

# **PALMGREN**

## **LATHE MACHINE**



***Read carefully and follow all safety rules and operating instructions before  
First use of this product***

## CONTENTS

Preface.....	2
1.Safety Rules for Lathes.....	3
2.Machine Specification .....	6
3.Constructional Indication.....	8
4.Unpacking and Installation.....	9
4.1 Unpacking.....	9
4.2 Cleaning.....	9
4.3 Installation.....	9
5.Lubrication.....	10
5.1 Headstock.....	10
5.2 Gearbox.....	10
5.3 Apron.....	10
5.4 Change gears.....	10
5.5 Others parts.....	10
6.Test Running.....	11
6.1 Operation symbols.....	11
6.2 Spindle speed control.....	12
7.Thread and Feed Selection.....	13
7.1 Thread and feed selection.....	13
7.2 Feed and thread tables.....	13
7.3 Thread cutting operation.....	17
8.Electric Circuit Control.....	19
9.Chucks and Chuck Mounting.....	21
10.Maintenance and Servicing.....	22
10.1 Lathe alignment.....	22
10.2 Saddle strip.....	22
10.3 Cross slide.....	22
10.4 Compound rest.....	23
10.5 Cross slide nut.....	23
10.6 Tail stock bed clamp.....	23
11.Bed Assembly.....	24
12.Headstock Assembly.....	29
13.Gearbox Control.....	36
14.Apron.....	42
15.Cross Slide & Compound.....	45
16.Tailstock Assembly.....	48
17.Steady & Follow Rest.....	52
18.Coolant System.....	54

## **Preface**

For an efficient and appropriate way of utilization, also for extending the machine's life, all the operators are requested to carefully read the instruction of this Manual before start to operate.

Most of the operators think, according to their own experience, they can handle the machine appropriately and hopeful to neglect what so important items in this booklet. Anyhow, we may say, as per previous experiencing, that many of the breakdowns are resulted from ignoring the instructions of the Manual. Although you have our one-year's warranty for the damage caused by the defect of the machine, either in material or functional, we will not take any responsibility for any damages arise out of improper operation.

In the mean time, besides specification, operator should also thoroughly and deeply acknowledge the character, function and maintenance of this machine before starting.

Generally, in addition to the description stated in coming chapter, you are requested to notice the following points:

1. Never install the machine in the place where the sun shines directly or where the radiation of heat can reach for avoiding from affecting the accuracy of the machine.
2. Use only the recommended lubrication oil.
3. Clean the machine every time when finish working, or a cover will be a plus to prevent the dust.
4. Try to get rid of chips or dusts especially in the grooves of the machine. Keep it as clean as possible or it may be scratched.
5. Whenever the grooves of the machine damaged by falling in extra articles, don't ever try to move Apron. It needs to be repaired to resume its work.

Hope this Operation Manual can be of great assistance and provide you more convenience when operating. The content of this Manual is the best solution derived from our long terms of manufacturing and operating experience. We wish to service you always with a policy of upgrading quality and a conviction in pursuit of perfection.

## **1. Safety Rules for Lathes**

Safety is a combination of operator common sense and alertness at all times when lathe is being used. Study these safety rules and general safety rules before operating and retain for future use.

(1) Do not grip a component with grease or oil on it.

Grip all components firmly.

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.

Know how to hold components properly when lifting.

(2) Be sure to clean oil or grease from hand tools, levers and handles.

Be sure there is enough texture on the surface of the hand tool or lever handle for proper safe hand contact.

(3) Grip hand tools and lever handles firmly.

Always choose the proper hand tool and appropriate grip position on the lever handle.

Do not use hand tools or lever handles in an awkward position.

Do not apply excessive force.

(4) Always use the recommended gripping position to grasp hand tools and lever handles.

(5) Do not allow turning or hand tools to be caught in the chuck or other holding device.

(6) Do not use broken, chipped or defective tools.

(7) Be sure work piece cannot move in chuck or other holding device.

(8) Beware of irregular shaped work pieces.

(9) Beware of large burrs on work pieces.

(10) Always select the correct tool for the job.

(11) Do not run the machine unattended.

(12) Do not use tools without handles.

(13) Always support the work piece as necessary using chucks, steadies and centers.

(14) Correctly locate tool in socket heads and screw slots.

(15) Beware of obstructions that prevent complete tightening of screws-ensure screw is tight.

(16) Do not rush work.

(17) Never substitute the wrong size tools if the correct sized tool is not available or cannot be located in the shop.

(18) Do not move guards while lathe is under power.

(19) Do not place hand or body in path of moving objects.

Beware of moving lathe parts that can fall.

Beware of 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 at the chuck or work piece.

Beware of hands or other parts of the body that may in position to be hit by a chuck or work piece.

(20) Beware of accidentally moving levers or turning the power on.

(21) Know the function of each and every control.

(22) Never place hand on chuck or workpiece to stop rotation of the spindle.

(23) Make sure power has been turned off when lathe is unused for sometime.

(24) Allow chuck to stop before operating it.

(25) Always check chuck area for chuck keys and loose items.

(26) Never start spindle with chuck key in the chuck.

(27) Do not allow distractions to interfere with lathe operations.

Do not operate lathe whilst talking.

(28) Beware of lathe dangers when attending to other aspects of lathe operation.

E.g. whilst operating tailstock.

(29) Beware of loose clothing near the rotating parts of the lathe.

(30) Beware of loose hair near the rotating parts of the lathe.

(31) Beware of performing another operating while in close proximity to rotating parts on the lathe.

(32) Always attend to filing and deburring operations.

Always pay attention to file or deburring tools close to the chuck , files and deburring tools may catch on chuck.

(33) Be sure lathe is in neutral position when placing gauges on components gripped in the chuck.

(34) Be sure motor is not running when using gauges on the machine.

(35) Always wear protection before operating the lathe.

Always wear the correct protection for even a short time when operating the lathe.

Never remove protection for even a short time when operating the lathe.

Wear protection devices correctly.

Know the correct way to wear protective devices.

(36) Beware of material flying from the lathes.

(37) Keep protective guards at the point of operation.

Know how to set or attach protective guards properly.

Never use the wrong protective guard.

(38) (a) When the chuck and workpiece are in motion never reach over, under or around a workpiece to make an adjustment.

(b) Never reach over, under or around a workpiece to retrieve anything.

(c) Beware of there you leave your tools during set up.

(d) Never reach over, under or around workpiece to move hand tool/lathe to another position.

(e) Never reach over, under or around the workpiece to tighten a lathe part.

(f) Never reach over, under or around workpiece to remove swarf.

- (39) Know the proper procedure for applying loads.  
Never apply force from an awkward position.
- (40) Never mount a workpiece too large for the lathe.
- (41) Never mount a workpiece too large for the operator to handle.
- (42) Use the equipment necessary for handling workpiece.
- (43) Never apply undue force on the accessory or control lever.
- (44) Secure all workpiece.
- (45) Secure all jaws, nuts, bolts and locks.
- (46) Always use the excessive force in polishing, filling and deburring.
- (47) Never take cuts beyond lathe's capability.
- (48) Never use excessive force in polishing, filling and deburring.
- (49) Always use the proper hand tool to remove swarf. Never hurry to remove swarf beware of swarf wrapped around the chuck or workpiece.
- (50) Never change gears by moving them with your hands.
- (51) Beware of tools/lathe parts falling on controls.

## **2. Machine Specification (13"×40"Engine lathe)**

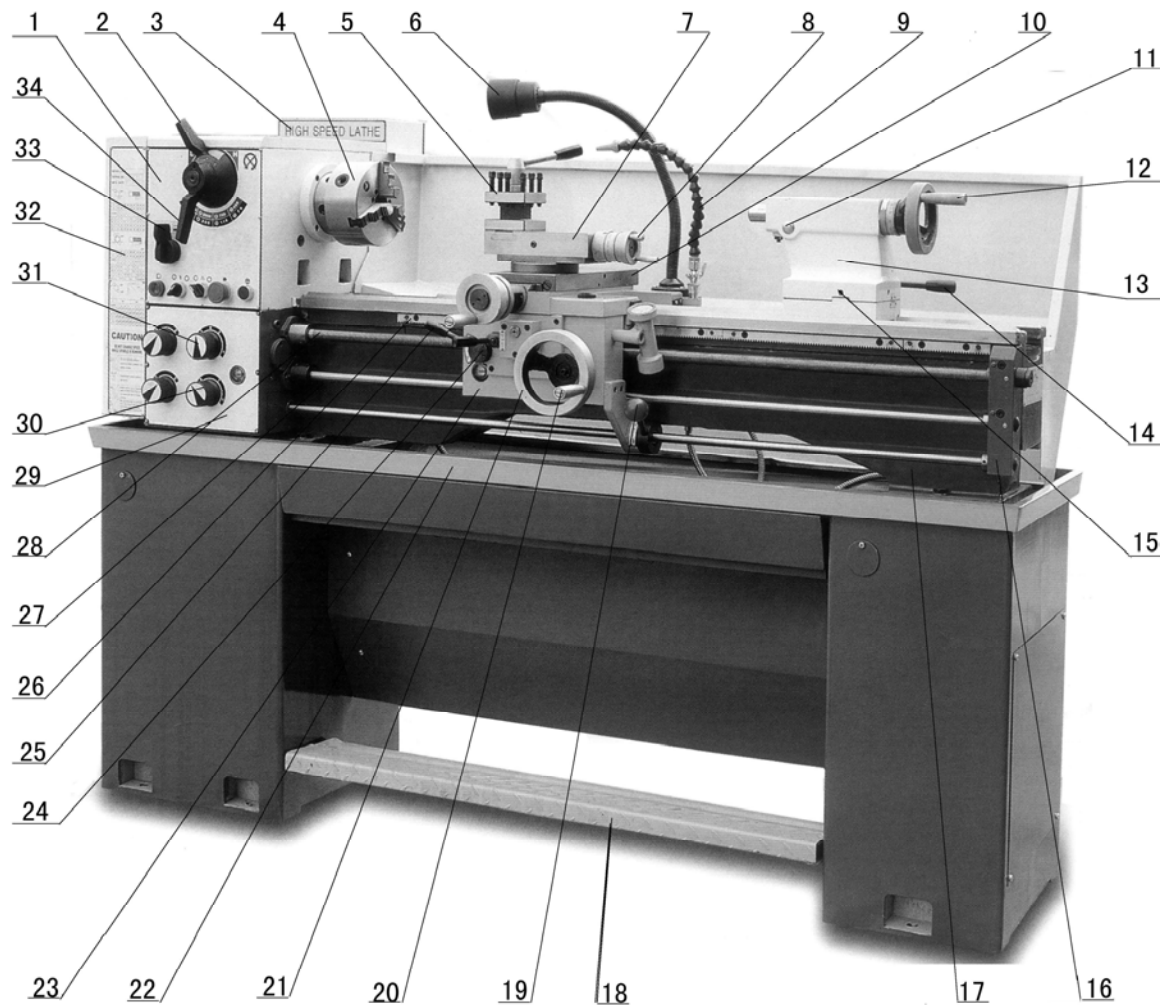
Bench lathe are especially suitable for machining, tool rooms and repairing working shops to machine shafts, spindle, sleeves, and disc work piece of middle or small types. They can also be used to cut imperial, diametric and module thread, and with compact construction and reasonable composition, they can cut very well. They are easy and reliable to operate, convenient to repair high in efficiency, and low noise.

## Technical specification

Swing over bed.....	330mm/13"
Swing over support.....	190mm/7.48"
Swing over gap.....	475mm/18.7"
Center height.....	165mm/6.49"
Distance between centers .....	1000mm(40")
Bed width.....	185mm/7.28"
Bed height.....	290mm/11.4"
Motor output .....	1.5kw/2HP
Voltage.....	230V/460V,prewired 230V
Spindle bore.....	.2"
Cam lock system.....	D1-5
Spindle speed.....	1680rpm
Spindle taper.....	MT6
Cross slide travel.....	160mm/6.3"
Compound slide travel.....	95mm3.74"
Leadscrew diameter.....	22mm0.86"
Feed rod diameter.....	19mm/0.748"
Cutting tool (Max. section) .....	16mm×16mm/0.63"×0.63"
Imperial thread.....	4-56T.P.I
Metric thread.....	0.4-7mm
Longitudinal feed.....	0.052-1.392mm/rev
Cross-feed.....	0.014-0.380mm/rev
Tailstock quill diameter & taper.....	MT3
NW/GW.....	520/640kgs(1144/1408lbs)
Packing Size(cm).....	1930×760×1450 mm/76"30"×57"



### 3. Constructional Indication



- |                                 |                                      |
|---------------------------------|--------------------------------------|
| 1. Headstock                    | 18. Foot-Brake                       |
| 2. Speed Selector               | 19. Spindle Control Lever            |
| 3. Eclectic Control Box         | 20. Longitudinal Traverse Hand wheel |
| 4. Spindle With Three-Jaw Chuck | 21. Longitudinal Traverse Hand Lever |
| 5. Tool Post                    | 22. Chip Tray                        |
| 6. Work Lamp                    | 23. Apron                            |
| 7. Compound Rest                | 24. Feed Axis Selector               |
| 8. Compound Rest Handle         | 25. Thread Cutting Engagement Lever  |
| 9. Coolant                      | 26. Rack                             |
| 10. Cross Slide                 | 27. Control Rod                      |
| 11. Quill Clamp Body            | 28. Lead screw                       |
| 12. Quill Travers Handle        | 29. Gear Box                         |
| 13. Tailstock                   | 30. Feed Box Selector                |
| 14. Tailstock Clamp Lever       | 31. Feed Box Selector                |
| 15. Tailstock Set-Over Screw    | 32. Gear Box Cover                   |
| 16. Support Body                | 33. Feed Direction Selector          |
| 17. Bed                         | 34. Speed Selector Lever             |

## 4. Unpacking and Installation

### 4.1. Unpacking

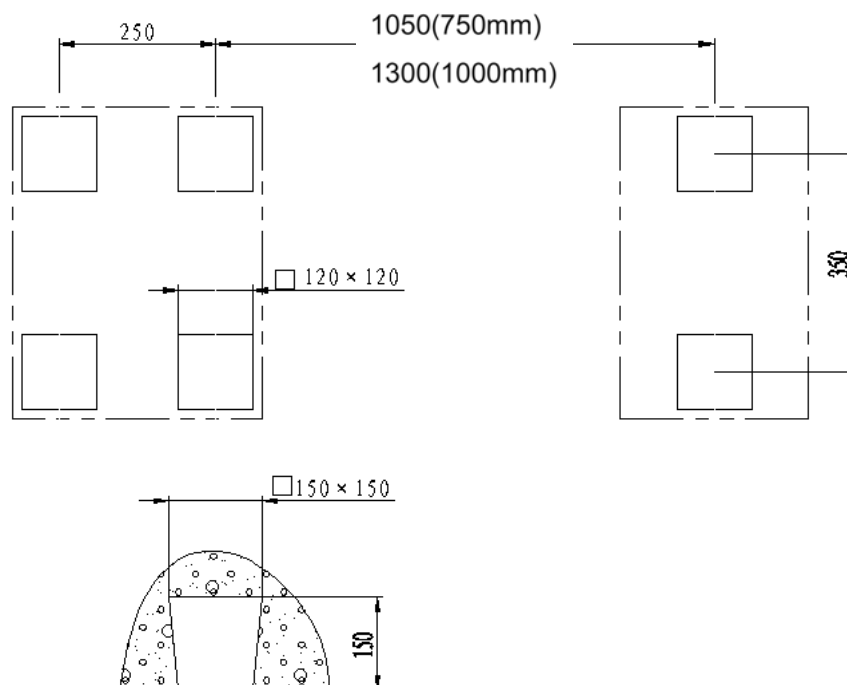
Unload the machine with a tackle, using clamping plates and eyebolts. Keep the machine in balance by moving the tailstock and the bed slide to the right. Avoid using sling chains as they could damage to feed rod and leadscrew. Lift the lathe carefully and place it softly into the floor or workbench.

### 4.2. Cleaning

Before taking the machine into operation, using kerosene (paraffin) or white spirit to remove the anti-corrosive coating or grease from all slideways and gear train. Don't use lacquer thinner or other caustic solvents. Oil all bright machine surfaces immediately after cleaning. Use heavy oil or grease on the change gears.

### 4.3. Installation

Place the lathe on a solid foundation. A concrete floor is the best base for the machine. (If necessary, use an under frame operational). Make sure there is sufficient area around the lathe for easy work and maintenance. Use a precision level on the bedways to make further adjustment for level condition, then tighten the foundation bolts evenly and finally recheck for level condition.



## **5. Lubrication**

Before putting the lathe into operation, make the following lubrication check.

### **5.1. Headstock**

The bearing of the headstock turns in an oil bath. Ensure that the oil level reaches three quarters of the oil gauge glass.

