

CATALOGO  
DEL TORNO

Universidad Distrital  
Francisco José de Caldas  
Facultad Tecnológica

00630<sup>A</sup><sub>B</sub>

GEARED HEAD LATHES

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Page 1

This machine has been tested and found qualified  
for despatch.

Chief of Technical

Control Department

Works Manager:



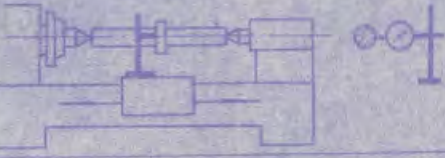
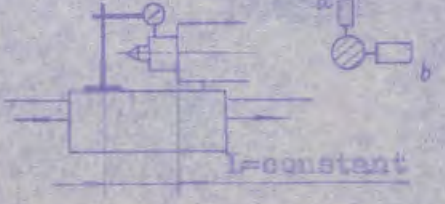
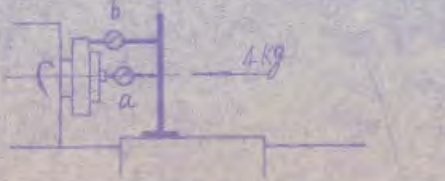
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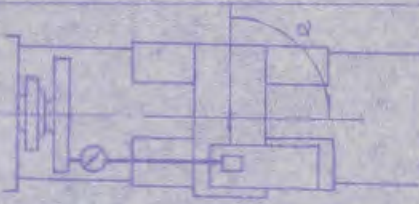

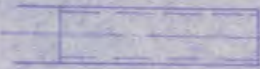
## INSPECTION CERTIFICATE OF GEARED HEAD

Before inspection, the machine tool should be horizontally adjusted. After adjustment, a level is placed at both ends of the machine body. The horizontal permissible error is  $0.02/1000$ . The direction of both ends should be same (in crosswise inspection, the level may be placed on the specially-made plate). The longitudinal permissible error is  $0.08/1000$  (in longitudinal inspection of V guide, the level can be placed on the specially-made V-shaped block. In inspection of plane guide, the level is placed directly on the guide).

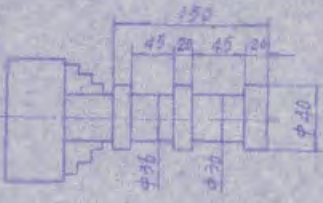
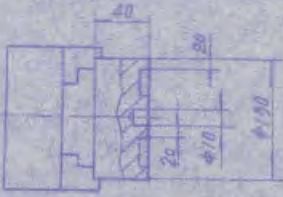
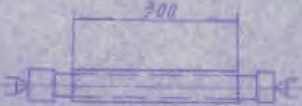
## I. Test of Geometric Accuracy

No.	Diagram	Inspection Item	Permissible error(mm)	Actual Value
G1	a) 	a) Linearity of the vertical guide	0.02 (Convexity) 0.0075 Partial error within any 250 length	0.01 0.005
	b) 	b) Parallel of the transverse guide	0.04/1000	0.008
G2		Linearity of the apron in transverse motion	0.02	0.007
G3		Parallel of the motion of tailstock to apron a) in vertical plane b) in transverse plane	a and b 0.03 0.02 in any 500 measuring length	0.008 0.012
G4		a) axial play of spindle b) travel of stay of spindle shoulder	a) 0.01 b) 0.02 (include axial play)	0.014 0.012

No.	Diagram	Inspection Item	Permissible error(mm)	Actual Value
65		Radial travel of axle journal	0.01	0.004
66		Radial travel of taper hole axis of spindle a) nearest spindle nose b) at a distance of 200mm	a) 0.01 b) 0.013 in 200 measuring length	0.003 0.008
67		Parallel of spindle axis to apron motion a) in vertical plane b) in transverse plane	a) 0.013 in 200 measuring length (inclined upward only) b) 0.01 in 200 measuring length (inclined forward only)	0.005 0.005
68		Center travel	0.015	0.007
69		Parallel of sleeve axis of tailstock to apron motion a) in vertical plane b) in transverse plane	a) 0.0055 in 35 measuring length (inclined upward only) b) 0.005 in 35 measuring length (inclined forward only)	0.002 0.002
010		Parallel of taper hole axis of tailstock sleeve to apron motion a) in vertical plane b) in transverse plane	a) 0.02 in 200 measuring length (inclined upward only) b) 0.02 in 200 measuring length (inclined forward only)	0.008 0.012
011		Equiheight of centers between headstock and tailstock	0.04 tailstock higher only	0.022
012		Parallel of top slide motion to spindle axis	0.0087 in 65 measuring length	0.008

No.	Diagram	Inspection Item	Permissible error(mm)	Actual Value
G13		Verticality of cross slide travel to spindle axis	0.01/150 direction deviation $\alpha \geq 90^\circ$	0.009
G14		Axial play of leadscrew	0.015	0.002
G15		Cumulative error of screw pitch in virtue of leadscrew	a) 0.04 in any 300 measuring length b) 0.015 in any 60 measuring length	0.02 0.010

### II. Working Accuracy Test

No.	Diagram	Inspection Item	Permissible error(mm)	Actual Value
P1		Accuracy of cylindrical turning a) roundness b) cylindricity (any large dia. of taper near the headstock end)	a) 0.01 b) 0.015 in 150 measuring length	0.007 0.008
P2		End plane turning (only concavity allowed)	0.01 at 150 dia. (Concave)	0.005
P3	 Pitch 3 Dia. $\phi 30$ Screw $60^\circ$	Screw pitch turning and the cumulative error over 300mm	a) 0.04 in 300 measuring length b) 0.015 in any 50 measuring length	0.02 0.008

Inspected by

J. X. HUANG

Signature: \_\_\_\_\_

PACKING LIST  
FOR  
GEARED HEAD LATHE MODEL C0630A

Swing over bed	300mm
Distance between centres	550mm
Ex-work No.	
Case dimensions (LxWxH)	1688x908x1536mm
N.W./G.W.	568/750kg

THE PEOPLE'S REPUBLIC OF CHINA  
SHANGHAI No. 11 MACHINE TOOL WORKS

Standard Attachments:

Item	Name	Specification	Qty.	Remarks
1	Geared Head lathe	Ø300x550mm	1 set.	C0630B Not with base
2	Motor	1.1 Kw	1 "	On the machine
3	3-Jaw chuck	Ø160mm	1 "	Including flange double-end bolt nut
4	Drive plate	Ø145mm	1 "	Including driver rod double-end bolt nut
5	Distributor case		1 "	C0630A On the machine C0630B Division
6	Standard center	Morse 3	1 pc.	For spindle
7	Center sleeve	5/3	1 "	"
8	Standard center	Morse 2	1 "	For stallstock
9	Square box wrench	8x8mm	1 "	For tool post
10	Double-end spanner	14x17mm	1 "	For mounting chuck steady rest, follower rest and for adjusting balance
11	Slotted round nut spanner	38-42mm	2 pcs.	For adjusting rod and leadscrew
12	"	55-62mm	2 "	For adjusting rear nut of spindle
13	"	78-85mm	1 pc.	For adjusting nut of front bearing
14	Fork type single end spanner	A=22mm	1 "	For adjusting nuts of carriage and leadscrew
15	Rubber V-belt	Type A 686mm	2 pcs.	
16	Change gear of metric machine	Z=30, 55, 70, 80, 95, 100, 127 Z=90	1 ea. 2 pcs.	Z=30, 90, 100, 1 ea. on the machine
17	Operation manual English and Chinese		1 ea.	
18	Test certificate English and Chinese		1 ea.	
19	Packing list English and Chinese		1 ea.	

Packing Inspector:  
Q.B.CHEN  
 Date:

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Model  
A  
C0630  
B

Packing list for Geared Head Lathe

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Special Attachments :

Item	Name	Specification	Qty.	Remarks
1	4-Jaw Chuck	$\phi 160$ mm	1 set.	Including flange
2	Follower Rest	$\phi 5 - \phi 30$ mm	1 set.	On the machine
3	Steady Rest	$\phi 5 - \phi 30$ mm	1 set.	"
4	Coolant Tank		1 set.	

Packing Inspector: Q.B.CHEN

Date :



SERIAL NO.

CASE DIMENSION: (L x W x H) 150cm x 134cm x 172cm

GROSS WEIGHT: 1700kg

NET WEIGHT: 1300kg

Item	Description	Specification	Qty.	Remark
A. Main machine and parts dismantled from the main machine				
1.	Machine body	X6125A	1 set	
2.	Handwheel		2 pcs.	on the main machine
3.	Handle		1 pce.	"
4.	V-belt	A1651	3 pcs.	in accessories box
5.	Return pipe	φ20	1 set	"
B. Accessories and tools				
6.	Milling arbor	φ22x585 Morse No.3	1 pce.	in accessories box
7.	Milling arbor	φ27x585 Morse No.3	1 pce.	"
8.	Pin	6x6x195	2 pcs.	"
9.	Spacing collar	φ22, φ27	22 pcs.	"
10.	Arbor for face mill	φ27x118 Morse No.3	1 pce.	"
11.	Drive plate	φ27	1 pce.	"
12.	Clamp screw for face mill	M12	1 pce.	attached with main machine
13.	Foundation bolts with nuts	M20x400	4 sets	in accessories box
14.	Screw	M12	1 pce.	"
15.	Wrench for clamp screw	20x6	1 pce.	"
16.	Handle for wrench	φ10x150	1 pce.	"
17.	Hex. socket wrench	5, 6, 8, 10, 12	1 pce. each	"

## PACKING LIST

PAGE 2

Item	Description	Specification	Qty.	Remarks
18.	Double end wrench	19x17, 22x24	each 1 pce.	in accessories box
19.	Single end wrench for round nut	64-72, 75-82, 46-52, 38-42	"	"
20.	Oil gun	200	1 pce.	"
21.	Vertical milling head	Worm taper No. 3	1 set	mounted on the machine according to the contract.
22.	Dividing head	100	1 set	supplied according to the contract.
23.	Rotary table	TR250	1 set	"
24.	Plain vice	136	1 set	"
	<del>_____</del>	<del>_____</del>	<del>_____</del>	<del>_____</del>
	<del>_____</del>	<del>_____</del>	<del>_____</del>	<del>_____</del>
27.	Screw	M12	1 pce.	attached with the vertical milling head.

## C. Technical documents

28. Operation manual

29. Quality certificate

30. Packing list

MODEL X6125A UNIVERSAL MILLING MACHINE

TEST CERTIFICATE

TABLE WIDTH

250 MM

SERIAL NO.

WANNAN MACHINE TOOL WORKS ANHUI

THE PEOPLE'S REPUBLIC OF CHINA

OPERATION MANUAL  
for  
GEARED HEAD LATHE MODEL  
C6162A  
C0630

Swing Over Bed 300mm  
Max. Length of Work 550mm  
Serial No.

SHANGHAI ELEVENTH MACHINE TOOL WORKS  
THE PEOPLE'S REPUBLIC OF CHINA

DANIL O KOLDAN

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## II. MAIN APPLICATION AND PERFORMANCE

CO630<sup>A</sup>/<sub>B</sub> are small-scale geared head lathes. They are capable of turning, boring, slot milling and drilling, etc. They can also be used for metric and inch threads machining.

CO630A is a kind of geared head lathe with base. CO630B is a kind of bench lathe. Both the lathes are all the same in structure, performance and application, featuring simple construction, easy operation, large bore of spindle and small floor space. They are suitable for the manufacture and repair of small machine parts in instrument-machining industry.

The lathes Models CO630A and CO630B are designed with two versions, which are lathes of metric and inch system. The lathe of metric system is mainly used for machining metric threads, but it can also be used to machine whitworth threads after its change gears are adjusted. In the same way, the lathe of inch system can machine not only the whitworth threads but also the metric ones. They are all the same in structure, performance and operation. The specifications in this operation manual are in metric system. The lathe of metric system indicated in the part of the change gears means it a lathe of metric system, and the lathe of inch system indicated in the part of the change gears means it a lathe of inch system.

The attachments, electric apparatus and single-phase or 3-phase motors can be provided on the users specific requests.

