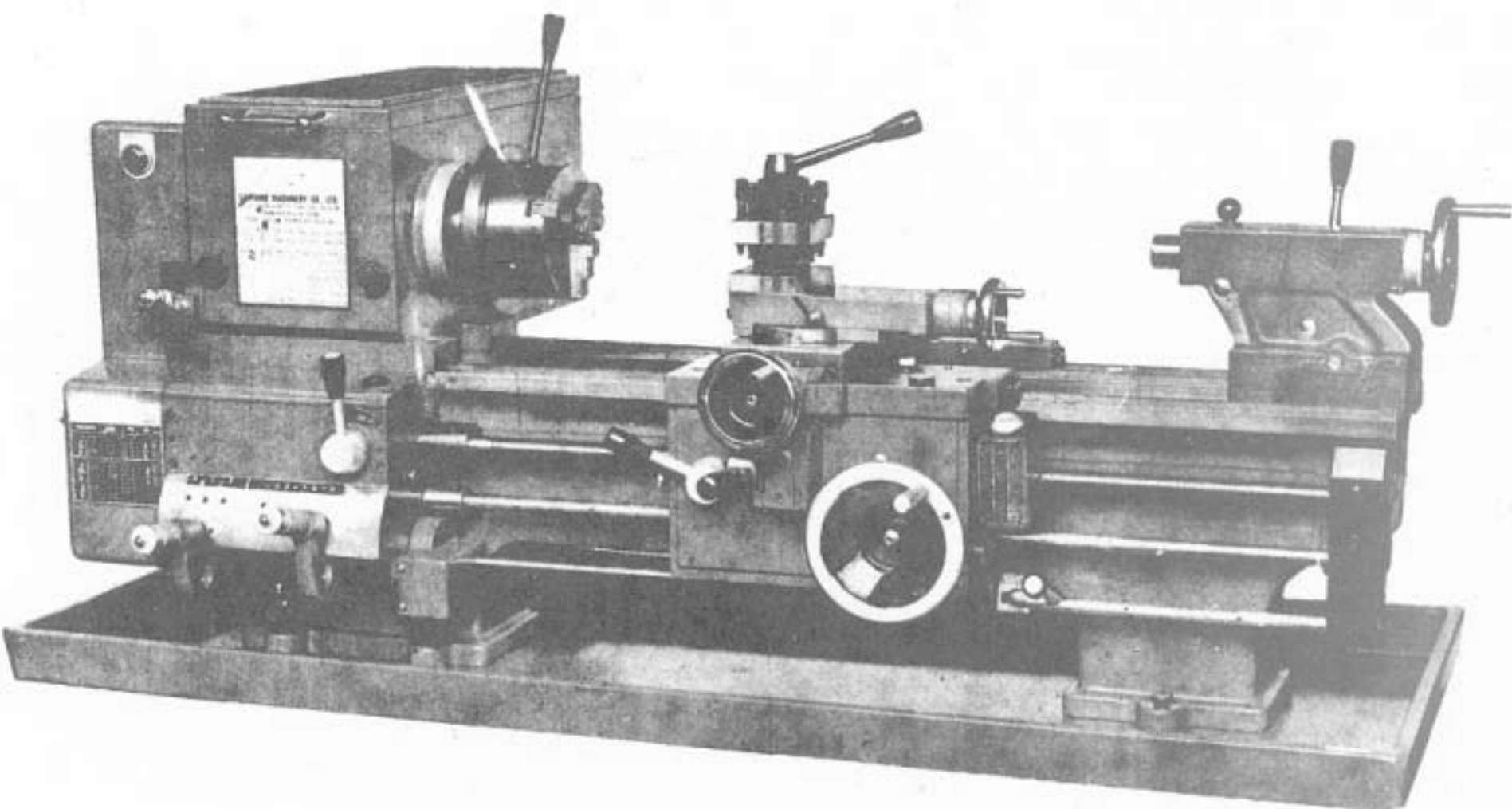


OPERATING INSTRUCTIONS AND MAINTENANCE MANUAL OF BENCH LATHE

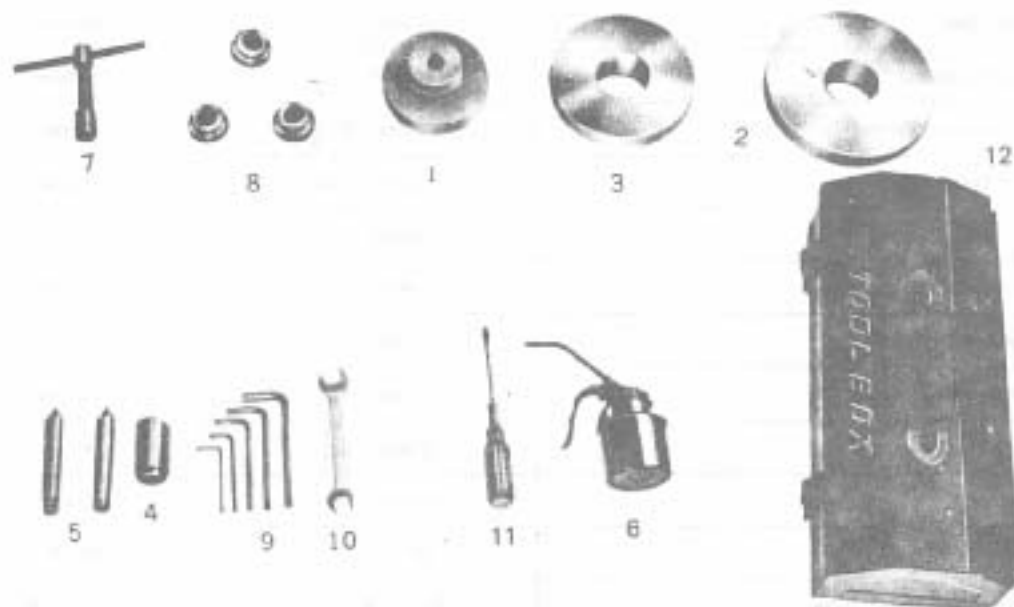
MODEL: 110-2034



CHIZHOU HOUSEHOLD MACHINE—TOOL WORKS
16 DONGHU ROAD, GUICHI CITY, ANHUI,
THE PEOPLE'S REPUBLIC OF CHINA

SPECIFICATION	CZ—300	CZ—300/1
1. Swing over bed	300mm $11\frac{4}{5}^{\circ}$	300mm $11\frac{4}{5}^{\circ}$
2. Swing over saddle	140mm $5\frac{1}{2}^{\circ}$	140mm $5\frac{1}{2}^{\circ}$
3. Distance between centers	530mm $20\frac{7}{8}^{\circ}$	860mm $33\frac{7}{8}^{\circ}$
4. Length of bed	1145mm 45°	1475mm 58°
5. Width of bed	182mm $7\frac{5}{32}^{\circ}$	182mm $7\frac{5}{32}^{\circ}$
6. Hole through spindle	36mm $1\frac{7}{16}^{\circ}$	36mm $1\frac{7}{16}^{\circ}$
7. Tailstock spindle travel	92mm $3\frac{5}{8}^{\circ}$	92mm $3\frac{5}{8}^{\circ}$
8. Cross slide travel	150mm $5\frac{11}{21}^{\circ}$	150mm $5\frac{11}{21}^{\circ}$
9. Tool slide travel	89mm $3\frac{1}{2}^{\circ}$	89mm $3\frac{1}{2}^{\circ}$
10. Saddle travel	470mm $18\frac{1}{2}^{\circ}$	800mm $31\frac{1}{2}^{\circ}$
11. Taper of spindle bore	M. T. NO. 5	M. T. NO. 5
12. Taper of center, Morse Taper	M. T. NO. 2, 3	M. T. NO. 2, 3
13. Range of spindle speeds	60—12 Changes, 50—1200R. P. M.	60—12 Changes, 50—1200R. P. M.
14. Lead screw diameter	22mm $\frac{7}{8}^{\circ}$	22mm $\frac{7}{8}^{\circ}$
15. Feed Rod diameter	19mm $\frac{3}{4}^{\circ}$	19mm $\frac{3}{4}^{\circ}$
16. Threads per inch of lead screw	8 T. P. I.	8 T. P. I.
17. Thread can be cut	m/m24Kinds 6. 5—16 inch 50 Kinds 4—112T.P. I.	m/m24Kinds 6. 5—15 inch 50 Kinds 4—112T.P. I.
18. Motor horse power	1HP, 1.5HP	1HP, 1.5HP
19. Net weight without attached stand (approx)	308kg	330kg
20. Net weight with attached floor stand (approx)	398kg	420kg
21. Packing size (without attached stand)	$59^{\circ} \times 29\frac{3}{4}^{\circ} \times 29\frac{3}{4}^{\circ}$	$70\frac{1}{2}^{\circ} \times 29\frac{3}{4}^{\circ} \times 29\frac{3}{4}^{\circ}$
22. Packing size (with attached floor stand) (approx)	$65^{\circ} \times 30^{\circ} \times 55^{\circ}$	$70\frac{1}{2}^{\circ} \times 30^{\circ} \times 55^{\circ}$

STANDARD ACCESSORIES



1. Motor pulley	1PC
2. Back plate 8 $\frac{1}{5}$ "	1PC
3. Back plate 6 $\frac{5}{8}$ "	1PC
4. Center sleeve (M. T. 5# / 3#)	1PC
5. Center (M. T. 2#, 3#)	1PC
6. Oil gun	1PC
7. Toolpost wrench	1PC
8. Change gear (30T, 32T, 46T)	3PC
9. Allen wrench (3, 4, 5, 6, 8)	5PC
10. Wrench opening	1Set
11. Screw drivers	1PC
12. Tool. Box	1PC

ELECTRICAL

The standard lathe is wired for 110 volts, 1 phase 60 cycles.

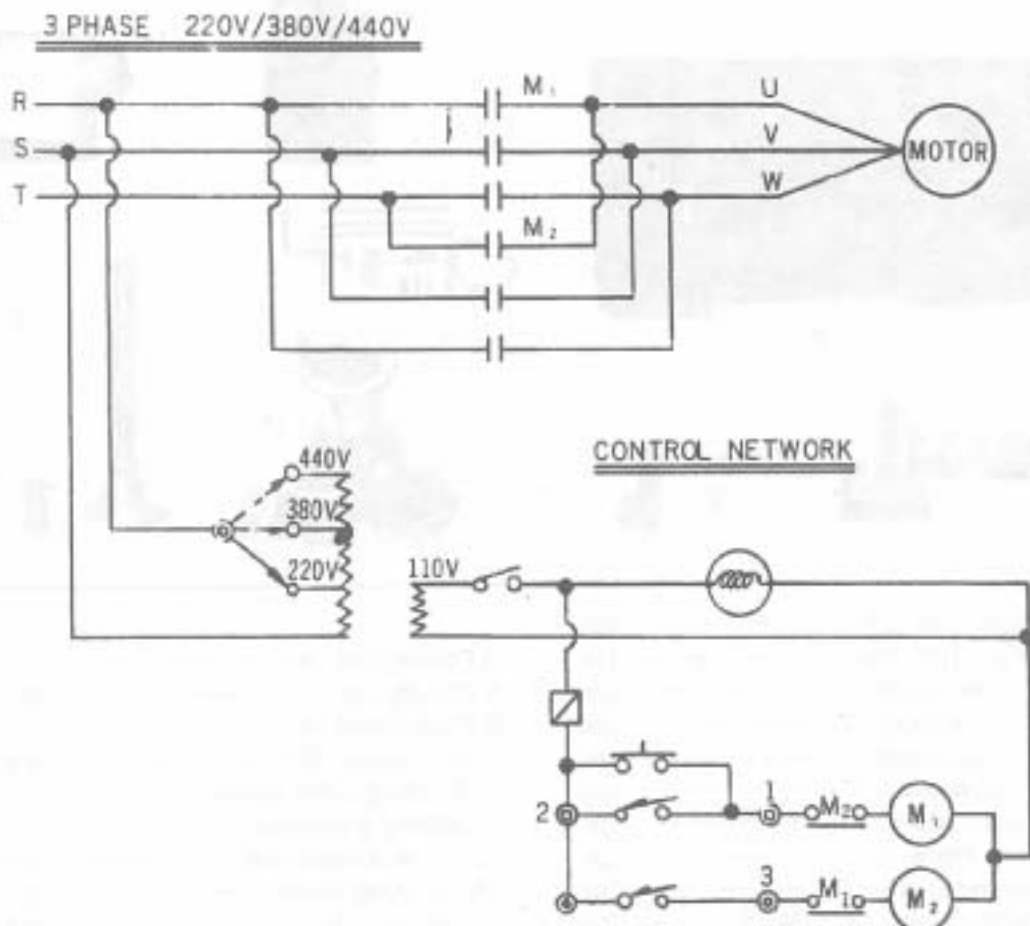
For connection to 220 volts, check the wiring diagram for the changeover shown in the motor terminal cover.

