

ACER

OPERATIONAL MANUAL

DYNAMIC 17" SERIES High Precision Engine Lathe

Model : Dynamic 1740G~Dynamic 1780G
Dynamic 2040G~Dynamic 2080G

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CHAPTER 1

OPERATING SAFETY GUIDELINES

1.1 GENERAL SAFETY PRECAUTIONS

- a. The operator must be a technician who is trained in the operation.
- b. The operator should wear safety clothes, such as a helmet ` safety glasses ` working clothes ` safety shoes .. etc, which must conform with government industrial safety regulations.
- c. Keep the machine and work area neat, clean and tidy.
- d. Keep all guards and cover plates in place and all machine cabinet doors closed.
- e. Never lay anything on the working surfaces of the machine, where it may foul rotating or moving parts.
- f. Do not touch or reach over moving or rotating machine parts.
- g. Ensure that you know how to stop the machine before starting it and stop the machine immediately if anything unexpected happens.
- h. Check the load capacity of revolving centers for the current application.
- i. Isolate the machine when leaving it unattended.
- j. The use of fluid causing poisoning or corrosion while cuttings prohibited
- k. Do not operate the machine in excess of its rated capacity.
- l. Do not wear rings ` watches ` ties or loose sleeved clothing.
- m. Do not interchange chucks or other spindle mounting items without checking for correct locking and maximum speed rating.
- n. Do not cutting magnesium metal or high magnesium alloys or any other material which may generate flammable hazards.

1.2 OPERATING POTENTIAL HAZARDS IN THE MACHINE

If a chuck has sustained, the rotation of the chuck may be dangerous. If the gripping force required for any given application is unknown in advance that the rotation of chuck will be hazardous. Therefore, you must be careful when selecting an appropriate chuck.

The actual gripping power being used for any given application is unknown from the chuck manufacturer.

It is possible that the workpiece becoming insecurely gripped due to the influence of centrifugal force under certain conditions. The factors involved include:

- a. too high a spindle speed for a particular application.
- b. weight and type of gripping jaws if it is not standard.
- c. the radius at which gripping jaws mass is concentrated.
- d. condition of chuck is inadequately lubricated.
- e. the state of balance is not correct.
- f. the gripping force applied to the workpiece in the static condition is inadequate.
- g. magnitude of the cutting forces involved are too great.
- h. the workpiece is gripped incorrectly.

Careful attention must be paid to these factors. As they vary with each particular application, a manufacturer cannot provide specific figures for general use, the factors involved being outside his control.

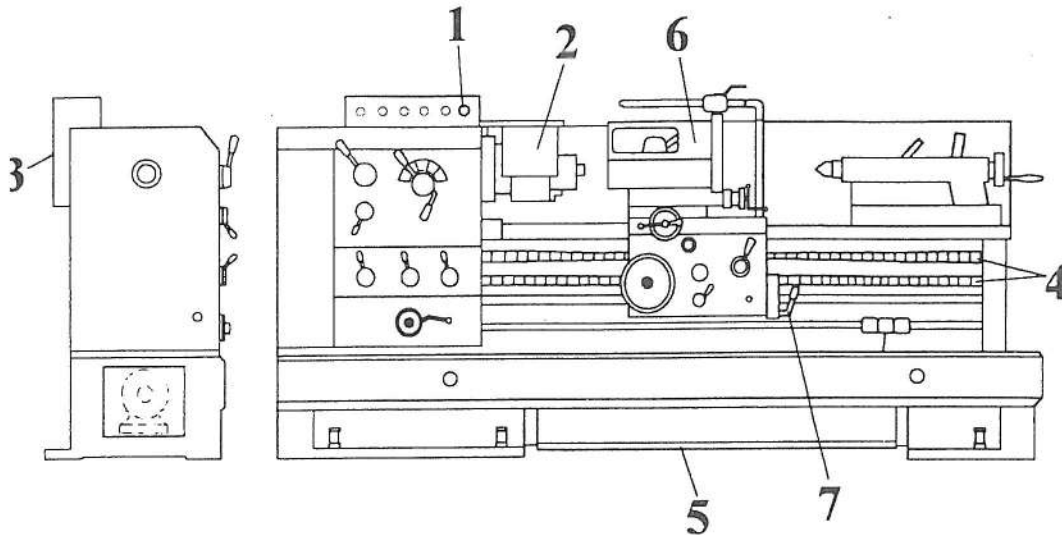
1.3 OPERATING SAFETY PRECAUTION AND PERSONAL PROTECTIVE EQUIPMENT(P.P.E)

(A)Operating Safety Precaution

- (1) Do not grip a component with grease or oil on it. Grip all components firmly.
- (2) Do not attempt to hold components that are too awkward or too difficult to hold. Do not hold components that are too heavy for the machine.
- (3) Do not allow turning or hand tools to be caught in the chuck or other holding device.
- (4) Do not run the machine unattended.
- (5) Do not move guards while lathe is under power.
- (6) Do not allow distractions to interfere with lathe operations. Do not operate lathe whilst talking.
- (7) Do not apply chisels or emery paper by hand to the workpiece.
- (8) Do not use hand tools or lever handles in an awkward position. Do not apply excessive force.
- (9) Do not use broken, chipped or defective tools.
- (10) Do not place hand on chuck or workpiece to stop rotation of the spindle
- (11) Do not place hand or body in path of moving objects. Beware of the moving parts of the lathe that might fall.
- (12) Beware of yourselves where you are moving your hand or body in relationship to the lathe. Beware of holding a tool or other parts inserted in or attached to the chuck or workpiece. Beware of hands or other parts of the body that may in position to be hit by a chuck or workpiece.
- (13) Beware of large burrs on workpieces.

-
- (14) Beware of obstructions that prevent completely tightening the screws. Ensure that screw is tight.
 - (15) Beware of loose clothing near the rotating parts of the lathe.
 - (16) Beware of loose hair near the rotating parts of the lathe.
 - (17) Be sure that the workpiece cannot move in chuck or other holding device.
 - (18) Make sure that the power has been turned off when the lathe is unused for sometime.
 - (19) Be sure that protective guards are in place of machine.
 - (20) Secure all workpieces.
 - (21) Secure all jaws ` nuts ` bolts and locks.
 - (22) Only use T-wrench when locking workpiece.
 - (23) Always use the proper hand tool to remove swarf. Never hurry when removing swarf. Beware of swarf wrapped around the chuck or workpiece.
 - (24) Always use the correct equipment.
 - (25) Never take depth of cuts beyond machine's capability. Never use excessive feedrates.
 - (26) Never mount a workpiece too large for the lathe.
 - (27) Never reach over under or around a workpiece to make an adjustment ` remove swarf ` tighten screw...etc, when the chuck and the workpiece are in motion.
 - (28) Never substitute the wrong size tools if the correct size tool is not available or cannot be located in the shop.
 - (29) Always wear the correct and appropriate protection before operating the lathe. Never remove protection for even a short time when operating the

1.5 SAFETY DEVICE AND INSPECTING BEFORE OPERATING



(A) safety device

1. emergency stop push-button:

2. chuck guard with interlock switch:

When open the chuck guard, ensure that the spindle is stopped. When closing the guard shown in the above figure, the spindle can be started by the start button.

3. electrical cabinet key and main isolator switch:

4. leadscrew & feed rod protection cover: (Not applicable in U.S.)

5. foot brake pedal:

(1) after step on the foot brake pedal, the spindle will stop rotating and power will be off

(2) the spindle will rotate after switch "forward & reverse lever" to middle position and restart the power.

6. chip guard:
to prevent the chip flying to the operator.

7. safety pin device onto the starting lever:
To operate the lever to start the spindle, the lever must be pulled horizontally and turn up for starting the spindle motor after pushing on the main main spindle switch. The lever can not be directly turn up for starting the spindle motor by the safety pin device.

(B) inspection of safety

1. the power will be off and spindle stop, when press emergency stop button.
2. the power will be off and spindle will not rotate when chuck guard is lifted.
3. after step on the foot brake pedal, the spindle will stop rotating immediately and power will be off.
4. check guards(covers) are in place and secured by tools.

CHAPTER 2

OVERALL DESCRIPTION OF THE MACHINE

2.1 FUNCTION , INTENDING USE AND PART DESCRIPTION

(A) Function And Intending Use:

The machine is a traditional manual lathe. It is assumed that the operator has been properly trained, skilled and is authorized to operate this machine. It is well designed for metal cutting as a machine tool and can be used for turning , drilling or tapping by tailstock. Under no circumstances must the machine be used to cut the following material as the process may generate highly toxic fumes or dusts and potentially inflammable waste. Therefore, flammable materials, such as Magnesium, carbon bar, plastic wood and low flash point cutting fluid are not intended use for machining by this lathe. According to the machine's design, the machine can not be used in the potential explosive environment

(B) Part Description:

1. headstock :

The headstock is a one-piece casting fitted with adjusting screws for proper alignment to the bedways and fastened to the bed with screws. The spindle is supported on three precision bearings in order to get maximum rigidity and precision and the other gears shafts operate on ball bearings. The complete gear train is lubricated by splash oil system.

2. bed:

The bed is a one-piece casting with a box-section member. The bedways is precision ground and high frequency heat-treatment.

3. saddle:

The wide saddle ensures the maximum rigidity against stresses of heavy cutting loads. The cross-slide and compound slides are fitted to the saddle. When fitted with metric screw, the cross slide moves 5 mm on diameter for each revolution of the hand wheel and the dial is graduated in 0.05 mm. The travel of the cross slide is 220 mm ($8\frac{5}{8}$ "). The compound slide travel is 180 mm (7").

4. apron:

The apron is a heavy duty double wall casting and all the shafts and gears are supported at both ends. It contains all the necessary gearing and controls to transmit power feed for longitudinal and cross movements as well as for thread cutting. The controls are interlocked to prevent simultaneous engagement of the feeds and threading.

5. gear box:

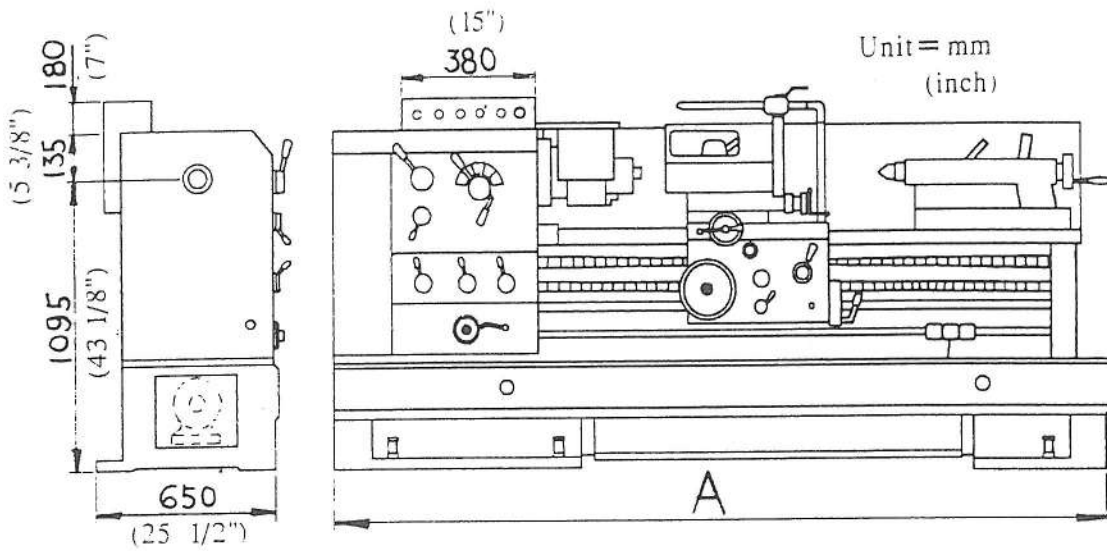
This gear box allows selection of metric and inch threads as well as feeds.

6. tailstock:

The tailstock is easy to move and adjust. It can be kept close to the headstock without the interference for the operation of tool post.

2.2 OVERALL DIMENSION AND CAPACITY OF MACHINE

For your convenience to operate these machines, please take the walkway into consideration. Therefore, the space requirement should add 1000 mm (40") to the overall dimension.



	1730G	1740G	1760G	1780G
spindle speed and power	50~1800 rpm(12 steps)/60 Hz, 7 $\frac{1}{2}$ Hp/4p			
swing over bed	17 1/8"			
swing over carriage	9 5/8"			
distance between center	30"	40"	60"	80"
A	72 1/4"	80"	102 1/8"	122"

2.3 MACHINE SPECIFICATIONS

ITEM	MODEL	1740G	1760G	1780G
General Capacity	Swing over bed	17" (435mm)		
	Swing over gap	26" (660mm)		
	Swing over carriage	9-5/8" (245mm)		
	Distance between centers	40" (1000mm)	60" (1500mm)	80" (2000mm)
Main Spindle	Type of spindle nose	D 1-6 or A 1-6		
	Main spindle bore	2-5/16" (58mm)		
	Taper of spindle bore	MT 6		
	Taper of center	MT 4		
	Spindle speeds	50-1800 rpm (12 steps)		
Carriage	Cross slide travel	8-5/8" (220mm)		
	Compound rest travel	7" (180mm)		
	Max. size cutting tool	1" x 1" (25 x 25mm)		
Tailstock	Spindle diameter	2-1/4" (58mm)		
	Spindle travel	6" (150mm)		
	Taper of center	MT 4		
Bed	Bed width	12" (300mm)		
	Bed length	73" (1860mm)	93" (2380mm)	113" (2880mm)
Threading & Feeding	System	Metric		Inch
	Pitch of leadscrew	35 Ø ,6mm/pitch		4 TPI
	Metric pitches cutting	0.5-7.0mm/pitch (22 kinds)		
	Whitworth threads cutting	4-56 TPI (36 kinds)		
	Module pitches cutting	0.5-3.5 (12kinds)		
	Diametral pitches cutting	8-56 (21 kinds)		
	Range of longitudinal feeds	0.05-0.70mm/rev.	0.002-0.028"/rev.	
	Range of cross feeds	0.025-0.35mm/rev.	0.001-0.014"/rev.	
Power	Main drive motor	7-1/2 HP		
	Coolant pump motor	1/8 HP		
Floor Dimension		85"x29" (2150x720mm)	105"x29" (2650x720mm)	124"x29" (3150x720mm)
Approx Weight		3500lbs (1590 kg)	3950 lbs (1795 kg)	4400lbs (2000 kg)
Packing Size		88" x 41" x 67"	107" x 41" x 67"	131" x 41" x 67"

Note: The manufacturer reserves the right to modify the design, specifications, mechanisms, etc. to improve the performances of machine without notice.
All the specifications shown above are for reference only.

STANDARD ACCESSORIES

Gap bed Built in coolant 9" three jaw adaptor plate 12" four jaw adaptor plate 14" face plate
Full length splash guard Four way tool post Steady rest Halogen light Tool box w/tools
Operational manual

OPTIONAL ACCESSORIES

Follow rest Micrometer stop Four position carriage stop 5C collet closer Quick change tool post
Taper turning attachment 12" drive plate Rear tool post 20" face plate Four jaw independent chuck
Three chuck universal chuck

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2.4 STANDARD ACCESSORIES AND OPTIONAL ACCESSORIES

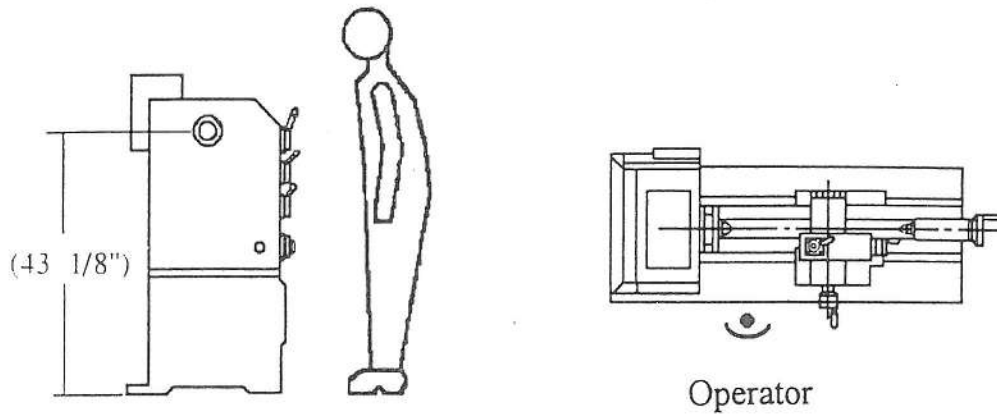
(A) Standard Accessories:

1. main motor fixed inside the machine.
2. change gears for module & D.P. cutting fixed inside the machine.
3. center sleeve(MT 4,6).
4. coolant equipment fixed inside the machine.
5. tool box with tool kits.
6. square tool post with wrench.
7. repair paint
8. chuck guard.
9. chip guard.
10. chuck key.
11. full length splash guard for 1730G
full length splash guard for 1740G
full length splash guard for 1760G
full length splash guard for 1780G
12. work light/quartz light

(B) Optional Accessories:

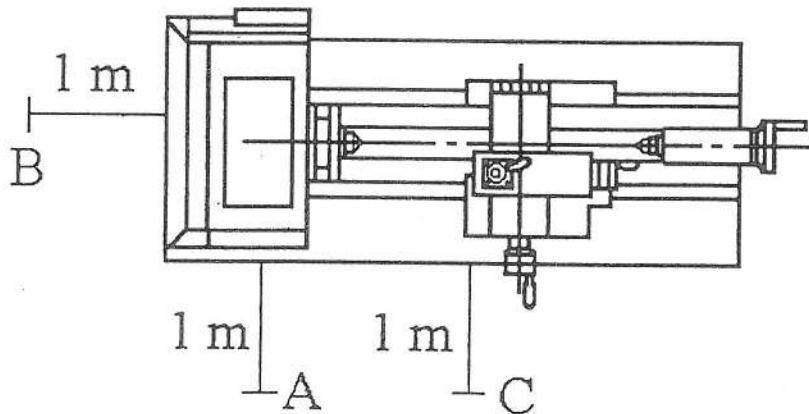
1. steady rest(bronze/bearing type)
2. follow rest.
3. 3-jaw chuck 230mm (9") w/plate
4. driving plate 500mm
5. collect closer attachment
6. rear toolpost
7. micro bed stop.
8. 4-position bed stop.
9. rotation center M.T.#4
10. taper turning attachment.
11. quick change toolpost.

2.5 OPERATOR POSITION AND NOISE LEVEL



noise level : less than 84 dB

The distance is 1 meter from the surface of the machinery and at a height of 1.6 meter from floor.



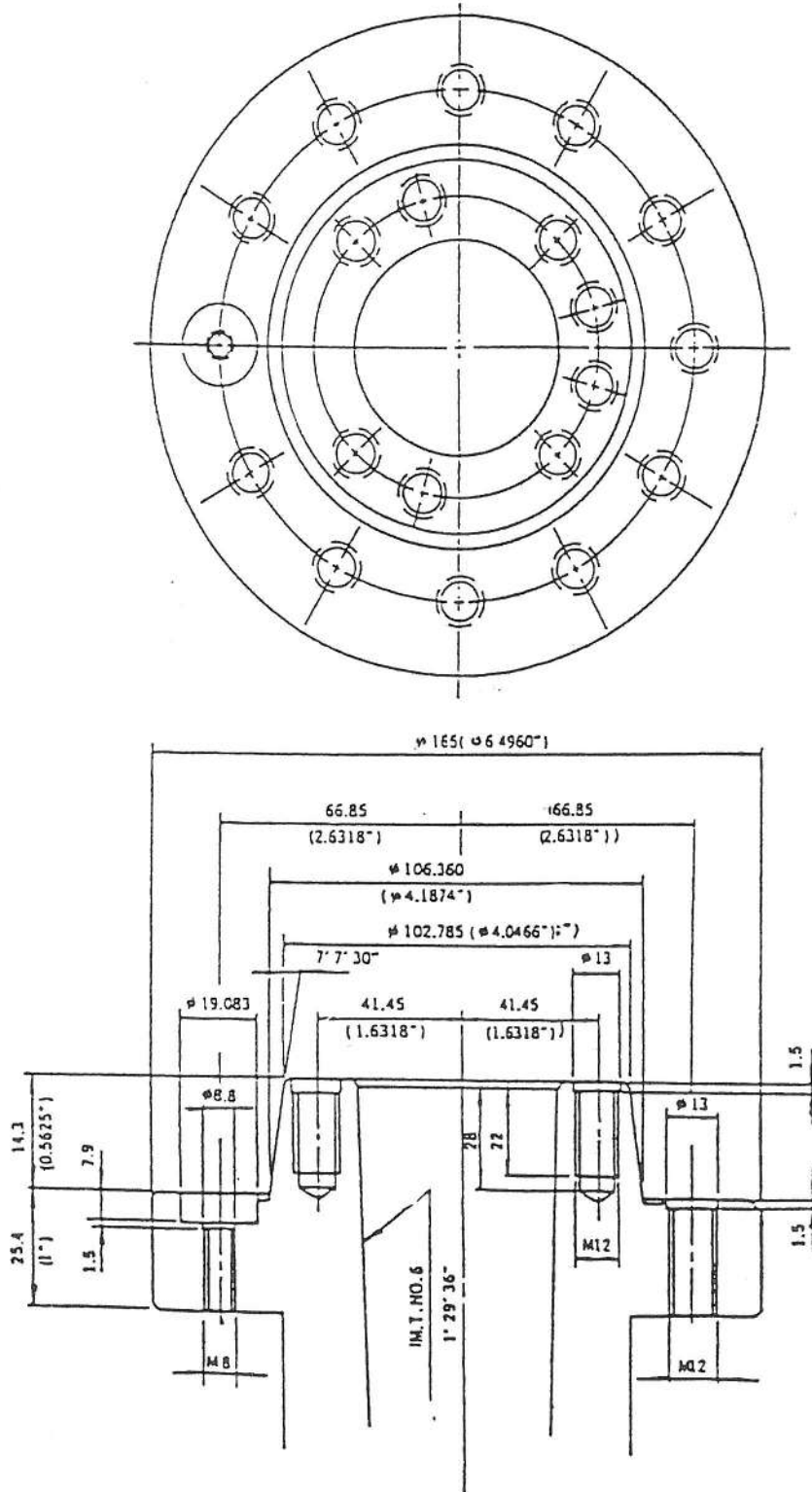
Load & Position: As CEN/TC 143/WG3 Dec.1994 (for 5.62 Kw power)

Position A	80 dB
Position B	81 dB
Position C	80 dB
Cutting Load	(1) Spindle speed : 885 r.p.m (2) Feed rate : 0.32 mm/rev. (3) Depth of cutting : 3 mm (4) Workpiece : $\phi 80 \times 100$ mm

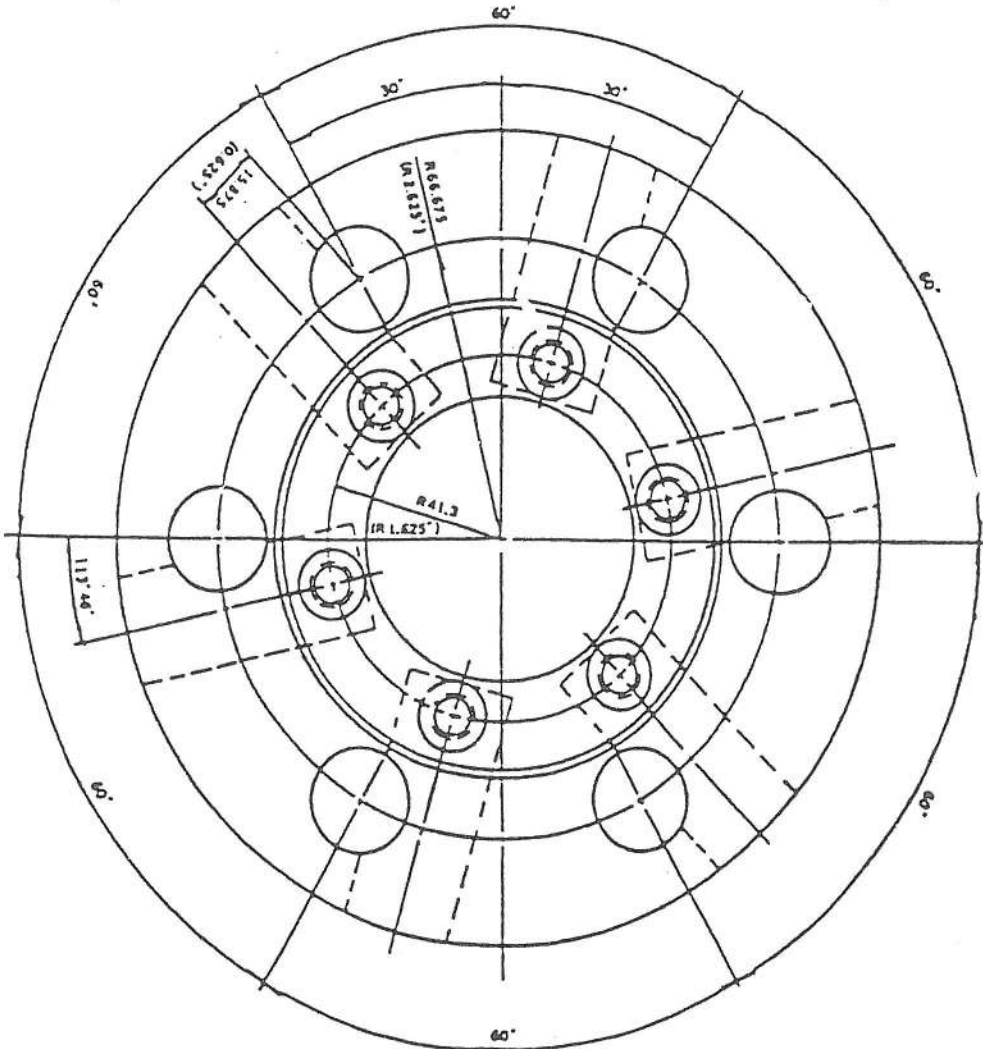
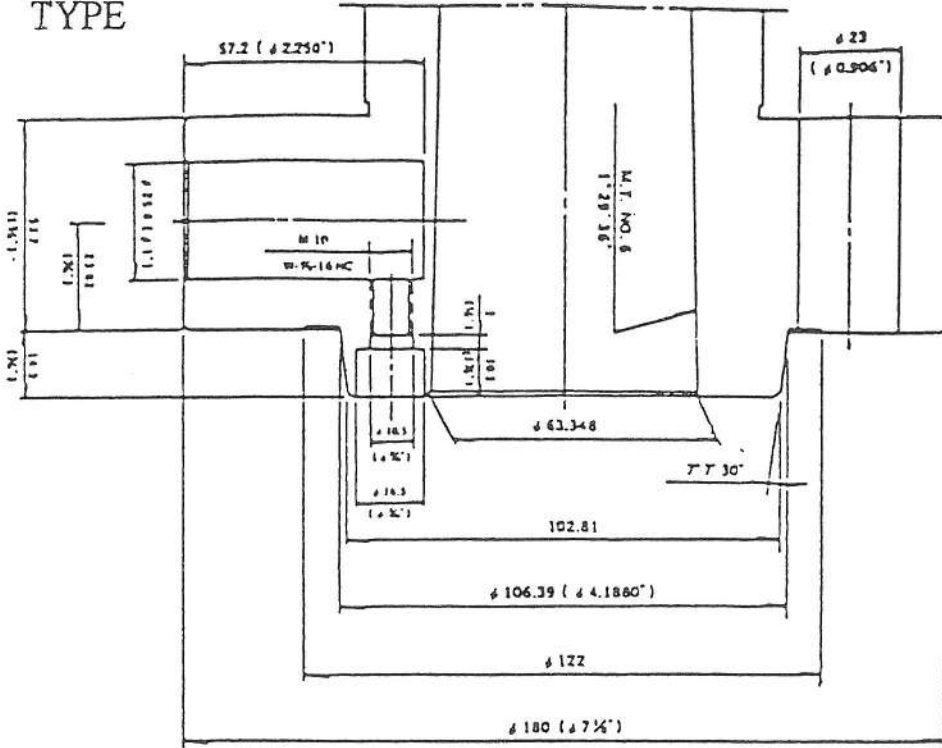
2.6 SPINDLE BORE AND TAILSTOCK QUILL TAPER DRAWING

(A) spindle bore detail & taper of spindle bore: A.S.A. A1-6 type or D1-6

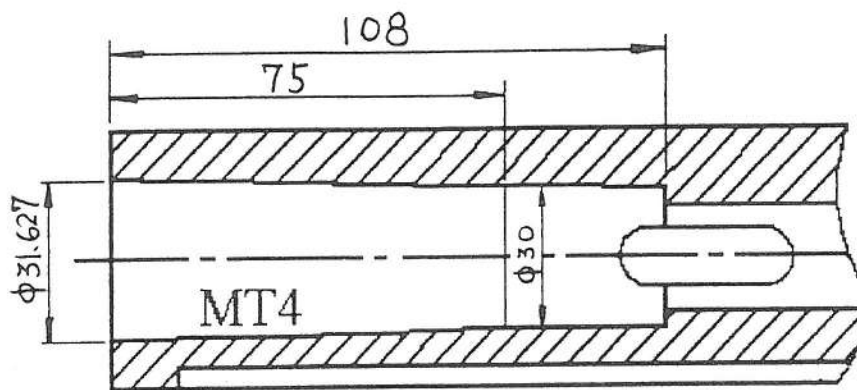
A.S.A. A1-6 TYPE



D1-6 TYPE



(B) quill bore detail & taper of quill bore: MT4



CHAPTER 3

PREPARATIONS BEFORE INSTALLING THE MACHINE

3.1 FOUNDATION REQUIREMENT

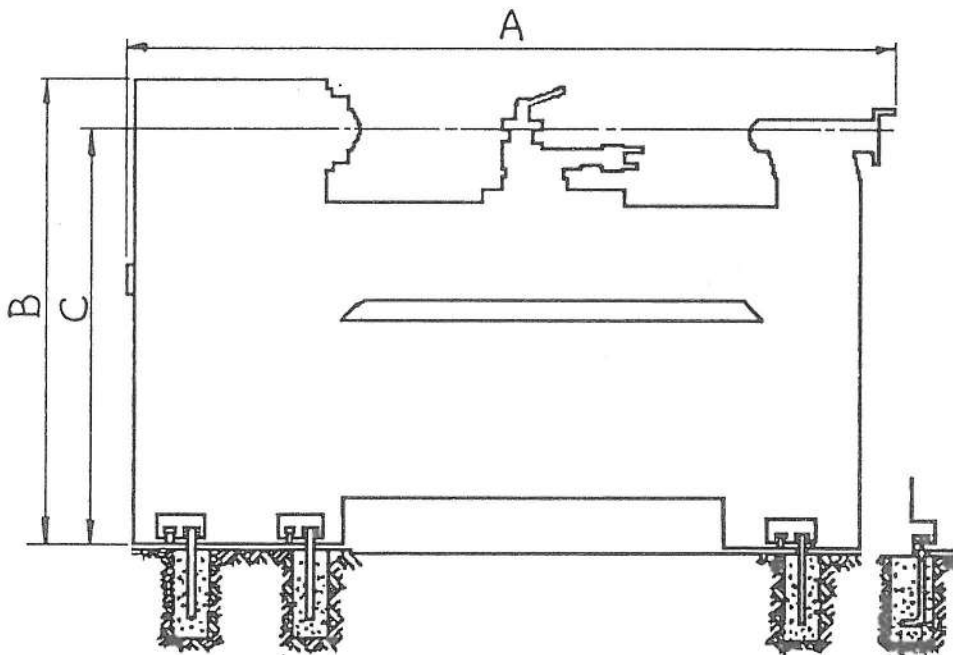
Firm, steady, well constructed ground and good level are the essential conditions for precision turning. The heat from sunshine and the vibration might influence precision turning.

