



T Mill Milling Machine Operation Manual

Chester UK Ltd
Clwyd Close
Hawarden Industrial Park
Hawarden
Chester
CH5 3PZ

Tel: 01244 531631

sales@chestermachinetools.com

www.chestermachinetools.com



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1. Warnings

1. Make sure that the operators read and understand the entire operation manual before starting to use this machine.
2. Always wear approved safety glasses/face shields whilst using this machine.
3. Before starting the machine, make sure that it has been properly grounded.
4. Do not wear ties, rings, watches or other jewellery and roll up sleeves above the elbow. Remove all loose clothing and tie back long hair. Do not wear gloves whilst operating this machine.
5. Keep the floor around the machine clean and free from scrap material, oil and grease.
6. Keep all of the machine guards in place at all times when the machine is in use, if they need to be removed for maintenance purposes, use extreme caution and replace the guards immediately after maintenance has been completed.
7. Do not over reach, maintain a balanced stance at all times so that you do not fall or lean against cutting tools or other moving parts.
8. Only ever make adjustments or carry out any maintenance after the machine has disconnected from the power supply.
9. Use the right tool for the task at hand, so not force a tool or attachment to do a job which it was not designed for.
10. Make sure that the motor switches are in the off position before connecting the machine to the power supply.
11. Keep visitors a safe distance from the work area.
12. Never attempt any operation or adjustment if the procedure is not known or understood.
13. Keep hands and fingers away from all of the rotating parts and cutting tools whilst the machine is in use.
14. Do not attempt to adjust or remove tools during operation.
15. Always keep cutting tools sharp.
16. Keep away from the turning handwheel, especially when operating at high speeds.
17. Only ever pour the correct amount of machine oil into the gearbox and the power feed, do not over fill.
18. Failure to comply with these warnings may cause serious injury.

Attention

Please carefully check the machine when opening the package and make sure that no parts are missing.

Please read the operation manual carefully before installing or adjusting the machine. When the installation is complete, check all of the handles, switches etc. and carry out a trial run of the machine before putting it into operation.

Be aware of the safety measures for the electrical system and the operation procedure.

Work Environment

1. The elevation of the workshop should be below 2000m.
2. Do not operate this machine in areas prone to conductive dust.
3. Do not install this machine close to explosive materials.

4. Keep the work area free from corrosive gas or steam which may corrode the metal or damage the insulation.
5. Keep this machine away from large sources of impact or vibration.

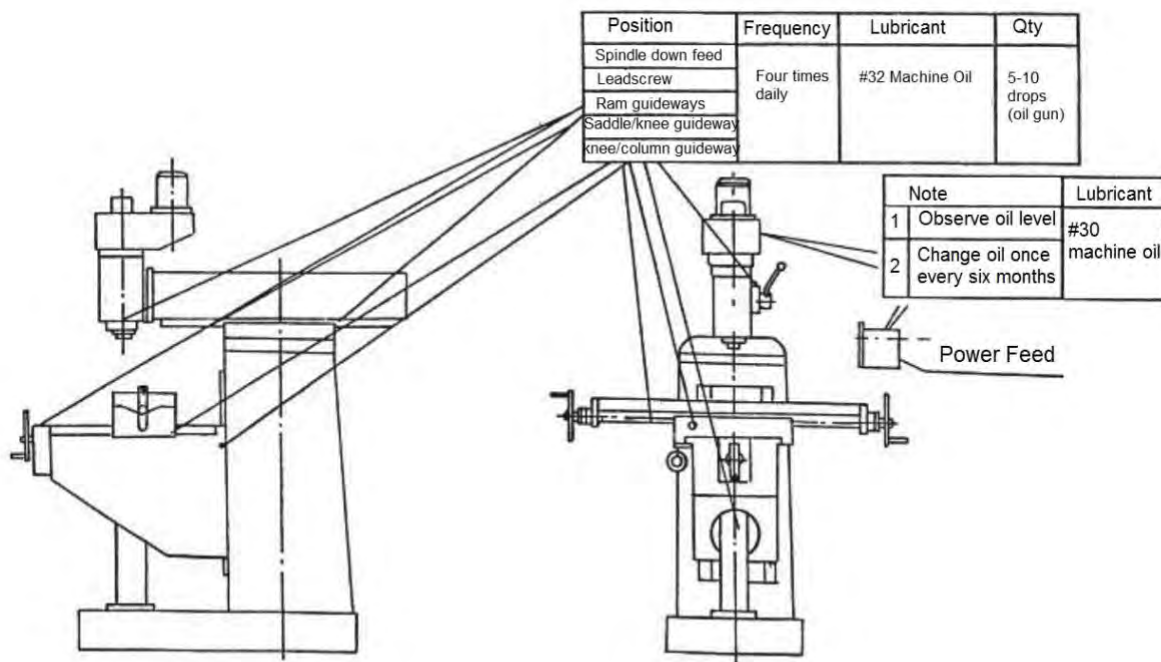
Operating Instructions

1. Before starting the machine, carefully read the operation manual and be fully acquainted with the features and functions of this machine.
2. The operator should be familiar with all of the safety rules and points for attention for running and maintaining this machine.
3. Remove all of the anti-rust oil or grease from the machine, fill the machine with lubricant and cover the bare metal surfaces with a thin layer of machine oil to protect from rust. Run the machine from low to high speeds and check that the function is normal.
4. Check that the grounding is reliable and has been properly connected before operating this machine.

Lubrication

Lubricate the sliding and rotating parts before the trial run.

Pour No.40 machine oil into the gearbox and power feed until the level of oil reached the line in the oil sight glass before completing an overall check on the machine.



Lubrication Diagram

2. Usage

This machine is used for cutting metals and non-metals. It is suitable for drilling, boring, milling and is used for instrument making, machining and repairing on single parts or batch production.

3. Use and Maintenance

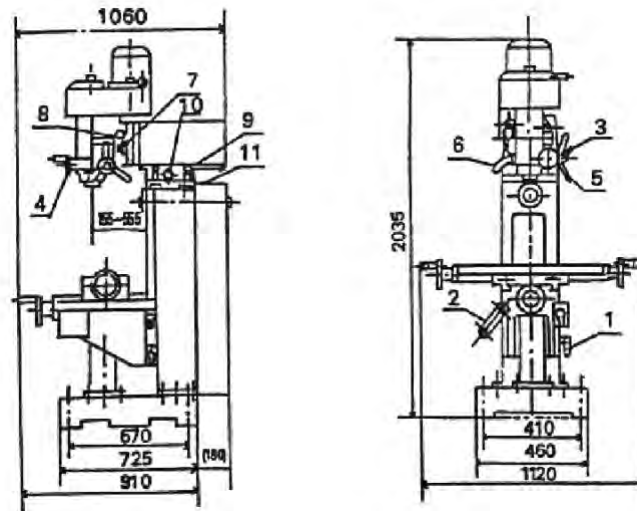


Fig 1

1. The user must read this operation manual carefully, they must know the structure and function of every handle and switch, the transmission system and the lubrication requirements well.
2. Before operating the machine, inspect the normal conditions of the column locking handle, the spindle sleeve and the electrical components. Make sure that the machine has been correctly grounded.
3. When the position of the spindle box to the table needs to be adjusted, two clamping levers (1) on the right side of the knee must be loosened, the table can then be raised by using the knee handle. Lock the table in position once the table is at the required height.
4. This machine has been fitted with a micro feed function, to use this function, turn the locking bolt (3) located on the right side of the head to engage the micro feed gear. Use the handwheel (4) located on the front of the head to micro feed the spindle. The spindle can reverse for tapping using the switch equipped on the left side of the head (this function is only available on the 3 phase model).
5. The spindle feed lever (5) must be disengaged from the micro feed gear during drilling and tapping. When the drilling and tapping job is finished, release the spindle feed lever to allow the lever to reset automatically. The elastic force can be adjusted after the loosening the screw located in the bottom of the spindle box, the spring can be turned to a new position. When milling, the spindle sleeve

clamping lever (6) should be tightened to lock the spindle. To obtain the best machining finish, choose the correct cutting tool and bring the table with the workpiece up to meet the cutting tool.

