TABLE OF CONTENT

IMPORTANT

DO NOT OPERATE, PROGRAM OR REPAIR THE MACHINE UNTIL YOU HAVE READ THIS MANUAL DETAILLY

DO NOT OPERATE, PROGRAM OR PERAIR THE MACHINE UNTIL YOU HAVE READ THE APPROPRIATE MANUALS !

NOTE: A SAFETY MANUAL MUST REMAIN ATTACHED TO THE MACHINE AT ALL TIMES.

SAFETY OPERATION RULES

1. SECURE WORK Use chuck to hold workpiece when practical. It's more safer than using your hand and it frees both hands to operate tool.
2. DON'T OVERREACH! Keep proper footing and balance at all times.
3. MAINTAIN TOOLS WITH CARE. Keep tools sharp and clean for the best and safest performance. Follow instructions for lubricating and changing accessories.
4. DISCONNECT TOOLS before servicing, when changing accessories such as cutting tools.
5. REDUCE THE RISK OF UNINTENTIONAL STARTING. Make sure switch is in off position, before intend plugged in.
6. USE RECOMMENDED ACCESSORIES. Consult the owner's manual for recommended assessories. The use of improper accessories may cause risk or injury to persons.
7. NEVER STAND ON TOOL. Serious injury could occur, if the tool is tipped or if the cutting tool is unintentionally contacted.
8. CHECK DAMAGE PARTS. Before, further use or the tool, a guard or other part that is damaged should be carefully checked to determine that it will operate properly and perform its intended function, check for alignment of moving parts, binding of moving parts, breakage of parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.
9. NEVER LEAVE TOOL RUNNING UNATTENDED, TURN POWER OFF! Don't leave tool until it comes to a complete stop.
10. ALWAYS USE SAFETY GLASSES. Common eyeglasses only have impact resistant lenses, they are NOT safety glasses.
11. KEEP GUARDS IN PLACE and in working order.
12. REMOVE ADJUSTING KEYS AND WRENCHES. Form habit of checking to see that keys and adjusting wrenches are removed from tool before turning it on.
13. KEEP WORK AREA CLEAN. Cluttered areas will invite accidents.
14. DON'T USE IN DANGEROUS ENVIRONMENT. Don't use power tools in damp or wet location, or expose them to rain. Keep work area well lighted.
15. KEEP CHILDREN AWAY. All visitors should be kept safe distance from work area.
16. MAKE WORKSHOP CHILD PROOF with padlocks, master switches, or by removing starter keys.
17. DON'T FORCE TOOL. Don't force tool or attachment to do a job for which it was not designed.
18. USE RIGHT TOOL. It will do the job better and safer at the rate for which it was designed.
19. WEAR PROPER APPAREL. No loose clothing, gloves, neckties, rings bracelets, or other jewelry to get caught in moving parts. Nonslip footwear is recommended, Wear protective hair covering to contain long hair.
20. Never use the high speed over one hour.
21. KEEP TURNING TOOLS TIGHT during operation.

SPECIFICATIONS

SPECIFICATIONS

MODEL	2040G	2060	2080G	20120G
General Capacity:				
Cener height		10 2/5"		
Max. swing over bed		20 1/10"		
Max. swing over gap		27 1/8"		
Max. swing over cross slide		13"		
Distance between centers	40"	60"	80"	118 1/8"
Main Spindle:				
Spindle nose		ASA1-8 or D1-8		
Spindle bore		3 1/8"		
Spindle speeds		20 ~ 1500RPM(18 Steps)		
Carriage:				
Cross slide travel		11 4/5"		
Compound rest travel		4 7/10"		
Tailstock:				
Tailstock spindle dia.		2 7/10"		
Tailstock spindle travel		5 9/10"		
Tailstock spindle taper		MT#4		
Bed:				
Bed width		13 4/5"		
Threading:				
Lead screw		4TPI or 6mm/pitch		
Metric pitch threads		0.5-7mm/pitch(24 klnds)		
Inch threads		4-56 TPI(36 kinds)		
Module pitch threads		0.5-3.5MP(16 kinds)		
DP threads		8-112DP(36 kinds)		
Feeding Range				
Range of longitudinal feeds		0.06-0.88mm/rev		
Rangeof cross feeds		0.06-0.88mm/rev.		
Motor:				
Main spindle		10HP		
Coolant pump motor		1/8HP		
Net Weight Approx.	4180 lbs	4650 lbs	5280 lbs	6600 lbs
Gross Weight Approx.	4840 lbs	5310 lbs	5940 lbs	7480 lbs

PREPARATION FOR OPERATION
&
CAUTIONS

NOTES BEFORE OPERATION:

UNPACKING:

After unpacking the transporting wooden case, users must inspect the machine carefully. If there are any shortage or damage, please contact your local dealer immediately.

MOVING & LIFTING:

Moving and lifting the machine use a special hang fixture as figure I shown and insert the special hang fixture into the gap center of the machine bed. Raising and lowering the machine should be careful. Don't touch the leadscrew, spindle or other handwheel etc. Be careful not to bump the machine against the floor. Before moving, please check the following portions:

1. Locked & clamped the tailstock.
2. Locked the saddle lock.
3. Engaged halfnut with leadscrew.

FOUNDATIONS:

Due to the cutting speed and spindle speed are much higher than before. An incomplete foundation will generate vibration and unstable condition. Since the foundation work should be done as figure shown, enough space and boundary are necessary, for which machine should be installed at least 2 feet from the wall and other machines.

LEVELLING THE MACHINE:

Anchor bolts and installation blocks must be fixed steadily into the cement. For alignment of the machine, place the square levelling gauge on the guideway of bed (The precision of levelling gauge is 0.0008/40" or more better) and measuring the level of the bed way from left to right, so as to, adjust the saddle, both front and rear. Make sure the sensitivity is within 0.0016/40".

After the levelling procedures are completed, fasten the foundation nuts. If flatness is deviated by fastening nuts, then it must re-measure again until no deviation is found.

CLEAN UP:

Anti-corrosive coating is applied on the machine before transport. For cleaning up the bed, the slides, and the leadscrew etc., we can use dissoluable solvent to clean off

the anti-corrosive coating. Don't use lacquer, varnish or kerosene! Apply lubricating oil to all the necessary portions. Check all the handles and levers to see if the machine is functioning properly, then set them to neutral positions.

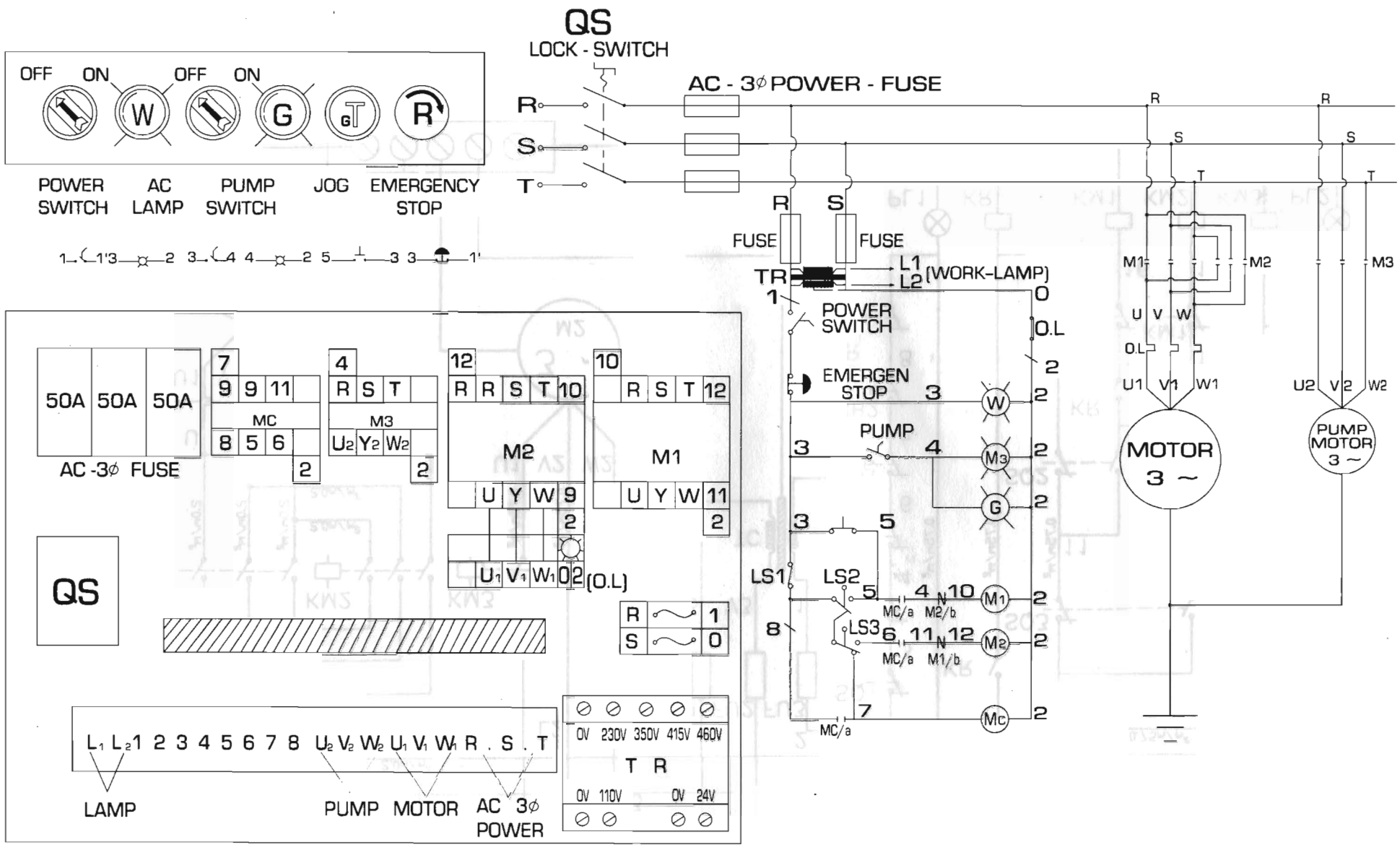
ELECTRICAL POWER CONNECTION:

Electrical cabinet is provided at the rear lower of the headstock, Inside this cabinet, it has a separate sub-panel for all of the electrical components, transformers and fuses etc. We also provided the electrical connecting diagram at following pages.

CAUTIONS:

After wiring, check the spindle rotating direction, which can be switched on the power switch and the jogging switch etc., If it rotates in counter-clockwise i.e it is the correct wiring. If it is not, we have to exchange two of the connecting terminals(R.S.T.) and then recheck the rotating direction again.

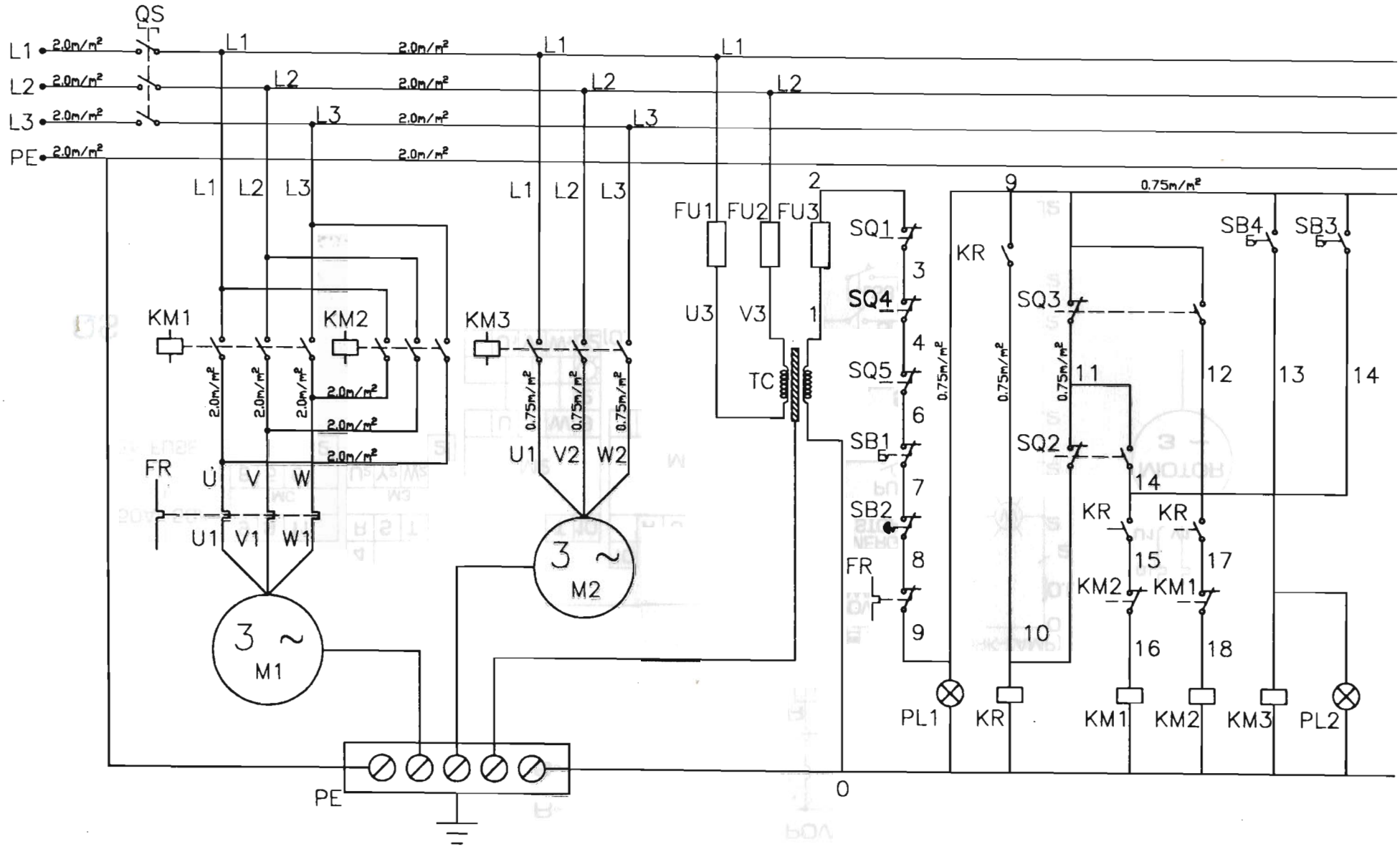
ELECTRICAL DIAGRAM
&
PARTS LIST



LS 1=MAIN MOTOR BRAKE STOP
(3.8)
LS 2=SPINDLE FDRWARD PUNNING
(5.8)
LS 3=SPINDEL REVERSE RUNNING
(6.7)

ACER (LATHE MACHINE)

CE Standard


QS
L1
L2
L3
PE
2.0m/m²
0.75m/m²
KM1
KM2
KM3
FR
U1
V1
W1
U
V
W
U2
V2
W2
M1
M2
FU1
FU2
FU3
U3
V3
TC
SQ1
SQ4
SQ5
SB1
SB2
SQ3
SQ2
SB4
SB3
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PL1
PL2
PE
0
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18

Manufacturer: **ACER**	SCHEDULE OF ELECTRICAL EQUIPMENT	sheet
Order		
TYPE:LATHE MACHINE	See also list	Drawn
		Checked