For exchanging the oil, remove the end cover and the change gears with swing frame. Drain off the oil by removing the drain plug on the bottom of the headstock. To fill, take off the headstock cover.

Check the oil level regularly. The first oil change should be made after 3 month, then change it once a year.

### **5.2. Gearbox**

Remove the end cover to expose the filling plug. Through it the Shell is filled to the oil level in the oil gauge glass regularly. The first oil change should be made after three months, then change it once a year.

### **5.3. Apron**

The oil bath is filled with Shell through the filling plug on the right side of the apron. Check the oil level in the oil gauge glass on the front regular. The first oil change should be made after three months, then change it once a year.

For exchanging the oil, drain away oil by taking off the drain plug on the bottom of the apron.

### **5.4. Change gears**



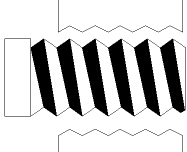
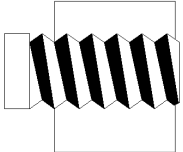
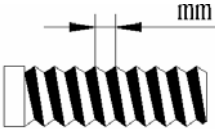
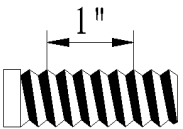
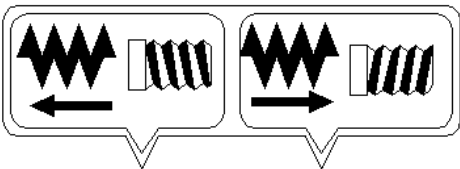






Lubricate the change gears with thick machine oil or grease once a month.

### **5.5. Other parts**

There are other lubricating points on the input shaft bracket of the gearbox, the handwheel on the apron, the longitudinal and cross slide, the thread dial indicator, the tailstock and the bracket, use the grease gun to put a few drops of oil from time to time. Lubricate the apron worm and worm gear, half nut and leadscrew twice a month. Apply a light oil film to the bed way and all other bright parts like the tailstock quill, feed rod etc. once a day.

## 6. Test Running

### 6.1. Operation symbols

 Red      Green	<b>Power</b> Green: on Red: off	 Red Green	<b>Coolant</b> Green: on Red: off
	Half nut opened		Half nut closed
	Metric thread		Imperial thread
		Right-hand thread and longitudinal feed toward the headstock side (left figure)	
		Left-hand thread and longitudinal feed toward the headstock side (right figure)	
	Longitudinal feed engaged (upward). Both Longitudinal feed disengaged (central). Cross feed engaged (downward)	<b>OIL</b>	Oil inlet (hole)
			Don't change speed while is running
	Electrical control (Danger)		JOG
	Pilot Lamp		STOP

## **6.2. Spindle speed control**

### **(A). Identification before operation**

Ensure that lubrication has been carried out as described before.

When the main spindle is rotating. The gearbox and feed axis of the bedslides are put into operation. The forward/reverse switch should be on neutral. The feed axis selector and feed/thread selector handle are in disengaged position. Under these circumstances, both the longitudinal traverse handwheel and cross traverse handle can be operated by hand.

### **(B). Main spindle rotation**

The main spindle rotation is selected by forward/reverse switch.

### **(C). Main spindle speed**

The speed of the main spindle is selecting by (high/low) speed selector (2) and 4 steps speed selector (34). For both high and low speed, there are 4 different positions. For correct speed, please refer to the speed chart. When selector (2) is on “high”, we can get the four speeds, according to the graph.

Never change the speed before the motor has stopped completely!

Adjusting the speed can be assisted by turn the main spindle by hand.

### **(D). Running-in**

Running in should be done at lowest possible spindle speed. Let the machine to run at lowest speed for about twenty minutes, and then check for irregularities. If everything seems in order, gradually increase the speed.

### **(E). Operation**

Use only high peripheral speed type chucks.

The maximum spindle speed for chuck plate of 255mm diameter should not be more than 1255r.p.m. When thread cutting or auto feeding are not in use, the feed/thread selector should be in neutral position, so as to ensure disengagement of the leadscrew and the feed rod. To avoid unnecessary wear, the thread dial indicator should be out of mesh with the leadscrew.

## 7. Thread and Feed Selection

### 7.1. Thread and feed selection

All feed and threads are given on the feed thread tables, fitted on the front and inside of the gear box cover (32), by setting the four feed selector handles (30), (31) etc.

#### (A). Hand feed operation

The movement of carriage is made by the longitudinal traverse handwheel (21), cross sliding by the cross traverse handle, and compound rest by the compound rest traverse handle (8), the carriage is anchored by turning the carriage lock screw in clockwise direction.

#### (B). Replacement of change gears

Take off the end cover firstly, and then loosen both the hexagon nut of the clamping bolt and the clamping screw of the swing frame to exchange the transmission shaft gear with another gear. And the change of driven gear is made by loosen the 120T and 127T gear shaft clamping nut, it is necessary for suitable back lash to intermediate the gears in both cases.

For any special threads not covered by the thread table, our engineering department is available to specify the most convenient change gearing required.

#### (C). Automatic feed operation and change

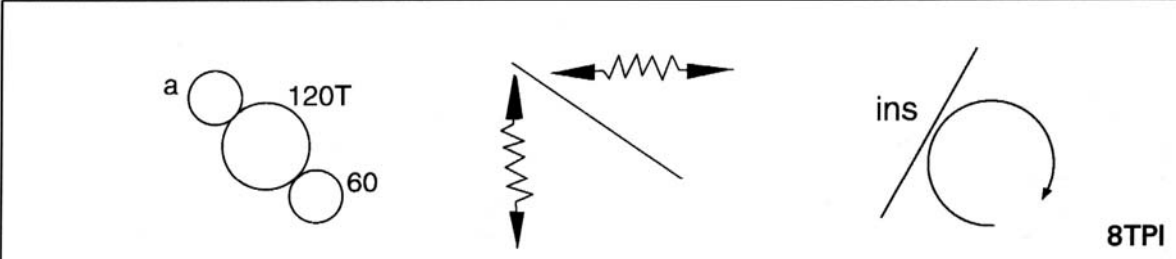
Ensure that 30T change gear at the transmission shaft and 60T at the driven shaft are set with 127T intermediate gear as shown on the feed and thread table. Then turn the feed direction selector (33) to left hand or right hand side according to the direction of feeding which you need and set the feed/thread selector (31) at “any” position, make sure the feed selector handle (2), (30) is engaged, thus the feed rod will rotate. When the feed axis selector (24) on the apron is pulled out and operated upward, we can obtain a longitudinal feed and cross feed can be obtained by pushing the selector in and operating it downward. (Make sure the thread cutting engagement lever ((25) at disengaged position before operating the feed axis selector.)

Feed direction can be changed by turning feed direction selector ( It have 32 kinds of feed speeds each in longitudinal and cross feed can be obtained by means of the feed selector handles (31), (30) etc.

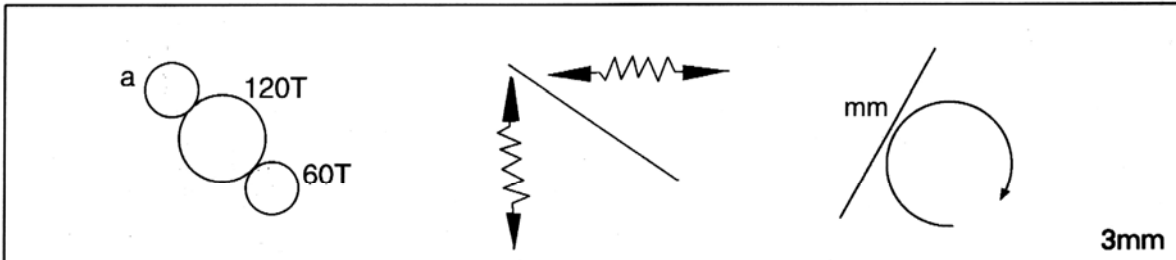
### 7.2. Feed and thread tables

#### (A) .Feed table

(a) Longitudinal and cross feed table for Imperial lathe

									
a		60T				30T			
LEVER		T	S	R	V	T	S	R	V
A	D	.0548 .0187	.0512 .0175	.0411 .0140	.0328 .0112	.0274 .0094	.0256 .0087	.0205 .0070	.0164 .0056
B	D	.0274 .0094	.0256 .0087	.0205 .0070	.0164 .0056	.0137 .0047	.0128 .0044	.0102 .0035	.0082 .0028
A	C	.0137 .0047	.0128 .0044	.0102 .0035	.0082 .0028	.0069 .0024	.0064 .0022	.0051 .0017	.0041 .0014
B	C	.0069 .0024	.0064 .0022	.0051 .0017	.0041 .0014	.0034 .0012	.0031 .0011	.0025 .0009	.0020 .0007

(b) Longitudinal and cross feed table for Metric lathe

									
a		60T				30T			
LEVER		T	S	R	V	T	S	R	V
A	D	1.392 .380	1.300 .351	1.044 .282	.835 .226	.696 .188	.650 .175	.522 .141	.418 .113
B	D	.696 .188	.650 .176	.522 .141	.418 .113	.348 .094	.325 .088	.261 .070	.208 .056
A	C	.348 .094	.325 .088	.261 .070	.208 .056	.174 .047	.162 .044	.130 .035	.104 .028
B	C	.174 .047	.162 .044	.130 .035	.104 .028	.087 .024	.081 .022	.065 .017	.052 .014

**(B). Thread tables****(a) Thread tables for Imperial leadscrew**

8TPI

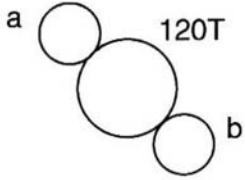
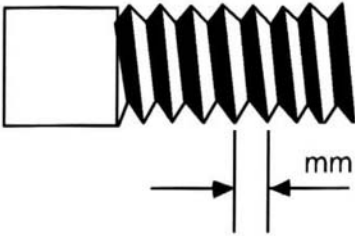
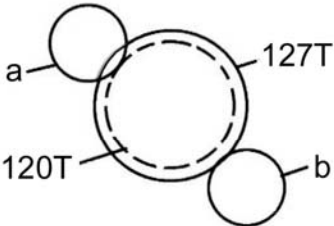
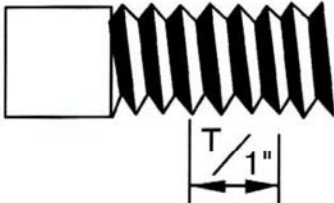
a		60	60	60	60	40	40	56	40	60
b		60	54	57	60	44	46	54	52	63
LEVER		4	1	1	1	1	1	2	1	3
		V	V	V	V	V	V	V	V	V
A	D	4	4 1/2		5	5 1/2		6	6 1/2	7
B	D	8	9	9 1/2	10	11	11 1/2	12	13	14
A	C	16	18	19	20	22	23	24	26	28
B	C	32	36	38	40	44	46	48	52	56

8TPI

a		56	60	60	30	60	60	30	60	56
b		60	60	60	60	60	60	60	60	63
LEVER		4	1	3	4	1	3	1	3	3
		R	R	S	T	V	R	T	V	V
A	D	7.0	6.0		5		4.5	4.0		
B	D	3.5	3.0		2.5		2.25	2.0	1.8	1.6
A	C	1.75	1.5	1.4	1.25	1.2		1.0	0.9	0.8
B	C		0.75	0.7		0.6		0.5	0.45	0.4



(b) Thread tables for Metric leadscrew

<div style="display: flex; justify-content: space-around; align-items: center;">   </div>									
<b>3mm</b>									
a	56	60	60	30	60	60	30	60	56
b	60	60	60	60	60	60	60	60	63
LEVER	4	1	3	4	1	3	1	3	3
	R	R	S	T	V	R	T	V	V
A	D	7.0	6.0		5		4.5	4.0	
B	D	3.5	3.0		2.5		2.25	2.0	1.8
A	C	1.75	1.5	1.4	1.25	1.2		1.0	0.9
B	C		0.75	0.7		0.6		0.5	0.45
<div style="display: flex; justify-content: space-around; align-items: center;">   </div>									
<b>3mm</b>									
a	60	60	60	60	40	40	56	40	60
b	60	54	57	60	44	46	54	52	63
LEVER	4	1	1	1	1	1	2	1	3
	V	V	V	V	V	V	V	V	V
A	D	4	4 1/2		5	5 1/2		6	6 1/2
B	D	8	9	9 1/2	10	11	11 1/2	12	13
A	C	16	18	19	20	22	23	24	26
B	C	32	36	38	40	44	46	48	52

### **7.3. Thread cutting operation**

In order to obtain the desired thread, all correct change gears must be installed in strict accordance with the chart, failure to do so will give incorrect threads.

Rotate the leadscrew by operating the feed/thread selector to any position and be sure the feed selector handle is engaged. Operate downward the thread cutting engagement lever (25), and it will be engaged with the leadscrew to obtain the longitudinal travel of carriage, namely, the thread cutting feed. Make sure the feed axis selector is disengaged (at neutral position) before operating the thread cutting engagement lever (25) since there is an interlock mechanism between the auto feeding and thread cutting engagement.

Direction of thread cutting can be chosen by turning the feed directing selector (33) at the headstock. There are 31 Nos. of thread pitches each in Imperial, 26 Nos. of Metric pitches those which can be obtained by turning the feed selector handles .

#### **(A).Thread dial indicator**

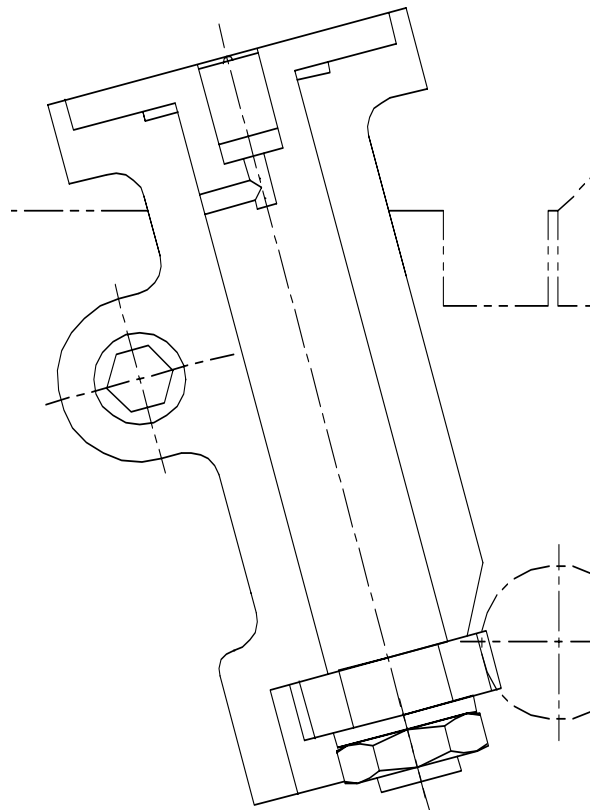
The thread dial indicator is installed on the right hand side of the apron; the indicator is used for thread cutting to engage with the leadscrew.

For minimum wear the thread dial indicator should be disengaged by swing the pinion out of mesh with the leadscrew when not in use.

Imperial threads on Imperial leadscrew machines or Metric threads on Metric leadscrew machine.

For these threads it is recommended that the thread dial indicator be used this allows the half nut of leadscrew to be engaged at the end of each thread cutting pass, provided that they are re-engaged in accordance with the indicator table mounted on the left hand side of the apron.

INDICATOR TABLE					
T.P.I	SCALE	T.P.I	SCALE	T.P.I	SCALE
4	1-4	13	1	44	1-4
$4\frac{1}{2}$	1	14	1.3	46	1.3
4		16	1-8	48	1-8
5	1	18	1.3	52	1-4
$5\frac{1}{2}$	1	19	1	56	1-8
5	1.3	20	1-4	64	1-8
$6\frac{1}{2}$	1	22	1.3	72	1-8
7	1	23	1	76	1-4
8	1-8	24	1-8	80	1-8
9	1	26	1.3	88	1-8
$9\frac{1}{2}$	1	28	1-4	92	1-8
10	1.3	32	1.3	96	1-8
11	1	36	1-4	104	1-8
$11\frac{1}{2}$	1	38	1.3	112	1-8
12	1-4	40	1-8		



(1) Imperial leadscrew machines (Imperial threads only)

The table shows:

T.P.I: threads per inch to be cut.

Scale: the dial numbers at which the half nut of leadscrew may be engaged.


