HARE&FORBES
MACHINERYHOUSE

Established 1930
Distributors of new & used workshop Equipment

L171 CL-80 CY6250B X 2000

OPERATION INSTRUCTION

09-12-2002

Contents

Important

To avoid any misunderstanding, when ordering spare parts or easy worn parts please always mention on your order:

1) The machine serial number;

2) The parts number on page 13 for spare parts.

The parts number on page 41 for easy worn parts.

Export: China National Machinery and Equipment Import & Export corperation. Yunnan Branch.

Address: 4 Bai Ta Lu, Kunming, Yunnan.

The People's Repuplic of China.

Chinese version of all technical documents in Chinese and English languages is regarded as final.

Operating Instructions

models CY6140B and CY6150B as well as Universal
models CY6240B and CY6250B

I. Applications

On ferrous or non-ferrous metals, plastics or synthetic rubber workpieces can these Universal Lathes, either used in roughing or finishing, perform all basic turning operations, such as external and internal cylindrical, conical or any kind of rotary surfaces, end-facing, grooving, cutting-off as well as thread-cutting in inch, metric, diametral pitch and module, including drilling, reaming, knurling and oil-groove broaching etc.

These lathes are built to a high degree of working accuracy with roundness error within 0.01mm, cylindricity error within 0.01mm on measured length of 100mm, the surface finish is not less than▽6 and threadpitch error within 0.06mm on measured length of 300mm. Lathes of CY6140B and CY6150B as well as CY6240B and CY6250B are then suitable for production and maintenance operations in single job and small batch works in machine shops, toolrooms, maintenance depots and laboratories.

We hope that through this booklet of "Operating Instruction" the machines will be properly installed. With ordinary care in service and periodical inspection on levelling, they will maintain their original accuracy for many years.

Specifications

A. Capacity

	Model	CY6140B	CY6240B	CY6150B	CY6250B
1.	Swing over bed mm	400	400	500	500
2.	Swing over cross slide mm	220	220	300	300
3.	Swing in gap mm		630		710
4.	Effective length in gap mm		240		240
5.	Max. center distance mm	750, 1000, 1500, 2000.			
6.	Spindle thru-bore diameter mm	82			

B. Main spindle

1. Spindle nose-camlock, short-taper flange type — D -8
2. Spindle taper bore: taper and diameter — 1:20;90mm
3. Number of speeds — 24
4. Range of speeds — 9-1600 r/min

C. Feeds and threads

1. Steps and range of feeds

Basic feeds:	65 longitudinal feeds	0.063 to 2.52 mm/r
	65 transversal feeds	0.025 to 1.01 mm/r
Reduced feeds:	13 longitudinal feeds	0.028 to 0.056 mm/r
	13 transversal feeds	0.011 to 0.023 mm/r
Amplified feeds:	15 longitudinal feeds	2.86 to 6.43 mm/r
	15 transversal feeds	1.15 to 2.58 mm/r

2. Rapid travelling speeds: longitudinal 4.5m/min(50Hz) or 5.4m/min(60Hz)
   transversal 1.9m/min(50Hz) or 2.3m/min(60Hz)
3. Varietres, steps and range of threads

	48 inch threads	72 to 1/8 teeth/in
	48 metric threads	0.5 to 224 mm
	45 diametral pitch threads	56 to 1/4 DP
	42 module threads	0.5 to 112 mm
	Pitch of leadscrew	12 mm

D. Carriage

1. Distance from tool-supporting base in tool post to main spindle axis — 28 mm
2. Max. cross section of tool shank — 25 mm X 25 mm
3. Graduation in degrees on swivel base
   clockwise 45° and counterclockwise 135°

SY-AB-R

4. Max. travel of top slide 145 mm

5. Max. travel of cross slide, for CY6140B and CY6240B: 320 mm
   for CY6150B and CY6250B: 340 mm

6. Permissible max. cutting force Pz 13700 N

7. Permissible max. feeding force Px 3400 N

E. Tailstock

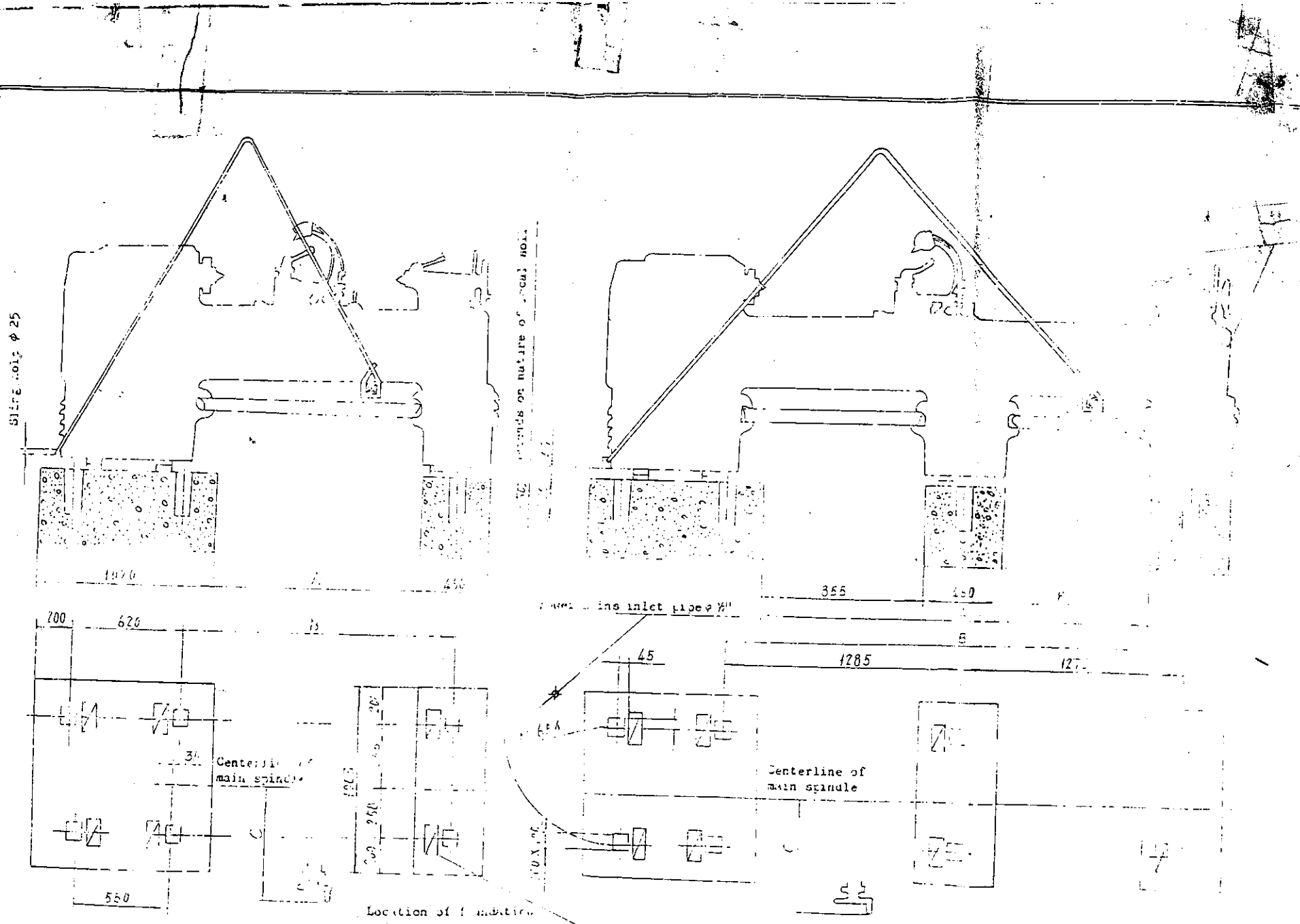
1. Tailstock quill diameter 75 mm
2. Max. travel of tailstock quill 150 mm
3. Tailstock center taper 5 MT
4. Max. set-over of tailstock ±15 mm

F. Motors and V-Belts

1. Power mains: AC Frequency 50Hz or 60Hz
   Voltage 220V, 380V, 420V or 440V
2. Main drive motor: Type 132M-4 7.5KW
   Type 160M-4 11 KW
   Type 160L-4 15 KW
3. Rapid travel motor: Type 2A0S 5634, 250 W
4. Coolant pump motor: Type A0B--25, 60 W
   flow capacity 25 l/min
5. V-Belts for main drive motor:
   B--2210, 4pcs for CY6140B and CY6240B with motor y132
   B--2184, 4pcs for CY6140B and CY6240B with motor y160
   B--2286, 4pcs for CY6150B and CY6250B with motor y132
   B--2261, 4pcs for CY6150B and CY6250B with motor y160

J. Overall dimensions and net weight

Model	Max. center distance mm	Overall dimensions (L x W x H) mm	Net weight Kg
CY6140B	750	2375 x 1043 x 1275	2175
	1000	2625 x 1043 x 1275	2250
CY6240B	1500	3125 x 1043 x 1275	2450
	2000	3625 x 1043 x 1275	2650
CY6150B	750	2375 x 1077 x 1315	2250
	1000	2625 x 1077 x 1315	2300
CY6250B	1500	3125 x 1077 x 1315	2500
	2000	3625 x 1077 x 1315	2700



Max center distance	750	1000	1500	2000
A	875	1125	1625	355 + 460 + 810
B	1305	1555	2055	1285 + 1270

Model	CY6140B	CY6150B
	CY6240B	CY6250B
C	578	613

Fig.1 Slinging and foundation plan

III. Slinging, handling and installation

(A) Slinging and handling

When lifting the packed lathe, ropes must be slung in accordance with the marks on the packing case. In transporting and unloading don't let it too much be tilted and the case should not be percussed or shocked violently so as not to damage the casebottom or the sideplates. Placing the case on edged bodies or upside down is strictly forbidden.

After the case is opened, inspect the outward condition of the machine immediately and check up the accessories and tools according to the packing list.

Follow the arrangements shown in Fig.1 to lift the lathe after unpacking. Depending upon the length of bed, the machine can be balanced by moving the saddle longitudinally to distribute the weight equally about the sling. Put soft pads or felt between ropes and the painted surface of lathe and care must be taken not to catch any of the levers or pushbuttons with the ropes when lifting.

(B) Installation

The machine has been checked and tested before delivery, yet installation should be carried out correctly to insure the machining accuracy for long time.

As shown in Fig.1 the lathe is supported on preconcreted base by a number of foundation wedges. Adjust the wedges by using a precision level to keep the longitudinal level not over 0.04 mm per meter and the transverse level not over 0.03/1000 mm

Whenever an approximate levelling is being finished, fill up the foundation bolt housings with concrete to fix the bolts. After it is fully dry and hardened, then carry on an accurate levelling, adjust the wedges gradually and tighten up the foundation bolt nuts evenly until the accurate levelling is obtained. Finally pour cement between the ground and the base to fix the foundation wedges, seal the surrounding area of the cabinet legs and smooth the ground surface.

Recheck the levelling once more before using the machine. Afterwards, every three months a periodical levelling check is necessary.

(C) Cleaning

Carefully remove the anti-corrosion coatings on all parts with kerosene. Wash the inner part of the headstock with heated kerosene. All capillary woolen yarns must be cleaned attentively one by one. Smear the sliding guide ways, leadscrew, feed shaft etc, with machine oil after washing and cleaning. When all parts of the machine are cleaned thoroughly and perfectly, then give a general lubrication sufficiently according to the lubricating system diagram.

(2) Trial running

Before putting the machine [illegible] read through every section of the manual, understand the machine and acquiant himself with the position of all the [illegible] and the details of operation.

Check the oiling condition of all the lubricating points.

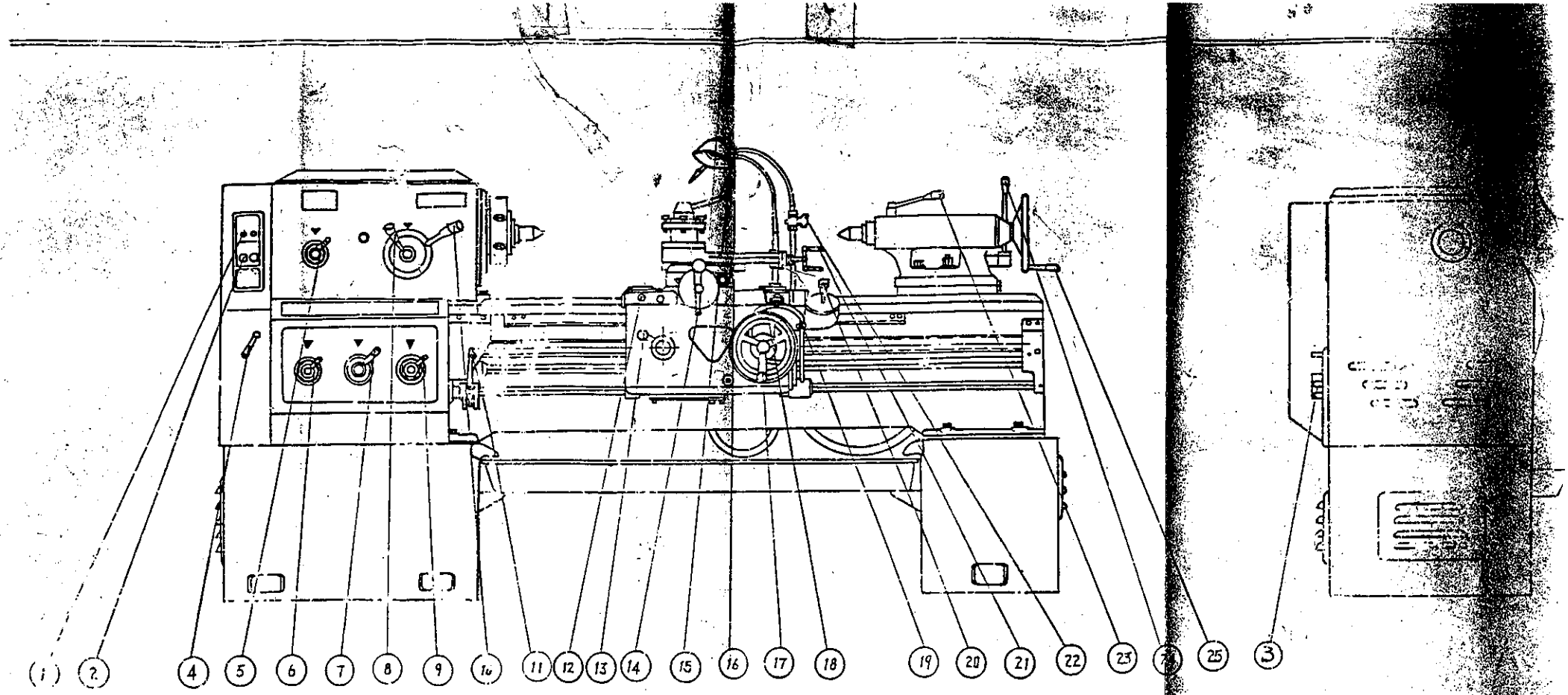
Check the working condition of each part of the machine manually.

Before power is supplied, check the electrical system to make sure whether the system is in good condition and whether motor is damped. After power has been supplied, check whether the main motor is rotating in clockwise direction (left view from the motor), if not, correct the electric connection immediately.

The above check being accomplished, a trial running test will be carried out. In the beginning of the trial the machine must be run at a minimum [illegible] some time and then gradually be accelerated. While the machine is [illegible] running check the lubricating, electrical and cooling system as well as the operating condition of each part attentively.

Only when the machine is normally operating, well-lubricating, [illegible] manipulating and sensitively braking, can it be started to work [illegible]

产品型号		
文件代号	SY-AB-t	第 8 共 61



1. Pushbutton control of coolant pump
   Pushbutton control of main drive motor
3. Pushbutton control of mains
4. Pulley guard clamping lever
5. Normal and modified pitches,
   reversing feed lever
6. Feed and thread variety dial knot
7. Feedbox lever gear ratio change lever
8. Main spindle speed change lever
9. Feedbox multiplying gear change lever
10. Main spindle speed change lever
11. Main spindle forward-brake-reverse lever
12. Pushbutton control of main motor
13. Split-nut closing and releasing lever
14. Cross slide traverse ball crank handle
15. Square turret turning clamping handle
16. Lamp switch
17. Saddle longitudinal travel handwheel
18. Lock screw of saddle
19. Main spindle forward-brake-reverse lever
20. Four-way power-feed lever with
    rapid-travel pushbutton
21. Top slide travel lever
22. Coolant flow regulating cock
23. Quill clamping handle
24. Tailstock clamping handle
25. Quill travel handwheel

Fig. 2 Operating elements and their locations

Table 1 Spindle speeds and working capacities

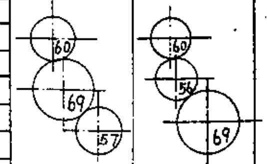
Serial No.	Spindle Speeds: Nominal value (Forward) r/min.	Spindle Speeds: Calculating value Forward r/min.	Spindle Speeds: Calculating value Reverse r/min.	Calculating efficiency of transmission	Nomiral capacity of motor 7.5 KW: Output power KW	7.5 KW: Max torque N·m	11 KW: Output power KW	11 KW: Max torque N·m	15 KW: Output power KW	15 KW: Max torque N·m	The weak link of transmission chain	Ratio of amplifier pitches
1	9	9.06	9.2	0.773	1.4	1470	1.4	1470	1.4	1470	Gear No.13 (Fig.3)	16:1
2	11	11.4	11.6		1.8		1.8		1.8			
3	14	14.2	14.4		2.2		2.2		2.2			
4	18	17.8	18.1		2.7		2.7		2.7			
5	22	22.1	22.4		3.4		3.4		3.4			
6	28	27.8	28.2		4.3		4.3		4.3			
7	35	34.7	35.2		5.3		5.3		5.3			
8	45	43.4	44.1		5.8	1276	6.9		6.9			
9	55	54.4	55.2	0.813	6.1	1070	6.1	1070	6.1	1075	Friction clutch	8:3
10	70	68.3	69.4			853	7.7		7.7			
11	85	85.4	86.7			681	8.9	1000	9.6			
12	105	106.8	108.5			545		800	12			
13	132	132.6	134.7			439		644	12.2	878		
14	170	166.7	169.3			349		512		698		
15	210	208.4	211.7			279		410		558		
16	260	260.5	264.6			223		327		447		
17	320	326.1	331.2			178	6.1	178	6.1	178		4:9
18	400	419.1	416.5			142	7.7		7.7			
19	500	512.5	520.5			114	8.9	167	9.6			
20	630	640.6	650.6			91		133	12			
21	800	795.8	808.2			74		108	12.2	146		
22	1000	1000.4	1016.0			58		85		117		
23	1250	1250.5	1270.0			47		69		93		
24	1600	1563.1	1587.5			37		59		75		

TYPE: CY6½40 B

Table 2 Feedrates and threadpitches

n	n	t	t	t	t	m	t	n	n	t	t	t	t	m	t	
A	A	A	B	C	D	D	B	A	A	A	B	C	D	D	B	
0.028	0.063	0.09	0.18	0.36	0.71		2.86	0.012	0.027	0.040	0.076	0.15	0.30		1.21	1
0.031	0.071	0.10	0.20	0.40	0.80		3.21	0.013	0.030	0.043	0.085	0.17	0.34		1.36	2
0.033	0.073		0.21	0.42	0.83		3.33	0.014	0.031		0.089	0.18	0.35		1.42	3
0.035	0.079	0.11	0.22	0.44	0.89		3.57	0.015	0.033	0.047	0.095	0.19	0.38		1.52	4
	0.081		0.23	0.46	0.92		3.67		0.034				0.39		1.56	5
0.037	0.084	0.12	0.24	0.48	0.95		3.80	0.016	0.036	0.050	0.101	0.20	0.40		1.62	6
0.038	0.087		0.25	0.49	0.98		3.92	0.017	0.037	0.052	0.104	0.21	0.42		1.67	7
0.042		0.13	0.27	0.53	1.07	1.68	4.28	0.018		0.057	0.114	0.23	0.46	0.72	1.82	8
0.046		0.14	0.29	0.58	1.17	1.84	4.67	0.019		0.062	0.124	0.24	0.49	0.78	1.99	9
0.047		0.15	0.30	0.60	1.21	1.89	4.82	0.020		0.064	0.128	0.25	0.51	0.80	2.05	10
0.049			0.31	0.62	1.25	1.96	5.00			0.066	0.133	0.26	0.53	0.83	2.12	11
0.050		0.16	0.32	0.64	1.29	2.02	5.16	0.021		0.068	0.137	0.27	0.55	0.86	2.19	12
0.054		0.17	0.34	0.66	1.38	2.16	5.51	0.023		0.073	0.146	0.29	0.58	0.92	2.34	13
0.056					1.43	2.24	5.71	0.024					0.60	0.95	2.43	14
					1.61	2.52	6.43	0.026					0.68	1.07	2.73	15

	t									m								DP								n										n	
	I	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	I	II	III	IV	I	II	III	IV		I	II
1		1	2	4	8	16	32	64	128	0.5	1	2	4	8	16	32	64																		1		
2	0.5		2.25	4.5	9	18	36	72	144			2.25	4.5	9	18	36	72									72									2		
3																																			3		
4		1.25	2.5	5	10	20	40	80	160		1.25	2.5	5	10	20	40	80																		4		
5																		56	28	14	7	3 1/2	1 3/4	7/8	7/16		28	14	7	3 1/2	1 3/4	7/8	7/16		5		
6																											27								6		
7			2.75	5.5	11	22	44	88	176			2.75	5.5	11	22	44	88																		7		
8		1.5	3	6	12	24	48	96	192	0.75	1.5	3	6	12	24	48	96	48	24	12	6	3	1 1/2	3/4	3/8		24	12	6	3	1 1/2	3/4	3/8	3/16	8		
9																		44	22	11	5 1/2	2 3/4		11/16			22	11	5 1/2	2 3/4		11/16			9		
10	0.75																									48									10		
11		1.75	3.5	7	14	28	56	112	224		1.75	3.5	7	14	28	56	112																		11		
12																		40	20	10	5	2 1/2	1 1/4	5/8	5/16		20	10	5	2 1/2	1 1/4	5/8	5/16		12		
13																										42									13	19	11 1/2
14																		36	18	9	4 1/2	2 1/4	1 1/8	9/16			18	9	4 1/2	2 1/4	1 1/8	9/16			14		
15																		32	16	8	4	2	1	1/2	1/4	36	16	8	4	2	1	1/2	1/4	1/8	15		



TYPE: CY6½50B

Table 2 Feedrates and Threadpitches

n (mm)	n (mm)	t (mm)	t (mm)	t (mm)	t (mm)	m (mm)	t (mm)	n (mm/)	n (mm/)	t (mm/)	t (mm/)	t (mm/)	t (mm/)	m (mm/)	t (mm/)	60/87/56
A	A	A	B	C	D	D	B	A	A	A	B	C	D	D	B	
0.028	0.063	0.09	0.18	0.36	0.71		2.86	0.012	0.027	0.040	0.076	0.15	0.30		1.21	1
0.031	0.071	0.10	0.20	0.40	0.80		3.21	0.013	0.030	0.043	0.085	0.17	0.34		1.36	2
0.033	0.073		0.21	0.42	0.83		3.33	0.014	0.031		0.089	0.18	0.35		1.42	3
0.035	0.079	0.11	0.22	0.44	0.89		3.57	0.015	0.033	0.047	0.095	0.19	0.38		1.52	4
	0.081		0.23	0.46	0.92		3.67		0.034				0.39		1.56	5
0.037	0.084	0.12	0.24	0.48	0.95		3.80	0.016	0.036	0.050	0.101	0.20	0.40		1.62	6
0.038	0.087		0.25	0.49	0.98		3.92	0.017	0.037	0.052	0.104	0.21	0.42		1.67	7
0.042		0.13	0.27	0.53	1.07	1.68	4.28	0.018		0.057	0.114	0.23	0.46	0.72	1.82	8
0.046		0.14	0.29	0.58	1.17	1.84	4.67	0.019		0.062	0.124	0.24	0.49	0.78	1.99	9
0.047		0.15	0.30	0.60	1.21	1.89	4.82	0.020		0.064	0.128	0.25	0.51	0.80	2.05	10
0.049			0.31	0.62	1.25	1.96	5.00			0.066	0.133	0.26	0.53	0.83	2.12	11
0.050		0.16	0.32	0.64	1.29	2.02	5.16	0.021		0.068	0.137	0.27	0.55	0.86	2.19	12
0.054		0.17	0.34	0.66	1.38	2.16	5.51	0.023		0.073	0.146	0.29	0.58	0.92	2.34	13
0.056					1.43	2.24	5.71	0.024					0.60	0.95	2.43	14
					1.61	2.52	6.43	0.026					0.68	1.07	2.73	15

60/87/56	t	t	t	t	t	t	t	t	t	m	m	m	m	m	m	m	m
	I	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
1		1	2	4	8	16	32	64	128	0.5	1	2	4	8	16	32	64
2	0.5		2.25	4.5	9	18	36	72	144			2.25	4.5	9	18	36	72
3																	
4		1.25	2.5	5	10	20	40	80	160		1.25	2.5	5	10	20	40	80
5																	
6																	
7			2.75	5.5	11	22	44	88	176			2.75	5.5	11	22	44	88
8		1.5	3	6	12	24	48	96	192	0.75	1.5	3	6	12	24	48	96
9																	
10	0.75																
11		1.75	3.5	7	14	28	56	112	224		1.75	3.5	7	14	28	56	112
12																	
13																	
14																	
15																	

60/87/56	DP	DP	DP	DP	DP	DP	DP	DP	n	n	n	n	n	n	n	n	n	⊛
	I	II	III	IV	I	II	III	IV	I	I	II	III	IV	I	II	III	IV	
1																		1
2									72									2
3																		3
4																		4
5	56	28	14	7	3 1/2	1 3/4	7/8	7/16		28	14	7	3 1/2	1 3/4	7/8	7/16		5
6										27								6
7																		7
8	48	24	12	6	3	1 1/2	3/4	3/8		24	12	6	3	1 1/2	3/4	3/8	3/16	8
9	44	22	11	5 1/2	2 3/4		11/16			22	11	5 1/2	2 3/4		11/16			9
10									48									10
11																		11
12	40	20	10	5	2 1/2	1 1/4	5/8	5/16		20	10	5	2 1/2	1 1/4	5/8	5/16		12
13									42									13
14	36	18	9	4 1/2	2 1/4	1 1/8	9/16			18	9	4 1/2	2 1/4	1 1/8	9/16			14
15	32	16	8	4	2	1	1/2	1/4	36	16	8	4	2	1	1/2	1/4	1/8	15

⊛	n I	n II
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13	19	11 1/2
14		
15		

IV. Operating system

(A) Operating elements

The operating elements and their locations are shown in Fig.2.

(B) Method of operation

1. Main drive system

The speed of the spindle is selected by gear shift lever 8 and 10. Matching the eight gear positions of lever 8 with the three gear positions (except the "white point" position) of lever 10 according to the same color, 24 steps of forward and reverse rotary speeds can be achieved. (as shown in Table I).

When lever 10 is in "white point" position, the spindle being disengaged from the gears of the drive shaft, both revolution of spindle and mechanical feeding are stopped. In this position, if the amplified pitch transmission is engaged, a feeding without spindle revolution can be carried out.

2. Feeding system

a. Selection of thread-pitch or feedrate is effected by actuating lever 5 on the headstock, levers 6, 7 and 9 on the feed gearbox.

1) Normal-and amplified pitches, forward and reverse feed lever 5 is used to change the pitch and the direction of thread or change the feedrate. Since the apron is adapting an overrunning clutch for transmission, so the carriage can be fed only when it is in "right-hand" position.

 —— shows right-hand normal pitches or basic feedrates

 —— shows left-hand normal pitches(no feed)

 —— shows right-hand amplified pitches or reduced or amplified feedrates

 —— shows left-hand amplified pitches(no feed)

2) The major function of thread-type change lever 6 is to select the required type of thread, and certainly can be used to change the feedrates as well.

t -- shows metric threads

n -- shows inch threads

m -- shows module threads

DP-- shows diametral pitch threads

-|- --"Direct-Connecting" position, shows the transmission is not passing through the change gears in feed gear-box.

3) The basic gear-ratio change lever 7, being actuated following the sequence from No.1 to No.15 on the circular index plate, can change the threadpitche or feedrates from small to big.

4) The multiplying gear change lever 9 is used to connect the leadscrew or the feeding rod, and multiply the threadpitch or the feedrates.

I, II, III, IV: used to connect the leadscrew [illegible]
A, B, C, D: used to connect the feed shaft [illegible]
Their multiplying ratios are I:II:III:IV=A:B:C:D=1:2:4:8. By matching [illegible] above levers, various threadpitches and feedrates can be acquired as shown in Table 2.