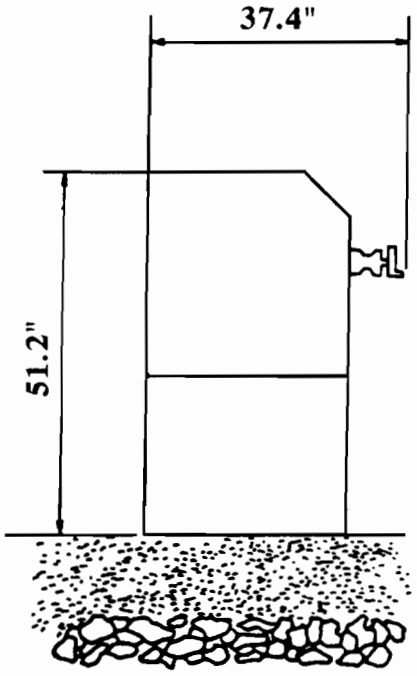
Item designation	Description and function	Technical data	Quantity	Supplier	Suppliers referance	Remarks
QS	Main Power(Door lock) Switch	AC 500V/50HZ 3P 16A	1	MACK	MK-316	IEC 408 IP 65
FU1 **FU2**	AC Fuse To Transformer	AC 600V 30 MM 2A	1 1	SHINING	FS-011	CSA. C22.2 NO. 59.2
FU3	Ac Low Voltage To Transformer	AC 600V 30 MM 3A	1	SHINING	FS 011	CSA. C22.2 NO. 59.2
KM1 **KM2** **KM3**	Contactors	3Pla Ri=AC 660V Rt= 25A AC3 220V 2.2KW 380V 4.0KW	1 1 1	N.H.D. HUH-DIAN	C-09D10 (4a)	IEC 158-1 VDE 0660 BS 5424-1 JIS 8325
FR	Over-Load (Relays)	5 ~ 8A 6.5A Ui=AC 600V Ith= 10A	1	N.H.D. HUH-DIAN	BTH-12 (1NO+1NC)	IEC 202-1 VDE 0660 JIS 8325 BS 5434-1
KR	Contactors-Relay	Coil=AC 24V AV 240V 5A DC 30V 5A	1	IDEC- IZUMI	RY4S-U	UL E55906 CSA LR35144
TC	Transformer	AC Hi=380V(220V) LO=24V TR-72VA	1	SUENN - LIANG	SP-TBS	IEC 75-5 EX 60742 IEC IP-2
TB	Casset Terminal-Block	AC 600V MAX.20A MAX.10A	3 16	SHINING	TA-020 TA-010	UL E22562
PL1 **PL2**	Piolt-Lamps Ac Power Lamp Piolt-Lamps Pump Lamp	AC 24V 1.5W 220φ	1 1	MACK	MK/L-22	IEC-144 IP 65.
SB1 **SB2** **SB3** **SB4**	Power Selector Switch Emergency-Stop Jogging-Botton Pump-Seclector	AC 250V 10A MAX.600V 380V 7.5A 1NO•1NC 22φ	1 1 1 1	MACK	MK/CP-22 MK/B -22 MK/BP-22 MK/C-22	IEC-144 IP 65
SQ1	Safe-Cover (Limit.Switch)	AC 400V 15.2A MAX.600V 1NO•1NC 22φ	1	ORMON	D4D-1520N	IEC 947-5-1 EX 60947-5-1 EX 50047 IP 65
SQ2 **SQ3** **SQ4**	For-Limit.Switch Rev-Limit.Switch Foot-Cut(L.S)	AC 125V 10A MAX.600V 250V 10A DC 115V 0.4A	1 1 1	MOUJEN	MJ-1704	UL E100183 HL 56C7
CABLE-LOCK	Cable-Glands		1	AVG	M-16	IF G8
LINE	Control-Line	0.75 m² MAX.300V (30/0.18)-7A Ambient Temp (35℃~60℃)	1	TONG-WU		CXS 679 JIS C3307
CABLE	PVC Cable-Wire	2.0 m2 •4c(37/0.26)/16A 1.25m2•4c(50/0.18)/11A Anbient Temp (35℃~60℃) MAX.600V	1	TONG-WU		CXC 3301.4398 JIS C3342.3401
M1	Main-Motor		1			
M2	Pump-Motor		1			

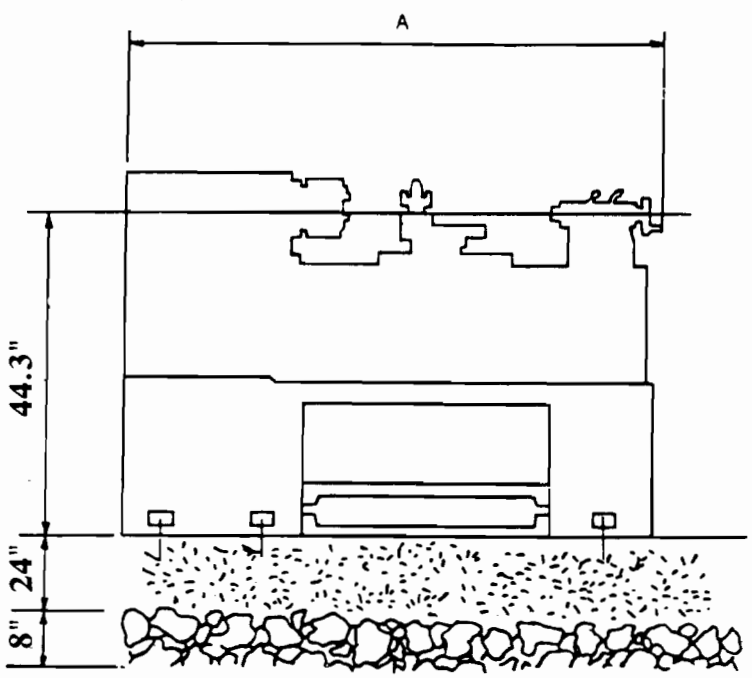
MACHINE INSTALLATION, DESCRIPTION, OPERATION & MAINTENANCE

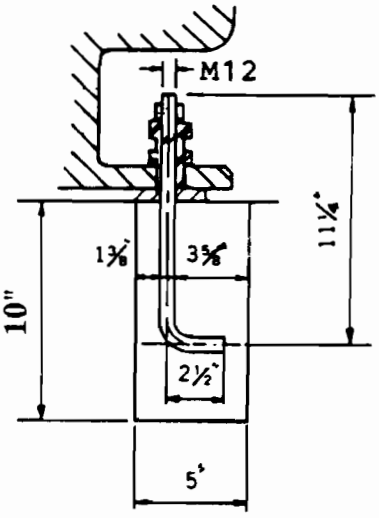
Installation

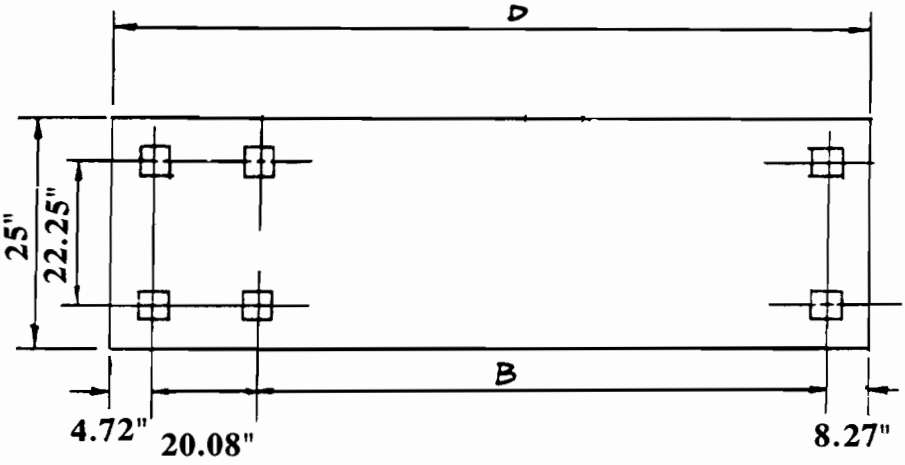
1-1 FOUNDATION DIAGRAM

unit : inch









	A	B	C	D
2040GH	83.86"	52.56"		85.63"
2060GH	110.63"	72.24"		105.31"
2080GH	148.82"	91.93"		125"

2-1 Lifting Machine

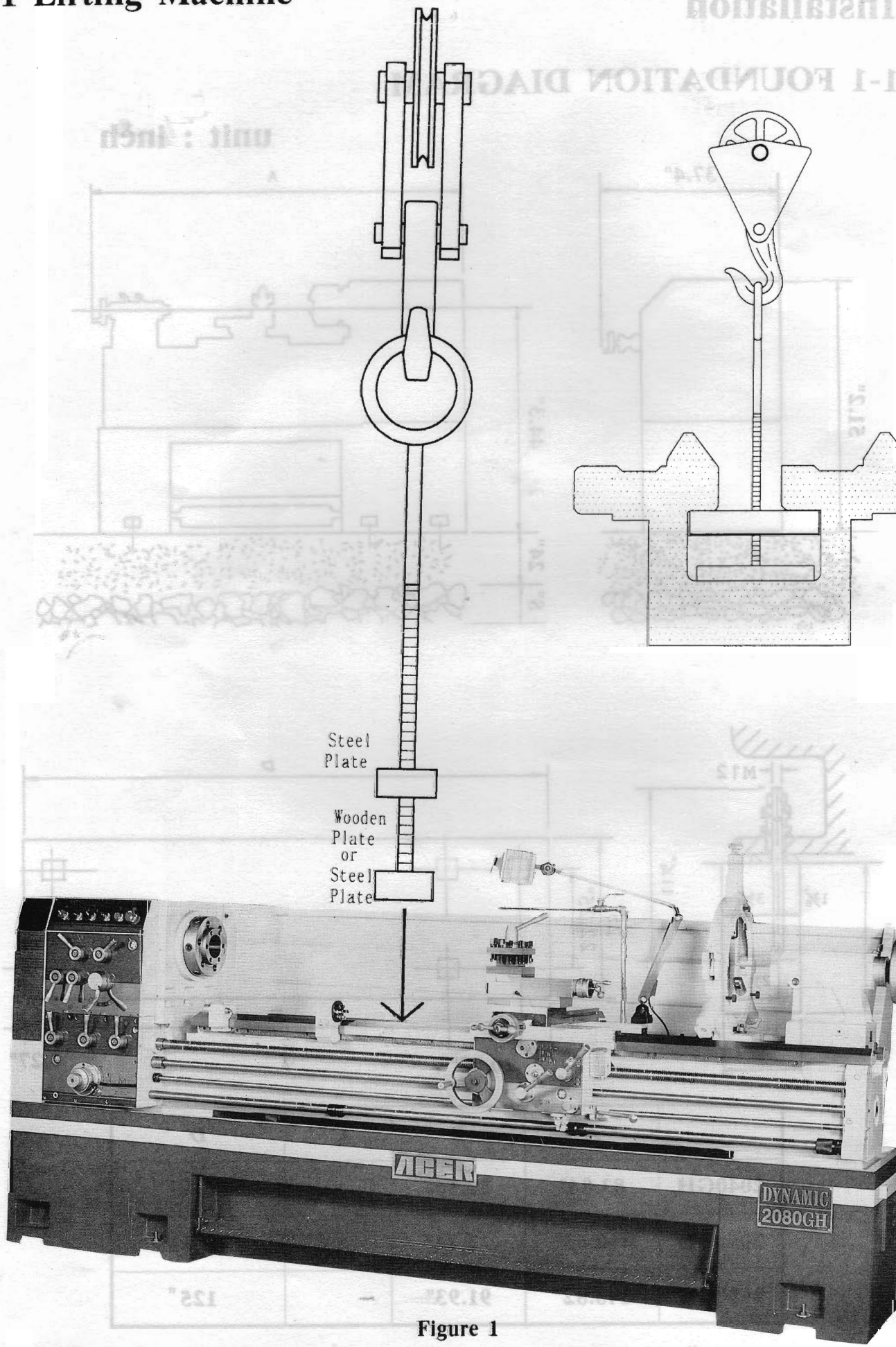


Figure 1

Installation

2-2 LEVELING OF LATHE

Anchor bolts and installation blocks must be fixed steadily to the cement.

For alignment of the machine, place spirit level which has sensitivity better than 0.0008/40" on the guideways of the bed, adjust the level of the bed-way from left to right, then adjust the level of saddle, both front and rear, make sure the sensitivity is within 0.0016/40".

After the adjustment of level, fasten the nuts; if flatness is deviated by fastening nuts, adjust it again until no deviation is found.

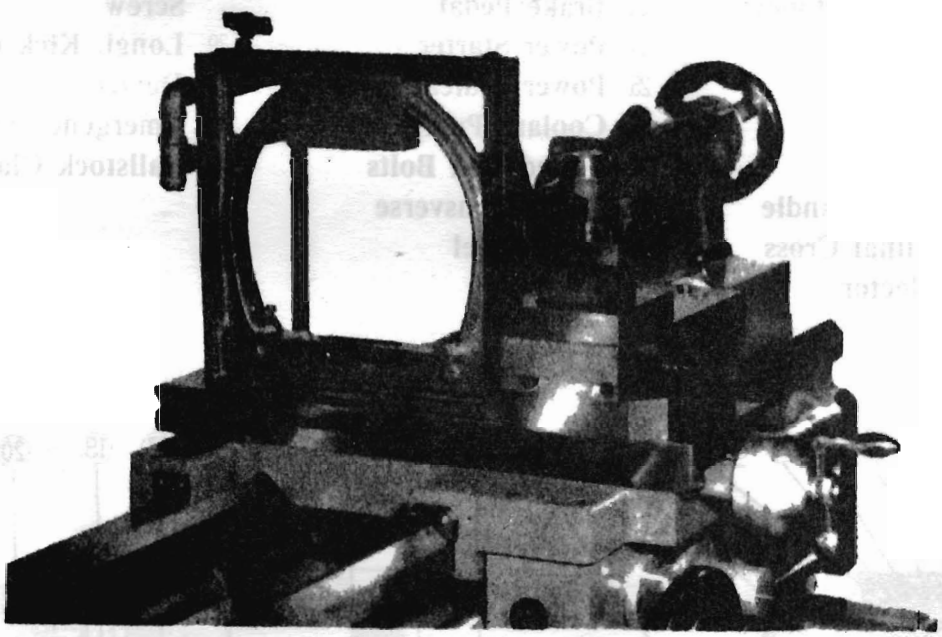


Figure 2

Description

MACHINE FEATURES

1. Headstock
2. Feed Gear Box
3. Apron
4. Tailstock
5. Spindle Speed Selector
6. High-Low Speed Selector
7. Feed Direction Selector
8. Feed Selector & Plate
9. Drive Motor Starter
10. Drive Motor Stopper Selector
11. Longitudinal Transverse Handwheel
12. Cross Feed Handle
13. Longitudinal-Cross Feed Selector
14. Threadcuting Engagement Lever
15. Treading Indicator Dial
16. Carriage Lock
17. Leadscrew
18. Feed Bar
19. Spindle Control Lever
20. Quill Lock
21. Coolant Pipe
22. Jogging Switch
23. Brake Pedal
24. Power Starter
25. Power Indicator
26. Coolant Pump
27. Foundation Bolts
28. Quill Transverse Handwheel
29. Gap
30. Feed Selector
31. Longitudinal-Cross Feed Clutch
32. Coolant Pump Indicator
33. Feed Selector
34. Feed Selector
35. Feed Selector
36. Engage Lever
37. Hand Pump
38. Pressure Adjusting Screw
39. Longi. Kick-out Device
40. Emergency Stop
41. Tailstock Clamp

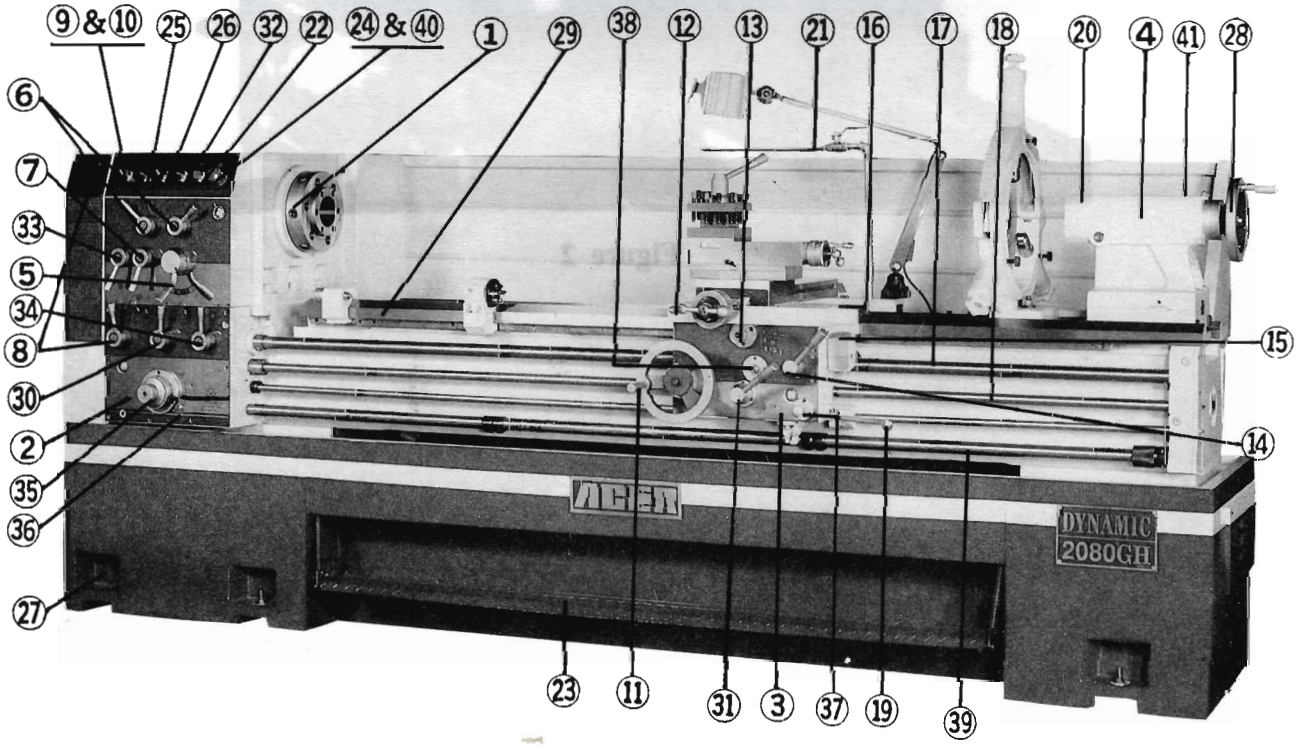


Figure 3

Preparation for Operation

4-1 SPINDLE ROTATION, STOP AND RESTART

1. **Turn on power source switch.**
2. **Set lever ⑦ at neutral position(Middle Position).**
3. **Set the spindle speed lever ⑤ to the needed speed. Then set ⑥ High/Low speed control lever to either high or low position and pole change switch to either ⊕ or ⊖ position according to the speed chart shown in table 1.**