6. The boring function of this machine can be realized after the correct tools have been equipped. For ease of use and for the best results, we recommend using the micro feed function.
7. The spindle box can be turned $\pm 90^\circ$ in the vertical plane. When turning the spindle box, loosen the three nuts connecting the spindle box to the ram and turn the spindle by using the micro worm (8) before retightening into position. The head can also be turned $\pm 45^\circ$ in the vertical plane.
8. The spindle box can also be moved forwards and backwards by moving the ram. Loosen the two clamping bolts (9) located on the right side of the ram and turn the gear shaft (10) to move the ram and spindle box. Tighten the clamping bolts when they are in position.
9. The spindle box can be turned 360° around the column in the horizontal plane. Loosen the 4 clamping nuts (11) under the ram, the ram can then be turned into the correct position before re-tightening the 4 clamping nuts.
10. The spindle can be started by using the switch located on the right side of the knee.
11. The horizontal milling spindle can be realized by turning the vertical spindle box 90° . To use the tool shaft and jack supplied, the spindle box will need to be turned 180° .
12. If the machine does not operate correctly or creates an irregular noise, turn the machine off immediately and do not restart until the malfunction has been resolved.

4. Main Parameters

Drilling Capacity	25mm
End Mill Capacity	25mm
Face Mill Capacity	100mm
Table Size	240 x 1000mm
Cross Travel	230mm
Vertical Travel	600mm
Longitudinal Travel	780mm
Spindle Taper	ISO30
Spindle Stroke	130mm
T-slot Size	14mm
Spindle Speeds	38-1350rpm
Headstock Tilt	±90°
Quill Travel	120mm
Horizontal Spindle Taper	ISO30
Number of Speeds	Variable 2 Speeds
Cross Feed Rate	Manual
Vertical Feed Rate	Manual
Rapid Cross Feed Rate	Manual
Vertical Cross Feed Rate	Manual
Motor	1.5kW (2hp)
Overall Dimensions	2200 x 1250 x 1450mm
Net Weight	850Kg

5. Transmission System and Change of Speed

1. The transmission of power from the motor to the spindle is provided through two v-belts.
2. Power is transmitted through the gears on the motor and sliding gears on the spindle, when changing the speed, stop the machine and move the position of the handles. Fine adjustment of the speed is then available by using the potentiometer on the side of the vertical head.

6. Lubrication and Roller Bearings

1. Each roller bearing to be lubricated is shown in the table below, the bearings should be lubricated with #2 grease.
2. The spindle, sleeve, column and table etc. should be lubricated as per Fig 1. At the correct intervals.

Position No.	Location	Bearing	Model	Qty
1	Spindle and Belt Pulley	Single Dust Defence Radial Ball Bearing	60109/p6	2
2	Spindle Sleeve	Single Dust Defence Radial Ball Bearing	60109/p6	1
3	Spindle Sleeve	Single Tapered Roller Bearing	2007110/p6	1
4	Middle Wheel	Single Dust Defence Radial Ball Bearing	60103	4
5	Spindle	Single Tapered Roller Bearing	2007111/p6	1
6	Spindle	Single Tapered Roller Bearing	7308E/p6	1
7	Wheel Shaft	Single Dust Defence Radial Ball Bearing	60105	2
8	I, II, III	Single Dust Defence Radial Ball Bearing	60204/p6	6

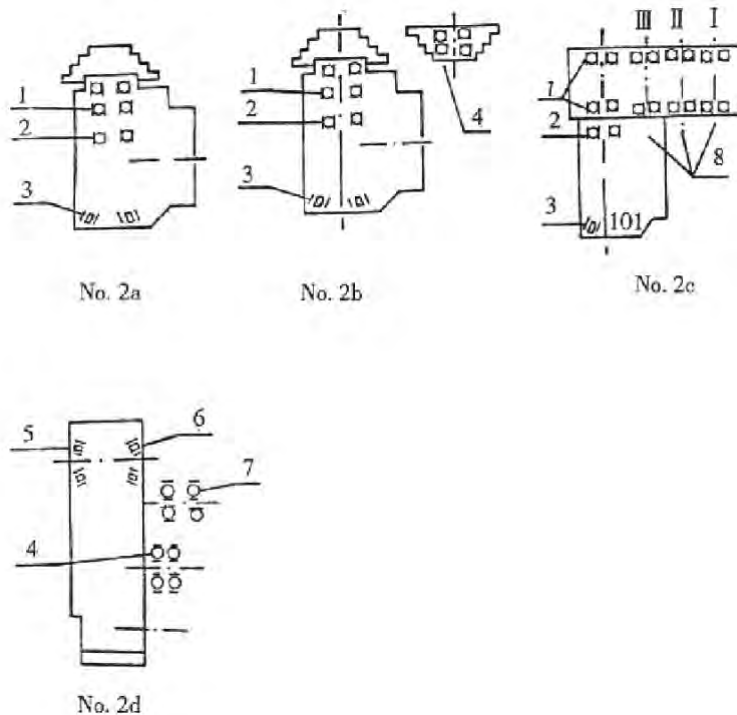


Fig 2 Roller Bearing Position

7. Electrical System

The electrical control system has been installed on the left side of the machine head, the electrical system of the horizontal spindle has been equipped under the right front. The electrical system supplied has been specked to make machining easy and safe to operate.

8. Transport

When transporting the machine, it must be moved and positioned carefully. Do not knock the machine when lifting or lowering.

9. Troubleshooting

1. If the motor does not run, inspect the connection to the machine or check the power source.
2. If the radial run out of the spindle is too large and is noisy and producing excessive heat, check to see if the spindle is loose. If the spindle is loose, adjust the nut on the spindle assembly.
3. If the machine wobbles, check the motor mounts, the levers, nuts, screws and the machine head support on the spindle, if these are loose adjust and lock into position.
4. If the spindle does not lower or raise easily, inspect the machine to see if there is

any scrap material between the spindle sleeve and gear shaft or fatigue in the spindle. Clean these parts and apply oil and readjust the spring.

5. If the knee does not lift steadily or it is noisy, check the gib strips, if they are loose, clean and adjust the gib to the correct position.
6. If the gearbox is noisy, stop the machine immediately and check the condition of the oil.
7. Make sure that the machine is removed from the power supply before carrying out any maintenance.

