MicroLux™

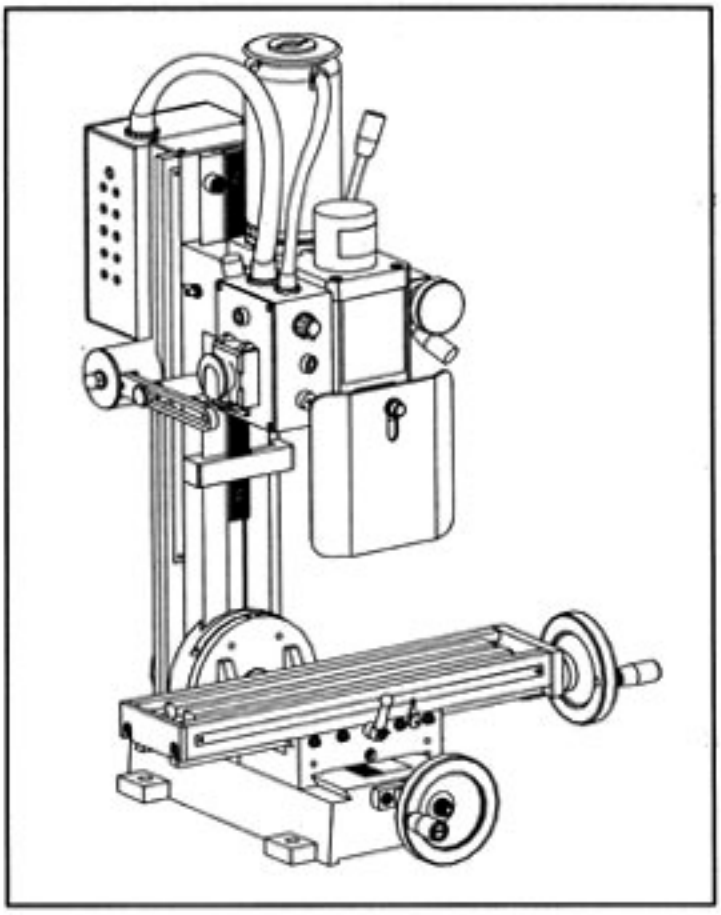
ALL-INCH
MINI DRILL/MILL
MACHINE

Micro-Mark

www.micromark.com

THE SMALL TOOL SPECIALISTS
Berkeley Heights, N.J. 07922

Instruction Manual



Read all instructions and warning before using this tool

WARNING!

Some dust created by power sanding, sawing, grinding, drilling and other construction activities contains chemicals known to the state of California to cause cancer, birth defects or other reproductive harm. Some examples of these chemicals are:

-Lead from lead-based paints,

-Crystalline silica from bricks and cement and other masonry product, and

-Arsenic and chromium from chemically-treated lumber.

Your risk from these exposures varies, depending on how often you do this type of work. To reduce your exposure to these chemicals; work in a well ventilated area, and work with approved safety equipment, such as those dust masks that are specially designed to filter out microscopic particles.

CONTENTS

Some Safety Features of this Machine

a) Purpose of this machine: This machine is designed for drilling, deep milling and face milling of small work pieces up to 300mm x 200mm x 200mm (about 12" x 11" x 11"). If the operator intends to use this machine on larger pieces, please contact your dealer before operation .

b) Before operating this machine:
- read these instructions completely.
- obtain some professional training on drilling and milling work.
- familiarize yourself with the design limits of this machine.
- take every safety precaution possible

c) Some important safety information.
- The noise level during operation is 70 to 75dB(A).
- The temperature range suitable for the operation & storage of this machine is -20 to +40 degrees C.

d) **Special Warning for this machine:**
- Warning ! If a power outage causes an interruption in machine operation, be sure to avoid accidental start up by turning off the ON-OFF switch until line power is restored.
- Warning ! Always wear approved eye protection during operation.

e) Correct handling of this machine.
- The net weight of this machine is 50 Kg (about 110 pounds). This machine would best be handled with the help of an appropriate lifting device.
- If the operator has to handle this machine without a lifting tool, be sure you can lift this weight comfortably without personal injury.

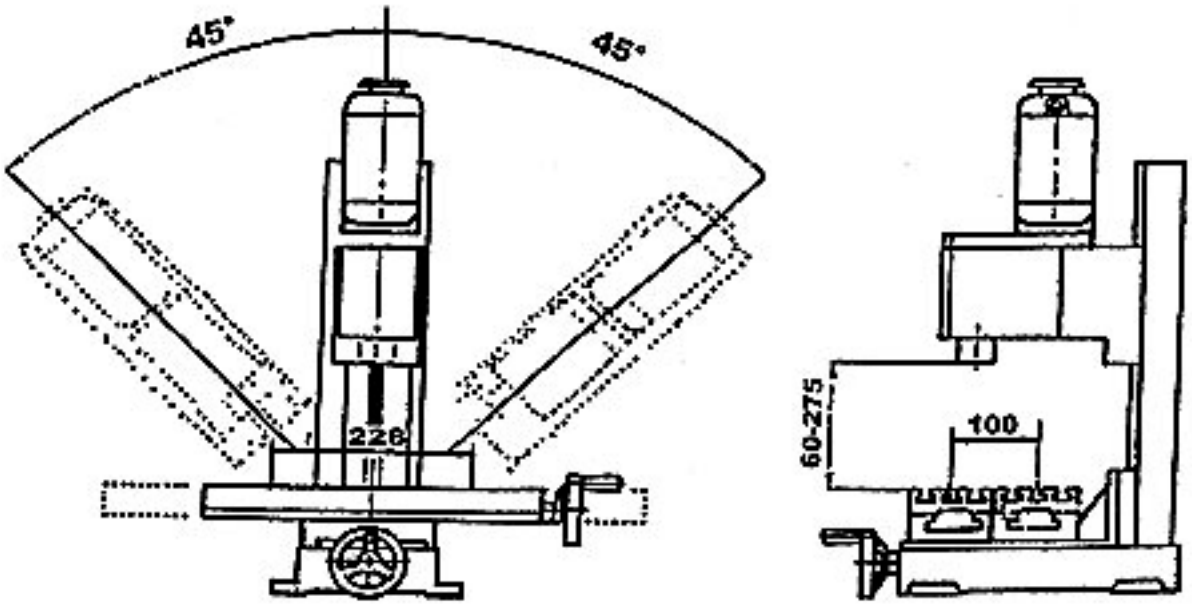
CHAPTER 1 SPECIFICATIONS

This is a mini vertical milling machine having multiple functions of either face milling or drilling.Many sizes and kinds of cutters are available. Be sure to purchase the correct cutter for the intended job.