(2) Metric leadscrew machines (Metric thread only)

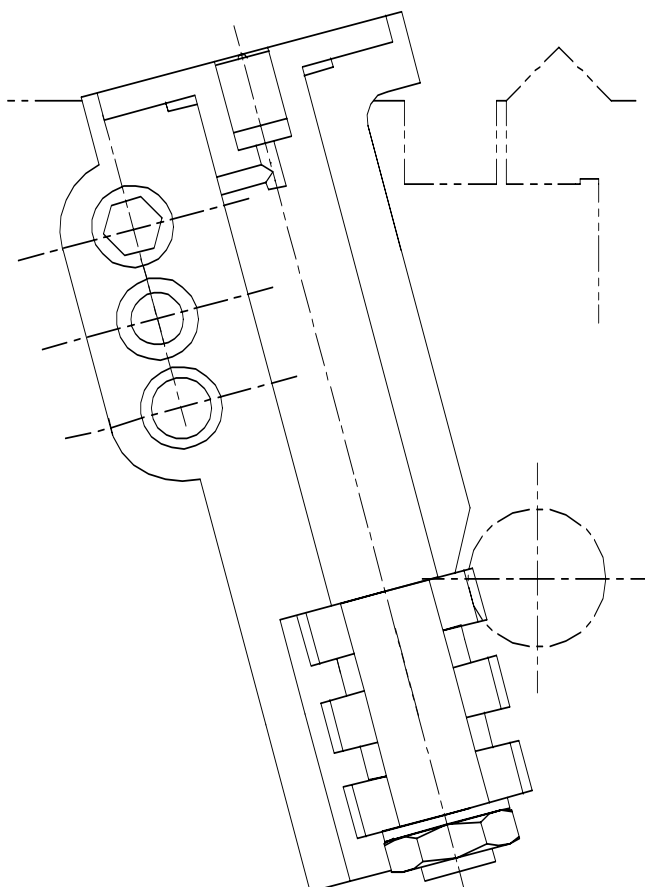
The table shows:

IN column 1: millimeter pitches to be cut.

28T, 30T, 32T: The number of teeth in “pitch-off gear” arranged to mesh with the leadscrew (this being selected from the stack, stored on the bottom of the dial spindle)

Dial graduation: The dial numbers at which the half nut may be engaged under No. of teeth of pick-off gear.

mm 	INDICATOR TABLE: METRIC DIAL GRADUATION		
	28T	30T	32T
0.40		1,3,5,7,9,11	
0.45		17	
0.50		1,3,5,7,9,11	
0.60		1,3,5,7,9,11	
0.70	1,4,7,10		
0.75		1,3,5,7,9,11	
1.00		1,3,5,7,9,11	
1.25		1,3,5,7,9,11	
1.50		1,3,5,7,9,11	
1.75	1,4,7,10		
2.00			1,4,7,10
2.25		1	
2.50		1,3,5,7,9,11	
2.80	1,7		
3.00		1,3,5,7,9,11	
3.50	1,4,7,10		
4.00			1,4,7,10
4.50		17	
5.00		1,3,5,7,9,11	
5.60	1		
6.00			1,4,7,10
7.00	1,4,7,10		

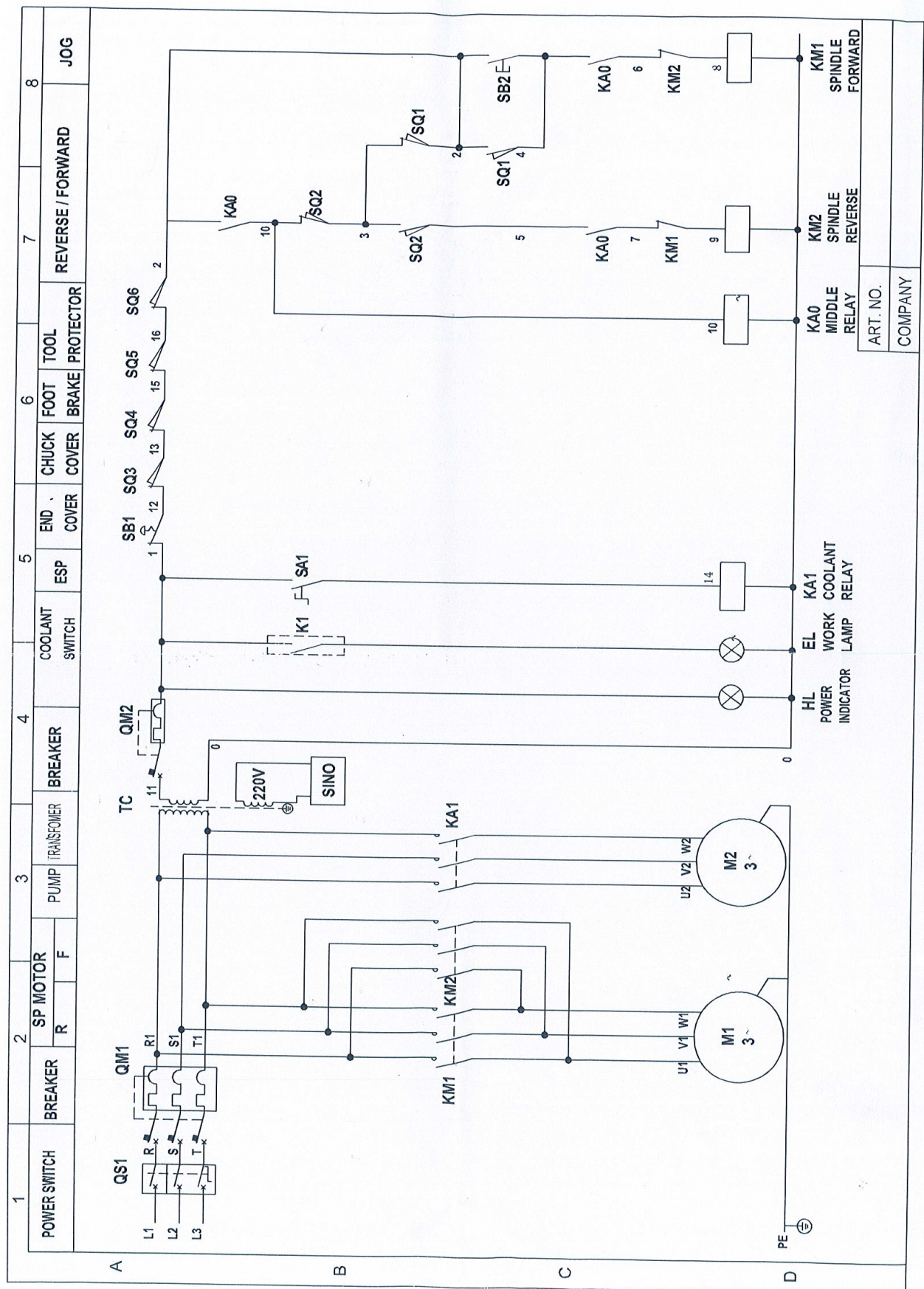


(3) Imperial threads on Metric leadscrew machines or Metric threads on Imperial lead screw machines

For these threads the half nut is kept engaged throughout the cutting of any one

thread. This involves reversing the whole drive by means of the spindle control lever (19) at each end of the thread cutting pass whilst at the same time relieving or increasing the cut as required. (Threads 'A' may also be by this method)

## 8. Electric Circuit Control



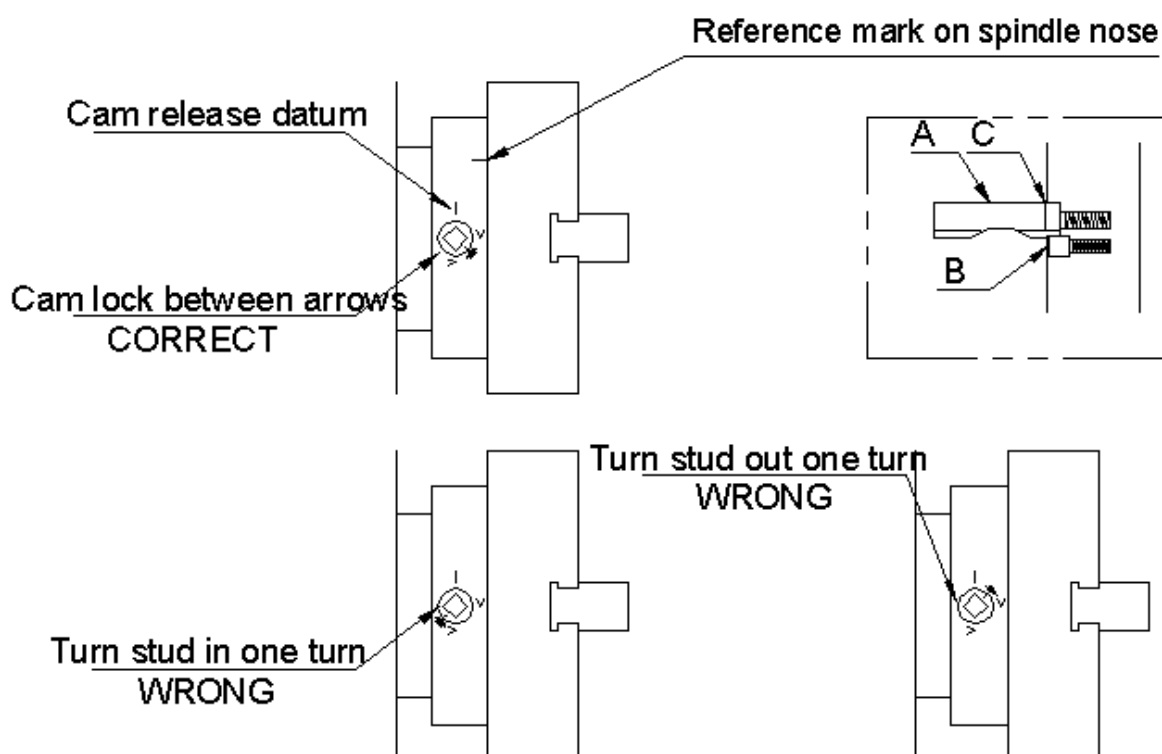
## 9. Chucks and Chuck Mounting

When fitting chucks or faceplates, first ensure that spindle and chuck tapers are scrupulously clean and that all cams lock in the correct positions, see Fig1. It may be necessary when mounting a new chuck to re-set the cam lock studs (A). To do this, remove the cap-head locking screws (B) and set each stud so that the scribed ring (C) is flush with the rear face of the chuck-with the slot lining up with the locking screw hole.

Now mount the chuck or faceplate on the spindle nose and tighten the six cams in turn. When fully tightened, the cam lock line on each cam should be between the two V marks on the spindle nose.

If any of the cams do not tighten fully within these limit marks, remove the chuck or faceplate and re-adjust the stud as indicated in the illustration. Fit and tighten the locking screw (B) at each stud before remounting the chuck for work. A reference mark should be made on each correctly fitted chuck or faceplate to coincide with the reference mark scribed in the spindle nose.

This will assist subsequent remounting. Do Not Interchange Chucks or faceplates between lathes without checking for correct cam locking.





## 10. Maintenances and Servicing

### 10.1. Lathe alignment

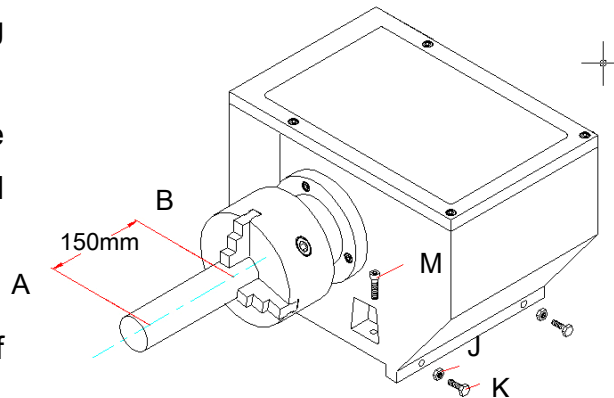
When the lathe is installed and ready for use, it is recommended to check the machine alignment before commencing work.

Alignment and leveling should be checked regularly to insure continued accuracy.

Adopt this procedure as follow:

Take a steel bar with a diameter of appr.50mm and a length of appr.200mm.

Span it in the chuck without using the center. Then cut off a chip over a length of 150mm and measure the difference in A and B.

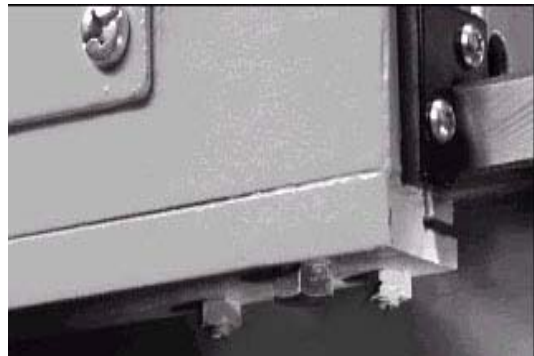


In order to correct a possible difference, loosen the screw (M) clamping the headstock on the bed and nut (J). Adjust the headstock with setscrew (K). Repeat the above procedure until all measuring is correct, Then clamping the nut (J), The lathe will be cutting correctly.

### 10.2. Saddle strip

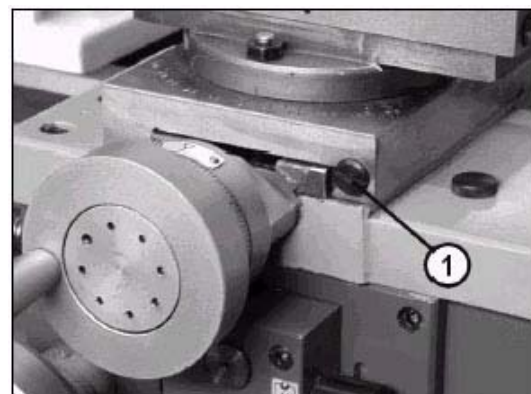
Wear on the rear saddle gig strip may be accommodated by adjustment of the socket head set screws.

The procedure for adjustment is to first take off the rear splash guard (when fitted), release the hexagon nuts and turn the socket head set screws slightly in clockwise and then re-clomp the hexagon nuts. Care should be taken to avoid over adjustment, a 45° turn at the socket head set screw approximately 0.125(0.005") take up in the gib.



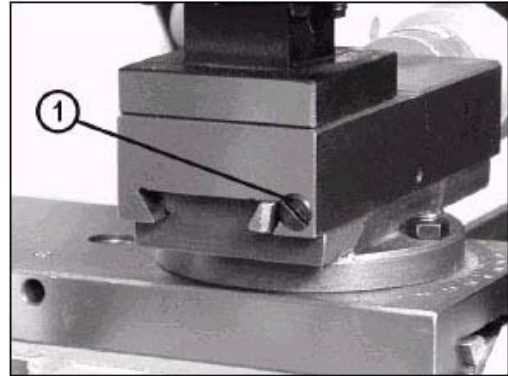
### 10.3. Cross slide

Wear on the taper-gib strip may be adjusted for by clockwise rotation of the slotted head screw on the front face of the cross slide. The procedure is to first slacken the similar screw at the rear then retighten this after adjustment to clamp the gib in its new position.



#### 10.4. Compound rest

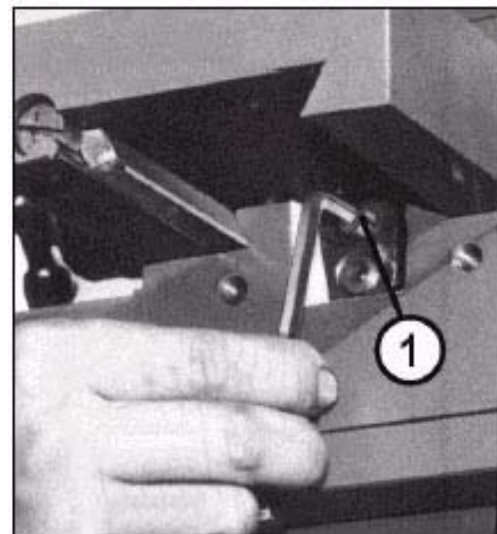
It is the same procedure as cross slide. To take up for wear on the compound rest taper gibe strip can adjust the slotted head screw on the tool post side of the compound rest by clockwise rotation. The procedure is to first slacken the similar screw at the opposite side then re-tighten this after adjustment to clamp the gib in its new position.



#### 10.5. Cross slide nut

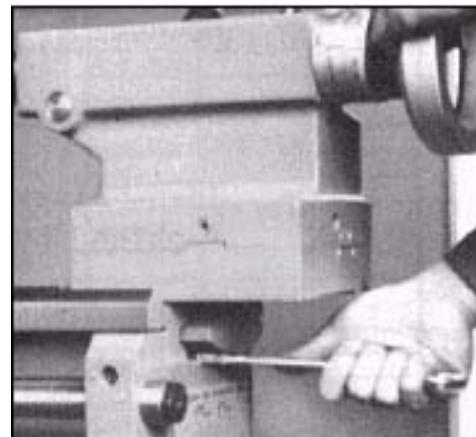
Provision is made for the elimination of backlash in the cross slide nut, the procedure for adjustment being as follows:

Take off the dust plate which is mounted on the rear face of saddle groove, turn the cross traverse handle by clockwise to move the cross feed nut until it reaches the end edge of the feed rod. Turn the socket head cap screw in a clockwise direction as required. Care should be taken to avoid over adjustment; a 45° turn at the socket head cap screw represents approximately 0.125mm(0.005") take up of backlash.



