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## **1. PREFACE**

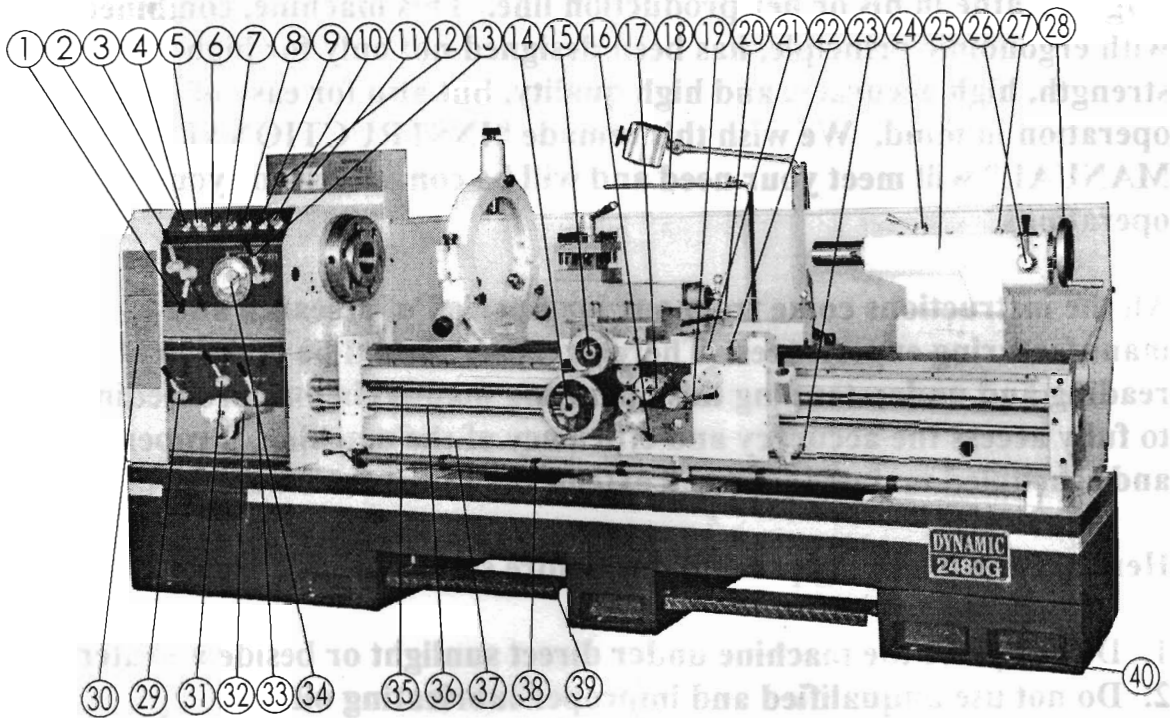
**We give our best regard to who place this High Precision Speed Engine Lathe in his or her production line. This machine, combined with ergonomic principle, has been designed not only for high strength, high accuracy, and high quality, but also for easy of operation in mind. We wish this remade “INSTRUCTIONAL MANUAL” will meet your need and will be convenient for your operations.**

**All the instructions come from our long period of research and manufacturing experiences. Therefore, care should be taken in reading and understanding this operating manual before proceeding to fully access the accuracy and efficiency of the machine. Proper and scheduled maintenance will extend the life of the machine.**

**Here are the following precautions before start-up:**

- 1. Do not place the machine under direct sunlight or beside a heater.**
- 2. Do not use unqualified and improper lubricating oil.**
- 3. Clean and lubricate the machine after daily operation.**
- 4. Always keep machine, especially its slideways, free from chips and other foreign particles.**
- 5. Do not move carriage along slideways, if surface of the way has any indents caused from falling hand tools, etc., on it. Moving the carriage through the damaged way, will cause tightening of the gibs.**

## 2. DESCRIPTION OF THE MACHINE



1. Feed selector
2. Feed direction selector
3. Headstock
4. Circuit indicator
5. Coolant pump indicator
6. Coolant pump switch
7. Main motor stop button
8. Main motor start button
9. Spindle jogging button
10. Auto break for power
11. Amp for main motor
12. Main power switch
13. H-L speed selector
14. Handwheel for longitudinal feeds
15. Crossfeed handle
16. Auto-feed engagement lever
17. Longitudinal/cross feed selector
18. Coolant nozzle
19. Half-nut engagement lever
20. Tool slide feed handle
21. Left rapid travel button
22. Right rapid travel button
23. For/Rev. starting-up lever
24. Quill lock lever
25. Tailstock
26. 1:1 or 1:4 change lever
27. Tailstock lock lever
28. Quill transverse handwheel
29. Feed selector
30. Tread and feeding tables
31. Feed selector
32. Engage and disengage lever
33. Inch & metric threads change lever
34. Spindle speed selector
35. Threading leadscrew
36. Feed rod
37. Starting-up rod
38. Multi-stop stopping rod
39. Foot brake pedal
40. Foundation bolts

### **3. INSTALLATION**

#### **3-1. Moving and Lifting**

**Move and lift the machine by using a 1 ½” diameter and 32” long iron bar. Go through the hole on the bed, and lift the unpacked machine with a wire rope. The wire rope should have enough capacity against the gross weight of the machine. Raising and lowering the machine should take extra care. Do not wrap rope around the leadscrew, spindle or other handwheel. Be careful not to bump the machine against the floor!**

**In order to have the machine properly balanced before hoisting, it is advisable to move tailstock and carriage to the extreme right end of the machine bed. Clamp both assemblies firmly in place, so they will not accidentally slide to the left when lifting.**

#### **3-2. Foundation Work**

**Nowadays, super hard alloy tools are used for high speed engine lathe. The cutting speed and the spindle speed are much higher than before. An incomplete foundation is known to produce vibration. Since super-hard tool is easily affected by the vibration, the foundation work should be done as figure shown. Enough space and boundary are necessary for the foundation. The machine should be installed at least two feet from the wall and other machines.**

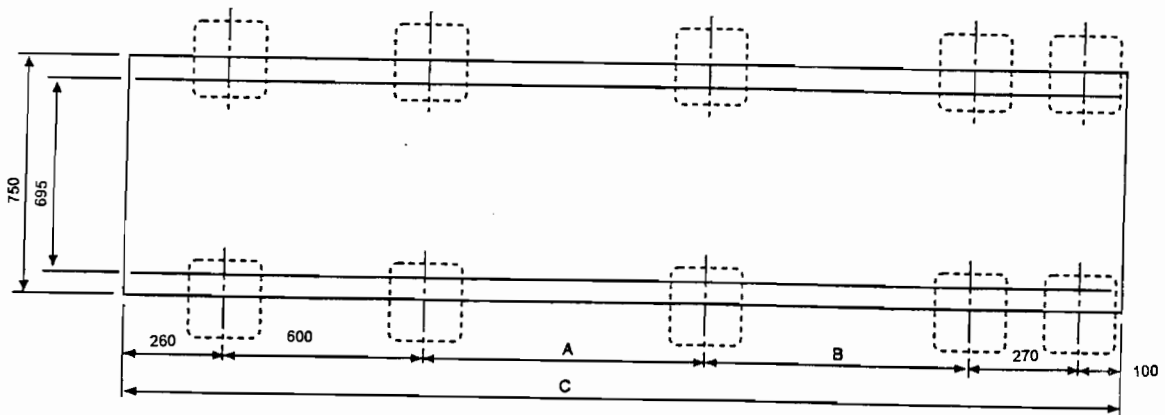
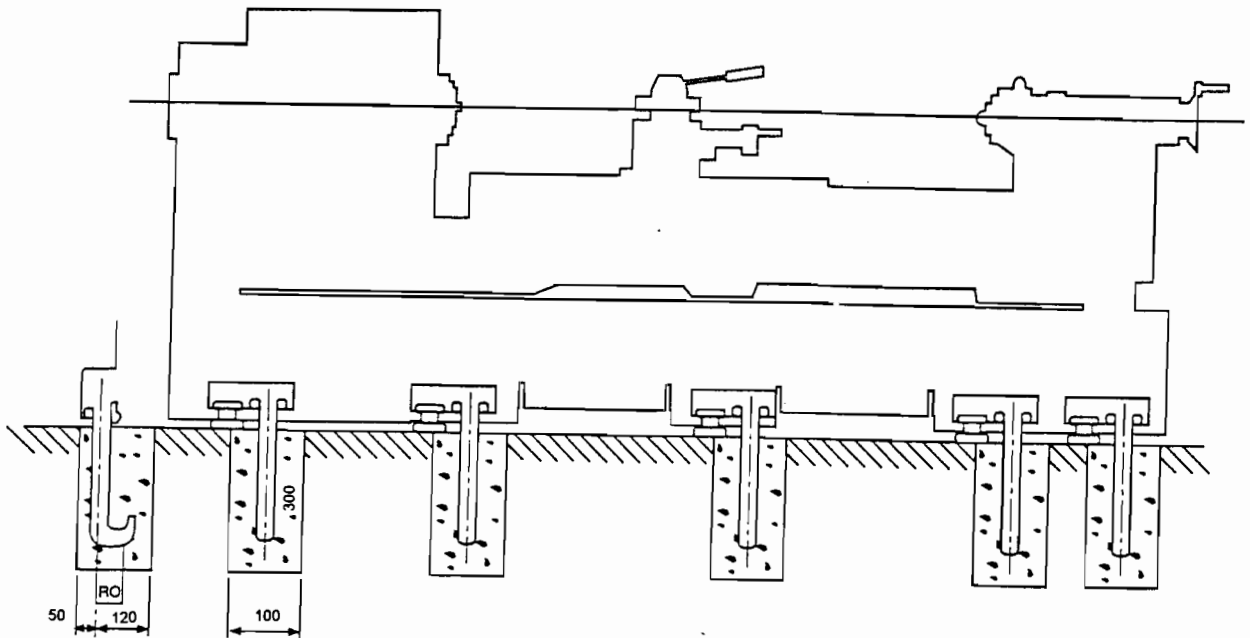
#### **3-3. Clean up**

**Anticorrosive is applied on the machine when shipped out. For cleaning up the bed, slides and leadscrew, etc., please use dissolvable solvent to take off the anticorrosive. Do not use lacquer thinner or gasoline. Apply machine oil to all the necessary positions when done. Check all the handles and levers to see if they are moving properly. Then set all handles and levers to neutral position. This is done to prevent accident that might happen.**

#### **3-4. Leveling**

**Once the machine is located on the prepared foundation, and the bed ways and slideways are cleaned thoroughly, precision engineering levels should be used alternately on the cross slide and slideways of the lathe. Reading the levels should be taken on the extreme ends of the slideways as well as in the center. Minute adjustments of leveling bolts should be made until the machine is within 0.0012/40”.**

### 3-5. Foundation map



	A	B	C
DYNAMIC24"/2960G	1516	—	2796
DYNAMIC24"/2980G	1010	1106	3296
DYNAMIC24"/29120G	1260	1356	3796
DYNAMIC24"/29160G	1540	1642	4366

## **4. ELECTRICAL WIRING**

### **4-1. Power Source Wiring**

**Be sure to carefully protect the electric wires exposed outside of the machine, because they are easily damaged by the sharp-edge chips. If not, they may induce a layer-short accident, and will lower the efficiency to a considerable extent. The respective wires should be connected with terminals R.S.T. at the control housing, which are located at the rear side of the front leg.**

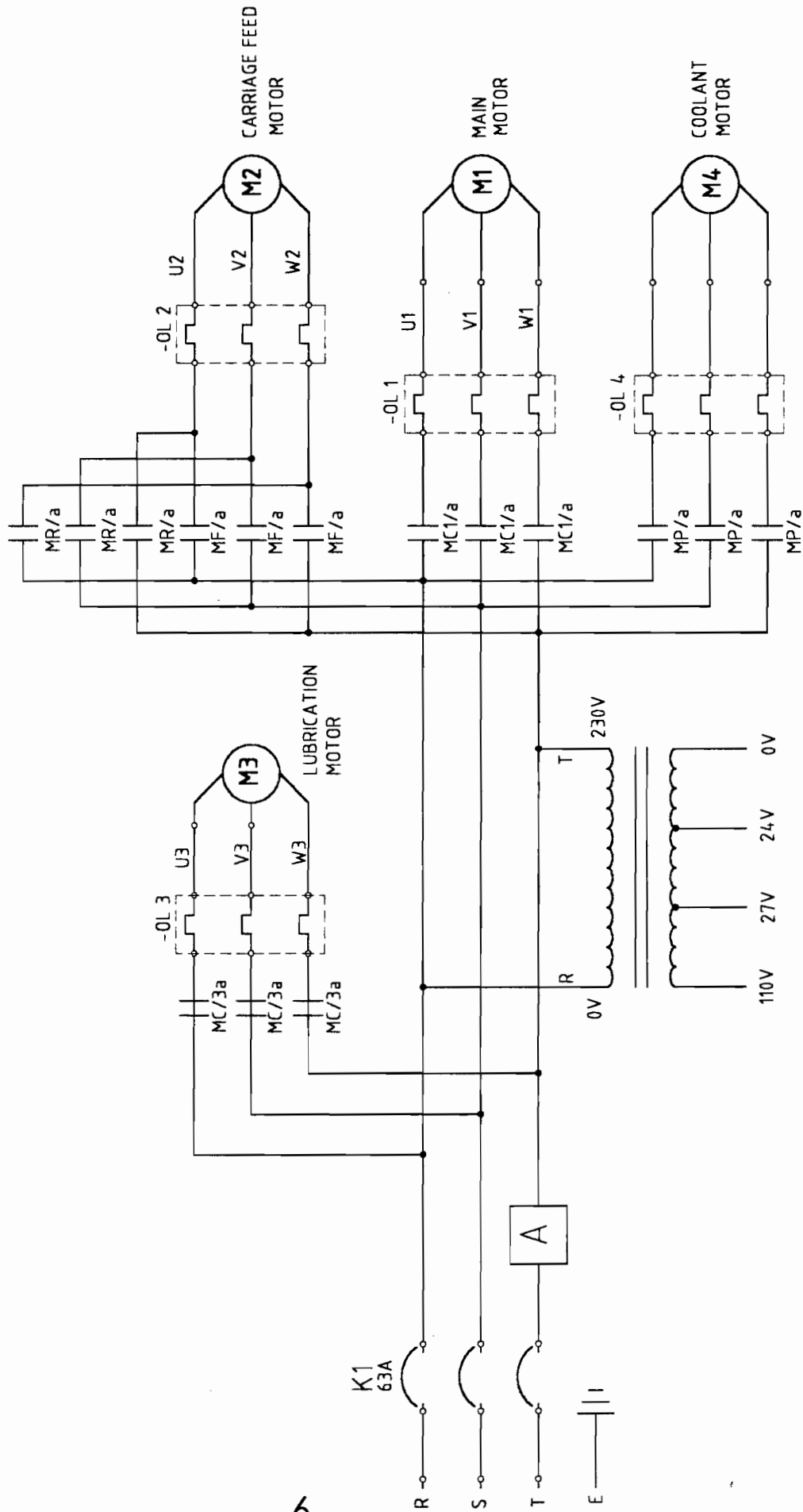
**Note: This machine is equipped with eight or 11 KW main motor. If electric wires need to confirm with a cap-tired code, please use size over AWG #12 to connect the machine.**

### **4-2. Caution**

**After wiring, check the spindle rotation. Turn on the power source switch and main motor switch on control panel, then turn the starting rod (#23) to forward direction. If the spindle also turns forward, the wiring is correct. If not, exchange two of the three wires on R.S.T. Then check the spindle 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 overload thermal relay, and restart the machine.**

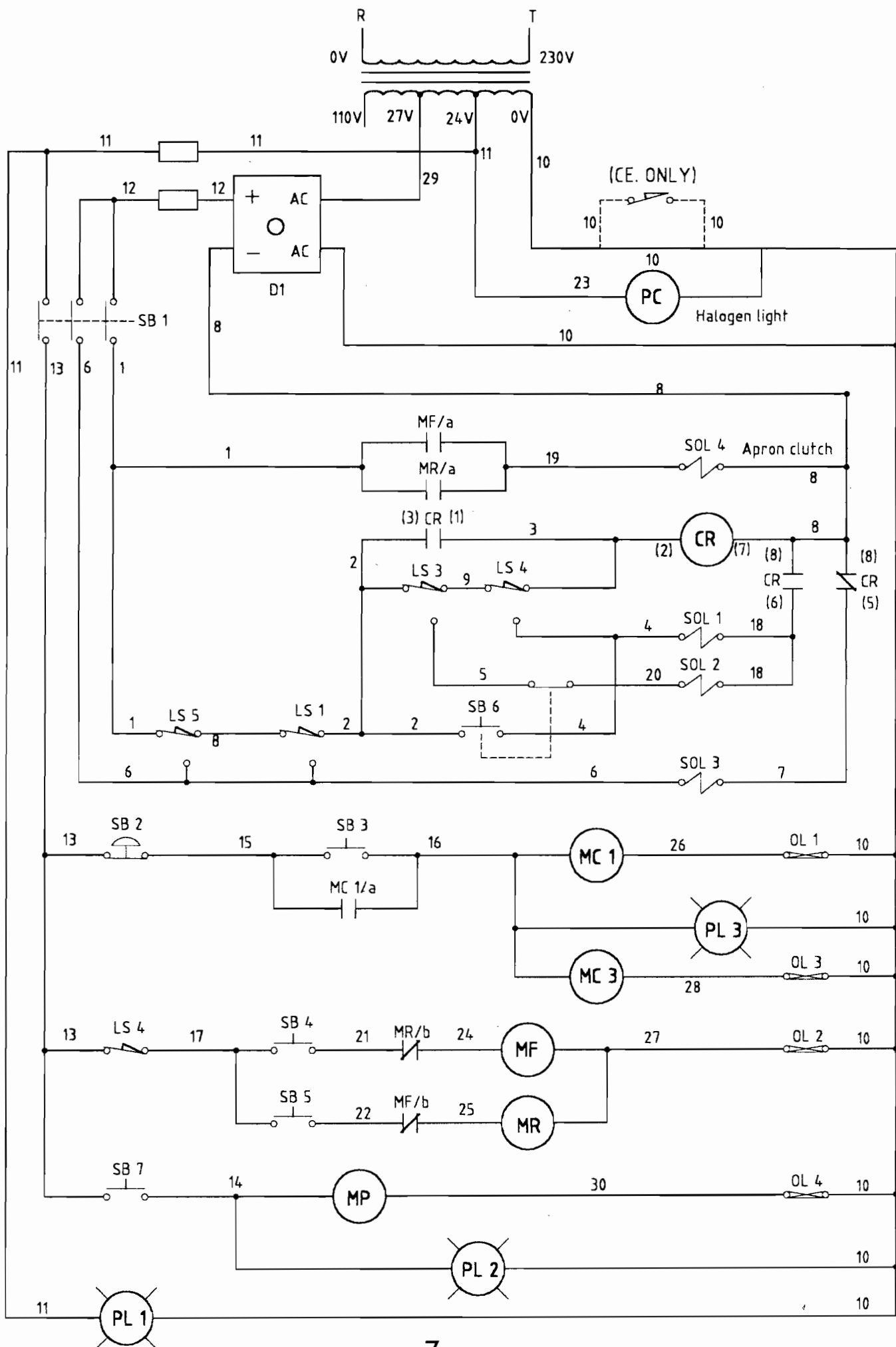
# 4-3. Electrical Wiring Diagram

## 24"/29" MOTOR WIRING





# 24"/29" CONTROL CIRCUIT



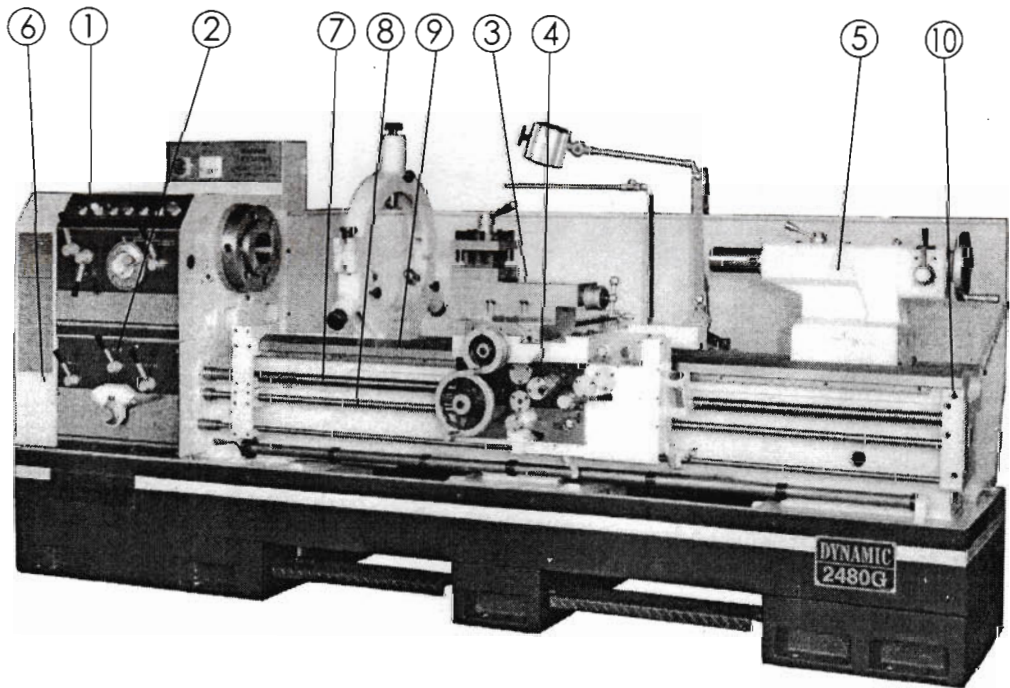
## **Electrical Part Description**

<b>M1: Main motor</b>	<b>PB2: Main motor stop switch</b>
<b>M2: Carriage feed motor</b>	<b>PB3: Emergency stop switch</b>
<b>M3: Lubrication pump motor</b>	<b>PB4: Carriage feed withdraw starter</b>
<b>M4: Coolant pump motor</b>	<b>PB5: Carriage feed forward starter jogging button</b>
<b>A: Ampere meter</b>	<b>FS: Fuse</b>
<b>MC1: Main motor magnetic switch</b>	<b>SOL1: Main motor forward clutch</b>
<b>MF/MR: Carriage feed for/rev magnetic Switch</b>	<b>SOL2: Main motor reverse clutch</b>
<b>MP3: Lube pump magnetic switch</b>	<b>SOL3: Spindle brake clutch</b>
<b>MPC: Coolant pump magnetic switch</b>	<b>S1: Coolant pump select switch</b>
<b>OL1: Main motor overload relay</b>	<b>LS1: Brake limit switch</b>
<b>OL2: Carriage motor overload relay</b>	<b>LS2: Spindle forward limit switch</b>
<b>OL3: Lube pump motor overload relay</b>	<b>LS3: Spindle reverse limit switch</b>
<b>OL4: Coolant motor overload relay</b>	<b>LS4: Carriage feed limit switch</b>
<b>TR: Voltage transformer</b>	<b>LS5: Carriage feed safety control switch</b>
<b>CR: Brake auxiliary relay</b>	<b>PL1: Power source indicator</b>
<b>PB1: Main motor starter</b>	<b>PL2: Pump motor indicator</b>
	<b>PL3: Main motor indicator</b>
	<b>REC: Rectifier</b>

## 5. LUBRICATION

It is most important to lubricate lathe before operation. 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 lubrication of the internal parts of the lathe. Oil level should be strictly observed. It is the most important reason for maintaining accuracy and longevity of the machine. The lubrication tank, headstock, gear box and apron should always be completely fill with correct oil type.

There is an oil pump on the apron side. It lubricates the apron, cross slide or bed ways. \*\*\*\*When set the knob to A position, it will only lubricate apron. If it is set to S, it will lubricate the cross slide and bed ways. Normally the knob is set to A position.

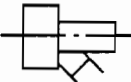

















The volume of the lube tank: 5 gallons  
Headstock: 10 gallons  
Gear box: 0.25 gallon  
Apron: 0.5 gallon

To keep the machine properly lubricated, follow the instruction given on the chart below.

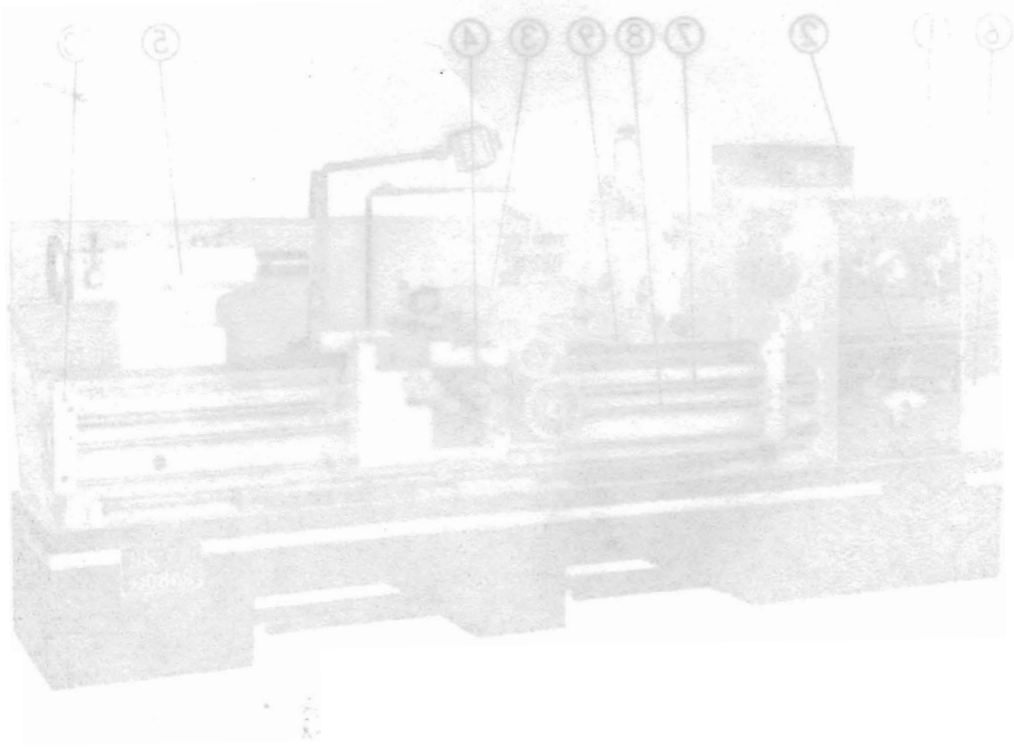
## 6. OPERATION AND USE

### 6-1. Designation for Symbols

6-1 DESIGNATION FOR SYMBOLS ON NAME PLATE					
	SYMBOLS	DESIGNATION		SYMBOLS	DESIGNATION
1	<b>HIGH</b>	High revolution	16	<b>W</b>	Inch thread
2	<b>LOW</b>	Low revolution	17	<b>M</b>	Metric thread
3		Forward feed	18		Half nut open
4	<b>N</b>	Neutral	19		Half nut close
5		Reverse feed	20		Pole change switch higher speed range
6		Longitudinal feed	21		Pole change switch lower speed range
7		Cross feed	22	<b>OIL</b>	Oil inlet
8		Electrical box	23	mm/ 	Feed value per revolution
9		Spindle jogging push button			
10	 GREEN	Power on			
11	 RED	Power off			
12		Main motor			
13		Coolant pump			
14		Spindle revolution			
15	<b>F</b>	Feeds			

# OIL LUBRICATION CHART

No.	LUBRICATION POINT	VISCOSITY S.U.S.100F	OIL RECOMMENDED	OIL EXCHANGE OR REPLENISHMENT
1	Headstock	320	SHELL(TELLUS)25	Three times a year
2	Feed gear box	320	SHELL(TONNA)33	Three times a year
3	Compound slide	320	SHELL(TONNA)33	Once a day
4	Apron	320	SHELL(TONNA)33	Keep the oil up to the oil window
5	Tailstock	320	SHELL(TONNA)33	Once a day
6	Change gears	320	SHELL(TONNA)33	Once a day
7	Lead screw	320	SHELL(TONNA)33	Once a day
8	Feed rod	320	SHELL(TONNA)33	Once a day
9	Bed ways	320	SHELL(TONNA)33	Once a day
10	Bracket	320	SHELL(TONNA)33	Once a day



Apron: 0.2 gallon  
 Gear box: 0.25 gallon  
 Headstock: 10 gallons  
 Tail of the tube tank: 2 gallons

To keep the machine properly lubricated, follow the instruction given on the chart below

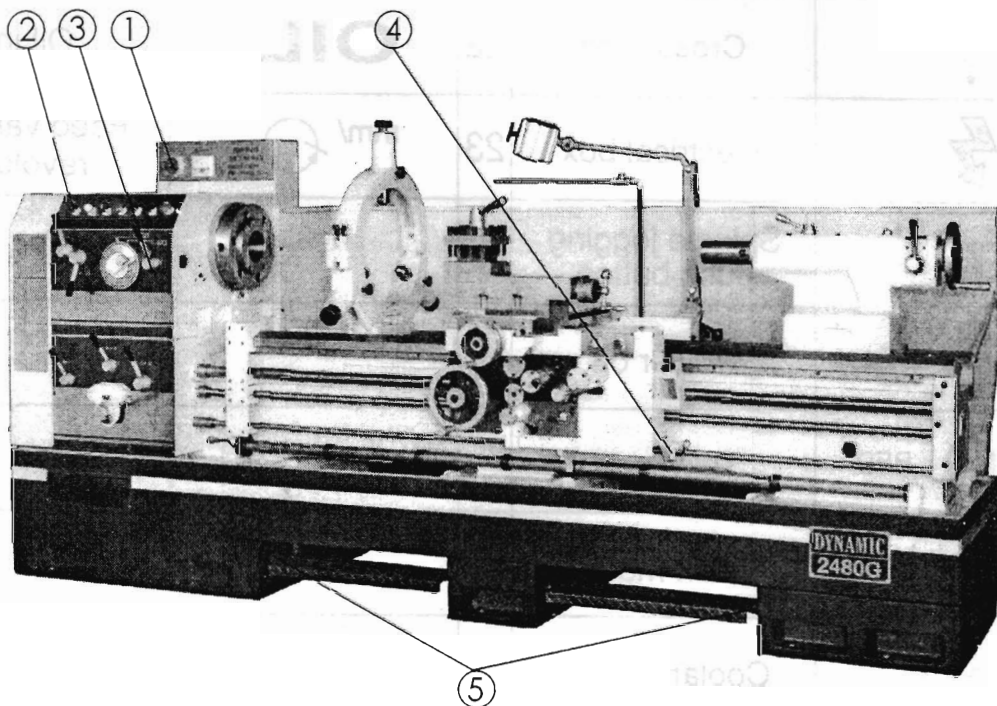
## 6-2. Starting and Stopping

Before starting up machine, make sure all running parts are properly lubricated as per the chart. And switch on after all the starting levers at gear box and apron are at neutral position.