On special order, some lathes are wired for 3 phase.

For electrical connections, merely connect your supply lines to the leads provided on the lathe. Before connecting, make sure the motor specification and the machine wiring correspond with power supply

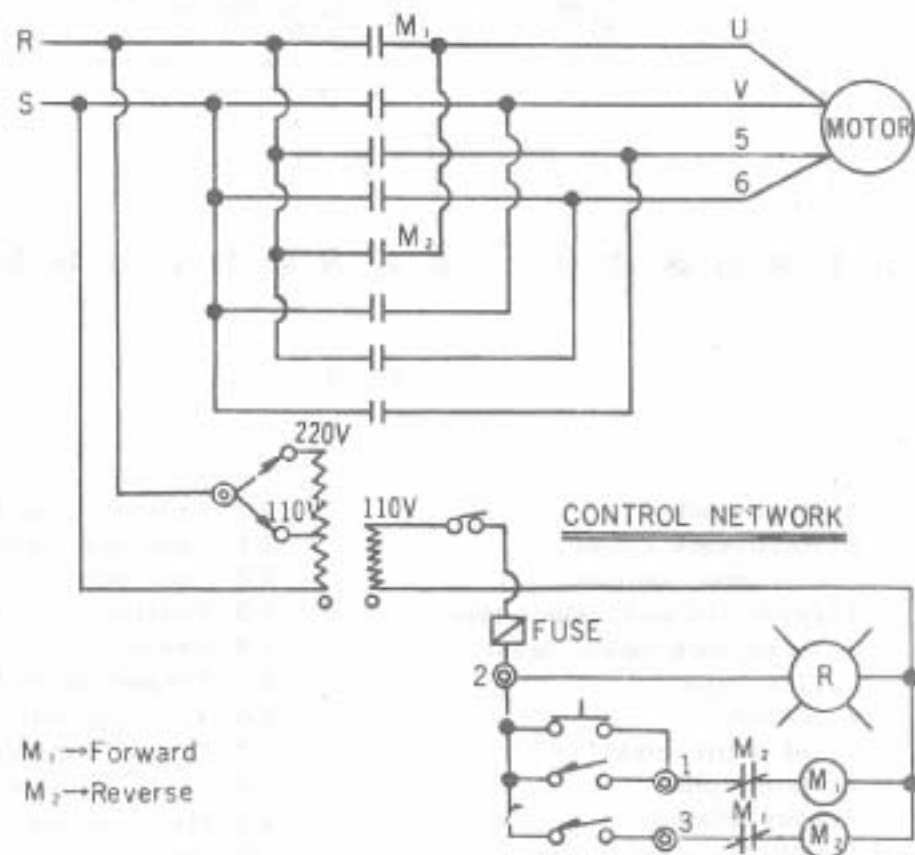
Check for correct direction of rotation. Should this need correction, turn OFF the power and interchange the leads according to the motor wiring diagram.

WIRING DIAGRAM FOR 220V/380V/440V 3 PHASE 60&50 CYCLE



WIRING DIAGRAM FOR 110V/220V 1 PHASE 60&50 CYCLE

1PHASE 110V/220V



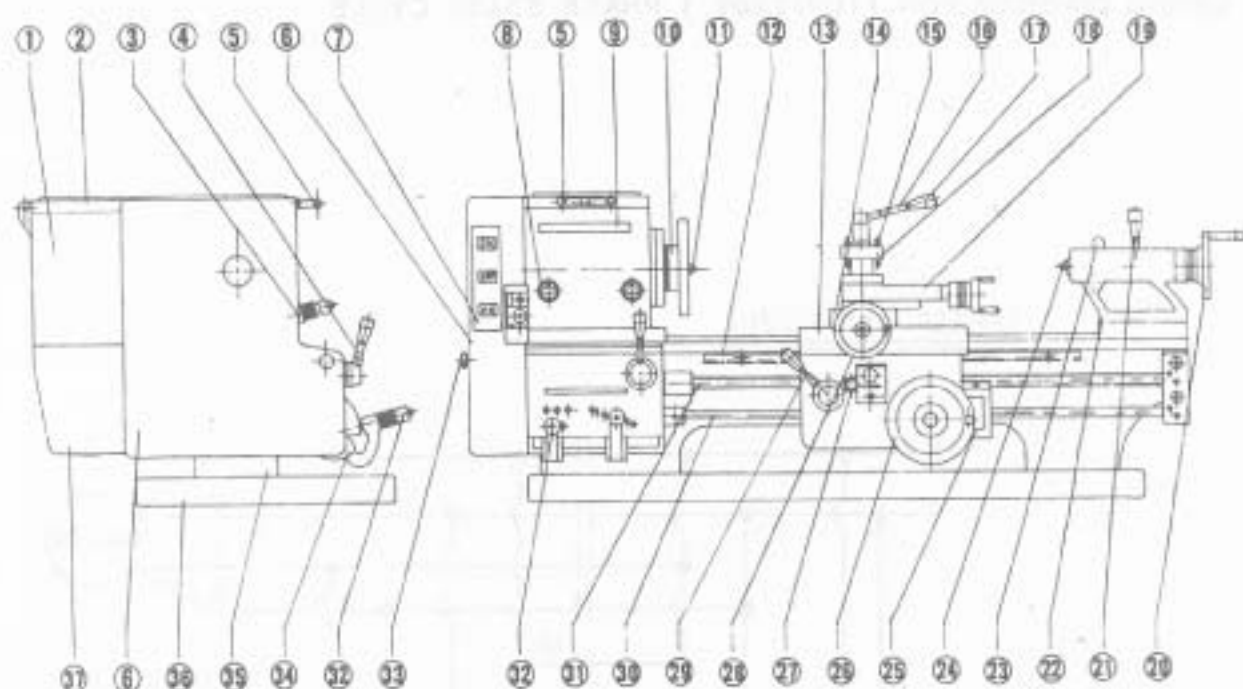


FIG. 1

- | | |
|-------------------------------------|-----------------------------------|
| 1. Headstock | 20. Tailstock handwheel |
| 2. Headstock cover | 21. Tailstock clamping lever |
| 3. End gear tumbler | 22. Tailstock |
| 4. Feed /thread select lever | 23. Tailstock quill lock lever |
| 5. Headstock cover lever | 24. Center |
| 6. End cover | 25. Threading DIAL |
| 7. Switch | 26. Carriage handwheel |
| 8. Oil sight glass | 27. Cross/longitudinal feed lever |
| 9. Name plate | 28. Cross slide handwheel |
| 10. Face plate | 29. Half nut lever |
| 11. Center | 30. Feed rod |
| 12. Rack | 31. Leadscrew |
| 13. Saddle | 32. Tumbler lever |
| 14. Cross slide | 33. Knob |
| 15. Locking bolt | 34. Gripper seat |
| 16. Toolpost clamping lever | 35. Bed |
| 17. Toolpost clamping lever of knob | 36. Chip pan |
| 18. Tool post | 37. Motor cover |
| 19. Compound slide | |

INSTALLATION



INSTALLATION

FOUNDATION

The foundation must be solid and heavy enough to support the weight of the machine and without noticeable deflection. The floor must be fairly level.

Concrete floor makes the best foundation. It provides the rigid base and minimizes vibration from adjacent machines. It is also very stable. Wooden floors must be checked for strength. Place a level on the floor and lower the machine. If the bubble shows appreciable deflection, the floor must be reinforced. For anchoring the machine to the floor, place the lathe in the location and mark off for the location of the anchor holes to be drilled. Remove the lathe, drill holes to suit the anchor bolts. Drive in the anchor and replace the lathe. Care should be taken for accurately marking the locations of the anchor bolt holes. If the machine is to be mounted on a bench, a precision level should be used first to check the bench surface is within the desirable tolerances.

MACHINE INSTALLATION

Sling the machine as shown in the sling chart Fig. 2

Pad the machine surfaces to prevent the sling damaging the surfaces.

When using sling move the carriage for proper balance and lock in place. Carefully lower the machine on its foundation over the leveling pads, wedges, or shims, whichever is used

CLEANING

Prior to shipment all machined and finished surfaces are coated to prevent rusting. Before moving the carriage or tailstock, use clean solvent to remove the rust preventive coating. For cleaning the leadscrew, rack, feedrod, etc., use brush and solvent. After thorough cleaning, lubricate the ways with way lube. Move the carriage and tailstock in any one direction approximately 1 inch, clean the ways for any residue of rust preventive coating. Move the other way approximately the same distance and repeat the process. Such care in the cleaning will ensure the removal of any foreign particles and prevent the ways from scoring.

CAUTION:

DO NOT USE AIR HOSE FOR CLEANING.

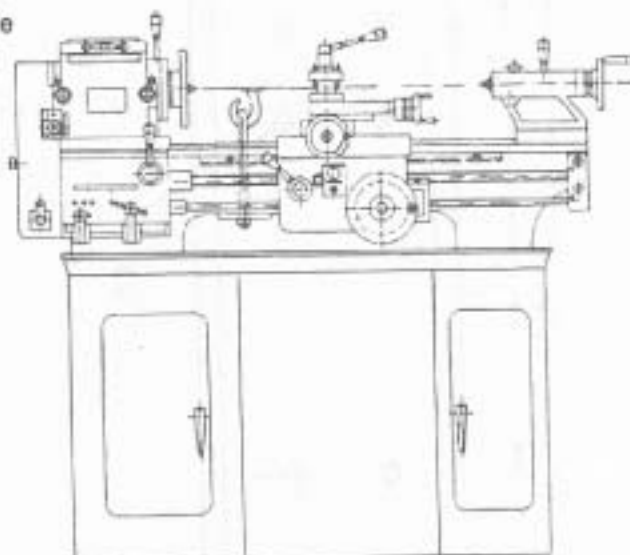


FIG 2

LEVELING

LEVELING OF THE LATHE

The lathe should be kept perfectly level at all times.