The revolving motion of leadscrew may be transmitted not via the variable gear trains in feedbox but driven directly by the transposing gears between output shaft of headstock and input shaft of feedbox to enable the operator to cut threads of special pitch. For this purpose, the thread variety dial knob 6 has to be put on position and the multiplying gear lever 9 on position IV.

b. Operator's control of carriage movement

1) The four-way power-feed lever 20 with rapid-travel pushbutton controls the longitudinal and transversal automatic feed and rapid movement of carriage. The hand-pushing direction of lever is just consistent with the required feeding direction of turning tool. When rapid travel is desired, push the lever 20 to the moving direction and press the pushbutton(on the head of the lever) with thumb simultaneously until the required position is reached and then release it.

2) For thread cutting, the longitudinal travel of tool is controlled by split-nut closing and releasing lever 17. Turn the lever clockise for closing and counterclockwise for releasing.

3) Manual operation of carriage is carried out by actuating saddle longitudinal travel handwheel 12, cross slide traverse ball crank handle 13 and top slide travel lever 21 according to the scale of their index dials.

c. The function of other control elements are clarified by their nomenclatures. They are operated following the usual method.

Among them, by lifting the forward-brake-reversing lever 11 or 19 up the main spindle is in forward rotation; by setting it down the main spindle is in reverse rotation, and by setting it in middle position the main spindle will then stop.

Besides, the square turret features that in any case it can be clamped quickly by turning the clamping handle 14 back less than a complete revolution after it has been released for swivelling to displace the tools.

Table 3 List of chief drive components

Unit	Headstock																																
Serial No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33
No. of teeth or starts	45	45	40	36	28	32	48	32	36	44	40	36	20	32	45	61	30	17	48	16	17	60	20	48	40	80	32	26	48	31	31	18	31
Module or lead (mm)	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	3	3	3	3	3	3	3	2.5	3	3	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Correction of profil shift and direction of helix angle														+1.525						+1 L.H.		-1 R.H.	+0.587 L.H.		+1 L.H.	-0.587 R.H.							
Part No.	A02081	A02082	A02083	A02084	A02085	A02086	A02106	A02087	A02089	A02091	A02088	A02092		A02105	A02093	A02094	A02095		A02096	AB02056	A02097	AB02098	A02099	AB02104	AB02102	AB02101	A02114	A02103	A02107	A02108		A02111	A02109

Unit	Transposing gears					Feed gearbox																												
Serial No.	34	35	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66
No. of teeth or starts	60	69	87	56	57	28	30	27	41	30	29	21	28	20	18	21	36	32	33	30	21	28	14	22	42	33	15	24	22	40	32	21	21	42
Module or lead (mm)	2	2		2	2	2.25	1.75	2.25	1.75	2.25	1.75	3	2	3	3	3	2	2	2	1.75	3	2	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2.25	2	2	2
Correction of profil shift and direction of helix angle						+0.60		-0.132	+0.525	-0.332	+0.573	+0.50	+0.30	+0.043	+1.352	-0.50	-0.760	+1.444	+0.812		+0.50	+0.30	+0.40	+0.40	-0.40	+0.132	+0.532		+0.40			+0.25	+0.25	-0.25
Part No.	A08042	A08043 / A.B08046-t		A08041	A08044	A07061		A07062	A07063	A07064		A07066		A07073	A07072	A07071	A07069	A07068	A07067	A07065	A07066		A07032		A07076	A07077	A07078	A07079	A07074			A07075	A07034	A07038

Unit	Apron																						Carriage					Tailstock		V-sheave		
Serial No.	67	68	69	70	71	72	73	74	75	76	77	78	79	80	81	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97		98
No. of teeth or starts	36	32	56	2	26	32	36	36	45	45	87	12		18	28	20	89	45	45	40	63	1	1	18	1	1	1	1	1	1	φ115	φ96	φ178
Module or lead (mm)	1.5	1.5	1.5	2.5	2.5	1.75	1.75	1.75	1.75	1.75	1.75	2.5	2.5	1.75	1.5	1.5	1.5	1.75	1.75	1.75	1.75	12	12	1.75	5	5	5	5	5	5	B		
Correction of profil shift and direction of helix angle				R.H.	R.H.																				L.H.	L.H.							
Part No.	A06061	A06062	A06063	A06057	A06021-R	A06064	A06065		A06066		A06069	A06052	A01024	A06071	A06072	A06073	A06074	A06065		A06067R	A06068R	A06022	A01021	A05031	A05021	A05011	A04011	A04031	A03022	A03075	AB01017/Y160 A01001 / AB01007/Y160 AB01007/Y132-68		A62003

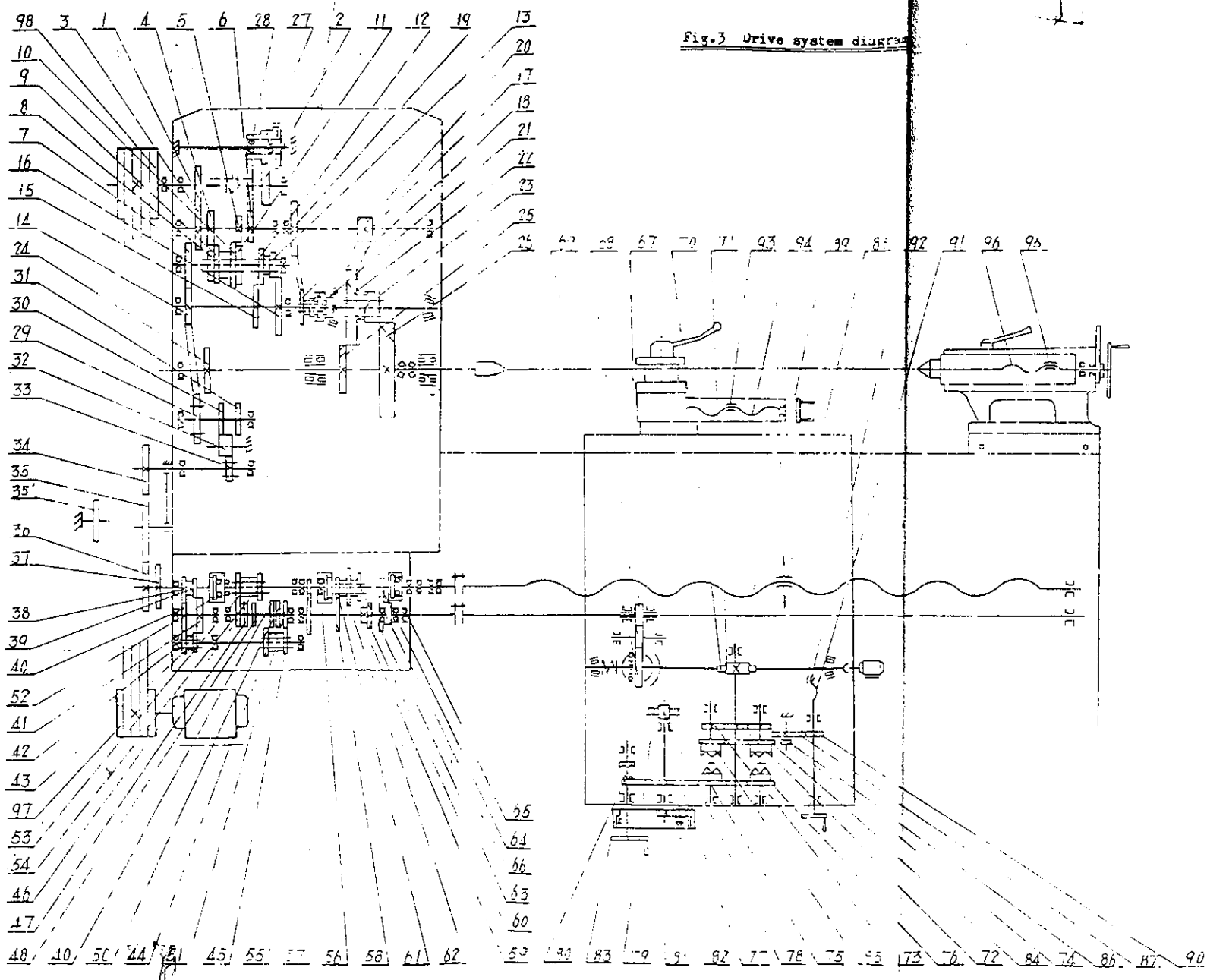


Fig.3 Drive system diagram

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名称	SY-18-七
日期	
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V. Drive system

(A) Drive system diagram and chief components

The drive system diagram of CY6140B, CY6240B, CY6150B and CY6250B is shown in Fig.3 and the chief components are shown in Table 3.

(B) Kinematic chain of drive system

1. The kinematic chain of main drive

According to the kinematic chain of main drive shown in drive system diagram, the main spindle speeds in revolutions per minute are derived as follows;

$$n_{motor} \times \frac{D}{178} \times 0.99 \times \frac{45}{40} \times \left\{ \left\{ \frac{28}{44},\ \frac{32}{40},\ \frac{36}{36},\ \frac{40}{32} \right\} \times \left\{ \frac{20}{61},\ \frac{36}{45} \right\} \times \begin{cases} \frac{30}{48} \times \frac{16}{60} \times \frac{20}{80} & \text{8 steps of low-speeds} \\ 1 \times \frac{20}{80} & \text{8 steps of intermediate-speeds} \\ 1 \times \frac{60}{40} & \text{8 steps of high-speeds} \end{cases} \right\}$$

where n_{motor}--speed in rpm of main drive motor

D_1--pitch diameter of V-belt sheave on motor

D_1=115 mm for AC Frequency f=50Hz

D_1= 96 mm for AC Frequency f=60Hz

0.99--Efficiency of belting

The 24 steps of main spindle speeds are thus computed from above formula and listed in Table 1.

2. The kinematic chain of feeding and threading

(1) According to the drive system diagram, the threadpitch of workpiece t_w relating to the feeding gear ratios is as follows:

$$t_w = 1 \times i_h \times i_t \times i_s \times i_b \times i_m \times T$$

where t_w--the threadpitch of workpiece to be cut (mm)

i_h--the mesh ratio of feeding gear train in headstock which is selected by means of lever 5.

for primary feeding: $\frac{48}{48} \times \frac{31}{31} = 1$

for amplified feeding: $\frac{80}{20} \times \frac{60}{16} \times \frac{48}{30} \times \frac{32}{18} \times \frac{48}{48} \times \frac{31}{31} = 16$

for reduced feeding: $\frac{40}{60} \times \frac{32}{48} \times \frac{48}{48} \times \frac{31}{31} = \frac{4}{9}$

i_t--the mesh ratio of transposing gears

for constant use: $\frac{60}{69\pm87} \times \frac{39\pm87}{56} = \frac{35}{14}$

for inch thrend 19 tpi: $\frac{60}{69\pm87} \times \frac{60\pm87}{57} = \frac{20}{19}$

for inch thread 11½ tpi: $\frac{60}{56\pm87} \times \frac{56\pm87}{69} = \frac{20}{23}$

i_s--the mesh ratio of thread-type change gears in feed gearbox which is selected by means of dial knob 6.

for metric threads: $\frac{28}{27} \times \frac{27}{30} = \frac{14}{15}$

for inch threads: $\frac{30}{41} \times \frac{27}{30} = \frac{27}{41}$

for module threads: $\frac{28}{27} \times \frac{41}{29}$

for diametral pitch threads: $\frac{30}{41} \times \frac{41}{29} = \frac{30}{29}$

i_b--the mesh ratio of primary change gears in feed gearbox which is selected by means of lever 7. 15 lever-positions in total.

for metric and module threads

$\frac{28}{36} \times \frac{18}{21} = \frac{2}{3}$ (lever-position No. 1)

$\frac{28}{32} \times \frac{18}{21} = \frac{3}{4}$ (lever-position No. 2)

$\frac{28}{32} \times \frac{20}{21} = \frac{5}{6}$ (lever-position No. 4)

$\frac{28}{36} \times \frac{33}{28} = \frac{11}{12}$ (lever-position No. 7)

$\frac{28}{32} \times \frac{32}{28} = 1$ (lever-position No. 8)

$\frac{28}{32} \times \frac{36}{28} = \frac{9}{8}$ (lever-position No. 10)

$\frac{21}{18} \times \frac{21}{21} = \frac{7}{6}$ (lever-position No. 11)

for inch threads and D P threads

$\frac{21}{18} \times \frac{36}{28} = \frac{3}{2}$ (lever-position No. 15)

$\frac{21}{18} \times \frac{32}{28} = \frac{4}{3}$ (lever-position No. 14)

$\frac{21}{21} \times \frac{36}{28} = \frac{9}{7}$ (lever-position No. 13)

$\frac{21}{20} \times \frac{32}{28} = \frac{6}{5}$ (lever-position No. 12)

$\frac{28}{32} \times \frac{36}{28} = \frac{9}{8}$ (lever-position No. 10)

$\frac{28}{32} \times \frac{32}{28} = \frac{12}{11}$ (lever-position No. 1)

$\frac{28}{32} \times \frac{32}{28} = 1$ (lever-position No. 8)

$\frac{28}{36} \times \frac{32}{28} = \frac{8}{9}$ (lever-position No. 6)

$\frac{21}{21} \times \frac{18}{21} = \frac{6}{7}$ (lever-position No. 5)

$\frac{28}{32} \times \frac{18}{21} = \frac{3}{4}$ (lever-position No. 2)

the gear combination $\frac{28}{36} \times \frac{21}{21} = \frac{7}{9}$ (lever-position No. 3) is used for getting feedrates only.

i_m--the mesh ratio of multiplying change gears in feed gearbox which is selected by means of lever 9.

$\frac{14}{42} \times \frac{15}{40} = \frac{1}{8}$ (lever-position I or A)

$\frac{14}{42} \times \frac{24}{32} = \frac{1}{4}$ (lever-position II or B)

$\frac{14}{42} \times \frac{33}{22} = \frac{1}{2}$ (lever-position III or C)

the spur gear couples into the internal gear, $\frac{22}{22} = 1$ (lever-position IV or D)

T--threadpitch of leadscrew (mm). T=12mm

Hence the nominal values of various thread-types are computed in accordance with the following formulas and listed in Table 2.

for metric threads:

threadpitch $t = t_w = 1 \times i_h \times i_t \times i_s \times i_b \times i_m \times T$ mm

for inch threads:

number of teeth per inch $n = \frac{25.4}{t_w} = \frac{25.4}{1 \times i_h \times i_t \times i_s \times i_b \times i_m \times T}$

for module threads:

number of module $m = \frac{t_w}{\pi} = \frac{1 \times i_h \times i_t \times i_s \times i_b \times i_m \times T \text{ mm}}{\pi}$

for D P threads:

number of diametral pitch $DP = \frac{25.4}{t_w} = \frac{25.4}{1 \times i_h \times i_t \times i_s \times i_b \times i_m \times T}$

The calculating errors of these kinematic chains resulting from above mentioned gear combinations are as follows:

for metric threads	$\delta_t = 0$
for inch threads	$\delta_n = 0.0291/1000$
for module threads	$\delta_m = 0.0540/1000$
for D.P. threads	$\delta_{DP} = 0.0813/1000$

(2) Basing upon the drive system diagram, the [illegible] to the following formula and it is [illegible]:

$$S_{longitudinal} = 1 \times i_h \times i_t \times i_s \times i_{SL} \times i_r \times \pi \times m \times z$$

$$S_{transverse} = 1 \times i_h \times i_t \times i_s \times i_b \times i_a \times i_r \times i_{ST} \times t_s$$

Where $S_{longitudinal}$--the longitudinal feedrates of carriage [illegible]

$S_{transverse}$--the transverse feedrates of cross slide [illegible]

i_r--the mesh ratio of a pair of gears in feed gearbox driving the feed shaft $i_r = \frac{21}{42} = \frac{1}{2}$ $i_t = \frac{60}{69\,(or\,87)} \times \frac{69\,(or\,87)}{56}$

i_{SL}--the mesh ratio of gear train from feed shaft to bed-rack

$$i_{SL} = \frac{36}{32} \times \frac{32}{56} \times \frac{2}{25} \times \frac{32}{36} \times \frac{45}{87}$$

i_{ST}--the mesh ratio of gear train from feed shaft to cross slide

$$i_{ST} = \frac{36}{32} \times \frac{32}{56} \times \frac{2}{25} \times \frac{32}{36} \times \frac{45}{40} \times \frac{63}{18}$$

m--module of spur gear No.79 $m = 2.5$ mm

z--number of teeth of spur gear No.79 $z = 12$

t_s--threadpitch of feed screw in cross slide $t_s = 5$ mm

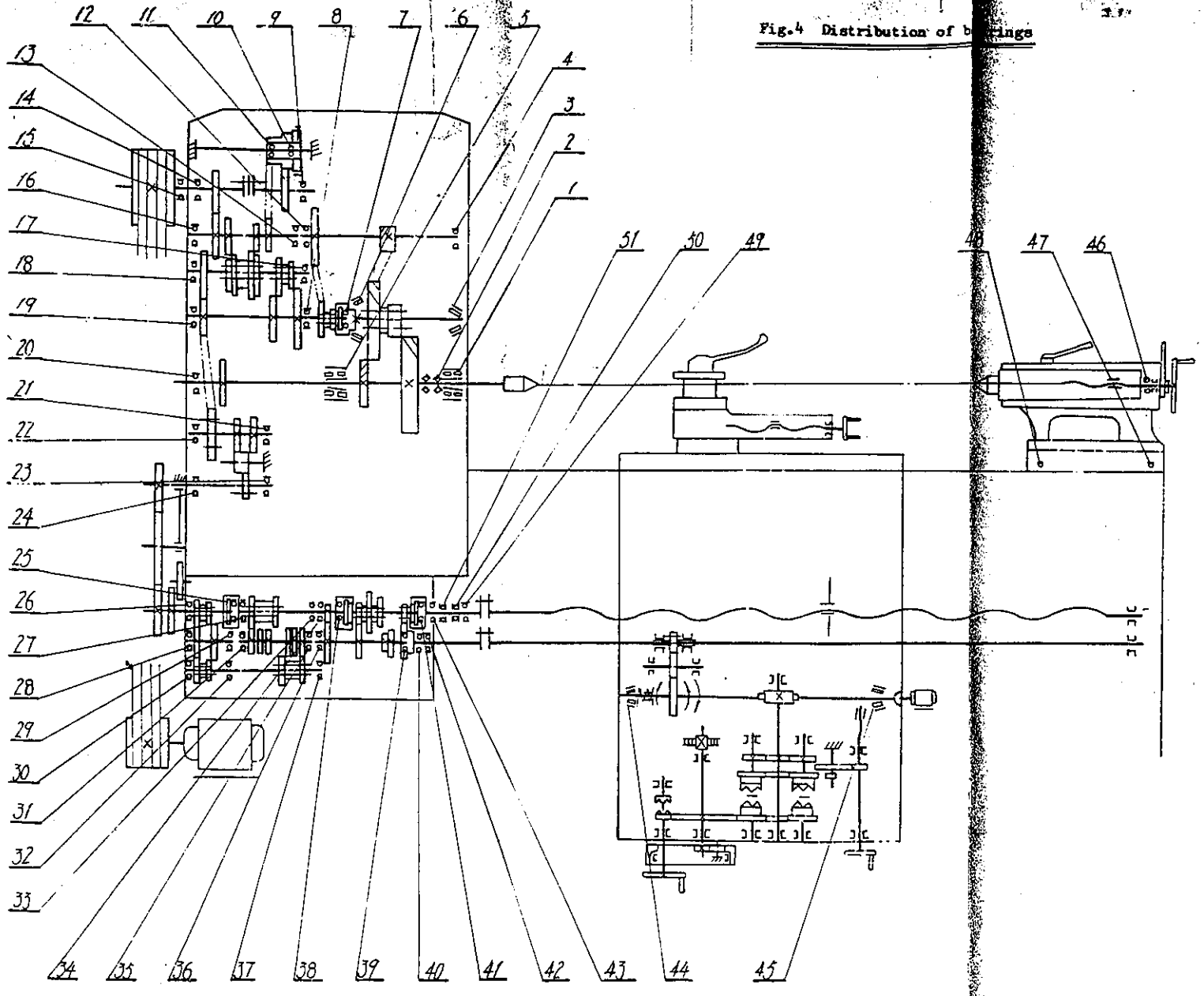


Fig.4 Distribution of b[illegible]ings

(C) Distribution and Details of Bearings

The distribution of ball bearings and roller bearings is shown in Fig. 4, and their details are listed in Table 4.

Table 4 Details of bearings

No.	Type No.	Specification	Qty	Location No. in Fig. 4
1	7000106	35 x 55 x 9	2	43, 49
2	105	25 x 47 x 12	10	33,7,10,11,21,23,32,34,40,42
3	106	30 x 55 x 13	1	24
4	203	17 x 40 x 12	9	25,29,31,35,36,37,38,39,41
5	205	25 x 52 x 15	3	13, 22, 27
6	208	40 x 80 x 18	3	9, 14, 15
7	303	17 x 47 x 14	1	28
8	304	20 x 52 x 15	1	30
9	305	25 x 62 x 17	3	26, 16, 17
10	306	30 x 72 x 19	2	18, 12
11	307	35 x 80 x 21	2	8, 4
12	308	40 x 90 x 23	1	19
13	D119	95 x 145 x 24	1	20
14	D3182120	100 x 150 x 37	1	5
15	1D3182124K	120 x 180 x 46	1	1
16	7205	25 x 52 x 16.5	2	44, 45
17	7209	45 x 85 x 21	1	6
18	7608	40 x 90 x 35.5	1	3
19	D8106	30 x 47 x 11	2	50, 51
20	5D2268124	120 x 180 x 72	1	2
21	8205	25 x 47 x 15	1	46
22	17	7 x 19 x 6	4	47, 48

VI. Electrical system

The principle of electrical system is shown [illegible]
is shown in Fig. 6, and the electric equipments [illegible]
for adapting to the different power systems of various countries, [illegible]
the machine can be provided optionly with electrical equipments [illegible]
50 HZ or 60 HZ, in main voltage of 220V, 380V, 420V or 440V and in control voltage of
110V, illuminator voltage of 24V in motor power of 10HP, 15HP or 20HP.

Before connecting the machine to the mains, it is necessary for our engineers to make sure that the fregency and voltage given on data plate agree with the local power system. The fuse haven't been provided with the machine and it should be mounted on the power line by the users according to the value of data plate.

The power line should enter the machine through the hole on the left side of the front leg, since the wiring board is also placed to the left of its rear window. An earthing wire is to be led out from side hole and tightened on the screw connecting to the ground. (PE)

While the main switch (QS) is in closing state, the local illuminator (EL1) and the pilot lamps(HL1 and HL2) mounted in green pushbutton (SB2 and SB3) of the main motor will light up, it shows that circuit is being connecter to network.

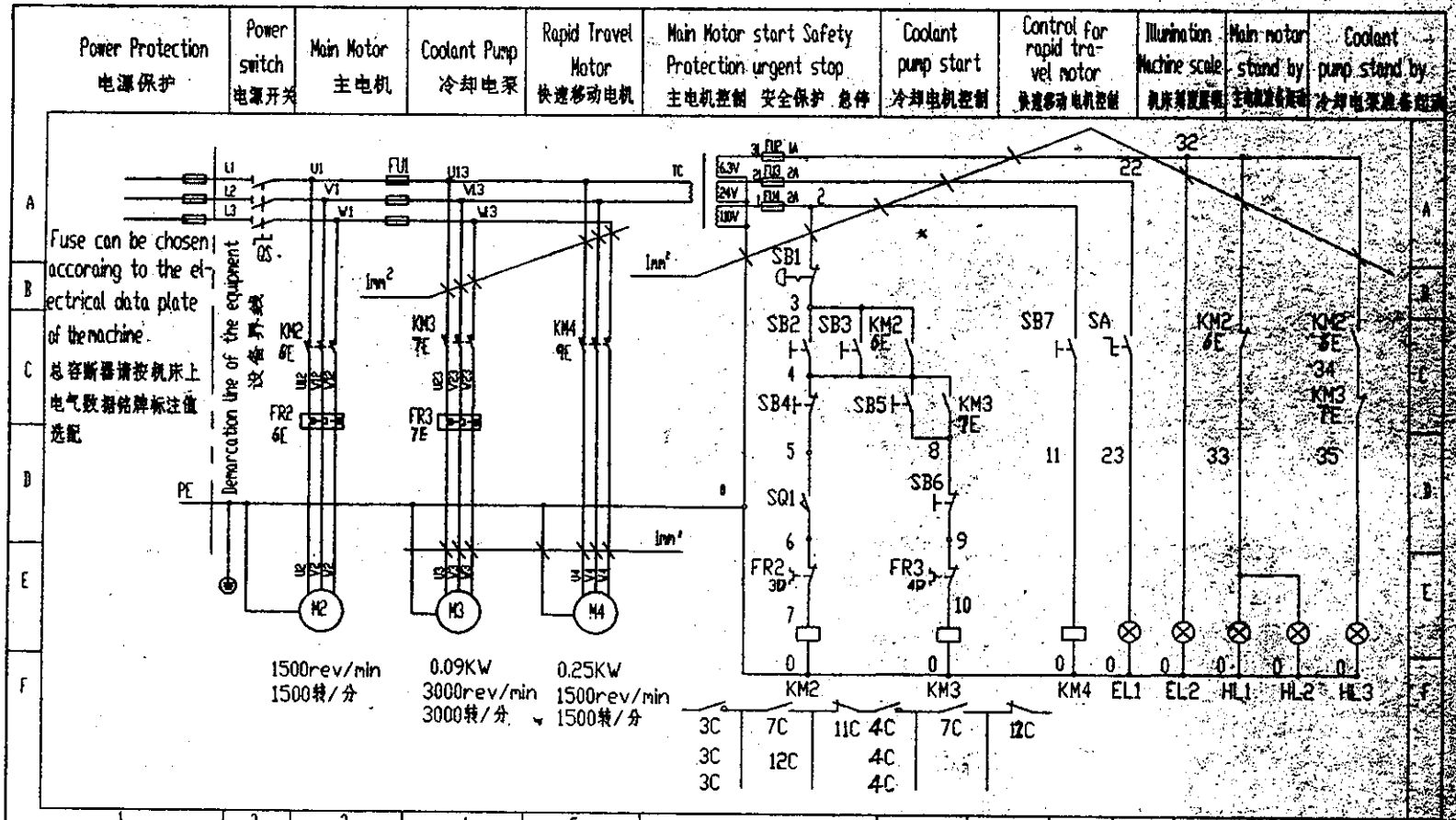
By pressing down the start-pushbutton, the pilot lamp will go out, it shows the command given by pressing green pushbutton is completed and the main motor is being started. Conversely, if press the red pushbutton (SB4), the the main motor will be stopped.

After starting the main motor, the pilot lamp (HL3) mounted in green pushbutton(SB5) of the coolant pump(M3) will light up and by pressing this pushbutton, the coolant pump will be started, the pump will be stopped automatically or restarted following the switching-off-or-on of the main motor.

A safety switch (SQ) is built in the belt cover, the main motor can't be started when opening the cover. An urgent stop-pushbutton (SB1) on the pushbutton plate can cut off all the circuits and beep the machine out of running when occuring some unexpected accident. After removing the obstacle, make sure to turn the urgent stop-pushtton in direction of an arrow to 30° restortion, then the machine can be restarted.

After connecting all the circuits, illuminating can be controlled by the switch mounted on the pilot lamps(EL1); the rapid travel motor of slide can be confrolled also by the black rapid travel pushbutton (SB7).

A hanger hole for the naked lock is also provided with the power switch of the machine. Various naked locks can be equipped at the customers choice. Special tools for opening the electrical equipment cabinet are available in accessory box.