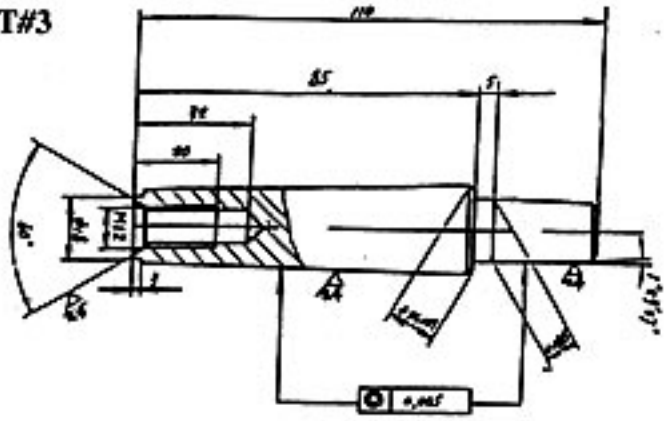
1.1 Machine Specifications

SPECIFICATIONS

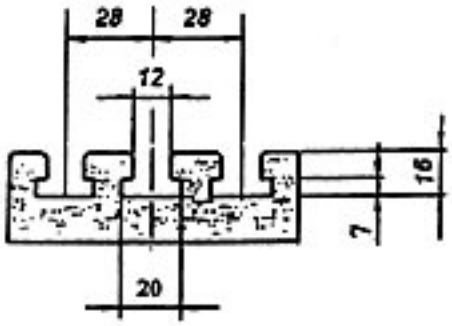
Max. table travel	9" (228mm)
Max. cross slide	4" (100mm)
Max. spindle travel	8 1/2" (215mm)
Headstock Tip Angle	-45° to +45°
Max. Power	350W
Spindle Speed	L: 0 ~ 1100 rpm H: 0 ~ 2500 rpm
Taper of hole in spindle	MT #3
Drilling Capacity	1/2"(13mm)
End Milling Capacity	1/2" (13mm)
Face Milling Capacity	1" (25mm)
Machine Weight	GW: 58kg NW: 50Kg (110 lbs.)
Shipping Dimension	560mm x 500mm x 740mm (LxWxH)



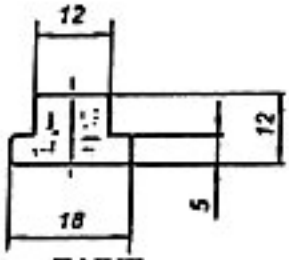
☐ **Taper Shank Specification-MT#3**



☐ **T-Slot Specification (mm)**



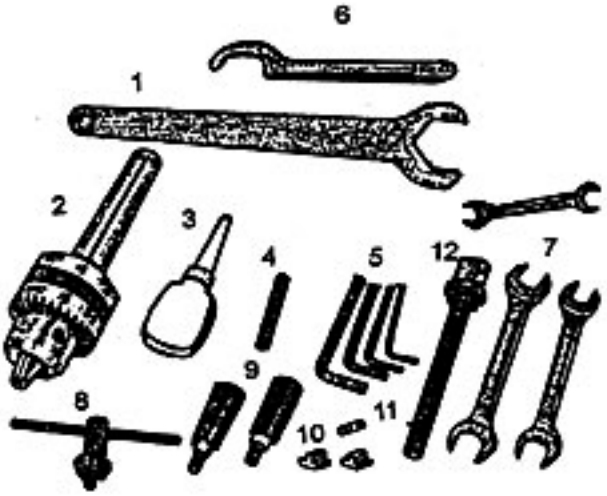
T-SLOT



T-NUT

1.2 Packing list of Accessories

1.	Large wrench S:36	1
2.	1/2" Drill chuck & taper shank	1
3.	Oil can	1
4.	Fixing Pin	1
5.	L Hex.Wrench S:3,4,5,6	4
6.	Socket head wrench D:45-52	1
7.	Double end wrench 8-10,14-17, 17-19	3
8.	Drill chuck holder	1
9.	Handle	2
10	T-Nut	2
11	Fuse 5A	1
12	Draw bar	1



CHAPTER 2 MACHINE INSTALLATION

2.1 Fundamental Machine Location

The machine should be bolted to a work bench to prevent it from sliding about and to maintain precise operation.

Selecting a Good Location

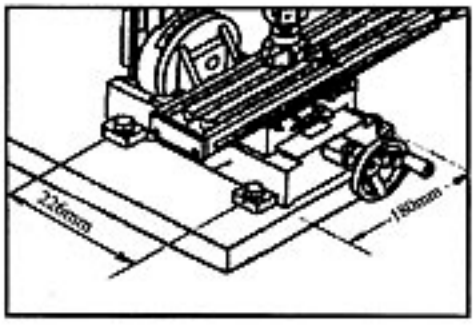
(1) The work bench should have a flat surface.

(2) Avoid a location with direct sunshine, heavy moisture or dust.

Mounting Instructions

(1) Drill 4 locating holes through the work bench to match the holes in the machine's base. (Be sure to provide adequate clearance for the movement of the Y-axis handwheel).

(2) Use metal shims to level the machine and attach to the work bench with four M10 (3/8") bolts, washers and nuts.



2.2 Check the Following Before Switching On the Machine:

To avoid personal injury, please assure the following:

1. Remove all tools used to mount the machine to your work bench.
2. Check that the line power matches the machine requirements (see label on front of machine).
3. Remove all stray objects in the vicinity of the machine.
4. Remove anti-rust coatings.
5. Check the tip angle of the column and tighten the column bolt.
6. Check the chuck, chuck holder and fixing pin on spindle to make sure they are freeto rotate.
7. Check the High-Low lever for proper setting.
8. Turn on the machine and verify the direction of spindle rotation (clockwise).
9. Check operation of handwheels and feed screws for proper operation.
10. During the test run, look for any faulty operation and make reparations before continuing with the machine's use.

CHAPTER 3 MAINTENANCE

3.1 Preventative Maintenance

3.1-1 Daily Maintenance

(1) Inspect each operating part to ensure sufficient lubrication.

(2) Check for loose or broken parts.

(3) Remove stray obstacles from around the machine in order to prevent machine damage and assure the safety of the operator.

(4) Please clean the machine clean after use and lubricate the moving parts to prevent rust.

(5) Watch for unusual operation; stop and repair immediately.