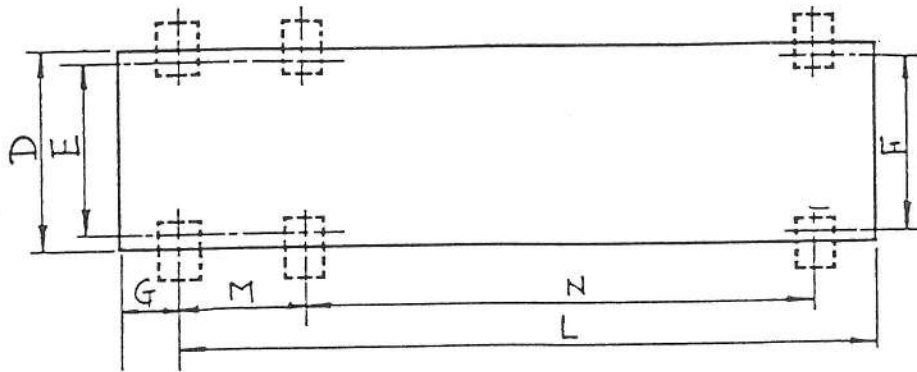
The foundation for machine needs:

- (1) Avoid the sunlight shining directly to the machine.
- (2) Avoid locating the lathe machine near press...etc.
- (3) Good ventilation.

Note:

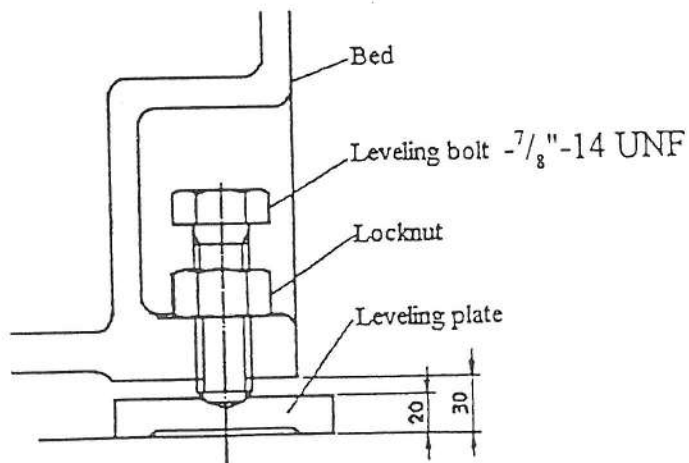
The lathe may be leveled and used free standing. Please refer to leveling device. However in order to obtain the best performance, it is recommended to install your machine with foundation bolt based on the foundation drawing and contact us.





unit:m/m

TYPE	A	B	C	D	E	F	G	M	N	L
1730G	2,115	1,230	1,095	655	605	605	170	343	1,080	1,840
1740G	2,140	1,230	1,095	655	605	605	160	360	1,330	2,055
1760G	2,695	1,240	1,095	655	603	603	160	360	1,828	2,568
1780G	2,750	1,230	1,095	655	605	605	160	360	2,280	3,105



Leveling device figure

3.2 POWER REQUIREMENTS

voltage	steady state voltage 0.9 .. 1.1 of nominal voltage.
frequency	0.99 .. 1.01 of normal frequency continuously, 0.98 .. 1.02 short-time.
harmonics	harmonic distortion not to exceed 10% of the total r.m.s voltage between the live conductors for the sum of the 2nd through 5th harmonic.
voltage unbalance in 3-phase supplies	neither the voltage of the negative sequence component nor the voltage of the zero sequence component shall exceed 2% of the positive sequence component
voltage impulses	not to exceed 1.5 ms in duration with a rise / fall time between 500 ns and 500 us and a peak value not more than 200% of the rated r.m.s. supply voltage.
voltage interruption	supply interrupted or at zero voltage for not more than 3 ms at any random time in the supply cycle there shall be more than 1 s between successive interruptions
voltage dips	voltage dips shall not exceed 20 % of the peak voltage of the supply for more than one cycle. there shall be more than 1 s between successive dips.

3.3 SITE LOCATION

- (a) temperature: Normal temperature is within +10 ° C to 38 ° C. If you want precision turning, please control the room temperature within 20~22 ° C.
- (b) humidity: 30% to 95% .
- (c) keep away from gas 、 chemical 、 ashes 、 acid 、 salty or explosive environment.
- (d) environment brightness: more than 300 LUX.

CHAPTER 4

TRANSPORTATION AND INSTALLATION

4.1 TRANSPORTATION

4.1.1 Machine Weight

DYNAMIC 17" SERIES LATHE				unit: lbs
Model Type	17 × 30	17 × 40	17 × 60	17 × 80
Net Weight	3200	3500	3950	4400
Gross Weight	3450	3750	4250	4750

Warning: always ensure the capacity of lifting equipment is adequate before attempting to lift.

4.1.2 Preparation And Safety Checks

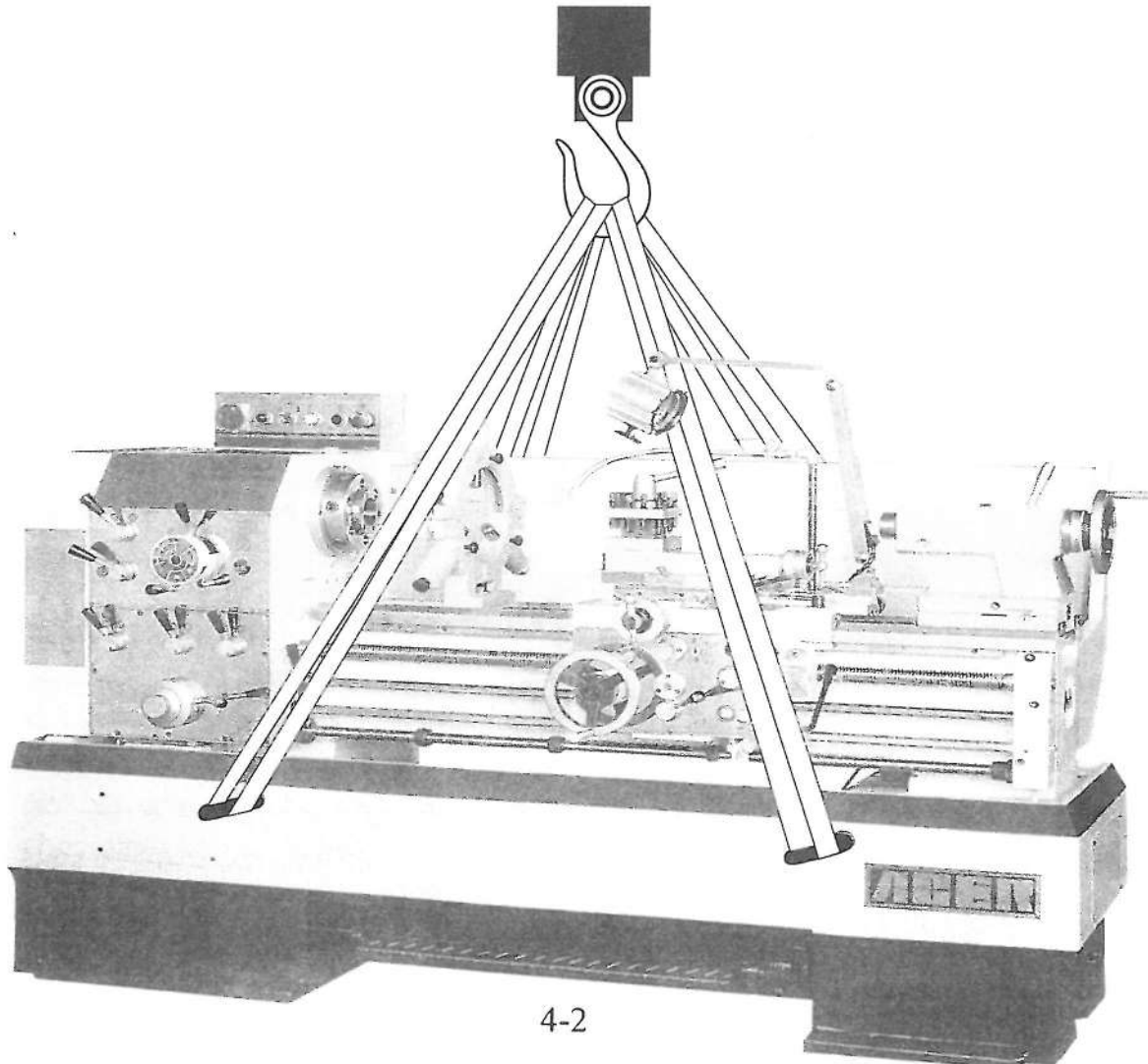
1. All equipments should be examined by one person only.
2. Slings must be examined through the whole length by eyes.
3. Operator must be qualified.
4. Operator should keep away when lifting. Do not allow any person to stand under the machine.
5. Ensure that eyebolts and securing screws of lifting equipments are correctly tightened.
6. Remove all loosen items.
7. Clamp tailstock securely at the tail of the bed.
8. Clamp saddle to bed.

4.1.3 Lifting Procedure

To leave the lathe bolted on skid is correct for moving. In order to have the machine perfectly balanced before hoisting, it is advised to move tailstock to the extreme right-hand position and carriage in the middle of the bed. Clamp both assemblies firmly in place so they will not accidentally slide on the guide way when lifting.

First, take out the rubber cover of the hole which located in the bed, then insert the $\phi 35\text{mm} \times 1.6\text{m}$ (length) steel bar through the hole shown in the figure. Hemp rope should be used in lifting, which should be at least 12mm in diameter(the strength of the hemp is 930 kg), or steel cable of equivalent strength.

Place soft-wooden blocks between the hoisting cable and the body of the machine at point where damage would occur if excessive pressure resulted from lifting. As the lathe lifts from the skid, check the blocks and cables in position and of the balance of the machine is proper; then to move the skid away and put down slowly the machine into the site location you wanted.



4.2 INSTALLATION

4.2.1 Cleaning

All machine's surfaces covered with a antirust preservative must be thoroughly cleaned off before moving any parts of the lathe. Only mild solvent and soft rags must be used for cleaning. Leave carriage and tailstock locked in position until exposed bed ways are cleaned. Using a good grease solvent, thoroughly remove the rust-preventive from exposed bed ways, tops, slides, and from all other machined surfaces.

Next, loosen the carriage lock screw and move carriage to a clean section of bed. Then, loosen tailstock clamp lever, move tailstock, and finish cleaning bed ways.

Use a stiff bristle brush (not wired) to clean leadscrew and carriage rack. Apply a light coating of machine oil to all machines surfaces for rust protection. For a long service life, be sure to make it a habit to clean and lubricate the machine regularly.

- Note: 1. Special care must be taken to completely clean the lead screw, feed shaft, slide way, spindle nose and quill nose.
2. Remove all moisture absorbent silica gel bags from machine and inside the electrical cabinet.
 3. The rust presentative coating is better removed by using "paraffin" applied with a clean brush. If the coating is softened material, please removed with clean rags. Remove rust preservative before moving slide way.

4.2.2 Level Adjustment

It is most important to set the lathe level and firm in order to perform accurately. For a best result, it is suggested to mount the lathe on a concrete floor. Please referred to chapter 3 " leveling device ". Once the machine is located on the prepared foundation, and the bed ways and slides be cleaned thoroughly, machine level should be used alternately on the cross slide and the sideways of the lathe. Readings of the level should be taken on the extreme ends of the sideways as well as in the center. Minute adjustments of leveling bolts should be made until the machine is perfectly leveled within 0.0012/40 " .

When the level of the lathe has been established, immediately grout the machine base to the foundation with the highest quality, shock-vibration-resistant mortar which is a kind of concrete, if installing machine with foundation bolt.

4.2.3 Power Source Wiring

The electrical equipment supplier is different depending on the models and your requirements. The machine is ready for installation on 3 phase or single phase, A.C. voltage as you require.

The respective wiring should be connected with terminals "L1,L2,L3,PE" at the electric box. After wiring, check the spindle rotating direction. Turn on the power source switch and push the jogging switch button to see if it is forward revolution. If not, replace two of the three wires (L1,L2,L3). Then check the rotation again.

If the spindle speed drops to zero during normal operation, but the pilot light is still on, it indicates that the overload thermal relay is working. Please turn off the main switch, reset the thermal overload relay and restart the machine.

Warning: 1. Before connecting to a power source, check motor voltage - phase and cycles .

2. Make sure that power supply is properly fused and the earth circuit is adequate.

3. Motor rotation must be clockwise shown in the cover of the motor. If the motor runs in the wrong direction, interchange two terminals for phases correction.

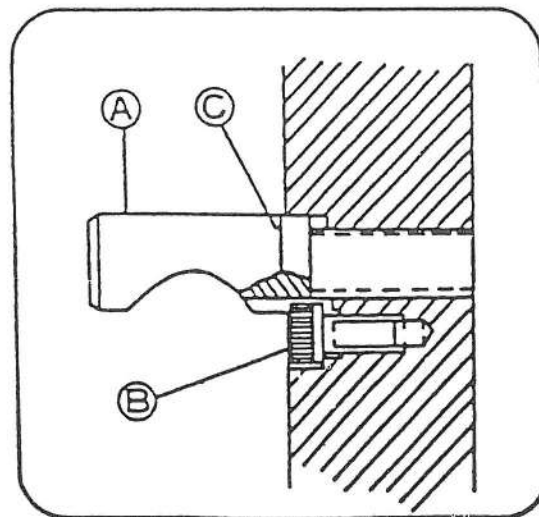
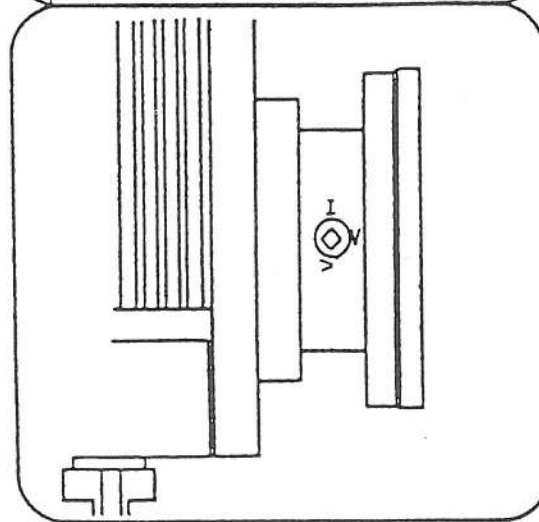
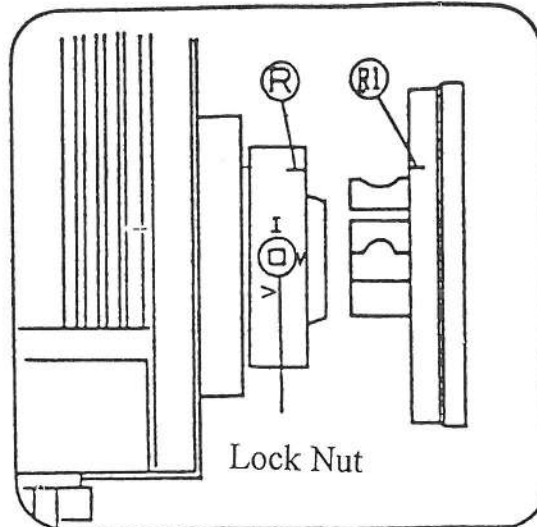
4.2.4 Dismantling Procedure of The Machine

The dismantling procedure is the reverse procedure of the installation.

4.3 CHUCK MOUNTING

Ensure that the location faces on both nose and attachment are scrupulously clean. Mount the attachment on to the spindle nose so that the reference mark (R) and (R1) are in line. Lock each cam by turning it clockwise using the key provided. Check for correct locking conditions. Each cam must be tightened with this index line between the two Vee marks on the nose.

Remove lock screw (B) to adjust camlock studs and turn stud (A) one full turn in or out as required. Re-fit and tighten lock screw (B). Note a datum ring (C) is marked on each stud as a guide to the original or initial setting.



Warning:

1. The specification of chuck is shown in the following table:

Type	3-jaw chuck
outer diameter	232mm
inner diameter	70 mm
allowable handle torque	15 kgf.m
gripping force	3900 kgf
approximate weight	22.7kg
max.allowa-ble speed	2000rpm

The instruction manual book of chuck is supplied with the machine, be sure to follow it before using.

2. Isolate the machine before chuck mounting.

3. A suitable size of timber with vee notch is ideal to protect the bed way under the spindle nose and allows the chuck body to be rested on it at the correct spindle height.

4. Take note of the limiting speeds when attaching chucking equipment.

5. Barrel oilers are provided on the chuck and lubricate it every week when chucking.

CHAPTER 5

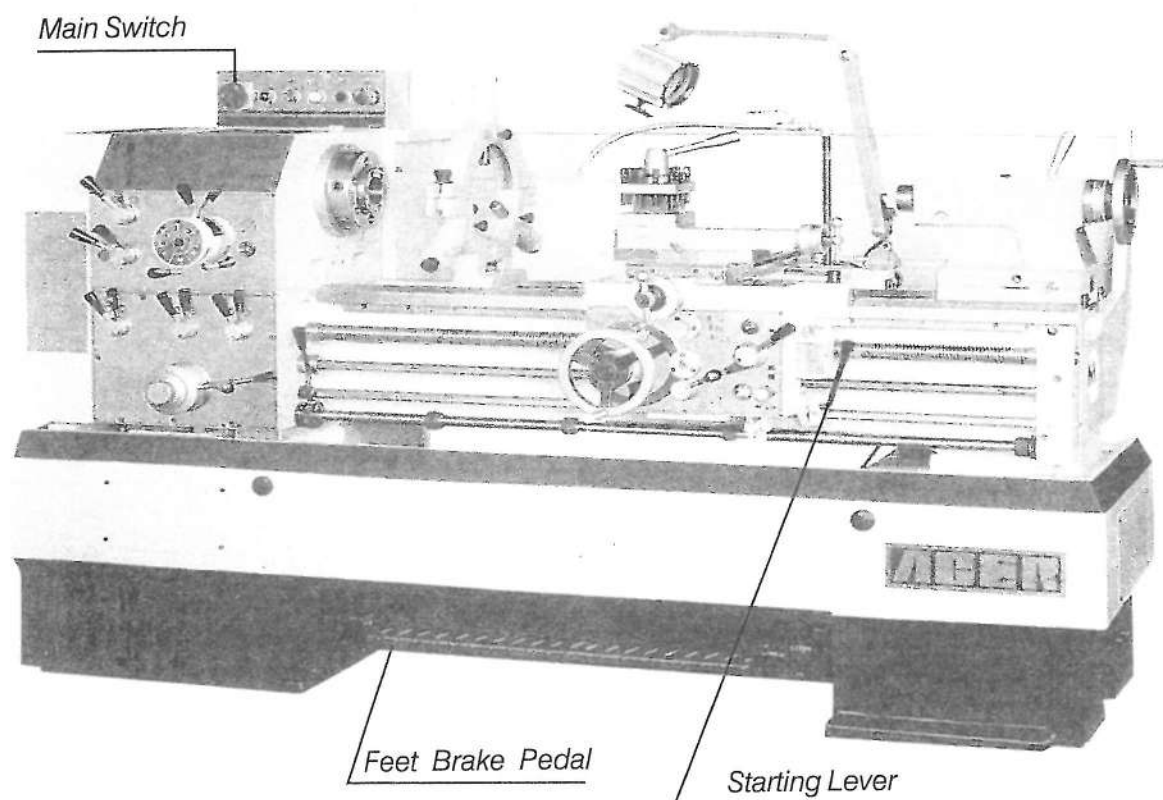
OPERATION AND USE

5.1 STARTING AND STOPPING

Before starting up machine, make sure if the proper lubrication to all running parts has been done as per lubrication chart. And switch on after ensuring the starting lever at apron which should be placed in the neutral position.

During switching on, the pilot lamp will be on. The starting up of main spindle is accomplished by the starting lever at the right of apron, the starting lever has a safety locking device which prevents any abrupt accident from operator. Move this starting lever horizontally to disengage a safety pin. When this lever is moved down, the main spindle stops revolving.

During the main spindle is revolving, if the foot brake pedal is pressed down, the main spindle will be stopped at once. If you want to start the machine again, switch the starting lever. If the emergency stop button is pressed down to stop the machine, firstly pull up the emergency stop button and then switch the starting lever to start the machine again.



5.2 SPINDLE SPEED CHANGE FOR 17" SERIES

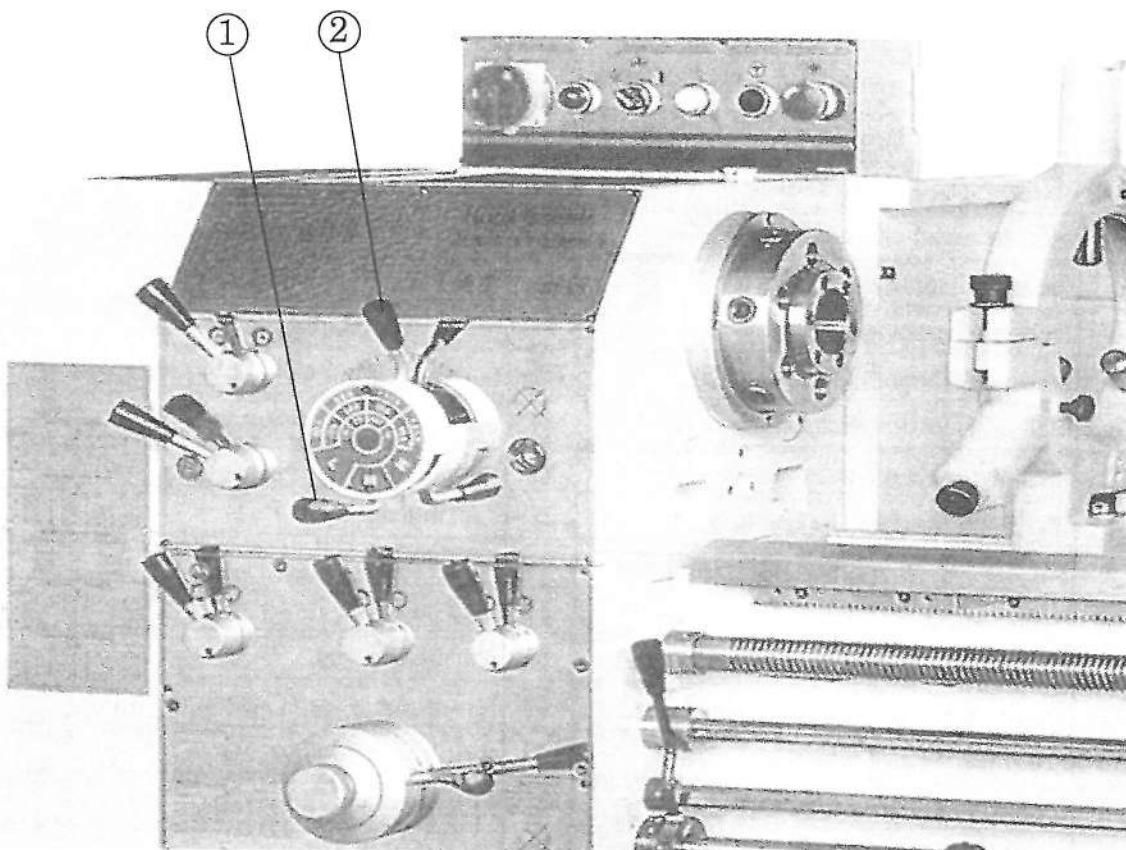
Select the appropriate spindle speed for working from cutting speed chart on the top of headstock. There are 12 steps in the range of spindle speed.(50~1800 r.p.m. 60/50 Hz for '17" series)

The change of main spindle speeds are accomplished by the lever (1) and the lever (2). Lever (1) selects H.M.L. position. Lever (2) selects speeds of 12 grades corresponding with lever (1).Please refer to figure below.

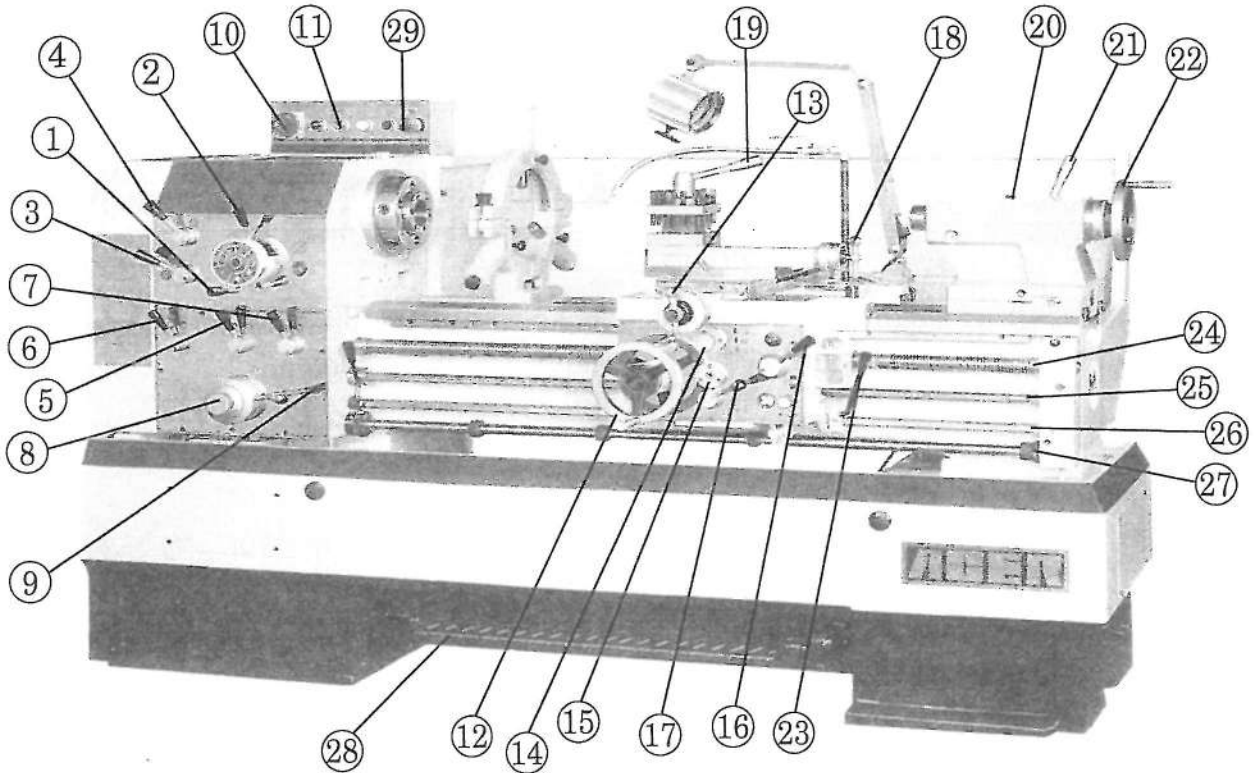
In order to obtain the desired spindle speeds, place the lever at the proper position. Be sure do not shift the lever when the spindle is running.

CHART OF SPINDLE SPEEDS (R.P.M.) UNDER 60 Hz												
LEVER	H				M				L			
17"	1,800	1,239	885	612	515	355	253	175	147	101	72	50

Warning:should turn off the motor and let spindle stop before changing the position of levers



5.2.1 Description of control unit of 17"/20" Series



Item	Driving unit	Item	Driving unit
1	spindle speed change lever	16	half-nut lever
2	spindle speed change lever	17	feeds engaging and disengaging lever
3	feed and leadscrew F.R grip	18	tool slide feeds hand wheel
4	feeds and threads change lever	19	tool post clamping lever
5	feeds and threads change lever	20	tailstock spindle clamping lever
6	inch and metric (feeds)change lever	21	tailstock body clamping lever
7	inch and metric change lever	22	tailstock hand wheel
8	feeds and threads change lever	23	starting-up lever
9	engage and disengage clamping lever	24	leadscrew
10	main switch	25	feed rod
11	coolant pump switch	26	starting-up rod
12	longitudinal feeds hand wheel	27	longitudinal feeds stopping rod
13	cross feeds hand wheel	28	foot brake pedal
14	longitudinal-cross feed change lever	29	emergency stop button
15	overload adjusting bolt		

Introduction:

1. spindle speed change lever:
Select the H.M.L position to decide the spindle speed.
- 2 spindle speed change lever:
Select the 12 grades speed accompanied with lever(1).
3. feed and leadscrew F.R grip:
Select the forward or backward direction of the leadscrew.
4. feeds and threads change lever:
Select the "C" or "D" position to decide the rate of feeds or threads accompanied with lever(5),(8). Please refer to chapter 5.3.
5. feeds and threads change lever:
Select the "A" or "B" position to decide the rate of feeds or threads accompanied with lever(4),(8). Please refer to chapter 5.3 or table. If you want to select the module threads(feeds), please change the gears shown in the table.
6. inch and metric change lever:
Select the "W" or "M" position to decide the feeds or threads together with lever(7). "W" means inch threads and "M" means metric threads system.
7. inch and metric change lever:
Select the "W" or "M" or neutral position to decide the feeds or threads together with lever (6) ; example, when select metric threads, the lever (6) and (7) must be place in "M" position. The feed rod (25) can be rotated, but the leadscrew rod (24) can not be rotated to complete thread process.
8. feeds and threads change lever:
Select the 9 grades to decide the rate of feed or threads accompanied with lever (4) , (5) according to the table. please refer to chapter 5.3.
9. engage and disengage clamping lever:
Turn the clamping lever (9) clockwise to engage the gears of the gear box and to transmit the leadscrew rod (24) or feed rod (25). Turn lever (9) counterclockwise to disengage the gears of the gear box.

10. main switch:

When switching on, the pilot lamp will be lighting. The starting-up of main spindle is accomplished by the starting-up lever(23) which is at the right of apron and the chuck guard which at the top of chuck.

11. coolant pump switch:

When switching on, the pilot lamp which at the right position will be lighting. The coolant will be flowed when open the valve level of the coolant nozzle. Please switch off when stop the cutting process.

12. longitudinal feeds hand wheel :

When moving longitudinal feed rapidly, turn continuously hand wheel (12) by hand. Do not operate the wheel of the machine in excess of its capacity.

13. cross feeds hand wheel :

When moving cross feed, turn continuously hand wheel(13) by hand. Turn the hand wheel (13) clockwise and feed the cross slide forwards. This dial of the hand wheel is graduated in 0.05mm(metric screw).

14. longitudinal-cross feed change lever:

The lever(14) determining the engaging for the power longitudinal or cross feed pull it outwards is for power longitudinal feed when pushing down the lever (7). There is a neutral position between outwards and inwards position in order to cut thread workpiece when pushing down the half-nut lever(16).

15. overload adjusting bolt .