First, switch on the auto breaker (1) the circuit lamp (2) will be lighted, then push on the main motor control button (3). The starting up of the main spindle is accomplished by either one of the starting levers (4) at the right side of the apron and gear box (factory installed option). The starting levers have a safety locking device which prevents any abrupt activation of the spindle by the operator.

Move this lever horizontally to disengage a safety pin, and move it up or down to get the reverse or forward spindle rotation. When this lever comes to neutral position, or the foot brake pedals (5) is pressed down, the main spindle will be stopped.

**Note:** The spindle FORWARD-REVERSE rotation is controlled by an electro-magnetic clutch, which is fitted inside of the headstock. And this clutch cooperates with a electro-magnetic brake, which is fitted at left side of the headstock, to stop the spindle rotation while the main motor is still running. This feature can save the power for motor starting and prolong the life of the motor.



### 6-3. Selection of Spindle Speeds

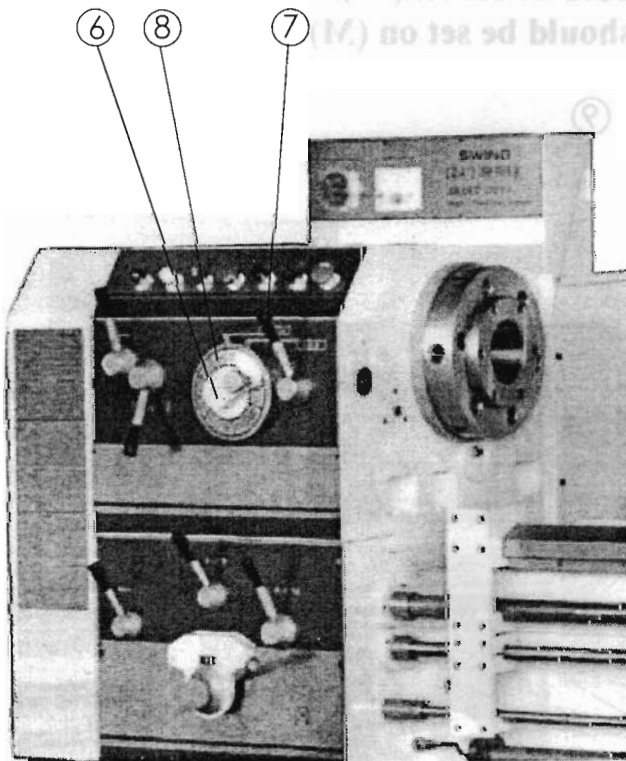
Select the appropriate spindle speed for working from the cutting speed chart on the front of the headstock. There are 12 steps in the spindle range of 25 ~1200 RPM. The change of the main spindle speeds is accomplished by moving the dial lever (6) and the lever (7).

Lever (7) selects H, L, and neutral positions.

Lever (6) selects 12 graded speeds, which corresponds to lever (6).

Spindle speeds dial (8) show 12 steps, being divided into 25, 38, 53, 75, 108, 149, 214, 308, 424, 603, 860, and 1200.

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



SPINDLE SPEEDS ( R.P.M.)

## 6-4. Feeds and Threads

### Feeds:

Find out desired feed rate on the Feed Table, turn the levers (10) (for position I & II), (11) (for position C & D), and the lever (12) (for position A & B) to the desired position as you found. Turn clamping lever (13) counterclockwise to disengage the gears, then turn the dial (14) to the position (1, 2, 3, 4, 5, 6, 7, 8, 9) as you find, then turn clamping lever (13) clockwise to engage the gears.

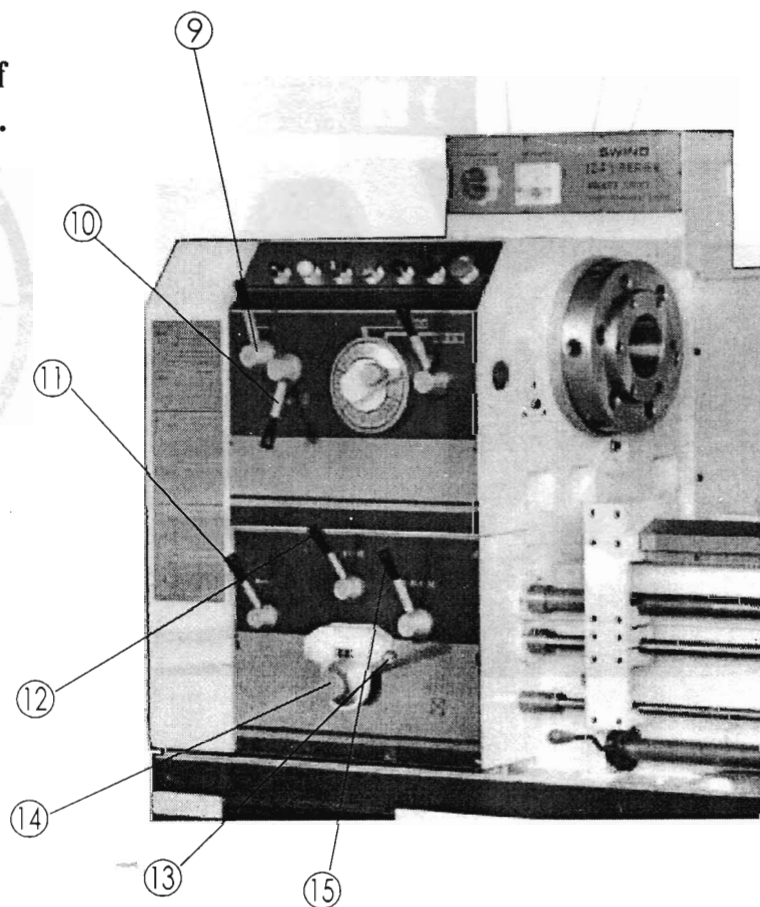
The lever (15) selects W (inch threading), O (neutral position), F (feed position) and M (metric threading).

However you must turn the lever (10) to feed position (F) position. The lever (9) selects Forward or Reverse revolution for feeding shaft. The feed rate indicated on the feed table is for longitudinal feed, and cross feed rate is  $\frac{1}{2}$  of longitudinal feed's value.

### Threads:

Find out the desired thread form from the Threading Table, then set the levers (10), (11), (12) and dial (14) to the desired position in the same way as feed selection. For Inch threading, the lever (15) should be set on (W). For Metric threading, the lever (15) should be set on (M).

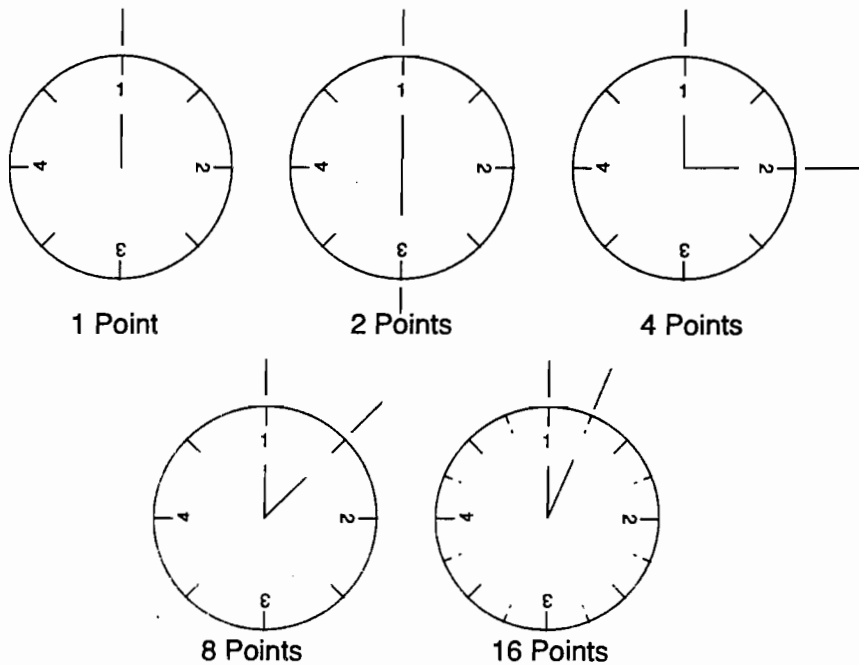
By exchanging the change gears, (44 T gear instead of 28 T gear) you can cut D.P. threads or Module threads as shown on the table next page.





## 6-5. Thread Cutting Indicator

The thread cutting indicator installed on the side of the apron has eight graduations. For cutting inch thread, the thread indicator is prepared for correct positioning of half-nut engagement. It is very convenient and easy.




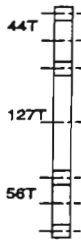

### INCH SYSTEM (LEADSCREW 4 T.P.I.)


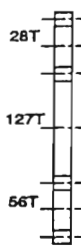

T. P. I.							DIVIDE	WORM
4	8	12	16	20	24	28	16	16T
32	36	40	44	48	56			
2	6	10	14	18	22	26	8	
3	5	7	9	11	13	19	4	
2½	3½	4½	5½	6½	9½	11½	2	
2¼	2¾	3¼	4½	4¼	5¾		1	



### METRIC SYSTEM (LEADSCREW 6mm/p)

m m / p							DIVIDE	WORM
6	3	2	15	1	0.75	0.5	16	16T
12	4						8	
8							4	
10	5	2.5	1.25				4	
7	3.5	1.75					2	

## 6-6. Feed and Thread Table

CHANGE GEARS	$\pi /$  inch For cutting D.P thread																				
	LEVER	1	2	3	4	5	6	7	8	9											
	W	I	B-C	4	4.5		5	5.5		6	6.5	7									
			B-C	8	9	9.5	10	11	11.5	12	13	14									
		II	B-D	16	18	19	20	22	23	24	26	28									
			A-C	32	36	38	40	44	46	48	52	56									
			A-D	64	72	76	80	88	92	96	104	112									
	 mm / $\pi$ For cutting module thread																				
	<table border="1"> <thead> <tr> <th>LEVER</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> </table>											LEVER	1	2	3	4	5	6	7	8	9
	LEVER	1	2	3	4	5	6	7	8	9											
	M	I	A-C	4	4.5	4.75	5	5.5	5.75	6	6.5	7									
			A-C	2	2.25		2.5	2.75		3	3.25	3.5									
II		A-D	1			1.25			1.5		1.75										
		B-C	0.5						0.75												
		B-D	0.25																		

CHANGE GEARS	1" /  For cutting inch thread.																				
	LEVER	1	2	3	4	5	6	7	8	9											
	W	I	B-C	2	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$									
			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									
		II	B-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									
			A-D	32	36	38	40	44	46	48	52	56									
	 mm For cutting metric thread.																				
	<table border="1"> <thead> <tr> <th>LEVER</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> </tr> </thead> </table>											LEVER	1	2	3	4	5	6	7	8	9
	LEVER	1	2	3	4	5	6	7	8	9											
	M	I	A-C	8	9	9.5	10	11	11.5	12	13	14									
			A-C	4	4.5	4.75	5	5.5	5.75	6	6.5	7									
II		A-D	2	2.25		2.5	2.75		3	3.25	3.5										
		B-C	1			1.25			1.5		1.75										
		B-D	0.5						0.75												

		 inch / 	Feed speed.								
LEVER		1	2	3	4	5	6	7	8	9	
F	I	A-C	0.017	0.019	0.020	0.020	0.022	0.024	0.025	0.027	0.029
		A-C	0.008	0.009	0.010	0.010	0.010	0.010	0.012	0.013	0.014
	II	A-D	0.004	0.005	0.005	0.006	0.006	0.006	0.006	0.007	0.007
		B-C	0.002	0.002	0.002	0.003	0.003	0.003	0.003	0.004	0.004
		B-D	0.001	0.001	0.001	0.001	0.002	0.002	0.002	0.002	0.002

# METRIC SYSTEM (LEADSCREW 6 mm/p)

CHANGE GEARS	mm / $\pi$ For cutting module thread												
	LEVER		1	2	3	4	5	6	7	8	9		
	M	I	A-C	4	4.5	4.75	5	5.5	5.75	6	6.5	7	
			A-C	2	2.25		2.5	2.75		3	3.25	3.5	
		II	A-D	1			1.25			1.5		1.75	
			B-C	0.5						0.75			
			B-D	0.25									
$\pi$ /  inch For cutting D.P. thread													
LEVER		1	2	3	4	5	6	7	8	9			
	W	I	B-C	4	4.5		5	5.5		6	6.5	7	
			B-C	8	9	9.5	10	11	11.5	12	13	14	
		II	B-D	16	18	19	20	22	23	24	26	28	
			A-C	32	36	38	40	44	46	48	52	56	
			A-D	64	72	76	80	88	92	96	104	112	

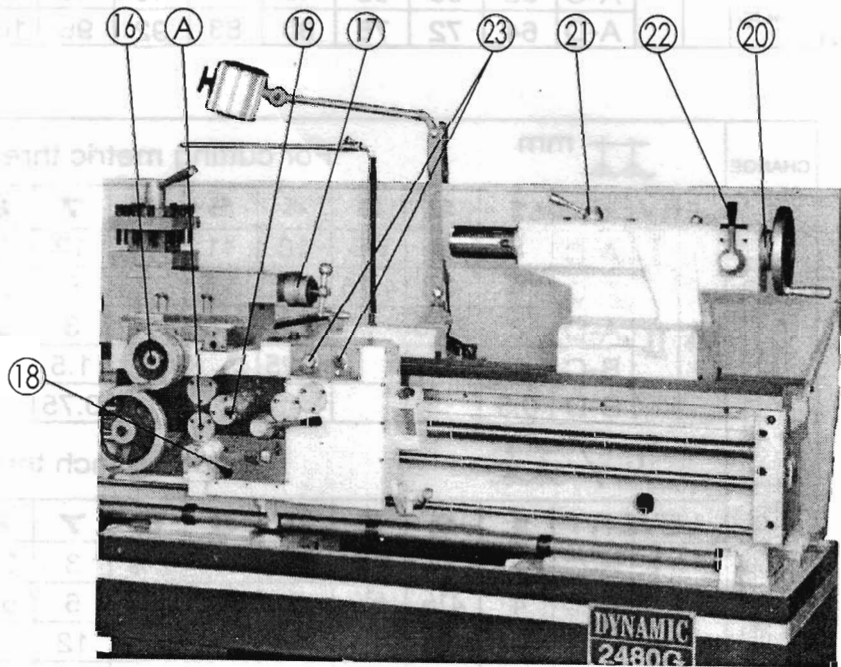
CHANGE GEARS	mm For cutting metric thread.											
	LEVER		1	2	3	4	5	6	7	8	9	
	M	I	A-C	8	9	9.5	10	11	11.5	12	13	14
			A-C	4	4.5	4.75	5	5.5	5.75	6	6.5	7
		II	A-D	2	2.25		2.5	2.75		3	3.25	3.5
			B-C	1			1.25			1.5		1.75
			B-D	0.5						0.75		
1" /  For cutting inch thread												
LEVER		1	2	3	4	5	6	7	8	9		
	W	I	B-C	2	2 $\frac{1}{4}$	2 $\frac{3}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$	3	3 $\frac{1}{4}$	3 $\frac{1}{2}$
			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
		II	B-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
			A-D	32	36	38	40	44	46	48	52	56

mm /		Feed speed.									
LEVER		1	2	3	4	5	6	7	8	9	
F	I	A-C	0.42	0.47	0.50	0.52	0.57	0.60	0.63	0.68	0.73
		A-C	0.21	0.23	0.25	0.26	0.28	0.30	0.32	0.34	0.36
	II	A-D	0.11	0.12	0.13	0.14	0.14	0.15	0.16	0.17	0.18
		B-C	0.05	0.06	0.06	0.07	0.07	0.08	0.08	0.09	0.09
		B-D	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.04	0.05

## 6-7. Carriage and Apron

Carriage moves along the bed by hand or power feed and supports the cross slide, compound rest, tool post and cutting tools. The cross slide handle (16) and tool post slide handle (17) move the cross slide and tool post slide in and out. 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 are accomplished by lever (18) (drop worm system). Lever (19) selects the engagement of longitudinal or cross feed. Press down is for cross feed and pull up is for longitudinal feed. The middle position is a neutral position between the two feeding systems.

The interlocking device is equipped so that the feeding system and the half-nut engagement system can not work together. There is an overload safety clutch by the shape of cone, which can be easily adjusted by turning set screw (A). The buttons (23) are for "rapid speed moving carriage or cross slide".



## 6-8. Tailstock

The diameter of tailstock is 3", and it is strong enough to withstand heavy cutting. Clamping of tailstock is done by push-and-pull clamping lever (20). Clamping of tailstock's spindle is done by lever (21).

The tailstock is equipped with dual spindle feed rate- 1:1 or 1:4. Which is selected by lever (22) for rapid positioning or heavy drilling for the tailstock.

## 7. MAINTENANCE

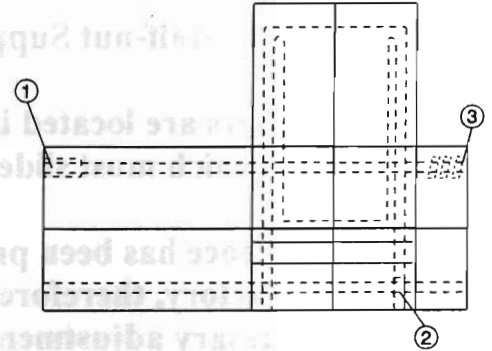
### 7-1. Adjustment of Bearing on Main Spindle

If the spindle spins too freely or play is noticeable when spindle is pushed back and forth, or when the bearing noise is heard on temperature change. Then proper adjustments of middle and front bearing are needed. Tightening or loosening the adjustment nut in the headstock is required.

### 7-2. Adjustment of Taper Gib

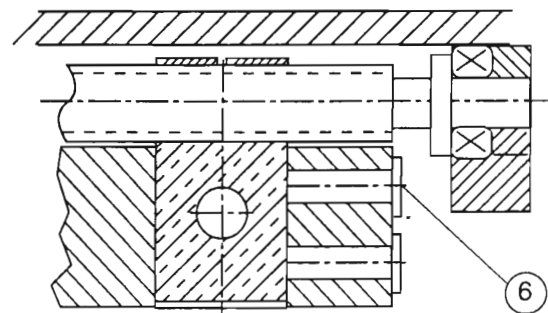
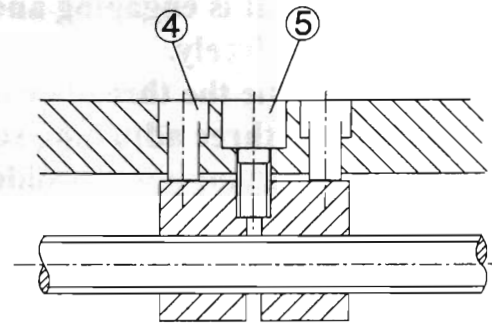
There is a taper gib in the cross slide, and tool post slide respectively. Adjust the taper gibs in a successive procedures as following.

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



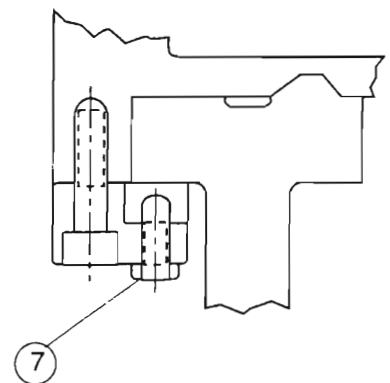
### 7-3. Eliminating Back-lash for Cross Slide and Tool Post Slide

There are adjusting screws can be adjusted to minimize the back-lash for cross slide leadscrew and tool post slide leadscrew. 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 back-lash of tool post slide.



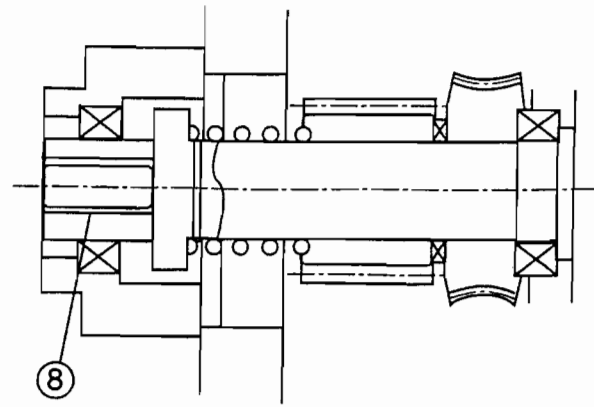
### 7-4. Carriage Gibs Adjustment

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



### 7-5. Adjustment of Overload Protection Device

Apron has a cone shape overload protection device. Its adjustment can be accomplished by adjusting screw (8). Be sure not to adjust this screw so frequently, because cone clutch does not wear very much even for a long period of usage.

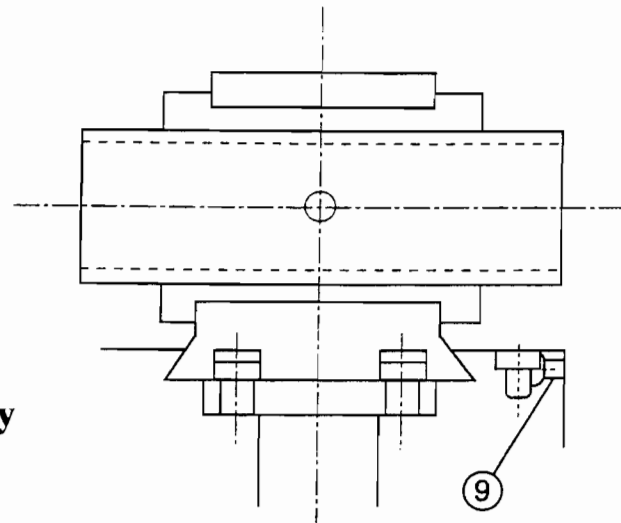


### 7-6. Adjustment of Half-nut Supporter

Half-nut supporters are located in the dovetail groove, which must slide up and down smoothly.

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

First, disassemble the thread chasing dial, then adjust the three adjusting screws (9) until the half-nut supporters slide smoothly in the dovetail groove.



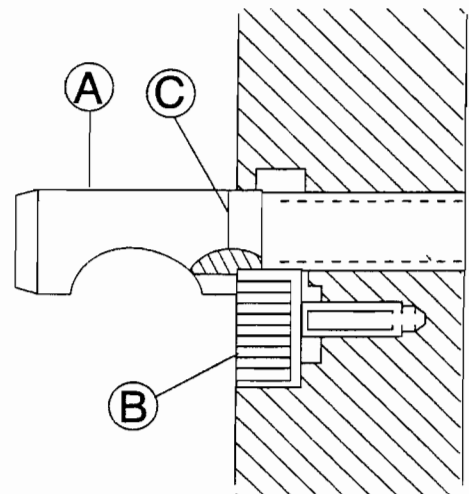
### 7-7. Adjustment of Camlock Studs

Remove lock screw (B)

Turn stud (A) one full turn in or out as required.

Refit and tighten lock screw (B)

Note: A datum ring (C) is marked on each stud as a guide to the original or initial setting.

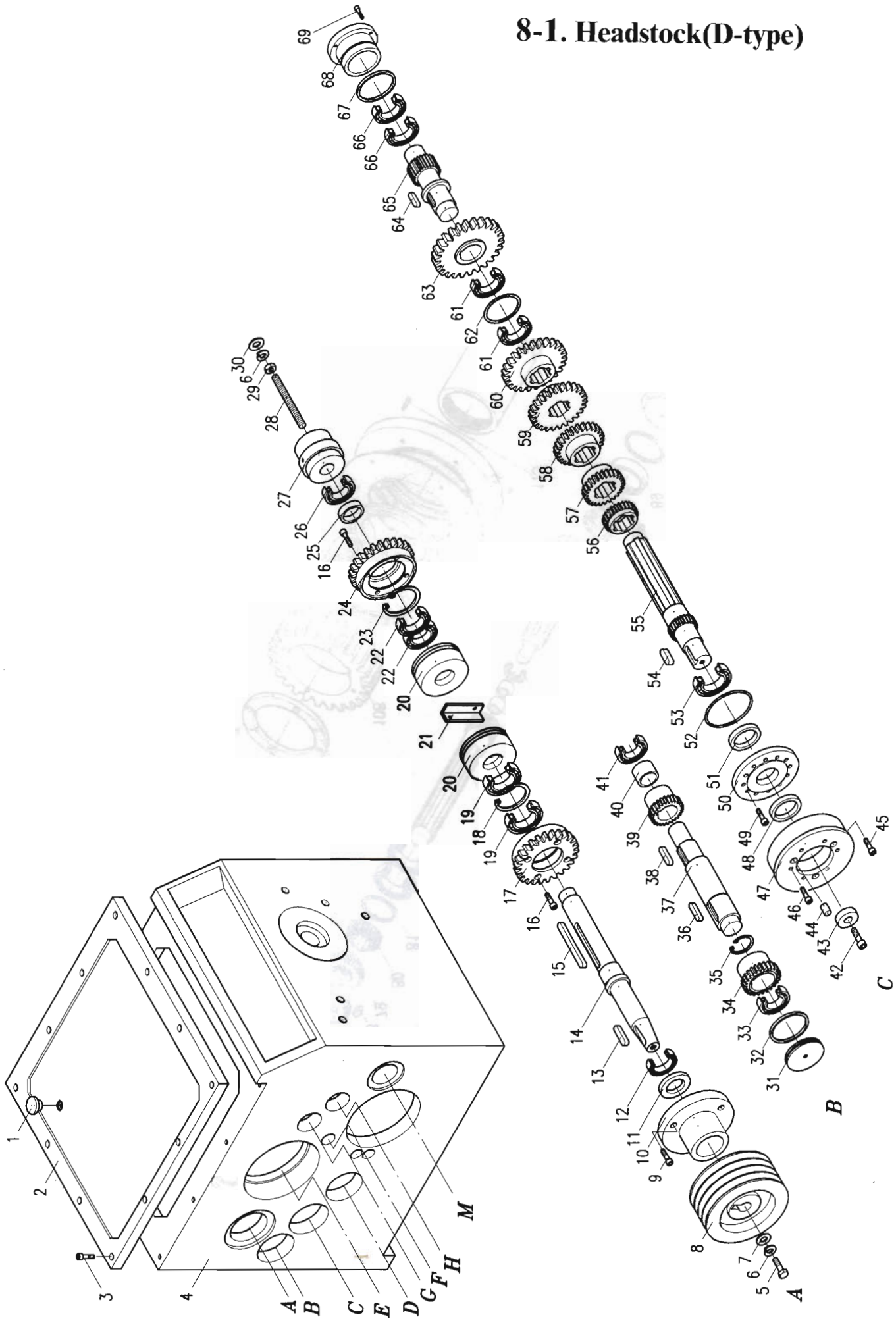


## **8. MECHANICAL PARTS LIST**

**When ordering parts please supplying the following information,**

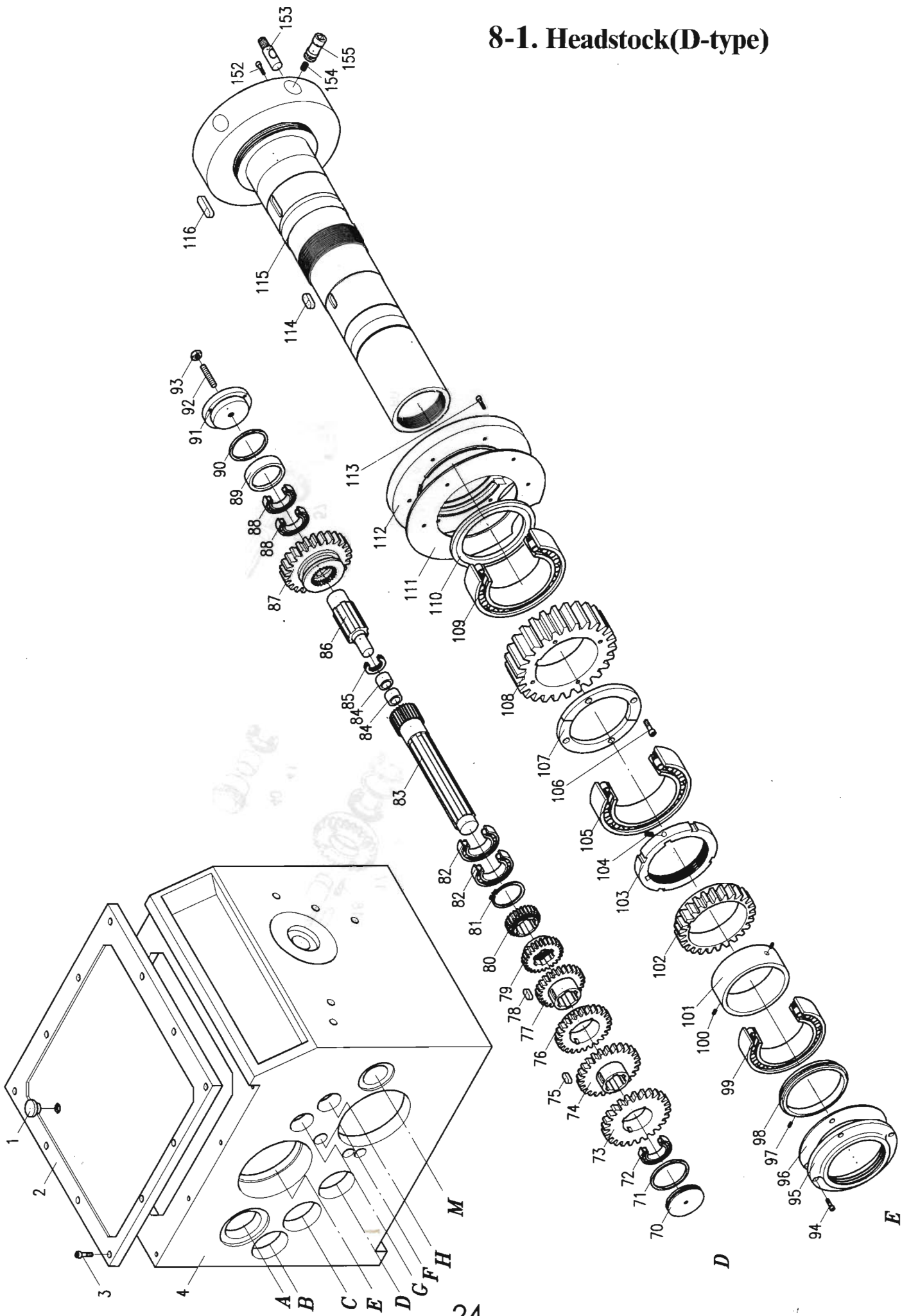
- 1. Model and serial number**
- 2. Year of production**
- 3. Item number and description**
- 4. Quantity**