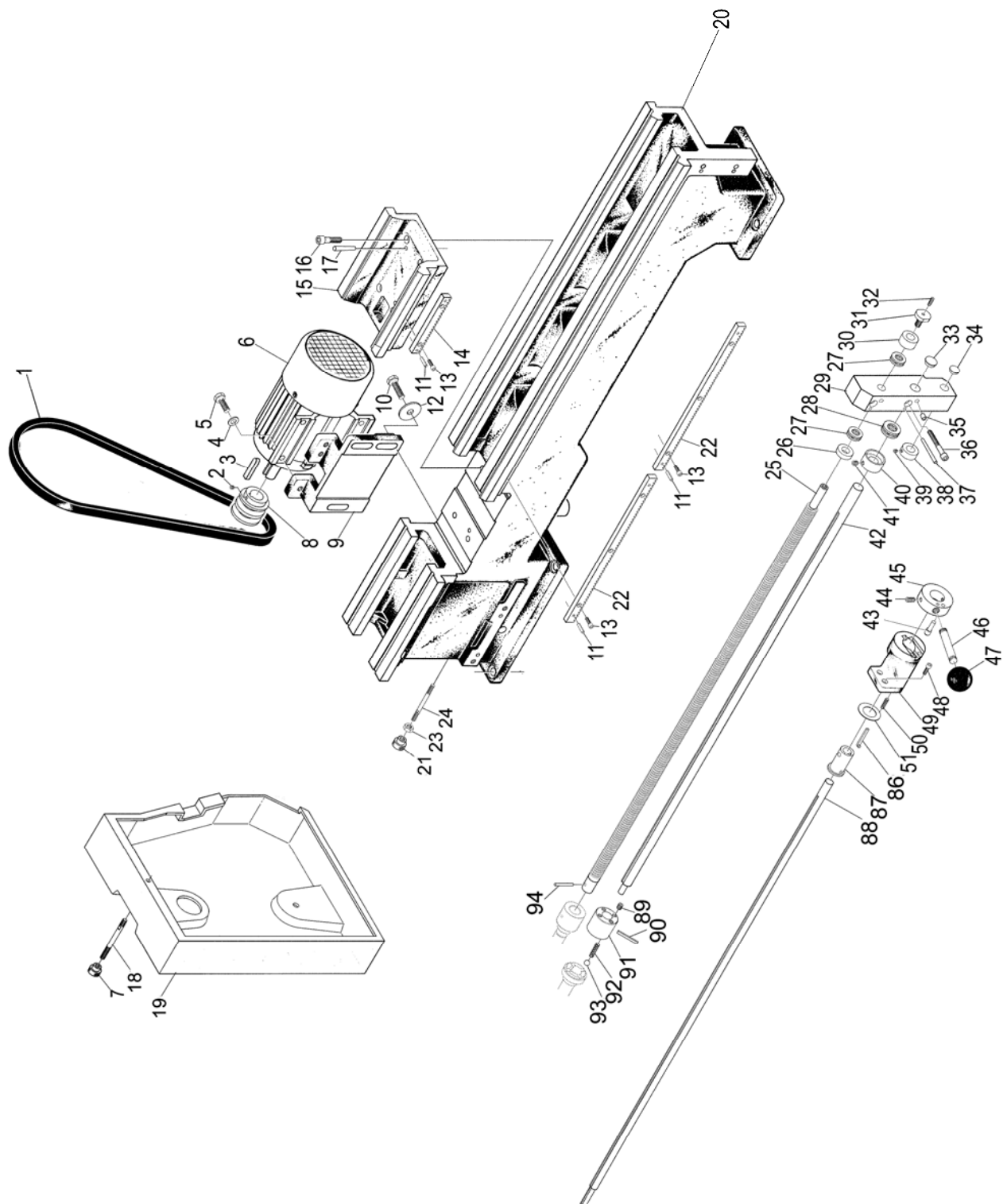
#### 10.6. Tail stock bed clamp

The angular lock position of the bed clamp lever is adjusted by means of the self-locking hexagon headed bolt located on the underside of the tailstock and between the bed ways.

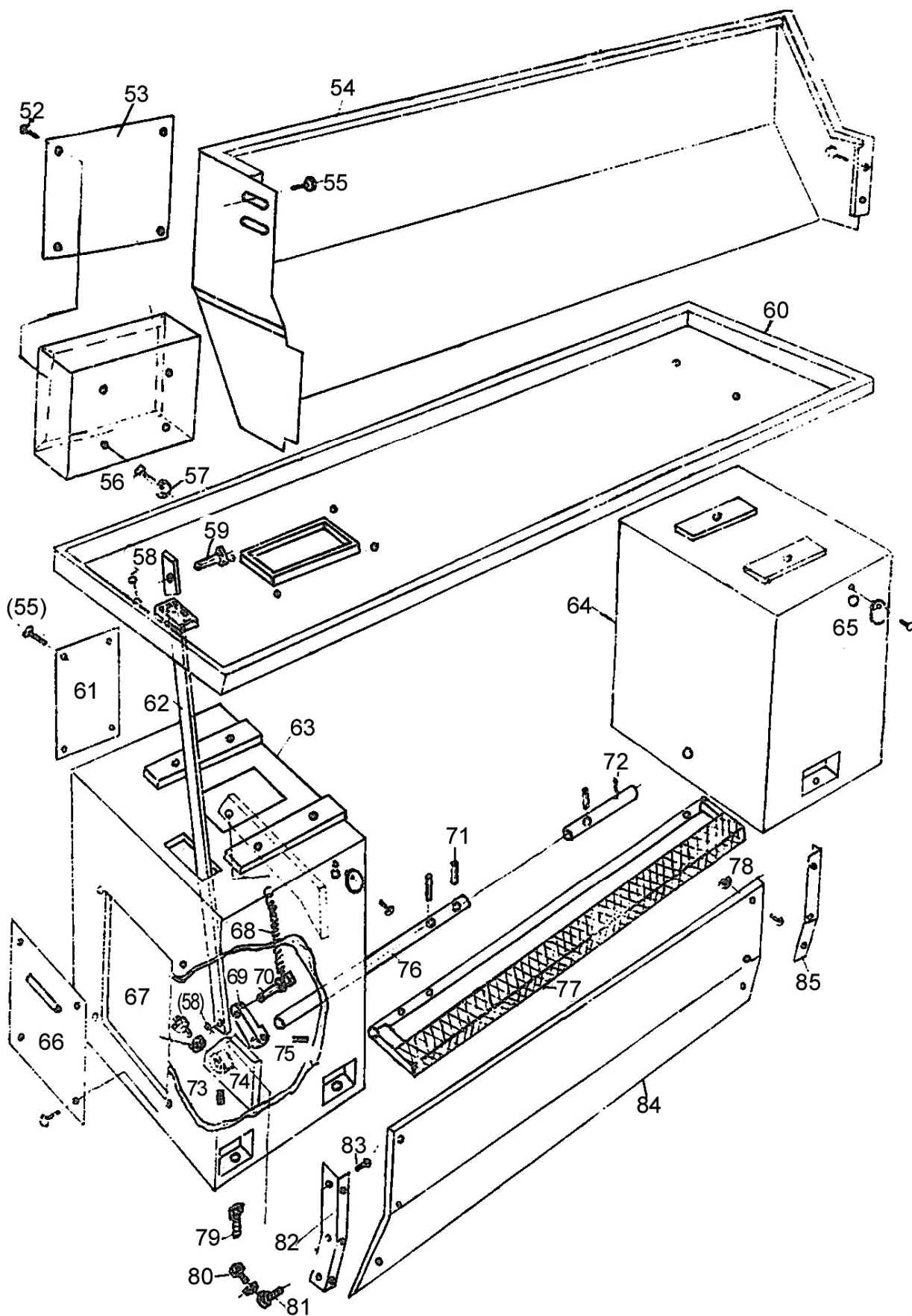




## 11.Bed Assembly (1/2)



## 11.Bed Assembly (2/2)

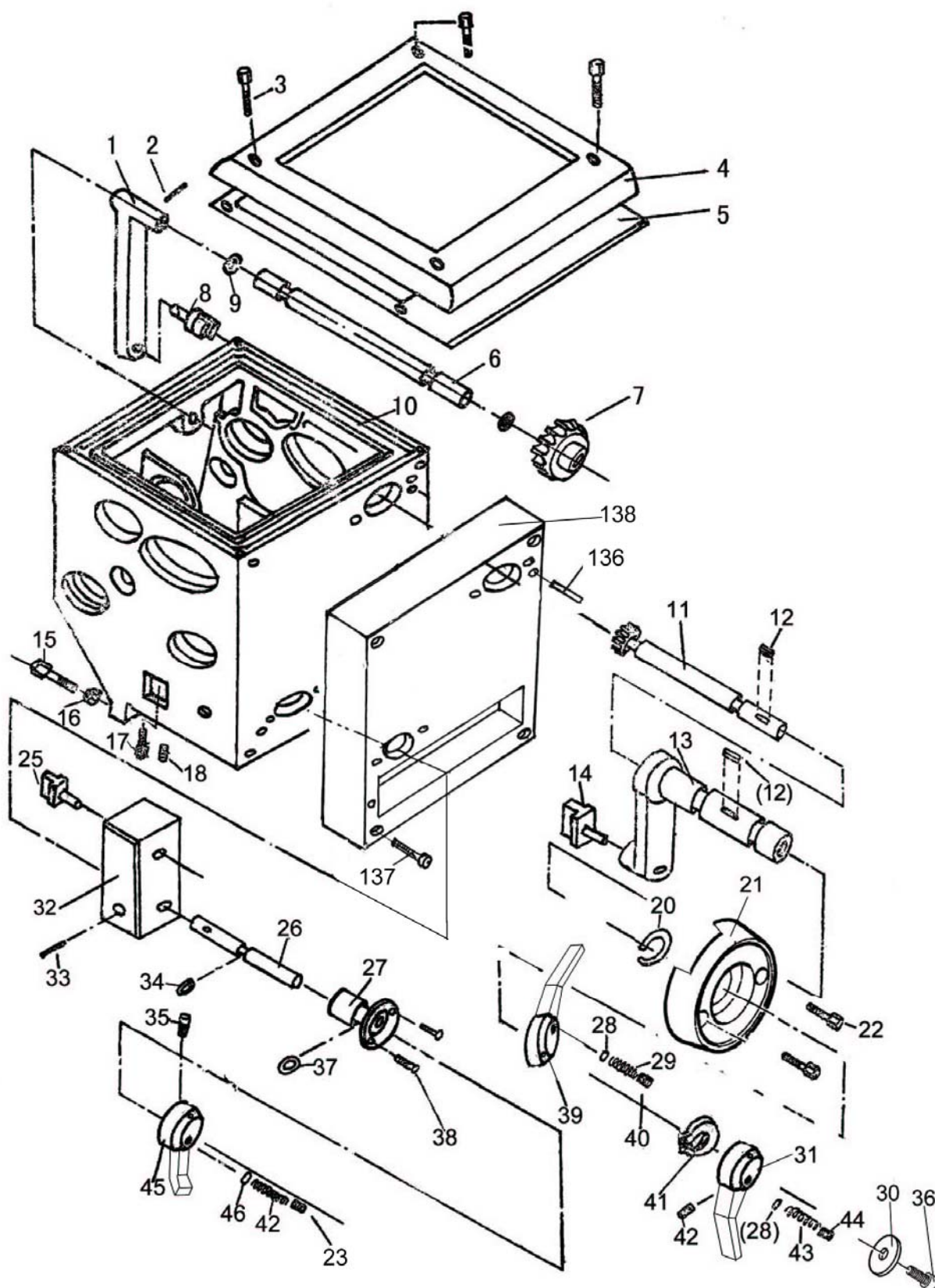


No.	Part No.	Name	Specification
1	GB1171-74	Belt	A813
2	GB77-85	Screw	M6×12
3	GB1096-79	Key	
4	GB97.1-86	Washer	8
5	GB5783-86	Bolt	M8×25
6	90S-4	Motor	
7	33-6032	Clamping Knob	
8	32-01107	Pulley	
9	32-01103a	Bracket	
10	GB5783-86	Bolt	M10×30
11	GB117-86	Pin	6×26
12	32-01222	Washer	
13	Gb70-85	Screw	M6×25
14	32-01203	Rack	
15	32-01102	Bridge	
16	GB70-85	Screw	M10×40
17	GB881-86	Taper Pin	8×60
18	33-6030	Position Stud	
19	32C-04513	Cover (32A)	
19	36C-04513	Cover (36A)	
20	32C-01101-1	Lathe Bed (1000)	
20	32C-01101-2	Lathe Bed (750)	
21	33-6032	Clamping Knob	
22	32-01204-1	Rack (1000)	
22	32-01204-2	Rack (750)	
23	GB6170-86	Nut	M10
24	33-6031	Position Stud	
25	33-6036B	Lead screw (1000)	
25	32C-6036B-2	Lead screw (750)	
26	33-6037	Sleeve	
27	GB301-85	Bearing	8102
28	GB301-85	Bell Steel	8104
29	33-6035	Bracket	
30	33-6038	Bearing Cover	
31	33-6039	Lock Screw	
32	GB78-85	Socket Head Set Screw	M6×20
33	32-01503	Plug	
34	32-01504	Plug	
35	GB1155-79	Ball Cap	6
36	GB70-85	Socket Head Cap Screw	M8×60
37	GB117-86	Taper Pin	5×60
38	33-6053	Sleeve	
39	GB77-85	Socket Head Set Screw	M6×8
40	CL6132-01-16	Bearing Cover	
41	GB77-85	Socket Head Set Screw	M8×10

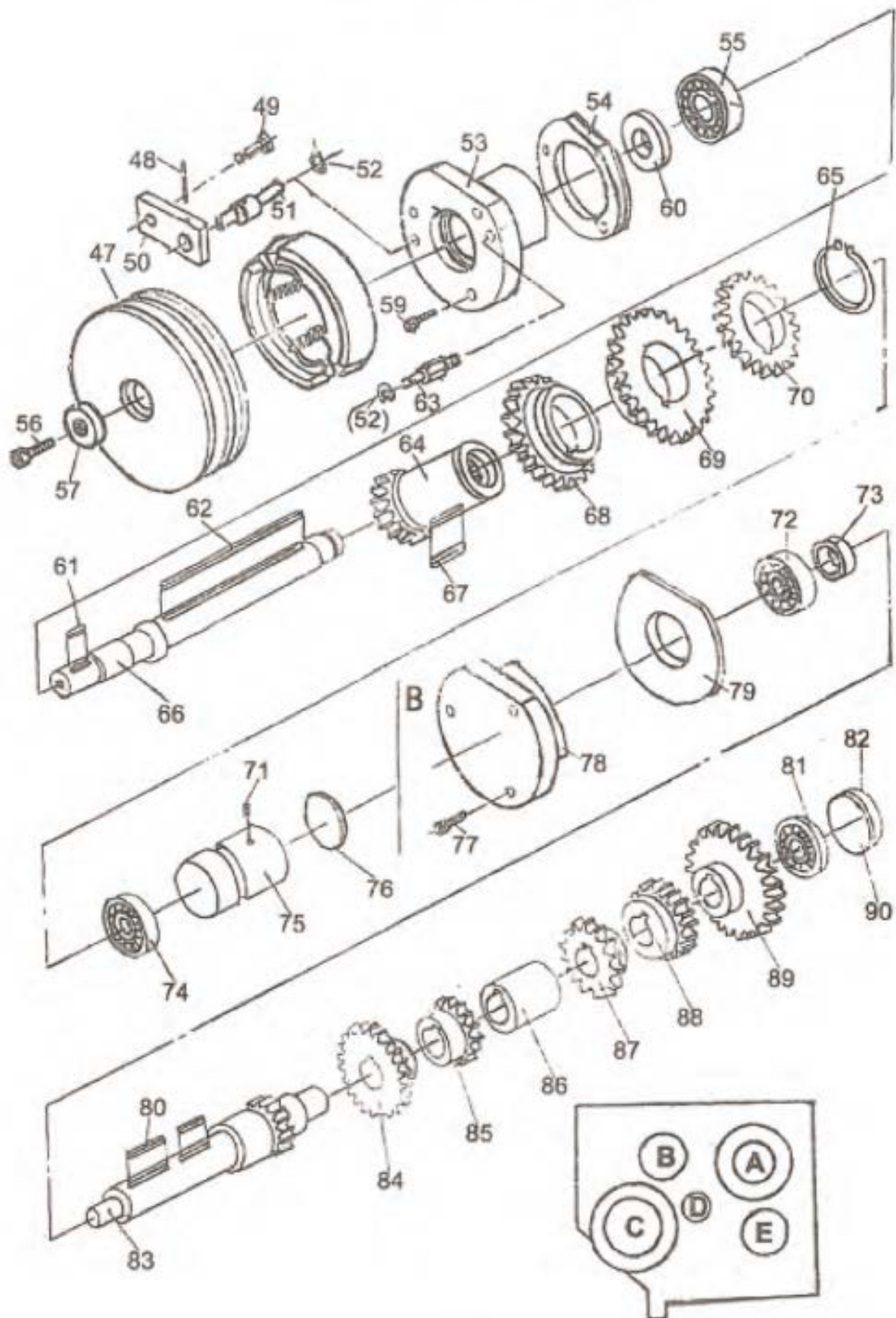
No.	Part No.	Name	Specification
42	33-6040B	Feed Rod (1000)	
42	32C-6040B-2	Feed Rod (750)	
43	33-6049	Position Setting Pin	
44	GB79-85	Socket Head Set Screw	8×16
45	33-6048	Gated Block	
46	33-6050	Spindle Control Lever	
47	GB4141.11-84	Spherical Knob	
48	GB70-85	Socket Head Cap Screw	M6×16
49	33-6045	Bracket	
50	GB2089-80	Compression Spring	1×6×20
51	33-6047	Thrust Piece	
52	GB818-85	Screw	M5×6
53	32-12206a	Cover	
54	32-01224-1	Splash Guard (1000)	
54	32-01224-2	Splash Guard (750)	
55	GB823-85	Screw	M6×10
56	GB818-85	Screw	M6×20
57	GB97.1-86	Washer	6
58	GB91-86	Pin	2×12
59	32-11212	Pin	
60	32C-01240-1	Oil Plate (1000)	
60	32C-01240-2	Oil Plate (750)	
61	32-01230	Rear Connecting Plate	
62	32-11208	Brake Pull Rod (32A)	
62	36-11208	Brake Pull Rod (36A)	
63	32-01229	Left Mounting Feet	
64	32-01228	Right Mounting Feet	
65	32-01234	Round Cover	
66	32-01231	Cover Plate	
67	32-11213	Cap-Shape Screw	
68	32-11204	Draw Spring	
69	32-11206	Pedal Arm	
70	32-11205	Pin	
71	GB879-86	Pin	3×25
72	32-11201	Shaft	
73	GB78-86	Screw	M8×6
74	32-11209	Nut	
75	GB879-86	Pin	5×40
76	32-11203	Pedal Shaft	
77	32-11202-1	Brake (1000)	
77	32-11202-2	Brake (750)	
78	GB823-86	Screw	M6×10
79	GB5781-86	Screw	M12×50
80	GB823-86	Screw	M6×10