1		2	3	4	5		6			7	8		9	10	11	12		
M2	V	FR2	FR3	FU1	M2	V	FR2	FR3	FU1	M2	V	FR2				FR3	FU1	
7.5KW	~220V	25.8A	0.58A	10A	11KW	~220V	39A	0.58A	10A	15KW	~220V							
	~380V	15.4A	0.32A	6A		~380V	22.5A	0.32A	6A		~380V	30A				0.32A	6A	
	~420V	14A	0.32A	6A		~420V	20A	0.32A	6A		~420V	28A				0.32A	6A	
	~440V	13A	0.32A	6A		~440V	19.6A	0.32A	6A		~440V	26.7A				0.32A	6A	
	~600V	9.7A	0.2A	4A		~600V	14.3A	0.2A	4A		~600V	19.5A				0.2A	4A	

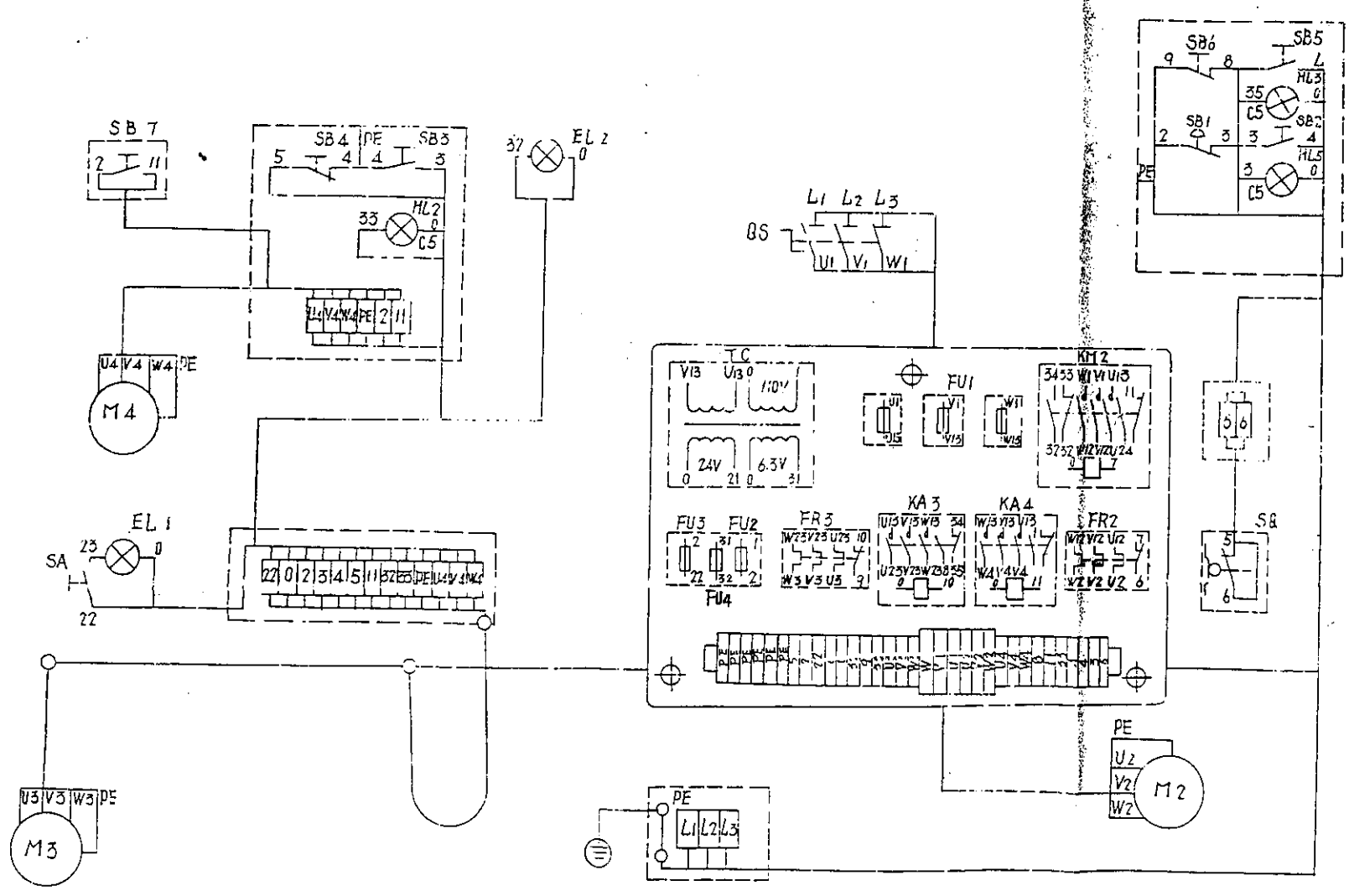
Noter the value value of thermal relay is the reference value, using the marked value on the data plate as standard. Users must take care of this.

注：各过热继电器整定值为参考值，以各电机铭牌标注值为标准，请用户注意。

The principle of electrical fquipments

电气原理图

Fig.6 Electrical wiring diagram



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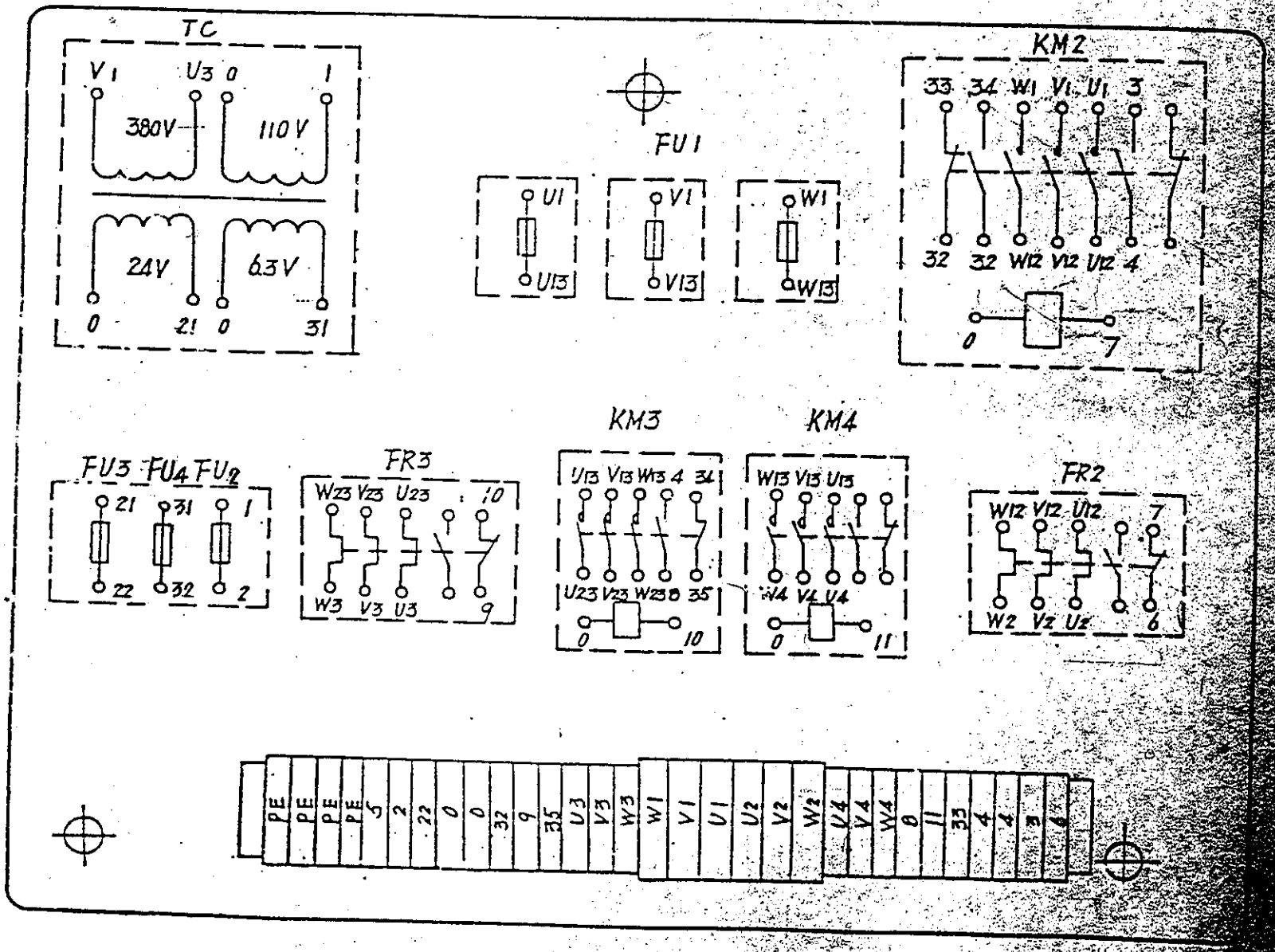
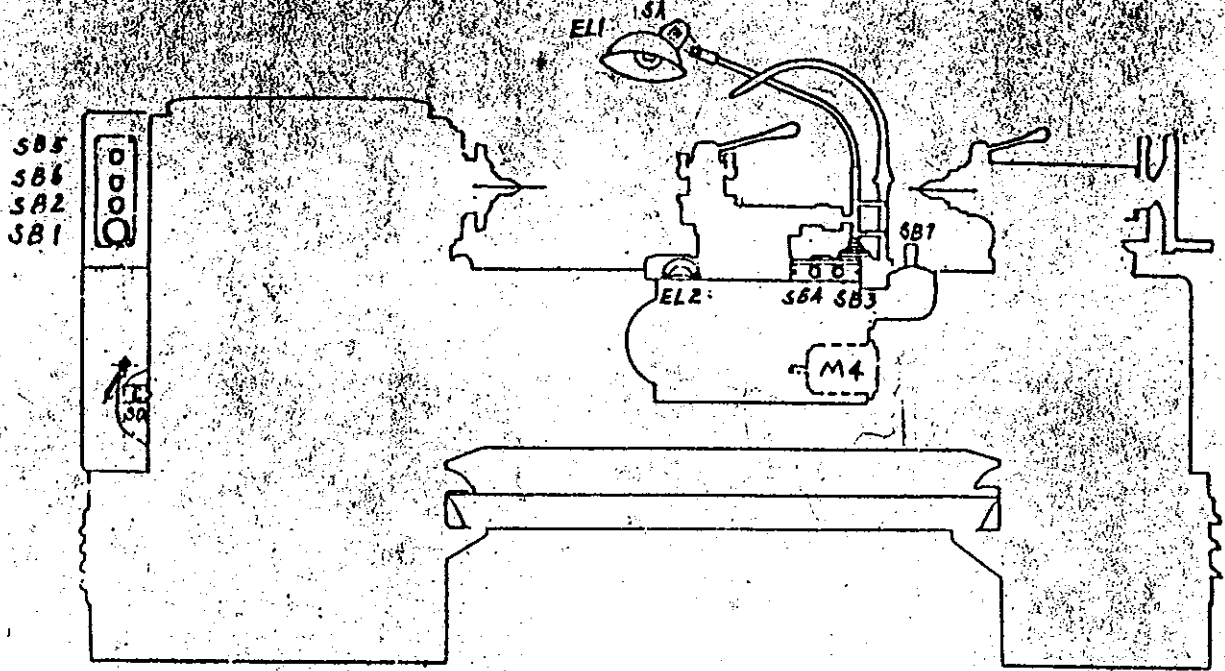
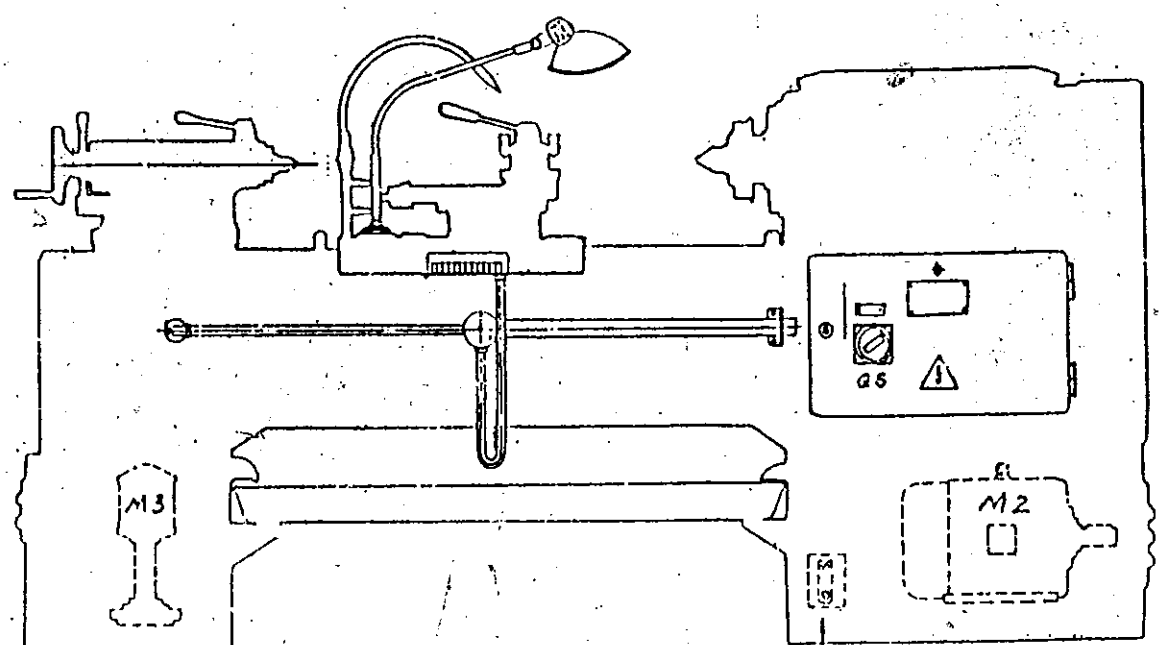


Location diagram

Installating diagram





Power 3～50Hz. PE

50A Fune 4X4 mm² Cu

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Table 6. List of electric equipments

No. of electric equipments	No. of electric diagram	Names and application	Technical parameter	Quantity	Reference model
SB1	7	Pushbutton, Emergence stop Selflocking Mushroom	Ue:380V~, Ith=5A ϕ35, red 1 (b).	1	LAD-D1JZ
SB2	7	Main motor start	ϕ28 green, 1 (a) +1 (b) lamp, 6.3V, 1W, BA9S	1	LA19-11D
SB3	8	〃		1	LA19-11D
SB4	7	Main motor stop	ϕ28 red, 1 (a) +1 (b)	1	LA19-11
SB5	8	Cooling pump start	ϕ28 green, 1 (a) +1 (b) lamp, 6.3V, 1W, BA9S	1	LA19-11D
SB6	9	Cooling pump stop	ϕ28 red, 1 (a) +1 (b)	1	LA11-11
SB7	10	Rapid trabvel motor start	Ue, 380V~, Ith=2.5A black, 1 (a) +1 (b)	1	LA9
SQ	7	Limit switch	Ue, 380V~, Ith=5A 1 (a) +1 (b)	1	LX19K
EL1	11	Work lamp	24V~, 40W lamp holder E27	1	JC11-1
EL2	12	Pilot lamp	6.3V~, 1W, colorless, BA9S	1	XD-0
FU1	3	Fuse	fuse link: 6A used for power of 600V 380V 420V 440V	3	am3
			10A used for power of 220V		
FU2	7	Fuse	fuse link: 1A	1	gF1
FU3	7	Fuse	fuse link: 2A	1	
FU4	7	Fuse	fuse link: 2A	1	
TC	6	Control transformer	primary: 600V 220V 380V 420V 440V 50HZ (60HZ)	1	depending on the power voltage of the principle of electrical diagram refe rence model (JBK-160)
			secondary. 110V, 100VA(85VA) 24 V, 45VA (70VA) 6.3V, 5 VA (5VA)		

Continue

No. of electric equip-ments	No. of electric diagram	Names and applications	Technical parameter	Quantity	Remarks Reference model
QS	2	Power switch	threephase, Ue, 500V ~ Ie, 25 A	1	HY1—25—SG used for: power 420V~ 440V~ 600V~ main moter: 7.5Kw power: 420V~ 600V~ main motor: 11Kw
			threephase Ue, 380V~ Ie, 40 A	1	HY1—40—SG used for power: 220V~ main motor: 7.5Kw power: 220V~ 380V~ main motor: 11Kw
			threephase Ue, 380V ~ Ie, 25 A		HY1—25—SG used for: power: 380V~ main motor: 7.5Kw
M 2	3	Three phase squirrel-cage motor Leg mounting type	7.5KW, 1500r.p.m insulation in E class 50Hz (60Hz)	1	Y132M—4 corresponding power: 220V~ 380V~ 420V~ 440V~ 600V~
			11KW, 1500r.p.m insulation in E class 50Hz (60Hz)		Y160M—4 corresponding power: 220V~ 420V~ 440V~ 600V~

Yinhan Machine Tool Works

Wiring Diagram

No. of electric equipments	Code No.	Names and application	Technical parameters	Qty.	Reference model
M 1	4	Three phase motor pump	0.09KW, 3000r.p.m insulation in E class 50Hz (60Hz)	1	2 AOB-26 corresponding power: 220V 380V 420V 440V 600V
M 4	5	Three phase squirrel-cage motor Flange mounting type	0.25Kw, 1500r.p.m insulation in E class 50Hz (60Hz)	1	2AOS5634 corresponding power: 220V 380V 420V 440V 500V
KM 2	7	Contactor	triple-pole, Ue, 380V~ Ie, 20A/AC3 coil, 110V~, 50HZ (60HZ) auxiliary contact head Ue, 110V~, Ith=5A 2 (a) + 2 (b)	1	3TB4317 suitable for power: 380V~ main motor: 7.5Kw
			triple-pole Ue, 380V~ Ie, 40A/AC3 coil, 110V~, 50HZ (60Hz) auxiliary contact head Ue, 110V~, Ith=5A 2 (a) + (b)	1	3TB4417 suitable for power: 220V~ 380V~ main motor: 11Kw power: 220V~ main motor: 7.5Kw
			triple-pole: Ue, 550V~ Ie, 20A/AC3 coil, 110V, 50HZ (60Hz) auxiliary coutact head Ue, 110V~, Ith=5A 2 (a) + (b)	1	3TB4317 suitable for power: 420V~ 440V~ main motor: 7.5Kw

No. of electric equipments	No. on electric diagram	Name and application	Technical parameter	Qty.	Order (Type)
KM3	9	Contactor relay	coil, 110V~, 50HZ (60HZ) Ue, 380V~, Ith=5A 4 (a) +4 (b)	2	3TB4010 suitable for power: 220V~ 380V~
KM4	10		coil, 110V~, 50HZ (60HZ) Ue, 500V~, Ith=5A 4 (a) +4 (b)	2	3TB4010 suitable for power: 420V~ 440V~ 600V~
FR 2	3	Overcurrent relay	current range/rated value 11--22A/15.4A	1	JRS2-25/F power: 380V~ main motor: 7.5Kw
			10—16A/14A	1	JRS2-25/F power: 420V~ main motor: 7.5Kw
			10—16A/13A	1	JRS2-25/F power: 440V~ main motor: 7.5Kw
			20—32A/25.8A	1	JRS2-63/F power: 220V~ main motor: 7.5Kw
			20—45A/39A	1	JRS2-63/F power: 220V~ main motor: 11Kw
			9~12.5/9.8A	1	Power: 600V~ motor 7.5KW
			12.5~18/14.5A	1	Power: 600V~ motor 11KW

Tool Works	Operating Instructions	

No. of electric equip-ments	No. of pcs	Function and application	Technical parameter		
FR 2	1	Overcurrent relay	current range/rated value 20—32A / 22.5A	1	JRS2-25/F power: 380V~ main motor: 11Kw
			14—22A / 20A		JRS2-25/F power: 420V~ main motor: 11Kw
			14—22A / 19.6A		JRS2-25/F power: 440V~ main motor: 11Kw
FR 1	1	Overcurrent relay	current range/rated value 0.45—0.72A / 0.58A	1	JRS2-12.5/F suitable for: power: 220V~ 50Hz
			0.25—0.35A / 0.32A		JRS2-12.5/F suitable for: power: 380V~ 420V~ 440V~
			0.15~0.22/0.2		Power 600V~

VII. Lubricating system

The lubricating system diagram is shown in Fig.7.
This machine is lubricated mainly by adopting No.30 machine oil with viscosity 3.81°--4.59°, E50.

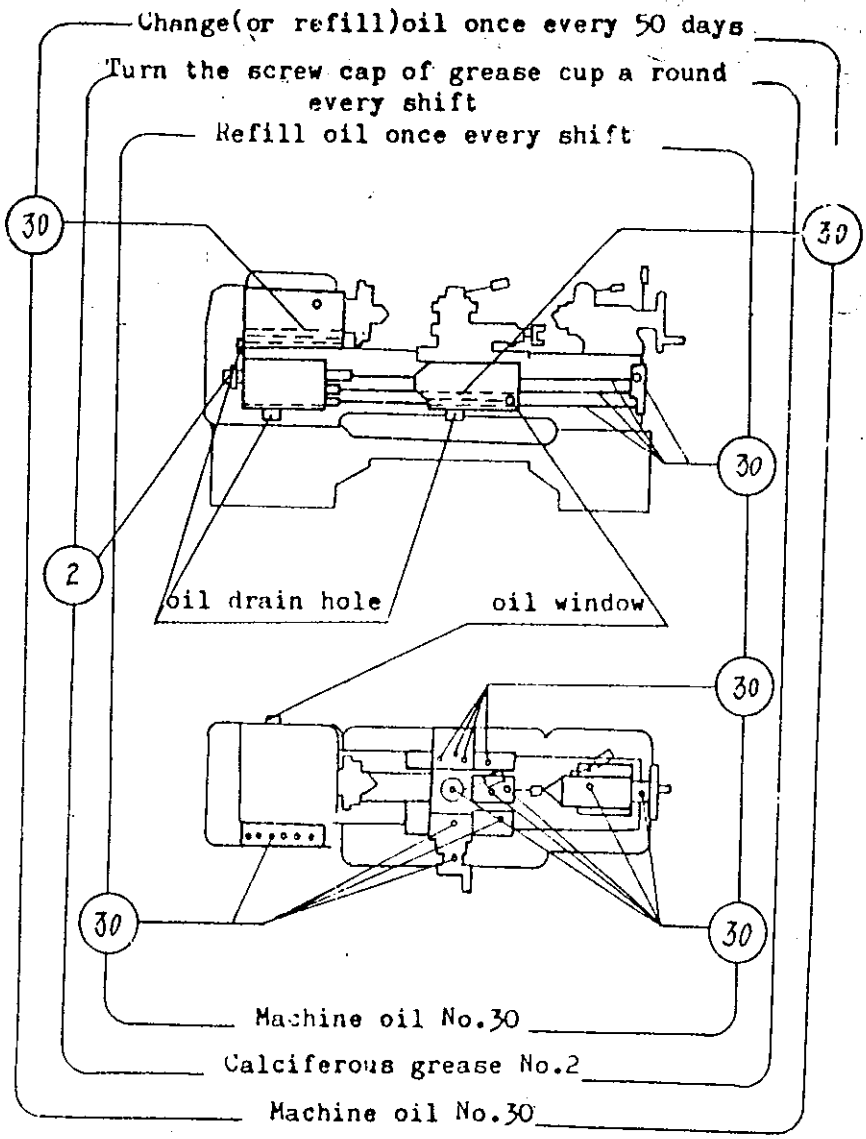

Fig.7 Lubricating system diagram

1. In the headstock the lubricating oil is supplied by a built-in trochoid pump driven by shaft 1 (Fig.8). The lubricant being raised and filtered, is then led to the oil pan and sump for lubricating gears, shafts as well as bearings. A circulatory lubrication is formed in the headstock. (Fig.9).
For check up the working condition of the pump, it provides an oil window on the headstock front. The oil level of headstock is observed from the sightglass at the rear side.

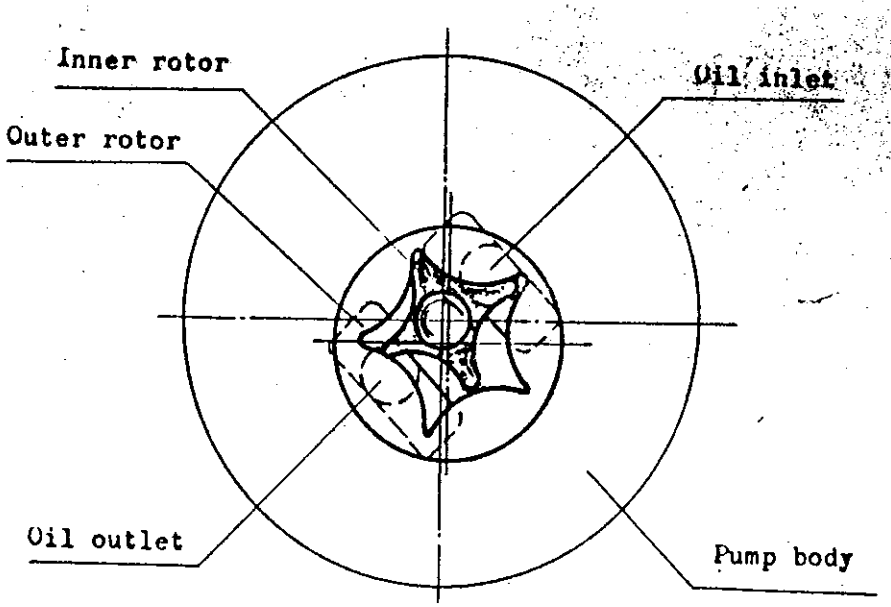

Fig.8 Schmatic sketch of trochoid pump in operation

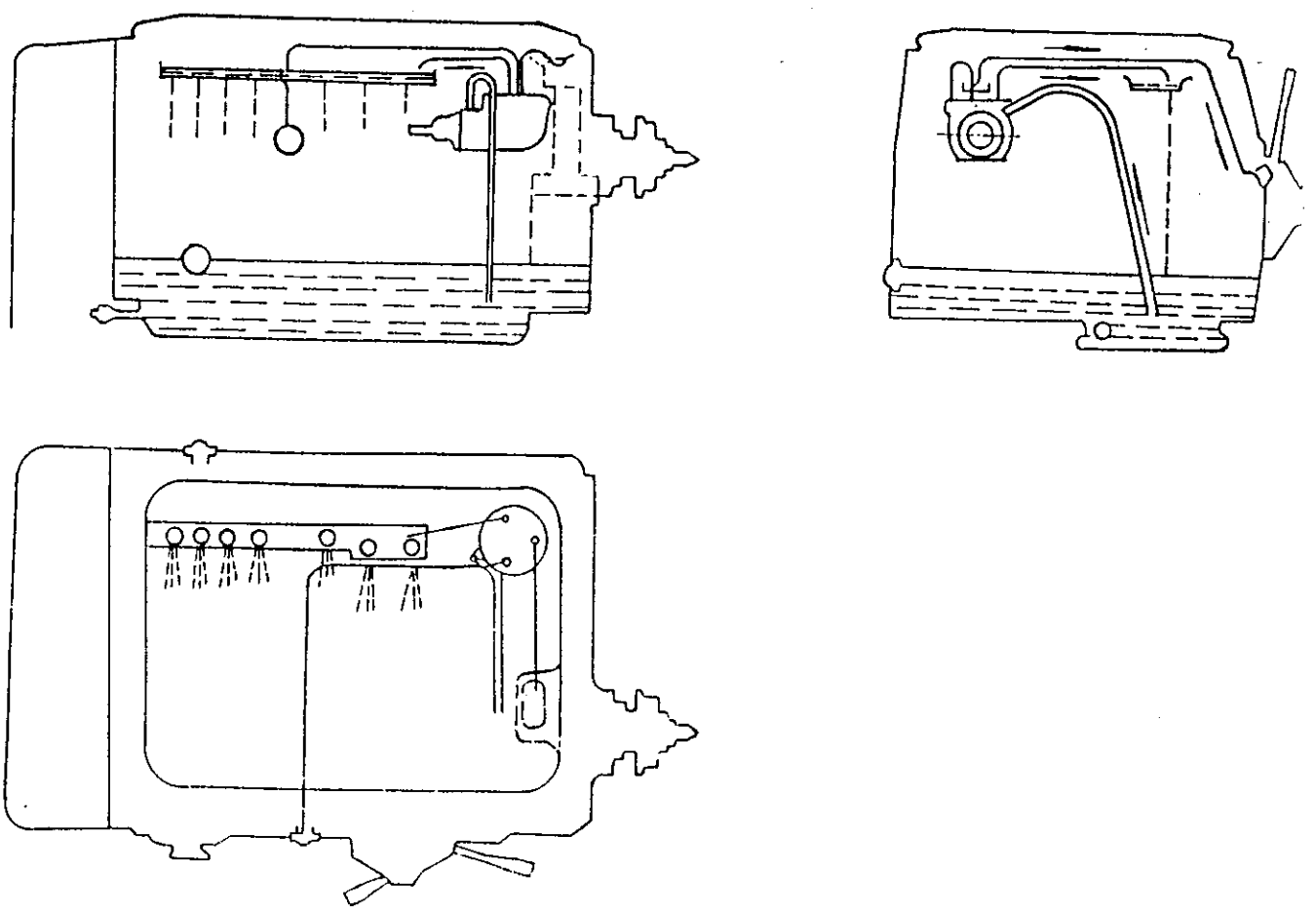

Fig.9 Lubricating diagram in headstock

2. The sump on top of feed box is used to reservoir lubricant. The part of the feed box are drop-lubricated through capillary woolen yarns in sump. After a period of operation, drain the waste oil according to the indication on sightglass. (Fig.10).