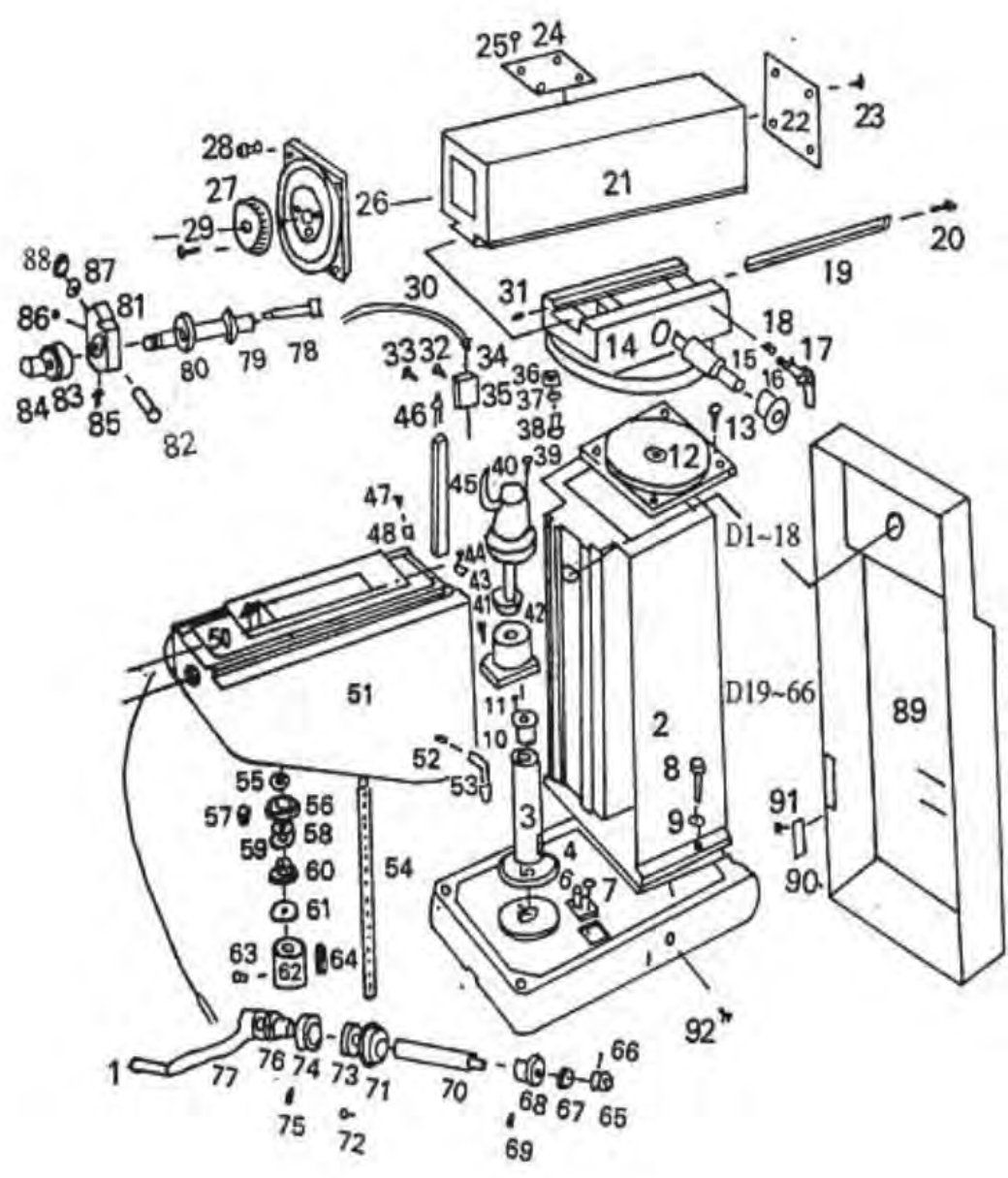
Notice:

The spindle box can be swiveled to $\pm 45^\circ$, when operating, please loosen the three retaining nuts and pay attention, these nuts only need to be released by 1 pitch, the swivel screw lever can then be moved with a socket wrench to incline the spindle box to the required angle. Turning the nut clockwise will turn the head counter-clockwise and vice versa. When turning the head, pay attention to the following:

1. When turning the head from the horizontal to vertical positions, you can help the movement by pushing the upper spindle box and twist the head.
2. When turning the spindle box from the vertical to horizontal positions, you can help by pushing on the upper spindle box to twist the head.