SPEED RANGE		1	2	3
H	I	910	1155	1500
	H	435	565	725
M	I	190	240	320
	H	93	115	150
L	I	43	55	71
	H	20	26	34

Table 1

4. **Push Forward/Reverse control lever ⑲ to the right and lift it up or push it down to get the forward or reverse revolution.**
5. **To stop the spindle rotation by using your foot to push the brake pedal.**
6. **To restart the spindle rotation, use the same Forward/Reverse control lever as before you stop. Then move it to neutral position and repeat step (4).**

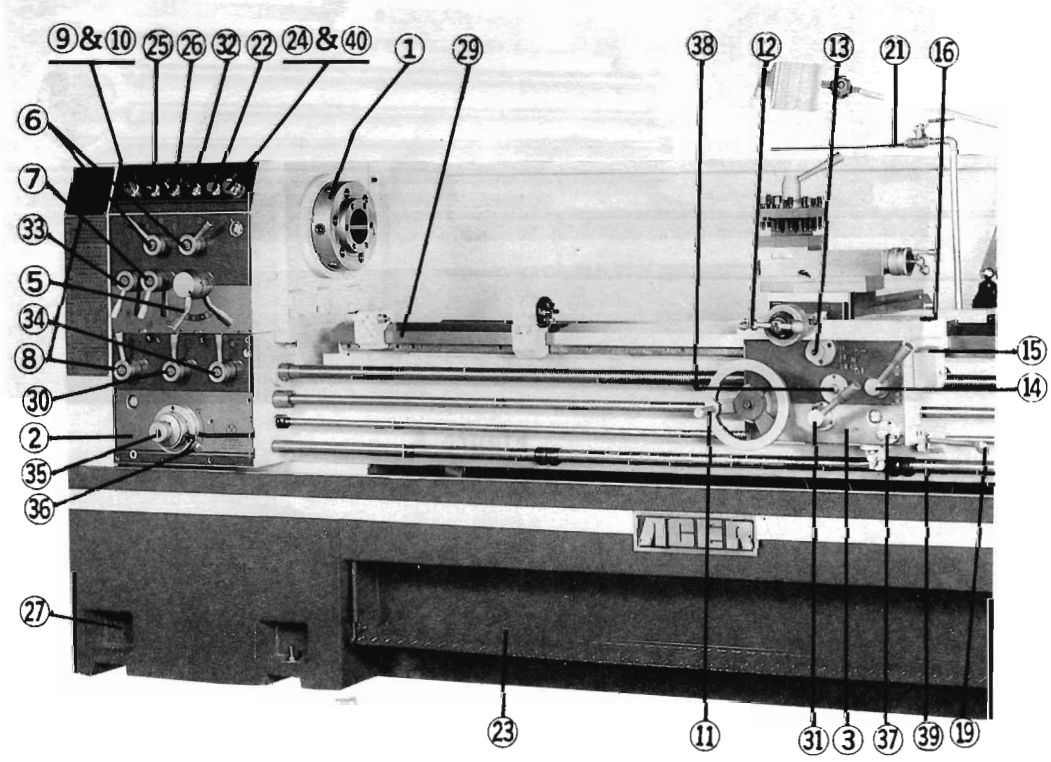


Figure 4

Preparation for Operation

CAUTIONS!!!

1. **Stop spindle rotation before changing spindle speed. Otherwise, the headstock gear will be damaged.**
2. **If it is hard to set the lever on position when change the speed, push the jogging switch push botton, then set the change gear lever again.**

4-2 OPERATION OF JOGGING SWITCH, PUSH BOTTON

There is a push button ㉒ on top of headstock(see Fig. 5). Push it slightly. The spindle will run positively and stop automatically. This is for changing speed easier and adjusting the center for raw material when a 4-jaw chuck is used.

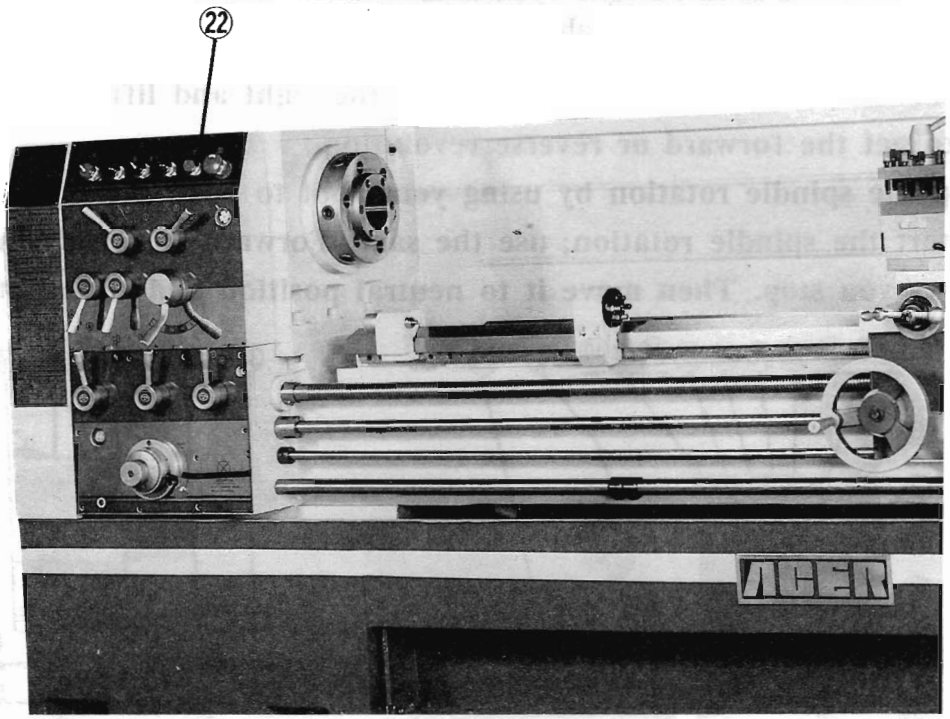


Figure 5

4-3 CHANGE GEAR SYSTEM

The change gear system is located at the left side of the headstock. Please refer to thread cutting chart, table 3. Be sure that the gears are aligned after you have changed them.

Caution: Don't attempt to change gears while spindle is rotating.

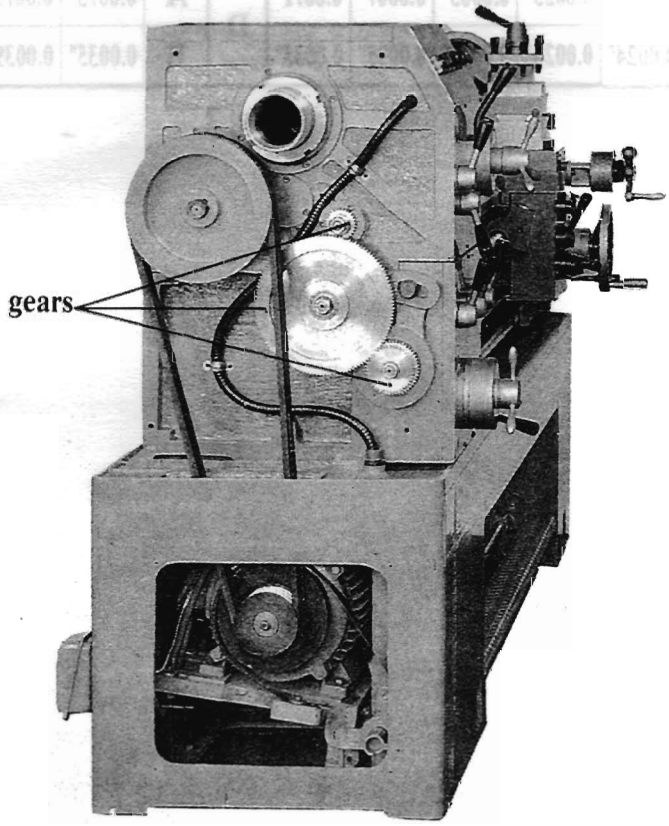


Figure 6

For longitudinal feed, push in lever ⑬. For cross feed, pull out lever ⑬. Please refer to table 2.

LEVER		Ⓕ M Feed speed					LEVER		Ⓕ M Feed speed				
		1	2	3	4	5			6	7	8	9	
C	A	0.50	0.56	0.63	0.69	0.72	C	A	0.76	0.82	0.85	0.88	
	B	0.25	0.28	0.32	0.35	0.36		B	0.38	0.41	0.43	0.44	
D	A	0.13	0.14	0.16	0.17	0.18	D	A	0.19	0.20	0.21	0.22	
	B	0.06	0.07	0.08	0.09	0.09		B	0.09	0.10	0.10	0.11	

Table 2

Preparation for Operation

LEVER		Ⓕ inch Feed speed					LEVER		Ⓕ inch Feed speed				
		1	2	3	4	5			6	7	8	9	
C	A	0.0197"	0.022"	0.0248"	0.0272"	0.0283"	C	A	0.0299"	0.0322"	0.0335"	0.0346"	
	B	0.0098"	0.011"	0.0126"	0.0138"	0.0142"		B	0.015"	0.0161"	0.0169"	0.0173"	
D	A	0.0051"	0.0055"	0.0063"	0.0067"	0.0071"	D	A	0.0075"	0.0079"	0.0083"	0.0087"	
	B	0.0024"	0.0028"	0.0031"	0.0035"	0.0035"		B	0.0035"	0.0039"	0.0039"	0.0043"	

Table 2

THREADING CHART

LEVER		W FOR CUTING INCH THREAD								
		1	2	3	4	5	6	7	8	9
D	A	4	4 1/2	4 3/4	5	5 1/2	5 3/4	6	6 1/2	7
	B	8	9	9 1/2	10	11	11 1/2	12	13	14
C	A	16	18	19	20	22	23	24	26	28
	B	32	36	38	40	44	46	48	52	56

LEVER		M FOR CUTTING METRIC THREAD								
		1	2	3	4	5	6	7	8	9
C	A	4	4.5	4.75	5	5.5	5.75	6	6.5	7
	B	2	2.25		2.5	2.75		3	3.25	3.5
D	A	1			1.25			1.5		1.75
	B	0.5			0.625			0.75		0.875

LEVER		W FOR CUTTING DP THREAD								
		1	2	3	4	5	6	7	8	9
D	A	8	9	9 1/2	10	11	11 1/2	12	13	14
	B	16	18	19	20	22	23	24	26	28
C	A	32	36	38	40	44	46	48	52	56
	B	64	72	76	80	88	92	96	104	112

LEVER		M FOR CUTTING MODULE THREAD								
		1	2	3	4	5	6	7	8	9
C	A	2	2.25		2.5	2.75		3	3.25	3.5
	B	1			1.25			1.5		1.75
D	A	0.5			0.625			0.75		0.875
	B	0.25								

Table 3

Preparation for Operation

4-4 MANUAL FEED

Carriage moves longitudinally by turning hand wheel ⑪ (Be sure to set lever ⑦ and ⑬ at neutral position, and pull levers ⑭ up). One division of hand wheel dial is corresponding to 0.002" and its one turn corresponds to 0.4" travel of carriage.

4-5 AUTOMATIC FEED

Automatic feed is operated as follows:

1) Choose feed direction by lever ⑦.
2) Set change gears and shift levers ⑧ & ㉚ & ㉝ & ㉞ to desired feed value.
3) Shift lever ㊱ to feed position.
4) Pull lever ⑭ up.
5) Feed selector ⑬ to select either longitudinal feed or cross feed.
6) Shift lever ⑲ to select direction of spindle rotation.
7) Automatic feed starts when ㉛ lever is operated and stops when it is pulled up to neutral position.

4-6 SWIVEL SLIDE

Loose two cap screws before swivelling it. (as shown Fig. ⑦)

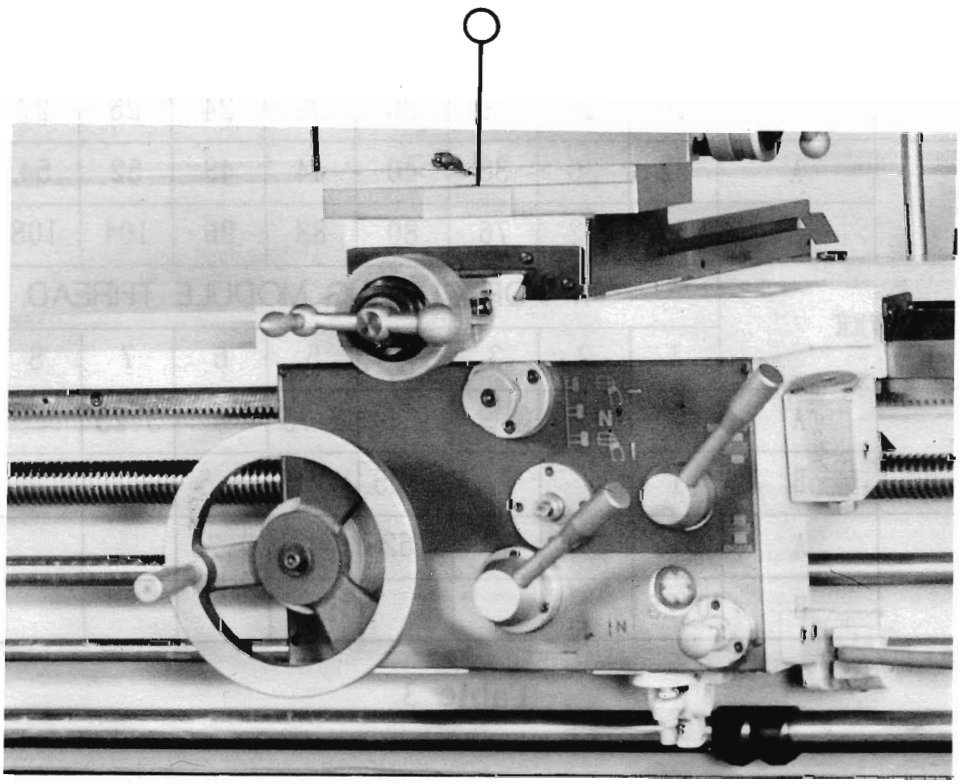


Figure 7

Preparation for Operation

4-7 TAILSTOCK

Tailstock-spindle moves out by turning hand wheel ㉘. Either the arbor of drill chuck or tailstock-spindle center comes out by excessively returning the tailstock-spindle.

Tailstock spindle is clamped by pushing lever ⑳ COUNTER-DIRECTION.
The tailstock is clamped by pulling lever ㊶ upward.

One division of its hand wheel dial corresponds to 0.025" and its one turn corresponds to 0.125" travel of tailstock spindle.