There is an overload safety device to disengage power cutting by means of bolt (15) which equipped with cone clutch mechanism. Turn the bolt clockwise to get more load when proceeding the power cutting process. Please do not adjust bolt (15) in excess of the machine capacity.

16. half-nut lever:

When all cutting thread processes are prepared, the operator is permitted to push down the half-nut lever (16) for the workpiece thread cutting . When pulling the lever (17) up to disengage the leadscrew, therefore, the thread cutting was stopped.

Note:

In the end of the thread cutting process, please pull up the lever (17) and turn the cross hand wheel (13) backwards simultaneously.

-
17. feeds engaging and disengaging lever:
The engaging and disengaging of longitudinal or cross feed is accomplished by the lever (17). If push down the lever(17), engage the feed rod (25) in order to power the cross feed or longitudinal feed decided by the longitudinal-cross feed change lever(14).
18. tool slide feeds hand wheel :
When moving longitudinal feed, turn hand wheel(18) continuously by hand. Turn the hand wheel (18) clockwise and move the compound slide located at the upper position forwards. The dial of the hand wheel is graduated in 0.02mm (metric screw).
19. tool post clamping lever:
Turn the clamping lever (19) clockwise to clamp the tool post which located at the top position of the cross slide. The maximum side of cutting tool is 25mm x 25mm.
20. tailstock spindle clamping lever:
Turn the lever (20) counterclockwisely to clamp the tailstock quill.
Note:
When use the center of the tailstock to support the workpiece, please clamp the quill by clamping lever (20) and clamp the tailstock body by clamping lever(21).
21. tailstock body clamping lever :
Turn the lever (21) counterclockwisely to clamp the tailstock body.
Note:
When use the center of the tailstock to support the workpiece or drill by tailstock or transport the lathe, please clamp the tailstock body by lever (21).
22. tailstock hand wheel :
When moving the stock of the tailstock, turn hand wheel (22) continuously by hand.
Note:
Do not operate the wheel (22) to drill over the machine capacity.
23. starting-up lever :
The starting-up lever(23) has a safety locking device to prevent unintended starting the spindle from any abrupt operation by operator. To operate the lever to start the spindle, the lever must be pulled horizontally to disengage a safety pin and turn up for starting the spindle motor after turning on the main

switch. When turn down, the spindle gets a clockwise revolution. When turn up, the spindle gets a counterclockwise revolution.

24. leadscrew:

Please see the above description.

25. feed rod:

Please see the above description.

26. starting-up rod:

Please see the above description.

27. longitudinal feeds stopping rod :

The stopping rod has 4 setting ring whose purpose is for 4 steps of automatic stop feeding by different ring position setting with stopping lever. The stopping lever is located at the left end of the stopping rod. For example, when the lever is set at "1 label" position, the longitudinal power feeder will be stopped until the starting-up lever touch the first setting ring.

28. foot brake pedal:

After stepping on the foot brake pedal, the spindle will stop rotating and power will be off. The spindle will rotate after switch the starting-up rod to middle position and restart the power.

29. emergency stop button:

When emergency situation happened, quickly push down the emergency stop button by hand. If you want to restart the machine, pull up the emergency stop button before starting the machine.

5.3 FEEDS AND THREADS OF 17" SERIES

(A) Feeds:

Find out desired feed in the feed table, turn the lever (5) and the lever (4) to the desired position (A,B and C,D) as you find, turn clamping lever (9) anti-clockwise to disengage the gear, then turn the lever (8) to the position (1,2,3,4,5,6,7,8,9) as you find, then turn clamping lever (9) clockwise to engage the gears. Please refer to fig. .

However you must turn the lever (6) to the feed position (~~~~), and turn the lever (7) to the neutral position.

The rate of feeds shown in the table are for longitudinal feed and cross feed is $\frac{1}{2}$ of longitudinal feed.

Feeds mm/rev.

LEVER		M(~~~~)								
		1	2	3	4	5	6	7	8	9
A	C	0.4	0.45	0.48	0.5	0.55	0.58	0.6	0.65	0.7
	D	0.2	0.22	0.24	0.25	0.28	0.29	0.3	0.32	0.35
B	C	0.1	0.11	0.12	0.13	0.14	0.15	0.15	0.16	0.18
	D	0.05	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09

Feeds ins/rev.

LEVER		M(~~~~)								
		1	2	3	4	5	6	7	8	9
A	C	0.016	0.018	0.019	0.020	0.022	0.023	0.024	0.026	0.028
	D	0.008	0.009	0.010	0.010	0.011	0.012	0.012	0.013	0.014
B	C	0.004	0.004	0.005	0.005	0.006	0.006	0.006	0.007	0.007
	D	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004

(B) Threads:

Find out the desired thread from the thread table, then to set the lever (4), (5), (8) and (9) to the desired position in the same way as feed selection by turning cut Metric threads without changing gears.

By using change gears, you can cut D.P. and Module threads.

Metric Threads

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

Module Threads

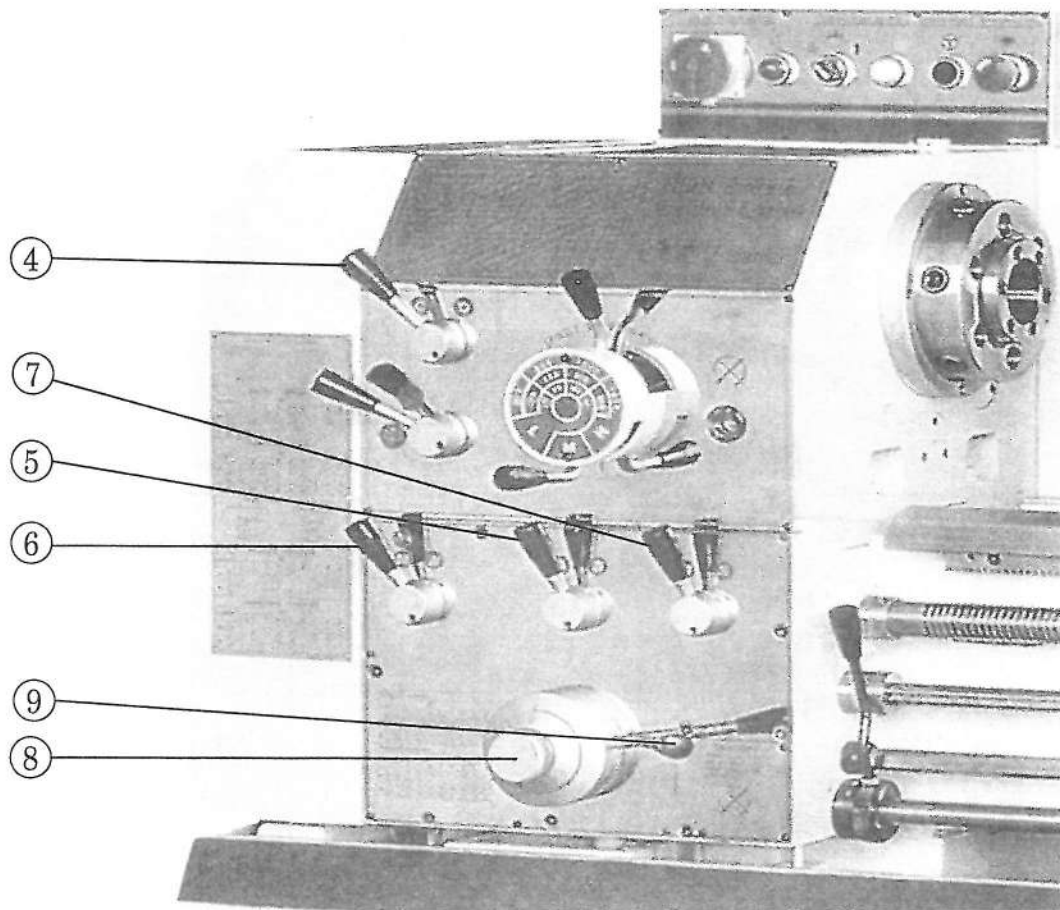
LEVER		M								
		1	2	3	4	5	6	7	8	9
A	C	2	2.25	-	2.5	2.75	-	3	3.25	3.5
	D	1	-	-	1.25	-	-	1.5	-	1.75
B	C	0.5	-	-	-	-	-	-	-	-
	D	-	-	-	-	-	-	-	-	-

Threads Per Inch

LEVER		W								
		1	2	3	4	5	6	7	8	9
B	C	4	4 $\frac{1}{2}$	4 $\frac{3}{4}$	5	5 $\frac{1}{2}$	5 $\frac{3}{4}$	6	6 $\frac{1}{2}$	7
	D	8	9	9 $\frac{1}{2}$	10	11	11 $\frac{1}{2}$	12	13	14
A	C	16	18	19	20	22	23	24	26	28
	D	32	36	38	40	44	46	48	52	56

Diametric Threads

LEVER		W								
		1	2	3	4	5	6	7	8	9
B	C	8	9	-	10	11	-	12	13	14
	D	16	18	-	20	22	-	24	26	28
A	C	32	36	-	40	44	-	48	52	56
	D	-	-	-	-	-	-	-	-	-

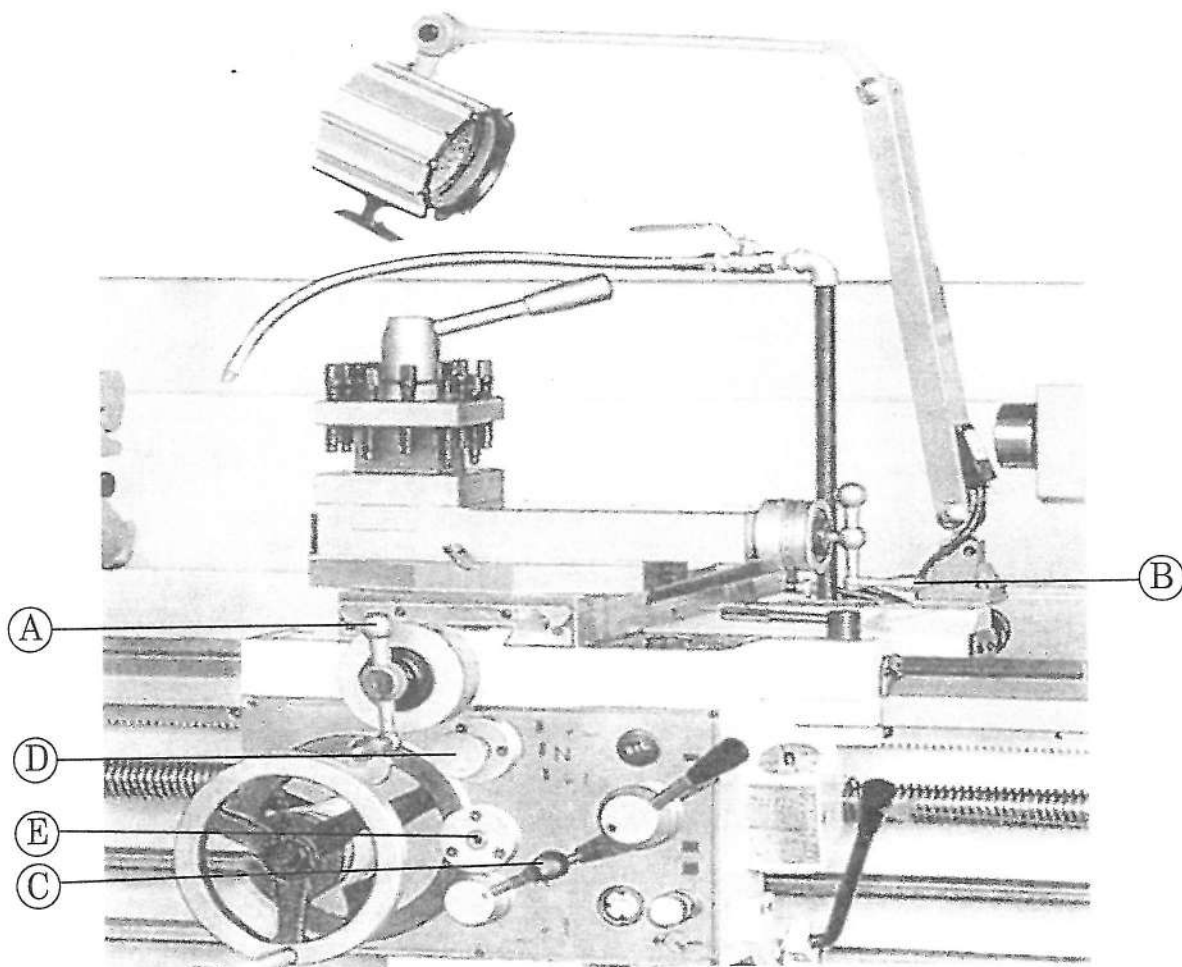


5.4 CARRIAGE AND APRON

Carriage moves along the bed by hand or by power feed and supports the cross slide, compound rest, tool post and cutting tools. The cross slide handle (A) and tool post slide handle (B) move the cross slide and tool post slide in and out. And handle collars are graduated in two hundredths one m.m. (0.02m.m. per unit) or in one thousandths one inch (0.001 in. per unit).

The apron, anchored to the front of the carriage, contains the power longitudinal and cross feed controls. The engaging and disengaging of longitudinal and cross feeds is accomplished by lever (C) (drop worm system). Lever (D) determines the engaging for the power longitudinal and cross feed; pull it out is for longitudinal feed, and push it in is for cross feed, and there is a neutral position between pull out and push in positions.

The interlocking device is equipped so that the longitudinal feed and the half-nut engaging can not work together. There is an overload safety device by means of cone clutch which can be easily adjusted by a screw (E).



5.5 SWarf REMOVING

When removing swarf, firstly turn off the power. Then wear gloves to take off the swarf.

CHAPTER 6

MAINTENANCE

6.1 LUBRICATION AND LUBRICANT

It is most important to lubricate lathe before operating. The operator should be responsible for the proper lubrication of the lathe. The grade and quality of lubricants are given on the following oil lubrication chart. The instructions on this chart are essential to the proper oiling of the internal parts of the lathe. Oil levels should be strictly observed, for it is of primary importance for proper operation and long life that the oil bath for the headstock which always be completely filled.

Note: 1. Headstock and gear box are lubricated by an automatic oil system.

2. Isolate the machine before removing any cover and making adjustment.

3. For 17" series, apron is oil bathed and equipped with pumping handle for forced lubrication. The oil will be forced to the oil grooves of carriage and then flow to the bed way and cross the slide way.

No.	Lubricating Point	Oiling Method	Viscosity S.U.S.100F	Oil Recommended	Oil Replenishment or Filling
1	headstock feed gearbox	to open upper cap on headstock	160	SHELL(TELLUS)27 ESSO(TERESSO)43	two times a year (replenishment)
2	compound slides oiler(nipple)	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
3	apron & carriage	pull the pump- ing handle at apron bottom	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
4	tailstock nipple	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
5	change gears nipple	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
6	leadscrew nipple	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
7	feed rod nipple	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)
8	bedways	by gun oiler	320	SHELL(TONNA)33 ESSO(TERESSO)52	once a day (filling)

6.2 COOLANT SYSTEM

Coolant is supplied via a gear pump mounted to the coolant tank and located at the machine base. The manually operated coolant tap is mounted to the rear of the saddle casting, and has a flexible stork to direct the coolant at the cutting tip.

The coolant pipe work is set internally and protected from hot swarf chips. The coolant system has manually controlled by ON/OFF push-button at the operator control panel.

Warning:

(1) Isolate the machine before removing any covers and making adjustments.

(2) The following precautions should be taken:

- avoid unnecessary contact with cutting fluid.**
- Wear protective clothing during operation.**
- change cutting fluids regularly.**
- dispose of fluids in accordance with statutory regulation.**
- avoid mixing different types of cutting fluids.**

6.2.1 Coolant System Filling Procedure

1. Transverse the saddle to the tailend of the machine.
2. With a suitable pipe to assist filling, fill the tank to within 1 cm($\frac{3}{8}$ ") of the top.
3. Clean any overspill on the floor immediately.
4. Power up the machine, open the coolant tap and run coolant pump to prime the system.

6.2.2 Coolant System Cleaning Procedure

1. Transverse the saddle to the tailend of the machine.
2. Using the machine coolant pump, the coolant can be pumped out into a suitable container.
3. Close the tap at the standpipe and power down the machine.

4. The coolant pipe and electrical cable attached to the pump will have excess length which can be pulled through.
5. Slide the coolant tank approximately 25.6" out the end of the machine and wedge the opposite end of the tank upward. The remaining liquid can be removed and the bottom of the tank wiped clean.
6. Clean any overspill on the floor immediately.
7. Re-fit the coolant tank and fill to within 1 cm(³/₈") from the top.
8. Power up the machine, open the coolant tap and run coolant pump to prime the system.

6.2.3 Coolant Capacities And Recommended Types For Ferrous Metal

Machine	Capacity	Esso	Shell	Mobil	Castrol
1730G	15 Liters	Cutwell 30	Dromus oil B	SOLVAC 1535	Syntilor Coolant
1740G	15 Liters				
1760G	15 Liters				
1780G	15 Liters				

Conversion factor: 1 Gallon = 3.7853 liters

6.3 ROUTINE MAINTENANCE PROGRAM

A regular program of preventative maintenance is recommended to keep the machine in good working order. This will reduce service calls and cost to you.

6.3.1 Weekly Check

area	attachment	item check	method of check	permissible condition	action if required
headstock	bearings and gears	lubrication	visual	level indicated on oil sight	top use replace oil annually
tailstock		lubrication		lubricate weekly	see lubrication checks
topslide		lubrication		lubricate weekly	see lubrication checks
coolant		level	visual	50mm below top of tank	top up see coolant filling

6.3.2 Half Year Checks

area	attachment	item check	method of check	permissible condition	action if required
headstock	spindle drive belts	tension	tension test tool	see belt tensioning tables	see belt tensioning section
saddle	taper gibs	slideway clearance	dial test indicator	see belt tensioning tables	see belt tensioning section
crossslide	taper gib strip	slideway clearance	dial test indicator	see belt tensioning tables	see gib adjustment section

6.3.3 Annual Checks

area	attachment	item check	method of check	permissible condition	action if required
headstock	spindle	alignment	test bar	see accuracy chart	re-align by service engineer
tailstock		body setover	test bar and test indicator	see accuracy chart	re-align
		runout	dial test indicator		check by service engineer
		cleaning			see coolant system cleaning

6.4 TROUBLE SHOOTING

TROUBLE SHOOTING CHART		
TROUBLE	PROBABLE CAUSE	CORRECTION
Vibration	Loose leveling screws	Set all screws so they bear evenly on leveling plates.
	Torn or mismatched vee belts	Replace vee belts with matched set.
	Work or chuck out of balance operating at high spindle speed motor out of balance	Balance chuck or reduce spindle speed Contact local representative of motor manufacturer.
Chatter	Tool bit improperly ground or not on center	Reground 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 feed	Reduce or increase spindle speed.
	Feed rate too high too low	Reduce or increase feed.
	Gibs of cross slide or compound rest loose Spindle bearings worn	Adjust gibs. Adjust spindle bearings
Chatter (cont'd)	Work improperly 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

<p>Work not turn straight</p>	<p>Headstock and tailstock centers not aligned Work improperly supported Bed not level Tool not on center when using taper attachment</p>	<p>Align tailstock center. Use steady rest or follow rest. Reduce overhang from chuck. Reduce bed, using precision level. Put tool on center.</p>
<p>Work out of round</p>	<p>Work loose between center or centers are excessively worn-work centers out of round Loose headstock spindle bearings</p>	<p>Adjust tailstock center. Regrind centers. Lap work centers. Adjust headstock spindle bearings</p>

CHAPTER 7

ADJUSTMENT

Warning: Isolate the machine before removing any cover(guard)and making adjustment

7.1 LEVELING ADJUSTMENT OF BED

As the workpiece accuracy mostly depends on the bed leveling recheck level of the bed frequently. Adjusting way should be according to the illustrations in the installation.

7.2 ADJUSTMENT OF BEARINGS ON MAIN SPINDLE

Spindle bearings have been preloaded at factory. And seldom require adjusting. If spindle spins too freely or play is noticeable when spindle is pushed back and forth or when the bearings are in the case of bearings noise or chattering or over temperature.

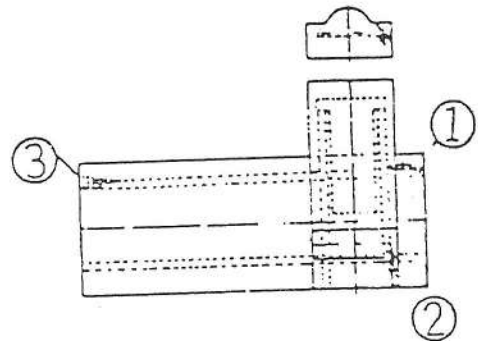
Properly adjust rear and front bearings by loosening or tightening the adjusting nuts in the spindle bearing rear cover.

It is necessary to make adjustment only when spindle is at operating temperature; run spindle at medium speed for about one hour.

7.3 ADJUSTMENT OF TAPER GIB

There is a taper gib in the cross slide and tool post slide respectively. Adjust the taper gibs in a successive procedures as following.

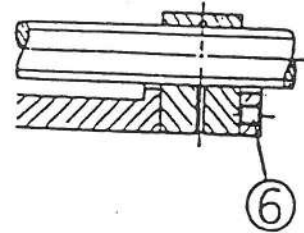
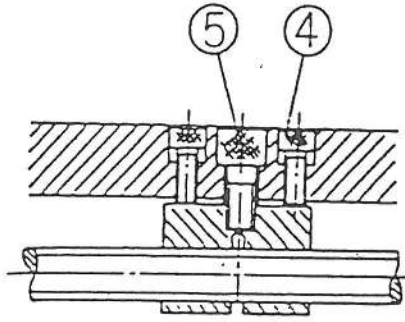
To adjust the gib adjusting screws (1), (2) evenly until slides move with a slight drag, then tighten the gib lock screw (3).



7.4 ELIMINATING BACK-LASH FOR CROSS SLIDE AND TOOL POST SLIDE

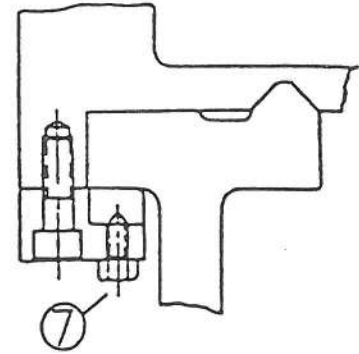
There are female screws can be adjusted to minimize the back-lash for cross slide screw and tool post slide screw. Loosen bolts (4) to some extent and tighten the adjusting screw (5) by a wrench, then the cross slide back-lash can be

eliminated. Tighten the adjusting screw(6)for eliminating the backlash of tool post slide.



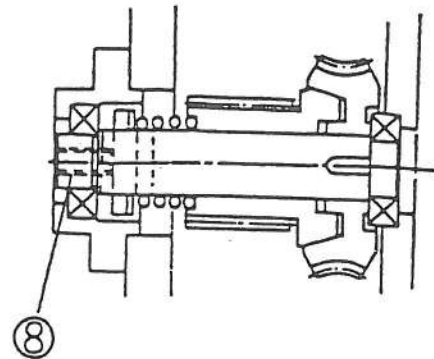
7.5 CARRIAGE GIBS ADJUSTMENT

If horizontal play develops between carriage and bed, adjust the four gib adjusting screws (7) evenly at rear of carriage until it moves on the bed with a slight drag.



7.6 ADJUSTMENT OF OVERLOAD PROTECTION DEVICE

Apron has an overload protection device by means of cone clutch. This adjustment can be accomplished by adjusting screw (8). Be sure do not adjust this screw so frequently because clutch does not wear so much even for a period of use.



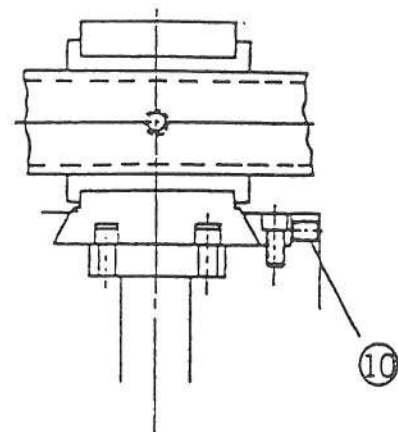
7.7 ADJUSTMENT OF FOOT BRAKE SYSTEM

This is a band type brake system so that the adjustment and maintenance for braking can be made easily. While to adjust the brake band, open the left cover of left leg first, then to loose the upper nut and adjust the adjusting nut at proper position, and retighten the upper nut again.

7.8 ADJUSTMENT OF HALF-NUT SUPPORTER

Half-nut supporters are located in the dove-tail groove which must be slid up and down smoothly.

The sliding clearance has been adjusted properly in factory, so please avoid the unnecessary adjustment except when the half-nut engaging and disengaging is too free.



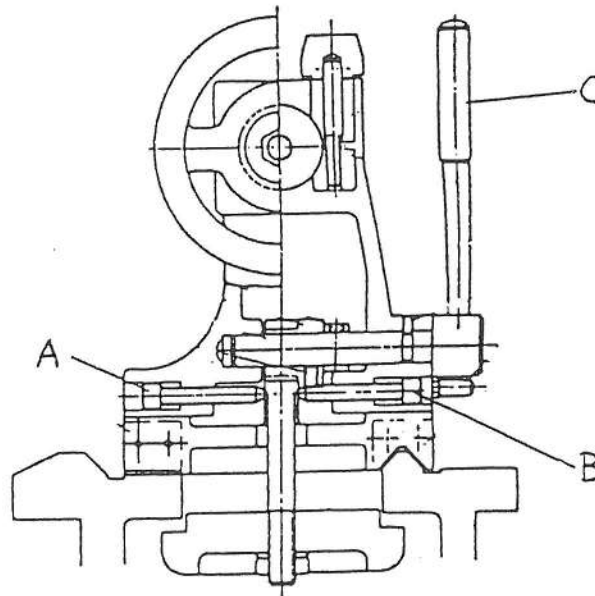
First, disassemble the chasing dial, then to adjust three adjusting screws (10) until the half-nut supporter slide smoothly in the dove-tail groove.

7.9 CORRECTING TAILSTOCK ALIGNMENT

Firstly, support a (12") mm ground steel test bar between spindle and tailstock centers. Fit a dial indicator to the tool post and transverse the center line length of the bar to confirm alignment. No end-to-end vibration should exist. Then, correct the alignment error which shown on the indicator by the following procedure:

Release the tailstock clamp lever (C) and adjust the set-over screw (A),(B) shown in the diagram. The following refers to the readings at the tailstock end of the ground test bar. If the diameter of test bar is greater, slacken screw (B) tighten screw (A). Continuous checking and adjusting until end-to-end readings of indicator are equal.

If taper turning is carried out, apply the above procedure to regain the parallel condition.



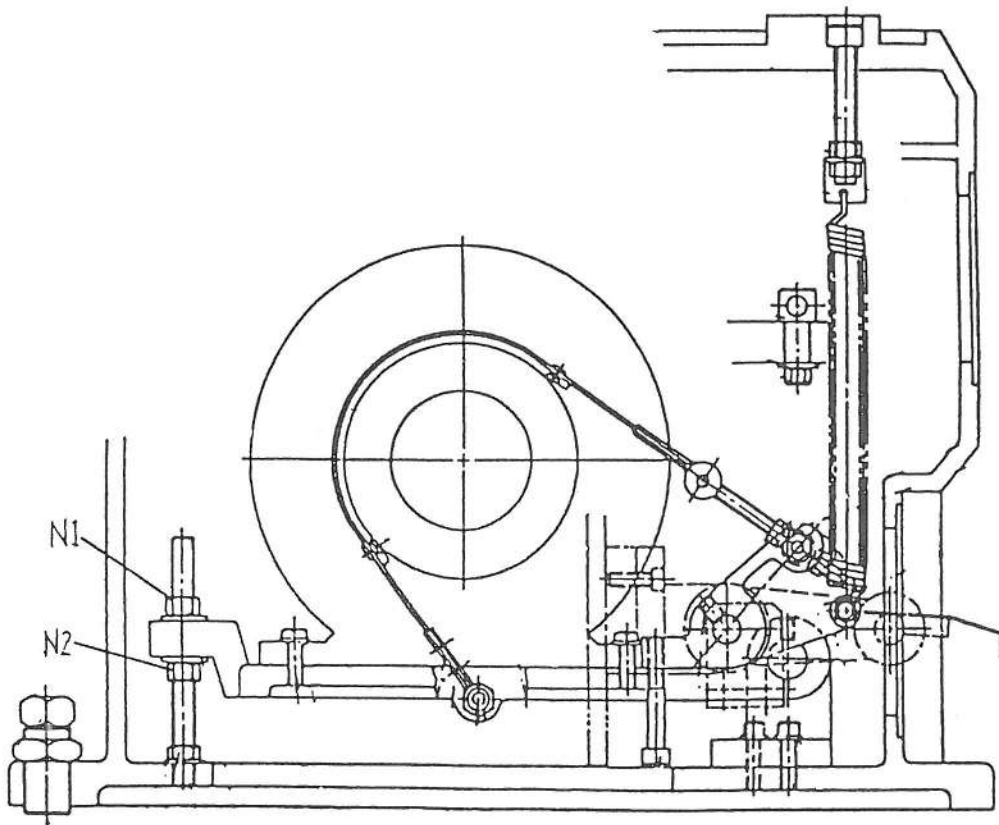
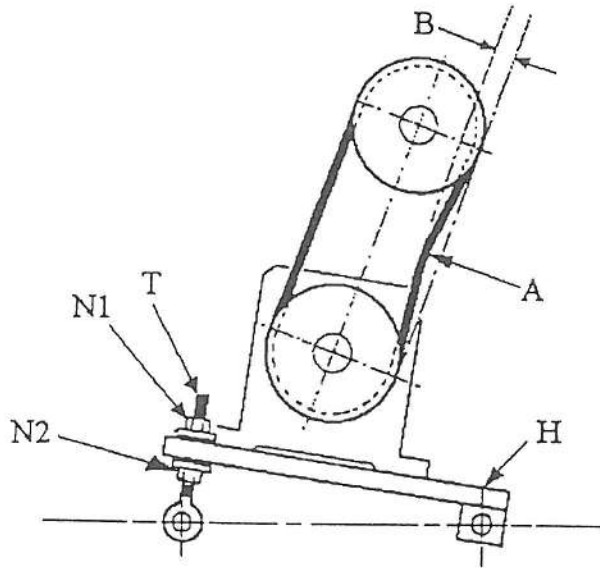
7.10 ADJUSTING THE DRIVING BELT

Variable speed machines require correct belt tension to transmit reliably the range of vibration in rpm.

Tension is provided by jacking the hinged motor platform up or down by means of nuts and spherical washers on two threaded storks as shown in the diagram.

Warning:

Turn electric power off at the isolator switch when adjusting the belt.