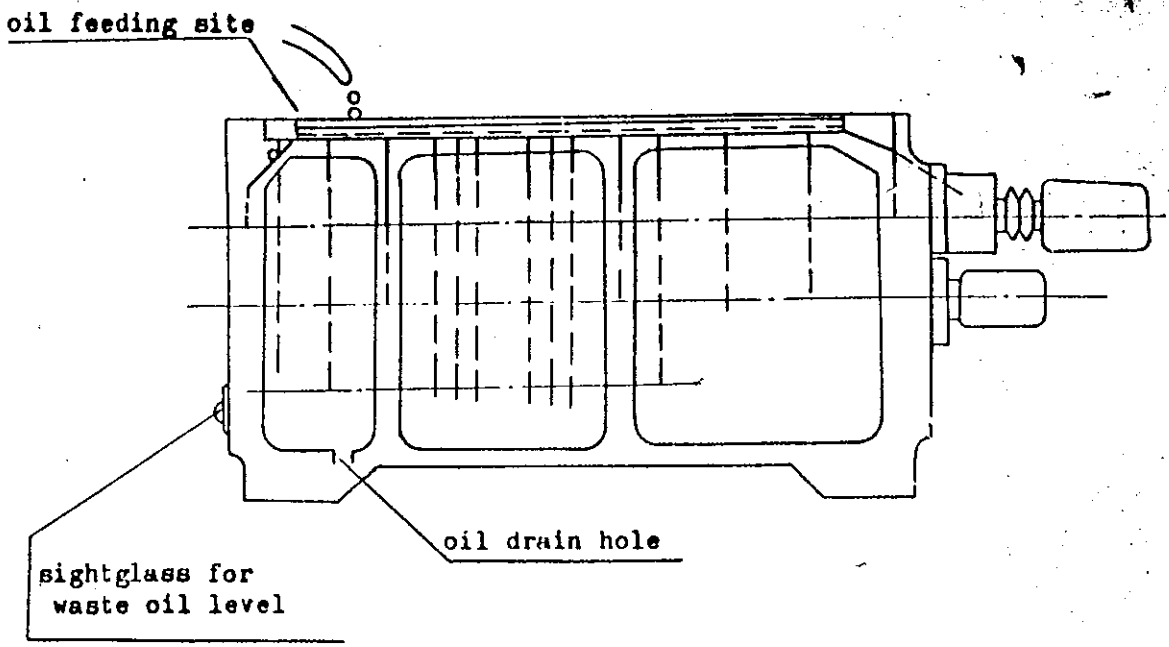

Fig.10 Lubricating diagram in feed gearbox

3. In the apron the internal sump is used to reservoir lubricant, the driving parts are splash-lubricated by the oil agitator during rapid travelling. Bearings in the apron are lubricated either by pressing machine oil through the cup on the saddle with oil gun, or drop-lubricated from the capillary woolen yarns in the top groove which reserve a part of the splashed oil. (Fig.11). The oil lever can be observed in sightglass at the front of the box.

4. The lower guideways of the saddle is lubricated by the through fine felt filtered oil reserved in two cups located in front and in rear each.

5. The upper guideways of the saddle, the transverse feed screw, the leadscrew of the top slide as well as quill and leadscrew of tailstock are all lubricated by oil gun.

6. End journals of the longitudinal leadscrew, feed shaft and reverse shaft are drop-lubricated by capillary woolen yarns in the oil reservoir at the top of the end journal bracket.

7. Idler shafts and sleeves of the transposing gear holder are lubricated with No.2 calciferous grease extruded by means of the screw cap of grease cups.

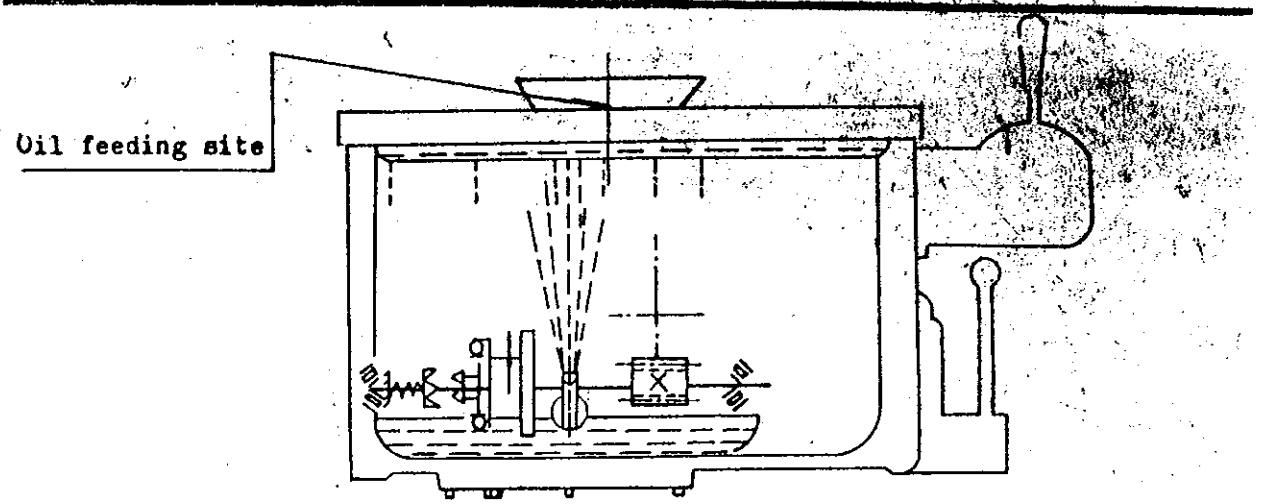

Fig.11 Lubricating diagram in apron

VIII. Cooling system

Coolant of this machine is stored in the rear cabinet leg for machine center distance up to 1500mm or in the middle cabinet leg for machine center distance of 2000mm. The circulation of coolant is effected by an AOB-25 three-phase electric pump. Coolant flow is regulated by a service cock on the coolant pipe.

IX. Construction and adjustment

1. Bed: The guideways of bed is induction-hardened.
   Main drive motor and coolant pump of the machine are installed in the front and rear (ormiddle) cabinet legs respectively. The power board is located in the square frame at the rear of bed. Tension of the main drive belts should be adjusted appropriately by means of the adjusting nuts. (Fig.12)

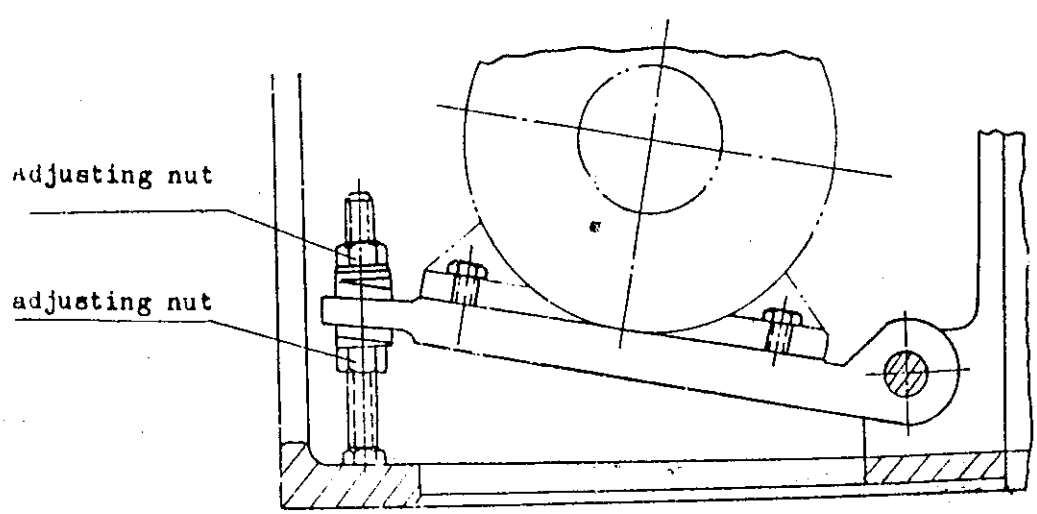

Fig.12 Adjusting diagram of drive belts

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2. Headstock

This machine adopts centralized all-gear drive system. Shaft I is driven by main drive motor through V-belts, and the revolving motion via multi-disc friction clutch and intermediate gears is then transmitted to the main spindle. The revolving direction of the spindle is controlled by the friction clutches. For ensuring a normal working state of main spindle, the friction clutches have to be adjusted appropriately. If it is too loose, starting will not be sensitive and power output of spindle will be reduced, slipping and heat-up may occur frequently, causing serious wear of clutch; if too tight, it will be hard to operate and will lose the effectiveness of safeguard. (Fig.13) After the friction clutches being disengaged, the rotation of the main spindle is then stopped by the brake. When the brakeage can't be realized within a sho time, the adjusting nuts can be used to tighten the brake band appropriately, but pay attention don't let the band be tortured! (Fig.14).

In the headstock, the main spindle adopts a three-point-supporting system, therein take the front and central bearings as chief supporters while the rear bearing as an auxiliary supporter.

In order to assure the machining precision and the cutting performanee, the clearance of spindle bearings should be adjusted carefully making the radial and axial accuracies in rotation of spindle up to the national standards of the machine tools precision. (Fig.16).

When the accuracies do not fulfil above mentioned requirements, proceed an adjustment as follows: Remove stud 8(Fig.16). through the opened hole insert the end of knurled head shaft AB13001 (see Table 7. Service tools) into the blind hole of nut 1. Then loose nut 1 by rotating the main spindle reversely and loose nut 2 after removing the lock-key. Thus nut 3 and nut 4 can be turned to adjust the front bearing and central bearing. After the completion of adjustment, the loosend parts should be tightened and put in place again.

The machine must be tested in an idle-running at max. speed for more than two hours after the adjustment is accomplished. Under a normal running condition of an even rise in temperature, the final temperature of the spindle should not exceed 70°C, if not, the bearings must be readjusted.

The balance weights fixed in the V-groove on gear 5 are set accordingly to eliminate the chattering of spindle during idle-running. The spindle has been balanced and rectified before delivery.

Around the circumference of main spindle flange a graduation of 48 lines has been engraved and an adjustable arrow is set by the side as a scale indicator to facilitate the dividing work in cutting multiple-threads of 9 kinds of starts (i.e. 2, 3, 4, 6, 8, 12, 16, 24, and 48 starts). Before starts-dividing in operation, the spindle speed change lever 10(Fig.2) should be put to "White poin position(neutral) at first and jot down the scale of graduation exactly opposing

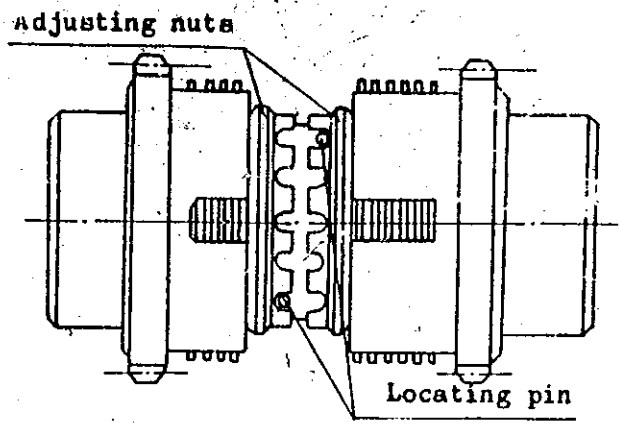

Fig.13 Diagram for adjusting the multi-disc friction clutches

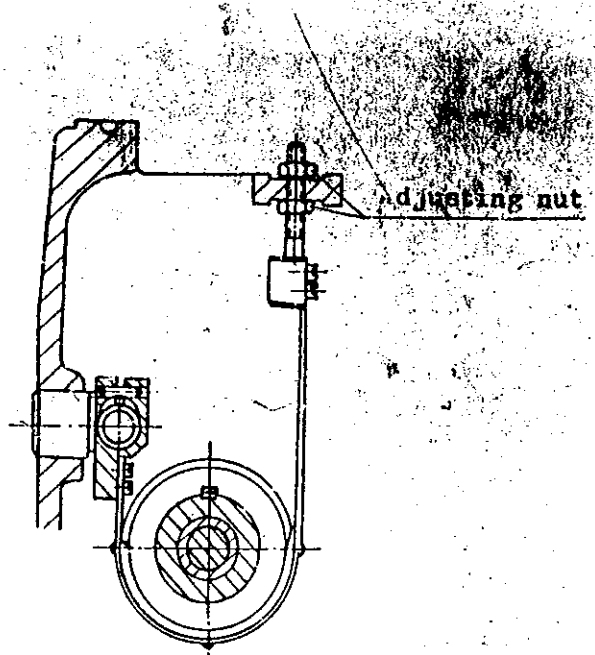

Fig.14 Diagram for adjusting braking band

to the adjustable arrow. After disengaging the normal- and amplified pitches forward and reverse feed lever 5, the spindle can then be turned by hand 48/Z divisions forward or reversely from the indicating scale in accordance with the desired direction. (Z=No. of starts of workpiece). Thereafter engage lever 5 and put lever 10 to original position. The workpiece in operation is now ready for cutting an another start of the multiple-thread.

Chain drive device is employed for shifting the basic gear group in main power transmission. When the chain is slackening, the exactitude of lever position on the circular plate of revolution-numbers would be affected. Under this condition the chain must be tightened by adjusting screw (Fig.15).

3. Tailstock

At the end of quill taper bore a stopper 6 is mounted to prevent the tool's taper shank from rotating. The body of tailstock can be moved transversally on base plate along the single-side guide rail, and its position on base plate is adjuste by screw 1. Loosen the clamping elements and screw 2 before moving and tighten them after setting. (Fig.17). When replacing the tailstock, right align the convex block on the body with the convex block 8 on base plate. Being moved longitudinally, the tailstock can be immediately clamped on bed by the eccentric shaft. Its clamping force may be regulated by nuts 3 and 4, and when the tailstock is loaded by heavy work,

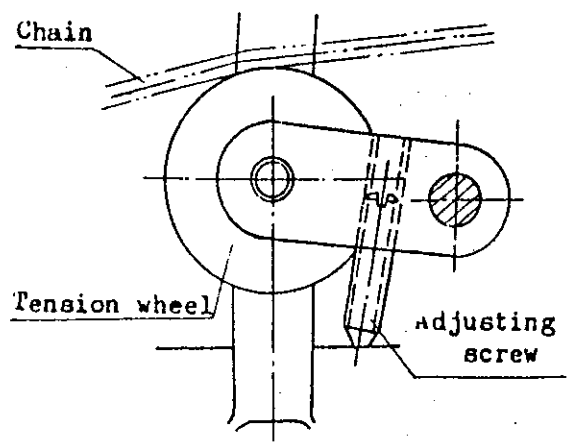

Fig.15 Diagram for adjusting the tension of chain

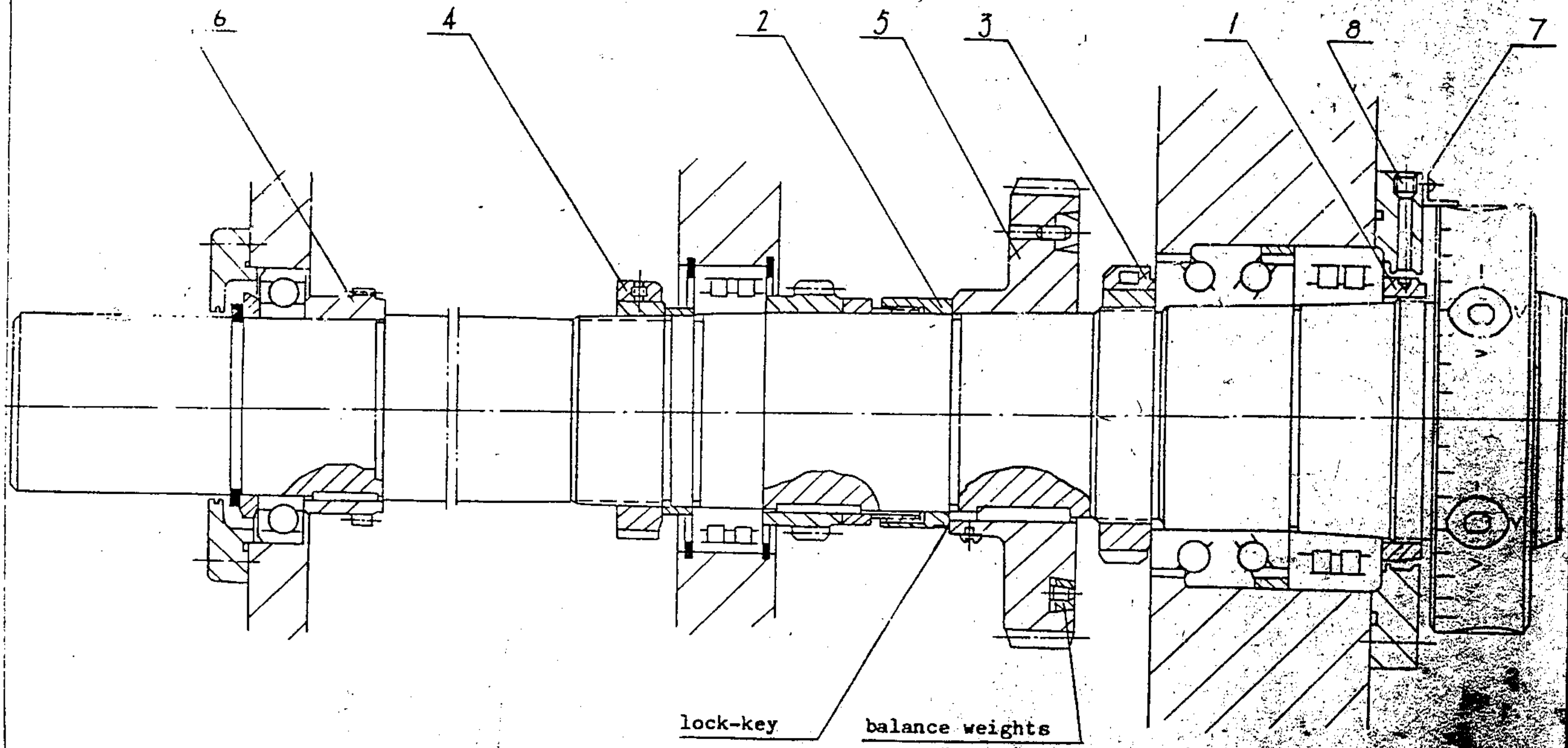

Fig.16 Adjusting diagram of spindle bearings

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tighten nut 5 also for ensuring a powerful clamp.

After loosing the clamping handle, through the underneath four ball bearings with elastic support, the tailstock will be floated about 0.05 -- 0.15 mm on the bed ways to reduce the friction or manual pushing force in moving along the bed-guideways. The floating amount is rather small and adjusted by screw 7. This adjustment can only be made when the tailstock is being clamped on the bed so as to ensure the rigidity of contact between tailstock and bed as well as to prevent the bearings from being crushed.

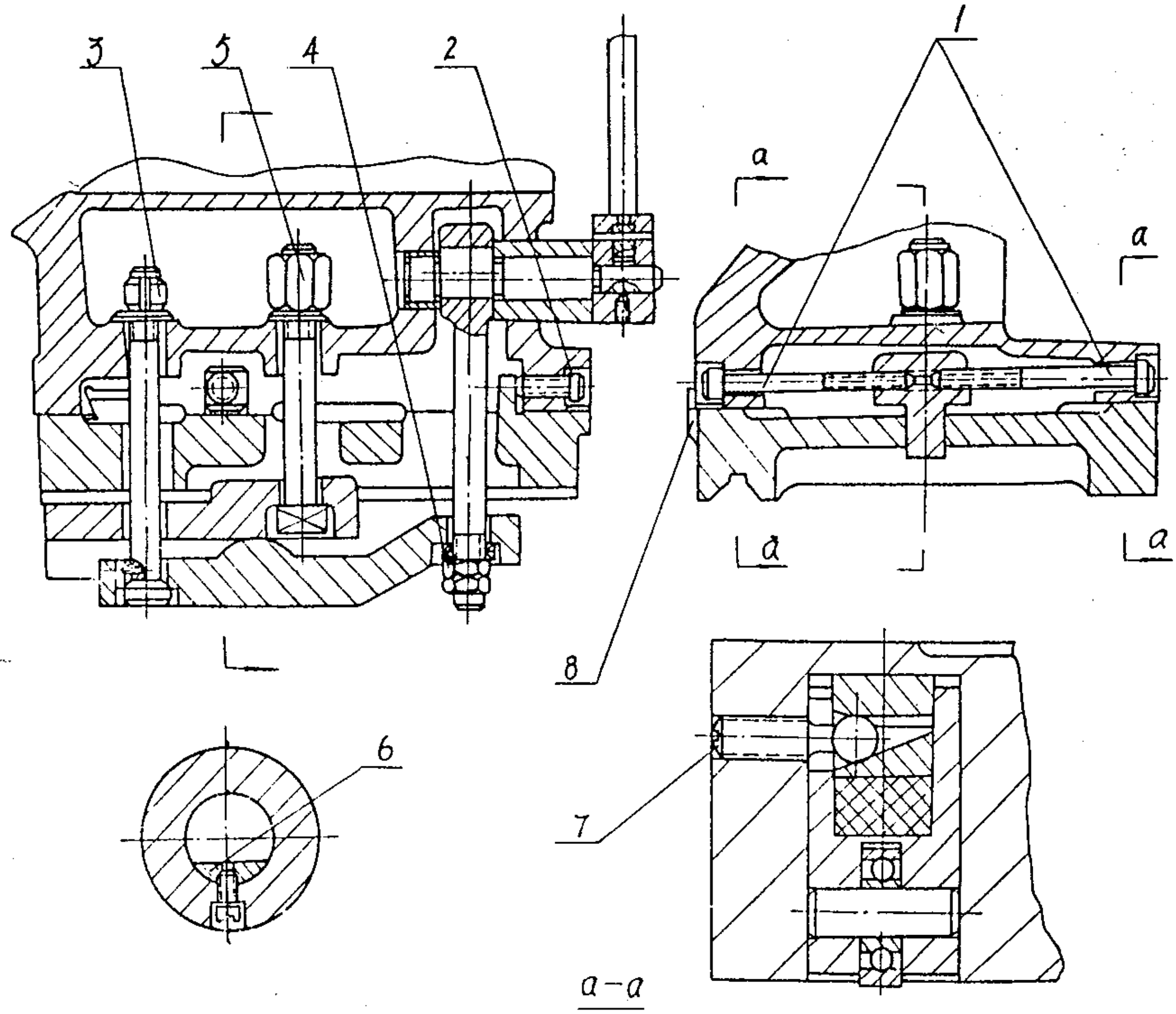


Fig.17 Adjusting diagram of tailstock

4. Carriage

In order to make the square turnable for tool-setting a cam driven by a single-direction pawl is used to lift up a locating pin from the top slide (Fig.18). When rotate the clamping handle counterclockwisely the square turret will be slightly lifted and the lift-up remains constant in many a time and oft operations. In all cases, following every tool setting the square turret can be clamped tightly by rotating the handle clockwisely less than a complete revolution.

If the square turret can't be shifted to the proper position during tool-sett try to loosen the spring 5, and conversely, if overstepped, try to tighten it. But this adjustment would not be too tight, otherwise the presure of spring 5 on ball should exceed the presure of spring 6 on locating pin, it would not only make the tool-setting strenuous, but also influence the locating accuracy of square turret.

The clamping handle and square turret can be detached for cleaning, having first removed the bolts 1 and 2 as well as the spring 3. The square turret should be reassmbled according to the sectional views shown in Fig.18.

The movement of cross slide is effected through a nut driven by the feed screw. This screw nut is of a slotted integral type so as to facilitate the adjustment of a right fit on pitch diameter and to eliminate the driving clearance. When adjusting, loosen stop screw 1 first and then set screw 2 until clearance is removed, thereafter retighten stop screw 1 and put dust cap 3 on (Fig.19).

If the play of the cross slide guideway or of the top slide guideway is too big, or the movement is not sensitive, the adjusting screws in noses at both ends of the gibs can be used for regulating.

Position locking devices are provided for top slide, cross slide and saddle respectively. If any of these parts requires position fixing on guideways, it needs only to tight up the relevant lock screw.(see Fig.2 Lock screw of saddle 16 and Fig.20).

5. Apron

The transversal or longitudinal travel of carriage is realized through the feeding mechanism of the machine. The feeding movement is transmitted into apron by feed shaft, passing through the overload clutch and wormgearing to the driving gear etc.

An one-way overrun clutch is mounted on the worm shaft to enable rapid travelling of the carriage at any time, that is, when the worm shaft is driven in a definite direction by the rapid travel motor, the feeding movement from the feed shaft will be run over.

For safety in operation, the longitudinal travel handwheel will disengage automatically when the carriage is in longitudinal power feeding or ropid travelling. It will engage again automatically as the above mentioned movement

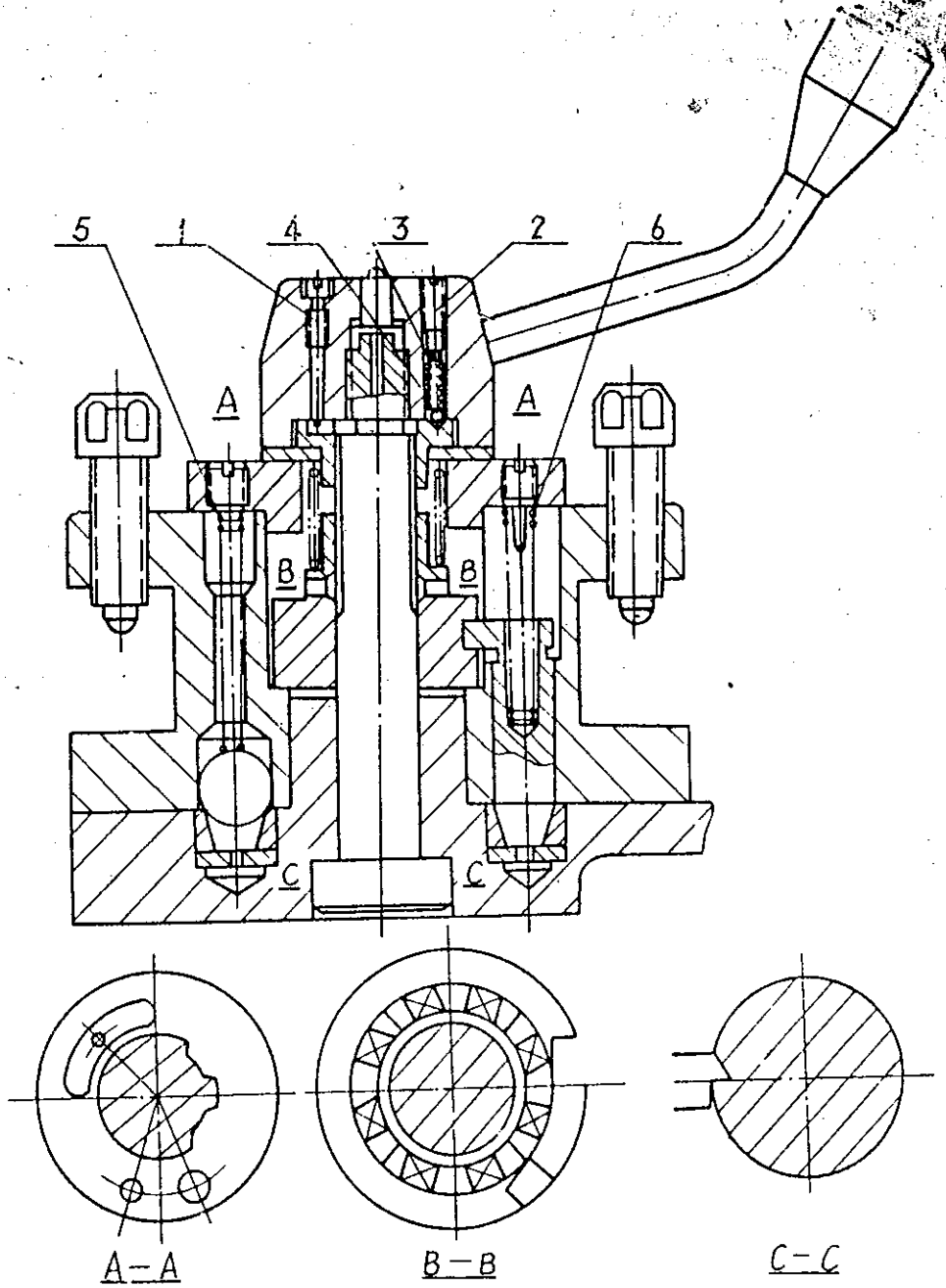


Fig.18 Construction sketch of square turret

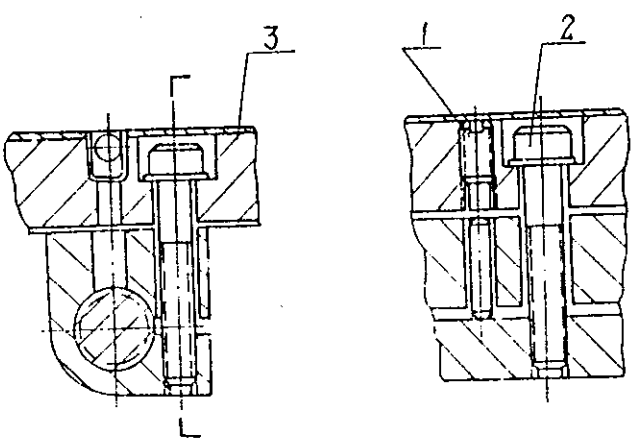


Fig.19 Adjusting diagram of screw nut in cross slide

is being stopped.

