MicroLux®

#84630

R8 Mill Instruction Manual

Please read and understand all instructions before using this tool.

Note: These instructions will show you how to assemble this machine,
work its controls and maintain it for long life.
It is not intended as an educational course on how to make parts using a mill.

Made in China for

Micro-Mark®

340 Snyder Avenue
Berkeley Heights, NJ 07922

For technical assistance, call 908-464-1094 Monday thru Friday, 1pm to 5pm ET

MM041504

CONTENTS

WARNING!

Some dust created by power sanding, sawing, grinding, drilling and other construction activities can contain 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 vary, 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 dust masks that are specially designed to filter out microscopic particles.

SAFETY INSTRUCTIONS

This machine is electrically powered.
To avoid electric shock:

- Do not use it in or near water.
- Make sure electrical plug is securely plugged into wall outlet.
- Make sure plug grounding pin is in place and socket is properly grounded.

For personal safety:

- Avoid loose-fitting clothing that can catch in the machine's rotating parts.
- Remove chuck keys and wrenches before turning on the machine.
- Make sure all tooling is securely attached to the machine and rotates properly.
- Make sure all workpieces are securely clamped to the table and/or tightly held in a vise which, in turn, is properly mounted.
- Make sure the machine is bolted securely to your workbench.

For machine longevity:

- Make sure all moving parts are lubricated with machine oil or grease.
- Make sure the drive belt tension is tight enough to avoid slipping under heavy load, but not so tight as to overload the motor and spindle bearings.
- Keep the machine clean.

Use common sense:

- Do not use the machine for other than its intended purpose.
- Do not use the machine to do jobs that it was not designed to do.
- Do not use the machine to do work in excess of its rated capacity.

Be careful!

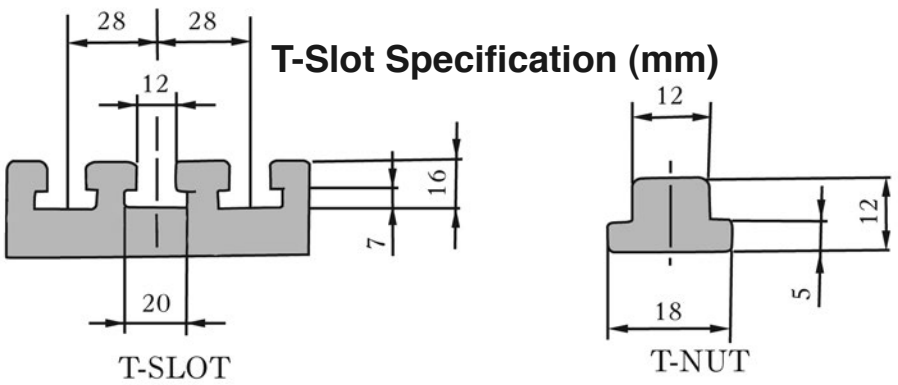
Make sure you unplug the machine before changing chucks, collets, cutters or any other tooling, or before performing any maintenance work.

After changing any tooling, rotate the spindle by hand to make sure everything is mounted correctly and nothing can fly off the machine when it is powered up.

AND, MOST IMPORTANTLY, ALWAYS WEAR SAFETY GLASSES

The electrical power/safety system is protected by a large red switch located on the right side of the control box. To unlock the safety shut-off switch, slide the big red cap toward the front of the machine to undo the latch. Then swing open the door a bit. If the speed control is all the way counterclockwise (in the clicked-off position), the green panel light will light, indicating you are ready to turn up the speed.

T-Slot Specification (mm)



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").

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 Warnings for this machine:

- If a power outage causes an interruption in machine operation, be sure to avoid accidental start-up by closing the emergency button and rotating RPM dial to OFF until line power is restored.
- Always wear approved eye protection during operation.

e) Correct handling of this machine:

- The net weight of this machine is about 110 pounds (50 Kg). 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

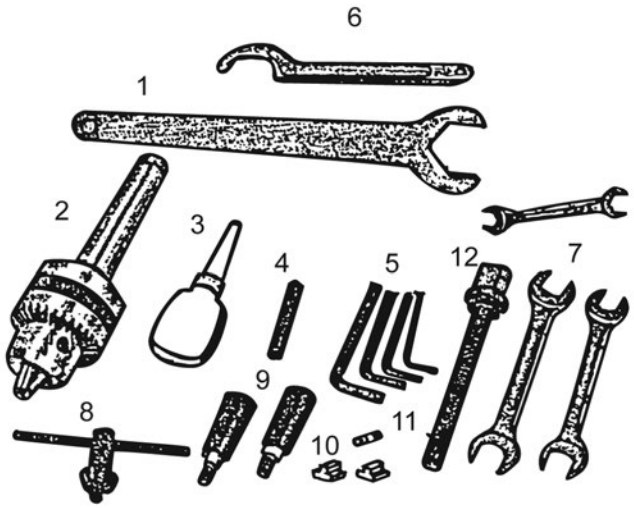
This is a mini vertical milling machine having multiple functions of either face milling or drilling. Many sizes and kinds of cutters are available. Be sure to purchase the correct cutter for the intended job.

