Cobra Mill Instruction Manual

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Introduction

Chester UK Limited is a specialist company that has been supplying the machine tool industry for over 15 years.

The Chester UK Head Office comprises of a 30,500-sq.ft factory complete with offices and a showroom. Specialising in conventional machine tools, Chester has built a reputation for quality and reliability, which is highly regarded in the machine tool industry and the model engineering market.

There are several divisions within the company; Export, Education, Model Engineering & UK Sales, all with dedicated sales personnel who are trained to answer your questions.

When buying from Chester you can be assured of a complete back-up service with mechanical and electrical engineers that are available to give advice if required.

Stock is a large part of any business and Chester have always invested substantially in building a large quantity of machines and spares, ready to satisfy customer requirements. Chester UK has one of the largest stocks of conventional new machines and accessories within Great Britain. Please take time to visit our website: www.chestermachinetools.com

Health & Safety

As with all machinery there are certain hazards involved with the operation and use of the lathe. Using the machine with respect and caution will considerably lessen the possibility of person injury. However, if normal safety precautions are overlooked or ignored, personal injury to the operator may result.

This machine was designed for certain applications only. We strongly recommend that the machine is not modified, and / or used for any application other than which it was designed. **If you have any questions relative to its application do not use the machine, until you have first been in contact with Chester UK.**
The lathe may not arrive with a power socket or plug. In the event of this happening, please inform Chester UK on Tel: (01244) 531 631.

Safety rules for all tools

User

1. **Wear correct apparel**
   No loose clothing, gloves, rings, bracelets or other jewellery to get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.
2. **Always wear eye protection**
   Refer to ANSLZ87.1 standard for appropriate recommendations. Also use face and / or a dust mask if the cutting operation is dusty.
3. **Don't overreach**
   Keep a proper footing and balance at all times.
4. **Never stand on a tool**
   Serious injury could occur if the tool is tipped or if the cutting tool is accidentally contacted.
5. **Never leave the tool running unattended**
   Turn power off. Leave tool until it comes to a complete stop.
6. **Drugs, alcohol and medication**
   Do not operate the tool while under the influence of drugs, alcohol or any medication.
7. **Make sure the tool is disconnected from the power supply**
   While motor is being mounted, connected or reconnected.
8. **Always**
   Keep hands and fingers away from any moving parts.
9. **Stop**
   The machine before moving chips.
10. **Shut-off**
    Power and clean the lathe and work area before leaving the machine.

Use of the machine

1. **Remove adjusting keys and wrenches**
   Form a habit of checking to see that keys and adjusting wrenches are removed from the tool before turning it 'on'.
2. **Don't force the tool**
   It will do the job better and be safer at the rate for which it was designed.
3. **Use the right tool**
   Don't force the tool or attachment to do a job for which it was not designed.
4. **Secure work**
   Use clamps or a vice to hold work when practical. It's safer than using your hands, and frees both to operate the machine.

5. **Maintain tools in top condition**

Keep tools sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.

6. **Use recommended accessories**

Consult Chester UK for recommended accessories. The use of improper accessories may cause hazards.

7. **Avoid accidental starting**

Make sure the switch is in the '**OFF'** position before plugging in power cord.

8. **Stop**

The machine before putting material in the vice.

9. **Always**

Have stock firmly clamped in the vice before starting the cut.

10. **Ground all tools**

If the tool is equipped with a three-prong plug, it should be plugged into a three-hole electrical receptacle. If an adapter is used to accommodate a two-prong receptacle, the adapter plug must be attached to a known ground. Never remove the third prong.

Adjustment

Make all adjustments with the power off. When assembling follow the manuals instructions, this will ensure correct instruction and a safe structure.

Working environment

1. **Keep the work area clean**

Cluttered areas and benches invite accidents.

2. **Don't use in a dangerous environment**

Don't use power tools in damp or wet locations, or expose to rain. Keep the work area well lit.

3. **Keep children etc at a safe distance.**

All children etc should be kept at a safe distance from the work area.

4. **Don't**

Install & use this machine in an explosive dangerous environment.

Maintenance

1. **Disconnect**

Machine from the power source when making repairs.

2. **Check damaged parts**

Before further use of the tool, a guard or other part that is damaged should be carefully checked to ensure that it would operate properly and perform its intended function check for alignment of moving parts, binding 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.

3. **Disconnect tools**

Before servicing and when changing accessories such as blades bits, cutters, etc.

4. **To prevent**

The corrosion of machined surfaces when a soluble is used as coolant, pay particular attention to wiping dry the surfaces where fluid accumulates and does not evaporate quickly, such as between the machine bed and vice.

Safety Device

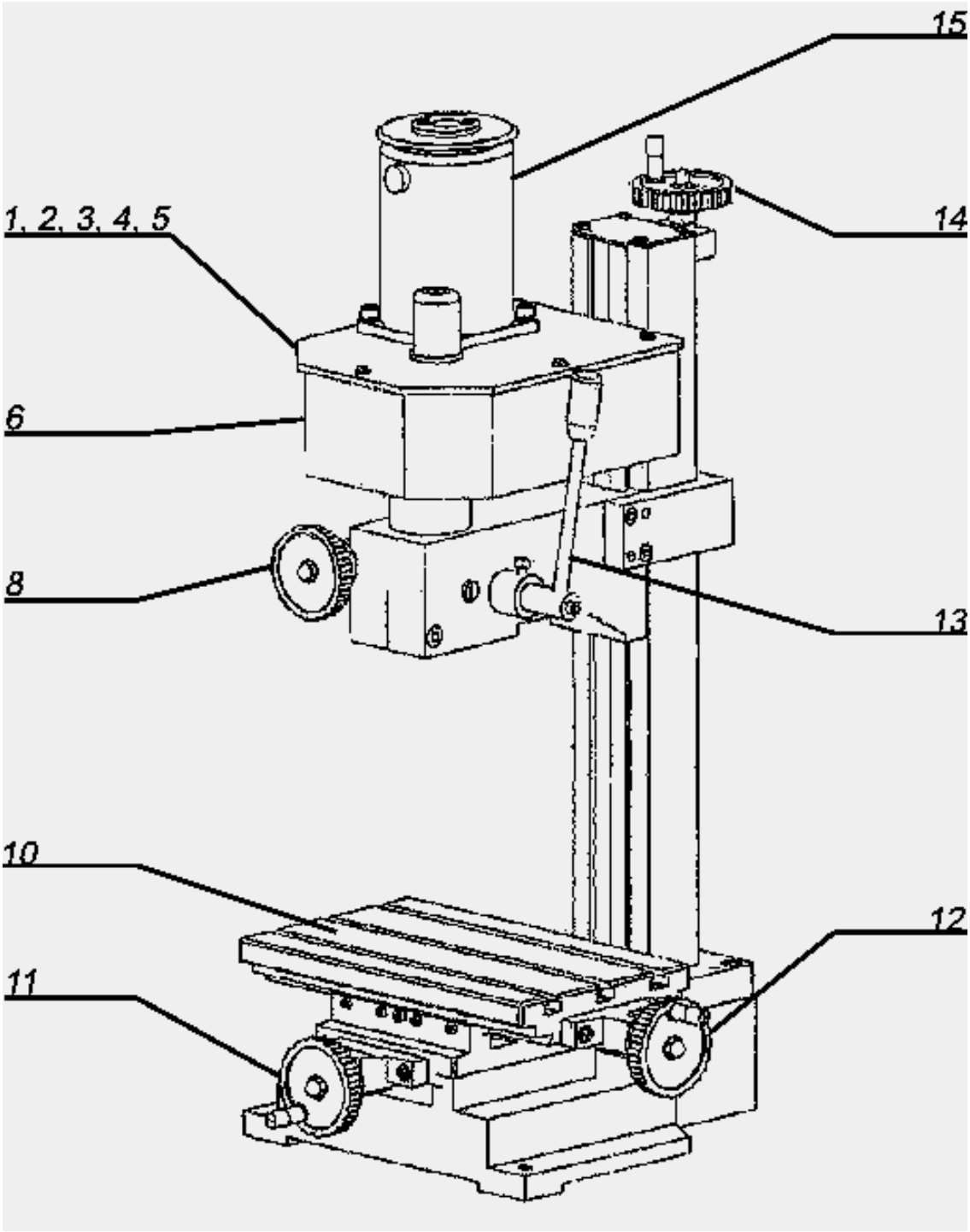
1. Interlock switch on pulley cover. As soon as the pulley cover is open, the machine will come to a stop with the function of this switch. Do not remove this switch from the machine for any reason, and check it's function frequently.