No.	Part No.	Name	Specification
81	32-01232	Screw	
82	32-01245	Left Plate	
83	GB823-86	Screw	M6×10
84	32-01247-1	Front Plate (1000)	
84	32-01247-2	Front Plate (750)	
85	32-01246	Right Plate	
86	32-01213	Key	
87	32-01201	Sleeve	
88	33-6043B	Started Rod (1000)	
88	32C-6043B-2	Started Rod (750)	
89	GB77-85	Screw	M8×10
90	GB879-86	Pin	5×40
91	33-2017a	Sleeve	
92	CL6132-01-38	Spring	
93	GB308-84	Steel Ball	6
94	6220-2085	Shear pin	

## 12.Headstock Assembly (1/3)

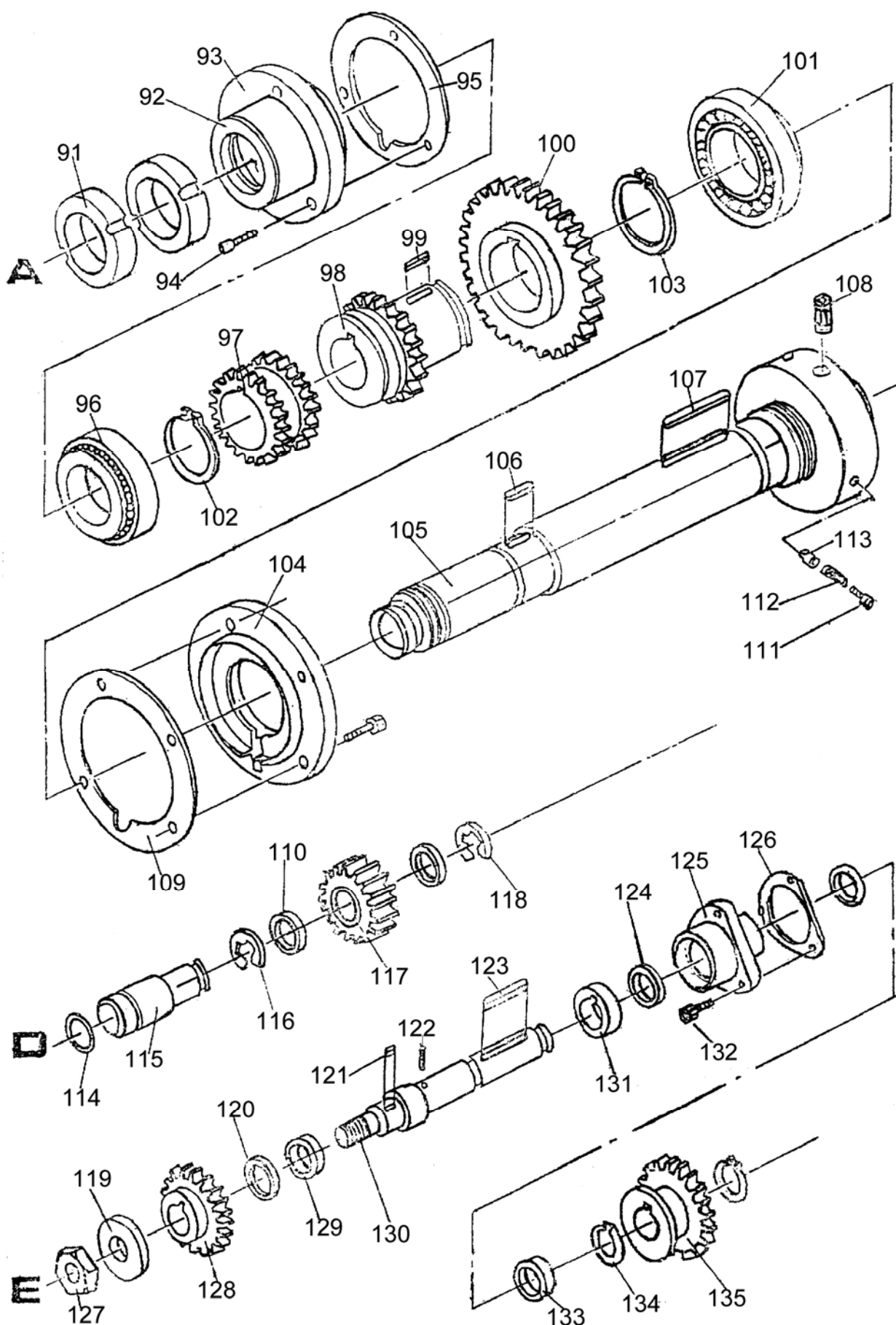


## 12.Headstock Assembly (2/3)





## 12.Headstock Assembly (3/3)





No.	Part No.	Name	Specification
1	32C-04109	Shift Lever	
2	GB879-86	Screw	5×32
3	GB70-85	Screw	M6×18
4	32C-04127	Casting Cover	
5	32C-04506	Gasket	
6	32-04232	Shaft	
7	32-04234	Gear	
8	32-04233	Shift Lever	
9	GB1235-76	O-Ring	14×2.4
10	32C-04107	Main Casting (32A)	
10	36C-04107	Main Casting (36A)	
11	32C-04254	Gear	
12	GB1096-79	Key	5×15
13	32C-04126	Thrift Collar	
14	32-04403	Shift Fork	
15	GB5783-86	Screw	M8×45
16	GB6172-86	Nut	M8
17	GB70-85	Screw	M10×35
18	GB78-85	Screw	M8×12
19	32-04240	Washer	
20	GB1235-76	O-Ring	30×3.1
21	32C-04115	Cover	
22	GB70-85	Screw	M6×35
23	GB78-85	Screw	M6×16
25	32-04402	Shift Fork	
26	32C-04255	Shaft	
27	32-04235	Collar	
28	GB308-84	Bell Steel	6
29	GB2089-80	Spring	1×6×7
30	32C-04242	Washer	
31	32C-04114	Handle	
32	32-04111	Shift Shaft	
33	GB879-86	Pin	4×18
34	GB1235-76	O-Ring	10×1.9
35	GB78-85	Screw	M6×16
36	32C-04243	Screw	
37	GB1235-76	O-Ring	20×2.4
38	GB819-85	Screw	M4×8
39	32C-04116	Handle	
40	GB78-85	Screw	M8×8
41	GB894.1-86	Circlip	30
42	GB2089-80	Spring	0.6×4.4×16
43	GB2089-80	Spring	1×6×20
44	GB78-85	Screw	M8×10

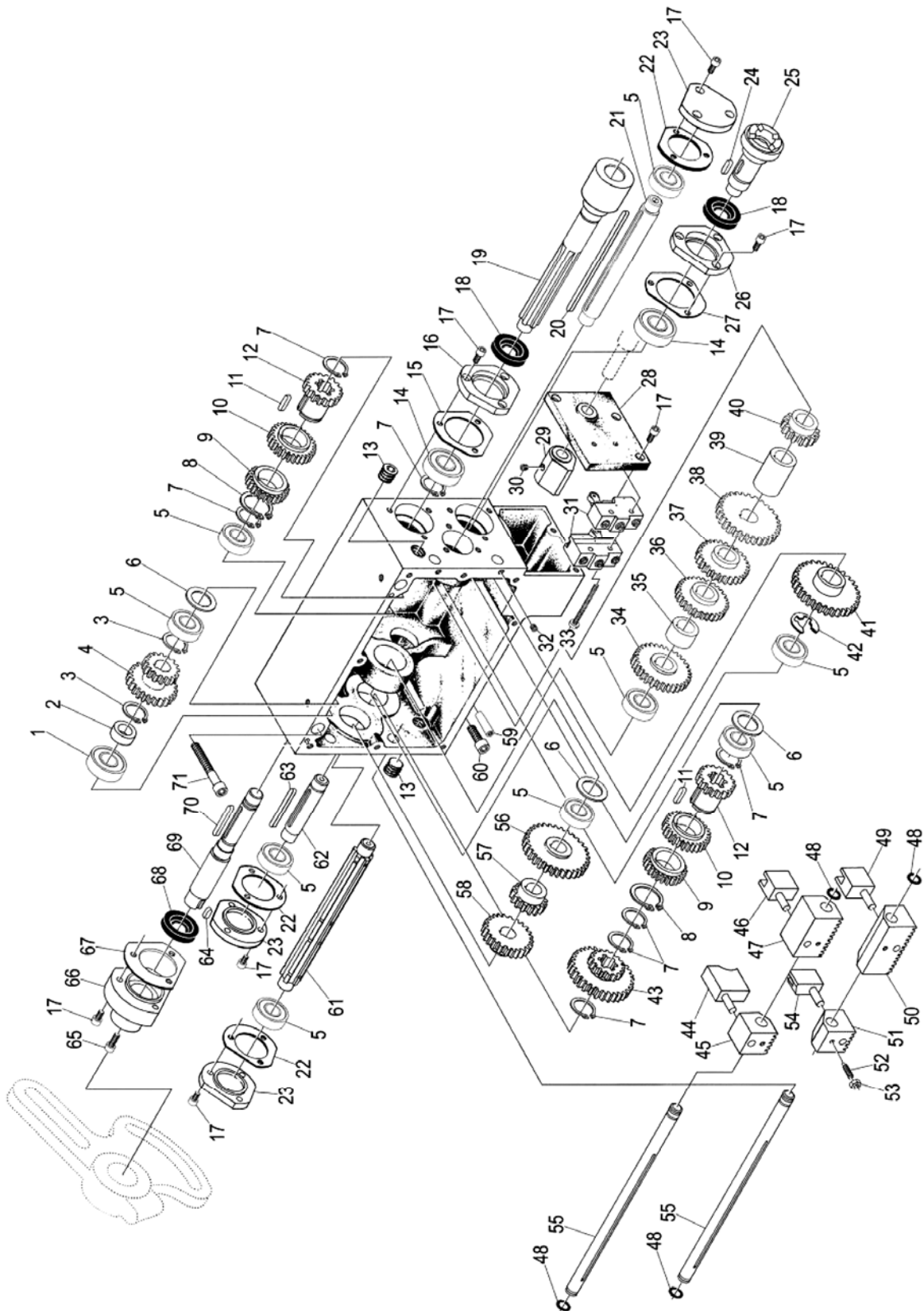
No.	Part No.	Name	Specification
45	32C-04110	Handle	
46	GB308-84	Bell Steel	5
47	32-04122	Pulley	
48	GB879-86	Pin	5×25
49	32-11212	Pin	
50	32-11210	Rocker	
51	32-11209	Rocker Shaft	
52	GB894.1-86	Circlip	8
53	32-04124	Cover	
54	32-04501-1	Gasket	
55	GB276-98	Thrust	105E
56	GB70-85	Screw	M8×15
57	32-04253	Washer	
59	GB70-85	Screw	M6×16
60	HG4-692-67	Oil Seal	SD25×40×10
61	GB1096-79	Key	8×20
62	GB1096-79	Key	6×120
63	32-11211	Shaft	
65	GB894.1-86	Circlip	35
66	32-04252	Shaft	
64	32-04217	Collar	2×2
67	GB1096-79	Key	5×50
68	32-04218	Gear	2×29
69	32-04219	Gear	2×46
70	32-04220	Gear	2×38
71	GB78-85	Screw	M8×16
72	GB276-88	Thrust	204E
73	32-04211	Washer	
74	GB276-88	Thrust	203
75	32-04106	Front Plug	
76	GB1235-76	O-Ring	40×3.1
77	GB70-85	Screw	M4×12
78	32-04123	Behind Cover	
79	32-04502-1	Gasket	
80	GB1096-79	Key	6×55
81	GB276-88	Thrust	204D
82	GB1235-76	O-Ring	47×3.1
83	32-04212	Shaft	2.25×16
84	32-04210	Gear	2×51
85	32-04209	Gear	2×43
86	32-04221	Washer	
87	32-04222	Gear	2×26
88	32-04223	Gear	2×34
89	32-04224	Gear	2.25×53
90	32-04225	Front Plug	

No.	Part No.	Name	Specification
91	32-04208	Nut	
92	32-04102	Collar	
93	32-04103	Behind Cover	
94	GB78-85	Screw	M6×25
95	32-04503	Gasket	
96	GB297-89	Thrust	7210E
97	32-04207	Gear	2×37
98	32-04227	Gear	2.25×37
99	GB1096-79	Key	8× 18
100	32-04226	Gear	2.25×74
101	GB297-89	Thrust	7212D
102	GB894.1-86	Circlip	50
103	GB894.1-86	Circlip	72
104	32-04108	Front Cover	
105	32-04228	Spindle	
106	GB1096-79	Key	6×40
107	GB1096-79	Key	8×85
108	32-04231	Cam	
109	32-04505	Gasket	
110	GB276-88	Thrust	7000104E
111	GB70-86	Screw	M8×18
112	32-04229	Spindle	
113	32-04230	Pin	
114	GB1235-76	O-Ring	25×2.4
115	32-04238	Shaft	
116	GB893.1-86	Circlip	42
117	32-04237	Gear	
118	GB893.1-86	Circlip	42
119	32-04206	Washer	
120	32-04204	Washer	
121	GB1096-79	Key	5×18
122	GB879-86	Pin	3×10
123	GB1096-79	Key	6×50
124	32-04401	Collar	
125	32-04101	Collar	
126	32-04504	Gasket	
127	GB6172-86	Nut	M12
128	32-04205	Gear	
129	32-04507	Oil Seal	
130	32-04239	Shaft	
131	32-04203	Washer	
132	GB70-85	Screw	M5×16
133	32-04202	Washer	
134	GB894.1	Circlip	20

---

No.	Part No.	Name	Specification
135	32-04201	Gear	
136	GB117-86	Taper Pin	6×60
137	GB70-85	Screw	M6×50
138	32C-04125(32A)	Frame	
138	36C-04125(36A)	Frame	

