Horizontal CNC LATHE

Operation Manual

Model: CK6180

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2 Technical Specification

2.1 Main Parameters

2.1.1 Max Swing Over Bed	800mm
2.1.2 Max Turning Dia. of Work piece	540mm
2.1.3 Distance Between Centers	1000/1500/2000/3000mm
2.1.4 Spindle Bore	Φ86&Φ105mm(op.)
2.1.5 Max Travel Distance（X-axis）	405mm

2.2 Spindle

2.2.1 Cone of Spindle Bore, Morse Taper	A2-8&A2-11(OP.)
2.2.2 Range of Spindle Speeds:	30-100,100-500,150-1000RPM

2.3 Feeding

2.3.1 Rapid Traverse

X-axis（Radius）	4m/min
Z-axis	6m/min

2.3.2 Min Increment Input

X-axis	0.001mm
Z-axis	0.001mm

2.3.3 Min Increment Output

X-axis	0.001mm
Z-axis	0.001mm

2.3.4 servo motor	Fanuc/Siemens/GSK or others
X-axis	12β (Fanuc)
Z-axis	22β(Fanuc)

2.3.4 The positioning device are controlled by programming or limit switches.

2.4 Tool Post

2.4.1 Number of Tool Post Stations	4 or 6/8/10(optional.)
2.4.2 Size of Tool Shank	32mm×32mm

2.5 Tail Stock

2.5.1 Dia. of Tailstock Quill	102mm
2.5.2 Max Range of Tailstock Quill	245mm
2.5.3 Taper of Tailstock Quill	MT5

2.6 Lubrication System

2.6.1 The bearings of spindle and lead screw should be lubricated regularly with the grease and oil for high-speed application.

2.6.2 The important surfaces, such as the bed slide way and carriages will be lubricated automatically by central lubrication pump according to travel distance on X/Z axis. Or you can setup your only lubrication distance according to frequency of operation time.

2.6.3 The sliding surfaces including the lead screw rod, controlling rod, tail should quill must be lubricated regularly by hand oil gun before or after each work shift.

2.6.4 Lubrication set-up on Fanuc controller

C0 = 300 T28 = 10s

2.6.5 Lubrication set-up on Siemens controller

X33050 = 1 Z33050 = 1 14510 (25) = 100 (0.1S)

14510 (26) = 500 (mm)

2.6.6 Lubrication type and frequency:

Assembly	Part	Method	Lubricant	Interval
Headstock	Spindle gears and bearings for CK6166/CK6180	Oil bath	Machine oil	6 month
Carriage slide	Bed way slides	Auto	Machine oil	Auto feed
Cross slide	Slides and screws	Auto	Machine oil	Auto feed
Tailstock	Quill and screw	Oil Can	Machine oil	Once per shift
Feed and lead screw	Screws and bearings	Auto	Machine oil	Auto feed

2.6.7 Lubrication System

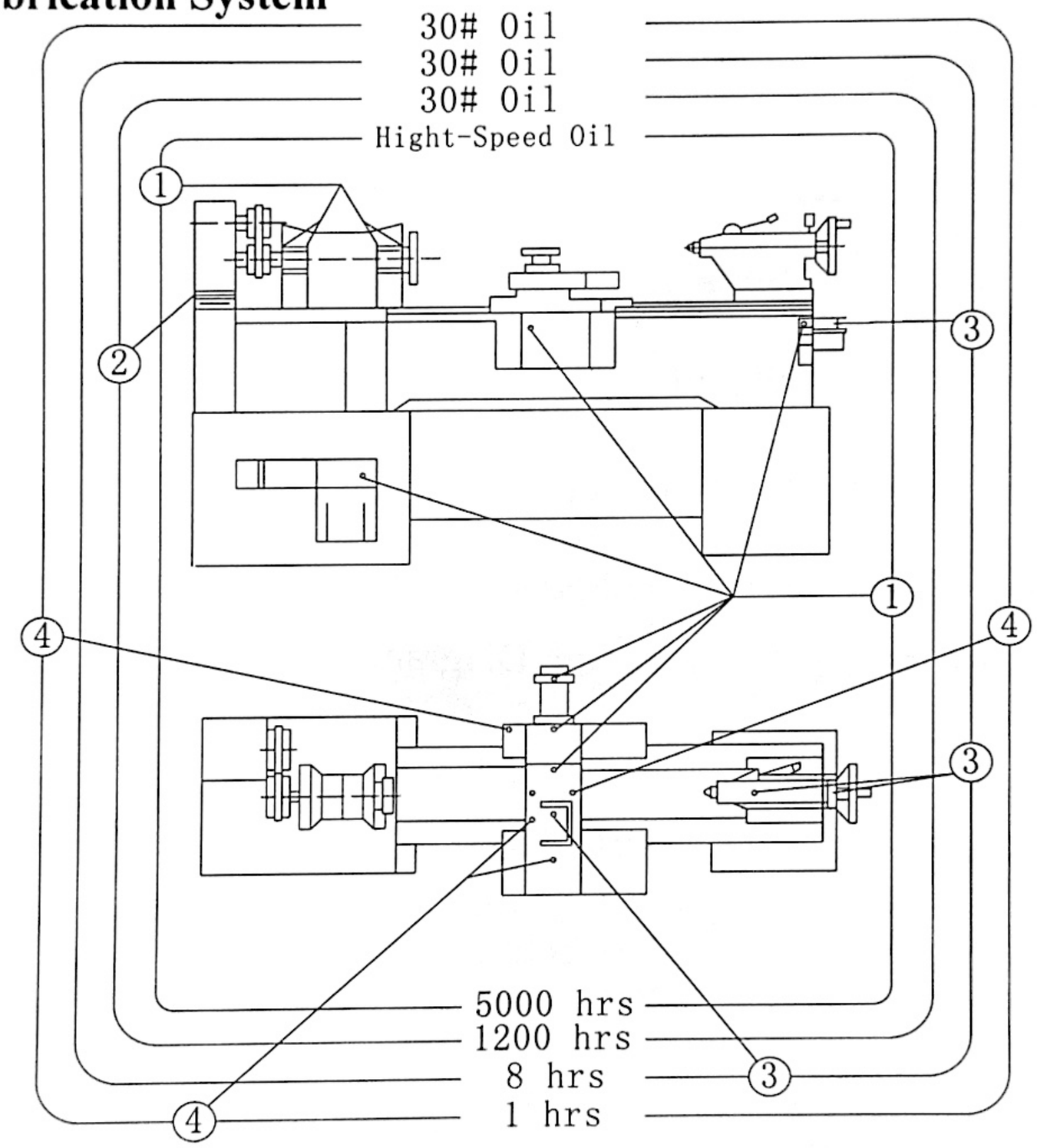


Fig 2-6-1 Lubrication System

2.6.8 The nuts used for supporting the lead screw will be lubricated automatically by the lubrication station periodically through the manifold. The bearings on the two ends should be lubricated with the grease, and refer to the item 2-6-1

2.6.9 The tailstock quill and lead screw should be lubricated by the oil gun.

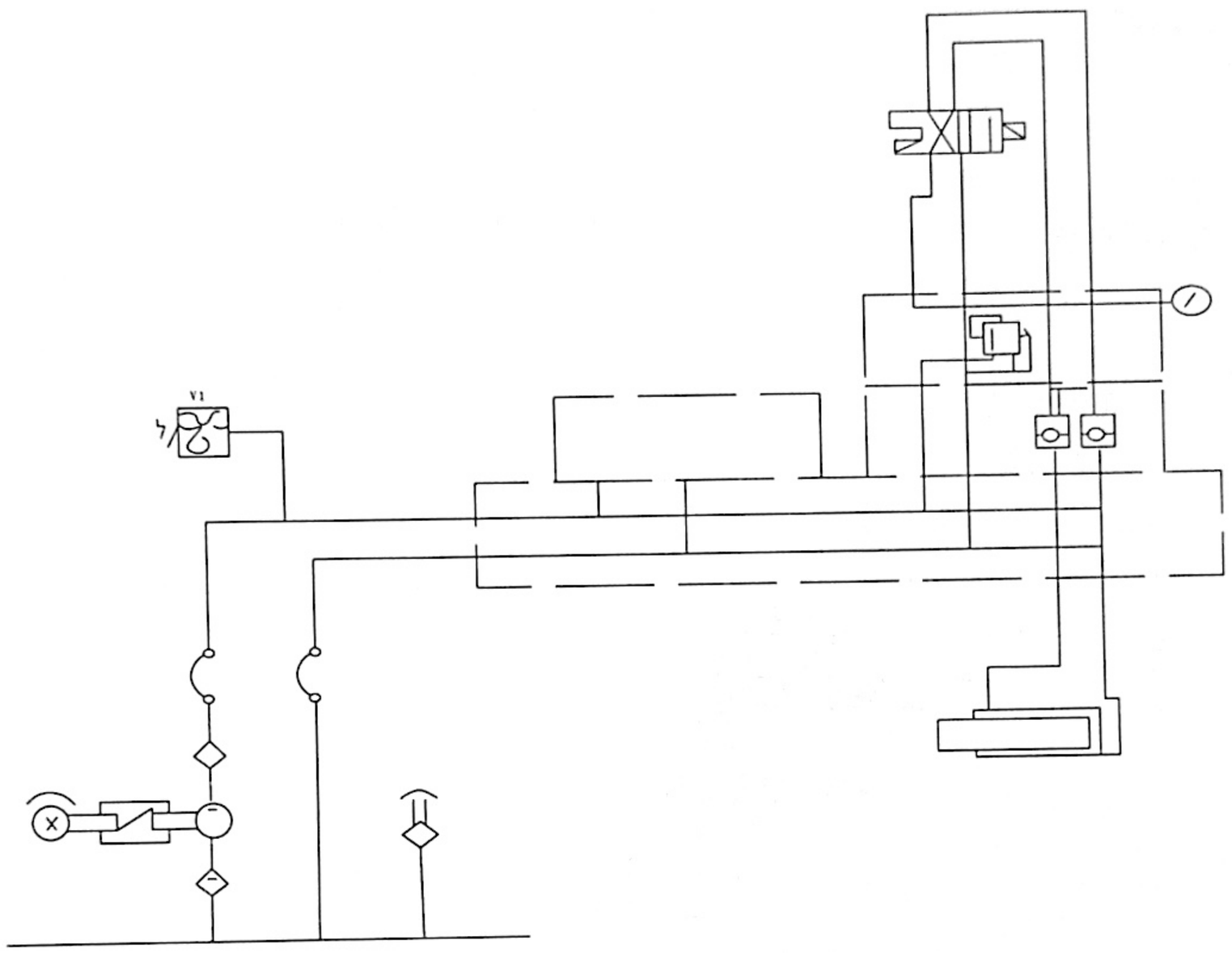


Fig 2-6-2 Hydraulic System & Principium Diagram

2.7 Cooling System

2.7.1 Cooling Pump　　2.4MPa，66L, 370W

2.7.2 Flux　　23L/min

2.8 Power Supply

2.8.1 A/C Power Supply: 380V/50HZ/3PH or under customer requested.

2.8.2 Main Motor　　11KW or 15KW (op.)

2.9 machine Sizes（LXWXH）

3900X1600X1830MMmm (2m)