# 8-1. Headstock(D-type)

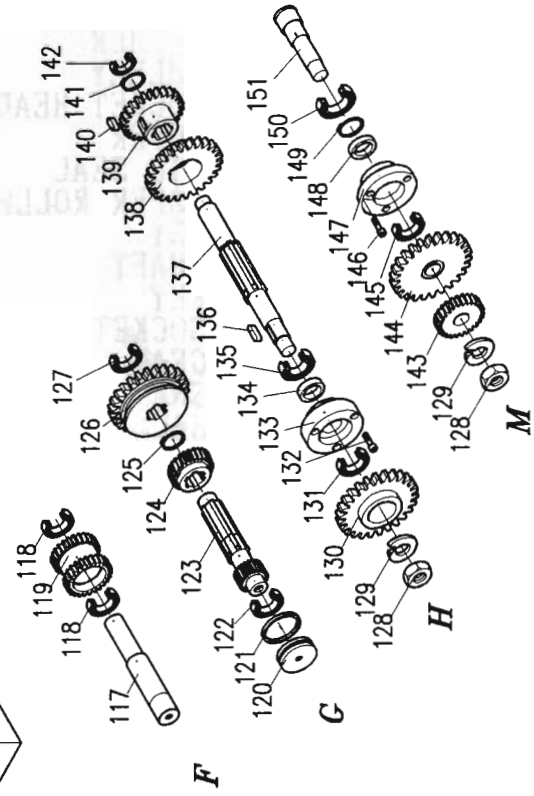
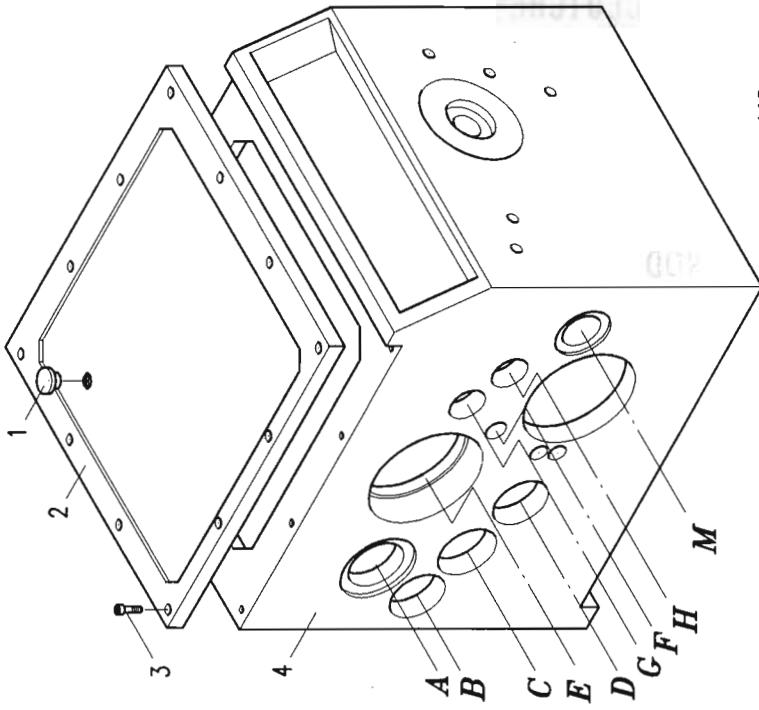




# 8-1. Headstock(D-type)



# 8-1. Headstock(D-type)



## 8-1. Headstock(D-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	5H-40800	PLUG	PLASTIC	1
2	9H-40020	COVER	FC15	1
3	SH-0830	SOCKET HEAD CAP SCREW	M8xP1.25x30L	12
4	9H-10010	HEADSTOCK BOX	FC25	1
5	SH-1235	SOCKET HEAD CAP SCREW	M12xP1.5x35L	1
6	SW-12	SPRING WASHER	Φ 12	2
7	9H-41130	WASHER	S20C	1
8	9H-40040	PULLEY	FC20	1
9	SH-0820	SOCKET HEAD CAP SCREW	M8xP1.25x20L	3
10	9H-40820	COVER	FC15	1
11	TC-406510	OIL SEAL	40x65x10	1
12	NJ-208	TAPER ROLLER BEARING	NJ-208	1
13	KY-121050	KEY	12x10x50	1
14	9H-40030	SHAFT	SCM4	1
15	KY-128120	KEY	12x8x120L	1
16	SH-0830	SOCKET HEAD CAP SCREW	M8xP1.25x30L	8
17	9H-41150	GEAR	SCM21 53T	1
18	CR-75	SNAP RING	#75	1
19	#6009	BALL BEARING	#6009	2
20	MWC-15	ELECTROMAGNETIC CLUTCHES	MWC-15	2
21	9H-41230	SEAT	SS41	1
22	#6208	BALL BEARING	#6208	2
23	CR-80	SNAP RING	#80	1
24	9H-40050	GEAR	SCM21 53T	1
25	9H-40060	SPACE COLLAR	S20C-D	1
26	#6307Z	BALL BEARING	#6307Z	1
27	9H-40890	OIL BASE	FC20	1
28	9H-40900	PUMP LOCKING ROD	S20C-D	1
29	N-16	NNT	M16	1
30	W-16	WASHER	Φ 16	1
31	9H-40070	COVER	FC15	1
32	G-80	O RING	#80	1
33	#6208	BALL BEARING	#6208	1
34	9H-40090	GEAR	SCM21 30T	1
35	CS-50	SNAP RING	#50	1
36	KY10845	KEY	10x8x45L	1
37	9H-40080	SHAFT	SCM21	1
38	KY10845	KEY	10x8x45L	1
39	9H-40100	GEAR	SCM21 26T	1
40	9H-40110	SPACE COLLAR	S20C-D	1
41	#6307	BALL BEARING	#6307	1
42	SH-1020	SOCKET HEAD CAP SCREW	M10xP1.5x20L	1
43	9H-40970	WASHER	S20C-D	1
44	9H-40870	DRIVING PIN	S45C	1
45	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	6
46	SH-0825	SOCKET HEAD CAP SCREW	M8xP1.25x25L	3
47	MDB-20T	BRAKE	MDB-20T	1
48	9H-41190	SPACE COLLAR	SS41	1
49	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	6
50	9H-40130	COVER	S20C	1
51	TC-456510	OIL SEAL	45x65x10	1
52	G-75	O RING	#75	1
53	#6209	BALL BEARING	#6209	1
54	KY-12835	KEY	12x8x35L	1
55	9H-40120	SHAFT	SCM21	1

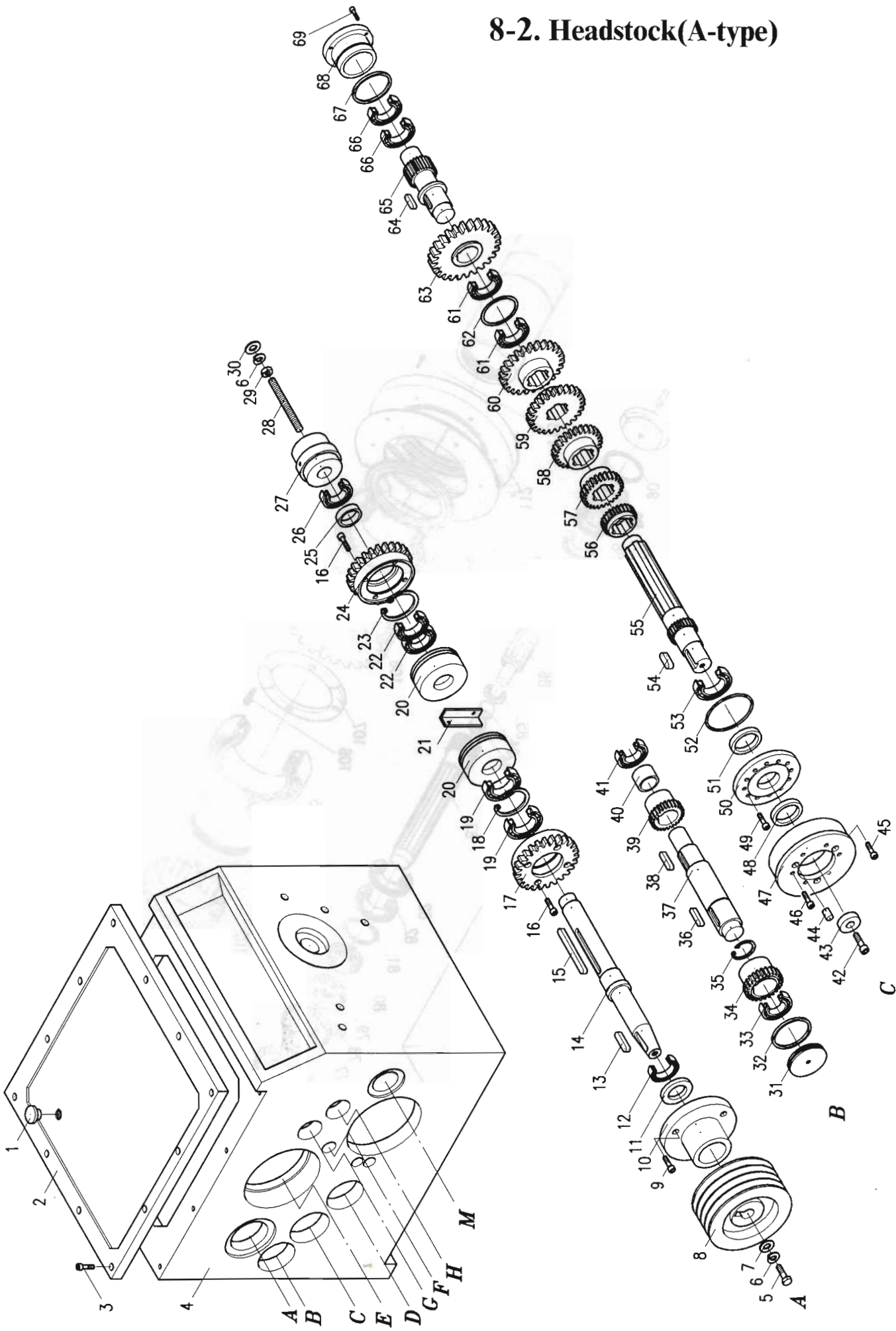
## 8-1. Headstock(D-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	9H-40140	GEAR	SCM21 27T	1
57	9H-40150	GEAR	SCM21 33T	1
58	9H-40160	GEAR	SCM21 40T	1
59	9H-40170	GEAR	SCM21 43T	1
60	9H-40180	GEAR	SCM21 53T	1
61	#6208	BALL BEARING	#6208	2
62	9H-40290	SPACE COLLAR	S20C	1
63	9H-40270	GEAR	SCM21 48T	1
64	KY-10835	KEY	10x8x35L	1
65	9H-40280	SHAFT	SCM21	1
66	#6208	BALL BEARING	#6208	2
67	G-75	O Ring	#75	1
68	9H-40300	COVER	FC15	1
69	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
70	9H-40070	COVER	FC15	1
71	G-75	O Ring	#75	1
72	#6208	BALL BEARING	#6208	1
73	9H-40210	GEAR	SCM21 59T	1
74	9H-40200	GEAR	SCM21 53T	1
75	KY-10825	KEY	10x8x25L	1
76	9H-40230	GEAR	SCM21 47T	1
77	9H-40220	GEAR	SCM21 40T	1
78	KY-10825	KEY	10x8x25L	1
79	9H-40240	GEAR	SCM21 33T	1
80	9H-40250	GEAR	SCM21 27T	1
81	CS-50	SNAP RING	#50	1
82	#6010	BALL BEARING	#6010	2
83	9H-40190	SHAFT	SCM21 17T	1
84	NK25x30x20	NEEDLE ROLLER BEARING	NK25x30x20	1
85	#51106	THRUST BEARING	#51106	1
86	9H-40340	SHAFT	SCM21	1
87	9H-40310	GEAR	SCM21 48T	1
88	#6208	BALL BEARING	#6208	2
89	9H-40330	SPACE COLLAR	FC15	1
90	G-80	O RING	#80	1
91	9H-40320	COVER	FC15	1
92	HS-1240	HEXAGON SOCKET SET SCREW	M12xP1.75x40L	1
93	N-12	NUT	M12	1
94	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
95	9H-40400	COVER	FC15	1
96	9H-40400P	PACKING	PACKING	1
97	HS-0506	HEXAGON SOCKET SET SCREW	M5xP0.8x6L	2
98	9H-41100	PRUENT OIL RING	S20C	1
99	NA4826	NEEDLE ROLLER BEARING	NA4826	1
100	HS-0806	HEXAGON SOCKET SET SCREW	M8xP1.25x6L	2
101	9H-40430	SPACE COLLAR	S20C	1
102	9H-40380	GEAR	SCM21 81T	1
103	9H-40390	NUT	S45C M135xP2.0	1
104	HS-1010	HEXAGON SOCKET SET SCREW	M10xP1.5x10L	2
105	48393/48320	TAPER ROLLER BEARING	48393/48320	1
106	SH-0812	SOCKET HEAD CAP SCREW	M8xP1.25x12L	4
107	9H-40370	SNAP RING	S20C	1
108	9H-40360	GEAR	SCM21 73T	1
109	48685/48620	TAPER ROLLER BEARING	48685/48620	1
110	9H-41080	PRUNED OIL RING	FC15	1

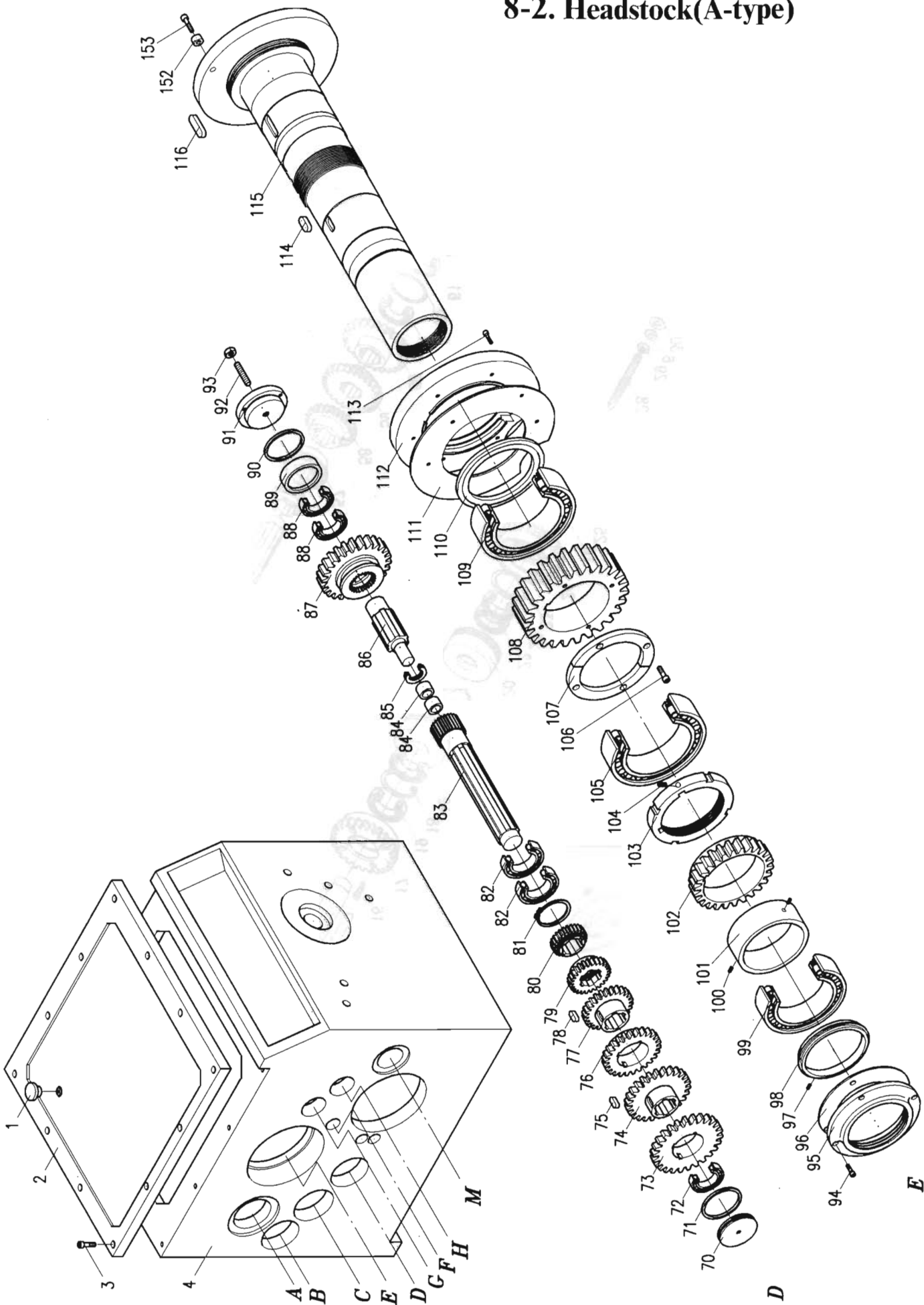
## 8-1. Headstock(D-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
111	9H-40420P	PACKING	PACKING	1
112	9H-40420D	COVER	FC15	1
113	SH-0625	SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
114	KY-151035	KEY	15x10x35L	1
115	9H-30350D	SPINDLE	SCM4	1
116	KY-151055	KEY	15x10x55L	1
117	9H-40440	SHAFT	S45C	1
118	#6005	BALL BEARING	#6005	2
119	9H-40450	GEAR	SCM21 31T	1
120	9H-40490	COVER	FC15	1
121	G-52	O SEAL	#52	1
122	#6205Z	BALL BEARING	#6205Z	1
123	9H-40460	SHAFT	SCM21	1
124	9H-40470	GEAR	SCM21 28T	1
125	CS-30	SNAP RING	#30	1
126	9H-40480	GEAR	SCM21 54T	1
127	#6205	BALL BEARING	#6205	1
128	N-20	NUT	M20	1
129	SW-20	SPRING WASHER	Φ 20	1
130	9B-41310	GEAR	FC25	1
131	#6005Z	BALL BEARING	#6005Z	1
132	SH-0625	SOCKET HEAD CAP SCREW	M6xP1.0x25L	3
133	11H-40530	COVER	FC15	1
134	TC25358	OIL SEAL	25x35x8	1
135	#6205Z	BALL BEARING	#6205Z	1
136	KY-7725	KEY	7x7x25L	1
137	9H-40500	SHAFT	SCM21	1
138	9H-40520	GEAR	SCM21 51T	1
139	9H-40510	GEAR	SCM21 42T	1
140	KY-7720	KEY	7x7x20L	1
141	CS-30	SNAP RING	#30	1
142	#6304	BALL BEARING	#6304	1
143	9B-41310	GEAR	FC25	1
144	9B-40110	GEAR	FC25	1
145	#6205Z	BALL BEARING	#6205Z	1
146	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
147	10H-41010	COVER	FC20	1
148	TC25388	OIL SEAL	25x38x8	1
149	CS-30	SNAP RING	#30	1
150	#6006-2RS	BALL BEARING	#6006-2RS	1
151	10H-41020	SHAFT	S45C	1
152	9H-40860	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x25L	6
153	9H-40850	CAM BOLT	S45C	6
154	9H-40870	SPRING	SWPA	6
155	9H-30840	CAM	SCM21	6

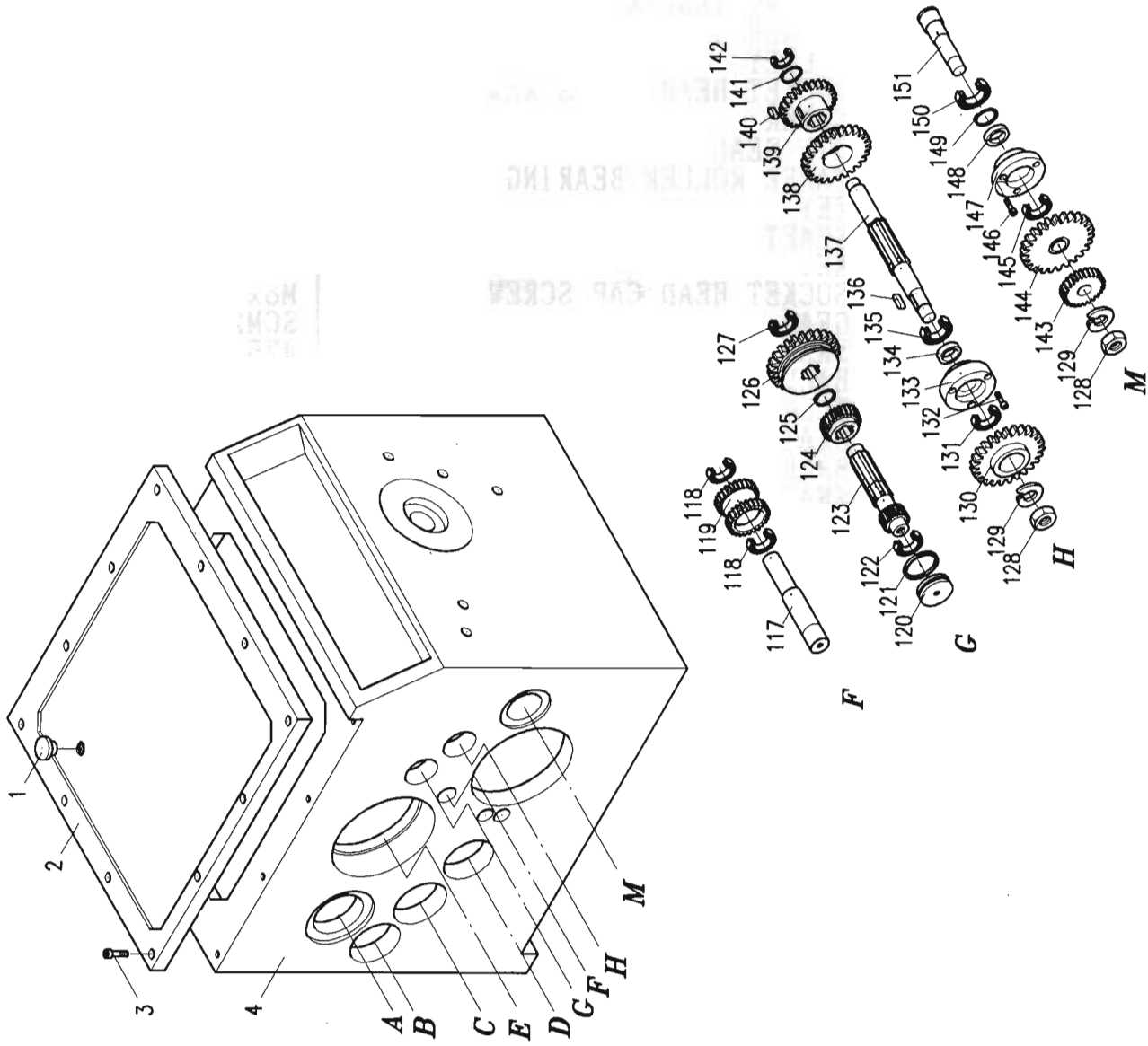
# 8-2. Headstock(A-type)



# 8-2. Headstock(A-type)



# 8-2. Headstock(A-type)





## 8-2. Headstock(A-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	5H-40800	PLUG	PLASTIC	1
2	9H-40020	COVER	FC15	1
3	SH-0830	SOCKET HEAD CAP SCREW	M8xP1.25x30L	12
4	9H-10010	HEADSTOCK BOX	FC25	1
5	SH-1235	SOCKET HEAD CAP SCREW	M12xP1.5x35L	1
6	SW-12	SPRING WASHER	φ 12	2
7	9H-41130	WASHER	S20C	1
8	9H-40040	PULLEY	FC20	1
9	SH-0820	SOCKET HEAD CAP SCREW	M8xP1.25x20L	3
10	9H-40820	COVER	FC15	1
11	TC-406510	OIL SEAL	40x65x10	1
12	NJ-208	TAPER ROLLER BEARING	NJ-208	1
13	KY-121050	KEY	12x10x50	1
14	9H-40030	SHAFT	SCM4	1
15	KY-128120	KEY	12x8x120L	1
16	SH-0830	SOCKET HEAD CAP SCREW	M8xP1.25x30L	8
17	9H-41150	GEAR	SCM21 53T	1
18	CR-75	SNAP RING	#75	1
19	#6009	BALL BEARING	#6009	2
20	MWC-15	ELECTROMACNETIC CLUTCHES	MWC-15	2
21	9H-41230	SEAT	SS41	1
22	#6208	BALL BEARING	#6208	2
23	CR-80	SNAP RING	#80	1
24	9H-40050	GEAR	SCM21 53T	1
25	9H-40060	SPACE COLLAR	S20C-D	1
26	#6307Z	BALL BEARING	#6307Z	1
27	9H-40890	OIL BASE	FC20	1
28	9H-40900	PUMP LOCKING ROD	S20C-D	1
29	N-16	NNT	M16	1
30	W-16	WASHER	φ 16	1
31	9H-40070	COVER	FC15	1
32	G-80	O RING	#80	1
33	#6208	BALL BEARING	#6208	1
34	9H-40090	GEAR	SCM21 30T	1
35	CS-50	SNAP RING	#50	1
36	KY10845	KEY	10x8x45L	1
37	9H-40080	SHAFT	SCM21	1
38	KY10845	KEY	10x8x45L	1
39	9H-40100	GEAR	SCM21 26T	1
40	9H-40110	SPACE COLLAR	S20C-D	1
41	#6307	BALL BEARING	#6307	1
42	SH-1020	SOCKET HEAD CAP SCREW	M10xP1.5x20L	1
43	9H-40970	WASHER	S20C-D	1
44	9H-40870	DRIVING PIN	S45C	1
45	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	6
46	SH-0825	SOCKET HEAD CAP SCREW	M8xP1.25x25L	3
47	MDB-20T	BRAKE	MDB-20T	1
48	9H-41190	SPACE COLLAR	SS41	1
49	SH-0816	SOCKET HEAD CAP SCREW	M8xP1.25x16L	6
50	9H-40130	COVER	S20C	1
51	TC-456510	OIL SEAL	45x65x10	1
52	G-75	O RING	#75	1
53	#6209	BALL BEARING	#6209	1
54	KY-12835	KEY	12x8x35L	1
55	9H-40120	SHAFT	SCM21	1