2. Interlock switch on cutting area. As soon as the pulley cover is open, the machine will come to a stop with the function of this switch. Do not remove this switch from the machine for any reason, and check it's function frequently.

Machine Specification

Drilling Capacity	10mm
End Milling Capacity	10mm
Face Milling Capacity	16mm
Spindle Stroke	30mm
Throat	140mm
Table Working Surface	145 x 240mm
Longitudinal Travel	200mm
Cross Travel	105mm
Vertical Travel	195mm
Max. Distance Spindle To Table	220mm
No. Of Spindle Speeds	Variable
Range Of Speeds	100-2000rpm
Spindle Taper	MT2
T Slot Size	8mm
Headstock Tilt	±45°
Motor	150W
Supply	240V
Weight (nw/gw)	44kg
Dimensions (LxWxH)	480 x 380 x 680mm

Features

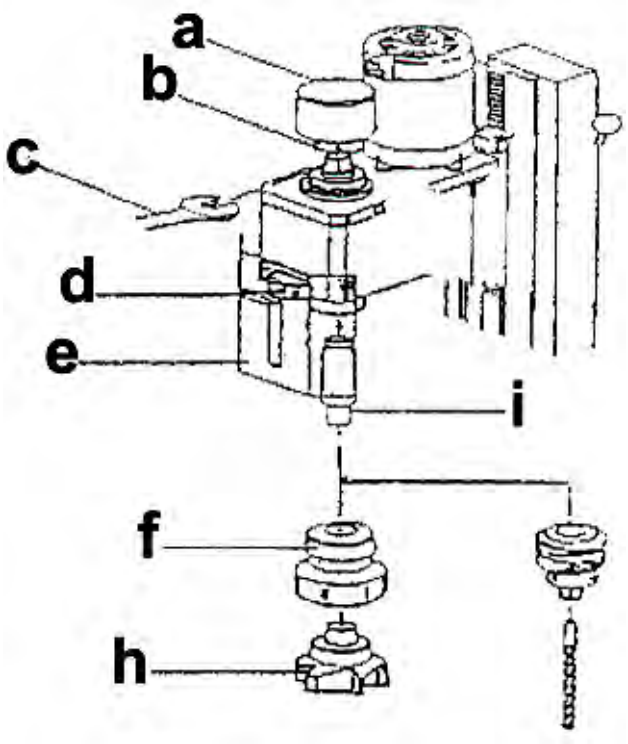


1. Forward/Off/Reverse Switch	**2.** Variable Speed Control Knob	**3.** Fuse Box
4. Power Light (Green)	**5.** Yellow Light (only 110V)	**6.** High Low Change Knob
7.	**8.** Fine Feeding Handwheel	**9.**
10. Work Table	**11.** Cross Feed Handwheel	**12.** Longitudinal Feed Handwheel
13. Handle	**14.** Lifting Handwheel	**15.** DC Motor

Operation

Installation Of The Tapered Shank

1. Disconnect from the main power supply, before you replace the cutter.
2. Remove the protective cover (a).
3. Wipe the spindle sleeve and taper shank.
4. Put the taper shank (i) into the spindle sleeve. Matt the cutter with an oilcloth.
5. Use a #14 open-end wrench (c), turning the spindle draw bar (clockwise) (b), in order to secure the tapered shank.
6. Pull out the fixing pin
7. Install the protective cover (a).



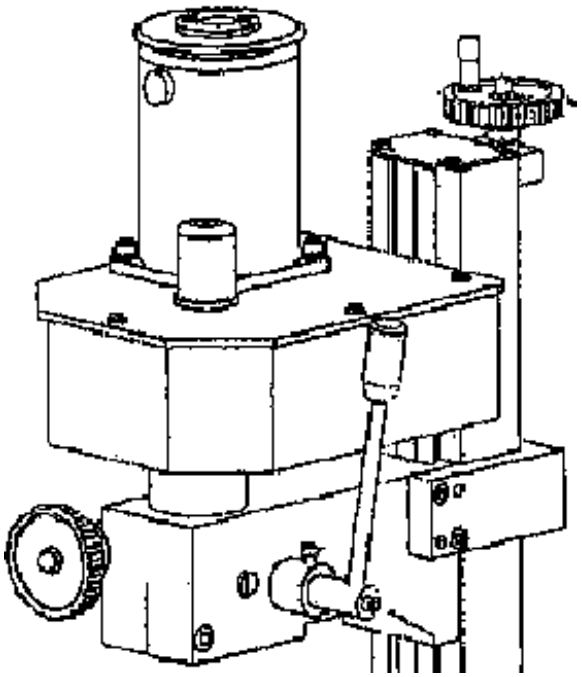
Removal Of The Tapered Shank

1. Disconnect from the main power supply, before you replace the cutter.
2. Remove the protective cover (a).
3. Use a#14 open-end wrench (c), to loosen the spindle draw bar (counter-clockwise) (i), in order to remove the tapered shank.
4. Knock the taper shank (i) (gently with a plastic hammer) to loosen it in the spindle sleeve.
5. Matt the cutter with an oilcloth.
6. Install the protective cover (a).

Travel Adjustment

The lifting handle can be used to control the travelling of the spindle box.

1. Loosen the screw inside the spindle box.
2. Rotation of the lifting handle will move the spindle box up or down.



Fine Feeding

To operate the fine feed, push the clutch lever in. This will enable the handwheel for the fine feed.

Mitre Wedge Adjustment

In the long term wear will occur on the dovetail. This will cause inaccuracy that can be eliminated by adjusting the mitre wedge (adjusting the dovetail gib strip). Adjusting the screw slides the tapered strip to reduce the gap and restore accuracy of the mill.
The following adjustments are possible:

1. Base & Y-Axis Cross Slide.
2. X-Axis Cross Slide & Work Table
3. Mill Head Seat & Vertical Column.
4. Mill Head & Spindle.