## III. MAIN SPECIFICATIONS AND DATA

## 1. General

Max. swing dia. of workpiece over bed	300 mm
Max. length of workpiece	950 mm
Max. swing dia. of workpiece over carriage	150 mm
Max. length of turning	510 mm

## 2. Headstock

Spindle go-bore dia.	38 mm
Taper of spindle hole	Horse No. 5
Variety of spindle speed	9
Range of spindle speeds (Forward and reverse)	60-2245 rpm

## 3. Quasrant and Feed Box

	Metric system	Inch system
No. of metric threads cut	11	12
Range of metric threads (mm)	0.5-3	0.45-3
No. of whitworth threads cut	17	17
Range of whitworth threads (t.p.i.)	6-40	6-40
No. of longitudinal & cross feeds	9 each	9 each
Range of longitudinal feed per spindle revolution (mm/inch)	0.028-0.188	0.0014-0.0073
Range of cross feeds per spindle revolution (mm/inch)	0.013-0.098	0.0007-0.0036
Leadscrew thread	3 mm	8 t.p.i.
Pitch of cross slide leadscrew	3 mm	8 t.p.i.
Travel of cross slide per graduation of leadscrew micrometer collar	0.02 mm	0.00053"
Pitch of top slide leadscrew	3 mm	10 t.p.i.
Travel of top slide per graduation of leadscrew micrometer collar	0.03 mm	0.001"

## 4. Apron and Carriage

Distance from base of tool to spindle axis	12 mm
Max. swivel of compound rest	$\pm 90^\circ$
Max. travel of top slide (manual)	65 mm
Max. travel of cross slide (manual)	150 mm
Max. travel of saddle (manual)	510 mm

## 5. Tailstock

Dia. of center sleeve	32 mm
Taper of sleeve hole	Morse No. 2
Max. travel of sleeve	60 mm
Max. setover of tailstock	15 mm

## 6. Electric Motor

Motor frequency (3-phase)	50/60 Hz
(single-phase)	50/60 Hz
Motor power	1.1 kW
speed (3-phase)	1500, 1620 rpm
(single-phase)	1500 rpm
voltage	220, 380, 420 V

## 7. Overall Dimensions and Weight

Geared head lathe C0630A

Dimensions (LxWxH)	1420x720x1155 mm
Weight	568 Kg

Geared head bench lathe C0630B

Dimensions (LxWxH)	1420x720x610 mm
Weight	487 Kg



IV. TABLE OF PRINCIPAL GEARS, LEADSCREWS  
AND NUTS IN THE TRANSMISSION SYSTEM

Component	Designated No.	Name of parts	No. of teeth or threads	Module or pitch	Pressure angle or thread angle	Material	Heat treatment
Headstock	1	Duplet gear	23	M1.5	20°	45	HRC52-5
"			54	"	"	"	"
"	2	Gear	47	"	"	"	"
"	3	Gear	31	"	"	"	"
"	4	Duplet gear	51	"	"	"	"
"			51	"	"	"	"
"	5	Gear	56	"	"	"	"
"	6		25	"	"	"	"
"	7		32	"	"	"	"
"	8	Triplet gear	46	"	"	"	"
"			48	"	"	"	"
"			23	"	"	"	"
"	9	Gear	51	"	"	"	"
"	10	"	54	"	"	"	"
"	11	"	73	"	"	"	"
"	12	"	51	"	"	"	"
Bed	28	rack	rack	"	"	"	"
Apron	29	"	12	M1.5 $\frac{1}{5} + 0.3$	"	"	"
"	30	"	27	"	"	"	"
"	31	Worm	single thread	"	"	"	HB220-35
"	32	Gear	70	M1.25	"	"	HRC52-57
"	33	"	35	"	"	"	"
"	34	Worm wheel	41	M1.5	"	HC20-40	"
"	35	Gear	47	"	"	45	"
"	36	"	18	M1.25	"	"	"
"	37	"	52	"	"	"	"
"	38	"	33	"	"	"	"
"	39	"	59	"	"	"	"
"	40	"	38	"	"	"	"
Saddle	41	"	21	"	"	"	"
Tailstock	48	Nut	single thread	3 (L.H.)		Z38S6-6-3	
"	49	Leadscrew	"	3 ( " )		45	

TABLE OF PRINCIPAL GEARS IN THE FEED BOX AND CHANGE GEAR  
BRACKET FOR THE MACHINE TOOL OF METRIC SYSTEM

Component	Designated No.	Name of parts	No. of teeth or threads	Module, pitch & revise factor	Pressure angle or thread angle	Material	Heat treatment	
Feed box	13	Triplet gear	42	1.25	20°	45	HR052-	
			56		"	"	"	
			28		"	"	"	
	14	Gear	30	2 $\frac{1}{2}$ -0.94	"	"	"	
	15	"	32	1.75	"	"	"	
	16	"	25	"	"	"	"	
	17	"	24	"	"	"	"	
	18	"	24	2 $\frac{1}{2}$ -0.7	"	"	"	
	19	"	35	1.5	"	"	"	
	20	"	30	"	"	"	"	
	21	"	42	1.25	"	"	"	
	22	"	28	"	"	"	"	
	23	"	56	"	"	"	"	
	24	Duplet gear	24	2 $\frac{1}{2}$ -0.7	"	"	"	
				28	1.75	"	"	
				35	"	"	"	
				36	"	"	"	
	26	" "	30	2 $\frac{1}{2}$ -0.94	"	"	"	
				35	1.5	"	"	
	27	Gear	40	1.5	"	"	"	
	Change gear bracket	50	Change gear	30	1.25	"	"	
		51	" "	55	"	"	"	
		52	" "	70	"	"	"	
		53	" "	80	"	"	"	
54		" "	90	"	"	"		

Component	Designated No.	Name of parts	No. of teeth or threads	Module, pitch & revise factor	Pressure angle or thread angle	Material	Heat Treatment
Change gear bracket	55	Change gear	95	1.25	20°	45	
	56	" "	100	"	"	"	
	57	" "	127	"	"	"	
Frame	42	Nut	single thread	3 (L.H.)	30°	20Sn6-6-3	
	43	Leadscrew	"	3 ( " )	"	45	
	44	Nut	"	3	"	20Sn6-6-3	
	45	Leadscrew	"	3	"	45	
	46	"	"	3	"	"	
	47	Nut	"	3	"	"	

TABLE OF PRINCIPAL GEARS IN THE FEED BOX AND CHANGE GEAR BRACKET FOR THE MACHINE TOOL OF INCH SYSTEM

Component	Designated No.	Name of parts	No. of teeth or threads	Module, pitch & revise factor	Pressure angle or thread angle	Material	Heat Treatment
Feed box	13	Triplet gear	42, 56, 28	1.25	20°	45	HR092-5
	14	Gear	30	1.5	"	"	"
	15	"	28	1.75	"	"	"
	16	"	38	1.5	"	"	"
	17	"	30	2 $\frac{3}{4}$ -0.94	"	"	"
	18	"	36	1.5 $\frac{5}{8}$ +0.75	"	"	"
	19	"	35	1.5	"	"	"
	20	"	30	1.5	"	"	"
	21	"	42	1.25	"	"	"
	22	"	28	1.25	"	"	"
	23	"	56	1.25	"	"	"

C0630<sup>A</sup><sub>B</sub>

## GEARED HEAD LATHE

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Page /e

Component	Designated No.	Name of parts	No. of teeth or threads	Module, pitch & revise factor	Pressure angle or thread angle	Material	Heat treatment
Feed box	24	Duplet gear	40	1.5	20°	45	HRC52-5
			32	1.75	"		"
	25	" "	32	1.5	"	"	"
			24	2.8-0.7	"		
			32	1.58+0.9	"		
	26	" "	35	1.5	"	"	"
			40	1.5	"		
Change gear bracket	50	Change gear	28	1.25	"	"	
	51	" "	30	1.25	"	"	
	52	" "	40	1.25	"	"	
	53	" "	45	1.25	"	"	
	54	" "	50	1.25	"	"	
	55	" "	60	1.25	"	"	
	56	" "	70	1.25	"	"	
	57	" "	90	1.25	"	"	
	58	" "	110	1.25	"	"	
	59	" "	127	1.25	"	"	
	Frame	42	Nut	single thread	8 t.p.i. (L.H.)	29°	ZQSn6-6-3
43		Leadscrew	"	"	"	45	
44		Nut	"	8 t.p.i.	"	ZQSn6-6-3	
45		Screw lever	"	"	"	45	
46		Leadscrew	"	10 t.p.i.	"	"	
47		Nut	"	"	"	ZQSn6-6-3	

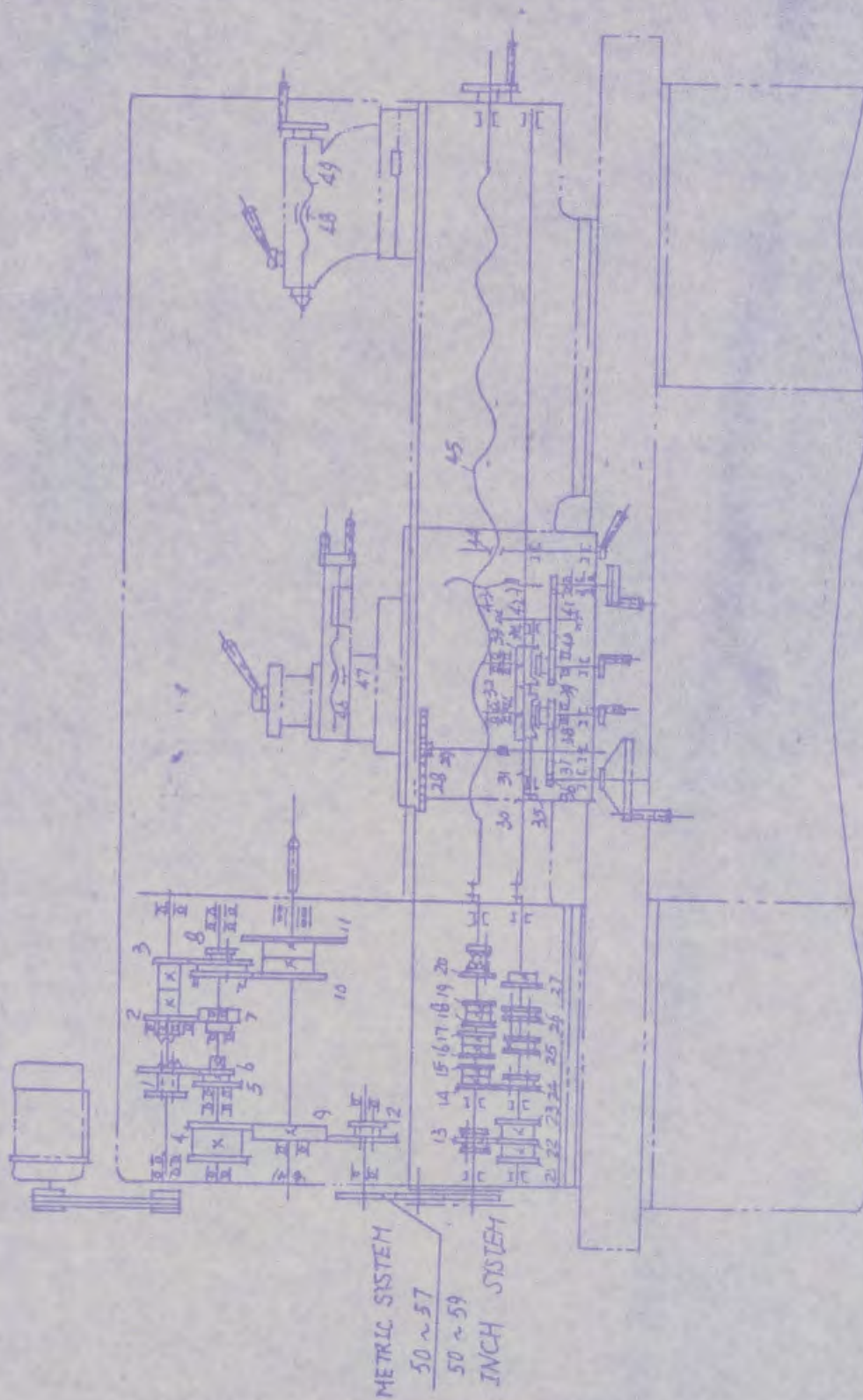


Fig 3. Driving System

## V. TABLE OF ROLLING BEARINGS

(See Fig. 4)

Type	Name	Specifications	Qty	Mounting position
D3182113	Double row radial short roller bearing	65x100x26	1	Headstock
D2007110	Single row taper roller bearing	50x80x20	1	"
D8110	Single thrust ball bearing	50x20x14	1	"
E7000103	Single row radial ball bearing	17x35x8	3	"
E1000902	"	15x28x7	1	"
E1000904	"	20x37x9	3	"
E1000908	"	40x52x7	1	"
E7000105	"	25x47x8	2	"
E7000102	"	15x32x8	2	"
E104	"	20x42x12	1	"
1000800	"	10x19x5	4	Apron
E103	Single thrust ball bearing	17x30x9	2	"
E101	"	12x26x9	2	Saddle