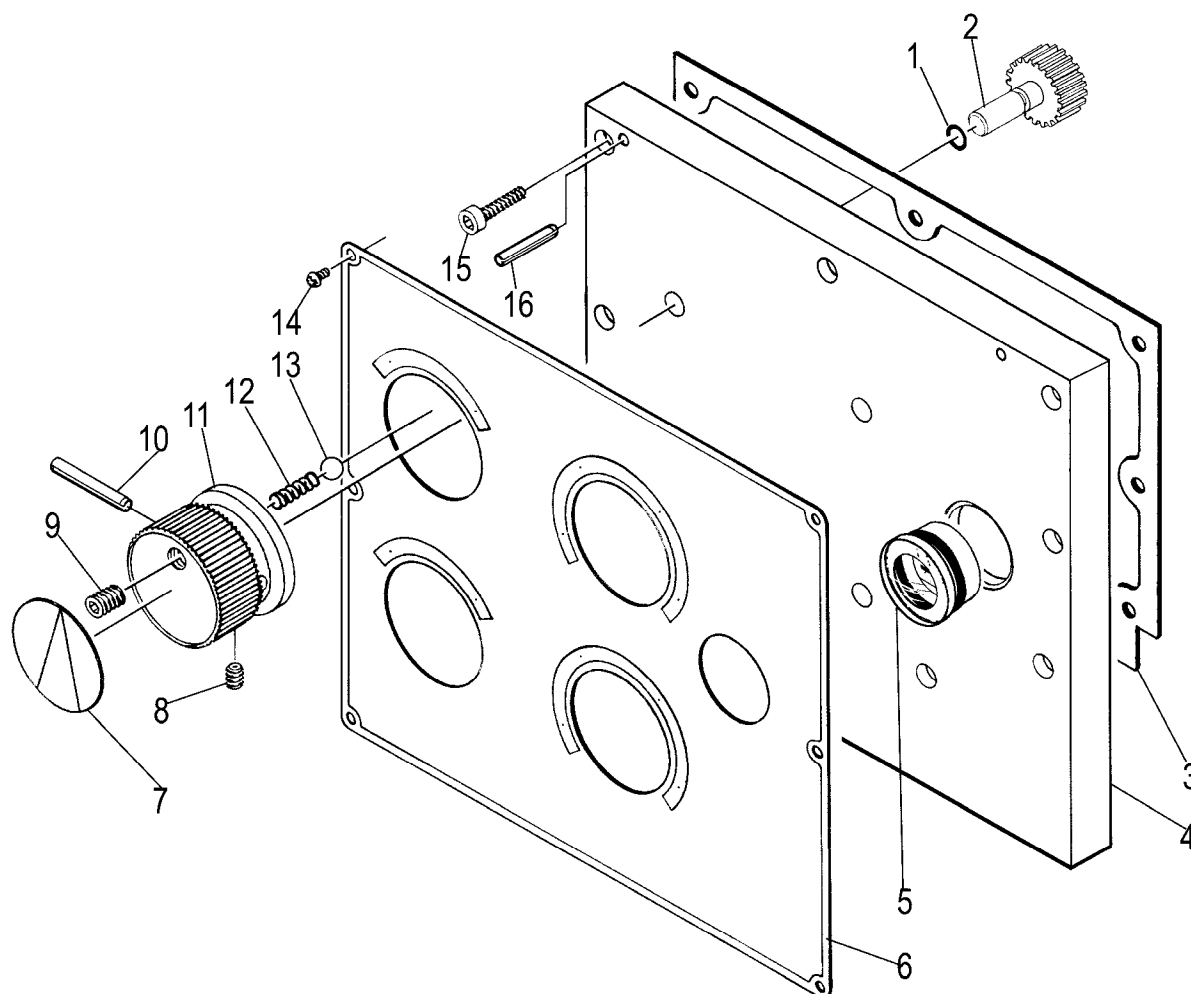
## 13. Gearbox Control (1/3)



No.	Part No.	Name	Specification
1	GB/T276-94	Deep Groove Ball Bearing	6203-2RS
2	33-2029	Collar	
3	GB894.2-86	Retaining Ring	16
4	33-2003	Gear	
5	GB894.2-86	Deep Groove Ball Bearing	6202-2RS
6	33-2004	Spacer	
7	GB894.2-86	Retaining Ring	20
8	GB894.2-86	Retaining Ring	28
9	33-2006	Gear	
10	33-2007	Gear	
11	GB1096-79	Double Round Head Key	C4×22
12	33-2008	Gear	
13	Q/ZB285-3	Oil Plug	ZG3/8"
14	GB/T276-86	Deep Groove Ball Bearing	6004-2RS
15	33-2027-1	Spacer	
16	33-2027	Bearing Cover	
17	GB70-85	Socket Head Cap Screw	M5×12
18	HG4-692-67	Oil Seal	25×40×7
19	6220-2005	Shaft	
20	GB1096-79	Double Round Head Key	4×145
21	6220-2013	Shaft	
22	6220-2026-1	Spacer	
23	6220-2026	Bearing Cover	
24	GB1096-79	Double Round Head Key	5×18
25	6220-2023	Shaft	
26	6220-2025	Bearing Cover	
27	6220-2025-1	Spacer	
28	6220-2048	Switch Cover	
29	6233-2055	Engaging Arm	
30	GB80-85	Socket Head Set Screw	M6×8
31	LXW5-11G2	Limit Main Switch	
32	GB79-85	Counter Sunk Flat Screw	M5×6
33	GB67-85	Button Head Screw	M4×45
34	6220-2014	Gear	
35	6220-2015	Spacer	
36	6220-2016	Gear	
37	6220-2017	Gear	
38	CM6220-2018	Gear	

No.	Part No.	Name	Specification
39	6220-2019	Sleeve	
40	6220-2020	Gear	
41	6220-2024	Gear	
42	GB896-86	Retaining Ring	15
43	6220-2022	Gear	
44	6220-2040B	Shifting Fork	
45	6220-2037B	Rack	
46	6220-2039B	Shifting Fork	
47	6220-2035B	Rack	
48	GB1235-76	O-Ring	12×1.9
49	6220-2039C	Shifting Fork	
50	6220-2036B	Rack	
51	6220-2038B	Rack	
52	GB79-85	Counter Sunk Flat Screw	M4×16
53	GB6170-86	Hexagon Nut	M4
54	6220-2040C	Shifting Fork	
55	6220-2042	Shaft	
56	6220-2012	Gear	
57	6220-2011	Gear	
58	6220-2010	Gear	
59	GB118-86	Taper Pin With Thread	8×26
60	GB70-85	Socket Head Cap Screw	M8×25
61	6220-2021	Shaft	
62	6220-2009	Shaft	
63	GB1096-79	Double Round Head Key	4×55
64	GB1096-79	Single Round Head Key	5×18
65	GB70-85	Socket Head Cap Screw	M6×16
66	6220-2028	Bracket	
67	6220-2028-1	Spacer	
68	GB9877.1-88	Oil Seal	22×35×7
69	6220-2002	Impute Shaft	
70	GB1096-79	Double Round Head Key	5×5×45
71	GB70-85	Socket Head Cap Screw	M8×65

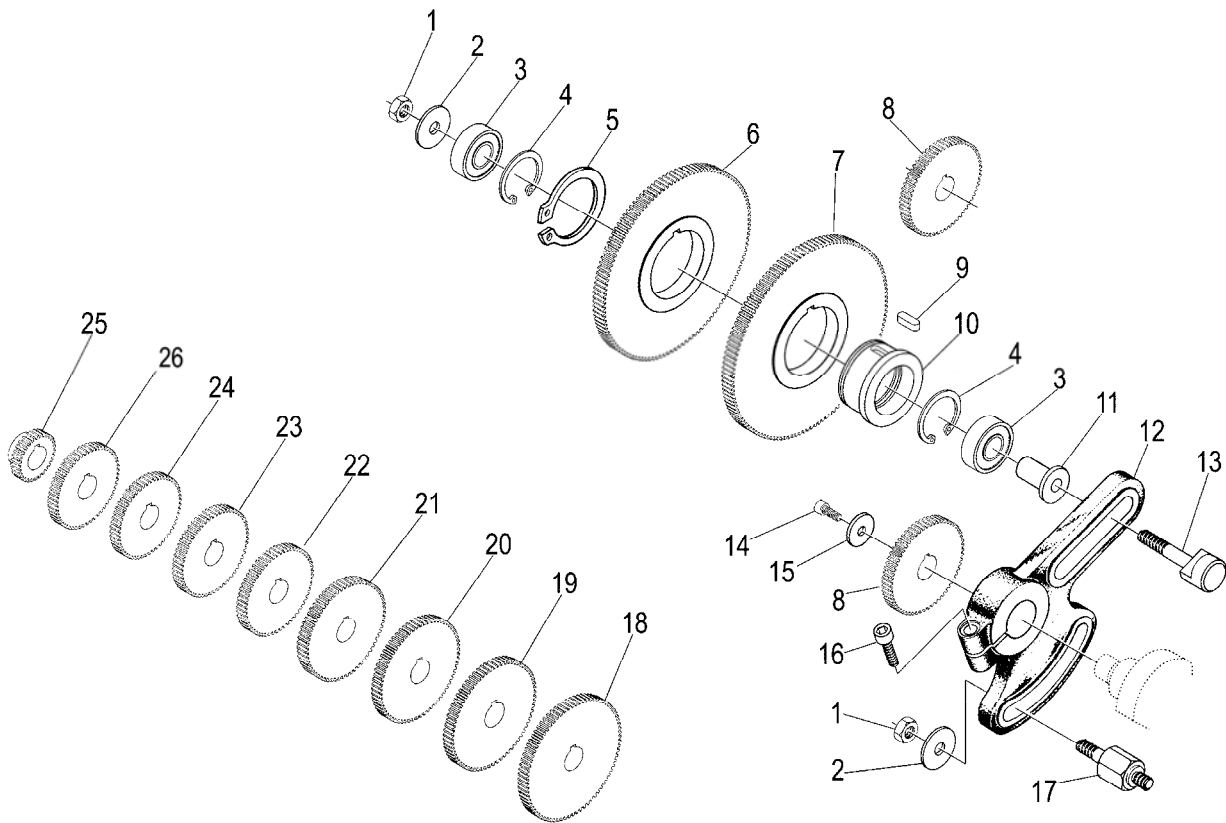
## 13. Gearbox Control (2/3)



No.	Part No.	Name	Specification
1	GB1235-76	O-Ring	10×1.9
2	6220-2049-01	Pinion Shaft	
3	32C-2030-1	Gasket	
4	32C-2030	Cover	
5	GB1160.1-89	Oil Sight Glass	A12
6	32C-2030-2	Plate	
7	RUN6246-101099	Plate	
8	GB80-85	Set Screw	M6×8
9	GB77-85	Set Screw	M8×12
10	GB879-86	Spring Pin	5×40
11	6220-2050	Knob	
12	GB2089-80	Spring	1×5×20
13	GB308-89	Steel Ball	6
14	GB818-85	Cross Recessed Head Screw	M4×8
15	GB70-85	Screw	M5×25
16	GB879-86	Spring Pin	4×30



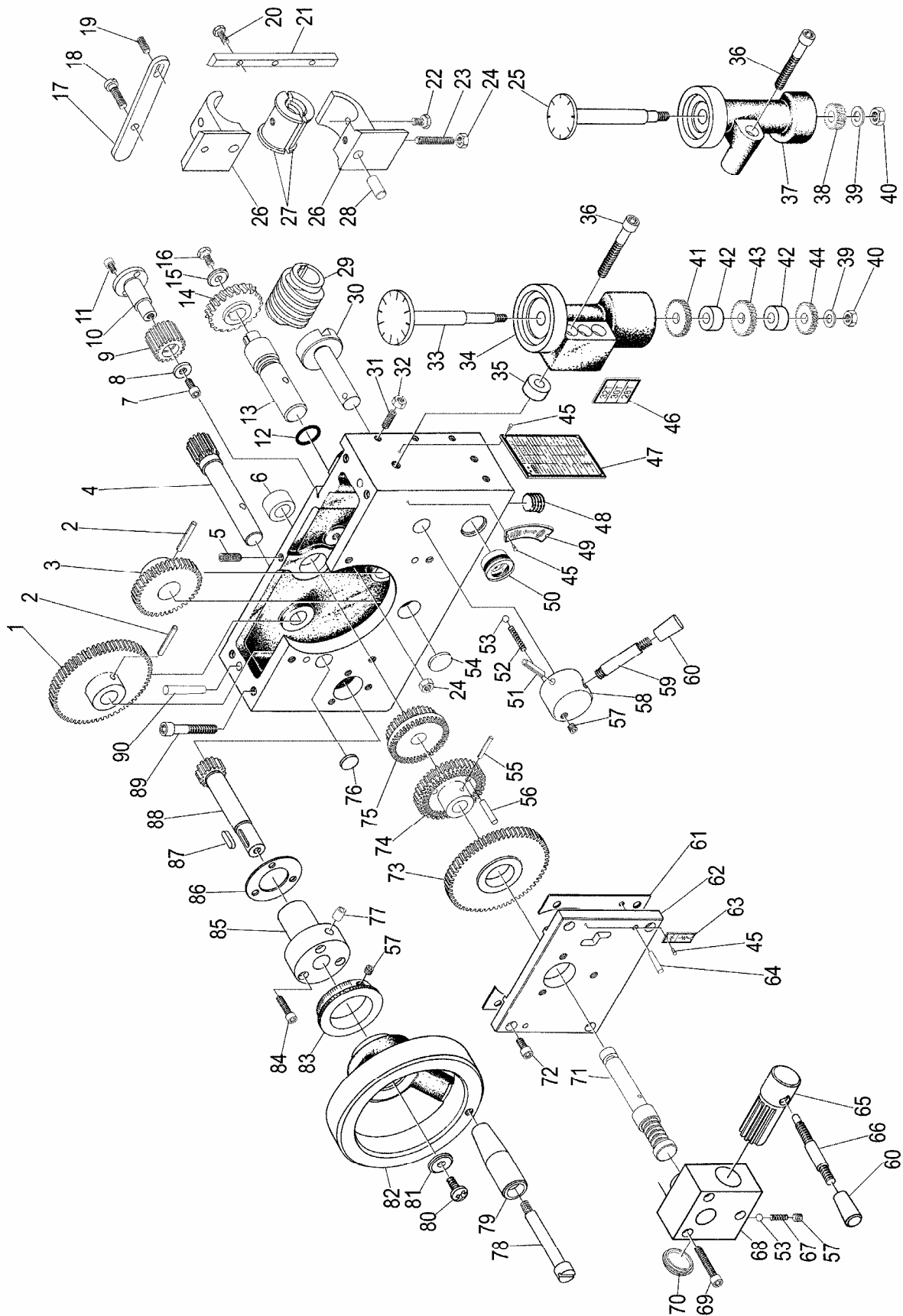
### 13. Gearbox Control (3/3)



No.	Part No.	Name	Specification
1	GB6170-86	Nut	M10
2	32-01222	Sleeve	
3	GB278-89	Bearing	80203
4	GB893.1-87	Retaining Ring	40
5	GB894.1-86	Retaining Ring	55
6	32-05230	Gear	M1.25×120T
7	32-05231	Gear	M1.25×127T
8	CL6232-05-41	Gear	M1.25×60T
9	GB1096-79	Key	6×18
10	33-6027	Bearing Housing	
11	33-6025	Sleeve	
12	32C-05112	Swing Frame	
13	32-05228	Setting Bolt	
14	GB70-85	Socket Hand Cap Screw	M6×15
15	CL6132-05-42	Sleeve	
16	GB70-85	Screw	M8×30
17	33-6029	Clamping Bolt	
18	CL6132A-15-07	Change Gear	M1.25×52T
19	CL6132A-15-05	Change Gear	M1.25×46T

No.	Part No.	Name	Specification
20	CL6132A-15-04	Change Gear	M1.25×44T
21	6220-2053	Change Gear	M1.25×63T
22	6220-2052	Change Gear	M1.25×57T
23	6220-2051	Change Gear	M1.25×56T
24	6220-2057	Change Gear	M1.25×54T
25	32-05242	Change Gear	M1.25×30T
26	CL6132A-15-03	Change Gear	M1.25×40T