Leveling Procedure

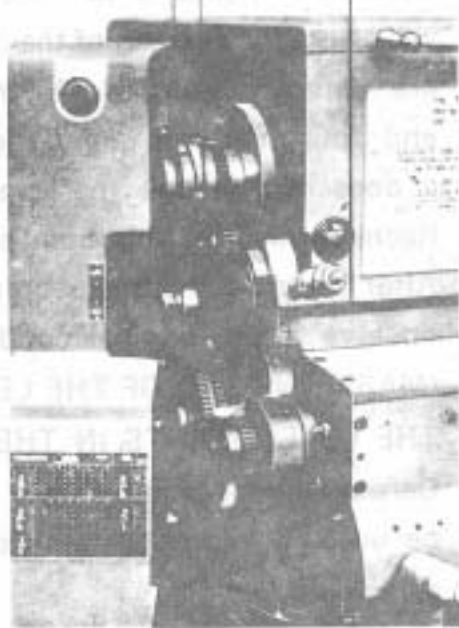
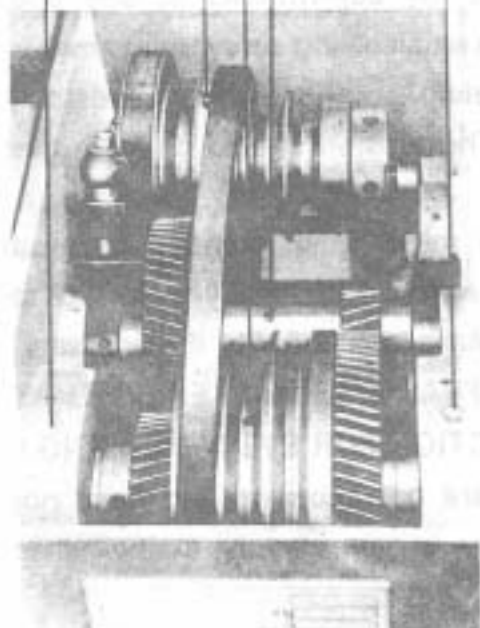
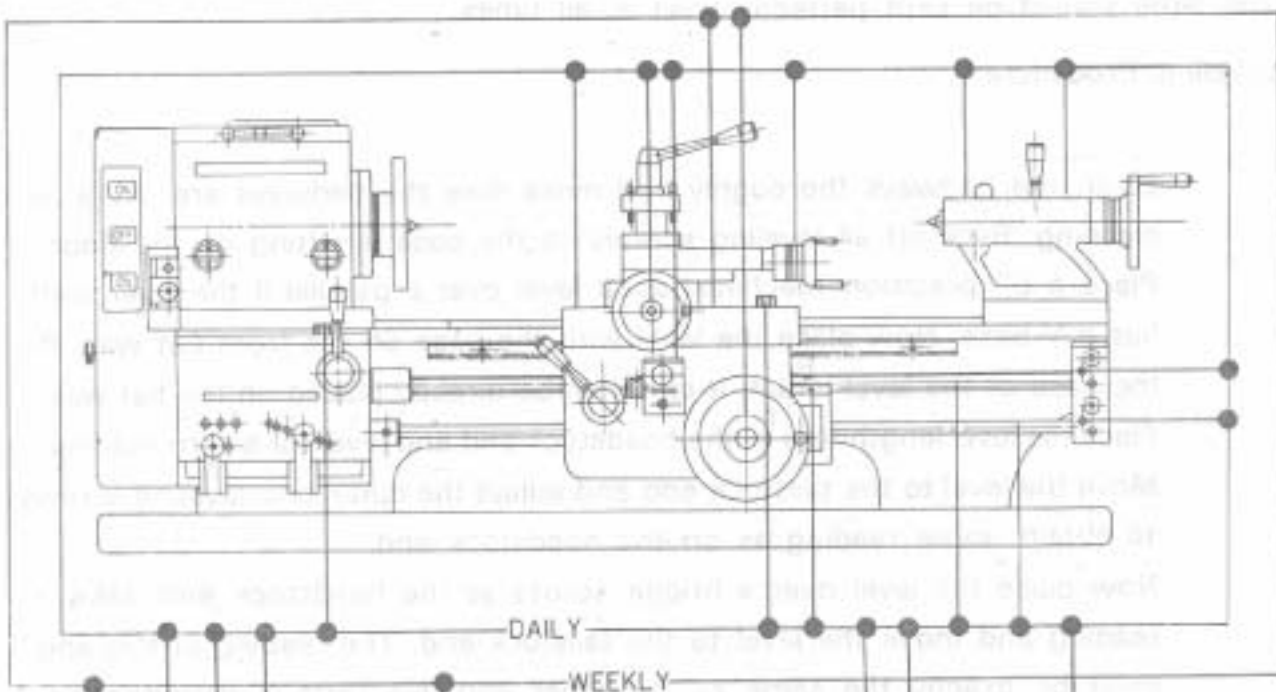
Clean the bedways thoroughly and make sure the bedways are dry after cleaning. Back off all leveling screws so the base is sitting on the floor. Place a 6" precision machinist spirit level over a parallel if the level used has a V-base. Now place the level with the base on the front flat way. If the base of the level is flat, it can then be directly placed on the flat way. Place the level lengthwise at the headstock end and level for a zero reading. Move the level to the tailstock end and adjust the outer end leveling screws to obtain same reading as on the headstock end.

Now place the level over a bridge across at the headstock end, take a reading and move the level to the tailstock end. The reading at this end must be exactly the same as the other end. No twist is permissible. Make adjustments to get the same reading at both ends.

It will be necessary to repeat this procedure several times, making necessary adjustments. You will find that the adjustments at one end will affect the reading of the other. After the end leveling screw adjustments are complete, turn down the center leveling screws at the headstock end until they rest under slight tension. The tension should be such that it does not change the level reading.

Recheck level at this time and make only minor adjustment, if necessary. After the machine has been put to use for a period of time, check level to observe if the original condition exists. Make adjustments if necessary. (MARK ONE END OF THE LEVEL WITH A ERASABLE MARKER SO THAT THE LEVEL POINTS IN THE SAME DIRECTION FOR EVERY READING.) Carpenter's or combination square level are not accurate and must not be used. Schedule a periodic level check as a part of your maintenance schedule.

LUBRICATION CHART



OPERATING INSTRUCTIONS

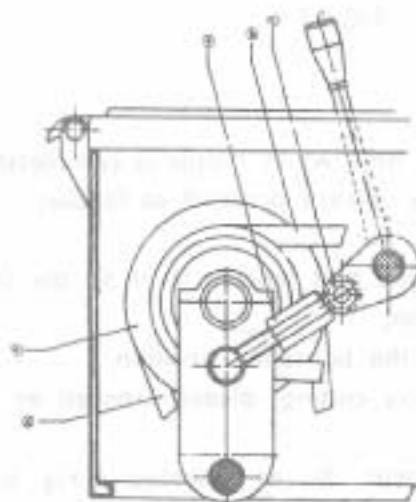
Do not operate the lathe until you are thoroughly familiar with all the controls and their functions.

Check oil levels and lubricate all sliding and rotating parts. See lubrication chart for grade of oil to be used and the lubrication.

HEADSTOCK

The machine is equipped with 2 belts, one from the motor to the upper rear pulley, and one from the upper rear pulley to the spindle pulley. The tension of the belts has been factory adjusted. It is advisable to check the tension before starting the machine. The belts should depress about $\frac{1}{2}$ inch by normal finger pressure. Tight belts will ruin the bearings. Adjust the tension, if necessary. An adjusting link mechanism is provided for this purpose. See Fig. 3 If the belt is loose, loosen bolt (C) and turn (A) until the desired tension is set. Then tighten the hexagon bolt (C) in position.

The spindle and bearings are lubricated by the oil from two oil reservoirs located at each side of the headstock. It is important that sufficient level of oil is maintained at all times.



- a: Adjuster nut
- b: Upper rear pulley to the spindle pulley belt.
- c: Hexagon bolt
- d: Motor to the upper rear pulley belt
- e: Upper rear pulley

FIG 3

HEADSTOCK CONTROLS

The headstock is constructed by gears and pulleys, provide 12 speeds from 50 to 1200 R.P.M. as indicated in Fig. 5 The backgear provides low spindle speeds from 50 to 220 R.P.M. and should be used for heavy cuts as well as large diameter work pieces.

MAIN SPINDLE ROTATION

Starting & stopping of spindle rotation can be made merely by the starting lever (a). Move the starting lever(a) up the spindle will be forward rotation, starting lever(a) down the spindle will be reverse rotation as shown in Fig. 4

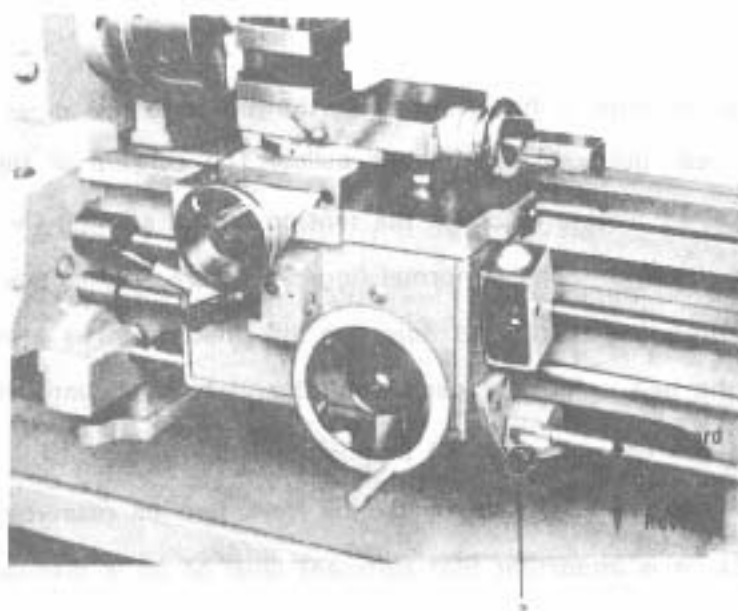


FIG. 4

OPERATION:

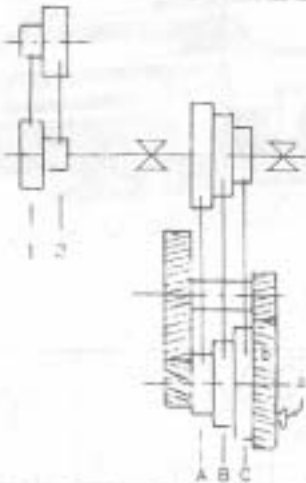




Caution: Speed changing can be made only when motor is completely stopped. When changing the three stage speeds, please proceed as follows:

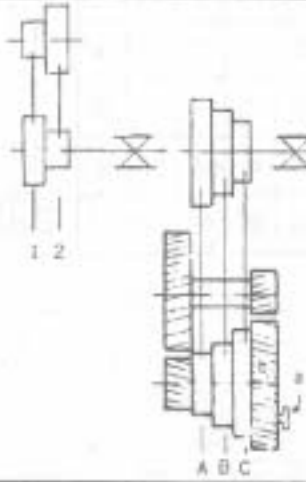




1. Turn off the motor
2. Raise the headstock cover and pull the belt tension lever to the loose position.
3. Move the belt to the desired position.
4. Push the belt tension lever back to the tightened position.

When using the back gears for heavy cutting, please proceed as follows:

1. Turn off the motor
2. Pull out the lock pin "a" from the gear "b" as indicated in Fig. 5, and make a half turn to set it in the "out" position.
3. Pull the lever (3) (Fig. 1.) to mesh the gears.