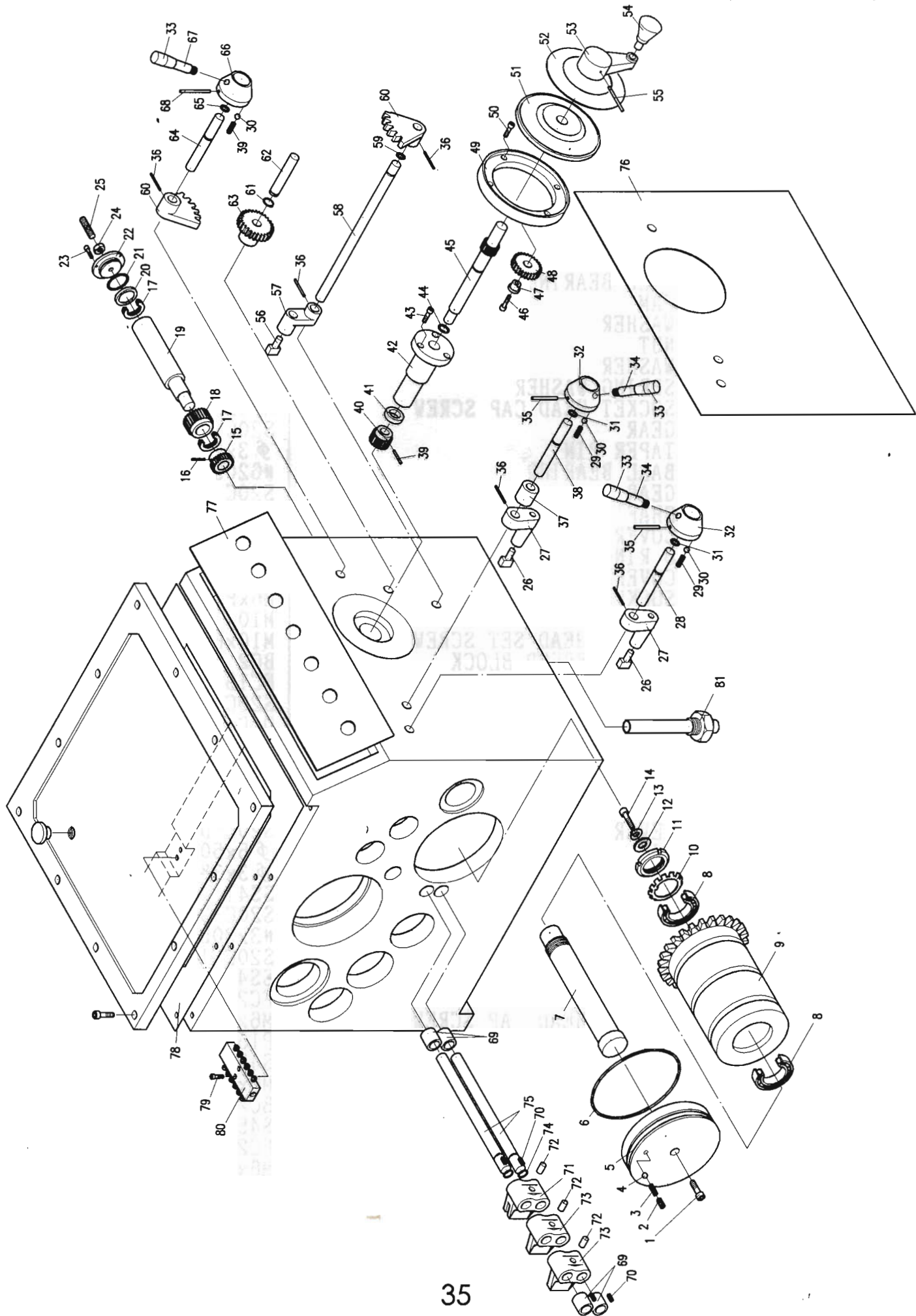
## 8-2. Headstock(A-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	9H-40140	GEAR	SCM21 27T	1
57	9H-40150	GEAR	SCM21 33T	1
58	9H-40160	GEAR	SCM21 40T	1
59	9H-40170	GEAR	SCM21 43T	1
60	9H-40180	GEAR	SCM21 53T	1
61	#6208	BALL BEARING	#6208	2
62	9H-40290	SPACE COLLAR	S20C	1
63	9H-40270	GEAR	SCM21 48T	1
64	KY-10835	KEY	10x8x35L	1
65	9H-40280	SHAFT	SCM21	1
66	#6208	BALL BEARING	#6208	2
67	G-75	O Ring	#75	1
68	9H-40300	COVER	FC15	1
69	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
70	9H-40070	COVER	FC15	1
71	G-75	O Ring	#75	1
72	#6208	BALL BEARING	#6208	1
73	9H-40210	GEAR	SCM21 59T	1
74	9H-40200	GEAR	SCM21 53T	1
75	KY-10825	KEY	10x8x25L	1
76	9H-40230	GEAR	SCM21 47T	1
77	9H-40220	GEAR	SCM21 40T	1
78	KY-10825	KEY	10x8x25L	1
79	9H-40240	GEAR	SCM21 33T	1
80	9H-40250	GEAR	SCM21 27T	1
81	CS-50	SNAP RING	#50	1
82	#6010	BALL BEARING	#6010	2
83	9H-40190	SHAFT	SCM21 17T	1
84	NK25x30x20	NEEDLE ROLLER BEARING	NK25x30x20	1
85	#51106	THRUST BEARING	#51106	1
86	9H-40340	SHAFT	SCM21	1
87	9H-40310	GEAR	SCM21 48T	1
88	#6208	BALL BEARING	#6208	2
89	9H-40330	SPACE COLLAR	FC15	1
90	G-80	O RING	#80	1
91	9H-40320	COVER	FC15	1
92	HS-1240	HEXAGON SOCKET SET SCREW	M12xP1.75x40L	1
93	N-12	NUT	M12	1
94	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
95	9H-40400	COVER	FC15	1
96	9H-40400P	PACKING	PACKING	1
97	HS-0506	HEXAGON SOCKET SET SCREW	M5xP0.8x6L	2
98	9H-41100	PRUENT OIL RING	S20C	1
99	NA4826	NEEDLE ROLLER BEARING	NA4826	1
100	HS-0806	HEXAGON SOCKET SET SCREW	M8xP1.25x6L	2
101	9H-40430	SPACE COLLAR	S20C	1
102	9H-40380	GEAR	SCM21 81T	1
103	9H-40390	NUT	S45C M135xP2.0	1
104	HS-1010	HEXAGON SOCKET SET SCREW	M10xP1.5x10L	2
105	48393/48320	TAPER ROLLER BEARING	48393/48320	1
106	SH-0812	SOCKET HEAD CAP SCREW	M8xP1.25x12L	4
107	9H-40370	SNAP RING	S20C	1
108	9H-40360	GEAR	SCM21 73T	1
109	48685/48620	TAPER ROLLER BEARING	48685/48620	1
110	9H-41080	PRUNED OIL RING	FC15	1

## 8-2. Headstock(A-type)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
111	9H-40420P	PACKING	PACKING	1
112	9H-40420A	COVER	FC15	1
113	SH-0625	SOCKET HEAD CAP SCREW	M6xP1.0x25L	6
114	KY-151035	KEY	15x10x35L	1
115	9H-30350A	SPINDLE	SCM4	1
116	KY-151055	KEY	15x10x55L	1
117	9H-40440	SHAFT	S45C	1
118	#6005	BALL BEARING	#6005	2
119	9H-40450	GEAR	SCM21 31T	1
120	9H-40490	COVER	FC15	1
121	G-52	O SEAL	#52	1
122	#6205Z	BALL BEARING	#6205Z	1
123	9H-40460	SHAFT	SCM21	1
124	9H-40470	GEAR	SCM21 28T	1
125	CS-30	SNAP RING	#30	1
126	9H-40480	GEAR	SCM21 54T	1
127	#6205	BALL BEARING	#6205	1
128	N-20	NUT	M20	1
129	SW-20	SPRING WASHER	φ 20	1
130	9B-41310	GEAR	FC25	1
131	#6005Z	BALL BEARING	#6005Z	1
132	SH-0625	SOCKET HEAD CAP SCREW	M6xP1.0x25L	3
133	11H-40530	COVER	FC15	1
134	TC25358	OIL SEAL	25x35x8	1
135	#6205Z	BALL BEARING	#6205Z	1
136	KY-7725	KEY	7x7x25L	1
137	9H-40500	SHAFT	SCM21	1
138	9H-40520	GEAR	SCM21 51T	1
139	9H-40510	GEAR	SCM21 42T	1
140	KY-7720	KEY	7x7x20L	1
141	CS-30	SNAP RING	#30	1
142	#6304	BALL BEARING	#6304	1
143	9B-41310	GEAR	FC25	1
144	9B-40110	GEAR	FC25	1
145	#6205Z	BALL BEARING	#6205Z	1
146	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
147	10H-41010	COVER	FC20	1
148	TC25388	OIL SEAL	25x38x8	1
149	CS-30	SNAP RING	#30	1
150	#6006-2RS	BALL BEARING	#6006-2RS	1
151	10H-41020	SHAFT	S45C	1
152	9H-41060	DRIVE KEY	SS41	1
153	HS-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	1

# 8-3. Headstock(Front Panel)



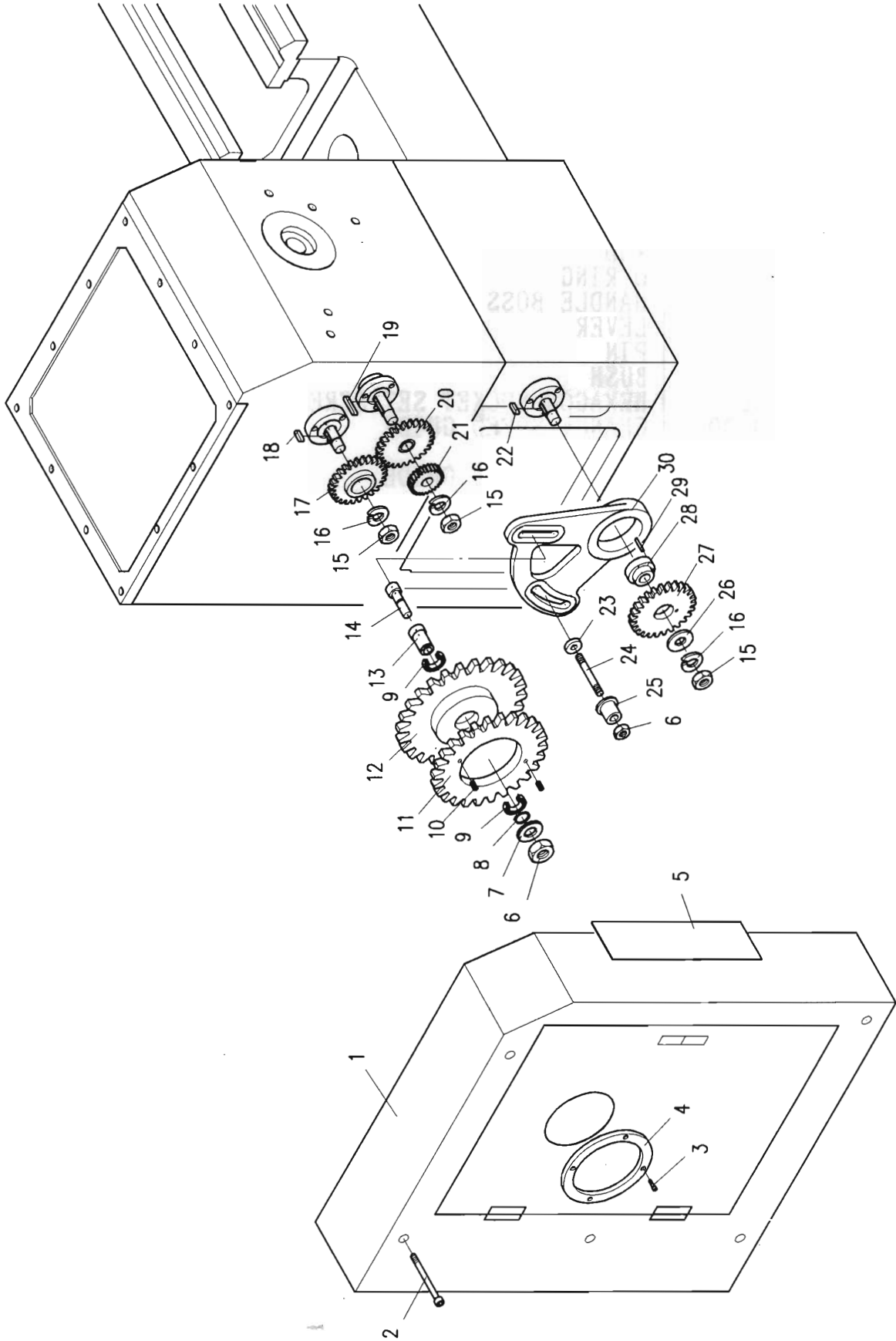
### 8-3. Headstock(Front Panel)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	SH-1025	SOCKET HEAD CAP SCREW	M10xP1.5x25L	1
2	SH-1210	SOCKET HEAD CAP SCREW	M12xP1.75x10L	1
3	O.D.3/8"	SPRING	O.D.3/8"WIRE 1	1
4	ϕ 3/8"	STEEL BALL	ϕ 3/8"	1
5	9H-40550	COVER	FC20	1
6	G-120	O RING	G120	1
7	9H-40780	SHAFT	S45C	1
8	#6208	BALL BEARING	#6208	2
9	9H-40760	CAM	FC25	1
10	AW08	WASHER	AW08	1
11	AN08	NUT	AN-081.5	1
12	9H41210	WASHER	SS41	1
13	SW-10	SPRING WASHER	ϕ 10	1
14	SH-1025	SOCKET HEAD CAP SCREW	M10xP1.5x25L	1
15	9H-40770	GEAR	S20C 20T	1
16	TP-0325	TAPER PIN	ϕ 3x25L	1
17	#6205	BALL BEARING	#6205	2
18	9H-40740	GEAR	S20C 20T	1
19	9H-41240	SHAFT	S20C-D	1
20	9H-41180	COVER	SS41	1
21	G-50	O RING	G50	1
22	9H-41170	COVER	FC15	1
23	SH-0610	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
24	N-10	NUT	M10	1
25	SS-1040	SOCKET HEAD SET SCREW	M10xP1.5x40L	1
26	9H-40570	CHANGE SPEED BLOCK	BC2	2
27	9H-40560	ROCKER ARM	FC15	2
28	9H-40540	ROD	S20C-D	1
29	O.D.1/4	SPRING	O.D.1/4 Wire 1	3
30	ϕ 1/4"	STEEL BALL	ϕ 1/4"	3
31	P-12	O RING	P12	2
32	9H-40910	HANDLE BOSS	S20C-D	2
33	7A-40580	PLASTIC KNOB	PLASTIC	3
34	9H-40930	LEVER	S20C-D	2
35	P-0550	PIN	ϕ 5x50L	2
36	TP-0338	TAPER PIN	ϕ 3x38L	4
37	9H-41120	WASHER	SS41	1
38	9H-40580	ROD	S20C-D	1
39	TP-0330	TAPER PIN	#3x30L	1
40	9H-40750	GEAR	S20C 15T	1
41	9H-41140	WASHER	SS41	1
42	9H-40720	BUSH	FC20	1
43	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	3
44	P-15	O RING	P15	1
45	9H-40730	GEAR SHAFT	S45C 12T	1
46	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	1
47	9H-40690	SHAFT	BC2	1
48	9H-40700	GEAR	S45C 24T	1
49	9H-40680	CHANGE SPEED BASE	FC25	1
50	SH-0618	SOCKET HEAD CAP SCREW	M6xP1.0x18L	4
51	9H-40670	CHANGE SPEED DISK	FC15	1
52	9P-40030	NAME PLATE	AL	1
53	9H-40660	ROCKER ARM	FC15	1
54	9H-40650	LEVER	S20C	1
55	TP-0450	TAPER PIN	#4x50L	1

### 8-3. Headstock(Front Panel)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	9H-40630	CHANGE SPEED BLOCK	BC2	1
57	9H-40620	ROCKER ARM	FC15	1
58	9H-40590	ROD	SS41	1
59	P-12	O RING	P12	1
60	9H-40600	QUADRANT GEAR	FC15	2
61	CS-16	SNAP RING	#16	1
62	9H-41110	SHAFT	S20C	1
63	9H-40990	GEAR	FC25	1
64	9H-40640	ROD	SS41	1
65	P-12	O RING	P12	1
66	9H-40950	HANDLE BOSS	S20C	1
67	9H-40930	LEVER	S20C-D	1
68	P-0460	PIN	∅ 4x60L	1
69	9H-41050	BUSH	S45C	4
70	HS-0606	HEXAGON SOCKET SET SCREW	M6xP1.0x6L	4
71	9H-40800	CHANGE SPEED GUIDE	BC2	1
72	9H-41160	SHAFT	SCM4	3
73	9H-40790	CHANGE SPEED GUIDE	BC2	2
74	P-12	O RING	P12	2
75	9H-41260	SHAFT	SS41	2
76	9P-30020	Name Plate	AL	1
77	9P-30010	Name Plate	AL	1
78	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	2
79	9H-41270	DISTRIBUTION OIL	AL	1
80	9H-41090	JOINT	SS41	1

# 8-4. Change Gear

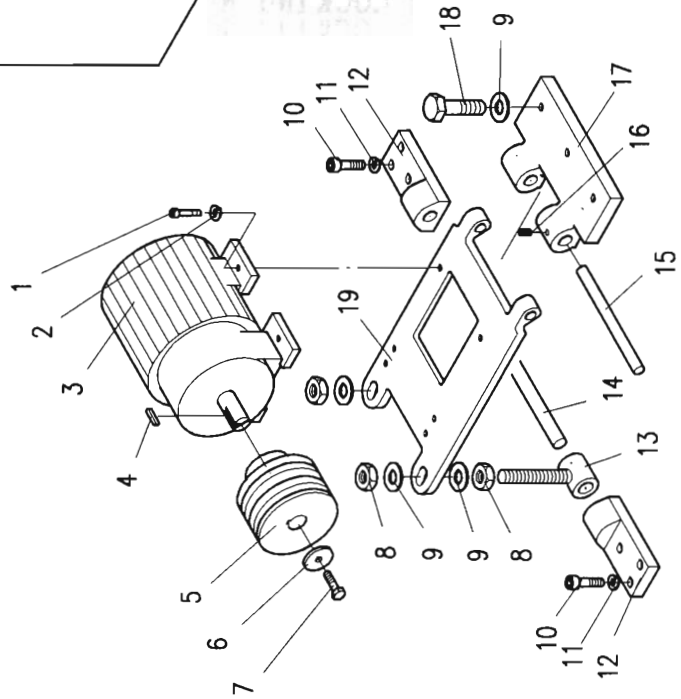
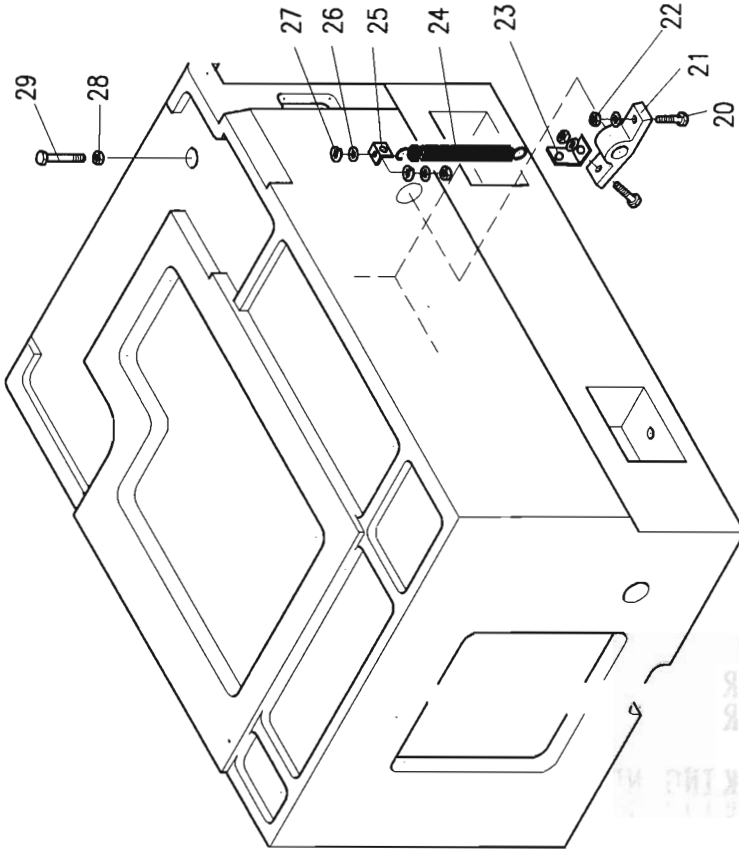


## 8-4. Change Gear

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9B-40080	SLIDE COVER	SS41	1
2	SH-10190	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x190L	5
3	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	4
4	9B-40670	COVER	FC15	1
5	9P-40080	NAME PLATE	AL	1
6	N-16	NUT	M16	2
7	∅ 16	SPRING WASHER	∅ 16	1
8	CS-45	SNAP RING	#45	1
9	#6005	BALL BEARING	#6005	2
10	SS-0810	HEXAGON SOCKET SET SCREW	M8xP1.25x10L	2
11	9B-40120	IDLE GEAR	120T	1
12	9B-40130	IDLE GEAR	127T	1
13	9B-40150	SHAFT	S20C	1
14	9B-40160	SHAFT	SS41	1
15	N-20	NUT	M20	1
16	∅ 20	SPRING WASHER	∅ 20	1
17	9B-41290	GEAR	FC25	1
18	K-7720	KEY	7x7x20L	1
19	K-7740	KEY	7x7x40L	1
20	9B-40110	GEAR	S45C	1
21	9B-41310	GEAR	S45C	1
22	K-7725	KEY	7x7x25L	1
23	9B-40200	LOCKING NUT	SS41	1
24	9B-40170	LOCKING SCREW	SS41	1
25	9B-40180	WASHER	S20C-D	1
26	9B-40680	WASHER	SS41	1
27	9B-40140	GEAR	S20C	1
28	9B-40190	SAFE PIN BASE	S45C	1
29	SP-0530	SAFE PIN	#5x30L	1
30	9B-40100	QUADRANT BRACKET	FC20	1



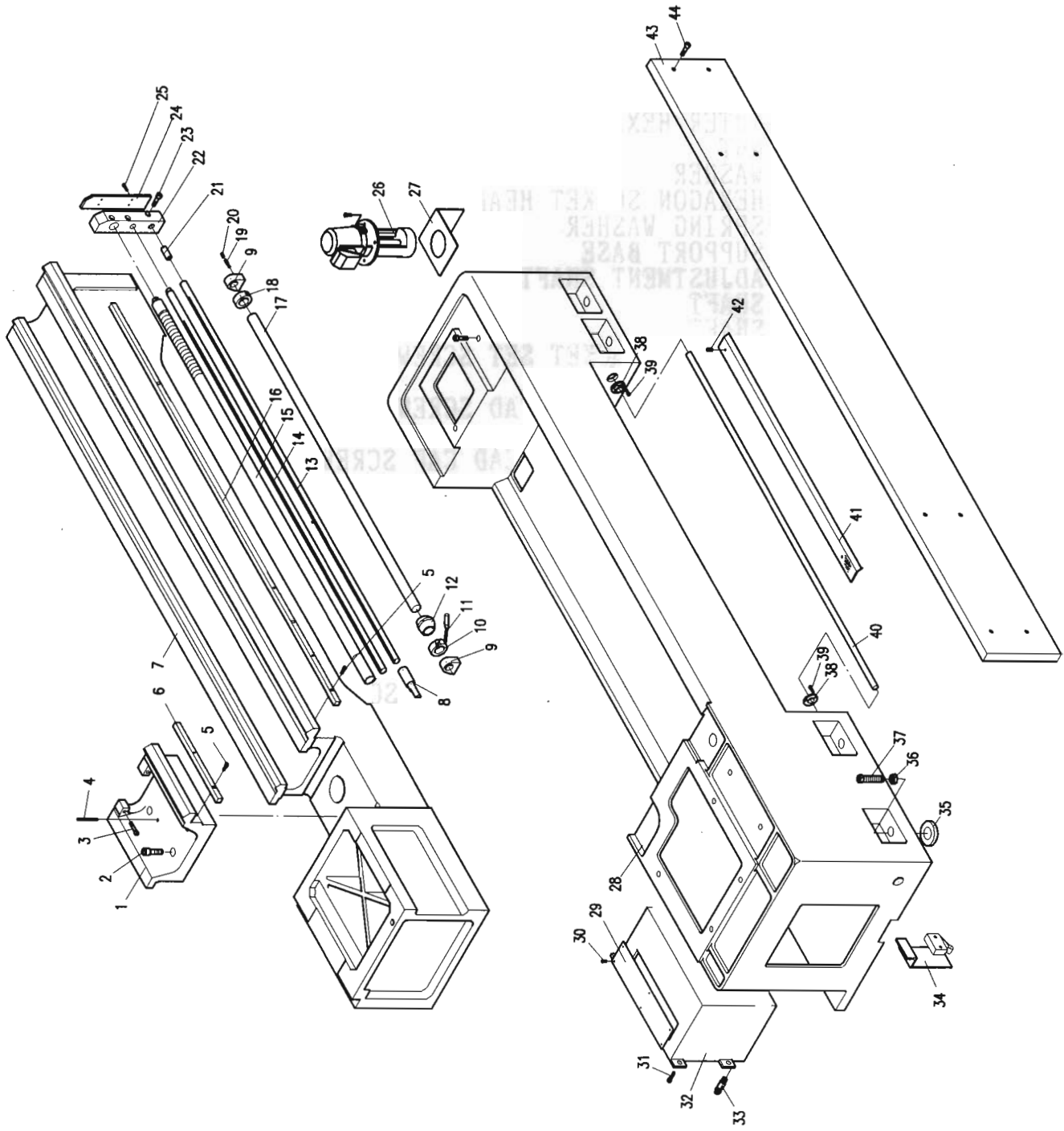
# 8-5. Brake Mechanism



## 8-5. Brake Mechanism

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	SH-1235	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.75x35L	4
2	SW-12	SPRING WASHER	Φ 12	4
3	15HP	MOTOR	15HP	1
4	K-121280	KEY	12x12x80L	1
5	9B-40230	MOTOR PULLEY	FC15	1
6	9B-40240	WASHER	SS41	1
7	HH-0825	OUTER HEXAGON HEAD SCREW	M8xP1.25x25L	1
8	N-20	NUT	M20xP2.0	4
9	W-20	WASHER	M20	7
10	SH-1250	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.75x50L	6
11	SW-12	SPRING WASHER	Φ 12	6
12	9B-40270	SUPPORT BASE	FC15	2
13	9B-40290	ADJUSTMENT SHAFT	S20C	2
14	9B-40280-1	SHAFT	SS41	1
15	9B-40280-2	SHAFT	SS41	1
16	SS-0816	HEXAGON SOCKET SET SCREW	M8xP1.25x16L	1
17	9B-40260	MOTOR BASE	FC15	1
18	HH-2050	OUTER HEXAGON HEAD SCREW	M20xP2.0x50L	3
19	9B-40250	BASE PLATE	FC20	1
20	HH-1080	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	2
21	9B-40720	ROCKER ARM	FC15	1
22	N-10	NUT	M10	2
23	9B-40710	ROD	SS41	1
24	O.D.-1"	TENSION SPRING	O.D.1", Wire Φ 1/8	1
25	9B-40710	ROD	SS41	1
26	W-10	WASHER	Φ 10	3
27	SW-10	SPRING WASHER	Φ 10	5
28	N-10	NUT	M10	2
29	HH-1080	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	1