Where:

A : applied force

H : hinged point

N1: upper nut

B : deflection

T : threaded bolt

N2: bottom nut

CHAPTER 8

ELECTRICAL PARTS LIST AND CIRCUIT

8.1 ELECTRICAL PARTS LIST (CE)

Item designation	Description and function	Technical data	Quantity	Supplier	Remarks
T1	Transformer	Input-AC220/380V Output-AC110/24V 250VA	1		
QS1	Main power switch	220V/32A 380V/25A	1	BREMAS or equivalent	IEC-947 VDE0660
F1	Fuse blocks	32A/400V 10 x 38	3	Legrand or equivalent	NFC-63210
F2	Fuse blocks	32A/400V 10 x 38	1	Legrand or equivalent	NFC-63210
F1	Fuse	32A/220V 25A/380V	3	Legrand or equivalent	NFC-63210
F2	Fuse	6A/220V 4A/380V	1	Legrand or equivalent	NFC-63210
KM1 KA1	Magnetic contactors	100-A09NJ3-B24V Max. 9A 4KW	2	A.B. or equivalent	IEC-947 VDE0660
KM2 KM3	Magnetic contactors	100-A24NJ3-B24V Max. 24A 5.5KW	2	A.B. or equivalent	IEC-947 VDE0660
SQ3 SQ4	Limit switch(c.w) Limit switch(c.c.w)	Z-15GW22-B 15A 250VAC	2	Omrom or equivalent	EN-61058-1
SQ2	Limit switch (chuck)	Z-15GL2-B 15A 250VAC	2	Omrom or equivalent	EN-61058-1
SQ1	Limit switch(brake)	ATO-11-1-ZB A 230V/6A 400V/4A	1	Moeleler or equivalent	IEC-947 VDE0660
SQ5	Limit switch(door)	WL CA2-2 15A 250VAC	1	Omrom or equivalent	EN-61058-1
FR1	Spindle overload	193-BSC32 22-32A	1	A.B. or equivalent	IEC-947 VDE0660
FR2	Coolant overload	193-BSA70 0.4-0.6A	1	A.B. or equivalent	IEC-947 VDE0660
SB2 SB3	Switch button	E K10	2	Moeleler or equivalent	IEC-947 VDE0660
E-stop		E K01	1	Moeleler or equivalent	IEC-947 VDE0660

SB4	Push button(jog)	E K10	1	Moeleler or equivalent	IEC-947 VDE0660
HL1	Indicator(coolant)	EF Max.2W	1	Moeleler or equivalent	IEC-947 VDE0660
HL2	Indicator(spindle)	EF Max.2W	1	Moeleler or equivalent	IEC-947 VDE0660
HL3	Work lamp	GY-635 75W 24V 250VAC	1	HALOSTAR or equivalent	
TB1	Terminal blocks	3P 30A 600V	1	TEND or equivalent	
TB2	Terminal blocks	19P 30A 600V	1	TEND or equivalent	
TB3	Terminal blocks	6P 25A 600V	1	TEND or equivalent	

U.S. Standard

LS1: FORWARD LIMIT SWITCH	MP : COOLANT PUMP MAGNETIC SWITCH
LS2: REVERSE LIMIT SWITCH	PL1: POWER SOURCE INDICATOR
LS3: BRAKE LIMIT SWITCH	CR : BRAKE AUXILIARY RELAY
LS4: SAFETY LIMIT SWITCH	OL1: MAIN MOTOR OVER-CURRENT RELAY
LS5: CHUCK GUARD LIMIT SWITCH	OL2: PUMP MOTOR OVER-CURRENT RELAY
M2 : COOLANT PNMP	S1 : POWER SOURCE SELECTOR SWITCH
K1 : DOOR-TYPE SWITCH	S2 : COOLANT PUMP SWITCH
PC : PLUG BRACKET	PB1: JOGGING SWITCH
M1 : MAIN MOTOR	S3 : EMERGENCY STOP SWITCH
MF : FORWARD MAGNETIC SWITCH	TR : TRANSFORMER
MR : REVERSE MAGNETIC SWITCH	

8.2 POWER SOURCE WIRING

Be sure to carefully protect electric wires exposed outside of the machine, which are liable to be damaged by chips. This will reduce accidents. The respective wirings should be connected with terminals R,S,T, at the control housing

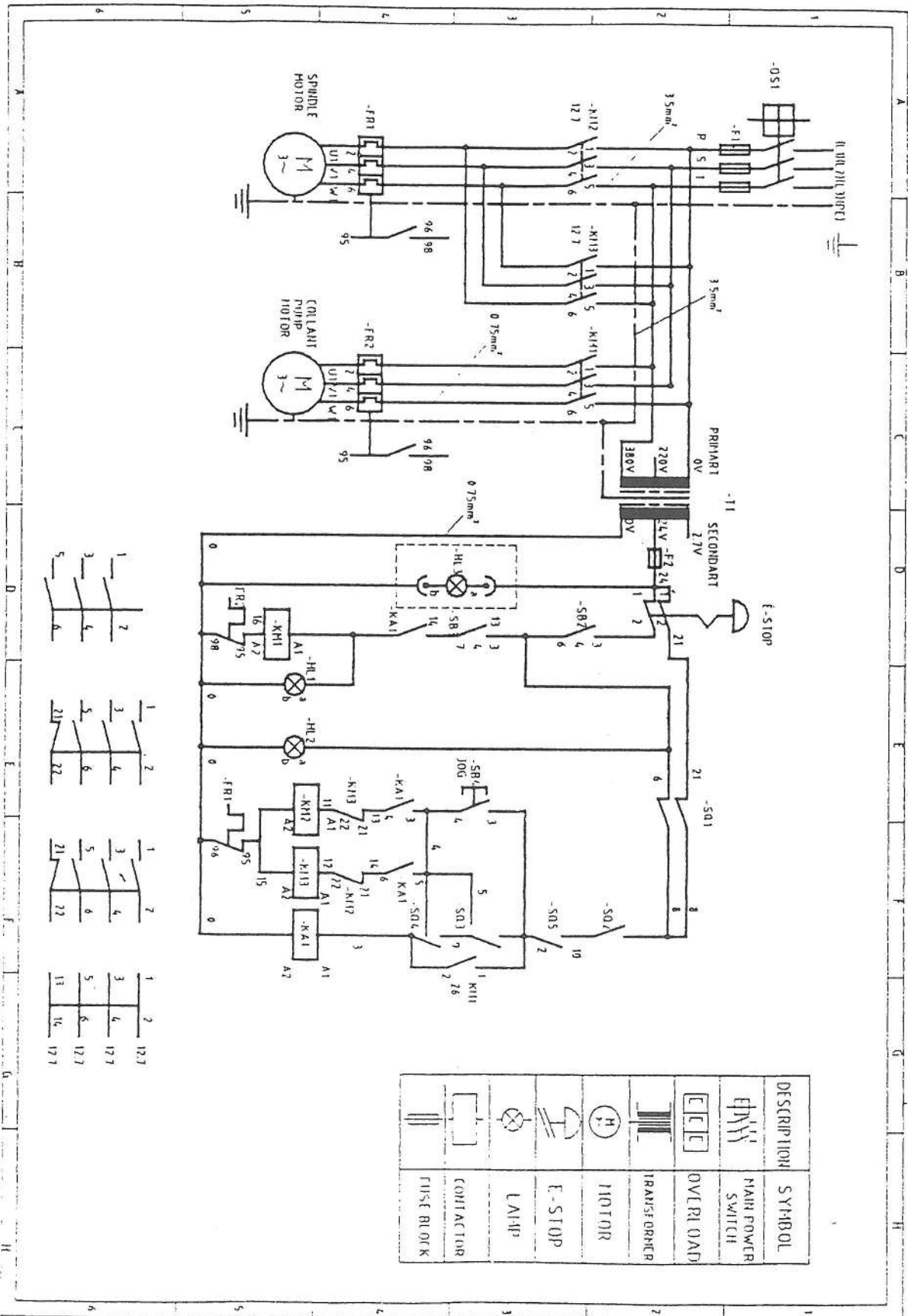
8.2.1 CAUTION

After wiring, check the spindle rotating direction. Turn on the power source switch and push the jogging switch button (T) If spindle turns forward the wiring is correct. If not, switch two of the three wires (R,S,T.). Then check the rotation again.

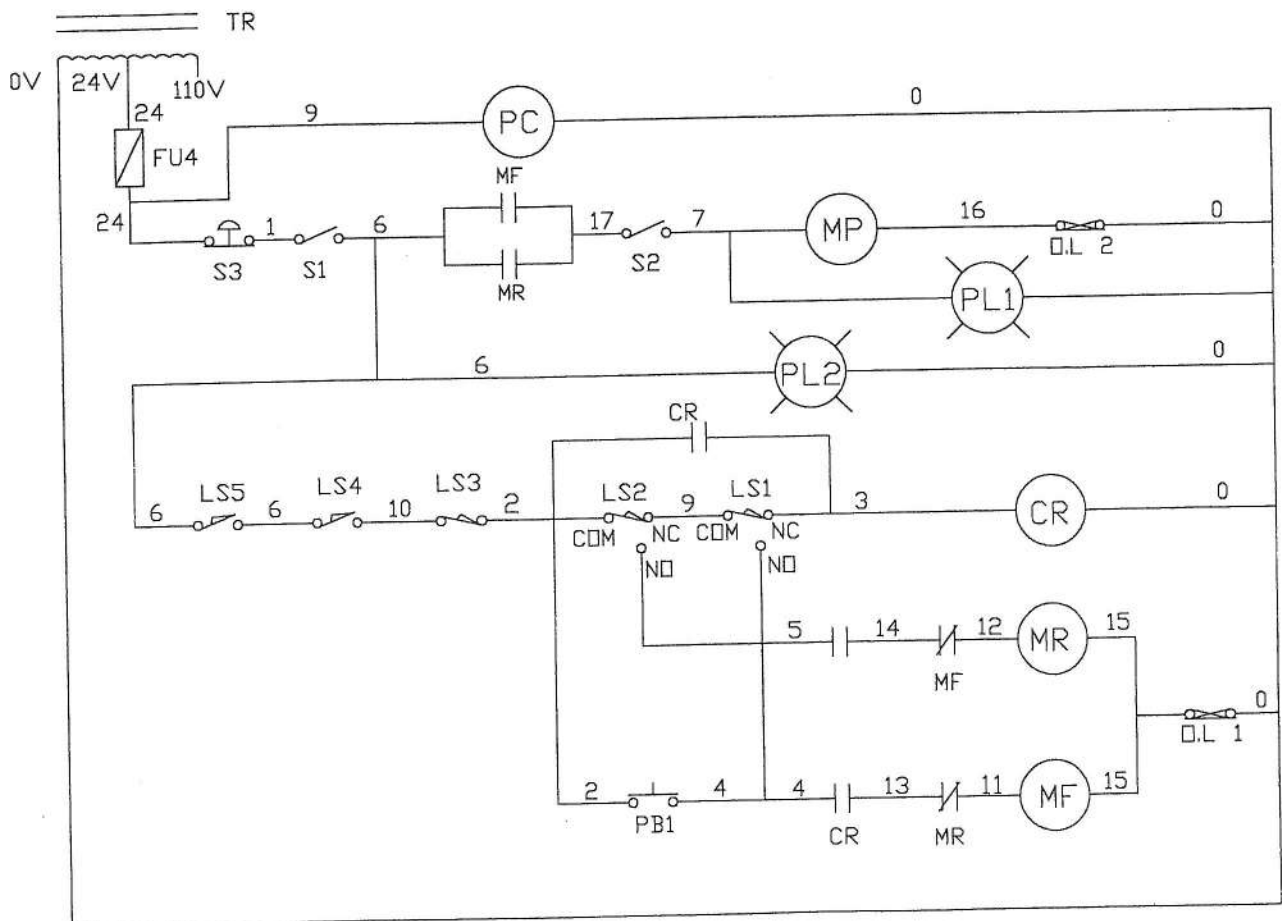
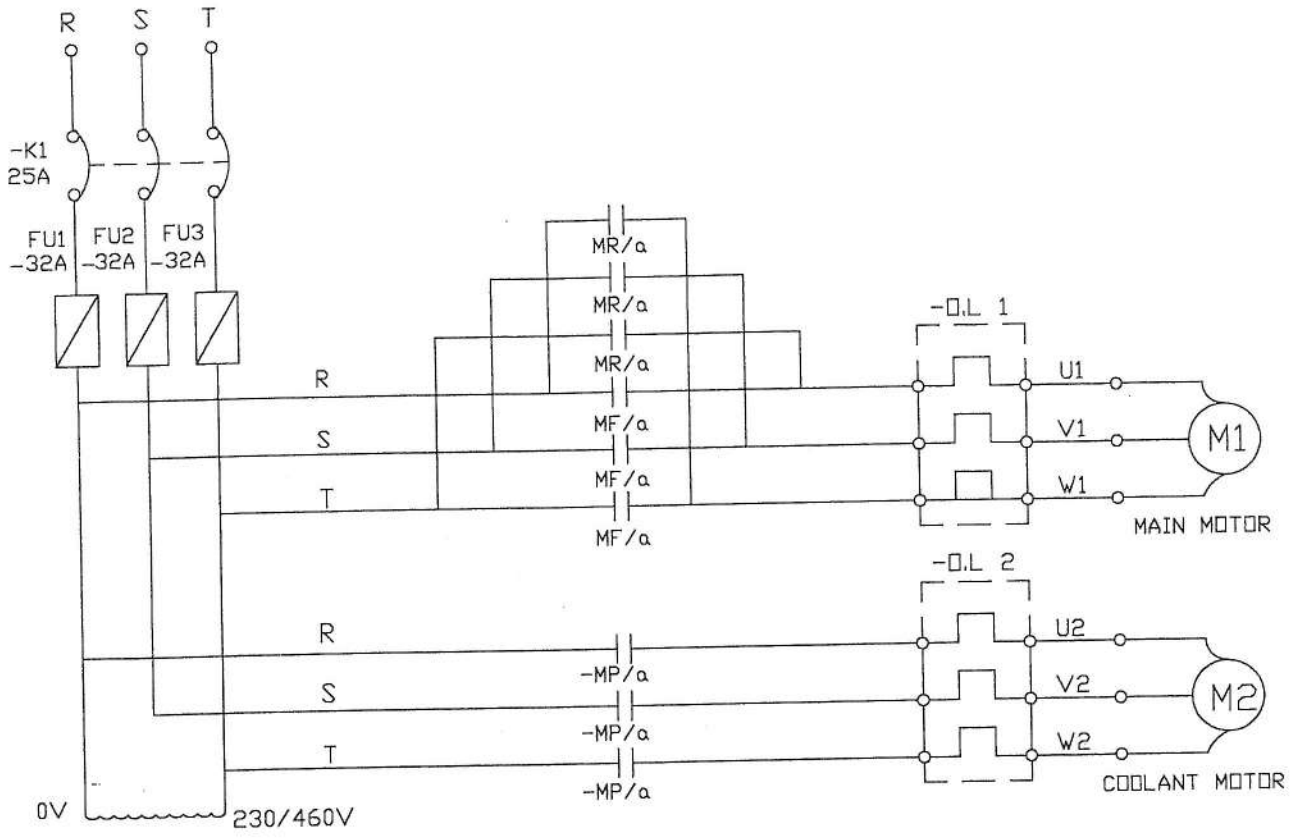
If the spindle speed drops to zero during normal operation, but the pilot light is still on, it indicates that the overload thermal relay is working. Please turn off the main switch, reset the thermal overload relay and restart the machine.

8.2 ELECTRICAL CIRCUIT

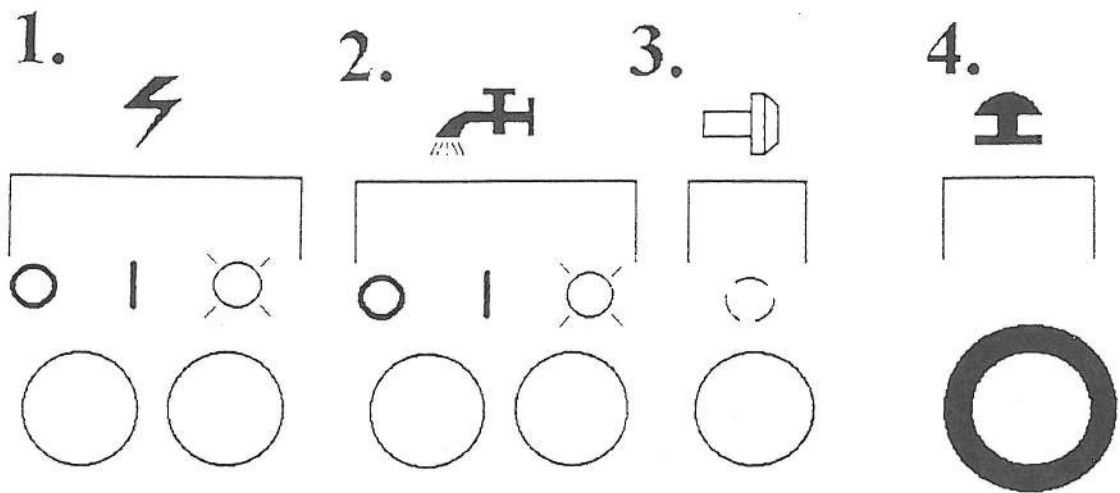
CE Standard



U.S. Standard 17" Control Circuit



8.3 PUSH BUTTON FOR PANEL



- 1. Power Supply Button
- 2. Coolant Control Button
- 3. Spindle Jog Button
- 4. Emergency Stop Button

CHAPTER 9

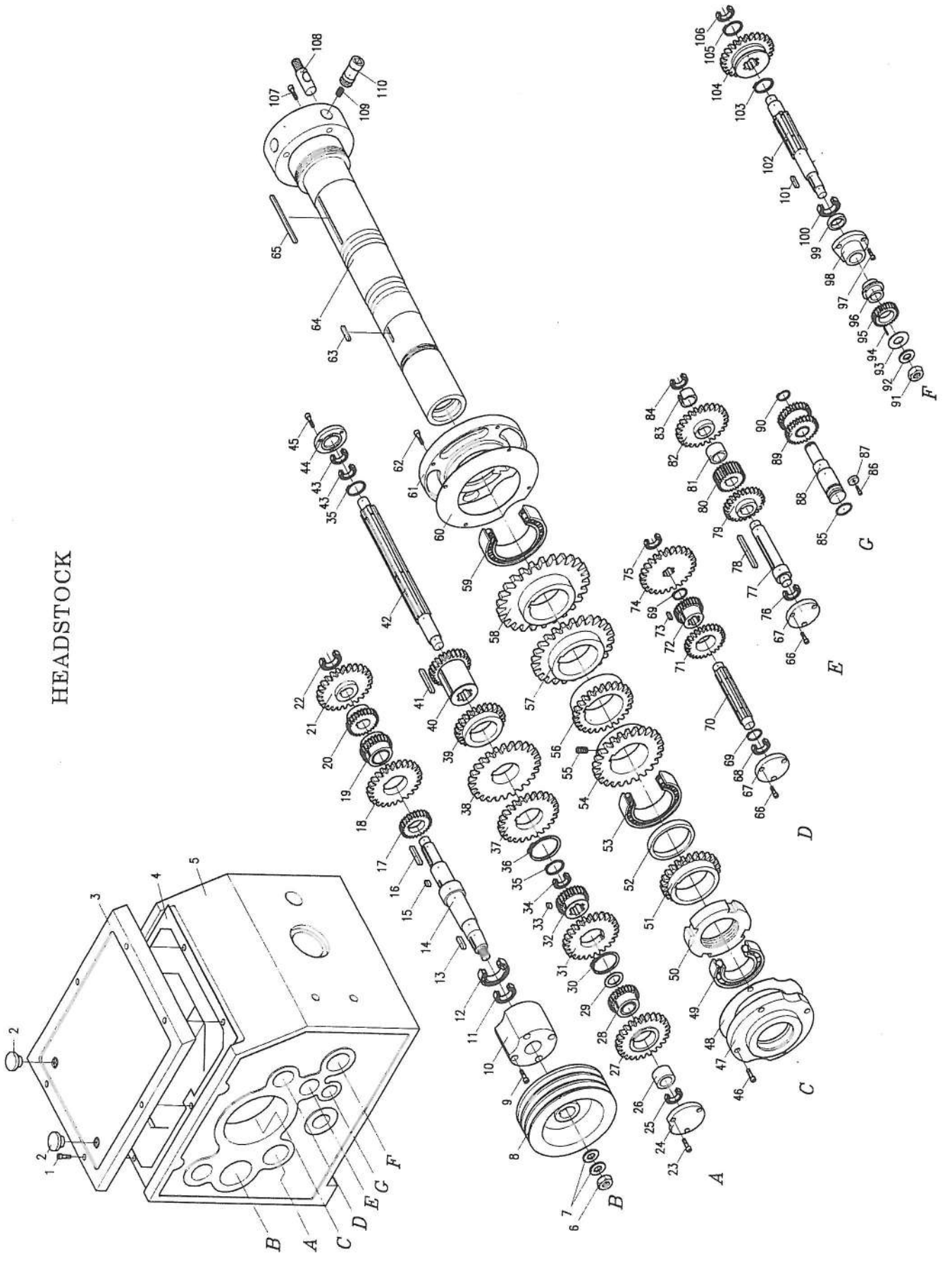
Parts list for 17" Series

MECHANICAL PARTS LIST FOR 17" SERIES

When ordering parts, please specify the following:

- 1. Series number**
- 2. Model & year of production**
- 3. Part number, page number & description**
- 4. Quantity**

HEADSTOCK



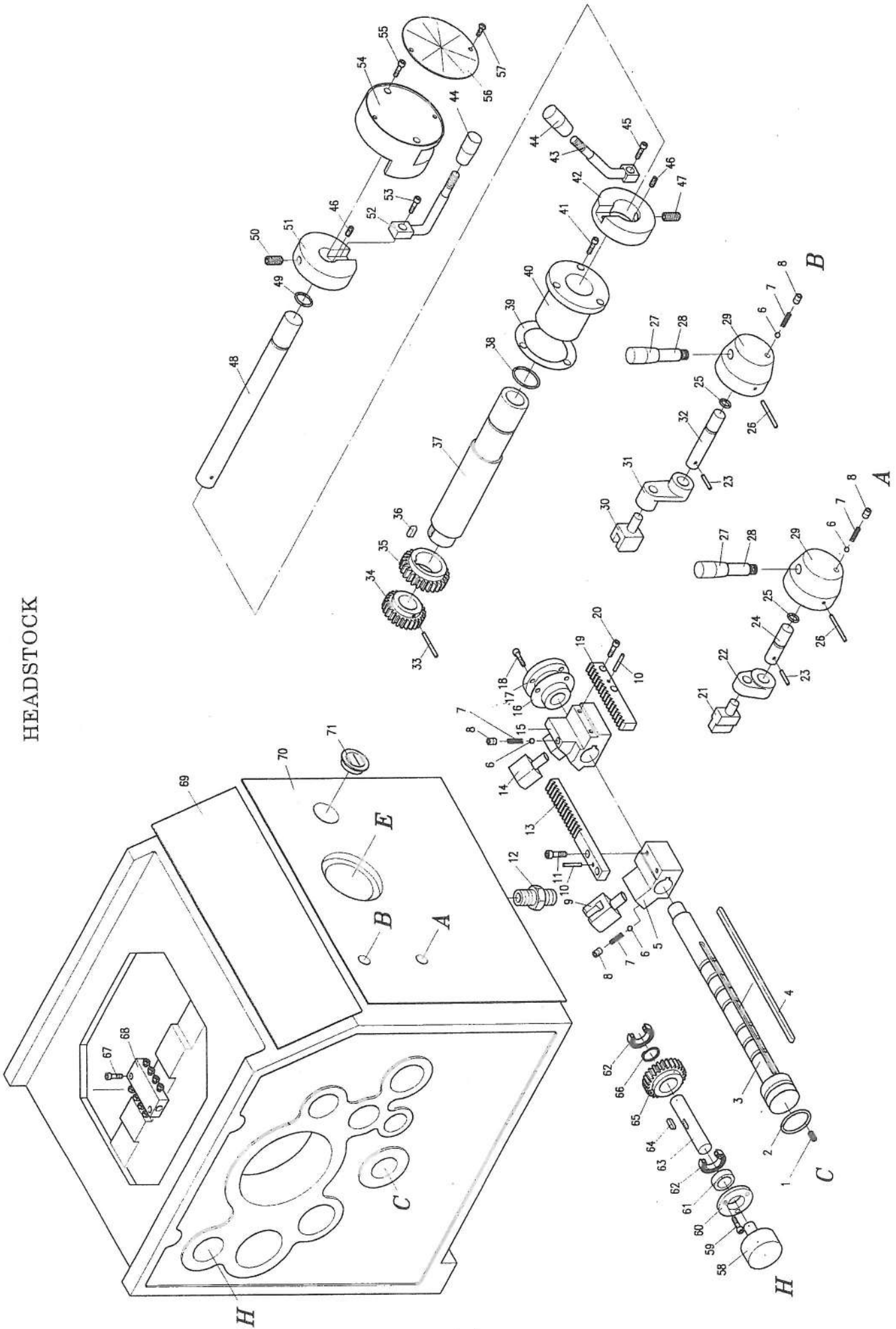
HEADSTOCK (D-TYPE)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	SH-0625	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
2	5H-40800	PLUG	Plastic	2
3	7H-30020	COVER	FC20	1
4	7H-40830	PACKING	PACKING	1
5	7H-10010	HEAD STOCK	FC25	1
6	N-16	NUT	M16xP2.0	1
7	W-16	WASHER	Φ 16	2
8	18H-40310	PULLEY	FC20	1
9	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
10	7H-40300	COVER	FC20	1
11	BB-6006	BALL BEARING	6006Z	1
12	BB-6007	BALL BEARING	6007-2RS	1
13	KY-7x7x28	KEY	7x7x28L	1
14	7H-30450	SHAFT	S45C	1
15	KY-7x7x12	KEY	7x7x12L	1
16	KY-7x7x45	KEY	7x7x45L	1
17	7H-40040	GEAR	SCM21,23T	1
18	7H-40050B	GEAR	SCM21,43T	1
19	7H-40050A	GEAR	SCM21,23T	1
20	7H-40060	GEAR	SCM21,23T	1
21	7H-40070	GEAR	SCM21,43T	1
22	BB-6304	BALL BEARING	6304	1
23	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
24	7H-40330	COVER	Plastic	1
25	BB-6304	BALL BEARING	6304	1
26	7H-40360	COLLAR	SS41	1
27	7H-40080B	GEAR	SCM21,43T	1
28	7H-40080A	GEAR	SCM21,23T	1
29	7H-40500	WASHER	SS41	1
30	S-38	RETAINING RING	S38	1
31	7H-40090B	GEAR	SCM21,43T	1
32	7H-40090A	GEAR	SCM21,23T	1
33	KY-7x7x12	KEY	7x7x12L	2
34	BB-62/32	BALL BEARING	62/32	1
35	S-32	RETAINING RING	S32	2
36	R-65	RETAINING RING	R65	1
37	7H-40100B	GEAR	SCB21,39T	1
38	7H-40100C	GEAR	SCM21,47T	1
39	7H-40100D	GEAR	SCM21,32T	1
40	7H-40100A	GEAR	SCM21,25T	1
41	KY-10x8x58	KEY	10x8x58L	1
42	7H-30110	SHAFT	SCM4	1
43	BB-6004	BALL BEARING	6004	2
44	7H-40320	COVER	AL	1
45	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
46	SH-0620	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x20L	4
47	7H-40290	COVER	FC20	1
48	7H-40960	PACKING		1
49	BB-6215	BALL BEARING	6215	1
50	AN-16	LOCKING NUT	AN16	1
51	7H-40160	GEAR	SCM21,44T	1
52	7H-40910	SPARCER	FC20	1
53	BB-32016	BALL BEARING	32016X	1
54	7H-40150	GEAR	SCM21,47T	1
55	SS-1010	HEXAGON SOCKET SET SCREW	M10xP1.5x10L	1

HEADSTOCK (D-TYPE)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7H-40140	GEAR	SCM21,39T	1
57	7H-30130	GEAR	SCM21,54T	1
58	7H-30120	GEAR	SCM21,61T	1
59	BB-32017	BALL BEARING	32017X	1
60	7H-40970	PACKING		1
61	7H-40280D	FRONT COVER	FC20	1
62	SH-0625	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	4
63	KY-12x8x22	KEY	12x8x22L	1
64	18H-30030D	SPINDLE	S45C	1
65	15x10x140	KEY	15x10x140L	1
66	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	6
67	7H-40340	COVER	Plastic	2
68	BB-6004	BALL BEARING	6004	1
69	S-25	RETAINING RING	S25	2
70	7H-30190	SHAFT	S45C	1
71	7H-40180B	GEAR	SCM21,30T	1
72	7H-40180A	GEAR	SCM21,20T	1
73	KY-5x5x17	KEY	5x5x17L	1
74	7H-40170	GEAR	SCM21,44T	1
75	BB-6004	BALL BEARING	6004	1
76	BB-6004	BALL BEARING	6004	1
77	7H-40260	SHAFT	S45C	1
78	KY-7x7x80	KEY	7x7x80L	1
79	7H-40200	GEAR	SCM21,30T	1
80	7H-40240	GEAR	SCM21,20T	1
81	7H-40380	COLLER	SS41	1
82	7H-40250	GEAR	SCM21,40T	1
83	7H-40370	COLLER	SS41	1
84	BB-6004	BALL BEARING	6004	1
85	G-26	"O" RING	G-26	1
86	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
87	7H-40510	WASHER	SS41	1
88	7H-40270	SHAFT	S45C	1
89	7H-40210	GEAR	SCM21,24T	1
90	S-22	RETAINING RING	S22	1
91	N-16	NUT	M16	1
92	W-16	WASHER	φ 16	1
93	7B-40980	WASHER	SS41	1
94	SP-03	PIN	φ 3	1
95	7B-40110	GEAR	S45C,28T	1
96	7B-40970	COLLER	SS41	1
97	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
98	7H-40350	COVER	AL	1
99	TC-253508	OIL SEAL	25x35x8	1
100	BB-6005	BALL BEARING	6005CMZ	1
101	KY-6x6x27	KEY	6x6x27L	1
102	7H-30230	SHAFT	S45C	1
103	S-32	RETAINING RING	S32	1
104	7H-40220	GEAR	SCM21,40T	1
105	S-32	RETAINING RING	S32	1
106	BB-6204	BALL BEARING	6204	1
107	7H-40400	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	6
108	7H-40410	CAM BOLT	S45C	6
109	7H-40420	SPRING	SWPA	6
110	7H-30390	CAM	SCM21	6