3.1-2 Seasonal Maintenance

(1) Use clean cotton cloth or soft gauze to clean each part of the machine.

(2) Confirm smooth motion of headstock and table.

(3) Check for proper spindle operation.

(4) Check for loose bolts and fasteners.

(5) Check for proper wiring connections.

3.1-3 Repairs and Maintenance

(1) Keep a record of all machine repairs.

(2) Do not perform any repairs while the machine is running.

(3) Inspect the machine regularly for proper operation; perform all repairs immediately.

(4) If you're unsure about your ability to make repairs, contact your dealer's service department for assistance.

3.2 Maintenance of Accessories

3.2-1 Maintenance of Cutter

(1) While installing a cutting tool, place a rag under it to avoid damaging the cutter or the table if the cutter accidentally falls.

(2) Store cutting tools in wood or plastic box to avoid damaging the cutting edges.

(3) Verify spindle is turning in the proper direction; otherwise, proper cutting action will be defeated. If unsure about direction of rotation, use slow speed or watch carefully as machine comes to a stop.

(4) Before starting machine, move the workpiece near the cutter, then start machine and move into poistion needed for milling.

(5) Keep cutting tools sharp. Dull cutters are hard on the machine, on the work piece, and destroy precision.

3.2-2 Tips for Using Accessories

(1) Keep taper shanks clean .

(2) Keep pairs of cutters and holders together whenever possible to increase operating confidence in subsequent use.

(3) Use the wrenches supplied with the machine to tighten the drawbars and chucks to avoid damage that can be caused by inappropriate tools.

(4) Use wrenches to tight bolts. Never use pliers or hammers on machine tools.

3.3 Lubrication

Be sure to keep all working parts properly lubricated:

☐ USE LUBRICATING OIL

(1) Base and saddle seat sliding faces.

(2) Saddle seat/working table sliding faces.

(3) Column seat and connecting strut sliding faces.

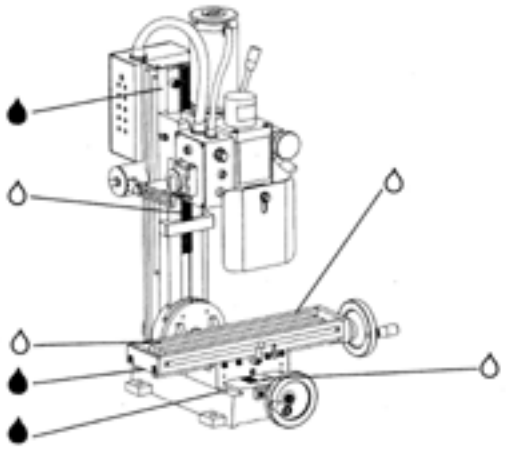
(4) Headstock and spindle box sliding faces.

☐ USE LUBRICATING GREASE

(1) X-Axis feed screw (saddle seat).

(2) Y-Axis feed screw (work table).

(3) Z-Axis feed gear rack (headstock).



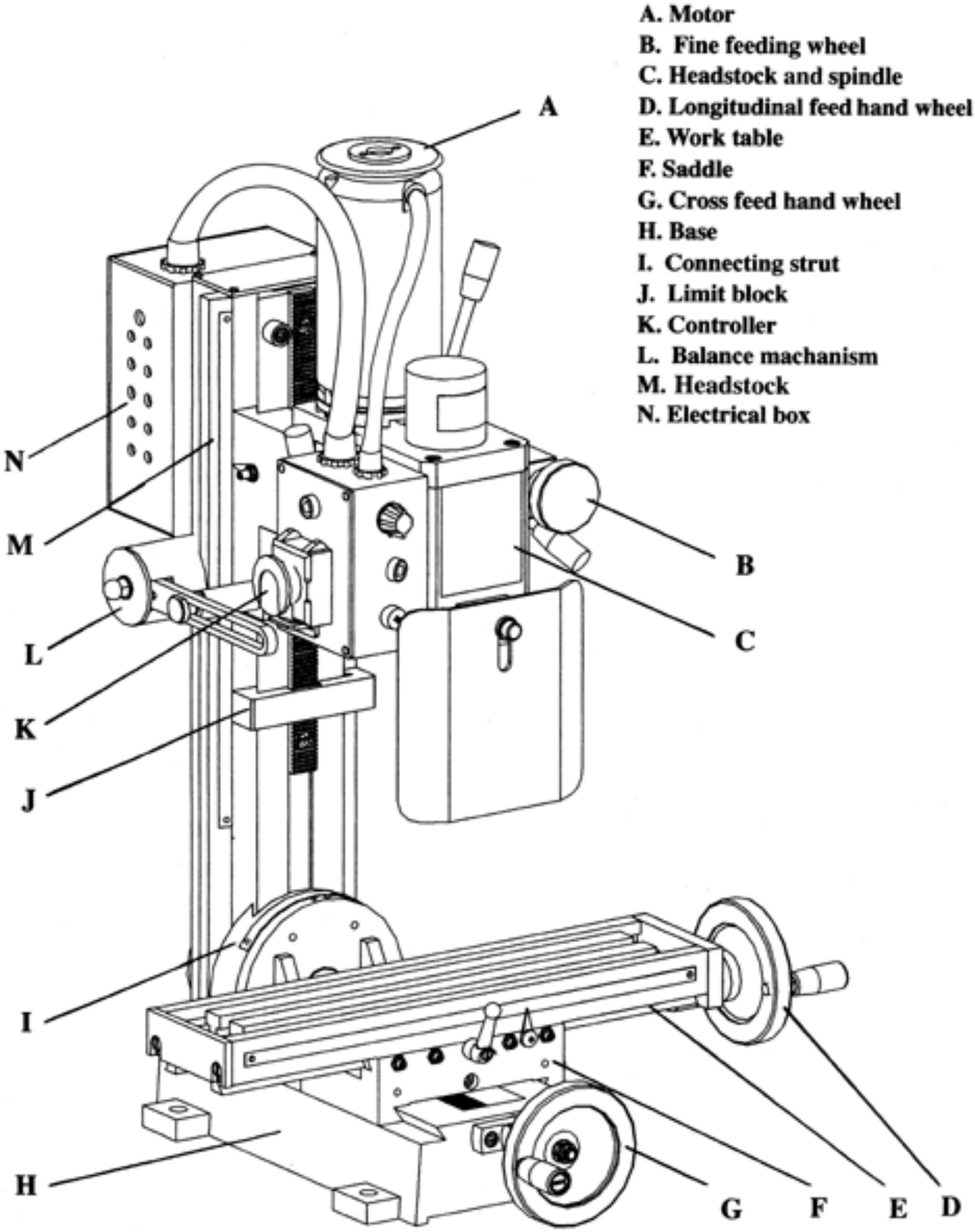
Lubricating grease

Lubricating oil

After use, clean the work table and coat lightly with oil to protect from rust.