2.10 Net Weight　　4800KGS (2m)

2.12 Spindle Speed Tables

Frequency Transducer Table（Range：20HZ～100HZ）

Low Speed	Middle Speed	High Speed
30～100	100～150	150～1000

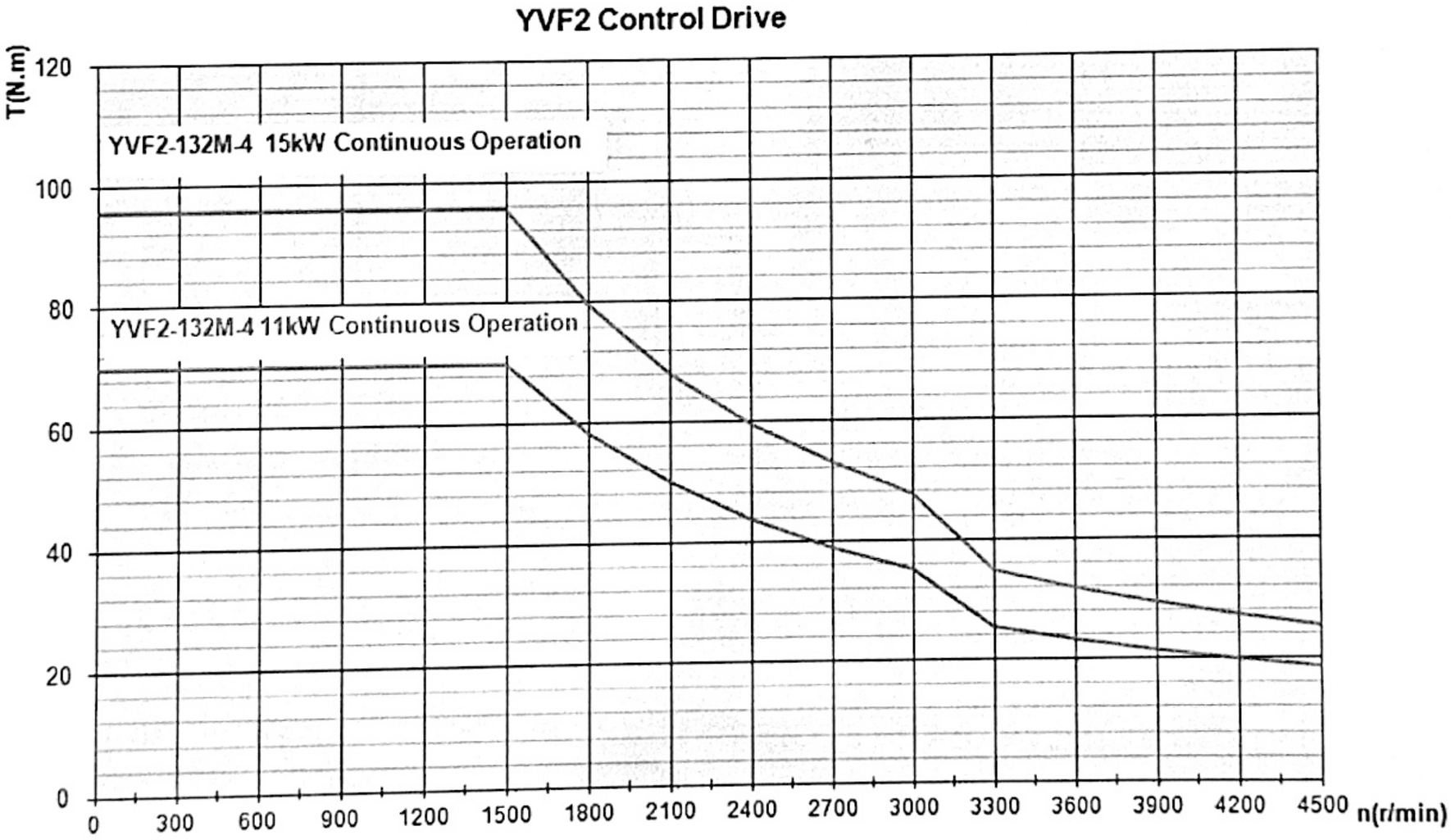
2.13 The frequency motor power and torque drawing as below:

Machine with gears on headstock:

T=Rating motor torque X diameter of spindle pulley / diameter of motor shaft X gear proportion

Maximum torque: CK6180= 98 X 190 /38 X2 =**980 N. m**

Minimum torque:　CK6180= 98 X190/38X1.627=**797.23 N. m**



3. Hoisting & Installation

3.1 Hoisting (See Figure 3-1 Hoisting and Installation)

3.2 Before hoisting the machine, open the slide door to the right hand side, and fix the CNC

control to the left. Please select the hoist capacity not less than 5 metric tons and be sure the safety during hoisting and installation.

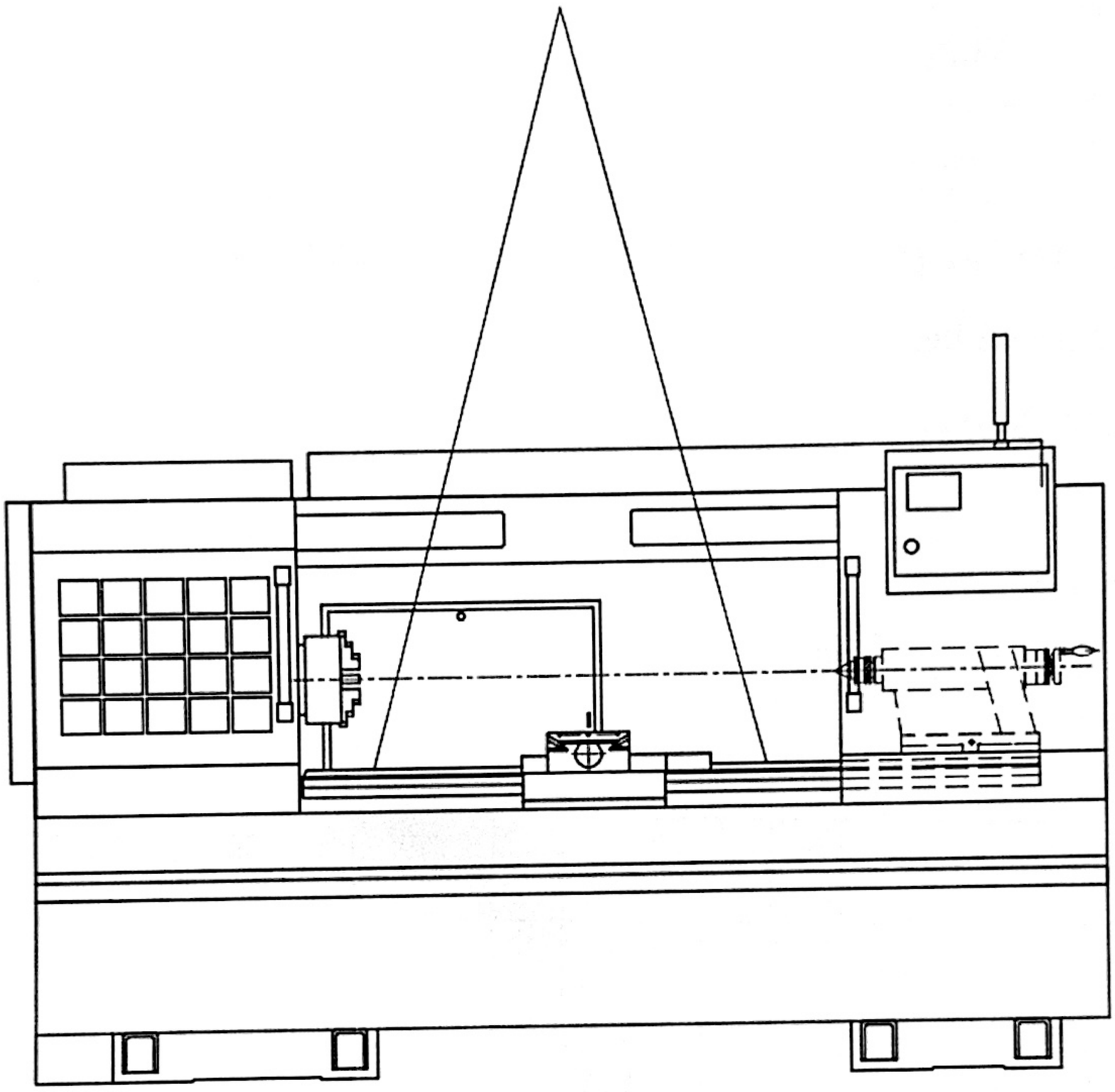


Figure 3-1 Position to hoist the machine

3.3 Please be sure there is enough space for the doors to slide, as well as the protecting covers to be opened if necessary.