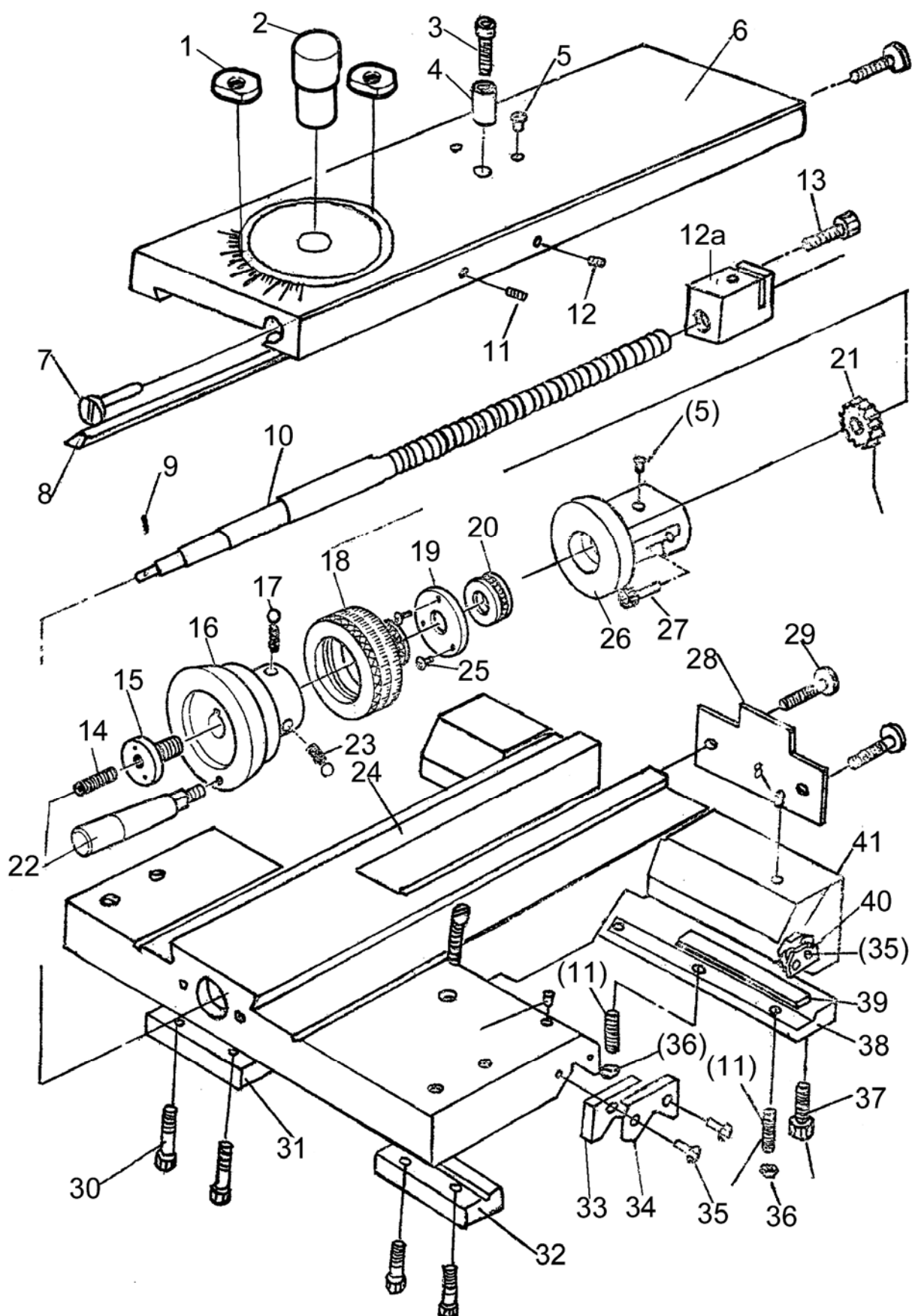
## 14.Apron



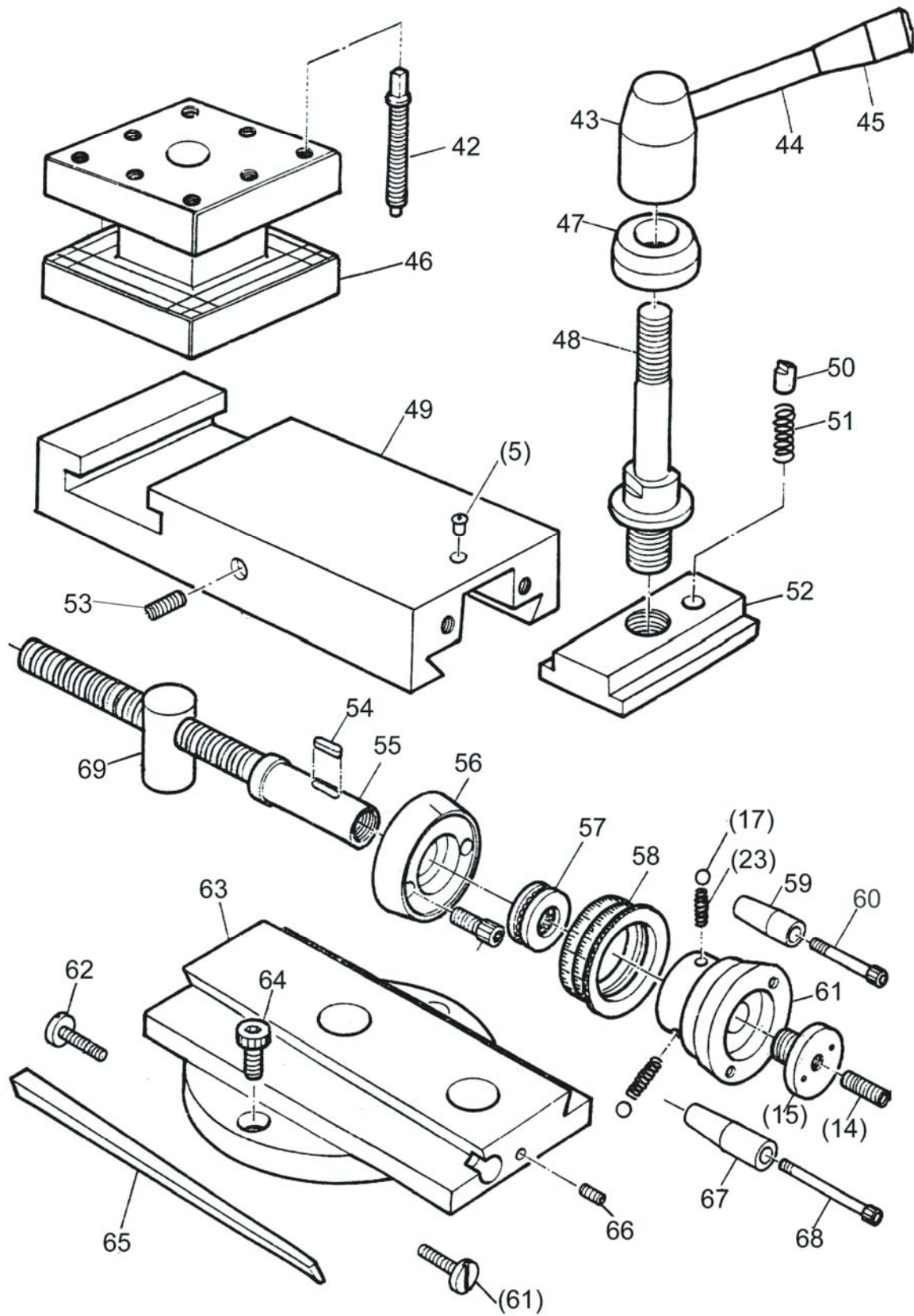
No.	Part No.	Name	Specification
1	33-4012	Gear	M1.5×60T
2	GB879-86	Spring Pin	5×30
3	33-4030	Gear	M1.5×18T
4	33-4010	Pinion Shaft	M1.5×11T
5	GB79-85	Set Screw	M6×16
6	33-4049	Sleeve	
7	GB70-85	Socket Head Cap Screw	M6×12
8	32-06240	Washer	
9	32-06231	Gear	
10	32-06232	Idle Shaft	
11	GB70-85	Socket Head Cap Screw	M5×12
12	GB1255-76	O-Ring	
13	33-4026	Shaft	
14	32-06429	Worm Gear	
15	33-4028	Washer	
16	GB5783-86	Cap Screw	M6×12
17	33-4038	Interlock Piece	
18	33-4051	Screw	
19	GB77-85	Socket Head Set Screw	M6×12
20	GB5783-86	Hexagon Head Screw	M5×20
21	33-4036	Gib	
22	GB5783-86	Hexagon Head Screw	M6×10
23	GB77-85	Socket Head Set Screw	M6×35
24	GB6170-85	Hexagon Nuts	M6
25	33-4040B	Dial Indicator(For Imperial Use)	
26	33-4035	Half Nut Base	
27	33-4035 1/2	Half Nut	
28	GB119-86	Pin	8×16
29	32-06228	Worm	
30	32-06225	Cam Shaft	
31	GB80-85	Socket Head Set Screw	M5×16
32	GB41-86	Hexagon Nut	M5
33	33-4040A	Dial Indicator (For Metric Use)	
34	33-4039A	Thread Dial Body (For Metric Use)	
35	32-06206	Washer	
36	GB70-85	Socket Head Cap Screw	M8×50
37	33-4039B	Thread Dial Body (For Imperial Use)	
38	33-4045A	Helical Gear(For Imperial Use)	
39	GB95-85	Washer	8
40	GB41-86	Hexagon Nut	M8×50
41	33-4043	Helical Gear (For Metric Use)	
42	32-06237	Spacer	
43	33-4042	Helical Gear (For Metric Use)	
44	33-4041	Helical Gear (For Metric Use)	

No.	Part No.	Name	Specification
45	GB827-86	Button Head River	2×5
46	33-4048	Helical Gear Chart	
47	33-4046	Indicator Table	
48	Q/ZG285.3	Drain Plug	1/8"
49	33-4050	Half Nut Indicator	
50	GB1160-89	Oil Sight Glass	A20
51	GB879-86	Spring Pin	5×35
52	Gb2089-80	Compression Spring	
53	GB308-77	Steel Ball	
54	33-4027	Plug	
55	GB879-86	Spring Pin	3×25
56	GB119-85	Pin	C5×25
57	GB77-85	Socket Head Set Screw	M6×6
58	33-4033	Lever Handle	
59	33-4034	Lever	
60	GB1342-73	Knob	M8×40
61	33-4002-1	Spacer	
62	33-4002	Front Cover	
63	33-4047	Feed Direction Indicator	
64	GB117-86	Taper Pin	5×20
65	33-4020	Cam Shaft	
66	33-4022	Change Lever	
67	GB2089-80	Compression Spring	
68	33-4019	Bracket	
69	GB70-85	Socket Head Cap Screw	M6×35
70	CL6132-06-02	Plug	
71	33-4013	Shifting Shaft	
72	GB70-85	Socket Head Cap Screw	M6×16
73	33-4016	Clutch Gear	
74	33-4015	Clutch Gear	
75	33-4014	Clutch Gear	
76	33-4011	Plug	
77	GB1155-79	Ball Cap	
78	33-4008	Bolt	
79	33-4009	Handle	
80	GB818-85	Cross Recessed Head Screw	M6×15
81	33-4007	Washer	
82	33-4005	Handle Wheel	
83	33-4006	Dial	
84	GB70-85	Socket Head Cap Screw	M5×25
85	33-4004	Bracket	
86	33-4004-1	Spacer	
87	GB1096-79	Double Round Head Key	5×5×20
88	33-4003	Gear Shaft	
89	GB70-85	Socket Head Cap Screw	M8×30
90	GB117-85	Taper Pin	8×40

## 15. Cross Slide & Compound (1/2)



## 15. Cross Slide Compound(2/2)

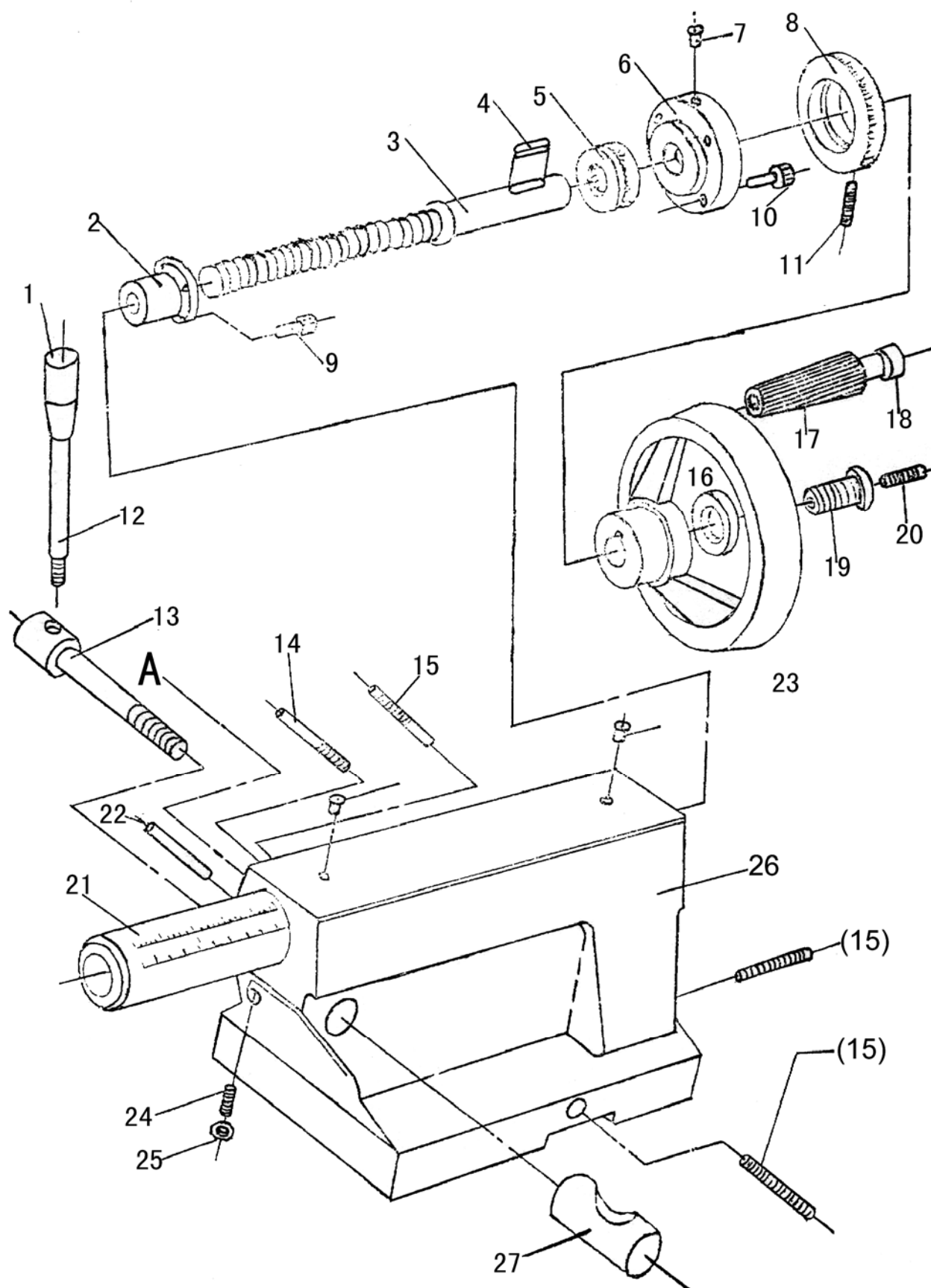


No.	Part No.	Name	Specification
1	CL6132-07-07	Slide	
2	CL6132-07-08	Slide Axis	
3	GB70-85	Screw	M6×16
4	32-07216	Bushing	
5	GB1155-79	Oil Cup	
6	CT32-07-01	Cross Slide	
7	33-3023	Bolt	
8	33-3022	Gib	
9	GB879-86	Pin	3×16
10	32C-07229	Leadscrew	2mm
10	32C-07229a	Leadscrew	2.54mm
11	GB77-85	Screw	6×26
12	GB77-85	Screw	M8×10
12a	32C-07415	Nut	2mm
12a	32C-07415a	Nut	2.54mm
13	GB70-85	Screw	M6×16
14	GB78-85	Screw	M6×25
15	CL6132-08-12	Screw	
16	CL6132-07-16	Handwheel	
17	GB308-84	Bell Steel	6
18	CT32-07222M	Index Ring	2mm
18	32-07222a	Index Ring	2.54mm
19	CL6132-07-18	Cover	
20	GB301-84	Bearing	8102
21	CM6233-3013	Gear	
22	32-07207b	Lever	
23	GB2089-80	Spring	0.7×5×9
24	32-07101	Saddle Casting	
25	GB818-85	Screw	M5×10
26	32-07120	Keep Rack	
27	GB70-85	Screw	M6×25
28	32-07225	Plate	
29	GB823-76	Screw	M8×12
30	GB5783-86	Screw	M8×20
31	32-07123	Strip	
32	32-07141	Front Strip	
33	32-07528	Wiper	
34	32-07227	Plate	
35	GB823-76	Screw	M4×12
36	GB6170-86	Nut	M6
37	GB5783-86	Screw	M8×25