10. Parts List and Diagram

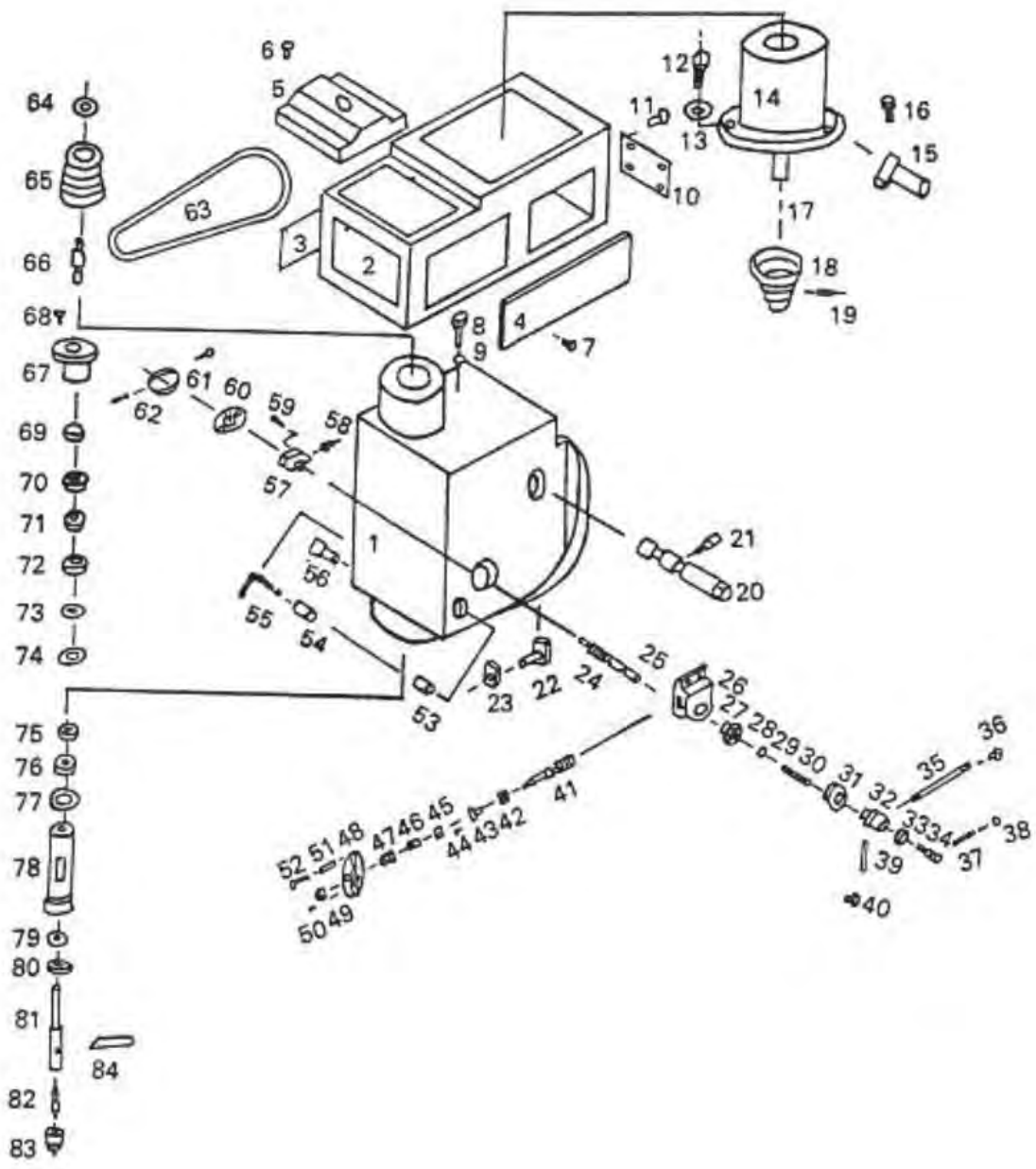
Column Parts



No.	Name	Qty
A1	Base	1
2	Column	1
3	Elevating Screw Housing	1
4	Screw	4
5	Washer	4
6	Connect Tube	1
7	Screw	2
8	Bolt	6
9	Washer	6
10	Collar	1
11	Screw	4
12	Hold Support	1
13	Screw	6
14	Around Bracket	1
15	Feed Shaft	1
16	Collar	1
17	Clamp Bolt	2
18	Clamp Block	2
19	Bevel Iron	1
20	Screw	1
21	Overarm	1
22	Cover	1
23	Screw	4
24	Cover	1
25	Screw	4
26	Hold Bracket	1
27	Gear	1
28	Screw	4
29	Bolt	2
30	Nozzle	1
31	Oil Cup	2
32	Screw	2
33	Bolt	1
34	Connect Tube	1
35	Hold Bracket	1
36	Nut	4
37	Washer	4
38	T-Bolt	4
39	Bolt	4
40	Electric Pump	1
41	Bolt	4
42	Support	1
43	Dust Cover	1
44	Screw	2
45	Bevel Iron	1

46	Adjust Screw	1
47	Screw	2
48	Wiper Plate	1
49	Wiper Plate	1
50	Wiper Plate	2
51	Knee	1
52	Clamp Block	2
53	Clamp Bolt	2
54	Vertical Leadscrew	1
55	Circular Nut	2
56	Conical Gear	1
57	Key	1
58	Ball Bearing	1
59	Adjust Washer	1
60	Collar	1
61	Ball Bearing	1
62	Nut	1

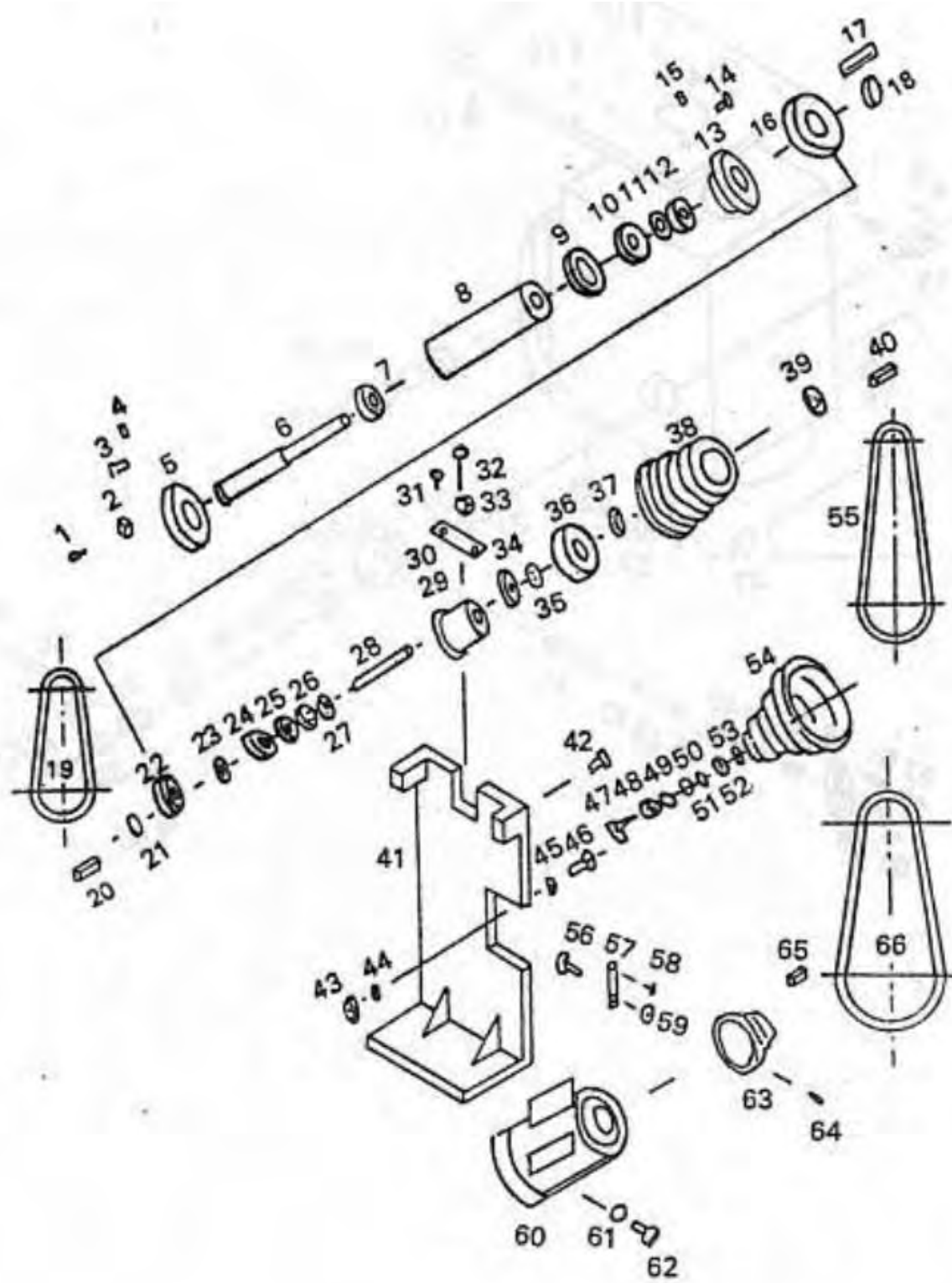
Head



No.	Name	Qty
C1	Spindle Box	1
2	Motor base	1
3	Left Cover	1
4	Right Cover	1
5	Pulley Cover	1
6	Screw	4
7	Screw	4
8	Bolt	6
9	Washer	6
10	Cover	1
11	Screw	4
12	Bolt	2
13	Washer	1
14	Cover	1
15	Screw	1
16	Bolt	2
17	Washer	1
18	Motor	1
19	Headless seat screw	1
20	Worm Gear	1
21	Pin	1
22	T-Bolt	3
23	Nut	1
24	Feed Shaft	1
25	Key	1
26	Worm Box	1
27	Screw	3
28	Bevel Gear	1
29	Retaining Ring	1
30	Spring	1
31	Scale Ring	1
32	Handle Bracket	1
33	Cover	1
34	Bolt	1
35	Handle Bar	3
36	Knob	3
37	Handle	1
38	Handle Collar	1
39	Scale	1
40	Rivet	2
41	Worm Gear	1
42	Ball Bearing	1
43	Small Cover	1
44	Screw	3
45	Ball Bearing	1

46	Collar	1
47	Scale Ring	1
48	Handwheel	1
49	Handle Collar	1
50	Handle	1
51	Nut	1
52	Key	1
53	Clamp Block	1
54	Clamp Block	1
55	Clamp Handle	1
56	Screw	1
57	Spring Seat	1
58	Screw	1
59	Screw	1
60	Spring Plate	1
61	Spring cap	1
62	Screw	2
63	V Belt	1
64	Nut	1
65	Spindle Pulley	1
66	Spring Sleeve	1
67	Collar	1
68	Screw	3
69	Retaining Ring	3
70	Ball Bearing	1
71	Collar	1
72	Ball Bearing	1
73	Retaining Ring	1
74	Retaining Ring	1
75	Pulley Nut	1
76	Washer	1
77	Ball Bearing	1
78	Sleeve	1
79	Ball Bearing	1
80	Dust Cover	1
81	Spindle	1
82	Spindle Bar	1
83	Drill Chuck	1
84	Wedge Shifter	1