3.4 The machine should be installed on a level, sound floor to maintain its accuracy. If the machine is bolted to an uneven floor, the bed will be slightly twisted, thus spoiling the accuracy of the machine. The machine should be fixed onto the ground with the anchor studs, and adjusted with the shims under the stands to maintain the straightness and

accuracy of the machine. The machine should be eventually within the horizontal level of 0.03/1000 along its length and 0.04/1000 across the slide ways. (See fig 3-1)

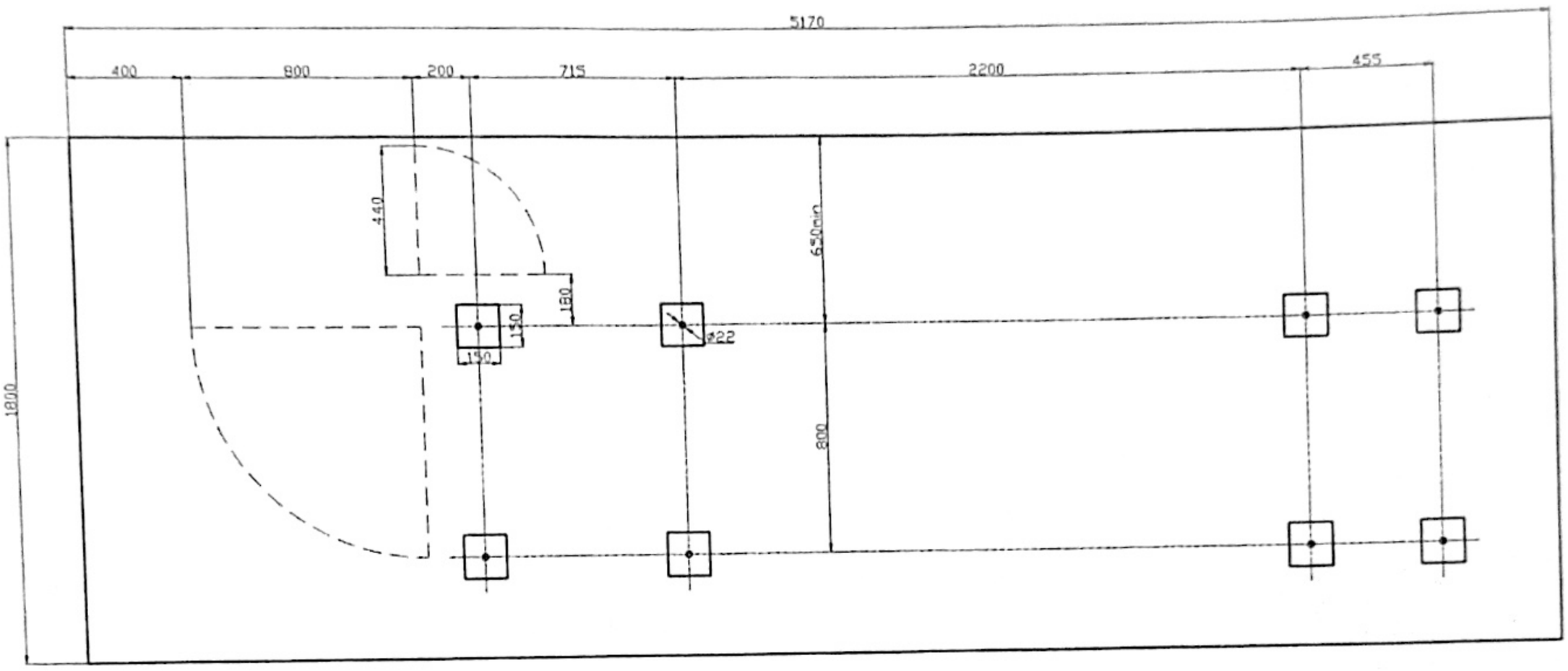
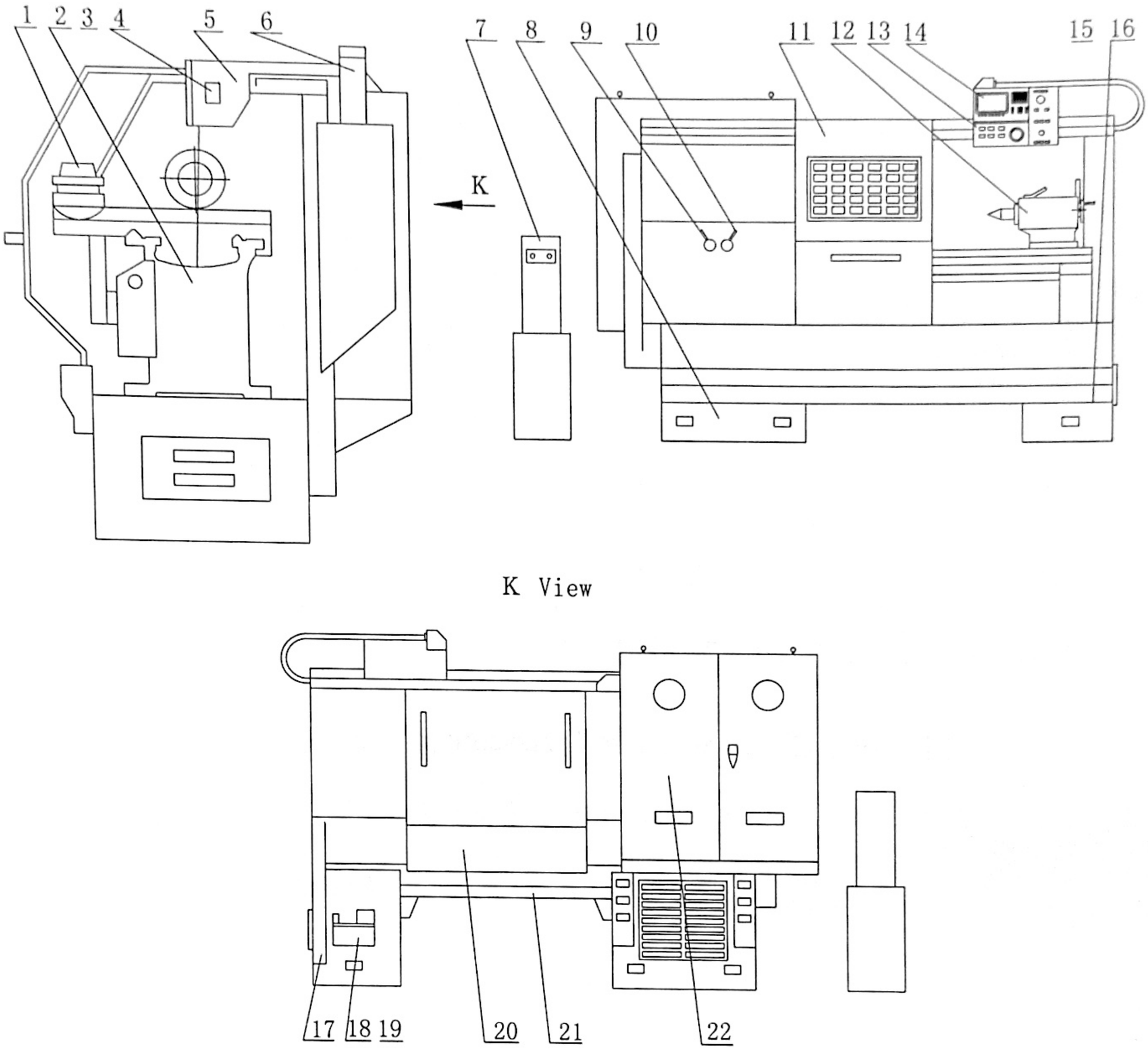


Fig 3-2 Lathe Base Plane & Installation Layout

3.5 The lathe is shown in the Fig 3-3 and listed as below:

1. Electric tool post
2. Lathe bed
3. TBA
4. Port connector, RS232
5. Control box
6. Flexible protection metal tube
7. Hydraulic oil tank * (if order)
8. Foot stands, front
9. Level I, spindle speed change



K View

Fig 3-3 Construction indication

3.6 Chuck Unit

Before assembly, you should cleaning up the spindle and the taper of the chuck, and get the cam turn in the right place. Especially we will adopt the 4-jaw chuck with dia.500 mm (See Fig 3-6-1Chuck Structure & Ass'y View)