1.1 Machine Specifications

Max. table travel	8.5"
Max. cross slide	4"
Max. spindle travel	7"
Headstock tip angle	–45˚ to +45˚
Max. power	500 watts
Spindle speed	0–2500 rpm
Taper of hole in spindle	R8
Drilling capacity	1/2"
End milling capacity	1/2"
Face milling capacity	1"
Machine weight	GW: 58kg NW: 50 Kg (110 lbs.)
Shipping dimension	560mm x 500mm x 740mm (L x W x H)

1.2 Packing list of Accessories

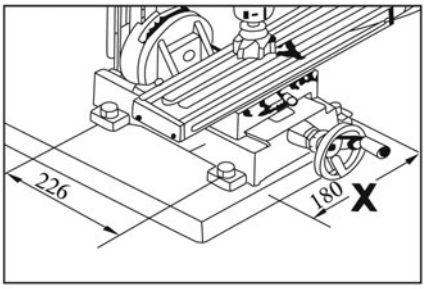
1. Large wrench S:36	1
2. 1/2" Drill chuck & R8 shank	1
3. Oil can	1
4. Fixing pin	1
5. L hex wrench S:3,4,5,6	4
6. Spanner wrench D:45-52	1
7. Double end wrench 8-10,14-17, 17-19	3
8. Drill chuck holder	1
9. Handle	2
10. T-nut	2
11. Fuse 5A	1
12. Drawbar	1



CHAPTER 2 · MACHINE INSTALLATION

2.1 Fundamental Machine Location

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



Selecting a Good Location

(1) The workbench 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 workbench 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 workbench with appropriate size 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 workbench.
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. Make sure chuck, R8 shank and drawbar are mounted correctly and spin freely.
7. Set speed (RPM) knob to OFF (fully counter-clockwise).
8. Check operation of handwheels and feed screws for proper operation.
9. During the test run, look for any faulty operation and make reparations before continuing with the machine's use.

2.3 Starting and Running the Machine

Plug your machine to line power, taking all precautions previously stated and insuring that the speed control knob is full counter-clockwise, setting it to OFF (you will NOT hear an audible click). You may now unlock the Emergency Off Button by pressing in the safety lock on the left side of the switch and then lifting up.

You will find a green (ON) button and a red (OFF) button. Press the green button to activate/power the panel. The green light will illuminate.

If all is still clear, slowly rotate the knob (clockwise) to begin the rotation of the spindle drive system.

CAUTION:

Always turn the speed control to the OFF position before starting the mill. Starting the mill with the speed control set to a higher speed can damage the speed control circuit board.

Run the machine for a total of 5 minutes, and during this time, gradually increase the spindle speed to its maximum. Continue to run the machine at this speed for at least 2 minutes, then shut it off. Disconnect the plug from the wall outlet. Check that all components are still secure and working freely and correctly. Also check to ensure the mountings are secure.

2.4 Machine Overload:

If you exceed the machine's capability, it is possible for the machine to shut down and go into overload during a milling/drilling operation. Should this happen, the yellow fault light will illuminate. If your mill is equipped with the optional digital readout, it will display "ERR."

IMPORTANT! First, rotate the RPM knob to OFF (counter-clockwise). You will now notice that the yellow overload light has gone out. While it is possible to start spinning again simply by rotating the RPM knob, at this point we advise you to push down on the emergency stop button and investigate the cause of the overload. Once you have cleared the situation, then, and only then, should you begin the startup sequence in this section.

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) 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 – if viewed from below, the chuck should spin counter-clockwise; 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 position 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 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.