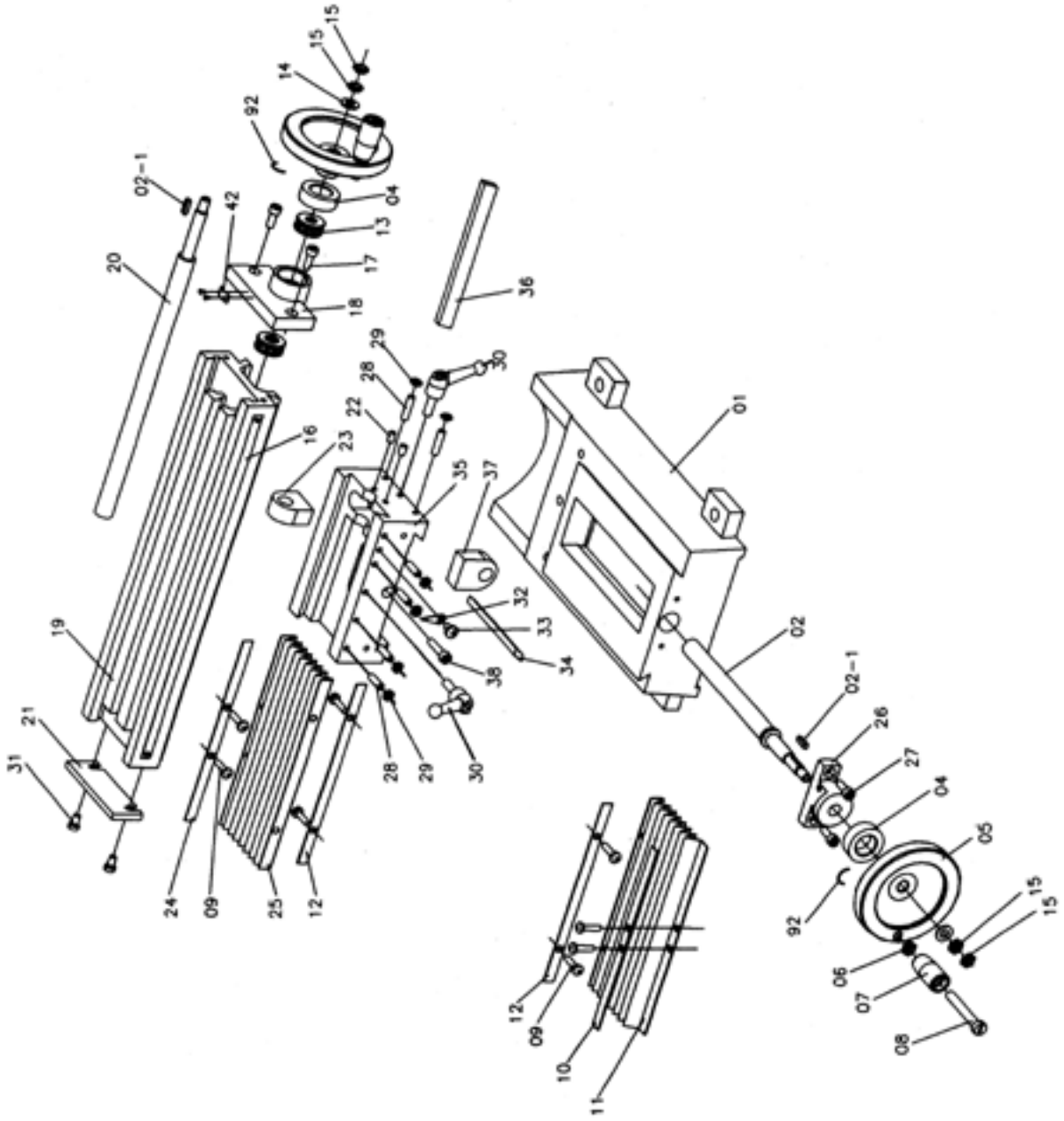
CHAPTER 4 MACHINE STRUCTURE

4.1 External Feature

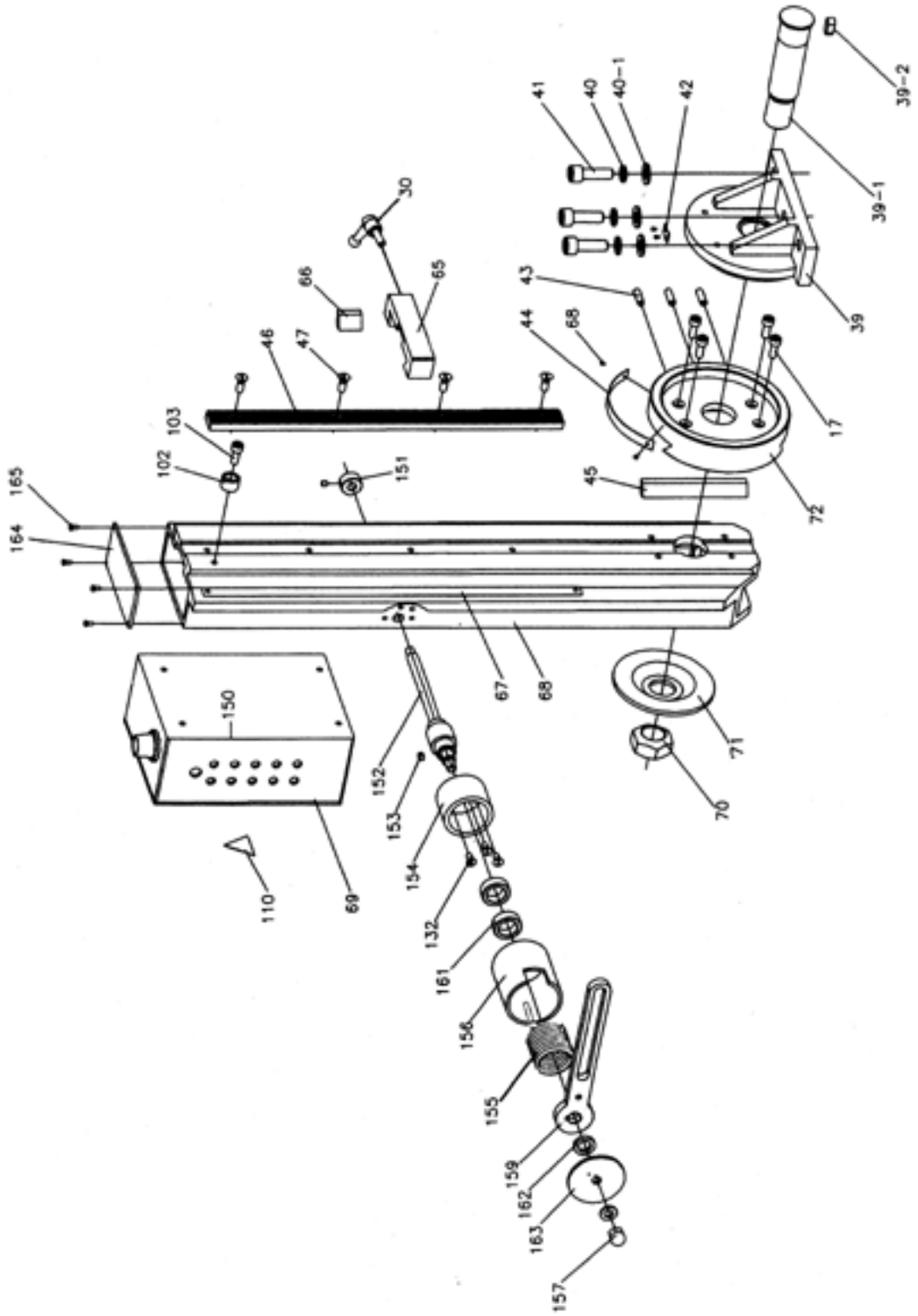


4.2 Assembly and Parts

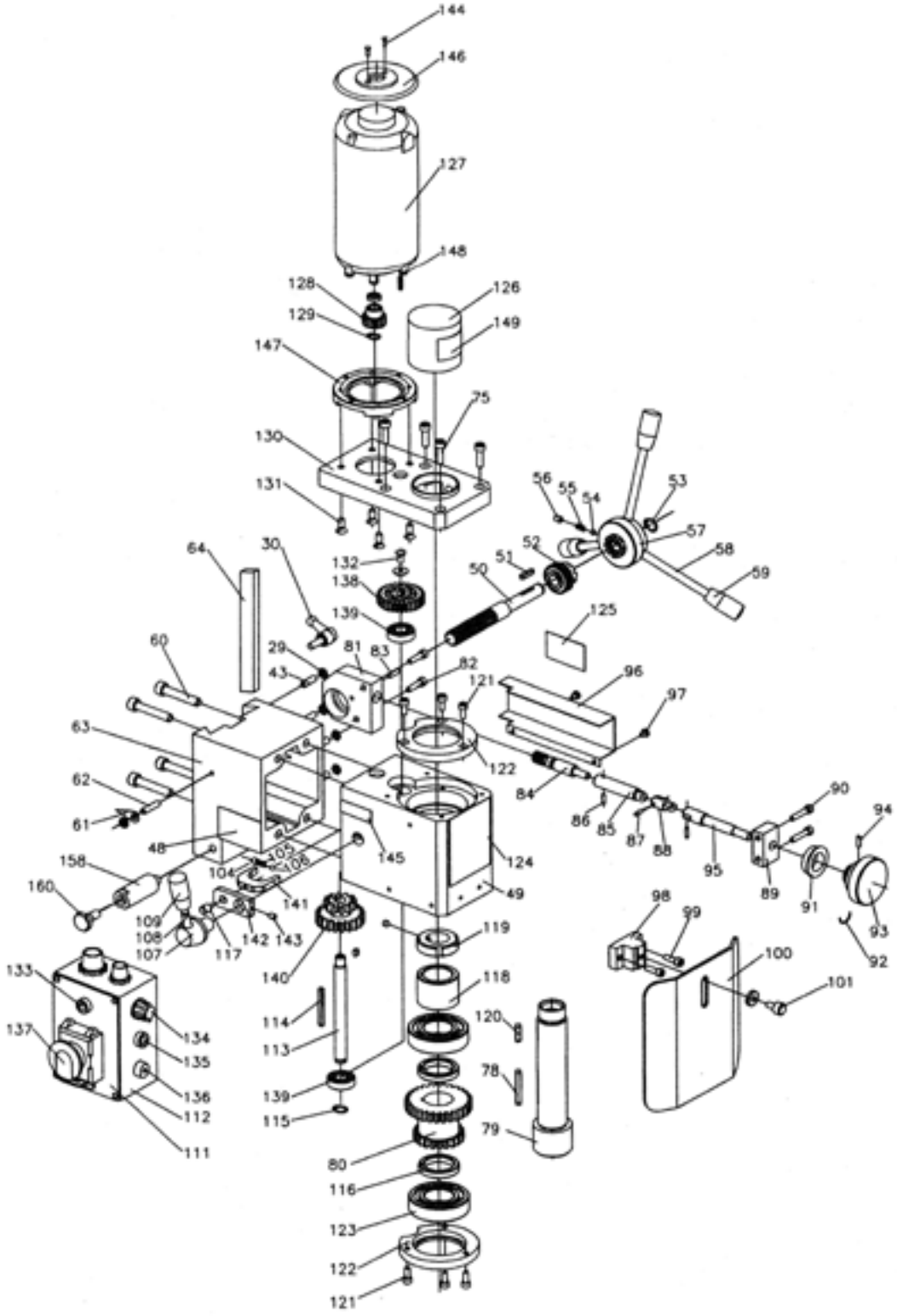
Longitudinal (Y) Axis
Cross (X)Axis



Vertial (Z)Axis



Spindle and Gear box



☐Parts List

Item No	Part Name	Q'ty	Item No	Part Name	Q'ty
1	Base	1	38	Cap screw M6 × 25	2
2	X-axis feeding screw	1	39	Fuselage seat	1
2-1	Key 4 × 16	2	39-1	Shaft	1
4	Dial	2	39-2	Key 8 × 12	1
5	Hand wheel	2	40	Spring washer 10	3
6	Nut M8	2	40-1	Washer 10	3
7	Knob	2	41	Cap screw M10 × 30	3
8	Screw M8 × 55	2	42	Guide finger	2
9	Cap screw M6 × 8	8	43	Set screw M6 × 22	7
10	Holding plate (1)	1	44	Ruler	1
11	Dust guard cover	1	45	Wedge	1
12	Holding plate (2)	2	46	Gear rack	1
13	Ball bearing 8200	2	47	Cap screw M6 × 12	4
14	Washer	2	48	Name plate	1
15	Nut M8	4	49	Spindle box	1
16	Y-axis ruler	1	50	Pinion	1
17	Cap screw M6 × 16	4	51	Key 4 × 25	1
18	Y-axis bearing seat	1	52	Bevel gear	1
19	Working table	1	53	Retaining ring 12	1
20	Y-axis feeding screw	1	54	Ball ø 5.0	1
21	End cover	1	55	Spring 0.8 × 0.8 × 10	1
22	Screw M6 × 10	2	56	Screw M6 × 8	1
23	Y-axis screw nut	1	57	Handle stock	1
24	Holding plate (3)	1	58	Operating lever	3
25	Dust guard cover	1	59	Lever cap	3
26	Screw seat	1	60	Cap screw M8 × 25	4
27	Cap screw M6 × 16	2	61	Guide finger	1
28	Set screw M6 × 22	6	62	Cap screw M6 × 25	1
29	Nut M6	13	63	Spindle box seat	1
30	Handle	3	64	Wedge	1
31	Screw M6 × 10	2	65	Limit block	1
32	Guide finger	1	66	Wedge	1
33	Screw M6 × 8	1	67	Ruler	1