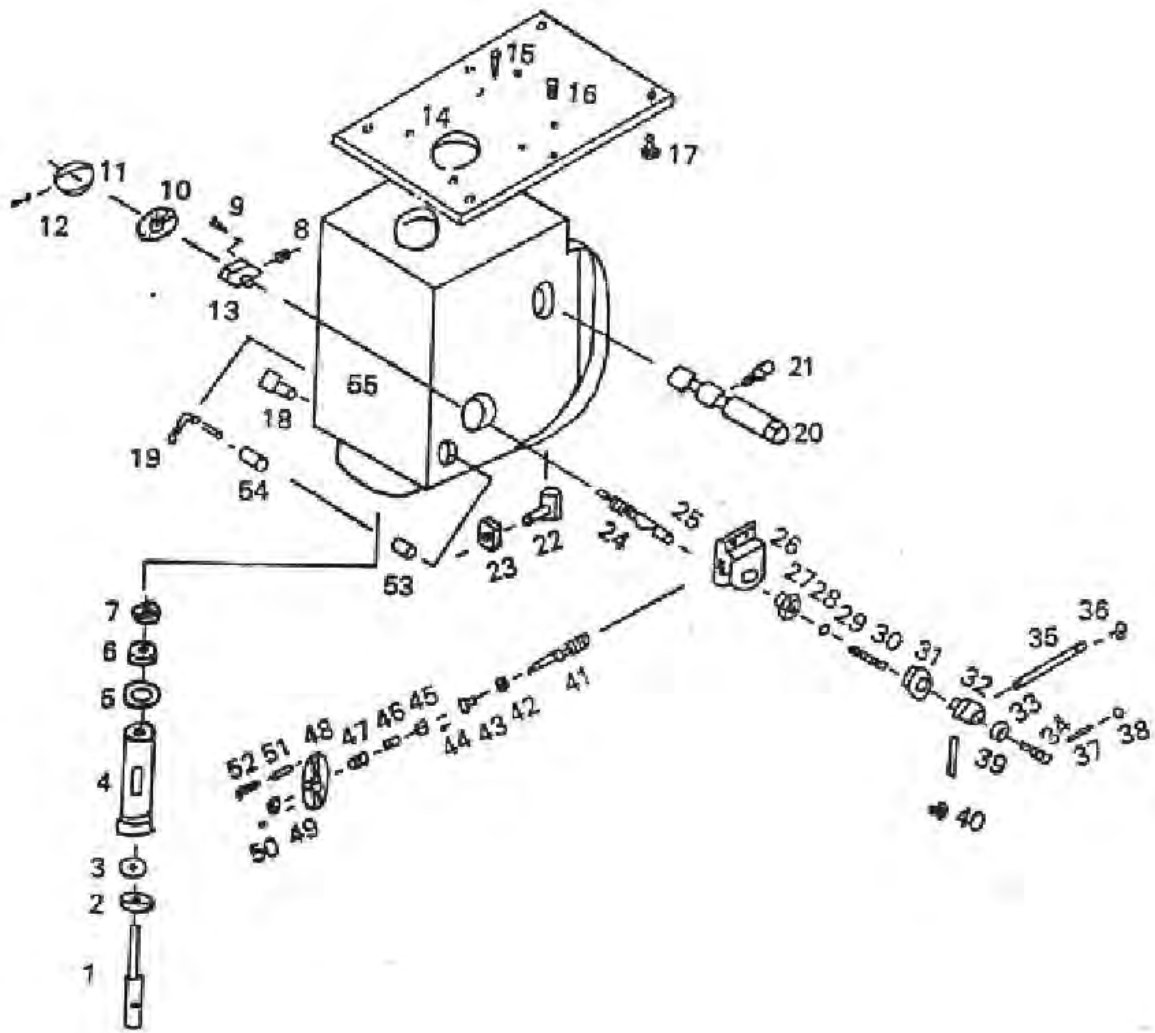
Horizontal Spindle



No.	Name	Qty
D1	Screw	4
2	Key	2
3	Screw	4
4	Oil Cup	1
5	Cover	1
6	Spindle	1
7	Ball bearing	1
8	Collar	1
9	Ball bearing	1
10	Washer	1
11	Washer	1
12	Nut	1
13	Cover	1
14	Screw	4
15	Oil Cup	1
16	Spindle Pulley	2
17	Key	1
18	Retaining Ring	1
19	V Belt	2
20	Key	1
21	Retaining Ring	1
22	Wheel	1
23	Ball bearing	1
24	Ball bearing	1
25	Ball bearing	1
26	Collar	1
27	Ball bearing	1
28	Small Shaft	1
29	Collar	1
30	Support	1
31	Screw	2
32	Bolt	1
33	Nut	1
34	Retaining Ring	1
35	Retaining Ring	1
36	Nut	2
37	Retaining Ring	1
38	Pulley	1
39	Retaining Ring	1
40	Key	1
41	Motor base	1
42	Screw	6
43	Nut	1
44	Washer	1
45	Washer	1

46	Small Shaft	1
47	Connect	1
48	Retaining Ring	1
49	Ball bearing	1
50	Collar	1
51	Ball bearing	1
52	Retaining Ring	1
53	Retaining Ring	1
54	Pulley	1
55	V Belt	1
56	Adjust Screw	1
57	Support	1
58	Screw	1
59	Nut	1
60	Motor	1
61	Washer	4
62	Bolt	4
63	Motor Wheel	1
64	Screw	1
65	Key	1
66	V Belt	1