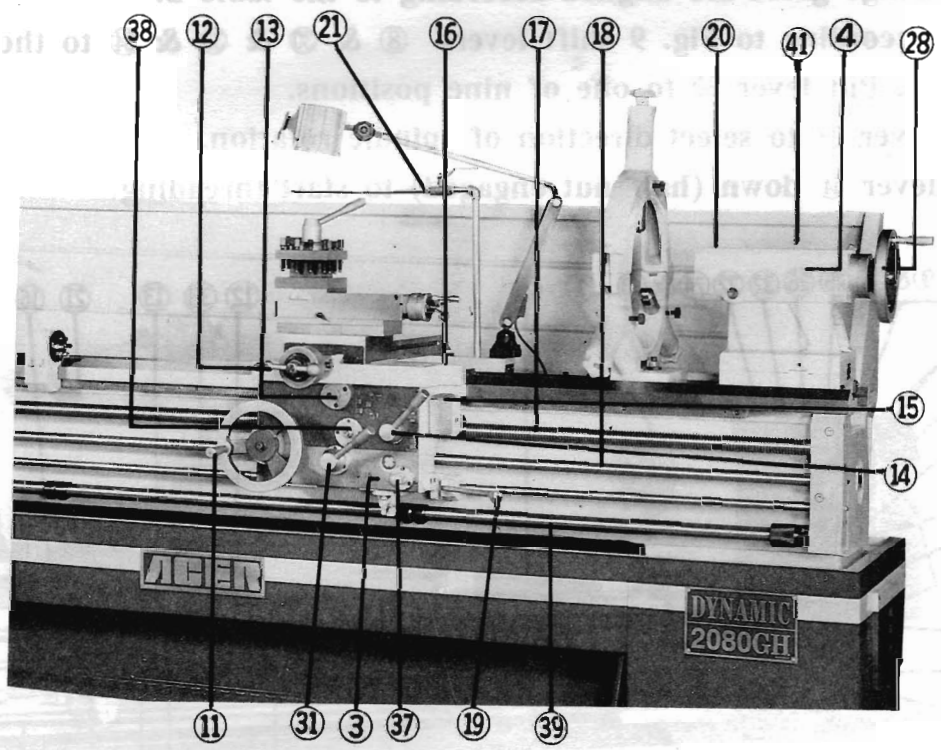


Figure 8

Thread Cutting

5-1 LEADSCREW OPERATION

Shift the lever ⑦ to the right or left, the leadscrew run forward or reverse rotation respectively.

5-2 INCH THREAD SYSTEM

The inch thread cutting is operated as follow:

1) **The change gears are aligned according to the table 2.**
2) **Then according to Fig. 9 shift levers ⑧ & ㉚ & ㉝ & ㉞ to the desired position. Put lever ㊱ to one of nine positions.**
3) **Shift lever ⑲ to select direction of spindle rotation.**
4) **Push lever ⑭ down (half nut engaged) to start threading.**

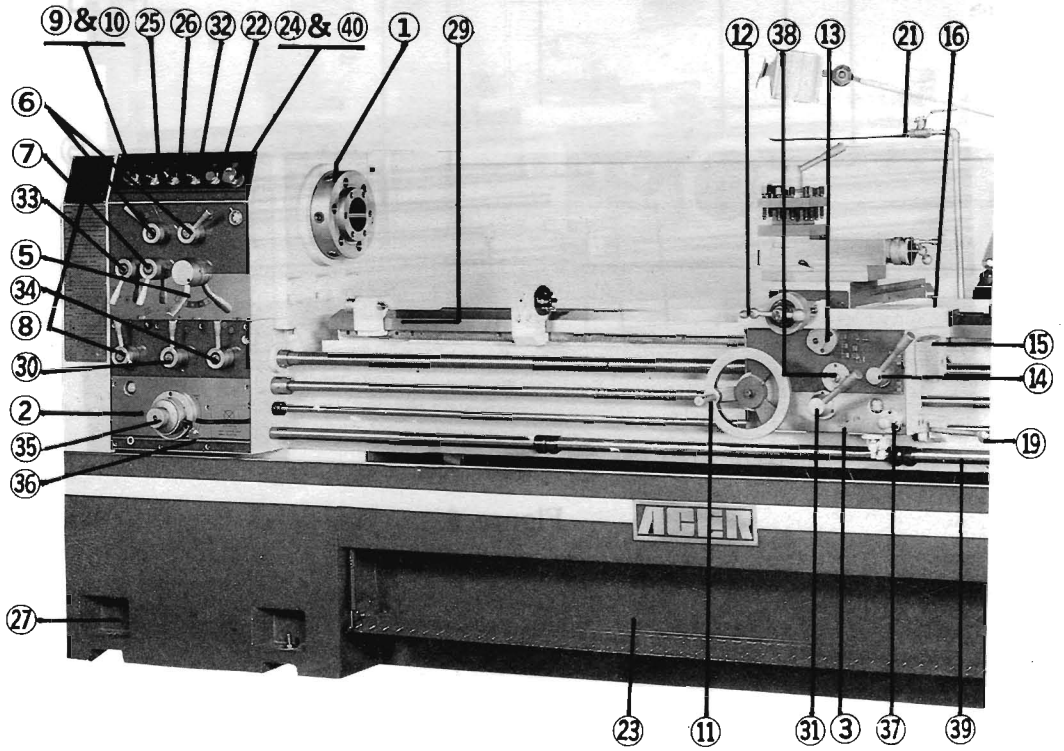


Figure 9

Thread Cutting

5-3 THREAD CUTTING INDICATOR

The thread cutting indicator installed. on the headstock tag which has eight graduations. For cutting inch thread, the thread cutting indicator is prepared for correct positioning of different gear levers.

As to metric thread cutting, half nut should be always engaged with lead-screw completely (When leadscrew is inch). Let tool post back up to starting position by reversing spindle rotation, then feed again.

Maintenance

6-1 LUBRICATIONS

6-1-1 LUBRICATION IN HEADSTOCK & NORTON FEED GEAR BOX.

Oil-bathed lubrication for both gear boxes. Please be sure the oil level is no lower than minimum level of oil window.

6-1-2 LUBRICATION IN CHANGE GEARS

(Transmission gears) Open the V-Belt cover. Lubricate the gears with oil for daily maintenance.

6-1-3 LUBRICATION IN CARRIAGE

Carriage slides and cross feed screw have to be oiled by hand pump.

6-1-4 LUBRICATION IN APRON

The oil cap in the right hand side of apron is for adding oil. Be sure oil level is on the proper height of oil window.

To change the oil in apron, the oil can be removed by taking off the drain plug at the bottom of the apron.

6-1-5 LUBRICATION IN BEDWAYS, LEADSCREW AND LEADSCREW BRACKET

Hand oiling is required from time to time.

6-1-6 COOLANT FOR CUTTING

The coolant pump control switch is located on top of the headstock. The pump works while turn on.

Maintenance

6-2 LUBE CHART

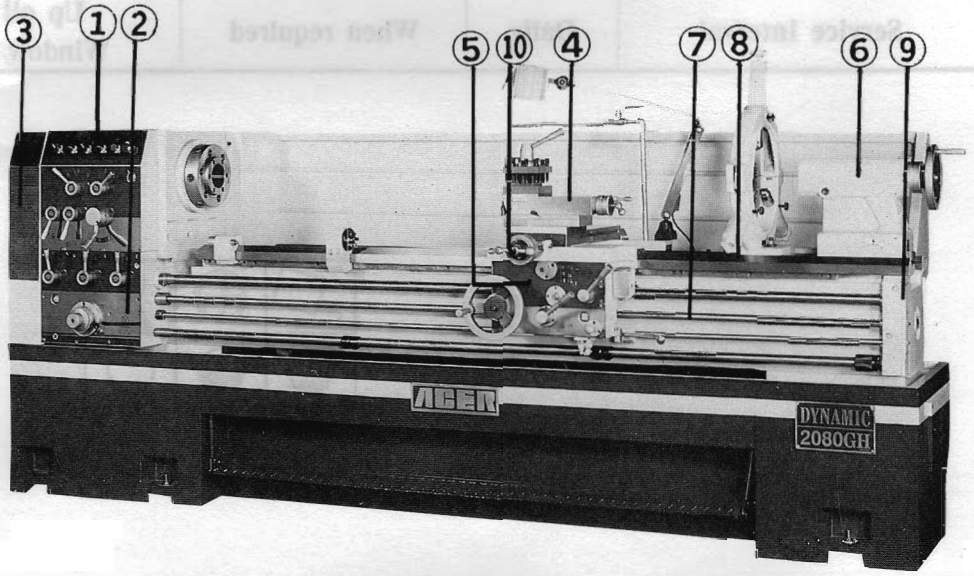


Figure 10

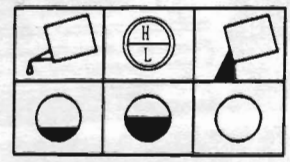
6-2-1 LUBRICATION DIAGRAM

No Inlet	Methods	Qty.	Oil no.	Schedule	Oil change
1. Headstock	Open oil tank cover.	3.6 gal.	1	Gauge once a month of oil indicator.	New machine once a month, later every other month.
2. Feed Gear Box					
3. Change Gears	Open the V-pully cover.	few	2	Daily	
4. Compound Slide	Use gun oiler	few	2	Daily	
5. Apron	Open the cup, fill by gun oiler	few	2	Daily	
6. Tailstock	Use Gun Oiler	few	2	Daily	
7. Leadscrew	Fill with gun oiler	few	2	Daily	
8. Bed way	Fill with Hand Pump	few	2	Daily	
9. Bracket	Fill with gun oiler	few	2	Daily	
10. Carriage screw	Fill with Hand Pump	few	2	Daily	

OIL NO.	MOBIL	ESSO	SHELL
1	D. T. E. Heavy Medium	Tellesso 52	Fellus 33
2	Vactra No. 2	Febis K-53	Tonna Oil 27

6-2-2 CE Lubrication Diagram

			
Service Interval	Daily	When required	Up oil level Window oftenly



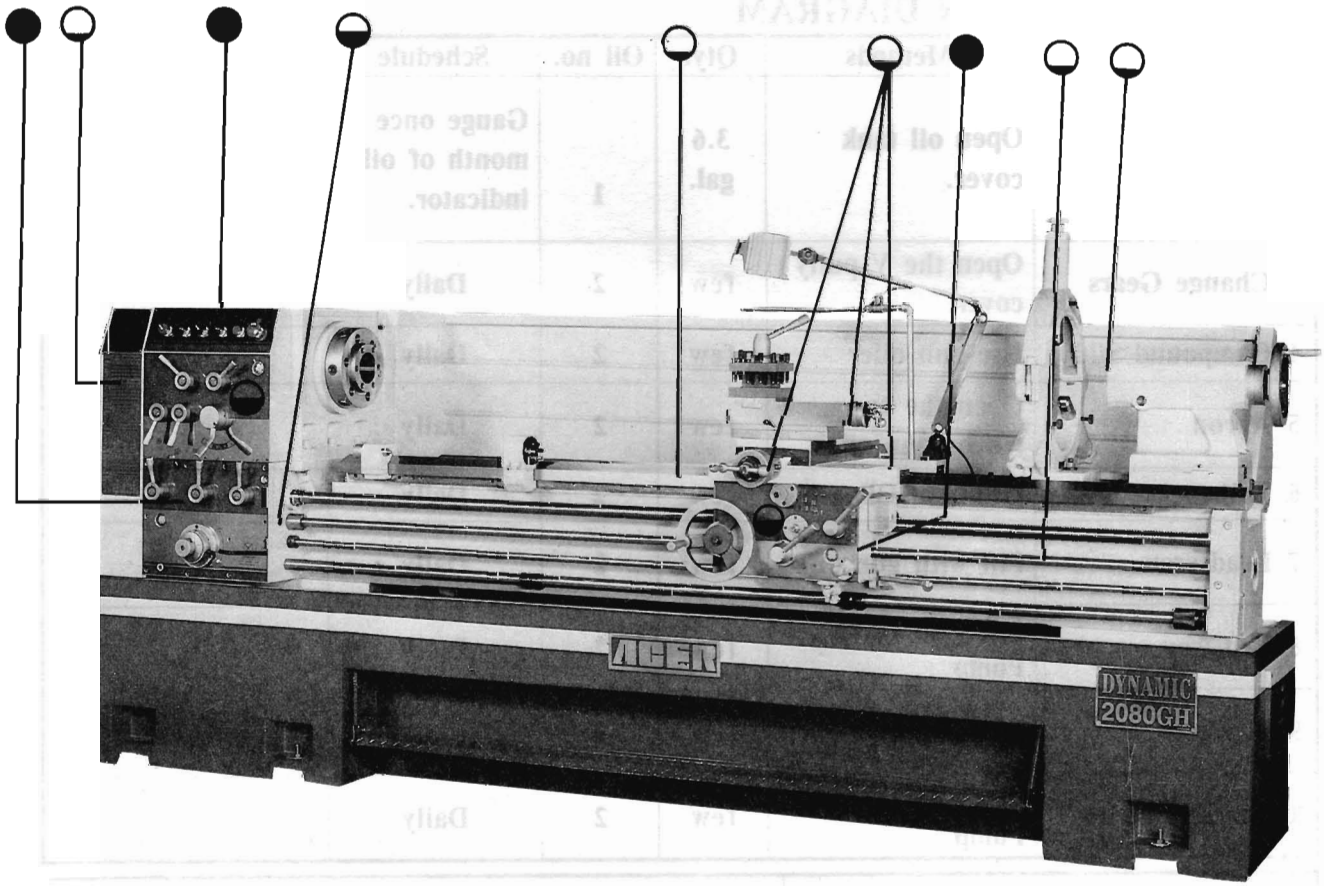


Figure 11

TROUBLE SHOOTING & REMEDY

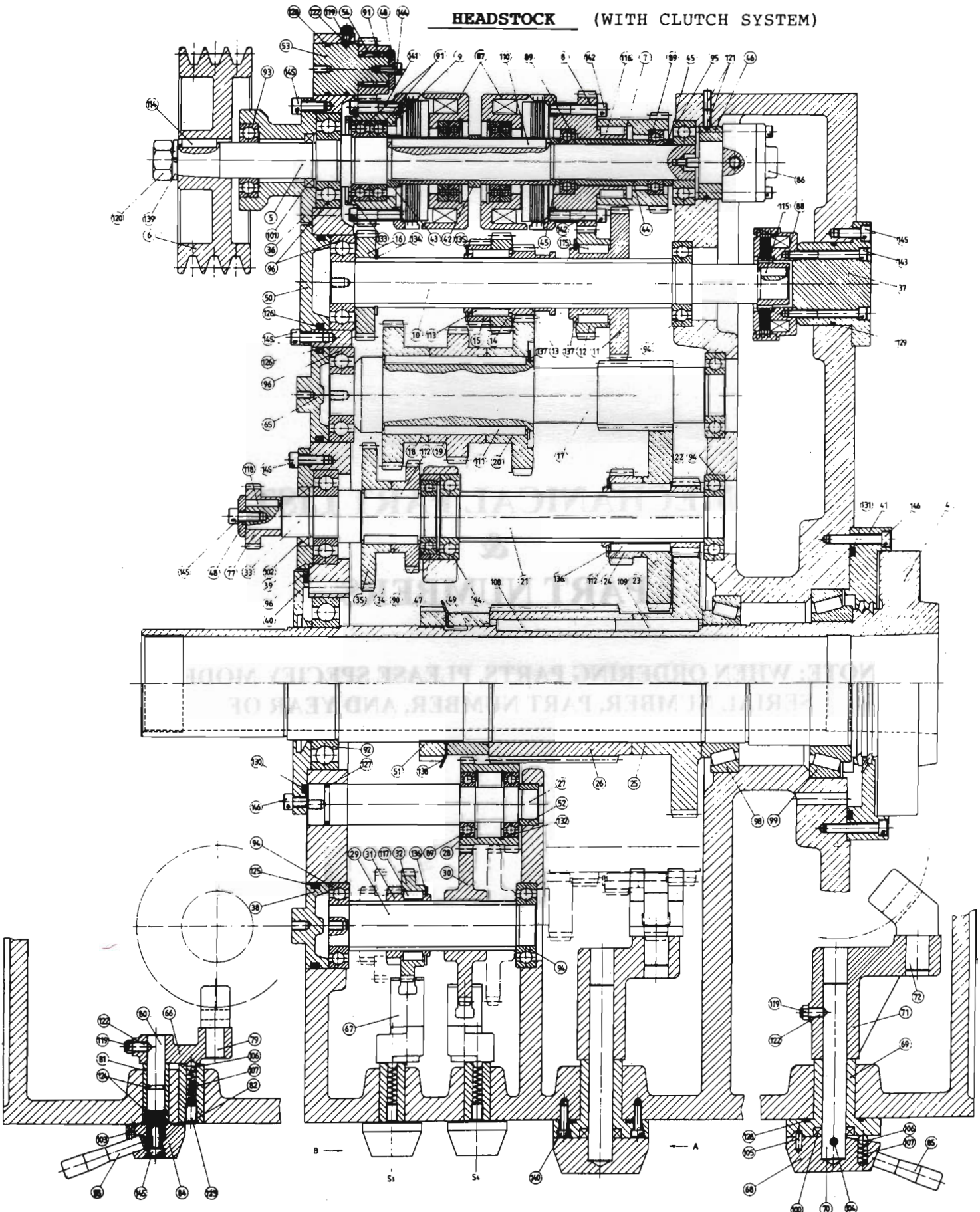
TROUBLE CAUSE & TROUBLE SHOOTING

TROUBLE ITEM	CAUSE	REMEDY
Vibration	Loose levelling screws	Set all screws so they bear evenly on leveling plates.
	Torn or mismatched Vee belts	Replace vee belts with matched set, or adjust roll.
	Work or chuck out of balance operating at high spindle speed.	Balance chuck or reduce spindle speed.
	Motor out of balance	Contact local representative or motor manufacturer.
Chatter	Tool bit improperly ground or not on center	Regrind tool bit or adjust tool holder so that area of contact between tool bit and work is decreased. Avoid extreme negative rake angle.
	Tool overhang too great	Keep point of tool bit as close as possible to tool holder.
	Using improper surface feet	Reduce or increase spindle speed.
	Feed rate too high or too low	Reduce or increase feed.
	Gibs of cross slide or pound rest loose	adjust gibs.
	Spindle bearings worn	Adjustspindle bearings.
Chatter (cont'd)	Work Imporoperly supported	Adjust tailstock center. Use steady rest or follow rest on long slender shafts. Minimize tailstock barrel extension.
	Vibration	See "Vibration" trouble above.
	Spindle bearing loose	Adjust spindle bearings.
Work not turned straight	Headstock and tailstock centers not aligned	Align tailstock center.
	Work improperly supported	Use steady rest of follow rest. Reduce overhang from chuck.
	Bed not level	Relevel bed, using precision level.
	Tool not on center when using taper attachment	Put tool on center.
Work out or round	Work loose between centers or centers are excessively worn--work centers out of round	Adjust tailstock center. regrind centers. Lap work centers.
	Loose headstock spindle bearings	Adjust headstock spindle bearings.
Cross slide or compound rest movement does not coincide with dial movement of respective adjusting screw.	Gib setting too tight or too loose	Adjust gibs.
	Workpiece is too long and slender	Use steady rest or follow rest.