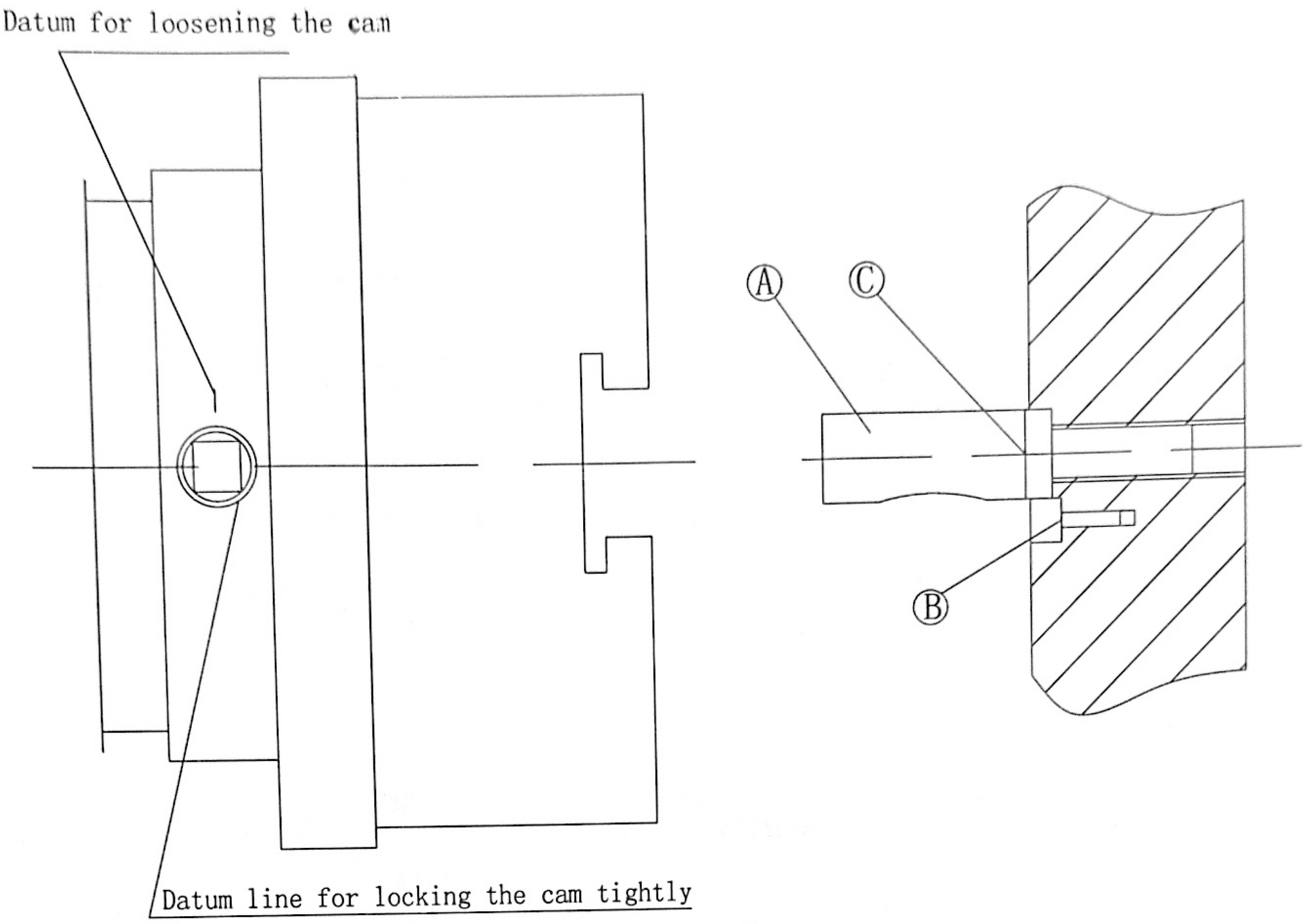


Fig 3-6-1 Chuck Structure & Assembly Drawings

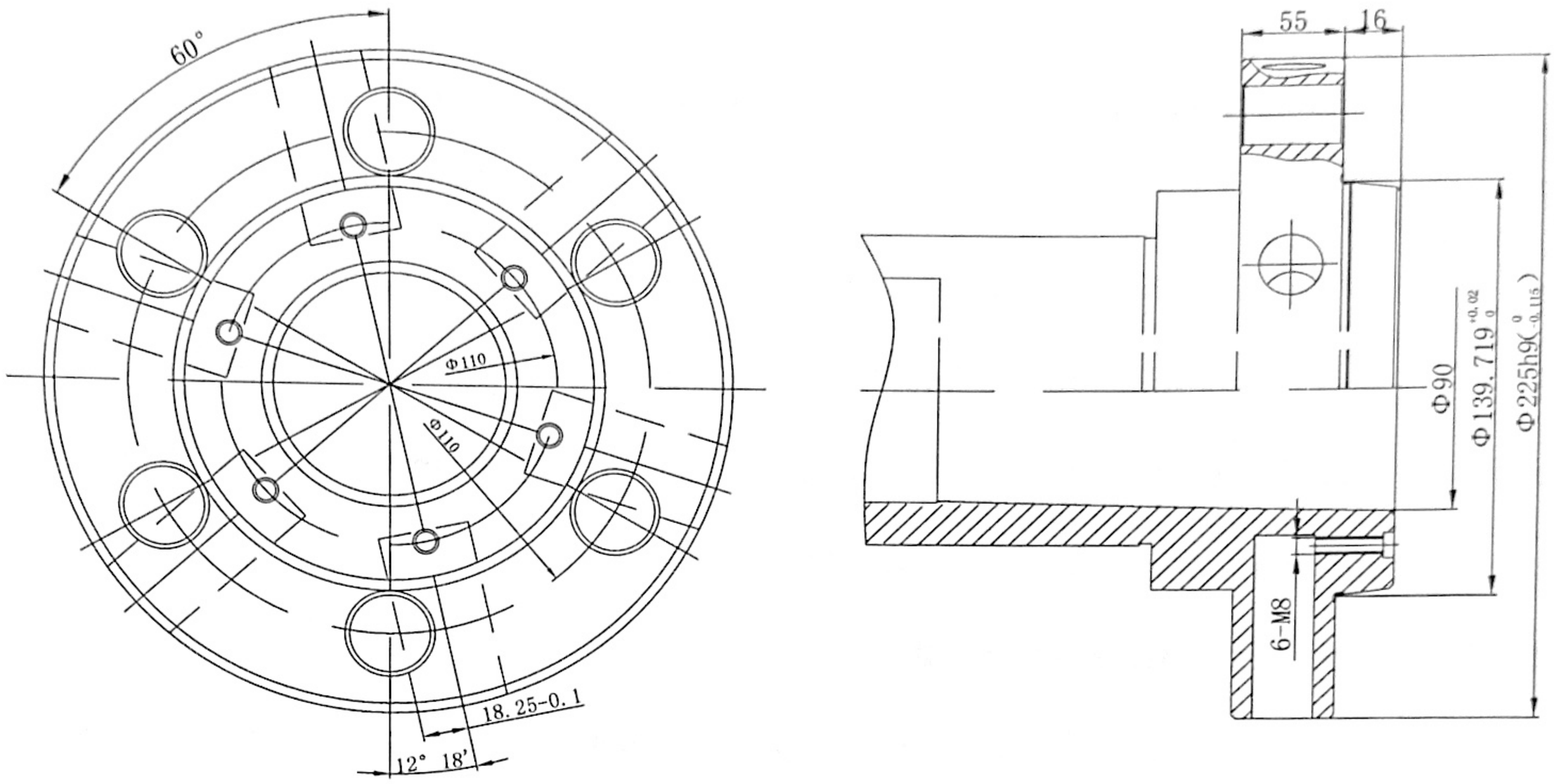


Fig 3-6-2 the details view of the spindle end

If you choose the optional accessories like the hydraulic chuck, the chuck will be controlled by the foot paddle to clamp. When you stress the foot paddle down, the clamping device will be loosen; when stress it down again, it will be clamped tight; and when you move your foot from the paddle, it will keep the clamping in the existing state. Please note, the foot paddle will be non-functional when the spindle is running at work.

The clamping force can be controlled by adjusting the pressure valve at site, and you can read the value from the pressure meter. Please note, the max. Pressure should not excess the rating pressure P= 25 kg/cm^2.

Once the power breaks off, the hydraulically valve will automatically cut off the hydraulic

circuit system and keep the chuck clamp in tight to avoid any risk from the work piece flying off from the chuck.

4 Instruction on trials, adjustment and operation

4.1 Connection with the power

4.1.1 Connect the power cords into the junction box under the electrical control box.

4.1.2 The power should be character of 3-phase with 5 electrical wires, including the zero wire and earth wire, which should be connected with the terminal of the machine.

4.1.3 When you plug the machine into the power, you can write a trial program by the manual and enter into the CNC system to see if the spindle is running in the right direction; if no, change each other any two wires from the 3 wires with 3-phase.

4.2 Preparation before operating

4.2.1 Put the spindle speed lever to the idle position, and verify if the lever is set properly by moving the spindle touching job button on left side of front metal cover.

4.2.2 Check if the V-Belt is in good condition, neither too loose nor too tight.

4.2.3 Check if the automatic lubrication system, especially the pump can work well after connecting to the power.

4.2.4 After inspection on the points mentioned above, you will enter the program to drive the gear box and keep the shaft (I) running for 15 minutes to check if the gear box can be automatically lubricated.

4.2.5 Change the speed levers in clockwise or counter-clockwise directions and check if the machine is running smoothly and quietly on different level. Please note, do not make the speed change before the spindle stops.

4.2.6 Check if the movement of longitudinal or cross feeding works smoothly, and if the

positioning device is workable.

4.2.7 You can make a short program including main movement and feeding movement if applicable and input into the machine, and keep it running without the load for a while.

Please note:

A. The machine should not be re-started within 60 seconds.

B. When the machine is working, the slide door should be in the protective zone.

C. If the spindle with the frequency convertor is rotating in wrong direction, please stop the machine and check the electric control unit accordingly.

D. Don't operate the speed levers when the spindle is rotating, otherwise the gears might be damaged seriously while the gears are badly engaged in the gear box.

E. Before running the spindle, check if the speed levers in the right position to ensure that the gears will engage and work in correct condition.

F: Once the brake doesn't work, you should stop the machine immediately by the manual emergency button and check it accordingly.

G: Before starting to process the work piece, the X-axis or Z-axis locating devices should be set in the right position to prevent the tool post from colliding with the tailstock or the chuck.

4.3 Alarm symptom code

Alarm code	Symptoms	Possible Solution
A 0.0 1000	Emergency stop	Release the emergency button or safety limited switch(if have)
A 0.1 1001	Over time on changing tool position	Reset and change tool again
A 0.2 1002	Low liquid level on central	Fill up the oil liquid

	lubrication pump	
A 0.3 1003	Front door limited switch open	Close the front door
A 0.4 1004	Alarm on inverter	Check on inverter
A 0.5 1005	Chuck not clamped	Clamp the chuck on footpad
A 0.6 1006	Turret is not locked tight	Reset the time of reversal running of turret; or checking the connection wire of turret locking; or not correct to use the turret locking signal to control the reversal contactor
A 0.7 1007	Low hydraulic pressure	Adjust the hydraulic switch or fill up hydraulic oil

4.4 General parameter set-up for Inverter:

1. 00-02 = 9
2. 05-01
3. 05-02
4. 05-03
5. 05-04
6. 05-00 = 1
7. RUN
8. 00-11 = 2
9. 00-16 = 1
10. 00-20 = 2
11. 00-21 = 1
12. 01-00 = 100-120HZ
13. 01-12 = 3-5s
14. 01-13 = 3-5s
15. 00-17

5 Maintenance

a. Check and adjust the tensile forces of the V-belts regularly to ensure the belts to work in perfect condition during its lifetime.

b. Clean off the waste chips or coolant regularly from the tool post to ensure the repeatability in position-setting accuracy.

c. Keep the lead screw always clean, considerable of that the lead screw will drive the feeding movement directly.

d. Lubricate the moving surfaces before using the steady rest or follow rest.

e. When you will mount the piecework or leave for a while, you must stop the main motor for safety.

f. Move the slide door in the protective zone when processing the work piece.

g. Restart the machine after not less than 60 seconds.

h. Clean the chips and scraps thoroughly from the spindle bore before starting to process the inner cylindrical surface of the work piece.

i. Fill the lubricant oil or grease regularly in accordance with all of the positions marked in Fig Lubrication System.

j. The oil level which is filled in the gear box should be as high as the center of the oil visual indicator.

k. The oil should be changed for the first time after 100 work hours, and changed for the second time after 250 work hours. Please drain the waste oil completely and clean the gear box thoroughly with the flushing oil.

6 Safety

a. Don't approach the moving belts while the protective cover is opened.

b. Before starting the spindle, check if the speed levers are in right positions. Unless the transmission system will be damaged duo the gears engaged improperly.

c. Don't change the speed levers when the spindle is rotating.

d. Once the brake doesn't work, press the emergency bottom immediately to stop the machine and then check it accordingly.

e. Don't mount the work piece till the spindle stops completely.

f. When you need to change the cut from the tool post automatically, you must stop the spindle or the work piece rotating completely.

g. Please stop the main motor running before you need to leave for a while.

h. Don't start to rotate the spindle before clamping the work piece firmly.

i. It's dangerous to approach the chuck when the spindle is running.

j. Don't turn the tool post before the tool fixed firmly.