The Way To Adjust

1. Loosen the locked nuts.
2. Adjust the foremost pressure of the mitre wedge by locked nut. If necessary, loosen all the adjusting screws to the same.
3. Tighten and loosen the adjusting screws, also keeping the pressure of each adjusting screw the same.
4. Tighten the locked nut uniformly.
5. When the nut is locked, please use the #3 interior hexagonal wrench to fix the adjusting screw from rotating (this will cause an unbalance in the pressure).
6. Please adjust the middle portion first and then go to toward the interior from two sides uniformly while you are adjusting the screw in order to ensure uniform pressure.

Controls

Initial Start

Set the HIGH / LOW range lever to low. Connect to the power supply. Select FORWARD, using the FORWARD / OFF / REVERSE Switch (A) on the main control Panel, then the power lamp (B) lights.
Switch on the Cobra Mill by slowly turning the Variable Speed Control Knob (C) clockwise.
The speed will increase progressively the further the knob is turned.

Run for a total of 5 minutes; gradually increase the spindle speed to its maximum. Run at top speed for at least 2 minutes at top speed before stopping.

Check that all components are secure, working freely and correctly.
Check that the Cobra Mill is mounted securely.
Repeat the procedure at a HIGH-speed setting.

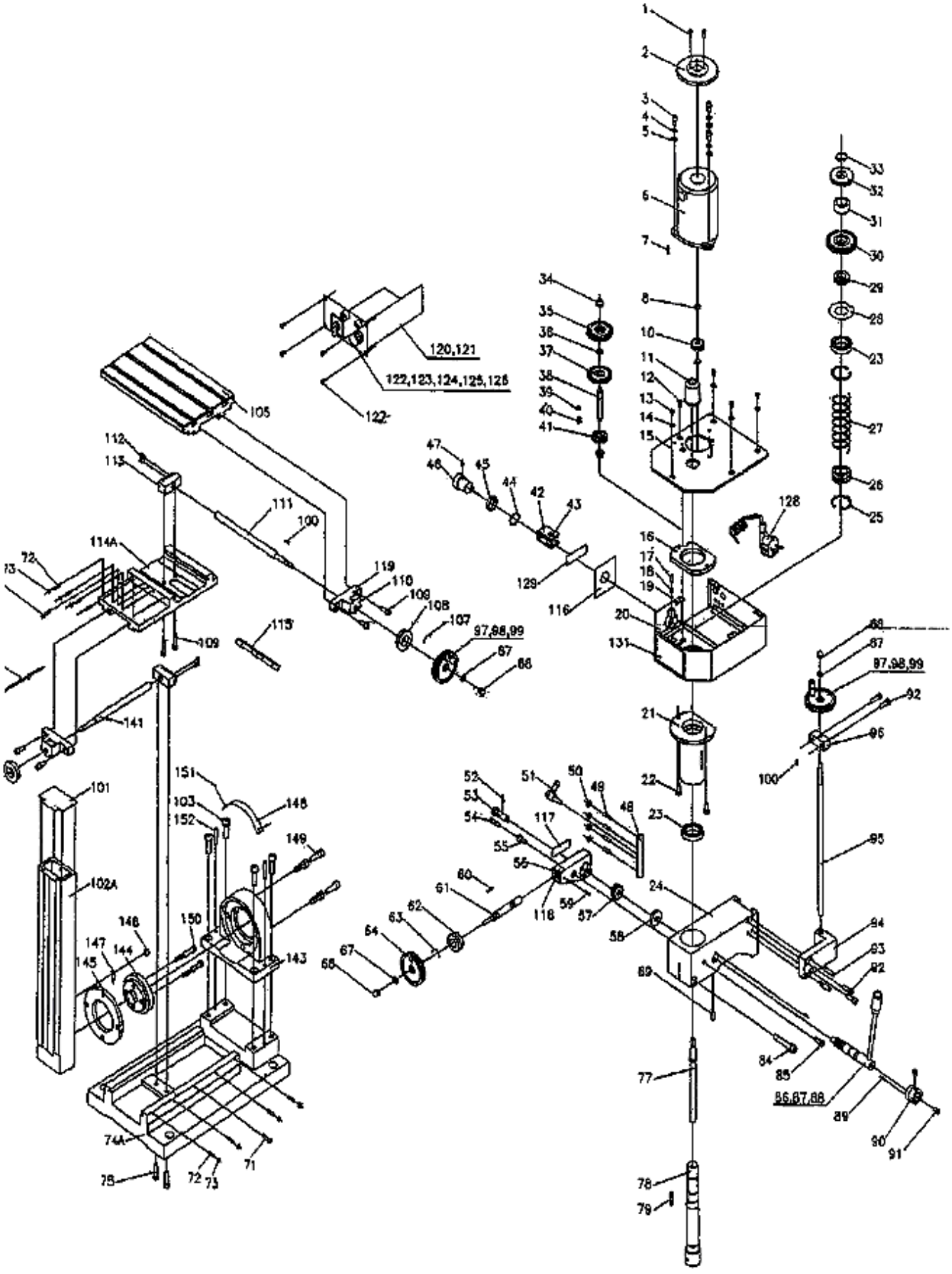
Caution
Never attempt to change from a HIGH to a LOW speed whilst the machine is running.

Starting Under Normal Conditions

1. Take all the necessary precautions previously stated, and ensure the workpiece is fixed firmly.
2. Select an appropriate speed level.
3. Select the FORWARD / off / REVERSE to a FORWARD or REVERSE position.
4. Proceed to start the machine as described above.
5. Whilst not in use, switch off and disconnect from the power supply.

Notice
When using 100~120v power, the socket will have to have a auto over-load protective function. If the feed is to fast, or the drilling is too deep, the Cobra Mill will stop working and a yellow light (behind the fuselage) will light up. By turning the Variable Speed control knob (D) and then turn on again, the Cobra will now work again and the yellow lamp will off automatically.