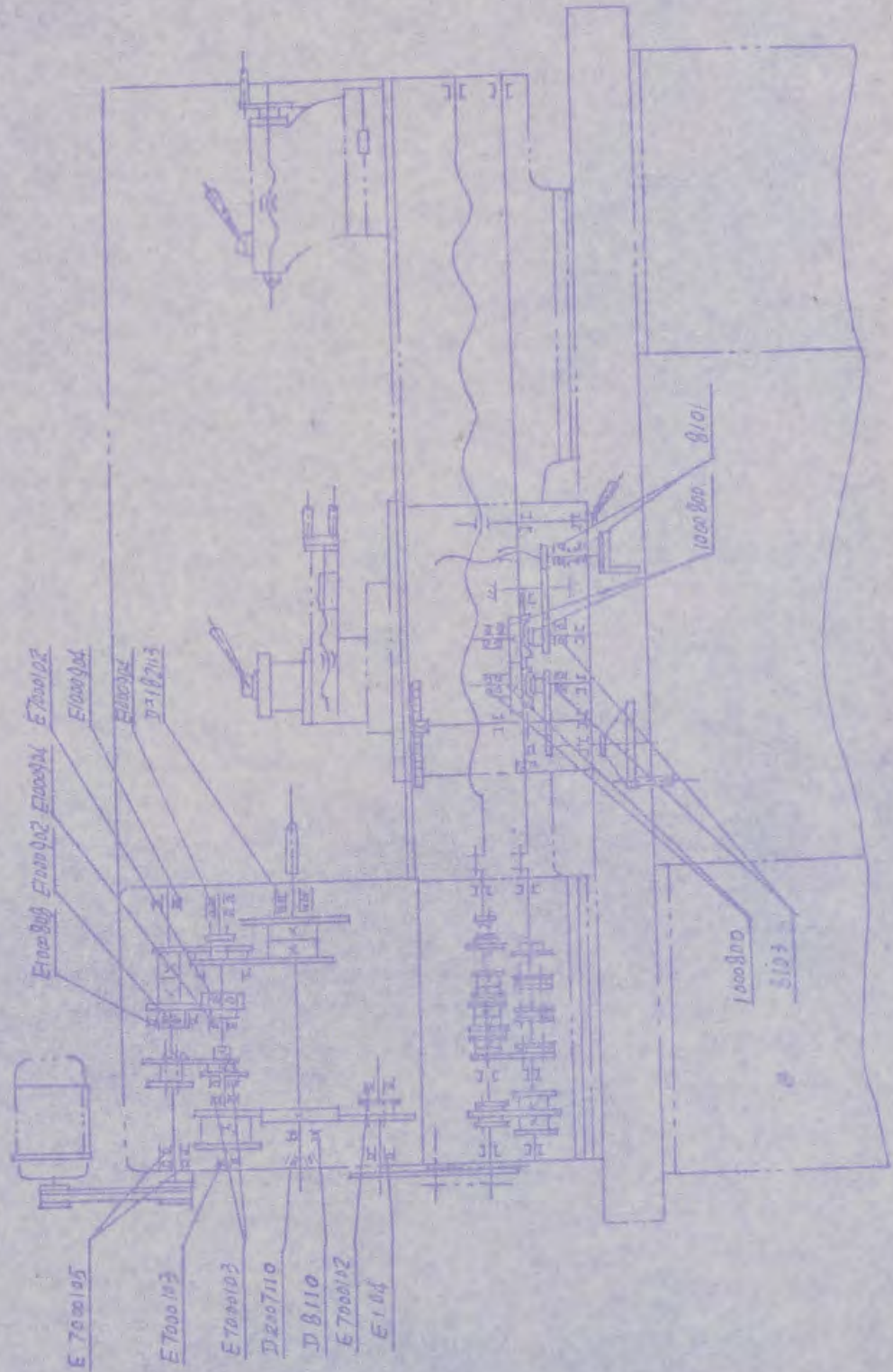


Fig 4. Antifriction Bearing Arrangement

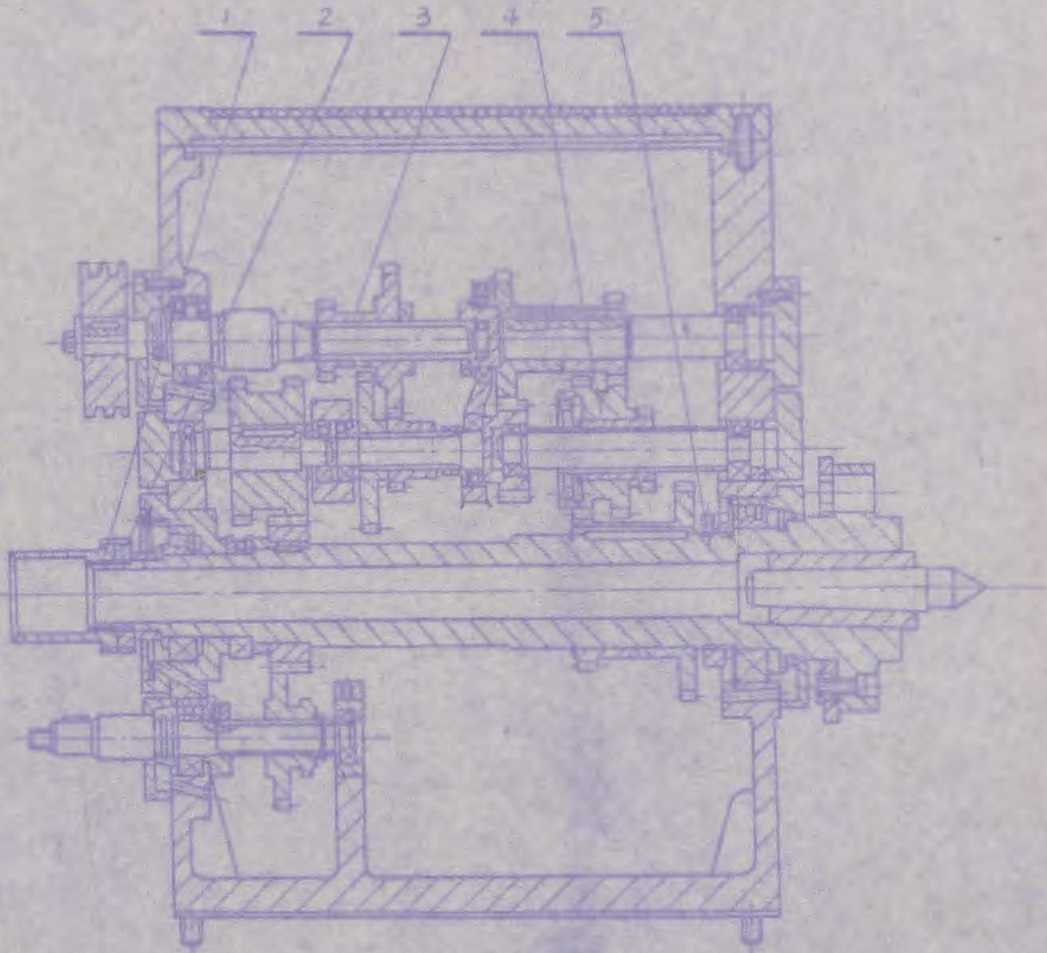


Fig. 5 Headstock

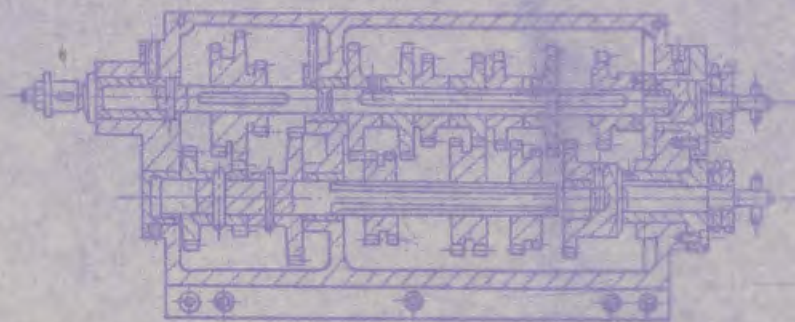


Fig. 6 Feedbox



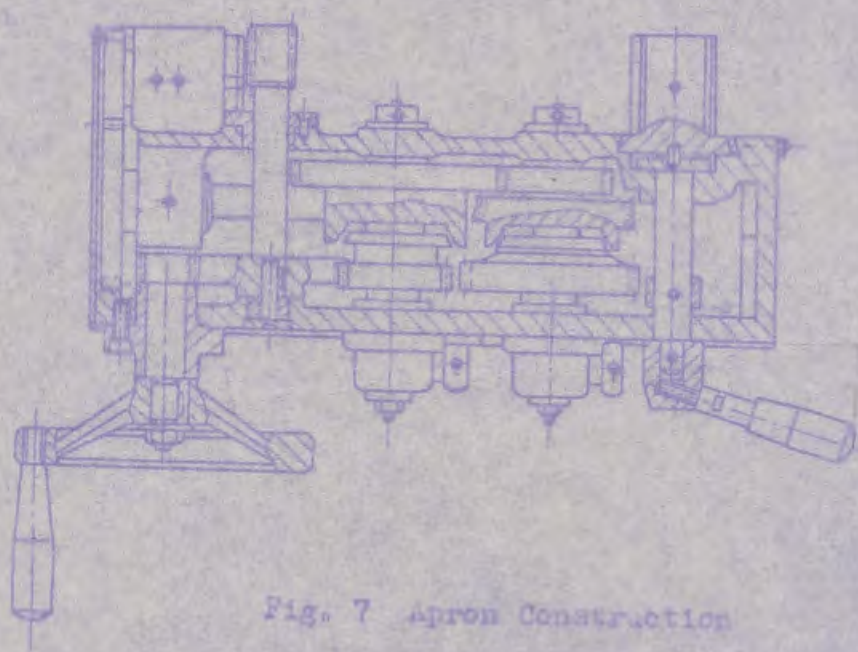


Fig. 7 Apron Construction

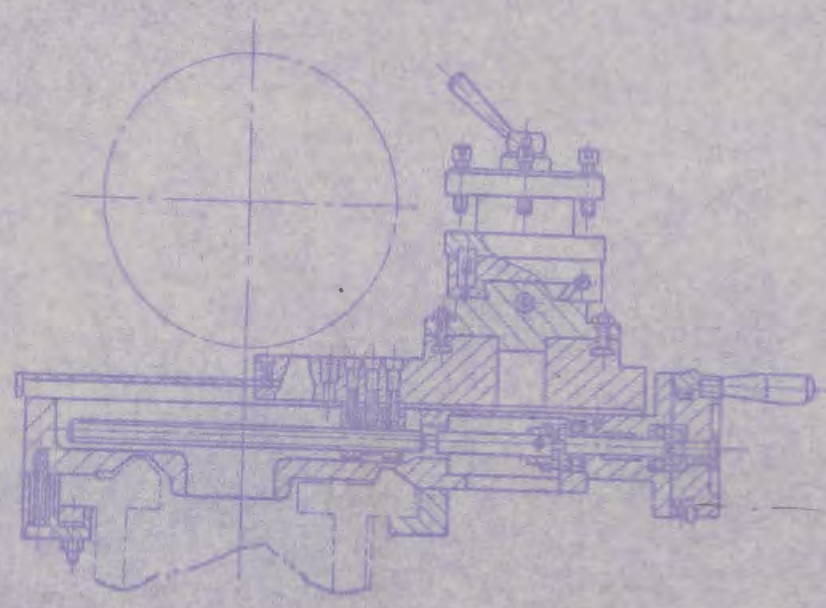


Fig. 8 Toolslide Construction

TEST CERTIFICATE

for

GEARED HEAD LATHE MODEL C0630A

Swing Over Bed

300mm

Distance Between Centers

550mm

Ex-works No. . 39-1069

THE SHANGHAI ELEVENTH MACHINE TOOLS WORKS

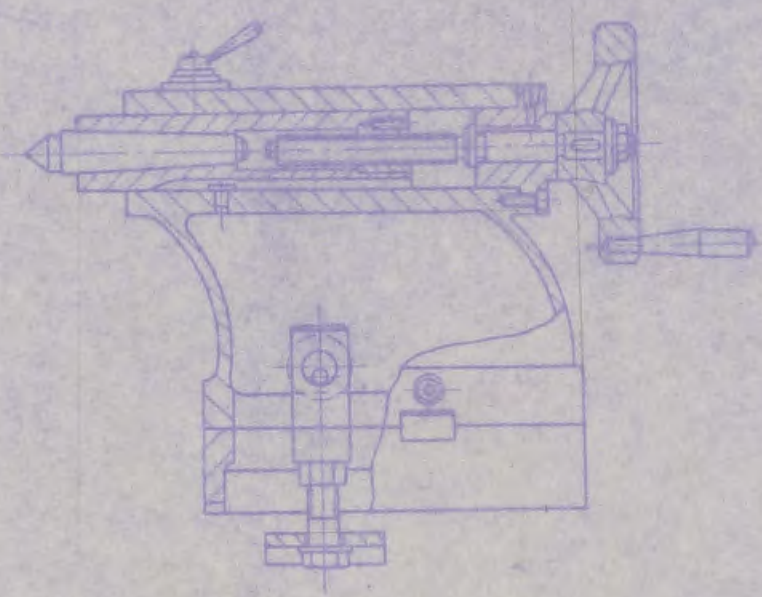
THE PEOPLE'S REPUBLIC OF CHINA

90630<sup>A</sup>  
B

GEARED HEAD LATHE

Total page  
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Fig. 9 Tailstock Construction

## XII. ELECTRIC SYSTEM

1. The power voltage of the electric equipment of the machine is 3-phase A. C. voltage. Illuminations are supplied from inside the machine. The illumination voltage is 24V.
2. Electric Equipment:
  - (1). Main motor (M1) fixed on machine body.
  - (2). Coolant pump motor (M2) attached.
  - (3). The power switch for controlling electric equipment is mounted at the middle of the machine base. The controlling button and coolant pump switch are at the left sides of the machine respectively.
3. Start of machine (See Electric Principle Figure)

Before starting the machine inspect all the electric equipment whether they are in good condition, whether the voltage and frequency are in accordance with the data indicated on the machine. Then connect the power source. The machine must be grounded.