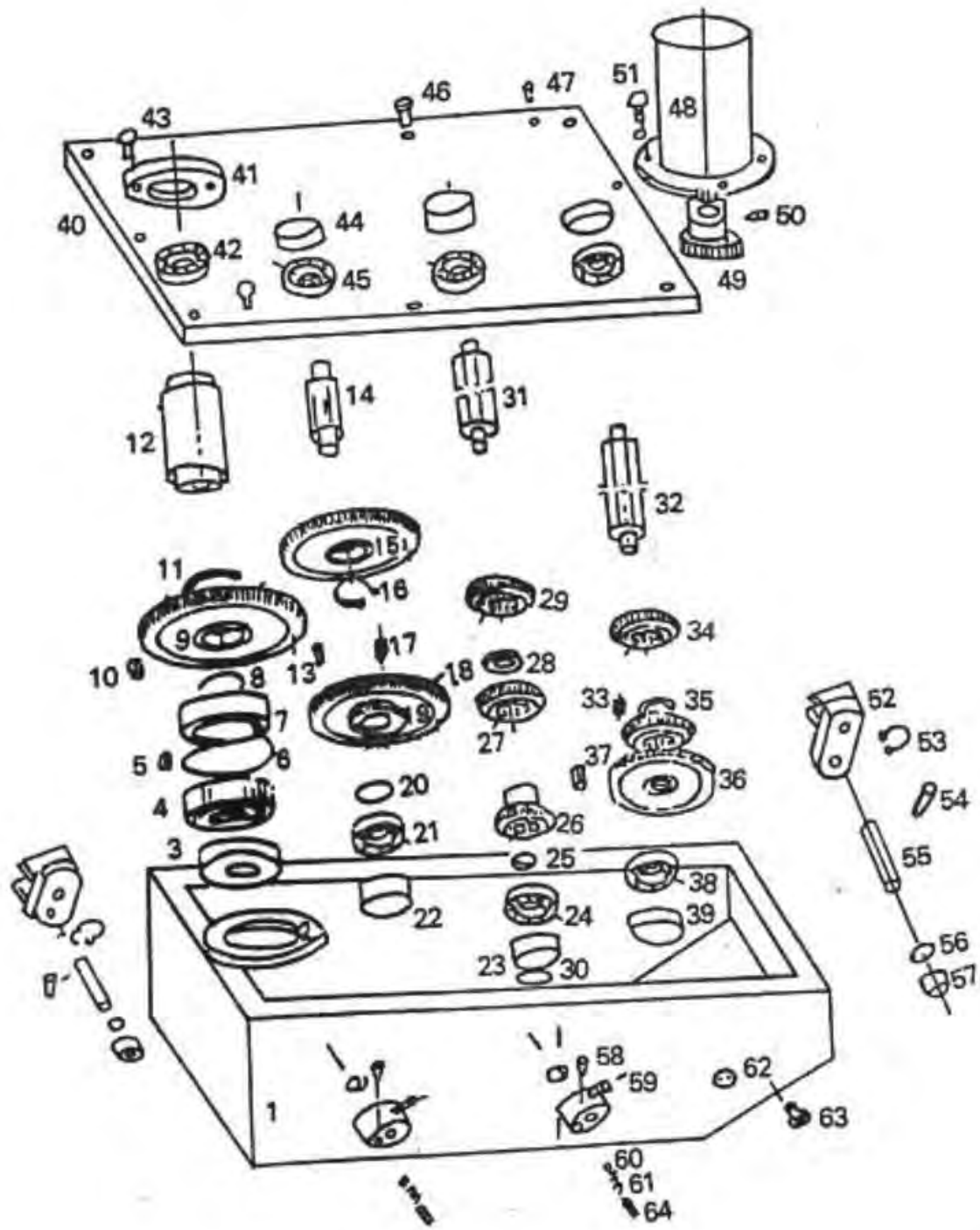
Gearbox



No.	Name	Qty
E1	Spindle	1
2	Dust Cover	1
3	Bearing	1
4	Sleeve	1
5	Bearing	1
6	Washer	1
7	Nut	1
8	Screw	1
9	Screw	1
10	Spring Plate	1
11	Spring Cap	1
12	Screw	1
13	Spring Seat	1
14	Base	1
15	Pin	2
16	Screw	6
17	Screw	6
18	Bolt	1
19	Clamp Handle	1
20	Worm Gear	1
21	Pin	1
22	T-Bolt	3
23	Nut	3
24	Feed Shaft	1
25	Key	1
26	Worm Box	1
27	Screw	3
28	Bevel Gear	1
29	Crescent Ring	1
30	Spring	1
31	Scale Ring	1
32	Handle Bracket	1
33	Cover	1
34	Bolt	1
35	Handle Bar	3
36	Knob	3
37	Handle	1
38	Handle Collar	1
39	Scale Ring	1
40	Rivet	2
41	Worm Gear	1
42	Bearing	1
43	Small Cover	1
44	Screw	3
45	Bearing	1

46	Collar	1
47	Scale Ring	1
48	Handwheel	1
49	Handle	1
50	Handle	1
51	Nut	1
52	Key	1
53	Clamp Block	1
54	Clamp Handle	1
55	Box	1

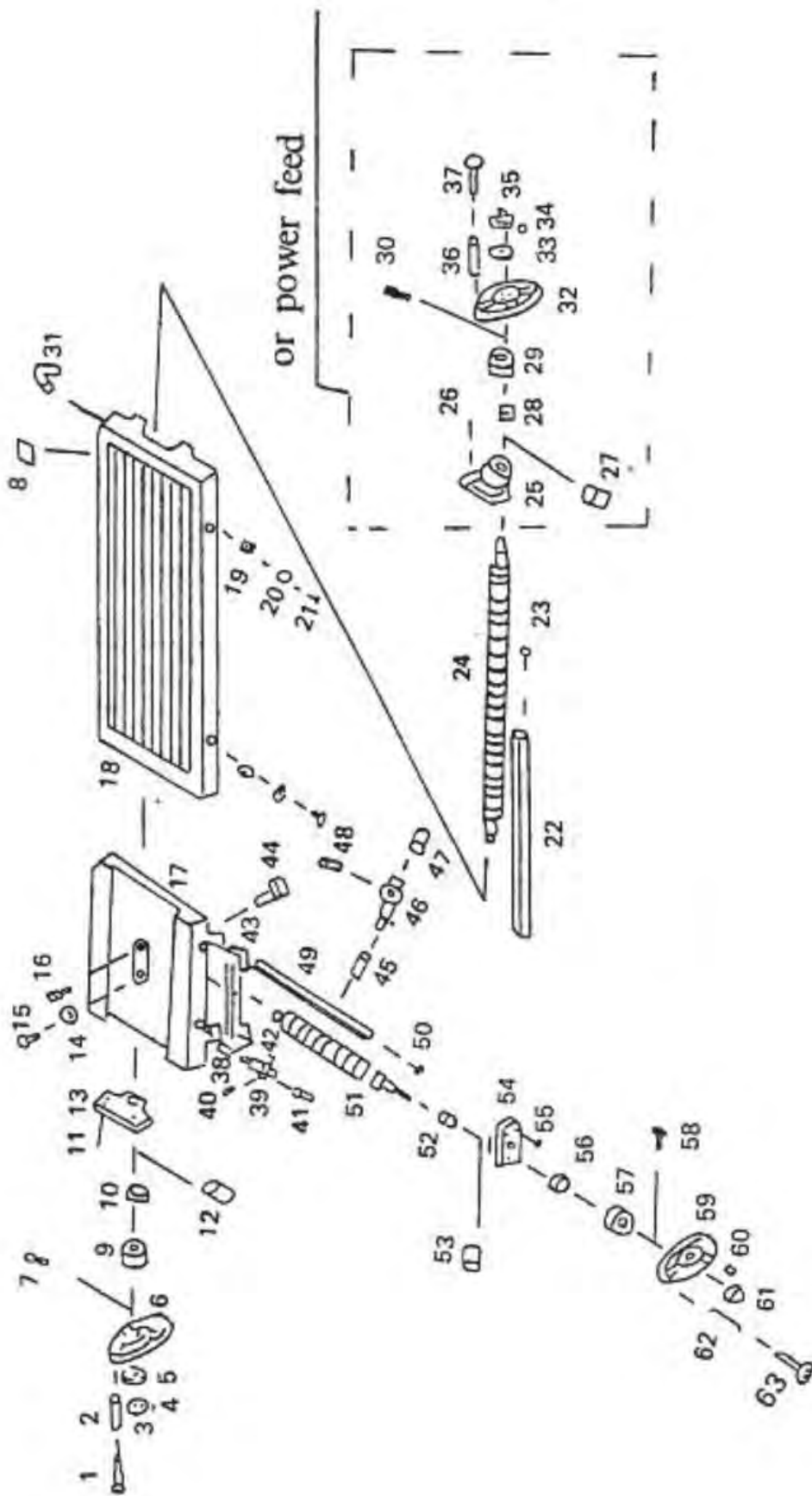
Gear Head



No.	Name	Qty
F1	Box	1
2	Collar	1
3	Oil Seal	1
4	Ball bearing	1
5	Screw	1
6	O-Ring	1
7	Collar	1
8	Retaining Ring	1
9	Gear	1
10	Key	1
11	Retaining Ring	1
12	Shaft	1
13	Key	1
14	Driving Shaft	1
15	Gear	1
16	Retaining Ring	1
17	Screw	1
18	Gear	1
19	Gear	1
20	O-Ring	2
21	Ball bearing	1
22	Collar	1
23	Collar	1
24	Ball bearing	1
25	Retaining Ring	1
26	Gear	1
27	Gear	1
28	Collar	1
29	Gear	1
30	O-Ring	1
31	Driving Shaft	1
32	Driving Shaft	1
33	Screw	1
34	Gear	1
35	Gear	1
36	Gear	1
37	Key	1
38	Bearing	1
39	Collar	1
40	Box Cover	1
41	Collar	1
42	Bearing	1
43	Screw	4
44	Collar	3
45	Bearing	3