Part Diagrams & Lists

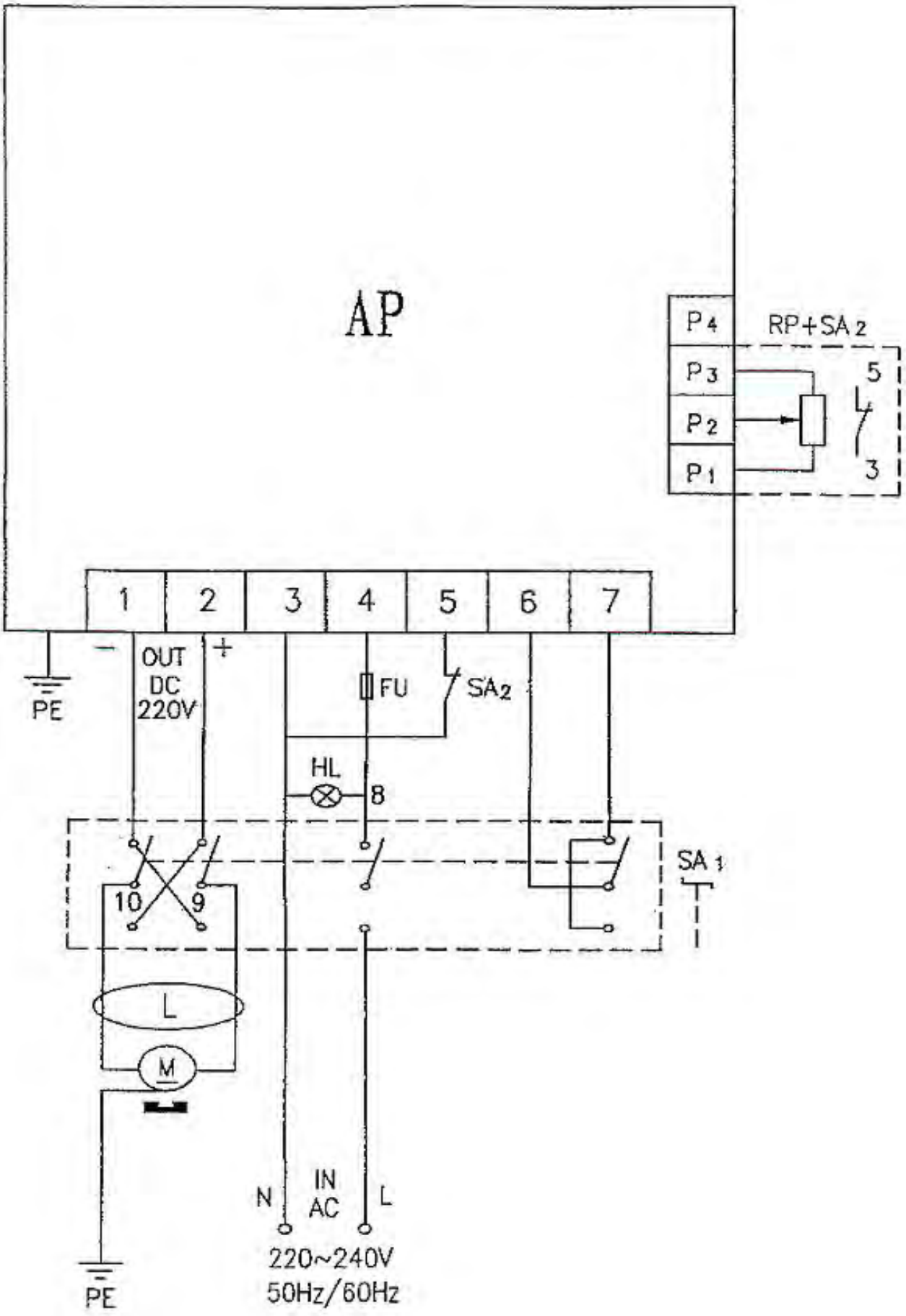


No.	Description	Q'ty	No.	Description	Q'ty
1	Screw M4 x 12	2	38	Shift shaft	1
2	Cover for the motor	1	39	Key 4 x 8	1
3	Screw M6 x 12	3	40	Key 4 x 12	1
4	Spring washer 6	3	41	Change gear	1
5	Washer 6	3	42	Dial fork	1
6	DC motor	1	43	Flange lining	2
7	Round key	1	44	Check ring 21	1
8	Check ring for shaft 8	2	45	Spacer	1
			46	Variable speed control knob	1
10	Motor gear	1	47	Spring pin 2 x 12	1
11	Safety cover	1	48	Wedge	1
12	Screw M4 x 6	1	49	Screw M5 x 18	4
13	Screw M4 x 8	4	50	Nut M5	4
14	Washer 4	4	51	Handle	1
15	Up cover	1	52	Pin A3 x 12	1
16	Sleeve support plate	1	53	Joint shaft	1
17	Screw M6 x 5	1	54	Screw M5 x 18	1
18	Compression spring	1	55	Joint screw	1
19	Steel ball 5	1	56	Worm base	1
20	Gear - box	1	57	Helical gear	1
21	Spindle sleeve	1	58	Spacer	1
22	Screw M6 x 14	2	59	Pin A3 x 18	1
23	Bearing 61905 - 2E	2	60	Key 2 x 18	1
24	Spindle box	1	61	Worm shaft	1
25	Check ring for hole 38	2	62	Dial	1
26	Spring seat ring	1	63	Damp spring	1
27	Compression spring	1	64	Hand wheel	1
28	Round nut stop gasket	1			
29	Round nut M24 x 1.5	1			
30	Spindle gear	1	67	Washer 6	4
31	Spacer	1	68	Top nut M6	4
32	Spindle gear	1	69	Screw M6 x 20	1
33	Check ring for shaft 20	1			
34	Powder metallurgy bearing	2	71	Screw M4 x 20	2
35	Gear	1	72	Screw M4 X 18	8
36	Check ring for shaft 10	1	73	Nut M4	8
37	Change gear	1	74A	Base	1