  - (1). Turn the power switch (QS1) on. The power indicator illuminates. Then operation is effected by operating the push-button on the indicator plate.
  - (2). The coolant pump is connected with the centre socket at the rear end of the machine base through inserting piece. It is necessary to be close and reliable when insertion.
4. Protection of Circuit and Overload
  - (1). The main motor, coolant pump motor are protected with (FR1, FR2) respectively for overload.
  - (2). The safety device is provided with fuse (FU1, FU2, FU3) for short-circuit.

5. C0630B is of bench type. Except the main motor, button and illuminator positioned at the machine tool, which are all mounted in the electric accessories box. User can connect in the electric accessories box. They are according to No. for each electric equipments. The electric accessories box is mounted under the left oil pan. They are all installed at the place of left hand before delivery. User can also mounted at proper position on request, winding wire of group should be properly adjusted.

6. When the machine doesn't provide a special attachment of cooling case. The sign with "\*" electric equipment. In order to provide convenience for user, the switch of coolant pump (SA1) was attached. If user requipped with the electric elements, (There are place, screw hole and connector column on the distributor plate) it can use the diagram of electric principle and distribution wire to connect wire. It can also provided a set of special attachments.

Electric Equipment List (See Fig.10)

Sym- bol	Dist- tribu- te	Name and use	Technical date	Qty.	Provi- sion unit	Type	Remarks
		Button	Ue=500V Ith=5A Ø25				
SB1	8	Emergency stop	1-a+1-b red	1		LA19-11J	
SB2	8	Spindle stop	1-a+1-b "	1		LA19-11	
SB3	8	Spindle forward	1-a+1-b green	1		"	
SB4	9	Spindle reverse	1-a+1-b "	1		"	
		Selective Switch	double pole 2 Ue=500V Ith=5A Ø25				
SA1	10	Coolant pump start	2-a+2-b black	1		LA18-22x 2	
QS1	2	Power switch	3-pole Ui=380V Ie=10A	1		H25-10L 02	
		Contactor	3-pole coil 1~ Ue,Hz In order to user				
KM1	4		Ie=10A	2		CJO-10A	
KM1A	3		2-a+2-b				
KM2	5		Ie=5A 1-a				
TC1	11	Transformer	Primary 1~ Ue,Hz In order to user Secondary 24,6V/50V A	1		BZQ-50	
HL	12	Indication lamp Bulb	Ue=6V 6V-C.15A white	1		XDX1	
EL	13	Lighting lamp Lamp socket Bulb	Ue=24V E27 40W	1		JC-15	
*XP2	6	Coolant pump plug	Ue=380V Ie=10A	1			
*XS2	6	Coolant pump socket		1		P20 <sup>K</sup> <sub>J</sub> 6 <sup>A</sup> <sub>Q</sub>	with- out model
FM1	3	Fuse	socket 24x28 with list	3		RL1-15	
FU2	11	"	" Ø14 2A	1		BHC	
FU3	11	"	" Ø6-6.5x30	1		BGLP-1	
			" Ø14 0.5A	1		"	
			" Ø6-6.5x30	1		"	
FR1	4	Overload relay	with list	1		JR10-10A	
*FR2	6	"	"	1		"	

Electric Equipment List (See Fig. 10)

Sym- bol	Dist- ribu- te	Name and use	Technical	Qty	Provi- sion unit	Type	Rema- rks
FR1	4	Overload relay	with list	1		JR10-10A	
* FR2	6	"	"	1		"	
M1	4	Squirrel-cage motor Foot-mounted	3~50/60Hz E-pole insulation 1/2 kw 4P	1		Y90S-4	
* M2	6	Motor-driven pump	40W 2P	1		DB-6	

List

	V./freq.		
Elements	220/50-60	380/50-60	420/50-60
FR1	4.8A	2.75A	2.7A
FR2	0.4	0.25	0.25
FU1	15A	10A	10A

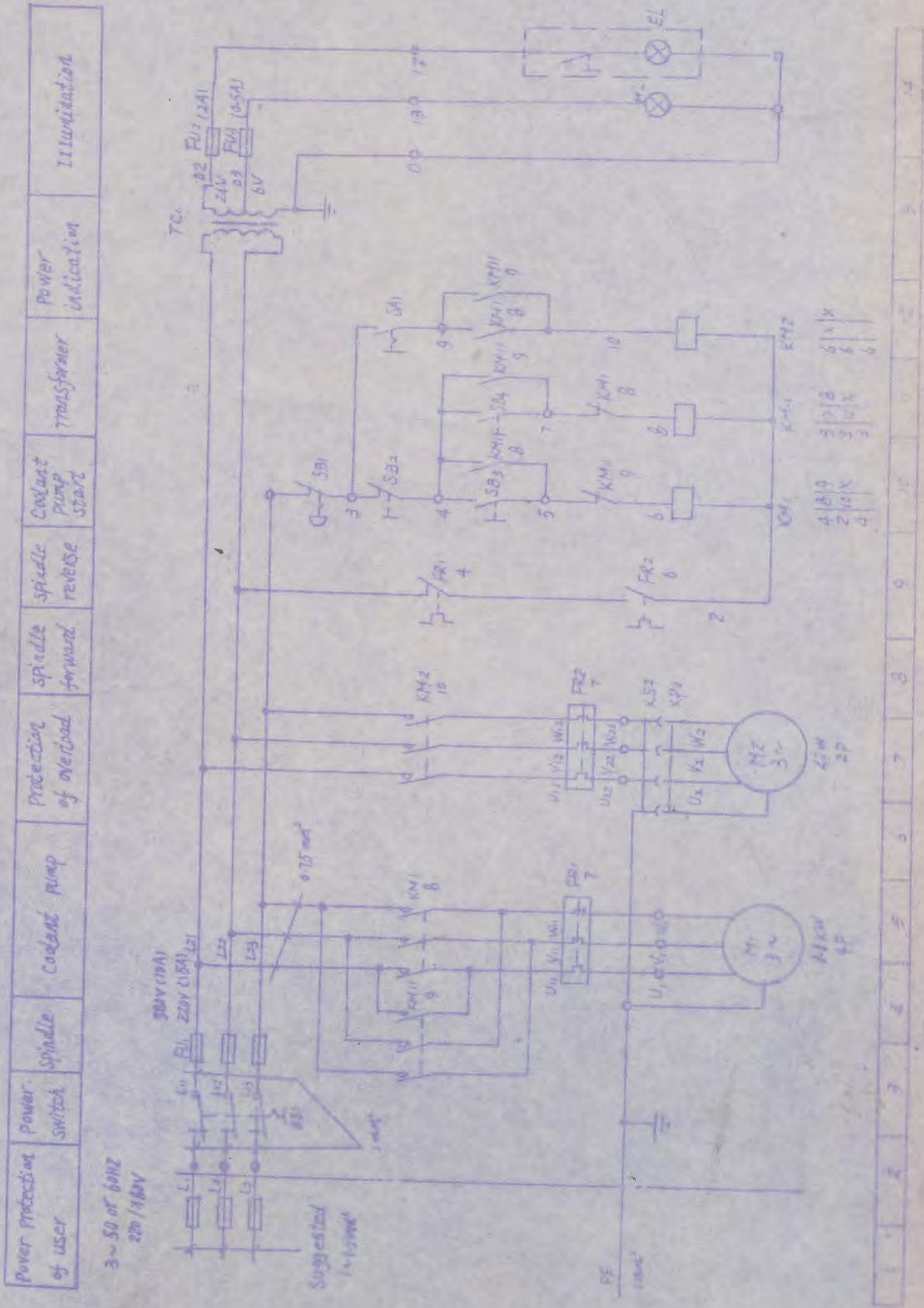
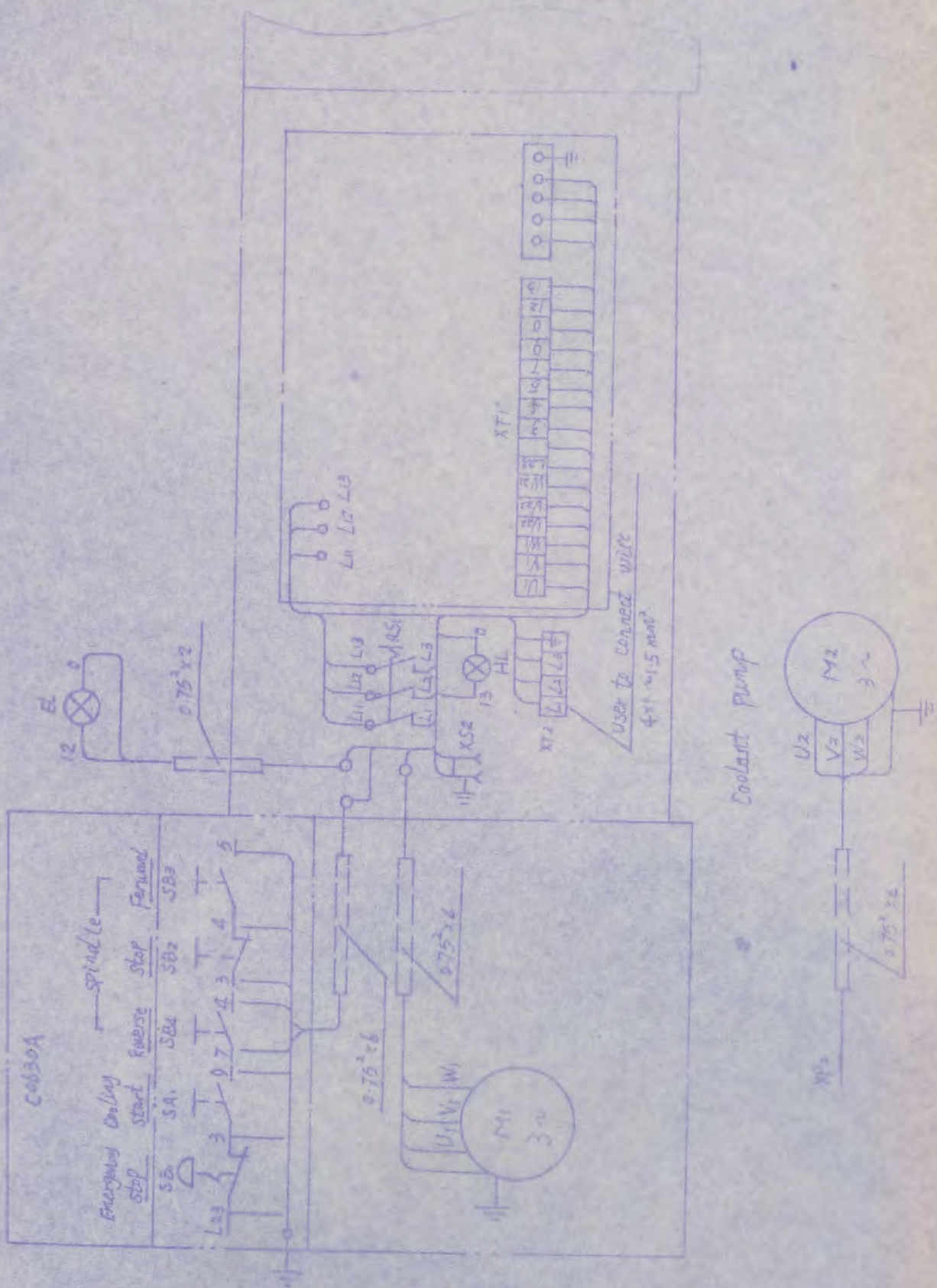
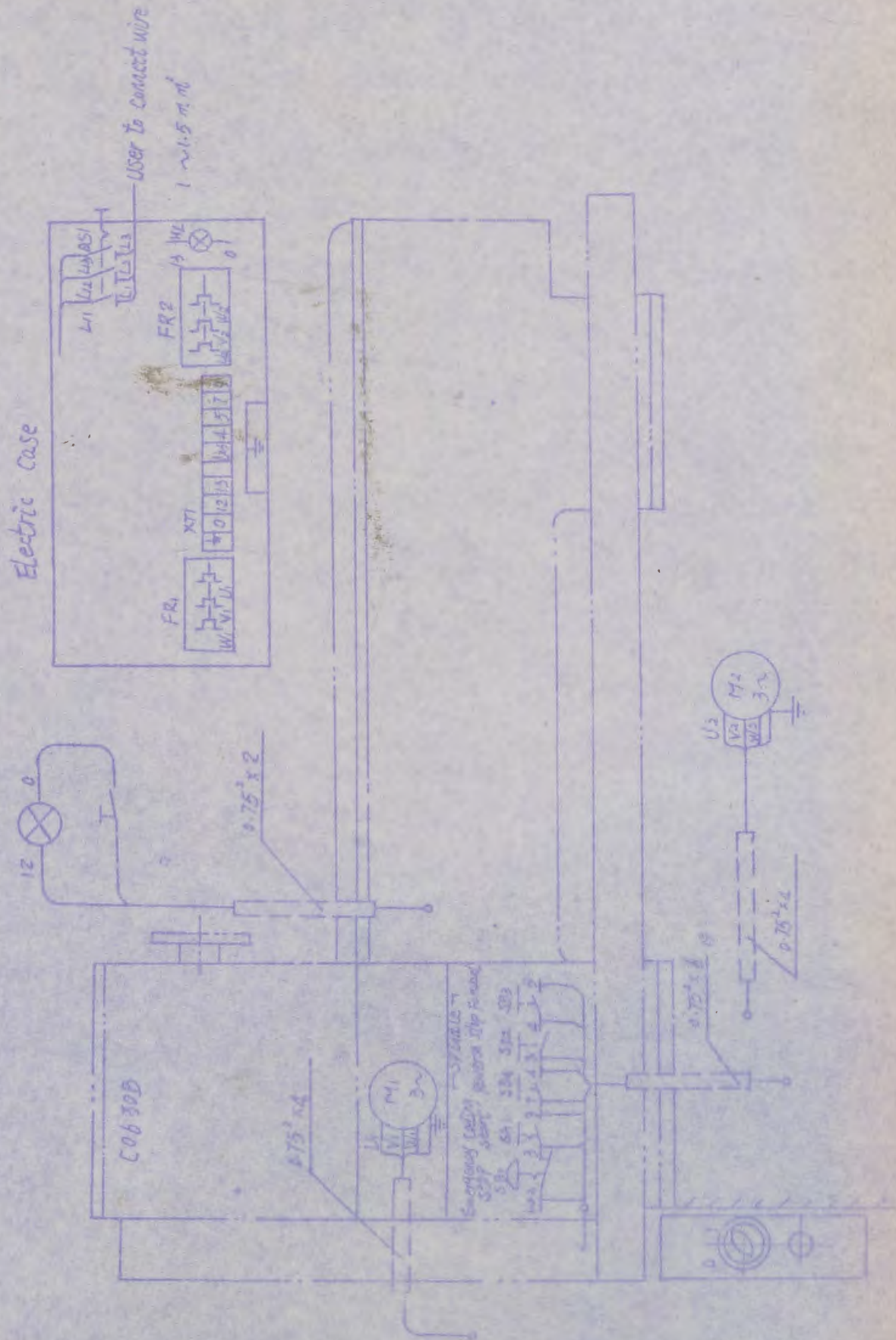