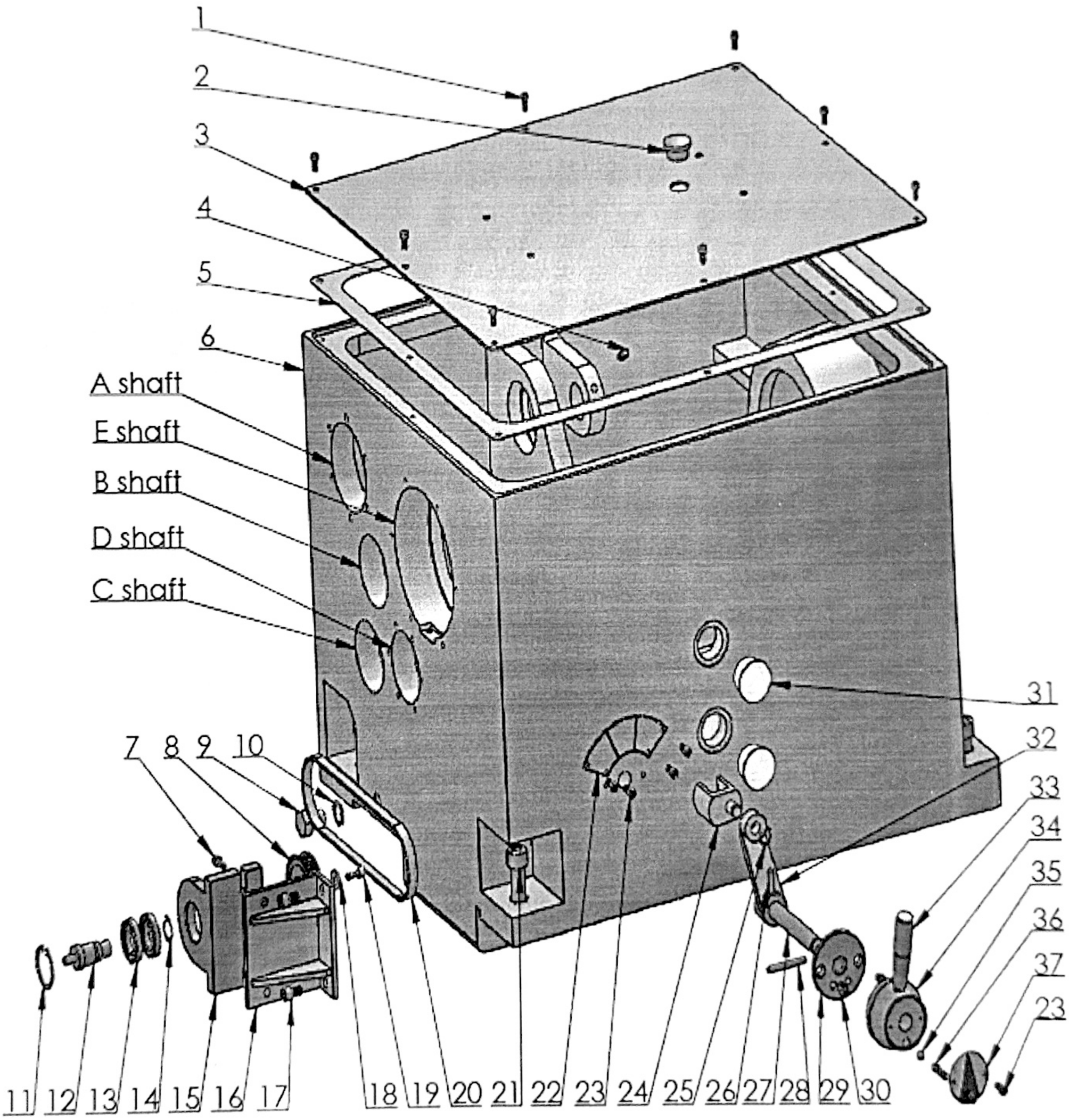
k. Before starting to process the work piece, the X-axis or Z-axis locating devices should be set in the right position to prevent the tool post from colliding with the tailstock or the chuck.

l. The machine is protected with the semi closed protecting covers, including the splash guard and the front slide door which can protect the splashing chips, debris, cooling liquid from hurting the operator.

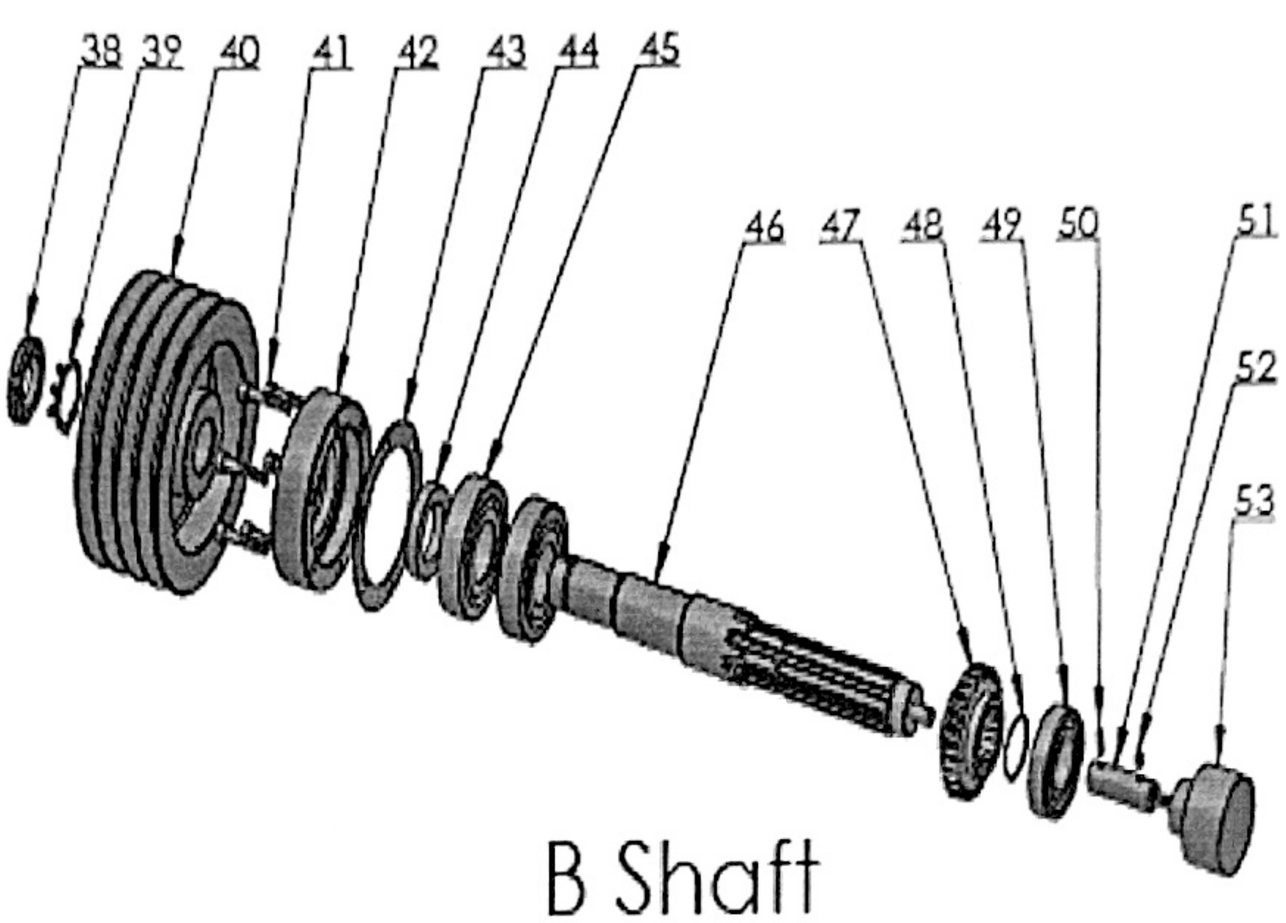
m. Check the V-belts and the moving parts regularly.