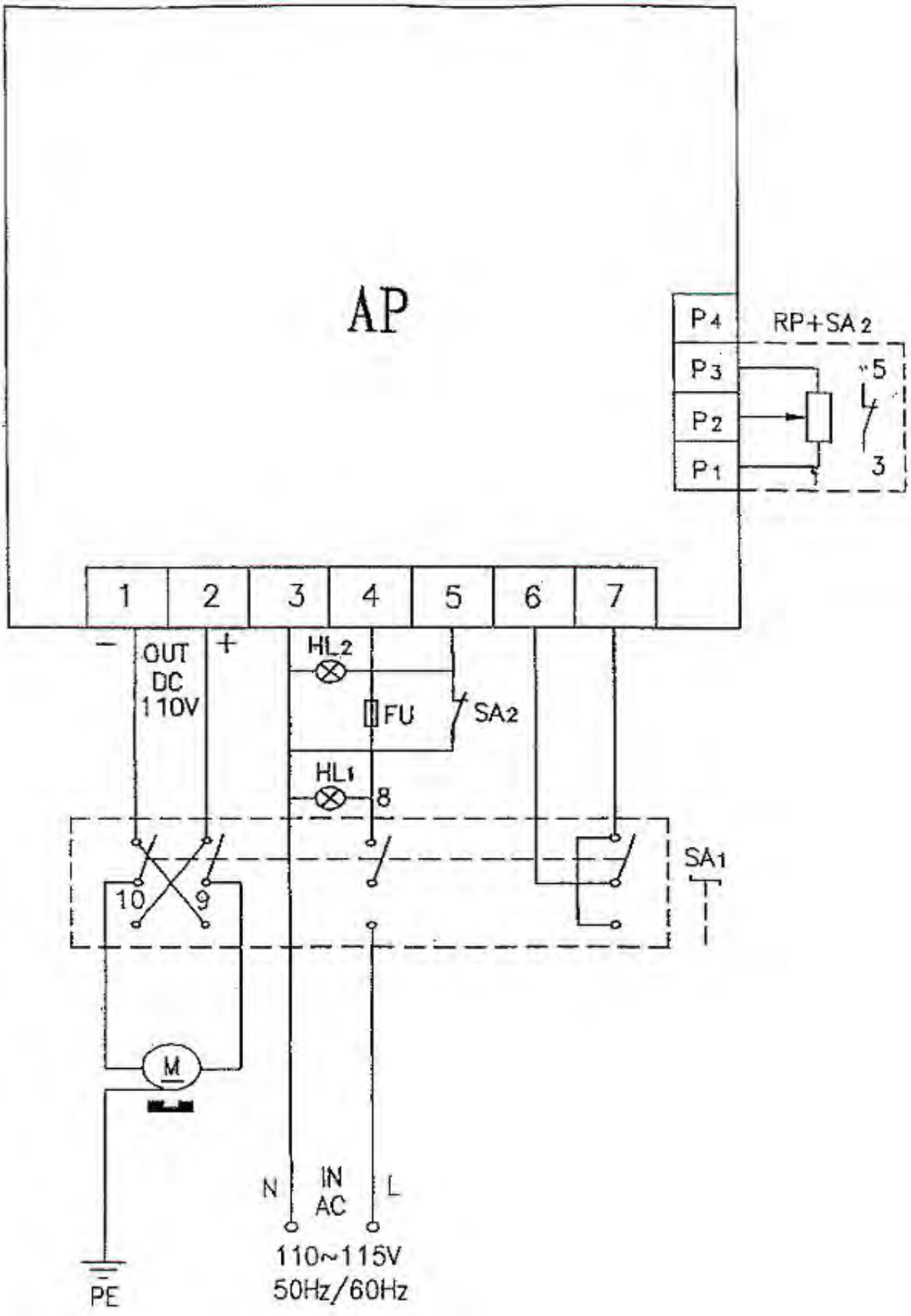
No.	Description	Q'ty	No.	Description	Q'ty
75	Screw M6 x 20	2	119	Dial label	1
77	Lock screw	1	120	Electricity box	1
78	Spindle	1	121	PC Board	1
79	Key 4 x 28	1	122	Power indicator light	1
84	Screw M8 x 50	1	123	Fuse box	1
85	Fix screw	1	124	Metachoresis switch	1
86	Gear shaft	1	125	Forward/reverse switch	1
87	Handle shaft	1	126	Electricity label	1
88	Long handle sleeve	1	127	Screw ST2.9 x 6.5	4
89	Spring pin 3 x 12	2	128	Power line	1
90	Mark show sleeve	1	129	Caution label	1
91	Screw M5 x 8	2	130	Spindle axis label	1
92	Screw M6 x 20	4	*131	Technical parameter label	1
93	Pin 6 x 26	2	*132	Drill chuck	1
94	Nut block	1	*133	Inside Six hom Wrench S:3,6	1
95	Lifting screw	1	*134	Double end Wrench: 5.5*, 8*10	1
96	Screw support	1	*135	Round nut Wrench D = 38 - 42	1
97	Hand wheel	3	*136	Oil can	1
98	Handle bolt	3	*137	Fuse	1
99	Handle sleeve	3	*138	Taper shank	1
100	Key 3 x 10	3	*139	Chuck key	1
101	Cover board	1	*140	T nut	4
102A	Fuselage	1	141	Cross screw	1
103	Screw	4	142	Cross wedge	1
105	Worktable	1	143	Connect plate support	1
107	Damp spring	2	144	Connect flange	1
108	Dial	2	145	Round clamp plate	1
109	Screw M6 x 16	4	146	Scale	1
110	Screw base	2	147	Finger	1
111	Lengthways screw	2	148	Screw M6*6	1
112	Screw M4 x 8	4	149	Screw M8*25	4
113	Screw nut	2	150	Screw M6*25	2
114A	Saddle	1	151	Label rivet 2*3	2
115	Wedge	2	152	Pin 6*35	2
116	Change speed label	1			
117	Joint label	1			
118	0 position label	2			

Circuit Diagram

220~240V / 50-60Hz



100~120V / 50-60Hz



Guide To Milling

Contents

1. Introduction

Milling machine is one of the most versatile conventional machine tools with a wide range of metal cutting capability. Many complicated operations such as indexing, gang milling, and straddle milling etc. can be carried out on a milling machine.

This training module is intended to give you a good appreciation on the type of milling machines and the various types of milling processes. Emphasis is placed on its industrial applications, operations, and the selection of appropriate cutting tools.

On completion of this module, you will acquire some of these techniques from the training exercises as illustrated in figure 1. However, to gain maximum benefit, you are strongly advised to make yourself familiar with the following notes before undertaking the training activities, and to have a good interaction between yourself and the staff in charge of your training.

Assessment of your training will be based on a combination of your skill and attitude in getting the work done.

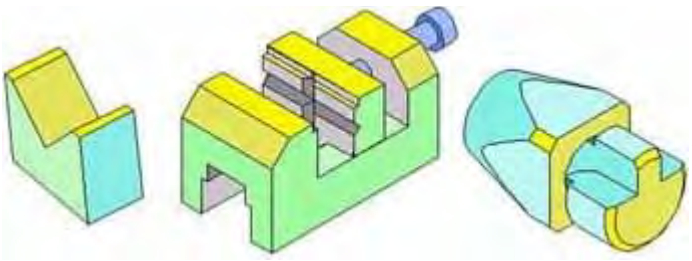


Figure 1. Milling Products

2. Types of Milling Machine

Most of the milling machine are constructed of ¡¥column and knee¡¦ structure and they are classified into two main types namely Horizontal Milling Machine and Vertical Milling Machine. The name Horizontal or Vertical is given to the machine by virtue of its spindle axis. Horizontal machines can be further classified into Plain Horizontal and Universal Milling Machine. The main difference between the two is that the table of an Universal Milling Machine can be set at an angle for helical milling while the table of a Plain Horizontal Milling Machine is not.

2.1. Horizontal Milling Machine

Figure 2 shows the main features of a Plain Horizontal Milling Machine.

Their functions are :-

a. Column
The column houses the spindle, the bearings, the gear box, the clutches, the shafts, the pumps, and the shifting mechanisms for transmitting power from the electric motor to the spindle at a selected speed.

b. Knee
The knee mounted in front of the column is for supporting the table and to provide an up or down motion along the Z axis.

c. Saddle
The saddle consists of two slideways, one on the top and one at the bottom located at 90º to each other, for providing motions in the X or Y axes by means of lead screws.

d. Table
The table is mounted on top of the saddle and can be moved along the X axis. On top of the table are some T-slots for the mounting of workpiece or clamping fixtures.

e. Arbor
The arbor is an extension of the spindle for mounting cutters. Usually, the thread end of an arbor is of left hand helix.

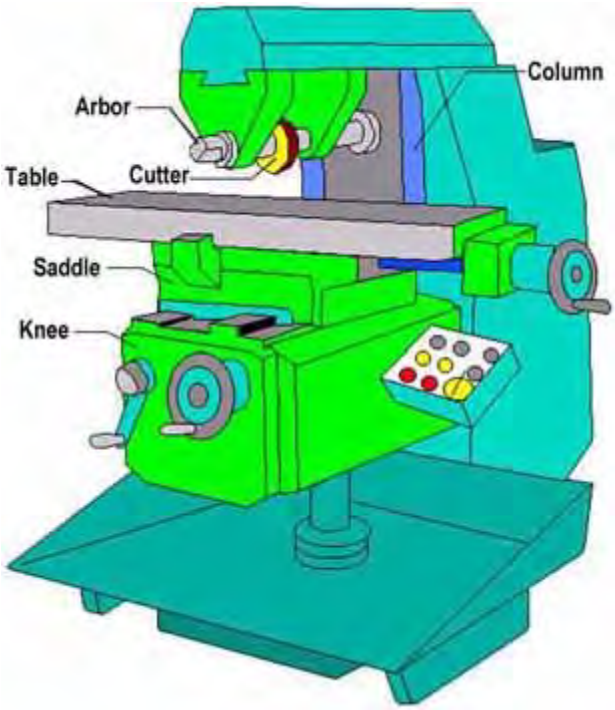


Figure 2. Horizontal Milling Machine

2.2. Vertical Milling Machine

Figure 3 shows a vertical milling machine which is of similar construction to a horizontal milling machine except that the spindle is mounted in the vertical position.