Under the condition that the cutting force and the feeding force can't approach the maximum allowable value specified by this machine, the adjusting screw 2 can be used in adjusting the overload clutch after the guard cap 1 is removed. (Fig.21). Care should be taken not making the clutch too tight, or otherwise it may lose the effectiveness for safeguard and cause machine parts to be damaged.

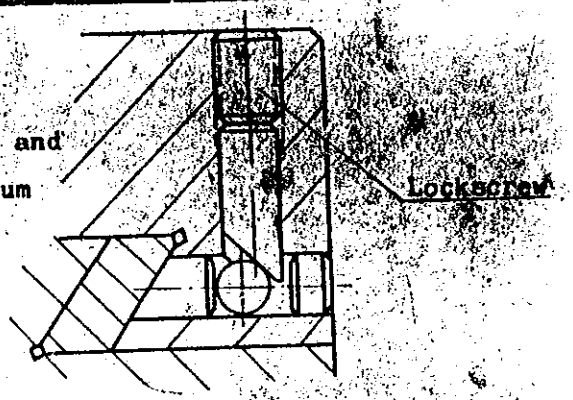


Fig.20 Diagram for locking devices of cross slide and top slide guide ways

An automatic mechanical interlocking device is set up between the longitudinal-transverse travel control-axle and the split-nut control-axle so as to prevent the leadscrew and the feed shaft from driving the apron simultaneously.

6. Feed box

The feed box provides with a specially designed "sliding gear mechanism", a thread variety change device and a multiply gear-ratio device to enable cutting common-used threads in inch, metric, diametral pitch or module without any effort of changing gears.

For ensuring the pitch accuracy of threads to be cut, the axial play of the leadscrew should be eliminated, the lock nut I can be used to adjust the thrust bearings 2 and 3. (Fig.22).

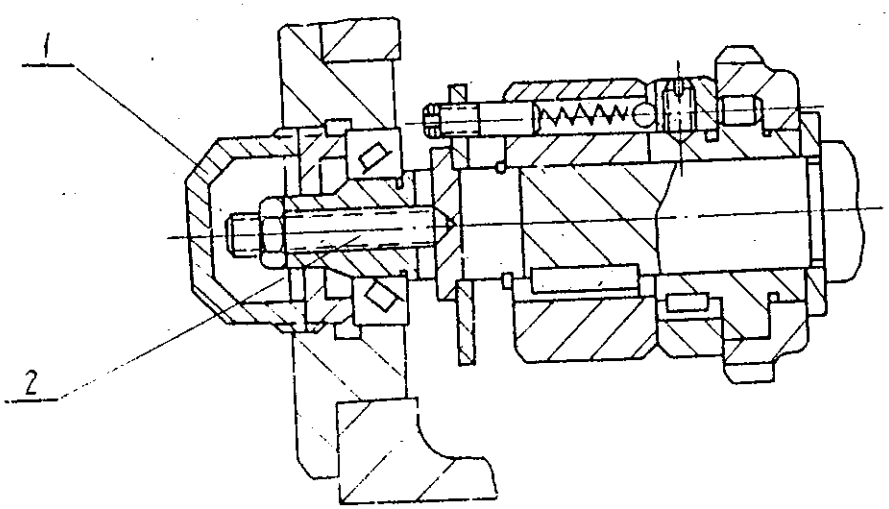


Fig.21 Adjusting diagram of overload clutch

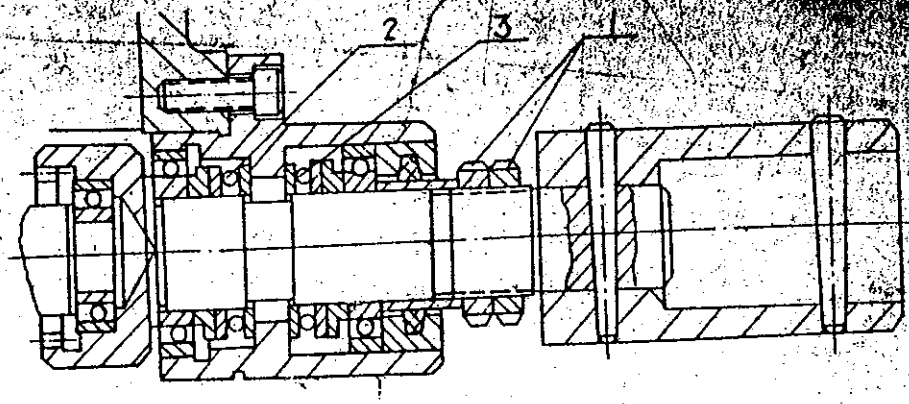


Fig.22 Adjusting diagram of thrust bearings on leadscrew

7. Transposing gears holder

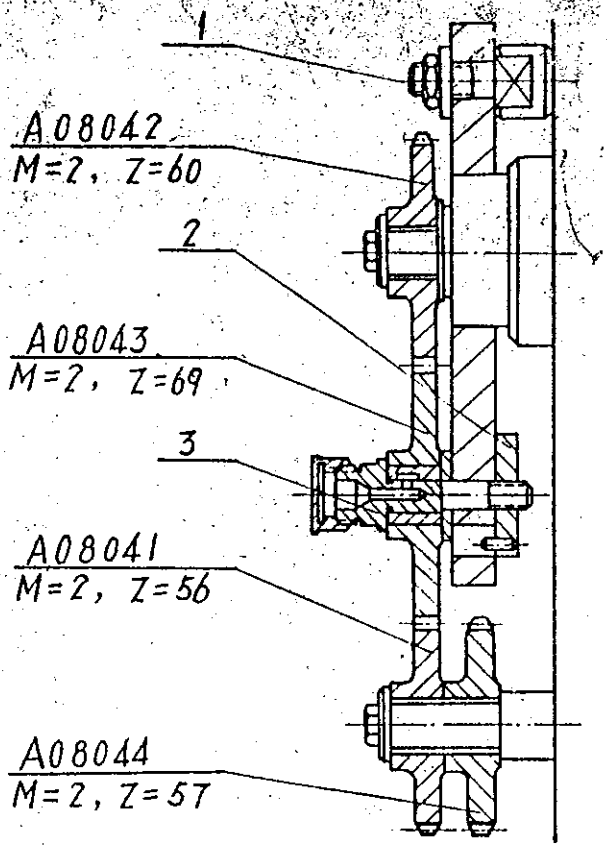
In most cases of thread-cutting it needs not to change the primary transposing gears which have been fitted on the quadrant by the left side of headstock. Only when workpieces of threadpitch 19 or 11½ teeth per inch being cut, it is then necessary to change and arrange them in accordance with the diagram shown in Fig.23. At that time, loosen idle axle 3 and remove it with nut 2, change the relevant gears accordingly and tighten them, thereafter loosen nut 1, turn the quadrant to adjust the clearance of gears in mesh and retighten it.

8. Chuck, driving plate, face plate and spindle nose

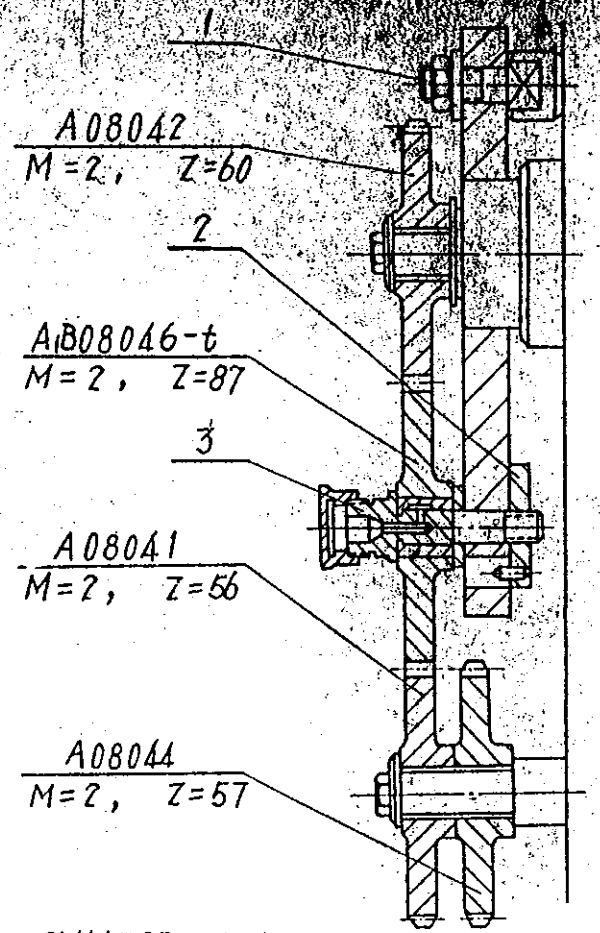
The chuck, driving plate or face plate is in connection with main spindle through spindle nose of camlock short taper flange type. To fit them over the spindle, the reference line engraved on each should be in alignment with the reference line engraved on spindle nose, and thereafter lock them firm by turning the cams on spindle flange in sequence and evenly. For the disassemblag the above mentioned procedures are inversed. (Fig.24).

The sketch with dimension of spindle nose is shown in Fig.25.

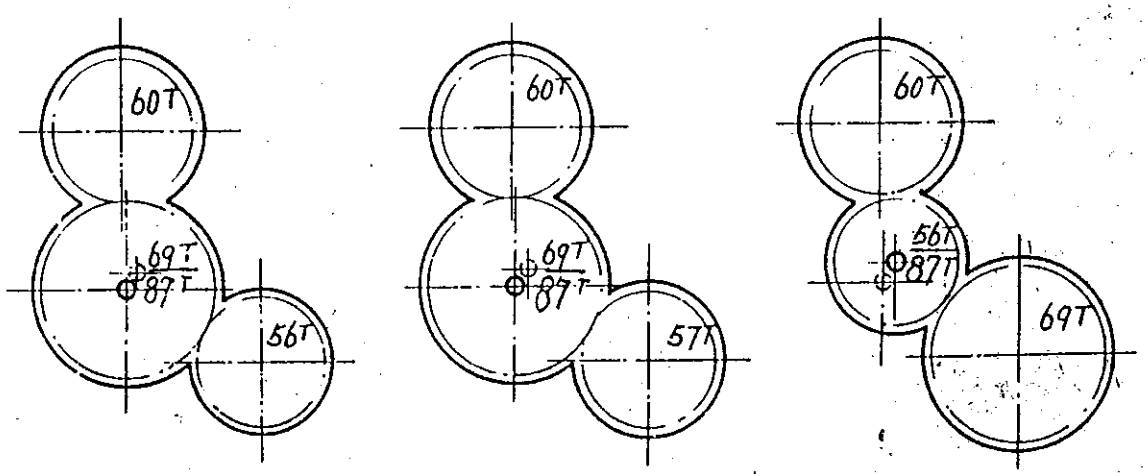
9. For guards and cover plates of this machine a diagram about their dismantling is shown in Fig.26.



CY6140B, CY6240B



CY6150B, CY6250B



primary change gears for 19 tpi for 11½ tpi

Fig.23 Transposing gears for thread-cutting

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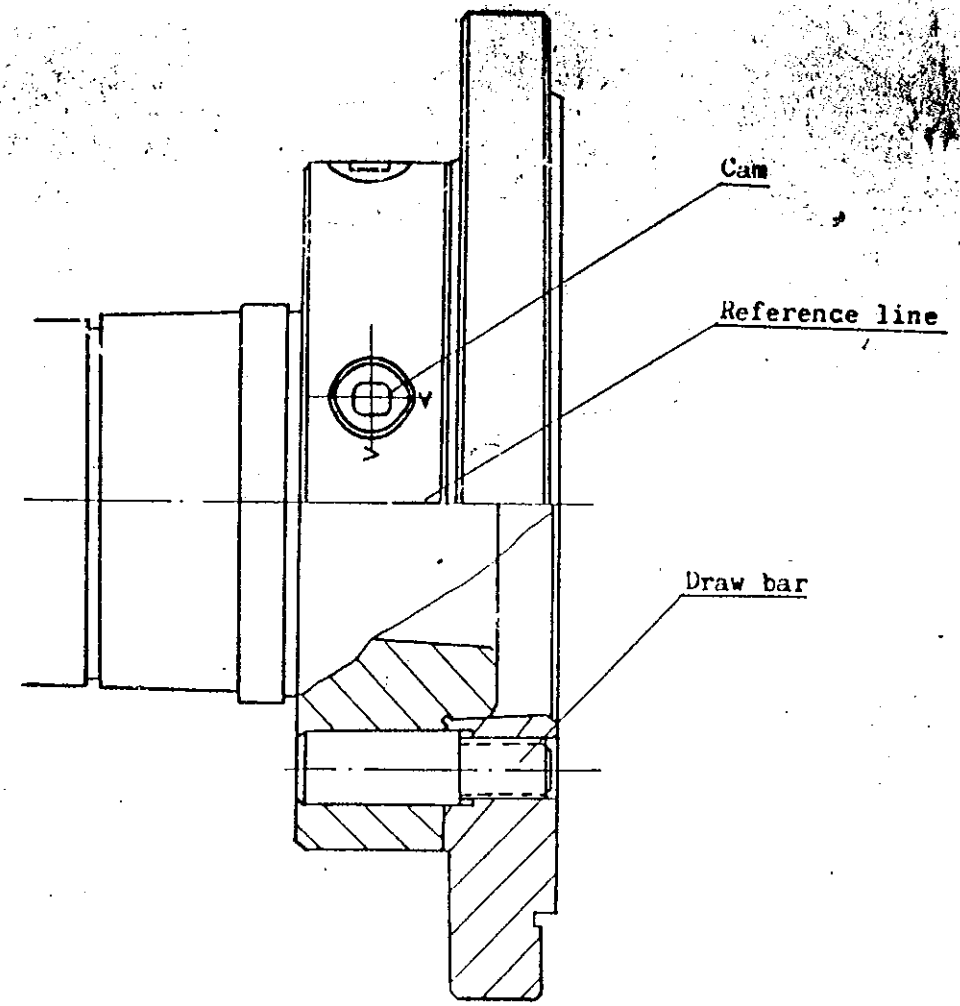


Fig.24 Assembly diagram for fitting chuck driving plate or face plate on spindle nose

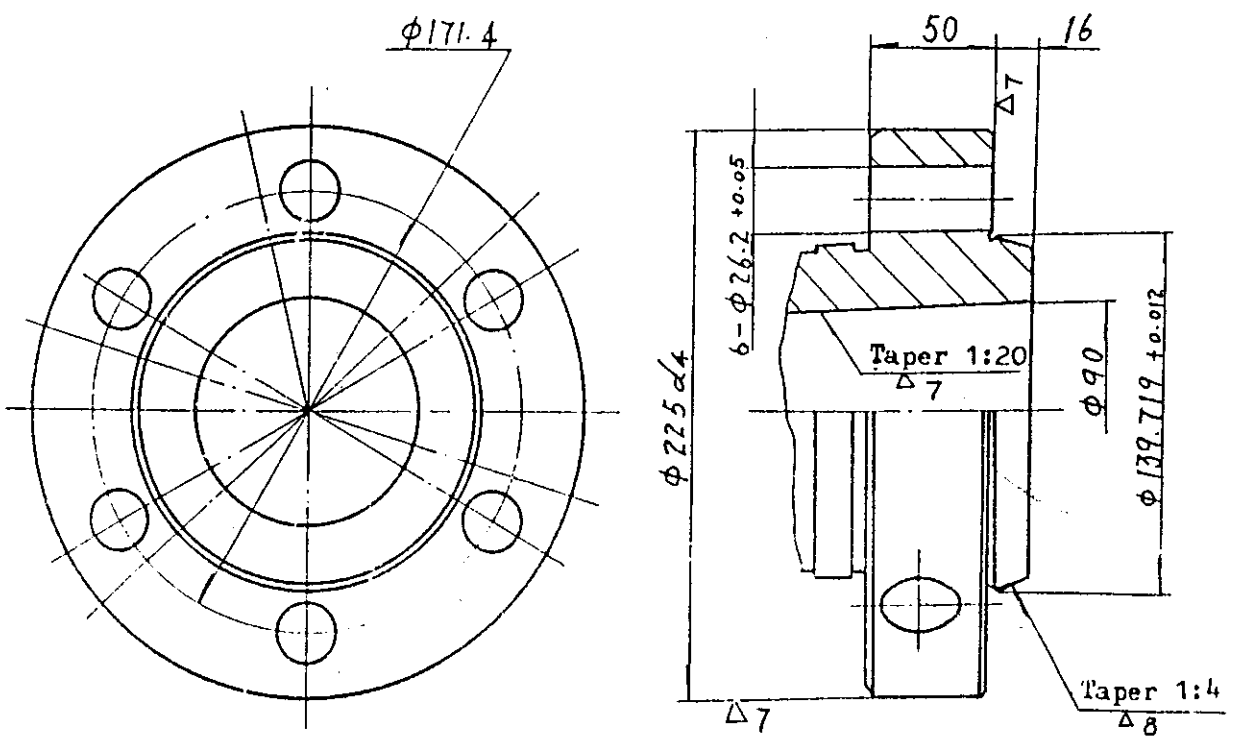


Fig.25 Diagrammatic sketch of spindle nose

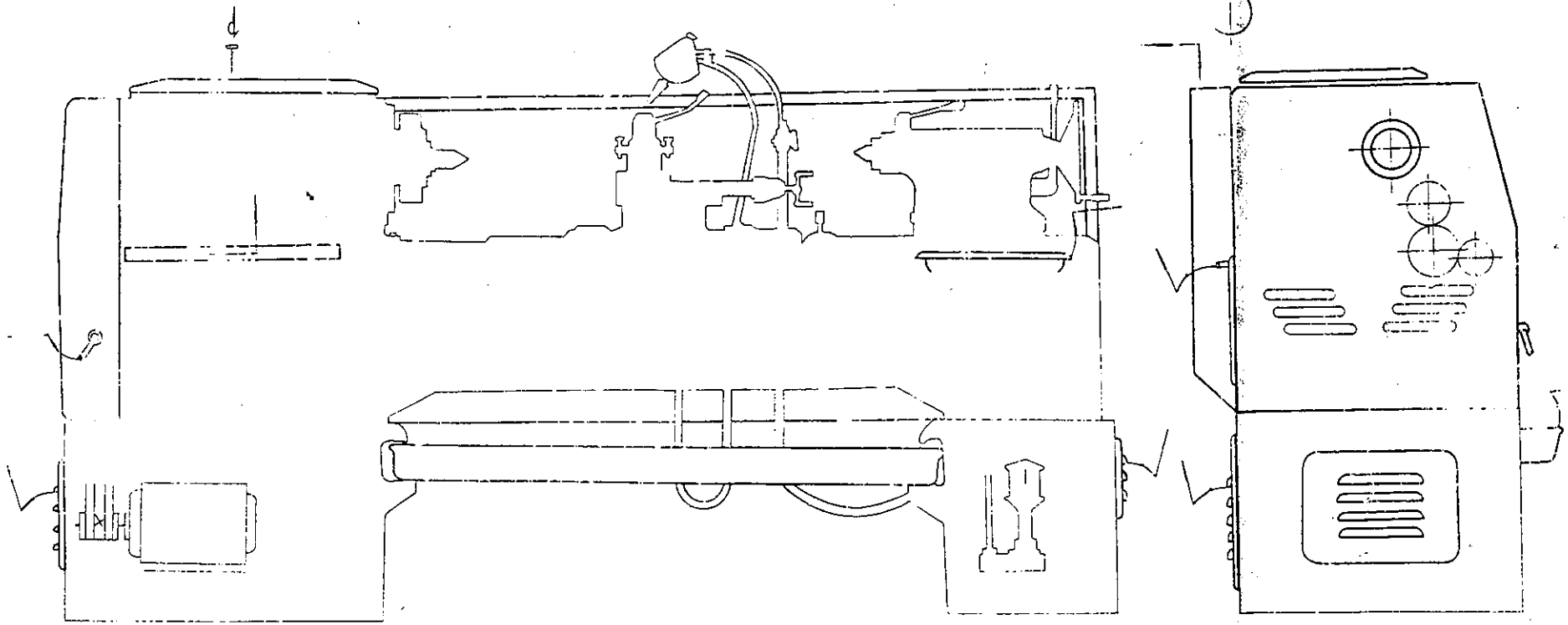


Fig.26 Diagrammatic sketch about dismantling of guard and cover plates

X. Maintenance and service

1. Lubricating

For sake of ensuring proper operation of the machine and maintaining the original accuracy for precision performance in long periods, it is of vital importance that all the rubbing surfaces should be thoroughly cleaned in service and correctly lubricated on schedule so as to reduce the wear of machine parts and smooth the running and operating.

Please pay appropriate attention to the following suggestions:

(1) All lubrication points should be oiled according to the lubrication diagram before any cutting is attempted. The lubricants must be of a good quality and clean.

(2) For assuring sufficient lubrication the oil level in the boxes should reach to red line half way up on sightglass, but it should not be too high, otherwise the oil will leak out. So it needs to check the oil level frequently and add oil from time to time as required to maintain oil level when the spindle is not running.

(3) The lubricant in the headstock and apron must be renewed every 2-3 months. As the initial wearing value of new machine parts is greater, it is recommended that the first and second oil-change should be carried out after about ten working days and twenty working days respectively, thus the impurities may be removed in due time.

Please follow the procedure for oil-change:

1) Drain the remaining oil from the box;

2) Flush the inner parts in the box thoroughly with new kerosene;

3) Refill with fresh oil up to the oil level mark.

(4) Filter in the headstock, capillary woolen yarns and filter-felts at other lubricating sites should be thoroughly cleaned once a month. Dust-proof felts at both ends of the lower bedways of saddle and the right end of the tailstock base plate have to be washed with kerosene once every week. Change the worn felts as soon as being found.

2. Operating:

Pay close attention to the following suggestions during operating:

(1) After the main motor is started, check the working condition of the oil pump first through the oil window of headstock. Only when oil appears in the window, the spindle may be started.

(2) In order to avoid damages of the gears in headstock, the gear shifting levers should be put in their correct catch position. It must be checked before starting the main spindle by the operator.

(3) Changing the speed of main spindle can only be done when the spindle stops rotating. In any case the gear shifting levers should not be actuated

when the spindle is in rapid revolution.
Changing the feedrates can be done in low-speed running or in stopping condition of main spindle.

(4) If the brake in headstock is out of order, it should be adjusted or repaired in time. Don't use the reverse friction clutch instead of the brake for stopping.

(5) When actuating the main spindle forward-brake-reversing lever in operation, the lever must be pulled or pressed to the proper position. It is not allowed to do speed-down cutting when the lever is not yet brought into position.

3. On use of the machine

For maintaining the service life and machining accuracy of the machine the following points are noteworthy:

(1) Check and adjust the tension of the V-belts at regular intervals for lengthening their service life.

(2) Clear away the dirt and coolant-contamination between the square turret and the top slide periodically to maintain the accuracy of location.

(3) When the quill taper bore of tailstock is used to hold the tool for cutting (such as spiral bohrers, reamers etc.), tool of M.T.No.5 taper shank with tang should be selected, and the tang has to be plugged levelly close against the stopper in the sleeve so as to prevent the tool from rotating in opertion and injuring the finished surface of taper bore.

(4) The long leadscrew is used only for thread-cutting. For maintaining its accuracy and prolong the service life, it is not allowed to use the leadscrew instead of feed shaft for longitudinal feeding.

Besides, as the leadscrew drives the apron directly when cutting threads and the overload clutch in the apron is then no more a safeguard in this operation, for avoiding damages of the machine parts, the cutting depth in thread-cutting should be attentively considered so as to keep the feeding force Px from ever exceeding 3400N.

(5) When the steady rest and/or the follow rest as well as the attachments (taper copy rule, thread chasing dial, stoppers etc.) are used in operation, their contact surface in rotating should be oiled accordingly.

XI. Attachments and tools

1. Attachments

A. Standard attachments are listed in Table 6.

Table 6 Details of standard attachments

Symbol	Article	Specification	Qty	Remarks
AB09100-1	Three-jaw scroll chuck with backplate	250	1set	
AB09100-2		320	1set	
AB09200	Driving plate	250	1set	
A_2B09300	Four-jaw independent chuck with backplate	400	1set	for CY6240B and CY6250B
A_2B09400	Face plate	630	1set	for CY6240B and CY6250B
A10100	Steady rest	20 - 130	1set	for CY6140B and CY6240B
$A_1$10100	Steady rest	20 - 130	1set	for CY6150B and CY6250B
A10200	Follow rest	20 - 80	1set	for CY6140B and CY6240B
$A_1$10200	Follow rest	20 - 80	1set	for CY6150B and CY6250B
AB02403	Center sleeve		1pc	
S77-1	Center	M5	2pcs	

B. Optional attachments includes:

Single-tool top slide,

Taper turning attachment,

Chasing dial (Thread dial indicator),

4-position carriage stopper,

4-position cross slide stopper,

Micrometer carriage stopper,

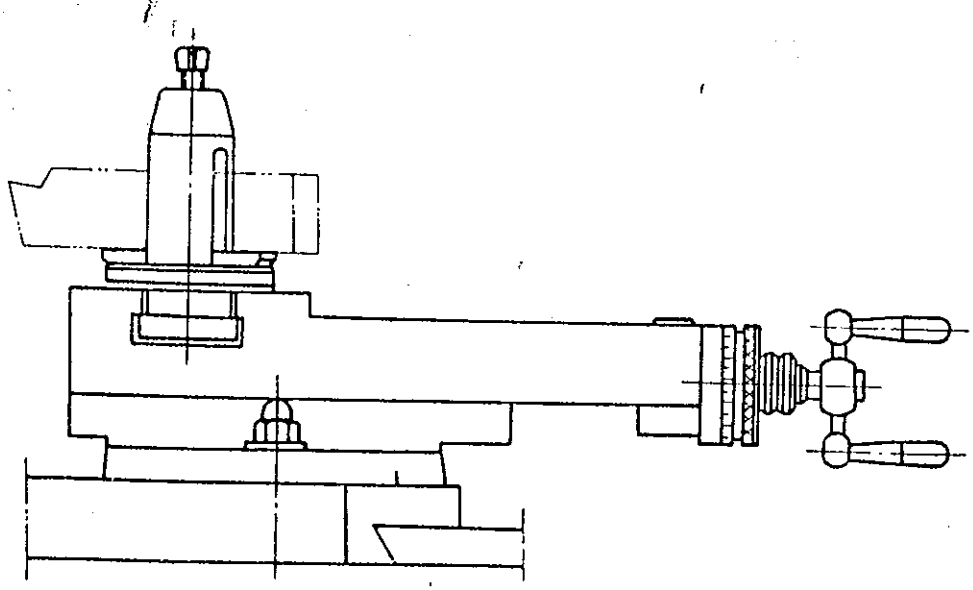
Automatic length stopper.

A.B04000/1 Single-tool compound rest

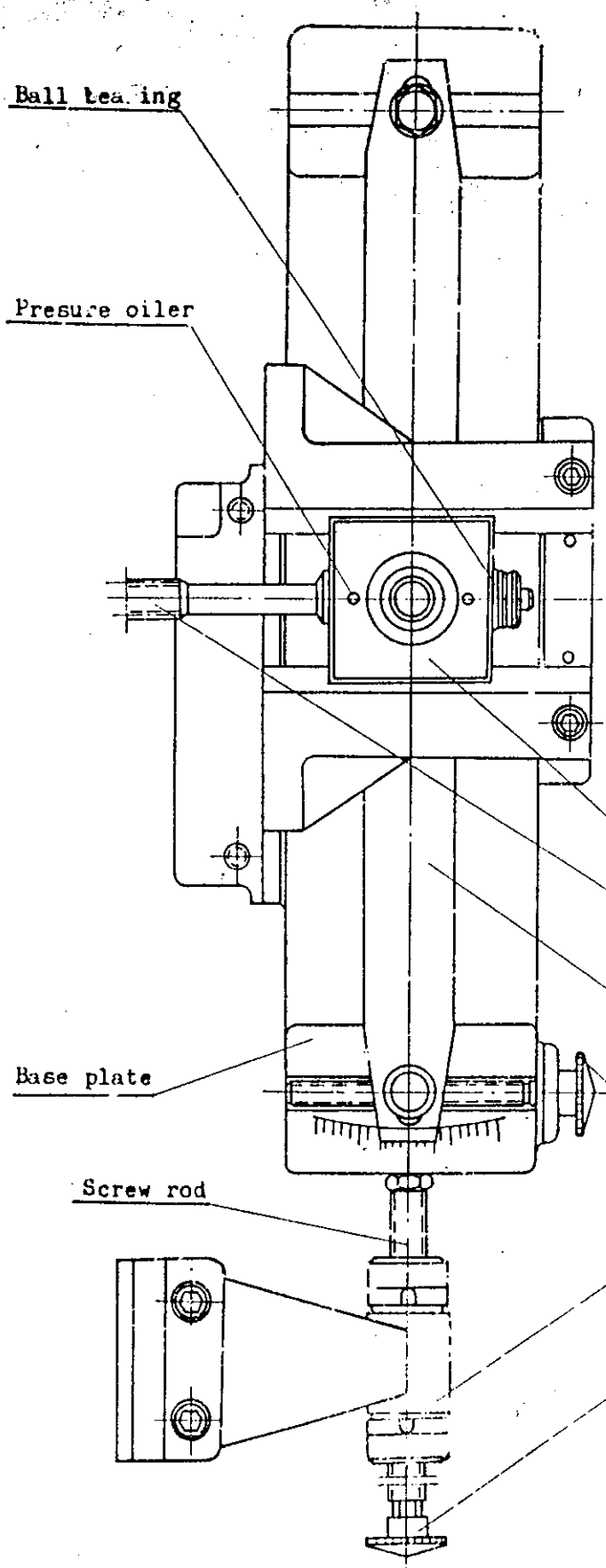
The single-tool compound rest is specially furnished for Universal Lathe CY6150B and Universal Gap-Bed Lathe CY6250B.