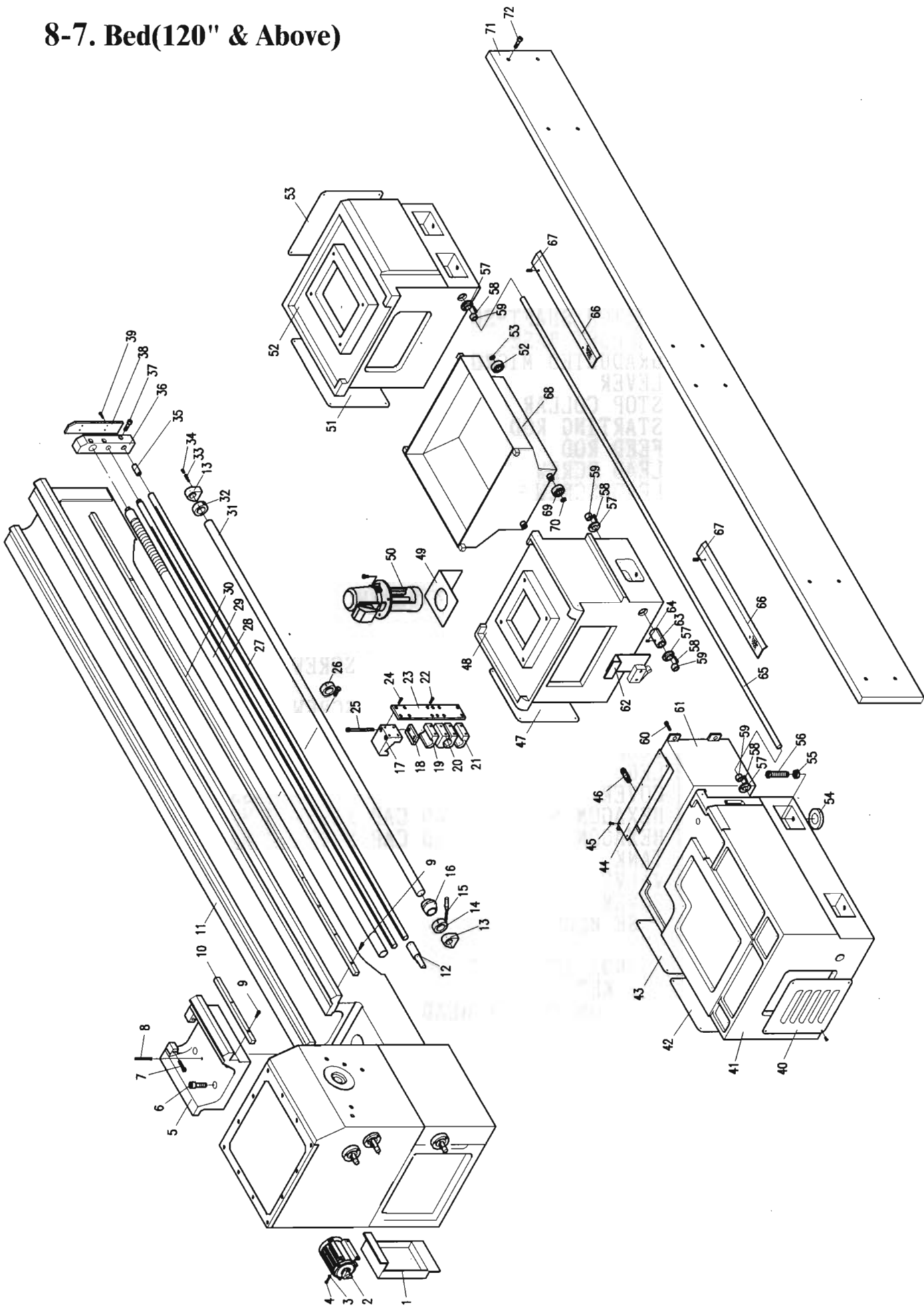
# 8-6. Bed(60"~80" Machine)



## 8-6. Bed(60"~80" Machine)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9B-40210	GAP	FC25	1
2	SH-1280	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.5x80L	4
3	SH-0845	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x45L	2
4	TP-0788	TAPE PIN	#7x88L	2
5	SH-0625	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	8
6	9B-40360	RACK	S45C	1
7	9B-10010	BED	FC25	1
8	9B-40450	SWITCH SHAFT-SP	SS41	1
9	9B-40620	SUPPORT BASE	FC15	2
10	9B-41190	GRADUATED MICRO COLLAR	SS41	1
11	9B-40490	LEVER	S20C-D	1
12	9B-40340	STOP COLLAR	SS41	1
13	9B-40060	STARTING ROD	SS41	1
14	9B-40050	FEED ROD	S20C-D	1
15	9B-40040 I	LEAD SCREW	S20C-D	1
	9B-40040 M	LEAD SCREW	S20C-D	1
16	9B-40350	RACK	S45C	1
17	9B-40070	STOP ROD	S20C-D	1
18	9B-40340	STOP COLLAR	SS41	1
19	SP-M8x20	SPRING	M8x20L	4
20	SS-0810	HEXAGON SOCKET SET SCREW	M8xP1.25x10L	1
21	9B-40500	COLLAR	S20C-D	1
22	9B-40370	BRACKET	FC15	1
23	SH-1270	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.5x70L	3
24	9B-40380	BRACKET COVER	FC15	1
25	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
26	1/2"HP	COOLANT PUMP	1/2"	1
27	9B-40660	COOLANT PUMP BED	SS41	1
28	9B-30020	LEG	FC15	1
29		COVER	SS41	1
30	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
31	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
32	9B-30870	TANK	SS41	1
33	PT-1/4"	VALVE	PT1/4"	1
34	9B-41240	COVER	SS41	1
35	9B-40730	BASE BLOCK	FC15	10
36	N-25	NUT	SS41	10
37	M-25	FOUNDATION BOLT	SS41	10
38	9B-40770	BRACKET	FC15	4
39	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	8
40	9B-40030	SHAFT	SS41	1
41	9B-40630	PEDAL	SPC	1
42	SS-1010	HEXAGON SOCKET SET SCREW	M10xP1.5x10L	4
43	9B-40590	COVER	SS41	1
44	SH-0835	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	8

# 8-7. Bed(120" & Above)



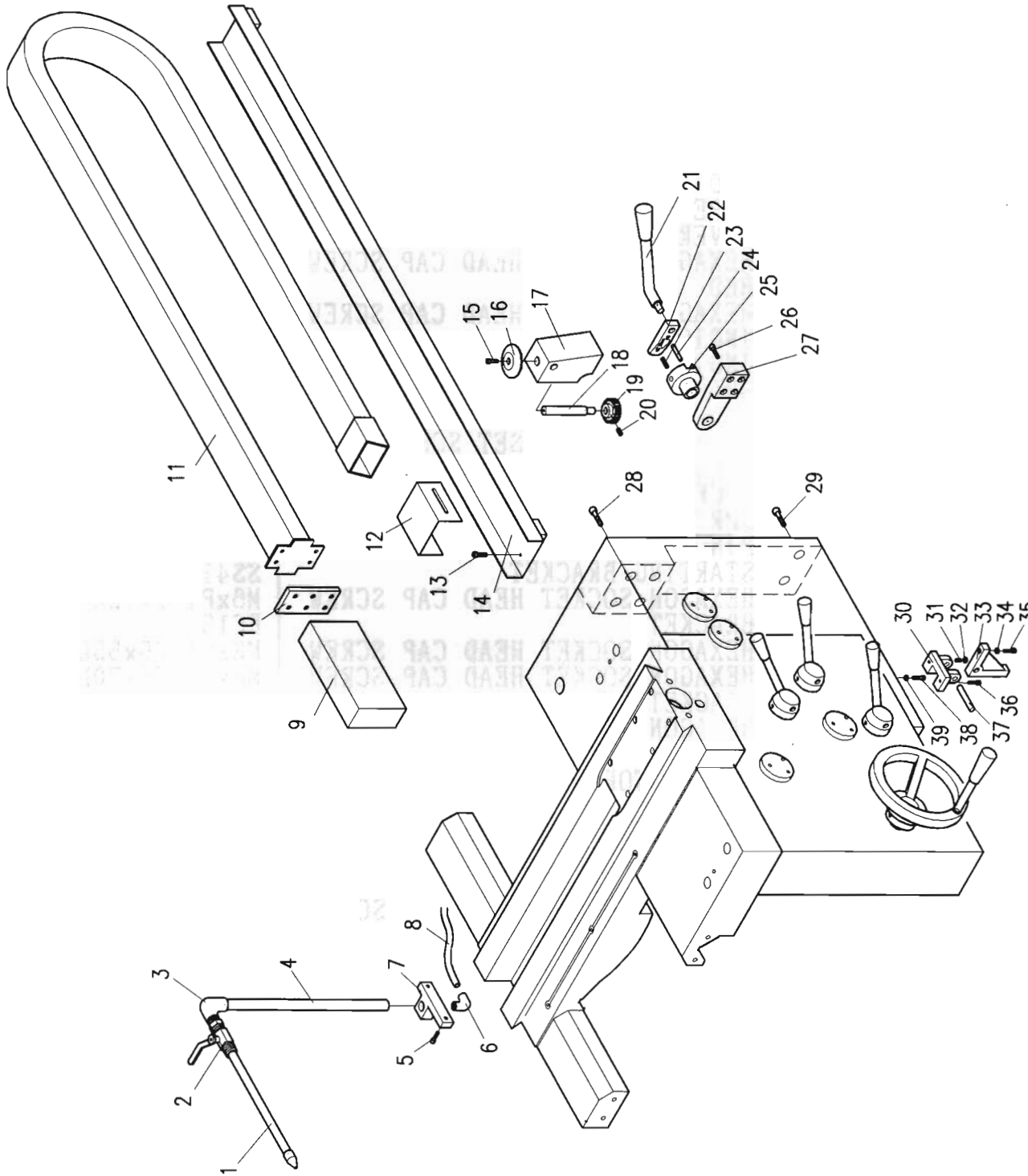
## 8-7. Bed(120" & Above)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9B-40640	COVER	SS41	1
2		DIRECT DRIVE PUMP		1
3	W-6	WASHER	∅ 6	4
4	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
5	9B-40210	GAP	FC25	1
6	SH-1280	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.5x80L	4
7	SH-0845	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x45L	2
8	TP-0788	TAPE PIN	#7x88L	2
9	SH-0625	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	8
10	9B-40360	RACK	S45C	1
11	9B-10010	BED	FC25	1
12	9B-40450	SWITCH SHAFT-SP	SS41	1
13	9B-40620	SUPPORT BASE	FC15	2
14	9B-41190	GRADUATED MICRO COLLAR	SS41	1
15	9B-40490	LEVER	S20C-D	1
16	9B-40340	STOP COLLAR	SS41	1
17	9B-31090	PULL ROD	FC20	1
18	9B-41080	COMPRESS PLATE	SS41	1
19	9B-41050	BRACKET	AL	1
20	9B-41060	BRACKET	AL	2
21	9B-41070	BRACKET	AL	1
22	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	8
23	9B-31110	COVER	FC20	1
24	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
25	SH-1080	HEXAGON SOCKET HEAD CAP SCREW	M10xP1.5x80L	2
26	9B-40340	POSITION COLLAR	SS41	1
27	9B-40060	STARTING ROD	SS41	1
28	9B-40050	FEED ROD	S20C-D	1
29	9B-40040	LEAD SCREW	S20C-D	1
30	9B-40350	RACK	S45C	1
31	9B-40070	STOP ROD	S20C-D	1
32	9B-40340	STOP COLLAR	SS41	1
33	SP-M8x20	SPRING	M8x20L	1
34	SS-0810	HEXAGON SOCKET SET SCREW	M8xP1.25x10L	1
35	9B-40500	COLLAR	S20C-D	1
36	9B-40370	BRACKET	FC15	1
37	SH-1270	HEXAGON SOCKET HEAD CAP SCREW	M12xP1.5x70L	3
38	9B-40380	BRACKET COVER	FC15	1
39	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
40	9B-40550	COVER	SS41	1
41	9B-30020	FRONT LEG	FC15	1
42	9B-40540SP	COVER	SS41	1
43	9B-40540	COVER	SS41	1
44		COVER	SS41	1
45	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	6
46	PT-1/4"	VALVE	PT1/4"	1
47	9B-40540	COVER	SS41	1
48	9B-30030	MIDDLE LEG	FC15	1
49	9B-40660	COOLANT PUMP BED	SS41	1
50	1/2"HP	COOLANT PUMP	1/2"	1
51	9B-40530	COVER	SS41	1
52	9B-30030	REAR LEG	FC15	1
53	9B-40530	COVER	SS41	1
54	9B-40730	BASE BLOCK	FC20	10
55	N-25	NUT	SS41	10

## 8-7. Bed(120" & Above)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	M-25	FOUNDATION BOLT	SS41	10
57	9B-40770	BRACKET	FC15	4
58	SH-0625	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x25L	8
59	9B-40400	BRAKT ARM	FC15	4
60	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
61	9B-30870	TANK	SS41	1
62	9B-41240	COVER	SS41	1
63	9B-40240A	COLLAR	SS41	1
64	SS-0625	HEXAGON SOCKET SET SCREW	M6xP1.0x25L	8
65	9B-40030	SHAFT	SS41	1
66	9B-40630	PEDAL	SPC	2
67	SS-1010	HEXAGON SOCKET SET SCREW	M10xP1.5x10L	4
68	9B-40520	TANK	SS41	2
69	9B-40560	ROLLER	FC15	4
70	CS-20	SNAP RING	S20	4
71	9B-40590	COVER	SS41	1
72	SH-0835	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	12

# 8-8. Accessories of Bed





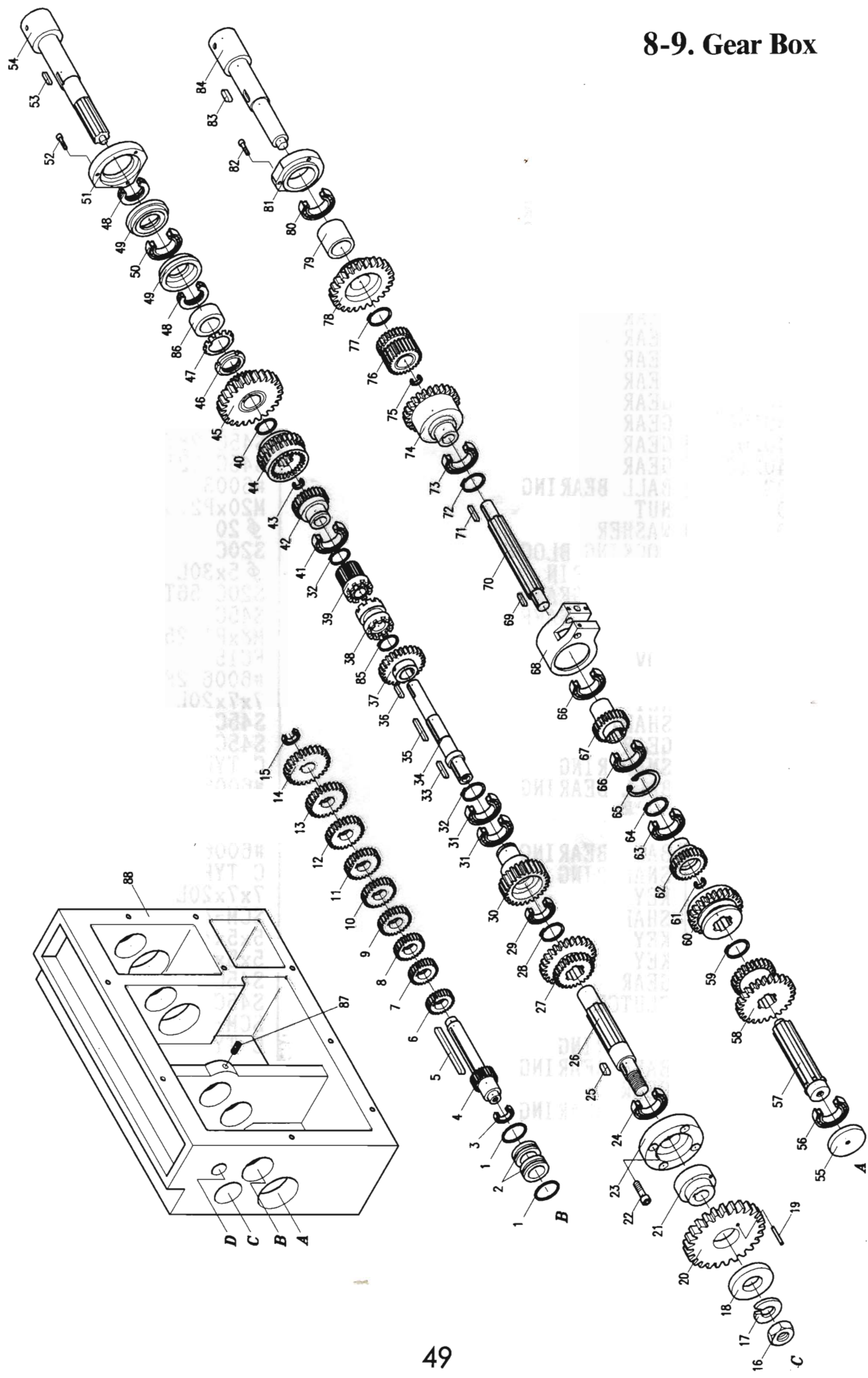
## 7-8. Trouble Shooting Chart

8-8 TROUBLE SHOOTING CHART		
TROUBLE	PROBABLE CAUSE	CORRECTION
Vibration	<p>Loose leveling screws</p> <p>Torn or mismatched vee belts</p> <p>Work or chuck out of balance operating at high spindle speeds</p> <p>Motor out of balance</p>	<p>Set all screws so they bear evenly on leveling plates.</p> <p>Replace vee belts with matched set.</p> <p>Balance chuck or reduce spindle speed.</p> <p>Contact local representative of motor manufacturer.</p>
Chatter	<p>Tool bit improperly ground or not on center</p> <p>Tool overhang too great</p> <p>Using improper surface feed</p> <p>Feed rate too high or too low</p> <p>Gibs of cross slide or compound rest loose</p> <p>Spindle bearings worn</p>	<p>Reground tool bit or adjust tool holder so that area of contact between tool bit and work is decreased. Avoid extreme negative rake angle</p> <p>Keep point of tool bit as close as possible to tool holder.</p> <p>Reduce or increase spindle speed.</p> <p>Reduce or increase feed.</p> <p>Adjust gibs.</p> <p>Adjust spindle bearings.</p>
Chatter (cont'd)	<p>Work improperly supported</p> <p>Vibration</p> <p>Spindle bearing loose</p>	<p>Adjust tailstock center. Use steady rest or follow rest on long slender shafts. Minimize tailstock barrel extension.</p> <p>See "Vibration" trouble above.</p> <p>Adjust spindle bearings.</p>
Work not turned straight	<p>Headstock and tailstock centers not aligned</p> <p>Work improperly supported</p> <p>Bed not level</p> <p>Tool not on center when using taper attachment</p>	<p>Align tailstock center.</p> <p>Use steady rest or follow rest.</p> <p>Reduce overhang from chuck.</p> <p>Relevel bed, using precision level.</p> <p>Put tool on center.</p>
Work out of round	<p>Work loose between centers or centers are excessively worn-work centers out of round</p> <p>Loose headstock spindle bearings</p>	<p>Adjust tailstock center. Regrind centers.</p> <p>Lap work center.</p> <p>Adjust headstock spindle bearings</p>

## 8-8. Accessories of Bed

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	3/8"	NOZZLE	3/8"x24"	1
2	3/8"	VALVE	3/8"	1
3	3/8"x3/8"	ELBOW	3/8"x3/8"	1
4	3/8"x470L	PIPE	470L	1
5	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	2
6	3/8"x3/8"	ELBOW	3/8"x3/8"	1
7	9B-41000	BED	FC25	1
8	3/8"x66"	HOSE	66"	1
9	9B-40800	BOX	SS41	1
10	9B-40790	BED	SS41	1
11	9B-40840	PIPE	SS41	1
12	9B-40820	COVER	SS41	1
13	SH-0616	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
14	9B-40830	BED	S20C-D	1
15	SH-0508	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x8L	1
16	7A-40320	INDICATE DISK	AL	1
17	9A-40800	INDICATE SET	FC15	1
18	9A-40810	SHAFT	SS41	1
19	9A-40490	GEAR	BC2	1
20	SS-0606	HEXAGON SOCKET SET SCREW	M6xP1.0x6L	1
21	9B-40580	HANDLE ROD	SS41	1
22	9A-40830	ROCKER ARM	SS41	1
23	O.D.-6	SPRING	O.D. 6	1
24	P-0430	PIN	φ 4x30L	1
25	9A-40820	STARTING BRACKET	SS41	1
26	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
27	5A-40510	BRACKET	FC15	1
28	SH-0855	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x55L	4
29	SH-0870	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x70L	2
30	7B-40090	BRACKET	FC15	1
31	SS-0516	HEXAGON SOCKET SET SCREW	M5xP0.8x16L	1
32	N-5	NUT	M5	1
33	9B-40220	TOUCH-STOPPER	FC15	1
34	N-8	NUT	M8	1
35	SH-0840	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x40L	1
36	SH-0512	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x12L	2
37	7B-40100	SHAFT	SS41	1
38	SH-0516	HEXAGON SOCKET HEAD CAP SCREW	M5xP0.8x16L	1
39	N-5	NUT	M5	1

# 8-9. Gear Box



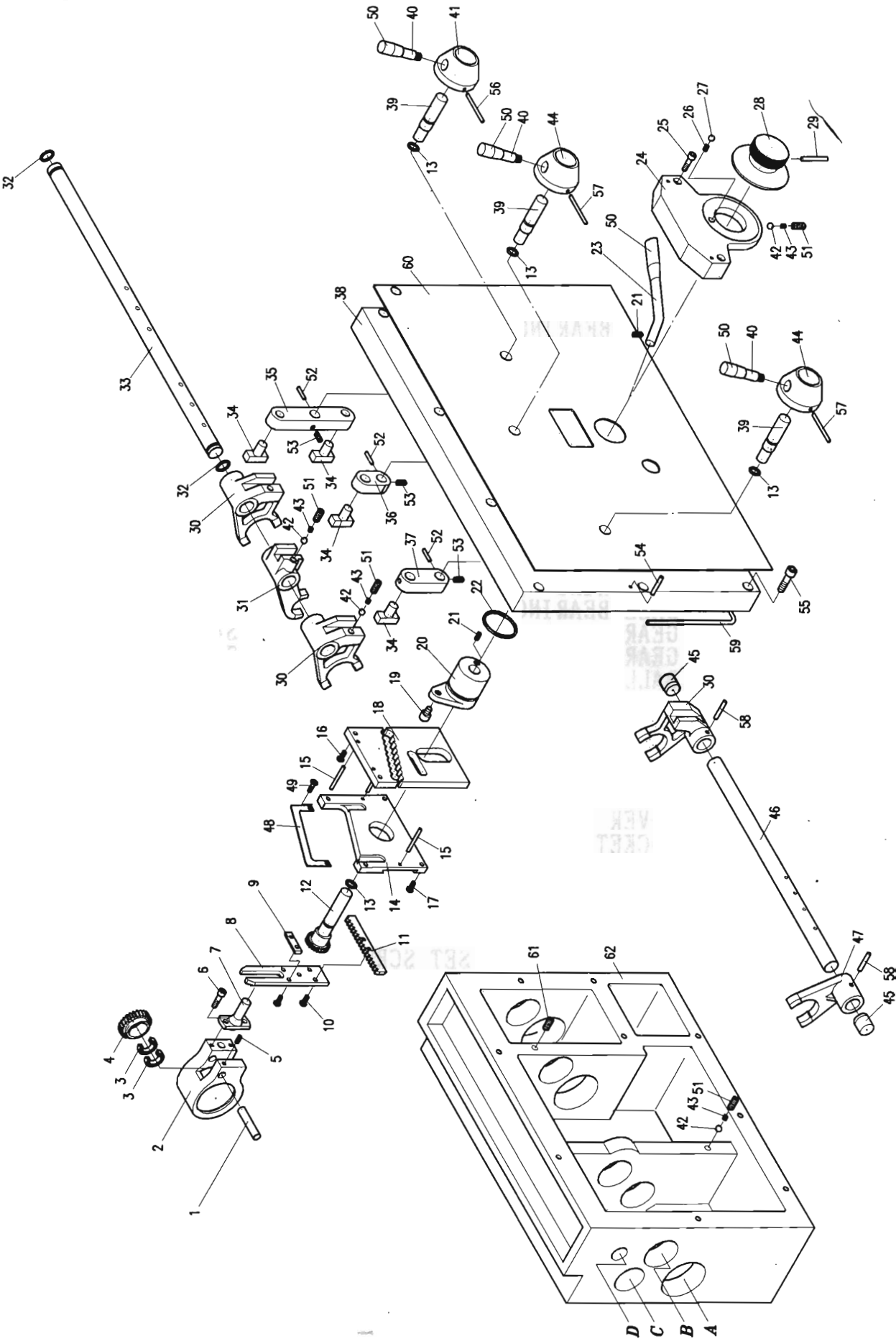
## 8-9. Gear Box

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	P-28	O RING	P28	2
2	7G-40140	SPACE COLLAR	S45C	2
3	#6003	BALL BEARING	#6003	1
4	9G-40120	SHAFT	S45C	1
5	KP-07790	KEY	7x7x90	1
6	9G-40130	GEAR	SCM-4 18T	1
7	9G-40140	GEAR	SCM-4 19T	1
8	9G-40150	GEAR	S45C 20T	1
9	9G-40160	GEAR	S45C 22T	1
10	9G-40170	GEAR	S45C 23T	1
11	9G-40180	GEAR	S45C 24T	1
12	9G-40190	GEAR	S45C 26T	1
13	9G-40200	GEAR	S45C 28T	1
14	9G-40210	GEAR	S45C 32T	1
15	#6003	BALL BEARING	#6003	1
16	N-20	NUT	M20xP2.5	1
17	W-20	WASHER	φ 20	1
18	9B-40680	LOCKING BLOCK	S20C	1
19	9B-40700	SPRING PIN	φ 5x30L	1
20	9B-40140	CHANGE GEAR	S20C 56T	1
21	9B-40190	BASE OF SAFE PIN	S45C	1
22	SH-0835	SOCKET HEAD CAP SCREW	M8xP1.25x35L	4
23	9G-40040	COVER	FC15	1
24	#6006-2RS	BALL BEARING	#6006-2RS	1
25	KP-07720	KEY	7x7x20L	1
26	9G-40030	SHAFT	S45C	1
27	9G-40050	GEAR	S45C 28Tx40T	1
28	CS-30	SNAP RING	C TYPE	1
29	#6005	BALL BEARING	#6005	1
30	9G-40060I	GEAR	S45C 21T	1
	9G-40060M	GEAR	S45C 21T	1
31	#6006	BALL BEARING	#6006	2
32	CS-30	SNAP RING	C TYPE	2
33	KP-07720	KEY	7x7x20L	1
34	9G-40220	SHAFT	SCM-4	1
35	KP-05540	KEY	5x5x40	1
36	KP-05522	KEY	5x5x22	1
37	9G-40230	GEAR	S45C	1
38	9G-40240	CLUTCH	S45C	1
39	9G-40250	GEAR	SCM-4	1
40	CS-26	SNAP RING	C TYPE	1
41	#6006	BALL BEARING	#6006	1
42	9G-40110	GEAR	S45C 24T	1
43	#6002	BALL BEARING	#6002	1
44	9G-40320I	GEAR	S45C	1
	9G-40320M	GEAR	S45C	1
45	9G-40330	GEAR	S45C 46T, 24T	1
46	9G-40340	LOCKING NUT	S20C	1
47	AW-06	LOCKING WASHER	#AW-06	1
48	#51106	THRUST BEARING	#51106	2
49	9G-40350	BUSH	S20C	2
50	#6006	BALL BEARING	#6006	1
51	9G-40360	COVER	FC15	1
52	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	3
53	KP-06622	KEY	6x6x22L	1

## 8-9. Gear Box

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
54	9G-40310	SHAFT	FC15	1
55	9G-40080	COVER	FC15	1
56	#6006	BALL BEARING	#6006	1
57	9G-40070	SHAFT	S45C	1
58	9G-40090	GEAR	S45C 30T×42T	1
59	CS-30	SNAP RING	C TYPE	1
60	9G-40100I	GEAR	S45C 25T	1
	9G-40100M	GEAR	S45C 25T	1
61	#6002	BALL BEARING	#6002	1
62	9G-40110	GEAR	S45C 24T	1
63	#6006	BALL BEARING	#6006	1
64	CS-30	SNAP RING	C TYPE	1
65	CR-55	SNAP RING	#55	1
66	#6006	BALL BEARING	#6006	2
67	9G-40270	GEAR	SCM21	1
68	9G-40280	ROCKER ARM	FC15	1
69	KP-05522	KEY	5×5×22	1
70	9G-40260	SHAFT	S45C	1
71	KP-05528	KEY	5×5×28	1
72	CS-30	SNAP RING	C TYPE	1
73	#6006	BALL BEARING	#6006	1
74	9G-40380I	GEAR	S45C	1
	9G-40380M	GEAR	S45C	1
75	#6002	BALL BEARING	#6002	1
76	9G-40390	GEAR	S45C	1
77	CS-30	SHAP RING	C TYPE	1
78	9G-40400	GEAR	S45C	1
79	9G-40410	SPACE COLLAR	S20C-D	1
80	#6006	BALL RING	#6006	1
81	9G-40420	COVER	FC15	1
82	SH-0516	SOCKET HEAD CAP SCREW	M5×P0.8×16L	3
83	KP-07720	KEY	7×7×20	1
84	9G-40370	SHAFT	S45C	1
85	CS-20	SNAP RING	C TYPE	1
86	9G-40730	SPACE COLLAR	SS41	1
87	HS-0816	HEXAGON SOCKET SET SCREW	M8×P1.25×16L	1
88	9G-20010	GEAR BOX	FC20	1