Fig. 10 Electric Principle Diagram





C0630A Diagram of distribute wire



C0630B Wiring Diagram

## VIII. LUBRICATION (Fig. 11)

When changing the lubrication oil in the feed box, remove the top and bottom plate covers. The hole is the filling hole for feed box. The hole is the filling hole for apron up to the level line indicated on the oil gauge.

When changing the lubrication oil in the headstock up to the level line indicated on the oil gauge. Time for change of lubrication oil in the headstock, first renewal should be made about 10 days of normal operation of the machine. Second, replacement is to be made again after 20 days. Thereafter, replace by fresh oil every 3 months. When changing oil, drain the used lot by way of the draining pipe on the back of the headstock housing. Then clean it by gasoline or kerosene. No. 7 or No. 10 machine oil (50°C viscosity, 6-13 centistoke) to be filled should be subjected to a cleaning process through a filter.

All the sliding surfaces including dovetail grooves should be lubricated with machine oil once each shift.

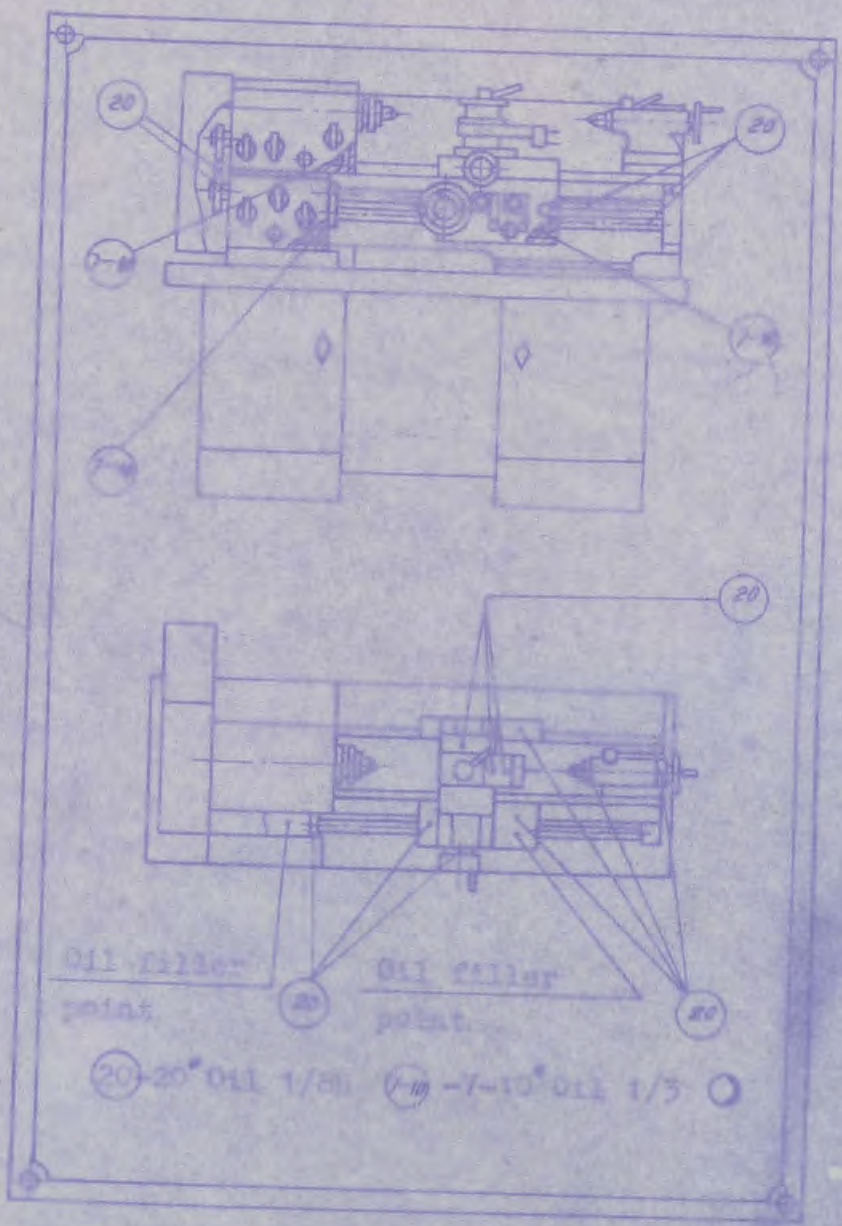


FIG. 31 Lubrication

## IX. INSTALLATION

- 9.1 After opening the case, first check the contents including *después abriendo la caja Aunq cheque el contenido incluido* those accessories according to the packing list supplied together with the machine.  
*ac*
- 9.2 When handling, the lifting ropes should be placed at both ends of the oil pans. For geared head lathe CO630A see Fig. 12 and geared head bench lathe CO630B see Fig. 13.
- 9.3 The installation dimensions of geared head lathe CO630A is referred to Fig. 14.
- 9.4 CO630B is a bench type one, install it on a sturdy wooden or steel table and secure it with bolts. The surface area of the supporting table can be determined with reference to the installation dimensions of the oil pan of the machine (Fig. 15). Installing the machine on a table which is not strong enough to warrant vibration-free running of the machine will be liable to have bad effect on the working accuracy of the machine, and is therefore not permitted.
- 9.5 When installing, the machine tool should be horizontally installed. Place the apron in the middle of the guideway and the level at both ends of the guideway on the machine. Readings of the level in longitudinal/cross directions are 0.08/1000.
- 9.6 The sliding and exposed surfaces of the machine are all applied with rust-proof grease. Remove it with gasoline or kerosene during installation.