Dismount the square turret compound rest and fit this single-tool compound rest on cross slide, an American toolpost is then installed for application of turning tools with standaed shank of cross section 19.05mm x 41.28mm.

The height from shank base plate to main spindle centerline is 37.3mm and the maximum travel of top slide is 146mm.(see sketch b below).



A312000 Taper turning attachment



This attachment is arranged at rear of the saddle(see sketch below).
During the longitudinal movement of saddle, the slide block connected to the feed screw makes a transverse motion along the inclined copy rule which is set on base plate in accordance with the desired taper angle. Thus a combined longitudinal-transverse movement of turning tool can be achieved for performing cone-shaped workpieces.
The maximum allowable taper angle of workpieces is ±10° and the maximum allowable taper turning length is 300mm.
After detaching the screw rod from the end of base plate and taking the bracket down, the machine is then still to be used for ordinary turning works.

AB21000 Chasing dial (Thread dial indicator)

The chasing dial is set up on the right hand front side of the [illegible] The dial is graduated in 15 divisions, since a complete cycle of the [illegible] sents 15 revolutions of the leadscrew, so that each division on dial equals one revolution of the leadscrew.

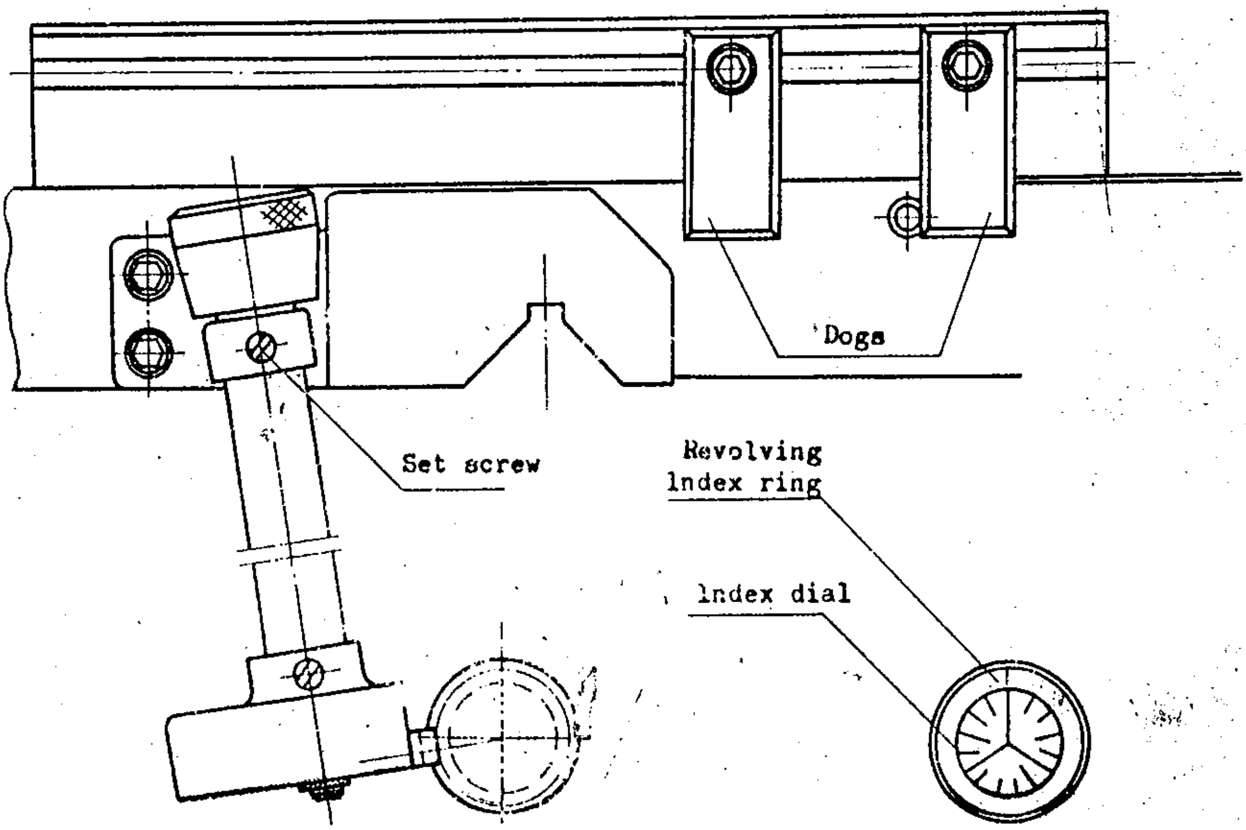
For getting an unbroken-thread in repeated cuts, each of the various metric threads listed in Table 2 can be cut easily and perfectly with the aid of chasing dial by taking the relevant index number y(or its multiples) in following table, where y represents the necessary number of revolutions of leadscrew to be indexed on dial whilst the split-nut disengages from the leadscrew:

Thread pitch (mm)	0.5	0.75	1	1.25	1.5	1.75	2	2.25	2.5	2.75	3	3.5	4	4.5	5	5.5
Index number y	1	1	1	5	1	—	1	3	5	—	1	—	1	3	5	—

Thread pitch (mm)	6	7	8	9	10	11	12	14	16	18	20	22	24	28	32	36
Index number y	1	—	—	3	5	—	1	—	—	3	5	—	—	—	—	3

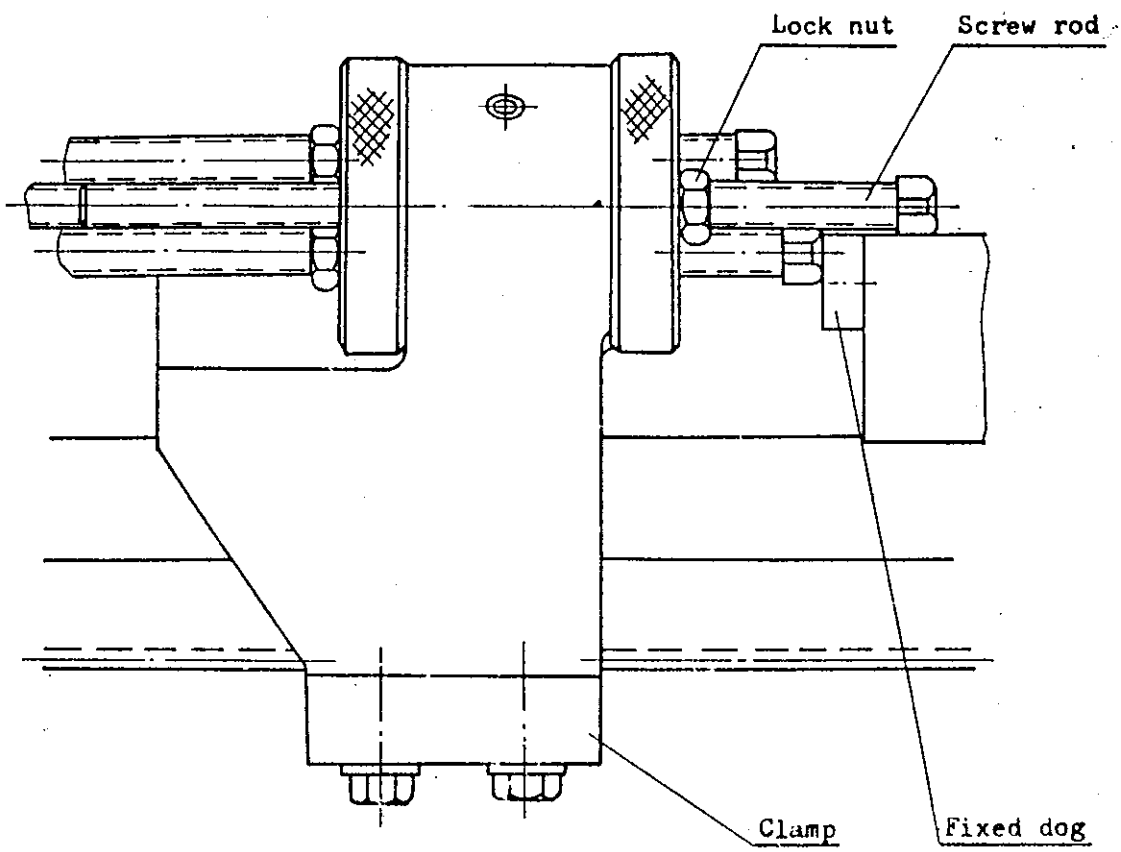
The feed-in and draw-back of turning tool could be limited by means of the dogs preset on the right hand side of cross slide.

Having first loosen the set screw, the chasing dial could be lifted up and disengages from the leadscrew when the chasing dial is not in use.



AB22100 4-position carriage stopper

The 4-position carriage stopper is mounted on the front bed-guideways by the left hand side of saddle and fastened by means of a clamp through its rack-teeth embeding into the bed-rack. It is used in producing batches of identical workpieces for avoiding loss of time through taking measurements, as each of the four adjustable stops may be set for a different position and may be revolved into position to locate the carriage for each of four successive cuts. The maximum adjustable length of each screw rod is about 125 mm.

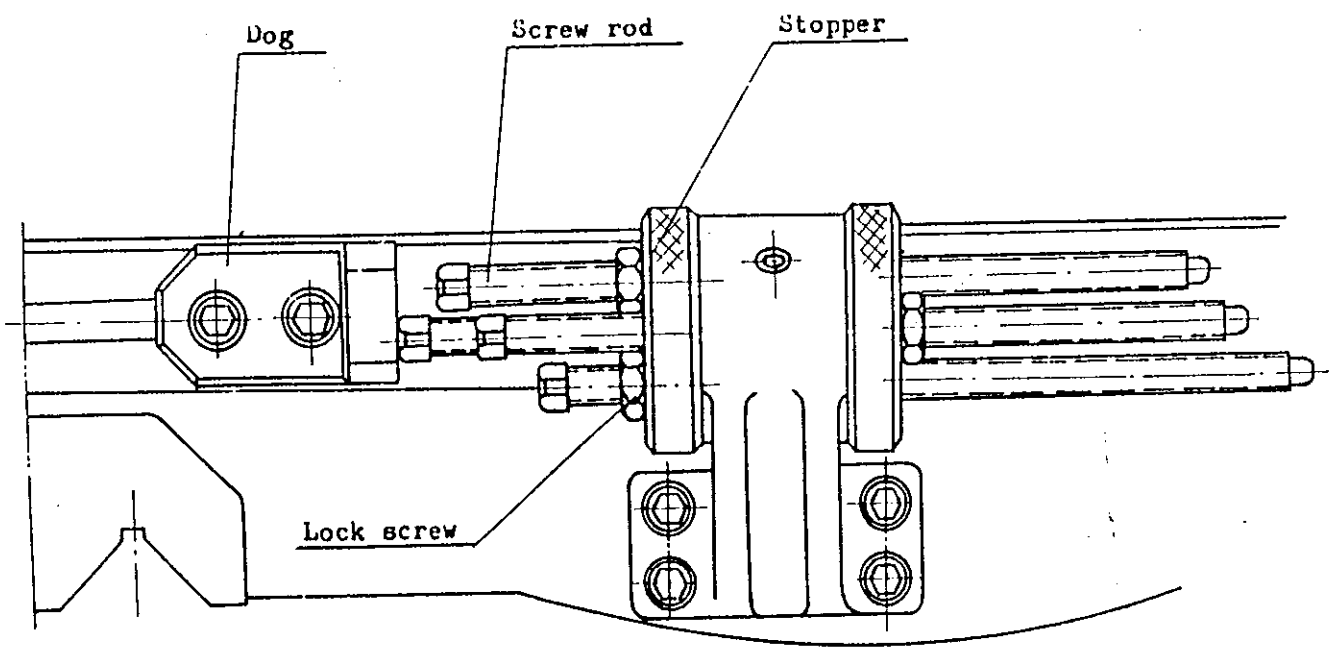


AB22200 4-position cross slide stopper

The 4-postion cross slide stopper is mounted on the right hand side of saddle, whereas the adjustable dog is fixed by screws along the T-slot on the right hand side of cross slide and moves with it together.

Four adjustable screw rods of stopper may be set for different cutting depths and may be revolved into position to locate the cross slide for each of four successive cuts. Thus, it is suitable to be used in batch production of identical workpieces.

The maximum adjustable length of each screw rod is about 125mm.

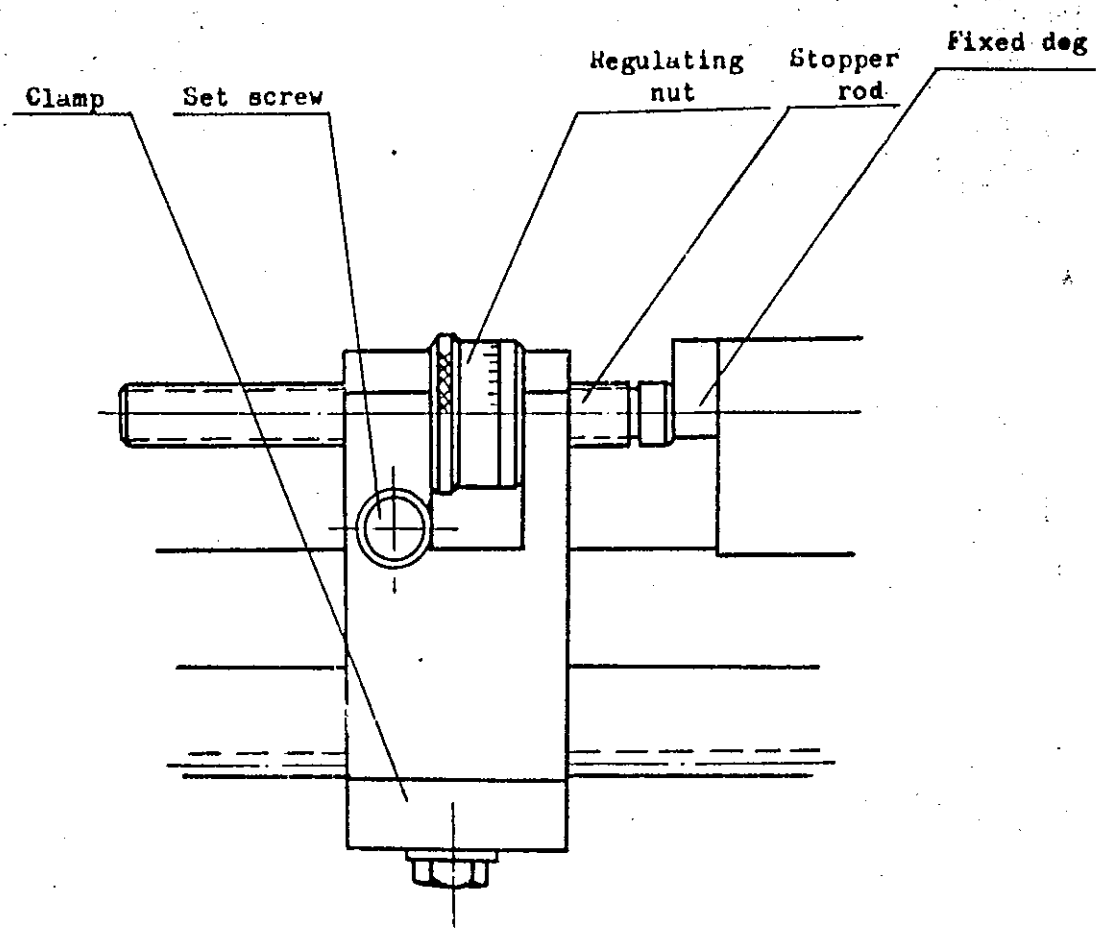


AB22500 Micrometer carriage stopper

The micrometer carriage stopper is mounted on the front bed-guideway, on the left hand side of saddle and fastened by means of a clamp through its rack-teeth embeding into the bed-rack.

The threadpitch of stopper screw rod is 1mm and each division on the barrel of the round-nut for fine adjustment equals 0.02mm in length. The set screw is used to lock the screw rod after the adjustment is completed.

The maximum adjustable length of screw rod is about 125mm.

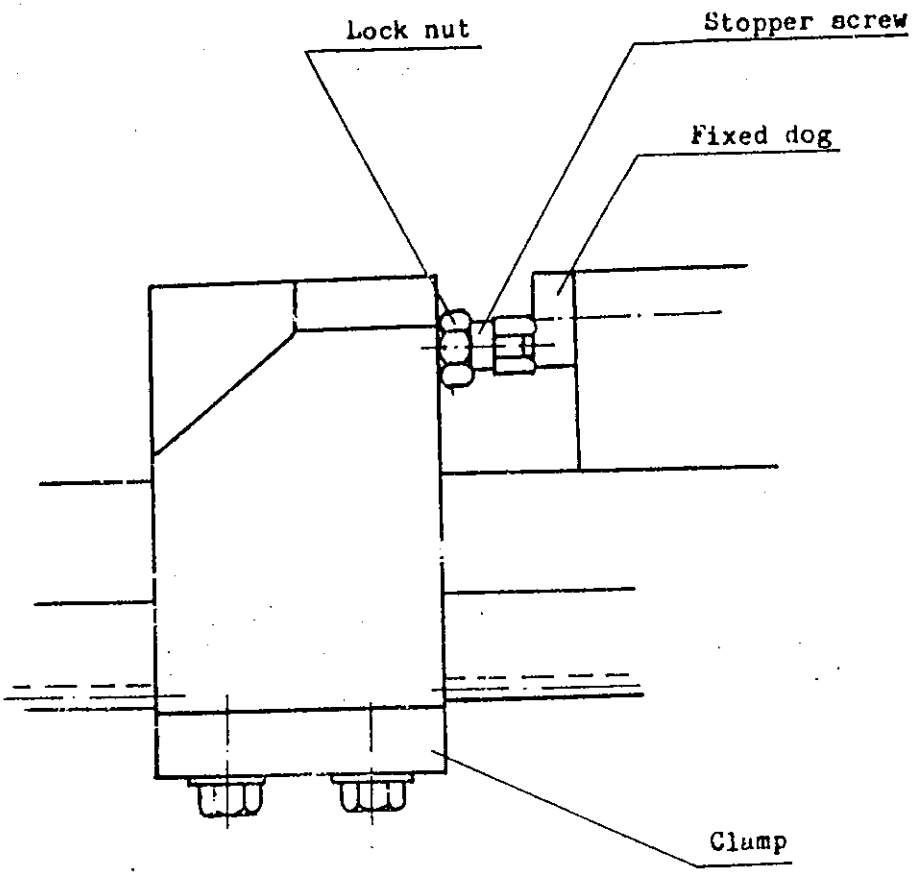


AB22600 automatic length stopper

The automatic length stopper is set up on the front bed-guideway by the left hand side of saddle and securely fastened by a clamp through its rack-teeth embeding into the bed-rack. The stopper screw has a length of 16mm for adjustment. As the saddle is being driven by the feed shaft and moving forward longitudinally until the fixed dog on left side of the saddle strikes the head of stopper screw, it causes an overload of the safty clutch in apron and shifts the power-feed lever returning to neutral position. A kick-off stop of automatic feeding is then performed.

When the power-feed lever is actuated for longitudinal travel again after a kick-off stop, it may sometimes happen that the lever could not be brought into the relevant position. This phenomenon would be eliminated at once merely by actuating the lever reversely to make the apron a starting-up.

The maximum kick force of stopper equals to the maximum permissible feeding force, i.e. 3400N .



2. Tools: The commonly used service tools are listed in Table 7.

Table 7 Details of commonly used tools

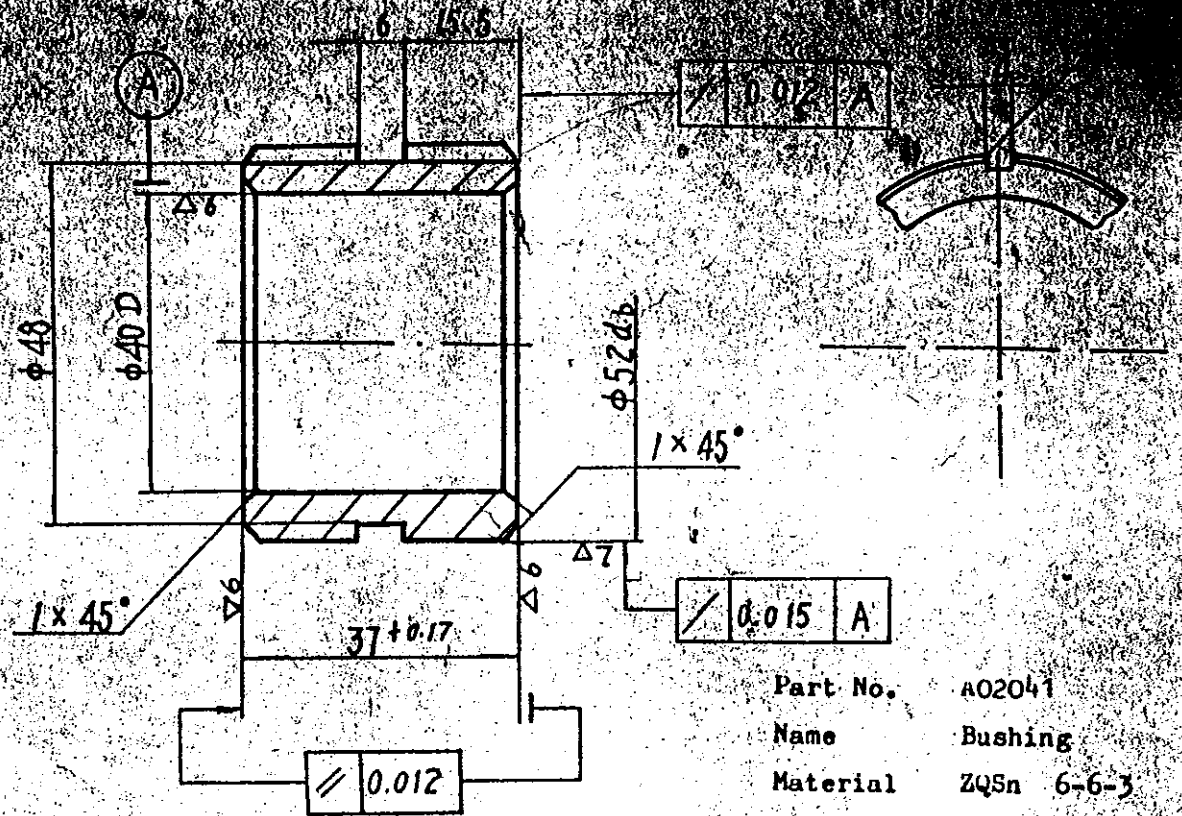
Symbol	Tool	Specification	Qty	Applications
AB13001	Knurled head shaft		1pc	Adjust the front lock nut of main spidle.
AB13002	Spanner	14	1pc	Mount the chuck, driving plate and face plate.
S91-1	Double-ended spanner	10 x 12	1pc	Fix the saddle. Adjust the rear plate of saddle, clamp the turning tool in single-tool tool post.
S91-1	Double-ended spanner	14 x 17	1pc	Adjust the rear presure plate of saddle and the screw rod of cross slide stopper. Change the transposing gears.
S91-1	Double-ended spanner	19 x 22	1pc	Adjust the brake band, the rotary angle of swivel base on cross slide, overload clutch in apron and the screw rods of carriage stopper.
S91-1	Double-ended spanner	27 x 30	1pc	Fix the body of tailstock on base plate and steady rest on bed. Adjust the motor rest and transposing gears holder, change the transposing gears.
S91-7	Socket screw hexagon wrench	5	1pc	Fix the top slide and cross slide. Adjust the stop dogs for cross slide stopper.
S91-7	Socket screw hexagon wrench	6	1pc	Adjust the main spindle bearings and overload clutch in apron.
S91-7	Socket screw hexagon wrench	8	1pc	Adjust the main spindle bearings and the screw nut of saddle, dismantel the cover plate of headstock.
S91-7	Socket screw hexagon wrench	10	1pc	Adjust the set-over of tailstock. Dismount the gap block.
S91-7	Socket screw hexagon wrench	12	1pc	Dismount the gap block. Fix the follow res
S92-3	Square socket wrench	17	set	Clamp the turning tools in square turret.
S93-1	"C" Spanner	45-48	1pc	Adjust the axial clearance of leadscrew. Fix the nuts of screw rod in bracket of taper turning attachment.
S93-1	"C" Spanner	135-165	1pc	Adjust the main spindle bearing.
CB1165-74	Oil gun	100c.c.	1pc	
	Screw driver	150	1pc	Adjust the springs of clutch, tension wheel of chain and gib screws etc.