MECHANICAL PART LIST
&
PART NUMBERS

NOTE: WHEN ORDERING PARTS, PLEASE SPECIFY MODEL, SERIAL NUMBER, PART NUMBER, AND YEAR OF PRODUCTION.

Headstock part I



HEADSTOCK (WITH CLUTCH SYSTEM)

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20HA-001	Headstock	1
2	20HA-002	Cover	1
3	20HA-003	Cover	1
4	20HA-004	Spindle	1
5	20HA-005	Shaft	1
6	20HA-006	V-Pulley	1
7	20HA-007	Spur Gear	1
8	20HA-008	Spur Gear	1
9	20HA-009	Spur Gear	1
10	20HA-010	Shaft	1
11	20HA-011	Spur Gear	1
12	20HA-012	Spur Gear	1
13	20HA-013	Spur Gear	1
14	20HA-014	Spur Gear	1
15	20HA-015	Spur Gear	1
16	20HA-016	Spur Gear	1
17	20HA-017	Shaft	1
18	20HA-018	Spur Gear	1
19	20HA-019	Spur Gear	1
20	20HA-020	Spur Gear	1
21	20HA-021	Shaft	1
22	20HA-022	Spur Gear	1
23	20HA-023	Spur Gear	1
24	20HA-024	Spur Gear	1
25	20HA-025	Spur Gear	1
26	20HA-026	Spur Gear	1
27	20HA-027	Shaft	1
28	20HA-028	Spur Gear	1
29	20HA-029	Shaft	1
30	20HA-030	Spur Gear	1
31	20HA-031	Spur Gear	1
32	20HA-032	Spur Gear	1
33	20HA-033	Shaft	1
34	20HA-034	Spur Gear	1
35	20HA-035	Spur Gear	1
36	20HA-036	Cover	1
37	20HA-037	Cover	1
38	20HA-038	Cover	1

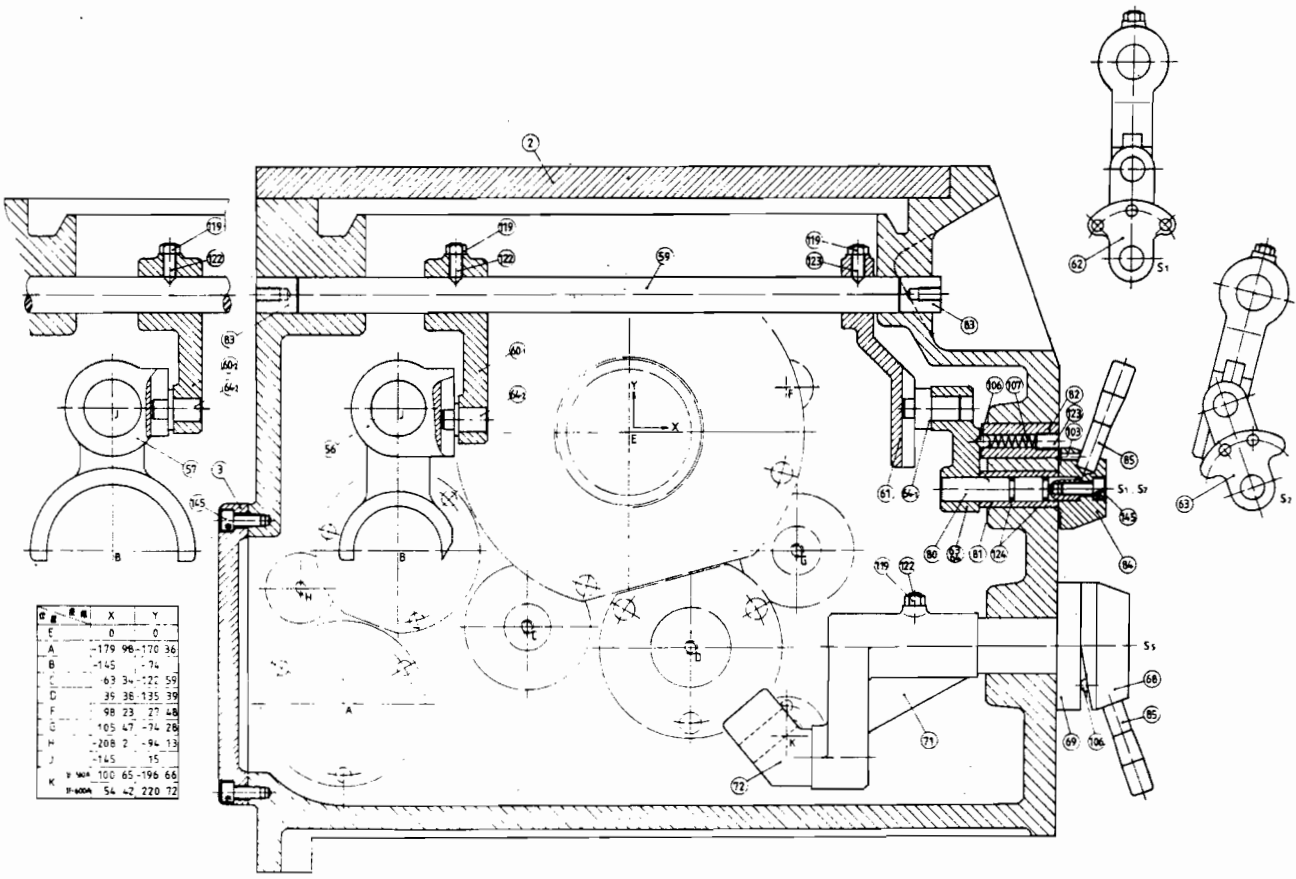
TEM NO.	PARTS NO.	DESCRIPTION	Q'TY
39	20HA-039	Cover	1
40	20HA-040	Cover	1
41	20HA-041	Front Bearing Cover	1
42	20HA-042	Plug	1
43	20HA-043	Space Collar	1
44	20HA-044	Space Collar	1
45	20HA-045	Space Collar	1
46			
47			
48	20HA-048	Washer	2
49	20HA-049	Space Coolar	1
50	20HA-050	Cap	1
51	20HA-051	Nut	1
52	20HA-052	Plug	1
53	20HA-053	Shaft	1
54	20HA-054	Spur Gear	1
55	20HA-055	Shaft	1
56	20HA-056	Change Speed Fork	1
57	20HA-057	Change Speed Fork	1
58			
59	20HA-059	Shaft	2
60	20HA-060	Rocker Arm	1EQ
61	20HA-061	Rocker Arm	2
62	20HA-062	Rocker Arm	1
63	20HA-063	Rocker Arm	1
64	20HA-064	Shaft	4
65	20HA-065	Cover	2
66	20HA-066	Rocker Arm	2
67	20HA-067	Change Speed Block	1
68	20HA-068	Lever Boss	1
69	20HA-069	Sleeve	1
70	20HA-070	Shaft	1
71	20HA-071	Rocker	1
72	20HA-072	Change Speed Block	1
73			
74	20HA-074	Idle Gear	1
75	20HA-075	Idle Gear	1
76	20HA-076	1.75M X 44 T Gear	1
77	20HA-077	1.75M X 28 T Geadr	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
78	20HA-078	Idle Shaft	1
79	20HA-079	Change Speed Block	1
80	20HA-080	Shaft	4
81	20HA-081	Sleeve	4
82	20HA-082	Sleeve	4
83	20HA-083	Plug	4
84	20HA-084	Lever Boss	4
85	20HA-085	Lever	5
86	20HA-086	Pump	1 AM A
87	20HA-087	Magnetic Clutch	2 OGURA MWC 5
88	20HA-088	Electromagnetic Brake	1 OGURA MWB 2.5
89	20HA-089	Bearing 6006	5
91	20HA-091	Bearing 6008	2
92	20HA-092	Bearing 6019	2
93	20HA-093	Bearing 6206	2
94	20HA-094	Bearing 6207	6
95	20HA-095	Bearing 6306	1
96	20HA-096	Bearing 6307	4
97	20HA-097	Bearing RNA 6903	1
98	20HA-098	Taper Roller Bearing 32021X	1
99	20HA-099	Taper Roller Bearing 32022X	1
100	20HA-100	Oil Seal 22X38X8	1
101	20HA-101	Oil Seal 30X55X12	1
102	20HA-102	Oil Seal 34X50X10	1
103	20HA-103	Spring Pin 4	4
104	20HA-104	Spring Pin 6X601	1
105	20HA-105	Straight Pin 5X181	1
106	20HA-106	Steel Ball 5/10"	5
107	20HA-107	Spring 5/10"	5
108	20HA-108	Key 16X10X100	1
109	20HA-109	Key 16X10X 70	1
110	20HA-110	Key 8X 7X130	1
111	20HA-111	Key 8X 7X120	2
112	20HA-112	Key 8X 7X 45	4
113	20HA-113	Key 8X 7X 30	2
114	20HA-114	Key 8X 7X 28	1
115	20HA-115	Key 8X 7X 25	3
116	20HA-116	Key 8X 7X 20	2
117	20HA-117	Key 8X 7X 16	2

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
118	20HA-118	Key 6X 6X 28	1
119	20HA-119	Nut M8X1.25	10
120	20HA-120	Nut M20Xp1.5	1
121	20HA-121	Set Serew M 8X1.25X151	2
122	20HA-122	Set Serew M 8X1.25X201	14
123	20HA-123	Set Serew M10X1.5 X101	4
124	20HA-124	"0" Ring P11	8
125	20HA-125	"0" Ring P62	1
126	20HA-126	"0" Ring P70	2
127	20HA-127	"0" Ring P30	3
128	20HA-128	"0" Ring P40	2
129	20HA-129	"0" Ring P65	1
130	20HA-130	"0" Ring P175	1
131	20HA-131	"0" Ring P210	1
132	20HA-132	Snap Ring RTW55	2
133	20HA-133	Snap Ring RTW68	1
134	20HA-134	Snap Ring RTW42	5
135	20HA-135	Snap Ring RTW50	1
136	20HA-136	Snap Ring RTW52	2
137	20HA-137	Snap Ring RTW60	2
138	20HA-138	Washer AW20	1
139	20HA-139	Spring Washer 20	1
140	20HA-140	Cap Screw M6X1X201	2
141	20HA-141	Cap Screw M6X1X301	4
142	20HA-142	Cap Screw M6X1X401	4
143	20HA-143	Cap Screw M6X1X651	4
144	20HA-144	Cap Screw M8X1.25X151	1
145	20HA-145	Cap Screw M8X1.25X201	14
146	20HA-146	Cap Screw M8X1.25X401	8
147	20HA-147	Washer 40X 70X 1	1
148	20HA-148	"0" Ring G85	1
149	20HA-149	Snap Ring STW15	4

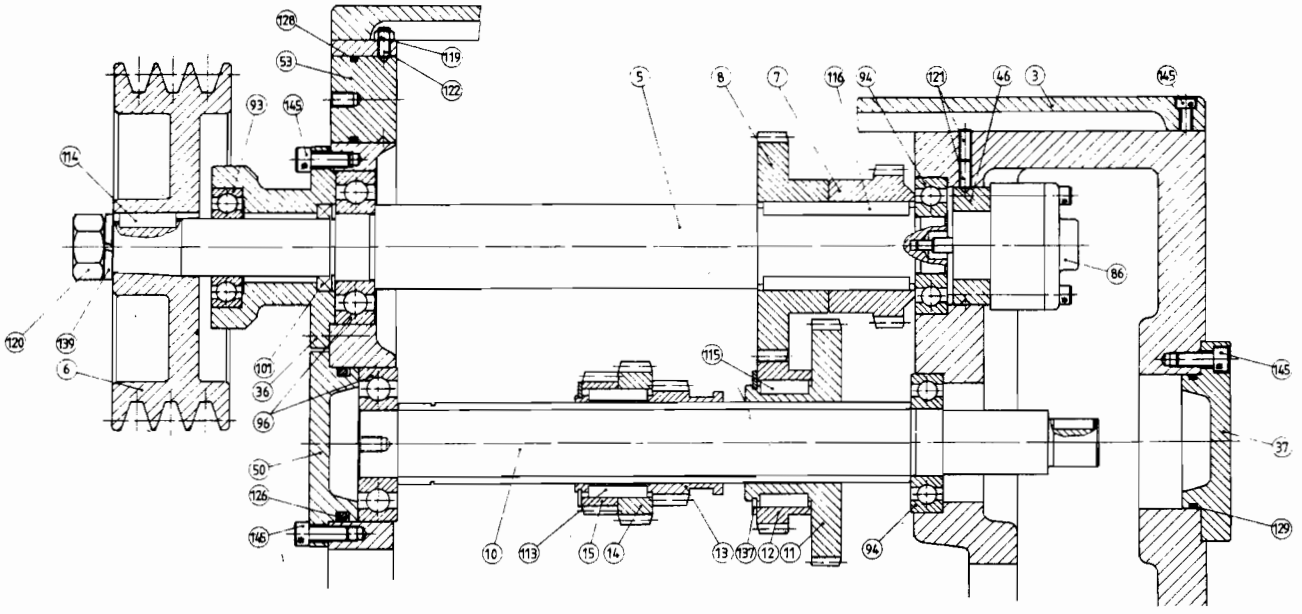
Headstock part II

(WITHOUT CLUTCH SYSTEM)