34	X-axis wedge	1	68	Fuselage	1
35	Saddle	1	69	Electric box	1
36	Y-axis wedge	1	70	Lock nut M24	1
37	X-axis screw nut	1	71	Big washer	1

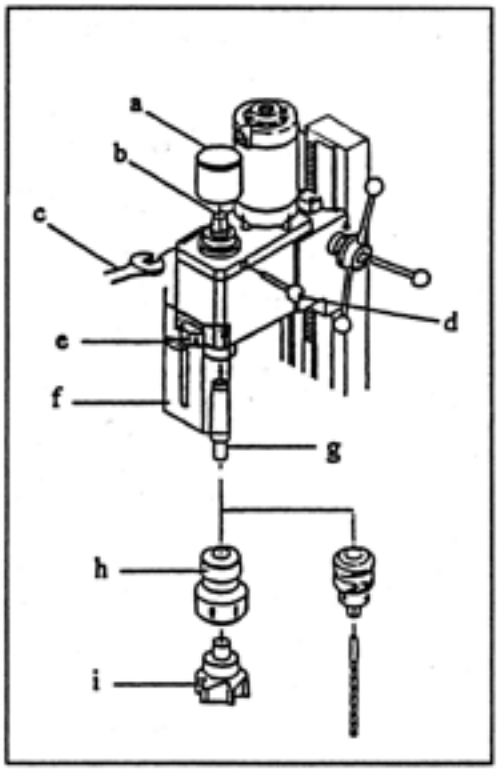
☐Parts List

Item No	Part Name	Q'ty	Item No	Part Name	Q'ty
72	Connecting strut	1	122	Bearing cover	2
78	Key 5 × 5 × 40	1	123	Ball bearing 80206	2
79	Spindle	1	124	Name plate	1
80	Transmission gear	1	125	Fine feeding label	1
81	Support block	1	126	Protecting cover	1
82	Screw M5 × 20	2	127	Motor	1
83	Pin 4 × 15	1	128	Motor gear	1
84	Worm	1	129	Intering ring 9.0	1
85	Sleeve	1	130	Motor seat	1
86	Pin 3 × 12	1	131	Flat screw M6 × 12	4
87	Pin 3 × 12	2	132	Round screw M5 × 8	4
88	Adjustable union	1	133	Yellow lamp	1
89	Bracket	1	134	Speed control knob	1
90	Screw M5 × 25	1	135	Green lamp	1
91	Dial	1	136	Fuse box	1
92	Spring steel 1.0	3	137	Emergency stop switch	1
93	Small hand wheel	1	138	Gear	1
94	Screw M5 × 16	1	139	Ball bearing 80101	2
95	Small shaft	1	140	Transmissiom gear	1
96	Cover	1	141	Bar	1
97	Screw M4 × 6	2	142	Linking board	1
98	Support of dust cover	1	143	Set screw M5 × 8	1
99	Screw M5 × 16	2	144	Self-tapping Screw ST2.9 × 8	2
100	Dust guard	1	145	H/L label	1
101	Clamp bolt M6 × 12	1	146	Motor cover	1
102	Upper end washer	1	147	Motor connecting flange	1
103	Upper end screw M6 × 16	1	148	Screw M6 × 10	4
104	Set screw M6 × 6	1	149	Warming lable	1
105	Spring 0.8 × 4.8 × 10	1	150	PC board	1
106	Ball ø 5.0	1	151	Lock sleeve	1
107	Handle seat	1	152	Rotor shaft	1
108	Double head bolt M8 × 70	1	153	Key 4 × 6	1
109	Knob	1	154	Spring support	1