HEADSTOCK



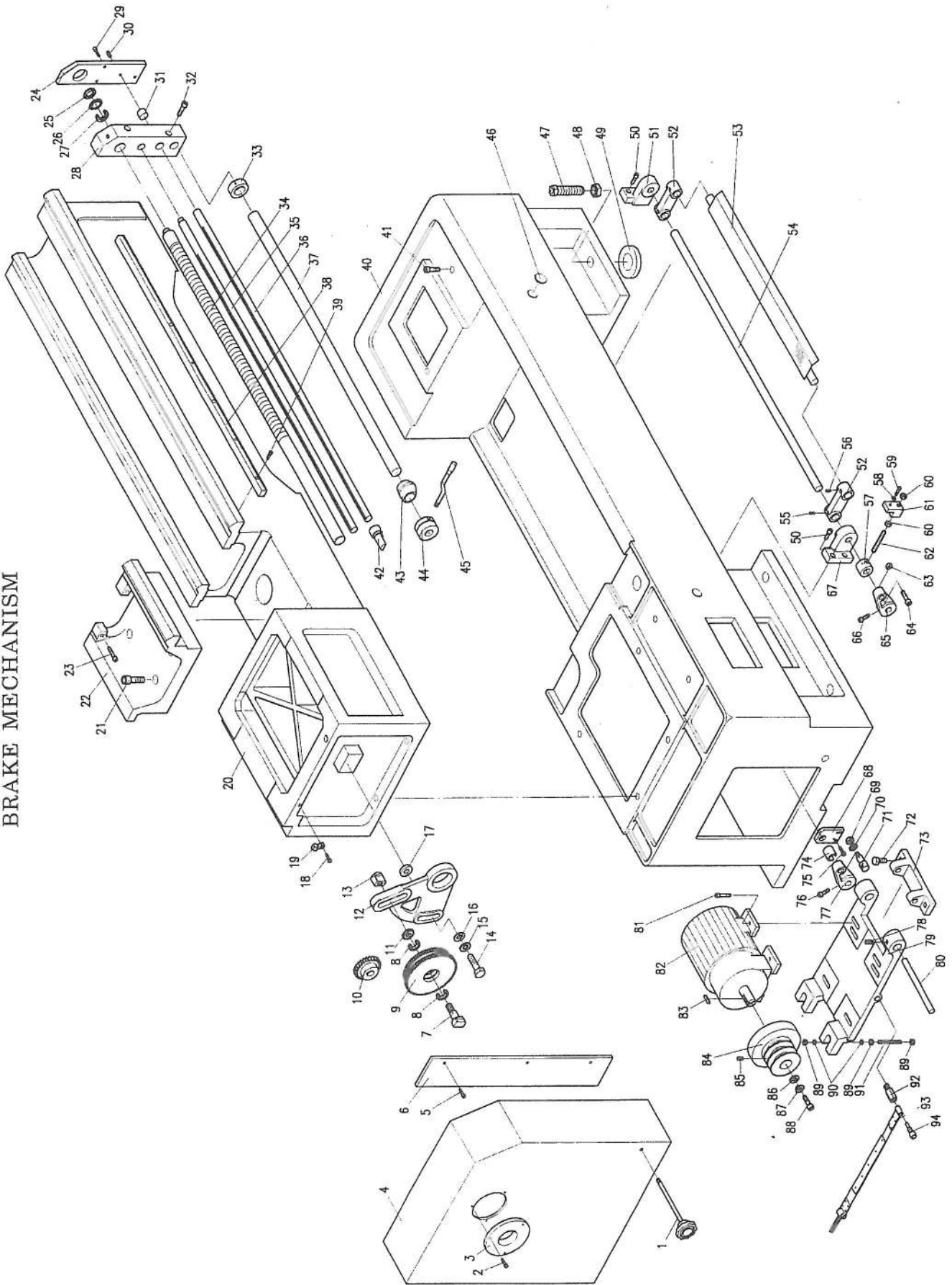
HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		HEALESS, SOCKET SET SCRWE	M6xP1.0x6L	1
2		"O" RING	P26	1
3	7H-40660	SHAFT	SS41	1
4		KEY	6x6x230L	1
5	7H-40630	ROCKER ARM	FC15	1
6		STEEL BALL	φ 1/4"	4
7		SPRING	O. D. 6xWIREx0.8	4
8		HEALESS, SOCKET SET SCRWE	M8xP1.25x6L	4
9	7H-40650	CHANGE SPEED BLOCK	BC2	1
10		PIN	φ 4x20L	2
11		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x14L	2
12	18H40920	CONTROLLER OF PROPORTION	SS41	1
13	7H-40640	RACK	SS41	1
14	7H-40620	CHANGE SPEED BLOCK	BC2	1
15	7H-40610	ROCKER ARM	FC15	1
16	7H-40990	PACKING	PACKING	1
17	7H-40740	COVER	FC15	1
18		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
19	7H-40600	RACK	S45C	1
20		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x14L	2
21	7H-40670	CHANGE SPEED BLOCK	BC2	1
22	7H-40680	ROCKER ARM	FC15	1
23		PIN	φ 5x36L	1
24	7H-40690	SHAFT	SS41	1
25		"O" RING	P12	2
26		PIN	φ 3x45L	2
27	7A-40580	KNOB	Plastic	2
28	3A-40380	LEVER	SS41	2
29	3H-40380	HANDLE BOSS	SS41	2
30	7H-40700	CHANGE SPEED BLOCK	BC2	1
31	7H-40710	ROCKER ARM	FC15	1
32	7H-40730	SHAFT	SS41	1
33		PIN	φ 5x40L	1
34	7H-40590	GEAR	S45C, 26T	1
35	7H-40580	GEAR	S45C, 26T	1
36		KEY	6x6x16L	1
37	7H-40530	CHANGE SPEED SHAFT	S45C	1
38		"O" RING	P32	1
39		PACKING	PACKING	1
40	7H-40540	BUSHING	FC20	1
41		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
42	7H-40550	HANDLE BOSS	SS41	1
43	7H-40760	LEVER	SS41	1
44	7A-40580	KNOB	Plastic	2
45		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
46		HEALESS, SOCKET SET SCRWE	M6xP1.0x6L	2
47		HEALESS, SOCKET SET SCRWE	M10xP1.5x10L	1
48	7H-40520	CHANGE SPEED ROD	S35C	1
49		"O" RING	P20	1
50		HEALESS, SOCKET SET SCRWE	M10xP1.5x10L	1
51	7H-40560	HANDLE BOSS	SS41	1
52	7H-40800	LEVER	SS41	1
53		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
54	7H-30570	COVER	Plastic	1
55		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x45L	2

HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56		NAME PLATE	AL	1
57		ROUND HEAD SCREW	M5xP0.8x8L	2
58	7L-40070	PUMP		1
59		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
60	7L-40010	COVER	SS41	1
61	7L-40040	COLLER	SS41	1
62		BEARING	6203	2
63	7L-40020	SHAFT	SS41	1
64		KEY	5x5x16	1
65	7L-40030	GEAR	Plastic	1
66		SNAP RING	S-20	1
67		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x20L	2
68	7L-40150	OIL-DISTRIBUTING SEAT		1
69	CH-7H1	NAME PLATE	AL	1
70	CH-7H2	NAME PLATE	AL	1
71		OIL WINDOWS	∅ 29	1

BRAKE MECHANISM



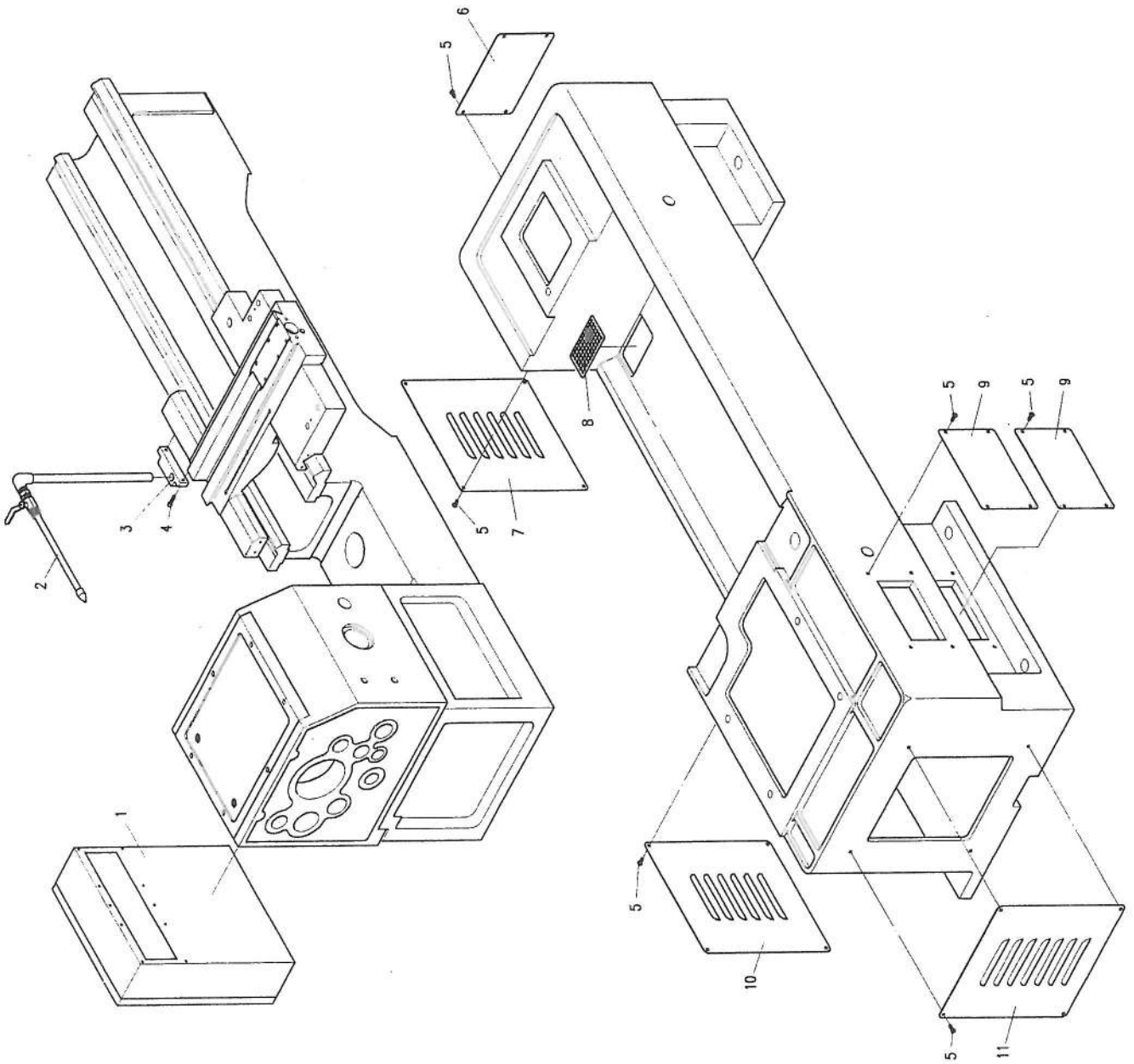
BRAKE MECHANISM

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7B-40220	LOCATING ROD	SS41	1
2		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	3
3	7B-40330	COVER	SS41	1
4	7B-20170	COVER	AL	1
5		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x20L	3
6	7B-40180	SIDE PLATE	SS41	1
7	7B-40140	SHAFT	SS41	1
8		BALL BEARING	6004	2
9	7B-30120	GEAR	FC15 120Tx127T	1
10	7B-40440	GEAR	S45C,28T	1
11	7B-40150	WASHER	SS41	1
12	7B-40160	QUADRANT BRACKET	FC15	1
13	7B-40130	SLIDING BLOCK	SS41	1
14		HEX. CAP SCREW	M16xP2.0x50L	1
15		SPRING WASHER	φ 16	1
16		WASHER	φ 16	1
17	7B-40470	WASHER	SS41	1
18		HEXAGON SOCKET HEAD CAP SCREW	3/16W24x3/8L	1
19		CABLE CLAMPS	SS41	1
20	7B-30010	BED	FC25	1
21		HEXAGON SOCKET HEAD CAP SCREW	M12xP1.5x80L	4
22	7B-40720	GAP	FC25	1
23		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x45L	2
24	7B-30200	BRACKET, COVER	Plastic	1
25		NUT	S45C	1
26		WASHER	SPC	1
27		THRUST BEARING	51105	1
28	7B-30190	BRACKET	FC15	1
29		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
30		HEXAGON SOCKET SET SCREW	M8xP1.25x16L	1
31	7B-40280	ADJUSTING BLOCK	SS41	1
32		HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	2
33	7B-41290	SHAFT COLLAR	SS41	1
34	7B-40040	LEAD SCREW	SS41	1
35	7B-40050	FEED ROD	SS41	1
36	7B-40060	STARTING ROD	SS41	1
37	7B-40260	STOPER ROD	SS41	1
38	7B-40030	RACK	SS41	1
39		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
40	7B-10020	END PLINTE	FFC25	1
41		HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	3
42	7B-40460	SHAFT	Plastic	1
43	7B-40070	POSITION COLLAR	Plastic	4
44	7B-41080	GRADUATE COLLAR	SS41	1
45	7B-41490	LEVER	SS41	1
46	7B-40790	COVER	SPC	4
47	7B-40950	FOUNDATION BOLT	SS41	6
48	7B-41270	NUT	SS41	6
49	7B-41240	BASE BLOCK	SS41	6
50		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
51	7B-41160-1	BRACKET	FC15	1
52	7B-41170	BRAKT ARM	FC15	2
53	7B-40300	PEDAL	SS41	1
54	7B-40310	SHAFT	SS41	1
55		HEXAGON SOCKET SET SCREW	M8xP1.25x16L	2

BRAKE MECHANISM

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7B-41570	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	2
57		COLLER	SS41	1
58		WASHER	Φ 6	1
59	7B-41560	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	1
60		NUT	M10	2
61	7B-41580	BASE	FC20	1
62	7B-41580	BLOT	SS41	1
63		NUT	M10	2
64	7B-40360CA	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	1
65		BRACK ARM	FC15	1
66	7B-41160-2	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	1
67		BRACKET	FC15	1
68	7B-41260	BRACKET	FC15	1
69		NUT	M10	1
70	7B-40370	WASHER	Φ 10	1
71		SHAFT	SS41	1
72		HEX. CAP SCREW	M10xP1.5x35L	3
73	7B-41190	SUPPORT BASE	FC15	1
74	7B-41300	COLLER	SS41	1
75		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x20L	2
76	7B-40360	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x25L	1
77		BRACK ARM	FC15	1
78	7B-30270	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x10L	1
79		MOTOR BASE	FC15	1
80	7B-41130	SHAFT	SS41	1
81		HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x50L	4
82	7B-40320	MOTOR	5HP / 7-1/2HP	1
83		KEY	6x6x20L	1
84	7B-40320	MOTOR PULLY	FC15	1
85		HEXAGON SOCKET SET SCREW	M8xP1.25x12L	1
86	7B-40820	WASHER	SS41	1
87		SPRING WASHER	Φ 16	1
88	7B-41120	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x50L	1
89		NUT	M16	6
90	7B-40340	WASHER	Φ 16	4
91		BLOT	SS41	2
92	7B-30350	BLOT	SS41	1
93		BRAKE BAND	5HP / 7-1/2HP	1
94		HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x40L	1

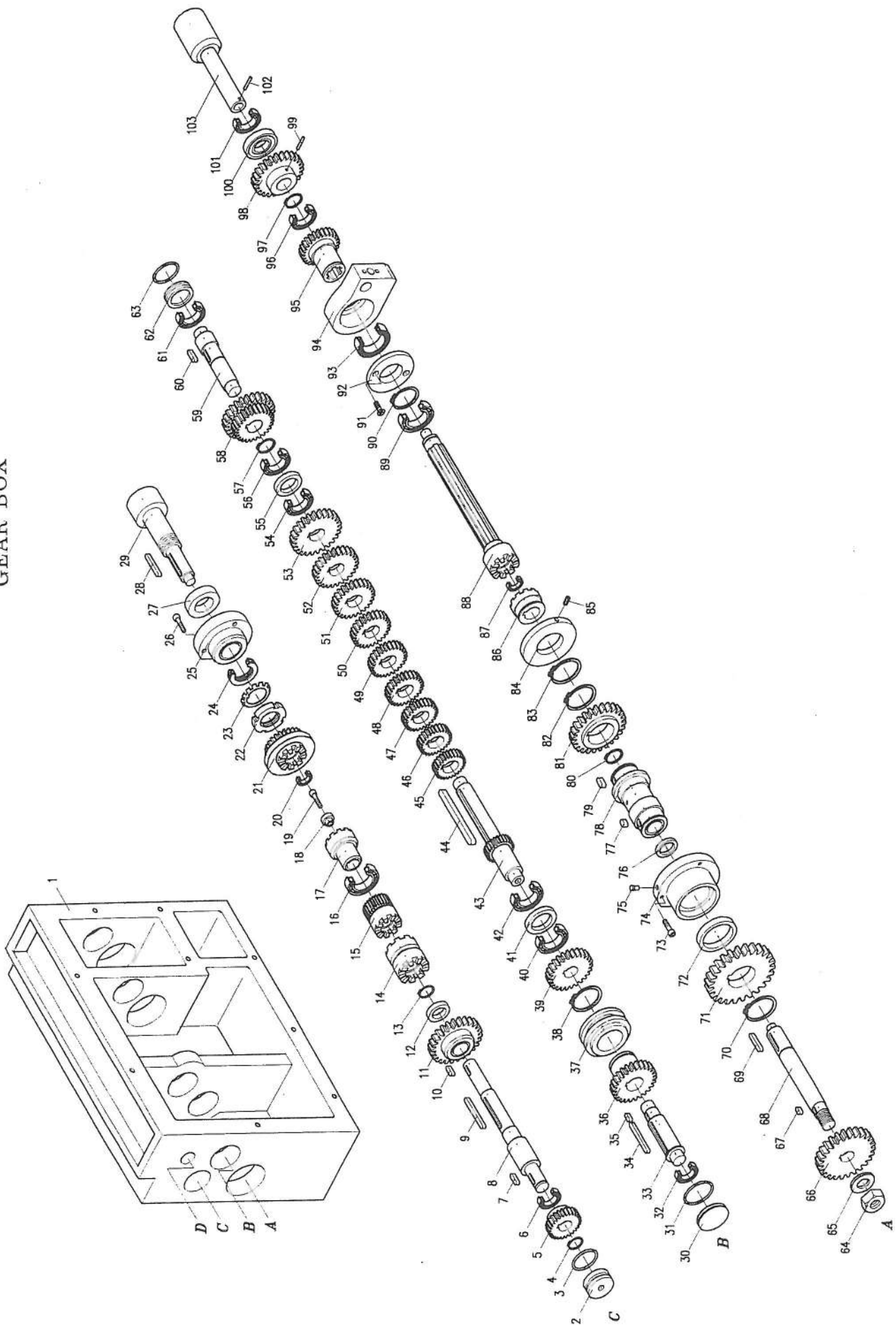
BRAKE MECHANISM



BRAKE MECHANISM

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7B-30940	BOX	S.P.C	1
2	7B-40760	PIPE ASSEMBLY		1
3	7B-40610	BRACKET	SS41	1
4		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	2
5		SCREW	M6xP1.0x12L	24
6	7B-41200	COVER	S.P.C	1
7	7B-41220	COVER	S.P.C	1
8	7B-41230	PLATE	S.P.C	1
9	7B-41180	COVER	S.P.C	1
10	7B-40430	COVER	S.P.C	1
11	7B-41210	COVER	S.P.C	1

GEAR BOX



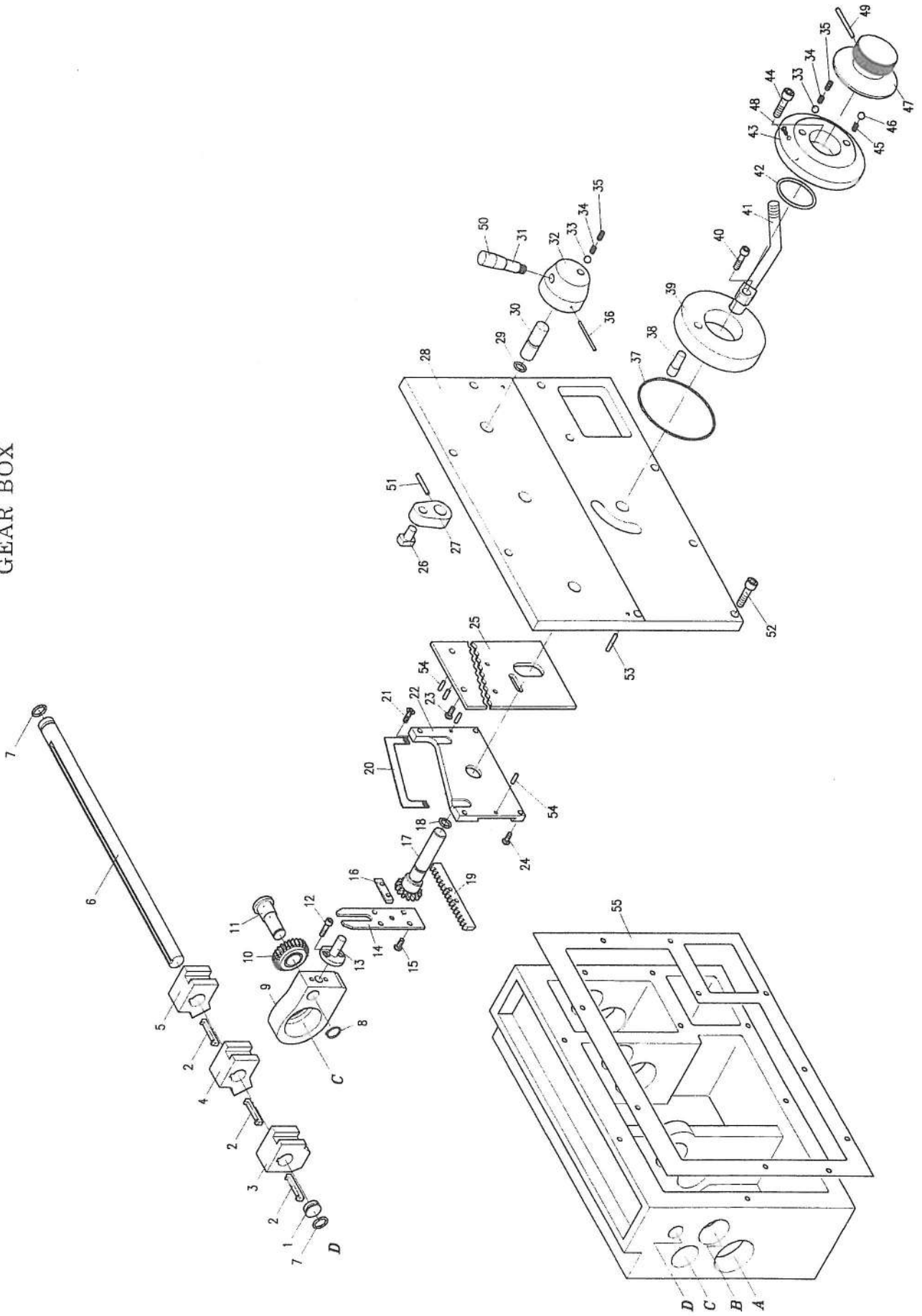
GEAR BOX

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7G-30010	GEAR BOX	FC20	1
2	7G-40140	HOLE PLUG	SS41	1
3	P-28	"O" RING	P28	1
4	CS-17	SNAP RING	C type. I.D.17	1
5	7G-40040	SUPR GEAR	S45C, M2x20T	1
6	BB-6003	BALL BEARING	#6003	1
7	KP-5517	KEY	5x5x17	1
8	7G-40030	SHAFT	S45C	1
9	KP-5550	KEY	5x5x50	1
10	KP-5515	KEY	5x5x15	1
11	7G-40050	CLUTCH GEAR	S45C, M2x32Tx18T	1
12	7G-40060	SPACE COLLAR	SS41	1
13	CS-18	SNAP RING	C type. I.D.18	1
14	7G-40070	CLUTCH GEAR	S45C, M2x18T	1
15	7G-40080	CLUTCH GEAR	S45C, M2x16T	1
16	BB-6005	BALL BEARING	#6005	1
17	7G-40090	CLUTCH GEAR	S45C	1
18	7G-40750	WASHER	SS41	1
19	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	1
20	BB-6001	BALL BEARING	#6001	1
21	7G-40100AB	CLUTCH GEAR	S45C, M2x24T	1
22	AN-05	LOCKING NUT	AN5	1
23	AW-05	LOCKING WASHER	AW5	1
24	BS-51105	THRUST BEARING	#51105	1
25	7G-40120	COVER	FC15	1
26	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	3
27	TC-253305	OIL SEAL	25x33x5	1
28	KP-5535	KEY	5x5x35L	1
29	7G-40130	SHAFT	S45C	1
30	7G-40150B	HOLE PLUG	SS41	1
31	P-28	"O" RING	P28	1
32	BB-16003	BALL BEARING	#16003	1
33	7G-40150A	SHAFT	S45C	1
34	KP-5550	KEY	5x5x50	1
35	KP-5513	KEY	5x5x13	1
36	7G-40170	SPUR GEAR	S45C, M2x28T	1
37	7G-40180	ROCKING COLLAR	SS41	1
38	CS-35	SNAP RING	C type. I.D.35	1
39	7G-40160	SPUR GEAR	S45C, M2x28T	1
40	BB-6203	BALL BEARING	#6203	1
41	7G-40190	SPACE COLLAR	SS41	1
42	BB-6203	BALL BEARING	#6203	1
43	7G-40200	GEAR SHAFT	S45C	1
44	KP-7790	KEY	7x7x90L	1
45	7G-40210	CUPR GEAR	S45C, M2x18T	1
46	7G-40220	CUPR GEAR	S45C, M2x19T	1
47	7G-40230	CUPR GEAR	S45C, M2x20T	1
48	7G-40240	CUPR GEAR	S45C, M2x22T	1
49	7G-40250	CUPR GEAR	S45C, M2x23T	1
50	7G-40260	CUPR GEAR	S45C, M2x24T	1
51	7G-40270	CUPR GEAR	S45C, M2x26T	1
52	7G-40280	CUPR GEAR	S45C, M2x28T	1
53	7G-40290	CUPR GEAR	S45C, M2x32T	1
54	BB-6003	BALL BEARING	#6003	1
55	7G-40320	SPACE COLLAR	SS41	1

GEAR BOX

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	BB-6003	BALL BEARING	#6003	1
57	CS-20	SNAP RING	C type. I.D.20	1
58	7G-40310AB	SUPR GEAR	S45C, M2.25x28T	1
59	7G-40300	SHAFT	SS41	1
60	KP-5518	KEY	5x5x18L	1
61	BB-6003	BALL BEARING	#6003	1
62	7G-40330	HOLE PLUG	SS41	1
63	P-28	"O" RING	P28	1
64	N-16	HEXAGON NUT	M16xP2.0	1
65	WP-16	WASHER	M16	1
66	7G-40490	SPUR GEAR	S45C, M1.75x42T	1
67	KP-5510	KEY	5x5x10L	1
68	7G-40340	SHAFT	S45C	1
69	KP-5528	KEY	5x5x28L	1
70	CS-35	SNAP RING	C type. I.D.35	1
71	7G-40480	SPUR GEAR	S45C, M1.75x49T	1
72	TC-405008	OIL SEAL	40x50x8	1
73	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	3
74	7G-40450	SHAFT COVER	FC15	1
75	OB-04	OILER	ϕ 1/4"	1
76	TC-202804	OIL SEAL	20x28x4	1
77	KP-6610	KEY	6x6x10L	1
78	7G-40360	SOCKET SHAFT	S45C	1
79	KP-6615	KEY	6x6x15L	1
80	CS-20	SNAP RING	C type. I.D.20	1
81	7G-40350	SPUR GEAR	S45C, M2x36T	1
82	CS-35	SNAP RING	C type. I.D.35	1
83	CS-35	SNAP RING	C type. I.D.35	1
84	7G-40370	GUIDE COLLAR	BC2	1
85	SS-0508	SOCKET SET SCREW	M5xP0.8x8L	1
86	7G-40380	FACE FEAR	S45C, M2x17T	1
87	BB-6001	BALL BEARING	#6001	1
88	7G-40390	SPLINE SHAFT	S45C	1
89	BB-6205	BALL BEARING	#6205	1
90	CS-30	SNAP RING	C type. I.D.30	1
91	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	2
92	7G-40400	COVER	SS41	1
93	NA-4906	NEEDLE BEARING	na4906	1
94	7G-40600	ROCKING ARM	FC15	1
95	7G-40410	SPUR GEAR	S45C, M2x24T	1
96	BB-6004	BALL BEARING	#6004	1
97	CS-20	SNAP RING	C type. I.D.20	1
98	7G-40420	SPUR GEAR	S45C, M2.25x28T	1
99	PT-0338	TAPER PIN	#3x38	1
100	TC-204208	OIL SEAL	20x42x8	1
101	BB-6004	BALL BEARING	#6004	1
102	PT-0319	TAPER PIN	#3x19	1
103	7G-40430	SHAFT	S45C	1