Figure 3. Vertical Milling Machine

Its additional features are :-

a. Milling head
The milling head consisting the spindle, the motor, and the feed control unit is mounted on a swivel base such that it can be set at any angle to the table.

b. Ram
The ram on which the milling head is attached can be positioned forward and backward along the slideway on the top of the column.

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3. Cutting Tools

3.1. Cutting Tools for Horizontal Milling

a. Slab Mills
For heavy cutting of large and flat surfaces.

Figure 4. Slab Mill

b. Side and Face Cutters
This type of cutters has cutting edges on the periphery and sides of the teeth for cutting shoulders and slots.

Figure 5. Side and Face Cutter

c. Slitting Saws
For cutting deep slots or for parting off.

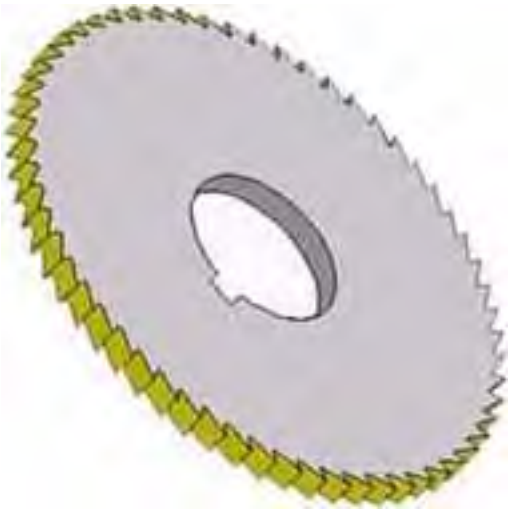


Figure 6. Slitting Saw

Note: Horizontal milling cutters are specified by the name, the material, the width, the diameter, and the hub size of the cutter.

Example --- Side and face cutter,
High Speed Steel,
Cutter size : 10 X ø 100
Hub size: ø 25

3.2. Cutting tools for Vertical Milling

a. End Mills
Commonly used for facing, slotting and profile milling.

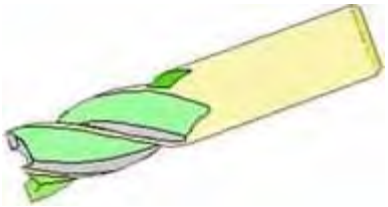


Figure 7. End Mill

b. Rough Cut End Mills
For rapid metal removal.

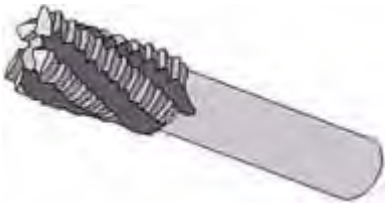


Figure 8. Rough Cut End Mill

c. Slot Drills
For producing pockets without drilling a hole before hand.

Figure 9. Slot Drill

d. Face Milling Cutters
For heavy cutting.

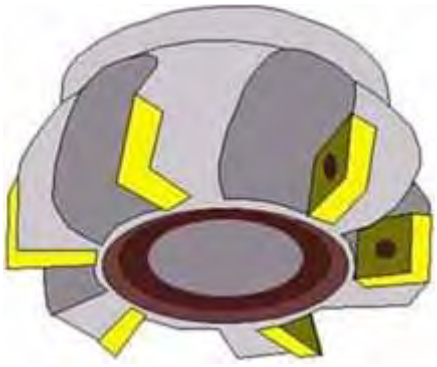


Figure 10. Face Milling Cutter

Note: Most vertical milling cutters are of end mill types and are specified by the material, the diameter, the length, the helical angle, the types of shank and the shank diameter. For face milling cutter, only the diameter of the cutter and the types of carbide inserts are required.

4. Industrial Applications

Milling machines are widely used in the tool and die making industry and are commonly used in the manufacturing industry for the production of a wide range of components as shown in figure 11. Typical examples are the milling of flat surface, indexing, gear cutting, as well as the cutting of slots and key-ways.

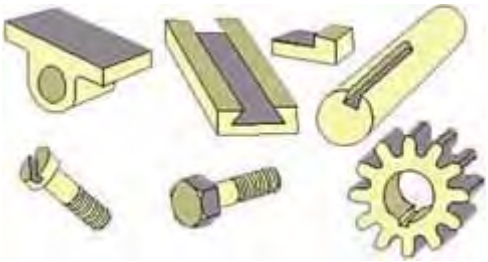


Figure 11. Components Made by Milling

When equipped with digital readout, the machine is capable of producing more precise work for the manufacturing of plastic moulds, tool & dies, and jigs & fixtures. Figure 12 shows a typical plastic mould produced by milling.

Figure 12. Plastic Mould

5. Milling Processes

Milling is a metal removal process by means of using a rotating cutter having one or more cutting teeth as illustrated in figure 13.

Cutting action is carried out by feeding the workpiece against the rotating cutter. Thus, the spindle speed, the table feed, the depth of cut, and the rotating direction of the cutter become the main parameters of the process. Good results can only be achieved with a well balanced settings of these parameters.

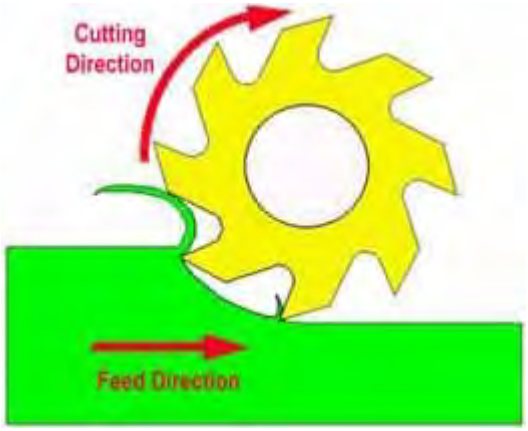


Figure 13. Milling Process

5.1. Spindle Speed

Spindle speed in revolution per minute (R.P.M.) for the cutter can be calculated from the equation :-

$$N = \frac{CS \times 1000}{\pi d}$$

where -- **N** = R.P.M. of the cutter
CS = Linear Cutting Speed of the material in m/min. (see table 1)
d = Diameter of cutter in mm

5.2. Feed Rate

Feed rate (F) is defined as the rate of travel of the workpiece in mm/min. But most tool suppliers recommend it as the movement per tooth of the cutter (f). Thus,

$$F = f \cdot u \cdot N$$

where -- **F** = table feed in mm/min
f = movement per tooth of cutter in mm (see table 1)
u = number of teeth of cutter
N = R.P.M. of the cutter

where

C.S. and feed rate for some common material :-

Tool Material	High Speed Steel		Carbide	
Material	Cutting Speed	Feed (f)	Cutting Speed	Feed (f)
Mild Steel	25	0.08	100	0.15
Aluminium	100	0.15	500	0.3
Hardened Steel	---	---	50	0.1

Table 1

5.3. Depth of Cut

Depth of cut is directly related to the efficiency of the cutting process. The deeper the cut the faster will be the production rate. Yet, it still depends on the strength of the cutter and the material to be cut.