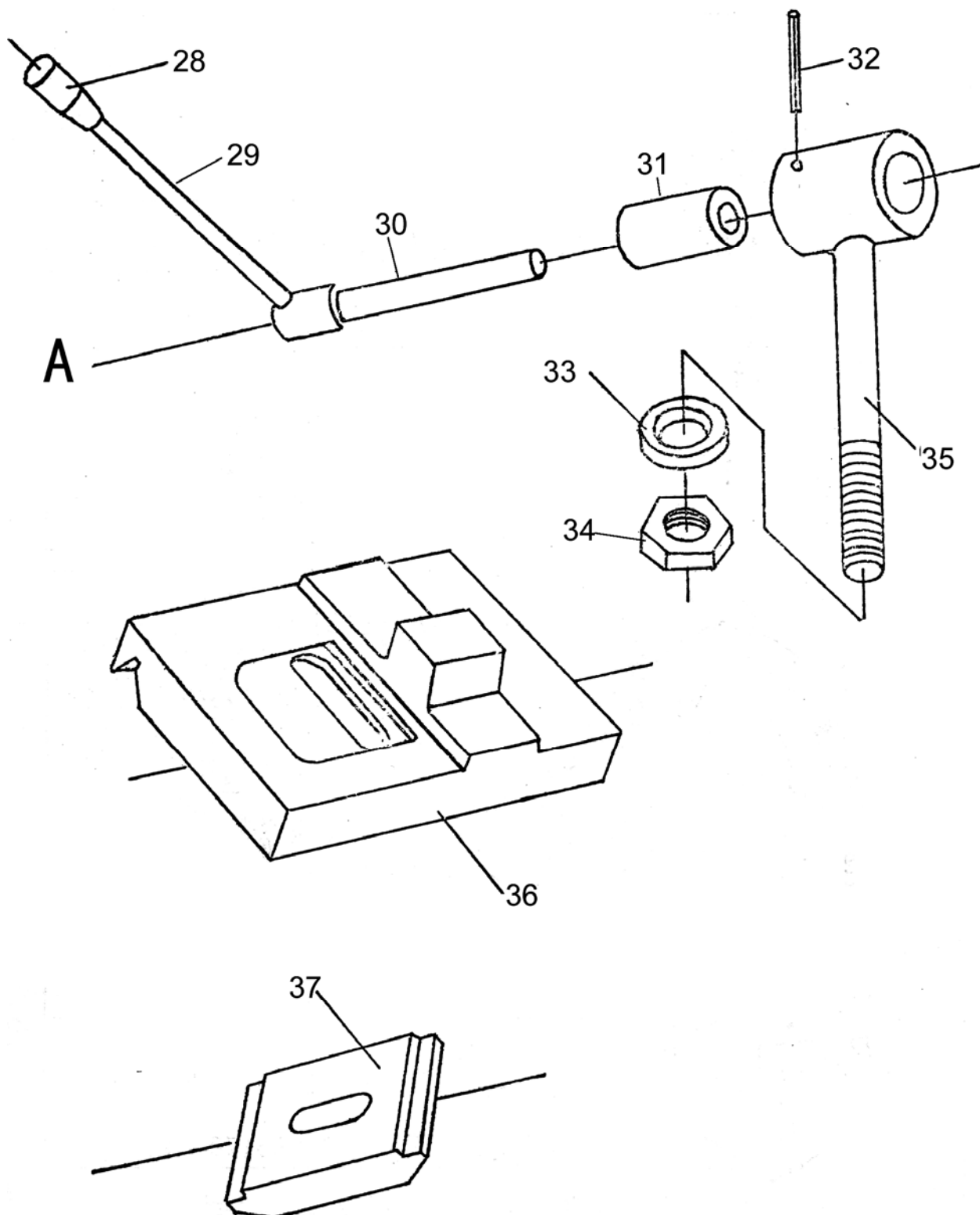


No.	Part No.	Name	Specification
38	32-07132	Strip	
39	32-07239	Strip	
40	32-07224	Plate	
41	32-07526	Wiper	
42	GB83-86	Screw	M10×50
43	GB4141.16-76	Collar	BM16×32
44	CL6132-07-36	Bolt	
45	GB4141.14-76	Collar	M10×50
46	CL6132-07-32	Tool Post (32A)	
46	CL6232-07-32	Tool Post (36A)	
47	CL6132-07-33	Washer	
48	CL6132-07-34	Shaft	
49	CL6132-07-49	Gib (32A)	
49	CL6232-07-49	Gib (36A)	
50	CL6132-07-29	Wiper	
51	GB2089-80	Spring	1×8×11
52	CL6132-07-37	Plate	
53	GB78-85	Screw	M8×20
54	GB1096-79	Key	4×14
55	CL6132A-07-05b	Leadscrew	4mm
55	CL6132-07-40b	Leadscrew	2.54mm
56	CL6132-07-41	Bracket	
57	GB301-84	Bearing	8103
58	CT32-07-09M	Index Ring	4mm
58	CT32-07-09	Index Ring	2.54mm
59	CL6132-07-43	Collar	
60	GB70-85	Screw	M5×25
61	CL6132-07-48	Handwheel	
62	CL6137-07-28	Screw	
63	CL6132-07-11	Swivel Slide (32A)	
63	CL6232-07-11	Swivel Slide (36A)	
64	GB70-85	Screw	M8×16
65	CL6132-07-10	Gib	
66	GB80-85	Screw	M6×16
67	CL6132-07-44	Collar	
68	GB70-85	Screw	M5×40
69	CL6132A-07-04	Nut	4mm
69	CL6132-07-39	Nut	2.54mm

## 16.Tailstock Assembly (1/2)

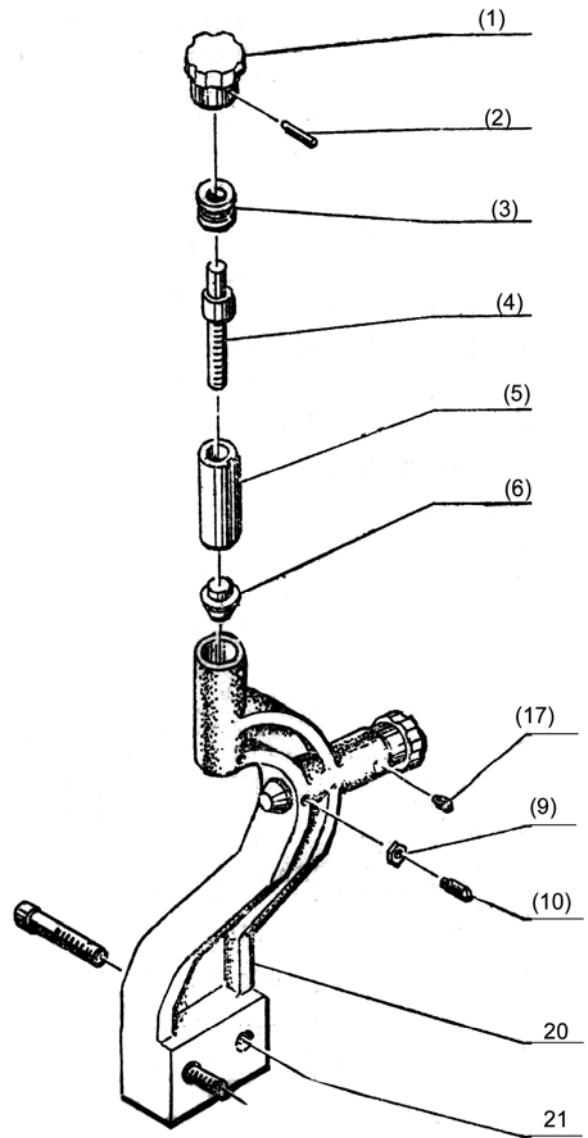
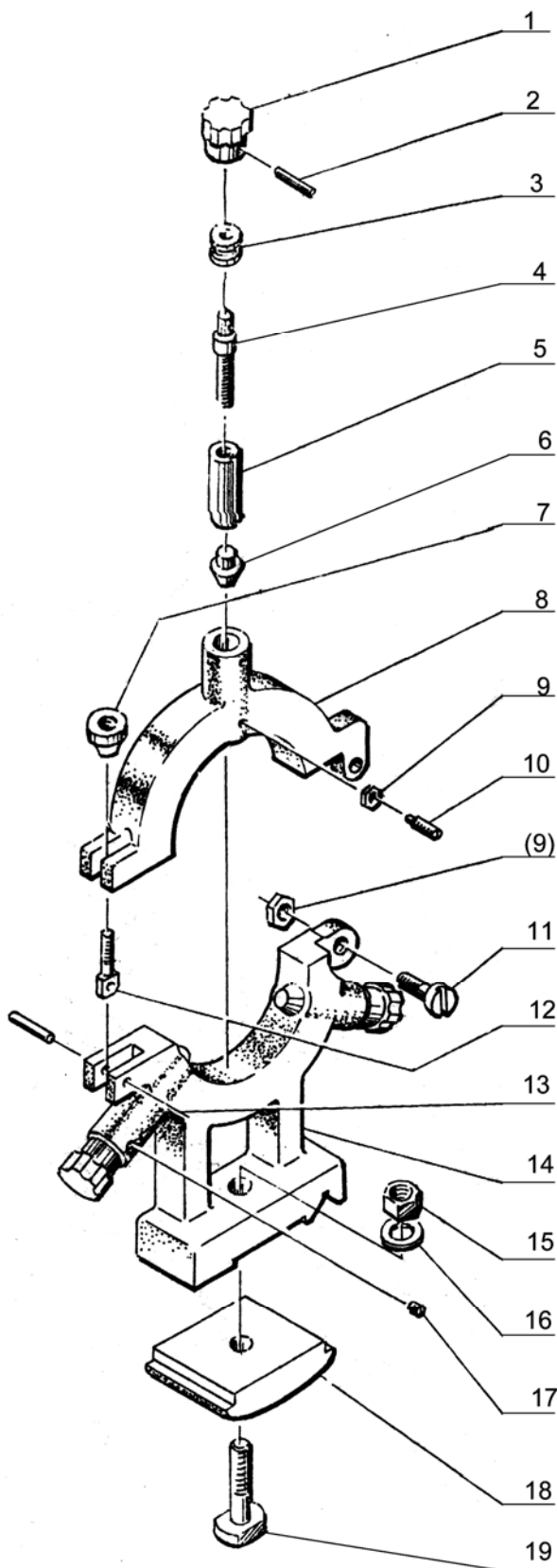


## 16.Tailstock Assembly (2/2)



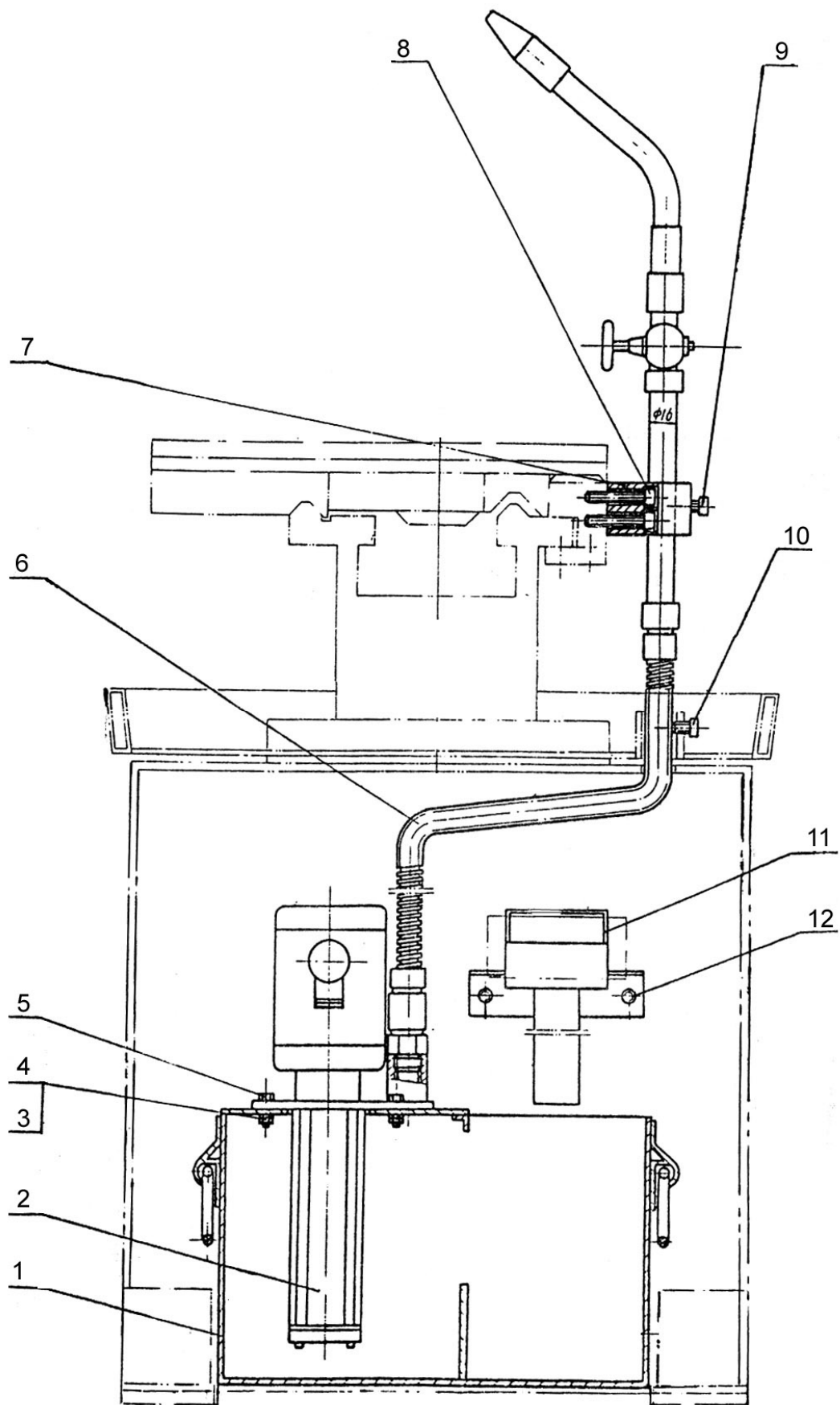
No.	Part No.	Name	Specification
1	JB1342-76	Knob	M8×40
2	32-08401	Nut	
3	32-08203	Screw	
4	GB1096-79	Key	4×15
5	GB301-84	Thrust	8102
6	32-08102	Hanger Cover	
7	GB1155-79	Oil	8
8	32-08402	Index Ring	
9	GB70-85	Screw	M4×10
10	GB70-85	Screw	M6×16
11	GB78-85	Screw	M6×10
12	32-08207	Screw	
13	32-08208	Shaft	
14	32-08209	Screw	
15	GB78-85	Screw	M10×45
16	32-08204	Washer	
17	32-08501	Lever	
18	32-07207b 2/2	Collar	
19	32-07207b 1/2	Screw	
20	GB73-85	Screw	M5×18
21	32-08202	Barrel	
22	32-08209	Screw	
23	32-08103	Handwheel	
24	GB79-85	Screw	M8×35
25	GB6172-86	Nut	M8
26	32-08101	Casting	
27	32-08403	Lock Block	
28	JB1342-76	Knob	M10×50
29	32-08214	Screw	
30	32-08213	Shaft	
31	32-08211	Collar	
32	GB879-86	Pin	5×24
33	GB97.1-86	Washer	B12
34	GB6170-86	Nut	M12
35	32-08212	Screw	
36	32-08105	Base (32A)	
36	36-08105	Base (36A)	
37	32-08104	Clamp Plate	

## 17.Steady & Follow Rest



No.	Part No.	Name	Specification
1	JB1360-76	Knob	32×8
2	GB119-86	Pin	3×18
3	32-10203	Collar	
4	32-10204	Screw	
5	32-10201	Collar	
6	32-10401	Clapping Head	
7	32-10205	Nut	
8	32-10101	Upside Of Center Rest	
9	GB6170-86	Nut	M6
10	GB79-85	Screw	M6×18
11	GB65-85	Screw	M6×30
12	32-10206	Screw	
13	GB879-86	Pin	5×24
14	32-10102	Downside Of Center Rest	(32A)
14	36-10102	Downside Of Center Rest	(36A)
15	GB6170-86	Nut	M12
16	GB97.1-86	Washer	12
17	GB78-85	Screw	M6×6
18	32-10103	Clamp	
19	GB37-85	Screw	M12×65
20	32-10104	Follow Rest (32A)	
20	36-10104	Follow Rest (36A)	
21	GB70-85	Screw	M8×45

## 18.Coolant System



No.	Part No.	Name	Specification
1	32/2-15201	Coolant Ark	
2	AB-12	Coolant Pump	
3	GB6170-86	Nut	M6
4	GB97.1-86	Washer	6
5	GB5783-86	Bolt	M6×15
6	JL15K-400	Coolant Duct	
7	32/2-15101	Casting Cover	
8	GB70-85	Screw	M5×25
9	GB70-85	Screw	M5×16
10	GB70-85	Screw	M5×25
11	32/2-15202	Return pipe	
12	GB67-85	Screw	M6×16