
27	5K-6187-1	Washer	66	001-M0800030	Socket Head Cap Screw (M8x30) (10Req)
28	5A-2029	Spring	67	012-M0000008	Spring Washer (M8) (12Req)
29	5A-2031-A	Handwheel	68	001-M0800055	Socket Head Cap Screw (M8x55) (4Req)
30	5A-2030	Needle Bearing Housing	69	5B-3006E-1	Motor Cover
31	020-00HK2020	Needle Bearing (HK2020)	70	008-M0500005	Set Screw (M5x5) (4Req)
32	5A-2035	Washer	71	014-05000040	Roll Pin (5x40) (2Req)
33	001-M01000040	Socket Head Cap Screw (M10x40) (5Req)	72	001-M0800035	Socket Head Cap Screw (M8x35) (8Req)
34	008-M08000008	Set Screw (M8x8) (5Req)	73	001-M0800075	Socket Head Cap Screw (M8x75) (8Req)
35	5A-2032	Handle	74	4B-2031	Limit Dog Bracket (2Req)
36	TP-3044	Saddle/Knee Gib Support	75	4B-2030-1	Limit Dog
37	TP-3045	Saddle/Knee Gib Support	76	4B-2029	Limit Dog
38	5A-3022	Felt Wipers (2Req)	78	014-05000030	Roll Pin (5x30) (2Req)

5AVK Z-AXIS ASSEMBLY



5AVK Z-AXIS ASSEMBLY

ITEM NO.	PARTS NO.	DESCRIPTION	ITEM NO.	PARTS NO.	DESCRIPTION
1	5A-4001	Knee	41	5A-4002A-2	Washer
2	5A-4004-M	Elevating Screw (mm)	42	5A-4002A	Needle Bearing Housing
2	5A-4004-I	Elevating Screw (inch)	43	5A-4054	Wiper Holder (2Req)
3	5A-4005-M	Elevating Screw Nut (mm)	44	5A-4053	Knee Wiper (2Req)
3	5A-4005-I	Elevating Screw Nut (inch)	45	TA-4083	Knee/Column Gib Support
4	5A-4008	Pedestal	46	TA-4084	Knee/Column Gib Support
5	5A-4014	Bevel Gear Cover	47	024-000000P9	O-Ring (P9) (2Req)
6	5A-4022	Elevating Gear Shaft	48	008-M0600006	Set Screw (M6x6) (6Req)
7	5A-4027	Screw Washer	49	009-I00000030	Nut (3/8)
8	5A-4031	Elevating Shaft	50	5A-4001-1-29	Cover
9	5A-4032	Dial Base Ring	51	5A-4003	Handle
10	5A-4036	Greasshaft Clutch Insert	52	051-750W-1:5	Knee Up/Down Motor (750W)
11	5A-4025-R	Bevel Gear (Clockwise)	53	022-00000019	Limit Switch (BNS-819-D02-62-10)
12	5A-4025-L	Bevel Gear (Counter Clockwise)	54	5A-4048	Limit Switch Bracket
13	020-06008LLB	Bearing (6008LLB)	55	022-00000007	Limit Switch (WL-D3)
14	015-S0000040	Snap Ring (S40)	56	3030.31	Lock Bolt Handle (2Req)
15	013-04040025	Key (4x4x25) (2Req)	57	3028	Gib Adj Screw (6Req)
16	5A-4024	Washer	58	TA-4085	Knee/Column Gib
17	020-006204ZZ	Bearing (6204ZZ)	59	TA-4086	Knee/Column Gib (2Req)
18	013-04040020	Key (4x4x20) (2Req)	60	4H-4043	Knee Lock Plunger (2Req)
19	5A-4020	Bevel Gear	61	002-M0600010	Hemisphere Head Cap Screw (M6x10) (18Req)
20	5A-4030	Bearing Housing	62	001-M0800025	Socket Head Cap Screw (M8x25) (3Req)
21	020-006006ZZ	Bearing (6006ZZ)	63	002-M04000008	Hemisphere Head Cap Screw (M4x8) (2Req)
22	5A-4013	Bevel Gear	64	001-M0600016	Socket Head Cap Screw (M6x16)
23	020-00051207	Single Direction Thrust Ball Bearing (51207)	65	012-M00000006	Washer (M6)
24	020-006005ZZ	Bearing (6005ZZ) (2Req)	66	001-M12000065	Socket Head Cap Screw (M12x65) (16Req)
25	4022	Washer (2Req)	67	001-M1000030	Socket Head Cap Screw (M10x30) (4Req)
26	013-06060015	Key (6x6x15)	68	001-M0600012	Socket Head Cap Screw (M6x12) (7Req)
27	4H-4107	Bearing Retaining Ring	69	003-M0800020	Flat Head Cap Screw (M8x20)
28	5A-4046	Knee Up/Down Motor Cover	70	002-M0500008	Hemisphere Head Cap Screw (M5x8) (3Req)
30	020-006305ZZ	Bearing (6305ZZ)	71	011-M00000005	Washer (M5)
31	5A-2020	Bearing Retaining Ring	72	001-M0500016	Socket Head Cap Screw (M5x16) (3Req)
32	035-0000AW05	Lock Washer (AW05) (2Req)	73	024-030x3.55	O-Ring (30x3.55) (2Req)
33	035-0000AN05	Lock Nut (AN05) (2Req)	74	001-M0500035	Socket Head Cap Screw (M5x35) (4Req)
34	020-0RNA4903	Needle Bearing (RNA4903)	75	001-M0500012	Socket Head Cap Screw (M5x12) (3Req)
35	5A-4034-M	Dial With 100 Graduation	76	002-M0600016	Hemisphere Head Cap Screw (M6x16) (4Req)
35	5A-4034-I	Dial With 83 Graduation	77	036-00000010	Grease Nipple (PT1/8")
36	6253	Set Screw	78	001-M1000035	Socket Head Cap Screw (M10x35) (4Req)
37	5K-6187-1	Washer	79	4B -2031A	Limit Dog
38	5A-2029	Spring	80	4B -2031B	Limit Dog
39	020-00HK2020	Needle Bearing (HK2020) (2Req)	81	001-M0600020	Socket Head Cap Screw (M6x20)
40	5A-4002	Elevating Crank	82	013- 0707R019	Key (7x7x19)