For a certain type of cutter, a typical range of cut will be recommended by the supplier. Nevertheless, it should be noted that a finer cut is usually associated with a better surface finish as well as a long tool life.

5.4. Direction of Cutter Rotation

a. Up Cut Milling

In up cut milling, the cutter rotates in a direction opposite to the table feed as illustrated in figure 14. It is conventionally used in most milling operations because the backlash between the leadscrew and the nut of the machine table can be eliminated.

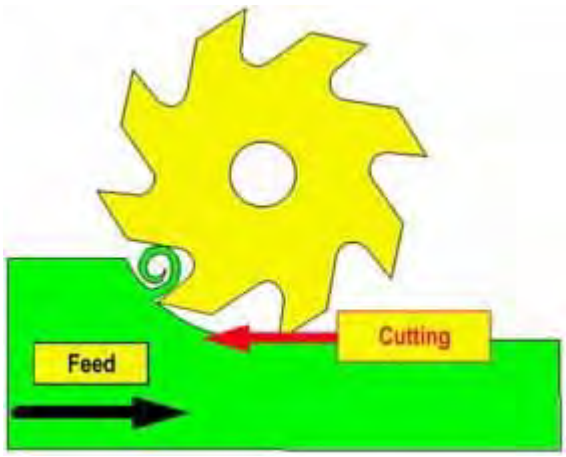


Figure 14. Up Cut Milling

b. Down Cut Milling

In down cut milling, the cutter rotates in the same direction as the table feed as illustrated in figure 15. This method is also known as Climb Milling and can only be used on machines equipped with a backlash eliminator or on a CNC milling machine. This method, when properly treated, will require less power in feeding the table and give a better surface finish on the workpiece.

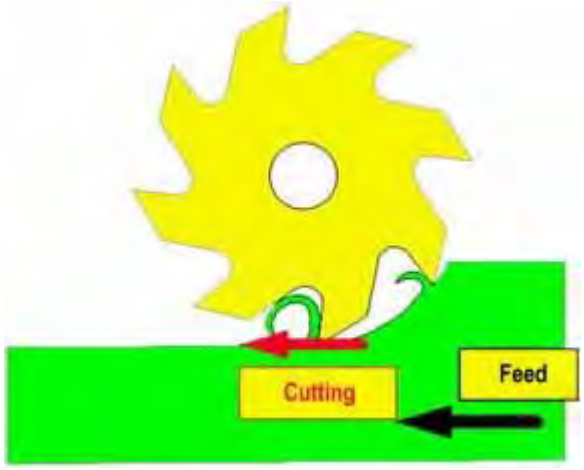
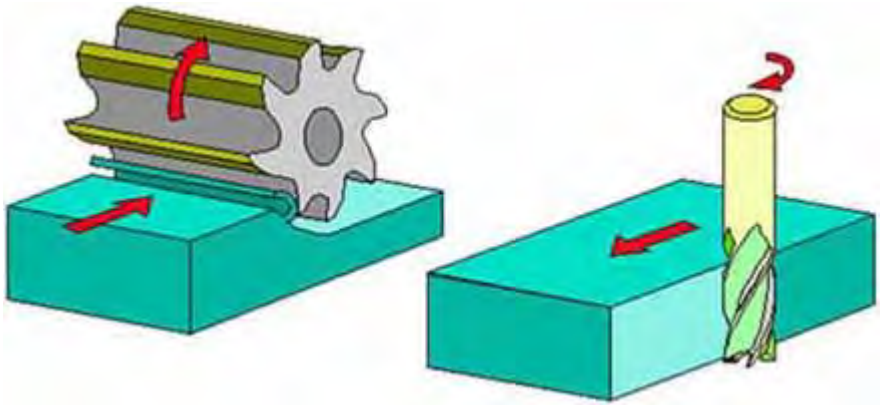


Figure 15. Down Cut Milling

6. Typical Milling Operations

6.1. Plain Milling

Plain milling is the milling of a flat surface with the axis of the cutter parallel to the machining surface. It can be carried out either on a horizontal machine or a vertical machine as shown in figure 16.



6.2. End Milling

End Milling is the milling of a flat surface with the axis of the cutter perpendicular to the machining surface as shown in figure 17.

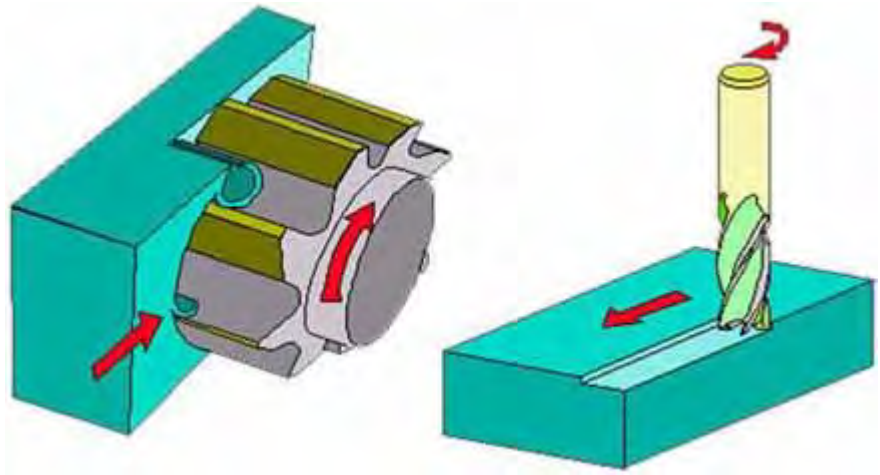


Figure 17. End Milling

6.3. Gang Milling

Gang milling is a horizontal milling operation that utilises three or more milling cutters grouped together for the milling of a complex surface in one pass. As illustrated in figure 18, different type and size of cutters should be selected for achieving the desire profile on the workpiece.

Figure 18. Gang Milling

6.4. Straddle Milling

In straddle milling, a group of spacers is mounted in between two side and face milling cutters on the spindle arbor as shown in figure 19. for the milling of two surfaces parallel to each other at a given distance.

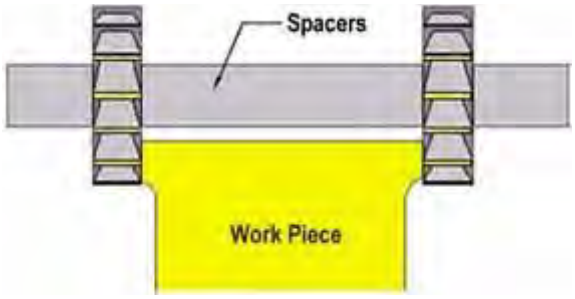


Figure 19. Straddle Milling

7. Milling Set Up

Correct use of holding device and a good set up are of crucial importance in achieving a safe, accurate, and efficient operation of the machine. Large workpiece can be mounted directly onto the machine table by means of tenons and screws while small workpieces are usually held by machine vice as shown in figure 20. In either case, a dial indicator is used for alignment checking.