FIG. 5

		A		B	C
	1	60 	100	75	50
		50 	83	62	41
	2	60 	220	165	120
		50 	183	137	100

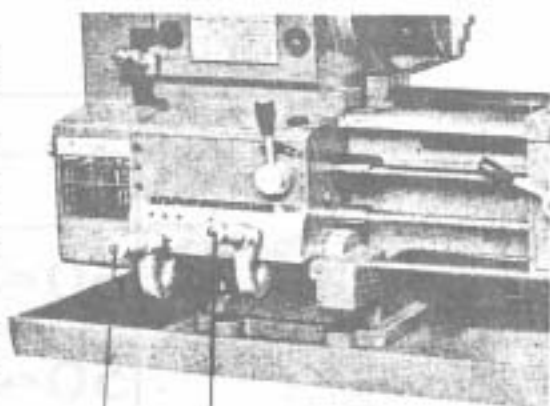
		A		B	C
	1	60 	550	410	300
		50 	458	340	250
	2	60 	1200	900	655
		50 	1000	750	545

QUICK CHANGE GEAR BOX (FIG. 5)

The quick change gear mechanism determines the rate of rotation of the lead screw and the feedrod in relation to the spindle speeds for threading, turning and facing operations. This quick change gear box is controlled by moving the two tumbler levers. Lever "A" has five positions, while lever "B" eight positions as shown in Fig. 6

When cutting inch threads, move the two tumbler levers to the desired position according to the inch thread cutting chart on the name plate. See Fig. 7. If you want cutting (5 $\frac{1}{2}$, 11 $\frac{1}{2}$, 23, 46, 92, 3 $\frac{1}{2}$, 7 $\frac{1}{2}$, 15, 30, 60.) threads move the two tumbler levers to the desired position according to the m/m thread cutting chart on the name plate see Fig. 10

WHEN CUTTING METRIC THREADS, CONSULT THE METRIC THREAD CUTTING CHART OUTSIDE OF HEADSTOCK END COVER. THE HALF-NUTS MUST REMAIN ENGAGED WITH THE LEADSCREW UNTIL THE THREAD CUTTING PROCESS IS COMPLETE. THE TOOL IS WITHDRAWN FROM THE WORK AT THE END OF THE CUT AND THE MOTOR IS REVERSED, BRINGING THE TOOL BACK TO THE START FOR SUCCESSIVE CUTS.



A B FIG 6

THREADING		INCH								40T 127T
	1	2	3	4	5	6	7	8		
A	4	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{2}$	6	6 $\frac{1}{2}$	7		
B	8	9	9 $\frac{1}{2}$	10	11	12	13	14		
C	16	18	19	20	22	24	26	28		
D	32	36	38	40	44	48	52	56	120T	
E	64	72	76	80	88	96	104	112	40T	

Feed Rod ($\frac{1}{4}$) Hand Wheel On The Left

Feeding	Inches /							
	1	2	3	4	5	6	7	8
A	0.1320	0.1173	0.1110	0.1055	0.0960	0.0880	0.0812	0.0754
B	0.0660	0.0586	0.0555	0.0527	0.0480	0.0440	0.0406	0.0377
C	0.0330	0.0293	0.0277	0.0263	0.0240	0.0220	0.0203	0.0188
D	0.0165	0.0146	0.0138	0.0131	0.0120	0.0110	0.0101	0.0094
E	0.0082	0.0072	0.0069	0.0065	0.0060	0.0055	0.0050	0.0047

Feed Rod ($\frac{1}{4}$) Hand Wheel On The Right

Feeding	Inches /							
	1	2	3	4	5	6	7	8
A	0.0822	0.0730	0.0692	0.0658	0.0597	0.0548	0.0504	0.0468
B	0.0411	0.0365	0.0346	0.0329	0.0309	0.0274	0.0253	0.0234
C	0.0205	0.0183	0.0173	0.0165	0.0150	0.0137	0.0126	0.0117
D	0.0102	0.0091	0.0087	0.0082	0.0075	0.0068	0.0063	0.0058
E	0.0051	0.0046	0.0043	0.0041	0.0038	0.0034	0.0032	0.0029

Feed Rod ($\frac{5}{8}$) Hand Wheel On The Left

Feeding	Inches /							
	1	2	3	4	5	6	7	8
A	0.1181	0.1050	0.0993	0.0944	0.0859	0.0787	0.0726	0.0674
B	0.0590	0.0525	0.0496	0.0472	0.0429	0.0393	0.0363	0.0337
C	0.0295	0.0262	0.0248	0.0236	0.0215	0.0197	0.0182	0.0168
D	0.0148	0.0131	0.0124	0.0118	0.0107	0.0098	0.0091	0.0084
E	0.0074	0.0066	0.0062	0.0059	0.0053	0.0049	0.0045	0.0042

Feed Rod ($\frac{5}{8}$) Hand Wheel On The Right

Feeding	Inches /							
	1	2	3	4	5	6	7	8
A	0.0919	0.0816	0.0773	0.0735	0.0667	0.0612	0.0566	0.0523
B	0.0459	0.0408	0.0387	0.0368	0.0334	0.0306	0.0283	0.0262
C	0.0229	0.0204	0.0193	0.0184	0.0167	0.0153	0.0141	0.0131
D	0.0115	0.0102	0.0097	0.0092	0.0083	0.0076	0.0071	0.0065
E	0.0057	0.0051	0.0048	0.0046	0.0041	0.0038	0.0035	0.0032

FIG. 7

CAUTION: "DO NOT CHANGE GEARS WHEN THE SPINDLE IS RUNNING"

CARRIAGE

The function of the carriage is to rigidly support the cutting tool and move it along or across the bed for turning, facing, boring or threading operations.

POWER FEED

For Longitudinal power feed pull up the cross/longitudinal feed lever.

The direction of the carriage traverse is selected from the headstock.

For cross feed push down CROSS/LONGITUDINAL feed lever.

While the cross/longitudinal feed lever is in position, the half-nut lever cannot be engaged

The built-in safety interlock mechanism will prevent simultaneous engagement of this lever and the half-nut lever

Half-nut lever engages the half nuts with the lead screw for threading. To engage, put cross/longitudinal feed lever in neutral position and engage the half-nut lever downwards in mesh with the threads of the leadscrew.

CAUTION: DO NOT FORCE THE HALF-NUT LEVER WHILE ENGAGING WITH THE LEADSCREW.

THREADING DIAL

The threading dial is located on the right side of the apron. It performs the important function of indicating the proper time to engage the half-nut lever so that the tool will enter the same groove of the thread on each successive cut. The dial is marked with lines numbered 1, 2, 3, 4, and in between are lines with no numbers. These are half lines and are called unnumbered lines. The dial when engaged with the leadscrew will cause the rotation of the dial. A single line is marked on the housing of the threading dial (fixed line).

The instruction plate riveted on the threading dial shows the selection and sequence of matching the revolving lines with the fixed line. (Fig.8)

For thread cutting engage the half-nuts at the appropriate numbers shown on the scale column of the threading dial plate. 1-4 on the scale means, the half-nuts can be engaged on any of the numbered lines 1-2-3-4 for each successive cut.

If the numbered lines are used for the first cut, for successive cuts only numbered lines must be used.

1-3 on the scale means the half-nuts can be engaged on 1 and 3 or 2 and 4 for successive cuts.

1-8 on the scale means the half-nuts can be engaged on any line, numbered or unnumbered.

THREAD DIAL PLATE

INDICATOR TABLE					
T.P.	SCALE	T.P.	SCALE	T.P.	SCALE
4	1-4	12	1-4	38	1-8
4 1/2		13	1	40	1-8
4 3/4		14	1/2	44	1-4
5	1	16	1-8	48	1-8
5 1/2		18	1/2	52	1-4
6	1-4	19	1	56	1-8
6 1/2		20	1-4	64	1-8
	1-4	22	1/2	72	1-8
8	1-8	24	1-8	76	1-4
9	1	26	1/2	80	1-8
9 1/2		28	1-4	96	1-8
10	1/2	32	1-8	104	1-8
	1	36	1/2	112	1-8

FIG. 8

FOUR POSITION TOOL POST

By turning the tool post lock handle counter clockwise, the tool can be rapidly indexed and locked in position.

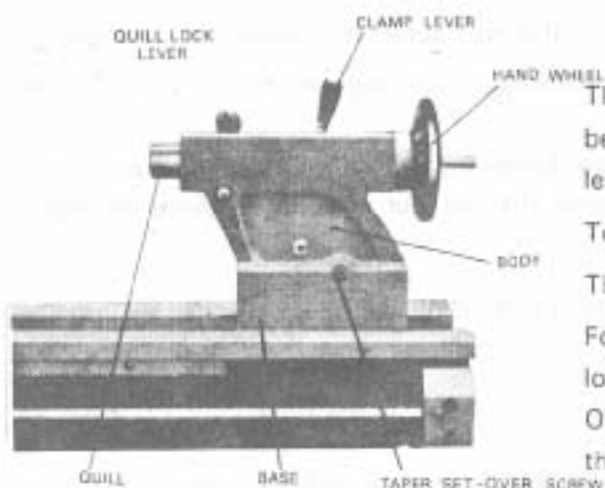


FIG. 9

TAILSTOCK


The tailstock slides along the bedways and may be anchored in any position by moving the clamp lever.

To slide the quill, rotate the tailstock handwheel.

The quill can be locked by the quill lock lever.

For small tapers, the tailstock can be set over by loosening the clamp lever and adjusting the SET OVER SCREWS on the front of and the rear of the tailstock base.

Table of thread cutting
(screw pitch in m/m)

THREADING		 mm								 INCH		
		1	2	3	4	5	6	7	8		1	
 40°	A	6			4.8		4			 40°	A	5- $\frac{1}{2}$
	B	3			2.4		2				B	11- $\frac{1}{2}$
	C	1.5			1.2		1				C	23
	D	0.75			0.6		0.5				D	46
	E				0.3		0.25				E	92
 30°	A	7.5			6		5			 30°	A	3- $\frac{1}{2}$
	B	3.75			3		2.5				B	7- $\frac{1}{2}$
	C	1.5			1.5		1.25				C	15
	D				0.75						D	30
	E										E	60
 20°	A	4.5	4				3					
	B	2.25	2		1.8		1.5					
	C		1		0.9		0.75					
	D		0.5		0.45							
	E		0.25									