4

The easy worm parts are as follows:

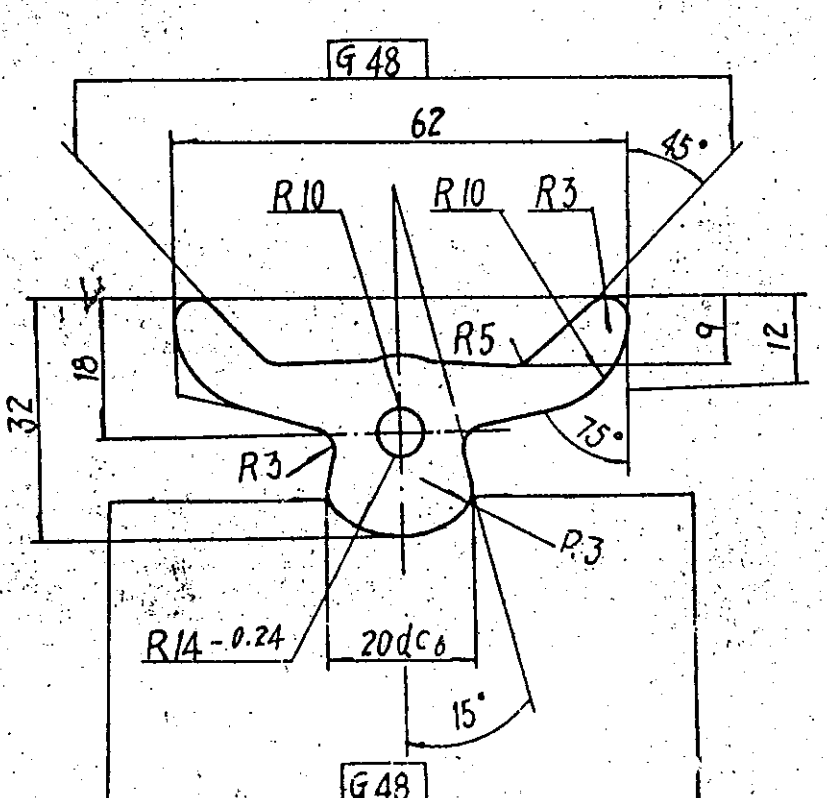
Table 8: Details of easy worm parts

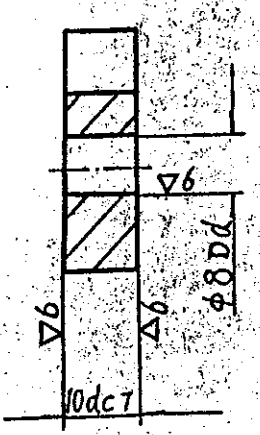
Seral No.	Part number	Part name	Material	Heat treatment	Qty
1	A02041	Bushing	ZQSn 6-6-3		2pcs
2	A02136	lever	45	G48 locally	1pc
3	A02192	Inner disc of clutch	15	So.5-C60	16pcs
4	A02193	Outer disc of clutch	15	So.5-C60	14pcs
5	A02194	Brake band	65 Mn		1pc
6	A02211	Outer rotor of trochoid pump	Sintered powder iron basic metal		1pc
7	A02212	Inner rotor of trochoid pump	Sintered powder iron basic metal		1pc
8	A02231	Brake friction plate	Canvas with iron sand		1pc
9	A 05011	Slide nut	ZQSn 6-6-3		1pc
10	A06021-R	Worm wheel	ZQSn 6-6-3		1pc
11	A 06022	Split-nut	ZQSn 6-6-3		1pc
12	A08011	Splined bush	ZQSn 6-6-3		1pc
13	J22-1	Screw M16 x 40	35		8pcs
14	Q99-1, 12	Slide block	HT 20-40		1pc
15	Q99-1, 16	Slide block	HT 20-40		1pc
16	S77-1, M5	Center II-MT5	T8	tip C59 shank C40	1pc



Part No. A02041
Name Bushing
Material ZQSn 6-6-3

Others ▽4



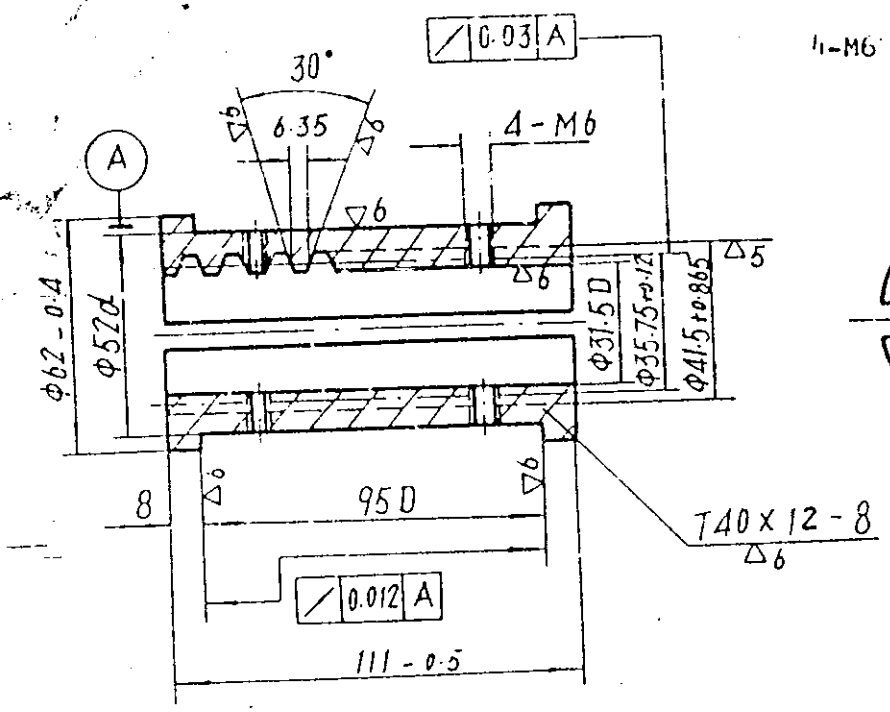


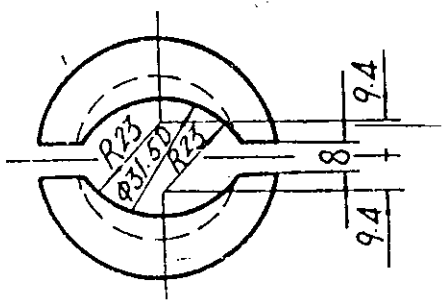
Part No. A02136
Name Lever
Material 45 or 45 locally

产品型号		第 53 页
文件代号	SY-A0-七	共 61 页
日期		

Others $\nabla 4$

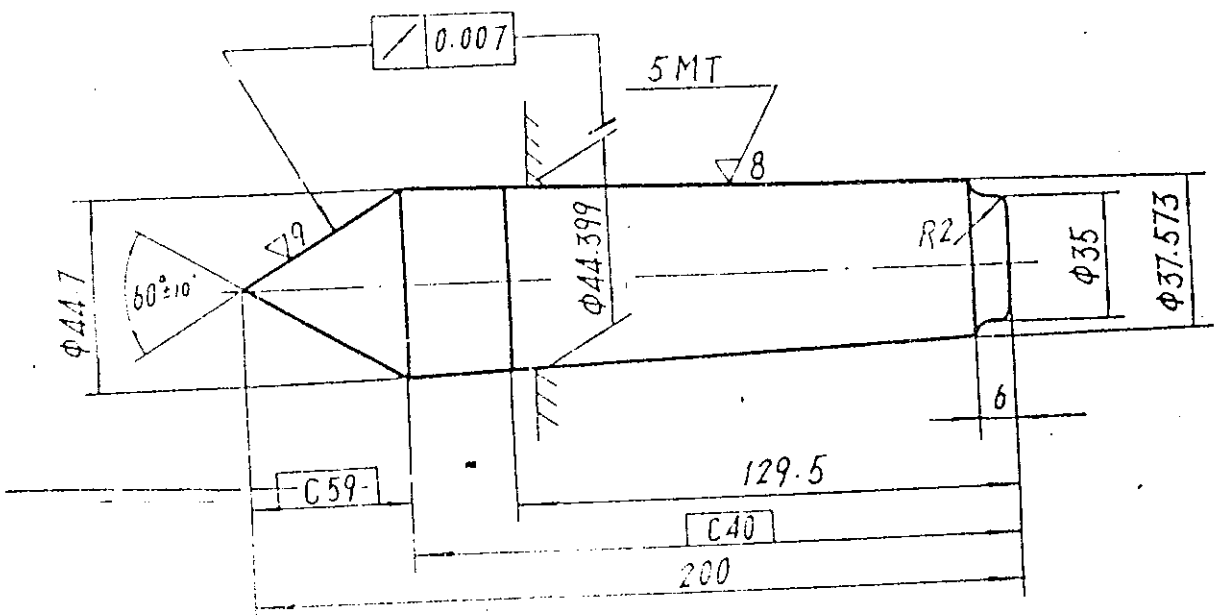
4-M6 Making with the holder





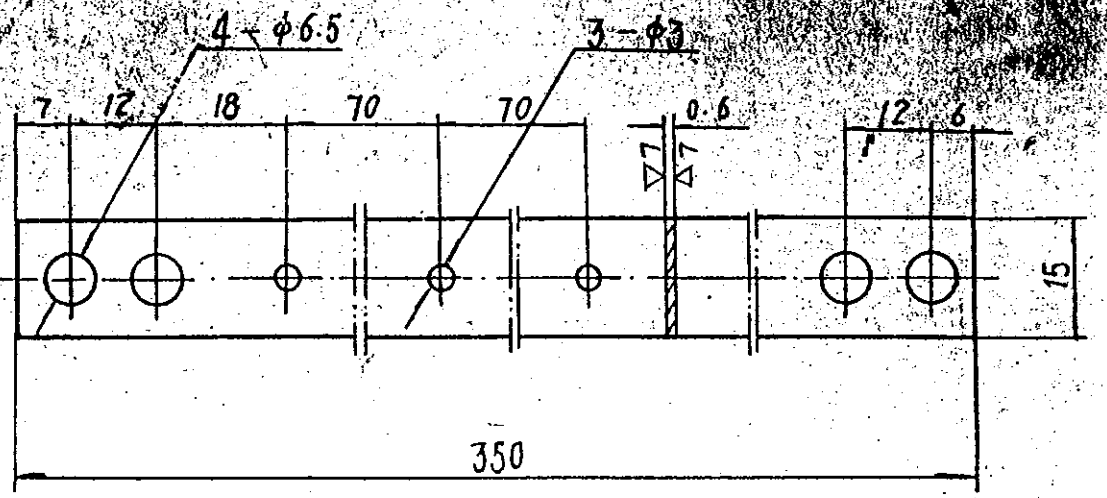
Part No. A 06022
Name Split-nut
Material ZQSn 6-6-3

Others $\nabla 5$



Symbol S77-1
Size 5MT
Name Center
Material T8

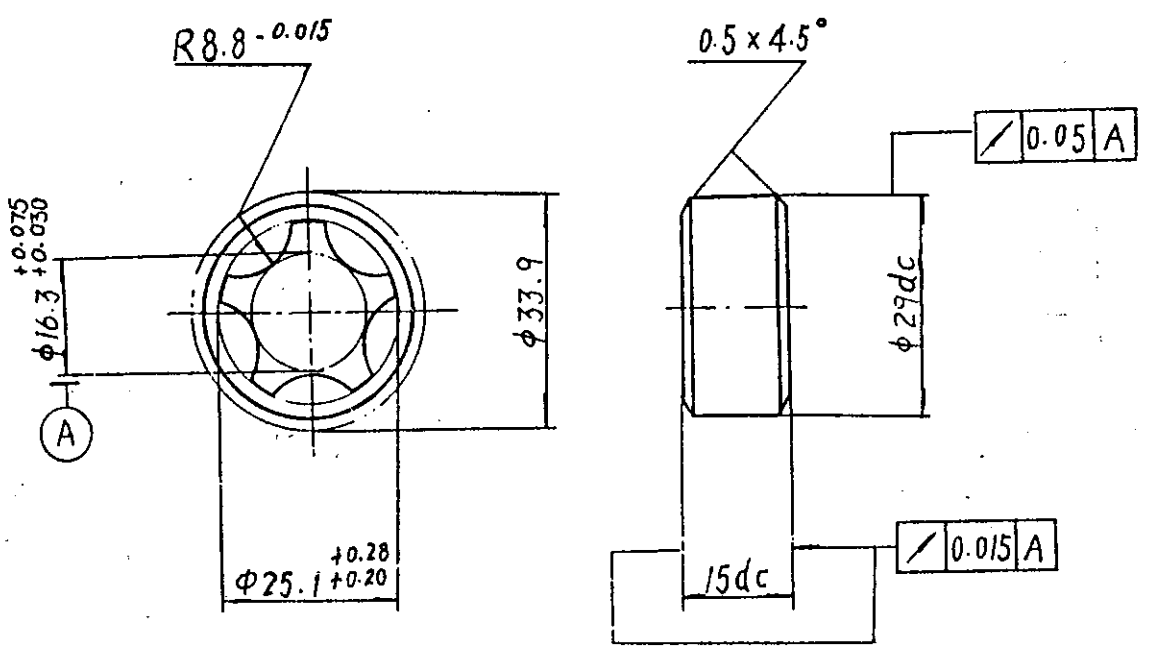
Others ▽4



Part No.	A02194
Name	Brake band
Material	65 Mn

Parameter: e=2.2, a=8.8 R=16.95, Z=5

Total ▽6

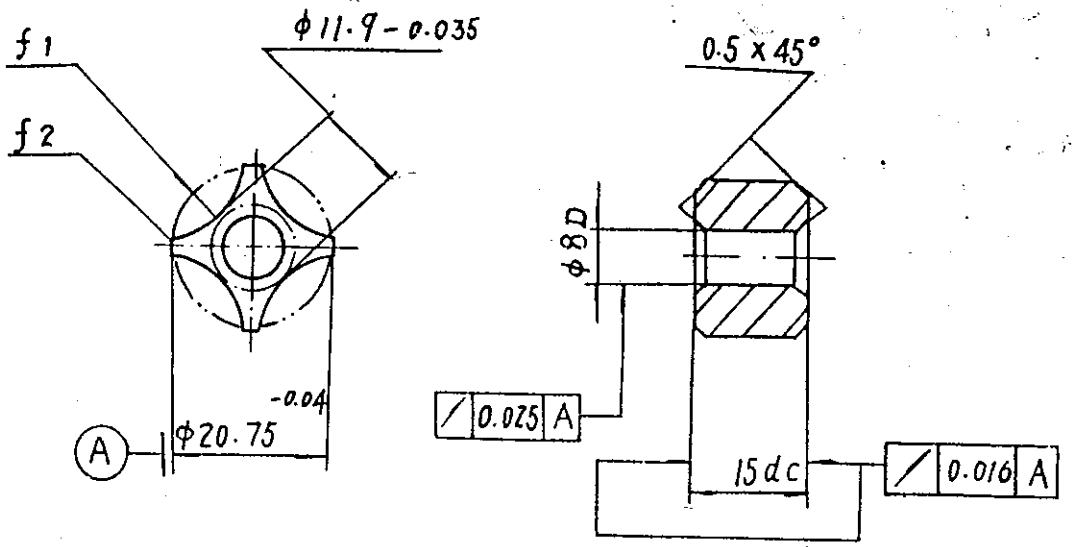


Part No.	A02211
Name	Outer rotor of trochoid pur
Material	Sinterd powder iron basic metal

产品型号		
文件代号	SY-A8-2	第 57 页
编制	日期	共 61 页

Parameter: e=2.2: R=16.95: a=8.8; 4=4.

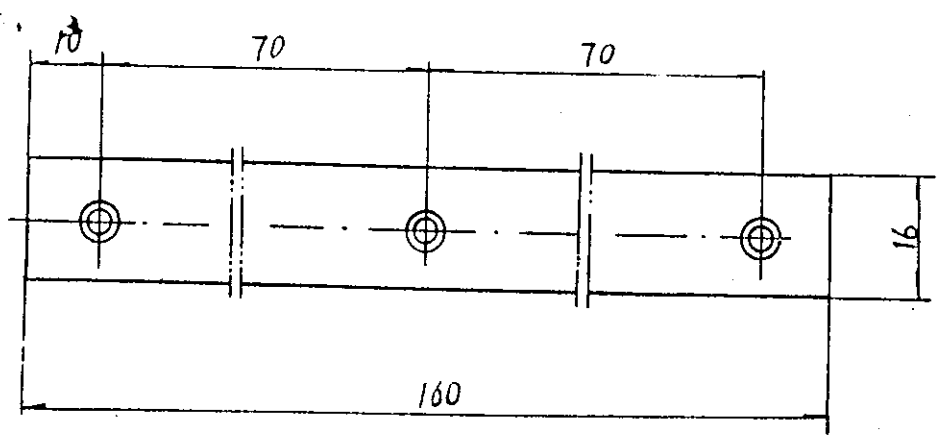
Total ▽ 6

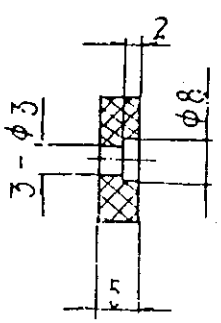


Part No. A02212

Name Inner rotor of trochoid p

Material Sintered powder iron basi metal





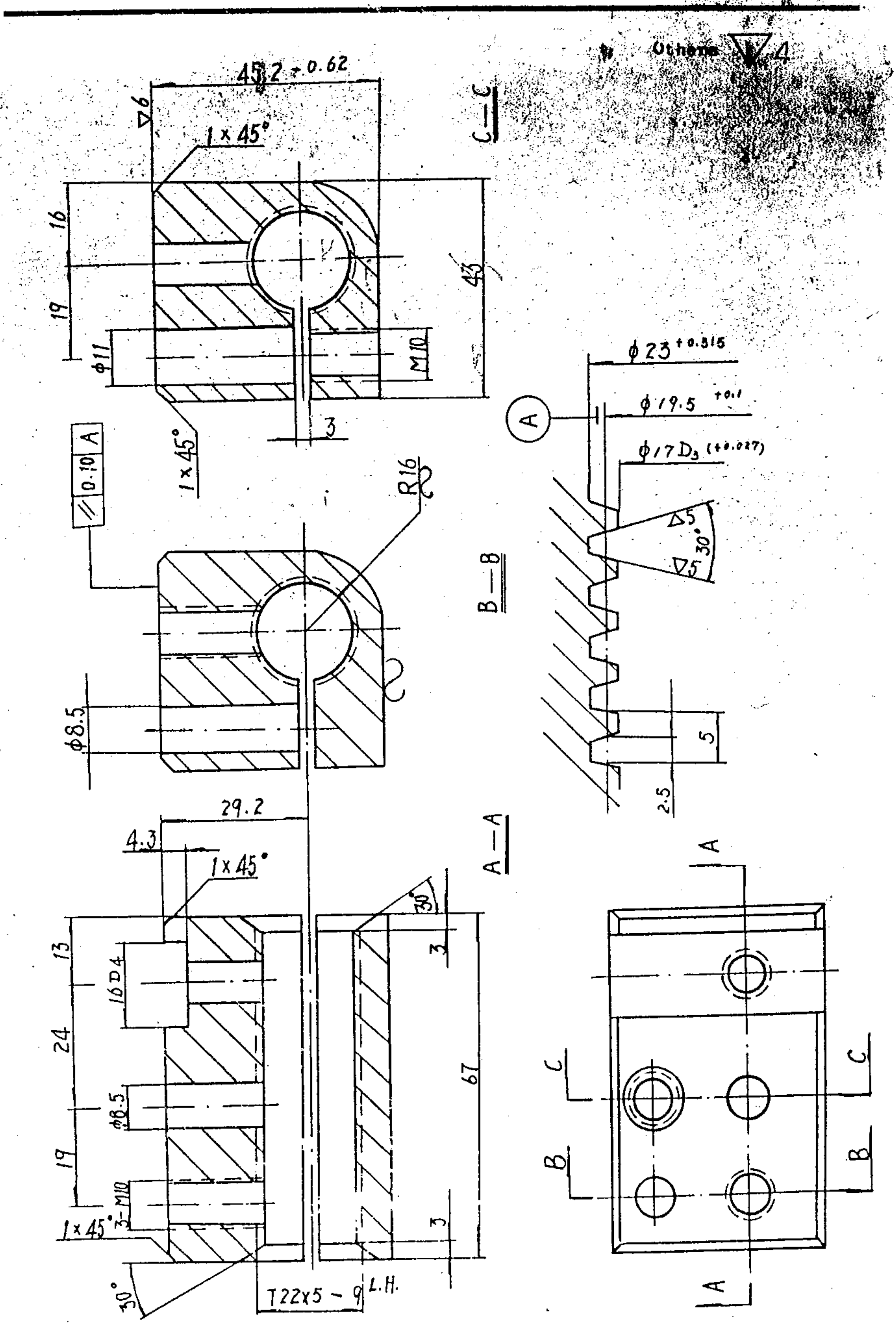
The cutting edges should be smooth and fl

Part No. A02231

Name Brake riction plate

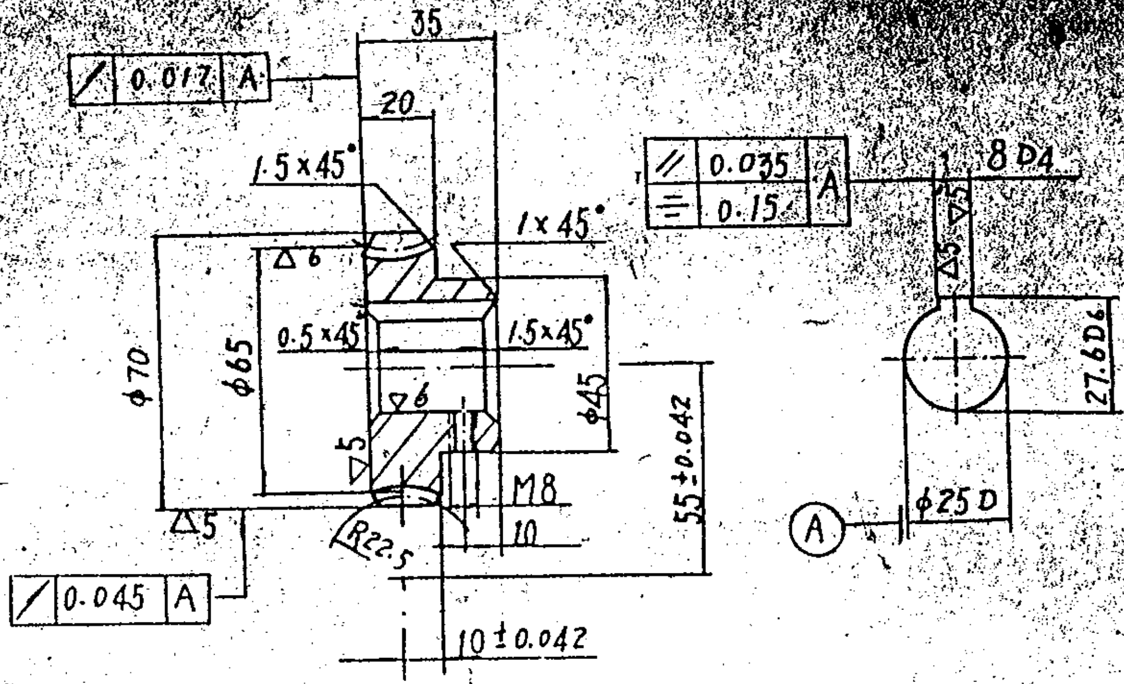
Material Canvas with iron sand

产品型号			
文件代号	SY-AB-t		
编制	日期	第 54 页	共 61 页



Part No. A 05011 Name: Slide nut Material ZQSn 6-6-3

产品型号		第 57 页	
文件代号	SY-A8-七	共 61 页	
编 制		日 期	



Type of worm: Archimedes spiral	Axial tooth angle of worm $\alpha_s=20$
Axial module of worm $m_s=2.5$	No.of teeth of worm wheel $Z_2=26$
Starts of worm $Z_1=2$	Shifting factor of worm wheel $\xi=0$
Spiral angle and direction of worm $\lambda=6^\circ 20' 25''$ R.H.	Precision class 8DC

Part No. A06021-R

Name Worm wheel

Material ZQSn 6-6-

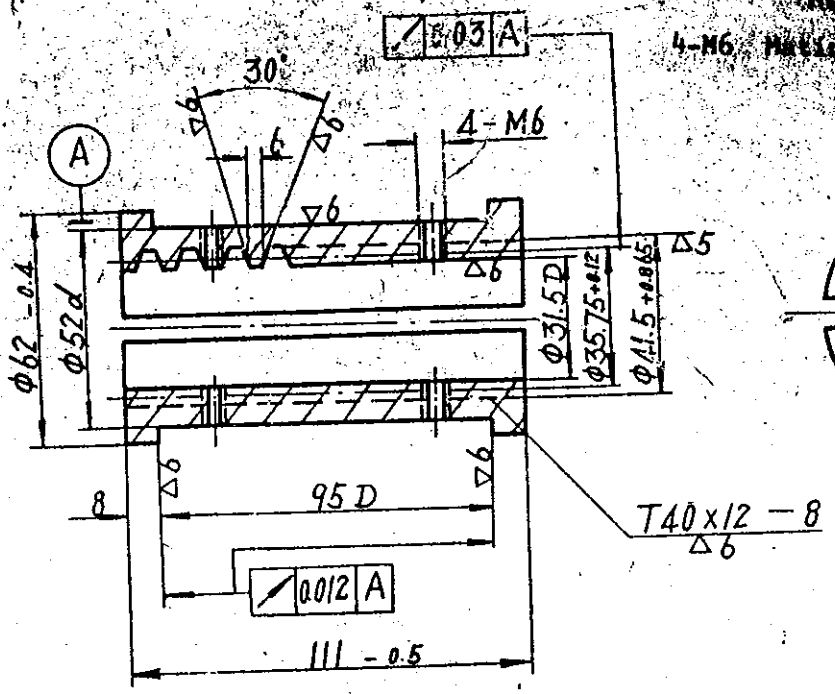
产品型号

零件代号 SY-A8-R

第 58 页

共 61 页

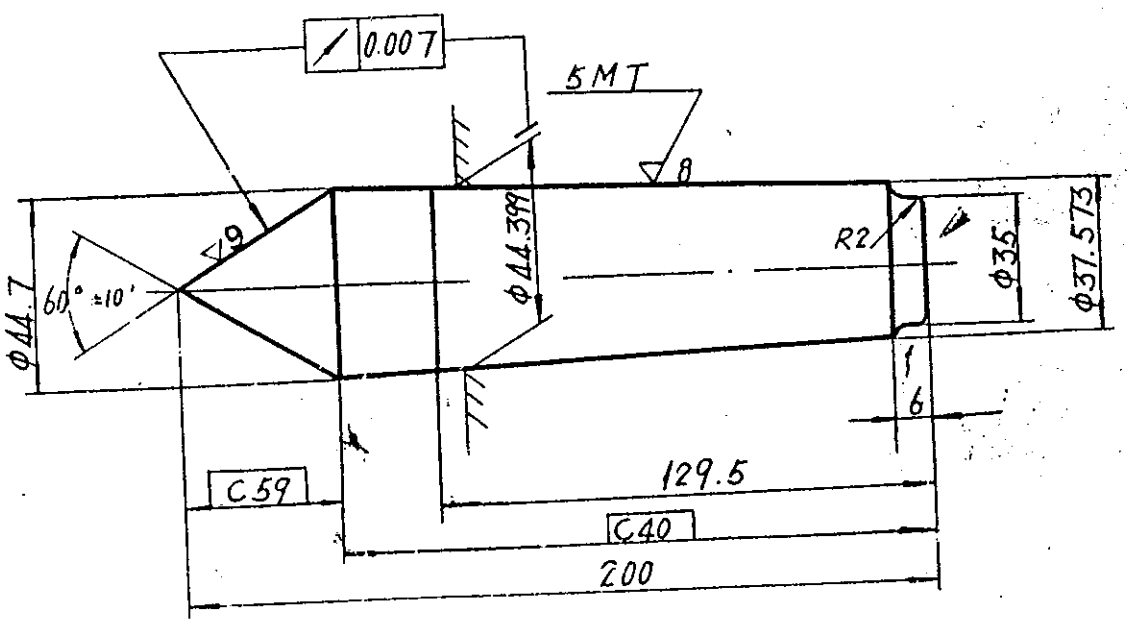
Others ∇4



4-M6 Mating with the ...