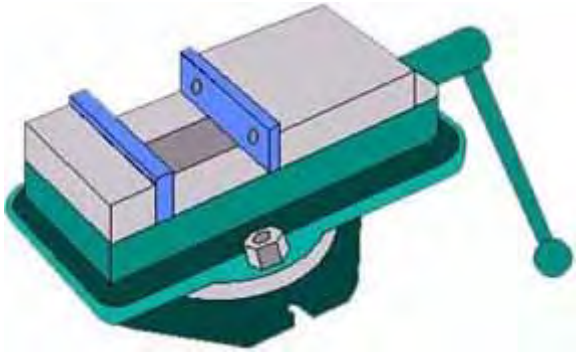


Figure 20. Machine Vice

7.1. Vice Alignment

In the setting up of the vice onto the machine table, the fix jaw of the vice must be set parallel to the machine table using a Parallel Bar and a Dial Indicator as illustrated in figure 21. Adjustments can only be made by using a hide face hammer to correct its position such that a near zero indicator movement is achieved at all positions along the parallel bar.

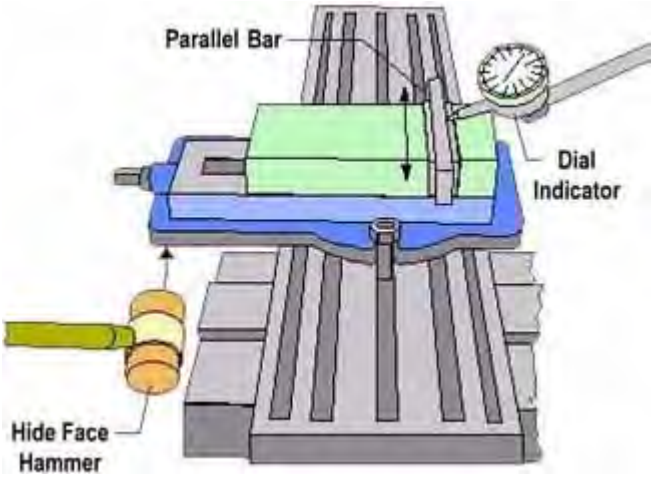


Figure 21. Machine Vice Set-up

7.2. Work Holding Method

In the machining of a complex component, it is usually started off with the milling of a rectangular block. To ensure that each surface of the rectangular block is perpendicular to its neighbouring surfaces, the following points should be noted:-

- The vice jaws and the workpiece must be free from burrs, chips, and cutting fluid.
- Smaller workpiece should be supported by parallel bars to provide the supporting datum.
- Round bar must be placed between the workpiece and the movable jaw to ensure that the workpiece is in perfect contact with the fix jaw.
- The vice handle should be tightened by hand to avoid over clamping of the workpiece as well as the vice. Hide face hammer should be used to assure that the workpiece is in perfect contact with the supporting base.
- On completion of the milling of the first face, the workpiece should be unloaded, deburred, and cleaned before the next operation.
- To machine the second and the third faces, the workpiece should be clamped with its preceding machined surface facing against the fix jaw of the vice.
- Similar clamping method can be applied in the machining of the fourth face.
- Yet it can also be clamped on the vice without the round bar.
- Both ends of the workpiece can be machined with the periphery flutes of the cutter using up cut milling as shown in figure 23.

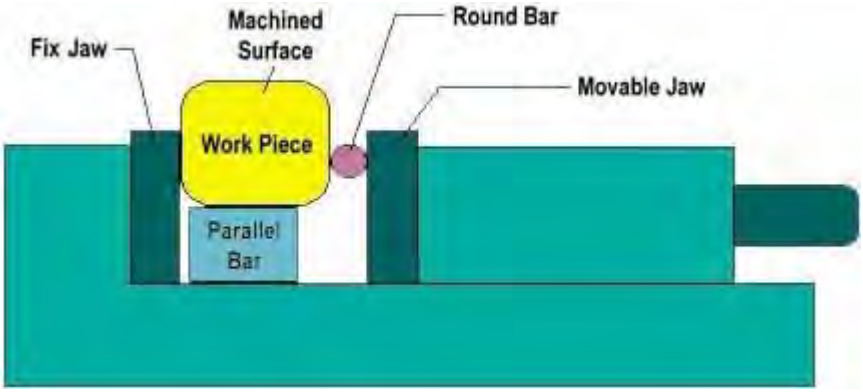


Figure 22. Holding Method by Using a Machine Vice

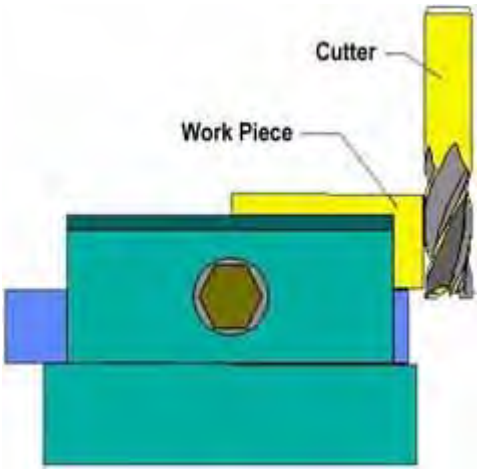


Figure 23. End Surface Milling

8. Safety

Safety practices of a machine shop should be followed. A complete understanding of the Safety Rules would enable the students to identify potential hazards that may occur under different working conditions such that appropriate preventive actions can be taken to avoid the happening of accidents. Emphasis should be given that the eyes of the machine operator must be protected by wearing a face shield (figure 24) to prevent accident that may be caused by chips, cutting fluid, and tool breakage.

Figure 24. Face Shield

Machine operators must also take care of their body such as fingers which keep out of any moving parts, especially the rotating cutter of the machine, to prevent any unnecessary accident hurt. The milling machine must be stopped immediately when any accidence occurred, so the operator must stand near by the control panel of the machine and pays more attention on the operation. Remember the Chinese phrase 'carefully can be driven the boat in thousand year' that you will enjoy the benefits provided by milling.

Annex C: (cont.) EC Declaration of Conformity

In accordance with EN 45014:1998

We	Chester UK Ltd.
of	Clwyd Close, Hawarden Industrial Estate, Manor Lane, Hawarden, Chester, CH5 3PZ, UK
declare that product:	Cobra Mill
Serial number	

is in accordance with:

98/37/EEC	The Machinery Safety Directive and its amending directives
73/23/EC	The Low Voltage Directive and its amending directives
89/336/EEC	The Electromagnetic Compatibility Directive and its amending directives

and has been designed and manufactured to the following specifications:

BS EN ISO 12100-1&2: 2003	Safety of machinery. Basic concepts, general principles for design
BS EN 13128: 2001	Safety of machine tools – Milling machines (including boring machines)
EN 60204-1:1998	Safety of machinery. Electrical equipment of machines. General requirements
EN 61000-6-2:2001	Electromagnetic compatibility (EMC). Generic standards. Immunity for industrial environments
EN 61000-6-4:2001	Electromagnetic compatibility (EMC). Generic standards. Emission standard for industrial environments

I hereby declare that the equipment named above has been designed to comply with the relevant sections of the above referenced specifications. The unit complies with all essential requirements of the Directives.

Signed by:

.....

CE05

Name:	Michael O'Hare
Position:	Managing Director
Done at:	Chester