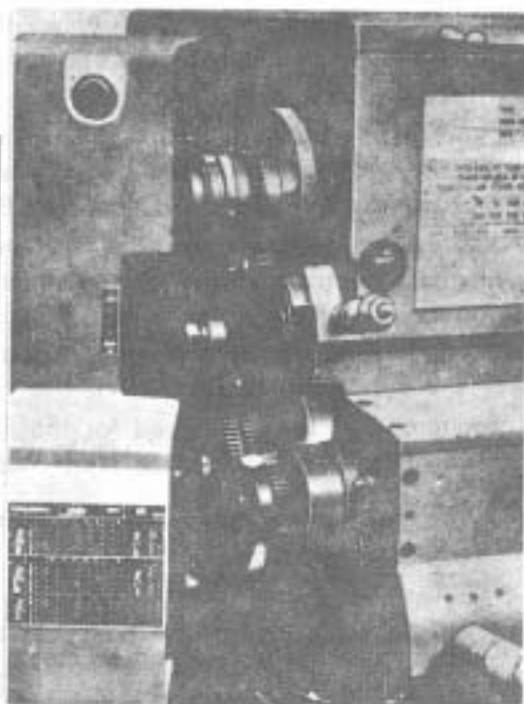
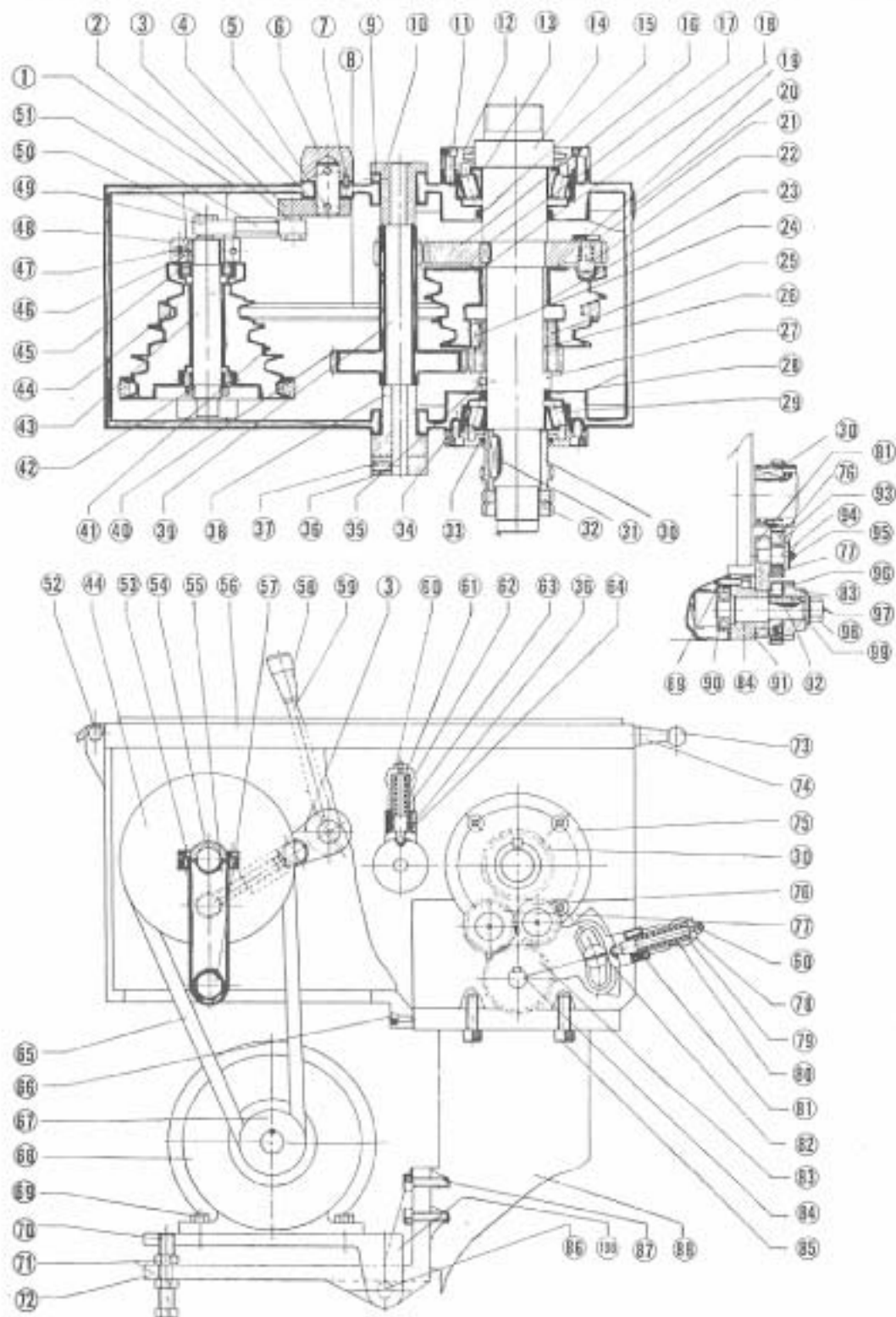


FIG. 10

PARTS LIST

INDEX

1. Headstock.....
2. Bed.....
3. Apron.....
4. Gear Box.....
5. Tailstock.....
6. Saddle.....



PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1	5A-01	Headstock case	FC25	1
2	5A-23	Fixing screw	SS41	1
3	4A-50	Bracket	FC25	1
4	5A-24	Axle	SS41	1
5		Spring pin	$\varnothing 5 \times 40$	2
6	4A-52	Lever seat	SS41	1
7		Headless set screw	M8 \times 16	1
8		V-belt	B-31	1
9		Headless set screw	M8 \times 10	1
10	5A-10	Back gear cover	FC20	1
11		Socket head cap screw	M8 \times 25	4
12	5A-09	Main spindle front cover	FC20	1
13		Taper roller bearing	# 32211	1
14	5A-02	Main spindle	S45C	1
15		Carpet		1
16	5A-03	Helical gear (75T)	FC25	1
17		Key	8 \times 17	1
18	5A-05	V-pulley	FC25	1
19	3A-7	Round nut	SS41	1
20		Oil gauge		1
21		Spring	1 \times 14	1
22	5A-04	Transmission pin	SS41	1
23	3A-9	Bush of v-pulley	gun metal	1
24		Key	8 \times 20	1
25	5A-06	Helical gear	FC25	1
26	3A-11	Bush of helical gear	gun metal	1
27	5A-07	Space collar	SS41	1
28		Carpet		1
29		Taper roller bearing	# 30210	1
30	5A-30	Spur gear	S45C	1
31		Key	8 \times 42	1
32	3A-15	Locking nut	SS41	2
33		Carpet		1
34		Socket head cap screw	M8 \times 16	4

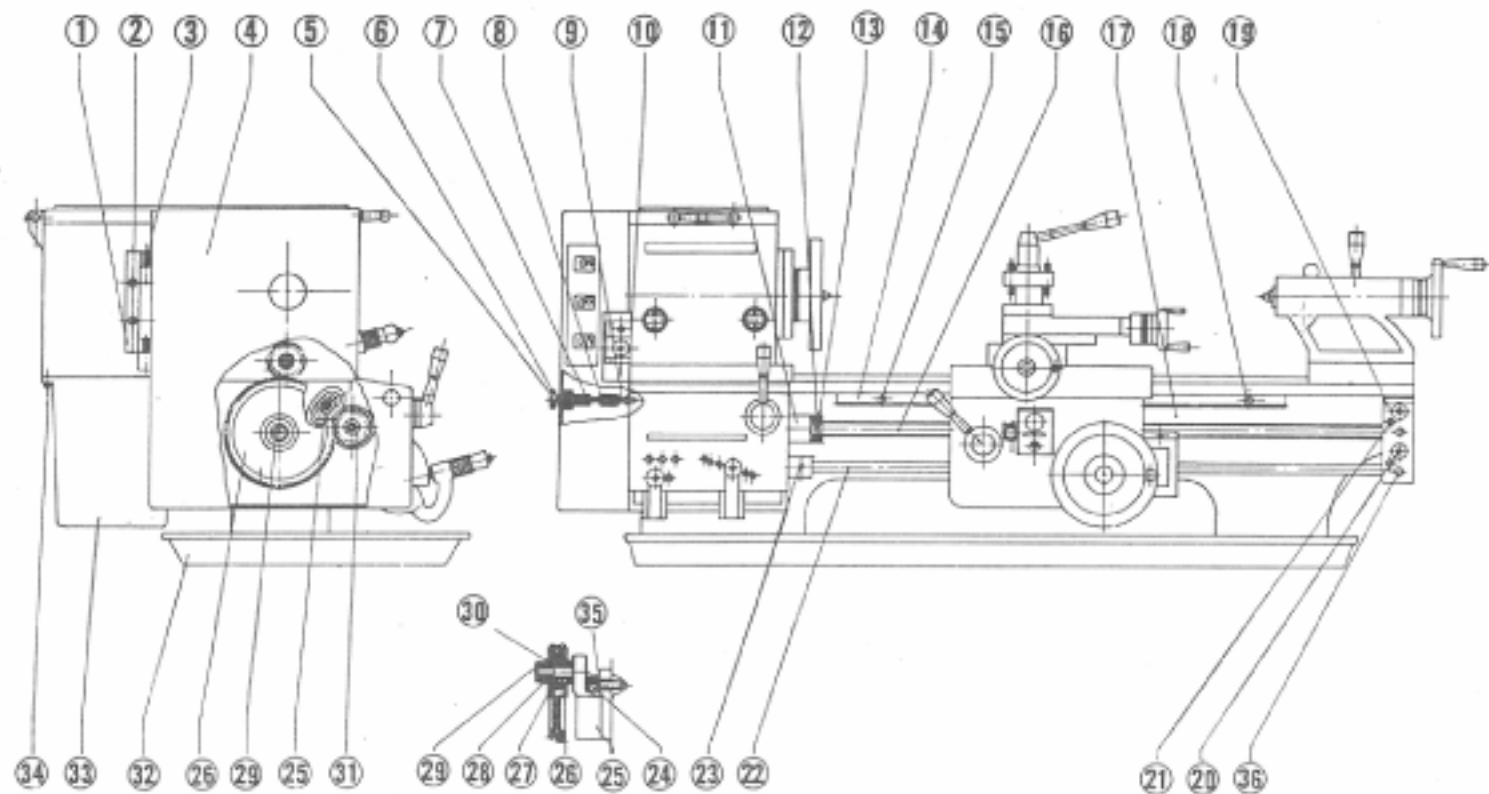
PARTS LIST NO. 2				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
35		Headless set screw	M8×6	1
36	5A-13	Supporting plate for back gear	FC20	1
37		Headless set screw	M8×18	1
38	5A-15	Back gear cover	FC20	1
39	5A-11	Back gear shaft	SS41	1
40	5A-12	Back gear	FC25	1
41		Oiler		1
42		Locking nut	SS41	1
43	5A-20	V-pulley shaft	S45C	1
44	5A-21	V-pulley	FC25	1
45		Ball bearing	#6005Z	2
46	5A-19	Locking nut	SS41	1
47		Socket head cap screw	M5×12	2
48	5A-18	Bracket cover	FC25	1
49	3G-31	Bolt of adjustable	SS41	1
50	5A-22	Bolt	SS41	1
51		Nut	SS41	1
52		Hexagon bolt	5/16×40	2
53		Socket head cap screw	M5×12	2
54	5A-17	Bracket cover	FC20	1
55	5A-16	Bracket	FC25	1
56	5A-28	Cover	FC25	1
57	5A-25	Bracket shaft	SS41	1
58		Handle grip		1
59	3E-13	Lever	SS41	1
60		Nut	1/4	2
61	3A-24	Lever	SS41	1
62	3A-24	Spring	SUP3	1
63	3A-22	Sleeve	S20C	1
64	5A-14	Sleeve shaft	S20C	1
65		V-belt	B-31	1
66		Socket head cap screw	M6×16	2
67	3G-17	Motor pulley	FC25	1
68		Motor	1HP	1