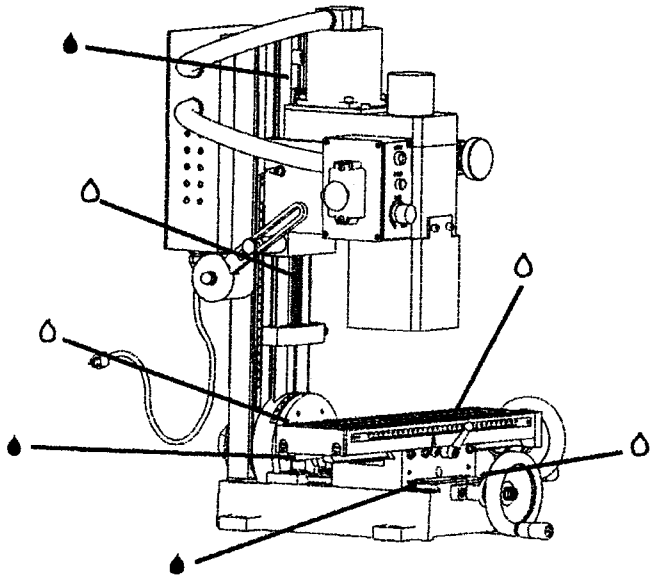
(4) Use wrenches to tighten bolts. Never use pliers or hammers on machine tools.

3.3 Lubrication

Be sure to keep all working parts properly lubricated:

Lubricating grease

Lubricating oil



USE LUBRICATING GREASE

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

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

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

USE LUBRICATING OIL

(1) Base and saddle seat sliding faces.

(2) Saddle seat/working table sliding faces.

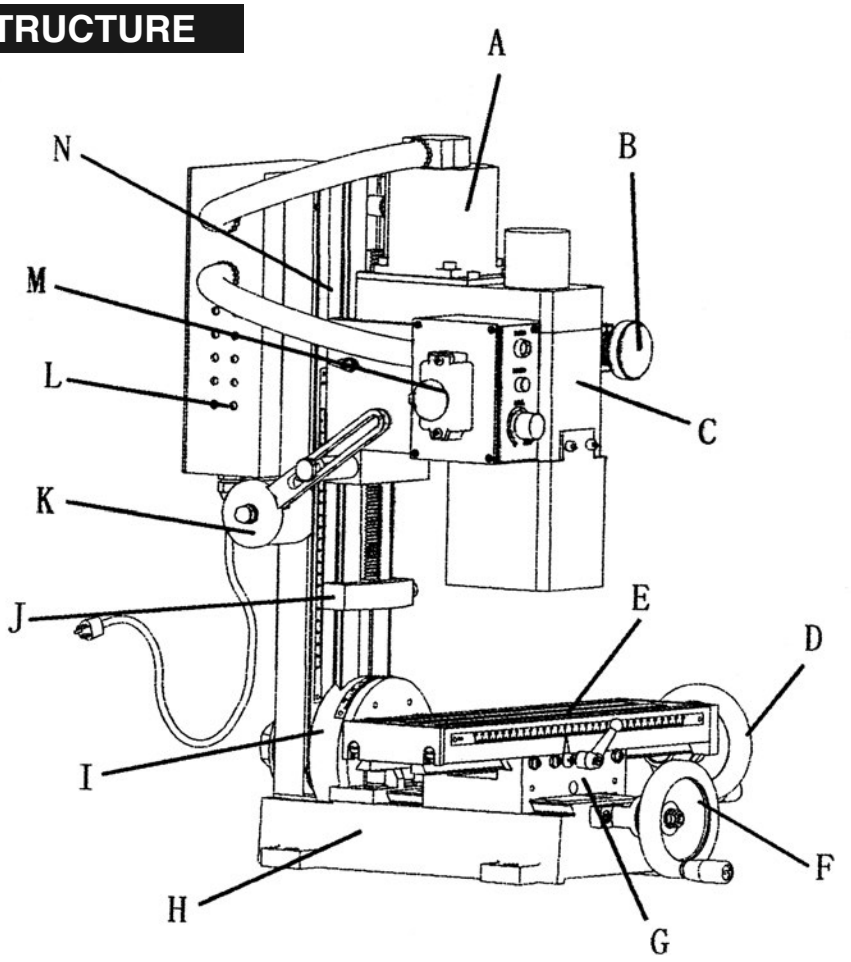
(3) Column seat and connecting strut sliding faces.

(4) Headstock and spindle box sliding faces.