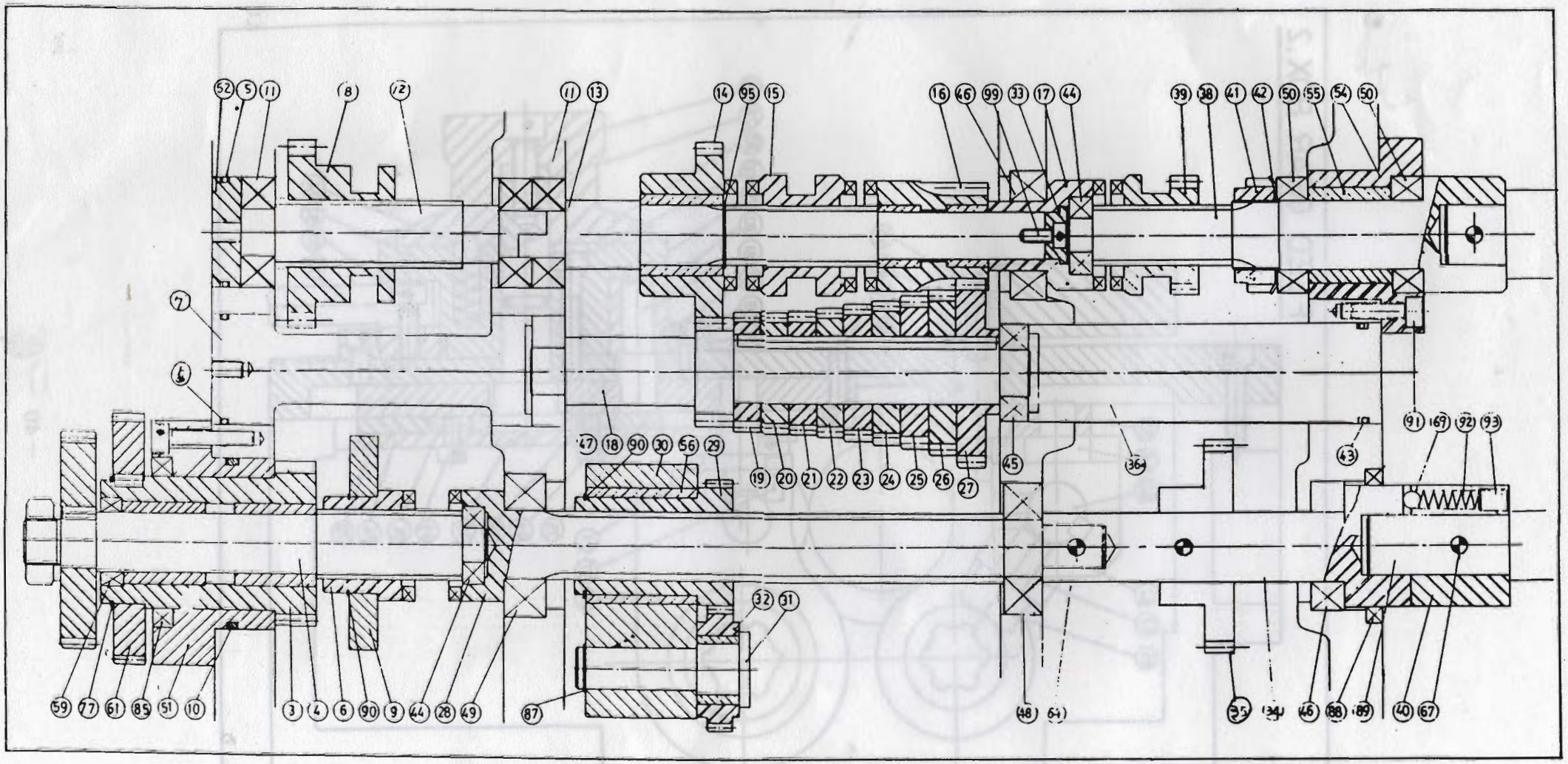
	X	Y
E	0	0
A	-179 98	-170 36
B	-145	-74
C	-63 34	-120 59
D	35 36	135 39
F	98 23	27 48
G	105 47	-74 28
H	-208 2	-94 13
J	-145	15
K	100 65	-196 66
	54 42	220 72

HEADSTOCK (WITHOUT CLUTCH SYSTEM)



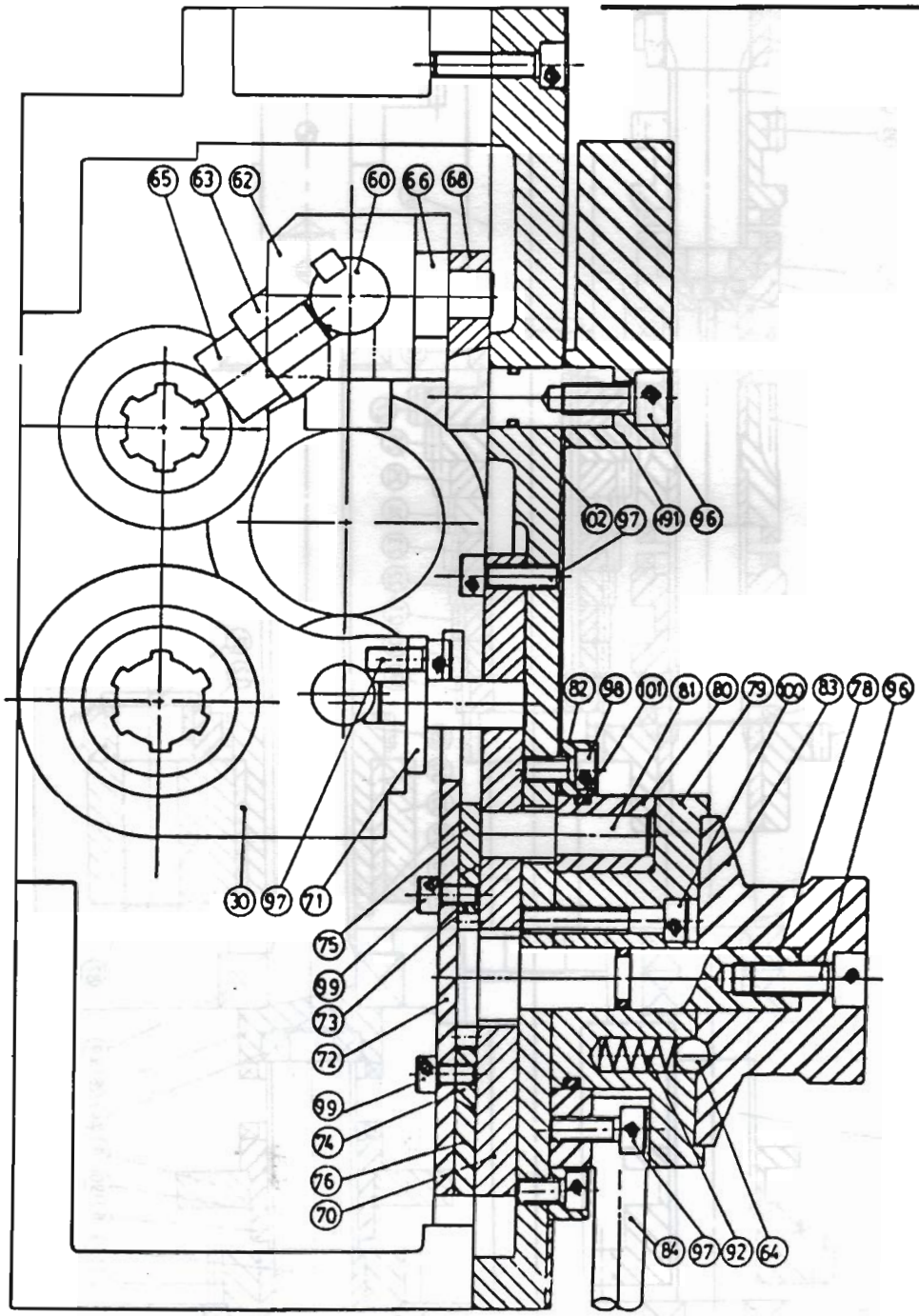
HEADSTOCK (WITHOUT CLUTCH SYSTEM)

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
3	20HA-003	Cover	1
5	20HA-005	Shaft	1
6	20HA-006	V-Pulley	1
7	20HA-007	Spur Gear	1
8	20HA-008	Spur Gear	1
10	20HA-010	Shaft	1
11	20HA-011	Spur Gear	1
12	20HA-012	Spur Gear	1
13	20HA-013	Spur Gear	1
14	20HA-014	Spur Gear	1
15	20HA-015	Spur Gear	1
36	20HA-036	Cover	1
37	20HA-037	Cover	1
46	20HA-046	Space Collar	1
50	20HA-050	Cap	1
53	20HA-053	Shaft	1
86	20HA-086	Pump	1 AM A
93	20HA-093	Bearing 6206	2
94	20HA-094	Bearing 6207	6
101	20HA-101	Oil Seal 30X55X12	1
113	20HA-113	Key 8X7X30	2
114	20HA-114	Key 8X7X28	1
116	20HA-116	Key 8X7X20	2
119	20HA-119	Nut M8X1.25	10
120	20HA-120	Nut M20Xp1.5	1
121	20HA-121	Set Serew M8X1.25X151	2
122	20HA-122	Set Screw M8X1.25X201	14
126	20HA-126	"0" Ring P70	2
129	20HA-129	"0" Ring G65	1
139	20HA-139	Spring Washer 20	1
145	20HA-145	Cap Screw M8X1.25X201	14



FEED GEAR BOX.1

FEED GEAR BOX.2



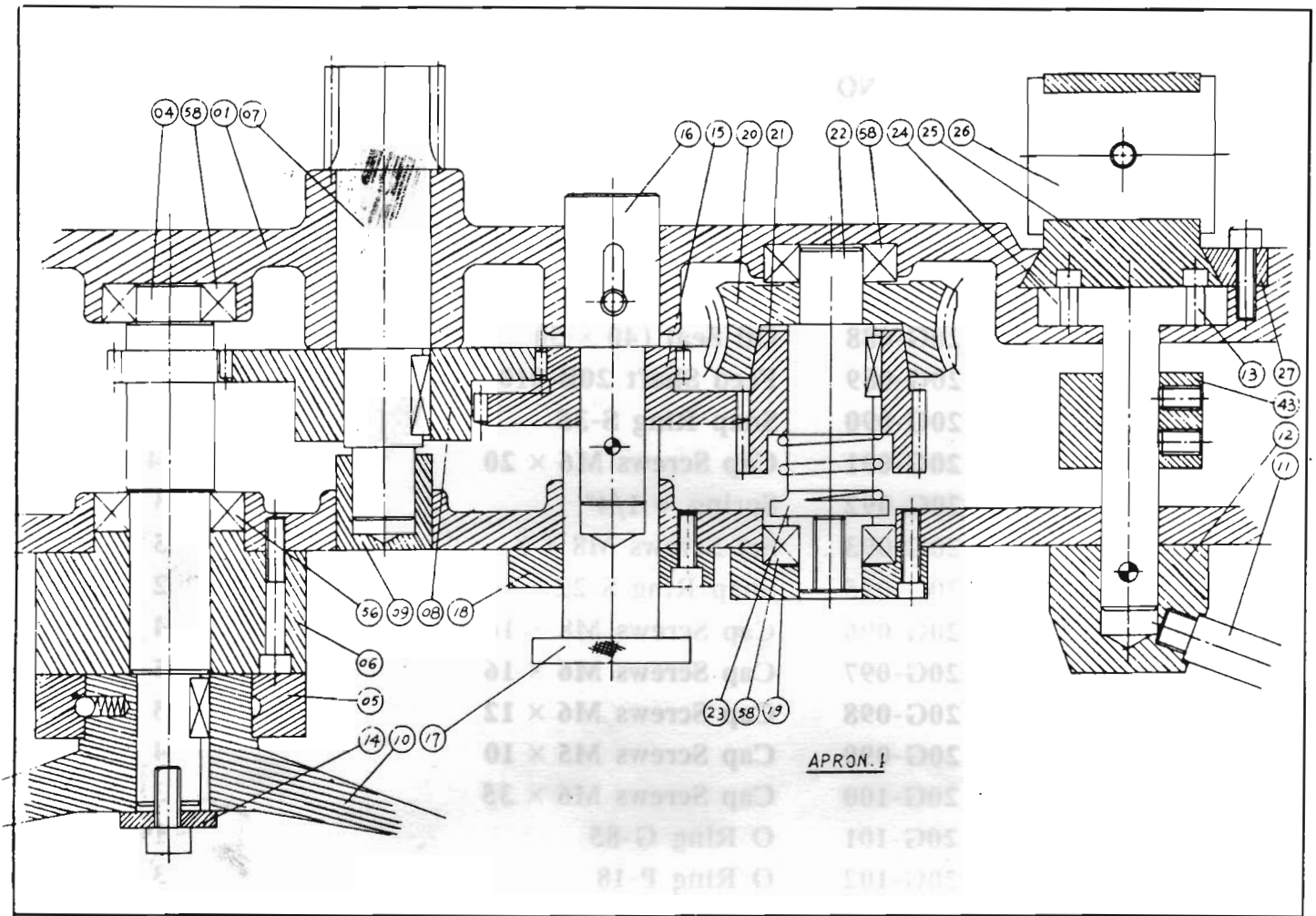
FEED GEAR BOX

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20G-001	Gear Box Body	1
2	20G-002	Front Cover	1
3	20G-003	Spur Gear	1
4	20G-004	Shaft	1
5	20G-005	"0"Ring G-35	2
6	20G-006	Gear	1
7	20G-007	Shaft	1
8	20G-008	Spur Gear	1
9	20G-009	Collar	1
10	20G-010	"0" Ring G-55	1
11	20G-011	Bearing 6004	3
12	20G-012	Spur Gear	1
13	20G-013	Shaft	1
14	20G-014	Spur Gear	1
15	20G-015	Gear	1
16	20G-016	Spur Gear	1
17	20G-017	Gear	1
18	20G-018	Shaft	1
19	20G-019	Spur Gear	1
20	20G-020	Spur Gear	1
21	20G-021	Spur Gear	1
22	20G-022	Spur Gear	1
23	20G-023	Spur Gear	1
24	20G-024	Spur Gear	1
25	20G-025	Spur Gear	1
26	20G-026	Spur Gear	1
27	20G-027	Spur Gear	1
28	20G-028	Shaft	1
29	20G-029	Spur Gear	1
30	20G-030	Housing	1
31	20G-031	Shaft	1
32	20G-032	Spur Gear	1
33	20G-033	Washer	1
34	20G-034	Shaft	1
35	20G-035	Spur Gear	1
36	20G-036	Shaft	1
38	20G-038	Shaft	1
39	20G-039	Spur Gear	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
40	20G-040	Coupling Socket	1
41	20G-041	Nut	1
42	20G-042	Washer	1
43	20G-043	"0" Ring G-30	1
44	20G-044	Bearings 6001	2
45	20G-045	Bearings 6003	1
46	20G-046	Bearings 6005	2
47	20G-047	Bearings 6203	1
48	20G-048	Bearings 6204	1
49	20G-049	Bearings 6205	1
50	20G-050	Bearings 6905ZZ	1
51	20G-051	Cover	1
52	20G-052	Cover	2
54	20G-054	Cover	1
55	20G-055	Bearings 51105	1
56	20G-056	Bearings NK 3530	1
59	20G-059	Oils Seal (22 × 32 × 7)	1
60	20G-060	Shaft	1
61	20G-061	Spur Gear	1
63	20G-063	Guide Block	3
64	20G-064	Spring Pin ϕ 6 × 45	2
65	20G-065	Copper Block	3
66	20G-066	Change Speed Block	3
67	20G-067	Taper Pin #5 × 45	2
68	20G-068	Sector	3
69	20G-069	Steel Ball ϕ 1/4"	6
70	20G-070	Setting Plate	1
71	20G-071	Shaft	1
72	20G-072	Plate	1
73	20G-073	Rack	1
74	20G-074	Slide Wedge	1
75	20G-075	Slide Wedge	1
76	20G-076	Slide Wedge	1
77	20G-077	Snap Ring S-45	1
78	20G-078	Gear	1
79	20G-079	Housing	1
80	20G-080	Rocking Ring	1
81	20G-081	Shaft	1
82	20G-082	Cover	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
83	20G-083	Change Speed Disc	1
84	20G-084	Rocking Lever	1
85	20G-085	Oil Seal (48 × 62 × 7)	1
86	20G-086	Snap Ring (S-17)	1
87	20G-087	Snap Ring (S-15)	1
88	20G-088	Oil Seal (40 × 50 × 8)	
89	20G-089	Feed Shaft 20B-010	1
90	20G-090	Snap Ring S-35	2
91	20G-091	Cap Screws M6 × 20	14
92	20G-092	Spring ϕ 1/4"	3
93	20G-093	Set Screws M8 × 8	5
95	20G-095	Snap Ring S-22	2
96	20G-096	Cap Screws M8 × 16	4
97	20G-097	Cap Screws M6 × 16	5
98	20G-098	Cap Screws M6 × 12	3
99	20G-099	Cap Screws M5 × 10	4
100	20G-100	Cap Screws M6 × 35	3
101	20G-101	O Ring G-85	1
102	20G-102	O Ring P-18	3