110	Warning label	1	155	Torsion spring	1
111	Controller	1	156	Cover	1
112	Label on controller	1	157	Nut	1
113	Shaft (1)	1	158	Prop	1
114	Double roud hea d key 4 × 4 × 45	1	159	Supporting shank	1
115	Internal ring ø 12	1	160	Screw	1
116	Spacing ring	2	161	Washer	2
117	Small shaft	1	162	Internal ring 12	1
118	Spacing ring	1	163	Cover	1
119	Spindle nut	1	164	Top Cover	1
120	Double round head key 5 × 5 × 30	1	165	Screw M 3 × 6	4
121	Cap screw M5 × 8	6			

CHAPTER 5 MECHANISM ADJUSTMENT

5.1 Installation and Removal of Taper shank

☐ Installation



(1) Turn off the main power before you replace the cutter.
(2) Pull out the protective cover(a).
(3) Wipe the spindle sleeve and taper shank.
(4) Put the taper shank (g) into spindle sleeve. Cutter should be held with oil cloth to protect machine and fingers.
(5) Insert fixing Pin (d) right on spindle sleeve.
(6) Use 14mm open end wrench (c) to tighten (clockwise) spindle draw bar (b) for holding taper shank .
(7) Pull out the fixing pin!
(8) Install the protective cover (a).

☐ Removal

(1) Turn off the main power before you replace the cutter.
(2) Pull out the protective cover (a).
(3) Insert fixing pin (d) right on spindle sleeve.
(4) Use 14mm open end wrench (c) to loosen (counter clockwise) the spindle draw bar (b).
(5) Knock the taper shank (g) gently by plastic hammer to loosen it in spindle sleeve.
Then take off the taper shank (g).
(6) Cutter should be held with oil cloth to protect machine and fingers.
(7) Install the protective cover(a).