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

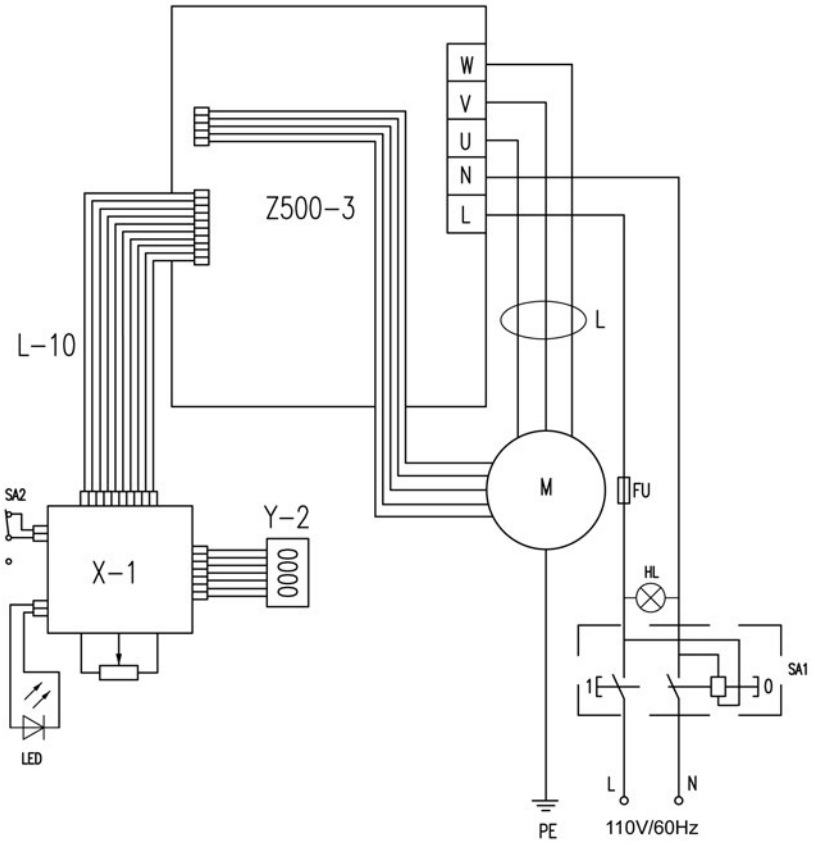
CHAPTER 4 • MACHINE STRUCTURE

4.1 External Features