7 Transmission System

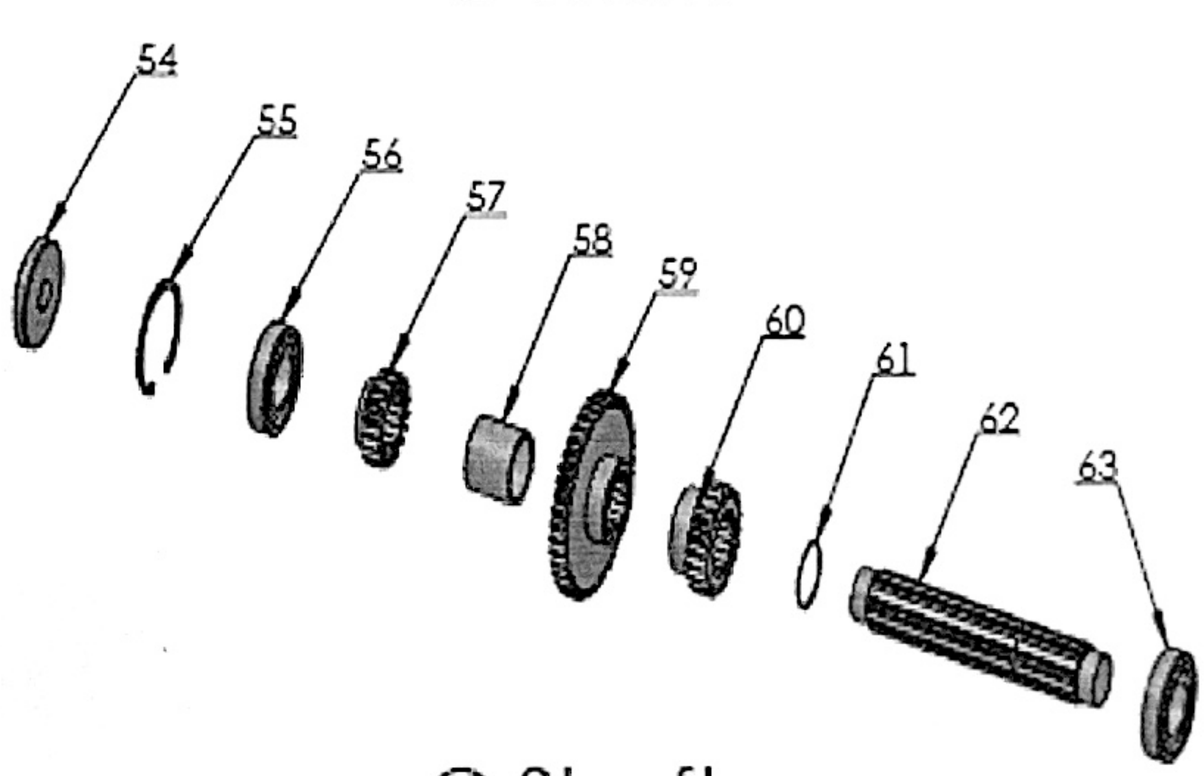
7.1 Headstock and Spindle unit



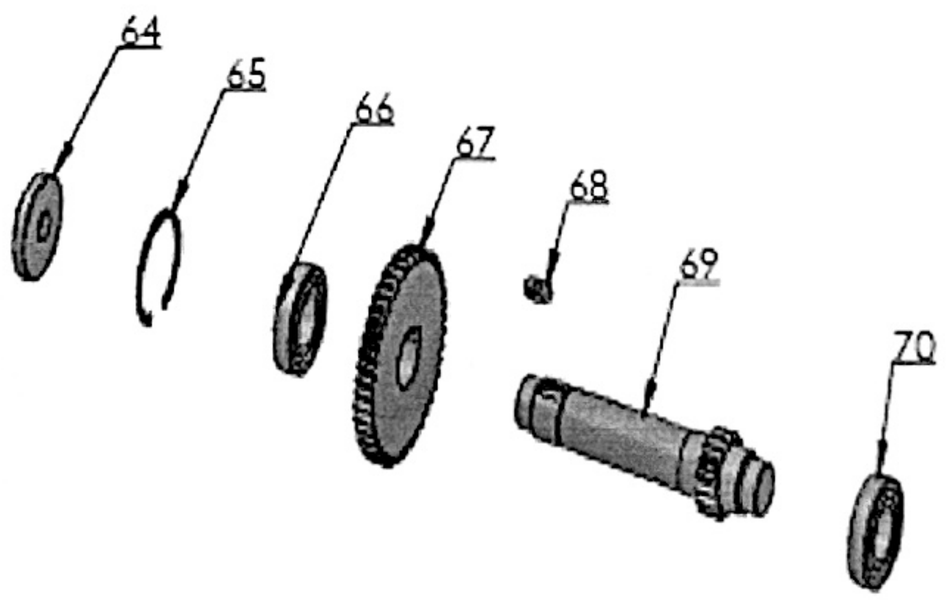
A Shaft



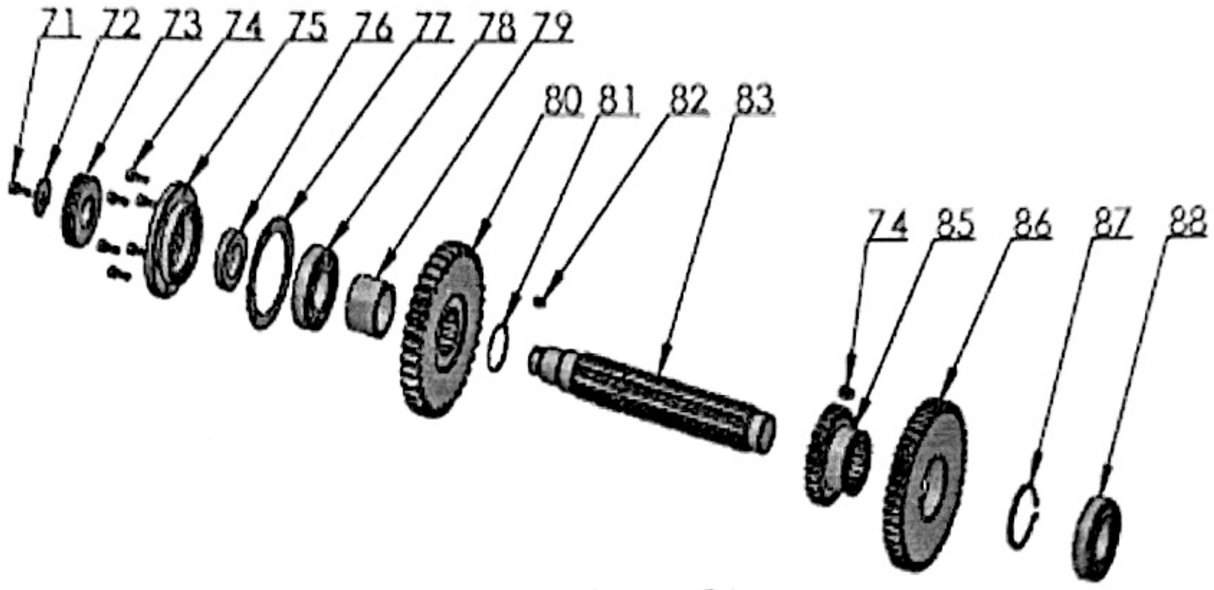
B Shaft



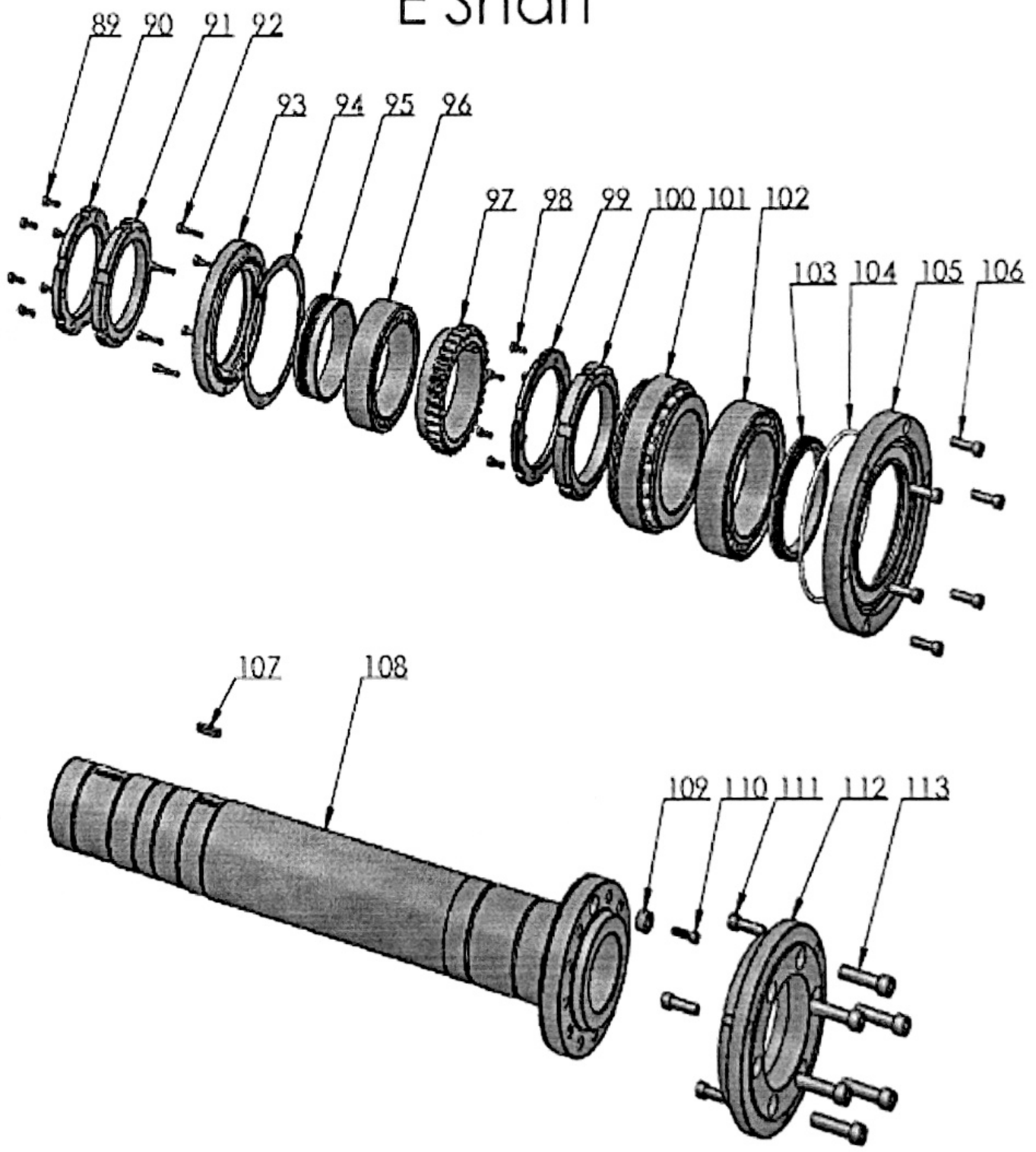
C Shaft



D Shaft



E Shaft

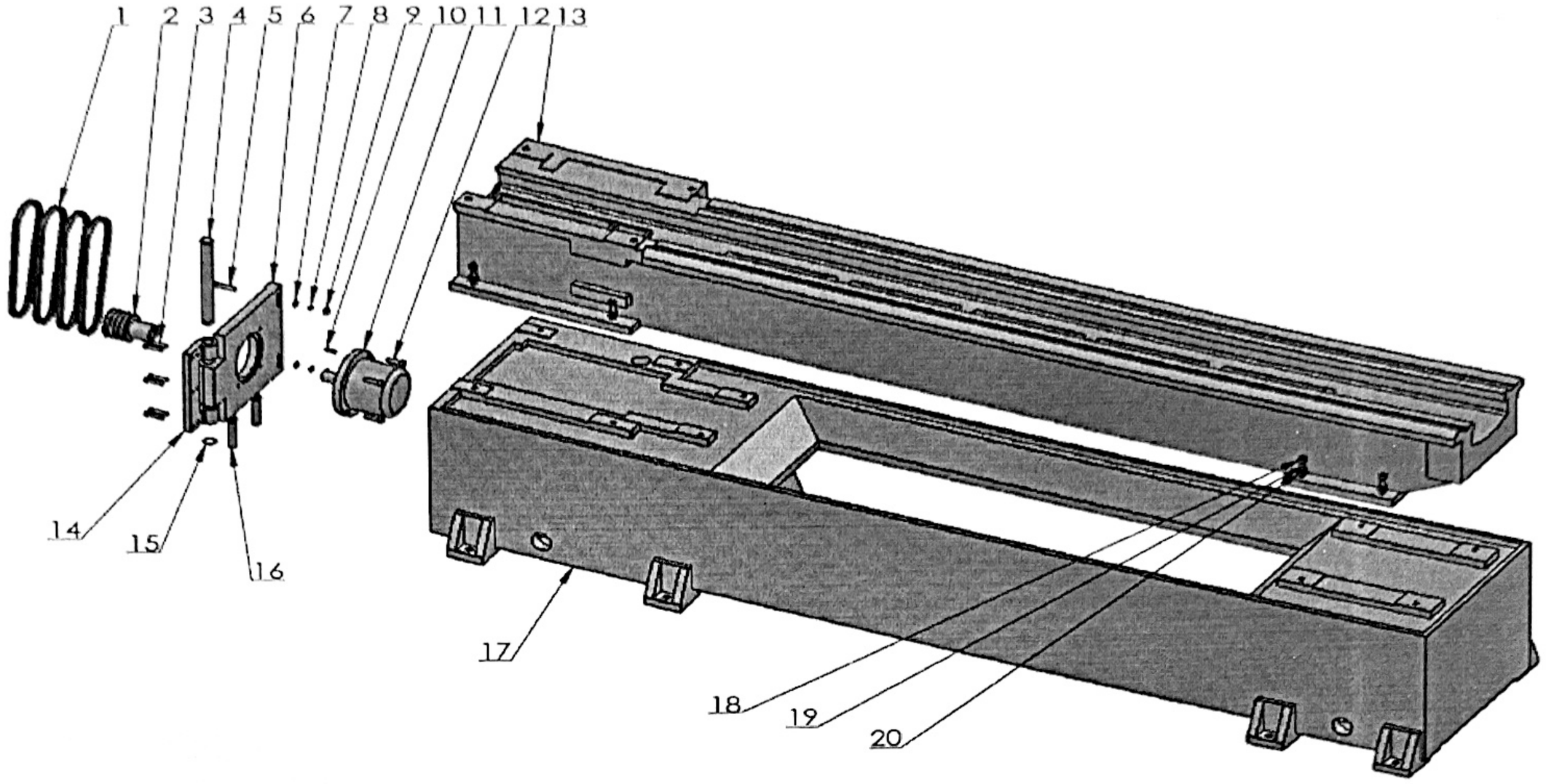


No.	Part No.	Name	specification	Qty.
1	GB70-85	SCREW	M5x15	8
2	C6241.02-079	SCREW		1
3	CJK6166-2010	THE SPINDLE BOX COVER		1
4	GB/T78	SCREW	M8x16	1
5	CJK6166-2011	COVER PAPER PAD		1
6	CJK6166-2001	THE SPINDLE BOX		1
7	GB70-85	SCREW	M6x20	2
8	CK66-02-053	synchronous pulley		1
9	GB/T5786-2000	BOLT	M16x1.5x20	1
10	GB95	FLAT WASHER	16	1
11	GB893.1-1986	SPRING WASHER	40	1
12	CJK6150.02-054	THE ENCODER SHAFT		1
13	GB276	BEARING	16004	2
14	GB894.1-1986	SPRING WASHER	20	1
15	1671101A	THE ENCODER BRACKET		1
16	CJK6150.02-005	BRACKET		1
17	GB70-85	SCREW	M8x14	2
18	CK66-02-052	SPACER		1
19	GB70-85	SCREW	M6x12	1
20	JB/T7512.1	synchronous belt	5M	1
21	GB70-85	SCREW	M16x55	4
22	CJK666.02-004	SPEED LABEL		1
23	GB70-85	SCREW	M3x6	6
24	CK66-02-050	FORK		1
25	GB894.1-1986	SPRING WASHER	12	1
26	GB/T879.2-2000	SPRING PIN	6x30	1
27	CK66-02-048	HANDLE SHAFT		1
28	GB/T879.2-2000	SPRING PIN	6x68	1
29	CK66-02-051	STEEL BALL SUPPORT		1
30	GB/T822-2000	SCREW	M6x12	2
31	GB1163	OIL MARK	M36x1.5	2
32	CK66-02-049	ARM		1
33	CK66-02-002	BANDLE		1
34	CK66-02-015	HANDLE SEAT		1
35	GB308	STEEL BALL	8	1
36	GB/T2089	SPRING	1x7x30	1
37	CK66-02-003	LABEL		1
38	GB812-1988	NUT	36x1.5	1
39	GB858-1988	LOCK WASHER	36	1

40	CK66-02-008	PULLEY		1
41	GB70-85	SCREW	M8x40	6
42	CK66-02-046	BEARING FLANGE SEAT		1
43	CK66-02-016	PAPER PAD		1
44	GB13871	FRAMEWORK OIL SEAL	FB4062	1
45	GB276	BEARING	6308	2
46	CK66-02-017	I AXIS		1
47	CK66-02-019	GEAR		1
48	GB894.1-1986	SPRING WASHER	40	1
49	GB276	BEARING	6207	1
50	GB/T879.2-2000	SPRING PIN	6x20	1