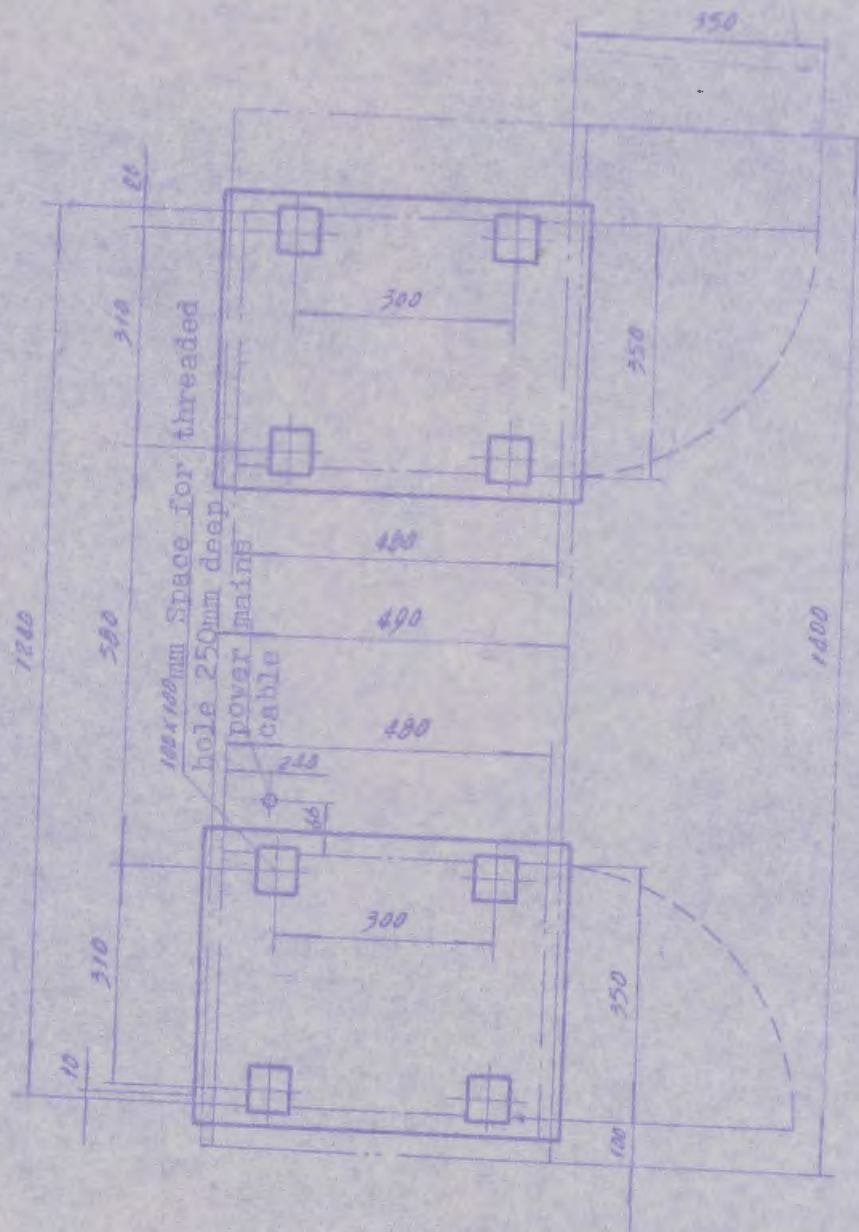


Fig. 14 Foundation Plan for CG630A

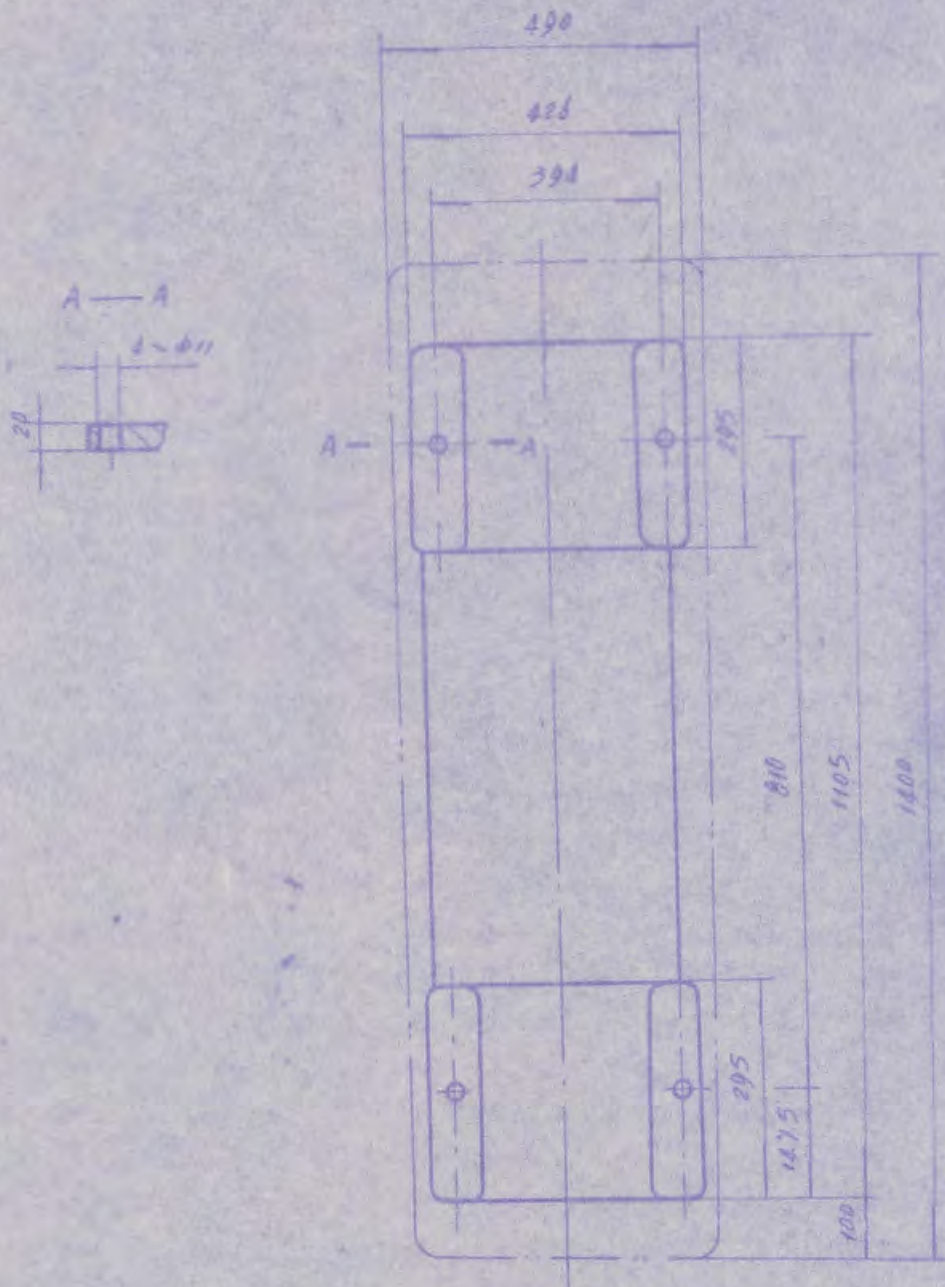


Fig. 15 Installation on Table  
for C0630B

## X. TEST RUN, ADJUSTMENT AND OPERATION

- 10.1 Before proceeding to operate the machine, the operator must first read carefully the operation manual and be conversant with the manipulation, adjustment, maintenance and lubrication instructions.
- 10.2 Clean the headstock with gasoline or kerosene, then fill with filtered lubrication oil of designated grade.
- 10.3 Lubricate properly the feed box, apron and all oiling points and sliding surfaces before the machine is put into running. Next inspect whether all operating levers are unimpeded and reliable, whether the carriage cross movement and saddle longitudinal movement are free and adjusted to a suitable degree of tightness. Otherwise, obtain optimum tightness through adjustment of the clamping plate and gib.
- 10.4 Make thorough inspection of the electric motor and electric equipment before running the machine, in view of the possible damage done to the connecting wires during transportation of the machine. To ensure safety in operation, the motor housing should be properly grounded. By a bare copper wire, then depress the running button to see if the motor runs in the direction consistent with that indicated by the button. Otherwise, reverse the motor wire connection.
- 10.5 Test the tension of the pulley V-belt and see whether it is suitable. Be sure that it is not over-tensioned, or excessive wearing will ensue. Adjust the motor position for proper V-belt tension. Adjust the screw with a ring spanner.
- 10.6 For test running, first run the machine idle with the speed control lever at the lowest gear. Idle running should be carried out for 20 minutes, followed by examination of various parts whether anything abnormal has happened. Only when the result of examination reveals no abnormality can the speed be gradually increased with running time at every step not less than 5 minutes. When the machine is running at top speed, the feed rate of the feed box should be kept at a medium level.
- 10.7 Operation (Fig. 16)

The headstock lever (1) is for the control of forward or reverse action of carriage cross and longitudinal movements.



Lever (2) and (3) are for changing spindle speed. The required spindle speed can be obtained by referring to the instructions given on the speed variation chart plate.

Feed box levers (4) and (5) are for changing the thread pitch and selecting longitudinal and cross feed rates. The combination of change gears are selected according to the threading chart. Lever (6) is for change of the leadscrew and feed rod movements. When the lever is at middle position, the swivelling of leadscrew and feed rod can be stopped.

The hand wheel (7) on the apron is for the control of longitudinal movement of the apron. Counter-clockwise turning will drive the apron and carriage to move to the left, and vice versa. Levers (10) and (11) are for operation of the apron longitudinal and cross slide cross movements. When the levers (10) and (11) are at low position, stop the apron longitudinal and cross slide cross movements, and vice versa. Lever (8) is for manipulation of the half nut. Separating or closing the half nut is for threading. Thread dial indicator (11) is for protection of threading. During operation, loosen the hexagonal bolt and tighten it again after the wormgear is engaged with the leadscrew. Remove it after it is finished using in order to avoid the leadscrew wearing.

On the saddle and carriage, lever (12) is for control of cross feed. Clockwise turning will give forward movement to the cross slide and counter-clockwise turning will give backward movement. Lever (17) is for setting of square tool post. The position of the square tool post can be changed by loosening the lever and be set by tightening the lever. Lever (15) is for top slide movement control. Clockwise turning will give forward movement and vice versa. The socket head screw (13) is used for fixing the cross slide when turning section area. The socket head set screw (14) is for fixing the base plate.

Lever (19) is for clamping of the tailstock center sleeve. Before operating handwheel (20), the lever must not be tightened until the tailstock center sleeve moves to its desired position. Push the lever (18) forward and the tailstock is clamped and pulling it back will loosen the clamping. The socket head screws (16) on the two sides of the tailstock are for the set-over of the tailstock in cross direction.

When using the chasing dial for cutting thread if by calculation, no proper dialing is possible for certain thread. The thread can be satisfactorily cut by changing the rotational direction of the driving motor while keeping the leadscrew-splitnut engaged.

## XI. MAINTENANCE

- 11.1 Before starting work, lubricate all the machine properly according to lubrication instructions so as to ensure that the machine is started under adequate lubrication.
- 11.2 Be sure to clean up the chips after work. Make a thorough wiping of all the machine parts and apply machine oil to prevent rusting.
- 11.3 Clean the interior of the headstock, apron and feed box, and replace the oil at regular intervals.
- 11.4 Inspect and make adjustment to tension of conveying belt at regular intervals.
- 11.5 Change spindle speed and feed rate only when the machine is completely stopped. If engagement of gears is found difficult, turn the spindle manually to facilitate engagement. Never shift gears when the machine is running to avoid possible damage to the gears.
- 11.6 The changing of spindle direction is effected by changing the motor direction. The rotation direction of the spindle can therefore be changed only when the spindle is brought to a complete stop. Direct shifting of direction is definitely not allowed.
- 11.7 When using center rest and follower rest, be sure to fill lubrication oil at the contacting points of the sliding block with the workpiece.
- 11.8 Protect the centers as much as possible and allow no scratches made to the trunion for mounting of chucks and the machine bed guideways so that the machining accuracy can be kept.
- 11.9 Timely repair work should be done immediately when any trouble or damage is found.

00630<sup>A</sup><sub>B</sub>

GEARED HEAD LATHE

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XII. MAIN ATTACHMENTS AND WEAR PARTS

Standard attachment:

Serial No.	Description	Specification	Qty.	Remarks
1	3-jaw chuck	Ø160 mm	1 set.	
2	Drive plate	Ø145 mm	1 set.	
3	Electric distribution box		1 set.	
4	Rubber V-belt	Type A 695	4 pcs.	2 pcs. for 3rd

Special attachment:

Serial No.	Description	Specification	Qty.	Remarks
1	4-jaw chuck	Ø160 mm	1 set.	
2	Follower rest	Ø5-Ø30 mm	1 set.	
3	Steady rest	Ø5-Ø30 mm	1 set.	
4	Coolant tank		1 set.	

Wearing parts (See Figs. 1,2,3)

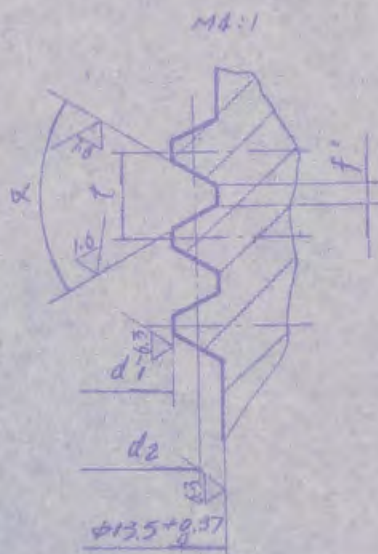
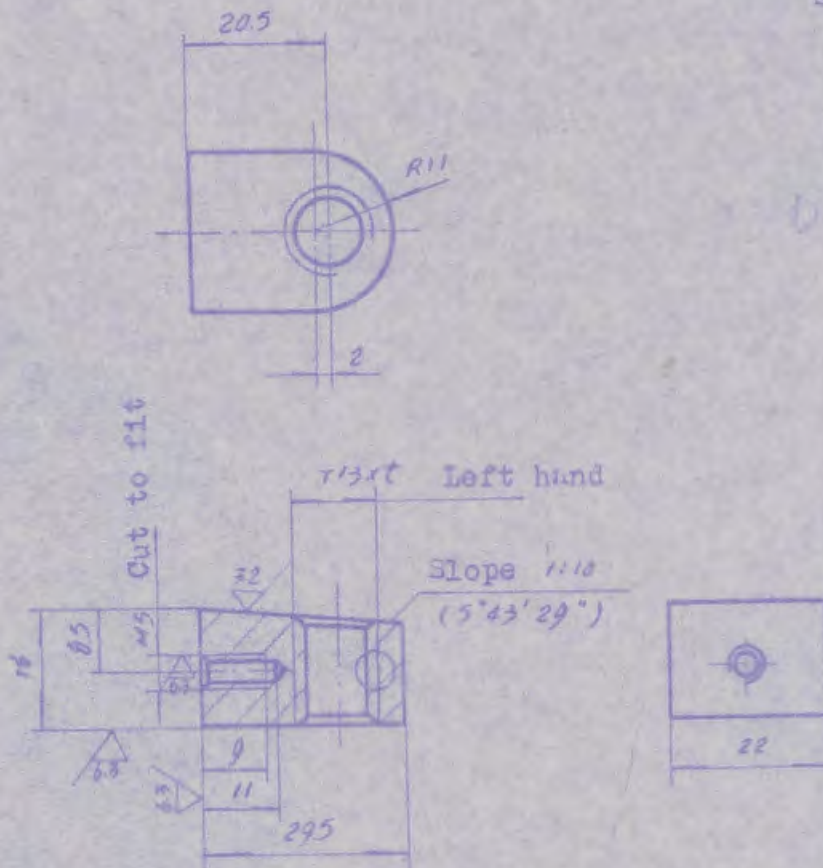
Serial No.	Description	Material	Qty.	Remarks
1	Cross leadscrew nut	ZQSn 6-6-3	1 pc.	
2	"	ZQSn 6-6-3	1 pc.	
3	Half nut	ZQSn 6-6-3	1 pc.	