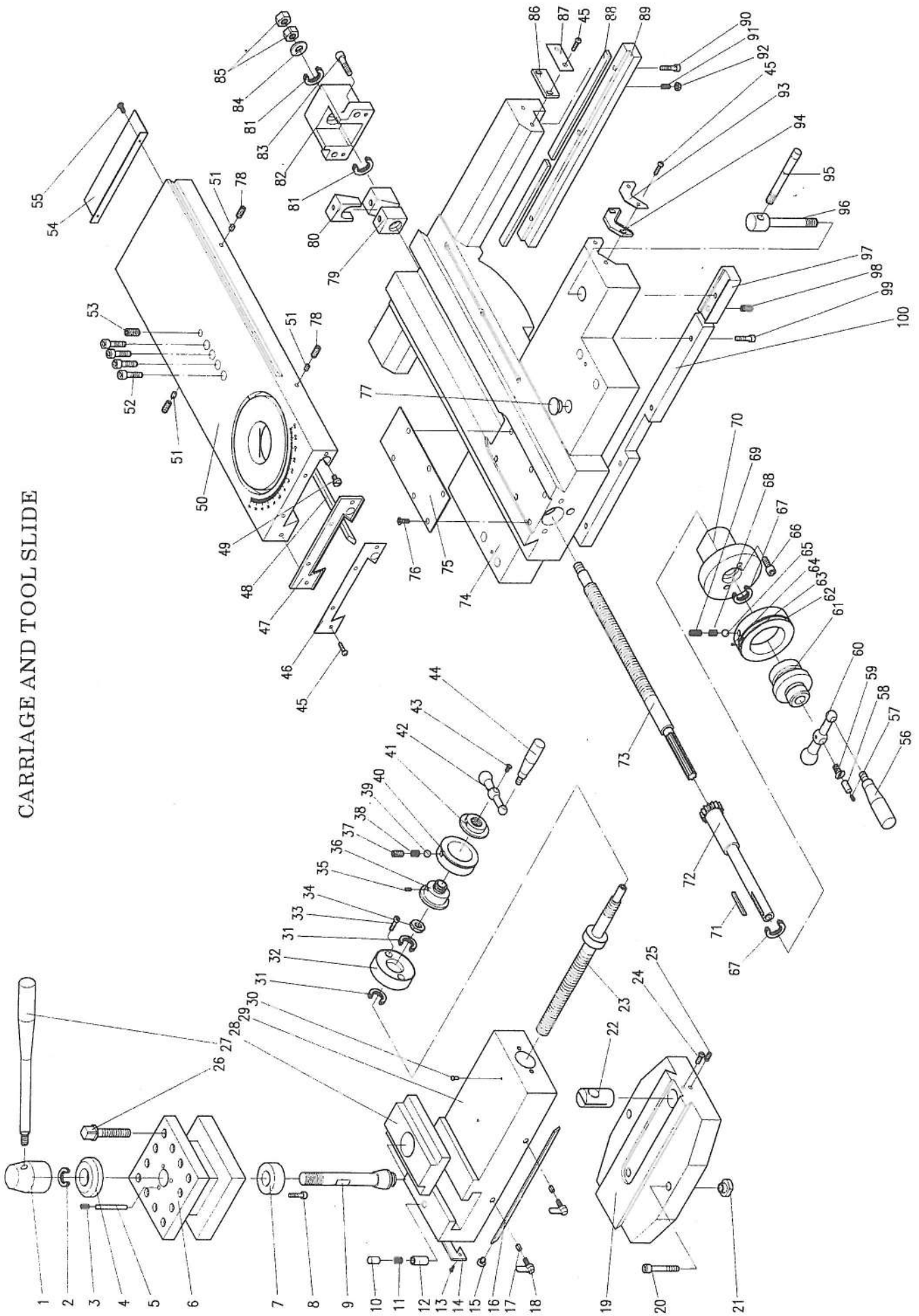
GEAR BOX



GEAR BOX

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7G-40760	HOLE PLUG	SS41	1
2	7G-40690	DOUBLE HEAD KEY	S45C	3
3	7G-40640	GUIDE BLOCK	BC2	1
4	7G-40650	GUIDE BLOCK	BC2	1
5	7G-40660	GUIDE BLOCK	BC2	1
6	7G-40620	GUIDE SHAFT	3/4"	1
7		"O" RING	P15	2
8	CS-15	SNAP RING	C type. I.D.15	1
9	7G-40600	ROCKING ARM	FC15	1
10	7G-40470	IDLE GEAR	S45C, M2x20T	1
11	7G-40460	SHAFT	S45C	1
12	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	2
13	7G-40610	CHANGING SPEED PIN	S45C	1
14	7G-40590	SLIDE PLATE	SS41	1
15	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	4
16	7G-40580	SLIDE WEDGE	SS41	1
17	7G-40520	GEAR SHAFT	S45C, M2x14T	1
18		"O" RING	P12	1
19	7G-40570	RACK	SS41	1
20	7G-40770	COVER	SS41	1
21		SCREW	M3xP0.5	2
22	7G-30560	GUIDE PLATE	SS41	1
23	SH-0510	SOCKET HEAD CAP SCREW	M5xP0.8x10L	2
24	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	4
25	7G-40550	SETTING PLATE	SS41	1
26	7G-40670	CHANGE SPEED BLOCK	SS41	3
27	7G-40720	ROCKING ARM	FC15	3
28	7G-40020	GEAR BOX COVER	FC20	1
29		"O" RING	P12	3
30	7G-40680	SHORT SHAFT	SS41	3
31	3A-40360	LEVER	SS41	3
32	3H-40380	HANDLE BOSS	SS41	3
33	B-04	STEEL BALL	φ 1/4	4
34	SC-0608	SPRING	φ 0.8	4
35	SS-0806	SOCKET SET SCREW	M8xP1.25x6L	4
36	PT-0345	TAPER PIN	#3x45	1
37	RG-90	"O" RING	G90	1
38	7G-40540	DOWEL	SS41	1
39	7G-40530	ROCKING ARM	FC15	1
40	SS-0612	SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
41	7G-40790	LEVER	SS41	1
42		"O" RING	G45	1
43	7G-40510	COVER	FC20	1
44	SH-0630	SOCKET HEAD CAP SCREW	M6xP1.0x30L	3
45		SPRING	φ 0.8	1
46	B-05	STEEL BALL	φ 5/16	1
47	7G-40500	SELECTOR	SS41	1
48		ROUND HEAD RIVET		1
49		PIN	φ 4x45L	1
50	7A-40580	KNOB	PLASTIC	1
51		PIN	φ 4x30L	1
52	SH-0620	SOCKET HEAD CAP SCREW	M6xP1.0x20L	8
53		PIN	φ 4x20L	2
54		PIN	φ 4x8L	4
55	7G-40800	PACKING		1

CARRIAGE AND TOOL SLIDE



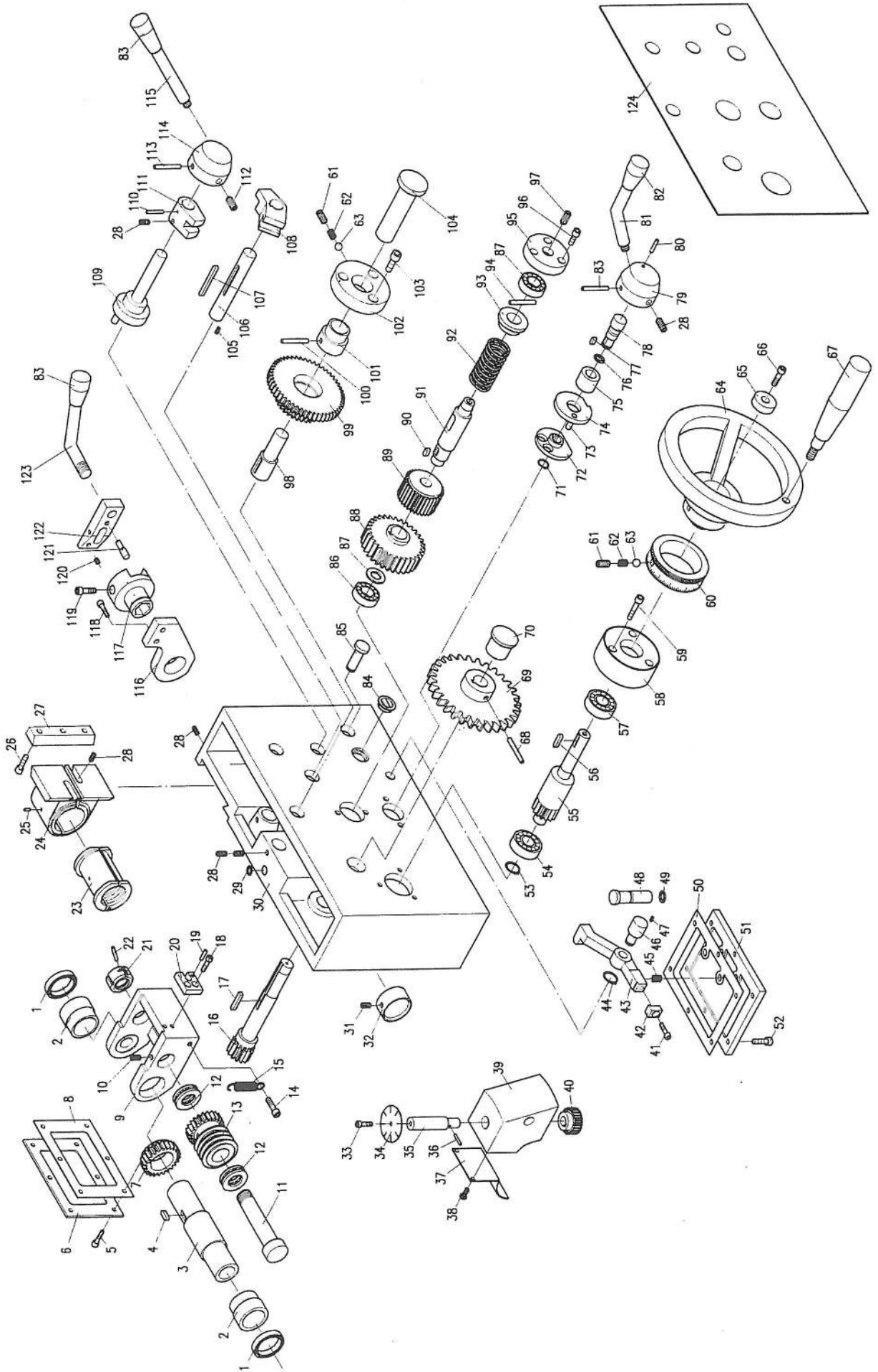
CARRIAGE AND TOOL SLIDE

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7S-40360	HANDLE BOSS	S20C-D	1
2		THRUST BEARING	51104	1
3		HEXAGON SOCKET SET SCREW	M6xP1.0x12L	1
4	7S-40370	WASHER	S20C-D	1
5	7S-40770	PIN	SS41	1
6	7S-40260	TURRET TOOL POST	S45C	1
7	7S-40650	SLEEVE	S45C	1
8	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	3
9	7S-40250	CLAMPING BOLT	S45C	1
10		PIN	SS41	1
11		SPRING	φ 5/16	1
12	7S-40480	PIN	SCM21	1
13		SCREW	M5xP0.8x8L	4
14	7S-40490	WIPER	PLASTIC	1
15	7S-40500	HEXAGON SOCKET HEAD CAP SCREW	SS41	1
16	7S-40050	GIB	FC20	1
17	7S-40520	SET BLOCK	PUB2	2
18	7S-40510	SET SCREW	S20C-D	2
19	7S-40030	TOOL SLIDE	FC25	1
20	SH-1028	SOCKET HEAD CAP SCREW	M10xP1.5x28L	3
21	7S-40060	NUT	SS41	3
22	7S-40170	LEAD SCREW NUT	PUC 2	1
23	7S-40160	LEAD SCREW	S45C	1
24		NUT	M6xP1.0	1
25	BS-51105	HEXAGON SOCKET SET SCREW	M6xP1.0x20L	1
26	7S-40270	LOCATING SCREW	SCM4	12
27	7S-40380	LEVER	SS41	1
28	7S-40300	LOCKING BLOCK	FC15	1
29	7S-40040	SLIDING TABLE	FC20	1
30		OILER	φ 1/4"	2
31		THRUST BEARING	51102	2
32	7S-40190	BRACKET	SS41	1
33		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
34	7S-40580	NUT	S20C-D	1
35		HEXAGON SOCKET SET SCREW	M6xP1.0x16L	1
36	7S-40180	INDEX RING BASE	SS41	1
37		HEXAGON SOCKET SET SCREW	M8xP1.25x8L	1
38		SPRING	φ 6x φ 0.8x15L	1
39		STEEL BALL	φ 1/4"	1
40	7S-40200	INDEX RING	SS41	1
41	7S-40720	NUT	SS41	1
42	7S-40700	LEVER	SS41	1
43		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	1
44	7S-40780	HANDLE	SS41	1
45		SCREW	M5xP0.8x8L	16
46	7S-40570	COVER	STAINLESS STEEL	2
47	7S-40400	WIPER	PLASTIC	2
48	18S-40150	GIB	FC20	1
49	7S-40420	ADJUSTING SCREW	SS41	2
50	18S-30020	COVER	FC25	1
51	7S-40520	SET BLOCK	PUB2	3
52		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
53		HEXAGON SOCKET SET SCREW	M10xP1.5x10L	1
54	7S-40790	COVER	SS41	1
55		SCREW	M5xP0.8x12L	2

CARRIAGE AND TOOL SLIDE

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7S-40460	HANDLE	SS41	1
57		HEXAGON SOCKET SET SCREW	M6xP1.0x25L	1
58	7S-40670	PIN	SS41	1
59	7S-40120	SCREW	SS41	1
60	7S-40110	LEVER	S20C	1
61	7S-40130	INDEX RING BASE	SS41	1
62	7S-40100I	INDEXRING	SS41	1
	7S-40100M	INDEXRING	SS41	1
63		STEEL BALL	Φ 1/4"	2
64		NAME PLATE	AL	1
65		ROUND HEAD RIVET		2
66		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x90L	2
67		THRUST BEARING	51103	2
68		SPRING	Φ 6xΦ 0.8x15L	2
69		HEXAGON SOCKET SET SCREW	M8xP1.25x6L	2
70	18S-40090	BRACKET	FC15	1
71		KEY	4x4x45L	1
72	18S-40080	SHAFT	SS41	1
73	18S-30070I	LEAD SCREW	S45C	1
	18S-30070M	LEAD SCREW	S45C	1
74	18S-30010	CARRIAGE	FC25	1
75	7S-40430	COVER	SS41	1
76		SCREW	M4xP0.7x6L	6
77		PLUG	Φ 3/4"	1
78		HEXAGON SOCKET SET SCREW	M8xP1.25x25L	3
79	7S-40220	LEAD SCREW NUT	PBC2	1
80	18S-40640	ADJUSTMENT BOLK	PBC2	1
81		THRUST BEARING	51102	2
82	18S-40140	BRACKET	FC15	1
83		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
84		WASHER	Φ 12	1
85		NUT	M12	2
86	7S-40340	WIPER	PLASTIC	2
87	7S-40540	COVER	STAINLESS STEEL	2
88	7S-40320	GIB	SS41	2
89	7S-40310	ADJUSTMENT GIB	FC20	1
90		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	5
91		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.25x18L	4
92		NUT	M6	4
93	7S-40530	COVER	STAINLESS STEEL	2
94	7S-40330	WIPER	PLASTIC	2
95	7S-40730	LEVER	SS41	1
96	7S-40740	HEXAGON BOLT	SS41	1
97	7S-40290	LOCK PLATE	SS41	1
98		HEXAGON SOCKET SET SCREW	M8xP1.25x30L	1
99		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
100	7S-40280	LOCK PLATE	FC15	1

APRON



APRON

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		OIL SEAL		2
2	7A-40620	BUSH	30x40x7	2
3	7A-40630	SHAFT	PBC2	1
4		KEY	S45C	1
5		HEXAGON SOCKET HEAD CAP SCREW	5x5x11L	1
6	7A-40030	COVER	M5xP0.8x12L	6
7	7A-40650	GEAR	SPC	1
8	18A-40440	PACKING	S45C	1
9	7A-30050L,R	WORM BASE	FC15	1
10		HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1
11	5A-40310	SHAFT	SS41	1
12		THRUST BEARING	51103	2
13	5A-40320L	GEAR	S45C	1
14		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
15		SPRING		1
16	7A-40200	PINION SHAFT	S45C	1
17		KEY	5x5x18L	1
18		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	2
19		PIN	#4x15L	1
20	7A-40060	PILOT BLOCK	SS41	1
21	5A-40710	NUT	SS41	1
22		PIN	#3x38L	1
23	18A-40350I	HALF NUT	BC2	1
	18A-40350M	HALF NUT	BC2	1
24	18A-30340	HALF NUT SUPPORT	FC20	1
25		SCREW	M6xP1.0x12L	2
26		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
27	7A-40240	GIB	FC15	1
28		HEXAGON SOCKET SET SCREW	M6xP1.0x12L	9
29		O RING	P11	1
30	18A-20010L,M	CASE	FC20	1
31		HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1
32	18A-40400	BUSHING	BC2	1
33		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x8L	1
34	7A-40320	INDICATE DISK	AL	1
35	7A-40330	SHAFT	SS41	1
36		PIN	#3x12L	1
37	7A-40600	COVER	SS41	1
38		SCREW	M5xP0.8x12L	2
39	7A-30310	INDICATE SET	FC15	1
40	7A-40340I	PUMP BASE	PBB2	1
	7A-40340M	PUMP BASE	PBB2	1
41		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
42	5A-40450	LOCKING BLOCK	S45C	1
43	7A-40290L,R	LOCKING ARM	FC15	1
44		SNAP RING	E10	1
45	7A-40610	SPRING	SWP	1
46	7A-40280	SHAFT	S20C	1
47		HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1
48	18A-40300	SHAFT	SS41	1
49		"O" RING	P11	1
50	18A-40430	PACKING		1
51	7A-40020	COVER	FC15	1
52		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	6
53		SNAP RING	A17	1

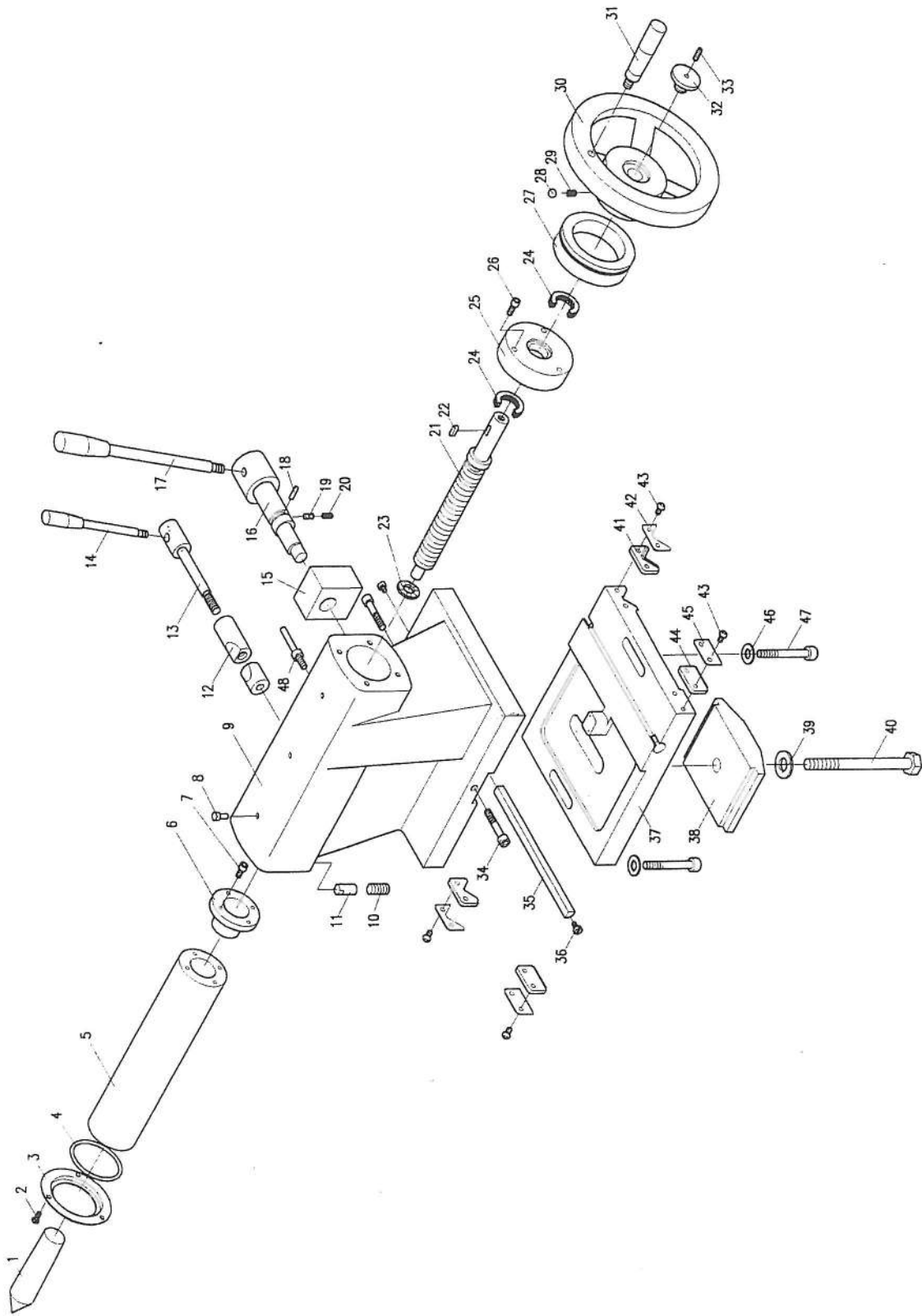
APRON

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
54		BEARING	6003	1
55	7A-40220	SHAFT	S45C	1
56		KEY	5x5x28L	1
57		BEARING	6005-2RS	1
58	7A-40360	SHAFT COLLAR	FC20	1
59		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x35L	3
60	7A-40430I	INDEX RING	SS41	1
	7A-40430M	INDEX RING	SS41	1
61		HEXAGON SOCKET SET SCREW	M8xP1.25x6L	2
62		SPRING	φ 1/4"	2
63		STEEL BALL	FC20	2
64	7A-30380	HANDLE WHEEL	FC15	1
65	5A-40700	WASHER	SS41	1
66		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
67	7A-40410	HANDLE	SS41	1
68		PIN	#3x32L	1
69	7A-40210	GEAR	S45C	1
70		COVER	BC2	1
71		SNAP RING	A10	1
72	7A-40090	MOVING PLATE	S45C	1
73	7A-40110	PIN	SS41	1
74	7A-40100	LOCKING PLATE	S45C	1
75	7A-40080	BUSHING	SS41	1
76		"O" RING	P11	1
77		KEY	5x5x11L	1
78	7A-40070	SHAFT	S45C	1
79	7A-40570	HANDLE BOSS	S20C-D	1
80		PIN	#4x20L	1
81	7A-40590	LEVER ROD	SS41	1
82	7A-40580	PLASTIC KNOB	PLASTIC	3
83		PIN	#3x39L	1
84		OIL WINOWS	φ 29	1
85	7A-40480	OIL PUMP	S45C	1
86		BEARING	6002-2RS	2
87	7A-40440	WASHER	SS41	1
88	7A-40130	WORM WHEEL	PBC2	1
89	7A-40140	SPUR GEAR	S45C	1
90		KEY	5x5x15L	1
91	7A-40120	SHAFT	S45C	1
92	5A-40690	SPRING	φ 34.5	1
93		WASHER	SS41	1
94	5A-40220	KEY	SS41	1
95	7A-40150	COVER	SS41	1
96		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
97		HEXAGON SOCKET SET SCREW	M8xP1.25x25L	1
98	5A-40130	SHAFT	S45C	1
99	7A-40170	GEAR	S45C	1
100		PIN	#3x39L	1
101	7A-40180	BUSHING	SS41	1
102	7A-40190	COVER	SS41	1
103		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
104	7A-40160	SHAFT	SS41	1
105		HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1
106	7A-40250	SHAFT	SS41	1
107		KEY	5x5x50L	1

APRON

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
108	7A-40260L,R	SHAFT KEY	FC15	1
109	7A-40230	SHAFT	SS41	1
110		PIN	#3x32L	1
111	7A-40270	SHAFT BLOCK	FC15	1
112		HEXAGON SOCKET SET SCREW	M8xP1.25x16L	1
113		PIN	#3x39L	1
114	7A-40540	HANDLE BOSS	S20C	1
115	5A-40540	LEVER	SS41	1
116	5A-40510	BRACKET	FC37	1
117	9A-40820	STARING BRACKET	SS41	1
118		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	2
119	5A-40610	SCREW	SS41	2
120	5A-40690	SPRING	∅ 0.8x25L	1
121	5A-40600	PIN	S20C	1
122	9A-40830	STARTER, ROCKER ARM	SS41	1
123	9B-40510	LEVER	SS41	1
124		NAME PLATE	AL	1

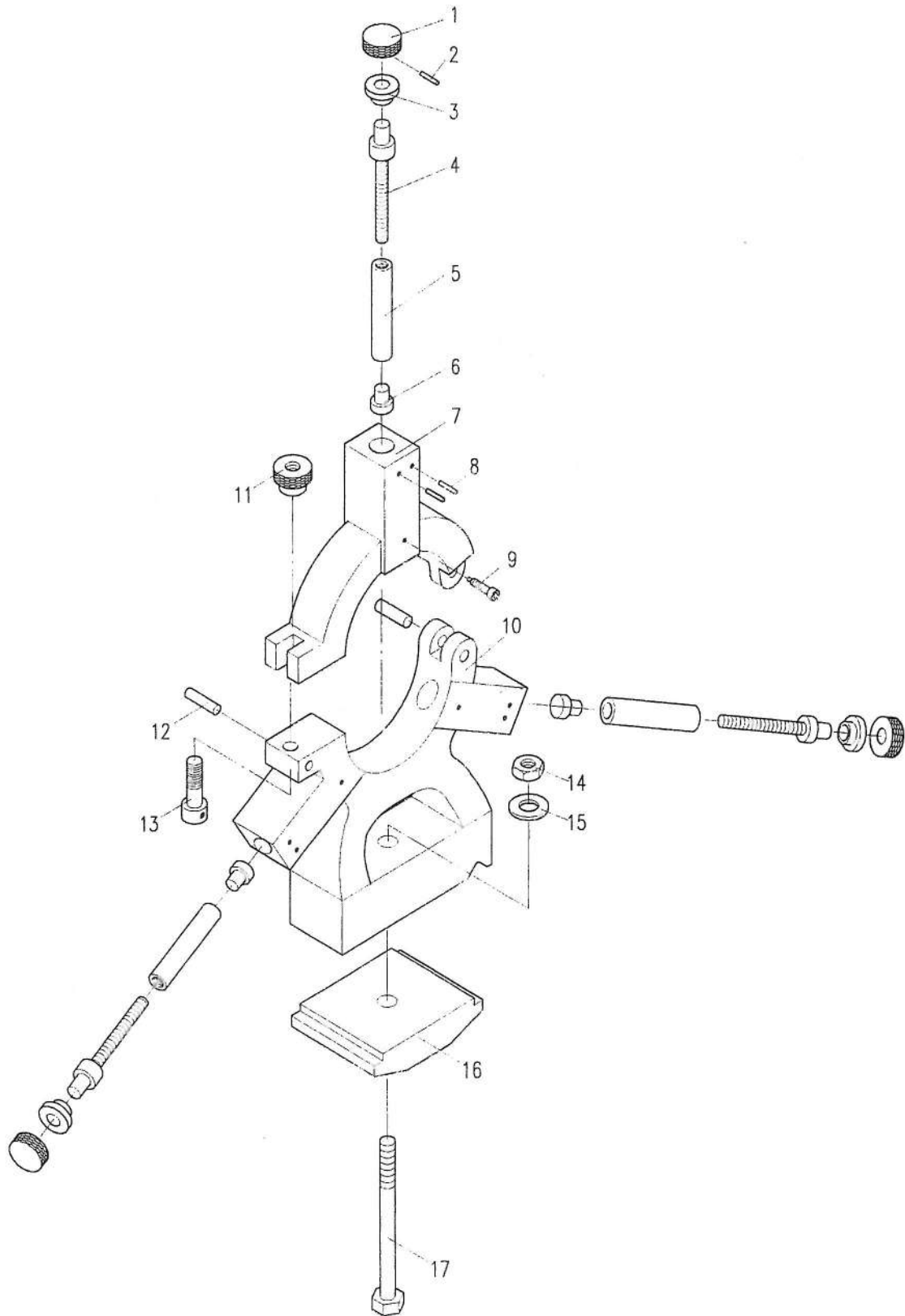
TAILSTOCK



TAILSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		CENTER	MT 4#	1
2		CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	3
3	7T-40200	COVER	SS41	1
4		"O" RING	P58	1
5	7T-40030	BARREL	S45C	1
6	18T-40040I	INDEXRING	SS41	1
	18T-40040M	INDEXRING	SS41	1
7		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
8		OILERS	1/4	3
9	18T-10010	TAILSTOCK CASTING	FC25	1
10		HEXAGON SOCKET SET SCREW	M14x14L	1
11	7T-40100	KEY	SS41	1
12	7T-40220	LOCATING NUT	FC15	1
13	7T-40110	LOCATING BOLT	SS41	1
14	7T-40120	BARREL LEVER	SS41	1
15	7T-40130	PIVOT BLOCK	SS41	1
16	7T-40140	CAM SHAFT	S45C	1
17	7T-40170	CLAMP LEVER	SS41	1
18	7T-40150-1	PIN	SS41	1
19	7T-40160	SCREW	M10xP1.0x8L	1
20		HEXAGON SOCKET SET SCREW	M10xP1.0x8L	1
21	18T-40050I	SCREW	S45C	1
	18T-40050M	SCREW	S45C	1
22		KEY	6x6x15	1
23	7T-40230	WASHER	SS41	1
24		THRUST BEARING	51105	2
25	7T-40060	FLANGE	FC20	1
26		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x14L	4
27	18T-40070I	INDEXRING	SS41	1
	18T-40070M	INDEXRING	SS41	1
28		BALL	φ 1/4	3
29		SPRING	6x0.8x10L	3
30	7T-30080	HANDLE WHEEL	FC20	1
31	7A-40410	HANDLE	SS41	1
32	7T-40090	SCREW	SS41	1
33		HEXAGON SOCKET SET SCREW	M8xP1.25x25L	1
34		HEXAGON SOCKET HEAD CAP SCREW	M10x1.5x50L	2
35	7T-40190	GIB	FC20	1
36	7T-40210	ADJUSTING SCREW	SS41	2
37	18T-30020	BASE	FC25	1
38	7T-40240	CLAMP PLATE	FC20	1
39	7T-40250	WASHER	SS41	1
40		BOLT	M16xP2.0x90L	1
41	7T-40260	WIPER	RUBBER	2
42	7T-40270	WIPER COVER	STAINLESS STEEL	2
43		CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	8
44	7T-40280	WIPER	RUBBER	2
45	7T-40290	WIPER COVER	STAINLESS STEEL	2
46		WASHER	φ 10	2
47		BOLT	M10xP1.5x50L	2
48	7T-40150-2	BOLT	M10	1

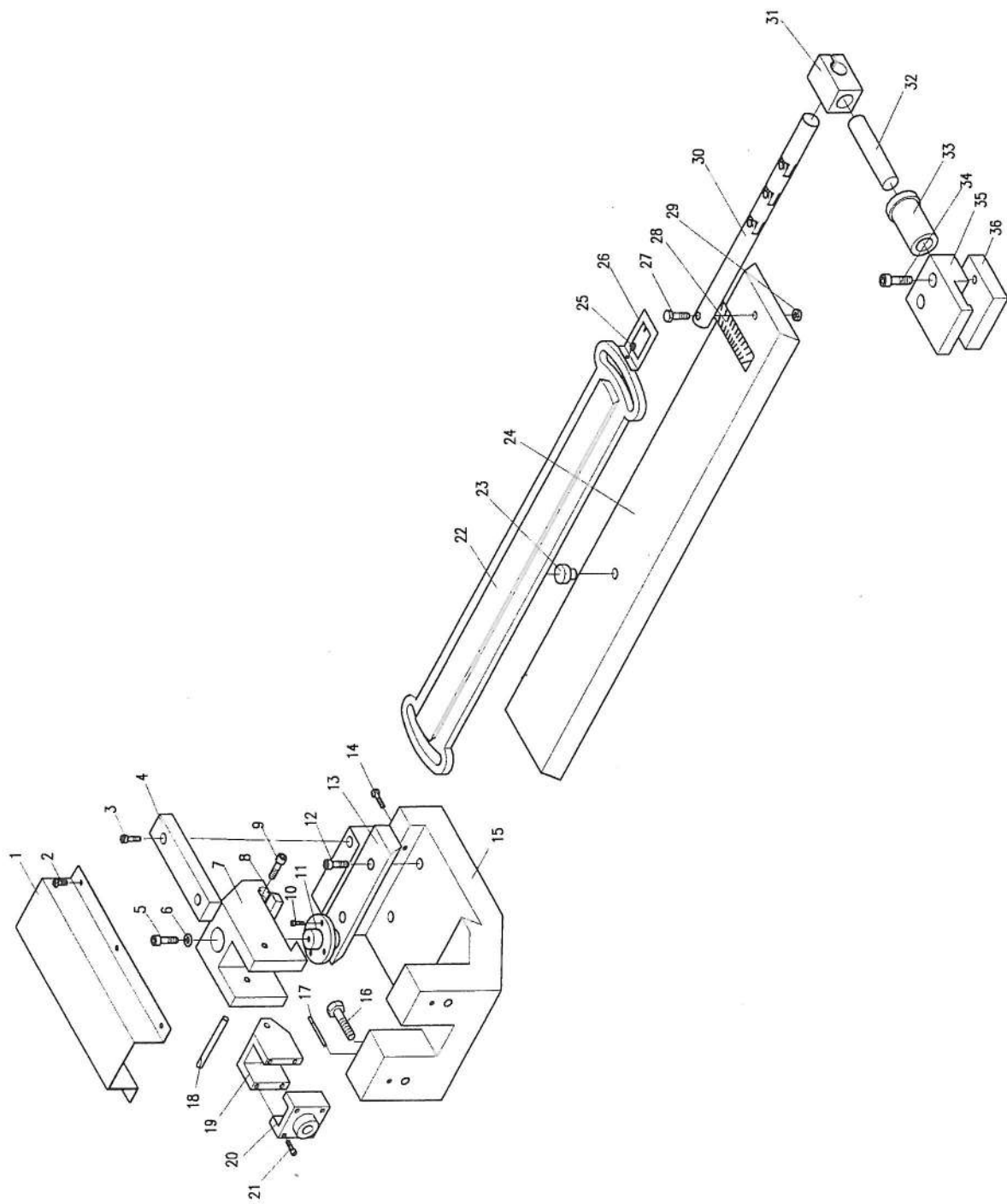
STEADY REST



STEADY REST

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7C-40060	ADJUSTMENT WHEEL	S20C-D	3
2	P-04	PIN	#4	3
3	7C-40130	COVER	S20C-D	3
4	7C-40050	ADJUSTMENT SCREW	SS41	3
5	7C-40030	SHAFT	S20C-D	3
6	7C-40040	BUSH	BC2	3
7	7C-30020	COVER	FC15	1
8	P-04	PIN	#4	6
9	SS-1012	SET SCREW	M10xP1.5x12L	3
10	7C-30010	BODY OF STEADY REST	FC15	1
11	7C-40080	NUT	S20C-D	1
12	7C-40090	CONNECT ROD	S20C-D	2
13	7C-40070	LOCKING SCREW	S20C-D	1
14	N-16	NUT	M16xP2.0	1
15	W-16	WASHER	#16	1
16	7C-40120	LOCKING PLATE	FC15	1
17	SH-16	SCREW	M16xP2.0	1