51	CK66-02-023	ADAPTER SLEEVE		1
52	GB/T77	SCREW	M6x8	1
53	K（D）BBY-2	OIL PUMP		1
54	CK66-02-014	DRAIN PLUG		1
55	GB893.1-1986	SPRING WASHER	72	1
56	GB276	BEARING	6207	1
57	CK66-02-018	GEAR		1
58	CK66-02-020	SPACER BUSH		1
59	CK66-02-021	GEAR		1
60	CK66-02-022	GEAR		1
61	GB894.1-1986	SPRING WASHER	40	1
62	CK66-02-045	II AXIS		1
63	GB276	BEARING	6207	1
64	CK66-02-014	DRAIN PLUG		1
65	GB893.1-1986	SPRING WASHER	72	1
66	GB276	BEARING	6207	1
67	CK66-02-024	GEAR		1
68	CK66-02-025	KEY		1
69	CK66-02-026	TRANSITION SHAFT		1
70	GB276	BEARING	6207	1
71	GB70-85	SCREW	M6x16	1
72	CK66-02-039	SPACER		1
73	CK66-02-037	synchronous pulley		1
74	GB70-85	SCREW	M6x16	6
75	CK66-02-035	III AXIS FLANGE		1
76	GB13871	FRAMEWORK OIL SEAL	FB3052	1
77	CK66-02-034	PAPER PAD		1
78	GB276	BEARING	6207	1
79	CK66-02-036	SPACER BUSH		1
80	CK66-02-027	GEAR		1
81	GB894.1-1986	SPRING WASHER	40	1
82	GB1096-79	KEY	6x12	1
83	CK66-02-029	III AXIS FLANGE		1

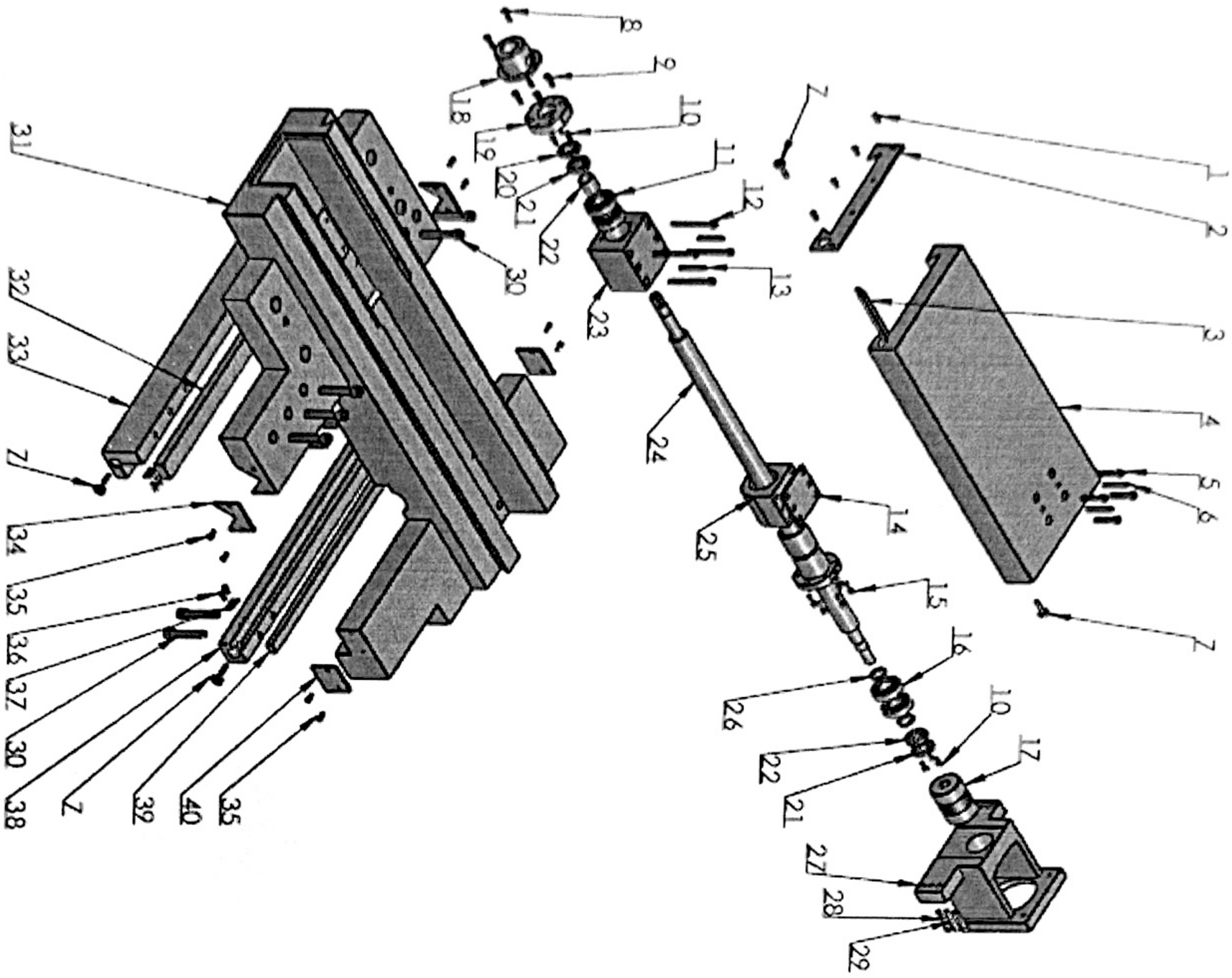
84	GB1096-79	KEY	8x15	1
85	CK66-02-030	GEAR		1
86	CK66-02-028	GEAR		1
87	GB894.1-1986	SPRING WASHER	55	1
88	GB276	BEARING	6207	1
89	GB70-85	SCREW	M6x16	6
90	CK66-02-043	LOCKING NUT		1
91	CK66-02-042	LOCKING NUT		1
92	GB70-85	SCREW	M6x30	6
93	CK66-02-009	BACK SPINDLE FLANGE		1
94	CK66-02-044	PAPER PAD		1
95	CK66-02-041	OIL SLINGER		1
96	GB285	BEARING	NNU4922K	1
97	CK66-02-040	GEAR		1
98	GB70-85	SCREW	M6x16	6
99	CK66-02-005	LOCKING NUT		1
100	CK66-02-004	LOCKING NUT		1
101	JB/T6362	BEARING	D2268124	1
102	GB285	BEARING	NN3024K	1
103	CK66-02-032	NUT		1
104		O-RINGS	195x5.3	1
105	CK66-02-012	SPINDLE FRONT FLANGE		1
106	GB70-85	SCREW	M10x35	6
107	CK66-02-038	KEY		1
108	CJK6166-2002	SPINDLE		1
109	CK66-02-031	LOCATING BUSH		1
110	GB70-85	SCREW	M8x25	1
111	GB70-85	SCREW	M12x30	1
112	CK66-02-013	CHUCK SEAT		1
113	GB70-85	SCREW	M16x60	1