46	Screw	6
47	Pin	2
48	Motor	1
49	Gear	1
50	Screw	1
51	Bolt	4
52	Lift Fork	2
53	Crescent Ring	2
54	Pin	2
55	Shaft	2
56	O-Ring	2
57	Collar	2
58	Pin	2
59	Handle	2
60	Ball	2
61	Spring	1
62	Oil Position	1
63	Bolt	1
64	Screw	2

Table

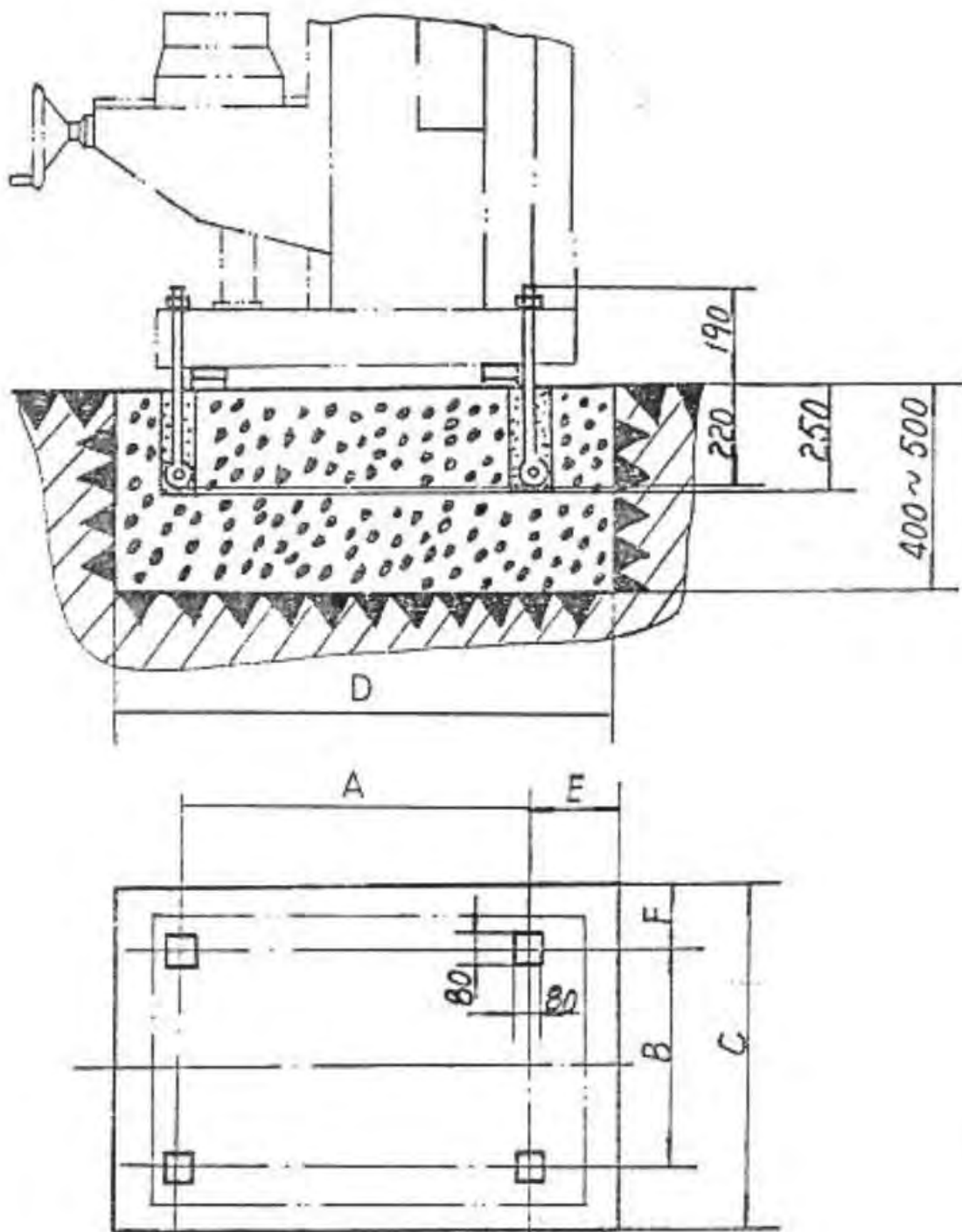


No.	Name	Qty
G1	Handle	1
2	Handle Collar	1
3	Nut	1
4	Key	1
5	Washer	1
6	Handwheel	1
7	Screw	1
8	Oil Cover	1
9	Scale Ring	1
10	Ball Bearing	1
11	Screw	1
12	Oil Cup	1
13	Support	1
14	Washer	1
15	Screw	1
16	Nut	1
17	Saddle	1
18	Table	1
19	Screw Bracket	2
20	Dog	2
21	Screw	2
22	Long Bevel Iron	1
23	Adjust Screw	1
24	Ball Screw	1
25	Support	1
26	Screw	4
27	Oil Cup	1
28	Ball Bearing	1
29	Scale Ring	1
30	Screw	1
31	Connect Tube	1
32	Handwheel	1
33	Washer	1
34	Key	1
35	Nut	1
36	Handle Collar	1
37	Handle	2
38	Clamp Block	2
39	Pin	2
40	Screw	2
41	Hand Board	2
42	Screw	2
43	Wiper Plate	2
44	Nut	1
45	Clamp Block	2

46	Screw	2
47	Hand Board	2
48	Pin	2
49	Bevel Iron	1
50	Adjust Screw	1
51	Ball Screw	1
52	Ball Bearing	1
53	Oil Cup	1
54	Support	1
55	Screw	1
56	Ball Bearing	1
57	Scale Ring	1
58	Screw	
59	Handwheel	1
60	Key	1
61	Nut	1
62	Handle Collar	1
63	Handle Bar	1