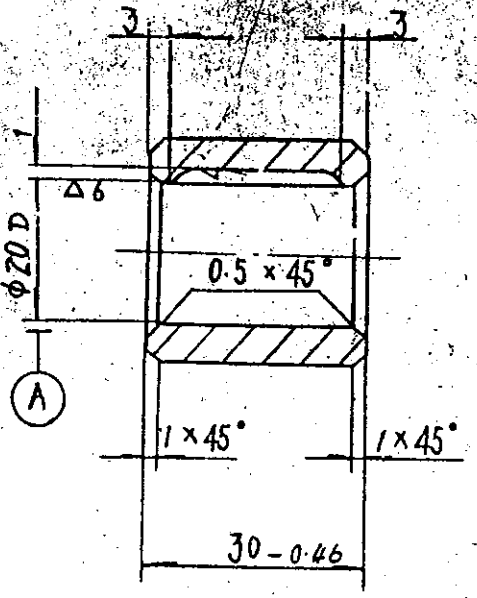
Part No.	A06022
Name	Split-nut
Material	ZQSn 6-6-3

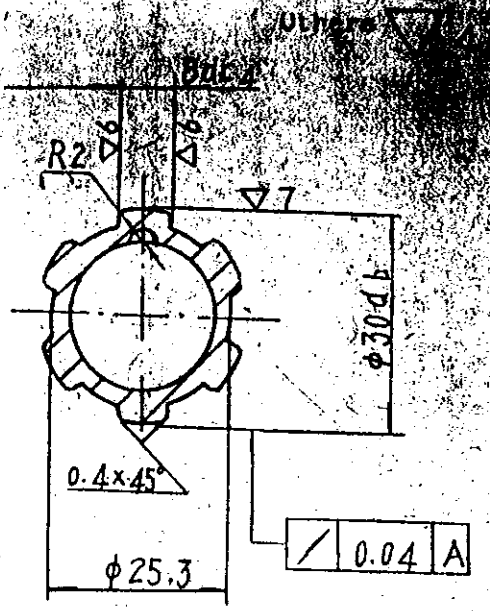
Others ∇5



Symbol	S77-1
Size	5MT
Name	Center
Material	T8

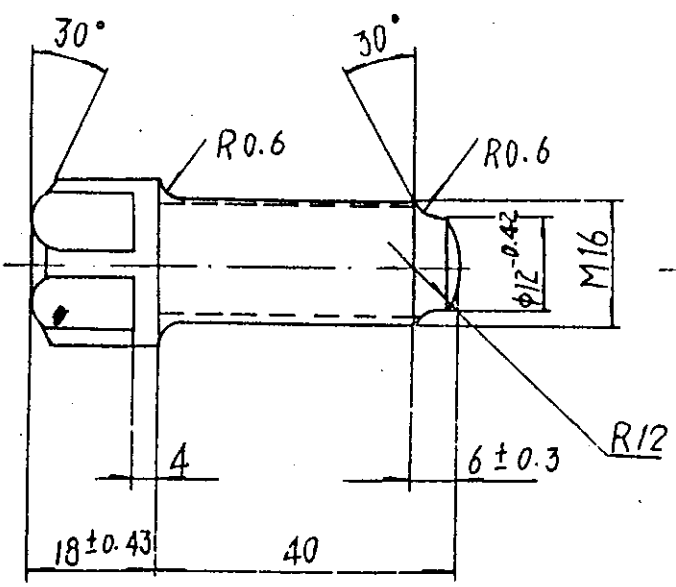
产品型号	
文件代号	SY-88-2
第 5 页	共 19 页

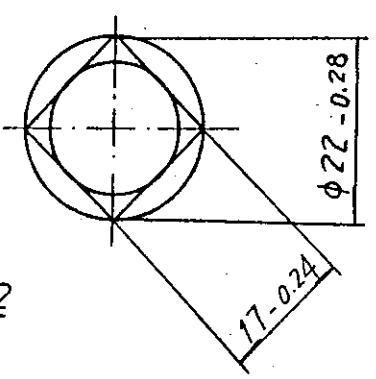




Part No. A08011.
Name Splined bush
Material ZQSn 6-6-3

Total ▽4

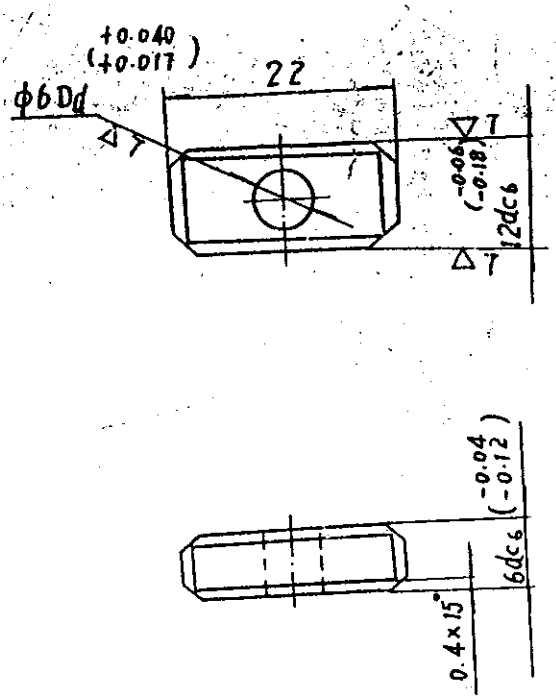




Symbol J22-1
Size M16 x 40
Name Screw
Material 35

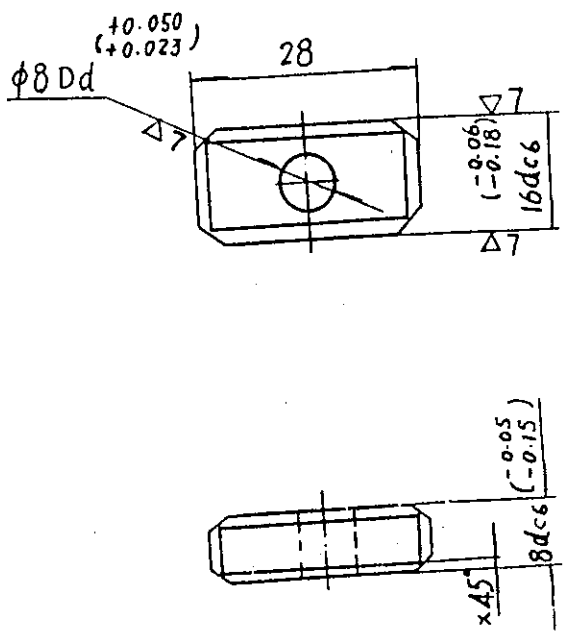
产品型号	
文件代号	SY-08-4
第 60 页	共 61 页

Others ▽



Symbol	Q99-1
Size	12
Name	Slide block
Material	HT20-40

Others ▽4



Symbol	Q99-1
Size	16
Name	Slide block
Material	HT20-40

产品型号		第 19 页	
文件代号	Sソ-AB-七	共 61 页	
校对	审核	日期	

Spare Parts

The schedule of spare parts

Serial No.	Part No	Name	Material	Heat Treatment	Unit	Remarks
1	A.01021/750	leadscrew	y40mn		1	
2	/1000	"	"		1	
3	/1500	"	"		1	
4	/2000	"	"		1	
5	A01024	gear ruck	45		2.3 4.6	
6	A01025	"	"		1	0.75M centre distasce for (c)62 $\frac{40}{20}$ B for A_2 01025A
7	AB02051	spindle	"	T235 G50	1	
8	A02052	I shaft	"	T235	1	
9	A02053	II shaft	"	"	1	
10	A02054	III shaft	"	"	1	
11	A02055	IV shaft	"	"	1	
12	A02056	V shaft	"	T235 G48	1	
13	A02057	VI shaft	"	T235	1	
14	A02058	IX shaft	"	"	1	
15	A02059	X shaft	"	"	1	
16	A02061	VIII shaft	"		1	
17	A02062	XI shaft	"	G48	1	
18	A02065	XIV shaft	"	"	1	
19	A02081	gear	"	"	1	
20	A02082	"	"	"	1	
21	A02083	"	"	G52	1	

Serial No.	Part No	Name	Material	Heat Treatment	Unit	Remarks
22	A02084	gear	45	G52	1	
23	A02085	"	"	"	1	
24	A02086	"	"	"	1	
25	A02087	"	"	"	1	
26	A02088	"	"	"	1	
27	A02089	"	"	"	1	
28	A02091	"	"	"	1	
29	A02092	"	"	"	1	
30	A02093	"	"	"	1	
31	A02094	"	"	"	1	
32	A02095	"	"	G48	1	
33	A02096	"	"	"	1	
34	A02097	"	"	"	1	
35	A02098	"	"	"	1	
36	A02099	"	"	"	1	
37	A020101	"	"	"	1	
38	A020102	"	"	"	1	
39	A020103	"	"	"	1	
40	A020104	"	"	"	1	
41	A020105	"	"	"	1	
42	A020106	"	"	"	1	
43	A020107	"	"	"	1	
44	A020108	"	"	"	1	

Serial No.	Part No	Name	Material	Heat Treatment	Unit	Remarks
45	A02109	gear	45	G48	1	
46	A02111	"	"	"	1	
47	A02114	"	"	"	1	
48	A03005	nut	H715-33		1	
49	A03021	bush	45	local G48	1	
50	A03022	leadscrew	y40mn		1	
51	A04011	nut	ZQSn6-6-3		1	
52	A04031	leadscrew	y40mn		1	
53	A04043	cam	40cr	local G48	1	
54	A04044	pin	20cr	So.9-C59	1	
55	A04046	lever seat	45		1	
56	A04048	ward circle	local G48		1	
57	A04059	bush	20cr	So.9-C59	4	
58	A04061	clutch	40cr	local G48	1	
59	A05011	nut	ZQSn6-6-3		1	
60	A05021	leadscrew	y40mn		1	CY6½50B for $A_1$05021
61	AB05031	gear	45	gear G48	1	
62	A06021	worm wheel	ZQSn6-6-3		1	
63	A06022	split-nut	"		1	
64	A06051	I shaft	45	T235	1	
65	A06052	II shaft	"	T235 gear G48	1	
66	A06053	III shaft IV shaft	"	T235	1	
67	A06054	IV shaft	"	"	1	

Serial No.	Part No	Name	Material	Heat Treatment	Unit	Remarks
68	A06055	V shaft	45	T235	1	
69	A06056	VII shaft	45		1	
70	A06057	VIII shaft	"		1	
71	A06058	IX shaft	"	local G48	1	
72	A06061	gear	"	"	1	
73	A06062	"	"	"	1	
74	A06063	"	Gcr15	y60	1	
75	A06064	"	45	gear G48	1	
76	A06065	"	"	"	2	
77	A06066	"	"		4	
78	A06067R	"	"	gear G48	1	
79	A06068 R	"	"	"	1	
80	A06069	"	"	"	1	
81	A06071	"	"	face-gear G48	1	
82	A06081	operating shaft	"	T235	1	
83	A06082	rod bush	"		1	
84	A06083	clutch	Gcr15	local G48	1	
85	A06084	"	40cr	local G52	1	
86	A06085	"	45	local G48	1	
87	A06092	interock pin	"		1	
88	A06107A	connecting bush	"		1	
89	A07031	shaft	"	T235	1	
90	A07032	gear shaft	"	T235 local G42	1	

Serial No	Part No	Name	Material	Heat Treatment	Unit	Remarks
91	A07033	shaft	45	T235	1	
92	A07034	gear shaft	"	gear G42	1	
93	A07035	shaft	"	T235	1	
94	A07036	"	"	"	1	
95	A07037	"	"	"	1	
96	A07038	gear shaft	"	gear G42	1	
97	A07039	shaft	"	T235	1	
98	A07061	gear	"	gear G42	1	
99	A07062	"	"	"	1	
100	A07063	"	"	"	1	
101	A07064	"	"	"	1	
102	A07065	"	"	"	1	
103	A07066	"	"	"	2	
104	A07067	"	"	"	1	
105	A07068	"	"	"	1	
106	A07069	"	"	"	1	
107	A07071	"	"	"	1	
108	A07072	"	"	"	1	
109	A07073	"	"	"	1	
110	A07074	"	"	"	1	
111	A07075	"	"	"	1	
112	A07076	"	"	"	1	
113	A07077	"	"	"	1	

产品型号			
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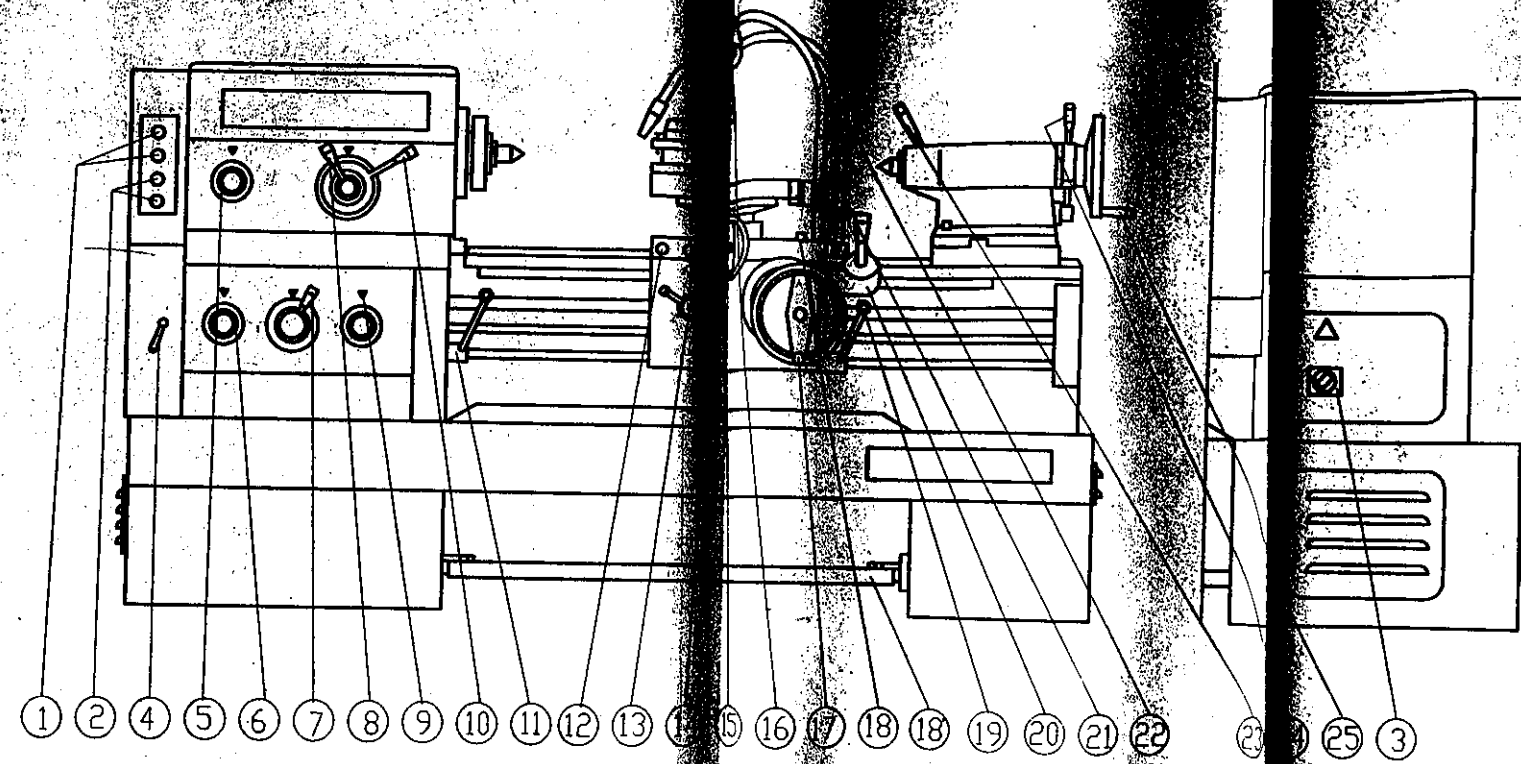
日期			

No.	Code	Name	Material	Quantity	Remarks
114	A07078	gear	45	1	
115	A07079	"	"	1	
116	A08011	splined bush	24Sn6-b-2	1	
117	A08021	shaft	45	C35	1	
118	A08041	gear	"	1	(4Y&450B for) A108041
119	A08042	"	"	1	A108042
120	A08043	"	"	1	A108043
121	A08044	"	"	1	A108044

产品型号			
文件代号	SY-A6-七	第 6 页	
编制		共 6 页	
日期			

4. Emergency brake

To prevent the situation from getting worse and worse at the time of emergency circumstance occurrence, step down the pedal which was build between the legs. The main power was cut off once the pedal begin step-downed and the brake torque was imposed by the brake hand to the V—belt thus the brake of the main motor and spindle was quickly realized. After completion of above—mentioned operation. If the forward-backward-stop lever of the spindle is in the original position (upward for spindle forward rotation, downward for reversed rotation), then the limited switch mounted on the vertical spindle with stop the machine's restart , to prevent the accident from happening. When restart is needed, set the above-mentioned lever to the spindle-stop position and operate the start pushbutton of the main motor.



1. Push-button control of coolant pump
2. Push-button control of main drive motor
3. Cover switch
4. Pulley-guard clamping lever
5. Normal and amplified pitches, forward and reverse feed lever
6. Feed and thread variety dial knob
7. Feedbox basic gear ratio change [illegible]
8. Main spindle speed change lever
9. Feedbox multiplying gear change [illegible]
10. Main spindle speed change lever
11. Main spindle forward-brake-reverse lever
12. Push-button control of main [illegible]
13. Split-nut closing and releasing [illegible]
14. Cross slide traverse ball crank handle
15. Square turret turning clamping handle
16. Lamp switch
17. Saddle longitudinal travel hand wheel
18. Lock screw of saddle
19. Spindle brake pedal
20. Main spindle forward-brake-reverse lever
21. [illegible]our-way power-feed lever
22. [illegible]h rapid-travel pushbutton
23. [illegible] slide travel lever
24. [illegible]lant flow regulating lock
25. [illegible]ll clamping handle
26. [illegible]ll stock clamping handle
27. [illegible]ll travel hand wheel

Fig 2 Operating element and their locations

VI. ELECTRICAL SYSTEM

The principle of electrical system is shown in page 6-3. The electric wire diagram is shown in page 6-4. The electric equipments diagram is shown in page 6-5 and the electric equipments list are shown in page6-6.

For adapting to the different power systems of various countries and regions, the machine can be provided optionally with electrical equipments in AC frequency of 50HZ or 60HZ, in control voltage of 110v and in main voltage of 220V,380V,420V,or 440V,600V,illuminator voltage of 24V, and in main motor power of 10HP,15HP or 20HP. It is necessary for our endures to make sure that the frequency and the voltage given or rating plate agree with the local power system.

Fuses are not provided with this machine. They can be mounted on the leading power line by our endusers according to the data on the rating plate.

Both power line and protective earth line should enter the machine through the cable gland on the left side of the front cabinet leg, since the wiring board is also placed to the left of its rear window. An enriching wire is to be let out from side hole and tightened on the screwconnecting (PE) to the ground.

After closing the main switch QS, the pilot lamp HL1 andHL2 in green pushbuttons SB2 and SB3 of main motor M2 will light up, it shows that the circuit is being connected and that the main motor is being started. By pressing down the start—button of main motor, the pilot lamps will go out, it shows the completed and the main motor is being started. By pressing down

the red pushbutton SB4 which serve to stop the main motor.

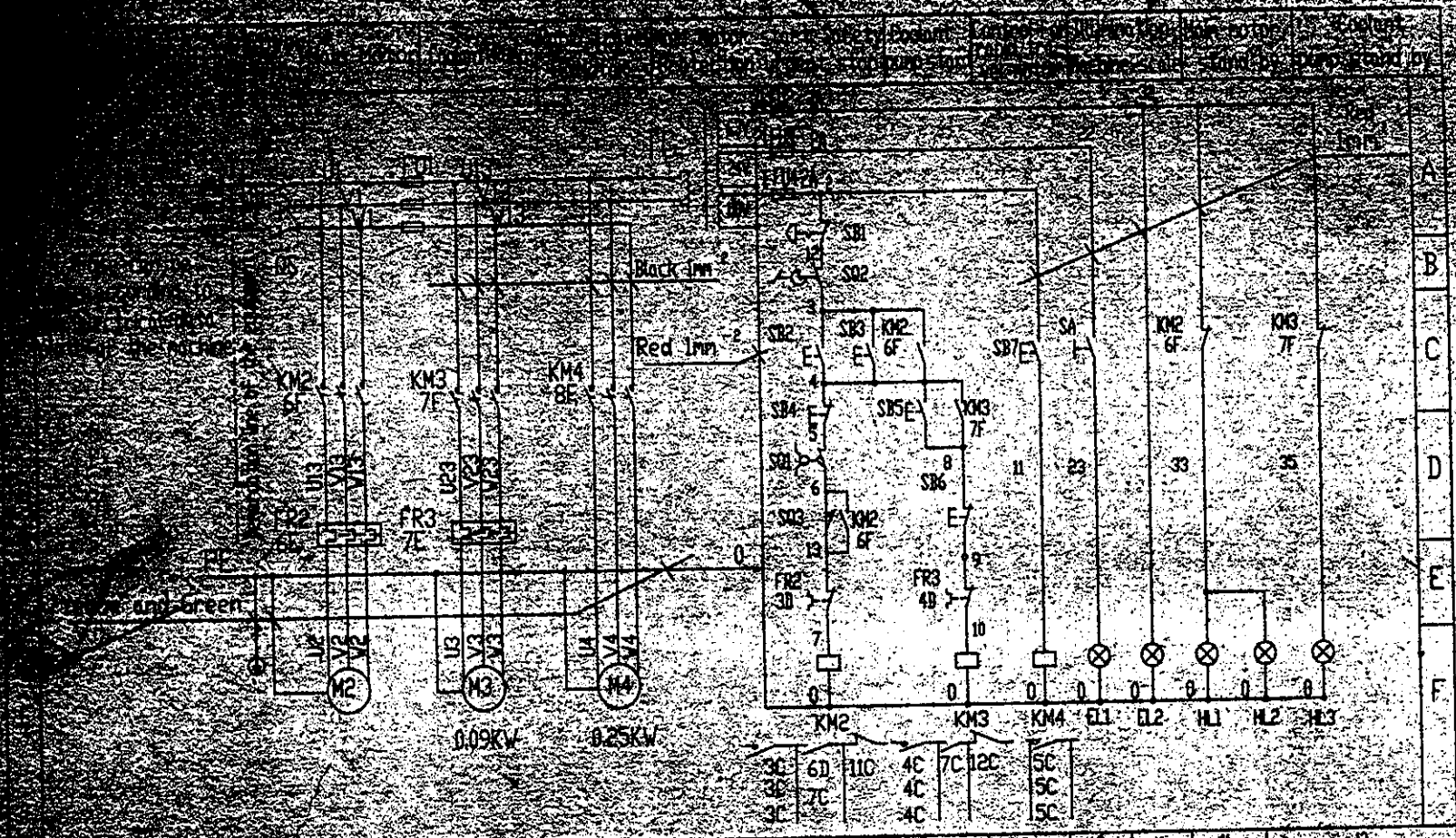
After starting the main motor, the pilot lamp HL3 in green start-button SB5 of coolant pump will light up, pressing down this button may start the coolant pump. Once the main motor is stopped, the coolant pump will stop automatically.

A protective switch SQ is built in the belt cover, when opening the cover, the main motor can't be started. An urgent stop-pushbutton (SB1) can cut off electric circuitry and can stop the machine. After removing trouble, turn this button in the direction the black arrow indicate to 30^0, then the machine can be restarted.

After the electric power is being connected, the rapid travel motor M4 is controlled by black pushbutton SB7 and the work lamp EL1 is controlled by switch K on lamp socket.

A hanger hole for the naked lock is also provided with the power switch of the machine. Various naked locks can be equipped at the customers choice .

Special tools for opening the electrical equipment cabinet are available in accessory box.

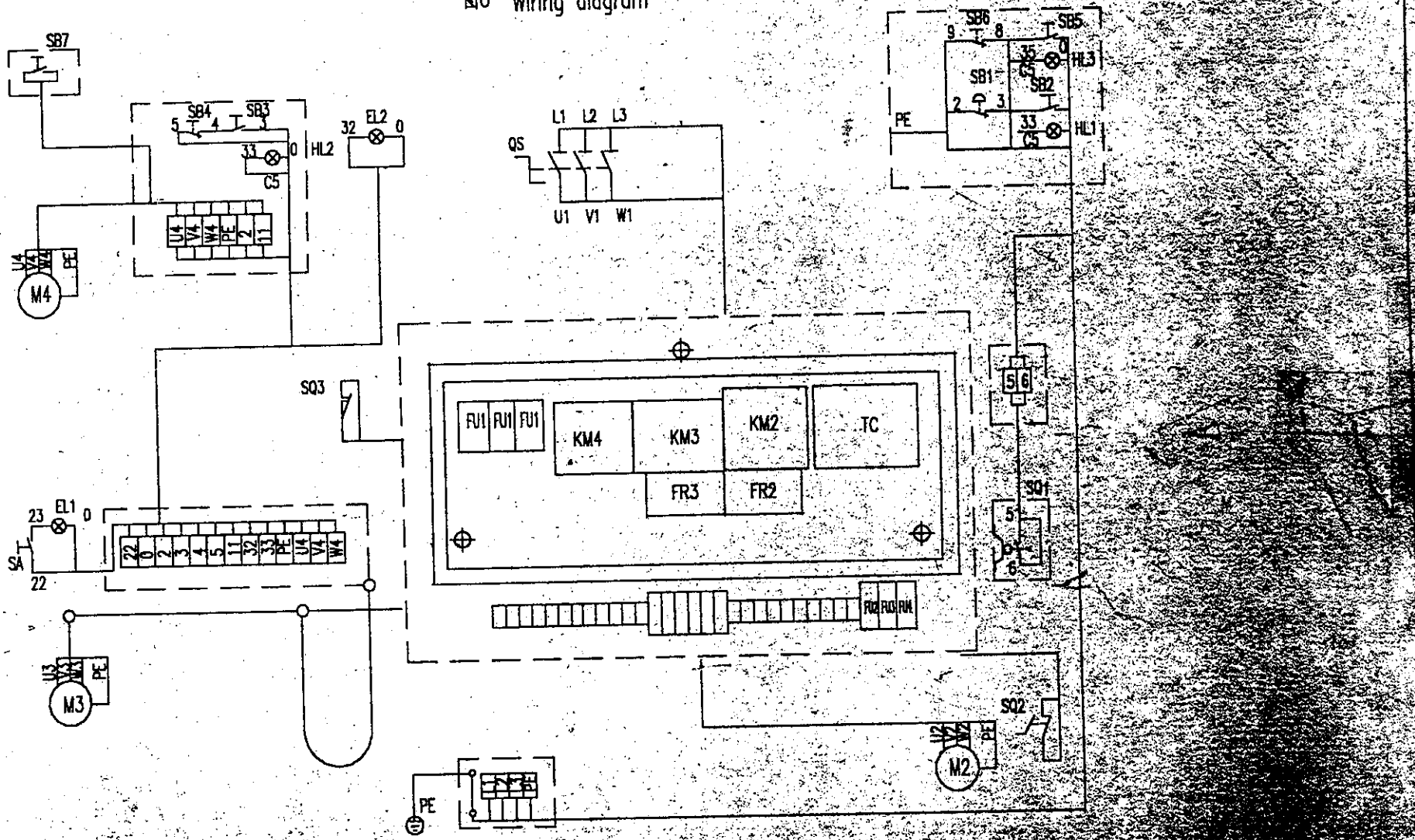


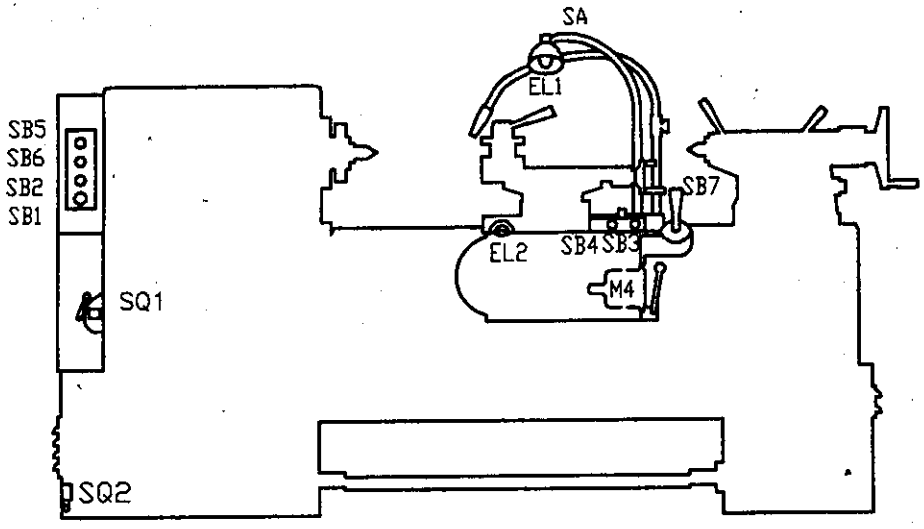
	1	2	3	4	5	6				8	9	10	11	12
AC	V	FR2	FR3	FU1	M2	V	FR2	FR3	FU1	M2	V	FR2	FR3	FU1
	~220V	25.9A	0.58A	10A		~220V	39A	0.58A	10A		~220V			
	~380V	15.4A	0.32A	6A		~380V	22.5A	0.32A	6A		~380V	30A	0.32A	6A
	~420V	14A	0.32A	6A	11KW	~420V	20A	0.32A	6A	15KW	~420V	28A	0.32A	6A
	~440V	13A	0.32A	6A		~440V	19.6A	0.32A	6A		~440V	26.7A	0.32A	6A
	~600V	9.7A	0.2A	4A		~600V	14.3A	0.2A	4A		~600V	19.5A	0.2A	4A

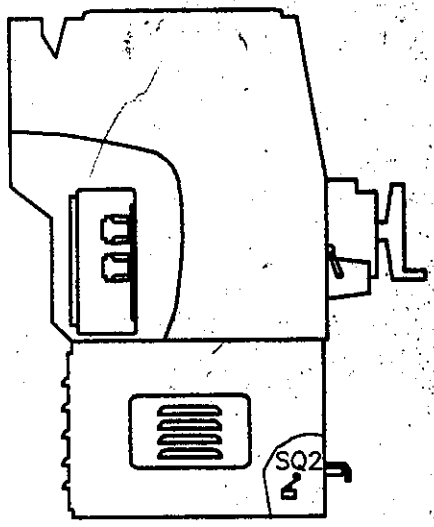
Nater the value value of thermal relay is the reference value, using the marked value on the data plate as standard. Users must take care of this !

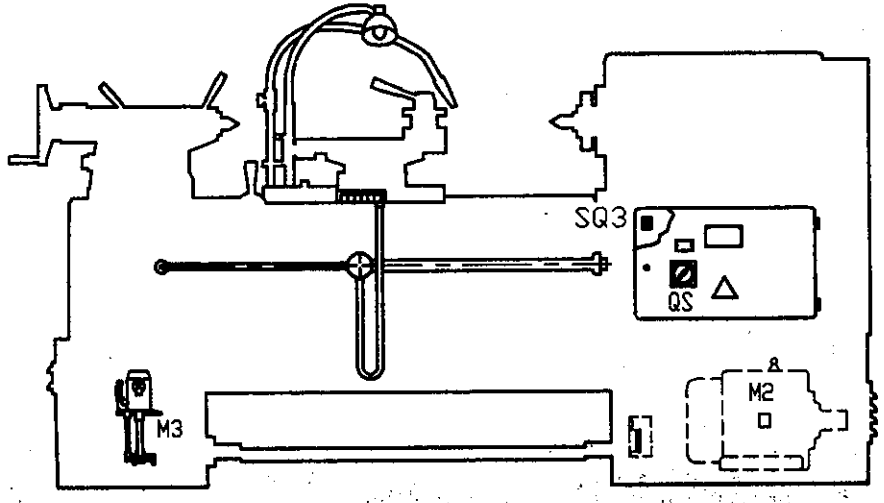
The Diagram of Electric Circuit

图6 Wiring diagram









Installation diagram

POWER 3~50HZ(60HZ)