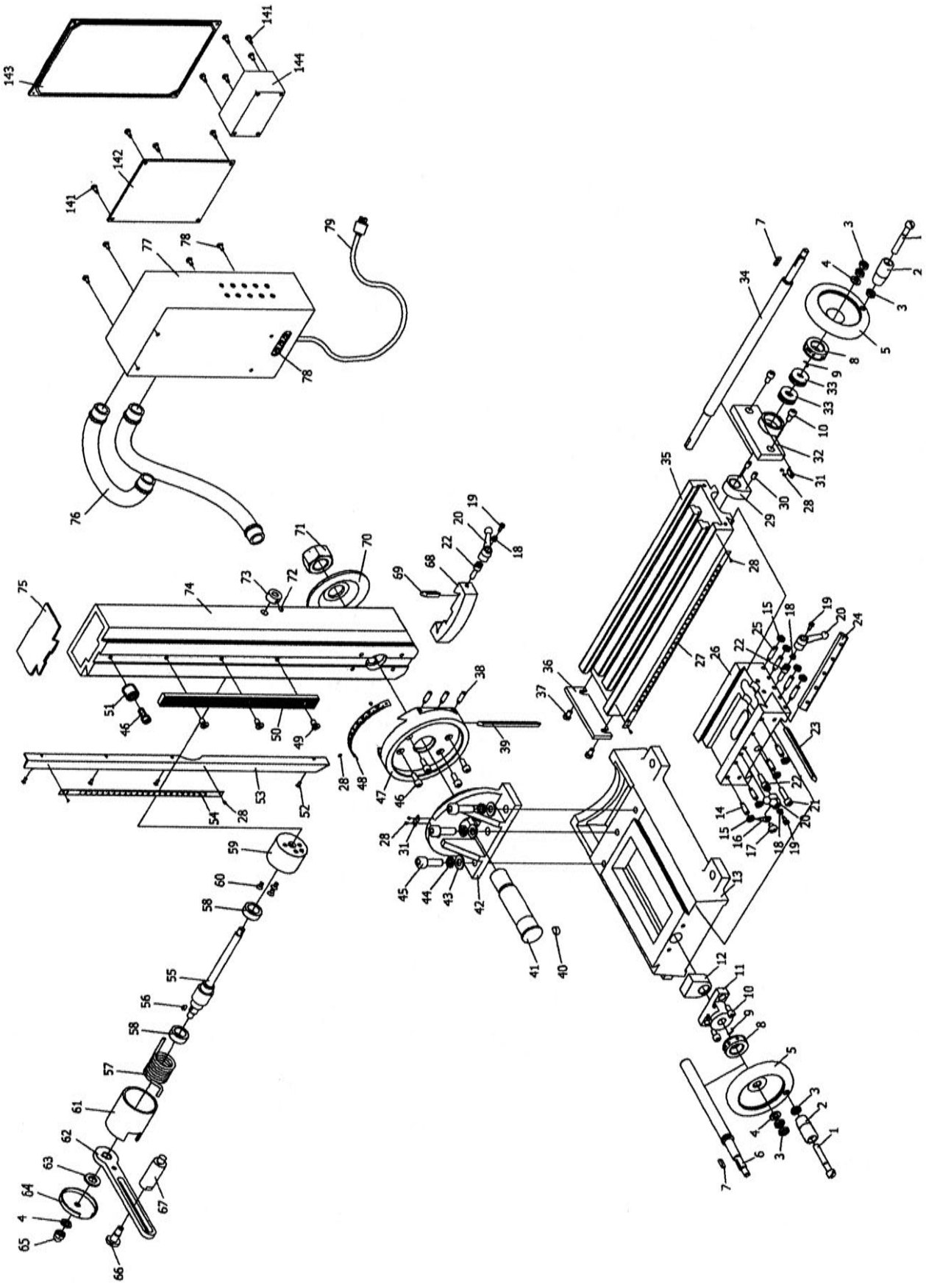


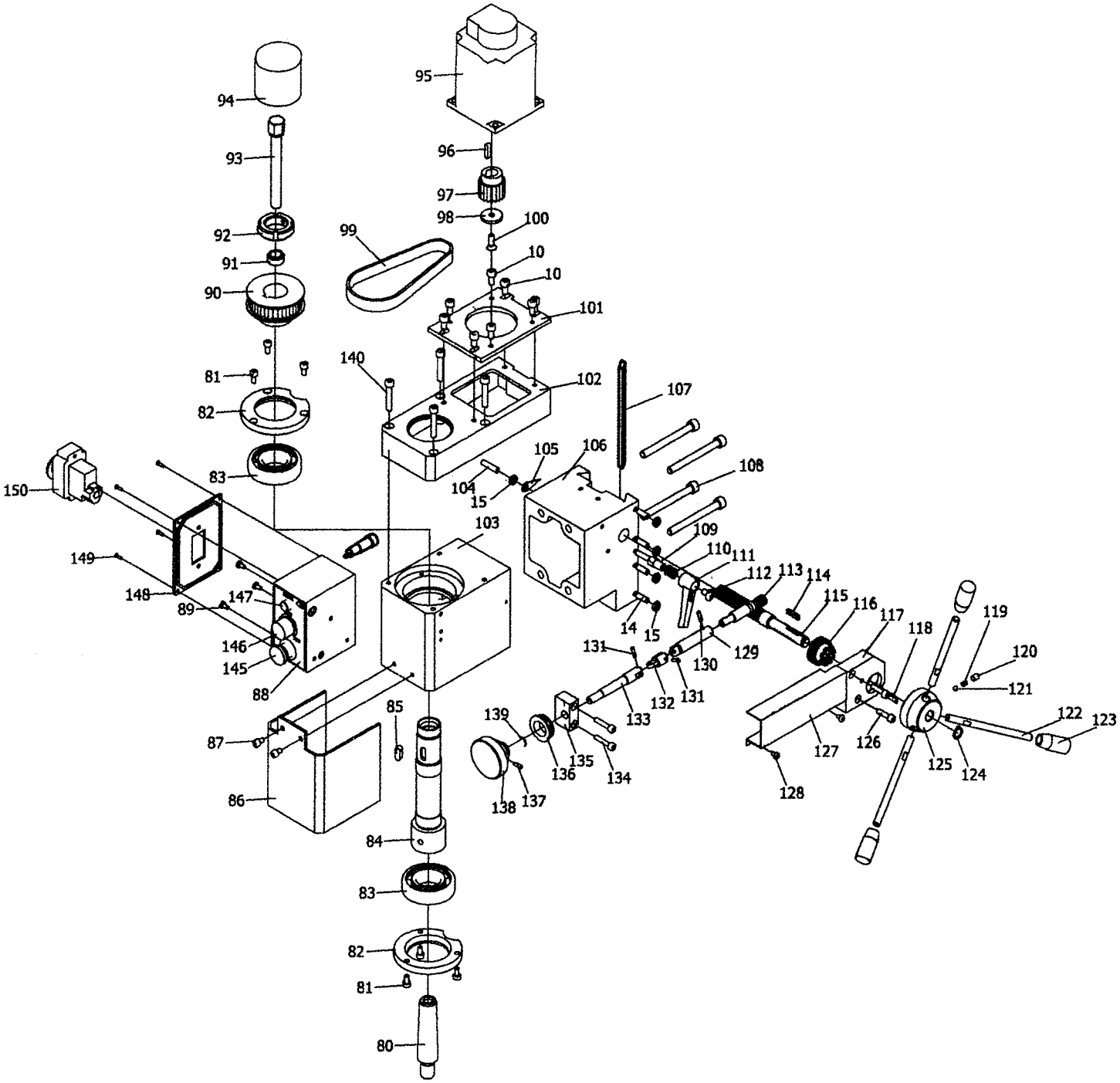
4.2 Power Connection/Disconnection & Operation