PARTS

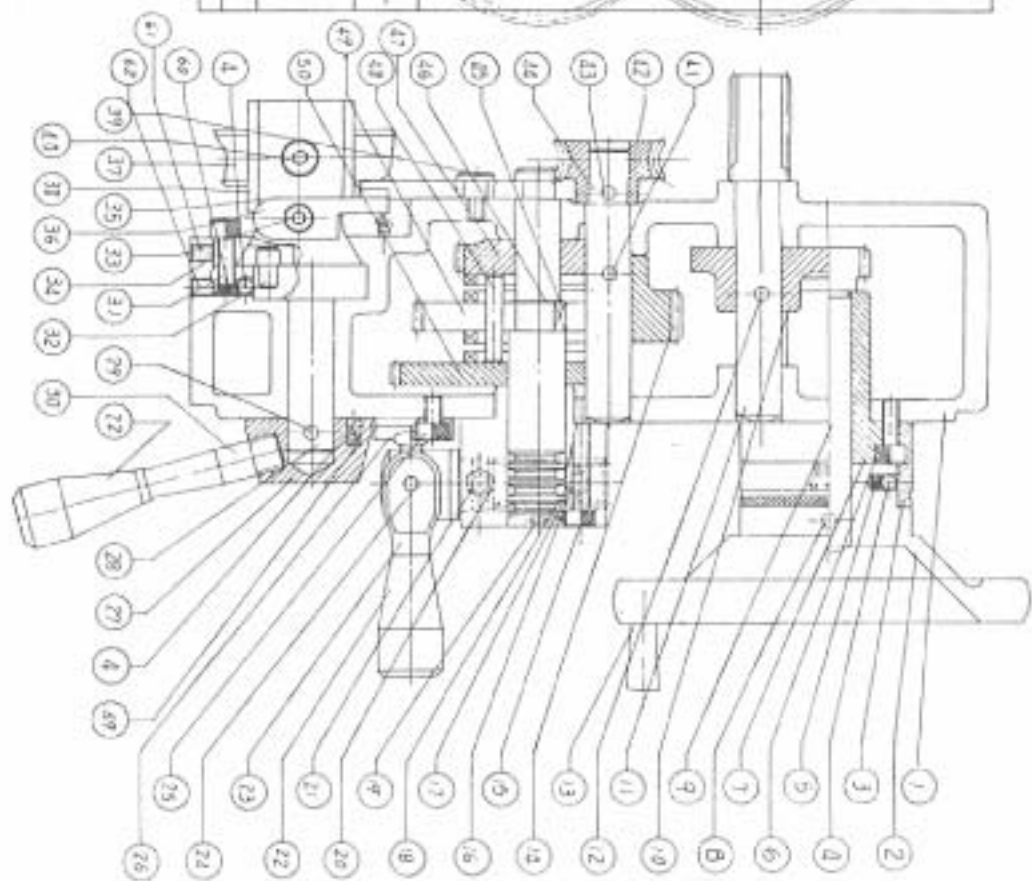
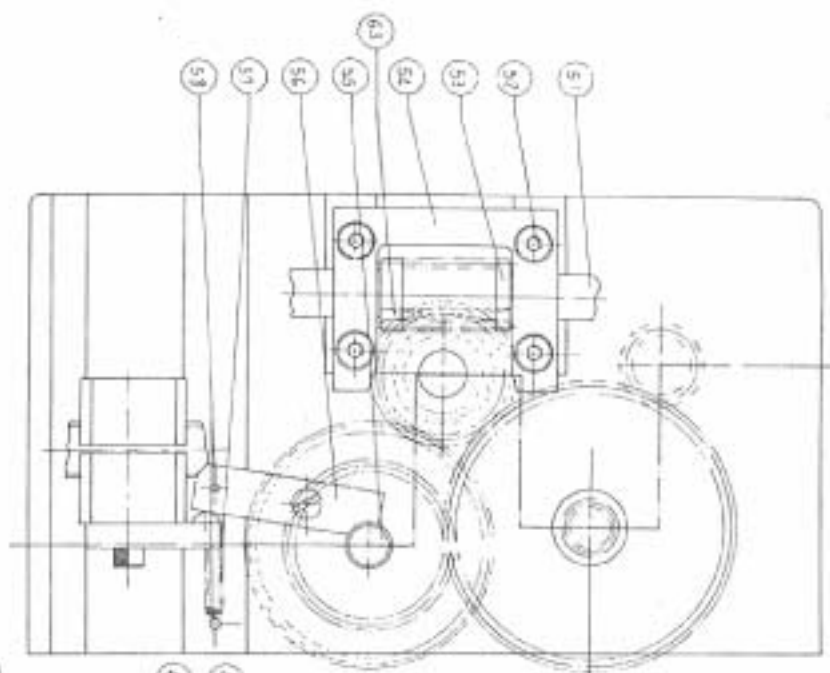
LIST

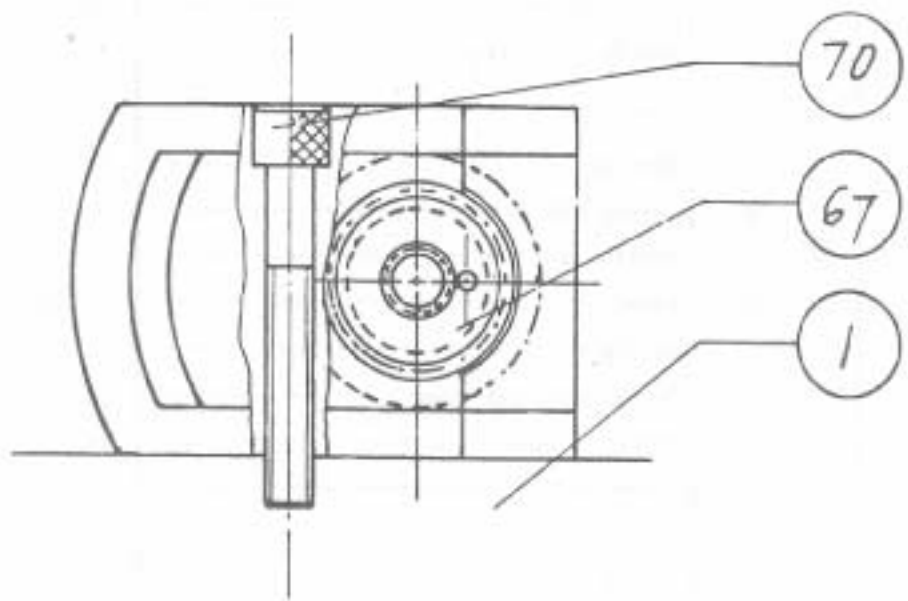
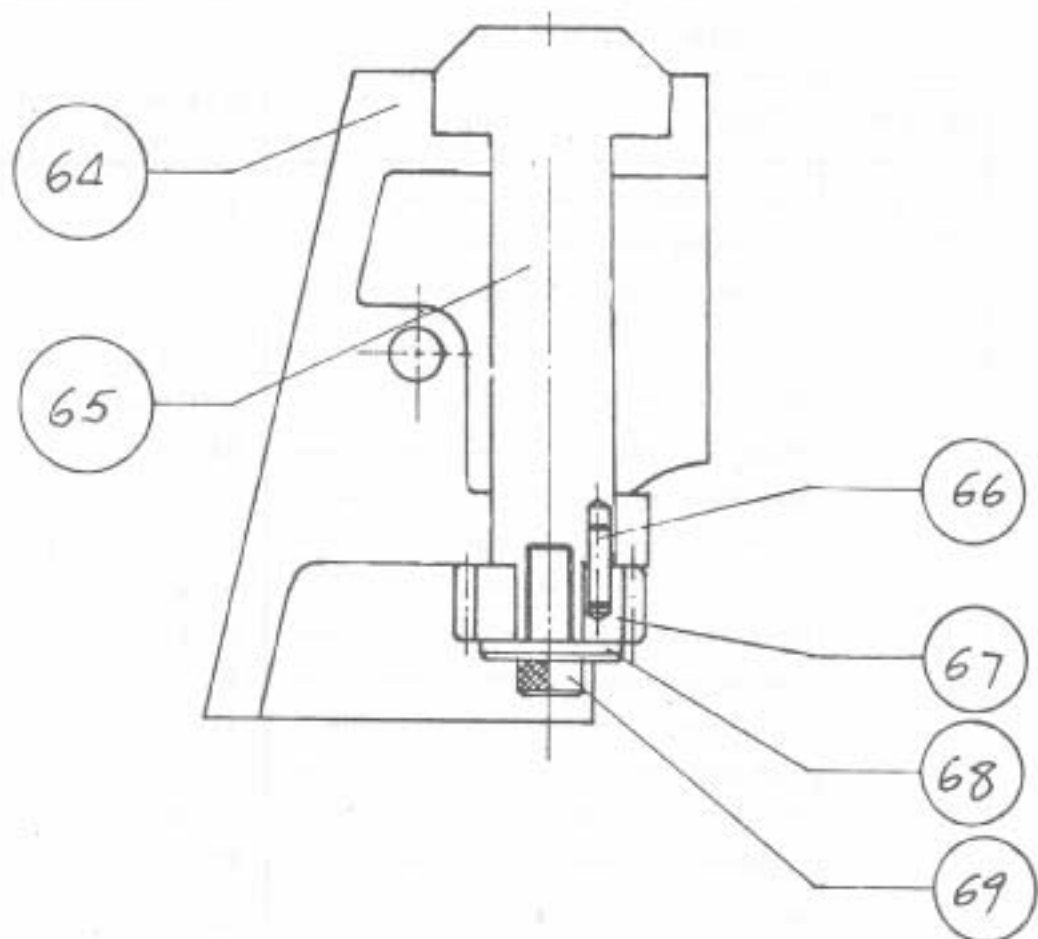
NO. 3

REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
69		Hexagon bolt	5/16×3/4	4
70		Hexagor bolt,	1/2×3	1
71		Nut	1/2	2
72	5A-27	Motor base plate	FC25	1
73	3A-43	Lever	S20C	1
74	3A-42	Lever	S20C	2
75	5A-08	Cover of spindle	FC25	1
76	3A-29	Spur gear	S45C	1
77	3A-30	Spur gear	S45C	1
78	3A-34	Lever	S20C	1
79	3A-35	Shaft	S20C	1
80		Spring	SUP3	1
81	3A-27	Tumbler	FC20	1
82	3A-38	Fixing screw	SS41	1
83	3A-33	Spur gear	S45C	1
84	3A-25	Shaft	SS41	1
85		Socket head cap screw	M10×30	4
86	5A-29	Heagon bolt	SS41	1
87		Socket head cap screw	M8×30	4
88	3B-1	Bad	FC30	1
89		Socket head cap screw	M6×20	3
90		Bearing	# 6202	1
91	3A-26	Bearing seat	FC25	1
92		Key	4×17	1
93	3A-31	Bush	gun metal	2
94	3A-28	Shaft	SS41	2
95		Oiler	1/4	1
96	3A-32	Spur gear	S45C	1
97		Oiler	1/4	1
98		Nut	1/2	1
99	3A-39	Washer	SS41	1
100	5A-26	Motor seat	FC25	1



PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1.		Support of side cover	FC20	1
2.		Socket head cap screw	M8×16	2
3.		Headless set screw	M8×12	2
4.		Side cover	AL	1
5.	3G-7	Knob	S20C	1
6.		Spring pin	3×15	1
7.	3G-6	Sleeve of cover	S20C	1
8.	3G-5	Axle	S20C	1
9.		Headless set screw	5/16×1¾	1
10.		Nut	5/16	1
11.	3B-6	Sleeve of lead screw	S20C	1
12.		Headless set screw	M6×6	1
13.		Taper pin	3×25	1
14.	3B-3	Rack	SS41	1
15.		Spring pin	5×35	2
16.	3B-5	Lead screw	S45C	1
17.	3B-1	Bed	FC30	1
18.		Socket head cap screw	M6×20	3
19.	5B-11	Bracket	FC25	1
20.		Socket head cap screw	M8×50	2
21.		Oiler	1/4	2
22.	3B-7	Feed rod	SS41	1
23.		Taper pin	#3×25	1
24.		Socket head cap screw	M10×35	1
25.	3B-8	Support	FC25	1
26.	3B-11	Gear	S45C	1
27.		Ball bearing	#6003 Z	2
28.	3B-12	Washer	3/8	1
29.		Nut	3/8	1
30.	3B-10	Sleeve	SS41	1
31.	3D-20	Gear	S45C	1
32.	3B-2	Chip pan	S20C	1
33.		Motor cover	AL	1
34.		Socket head cap screw	M5×20	3
35.		Washer	3/8	1
36.		Spring pin	5×55	2





PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1	3C-1	Case of apron	FC 25	1
2	3C-5	Handwheel	FC 25	1
3	3C-4	Graduation collar	S 20C	1
4		Steel ball	$\varnothing \frac{1}{4}$	3
5		Spring	SUP 6 \varnothing 1	1
6		Socket head cap screw	M6 \times 16	2
7	3C-3	Axle bush	FC 25	1
8		Spring pin	\varnothing 5 \times 60	1
9	3C-2	Axle	S 45C	1
10	3C-7	Spur gear(M2 \times 50T)	S 45C	1
11	3C-6	Transmission shaft	S 45C	1
12		Spring pin	\varnothing 5 \times 30	1
13	3E-9	Grip hand	S 20C	1
14	3C-10	Spur gear(2M \times 24T)	S 40C	1
15		Socket head cap screw	M 6 \times 40	3
16		Steel ball	$\varnothing \frac{1}{4}$	1
17		Compression spring	SUP 6 \varnothing 1	1
18		Headless set screw	M 8 \times 8	1
19		Oiler	$\frac{1}{4}$	1
20		Hexagon nut	\varnothing 5/16"	1
21	3C-18	Fixing bolt	S 20C	1
22	3C-38	Handle grip		2
23	3C-20	Lever	S 20C	1
24		Spring pin	\varnothing 5 \times 25	1
25		Socket head cap screw	M 6 \times 12	2
26	3C-21	Safety stopper	FC 25	1
27	3C-22	Lever seat	S 20C	1
28	3C-23	Clutch of half nut	S 20C	1
29		Spring pin	\varnothing 5 \times 35	1