7.2 BED ASSEMBLY



No.	Part No.	Name	specification	Qty.
1		V-BELT		3
2	CK6150-1711105	PULLEY FOR MOTOR		1
3	GB70-86	SCREW	M10x55	6
4	CK6150-1711202	BRACKET AXLE		1
5	GB70-85	SCREW	M12x65	2
6	CK6150-1711104	MOTOR BASE PLATE		1
7	GB95	FLAT WASHER	12	2
8	GB/T93-1987	SPRING WASHER	12	2
9	GB/T6170-2000	NUT	M12	2
10	GB1096	KEY	10X60	1
11		MOTOR		1
12	GB70-86	SCREW	M12x50	4
13	CK66-2000	LATHE BODY		1
14	CK6150-1711203	BRACKET AXLE		1
15	GB894.1-1986	WASHER	35	1
16	CK6150-1711201	ADJUSTING BOLT		2
17	CK66-1002	BED		1
18	GB70-85	SCREW	M16x55	8
19	GB/T93-1987	SPRING WASHER	16	8
20	GB95	FLAT WASHER	16	8

7.3 X-axis assembly

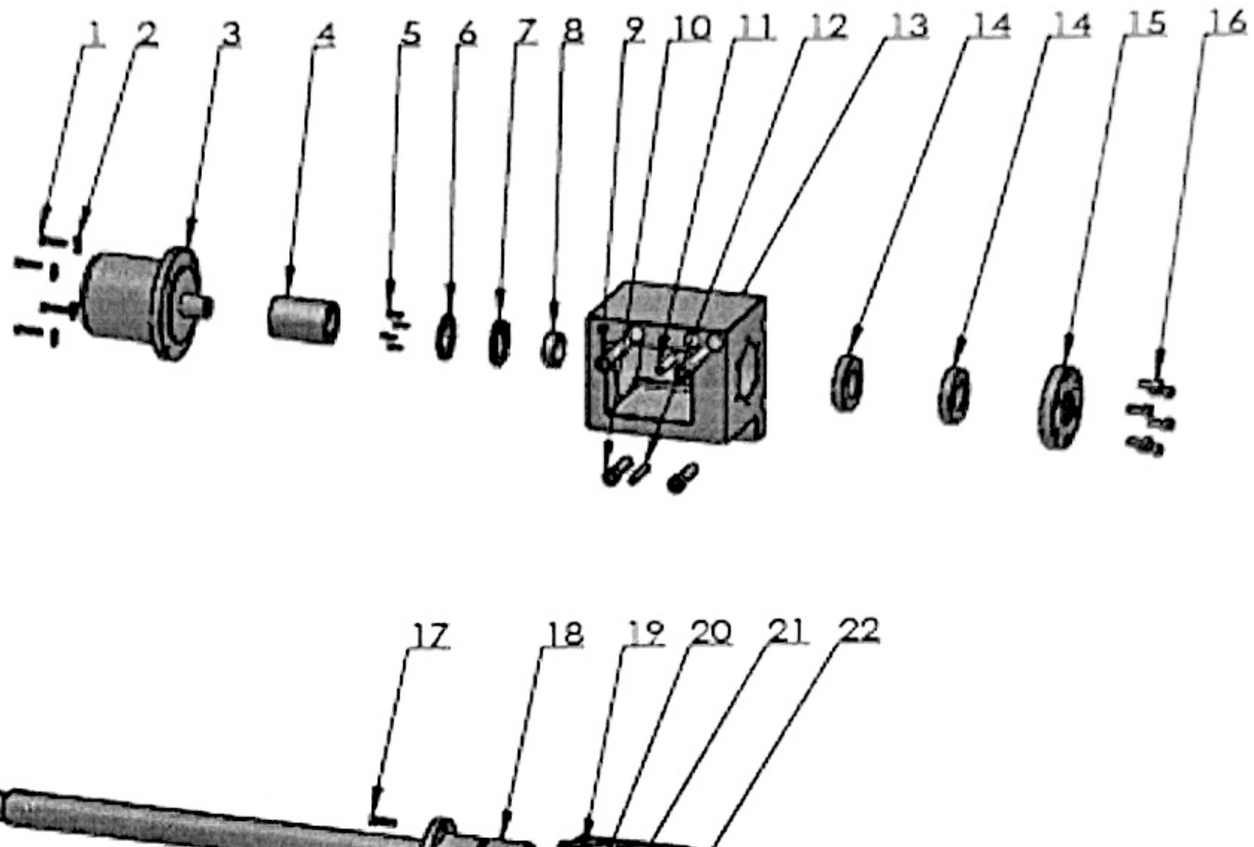


No.	Part No.	Name	specification	Qty.
1	GB70-85	SCREW	M5x15	4
2	CK66-05-001	WIPER		1
3	CK66-05-002	GIB		1
4	CK66-05-003	COVER-CROSS SLIDING		1
5	GB70-85	SCREW	M8x40	4
6	GB118	PIN	8X40	2
7	CK66-05-004	GIB SCREW		6
8	GB70-85	SCREW	M6x12	2
9	GB70-85	SCREW	M6x20	4
10	GB70-85	SCREW	M5x12	6
11	GB/T292-1994	BEARING	7204AC	2
12	GB70-85	SCREW	M8x75	4
13	GB118	PIN	8X40	2

14	CK66-05-005	ADJUSTING BASE PLATE		1
15	GB70-85	SCREW	M6x15	6
16	GB276	BEARING	6204	2
17		COUPLING	55x75-22x16	1
18	CK66-05-006	FRONT BRACKET COVER		1
19	CK66-05-007	FRONT GLAND		1
20	CK66-05-008	NUT		2
21	CK66-05-009	NUT		2
22	CK66-05-010	SPACER BUSH		1
23	CK66-05-011	FRONT SUPPORT		1
24	CK66-05-012	CROSS FEED SCREW		1
25	CK66-05-013	NUT SEAT		1
26	CK66-05-014	COLLAR		2
27	CK66-05-015	BACK SUPPORT		1
28	GB70-85	SCREW	M8x35	4
29	GB118	PIN	8X40	2
30	GB70-85	SCREW	M12x50	9
31	CK66-05-016	COMPOUNT REST		1
32	CK66-05-017	GIB		1
33	CK66-05-018	FRONT PRESSING PLATE		1
34	CK66-05-019	CASE - WIPER		2
35	GB70-85	SCREW	M5x12	8
36	GB70-85	SCREW	M4x10	8
37	CK66-05-020	CATCH OF GIB		4
38	CK66-05-021	BACK PRESSING PLATE		1
39	CK66-05-022	GIB		1
40	CK66-05-023	CASE - WIPER		2

7.4 Z axis ASSEMBLY

Z SHAF



No.	Part No.	Name	specification	Qty.
1	GB70-85	SCREW	M8x25	4
2	GB93	SPRING WASHER	8	4
3		MOTOR		1
4		COUPLING		1
5	GB70-85	SCREW	M5x15	4
6	1712201	LOCKING NUT		1
7	1712202	LOCKING NUT		1
8	1712204	COLLAR		1
9	GB70-85	SCREW	M16x80	2
10	GB70-85	SCREW	M16x50	2
11	GB118	PIN	12X80	1
12	GB118	PIN	12X50	1
13	CK6150-1712101	LEFT SUPPORT		1
14		BEARING	7208AC	2

15	1712102A	LEFT GLAND		1
16	GB70-85	SCREW	M10x25	6
17	GB70-85	SCREW	M10x25	6
18	1712203A	LEAD SCREW		1
19	1741101A	NUT SEAT		1
20	GB70-85	SCREW	M12x45	4
21	GB118	PIN	12X45	2
22	1741102A	SADDLE		1
23	GB70-85	SCREW	M12x35	4
24	GB118	PIN	10X50	2
25	1712103A	RIGHT SUPPORT		1
26		BASE PLATE		1
27	1712207	SLEEVE		2
28		BEARING	6008	2
29	1712201	LOCKING NUT		1
30	1712202	LOCKING NUT		1
31	GB70-85	SCREW	M5x10	4
32	1712801A	END COVER		1
33	GB70-85	SCREW	M5x20	3

PACKING LIST

NO.	DESCRIPTION	SPECIFICATIONS	QTY'	NOTE
1	MAIN MACHINE	CK6180	1	
2	TECHNICAL DOCUMENTS WITH THE MACHINE			
	1. PACKING LIST		1	
	2. OPERATION MANUAL		1	
	3. CERTIFICATE OF INSPECTION		1	
3	STANDARD ACCESSORIES			
	1. 3-JAW CHUCK	Φ305mm	1	FIXED ON MACHINE
	2.OPEN-ENDED WRENCH	14-17	1	
	3.OPEN-ENDED WRENCH	17-19	1	
	4.OPEN-ENDED WRENCH	22-24	1	
	5.HEXAGONAL WRENCH	4、5、6、8、10	1SET (5PCS)	
	6. TOOL POST WRENCH		1	
	7. CHUCK SPANNER		1	
	* 8. DEAD CENTER	M.T.5#	1	
	* 9. CENTER SLEEVE	105(110)/MT5#	1	
	10.QUAKE-PROOF SIZING BLOCK		8	
	11. OIL GUN	150ML	1	
	12. LIVING CENTER	M.T.5#	1	
	13. TRIANGULAR BELT	B2388/2464	1	

*IF MACHINE WITH HYDRAULIC CHUCK,THERE IS NO CENTER SLEEVE AND THE QUANTITY OF THE DEAD CENTER WILL BE ONE PIECE