Apron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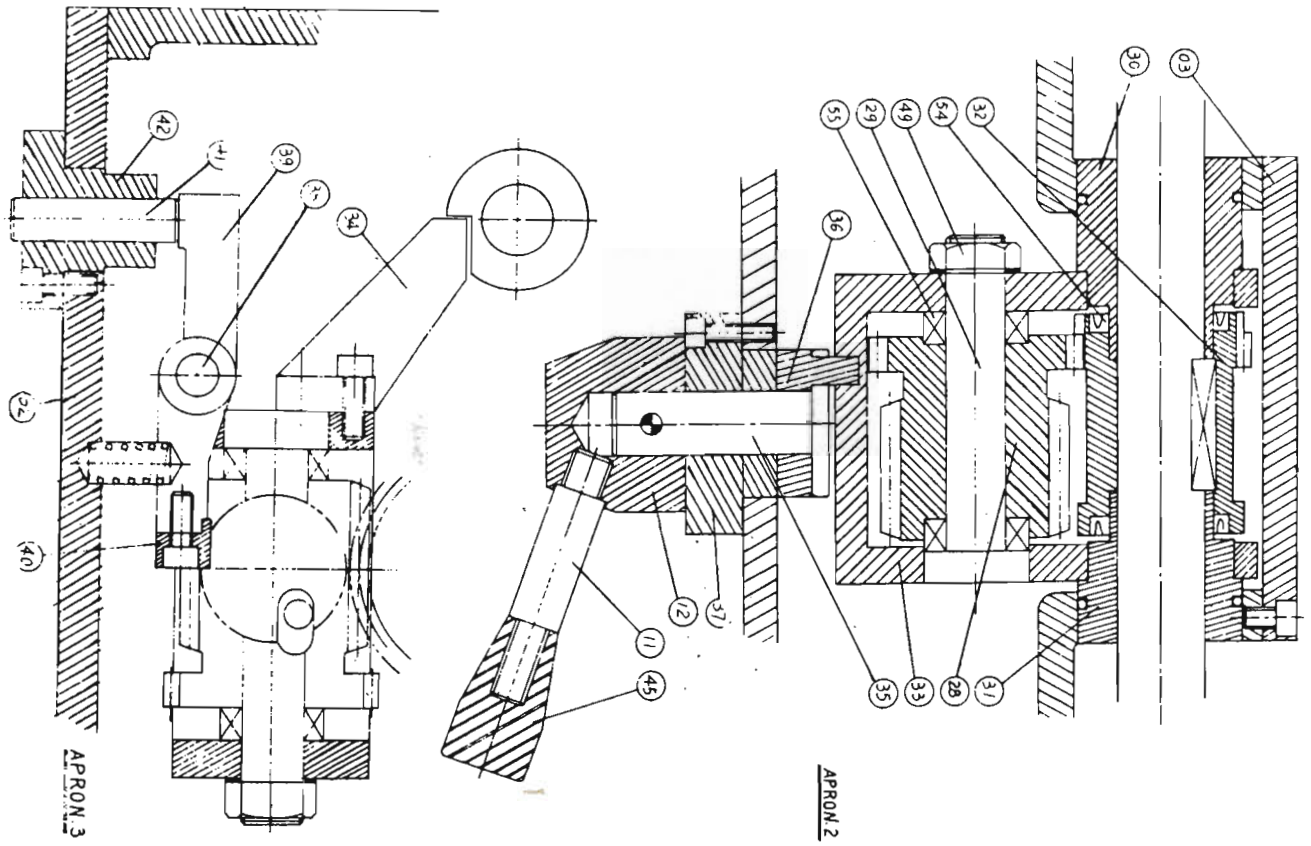
APRON.1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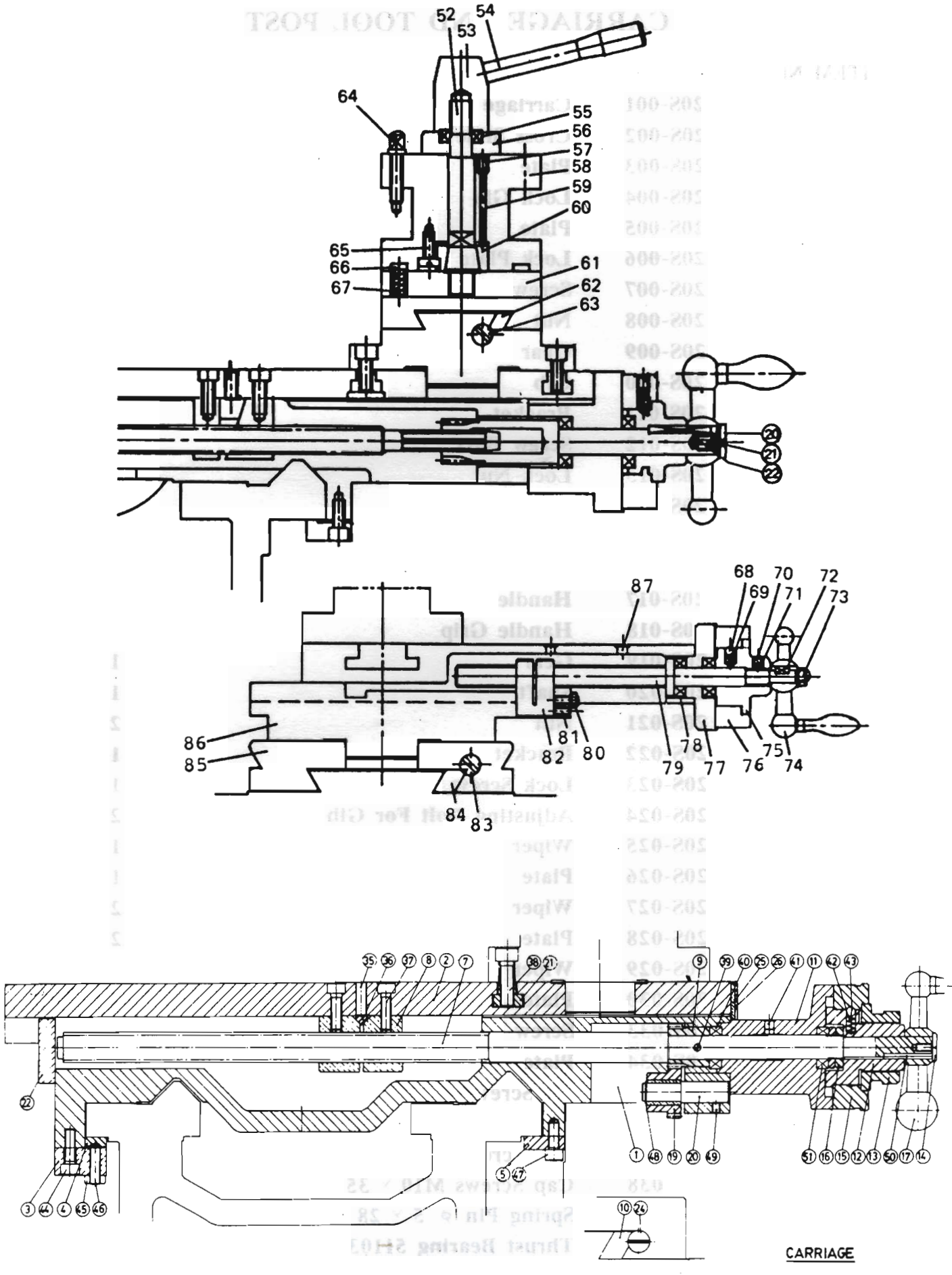
APRON.2

APRON

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20A-001	Apron Body	1
2	20A-002	Cover	1
3	20A-003	Cover	1
4	20A-004	Shaft	1
5	20A-005	Graduated Collar	1
6	20A-006	Housing	1
7	20A-007	Pinion Shaft	1
8	20A-008	Spur Gear	1
9	20A-009	Housing	1
10	20A-010	Handwheel	1
11	20A-011	Handle Grip	2
12	20A-012	Lever Boss	2
13	20A-013	Shaft	2
15	20A-015	Gear	1
16	20A-016	Shaft	1
17	20A-017	Shaft	1
18	20A-018	Housing	1
19	20A-019	Housing	1
20	20A-020	Worm Gear	1
21	20A-021	Gear	1
22	20A-022	Shaft	1
23	20A-023	Shaft	1
24	20A-024	Shaft	1
25	20A-025	Half Nut Support	1
26	20A-026	Half Nut	1
27	20A-027	Gib	1
28	20A-028	Gear	1
29	20A-029	Axle	1
30	20A-030	Bush	1
31	20A-031	Bush	1
32	20A-032	Gear	1
33	20A-033	Worm Box	1
34	20A-034	Buffle	1
35	20A-035	Shaft Gear	1
36	20A-036	Collar	1
37	20A-037	Housing	1
38	20A-038	Shaft	1
39	20A-039	Rocking Arm	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
40	20A-040	Safety Block	1
41	20A-041	Stick Bar	1
42	20A-042	Housing	1
43	20A-043	Shaft	1
45	20A-045	Hand Knob	1
48		Bearing 51104	1
49	20A-049	Lock Nut	1
54	20A-054	Oil Seal (30 × 40 × 5)	1
55	20A-055	Thrust Bearing 51103	2
56	20A-056	Bearing 6005	1
58	20A-058	Bearing 6004	2

Carriage and tool Post



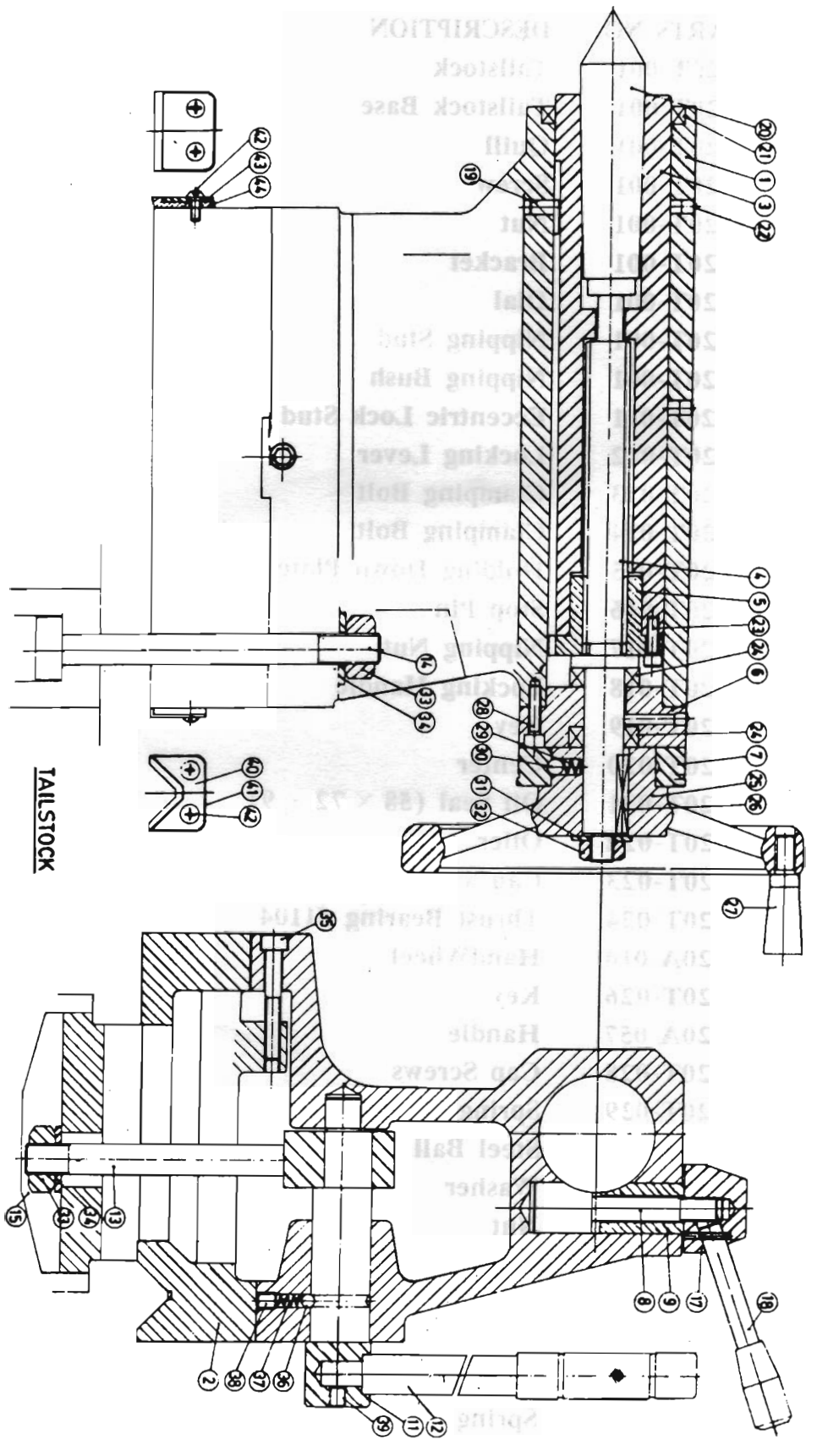
CARRIAGE AND TOOL POST

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20S-001	Carriage	1
2	20S-002	Cross Slide	1
3	20S-003	Plate	1
4	20S-004	Lock Gib	1
5	20S-005	Plate	2
6	20S-006	Lock Plate	1
7	20S-007	Screw	1
8	20S-008	Nut	1
9	20S-009	Gear	1
10	20S-010	Gib	1
11	20S-011	Bracket	1
12	20S-012	Screw Boss	1
13	20S-013	Lock Nut	1
14	20S-014	Screw	1
15	20S-015	Graduated Collar	1
16	20S-016	Nut	2
17	20S-017	Handle	1
18	20S-018	Handle Grip	1
19	20S-019	Gear	1
20	20S-020	Shaft	1
21	20S-021	Nut	2
22	20S-022	Bracket	1
23	20S-023	Lock Screw	1
24	20S-024	Adjusting Bolt For Gib	2
25	20S-025	Wiper	1
26	20S-026	Plate	1
27	20S-027	Wiper	2
28	20S-028	Plate	2
29	20S-029	Wiper	2
30	20S-030	Plate	2
33	20S-033	Screw	1
34	20S-034	Plate	1
35	20S-035	Set Screw M8 × 25	1
36	20S-036	Key	1
37	20S-037	Cap Screws M8 × 25	3
38	20S-038	Cap Screws M10 × 35	2
39	20S-039	Spring Pin ϕ 5 × 28	1
40	20S-040	Thrust Bearing 51103	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
41	20S-041	Oiler ϕ 1/4"	1
42	20S-042	Spring ϕ 1/4"	2
43	20S-043	Steel Ball ϕ 1/4"	2
44	20S-044	Cap Screws M8 × 20	5
45	20S-045	Nuts M8	5
46	20S-046	Set Screws M8 × 30	5
47	20S-047	Cap Screws M8 × 16	4
48	20S-048	Snap Screws S13	1
49	20S-049	Set Screws M6 × 6	1
50	20S-050	Key 4 × 4 × 25	1
51	20S-051	Thrust Bearing 51103	1
52	20S-052	Clamping Bolt	1
53	20S-053	Handle Boss	1
54	20S-054	Handle	1
55	20S-055	Thrust Bearing 51104	1
56	20S-056	Washer	1
57	20S-057	Hex. Set Screw	3
58	20S-058	Turret Tool Post	1
59	20S-059	Pin	3
60	20S-060	Sleeve	1
61	20S-061	Locking Block	1
62	20S-062	Gib	1
63	20S-063	Cam Screw	1
64	20S-064	Locking Screw	12
65	20S-065	Screw	3
66	20S-066	Pin	1
67	20S-067	Spring ϕ 5/12	1
68	20S-068	Steel Ball ϕ 3/16"	1
69	20S-069	Spring ϕ 1/16"	1
70	20S-070	Hex. Set Screw M6 × 91 × 61	1
71	20S-071	Washer	1
72	20S-072	Key	1
73	20S-073	Nut	1
74	20S-074	Lever	1
75	20S-075	Indexing Base	1
76	20S-076	Indexing Ring	1
77	20S-077	Bracket	1
78	20S-078	Thrust Bearing 51102	2
79	20S-079	Locking Screw 20S-079	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
80	20S-080	Nut M6 × P1	1
81	20S-081	Hex. Set Screw M6 × P1 × 201	
82	20S-082	Screw Nut	1
83	20S-083	Adjusting Screw	1
84	20S-084	Gib	1
85	20S-085	Cover	1
86	20S-086	Tool Slide	1
87	20S-087	Oiler	2