See steps 2.3 and 2.4, located on page 6.



4.3 Assembly and Parts

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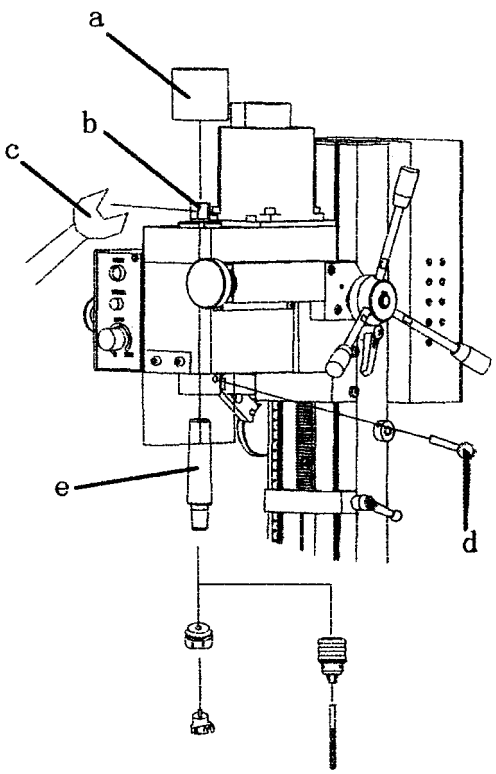
PARTS LIST

Item No.	Part Name	Qty.
1	Screw M8 x 55	2
2	Handle	2
3	Nut M8	6
4	Washer 8	3
5	Handle	2
6	Y-Axis feeding screw	1
7	Key 4 x 16	2
8	Graduated collar	2
9	Spring	2
10	Screw M6 x 12	12
11	Y-Axis screw seat	1
12	Nut	1
13	Base	1
14	Screw M6 x 20	8
15	Nut M6	13
16	Indicator	1
17	Screw M6 x 8	1
18	Spring	3
19	Screw	3
20	Handle	3
21	Screw M6 x 25	1
22	Bolt	3
23	Y-Axis wedge	1
24	X-Axis wedge	1
25	Screw M6 x 25	4
26	Saddle	1
27	Ruler	1
28	Screw for label 2 x 3	10
29	Nut	1
30	Screw M6 x 10	2
31	Guide finger	2
32	X-Axis bearing seat	1
33	Bearing 8200	2
34	X-Axis feeding screw	1
35	Working table	1
36	End cover	1
37	Screw M6 x 10	2
38	Screw M6 x 20	3
39	Wedge	1
40	Key 8 x 12	1
41	Shaft	1
42	Bracket	1
43	Washer 10	3
44	Spring washer 10	3
45	Screw M10 x 30	3
46	Screw M3 x 16	5
47	Connect Tray	1
48	Ruler	1
49	Screw M6 x 12	3
50	Gear	1
51	Fixed sleeve	1
52	Screw M3 x 8	4
53	Bracket	1
54	Ruler	1
55	Shaft	1
56	Key 4 x 8	1
57	Spring	1
58	Ferrule	1
59	Spring seat	1
60	Screw M5 x 8	3
61	Cover	1
62	Bearing shank	1
63	Washer 12	1
64	Cover	1
65	Nut M8	1
66	Screw	1
67	Support	1
68	Limit block	1
69	Small wedge	1
70	Washer	1
71	Nut M24	1
72	Screw M5 x 6	1
73	Tightening ring	1
74	Fuselage	1
75	Coping	1
76	Power line	2
77	Electric box	1
78	Screw M4 x 8	7
79	Plug	1
80	B16 Shank	1
81	Screw M5 x 10	6
82	Oil cover	2
83	Bearing 80206	2
84	Spindle	1
85	Key 6 x 18	1
86	Dust cover	1
87	Screw M5 x 8	2
88	Control box	1
89	Screw M4 x 8	3
90	Pulley	1
91	Fixed sleeve	1
92	Nut	1
93	M12 Pull shaft	1
94	Dust cover	1
95	Brushless motor	1
96	Key	1
97	Pulley	1
98	Washer IV	1
99	Drive belt	1
100	Screw H M6 x 18	1
101	Connect board for motor	1
102	Cover	1
103	Spindle box	1
104	Screw M6 x 25	1
105	Indicator	1
106	Spindle box	1
107	Wedge	1
108	Screw M8 x 80	4
109	Bolt	1
110	Spring Y II	1
111	Small handle	1
112	Screw M6 x 10	1
113	Worm	1
114	Key 4 x 20	1
115	Gear	1
116	Gear	1
117	Support	1
118	Pin B4 x 16	1
119	Spring	1
120	Screw M6 x 8	1
121	Steel ball	1
122	Handle	3
123	Lever cap M8 x 40	3
124	Check ring	1
125	Handle seat	1
126	Screw M5 x 20	2
127	Cover	1
128	Screw M4 x 6	2
129	Sleeve	1
130	Pin A3 x 12	1
131	Pin B3 x 12	2
132	Universal joint	1
133	Universal shaft	1
134	Screw M5 x 25	2
135	Bracket	1
136	Graduated collar	1
137	Screw M4 x 12	1
138	Small handle	1
139	Spring	1
140	Screw M6 x 35	4
141	Screw	8
142	PC board	1
143	Cover	1
144	Filter	1
145	Button	1
146	Green lamp	1
147	Yellow lighting pipe	1
148	Cover	1
149	Screw	8
150	Switch	1