Installation

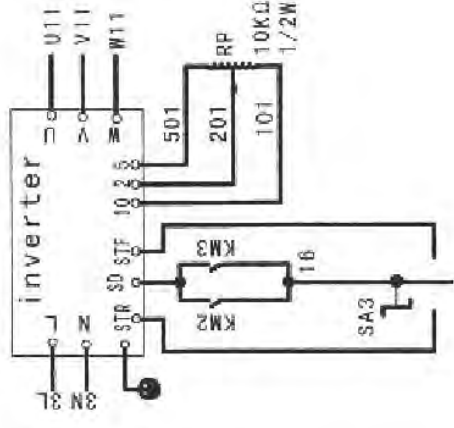
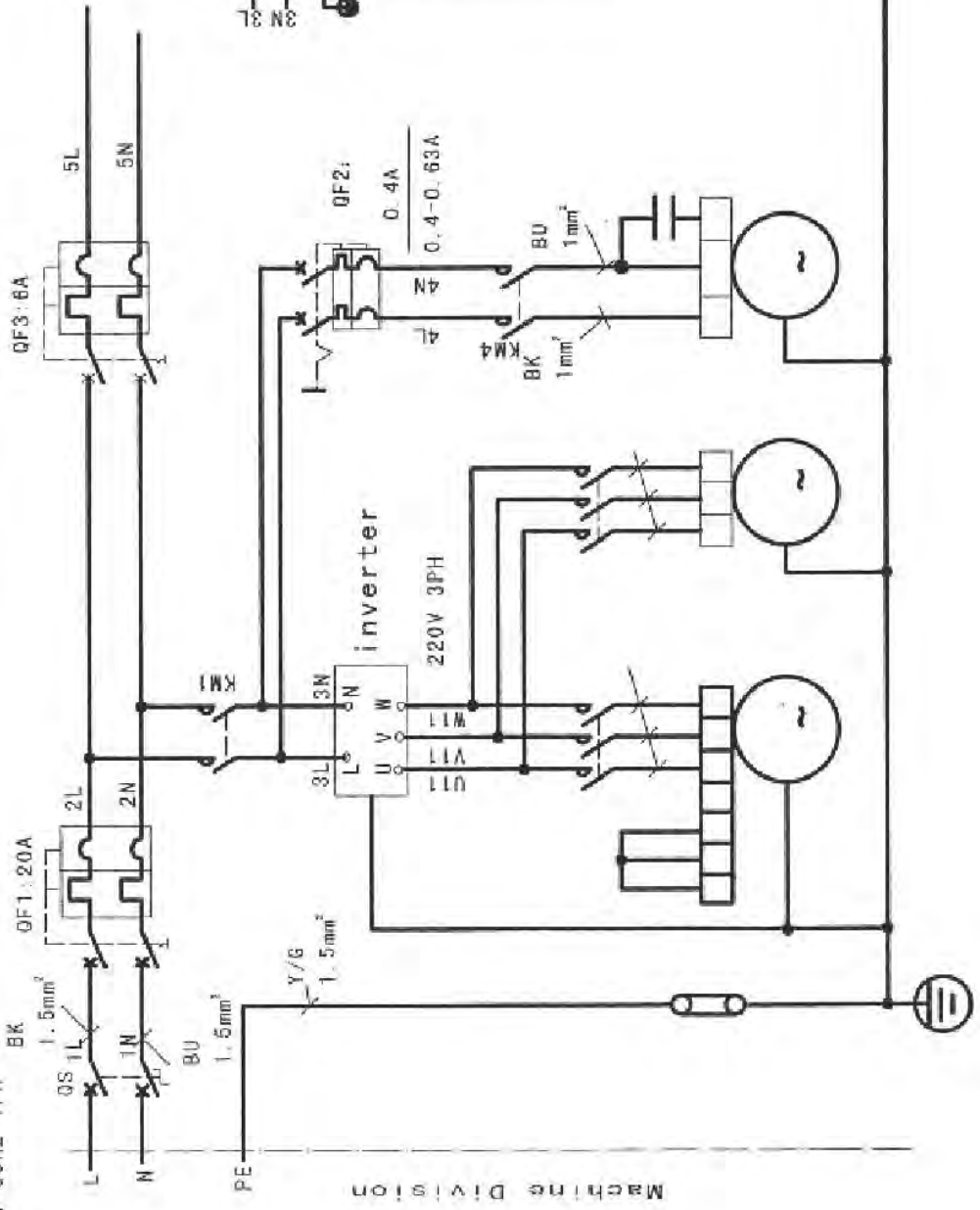
Foundation Plan



A	B	C	D	E	F
845	466	760	1285	220	150

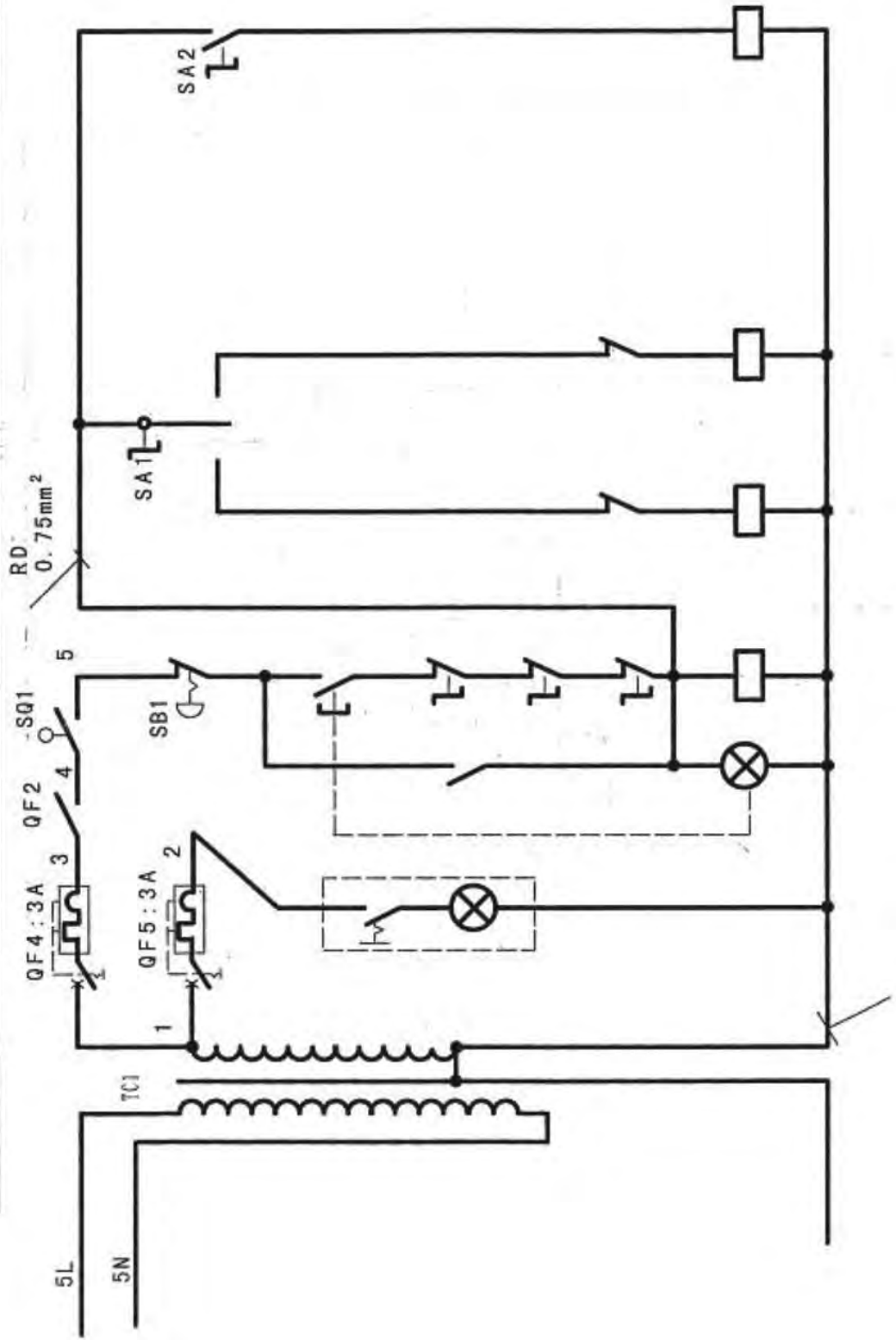
Power switch	Vertical speed		Horizontal		Coolant
	CW	CCW	CW	CCW	

240V 50Hz 1PH BK



Machines Division

Transformer	Light	E. stop Protection	Vertical control	Horizontal control	Coolant control
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Transformer	Digital readout		X-power feed
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