Tailstock

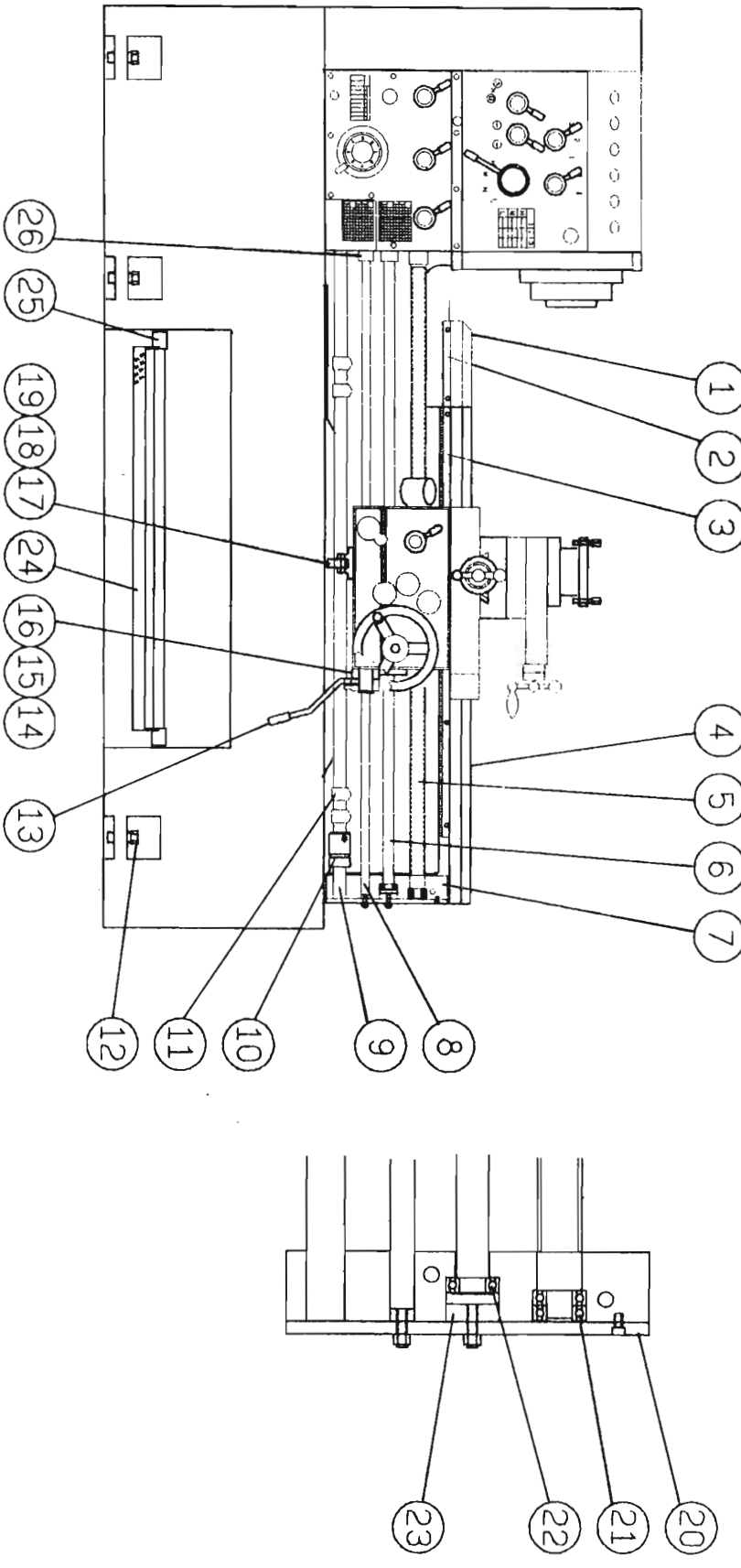


TAILSTOCK

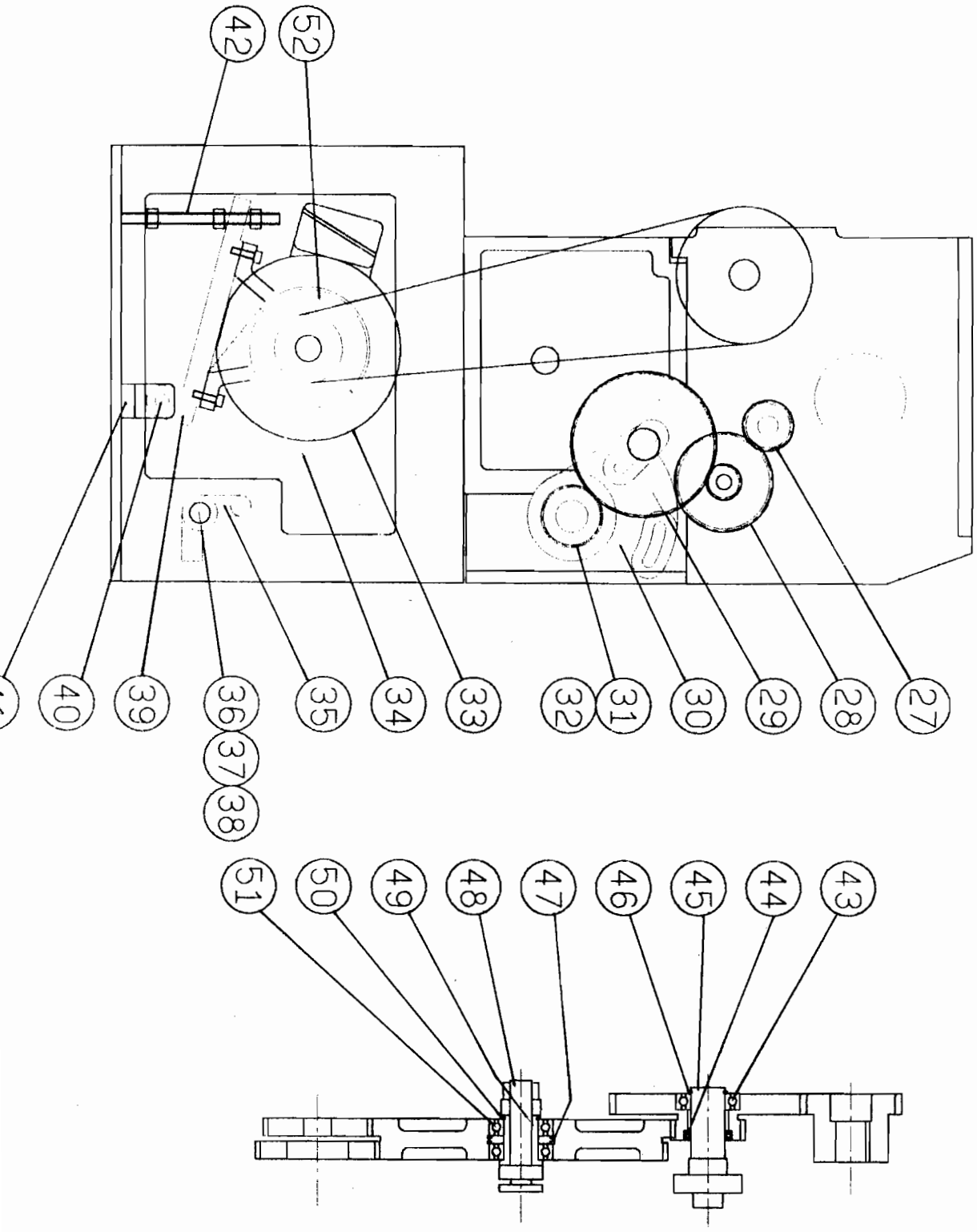
ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20T-001	Tailstock	1
2	20T-001	Tailstock Base	1
3	20T-001	Quill	1
4	20T-001	Screw	1
5	20T-001	Nut	1
6	20T-001	Bracket	1
7	20T-001	Dial	1
8	20T-001	Nipping Stud	1
9	20T-001	Nipping Bush	1
11	20T-011	Eccentric Lock Stud	1
12	20T-012	Locking Lever	1
13	20T-013	Clamping Bolt	1
14	20T-014	Clamping Bolt	1
15	20T-015	Holding Down Plate	1
16	20T-016	Stop Pin	1
17	20T-017	Nipping Nut	1
18	20T-018	Locking Handle	1
19	20T-019	Key	1
20	20T-020	Center	1
21	20T-021	Oil Seal (58 × 72 × 9)	1
22	20T-022	Oiler	1
23	20T-023	Cap Screws	3
24	20T-024	Thrust Bearing 51104	2
25	20A-010	HandWheel	1
26	20T-026	Key	1
27	20A-057	Handle	1
28	20T-028	Cap Screws	4
29	20T-029	Spring	1
30	20T-030	Steel Ball	1
31	20T-031	Washer	1
32	20T-032	Nut	1
33	20T-033	Nut	1
34	20T-034	Washer	1
35	20T-035	Cap Screw	2
36	20T-036	Steel Ball	1
37	20T-037	Spring	1
38	20T-038	Set Screw	1
39	20T-039	Set Screw	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
40	20T-040	Plate	2
41	20T-041	Wiper	2
42	20T-042	Screw	8
43	20T-043	Plate	2
44	20T-044	Wiper	2

Assembly of Bed and Machine Casting



Assembly of Bed and Machine Casting

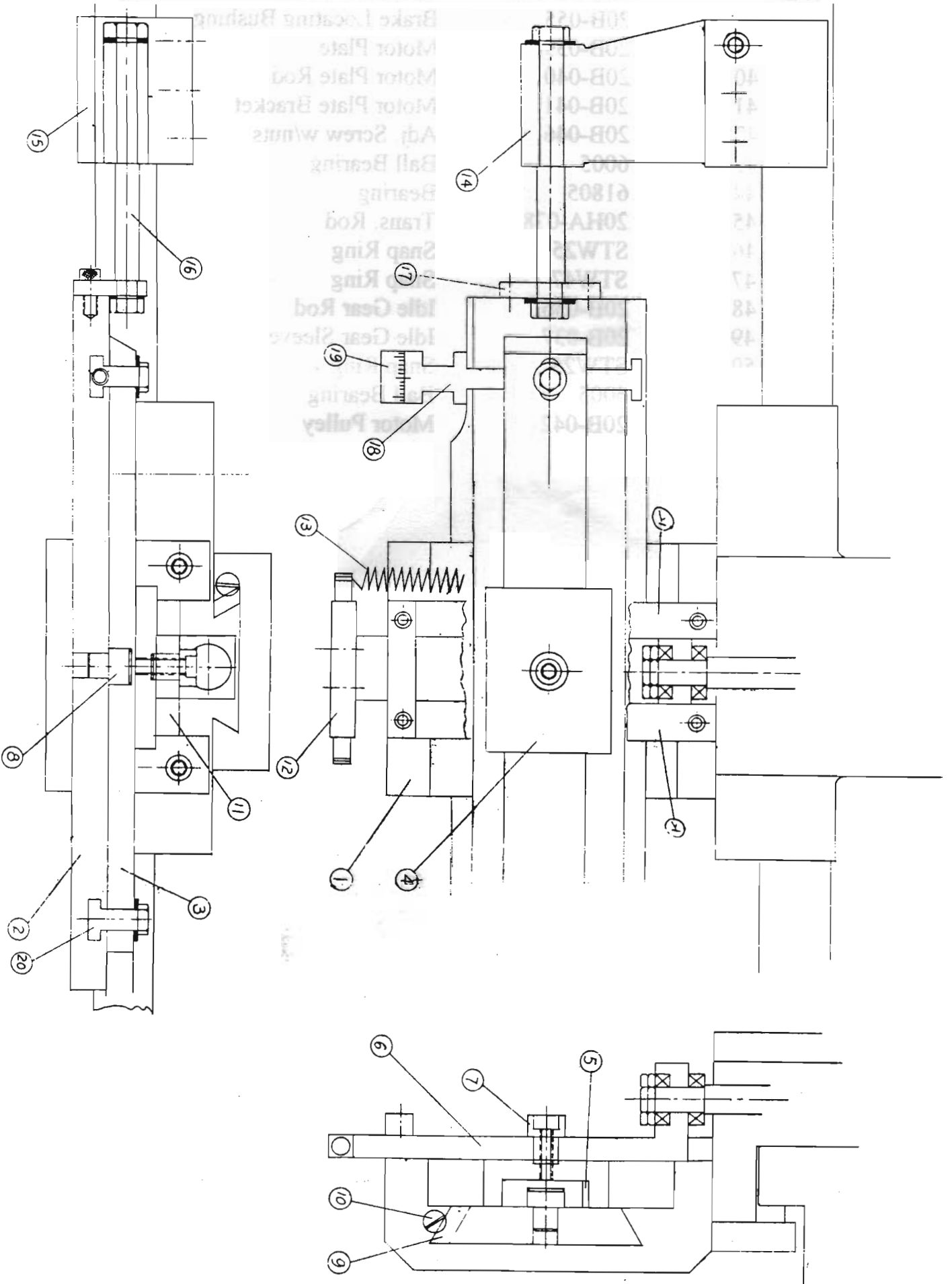


ASSEMBLY OF BED AND MACHINE CASTING

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20B-001-2	Gap bed	1
2	20B-024A	Gear Rack	1
3	20B-024C	Gear Rack	1
4	20B-001	Machine Bed	1
5	20B-007	Long. Leadscrew	1
6	20B-010	Feed Rod	1
7	20B-005	Holding Bracket	1
8	20B-009	Starting Rod	1
9	20B-008	Stopping Rod	1
10	20B-011	Rotation Sleeve	1
11	20B-012	Stopping Block	4
12	20B-050	Leveling Screw	6
13	20B-021	Starting Lever w/Handle	1
14	20B-019	Lever Bracket	1
15	20B-018	Rocker Arm	1
16	20B-020	Starter Sleeve	1
17	20B-014	Stopping Bracket	1
18	20B-013	Perpen. Rocker Arm	1
19	20B-015	Bracket Rod	1
20	20B-006	Bracket Cover	1
21	6004	Ball Bearing	2
22	6004	Ball Bearing	1
23	20B-023	Adjusting Bushing	1
24	20B-045	Foot Brake Plate	1
25	20B-048	Brake Plate Rod	1
26	20B-017	Short Starter Rod	1
27	20HA-150	Gear,	1
28	20HA-151I	Gear,	1
29	20B-033	Idle Gear,	1
30	20B-066	Quadrant Bracket	1
31	20B-034	Spur Gear,	1
32	20B-035	Spur Gear,	1
33	20B-067	Spindle Motor, 10 HP	1
34	20B-044	Brake Shoe Assembly	1
35	20B-043	Brake Rocking Arm	1
36	20B-068	Micro-limiting Switch	1
37	20B-056	Switch Contacting Block	1

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
38	20B-055	Brake Locating Bushing	1
39	20B-039	Motor Plate	1
40	20B-040	Motor Plate Rod	1
41	20B-041	Motor Plate Bracket	1
42	20B-046	Adj. Screw w/nuts	2
43	6005	Ball Bearing	1
44	61805	Bearing	1
45	20HA-078	Trans. Rod	1
46	STW25	Snap Ring	1
47	STW47	Snap Ring	2
48	20B-036	Idle Gear Rod	1
49	20B-037	Idle Gear Sleeve	1
50	STW25	Snap Ring	1
51	6005	Ball Bearing	2
52	20B-042	Motor Pulley	1

TAPER TURNING A TTACHMENT



TAPER TURNING ATTACHMENT

ITEM NO.	PARTS NO.	DESCRIPTION	Q'TY
1	20TA-001	Casting Body	1
2	20TA-002	Sliding Plate	1
3	20TA-003	Taper Sliding Plate	1
4	20TA-004	Locating Bracket	1
5	20TA-005	Locating Block	1
6	20TA-006	Pulling Plate	1
7	20TA-007	Screw Sleeve	1
8	20TA-008	Center Rod	1
9	20TA-009	Gib	1
10	20TA-010	Gib Screw	2
11	20TA-011	Bushing Plate	1
12	20TA-012	End Rod	1
13	20TA-013	Pulling Spring	1
14	20TA-014	End Locating Set	1
15	20TA-015	Locating Plate	1
16	20TA-016	Straight Rod	1
17	20TA-017	Plate Bushing	1
18	20TA-018	Adjusting Screw	1
19	20TA-019	Dial	1
20	20TA-020	Fixing Screw w/nut	2
21	20TA-021	Bushing Plate	2

STEADY REST