# 8-9. Gear Box



## 8-9. Gear Box

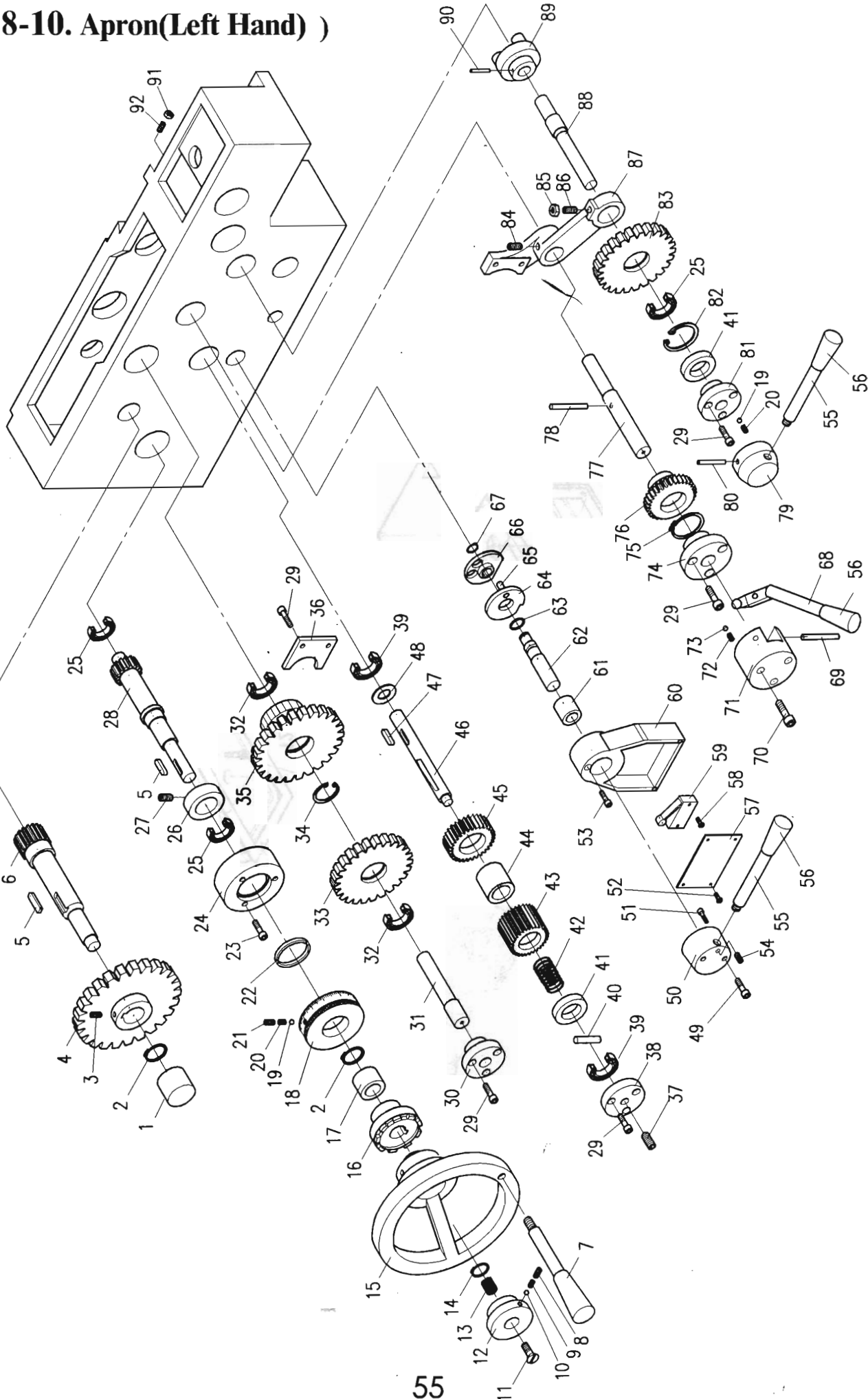
REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9G-40290	SHAFT	S45C	1
2	9G-40280	ROCKER ARM	FC25	1
3	#6000	BALL BEARING	#6000	2
4	9G-40300	GEAR	SCM-21	1
5	SS-0610	SET SCREW	M6xP1.0x10L	1
6	SH-0612	SOCKET HEAD CAP SCREW	M6xP1x12L	2
7	9G-40500	SHORT SHAFT	S20C	1
8	9G-40490	SLIDE PLATE	SS41	1
9	7G-40580	SLIDE WEDGE	SS41	1
10	SS-0510	SET SCREW	M5xP0.8x10L	4
11	7G-40570	RACK	SS41	1
12	9G-40460	SHAFT	S45C	1
13	P-12	O RING	P12	4
14	9G-40480	GUIDE PLATE	FC25	1
15	P-0412	SPRING PIN	∅ 4x12L	4
16	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	2
17	SH-0516	SOCKET HEAD CAP SCREW	M5xP0.8x16L	4
18	9G-40470	SETTING PLATE	FC25	1
19	SH-0808	SOCKET HEAD CAP SCREW	M8xP1.25x8L	1
20	9G-40450	ROCKER ARM	FC20	1
21	SS-0808	SET SCREW	M8xP1.25x8L	2
22	P-35	O RING	P-35	1
23	9G-40670	LEVER	S20C-D	1
24	9G-40440	BRACKET	FC15	1
25	SH-0630	SOCKET HEAD CAP SCREW	M6xP1.0x30L	2
26	SC-0801	SPRING	O.D. 5/16"	1
27	SB-05	STEEL BALL	∅ 5/16"	1
28	9G-40430	CHANGE SPEED DISK	SS41	1
29	TP-0440	TAPER PIN	4#40L	1
30	9G-40550	GUIDE BLOCK	BC2	2
31	9G-40590	GUIDE BLOCK	BC2	1
32	P-16	OIL RING	P-16	2
33	9G-40610	SHAFT	SS41	1
34	9G-40540	CHANGE SPEED BLOCK	BC2	5
35	9G-40530	CONNECT ROD	FC15	1
36	9G-40570	CONNECT ROD	FC15	1
37	9G-40580	CONNECT ROD	3601	1
38	9G-30020	COVER	FC20	1
39	9G-40520	SHAFT	S20C-D	3
40	9H-40930	LEVER	S20C-D	3
41	9G-40510	HANDLE BOSS	S20C	1
42	B-04	STEEL BALL	∅ 1/4"	4
43	SC-0601	SPRING	O.D. 6xWire1∅	4
44	9G-40980	HANDLE BOSS	S20C-D	2
45	9G-40650	COVER	SS41	2
46	9G-40620	SHAFT	SS41	1
47	9G-40600	GUIDE BLOCK	BC2	1
48	9G-40740	GUIDE BLOCK	BC2	1
49	SH-0406	SOCKET HEAD CAP SCREW	M4xP.07x6L	2
50	7A-40580	PLASTIC KNOB	PLASTIC	4
51	SS-0806	SET SCREW	M8xP1.25x6L	4
52	P-0420	SPRING PIN	∅ 4x20L	3
53	SS-0612	SET SCREW	M6xP1.0x12L	3
54	P-0530	SPRING PIN	∅ 5x30L	2
55	SH-0840	SOCKET HEAD CAP SCREW	M8xP1.25x40L	10

## 8-9. Gear Box

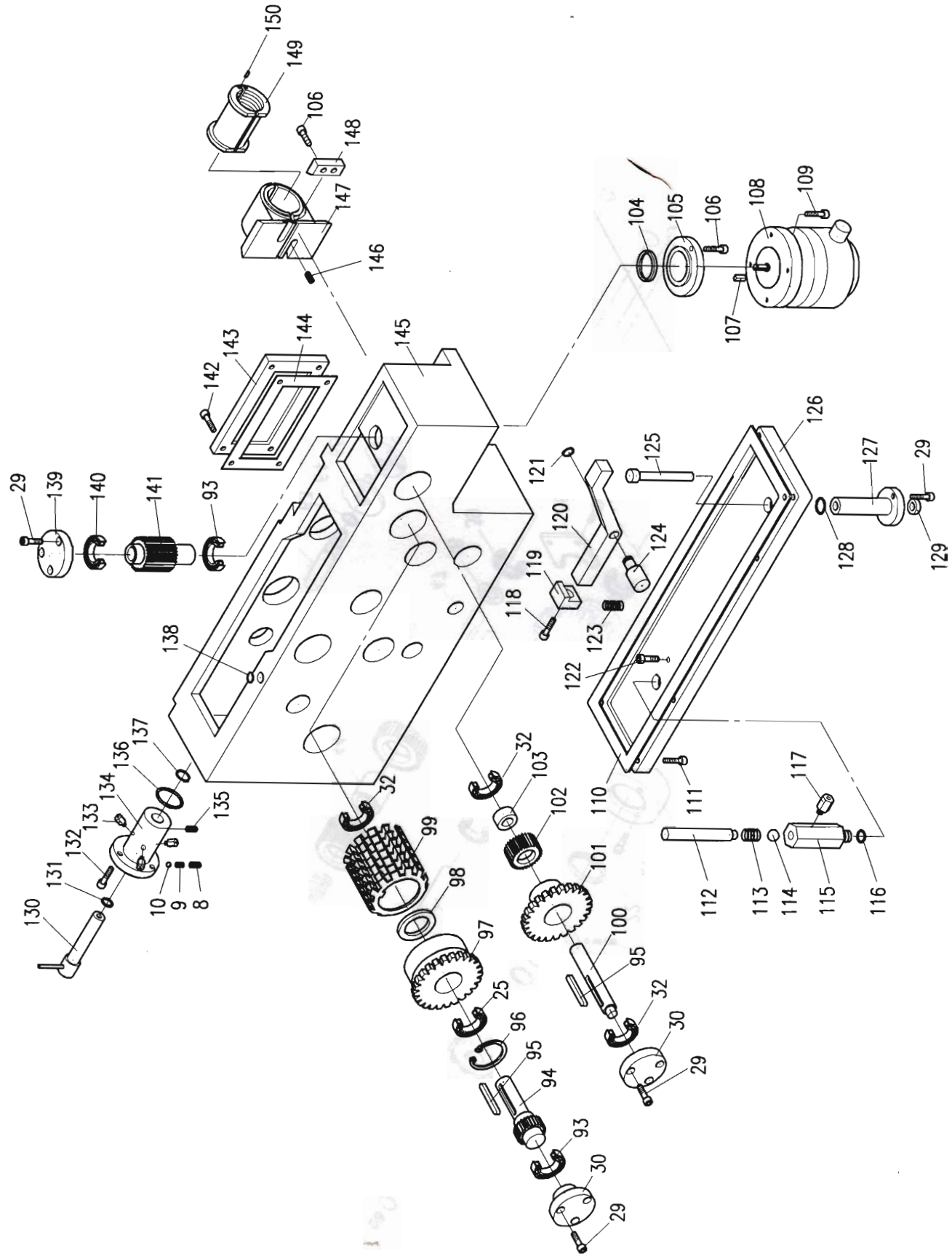
REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	P-0458	SPRING PIN	\$ 4x58L	1
57	P-0450	SPRING PIN	\$ 4x50L	2
58	P-0530	SPRING PIN	\$ 5x30L	2
59	\$ 5	O RING	\$ 5	1
60	9P-30040	NAME PLATE	AL	1
61	SS-0820	SET SCREW	M8xP1.25x20L	1
62	9G-20010	GEAR BOX	FC20	1



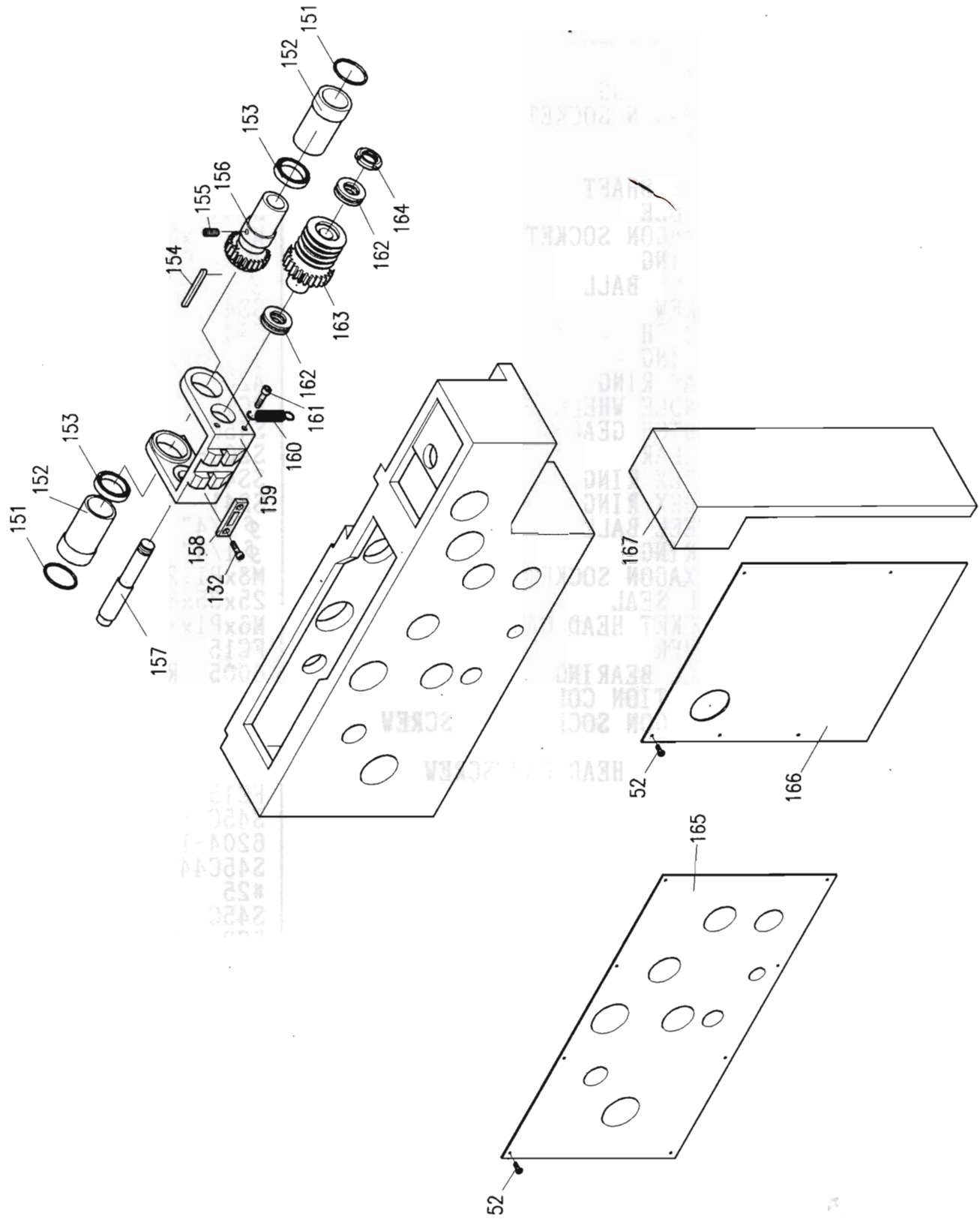
# 8-10. Apron(Left Hand )



# 8-10. Apron(Left Hand)



# 8-10. Apron(Left Hand)



## 8-10. Apron(Left Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9A-40120	COVER	BC2	1
2	A-25	SNAP RING	#25	2
3	SS-0812	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	1
4	9A-40100	GEAR	S45C	1
5	KY-7725	KEY	7x7x25L	2
6	9A-40090L	GEAR SHAFT	S45C	1
7	9A-40940	HANDLE	SS41	1
8	SS-0606	HEXAGON SOCKET SET SCRW	M6xP1x6L	1
9	SP-3/16"	SPRING	Φ 3/16"xWire#1	1
10	SB-3/16"	STEEL BALL	Φ 3/16"	1
11	9A-40080	SCREW	SS41	1
12	9A-40530	CLUTCH	SS41	1
13	SP-1.5x20	SPRING	Φ 1.5x20L	1
14	CS-20	SNAP RING	A20	1
15	9A-40070	HANDLE WHEEL	FC15	1
16	9A-40520	CLUTCH GEAR	S45C	1
17	9A-40510	COLLAR	S20C-D	1
18	9A-40060I	INDEX RING	SS41	1
	9A-40060M	INDEX RING	SS41	1
19	SB-1/4"	STEEL BALL	Φ 1/4"	2
20	SP-1/4"	SPRING	Φ 1/4"	2
21	SS-0808	HEXAGON SOCKET SET SCREW	M8xP1.25x8L	1
22	TC-25x35x8	OIL SEAL	25x35x8L	1
23	SH-0618	SOCKET HEAD CAP SCREW	M6xP1x18L	3
24	9A-40050L	COVER	FC15	1
25	#6005-1RS	BALL BEARING	6005-1RS	4
26	9A-40030-1	POSITION COLLAR	S45C	1
27	SS-0812	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	1
28	9A-40040	SHAFT	S45C	1
29	SH-0612	SOCKET HEAD CAP SCREW	M6xP1x12L	35
30	9A-40610	COVER	FC15	3
31	9A-40130	SHAFT	S45C	1
32	#6204-1RS	BALL BEARING	6204-1RS	6
33	9A-40710L	GEAR	S45C44T	1
34	CS-25	SNAP RING	#25	3
35	9A-40140	GEAR	S45C	1
36	9A-40700	FORK	BC2	1
37	SS-0835	HEXAGON SOCKET SET SCREW	M8xP1.25x35	1
38	9A-40360	COVER	FC15	1
39	#6203-2RS	BALL BEARING	#6203-2RS	2
40	9A-40350	PIN	S20C	1
41	9A-40840	WASHER	SS41	2
42	9A-40500	SPRING	Φ 34.5xWire Φ 3	1
43	9A-40340	GEAR	S45C28T	1
44	9A-40400	CLUTCH GEAR	S45C	1
45	9A-40330	WORM GEAR	BC2	1
46	9A-40320	SHAFT	S45C	1
47	KY-5520	KEY	5x5x20L	1
48	9A-40900	WASHER	SS41	1
49	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	2
50	9A-40380	HANDLE BOSS	SS41	1
51	SH-0515	SOCKET HEAD CAP SCREW	M5xP0.8x15L	1
52	SH-0408	SCREW	M4xP0.7x8L	17
53	SH-0525	SCREW	M5xP0.8x25L	3
54	SS-0608	HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1

## 8-10. Apron(Left Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
55	9A-40910	HANDLE	SS41	2
56	7A-40580	PLASTIC KNOB	PLASTIC	3
57	9A-40760	COVER	SPC	1
58	SS-0420	SCREW	M4xP0.7x20L	2
59	V-15FC22-1B	MICRO SWITCH	V-15FC22-1B Mi	1
60	9A-40750	BRACKET	AL	1
61	9A-40730	COLLAR	S45C	1
62	9A-40370	SHAFT	S45C	1
63	P-12	O RING	P12	1
64	7A-40100L	LOCKING PLATE	S45C	1
65	7A-40110	PIN	S45C	1
66	7A-40090	MOVING PLATE	S45C	1
67	CS-10	SNAP RING	#10	2
68	9A-40170	HANDLE	SS41	1
69	P-0450	PIN	#4x50L	1
70	SH-0650	SOCKET HEAD CAP SCREW	M6xP1x50	3
71	9A-40160	HANDLE BOSS	SS41	1
72	SP-1/4	SPRING	Φ 1/4xWire Φ 1m	1
73	SB-1/4	STEEL BALL	Φ 1/4"	1
74	9A-40150	SHAFT HOUSING	BC2	1
75	9A-40680	GEAR	S45C	1
76	A-38	SNAP RING	#38	1
77	9A-40180	SHAFT	S45C	1
78	P-0438	PIN	#4x38L	1
79	9G-40510	HANDLE BOSS	SS41	1
80	P-0350	PIN	#3x50L	1
81	9A-40650	COVER	FC15	1
82	CR-47	SNAP RING	#47	1
83	9A-40660	GEAR	S45C	1
84	SS-0806	HEXAGON SOCKET SET SCREW	M8xP1.25x6L	1
85	N-8	NUT	M8xP1.25	1
86	SS-0815	HEXAGON SOCKET SET SCREW	M8xP1.25x15L	1
87	9A-40690L	ROCKER ARM	FC20	1
88	9A-40190	HALF NUT SHAFT	S45C	1
89	9A-40200	WORM ROD	S45C	1
90	TP-4"x40	TAPER PIN	4"x40L	1
91	N-6	NUT	M6xP1.0	2
92	SS-0612	HEXAGON SOCKET SET SCREW	M6xP1.0x12L	2
93	#6005-2RS	BALL BEARING	#6005-2RS	2
94	9A-40620	CLUTCH SHAFT	SCM4	1
95	KY-6650	KEY	6x6x50	2
96	CR-47	SNAP RING	#47	1
97	9A-40630	CLUTCH GEAR	SCM4 35T	1
98	9A-40640	WASHER	SS41	1
99	MWC-1.2	CLUTCH	MWC-1.2	1
100	9A-40590	SHAFT	S45C	1
101	9A-40580	GEAR	S45C35T	1
102	9A-40570	WORM GEAR	PBC2 20T	1
103	9A-40600	SPACE COLLAR	SS41	1
104	TC-25x35x8	OIL SEAL	25x35x8	2
105	9A-40560	COVER	FC15	1
106	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	1
107	KY-5515	KEY	5x5x15L	1
108	1/4HP	MOTOR	1/4HP	1
109	SS-0820	HEXAGON SOCKET SET SCRW	M8xP1.25x20L	4

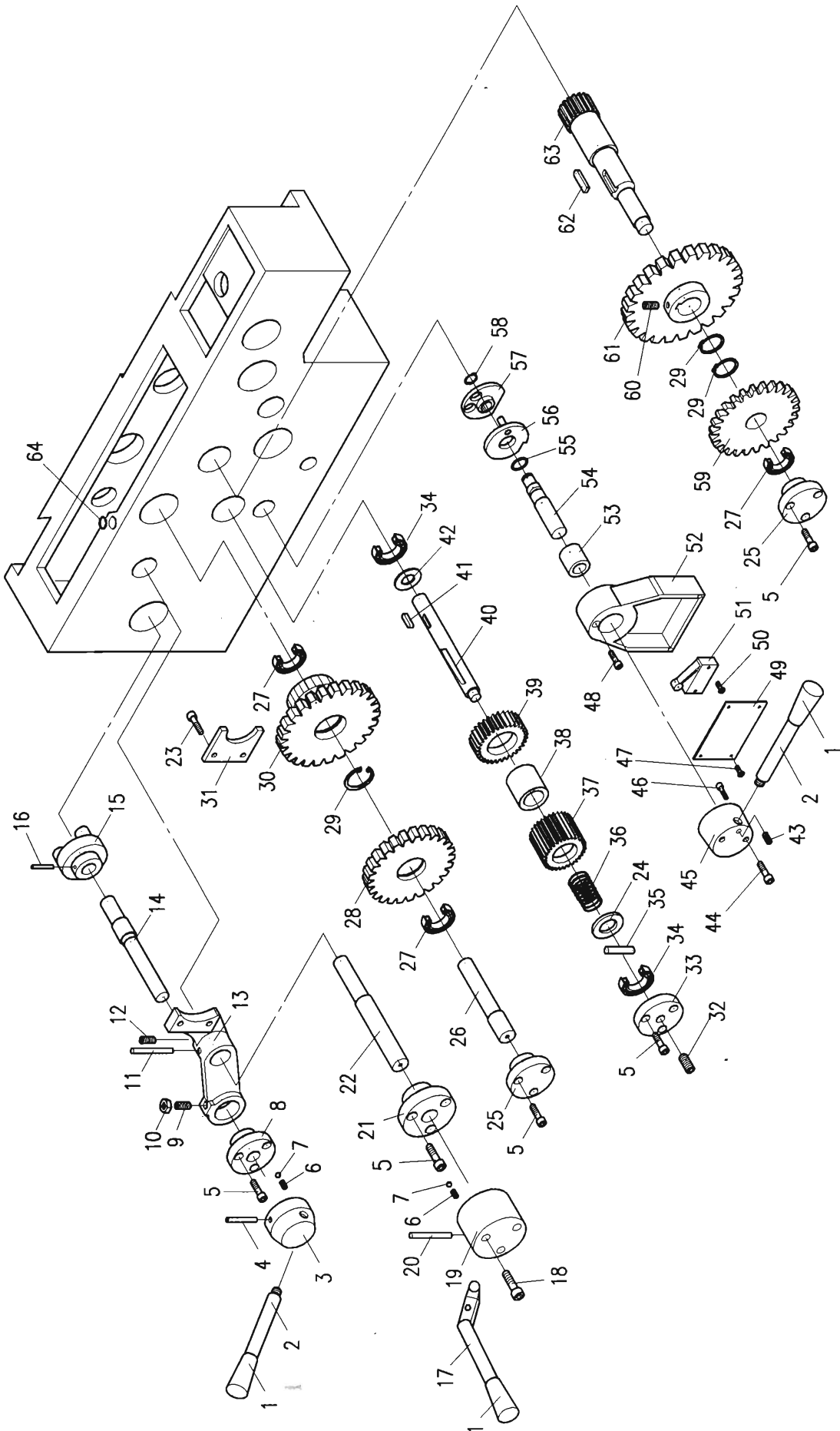
## 8-10. Apron(Left Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
110	9A-40020P	PACKING	PACKING	1
111	SH-0520	SOCKET HEAD CAP SCREW	M5xP0.8x20L	1
112	9A-40410	PISTON	S45C	1
113	SP-1x30L	SPRING	Φ 1x30L	1
114	SB-1/4"	STEEL BALL	Φ 1/4"	1
115	PA-020	CYLINDER	BC2	1
116	PA-070	NUT	F45C	1
117	PA-040	VALVE	1/8"PT	1
118	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
119	5A-40450	LOCKING BLOCK	S45C	1
120	9A-40390L	ROCKER ARM	FC15	1
121	CS-10	SNAP RING	#10	1
122	PT-1/4"	SOCKET HEAD CAP SCREW	1/4PT	1
123	SP-5/16"	SPRING	Φ 5/16xWire#1	1
124	9A-40720	SHAFT	S45C	1
125	9A-40450L	ROD	S45C	1
126	9A-40020L	BOTTOM COVER	FC15	1
127	9A-40460L	STOP ROD BASE	FC25	1
128	TC-10x8x6	OIL SEAL	TC10x8x6	1
129	P-20	O RING	P20	1
130	9A-40420	OIL DISTRIBUTION SHAFT	S45C	1
131	P-11	O RING	P11	1
132	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
133	PT-1/8	VALVE	1/8"PT,PC4	3
134	9A-40430	OIL DISTRIBUTION BASE	FC15	1
135	SS-0612	HEXAGON SOCKET SET SCREW	M6xP1.0x12L	1
136	G-30	O RING	G30	1
137	CS-10	SNAP RING	E10	1
138	G-9	O RING	P9	1
139	9A-40550	COVER	FC15	1
140	#6004	BALL BEARING	#6004	1
141	9A-40540	WORM SHAFT	S45C	1
142	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	4
143	9A-40030	REAR COVER	FC15	1
144	9A-40030P	PACKING	PACKING	1
145	9A-10010L	APRON BOX	FC20	1
146	SS-0820	HEXAGON SOCKET SET SCREW	M8xP1.25x20L	2
147	9A-40220	HALF NUT BASE	FC20	1
148	9A-40210	GIB	FC15	1
149	9A-40230I	HALF NUT	BC2	1
	9A-40230M	HALF NUT	BC2	1
150	SS-0525	HEXAGON SOCKET SET SCREW	M5xP0.8x25L	4
151	P-38	O RING	P38	2
152	9A-40270	BUSH	BC2	2
153	TC-30x40x7	OIL SEAL	30x40x7	2
154	KY-7735	KEY	7x7x35L	1
155	SH-0508	SCREW	M5xP0.8x8L	1
156	9A-40260	GEAR	S45C26T	1
157	9A-40300	GEAR SHAFT	S45C	1
158	9A-40470	LOCKING PLATE	SS41	1
159	9A-40280L	WORM BASE	FC15	1
160	SP	SPRING	SPRING	1
161	SH-0612	SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
162	#51104	THRUST BEARING	#51104	2
163	9A-40290	GEAR	S45C24T	1