A  
CO630  
B

GEARED HEAD LATHE

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40  
page 33

Others   
Sharp corners rounded



Machine	Metric	Whitworth
Size		
713x8	713x7	713x8.75
Left hand	L.H.	L.H.
l	7	7.175
f'	0.964	1.04
d <sub>1</sub>	φ10 <sup>+0.15</sup>	φ9.82 <sup>+0.15</sup>
d <sub>2</sub>	φ11.5 <sup>+0.1</sup>	φ11.81 <sup>+0.1</sup>
α	30°	29°

Material: MSn6-6-3

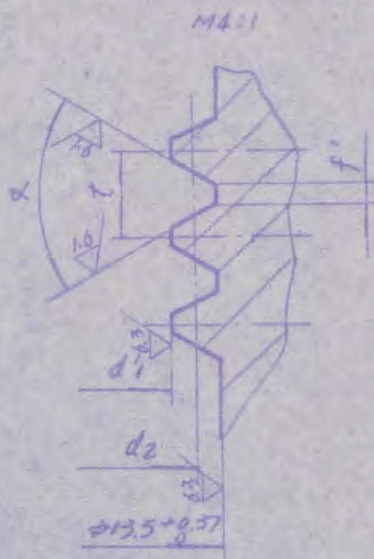
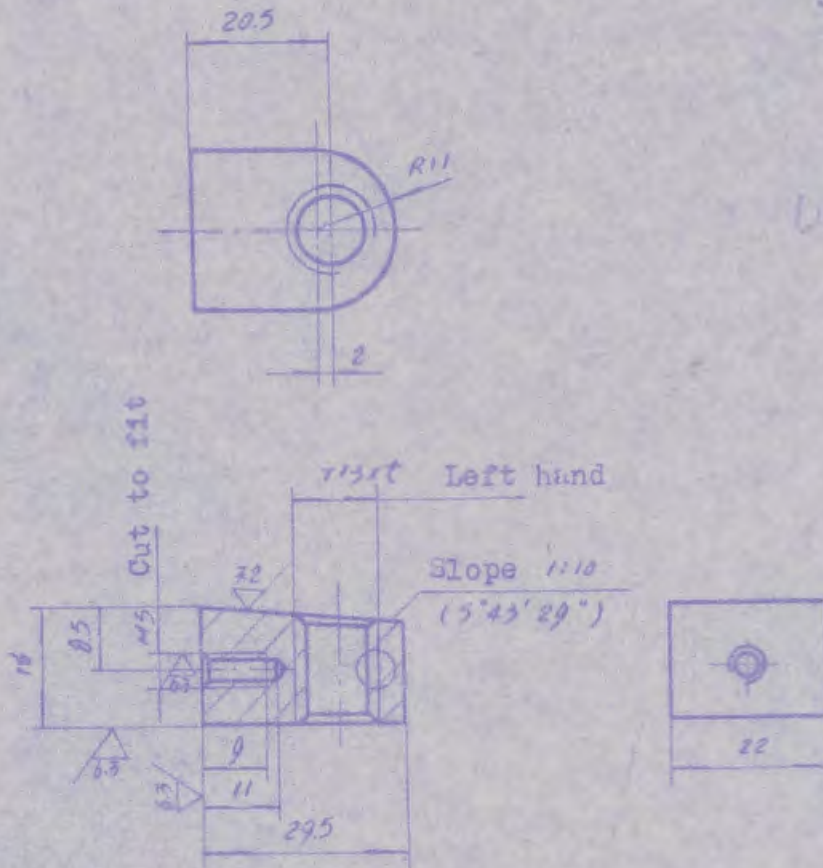
Fig. 1 Cross Leadscrew Nut

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CO630  
B

GEARED HEAD LATHE

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Others   
Sharp corners rounded

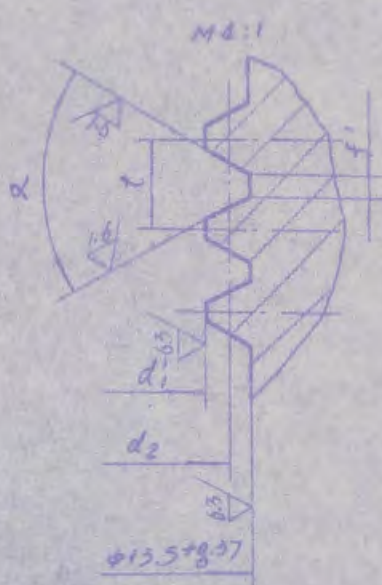
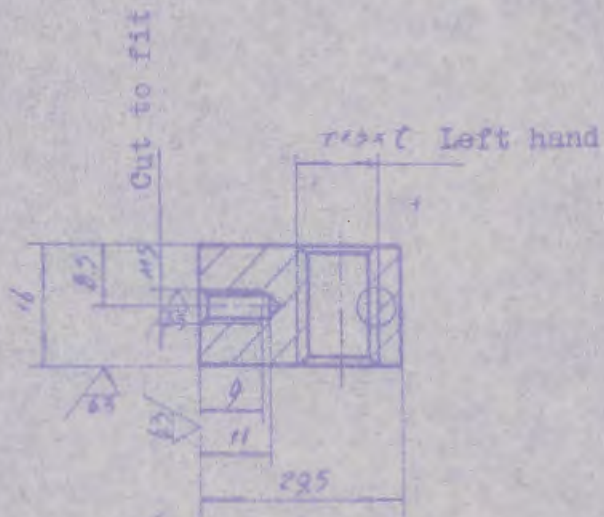
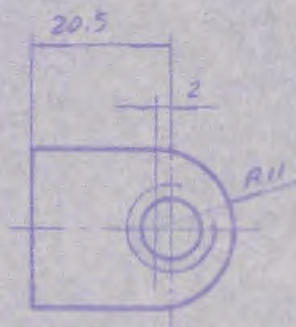


Machine	Metric	Whitworth
Size		
71346	71346	71342/75
Left hand	L.H.	L.H.
$\tau$	3	3.175
$f'$	0.964	1.04
$d_1$	$\phi 10^{+0.15}$	$\phi 9.92^{+0.15}$
$d_2$	$\phi 11.5^{+0.1}$	$\phi 11.41^{+0.1}$
$\alpha$	30°	29°

Material: BQSn6-6-3

Fig. 1 Cross Leadscrew Nut

Others    
 Sharp corners rounded



Machine Size	Metric	Whitworth
TEST L.H.	TEST L.H.	TEST L.H.
t	3	3.175
f'	0.964	1.02
d <sub>1</sub>	$\phi 10^{+0.15}$	$\phi 9.92^{+0.05}$
d <sub>2</sub>	$\phi 11.5^{+0.01}$	$\phi 11.41^{+0.01}$
$\alpha$	30°	29°

Material: S45C-6-

Fig= 2 Cross Leadscrew Nut

MODEL XG125A UNIVERSAL MILLING MACHINE

OPERATION MANUAL

TABLE WIDTH

250 MM

SERIAL NO.

WANNAN MACHINE TOOL WORKS ANHUI

THE PEOPLE'S REPUBLIC OF CHINA



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### I. CHARACTERISTICS & APPLICATION

Universal milling machine model x6125A is of medium size, used for milling flat, inclined face, vertical surface, slots, etc, by employing disc cutters, angular cutters, formed cutters and face milling cutters.

When mounted with the vertical milling attachment, the machine will be able to perform milling operations in various direction, the rotary milling table enables the cutting of ring-formed and curved grooves, whereas with the universal dividing head, the machine will be able to cut spur gears under  $M=3m$ , helical gears bevel gears, etc.

Owing to the versatile applications, the machine is well suited for repair shops and tool rooms for single piece and lot production.

The machine adopt piston pump to lubricate and cool the spindle concentricately.

The machine is of simple construction which facilitates operation and maintenance.

The working accuracy of the machine is grade IT8, surface roughness  $1.6$ .

The longitudinal, cross and vertical movements of the table can both be operated by hand and by power, in forward and reverse direction. Automatic stop and safety device are provided for the power feed.

Facilities for adjustment are incorporated in those parts of the machine liable to wear.

The machine provides 12 spindle speeds and 12 feeds (3-dimensional); selection is made by hand levels.

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II. MAIN SPECIFICATIONS

Work table surface	250 x 900mm
No. of T slots on table	3
Width of T slot	14mm
Distance between T slots	54mm
Table travel:	
Longitudinal	500mm
Cross	165mm
Vertical	300mm
Distance from center line of cutter spindle to table Min.	60mm
Cutter spindle taper	Morse No. 3
Arbor diameter	∅22, ∅27
Diameter of arbor for mill	∅27
No. of spindle speeds	12
Range of spindle speeds	32--1250 r/min
No. of feeds, various directions	12
Range of feeds:	
Longitudinal	5.6--181 r/min
Cross	11.3--365 r/min
Vertical	4.5--146.2 r/min
Table swivel Max.	±15°
Motor power	2/2.4 kw
Motor speed	1430/2850 r/min
Electric coolant pump	
Type	DB-258
Power	0.120 kw
Capacity	25 L/min
Speed	2760 r/min
Overall dimensions(LxWxH)	1400x1350x1478 mm
Net weight	1300 kg

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### III. TRANSMISSION SYSTEM

#### 1. Main Transmission System(Fig.2)

The main shaft I in the gear bar is driven by the two-speed motor through V-belts and pulleys d1 & d2. Shaft I drives the 3 gear cluster on shaft II through gears(1), (2). Through the gears(3) (5) (7) of the 3 gear cluster & the 3 sliding gears(4) (6) or (8) on shaft III, the latter is driven at 9 speeds. Then from any one of the 2 gears(9) & (11) on shaft III and the gear(10) or (12) on shaft IV--cutter spindle, the latter obtain 12 speeds (32, 70, 96, 109, 160, 200, 225, 380, 466, 620, 935, 1250).

#### 2. Power Feed System(Fig.2)

The feed system obtains its power from the 3 gear cluster on shaft II of the main transmission system. Through the gear(3) (5) or (7) of the 3 gear cluster on shaft II and the sliding gear(13), (14) or (15) on shaft I, the latter obtain 6 speeds. Then through any of the 2 gears(16) & (18) on shaft I and gear(17) or (19) fixed on shaft(II'), the latter may be driven at any of the 12 speeds.

Power from shaft(II') is transmitted through chain and sprockets (20) & (21) to shaft(III'), giving it 12 speeds. And then to the feed mechanism in the knee by means of a universal joint mechanism and through overload protection device.

Sliding gear(22) inside the knee on the extendal shaft of the universal joint, through the gear(23) on shaft(IV') drives(24) fixed on shaft(V') in the forward direction, so as to drive the worm (39) fixed on the same shaft and worm wheel(38) and through gears (40), (41), (42), to drive the gear(43) on sliding block, and then power is transmitted through gear(44) and bevel gears(45) (46) to the long feed screw for longitudinal movement of the table, as there are 12 speeds for shaft(III'), there are 12 longitudinal feeds, viz: 5.6, 11.2, 14.6, 19.7, 25.6, 29.7, 39.6, 51.2, 67.7, 90.4, 135, 181 mm/min. When gear(43) is disengaged with(42), the drive is interrupted with the latter running idle. If, in the meantime, the handwheel mounted on the long feed screw is turned, the machine is operated for longitudinal table movement by hand.

By means of a power feed reversing handle, the gear(22) can be caused to mesh gear(24) on shaft(V') direct, thus feeding in reverse direction, at the same time gear(24) drives(23) on shaft(IV') in the reverse direction.

With gear(23) running either in the forward or reverse direction, power is transmitted through gear(25) on shaft(IV'), gears(26), (27),

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to gears(28) & (29) on shaft(XII'). When gear(29) is not engaged with gear(30) on sliding block, manual feed of table either in the transverse or vertical direction can be effected by the respective handwheel.

The sliding block can be shifted to have the gear(30) engaged with the gear(29) and at the same time meshed with either(33) or (31) for running in the same direction.

When gear(33) is meshed by(30), the bevel gears(34) & (35) are driven, vertical movement of the table is obtained, through the elevating nut and screw with 11 feeds, viz: 4.5, 9.1, 11.8, 16, 20.7, 24.32, 41.4, 54.8, 109.5, 146.2 mm/min.

When gear(31) is meshed by(30), gear(31) through(32), worm(36) drives rack(37) under the saddle, transverse movement of the table is obtained with 12 feeds, viz: 11.3, 22.6, 30, 40, 51.7, 60, 80, 103.4, 136.9, 182.5, 274, 366 mm/min.