5.1 Installation and Removal of Taper Shank



Installation

(1) Turn off the main power before you replace the cutter.

(2) Remove the protective cover (a).

(3) Wipe the spindle sleeve and R8 shank.

(4) Put the shank (g) into spindle sleeve with chuck. Cutter should be held with a cloth to protect machine and fingers.

(5) Insert fixing pin (d) right on spindle sleeve, or spanner wrench on notched nut by (b).

(6) Use 14mm open end wrench (c) to tighten (clockwise) spindle drawbar (b) for holding taper shank.

(7) Pull out the fixing pin, if used.

(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, or use spanner wrench.

(4) Use 14mm open end wrench (c) to tighten (counter-clockwise) spindle drawbar (b).

(5) Knock the taper shank (g) gently by plastic hammer to loosen it in spindle sleeve.

(6) Cutter should be held with oilcloth 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

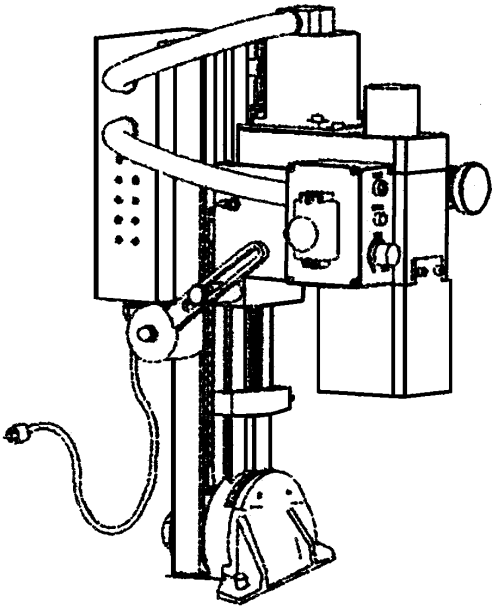
Use the limit block to control the travel of the headstock.

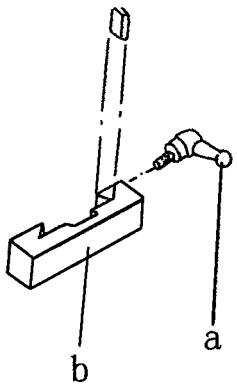
(1) Loosen the handle (a) on side of the limit block (b).

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

(3) Tighten the handle.

(4) Use ruler on headstock to measure position.