※ For your safety,

any adjustment on machine

should be made

with power disconnected. ※

5.2 Travel Adjustment

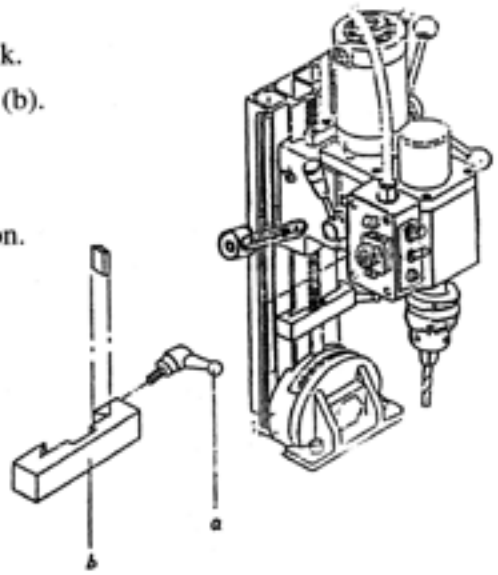
Use the limit block to control the travel of headstock.

(1) Loosen the handle (a) on side of the limit block (b).

(2) Adjust the limit block (b) into position.

(3) Tighten the handle.

(4) Use ruler on heastock handle to measure position.



5.3 Adjust Tip Angle of Headstock

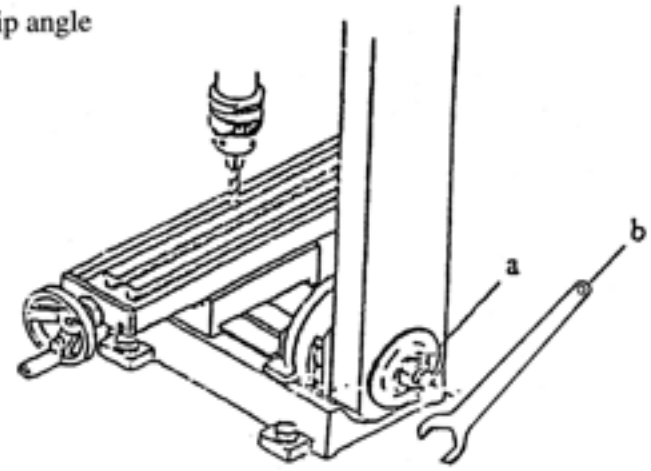
(1) Turn off the main power before adjusting.

(2) Hold the headstock firmly to avoid damaging the machine or injury to the operator.

(3) Loosen the lock nut (a) with large wrench (b).

(4) Adjust the headstock to the desired tip angle (45° maximum right or left)

(5) Tighten lock nut with large wrench.



5.4 Gib Adjustment

After a long or hard use, any "play" noted in the table mechanism or headstock column may be taken up by adjusting the "gibs" (wedges) located in the slide mechanisms. Periodic checking and adjusting of the gibs will assure continued machining precision and avoid chatter.

The following items may need adjustment

1. Base and saddle seat sliding faces.
2. Saddle seat and working table sliding facs.
3. Headstock seat and connecting strut sliding faces.
4. Heastock and spindle box slide face.

Note: Leave the spindle box at the highest position when machine is idle.

Adjustment procedure

1. Loosen the lock nuts.
2. Back off all set screws.
3. Tighten each set screw carefully until gentle contact is made. Work from the center screw alternately outward. Assure slides move smoothly without play and without binding.
4. Tighten the lock nuts uniformly (hold the set screw with the provided hex key to prevent unwanted rotation of the screw) and again check for smooth, play-free operation.

CHAPTER 6 OPERATING NOTES

6.1 Method of Operation

☐ Drilling or Deep Milling

1. Follow instructions in section 5 to install cutters. Be sure cutters are held tightly.
2. Select appropriate speed level .**(NOTE: Change the HIGH/LOW speed lever only when machine is not running)**
3. Use vise or hold down clamps to attach workpiece to the milling table.
4. Adjust work table (Longitudinal AxisY) and Saddle seat (Cross Axis X) in position.
5. Adjust the column limit block to proper position.
6. Put adjusting tools in order and remove all obstacles which surround the machine.
7. Turn on the main power. Adjust appropriate spindle speed for drilling or deep milling.
8. Refer to the scale on headstock to determine drilling or milling depth.
9. When completing the operation, turn off power and move the spindle to full up position.
10. Clean the machine.

☐ Face Milling

1. Follow instructions in section 5 to install cutters. Be sure cutters are held tightly.
2. Select appropriate speed level .**(NOTE: Change the HIGH/LOW speed lever only when machine is not running)**
3. Use vise or hold down clamps to attach workpiece to the milling table.
4. Adjust working table (Longitudinal Axis Y) and Saddle seat (Cross Axis X) in position.
5. Adjust the column limit block to proper position.
6. Arrange all tools in proper place.
7. Turn on power. Turn hand wheel of work table (Y-axis) and saddle seat (X-axis) to do face milling.
8. When completing the operation, turn off power and move the spindle to full up position.
9. Clean the machine.

☐ Drilling or Milling Speed

Before any operation, set the spindle to a correct running speed.
The operating speed range is 0 to 2500 rpm. Generally, you can use high speed for soft materials or small holes. Use slow speed for hard materials or large holes.

6.2 Operation Checklist

Please check the following items as you operate in order to ensure proper operation and safety.

☐ Inspection before turn on

1. Before turning on the power, check that the chuck is sufficently tightened.
2. Check for loose machine parts .
3. Check the speed adjustment lever for correct position.
4. Check that the workpiece is held securely in the vise or clamp.
5. Clean and remove any obstacles around the machine.

☐ During Operation

1. Do not operate the machine while under the influence of alcoholic beverages.
2. Do not wear gloves or a necktie while operating the machine.
3. Use only the appropriate cutting tools..
4. The machine will shake under the following conditions:
   a. Excessive depth of cut.
   b. Excessive speed of feed.
   c. Excessive spindle speed.
   d. Loose vice, work piece clamps, or gibs.
   e. Machine not sufficiently secured to work bench.