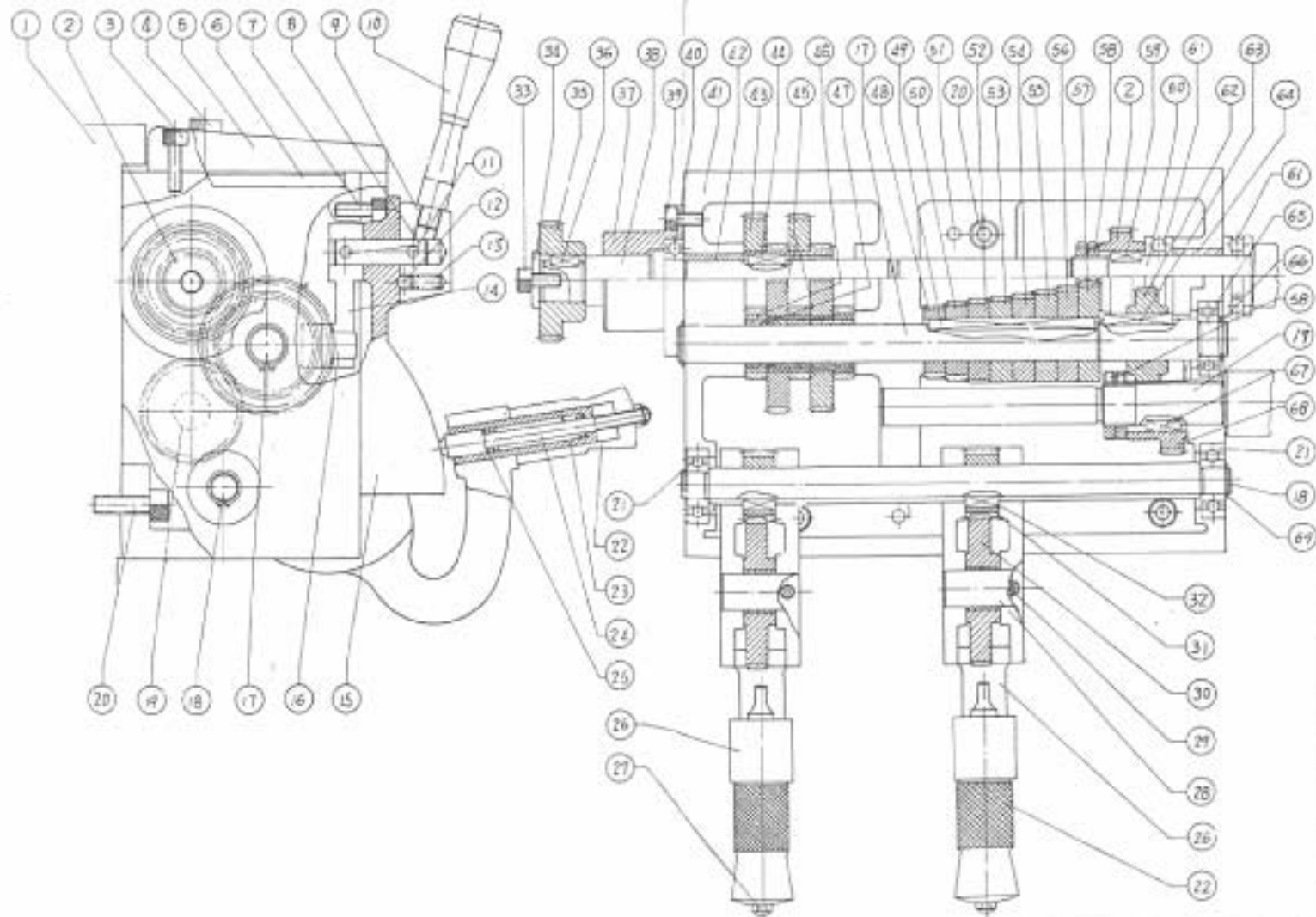
PARTS

LIST

NO. 2

REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
30	3C-24	Lever	S 20C	1
31		Socket head cap screw	M 6×16	2
32	3C-23	Pin	S 20C	1
33		Socket head cap screw	M 6×12	1
34	3C-25	Guide plate	FC 25	1
35	3C-26	Half nut supporter	FC 25	1
36	3C-28	Arm	FC 25	1
37	3B-5	Lead screw	SS 41	1
38	3C-27	Half nut	gun metal	1
39	3C-26	Set screw	S 20C	1
40		Socket head cap screw	M 6×12	2
41		Spring pin	3 rd × 25	1
42	3C-9	Worm gear	gun metal	1
43		Taper pin	3 rd × 25	1
44	3C-8	Gear shaft	S 45C	1
45		Key	4×4×10	1
46		E-Type snap ring	Ø 12	1
47	3C-12	Clutch gear	S 45C	1
48	3C-15	Safety pin		1
49	3C-13	Clutch gear	S 45C	1
50	3C-14	Clutch gear	S 45C	1
51	3B-7	Feed rod	S 45C	1
52		Socket head cap screw	M 6×25	4
53	3C-33	Worm	SS 41	1
54	3C-32	Seat frame	FC 20	1
55	3C-11	Change shaft	SS 41	1
56	3C-31	Safety piece		1
57	3C-30	Spring	SUP 6	1

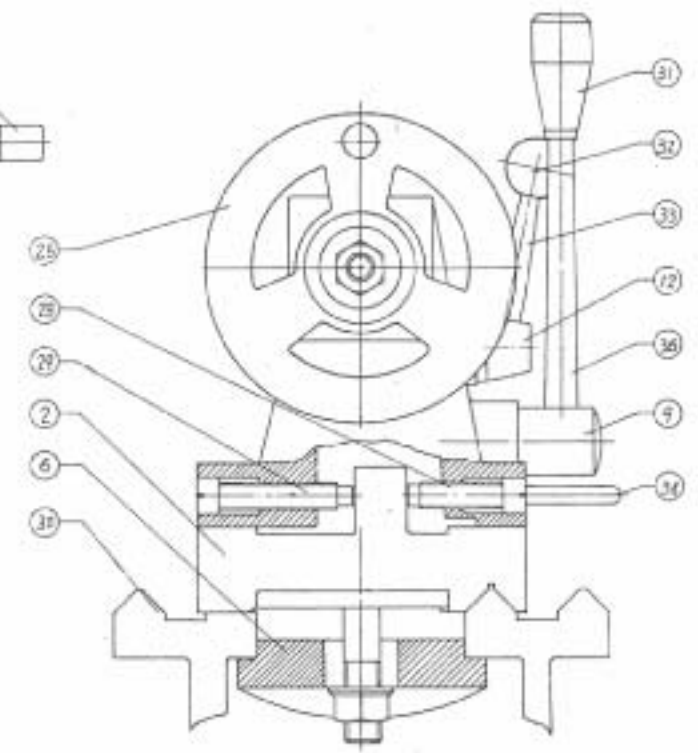
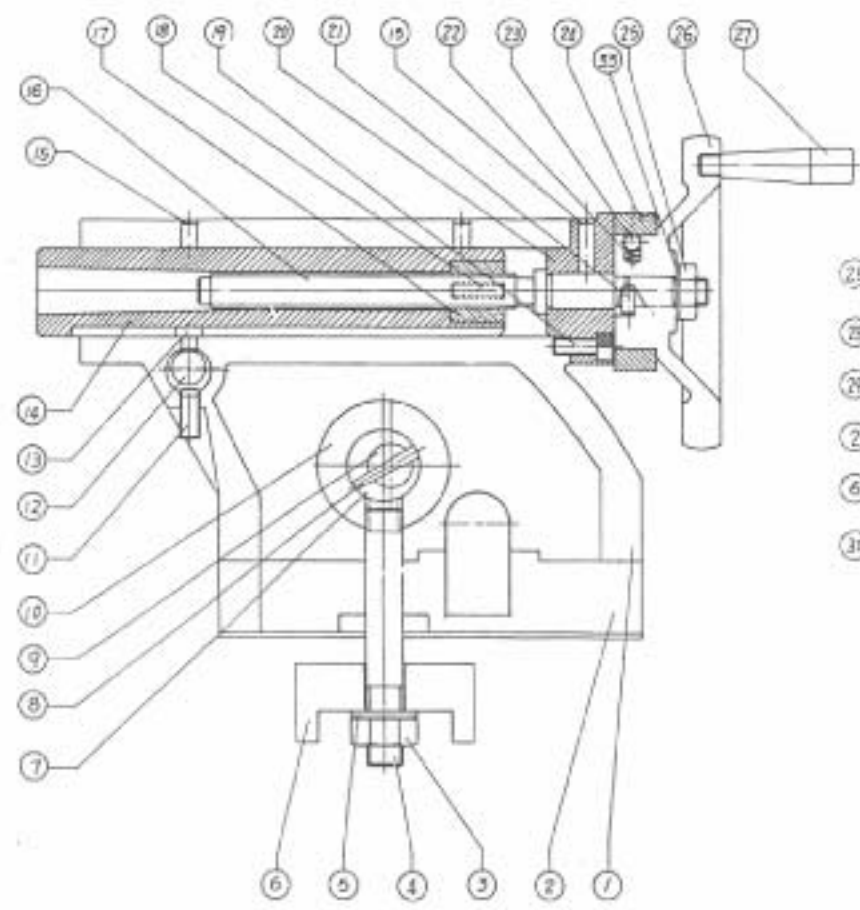
PARTS LIST NO. 3				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
58	3C-29	Pin	S 20C	2
59		Spring	SUP 6	1
60		Spring	SUP 6	1
61		Headless set screw	M 6×12	2
62		Headless set screw	M 8×8	1
63		Key	5×5×45	1
64	3C-34	Thread cutting indicator seat	FC 20	1
65	3C-35	Indicator shaft	SS 41	1
66	3C-37	Pin	SS 41	1
67	3C-36	Indicator gear	gun metal	1
68	3C-40	Washer	S 20C	1
69		Socket head cap screw	M 6×20	1
70		Socket head cap screw	M 6×45	1



PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1	3B-1	Bed	FC 30	1
2	3D-15	Spur gear	S 45C	1
3		Socket head cap screw	M 6×20 M 6×16	2 2
4	3D-41	Plug		1
5	3D-40	Gear box up cover	FC 20	1
6		Woolen rug		1
7		Socket head cap screw	M 6×16	4
8	3D-34	Shaft	S 45C	1
9	3D-33	Lever seat	SS 41	1
10	3C-38	Knob		
11		Spring pin	5∅×35 5∅×25	1 1
12		Steel ball	$\frac{1}{4}\emptyset$	1
13		Spring	SUP 6	1
14	3D-35	Connecting rod	FC 20	1
15	3D-39	Gear box front cover	FC 20	1
16	3D-36	Fork	FC 20	1
17	3D-13	Shaft	S 45C	1
18	3D-24	Shaft	S 45C	1
19	3D-22	Shaft	S 45C	1
20		Socket head cap screw	M 8×25	3
21		Ball bearing	#6201 ²⁵	2
22	3D-19	Gripper	SS 41	2
23	3D-30	Sleeve of gripper	S 20C	2
24	3D-32	Axle of gripper	SS 41	2
25	3D-31	Spring	SUP 6	2
26	3D-28	Gripper seat	FC 25	2
27		Cap nut	$\emptyset\frac{1}{4}$	2
28	3D-27	Gear shaft	S 45C	2
29		Headless set screw	M 6×6	4