5.3 Adjust Tip Angle of Headstock

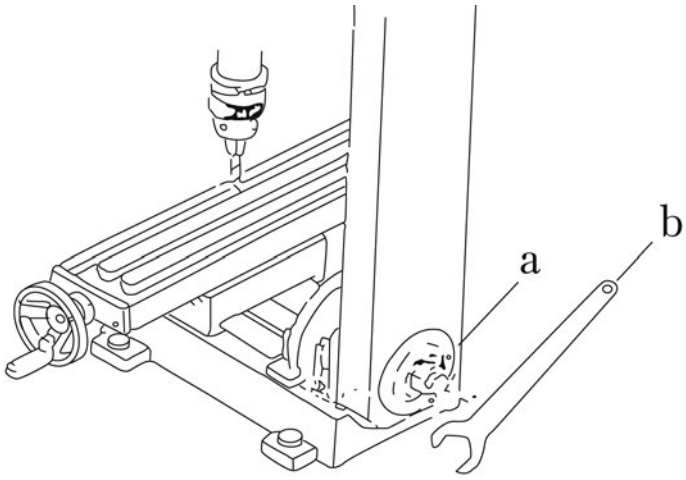
(1) Turn off main power before adjusting

(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 left or right).

(5) Tighten lock nut with large wrench.



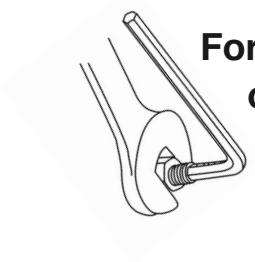
5.4 Gib Adjustment

After 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 faces.
3. Headstock seat and connecting strut sliding faces.
4. Headstock and spindle box slide face.

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



For your safety, any adjustment on machine should be made with power disconnected.

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.
3. Use vise or hold down clamps to attach workpiece to the milling table.
4. Adjust worktable (Longitudinal Axis Y) 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 around 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.
3. Use vise or hold down clamps to attach workpiece to the milling table.
4. Adjust worktable (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 worktable (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. Use our digital spindle readout if equipped.

6.2 Operation Checklist

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

Inspection before start-up

1. Before turning on the power, check that the chuck is sufficiently 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 area 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 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 vise, workpiece clamps or gibs.
    e. Machine not sufficiently secured to workbench.

7.1 Power Connection/Disconnection & Operation

(1) The connection, disconnection and grounding is carried out through the plug, equipped on the machine. For 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.

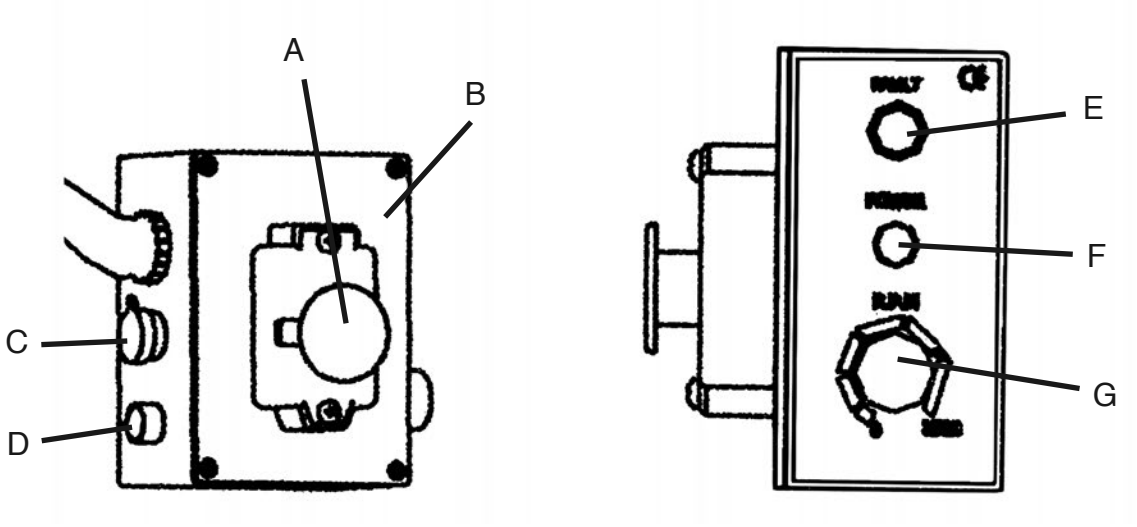
EXTENSION LEAD CHART

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 120v, single phase, 60Hz.

(4) Make sure the Emergency Stop switch (A) (left on the control box) is in closed position before plugging in cord.

(5) Disconnect tools from power source with plug before servicing and when changing accessories such as guard.



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

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