### 8-10. Apron(Left Hand)

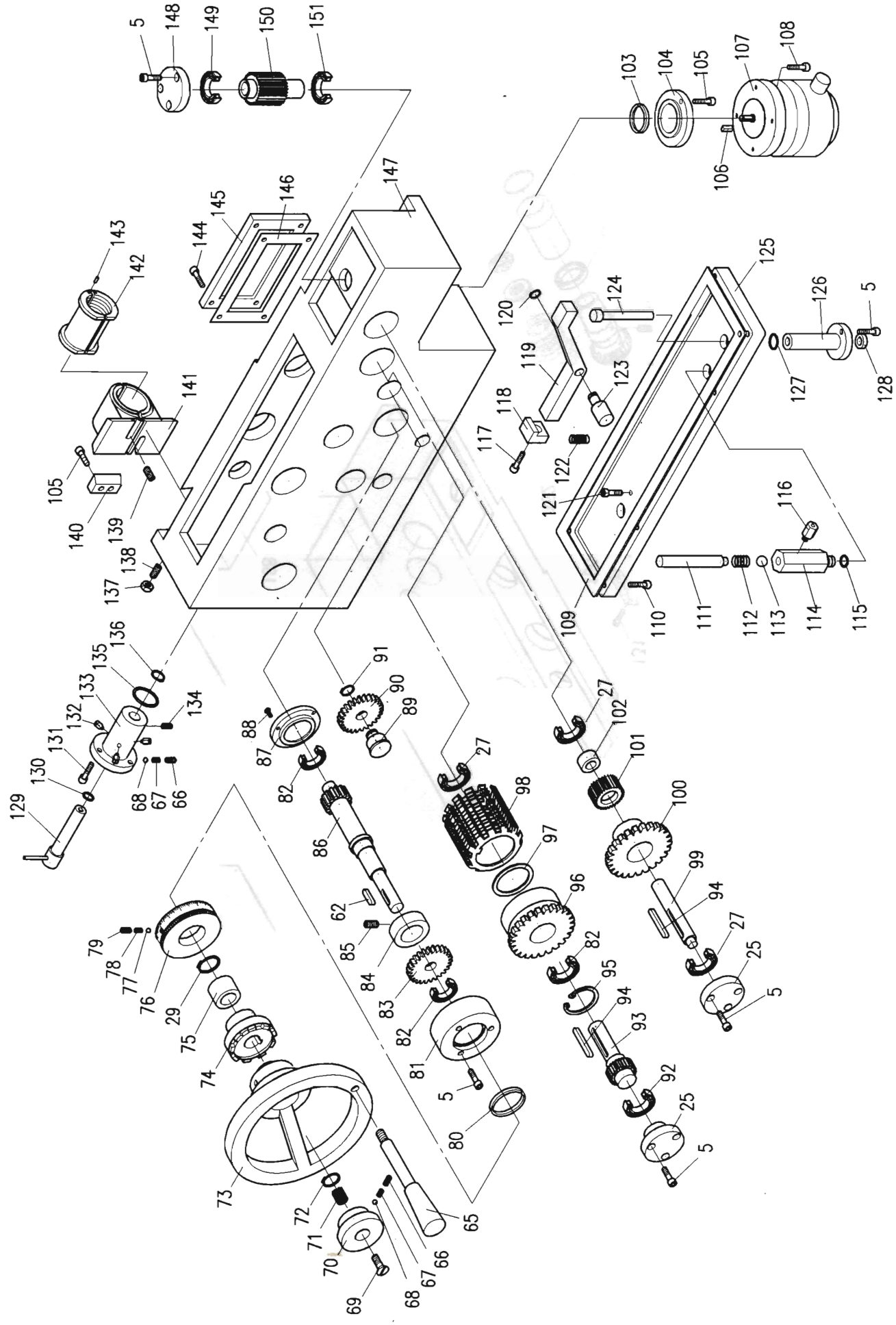
REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
164	9A-40310	NUT	S20C	1
165	9P-40010	NAME PLATE	AL	1
166	9A-40740	COVER	SS41	1
167	9S-40640	COVER		1

# 8-11. Apron(Right Hand)

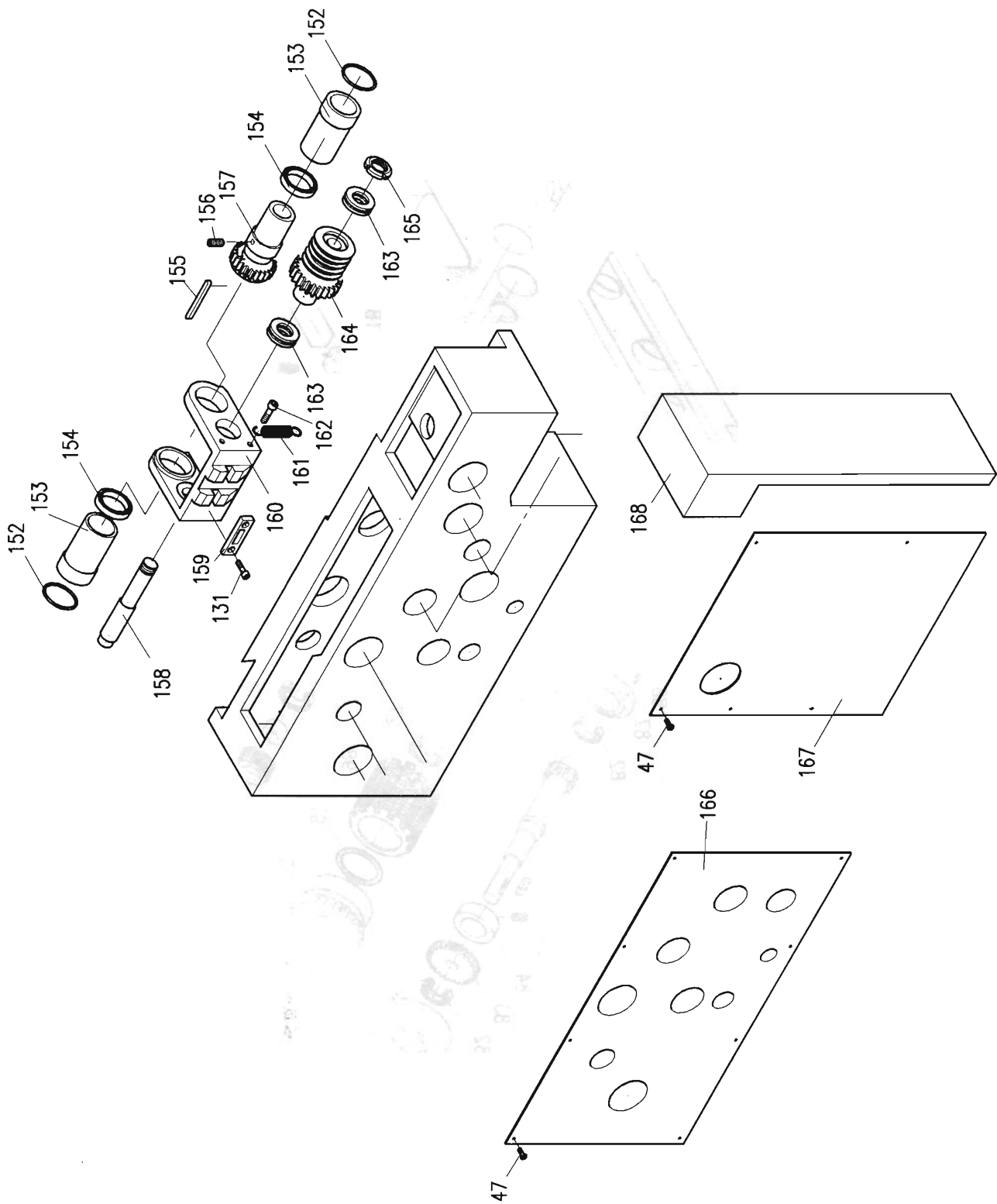




# 11. Apron(Right Hand)



# 8-11. Apron(Right Hand)



## 8-11. Apron(Right Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	7A-40580	PLASTIC KNOB	PLASTIC	3
2	9A-40910	HANDLE	SS41	2
3	9G-40510	HANDLE BOSS	SS41	1
4	P-0350	PIN	#3x50L	1
5	SH-0612	SOCKET HEAD CAP SCREW	M6xP1x12L	35
6	SP-1/4"	SPRING	∅ 1/4"	2
7	SB-1/4"	STEEL BALL	∅ 1/4"	2
8	9A-40650	COVER	FC15	1
9	SH-0815	SOCKET HEAD CAP SCREW	M8xP1.25x15L	1
10	N-8	NUT	M8xP1.25	1
11	P-0345	PIN	#3x45L	1
12	SS-0806	HEXAGON SOCKET SET SCREW	M8xP1.25x6L	1
13	9A-40690R	ROCKER ARM	FC20	1
14	9A-40190	HALF NUT ROD	S45C	1
15	9A-40200	ROD	S45C	1
16	TP-4"x40	TAPER PIN	#4"x40L	1
17	9A-40170	HANDLE	SS41	1
18	SH-0650	SOCKET HEAD CAP SCREW	M6xP1x50	3
19	9A-40160	HANDLE BOSS	SS41	1
20	P-0450	PIN	#4x50L	1
21	9A-40150	SHAFT HOUSING	BC2	1
22	9A-40180	ROD	S45C	1
23	SH-0612	SOCKET HEAD CAP SCREW	M6xP1x12L	2
24	9A-40840	WASHER	SS41	1
25	9A-40610	COVER	FC15	4
26	9A-40130	SHAFT	S45C	1
27	#6204 1RS	BALL BEARING	6204 1RS	6
28	9A-40710R	GEAR	S45C44T	1
29	CS-25	SNAP RING	#25	3
30	9A-40140	GEAR	S45C	1
31	9A-40700	FORK	BC2	1
32	SS-0835	HEXAGON SOCKET SET SCREW	M8xP1.25x35	1
33	9A-40360	COVER	FC15	1
34	#6203-2RS	BALL BEARING	#6203-2RS	2
35	9A-40350	PIN	S20C	1
36	9A-40500	SPRING	∅ 34.5xWire ∅ 3	1
37	9A-40340	GEAR	S45C28T	1
38	9A-40400	CLUTCH GEAR	S45C	1
39	9A-40330	WORM GEAR	BC2	1
40	9A-40320	SHAFT	S45C	1
41	KY-050520	KEY	5x5x20L	1
42	9A-40900	WASHER	SS41	1
43	SS-0608	HEXAGON SOCKET SET SCREW	M6xP1.0x8L	1
44	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
45	9A-40380	HANDLE BOSS	SS41	1
46	SH-0515	SOCKET HEAD CAP SCREW	M5xP0.8x15L	1
47	SH-0408	SCREW	M4xP0.7x8L	9
48	SH-0525	SCREW	M5xP0.8x25L	3
49	9A-40760	COVER	SPC	1
50	SS-0420	SCREW	M4xP0.7x20L	2
51	V-15FC22-1B	MICRO SWITCH	V-15FC22-1B Mi	1
52	9A-40750	BRACKET	AL	1
53	9A-40730	COLLAR	S45C	1
54	9A-40370	SHAFT	S45C	1
55	P-12	O RING	P12	1

## 8-11. Apron(Right Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
56	7A-40090	MOVING PLATE	S45C	1
57	7A-40100R	LOCKING PLATE	S45C	1
58	CS-10	SNAP RING	#10	2
59	9A-40850R	IDLE GEAR	S45C52T	1
60	SS-0812	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	1
61	9A-40100	GEAR	S45C	1
62	KY-7725	KEY	7x7x25L	2
63	9A-40090R	GEAR SHAFT	S45C	1
64	P-9	O RING	P9	1
65	9A-40940	HANDLE	SS41	1
66	SS-0606	HEXAGON SOCKET SET SCRW	M6xP1x6L	1
67	SP3/16"	SPRING	Φ 3/16"xWire#1	1
68	SB3/16"	STEEL BALL	Φ 3/16"	1
69	9A-40080	SCREW	SS41	1
70	9A-40530	CLUTCH	SS41	1
71	SP-1.5x20	SPRING	Φ 1.5x20L	1
72	CS-20	SNAP RING	A20	1
73	9A-40070	HANDLE WHEEL	FC15	1
74	9A-40520	CLUTCH GEAR	S45C	1
75	9A-40510	COLLAR	S20C-D	1
76	9A-40060I	INDEX RING	SS41	1
	9A-40060M	INDEX RING	SS41	1
77	SB-1/4"	STEEL BALL	Φ 1/4"	1
78	SP-1/4"	SPRING	Φ 1/4"	1
79	SS-0808	HEXAGON SOCKET SET SCREW	M8-P1.25x8L	1
80	TC-253508	OIL SEAL	25x35x8L	1
81	9A-40050R	COVER	FC15	1
82	#6005 1RS	BALL BEARING	6005 1RS	4
83	9A-40860R	IDLE GEAR	S45C34T	1
84	9A-40030-1	POSITION COLLAR	S45C	1
85	SS-0812	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	1
86	9A-40040	SHAFT	S45C	1
87	9A-40890R	COVER	FC15	1
88	SH-0412	SCREW	M4xP0.7x12L	3
89	9A-40880R	SHAFT	S45C	1
90	9A-40870R	IDLE GEAR	S45C	1
91	CS-15	SNAP RING	A15	1
92	#6005 1RS	BALL BEARING	6005 1RS	1
93	9A-40620	CLUTCH SHAFT	SCM4	1
94	KY-6650	KEY	6x6x50	1
95	CR-47	SNAP RING	#47	1
96	9A-40630	CLUTCH GEAR	SCM4 35T	1
97	9A-40640	WASHER	SS41	1
98	MWC-1.2	CLUTCH	MWC1.2	1
99	9A-40590	SHAFT	S45C	1
100	9A-40580	GEAR	S45C35T	1
101	9A-40570	WORM GEAR	PBC2 20T	1
102	9A-40600	SPACE COLLAR	SS41	1
103	TC-25x35x8	OIL SEAL	25x35x8	2
104	9A-40560	COVER	FC15	1
105	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
106	KY-5515	KEY	5x5x15L	1
107	1/4HP	MOTOR	1/4HP	1
108	SS-0820	HEXAGON SOCKET SET SCRW	M8xP1.25x20L	4
109	9A-40020P	PACKING	PACKING	1

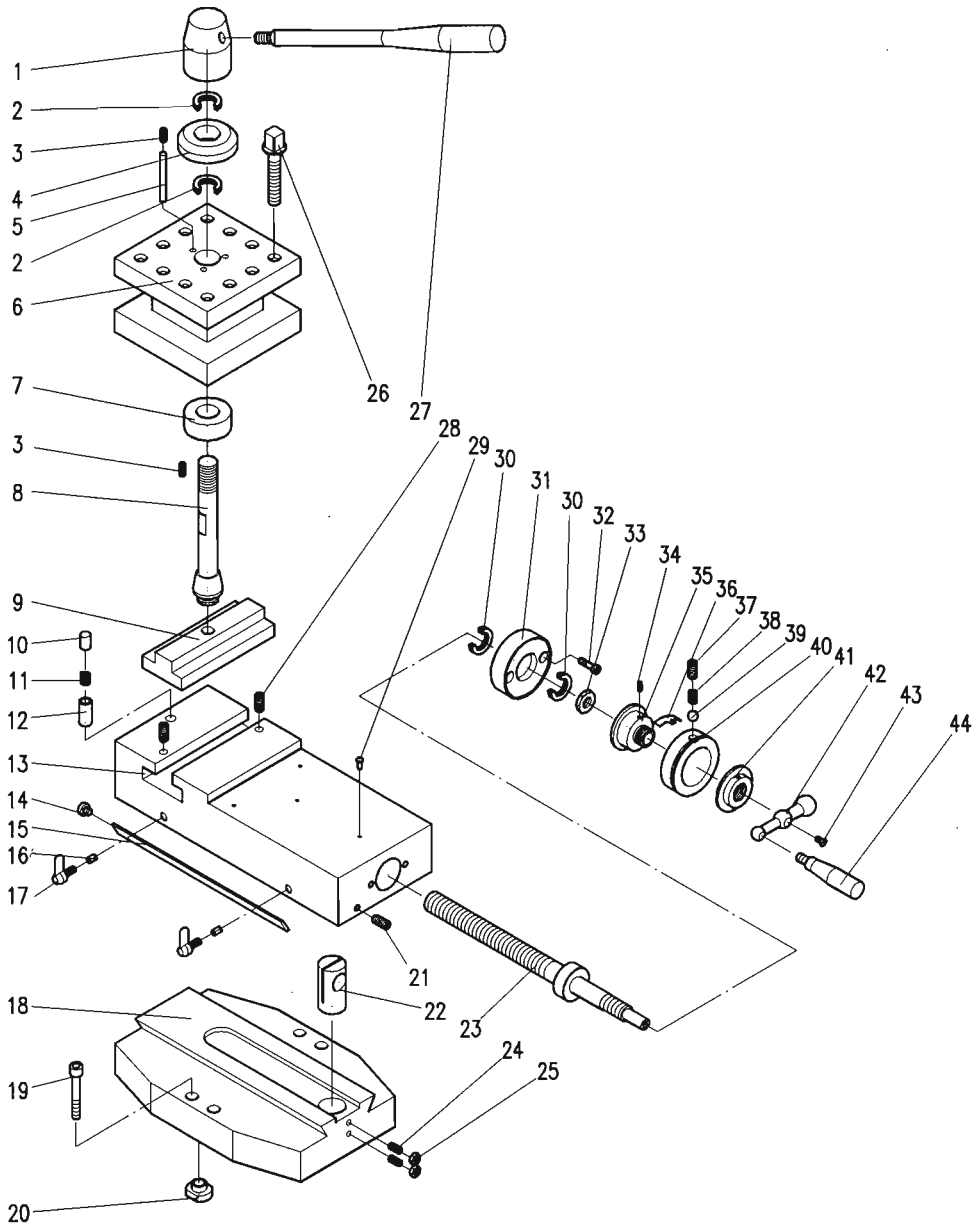
## 8-11. Apron(Right Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
110	SH-0520	SOCKET HEAD CAP SCREW	M5xP0.8x20L	1
111	9A-40410	PISTON	S45C	1
112	SP $\phi$ 1x30L	SPRING	$\phi$ 1x30L	1
113	SB $\phi$ 1/4"	NUT	$\phi$ 1/4"	1
114	PA-020	CYLINDER	BC2	1
115	PA-070	NUT	F45C	1
116	PA-040	VALVE	VALVE	1
117	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	1
118	5A-40450	LOCKING PLATE	S45C	1
119	9A-40390R	ROCKET ARM	FC15	1
120	CS-10	SNAP RING	#10	1
121	PT-1/4	SOCKET HEAD CAP SCREW	PT-1/4	1
122	SP5/16"	SPRING	$\phi$ 5/16xWire#1	1
123	9A-40720	SHAFT	S45C	1
124	9A-40450R	ROD	S45C	1
125	9A-40020R	BOTTOM COVER	FC15	1
126	9A-40460R	STOP ROD BASE	FC25	1
127	TC-10x8x6	OIL SEAL	TC10x8x6	1
128	P-20	O RING	P20	1
129	9A-40420	OIL DISTRIBUTION SHAFT	S45C	1
130	P-11	O RING	P11	1
131	SH-0512	SOCKET HEAD CAP SCREW	M5xP0.8x12L	5
132	PT-1/8	VALVE	1/8PT,PC4	3
133	9A-40430	OIL DISTRIBUTION BASE	FC15	1
134	SS-0612	HEXAGON SOCKET SET SCREW	M6xP1.0x12L	1
135	G-30	O RING	G30	1
136	CS-10	SNAP RING	E10	1
137	N-6	NUT	M6xP1	3
138	SS-0628	HEXAGON SOCKET SET SCREW	M6xP1x28L	3
139	SS-0820	HEXAGON SOCKET SET SCREW	M8xP1.25x20L	2
140	9A-40210	GIB	FC15	1
141	9A-40220	HALF NUT BASE	FC20	1
142	9A-40230I	HALF NUT	BC2	1
	9A-40230M	HALF NUT	BC2	1
143	SS-0525	HEXAGON SOCKET SET SCREW	M5xP0.8x25L	4
144	SH-0510	SOCKET HEAD CAP SCREW	M5xP0.8x10L	4
145	9A-40030	REAR COVER	FC15	1
146	9A-40030P	PACKING	PACKING	1
147	9A-10010R	APRON BOX	FC20	1
148	9A-40550	COVER	FC15	1
149	#6004	BALL BEARING	#6004	1
150	9A-40540	WORM SHAFT	S45C	1
151	#6005-2RS	BALL BEARING	#6005-2RS	1
152	P-38	O RING	P38	2
153	9A-40270	BUSH	BC2	2
154	TC-30x40x7	OIL SEAL	30x40x7	2
155	KY-7735	KEY	7x7x35L	1
156	SH-0508	SCREW	M5xP0.8x8L	1
157	9A-40260	GEAR	S45C26T	1
158	9A-40300	GEAR SHAFT	S45C	1
159	9A-40470	LOCKING PLATE	SS41	1
160	9A-40280R	WORM BASE	FC15	1
161	SP	SPRING	SPRING	1
162	SH-0612	SOCKET HEAD CAP SCREW	M6xP1.0x12L	1
163	TB-51104	THRUST BEARING	#51104	2

## 8-11. Apron(Right Hand)

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
164	9A-40290	GEAR	S45C24T	1
165	9A-40310	NUT	S20C	1
166	9P-40010	NAME PLATE	AL	1
167	9A-40740	COVER	SS41	1
168	9S-40640	COVER		1

# -12. Carriage

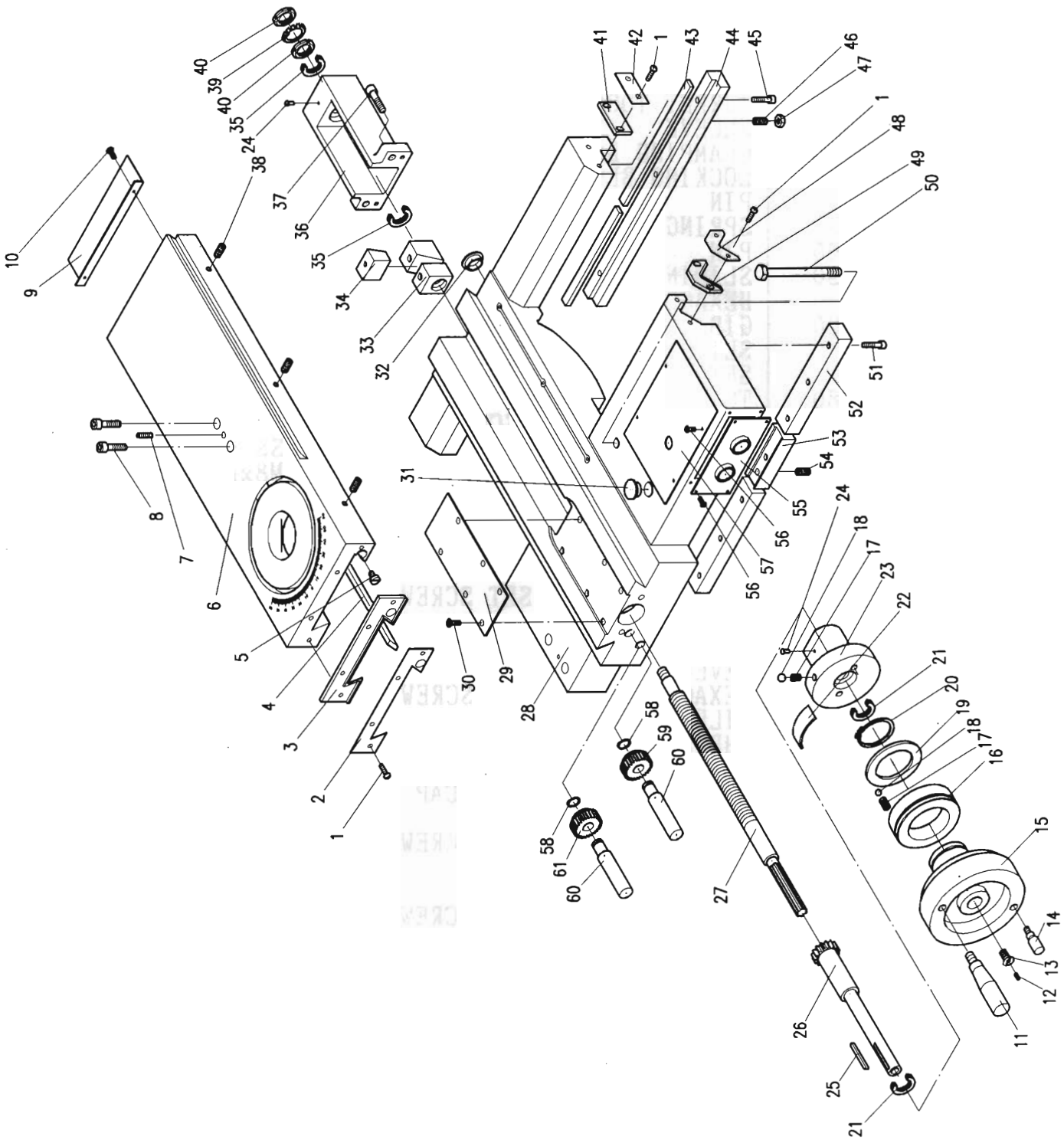


## 8-12. Carriage

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9S-40330	HANDLE BOSS	S20C-D	1
2	#51105	THRUST BEARING	51105	2
3	SS-0812	HEXAGON SOCKET SET SCREW	M8xP1.25x12L	6
4	9S-40320	WASHER	S20C-D	1
5	9S-40570	PIN	SS41	3
6	9S-40300	TURRET TOOL POST	S45C	1
7	9S-40550	SLEEVE	S45C	1
8	9S-40290	CLAMPING BOLT	S45C	1
9	9S-40560	LOCKING BLOCK	SS41	1
10	7S-40480	PIN	SS41	1
11	SP-5/16	SPRING	∅ 5/16	1
12	9S-40260	PIN	SCM21	1
13	9S-40190	SLIDING TABLE	FC20	1
14		HEXAGON SOCKET HEAD CAP SCREW	SS41	1
15	9S-40200	GIB	FC20	1
16	PUB2	SET BLOCK	PUB2	3
17		SET SCREW	S20C-D	3
18	9S-40180	TOOL SLIDE	FC25	1
19	SH-1028	SOCKET HEAD CAP SCREW	M10xP1.5x28L	4
20	9S-40270	NUT	SS41	4
21	SS-0840	HEXAGON SOCKET SET SCREW	M8xP1.25x40L	1
22	9S-40220I	LEADSCREW NUT	PUC 2	1
	9S-40220M	LEADSCREW NUT	PUC 2	1
23	9S-40210I	LEAD SCREW	S45C	1
	9S-40210M	LEAD SCREW	S45C	1
24	SS-0620	HEXAGON SOCKET SET SCREW	M6xP1.0x20L	2
25	N-6	NUT	M6xP1.0	2
26	9S-40270	LOCATING SCREW	SCM4	12
27	9S-40350	LEVER	SS41	1
28	SS-0810	HEXAGON SOCKET SET SCREW	M8xP1.25x10L	2
29	∅ 1/4"	OILER	∅ 1/4"	2
30	#51102	THRUST BEARING	51102	2
31	9S-40190	BRACKET	SS41	1
32	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
33	7S-40580	NUT	S20C-D	1
34	SS-0616	HEXAGON SOCKET SET SCREW	M6xP1.0x16L	1
35	7S-40180	INDEX RING BASE	SS41	1
36	7P-40700	PLATE	AL	1
37	SS-0808	HEXAGON SOCKET SET SCREW	M8xP1.25x8L	1
38	∅ 6x15L	SPRING	∅ 6x∅ 0.8x15L	1
39	∅ 1/4"	STEEL BALL	∅ 1/4"	1
40	7S-40200	INDEX RING	SS41	1
41	7S-40720	NUT	SS41	1
42	7S-40700	LEVER	SS41	1
43	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	1
44	7S-40780	HANDLE	SS41	1



# 8-13. Cross Slide & Saddle Assy'



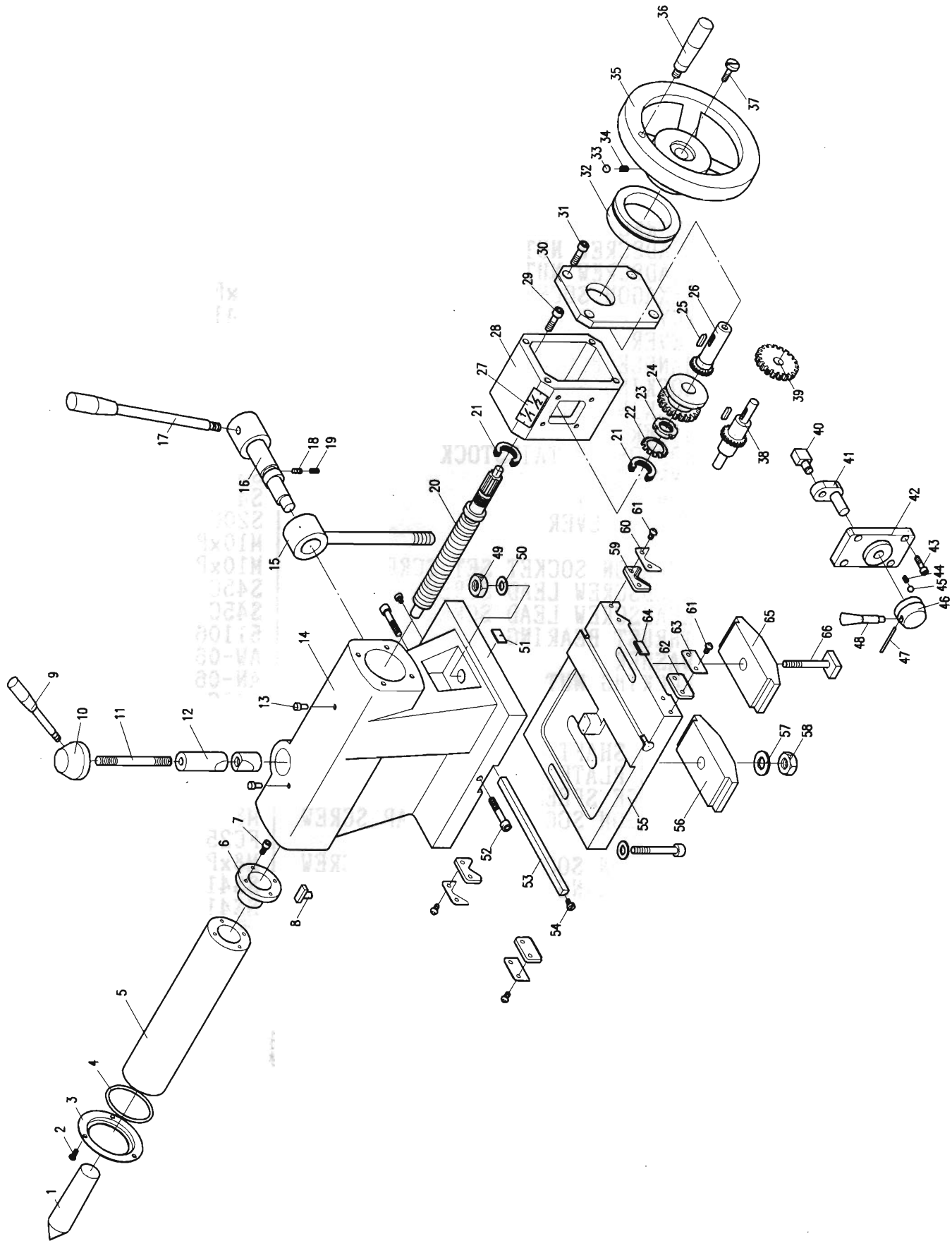
## 8-13. Cross Slide & Saddle Assy'