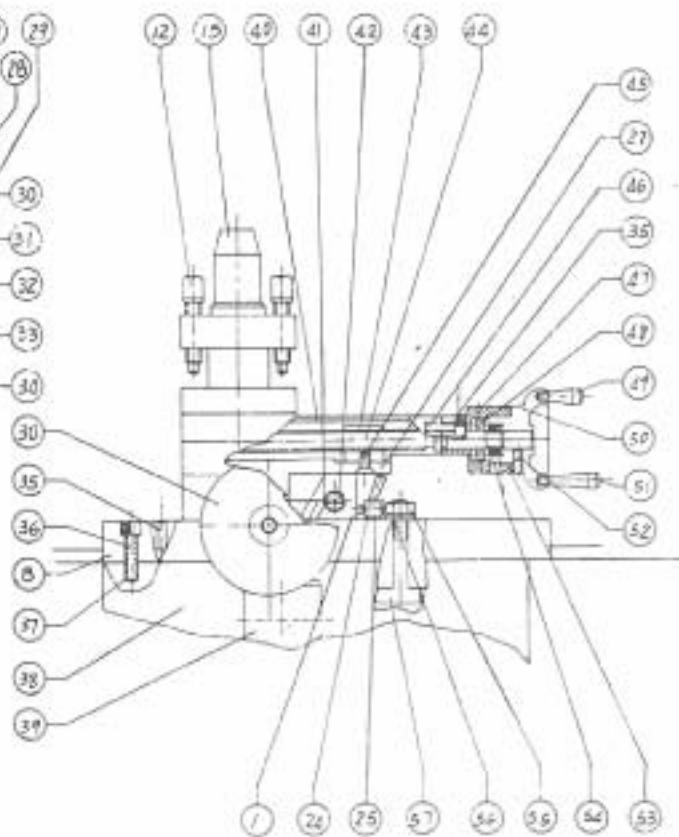
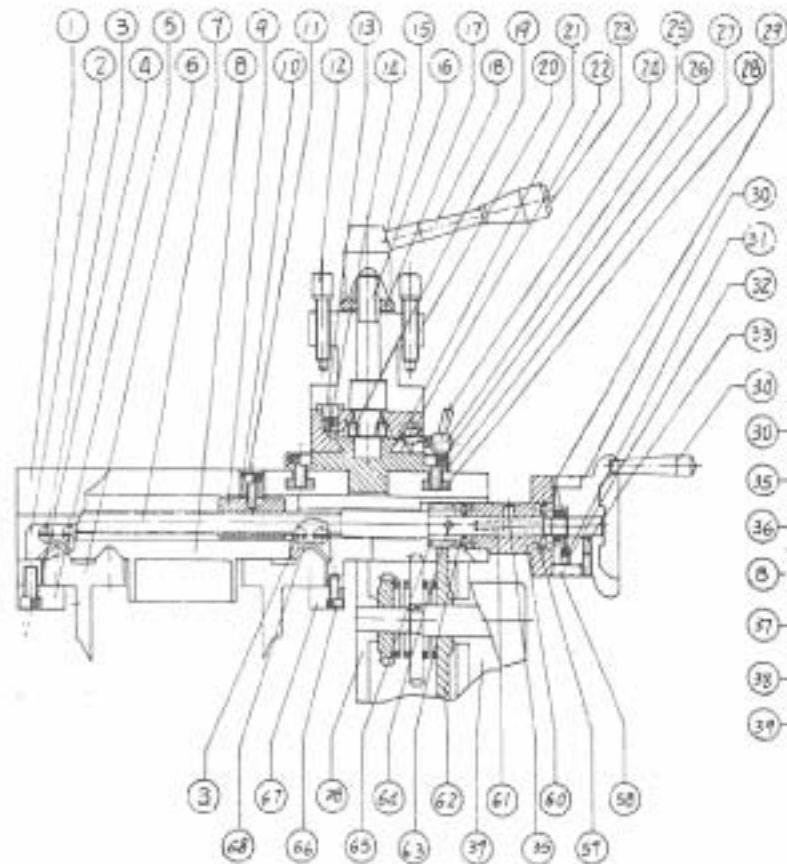
PARTS LIST NO. 2				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
30	3D-26	Gear	S 45C	2
31	3D-25	Gear	S 45C	2
32		Key	5×5×14	2
33		Socket head cap screw	M 6×12	1
34	3D-21-1	Washer	SS 41	1
35	3D-20	Gear	S 45C	1
36		Key	5×5×13	1
37	3D-19	Bearing case	FC 20	1
38	3D-21	Shaft	SS 41	1
39		Cap screw	M 6×12	3
40		Ball bearing	# 6003	1
41	3D-1	Gear box body	FC 25	1
42	3D-1-2	Bushing	gun metal	1
43	3D-17	Gear	SS 41	1
44		Key	5×5×15	1
45	3D-3	Gear	SS 41	3
46	3D-2	Gear	SS 41	1
47	3D-2-1	Bushing	gun metal	1
48	3D-4	Gear	S 45C	1
49		Key	5×5×72	1
50	3D-5	Gear	S 45C	1
51		Spring pin	Ø 5×20	2
52	3D-6	Gear	S 45C	1
53	3D-7	Gear	S 45C	1
54	3D-8	Gear	S 45C	1
55	3D-9	Gear	S 45C	1
56	3D-10	Gear	S 45C	1
57	3D-11	Gear	S 45C	1

PARTS LIST NO. 3				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
58	3D-16	Nut	SS 41	4
59		Key	5×5×15	1
60	3D-14	Lead screw	S 45C	1
61		Thrust ball bearing	# 2901	2
62	3D-12	Gear	S 45C	4
63		Key	5×5×15	1
64	3D-1-1	Bushing	gun metal	1
65		Ball bearing	# 6002 ^{rs}	1
66		C-Type snap ring	Ø 16	2
67		Key	5×5×15	1
68	3D-23	Gear	S 45C	1
69		C-Type snap ring	Ø 12	2



PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1	3E-1	Tailstock	FC 25	1
2	3E-2	Base plate	FC 25	1
3		Hexagon nut	$\varnothing \frac{1}{2}$ "	1
4	3E-17	Clamping bolt	S 20C	1
5		Washer	$\varnothing \frac{1}{2}$ "	1
6	3E-18	Clamping block	FC 20	1
7	3E-15	Sleeve	S 20C	1
8		Taper pin	# 3×25	1
9	3E-14	Clamping axle	S 20C	1
10	3E-16	Sleeve	S 20C	1
11	3E-23	Fixing bolt	S 20C	1
12	3E-11	Eccentric axle	S 20C	1
13		Key	S 20C	1
14	3E-3	Tailstock quill	S 45C	1
15		Oiler	$\varnothing \frac{1}{4}$ "	3
16	3E-5	Lead screw of tailstock	S 45C	1
17	3E-4	Bush of Tail stock quill	gun metal	2
18		Headless set screw	M 6×20	4
19		Socket head cap screw	M 6×16	1
20	3E-6	Bracket	FC 25	1
21	3E-12	Pin	S 20C	1
22		Compression spring	SUP 6	1
23		Steel ball	$\varnothing \frac{1}{4}$ "	1
24	3E-7	Graduation collar	S 20 C	1
25		Hexagon nut	$\varnothing \frac{3}{8}$ "	1
26	3E-8	Handwheel	S 20C	1
27	3E-9	Handle	S 20C	1
28	3E-20	Adjustable screw	S 20C	1

PARTS LIST NO. 2				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
29	3E-19	Adjustable screw	S 20C	1
30	3B-1	Bed	FC 30	1
31	3C-38	Knob		1
32	3E-22	Knob		1
33	3E-10	Clamp lever	S 20C	1
34	3E-21	Stud	S 20C	1
35		Washer	Ø 3/8"	1
36	3E-13	Clamp lever	S 20C	1



PARTS LIST NO. 1				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
1	3H-6	Cross slide	FC 25	1
2	3H-39	Wiper	Rubber	2
3		Round head screw	$3/16 \times \frac{1}{2}$	8
4		Socket head cap screw	M 8×16	3
5	3H-3	Block slide(back)	FC 20	1
6	3B-1	Bed	FC 30	1
7	3H-11	Lead screw of cross slide	S 45C	1
8	3H-1	Saddle	FC 25	1
9	3H-10	Lead screw nut	gun metal	1
10	3H-9	Fixing sleeve	S 20C	1
11		Socket head cap screw	M 6×15	1
12	3H-35	Clamping bolt	SS 41	1
13	3H-33	Locating pin	SS 41	1
14	3H-32	Spring	SUP 6	1
15	3H-37	Tool post clamp lever seat	S 20C	1
16	3H-30	Clamping axle	SS 41	1
17	3H-36	Washer	S 20C	1
18	3H-38	Clamping lever	S 20C	1
19		Headless set screw	M 6×6	2
20	3H-34	Tool post	SS 41	1
21	3H-28	Gib	FC 20	1
22	3H-29	Adjustable screw of gib	S 20C	1
23	3C-38	Knob		1
24		Pin	# 3	2
25	3H-31	Clamping bolt	S 20C	1
26		Socket head cap screw	M 8×12	2
27	3H-19	Swivel base	FC 25	1
28	3H-18	Fixing block	S 20C	2

PARTS LIST NO. 2				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
29	3H-15	Nut	$\varnothing \frac{1}{2}$	2
30		Gross slide handwheel	FC 25	1
31		Spring	SUP 6	1
32		Steel ball	$\varnothing \frac{1}{4}$	1
33		Headless set screw	M 6×12	1
34	3H-16	Handle	S 20C	1
35		Oiler	$\varnothing \frac{1}{4}$	6
36		Socket head cap screw	M 8×30	2
37		Spring pin	5×5×35	2
38	3C-1	Case of apron	FC 25	1
39	3C-16	Bracket	FC 25	1
40	3H-22	Compound slide	FC 25	1
41	3H-7	Gib	FC 20	1
42	3H-8	Adjustable screw of gib	S 20C	2
43	3H-20	Nut	Cu	1
44	3H-21	Lead screw of compound slide	S 45C	1
45		Set screw	M 6×12	1
46		Socket head cap screw	M 6×20	2
47		Bearing seat	FC 25	1
48		Thrust ball bearing	# 2901	1
49	3H-26	Handle	S 20C	1
50	3H-25	Handwheel	FC 25	1
51	3H-27	Handle	S 20C	1
52		Headless set screw	M 6×6	2
53	3H-24	Granduation collar	S 20C	1
54		Nut	$\varnothing 7/16$	2
55		Nut	$\varnothing 3/8$	1
56		Washer	$\varnothing 3/8$	1

PARTS LIST NO. 3				
REF. NO.	PART NO.	PARTS NAME	MATERIAL & SPEC.	AMT USED
57	3H-4	Fixing bolt	SS 41	1
58	3H-14	Graduation collar	S 20C	1
59		Thrust ball bearing	# 2901	1
60	3H-13	Bearing seat	FC 25	1
61		Socket head cap screw	M 6×50	2
62	3C-14	Clutch gear	S 45C	1
63		Thrust ball bearing	# 2901	1
64		Spring pin	5×5×20	1
65	3H-12	Pinion	S 45C	1
66		Socket head cap screw	M 6×16	4
67	3H-2	Block slide(front)	FC 20	2
68	3H-40	Wiper	Rubber	2