TAPER TURNING ATTACHMENT



TAPER TURNING ATTACHMENT

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	TA-40220	COVER	SS41	1
2	MS-0508	MACHINE SCREW	M5xP0.8x8L	6
3	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	4
4	TA-40090	COMPRESS PLATE	FC15	2
5	SH-0612	SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
6	TA-40250	WASHER	SS41	1
7	TA-40050	BRACKET	FC20	1
8	TA-40100	GIB	FC15	1
9	7S-40500	ADJUSTING BOLT	SS41	1
10	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
11	TA-40170	SHAFT	SS41	1
12	SH-0520	SOCKET HEAD CAP SCREW	M5xP0.8x20L	3
13	TA-40110	GIB	FC15	1
14	SS-0828	HEXAGON SOCKET SET SCREW	M8xP1.25x28L	4
15	TA-30010	BODY OF TAPER ATTCHMENT	FC15	1
16		BOLT	M8xP1.25x35L	4
17	SP-05	PIN	#5	2
18	TA-40240	SHAFT	S45C	1
19	TA-40230	CONNTING BLOCK	S45C	1
20	TA-40130	CONNSCT	S45C	1
21	SH-0530	SOCKET HEAD CAP SCREW	M5xP0.8x30L	4
22	TA-30030	SWIVEL	FC15	1
23	TA-40140	ROTARING SHAFT	SS41	1
24	TA-30020	SLIDE PLATE	FC15	1
25		RIVET	∅ 2	1
26	TA-40210	GRADUATED INDICTOR	STAINLESS	1
27	TA-40180	BOLT	M10xP1.5	1
28	TA-40210	GRADUATED INDICTOR	AL	1
29	N-10	NUT	M10xP1.5	1
30	TA-40090	CONNECTING ROD	SS41	1
31	TA-40070	CLAMP BRACKET	SS41	1
32		SHAFT	SS41	1
33		SHAFT	SS41	1
34		SOCKET HEAD CAP SCREW	M8xP1.25x35L	2
35	TA-40070A	CLAMP BRACKET	FC15	1
36		BLOCK	SS41	1

CHAPTER 10

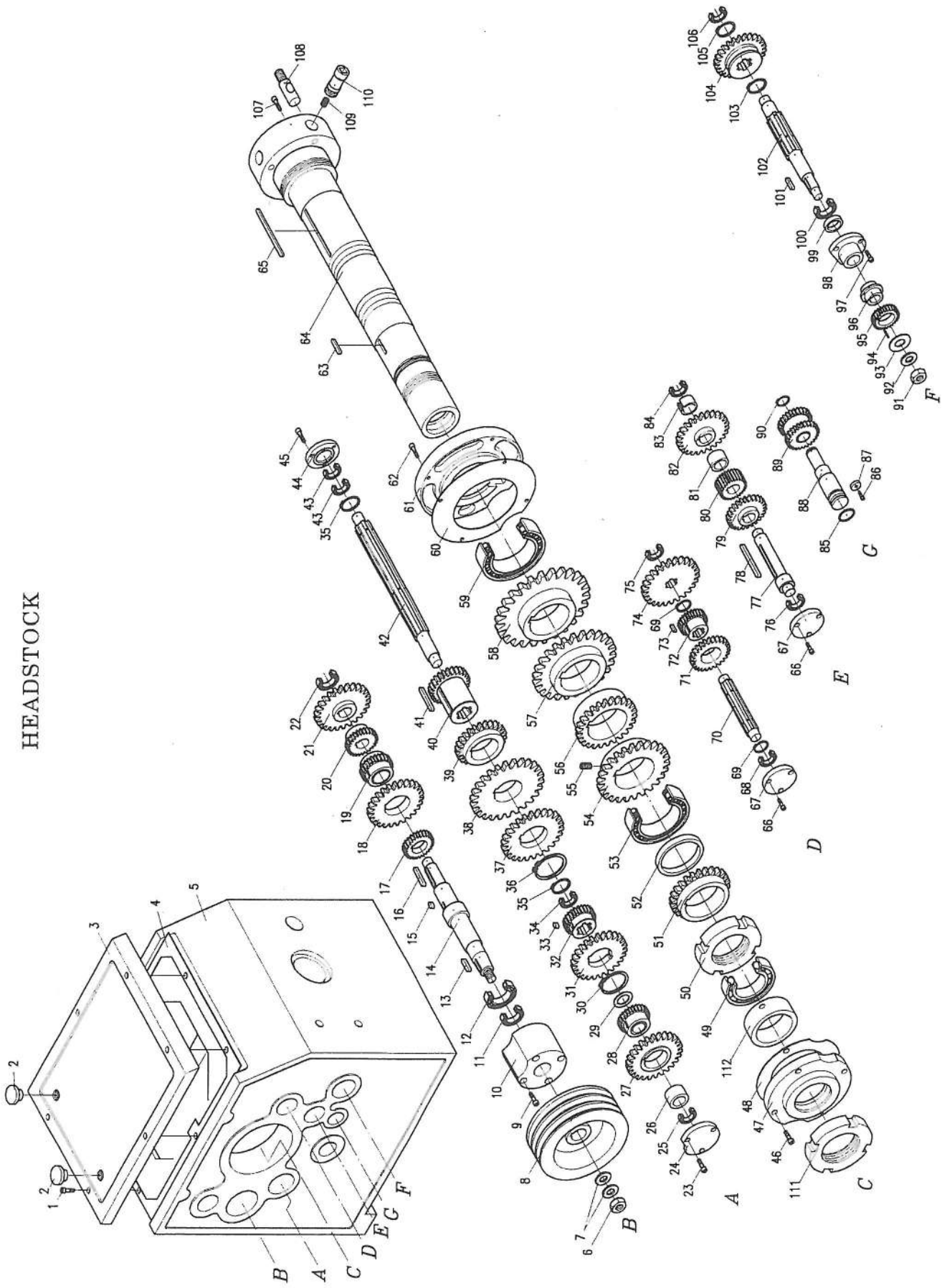
Parts list for 20" Series

MECHANICAL PARTS LIST FOR 20" SERIES

When ordering parts, please specify the following:

- 1. Series number**
- 2. Model & year of production**
- 3. Part number, page number & description**
- 4. Quantity**

HEADSTOCK



HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
2	5H-40800	PLUG	Plastic	2
3	7H-30020	COVER	FC20	1
4	7H-40830N	PACKING	PACKING	1
5	20H-10010	HEAD STOCK	FC25	1
6		NUT	M16xP2.0	1
7		WASHER	Ø 16	2
8	18H-40310	PULLEY	FC20	1
9		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
10	7H-40300	COVER	FC20	1
11		BALL BEARING	6006Z	1
12		BALL BEARING	6007-2RS	1
13		KEY	7x7x28L	1
14	7H-30450	SHAFT	S45C	1
15		KEY	7x7x12L	1
16		KEY	7x7x45L	1
17	7H-40040	GEAR	SCM21,23T	1
18	7H-40050B	GEAR	SCM21,43T	1
19	7H-40050A	GEAR	SCM21,23T	1
20	7H-40060	GEAR	SCM21,23T	1
21	7H-40070	GEAR	SCM21,43T	1
22		BALL BEARING	6304	1
23		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
24	7H-40330	COVER	Plastic	1
25		BALL BEARING	6304	1
26	7H-40360	COLLAR	SS41	1
27	7H-40080B	GEAR	SCM21,43T	1
28	7H-40080A	GEAR	SCM21,23T	1
29	7H-40500	WASHER	SS41	1
30		RETAINING RING	S38	1
31	7H-40090B	GEAR	SCM21,43T	1
32	7H-40090A	GEAR	SCM21,23T	1
33		KEY	7x7x12L	2
34		BALL BEARING	62/32	1
35		RETAINING RING	S32	2
36		RETAINING RING	R65	1
37	7H-40100B	GEAR	SCB21,39T	1
38	7H-40100C	GEAR	SCM21,47T	1
39	7H-40100D	GEAR	SCM21,32T	1
40	7H-40100A	GEAR	SCM21,25T	1
41		KEY	10x8x58L	1
42	7H-30110	SHAFT	SCM4	1
43		BALL BEARING	6004	2
44	7H-40320	COVER	AL	1
45		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
46		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x20L	4
47	20H-40290	COVER	FC20	1
48	7H-40960	PACKING		1
49		BALL BEARING	32215	1
50	20H-40480	LOCKING NUT	AN16	1
51	7H-40160	GEAR	SCM21,44T	1
52	7H-40910	SPARCR	FC20	1
53		BALL BEARING	32016X	1
54	7H-40150	GEAR	SCM21,47T	1
55		HEXAGON SOCKET SET SCREW	M10xP1.5x10L	1

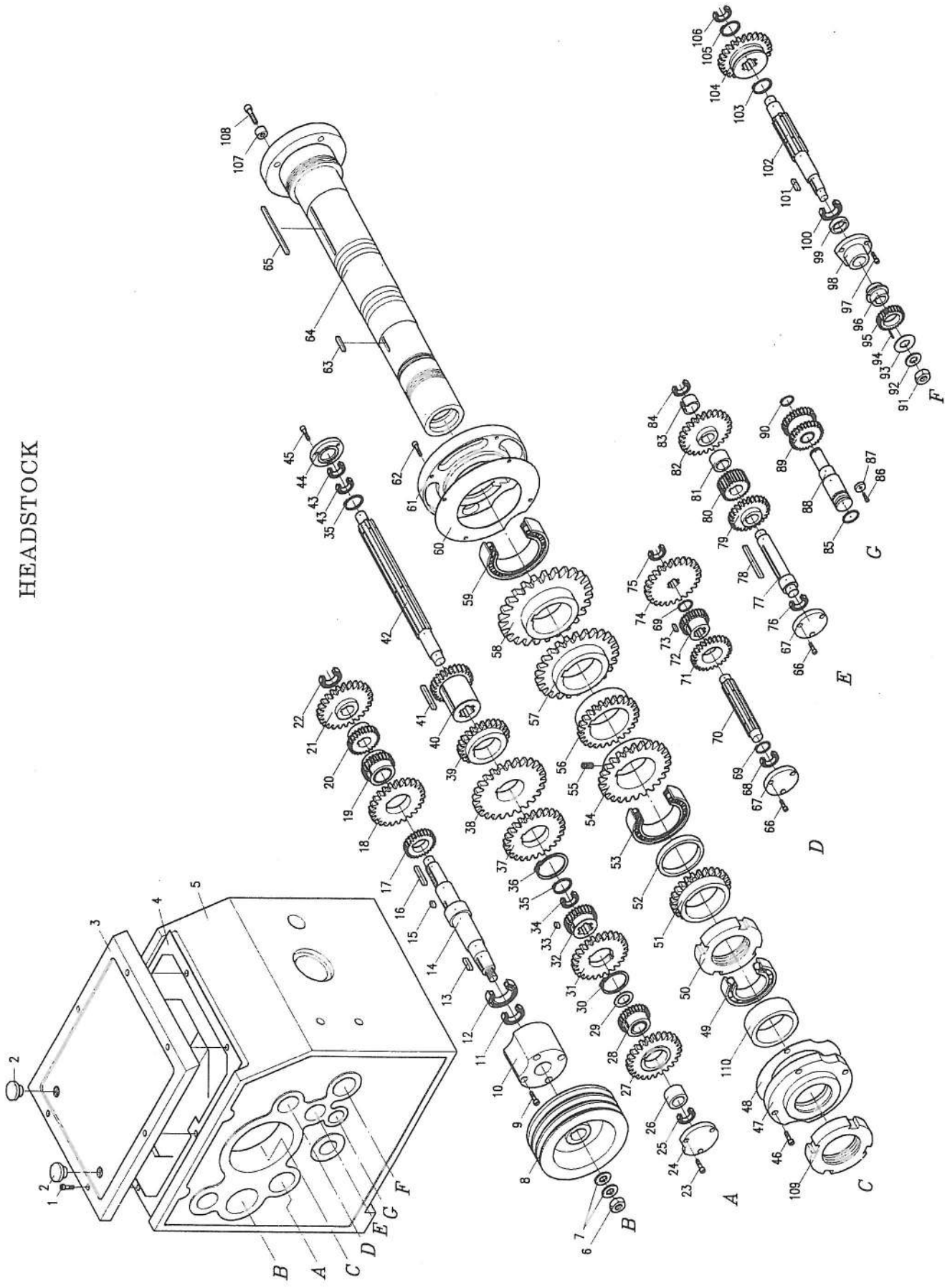
HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7H-40140	GEAR	SCM21,39T	1
57	7H-30130	GEAR	SCM21,54T	1
58	7H-30120	GEAR	SCM21,61T	1
59		BALL BEARING	32017X	1
60	7H-40970	PACKING		1
61	7H-40280D	FRONT COVER	FC20	1
62		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	4
63		KEY	12x8x22L	1
64	20H-30030D	SPINDLE	S45C	1
65		KEY	15x10x140L	1
66		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	6
67	7H-40340	COVER	Plastic	2
68		BALL BEARING	6004	1
69		RETAINING RING	S25	2
70	7H-30190	SHAFT	S45C	1
71	7H-40180B	GEAR	SCM21,30T	1
72	7H-40180A	GEAR	SCM21,20T	1
73		KEY	5x5x17L	1
74	7H-40170	GEAR	SCM21,44T	1
75		BALL BEARING	6004	1
76		BALL BEARING	6004	1
77	7H-40260	SHAFT	S45C	1
78		KEY	7x7x80L	1
79	7H-40200	GEAR	SCM21,30T	1
80	7H-40240	GEAR	SCM21,20T	1
81	7H-40380	COLLER	SS41	1
82	7H-40250	GEAR	SCM21,40T	1
83	7H-40370	COLLER	SS41	1
84		BALL BEARING	6004	1
85		"O" RING	G-26	1
86		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
87	7H-40510	WASHER	SS41	1
88	7H-40270	SHAFT	S45C	1
89	7H-40210	GEAR	SCM21,24T	1
90		RETAINING RING	S22	1
91		NUT	M16	1
92		WASHER	φ 16	1
93	20B-40430	WASHER	SS41	1
94		PIN	φ 3	1
95	20B-40110	GEAR	S45C,28T	1
96	20B-40970	COLLER	SS41	1
97		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
98	7H-40350	COVER	AL	1
99		OIL SEAL	25x35x8	1
100		BALL BEARING	6005CMZ	1
101		KEY	6x6x27L	1
102	7H-30230	SHAFT	S45C	1
103		RETAINING RING	S32	1
104	7H-40220	GEAR	SCM21,40T	1
105		RETAINING RING	S32	1
106		BALL BEARING	6204	1
107	7H-40400	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	6
108	7H-40410	CAM BOLT	S45C	6
109	7H-40420	SPRING	SWPA	6
110	7H-30390	CAM	SCM21	6

HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
111 112	20H-40040 20H-40300	LOCKING NUT SPARCER	AN15 S45C	1 1

HEADSTOCK



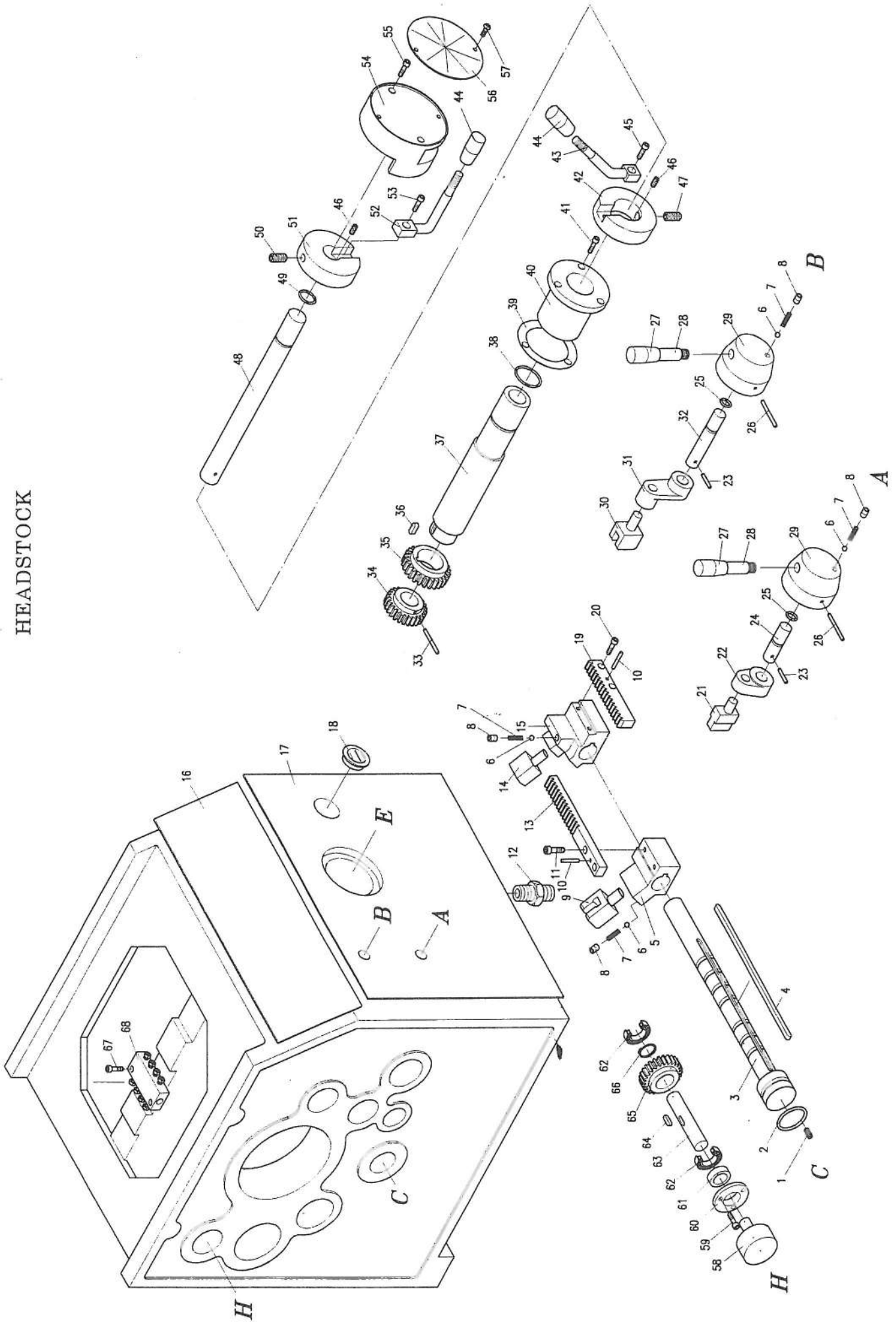
HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
2	5H-40800	PLUG	Plastic	2
3	7H-30020	COVER	FC20	1
4	7H-40830N	PACKING	PACKING	1
5	20H-10010	HEAD STOCK	FC25	1
6		NUT	M16xP2.0	1
7		WASHER	φ 16	2
8	18H-40310	PULLEY	FC20	1
9		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
10	7H-40300	COVER	FC20	1
11		BALL BEARING	6006Z	1
12		BALL BEARING	6007-2RS	1
13		KEY	7x7x28L	1
14	7H-30450	SHAFT	S45C	1
15		KEY	7x7x12L	1
16		KEY	7x7x45L	1
17	7H-40040	GEAR	SCM21,23T	1
18	7H-40050B	GEAR	SCM21,43T	1
19	7H-40050A	GEAR	SCM21,23T	1
20	7H-40060	GEAR	SCM21,23T	1
21	7H-40070	GEAR	SCM21,43T	1
22		BALL BEARING	6304	1
23		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
24	7H-40330	COVER	Plastic	1
25		BALL BEARING	6304	1
26	7H-40360	COLLAR	SS41	1
27	7H-40080B	GEAR	SCM21,43T	1
28	7H-40080A	GEAR	SCM21,23T	1
29	7H-40500	WASHER	SS41	1
30		RETAINING RING	S38	1
31	7H-40090B	GEAR	SCM21,43T	1
32	7H-40090A	GEAR	SCM21,23T	1
33		KEY	7x7x12L	2
34		BALL BEARING	62/32	1
35		RETAINING RING	S32	2
36		RETAINING RING	R65	1
37	7H-40100B	GEAR	SCB21,39T	1
38	7H-40100C	GEAR	SCM21,47T	1
39	7H-40100D	GEAR	SCM21,32T	1
40	7H-40100A	GEAR	SCM21,25T	1
41		KEY	10x8x58L	1
42	7H-30110	SHAFT	SCM4	1
43		BALL BEARING	6004	2
44	7H-40320	COVER	AL	1
45		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
46		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x20L	4
47	20H-40290	COVER	FC20	1
48	7H-40960	PACKING		1
49		BALL BEARING	32215	1
50		LOCKING NUT	AN16	1
51	7H-40160	GEAR	SCM21,44T	1
52	7H-40910	SPARCER	FC20	1
53		BALL BEARING	32016X	1
54	7H-40150	GEAR	SCM21,47T	1
55		HEXAGON SOCKET SET SCREW	M10xP1.5x10L	1

HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7H-40140	GEAR	SCM21,39T	1
57	7H-30130	GEAR	SCM21,54T	1
58	7H-30120	GEAR	SCM21,61T	1
59		BALL BEARING	32017X	1
60	7H-40970	PACKING		1
61	7H-40280A	FRONT COVER	FC20	1
62		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	4
63		KEY	12x8x22L	1
64	20H-30030A	SPINDLE	S45C	1
65		KEY	15x10x140L	1
66		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	6
67	7H-40340	COVER	Plastic	2
68		BALL BEARING	6004	1
69		RETAINING RING	S25	2
70	7H-30190	SHAFT	S45C	1
71	7H-40180B	GEAR	SCM21,30T	1
72	7H-40180A	GEAR	SCM21,20T	1
73		KEY	5x5x17L	1
74	7H-40170	GEAR	SCM21,44T	1
75		BALL BEARING	6004	1
76		BALL BEARING	6004	1
77	7H-40260	SHAFT	S45C	1
78		KEY	7x7x80L	1
79	7H-40200	GEAR	SCM21,30T	1
80	7H-40240	GEAR	SCM21,20T	1
81	7H-40380	COLLER	SS41	1
82	7H-40250	GEAR	SCM21,40T	1
83	7H-40370	COLLER	SS41	1
84		BALL BEARING	6004	1
85		"O" RING	G-26	1
86		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
87	7H-40510	WASHER	SS41	1
88	7H-40270	SHAFT	S45C	1
89	7H-40210	GEAR	SCM21,24T	1
90		RETAINING RING	S22	1
91		NUT	M16	1
92		WASHER	φ 16	1
93	20B-40430	WASHER	SS41	1
94		PIN	φ 3	1
95	20B-40110	GEAR	S45C,28T	1
96	20B-40970	COLLER	SS41	1
97		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
98	7H-40350	COVER	AL	1
99		OIL SEAL	25x35x8	1
100		BALL BEARING	6005CMZ	1
101		KEY	6x6x27L	1
102	7H-30230	SHAFT	S45C	1
103		RETAINING RING	S32	1
104	7H-40220	GEAR	SCM21,40T	1
105		RETAINING RING	S32	1
106		BALL BEARING	6204	1
107	7H-40460	DRIVE KEY	SS41	1
108		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	1
109	20H-40040	LOCKING NUT	AN15	1
110	20H-40300	SPARCER	S45C	1

HEADSTOCK



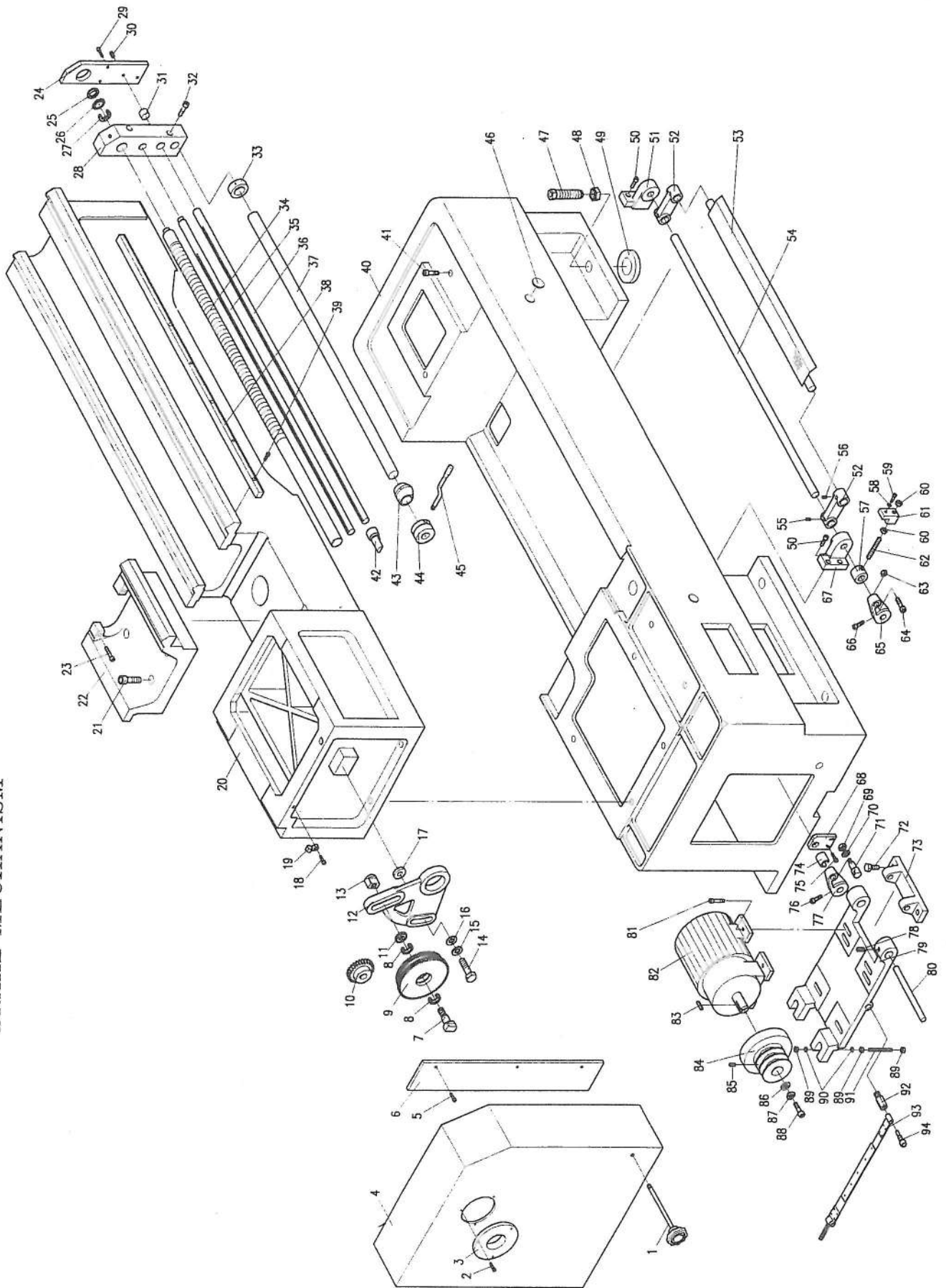
HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		HEALESS, SOCKET SET SCRWE	M6xP1.0x6L	1
2		"O" RING	P26	1
3	20H-40660	SHAFT	SS41	1
4		KEY	6x6x230L	1
5	7H-40630	ROCKER ARM	FC15	1
6		STEEL BALL	Ø 1/4"	4
7		SPRING	O.D.6xWIREx0.8	4
8		HEALESS, SOCKET SET SCRWE	M8xP1.25x6L	4
9	7H-40650	CHANGE SPEED BLOCK	BC2	1
10		PIN	Ø 4x20L	2
11		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x14L	2
12	20H-40920	CONTROLLER OF PROPORTION	SS41	1
13	7H-40640	RACK	SS41	1
14	7H-40620	CHANGE SPEED BLOCK	BC2	1
15	7H-40610	ROCKER ARM	FC15	1
16	CH-20H1	NAME PLATE	AL	1
17	CH-20H2	NAME PLATE	AL	1
18		OIL WINDOWS	Ø 29	1
19	7H-40600	RACK	S45C	1
20		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x14L	2
21	7H-40670	CHANGE SPEED BLOCK	BC2	1
22	7H-40680	ROCKER ARM	FC15	1
23		PIN	Ø 5x36L	1
24	7H-40690	SHAFT	SS41	1
25		"O" RING	P12	2
26		PIN	Ø 3x45L	2
27	7A-40580	KNOB	Plastic	2
28	3A-40380	LEVER	SS41	2
29	3H-40380	HANDLE BOSS	SS41	2
30	7H-40700	CHANGE SPEED BLOCK	BC2	1
31	7H-40710	ROCKER ARM	FC15	1
32	7H-40730	SHAFT	SS41	1
33		PIN	Ø 5x40L	1
34	7H-40590	GEAR	S45C,26T	1
35	7H-40580	GEAR	S45C,26T	1
36		KEY	6x6x16L	1
37	7H-40530	CHANGE SPEED SHAFT	S45C	1
38		"O" RING	P32	1
39		PACKING	PACKING	1
40	7H-40540	BUSHING	FC20	1
41		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
42	7H-40550	HANDLE BOSS	SS41	1
43	7H-40760	LEVER	SS41	1
44	7A-40580	KNOB	Plastic	2
45		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
46		HEALESS, SOCKET SET SCRWE	M6xP1.0x6L	2
47		HEALESS, SOCKET SET SCRWE	M10xP1.5x10L	1
48	7H-40520	CHANGE SPEED ROD	S35C	1
49		"O" RING	P20	1
50		HEALESS, SOCKET SET SCRWE	M10xP1.5x10L	1
51	7H-40560	HANDLE BOSS	SS41	1
52	7H-40800	LEVER	SS41	1
53		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
54	7H-30570	COVER	Plastic	1
55		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x45L	2

HEADSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56		NAME PLATE	AL	1
57		ROUND HEAD SCREW	M5xP0.8x8L	2
58	7L-40070	PUMP		1
59		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	3
60	7L-40010	COVER	SS41	1
61	7L-40040	COLLER	SS41	1
62		BEARING	6203	2
63	7L-40020	SHAFT	SS41	1
64		KEY	5x5x16	1
65	7L-40030	GEAR	Plastic	1
66		SNAP RING	S-20	1
67		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x20L	2
68	7L-40150	OIL-DISTRIBUTING SEAT		1

BRAKE MECHANISM



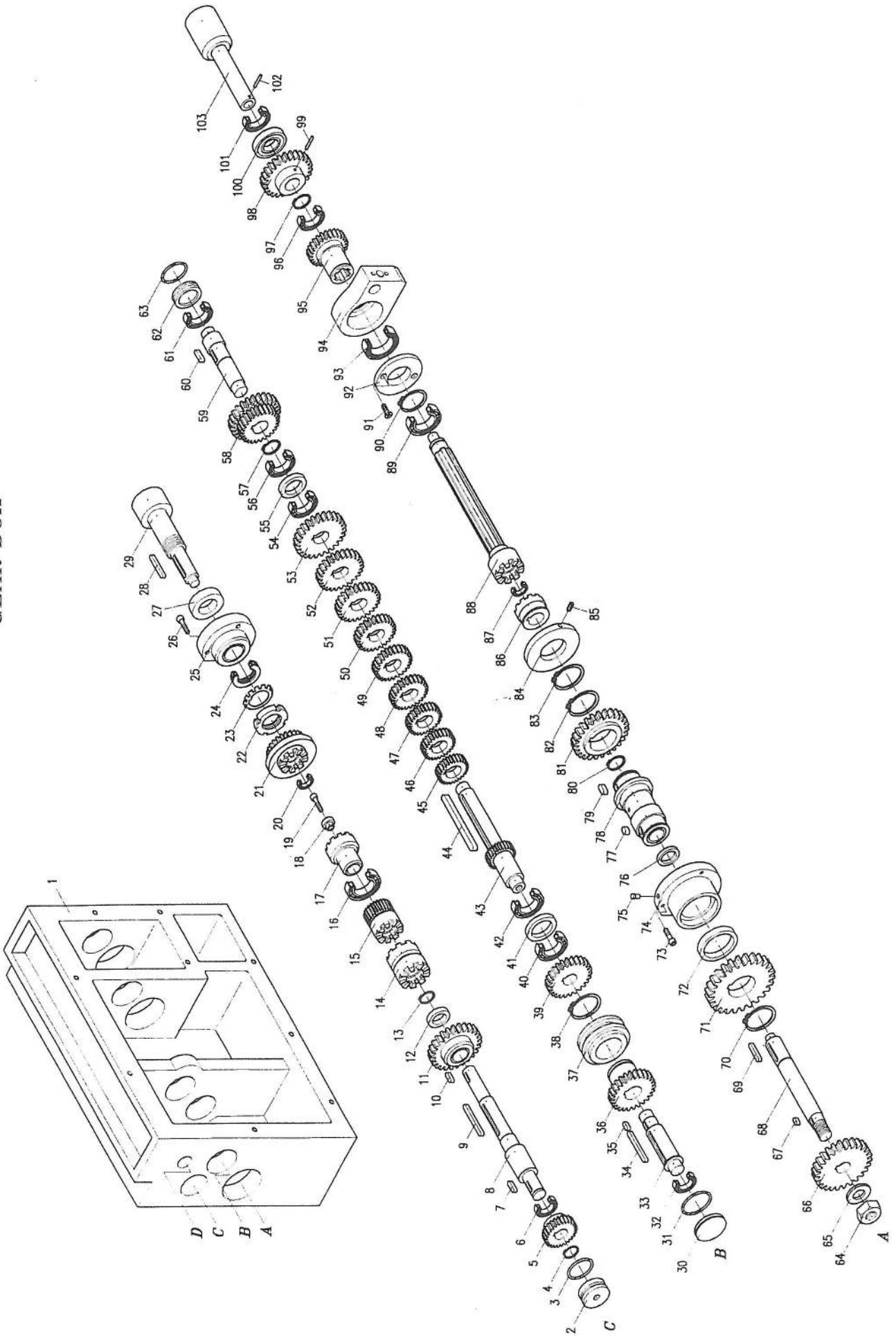
BRAKE MECHANISM

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7B-40220	Locating rod	SS41	1
2		Hexagon Socket Head Cap Screw	M6xP1.0x12L	3
3	7B-40330	Cover	SS41	1
4	20B-20170	Cover	AL	1
5		Hexagon Socket Head Cap Screw	M6xP1.0x20L	3
6	20B-40180	Side Plate	SS41	1
7	7B-40140	Shaft	SS41	1
8		Ball Bearing	6004	2
9	20B-30120	Gear	FC15 120Tx127T	1
10	20B-40440	Gear	S45C,28T	1
11	7B-40150	Washer	SS41	1
12	7B-40160	Quadrant Bracket	FC15	1
13	7B-40130	Sliding Block	SS41	1
14		Hex. Cap Screw	M16xP2.0x50L	1
15		Spring Washer	φ 16	1
16		Washer	φ 16	1
17	7B-40470	Washer	SS41	1
18		Hexagon Socket Head Cap Screw	3/16W24x3/8L	1
19		Cable Clamps	SS41	1
20	7B-30010	Bed	FC25	1
21		Hexagon Socket Head Cap Screw	M12xP1.5x80L	4
22	7B-40720	Gap	FC25	1
23		Hexagon Socket Head Cap Screw	M8xP1.25x45L	2
24	7B-30200	Bracket, Cover	Plastic	1
25		Nut	S45C	1
26		Washer	SPC	1
27		Thrust Bearing	51105	1
28	7B-30190	Bracket	FC15	1
29		Hexagon Socket Head Cap Screw	M6xP1.0x12L	4
30		Hexagon Socket Set Screw	M8xP1.25x16L	1
31	7B-40280	Adjusting Block	SS41	1
32		Hexagon Socket Head Cap Screw	M10xP1.5x80L	2
33	7B-41290	Shaft Collar	SS41	1
34	7B-40040	Lead Screw	SS41	1
35	7B-40050	Feed Rod	SS41	1
36	7B-40060	Starting Rod	SS41	1
37	7B-40260	Stoper Rod	SS41	1
38	7B-40030	Rack	SS41	1
39		Hexagon Socket Head Cap Screw	M6xP1.0x25L	6
40	7B-10020	End Plinte	FFC25	1
41		Hexagon Socket Head Cap Screw	M10xP1.5x80L	3
42	7B-40460	Shaft	Plastic	1
43	7B-40070	Position Collar	Plastic	4
44	7B-41080	Graduate Collar	SS41	1
45	7B-41490	Lever	SS41	1
46	7B-40790	Cover	SPC	4
47	7B-40950	Foundation Bolt	SS41	6
48	7B-41270	Nut	SS41	6
49	7B-41240	Base Block	SS41	6
50		Hexagon Socket Head Cap Screw	M8xP1.25x20L	4
51	7B-41160-1	Bracket	FC15	1
52	7B-41170	Brakt Arm	FC15	2
53	7B-40300	Pedal	SS41	1
54	7B-40310	Shaft	SS41	1
55		Hexagon Socket Set Screw	M8xP1.25x16L	2

BRAKE MECHANISM

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56		Hexagon Socket Set Screw	M8xP1.25x12L	2
57	7B-41570	Coller	SS41	1
58		Washer	Φ 6	1
59		Hexagon Socket Head Cap Screw	M6xP1.0x25L	1
60		Nut	M10	2
61	7B-41560	Base	FC20	1
62	7B-41580	Blot	SS41	1
63		Nut	M10	2
64		Hexagon Socket Head Cap Screw	M10xP1.5x80L	1
65	7B-40360CA	Brack Arm	FC15	1
66		Hexagon Socket Head Cap Screw	M8xP1.25x30L	1
67	7B-41160-2	Bracket	FC15	1
68	7B-41260	Bracket	FC15	1
69		Nut	M10	1
70		Washer	Φ 10	1
71	7B-40370	Shaft	SS41	1
72		Hex. Cap Screw	M10xP1.5x35L	3
73	7B-41190	Support Base	FC15	1
74	7B-41300	Coller	SS41	1
75		Hexagon Socket Head Cap Screw	M6xP1.0x20L	2
76		Hexagon Socket Head Cap Screw	M8xP1.25x25L	1
77	7B-40360	Brack Arm	FC15	1
78		Hexagon Socket Head Cap Screw	M10xP1.5x10L	1
79	7B-30270	Motor Base	FC15	1
80	7B-41130	Shaft	SS41	1
81		Hexagon Socket Head Cap Screw	M10xP1.5x50L	4
82		Motor	5HP / 7-1/2HP	1
83		Key	6x6x20L	1
84	7B-40320	Motor Pully	FC15	1
85		Hexagon Socket Set Screw	M8xP1.25x12L	1
86	7B-40820	Washer	SS41	1
87		Spring Washer	Φ 16	1
88		Hexagon Socket Head Cap Screw	M10xP1.5x50L	1
89		Nut	M16	6
90		Washer	Φ 16	4
91	7B-41120	Blot	SS41	2
92	7B-40340	Blot	SS41	1
93	7B-30350	Brake Band	5HP / 7-1/2HP	1
94		Hexagon Socket Head Cap Screw	M10xP1.5x40L	1

GEAR BOX



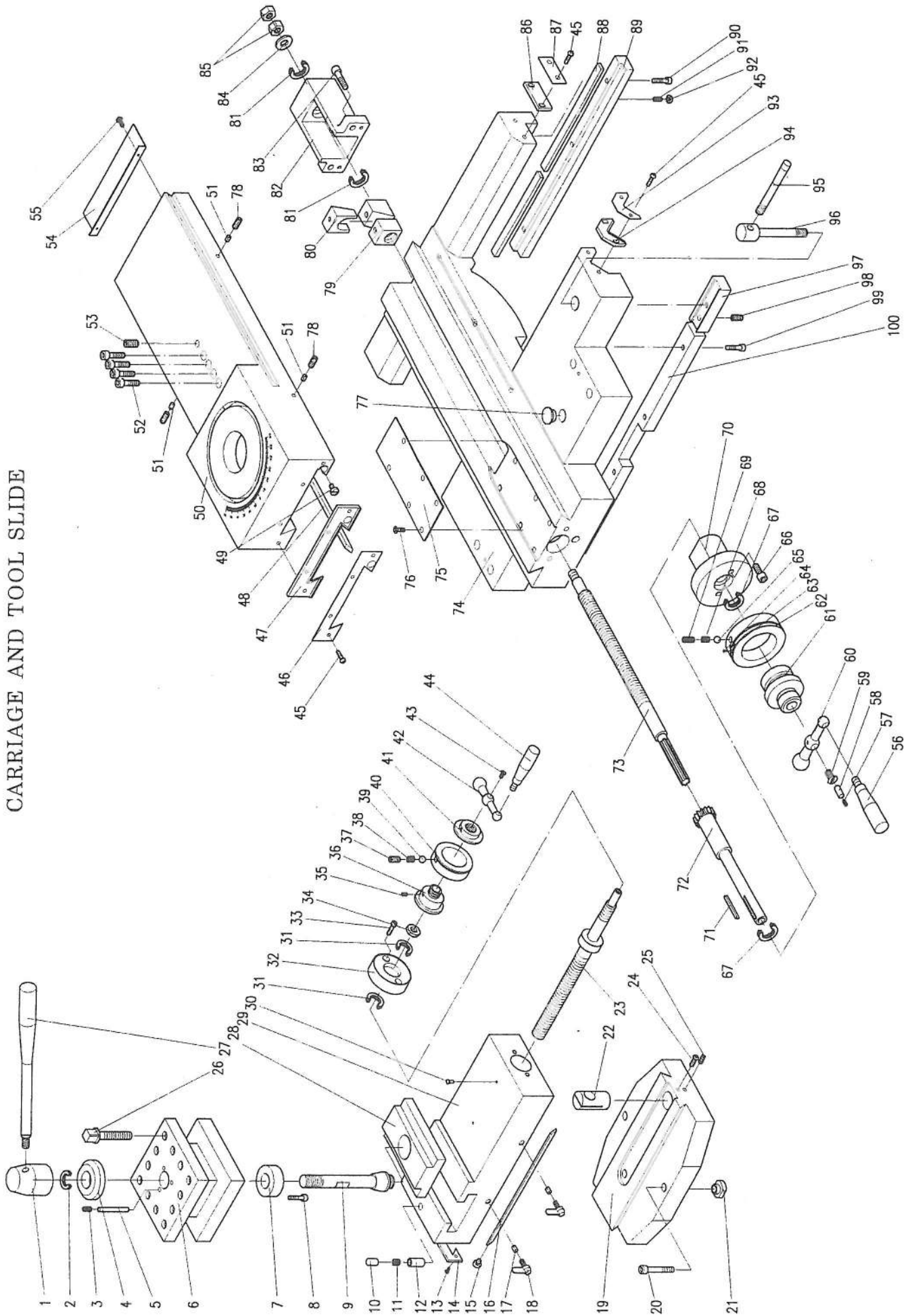
GEAR BOX

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7G-30010	Gear box	FC20	1
2	7G-40140	Hole plug	SS41	1
3		"O" Ring	P28	1
4	CS-17	Snap ring	C type. I.D.17	1
5	7G-40040	Supr gear	S45C, M2x20T	1
6	BB-6003	Ball bearing	#6003	1
7	KP-5517	Key	5x5x17	1
8	7G-40030	Shaft	S45C	1
9	KP-5551	Key	5x5x51	1
10	KP-5515	Key	5x5x15	1
11	7G-40050	Clutch gear	S45C, M2x32Tx18T	1
12	7G-40060	Space collar	SS41	1
13	CS-17	Snap ring	C type. I.D.17	1
14	7G-40070	Clutch gear	S45C, M2x18T	1
15	7G-40080	Clutch gear	S45C, M2x16T	1
16	BB-6005	Ball bearing	#6005	1
17	7G-40090	Clutch gear	S45C	1
18	7G-40750	Washer	SS41	1
19	SH-0516	Socket head cap screw	M5xP0.8x16L	1
20	BB-6001	Ball bearing	#6001	1
21	7G-40100	Clutch gear	S45C, M2x24T	1
22		Locking Nut	AN5	1
23		Locking Washer	AW5	1
24	BS-51105	Thrust bearing	#51105	1
25	7G-40120	Cover	FC15	1
26	SH-0516	Socket head cap screw	M5xP0.8x16L	3
27		Oil Seal	25x35x5	1
28	KP-5536	Key	5x5x36L	1
29	7G-40130	Shaft	S45C	1
30	7G-40150B	Hole plug	SS41	1
31		"O" Ring	P35	1
32	BB-16003	Ball bearing	#16003	1
33	7G-40150A	Shaft	S45C	1
34	KP-5550	Key	5x5x50	1
35	KP-5513	Key	5x5x13	1
36	7G-40170	Spur gear	S45C, M2x28T	1
37	7G-40180	Rocking collar	SS41	1
38	CS-35	Snap ring	C type. I.D.35	1
39	7G-40160	Spur gear	S45C, M2x28T	1
40	BB-6203	Ball bearing	#6203	1
41	7G-40190	Space collar	SS41	1
42	BB-6203	Ball bearing	#6203	1
43	7G-40200	Gear shaft	S45C	1
44	KP-7790	Key	7x7x90L	1
45	7G-40210	Cupr gear	S45C, M2x18T	1
46	7G-40220	Cupr gear	S45C, M2x19T	1
47	7G-40230	Cupr gear	S45C, M2x20T	1
48	7G-40240	Cupr gear	S45C, M2x22T	1
49	7G-40250	Cupr gear	S45C, M2x23T	1
50	7G-40260	Cupr gear	S45C, M2x24T	1
51	7G-40270	Cupr gear	S45C, M2x26T	1
52	7G-40280	Cupr gear	S45C, M2x28T	1
53	7G-40290	Cupr gear	S45C, M2x32T	1
54	BB-6003	Ball bearing	#6003	1
55	7G-40320	Space collar	SS41	1

GEAR BOX

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	BB-6003	Ball bearing	#6003	1
57	CS-20	Snap ring	C type. I.D. 20	1
58	7G-40310	Supr gear	S45C, M2.25x28T	1
59	7G-40300	Shaft	SS41	1
60	KP-5518	Key	5x5x18L	1
61	BB-6003	Ball bearing	#6003	1
62	7G-40330	Hole plug	SS41	1
63		"O" Ring	P28	1
64	N-16	Hexagon nut	M16xP2.0	1
65	WP-16	Washer	M16	1
66	20G-40490	Spur gear	S45C, M1.75x42T	1
67	KP-5510	Key	5x5x10L	1
68	7G-40340	Shaft	S45C	1
69	KP-5528	Key	5x5x28L	1
70	CS-35	Snap ring	C type. I.D. 35	1
71	20G-40480	Spur gear	S45C, M1.75x49T	1
72		Oil Seal	40x50x8	1
73	SH-0516	Socket head cap screw	M5xP0.8x16L	3
74	7G-40450	Shaft cover	FC15	1
75	OB-04	Oiler	∅ 1/4"	1
76		Oil Seal	20x28x4	1
77	KP-6610	Key	6x6x10L	1
78	7G-40360	Socket shaft	S45C	1
79	KP-6615	Key	6x6x15L	1
80	CS-20	Snap ring	C type. I.D. 20	1
81	7G-40350	Spur gear	S45C, M2x36T	1
82	CS-35	Snap ring	C type. I.D. 35	1
83	CS-35	Snap ring	C type. I.D. 35	1
84	7G-40370	Guide collar	BC2	1
85	SS-0508	Socket set screw	M5xP0.8x8L	1
86	7G-40380	Face fear	S45C, M2x17T	1
87	BB-6001	Ball bearing	#6001	1
88	7G-40390	Spline shaft	S45C	1
89	BB-6205	Ball bearing	#6205	1
90	CS-30	Snap ring	C type. I.D. 30	1
91	SH-0516	Socket head cap screw	M5xP0.8x16L	2
92	7G-40400	Cover	SS41	1
93	NA-4906	Needle bearing	na4906	1
94	7G-40600	Rocking arm	FC15	1
95	7G-40410	Spur gear	S45C, M2x24T	1
96	BB-6004	Ball bearing	#6004	1
97	CS-20	Snap ring	C type. I.D. 20	1
98	7G-40420	Spur gear	S45C, M2.25x28T	1
99	PT-0338	Taper pin	#3x38	1
100		Oil Seal	20x28x4	1
101	BB-6004	Ball bearing	#6004	1
102	PT-0319	Taper pin	#3x19	1
103	7G-40430	Shaft	S45C	1

CARRIAGE AND TOOL SLIDE



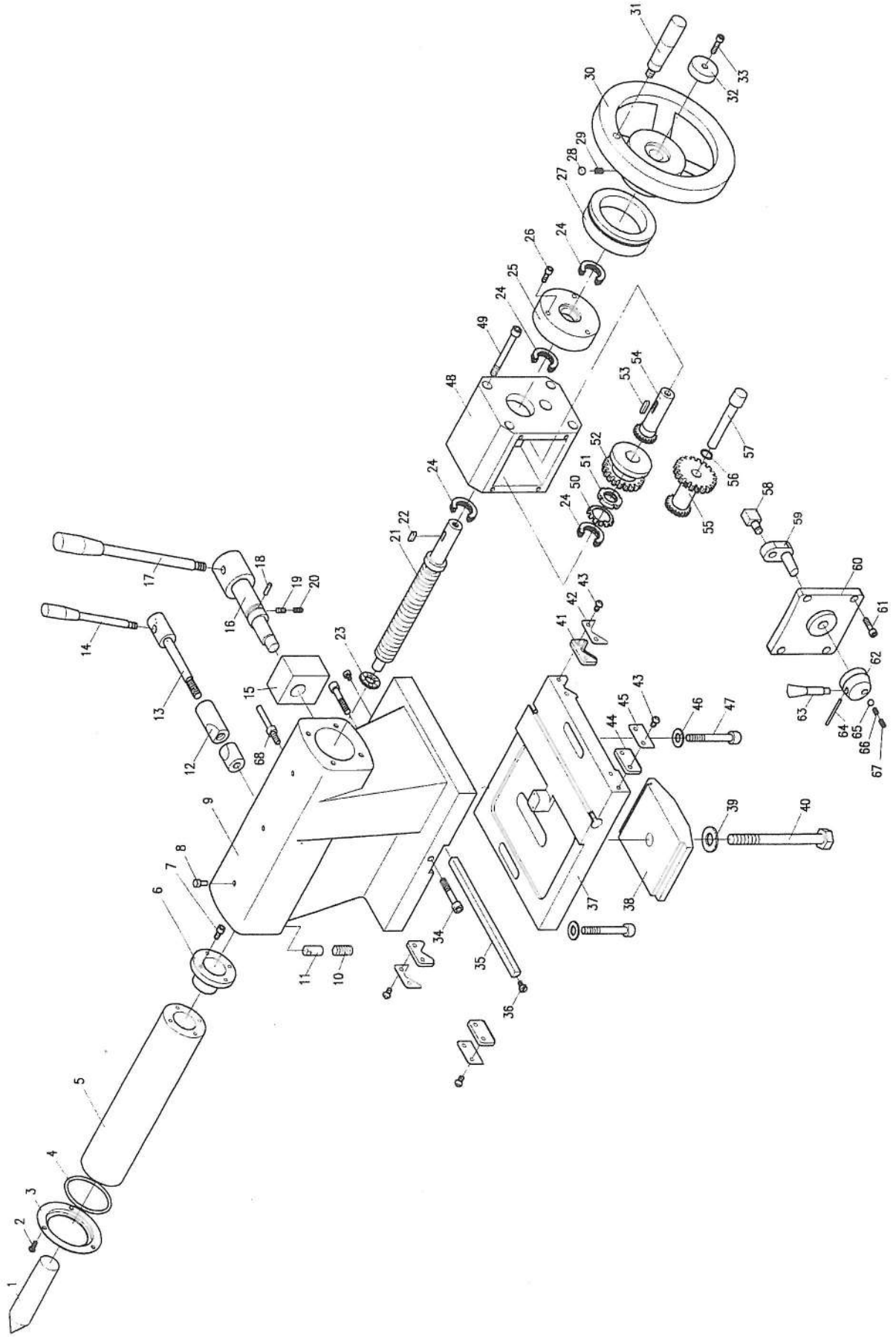
CARRIAGE AND TOOL SLIDE

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7S-40360	HANDLE BOSS	S20C-D	1
2		THRUST BEARING	51104	1
3		HEXAGON SOCKET SET SCREW	M6xP1.0x12L	1
4	7S-40370	WASHER	S20C-D	1
5	7S-40770	PIN	SS41	1
6	7S-40260	TURRET TOOL POST	S45C	1
7	7S-40650	SLEEVE	S45C	1
8	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	3
9	7S-40250	CLAMPING BOLT	S45C	1
10		PIN	SS41	1
11		SPRING	φ 5/16	1
12	7S-40480	PIN	SCM21	1
13		SCREW	M5xP0.8x8L	4
14		WIPER	PLASTIC	1
15	7S-40500	HEXAGON SOCKET HEAD CAP SCREW	SS41	1
16	7S-40050	GIB	FC20	1
17	7S-40520	SET BLOCK	PUB2	2
18	7S-40510	SET SCREW	S20C-D	2
19	7S-40030	TOOL SLIDE	FC25	1
20	SH-1028	SOCKET HEAD CAP SCREW	M10xP1.5x28L	3
21	7S-40060	NUT	SS41	3
22	7S-40170	LEAD SCREW NUT	PUC 2	1
23	7S-40160	LEAD SCREW	S45C	1
24		NUT	M6xP1.0	1
25	BS-51105	HEXAGON SOCKET SET SCREW	M6xP1.0x20L	1
26	7S-40270	LOCATING SCREW	SCM4	12
27	7S-40380	LEVER	SS41	1
28	7S-40300	LOCKING BLOCK	FC15	1
29	7S-40040	SLIDING TABLE	FC20	1
30		OILER	φ 1/4"	2
31		THRUST BEARING	51102	2
32	7S-40190	BRACKET	SS41	1
33		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
34	7S-40580	NUT	S20C-D	1
35		HEXAGON SOCKET SET SCREW	M6xP1.0x16L	1
36	7S-40180	INDEX RING BASE	SS41	1
37		HEXAGON SOCKET SET SCREW	M8xP1.25x8L	1
38		SPRING	φ 6x φ 0.8x15L	1
39		STEEL BALL	φ 1/4"	1
40	7S-40200	INDEX RING	SS41	1
41	7S-40720	NUT	SS41	1
42	7S-40700	LEVER	SS41	1
43		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	1
44	7S-40780	HANDLE	SS41	1
45		SCREW	M5xP0.8x8L	16
46	7S-40570	COVER	STAINLESS STEEL	2
47	7S-40400	WIPER	PLASTIC	2
48	18S-40150	GIB	FC20	1
49	7S-40420	ADJUSTING SCREW	SS41	2
50	20S-30020	COVER	FC25	1
51	7S-40520	SET BLOCK	PUB2	3
52		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
53		HEXAGON SOCKET SET SCREW	M10xP1.5x10L	1
54	20S-40750	COVER	SS41	1
55		SCREW	M5xP0.8x12L	2

CARRIAGE AND TOOL SLIDE

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7S-40460	HANDLE	SS41	1
57		HEXAGON SOCKET SET SCREW	M6xP1.0x25L	1
58	7S-40670	PIN	SS41	1
59	7S-40120	SCREW	SS41	1
60	7S-40110	LEVER	S20C	1
61	7S-40130	INDEX RING BASE	SS41	1
62	7S-40100I	INDEXRING	SS41	1
	7S-40100M	INDEXRING	SS41	1
63		STEEL BALL	Φ 1/4"	2
64		NAME PLATE	AL	1
65		ROUND HEAD RIVET		2
66		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x90L	2
67		THRUST BEARING	51103	2
68		SPRING	Φ 6xΦ 0.8x15L	2
69		HEXAGON SOCKET SET SCREW	M8xP1.25x6L	2
70	18S-40090	BRACKET	FC15	1
71		KEY	4x4x45L	1
72	20S-40080	SHAFT	SS41	1
73	20S-30070I	LEAD SCREW	S45C	1
	20S-30070M	LEAD SCREW	S45C	1
74	20S-30010	CARRIAGE	FC25	1
75	20S-40430	COVER	SS41	1
76		SCREW	M4xP0.7x6L	6
77		PLUG	Φ 3/4"	1
78		HEXAGON SOCKET SET SCREW	M8xP1.25x25L	3
79	7S-40220	LEAD SCREW NUT	PBC2	1
80	18S-40640	ADJUSTMENT BOLK	PBC2	1
81		THRUST BEARING	51102	2
82	20S-40140	BRACKET	FC15	1
83		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
84		WASHER	Φ 12	1
85		NUT	M12	2
86	7S-40340	WIPER	PLASTIC	2
87	7S-40540	COVER	STAINLESS STEEL	2
88	7S-40320	GIB	SS41	2
89	7S-40310	ADJUSTMENT GIB	FC20	1
90		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	5
91		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.25x18L	4
92		NUT	M6	4
93	7S-40530	COVER	STAINLESS STEEL	2
94	7S-40330	WIPER	PLASTIC	2
95	7S-40730	LEVER	SS41	1
96	7S-40740	HEXAGON BOLT	SS41	1
97	7S-40290	LOCK PLATE	SS41	1
98		HEXAGON SOCKET SET SCREW	M8xP1.25x30L	1
99		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	4
100	7S-40280	LOCK PLATE	FC15	1

TAILSTOCK



TAILSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1		CENTER	MT 4#	1
2		CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	3
3	7T-40200	COVER	SS41	1
4		"O" RING	P58	1
5	7T-40030	BARREL	S45C	1
6	20T-40050I	INDEXRING	SS41	1
	20T-40050M	INDEXRING	SS41	1
7		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
8		OILERS	1/4	3
9	18T-10010	TAILSTOCK CASTING	FC25	1
10		HEXAGON SOCKET SET SCREW	M14x14L	1
11	7T-40100	KEY	SS41	1
12	7T-40220	LOCATING NUT	FC15	1
13	7T-40110	LOCATING BOLT	SS41	1
14	7T-40120	BARREL LEVER	SS41	1
15	7T-40130	PIVOT BLOCK	SS41	1
16	7T-40140	CAM SHAFT	S45C	1
17	7T-40170	CLAMP LEVER	SS41	1
18	7T-40150-1	PIN	SS41	1
19	7T-40160	SCREW	M10xP1.0x8L	1
20		HEXAGON SOCKET SET SCREW	M10xP1.0x8L	1
21	18T-40040I	SCREW	S45C	1
	18T-40040M	SCREW	S45C	1
22		KEY	6x6x15	1
23	7T-40230	WASHER	SS41	1
24		THRUST BEARING	51105	4
25	7T-40060	FLANGE	FC20	1
26		HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
27	18T-40070I	INDEXRING	SS41	1
	18T-40070M	INDEXRING	SS41	1
28		BALL	φ 1/4	3
29		SPRING	6x0.8x10L	3
30	7T-30080	HANDLE WHEEL	FC20	1
31	7A-40410	HANDLE	SS41	1
32	20T-40130	SCREW	SS41	1
33		HEXAGON SOCKET CAP SCREW	M8xP1.25x25L	1
34		HEXAGON SOCKET HEAD CAP SCREW	M10x1.5x50L	2
35	7T-40190	GIB	FC20	1
36	7T-40210	ADJUSTING SCREW	SS41	2
37	20T-30020	BASE	FC25	1
38	7T-40240	CLAMP PLATE	FC20	1
39	7T-40250	WASHER	SS41	1
40		BOLT	M16xP2.0x130L	1
41	7T-40260	WIPER	RUBBER	2
42	7T-40270	WIPER COVER	STAINLESS STEEL	2
43		CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	8
44	7T-40280	WIPER	RUBBER	2
45	7T-40290	WIPER COVER	STAINLESS STEEL	2
46		WASHER	φ 10	2
47		BOLT	M10xP1.5x80L	2
48	20T-30010A	CHANGE SPEED BOX	FC20	1
49		HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x35L	4
50		LOCKING WASHER	AW-05	1
51		LOCKING NUT	AN-05	1
52	20T-40080	GEAR	S45C	1

TAILSTOCK

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
53		KEY	6x6x25L	1
54	20T-40070	GEAR SHAFT	S45C	1
55	20T-40090	GEAR	S45C	1
56		SNAP RING	S16	1
57	20T-40100	SHAFT	S45C	1
58	9T-402400	CHANGE SREED BLOCK	BC2	1
59	20T-40110	ROCKER ARM	FC15	1
60	20T-40020B	COVER	FC20	1
61		HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	4
62	3H-40380	BARREL	S45C	1
63	3A-40380	INDEXRING	SS41	1
64		SPRING PIN	∅ 5x45L	1
65		BALL	∅ 1/4	1
66		SPRING	6x0.8x10L	1
67		HEXAGON SOCKET SET SCREW	M8x1.0x6L	1
68	7T-40150-2	BOLT	SS41	1