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	SB-0512	HEX. SOCKET BUTTON HEAD SCREW	M5xP0.8x12L	16
2	9S-40380	WIPER COVER	STAINLESS STEEL	2
3	9S-40370	WIPER	PLASTIC	2
4	9S-40050	GIB	FC20	1
5	7S-40420	ADJUSTING SCREW	SS41	2
6	9S-30020	CROSS SLIDE	FC25	1
7	SS-1025	HEXAGON SOCKET SET SCREW	M10xP1.5x25L	1
8	SH-0830	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	2
9	9S-40340	COVER	SS41	1
10	SH-0610	SCREW	M6xP1.0x10L	2
11	7A-40410	HANDLE	SS41	1
12	SS-0630	HEXAGON SOCKET SET SCREW	M6xP1.0x30L	1
13	7S-40120	SCREW	SS41	1
14	9S-40100	LEVER	SS41	1
15	9S-40080	HANDLE WHEEL	SS41	1
16	9S-40070I	INDEX RING	SS41	1
	9S-40070M	INDEX RING	SS41	1
17	ϕ 1/4"	SPRING	ϕ 1/4"	2
18	ϕ 1/4"	STEEL BALL	ϕ 1/4"	2
19	9S-40530	WASHER	SS41	1
20	A-50	SNAP RING	A50	1
21	#51104	THRUST BEARING	#51104	2
22	7S-40550	COVER	SS41	1
23	9S-40090	BRACKET	FC15	1
24	ϕ 1/4"	OILER	ϕ 1/4"	2
25	KY-5540	KEY	5x5x40L	1
26	9S-40030	SHAFT	S45C	1
27	9S-30040I	LEAD SCREW	S45C	1
	9S-30040M	LEAD SCREW	S45C	1
28	9S-30010	CARRIAGE	FC25	1
29	9S-40430	OIL COVER	SS41	1
30	SH-0408	SCREW	M4xP0.7x8L	6
31	ϕ 3/4"	PLUG	ϕ 3/4"	1
32	9S-40630	COVER	PLASTIC	1
33	9S-40110I	LEADSCREW NUT	PBC2	1
	9S-40110M	LEADSCREW NUT	PBC2	1
34	9S-40510	ADJUSTMENT BOLK	SS41	1
35	#51104	THRUST BEARING	51104	2
36	9S-40120	BRACKET	FC15	1
37	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	2
38	SS-0830	HEXAGON SOCKET SET SCREW	M8xP1.25x30L	3
39	AW-04	WASHER	AW04	1
40	AN-04	NUT	AN04	2
41	9S-40410	WIPER	PLASTIC	2
42	9S-40420	WIPER COVER	STAINLESS STEEL	2
43	9S-40140	GIB	SS41	2
44	9S-40130	ADJUSTMENT GIB	FC20	1
45	SH-0835	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x35L	5
46	SS-0825	HEXAGON SOCKET HEAD SCREW	M8xP1.25x25L	5
47	N-8	NUT	M8	5
48	9S-40400	WIPER COVER	STAINLESS STEEL	2
49	9S-40390	WIPER	PLASTIC	2
50	M10x130L	HEXAGON BOLT HEXAGON BOLT	M10xP1.5x130L	1
51	SH-0820	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x20L	6
52	9S-40150	LOCK PLATE	FC15	2

## 8-13. Cross Slide & Saddle Assy'

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
53	9S-40360	LOCK PLATE	SS41	1
54	SS-0620	HEXAGON SOCKET SET SCREW	M6xP1.0x20L	1
55	9P-40010	NAME PLATE	AL	1
56	SB-0408	HEX. SOCKET BUTTON HEAD SCREW	M4xP0.7x8L	8
57	9S-40770	COVER	SS41	1
58	CS-12	SNAP RING	E12	2
59	9S-40160	GEAR	SCM21	1
60	9S-40170	SHAFT	S45C	2
61	9S-40650	GEAR	SCM21	1

# 8-14. Tailstock



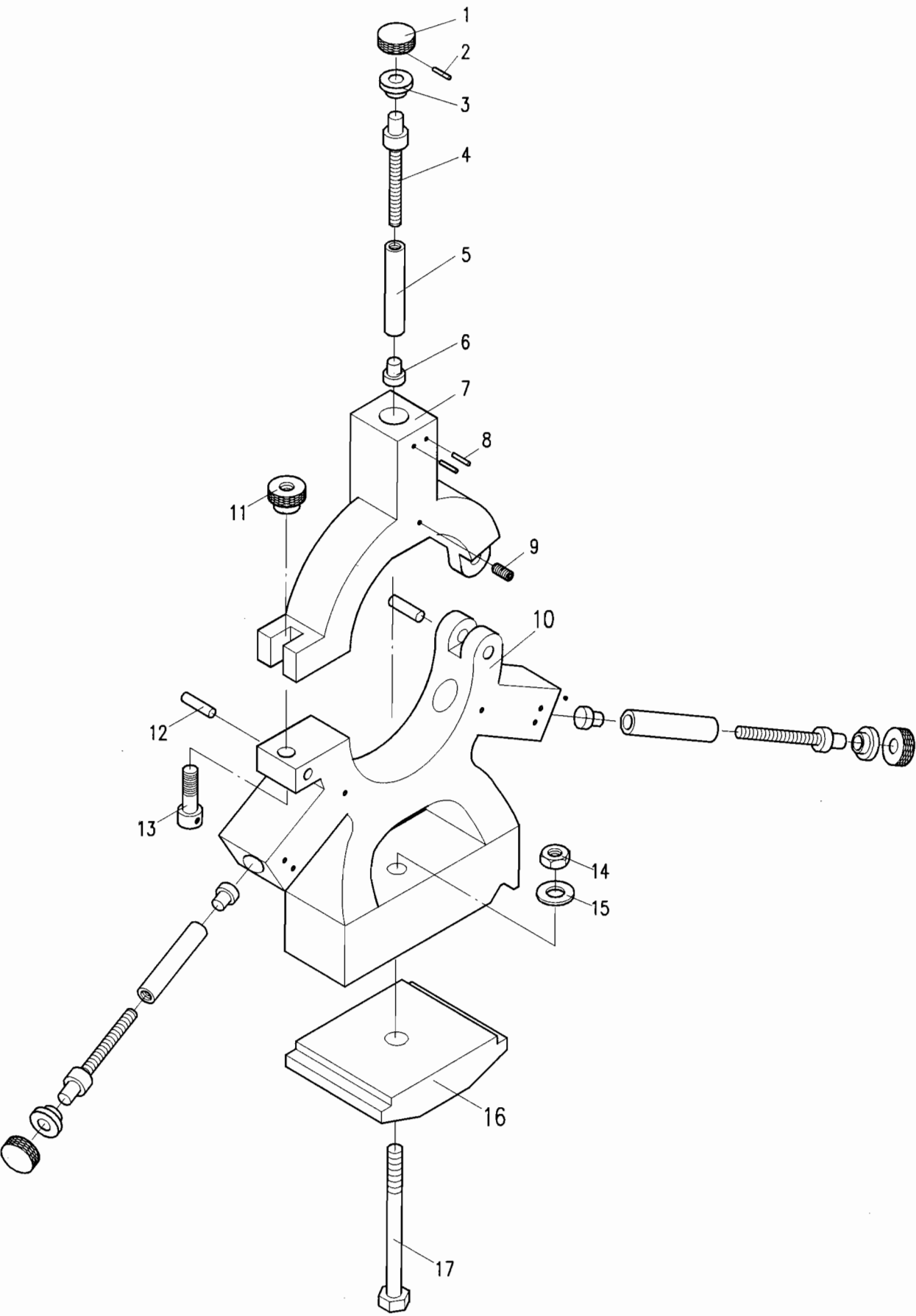
## 8-14. Tailstock

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	MT-5#	CENTER	MT 5#	1
2	CH-0510	CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	3
3	9T-40170	COVER	FC15	1
4	P-75	"O" RING	P75	1
5	9T-40030	BARREL	S45C	1
6	9T-40050I	LEADSCREW NUT	SS41	1
	9T-40050M	LEADSCREW NUT	SS41	1
7	SH-0816	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x16L	4
8	9T-40110	KEY	SS41	1
9	9T-40280	LEVER	SS41	1
10	9T-40270	HANDLE BOSS	SS41	1
11	9T-40260	LOCKING SCREW	SS41	1
12	9T-40250	LOCKING ROD	BC2	1
13	OB-04	OILER	1/2"	2
14	9T-30010	BODY OF TAILSTOCK	FC15	1
15	9T-40200	EYE BOLT	SS41	1
16	9T-40190	CAM SHAFT	S45C	1
17	9T-40180	CLAMP LEVER	S20C-D	1
18	SS-1008	SCREW	M10xP1.0x8L	2
19	SS-1010	HEXAGON SOCKET SET SCREW	M10xP1.0x10L	1
20	9T-40040I	LEADSCREW LEAD SCREW	S45C	1
	9T-40040M	LEADSCREW LEAD SCREW	S45C	1
21	#51106	THRUST BEARING	51106	2
22	AW-06	WASHER	AW-06	1
23	AN-06	LOCKING NUT	AN-06	1
24	9T-40120	GEAR	S45C	1
25	KY-6625	KEY	6x6x25L	1
26	9T-40060	GEAR SHAFT	S45C	1
27	9P-40160	NAME PLATE	AL	1
28	9T-40160	CHANGE SPEED BOX	FC20	1
29	SH-0830	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	4
30	9T-40100	COVER	FC25	1
31	SH-0830	HEXAGON SOCKET HEAD CAP SCREW	M8xP1.25x30L	4
32	9T-40090I	INDEX RING	SS41	1
	9T-40090M	INDEX RING	SS41	1
33	ϕ 1/4	BALL	ϕ 1/4	3
34	S-6x0.8x10	SPRING	6x0.8x10L	3
35	9T-30350	HANDLE WHEEL	FC15	1
36	9A-40940	HANDLE	SS41	1
37	9A-40080	SCREW	SS41	1
38	9T-40140	GEAR SHAFT	S45C	1
39	9T-40150	GEAR	S45C	1
40	9T-40240	CHANGE SPEED BLOCK	BC2	1
41	9T-40230	ROCKER ARM	FC15	1
42	9T-40220	COVER	FC20	1
43	SH-0612	HEXAGON SOCKET HEAD CAP SCREW	M6xP1.0x12L	4
44	ϕ 6x0.8	SPRING	O.D. ϕ 6 WIRE 0.8	1
45	ϕ 1/4"	STEEL BALL	ϕ 1/4"	1
46	9H-40910	HANDLE BOSS	S20C-D	1
47	P-0550	PIN	ϕ 5x50L	1
48	9H-40930	LEVER	S20C-D	1
49	N-16	NUT	M16	1
50	9T-40080	WASHER	ϕ 16	1
51	9P-40010	NAME PLATE	AL	1
52	SH-1050	HEXAGON SOCKET HEAD CAP SCREW	M10x1.5x50L	2

## 8-14. Tailstock

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
53	9T-40330	GIB	FC20	1
54	7T-40210	ADJUSTING SCREW	SS41	2
55	9T-30020	TAILSTOCK BASE	FC25	1
56	9T-40210	CLAMP PLATE	FC20	1
57	9T-40320	WASHER	SS41	1
58	N-16	NUT	M16	1
59	9T-40290	WIPER	RUBBER	2
60	9T-40300	WIPER COVER	STAINLESS STEEL	2
61	CH-0510	CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	8
62	9S-40410	WIPER	RUBBER	2
63	9S-40420	WIPER COVER	STAINLESS STEEL	2
64	9P-40030	NAME PLATE	AL	1
65	9T-40340	LOCKING BLOCK	FC15	1
66	9T-40070	LOCKING ROD	SS41	1

# 8-15. Steady Rest

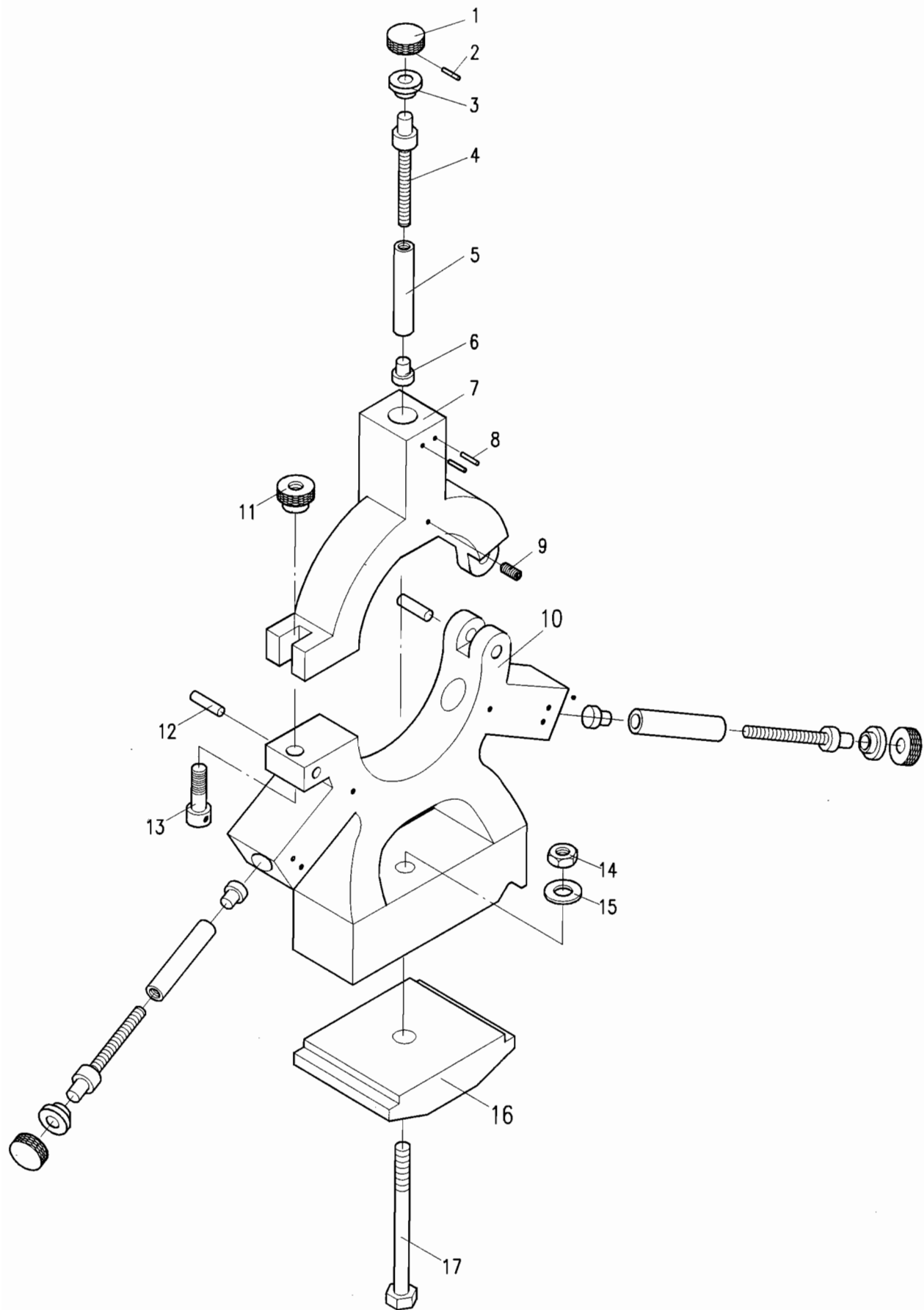


## 8-14. Tailstock

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
53	9T-40330	GIB	FC20	1
54	7T-40210	ADJUSTING SCREW	SS41	2
55	9T-30020	TAILSTOCK BASE	FC25	1
56	9T-40210	CLAMP PLATE	FC20	1
57	9T-40320	WASHER	SS41	1
58	N-16	NUT	M16	1
59	9T-40290	WIPER	RUBBER	2
60	9T-40300	WIPER COVER	STAINLESS STEEL	2
61	CH-0510	CROSS RECESSED HEAD MACHINE SCREW	M5xP0.8x10L	8
62	9S-40410	WIPER	RUBBER	2
63	9S-40420	WIPER COVER	STAINLESS STEEL	2
64	9P-40030	NAME PLATE	AL	1
65	9T-40340	LOCKING BLOCK	FC15	1
66	9T-40070	LOCKING ROD	SS41	1



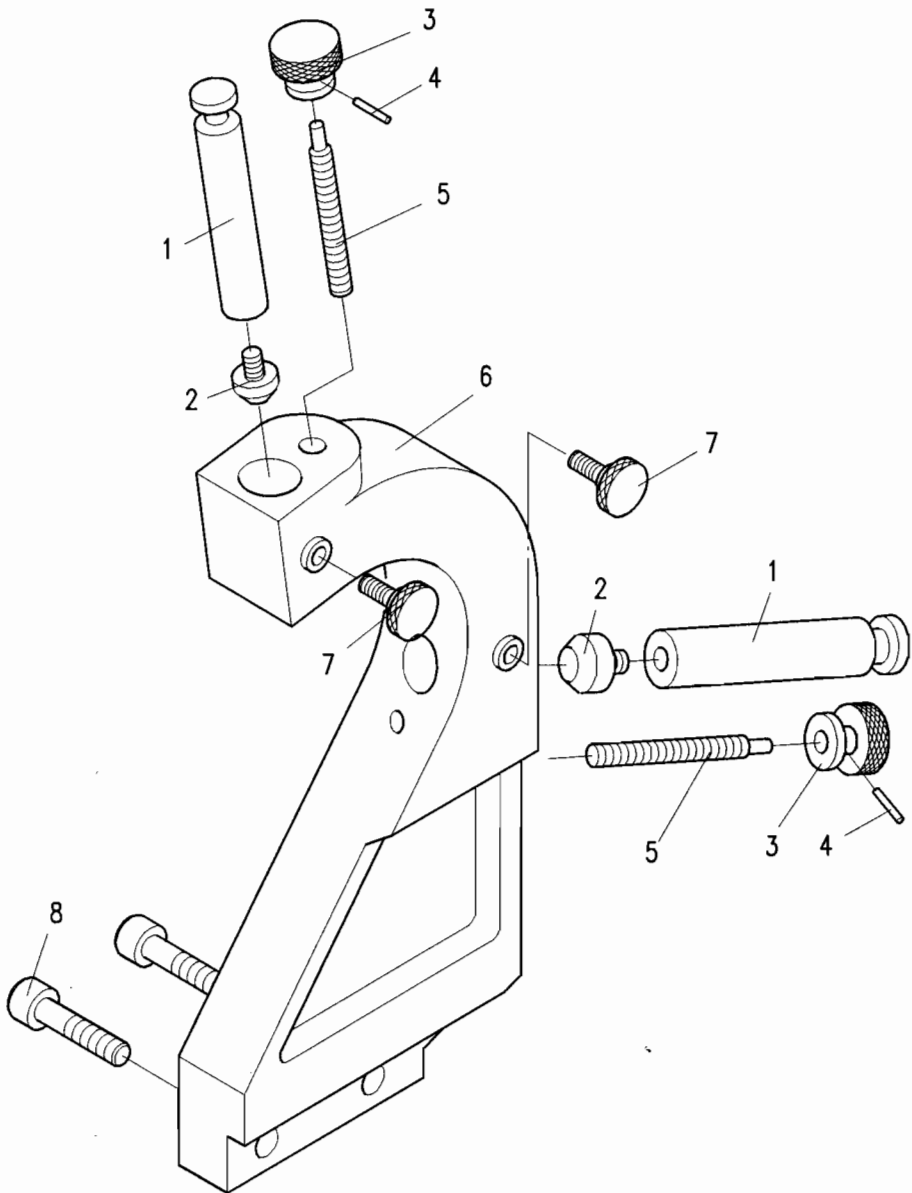
# 8-15. Steady Rest



## 8-15. Steady Rest

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9C-40060	Adjustment wheel	S20C-D	3
2	P-4	Pin	#4	3
3	9C-40120	Cover	S20C-D	3
4	9C-40050	Adjustment screw	SS41	3
5	9C-40030	Shaft	S20C-D	3
6	9C-40040	Bush	BC2	3
7	9C-30020	Cover	FC15	1
8	P-4	Pin	#4	6
9	SS-1012	Set screw	M10xP1.5x12L	3
10	9C-30010	Body of steady rest	FC15	1
11	9C-40080	Nut	S20C-D	1
12	9C-40090	Connect rod	S20C-D	2
13	9C-40070	Locking screw	S20C-D	1
14	N-18	Nut	M18xP2.5	1
15	W-16	Washer	#16	1
16	9T-40210	Locking plate	FC15	1
17	SH-18115	Screw	M18xP2.5x115L	1

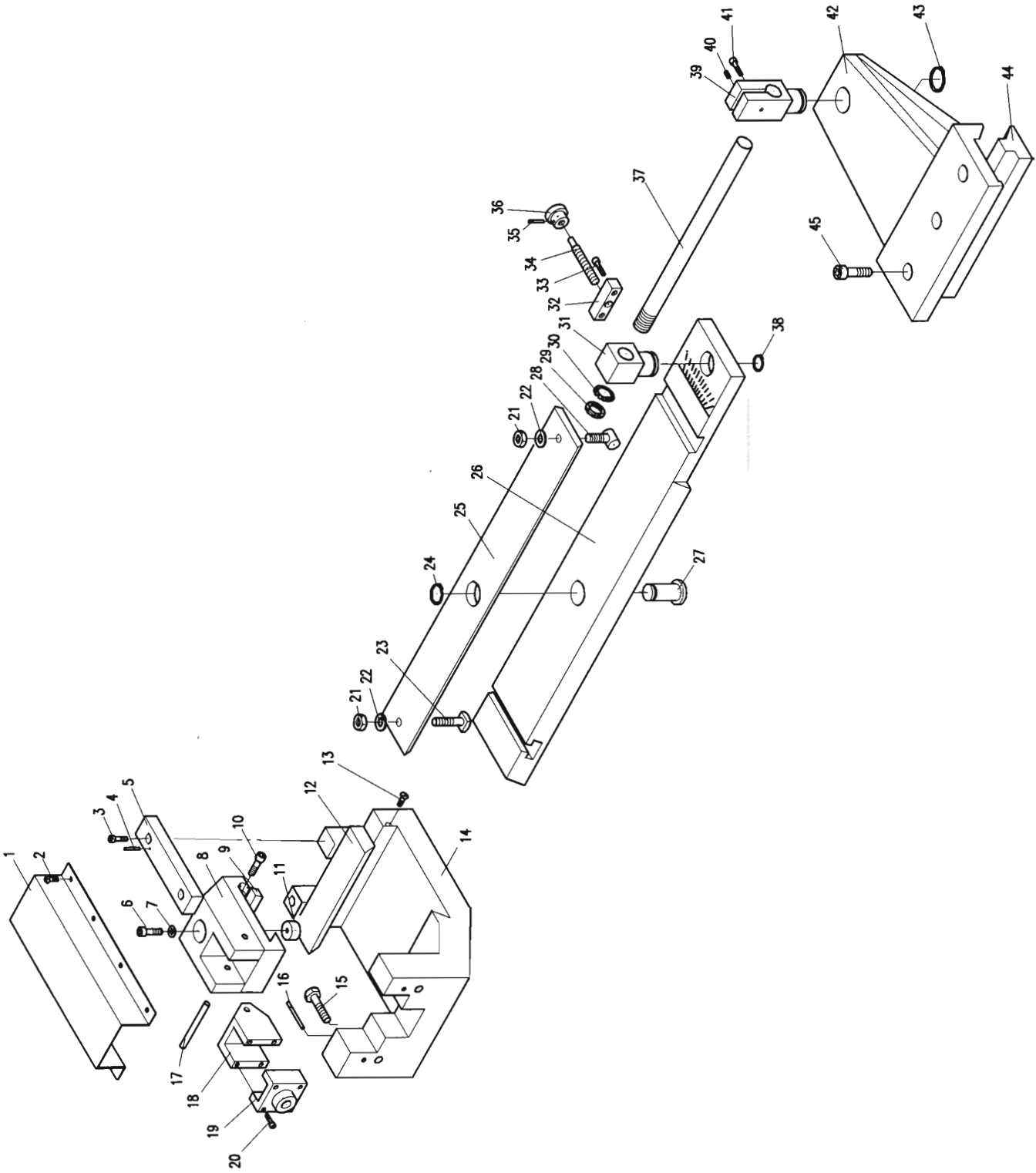
# 8-16. Follow Rest



## 8-16. Follow Rest

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	SS-1020	SET SCREW	M10cP1.5x20L	2
2	9F-40010	BODY OF FLOW REST	FC25	1
3	9F-40030	CLAW	BC2	2
4	9F-40020	CLAW SHAFT	S20C-D	2
5	9F-40040	ADJUSTMENT SCREW	S20C-D	2
6	∅ 3x20L	SPRING PIN	∅ 3x20L	2
7	9F-40050	HANDLE BOSS	SS41	2
8	SH-1240	SOCKET HEAD CAP SCREW	M12xP1.75x40L	2

# -17. Taper Turning Attachment



## 8-17. Taper Turning Attachment

REF NO.	PART NO.	PART NAME	SPECIFICATION	USED Q'TY
1	9TA-143(N)	COVER	S45CxSS41	1
2	MS-0610	MACHINE SCREW	M6xP1x10L	8
3	SH-0815	SOCKET HEAD CAP SCREW	M8xP1.25x15L	4
4	TP0320	TAPER PIN	#3x20L	4
5	9TA-253(N)	COMPRESS PLATE	FC25	2
6	SH-0610	SOCKET HEAD CAP SCREW	M6xPx10L	1
7	9TA-103(N)	WASHER	SS41	1
8	7S-410	ADJUSTMENT SCREW	SS41	1
	7S-420	ADJUSTMENT SCREW	SS41	1
9	9TA-133(N)	GIB	S20C	1
10	9TA-043(N)	SLIDING SADDLE	FC25	1
11	9TA-093(N)	SHAFT	S45C	1
12	9TA-123(N)	GIB	FC25	1
13	7S-500	ADJUSTMENT SCREW	SS41	2
14	9TA-013(N)	BODY OF TAPER ATTACHMENT	FC25	1
15	SH-1245	SOCKET HEAD CAP SCREW	M12xP1.75x45L	4
16	9TA-193(N)	PAPER PIN	#5x64L	2
17	9TA-113(N)	SHAFT	S45C	1
18	9TA-063(N)	CONNTING BLOCK	FC25	1
19	9TA-073(N)	SHAFT BUSH	FC25	1
20	SH-0616	SOCKET HEAD CAP SCREW	M6xP1.0x16L	4
21	M12	NUT	M12-P1.75	2
22	M-12	WASHER	M12	2
23	9TA-183(N)	BOLT	S45C	1
24	SR25	SNAP RING	A25	1
25	9TA-033(N)	GUIDE PLATE	FC25	1
26	9TA-023(N)	SLIDE PLATE	FC25	1
27	9TA-083(N)	SHAFT	S45C	1
28	9TA-173(N)	BOLT	S45C	1
29	AN-04	LOCK NUT	AN04	2
30	AW-04	LOCK WASHER	AW04	1
31	9TA-163(N)	SHAFT	S45C	1
32	9TA-203(N)	SIDE PLATE	SS41	1
33	SH-0620	SOCKET HEAD CAP SCREW	M6xP1x20L	2
34	9TA-213(N)	ADJUSTMENT SCREW	S45C	1
35	SP-320	SPING PIN	φ 3x204	1
36	9TA-190	HANDLE	S20C	1
37	9TA-153(N)	CONNECTING ROD	S20C-D	1
38	SR-20	SNAP RING	A20	1
39	9TA-223(N)	SHAFT	S45C	1
40	SS-0818	HEXAGON SOCKET SET SCREW	M8xP1.25x18L	1
41	SH-0825	SOCKET HEAD CAP SCREW	M8xP1.25x25L	1
42	9TA-223(N)	CLAMP BRACKET	FC20	1
43	SR-20	SNAP RING	A20	1
44	9TA-243(N)	COMPRESS PLATE	FC25	1
45	SH-1255	SOCKET HEAD CAP SCREW	M12xP1.75x55L	3