CHAPTER 7 GENERAL SAFETY INSTRUCTIONS

Warning! When using electrically powered tools, basic safety precautions should always be followed to reduce the risk of fire, electric shock and personal injury. Read and save all the following instructions before operating this product:

1. Keep work area clean.
   -Cluttered areas and benches invite injuries.
2. Consider work area environment.
   -Do not expose power tool to rain. Do not use power tools in damp or wet locations. Keep work area well lit. Do not use power tools where there is risk of fire or explosion.
3. Guard against electric shock.
   - Avoid bodily contact with earthed or grounded surfaces (e.g. pipes, radiators, ranges, refrigerators).
4. Keep children away.
   - Do not let visitors touch the tool or power cord. All visitors should be kept away from work area.
5. Store idle tools.
   - When not in use, tools should be stored in a dry, high or locked up place, out of reach of children.
6. Do not force the tools.
   - It will do the job better and safer at the rate for which it was intended.
7. Use the right tool.
   - Do not force small tools or attachments to do the job of a heavy duty tool. Do not use tools for purposes not intended; for example: do not use circular saws to cut three limbs or logs.
8. Dress properly.
   - Do not wear loose clothing or jewelry; they can be caught in moving parts. Rubber gloves and non-skid footwear are recommended when working outdoors. Wear protectivehair covering to contain long hair.
9. Use safety glasses.
   -Also use face or dust mask if the cutting operation is dusty.
10. Connect dust extraction equipment.
    - If devices are provided for the collection of dust, ensure these are connected and properly used.
11. Do not abuse the cord.
    - Never carry the tool by cord or yank it to disconnect it from the socket. Keep the cord away from heat, oil and sharp edges.
12. Secure work
    -Use clamp or a vice to hold the work. It is better than using your hand and it frees both hands to operate the tool.
13. Do not overreach.
    - Keep proper footing and balance at all times.

14. Maintain tools with care.

    - Keep cutting tools sharp and clean for better and safer performance. Follow instructions for lubrication and changing accessories. Inspect tool cord periodically and, if damaged, have it repaired by an authorized service facility. Inspect extension cords periodically and replace if damaged. Keep handles dry, clean and free from oil and grease.

15. Disconnect tools.

    - When not in use, before servicing, and when changing accessories such as blades, bits and cutters.

16. Remove adjusting keys and wrenches.

    - Always check to see that keys and adjusting wrenches are removed from the tool before turning it on.

17. Avoid unintentional starting.

    - Do not carry a plugged-in tool with a finger on the switch. Ensure switch is off when plugging in.

18. Use outdoor extension cords.

    - When tool is used outdoors, use only extension cords intended for outdoor use.

19. Stay alert.

    - Watch what you are doing. Use common sense. Do not operate tool when you are tired.

20. Check damaged parts.

    - Before further use of the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function. Check for alignment of moving parts, free running of moving parts, breakage of parts, mounting and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced by an authorized service center unless otherwise indicated in this instruction manual. Have defective switches replaced by an authorized service facility. Do not use the tool if the switch does not turn it on and off properly.

21. Warning.

    - Using any accessory or attachment other than those recommended in this instruction manual may present a risk of personal injury.

22. Have this tool repaired by a qualified person.

    - This electric tool is in accordance with the relevant safety requirements. Repairs should be carried out only by qualified persons using original replacement parts, otherwise this may result in considerable danger to the user.

CHAPTER 8 POWER CONNECTIONS & ELECTRICITY

8.1 Power Connection/Disconnection & Operation

1. The connection, disconnection, and grounding is carried out through the plug, equipped on the machine. For the safety reasons, do not change this plug into any other type under any circumstances.
2. For the protection of control device, we recommend the operator to supply a fuse with a current rating and the total length between fuse and connection terminal according to the following **"EXTENSION LEAD CHART"**

EXTENSION LEAD CHART

Ampere rating	3A	6A	10A	13A
Extension Cable Length	Wire Size mm^2			
7.5m	0.75	0.75	1.0	1.25
15m	0.75	0.75	1.0	1.5
22.5m	0.75	0.75	1.0	1.5
30m	0.75	0.75	1.25	1.5
45.5m	0.75	1.25	1.5	2.5

3. The exact power source is 110V ,single phase, 60Hz.
4. Make sure the Emergency Stop switch(A) (left beside the electrical box) is in **"OFF"** position before plugging in cord.
5. Disconnect tools from power source with plug before servicing and when changing accessories such as guard.

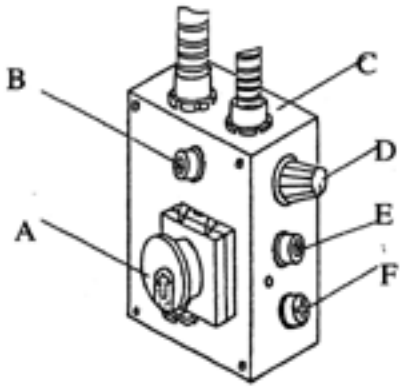
8.2 Operation

1. INITIAL START

Taking all precautions stated,set the HIGH-LOW range lever to Low.Insert the electric plug into the socket.

Release the Emergency Stop Switch(A) by pushing down on the red knob slightly and pushing it up ,as indicated by the arrow on the top of the red knob,the green lamp (E) lights.

Switch on the machine by GENTLY turining the Variable Speed control knob (D),



A. Emergency stop switch B. Yellow lamp
C. Electric control box D. Variable speed control knob
E. Green lamp F. Fuse box

clockwise. A click will be heard as motor power is turned on, but the spindle will not rotate until the knob is turned clockwise a little further. Speed will increase progressively as the knob is turned.

Run for a total of 5 minutes...during which time, gradually increase spindle speed to its maximum. Run for at least 2 minutes at this speed before stopping the machine and disconnecting from the main supply line.

Check that all components are still secure and working freely and correctly.
Check also to ensure the mounting is secure.

Repeat the procedure at HIGH range setting.

CAUTION: NEVER attempt to change from HIGH to LOW range when the machine is running.

2. STARTING UNDER NORMAL CONDITIONS

1) Take all necessary precautions previously stated, and ensure the workpiece is held firmly .
2) Set the Speed range control lever to HIGH or LOW as required.
3) Set the Motor power switch (E) to "I" position.
4) Proceed to start the machine as described in Section 1 above.
5) If the machine is to be left unattended, turn the Motor power switch (E) to "O" position, then disconnect from the main supply line (unplug it).

ATTENTION: The power supply system of this machine has an automatic overload protection device. If the feed is too fast, or drilling is too deep, the system will stop working, and a yellow lamp (B) will light.
Just turn off the Variable Speed control knob (D) and then turn on again.
The system will work again and the yellow lamp will go off automatically.

Electrical Circuit Diagram

105V~115V