#### IV. CONSTRUCTION (FIG.3)

The machine is mainly composed of 6 principal parts: column, base, knee, table, saddle plate and saddle. (refer to Fig. 3)

The motor(31) is installed in the lower part of the column(2) and drives the main shaft(23) through the pulleys(20) & (24). Power is transmitted from the main shaft to the spindle(16) through gears in the gear box. The spindle has a Morse No. 3 taper hole for mounting milling cutter or the milling arbor(11). The other end of the arbor is mounted into the bearing of the arbor bracket(12) which is mounted on the overarm(13). The knee is capable of sliding up and down along guideways of the column. Atop the knee is mounted the saddle(7) which can be moved transversely along guideways on knee. The saddle plate(8) is mounted the top of the saddle and it can be turned in the circular guideways of the saddle. On the top of the saddle plate is mounted the table(9) which travels along longitudinal guideways of the plate, the column and the knee are rigidly assembled on the base(1). Underneath the knee support(3) which suggests the load carrying capacity of the knee. Housed within the knee support is the elevating screw for vertical movement of the knee. The longitudinal, transverse and vertical movements of the table can be operated by handwheels and also by power. This is transmitted from the main shaft through a system of gears, sprockets and a universal joint mechanism(26) to gear in the knee

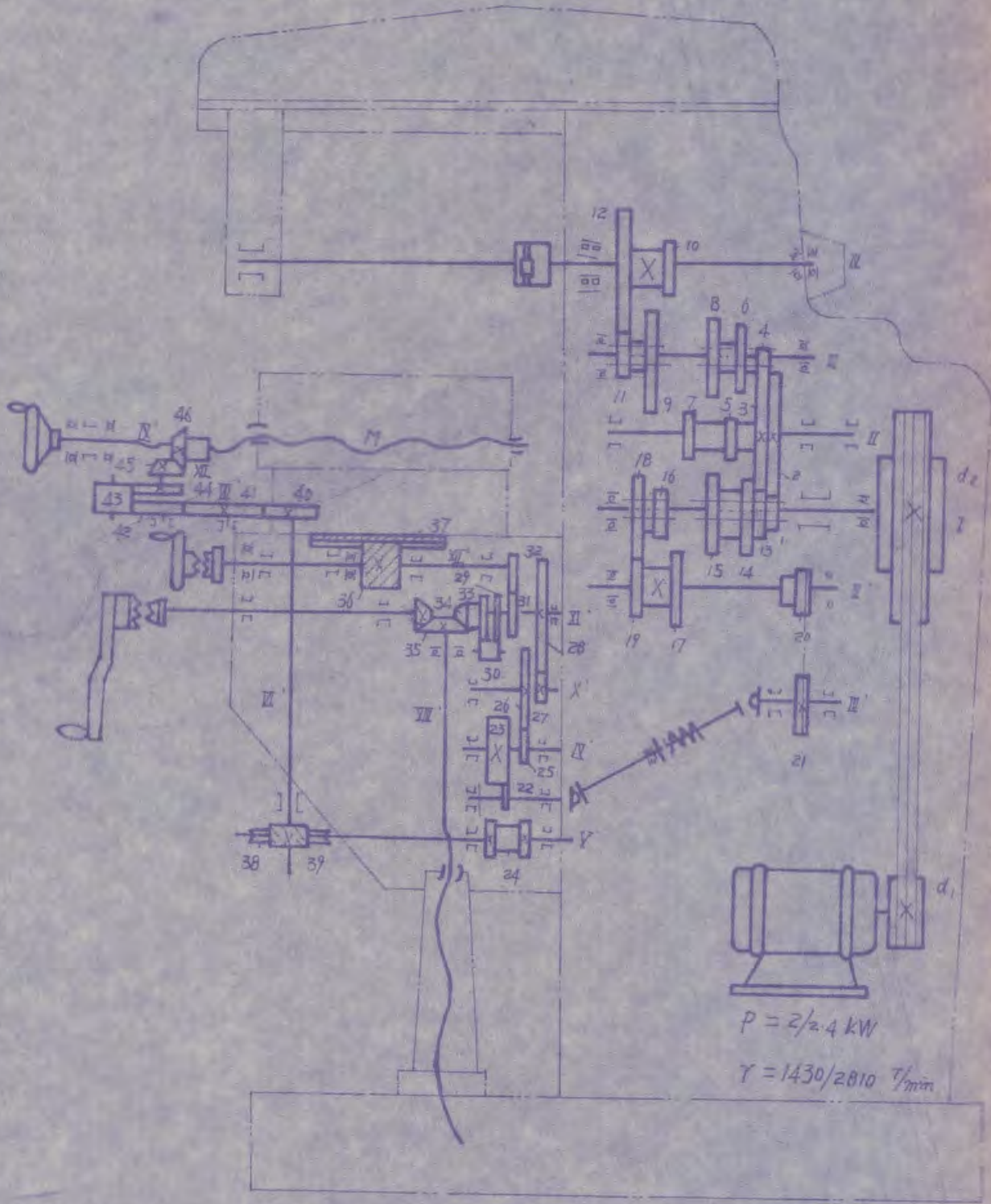


Fig. 2 TRANSMISSION DIAGRAM

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for feed movements in the forward or reverse direction. The electric coolant pump(35) is mounted on the base to provide cutter with coolant liquid. A protective cover(21) is provided on the rear of the column for safety purposes and also to give the machine an elegant appearance. A copious amount of lubricating oil should be maintained in the gear box on the upper part of the column to ensure proper lubrications of the gears and bears and bearings of the main transmission system, for that purpose a gauge glass(36) is provided on the left side of the column. On the front edge of the table are mounted adjustable trip dogs(39), which when indulged upon by the stop pin(37), will disengage the gear mounted on the sliding block in the saddle plate, and thus stop the longitudinal movement of the table, thereby preventing table over-run and consequential damages. Similarly the left side of the saddle and left side of column are also mounted with adjustable trip dogs, which, when actuated by any of two stop pins on the knee, will disengage the gear mounted on the sliding block in the knee, and thus stop the transverse or vertical movement. The stop dogs can be set according to requirements of work. To safeguard the feed mechanism against troubles and overload, an overload protection device(27) is provided in the universal joint. In case of overload, the safety pin will be pushed outward, producing a rattling sound to signal the trouble and interrupting the power transmission automatically. The operator should then stop the machine and remedy the trouble before resuming operation. The device is adjustable, but do not make adjustment until it is necessary. As to its adjusting method, please refer to "Maintenance" part in this "Operation Manual".

#### V. CONTROLS

(Refer to electrical system and Fig. 3, please)

Connect the machine with the power before turn the electric lock switch on the door of electric box to the "ON" position and then press the "START" push button on the front of the machine, to start the motor. The spindle is driven through 3 pcs "A" type belts on (20) (24) and a series of gears. Should it be necessary to change the spindle speed, press "MICRO" push button(17) and set the positions of levers(18) (19) and high-low speed switch on electric box according to the speed chart. The machine can operate at any one of 12 speeds.

The long screw under the table can be turned by handwheel(35)

for longitudinal feed movement of the table, or it can be operated for power feed by the longitudinal power feed lever(38). Transverse movement of the table can be controlled by handwheel(6) or engaged for power feed by turning the transverse and vertical power feed control lever(54) by an angle according to an index plate. Vertical movement of the table can be affected by handwheel(5), and likewise it can be engaged for power feed by turning the control lever(34). The feed in all 3 directions can be reversed by manipulating the lever(41). The feed rates in all 3 directions can be selected by shifting the levers(20) & (24) according to feed chart form among 12 feed rates. The transverse, longitudinal and vertical positions of the table can be set by means of the levers(40), (25), (29) respectively.

Note: Before speed changing or changing of feed direction, the machine must be stopped for preventing damage to the parts.

#### VI. LUBRICATION

Before commencing to use the new machine, the window cover of the machine in left upward side must be dismantled. Then fill NJ-30 oil(Viscosity 27-33 Cst. at 50°C or 3.8--4.6°E<sub>50</sub>) into the gear box, until oil level is about 3-5 mm above the line marked of the oil level indicator.(to reference Fig. 4, please)

When it is found that oil line is lower than the line marked of the oil level indicator, the oil should be added.

Other lubricating points refer to Fig. 4. In addition, commencing to use the new machine cross handwheel must be cranked for cross movement to two extremity positions until three oil baths are uncovered, then fill NJ-30 oil into filler point afterwards fill oil each week.

NJ-30 oil should be coated on the guideway of the machine, while 209 molybdenum disulfide lubrication should be coated on the screw rod of the machine.



## VII. COOLANT SYSTEM

Emulsified coolant is generally used on machine tools, but different kinds of coolant should be applied for various materials to be cut.

The electric coolant pump(33) (Fig. 3), with a capacity of 25 l/min, supplies copious amount of coolant to the system for cooling any kind of cutter. Coolant is delivered from the reservoir under the base through pipe(15) (Fig. 3) to nozzle(14), the position of which can be adjusted to suit any cutter position. Return coolant flows through the grooves of the table, the return pipe(28) and filter, back to the reservoir, and the coolant cycle is thus repeated.

The electric coolant pump may be started by means of a switch at the left side of column, when the coolant is not needed stop the coolant pump by the switch. During changing of the coolant, the oil plug(32) (Fig. 3) should be screwed out for bleeding out the coolant. Afterwards the oil plug is screwed in and fill in new coolant into the oil filler.

## VIII. OPERATION STEPS OF ELECTRIC SYSTEM

The whole electrical system of the machine is composed of the main driving, cooling, illuminating circuit, lighting, controlling, protecting, etc. The operating process is as follows:

### A. Preparation.

1. Connect with the main electric power before turn the door key switch of electric cabinet to "ON" position and the power for the running of the machines has been connected.
2. Turn on the light by turning the switch "EL".
3. Different speed can be obtained by turning two-speed switch and the speed changing level on right side to required position.

There is installed a pulsative rotating button "T" above the speed changing lever so as to facilitate the shifting of gears.

While trouble occur in gearing, depress the button "T" and the main motor will make a collective counter-rotating to eliminate it. (Remark: The speed can not be changed when the motor is rotating.)

### B. OPERATION.

1. Depress rotation or counter-rotation button on front button plate in left side of machine(Both in given color, direction of rotation is marked with arrow) to make main motor M1 to rotate forward or

5KVHD 高速立式铣床

合 格 证 明 书

(10" X 50")

254mm X 1270mm

出厂编号: **129**

中 华 人 民 共 和 国  
中 美 合 资  
昆 明 机 械 有 限 公 司  
中 国 昆 明

# 合格证明书

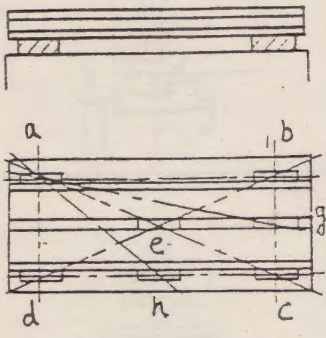
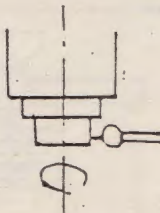
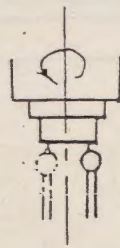
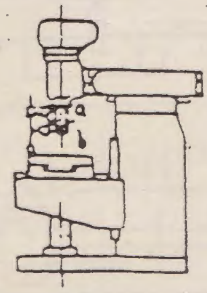
5KVHD-2M

第 1 页

共 5 页

## 精度检验记录单

1、机床精度检验：

序号	检验项目	简 图	精 度 (mm)	
			允 差	实 测
G1	工作台面的平面度		在1000 长度内 为0.040 工作台 长度每增 加1000允 差值增加 0.005 最大允 差值为0.050 局部公差： 在任意300 测量长度上 为0.020	0.03/1000
G2	主轴定心轴颈的径向跳动		0.01	0.01
G3	主轴轴端面的跳动		0.020	0.01
G4	主轴锥孔的径向跳动 a. 靠近主 轴端面 b. 距主轴 端面100 处		a. 0.01  b. 0.02	0.005  0.015



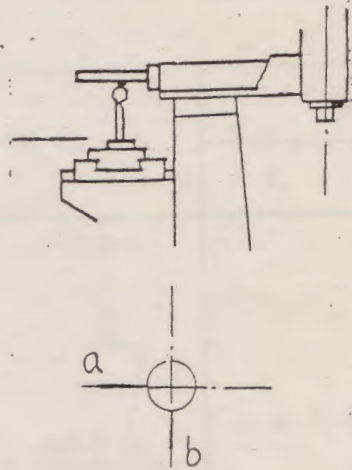
# 合格证明书

5KVHD-ZM

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共 5 页

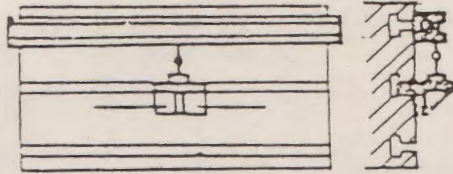
G14  
工作台面  
对滑枕端  
部安装附  
件的基准  
面垂直度  
(用于有  
附件安装  
基准面的  
机床)



a 及 b  
0.015/  
100

G15

工作台中  
夹或基准 T 形  
槽的直线度

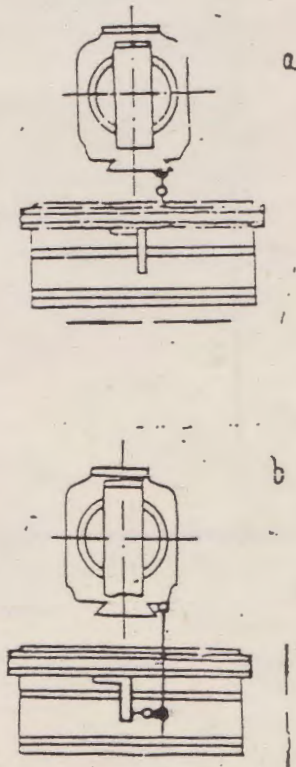


在任意 500  
测量长度上为  
0.010  
最大允差  
值为 0.030

0.005

G16

工作台横向移  
动对工作台纵向移  
动的垂直度



0.020/300

0.015

